ACTUARIAL FLOOD STANDARDS

AF-1 Flood 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.

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

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

Different modeling approaches may require different input data.

Relevant Form: GF-5, Actuarial Flood Standards Expert Certification

Disclosures

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

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

3. Describe the different flood policies, contracts, and endorsements as specified in Section 627.715, Florida Statutes, that are modeled.

4. Provide a copy of the input form(s) used by the flood model with the flood model options available for selection by the user for the Florida flood model under review. Describe the process followed by the user to generate the flood model output produced from the input form. Include the flood 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.

5. Disclose, in a flood model output report, the specific inputs required to use the flood model and the options of the flood model selected for use in a personal residential property flood insurance rate filing. Include the flood model name and version

identification on the flood model output report. All items included in the flood model output report submitted to the Commission should be clearly labeled and defined.

6. Explain the differences in data input and model output required for coastal and inland flood modeling.

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

Audit

1. Quality assurance procedures, including methods to assure accuracy of flood insurance or other input data, will be reviewed. Compliance with this standard will be readily demonstrated through documented rules and procedures.

2. All flood model inputs and assumptions will be reviewed to determine that the flood model output report appropriately discloses all modifications, adjustments, assumptions, and defaults used to produce the flood loss costs and flood probable maximum loss levels.

3. Explanation of the differences in data input and model output for coastal and inland flood modeling will be reviewed.

AF-2 Flood Events Resulting in Modeled Flood Losses

A. Flood modeled loss costs and flood probable maximum loss levels shall reflect insured flood related damages from both coastal and inland flood events impacting Florida that is consistent with the statutory definition of flood.

B. Time element flood loss costs shall reflect insured flood losses due to infrastructure damage caused by a flood event.

C. The modeling organization shall have a documented procedure for addressing double counting or under counting of flood losses from any source.

Purpose: Flood loss costs and flood probable maximum loss levels should reflect the flood losses insurers pay as a result of a flood event (coastal and inland flooding). Note: the flood event may originate outside of Florida and may involve multiple circumstances or a confluence of events (e.g., meteorological events and hydrological events) that contribute to flooding in Florida. Coastal flooding includes storm surge, and inland flooding includes riverine, lacustrine, and surface water flooding.

Flood loss costs and flood probable maximum loss levels should only include insured flood related losses and time element flood losses in Florida resulting from an event modeled as a flood event (as described above) consistent with Section 627.715, Florida Statutes, and consistent with the different flood policies, contracts, and endorsements. The event should include all such insured flood related damage due to a flood event causing loss in Florida and should not be over-estimated or under-estimated.

Relevant Forms: GF-5, Actuarial Flood Standards Expert Certification
AF-2, Total Flood Statewide Loss Costs

Disclosures

1. Describe how damage from model generated floods (originating either inside or outside of Florida) is excluded or included in the calculation of flood loss costs and flood probable maximum loss levels for Florida.

2. Describe how wind losses associated with coastal flooding are ~~removed from~~treated in the calculation of flood loss costs and flood probable maximum loss levels for Florida.

3. Describe how the model considers the correlation and potential overlap of losses associated with coastal and inland flooding.

4. Other than coastal and inland flooding, state whether any other types of flooding events are modeled. If so, describe how damage resulting from these flood type events is treated in the calculation of flood loss costs and flood probable maximum loss levels for Florida.

Audit

1. The flood model will be reviewed to evaluate whether the determination of losses in the flood model is consistent with this standard.

2. The flood model will be reviewed to determine that meteorological or hydrological events originating either inside or outside of Florida are modeled for flood losses occurring in Florida and that such effects are considered in a manner which is consistent with this standard.

3. The flood model will be reviewed to determine whether the model takes into account any damage resulting directly and solely from wind. Losses associated with flooding will be reviewed to determine the treatment of wind losses.

4. The documented procedure addressing the double counting or under counting of flood losses will be reviewed.

5. The effect on loss costs and probable maximum loss levels arising from flood events that are neither inland nor coastal flooding will be reviewed.

AF-3 Flood Coverages

A. The methods used in the development of personal residential ~~structure~~ building property flood loss costs shall be actuarially sound.

B. The methods used in the development of personal residential appurtenant structure flood loss costs shall be actuarially sound.

C. The methods used in the development of personal residential ~~contents~~ property flood loss costs shall be actuarially sound.

D. The methods used in the development of personal residential time element flood loss costs shall be actuarially sound.

~~E. The methods used in the development of personal residential increased cost of compliance (ICC) coverage flood loss costs shall be actuarially sound.~~ **To be revisited on October 8**

Note from Commissioner Lee: Increased Cost of Compliance coverage is available in addition to Structure coverage as long as the combined Structure and Increased Cost of Compliance coverage does not exceed a given amount.

Purpose: A reasonable representation of personal residential ~~structures~~building property, appurtenant structure~~s~~, ~~contents~~personal property, and time element flood losses is necessary in order to address how the different flood policies, contracts, and endorsements handle flood losses.

Certain policies, contracts, and endorsements may include coverage for water intrusion. Coverage C (other coverages) is not included.

Relevant Form: GF-5, Actuarial Flood Standards Expert Certification

Disclosures

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

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

3. Describe the methods used in the flood model to calculate flood loss costs for ~~contents~~ personal property coverage associated with personal residential properties.

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

5. Explain if and describe how coverage for water intrusion is ~~included~~ treated in the loss costs methods described in Disclosures 1-4 above.

Audit

1. The methods used to produce personal residential ~~structure~~building property, appurtenant structure, ~~contents~~personal property, and time element flood loss costs will be reviewed.

2. The ~~process used for including and quantifying~~treatment of coverage for water intrusion will be reviewed.

AF-4 Modeled Flood Loss Cost and Flood Probable Maximum Loss Level Considerations

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

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

C. Flood loss cost projections and flood probable maximum loss levels shall not include any explicit provision for wind losses.

D. Damage caused from inland and coastal flooding shall be included in the flood model's calculation of flood loss costs and flood probable maximum loss levels.

E. Flood loss cost projections and flood probable maximum loss levels shall be capable of being calculated from exposures at a geocode (latitude-longitude) level of resolution including the consideration of flood extent and depth.

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

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

Flood probable maximum loss levels can be either on an annual aggregate or an annual occurrence basis. Both bases can be useful for understanding the flood loss distribution produced by the flood model.

Flood loss costs represent the expected annual 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.

Flood 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 flood modeling.

Flood 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 flood loss experience that has been used to develop and validate flood loss projection models. The standard does not allow for prospective recognition of future economic inflation or price inflation.

Relevant Form: GF-5, Actuarial Flood Standards Expert Certification
AF-8, Flood Probable Maximum Loss for Florida

Disclosures

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

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

3. Describe how the flood model incorporates demand surge in the calculation of flood loss costs and flood probable maximum loss levels. Indicate if there are any differences in the manner that demand surge is incorporated for coastal and inland flooding.

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

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

Audit

1. How the flood model handles expenses, risk load, investment income, premium reserves, taxes, assessments, profit margin, economic inflation, and any criteria other than direct property flood insurance claim payments will be reviewed.

2. The method of determining flood probable maximum loss levels on both an annual aggregate and an annual occurrence basis will be reviewed.

3. The uncertainty in the flood probable maximum loss levels will be reviewed.

4. The data and methods used to incorporate individual aspects of demand surge on personal residential coverages for coastal and inland flooding, inclusive of the effects from building material costs, labor costs, contents costs, and repair time will be reviewed.

5. How the flood model accounts for economic inflation associated with past insurance experience will be reviewed.

6. The ~~methods used to exclude wind losses from~~treatment of wind losses in the determination of flood losses will be reviewed.

7. How the flood model determines flood loss costs and flood probable maximum loss levels associated with coastal flooding will be reviewed.

8. How the flood model determines flood loss costs and flood probable maximum loss levels associated with inland flooding will be reviewed.

9. The methods used to ensure there is no systematic over-estimation or under-estimation of flood loss costs and flood probable maximum loss levels from coastal and inland flooding will be reviewed.

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

AF-5 Flood Policy Conditions

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

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

C. Deductible loss costs shall be calculated in accordance with Section 627.715, Florida Statutes.

Purpose: For a given flood event and personal residential policy type, flood losses may fall below the deductible or above the policy limit; and therefore, the distribution of flood losses is important.

Section 627.715, Florida Statutes, presents a number of options regarding deductibles and loss settlement options. Flood policy exclusions are also an important consideration.

Relevant Form: GF-5, Actuarial Flood Standards Expert Certification

Disclosures

1. Describe the methods used in the flood model to treat deductibles, policy limits, policy exclusions, loss settlement provisions, and insurance-to-value criteria when projecting flood loss costs and flood probable maximum loss levels.

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

   Example:

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

3. Describe how the flood 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 flood model results will be reviewed.

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

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

4. Treatment of annual deductibles will be reviewed.

AF-6 Flood Loss Outputs and Logical Relationships to Risk

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

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

C. Flood loss costs cannot increase as the structure flood damage resistance increases, all other factors held constant.

D. Flood loss costs cannot increase as flood hazard mitigation measures incorporated in the structure increase, all other factors held constant.

E. Flood loss costs shall be consistent with the effects of flood control measures, all other factors held constant. **To be revisited with MHF-6**

F. Flood loss costs cannot increase as the quality of building codes~~, floodplain management regulations, and enforcement~~ increases, all other factors held constant.

G. Flood loss costs shall decrease as deductibles increase, all other factors held constant.

H. The relationship of flood loss costs for individual coverages, (e.g., personal residential structure, appurtenant structure, contents, time element, and increased cost of compliance) shall be consistent with the coverages provided.

I. Flood output ranges shall be logical for the type of risk being modeled and apparent deviations shall be justified.

J. All other factors held constant, flood output ranges produced by the flood model shall in general reflect lower flood loss costs for personal residential structures that have a higher elevation versus those that have a lower elevation.

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

Purpose: This standard is to ensure that flood probable maximum loss levels are 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 flood probable maximum loss levels. Flood probable maximum loss levels can be determined based upon both an annual aggregate basis and an annual occurrence basis.

Modeled flood loss costs should vary according to risk. If the risk of loss due to floods is higher for one area or personal residential structure type, then the flood loss costs should also be higher. Likewise, if there is no difference in risk there should be no difference in flood loss costs. Flood loss costs not having these properties do not have a logical relationship to risk.

Relevant Forms:
GF-5, Actuarial Flood Standards Expert Certification
AF-1, Zero Deductible Personal Residential Standard Flood Loss Costs
AF-2, Total Flood Statewide Loss Costs
AF-3, Personal Residential Standard Flood Loss Costs by ZIP Code
AF-4, Flood Output Ranges
AF-5, Logical Relationship to Flood Risk (Trade Secret item)
AF-6, Flood Probable Maximum Loss for Florida
SF-2, Examples of Flood Loss Exceedance Estimates
SF-5, Average Annual Zero Deductible Statewide Flood Loss Costs – Historical versus Modeled

Disclosures

1. Provide a completed Form AF-1, Zero Deductible Personal Residential Standard Flood Loss Costs. Provide a link to the location of the form [insert hyperlink here].

2. Provide a completed Form AF-2, Total Flood Statewide Loss Costs. Provide a link to the location of the form [insert hyperlink here].

3. Provide a completed Form AF-3, Personal Residential Standard Flood Loss Costs by ZIP Code. Provide a link to the location of the form [insert hyperlink here].

4. Provide a completed Form AF-4, Flood Output Ranges, using the modeling organization specified, predetermined, and comprehensive exposure dataset. Provide a link to the location of the form [insert hyperlink here].

5. Provide a completed Form AF-6, Flood Probable Maximum Loss for Florida. Provide a link to the location of the form [insert hyperlink here].

6. Describe how the flood model produces flood probable maximum loss levels.

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

8. Explain any difference between the values provided on Form AF-6, Flood Probable Maximum Loss for Florida, and those provided on Form SF-2, Examples of Flood Loss Exceedance Estimates.

9. Provide an explanation for all anomalies in the flood loss costs that are not consistent with the requirements of this standard.

Audit

1. The data and methods used for flood probable maximum loss levels for Form AF-6, Flood Probable Maximum Loss for Florida, will be reviewed. The Top Event and Conditional Tail Expectations will be reviewed.

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

3. Graphical representations of flood loss costs by rating areas and geographic zones (consistent with the modeling organization's grid resolution) will be reviewed.

4. Color-coded maps depicting the effects of topography and flood control measures on flood loss costs by rating areas and geographic zones (consistent with the modeling organization's grid resolution) will be reviewed.

5. The procedures used by the modeling organization to verify the individual flood loss cost relationships will be reviewed. Methods (including any software) used in verifying Standard AF-6.C, D, E, F, G, and J will be reviewed. Forms AF-1, Zero Deductible Personal Residential Standard Flood Loss Costs, AF-2, Total Flood Statewide Loss Costs, AF-3, Personal Residential Standard Flood Loss Costs by ZIP Code, and AF-5, Logical Relationship to Flood Risk (Trade Secret item), will be reviewed to assess flood coverage relationships.

6. The flood loss cost relationships among deductible, construction type, policy form, coverage, building code~~/enforcement, floodplain management regulations~~, construction characteristics, elevation of residential structure, territory, and region will be reviewed.

7. The total personal residential insured flood losses provided in Forms AF-2, Total Flood Statewide Loss Costs and AF-3, Personal Residential Standard Flood Loss Costs by ZIP Code, will be reviewed.

~~8. The total personal residential insured flood losses provided in Form AF-3, Personal Residential Standard Flood Loss Costs by ZIP Code, separated into coastal personal residential insured flood losses and inland personal residential insured flood losses will be reviewed.~~

~~9.~~8. Form AF-4, Flood Output Ranges will be reviewed, including geographical representations of the data where applicable.

~~10.~~9. Form AF-4, Flood Output Ranges will be reviewed to ensure appropriate relativities among deductibles, coverages, and construction types.

~~11~~10. Apparent anomalies in the flood output ranges and their justification will be reviewed.

Form AF-1: Zero Deductible Personal Residential Standard Flood Loss Costs

Purpose: This form and the associated maps illustrate the range and variation of zero deductible standard flood loss costs across Florida for personal residential building property and for personal property separately for frame owners, masonry owners, and manufactured homes. Each modeling organization can define its own rating areas or geographic zones.

A. Provide three maps, color-coded by rating areas or geographic zones (with a minimum of six value ranges), displaying zero deductible personal residential standard flood loss costs per $1,000 of exposure for wood frame, masonry, and manufactured homes.

   Note: Standard Flood in Florida is equivalent to the National Flood Insurance Program (NFIP). Rating areas or geographic zones shall be defined by the modeling organization.

B. Create exposure sets for these exhibits by modeling all of the buildings from Notional Set 3 described in the file *"NotionalInput15_Flood.xlsx"* geocoded to each rating area or geographic zone in the state, as provided in the flood model. Define the model's flood rating areas or geographic zones. Provide the predominant County name and the Federal Information Processing Standards (FIPS) Code associated with each rating area or geographic zone. Refer to the Notional Standard Flood Policy Specifications 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 *"2015FormAF1.xlsx"* in both Excel and PDF format, the underlying standard flood loss cost data rounded to three decimal places used for A. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name.

Notional Standard Policy Specifications

Policy Type	Assumptions
Owners	**Coverage A = Building Property** • Replacement cost included subject to Coverage A limit • Excludes all appurtenant structures • Water intrusion excluded **Coverage B = Personal Property** • Actual cash value included subject to Coverage B limit • Water intrusion excluded **Time Element Coverage** • **To be defined by Modelers**

✧ Flood loss costs per $1,000 shall be related to the Coverage A limit for Coverage A, ~~and~~ to the Coverage B limit for Coverage B, and to the Time Element limit for Time Element Coverage

Manufactured Homes

Coverage A = Building

- Special loss settlement provision: Minimum of (replacement cost, 1.5 x actual cost value subject to Coverage A limit)
- Water intrusion excluded

Coverage B = Personal Property

- Actual cash value subject to Coverage B limit
- Water intrusion excluded

Time Element Coverage

- **To be defined by Modelers**

✧ Flood loss costs per $1,000 shall be related to the Coverage A limit for Coverage A, ~~and~~ to the Coverage B limit for Coverage B, and to the Time Element limit for Time Element Coverage

Form AF-2: Total Flood Statewide Loss Costs

Purpose: This form illustrates the modeling organization's ability to replicate historical flood loss costs.

A. Provide the total personal residential insured flood loss and the dollar contribution to the average annual flood loss assuming zero deductible policies for individual historical flooding events using a modeling organization specified, predetermined and comprehensive exposure dataset. The list of flooding events in this form shall include meteorological and hydrological events and circumstances occurring inside or outside of Florida that resulted in or contributed to flooding in Florida included in the modeling organization flood event dataset (e.g., Florida and by-passing hurricanes, tropical cyclones below hurricane strength that caused flood losses in Florida, rainfall events that caused flood losses in Florida).

   The table below contains the minimum number of tropical cyclones from HURDAT2 and rainfall events to be included in the modeling organization flood event dataset. Each tropical cyclone and rainfall event has been assigned an ID number. The modeling organization may exclude tropical cyclones and rainfall events that had zero modeled impact, or may include additional tropical cyclones and rainfall events when there is clear justification for the additions. For tropical cyclones and rainfall events in the table below resulting in zero loss, the table entry shall be left blank. Additional tropical cyclones and rainfall events included in the modeling organization flood event dataset shall be added to the table below in order of year and assigned an intermediate ID number as the tropical cyclone and rainfall event 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 AF-2, Total Flood Statewide Loss Costs, in a submission appendix.

ID	Landfall/ Closest Approach Date	Year	Name	Personal Residential Insured Losses ($)	Dollar Contribution
005	08/15/1901	1901	NoName04-1901		
010	09/11/1903	1903	NoName03-1903		
015	10/17/1904	1904	NoName04-1904		
020	06/17/1906	1906	NoName02-1906		
025	09/27/1906	1906	NoName06-1906		
030	10/18/1906	1906	NoName08-1906		
035	10/11/1909	1909	NoName11-1909		
040	10/18/1910	1910	NoName05-1910		
045	08/11/1911	1911	NoName02-1911		
050	09/14/1912	1912	NoName04-1912		
055	08/01/1915	1915	NoName01-1915		
060	09/04/1915	1915	NoName04-1915		
065	07/05/1916	1916	NoName02-1916		
070	10/18/1916	1916	NoName14-1916		

ID	Landfall/ Closest Approach Date	Year	Name	Personal Residential Insured Losses ($)	Dollar Contribution
075	09/29/1917	1917	NoName04-1917		
080	09/10/1919	1919	NoName02-1919		
085	10/25/1921	1921	TampaBay06-1921		
090	09/15/1924	1924	NoName05-1924		
095	10/21/1924	1924	NoName10-1924		
100	07/28/1926	1926	NoName01-1926		
105	09/18/1926	1926	GreatMiami07-1926		
110	10/21/1926	1926	NoName10-1926		
115	08/08/1928	1928	NoName01-1928		
120	09/17/1928	1928	LakeOkeechobee04-1928		
125	09/28/1929	1929	NoName02-1929		
130	09/01/1932	1932	NoName03-1932		
135	07/30/1933	1933	NoName05-1933		
140	09/04/1933	1933	NoName11-1933		
145	09/03/1935	1935	LaborDay03-1935		
150	11/04/1935	1935	NoName07-1935		
155	07/31/1936	1936	NoName05-1936		
160	08/11/1939	1939	NoName02-1939		
165	10/06/1941	1941	NoName05-1941		
170	10/19/1944	1944	NoName13-1944		
175	06/24/1945	1945	NoName01-1945		
180	09/15/1945	1945	NoName09-1945		
185	10/08/1946	1946	NoName06-1946		
190	09/17/1947	1947	NoName04-1947		
195	10/12/1947	1947	NoName09-1947		
200	09/22/1948	1948	NoName08-1948		
205	10/05/1948	1948	NoName09-1948		
210	08/26/1949	1949	NoName02-1949		
215	08/31/1950	1950	Baker-1950		
220	09/05/1950	1950	Easy-1950		
225	10/18/1950	1950	King-1950		
230	09/26/1953	1953	Florence-1953		
235	10/09/1953	1953	Hazel-1953		
240	09/25/1956	1956	Flossy-1956		
245	09/10/1960	1960	Donna-1960		
250	08/27/1964	1964	Cleo-1964		
255	09/10/1964	1964	Dora-1964		
260	10/14/1964	1964	Isbell-1964		
265	09/08/1965	1965	Betsy-1965		
270	06/09/1966	1966	Alma-1966		
275	10/04/1966	1966	Inez-1966		
280	10/19/1968	1968	Gladys-1968		
285	06/19/1972	1972	Agnes-1972		
290	09/23/1975	1975	Eloise-1975		
295	09/04/1979	1979	David-1979		
300	09/13/1979	1979	Frederic-1979		
305	09/02/1985	1985	Elena-1985		

ID	Landfall/ Closest Approach Date	Year	Name	Personal Residential Insured Losses ($)	Dollar Contribution
310	11/21/1985	1985	Kate-1985		
315	10/12/1987	1987	Floyd-1987		
320	08/24/1992	1992	Andrew-1992		
325	08/03/1995	1995	Erin-1995		
330	10/04/1995	1995	Opal-1995		
335	07/19/1997	1997	Danny-1997		
340	09/03/1998	1998	Earl-1998		
345	09/25/1998	1998	Georges-1998		
350	10/15/1999	1999	Irene-1999		
355	08/13/2004	2004	Charley-2004		
360	09/05/2004	2004	Frances-2004		
365	09/16/2004	2004	Ivan-2004		
370	09/26/2004	2004	Jeanne-2004		
375	0710/2005	2005	Dennis-2005		
380	08/25/2005	2005	Katrina-2005		
385	10/24/2005	2005	Wilma-2005		
390	08/18/2008	2008	Tropical Storm Fay		
395		May 2009	Unnamed Storm in East Florida		
400		July 2013	Unnamed Storm on Panhandle		
405			Storm chosen by modeling organization		
			Total		

Form AF-3: Personal Residential Standard Flood Loss Costs by ZIP Code

Purpose: This form illustrates the modeling organization's ability to estimate zero deductible standard flood loss costs for a specified set of historical flood events.

A. Provide the percentage of personal residential zero deductible standard flood losses, rounded to four decimal places, and the monetary contribution from the events listed below using the modeling organization specified, predetermined, and comprehensive exposure dataset. Include all ZIP Codes where losses are material. Disclose the materiality threshold.

B. Provide maps color-coded by ZIP Code depicting the percentage total personal residential standard flood losses from each flood event and for the cumulative flood 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%

C. Provide, in the format given in the file named "*2015FormAF3.xlsx*" in Excel format, the total flood loss costs by ZIP Code. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Also include Form AF-3, Personal Residential Standard Flood Loss Costs by ZIP Code, in a submission appendix.

Form AF-3 Events:

- Hurricane Andrew (1992)
- Hurricane Ivan (2004)
- Hurricane Jeanne (2004)
- Hurricane Wilma (2005)
- Tropical Storm Fay (2008)
- Unnamed Storm in East Florida (May 2009)
- Unnamed Storm on Panhandle (July 2013)
- Storm chosen by modeling organization

Form AF-4: Flood Output Ranges

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

A. Provide personal residential flood output ranges in the format shown in the file named *"2015FormAF4.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 AF-4, Flood Output Ranges, in a submission appendix.

B. Provide flood loss costs rounded to three decimal places by county. Within each county, flood 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, and manufactured homes. For each of these categories using rating areas or geographic zones, the flood output range shall show the highest flood loss cost, the lowest flood loss cost, and the weighted average flood loss cost. The aggregate personal residential exposure data for this form shall be developed from the modeling organization specified, predetermined, and comprehensive exposure dataset except for insured values and deductibles information. Insured values shall be based on the standard flood output range specifications given below. When calculating the weighted average flood loss costs, weight the flood loss costs by the total insured value calculated above. Include the statewide range of flood loss costs (i.e., low, high, and weighted average).

C. If a modeling organization has flood loss costs for a rating area or geographic zone for which there is no exposure, give the flood loss costs zero weight (i.e., assume the exposure in that rating area or geographic zone is zero). Provide a list in the submission document of those rating areas or geographic zones where this occurs.

D. If a modeling organization does not have flood loss costs for a rating area or geographic zone for which there is some exposure, do not assume such flood loss costs are zero, but use only the exposures for which there are flood loss costs in calculating the weighted average flood loss costs. Provide a list in the submission document of the rating areas or geographic zones where this occurs.

E. NA shall be used in cells to signify no exposure.

F. All anomalies in flood loss costs that are not consistent with the requirements of Standard AF-6, Flood Loss Outputs and Logical Relationships to Risk, and have been explained in Disclosure AF-6.9 shall be shaded.

Standard Flood Output Range Specifications

Policy Type	Assumptions
Owners	**Coverage A = Building Property** • Coverage A limit = $100,000 • Replacement Cost included subject to Coverage A limit • Water intrusion excluded • Deductible = $1,500 **Coverage B = Personal Property** • Coverage B limit = $40,000 • Actual cash value included subject to Coverage B limit • Water intrusion excluded • Deductible = $1,000 **Time Element Coverage** • **To be defined by Modelers** ✧ Dominant Coverage = A ✧ Flood loss costs per $1,000 shall be specified for each Coverage limit
Renters	**Coverage B = Personal Property** • Coverage B limit = $25,000 • No coverage for tenant improvements • Water intrusion excluded • Deductible = $1,000 • Actual cash value included subject to Coverage B limit **Time Element Coverage** • **To be defined by Modelers** ✧ Flood loss costs per $1,000 shall be related to the Coverage B limit
Condo Unit Owners	**Coverage A = Building Property** • Coverage A limit = 10% of Coverage C limit • Replacement Cost included subject to Coverage A limit **Coverage B = Personal Property** • Coverage B limit = $50,000 • Actual cash value included subject to Coverage B limit • Water intrusion excluded • Deductible = $500 **Time Element Coverage** • **To be defined by Modelers** ✧ Flood loss costs per $1,000 shall be related to the Coverage B limit
Manufactured Homes	**Coverage A = Building Property** • Coverage A limit = $50,000 • Minimum of replacement cost, actual cash value subject to Coverage A limit

- Deductible = $500

Coverage B = Personal Property

- Coverage B limit = 50% of Coverage A limit
- Replacement Cost included subject to Coverage B limit

Time Element Coverage

- **To be defined by Modelers**

✧ Flood loss costs per $1,000 shall be related to the coverage limit

Form AF-5: Logical Relationship to Flood Risk (Trade Secret Item)

Purpose: This form provides an illustration of the flood loss cost relationships among deductible, construction type, policy form, coverage, year of construction, foundation strength, condo unit floor, number of stories, lowest floor elevation, and proximity of the risk to the flood source.

A. Provide the logical relationship to flood risk exhibits in the format shown in the file named *"2015FormAF5.xlsx."*

B. Create exposure sets for each exhibit by modeling all of the flood coverages from the appropriate Notional Set listed below at each of the locations in "Location Grid A" as described in the file *"NotionalInput15_Flood.xlsx."* Refer to the Notional Standard Flood Policy Specifications below for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information.

Location Grid A and Grid B to be revised for flood. Modelers will provide a list of grid points. Requested to receive revised grid points by November 1.

Exhibit	Notional Set
Deductible Sensitivity	Set 1
Construction Sensitivity	Set 2
Policy Form Sensitivity	Set 3
Coverage Sensitivity	Set 4
Year Built Sensitivity	Set 5
Foundation Strength Sensitivity	Set 6
Condo Unit Floor Sensitivity	Set 7
Number of Stories Sensitivity	Set 8
Lowest Floor Elevation of Residential Structure Sensitivity	Set 9
Proximity to Flood Event source (measured in feet) Sensitivity	Set 10

Foundation strength sensitivity – Request Modelers define a strong and a weak foundation using modelable characteristics (foundation type, open/closed, deep/shallow, manufactured home anchored/not anchored.

Modelers will look at the proximity sensitivity to recommend best way to present.

Flood models shall treat points in "Location Grid A" as coordinates that would result from a geocoding process. Flood models shall treat points by simulating flood loss at exact location or by using the nearest modeled parcel/street/cell in the flood model. Explain any assumptions, deviations, and differences from the prescribed exposure information.

Report results for each of the points in "Location Grid A" individually, unless specified. Flood loss cost per $1,000 of exposure shall be rounded to three decimal places.

Note: All flood deductibles are $0 except for the Deductible Sensitivity. Coverage Sensitivity includes time element.

D. All anomalies in flood loss costs that are not consistent with the requirements of Standard AF-6, Flood Loss Outputs and Logical Relationships to Risk, and have been explained in Disclosure AF-6.9 shall be shaded.

E. Create an exposure set and report flood loss costs results for strong foundation owners frame buildings (Notional Set 6) for each of the points in "Location Grid B" as described in the file *"NotionalInput15_Flood.xlsx."* Provide a color-coded contour map of the flood loss costs. Provide a scatter plot of the flood loss costs (*y*-axis) against distance to closest coast (*x*-axis).

Notional Standard Flood Policy Specifications

Policy Type — **Assumptions**

Owners

Coverage A = Building Property
- Coverage A limit = $100,000
- Replacement Cost included subject to Coverage A limit
- Water intrusion excluded
- Deductible = $1,500

Coverage B = Personal Property
- Coverage B limit = $40,000
- Actual cash value included subject to Coverage B limit
- Water intrusion excluded
- Deductible = $1,000

Time Element Coverage
- **To be defined by Modelers**

✧ Dominant Coverage = A
✧ Flood loss costs per $1,000 shall be specified for each coverage limit

Renters

Coverage B = Personal Property
- Coverage B limit = $25,000
- No coverage for tenant improvements
- Water intrusion excluded
- Deductible = $1,000
- Actual cash value included subject to Coverage B limit

Time Element Coverage
- **To be defined by Modelers**

✧ Flood loss costs per $1,000 shall be related to the Coverage B limit

Condo Unit Owners

Coverage A = Building Property
- Coverage A limit = $10% of Coverage C limit
- Replacement Cost included subject to Coverage A limit

Coverage B = Personal Property

- Coverage B limit = $50,000
- Actual cash value included subject to Coverage B limit
- Water intrusion excluded
- Deductible = $500

Time Element Coverage

- **To be defined by Modelers**

✧ Flood loss costs per $1,000 shall be related to the Coverage B limit

Manufactured Homes

Coverage A = Building Property

- Coverage A limit = $50,000
- Minimum of replacement cost, actual cash value subject to Coverage A limit
- Deductible = $500

Coverage B = Personal Property

- Coverage B limit = 50% of Coverage A limit
- Replacement cost included subject to Coverage B limit

Time Element Coverage

- **To be defined by Modelers**

✧ Flood loss costs per $1,000 shall be related to the coverage limit

Form AF-6: Flood Probable Maximum Loss for Florida

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

A. Provide a detailed explanation of how the Expected Annual Flood Losses and Annual Exceedance Probabilities are calculated.

B. Complete Part A showing the personal residential flood probable maximum loss for Florida. For the Expected Annual Flood Losses column, provide personal residential, zero deductible statewide flood loss costs using the modeling organization specified, predetermined and comprehensive exposure dataset.

In the column Annual Exceedance Probability, provide the probability associated with the average flood loss within the ranges indicated on a cumulative basis.

For example, if the average flood loss is $4,705 million for the range $4,501 million to $5,000 million, provide the annual exceedance probability associated with a flood loss that is $4,705 million or greater.

For each flood loss range in millions ($1,001-$1,500, $1,501-$2,000, $2,001-$2,500) the average flood loss within that range shall be identified and then the annual exceedance probability associated with that flood loss calculated. The annual exceedance probability is the probability of the flood loss equaling or exceeding this average flood 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). Annual exceedance probabilities shall be based on cumulative probabilities.

An annual exceedance probability for an average flood loss of $4,705 million within the $4,501-$5,000 million range should be higher than the annual exceedance probability for an average flood loss of $5,455 million associated with a $5,001- $6,000 million range.

C. Provide the estimated flood loss and uncertainty interval for each of the Personal Residential Annual Exceedance Probabilities 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 Flood Loss Level.

D. 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 AF-6, Flood Probable Maximum Loss for Florida, in a submission appendix.

Part A – Personal Residential Flood Probable Maximum Loss for Florida

LOSS RANGE (MILLIONS)			TOTAL LOSS	AVERAGE LOSS (MILLIONS)	NUMBER OF FLOODS	EXPECTED ANNUAL FLOOD LOSSES*	ANNUAL EXCEEDANCE PROBABILITY	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 residential zero deductible statewide flood loss using the modeling organization specified, predetermined and comprehensive exposure dataset.

Part B – Personal Residential Flood Probable Maximum Loss for Florida (Annual Aggregate)

Annual Exceedance Probability	Estimated Flood Loss Level	Uncertainty Interval	Conditional Tail Expectation
Top Event			---
0.001			
0.002			
0.004			
0.01			
0.02			
0.05			
0.10			
0.20			

Part C – Personal Residential Flood Probable Maximum Loss for Florida (Annual Occurrence)

Annual Exceedance Probability	Estimated Flood Loss Level	Uncertainty Interval	Conditional Tail Expectation
Top Event			---
0.001			
0.002			
0.004			
0.01			
0.02			
0.05			
0.10			
0.20			