



Resilient Ocean Public Meeting #2

Township of Ocean Vulnerability Assessment

December 7, 2022

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Resilient NJ Program Overview

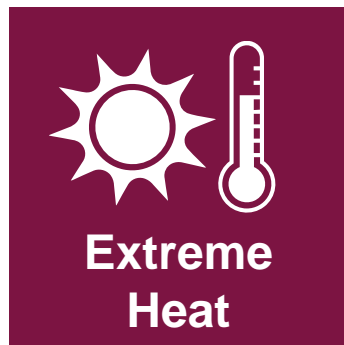
- Resilient NJ is an assistance program to support local and regional climate resilience planning.
- As of February, 2021, municipalities in NJ are required to incorporate a climate change-related hazard vulnerability assessment into any Master Plan Land Use Element.
- The Township of Ocean is one of the first municipalities to participate in the program and is receiving support to integrate climate change science into land use planning and decision-making.

NJDEP's *Local Planning for Climate Change Toolkit*, breaks down the planning process into four steps:



Resilient NJ Program Overview

- This program aims to strengthen the Township's resilience to the effects of:



- We are preparing a vulnerability assessment to identify how the impacts of climate change are projected to affect the community and its assets.
- The assessment supports the development of an action item portfolio to identify projects that improve the Township's resilience to climate change.

Key Definitions & Concepts

Vulnerability

The extent to which people, places, systems, or things are prone to, or are unable to cope with, adverse impacts of climate change

Vulnerability to climate change can be broken down into the following three elements:

Exposure

The degree to which a climate variation or change may affect people, places, or systems

Sensitivity

The degree to which people, places, or systems could be harmed by that exposure

Adaptive Capacity

The degree to which people, places, or systems could mitigate the potential for harm by taking action to reduce exposure or sensitivity

A **vulnerability assessment** combines these three elements to evaluate how climate change will affect an identified population, place, or system.

HAZARD

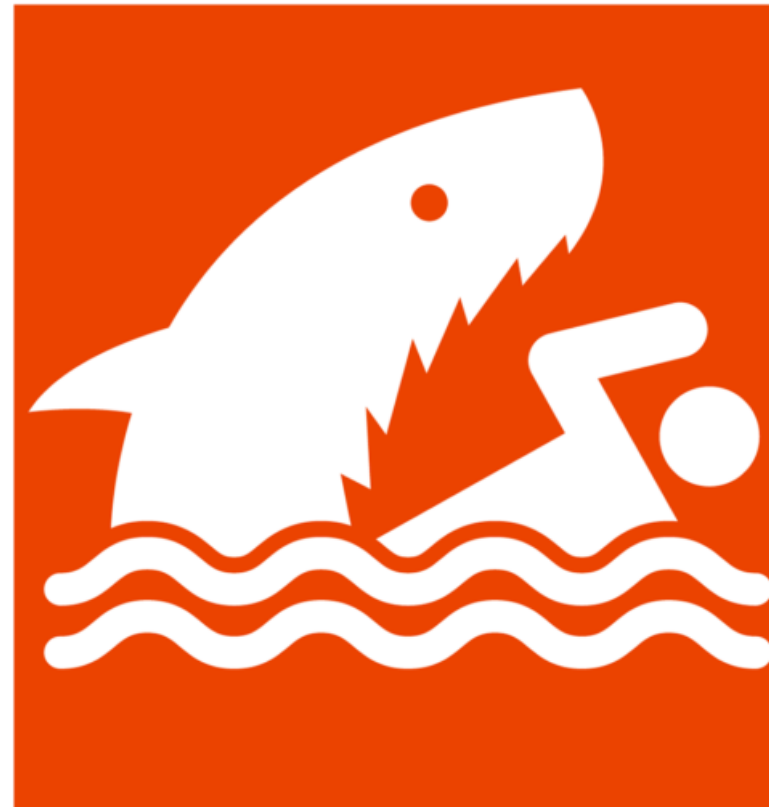
VS

RISK

A **HAZARD** is something that has the potential to harm you



RISK is the likelihood of a hazard causing harm



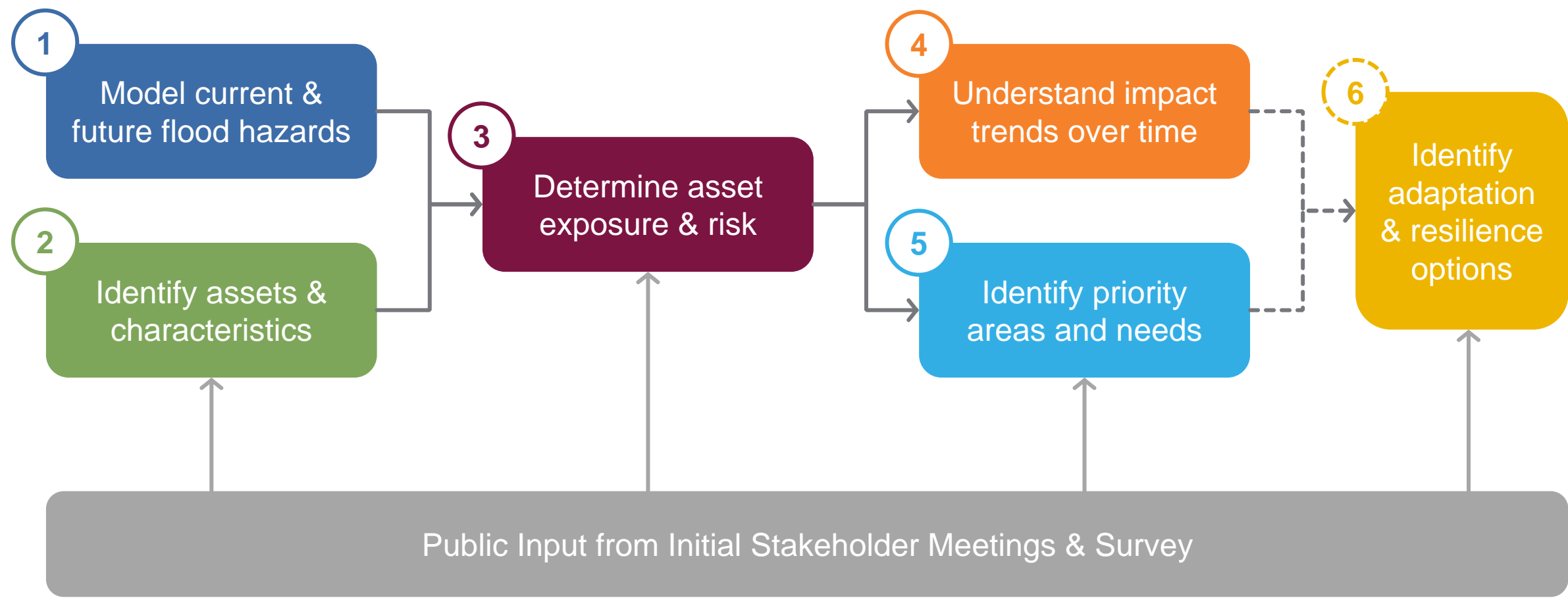
Meeting Purpose and Goals

- Through this meeting, we hope to achieve the following goals:
 - Present and verify results from the vulnerability assessment
 - Identify objectives and priorities to inform appropriate and relevant adaptation and resilience actions



Climate change can affect communities in many ways. We need your help and local knowledge to understand what is important to Ocean to ultimately identify solutions that best meets the community's resilience needs and supports its long-term goals.

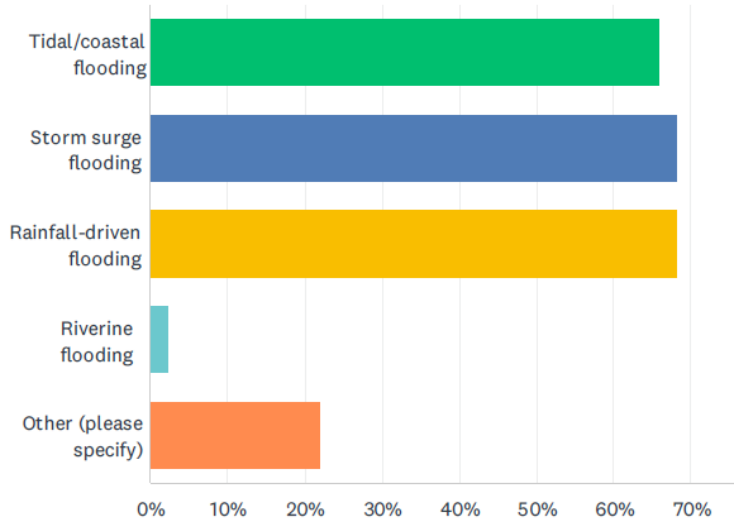
Assessment Process



Public Input

Challenges

What types of flooding have you witnessed?



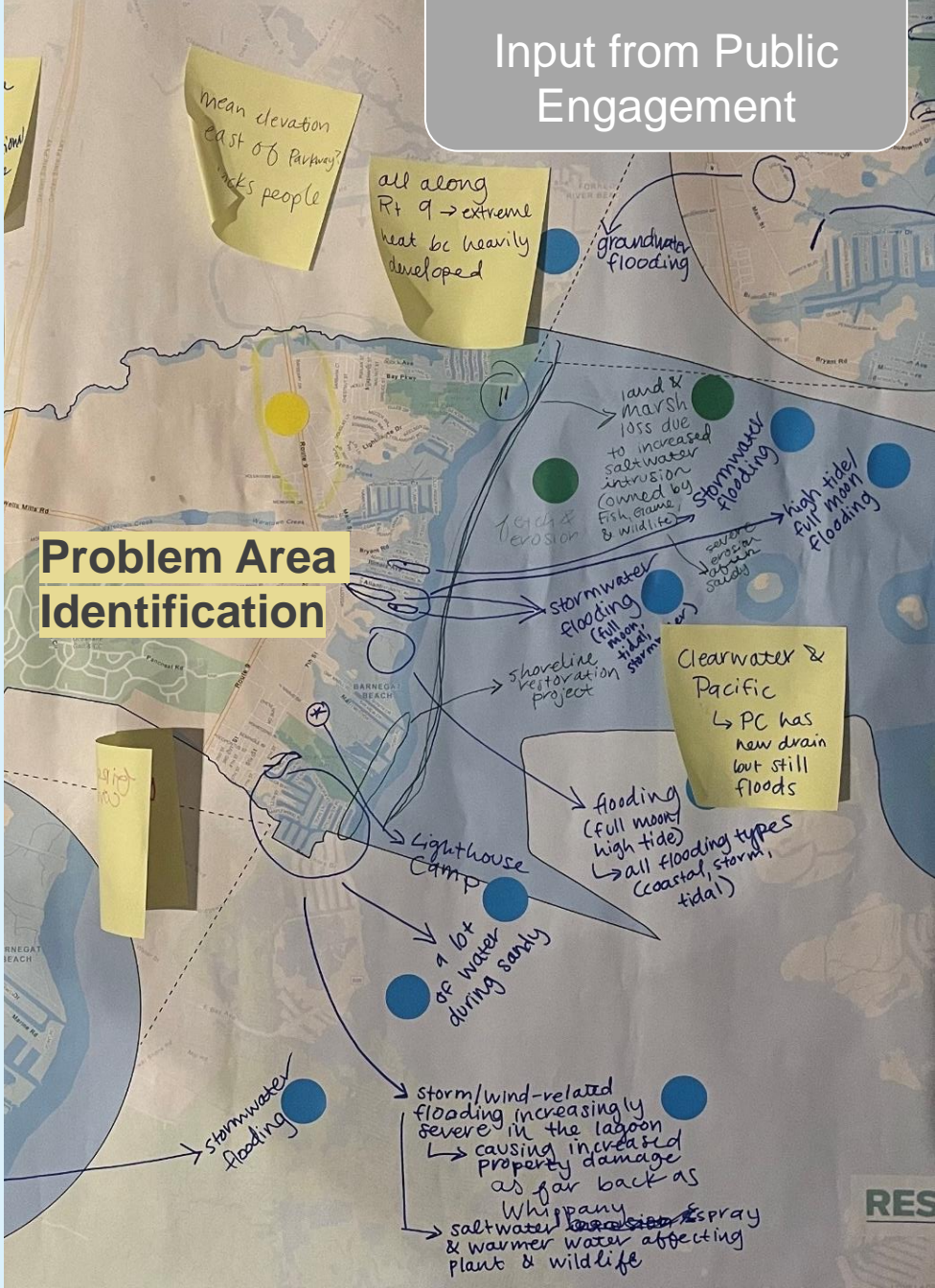
What concerns do you have about how climate change may affect the Township of Ocean?

I believe we are seeing changes that are more dangerous to all of our communities. More frequent flooding, higher winds, more severe tornados and higher temperatures more frequently.

Flooding big time. Water levels are rising.

I'm afraid of forest fires.

ability to sustain current ecological environment including wet lands and forest areas.



Aspirations

Imagine the year 2072, what do you hope to see in the Township of Ocean?



What does a resilient Township of Ocean look like to you?

Input from Public Engagement

Educated population that respects, honors, and lives responsibly in our environment this comes from educating children to love and respect our environment, educational opportunities for residents and not allowing outsiders to come in and destroy our land. Using vacant land outside Kristy's diner for a community natural sustainable garden that promotes local wildlife.

It looks somewhat similar to what is
does now, with little additional
development.

As waters rise and old homes are damaged the rules to rebuild may need to change. Maybe the coast lines start to be no build zones and become natural buffers again.

Lots of trees stop the building and protect our land this not only will help with flooding but also drought. Enough draining, not concrete everywhere, development of vacant buildings (old thirsty mallard) not new buildings that tear down trees, community gardens, possibly a parking garage at school etc with solar panels (like in stafford). Beautification of what we have that honors our environment not new building.

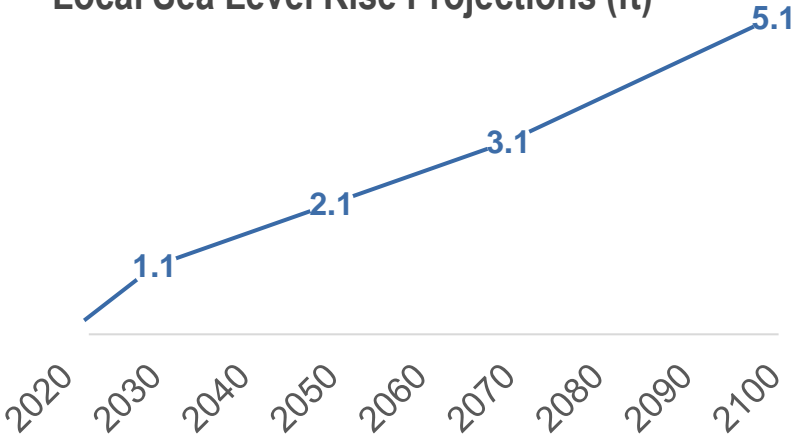
2100

Model current & future flood hazards

Floodplain Extents

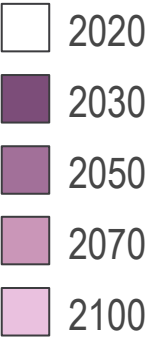
- Open Water / High Tide
- Moderate Storm (10-yr)
- Major Storm (100-yr)

Local Sea Level Rise Projections (ft)

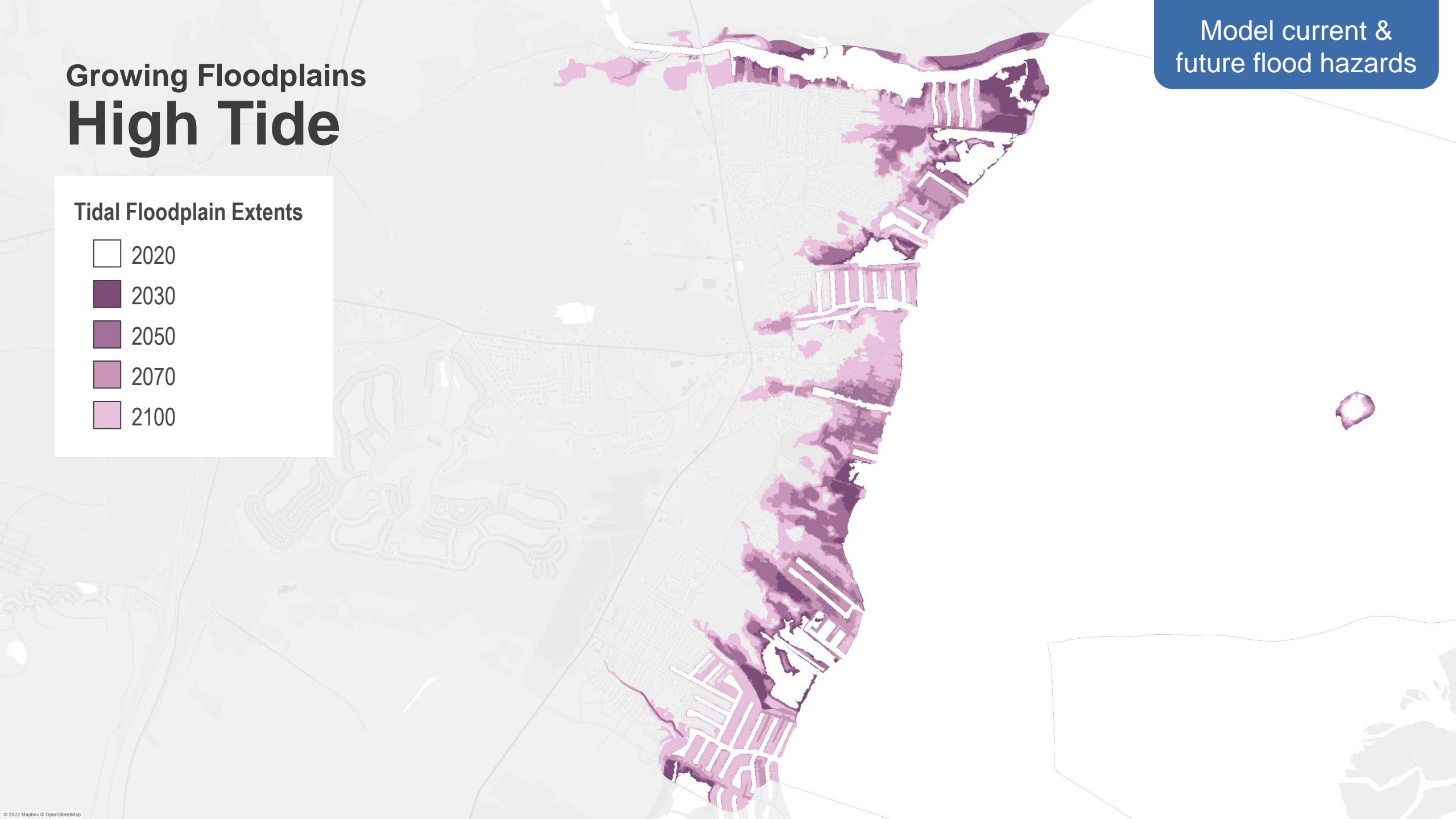


Growing Floodplains High Tide

Tidal Floodplain Extents

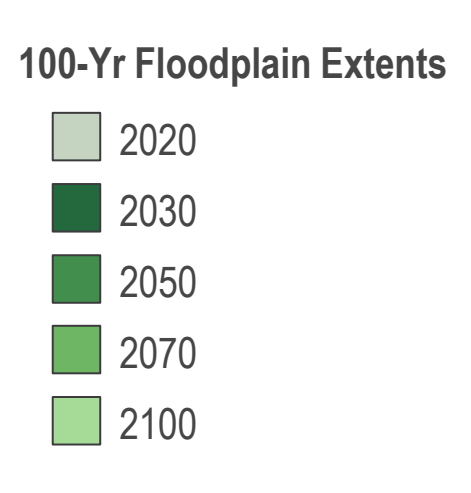


Model current & future flood hazards



Growing Floodplains Major Storm

Model current & future flood hazards



Assets

Identify assets & characteristics

- Buildings
- Critical Infrastructure
- Roadways
- Natural Resources



Built Asset Exposure

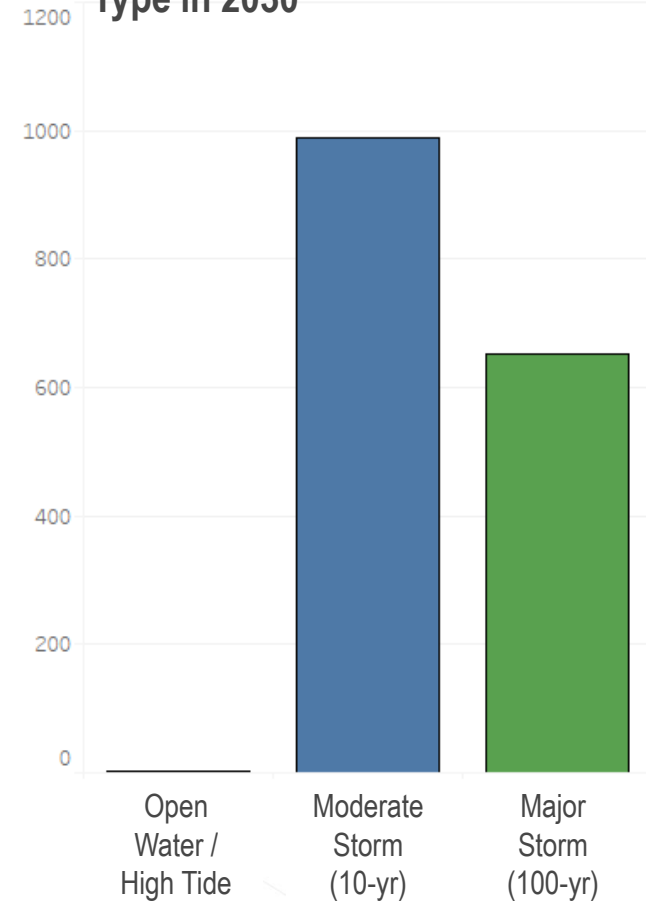
2030

Exposed Assets

- Open Water / High Tide
- Moderate Storm (10-yr)
- Major Storm (100-yr)

Determine asset exposure & risk

Exposed Buildings by Flood Event Type in 2030



Built Asset Exposure

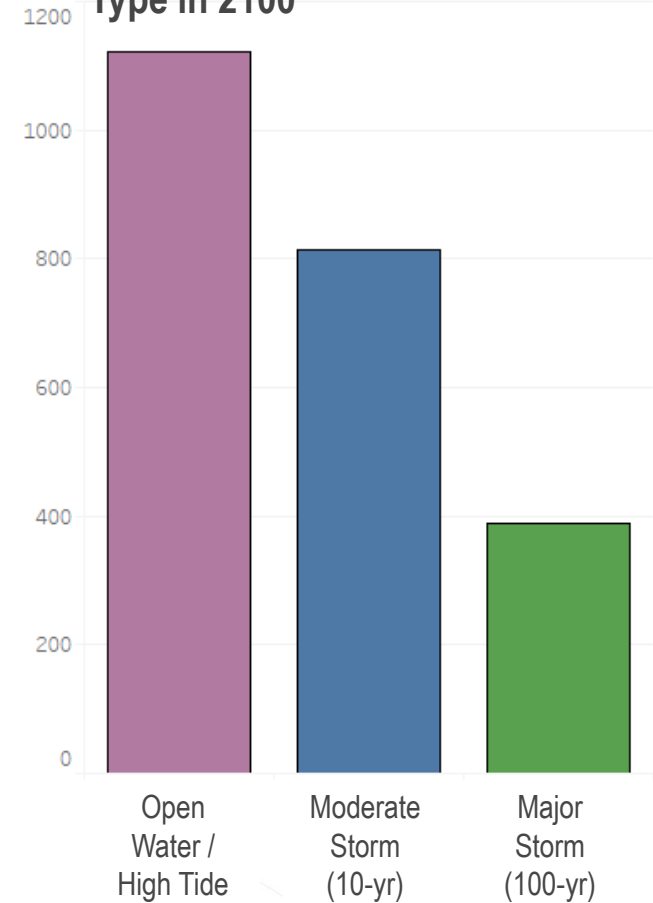
2100

Exposed Assets

- Open Water / High Tide
- Moderate Storm (10-yr)
- Major Storm (100-yr)

Determine asset exposure & risk

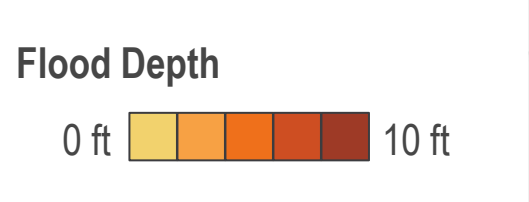
Exposed Buildings by Flood Event Type in 2100



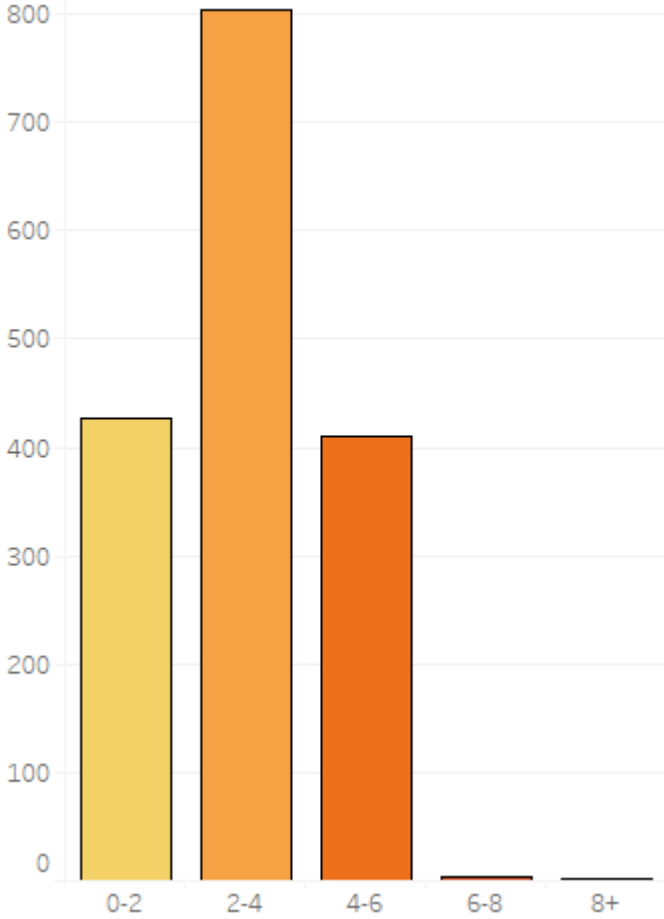
Built Asset Risk

Major Storm in 2030

Determine asset exposure & risk



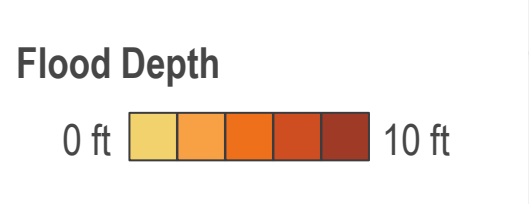
Exposed Buildings by Flood Depth During Major Storm in 2030



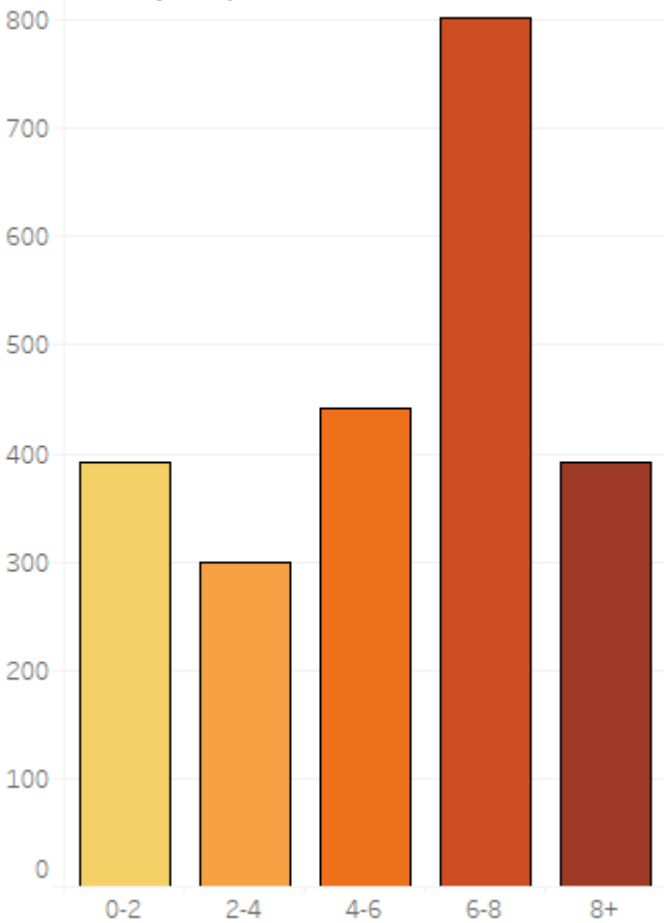
Built Asset Risk

Major Storm in 2100

Determine asset exposure & risk



Exposed Buildings by Flood Depth
During Major Storm in 2100



Natural Resources

Determine asset
exposure & risk

Likelihood of Tidal Marsh Loss

Low  High

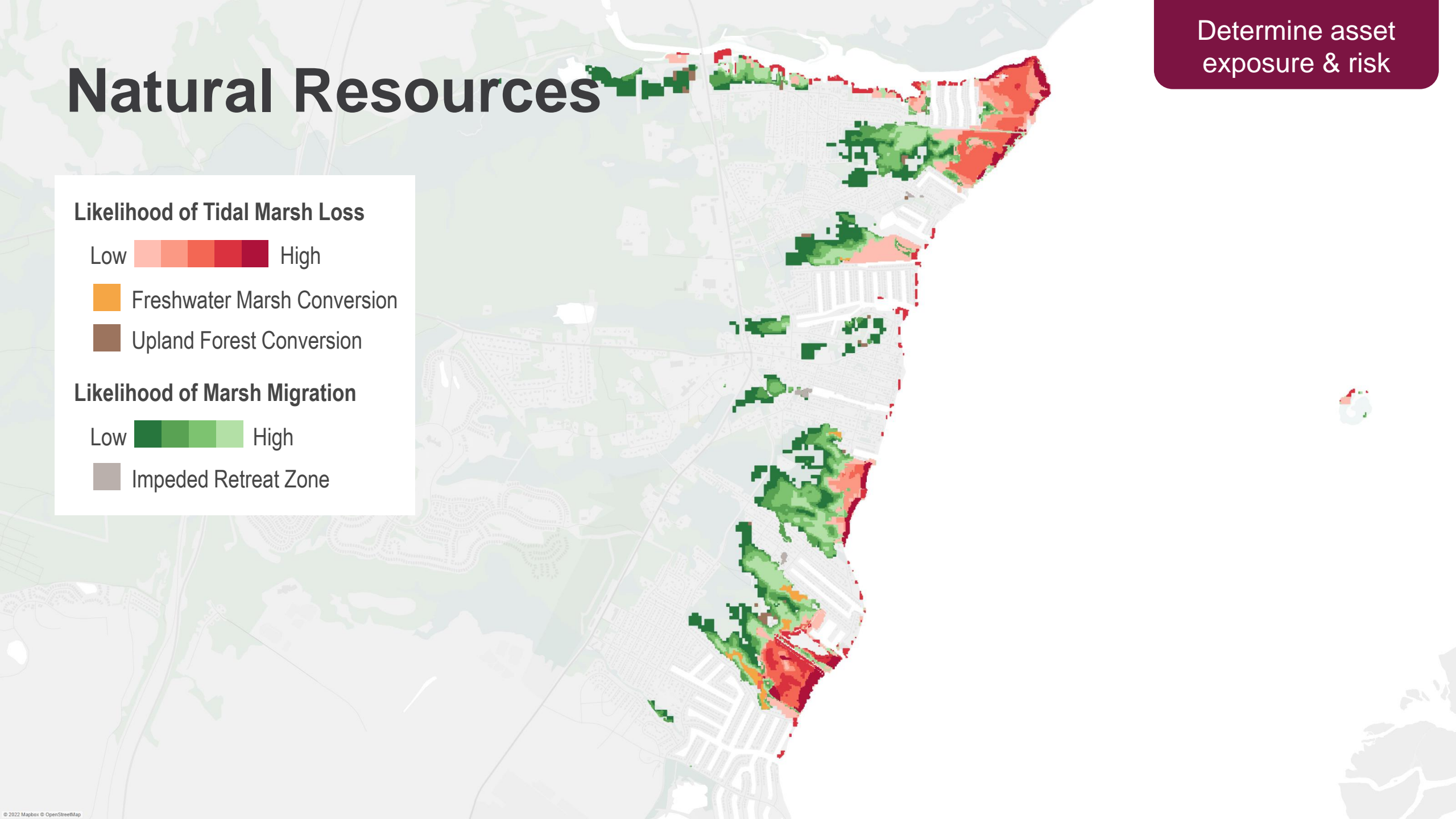
 Freshwater Marsh Conversion

 Upland Forest Conversion

Likelihood of Marsh Migration

Low  High

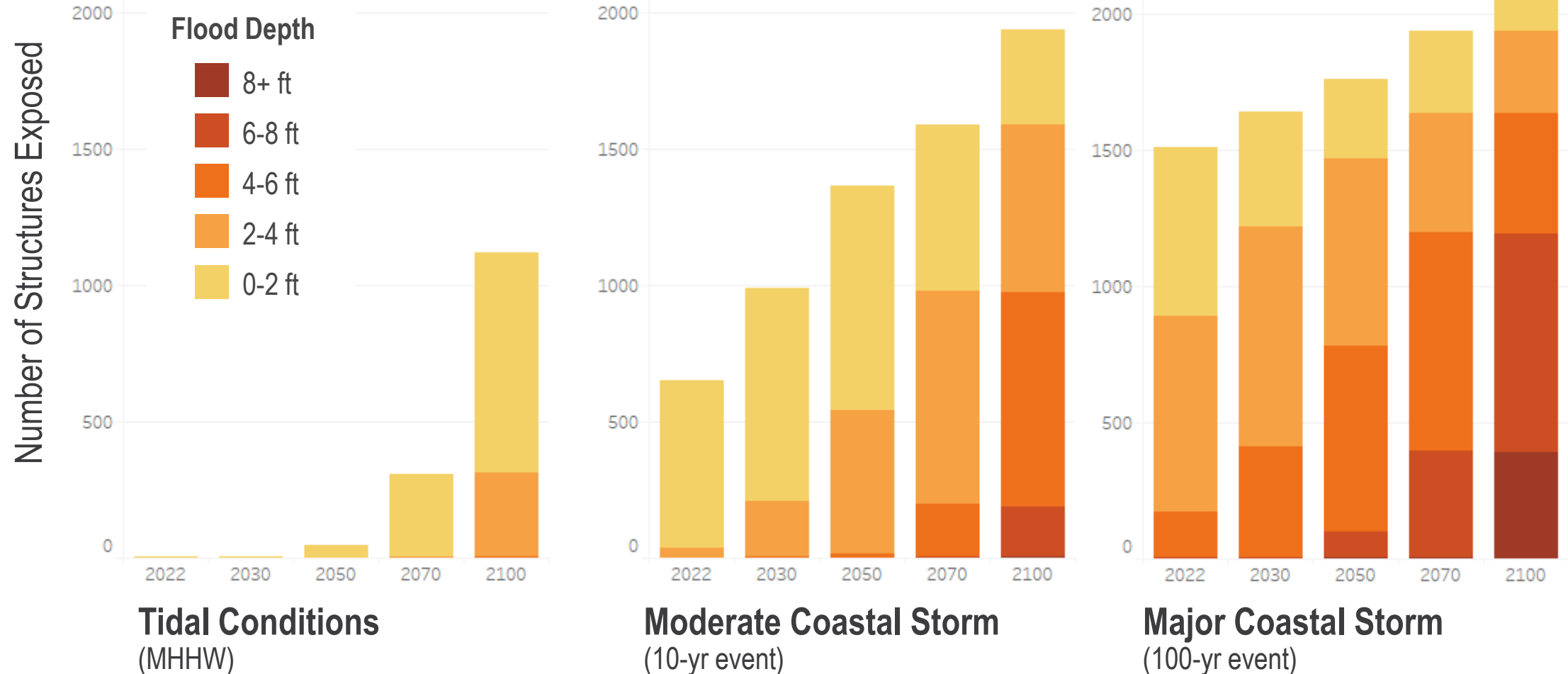
 Impeded Retreat Zone



Building Risk Trends

Growing Floodplains and Deepening Waters

Understand impact trends over time



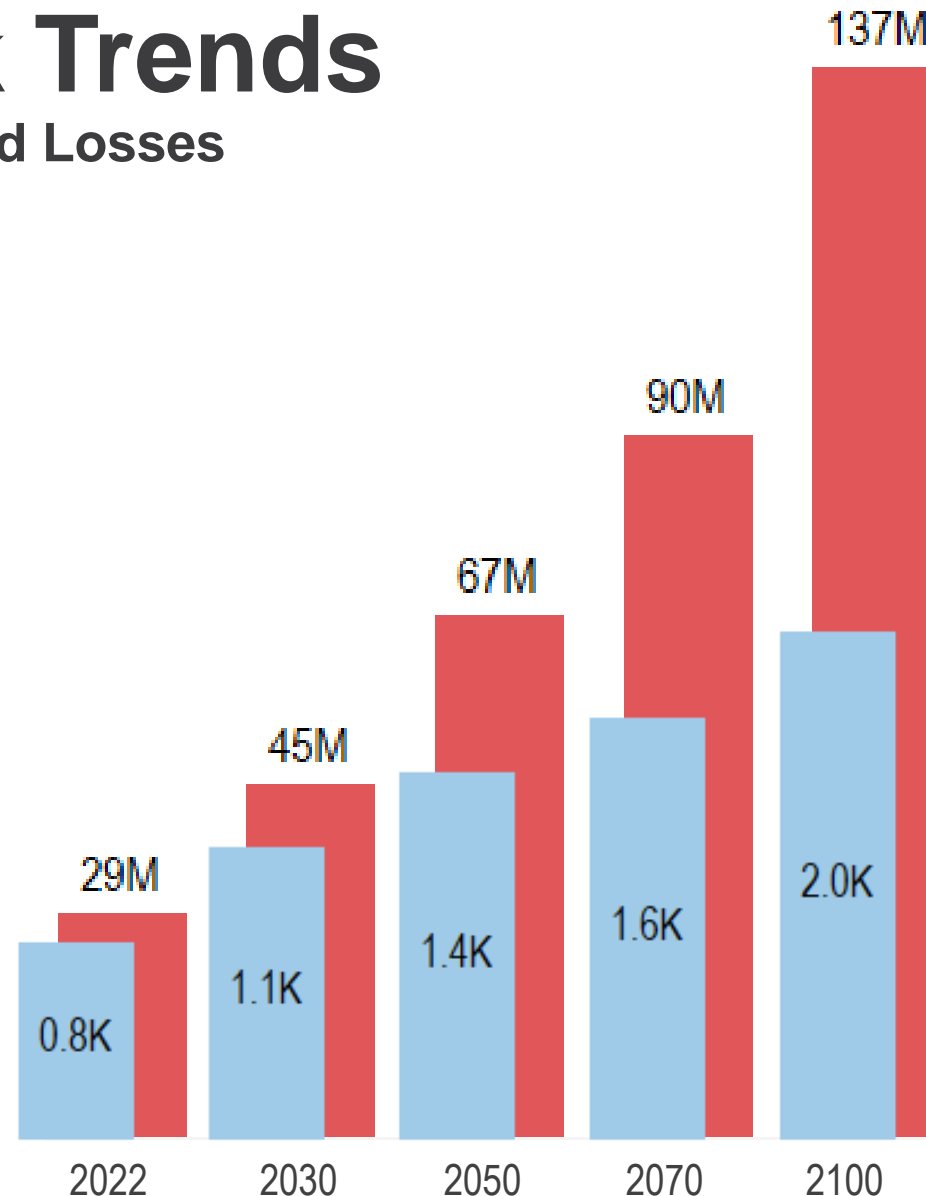
Building Risk Trends

Worsening Economic Flood Losses

Understand impact trends over time

Building Damages* due to a Moderate Coastal Storm (10-yr event)

Buildings Exposed to a Moderate Coastal Storm (10-yr event)



** Basic loss modeling based on USACE data and damage functions, assuming standard elevation and foundation type of slab on grade.*

Inundation Areas

Areas of near-term sea level rise
inundation over developed land

Tidal Floodplain Extents over Developed Areas

- 2020 Coastline
- 2030 Exposure
- 2050 Exposure
- 2070 Exposure

Sand's Point

Holiday Harbor

Bay Haven

Barnegat Beach

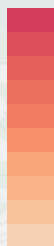
Identify priority
areas and needs

Homes & Residents

Residential Structures

Impact Hotspots

Higher



Lower

Sand's Point

Holiday Harbor

Skipper's Cove

Bay Haven

Barnegat Beach

Pebble Beach

Public Services

Public and Religious Facilities

Oyster Creek

Community Center

Businesses

Commercial, Industrial, and Agricultural Facilities

Identify priority areas and needs

Holiday Harbor

North Harbor

South Harbor

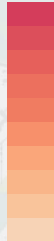
Key Harbor

Environmental Contamination

Point sources for water and environmental pollution

Impact Hotspots

Higher



Lower

Water Sources

Hazardous Materials
(known contaminated sites and gas stations)

Natural Resources

Areas of marsh loss and retreat

Sand's Point

Lighthouse Drive

Upper Barnegat Bay Wildlife Management Area

Identify priority areas and needs

Impact Hotspots

Higher



Lower

Discussion

Does this information change the way you think about the future of your community?

How do you think this information should impact long-term planning in your community?

Is there something here that surprised you?
Concerns that you did not see captured?

Built Asset Exposure 2100

Exposed Assets

- High Tide
- Moderate Storm
- Major Storm

Natural Resources at Risk

Likelihood of Tidal Marsh Loss

Low High

Freshwater Marsh Conversion

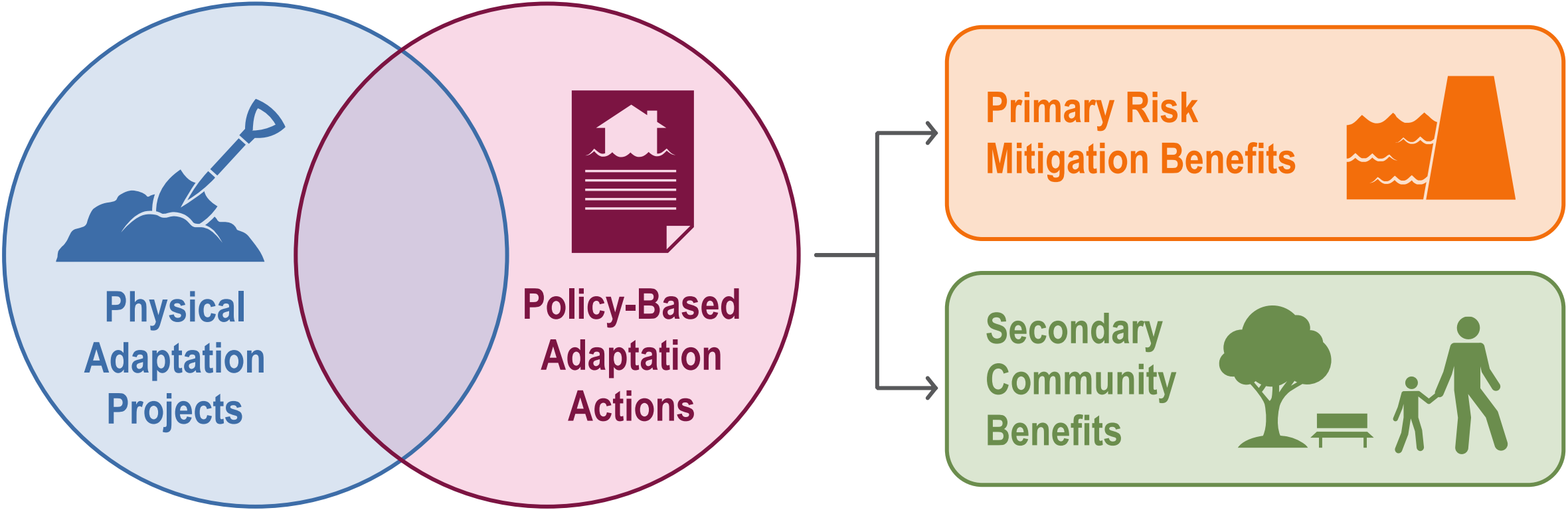
Upland Forest Conversion

Likelihood of Marsh Migration

Low High

Impeded Retreat Zone

Adaptation Options & Benefits



Physical Adaptation Projects



Hard Protective
Shorelines &
Floodwalls



Living
Shorelines &
Hybrid Solutions



Wetland &
Natural Habitat
Restoration

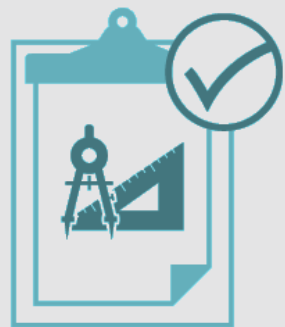


Deployable
Floodgates &
Barriers



Elevated
Homes &
Infrastructure

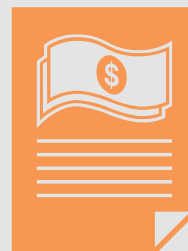
Policy and Planning Actions



Resilient
Design
Standards



Restricted
Development



Bond or Tax
to Fund
Adaptation



Direct Financial
Support
Program



Voluntary
Buyout
Programs

Hazard & Risk Mitigation Benefits



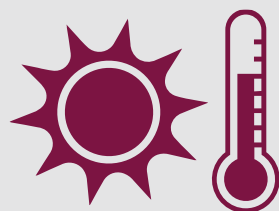
Near-Term Extreme
Storm Preparedness



Long-Term Sea Level
Rise Adaptation



Erosion
Management



Extreme Heat
Mitigation



Wildfire Risk
Reduction



Rainfall & Stormwater
Flood Reduction

Secondary Community Benefits



Support for Vulnerable Populations



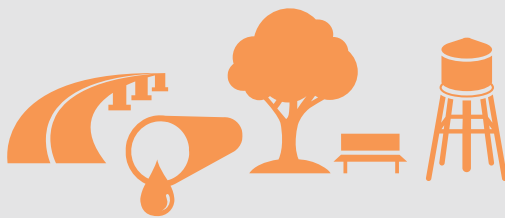
Public Waterway Access



Jobs & Economic Activity



Natural Resource Preservation



Improved Public Infrastructure



Recreational Opportunities



Community Partnerships



Educational Resources

Project Phases & Timeline

