Flood Impacting Threshold

Flood Impacting Threshold | FITS™ Scores | PrecisionRating™
Agenda

- Introduce the concept of Flood Impacting Threshold (FIT)
- Introduce Applications of the FIT concept
  - FITS™ Scores
  - PrecisionRating™
  - Mitigation Modeler
- Share some project experience and lessons learned
- Q & A

An abstract of this presentation is available at www.StreamMethods.com

A million to thanks to Wen, Jeff, Sue, Jing, and Jason. You are the best!

* Some graphics used in this presentation are direct downloads from internet.
Background

FIT concept, FITS™ Scores, and PrecisionRating™ are fruits of Project Everest-Marina, designed to search for ways to differentiate flood risk anywhere.

- “Why do I have to buy insurance but my next door neighbor 20 feet away does not?
- “Why do I pay $10 more than the guy across street does?”
- “Which flood events would affect me?”
- “Which flood events would NOT affect me?”
- “How to differentiate risk precisely and consistently at the building level”
- “Would it be a good score?”
Flood Impact Threshold

The Concept
Flood Impacting Threshold – The FIT Concept

- A threshold event marking ZERO flood impact
- Various types of FIT for various purposes
- Today’s focus is just one type of FIT events: when water just *tangentally touches* a structure
  - A physical property of the structure, Independent of human judgement, globally applicable
  - Mathematically beautiful: 0. ONLY one such threshold exists on a location or a structure
  - A clearly defined boundary event, critical for rating
  - Unique and comparative, good for scoring purposes
  - Can be consistently and precisely modeled
  - Intelligible
Application 1: FITS™ Scores

Modeled FIT Characteristics and Conditions
Various FITS™ Scores

FITS™ Scores are modeled **consistently** and **precisely** by following NFIP standards

FITS™ Elevation (ft.) = **48.8**
FITS™ AEP = **5.3%**
FITS™ Return Period = **18.8 yr.**

FITS™ Score-M (x 10,000) = **531**

InstaScore™ (1-5) = **5**
Compare FITS™ Scores

- Precisely describes flood risk
- Great sensibility reflecting tiny differences
- Applicable globally
- CONTINUOUSLY reflecting the progressive nature of flooding
Modeling FITS™ Scores

To precisely model FITS™ Scores, one need

- High-grade models and maps!
  - Hydrodynamic models
  - NFIP Standards meets the criterion
  - Hi-resolution Inputs, especially terrain and structure elevation
- Multi-frequencies. All frequencies.
- Lots of models and maps
- Critical FIT factors: Terrain Elevation, Structure Footprints, Structure Elevation
Modeling FITS™ Scores (Cont.)
To FIT, Lots of Models Needed
Application 2: PrecisionRating™
“Not PRECISELY counting the FULL RANGE results in either UNDER or OVER rating.”
Rating Boundaries & Structure Elevation

FIT-FICC-Structure Elevation

FIT

FICC

Return Period (years)

Relative Floor Elevation from Ground (ft.)

FIT-R

FICC-R
FIT Events are Critical for Rating

- Upper and Lower boundaries both critical
- "Heads" >> "Tails" (but not always)
AAL500 vs. PrecisionRating™
Massive Scale Comparison

- Building footprints Analyzed: > 2 M
- Within SMI 500-year: 980,650
- PrecisionRate > AAL500 Rate: 547,039
- AAL500 Rate > PrecisionRate: 483,611
AAL500 vs PrecisionRating

For this building affixed to this location, AAL500 is ALWAYS over-priced
AAL500 vs. PrecisionRating™

- DIFFERENT
- > 500,000 buildings, RC is within 40% of AAL500 Rating
- > 450,000 buildings with a relative difference of >120%

(Preliminary research results. SMI 2017 - 2019)
AAL500 vs. PrecisionRating™ (cont.)

- VERY DIFFERENT
- With > 500,000 buildings, PrecisionRating within 1.3 times of AAL500
- With > 400,000 M buildings, PrecisionRating is 1.3 times more than AAL500

(Preliminary research results. SMI 2017 - 2019)

Building footprints Analyzed > 2 M
Within SMI 500-year 980,650
PrecisionRate > AAL500 Rate 547,039
AAL500 Rate > PrecisionRate 433,611
AAL500 vs. PrecisionRating™ (cont.)

- Still “half over, half under”
- > 400,000 buildings, AAL500 is OVER priced
- > 500,000 M buildings, AAL500 is UNDER priced

(Preliminary research results. SMI 2017 - 2019)

Building footprints Analyzed > 2 M
Within SMI 500-year 980,650
PrecisionRate > AAL500 Rate 547,039
AAL500 Rate > PrecisionRate 433,611
AAL500 vs. PrecisionRating™ (cont.)

- Building footprints analyzed: > 2 M
- Within SMI 500-year: 980,650
- PrecisionRate > AAL500 Rate: 547,039
- AAL500 Rate > PrecisionRate: 433,611
AAL25-500 vs. PrecisionRating (FIT-FICC Effect)

1. **“LOW” Risk Zone** - Beyond 500 year FP.
   - AAL25-500 doesn’t handle this zone well. When it does, it overestimates risk for this “zone.”

2. **25-500 Zone** (This may be the most common zone).
   - Though uncertain, AAL25-500 most likely overestimates risk.

   - Current Approach underestimates flood risk.
“The guy across the street”
Rating Any Structure in Any Zones

- Increased market size
- Know the “right price”
- Know where “over”
- Know where “under”
- RLPs’ higher risk reflected
Application 3: Mitigation Modeler

Raising FIT
Modeling Mitigation – Raise FIT and $ave

FITS Mitigation Modeling

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Enough? You Think?
Summary

- Flood Impacting Threshold reflects the progressive nature of flooding water
  - Breaking out from in/out paradigms (From in a zone to on the line)
  - Applicable globally

- FITS™ Scores can precisely differentiate risk house-to-house
  - Great sensitivity for answering the “My neighbor next door” question
  - A good score for comparability

- PrecisionRating™
  - Rating precisely and fully in any zone
  - FIT is a critical factor for rating
  - Preliminary results show significant difference

- Lots of Maps and Models Needed
  - “Simple” approaches do not generate satisfactory results.
  - Hydrodynamic modeling is good for such precision.

- More R&D is needed. It is just the beginning.
Q & A

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