2019 AIR Florida Insurance Forum

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Flood Insights and Innovation

Marc Treacy
Peter Bingenheimer

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Aftermath of Recent Events Highlights Damage Floods Can Cause

Why Is Privatization Such a Big Deal for Insurers?

Flood Insurance Gap Is a USD 40 Billion Opportunity[1]

1. http://www.brinknews.com/flood-insurance-gap-represents-40-billion-new-market/

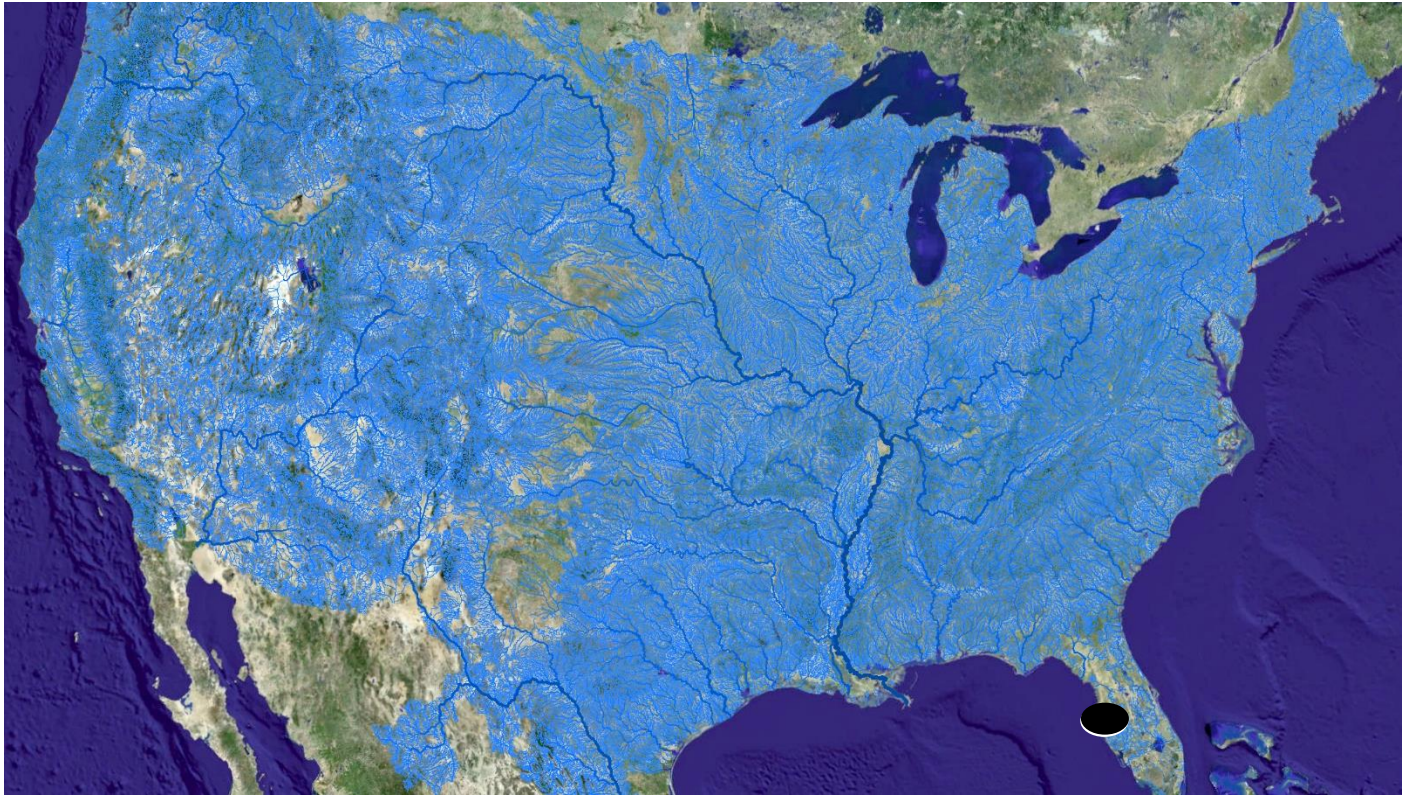
Foundations for Building a Flood Insurance Portfolio

Underwriting

Pricing

Portfolio Management

A Flood Solution Robust at All Scales



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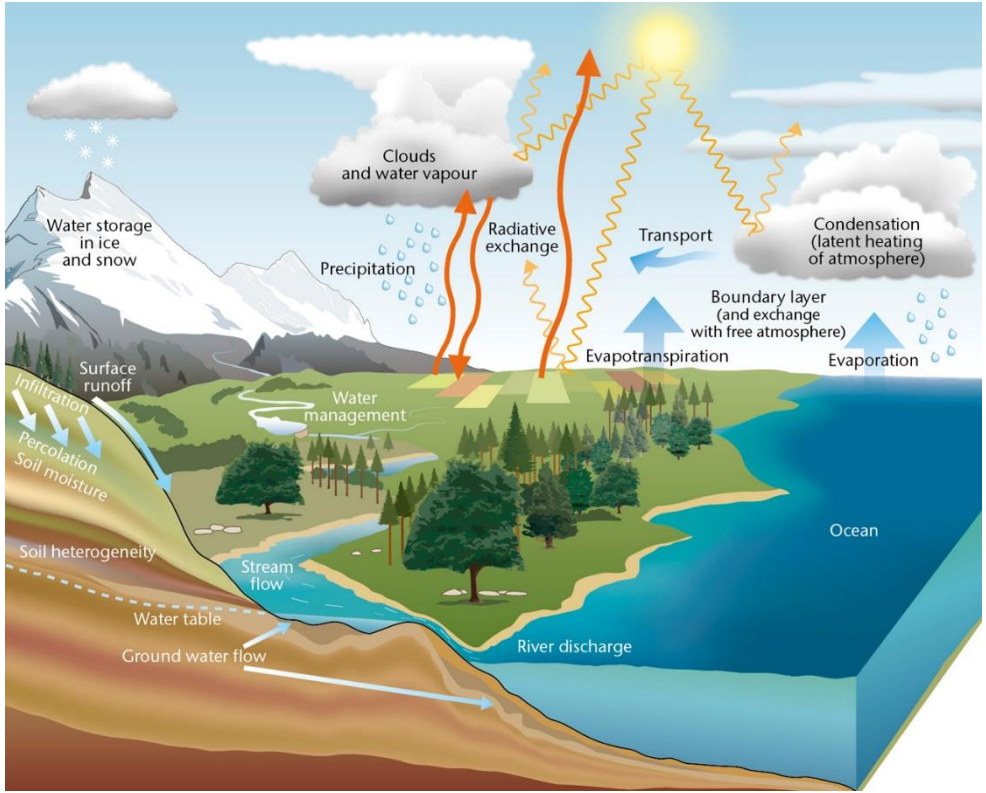
Event-Based Flood Hazard Modeling Across Contiguous U.S.



Precipitation

↓

Runoff & Flow

↓

Flood Extents

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Translating Precipitation to Flood Extents

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Models Need to Account for Risk Both On and Off Floodplains

On-Plain Flooding

Off-Plain Flooding

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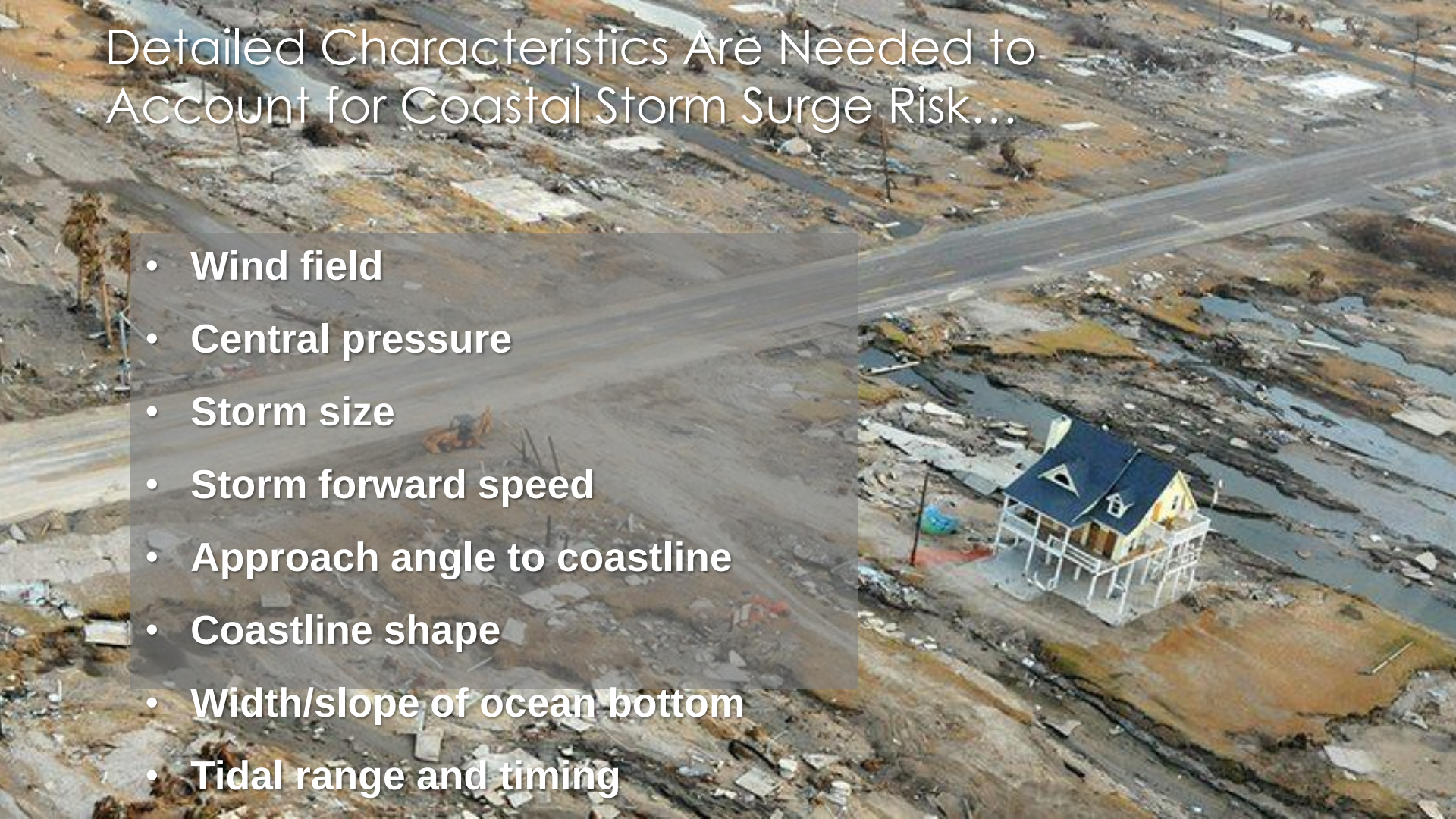
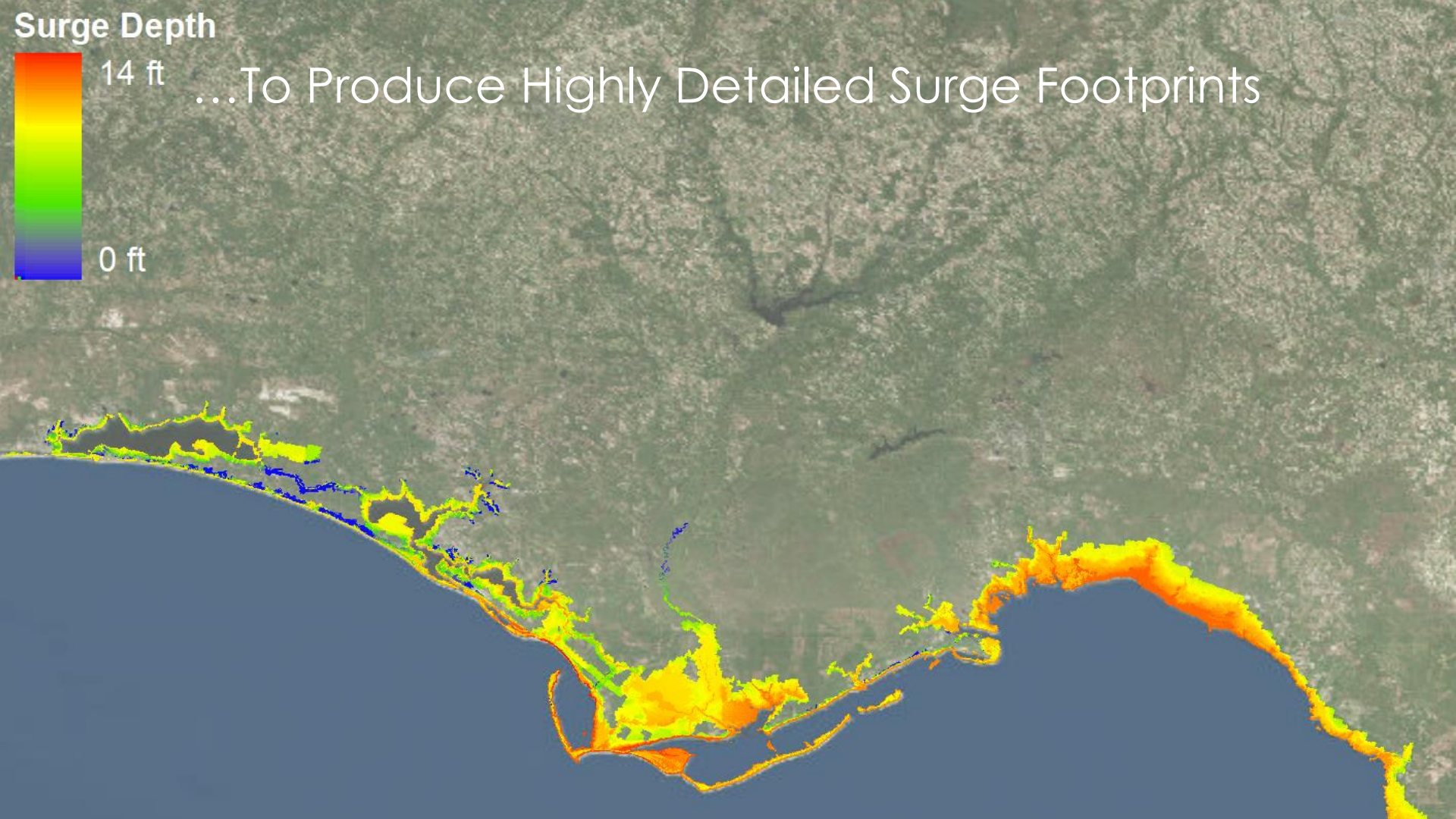
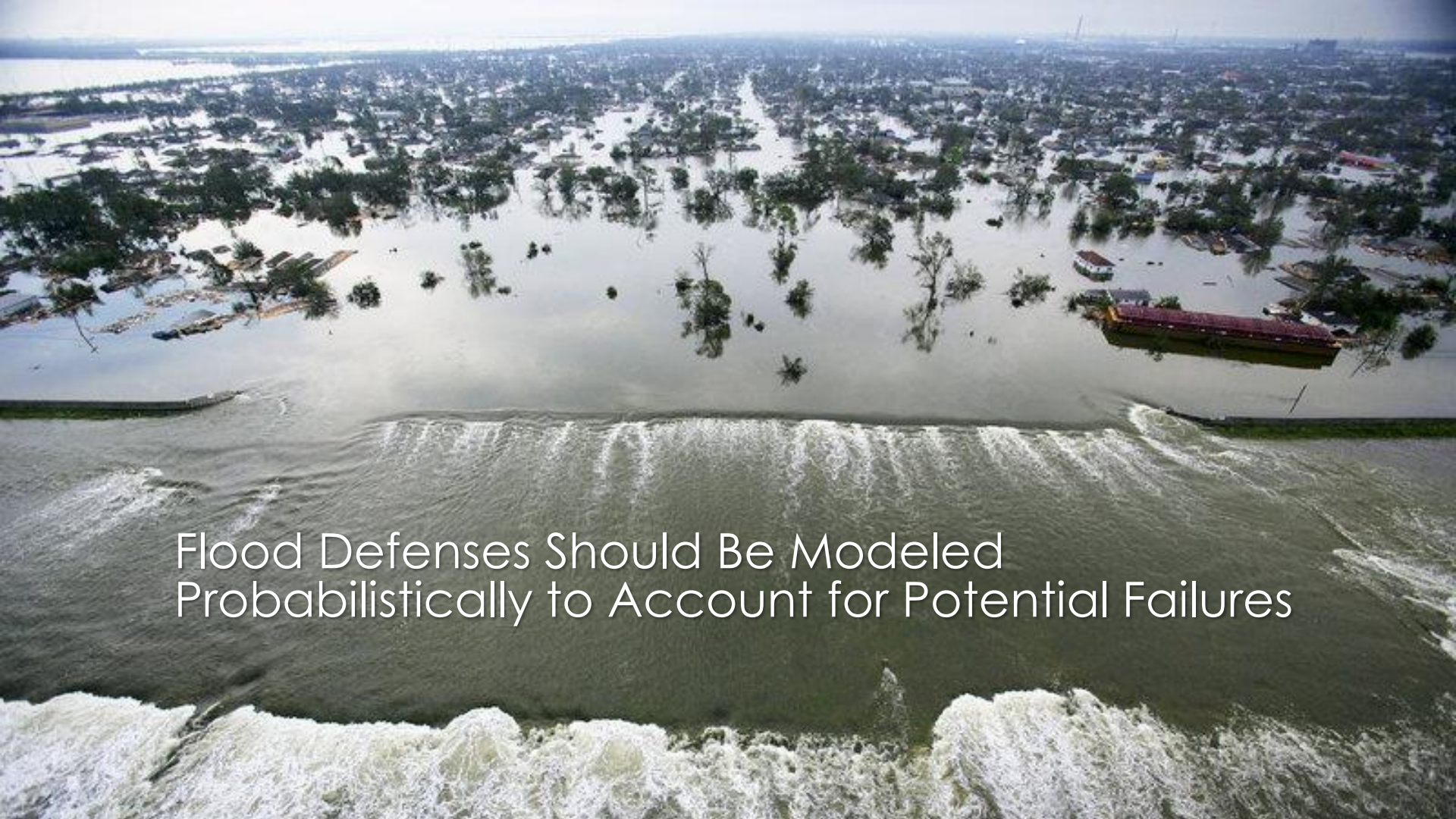
Detailed Characteristics Are Needed to Account for Coastal Storm Surge Risk…



- **Wind field**
- **Central pressure**
- **Storm size**
- **Storm forward speed**
- **Approach angle to coastline**
- **Coastline shape**
- **Width/slope of ocean bottom**
- **Tidal range and timing**

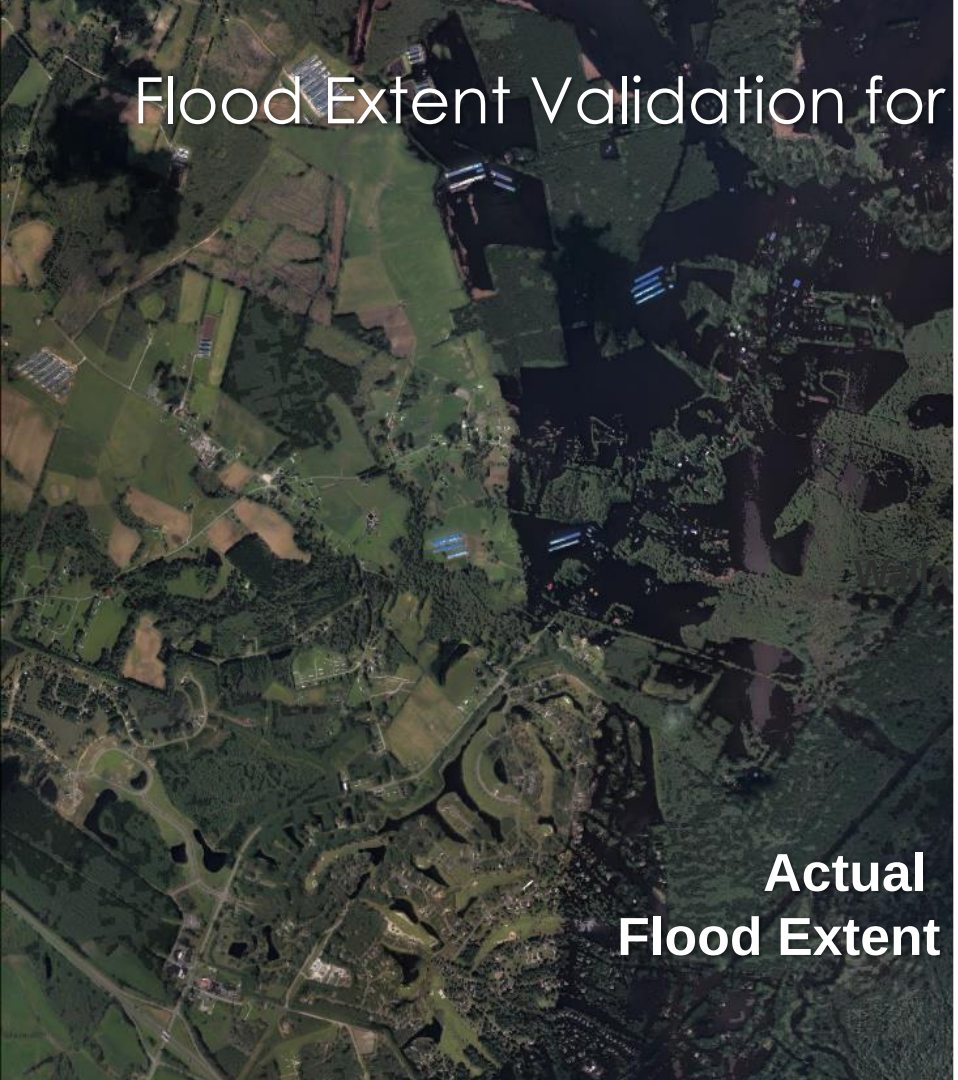
…To Produce Highly Detailed Surge Footprints

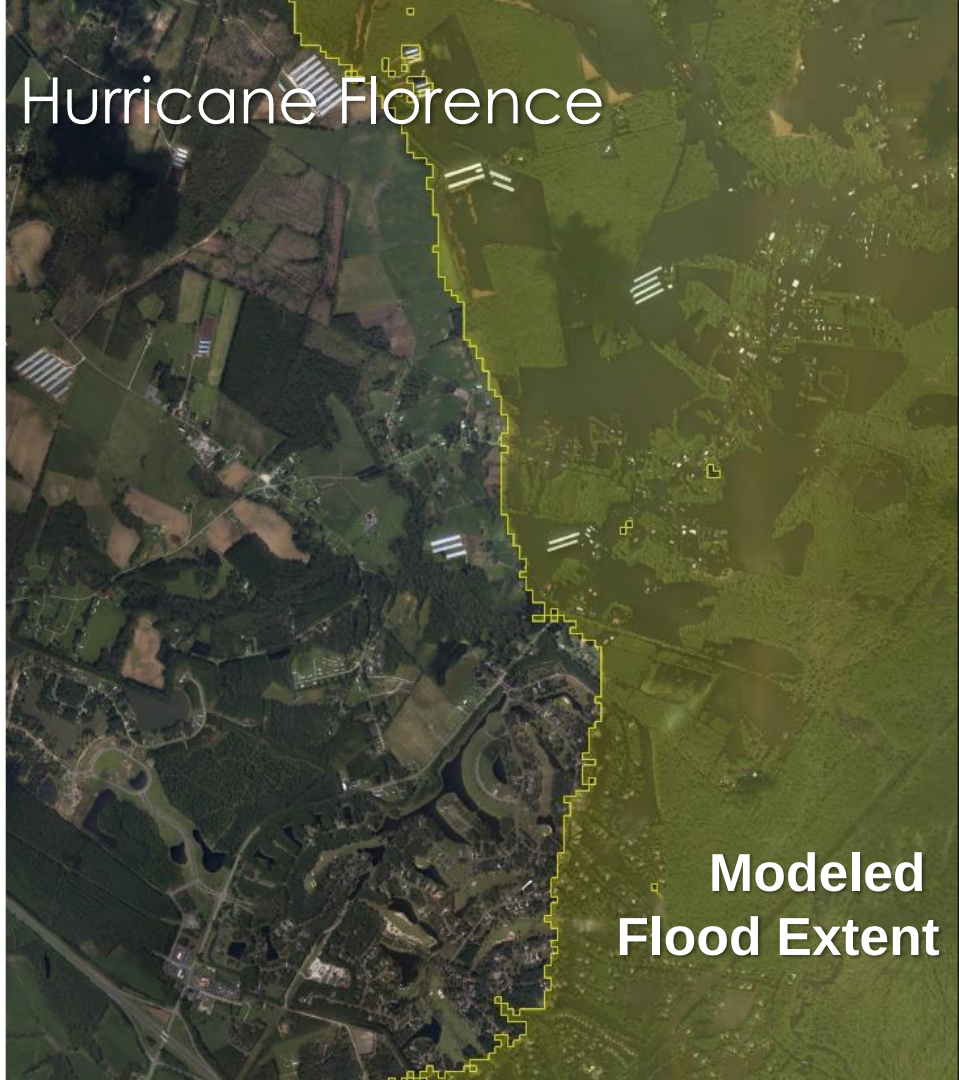




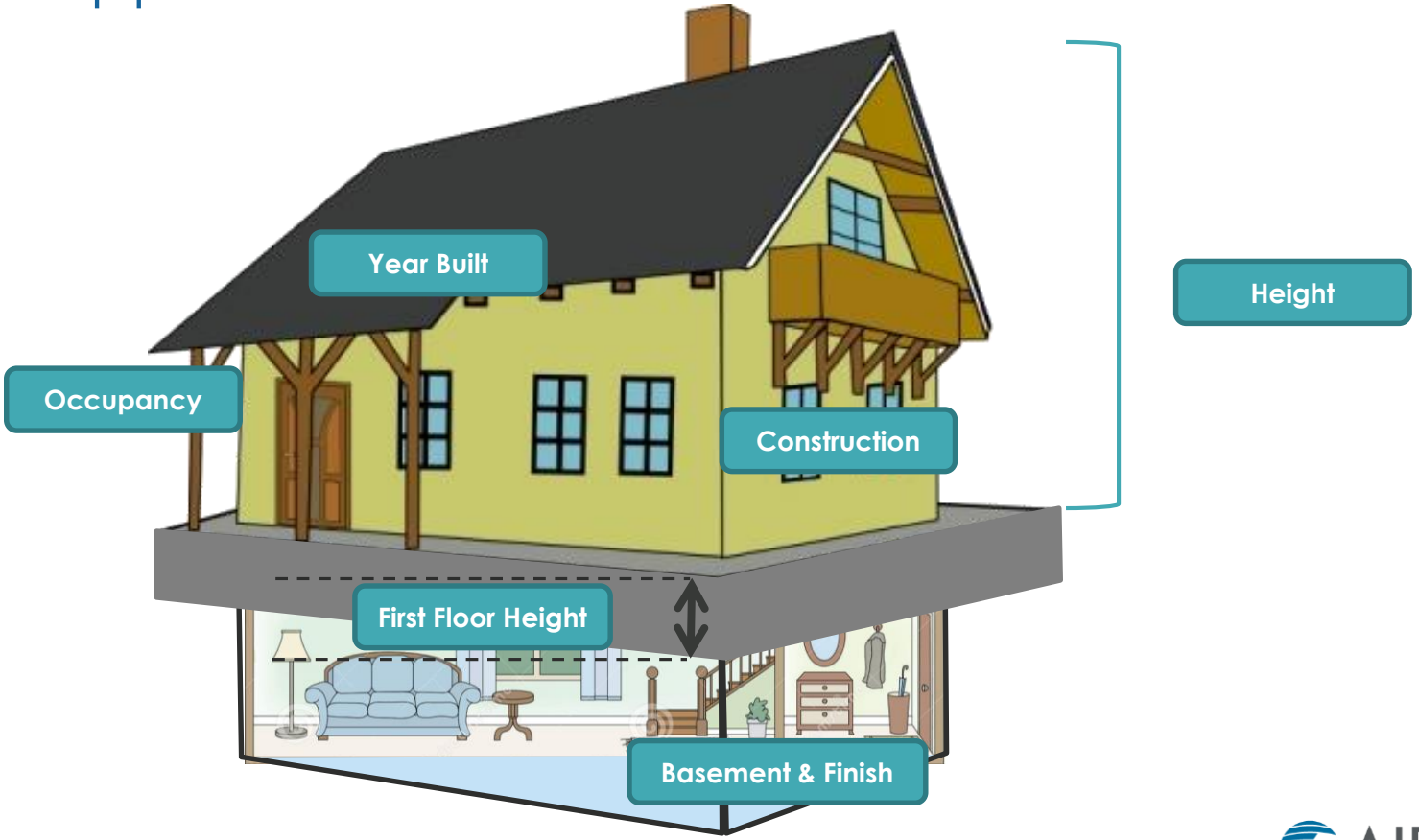
Flood Defenses Should Be Modeled Probabilistically to Account for Potential Failures

Flood Extent Validation for Hurricane Florence





Model Supports Detailed Risk Differentiation



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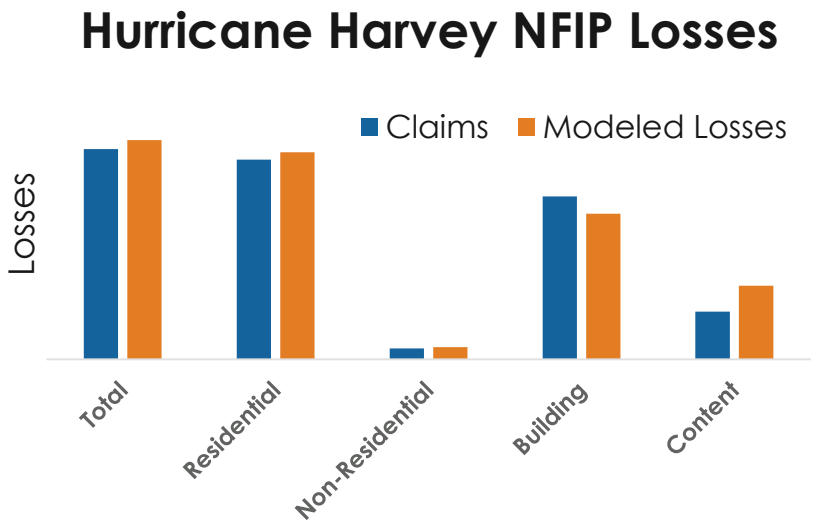
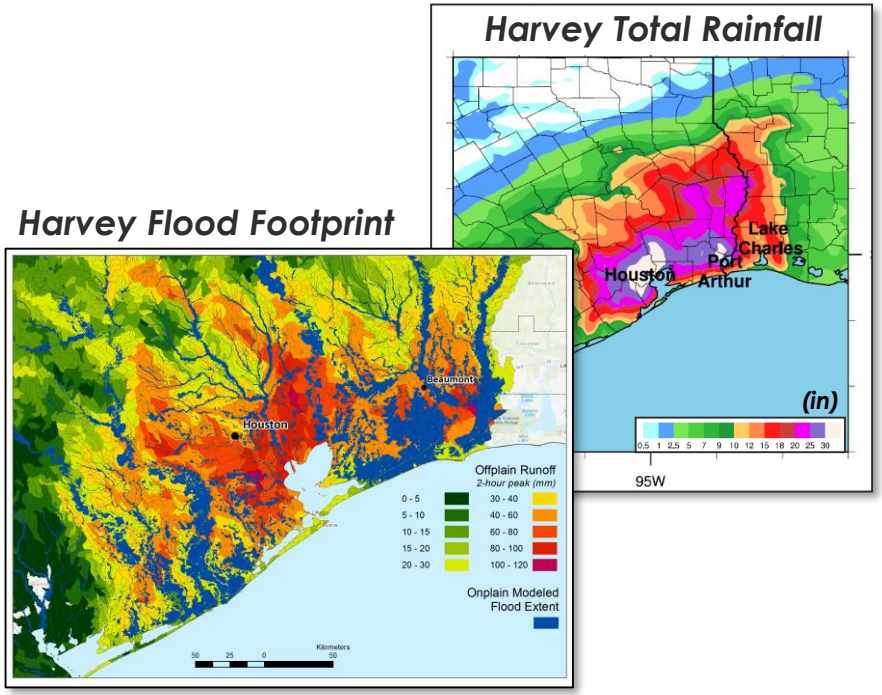
Recent Events Validate Existing Assumptions in the Vulnerability Module





Using AIR's Industry Exposure Database with NFIP's policy conditions and take-up rates

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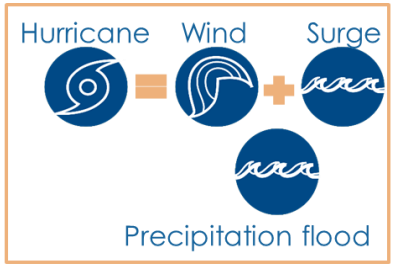
AIR Plans to Account for Flooding from Hurricane Induced Precipitation in 2020

AIR Hurricane Model for the U.S.



AIR Inland Flood Model for the U.S.

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WaterLine™

Why Flood Hazard Scoring?

FEMA flood maps have limitations. Carriers need a product to assist with risk selection.

WaterLine addresses property-level underwriting needs that can be used along with FEMA flood zone data and more complex flood models

Provides highly granular (property-level) flood risk score for the U.S.

WaterLine Makes Understanding Flood Risk Easy

Simple & intuitive underwriting decisions

Complete coverage @10-meter resolution for the contiguous U.S.

Breakdown of the overall risk score into riverine, pluvial, and storm surge

Hazard score supported by information on driving factors

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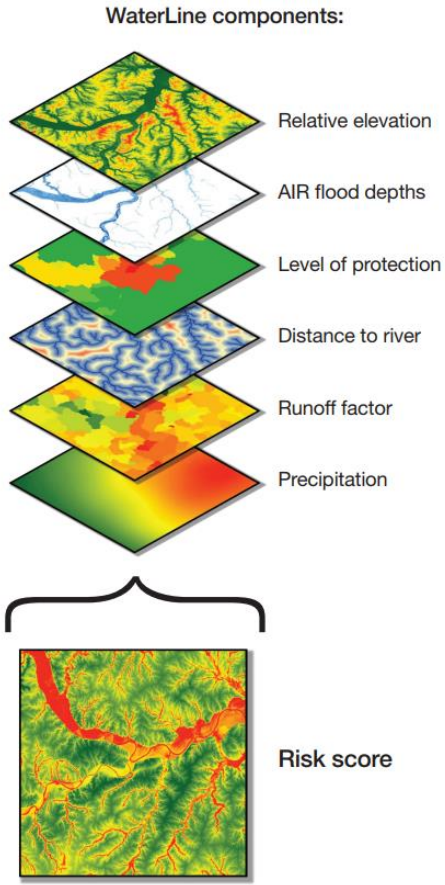
WaterLine Scoring Methodology

Signifies the expectation of flood hazard severity at any location

Reflects the whole spectrum of frequency and severity of hazard

Leverages AIR U.S. inland and storm surge models

Validated using data from ISO®, USGS, and Claims from Development Partners



Source: WaterLine Flyer

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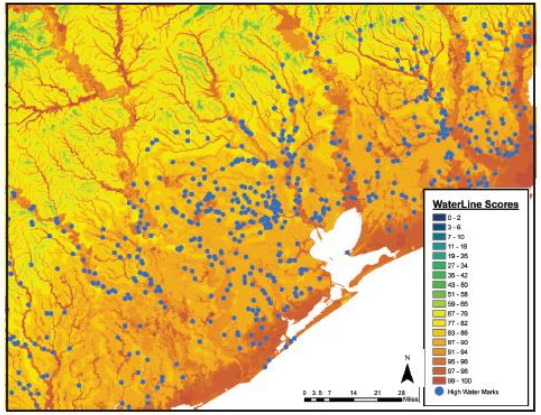
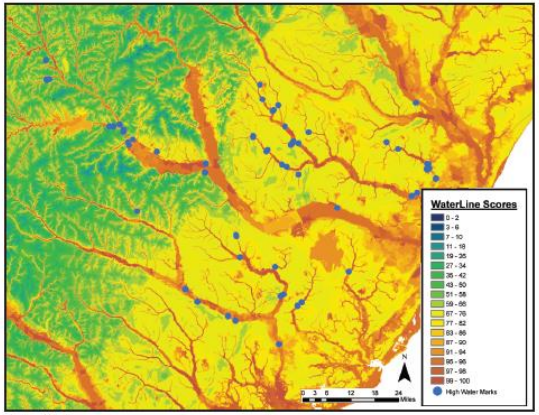
WaterLine Validation

2017 Houston, Texas



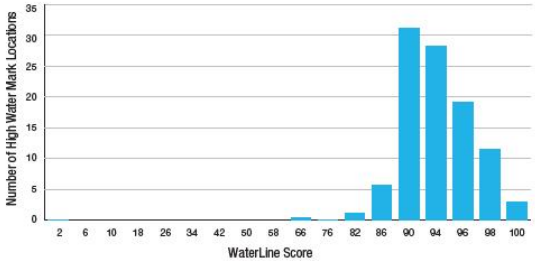
Source: USGS

2015 South Carolina

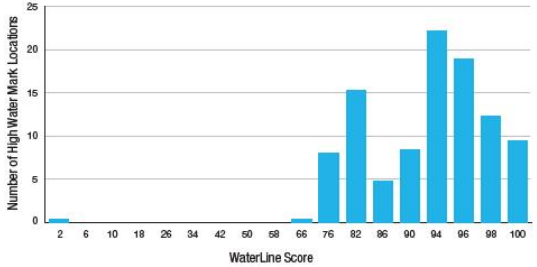


Source: USGS

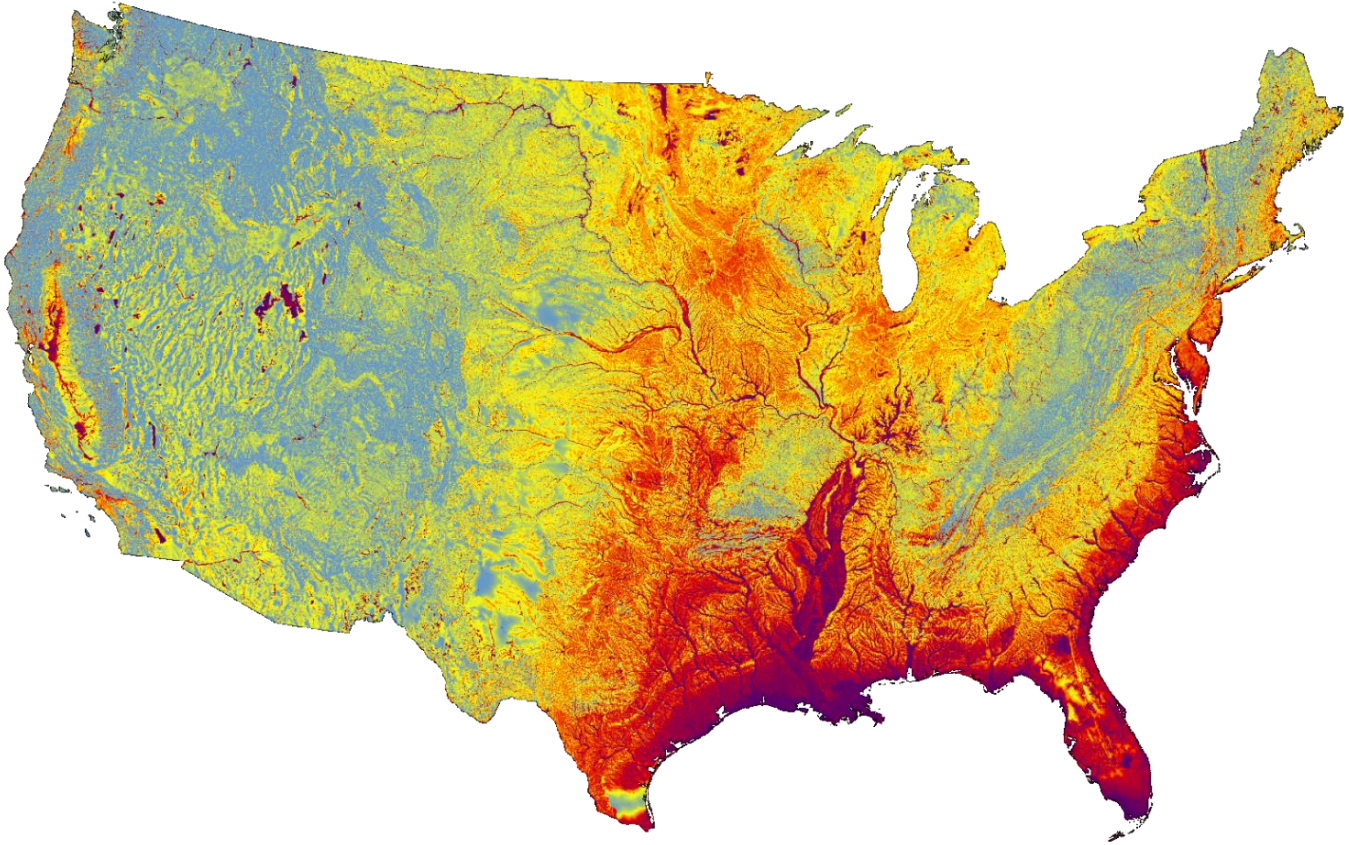
Houston, Texas: High Water Mark Score Distribution



South Carolina: High Water Mark Score Distribution



WaterLine Provides a Comprehensive View of Risk



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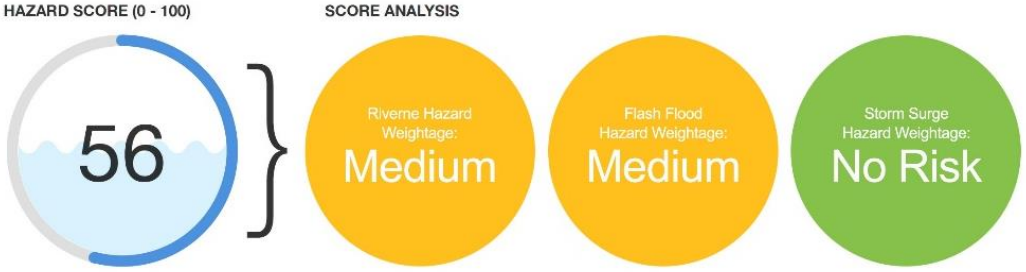
WaterLine: Optimize Underwriting

Assesses flood risk across the contiguous United States

- 0-to-100 relative risk scale
- Streamlined, property-level risk selection
- Stronger risk accumulation and coverage guidelines
- Admitted, non-admitted, and Lloyd's business uses



KEY BENEFIT

Helps carriers mitigate reputational risk by providing flood risk insights they can use to educate policyholders—regardless of whether they offer flood insurance coverage options or not.

Time = Money

ISO Has Developed Personal and Commercial Flood Programs to Assist Insurers

- Broader and more flexible than the NFIP
- Similar to standard homeowners or commercial policies
- Actuarially sound loss costs —based on AIR, ISO, and NFIP data
- No maximum limits of liability

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A Turnkey Solution Addressing the Full Life Cycle of Flood Insurance