**Actuarial Standards**

**A-1 Hurricane Modeling Input Data and Output Reports**

1. ***Adjustments, edits, inclusions, or deletions to insurance company or other input data used by the modeling organization shall be based upon generally accepted actuarial, underwriting, and statistical procedures.***
2. ***All modifications, adjustments, assumptions, inputs and input file identification, and defaults necessary to use the hurricane model shall be actuarially sound and shall be included with the hurricane model output report. Treatment of missing values for user inputs required to run the hurricane model shall be actuarially sound and described with the hurricane model output report.***

Purpose: Modeled hurricane loss costs and hurricane probable maximum loss levels rely on certain insurer input data assumptions. Implicit assumptions may or may not be appropriate for a given entity using the hurricane model, depending on the circumstances.

Different hurricane modeling approaches may require different input data.

Relevant Form: G-5, Actuarial Standards Expert Certification

**Disclosures**

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

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

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

1. Provide a copy of the input form(s) used by the hurricane model with the hurricane 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 hurricane model output produced from the input form. Include the hurricane 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.
2. Disclose, in a hurricane model output report, the specific inputs required to use the hurricane model and the options of the hurricane model selected for use in a residential property insurance rate filing. Include the hurricane model name and version identification on the hurricane model output report. All items included in the hurricane model output report submitted to the Commission should be clearly labeled and defined.

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

1. Disclose if changing the order of the hurricane model input exposure data produces different hurricane model output or results.
2. Disclose if removing and adding policies from the hurricane model input file affects the output or results for the remaining policies.

**Audit**

1. Quality assurance procedures, including methods to assure accuracy of insurance or other input data, will be reviewed. Compliance with this standard will be readily demonstrated through documented rules and procedures.
2. All hurricane model inputs and assumptions will be reviewed to determine that the hurricane model output report appropriately discloses all modifications, adjustments, assumptions, and defaults used to produce the hurricane loss costs and hurricane probable maximum loss levels.

**A-2 Hurricane Events Resulting in Modeled Hurricane Losses\***

*(\*Significant Revision)*

1. ***Modeled hurricane loss costs and hurricane probable maximum loss levels shall reflect all insured wind related damages from storms that reach hurricane strength and produce minimum damaging windspeeds or greater on land in Florida.***
2. ***The modeling organization shall have a documented procedure for addressing over counting or under counting of hurricane losses.***

Question from CoreLogic:

We would like to have clarification on standard A-2.B. This standard requires documented procedure on the over counting and under counting of hurricane losses. Is this requirement in relation to the hazard component, vulnerability component, use of claims data, definition of an event (e.g., by-passing hurricanes like Matthew), or a combination of these items?

Purpose: Hurricane loss costs and hurricane probable maximum loss levels should reflect the hurricane losses insurers pay as a result of a hurricane.

Hurricane loss costs and hurricane probable maximum loss levels should only include insured wind-related hurricane losses and time element hurricane losses in Florida resulting from an event modeled as a hurricane consistent with s. 627.4025, F.S. The event should include all such insured wind-related damage caused by a hurricane that makes landfall in Florida as a hurricane or by-passes Florida as a hurricane and comes close enough to cause damaging winds in Florida, without over counting or under counting hurricane loss costs and hurricane probable maximum loss levels.

Relevant Forms: G-5, Actuarial Standards Expert Certification

A-2A, Base Hurricane Storm Set Statewide Hurricane Losses (2012 FHCF Exposure Data)

A-2B, Base Hurricane Storm Set Statewide Hurricane Losses (2017 FHCF Exposure Data)

**Disclosures**

1. Describe how damage from model-generated storms (landfalling and by-passing) is excluded or included in the calculation of hurricane loss costs and hurricane probable maximum loss levels for Florida.
2. Describe how damage resulting from concurrent or preceding flood or hurricane storm surge is treated in the calculation of hurricane loss costs and hurricane probable maximum loss levels for Florida.

**Audit**

1. The hurricane model will be reviewed to evaluate whether the determination of hurricane losses in the hurricane model is consistent with this standard.
2. The hurricane model will be reviewed to determine that by-passing storms and their effects are considered in a manner that is consistent with this standard.
3. The hurricane model will be reviewed to determine whether the hurricane model takes into account any damage resulting directly and solely from flood or hurricane storm surge. Hurricane losses associated with wind damage will be reviewed to determine the treatment of flood and hurricane storm surge.
4. The documented procedure addressing the over counting or under counting of hurricane losses will be reviewed.

Question from RMS:

Further clarification is requested on Standard A-2, Audit 4: Could more detail be provided on what the Professional Team will be seeking?

**A-3 Hurricane Coverages**

1. ***The methods used in the calculation of building hurricane loss costs shall be actuarially sound.***
2. ***The methods used in the calculation of appurtenant structure hurricane loss costs shall be actuarially sound.***
3. ***The methods used in the calculation of contents hurricane loss costs shall be actuarially sound.***
4. ***The methods used in the calculation of time element hurricane loss costs shall be actuarially sound.***

Purpose: A reasonable representation of building, appurtenant structure, contents, and time element hurricane losses is necessary in order to address policies that principally cover building, appurtenant structure, contents and time element, such as tenants and condo unit owners policies.

Relevant Form: G-5, Actuarial Standards Expert Certification

**Disclosures**

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

Suggestion from Commissioner Lee:

1. Describe the methods used in the hurricane model to calculate hurricane loss costs for building coverage associated with personal and commercial residential properties. This includes coverage for ordinance or law.

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

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

**Audit**

1. The methods used to produce building, appurtenant structure, contents and time element hurricane loss costs will be reviewed.

**A-4 Modeled Hurricane Loss Cost and Hurricane Probable Maximum Loss Level Considerations**

1. ***Hurricane loss cost projections and hurricane probable maximum loss levels shall not include expenses, risk load, investment income, premium reserves, taxes, assessments, or profit margin.***
2. ***Hurricane loss cost projections and hurricane probable maximum loss levels shall not make a prospective provision for economic inflation.***
3. ***Hurricane loss cost projections and hurricane probable maximum loss levels shall not include any explicit provision for direct hurricane storm surge losses.***
4. ***Hurricane loss cost projections and hurricane probable maximum loss levels shall be capable of being calculated from exposures at a geocode (latitude-longitude) level of resolution.***
5. ***Demand surge shall be included in the hurricane model’s calculation of hurricane loss costs and hurricane probable maximum loss levels using relevant data and actuarially sound methods and assumptions.***

Purpose: The hurricane loss costs and hurricane probable maximum loss levels from the hurricane model should reflect hurricane losses paid by the insurance company as insurance claims resulting from wind damage from an event as defined in Standard A-2, Hurricane Events Resulting in Modeled Hurricane Losses.

Hurricane probable maximum loss levels can be either on an annual aggregate, an annual occurrence basis, or an event basis. All bases can be useful for understanding the hurricane loss distribution produced by the hurricane model.

Hurricane loss costs represent the expected annual hurricane loss per $1,000 exposure. Other “expense and profit loads” such as those listed in the standard may be included in rate filings but are outside the scope of the Commission.

Hurricane loss severity may be influenced by supply and demand factors applicable to material and labor costs. This is generally known as demand surge which occurs at the time of a large catastrophic event and is recognized as an important element for hurricane modeling.

Insurance may also be influenced (although perhaps differently from demand surge) by general price inflation. This is a type of economic inflation that is associated with past insured wind loss experience that has been used to develop and validate hurricane loss projection models. The standard does not allow for prospective recognition of future economic inflation or price inflation.

Suggestion from Commissioner Lee:

**Explanation:** Added reference to legal and claims environment to address the recent impact of assignment of benefits and attorney involvement. Open to discussing this be an Inquiry.

**Amendatory Language:**

Insurance may also be influenced (although perhaps differently from demand surge) by general price inflation as well as impact of legal and claims environment. This is a type of economic inflation that is associated with past insured wind loss experience that has been used to develop and validate hurricane loss projection models. The standard does not allow for prospective recognition of future economic inflation or price inflation.

Hurricane storm surge can be covered by the National Flood Insurance Program or in some cases by other policies.

Relevant Forms: G-5, Actuarial Standards Expert Certification

A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data)

A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data)

**Disclosures**

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

1. Identify the highest level of resolution for which hurricane loss costs and hurricane probable maximum loss levels can be provided. Identify all possible resolutions available for the reported hurricane output ranges.
2. Describe how the hurricane model incorporates demand surge in the calculation of hurricane loss costs and hurricane probable maximum loss levels.
3. Provide citations to published papers, if any, or modeling-organization studies that were used to develop how the hurricane model estimates demand surge.
4. Describe how economic inflation has been applied to past insurance experience to develop and validate hurricane loss costs and hurricane probable maximum loss levels.

**Audit**

1. How the hurricane model handles expenses, risk load, investment income, premium reserves, taxes, assessments, profit margin, economic inflation, and any criteria other than direct property insurance claim payments will be reviewed.
2. The method of determining hurricane probable maximum loss levels will be reviewed.
3. The uncertainty in the estimated annual hurricane loss costs and hurricane probable maximum loss levels will be reviewed.
4. The data and methods used to incorporate individual aspects of demand surge on personal and commercial residential hurricane losses, inclusive of the effects from building material costs, labor costs, contents costs, and repair time will be reviewed.

Suggestion from Commissioner Lee:

**Explanation:** Added reference to legal and claims environment to address the recent impact of assignment of benefits and attorney involvement. Open to discussing this be an Inquiry.

**Amendatory Language:**

4. The data and methods used to incorporate individual aspects of demand surge on personal and commercial residential hurricane losses, inclusive of the effects from building material costs, labor costs, contents costs, legal and claims environment, and repair time will be reviewed.

1. How the hurricane model accounts for economic inflation associated with past insurance experience will be reviewed.
2. The treatment of flood and storm surge losses in the determination of modeled hurricane losses will be reviewed.

7. All referenced literature will be reviewed, in hard copy or electronic form, to determine applicability.

**A-5 Hurricane Policy Conditions**

1. ***The methods used in the development of mathematical distributions to reflect the effects of deductibles and policy limits shall be actuarially sound.***
2. ***The relationship among the modeled deductible hurricane loss costs shall be reasonable.***
3. ***Deductible hurricane loss costs shall be calculated in accordance with s. 627.701(5)(a), F.S.***

Purpose: For a given windspeed and building type, hurricane losses may fall below the deductible or above the policy limit. Therefore, the distribution of hurricane losses is important.

The determination of insurance coverage for a commercial residential policy is dependent upon the contractual responsibility of the condo unit owner or condo unit renter and that of the condominium association and the building owner. It is important that these responsibilities be appropriately accounted for in modeling hurricane loss cost projections and commercial residential hurricane probable maximum loss levels.

Relevant Form: G-5, Actuarial Standards Expert Certification

A-4A, Hurricane Output Ranges (2012 FHCF Exposure Data)

A-4B, Hurricane Output Ranges (2017 FHCF Exposure Data)

A-6, Logical Relationship to Hurricane Risk (Trade Secret Item)

**Disclosures**

1. Describe the methods used in the hurricane model to treat deductibles (both flat and percentage), policy limits, and insurance-to-value criteria when projecting hurricane loss costs and hurricane probable maximum loss levels. hurricane
2. Describe whether, and if so how, the hurricane model treats policy exclusions and loss settlement provisions.
3. Complete the following table using the method implemented in the hurricane model.



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Building Value | Policy Limit | Deductible | Damage Ratio | Ground Up Hurricane Loss | Insurance Hurricane Loss |
| $100,000 | $90,000 | $500 | 2% |  |  |
| $100,000 | $90,000 | $500 | 50% |  |  |
| $100,000 | $90,000 | $500 | 92% |  |  |
| $100,000 | $90,000 | $500 | 100% |  |  |
| $100,000 | $100,000 | $500 | 92% |  |  |

4. Describe how the hurricane model treats annual deductibles.

**Audit**

1. The process used to determine the accuracy of the insurance-to-value criteria in data used to develop and validate the hurricane model results will be reviewed.

2. To the extent that insurance claims data are used to develop mathematical depictions of deductibles, policy limits, policy exclusions, and loss settlement provisions, the goodness-of-fit of the data to fitted models will be reviewed.

3. To the extent that insurance claims data are used to validate the hurricane model results, the treatment of the effects of deductibles, policy limits, policy exclusions, loss settlement provisions, and coinsurance in the data will be reviewed.

1. Treatment of annual deductibles will be reviewed.

5. Justification for the changes from the previously-accepted hurricane model in the relativities among corresponding deductible amounts for the same coverage will be reviewed.

**A-6 Hurricane Loss Outputs and Logical Relationships to Risk**

1. ***The methods, data, and assumptions used in the estimation of hurricane probable maximum loss levels shall be actuarially sound.***
2. ***Hurricane loss costs shall not exhibit an illogical relation to risk, nor shall hurricane loss costs exhibit a significant change when the underlying risk does not change significantly.***
3. ***Hurricane loss costs produced by the hurricane model shall be positive and non-zero for all valid Florida ZIP Codes.***
4. ***Hurricane loss costs cannot increase as the quality of construction type, materials and workmanship increases, all other factors held constant.***
5. ***Hurricane loss costs cannot increase as the presence of fixtures or construction techniques designed for hazard mitigation increases, all other factors held constant.***
6. ***Hurricane loss costs cannot increase as the wind resistant design provisions increase, all other factors held constant.***
7. ***Hurricane loss costs cannot increase as building code enforcement increases, all other factors held constant.***
8. ***Hurricane loss costs shall decrease as deductibles increase, all other factors held constant.***
9. ***The relationship of hurricane loss costs for individual coverages, (e.g., building, appurtenant structure, contents, and time element) shall be consistent with the coverages provided.***
10. ***Hurricane output ranges shall be logical for the type of risk being modeled and apparent deviations shall be justified.***
11. ***All other factors held constant, hurricane output ranges produced by the hurricane model shall in general reflect lower hurricane loss costs for:***
    1. ***masonry construction versus frame construction,***
    2. ***personal residential risk exposure versus manufactured home risk exposure,***
    3. ***inland counties versus coastal counties, and***
    4. ***northern counties versus southern counties.***

**A-6 Hurricane Loss Outputs and Logical Relationships to Risk (Continued)**

1. ***For hurricane loss cost and hurricane probable maximum loss level estimates derived from and 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.***

Suggestion from Commissioner Lee:

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

1. masonry construction versus frame construction,

2. personal residential risk exposure versus manufactured home risk exposure,

3. inland counties versus coastal counties,

4. northern counties versus southern counties, and

5. newer versus older construction.

Purpose: Hurricane probable maximum loss levels are to be based on an actuarially sound methodology. The actuarial soundness resulting from compliance with the standard is particularly important to capital markets, insurers, reinsurers, and rating agencies that frequently use hurricane probable maximum loss levels.

Modeled hurricane loss costs should vary according to risk. If the risk of loss due to hurricanes is higher for one area or building type, then the hurricane loss costs should also be higher. Likewise, if there is no difference in risk, there should be no difference in hurricane loss costs. Hurricane loss costs not having these properties do not have a logical relationship to risk.

Revisions to the hurricane model lead to changes in the hurricane output ranges which are to be reasonable. This standard requires that the impacts on the hurricane loss costs are attributable to the revisions.

Relevant Forms: G-5, Actuarial Standards Expert Certification

A-1, Zero Deductible Personal Residential Hurricane Loss Costs by ZIP Code

A-2A, Base Hurricane Storm Set Statewide Hurricane Losses (2012 FHCF Exposure Data)

A-2B, Base Hurricane Storm Set Statewide Hurricane Losses (2017 FHCF Exposure Data)

A-3A, 2004 Hurricane Season Losses (2012 FHCF Exposure Data)

A-3B, 2004 Hurricane Season Losses (2017 FHCF Exposure Data)

A-4A, Hurricane Output Ranges (2012 FHCF Exposure Data)

A-4B, Hurricane Output Ranges (2017 FHCF Exposure Data)

A-5, Percentage Change in Hurricane Output Ranges (2012 FHCF Exposure Data)

A-6, Logical Relationship to Hurricane Risk (Trade Secret item)

A-7, Percentage Change in Logical Relationship to Hurricane Risk

A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data)

A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data)

S-2A, Examples of Hurricane Loss Exceedance Estimates (2012 FHCF Exposure Data)

S-2B, Examples of Hurricane Loss Exceedance Estimates (2017 FHCF Exposure Data)

S-5, Average Annual Zero Deductible Statewide Hurricane Loss Costs – Historical versus Modeled

**Disclosures**

1. Provide a completed Form A-1, Zero Deductible Personal Residential Hurricane Loss Costs by ZIP Code. Provide a link to the location of the form [insert hyperlink here].
2. Provide a completed Form A-2A, Base Hurricane Storm Set Statewide Hurricane Losses (2012 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

3. Provide a completed Form A-2B, Base Hurricane Storm Set Statewide Hurricane Losses (2017 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

4. Provide a completed Form A-3A, 2004 Hurricane Season Losses (2012 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

5. Provide a completed Form A-3B, 2004 Hurricane Season Losses (2017 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

6. Provide a completed Form A-4A, Hurricane Output Ranges (2012 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

7. Provide a completed Form A-4B, Hurricane Output Ranges (2017 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

8. Provide a completed Form A-5, Percentage Change in Hurricane Output Ranges (2012 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

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

10. Provide a completed Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

11. Provide a completed Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data). Provide a link to the location of the form [insert hyperlink here].

12. Describe how the hurricane model produces hurricane probable maximum loss levels.

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

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

15. Explain any differences between the values provided on Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data), and those provided on Form S-2A, Examples of Hurricane Loss Exceedance Estimates (2012 FHCF Exposure Data).

16. Explain any differences between the values provided on Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data), and those provided on Form S-2B, Examples of Hurricane Loss Exceedance Estimates (2017 FHCF Exposure Data).

17. Provide an explanation for all hurricane loss costs that are not consistent with the requirements of this standard.

18. Provide an explanation of the differences in hurricane output ranges between the previously-accepted hurricane model and the current hurricane model based on the 2012 FHCF Exposure Data.

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

**Audit**

1. The data and methods used for hurricane probable maximum loss levels for Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data), and Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data), will be reviewed. The hurricane associated with the Top Events will be reviewed.
2. The frequency distribution and the individual event severity distribution underlying Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data) and Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data), will be reviewed.
3. The first and second moments of the Annual Aggregate and Annual Occurrence distributions underlying the tables in Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data), and Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data), will be reviewed.
4. The first and second moments of the frequency and severity distributions underlying the hurricane probable maximum loss levels shown in Parts B and C in Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data) and Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data), will be reviewed.

Suggestion from AIR:

**Problem Statement:** The wording of these audit items assumes parametric formulations for a frequency and severity distribution underlying losses. Not every modeler creates their event sets in the same way and some may not be able to provide what is being asked. The wording of the ROA should be flexible enough to allow for different approaches and not make assumptions/demands for a specific modeling approach.

**Explanation:** The proposed changes will recognize the potential for modeling event sets using a combination of physical and parametrical approach as opposed to a strictly parametric approach.

**Amendatory Language:** To Audit 2, add in “or information about the formulation of events;” to Audit 4, add in “or similar information about the event distributions.”

2. The frequency distribution and the individual event severity distribution, or information about the formulation of events, underlying Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data) and Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data) will be reviewed.

4. The first and second moments of the frequency and severity distributions, or similar information about the event distribtuions, underlying the hurricane probable maximum loss levels shown in Parts B and C in Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data) and Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data) will be reviewed.

1. All referenced literature will be reviewed, in hard copy or electronic form, to determine applicability.
2. Graphical representations of hurricane loss costs by ZIP Code and county will be reviewed.
3. Color-coded maps depicting the effects of land friction on hurricane loss costs by ZIP Code will be reviewed.
4. The procedures used by the modeling organization to verify the individual hurricane loss cost relationships will be reviewed. Methods (including any software) used in verifying Standard A-6 will be reviewed. Forms A-1, Zero Deductible Personal Residential Hurricane Loss Costs by ZIP Code, A-2A, Base Hurricane Storm Set Statewide Hurricane Losses (2012 FHCF Exposure Data), A-2B, Base Hurricane Storm Set Statewide Hurricane Losses (2017 FHCF Exposure Data), A-3A, 2004 Hurricane Season Losses (2012 FHCF Exposure Data), A-3B, 2004 Hurricane Season Losses (2017 FHCF Exposure Data), A-6, Logical Relationship to Hurricane Risk (Trade Secret item), and A-7, Percentage Change in Logical Relationship to Hurricane Risk, will be reviewed to assess coverage relationships.

6. The hurricane loss cost relationships among deductible, construction type, policy form, coverage, building code/enforcement, building strength, condo unit floor, number of stories, territory, and region will be reviewed.

7. The total personal and commercial residential insured hurricane losses provided in Forms A-2A, Base Hurricane Storm Set Statewide Hurricane Losses (2012 FHCF Exposure Data), A-2B, Base Hurricane Storm Set Statewide Hurricane Losses (2017 FHCF Exposure Data), A-3A, 2004 Hurricane Season Losses (2012 FHCF Exposure Data), and A-3B, 2004 Hurricane Season Losses (2017 FHCF Exposure Data), will be reviewed individually for total personal residential and total commercial residential insured hurricane losses.

8. Forms A-4A, Hurricane Output Ranges (2012 FHCF Exposure Data), A-5, Percentage Change in Hurricane Output Ranges (2012 FHCF Exposure Data), and A-4B, Hurricane Output Ranges (2017 FHCF Exposure Data), will be reviewed, including geographical representations of the data where applicable.

9. Justification for all changes in hurricane loss costs based on the 2012 FHCF Exposure Data from the previously-accepted hurricane model will be reviewed.

10. Form A-4A, Hurricane Output Ranges (2012 FHCF Exposure Data) and Form A-4B, Hurricane Output Ranges (2017 FHCF Exposure Data), will be reviewed to ensure appropriate relativities among deductibles, coverages, and construction types.

11. Apparent anomalies in the hurricane output ranges and their justification will be reviewed.

12. Forms A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data), and A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data), will be reviewed.

**Form A-1: Zero Deductible Personal Residential Hurricane**

**Loss Costs by ZIP Code**

Purpose: This form and the associated maps illustrate the range and variation by ZIP Code of zero deductible hurricane loss costs across Florida separately for frame owners, masonry owners, and manufactured homes.

1. Provide three maps, color-coded by ZIP Code (with a minimum of six value ranges), displaying zero deductible personal residential hurricane loss costs per $1,000 of exposure for frame owners, masonry owners, and manufactured homes.
2. Create exposure sets for these exhibits by modeling all of the buildings from Notional Set 3 described in the file *“NotionalInput17.xlsx”* geocoded to each ZIP Code centroid in the state, as provided in the hurricane model. Provide the predominant County name and the Federal Information Processing Standards (FIPS) code associated with each ZIP Code centroid. Refer to the Notional Hurricane Policy Specifications below for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information.
3. Provide, in the format given in the file named *“2017FormA1.xlsx”*in both Excel and PDF format, the underlying hurricane loss cost data, rounded to three decimal places in the PDF file, used for A. above. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name.

**Notional Hurricane Policy Specifications**

**Policy Type Assumptions**

**Owners Coverage A = Building**

* Replacement Cost included subject to Coverage A limit
* Law and Ordinance not included

**Coverage B = Appurtenant Structure**

* 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

Hurricane loss costs per $1,000 shall be related to the Coverage A limit

**Manufactured Homes Coverage A = Building**

* Replacement Cost included subject to Coverage A limit

**Coverage B = Appurtenant Structure**

* 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

Hurricane loss costs per $1,000 shall be related to the Coverage A limit

**Form A-2A: Base Hurricane Storm Set Statewide Hurricane Losses**

**(2012 FHCF Exposure Data)**

Purpose: This form illustrates the modeling organization’s ability to replicate reasonably historical hurricane losses for landfalling and by-passing Florida hurricanes.

1. Provide the total insured hurricane loss and the dollar contribution to the average annual hurricane loss assuming zero deductible policies for individual historical hurricanes using the Florida Hurricane Catastrophe Fund’s personal and commercial residential zero deductible exposure data provided in the file named “*hlpm2012c.exe.”* The list of hurricanes in this form shall 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 117-year period 1900-2016. Hurricane intensity for by-passing hurricanes is the intensity at maximum windspeed, not the windspeed on Florida. 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 additions. For hurricanes in the table below resulting in zero hurricane loss, the table entry shall be left blank. Additional hurricanes included in the hurricane 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. If additional assumptions are necessary to complete this form, provide the rationale for the assumptions as well as a detailed description of how they are included.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include Form A-2A, Base Hurricane Storm Set Statewide Hurricane Losses (2012 FHCF Exposure Data), in a submission appendix.

| **ID** | **Landfall/**  **Closest Approach Date** | **Year** | **Name** | **Region/**  **Category** | **Personal and Commercial Residential Insured Hurricane Losses ($)** | **Dollar Contribution** |
| --- | --- | --- | --- | --- | --- | --- |
| 005 | 08/15/1901 | 1901 | NoName04-1901 | F1 |  |  |
| 010 | 09/11/1903 | 1903 | NoName03-1903 | C1/A1 |  |  |
| 015 | 10/17/1904 | 1904 | NoName04-1904 | C1 |  |  |
| 020 | 06/17/1906 | 1906 | NoName02-1906 | B1/C1 |  |  |
| 025 | 09/27/1906 | 1906 | NoName06-1906 | F2/ByP2 |  |  |
| 030 | 10/18/1906 | 1906 | NoName08-1906 | B3/C3 |  |  |
| 035 | 10/11/1909 | 1909 | NoName11-1909 | B3 |  |  |
| 040 | 10/18/1910 | 1910 | NoName05-1910 | B2 |  |  |
| 045 | 08/11/1911 | 1911 | NoName02-1911 | A1 |  |  |
| 050 | 09/14/1912 | 1912 | NoName04-1912 | F1/ByP1 |  |  |
| 055 | 08/01/1915 | 1915 | NoName01-1915 | D1 |  |  |
| 060 | 09/04/1915 | 1915 | NoName04-1915 | A1 |  |  |
| 065 | 07/05/1916 | 1916 | NoName02-1916 | F3/ByP3 |  |  |
| 070 | 10/18/1916 | 1916 | NoName14-1916 | A2 |  |  |
| 075 | 09/29/1917 | 1917 | NoName04-1917 | A3 |  |  |
| 080 | 09/10/1919 | 1919 | NoName02-1919 | B4 |  |  |
| 085 | 10/25/1921 | 1921 | TampaBay06-1921 | B3 |  |  |
| 090 | 09/15/1924 | 1924 | NoName05-1924 | A1 |  |  |
| 095 | 10/21/1924 | 1924 | NoName10-1924 | B1 |  |  |
| 100 | 07/28/1926 | 1926 | NoName01-1926 | D2 |  |  |
| 105 | 09/18/1926 | 1926 | GreatMiami07-1926 | C4/A3 |  |  |
| 110 | 10/21/1926 | 1926 | NoName10-1926 | ByP3 |  |  |
| 115 | 08/08/1928 | 1928 | NoName01-1928 | C2 |  |  |
| 120 | 09/17/1928 | 1928 | LakeOkeechobee04-1928 | C4 |  |  |
| 125 | 09/28/1929 | 1929 | NoName02-1929 | C3/A1 |  |  |
| 130 | 09/01/1932 | 1932 | NoName03-1932 | F1/ByP1 |  |  |
| 135 | 07/30/1933 | 1933 | NoName05-1933 | C1 |  |  |
| 140 | 09/04/1933 | 1933 | NoName11-1933 | C3 |  |  |
| 145 | 09/03/1935 | 1935 | LaborDay03-1935 | C5/A2 |  |  |
| 150 | 11/04/1935 | 1935 | NoName07-1935 | C2 |  |  |
| 155 | 07/31/1936 | 1936 | NoName05-1936 | A2 |  |  |
| 160 | 08/11/1939 | 1939 | NoName02-1939 | C1/A1 |  |  |
| 165 | 10/06/1941 | 1941 | NoName05-1941 | C2/A1 |  |  |
| 170 | 10/19/1944 | 1944 | NoName13-1944 | B3 |  |  |
| 175 | 06/24/1945 | 1945 | NoName01-1945 | A1 |  |  |
| 180 | 09/15/1945 | 1945 | NoName09-1945 | C4 |  |  |
| 185 | 10/08/1946 | 1946 | NoName06-1946 | B2 |  |  |
| 190 | 09/17/1947 | 1947 | NoName04-1947 | C4 |  |  |
| 195 | 10/12/1947 | 1947 | NoName09-1947 | B1/E2 |  |  |
| 200 | 09/22/1948 | 1948 | NoName08-1948 | B4 |  |  |
| 205 | 10/05/1948 | 1948 | NoName09-1948 | B2 |  |  |
| 210 | 08/26/1949 | 1949 | NoName02-1949 | C4 |  |  |
| 215 | 08/31/1950 | 1950 | Baker-1950 | F1/ByP1 |  |  |
| 220 | 09/05/1950 | 1950 | Easy-1950 | A3 |  |  |
| 225 | 10/18/1950 | 1950 | King-1950 | C4 |  |  |
| 230 | 09/26/1953 | 1953 | Florence-1953 | A1 |  |  |
| 235 | 10/09/1953 | 1953 | Hazel-1953 | B1 |  |  |
| 240 | 09/25/1956 | 1956 | Flossy-1956 | A1 |  |  |
| 245 | 09/10/1960 | 1960 | Donna-1960 | B4 |  |  |
| 250 | 09/15/1960 | 1960 | Ethel-1960 | F1 |  |  |
| 255 | 08/27/1964 | 1964 | Cleo-1964 | C2 |  |  |
| 260 | 09/10/1964 | 1964 | Dora-1964 | D2 |  |  |
| 265 | 10/14/1964 | 1964 | Isbell-1964 | B3 |  |  |
| 270 | 09/08/1965 | 1965 | Betsy-1965 | C3 |  |  |
| 275 | 06/09/1966 | 1966 | Alma-1966 | A2 |  |  |
| 280 | 10/04/1966 | 1966 | Inez-1966 | B1 |  |  |
| 285 | 10/19/1968 | 1968 | Gladys-1968 | A2 |  |  |
| 290 | 08/18/1969 | 1969 | Camille-1969 | F5 |  |  |
| 295 | 06/19/1972 | 1972 | Agnes-1972 | A1 |  |  |
| 300 | 09/23/1975 | 1975 | Eloise-1975 | A3 |  |  |
| 305 | 09/04/1979 | 1979 | David-1979 | C2/E2 |  |  |
| 310 | 09/13/1979 | 1979 | Frederic-1979 | F3 |  |  |
| 315 | 09/02/1985 | 1985 | Elena-1985 | F3/ByP3 |  |  |
| 320 | 11/21/1985 | 1985 | Kate-1985 | A2 |  |  |
| 325 | 10/12/1987 | 1987 | Floyd-1987 | B1 |  |  |
| 330 | 08/24/1992 | 1992 | Andrew-1992 | C5 |  |  |
| 335 | 08/03/1995 | 1995 | Erin-1995 | C1/A2 |  |  |
| 340 | 10/04/1995 | 1995 | Opal-1995 | A3 |  |  |
| 345 | 07/19/1997 | 1997 | Danny-1997 | F1 |  |  |
| 350 | 09/03/1998 | 1998 | Earl-1998 | A1 |  |  |
| 355 | 09/25/1998 | 1998 | Georges-1998 | B2/F2 |  |  |
| 360 | 10/15/1999 | 1999 | Irene-1999 | B1 |  |  |
| 365 | 08/13/2004 | 2004 | Charley-2004 | B4 |  |  |
| 370 | 09/05/2004 | 2004 | Frances-2004 | C2 |  |  |
| 375 | 09/16/2004 | 2004 | Ivan-2004 | F3/ByP3 |  |  |
| 380 | 09/26/2004 | 2004 | Jeanne-2004 | C3 |  |  |
| 385 | 0710/2005 | 2005 | Dennis-2005 | A3 |  |  |
| 390 | 08/25/2005 | 2005 | Katrina-2005 | C1 |  |  |
| 395 | 09/20/2005 | 2005 | Rita-2005 | ByP2 |  |  |
| 400 | 10/24/2005 | 2005 | Wilma-2005 | B3 |  |  |
| 405 | 09/02/2016 | 2016 | Hermine-2016 | A1 |  |  |
| 410 | 10/07/2016 | 2016 | Matthew-2016 | ByP3 |  |  |
|  |  |  |  |  |  |  |
|  |  |  | **Total** |  |  |  |

Note: Total dollar contributions should agree with the total average annual zero deductible statewide hurricane loss costs provided in Form S-5, Average Annual Zero Deductible Statewide Hurricane Loss Costs – Historical versus Modeled, based on the 2012 FHCF Exposure Data.

**Form A-2B: Base Hurricane Storm Set Statewide Hurricane Losses**

**(2017 FHCF Exposure Data)**

Purpose: This form illustrates the modeling organization’s ability to replicate reasonably historical hurricane losses for landfalling and by-passing Florida hurricanes.

1. Provide the total insured hurricane loss and the dollar contribution to the average annual hurricane loss assuming zero deductible policies for individual historical hurricanes using the Florida Hurricane Catastrophe Fund’s personal and commercial residential zero deductible exposure data found in the file named “*hlpm2017c.exe.”* The list of hurricanes in this form shall 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 117-year period 1900-2016. Hurricane intensity for by-passing hurricanes is the intensity at maximum windspeed, not the windspeed on Florida. 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 additions. For hurricanes in the table below resulting in zero hurricane loss, the table entry shall be left blank. Additional hurricanes included in the hurricane 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. If additional assumptions are necessary to complete this form, provide the rationale for the assumptions as well as a detailed description of how they are included.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include Form A-2B, Base Hurricane Storm Set Statewide Hurricane Losses (2017 FHCF Exposure Data), in a submission appendix.

| **ID** | **Landfall/**  **Closest Approach Date** | **Year** | **Name** | **Region/**  **Category** | **Personal and Commercial Residential Insured Hurricane Losses ($)** | **Dollar Contribution** |
| --- | --- | --- | --- | --- | --- | --- |
| 005 | 08/15/1901 | 1901 | NoName04-1901 | F1 |  |  |
| 010 | 09/11/1903 | 1903 | NoName03-1903 | C1/A1 |  |  |
| 015 | 10/17/1904 | 1904 | NoName04-1904 | C1 |  |  |
| 020 | 06/17/1906 | 1906 | NoName02-1906 | B1/C1 |  |  |
| 025 | 09/27/1906 | 1906 | NoName06-1906 | F2/ByP2 |  |  |
| 030 | 10/18/1906 | 1906 | NoName08-1906 | B3/C3 |  |  |
| 035 | 10/11/1909 | 1909 | NoName11-1909 | B3 |  |  |
| 040 | 10/18/1910 | 1910 | NoName05-1910 | B2 |  |  |
| 045 | 08/11/1911 | 1911 | NoName02-1911 | A1 |  |  |
| 050 | 09/14/1912 | 1912 | NoName04-1912 | F1/ByP1 |  |  |
| 055 | 08/01/1915 | 1915 | NoName01-1915 | D1 |  |  |
| 060 | 09/04/1915 | 1915 | NoName04-1915 | A1 |  |  |
| 065 | 07/05/1916 | 1916 | NoName02-1916 | F3/ByP3 |  |  |
| 070 | 10/18/1916 | 1916 | NoName14-1916 | A2 |  |  |
| 075 | 09/29/1917 | 1917 | NoName04-1917 | A3 |  |  |
| 080 | 09/10/1919 | 1919 | NoName02-1919 | B4 |  |  |
| 085 | 10/25/1921 | 1921 | TampaBay06-1921 | B3 |  |  |
| 090 | 09/15/1924 | 1924 | NoName05-1924 | A1 |  |  |
| 095 | 10/21/1924 | 1924 | NoName10-1924 | B1 |  |  |
| 100 | 07/28/1926 | 1926 | NoName01-1926 | D2 |  |  |
| 105 | 09/18/1926 | 1926 | GreatMiami07-1926 | C4/A3 |  |  |
| 110 | 10/21/1926 | 1926 | NoName10-1926 | ByP3 |  |  |
| 115 | 08/08/1928 | 1928 | NoName01-1928 | C2 |  |  |
| 120 | 09/17/1928 | 1928 | LakeOkeechobee04-1928 | C4 |  |  |
| 125 | 09/28/1929 | 1929 | NoName02-1929 | C3/A1 |  |  |
| 130 | 09/01/1932 | 1932 | NoName03-1932 | F1/ByP1 |  |  |
| 135 | 07/30/1933 | 1933 | NoName05-1933 | C1 |  |  |
| 140 | 09/04/1933 | 1933 | NoName11-1933 | C3 |  |  |
| 145 | 09/03/1935 | 1935 | LaborDay03-1935 | C5/A2 |  |  |
| 150 | 11/04/1935 | 1935 | NoName07-1935 | C2 |  |  |
| 155 | 07/31/1936 | 1936 | NoName05-1936 | A2 |  |  |
| 160 | 08/11/1939 | 1939 | NoName02-1939 | C1/A1 |  |  |
| 165 | 10/06/1941 | 1941 | NoName05-1941 | C2/A1 |  |  |
| 170 | 10/19/1944 | 1944 | NoName13-1944 | B3 |  |  |
| 175 | 06/24/1945 | 1945 | NoName01-1945 | A1 |  |  |
| 180 | 09/15/1945 | 1945 | NoName09-1945 | C4 |  |  |
| 185 | 10/08/1946 | 1946 | NoName06-1946 | B2 |  |  |
| 190 | 09/17/1947 | 1947 | NoName04-1947 | C4 |  |  |
| 195 | 10/12/1947 | 1947 | NoName09-1947 | B1/E2 |  |  |
| 200 | 09/22/1948 | 1948 | NoName08-1948 | B4 |  |  |
| 205 | 10/05/1948 | 1948 | NoName09-1948 | B2 |  |  |
| 210 | 08/26/1949 | 1949 | NoName02-1949 | C4 |  |  |
| 215 | 08/31/1950 | 1950 | Baker-1950 | F1/ByP1 |  |  |
| 220 | 09/05/1950 | 1950 | Easy-1950 | A3 |  |  |
| 225 | 10/18/1950 | 1950 | King-1950 | C4 |  |  |
| 230 | 09/26/1953 | 1953 | Florence-1953 | A1 |  |  |
| 235 | 10/09/1953 | 1953 | Hazel-1953 | B1 |  |  |
| 240 | 09/25/1956 | 1956 | Flossy-1956 | A1 |  |  |
| 245 | 09/10/1960 | 1960 | Donna-1960 | B4 |  |  |
| 250 | 09/15/1960 | 1960 | Ethel-1960 | F1 |  |  |
| 255 | 08/27/1964 | 1964 | Cleo-1964 | C2 |  |  |
| 260 | 09/10/1964 | 1964 | Dora-1964 | D2 |  |  |
| 265 | 10/14/1964 | 1964 | Isbell-1964 | B3 |  |  |
| 270 | 09/08/1965 | 1965 | Betsy-1965 | C3 |  |  |
| 275 | 06/09/1966 | 1966 | Alma-1966 | A2 |  |  |
| 280 | 10/04/1966 | 1966 | Inez-1966 | B1 |  |  |
| 285 | 10/19/1968 | 1968 | Gladys-1968 | A2 |  |  |
| 290 | 08/18/1969 | 1969 | Camille-1969 | F5 |  |  |
| 295 | 06/19/1972 | 1972 | Agnes-1972 | A1 |  |  |
| 300 | 09/23/1975 | 1975 | Eloise-1975 | A3 |  |  |
| 305 | 09/04/1979 | 1979 | David-1979 | C2/E2 |  |  |
| 310 | 09/13/1979 | 1979 | Frederic-1979 | F3 |  |  |
| 315 | 09/02/1985 | 1985 | Elena-1985 | F3/ByP3 |  |  |
| 320 | 11/21/1985 | 1985 | Kate-1985 | A2 |  |  |
| 325 | 10/12/1987 | 1987 | Floyd-1987 | B1 |  |  |
| 330 | 08/24/1992 | 1992 | Andrew-1992 | C5 |  |  |
| 335 | 08/03/1995 | 1995 | Erin-1995 | C1/A2 |  |  |
| 340 | 10/04/1995 | 1995 | Opal-1995 | A3 |  |  |
| 345 | 07/19/1997 | 1997 | Danny-1997 | F1 |  |  |
| 350 | 09/03/1998 | 1998 | Earl-1998 | A1 |  |  |
| 355 | 09/25/1998 | 1998 | Georges-1998 | B2/F2 |  |  |
| 360 | 10/15/1999 | 1999 | Irene-1999 | B1 |  |  |
| 365 | 08/13/2004 | 2004 | Charley-2004 | B4 |  |  |
| 370 | 09/05/2004 | 2004 | Frances-2004 | C2 |  |  |
| 375 | 09/16/2004 | 2004 | Ivan-2004 | F3/ByP3 |  |  |
| 380 | 09/26/2004 | 2004 | Jeanne-2004 | C3 |  |  |
| 385 | 0710/2005 | 2005 | Dennis-2005 | A3 |  |  |
| 390 | 08/25/2005 | 2005 | Katrina-2005 | C1 |  |  |
| 395 | 09/20/2005 | 2005 | Rita-2005 | ByP2 |  |  |
| 400 | 10/24/2005 | 2005 | Wilma-2005 | B3 |  |  |
| 405 | 09/02/2016 | 2016 | Hermine-2016 | A1 |  |  |
| 410 | 10/07/2016 | 2016 | Matthew-2016 | ByP3 |  |  |
|  |  |  |  |  |  |  |
|  |  |  | **Total** |  |  |  |

Note: Total dollar contributions should agree with the total average annual zero deductible statewide hurricane loss costs provided in Form S-5, Average Annual Zero Deductible Statewide Hurricane Loss Costs – Historical versus Modeled, based on the 2017 FHCF Exposure Data.

**Form A-3A: 2004 Hurricane Season Losses**

**(2012 FHCF Exposure Data)**

Purpose: This form illustrates the modeling organization’s ability to replicate reasonably historical hurricane losses for the four Florida landfalling hurricanes in 2004.

1. Provide the percentage of residential zero deductible hurricane losses, rounded to four decimal places in the printed form, 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 hurricane losses are equal to or greater than $500,000.

Use the 2012 Florida Hurricane Catastrophe Fund’s personal and commercial residential zero deductible exposure data provided in the file named *“hlpm2012c.exe.”*

Rather than using directly a specified published windfield, the winds underlying the hurricane loss cost calculations must be produced by the hurricane model being evaluated and should be the same hurricane parameters as used in completing Form A-2A, Base Hurricane Storm Set Statewide Hurricane Losses (2012 FHCF Exposure Data).

B. Provide maps color-coded by ZIP Code depicting the percentage of total residential hurricane losses from each hurricane, Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) and for the cumulative hurricane 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%

Plot the relevant storm track on each map.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include Form A-3A, 2004 Hurricane Season Losses (2012 FHCF Exposure Data), in a submission appendix.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Hurricane Charley** | | **Hurricane Frances** | | **Hurricane Ivan** | | **Hurricane Jeanne** | | **Total** | |
| ZIP Code | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

**Form A-3B: 2004 Hurricane Season Losses**

**(2017 FHCF Exposure Data)**

Purpose: This form illustrates the modeling organization’s ability to replicate reasonably historical hurricane losses for the four Florida landfalling hurricanes in 2004.

1. Provide the percentage of residential zero deductible hurricane losses, rounded to four decimal places in the printed form, 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 hurricane losses are equal to or greater than $500,000.

Use the 2017 Florida Hurricane Catastrophe Fund’s personal and commercial residential zero deductible exposure data provided in the file named *“hlpm2017c.exe.”*

Rather than using directly a specified published windfield, the winds underlying the hurricane loss cost calculations must be produced by the hurricane model being evaluated and should be the same hurricane parameters as used in completing Form A-2B, Base Hurricane Storm Set Statewide Hurricane Losses (2017 FHCF Exposure Data).

B. Provide maps color-coded by ZIP Code depicting the percentage of total residential hurricane losses from each hurricane, Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) and for the cumulative hurricane 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%

Plot the relevant storm track on each map.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include Form A-3B, 2004 Hurricane Season Losses (2017 FHCF Exposure Data), in a submission appendix.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Hurricane Charley** | | **Hurricane Frances** | | **Hurricane Ivan** | | **Hurricane Jeanne** | | **Total** | |
| ZIP Code | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) | Personal & Commercial Residential Monetary Contribution ($) | Percent of Losses (%) |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

**Form A-4A: Hurricane Output Ranges (2012 FHCF Exposure Data)**

Purpose: This form provides an illustration of the projected personal and commercial residential modeled hurricane loss costs by county and provides a means to review for appropriate differentials among deductibles, coverages, and construction types.

A. Provide personal and commercial residential hurricane output ranges in the format shown in the file named *“2017FormA4A.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 hurricane standards year, and the form name. Also include Form A-4A, Hurricane Output Ranges (2012 FHCF Exposure Data), in a submission appendix.

B. Provide hurricane loss costs, rounded to three decimal places in the printed form, by county. Within each county, hurricane 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 homes, and commercial residential. For each of these categories using ZIP Code centroids, the hurricane output range shall show the highest hurricane loss cost, the lowest hurricane loss cost, and the weighted average hurricane 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 values and deductibles information. Insured values shall be based on the hurricane output range specifications given below. Deductible amounts of 0% and as specified in the hurricane output range specifications given below shall be assumed to be uniformly applied to all risks. When calculating the weighted average hurricane loss costs, weight the hurricane loss costs by the total insured value calculated above. Include the statewide range of hurricane loss costs (i.e., low, high, and weighted average).

C. If a modeling organization has hurricane loss costs for a ZIP Code for which there is no exposure, give the hurricane 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.

1. If a modeling organization does not have hurricane loss costs for a ZIP Code for which there is some exposure, do not assume such hurricane loss costs are zero, but use only the exposures for which there are hurricane loss costs in calculating the weighted average hurricane loss costs. Provide a list in the submission document of the ZIP Codes where this occurs.
2. NA shall be used in cells to signify no exposure.

F. All hurricane loss costs that are not consistent with the requirements of Standard A-6, Hurricane Loss Outputs and Logical Relationships to Risk, and have been explained in Disclosure A-6.17 shall be shaded.

G. Indicate if per diem is used in producing hurricane loss costs for Coverage D (Time Element) in the personal residential hurricane output ranges. If a per diem rate is used, a rate of $150.00 per day per policy shall be used.

**Form A-4B: Hurricane Output Ranges (2017 FHCF Exposure Data)**

Purpose: This form provides an illustration of the projected personal and commercial residential modeled hurricane loss costs by county and provides a means to review for appropriate differentials among deductibles, coverages, and construction types.

A. Provide personal and commercial residential hurricane output ranges in the format shown in the file named *“2017FormA4B.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 hurricane standards year, and the form name. Also include Form A-4B, Hurricane Output Ranges (2017 FHCF Exposure Data), in a submission appendix.

B. Provide hurricane loss costs, rounded to three decimal places in the printed form, by county. Within each county, hurricane 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 homes, and commercial residential. For each of these categories using ZIP Code centroids, the hurricane output range shall show the highest hurricane loss cost, the lowest hurricane loss cost, and the weighted average hurricane loss cost. The aggregate residential exposure data for this form shall be developed from the information in the file named *“hlpm2017c.exe,”* except for insured values and deductibles information. Insured values shall be based on the hurricane output range specifications given below. Deductible amounts of 0% and as specified in the hurricane output range specifications given below shall be assumed to be uniformly applied to all risks. When calculating the weighted average hurricane loss costs, weight the hurricane loss costs by the total insured value calculated above. Include the statewide range of hurricane loss costs (i.e., low, high, and weighted average).

C. If a modeling organization has hurricane loss costs for a ZIP Code for which there is no exposure, give the hurricane 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.

1. If a modeling organization does not have hurricane loss costs for a ZIP Code for which there is some exposure, do not assume such hurricane loss costs are zero, but use only the exposures for which there are hurricane loss costs in calculating the weighted average hurricane loss costs. Provide a list in the submission document of the ZIP Codes where this occurs.
2. NA shall be used in cells to signify no exposure.

F. All hurricane loss costs that are not consistent with the requirements of Standard A-6, Hurricane Loss Outputs and Logical Relationships to Risk, and have been explained in Disclosure A-6.17 shall be shaded.

G. Indicate if per diem is used in producing hurricane loss costs for Coverage D (Time Element) in the personal residential hurricane output ranges. If a per diem rate is used, a rate of $150.00 per day per policy shall be used.

**Hurricane 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 Structure**

* 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
* Hurricane loss costs per $1,000 shall be related to the Coverage A limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* 2% Deductible of Coverage A
* All-other perils deductible = $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
* Hurricane loss costs per $1,000 shall be related to the Coverage C limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* 2% Deductible of Coverage C
* All-other perils deductible = $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
* Hurricane loss costs per $1,000 shall be related to the Coverage C limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* 2% Deductible of Coverage C
* All-other perils deductible = $500

**Manufactured Home s**

**Coverage A = Building**

* Coverage A limit = $50,000
* Replacement Cost included subject to Coverage A limit

**Coverage B = Appurtenant Structure**

* 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
* Hurricane loss costs per $1,000 shall be related to the Coverage A limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* 2% Deductible of Coverage A
* All-other perils deductible = $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
* Hurricane loss costs per $1,000 shall be related to the Coverage A limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* 3% Deductible of Coverage A
* All-other perils deductible = $500

**Form A-5: Percentage Change in Hurricane Output Ranges**

**(2012 FHCF Exposure Data)**

Purpose: This form illustrates the impact of changes in the hurricane model on the hurricane loss cost output ranges from the previously-accepted hurricane model.

A. Provide summaries of the percentage change in average hurricane loss cost output range data compiled in Form A-4A, Hurricane Output Ranges (2012 FHCF Exposure Data), relative to the equivalent data compiled from the previously-accepted hurricane model in the format shown in the file named *“2017FormA5.xlsx.”*

For the change in hurricane output range exhibit, provide the summary by:

* Statewide (overall percentage change),
* By region, as defined in *Figure 14* – North, Central and South,
* By county, as defined in *Figure 15* – Coastal and Inland.

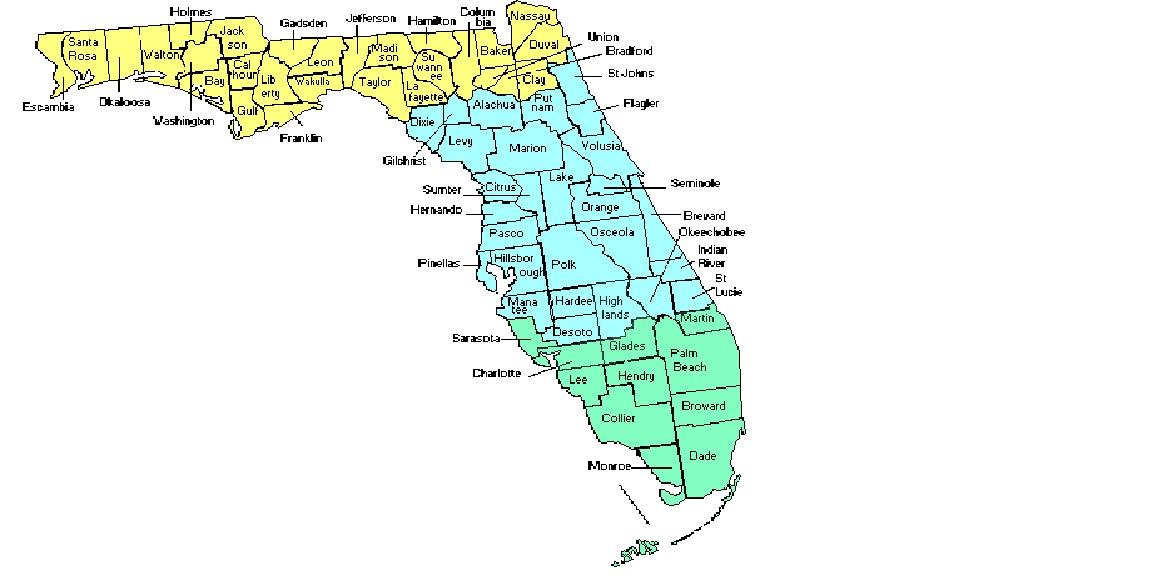
B. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include all tables in Form A-5, Percentage Change in Hurricane Output Ranges (2012 FHCF Exposure Data), in a submission appendix.

C. Provide color-coded maps by county reflecting the percentage changes in the average hurricane loss costs based on the 2012 FHCF Exposure Data with specified deductibles for frame owners, masonry owners, frame renters, masonry renters, frame condo unit owners, masonry condo unit owners, manufactured homes, and commercial residential from the hurricane output ranges from the previously-accepted hurricane model.

Counties with a negative percentage change (reduction in hurricane loss costs) shall be indicated with shades of blue; counties with a positive percentage change (increase in hurricane 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.

### *Figure 14*

State of Florida by North/Central/South Regions



**North**

**Central**

**South**

### *Figure 15*

State of Florida by Coastal/Inland Counties



**Inland**

**Coastal**

**Form A-6: Logical Relationship to Hurricane Risk**

**(Trade Secret Item)**

Purpose: This form provides an illustration of the hurricane loss cost relationships among deductible, policy form, construction type, coverage, year of construction, building strength, condo unit floor, and number of stories.

A. Provide the logical relationship to hurricane risk exhibits in the format shown in the file named *“2017FormA6.xlsx.”*

B. Create exposure sets for each exhibit by modeling all of the coverages from the appropriate Notional Set listed below at each of the locations in “Location Grid A” as described in the file *“NotionalInput17.xlsx.”* Refer to the Notional Hurricane Policy Specifications below for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information. In particular, explain how the treatment of unknown is handled in each sensitivity.

|  |  |
| --- | --- |
| Exhibit | Notional Set |
| Deductible Sensitivity | Set 1 |
| Policy Form Sensitivity | Set 2 |
| Policy Form/Construction 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 |

Hurricane models shall treat points in “Location Grid A” as coordinates that would result from a geocoding process. Hurricane models shall treat points by simulating hurricane loss at exact location or by using the nearest modeled parcel/street/cell in the hurricane model.

Report results for each of the points in “Location Grid A” individually, unless specified. Hurricane loss costs per $1,000 of exposure shall be rounded to three decimal places in the printed form.

C. All hurricane loss costs that are not consistent with the requirements of Standard A-6, Hurricane Loss Outputs and Logical Relationships to Risk, and have been explained in Disclosure A-6.17 shall be shaded.

D. Create an exposure set and report hurricane loss costs results for strong owners frame buildings (Notional Set 6) for each of the points in “Location Grid B” as described in the file *“NotionalInput17.xlsx.”* Provide a color-coded contour map of the hurricane loss costs. Provide a scatter plot of the hurricane loss costs (*y*-axis) against distance to closest coast (*x*-axis).

**Notional Hurricane Policy Specifications**

**Policy Type Assumptions**

**Owners Coverage A = Building**

* Replacement Cost included subject to Coverage A limit
* Law and Ordinance not included

**Coverage B = Appurtenant Structure**

* 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
* Hurricane loss costs per $1,000 shall be related to the Coverage A limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* All-other perils deductible = $500

**Renters 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
* Hurricane loss costs per $1,000 shall be related to the Coverage C limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* All-other perils deductible = $500

**Condo Unit Owners**

**Coverage A = Building**

* Replacement Cost included subject to Coverage A 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
* Hurricane loss costs per $1,000 shall be related to the Coverage C limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* All-other perils deductible = $500

**Manufactured Homes**

**Coverage A = Building**

* Replacement Cost included subject to Coverage A limit

**Coverage B = Appurtenant Structure**

* 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
* Hurricane loss costs per $1,000 shall be related to the Coverage A limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* All-other perils deductible = $500

**Commercial Residential**

**Coverage A = Building**

* Replacement Cost included subject to Coverage A 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
* Hurricane loss costs per $1,000 shall be related to the Coverage A limit
* Hurricane loss costs for the various specified deductibles shall be determined based on annual deductibles
* All-other perils deductible = $500

**Form A-7: Percentage Change in Logical Relationship**

**to Hurricane Risk**

Purpose: This form illustrates the impact of changes in the hurricane model on the logical relationship to hurricane risk exhibits from the previously-accepted hurricane model.

A. Provide summaries of the percentage change in logical relationship to hurricane risk exhibits from the previously-accepted hurricane model in the format shown in the file named *“2017FormA7.xlsx.”*

B. Create exposure sets for each exhibit by modeling all of the coverages from the appropriate Notional Set listed below at each of the locations in “Location Grid B” as described in the file *“NotionalInput17.xlsx.”* Refer to the Notional Hurricane Policy Specifications provided in Form A-6, Logical Relationship to Hurricane Risk (Trade Secret item), for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information. In particular, explain how the treatment of unknown is handled in each sensitivity.

|  |  |
| --- | --- |
| Exhibit | Notional Set |
| Deductible Sensitivity | Set 1 |
| Policy Form Sensitivity | Set 2 |
| Policy Form/Construction 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 |

Hurricane models shall treat points in “Location Grid B” as coordinates that would result from a geocoding process. Hurricane models shall treat points by simulating hurricane loss at exact location or by using the nearest modeled parcel/street/cell in the hurricane model.

Provide the results statewide (overall percentage change) and by the regions defined in Form A-5, Percentage Change in Hurricane Output Ranges (2012 FHCF Exposure Data).

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include all tables in Form A-7, Percentage Change in Logical Relationship to Hurricane Risk, in a submission appendix.

**Form A-8A: Hurricane Probable Maximum Loss for Florida**

**(2012 FHCF Exposure Data)**

Purpose: This form provides an illustration of the distribution of hurricane losses. The form also illustrates that appropriate calculations were used to produce both expected annual hurricane losses and hurricane probable maximum loss levels.

1. Provide a detailed explanation of how the Expected Annual Hurricane Losses and Return Periods are calculated.
2. Complete Part A showing the personal and commercial residential hurricane probable maximum loss for Florida. For the Expected Annual Hurricane Losses column, provide personal and commercial residential, zero deductible statewide hurricane loss costs based on the 2012 Florida Hurricane Catastrophe Fund’s personal and commercial residential zero deductible exposure data found in the file named *“hlpm2012c.exe.”*

In the column, Return Period (Years), provide the return period associated with the average hurricane loss within the ranges indicated on a cumulative basis.

For example, if the average hurricane loss is $4,705 million for the range $4,501 million to $5,000 million, provide the return period associated with a hurricane loss that is $4,705 million or greater.

For each hurricane loss range in millions ($1,001-$1,500, $1,501-$2,000, $2,001-$2,500) the average hurricane loss within that range should be identified and then the return period associated with that hurricane loss calculated. The return period is then the reciprocal of the probability of the hurricane loss equaling or exceeding this average hurricane loss size.

The probability of equaling or exceeding the average of each range should be smaller as the ranges increase (and the average hurricane losses within the ranges increase). Therefore, the return period associated with each range and average hurricane 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 hurricane loss of $4,705 million within the $4,501-$5,000 million range should be lower than the return period for an average hurricane loss of $5,455 million associated with a $5,001- $6,000 million range.

C. Provide a graphical comparison of the current hurricane model Residential Return Periods hurricane loss curve to the previously-accepted hurricane model Residential Return Periods hurricane loss curve. Residential Return Period (Years) shall be shown on the *y*-axis on a log 10 scale with Hurricane Losses in Billions shown on the *x*-axis. The legend shall indicate the corresponding hurricane model with a solid line representing the current year and a dotted line representing the previously-accepted hurricane model.

D. Provide the estimated hurricane 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 hurricane losses greater than the Estimated Hurricane Loss Level.

E. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include Form A-8A, Hurricane Probable Maximum Loss for Florida (2012 FHCF Exposure Data), in a submission appendix.

**Part A – Personal and Commercial Residential Hurricane Probable Maximum Loss for Florida**

| **HURRICANE**  **LOSS RANGE**  **(MILLIONS)** | | | **TOTAL HURRICANE LOSS** | **AVERAGE HURRICANE LOSS (MILLIONS)** | **NUMBER OF**  **HURRICANES** | **EXPECTED ANNUAL HURRICANE LOSSES\*** | **RETURN PERIOD (YEARS)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| $ - | to | $ 500 |  |  |  |  |  |
| $ 501 | to | $ 1,000 |  |  |  |  |  |
| $ 1,001 | to | $ 1,500 |  |  |  |  |  |
| $ 1,501 | to | $ 2,000 |  |  |  |  |  |
| $ 2,001 | to | $ 2,500 |  |  |  |  |  |
| $ 2,501 | to | $ 3,000 |  |  |  |  |  |
| $ 3,001 | to | $ 3,500 |  |  |  |  |  |
| $ 3,501 | to | $ 4,000 |  |  |  |  |  |
| $ 4,001 | to | $ 4,500 |  |  |  |  |  |
| $ 4,501 | to | $ 5,000 |  |  |  |  |  |
| $ 5,001 | to | $ 6,000 |  |  |  |  |  |
| $ 6,001 | to | $ 7,000 |  |  |  |  |  |
| $ 7,001 | to | $ 8,000 |  |  |  |  |  |
| $ 8,001 | to | $ 9,000 |  |  |  |  |  |
| $ 9,001 | to | $ 10,000 |  |  |  |  |  |
| $ 10,001 | to | $ 11,000 |  |  |  |  |  |
| $ 11,001 | to | $ 12,000 |  |  |  |  |  |
| $ 12,001 | to | $ 13,000 |  |  |  |  |  |
| $ 13,001 | to | $ 14,000 |  |  |  |  |  |
| $ 14,001 | to | $ 15,000 |  |  |  |  |  |
| $ 15,001 | to | $ 16,000 |  |  |  |  |  |
| $ 16,001 | to | $ 17,000 |  |  |  |  |  |
| $ 17,001 | to | $ 18,000 |  |  |  |  |  |
| $ 18,001 | to | $ 19,000 |  |  |  |  |  |
| $ 19,001 | to | $ 20,000 |  |  |  |  |  |
| $ 20,001 | to | $ 21,000 |  |  |  |  |  |
| $ 21,001 | to | $ 22,000 |  |  |  |  |  |
| $ 22,001 | to | $ 23,000 |  |  |  |  |  |
| $ 23,001 | to | $ 24,000 |  |  |  |  |  |
| $ 24,001 | to | $ 25,000 |  |  |  |  |  |
| $ 25,001 | to | $ 26,000 |  |  |  |  |  |
| $ 26,001 | to | $ 27,000 |  |  |  |  |  |
| $ 27,001 | to | $ 28,000 |  |  |  |  |  |
| $ 28,001 | to | $ 29,000 |  |  |  |  |  |
| $ 29,001 | to | $ 30,000 |  |  |  |  |  |
| $ 30,001 | to | $ 35,000 |  |  |  |  |  |
| $ 35,001 | to | $ 40,000 |  |  |  |  |  |
| $ 40,001 | to | $ 45,000 |  |  |  |  |  |
| $ 45,001 | to | $ 50,000 |  |  |  |  |  |
| $ 50,001 | to | $ 55,000 |  |  |  |  |  |
| $ 55,001 | to | $ 60,000 |  |  |  |  |  |
| $ 60,001 | to | $ 65,000 |  |  |  |  |  |
| $ 65,001 | to | $ 70,000 |  |  |  |  |  |
| $ 70,001 | to | $ 75,000 |  |  |  |  |  |
| $ 75,001 | to | $ 80,000 |  |  |  |  |  |
| $ 80,001 | to | $ 90,000 |  |  |  |  |  |
| $ 90,001 | to | $ 100,000 |  |  |  |  |  |
| $ 100,001 | to | $ Maximum |  |  |  |  |  |
| **Total** | | |  |  |  |  |  |

\*Personal and commercial residential zero deductible statewide hurricane loss using 2012 FHCF personal and commercial residential zero deductible exposure data (file name: *hlpm2012c.exe)*.

**Part B – Personal and Commercial Residential Hurricane Probable Maximum Loss for Florida (Annual Aggregate)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Return Period (Years)** | **Estimated Hurricane Loss Level** | **Uncertainty Interval** | **Conditional Tail Expectation** |
| Top Event |  |  | --- |
| 1,000 |  |  |  |
| 500 |  |  |  |
| 250 |  |  |  |
| 100 |  |  |  |
| 50 |  |  |  |
| 20 |  |  |  |
| 10 |  |  |  |
| 5 |  |  |  |

**Part C – Personal and Commercial Residential Hurricane Probable**

**Maximum Loss for Florida (Annual Occurrence)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Return Period (Years)** | **Estimated Hurricane Loss Level** | **Uncertainty Interval** | **Conditional Tail Expectation** |
| Top Event |  |  | --- |
| 1,000 |  |  |  |
| 500 |  |  |  |
| 250 |  |  |  |
| 100 |  |  |  |
| 50 |  |  |  |
| 20 |  |  |  |
| 10 |  |  |  |
| 5 |  |  |  |

**Form A-8B: Hurricane Probable Maximum Loss for Florida**

**(2017 FHCF Exposure Data)**

Purpose: This form provides an illustration of the distribution of hurricane losses. The form also illustrates that appropriate calculations were used to produce both expected annual hurricane losses and hurricane probable maximum loss levels.

1. Provide a detailed explanation of how the Expected Annual Hurricane Losses and Return Periods are calculated.
2. Complete Part A showing the personal and commercial residential hurricane probable maximum loss for Florida. For the Expected Annual Hurricane Losses column, provide personal and commercial residential, zero deductible statewide hurricane loss costs based on the 2017 Florida Hurricane Catastrophe Fund’s personal and commercial residential zero deductible exposure data found in the file named *“hlpm2017c.exe.”*

In the column, Return Period (Years), provide the return period associated with the average hurricane loss within the ranges indicated on a cumulative basis.

For example, if the average hurricane loss is $4,705 million for the range $4,501 million to $5,000 million, provide the return period associated with a hurricane loss that is $4,705 million or greater.

For each hurricane loss range in millions ($1,001-$1,500, $1,501-$2,000, $2,001-$2,500) the average hurricane loss within that range should be identified and then the return period associated with that hurricane loss calculated. The return period is then the reciprocal of the probability of the hurricane loss equaling or exceeding this average hurricane loss size.

The probability of equaling or exceeding the average of each range should be smaller as the ranges increase (and the average hurricane losses within the ranges increase). Therefore, the return period associated with each range and average hurricane 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 hurricane loss of $4,705 million within the $4,501-$5,000 million range should be lower than the return period for an average hurricane loss of $5,455 million associated with a $5,001- $6,000 million range.

C. Provide a graphical comparison of the current hurricane model Residential Return Periods hurricane loss curve to the previously-accepted hurricane model Residential Return Periods hurricane loss curve. Residential Return Period (Years) shall be shown on the *y*-axis on a log 10 scale with Hurricane Losses in Billions shown on the *x*-axis. The legend shall indicate the corresponding hurricane model with a solid line representing the current year and a dotted line representing the previously-accepted hurricane model.

D. Provide the estimated hurricane 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 hurricane losses greater than the Estimated Hurricane Loss Level.

E. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the hurricane standards year, and the form name. Also include Form A-8B, Hurricane Probable Maximum Loss for Florida (2017 FHCF Exposure Data), in a submission appendix.

**Part A – Personal and Commercial Residential Hurricane Probable Maximum Loss for Florida**

| **HURRICANE**  **LOSS RANGE**  **(MILLIONS)** | | | **TOTAL HURRICANE LOSS** | **AVERAGE HURRICANE LOSS (MILLIONS)** | **NUMBER OF**  **HURRICANES** | **EXPECTED ANNUAL HURRICANE LOSSES\*** | **RETURN PERIOD (YEARS)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| $ - | to | $ 500 |  |  |  |  |  |
| $ 501 | to | $ 1,000 |  |  |  |  |  |
| $ 1,001 | to | $ 1,500 |  |  |  |  |  |
| $ 1,501 | to | $ 2,000 |  |  |  |  |  |
| $ 2,001 | to | $ 2,500 |  |  |  |  |  |
| $ 2,501 | to | $ 3,000 |  |  |  |  |  |
| $ 3,001 | to | $ 3,500 |  |  |  |  |  |
| $ 3,501 | to | $ 4,000 |  |  |  |  |  |
| $ 4,001 | to | $ 4,500 |  |  |  |  |  |
| $ 4,501 | to | $ 5,000 |  |  |  |  |  |
| $ 5,001 | to | $ 6,000 |  |  |  |  |  |
| $ 6,001 | to | $ 7,000 |  |  |  |  |  |
| $ 7,001 | to | $ 8,000 |  |  |  |  |  |
| $ 8,001 | to | $ 9,000 |  |  |  |  |  |
| $ 9,001 | to | $ 10,000 |  |  |  |  |  |
| $ 10,001 | to | $ 11,000 |  |  |  |  |  |
| $ 11,001 | to | $ 12,000 |  |  |  |  |  |
| $ 12,001 | to | $ 13,000 |  |  |  |  |  |
| $ 13,001 | to | $ 14,000 |  |  |  |  |  |
| $ 14,001 | to | $ 15,000 |  |  |  |  |  |
| $ 15,001 | to | $ 16,000 |  |  |  |  |  |
| $ 16,001 | to | $ 17,000 |  |  |  |  |  |
| $ 17,001 | to | $ 18,000 |  |  |  |  |  |
| $ 18,001 | to | $ 19,000 |  |  |  |  |  |
| $ 19,001 | to | $ 20,000 |  |  |  |  |  |
| $ 20,001 | to | $ 21,000 |  |  |  |  |  |
| $ 21,001 | to | $ 22,000 |  |  |  |  |  |
| $ 22,001 | to | $ 23,000 |  |  |  |  |  |
| $ 23,001 | to | $ 24,000 |  |  |  |  |  |
| $ 24,001 | to | $ 25,000 |  |  |  |  |  |
| $ 25,001 | to | $ 26,000 |  |  |  |  |  |
| $ 26,001 | to | $ 27,000 |  |  |  |  |  |
| $ 27,001 | to | $ 28,000 |  |  |  |  |  |
| $ 28,001 | to | $ 29,000 |  |  |  |  |  |
| $ 29,001 | to | $ 30,000 |  |  |  |  |  |
| $ 30,001 | to | $ 35,000 |  |  |  |  |  |
| $ 35,001 | to | $ 40,000 |  |  |  |  |  |
| $ 40,001 | to | $ 45,000 |  |  |  |  |  |
| $ 45,001 | to | $ 50,000 |  |  |  |  |  |
| $ 50,001 | to | $ 55,000 |  |  |  |  |  |
| $ 55,001 | to | $ 60,000 |  |  |  |  |  |
| $ 60,001 | to | $ 65,000 |  |  |  |  |  |
| $ 65,001 | to | $ 70,000 |  |  |  |  |  |
| $ 70,001 | to | $ 75,000 |  |  |  |  |  |
| $ 75,001 | to | $ 80,000 |  |  |  |  |  |
| $ 80,001 | to | $ 90,000 |  |  |  |  |  |
| $ 90,001 | to | $ 100,000 |  |  |  |  |  |
| $ 100,001 | to | $ Maximum |  |  |  |  |  |
| **Total** | | |  |  |  |  |  |

\*Personal and commercial residential zero deductible statewide hurricane loss using 2017 FHCF personal and commercial residential zero deductible exposure data (file name: *hlpm2017c.exe)*.

**Part B – Personal and Commercial Residential Hurricane Probable Maximum Loss for Florida (Annual Aggregate)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Return Period (Years)** | **Estimated Hurricane Loss Level** | **Uncertainty Interval** | **Conditional Tail Expectation** |
| Top Event |  |  | --- |
| 1,000 |  |  |  |
| 500 |  |  |  |
| 250 |  |  |  |
| 100 |  |  |  |
| 50 |  |  |  |
| 20 |  |  |  |
| 10 |  |  |  |
| 5 |  |  |  |

**Part C – Personal and Commercial Residential Hurricane Probable**

**Maximum Loss for Florida (Annual Occurrence)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Return Period (Years)** | **Estimated Hurricane Loss Level** | **Uncertainty Interval** | **Conditional Tail Expectation** |
| Top Event |  |  | --- |
| 1,000 |  |  |  |
| 500 |  |  |  |
| 250 |  |  |  |
| 100 |  |  |  |
| 50 |  |  |  |
| 20 |  |  |  |
| 10 |  |  |  |
| 5 |  |  |  |