FLORIDA COMMISSION ON HURRICANE LOSS PROJECTION METHODOLOGY

November 2016 Submission

April 12, 2017 Revision

CoreLogic®

Florida Hurricane Model 2017a

A Component of the CoreLogic North Atlantic Hurricane Model in Risk Quantification and Engineering™

Submitted under the 2015 Standards of the FCHLPM

CoreLogic®

Irvine, CA
Oakland, CA
Boulder, CO
Austin, TX
Westlake, TX
Madison, WI
Milwaukee, WI
London, UK
Paris, France

April 12, 2017

Lorilee Medders, Chair
Florida Commission on Hurricane Loss Projection Methodology
c/o Donna Sirmons
Florida State Board of Administration
1801 Hermitage Boulevard, Suite 100
Tallahassee, FL 32308

Dear Lorilee Medders:

I am pleased to inform you that CoreLogic, Inc. is ready for the Commission's review and re-certification of the Florida Hurricane Model component of its Risk Quantification and Engineering™ software for use in Florida. As required by the Commission, enclosed are the data and analyses for the General, Meteorological, Vulnerability, Actuarial, Statistical, and Computer Standards, updated to reflect compliance with the Standards set forth in the Commission's *Report of Activities as of November 1, 2015*. In addition, the CoreLogic Florida Hurricane Model has been reviewed by professionals having credentials and/or experience in the areas of meteorology, engineering, actuarial science, statistics, and computer science, as documented in the signed Expert Certification (Forms G-1 to G-6). We have also completed the Editorial Certification (Form G-7).

The following changes were made to the model between the previously accepted submission (Florida Hurricane Model 2015a) and the current submission (Florida Hurricane Model 2017a):

1. The probabilistic hurricane database has been regenerated to be consistent with the National Hurricane Center's HURDAT2 data set as of June 9, 2015.
2. The storm parameters Rmax, Forward Speed, and Profile Factor have been updated to reflect updates in the HRD HURDAT Reanalysis Project and HURDAT2 data set.
3. The ZIP Code database has been updated to March 2016.
4. Vulnerability functions have been updated as follows: vulnerability functions for appurtenant structures have been updated; post 1994 default manufactured homes have been updated from double-wide to single-wide; ASTM D7158 Class D and Class H shingles have been introduced; and 1996-2002 default masonry structures have been set to unreinforced masonry outside of Miami-Dade and Broward Counties. The user can also explicitly specify masonry structures to be reinforced or unreinforced regardless of year built or location.
5. Structure type assignments provided in the model for the Florida Hurricane Catastrophe Fund Portfolio and unknown structure types have been updated. This update impacts loss costs in Forms A-2, A-3, A-8, S-2, and S-5.
6. Functionality for screened enclosures and high-valued homes has been implemented. This functionality has not been used in the submission.
7. Time element calculations have been updated to account for secondary structural characteristics and year-of-construction.

CoreLogic is confident that its Florida Hurricane Model is in compliance with the Commission's standards and is ready to be reviewed by the Professional Team.

Sincerely,

Justin Brolley

CoreLogic, Inc.
Justin M. Brolley
Senior Principal Research Scientist, Model Development, Insurance and Spatial Solutions

Enclosures:

1. 7 bound copies of the CoreLogic Submission

2. 1 CD (labeled 'FCHLPM – CoreLogic 2015') containing an electronic copy of the CoreLogic Submission (FCHLPM_CoreLogic2015_12April2017.pdf) and the following files:

   - 2015FormM1_CoreLogic_27October2016.xlsx
   - 2015FormM3_CoreLogic_20March2017.xlsx
   - 2015FormV2_CoreLogic_20March2017.xlsx
   - 2015FormA1_CoreLogic_20March2017.xlsx
   - 2015FormA1_CoreLogic_20March2017.pdf
   - 2015FormA2_CoreLogic_20March2017.xlsx
   - 2015FormA3_CoreLogic_20March2017.xlsx
   - 2015FormA3_CoreLogic_20March2017.xlsx
   - 2015FormA5_CoreLogic_20March2017.xlsx
   - 2015FormA7_CoreLogic_20March2017.xlsx
   - 2015FormA8_CoreLogic_20March2017.xlsx

Model Submission Checklist

1. Please indicate by checking below that the following has been included in your submission to the Florida Commission on Hurricane Loss Projection Methodology.

Yes	No	Item
X		1. Letter to the Commission
X		a. Refers to the certification forms and states that professionals having credentials and/or experience in the areas of meteorology, statistics, structural/wind engineering, actuarial science, and computer/information science have reviewed the model for compliance with the standards
X		b. States model is ready to be reviewed by the Professional Team
X		c. Any caveats to the above statements noted with a complete explanation
X		2. Summary statement of compliance with each individual standard and the data and analyses required in the disclosures and forms
X		3. General description of any trade secret information the modeling organization intends to present to the Professional Team and the Commission
X		4. Model Identification
X		5. Seven (7) Bound Copies (duplexed)
X		6. Link emailed to SBA staff containing all required documentation that can be downloaded from a single ZIP file
X		a. Submission text in PDF format
X		b. PDF file supports highlighting and hyperlinking, and is bookmarked by standard, form, and section
X		c. Data file names include abbreviated name of modeling organization, standards year, and form name (when applicable)
	X	d. Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis), if required, in ASCII and PDF format
X		e. Forms M-1 (Annual Occurrence Rates), M-3 (Radius of Maximum Winds and Radii of Standard Wind Thresholds), V-2 (Mitigation Measures – Range of Changes in Damage), A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), A-2 (Base Hurricane Storm Set Statewide Losses), A-3 (2004 Hurricane Season Losses, A-4 (Output Ranges), A-5 (Percentage Change in Output Ranges), A-7 (Percentage Change in Logical Relationship to Risk), and A-8 (Probable Maximum Loss for Florida) in Excel format
X		7. All hyperlinks to the locations of forms are functional
X		8. Table of Contents
X		9. Materials consecutively numbered from beginning to end starting with the first page (including cover) using a single numbering system, including date and time in footnote
X		10. All tables, graphs, and other non-text items consecutively numbered using whole numbers, listed in Table of Contents, and clearly labeled with abbreviations defined
X		11. All column headings shown and repeated at the top of every subsequent page for forms and tables
X		12. Standards, disclosures, and forms in *italics*, modeling organization responses in non-italics
X		13. All graphs and maps conform to guidelines in **II. Notification Requirements A.5.e.**
X		14. All units of measurement clearly identified with appropriate units used
X		15. All forms included in submission document as appendix except Forms V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item) and A-6 (Logical Relationship to Risk, Trade Secret item).
X		16. Hard copy documentation identical to electronic version
X		17. Signed Expert Certification Forms G-1 to G-7
X		18. All acronyms listed and defined in submission appendix

2. Explanation of "No" responses indicated above. (Attach additional pages if needed.)
   Form S-6 was submitted in 2010, and can be made available upon request.

CoreLogic Florida Hurricane Model 2017a	Justin Brolley	Apr. 12, 2017
Model Name	Modeler Signature	Date

Model Identification

Name of Model and Version: CoreLogic Florida Hurricane Model 2017a

Name of Platform: Risk Quantification and Engineering

Name of Modeling Organization: CoreLogic, inc.

Street Address: 555 12th Street, Suite 1100

City, State, ZIP Code: Oakland, CA 94607

Mailing Address, if different from above:

Contact Person: Justin Brolley

Phone Number: (510) 285-3962

E-mail Address: jbrolley@corelogic.com

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- Windows™ is a trademark of Microsoft Corporation.
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General Description of Trade Secret Information (Checklist Item #3)

The following items are trade secret information that will be presented to the Commission and Professional Team:

- Form A-6
- Form V-3
- Additional items identified by the Professional Team during on-site visit and/or additional verification review

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GENERAL STANDARDS

G-1 Scope of the Computer Model and Its Implementation

A. The model shall project loss costs and probable maximum loss levels for damage to residential property from hurricane events.

The model projects loss costs and probable maximum losses for residential property from hurricane events.

For purposes of the Commission's review and determination of acceptability, the loss costs and probable maximum loss levels submitted for this review are expected losses resulting from hurricanes. Wind losses resulting from a hurricane are included even if wind speeds fall below hurricane force. The vulnerability functions are based to a large degree on hurricane claims data, which includes wind speeds above and below the hurricane threshold of 74 mph.

Expected loss costs and probable maximum losses include primary structure, appurtenant structures, contents, other covered personal property, and time element expenses.

B. The modeling organization shall maintain a documented process to assure continual agreement and correct correspondence of databases, data files, and computer source code to slides, technical papers, and/or modeling organization documents.

CoreLogic maintains a documented process to assure continual agreement and correct correspondence of databases, data files, and computer source code, and will have it available to the professional team during the on-site visit.

C. All software and data (1) located within the model, (2) used to validate the model, (3) used to project modeled loss costs and probable maximum loss levels, and (4) used to create forms required by the Commission in the Report of Activities shall fall within the scope of the Computer/Information Standards and shall be located in centralized, model-level file areas.

Model software and data located within the model, used to validate the model, used to project modeled loss costs and probable maximum loss levels, and used to create form required by the Commission in the Report of Activities fall within the scope of the Computer/Information Standards and are located in centralized model-level file areas.

Disclosures

1. *Specify the model version identification. If the model submitted for review is implemented on more than one platform, specify each model platform. Specify which platform is the primary platform and verify any other platforms produce the same model output results or are otherwise functionally equivalent as provided for in the "Process for Determining the Acceptability of a Computer Simulation Model" in VI. Review by the Commission, I. Review and Acceptance Criteria for Functionally Equivalent Model Software Platforms.*

   The CoreLogic Florida Hurricane Model 2017a. The version number is designated by the year of public release. If subsequent model revisions occur, the version numbers would have a letter appended after the year (2017a, 2017b, etc.) The CoreLogic Florida Hurricane Model 2017 is a component of the Risk Quantification and Engineering™ (RQE) platform.

2. *Provide a comprehensive summary of the model. This summary should include a technical description of the model, including each major component of the model used to project residential loss costs and probable maximum loss levels for damage to insured residential property from hurricane events causing damage in Florida. Describe the theoretical basis of the model and include a description of the methodology, particularly the wind components, the vulnerability components, and the insured loss components used in the model. The description should be complete and must not reference unpublished work.*

General description of Risk Quantification and Engineering™

Risk Quantification and Engineering™ (RQE) is CoreLogic's global catastrophe management software, covering over 90 countries and the perils of hurricane / typhoon / cyclone (in Florida and elsewhere), windstorm, winterstorm, tornado, hail, wildfire, earthquake (ground shaking, fire following, sprinkler leakage, workers comp), and flood.

The RQE platform is a networked, multi-user, client server architecture enabling enterprise-wide analysis using centralized and sharable databases. RQE uses a cost efficient industry standard computer infrastructure that can easily expand to meet growing user demand. RQE uses standard PCs for end user 'clients' running ordinary internet browsers. All users are networked to standard Windows based servers which can be configured in scalable clusters to provide higher performance and capacity.

RQE enables insurer and reinsurer analysis of multiple perils for over 90 countries. A single product platform and user interface provides primary, facultative, treaty underwriting and accumulation management capability across all lines of business with aggregation up to the corporate level. RQE also provides underwriters with important information about risk volatility and the impact of writing a new program on available capacity to enable real-time portfolio optimization.

One of the components of RQE is the United States hurricane model, a probabilistic model designed to estimate damage and insured losses due to the occurrence of hurricanes along the 3100 miles of US coastline from Texas to Maine. The Florida Hurricane Model 2017a is a component of the United States hurricane model that applies to the State of Florida. The United States hurricane model estimates the full probabilistic distribution of damage and loss for any scenario storm event. The United States hurricane model calculates Average Annual Damage and Loss estimates, as well as annual probability exceedances using a database of 32,582 stochastic storm simulation results to develop average annual loss rates for each property site. Scenario and average annual damage and losses can be calculated for individual property sites or for entire portfolios of residential and commercial properties.

Scenario storms, derived from HURDAT2, are used to estimate the mean and standard deviation of damage and loss due to a single event. Any of the over 100 years of historical storms contained in the storm database can be selected by users to calculate damage and loss. Damage and loss results for any of the 32,582 stochastic storm simulation results are also available through the event loss table (ELT) reports.

Probabilistic Annual Damage & Loss is computed using the results of 32,582 stochastic storm simulation results. Annual damage and loss estimates are developed for each individual site and aggregated, if desired, to overall portfolio damage and loss amounts. The Florida Hurricane Model's climatological models are based on NOAA (National Oceanic & Atmospheric Administration)/NWS (National Weather Service) Technical Reports. Climatological probability distributions (i.e., for storm parameters) were developed using an Adaptive Kernel Smoothing technique applied to the historical hurricane record published by NOAA.

Overall Model Methodology

The Florida Hurricane Model modeling methodology can be segmented into four components: 1) the Hazard definition, 2) Geocoding of Risk Location, 3) Damage estimate, and 4) Loss estimation.

1. Hazard Definition

The storm database used by the Florida Hurricane Model is a combination of historical and stochastic storms. Wind speed probabilistic distributions are calculated using the probabilistic distributions of all important storm parameters. The storm intensity is driven directly from the coastline-dependent smoothed hurricane landfall maximum wind speed distributions generated from the information in the National Hurricane Center HURDAT2. The distributions for radius of maximum winds and translational speed are derived from NOAA Technical Report NWS 38 [Ho et al. 1987], the Hurricane Research Division's HURDAT Reanalysis Project, HURDAT2, DeMaria's Extended BestTrack, and the National Hurricane Center's Tropical Cyclone Reports and Advisories. A proprietary wind speed equation based upon the NOAA model as published in NWS 23 [Schwerdt, Ho, and Watkins 1979] and NWS 38 [Ho et al. 1987], modified and generalized to properly simulate wind speeds for all SSI categories of storms, computes a central pressure, which is used to apply inland decay [Vickery and Twisdale 1995] and as an input to the determination of the radius of maximum winds for severe storms. The equation then computes wind speeds using the storm's maximum sustained wind speed, the filling rate, radius to maximum winds, the storm track, translation speed, the gust factor [Krayer and Marshall 1992], the storm profile (attenuation of wind speed outward from the center), and the friction caused by local terrain and man-made structures.

2. Geocoding of Risk Location

The Florida Hurricane Model utilizes CoreLogic's Structure-level and Parcel-level Geocoding Engine PxPoint™ to compute the latitude and longitude of each site analyzed. The street address, if provided, is used to geocode to the latitude/longitude coordinates based on the centroid of the structure footprint, the centroid of the parcel, or the street address, as available, in descending order of priority. Failing the presence of a street address, the geocoding can be done at a ZIP Code, City, or County centroid basis. Wind speed distributions at the site locations are computed taking local friction into account.

3. Estimation of Damage

The Florida Hurricane Model provides the facility to define each of the property assets being analyzed in order to compute resulting damage. Damage can be calculated for Buildings, Appurtenant Structures, Contents, Time Element (such as Additional Living Expense (ALE) or Business Interruption (BI)), and up to three additional user defined coverage types. Site information includes the latitude and longitude of the locations, the structure types (96 types), structure details such as number of stories, insured value, cladding type and a class of occupancy type (12 types). Vulnerability functions may be modified by the incorporation of secondary structural components such as roof type, roof strength, roof-wall strength, wall-floor strength, wall-foundation strength, opening protection, and wind-door-skylight strength. Damage is estimated using vulnerability functions associated with the structure definition and occupancy type and the distribution of peak gust wind speeds at each site. The vulnerability functions used by the Florida Hurricane Model have been derived through three methods: empirical data, expert opinion, and engineering analysis [Fujita 1992, McDonald-Mehta Engineers 1993, Simiu and Scanlan 1996].

The probabilistic distribution of damage (for each coverage and site) is derived through the discrete calculations of the probabilistic distribution of wind speeds for the site with the probabilistic distributions of damage for given wind speeds. Damage distributions for each of the sites are aggregated into an overall portfolio distribution of damage.

Since there can be a high degree of damage correlation for similar structure types within a geographic area, The Florida Hurricane Model properly takes into account site and coverage level correlations when aggregating individual site damage into an overall portfolio damage amount.

4. Estimation of Loss

Insurance information in the form of insured values, limits, deductibles and facultative and/or treaty reinsurance are then aggregated, using discrete calculations, with the probabilistic distribution of computed damage for each site to determine the probabilistic distribution of “insured loss” amount. Correlation is properly taken into account when aggregating individual site loss into an overall portfolio loss amount.

Reports

The Florida Hurricane Model produces a vast array of management information, more than 200 reports in all. Report categories include:

<u>Underwriting</u>. TIV and premium can be mapped by geographical segmentation (state, county or ZIP Code) or reported by corporate segmentation (company, division, branch, line of business, policy type, producer, account, policy or site). Profiles of the deductibles and limits in the portfolio can also be displayed.

<u>Scenario Storms</u>. Damage (ground-up effects), gross loss (including deductibles and limits), net loss (including facultative reinsurance) can be reported at all of the levels noted in the underwriting reports. Mean values and an upper bound corresponding to a prescribed non-exceedance level are provided.

<u>Probabilistic</u>. In a manner similar to Scenario Storms, the damage, gross loss, and net loss can be reported, including non-exceedances. Additional reports displaying portfolio damage and loss for different non-exceedance levels, for either annual aggregate or per occurrence analysis methods, are available.

Reinsurance. Scenario and probabilistic results are displayed by reinsurer (including facultative reinsurance) or by treaty. Probabilistic results include the probability of penetrating and exceeding treaty layers.

Landfall Series. An abbreviated set of reports is available from running a series of storms against the portfolio. The series of storms can be either of uniform intensity (as denoted by the SSI scale) or uniform recurrence levels. The storm series can have landfalls at 1, 10 or 35 mile intervals.

Probability Distributions

In many instances, probability distributions have been developed from historical data (e.g., storm parameters such as radius to maximum winds, forward speed, etc.) and vulnerability functions. Goodness-of-fit tests have been used to compare modeled distributions of various parameters with the underlying historical data.

Sensitivity and Uncertainty Analyses

Many sensitivity and uncertainty analyses have been performed in the development of the Florida Hurricane Model. For example, sensitivity analyses have been performed on track spacing; on the number of attack angles given landfall; on the number of wind speed class intervals given landfall and attack angle; and on the number of other storm parameter samples used in the stochastic hurricane database. A number of uncertainty analyses have been performed as well, including studies on the impact of vulnerability uncertainty on the loss exceedance curve.

Software/Hardware - Risk Quantification and Engineering™

The requirements for the Risk Quantification and Engineering™ (RQE) hardware configuration consist of a Master Server and one or more Analysis Servers.

Applications running on the Master Server include the Master database, the Web Server, and the Java Server. CoreLogic processes, including the importing of portfolio data and some analyses also run on the Master Server.

Master database: Contains RQE System tables, customer portfolio data, and final analysis results.

Web Server: Handles communications between the remote Client PCs and communicates with the Java Server.

Java Server: Manages the activities performed on the Master and Analysis Server(s) and the Master and Results Databases.

The Analysis Server houses the Results Database, containing the intermediate results tables, and runs most of the analysis calculations. RQE users access the Master Server via Internet Explorer web browsers commonly installed on the Client PCs. The Client PC may access the system via the LAN or via a WAN/Internet.

Minimum Client Requirements:

- Operating System: Windows 7 or later.
- Processor: 2.4 GHz or higher.
- RAM: 2 GB minimum (4 GB is recommended).
- Microsoft Office 2007 or later (Office is only required if using the spreadsheet import option in RQE).
- Browser: Microsoft Internet Explorer Version 9 or later.
- Monitor: Screen resolution of 1280 by 800 or greater; screen color depth of 256 colors or greater.

Minimum Server Hardware Requirements:
(Master Server and Analysis Server(s))

- Operating System: Windows 2008 R2 Server (SP2), 64 bit OS.
- Processors: 1-Quad Core CPU, 2.66 GHz or higher.
- RAM: 12 GB.
- Hard Drives: Capacity to house eight 146 Gigabyte drives.
- NTFS File System.
- DVD.
- NIC: 1.0 Gigabit.

The model structure is translated to the program structure using Object Oriented Design and Analysis methodology. Physical and abstract entities in the model structure are mapped to objects of the program structure. The interactions between objects are captured using Flowcharts and Event diagrams. Object oriented practices (data encapsulation, abstraction, inheritance and polymorphism) are extensively used to derive the benefits of Object Oriented approach.

Basis for Methodology

The Florida Hurricane Model's climatological models are based on NOAA/NWS Technical Reports [Schwerdt, et. al. (1979); Ho, et. al. (1987)]. Climatological probability distributions (i.e., for storm parameters) were developed using Adaptive Kernel Smoothing [Scott (1992)] applied to the historical hurricane record published by NOAA [Jarvinen, et. al. (1984); Cry (1965)]. The maximum wind speed and overwater wind field modeling was developed from NOAA/NWS equations [Schwerdt, et. al. (1979)], with some empirical adjustment in order to generalize the equations for lower intensity storms. The model uses current scientifically accepted boundary layer methods to convert a marine surface (10-meter 1-minute) windfield to one which incorporates local land friction when over land. The friction factors were developed by weighting and averaging surface roughness within 20 km of a location and within a given directional sector. Vulnerability relationships were developed from several sources, including observed damage relationships in historical storms [Friedman 1972, 1984; numerous Travelers Insurance Company internal memoranda] and engineering studies [McDonald-Mehta (1993)]. The simulation methodology combines several standard techniques including physical modeling [Friedman 1975], Monte Carlo simulation [Metropolis and Ulam (1949)] and Variance Reduction Techniques [Kahn (1950); Rubinstein (1981)]. The evaluation of loss costs and other risk measures is based on standard actuarial theory [Beard, et. al. (1984)].

3. *Provide a flowchart that illustrates interactions among major model components.*

The Florida Hurricane Model is a complex system made up of many components, databases, and data files. The flowcharts, class diagrams, and tables on the following pages summarize the key aspects of the system. These aspects include the representation of physical entities of the hurricane catastrophe domain (e.g. storm, site, portfolio, etc.) as classes and objects within the program (Figure 1); the procedural flow of information and steps within the program (Figure 2); and the exchange of information among various components of the system (e.g. portfolio tables, storm database, results tables, etc.) (Table 1 and Figure 3).

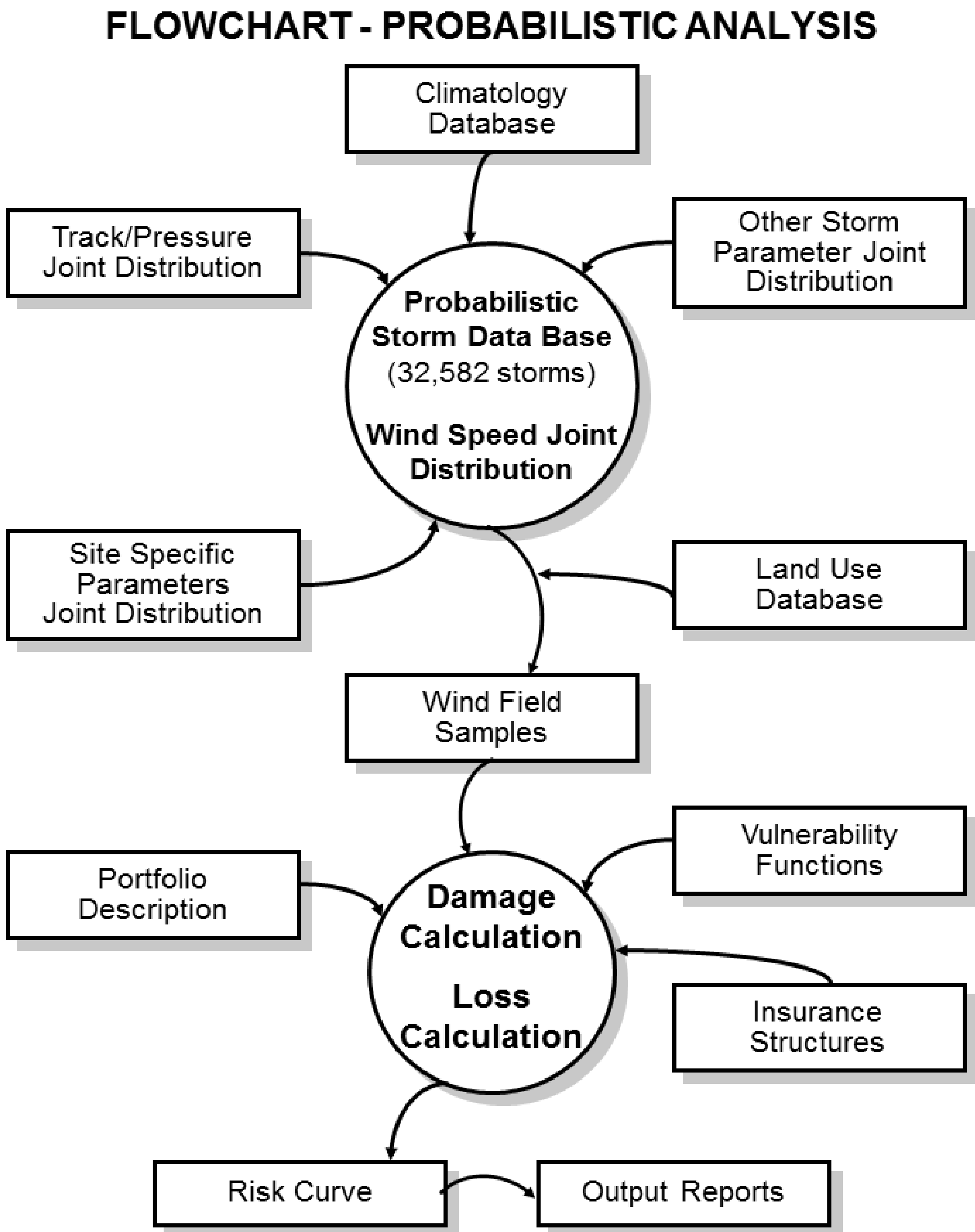


Figure 1. Flowchart – The Florida Hurricane Model Probabilistic Analysis

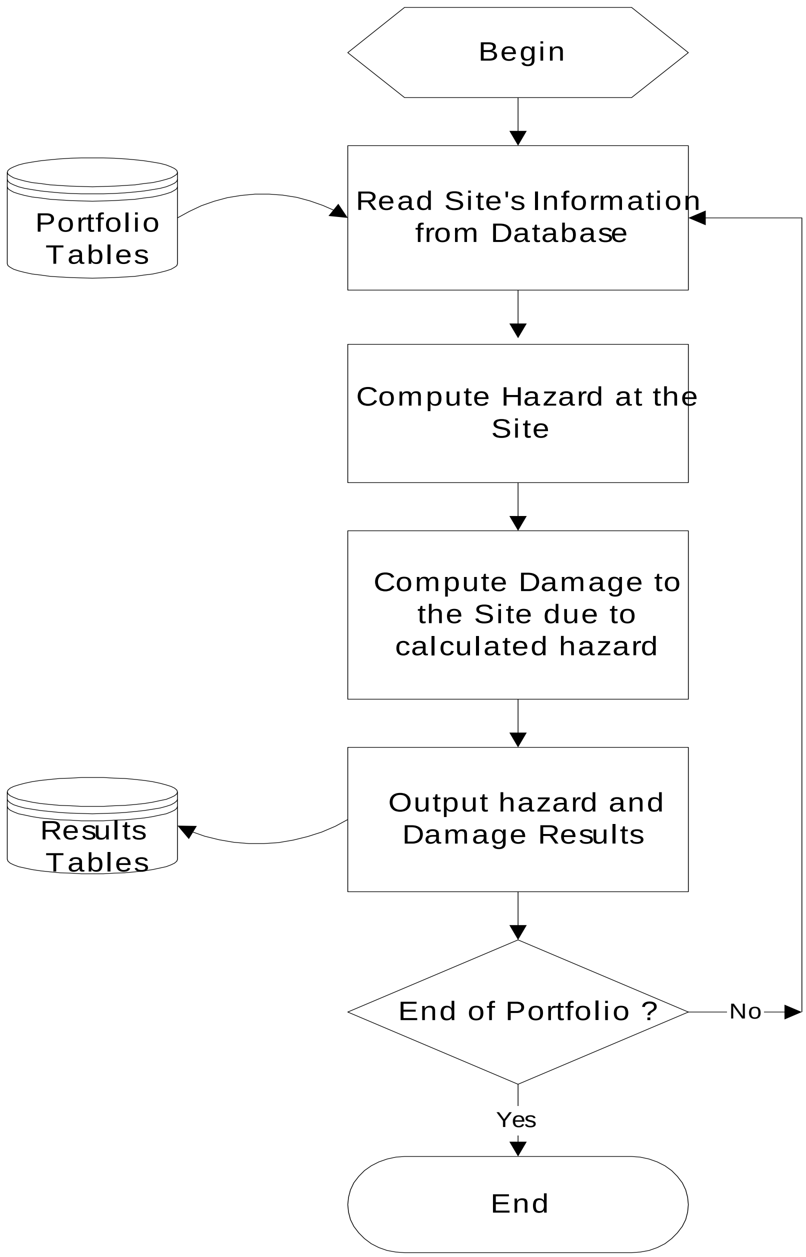
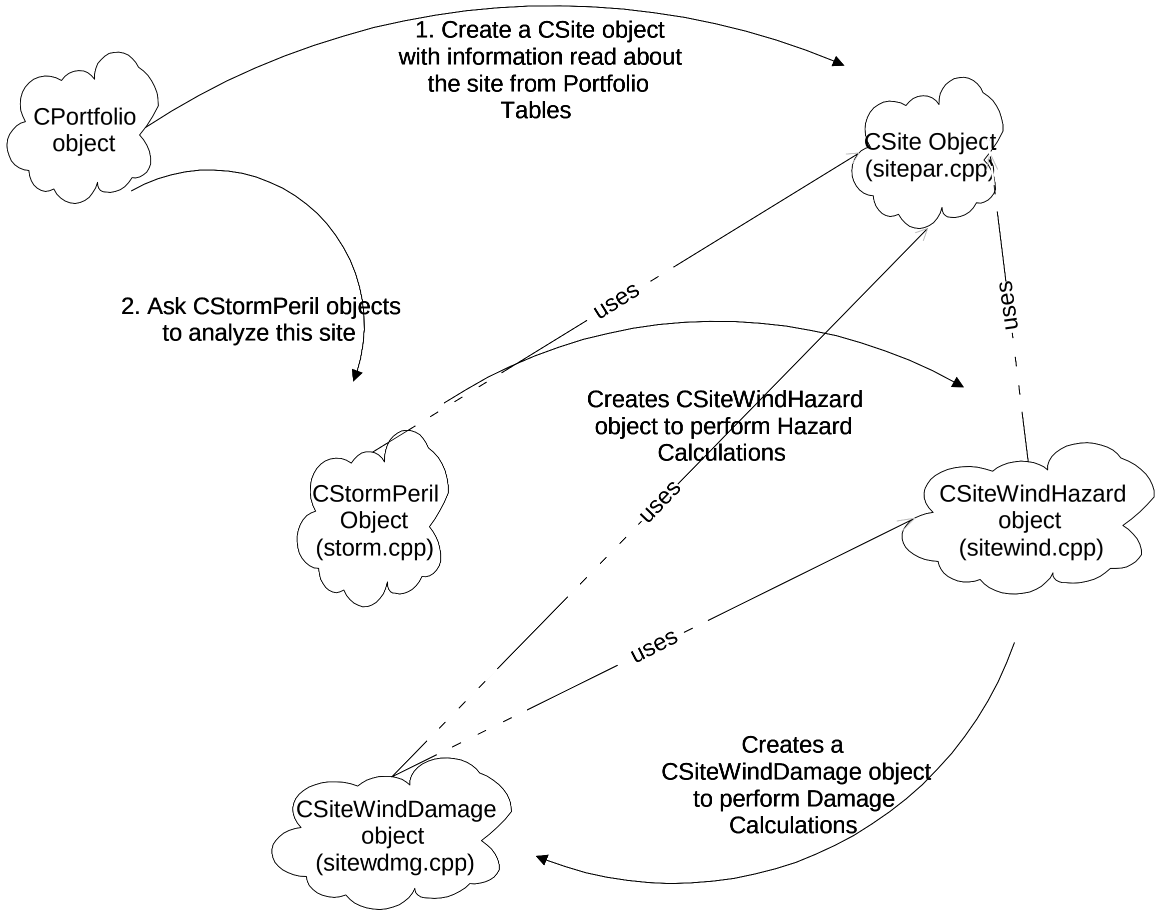


Figure 2. Flowchart – The Florida Hurricane Model Hazard and Damage Calculation Procedure

TABLE 1. KEY CLASSES OF THE FLORIDA HURRICANE MODEL WIND SPEED AND DAMAGE CALCULATION

Class	No. of Instances	Owner(s)	Responsibilities
Cportfolio	Once	Main()	• Principal object that serves as starting point. • Connects to Database. • Opens Input and Output tables. • Performs static initializations (like loading binary files into memory) • Creates CSite objects (one at time) • Creates the Peril objects (CStormPeril) • Analyzes the portfolio using the Peril objects
Csite	Multiple	CPortfolio	• Holds site specific information • Calculates information necessary for performing hazard and damage computations.
CstormPeril	Multiple	CPortfolio	• Represents the Peril • Loads storm information from Database and prepares the storm • Uses CSiteWindHazard object to perform hazard calculations
Cstorm	Multiple	CStormPeril	• Holds the storm information read from Database. • Calculates storm parameters necessary for subsequent computations.
CsiteWindHazard	Once	CStormPeril	• Calculates hazard from a given Storm to a given Site. • Uses CStormPeril, CStorm, CSite objects to perform hazard calculations
CsiteWindDamage	Once	CSiteWindHazard, CStormPeril	• Calculates damage to a site from a given hazard. • Uses CSite, CSiteWindHazard and other objects (e.g. CCoverage for coverage information, CDamage for damage curves, CResult for storing results information etc.)



Object Deployment for Hazard and Damage Calculations

Figure 3. Flowchart - Object Deployment for the Florida Hurricane Model Hazard and Damage Calculations

4. *Provide a comprehensive list of complete references pertinent to the model by standard grouping using professional citation standards.*

List of References:

Meteorology Standards

Beven, Jack, and Hugh D. Cobb, III (2006), “Tropical Cyclone Report Hurricane Ophelia 6-17 September 2005”, National Hurricane Center, January 2006.

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5. *Provide the following information related to changes in the model from the previously accepted model to the initial submission this year:*

A. Model Changes

1. A summary description of changes that affect the personal or commercial residential loss costs or probable maximum loss levels,

The following significant changes were made to the model between the previously accepted submission (CoreLogic/EQECAT Florida Hurricane Model 2015a) and the current submission (CoreLogic Florida Hurricane Model 2017a):

1. The probabilistic hurricane database has been regenerated to be consistent with the National Hurricane Center's HURDAT2 data set as of June 9, 2015

2. The storm parameters Rmax, Forward Speed, and Profile Factor have been updated to reflect updates in the HRD HURDAT Reanalysis Project and HURDAT2 data set.

3. The ZIP Code database has been updated to March 2016.

4. Vulnerability functions have been updated as follows: vulnerability functions for appurtenant structures have been updated; post 1994 default manufactured homes have been updated from double-wide to single-wide; ASTM D7158 Class D and Class H shingles have been introduced; and 1996-2002 default masonry structures have been set to unreinforced masonry outside of Miami-Dade and Broward Counties. The user can also explicitly specify masonry structures to be reinforced or unreinforced regardless of year built or location.

5. Structure type assignments provided in the model for the Florida Hurricane Catastrophe Fund Portfolio and unknown structure types have been updated. This update impacts loss costs in Forms A-2, A-3, A-8, S-2, and S-5.

6. Functionality for screened enclosures and high-valued homes has been implemented. This functionality has not been used in the submission.

7. Time element calculations have been updated to account for secondary structural characteristics and year-of-construction.

2. A list of all other changes, and

Other peril/models have been updated in addition to the Florida Hurricane Model. The other updates include as follows:

- Italy Earthquake Model
- United States Earthquake Model
- United States Flood Model
- ZIP Codes for all states in the United States

3. The rationale for each change.

1. The probabilistic hurricane database has been regenerated to be consistent with the latest available HURDAT2 data set at the time of the initial submission. This update satisfies the requirements set forth in Standards M-1 and M-2.

2. The updates to the storm parameters (Rmax, Forward Speed, and Profile Factor) have been updated to conform to information available in HURDAT2 and other scientifically acceptable sources. HURDAT2 has included landfall information and quadrant wind radii, and this has led to the investigation and updates to forward speed, profile factor, and Rmax. Although the Rmax is not directly available in HURDAT2 itself, HRD provides Rmax for pre-1956 storms. The Rmax for recent storms (since 1988) are available in Extended Best Track. These updates satisfy the requirements set forth in Standards M-1 and M-2.

3. The ZIP Code database has been updated to March 2016. This update satisfies the requirements set forth in Standard G-3.

4. Vulnerability functions have been updated as follows: vulnerability functions for appurtenant structures have been updated; post 1994 default manufactured homes have been updated from double-wide to single-wide; ASTM D7158 Class D and Class H shingles have been introduced; and 1996-2002 default masonry structures have been set to unreinforced masonry outside of Miami-Dade and Broward Counties. The user can also explicitly specify masonry structures to be reinforced or unreinforced regardless of year built or location. These updates satisfy the requirements set forth in Standards V-1 through V-3.

5. Structure type assignments provided in the model for the Florida Hurricane Catastrophe Fund Portfolio and unknown structure types have been updated to reflect newer data and better mapping of FHCF construction types to CoreLogic structures. Examples of updates include revised structure composition for unknown construction types based on newer data for residential and commercial properties in the North and South of Florida, and use of revised mapping for Superior structures with reinforced concrete roofs. This update impacts loss costs in Forms A-2, A-3, A-8, S-2, and S-5.

6. Functionality for screened enclosures and high-valued homes has been implemented. This functionality has not been used in the submission. These features are added to account for these special policies.

7. Time element calculations have been updated to account for secondary structural characteristics and year-of-construction.

B. *Percentage difference in average annual zero deductible statewide loss costs based on the 2012 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file name "hlpm2012c.exe" for:*

1. All changes combined, and

The average annual zero deductible statewide loss cost has increased by 3.7% as a result of all changes combined.

2. *Each individual model component change.*

The average annual zero deductible statewide loss cost has increased by 1.5% as a result of the HURDAT2 update, and has increased by 2.1% as a result of storm parameter updates. In addition, the vulnerability updates have caused an additional 6.7% increase. The functionalities of screened enclosures and high-valued homes have not impacted loss costs for the Florida Hurricane Catastrophe Fund's aggregate exposure. The average annual zero deductible statewide loss cost has decreased by 0.1% as a result of the ZIP Code database update, and the updates to structural mappings have resulted in a 5.8% decrease. The time element update has resulted in a 0.7% decrease.

C. *Color-coded maps by county reflecting the percentage difference in average annual zero deductible statewide loss costs based on the 2012 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "hlpm2012c.exe" for each model component change.*

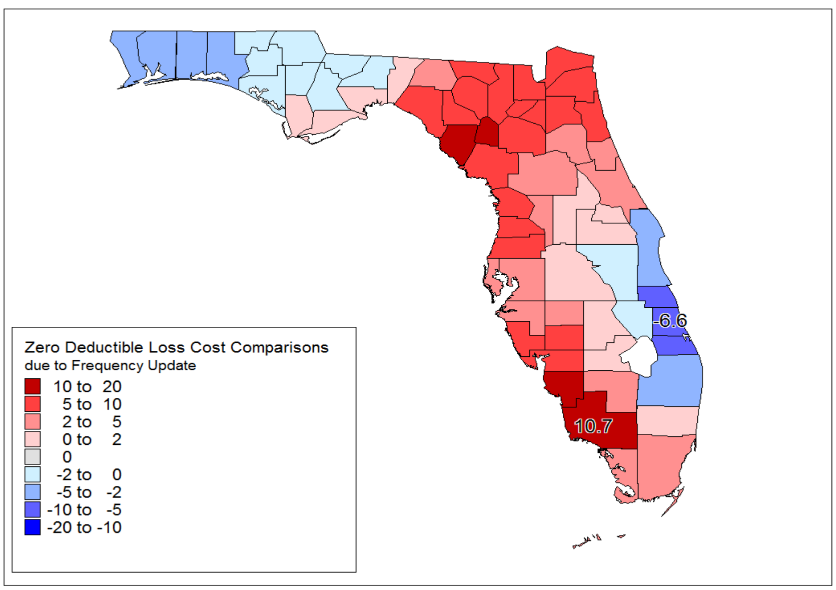

Figure 4. Impact on average annual zero deductible loss costs – Frequency Update

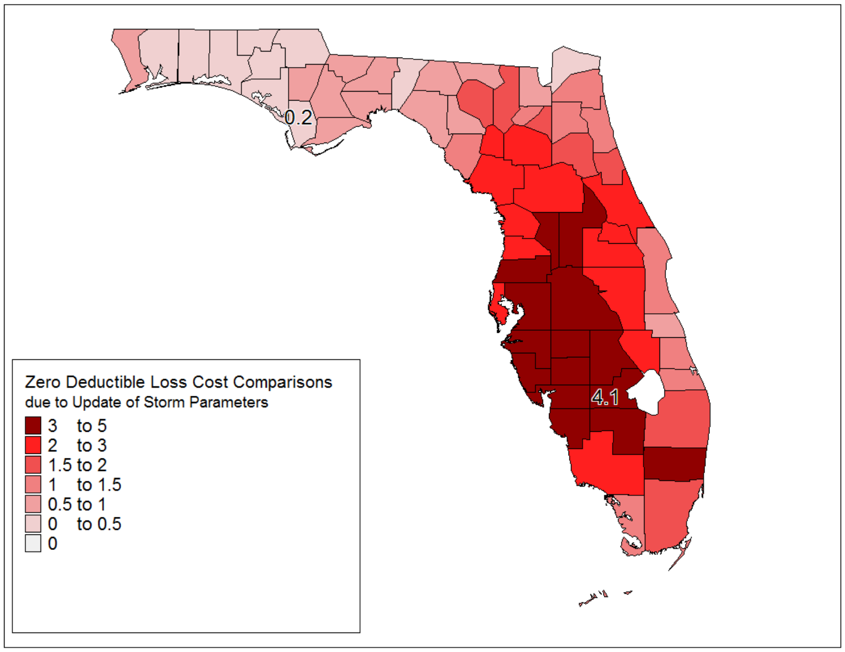

Figure 5. Impact on average annual zero deductible loss costs – Storm Parameter Update

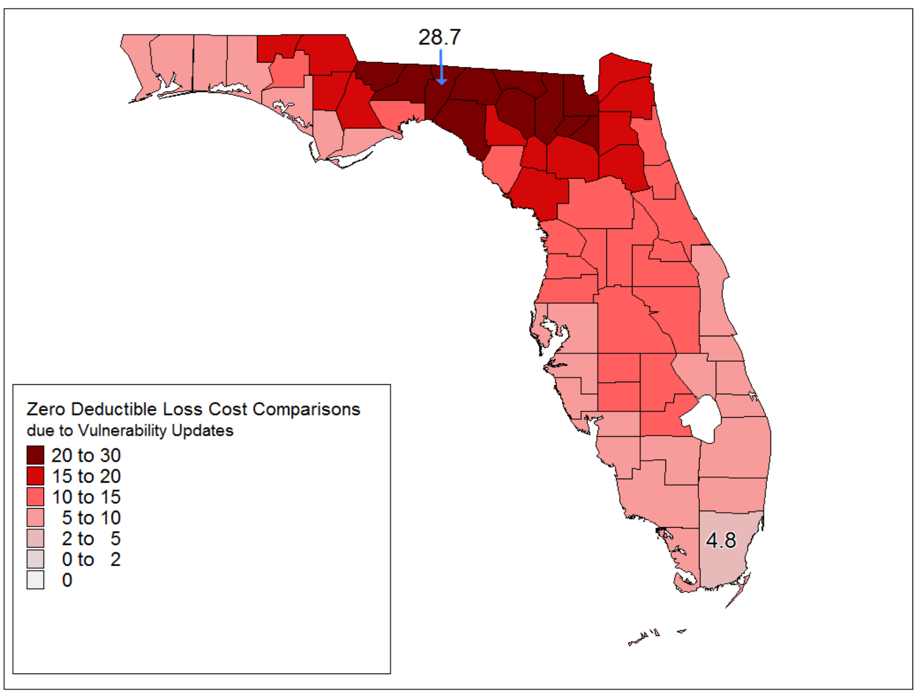

Figure 6. Impact on average annual zero deductible loss costs – Vulnerability Updates

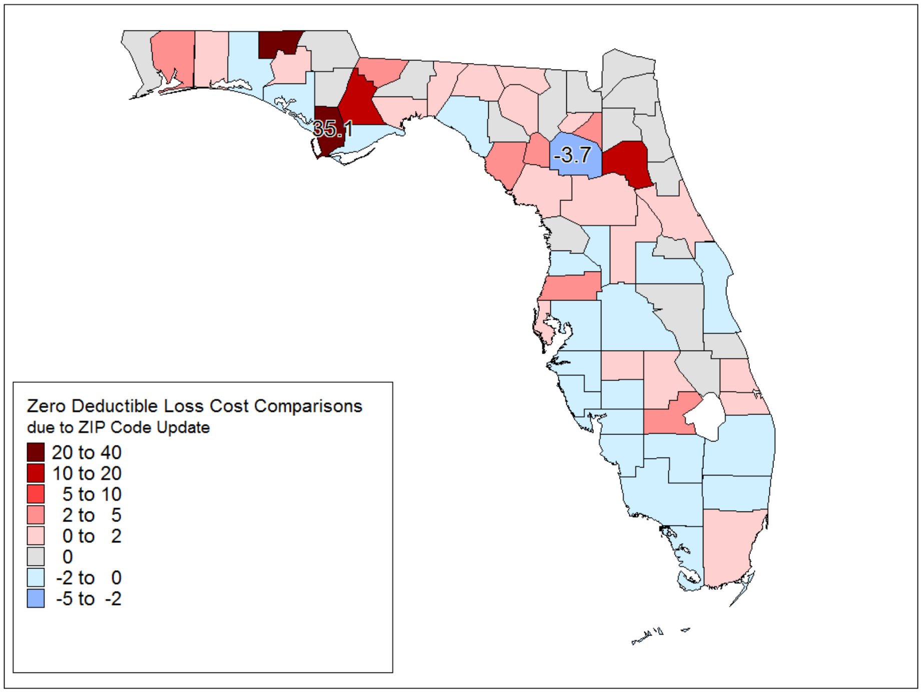

Figure 7. Impact on average annual zero deductible loss costs – ZIP Code Update

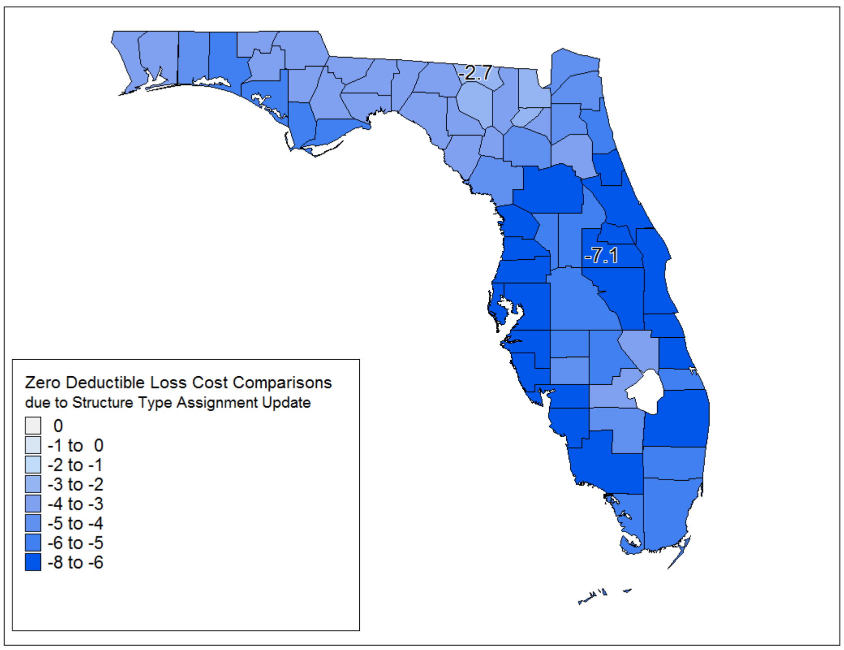

Figure 8. Impact on average annual zero deductible loss costs – Structure Type Assignment Update

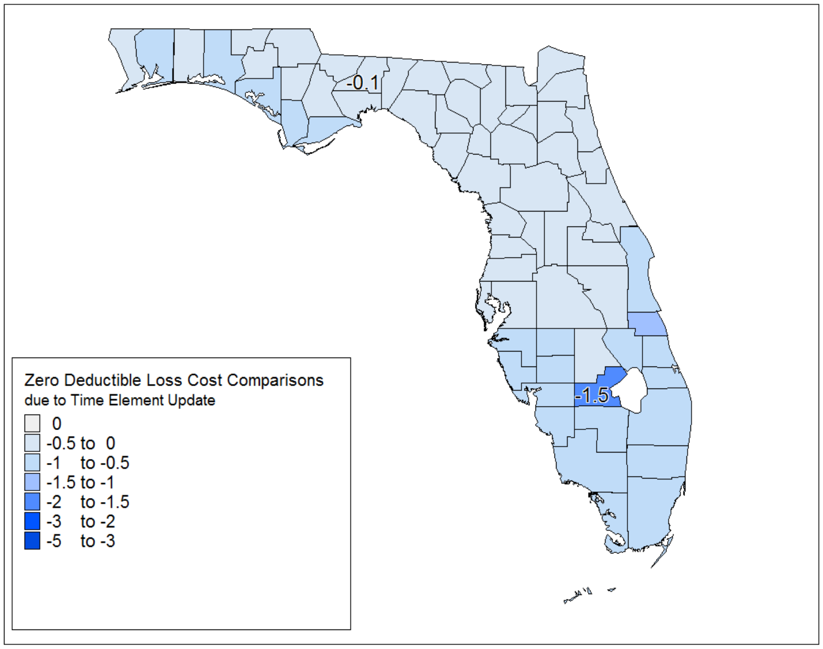

Figure 9. Impact on average annual zero deductible loss costs – Time Element Update

D. *Color-coded map by county reflecting the percentage difference in average annual zero deductible statewide loss costs based on the 2012 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "hlpm2012c.exe" for all model components changed.*

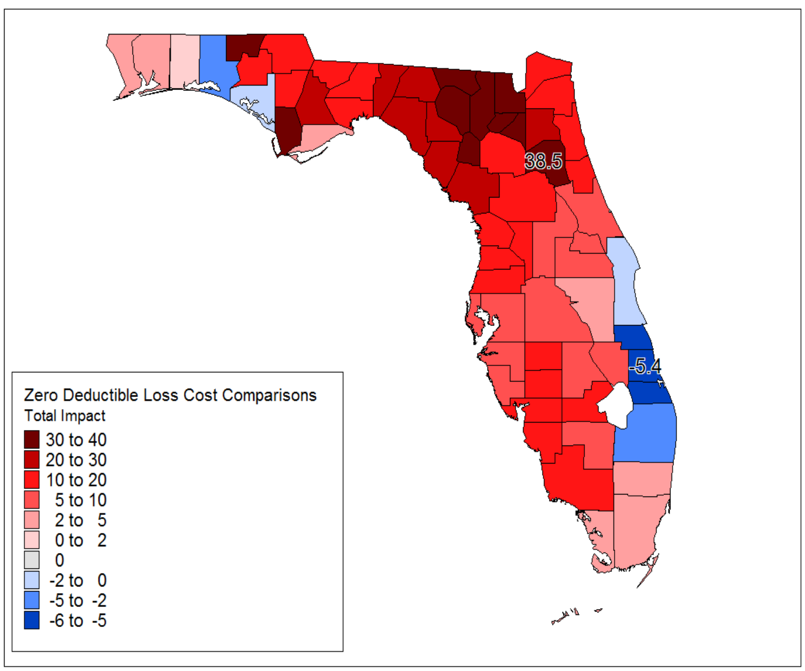

Figure 10. Impact on average annual zero deductible loss costs – All Updates

6. *Provide a list and description of any potential interim updates to underlying data relied upon by the model. State whether the time interval for the update has a possibility of occurring during the period of time the model could be found acceptable by the Commission under the review cycle in this Report of Activities.*

   CoreLogic has no plans for interim updates to the underlying data relied upon by the model during the period of time the model could be found acceptable by the Commission under the review cycle in this Report of Activities.

G-2 Qualifications of Modeling Organization Personnel and Consultants Engaged in Development of the Model

A. Model construction, testing, and evaluation shall be performed by modeling organization personnel or consultants who possess the necessary skills, formal education, or experience to develop the relevant components for hurricane loss projection methodologies.

The model construction, testing, and evaluation was performed by a team of individuals who possess the necessary skills, formal education, and experience to develop hurricane loss projection methodologies, and who abide by the standards of professional conduct adopted by their profession.

B. The model and model submission documentation shall be reviewed by either modeling organization personnel or consultants in the following professional disciplines with requisite experience: structural/wind engineering (licensed Professional Engineer), statistics (advanced degree), actuarial science (Associate or Fellow of Casualty Actuarial Society or Society of Actuaries), meteorology (advanced degree), and computer/information science (advanced degree). These individuals shall certify Forms G-1 through G-6, Expert Certification forms, as applicable.

The model and all modifications to it have been reviewed by modeler personnel or consultants in the following professional disciplines with requisite experience, if relevant: structural/wind engineering (licensed Professional Engineer), statistics (advanced degree), actuarial science (Associate or Fellow of Casualty Actuarial Society or Society of Actuaries), meteorology (advanced degree), and computer/information science (advanced degree). These individuals are signatories on Forms G-1 through G-6 as applicable and abide by the standards of professional conduct if adopted by their profession.

Disclosures

1. *Organization Background*

   A. *Describe the ownership structure of the modeling organization engaged in the development of the model. Describe affiliations with other companies and the nature of the relationship, if any. Indicate if your organization has changed its name and explain the circumstances.*

   CoreLogic, Inc provides data and analytics to its real estate, mortgage finance, insurance, and public sector clients to help them identify and manage growth opportunities, improve business performance, and manage risk.

EQECAT, Inc. is a wholly owned subsidiary of CoreLogic. CoreLogic has acquired EQECAT in December 2013. Due to full integration into CoreLogic in 2016, the name EQECAT is no longer used.

B. *If the model is developed by an entity other than a modeling organization, describe its organizational structure and indicate how proprietary rights and control over the model and its components is exercised. If more than one entity is involved in the development of the model, describe all involved.*

The Florida Hurricane Model is developed by CoreLogic, Inc., a modeling company.

C. *If the model is developed by an entity other than a modeling organization, describe the funding source for the model.*

The Florida Hurricane Model is developed by CoreLogic, Inc., a modeling company.

D. *Describe any services other than hurricane modeling provided by the modeling organization.*

CoreLogic, Inc. provides a complete range of catastrophe management services: portfolio analysis; consulting on product pricing, structure, and underwriting guidelines; training for underwriters and loss control staff on critical structural details; securitization; information on scientific developments and hazard investigations from its own research and via links to key sites on the World Wide Web from the CoreLogic home page; engineering evaluations of major individual risks; assistance with large claims settlements; and hazard modeling software.

CoreLogic provides risk analysis to other perils in the United States and globally including floods (United States and Europe), earthquakes (global), tornado/hail (United States), wildfire (California), winter storm (United States), and wind and sea-surge from non-tropical systems (Europe).

E. *Indicate if the modeling organization has ever been involved directly in litigation or challenged by a governmental authority where the credibility of one of its U.S. hurricane model versions for projection of loss costs or probable maximum loss levels was disputed. Describe the nature of the case and its conclusion.*

CoreLogic has engaged in a review of the model with the Hawaii Insurance Division, which is a requirement for all hurricane loss models to be used in residential rate filings in Hawaii.

In February 2009, CoreLogic (formerly EQECAT) sent a submission of Hawaii Insurance Division Memorandum 2007-2R. This submission is expected to resolve the follow-up questions the Division had with respect to CoreLogic's prior filing of Memorandum 2003-3R. The follow-up questions from the Hawaii Insurance Division were of clarification nature and have no bearing on any aspect of the model applicable to Florida.

2. *Professional Credentials*

A. *Provide in a tabular format (a) the highest degree obtained (discipline and university), (b) employment or consultant status and tenure in years, and (c) relevant experience and responsibilities of individuals involved in acceptability process or in any of the following aspects of the model:*

1. *Meteorology*
2. *Vulnerability*
3. *Actuarial Science*
4. *Statistics*
5. *Computer Science/Information Science*

The tables below summarize the credentials for the individuals involved in the development and maintenance of the Florida Hurricane Model. More detailed credentials for selected personnel are provided in Appendix #7.

1. Meteorology

TABLE 2. PROFESSIONAL CREDENTIALS OF PERSONNEL IN METEOROLOGY

Name	Highest Degree	Employee Since	Relevant Experience
Annes Haseemkunju	Ph.D. Meteorology Cochin University of Science and Technology	2009	Meteorology, hurricane analysis
Justin Brolley	Ph.D. Meteorology Florida State University	2007	Meteorology, hurricane analysis
Mahmoud Khater	Ph.D. Structural Engineering Cornell University	1988	Model design, probabilistic analysis
Fan Lei	M.S. Meteorology University of Maryland	2007	Meteorology
David Smith	M.S. Geophysics Yale University	1994	Meteorology, hurricane analysis
Jingyun Wang	Ph.D. Atmospheric Science Boston University	2007	Meteorology

2. Vulnerability

TABLE 3. PROFESSIONAL CREDENTIALS OF PERSONNEL IN CIVIL ENGINEERING

Name	Highest Degree	Employee Since	Relevant Experience
James R. (Bob) Bailey	Ph.D. Civil Engineering Texas Tech University	Consultant	Wind engineering
Omar Khemici	Ph.D. Civil Engineering Stanford University	1990	Structural engineering
Amanuel Tecle	Ph.D. Civil and Environmental Engineering Florida International University	2012	Structural engineering

3. Actuarial Science

TABLE 4. PROFESSIONAL CREDENTIALS OF PERSONNEL IN ACTUARIAL SCIENCES

Name	Highest Degree	Employee Since	Relevant Experience
Howard Kunst, FCAS, MAAA	B.S. Mathematics University of Wisconsin – Stevens Point	2012	Actuarial science

4. Statistics

TABLE 5. PROFESSIONAL CREDENTIALS OF PERSONNEL IN STATISTICS

Name	Highest Degree	Employee Since	Relevant Experience
James Johnson	Ph.D. Civil Engineering University of Illinois	Consultant	Probabilistic analysis
Mahmoud Khater	Ph.D. Structural Engineering Cornell University	1988	Model design, probabilistic analysis
Ilyes Meftah	M.S. Probability and Statistics, University Pierre and Marie Curie - Paris	2012	Probabilistic Analysis, Pricing
David Smith	M.S. Geophysics Yale University	1994	Model design, probabilistic analysis

5. Computer/Information Science

TABLE 6. PROFESSIONAL CREDENTIALS OF PERSONNEL IN COMPUTER/INFORMATION SCIENCES

Name	Highest Degree	Employee Since	Relevant Experience
Branimir Betov	M.S. Electrical Engineering Technical University of Sofia, Bulgaria	1998	Software development
Binu John	M.S. Computer Science Bharathiar University	2012	Software development
Kent David	M.S. Structural Analysis and Design University of California, Berkeley	1987	Software quality assurance
Aarti Desai	M.B.A. University of Missouri, St. Louis	2007	Product management
Rodney Griffin	BSc - Computer Science - University of South Africa	2012	Product management
Ray Kincaid	M.B.A. Pepperdine University	1985	Software development
Tom Larsen	M. Eng. Structural Engineering University of California, Berkeley	1989	Model design, software development, software product management
Jason Mok	B.S. Computer Engineering San Jose State University	2006	Software development
Jonathan Moss	B.A. Mathematics St. Norbert College	2012	Software development
Sergey Pasternak	B.S. Electrical Engineering Petrochemical and Gas Industry Institute, Moscow, Russia	1995	Software development
David Smith	M.S. Geophysics Yale University	1994	Model design, software development

B. *Identify any new employees or consultants (since the previous submission) engaged in the development of the model or the acceptability process.*

Howard Kunst, CoreLogic's Actuary, has become involved in the Florida Hurricane Model development, document submission, and review for the first time in 2016.

6. *Provide visual business workflow documentation connecting all personnel related to model design, testing, execution, maintenance, and decision-making.*

See Figure 11 below.

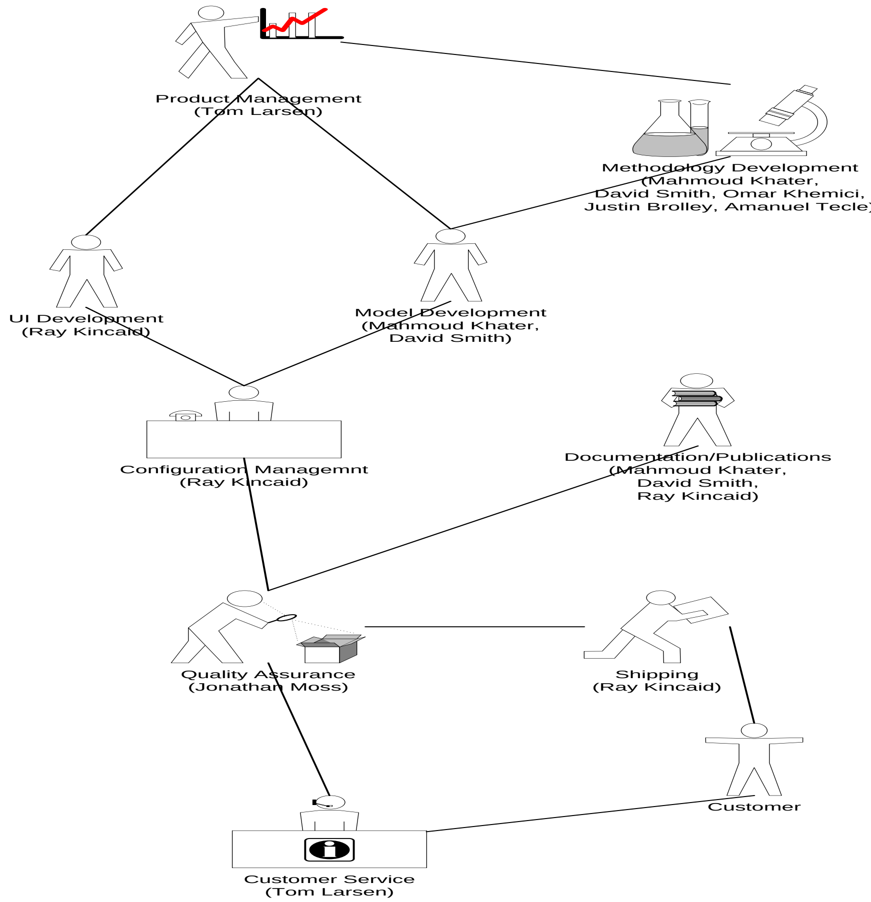

Figure 11. Business Workflow Diagram

3. *Independent Peer Review*

   A. *Provide reviewer names and dates of external independent peer reviews that have been performed on the following components as currently functioning in the model:*

      1. *Meteorology*
      2. *Vulnerability*
      3. *Actuarial Science*
      4. *Statistics*
      5. *Computer/Information Science*

1. Meteorology

Professor Robert Tuleya performed a review of the hurricane windfield model in February 2011. His comments included the following: “I reviewed the EQECAT [now CoreLogic] revised wind field model. The review was composed of several presentations by EQECAT [now CoreLogic], review of several scientific references as well as fruitful discussion between EQECAT [now CoreLogic] and myself. This model is a parametric model, which estimates the evolution of the inland surface wind field given the values of several parameters describing the low-level wind field just off shore. The model uses as observed input the storm intensity, radial extent of winds and the storm track. It also assumes a standard filling rate as the storm progresses inland. The EQECAT [now CoreLogic] model uses a sophisticated high resolution land use field to diagnose the effect of upwind roughness effects accurately. The terrain roughness was shown to have a dual role of reducing the damaging wind field due to frictional retardation but also to a lesser extent increasing the possible wind effects by contributing to a larger gust factor with increasing roughness. The presentation indicated realistic wind behavior for an incoming storm making landfall. The time evolution of the EQECAT [now CoreLogic] model was quite similar to more sophisticated 3-D NWP operational and research models, lending credibility to their model product. EQECAT [now CoreLogic] also showed comparisons and verification to observed surface wind field as well. The model has a deviational component to account for statistical variation in results. This estimate appears to be handled well, with the model for the most part, verifying well compared to observations. Overall, I believe the EQECAT [now CoreLogic] revised model should model observed landfall wind evolution quite well for both individual storms as well as for estimating a climatological group of storms."

2. Statistics

Dr. C. Allin Cornell and Dr. Richard Mensing reviewed the overall methodology and technical approach in 1995. Their comments were as follows: Cornell - suggested we make the procedure more transparent in order to facilitate communication and learning by the users - "simple, brute force Monte Carlo simulation is about as straight-forward as you can be... but you are doing something smarter and hence more difficult to grasp." Further suggestions were for a thorough sensitivity study and ideas for the treatment of uncertainty. Mensing - "Overall, I believe the methodology represents a very good approach to a probabilistic analysis of the damages and losses associated with hurricanes." His suggestions were to review the treatment of uncertainty and verify the adequacy of the portfolio input data. Additional studies were done to address these issues prior to the release of the Florida Hurricane Model.

3. Vulnerability

Dr. Kishor Mehta, Dr. James McDonald, and Dr. C. Allin Cornell performed independent reviews of the vulnerability model in 1995. Professor S. Narasimhan performed an independent review of the residential timber and masonry vulnerability functions in 2013.

4. Actuarial Science

Discussed in conjunction with Statistics above.

5. Computer/Information Science

Dr. Gamil Serag Eldin and Dr. Kashif Ali performed independent reviews of the computer science aspects of the model in 2013.

B. *Provide documentation of independent peer reviews directly relevant to the modeling organization's responses to the current standards, disclosures, or forms. Identify any unresolved or outstanding issues as a result of these reviews.*

Refer to Appendix #8 for documentation. There are no unresolved or outstanding issues resulting from the reviews.

C. *Describe the nature of any on-going or functional relationship the organization has with any of the persons performing the independent peer reviews.*

Dr. Cornell has also done a peer review on our USQUAKE model. Dr. Mensing was a full-time employee of CoreLogic for several years, although he was an independent consultant at the time he performed the review described above. Drs. Cornell and Mensing and Professor Tuleya were compensated for their time by CoreLogic.

4. *Provide a completed Form G-1, General Standards Expert Certification. Provide a link to the location of the form [insert hyperlink here].*

See Form G-1 at Appendix #1.

5. *Provide a completed Form G-2, Meteorological Standards Expert Certification. Provide a link to the location of the form [insert hyperlink here].*

See Form G-2 at Appendix #1.

6. *Provide a completed Form G-3, Statistics Standards Expert Certification. Provide a link to the location of the form [insert hyperlink here].*

See Form G-3 at Appendix #1.

7. *Provide a completed Form G-4, Vulnerability Standards Expert Certification. Provide a link to the location of the form [insert hyperlink here].*

See Form G-4 at Appendix #1.

8. *Provide a completed Form G-5, Actuarial Standards Expert Certification. Provide a link to the location of the form [insert hyperlink here].*

See Form G-5 at Appendix #1.

9. *Provide a completed Form G-6, Computer/Information Standards Expert Certification. Provide a link to the location of the form [insert hyperlink here].*

See Form G-6 at Appendix #1.

G-3 Insured Exposure Location

A. *ZIP Codes used in the model shall not differ from the United States Postal Service publication date by more than 24 months at the date of submission of the model. ZIP Code information shall originate from the United States Postal Service.*

The Florida Hurricane Model ZIP Code database was updated in October 2016, based on information originating from the United States Postal Service current as of March 2016.

B. *ZIP Code centroids, when used in the model, shall be based on population data.*

The ZIP Code centroids used in the Florida Hurricane Model are derived using population.

C. *ZIP Code information purchased by the modeling organization shall be verified by the modeling organization for accuracy and appropriateness.*

CoreLogic verifies each new ZIP Code database through a suite of procedures, including automated numeric tests and visual tests.

D. *If any hazard or any model vulnerability components are dependent on ZIP Code databases, the modeling organization shall maintain a logical process for ensuring these components are consistent with the recent ZIP Code database updates.*

CoreLogic has a logical process that maintains and ensures the consistency between the ZIP Code database updates and the hazard and vulnerability components.

E. *Geocoding methodology shall be justified.*

CoreLogic geocoding methodology is justified.

Disclosures

1. *List the current ZIP Code databases used by the model and the model components to which they relate. Provide the effective (official United States Postal Service) date corresponding to the ZIP Code databases.*

The Florida Hurricane Model uses 5-Digit ZIP Code from the HERE Corporation. The ZIP Code data is created using a combination of HERE data, the United States Postal Service (USPS) ZIP+4 Data File, the USPS National 5-Digit ZIP Code and Post Office Directory, USPS ZIP+4 State Directories, and the USPS City State File.

The ZIP Code data is used in the import component of the model.

The effective date of the ZIP Code data is March 2016.

2. *Describe in detail how invalid ZIP Codes are handled.*

Invalid ZIP Codes in input data are generated from many sources, including (a) typographical errors in the insurers' data, (b) usage of mailing address instead of site address, or (c) usage of an out of date ZIP Code. The Florida Hurricane Model's program attempts to locate any invalid sites to the most refined level possible, the data quality permitting. At the end of the 'geocoding' process, the Florida Hurricane Model echoes the status of the quality of the data, indicating how many locations were mapped to the street address level, to ZIP Code centroids, city centroids, and to county centroids.

In addition, if users are uncertain of the quality of street address information, they can enter latitude and longitude coordinates.

The steps in the geocoding process are as follows:

1. If the street address is available, the program attempts to geocode the location to its exact location, to within approximately 400 feet in most urban areas.

2. If the program was unable to calculate the exact street location, the program looks at the site ZIP Code. If the input ZIP Code exactly matches a ZIP Code in our database, the geocoding stops.

3. If the exact ZIP Code was not matched, the program then looks through the database of 'point' ZIP Codes. Point ZIP Codes indicate Post Office boxes or private entities who desire their own ZIP Code. The location of these point ZIP Codes is provided by the US Government. For displaying maps of exposure and losses, these ZIP Codes are also 'mapped' to regional ZIP Codes which correspond to the ZIP Code area which the point ZIP Code is in.

4. If the location is still not found, the program next looks at the city name in the input data. If the city name was included in the input data, and the city name is in the Florida Hurricane Model's databases, then the location is geocoded to a city centroid, and the geocoding summary is updated to indicate this.

5. If the location is still not found, the program next looks at the county name in the input data. If the county name was included in the input data, and the county name is in the Florida Hurricane Model's databases, then the location is geocoded to a county centroid, and the geocoding summary is updated to indicate this.

6. If the data provided fails, these steps then the risk is removed from the database.

3. *Describe the data, methods, and process used in the model to convert among street addresses, geocode locations (latitude-longitude), and ZIP Codes.*

   The CoreLogic Florida hurricane model uses a process that ensures consistency between street address, latitude/longitude, ZIP Codes for every site. Sites with street addresses are converted to latitude/longitude based on a geographic information system database. The ZIP Codes for sites geocoded as latitude/longitude are obtained by finding the correct ZIP Code polygon. The sites geocoded as ZIP Codes use latitude/longitude of ZIP Code centroids.

4. *List and provide a brief description of each model ZIP Code-based database (e.g., ZIP Code centroids).*

   CoreLogic's Florida hurricane model includes a database table that contains the ZIP Code centroids for each ZIP Code. When the client imports a ZIP Code based portfolio, the model uses the centroid location from the database table. The model uses a database containing default year of construction. The model also uses ZIP Code-based database to represent the wind borne debris regions.

5. *Describe the process for updating model ZIP Code-based databases.*

   CoreLogic acquires updated ZIP Codes and their centroids from HERE data. The ZIP Code centroids undergo quality assurance including the following:

   1. ZIP Code Centroid locations must be within their ZIP Code boundaries.

   2. Every ZIP Code must have only one centroid location.

   3. All ZIP Code Centroids must be located on land.

   4. Default year of construction is based on US Census housing data.

   After quality assurance, the database table containing ZIP Codes and their centroids are updated.

G-4 Independence of Model Components

The meteorological, vulnerability, and actuarial components of the model shall each be theoretically sound without compensation for potential bias from the other two components.

The meteorology, vulnerability, and actuarial components of the Florida Hurricane Model have been independently developed, verified, and validated. The meteorology component, completely independent of the other components, calculates wind speed at each site.

The vulnerability component is entirely independent of all other calculations, e.g. meteorological, loss, etc. Validation of the vulnerability functions has been performed independently from other validation tests, e.g. whenever the vulnerability functions have been validated using claims data from a historical storm, the wind field for that storm has first been validated independently. If any of the other calculation modules were changed, no changes would be necessary to the vulnerability functions.

The loss distributions are calculated using the damage distribution at each site and the policy structure. Finally, the site distributions (damage and loss) are combined statistically to estimate the expected annual loss and the loss exceedance curve for the portfolio. All components together have been validated and verified to produce reasonable and consistent results.

G-5 Editorial Compliance

The submission and any revisions provided to the Commission throughout the review process shall be reviewed and edited by a person or persons with experience in reviewing technical documents who shall certify on Form G-7, Editorial Review Expert Certification that the submission has been personally reviewed and is editorially correct.

All documents provided to the Commission by CoreLogic throughout the review process have been reviewed and edited by a person or persons with experience in reviewing technical documents. The document has been personally reviewed to ensure that it is editorially correct. This has been certified on Form G-7.

Disclosures

1. *Describe the process used for document control of the submission. Describe the process used to ensure that the paper and electronic versions of specific files are identical in content.*

   Data in the paper (Word document) version is copied directly from the electronic versions of specific files. In order to ensure consistency, data from both the Word document and the electronic files are copied onto a Microsoft Excel document for comparison.

2. *Describe the process used by the signatories on Forms G-1 through G-6, Expert Certification forms, to ensure that the information contained under each set of standards is accurate and complete.*

   Each signatory reviews the CoreLogic responses for each standard and form within the relevant set of standards, including data, maps, and exhibits provided, to ensure that the responses are consistent with the model being submitted and with any relevant CoreLogic procedures.

3. *Provide a completed Form G-7, Editorial Review Expert Certification. Provide a link to the location of the form [insert hyperlink here].*

   See Form G-7 at Appendix #1.

Meteorological Standards

M-1 Base Hurricane Storm Set

A. The Base Hurricane Storm Set is the National Hurricane Center HURDAT2 starting at 1900 as of June 9, 2015 (or later), incorporating the period (1900-2014). Annual frequencies used in both model calibration and model validation shall be based upon the Base Hurricane Storm Set. Complete additional season increments based on updates to HURDAT2 approved by the Tropical Prediction Center/National Hurricane Center are acceptable modifications to these data. Peer reviewed atmospheric science literature can be used to justify modifications to the Base Hurricane Storm Set.

The storm set used is the National Hurricane Center HURDAT2 starting at 1900 as of June 9, 2015.

B. Any trends, weighting or partitioning shall be justified and consistent with currently accepted scientific literature and statistical techniques. Calibration and validation shall encompass the complete Base Hurricane Storm Set as well as any partitions.

No trending, weighting, or partitioning has been performed with respect to the Base Hurricane Storm Set.

Disclosures

1. *Specify the Base Hurricane Storm Set the release date and the time period used to develop and implement landfall and by-passing hurricane frequencies into the model.*

   The storm set used is the National Hurricane Center HURDAT2 starting at 1900 as of June 9, 2015. The hurricane seasons used for development of landfall and by-passing frequencies include 1900 through 2014.

2. *If the modeling organization has made any modifications to the Base Hurricane Storm Set related to landfall frequency and characteristics, provide justification for such modifications.*

   CoreLogic has not modified the Base Hurricane Storm Set.

3. *If the model incorporates short-term, long-term, or other systematic modification of the historical data leading to differences between modeled climatology and that in the entire Base Hurricane Storm Set, describe how this is incorporated.*

The model considers only the long term view of hurricane frequencies, i.e. it makes no modification of the frequencies implied by the entire Base Hurricane Storm Set.

4. *Provide a completed Form M-1, Annual Occurrence Rates. Provide a link to the location of the form [insert hyperlink here].*

See Form M-1 at Appendix #2.

M-2 Hurricane Parameters and Characteristics

Methods for depicting all modeled hurricane parameters and characteristics, including but not limited to windspeed, radial distributions of wind and pressure, minimum central pressure, radius of maximum winds, landfall frequency, tracks, spatial and time variant windfields, and conversion factors, shall be based on information documented in currently accepted scientific literature.

The modeling of hurricane parameters and characteristics is based on information documented by currently accepted scientific literature or on CoreLogic analyses of meteorological data.

Disclosures

1. *Identify the hurricane parameters (e.g., central pressure or radius of maximum winds) that are used in the model.*

   The following parameter descriptions all pertain specifically to the Florida Hurricane Model probabilistic analysis. Use of the Florida Hurricane Model in a 'user storm' scenario mode may allow much greater flexibility in some parameters (i.e., landfall location, track direction, etc.) than the discrete, categorized values used in the probabilistic database.

Hurricane Parameters in the Model:

1. Landfall Location: Landfall segments of 10 nautical miles in length run along the coastline from south of the Texas-Mexico border through Maine. There are 310 discrete landfall segments used to develop the probabilistic hurricane data set. The Florida coast runs from landfall segment #84 (Escambia county, FL-Alabama border), through segment #180 (Nassau county, FL-Georgia border). That is, from coastal milepost 840 through 1800. The historical data used is the National Hurricane Center HURDAT2 starting at 1900 as of June 9, 2015.

2. Track Direction: Distributions for storm direction vary geographically and are based on smoothed historical data. The historical data used is the portion of the National Hurricane Center HURDAT2 from 1900 through 2014 as of June 9, 2015. All hurricanes in HURDAT2 from 1900 through 2014 were used.

3. Maximum One-Minute Sustained Wind Speed: The maximum one-minute sustained wind speed is the main parameter used to define hurricane intensity, and is one of the most critical items when considering loss sensitivity. The possible range in landfall values is from 74 mph to 180 mph, although the model will run at lower values (weaker storms) to

accommodate inland filling. The storm intensity is driven directly from the coastline-dependent smoothed wind speed distributions generated from the information in the National Hurricane Center HURDAT2 starting at 1900 as of June 9, 2015. All hurricanes in this data set were used.

4. Radius of Maximum Winds: This is the distance from the geometric center of the storm to the region of highest winds, typically within the eye wall of a well-developed hurricane. This parameter, after landfall location and maximum sustained wind speed, is the next most critical in terms of loss sensitivity. The parameter is statistically dependent on coastline location and landfall intensity. The historical data used is information contained in Hurricane Research Division's HURDAT Reanalysis Project (1900-1955), NOAA Technical Report NWS 38 (1956-1984), National Hurricane Center's Tropical Cyclone Reports and Advisories (1985-1987), and DeMaria's Extended BestTrack (1988-2012) updated through the 2014 hurricane season. All hurricanes in HURDAT2 from 1900 through 2014 were used.

5. Translational Speed: This is the speed of the movement of the entire storm system itself. It is generally responsible for the asymmetry of a hurricane's wind field. It also has an effect on the distance which the highest winds are carried inland as the time-dependent filling weakens the storm. The parameter is statistically dependent on coastline location and storm strength, and in Florida, averages about 12-14 mph. The historical data used is information contained in HURDAT2 (1900-1955 and 1983-2014) and NOAA Technical Report NWS 38 (1956-1982), updated through the 2014 hurricane season. All hurricanes in the Official Hurricane Set were used. All hurricanes in HURDAT2 from 1900 through 2014 were used.

6. Filling Rate (inland decay rate): Overland attenuation (filling) is described by exponential decay of the hurricane central pressure deficit (difference between the background pressure and the storm central pressure). The filling rate is the parameter specifying the rate of this exponential decay. The historical data used is the National Hurricane Center HURDAT starting at 1900 as of June 1, 2007.

7. Profile Factor: This is a dimensionless shape parameter that varies the drop-off of winds outward from the hurricane's eye. Since an individual hurricane's profile may differ from the average, this parameter allows the user to best fit an actual storm's profile when modeling the specific event. In the probabilistic hurricane database, the profile factor is based on the profile factors of historical storms that have made landfall near the location of the probabilistic storm subject to a maximum that is dependent on the radius of maximum winds. The historical data used is the National Hurricane Center Marine Exposure from the Advisory Archives (1963-

1967), DeMaria's Extended Best Track (1988-2003), and HURDAT2 (2004-2012).

8. Inflow Angle: This is the angle between purely circular (tangential) motion and the actual direction of air flowing in towards the center of the hurricane. Modeling of the Inflow Angle is based on Kwon and Cheong (2010).

9. The model also considers air density and the Coriolis parameter, among other variables.

2. *Describe the dependencies among variables in the windfield component and how they are represented in the model, including the mathematical dependence of modeled windfield as a function of distance and direction from the center position.*

The model considers the radius of maximum winds to be dependent on central pressure for hurricanes with central pressure < 930 mb.

We have analyzed the dependence of the radius of maximum winds (Rmax) on central pressure (P0) using the empirical data taken from NWS 38 Tables 1 and 2. For storms with P0 greater than 930 mb, we have not found any statistically significant correlation between Rmax and P0. This result is consistent with the findings of NWS 38. Therefore, for storms with P0 greater than 930 mb, we use Rmax as a function of landfall location only, as given by NWS 38 Figures 37 and 38.

For stronger storms with P0 less than 930 mb, we have found a statistically significant correlation between P0 and Rmax. This is consistent with the results of NWS 38. Therefore, below 930 mb, we use a piecewise linear relationship to model the dependence of Rmax on P0. This information is reflected in Form M-2.

Also, the profile factor is subject to a maximum that is dependent on the radius of maximum winds.

Within the radius of maximum winds, the Inflow Angle is dependent on the distance from the storm center, and it is a constant at distances greater than the radius of maximum winds. The modeling of the Inflow Angle is based on Kwon and Cheong (2010).

Aside from these dependencies, all variables in the wind field component of the model are considered to be independent.

3. *Identify whether hurricane parameters are modeled as random variables, as functions, or as fixed values for the stochastic storm set. Provide rationale for the choice of parameter representations.*

The joint probability distribution for landfall location, track direction, and maximum one-minute sustained wind speed is obtained from a Maximum Likelihood Estimation kernel smoothing technique applied to the historical data. Radius to maximum winds and translational speed are modeled using lognormal distributions, the parameters of which vary smoothly along the coast. The profile factor or size of hurricane in the stochastic set is specified probabilistically as a function of the location of landfall, and an upper bound is additionally imposed as a function of the radius of maximum winds. In the historical set, the profile factor is derived from the quadrant wind radii information in the archived NHC forecast advisories (and their predecessors for events prior to 1995). The filling rate is modeled using a normal distribution. The modeling of the Inflow Angle is based on Kwon and Cheong (2010).

The parameter representations have been selected so as to provide agreement with historical data and to extrapolate to the full range of potential values, or to provide the best fit to historical data among commonly used distributions.

4. *Describe if and how any hurricane parameters are treated differently in the historical and stochastic storm sets and provide rationale.*

   All hurricane parameters are treated consistently in the historical and stochastic storm sets.

   The treatment of decay rates for stochastic and historical hurricanes in the CoreLogic model is the same, except that for historical hurricanes the storm intensity is fixed every six hours with the observed storm intensities. Specifically, the decay rate is a regionally-dependent parameter for stochastic hurricanes, whereas for historical hurricanes a decay rate is fitted for each six-hourly track segment and used to interpolate the intensity between the six-hourly observations.

5. *State whether the model simulates surface winds directly or requires conversion between some other reference level or layer and the surface. Describe the source(s) of conversion factors and the rationale for their use. Describe the process for converting the modeled vortex winds to surface winds including the treatment of the inherent uncertainties in the conversion factor with respect to location of the site compared to the radius of maximum winds over time. Justify the variation in the surface winds conversion factor as a function of hurricane intensity and distance from the hurricane center.*

   The model directly simulates surface winds.

6. *Describe how the windspeeds generated in the windfield model are converted from sustained to gust and identify the averaging time.*

The Florida Hurricane Model converts one-minute sustained 10-meter wind speeds to peak gust 10-meter wind speeds using a gust factor function that takes surface friction from land use and land cover into account (rougher terrain has a higher gust factor). The uncertainty on the gust factor depends on the input one-minute sustained wind speed (higher wind speeds have less uncertainty on the gust factor). The averaging interval for gust wind speeds is defined as 2 seconds.

7. *Describe the historical data used as the basis for the model's hurricane tracks. Discuss the appropriateness of the model stochastic hurricane tracks with reference to the historical hurricane data.*

   In the probabilistic database, distributions for storm direction vary geographically and are based on smoothed historical data. The historical data used is the portion of the National Hurricane Center HURDAT2 from 1900 through 2014 as of June 9, 2015. All hurricanes in HURDAT2 from 1900 through 2014 were used.

8. *If the historical data are partitioned or modified, describe how the hurricane parameters are affected.*

   The historical data are not partitioned or modified.

9. *Describe how the coastline is segmented (or partitioned) in determining the parameters for hurricane frequency used in the model. Provide the hurricane frequency distribution by intensity for each segment.*

   In the probabilistic analysis, the coast is divided into a series of 10 nautical mile (nmi) segments. The landfall frequency is a smooth curve developed along the entire coast using an adaptive smoothing procedure on the milepost locations of the historic storm set landfalls. Distributions of the other modeling parameters were similarly developed. Frequencies, parameters, and distributions thus change smoothly from one segment to the next. For hurricane frequency distributions by intensity and segment, see Form M-1.

10. *Describe any evolution of the functional representation of hurricane parameters during an individual storm life cycle.*

    The Florida Hurricane Model has no changes in the functional representation of hurricane parameters during an individual storm life cycle, although local wind speeds are modified according to frictional effects, often resulting in substantial changes in wind speeds over short distances, particularly near the coast.

M-3 Hurricane Probabilities

A. Modeled probability distributions of hurricane parameters and characteristics shall be consistent with historical hurricanes in the Atlantic basin.

Modeled probability distributions of hurricane parameters and characteristics are consistent with historical hurricanes in the Atlantic basin.

B. Modeled hurricane landfall frequency distributions shall reflect the Base Hurricane Storm Set used for category 1 to 5 hurricanes and shall be consistent with those observed for each coastal segment of Florida and neighboring states (Alabama, Georgia, and Mississippi).

Modeled hurricane landfall frequency distributions reflect the base hurricane storm set and are consistent with those observed for each coastal segment of Florida and other states along the Atlantic and Gulf Coasts.

C. Models shall use maximum one-minute sustained 10-meter windspeed when defining hurricane landfall intensity. This applies both to the Base Hurricane Storm Set used to develop landfall frequency distributions as a function of coastal location and to the modeled winds in each hurricane which causes damage. The associated maximum one-minute sustained 10-meter windspeed shall be within the range of windspeeds (in statute miles per hour) categorized by the Saffir-Simpson scale.

TABLE 7. SAFFIR-SIMPSON HURRICANE SCALE

Category	Winds (mph)	Damage
1	74 - 95	Minimal
2	96 - 110	Moderate
3	111 - 129	Extensive
4	130 - 156	Extreme
5	157 or higher	Catastrophic

The Florida Hurricane Model uses maximum one-minute sustained 10-meter wind speed when defining hurricane landfall intensity.

The Florida Hurricane Model pressure-wind speed relationship generates wind speeds which are in agreement with the Saffir-Simpson category definition. Wind speeds developed for historical hurricanes are also consistent with the observed values.

Disclosures

1. *Provide a complete list of the assumptions used in creating the hurricane characteristic databases.*

   Storm parameters originate from a variety of sources depending on the year of the historical event. The radius of maximum winds are from HURDAT reanalysis project (1900-1955), NOAA Publication NWS-38 (1956-1984), specific reports or publications from the National Hurricane Center (including Tropical Cyclone Reports and Advisories) for 1985-1987, and DeMaria's extended BestTrack (1988-2014). The forward speed is obtained from HURDAT2 using distance calculation of storm location (1900-1955; 1983-2014) and NOAA Publication NWS-38 (1956-1982). The profile factor is based on the quadrant wind radii from National Hurricane Center Advisory Archives (1963-1967), DeMaria's Extended Best Track (1988-2003), and HURDAT2 (2004-2014). Publications include Powell, M.D., D. Bowman, D. Gilhousen, S. Murillo, N. Carrasco, and R. St. Fluer, "Tropical Cyclone Winds at Landfall", *Bulletin of the American Meteorological Society* 85(6): 845-851 (2004); Franklin, J.L., M.L. Black, and K. Valde, "GPS dropwindsonde wind profiles in hurricanes and their operational implications", *Weather and Forecasting,* 18(1): 32-44 (2003); and Houston, S.H., and M.D. Powell, "Surface wind fields for Florida Bay Hurricanes", *Journal of Coastal Research*, 19: 503-513 (2003). Coastline-dependent landfall frequency and severity distributions for the state of Florida were developed from the National Hurricane Center HURDAT2 starting at 1900 as of June 9, 2015.

   Standard statistical techniques are used to develop the hurricane parameter and frequency distributions. The underlying assumption is that the period 1900 through 2014 is representative in terms of hurricane climatology in Florida and adjacent areas.

2. *Provide a brief rationale for the probability distributions used for all hurricane parameters and characteristics.*

   Data sources include the following:

   Landfall Maximum Sustained Windspeed: National Hurricane Center HURDAT2 starting at 1900 as of June 9, 2015 (1900-2014).

   Radius of Maximum Winds: Hurricane Research Division's HURDAT Reanalysis Project (1900-1955), NOAA Technical Report NWS 38 (1956-1984), National Hurricane Center's Tropical Cyclone Reports and Advisories (1985-1987), and DeMaria's Extended BestTrack (1988-2014) Translation Speed: NOAA Technical Report NWS 38 (up to 1984), National Hurricane Center's Tropical Cyclone Reports and Advisories (1985-2004)

   Translation Speed: HURDAT2 (1900-1955 and 1983-2014) and NOAA Technical Report NWS 38 (1956-1982)

   Filling Rate: Developed from HURDAT (1900-2006)

   Profile Factor: Hurricane Center Marine Exposure from the Advisory Archives (1963-1967), DeMaria's Extended Best Track (1988-2003), and HURDAT2 (2004-2014)

   The parameter representations have been selected so as to provide agreement with historical data and to extrapolate to the full range of potential values and to provide the best fit to historical data among commonly used distributions.

M-4 Hurricane Windfield Structure

A. Windfields generated by the model shall be consistent with observed historical storms affecting Florida.

Windfields generated by the model are consistent with observed historical storms.

B. The land use and land cover (LULC) database shall be consistent with National Land Cover Database (NLCD) 2011 or later. Use of alternate data sets shall be justified.

The land use and land cover (LULC) database is consistent with the National Land Cover Database (NLCD) 2011 (published in April 2014).

C. The translation of land use and land cover or other source information into a surface roughness distribution shall be consistent with current state-of-the-science and shall be implemented with appropriate geographic information system data.

The translation of land use and land cover information into a surface roughness distribution in the model is consistent with current state-of-the-science, and has been implemented with appropriate GIS data.

D. With respect to multi-story buildings, the model windfield shall account for the effects of vertical variation of winds if not accounted for in the vulnerability functions.

The model accounts for vertical variation of winds for multi-story structures in the vulnerability functions.

Disclosures

1. *Provide a rotational windspeed (y-axis) versus radius (x-axis) plot of the average or default symmetric wind profile used in the model and justify the choice of this wind profile.*

   Figure 12 below shows the minimum, mean, and maximum profiles used in Florida in the current submission. The profiles for the current submission were developed from historical data in Florida.

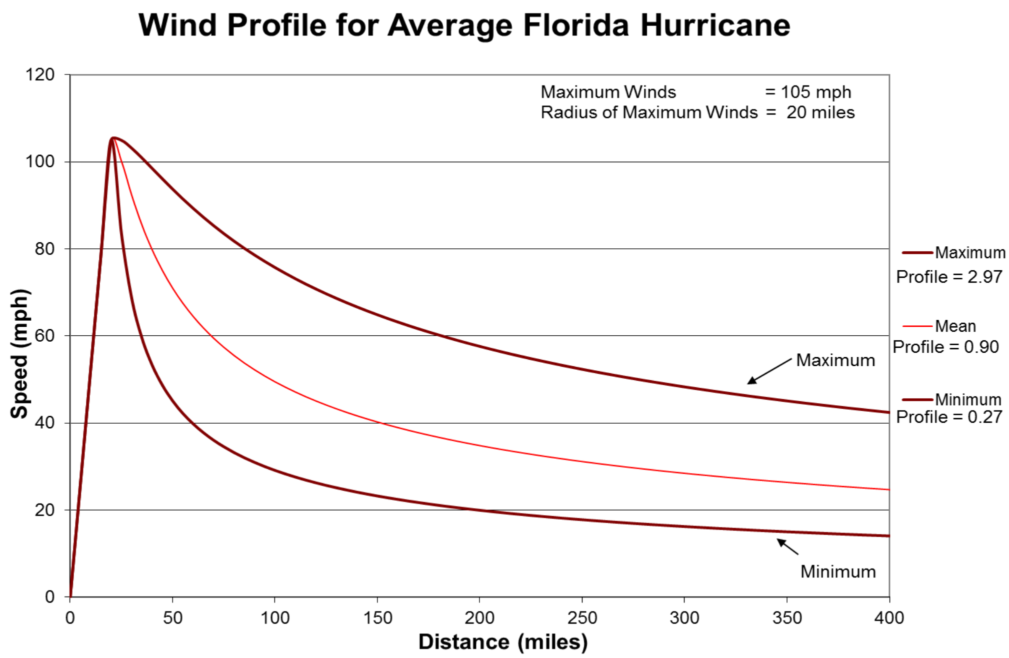

Figure 12. Wind Profile for Average Florida Hurricane.

2. *If the model windfield has been modified in any way from the previous submission, provide a rotational windspeed (y-axis) versus radius (x-axis) plot of the average or default symmetric wind profile for both the new and old functions. The choice of average or default must be consistent for the new and old functions.*

   The current model windfield storm radial wind profile has not been modified from the previous submission, and is plotted in Figure 12.

3. *If the model windfield has been modified in any way from the previous submission, describe variations between the new and old windfield functions with reference to historical storms.*

   The model windfield methodology has not been updated from the previous submission.

4. *Describe how the vertical variation of winds is accounted for in the model where applicable. Document and justify any difference in the methodology for treating historical and stochastic storm sets.*

   The model accounts for vertical variation of winds for multi-story structures in the vulnerability functions.

5. *Describe the relevance of the formulation of gust factor(s) used in the model.*

The Florida Hurricane Model converts one-minute sustained 10-meter wind speeds to peak gust 10-meter wind speeds using a gust factor function that takes surface friction from land use and land cover into account (rougher terrain has a higher gust factor). The uncertainty on the gust factor depends on the input one-minute sustained wind speed (higher wind speeds have less uncertainty on the gust factor). The gust factor is based on information in Krayer and Marshall, 1992: Gust factors applied to hurricane winds, *Bulletin of the American Meteorological Society,* Volume 73, pp. 613-617, and other scientifically accepted studies.

As discussed in the vulnerability standards, the CoreLogic model uses peak gust wind speed because damage is believed to be better correlated with peak gusts than with long-term sustained wind speeds.

6. *Identify all non-meteorological variables (e.g., surface roughness, topography, etc.) that affect the windspeed estimation*

Surface roughness, as determined by land use and land cover data, affects the local wind speeds in the model.

7. *Provide the collection and publication dates of the land use and land cover data used in the model and justify their timeliness for Florida.*

The Florida Hurricane Model uses land use and land cover data provided in the National Land Cover Database 2011 (NLCD 2011). The database was completed for the conterminous United States and published in April 2014.

8. *Describe the methodology used to convert land use and land cover information into a spatial distribution of roughness coefficients in Florida and adjacent states.*

A roughness length is assigned to each land use / land cover category in the data provided in the National Land Cover Database 2011 (NLCD 2011), based on recent meteorological references. These values are then spatially averaged into 16 directional effective roughness lengths using currently accepted methods. Each of the 16 values is then converted to a frictional wind-reduction factor using standard, scientifically accepted boundary layer similarity theory.

9. *Demonstrate the consistency of the spatial distribution of model-generated winds with observed windfields for hurricanes affecting Florida. Describe and justify the appropriateness of the databases used in the windfield validations.*

CoreLogic regularly reviews modeled versus observed hurricane wind fields. Figure 13 below is a comparison of modeled (shading) and observed (numbers) surface peak gusts in mph for Hurricane Wilma (2005). The observed windfields are obtained from the National Hurricane Center's Tropical Cyclone Reports.

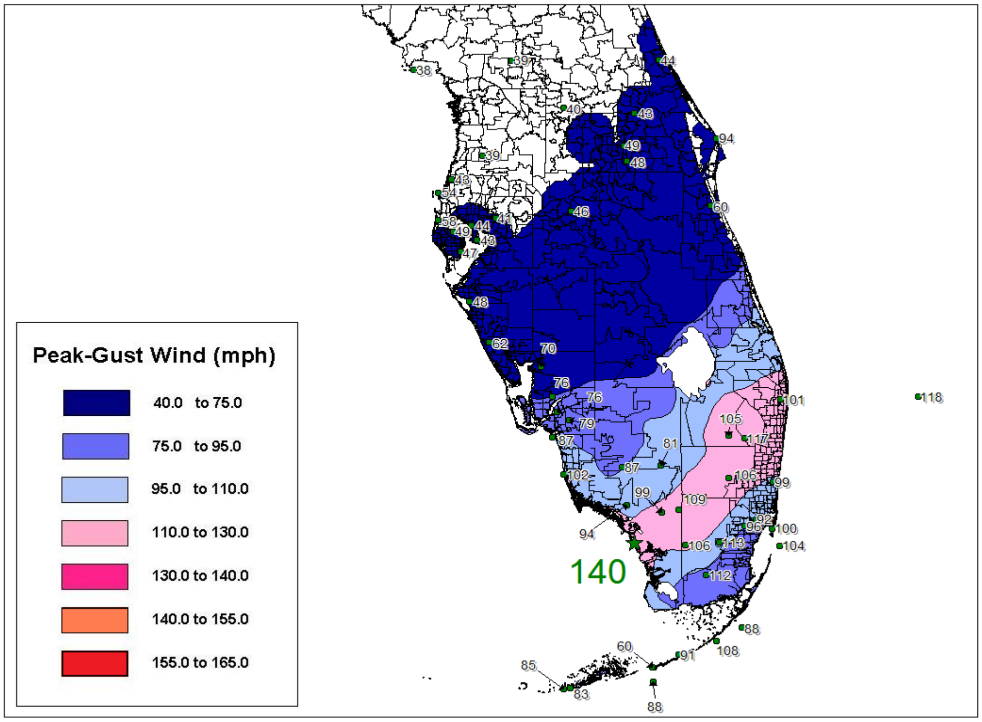

Figure 13. Wind Field for Hurricane Wilma (2005)

10. *Describe how the model's windfield is consistent with the inherent differences in windfields for such diverse hurricanes as Hurricane King (1950), Hurricane Charley (2004), Hurricane Jeanne (2004), and Hurricane Wilma (2005).*

The parameters used to define a hurricane in the CoreLogic wind field model provide enough control to capture a wide variety of storm characteristics. Obvious features such as the landfall location, storm track, and intensity of the storm in terms of one-minute sustained winds are included, and further definition of the event is provided by the radius to maximum winds and profile factor to describe the 'width' of the storm, and by the translational speed to describe the asymmetry between the right and left sides of the storm. All of these parameters can vary widely from event to event including Hurricanes King (1950), Charley (2004), Jeanne (2004), and Wilma (2005).

11. *Describe any variations in the treatment of the model windfield for stochastic versus historical storms and justify this variation.*

The treatment of the model windfield for stochastic and historical storms is the same, except that for historical hurricanes the storm intensity is fixed every six hours with the observed storm intensities (using HURDAT2). Specifically, the decay rate is a regionally-dependent parameter for stochastic hurricanes, whereas for historical hurricanes a decay rate is fitted for each six-hourly track segment and used to interpolate the intensity between the six-hourly observations. The radius of maximum winds for historical storms is based on available observations; the radius of maximum winds is constant for a given landfall for stochastic storms.

12. *Provide a completed Form M-2, Maps of Maximum Winds. Explain the differences between the spatial distributions of maximum winds for open terrain and actual terrain for historical storms. Provide a link to the location of the form [insert hyperlink here].*

See Form M-2 at Appendix #2.

The current model includes the treatment of the time evolution of the windfield, the directional impact of upwind surface roughness conditions, and the inflow angle. These features provide a refined modeling of local effects, especially along complex coastlines and coastal waterways such as bays and estuaries, and for improved modeling of transitions from one land use / land cover category to another.

The spatial distribution of maximum winds for historic hurricanes show the general characteristic of lower winds near the coast, as well as lower winds inland when the actual local terrain conditions are used relative to a uniformly smooth "open terrain". Some notable differences well inland can also be seen, where lower winds occur when rougher terrain is taken into account (e.g., metro-Orlando, Panhandle forested areas) compared with using only open terrain.

M-5 Landfall and Over-Land Weakening Methodologies

A. *The hurricane over-land weakening rate methodology used by the model shall be consistent with the historical records and with current state-of-the-science.*

The hurricane over-land weakening rate methodology used by the Florida Hurricane Model for hurricanes in Florida is based on and consistent with historical records and the current state-of-the-science.

B. *The transition of winds from over-water to over-land within the model shall be consistent with current state-of-the-science.*

The Florida Hurricane Model uses land friction to produce a reduction of the marine (overwater) wind speeds when moving over land which is consistent with the accepted scientific literature and with geographic surface roughness. The directionally averaged surface roughness friction factors produce a smooth transition of windspeeds from over-water to over-land exposure.

Disclosures

1. *Describe and justify the functional form of hurricane decay rates used by the model.*

   Overland attenuation (filling) is handled by exponential decay formulas fit to historical data. The basic form of this equation is:

   DP(t) = DP(0) exp [-mu * t]

   where DP(0) is the hurricane central pressure deficit (difference in the ambient pressure of 1013 mb and the storm central pressure) at landfall; t is the time after landfall; and mu is the decay rate parameter. The formula estimates the pressure deficit at any time t after landfall. The decay parameter, mu, is a function of the initial pressure deficit, derived from historical data using methodology consistent with Vickery and Twisdale (1995).

2. *Provide a graphical representation of the modeled decay rates for Florida hurricanes over time compared to wind observations.*

   The decay rates for two Florida hurricanes are shown in Figures 14 and 15.

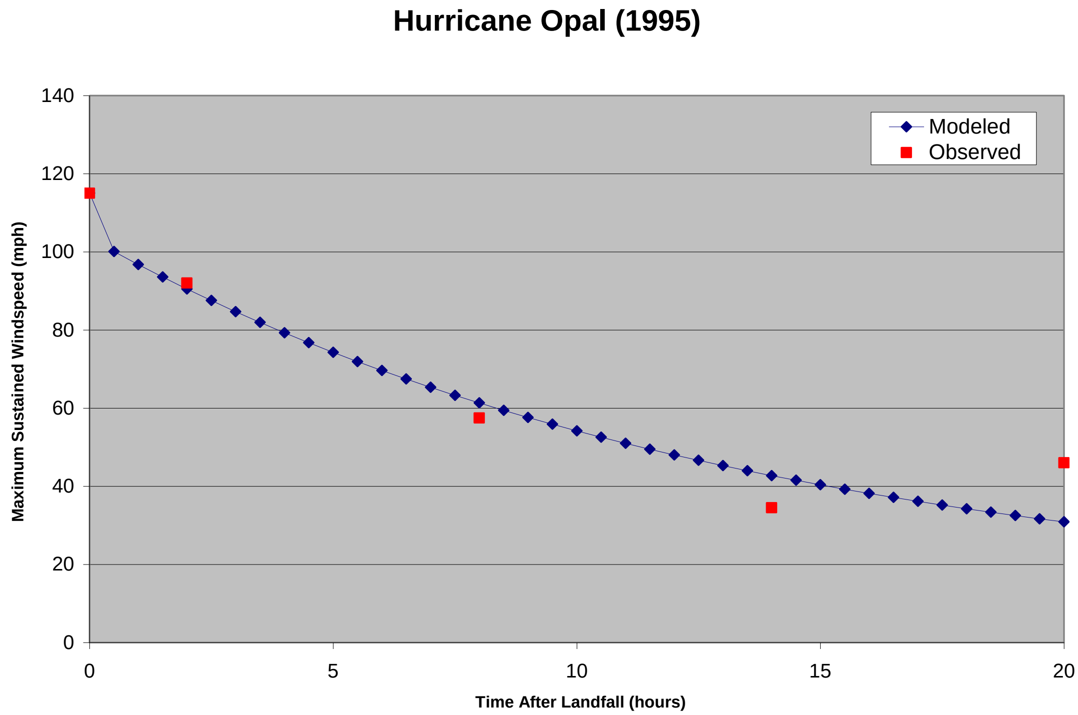

Figure 14. Hurricane Opal (1995)

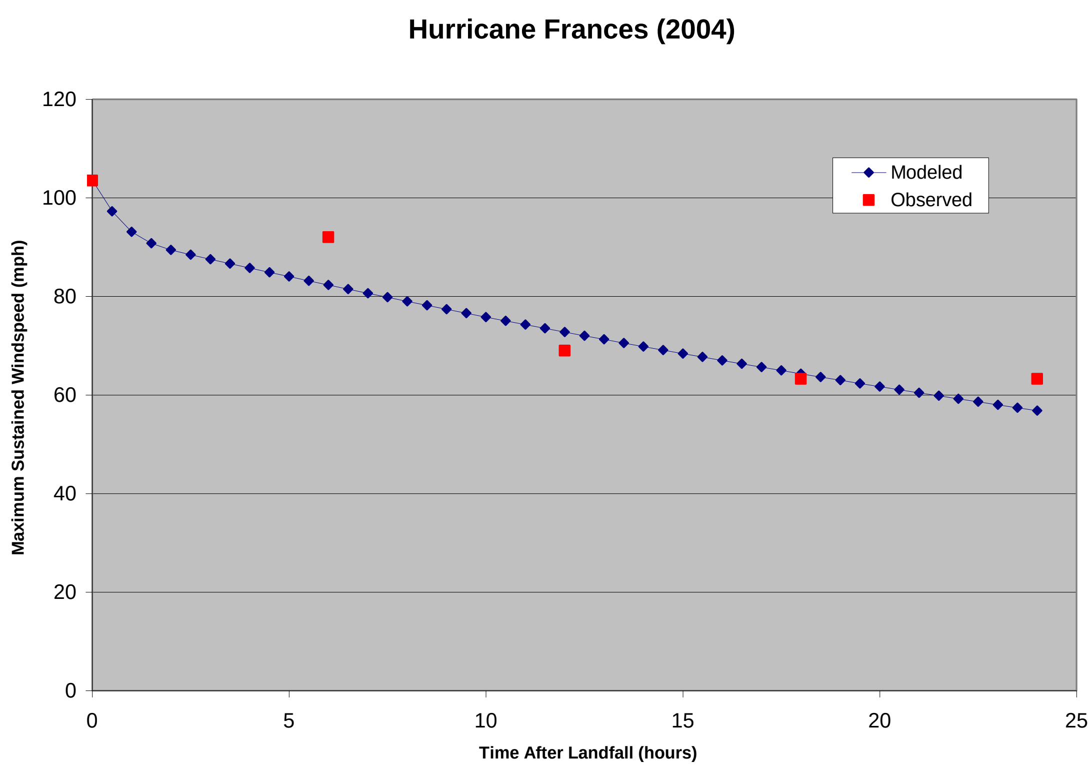

Figure 15. Hurricane Frances (2004)

3. *Describe the transition from over-water to over-land boundary layer simulated in the model.*

   The model uses current scientifically accepted boundary layer methods to convert a marine surface (10-meter 1-minute) windfield to one which incorporates local land friction when over land. The friction factors were developed by weighting and averaging surface roughness within 20 km of a location and within a given directional sector. Application of these directional friction factors produces a smooth transition of windspeeds from over-water to over-land exposure.

4. *Describe any changes in hurricane parameters, other than intensity, resulting from the transition from over-water to over-land.*

   There are no changes in hurricane parameters when a storm moves from over-water to over-land, other than its intensity via the filling rate.

5. *Describe the representation in the model of the passage over non-continental U.S. land masses on hurricanes affecting Florida.*

   Intensities for stochastic storms are based on the statistical analyses of historical storms by location. An historical storm crossing over a non-continental U.S. land mass (such as Cuba) would have an impact on the storm's intensity. This intensity would then have an impact on the intensities of the stochastic storm set. The final intensity upon reaching Florida, however, has already been accounted for in the coastline-dependent intensity distribution.

6. *Document any differences between the treatment of decay rates in the model for stochastic hurricanes compared to historical hurricanes affecting Florida.*

   The treatment of decay rates for stochastic and historical hurricanes in the CoreLogic model is the same, except that for historical hurricanes the storm intensity is fixed every six hours with the observed storm intensities (using HURDAT2). Specifically, the decay rate is a regionally-dependent parameter for stochastic hurricanes, whereas for historical hurricanes a decay rate is fitted for each six-hourly track segment and used to interpolate the intensity between the six-hourly observations.

M-6 Logical Relationships of Hurricane Characteristics

A. The magnitude of asymmetry shall increase as the translation speed increases, all other factors held constant.

The magnitude of asymmetry in the Florida Hurricane Model increases as the translation speed increases, all other factors held constant.

B. The mean wind speed shall decrease with increasing surface roughness (friction), all other factors held constant.

The mean wind speed in the Florida Hurricane Model decreases with increasing surface roughness (friction), all other factors held constant.

Disclosures

1. *Describe how the asymmetric structure of hurricanes is represented in the model.*

   The asymmetric nature of hurricanes is modeled using an Asymmetry Term, which is a function of the translational speed of the storm, as well as the angle between a given location within the windfield and the storm's direction of motion.

   Starting with a stationary marine windfield, the term will generally add to windspeeds on the right side of the storm (when looking in the direction of storm motion), and subtract from windspeeds on the left. This asymmetry of the overall windfield will become stronger as the translational speed of the storm increases.

2. *Provide a completed Form M-3, Radius of Maximum Winds and Radii of Standard Wind Thresholds. Provide a link to the location of the form here [insert hyperlink here].*

   See Form M-3 at Appendix #2.

3. *Discuss the radii values for each wind threshold in Form M-3, Radius of Maximum Winds and Radii of Standard Wind Thresholds, with reference to available hurricane observations such as those in HURDAT2. Justify the appropriateness of the databases used in the radii validations.*

   The radii values for each wind threshold in Form M-3 are consistent with available hurricane observations. The database used for developing wind radii are from HURDAT2.

Statistical Standards

S-1 Modeled Results and Goodness-of-Fit

A. The use of historical data in developing the model shall be supported by rigorous methods published in currently accepted scientific literature.

CoreLogic's use of historical data in developing the Florida Hurricane Model is supported by rigorous methods published in currently accepted scientific literature.

B. Modeled and historical results shall reflect statistical agreement using currently accepted scientific and statistical methods for the academic disciplines appropriate for the various model components or characteristics.

Modeled and historical results reflect agreement using currently accepted scientific and statistical methods in the appropriate disciplines for the various model components and characteristics.

Disclosures

1. *Provide a completed Form S-3, Distributions of Stochastic Hurricane Parameters. Identify the form of the probability distributions used for each function or variable, if applicable. Identify statistical techniques used for estimation and the specific goodness-of-fit tests applied along with the corresponding p-values. Describe whether the fitted distributions provide a reasonable agreement with the historical data. Provide a link to the location of the form [insert hyperlink here].*

Radius to maximum winds, translational speed, and profile factor are modeled using lognormal distributions, the parameters of which vary smoothly along the coast. Filling rate is modeled using a normal distribution. Friction and gust factor are modeled using lognormal distributions. Chi-squared test, Kolmogorov-Smirnov test, and Student's t-test have been performed to assess the goodness-of-fit, and reasonable agreement with the historical data has been shown.

Landfall Location: The distribution of landfall location is generated using the maximum likelihood estimation kernel smoothing on HURDAT2 data from 1900-2014. The goodness-of-fit test was conducted using the Chi-squared test. The resulting p-value is 0.18 which indicates that the modeled distribution cannot be rejected at the 5% level of significance.

Track Direction: The distribution of track direction is generated using maximum likelihood estimation kernel smoothing on HURDAT2 data from 1900-2014. The goodness-of-fit test was conducted using the Kolmogorov-

Smirnov test. The resulting p-value is 0.99 which indicates that the modeled distribution cannot be rejected at the 5% level of significance.

Maximum Sustained Wind Speed: The distribution of the maximum sustained wind speed is generated using maximum likelihood estimation kernel smoothing on HURDAT2 data from 1900-2014. The goodness-of-fit test was conducted using the Chi-squared test. The resulting p-value is 0.24 which indicates that the modeled distribution cannot be rejected at the 5% level of significance.

Radius of Maximum Winds: The distribution of the radius-of-maximum winds is generated using a lognormal distribution on HRD HURDAT Reanalysis Project (1900-1955), NWS 38 (1956-1984), NHC Tropical Cyclone Reports and Advisories (1985-1987), and DeMaria's Extended Best Track (1988-2014). The goodness-of-fit test was conducted using the Student's t-test on the natural logarithms of the radius of maximum winds. The resulting p-value is 0.71 which indicates that the modeled distribution cannot be rejected at the 5% level of significance.

Translational Speed: The distribution of the translational speed is generated using a lognormal distribution on HURDAT2 (1900-1955; 1983-2014) and NWS 38 (1956-1982). The goodness-of-fit test was conducted using the Student's t-test on the natural logarithms of the translations speed. The resulting p-value is 0.44 which indicates that the modeled distribution cannot be rejected at the 5% level of significance.

Inland Filling Rate: The distribution of the inland filling rate is generated using a normal distribution on HURDAT from 1900-2006. The goodness-of-fit test was conducted using the Student's t-test on the inland filling rate. The resulting p-value is 0.80 which indicates that the modeled distribution cannot be rejected at the 5% level of significance.

Profile Factor: The distribution of the profile factor is generated using a lognormal distribution on NHC Advisories (1963-1967), DeMaria's Extended Best Track (1988-2003), and HURDAT2 (2004-2014). The goodness-of-fit test was conducted using the Student's t-test on the natural logarithms of the profile factor. The resulting p-value is 0.61 which indicates that the modeled distribution cannot be rejected at the 5% level of significance.

See Form S-3 at Appendix #3.

2. *Describe the nature and results of the tests performed to validate the windspeeds generated.*

CoreLogic has performed a study of model generated peak gust wind patterns with those of actual hurricanes: Actual peak gust observations were obtained for eighteen landfalls of fifteen notable hurricanes since 1960. These observations were compared with model-generated peak gust wind speeds. Scatter plots were made of observed versus modeled. Table 8 below summarizes the results, and is limited to observations with gusts above 60 mph to avoid including areas where wind damage on the fringe of a storm would not be significant; (this level would roughly correspond to a 1-minute sustained of 45 mph).

TABLE 8. COMPARISON OF POINT LOCATION OBSERVATIONS WITH MODEL-GENERATED WINDS (Peak Gust Observations 60 mph or more)

Hurricane	Year	#Obs	#Simulated +/- 10 mph		#Simulated +/- 15 mph	
Donna	1960	21	12	57%	16	76%
Carla	1961	14	8	57%	11	79%
Betsy	1965	18	13	72%	15	83%
Alicia	1983	6	4	67%	5	83%
Elena	1985	8	3	38%	6	75%
Gloria	1985	18	13	72%	17	94%
Hugo	1989	8	5	63%	5	63%
Bob	1991	18	8	44%	12	67%
Andrew	1992	11	5	45%	7	64%
Charley	2004	7	6	86%	7	100%
Frances	2004	23	8	35%	14	61%
Ivan	2004	3	2	67%	2	67%
Jeanne	2004	7	5	71%	7	100%
Katrina	2005	13	8	62%	11	85%
Wilma	2005	28	16	57%	23	82%
Total		203	116	57%	158	78%

3. *Provide the date of loss of the insurance company claims data used for validation and verification of the model.*

The primary information available for validation and verification of the model is claims data from Hurricanes Alicia (1983), Elena (1985), Gloria (1985), Juan (1985), Kate (1985), Hugo (1989), Bob (1991), Andrew (1992), Iniki (1992), Erin (1995), Opal (1995), Charley (2004), Frances (2004), Ivan (2004), Jeanne (2004), Katrina (2005), Rita (2005), and Wilma (2005).

4. *Provide an assessment of uncertainty in probable maximum loss levels and loss costs for output ranges using confidence intervals or other accepted scientific characterizations of uncertainty.*

Figure 16 below compares the loss exceedance curve presented in Form S-2 with the curves that would result from adding or subtracting one standard deviation (sigma) to the total annual hurricane frequency in the model using the hypothetical data set.

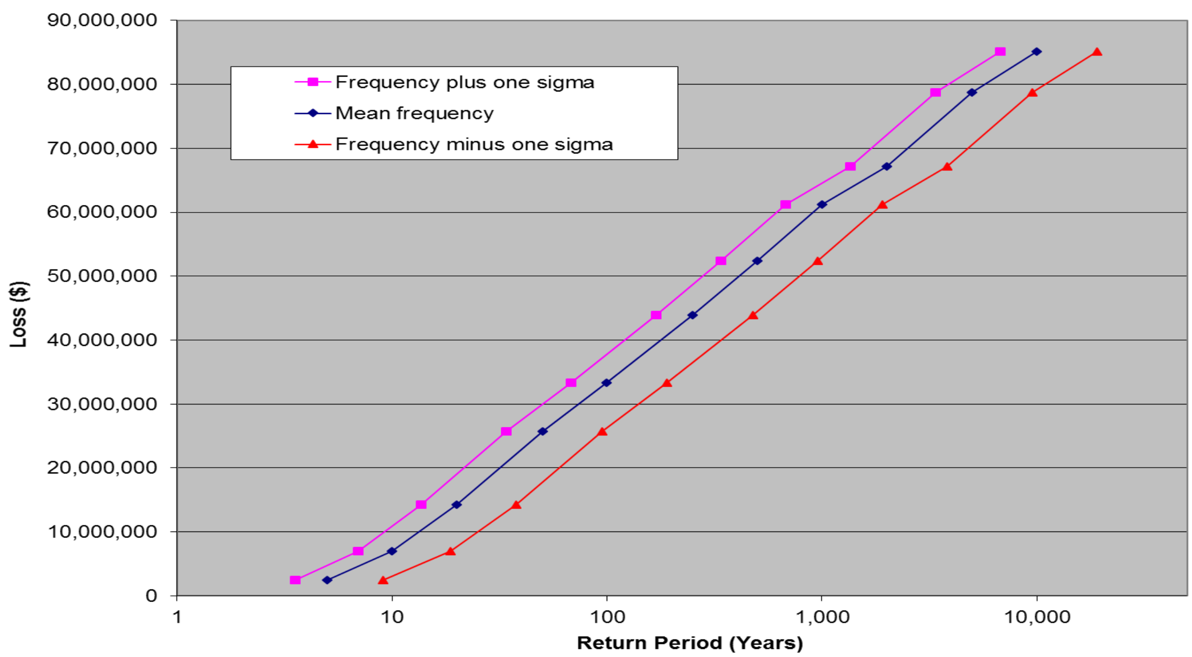

Figure 16. Uncertainty Analysis for Frequency

5. *Justify any differences between the historical and modeled results using currently accepted scientific and statistical methods in the appropriate disciplines.*

A number of tests have been performed to verify that the differences between historical and modeled results are not statistically significant. Form S-5 at the end of this section provides such tests for the historical versus modeled results for the 2012 FHCF exposures.

6. *Provide graphical comparisons of modeled and historical data and goodness-of-fit tests. Examples include hurricane frequencies, tracks, intensities, and physical damage.*

Figures 17 and 18 are examples of graphical comparisons of modeled and historical data.

Figure 17 compares the historical data for translational speed at mileposts 1225 (western Florida) and 1525 (eastern Florida) with the lognormal distributions used to model it. As an example of a more quantitative comparison, we performed a Kolmogorov-Smirnov test to assess the goodness-of-fit of our modeled distribution for the translational speed at milepost 1225 to the historical data. The resulting p-value is 0.995 which indicates that the model distribution cannot be rejected at the 5% level of significance. Similarly, for milepost 1525, the resulting p-value is 0.405 which indicates that the model distribution cannot be rejected at the 5% level of significance.

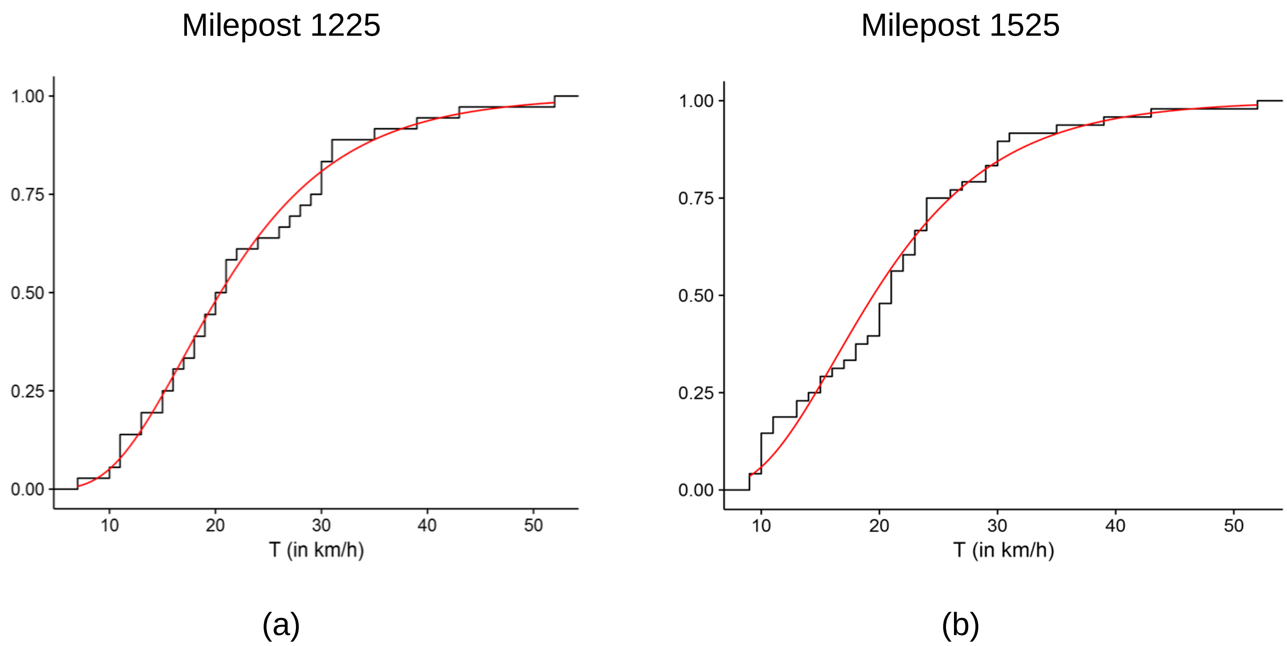

Figure 17. Goodness-of-fit for Translational Speed Comparing Modeled Forward Speed (Red) with Observed Forward Speed (Black)

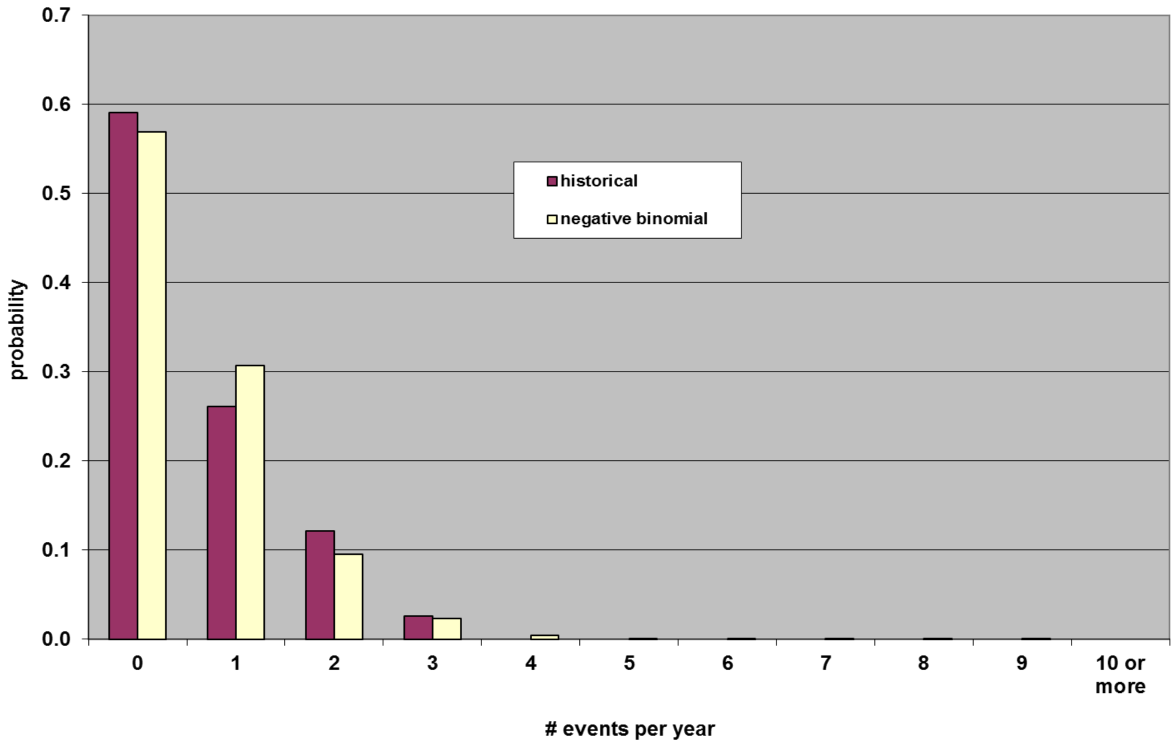

Figure 18. Goodness-of-fit for Hurricane Frequency in Florida

Figure 18 compares the historical data for hurricane frequency in Florida with the negative binomial distribution used to model it. We performed the Chi-Square test to assess the goodness of fit of our modeled distribution for hurricane frequency in Florida to the historical data. The simulated p-value is 70% which is larger than the critical p-value of 5%, hence the modeled distribution cannot be rejected at that level of significance.

7. *Provide a completed Form S-1, Probability of Florida Landfalling Hurricanes per Year. Provide a link to the location of the form [insert hyperlink here].*

   See Form S-1 at Appendix #3.

8. *Provide a completed Form S-2, Examples of Loss Exceedance Estimates. Provide a link to the location of the form [insert hyperlink here].*

   See Form S-2 at Appendix #3.

S-2 Sensitivity Analysis for Model Output

The modeling organization shall have assessed the sensitivity of temporal and spatial outputs with respect to the simultaneous variation of input variables using currently accepted scientific and statistical methods in the appropriate disciplines and shall have taken appropriate action.

CoreLogic has assessed the sensitivity of temporal and spatial outputs with respect to the simultaneous variation of input variables using currently accepted scientific and statistical methods in the appropriate disciplines, and has taken appropriate action.

Disclosures

1. *Identify the most sensitive aspect of the model and the basis for making this determination.*

   The most sensitive aspect of our model involves the conversion of wind speed to damage. This is due to the fact that the damage sustained by a particular structure type depends very sensitively on the wind speed experienced at the site. For example, the damage sustained by a given structure type depends approximately on the wind speed raised to some power. If the damage is proportional to the fifth power of the wind speed, then a 1% uncertainty in the wind speed will result in a 5% uncertainty in the damage calculated at that site. The origin of this uncertainty is the underlying non-linearity of the vulnerability relationship, and not in any assumptions, data or properties unique to our model.

2. *Identify other input variables that impact the magnitude of the output when the input variables are varied simultaneously. Describe the degree to which these sensitivities affect output results and illustrate with an example.*

   Other variables that impact the output of the model include the vulnerability functions, mitigation measures, demand surge, deductibles, limits, and exposure values. The sensitivities depend on the variable in question. The damage varies linearly with exposure value; doubling the exposure value would double the damage in the average annual and probable maximum loss levels. In Form V-2, the mitigation measures cause a difference in damage by as little as 0.6% to as much as 27.2% depending on the mitigation measure in question and the combination of mitigation measures. The sensitivities of other variables, such as vulnerability functions and deductibles, can be seen in Form A-7.

3. *Describe how other aspects of the model may have a significant impact on the sensitivities in output results and the basis for making this determination.*

   The results of any model depend sensitively on details of the structural characteristics and location of the insured sites. Often, this information is not provided by the insurance or underwriting agency for use by the model. Such details can potentially have a large impact on results due to the large variation in damageability among different structure classes and secondary structural configurations, and to the large variation in the wind hazard with respect to distance to coast and other factors.

4. *Describe and justify action or inaction as a result of the sensitivity analyses performed.*

   The sensitivity analyses performed during the initial development of the model were crucial in determining optimal sample sizes and the relative importance of parameters. Subsequent analyses have been used to verify that the decisions made continue to be valid.

5. *Provide a completed Form S-6, Hypothetical Events for Sensitivity and Uncertainty Analysis (Requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis. For models previously found acceptable, the Commission will determine at the meeting to review modeling organization submissions, if an existing modeling organization will be required to provide Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) prior to the Professional Team on-site review). If applicable, provide a link to the location of the form [insert hyperlink here].*

   Form S-6 will be provided if required.

S-3 Uncertainty Analysis for Model Output

The modeling organization shall have performed an uncertainty analysis on the temporal and spatial outputs of the model using currently accepted scientific and statistical methods in the appropriate disciplines and shall have taken appropriate action. The analysis shall identify and quantify the extent that input variables impact the uncertainty in model output as the input variables are simultaneously varied.

CoreLogic has performed uncertainty analysis on the temporal and spatial outputs of the model using currently accepted scientific and statistical methods in the appropriate disciplines and has taken appropriate action. The analysis has identified and quantified the extent that input variables impact the uncertainty in model output as the input variables are simultaneously varied.

Disclosures

1. *Identify the major contributors to the uncertainty in model outputs and the basis for making this determination. Provide a full discussion of the degree to which these uncertainties affect output results and illustrate with an example.*

   Major contributors to the uncertainty in model output include uncertainty on storm parameters, uncertainty on site parameters, and uncertainty on the vulnerability functions, as identified in our uncertainty analysis.

   One such contributor is the conversion of wind speed to damage. This is due to the fact that the damage sustained by a particular structure type depends very sensitively on the of wind speed experienced at the site. For example, the damage sustained by a given structure type depends approximately on the of wind speed raised to some power. If the damage is proportional to the fifth power of the wind speed, then a 1% uncertainty in the wind speed will result in a 5% uncertainty in the damage calculated at that site. The origin of this uncertainty is the underlying non-linearity of the vulnerability relationship, and not in any assumptions, data or properties unique to our model.

2. *Describe how other aspects of the model may have a significant impact on the uncertainties in output results and the basis for making this determination.*

   The results of any model depend sensitively on details of the structural characteristics and location of the insured sites. Often, this information is not provided by the insurance or underwriting agency for use by the model. Such details can potentially have a large impact on results due to the large variation in damageability among different structure classes and secondary structural configurations, and to the large variation in the wind hazard with respect to distance to coast and other factors.

3. *Describe and justify action or inaction as a result of the uncertainty analyses performed.*

   The uncertainty analyses performed during the initial development of the model were crucial in determining optimal sample sizes and the relative importance of parameters. Subsequent analyses have been used to verify that the decisions made continue to be valid.

4. *Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis), if disclosed under Standard S-2 (Sensitivity Analysis for Model Output), will be used in the verification of Standard S-3 (Uncertainty Analysis for Model Output).*

   Form S-6 will be provided if required.

S-4 County Level Aggregation

At the county level of aggregation, the contribution to the error in loss cost estimates attributable to the sampling process shall be negligible.

CoreLogic's United States hurricane model estimates loss costs in the mainland United States from Texas to Maine on the basis of 32,582 stochastic storm simulation results. Of these, 16,665 affect Florida. Given the high resolution of the stochastic storm database, the contribution to the error in loss cost estimates induced by the sampling process is negligible.

Disclosure

1. *Describe the sampling plan used to obtain the average annual loss costs and output ranges. For a direct Monte Carlo simulation, indicate steps taken to determine sample size. For importance sampling design or other sampling scheme, describe the underpinnings of the design and how it achieves the required performance.*

   CoreLogic's United States hurricane model estimates loss costs using a Latin Hypercube technique. The primary storm (e.g. radius, forward speed, and filling rate) and site (e.g. friction, gust factor) parameters are all random variables in the model.

S-5 Replication of Known Hurricane Losses

The model shall estimate incurred losses in an unbiased manner on a sufficient body of past hurricane events from more than one company, including the most current data available to the modeling organization. This standard applies separately to personal residential and, to the extent data are available, to commercial residential. Personal residential loss experience may be used to replicate structure-only and contents-only losses. The replications shall be produced on an objective body of loss data by county or an appropriate level of geographic detail and shall include loss data from both 2004 and 2005.

CoreLogic's United States hurricane model reasonably replicates incurred losses on a sufficient body of past hurricane events, including the most current data available to CoreLogic, which includes 2004 and 2005 data.

Disclosures

1. *Describe the nature and results of the analyses performed to validate the loss projections generated for personal and commercial residential losses separately. Include analyses for the 2004 and 2005 hurricane seasons.*

Overall reasonability/validity checks on historical storm estimates and expected annual loss estimates are continuously conducted on portfolios received from our clients.

Some of the validation comparisons performed are summarized in Form S-4.

2. *Provide a completed Form S-4, Validation Comparisons. Provide a link to the location of the form [insert hyperlink here].*

See Form S-4 at Appendix #3.

S-6 Comparison of Projected Hurricane Loss Costs

The difference, due to uncertainty, between historical and modeled annual average statewide loss costs shall be reasonable, given the body of data, by established statistical expectations and norms.

The difference, due to uncertainty, between historical and modeled annual average statewide loss costs is statistically reasonable, as shown in the information provided below.

Disclosures

1. *Describe the nature and results of the tests performed to validate the expected loss projections generated. If a set of simulated hurricanes or simulation trials was used to determine these loss projections, specify the convergence tests that were used and the results. Specify the number of hurricanes or trials that were used.*

The results of our model were validated by checking each component of the model separately. We took the following steps to validate the hazard component:

a) Ensure that the frequency of the simulated storms matches against historical landfall frequency.

b) Compare the model return period wind speed estimates by landfall location against other substantive research in this area.

Steps a) and b) were used as the reasonability check for the hazard frequency (number of landfalls per year) and severity (expected wind speeds to be experienced every x years).

Given reasonability of the hazard component of the model, loss estimates were compared to actual losses sustained by specific insurance companies. In addition, comparisons of statewide expected annual loss versus the average of all historical events impacting Florida in this century were compared in order to validate estimated losses.

The expected annual loss estimates produced by the model are further checked for reasonability against alternative methods of obtaining the same results. Such methods include Monte Carlo simulations, analyses based solely on historical storms and actuarial techniques, and alternative methods using NHRS and historical frequency rates.

Relativities of the expected annual loss estimates by geographic territory and by construction type have also been evaluated to ensure reasonableness.

Convergence tests were also performed in order to ensure that the model produces stable results and that additional detail (i.e., simulated storms) would not significantly alter the result. The basis for our expected annual loss estimates is the modeling of 32,582 storms.

2. *Identify and justify differences, if any, in how the model produces loss costs for specific historical events versus loss costs for events in the stochastic hurricane set.*

There are no differences in how the model produces loss costs for specific historical events versus loss costs for events in the stochastic hurricane set.

3. *Provide a completed Form S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled. Provide a link to the location of the form [insert hyperlink here].*

See Form S-5 at Appendix #3.

Vulnerability Standards

V-1 Derivation of Building Vulnerability Functions

A. Development of the building vulnerability functions shall be based on at least one of the following: (1) insurance claims data, (2) laboratory and field testing, (3) rational structural analysis, and (4) post-event site investigations. Any development of the building vulnerability functions based on rational structural analysis, post-event site investigations, and laboratory and field testing shall be supported by historical data.

CoreLogic's United States hurricane model building vulnerability functions are based on historically observed damage (in terms of both claims data and post-hurricane field surveys), experimental research conducted by Professors Kishor Mehta and James McDonald at Texas Tech.

The claims data analyzed are from two basic sources: (1) claims data from all major storms during the period 1954 - 1994 analyzed by Dr. Don Friedman and John Mangano while managing the Natural Hazard Research Service (NHRS) effort for The Travelers Insurance Company; and (2) claims data from Hurricanes Alicia (1983), Elena (1985), Gloria (1985), Juan (1985), Kate (1985), Hugo (1989), Bob (1991), Andrew (1992), Iniki (1992), Erin (1995), and Opal (1995) provided to CoreLogic by the insurance companies assisting with the development of CoreLogic's United States hurricane model.

In addition, CoreLogic has analyzed claims data from Hurricanes Charley (2004), Frances (2004), Ivan (2004), Jeanne (2004), Katrina (2005), Rita (2005), and Wilma (2005); this analysis resulted in an update to the manufactured home vulnerability in Florida in June 2008 (first included in WORLDCATenterprise Version 3.11), but it has not resulted in any other updates to the vulnerability functions in Florida.

CoreLogic[1] teams have conducted post-disaster field surveys for several storms in the past few years, including Hurricanes Andrew (1992), Iniki (1992), Luis (1995), Marilyn (1995), Opal (1995), Georges (1998), Irene (1999), Lili (2002), Fabian (2003), Isabel (2003), Charley (2004), Frances (2004), Ivan (2004), Jeanne (2004), Katrina (2005), Rita (2005), and Ike (2008); Typhoon Paka (1997); and the Oklahoma City (1999), Fort Worth (2000), and Midwest (2003) tornado outbreaks. In addition, the research of Professors Mehta and McDonald incorporates a large amount of investigation into the effects of all major storms over a 25-year period.

B. The derivation of the building vulnerability functions and their associated uncertainties shall be theoretically sound and consistent with fundamental engineering principles.

The method of derivation of the CoreLogic's vulnerability functions and associated uncertainties is theoretically sound and consistent with fundamental engineering principles.

C. Residential building stock classification shall be representative of Florida construction for personal and commercial residential properties.

Residential building stock classification of the Florida Hurricane Model is representative of Florida construction for personal and commercial residential properties.

D. Building height/number of stories, primary construction material, year of construction, location, building code, and other construction characteristics, as applicable, shall be used in the derivation and application of building vulnerability functions.

The Florida Hurricane Model allows a user to account for the unique features of individual buildings, including building height/number of stories, primary construction material, year of construction, location, building code, and other construction characteristics. Such features modify the vulnerability functions.

E. Vulnerability functions shall be separately derived for commercial residential building structures, personal residential building structures, manufactured homes, and appurtenant structures.

CoreLogic's vulnerability functions are separately derived for commercial residential building structures, personal residential building structures, manufactured homes, and appurtenant structures. The appurtenant structures vulnerability functions are updated in this new model version.

F. The minimum wind speed that generates damage shall be consistent with fundamental engineering principles.

CoreLogic's vulnerability functions calculate damage for all peak gust wind speeds greater than or equal to 40 miles per hour.

G. Building vulnerability functions shall include damage as attributable to windspeed and wind pressure, water infiltration, and missile impact associated with hurricanes. Vulnerability functions shall not include explicit damage to the structure due to flood, storm surge, or wave action.

CoreLogic's vulnerability functions include damage due to hurricane hazards such as windspeed and wind pressure, water infiltration, and missile impact.

CoreLogic's vulnerability functions do not include explicit damage due to flood, storm surge, or wave action.

Disclosures

1. *Describe any modifications to the building vulnerability component in the model since the previously accepted model.*

   The following changes to the building vulnerability functions have been implemented in this model version:

   The appurtenant structures (Coverage B) vulnerability functions have been updated using recently acquired claims data from 2004 and 2005 storms.

   Masonry structures without reinforcement specification are considered unreinforced before 1996 and reinforced after 2002 in all counties. Between 1996 and 2002, masonry structures with unspecified reinforcement are considered reinforced in Miami-Dade and Broward Counties and unreinforced in other counties. The client has the option to specify whether a masonry structure is reinforced or unreinforced regardless of age of construction.

   The default mitigation measure option for manufactured home width has been updated from "Double Wide" to "Single Wide" for manufactured homes built after 1994.

   Based on Table 1507.2.7.1 of the Florida Building Code (FBC2010), two event rated shingles were added corresponding to Class D and Class H.

   Functionality for screened enclosures and high-valued homes has been implemented.

2. *Provide a flow chart documenting the process by which the building vulnerability functions are derived and implemented.*

   Figure 19 and 20 summarize the process by which CoreLogic develops its vulnerability functions. Abbreviations used in these figures are: Coverage (Cov) A: Building, Cov B: Appurtenant Structures, Cov C: Contents, Cov D: Time Element, and WS: Windspeed.

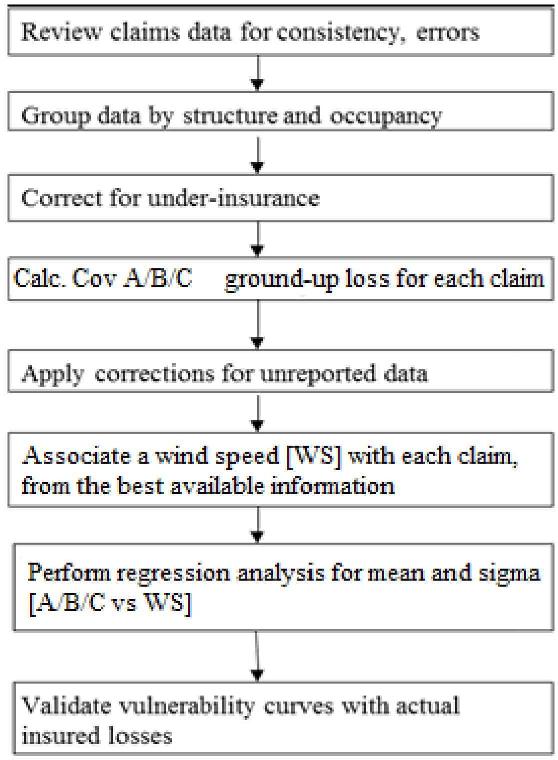

Figure 19. Flowchart – Building, Appurtenant Structures, and Contents Vulnerability Development

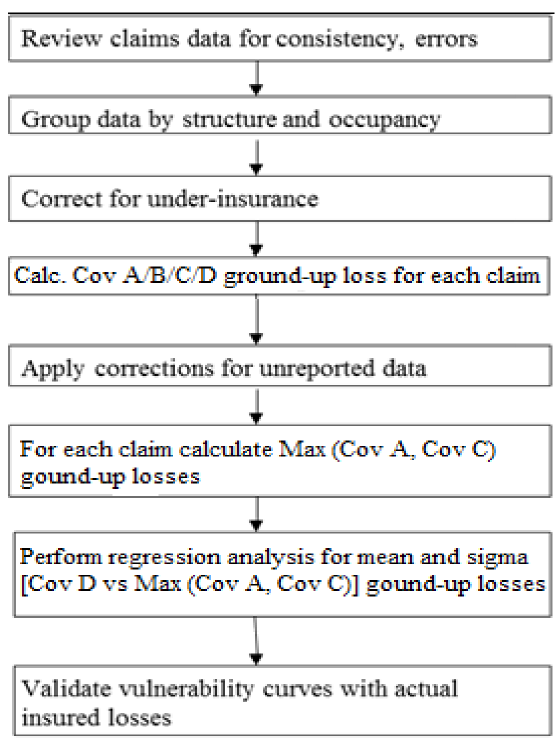

Figure 20. Flowchart – Time Element Vulnerability Development

3. *Describe the nature and extent of actual insurance claims data used to develop the building vulnerability functions. Describe in detail what is included, such as, number of policies, number of insurers, date of loss, and number of units of dollar exposure, separated into personal residential, commercial residential, and manufactured home.*

   The primary set of claims data used to develop the vulnerability functions contains over 13 million policies from 7 insurers, with a total exposure of about $2.3 trillion and a total insured loss of about $12 billion. By far the majority of this data is from personal lines, but about 120,000 of the policies are from commercial residential lines, and about 234,000 of the policies are from manufactured homes. The corresponding exposures are about $73 billion for commercial residential lines and about $15 billion for manufactured homes. The data set includes claims from 18 hurricanes since 1983. The commercial residential data is from all eight 2004 and 2005 storms that affected Florida.

   In addition, the CoreLogic vulnerability functions are based on a large body of claims data from the Natural Hazard Research Service (NHRS), covering all major storms during the period 1954 – 1994.

4. *Describe the assumptions, data (including insurance claims data), methods, and processes used for the development of the building vulnerability functions.*

   Vulnerability functions were first developed in 1994, and have undergone a series of updates since then. In the current release, vulnerability functions for the appurtenant structures have been updated using insurance claims data and methodology described in Figure 19. Supporting documents and claims data are available in the office for review.

5. *Summarize post-event site investigations, including the source, and provide a brief description of the resulting use of these data in development or validation of building vulnerability functions.*

   Site inspections for storms prior to 2004 are summarized in the CoreLogic document 'Secondary Structural Modifiers: Features and Model Description', Rev. 1, 2008. The primary use of these site inspections was to calibrate and validate the secondary structural module of the software. CoreLogic engineers also performed site inspections after Hurricanes Charley, Frances, Ivan, and Jeanne in 2004; Hurricane Katrina in 2005; and Hurricane Ike in 2008.

   Following major windstorms, CoreLogic engineers conduct reconnaissance field surveys of the affected areas to collect data. This information enables us to verify that the overall building performance of different structures matches the damage functions in our model. In addition, these events offer us the unique opportunity to gather evidence on failure modes of secondary features, which allows us to constantly enhance the mitigation measures component of the model.

6. *Describe the categories of the different building vulnerability functions. Specifically, include descriptions of the building types and characteristics, building height, number of stories, regions within the state of Florida, year of construction, and occupancy types in which a unique building vulnerability function is used. Provide the total number of building vulnerability functions available for use in the model for personal and commercial residential classifications.*

The Florida Hurricane Model uses a total of 96 basic construction types, covering all occupancies. Twenty-one are low-rise residential types, applicable to building heights from one to three stories, and nine are mid/high-rise commercial types, applicable to building heights of four or more stories, with distinct vulnerability functions for each structure type applicable to building heights from four to seven stories (mid-rise) and more than seven stories (high-rise).

They are characterized by four parameters: occupancy, number of stories, structural system, and exterior cladding strength. The Florida Hurricane Model uses occupancies rather than line of business, because empirical evidence has shown that the former is more relevant to building performance. The Florida Hurricane Model has distinct vulnerability functions for structure and contents, and describes time element losses as a function of direct damage and detailed occupancy type. Residential occupancy vulnerability functions include 30 different types.

For low-rise residential structures, the 21 structure types are as follows:

10 residential ISO classes, some of which have been assigned a revised mapping, plus one curve for average residential ISO:

- ISO Residential Class 1:Frame
- ISO Residential Class 2:Joisted Masonry
- ISO Residential Class 3:Non-combustible
- ISO Residential Class 4:Masonry Non-combustible
- ISO Residential Class 5:Modified Fire-resistive
- ISO Residential Class 6:Fire-resistive
- ISO Residential Class 7:Heavy Timber Joisted Masonry
- ISO Residential Class 8:Super Non-combustible
- ISO Residential Class 9:Super Masonry Non-combustible
- ISO Residential Average

9 engineering classifications:

- Residential, Low-Rise, Reinforced-Masonry, Strong-Cladding
- Residential, Low-Rise, Reinforced-Masonry, Weak-Cladding
- Residential, Low-Rise, Reinforced-Masonry, Average-Cladding

- Residential, Low-Rise, Timber, Strong-Cladding
- Residential, Low-Rise, Timber, Weak-Cladding
- Residential, Low-Rise, Timber, Average-Cladding
- Residential, Low-Rise, Unreinforced-Masonry, Strong-Cladding
- Residential, Low-Rise, Unreinforced-Masonry, Weak-Cladding
- Residential, Low-Rise, Unreinforced-Masonry, Average-Cladding

2 manufactured home curves:

- Residential, Low-Rise, Manufactured Home - Tied Down
- Residential, Low-Rise, Manufactured Home - Not Tied Down

For mid/high-rise structures, the 9 structure types are as follows:

- Mid/High-rise, Concrete, Strong-Cladding
- Mid/High-rise, Concrete, Weak-Cladding
- Mid/High-rise, Concrete, Average-Cladding
- Mid/High-rise, Heavy-Steel, Strong-Cladding
- Mid/High-rise, Heavy-Steel, Weak-Cladding
- Mid/High-rise, Heavy-Steel, Average-Cladding
- Mid/High-rise, Reinforced-Masonry, Strong-Cladding
- Mid/High-rise, Reinforced-Masonry, Weak-Cladding
- Mid/High-rise, Reinforced-Masonry, Average-Cladding

For the nine engineering low rise structures, the vulnerability model provides different vulnerability functions for 1-, 2- and 3-story structures. The differentiation is based on analysis of claims data. For mid/high-rise structure types, the number of stories is additionally used to select either a mid-rise (4 to 7 stories) or high-rise (8 or more stories) vulnerability functions.

The year of construction and regions within the State of Florida impact the default mitigation measures. The default mitigation measures are based on the Florida Building Code and construction practice.

7. *Describe the process by which local construction practices and building code adoption and enforcement are considered in the development of the building vulnerability functions.*

Features pertaining to local construction and building code criteria are identified as secondary structural features in the model and can be selected by the users.

8. *Describe the relationship between building structure and appurtenant structure vulnerability functions and their consistency with insurance claims data.*

The model has separate vulnerability functions for the appurtenant structures and for the primary building structures. The appurtenant structures vulnerability functions are associated with corresponding primary building structures vulnerability functions. For example, the vulnerability function for the appurtenant structures in a wood frame home is coupled with the wood frame vulnerability function of the main building. The vulnerability functions for the appurtenant structures are derived from insurance claims data. The analysis of the claims data from these two coverages shows that there is a correlation between the building and appurtenant structure vulnerability functions.

9. *Describe the assumptions, data (including insurance claims data), methods, and processes used to develop building vulnerability functions for unknown residential construction types or for when some building characteristics are unknown.*

Unknown structure types in Florida are modeled by the Default building vulnerability functions which are defined by the TIV weighted average of the different structures composing the Florida Hurricane Cat Fund portfolio.

CoreLogic's model has default building characteristics based on the year-of-construction when characteristics are unknown or not provided. If the year of construction is not provided, the model assigns a default year of construction based on the ZIP Code.

10. *Describe how vulnerability functions are selected when input data are missing, incomplete, or conflicting.*

The primary characteristics needed to select the proper vulnerability functions are:

- Structure type
- Height
- Year built

When any, or all, of these parameters are missing, or conflicting, the model will do the following:

Year built: The model will use a default year built for each zip code.

Height: The model will use a default height defined for each structure type.

Structure type: The model will use two linear combinations of structure types based on FHCF portfolio composition, one for North Florida and one for Central and South Florida. The Northern region encompasses all counties to the north of the counties of Levy, Marion, Volusia and Flagler. These later counties and all other to their south are part of the Central and South Florida.

11. *Identify the one-minute average sustained wind speed and the wind speed reference height at which the model begins to estimate damage.*

The model begins estimating damage at a peak gust wind speed of 40 mph. An equivalent one-minute average wind speed can be estimated, but will vary depending on terrain conditions and elevation. For open terrain and an elevation of 10 meters, 40 mph peak gusts equate approximately with a one-minute average wind speed of 35 mph. At other elevations and on different terrain, the one-minute average may be significantly different from this amount. For detail on this issue, the reader is referred to Simiu and Scanlan, 1996, Wind Effects on Structures, 3rd ed., John Wiley and Sons, New York, section 2.3.6. Note that the Florida Hurricane Model uses peak gust wind speed because damage is believed to be better correlated with peak gusts than with long-term sustained wind speeds. This approach is consistent with standard structural design philosophy: one designs for extreme, or peak, conditions, such as the momentary resting of a heavy piece of equipment on an inadequately strong patch of roof. It is the load at that moment that causes the equipment to punch through the roof, not the load averaged over the previous minute.

Ted Fujita, of the University of Chicago, also pointed out (following Hurricanes Andrew and Iniki) that the gusts should be more important than the sustained wind when considering damage production. In his concluding remarks in an analysis of a videotape of a roof being blown from a house during Hurricane Iniki, he states: "It is important to realize that the roof can be blown away by 1 to 2 sec winds rather than a sustained wind" (Storm Data, Sept. 1992, Vol. 34, page 27).

12. *Describe how the duration of wind speeds at a particular location over the life of a hurricane is considered.*

The duration of wind speeds is not explicitly considered in the model, although duration effects are included in the claims data used to develop the vulnerability functions.

13. *Describe how the model addresses wind borne missile impact damage and water infiltration.*

The model addresses the wind borne missile impact damage and water infiltration using secondary structural modifiers. There are several modifiers that address the wind borne impact, namely, Glazing Type, Wall Cladding, Shutters, Skylight Type, Overhead Doors, Evidence of Glazing Standards and Door Reinforcements. Similarly, water infiltration is addressed through options in the Roof Sheathing feature.

14. *Provide a completed Form V-1, One Hypothetical Event. Provide a link to the location of the form [insert hyperlink here].*

Please see Form V-1 at Appendix #4.

V-2 Derivation of Contents and Time Element Vulnerability Functions

A. Development of the contents and time element vulnerability functions shall be based on at least one of the following: (1) insurance claims data, (2) tests, (3) rational structural analysis, and (4) post-event site investigations. Any development of the contents and time element vulnerability functions based on rational structural analysis, post-event site investigations, and tests shall be supported by historical data.

CoreLogic's United States hurricane model contents and time element vulnerability functions are based on historically observed damage (in terms of both claims data and post-hurricane field surveys), experimental research conducted by Professors Kishor Mehta and James McDonald at Texas Tech.

The claims data analyzed are from two basic sources: (1) claims data from all major storms during the period 1954 - 1994 analyzed by Dr. Don Friedman and John Mangano while managing the Natural Hazard Research Service (NHRS) effort for The Travelers Insurance Company; and (2) claims data from Hurricanes Alicia (1983), Elena (1985), Gloria (1985), Juan (1985), Kate (1985), Hugo (1989), Bob (1991), Andrew (1992), Iniki (1992), Erin (1995), and Opal (1995) provided to CoreLogic by the insurance companies assisting with the development of CoreLogic's United States hurricane model.

In addition, CoreLogic has analyzed claims data from Hurricanes Charley (2004), Frances (2004), Ivan (2004), Jeanne (2004), Katrina (2005), Rita (2005), and Wilma (2005); this analysis resulted in an update to the manufactured home vulnerability in Florida in June 2008 (first included in WORLDCATenterprise Version 3.11), but it has not resulted in any other updates to the vulnerability functions in Florida.

CoreLogic teams have conducted post-disaster field surveys for several storms in the past few years, including Hurricanes Andrew (1992), Iniki (1992), Luis (1995), Marilyn (1995), Opal (1995), Georges (1998), Irene (1999), Lili (2002), Fabian (2003), Isabel (2003), Charley (2004), Frances (2004), Ivan (2004), Jeanne (2004), Katrina (2005), Rita (2005), and Ike (2008); Typhoon Paka (1997); and the Oklahoma City (1999), Fort Worth (2000), and Midwest (2003) tornado outbreaks. In addition, the research of Professors Mehta and McDonald incorporates a large amount of investigation into the effects of all major storms over a 25-year period.

B. The relationship between the modeled building and contents vulnerability functions and historical structure and contents losses shall be reasonable.

CoreLogic has separate vulnerability functions for contents. Content vulnerability curves in the Florida Hurricane Model are based on claims data.

C. Time element vulnerability function derivations shall consider the estimated time required to repair or replace the property.

The model's time element vulnerability functions have been derived from claims data and consider the estimated time required to repair or replace the property.

D. The relationship between the modeled structure and time element vulnerability functions and historical building and time element losses shall be reasonable.

CoreLogic's model calculates time element damage as a function of building and content damage. Time element vulnerability curves in the Florida Hurricane Model are based on claims data. The derivation of the vulnerability functions from claims follows a rigorous standard procedure to ensure that no erroneous data is used and that all fields are clearly defined. At the end of the vulnerability generation a validation is performed. This validation ensures that the relationship between time element losses and building (and contents) losses are reasonable.

E. Time element vulnerability functions used by the model shall include time element coverage claims associated with wind, flood, and storm surge damage to the infrastructure caused by a hurricane.

Time element vulnerability curves in the Florida Hurricane Model are based on claims data.

1. *Describe any modifications to the contents and time element vulnerability component in the model since the previously accepted model.*

The vulnerability functions for contents in Florida have not been modified since the previously accepted model.

Time element calculations have been updated to account for secondary structural characteristics and year-of-construction.

2. *Provide a flow chart documenting the process by which the contents vulnerability functions are derived and implemented.*

Figure 21 summarizes the process by which CoreLogic develops its Building, Appurtenant Structures and Contents vulnerability functions. Abbreviations used in this figure are: Cov A: Building, Cov B: Appurtenant Structures, Cov C: Contents, and WS: Windspeed.

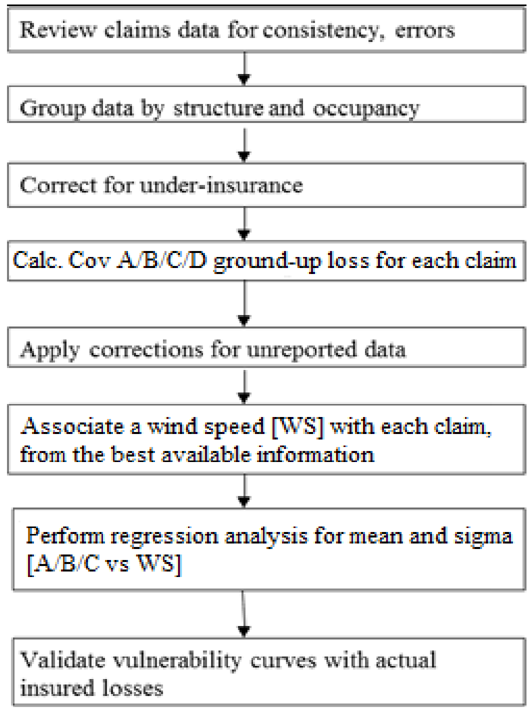

Figure 21. Flowchart – Building, Appurtenant Structures, and Contents Vulnerability Development

3. *Describe the assumptions, data (including insurance claims data), methods, and processes used to develop and validate the contents vulnerability functions.*

Residential content vulnerability functions were developed by regressing historic content claims against peak gust wind speed, using claims data gathered and analyzed since 1954. In the Florida Hurricane Model, the user identifies the structure type containing the contents, choosing from one or a combination of the basic structure types available in the Florida Hurricane Model. That is not to say that content vulnerability is the same as building vulnerability: there are two sets of vulnerability functions for each of the basic types, one set for contents and one set for buildings. The content vulnerability is a function of the structure *type*, but it is not a direct function of the building vulnerability function. At this point, it would be helpful to clarify the distinction between "content vulnerability," "building vulnerability," and "structure type." *Structure type* refers to the building's structural system: whether the building is wood-frame, masonry, concrete, etc.; whether the exterior wall material is strong or not; whether the windows are large or small; and so on. When we say *building vulnerability,* we mean the degree to which a building of a given structure type is estimated to be damaged at a given wind speed. A building with a concrete structure type is likely to be less vulnerable than a building with a timber structure type. Similarly, *content vulnerability* refers to the degree to which contents within a building of a given structure type are estimated to be damaged at a given wind speed. Contents in a building with a concrete structure type are less vulnerable to wind damage than contents in a building with a timber structure type. Building vulnerability and content vulnerability are both functions of structure type, but content vulnerability is not a function of building vulnerability.

To the extent that both building damage and content damage increase at higher wind speeds, and to the extent that both building and content damage are generally higher in more vulnerable structure types, the two are positively correlated, but there is no direct functional dependency defined in the Florida Hurricane Model between the content vulnerability function and the building vulnerability for the same structure type -- there is no magic factor applied to building damage to get content damage, nor should there be in the best designed model. To impose such a direct dependency would produce poorer vulnerability functions than are incorporated in the Florida Hurricane Model. Content damage, like building damage, is estimated when peak gust wind speed (2 second averaging time) exceeds 40 mph. Loss is calculated based on damage, deductible, limits, etc.

Figure 22 below demonstrates the relationship between building and contents losses exhibited in a series of hypothetical storms run in the model.

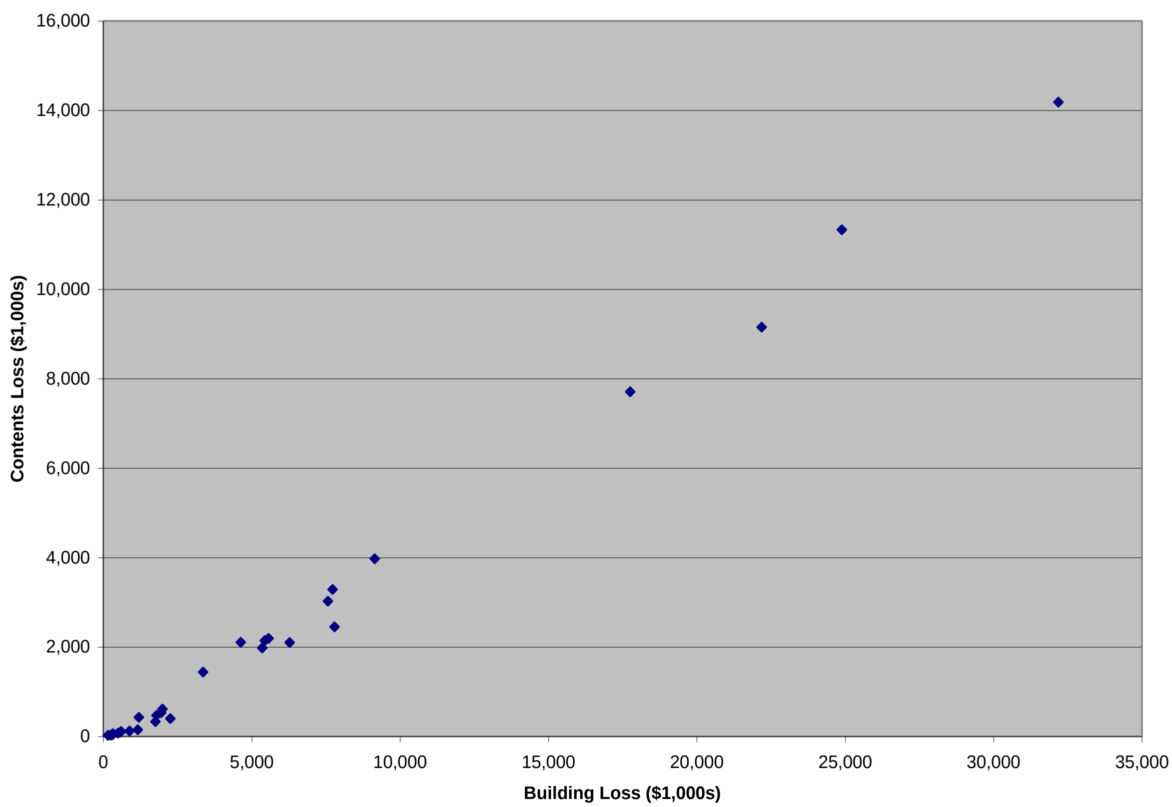

Figure 22. Relationship between Building and Contents Losses

4. *Provide the number of contents vulnerability functions. Describe whether different contents vulnerability relationships are used for personal residential, commercial residential, manufactured home, unit location for condo owners and apartment renters, and various building classes.*

Similar to the building vulnerability functions discussed in Standard V-1, Disclosure 6, the Florida Hurricane Model uses a total of 96 basic construction types, covering all occupancies. Thirty of these vulnerability functions are applicable to the residential occupancy. Twenty-one are low-rise residential types, applicable to building heights from one to three stories, and nine are mid/high-rise commercial types, applicable to building heights of four or more stories, with distinct vulnerability functions for each structure type applicable to building heights from four to seven stories (mid-rise) and more than seven stories (high-rise). There is no distinction for contents vulnerability functions among the different groups with in the residential occupancy for the same structure type. For example, the same contents vulnerability function will be used for personal residential, say a low-rise timber structure, and the condo unit owners contents vulnerability function in a similar structure.

5. *Provide a flow chart documenting the process by which the time element vulnerability functions are derived and implemented.*

The Florida Hurricane Model estimates time element costs as a function of building damage, content damage, and occupancy as indicated in Figure 23. The program first determines the greater of building or content damage (as percentages of the coverage value) and then evaluates the time element vulnerability function at this x-value. There is no minimum threshold at which time element loss is calculated. That is to say, if a site experiences significant structure or content damage, some time element cost is estimated to occur. The size of the storm, even if it is “merely” a category 1 event, is irrelevant to the policyholder and the insurer; all that matters is whether the home is occupiable under the terms of the policy. Nor would a threshold structure damage make sense: even if the structure experiences minimal damage, such as just a few broken windows, significant damage to contents can result in significant time element costs. It is for this reason that the Florida Hurricane Model uses both structure and content damage, as well as occupancy, in determining time element costs.

Figure 23 summarizes the process by which CoreLogic develops its Time Element vulnerability functions. Abbreviations used in this figure are: Cov A: Building, Cov C: Contents, Cov D: Time Element, and WS: Windspeed.

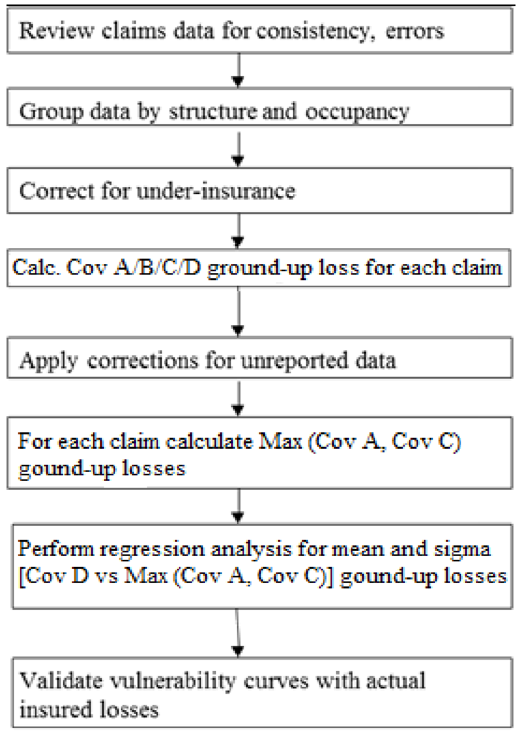

Figure 23. Flowchart – Time Element Vulnerability Development

6. *Describe the assumptions, data (including insurance claims data), methods, and processes used to develop and validate the time element vulnerability functions.*

The Florida Hurricane Model estimates time element costs as a function of building damage, content damage, and occupancy. The program first determines the greater of building or content damage (as percentages of the coverage value) and then evaluates the time element vulnerability function at this x-value. There is no minimum threshold at which time element loss is calculated. That is to say, if a site experiences significant structure or content damage, some time element cost is estimated to occur. The size of the storm, even if it is "merely" a category 1 event, is irrelevant to the policyholder and the insurer; all that matters is whether the home is occupiable under the terms of the policy. Nor would a threshold structure damage make sense: even if the structure experiences minimal damage, such as just a few broken windows, significant damage to contents can result in significant time element costs. It is for this reason that the Florida Hurricane Model uses both structure and content damage, as well as occupancy, in determining time element costs.

We recognize that the ideal model would also include explicit consideration of lifeline functionality, for example, whether electrical power and water are available at the insured's home. Unfortunately, proper analysis of lifeline functionality is a complex issue. Merely to begin such an analysis requires detailed information on the lifeline facilities, such as the locations, structural characteristics, and links between utility elements like local water mains, pumping stations, power plants, etc. Suffice it to say this type of data is tightly controlled by the multitude of public utilities involved, and is generally unavailable at the local level. The reader should not infer from this that the Florida Hurricane Model underestimates time element costs by an amount equal to lifeline-related effects. There is a strong positive correlation between local lifeline damage and damage to a policyholder's home. That correlation results from a common cause: higher wind speeds generally result in higher damage to homes, power lines, and even underground water mains, which can experience damage from uprooted trees. The historical data that go into CoreLogic's time element vulnerability functions therefore account for lifeline damage, if only in an indirect, average way, because they are based on damage that is correlated with lifeline damage.

7. *Describe how time element vulnerability functions take into consideration the damage (including damage due to storm surge, flood, and wind) to local and regional infrastructure.*

Storm surge and flood damage are not modeled explicitly in the Florida Hurricane Model. However, to the extent that such perils (in addition to wind damage) affect time element claims through damage to the infrastructure, they are implicitly included in the Florida Hurricane Model time element vulnerability functions.

8. *Describe the relationship between building structure and contents vulnerability functions.*

The building vulnerability functions and the contents vulnerability functions are generated separately from the claims data. Their derivation is independent from one another, but these vulnerability functions are correlated to the extent of the damage to the building affects the damage to the contents. The relationship between the building and contents vulnerability functions can be observed by the linear trend shown in Figure 24 and demonstrating that the two are positively correlated. As indicated in the response to Standard V-2.B there is no direct functional dependency defined in the Florida Hurricane Model between the building vulnerability function and the contents vulnerability function.

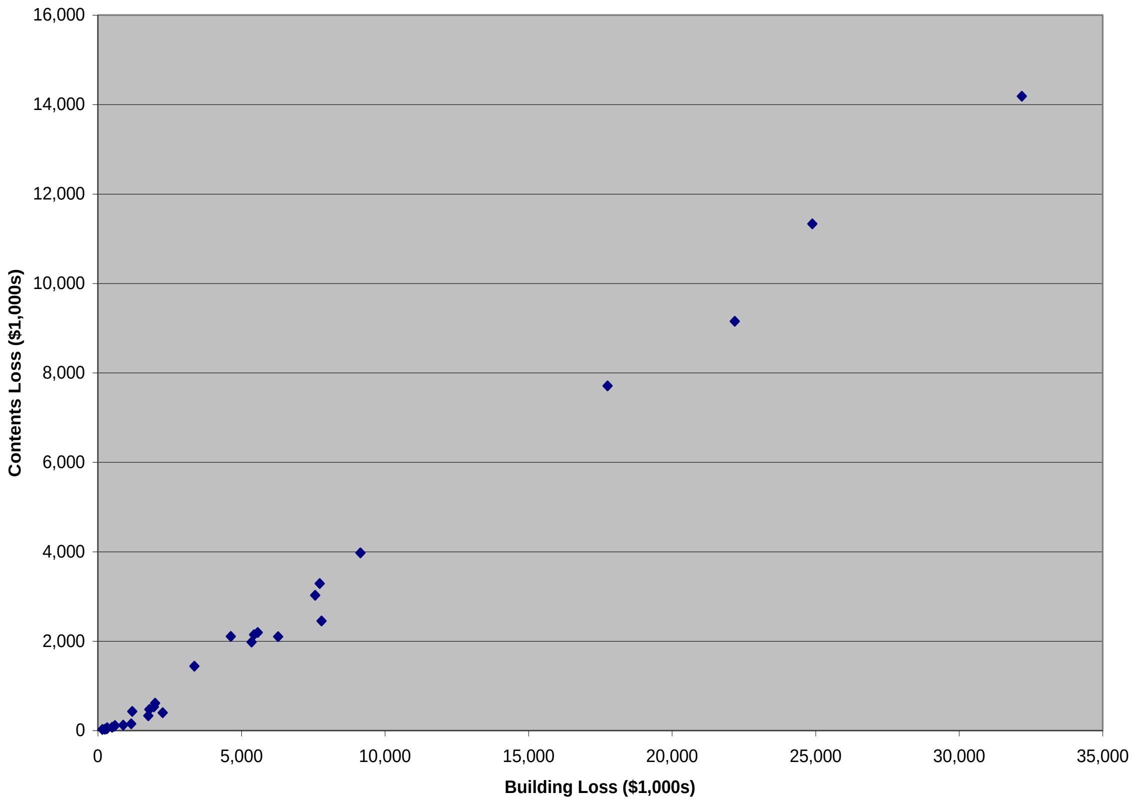

Figure 24. Relationship between Building and Contents Losses

9. *Describe the relationship between building structure and time element vulnerability functions.*

The time element vulnerability function expresses the damage ratio with respect to the annual time element coverage. This ratio is a function of the maximum of the building and contents damage ratios.

10. *Describe the assumptions, data (including insurance claims data), methods, and processes used to develop contents and time element vulnerability functions for unknown residential construction types and for when some of the primary characteristics are unknown.*

Unknown structure types in Florida are modeled by the Default contents and time element vulnerability functions which are defined by the TIV weighted average of the different structures composing the Florida Hurricane Cat Fund portfolio.

CoreLogic's model has default building characteristics based on the year-of-construction when characteristics are unknown or not provided.

V-3 Mitigation Measures

A. *Modeling of mitigation measures to improve a building's hurricane wind resistance, the corresponding effects on vulnerability, and their associated uncertainties shall be theoretically sound and consistent with fundamental engineering principles. These measures shall include fixtures or construction techniques that enhance the performance of the building and its contents and shall consider:*

- ***Roof strength***
- ***Roof covering performance***
- ***Roof-to-wall strength***
- ***Wall-to-floor-to-foundation strength***
- ***Opening protection***
- ***Window, door, and skylight strength.***

The modeling organization shall justify all mitigation measures considered by the model.

The Florida Hurricane Model allows for modifications to the vulnerability curves in the secondary structural component of the model if additional knowledge about the construction characteristics is available. Such construction characteristics include roof strength, roof covering performance, roof-to-wall strength, wall-to-floor-to-foundation strength, opening protection, and window, door, and skylight strength.

B. *Application of mitigation measures that enhance the performance of the building and its contents shall be justified as to the impact on reducing damage whether done individually or in combination.*

The application of modifications to the vulnerability curves in the secondary structural component of the Florida Hurricane Model is reasonable both individually and in combination.

Disclosures

1. *Describe any modifications to mitigation measures in the model since the previously accepted model.*

One option was updated in the default mitigation measures for Post-1994 mobiles homes where the width was changed from “Double-wide” to “Single-wide”.

Two Roofing Material options were added: ASTM D7158 Class D and Class H Shingles.

2. *Provide a completed Form V-2, Mitigation Measures, Range of Changes in Damage. Provide a link to the location of the form [insert hyperlink here].*

   See Form V-2 at Appendix #4.

3. *Provide a description of the mitigation measures used by the model, whether or not they are listed in Form V-2, Mitigation Measures, Range of Changes in Damage.*

   A large number of mitigation measures relevant to residential structures including manufactured homes are available in the model. These measures are provided as various options under about 30 different secondary structural features. There are both a number of features available that are not used in Form V-2, e.g. glazing extent, as well as a number of options within each feature, e.g. additional roof profile types beyond braced gable and hip.

   The mitigation measures as well as their corresponding options available in the Florida Hurricane Model are described in the table below.

TABLE 9. LIST OF MITIGATION MEASURES IN CORELOGIC MODEL

System	Secondary Structural Feature	Description	In Form V-2
Roofing System	Roof Covering	Unknown or Other	
		Ordinary Asphalt Shingles	
		Event Rated Class G Asphalt Shingles	Yes
		Built-Up Roofing	
		Asbestos Cement	
		Asphalt on Slab	
		Single-ply Membrane, Not Attached	
		Single-ply Membrane, Attached	Yes
		Metal Decking	Yes
		Wood Shingles or Shakes	
		Slate/Tile	
		Fire Resistive	
		Event Rated Class D Asphalt Shingles	
		Event Rated Class H Asphalt Shingles	Yes
	Roof Sheathing	Unknown	
		Wood (Except Plywood)	
		Reinforced Concrete	
		Gypsum Concrete	
		Metal Deck W/o Concrete	

System	Secondary Structural Feature	Description	In Form V-2
		Metal Deck With Concrete	
		Metal Deck With Insulation	
		Waferboard	
		Plywood Sheet or OSB With 6d Nailing	Yes
		Plywood Sheet: Sealed Joints and 6d Nailing	
		Plywood Sheets With 8d Nailing	Yes
		Plywood Sheets With 8d Ring Shank Nailing	
		Plywood Sheets: Sealed Joints and 8d Nailing	
		Plywood Sheets: Sealed Joints and 8d Ring Shank Nailing	
		Plywood Sheets: ASTM Felt and 6d Nailing	
		Plywood Sheets: ASTM Felt and 8d Nailing	
		Plywood Sheets: ASTM Felt and 8d Ring Shank Nailing	
		Plywood Sheets: Sealed Joints + ASTM Felt and 6d Nailing	
		Plywood Sheets: Sealed Joints + ASTM Felt and 8d Nailing	
		Plywood Sheets: Sealed Joints + ASTM Felt and 8d Ring Shank Nailing	
		Plywood Sheet or OSB With Unknown Nailing	
		Plywood Sheet: Sealed Joints With Unknown Nailing	
		Plywood Sheet: ASTM Felt With Unknown Nailing	
		Plywood Sheet: Sealed Joints + ASTM Felt With Unknown Nailing	
	Roof Flashing	Unknown or N.A.	
		Loose, bent or deteriorated flashing	
		Good condition with adequate fastening	
	Roof Condition	Unknown	
		Poor, Needs Replacing	
		Fair	
		Average	

System	Secondary Structural Feature	Description	In Form V-2
		Good	
		Very Good or New	
	Roof Age	Unknown	
		Less Than 5 Years	
		6 to 10 Years	
		11 to 15 Years	
		16 to 20 Years	
		More Than 20 Years	
	Roof Profile	Unknown	
		Flat or Gable: Slope < 10 deg.	
		Gable - Braced	
		Gable - Unbraced	Yes
		Gable - Unknown	
		Hip: Slope>30 deg.	
		Stepped or Multi-level	
		Hip: Slope < 30 deg.	
	Roof Overhang	Unknown	
		None	
		Less Than 1 Foot	
		More Than 1 Foot	
	Parapet	Unknown or None	
		Non-structural, any height	
		Structural, < 3' tall (Flat/low slope Roof)	
		Structural, > 3' tall (Flat/low slope Roof)	
	Roof Equipment Anchorage	Unknown or N.A.	
		No Equipment	
		Poorly Anchored	
		Well Anchored	
Anchorage System	Roof-to-Wall Connection	Unknown or Unable to Locate	
		No connection	
		Partial connection	
		Bolted along with Nails (Wood Frames)	Yes
		Ordinary Box Nails (Wood Frames)	

System	Secondary Structural Feature	Description	In Form V-2
		Straps, Clips or Extra Strengthening such as Wraps and Double Wraps	Yes
		Tie-down straps in RC (masonry walls)	
		Bolted or welded connections	
		Integrated RC slab with masonry wall	
	Wall-to-Floor-to-Foundation Anchorage	Unknown or Unable to Locate	
		No or Inadequate Connection	
		Ordinary Nailed Connection	
		1/2" dia. Anchor bolts @ 6ft Spacing O.C.	
		Additional Straps or Ties	
		Continuous Structural Anchor to Ground	
		1/2" dia. Anchor Bolts @ 4ft Spacing O.C.	
		5/8" dia. Anchor Bolts @ 6ft Spacing O.C.	Yes
Wall System	Wall Cladding	Unknown or Other	
		Concrete (All Types)	
		EIFS (Foam + Plaster)	
		Masonry	Yes
		Corrugated Metal Panels	
		Wood, Metal, or Plastic Siding	Yes
		Stone Panel	
		Stucco	
		Plywood	
		Asbestos Cement	
	Exterior Wall Condition	Unknown	
		Poor, needs replacing	
		Fair	
		Average	
		Good	
		Very Good or New	
	Condition of Wood Framing	Unknown or N.A.	
		Not Weakened or N.A.	
		Weakened Framing	
	Entryway Door Opening	Unknown	
		Minor (< 10%)	
		Moderate (10% to 25%)	
		Major (> 25%)	

System	Secondary Structural Feature	Description	In Form V-2
	Overhead Doors	Unknown or N.A.	
		No	
		Single Door: Detached Garage	
		Double Doors: Detached Garage	
		Single Door: Attached Garage	
		Double Doors: Attached Garage	
		More than 2 Doors: Attached	
		More than 2 Doors: Detached	
		All Structurally Reinforced	Yes
	Door Reinforcements	Unknown or N.A.	
		Hollow-core or Glass Panes (Residential)	
		Tempered Glass Door (Commercial)	
		Solid Door or Stiffened Panels	
		Impact Resistant Door and Frame	Yes
Opening Protection System	Glazing Extent	Unknown	
		No Glazing	
		Very Minor (< 5% of exterior wall area)	
		Minor (6% To 10% of exterior wall area)	
		Moderate (11%-30% exterior wall area)	
		Major (31% to 70% of exterior wall area)	
		Almost All (> 70% of exterior wall area)	
	Glazing Type	Unknown or N.A.	
		Ordinary: Annealed	Yes
		Heat Strengthened	
		Fully-tempered	
		Insulated	
		Laminated	
		Plastic	
		Polycarbonate	
		Plastic - discoloration	
		Polycarbonate - discoloration	
	Glazing Size	Unknown or N.A.	
		Small (< 25 Sq. Ft.)	
		Medium (25-50 Sq. Ft.)	
		Large (> 50 Sq. Ft.)	

System	Secondary Structural Feature	Description	In Form V-2
	Evidence of Glazing Standards	Unknown or N.A.	
		No Evidence	
		Visible Evidence	
	Shutters	Unknown or N.A.	
		No Shutters or screens	Yes
		Temporary Shutters	Yes
		Permanent Hurricane Shutters	
		Impact-resistant Fabric Screens	
	Skylight Extent	Unknown or None	Yes
		Minor (<15% of roof surface area)	
		Moderate (15%-40% of roof area)	
		Major (> 40% of roof surface area)	
	Skylight Type	Unknown or N.A.	
		Ordinary Glass	
		Strengthened Glass	
		Insulated Glass	
		Laminated Glass	Yes
		Plastic - no discoloration	
		Polycarbonate - no discoloration	
		Plastic - discoloration	
		Polycarbonate - discoloration	
	Sliding Glass Door	Unknown or N.A.	
		No	
		Not Rated for Design Pressure (DP) nor Debris Impact (TAS and ASTM)	
		Rated Only for Design Pressure (DP)	
		Rated for Design Pressure (DP) and Debris Impact (TAS and ASTM)	Yes
Manufac-tured Home	Manufactured Home Wall-to-Floor Anchorage	Unknown	
		Inadequate Connection	
		Ordinary Nailed Connections	
		Anchor Bolts	
		Additional Strengthening	
	Manufactured Home Width	Unknown	
		Single-wide	
		Double-wide	

System	Secondary Structural Feature	Description	In Form V-2
General	Wind Exposure	Unknown or Average	
		Very High	
		Above Average	
		Below Average	
		Very Low	
	Design Code	Unknown	Yes (related to Year of Construc-tion)
		NBC/UBC/CABO/IBC	
		ANSI/ASCE/IRC	
		SFBC	
		SBC w/o Debris Impact Standards	
		SBC w/ Debris Impact Standards	
		HUD - Pre 1994 Manufactured Homes	
		HUD - Post 1994 Manufactured Homes	
		Florida Building Code	
		IBC/IRC	
		Code Plus by Federal Alliance for Safe Homes (FLASH)	
		Fortified for Safe Living (IBHS)	
	Code Enforcement	Unknown	
		No	
		Yes	

4. *Describe how mitigation measures are implemented in the model. Identify any assumptions.*

   The options applicable to the different mitigation measures are selected and entered into the input portfolio file in conjunction with the base structure type to modify its corresponding base vulnerability curve. The magnitude of the modification imparted by the selected mitigation measures to the base vulnerability curve is estimated in an algorithm where the relative vulnerability contributions of the various mitigation measures are combined.

   Redundancy between mitigation measures within each system is taken into consideration to avoid double counting. Also, interaction between two systems is included in the algorithm to best represent the overall vulnerability of the structure. Such interaction is important in the roof-to-wall connection and the wall-to-floor-to-foundation connection.

The scoring system used in this algorithm is based on post-disaster field surveys, engineering calculations, published papers, testing and engineering judgment.

The use of the mitigation measures assumes that users have accurate information on a number of mitigation measures characterizing the buildings in their portfolios.

5. *Describe how the effects of multiple mitigation measures are combined in the model and the process used to ensure that multiple mitigation measures are correctly combined.*

The scoring system used to modify the vulnerability functions accounts for interaction among features (two important classes of such interaction relate to the roof-to-wall connection and the wall-to-floor-to-foundation connection).

6. *Describe how building and contents damage are affected by performance of mitigation measures. Identify any assumptions.*

The building and contents damage will be affected by the mitigation measures and would result in an increase or a decrease of the damage depending on their performance. Each of the Secondary Structural Features listed in Table 9 has several options from which users can choose to better match the building characteristics. These options include a spectrum of actual possible characteristics ranging in quality and strength that can weaken, maintain or improve the overall building performance, as well as the contents vulnerability. Some mitigation measures, such as roof-to-wall connections and roofing materials have significant impact where a lower performance component could lead to catastrophic failure of the building.

7. *Describe how mitigation measures affect the uncertainty of the vulnerability. Identify any assumptions.*

The diversity and frequency of mitigation measures in the building stock provide the extent of the uncertainty in the vulnerability model. It is assumed that the claims data provide a tool to define the uncertainty due to the mitigation measures.

Actuarial Standards

A-1 Modeling Input Data and Output Reports

A. Adjustments, edits, inclusions, or deletions to insurance company or other input data used by the modeling organization shall be based upon accepted actuarial, underwriting, and statistical procedures.

Adjustments, edits, inclusions, or deletions to insurance company input data used by the modeler are based upon accepted actuarial, underwriting, and statistical procedures.

B. All modifications, adjustments, assumptions, inputs and input file identification, and defaults necessary to use the model shall be actuarially sound and shall be included with the model output report. Treatment of missing values for user inputs required to run the model shall be actuarially sound and described with the model output report.

Any assumption or method used by CoreLogic's hurricane loss projection model that relates to a specific insurer's inputs to the model, if any, for the purposes of preparing the insurer's rate filing is clearly identified.

Disclosures

1. *Identify insurance-to-value assumptions and describe the methods and assumptions used to determine the true property value and associated losses. Provide a sample calculation for determining the property value.*

The Florida Hurricane Model does not make any insurance-to-value assumption to determine the true property replacement cost. Hence, no such correction is made by the model in the course of a portfolio analysis. The assumption made is that the total insured value provided represents true property value, so no underinsurance factor is necessary. However, CoreLogic uses insurance-to-value information provided by insurance companies to assess property replacement values when processing claims data for the development of vulnerability functions.

Calculations on loss costs based on property value (replacement value) are determined in the examples below:

Example #1:	
Policy Limit:	$200,000
Replacement: Value:	$220,000
Insured Value (Input):	$220,000
Damage Ratio:	50%
Deductible:	0%
Model Loss (with Replacement Value):	$110,000

Example #2:	
Policy Limit:	$200,000
Replacement Value:	$220,000
Damage Ratio:	95%
Deductible:	0%
Model Loss (with Replacement Value):	$200,000

Although the cost to repair/replace the structure is $209,000 in example #2, losses cannot exceed the limit.

2. *Identify depreciation assumptions and describe the methods and assumptions used to reduce insured losses on account of depreciation. Provide a sample calculation for determining the amount of depreciation and the actual cash value (ACV) losses.*

The Florida Hurricane Model does not calculate or use a depreciation factor. It is expected that the user applies depreciation (if applicable) to the insured value or sets the insured value as the actual cash value. An example accounting for depreciation is given below:

Coverage C (contents) Limit:	$50,000
Depreciation Factor:	60%
Actual Cash Value for Coverage C:	$30,000
Insured Value for Coverage C (Input):	$30,000
Damage Ratio of Contents:	2%
Contents Losses (using $30,000 for Insured Value):	$600

3. *Describe the methods used to distinguish among policy form types (e.g., homeowners, dwelling property, manufactured home, tenants, condo unit owners).*

The Florida Hurricane Model has no pre-determined policy form types in it. The user must specify the format of the policy form in the input file. The model can accept a wide variety of combinations of deductible and limits. The primary assumption in the analysis of different policy forms is that the user has input the data correctly. The Florida Hurricane Model has many reports which the user can use to validate the correctness of the data, but the responsibility for the correctness of the analysis resides with the user. The model can produce loss costs for different types of policies. All the elements of the loss are retained following an analysis. With a properly formatted input file, the user can produce reports which detail many breakdowns of the data, not just by Policy Type, but also by ZIP Code, county, state, line of business, branch, division, etc. The user has to select the correct identification codes for the various reports needed.

4. *Provide a copy of the input form(s) used in the model with model options available for selection by the user for the Florida hurricane model under review. Describe the process followed by the user to generate the model output produced from the input form. Include the model name and version identification on the input form. All items included in the input form submitted to the Commission should be clearly labeled and defined.*

An example of the Florida Hurricane Model input form is shown below. The field names are in the first column, and arranged into six groups (P for policy information, PC for policy coverage information, PF for policy facultative reinsurance, S for site information, SC for site coverage information, and SF for site facultative reinsurance). The example below has five records of data (policy numbers FLP001 through FLP005). To generate the model output, a user of the model imports the import form using functionality built into the CoreLogic software, selects the relevant analysis options and desired output reports, and executes the analysis.

TABLE 10. FLORIDA HURRICANE MODEL 2017A INPUT FORM

P_PolNum	FLP001	FLP002	FLP003	FLP004	FLP005
P_InsName					
P_AcctNum					
P_AcctName					
P_Company	C1	C1	C1	C1	C1
P_Division	NY	NY	FL	FL	NY
P_Branch	Mia	Mia	Mia	Mia	Mia
P_LineBus	HO	HO	MP	MP	HO
P_PolTyp	COMF	COMF	HO	HO	HO
P_PolStats	IN	IN	IN	IN	IN
P_IncpDate	20020901	20021101	20021201	20020901	20021101
P_ExprDate	20030831	20031031	20031130	20030831	20031031
P_Producer	9912	4412	7413	1284	9912
P_TransID	99	99	99	99	99
PC_PerlTyp	Wind	Wind	Wind	Wind	Wind
PC_CvgTyp	Bldg	Cont	Time	Time	ALE
PC_LmtAmt	500	333	111	222	67
PC_LmtTyp	CovSpec	CovSpec	CovSpec	CovSpec	CovSpec
PC_DedAmt	1000	1000	1000	1000	1000
PC_DedTyp	CovSpec	CovSpec	CovSpec	CovSpec	CovSpec
PC_PolPrm	600	600	600	600	600
PC_AttcPnt	0	0	0	0	0
PC_ProRata	100	100	100	100	100
PF_CertNum					
PF_PerlTyp					
PF_CvgTyp					
PF_ReinApp					
PF_AttPnt					

PF_LayAmt					
PF_CedPcnt					
PF_ReinTyp					
PF_AggLmt					
PF_Reinsr					
PF_Broker					
PF_CertSta					
PF_ReinPrm					
PF_TrtyNum					
S_Number	1	1	1	1	1
S_Name					
S_StrAddr	400 S Greenwood	2040 Whitfield	7400 Nw 19	2801 Rosselle	4586 Palm Ave
S_City	Clearwater	Sarasota	Miami	Jacksonville	Hialeah
S_County	Pinellas	Manatee	Dade	Duval	Dade
S_State	FL	FL	FL	FL	FL
S_Zip_5dg	34616	34243	33147	32205	33012
S_WndStruc	SC52	SC52	SC654	SC654	SC654
S_WndOccpy	OC1	OC1	OC1	OC1	OC1
S_YrBuilt	1968	1980	1934	1942	1960
S_NumStory	1	2	1	1	1
S_NumStruc	1	1	1	1	1
SC_PerlTyp	Wind	Wind	Wind	Wind	Wind
SC_CvgTyp	Bldg	Cont	Time	Time	ALE
SC_CovQual	50	50	50	50	50
SC_TIV	600	350	150	250	75
SC_LmtAmt	500	333	111	222	67
SC_LmtTyp	CovSpec	CovSpec	CovSpec	CovSpec	CovSpec
SC_DedAmt	1000	1000	1000	1000	1000
SC_DedTyp	CovSpec	CovSpec	CovSpec	CovSpec	CovSpec
SC_Prem	600	600	600	600	600
SF_CertNum					
SF_PerlTyp					
SF_CvgTyp					
SF_ReinApp					
SF_AttPnt					
SF_LayAmt					
SF_CedPcnt					
SF_ReinTyp					
SF_Reinsr					
SF_Broker					
SF_CertSta					
SF_Prem					
SF_TrtyNum					

The table below provides descriptions for each of the input data fields.

TABLE 11. DESCRIPTION OF INPUT DATA FIELDS

Field Name	Data Group	Description
P_PolNum	Policy	Policy Number
P_InsName	Policy	Insured Name
P_AcctNum	Policy	Account Number
P_AcctName	Policy	Account Name
P_Company	Policy	Company
P_Division	Policy	Division
P_Branch	Policy	Branch
P_LineBus	Policy	Line of Business
P_PolTyp	Policy	Policy Type

Field Name	Data Group	Description
P_PolStats	Policy	Policy Status
P_IncpDate	Policy	Inception Date
P_ExprDate	Policy	Expiration Date
P_Producer	Policy	Producer
P_TransID	Policy	Translation ID
PC_PerlTyp	Policy Coverage	Peril Type
PC_CvgTyp	Policy Coverage	Coverage Type
PC_LmtAmt	Policy Coverage	Limit Amount
PC_LmtTyp	Policy Coverage	Limit Type
PC_DedAmt	Policy Coverage	Deductible Amount
PC_DedTyp	Policy Coverage	Deductible Type
PC_PolPrm	Policy Coverage	Policy Premium
PC_AttcPnt	Policy Coverage	Attachment Point
PC_ProRata	Policy Coverage	Prorata
PF_CertNum	Policy Facultative	Certificate Number
PF_PerlTyp	Policy Facultative	Peril Type
PF_CvgTyp	Policy Facultative	Coverage Type
PF_ReinApp	Policy Facultative	Reinsurance Applies
PF_AttPnt	Policy Facultative	Attachment Point
PF_LayAmt	Policy Facultative	Layer Amount
PF_CedPcnt	Policy Facultative	Ceded Percentage
PF_ReinTyp	Policy Facultative	Reinsurance Type
PF_AggLmt	Policy Facultative	Aggregate Limit
PF_Reinsr	Policy Facultative	Reinsurer
PF_Broker	Policy Facultative	Broker
PF_CertSta	Policy Facultative	Certificate Status
PF_ReinPrm	Policy Facultative	Reinsurance Premium
PF_TrtyNum	Policy Facultative	Treaty Number
S_Number	Site	Site Number
S_Name	Site	Site Name
S_StrAddr	Site	Street Address
S_City	Site	City
S_County	Site	County
S_State	Site	State
S_Zip_5dg	Site	ZIP Code
S_WndStruc	Site	Wind Structure Type
S_WndOccpy	Site	Wind Occupancy Type
S_YrBuilt	Site	Year Built
S_NumStory	Site	Number of Stories
S_NumStruc	Site	Number of Structures
SC_PerlTyp	Site Coverage	Peril Type
SC_CvgTyp	Site Coverage	Coverage Type
SC_CovQual	Site Coverage	Coverage Quality
SC_TIV	Site Coverage	Total Insured Value
SC_LmtAmt	Site Coverage	Limit Amount
SC_LmtTyp	Site Coverage	Limit Type
SC_DedAmt	Site Coverage	Deductible Amount
SC_DedTyp	Site Coverage	Deductible Type
SC_Prem	Site Coverage	Premium
SF_CertNum	Site Facultative	Certificate Number
SF_PerlTyp	Site Facultative	Peril Type
SF_CvgTyp	Site Facultative	Coverage Type
SF_ReinApp	Site Facultative	Reinsurance Applies
SF_AttPnt	Site Facultative	Attachment Point
SF_LayAmt	Site Facultative	Layer Amount
SF_CedPcnt	Site Facultative	Ceded Percentage

Field Name	Data Group	Description
SF_ReinTyp	Site Facultative	Reinsurance Type
SF_Reinsr	Site Facultative	Reinsurer
SF_Broker	Site Facultative	Broker
SF_CertSta	Site Facultative	Certificate Status
SF_Prem	Site Facultative	Reinsurance Premium
SF_TrtyNum	Site Facultative	Treaty Number

5. *Disclose, in a model output report, the specific inputs required to use the model and the options of the model selected for the use in a residential property insurance rate filing. Include the model name and version identification on the model output report. All items included in the output report form submitted to the Commission shall be clearly labeled and defined.*

The output reports on the next four pages provide an example of the information given. In the reports, 'Multiple Layer Flag', if 'On', indicates that policies having the same account number should be treated as layers of a single policy, and 'Global Limits/Deductibles', if other than 'None Applied', indicates that the limits and/or deductibles in the portfolio have been overridden with some user-specified global values.

Geocode Statistics by State
for Portfolio case1

Geocode Statistics	Number of Locations	Building TIV $(Thousands)	Contents TIV $(Thousands)	Total Property TIV $(Thousands)	Time Element TIV $(Thousands)	Total TIV $(Thousands)
State: Florida						
Postal Code	2	200	0	200	0	200
Florida State Total	**2**	**$200**	**$0**	**$200**	**$0**	**$200**
Total for All States	**2**	**$200**	**$0**	**$200**	**$0**	**$200**

Factors Used in Analysis:

Peril Type: Hurricane
Multiple Layer Flag: Off

Product Version: Florida Hurricane Model Version: 2017a

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Quality Factor by State
for Portfolio case1

Quality Factor	Number of Locations	Building TIV $(Thousands)	Contents TIV $(Thousands)	Total Property TIV $(Thousands)	Time Element TIV $(Thousands)	Total TIV $(Thousands)
State: Florida						
50	2	200	0	200	0	200
Florida State Total	**2**	**$200**	**$0**	**$200**	**$0**	**$200**
Total for All States	**2**	**$200**	**$0**	**$200**	**$0**	**$200**

Factors Used in Analysis:

Peril Type: Hurricane
Multiple Layer Flag: Off

Product Version: Florida Hurricane Model Version: 2017a

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Structure Types by State
for Portfolio case1

Structure Types	Number of Locations	Building TIV $(Thousands)	Contents TIV $(Thousands)	Total Property TIV $(Thousands)	Time Element TIV $(Thousands)	Total TIV $(Thousands)
State: Florida						
Commercial, Low-Rise, Unreinforced-Masonry, Average-Cladding	1	100	0	100	0	100
Residential, Low-Rise, Timber, Average-Cladding	1	100	0	100	0	100
Florida State Total	**2**	**$200**	**$0**	**$200**	**$0**	**$200**
Total for All States	**2**	**$200**	**$0**	**$200**	**$0**	**$200**

<u>Factors Used in Analysis:</u>
Peril Type: Hurricane
Multiple Layer Flag: Off

Product Version: Florida Hurricane Model Version: 2017a

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Hurricane - Expected Annual Damage and Loss by State for Portfolio case1

State	Total TIV $(Thousands)	No. of Bldgs.	Expected Annual Damage $(Thousands)	Expected Annual Damage % Total TIV	Expected Annual Gross Loss $(Thousands)	Expected Annual Gross Loss % Total TIV	Expected Annual Fac. Cessions $(Thousands)	Expected Annual Net Loss $(Thousands)	Expected Annual Net Loss % Total TIV
Florida	200	2	0.91	0.4568	0.91	0.4568	0.00	0.91	0.4568
Total for All States	**$200**	**2**	**$0.91**	**0.4568%**	**$0.91**	**0.4568%**	**$0.00**	**$0.91**	**0.4568%**

Factors Used in Analysis:

Demand Surge Factor: Demand Surge Not Included
Region: U.S. Mainland
Global Limits/Deductibles: None Applied
Multiple Layer Flag: Off

Product Version: Florida Hurricane Model Version: 2017a

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6. *Describe actions performed to ensure the validity of insurer or other input data used for model inputs or validation/verification.*

Client data are extensively tested during the import process into the CoreLogic system to confirm their accuracy. Field level validation is performed to confirm that every data element within each record falls within known ranges. Data not falling within known ranges are marked as errors or a warning in a log depending upon the severity of the problem. Child/parent and other key relationships are also checked. A summary log is displayed at the end of import process denoting the number records which have warnings or errors.

7. *Disclose if changing the order of the model input exposure data produces different model output or results.*

Changing the order of model input exposure data produces the same model output and results for each exposure record and the ensemble.

8. *Disclose if removing and adding policies from the model input file affects the output or results for the remaining policies.*

Addition and removal of policies from the model input file produces the same model output and results for remaining policies. The model output and results for the ensemble will differ.

A-2 Event Definition

A. Modeled loss costs and probable maximum loss levels shall reflect all insured wind related damages from storms that reach hurricane strength and produce minimum damaging wind speeds or greater on land in Florida.

Modeled loss costs and probable maximum loss levels reflect all damages starting when modeled damage is first caused in Florida from an event modeled as a hurricane at that point in time and will include all subsequent damage in Florida from that event.

Disclosures

1. *Describe how damage from model generated storms (landfalling and by-passing) is excluded or included in the calculation of loss costs and probable maximum loss levels for Florida.*

   All damage from any storm that makes landfall or close bypass at hurricane status (Category 1 or above) is included in the calculation of loss costs and probable maximum loss levels, including portions below Category 1 strength.

2. *Describe how damage resulting from concurrent or preceding flood or hurricane storm surge is treated in the calculation of loss costs and probable maximum loss levels for Florida.*

   Residential property damage from storm surge is not explicitly calculated by the model. However, to the extent that a fraction of such flood damage is included in the claims data, this damage will also be reflected in the damage estimation and hence in the loss costs and probable maximum loss levels. Claims data used in deriving vulnerability functions excludes properties that are likely impacted by storm surge.

A-3 Coverages

A. The methods used in the calculation of building loss costs shall be actuarially sound.

The methods used in the calculation of building loss costs are actuarially sound.

B. The methods used in the calculation of appurtenant structure loss costs shall be actuarially sound.

The methods used in the calculation of appurtenant structure loss costs are actuarially sound.

C. The methods used in the calculation of contents loss costs shall be actuarially sound.

The methods used in the calculation of contents loss costs are actuarially sound.

D. The methods used in the calculation of time element loss costs shall be actuarially sound.

The methods used in the calculation of time element loss costs are actuarially sound.

Disclosures

1. *Describe the methods used in the model to calculate loss costs for building coverage associated with personal and commercial residential properties.*

Residential building vulnerability functions were developed by regressing historic building claims against peak gust wind speed, using claims data gathered and analyzed over the last 40 years. In the Florida Hurricane Model, the user identifies the structure type (wood-frame, masonry, concrete, etc.), choosing from one or a combination of the basic structure types available in the Florida Hurricane Model. When we say building vulnerability, we mean the degree to which a building of a given structure type is estimated to be damaged at a given wind speed. A building with a concrete structure type is likely to be less vulnerable than a building with a timber structure type. The building damage increases at higher wind speeds.

2. *Describe the methods used in the model to calculate loss costs for appurtenant structure coverage associated with personal and commercial residential properties.*

The new appurtenant structure vulnerability functions were used for the calculation of the loss costs of Coverage B.

3. *Describe the methods used in the model to calculate loss costs for contents coverage associated with personal and commercial residential properties.*

Residential content vulnerability functions were developed by regressing historic content claims against peak gust wind speed, using claims data gathered and analyzed over the last 40 years. In the Florida Hurricane Model, the user identifies the structure type containing the contents, choosing from one or a combination of the basic structure types available in the Florida Hurricane Model. That is not to say that content vulnerability is the same as building vulnerability: there are two sets of vulnerability functions for each of the basic types, one set for contents and one set for buildings. The content vulnerability is a function of the structure *type*, but it is not a direct function of the building vulnerability function. At this point, it would be helpful to clarify the distinction between “content vulnerability,” “building vulnerability,” and “structure type.” *Structure type* refers to the building’s structural system: whether the building is wood-frame, masonry, concrete, etc.; whether the exterior wall material is strong or not; whether the windows are large or small; and so on. When we say *building vulnerability,* we mean the degree to which a building of a given structure type is estimated to be damaged at a given wind speed. A building with a concrete structure type is likely to be less vulnerable than a building with a timber structure type. Similarly, *content vulnerability* refers to the degree to which contents within a building of a given structure type are estimated to be damaged at a given wind speed. Contents in a building with a concrete structure type are less vulnerable to wind damage than contents in a building with a timber structure type. Building vulnerability and content vulnerability are both functions of structure type, but content vulnerability is not a function of building vulnerability.

To the extent that both building damage and content damage increase at higher wind speeds, and to the extent that both building and content damage are generally higher in more vulnerable structure types, the two are positively correlated, but there is no direct functional dependency defined in the Florida Hurricane Model between the content vulnerability function and the building vulnerability for the same structure type -- there is no adjustment factor applied to building damage to get content damage, nor should there be in the best designed model. To impose such a direct dependency would produce less representative vulnerability functions than are incorporated in the Florida Hurricane Model. Content damage, like building damage, is estimated when peak gust wind speed (2 second averaging time) exceeds 40 mph. Loss is calculated based on damage, deductible, limits, etc.

Figure 25 below demonstrates the relationship between building and contents losses exhibited in a series of hypothetical storms run in the model.

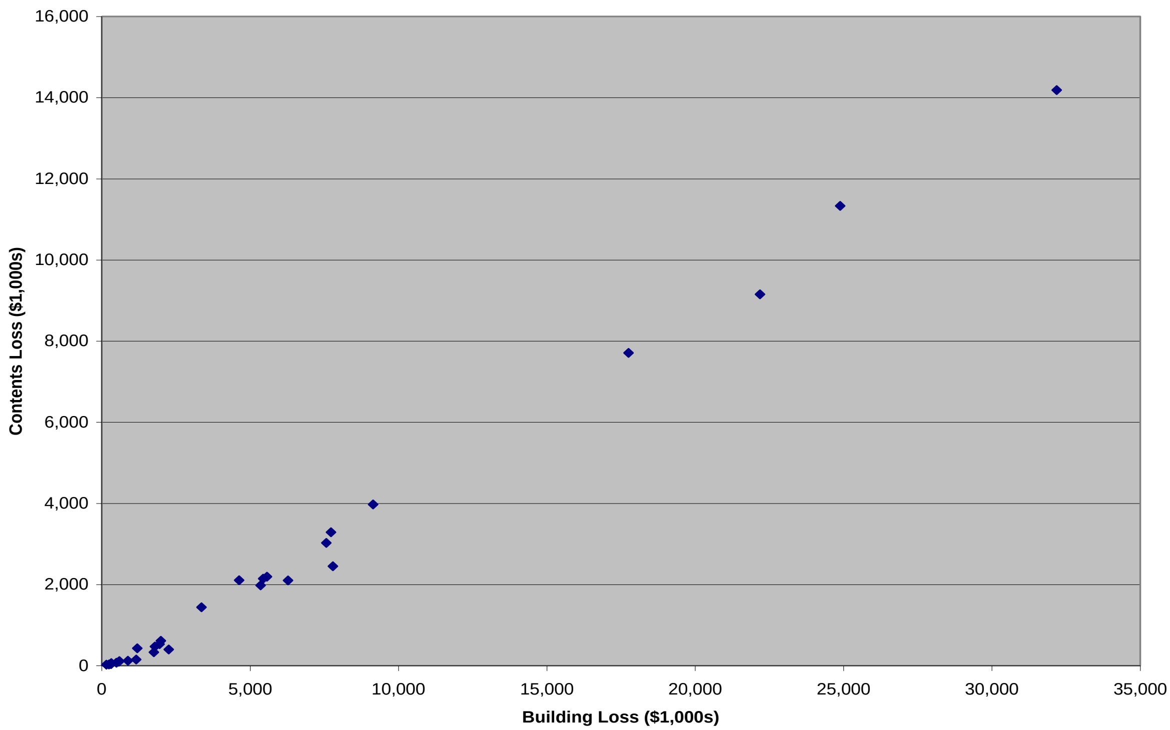


Figure 25. Relationship between Building and Contents Losses

4. *Describe the methods used in the model to calculate loss costs for time element coverage associated with personal and commercial residential properties.*

The Florida Hurricane Model estimates time element costs as a function of building damage, content damage, and occupancy. The program first determines the greater of building or content damage (as percentages of the coverage value) and then evaluates the time element vulnerability function at this x-value. There is no minimum threshold at which time element loss is calculated. That is to say, if a site experiences significant structure or content damage, some time element cost is estimated to occur. The size of the storm, even if it is “merely” a category 1 event, is irrelevant to the policyholder and the insurer; all that matters is whether the home is occupiable under the terms of the policy. Nor would a threshold structure damage make sense: even if the structure experiences minimal damage, such as just a few broken windows, significant damage to contents can result in significant time element costs. It is for this reason that the Florida Hurricane Model uses both structure and content damage, as well as occupancy, in determining time element costs.

We recognize that the ideal model would also include explicit consideration of lifeline functionality, for example, whether electrical power and water are available at the insured's home. Unfortunately, proper analysis of lifeline functionality is a complex issue. Merely to begin such an analysis requires detailed information on the lifeline facilities, such as the locations, structural characteristics, and links between utility elements like local water mains, pumping stations, power plants, etc. Suffice it to say this type of data is tightly controlled by the multitude of public utilities involved, and is generally unavailable at the local level. The reader should not infer from this that the Florida Hurricane Model underestimates time element costs by an amount equal to lifeline-related effects. There is a strong positive correlation between local lifeline damage and damage to a policyholder's home. That correlation results from a common cause: higher wind speeds generally result in higher damage to homes, power lines, and even underground water mains, which can experience damage from uprooted trees. The historical data that go into the Florida Hurricane Model's time element vulnerability functions therefore account for lifeline damage, if only in an indirect, average way, because they are based on damage that is correlated with lifeline damage.

A-4 Modeled Loss Cost and Probable Maximum Loss Considerations

A. Loss cost projections and probable maximum loss levels shall not include expenses, risk load, investment income, premium reserves, taxes, assessments, or profit margin.

Loss cost projections and probable maximum loss levels produced do not include expenses, risk load, investment income, premium reserves, taxes, assessments, or profit margin.

B. Loss cost projections and probable maximum loss levels shall not make a prospective provision for economic inflation.

The model does not make a prospective provision for economic inflation with regard to losses, probable maximum loss levels, or policy limits.

C. Loss cost projections and probable maximum loss levels shall not include any explicit provision for direct hurricane storm surge losses.

The model does not include any provision for direct hurricane storm surge with regard to losses or probable maximum loss levels.

D. Loss cost projections and probable maximum loss levels shall be capable of being calculated from exposures at a geocode (latitude-longitude) level of resolution.

The model can calculate loss costs and probable maximum loss levels for specific latitude-longitude coordinates.

E. Demand surge shall be included in the model's calculation of loss costs and probable maximum loss levels using relevant data and actuarially sound methods and assumptions.

Demand surge has been included in all analyses submitted for review by the Commission, using relevant data.

The methods and assumptions used in the estimation of demand surge are actuarially sound.

Disclosures

1. *Describe the method(s) used to estimate annual loss costs and probable maximum loss levels. Identify any source documents used and any relevant research results.*

Overall Model Methodology

The Florida Hurricane Model modeling methodology can be segmented into four components: 1) the Hazard definition, 2) Propagation of the hazard to a site, 3) Damage estimate, and 4) Loss estimation.

1. Hazard Definition

The storm database used by the Florida Hurricane Model is a combination of historical and stochastic storms. Wind speed probabilistic distributions are calculated using the probabilistic distributions of all important storm parameters. The storm intensity is driven directly from the coastline-dependent smoothed hurricane landfall maximum wind speed distributions generated from the information in the National Hurricane Center HURDAT2. The distributions for radius of maximum winds and translational speed are derived from NOAA Technical Report NWS 38 [Ho et al. 1987], the Hurricane Research Division's HURDAT Reanalysis Project, HURDAT2, DeMaria's Extended BestTrack, and the National Hurricane Center's Tropical Cyclone Reports and Advisories. A proprietary wind speed equation based upon the NOAA model as published in NWS 23 [Schwerdt, Ho, and Watkins 1979] and NWS 38 [Ho et al. 1987], modified and generalized to properly simulate wind speeds for all SSI categories of storms, computes a central pressure, which is used to apply inland decay [Vickery and Twisdale 1995] and as an input to the determination of the radius of maximum winds for severe storms. The equation then computes wind speeds using the storm's maximum sustained wind speed, the filling rate, radius to maximum winds, the storm track, translation speed, the gust factor [Krayer and Marshall 1992], the storm profile (attenuation of wind speed outward from the center), and the friction caused by local terrain and man-made structures.

2. Geocoding of Risk Location

The Florida Hurricane Model utilizes CoreLogic's Structure-level and Parcel-level Geocoding Engine PxPoint™ to compute the latitude and longitude of each site analyzed. The street address, if provided, is used to geocode to the latitude/longitude coordinates based on the centroid of the structure footprint, the centroid of the parcel, or the street address, as available, in descending order of priority. Failing the presence of a street address, the geocoding can be done at a ZIP Code, City, or County centroid basis. Wind speed distributions at the site locations are computed taking local friction into account.

3. Estimation of Damage

The Florida Hurricane Model provides the facility to define each of the property assets being analyzed in order to compute resulting damage. Damage can be calculated for Structure, Contents, Time Element (such as Additional Living Expense (ALE) or Business Interruption (BI)), and up to three additional user defined coverage types. Site information includes the latitude and longitude of the locations, the structure types (96 types), structure details such as number of stories, insured value, cladding type and a class of occupancy type (12 types). Vulnerability functions may be modified by the incorporation of secondary structural components such as roof type, roof strength, roof-wall strength, wall-floor strength, wall-foundation strength, opening protection, and wind-door-skylight strength. Damage is estimated using vulnerability functions associated with the structure definition and occupancy type and the distribution of peak gust wind speeds at each site. The vulnerability functions used by the Florida Hurricane Model have been derived through three methods: empirical data, expert opinion, and engineering analysis [Fujita 1992, McDonald-Mehta Engineers 1993, Simiu and Scanlan 1996].

The probabilistic distribution of damage (for each coverage and site) is derived through the discrete calculations of the probabilistic distribution of wind speeds for the site with the probabilistic distributions of damage for given wind speeds. Damage distributions for each of the sites are aggregated into an overall portfolio distribution of damage.

Since there can be a high degree of damage correlation for similar structure types within a geographic area, the Florida Hurricane Model properly takes into account site and coverage level correlations when aggregating individual site damage into an overall portfolio damage amount.

4. Estimation of Loss

Insurance information in the form of insured values, limits, deductibles and facultative and/or treaty reinsurance uses discrete calculations with the probabilistic distribution of computed damage for each site to determine the probabilistic distribution of “insured loss” amount. Correlation is properly taken into account when aggregating individual site loss into an overall portfolio loss amount.

2. *Identify the highest level of resolution for which loss costs and probable maximum loss levels can be provided. Identify all possible resolutions available for the reported output ranges.*

Loss costs can be provided at state, county, ZIP Code, and site (specific latitude-longitude) levels. For the reported output ranges, all analyses were performed at the ZIP Code level.

3. *Describe how the model incorporates demand surge in the calculation of loss costs and probable maximum loss levels.*

The Florida Hurricane Model offers the option to either include or exclude the increased loss resulting from the effect of demand surge which is observed following major cat events.

Two indices are calculated to determine the magnitude of the demand surge at any given location subjected to a windspeed V. The Cat Index is a function of the storm intensity and the landfall milepost. This index is a function of the storm ground-up damage on one hand, and the availability of building materials and construction labor in the affected region on the other hand. The Cat Inflation Index represents the factor by which repair cost increases in a cat event as a function of V.

4. *Provide citations to published papers, if any, or modeling organization studies that were used to develop how the model estimates demand surge.*

The demand surge algorithm used in the Florida Hurricane Model is strictly based on CoreLogic research.

5. *Describe how economic inflation has been applied to past insurance experience to develop and validate loss costs and probable maximum loss levels.*

Exposure and claims data from the time of the event was used to validate loss costs and probable maximum loss levels from the event of interest.

A-5 Policy Conditions

A. The methods used in the development of mathematical distributions to reflect the effects of deductibles and policy limits shall be actuarially sound.

The methods used in the development of mathematical distributions to reflect the effects of deductibles and policy limits are actuarially sound.

B. The relationship among the modeled deductible loss costs shall be reasonable.

The Florida Hurricane Model estimates the damage distribution for a given site through discrete calculations of the site hazard distribution and the corresponding vulnerability function as shown in Figure 26 below.

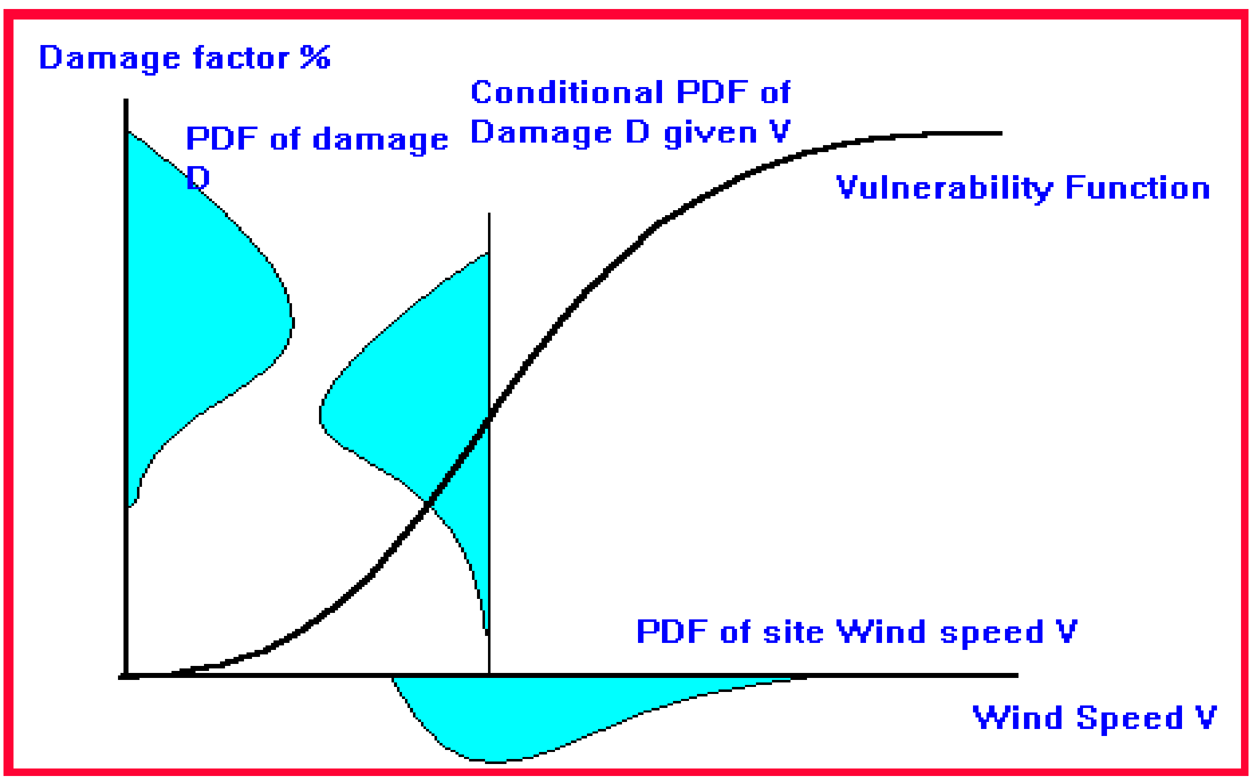


Figure 26. Uncertainty on Hazard and Damage

The loss distribution is estimated through the discrete calculations of the site damage distribution, taking into account deductibles and limits, as shown in Figure 27 below.

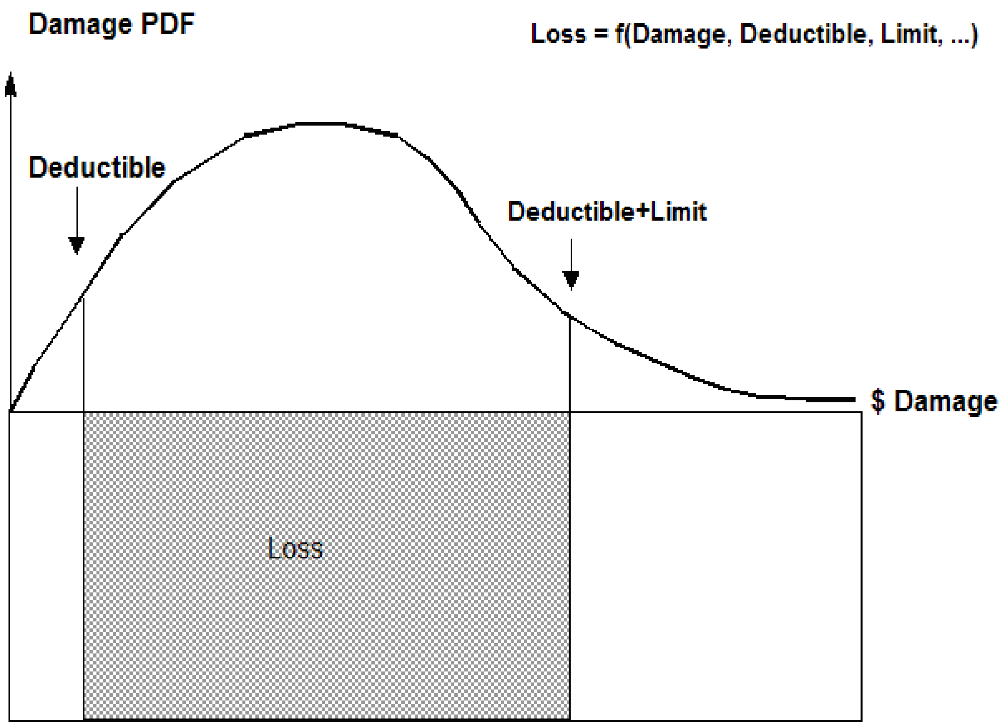


Figure 27. Damage Distribution to Calculate Loss

C. Deductible loss costs shall be calculated in accordance with s. 627.701(5)(a), F.S.

All loss costs have been calculated in accordance with s.627.701(5)(a), F.S.

Disclosures

1. *Describe the methods used in the model to treat deductibles (both flat and percentage), policy limits, replacement costs, and insurance-to-value criteria when projecting loss costs and probable maximum loss levels.*

The model assumes that the user has correctly input the replacement cost of all coverages in the portfolio. The input replacement cost must include any adjustments for insurance-to-value, as the model does not make any corrections for this. The deductible is also a user input value. The user may input a flat deductible (i.e., a fixed dollar amount) or a percentage amount (a percentage of the TIV). Deductibles may be applied separately to each coverage, or applied to aggregated damage. The allowed aggregations are *Blanket* (i.e., all coverages subject to one deductible) or *Property Damage / Business Interruption* (*PD/BI*) (i.e. all real property coverages are subject to one deductible, and the *Time Element* coverage is subject to a different deductible). Limits are input by the user, in a manner similar to that for deductibles. Limits are input as a dollar amount, to be applied either to (a) all coverages separately, (b) all coverages in aggregate, or (c) two limits, one for real property, and one for *Time Element*. Internally, the program calculates the loss by aggregating over the probability distribution function (PDF) of the damage.

2. *Describe whether, and if so how, the model treats policy exclusions and loss settlement provisions.*

   The Florida Hurricane model can handle policy exclusions. The model has no explicit support for loss settlement provisions.

3. *Provide an example of how insurer loss (loss net of deductibles) is calculated. Discuss data or documentation used to validate the method used by the model.*

Example:

(A) Building Value	Policy Limit	(B) Deductible	(C) Damage Ratio	(D)=(A)*(C) Zero Deductible Loss	(E)=(D)-(B) Loss Net of Deductible
100,000	90,000	500	2%	2,000	1,500

Consider the property in the example above with given value, limit, and deductible, subject to a wind speed with average damage ratio as given. Assume further that the vulnerability functions specify the range of possible outcomes as follows:

Probability of Zero Damage =	0.50
Probability of Damage Greater than Zero =	0.50
Probability Distribution of Positive Damages =	{Lognormal with mean=4% and standard deviation=6%} truncated at 100%

(Note: this functional distribution is only used for illustrative purposes and does not necessarily reflect the method contained within the Florida Hurricane Model.)

Then the average damage rate (mathematical expectation) is 0.5 x 4% = 2%, as specified, providing an expected damage amount (ground up loss) of $100,000 x 2% = $2000.

For any given property, the insurer loss is the greater of two quantities: (1) zero, and (2) the damage minus the deductible, but not greater than the policy limit. Because the damage is a random variable, i.e., it is associated with a probability distribution, so too is the insurer loss. However, we can calculate the average insurer loss (mathematical expectation) by the following expression:

$$100{,}000 \cdot \left[\int_{0.005}^{0.9+.005} (x-0.005) \cdot f(x)dx + \int_{0.9+.005}^{1} (0.9) \cdot f(x)dx \right]$$

where f(x) is the probability density function defined above. In this case, the result comes out to be an expected insurer loss of $1752. This is substantially higher than $1500 because the expectation combines the probabilities of high-loss outcomes, where the deductible is fully applied, with low-loss outcomes, where the deductible does not fully apply.

The foregoing example illustrates the actuarial theory behind the application of deductibles and limits. The Florida Hurricane Model implements this theory in loss cost calculations by a Latin Hypercube Sampling. For each property, one thousand instances of the random damage ratio are drawn from the model's probability distribution for damage ratio. The deductibles and limits are applied to each outcome and the results are averaged. Table 12 illustrates this process.

TABLE 12. EXAMPLE DAMAGE TO LOSS SIMULATION

Instance #	Damage Ratio	Ground Up Loss	Insurer Loss
1	0.00	0.00	0.00
2	2%	2,000.00	1,500.00
...	...	...	...
999	0.37%	370.00	0.00
1000	10%	10,000.00	9,500.00
Total		2,000,765	1,751,942.00
Average	2.001%	2,001.00	1.752.00

The theoretical calculation presented above is standard in the actuarial literature. See, for example, chapter 3 of R. E. Beard, T. Pentikainen, and E. Pesonen's *Risk Theory: the Stochastic Basis of Insurance* (3rd Edition, New York: Chapman and Hall) or chapter 5 of R. V. Hogg and S. A. Klugman's *Loss Distributions* (New York: John Wiley and Sons).

The implementation by way of simulation is standard in the simulation literature. See, for example, chapter 4 of R. Y. Rubenstein's *Simulation and the Monte Carlo Method* (New York: John Wiley and Sons) or chapter 5 of J. M. Hammersley and D. C. Handscomb's *Monte Carlo Methods* (New York: Barnes & Noble), or M.P. Bohn, et. al., "Application of the SSMRP Methodology to the Seismic Risk at the Zion Nuclear Plant," prepared for the U.S. Nuclear Regulatory Commission, Lawrence Livermore National Laboratory.

The specifics of the distributional models are based both on engineering studies of the variability of damage from winds and on extensive historical datasets detailing losses risk-by-risk.

4. *Describe how the model treats annual deductibles.*

All results in this submission, where annual deductibles are required, were compiled through the post-processing of intermediate results generated by the standard CoreLogic model. The handling of the annual deductibles was done according to the 627.701(5)(a) Florida Statutes.

Using stratified sampling, for each year, a number of events are simulated from the hurricane frequency distribution. As each simulated year progresses, losses from each hurricane during that year are tracked by policy and the corresponding effect on the remaining amount of the hurricane deductible evaluated. The results are used to quantify the annual deductible effects.

A-6 Loss Output and Logical Relationships to Risk

A. The methods, data, and assumptions used in the estimation of probable maximum loss levels shall be actuarially sound.

The methods, data, and assumptions used in the estimation of probable maximum loss levels are actuarially sound.

B. Loss costs shall not exhibit an illogical relation to risk, nor shall loss costs exhibit a significant change when the underlying risk does not change significantly.

CoreLogic's loss costs exhibit logical relation to risk. Loss costs produced by the model do not exhibit a significant change when the underlying risk does not change significantly.

C. Loss costs produced by the model shall be positive and non-zero for all valid Florida ZIP Codes.

Loss costs produced by the model are positive and non-zero for all valid Florida ZIP Codes.

D. Loss costs cannot increase as the quality of construction type, materials and workmanship increases, all other factors held constant.

Loss costs do not increase as the quality of construction type, materials, and workmanship increases, all other factors held constant.

E. Loss costs cannot increase as the presence of fixtures or construction techniques designed for hazard mitigation increases, all other factors held constant.

Loss costs do not increase with the presence of fixtures or construction techniques designed for hazard mitigation, all other factors held constant.

F. Loss costs cannot increase as the wind resistant design provisions increase, all other factors held constant.

Loss costs do not increase with the use of wind resistant design provisions, all other factors held constant.

G. Loss costs cannot increase as building code enforcement increases, all other factors held constant.

Loss costs do not increase as building code enforcement increases, all other factors held constant.

H. Loss costs shall decrease as deductibles increase, all other factors held constant.

Loss costs decrease as deductibles increase, all other factors held constant.

I. The relationship of loss costs for individual coverages, (e.g., buildings, appurtenant structure, contents, and time element) shall be consistent with the coverages provided.

Relationships among the loss costs for coverages A, B, C, and D are consistent with the coverages provided.

J. Output ranges shall be logical for the type of risk being modeled and apparent deviations shall be justified.

The output ranges produced by the model are logical for the type of risk being modeled and deviations are supported.

K. All other factors held constant, output ranges produced by the model shall reflect lower loss costs for:

1. masonry construction versus frame construction,
The output ranges produced by the model reflect lower loss costs for masonry construction versus frame construction, subject to the discussion in Disclosure 12 below.

2. personal residential risk exposure versus manufactured home risk exposure,
The output ranges produced by the model reflect lower loss costs for personal residential risk exposure versus manufactured home risk exposure, subject to the discussion in Disclosure 12 below.

3. inland counties versus coastal counties, and
The output ranges produced by the model reflect lower loss costs, in general, for inland counties versus coastal counties.

4. northern counties versus southern counties.
The output ranges produced by the model reflect lower loss costs, in general, for northern counties versus southern counties.

L. For loss cost and probable maximum loss level estimates derived from or validated with historical insured hurricane losses, the assumptions in the derivations concerning (1) construction characteristics, (2) policy provisions, (3) coinsurance, and (4) contractual provisions shall be appropriate based on the type of risk being modeled.

Vulnerability functions in the Florida Hurricane Model are based on claims data obtained from insurance companies and are appropriate based on the type of risk being modeled. For each data set obtained, the following process is used to incorporate the data into new or existing vulnerability functions:

1. Review claims data to ensure consistency, correct any errors through interactions with the insurance company that provided the data and determine all of the elements included within the claims data (e.g., allocated loss adjustment expense, etc.).

2. Group the data into appropriate construction classes, and ensure consistency between definitions of different insurers. This includes incorporating consideration of the relevant underwriting practices of the insurance company that provided the data.

3. Correct insured values to include under-insurance, if any (e.g., 80% insured to value clause in many homeowner policies). This process is done by consulting with the insurance company that provided the data.

4. Calculate ground up loss for each coverage, using the paid claim amount and the deductible.

5. Apply corrections to account for unreported data, e.g. damage below the deductible. This correction is generally negligible for residential claims, which typically have low deductibles.

6. Associate a wind speed to each location using the best available official historical information.

7. Perform regression analysis to derive the vulnerability functions by construction class and coverage. This process may involve merging the new data set with previously analyzed claims.

8. Validate curves against loss experience from various insurance portfolios.

Disclosures

1. *Provide a completed Form A-1, Zero Deductible Personal Residential Loss Costs by ZIP Code. Provide a link to the location of the form [insert hyperlink here].*

   See Form A-1 at Appendix #5.

2. *Provide a completed Form A-2, Base Hurricane Storm Set Statewide Loss Costs. Provide a link to the location of the form [insert hyperlink here].*

   See Form A-2 at Appendix #5.

3. *Provide a completed Form A-3, 2004 Hurricane Season Losses. Provide a link to the location of the form [insert hyperlink here].*

   See Form A-3 at Appendix #5.

4. *Provide a completed Form A-4, Output-Ranges. Provide a link to the location of the form [insert hyperlink here].*

   See Form A-4 at Appendix #5.

5. *Provide a completed Form A-5, Percentage Change in Output Ranges. Provide a link to the location of the form [insert hyperlink here].*

   See Form A-5 at Appendix #5.

6. *Provide a completed Form A-7, Percentage Change in Logical Relationship to Risk. Provide a link to the location of the form [insert hyperlink here].*

   See Form A-7 at Appendix #5.

7. *Provide a completed Form A-8, Probable Maximum Loss for Florida. Provide a link to the location of the form [insert hyperlink here].*

   See Form A-8 at Appendix #5.

8. *Describe how the model produces probable maximum loss levels.*

   The model simulates 300,000 years of North Atlantic hurricane events. Occurrence exceedance probabilities are based on the maximum loss within each of the simulated years; annual aggregate exceedance probabilities are based on the sum of the losses within each of the simulated years.

9. *Provide citations to published papers, if any, or modeling organization studies that were used to estimate probable maximum loss levels.*

   No specific papers were used as the basis for the estimation of probable maximum loss levels.

10. *Describe how the probable maximum loss levels produced by the model include the effects of personal and commercial residential insurance coverage.*

    Probable maximum loss levels produced by the model incorporate damage and insured loss calculations for both personal and commercial residential exposures. The methodology to compute probable maximum loss levels is consistent between personal and commercial residential exposures, and is based on a 300,000-year simulation.

11. *Explain any difference between the values provided on Form A-8, Probable Maximum Loss for Florida, and those provided on Form S-2, Examples of Loss Exceedance Estimates.*

    There are no such differences in values.

12. *Provide an explanation for all anomalies in the loss costs that are not consistent with the requirements of this Standard.*

    All the loss costs shown in Form A-4 are consistent with the requirements of this standard, except:

- Statewide weighted average loss costs for masonry are higher than the corresponding statewide weighted average loss costs for frame for all coverage types, policy types, and deductibles in Form A-4. This is due to the masonry exposures generally being more heavily weighted than the frame exposures in areas having higher levels of hazard.

- Weighted average loss costs for masonry owners are equal to or higher than the corresponding maximum/minimum loss costs for frame owners for certain coverage types and deductibles for a number of counties in Form A-4. This is due to variations in secondary structural modifiers and a few ZIP Codes whose exposures lack frame or masonry coverages. Weighted average loss costs for masonry renters and condos are equal to or higher than the corresponding weighted average loss costs for frame renters and condos for certain coverage types and deductibles for a number of counties in Form A-4. All of these situations are due to the masonry exposures in these counties being more heavily weighted than the frame exposures in areas having higher levels of hazard and the variations of secondary structural modifiers and age groups.

13. *Provide an explanation of the differences in output ranges between the previously accepted model and the current model.*

    The following significant changes were made to the model between the previously accepted submission (CoreLogic Florida Hurricane Model 2015a) and the current submission (CoreLogic Florida Hurricane Model 2017a):

    1. The probabilistic hurricane database has been regenerated to be consistent with the latest available HURDAT2 data set at the time of the initial submission. The individual stochastic storm frequencies have been adjusted to account for the climatology of the historical storm landfall track direction by landfall location while preserving the total frequency by landfall location and intensity. This update satisfies the requirements set forth in Standard M-1 and M-2.

    2. The updates to the storm parameters (Rmax, Forward Speed, and Profile Factor) have been updated to conform to information available in HURDAT2 and other

scientifically acceptable sources. HURDAT2 has included landfall information and quadrant wind radii, and this has led to the investigation and updates to forward speed, profile factor, and Rmax. Although the Rmax is not directly available in the HURDAT2 itself, HRD provides Rmax for pre-1956 storms. The Rmax for recent storms (since 1988) are available in Extend Best Track. These updates satisfy the requirements set forth in Standards M-1 and M-2.

3. The ZIP Code database has been updated to March 2016. This update satisfies the requirements set forth in Standard G-3.

4. Vulnerability functions have been updated as follows: vulnerability functions for appurtenant structures have been updated; post 1994 default manufactured homes have been updated from double-wide to single-wide; ASTM D7158 Class D and Class H shingles have been introduced; and 1996-2002 default masonry structures have been set to unreinforced masonry outside of Miami-Dade and Broward Counties. The user can also explicitly specify masonry structures to be reinforced or unreinforced regardless of year built or location. These updates satisfy the requirements set forth in Standards V-1 through V-3.

5. Structure type assignments provided in the model for the Florida Hurricane Catastrophe Fund Portfolio and unknown structure types have been updated. This update impacts loss costs in Forms A-2, A-3, A-8, S-2, and S-5.

6. Functionality for screened enclosures and high-valued homes has been implemented. This functionality has not been used in the submission.

7. Time element calculations have been updated to account for secondary structural characteristics and year-of-construction.

14. Identify the assumptions used to account for the effects of coinsurance on commercial residential loss costs.

For each set of claims data used to derive or validate the commercial residential vulnerability functions, CoreLogic has clarified any potential issues, including the effects of coinsurance, with the company providing the data.

Computer/Information Standards

CI-1 Documentation

A. Model functionality and technical descriptions shall be documented formally in an archival format separate from the use of letters, slides, and unformatted text files.

CoreLogic maintains an archive of model functionality and technical descriptions separate from the use of letters, slides, and unformatted text files.

B. The modeling organization shall maintain a primary document repository, containing or referencing a complete set of documentation specifying the model structure, detailed software description, and functionality. Documentation shall be indicative of accepted model development and software engineering practices.

CoreLogic maintains all such documentation, and will have it available to the professional team during the on-site visit.

C. All computer software (i.e., user interface, scientific, engineering, actuarial, data preparation, and validation) relevant to the submission shall be consistently documented and dated.

CoreLogic maintains all such documentation, and will have it available to the professional team during the on-site visit.

D. The modeling organization shall maintain (1) a table of all changes in the model from the previously accepted model to the initial submission this year and (2) a table of all substantive changes since this year's initial submission.

CoreLogic maintains such a table that provides all changes from the previously accepted model to the initial submission and all substantive changes since this year's initial submission.

E. Documentation shall be created separately from the source code.

CoreLogic maintains all such documentation, and will have it available to the professional team during the on-site visit.

CI-2 Requirements

The modeling organization shall maintain a complete set of requirements for each software component as well as for each database or data file accessed by a component. Requirements shall be updated whenever changes are made to the model.

CoreLogic maintains such requirements and documentation, and will have it available to the professional team during the on-site visit. CoreLogic updates the relevant requirements documentation whenever changes are made to the model.

Disclosure

1. *Provide a description of the documentation for interface, human factors, functionality, documentation, data, human and material resources, security, and quality assurance.*

CoreLogic maintains a set of documents describing the specifications and product requirements for user interfaces, database schema, client customizations, security considerations, user manuals, and references.

The above documentation will be available to the professional team during the on-site visit.

CI-3 Model Architecture and Component Design

The modeling organization shall maintain and document (1) detailed control and data flowcharts and interface specifications for each software component, (2) schema definitions for each database and data file, (3) flowcharts illustrating model-related flow of information and its processing by modeling organization personnel or consultants, and (4) system model representations associated with (1)-(3). Documentation shall be to the level of components that make significant contributions to the model output.

The design levels of the software have been documented, including software components and interfaces, data files, and database elements. The documentation includes detailed control and data flowcharts and interface specifications for each software component, schema definitions for each database and data file, and flowcharts illustrating model-related flow of information and its processing by modeling organization personnel. This documentation will be shown to the professional team during the on-site visit.

CI-4 Implementation

A. The modeling organization shall maintain a complete procedure of coding guidelines consistent with accepted software engineering practices.

CoreLogic maintains such a procedure.

B. The modeling organization shall maintain a complete procedure used in creating, deriving, or procuring and verifying databases or data files accessed by components.

CoreLogic maintains such a procedure.

C. All components shall be traceable, through explicit component identification in the model representations (e.g., flowcharts) down to the code level.

All components are traceable in this manner.

D. The modeling organization shall maintain a table of all software components affecting loss costs and probable maximum loss levels, with the following table columns: (1) Component name, (2) Number of lines of code, minus blank and comment lines; and (3) Number of explanatory comment lines.

This table will be available for review by the professional team.

E. Each component shall be sufficiently and consistently commented so that a software engineer unfamiliar with the code shall be able to comprehend the component logic at a reasonable level of abstraction.

The source code is commented in this manner. Also, CoreLogic maintains live intranet source code documentation for the analysis engines. The model is based upon published research modified as appropriate by CoreLogic's meteorological, engineering, and statistical personnel. System data is organized and maintained in tables, binary files, or flat files, depending upon the type of analysis. The underlying model including algorithm implementation and technical assumptions along with the procedures used for updating the system data will be available for review by the professional team during the on-site visit. The overall system design has been implemented using standard software engineering techniques. System documentation is maintained to define critical system functionality in terms of Data Flowcharts, Structure Charts, and the corresponding narratives which describe how each module functions. This information is available for on-site review.

F. The modeling organization shall maintain the following documentation for all components or data modified by items identified in Standard G-1 (Scope of the Computer Model and Its Implementation), Disclosure 5 and Audit 5:

1. A list of all equations and formulas used in documentation of the model with definitions of all terms and variables.

This list will be available for review by the professional team.

2. A cross-referenced list of implementation source code terms and variable names corresponding to items within F.1 above.

This list will be available for review by the professional team.

Disclosure

1. Specify the hardware, operating system, other software, and all computer languages required to use the model.

Details regarding the required hardware, operating system, and other software are given in Standard G-1, Disclosure 2. The computational components of the model have been developed in C++; other components have been developed in C++ and Java.

CI-5 Verification

A. General

For each component, the modeling organization shall maintain procedures for verification, such as code inspections, reviews, calculation crosschecks, and walkthroughs, sufficient to demonstrate code correctness. Verification procedures shall include tests performed by modeling organization personnel other than the original component developers.

The models have been extensively tested to verify that calculated results are consistent with the intended simulation approach. A variety of methods have been employed. These include algorithm verification through comparison to independently developed software packages, hand calculations, and sensitivity analyses. Much of this verification is performed by personnel other than the original component developers.

Extensive validation testing of the software generated wind fields has been performed to confirm that generated wind speeds are consistent with observations. Numerous analyses have been conducted using actual insurance portfolio data to confirm the reasonableness of resulting answers.

B. Component Testing

1. ***The modeling organization shall use testing software to assist in documenting and analyzing all components.***

Testing software is used to assist in documenting and analyzing all components.

2. ***Unit tests shall be performed and documented for each component.***

Unit tests have been performed and documented for each component relevant to residential hurricane loss costs in Florida.

3. ***Regression tests shall be performed and documented on incremental builds.***

A suite of automated regression tests is regularly run on the software to ensure integrity of the various components as well as the results produced by the integrated system.

Quality assurance documentation includes a description for each test case from the regression testing suite.

4. ***Aggregation tests shall be performed and documented to ensure the correctness of all model components. Sufficient testing shall be performed to ensure that all components have been executed at least once.***

A suite of automated regression tests is regularly run on the software to ensure integrity of the various components as well as the results produced by the integrated system.

C. Data Testing

1. ***The modeling organization shall use testing software to assist in documenting and analyzing all databases and data files accessed by components.***

Testing software is used to assist in documenting and analyzing all databases and data files accessed by components.

2. ***The modeling organization shall perform and document integrity, consistency, and correctness checks on all databases and data files accessed by the components.***

Client data is extensively tested during the import process into the CoreLogic system to confirm its accuracy. Field level validation is performed to confirm that every data element within each record falls within known ranges. Data not falling within known ranges is marked as an error or a warning in a log depending upon the severity of the problem. Child/parent and other key relationships are also checked. A summary log is displayed at the end of import process denoting the number records which have warnings or errors.

Disclosures

1. *State whether any two executions of the model with no changes in input data, parameters, code, and seeds of random number generators produce the same loss costs and probable maximum loss levels.*

Yes, they produce the same loss costs and probable maximum loss levels.

2. *Provide an overview of the component testing procedures.*

A suite of automated regression tests is regularly run on the software to ensure integrity of the various components as well as the correctness and consistency of results produced by the integrated system.

3. *Provide a description of verification approaches used for externally acquired data, software, and models.*

   For software components, we run any tests supplied by the producer or devise tests ourselves if the producer's tests are insufficient to test the component to a satisfactory level. (The only external libraries we use for Florida Hurricane are a couple of boost.org libraries at the reporting stage which have a plethora of unit tests.)

   External Data: Since every dataset is unique and has its own specifics, we devise different methods for validating it. For most we review with a subject matter expert and if we already have a previous version compare and inspect the differences. We set a threshold for an acceptable difference and reviewed the differences to make sure they are satisfactory.

   The ZIP Code data used in developing ZIP Code centroids and polygons have been updated, replacing the Pitney Bowes May 2014 version with the latest HERE May 2016 version. The new data set was reviewed thoroughly.

   ZIP Code polygons have been inspected for discontinuities and anomalies. The ZIP Code population-weighted centroids have been inspected to ensure that they are located over land and located logically with respect to populated areas. These inspections were used with GIS software, Bing Maps, and Google Earth.

   The ZIP Code GIS input has been inspected for polygon validity (e.g. no polygons with fewer than 3 vertexes, self-intersections, etc.)

CI-6 Model Maintenance and Revision

A. *The modeling organization shall maintain a clearly written policy for model review, maintenance, and revision, including verification and validation of revised components, databases, and data files.*

CoreLogic has a clearly written policy for model revision with respect to methodologies and data, including model review, maintenance, verification and validation of revised components, databases, and data files.

B. *A revision to any portion of the model that results in a change in any Florida residential hurricane loss cost or probable maximum loss level shall result in a new model version identification.*

A revision to any portion of the model that results in a change in any Florida residential hurricane loss cost results in a new model version identification.

C. *The modeling organization shall use tracking software to identify and describe all errors, as well as modifications to code, data, and documentation.*

CoreLogic uses tracking software to identify all errors, as well as modifications to code, data, and documentation.

CoreLogic's policies and procedures for model revision will be made available to the professional team during the on-site visit.

D. *The modeling organization shall maintain a list of all model versions since the initial submission for this year. Each model description shall have a unique version identification, and a list of additions, deletions, and changes that define that version.*

CoreLogic maintains such a list of all model versions since the initial submission for the year. Each model description has a unique version identification with a list of additions, deletions, and changes that define that version.

Disclosures

1. Identify procedures used to review and maintain code, data, and documentation.

CoreLogic has a series of ISO procedures regarding the review and maintenance of code, data, and documentation, and these will be made available to the professional team.

2. Describe the rules underlying the model and code revision identification systems.

CoreLogic produces a major release of its software (including Risk Quantification and Engineering™ (RQE)) approximately annually. Between such major releases CoreLogic sometimes produces interim releases, generally to update one or more models within RQE, to provide additional software functionality, or to provide other enhancements or corrections. Version numbers for major releases are of the form Risk Quantification and Engineering™ M.X, e.g. Risk Quantification and Engineering™ 13.00. Version numbers for interim releases append an additional two-digit number, e.g. Risk Quantification and Engineering™ 13.00.01.

The CoreLogic Florida Hurricane model is contained in our client-server software RQE. The Florida Hurricane model version number is included on all output reports produced by RQE. Any change in Florida residential hurricane loss costs results in a new version number of the CoreLogic Florida Hurricane model.

For example, the initial submission under the 2015 standards is for the CoreLogic Florida Hurricane Model 2017. The version number is designated by the year of completion. If subsequent model revisions occur, the version numbers would have a letter appended after the year (2017a, 2017b, etc.)

CI-7 Security

The modeling organization shall have implemented and fully documented security procedures for: (1) secure access to individual computers where the software components or data can be created or modified, (2) secure operation of the model by clients, if relevant, to ensure that the correct software operation cannot be compromised, (3) anti-virus software installation for all machines where all components and data are being accessed, and (4) secure access to documentation, software, and data in the event of a catastrophe.

In accordance with standard industry practices, CoreLogic has in place security procedures for access to code, data, and documentation, including disaster contingency, and for maintenance of anti-virus software on all machines where code and data are accessed. Procedures are also in place to ensure that licensees of the model cannot compromise the correct operation of the software. These procedures will be made available to the professional team during the on-site visit.

Disclosures

1. Describe methods used to ensure the security and integrity of the code, data, and documentation.

The model can only be used by authorized users. Authorized user accounts are created by a trusted administrator. The program files of the model are in machine code and cannot be reverse engineered or tampered with. The data files (vulnerability curves, hazard etc.) are in binary format and cannot be tampered with. The output from the model is always labeled with the analysis parameters and other information needed to repeat a particular analysis - thus, reports of the program cannot be misused or altered to present incorrect information.

Appendix 1 – Forms in General Standards

Form G-1: General Standards Expert Certification

Purpose: This form identifies the signatory or signatories who have reviewed the current submission for compliance with the General Standards (G1-G5) in accordance with the stated provisions.

I hereby certify that I have reviewed the current submission of CoreLogic Florida Hurricane Model Version 2017a for compliance with the 2015 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) The model meets the General Standards (G1 – G5);
2) The disclosures and forms related to the General Standards section are editorially and technically accurate, reliable, unbiased, and complete;
3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession;
4) My review involved ensuring the consistency of the content in all sections of the submission; and
5) In expressing my opinion, I have not been influenced by any other party in order to bias or prejudice my opinion.

David Smith, Senior Director	M.S., Geophysics
Name	*Professional Credentials (Area of Expertise)*
[signature]	26 OCT 2016
Signature (original submission)	*Date*
[signature]	16 DEC 2016
Signature (response to deficiencies, if any)	*Date*
[signature]	17 MAR 2017
Signature (revisions to submission, if any)	*Date*
[signature]	7 APR 2017
Signature (final submission)	*Date*

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)	*Date*

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement. Include Form G-1, General Standards Expert Certification, in a submission appendix.

Form G-2: Meteorological Standards Expert Certification

Purpose: This form identifies the signatory or signatories who have reviewed the current submission for compliance with the Meteorological Standards (M1-M6) in accordance with the stated provisions.

I hereby certify that I have reviewed the current submission CoreLogic Florida Hurricane Model Version 2017a for compliance with the 2015 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) The model meets the Meteorological Standards (M1 – M6);
2) The disclosures and forms related to the Meteorological Standards section are editorially and technically accurate, reliable, unbiased, and complete;
3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
4) In expressing my opinion, I have not been influenced by any other party in order to bias or prejudice my opinion.

Justin Brolley, Senior Principal Research Scientist	Ph.D., Meteorology
Name	*Professional Credentials (Area of Expertise)*
Justin M. Brolley	26 Oct. 2016
Signature (original submission)	*Date*
Justin M. Brolley	16 Dec. 2016
Signature (response to deficiencies, if any)	*Date*
Justin M. Brolley	17 Mar. 2017
Signature (revisions to submission, if any)	*Date*
Justin M. Brolley	7 Apr. 2017
Signature (final submission)	*Date*

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)	*Date*

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement. Include Form G-2, General Standards Expert Certification, in a submission appendix.

Form G-3: Statistical Standards Expert Certification

Purpose: This form identifies the signatory or signatories who have reviewed the current submission for compliance with the Statistical Standards (S1-S6) in accordance with the stated provisions.

I hereby certify that I have reviewed the current submission of CoreLogic Florida Hurricane Model Version 2017a for compliance with the 2015 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) The model meets the Statistical Standards (S1 – S6);
2) The disclosures and forms related to the Statistical Standards section are editorially and technically accurate, reliable, unbiased, and complete;
3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
4) In expressing my opinion, I have not been influenced by any other party in order to bias or prejudice my opinion.

Mahmoud Khater, Chief Science and Engineering Officer
Name

Ph.D., Civil Engineering
Professional Credentials (Area of Expertise)

Signature (original submission)

10-26-16
Date

David Smith, Senior Director
Name

M.S. Geophysics
Professional Credentials (Area of Expertise)

Signature (response to deficiencies, if any)

16 DEC 2016
Date

Signature (revisions to submission, if any)

17 MAR 2017
Date

Signature (final submission)

7 APR 2017
Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement. Include Form G-3, General Standards Expert Certification, in a submission appendix.

Form G-4: Vulnerability Standards Expert Certification

Purpose: This form identifies the signatory or signatories who have reviewed the current submission for compliance with the Vulnerability Standards (V1-V3) in accordance with the stated provisions.

I hereby certify that I have reviewed the current submission of CoreLogic Florida Hurricane Model Version 2017a for compliance with the 2015 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) The model meets the Vulnerability Standards (V1 – V3);
2) The disclosures and forms related to the Vulnerability Standards section are editorially and technically accurate, reliable, unbiased, and complete;
3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
4) In expressing my opinion, I have not been influenced by any other party in order to bias or prejudice my opinion.

Omar Khemici, Director	Ph.D., P.E. Civil Engineering
Name	*Professional Credentials (Area of Expertise)*
Omar Khemici	10/26/2016
Signature (original submission)	*Date*
Omar Khemici	12/16/2016
Signature (response to deficiencies, if any)	*Date*
Omar Khemici	3/17/2017
Signature (revisions to submission, if any)	*Date*
Omar Khemici	4/7/2017
Signature (final submission)	*Date*

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)	*Date*

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement. Include Form G-4, General Standards Expert Certification, in a submission appendix.

Form G-5: Actuarial Standards Expert Certification

Purpose: This form identifies the signatory or signatories who have reviewed the current submission for compliance with the Actuarial Standards (A1-A6) in accordance with the stated provisions.

I hereby certify that I have reviewed the current submission of CoreLogic Florida Hurricane Model Version 2017a for compliance with the 2015 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) The model meets the Actuarial Standards (A1 – A6);
2) The disclosures and forms related to the Actuarial Standards section are editorially and technically accurate, reliable, unbiased, and complete;
3) My review was completed in accordance with the Actuarial Standards of Practice and Code of Conduct; and
4) In expressing my opinion, I have not been influenced by any other party in order to bias or prejudice my opinion.

Howard A Kunst, Chief Actuary *Name*	FCAS, MAAA *Professional Credentials (Area of Expertise)*
Howard A Kunst *Signature (original submission)*	10-24-2016 *Date*
Howard A Kunst *Signature (response to deficiencies, if any)*	12-16-2016 *Date*
Howard A. Kunst *Signature (revisions to submission, if any)*	3-17-2017 *Date*
Howard A Kunst *Signature (final submission)*	4-10-2017 *Date*

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)	*Date*

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement. Include Form G-5, General Standards Expert Certification, in a submission appendix.

Form G-6: Computer/Information Standards Expert Certification

Purpose: This form identifies the signatory or signatories who have reviewed the current submission for compliance with the Computer/Information Standards (CI1-CI7) in accordance with the stated provisions.

I hereby certify that I have reviewed the current submission of CoreLogic Florida Hurricane Model Version 2017a for compliance with the 2015 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) The model meets the Computer Standards (C1 – C7);
2) The disclosures and forms related to the Computer Standards section are editorially and technically accurate, reliable, unbiased, and complete;
3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
4) In expressing my opinion, I have not been influenced by any other party in order to bias or prejudice my opinion.

Branimir Betov, Director
Name

M.S., Electrical Engineering
Professional Credentials (Area of Expertise)

Signature (original submission)

26 Oct 2016
Date

Signature (response to deficiencies, if any)

16 Dec 2016
Date

Signature (revisions to submission, if any)

17 Mar 2017
Date

Signature (final submission)

12 April 2017
Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement. Include Form G-6, General Standards Expert Certification, in a submission appendix.

Form G-7: Editorial Review Expert Certification

Purpose: This form identifies the signatory or signatories who have reviewed the current submission for compliance with the Commission's Notification Requirements and General Standard G-5, Editorial Compliance, in accordance with the stated provisions.

I/We hereby certify that I/we have reviewed the current submission of CoreLogic Florida Hurricane Model Version 2017a for compliance with the "Process for Determining the Acceptability of a Computer Simulation Model" adopted by the Florida Commission on Hurricane Loss Projection Methodology in its *Report of Activities as of November 1, 2015*, and hereby certify that:

1) The model submission is in compliance with the Commission's Notification Requirements and General Standard G-5 (Editorial Compliance);
2) The disclosures and forms related to each standards section are editorially accurate and contain complete information and any changes that have been made to the submission during the review process have been reviewed for completeness, for grammatical correctness, and for typographical errors;
3) There are no incomplete responses, inaccurate citations, charts or graphs, or extraneous text or references;
4) The current version of the model submission has been reviewed for grammatical correctness, typographical errors, completeness, the exclusion of extraneous data/information and is otherwise acceptable for publication; and
5) In expressing my/our opinion, I/we have not been influenced by any other party in order to bias or prejudice my/our opinion.

Justin Brolley, Senior Principal Research Scientist	Ph.D., Meteorology
Name	*Professional Credentials (Area of Expertise)*
Justin M. Brolley	27 Oct, 2016
Signature (original submission)	*Date*
Justin M. Brolley	21 Dec, 2016
Signature (response to deficiencies, if any)	*Date*
Justin M. Brolley	20 Mar. 2017
Signature (revisions to submission, if any)	*Date*
Justin M. Brolley	12 Apr. 2017
Signature (final submission)	*Date*

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)	*Date*

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement. Include Form G-7, General Standards Expert Certification, in a submission appendix.

Appendix 2 – Forms in Meteorological Standards

Form M-1: Annual Occurrence Rates

A. *Provide annual occurrence rates for landfall from the data set defined by marine exposure that the model generates by hurricane category (defined by maximum windspeed at landfall in the Saffir-Simpson scale) for the entire state of Florida and selected regions as defined in Figure 28 below. List the annual occurrence rate per hurricane category. Annual occurrence rates shall be rounded to two decimal places. The historical frequencies below have been derived from the Base Hurricane Storm Set as defined in Standard M-1, Base Hurricane Storm Set. If the modeling organization Base Hurricane Storm Set differs from that defined in Standard M-1 (for example, using a different historical period), the historical rates in the table shall be edited to reflect this difference (see below).*

See the tables in this form.

B. *Describe model variations from the historical frequencies.*

Model variations from the historical frequencies are primarily due to the sparseness in the historical data. The development of the stochastic event set has included smoothing this data, resulting in what we believe is the best estimate of hurricane frequencies by location and intensity.

C. *Provide vertical bar graphs depicting distributions of hurricane frequencies by category by region of Florida (Figure 28 below) and for the neighboring states of Alabama/Mississippi and Georgia. For the neighboring states, statistics based on the closest milepost to the state boundaries used in the model are adequate.*

See Figure 29 in this form.

D. *If the data are partitioned or modified, provide the historical annual occurrence rates for the applicable partition (and its complement) or modification as well as the modeled annual occurrence rates in additional copies of Form M-1 (Annual Occurrence Rates).*

The data have not been partitioned or modified. The historical annual occurrence rates of by-passing hurricanes have been modified to account for storms that have produced damaging winds in Florida (as indicated in Form A-2) that are not included in the original Form M-1.

E. *List all hurricanes added, removed, or modified from the previously accepted submission version of the Base Hurricane Storm Set.*

The base storm set has been updated to reflect the reanalysis that has been performed by the Hurricane Research Division on the 1946-1955 hurricanes. In addition to the 1946-1955 hurricane seasons, some storms, especially 1983-1991, have been updated due to the inclusion of the landfall location intensities in the 2015 HURDAT2 release. These storms include the following: NoName02-1906, NoName06-1946, NoName04-1947, NoName09-1947, NoName05-1948, NoName08-1948, NoName09-1948, NoName02-1949, Easy-1950, King-1950, Florence-1953, Hazel-1953, Camille-1969, Elena-1985, Juan-1985, Floyd-1987, Florence-1988, and Irene-1999.

F. *Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. A hard copy of Form M-1 (Annual Occurrence Rates) shall be included in a submission appendix.*

TABLE 13. HISTORICAL AND MODELED ANNUAL OCCURRENCE RATES

Modeled Annual Occurrence Rates

	Entire State				Region A – NW Florida			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	*23*	*0.20*	**27**	**0.24**	*14*	*0.12*	**12**	**0.11**
2	*16*	*0.14*	**15**	**0.13**	*5*	*0.04*	**7**	**0.06**
3	*15*	*0.13*	**15**	**0.14**	*6*	*0.05*	**5**	**0.04**
4	*10*	*0.09*	**9**	**0.08**	*0*	*0.00*	**1**	**0.01**
5	*2*	*0.02*	**2**	**0.01**	*0*	*0.00*	**0**	**0.00**

	Region B – SW Florida				Region C – SE Florida			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	*7*	*0.06*	**6**	**0.05**	*6*	*0.05*	**9**	**0.08**
2	*4*	*0.03*	**4**	**0.04**	*6*	*0.05*	**5**	**0.05**
3	*5*	*0.04*	**6**	**0.06**	*6*	*0.05*	**6**	**0.05**
4	*4*	*0.03*	**3**	**0.03**	*6*	*0.05*	**6**	**0.05**
5	*1*	*0.01*	**0**	**0.00**	*1*	*0.01*	**1**	**0.01**

	Region D – NE Florida				Florida By-Passing Hurricanes			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	*1*	*0.01*	**2**	**0.01**	*7*	*0.06*	**4**	**0.04**
2	*2*	*0.02*	**1**	**0.01**	*6*	*0.06*	**2**	**0.02**
3	*0*	*0.00*	**1**	**0.01**	*5*	*0.04*	**3**	**0.03**
4	*0*	*0.00*	**0**	**0.00**	*2*	*0.02*	**1**	**0.01**
5	*0*	*0.00*	**0**	**0.00**	*0*	*0.00*	**1**	**0.01**

	Region E – Georgia				Region F – Alabama/Mississippi			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	*1*	*0.01*	**2**	**0.02**	*6*	*0.05*	**4**	**0.04**
2	*1*	*0.01*	**1**	**0.01**	*3*	*0.03*	**2**	**0.02**
3	*0*	*0.00*	**1**	**0.01**	*5*	*0.04*	**3**	**0.03**
4	*0*	*0.00*	**0**	**0.00**	*1*	*0.01*	**1**	**0.01**
5	*0*	*0.00*	**0**	**0.00**	*1*	*0.01*	**0**	**0.00**

Note: Except where specified, Number of Hurricanes does not include By-Passing Hurricanes. Each time a hurricane goes from water to land (once per region) it is counted as a landfall in that region. However, each hurricane is counted only once in the Entire State totals. Hurricanes recorded for adjacent states need not have reported damaging winds in Florida.

(FORM M-1 CONTINUED)

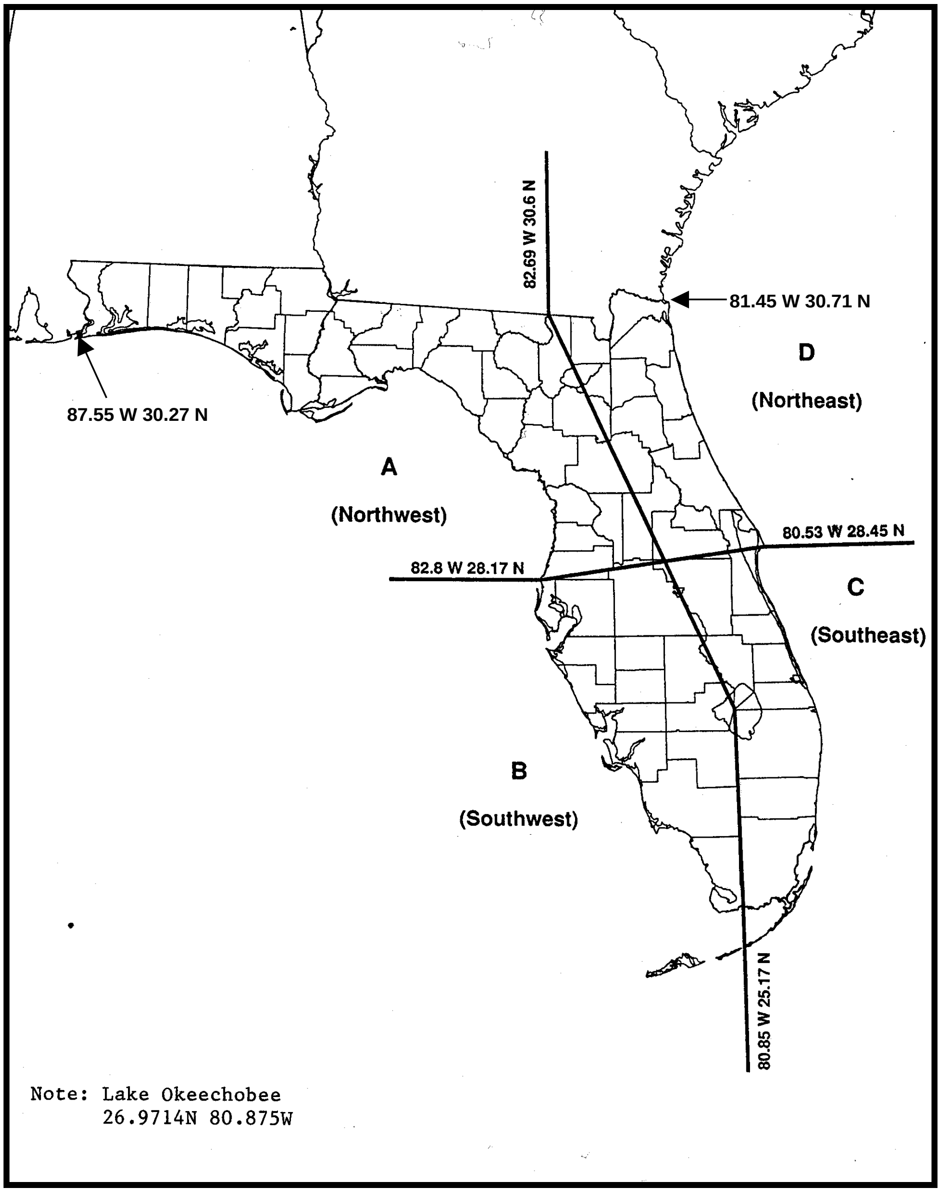


Figure 28. State of Florida and Neighboring States by Region

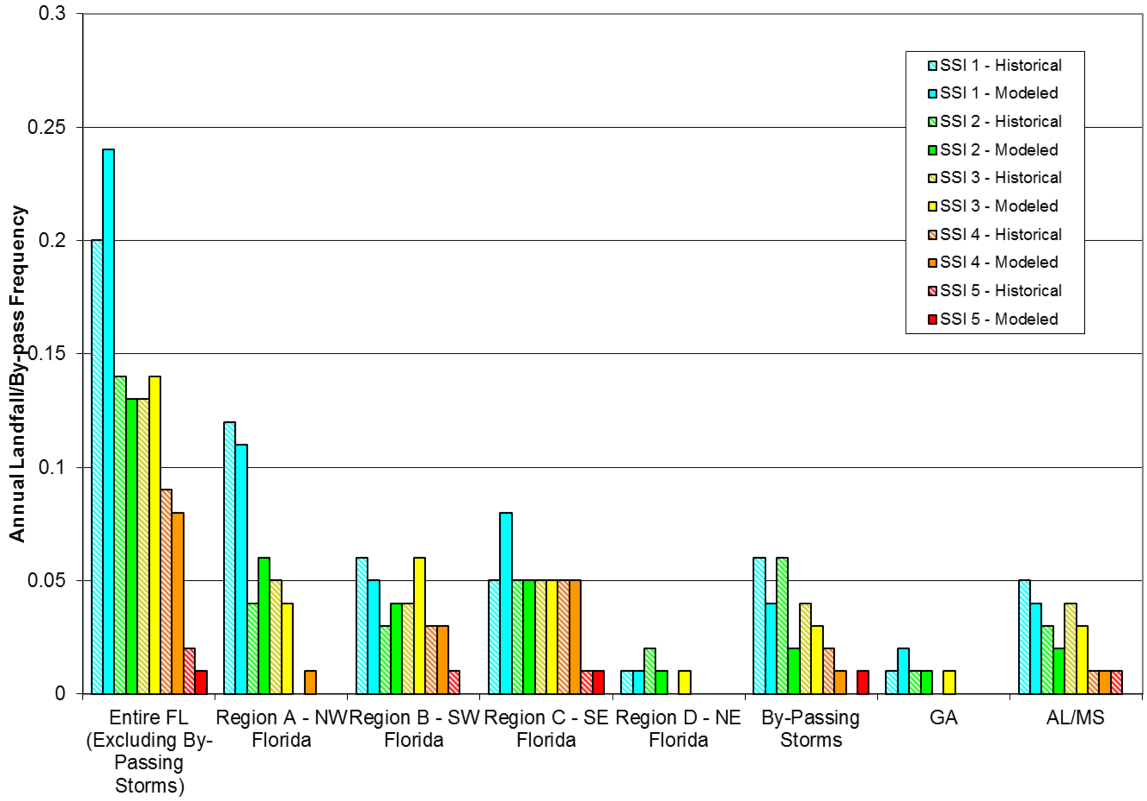


Figure 29. Hurricane Frequencies by Category by Region

Form M-2: Maps of Maximum Winds

A. *Provide color contour plots on maps with ZIP Code Boundaries of the maximum winds for the modeled version of the Base Hurricane Storm Set for land use as set for open terrain and land use set for actual terrain. Plot the position and values of the maximum winds on each contour map.*

See Figure 30 in this form.

B. *Provide color contour plots on maps with ZIP Code boundaries of the maximum winds for a 100-year and a 250-year return period from the stochastic storm set for land use set for open terrain and for land use set for actual terrain. Plot the position and values of the maximum windspeeds on each contour map.*

See Figures 31 and 32 in this form.

Actual terrain is the roughness distribution used in the standard version of the model as defined by the modeling organization. Open terrain uses the same roughness length of 0.03 meters at all land points.

Maximum winds in these maps are defined as the maximum one-minute sustained winds over the terrain as modeled and recorded at each location.

The same color scheme and increments shall be used for all maps.

Use the following seven isotach values and interval color coding:

(1)	*Minimum Damaging*	*Blue*
(2)	*50 mph*	*Medium Blue*
(3)	*65 mph*	*Light Blue*
(4)	*80 mph*	*White*
(5)	*95 mph*	*Light Red*
(6)	*110 mph*	*Medium Red*
(7)	*125 mph*	*Red*
(8)	*140 mph*	*Magenta*

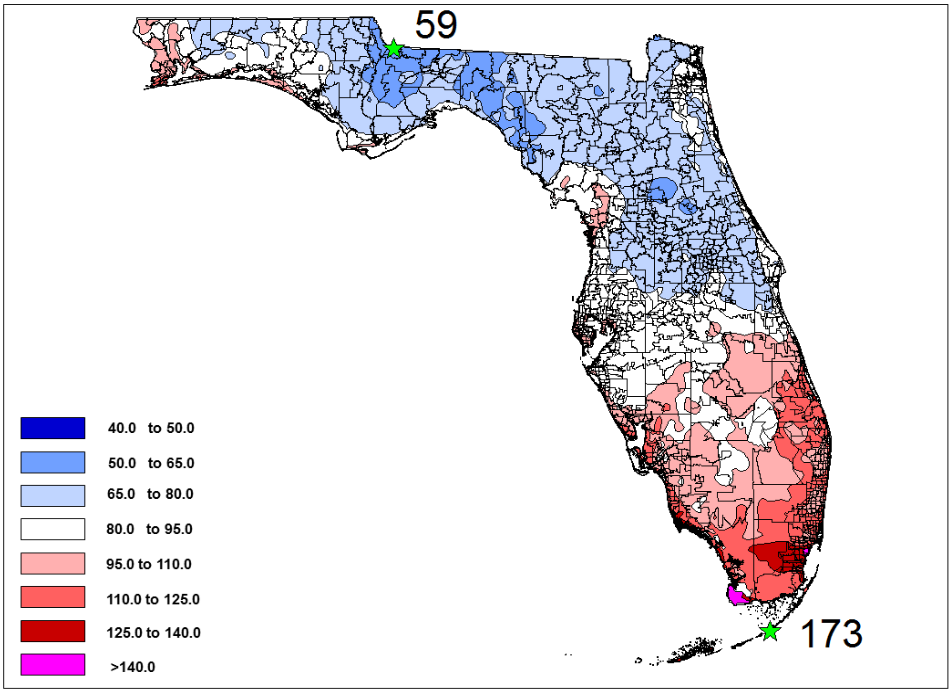
Contouring in addition to these isotach values may be included.

The maximum historical windspeed plotted is 173 mph and 177 mph for actual and open terrain respectively; the maximum stochastic windspeed for the 100-year return period is 135 mph and 139 mph for actual and open terrain respectively. The maximum stochastic windspeed for the 250-year return period is 152 mph and 157 mph for actual and open terrain respectively. Locations of maximum windspeed are marked with a green star.

C. Include Form M-2, Maps of Maximum Winds, in a submission appendix.

(FORM M-2 CONTINUED)

a)



b)

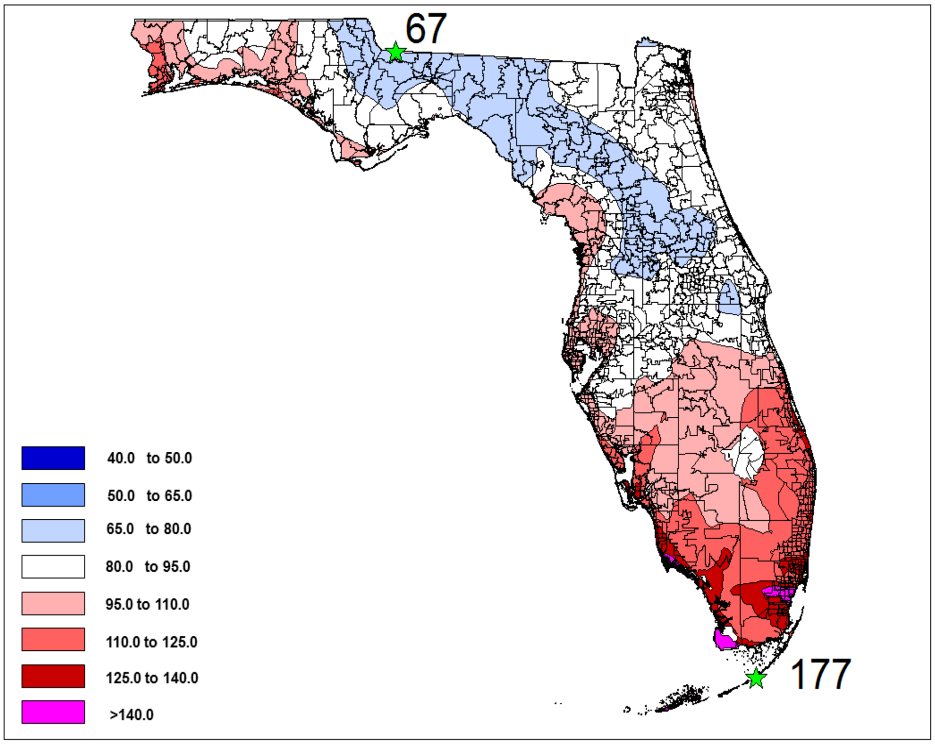
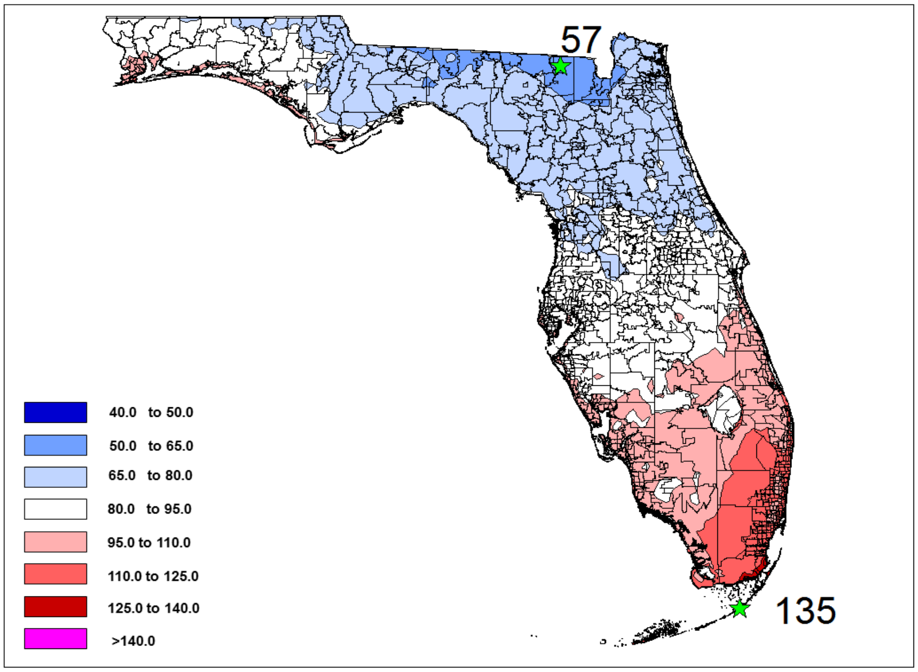


Figure 30. Contour Map - Maximum Winds for Modeled Version of Base Hurricane Storm Set for actual terrain (a) and open terrain (b). Wind Speeds are One-Minute Sustained in mph. Locations of maximum windspeed are marked with a green star.

(FORM M-2 CONTINUED)

a)



b)

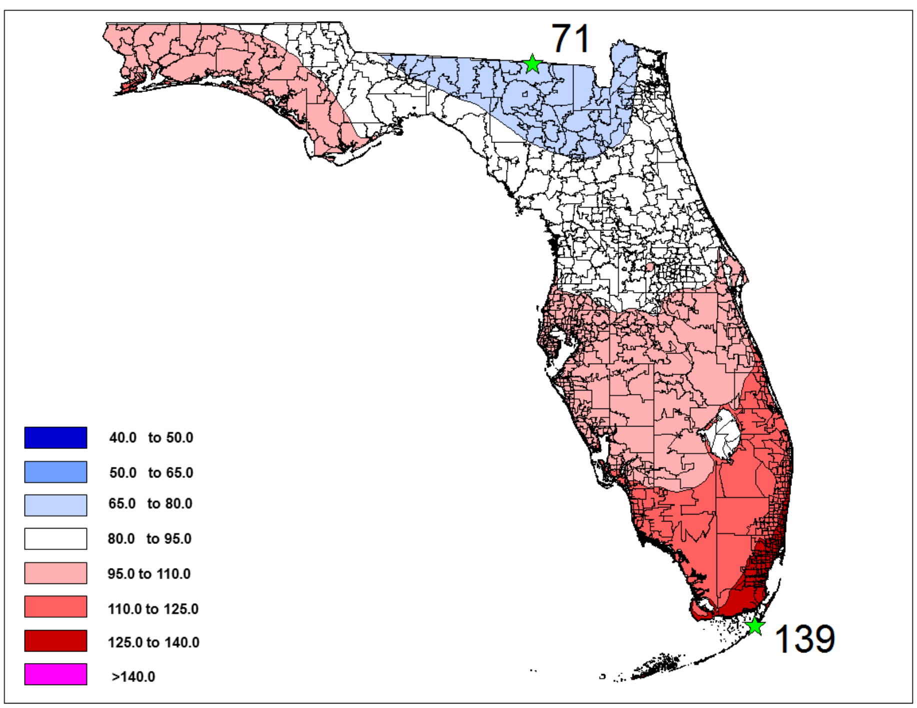
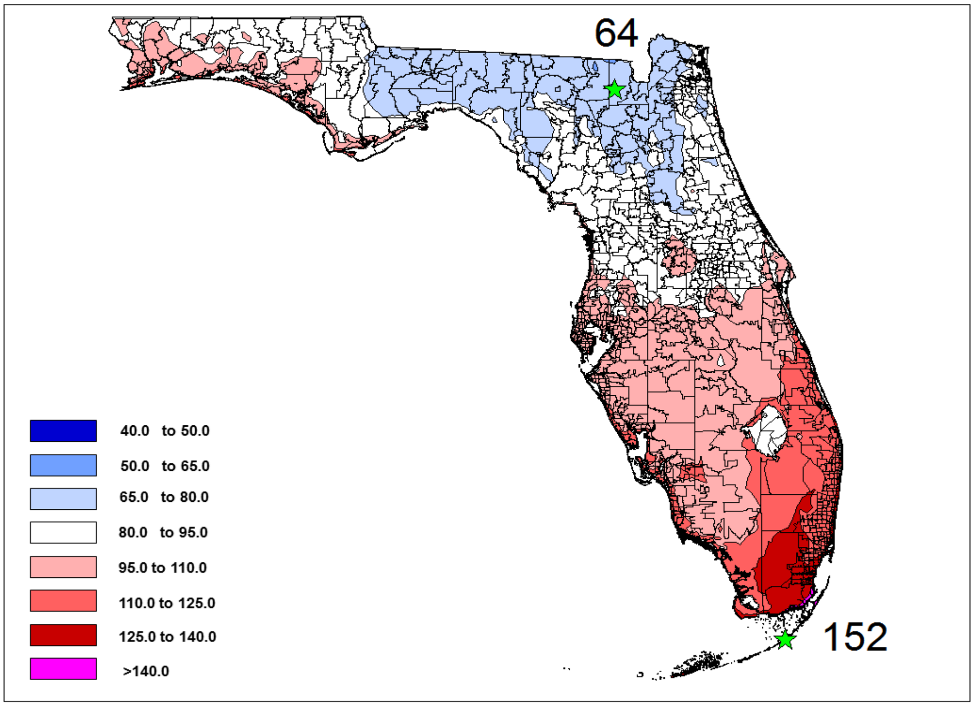


Figure 31. Contour Map - Maximum Winds for 100-Year Return Period from Stochastic Storm Set for actual terrain (a) and open terrain (b). Wind Speeds are One-Minute Sustained in mph. Locations of maximum windspeed are marked with a green star.

(FORM M-2 CONTINUED)

a)



b)

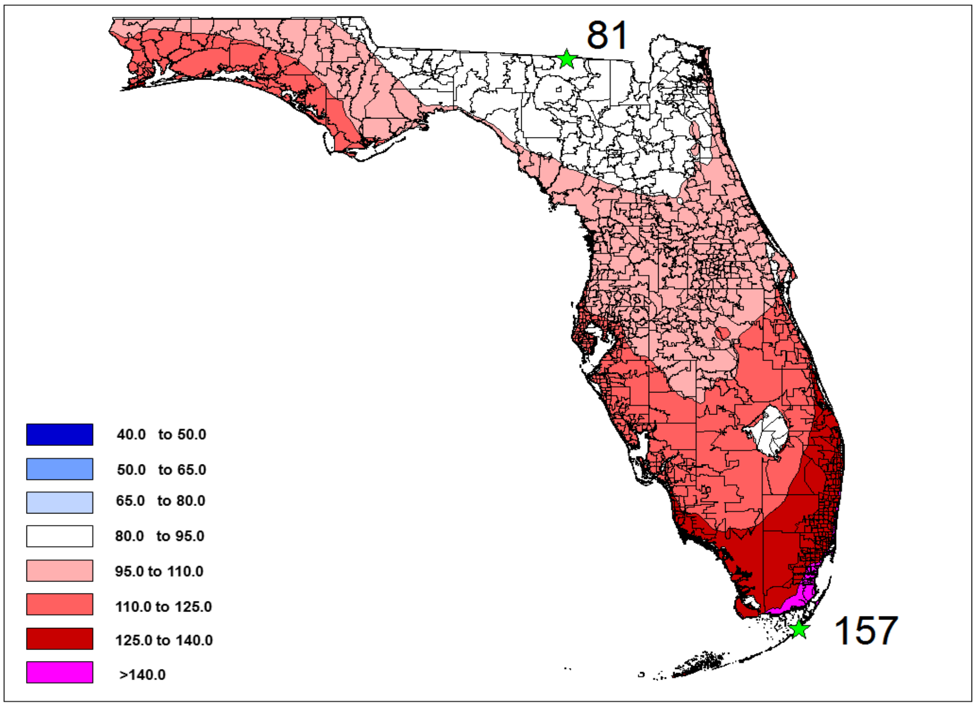


Figure 32. Contour Map - Maximum Winds for 250-Year Return Period from Stochastic Storm Set for actual terrain (a) and open terrain (b). Wind Speeds are One-Minute Sustained in mph. Locations of maximum windspeed are marked with a green star.

Form M-3: Radius of Maximum Winds and Radii of Standard Wind Thresholds

A. *For the central pressures in the table below, provide the first quartile (1Q), median (2Q), and third quartile (3Q) values for (1) the radius of maximum winds (Rmax) used by the model to create the stochastic storm set, and the first quartile (1Q), median (2Q), and third quartile (3Q) values for the outer radii of (2) Category 3 winds (>110 mph), (3) Category 1 winds (>73 mph), and (4) gale force winds (>40 mph).*

TABLE 14. MODEL MINIMUM AND MAXIMUM RMAX AND OUTER RADII AS A FUNCTION OF LANDFALL CENTRAL PRESSURE

Central Pressure (mb)	Rmax (mi)			Outer Radii (>110 mph) (mi)			Outer Radii (>73 mph) (mi)			Outer Radii (>40 mph) (mi)		
	1Q	2Q	3Q	1Q	2Q	3Q	1Q	2Q	3Q	1Q	2Q	3Q
990	15	21	27	n/a	n/a	n/a	21	29	39	66	95	144
980	16	23	30	n/a	n/a	n/a	31	43	57	94	136	192
970	16	23	30	16	21	27	38	55	74	113	166	227
960	16	22	28	20	27	37	43	62	88	120	179	257
950	16	22	31	25	34	46	50	73	101	134	201	277
940	16	22	29	29	39	57	58	84	126	151	224	332
930	14	20	29	27	40	56	54	81	120	137	207	300
920	11	15	23	24	36	49	48	76	110	120	180	249
910	7	9	13	16	24	35	32	53	78	77	120	170
900	5	8	11	15	19	28	29	38	53	67	89	126

B. *Describe the procedure used to complete this form.*

The form was completed by taking the frequency distributions of Rmax and outer wind radii. The outer wind radii were derived from the model's windfield equation which accounts for maximum sustained wind speed, radius of maximum winds, forward speed, and the profile factor.

C. *Identify the other variables that influence Rmax.*

The radius of maximum winds is dependent on landfall location and storm intensity.

D. *Specify any truncations applied to Rmax distributions in the model, and if and how these truncations vary with other variables.*

There are no truncations to the Rmax distributions in the model.

E. *Provide a box plot and histogram and histogram of Central Pressure (x-axis) versus Rmax (y-axis) to demonstrate relative populations and continuity of sampled hurricanes in the stochastic storm set.*

A box plot of Rmax vs. Central Pressure is provided in Figure 33 in this form. Histograms are provided in Figure 34 in this form.

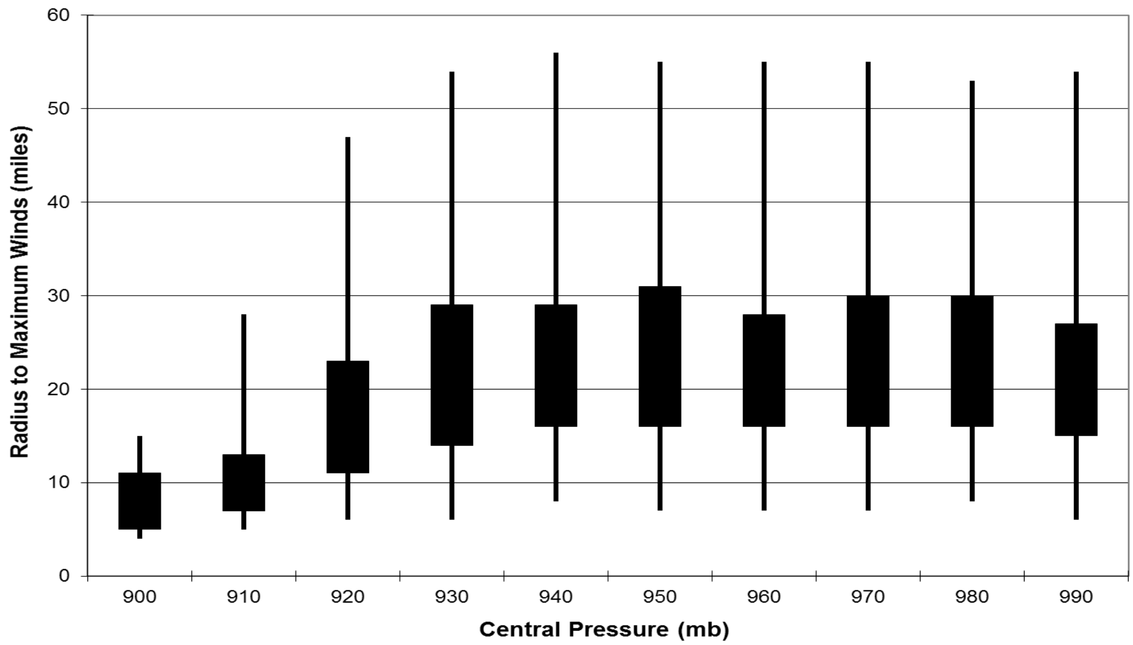
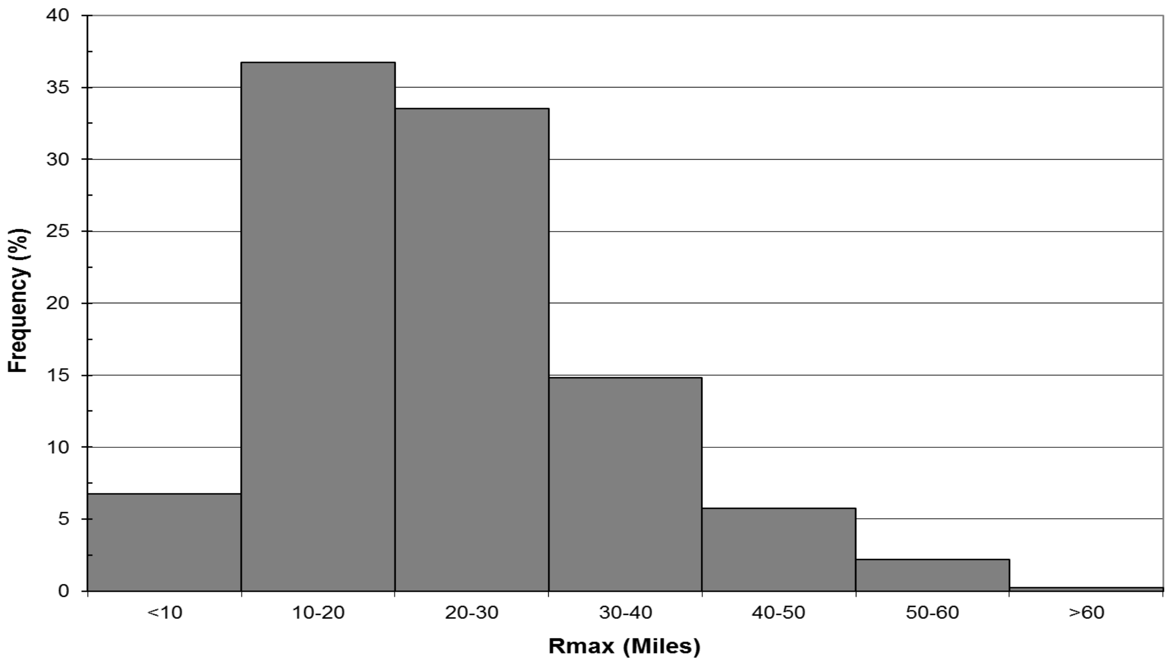


Figure 33. Rmax vs. Central Pressure – Box plot

(a)



(b)

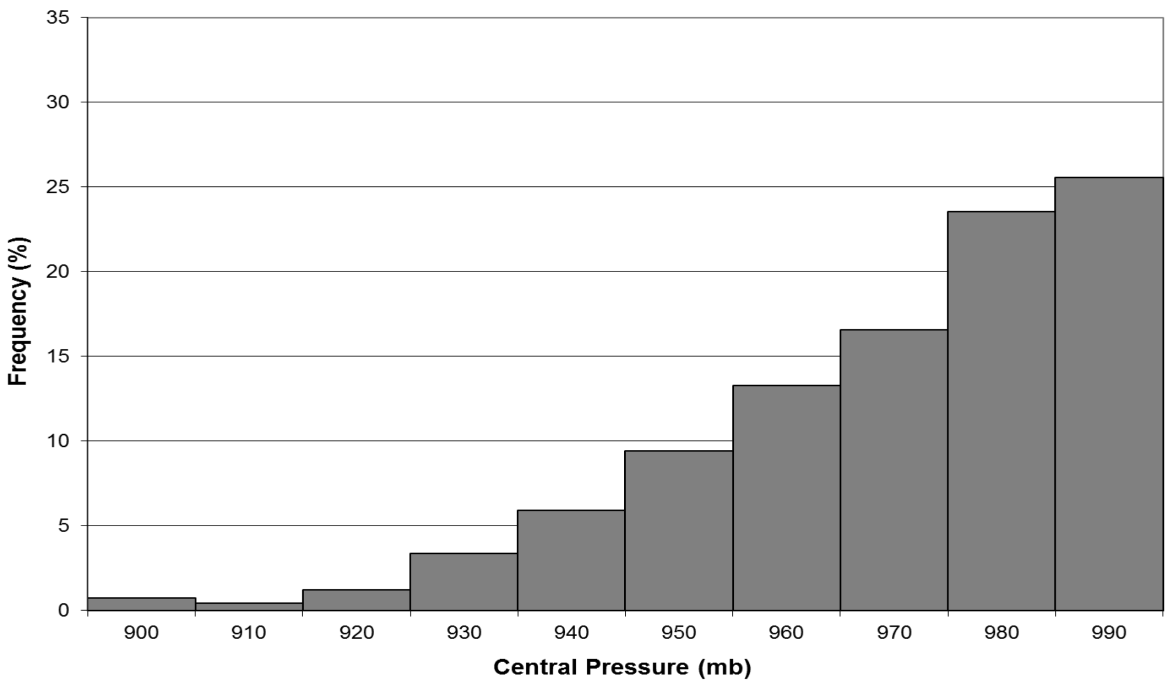


Figure 34. Rmax and Central Pressure – Histograms. Histogram for Rmax is presented in panel (a); histogram for Central Pressure is presented in panel (b).

F. *Provide this form in Excel using the format given in the file named "2015FormM3.xlsx." The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also include Form M-3, Radius of Maximum Winds and Radii of Standard Wind Thresholds, in a submission appendix.*

Appendix 3 – Forms in Statistical Standards

Form S-1: Probability and Frequency of Florida Landfalling Hurricanes per Year

Complete the table below showing the probability and modeled frequency of landfalling Florida hurricanes per year. Modeled probability shall be rounded to four decimal places. The historical probabilities and frequencies below have been derived from the Base Hurricane Storm Set for the 115-year period 1900-2014 (as given in Form A-2, Base Hurricane Storm Set Statewide Losses). Exclusion of hurricanes that caused zero modeled Florida damage or additional Florida landfalls included in the modeling organization Base Hurricane Storm Set as identified in their response to Standard M-1 (Base Hurricane Storm Set) should be used to adjust the historical probabilities and frequencies provided here.

If the data are partitioned or modified, provide the historical probabilities and frequencies for the applicable partition (and its complement) or modification as well as the modeled probabilities and frequencies in additional copies of Form S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year).

TABLE 15. MODEL RESULTS: PROBABILITY OF FLORIDA LANDFALLING HURRICANES PER YEAR

Number Of Hurricanes Per Year	*Historical Probabilities*	*Modeled Probabilities*	*Historical Frequencies*	*Modeled Frequencies*
0	0.5913	0.5690	68	65
1	0.2609	0.3067	30	35
2	0.1217	0.0957	14	11
3	0.0261	0.0230	3	3
4	0.0000	0.0046	0	1
5	0.0000	0.0008	0	0
6	0.0000	0.0001	0	0
7	0.0000	0.0000	0	0
8	0.0000	0.0000	0	0
9	0.0000	0.0000	0	0
10 or more	0.0000	0.0000	0	0

Form S-2: Examples of Loss Exceedance Estimates

Provide estimates of the aggregate personal and commercial insured losses for various probability levels using the notional risk dataset specified in Form A-1, Zero Deductible Personal Residential Loss Costs by ZIP Code, and using the 2012 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential zero deductible exposure data provided in the file named "hlpm2012c.exe." Provide the total average annual loss for the loss exceedance distribution. If the modeling methodology does not allow the model to produce a viable answer, please state so and why.

Include Form S-2, Examples of Loss Exceedance Estimates, in a submission appendix.

TABLE 16. LOSS EXCEEDANCES ESTIMATES OF HYPOTHETICAL DATA SET AND 2012 FHCF DATA SET

Part A			
Return Time (years)	**Probability of Exceedance**	**Estimated Loss Hypothetical Data Set ($)**	**Estimated Personal & Commercial Residential Loss FHCF Data Set ($)**
Top event		137,638,000	295,056,000,000
10000	0.0001	85,100,000	179,629,000,000
5000	0.0002	78,800,000	147,385,000,000
2000	0.0005	67,200,000	123,063,000,000
1000	0.001	61,200,000	106,609,000,000
500	0.002	52,400,000	91,850,000,000
250	0.004	43,900,000	75,808,000,000
100	0.01	33,300,000	56,048,000,000
50	0.02	25,700,000	40,537,000,000
20	0.05	14,300,000	21,308,000,000
10	0.1	7,000,000	10,072,000,000
5	0.2	2,500,000	3,554,000,000
Part B			
Mean (Total Average Annual Loss)		2,500,000	3,816,000,000
Median		32,000	58,000,000
Standard Deviation		6,500,000	10,831,000,000
Interquartile Range		1,500,000	2,211,000,000
Sample Size		32,582 events	32,582 events

Form S-3: Distributions of Stochastic Hurricane Parameters

Provide the probability distribution functional form used for each stochastic hurricane parameter in the model. Provide a summary of the rationale for each functional form selected for each general classification. Include Form S-3, Distributions of Stochastic Hurricane Parameters, in a submission appendix.

TABLE 17. DISTRIBUTIONS OF HURRICANE PARAMETERS

Stochastic Hurricane Parameter (Function or Variable)	Functional Form of Distribution	Data Source	Year Range Used	Justification for Functional Form
Landfall Location	Maximum Likelihood Estimation Kernel Smoothing	HURDAT2	1900-2014	Preferred method of derivation so as to provide agreement with historical data and to extrapolate to full range of potential values
Track Direction	Maximum Likelihood Estimation Kernel Smoothing	HURDAT2	1900-2014	Preferred method of derivation so as to provide agreement with historical data and to extrapolate to full range of potential values
Maximum Sustained Wind Speed	Maximum Likelihood Estimation Kernel Smoothing	HURDAT2	1900-2014	Preferred method of derivation so as to provide agreement with historical data and to extrapolate to full range of potential values
Radius of Maximum Winds	Lognormal	HRD HURDAT Reanalysis Project (1900-1955); NWS 38 (1956-1984); NHC TC Reports and Advisories (1985-1987); DeMaria's Extended Best Track (1988-2014)	1900-2014	Provides best fit to historical data among commonly used distributions
Translational Speed	Lognormal	HURDAT2 (1900-1955; 1983-2014); NWS 38 (1956- 1982)	1900-2014	Provides best fit to historical data among commonly used distributions
Inland Filling Rate	Normal	HURDAT	1900-2006	Provides best fit to historical data among commonly used distributions
Profile Factor	Lognormal	NHC Advisories (1963-1967); DeMaria's Extended Best Track (1988-2003); HURDAT2 (2004-2014)	1963-1967; 1988-2014	Provides best fit to historical data among commonly used distributions

Form S-4: Validation Comparisons

A. *Provide five validation comparisons of actual personal residential exposures and loss to modeled exposures and loss. These comparisons must be provided by line of insurance, construction type, policy coverage, county or other level of similar detail in addition to total losses. Include loss as a percent of total exposure. Total exposure represents the total amount of insured values (all coverages combined) in the area affected by the hurricane. This would include exposures for policies that did not have a loss. If this is not available, use exposures for only those policies that had a loss. Specify which was used. Also, specify the name of the hurricane event compared.*

B. *Provide a validation comparison of actual commercial residential exposures and loss to modeled exposures and loss. Use and provide a definition of the model's relevant commercial residential classifications*

C. *Provide scatter plot(s) of modeled vs. historical losses for each of the required validation comparisons. (Plot the historical losses on the* x*-axis and the modeled losses on the* y*-axis.)*

D. *Include Form S-4, Validation Comparisons, in a submission appendix.*

Rather than using directly a specific published hurricane wind field, the winds underlying the modeled loss cost calculations must be produced by the model being evaluated and should be the same hurricane parameters as used in completing Form A-2 (Base Hurricane Storm Set Statewide Losses).

TABLE 18. TOTALS BY COMPANY

Company	Event	Year	TIV ($M)	Actual ($M)	CoreLogic ($M)	Difference
A	Opal	1995	222,270.00	112.91	113.23	0.3%
B	Andrew	1992	4,578.28	48.20	57.24	18.8%
C	Andrew	1992	1,229.95	19.93	23.27	16.8%
D	Andrew	1992	519.86	30.75	37.91	23.3%
E	Andrew	1992	608.67	29.02	36.90	27.2%
F	Charley	2004	221,681.89	1134.00	1,069.95	-5.6%
F	Frances	2004	221,681.89	686.19	335.31	-51.1%
F	Ivan	2004	221,681.89	297.35	315.96	6.3%
F	Jeanne	2004	221,681.89	362.76	381.41	5.1%
F	Wilma	2005	240,854.58	902.63	728.95	-19.2%

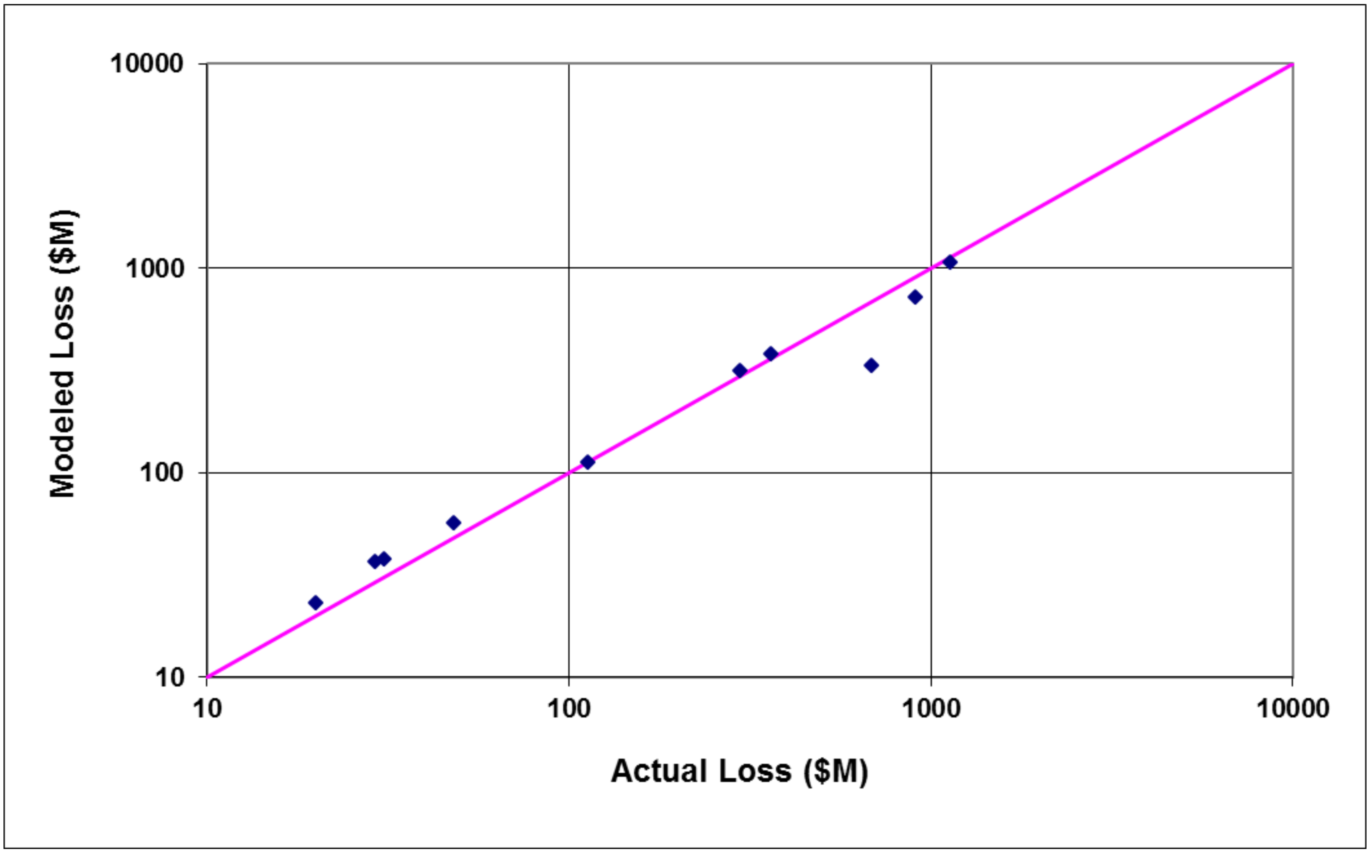


Figure 35. Historical vs. Modeled Losses for Companies A to F

(FORM S-4 CONTINUED)

TABLE 19. COMPANY C BY LINE OF BUSINESS

Event	LOB	TIV ($M)	Actual ($M)	CoreLogic ($M)	Difference
Andrew	Manufactured Homes	56.16	0.82	0.64	-22.3%
	Fire & Extended	11.80	0.16	0.25	59.3%
	Homeowners	1,017.47	17.28	20.55	18.9%
	Renters/Tenants	10.99	0.13	0.12	-5.9%
	Landlord	74.29	1.00	1.15	15.3%
	Condominiums	59.25	0.54	0.55	2.6%
	Total	1,229.95	19.93	23.27	16.8%

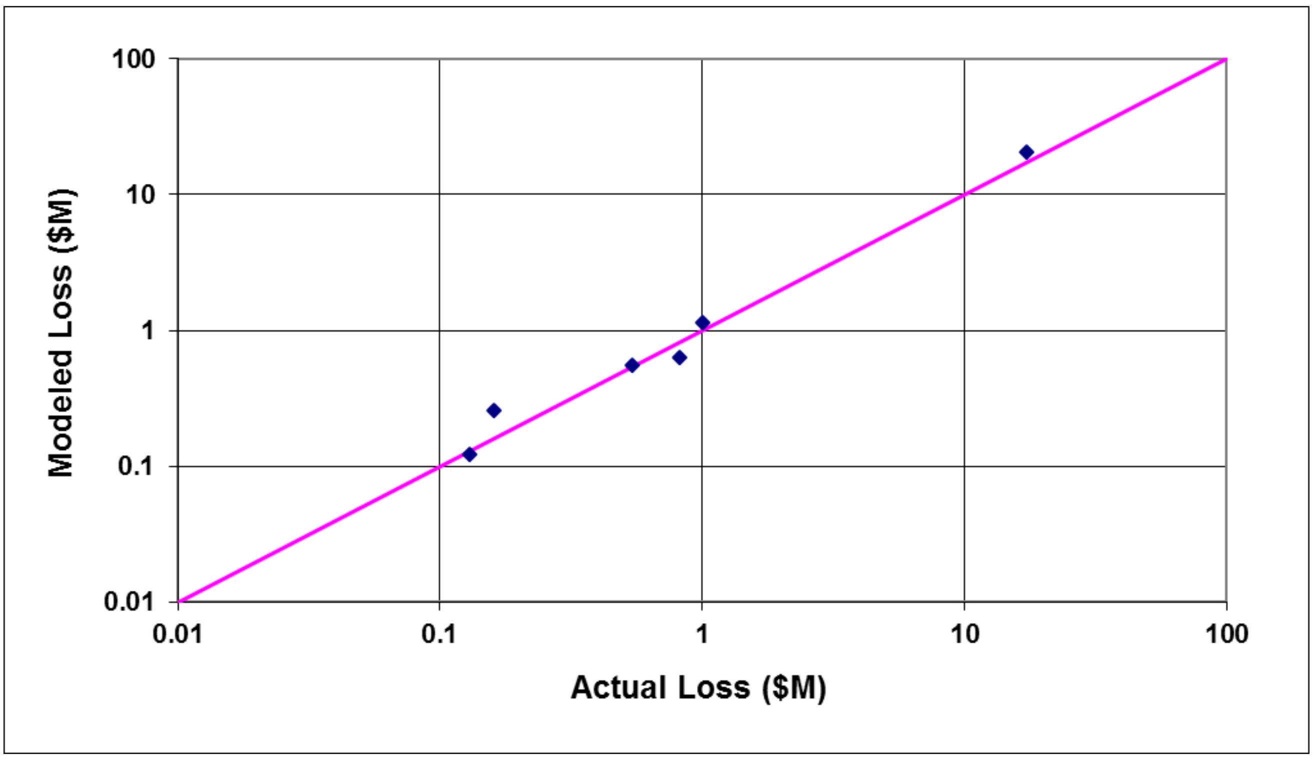


Figure 36. Historical vs. Modeled Losses by LOB for Company C

(FORM S-4 CONTINUED)

TABLE 20. COMPANY D BY COUNTY

Event	County	TIV ($M)	Actual ($M)	CoreLogic ($M)	Difference
Andrew	Broward	234.51	0.50	0.46	-8.7%
	Charlotte	25.64	0.00	0.00	0.0%
	Collier	44.65	0.18	0.16	-12.9%
	Hendry	2.74	0.00	0.00	0.0%
	Martin	8.22	0.00	0.00	0.0%
	Miami-Dade	203.79	30.01	37.29	24.3%
	Monroe	0.31	0.00	0.00	0.0%
	Total	519.86	30.75	37.91	23.3%

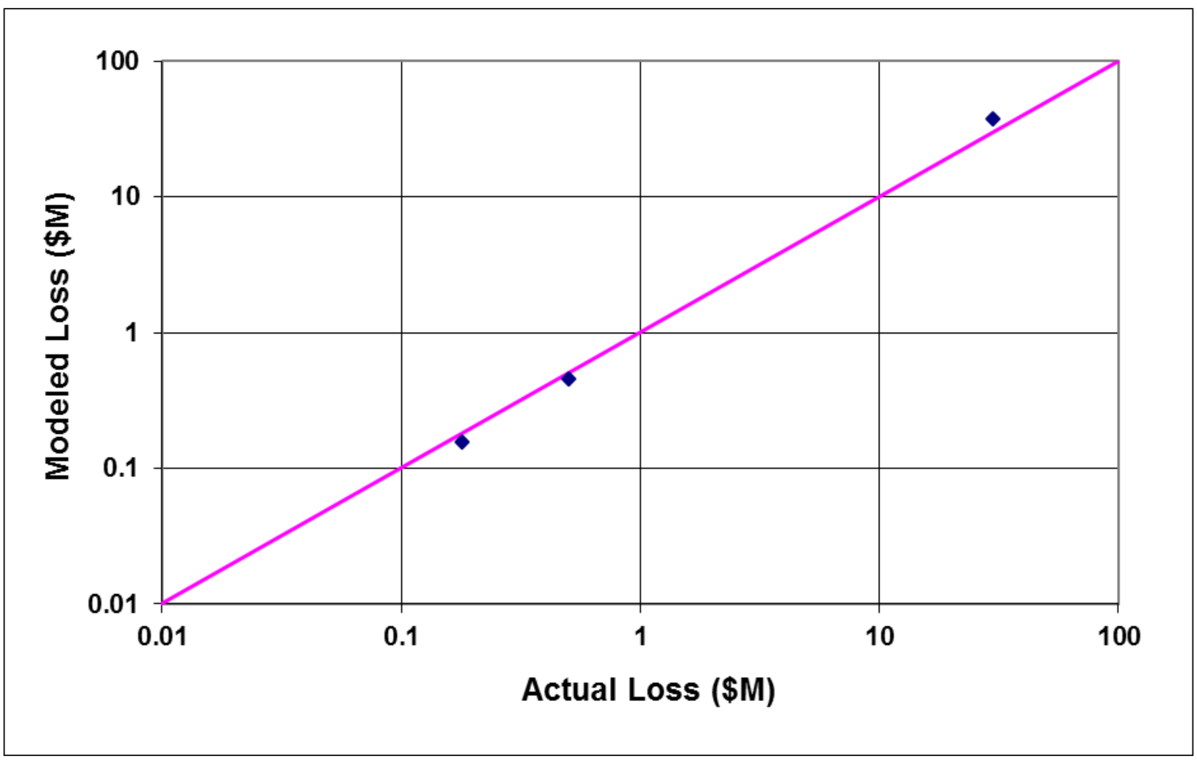


Figure 37. Historical vs. Modeled Losses by County for Company D

(FORM S-4 CONTINUED)

TABLE 21. COMPANY E BY LINE OF BUSINESS

Event	LOB	TIV ($M)	Actual ($M)	CoreLogic ($M)	Difference
Andrew	Homeowner Form 1	0.15	0.02	0.02	0.5%
	Homeowner Form 3	179.08	7.34	10.58	44.1%
	Homeowner Form 4	8.25	0.22	0.33	50.9%
	Homeowner Form 5	368.84	20.82	25.08	20.4%
	Homeowner Form 6	52.36	0.63	0.89	41.6%
	Total	608.67	29.02	36.90	27.2%

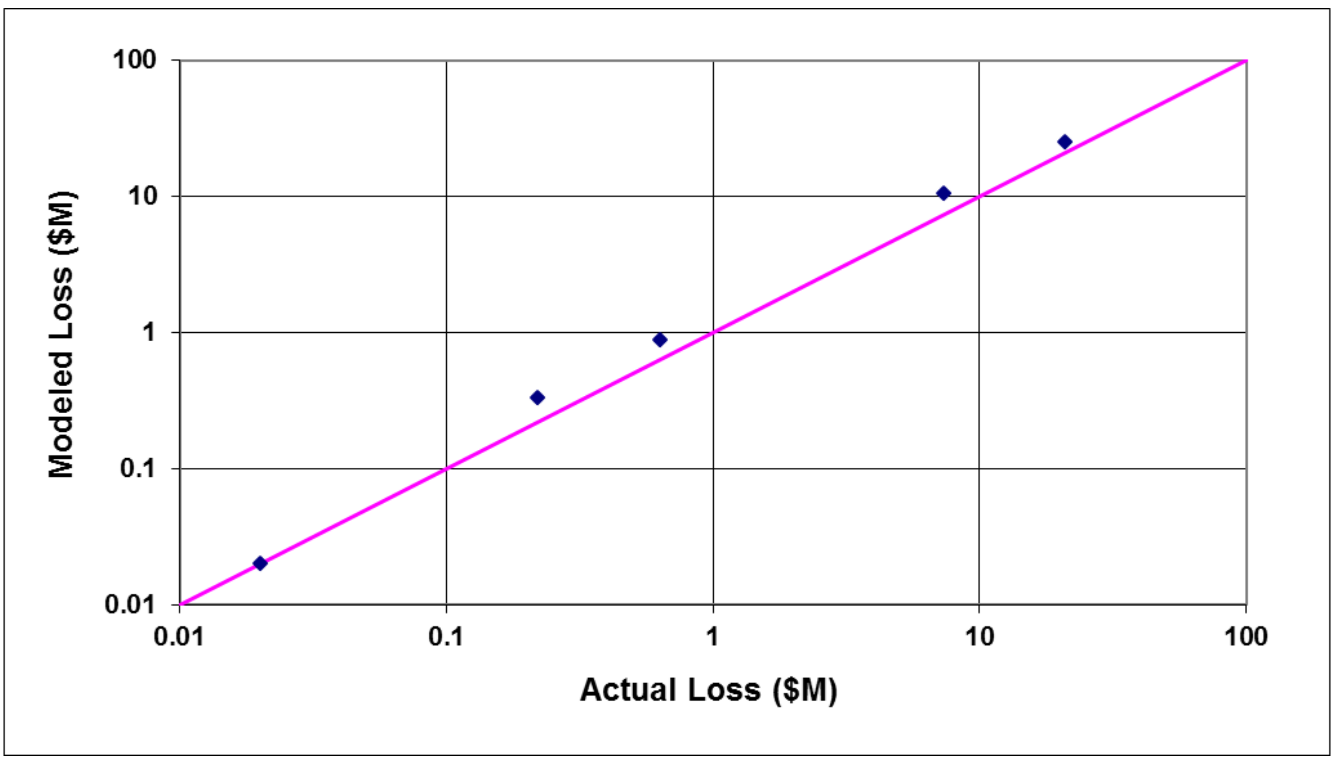


Figure 38. Historical vs. Modeled Losses by LOB for Company E

TABLE 22. TOTALS BY COMPANY – COMMERCIAL RESIDENTIAL

Company	Event	Year	TIV ($M)	Actual ($M)	CoreLogic ($M)	Difference
G	Wilma	2005	10,869.45	156.34	139.70	-10.64%

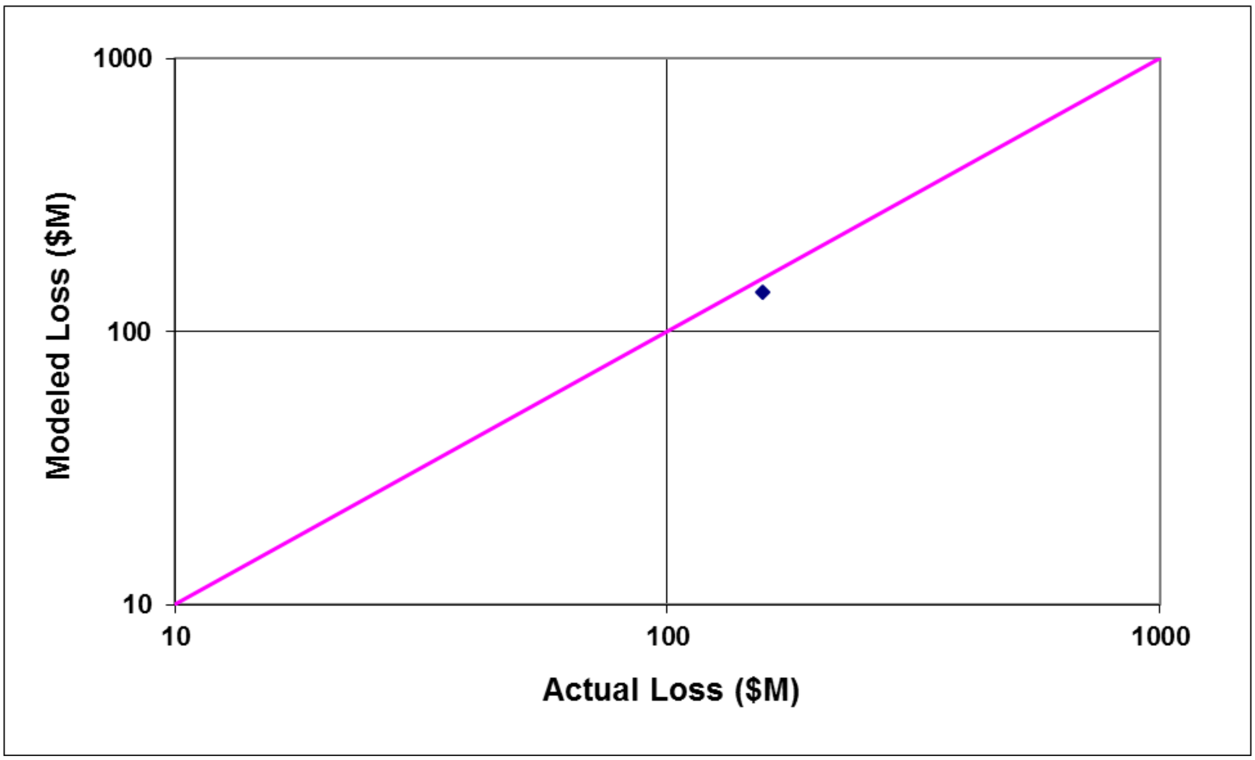


Figure 39. Historical vs. Modeled Losses – Commercial Residential

Form S-5: Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled

A. *Provide the average annual zero deductible statewide personal and commercial residential loss costs produced using the list of hurricanes in the Base Hurricane Storm Set as defined in Standard M-1 (Base Hurricane Storm Set) based on the 2012 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named* **"hlpm2012c.exe"**.

B. *Provide a comparison with the statewide personal and commercial residential loss costs produced by the model on an average industry basis*

TABLE 23. AVERAGE ANNUAL ZERO DEDUCTIBLE STATEWIDE PERSONAL AND COMMERCIAL RESIDENTIAL LOSS COSTS

Time Period	Historical Hurricanes	Produced by Model
Current Submission	\$3.31 Billion	\$3.82 Billion
Previously Accepted Submission	\$3.40 Billion	\$3.68 Billion
Percentage Change Current Submission / Previously Accepted Submission	-2.73%	3.72%

C. *Provide the 95% confidence interval on the differences between the mean of the historical and modeled personal and commercial residential loss.*

Based on the historical storm set for the 115-year experience period (1900 through 2014) and using the Florida Hurricane Catastrophe Fund's 2012 aggregate personal residential exposure data resulted in a statewide historical annual average zero deductible loss of \$3.31 billion and a modeled annual average zero deductible loss of \$3.82 billion.

The difference can be shown to be statistically insignificant as follows:

Let X_i (i=1…84) represent the losses from the 84 historical events, which occurred over 115 years. Then the historical annual loss cost A is given by:

$$A = \sum X_i / 115 \text{ (where } i = 1 \ldots 84) = \$3.31 \text{ Billion}$$

The standard error of A is given by:

$$S.E(A) = SQRT(A^2/84 + 84 * Var(\{X_i\})/115^2) = \$0.74 \text{ Billion}$$

where Var ($\{X_i\}$) is the variance of the historical losses (from the 84 storms). This assumes that the X_i have identical independent distributions and the frequency has a Poisson distribution.

Using the t-test the two-tailed 90% confidence for the true annual loss cost interval (narrower than the 95% confidence interval) is given by the range:

A1 = A - 1.671 * S.E (A) = $2.07 Billion
A2 = A + 1.671 * S.E (A) = $4.55 Billion

The modeled annual loss cost ($3.82 Billion) is within the above range, so the difference between the historical and the modeled results is not statistically significant.

D. If the data are partitioned or modified, provide the average annual zero deductible statewide personal and commercial residential loss costs for the applicable partition (and its complement) or modification, as well as the modeled average annual zero deductible statewide personal and commercial residential loss costs in additional copies of Form S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled.

The data are not partitioned or modified.

E. Include Form S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled, in a submission appendix.

Appendix 4 – Forms in Vulnerability Standards

Form V-1: One Hypothetical Event

A. *Wind speeds for 96 ZIP Codes and sample personal and commercial residential exposure data are provided in the file named **"FormV1Input15.xls."** The wind speeds and ZIP Codes represent a hypothetical hurricane track. Model the sample personal and commercial residential exposure data provided in the file named against these windspeeds at the specified ZIP Codes and provide the damage ratios summarized by windspeed (mph) and construction type.*

The windspeeds provided are one-minute sustained 10-meter wind speeds. The sample personal and commercial residential exposure data provided consists of four structures (one of each construction type – wood frame, masonry, manufactured home, and concrete) individually placed at the population centroid of each of the ZIP Codes provided. Each ZIP Code is subjected to a specific windspeed. For completing Part A, Estimated Damage for each individual windspeed range is the sum of ground up loss to all structures in the ZIP Codes subjected to that individual windspeed range, excluding demand surge and storm surge. Subject Exposure is all exposures in the ZIP Codes subjected to that individual windspeed range. For completing Part B, Estimated Damage is the sum of the ground up loss to all structures of a specific type (wood frame, masonry, manufactured home, or concrete) in all of the windspeed ranges, excluding demand surge and storm surge. Subject Exposure is all exposures of that specific type in all of the ZIP Codes.

One reference structure for each of the construction types shall be placed at the population centroid of the ZIP Codes. Do not include contents, appurtenant structures, or time element coverages.

Reference Frame Structure:	***Reference Masonry Structure:***
One story *Unbraced gable end roof* *ASTM D3161 Class F (110 mph) or* *ASTM D7158 Class G (120 mph) shingles* *½" plywood deck* *6d nails, deck to roof members* *Toe nail truss to wall anchor* *Wood framed exterior walls* *5/8" diameter anchors at 48" centers for* *wall/floor/foundation connections* *No shutters* *Standard glass windows* *No door covers* *No skylight covers* *Constructed in 1995*	*One story* *Unbraced gable end roof* *ASTM D3161 Class F (110 mph) or* *ASTM D7158 Class G (120 mph) shingles* *½" plywood deck* *6d nails, deck to roof members* *Weak truss to wall connection* *Masonry exterior walls* *No vertical wall reinforcing* *No shutters* *Standard glass windows* *No door covers* *No skylight covers* *Constructed in 1995*

Reference Manufactured Home Structure:	*Reference Concrete Structure:*
Tie downs *Single unit* *Manufactured in 1980*	*Twenty story* *Eight apartment units per story* *No shutters* *Standard glass windows* *Constructed in 1980*

B. Confirm that the structures used in completing the Form are identical to those in the above table for the reference structures. If additional assumptions are necessary to complete this Form (for example, regarding structural characteristics, duration, or surface roughness), provide the reasons why the assumptions were necessary as well as a detailed description of how they were included.

The structures used in completing the Form are identical to those in the above table. The input one-minute sustained 10-meter wind speeds were assumed to be over-land and were converted to peak gust wind speeds.

Form V-1: One Hypothetical Event

Part A

Windspeed (mph)	Estimated Damage/ Subject Exposure
41 – 50	0.14%
51 – 60	0.32%
61 – 70	0.92%
71 – 80	1.79%
81 – 90	3.51%
91 – 100	6.73%
101 – 110	11.16%
111 – 120	23.00%
121 – 130	32.10%
131 – 140	47.66%
141 – 150	60.63%
151 – 160	67.34%
161 – 170	74.23%

Part B

Construction Type	Estimated Damage/ Subject Exposure
Wood Frame	24.88%
Masonry	20.73%
Manufactured Home	36.12%
Concrete	6.53%

C. *Provide a plot of the Form V-1 (One Hypothetical Event), Part A data.*

A plot of the Form V-1 Part A data is provided in Figure 40 below.

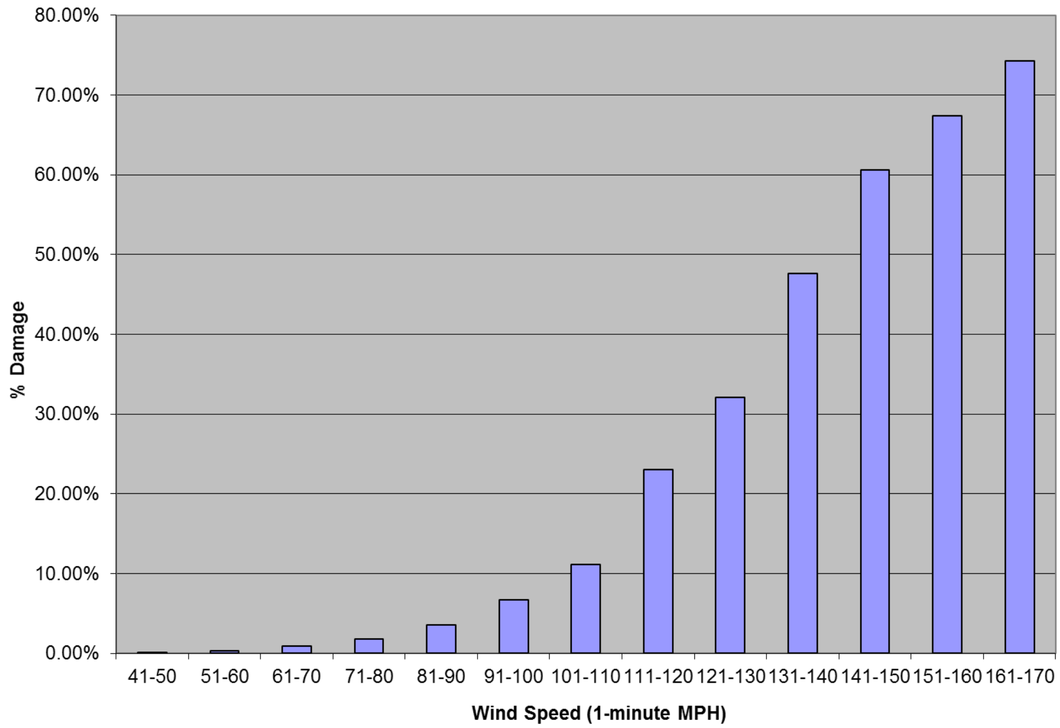


Figure 40. Plot of Form V-1 Part A data.

D. *Include Form V-1, One Hypothetical Event, in a submission appendix.*

Form V-2: Mitigation Measures – Range of Changes in Damage

A. *Provide the change in the zero deductible personal residential reference building damage rate (not loss cost) for each individual mitigation measure listed in Form V-2 (Mitigation Measures – Range of Changes in Damage) as well as for the combination of the four mitigation measures provided for the Mitigated Frame Building and the Mitigated Masonry Building below.*

B. *If additional assumptions are necessary to complete this form (for example, regarding duration or surface roughness), provide the rationale for the assumptions as well as a detailed description of how they are included.*

C. *Provide this form in Excel format without truncation. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form V-2, Mitigation Measures, Range of Changes in Damage, in a submission appendix.*

Reference Frame Structure: *One story* *Unbraced gable end roof* *ASTM D3161 Class F (110 mph) or* *ASTM D7158 Class G (120 mph) shingles* *½" plywood deck* *6d nails, deck to roof members* *Toe nail truss to wall anchor* *Wood framed exterior walls* *5/8" diameter anchors at 48" centers for wall/floor/foundation connections* *No shutters* *Standard glass windows* *No door covers* *No skylight covers* *Constructed in 1995*	***Reference Masonry Structure:*** *One story* *Unbraced gable end roof* *ASTM D3161 Class F (110 mph) or* *ASTM D7158 Class G (120 mph) shingles* *½" plywood deck* *6d nails, deck to roof members* *Weak truss to wall connection* *Masonry exterior walls* *No vertical wall reinforcing* *No shutters* *Standard glass windows* *No door covers* *No skylight covers* *Constructed in 1995*
Mitigated Frame Structure: *ASTM D7158 Class H (150 mph) shingles* *8d nails, deck to roof members* *Truss straps at roof* *Plywood Shutters*	***Mitigated Masonry Structure:*** *ASTM D7158 Class H (150 mph) shingles* *8d nails, deck to roof members* *Truss straps at roof* *Plywood Shutters*

Reference and mitigated buildings are fully insured building structures with a zero deductible building only policy. Place the reference structure at the population centroid for ZIP Code 33921. Windspeeds used in the form are one-minute sustained 10-meter windspeeds.

Form V-2: Mitigation Measures – Range of Changes in Damage

TABLE 24. FORM V-2: MITIGATION MEASURES – RANGE OF CHANGES IN DAMAGE

INDIVIDUAL MITIGATION MEASURES			PERCENTAGE CHANGES IN DAMAGE* (REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE * 100									
			FRAME STRUCTURE					MASONRY STRUCTURE				
			WINDSPEED (MPH)					WINDSPEED (MPH)				
			60	85	110	135	160	60	85	110	135	160
	REFERENCE STRUCTURE		0	0	0	0	0	0	0	0	0	0
ROOF STRENGTH	BRACED GABLE ENDS		15.1%	14.6%	12.4%	9.9%	4.8%	13.6%	13.4%	11.6%	9.4%	5.9%
ROOF STRENGTH	HIP ROOF		19.0%	18.2%	15.5%	12.5%	6.2%	17.3%	16.8%	14.5%	11.9%	7.5%
ROOF COVERING	METAL		-8.7%	-8.6%	-7.3%	-5.7%	-2.7%	-8.1%	-8.3%	-7.1%	-5.6%	-3.4%
ROOF COVERING	ASTM D7158 Class H Shingles (150 MPH)		1.9%	1.9%	1.6%	1.2%	0.6%	1.7%	1.7%	1.5%	1.2%	0.7%
ROOF COVERING	MEMBRANE		-5.2%	-5.1%	-4.3%	-3.4%	-1.6%	-5.0%	-5.1%	-4.4%	-3.5%	-2.1%
ROOF COVERING	NAILING OF DECK	8d	1.9%	1.9%	1.6%	1.2%	0.6%	1.7%	1.7%	1.5%	1.2%	0.7%
ROOF-WALL STRENGTH	CLIPS		17.8%	17.1%	14.6%	11.6%	5.8%	16.2%	15.8%	13.7%	11.1%	7.1%
ROOF-WALL STRENGTH	STRAPS		17.8%	17.1%	14.6%	11.6%	5.8%	16.2%	15.8%	13.7%	11.1%	7.1%
WALL-FLOOR STRENGTH	TIES OR CLIPS		4.6%	4.6%	3.9%	3.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%
WALL-FLOOR STRENGTH	STRAPS		4.6%	4.6%	3.9%	3.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%
WALL-FOUNDATION STRENGTH	LARGER ANCHORS OR CLOSER SPACING		0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	-
WALL-FOUNDATION STRENGTH	STRAPS		4.6%	4.6%	3.9%	3.0%	1.4%	-	-	-	-	-
WALL-FOUNDATION STRENGTH	VERTICAL REINFORCING		-	-	-	-	-	-	-	-	-	-
OPENING PROTECTION	WINDOW SHUTTERS	PLYWOOD	12.1%	12.0%	10.1%	7.9%	3.8%	11.0%	11.0%	9.4%	7.6%	4.7%
OPENING PROTECTION	WINDOW SHUTTERS	METAL	12.1%	12.0%	10.1%	7.9%	3.8%	11.0%	11.0%	9.4%	7.6%	4.7%
OPENING PROTECTION	DOOR AND SKYLIGHT COVERS		21.8%	20.6%	17.7%	14.3%	7.2%	19.9%	19.2%	16.6%	13.6%	8.7%
OPENING PROTECTION	WINDOW	IMPACT RATED	10.6%	10.5%	8.9%	7.0%	3.3%	9.7%	9.8%	8.4%	6.7%	4.1%
OPENING PROTECTION	ENTRY DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	10.6%	10.5%	8.9%	7.0%	3.3%	9.7%	9.8%	8.4%	6.7%	4.1%
OPENING PROTECTION	GARAGE DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	10.6%	10.5%	8.9%	7.0%	3.3%	9.7%	9.8%	8.4%	6.7%	4.1%
OPENING PROTECTION	SLIDING GLASS DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	18.8%	18.0%	15.4%	12.3%	6.2%	17.3%	16.8%	14.5%	11.9%	7.5%
OPENING PROTECTION	SKYLIGHT	IMPACT RATED	13.8%	13.5%	11.4%	9.0%	4.4%	12.3%	12.2%	10.5%	8.5%	5.3%
MITIGATION MEASURES IN COMBINATION			PERCENTAGE CHANGES IN DAMAGE* (REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE * 100									
			FRAME STRUCTURE					MASONRY STRUCTURE				
			WINDSPEED (MPH)					WINDSPEED (MPH)				
			60	85	110	135	160	60	85	110	135	160
STRUCTURE	MITIGATED STRUCTURE		27.2%	25.6%	22.0%	17.8%	9.1%	25.2%	24.0%	20.8%	17.2%	11.1%

* Note: Larger or closer spaced anchor bolts: not currently distinguished in the model, as other aspects are deemed more important; also difficult to ascertain vertical reinforcing for masonry walls: this feature is accounted for through the selection of the base structure; vertically reinforced masonry walls are considered by the CoreLogic model as Reinforced Masonry (RM).

The input one-minute sustained 10-meter wind speeds were assumed to be over-water and were converted to over-land peak gust wind speeds using the minimum direction-dependent roughness length for the ZIP Code centroid and the model's standard gust factor formulation.

Form V-3: Mitigation Measures – Mean Damage Ratios and Loss Costs (Trade Secret Item)

This form will be provided during the professional team on-site review as well as the closed meeting portion of the commission meeting.

Appendix 5 – Forms in Actuarial Standards

Form A-1: Zero Deductible Personal Residential Loss Costs by ZIP Code

A. *Provide three maps, color-coded by ZIP Code (with a minimum of 6 value ranges), displaying zero deductible personal residential loss costs per $1,000 of exposure for frame, masonry, and manufactured homes.*

Thematic maps displaying zero deductible loss costs by 5-digit ZIP Code for frame, masonry, and manufactured homes are provided in Figures 41 to 43.

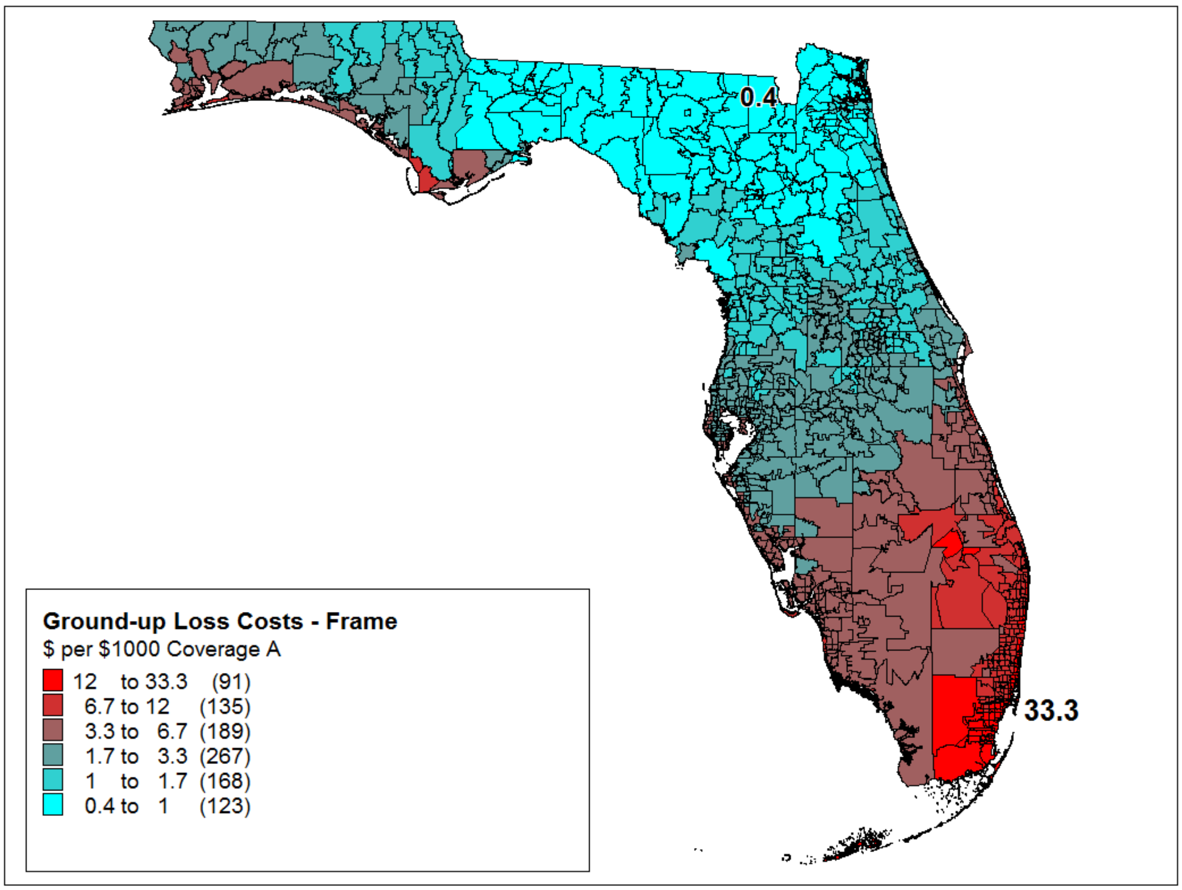


Figure 41. Ground-up Loss Costs for Frame Structures

(FORM A-1 CONTINUED)

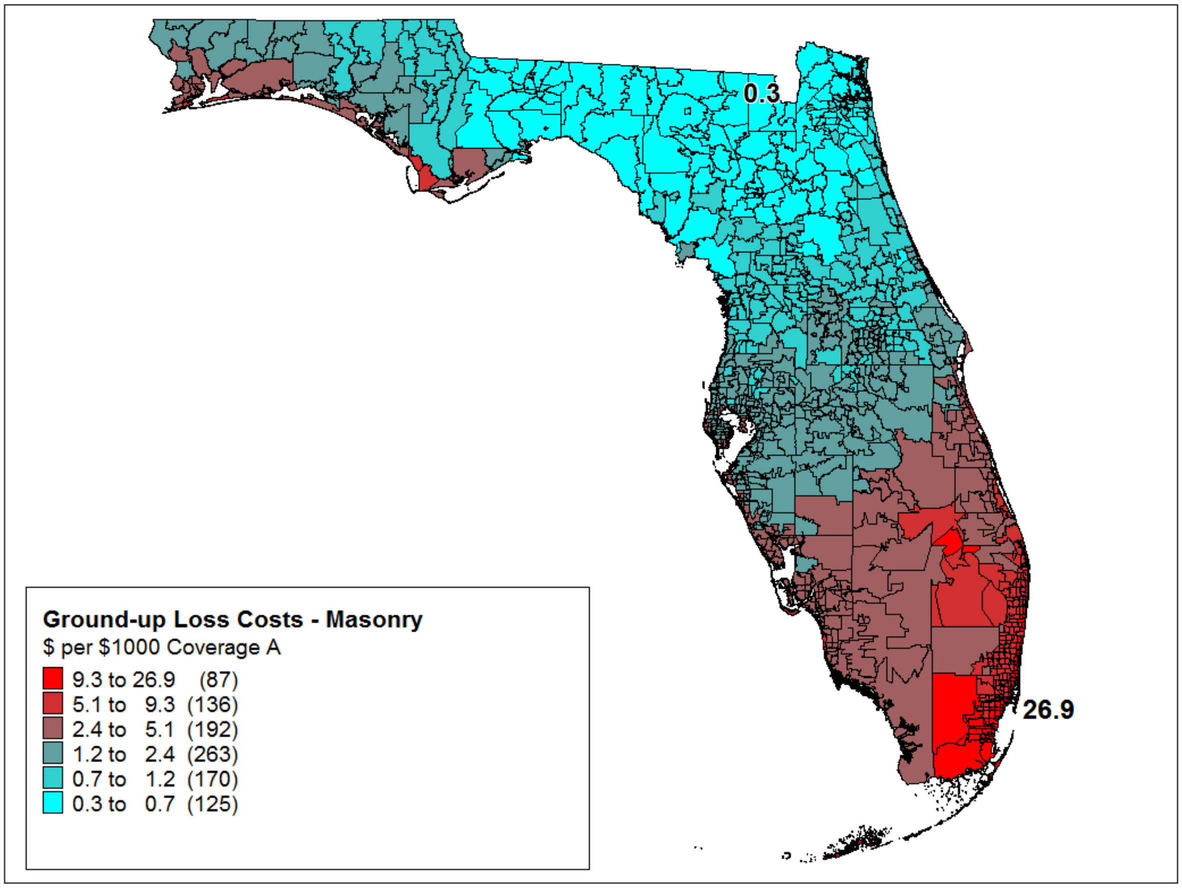


Figure 42. Ground-up Loss Costs for Masonry Structures

(FORM A-1 CONTINUED)

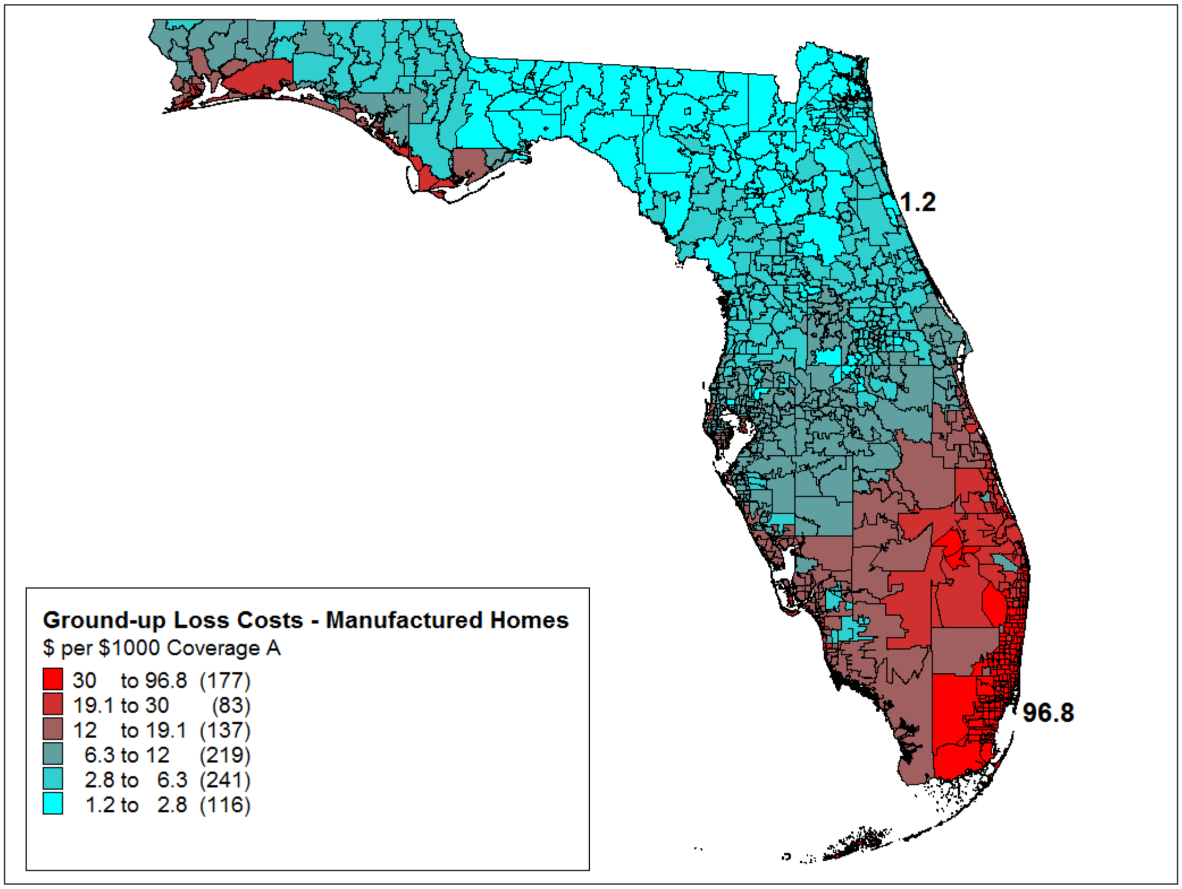


Figure 43. Ground-up Loss Costs for Manufactured Home Structures

B. *Create exposure sets for these exhibits by modeling all of the structures from Notional Set 3 described in the file **"NotionalInput15.xlsx"** geocoded to each ZIP Code centroid in the state, as provided in the model. Provide the predominant County name and the Federal Information Processing Standards (FIPS) Code associated with each ZIP Code centroid. Refer to the Notional Policy Specification below for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information.*

C. *Provide in the format given in the file named "2015FormA1.xlsx," the underlying loss cost data rounded to 3 decimal places used for A. above in both Excel and PDF format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name.*

Notional Policy Specifications

Policy Type	**Assumptions**
Owners	**Coverage A = Structure** • Replacement Cost included subject to Coverage A limit • Law and Ordinance not included **Coverage B = Appurtenant Structures** • Replacement Cost included subject to Coverage B limit • Law and Ordinance not included **Coverage C = Contents** • Replacement Cost included subject to Coverage C limit **Coverage D = Time Element** • Time Limit = 12 months • Per Diem = $150.00/day per policy, if used ✧ Loss costs per $1,000 shall be related to the Coverage A limit.
Manufactured Home	**Coverage A = Structure** • Replacement Cost included subject to Coverage A limit **Coverage B = Appurtenant Structures** • Replacement Cost included subject to Coverage B limit **Coverage C = Contents** • Replacement Cost included subject to Coverage C limit **Coverage D = Time Element** • Time Limit = 12 months • Per Diem = $150.00/day per policy, if used ✧ Loss costs per $1,000 shall be related to the Coverage A limit.

This information is provided in the file 2015FormA1_CoreLogic_20March2017.xlsx.

Form A-2: Base Hurricane Storm Statewide Loss Costs

A. *Provide the total insured loss and the dollar contribution to the average annual loss assuming zero deductible policies for individual historical hurricanes using the Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the files named "hlpm2012c.exe." The list of hurricanes in this form should include all Florida and by-passing hurricanes in the modeling organization Base Hurricane Storm Set, as defined in Standard M-1 (Base Hurricane Storm Set).*

The table below contains the minimum number of hurricanes from HURDAT2 to be included in the Base Hurricane Storm Set, based on the 115-year period 1900-2014. Each hurricane has been assigned an ID number. As defined in Standard M-1 (Base Hurricane Storm Set), the Base Hurricane Storm Set for the modeling organization may exclude hurricanes that had zero modeled impact, or it may include additional hurricanes when there is clear justification for the changes. For hurricanes in the table below resulting in zero loss, the table entry should be left blank. Additional hurricanes included in the model's Base Hurricane Storm Set shall be added to the table below in order of year and assigned an intermediate ID number as the hurricane falls within the bounding ID numbers.

B. *Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also, include Form A-2, Base Hurricane Storm Set Statewide Losses, in a submission appendix.*

TABLE 25. FORM A-2: BASE HURRICANE STORM SET AVERAGE ANNUAL ZERO DEDUCTIBLE STATEWIDE LOSS COSTS

FORM A-2: BASE HURRICANE STORM SET AVERAGE ANNUAL ZERO DEDUCTIBLE STATEWIDE LOSS COSTS

ID	Date	Year	Name	Total Personal Residential and Commercial Insured Losses ($1000s)	Dollar Contribution ($1000s)
005	8/15/1901	1901	NoName04-1901	199,215	1,732
010	9/11/1903	1903	NoName03-1903	3,313,039	28,809
015	10/17/1904	1904	NoName04-1904	673,657	5,858
020	6/17/1906	1906	NoName02-1906	1,688,838	14,686
025	9/27/1906	1906	NoName06-1906	1,280,808	11,137
030	10/18/1906	1906	NoName08-1906	1,603,611	13,944
035	10/11/1909	1909	NoName11-1909	920,913	8,008
040	10/18/1910	1910	NoName05-1910	7,749,324	67,385
045	8/11/1911	1911	NoName02-1911	467,791	4,068
050	9/14/1912	1912	NoName04-1912	430,040	3,739
055	8/1/1915	1915	NoName01-1915	349,972	3,043
060	9/4/1915	1915	NoName04-1915	384,015	3,339
065	7/5/1916	1916	NoName02-1916	416,914	3,625
070	10/18/1916	1916	NoName14-1916	892,719	7,763
075	9/29/1917	1917	NoName04-1917	2,932,601	25,501
080	9/10/1919	1919	NoName02-1919	6,997,737	60,850
085	10/25/1921	1921	TampaBay06-1921	9,177,146	79,801
090	9/15/1924	1924	NoName05-1924	66,591	579
095	10/21/1924	1924	NoName10-1924	787,483	6,848
100	7/28/1926	1926	NoName01-1926	2,220,985	19,313
105	9/18/1926	1926	GreatMiami07-1926	51,178,734	445,032
110	10/21/1926	1926	NoName10-1926	2,112,676	18,371
115	8/8/1928	1928	NoName01-1928	1,301,966	11,321
120	9/17/1928	1928	LakeOkeechobee04-1928	33,564,941	291,869
125	9/28/1929	1929	NoName02-1929	5,585,569	48,570
130	9/1/1932	1932	NoName03-1932	494,359	4,299
135	7/30/1933	1933	NoName05-1933	357,604	3,110
140	9/4/1933	1933	NoName11-1933	7,411,533	64,448
145	9/3/1935	1935	LaborDay03-1935	20,054,317	174,385
150	11/4/1935	1935	NoName07-1935	1,671,271	14,533
155	7/31/1936	1936	NoName05-1936	1,428,836	12,425
160	8/11/1939	1939	NoName02-1939	838,949	7,295
165	10/6/1941	1941	NoName05-1941	3,718,124	32,332
170	10/19/1944	1944	NoName13-1944	10,712,586	93,153
175	6/24/1945	1945	NoName01-1945	944,308	8,211
180	9/15/1945	1945	NoName09-1945	10,098,434	87,812
185	10/8/1946	1946	NoName06-1946	3,147,646	27,371
190	9/17/1947	1947	NoName04-1947	26,705,351	232,220
195	10/12/1947	1947	NoName09-1947	1,476,407	12,838
200	9/22/1948	1948	NoName08-1948	2,358,439	20,508
205	10/5/1948	1948	NoName09-1948	451,966	3,930
210	8/26/1949	1949	NoName02-1949	13,683,232	118,985
215	8/31/1950	1950	Baker-1950	204,368	1,777
220	9/5/1950	1950	Easy-1950	3,621,493	31,491
225	10/18/1950	1950	King-1950	14,192,494	123,413
230	9/26/1953	1953	Florence-1953	374,910	3,260
235	10/9/1953	1953	Hazel-1953	563,219	4,898
240	9/25/1956	1956	Flossy-1956	606,714	5,276
245	9/10/1960	1960	Donna-1960	11,712,203	101,845
250	8/27/1964	1964	Cleo-1964	4,264,148	37,080
255	9/10/1964	1964	Dora-1964	3,715,081	32,305
260	10/14/1964	1964	Isbell-1964	4,485,209	39,002

ID	Date	Year	Name	Total Personal Residential and Commercial Insured Losses ($1000s)	Dollar Contribution ($1000s)
265	9/8/1965	1965	Betsy-1965	7,568,125	65,810
270	6/9/1966	1966	Alma-1966	533,248	4,637
275	10/4/1966	1966	Inez-1966	370,626	3,223
280	10/19/1968	1968	Gladys-1968	1,988,795	17,294
285	6/19/1972	1972	Agnes-1972	45,107	392
290	9/23/1975	1975	Eloise-1975	825,779	7,181
295	9/4/1979	1979	David-1979	3,952,887	34,373
300	9/13/1979	1979	Frederic-1979	596,558	5,187
305	9/2/1985	1985	Elena-1985	2,489,382	21,647
310	11/21/1985	1985	Kate-1985	365,242	3,176
315	10/12/1987	1987	Floyd-1987	51,326	446
320	8/24/1992	1992	Andrew-1992	26,659,085	231,818
325	8/3/1995	1995	Erin-1995	1,450,832	12,616
330	10/4/1995	1995	Opal-1995	1,683,321	14,638
335	7/19/1997	1997	Danny-1997	132,700	1,154
340	9/3/1998	1998	Earl-1998	185,040	1,609
345	9/25/1998	1998	Georges-1998	410,072	3,566
350	10/15/1999	1999	Irene-1999	2,096,253	18,228
355	8/13/2004	2004	Charley-2004	10,154,154	88,297
360	9/5/2004	2004	Frances-2004	7,660,183	66,610
365	9/16/2004	2004	Ivan-2004	3,141,902	27,321
370	9/26/2004	2004	Jeanne-2004	7,997,176	69,541
375	7/10/2005	2005	Dennis-2005	1,404,729	12,215
380	8/25/2005	2005	Katrina-2005	1,567,493	13,630
385	10/24/2005	2005	Wilma-2005	10,919,177	94,949
	Other hurricanes included				
032	9/21/1909	1909	NoName09-1909	41,786	363
141	10/5/1933	1933	NoName17-1933	518,494	4,509
143	6/16/1934	1934	NoName01-1934	29,059	253
246	9/15/1960	1960	Ethel-1960	9,630	84
281	8/18/1969	1969	Camille-1969	6,145	53
304	9/25/1985	1985	Bob-1985	140,839	1,225
384	9/8/2005	2005	Ophelia-2005	195,739	1,702
				Total	3,311,140

Note: Total dollar contributions should agree with the total average annual zero deductible statewide loss costs provided in Form S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled.

Form A-3: 2004 Hurricane Season Losses

A. Provide the percentage of residential zero deductible losses, rounded to four decimal places, and the monetary contribution from Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) for each affected ZIP Code, individually and in total. Include all ZIP Codes where losses are equal to or greater than $500,000.

Use the 2012 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "hlpm2012c.exe."

Rather than using directly a specified published windfield, the winds underlying the loss cost calculations must be produced by the model being evaluated and should be the same hurricane parameters as used in completing Form A-2 (Base Hurricane Storm Set Statewide Losses).

B. Provide maps color-coded by ZIP Code depicting the percentage of total residential losses from each hurricane, Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) and for the cumulative losses using the following interval coding:

Red	*Over 5%*
Light Red	*2% to 5%*
Pink	*1% to 2%*
Light Pink	*0.5% to 1%*
Light Blue	*0.2% to 0.5%*
Medium Blue	*0.1% to 0.2%*
Blue	*Below 0.1%*

The relevant storm track should be plotted on each map.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also, include Form A-3, 2004 Hurricane Season Losses, in a submission appendix.

TABLE 26. FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
32003	0	0.0000%	1860	0.0244%	0	0.0000%	1490	0.0187%	3350	0.0116%
32008	0	0.0000%	0	0.0000%	0	0.0000%	955	0.0120%	1198	0.0041%
32024	0	0.0000%	574	0.0075%	0	0.0000%	4010	0.0504%	4584	0.0159%
32025	0	0.0000%	0	0.0000%	0	0.0000%	1617	0.0203%	2073	0.0072%
32033	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	787	0.0027%
32034	0	0.0000%	1794	0.0235%	0	0.0000%	0	0.0000%	1794	0.0062%
32038	0	0.0000%	0	0.0000%	0	0.0000%	1681	0.0211%	1979	0.0068%
32043	0	0.0000%	1134	0.0149%	0	0.0000%	680	0.0085%	1814	0.0063%
32052	0	0.0000%	0	0.0000%	0	0.0000%	607	0.0076%	750	0.0026%
32053	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	535	0.0018%
32054	0	0.0000%	0	0.0000%	0	0.0000%	649	0.0082%	821	0.0028%
32055	0	0.0000%	0	0.0000%	0	0.0000%	2058	0.0259%	2451	0.0085%
32059	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	531	0.0018%
32060	0	0.0000%	763	0.0100%	0	0.0000%	3156	0.0397%	3919	0.0136%
32062	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	587	0.0020%
32064	0	0.0000%	0	0.0000%	0	0.0000%	684	0.0086%	857	0.0030%
32065	0	0.0000%	836	0.0110%	0	0.0000%	0	0.0000%	836	0.0029%
32066	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	771	0.0027%
32068	0	0.0000%	1268	0.0166%	0	0.0000%	1599	0.0201%	2866	0.0099%
32071	0	0.0000%	0	0.0000%	0	0.0000%	656	0.0082%	815	0.0028%
32073	0	0.0000%	1404	0.0184%	0	0.0000%	1328	0.0167%	2732	0.0094%
32080	8069	0.0796%	2277	0.0299%	0	0.0000%	1268	0.0159%	11614	0.0402%
32082	4744	0.0468%	4777	0.0627%	0	0.0000%	2493	0.0313%	12014	0.0415%
32084	2690	0.0265%	1439	0.0189%	0	0.0000%	779	0.0098%	4908	0.0170%
32086	3987	0.0393%	1538	0.0202%	0	0.0000%	887	0.0111%	6412	0.0222%
32091	0	0.0000%	0	0.0000%	0	0.0000%	727	0.0091%	1028	0.0036%
32092	1538	0.0152%	1744	0.0229%	0	0.0000%	0	0.0000%	3282	0.0114%
32094	0	0.0000%	0	0.0000%	0	0.0000%	533	0.0067%	641	0.0022%
32095	555	0.0055%	0	0.0000%	0	0.0000%	0	0.0000%	1225	0.0042%
32102	750	0.0074%	0	0.0000%	0	0.0000%	0	0.0000%	1101	0.0038%
32110	1640	0.0162%	0	0.0000%	0	0.0000%	0	0.0000%	2036	0.0070%
32112	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	886	0.0031%
32113	0	0.0000%	0	0.0000%	0	0.0000%	933	0.0117%	1158	0.0040%
32114	7684	0.0758%	1212	0.0159%	0	0.0000%	645	0.0081%	9541	0.0330%
32117	8255	0.0814%	1425	0.0187%	0	0.0000%	743	0.0093%	10424	0.0360%
32118	20530	0.2025%	3141	0.0412%	0	0.0000%	1458	0.0183%	25130	0.0869%
32119	13952	0.1376%	2357	0.0309%	0	0.0000%	1279	0.0161%	17588	0.0608%
32124	1236	0.0122%	0	0.0000%	0	0.0000%	0	0.0000%	1533	0.0053%
32127	27382	0.2701%	4656	0.0611%	0	0.0000%	2666	0.0335%	34704	0.1200%
32128	16902	0.1667%	2437	0.0320%	0	0.0000%	1559	0.0196%	20898	0.0723%
32129	16112	0.1589%	2150	0.0282%	0	0.0000%	1289	0.0162%	19551	0.0676%
32130	2243	0.0221%	0	0.0000%	0	0.0000%	0	0.0000%	2948	0.0102%
32131	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	588	0.0020%
32132	5296	0.0522%	1148	0.0151%	0	0.0000%	695	0.0087%	7138	0.0247%
32134	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	631	0.0022%
32136	5808	0.0573%	1262	0.0166%	0	0.0000%	662	0.0083%	7732	0.0267%
32137	16122	0.1590%	3244	0.0426%	0	0.0000%	2049	0.0257%	21415	0.0741%
32141	11172	0.1102%	3416	0.0448%	0	0.0000%	2013	0.0253%	16601	0.0574%
32148	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	691	0.0024%
32159	0	0.0000%	7686	0.1008%	0	0.0000%	23371	0.2937%	31057	0.1074%
32162	0	0.0000%	11313	0.1484%	0	0.0000%	53297	0.6697%	64610	0.2234%
32163	0	0.0000%	0	0.0000%	0	0.0000%	1362	0.0171%	1588	0.0055%
32164	11901	0.1174%	2086	0.0274%	0	0.0000%	1268	0.0159%	15255	0.0528%
32168	22014	0.2172%	3726	0.0489%	0	0.0000%	2192	0.0275%	27933	0.0966%
32169	22066	0.2177%	4605	0.0604%	0	0.0000%	2423	0.0305%	29095	0.1006%
32174	33932	0.3347%	5728	0.0752%	0	0.0000%	3253	0.0409%	42913	0.1484%
32176	24860	0.2452%	3231	0.0424%	0	0.0000%	1598	0.0201%	29688	0.1027%
32177	0	0.0000%	974	0.0128%	0	0.0000%	770	0.0097%	2147	0.0074%
32179	0	0.0000%	0	0.0000%	0	0.0000%	1616	0.0203%	2072	0.0072%
32180	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	787	0.0027%
32189	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	531	0.0018%
32195	0	0.0000%	0	0.0000%	0	0.0000%	1300	0.0163%	1738	0.0060%
32205	0	0.0000%	1010	0.0133%	0	0.0000%	909	0.0114%	1919	0.0066%
32207	0	0.0000%	1458	0.0191%	0	0.0000%	0	0.0000%	1458	0.0050%
32208	0	0.0000%	525	0.0069%	0	0.0000%	0	0.0000%	525	0.0018%
32210	0	0.0000%	1864	0.0245%	0	0.0000%	0	0.0000%	1864	0.0064%
32211	0	0.0000%	739	0.0097%	0	0.0000%	0	0.0000%	739	0.0026%
32216	0	0.0000%	913	0.0120%	0	0.0000%	0	0.0000%	913	0.0032%
32217	660	0.0065%	827	0.0109%	0	0.0000%	0	0.0000%	1487	0.0051%
32218	0	0.0000%	1253	0.0164%	0	0.0000%	0	0.0000%	1253	0.0043%
32221	0	0.0000%	730	0.0096%	0	0.0000%	0	0.0000%	730	0.0025%
32223	1211	0.0119%	1558	0.0204%	0	0.0000%	0	0.0000%	2768	0.0096%
32224	1055	0.0104%	1505	0.0197%	0	0.0000%	0	0.0000%	2559	0.0089%
32225	1803	0.0178%	2357	0.0309%	0	0.0000%	0	0.0000%	4161	0.0144%
32226	0	0.0000%	590	0.0077%	0	0.0000%	0	0.0000%	590	0.0020%
32233	889	0.0088%	1068	0.0140%	0	0.0000%	0	0.0000%	1957	0.0068%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
32244	0	0.0000%	1627	0.0213%	0	0.0000%	0	0.0000%	1627	0.0056%
32246	837	0.0083%	1051	0.0138%	0	0.0000%	0	0.0000%	1888	0.0065%
32250	1170	0.0115%	1412	0.0185%	0	0.0000%	663	0.0083%	3245	0.0112%
32256	0	0.0000%	1327	0.0174%	0	0.0000%	0	0.0000%	1327	0.0046%
32257	1129	0.0111%	1277	0.0168%	0	0.0000%	0	0.0000%	2406	0.0083%
32258	879	0.0087%	1096	0.0144%	0	0.0000%	0	0.0000%	1975	0.0068%
32259	1952	0.0193%	2184	0.0287%	0	0.0000%	0	0.0000%	4135	0.0143%
32266	0	0.0000%	538	0.0071%	0	0.0000%	0	0.0000%	1212	0.0042%
32277	0	0.0000%	1028	0.0135%	0	0.0000%	0	0.0000%	1028	0.0036%
32301	0	0.0000%	2463	0.0323%	786	0.0251%	0	0.0000%	3248	0.0112%
32303	0	0.0000%	5243	0.0688%	2252	0.0720%	0	0.0000%	7495	0.0259%
32304	0	0.0000%	1476	0.0194%	0	0.0000%	0	0.0000%	1958	0.0068%
32305	0	0.0000%	1038	0.0136%	0	0.0000%	0	0.0000%	1430	0.0049%
32308	0	0.0000%	4032	0.0529%	1057	0.0338%	852	0.0107%	5941	0.0205%
32309	0	0.0000%	6571	0.0862%	2013	0.0644%	1539	0.0193%	10123	0.0350%
32310	0	0.0000%	798	0.0105%	0	0.0000%	0	0.0000%	1173	0.0041%
32311	0	0.0000%	2186	0.0287%	639	0.0204%	587	0.0074%	3412	0.0118%
32312	0	0.0000%	5831	0.0765%	2679	0.0856%	0	0.0000%	8510	0.0294%
32317	0	0.0000%	2609	0.0342%	728	0.0233%	615	0.0077%	3952	0.0137%
32327	0	0.0000%	1377	0.0181%	667	0.0213%	0	0.0000%	2044	0.0071%
32328	0	0.0000%	0	0.0000%	832	0.0266%	0	0.0000%	1025	0.0035%
32331	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	550	0.0019%
32333	0	0.0000%	960	0.0126%	0	0.0000%	0	0.0000%	1429	0.0049%
32340	0	0.0000%	647	0.0085%	0	0.0000%	959	0.0120%	1606	0.0056%
32344	0	0.0000%	1732	0.0227%	0	0.0000%	697	0.0088%	2763	0.0096%
32347	0	0.0000%	1394	0.0183%	0	0.0000%	507	0.0064%	2071	0.0072%
32348	0	0.0000%	1116	0.0146%	0	0.0000%	518	0.0065%	1765	0.0061%
32351	0	0.0000%	535	0.0070%	0	0.0000%	0	0.0000%	1025	0.0035%
32401	0	0.0000%	0	0.0000%	3181	0.1017%	0	0.0000%	3181	0.0110%
32404	0	0.0000%	0	0.0000%	4884	0.1561%	0	0.0000%	4884	0.0169%
32405	0	0.0000%	0	0.0000%	4578	0.1464%	0	0.0000%	4578	0.0158%
32407	0	0.0000%	0	0.0000%	3431	0.1097%	0	0.0000%	3431	0.0119%
32408	0	0.0000%	0	0.0000%	11647	0.3723%	0	0.0000%	11647	0.0403%
32409	0	0.0000%	0	0.0000%	1176	0.0376%	0	0.0000%	1176	0.0041%
32413	0	0.0000%	0	0.0000%	10316	0.3298%	0	0.0000%	10316	0.0357%
32425	0	0.0000%	0	0.0000%	1088	0.0348%	0	0.0000%	1088	0.0038%
32428	0	0.0000%	0	0.0000%	1512	0.0483%	0	0.0000%	1512	0.0052%
32433	0	0.0000%	0	0.0000%	2959	0.0946%	0	0.0000%	2959	0.0102%
32435	0	0.0000%	0	0.0000%	1038	0.0332%	0	0.0000%	1038	0.0036%
32439	0	0.0000%	0	0.0000%	3378	0.1080%	0	0.0000%	3378	0.0117%
32444	0	0.0000%	0	0.0000%	3682	0.1177%	0	0.0000%	3682	0.0127%
32446	0	0.0000%	0	0.0000%	747	0.0239%	0	0.0000%	747	0.0026%
32456	0	0.0000%	0	0.0000%	2395	0.0766%	0	0.0000%	2395	0.0083%
32459	0	0.0000%	0	0.0000%	19850	0.6346%	0	0.0000%	19850	0.0686%
32461	0	0.0000%	0	0.0000%	601	0.0192%	0	0.0000%	601	0.0021%
32501	0	0.0000%	0	0.0000%	71834	2.2965%	0	0.0000%	71834	0.2484%
32502	0	0.0000%	0	0.0000%	33687	1.0769%	0	0.0000%	33687	0.1165%
32503	0	0.0000%	0	0.0000%	217409	6.9504%	0	0.0000%	217409	0.7519%
32504	0	0.0000%	0	0.0000%	172681	5.5205%	0	0.0000%	172681	0.5972%
32505	0	0.0000%	0	0.0000%	110886	3.5449%	0	0.0000%	110886	0.3835%
32506	0	0.0000%	0	0.0000%	266678	8.5255%	0	0.0000%	266678	0.9223%
32507	0	0.0000%	0	0.0000%	473166	15.1267%	0	0.0000%	473166	1.6364%
32508	0	0.0000%	0	0.0000%	1325	0.0424%	0	0.0000%	1325	0.0046%
32514	0	0.0000%	0	0.0000%	184603	5.9016%	0	0.0000%	184603	0.6384%
32526	0	0.0000%	0	0.0000%	254026	8.1210%	0	0.0000%	254026	0.8785%
32531	0	0.0000%	0	0.0000%	3479	0.1112%	0	0.0000%	3479	0.0120%
32533	0	0.0000%	0	0.0000%	191304	6.1158%	0	0.0000%	191304	0.6616%
32534	0	0.0000%	0	0.0000%	67787	2.1671%	0	0.0000%	67787	0.2344%
32535	0	0.0000%	0	0.0000%	10201	0.3261%	0	0.0000%	10201	0.0353%
32536	0	0.0000%	0	0.0000%	11671	0.3731%	0	0.0000%	11671	0.0404%
32539	0	0.0000%	0	0.0000%	7981	0.2552%	0	0.0000%	7981	0.0276%
32541	0	0.0000%	0	0.0000%	37172	1.1883%	0	0.0000%	37172	0.1286%
32547	0	0.0000%	0	0.0000%	38047	1.2163%	0	0.0000%	38047	0.1316%
32548	0	0.0000%	0	0.0000%	31587	1.0098%	0	0.0000%	31587	0.1092%
32550	0	0.0000%	0	0.0000%	27139	0.8676%	0	0.0000%	27139	0.0939%
32561	0	0.0000%	0	0.0000%	143358	4.5830%	0	0.0000%	143358	0.4958%
32563	0	0.0000%	0	0.0000%	124776	3.9890%	0	0.0000%	124776	0.4315%
32564	0	0.0000%	0	0.0000%	1377	0.0440%	0	0.0000%	1377	0.0048%
32565	0	0.0000%	0	0.0000%	12086	0.3864%	0	0.0000%	12086	0.0418%
32566	0	0.0000%	0	0.0000%	107957	3.4513%	0	0.0000%	107957	0.3733%
32567	0	0.0000%	0	0.0000%	719	0.0230%	0	0.0000%	719	0.0025%
32568	0	0.0000%	0	0.0000%	9514	0.3041%	0	0.0000%	9514	0.0329%
32569	0	0.0000%	0	0.0000%	32983	1.0544%	0	0.0000%	32983	0.1141%
32570	0	0.0000%	0	0.0000%	68583	2.1925%	0	0.0000%	68583	0.2372%
32571	0	0.0000%	0	0.0000%	149575	4.7818%	0	0.0000%	149575	0.5173%
32577	0	0.0000%	0	0.0000%	35872	1.1468%	0	0.0000%	35872	0.1241%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
32578	0	0.0000%	0	0.0000%	48882	1.5627%	0	0.0000%	48882	0.1690%
32579	0	0.0000%	0	0.0000%	19171	0.6129%	0	0.0000%	19171	0.0663%
32580	0	0.0000%	0	0.0000%	4466	0.1428%	0	0.0000%	4466	0.0154%
32583	0	0.0000%	0	0.0000%	64418	2.0594%	0	0.0000%	64418	0.2228%
32601	0	0.0000%	0	0.0000%	0	0.0000%	2277	0.0286%	2643	0.0091%
32603	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	505	0.0017%
32605	0	0.0000%	1243	0.0163%	0	0.0000%	7253	0.0911%	8496	0.0294%
32606	0	0.0000%	1040	0.0136%	0	0.0000%	5962	0.0749%	7002	0.0242%
32607	0	0.0000%	954	0.0125%	0	0.0000%	4426	0.0556%	5380	0.0186%
32608	0	0.0000%	1753	0.0230%	0	0.0000%	8018	0.1007%	9771	0.0338%
32609	0	0.0000%	0	0.0000%	0	0.0000%	1959	0.0246%	2277	0.0079%
32615	0	0.0000%	656	0.0086%	0	0.0000%	4035	0.0507%	4691	0.0162%
32617	0	0.0000%	0	0.0000%	0	0.0000%	899	0.0113%	1101	0.0038%
32618	0	0.0000%	0	0.0000%	0	0.0000%	1204	0.0151%	1526	0.0053%
32619	0	0.0000%	0	0.0000%	0	0.0000%	630	0.0079%	843	0.0029%
32621	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	710	0.0025%
32625	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	762	0.0026%
32626	0	0.0000%	507	0.0067%	0	0.0000%	693	0.0087%	1201	0.0042%
32640	0	0.0000%	0	0.0000%	0	0.0000%	1184	0.0149%	1544	0.0053%
32641	0	0.0000%	0	0.0000%	0	0.0000%	1509	0.0190%	1788	0.0062%
32643	0	0.0000%	0	0.0000%	0	0.0000%	2469	0.0310%	2949	0.0102%
32653	0	0.0000%	769	0.0101%	0	0.0000%	4673	0.0587%	5442	0.0188%
32656	0	0.0000%	571	0.0075%	0	0.0000%	1092	0.0137%	1663	0.0058%
32666	0	0.0000%	0	0.0000%	0	0.0000%	653	0.0082%	1002	0.0035%
32667	0	0.0000%	0	0.0000%	0	0.0000%	1273	0.0160%	1548	0.0054%
32668	0	0.0000%	515	0.0068%	0	0.0000%	1192	0.0150%	1707	0.0059%
32669	0	0.0000%	784	0.0103%	0	0.0000%	3405	0.0428%	4189	0.0145%
32680	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	682	0.0024%
32686	0	0.0000%	0	0.0000%	0	0.0000%	1587	0.0199%	1940	0.0067%
32693	0	0.0000%	0	0.0000%	0	0.0000%	1546	0.0194%	2017	0.0070%
32696	0	0.0000%	638	0.0084%	0	0.0000%	1799	0.0226%	2437	0.0084%
32701	10107	0.0997%	4244	0.0557%	0	0.0000%	2750	0.0346%	17100	0.0591%
32702	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	854	0.0030%
32703	16609	0.1638%	9826	0.1289%	0	0.0000%	6751	0.0848%	33186	0.1148%
32707	27505	0.2713%	7408	0.0972%	0	0.0000%	3476	0.0437%	38389	0.1328%
32708	50196	0.4952%	12711	0.1668%	0	0.0000%	6118	0.0769%	69025	0.2387%
32709	1174	0.0116%	544	0.0071%	0	0.0000%	0	0.0000%	2045	0.0071%
32712	24364	0.2403%	13383	0.1756%	0	0.0000%	10787	0.1355%	48533	0.1678%
32713	15092	0.1489%	3309	0.0434%	0	0.0000%	2372	0.0298%	20773	0.0718%
32714	16611	0.1639%	7093	0.0931%	0	0.0000%	4750	0.0597%	28455	0.0984%
32720	12829	0.1266%	2968	0.0389%	0	0.0000%	2270	0.0285%	18066	0.0625%
32724	17607	0.1737%	2648	0.0347%	0	0.0000%	2110	0.0265%	22365	0.0773%
32725	34778	0.3431%	6037	0.0792%	0	0.0000%	3269	0.0411%	44085	0.1525%
32726	2743	0.0271%	4522	0.0593%	0	0.0000%	6321	0.0794%	13586	0.0470%
32730	3585	0.0354%	882	0.0116%	0	0.0000%	0	0.0000%	4887	0.0169%
32732	7846	0.0774%	1289	0.0169%	0	0.0000%	1134	0.0143%	10268	0.0355%
32735	533	0.0053%	867	0.0114%	0	0.0000%	1215	0.0153%	2615	0.0090%
32736	2876	0.0284%	1755	0.0230%	0	0.0000%	1993	0.0250%	6624	0.0229%
32738	33824	0.3337%	5560	0.0730%	0	0.0000%	3126	0.0393%	42510	0.1470%
32744	2387	0.0236%	0	0.0000%	0	0.0000%	0	0.0000%	2886	0.0100%
32746	35732	0.3525%	10106	0.1326%	0	0.0000%	5465	0.0687%	51303	0.1774%
32750	15680	0.1547%	6969	0.0914%	0	0.0000%	4852	0.0610%	27500	0.0951%
32751	20986	0.2070%	10140	0.1330%	0	0.0000%	7343	0.0923%	38469	0.1330%
32754	3446	0.0340%	2794	0.0367%	0	0.0000%	1650	0.0207%	7890	0.0273%
32757	9508	0.0938%	6282	0.0824%	0	0.0000%	6932	0.0871%	22721	0.0786%
32759	824	0.0081%	0	0.0000%	0	0.0000%	0	0.0000%	1547	0.0053%
32763	11752	0.1159%	2040	0.0268%	0	0.0000%	1329	0.0167%	15121	0.0523%
32764	4014	0.0396%	0	0.0000%	0	0.0000%	0	0.0000%	4749	0.0164%
32765	56757	0.5599%	15154	0.1988%	0	0.0000%	7373	0.0926%	79284	0.2742%
32766	19368	0.1911%	5381	0.0706%	0	0.0000%	2916	0.0366%	27664	0.0957%
32767	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	790	0.0027%
32771	29271	0.2888%	9076	0.1191%	0	0.0000%	4817	0.0605%	43165	0.1493%
32773	12809	0.1264%	3620	0.0475%	0	0.0000%	1894	0.0238%	18323	0.0634%
32776	7884	0.0778%	2202	0.0289%	0	0.0000%	1675	0.0210%	11761	0.0407%
32778	3882	0.0383%	5958	0.0782%	0	0.0000%	9328	0.1172%	19168	0.0663%
32779	39156	0.3863%	17222	0.2260%	0	0.0000%	12156	0.1527%	68534	0.2370%
32780	4033	0.0398%	10897	0.1430%	0	0.0000%	7531	0.0946%	22462	0.0777%
32784	978	0.0096%	1645	0.0216%	0	0.0000%	2199	0.0276%	4822	0.0167%
32789	40585	0.4004%	21052	0.2762%	0	0.0000%	14613	0.1836%	76250	0.2637%
32792	30862	0.3045%	11698	0.1535%	0	0.0000%	5775	0.0726%	48335	0.1672%
32796	3736	0.0369%	4878	0.0640%	0	0.0000%	2924	0.0367%	11538	0.0399%
32798	1558	0.0154%	1335	0.0175%	0	0.0000%	1408	0.0177%	4300	0.0149%
32801	8041	0.0793%	5295	0.0695%	0	0.0000%	3043	0.0382%	16379	0.0566%
32803	15635	0.1542%	7978	0.1047%	0	0.0000%	5347	0.0672%	28961	0.1002%
32804	15873	0.1566%	10304	0.1352%	0	0.0000%	6486	0.0815%	32663	0.1130%
32805	7445	0.0734%	4219	0.0554%	0	0.0000%	2431	0.0305%	14095	0.0487%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
32806	23876	0.2355%	13483	0.1769%	0	0.0000%	7676	0.0964%	45035	0.1557%
32807	15422	0.1521%	6971	0.0915%	0	0.0000%	3042	0.0382%	25436	0.0880%
32808	14006	0.1382%	6632	0.0870%	0	0.0000%	4584	0.0576%	25223	0.0872%
32809	10624	0.1048%	9280	0.1218%	0	0.0000%	4770	0.0599%	24673	0.0853%
32810	14267	0.1407%	6956	0.0913%	0	0.0000%	4587	0.0576%	25810	0.0893%
32811	8596	0.0848%	5129	0.0673%	0	0.0000%	3027	0.0380%	16751	0.0579%
32812	30056	0.2965%	13357	0.1753%	0	0.0000%	6016	0.0756%	49429	0.1709%
32814	7647	0.0754%	3055	0.0401%	0	0.0000%	1534	0.0193%	12236	0.0423%
32816	1271	0.0125%	0	0.0000%	0	0.0000%	0	0.0000%	1752	0.0061%
32817	24997	0.2466%	6746	0.0885%	0	0.0000%	3502	0.0440%	35245	0.1219%
32818	16580	0.1636%	10635	0.1395%	0	0.0000%	7366	0.0926%	34581	0.1196%
32819	28665	0.2828%	20024	0.2627%	0	0.0000%	12943	0.1626%	61631	0.2131%
32820	6975	0.0688%	2259	0.0296%	0	0.0000%	1209	0.0152%	10444	0.0361%
32821	7362	0.0726%	6782	0.0890%	0	0.0000%	5271	0.0662%	19414	0.0671%
32822	24858	0.2452%	10915	0.1432%	0	0.0000%	4660	0.0586%	40434	0.1398%
32824	21719	0.2143%	18687	0.2452%	0	0.0000%	9058	0.1138%	49464	0.1711%
32825	42837	0.4226%	16103	0.2113%	0	0.0000%	7355	0.0924%	66296	0.2293%
32826	13882	0.1369%	4619	0.0606%	0	0.0000%	2434	0.0306%	20935	0.0724%
32827	11236	0.1108%	6391	0.0839%	0	0.0000%	3079	0.0387%	20706	0.0716%
32828	46817	0.4618%	21964	0.2882%	0	0.0000%	9963	0.1252%	78745	0.2723%
32829	13660	0.1348%	5710	0.0749%	0	0.0000%	2586	0.0325%	21956	0.0759%
32832	22626	0.2232%	9661	0.1268%	0	0.0000%	3992	0.0502%	36279	0.1255%
32833	7189	0.0709%	3410	0.0447%	0	0.0000%	1729	0.0217%	12328	0.0426%
32835	21719	0.2143%	18407	0.2415%	0	0.0000%	10113	0.1271%	50239	0.1737%
32836	23395	0.2308%	24732	0.3245%	0	0.0000%	16007	0.2011%	64134	0.2218%
32837	29442	0.2904%	25184	0.3304%	0	0.0000%	13028	0.1637%	67654	0.2340%
32839	10135	0.1000%	7288	0.0956%	0	0.0000%	3631	0.0456%	21054	0.0728%
32901	552	0.0054%	20274	0.2660%	0	0.0000%	13781	0.1732%	34607	0.1197%
32903	811	0.0080%	31429	0.4124%	0	0.0000%	20272	0.2547%	52512	0.1816%
32904	1206	0.0119%	27811	0.3649%	0	0.0000%	19289	0.2424%	48307	0.1671%
32905	603	0.0060%	26411	0.3465%	0	0.0000%	19581	0.2460%	46595	0.1611%
32906	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	505	0.0017%
32907	1774	0.0175%	47667	0.6254%	0	0.0000%	33772	0.4244%	83213	0.2878%
32908	0	0.0000%	11761	0.1543%	0	0.0000%	11027	0.1386%	23151	0.0801%
32909	1007	0.0099%	33515	0.4397%	0	0.0000%	27223	0.3421%	61745	0.2135%
32920	621	0.0061%	7616	0.0999%	0	0.0000%	4354	0.0547%	12591	0.0435%
32922	541	0.0053%	3786	0.0497%	0	0.0000%	2336	0.0294%	6663	0.0230%
32926	2197	0.0217%	9365	0.1229%	0	0.0000%	5449	0.0685%	17012	0.0588%
32927	2590	0.0255%	11035	0.1448%	0	0.0000%	6380	0.0802%	20004	0.0692%
32931	1598	0.0158%	21608	0.2835%	0	0.0000%	12424	0.1561%	35630	0.1232%
32934	1222	0.0121%	21312	0.2796%	0	0.0000%	13853	0.1741%	36386	0.1258%
32935	1280	0.0126%	34441	0.4519%	0	0.0000%	22437	0.2819%	58159	0.2011%
32937	1565	0.0154%	40891	0.5365%	0	0.0000%	25074	0.3151%	67530	0.2335%
32940	2635	0.0260%	39895	0.5234%	0	0.0000%	25913	0.3256%	68443	0.2367%
32948	0	0.0000%	4786	0.0628%	0	0.0000%	6531	0.0821%	11400	0.0394%
32949	0	0.0000%	6422	0.0843%	0	0.0000%	4707	0.0591%	11224	0.0388%
32950	0	0.0000%	10058	0.1320%	0	0.0000%	7228	0.0908%	17495	0.0605%
32951	591	0.0058%	45811	0.6011%	0	0.0000%	28734	0.3610%	75136	0.2598%
32952	2446	0.0241%	18893	0.2479%	0	0.0000%	11708	0.1471%	33046	0.1143%
32953	2000	0.0197%	12065	0.1583%	0	0.0000%	7366	0.0926%	21431	0.0741%
32955	2589	0.0255%	25500	0.3346%	0	0.0000%	16028	0.2014%	44118	0.1526%
32958	779	0.0077%	110002	1.4433%	0	0.0000%	97762	1.2284%	208543	0.7212%
32960	0	0.0000%	62579	0.8211%	0	0.0000%	105205	1.3219%	167784	0.5802%
32962	0	0.0000%	76051	0.9978%	0	0.0000%	105985	1.3317%	182037	0.6295%
32963	0	0.0000%	364080	4.7769%	0	0.0000%	466721	5.8645%	830801	2.8732%
32966	0	0.0000%	61113	0.8018%	0	0.0000%	75949	0.9543%	137460	0.4754%
32967	0	0.0000%	67922	0.8912%	0	0.0000%	76730	0.9641%	145149	0.5020%
32968	0	0.0000%	40724	0.5343%	0	0.0000%	77854	0.9783%	118968	0.4114%
32976	0	0.0000%	63522	0.8334%	0	0.0000%	45865	0.5763%	109792	0.3797%
33004	0	0.0000%	1285	0.0169%	0	0.0000%	0	0.0000%	1599	0.0055%
33009	0	0.0000%	2508	0.0329%	0	0.0000%	687	0.0086%	3195	0.0111%
33010	0	0.0000%	835	0.0110%	0	0.0000%	0	0.0000%	1108	0.0038%
33012	0	0.0000%	1923	0.0252%	0	0.0000%	543	0.0068%	2466	0.0085%
33013	0	0.0000%	937	0.0123%	0	0.0000%	0	0.0000%	1266	0.0044%
33014	0	0.0000%	2217	0.0291%	0	0.0000%	613	0.0077%	2830	0.0098%
33015	0	0.0000%	3618	0.0475%	0	0.0000%	1047	0.0132%	4665	0.0161%
33016	0	0.0000%	1596	0.0209%	0	0.0000%	0	0.0000%	2083	0.0072%
33018	0	0.0000%	2050	0.0269%	0	0.0000%	631	0.0079%	2682	0.0093%
33019	0	0.0000%	1666	0.0219%	0	0.0000%	587	0.0074%	2253	0.0078%
33020	0	0.0000%	2608	0.0342%	0	0.0000%	701	0.0088%	3309	0.0114%
33021	0	0.0000%	5704	0.0748%	0	0.0000%	1636	0.0206%	7340	0.0254%
33023	0	0.0000%	6112	0.0802%	0	0.0000%	1357	0.0170%	7468	0.0258%
33024	0	0.0000%	7730	0.1014%	0	0.0000%	1996	0.0251%	9726	0.0336%
33025	0	0.0000%	3810	0.0500%	0	0.0000%	1143	0.0144%	4954	0.0171%
33026	0	0.0000%	4362	0.0572%	0	0.0000%	1428	0.0179%	5790	0.0200%
33027	0	0.0000%	5317	0.0698%	0	0.0000%	1774	0.0223%	7091	0.0245%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
33028	0	0.0000%	2127	0.0279%	0	0.0000%	825	0.0104%	2953	0.0102%
33029	0	0.0000%	6099	0.0800%	0	0.0000%	2194	0.0276%	8293	0.0287%
33030	0	0.0000%	563	0.0074%	0	0.0000%	0	0.0000%	789	0.0027%
33031	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	660	0.0023%
33032	0	0.0000%	776	0.0102%	0	0.0000%	0	0.0000%	1058	0.0037%
33033	0	0.0000%	823	0.0108%	0	0.0000%	0	0.0000%	1108	0.0038%
33036	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	648	0.0022%
33037	0	0.0000%	1415	0.0186%	0	0.0000%	0	0.0000%	1415	0.0049%
33040	901	0.0089%	0	0.0000%	1854	0.0593%	0	0.0000%	2756	0.0095%
33042	0	0.0000%	0	0.0000%	573	0.0183%	0	0.0000%	826	0.0029%
33050	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	721	0.0025%
33054	0	0.0000%	971	0.0127%	0	0.0000%	0	0.0000%	1196	0.0041%
33055	0	0.0000%	2120	0.0278%	0	0.0000%	653	0.0082%	2774	0.0096%
33056	0	0.0000%	1760	0.0231%	0	0.0000%	558	0.0070%	2318	0.0080%
33060	0	0.0000%	5454	0.0716%	0	0.0000%	1398	0.0176%	6852	0.0237%
33062	0	0.0000%	7541	0.0989%	0	0.0000%	2002	0.0252%	9544	0.0330%
33063	0	0.0000%	12742	0.1672%	0	0.0000%	3546	0.0446%	16288	0.0563%
33064	0	0.0000%	13400	0.1758%	0	0.0000%	3242	0.0407%	16642	0.0576%
33065	0	0.0000%	14915	0.1957%	0	0.0000%	4181	0.0525%	19096	0.0660%
33066	0	0.0000%	6294	0.0826%	0	0.0000%	1465	0.0184%	7759	0.0268%
33067	0	0.0000%	14274	0.1873%	0	0.0000%	4487	0.0564%	18761	0.0649%
33068	0	0.0000%	8123	0.1066%	0	0.0000%	2072	0.0260%	10195	0.0353%
33069	0	0.0000%	3985	0.0523%	0	0.0000%	1119	0.0141%	5104	0.0177%
33070	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	579	0.0020%
33071	0	0.0000%	18643	0.2446%	0	0.0000%	5287	0.0664%	23930	0.0828%
33073	0	0.0000%	7107	0.0932%	0	0.0000%	1893	0.0238%	9000	0.0311%
33076	0	0.0000%	12489	0.1639%	0	0.0000%	4187	0.0526%	16676	0.0577%
33109	0	0.0000%	570	0.0075%	0	0.0000%	0	0.0000%	757	0.0026%
33125	0	0.0000%	817	0.0107%	0	0.0000%	0	0.0000%	1092	0.0038%
33126	0	0.0000%	800	0.0105%	0	0.0000%	0	0.0000%	1016	0.0035%
33127	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	637	0.0022%
33129	0	0.0000%	729	0.0096%	0	0.0000%	0	0.0000%	992	0.0034%
33133	0	0.0000%	2658	0.0349%	0	0.0000%	1007	0.0127%	3665	0.0127%
33134	0	0.0000%	2299	0.0302%	0	0.0000%	906	0.0114%	3205	0.0111%
33135	0	0.0000%	537	0.0070%	0	0.0000%	0	0.0000%	713	0.0025%
33137	0	0.0000%	505	0.0066%	0	0.0000%	0	0.0000%	692	0.0024%
33138	0	0.0000%	1332	0.0175%	0	0.0000%	0	0.0000%	1754	0.0061%
33139	0	0.0000%	2386	0.0313%	0	0.0000%	762	0.0096%	3148	0.0109%
33140	0	0.0000%	2988	0.0392%	0	0.0000%	977	0.0123%	3965	0.0137%
33141	0	0.0000%	2185	0.0287%	0	0.0000%	559	0.0070%	2744	0.0095%
33142	0	0.0000%	863	0.0113%	0	0.0000%	0	0.0000%	1150	0.0040%
33143	0	0.0000%	2766	0.0363%	0	0.0000%	1139	0.0143%	3905	0.0135%
33144	0	0.0000%	826	0.0108%	0	0.0000%	0	0.0000%	1099	0.0038%
33145	0	0.0000%	1012	0.0133%	0	0.0000%	0	0.0000%	1379	0.0048%
33146	0	0.0000%	1373	0.0180%	0	0.0000%	520	0.0065%	1893	0.0065%
33147	0	0.0000%	968	0.0127%	0	0.0000%	0	0.0000%	1305	0.0045%
33149	0	0.0000%	1530	0.0201%	0	0.0000%	511	0.0064%	2041	0.0071%
33150	0	0.0000%	553	0.0073%	0	0.0000%	0	0.0000%	747	0.0026%
33154	0	0.0000%	2065	0.0271%	0	0.0000%	626	0.0079%	2692	0.0093%
33155	0	0.0000%	1938	0.0254%	0	0.0000%	755	0.0095%	2692	0.0093%
33156	0	0.0000%	4222	0.0554%	0	0.0000%	1807	0.0227%	6029	0.0208%
33157	0	0.0000%	2821	0.0370%	0	0.0000%	994	0.0125%	3815	0.0132%
33158	0	0.0000%	668	0.0088%	0	0.0000%	0	0.0000%	937	0.0032%
33160	0	0.0000%	2231	0.0293%	0	0.0000%	798	0.0100%	3029	0.0105%
33161	0	0.0000%	1861	0.0244%	0	0.0000%	546	0.0069%	2407	0.0083%
33162	0	0.0000%	1960	0.0257%	0	0.0000%	581	0.0073%	2540	0.0088%
33165	0	0.0000%	2338	0.0307%	0	0.0000%	895	0.0112%	3233	0.0112%
33166	0	0.0000%	832	0.0109%	0	0.0000%	0	0.0000%	1124	0.0039%
33167	0	0.0000%	690	0.0091%	0	0.0000%	0	0.0000%	902	0.0031%
33168	0	0.0000%	1029	0.0135%	0	0.0000%	0	0.0000%	1346	0.0047%
33169	0	0.0000%	1794	0.0235%	0	0.0000%	580	0.0073%	2374	0.0082%
33172	0	0.0000%	841	0.0110%	0	0.0000%	0	0.0000%	996	0.0034%
33173	0	0.0000%	1619	0.0212%	0	0.0000%	569	0.0072%	2188	0.0076%
33174	0	0.0000%	761	0.0100%	0	0.0000%	0	0.0000%	1028	0.0036%
33175	0	0.0000%	2333	0.0306%	0	0.0000%	967	0.0122%	3301	0.0114%
33176	0	0.0000%	3196	0.0419%	0	0.0000%	1283	0.0161%	4479	0.0155%
33177	0	0.0000%	1708	0.0224%	0	0.0000%	714	0.0090%	2421	0.0084%
33178	0	0.0000%	1934	0.0254%	0	0.0000%	602	0.0076%	2537	0.0088%
33179	0	0.0000%	2887	0.0379%	0	0.0000%	783	0.0098%	3669	0.0127%
33180	0	0.0000%	2158	0.0283%	0	0.0000%	673	0.0085%	2832	0.0098%
33181	0	0.0000%	864	0.0113%	0	0.0000%	0	0.0000%	1135	0.0039%
33182	0	0.0000%	728	0.0095%	0	0.0000%	0	0.0000%	991	0.0034%
33183	0	0.0000%	1304	0.0171%	0	0.0000%	0	0.0000%	1800	0.0062%
33184	0	0.0000%	822	0.0108%	0	0.0000%	0	0.0000%	1131	0.0039%
33185	0	0.0000%	1114	0.0146%	0	0.0000%	0	0.0000%	1572	0.0054%
33186	0	0.0000%	3183	0.0418%	0	0.0000%	1246	0.0157%	4429	0.0153%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
33187	0	0.0000%	805	0.0106%	0	0.0000%	0	0.0000%	1160	0.0040%
33189	0	0.0000%	716	0.0094%	0	0.0000%	0	0.0000%	982	0.0034%
33193	0	0.0000%	1633	0.0214%	0	0.0000%	542	0.0068%	2175	0.0075%
33196	0	0.0000%	1846	0.0242%	0	0.0000%	716	0.0090%	2562	0.0089%
33301	0	0.0000%	2783	0.0365%	0	0.0000%	922	0.0116%	3705	0.0128%
33304	0	0.0000%	2319	0.0304%	0	0.0000%	618	0.0078%	2938	0.0102%
33305	0	0.0000%	2457	0.0322%	0	0.0000%	620	0.0078%	3077	0.0106%
33306	0	0.0000%	887	0.0116%	0	0.0000%	0	0.0000%	1108	0.0038%
33308	0	0.0000%	7291	0.0957%	0	0.0000%	1717	0.0216%	9008	0.0312%
33309	0	0.0000%	6390	0.0838%	0	0.0000%	1516	0.0191%	7906	0.0273%
33311	0	0.0000%	5495	0.0721%	0	0.0000%	1364	0.0171%	6858	0.0237%
33312	0	0.0000%	6252	0.0820%	0	0.0000%	1813	0.0228%	8065	0.0279%
33313	0	0.0000%	6605	0.0867%	0	0.0000%	1699	0.0214%	8305	0.0287%
33314	0	0.0000%	1956	0.0257%	0	0.0000%	596	0.0075%	2552	0.0088%
33315	0	0.0000%	1763	0.0231%	0	0.0000%	0	0.0000%	2253	0.0078%
33316	0	0.0000%	2532	0.0332%	0	0.0000%	800	0.0100%	3332	0.0115%
33317	0	0.0000%	8751	0.1148%	0	0.0000%	2474	0.0311%	11225	0.0388%
33319	0	0.0000%	10610	0.1392%	0	0.0000%	2669	0.0335%	13279	0.0459%
33321	0	0.0000%	14351	0.1883%	0	0.0000%	3814	0.0479%	18165	0.0628%
33322	0	0.0000%	10210	0.1340%	0	0.0000%	2806	0.0353%	13016	0.0450%
33323	0	0.0000%	5411	0.0710%	0	0.0000%	1571	0.0197%	6982	0.0241%
33324	0	0.0000%	8639	0.1133%	0	0.0000%	2586	0.0325%	11224	0.0388%
33325	0	0.0000%	5034	0.0660%	0	0.0000%	1709	0.0215%	6742	0.0233%
33326	0	0.0000%	6808	0.0893%	0	0.0000%	2152	0.0270%	8960	0.0310%
33327	0	0.0000%	3912	0.0513%	0	0.0000%	1443	0.0181%	5355	0.0185%
33328	0	0.0000%	5604	0.0735%	0	0.0000%	1737	0.0218%	7341	0.0254%
33330	0	0.0000%	3692	0.0484%	0	0.0000%	1302	0.0164%	4994	0.0173%
33331	0	0.0000%	5627	0.0738%	0	0.0000%	1968	0.0247%	7595	0.0263%
33332	0	0.0000%	2585	0.0339%	0	0.0000%	921	0.0116%	3506	0.0121%
33334	0	0.0000%	4771	0.0626%	0	0.0000%	1156	0.0145%	5928	0.0205%
33351	0	0.0000%	7446	0.0977%	0	0.0000%	1808	0.0227%	9254	0.0320%
33401	0	0.0000%	23840	0.3128%	0	0.0000%	16368	0.2057%	40207	0.1390%
33403	0	0.0000%	8797	0.1154%	0	0.0000%	10871	0.1366%	19669	0.0680%
33404	0	0.0000%	23205	0.3045%	0	0.0000%	25701	0.3229%	48906	0.1691%
33405	0	0.0000%	21697	0.2847%	0	0.0000%	12349	0.1552%	34046	0.1177%
33406	0	0.0000%	21438	0.2813%	0	0.0000%	12492	0.1570%	33930	0.1173%
33407	0	0.0000%	25457	0.3340%	0	0.0000%	24286	0.3052%	49743	0.1720%
33408	0	0.0000%	49303	0.6469%	0	0.0000%	54305	0.6824%	103608	0.3583%
33409	0	0.0000%	24190	0.3174%	0	0.0000%	18474	0.2321%	42664	0.1475%
33410	0	0.0000%	66932	0.8782%	0	0.0000%	78548	0.9870%	145479	0.5031%
33411	0	0.0000%	97344	1.2772%	0	0.0000%	69816	0.8773%	167160	0.5781%
33412	0	0.0000%	48566	0.6372%	0	0.0000%	46345	0.5823%	94911	0.3282%
33413	0	0.0000%	15060	0.1976%	0	0.0000%	9432	0.1185%	24492	0.0847%
33414	0	0.0000%	120824	1.5853%	0	0.0000%	69550	0.8739%	190374	0.6584%
33415	0	0.0000%	32438	0.4256%	0	0.0000%	18779	0.2360%	51217	0.1771%
33417	0	0.0000%	34867	0.4575%	0	0.0000%	25744	0.3235%	60612	0.2096%
33418	0	0.0000%	141513	1.8567%	0	0.0000%	158912	1.9968%	300424	1.0390%
33426	0	0.0000%	18015	0.2364%	0	0.0000%	6915	0.0869%	24930	0.0862%
33428	0	0.0000%	25425	0.3336%	0	0.0000%	8037	0.1010%	33462	0.1157%
33430	0	0.0000%	6907	0.0906%	0	0.0000%	3796	0.0477%	10782	0.0373%
33431	0	0.0000%	13162	0.1727%	0	0.0000%	3828	0.0481%	16991	0.0588%
33432	0	0.0000%	13677	0.1795%	0	0.0000%	3745	0.0471%	17422	0.0602%
33433	0	0.0000%	30550	0.4008%	0	0.0000%	9397	0.1181%	39948	0.1382%
33434	0	0.0000%	25107	0.3294%	0	0.0000%	7880	0.0990%	32987	0.1141%
33435	0	0.0000%	28434	0.3731%	0	0.0000%	10563	0.1327%	38997	0.1349%
33436	0	0.0000%	58181	0.7634%	0	0.0000%	21871	0.2748%	80052	0.2768%
33437	0	0.0000%	70596	0.9263%	0	0.0000%	27715	0.3482%	98312	0.3400%
33438	0	0.0000%	1324	0.0174%	0	0.0000%	1626	0.0204%	2956	0.0102%
33440	0	0.0000%	10829	0.1421%	0	0.0000%	5054	0.0635%	16265	0.0562%
33441	0	0.0000%	6998	0.0918%	0	0.0000%	1813	0.0228%	8811	0.0305%
33442	0	0.0000%	11899	0.1561%	0	0.0000%	3236	0.0407%	15135	0.0523%
33444	0	0.0000%	12598	0.1653%	0	0.0000%	3889	0.0489%	16487	0.0570%
33445	0	0.0000%	30998	0.4067%	0	0.0000%	10219	0.1284%	41218	0.1425%
33446	0	0.0000%	40195	0.5274%	0	0.0000%	13814	0.1736%	54009	0.1868%
33449	0	0.0000%	18900	0.2480%	0	0.0000%	9208	0.1157%	28108	0.0972%
33455	0	0.0000%	73283	0.9615%	0	0.0000%	74597	0.9373%	147879	0.5114%
33458	0	0.0000%	90990	1.1938%	0	0.0000%	146774	1.8442%	237763	0.8223%
33460	0	0.0000%	20191	0.2649%	0	0.0000%	9743	0.1224%	29933	0.1035%
33461	0	0.0000%	25792	0.3384%	0	0.0000%	13170	0.1655%	38963	0.1347%
33462	0	0.0000%	35788	0.4696%	0	0.0000%	14679	0.1844%	50467	0.1745%
33463	0	0.0000%	54339	0.7129%	0	0.0000%	23421	0.2943%	77760	0.2689%
33467	0	0.0000%	93709	1.2295%	0	0.0000%	43153	0.5422%	136862	0.4733%
33468	0	0.0000%	0	0.0000%	0	0.0000%	598	0.0075%	1089	0.0038%
33469	0	0.0000%	47624	0.6248%	0	0.0000%	64164	0.8062%	111787	0.3866%
33470	0	0.0000%	48303	0.6338%	0	0.0000%	57596	0.7237%	105900	0.3662%
33471	0	0.0000%	4430	0.0581%	0	0.0000%	5852	0.0735%	10507	0.0363%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
33472	0	0.0000%	26342	0.3456%	0	0.0000%	11072	0.1391%	37414	0.1294%
33473	0	0.0000%	5264	0.0691%	0	0.0000%	2084	0.0262%	7348	0.0254%
33476	0	0.0000%	4443	0.0583%	0	0.0000%	3353	0.0421%	7828	0.0271%
33477	0	0.0000%	72660	0.9533%	0	0.0000%	79700	1.0015%	152361	0.5269%
33478	0	0.0000%	36577	0.4799%	0	0.0000%	46598	0.5855%	83175	0.2876%
33480	0	0.0000%	110502	1.4498%	0	0.0000%	61803	0.7766%	172304	0.5959%
33483	0	0.0000%	20791	0.2728%	0	0.0000%	6599	0.0829%	27390	0.0947%
33484	0	0.0000%	31493	0.4132%	0	0.0000%	10460	0.1314%	41953	0.1451%
33486	0	0.0000%	14393	0.1888%	0	0.0000%	4369	0.0549%	18762	0.0649%
33487	0	0.0000%	20187	0.2649%	0	0.0000%	6039	0.0759%	26226	0.0907%
33493	0	0.0000%	1234	0.0162%	0	0.0000%	682	0.0086%	1931	0.0067%
33496	0	0.0000%	41913	0.5499%	0	0.0000%	14087	0.1770%	56000	0.1937%
33498	0	0.0000%	22145	0.2905%	0	0.0000%	7181	0.0902%	29326	0.1014%
33510	0	0.0000%	8077	0.1060%	0	0.0000%	16193	0.2035%	24270	0.0839%
33511	0	0.0000%	12338	0.1619%	0	0.0000%	26234	0.3296%	38572	0.1334%
33513	0	0.0000%	2141	0.0281%	0	0.0000%	4678	0.0588%	6820	0.0236%
33514	0	0.0000%	0	0.0000%	0	0.0000%	977	0.0123%	1418	0.0049%
33523	0	0.0000%	4396	0.0577%	0	0.0000%	6363	0.0799%	10759	0.0372%
33525	0	0.0000%	7840	0.1029%	0	0.0000%	11721	0.1473%	19562	0.0677%
33527	0	0.0000%	4789	0.0628%	0	0.0000%	11472	0.1441%	16261	0.0562%
33534	0	0.0000%	2570	0.0337%	0	0.0000%	4675	0.0587%	7244	0.0251%
33538	0	0.0000%	723	0.0095%	0	0.0000%	2655	0.0334%	3378	0.0117%
33540	0	0.0000%	4111	0.0539%	0	0.0000%	5801	0.0729%	9912	0.0343%
33541	0	0.0000%	9750	0.1279%	0	0.0000%	14950	0.1878%	24700	0.0854%
33542	0	0.0000%	10121	0.1328%	0	0.0000%	15041	0.1890%	25162	0.0870%
33543	0	0.0000%	12137	0.1592%	0	0.0000%	20201	0.2538%	32337	0.1118%
33544	0	0.0000%	5616	0.0737%	0	0.0000%	11118	0.1397%	16734	0.0579%
33545	0	0.0000%	4492	0.0589%	0	0.0000%	7153	0.0899%	11644	0.0403%
33547	977	0.0096%	7879	0.1034%	0	0.0000%	22633	0.2844%	31489	0.1089%
33548	0	0.0000%	2887	0.0379%	0	0.0000%	5113	0.0642%	8000	0.0277%
33549	0	0.0000%	5816	0.0763%	0	0.0000%	10478	0.1317%	16294	0.0563%
33556	0	0.0000%	11243	0.1475%	0	0.0000%	15303	0.1923%	26546	0.0918%
33558	0	0.0000%	6281	0.0824%	0	0.0000%	9314	0.1170%	15595	0.0539%
33559	0	0.0000%	3312	0.0435%	0	0.0000%	6454	0.0811%	9766	0.0338%
33563	673	0.0066%	5849	0.0767%	0	0.0000%	15647	0.1966%	22169	0.0767%
33565	0	0.0000%	7354	0.0965%	0	0.0000%	12510	0.1572%	19863	0.0687%
33566	847	0.0084%	7017	0.0921%	0	0.0000%	18820	0.2365%	26684	0.0923%
33567	625	0.0062%	2924	0.0384%	0	0.0000%	8191	0.1029%	11739	0.0406%
33569	0	0.0000%	10278	0.1348%	0	0.0000%	21249	0.2670%	31526	0.1090%
33570	0	0.0000%	3875	0.0508%	0	0.0000%	8583	0.1079%	12458	0.0431%
33572	0	0.0000%	9492	0.1245%	0	0.0000%	19076	0.2397%	28568	0.0988%
33573	635	0.0063%	8101	0.1063%	0	0.0000%	17063	0.2144%	25798	0.0892%
33576	0	0.0000%	2470	0.0324%	0	0.0000%	3329	0.0418%	5799	0.0201%
33578	0	0.0000%	8062	0.1058%	0	0.0000%	15613	0.1962%	23675	0.0819%
33579	0	0.0000%	6043	0.0793%	0	0.0000%	13062	0.1641%	19562	0.0677%
33584	0	0.0000%	8473	0.1112%	0	0.0000%	15164	0.1905%	23637	0.0817%
33585	0	0.0000%	0	0.0000%	0	0.0000%	721	0.0091%	837	0.0029%
33592	0	0.0000%	2471	0.0324%	0	0.0000%	3082	0.0387%	5553	0.0192%
33594	0	0.0000%	15281	0.2005%	0	0.0000%	34209	0.4298%	49491	0.1712%
33596	0	0.0000%	12498	0.1640%	0	0.0000%	31668	0.3979%	44166	0.1527%
33597	0	0.0000%	2342	0.0307%	0	0.0000%	4002	0.0503%	6344	0.0219%
33598	0	0.0000%	1946	0.0255%	0	0.0000%	5214	0.0655%	7386	0.0255%
33602	0	0.0000%	4315	0.0566%	0	0.0000%	6666	0.0838%	10980	0.0380%
33603	0	0.0000%	3645	0.0478%	0	0.0000%	7341	0.0922%	10986	0.0380%
33604	0	0.0000%	5580	0.0732%	0	0.0000%	10664	0.1340%	16244	0.0562%
33605	0	0.0000%	2312	0.0303%	0	0.0000%	3851	0.0484%	6163	0.0213%
33606	0	0.0000%	9357	0.1228%	0	0.0000%	13748	0.1728%	23105	0.0799%
33607	0	0.0000%	3103	0.0407%	0	0.0000%	5186	0.0652%	8289	0.0287%
33609	0	0.0000%	8749	0.1148%	0	0.0000%	13100	0.1646%	21849	0.0756%
33610	0	0.0000%	3974	0.0521%	0	0.0000%	8367	0.1051%	12342	0.0427%
33611	0	0.0000%	9102	0.1194%	0	0.0000%	20576	0.2585%	29678	0.1026%
33612	0	0.0000%	4783	0.0627%	0	0.0000%	9565	0.1202%	14348	0.0496%
33613	0	0.0000%	5420	0.0711%	0	0.0000%	10947	0.1376%	16367	0.0566%
33614	0	0.0000%	5271	0.0692%	0	0.0000%	8737	0.1098%	14008	0.0484%
33615	0	0.0000%	10807	0.1418%	0	0.0000%	10168	0.1278%	20975	0.0725%
33616	0	0.0000%	3833	0.0503%	0	0.0000%	6369	0.0800%	10202	0.0353%
33617	0	0.0000%	7625	0.1000%	0	0.0000%	12190	0.1532%	19815	0.0685%
33618	0	0.0000%	8802	0.1155%	0	0.0000%	13104	0.1647%	21906	0.0758%
33619	0	0.0000%	3793	0.0498%	0	0.0000%	7395	0.0929%	11188	0.0387%
33624	0	0.0000%	11546	0.1515%	0	0.0000%	17242	0.2167%	28788	0.0996%
33625	0	0.0000%	4973	0.0652%	0	0.0000%	8604	0.1081%	13577	0.0470%
33626	0	0.0000%	9851	0.1293%	0	0.0000%	9861	0.1239%	19712	0.0682%
33629	0	0.0000%	15545	0.2040%	0	0.0000%	33235	0.4176%	48780	0.1687%
33634	0	0.0000%	4796	0.0629%	0	0.0000%	4897	0.0615%	9693	0.0335%
33635	0	0.0000%	3976	0.0522%	0	0.0000%	3286	0.0413%	7261	0.0251%
33637	0	0.0000%	2270	0.0298%	0	0.0000%	4191	0.0527%	6461	0.0223%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
33647	0	0.0000%	14274	0.1873%	0	0.0000%	35050	0.4404%	49324	0.1706%
33701	0	0.0000%	1540	0.0202%	0	0.0000%	1693	0.0213%	3233	0.0112%
33702	0	0.0000%	2947	0.0387%	0	0.0000%	4687	0.0589%	7634	0.0264%
33703	0	0.0000%	3256	0.0427%	0	0.0000%	5290	0.0665%	8546	0.0296%
33704	0	0.0000%	3135	0.0411%	509	0.0163%	3845	0.0483%	7489	0.0259%
33705	0	0.0000%	2592	0.0340%	0	0.0000%	2806	0.0353%	5398	0.0187%
33706	0	0.0000%	5260	0.0690%	0	0.0000%	4510	0.0567%	10258	0.0355%
33707	0	0.0000%	4645	0.0609%	0	0.0000%	3798	0.0477%	8443	0.0292%
33708	0	0.0000%	5282	0.0693%	0	0.0000%	2498	0.0314%	7780	0.0269%
33709	0	0.0000%	3142	0.0412%	0	0.0000%	1932	0.0243%	5074	0.0175%
33710	0	0.0000%	5493	0.0721%	0	0.0000%	3939	0.0495%	9432	0.0326%
33711	0	0.0000%	1991	0.0261%	0	0.0000%	1735	0.0218%	3726	0.0129%
33712	0	0.0000%	1908	0.0250%	0	0.0000%	2074	0.0261%	3981	0.0138%
33713	0	0.0000%	3209	0.0421%	0	0.0000%	2741	0.0344%	5950	0.0206%
33714	0	0.0000%	1300	0.0171%	0	0.0000%	1187	0.0149%	2487	0.0086%
33715	0	0.0000%	2804	0.0368%	0	0.0000%	3089	0.0388%	6210	0.0215%
33716	0	0.0000%	807	0.0106%	0	0.0000%	1006	0.0126%	1812	0.0063%
33755	0	0.0000%	4566	0.0599%	0	0.0000%	3149	0.0396%	7715	0.0267%
33756	0	0.0000%	7434	0.0975%	0	0.0000%	4271	0.0537%	11706	0.0405%
33759	0	0.0000%	2204	0.0289%	0	0.0000%	2228	0.0280%	4432	0.0153%
33760	0	0.0000%	1225	0.0161%	0	0.0000%	1201	0.0151%	2426	0.0084%
33761	0	0.0000%	4282	0.0562%	0	0.0000%	4264	0.0536%	8546	0.0296%
33762	0	0.0000%	1788	0.0235%	0	0.0000%	1725	0.0217%	3513	0.0121%
33763	0	0.0000%	2455	0.0322%	0	0.0000%	2110	0.0265%	4565	0.0158%
33764	0	0.0000%	4928	0.0647%	0	0.0000%	3401	0.0427%	8329	0.0288%
33765	0	0.0000%	1473	0.0193%	0	0.0000%	1375	0.0173%	2849	0.0099%
33767	0	0.0000%	4735	0.0621%	0	0.0000%	2192	0.0275%	6928	0.0240%
33770	0	0.0000%	4878	0.0640%	0	0.0000%	3145	0.0395%	8023	0.0277%
33771	0	0.0000%	2891	0.0379%	0	0.0000%	2226	0.0280%	5117	0.0177%
33772	0	0.0000%	5041	0.0661%	0	0.0000%	2445	0.0307%	7486	0.0259%
33773	0	0.0000%	2407	0.0316%	0	0.0000%	1652	0.0208%	4059	0.0140%
33774	0	0.0000%	4847	0.0636%	0	0.0000%	2486	0.0312%	7333	0.0254%
33776	0	0.0000%	4710	0.0618%	0	0.0000%	2125	0.0267%	6835	0.0236%
33777	0	0.0000%	3466	0.0455%	0	0.0000%	2077	0.0261%	5543	0.0192%
33778	0	0.0000%	2484	0.0326%	0	0.0000%	1489	0.0187%	3973	0.0137%
33781	0	0.0000%	2306	0.0303%	0	0.0000%	1692	0.0213%	3998	0.0138%
33782	0	0.0000%	2630	0.0345%	0	0.0000%	2113	0.0265%	4743	0.0164%
33785	0	0.0000%	3627	0.0476%	0	0.0000%	1641	0.0206%	5268	0.0182%
33786	0	0.0000%	1901	0.0249%	0	0.0000%	827	0.0104%	2728	0.0094%
33801	10383	0.1024%	16482	0.2163%	0	0.0000%	41407	0.5203%	68273	0.2361%
33803	4642	0.0458%	16313	0.2140%	0	0.0000%	49223	0.6185%	70178	0.2427%
33805	903	0.0089%	7434	0.0975%	0	0.0000%	18909	0.2376%	27246	0.0942%
33809	1843	0.0182%	14550	0.1909%	0	0.0000%	37097	0.4661%	53490	0.1850%
33810	2961	0.0292%	22548	0.2958%	0	0.0000%	59217	0.7441%	84726	0.2930%
33811	3326	0.0328%	9874	0.1295%	0	0.0000%	26504	0.3330%	39703	0.1373%
33812	5190	0.0512%	8002	0.1050%	0	0.0000%	20321	0.2553%	33513	0.1159%
33813	20905	0.2062%	30705	0.4029%	0	0.0000%	77037	0.9680%	128646	0.4449%
33815	785	0.0077%	2503	0.0328%	0	0.0000%	7996	0.1005%	11284	0.0390%
33820	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	670	0.0023%
33823	11874	0.1171%	20696	0.2715%	0	0.0000%	51486	0.6469%	84056	0.2907%
33825	45544	0.4493%	16020	0.2102%	0	0.0000%	54068	0.6794%	115632	0.3999%
33827	8534	0.0842%	3378	0.0443%	0	0.0000%	8645	0.1086%	20558	0.0711%
33830	19028	0.1877%	13601	0.1785%	0	0.0000%	29155	0.3663%	61784	0.2137%
33834	9389	0.0926%	1148	0.0151%	0	0.0000%	2769	0.0348%	13306	0.0460%
33837	12920	0.1275%	19484	0.2556%	0	0.0000%	30519	0.3835%	62923	0.2176%
33838	3814	0.0376%	2305	0.0302%	0	0.0000%	4982	0.0626%	11101	0.0384%
33839	1556	0.0153%	1719	0.0225%	0	0.0000%	3618	0.0455%	6892	0.0238%
33841	12198	0.1203%	2698	0.0354%	0	0.0000%	7582	0.0953%	22478	0.0777%
33843	22917	0.2261%	7306	0.0959%	0	0.0000%	20972	0.2635%	51195	0.1770%
33844	29634	0.2923%	23238	0.3049%	0	0.0000%	59668	0.7497%	112540	0.3892%
33846	0	0.0000%	0	0.0000%	0	0.0000%	505	0.0063%	748	0.0026%
33847	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	880	0.0030%
33848	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	693	0.0024%
33849	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	638	0.0022%
33850	4522	0.0446%	4766	0.0625%	0	0.0000%	13115	0.1648%	22403	0.0775%
33851	1187	0.0117%	676	0.0089%	0	0.0000%	1513	0.0190%	3376	0.0117%
33852	8942	0.0882%	26757	0.3511%	0	0.0000%	56752	0.7131%	92451	0.3197%
33853	24596	0.2426%	7713	0.1012%	0	0.0000%	19840	0.2493%	52149	0.1803%
33854	639	0.0063%	0	0.0000%	0	0.0000%	713	0.0090%	1631	0.0056%
33855	1179	0.0116%	1268	0.0166%	0	0.0000%	3518	0.0442%	5965	0.0206%
33857	0	0.0000%	2794	0.0367%	0	0.0000%	4184	0.0526%	7203	0.0249%
33859	26804	0.2644%	7201	0.0945%	0	0.0000%	19340	0.2430%	53345	0.1845%
33860	5648	0.0557%	7358	0.0965%	0	0.0000%	20217	0.2540%	33224	0.1149%
33865	1017	0.0100%	0	0.0000%	0	0.0000%	0	0.0000%	1633	0.0056%
33867	0	0.0000%	0	0.0000%	0	0.0000%	853	0.0107%	1146	0.0040%
33868	2414	0.0238%	5170	0.0678%	0	0.0000%	9730	0.1223%	17314	0.0599%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
33870	9681	0.0955%	17886	0.2347%	0	0.0000%	47131	0.5922%	74698	0.2583%
33872	19966	0.1970%	11627	0.1526%	0	0.0000%	46398	0.5830%	77991	0.2697%
33873	28539	0.2815%	3739	0.0491%	0	0.0000%	9535	0.1198%	41813	0.1446%
33875	10852	0.1071%	7665	0.1006%	0	0.0000%	21890	0.2751%	40407	0.1397%
33876	2266	0.0224%	6311	0.0828%	0	0.0000%	13754	0.1728%	22332	0.0772%
33877	0	0.0000%	0	0.0000%	0	0.0000%	516	0.0065%	1180	0.0041%
33880	17186	0.1695%	21638	0.2839%	0	0.0000%	45366	0.5700%	84190	0.2912%
33881	16472	0.1625%	25785	0.3383%	0	0.0000%	62874	0.7900%	105131	0.3636%
33884	49547	0.4888%	31754	0.4166%	0	0.0000%	67309	0.8458%	148611	0.5139%
33890	21721	0.2143%	1610	0.0211%	0	0.0000%	5184	0.0651%	28515	0.0986%
33896	5778	0.0570%	6094	0.0800%	0	0.0000%	8036	0.1010%	19908	0.0688%
33897	8268	0.0816%	13312	0.1747%	0	0.0000%	23557	0.2960%	45137	0.1561%
33898	32252	0.3182%	12707	0.1667%	0	0.0000%	36421	0.4576%	81380	0.2814%
33901	12031	0.1187%	1418	0.0186%	0	0.0000%	881	0.0111%	14330	0.0496%
33903	175652	1.7328%	2077	0.0272%	0	0.0000%	1596	0.0200%	179324	0.6202%
33904	393006	3.8770%	2632	0.0345%	0	0.0000%	1563	0.0196%	397201	1.3736%
33905	14788	0.1459%	2082	0.0273%	0	0.0000%	1704	0.0214%	18574	0.0642%
33907	10656	0.1051%	1327	0.0174%	0	0.0000%	701	0.0088%	12684	0.0439%
33908	134575	1.3276%	3964	0.0520%	0	0.0000%	2127	0.0267%	140666	0.4865%
33909	273815	2.7012%	1380	0.0181%	0	0.0000%	958	0.0120%	276154	0.9550%
33912	22487	0.2218%	2105	0.0276%	0	0.0000%	1174	0.0147%	25766	0.0891%
33913	6491	0.0640%	1562	0.0205%	0	0.0000%	949	0.0119%	9002	0.0311%
33914	1070860	10.5640%	2807	0.0368%	0	0.0000%	1722	0.0216%	1075389	3.7190%
33916	4858	0.0479%	0	0.0000%	0	0.0000%	0	0.0000%	5629	0.0195%
33917	170088	1.6779%	2168	0.0284%	0	0.0000%	1659	0.0209%	173916	0.6015%
33919	62503	0.6166%	3198	0.0420%	0	0.0000%	1757	0.0221%	67457	0.2333%
33920	1506	0.0149%	1233	0.0162%	0	0.0000%	831	0.0104%	3570	0.0123%
33921	368912	3.6393%	2077	0.0272%	0	0.0000%	1363	0.0171%	372704	1.2889%
33922	112016	1.1050%	0	0.0000%	0	0.0000%	0	0.0000%	112668	0.3896%
33924	191478	1.8889%	751	0.0099%	0	0.0000%	0	0.0000%	192788	0.6667%
33928	8954	0.0883%	1789	0.0235%	0	0.0000%	1124	0.0141%	11867	0.0410%
33931	108239	1.0678%	1131	0.0148%	0	0.0000%	770	0.0097%	110140	0.3809%
33932	642	0.0063%	0	0.0000%	0	0.0000%	0	0.0000%	647	0.0022%
33935	1347	0.0133%	4438	0.0582%	0	0.0000%	4053	0.0509%	9838	0.0340%
33936	3110	0.0307%	2844	0.0373%	0	0.0000%	1496	0.0188%	7449	0.0258%
33945	550	0.0054%	0	0.0000%	0	0.0000%	0	0.0000%	553	0.0019%
33946	61726	0.6089%	0	0.0000%	0	0.0000%	566	0.0071%	62740	0.2170%
33947	80944	0.7985%	694	0.0091%	0	0.0000%	827	0.0104%	82466	0.2852%
33948	130679	1.2891%	1609	0.0211%	0	0.0000%	2077	0.0261%	134366	0.4647%
33950	438467	4.3255%	3760	0.0493%	0	0.0000%	3832	0.0482%	446060	1.5426%
33952	168236	1.6596%	2771	0.0364%	0	0.0000%	3431	0.0431%	174438	0.6033%
33953	28973	0.2858%	528	0.0069%	0	0.0000%	715	0.0090%	30217	0.1045%
33954	37218	0.3672%	1078	0.0141%	0	0.0000%	1499	0.0188%	39795	0.1376%
33955	221802	2.1881%	1179	0.0155%	0	0.0000%	1015	0.0128%	223997	0.7747%
33956	142442	1.4052%	0	0.0000%	0	0.0000%	0	0.0000%	143175	0.4951%
33957	950282	9.3745%	2431	0.0319%	0	0.0000%	1103	0.0139%	953816	3.2986%
33960	0	0.0000%	0	0.0000%	0	0.0000%	1011	0.0127%	1498	0.0052%
33966	7562	0.0746%	705	0.0092%	0	0.0000%	0	0.0000%	8735	0.0302%
33967	8054	0.0795%	1353	0.0178%	0	0.0000%	758	0.0095%	10165	0.0352%
33971	3156	0.0311%	1418	0.0186%	0	0.0000%	790	0.0099%	5364	0.0186%
33972	1826	0.0180%	1723	0.0226%	0	0.0000%	958	0.0120%	4506	0.0156%
33973	682	0.0067%	0	0.0000%	0	0.0000%	0	0.0000%	1138	0.0039%
33974	901	0.0089%	821	0.0108%	0	0.0000%	0	0.0000%	2208	0.0076%
33976	1235	0.0122%	554	0.0073%	0	0.0000%	0	0.0000%	2111	0.0073%
33980	126090	1.2439%	1188	0.0156%	0	0.0000%	1536	0.0193%	128814	0.4455%
33981	129197	1.2745%	863	0.0113%	0	0.0000%	904	0.0114%	130964	0.4529%
33982	164493	1.6227%	1451	0.0190%	0	0.0000%	1697	0.0213%	167641	0.5798%
33983	261156	2.5763%	1733	0.0227%	0	0.0000%	2460	0.0309%	265349	0.9177%
33990	327987	3.2356%	2086	0.0274%	0	0.0000%	1301	0.0163%	331375	1.1460%
33991	186521	1.8400%	1232	0.0162%	0	0.0000%	734	0.0092%	188487	0.6518%
33993	381340	3.7619%	1261	0.0165%	0	0.0000%	789	0.0099%	383389	1.3259%
34102	8947	0.0883%	3273	0.0429%	0	0.0000%	1598	0.0201%	13819	0.0478%
34103	7037	0.0694%	2080	0.0273%	0	0.0000%	974	0.0122%	10091	0.0349%
34104	2864	0.0283%	1351	0.0177%	0	0.0000%	626	0.0079%	4841	0.0167%
34105	5323	0.0525%	2205	0.0289%	0	0.0000%	1143	0.0144%	8670	0.0300%
34108	15582	0.1537%	4266	0.0560%	0	0.0000%	1992	0.0250%	21840	0.0755%
34109	6568	0.0648%	2487	0.0326%	0	0.0000%	1287	0.0162%	10342	0.0358%
34110	9881	0.0975%	3135	0.0411%	0	0.0000%	1672	0.0210%	14688	0.0508%
34112	4005	0.0395%	1810	0.0237%	0	0.0000%	781	0.0098%	6596	0.0228%
34113	2187	0.0216%	1052	0.0138%	0	0.0000%	553	0.0069%	3792	0.0131%
34114	1352	0.0133%	755	0.0099%	0	0.0000%	0	0.0000%	2508	0.0087%
34116	1929	0.0190%	1075	0.0141%	0	0.0000%	548	0.0069%	3552	0.0123%
34117	925	0.0091%	1083	0.0142%	0	0.0000%	0	0.0000%	2495	0.0086%
34119	6256	0.0617%	2840	0.0373%	0	0.0000%	1639	0.0206%	10736	0.0371%
34120	2219	0.0219%	1983	0.0260%	0	0.0000%	1044	0.0131%	5246	0.0181%
34134	18233	0.1799%	3805	0.0499%	0	0.0000%	1985	0.0249%	24022	0.0831%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
34135	11090	0.1094%	3727	0.0489%	0	0.0000%	1942	0.0244%	16760	0.0580%
34142	0	0.0000%	507	0.0067%	0	0.0000%	0	0.0000%	912	0.0032%
34145	4630	0.0457%	2214	0.0291%	0	0.0000%	952	0.0120%	7796	0.0270%
34201	0	0.0000%	681	0.0089%	0	0.0000%	1246	0.0157%	2212	0.0076%
34202	1562	0.0154%	2659	0.0349%	0	0.0000%	5666	0.0712%	9888	0.0342%
34203	0	0.0000%	1931	0.0253%	0	0.0000%	3499	0.0440%	5431	0.0188%
34205	0	0.0000%	1709	0.0224%	0	0.0000%	2913	0.0366%	4622	0.0160%
34207	0	0.0000%	1415	0.0186%	0	0.0000%	1990	0.0250%	3406	0.0118%
34208	0	0.0000%	1713	0.0225%	0	0.0000%	3374	0.0424%	5087	0.0176%
34209	0	0.0000%	4231	0.0555%	0	0.0000%	5913	0.0743%	10144	0.0351%
34210	0	0.0000%	1414	0.0186%	0	0.0000%	2043	0.0257%	3457	0.0120%
34211	0	0.0000%	595	0.0078%	0	0.0000%	1317	0.0165%	2139	0.0074%
34212	504	0.0050%	2138	0.0280%	0	0.0000%	4534	0.0570%	7176	0.0248%
34216	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	888	0.0031%
34217	0	0.0000%	2310	0.0303%	0	0.0000%	2644	0.0332%	5235	0.0181%
34219	609	0.0060%	2565	0.0337%	0	0.0000%	6128	0.0770%	9303	0.0322%
34221	0	0.0000%	4720	0.0619%	0	0.0000%	7804	0.0981%	12523	0.0433%
34222	0	0.0000%	1379	0.0181%	0	0.0000%	2507	0.0315%	3885	0.0134%
34223	20326	0.2005%	1464	0.0192%	0	0.0000%	2521	0.0317%	24310	0.0841%
34224	62311	0.6147%	988	0.0130%	0	0.0000%	1369	0.0172%	64668	0.2236%
34228	0	0.0000%	2951	0.0387%	556	0.0178%	4302	0.0541%	7809	0.0270%
34229	944	0.0093%	1039	0.0136%	0	0.0000%	1813	0.0228%	3797	0.0131%
34231	1346	0.0133%	2032	0.0267%	0	0.0000%	4632	0.0582%	8011	0.0277%
34232	1023	0.0101%	2195	0.0288%	0	0.0000%	3904	0.0491%	7123	0.0246%
34233	650	0.0064%	1186	0.0156%	0	0.0000%	2061	0.0259%	3898	0.0135%
34234	0	0.0000%	1221	0.0160%	0	0.0000%	2120	0.0266%	3341	0.0116%
34235	0	0.0000%	1287	0.0169%	0	0.0000%	2548	0.0320%	4289	0.0148%
34236	583	0.0058%	1311	0.0172%	0	0.0000%	2812	0.0353%	4706	0.0163%
34237	0	0.0000%	695	0.0091%	0	0.0000%	1297	0.0163%	2182	0.0075%
34238	1220	0.0120%	1818	0.0239%	0	0.0000%	3081	0.0387%	6119	0.0212%
34239	589	0.0058%	1483	0.0195%	0	0.0000%	2490	0.0313%	4562	0.0158%
34240	1535	0.0151%	1366	0.0179%	0	0.0000%	3016	0.0379%	5917	0.0205%
34241	1489	0.0147%	1397	0.0183%	0	0.0000%	2939	0.0369%	5825	0.0201%
34242	898	0.0089%	1778	0.0233%	0	0.0000%	3383	0.0425%	6058	0.0210%
34243	0	0.0000%	2740	0.0359%	0	0.0000%	4955	0.0623%	7695	0.0266%
34251	4913	0.0485%	1309	0.0172%	0	0.0000%	4591	0.0577%	10813	0.0374%
34266	161250	1.5907%	3618	0.0475%	0	0.0000%	10617	0.1334%	175484	0.6069%
34269	57822	0.5704%	612	0.0080%	0	0.0000%	1063	0.0134%	59497	0.2058%
34275	2339	0.0231%	1377	0.0181%	0	0.0000%	2660	0.0334%	6376	0.0221%
34285	3286	0.0324%	1129	0.0148%	0	0.0000%	2340	0.0294%	6755	0.0234%
34286	38506	0.3799%	1030	0.0135%	0	0.0000%	1532	0.0193%	41069	0.1420%
34287	107121	1.0567%	1533	0.0201%	0	0.0000%	2085	0.0262%	110738	0.3830%
34288	101815	1.0044%	597	0.0078%	0	0.0000%	1064	0.0134%	103477	0.3579%
34289	3502	0.0345%	0	0.0000%	0	0.0000%	0	0.0000%	3765	0.0130%
34291	10178	0.1004%	0	0.0000%	0	0.0000%	0	0.0000%	10791	0.0373%
34292	4613	0.0455%	1028	0.0135%	0	0.0000%	1631	0.0205%	7272	0.0251%
34293	9025	0.0890%	1646	0.0216%	0	0.0000%	3225	0.0405%	13896	0.0481%
34420	0	0.0000%	1099	0.0144%	0	0.0000%	4202	0.0528%	5301	0.0183%
34428	0	0.0000%	1926	0.0253%	0	0.0000%	2079	0.0261%	4005	0.0138%
34429	0	0.0000%	3176	0.0417%	0	0.0000%	2597	0.0326%	5773	0.0200%
34431	0	0.0000%	1436	0.0188%	0	0.0000%	2668	0.0335%	4104	0.0142%
34432	0	0.0000%	2065	0.0271%	0	0.0000%	5465	0.0687%	7530	0.0260%
34433	0	0.0000%	1331	0.0175%	0	0.0000%	2294	0.0288%	3625	0.0125%
34434	0	0.0000%	1464	0.0192%	0	0.0000%	2349	0.0295%	3813	0.0132%
34436	0	0.0000%	2121	0.0278%	0	0.0000%	3627	0.0456%	5747	0.0199%
34442	0	0.0000%	3523	0.0462%	0	0.0000%	6296	0.0791%	9819	0.0340%
34446	0	0.0000%	7329	0.0962%	0	0.0000%	7064	0.0888%	14393	0.0498%
34448	0	0.0000%	4039	0.0530%	0	0.0000%	2669	0.0335%	6708	0.0232%
34449	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	659	0.0023%
34450	0	0.0000%	2555	0.0335%	0	0.0000%	5343	0.0671%	7898	0.0273%
34452	0	0.0000%	2351	0.0308%	0	0.0000%	5072	0.0637%	7423	0.0257%
34453	0	0.0000%	2224	0.0292%	0	0.0000%	4090	0.0514%	6315	0.0218%
34461	0	0.0000%	2257	0.0296%	0	0.0000%	3656	0.0459%	5913	0.0205%
34465	0	0.0000%	4329	0.0568%	0	0.0000%	6308	0.0793%	10637	0.0368%
34470	0	0.0000%	952	0.0125%	0	0.0000%	5077	0.0638%	6028	0.0208%
34471	0	0.0000%	2384	0.0313%	0	0.0000%	9286	0.1167%	11670	0.0404%
34472	0	0.0000%	1569	0.0206%	0	0.0000%	7024	0.0883%	8593	0.0297%
34473	0	0.0000%	1667	0.0219%	0	0.0000%	6797	0.0854%	8464	0.0293%
34474	0	0.0000%	764	0.0100%	0	0.0000%	3163	0.0397%	3927	0.0136%
34475	0	0.0000%	0	0.0000%	0	0.0000%	1456	0.0183%	1810	0.0063%
34476	0	0.0000%	2538	0.0333%	0	0.0000%	10822	0.1360%	13361	0.0462%
34479	0	0.0000%	704	0.0092%	0	0.0000%	3417	0.0429%	4121	0.0143%
34480	0	0.0000%	2086	0.0274%	0	0.0000%	8767	0.1102%	10854	0.0375%
34481	0	0.0000%	2299	0.0302%	0	0.0000%	7432	0.0934%	9731	0.0337%
34482	0	0.0000%	1816	0.0238%	0	0.0000%	7159	0.0900%	8976	0.0310%
34484	0	0.0000%	0	0.0000%	0	0.0000%	2109	0.0265%	2563	0.0089%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
34488	0	0.0000%	0	0.0000%	0	0.0000%	891	0.0112%	1260	0.0044%
34491	0	0.0000%	3465	0.0455%	0	0.0000%	15621	0.1963%	19086	0.0660%
34601	0	0.0000%	6904	0.0906%	0	0.0000%	7383	0.0928%	14287	0.0494%
34602	0	0.0000%	3287	0.0431%	0	0.0000%	4156	0.0522%	7443	0.0257%
34604	0	0.0000%	3581	0.0470%	0	0.0000%	2932	0.0368%	6513	0.0225%
34606	0	0.0000%	12705	0.1667%	0	0.0000%	8730	0.1097%	21435	0.0741%
34607	0	0.0000%	3893	0.0511%	0	0.0000%	2587	0.0325%	6480	0.0224%
34608	0	0.0000%	12702	0.1667%	0	0.0000%	10108	0.1270%	22809	0.0789%
34609	0	0.0000%	17974	0.2358%	0	0.0000%	14659	0.1842%	32633	0.1129%
34610	0	0.0000%	3421	0.0449%	0	0.0000%	4112	0.0517%	7534	0.0261%
34613	0	0.0000%	9736	0.1277%	0	0.0000%	8458	0.1063%	18194	0.0629%
34614	0	0.0000%	1738	0.0228%	0	0.0000%	1801	0.0226%	3539	0.0122%
34637	0	0.0000%	2228	0.0292%	0	0.0000%	2684	0.0337%	4911	0.0170%
34638	0	0.0000%	7572	0.0993%	0	0.0000%	9388	0.1180%	16960	0.0587%
34639	0	0.0000%	7645	0.1003%	0	0.0000%	10146	0.1275%	17792	0.0615%
34652	0	0.0000%	4959	0.0651%	0	0.0000%	7388	0.0928%	12348	0.0427%
34653	0	0.0000%	5290	0.0694%	0	0.0000%	7044	0.0885%	12334	0.0427%
34654	0	0.0000%	5626	0.0738%	0	0.0000%	5962	0.0749%	11588	0.0401%
34655	0	0.0000%	9968	0.1308%	0	0.0000%	10861	0.1365%	20829	0.0720%
34667	0	0.0000%	8814	0.1156%	0	0.0000%	12618	0.1585%	21432	0.0741%
34668	0	0.0000%	7627	0.1001%	0	0.0000%	10526	0.1323%	18153	0.0628%
34669	0	0.0000%	3214	0.0422%	0	0.0000%	3985	0.0501%	7199	0.0249%
34677	0	0.0000%	6174	0.0810%	0	0.0000%	5943	0.0747%	12117	0.0419%
34681	0	0.0000%	678	0.0089%	0	0.0000%	0	0.0000%	1177	0.0041%
34683	0	0.0000%	13449	0.1765%	0	0.0000%	10716	0.1346%	24165	0.0836%
34684	0	0.0000%	5222	0.0685%	0	0.0000%	5882	0.0739%	11104	0.0384%
34685	0	0.0000%	5194	0.0681%	0	0.0000%	6365	0.0800%	11559	0.0400%
34688	0	0.0000%	3700	0.0486%	0	0.0000%	3323	0.0418%	7024	0.0243%
34689	0	0.0000%	8203	0.1076%	0	0.0000%	6430	0.0808%	14633	0.0506%
34690	0	0.0000%	2540	0.0333%	0	0.0000%	2513	0.0316%	5053	0.0175%
34691	0	0.0000%	3991	0.0524%	0	0.0000%	4150	0.0521%	8140	0.0282%
34695	0	0.0000%	4817	0.0632%	0	0.0000%	4386	0.0551%	9203	0.0318%
34698	0	0.0000%	10729	0.1408%	0	0.0000%	7690	0.0966%	18419	0.0637%
34705	580	0.0057%	828	0.0109%	0	0.0000%	1308	0.0164%	2716	0.0094%
34711	22044	0.2175%	43467	0.5703%	0	0.0000%	59018	0.7416%	124529	0.4307%
34714	6131	0.0605%	11634	0.1526%	0	0.0000%	13235	0.1663%	31000	0.1072%
34715	3694	0.0364%	7072	0.0928%	0	0.0000%	9305	0.1169%	20071	0.0694%
34731	0	0.0000%	2117	0.0278%	0	0.0000%	5733	0.0720%	7850	0.0271%
34734	2863	0.0282%	2676	0.0351%	0	0.0000%	1887	0.0237%	7426	0.0257%
34736	575	0.0057%	6399	0.0840%	0	0.0000%	13496	0.1696%	20469	0.0708%
34737	0	0.0000%	1598	0.0210%	0	0.0000%	2896	0.0364%	4861	0.0168%
34739	0	0.0000%	1183	0.0155%	0	0.0000%	3145	0.0395%	4491	0.0155%
34741	18231	0.1798%	19083	0.2504%	0	0.0000%	10973	0.1379%	48286	0.1670%
34743	23792	0.2347%	26029	0.3415%	0	0.0000%	15123	0.1900%	64944	0.2246%
34744	44404	0.4380%	48784	0.6401%	0	0.0000%	27931	0.3510%	121119	0.4189%
34746	24863	0.2453%	42235	0.5541%	0	0.0000%	32257	0.4053%	99355	0.3436%
34747	18441	0.1819%	29533	0.3875%	0	0.0000%	24317	0.3056%	72292	0.2500%
34748	1249	0.0123%	16177	0.2122%	0	0.0000%	43948	0.5522%	61374	0.2123%
34753	0	0.0000%	1442	0.0189%	0	0.0000%	2986	0.0375%	4544	0.0157%
34756	1399	0.0138%	3899	0.0512%	0	0.0000%	4162	0.0523%	9460	0.0327%
34758	16386	0.1616%	24450	0.3208%	0	0.0000%	24031	0.3019%	64867	0.2243%
34759	25858	0.2551%	26429	0.3468%	0	0.0000%	35277	0.4433%	87564	0.3028%
34760	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	1374	0.0048%
34761	23801	0.2348%	12966	0.1701%	0	0.0000%	8868	0.1114%	45635	0.1578%
34762	0	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	636	0.0022%
34769	21322	0.2103%	23838	0.3128%	0	0.0000%	14048	0.1765%	59208	0.2048%
34771	19558	0.1929%	13406	0.1759%	0	0.0000%	6252	0.0786%	39216	0.1356%
34772	25188	0.2485%	29990	0.3935%	0	0.0000%	19495	0.2450%	74673	0.2582%
34773	701	0.0069%	2510	0.0329%	0	0.0000%	1250	0.0157%	4460	0.0154%
34785	0	0.0000%	1151	0.0151%	0	0.0000%	5473	0.0688%	6624	0.0229%
34786	42981	0.4240%	57859	0.7591%	0	0.0000%	48331	0.6073%	149171	0.5159%
34787	27601	0.2723%	30988	0.4066%	0	0.0000%	29464	0.3702%	88053	0.3045%
34788	839	0.0083%	3840	0.0504%	0	0.0000%	8261	0.1038%	12940	0.0448%
34797	0	0.0000%	1030	0.0135%	0	0.0000%	1598	0.0201%	2843	0.0098%
34945	0	0.0000%	11104	0.1457%	0	0.0000%	13270	0.1667%	24374	0.0843%
34946	0	0.0000%	10784	0.1415%	0	0.0000%	13710	0.1723%	24495	0.0847%
34947	0	0.0000%	9498	0.1246%	0	0.0000%	12140	0.1525%	21638	0.0748%
34949	0	0.0000%	61298	0.8043%	0	0.0000%	79155	0.9946%	140454	0.4857%
34950	0	0.0000%	16596	0.2177%	0	0.0000%	23533	0.2957%	40129	0.1388%
34951	0	0.0000%	53063	0.6962%	0	0.0000%	81271	1.0212%	134334	0.4646%
34952	0	0.0000%	100041	1.3126%	0	0.0000%	149168	1.8743%	249209	0.8618%
34953	0	0.0000%	99407	1.3043%	0	0.0000%	137670	1.7299%	237077	0.8199%
34956	0	0.0000%	7577	0.0994%	0	0.0000%	8921	0.1121%	16498	0.0571%
34957	0	0.0000%	83364	1.0938%	0	0.0000%	92024	1.1563%	175388	0.6065%
34972	0	0.0000%	28281	0.3711%	0	0.0000%	33058	0.4154%	61796	0.2137%
34974	1405	0.0139%	67210	0.8818%	0	0.0000%	87903	1.1045%	156518	0.5413%

FORM A-3: LOSSES FROM THE 2004 HURRICANE SEASON (CONTINUED)

	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses	Personal and Commercial Residential Monetary Contribution ($1000s)	Percent of Losses
34981	0	0.0000%	8086	0.1061%	0	0.0000%	8054	0.1012%	16140	0.0558%
34982	0	0.0000%	64361	0.8444%	0	0.0000%	68627	0.8623%	132988	0.4599%
34983	0	0.0000%	69143	0.9072%	0	0.0000%	91601	1.1510%	160744	0.5559%
34984	0	0.0000%	33701	0.4422%	0	0.0000%	41988	0.5276%	75689	0.2618%
34986	0	0.0000%	59612	0.7821%	0	0.0000%	78893	0.9913%	138504	0.4790%
34987	0	0.0000%	12081	0.1585%	0	0.0000%	15344	0.1928%	27426	0.0948%
34990	0	0.0000%	109436	1.4358%	0	0.0000%	127291	1.5994%	236727	0.8187%
34994	0	0.0000%	34240	0.4492%	0	0.0000%	33350	0.4190%	67589	0.2337%
34996	0	0.0000%	68849	0.9033%	0	0.0000%	58452	0.7345%	127301	0.4402%
34997	0	0.0000%	95906	1.2583%	0	0.0000%	98342	1.2357%	194248	0.6718%

(FORM A-3 CONTINUED)

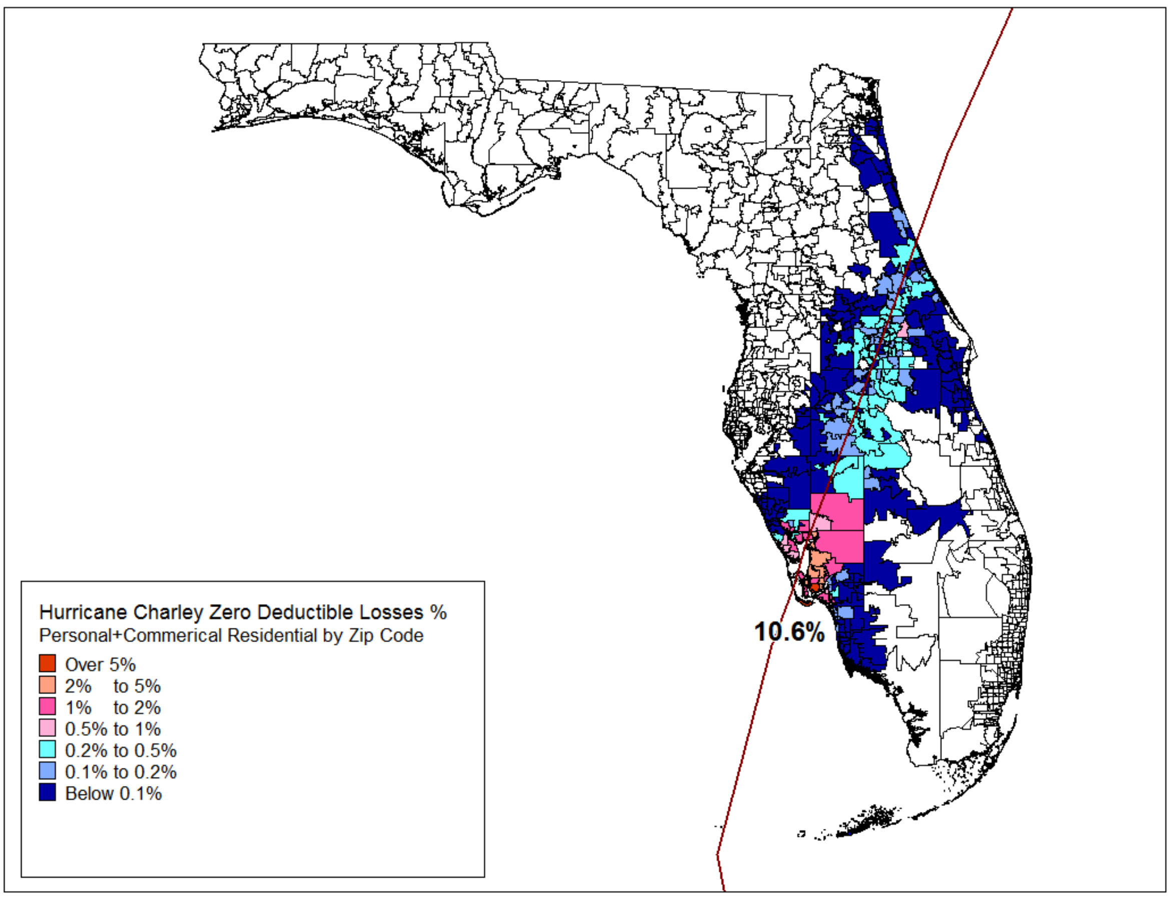


Figure 44. Hurricane Charley-2004 % of Loss for the 2012 Florida Hurricane Catastrophe Fund Total Personal and Commercial Residential Exposure by Zip Code.

(FORM A-3 CONTINUED)

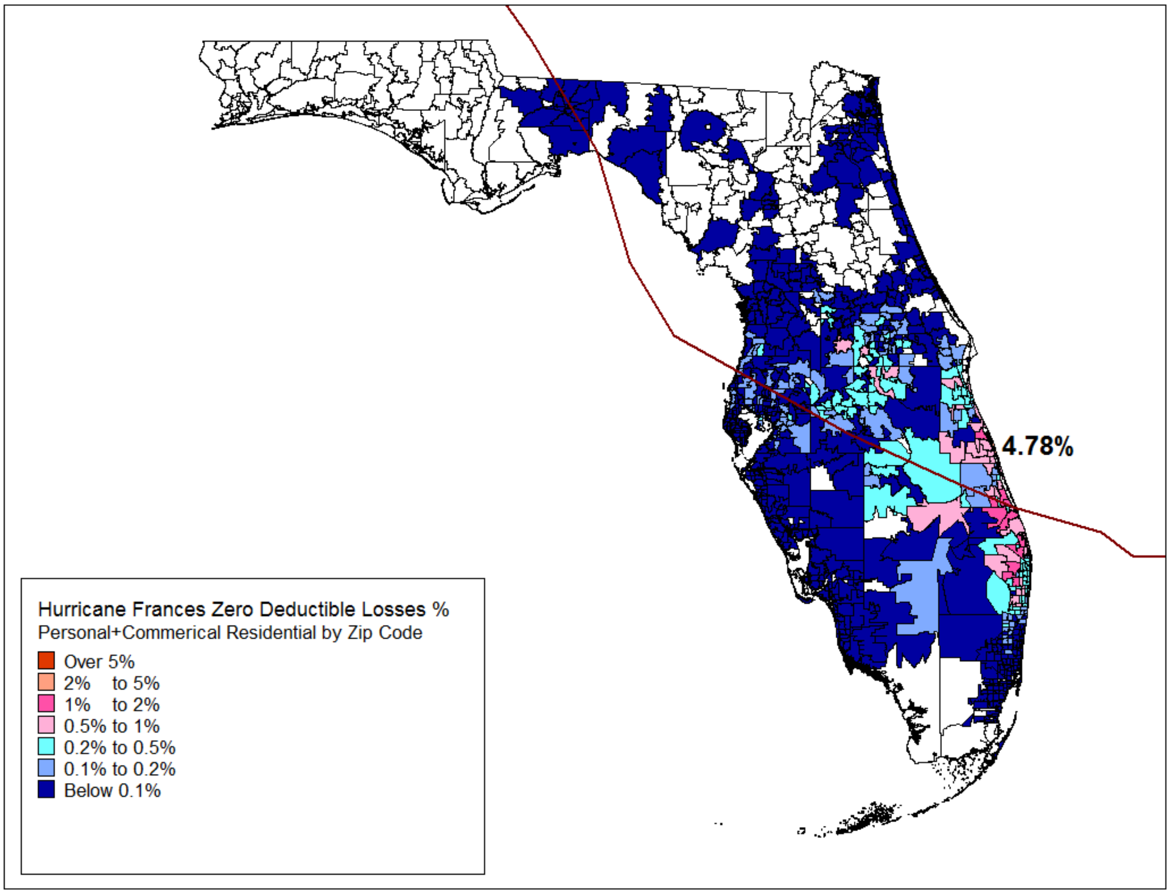


Figure 45. Hurricane Frances-2004 % of Loss for the 2012 Florida Hurricane Catastrophe Fund Total Personal and Commercial Residential Exposure by Zip Code.

(FORM A-3 CONTINUED)

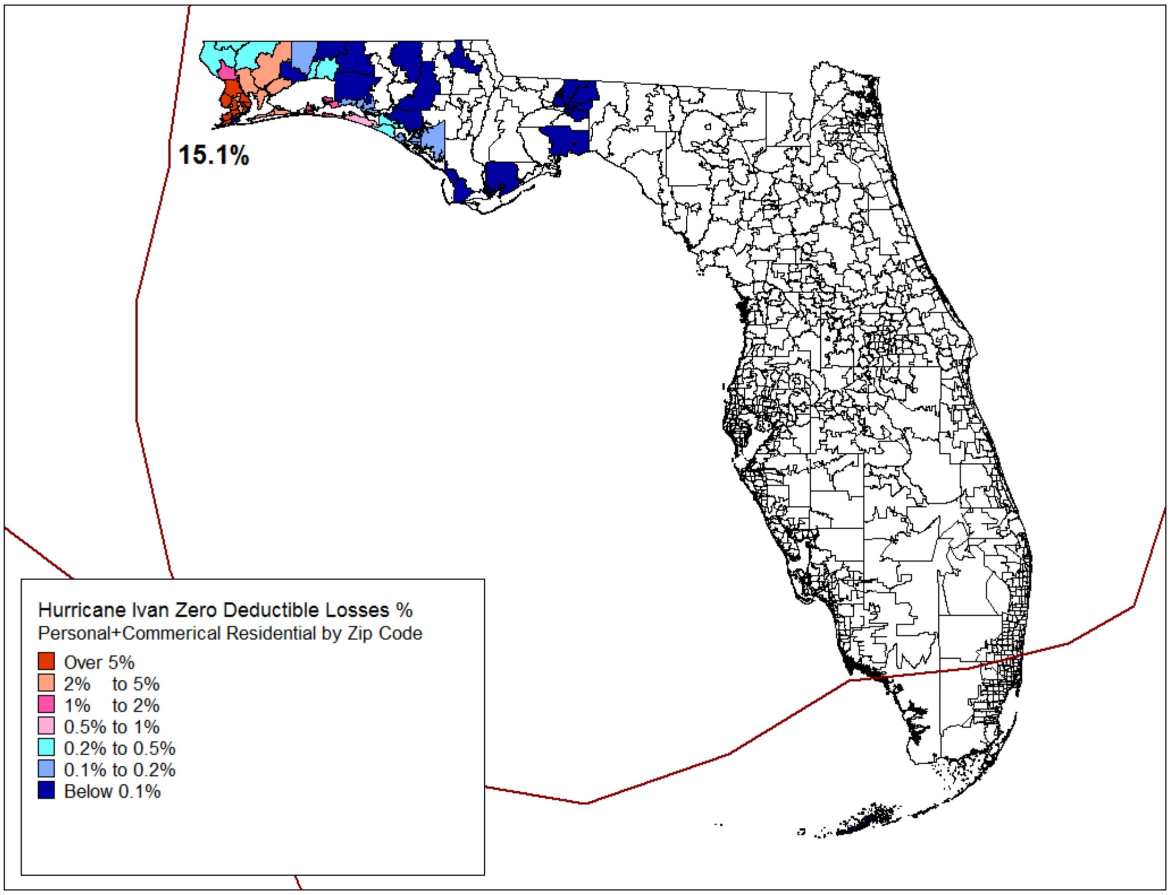


Figure 46. Hurricane Ivan-2004 % of Loss for the 2012 Florida Hurricane Catastrophe Fund Total Personal and Commercial Residential Exposure by Zip Code.

(FORM A-3 CONTINUED)

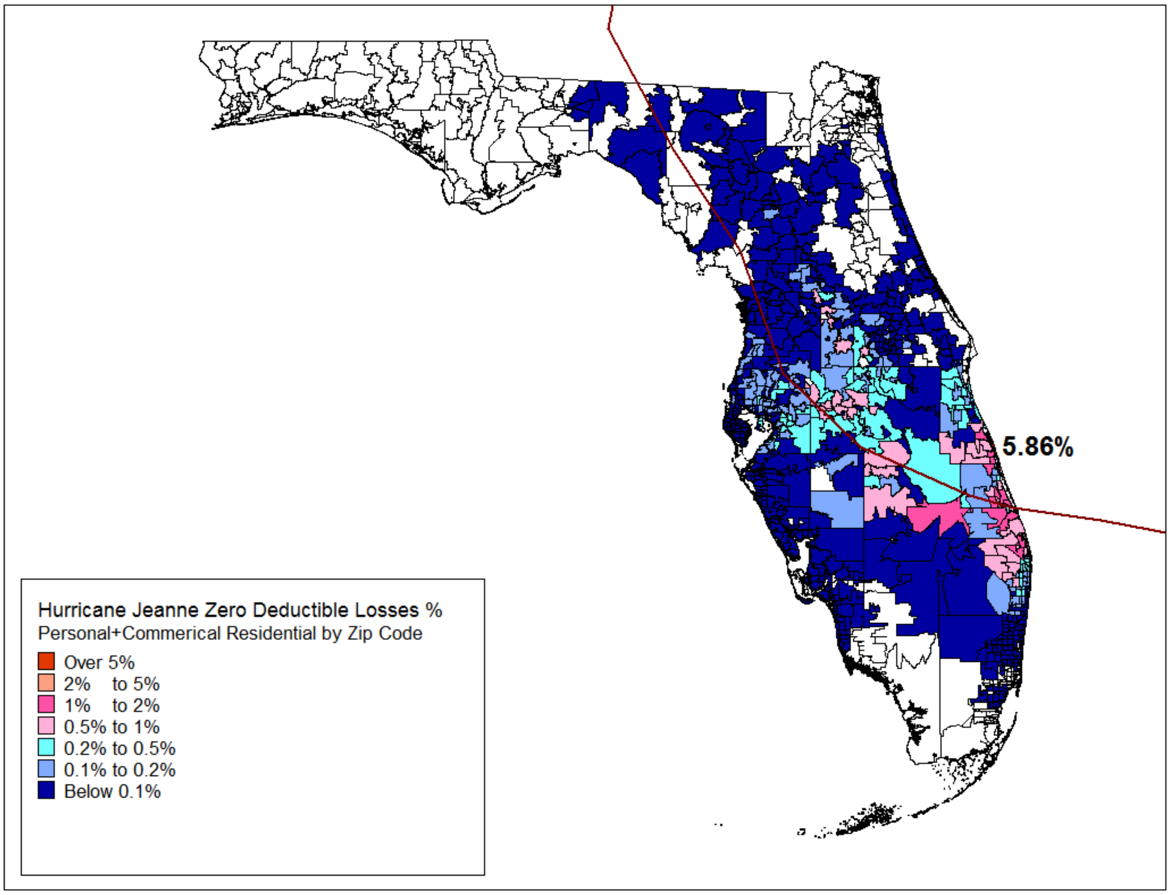


Figure 47. Hurricane Jeanne-2004 % of Loss for the 2012 Florida Hurricane Catastrophe Fund Total Personal and Commercial Residential Exposure by Zip Code.

(FORM A-3 CONTINUED)

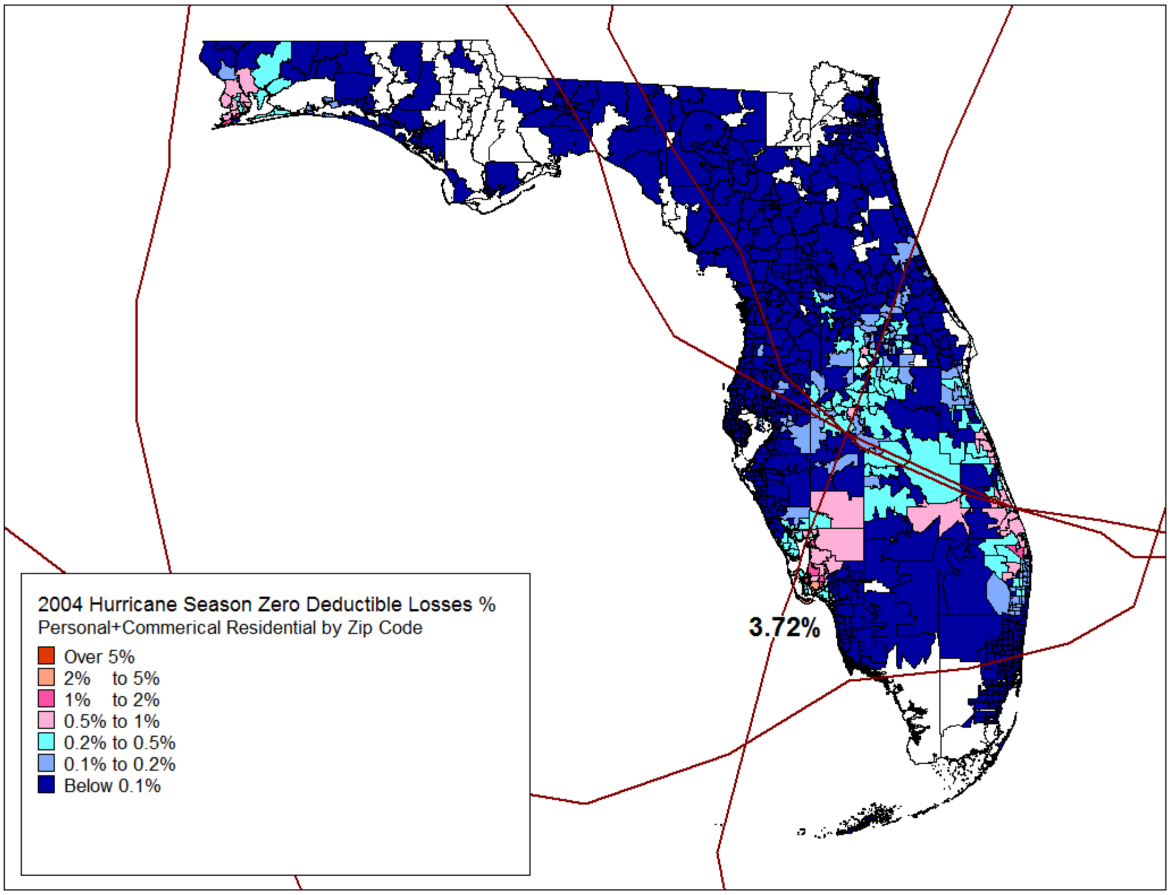


Figure 48. 2004 Season % of Loss for the 2012 Florida Hurricane Catastrophe Fund Total Personal and Commercial Residential Exposure by Zip Code.

Form A-4: Output Ranges

A. Provide personal and commercial residential output ranges in the format shown in the file named *"2015FormA4.xlsx"* by using an automated program or script. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also, include Form A-4, Output Ranges, in a submission appendix.

B. Provide loss costs rounded to three (3) decimal places by county. Within each county, loss costs shall be shown separately per $1,000 of exposure for frame owners, masonry owners, frame renters, masonry renters, frame condo unit owners, masonry condo unit owners, manufactured home, and commercial residential. For each of these categories using ZIP Code centroids, the output range shall show the highest loss cost, the lowest loss cost, and the weighted average loss cost. The aggregate residential exposure data for this form shall be developed from the information in the file named *"hlpm2012c.exe,"* except for insured value and deductibles information. Insured values shall be based on the output range specifications below. Deductible amounts of 0% and as specified in the output range specifications will be assumed to be uniformly applied to all risks. When calculating the weighted average loss costs, weight the loss costs by the total insured value calculated above. Include the statewide range of loss costs (i.e., low, high, and weighted average).

C. If a modeling organization has loss costs for a ZIP Code for which there is no exposure, give the loss costs zero weight (i.e., assume the exposure in that ZIP Code is zero). Provide a list in the submission document of those ZIP Codes where this occurs.

D. If a modeling organization does not have loss costs for a ZIP Code for which there is some exposure, do not assume such loss costs are zero, but use only the exposures for which there are loss costs in calculating the weighted average loss costs. Provide a list in the submission document of the ZIP Codes where this occurs.

E. NA shall be used in cells to signify no exposure.

F. All anomalies in loss costs that are not consistent with the requirements of Standard A-6 (Loss Output) and have been explained in Disclosure A-6.15 shall be shaded.

G. Indicate if per diem is used in producing loss costs for Coverage D (Time Element) in the personal residential output ranges. If a per diem rate is used, a rate of $150.00 per day per policy shall be used.

All ZIP Codes in the 2012 FHCF exposure have loss costs in the model.

The Form A-4 results appear in the file 2015FormA4_CoreLogic_20March2017.xlsx.

Output Range Specifications

Policy Type	Assumptions
Owners	**Coverage A = Building** • Coverage A limit = $100,000 • Replacement Cost included subject to Coverage A limit • Law and Ordinance not included **Coverage B = Appurtenant Structures** • Coverage B limit = 10% of Coverage A limit • Replacement Cost included subject to Coverage B limit • Law and Ordinance not included **Coverage C = Contents** • Coverage C limit = 50% of Coverage A limit • Replacement Cost included subject to Coverage C limit **Coverage D = Time Element** • Coverage D limit = 20% of Coverage A limit • Time limit = 12 months • Per diem = $150.00/day per policy, if used ✧ Dominant Coverage = A. ✧ Loss costs per $1,000 shall be related to the Coverage A limit. ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles. ✧ 2% Deductible of Coverage A. ✧ All-other perils deductible shall be $500.
Renters	**Coverage C = Contents** • Coverage C limit = $25,000 • Replacement Cost included subject to Coverage C limit **Coverage D = Time Element** • Coverage D limit = 40% of Coverage C limit • Time limit = 12 months • Per diem = $150.00/day per policy, if used ✧ Dominate Coverage = C. ✧ Loss costs per $1,000 shall be related to the Coverage C limit.

- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage C.
- ✧ All-other perils deductible shall be $500.

Condo Unit Owners

Coverage A = Building

- Coverage A limit = 10% of Coverage C limit
- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Coverage C limit = $50,000
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 40% of Coverage C limit
- Time limit = 12 months
- Per diem = $150.00/day per policy, if used

- ✧ Dominant Coverage = C.
- ✧ Loss costs per $1,000 shall be related to the Coverage C limit.

- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage C.
- ✧ All-other perils deductible shall be $500.

Manufactured Home

Coverage A = Building

- Coverage A limit = $50,000
- Replacement Cost included subject to Coverage A limit

Coverage B = Appurtenant Structures

- Coverage B limit = 10% of Coverage A limit
- Replacement Cost included subject to Coverage B limit

Coverage C = Contents

- Coverage C limit = 50% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = $150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per $1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage A.
- ✧ All-other perils deductible shall be $500.

Commercial Residential

Coverage A = Building

- Coverage A limit = $750,000
- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Coverage C limit = 5% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = $150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per $1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 3% Deductible of Coverage A.
- ✧ All-other perils deductible shall be $500.

TABLE 27. FORM A-4: OUTPUT RANGES FOR ZERO DEDUCTIBLE LOSS COSTS PER $1000

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Alachua	LOW	0.621	0.372	0.805	0.182	0.153	0.194	0.168	0.308
	AVERAGE	0.741	0.537	1.633	0.205	0.179	0.255	0.210	0.361
	HIGH	1.031	0.734	2.865	0.251	0.223	0.325	0.267	0.508
Baker	LOW	0.424	0.301	0.686	0.147	0.140	NA	NA	NA
	AVERAGE	0.538	0.381	0.908	0.172	0.162	NA	NA	NA
	HIGH	0.556	0.392	1.019	0.182	0.167	NA	NA	NA
Bay	LOW	1.645	1.242	2.899	0.411	0.351	0.841	0.617	1.212
	AVERAGE	3.785	2.602	7.044	1.248	1.064	2.680	1.683	3.211
	HIGH	7.355	5.520	25.956	3.287	2.402	4.585	2.859	5.094
Bradford	LOW	0.614	0.427	0.693	0.184	0.167	NA	NA	NA
	AVERAGE	0.725	0.519	1.239	0.236	0.212	NA	NA	NA
	HIGH	0.763	0.543	1.354	0.246	0.217	NA	NA	NA
Brevard	LOW	1.776	0.997	3.761	0.556	0.397	0.523	0.387	0.640
	AVERAGE	3.101	2.119	10.280	1.089	0.899	1.459	1.530	2.190
	HIGH	7.454	5.504	18.939	3.401	3.039	4.290	3.216	3.883
Broward	LOW	4.668	2.517	12.790	1.373	1.582	1.361	1.121	2.089
	AVERAGE	8.610	5.836	25.670	3.572	2.900	4.175	3.731	5.873
	HIGH	16.067	11.404	46.427	8.576	6.300	11.031	6.880	8.895
Calhoun	LOW	1.173	0.814	1.907	0.284	0.227	NA	NA	NA
	AVERAGE	1.244	0.864	2.265	0.322	0.257	NA	NA	NA
	HIGH	1.371	0.987	2.565	0.382	0.304	NA	NA	NA
Charlotte	LOW	2.580	1.659	6.545	0.669	0.462	1.028	0.764	1.185
	AVERAGE	3.471	2.241	8.053	1.235	0.883	1.958	1.038	1.594
	HIGH	4.011	3.293	14.821	1.843	1.107	2.488	1.596	2.289
Citrus	LOW	1.055	0.689	2.284	0.297	0.241	0.416	0.251	0.554
	AVERAGE	1.282	0.829	2.820	0.352	0.276	0.438	0.357	0.640
	HIGH	1.602	1.046	4.729	0.441	0.326	0.520	0.427	0.777
Clay	LOW	0.628	0.430	1.148	0.175	0.158	0.197	0.166	0.286
	AVERAGE	0.786	0.570	1.426	0.230	0.200	0.264	0.210	0.384
	HIGH	1.279	0.696	3.710	0.267	0.238	0.309	0.270	0.540
Collier	LOW	2.684	1.550	5.419	0.983	0.652	0.736	0.562	1.176
	AVERAGE	4.641	2.912	13.124	2.117	1.500	2.495	1.882	2.939
	HIGH	8.899	5.800	27.520	4.520	2.751	4.936	3.529	4.774
Columbia	LOW	0.590	0.371	0.767	0.176	0.165	0.230	0.198	0.240
	AVERAGE	0.638	0.442	1.224	0.198	0.172	0.242	0.210	0.240
	HIGH	0.730	0.498	1.348	0.217	0.185	0.249	0.215	0.240
DeSoto	LOW	2.828	1.963	5.638	1.021	0.716	1.064	0.835	1.478
	AVERAGE	3.383	2.257	7.247	1.109	0.825	1.171	0.839	1.485
	HIGH	4.178	2.977	8.886	1.122	0.860	1.427	1.027	1.811
Dixie	LOW	0.684	0.436	1.362	0.207	0.234	0.156	0.166	0.280
	AVERAGE	0.892	0.528	1.555	0.263	0.238	0.268	0.224	0.324
	HIGH	1.579	1.095	4.462	0.287	0.519	0.349	0.281	0.478
Duval	LOW	0.469	0.387	1.063	0.159	0.143	0.151	0.151	0.276
	AVERAGE	0.851	0.625	1.496	0.243	0.211	0.266	0.240	0.421
	HIGH	1.461	1.759	7.468	0.489	0.447	0.556	0.438	1.040

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Escambia	LOW	1.643	1.206	3.070	0.435	0.345	0.918	0.750	1.162
	AVERAGE	4.416	3.365	8.394	1.639	1.354	2.533	1.498	2.804
	HIGH	7.879	5.388	13.753	3.786	3.080	4.421	3.310	4.245
Flagler	LOW	0.849	0.542	1.966	0.228	0.196	0.431	0.190	0.297
	AVERAGE	1.100	0.616	2.576	0.308	0.219	0.471	0.238	0.376
	HIGH	1.668	1.142	3.166	0.624	0.449	0.732	0.513	0.917
Franklin	LOW	2.105	1.916	6.124	0.820	0.736	0.505	0.492	2.403
	AVERAGE	3.149	2.633	7.440	1.434	1.085	0.965	1.043	2.403
	HIGH	6.206	5.051	8.878	2.050	1.283	2.563	1.497	2.403
Gadsden	LOW	0.470	0.361	0.911	0.139	0.125	NA	0.174	0.327
	AVERAGE	0.621	0.445	1.164	0.163	0.144	NA	0.174	0.344
	HIGH	0.908	0.638	1.849	0.217	0.175	NA	0.174	0.351
Gilchrist	LOW	0.908	0.602	1.700	0.279	0.240	NA	0.282	NA
	AVERAGE	1.006	0.701	1.989	0.322	0.267	NA	0.282	NA
	HIGH	1.048	0.746	2.139	0.328	0.273	NA	0.282	NA
Glades	LOW	3.729	2.134	8.272	1.627	1.213	NA	NA	NA
	AVERAGE	4.731	3.203	11.209	1.627	1.213	NA	NA	NA
	HIGH	4.762	3.216	11.311	1.627	1.213	NA	NA	NA
Gulf	LOW	1.345	1.048	2.567	0.343	0.302	1.871	1.142	2.172
	AVERAGE	4.391	3.563	6.032	2.203	1.621	1.871	1.149	2.172
	HIGH	5.043	4.372	12.976	2.498	1.824	1.871	1.625	2.172
Hamilton	LOW	0.467	0.323	0.843	0.138	0.132	NA	NA	NA
	AVERAGE	0.500	0.347	0.875	0.163	0.151	NA	NA	NA
	HIGH	0.516	0.362	0.927	0.173	0.152	NA	NA	NA
Hardee	LOW	2.667	1.811	5.623	0.769	0.577	NA	0.749	0.935
	AVERAGE	2.757	1.865	6.006	0.838	0.628	NA	0.749	0.994
	HIGH	2.907	1.983	6.341	0.992	0.774	NA	0.749	1.516
Hendry	LOW	4.208	2.749	9.731	1.388	0.945	1.753	1.324	2.813
	AVERAGE	4.986	3.550	12.664	1.867	1.325	2.460	1.714	2.813
	HIGH	6.430	4.412	14.986	2.179	1.628	2.713	1.787	2.813
Hernando	LOW	1.280	0.601	2.901	0.353	0.182	0.448	0.345	0.627
	AVERAGE	1.527	1.062	3.922	0.418	0.342	0.598	0.466	0.742
	HIGH	2.045	1.266	4.562	0.539	0.426	0.700	0.533	0.909
Highlands	LOW	2.829	1.926	5.919	0.820	0.604	1.075	0.810	1.465
	AVERAGE	3.266	2.249	8.242	0.984	0.698	1.189	0.907	1.590
	HIGH	4.258	2.996	13.605	1.295	0.891	1.434	1.098	1.931
Hillsborough	LOW	1.240	0.910	1.944	0.346	0.281	0.432	0.336	0.582
	AVERAGE	2.321	1.523	5.446	0.725	0.580	0.853	0.766	1.107
	HIGH	4.109	2.859	11.606	1.608	1.266	1.814	1.364	1.903
Holmes	LOW	1.147	0.857	2.268	0.292	0.330	0.527	NA	0.874
	AVERAGE	1.459	1.064	2.681	0.372	0.330	0.527	NA	0.874
	HIGH	1.509	1.102	2.852	0.398	0.330	0.527	NA	0.874
Indian River	LOW	2.976	1.528	7.429	0.750	0.691	2.129	1.246	2.165
	AVERAGE	5.393	3.192	12.753	2.626	1.865	3.035	2.669	3.616
	HIGH	7.425	5.321	25.776	3.731	4.224	4.513	5.571	4.395
Jackson	LOW	1.001	0.690	1.642	0.240	0.214	NA	0.274	0.466
	AVERAGE	1.149	0.837	2.080	0.291	0.256	NA	0.299	0.693
	HIGH	1.456	1.032	2.537	0.392	0.314	NA	0.385	0.759

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Jefferson	LOW	0.451	0.309	0.790	0.132	0.111	0.156	NA	NA
	AVERAGE	0.471	0.324	0.880	0.136	0.121	0.156	NA	NA
	HIGH	0.595	0.404	1.544	0.153	0.132	0.156	NA	NA
Lafayette	LOW	0.698	0.512	0.808	0.218	0.173	0.269	NA	NA
	AVERAGE	0.723	0.513	1.427	0.218	0.173	0.269	NA	NA
	HIGH	0.724	0.513	1.429	0.218	0.173	0.269	NA	NA
Lake	LOW	1.074	0.700	2.298	0.292	0.247	0.360	0.294	0.670
	AVERAGE	1.844	1.288	5.078	0.504	0.397	0.721	0.539	0.882
	HIGH	2.579	1.826	8.110	0.755	0.562	0.845	0.643	1.188
Lee	LOW	2.360	1.201	4.354	0.714	0.561	0.689	0.441	0.922
	AVERAGE	4.977	2.271	11.274	1.520	0.861	2.368	1.251	1.986
	HIGH	8.535	6.585	17.767	4.943	3.511	5.943	4.854	5.550
Leon	LOW	0.487	0.341	0.957	0.117	0.103	0.136	0.120	0.209
	AVERAGE	0.662	0.470	1.356	0.168	0.152	0.204	0.181	0.324
	HIGH	0.939	0.637	2.583	0.221	0.192	0.255	0.215	0.469
Levy	LOW	0.695	0.463	1.230	0.242	0.177	0.626	0.440	0.577
	AVERAGE	1.154	0.779	2.276	0.375	0.295	0.626	0.440	0.782
	HIGH	1.540	1.078	3.118	0.625	0.529	0.626	0.440	0.797
Liberty	LOW	0.737	0.496	1.316	0.203	0.222	NA	NA	NA
	AVERAGE	0.973	0.701	1.695	0.255	0.222	NA	NA	NA
	HIGH	1.043	0.735	1.878	0.259	0.222	NA	NA	NA
Madison	LOW	0.469	0.327	0.831	0.142	0.123	NA	NA	NA
	AVERAGE	0.558	0.383	1.003	0.158	0.137	NA	NA	NA
	HIGH	0.686	0.466	1.208	0.182	0.178	NA	NA	NA
Manatee	LOW	1.777	1.091	3.956	0.564	0.359	0.466	0.369	0.566
	AVERAGE	2.908	1.648	7.606	0.994	0.671	1.654	1.154	1.694
	HIGH	6.456	4.923	16.369	3.167	2.876	3.814	3.312	3.941
Marion	LOW	0.614	0.402	1.163	0.152	0.141	0.202	0.296	0.288
	AVERAGE	1.358	0.862	2.903	0.348	0.289	0.474	0.402	0.558
	HIGH	1.815	1.172	4.192	0.475	0.348	0.616	0.485	0.855
Martin	LOW	5.857	2.920	13.324	2.272	0.712	3.013	2.332	3.471
	AVERAGE	7.095	4.491	21.178	3.636	2.319	4.463	3.579	4.728
	HIGH	9.837	6.887	28.058	5.356	3.833	6.091	4.862	5.993
Miami-Dade	LOW	5.345	1.933	17.319	1.125	1.378	1.141	0.841	3.075
	AVERAGE	11.399	7.857	30.343	6.838	5.174	7.433	5.921	7.519
	HIGH	22.276	14.852	53.949	15.331	9.421	12.169	13.551	14.081
Monroe	LOW	11.651	8.690	30.527	5.989	5.122	6.566	6.136	6.907
	AVERAGE	14.580	14.287	49.273	8.379	9.425	11.904	11.566	10.691
	HIGH	27.359	21.203	65.136	17.132	14.090	19.336	16.729	16.329
Nassau	LOW	0.435	0.309	0.822	0.138	0.130	0.356	0.158	0.288
	AVERAGE	0.817	0.515	1.244	0.281	0.210	0.356	0.309	0.542
	HIGH	1.411	0.617	3.171	0.305	0.226	0.356	0.352	0.544
Okaloosa	LOW	1.698	1.213	3.354	0.453	0.369	0.470	1.268	0.755
	AVERAGE	3.851	2.831	5.419	1.415	1.124	2.252	1.556	2.825
	HIGH	6.678	5.049	18.465	2.906	2.482	3.111	2.203	3.584
Okeechobee	LOW	4.309	2.924	10.612	1.489	1.095	2.695	1.003	1.872
	AVERAGE	5.824	4.068	17.077	1.998	1.632	2.695	2.280	3.413
	HIGH	6.942	4.760	18.654	2.586	2.000	2.695	2.458	3.433

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Orange	LOW	1.285	0.877	1.840	0.304	0.268	0.380	0.310	0.562
	AVERAGE	1.718	1.190	4.477	0.434	0.343	0.524	0.415	0.753
	HIGH	2.373	1.855	9.266	0.753	0.519	0.637	0.499	0.951
Osceola	LOW	1.254	0.909	3.677	0.321	0.255	0.400	0.303	0.595
	AVERAGE	1.844	1.405	5.557	0.488	0.391	0.538	0.392	0.745
	HIGH	2.836	1.888	9.259	0.824	0.570	0.790	0.680	1.250
Palm Beach	LOW	4.260	2.791	10.061	1.959	1.345	1.404	0.849	1.699
	AVERAGE	8.584	5.641	21.108	7.010	3.970	5.149	4.174	5.585
	HIGH	15.558	15.068	51.883	8.681	6.273	9.959	8.581	9.859
Pasco	LOW	1.318	0.968	2.776	0.359	0.293	0.436	0.344	0.599
	AVERAGE	1.631	1.185	4.530	0.467	0.389	0.623	0.582	0.933
	HIGH	2.372	1.495	6.936	0.700	0.644	1.063	0.826	1.278
Pinellas	LOW	1.627	0.695	2.378	0.393	0.379	0.669	0.342	0.916
	AVERAGE	2.874	1.957	6.688	0.938	0.840	1.419	1.154	1.752
	HIGH	4.761	4.296	12.808	2.371	2.042	3.192	2.585	3.113
Polk	LOW	1.293	0.974	3.099	0.349	0.273	0.398	0.314	0.588
	AVERAGE	2.317	1.581	5.987	0.650	0.517	0.708	0.609	0.972
	HIGH	3.137	2.072	8.814	0.986	0.773	1.100	0.834	1.542
Putnam	LOW	0.693	0.487	1.258	0.244	0.176	0.252	0.213	0.501
	AVERAGE	0.983	0.682	2.065	0.264	0.224	0.346	0.242	0.522
	HIGH	1.361	0.935	2.993	0.372	0.284	0.428	0.344	0.649
St. Johns	LOW	0.377	0.237	1.312	0.144	0.132	0.144	0.125	0.173
	AVERAGE	0.961	0.692	2.028	0.348	0.298	0.486	0.382	0.682
	HIGH	1.388	0.911	4.611	0.503	0.358	0.609	0.480	0.854
St. Lucie	LOW	4.182	1.829	10.295	1.556	0.593	0.936	0.685	1.192
	AVERAGE	5.689	2.858	16.010	2.206	1.245	3.302	2.859	3.891
	HIGH	10.055	7.203	24.144	5.457	3.187	4.977	3.834	4.803
Santa Rosa	LOW	1.949	1.453	3.735	0.585	0.471	1.006	1.054	0.819
	AVERAGE	4.053	3.168	7.886	1.714	1.363	4.459	2.274	3.903
	HIGH	8.491	6.598	29.405	4.545	2.536	5.210	2.870	5.238
Sarasota	LOW	1.544	1.079	4.406	0.648	0.469	0.597	0.451	0.741
	AVERAGE	3.480	2.153	10.308	1.359	1.029	1.992	1.567	2.227
	HIGH	5.776	3.733	16.096	2.738	2.007	3.414	2.630	3.343
Seminole	LOW	1.462	0.859	3.390	0.346	0.255	0.401	0.310	0.586
	AVERAGE	1.613	1.099	4.087	0.403	0.320	0.503	0.396	0.731
	HIGH	2.317	1.420	5.654	0.437	0.469	0.554	0.434	0.812
Sumter	LOW	1.284	0.874	2.806	0.363	0.287	0.433	0.353	0.576
	AVERAGE	1.317	0.904	3.731	0.385	0.321	0.538	0.372	0.745
	HIGH	1.945	1.256	4.187	0.455	0.443	0.580	0.453	0.835
Suwannee	LOW	0.590	0.408	1.100	0.174	0.152	0.195	0.188	0.325
	AVERAGE	0.660	0.458	1.263	0.182	0.164	0.195	0.188	0.398
	HIGH	0.853	0.582	1.682	0.233	0.206	0.195	0.188	0.496
Taylor	LOW	0.553	0.404	0.903	0.156	0.184	0.172	0.151	0.193
	AVERAGE	0.756	0.536	1.340	0.207	0.186	0.174	0.151	0.193
	HIGH	0.795	0.546	1.478	0.219	0.212	0.211	0.151	0.193
Union	LOW	0.605	0.426	0.976	0.192	0.174	0.200	0.179	0.336
	AVERAGE	0.606	0.427	1.106	0.194	0.181	0.200	0.179	0.336
	HIGH	0.725	0.442	1.768	0.195	0.181	0.200	0.179	0.336

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Volusia	LOW	0.615	0.367	1.297	0.207	0.137	0.332	0.167	0.412
	AVERAGE	1.587	1.022	3.352	0.409	0.476	0.685	0.696	1.111
	HIGH	3.443	2.484	10.504	1.154	0.816	1.525	1.188	1.486
Wakulla	LOW	0.565	0.408	1.182	0.143	0.121	0.203	0.507	0.315
	AVERAGE	0.704	0.515	1.300	0.163	0.148	0.350	0.507	0.918
	HIGH	1.390	1.182	3.492	0.399	0.362	0.452	0.507	1.039
Walton	LOW	1.527	1.115	3.005	0.426	0.333	0.916	0.298	0.965
	AVERAGE	3.334	2.184	5.298	1.246	1.111	2.710	1.696	2.767
	HIGH	5.673	4.137	13.433	2.598	1.900	3.592	2.151	3.612
Washington	LOW	1.451	1.098	2.740	0.423	0.341	0.492	NA	0.789
	AVERAGE	1.569	1.158	2.927	0.442	0.347	0.492	NA	0.789
	HIGH	1.963	1.365	3.966	0.565	0.434	0.492	NA	0.789
Statewide	LOW	0.377	0.237	0.686	0.117	0.103	0.136	0.120	0.173
	AVERAGE	2.619	3.115	6.781	1.518	1.829	1.602	2.507	4.257
	HIGH	27.359	21.203	65.136	17.132	14.090	19.336	16.729	16.329

TABLE 28. FORM A-4: OUTPUT RANGES FOR SPECIFIED DEDUCTIBLE LOSS COSTS PER $1000

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Alachua	LOW	0.173	0.081	0.409	0.015	0.009	0.018	0.008	0.021
	AVERAGE	0.210	0.140	0.977	0.022	0.012	0.032	0.016	0.032
	HIGH	0.382	0.240	2.169	0.049	0.030	0.052	0.045	0.098
Baker	LOW	0.065	0.053	0.239	0.004	0.003	NA	NA	NA
	AVERAGE	0.112	0.069	0.397	0.007	0.007	NA	NA	NA
	HIGH	0.137	0.073	0.483	0.010	0.008	NA	NA	NA
Bay	LOW	0.689	0.491	1.979	0.101	0.066	0.361	0.228	0.412
	AVERAGE	2.411	1.533	5.777	0.705	0.588	1.843	1.045	1.741
	HIGH	5.522	4.001	24.158	2.434	1.672	3.508	2.006	3.193
Bradford	LOW	0.134	0.081	0.299	0.010	0.006	NA	NA	NA
	AVERAGE	0.193	0.113	0.613	0.020	0.008	NA	NA	NA
	HIGH	0.214	0.121	0.700	0.022	0.010	NA	NA	NA
Brevard	LOW	0.787	0.343	2.759	0.192	0.105	0.165	0.073	0.101
	AVERAGE	1.872	1.132	8.904	0.597	0.482	0.843	0.933	1.007
	HIGH	5.705	3.944	17.350	2.586	2.303	3.270	2.362	2.281
Broward	LOW	3.065	1.381	11.216	0.691	0.870	0.718	0.527	0.917
	AVERAGE	6.651	4.206	23.598	2.614	2.044	3.022	2.694	3.813
	HIGH	13.717	9.455	44.150	7.244	5.210	9.498	5.590	6.516
Calhoun	LOW	0.453	0.258	1.208	0.062	0.032	NA	NA	NA
	AVERAGE	0.498	0.290	1.497	0.084	0.048	NA	NA	NA
	HIGH	0.551	0.389	1.742	0.118	0.075	NA	NA	NA
Charlotte	LOW	1.451	0.768	5.358	0.268	0.147	0.467	0.297	0.341
	AVERAGE	2.255	1.262	6.806	0.733	0.470	1.296	0.539	0.639
	HIGH	2.774	2.233	13.523	1.312	0.652	1.769	1.045	1.171
Citrus	LOW	0.389	0.198	1.512	0.058	0.036	0.126	0.033	0.119
	AVERAGE	0.576	0.294	2.037	0.104	0.060	0.140	0.106	0.154
	HIGH	0.931	0.471	3.985	0.172	0.092	0.173	0.147	0.209
Clay	LOW	0.142	0.067	0.551	0.009	0.004	0.018	0.014	0.023
	AVERAGE	0.234	0.148	0.789	0.029	0.019	0.042	0.024	0.050
	HIGH	0.597	0.240	2.944	0.045	0.041	0.058	0.036	0.099
Collier	LOW	1.538	0.734	4.350	0.433	0.224	0.268	0.167	0.336
	AVERAGE	3.143	1.775	11.612	1.450	0.937	1.676	1.197	1.546
	HIGH	7.246	4.422	25.874	3.677	2.015	3.890	2.649	3.073
Columbia	LOW	0.123	0.057	0.319	0.010	0.006	0.024	0.017	0.014
	AVERAGE	0.155	0.094	0.626	0.013	0.007	0.025	0.018	0.014
	HIGH	0.208	0.115	0.732	0.028	0.011	0.028	0.019	0.014
DeSoto	LOW	1.524	0.974	4.594	0.539	0.300	0.488	0.340	0.496
	AVERAGE	2.049	1.192	5.857	0.589	0.385	0.581	0.343	0.501
	HIGH	2.864	1.910	7.540	0.628	0.452	0.803	0.475	0.756
Dixie	LOW	0.203	0.092	0.777	0.025	0.044	0.009	0.007	0.030
	AVERAGE	0.332	0.145	0.942	0.061	0.047	0.058	0.033	0.044
	HIGH	0.772	0.475	3.520	0.077	0.229	0.098	0.057	0.092
Duval	LOW	0.093	0.069	0.495	0.011	0.007	0.009	0.009	0.020
	AVERAGE	0.296	0.201	0.893	0.043	0.028	0.042	0.032	0.056
	HIGH	0.741	1.024	6.464	0.195	0.161	0.203	0.144	0.375

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Escambia	LOW	0.751	0.535	2.164	0.133	0.083	0.405	0.307	0.352
	AVERAGE	2.871	2.131	6.934	1.006	0.815	1.678	0.877	1.329
	HIGH	5.934	3.883	11.974	2.966	2.341	3.368	2.423	2.405
Flagler	LOW	0.218	0.102	1.160	0.017	0.010	0.107	0.009	0.019
	AVERAGE	0.393	0.145	1.701	0.071	0.026	0.153	0.036	0.048
	HIGH	0.757	0.426	2.222	0.276	0.150	0.318	0.160	0.248
Franklin	LOW	1.013	1.013	4.878	0.380	0.371	0.178	0.155	1.135
	AVERAGE	1.842	1.567	6.070	0.868	0.636	0.519	0.585	1.135
	HIGH	4.681	3.735	7.500	1.383	0.822	1.787	0.928	1.135
Gadsden	LOW	0.113	0.065	0.437	0.007	0.010	NA	0.021	0.039
	AVERAGE	0.159	0.113	0.618	0.015	0.013	NA	0.021	0.045
	HIGH	0.314	0.227	1.190	0.036	0.025	NA	0.021	0.046
Gilchrist	LOW	0.321	0.170	1.040	0.066	0.046	NA	0.058	NA
	AVERAGE	0.377	0.220	1.290	0.086	0.056	NA	0.058	NA
	HIGH	0.401	0.242	1.420	0.088	0.058	NA	0.058	NA
Glades	LOW	2.378	0.981	6.859	0.955	0.638	NA	NA	NA
	AVERAGE	3.044	1.754	9.521	0.955	0.638	NA	NA	NA
	HIGH	3.068	1.765	9.613	0.955	0.638	NA	NA	NA
Gulf	LOW	0.472	0.392	1.648	0.061	0.063	1.175	0.678	0.993
	AVERAGE	2.966	2.413	4.878	1.551	1.074	1.175	0.680	0.993
	HIGH	3.500	3.063	11.345	1.787	1.229	1.175	1.069	0.993
Hamilton	LOW	0.088	0.060	0.327	0.007	0.006	NA	NA	NA
	AVERAGE	0.097	0.068	0.365	0.009	0.006	NA	NA	NA
	HIGH	0.101	0.071	0.413	0.009	0.008	NA	NA	NA
Hardee	LOW	1.510	0.867	4.430	0.343	0.208	NA	0.312	0.230
	AVERAGE	1.561	0.894	4.771	0.404	0.245	NA	0.312	0.262
	HIGH	1.683	0.971	5.067	0.562	0.398	NA	0.312	0.540
Hendry	LOW	2.664	1.462	8.185	0.775	0.409	1.014	0.705	1.126
	AVERAGE	3.327	2.094	10.919	1.112	0.699	1.522	0.896	1.126
	HIGH	4.572	2.778	13.060	1.331	0.930	1.702	0.929	1.126
Hernando	LOW	0.527	0.172	2.097	0.112	0.021	0.146	0.091	0.133
	AVERAGE	0.744	0.450	3.050	0.143	0.100	0.234	0.165	0.184
	HIGH	1.181	0.593	3.694	0.217	0.167	0.314	0.227	0.271
Highlands	LOW	1.439	0.863	4.519	0.304	0.183	0.442	0.294	0.355
	AVERAGE	1.789	1.095	6.774	0.443	0.251	0.528	0.350	0.456
	HIGH	2.818	1.827	12.233	0.747	0.401	0.700	0.478	0.700
Hillsborough	LOW	0.520	0.335	1.346	0.094	0.054	0.117	0.065	0.104
	AVERAGE	1.336	0.754	4.363	0.361	0.258	0.416	0.360	0.378
	HIGH	2.879	1.835	10.486	1.090	0.822	1.183	0.836	0.958
Holmes	LOW	0.431	0.329	1.533	0.049	0.084	0.174	NA	0.228
	AVERAGE	0.633	0.436	1.850	0.095	0.084	0.174	NA	0.228
	HIGH	0.661	0.461	1.982	0.110	0.084	0.174	NA	0.228
Indian River	LOW	1.567	0.578	5.961	0.268	0.283	1.278	0.621	0.827
	AVERAGE	3.751	1.936	11.175	1.866	1.247	2.145	1.857	2.002
	HIGH	5.589	3.950	24.081	2.851	3.421	3.485	4.442	2.634
Jackson	LOW	0.336	0.191	0.942	0.029	0.030	NA	0.050	0.044
	AVERAGE	0.430	0.301	1.328	0.059	0.051	NA	0.063	0.128
	HIGH	0.644	0.428	1.873	0.122	0.083	NA	0.103	0.148

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Jefferson	LOW	0.090	0.050	0.350	0.009	0.002	0.011	NA	NA
	AVERAGE	0.092	0.054	0.416	0.009	0.004	0.011	NA	NA
	HIGH	0.194	0.115	1.050	0.018	0.009	0.011	NA	NA
Lafayette	LOW	0.211	0.143	0.427	0.035	0.013	0.050	NA	NA
	AVERAGE	0.217	0.144	0.828	0.035	0.013	0.050	NA	NA
	HIGH	0.217	0.163	0.830	0.035	0.013	0.050	NA	NA
Lake	LOW	0.384	0.181	1.473	0.056	0.029	0.070	0.039	0.103
	AVERAGE	0.823	0.488	4.028	0.146	0.093	0.260	0.158	0.176
	HIGH	1.457	0.919	6.774	0.328	0.202	0.369	0.235	0.359
Lee	LOW	1.245	0.481	3.385	0.315	0.194	0.243	0.125	0.201
	AVERAGE	3.512	1.253	9.864	0.941	0.421	1.627	0.697	0.891
	HIGH	6.799	5.080	16.001	3.978	2.812	4.883	3.960	3.831
Leon	LOW	0.104	0.060	0.538	0.005	0.002	0.007	0.003	0.012
	AVERAGE	0.185	0.120	0.803	0.013	0.008	0.018	0.012	0.021
	HIGH	0.404	0.231	2.023	0.046	0.019	0.036	0.031	0.075
Levy	LOW	0.250	0.114	0.737	0.064	0.028	0.263	0.149	0.126
	AVERAGE	0.453	0.248	1.474	0.119	0.061	0.263	0.149	0.203
	HIGH	0.723	0.465	2.229	0.321	0.256	0.263	0.149	0.208
Liberty	LOW	0.202	0.112	0.729	0.029	0.034	NA	NA	NA
	AVERAGE	0.329	0.211	1.041	0.038	0.034	NA	NA	NA
	HIGH	0.369	0.224	1.191	0.038	0.034	NA	NA	NA
Madison	LOW	0.083	0.050	0.340	0.009	0.004	NA	NA	NA
	AVERAGE	0.146	0.087	0.507	0.014	0.007	NA	NA	NA
	HIGH	0.204	0.108	0.674	0.019	0.022	NA	NA	NA
Manatee	LOW	0.838	0.446	3.138	0.223	0.111	0.146	0.093	0.120
	AVERAGE	1.820	0.879	6.483	0.552	0.334	1.093	0.705	0.808
	HIGH	5.082	3.730	14.762	2.469	2.297	2.980	2.629	2.584
Marion	LOW	0.169	0.072	0.618	0.006	0.005	0.019	0.034	0.023
	AVERAGE	0.549	0.256	2.021	0.072	0.042	0.127	0.080	0.093
	HIGH	0.920	0.474	3.240	0.149	0.077	0.208	0.131	0.216
Martin	LOW	4.050	1.615	11.533	1.425	0.318	2.050	1.522	1.797
	AVERAGE	5.227	2.974	19.265	2.730	1.585	3.364	2.641	2.851
	HIGH	7.716	5.321	26.289	4.333	2.950	4.858	3.811	3.940
Miami-Dade	LOW	3.806	1.044	15.304	0.618	0.867	0.558	0.386	1.385
	AVERAGE	9.271	6.075	28.123	5.628	4.092	6.036	4.691	5.214
	HIGH	19.745	12.647	51.480	13.571	7.932	10.408	11.801	11.034
Monroe	LOW	9.388	6.802	27.969	4.852	4.138	5.274	4.863	4.498
	AVERAGE	12.120	12.084	46.690	7.067	8.146	10.322	10.084	8.050
	HIGH	24.710	18.763	62.340	15.377	12.553	17.530	15.128	13.388
Nassau	LOW	0.079	0.045	0.363	0.004	0.003	0.073	0.009	0.037
	AVERAGE	0.266	0.133	0.722	0.055	0.024	0.073	0.051	0.082
	HIGH	0.731	0.171	2.372	0.063	0.027	0.073	0.098	0.082
Okaloosa	LOW	0.784	0.452	2.389	0.127	0.072	0.139	0.635	0.154
	AVERAGE	2.465	1.703	4.301	0.845	0.616	1.436	0.868	1.348
	HIGH	4.929	3.582	16.937	2.078	1.771	2.169	1.427	2.025
Okeechobee	LOW	2.599	1.593	8.915	0.804	0.546	1.624	0.425	0.666
	AVERAGE	3.944	2.523	15.081	1.202	0.956	1.624	1.423	1.598
	HIGH	4.945	3.090	16.585	1.662	1.237	1.624	1.563	1.610

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Orange	LOW	0.489	0.253	1.177	0.047	0.028	0.069	0.041	0.069
	AVERAGE	0.737	0.429	3.420	0.097	0.056	0.121	0.074	0.117
	HIGH	1.163	0.951	8.035	0.334	0.143	0.211	0.132	0.236
Osceola	LOW	0.504	0.283	2.721	0.064	0.031	0.082	0.040	0.068
	AVERAGE	0.834	0.542	4.379	0.143	0.087	0.142	0.076	0.116
	HIGH	1.601	0.849	8.107	0.373	0.182	0.267	0.211	0.359
Palm Beach	LOW	2.754	1.644	8.528	1.168	0.690	0.749	0.358	0.622
	AVERAGE	6.604	3.985	19.055	5.807	3.022	3.938	3.109	3.537
	HIGH	13.140	12.948	49.516	7.378	5.129	8.455	7.210	7.369
Pasco	LOW	0.557	0.385	1.969	0.102	0.068	0.126	0.086	0.120
	AVERAGE	0.787	0.547	3.522	0.173	0.132	0.238	0.252	0.312
	HIGH	1.422	0.848	6.014	0.353	0.342	0.631	0.460	0.550
Pinellas	LOW	0.847	0.262	1.739	0.116	0.114	0.278	0.111	0.280
	AVERAGE	1.872	1.168	5.687	0.541	0.483	0.899	0.701	0.858
	HIGH	3.472	3.277	11.625	1.829	1.533	2.507	1.979	1.967
Polk	LOW	0.516	0.349	2.152	0.083	0.044	0.087	0.056	0.082
	AVERAGE	1.208	0.705	4.788	0.250	0.167	0.266	0.204	0.237
	HIGH	1.947	1.108	7.671	0.530	0.374	0.503	0.336	0.518
Putnam	LOW	0.178	0.103	0.684	0.031	0.010	0.030	0.012	0.083
	AVERAGE	0.342	0.197	1.309	0.041	0.024	0.067	0.021	0.093
	HIGH	0.621	0.358	2.108	0.100	0.045	0.112	0.064	0.129
St. Johns	LOW	0.069	0.027	0.773	0.009	0.004	0.007	0.004	0.006
	AVERAGE	0.358	0.207	1.324	0.098	0.068	0.160	0.098	0.157
	HIGH	0.601	0.309	3.742	0.209	0.101	0.247	0.162	0.218
St. Lucie	LOW	2.539	0.841	8.543	0.842	0.224	0.405	0.259	0.326
	AVERAGE	3.995	1.595	14.225	1.437	0.689	2.322	1.997	2.172
	HIGH	8.027	5.463	21.988	4.386	2.351	3.816	2.847	2.873
Santa Rosa	LOW	0.957	0.699	2.735	0.242	0.156	0.459	0.526	0.193
	AVERAGE	2.585	1.944	6.514	1.093	0.804	3.410	1.490	2.194
	HIGH	6.495	4.908	27.502	3.576	1.765	4.078	2.045	3.202
Sarasota	LOW	0.760	0.478	3.504	0.300	0.190	0.235	0.157	0.194
	AVERAGE	2.361	1.284	9.118	0.894	0.627	1.394	1.039	1.187
	HIGH	4.363	2.577	14.932	2.105	1.431	2.623	1.930	2.012
Seminole	LOW	0.550	0.285	2.375	0.047	0.035	0.057	0.035	0.069
	AVERAGE	0.682	0.378	3.089	0.090	0.052	0.118	0.070	0.121
	HIGH	1.269	0.575	4.692	0.117	0.141	0.156	0.100	0.179
Sumter	LOW	0.493	0.287	1.797	0.081	0.041	0.095	0.058	0.087
	AVERAGE	0.529	0.307	2.720	0.089	0.053	0.155	0.066	0.163
	HIGH	0.927	0.488	3.083	0.143	0.141	0.196	0.099	0.204
Suwannee	LOW	0.144	0.089	0.557	0.019	0.010	0.022	0.020	0.048
	AVERAGE	0.181	0.113	0.685	0.022	0.018	0.022	0.020	0.070
	HIGH	0.269	0.155	1.000	0.045	0.034	0.022	0.020	0.101
Taylor	LOW	0.146	0.119	0.445	0.018	0.017	0.024	0.021	0.017
	AVERAGE	0.250	0.147	0.762	0.031	0.022	0.029	0.021	0.017
	HIGH	0.270	0.157	0.959	0.035	0.065	0.030	0.021	0.017
Union	LOW	0.133	0.067	0.425	0.012	0.008	0.014	0.007	0.041
	AVERAGE	0.135	0.074	0.522	0.012	0.008	0.014	0.007	0.041
	HIGH	0.248	0.095	1.127	0.013	0.008	0.014	0.007	0.041

County	Loss Costs	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Volusia	LOW	0.128	0.051	0.703	0.020	0.003	0.057	0.005	0.027
	AVERAGE	0.715	0.365	2.450	0.114	0.183	0.271	0.288	0.327
	HIGH	2.240	1.528	9.240	0.654	0.438	0.926	0.687	0.520
Wakulla	LOW	0.139	0.073	0.683	0.007	0.002	0.023	0.168	0.021
	AVERAGE	0.204	0.132	0.776	0.016	0.012	0.075	0.168	0.257
	HIGH	0.533	0.513	2.541	0.108	0.085	0.111	0.168	0.306
Walton	LOW	0.677	0.447	2.152	0.138	0.085	0.436	0.056	0.246
	AVERAGE	2.020	1.179	4.159	0.707	0.615	1.828	1.020	1.315
	HIGH	3.952	2.702	11.607	1.790	1.221	2.575	1.369	1.907
Washington	LOW	0.589	0.441	1.881	0.115	0.084	0.134	NA	0.130
	AVERAGE	0.663	0.481	2.026	0.129	0.086	0.134	NA	0.130
	HIGH	0.996	0.593	2.930	0.211	0.132	0.134	NA	0.130
Statewide	LOW	0.065	0.027	0.239	0.004	0.002	0.007	0.003	0.006
	AVERAGE	1.606	2.034	5.659	1.051	1.272	1.041	1.769	2.662
	HIGH	24.710	18.763	62.340	15.377	12.553	17.530	15.128	13.388

Form A-5: Percentage Change in Output Ranges

A. *Provide summaries of the percentage change in average loss cost output range data compiled in Form A-4, Output Ranges, relative to the equivalent data compiled from the previously accepted model in the format shown in the file named "2015FormA5.xlsx."*

For the change in output range exhibit, provide the summary by:

- *Statewide (overall percentage change),*
- *By region, as defined in Figure 49 – North, Central and South,*
- *By county, as defined in Figure 50 – Coastal and Inland.*

B. *Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also, include all tables in Form A-5, Percentage Change in Output Ranges, in a submission appendix.*

Figure 49. State of Florida by North/Central/South Regions

State of Florida by North/Central/South Regions

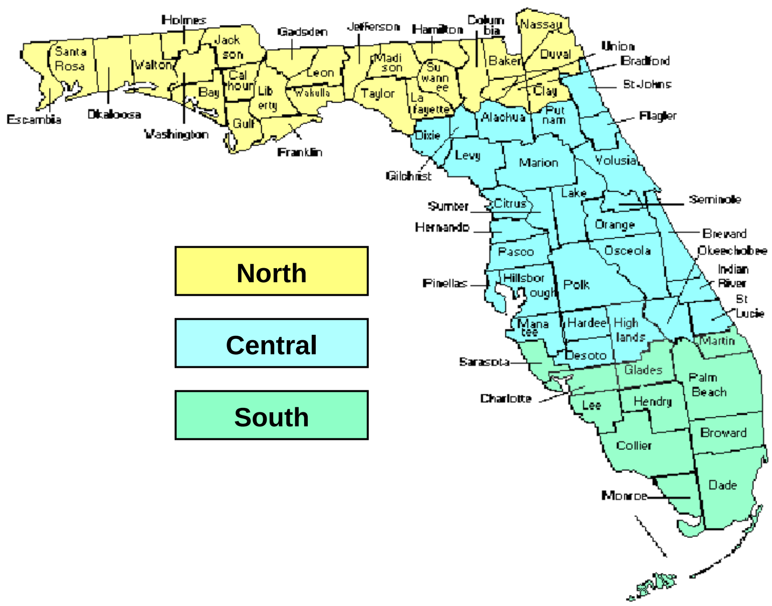
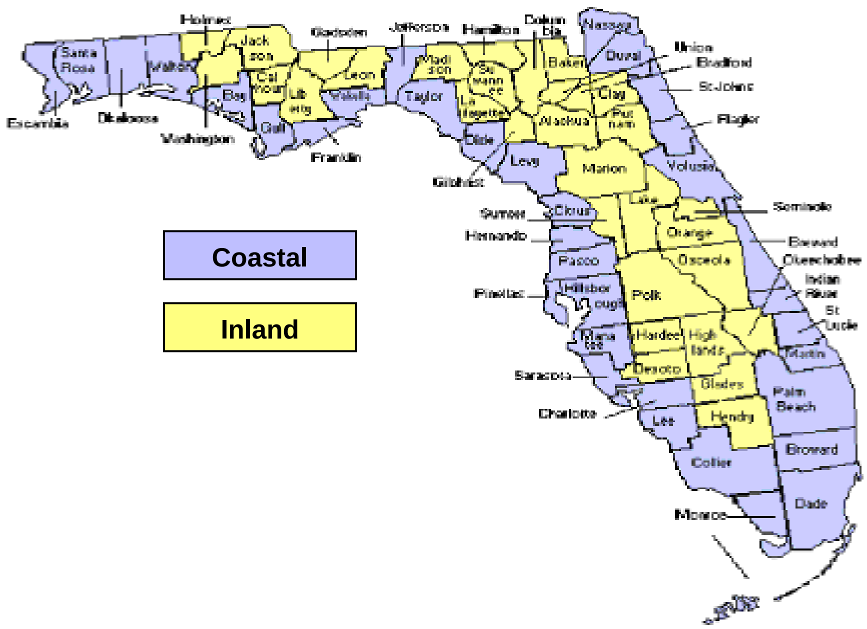


Figure 50. State of Florida by Coastal/Inland Counties

State of Florida by Coastal/Inland Counties



The results are shown on Form A-5.

Form A-5: Percentage Change in Output Ranges

TABLE 29. FORM A-5: PERCENTAGE CHANGE IN OUTPUT RANGES

Form A-5 Percentage Change in Output Ranges

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Percentage Change in $0 Deductible Output Ranges

Region	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Coastal	12.122	14.798	15.285	(2.199)	(1.078)	0.515	(0.043)	4.931
Inland	23.115	20.516	18.990	1.665	2.551	2.064	3.281	3.962
North	12.647	17.356	20.254	(2.657)	0.075	(1.497)	(4.205)	0.621
Central	17.287	18.347	16.862	0.821	0.920	1.626	0.440	4.552
South	11.122	14.266	15.296	(2.444)	(1.239)	0.795	0.037	5.041
Statewide	13.758	15.281	16.480	(1.880)	(0.923)	0.628	(0.007)	4.920

Percentage Change in Specified Deductible Output Ranges

Region	Frame Owners	Masonry Owners	Manufactured Homes	Frame Renters	Masonry Renters	Frame Condo Unit	Masrony Condo Unit	Commercial Residential
Coastal	12.567	16.464	13.928	(3.428)	(2.489)	(0.576)	(1.480)	5.114
Inland	29.897	29.933	16.359	1.833	4.408	1.916	5.489	8.316
North	13.625	20.503	15.614	(3.899)	0.455	(1.848)	(5.016)	1.938
Central	18.546	22.550	14.526	(1.303)	(1.237)	0.130	(1.599)	4.700
South	11.475	15.939	14.753	(3.470)	(2.539)	(0.379)	(1.373)	5.195
Statewide	14.246	17.096	14.672	(3.275)	(2.403)	(0.507)	(1.456)	5.124

C. *Provide color-coded maps by county reflecting the percentage changes in the average loss costs with specified deductibles for frame owners, masonry owners, frame renters, masonry renters, frame condo unit owners, masonry condo unit owners, manufactured home, and commercial residential from the output ranges from the previously accepted model.*

Counties with a negative percentage change (reduction in loss costs) shall be indicated with shades of blue; counties with a positive percentage change (increase in loss costs) shall be indicated with shades of red; and counties with no percentage change shall be white. The larger the percentage change in the county, the more intense the color-shade.

The percentage changes in the county level weighted average loss costs with the specified deductible for the eight policy types are shown in Figures 51 to 58 below.

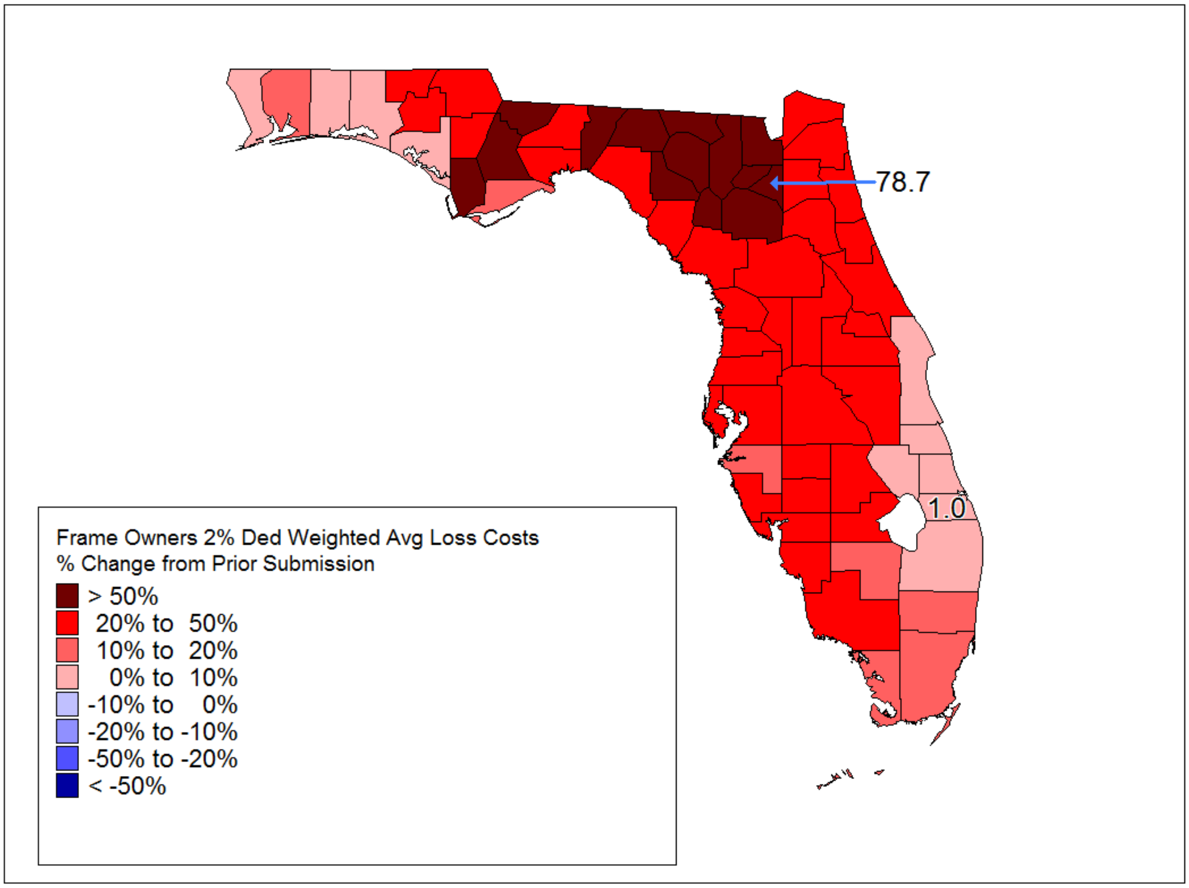


Figure 51. Frame Owners - % changes by county

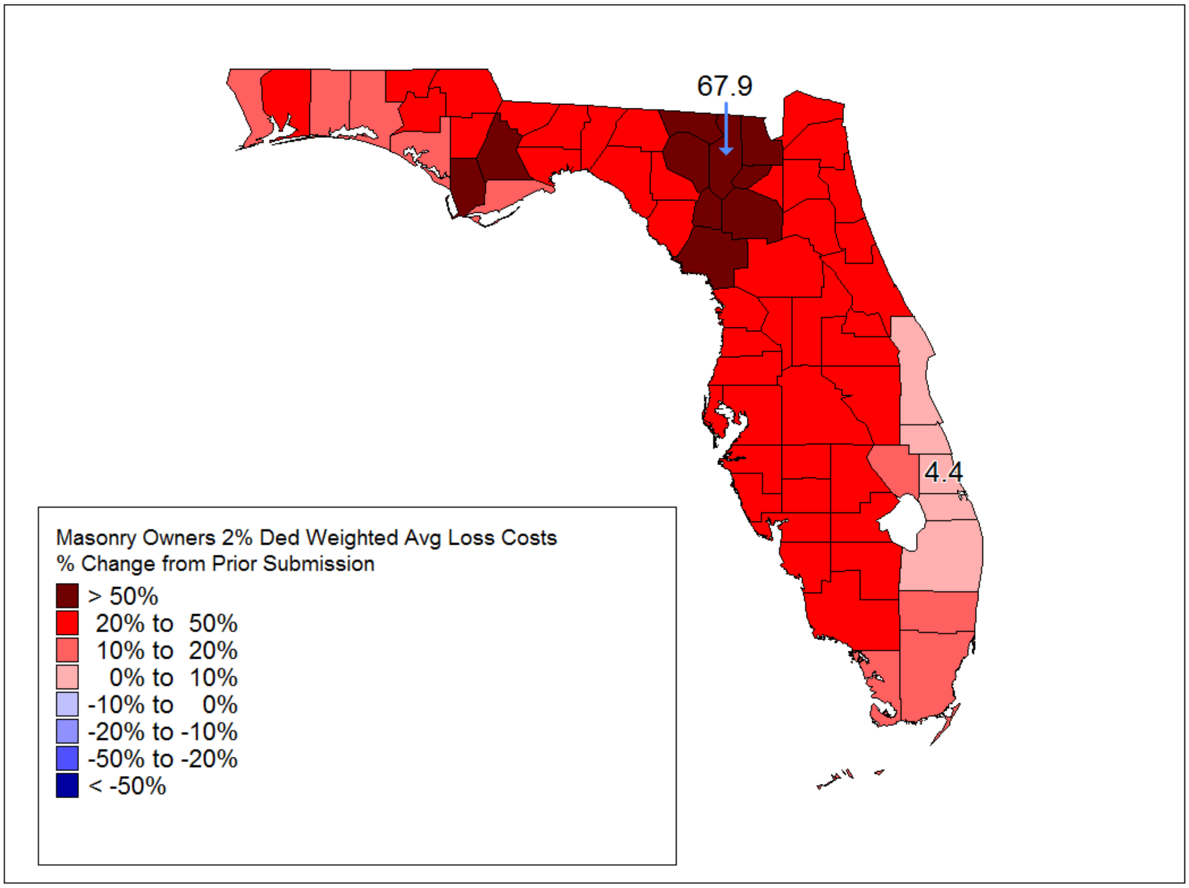


Figure 52. Masonry Owners - % changes by county

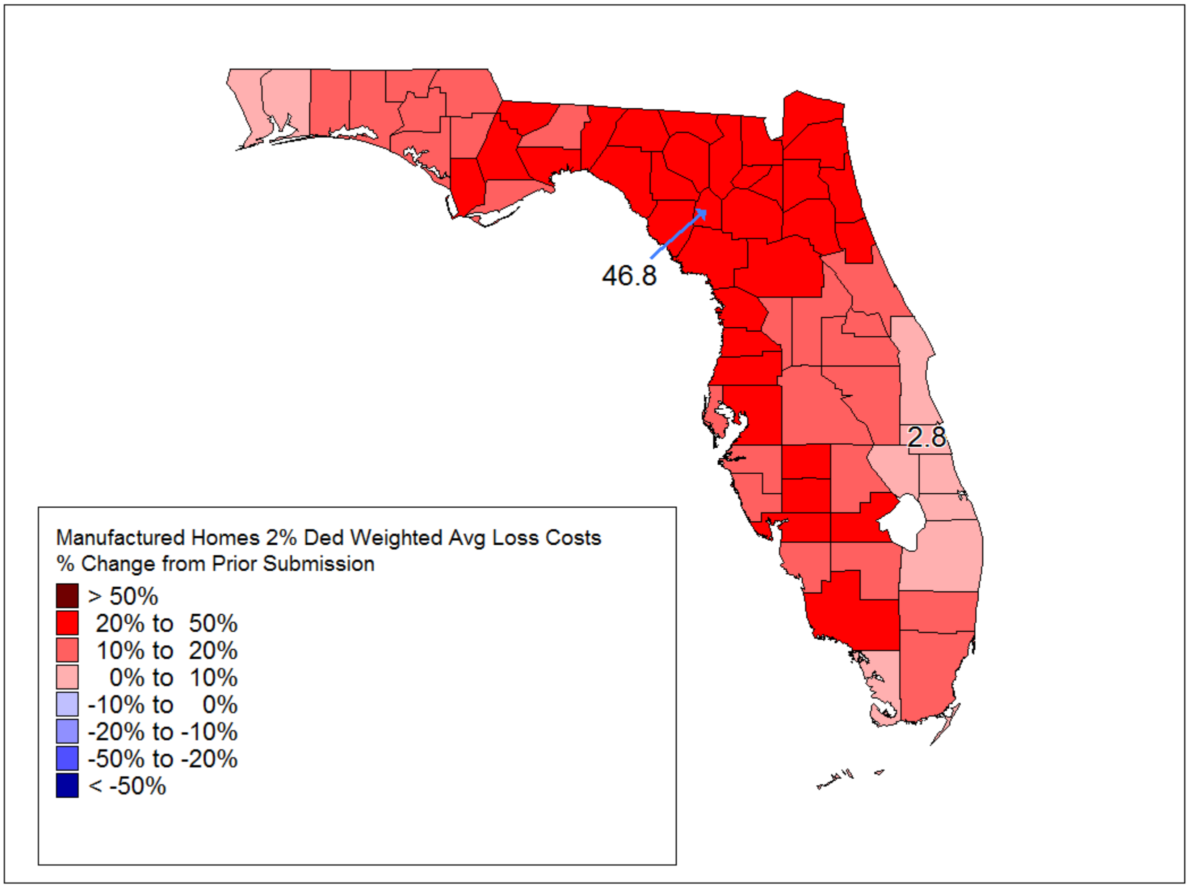


Figure 53. Manufactured Homes - % changes by county

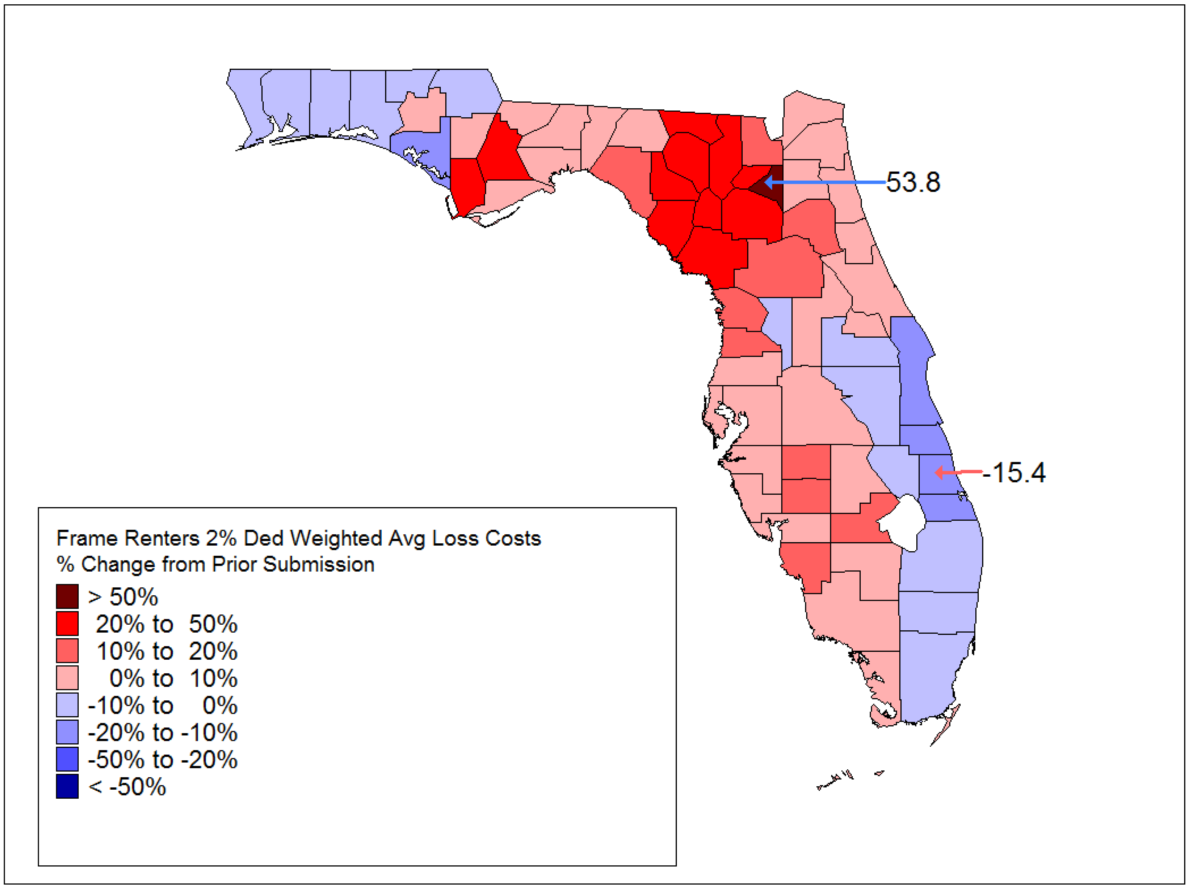


Figure 54. Frame Renters - % changes by county

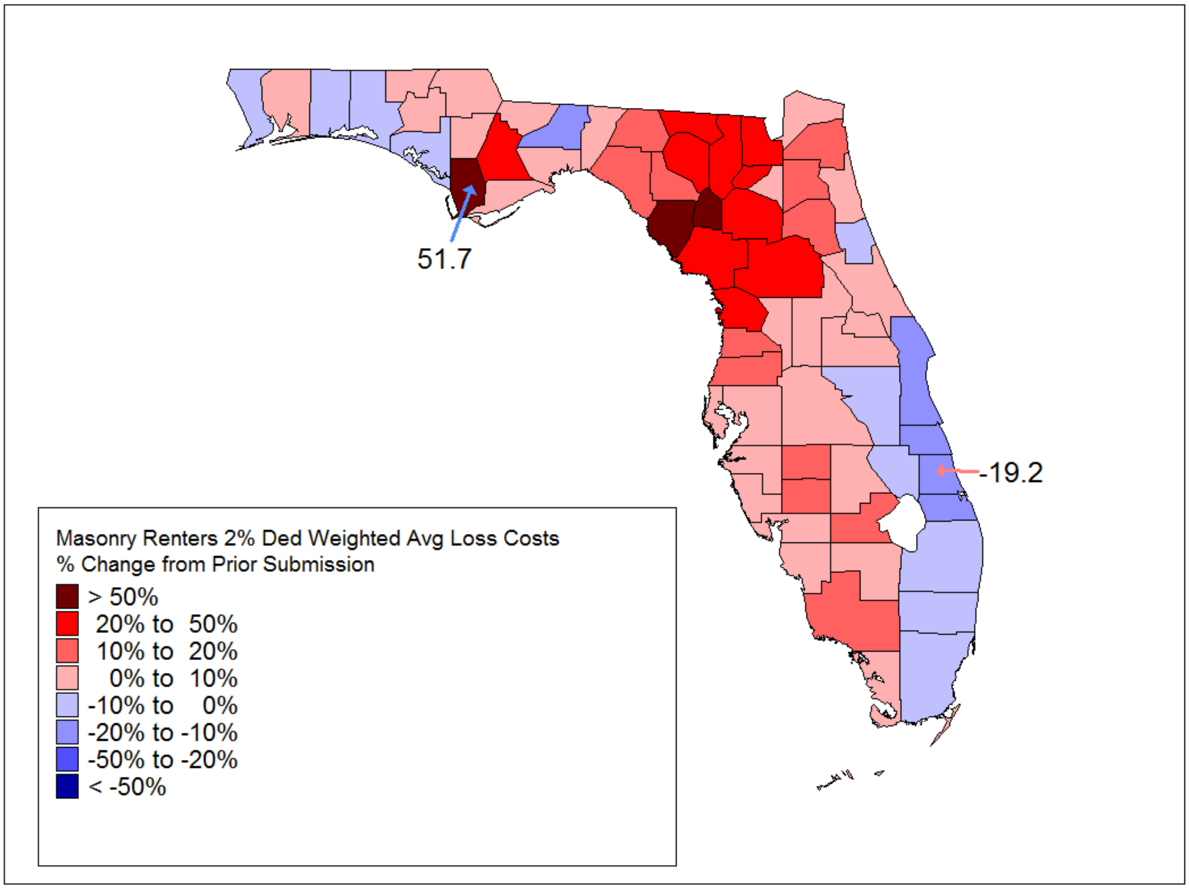


Figure 55. Masonry Renters - % changes by county

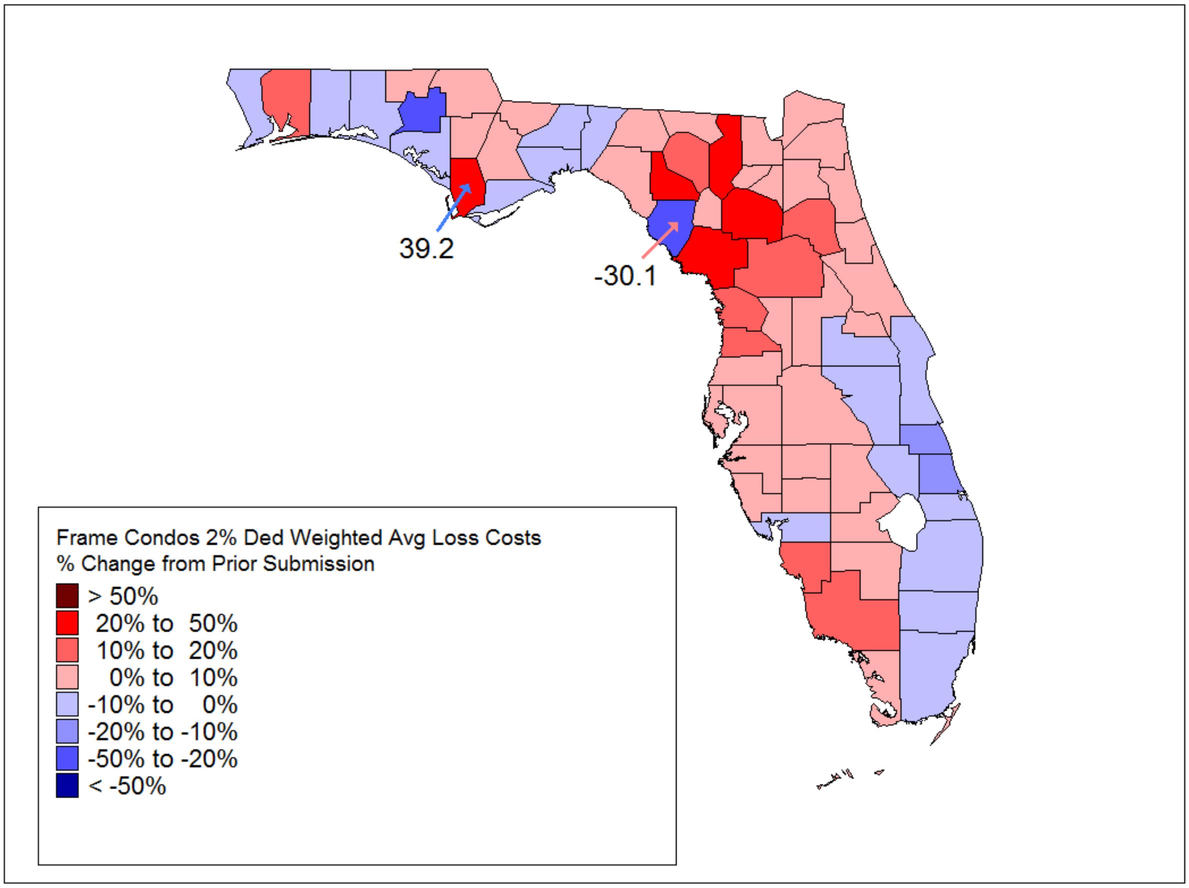


Figure 56. Frame Condos - % changes by county

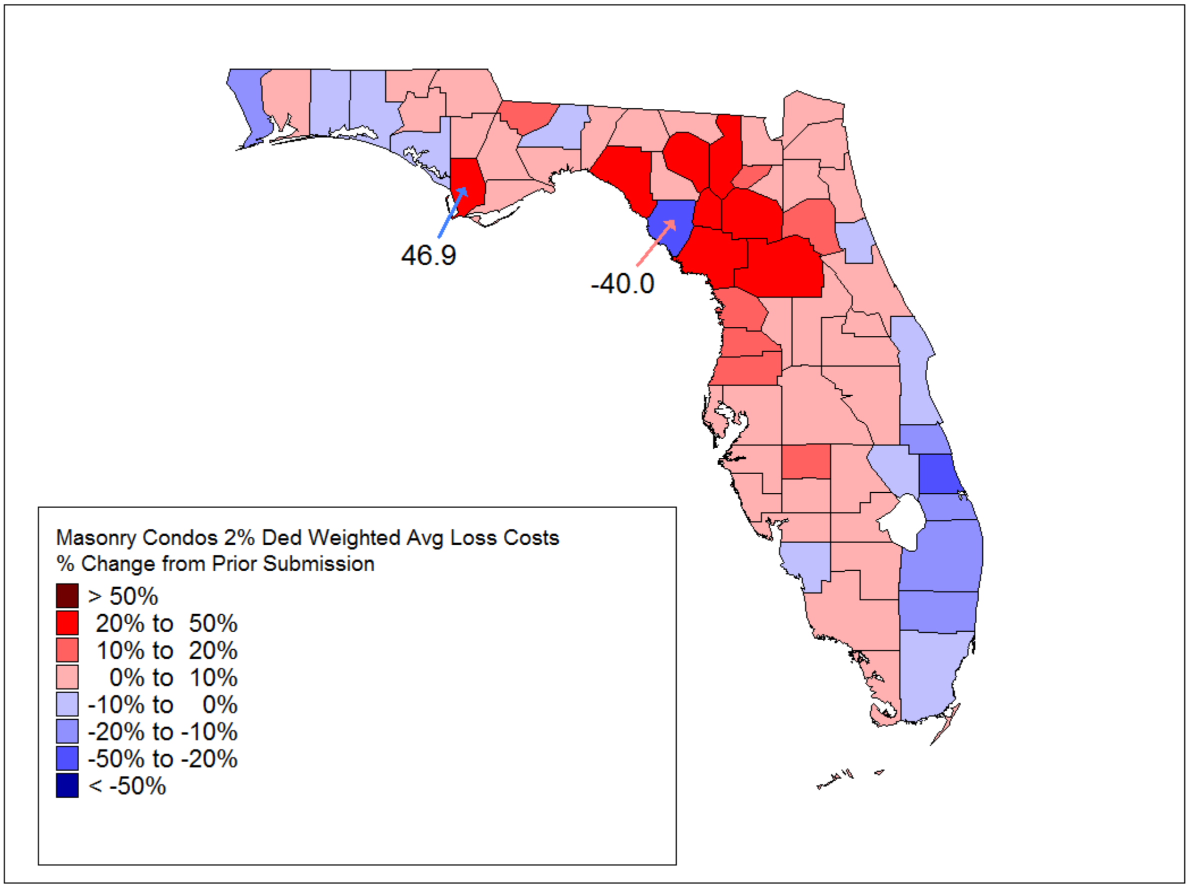


Figure 57. Masonry Condos - % changes by county

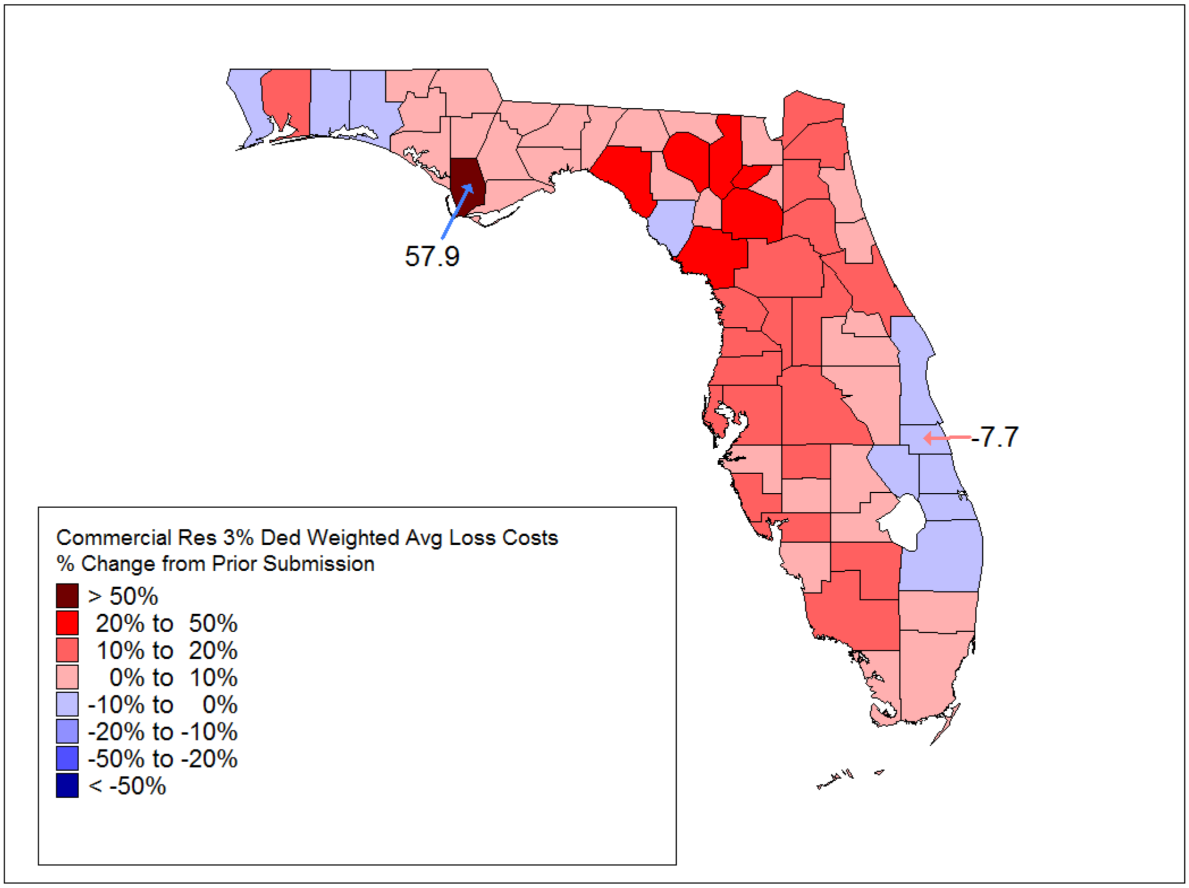


Figure 58. Commercial Residential - % changes by county

Form A-6: Logical Relationship to Risk (Trade Secret Item)

This form will be provided during the professional team on-site review as well as the closed meeting portion of the commission meeting.

Form A-7: Percentage Change in Logical Relationship to Risk

A. Provide summaries of the percentage change in logical relationship to risk exhibits from the previously accepted model in the format shown in the file named "2015FormA7.xlsx."

*B. Create exposure sets for each exhibit by modeling all of the structures from the appropriate Notional Set listed below at each of the locations in "Location Grid B" as described in the file **"NotionalInput15.xlsx."** Refer to the Notional Policy Specifications provided in Form A-6 (Logical Relationship to Risk, Trade Secret item) for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information.*

Exhibit	Notional Set
Deductible Sensitivity	Set 1
Construction Sensitivity	Set 2
Policy Form Sensitivity	Set 3
Coverage Sensitivity	Set 4
Building Code/Enforcement (Year Built) Sensitivity	Set 5
Building Strength Sensitivity	Set 6
Condo Unit Floor Sensitivity	Set 7
Number of Stories Sensitivity	Set 8

Models shall treat points in Location Grid B as coordinates that would result from a geocoding process. Models shall treat points by simulating loss at exact location or by using the nearest modeled parcel/street/cell in the model.

Provide the results statewide (overall percentage change) and by the regions defined in Form A-5, Percentage Change in Output Ranges.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also, include all tables in Form A-7, Percentage Change in Logical Relationship to Risk, in a submission appendix.

TABLE 30. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK – DEDUCTIBLES

Form A-7: Percent Change in Logical Relationship to Risk - Deductibles

Modeling Organization: CoreLogic, inc

Model Name & Version Number: Florida Hurricane Model 2017a

Model Release Date: 20 March 2017

Construction / Policy	Region	Percent Change in Loss Cost					
		$0	$500	1%	2%	5%	10%
Frame Owners	Coastal	12.6%	13.1%	13.3%	13.5%	13.1%	12.0%
	Inland	21.3%	24.4%	25.9%	27.7%	29.7%	30.3%
	North	12.8%	13.8%	14.1%	14.0%	13.0%	11.3%
	Central	17.1%	18.5%	19.0%	19.3%	18.1%	15.0%
	South	12.2%	12.6%	12.9%	13.1%	13.0%	12.1%
	Statewide	13.4%	14.0%	14.3%	14.4%	13.8%	12.5%
Masonry Owners	Coastal	12.8%	13.4%	13.7%	13.9%	13.7%	12.7%
	Inland	20.0%	23.1%	24.7%	26.8%	30.8%	33.8%
	North	12.0%	13.0%	13.3%	13.6%	13.4%	12.5%
	Central	16.4%	17.8%	18.3%	18.7%	18.1%	15.5%
	South	12.6%	13.1%	13.4%	13.7%	13.7%	12.8%
	Statewide	13.4%	14.1%	14.4%	14.7%	14.3%	13.1%
Manufactured Homes	Coastal	11.9%	12.2%	12.2%	12.3%	12.5%	12.6%
	Inland	16.1%	17.4%	17.4%	17.9%	18.8%	19.3%
	North	8.9%	9.3%	9.3%	9.4%	9.5%	9.3%
	Central	13.8%	14.4%	14.4%	14.7%	15.0%	15.0%
	South	12.2%	12.4%	12.4%	12.5%	12.7%	12.9%
	Statewide	12.3%	12.6%	12.6%	12.8%	13.0%	13.1%
Frame Renters	Coastal	2.3%	1.8%	1.8%	1.8%	1.3%	0.5%
	Inland	3.1%	4.5%	4.5%	4.5%	5.0%	5.6%
	North	-0.9%	-1.1%	-1.1%	-1.1%	-1.2%	-1.2%
	Central	1.8%	0.7%	0.7%	0.7%	-0.4%	-1.7%
	South	2.9%	2.5%	2.5%	2.5%	1.9%	1.1%
	Statewide	2.3%	1.9%	1.9%	1.9%	1.4%	0.6%
Masonry Renters	Coastal	2.1%	1.6%	1.6%	1.6%	0.9%	0.1%
	Inland	3.2%	5.2%	5.2%	5.2%	5.8%	6.2%
	North	-0.9%	-1.0%	-1.0%	-1.0%	-1.1%	-1.0%
	Central	1.8%	0.4%	0.4%	0.4%	-0.9%	-2.3%
	South	2.7%	2.1%	2.1%	2.1%	1.4%	0.6%
	Statewide	2.2%	1.7%	1.7%	1.7%	1.0%	0.2%
Frame Condo Unit	Coastal	2.6%	2.3%	2.3%	2.1%	1.5%	0.8%
	Inland	3.4%	4.3%	4.3%	4.7%	5.3%	5.8%
	North	-0.8%	-0.9%	-0.9%	-1.0%	-1.1%	-1.1%
	Central	2.2%	1.5%	1.5%	1.0%	-0.1%	-1.5%
	South	3.2%	3.0%	3.0%	2.7%	2.1%	1.3%
	Statewide	2.6%	2.4%	2.4%	2.2%	1.6%	0.9%
Masonry Condo Unit	Coastal	2.4%	2.1%	2.1%	1.8%	1.1%	0.3%
	Inland	3.4%	4.7%	4.7%	5.3%	6.0%	6.5%
	North	-0.7%	-0.8%	-0.8%	-0.9%	-1.0%	-0.9%
	Central	2.2%	1.4%	1.4%	0.7%	-0.6%	-2.1%
	South	3.0%	2.7%	2.7%	2.4%	1.7%	0.8%
	Statewide	2.5%	2.2%	2.2%	1.9%	1.2%	0.4%

Construction / Policy	Region	Percent Change in Loss Cost					
		$0	2%	3%	5%	10%	
Commercial Residential	Coastal	5.0%	5.0%	4.8%	4.4%	3.4%	
	Inland	4.5%	8.2%	8.7%	9.6%	11.5%	
	North	-0.4%	-0.2%	-0.1%	0.1%	0.7%	
	Central	3.8%	3.4%	3.1%	2.4%	0.8%	
	South	6.0%	5.8%	5.6%	5.1%	4.0%	
	Statewide	5.0%	5.1%	4.9%	4.5%	3.5%	

TABLE 31. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK - CONSTRUCTION

Form A-7: Percent Change in Logical Relationship to Risk - Construction

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Policy	Region	Percent Change in Loss Cost	
		Masonry	Frame
Owners	Coastal	12.8%	12.6%
	Inland	20.0%	21.3%
	North	12.0%	12.8%
	Central	16.4%	17.1%
	South	12.6%	12.2%
	Statewide	13.4%	13.4%
Renters	Coastal	2.1%	2.3%
	Inland	3.2%	3.1%
	North	-0.9%	-0.9%
	Central	1.8%	1.8%
	South	2.7%	2.9%
	Statewide	2.2%	2.3%
Condo Unit	Coastal	2.4%	2.6%
	Inland	3.4%	3.4%
	North	-0.7%	-0.8%
	Central	2.2%	2.2%
	South	3.0%	3.2%
	Statewide	2.5%	2.6%
Policy	**Region**	**Percent Change in Loss Cost**	
		Concrete	
Commercial Residential	Coastal	5.0%	
	Inland	4.5%	
	North	-0.4%	
	Central	3.8%	
	South	6.0%	
	Statewide	5.0%	

TABLE 32. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK – POLICY FORM

Form A-7: Percent Change in Logical Relationship to Risk - Policy Form

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Region	Percent Change in Loss Cost		
	Frame Owners	Masonry Owners	Manufactured Homes
Coastal	12.6%	12.8%	11.9%
Inland	21.3%	20.0%	16.1%
North	12.8%	12.0%	8.9%
Central	17.1%	16.4%	13.8%
South	12.2%	12.6%	12.2%
Statewide	13.4%	13.4%	12.3%

TABLE 33. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK – COVERAGE

Form A-7: Percent Change in Logical Relationship to Risk - Coverage

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Construction / Policy	Region	Percent Change in Loss Cost			
		Coverage A	Coverage B	Coverage C	Coverage D
Frame Owners	Coastal	4.5%	126.3%	2.5%	1.3%
	Inland	4.4%	230.6%	4.6%	0.1%
	North	0.1%	176.7%	-0.6%	-2.0%
	Central	4.1%	185.2%	2.5%	-0.3%
	South	5.2%	112.8%	3.0%	2.2%
	Statewide	4.5%	137.0%	2.7%	1.2%
Masonry Owners	Coastal	4.4%	132.9%	2.2%	1.8%
	Inland	4.5%	216.0%	4.6%	0.6%
	North	0.1%	169.9%	-0.6%	-1.6%
	Central	4.2%	179.0%	2.2%	0.5%
	South	5.0%	123.2%	2.7%	2.7%
	Statewide	4.4%	141.0%	2.3%	1.6%
Manufactured Homes	Coastal	5.7%	87.3%	3.8%	15.6%
	Inland	4.8%	146.2%	5.6%	4.0%
	North	0.0%	112.5%	-1.0%	9.0%
	Central	4.9%	122.4%	3.1%	7.0%
	South	6.8%	78.9%	4.6%	17.7%
	Statewide	5.6%	93.4%	3.8%	14.7%
Frame Renters	Coastal	0.0%	0.0%	2.5%	1.3%
	Inland	0.0%	0.0%	4.6%	0.1%
	North	0.0%	0.0%	-0.6%	-2.0%
	Central	0.0%	0.0%	2.5%	-0.3%
	South	0.0%	0.0%	3.0%	2.2%
	Statewide	0.0%	0.0%	2.6%	1.2%
Masonry Renters	Coastal	0.0%	0.0%	2.2%	1.8%
	Inland	0.0%	0.0%	4.6%	0.6%
	North	0.0%	0.0%	-0.6%	-1.6%
	Central	0.0%	0.0%	2.2%	0.5%
	South	0.0%	0.0%	2.7%	2.7%
	Statewide	0.0%	0.0%	2.3%	1.6%
Frame Condo Unit	Coastal	4.5%	0.0%	2.5%	1.3%
	Inland	4.4%	0.0%	4.6%	0.1%
	North	0.1%	0.0%	-0.6%	-2.0%
	Central	4.1%	0.0%	2.5%	-0.3%
	South	5.2%	0.0%	3.0%	2.2%
	Statewide	4.5%	0.0%	2.6%	1.2%
Masonry Condo Unit	Coastal	4.4%	0.0%	2.2%	1.8%
	Inland	4.5%	0.0%	4.6%	0.6%
	North	0.1%	0.0%	-0.6%	-1.6%
	Central	4.2%	0.0%	2.2%	0.5%
	South	5.0%	0.0%	2.7%	2.7%
	Statewide	4.4%	0.0%	2.3%	1.6%
Commercial Residential	Coastal	5.4%	0.0%	3.9%	1.3%
	Inland	6.1%	0.0%	4.7%	0.6%
	North	-0.1%	0.0%	-0.5%	-1.7%
	Central	4.4%	0.0%	3.7%	1.2%
	South	6.3%	0.0%	4.5%	2.1%
	Statewide	5.5%	0.0%	3.9%	1.2%

TABLE 34. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK – BUILDING CODE / ENFORCEMENT (YEAR BUILT) SENSITIVITY

Form A-7: Percent Change in Logical Relationship to Risk - Building Code / Enforcement (Year Built) Sensitivity

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Construction / Policy	Region	Percent Change in Loss Cost		
		Year Built 1980	Year Built 1998	Year Built 2004
Frame Owners	Coastal	12.7%	9.8%	5.9%
	Inland	21.5%	20.5%	19.8%
	North	12.8%	11.7%	10.1%
	Central	17.3%	16.1%	14.6%
	South	12.3%	8.5%	4.1%
	Statewide	13.6%	11.1%	7.9%
Masonry Owners	Coastal	12.9%	16.2%	7.7%
	Inland	20.1%	21.6%	19.2%
	North	12.1%	16.5%	10.6%
	Central	16.4%	20.2%	15.2%
	South	12.7%	15.2%	6.3%
	Statewide	13.6%	16.8%	9.5%
Construction / Policy	**Region**	**Percent Change in Loss Cost**		
		Year Built 1974	**Year Built 1992**	**Year Built 2004**
Manufactured Homes	Coastal	11.4%	11.4%	14.4%
	Inland	15.9%	15.9%	29.8%
	North	8.6%	8.6%	16.2%
	Central	13.6%	13.6%	21.8%
	South	11.6%	11.6%	13.6%
	Statewide	11.9%	11.9%	15.6%
Construction / Policy	**Region**	**Percent Change in Loss Cost**		
		Year Built 1980	**Year Built 1998**	**Year Built 2004**
Frame Renters	Coastal	2.5%	-8.0%	-19.3%
	Inland	3.8%	0.3%	-1.7%
	North	-0.7%	-4.2%	-10.6%
	Central	2.3%	-1.5%	-8.4%
	South	3.1%	-9.9%	-21.9%
	Statewide	2.6%	-7.2%	-17.3%
Masonry Renters	Coastal	2.5%	-3.5%	-16.7%
	Inland	3.7%	2.3%	0.0%
	North	-0.5%	-0.2%	-8.3%
	Central	2.3%	2.1%	-5.7%
	South	3.1%	-5.4%	-19.5%
	Statewide	2.6%	-3.0%	-14.7%
Frame Condo Unit	Coastal	2.8%	-6.4%	-16.5%
	Inland	3.9%	1.0%	-0.7%
	North	-0.6%	-3.6%	-9.1%
	Central	2.6%	-0.6%	-6.5%
	South	3.4%	-8.1%	-18.9%
	Statewide	2.9%	-5.7%	-14.7%
Masonry Condo Unit	Coastal	2.8%	-1.9%	-14.5%
	Inland	3.9%	3.0%	0.7%
	North	-0.4%	0.5%	-7.3%
	Central	2.6%	3.0%	-4.4%
	South	3.3%	-3.6%	-17.1%
	Statewide	2.8%	-1.5%	-12.6%
Commercial Residential	Coastal	5.1%	2.3%	-1.0%
	Inland	4.7%	4.0%	3.6%
	North	-0.3%	-1.1%	-2.6%
	Central	3.9%	3.1%	2.0%
	South	6.1%	2.7%	-1.1%
	Statewide	5.1%	2.4%	-0.4%

TABLE 35. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK – BUILDING STRENGTH

Form A-7: Percent Change in Logical Relationship to Risk - Building Strength

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Construction / Policy	Region	Percent Change in Loss Cost		
		Weak	Medium	Strong
Frame Owners	Coastal	13.2%	9.8%	5.9%
	Inland	21.8%	20.5%	19.3%
	North	13.2%	11.7%	9.6%
	Central	17.6%	16.1%	13.9%
	South	12.8%	8.5%	4.4%
	Statewide	14.0%	11.1%	7.6%
Masonry Owners	Coastal	13.2%	16.2%	7.8%
	Inland	20.2%	21.6%	18.7%
	North	12.3%	16.5%	10.2%
	Central	16.6%	20.2%	14.7%
	South	13.0%	15.2%	6.5%
	Statewide	13.8%	16.8%	9.4%
Manufactured Homes	Coastal	3.3%	11.4%	11.6%
	Inland	1.9%	15.9%	29.7%
	North	-2.2%	8.6%	14.3%
	Central	2.3%	13.6%	19.8%
	South	4.4%	11.6%	10.7%
	Statewide	3.1%	11.9%	12.8%
Frame Renters	Coastal	4.3%	-7.9%	-18.9%
	Inland	5.1%	0.3%	-3.2%
	North	0.6%	-4.2%	-11.4%
	Central	3.8%	-1.5%	-9.3%
	South	4.9%	-9.8%	-21.2%
	Statewide	4.3%	-7.2%	-17.3%
Masonry Renters	Coastal	3.4%	-3.5%	-16.5%
	Inland	4.3%	2.4%	-0.8%
	North	0.1%	-0.2%	-8.8%
	Central	3.0%	2.1%	-6.4%
	South	4.0%	-5.4%	-19.0%
	Statewide	3.4%	-2.9%	-14.7%
Frame Condo Unit	Coastal	5.5%	-5.8%	-16.4%
	Inland	6.2%	1.8%	-1.8%
	North	1.7%	-2.8%	-9.8%
	Central	5.1%	0.1%	-7.4%
	South	6.2%	-7.6%	-18.4%
	Statewide	5.6%	-5.2%	-14.9%
Masonry Condo Unit	Coastal	4.7%	-1.3%	-14.6%
	Inland	5.4%	3.8%	0.2%
	North	1.2%	1.4%	-7.8%
	Central	4.2%	3.8%	-5.1%
	South	5.3%	-3.1%	-16.8%
	Statewide	4.7%	-0.8%	-12.9%
Commercial Residential	Coastal	6.6%	2.3%	1.1%
	Inland	5.5%	4.0%	3.8%
	North	0.6%	-1.1%	-2.0%
	Central	4.9%	3.1%	2.4%
	South	7.6%	2.7%	1.4%
	Statewide	6.5%	2.4%	1.4%

TABLE 36. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK – CONDO UNIT FLOOR

Form A-7: Percent Change in Logical Relationship to Risk - Condo Unit Floor

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Construction / Policy	Region	Percent Change in Loss Cost			
		3rd Floor	9th Floor	15th Floor	20th Floor
Condo Unit A	Coastal	2.4%	2.4%	2.4%	2.4%
	Inland	3.0%	3.0%	3.0%	3.0%
	North	-1.5%	-1.5%	-1.5%	-1.5%
	Central	2.5%	2.5%	2.5%	2.5%
	South	3.0%	3.0%	3.0%	3.0%
	Statewide	2.4%	2.4%	2.4%	2.4%
Condo Unit B	Coastal	5.5%	5.5%	5.5%	5.5%
	Inland	4.2%	4.2%	4.2%	4.2%
	North	0.3%	0.3%	0.3%	0.3%
	Central	4.3%	4.3%	4.3%	4.3%
	South	6.5%	6.5%	6.5%	6.5%
	Statewide	5.3%	5.3%	5.3%	5.3%

TABLE 37. FORM A-7: PERCENT CHANGE IN LOGICAL RELATIONSHIP TO RISK – NUMBER OF STORIES

Form A-7: Percent Change in Logical Relationship to Risk - Number of Stories

Modeling Organization: CoreLogic, inc
Model Name & Version Number: Florida Hurricane Model 2017a
Model Release Date: 20 March 2017

Construction / Policy	Region	Percent Change in Loss Cost		
		1 Story	2 Story	
Frame Owners	Coastal	12.6%	12.5%	
	Inland	21.3%	21.4%	
	North	12.8%	12.8%	
	Central	17.1%	17.1%	
	South	12.2%	12.1%	
	Statewide	13.4%	13.4%	
Masonry Owners	Coastal	12.8%	12.8%	
	Inland	20.0%	20.0%	
	North	12.0%	12.0%	
	Central	16.3%	16.4%	
	South	12.6%	12.6%	
	Statewide	13.4%	13.4%	
Frame Renters	Coastal	2.3%	2.3%	
	Inland	3.1%	3.1%	
	North	-0.9%	-0.9%	
	Central	1.8%	1.8%	
	South	2.9%	2.9%	
	Statewide	2.3%	2.3%	
Masonry Renters	Coastal	2.1%	2.1%	
	Inland	3.2%	3.2%	
	North	-0.9%	-0.9%	
	Central	1.8%	1.8%	
	South	2.7%	2.7%	
	Statewide	2.2%	2.2%	
Construction / Policy	**Region**	**Percent Change in Loss Cost**		
		5 Story	**10 Story**	**20 Story**
Commercial Residential	Coastal	5.0%	5.0%	5.0%
	Inland	4.6%	4.5%	4.5%
	North	-0.4%	-0.4%	-0.4%
	Central	3.8%	3.8%	3.8%
	South	6.0%	6.0%	6.0%
	Statewide	5.0%	5.0%	5.0%

Form A-8: Probable Maximum Loss for Florida

A. *Provide a detailed explanation of how the Expected Annual Hurricane Losses and Return Periods are calculated.*

The expected annual losses and return periods are based on the CoreLogic stochastic event set of 32,582 stochastic events affecting the mainland United States, of which 16,665 affect the 2012 FHCF exposure data provided by the Commission. Each of the 16,665 hurricanes has an annual frequency defined in the model, and a modeled result for Personal and Commercial Residential Zero Deductible statewide loss, using the FHCF exposure data. When the 16,665 hurricanes are sorted in descending order of loss (Personal and Commercial Residential), the exceedance frequency for each loss is given by the sum of all hurricane frequencies with losses at or above that level.

Each row of the tables in Part A represents a range of losses. We calculated the average loss for each range as the sum of all losses (from the 16,665 hurricanes) falling within the range divided by the number of such losses (the number of losses is provided in the 'No. of storms' column).

We calculated the expected annual hurricane loss for each range by summing the product of loss and annual frequency over all hurricanes with losses falling within the range.

We calculated the return period in years for each range by first interpolating the exceedance frequency to the value corresponding to the average loss for the range (this was done linearly between the adjacent hurricane losses, from among the 16,665 hurricanes). Taking this exceedance frequency to be λ, we calculated the return period in years as $1 / (1 – \exp(-\lambda))$.

B. *Complete Part A showing the personal and commercial residential probable maximum loss for Florida. For the Expected Annual Hurricane Losses column, provide personal and commercial residential, zero deductible statewide loss costs based on the 2012 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named* ***"hlpm2012c.exe."***

In the column, Return Period (Years), provide the return period associated with the average loss within the ranges indicated on a cumulative basis.

For example, if the average loss is $4,705 million for the range $4,501 million to $5,000 million, provide the return period associated with a loss that is $4,705 million or greater.

For each loss range in millions ($1,001-$1,500, $1,501-$2,000, $2,001-$2,500) the average loss within that range should be identified and then the return period associated with that *loss calculated. The return period is then the reciprocal of the probability of the loss equaling or exceeding this average loss size.*

The probability of equaling or exceeding the average of each range should be smaller as the ranges increase (and the average losses within the ranges increase). Therefore, the return period associated with each range and average loss within that range should be larger as the ranges increase. Return periods shall be based on cumulative probabilities.

A return period for an average loss of $4,705 million within the $4,501-$5,000 million range should be lower than the return period for an average loss of $5,455 million associated with a $5,001- $6,000 million range.

See the completed form on next page.

C. *Provide a graphical comparison of the current submission Residential Return Periods loss curve to the previously accepted submission Residential Return Periods loss curve. Residential Return Period (Years) shall be shown on the y-axis on a log 10 scale with Losses in Billions shown on the x-axis. The legend shall indicate the corresponding submission with a solid line representing the current year and a dotted line representing the previously accepted submission.*

See Figure 59 in this form.

D. *Provide the estimated loss and uncertainty interval for each of the Personal and Commercial Residential Return Periods given in Part B, Annual Aggregate and Part C, Annual Occurrence. Describe how the uncertainty intervals are derived. Also, provide in Parts B and C, the Conditional Tail Expectation, the expected value of losses greater than the Estimated Loss Level.*

See the completed form below. The uncertainty intervals were derived by constructing exceedance curves based on the extremes of the 95% confidence interval on each event.

E. *Provide this Form Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also, include Form A-8, Probable Maximum Loss for Florida, in a submission appendix.*

The Form A-8 results appear in the file 2015FormA8_CoreLogic_20March2017.xlsx.

TABLE 38. FORM A-8: PERSONAL AND COMMERCIAL RESIDENTIAL PROBABLE MAXIMUM LOSS FOR FLORIDA

FORM A-8: PROBABLE MAXIMUM LOSS FOR FLORIDA FOR PERSONAL AND COMMERCIAL RESIDENTIAL

Part A

LOSS RANGE (Millions)			TOTAL LOSS (Millions)	AVERAGE LOSS (Millions)	NUMBER OF HURRICANES	EXPECTED ANNUAL HURRICANE LOSSES (Millions)	RETURN PERIOD (YEARS)
$ -	TO	$ 500	$ 890,803	$ 161	5,543	$ 52.6	2
$ 501	TO	$ 1,000	$ 1,391,964	$ 731	1,904	$ 77.3	3
$ 1,001	TO	$ 1,500	$ 1,565,804	$ 1,241	1,262	$ 87.4	3
$ 1,501	TO	$ 2,000	$ 1,690,673	$ 1,741	971	$ 98.9	4
$ 2,001	TO	$ 2,500	$ 1,624,954	$ 2,241	725	$ 76.0	4
$ 2,501	TO	$ 3,000	$ 1,562,597	$ 2,741	570	$ 71.1	4
$ 3,001	TO	$ 3,500	$ 1,520,112	$ 3,234	470	$ 77.9	5
$ 3,501	TO	$ 4,000	$ 1,456,807	$ 3,745	389	$ 63.2	5
$ 4,001	TO	$ 4,500	$ 1,524,373	$ 4,234	360	$ 75.7	6
$ 4,501	TO	$ 5,000	$ 1,430,865	$ 4,738	302	$ 69.6	6
$ 5,001	TO	$ 6,000	$ 2,629,304	$ 5,501	478	$ 124.7	7
$ 6,001	TO	$ 7,000	$ 2,492,551	$ 6,474	385	$ 99.0	8
$ 7,001	TO	$ 8,000	$ 2,298,486	$ 7,463	308	$ 100.4	9
$ 8,001	TO	$ 9,000	$ 2,154,602	$ 8,483	254	$ 88.9	10
$ 9,001	TO	$ 10,000	$ 2,079,211	$ 9,494	219	$ 92.4	10
$ 10,001	TO	$ 11,000	$ 2,077,950	$ 10,442	199	$ 76.5	11
$ 11,001	TO	$ 12,000	$ 1,955,992	$ 11,506	170	$ 65.8	12
$ 12,001	TO	$ 13,000	$ 1,824,269	$ 12,495	146	$ 76.5	13
$ 13,001	TO	$ 14,000	$ 1,928,703	$ 13,487	143	$ 70.8	14
$ 14,001	TO	$ 15,000	$ 1,808,975	$ 14,472	125	$ 62.0	15
$ 15,001	TO	$ 16,000	$ 1,760,557	$ 15,443	114	$ 73.2	16
$ 16,001	TO	$ 17,000	$ 1,350,070	$ 16,464	82	$ 47.6	17
$ 17,001	TO	$ 18,000	$ 1,384,434	$ 17,524	79	$ 51.0	18
$ 18,001	TO	$ 19,000	$ 1,403,424	$ 18,466	76	$ 62.6	19
$ 19,001	TO	$ 20,000	$ 1,343,726	$ 19,474	69	$ 42.3	19
$ 20,001	TO	$ 21,000	$ 1,355,641	$ 20,540	66	$ 83.0	21
$ 21,001	TO	$ 22,000	$ 1,526,059	$ 21,494	71	$ 50.9	22
$ 22,001	TO	$ 23,000	$ 1,526,187	$ 22,444	68	$ 46.3	23
$ 23,001	TO	$ 24,000	$ 1,033,547	$ 23,490	44	$ 26.8	24
$ 24,001	TO	$ 25,000	$ 1,568,440	$ 24,507	64	$ 72.7	25
$ 25,001	TO	$ 26,000	$ 1,352,266	$ 25,514	53	$ 63.1	27
$ 26,001	TO	$ 27,000	$ 1,219,420	$ 26,509	46	$ 54.5	29
$ 27,001	TO	$ 28,000	$ 1,099,001	$ 27,475	40	$ 59.3	30
$ 28,001	TO	$ 29,000	$ 1,537,977	$ 28,481	54	$ 68.6	33
$ 29,001	TO	$ 30,000	$ 1,005,167	$ 29,564	34	$ 40.3	35
$ 30,001	TO	$ 35,000	$ 5,828,849	$ 32,382	180	$ 204.0	40
$ 35,001	TO	$ 40,000	$ 5,210,986	$ 37,489	139	$ 210.8	53
$ 40,001	TO	$ 45,000	$ 4,484,563	$ 42,307	106	$ 203.1	70
$ 45,001	TO	$ 50,000	$ 4,228,335	$ 47,509	89	$ 154.7	97
$ 50,001	TO	$ 55,000	$ 2,511,136	$ 52,315	48	$ 66.1	129
$ 55,001	TO	$ 60,000	$ 2,740,279	$ 57,089	48	$ 89.1	148
$ 60,001	TO	$ 65,000	$ 3,127,958	$ 62,559	50	$ 127.7	240
$ 65,001	TO	$ 70,000	$ 2,489,241	$ 67,277	37	$ 47.2	302
$ 70,001	TO	$ 75,000	$ 1,731,168	$ 72,132	24	$ 26.9	367
$ 75,001	TO	$ 80,000	$ 1,158,533	$ 77,236	15	$ 70.9	502
$ 80,001	TO	$ 90,000	$ 1,583,556	$ 83,345	19	$ 50.2	759
$ 90,001	TO	$ 100,000	$ 959,002	$ 95,900	10	$ 22.0	1,048
$ 100,001	TO	Maximum	$ 1,976,043	$ 116,238	17	$ 94.1	3,284
				TOTAL:	16,665	$ 3,815.9	

TABLE 39. FORM A-8: PERSONAL AND COMMERCIAL RESIDENTIAL PROBABLE MAXIMUM LOSS FOR FLORIDA (ANNUAL AGGREGATE)

Return Time (years)	Estimated Loss (Millions)	Uncertainty Interval*	Conditional Tail Expectation
Top Event	$295,056	$117,309 to $338,955	---
1000	$106,609	$55,615 to $158,509	$132,584
500	$91,850	$50,505to $130,470	$115,534
250	$75,808	$40,873 to $107,651	$98,895
100	$56,048	$26,613 to $82,205	$78,080
50	$40,537	$19,380 to $64,149	$62,833
20	$21,308	$9,586 to $35,381	$42,712
10	$10,072	$4,071 to $16,808	$28,700
5	$3,554	$1,123 to $5,805	$17,400

*Uncertainty bounds are not a standard output of the CoreLogic model.

TABLE 40. FORM A-8: PERSONAL AND COMMERCIAL RESIDENTIAL PROBABLE MAXIMUM LOSS FOR FLORIDA (ANNUAL OCCURRENCE)

Return Time (years)	Estimated Loss (Millions)	Uncertainty Interval*	Conditional Tail Expectation
Top Event	$206,829	$101,363 to $220,075	---
1000	$101,367	$54,431 to $137,398	$124,199
500	$84,394	$48,448 to $113,650	$107,809
250	$69,688	$336,892 to $101,060	$92,145
100	$51,655	$24,806 to $74,007	$72,597
50	$37,191	$17,857 to $58,004	$58,219
20	$19,104	$8,726 to $31,473	$39,303
10	$8,893	$3,624 to $14,492	$26,183
5	$3,165	$982 to $5,168	$15,769

*Uncertainty bounds are not a standard output of the CoreLogic model.

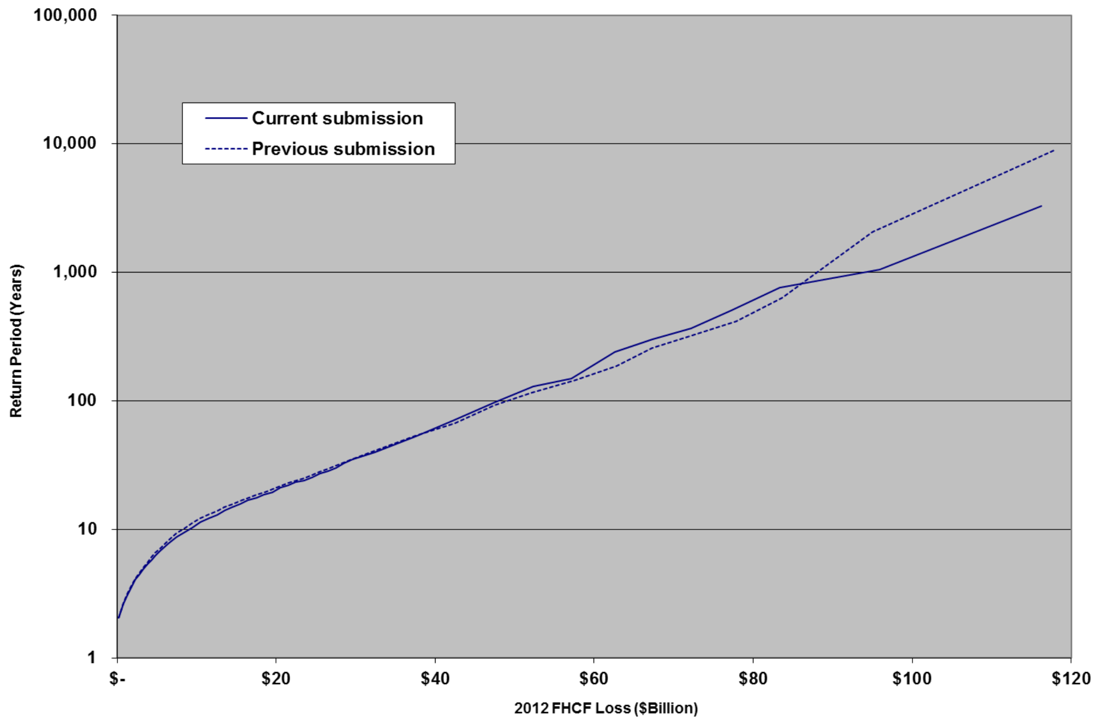


Figure 59. Current Submission Return Periods vs. Prior Year's Submission Return Periods

Appendix 6 - Acronyms

ALE – Additional Living Expense

B - Building

BI – Business Interruption

C - Contents

DP – Pressure Deficit

ELT – Event Loss Table

FHCF – Florida Hurricane Catastrophe Fund

GIS – Geographic Information System

HRD – Hurricane Research Division

LULC – Land Use / Land Cover

mph – miles per hour

NHC – National Hurricane Center

NHRS – National Hazard Research Service

NLCD – National Land Cover Database

NOAA – National Oceanic & Atmospheric Administration

NWP – Numerical Weather Prediction

NWS – National Weather Service

P – Policy Information

PC – Policy Coverage Information

PD – Property Damage

PDF – Probability Distribution Function

PF – Policy Facultative Reinsurance

Rmax – Radius of Maximum Winds

RQE - Risk Quantification and Engineering™

S – Site Information

SC – Site Coverage Information

SF – Site Facultative Reinsurance

SSI – Saffir-Simpson Intensity

TE / T – Time Element

TIV – Total Insured Value

US / U.S. – United States

USPS – Untied States Postal Service

WS – Wind Speed

Appendix 7 - Credentials of Selected Personnel

CREDENTIALS

Dr. James R. (Bob) Bailey has more than 25 years of experience as a technical consultant, researcher, and project manager. His doctoral work in Civil Engineering included an emphasis on wind engineering, specifically wind effects on buildings and components. He is experienced in subjects related to construction materials, solid mechanics, dynamics, numerical analysis, structural analysis, and design. He served as a consultant to NASA by performing an on-site inspection at the Marshall Space Flight Center to assess the structural integrity of buildings subject to tornado winds. He also has performed on-site inspections of commercial high-rise buildings in Dallas to evaluate the performance of structurally-glazed window glass systems subject to extreme wind events. He is a member of the API subcommittee that is developing a new wind loading specification for drilling masts and derricks. Dr. Bailey holds a Ph.D., M.S., and B.S. in Civil Engineering from Texas Tech University.

Dr. James J. Johnson has more than 40 years of project management and civil/nuclear engineering experience, serving the insurance/reinsurance, Fortune 500, and nuclear (domestic and international) industries. From its creation in 1994 until 2000 he headed the EQECAT division, a group that provides catastrophic risk management services to the global insurance and reinsurance industries, including catastrophe modeling software, portfolio and single site analysis, risk management consulting, training, and information. In addition, Dr. Johnson has participated in the development, implementation, and teaching of seismic risk and seismic margin assessment methodologies. He has participated in seismic PRAs of over 20 nuclear power plants. His participation encompasses many aspects including hazard definition, seismic response and uncertainty determination, detailed walkdowns, and fragility assessment. Dr. Johnson has contributed to over 80 technical reports and journal articles and is a member of the Earthquake Engineering Research Institute, American Society of Civil Engineers, and other technical organizations. Dr. Johnson holds a Ph.D. and M.S. in civil engineering from the University of Illinois, and a B.C.E. in civil engineering from the University of Minnesota. He is also a licensed Civil Engineer in California.

Dr. Mahmoud Khater, Chief Scientist and Engineering Officer of CoreLogic, has more than 30 years of engineering experience in natural hazards risk and reliability assessment; in the insurance, power, industrial, and commercial sectors; and in the behavior of structures and lifelines under seismic and wind loading. His experience includes seismic, fire, and hurricane hazard and risk assessments for single buildings, lifeline systems, and portfolios of properties. Dr. Khater has served as CoreLogic's project and technical manager for the development of state-of-the-art probabilistic analysis computer programs for application to civil engineering problems, seismic risk analysis, and hurricane risk assessment. Responsibilities have included several earthquake and hurricane structural response analyses and portfolio analyses. Dr. Khater holds a Ph.D. in structural engineering from Cornell University, and a M.Sc. and M.Bc. in structural engineer from Cairo University in Egypt. He is an active member in the Earthquake Engineering Research Institute and the American Society of Engineers.

Dr. Omar Khemici has more than 30 years of extensive professional experience in structural engineering and natural hazard risk assessment and mitigation. As a Director for CoreLogic, he provides technical direction and support to a variety of key projects. He performed the QA verification of different USWIND™ modules through hand calculations, and participated in the development of the USWIND™ and USQUAKE™ vulnerability functions. He also participated in the development of the USWildfire™. Dr. Khemici is project manager for jobs with the primary insurance, reinsurance companies, and financial institutions. Dr. Khemici graduated from Stanford University in 1982 and is a licensed Civil Engineer in California.

Raymond Kincaid, Senior Director of CoreLogic, has more than 30 years of experience in natural hazards risk management. For the last 20 years he has directed the UI portion of the development of several software products used to assess and manage insurance portfolio risk resulting from catastrophic events including hurricanes, earthquakes, high winds, and flood. Products developed under his guidance include USWIND™, USQUAKE™, UKWIND™, and UKFLOOD™. He also has extensive experience in the design and analysis of structures to resist extreme loadings including earthquakes, hurricane, blast, and nuclear weapons effects. Mr. Kincaid has directed major natural phenomena and seismic hazard analysis programs for numerous government, manufacturing, and commercial clients. Representative clients include the Department of Energy, U.S. Postal Service, Allendale Insurance, Pacific Bell, Anheuser-Busch, 3M, Northrop, Unisys, General Foods, Litton, Parker-Hannifin, and Rockwell International.

Thomas I. Larsen, Senior Director of CoreLogic , has more than 25 years of professional structural engineering, research, computer programming, and project management experience. He participated in the development of the USWIND™ and USQUAKE™ natural catastrophe financial risk assessment software programs. This includes project management for analyses for selected clients, review of the software methodology for consistency and completeness, and compilation of post-earthquake/hurricane damage and loss experience data. Prior work includes natural catastrophe hazard (earthquake and related perils such as tsunami and fire following, hurricane and other windstorm, and volcano) and/or risk analysis for many different regions including Australia, Chile, Iceland, Italy, New Zealand, Puerto Rico, the Sakhalin Islands, and the Caspian Sea area. Mr. Larsen holds a M.Eng. in structural engineering from the University of California in Berkeley and B.S. in structural engineering from Stanford University. He is presently a licensed civil engineer in California.

David F. Smith, Senior Director of CoreLogic , has more than 20 years of professional experience in hurricane model design, natural hazard research, software development, and project management. He participated in the development of the USWIND™ and USQUAKE™ natural catastrophe financial risk assessment software programs. This includes development of the hazard portions of both programs, risk analyses for selected clients, and review of the software methodology for consistency and completeness. Mr. Smith also managed the development of the hazard portion of the CoreLogic tropical cyclone models for Asia and the Caribbean. Prior work includes natural catastrophe hazard and/or risk analysis for many different regions including Puerto Rico, Jamaica, Costa Rica, the Philippines, and Japan. Mr. Smith holds a M.S. in geophysics from Yale University and a B.S. in mathematics from the University of Chicago.

Appendix 8 – Independent Reviews

Review of CoreLogic Wind Model

Professor Robert Tuleya

I reviewed the EQECAT [now CoreLogic] revised wind field model. The review was composed of several presentations by EQECAT [now CoreLogic], review of several scientific references as well as fruitful discussion between EQECAT [now CoreLogic] and myself. This model is a parametric model, which estimates the evolution of the inland surface wind field given the values of several parameters describing the low-level wind field just off shore. The model uses as observed input the storm intensity, radial extent of winds and the storm track. It also assumes a standard filling rate as the storm progresses inland. The EQECAT [now CoreLogic] model uses a sophisticated high resolution land use field to diagnose the effect of upwind roughness effects accurately. The terrain roughness was shown to have a dual role of reducing the damaging wind field due to frictional retardation but also to a lesser extent increasing the possible wind effects by contributing to a larger gust factor with increasing roughness. The presentation indicated realistic wind behavior for an incoming storm making landfall. The time evolution of the EQECAT [now CoreLogic] model was quite similar to more sophisticated 3-D NWP operational and research models, lending credibility to their model product. EQECAT [now CoreLogic] also showed comparisons and verification to observed surface wind field as well. The model has a deviational component to account for statistical variation in results. This estimate appears to be handled well, with the model for the most part, verifying well compared to observations. Overall, I believe the EQECAT [now CoreLogic] revised model should model observed landfall wind evolution quite well for both individual storms as well as for estimating a climatological group of storms.

Review of CoreLogic Vulnerability Curves

Professor S. Narasimhan

I was provided vulnerability curves for Residential Low-Rise Timber (LRT) and Low-Rise Reinforced Masonry (LRM) structure types by EQECAT [now CoreLogic]. These included separate curves for Building Damage, Content Damage and Additional Living Expenses, applicable to average cladding. Provided in an excel spreadsheet, they correspond to the mean damage ratios (historic loss normalized by the total value of the buildings belonging to that category) conditioned on the estimated wind speed (2-sec gust). I was informed by EQECAT [now CoreLogic] that these base curves are applicable without modification for homes built during the period 1973-1982, and are broadly applicable in the state of Florida. Other information such as the vulnerability matrix (probability distribution at a given speed), disaggregation details going from aggregate loss data to individual classes, and details of loss data statistical analysis were not provided.

My review is limited in nature, and is restricted to the mean damage curves for the two types, mostly building damage, with some observations for contents. These included comparing these curves with published references from the literature and my observations based on my research experience in the field of wind engineering. For my review, I converted the wind speeds to a 2-sec averaging time to facilitate direct comparisons with published literature. Due to the limited scope and the nature of data available at my disposal, I have attempted to draw approximate conclusions (often qualitative), and hence my statements must be interpreted in this context. I have also purposefully avoided direct comparisons with engineering models (e.g., HAZUS), since the nature of underlying data and assumptions between these categories are vastly different.

The base vulnerability curves used by EQECAT [now CoreLogic]−originating from historical insured loss data−do not incorporate explicit relationships between building damage and the loss experienced. In terms of insured loss, lower bound wind speed at which little or no loss occurred for LRT is consistent with published data (from both Hurricane Andrew and Hugo [1]). However, at the higher regions of the spectrum (at 160 mph) the EQECAT [now CoreLogic] curve for LRT appears to slightly underestimate the loss. However, recognizing the highly nonlinear and complex interactions of damage at these scales, I do not consider prudent to comment on the accuracy aspect, and one has view it within the context of underlying loss data and the hazard model contributing to these relationships. In the intermediate ranges (90-130 mph), the curves are reasonably consistent with published data from Hurricanes Andrew and Hugo. For Hurricanes Katrina and Rita, the EQECAT [now CoreLogic] loss curves for residential construction (timber) appear to be consistent (damage curve showing < 5% damage) with observed damage (mostly roof covering) for the lower range of wind speeds (< 120 mph) that were estimated for these events [2].

While there is significant data on LRT structures, this is not the case for RM housing. Overall, this type of construction is expected to outperform LRT, which is reflected in the lower mean vulnerability curves in EQECAT [now CoreLogic]. As expected, at lower wind speeds, the predicted damage (mean) is similar to LRT, as the main damage contribution is likely from the roofing and/glazing systems. At higher hazard levels, the damage is expected to be less as the building walls are expected to sustain little or no damage.

Regarding content and ALE curves, I expect them to reflect the underlying loss data, which is acceptable. As I expected, the contents vulnerability is lower (as a percentage of the insured content value) than the structural damage, at lower wind speeds (say, less than 130 mph).

Published research [3] supports this regarding the total value of insured content loss in Andrew, although the ratio of insured value of the contents to the structural values is difficult to determine from the literature.

Overall, I think the base curves for building damage are reasonable, and are fairly consistent with much of reported damage available in the public domain (from especially large events such as Andrew and Katrina) and with engineering experience.

References

1. Vickery, et. al. (2006). “HAZUS-MH Hurricane Model Methodology. II: Damage and Loss Estimation”, *Natural Hazards Review*, 7(2), 94-103.

2. NIST (2006). “Performance of Physical Structures in Hurricane Katrina and Hurricane Rita: A Reconnaissance Report”, NIST Technical Note 1476.

3. Pinelli et al. (2008). “Validation of a probabilistic model for hurricane insurance loss projections in Florida,” *Reliability Engineering & System Safety*, 93(12), 1896–1905.

* A small section containing detailed recommendations for future improvement has been removed, as it contains proprietary information. The full review will be provided to the professional team during the on-site visit.

Software Review Report

Gamil Serag Eldin, Ph.D. and Kashif Ail, Ph.D.

1. Product Identification

RQE (Risk Quantification & Engineering) is a Catastrophe Risk Modeling Software Platform developed by EQECAT [now CoreLogic]. This review is done for version 13 of this software (RQE-13) released on January 31, 2013. The review was done on Thursday February 26, 2013. Gamil Serag Eldin, Ph.D.and Kashif Ali Ph.D. Lecturer and researcher at Berkeley Initiative in Soft Computing Research Group (BISC), computer science department, University of California, Berkeley, carried the review. Final date of completion of this document is March 14, 2013.

2. Objectives and Methodologies

The objective of this document is to assess the quality of the RQE-13 software with respect to code development and overall quality. In this report IEEE software review standards have been adapted (IEEE Std. 1028-2008). Among the five types[1] of reviews stated by IEEE standards, Walk-through[2] review has been implemented as per EQECAT [now CoreLogic] Inc. request (types of Std. 1028-1997). Also according to the same standards a "systematic" software review has been adapted and implemented.

- Team participation
  From CoreLogic Inc.: David Smith and Branimir Betov.
  Reviewer team: Gamil Serag eldin and Kashif Ali.

[1] The five types of reviews a) Management reviews b) Technical reviews c) Inspections d) Walk-throughs e) Audits, IEEE Standard for Software Reviews 1028-2008, page 1.
[2] "Walk-through: A static analysis technique in which a designer or programmer leads members of the development team and other interested parties through a software product, and the participants ask questions and make comments about possible errors, violation of development standards, and other problems." IEEE Standard for Software Reviews 1028-1997, page 5.

3. System Description

We evaluated RQE-13 software, developed by EQECAT [now CoreLogic] Inc., from software engineering standpoint.

3.1 RQE-13 Components

The RQE-13 software consists of four major components, namely user interface, application server, analysis server, and database, and follows a traditional client-server paradigm.

The client interacts by submitting a portfolio and required reporting, over the web using standard HTTP (REST) protocol, with an application server. Required portfolio is mapped internally and is stored, by the application server, into a centralized database. The database is used to store intermediate, evaluated and yearly-simulated calculations.

The client accesses the database via the application server, using a browser, or possibly an in-house database access and reporting solutions. Application server disintegrate the portfolio jobs into smaller batches of tasks, which then is scheduled to possibly more than one analysis server, ensuring data dependencies and performance. Various available modeling engines, e.g., damage, wind, earthquake and flood, are run against the portfolio data, in parallel and in independent fashion. The calculated data is stored back to the centralized database and then presented to clients using several available reporting formats. For interoperability, clients can

import/export data from an existing catastrophe modeling software.

3.2 Improvements

Modularity, inheritance and decoupling are important principles in software development, especially object-oriented programming. In comparison with earlier version, known as WORLDCAT, significant portion has been re-designed and re-implemented, from scratch, to achieve maximal flexibility, scalability and performance by adopting the aforementioned software engineering principles. The major change includes complete reimplementation of the financial unit to support universal methodology, decoupling of the loss and unlimited nested sub-conditions for it, migration of Sybase to SQL database and multi-tier database schematics. Furthermore, by use of efficient protocols, measure are taken to ensure only required data is transferred between computing nodes and database therefore reducing memory footage and data overheads. Various in-house testing suites are developed to ensure the functional accuracy of modeling engines and overall software quality.

4. Software Development Process Analysis

We analyzed the software development process and software engineering practices used during RQE-13 development. We noted the following practices:

- Customer requirements gathered, over span of one year, were translated into functional and technical specifications.

- The specifications were translated into pseudo-code, followed by algorithmic analysis, coding and testing benchmarks. Numerous object-oriented programming languages, for performance and portability reasons, are used for implementation. Standard protocols, with in-house optimization, were devised for inter-module communication, allowing future enhancements.

- Upon code inspection, we find the whole system follows modular design with proper use of object-oriented programming principles. This facilitated the software to be scalable, efficient utilization of computational and storage resources and incremental enhancements, including coding bugs and support fixes, if any.

- Standard software development practices, e.g., universal coding style, coding comments, software repository, formal and informal code reviews and bug tracking system were employed. The software quality is maintained throughout the development efforts.

- Unit testing, regression testing and integration testing were performed, using an in-house benchmarking system, by dedicated QA team on regular basis. The unit test was marked valid only if the results from the experimental are ensured to be within 0.01% of the expected outcome. Extreme testing is performed for all possible reporting combination, utilizing maximum of 48 computing nodes.

- Documentations about the software installation, algorithmic details of the various models, and modules details are updated on regular basis.

- Software was publicly released without any outstanding level-1 and level-2 bugs.

5. Remarks/Suggestions

We believe the RQE-13 software has been developed following generally accepted professional software engineering practices, from drafting of the requirement specifications to quality assurance and testing; as described by SWEBOK[3] guidelines.

Reference

IEEE Standard for Software Reviews and Audits - 1028-2008 and 1028-1997.

[3]Guide to the Software Engineering Body of Knowledge (SWEBOK), an IEEE/ACM Standards

*A small section containing detailed recommendations for future improvement has been removed, as it contains proprietary information. The full review will be provided to the professional team during the on-site visit.

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