

The "Flood Risk" Awakens

The Emergence of Hazus within the FEMA NFIP Program

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December 10, 2015

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FLOOD RISK

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What Is Flood Risk?

Agenda

Past: Flood Maps

Present: Flood Risk Products

**Future: Future Conditions
Flood Risk**

JEDI MIND TRICK

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**Decide on methods to show
flood risk**

**Make products to show flood
risk**

**Address why products do
not meet expectations**



**"YOU MUST
UNLEARN
WHAT YOU
HAVE
LEARNED"**

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Episode I: The Flooding Menace

What is Flooding?

**Overflow of water that
submerges land which is
usually dry**

Flooding = impacts to people and property





NEVER TELL ME THE ODDS

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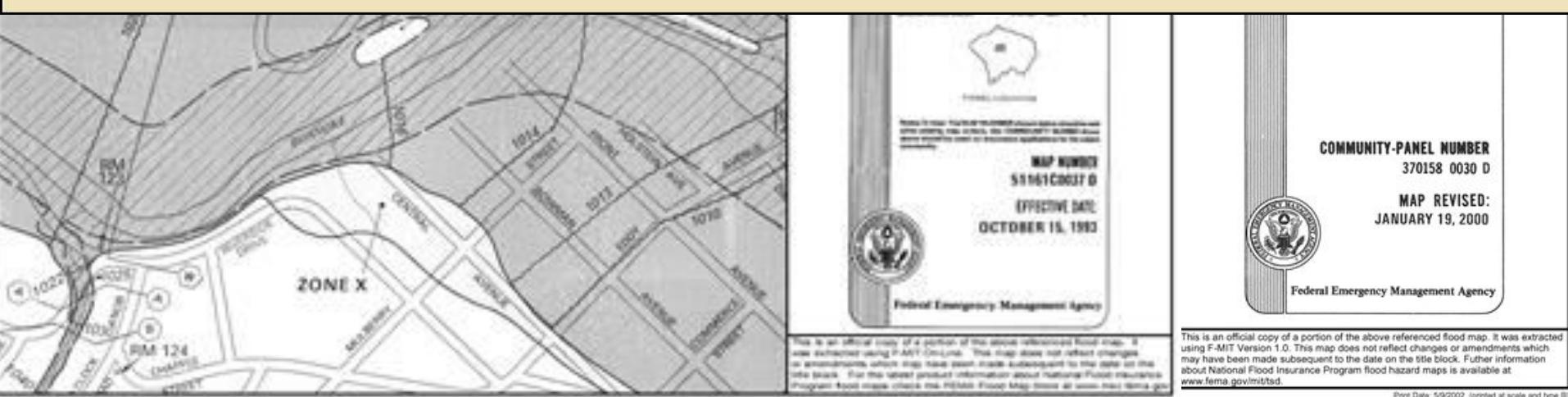
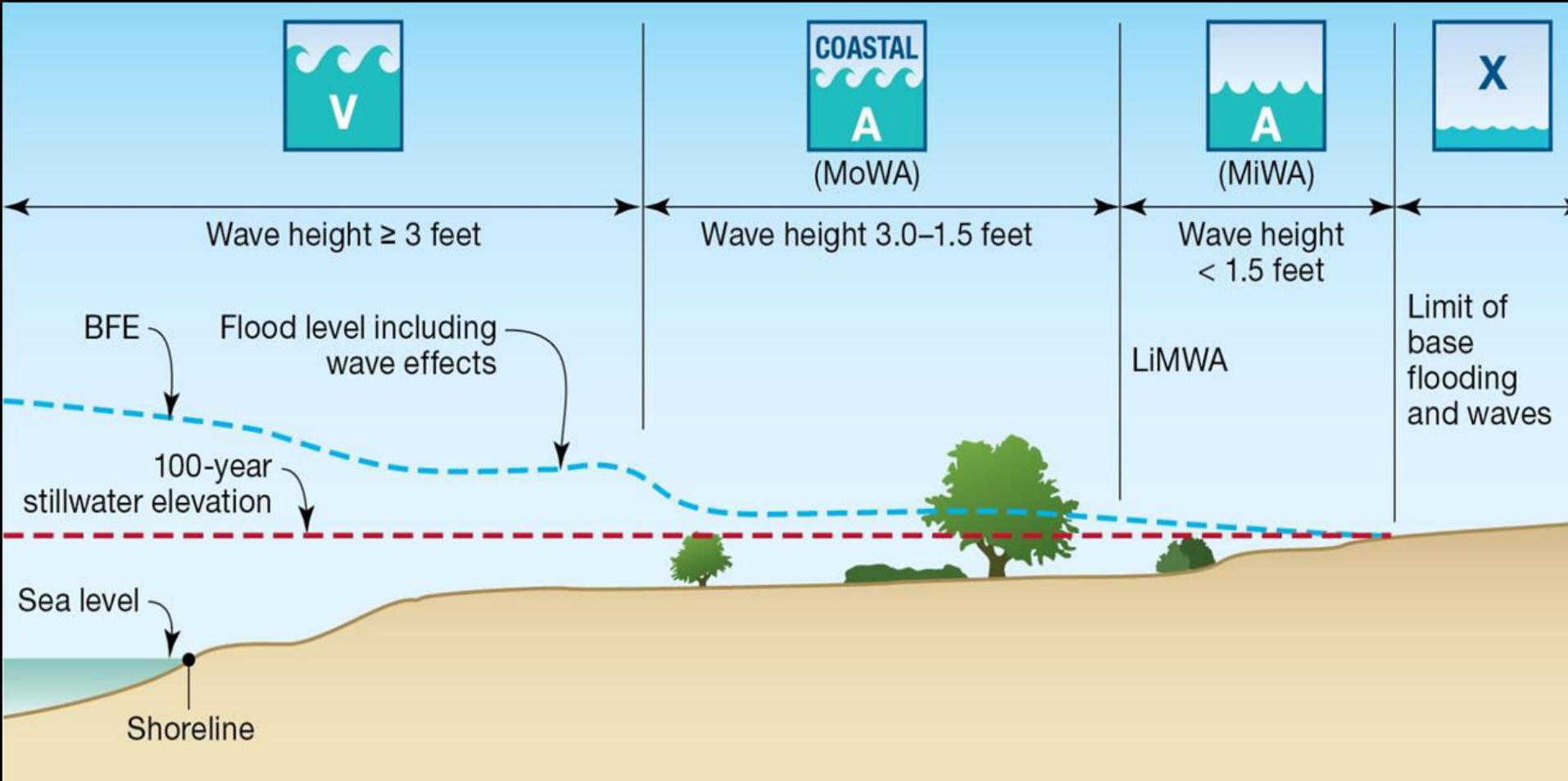
Episode II: Attack of the FIRMs

What is Flood Mapping?

**Flood Insurance Rate Maps
(FIRMs) show the Special
Flood Hazard Area
designated by FEMA
standards**

Flood mapping = paper map to show where flooding happens



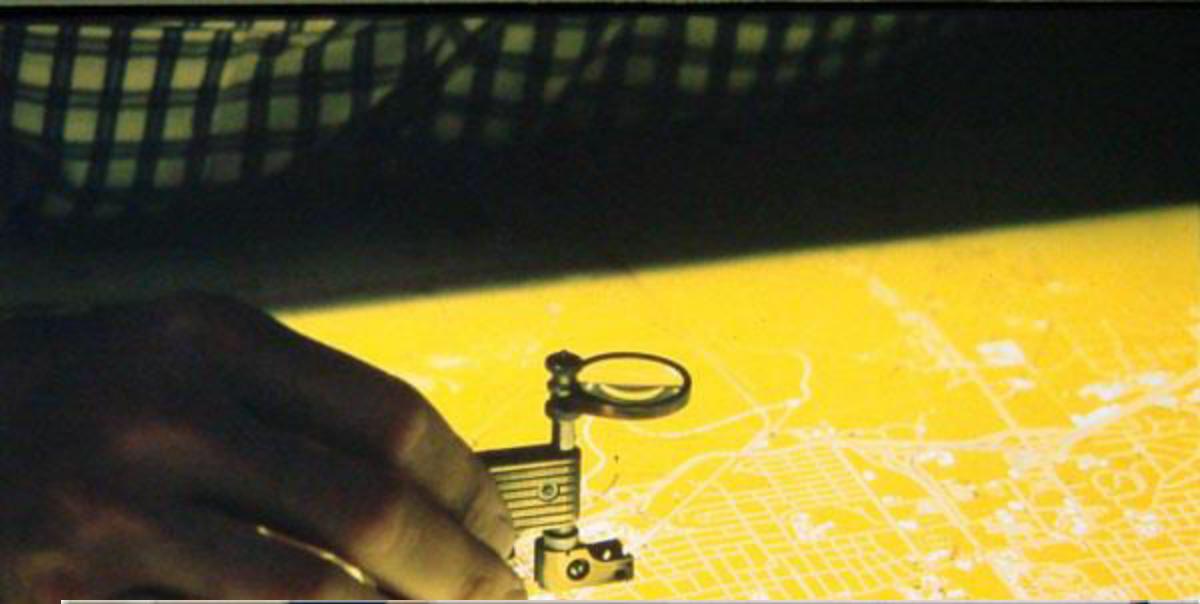
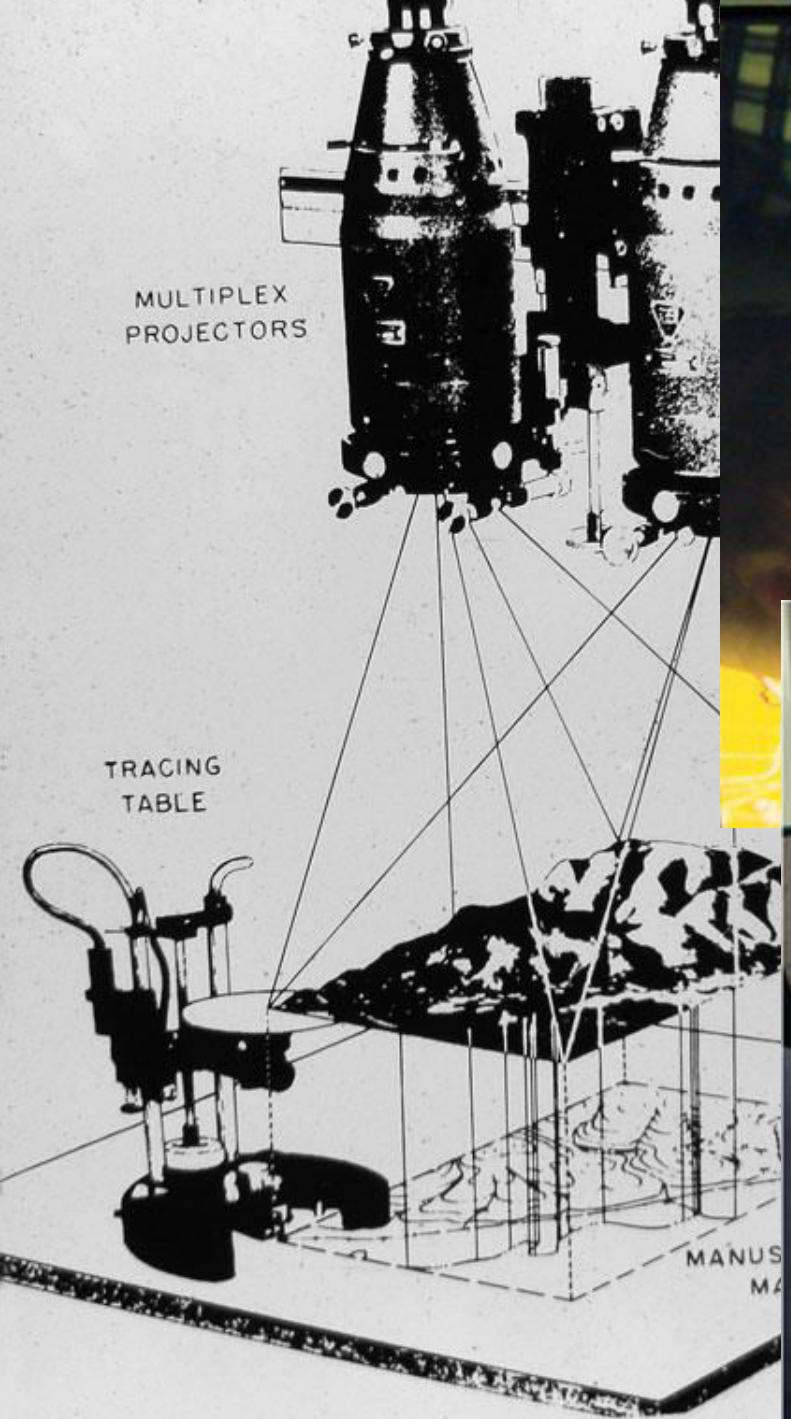


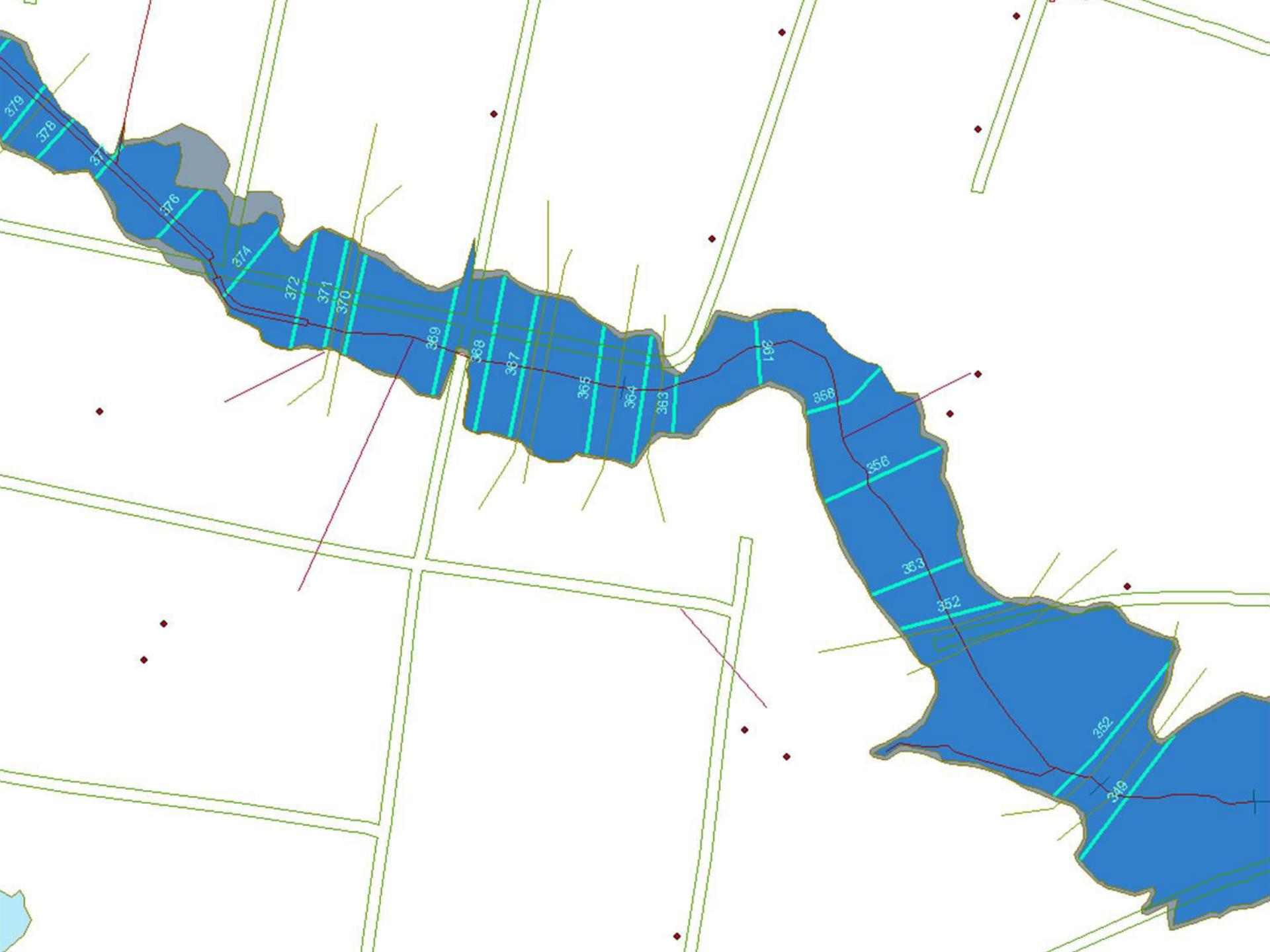
Episode III: Revenge of the Data

**Why is the Flood Mapping still
Wrong?**

**Mapping is based on best
available data and models
FOR THE BUDGET
AVAILABLE**







Episode IV: A New Hope – Risk MAP

What is Flood Risk?

**Floods damaging
something of value**

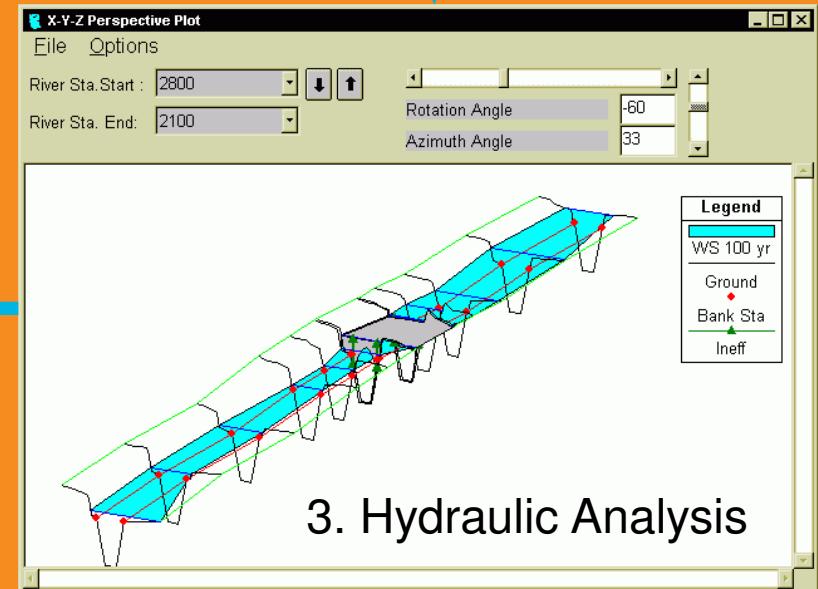
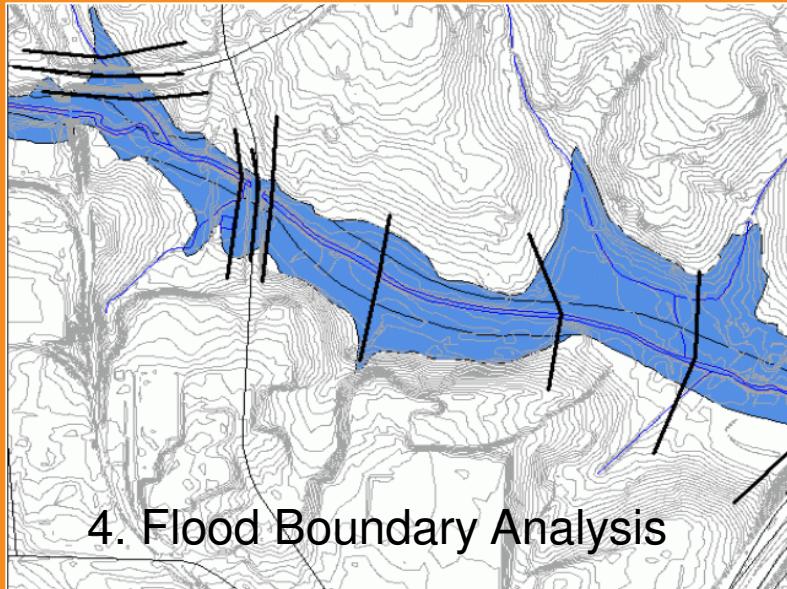
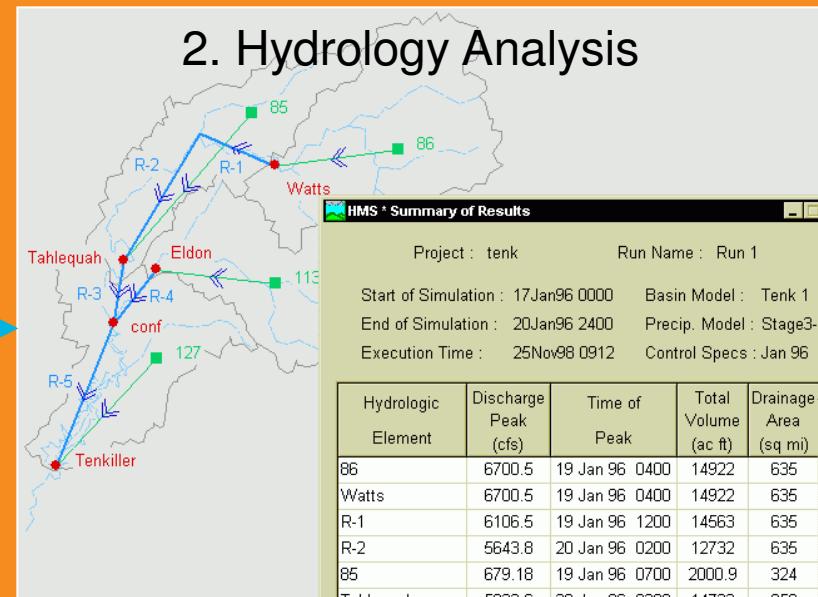


Episode V: The Data Strikes Back

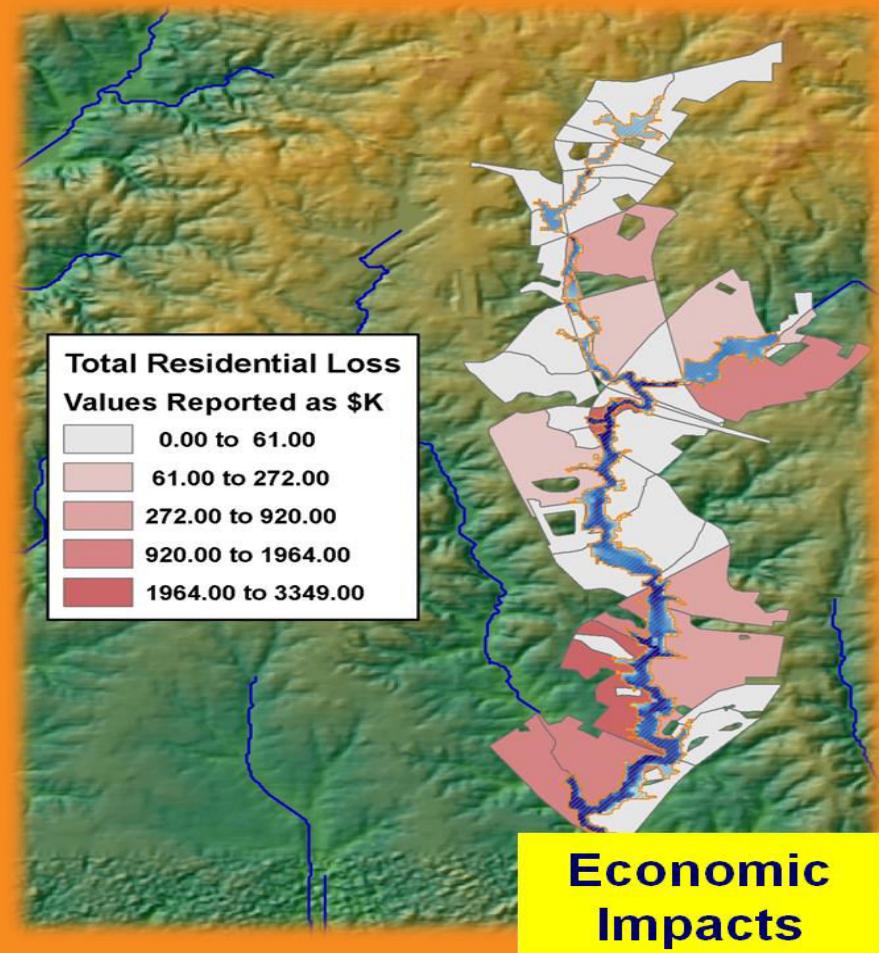
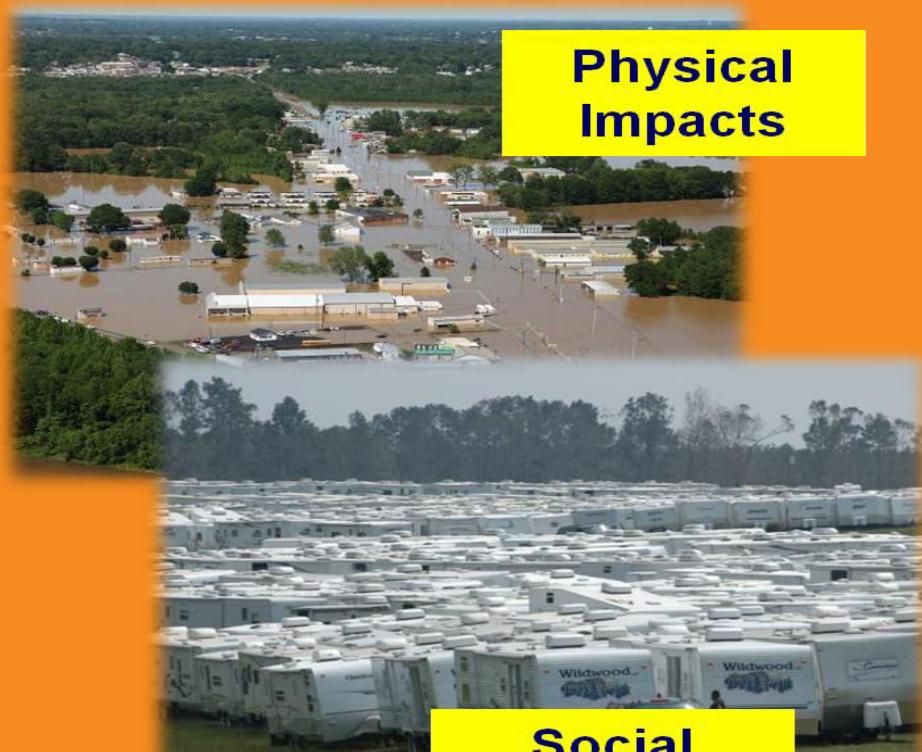
How do we model Flood Risk?

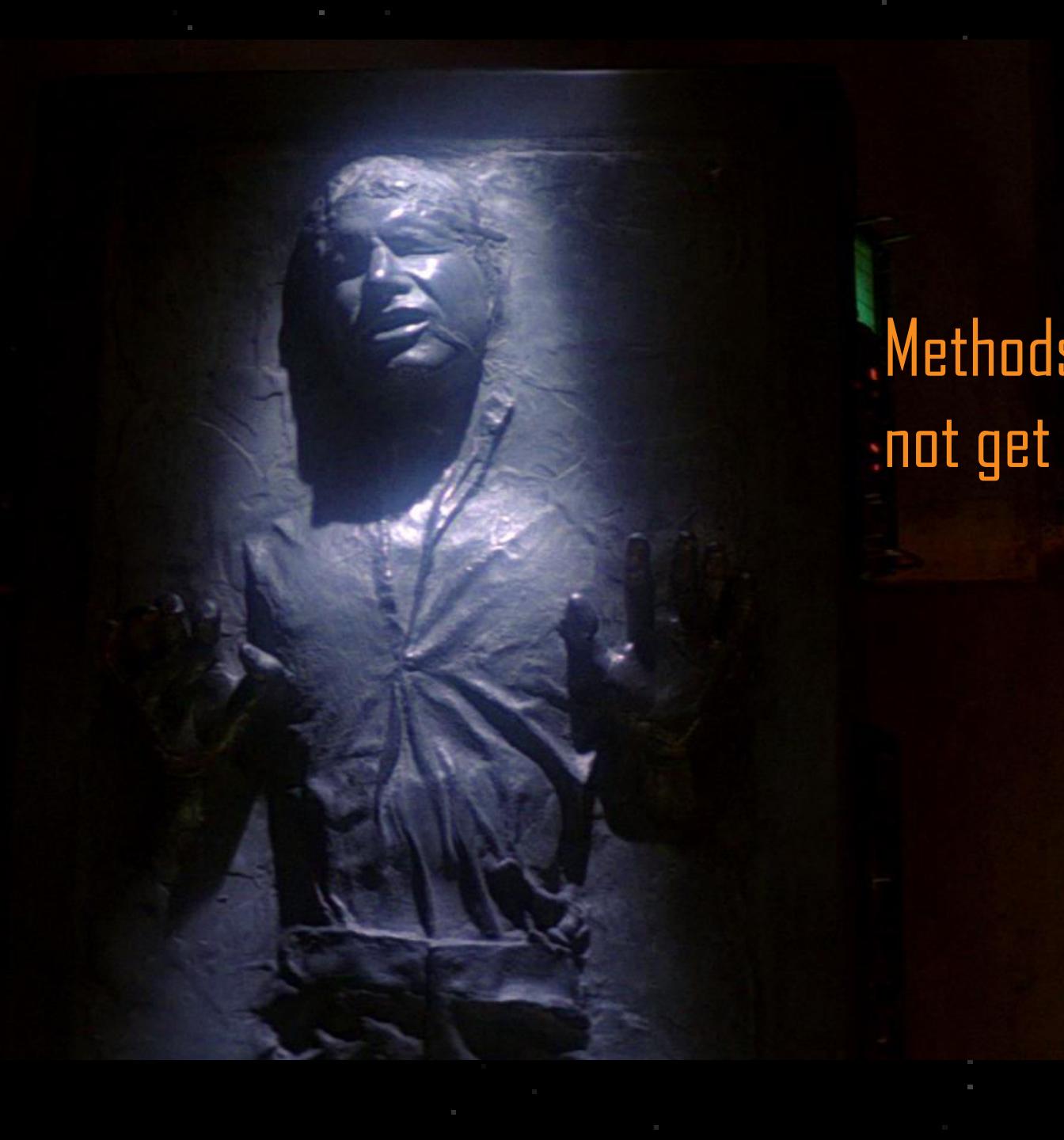
**GIS-based tools like Hazus
using best available data**

Automated Modeling Processes



Hazus Outputs



A statue of a man in a suit, frozen in ice, with glowing blue eyes.

Methods and Tools must
not get frozen in time...

Episode VI: Return of the Risk

**Why is Flood Risk Modeling
still Wrong?**

**GIS-based tools like Hazus
using best available data**

I've got a bad feeling
about this...

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The balancing act and managing expectations

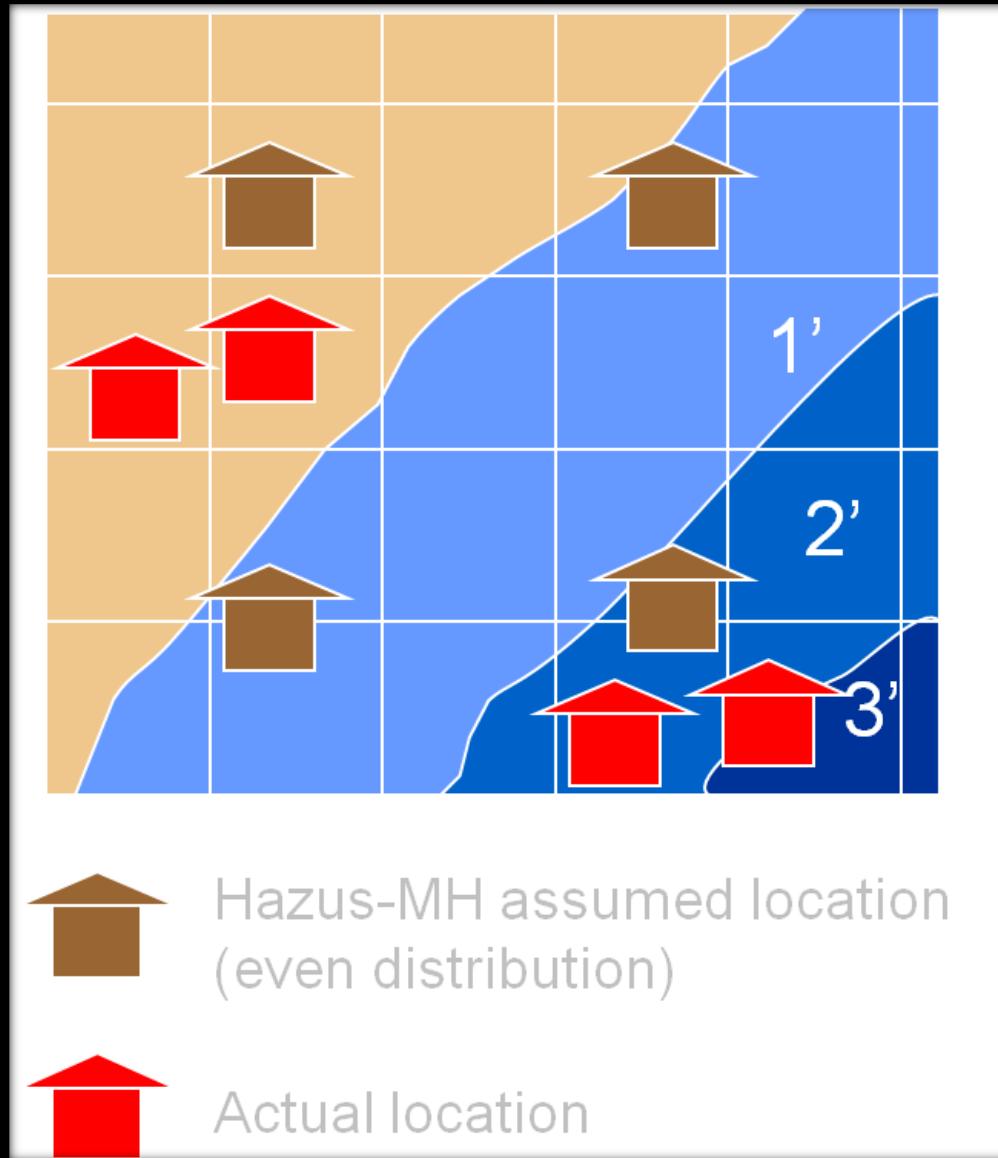
**How well is
what is at
risk
defined?
(Inventory)**



**How accurate is
the loss
estimation
methodology?**

**How well is the hazard
defined?**

The challenge with homogenous census block analysis



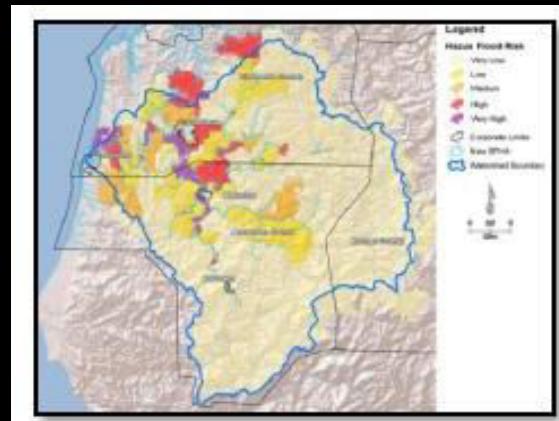
Flood Risk Assessment Datasets

–Flood Risk Assessment Data

- 2010 HAZUS Average Annualized Loss (AAL) Study Data
- Refined HAZUS and Other Risk Analyses Data
- Composite Data



HAZUS MH



Flood Risk Assessment



Seemed like a good idea
at the time.....

1. Jar Jar's the key to all this, if we get Jar Jar working. 'Cause he's a funnier character than we've ever had in the movies.
– George Lucas (1999)

2. 2010 AAL Study

Episode VII: The “Real” Flood Risk Awakens

**How is flood risk going to
change in the future?**



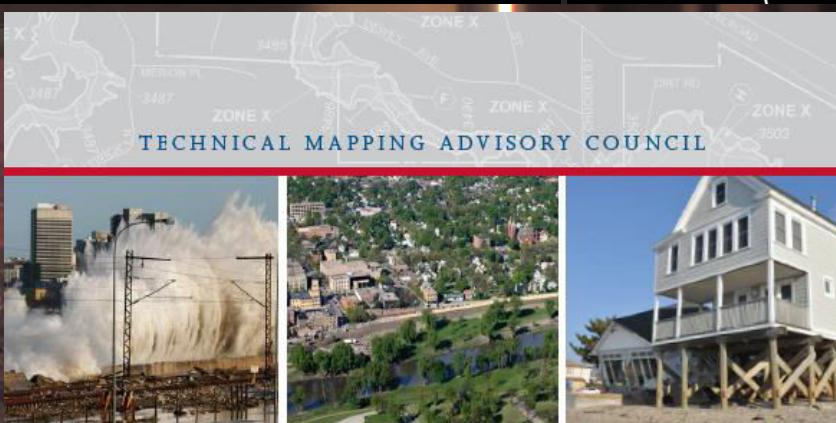
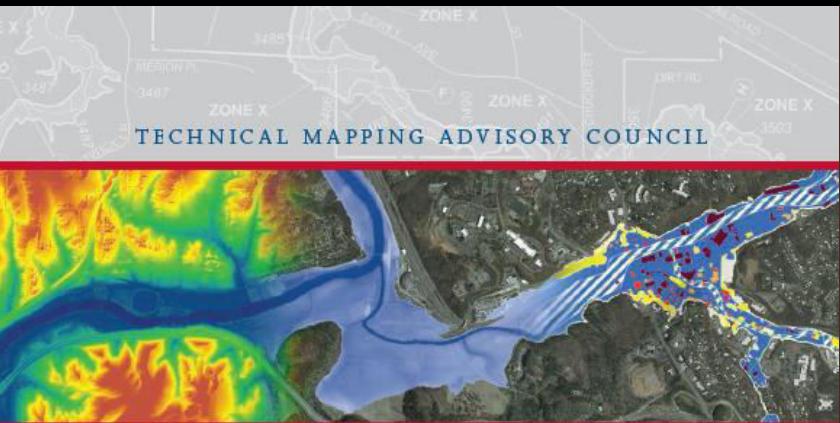
Always In Motion
The Future Is.

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FEMA Technical Mapping Advisory Council (TMAC)



TMAC
2015 ANNUAL REPORT
INTERIM

October 2015

TMAC
FUTURE CONDITIONS REPORT
INTERIM

October 2015

TMAC 2015 Annual Report

Recommendation No. 10: FEMA should transition from identifying the 1-percent-annual-chance floodplain and associated base flood elevation as the basis for insurance rating purposes to a structure-specific flood frequency determination and associated flood elevations.

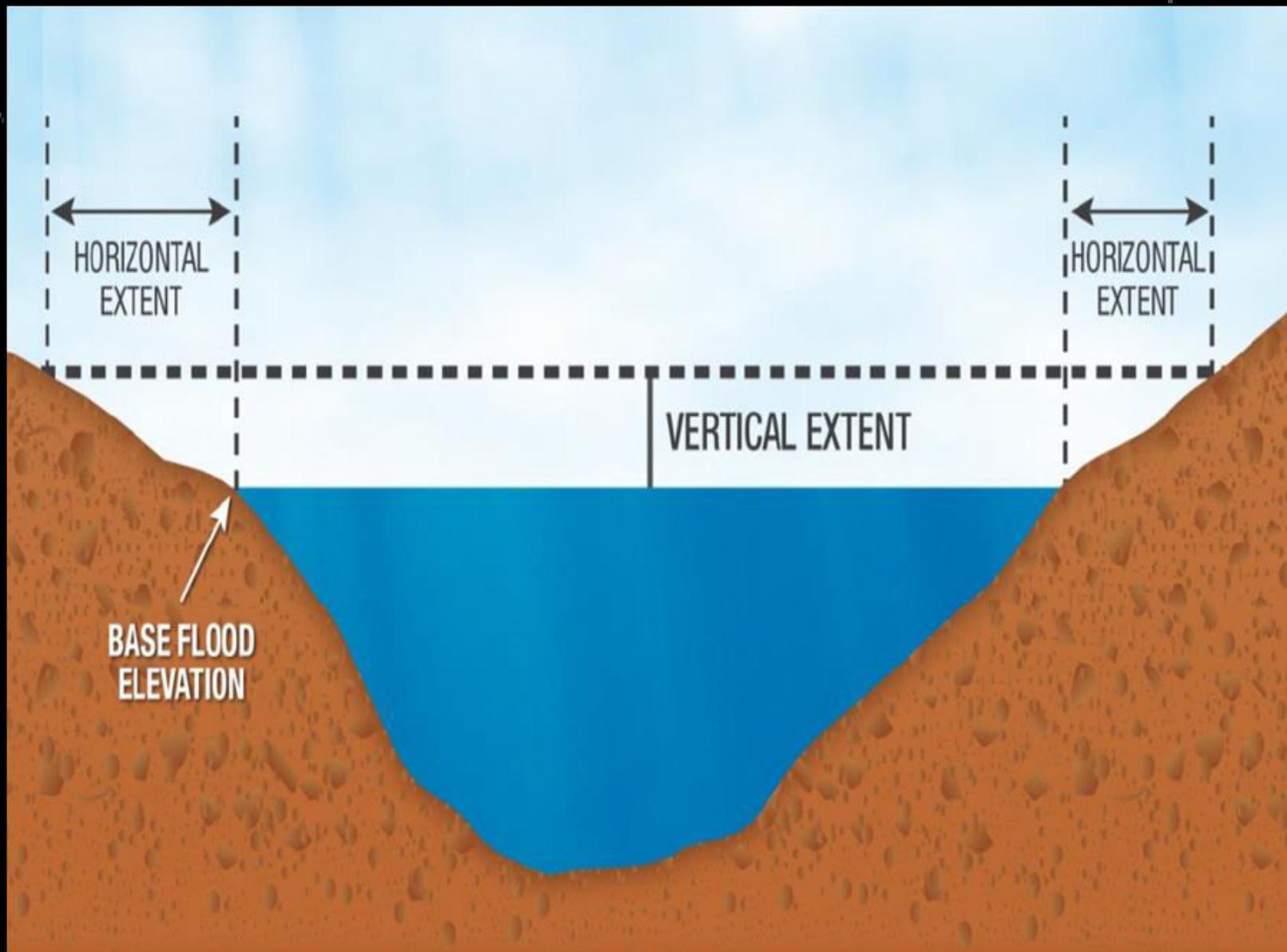
TMAC 2015 Future Conditions Report

Future risk assessment should have

Climate change (Sea Level Rise and Riverine Impacts)

Population change (land use)

Scenario-based (with uncertainty)



Federal Flood Risk Management Standard (FFRMS) and EO 13690

EO 13690 establishes new construction elevation standard

- Climate-Informed Science Approach
 - 100-year (1%-annual-chance) flood elevation plus freeboard of 2 or 3 feet (building criticality)
 - 500-year (0.2%-annual-chance) flood elevation

Federal Register/Vol. 80, No. 23/Wednesday, February 4, 2014/Presidential Documents

6425

Presidential Documents

Executive Order 13690 of January 30, 2015

Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to ensure that the Nation's resilience to current and future flood risk, I hereby direct the following:

Section 1. Policy. It is the policy of the United States to improve the resilience of communities and Federal assets against the impacts of flooding. These impacts are anticipated to increase over time due to the effects of climate change and other threats. Losses caused by flooding affect the environment, our economic prosperity, and public health and safety, each of

Revised Guidelines for Implementing Executive Order 11988, Floodplain Management

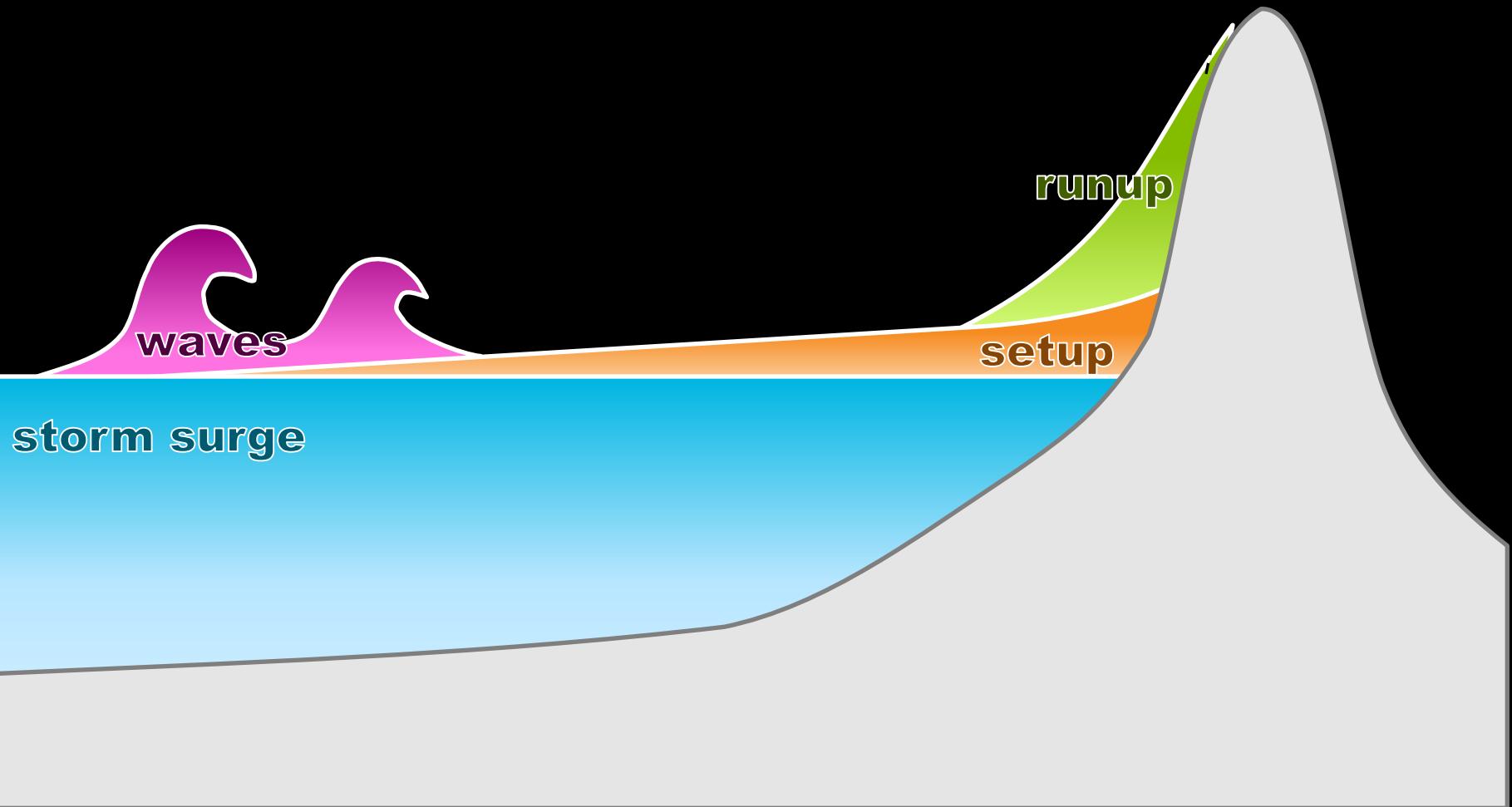
DRAFT FOR PUBLIC COMMENT

1/28/2015

1

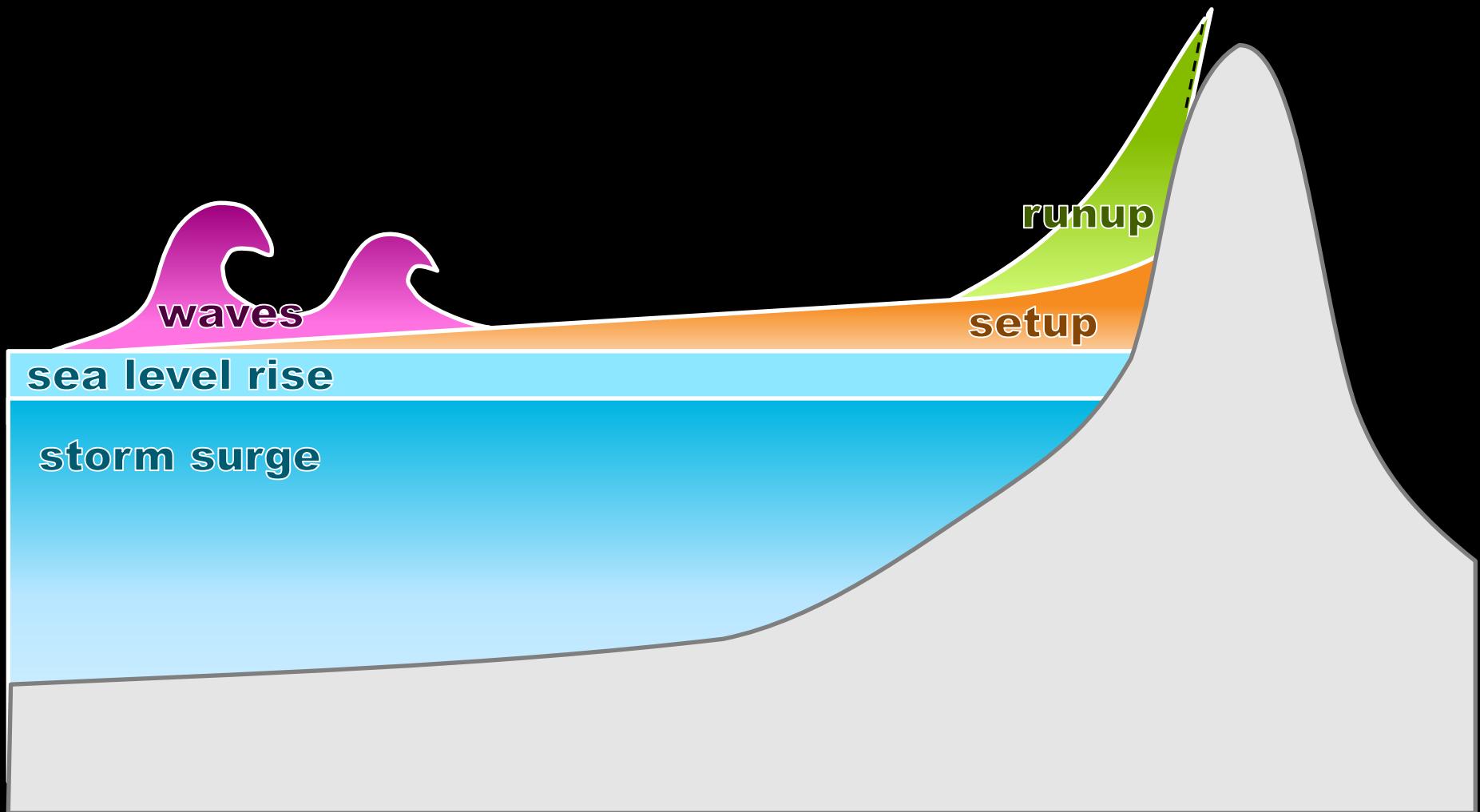
2

Coastal Flood Modeling - Components



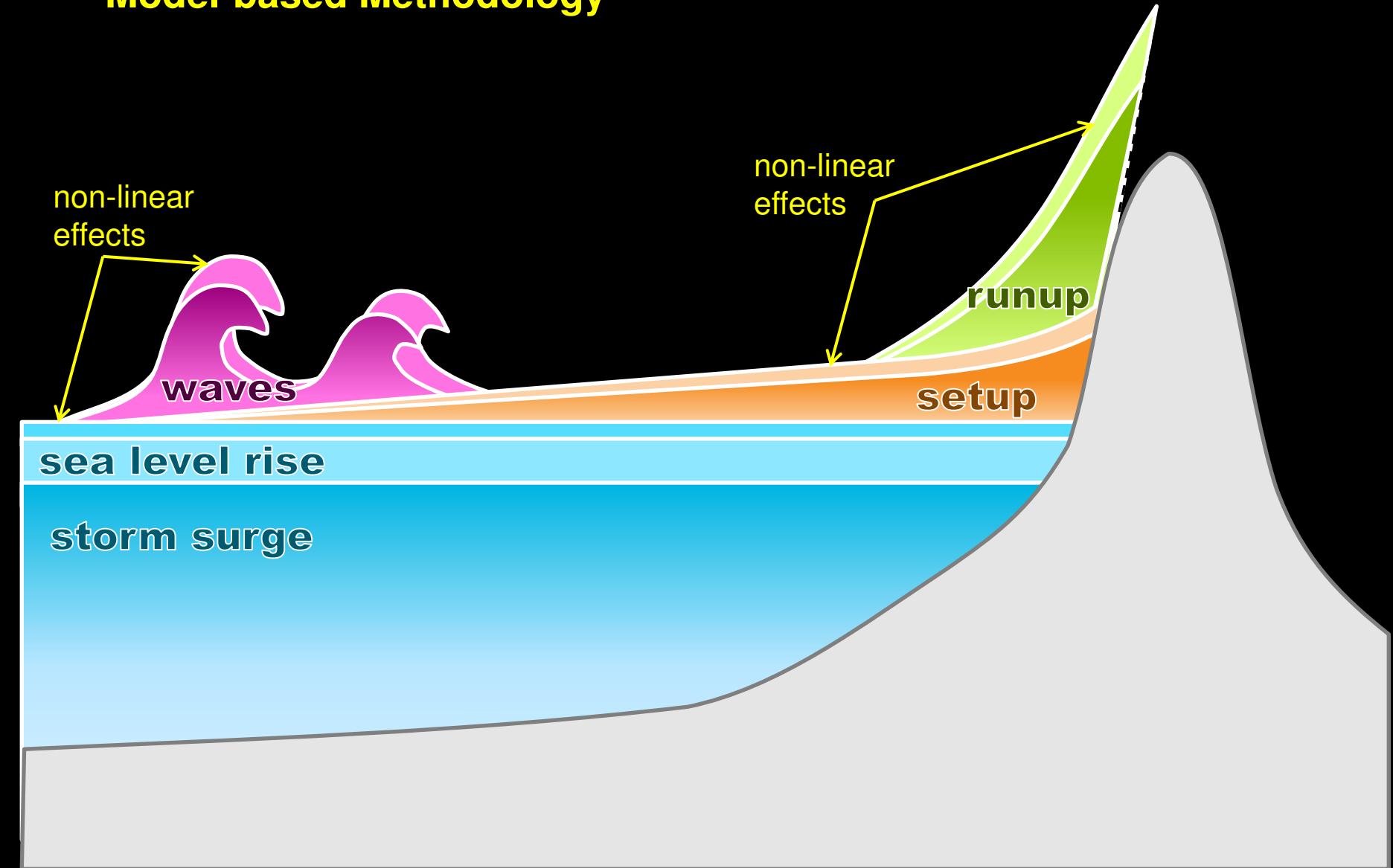
Coastal Flood Modeling - Approaches

– “Bathtub” Methodology

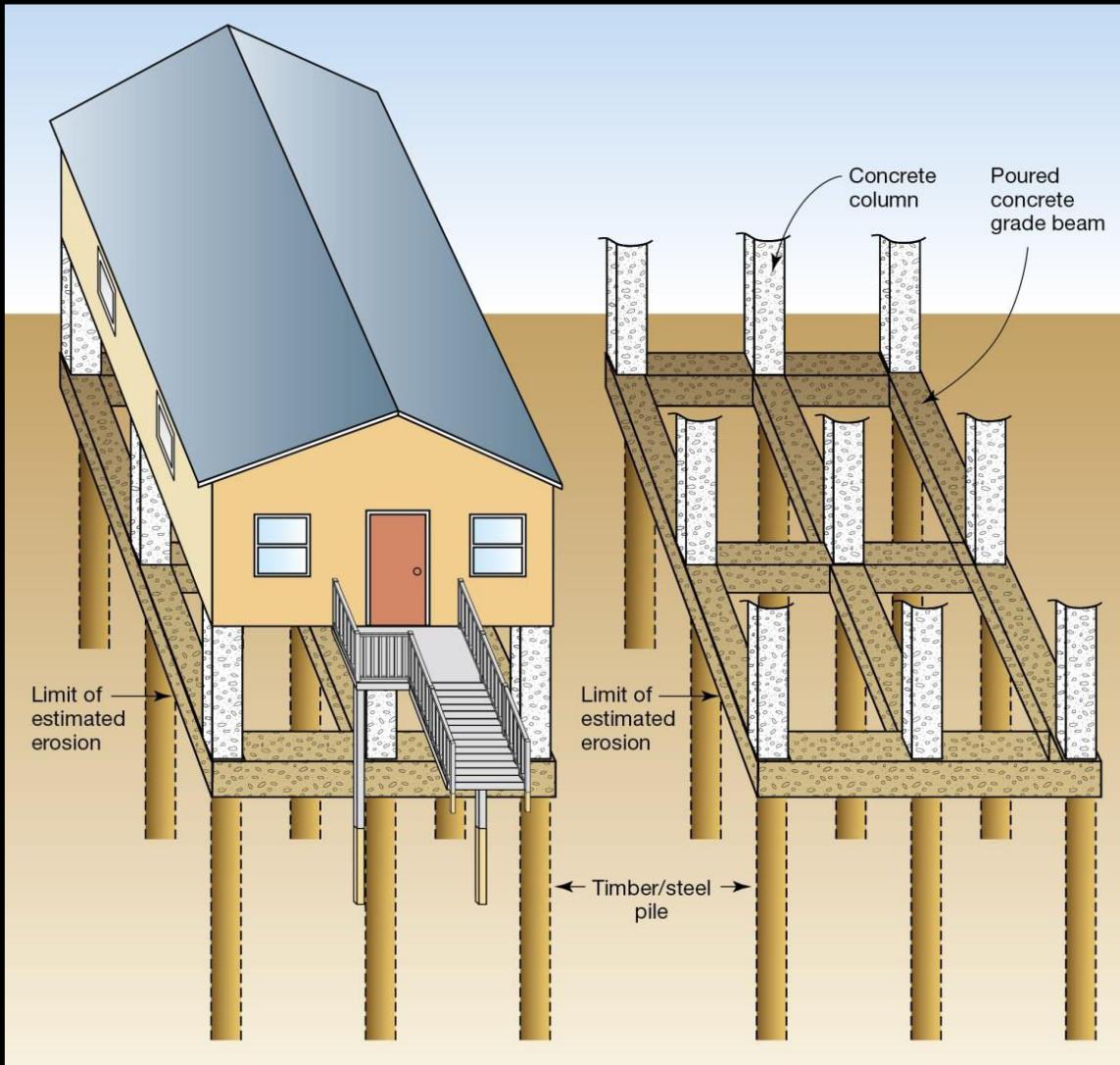


Coastal Flood Modeling - Approaches

– Model-based Methodology

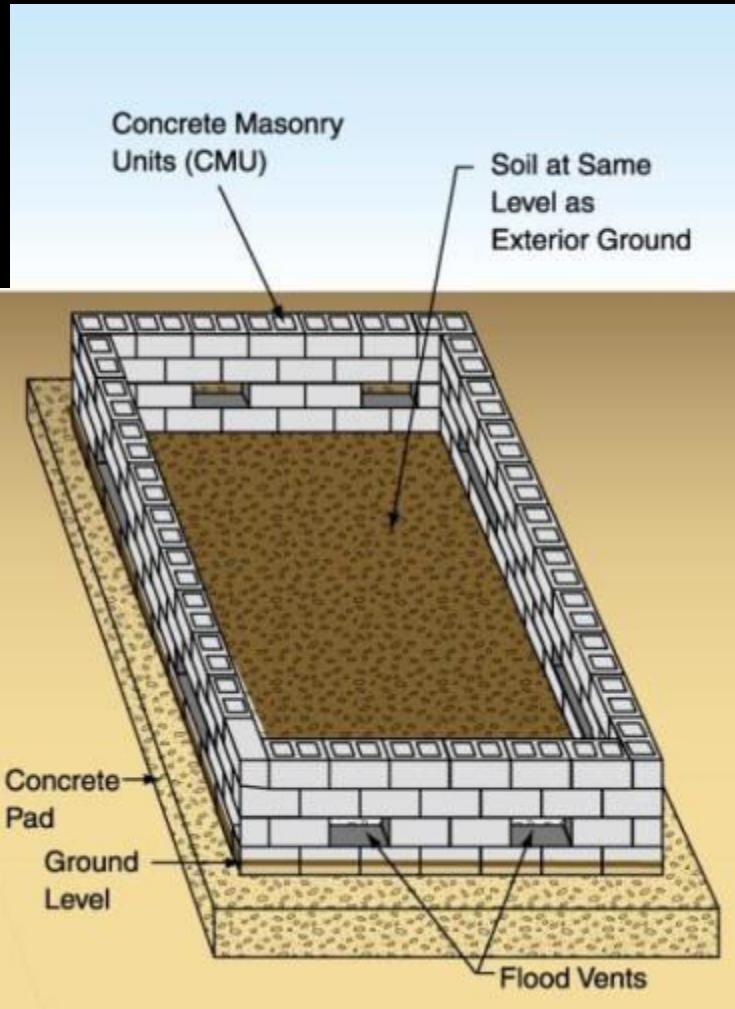
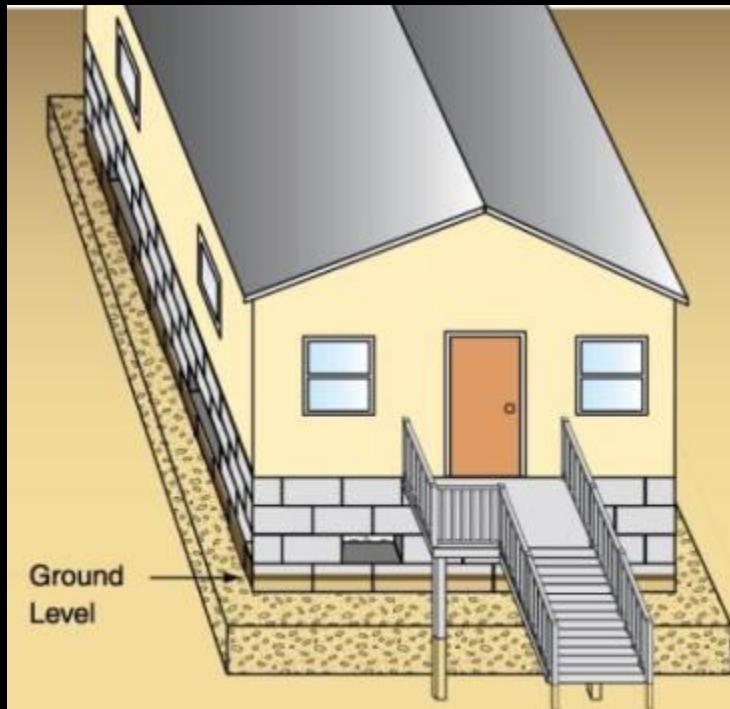


Open Foundations = Wide Range of Flood Elevations



Closed Foundations = Limited Usage in Coastal Floodplains

Closed foundations are not recommended in Coastal A Zones and not allowed in Zone V

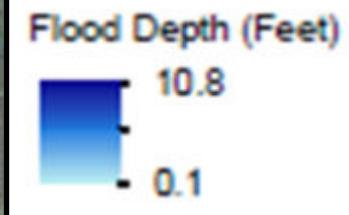


Current Peak Flow (cfs)

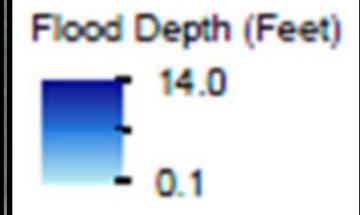
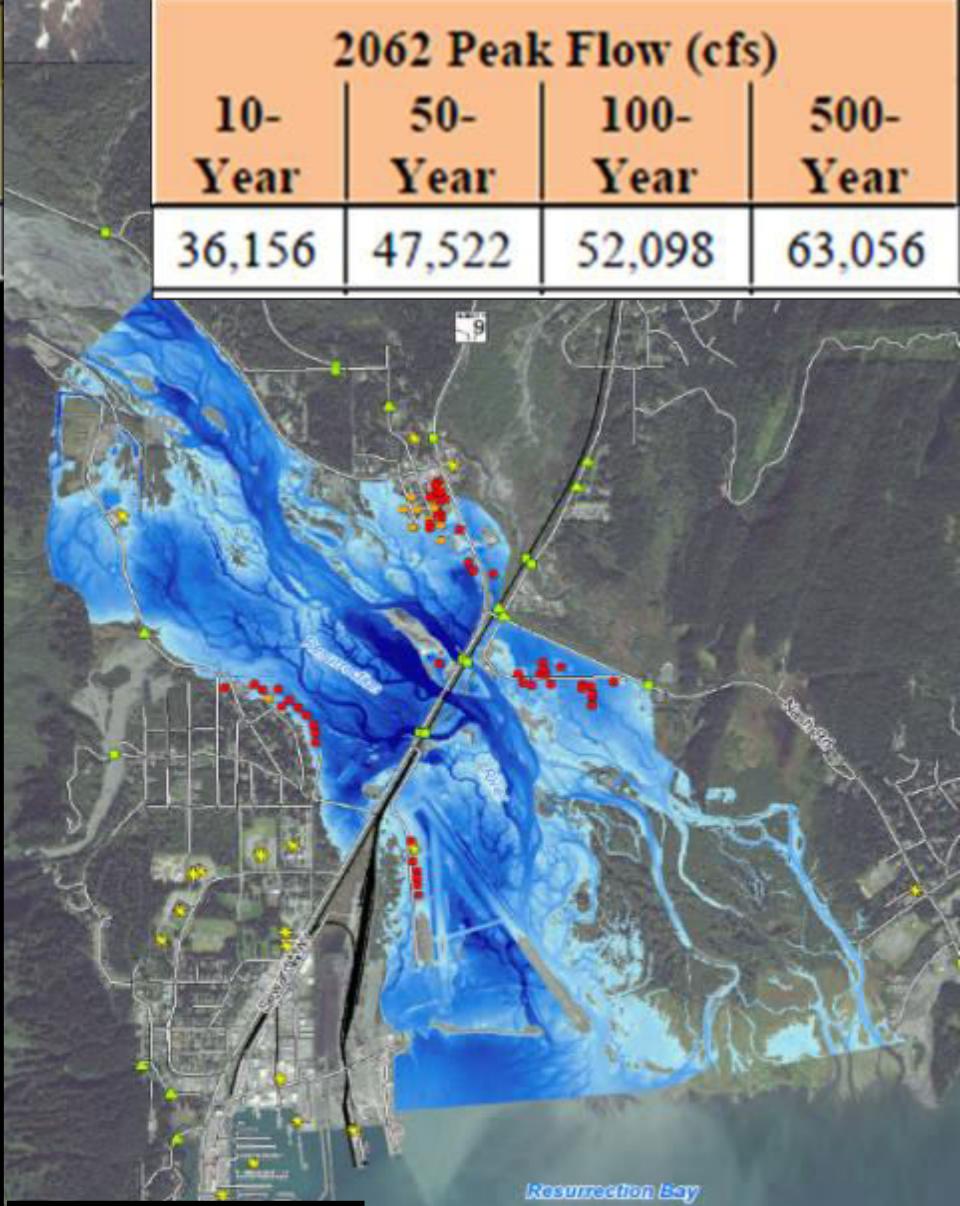
10-Year	50-Year	100-Year	500-Year
19,230	26,190	29,160	36,570

2062 Peak Flow (cfs)

10-Year	50-Year	100-Year	500-Year
36,156	47,522	52,098	63,056



100-Year Event



100-Year Event

How to we break this cycle:

**Decide on methods to show
flood risk**

**Make products to show flood
risk**

**Address why products do
not meet expectations**

“

DO. OR DO NOT.
THERE IS NO TRY.

-Yoda



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A black and white photograph of Harrison Ford as Han Solo. He is in the foreground, looking slightly off-camera with a serious expression. He wears a dark vest over a light-colored shirt. In the background, the ornate interior of a Mos Eisley Cantina is visible, with several people in Star Wars costumes, including Ewoks and Tusken Raiders, walking around.

“MAY THE FORCE BE WITH YOU.”