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April 17, 2015

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

Re: Corrections to RiskLink 13.0 submission

Dear Dr. Medders:

During our preparation for the Professional Team's onsite audit of RiskLink 15.0, we discovered two errors in our RiskLink 13.0 submission. These impact only the submission, and not the model itself. The history of RiskLink 13.0 software acceptance is shown in the following table.

Version	Build	Acceptance	Expiration	Comments
13.0	1509	June 19, 2013	September 1, 2015	Not released to clients
13.0	1515	July 31, 2013	September 1, 2015	Functionally equivalent to 13.0, Build 1509
13.1	1526	February 12, 2014	September 1, 2015	Functionally equivalent to 13.0, Build 1509

The corrections are to Figure 38 and Form V-2. These were reviewed, along with an updated version of Form V-3, by the Professional Team during their onsite audit March 16 through 18. Attached are change pages for Figure 38 and Form V-2. Form V-3 is Trade Secret, and we are prepared to show that form to the Commission in a Trade Secret session.

- The  $R_{max}$  values for a few historical storms and the corresponding CDF and p-values were corrected.
- The incorrect ZIP Code was used to generate Forms V-2 and V-3. The forms were recreated using ZIP Code 33921, resulting in different percent changes in damage in Form V-2 for the 135 and 160 mph bands for a few of the mitigation measures.

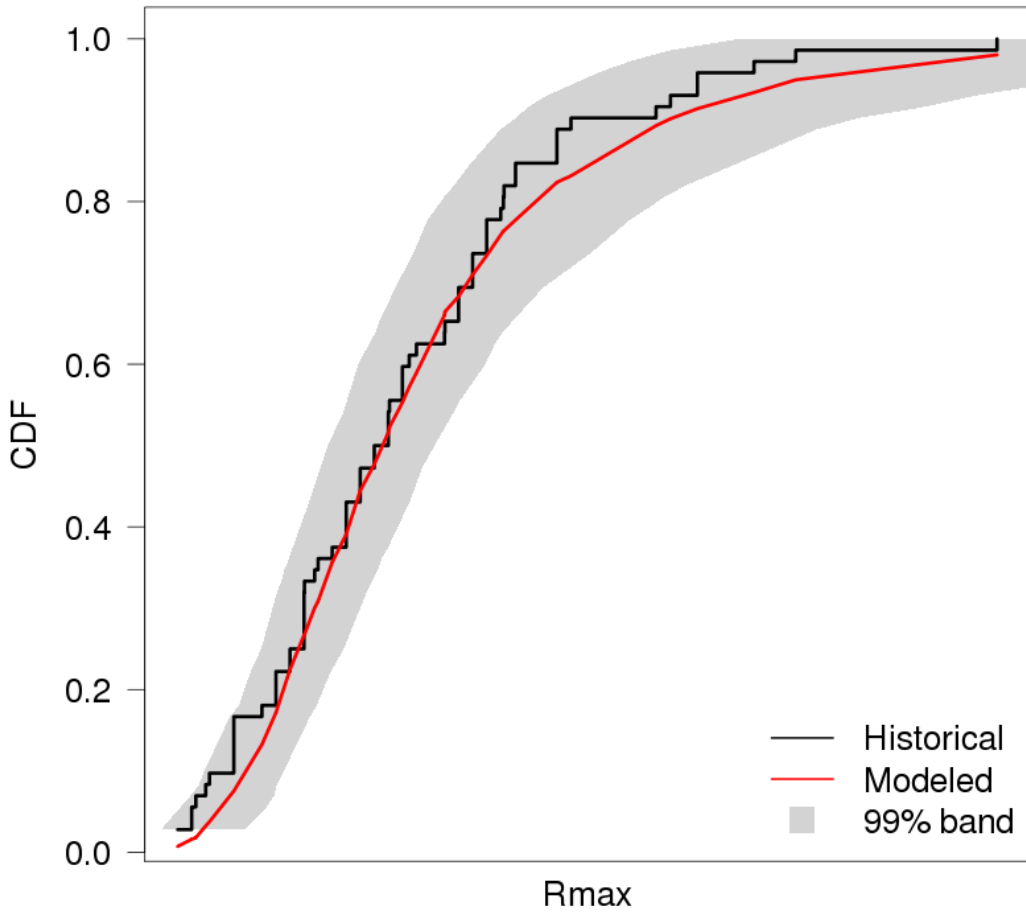
Following the advice of the Professional Team, we request that these issues be discussed and, if feasible, decided during the scheduled June 30 Commission meeting.

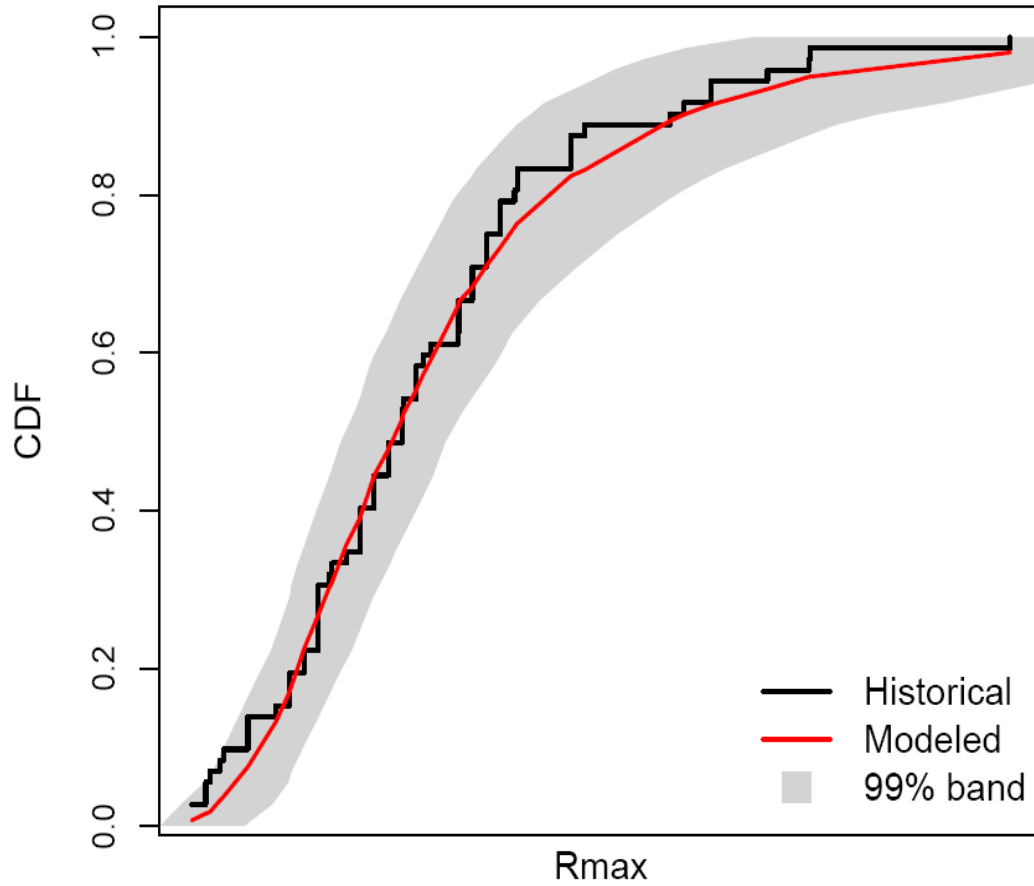
Respectfully,

Michael Young  
Senior Director, Model Product Management  
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Office: 510-505-3212

**Radius to Maximum Winds**

Figure 38 shows a comparison of the observed and modeled  $R_{max}$  distributions in Florida and neighboring states.





**Figure 38:  $R_{max}$  Cumulative Distribution Function (CDF)**

The reasonable agreement suggested by the figure above is confirmed by the goodness of fit test results. The Kolmogorov-Smirnov test on the radius of maximum winds produces a p-value of [87.56%](#), and a chi-square test with eight equal cells produces a p-value of [89.3%](#). The historical data used for the comparison covers the 1900 to 2011 period.

Individual Mitigation Measures		Percent Changes in Damage ((Reference Damage Rate - Mitigated Damage Rate)/Reference Damage Rate) *100										
		Frame Structure					Masonry Structure					
		Wind Speed (MPH)					Wind Speed (MPH)					
		60	85	110	135	160	60	85	110	135	160	
	Reference Structure											
Roof Strength												
	Braced Gable	1.8%	0.0%	0.9%	0.0%	0.0%	1.8%	0.0%	0.9%	0.0%	0.0%	
	Hip	30.9%	39.4%	36.9%	16.2%	0.0%	30.9%	39.4%	36.9%	16.2%	0.0%	
Roof Covering	Metal	21.2%	13.1%	10.9%	0.0%	0.0%	21.2%	13.1%	10.9%	0.0%	0.0%	
	Rated Shingle (110 mph)	48.4%	27.9%	6.9%	0.0%	0.0%	48.4%	27.9%	6.9%	0.0%	0.0%	
	Membrane	7.7%	0.9%	2.0%	0.0%	0.0%	7.7%	0.9%	2.0%	0.0%	0.0%	
	Nailing of Deck	8d Nails	22.5%	53.9%	44.4%	17.0%	2.2%	22.5%	53.9%	44.4%	17.0%	2.8%
		8d Nails HWS	25.0%	60.5%	51.9%	22.3%	3.1%	25.0%	60.5%	51.9%	22.3%	3.7%
10d Nails		25.0%	63.8%	55.6%	24.1%	5.1%	25.0%	63.8%	55.6%	24.1%	5.7%	
Roof/Wall Strength												
	Clips	13.0%	21.0%	23.3%	20.0%	11.8%	13.0%	21.0%	23.3%	20.0%	12.3%	
	Straps	17.4%	43.4%	43.3%	29.6%	11.8%	17.4%	43.4%	43.3%	29.6%	12.3%	
Wall-Floor Strength												
	Ties or Clips	0.0%	0.0%	15.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Straps	0.0%	0.0%	15.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Wall Foundation Strength												
	Larger Anchor or Closer Spacing	0.0%	0.0%	15.0%	15.0%	0.0%	-	-	-	-	-	
	Straps	0.0%	0.0%	15.0%	15.0%	0.0%	-	-	-	-	-	
	Vertical Reinforcing	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%	0.0%	
Opening Protection	Window Shutters	Plywood	2.0%	9.6%	25.9%	15.1%	0.0%	2.0%	9.6%	25.9%	15.1%	0.0%
		Steel	5.9%	20.5%	39.8%	19.8%	0.0%	5.9%	20.5%	39.8%	19.8%	0.0%
		Engineered	11.8%	28.5%	44.4%	24.5%	0.0%	11.8%	28.5%	44.4%	24.5%	0.0%
	Door and Skylight Cover	21.6%	35.4%	44.4%	24.5%	0.0%	21.6%	35.4%	44.4%	24.5%	0.0%	
Window, Door & Skylight Strength	Windows	Laminated	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
		Impact Glass	11.8%	28.5%	44.4%	24.5%	0.0%	11.8%	28.5%	44.4%	24.5%	0.0%
Mitigation Measures In Combination		Percent Changes in Damage ((Reference Damage Rate - Mitigated Damage Rate)/Reference Damage Rate) *100										
		Frame Structure					Masonry Structure					
		Wind Speed (MPH)					Wind Speed (MPH)					
		60	85	110	135	160	60	85	110	135	160	
Structure	Mitigated Structure	67.6%	85.5%	78.3%	50.4%	18.5%	67.6%	85.5%	78.3%	50.4%	19.0%	

Individual Mitigation Measures		Percent Changes in Damage ((Reference Damage Rate - Mitigated Damage										
		Frame Structure					Masonry Structure					
		Wind Speed (MPH)					Wind Speed (MPH)					
		60	85	110	135	160	60	85	110	135	160	
	Reference Structure											
Roof Strength	Braced Gable	1.8%	0.0%	0.9%	0.0%	0.0%	1.8%	0.0%	0.9%	0.0%	0.0%	
	Hip	30.9%	39.4%	36.9%	<del>12.0%</del>	0.0%	30.9%	39.4%	36.9%	16.2%	0.0%	
Roof Covering	Metal	21.2%	13.1%	10.9%	0.0%	0.0%	21.2%	13.1%	10.9%	0.0%	0.0%	
	Rated Shingle (110 mph)	48.4%	27.9%	6.9%	0.0%	0.0%	48.4%	27.9%	6.9%	0.0%	0.0%	
	Membrane	7.7%	0.9%	2.0%	0.0%	0.0%	7.7%	0.9%	2.0%	0.0%	0.0%	
	Nailing of Deck	8d Nails	22.5%	53.9%	44.4%	<del>12.8%</del>	<del>-0.0%</del>	22.5%	53.9%	44.4%	17.0%	<del>-0.0%</del>
		8d Nails HWS	25.0%	60.5%	51.9%	<del>18.4%</del>	<del>-0.0%</del>	25.0%	60.5%	51.9%	22.3%	<del>-0.0%</del>
10d Nails		25.0%	63.8%	55.6%	<del>20.3%</del>	<del>-0.0%</del>	25.0%	63.8%	55.6%	24.1%	<del>-0.0%</del>	
Roof-Wall Strength	Clips	13.0%	21.0%	23.3%	<del>16.0%</del>	<del>-0.0%</del>	13.0%	21.0%	23.3%	20.0%	<del>-0.0%</del>	
	Straps	17.4%	43.4%	43.3%	<del>26.1%</del>	<del>-0.0%</del>	17.4%	43.4%	43.3%	29.6%	<del>-0.0%</del>	
Wall-Floor Strength	Ties or Clips	0.0%	0.0%	15.0%	<del>10.7%</del>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Straps	0.0%	0.0%	15.0%	<del>10.7%</del>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Wall Foundation Strength	Larger Anchor or Closer Spacing	0.0%	0.0%	15.0%	<del>10.7%</del>	0.0%	-	-	-	-	-	
	Straps	0.0%	0.0%	15.0%	<del>10.7%</del>	0.0%	-	-	-	-	-	
	Vertical Reinforcing	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%	0.0%	
Opening Protection	Window Shutters	Plywood	2.0%	9.6%	25.9%	<del>10.8%</del>	0.0%	2.0%	9.6%	25.9%	15.1%	0.0%
		Steel	5.9%	20.5%	39.8%	<del>15.8%</del>	0.0%	5.9%	20.5%	39.8%	19.8%	0.0%
		Engineered	11.8%	28.5%	44.4%	<del>20.7%</del>	0.0%	11.8%	28.5%	44.4%	24.5%	0.0%
	Door and Skylight Cover	21.6%	35.4%	44.4%	<del>20.7%</del>	0.0%	21.6%	35.4%	44.4%	24.5%	0.0%	
Window, Door & Skylight Strength	Windows	Laminated	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
		Impact Glass	11.8%	28.5%	44.4%	<del>20.7%</del>	0.0%	11.8%	28.5%	44.4%	24.5%	0.0%
Mitigation Measures In Combination		Percent Changes in Damage ((Reference Damage Rate - Mitigated Damage Rate)/Reference Damage Rate) *100)										
		Frame Structure					Masonry Structure					
		Wind Speed (MPH)					Wind Speed (MPH)					
		60	85	110	135	160	60	85	110	135	160	
Structure	Mitigated Structure	67.6%	85.5%	78.3%	<del>47.9%</del>	<del>-3.9%</del>	67.6%	85.5%	78.3%	50.4%	<del>-6.1%</del>	

Figure 61: Percent Change in Damage for Various Mitigation Measures

### Form G-1: General Standards Expert Certification

I hereby certify that I have reviewed the current submission of RiskLink Version 13.0 (Build 1509) for compliance with the 2011 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

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

Michael Young  
Name

MSc, Engineering Science  
Professional Credentials (Area of Expertise)

  
Signature (original submission)

10/30/2012  
Date

  
Signature (response to deficiencies, if any)

12/21/2012  
Date

  
Signature (revisions to submission, if any)      Date

3/11/2013

  
Signature (final submission)

5/14/2013  
Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

  
Signature (revisions to submission)

4/16/2015  
Date

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

## Form G-3: Vulnerability Standards Expert Certification

I hereby certify that I have reviewed the current submission of RiskLink Version 13.0 (Build 1509) for compliance with the 2011 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the Vulnerability Standards (V1 – V3);
- 2) The Disclosures and Forms related to the Vulnerability Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
- 4) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Michael Young  
Name

MSc, Engineering Science  
Professional Credentials (Area of Expertise)

  
Signature (original submission)

10/30/2012  
Date

  
Signature (response to deficiencies, if any)

12/21/2012  
Date


  
Signature (revisions to submission, if any)

3/11/2013  
Date

  
Signature (final submission)

5/14/2013  
Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. . Additional signature lines shall be added as necessary with the following format:

  
Signature (revisions to submission)

4/16/2015  
Date

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

## Form G-5: Statistical Standards Expert Certification

I hereby certify that I have reviewed the current submission of RiskLink Version 13.0 (Build 1509) for compliance with the 2011 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the Statistical Standards (S1 – S6);
- 2) The Disclosures and Forms related to the Statistical Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
- 4) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Enrica Bellone  
Name

PhD, Statistics  
Professional Credentials (Area of Expertise)



Signature (original submission)

10/30/2012  
Date



Signature (response to deficiencies, if any)

12/21/2012  
Date



Signature (revisions to submission, if any)

3/11/2013  
Date



Signature (final submission)

5/14/2013  
Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:



Signature (revisions to submission)

4/16/2015  
Date

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.



## Form G-7: Editorial Certification

I hereby certify that I have reviewed the current submission of RiskLink Version 13.0 (Build 1509) for compliance with the "Process for Determining the Acceptability of a Computer Simulation Model" adopted by the Florida Commission on Hurricane Loss Projection Methodology in its Report of Activities as of December 31, 2011, and hereby certify that:

- 1) The model submission is in compliance with the Commission's Notification Requirements and General Standard G-5;
- 2) The Disclosures and Forms related to each Standards section are editorially accurate and contain complete information and any changes that have been made to the submission during the review process have been reviewed for completeness, grammatical correctness, and typographical errors;
- 3) There are no incomplete responses, inaccurate citations, charts or graphs, or extraneous text or references;
- 4) The current version of the model submission has been reviewed for grammatical correctness, typographical errors, completeness, the exclusion of extraneous data/ information and is otherwise acceptable for publication; and
- 5) In expressing my/our opinion I/we have not been influenced by any other party in order to bias or prejudice my/our opinion.

Beth Stamann

Name



Signature (original submission)

Senior Documentation Specialist

Professional Credentials (Area of Expertise)

10/30/2012

Date



Signature (response to Deficiencies, if any)

12/21/2012

Date



Signature (revisions to submission, if any)

3/11/2013

Date

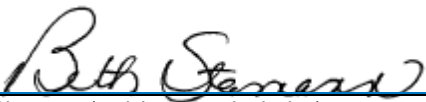


Signature (final submission)

5/14/2013

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:



Signature (revisions to submission)

Date

4/16/2015

NOTE: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.