



FCHLPM 2009 Standards  
Commission Meeting

# **RMS<sup>®</sup> North Atlantic Hurricane Model RiskLink 11.0.SP2**

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**September 21, 2011**

**Tallahassee, FL**

# Agenda


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- Timeline review
- Incident Review (4)
  - Description of incident
  - Impact of incidents
  - Actions taken as a result of incidents
  
- Request for equivalent designations for RiskLink 11.0.SP2a / SP2b

# Timeline related to RiskLink 11.0.SP2

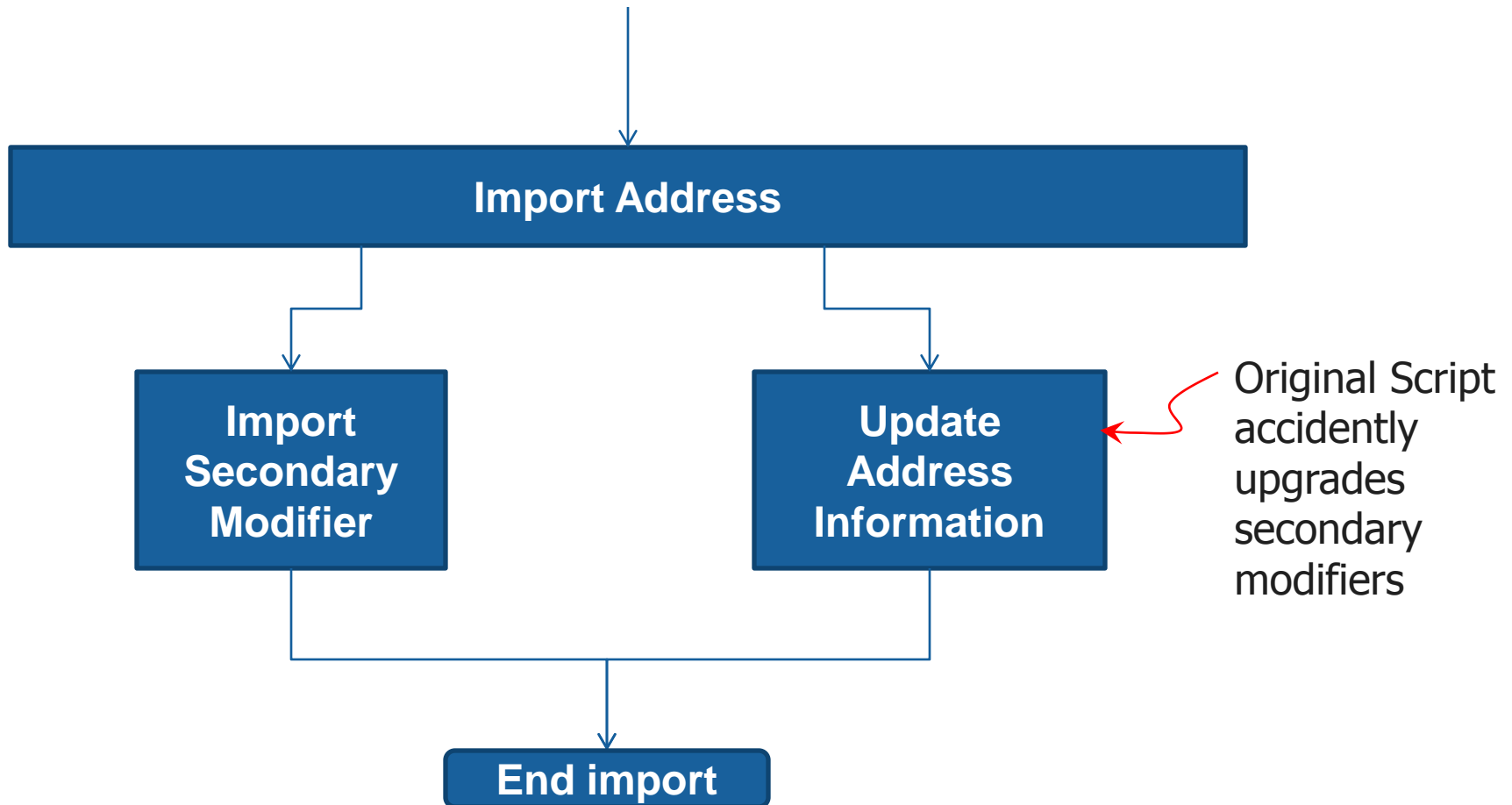
- June 2, 2011
  - RiskLink 11.0.SP1 approval
- Aug 12, 2011
  - Notification of 3 incidents corrected in RiskLink 11.0.SP2
  - Regression Tests on Form A-6 / A-9 / S-5 RiskLink 11.0.SP2 vs 11.0.SP1
- Aug 24, 2011
  - RMS receives memo from chair with list of questions to discuss with Professional Team regarding 11.0.SP2
- Sept 2, 2011
  - RMS discovers error in RiskLink 11.0.SP1 submission document.
- Sept 9, 2011
  - additional detail on incident described in Sept 2 letter provided.
  - Updates to submission for Form A-6, A-7, A-8, CR
- Sept 20, 2011
  - RMS reviews all 4 incidents with Professional Team

# Incident 1: Related to Restructured Modifiers in RiskLink 11.0.SP1

- Construction Quality
  - Roof Covering
  - Roof Geometry
  - Roof Anchor
  - Commercial Appurtenance Structures (formerly External Ornamentation)
  - Residential Appurtenant Structures (formerly Architectural Elements)
  - Opening Protection (formerly Wind Resistance -- Windows)
  - Cladding Type
  - Roof Sheathing Attachment
  - Frame-Foundation Connection
  - Roof Equipment Hurricane Bracing (formerly Mech/Elec Equipment -- Roof)
- Example: before Hip Roof = option 2, now Hip Roof = option 3**
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# Conceptual Flow Chart of Import Process

- Import process has parallel branches that run independently of each other



# Incident 1 – Impact

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- **It is unlikely that any client analysis are affected by Incident 1.**
  - **Issue is rare and hard to repeat**
  - **RMS found the issue when conducting client acceptance testing.**
  - **Clients who follow standard quality checks using the import summary report would catch the error should it occur.**
- **RMS is not aware of any client organization that has used RiskLink 11.0.SP1 in a state filing that may be affected by this incident.**

# Incident 1 – Actions Taken

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- **Clients Informed by email communication**
- **Patch issued on RMS.com as Service Pack 2**
- **Internally, RMS staff have researched and documented the incident in Root Cause Analysis document**
- **Issue has been added to list of QA tests to check during next release cycle.**

# Incident 2: Performance Issue - multiple region run time

- Description: RiskLink platform supports multiple peril model regions to evaluate international portfolios as well as domestic portfolios
  - US Hurricane
  - Canada Hurricane
  - Off Shore Platform model
  - Etc.
- When running combinations of peril-regions model run time is 2.5 - 3 times slower than each peril-region run separately.
- Cause:
  - While reviewing and profiling the code to improve the run time performance for NAHU models, RMS staff found that there was one unused string variable consuming memory for each location-event combination of the loss calculation loop.
- Fix:
  - Remove the unused string variable
- Impact:
  - Loss results are identical in both cases – this is only a performance issue.



# Incident 3 - Performance - Loss Amplification

## ■ Description:

- Performance slows by as much as 50% in North Atlantic hurricane model (All Regions) when turning on loss amplification (demand surge).
- Issue is not noticeable on small Florida-only portfolios.

## ■ Cause:

- While reviewing and profiling the code to improve the run time performance for NAHU models, RMS staff found that loading the loss amplification table could be improved.

## ■ Fix:

- Optimized loading logic for loss amplification table.

## ■ Impact:

- Only run-time performance is affected by this issue
- No impact on loss costs

# Incident 4 – Postal Code-County mapping

- Question in Pro Team memo focuses on Glades, Okeechobee, Taylor and Union counties
  - Questions why losses are different from 2007 FHCF exposure distributions
- Original submission discussed this issue in Form A-8
  - Differences were attributed to updated county mapping

## ■ Original Form A-6 Results - COF

COUNTY	LOSS COSTS	\$0 DEDUCTIBLE STRUCTURE	\$0 DEDUCTIBLE CONTENTS	\$0 DEDUCTIBLE ADDITIONAL LIVING EXPENSE	\$500 DEDUCTIBLE TOTAL*	\$1,000 DEDUCTIBLE TOTAL*	\$2,500 DEDUCTIBLE TOTAL*	1% DEDUCTIBLE TOTAL*	2% DEDUCTIBLE TOTAL*	5% DEDUCTIBLE TOTAL*
GLADES	LOW	0.173	0.759	0.132	0.972	0.917	0.804	0.972	0.917	0.804
	HIGH	0.609	2.890	0.557	3.859	3.715	3.378	3.859	3.715	3.378
	WGHTD AVE	0.546	2.586	0.497	3.446	3.315	3.010	3.446	3.315	3.010
OKEECHOBEE	LOW									
	HIGH									
	WGHTD AVE									

# Relationship between Postal Codes and Counties

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## ■ Geocoding Engine

- Identifies county based on predefined postal code-county assignment
- Must assign a single county even when a postal code intersects multiple counties
- County assignment is located in the *uspost* table in the geocoding database

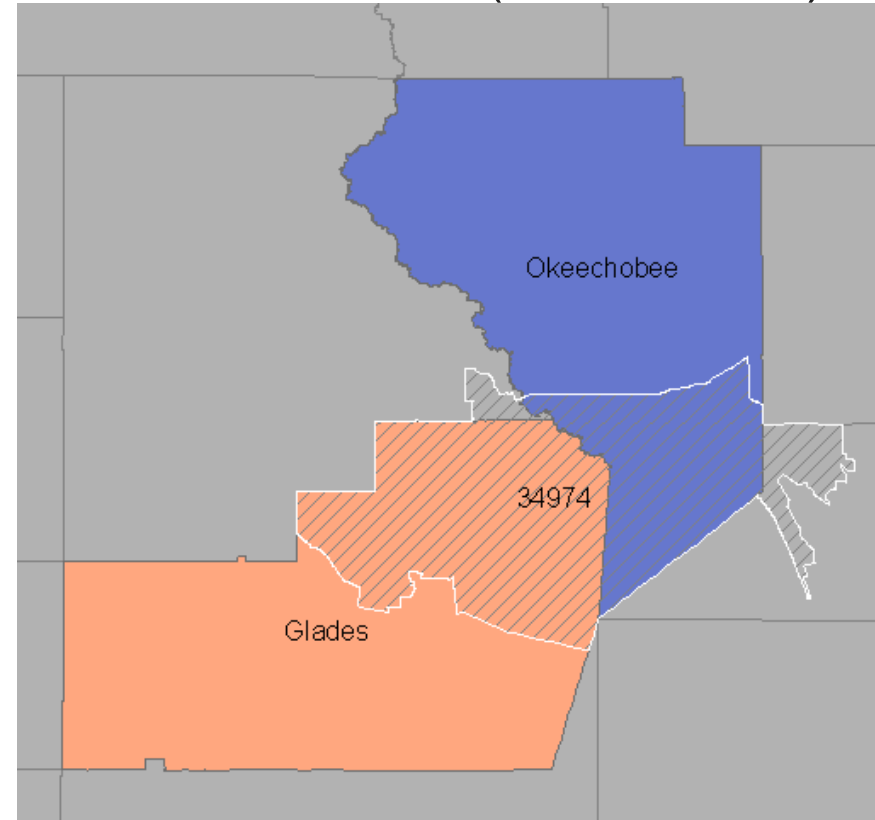
# Glades vs Okeechobee - COF / COM exposure

- 5 postal codes in Okeechobee and Glades counties (FHCF 2007)

Postal Code	COF Buildings	COM Buildings
33471	0	0
33944	0	0
34972	0	2
34973	0	0
34974	14	117

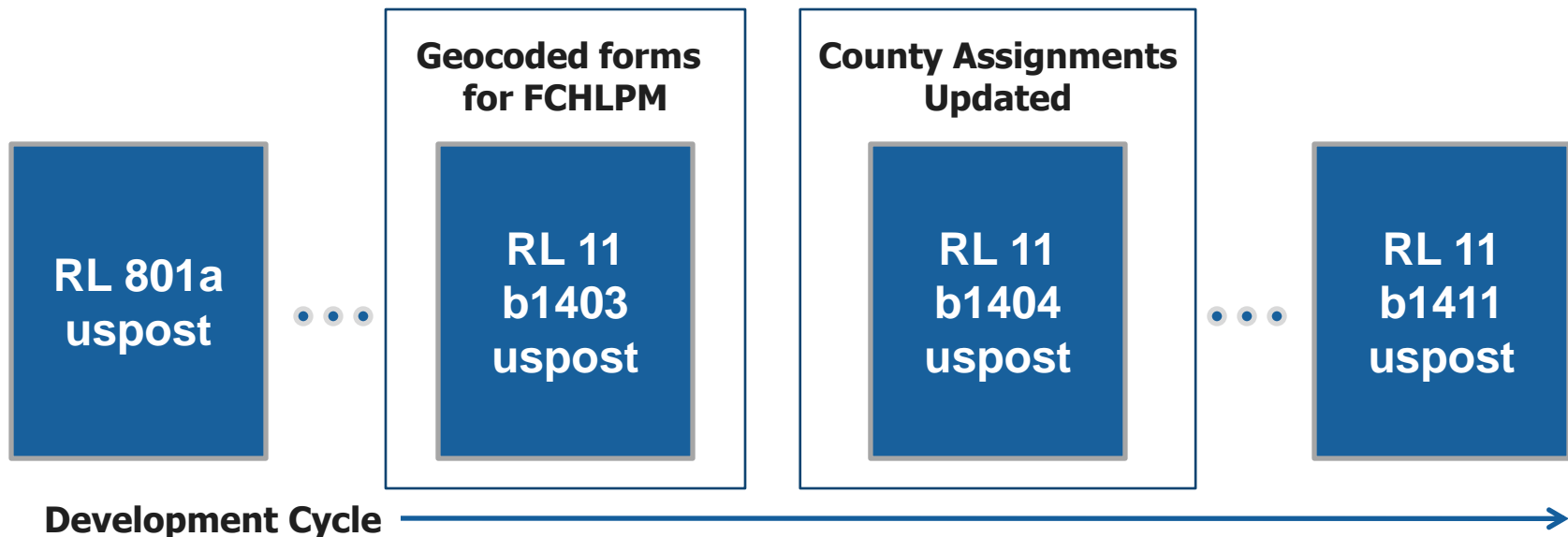
- Initial submission county assignment differed from FHCF

Postal Code	FHCF Assignment	Submission 11.0.SP1
33471	Glades	Glades
33944	Glades	Glades
34972	Okeechobee	Okeechobee
34973	Okeechobee	Okeechobee
34974	Okeechobee	Glades



# Versions of *uspost* Table

- Development cycle
  - Build 1403 included an intermediate version of the *uspost* table
  - Build 1404 updated counties assigned to 13 postal codes in *uspost* table and was included in the final release
- FCHLPM analysis work started during b1403 in order to meet deadline



# Updated Form A-6 Results - COF

## ■ Original COF Results

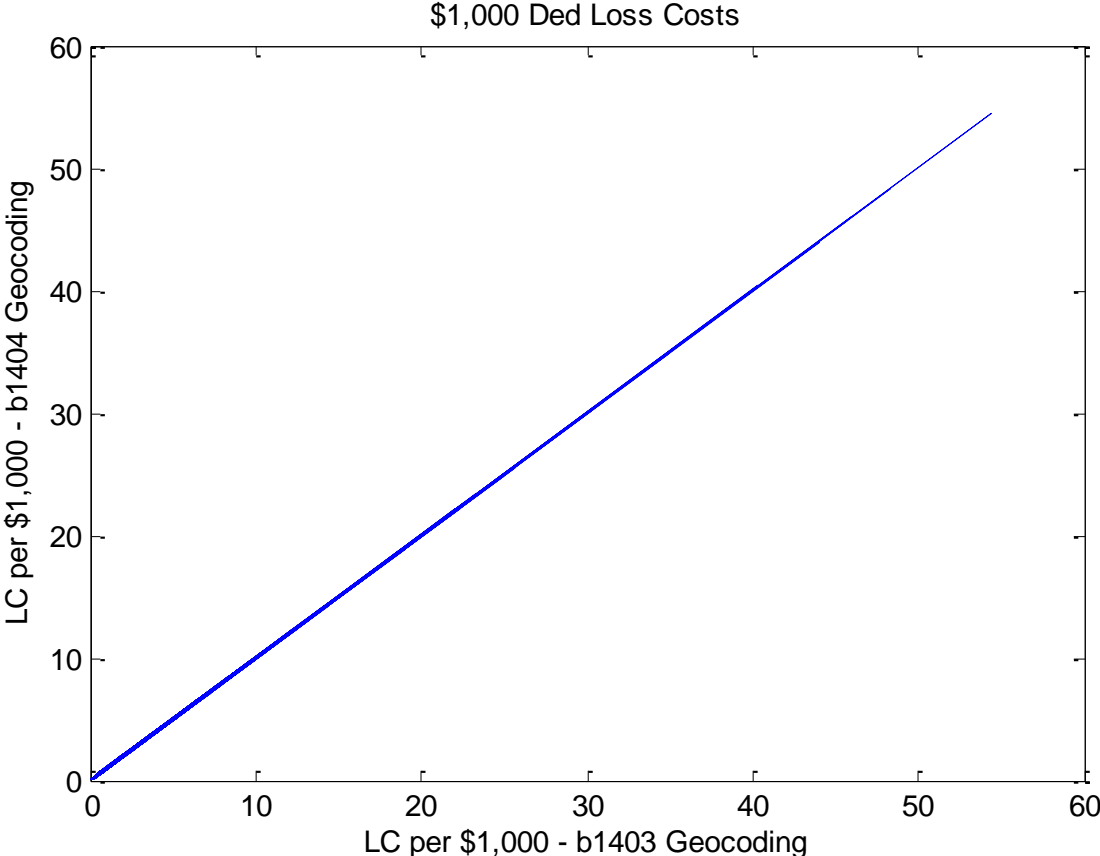
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## ■ Updated COF Results

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# Impact

- No change to location/zip or statewide loss costs
- Changes only occur in assignment to county



# Impact on Forms

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- Form A-6
  - Reported county-level loss costs change in 24 counties
  - Changes range +/- \$4.3/ \$1000 (in loss cost)
- Corresponding changes in Form A-7 / A-8, and ComRes output ranges reviewed with pro team
- This incident does not require software / model updates to be released to clients
- No impact on loss cost at post code level or lower, or at statewide aggregate level



# Incident 4 – Actions taken

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- Root Cause analysis documented
- Reviewed process for submission creation vs. build schedule.
- Added a test case to the Form A-6 QA to check for changes in geocoding

# Summary of Incidents in RiskLink 11.0.SP2

Incident	Model Change	Submission Change	Client Loss Cost Output
1 – Import	Yes	No	Possible impact
2 – Run time - All Regions	Yes	No	No impact
3 – Run time - Loss Amp	Yes	No	No impact
4 – Postcode-county mapping	No	Yes	No impact

# Changes to the Submission Document

Change Pages	Track Change Page-Page Nos.	# of Submission Change Pages	RMS Submission Page No.	Notes
<b>Changes related to Postcode-county mapping error</b>				
Updated Form CR	198 - 203	6	198 - 203	Track change version shown in file: RMS09Standards&Disclosures_ComResOutputRanges_20110909.pdf
Updated data for Form A6	262 - 321	60	262 - 321	Track change version shown in file: RMS09Standards&Disclosures_FormA6_20110909.pdf
Updated data for Form A7	322 - 326	3	322 - 325	Track change version shown in file: RMS09Standards&Disclosures_FormA7_20110909.pdf
Updated all maps in Form A8 - Form verbiage removed-no longer applies to updated form.	327 - 341	8	326 - 333	Track change version shown in file: RMS09Standards&Disclosures_FormA8_20110909.pdf
<b>Further changes to model version numbering and/or date</b>				
Submission Checklist		1	5	Model version number and date updated
Model Identification Page		1	9	Model version number and date updated
General Standards		2	93/94	Additional signature line, model version number and date
Meteorological Standards		2	95/96	Additional signature line, model version number and date
Vulnerability Standards		2	97/98	Additional signature line, model version number and date
Actuarial Standards		2	99/100	Additional signature line, model version number and date
Statistical Standards		2	101/102	Additional signature line, model version number and date
Computer Standards		2	103/104	Additional signature line, model version number and date
Editorial Certification		2	105/106	Additional signature line, model version number and date
Standard C-6 Edit		1	398	11.0.1411.1 updated to 11.0.1411.2 to coincide with 11.0.SP2
Appendix C Figure 103 - Splash Screen		1	414	New splash screen for model version 11.0.SP2
Appendix D: First Page Post Import Summary		1	415	First Page Only - Date and model version number changes
Appendix D: First Page Analysis Summary Report		1	419	First Page Only - Date and model version number changes
Changes in version from 11.0.SP1 to 11.0.SP2		All	3, 5, 9, 21, 37, 87, 95, 97, 101, 107, 118, 119, 175, 180, 398	Misc. Pages in Submission (listed) + Cover Page & All Footers
Changes in date from Mar 2011 to Sep 2011		All	2, 5, 9	Misc. Pages in Submission (listed) + Cover Page & All Footers

- RMS has prepared revised submission document for RiskLink 11.0.SP2 with all changes incorporated, and is willing to submit printed copies.

# Request for Equivalent Designation

**Why is RMS requesting consideration of acceptability for two new models (SP2a and SP2b) rather than for one model?**

- **The North Atlantic Hurricane Model is identical in all three Service Patches – SP2 / SP2a / SP2b**

<b>Peril Model</b>	<b>SP2</b>	<b>SP2a</b>	<b>SP2b</b>
North Atlantic Hurricane	X	X	X
China Typhoon		X	X
European Windstorm			X

- **RMS is seeking a letter stating that all three designations are acceptable.**