

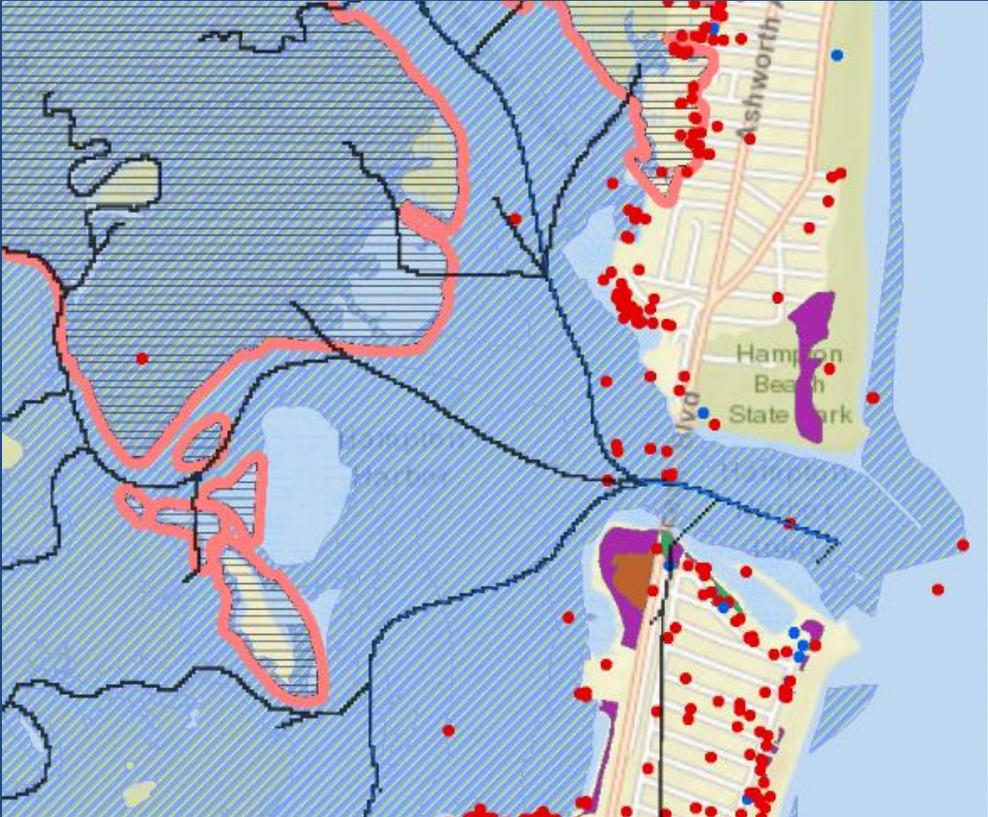


# Coastal Vulnerability Assessment

## Env-Wt 603.05

October 10, 2019

*Stefanie M. Giallongo*  
*Land Resources Management*



# Agenda

1) Vulnerability & Risk Tolerance

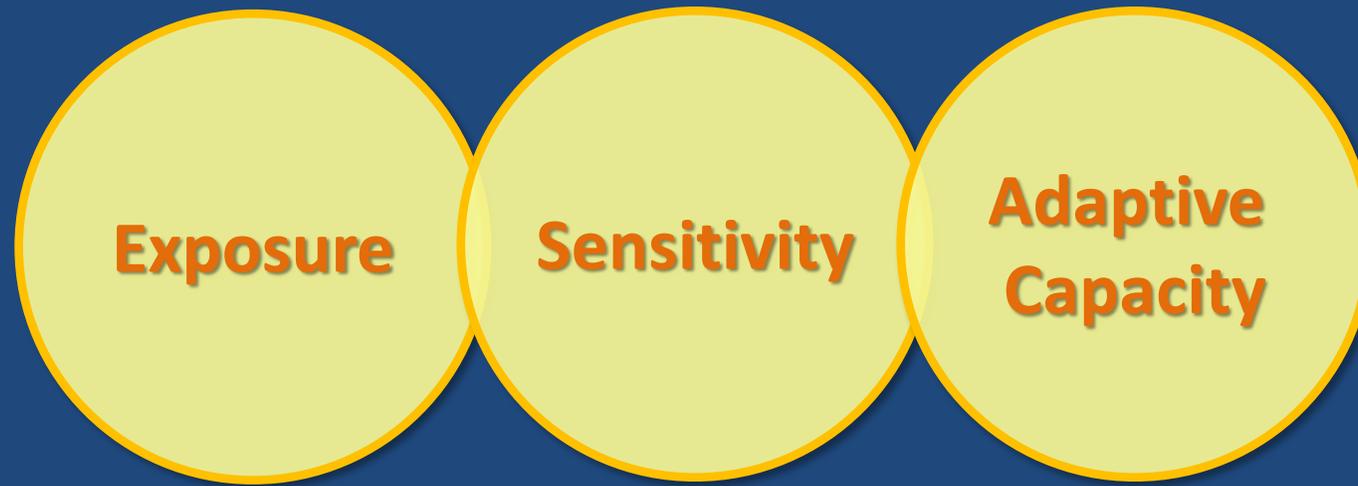
2) [*The New*] Env-Wt 603.05 Vulnerability Assessment

3) Additional Resources

# What is Vulnerability?

“...the likelihood that an asset will experience harm due to exposure to coastal hazards...”

*(NH Coastal Risk & Hazards Commission)*



# What is Risk Tolerance?

“...a project’s willingness to accept a higher or lower probability of flooding impacts.”

*(NH Coastal Flood Risk Summary, Part II: Guidance, draft)*

Ex. Critical Infrastructure, historic sites, essential ecosystems, high value assets

Plan, design & construct using higher coastal flood risk projections

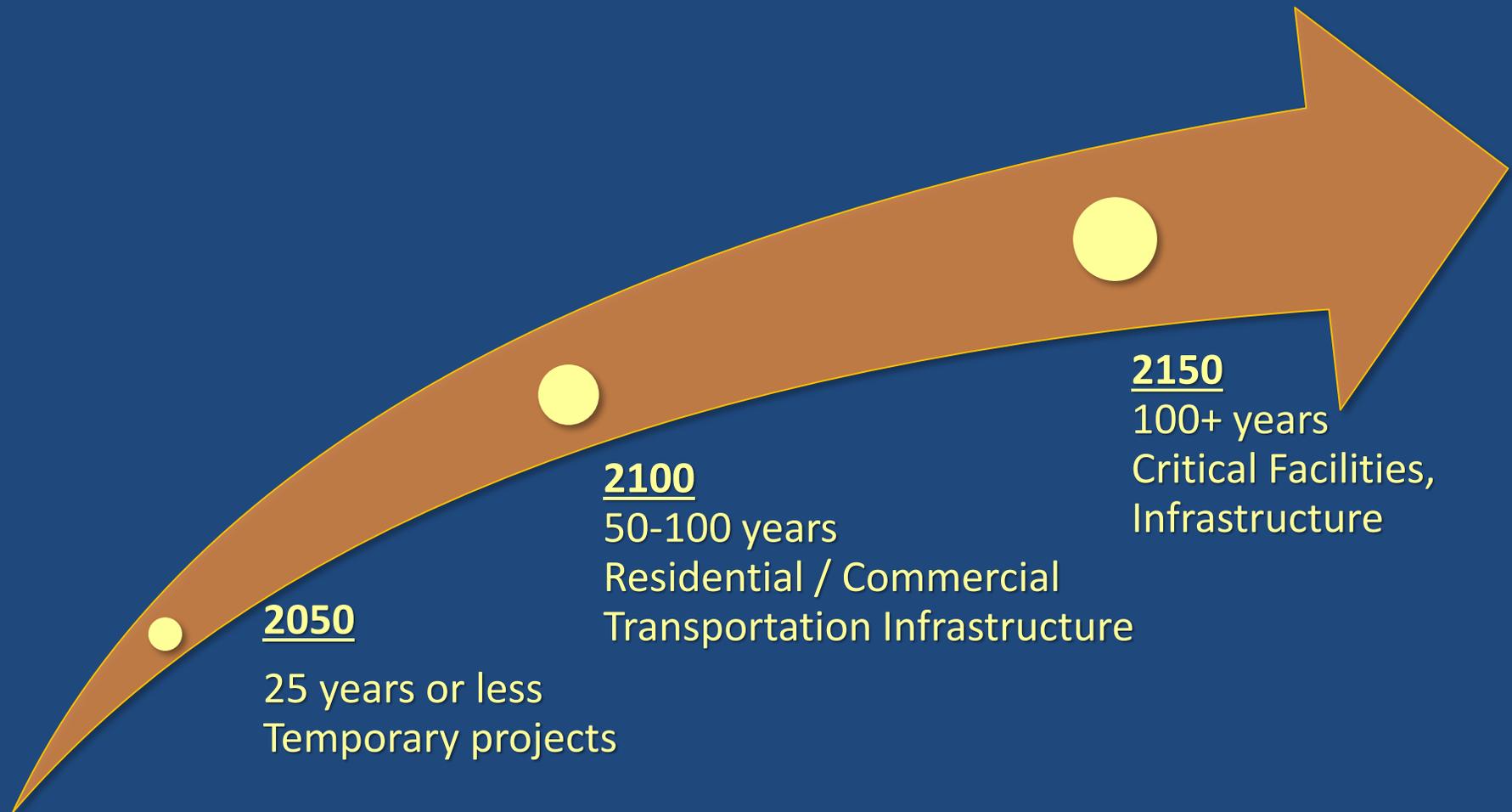


Ex. Sheds, pathways, small docks

Option to plan, design & construct for less protective coastal flood risk projections

# Env-Wt 603.05 Vulnerability Assessment & Risk Tolerance

(a) Determine the **time period**.



# Env-Wt 603.05 Vulnerability Assessment & Risk Tolerance

(a) Determine the **time period**.

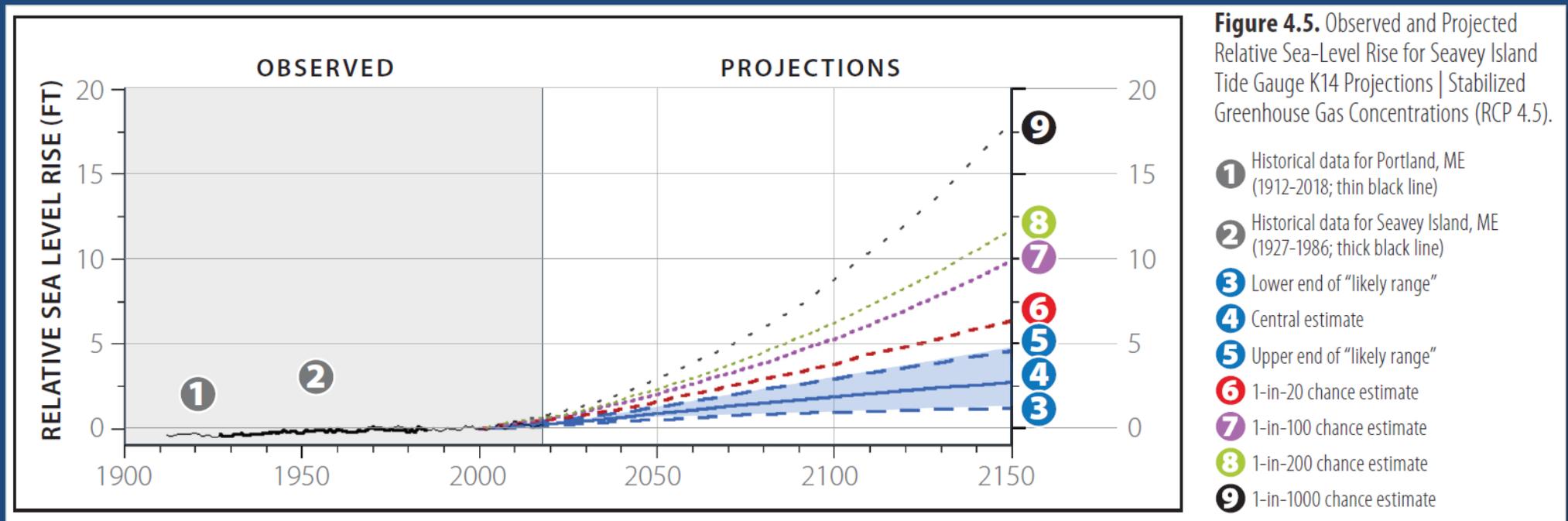
(b) Identify the **risk tolerance**.

RISK TOLERANCE	HIGH	MEDIUM	LOW	EXTREMELY LOW
<b>DESCRIPTION</b>	A project that is willing to tolerate a high level of flood risk	A project that is willing to tolerate a medium level of flood risk	A project that is willing to tolerate a low level of flood risk	A project that is willing to tolerate an extremely low level of flood risk
<b>POSSIBLE PROJECT CHARACTERISTICS</b>  RISK TOLERANCE WILL DEPEND ON THE MIX AND IMPORTANCE OF THESE CHARACTERISTICS TO THE PROJECT	Low value or cost	Medium value or cost	High value or cost	Extremely high value or cost
	Easy to modify	Moderately modifiable	Difficult to modify	Extremely difficult to modify
	Little to no implications on public function and/or safety	Moderate implications for public function and/or safety	Critical to public function and/or safety	High risk of public harm if project fails
	Low sensitivity to inundation	Moderate sensitivity to inundation	High sensitivity to inundation	Extremely high sensitivity to inundation
<b>PROJECT EXAMPLE</b>  INCLUDES ANALYSIS, PLANNING, DESIGN, AND/OR CONSTRUCTION	walking trail	local road culvert	wastewater treatment facility	hospital



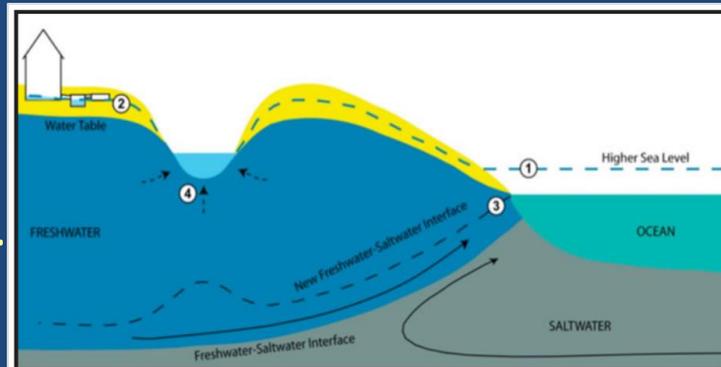
# Env-Wt 603.05 Vulnerability Assessment & Risk Tolerance

- (a) Determine the **time period**.
- (b) Identify the **risk tolerance**.
- (c) Assess relative **sea level rise (SLR)**.

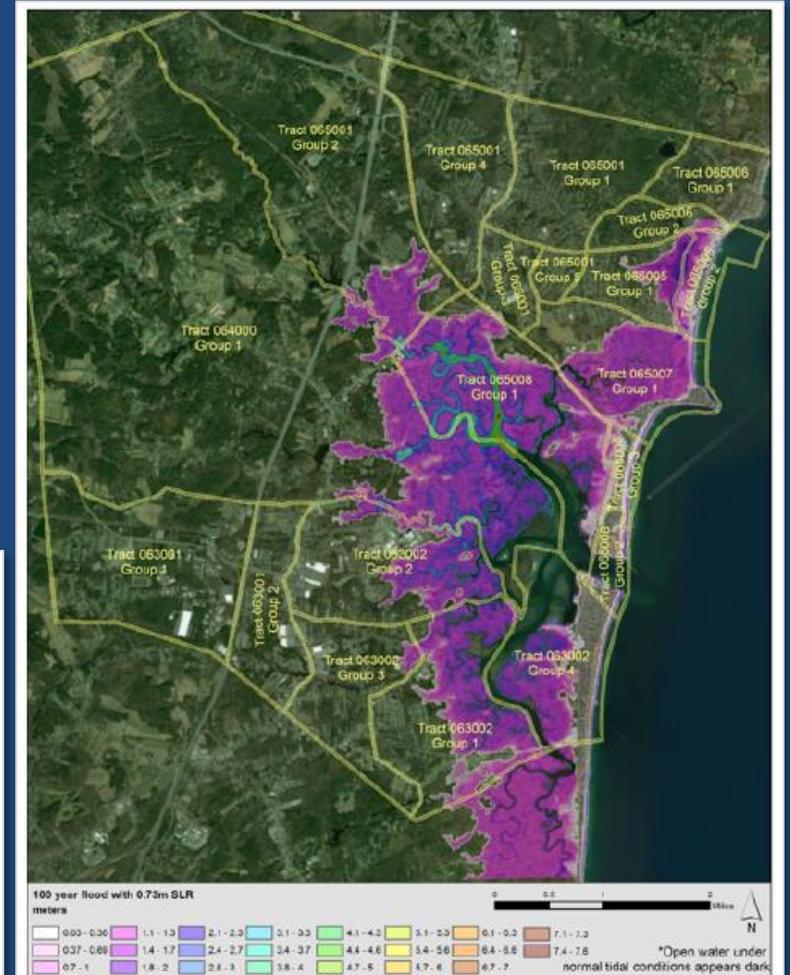


# Env-Wt 603.05 Vulnerability Assessment & Risk Tolerance

- (a) Determine the **time period**.
- (b) Identify the **risk tolerance**.
- (c) Assess relative **sea level rise (SLR)**.
- (d) Identify areas subject to flooding from SLR and areas which are currently located within the 100-year flood plain and subject to coastal flood risk.
- (e)



**Figure 6.1.** Schematic drawing showing the interconnected system of groundwater (fresh and saline) and surface water. Some consequences of rising groundwater are indicated: (1) SLR-induced groundwater rise, (2) septic system failure and basement flooding, (3) landward movement of the freshwater/saltwater interface, and (4) increased groundwater discharge to streams. **Source: U.S. Geological Survey; not to scale, vertically greatly exaggerated.**

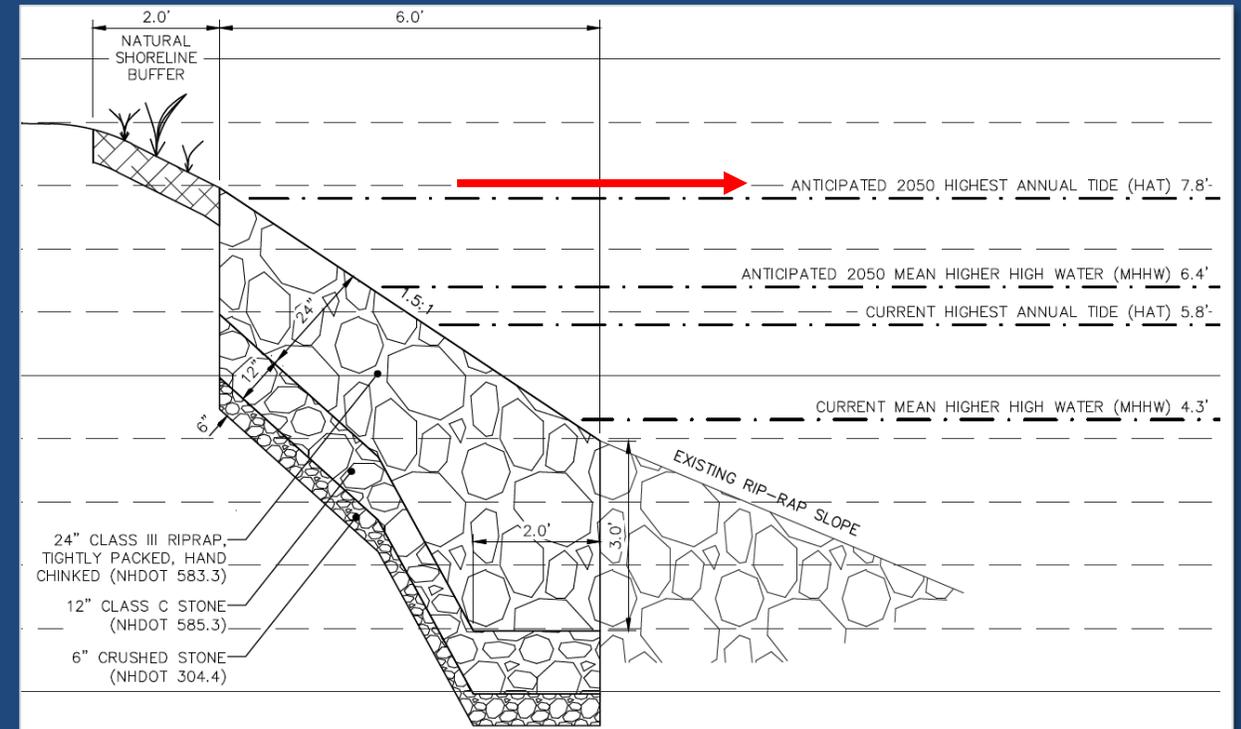


**Figure 5.2.** Inundation extent for Hampton-Seabrook Estuary under the 100-year (1%) storm surge event with relative sea level (RSL) rise of 0.73 m/2.4 feet occurring at MHW. **Source: Kirshen et al. (2018).**



# Env-Wt 603.05 Vulnerability Assessment & Risk Tolerance

- (a) Determine the **time period**.
- (b) Identify the **risk tolerance**.
- (c) Assess relative **sea level rise (SLR)**.
- (d) Identify areas subject to flooding from SLR and areas which are currently located within the 100-year flood plain and subject to coastal flood risk.
- (e) 100-year flood plain and subject to coastal flood risk.
- (f) Assess and describe **cumulative vulnerability** and coastal flood risk with project **design plans**.

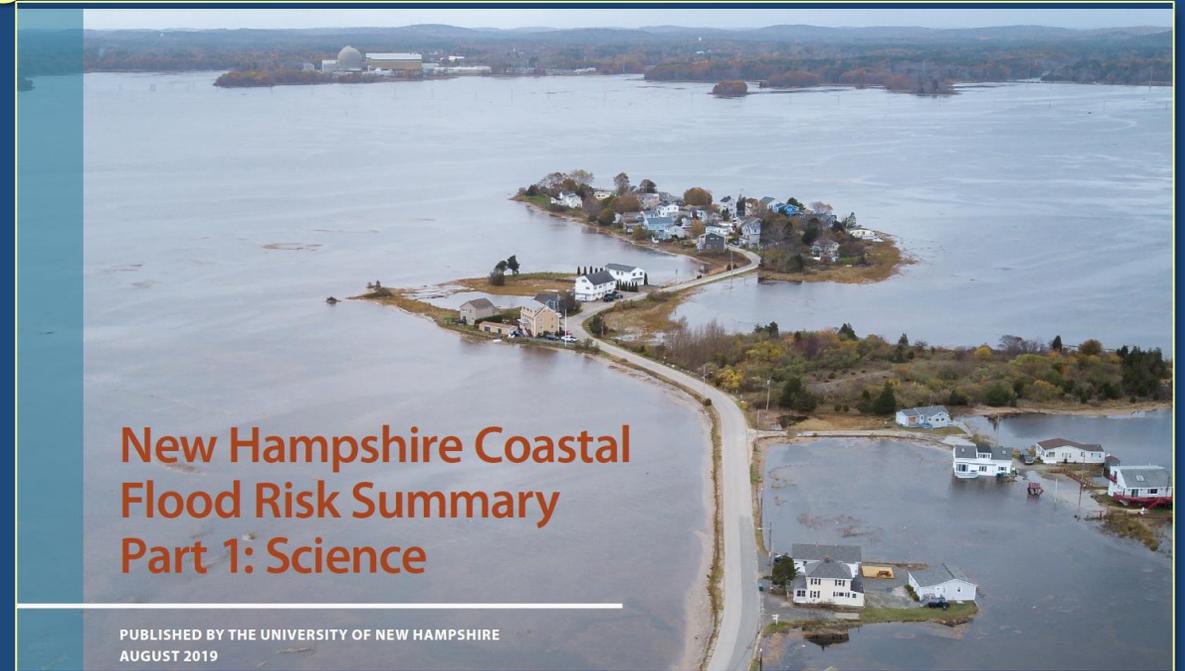


# Env-Wt 603.05 Vulnerability Assessment & Risk Tolerance

- (a) Determine the **time period**.
- (b) Identify the **risk tolerance**.
- (c) Assess relative **sea level rise (SLR)**.
- (d) Identify areas subject to flooding from SLR and areas which are currently located within the
- (e) 100-year flood plain and subject to coastal flood risk.
- (f) Assess and describe **cumulative vulnerability** and coastal flood risk with project **design plans**.
- (g) When questions / conflicts arise, **let's meet** to discuss.

# Additional Coastal Resources

- NH Coastal Flood Risk Summary.  
Part I: Science.  
Part II: Guidance (draft).



DRAFT FOR PUBLIC REVIEW

APPENDIX 2 – WORKSHEET

NEW HAMPSHIRE COASTAL FLOOD RISK SUMMARY

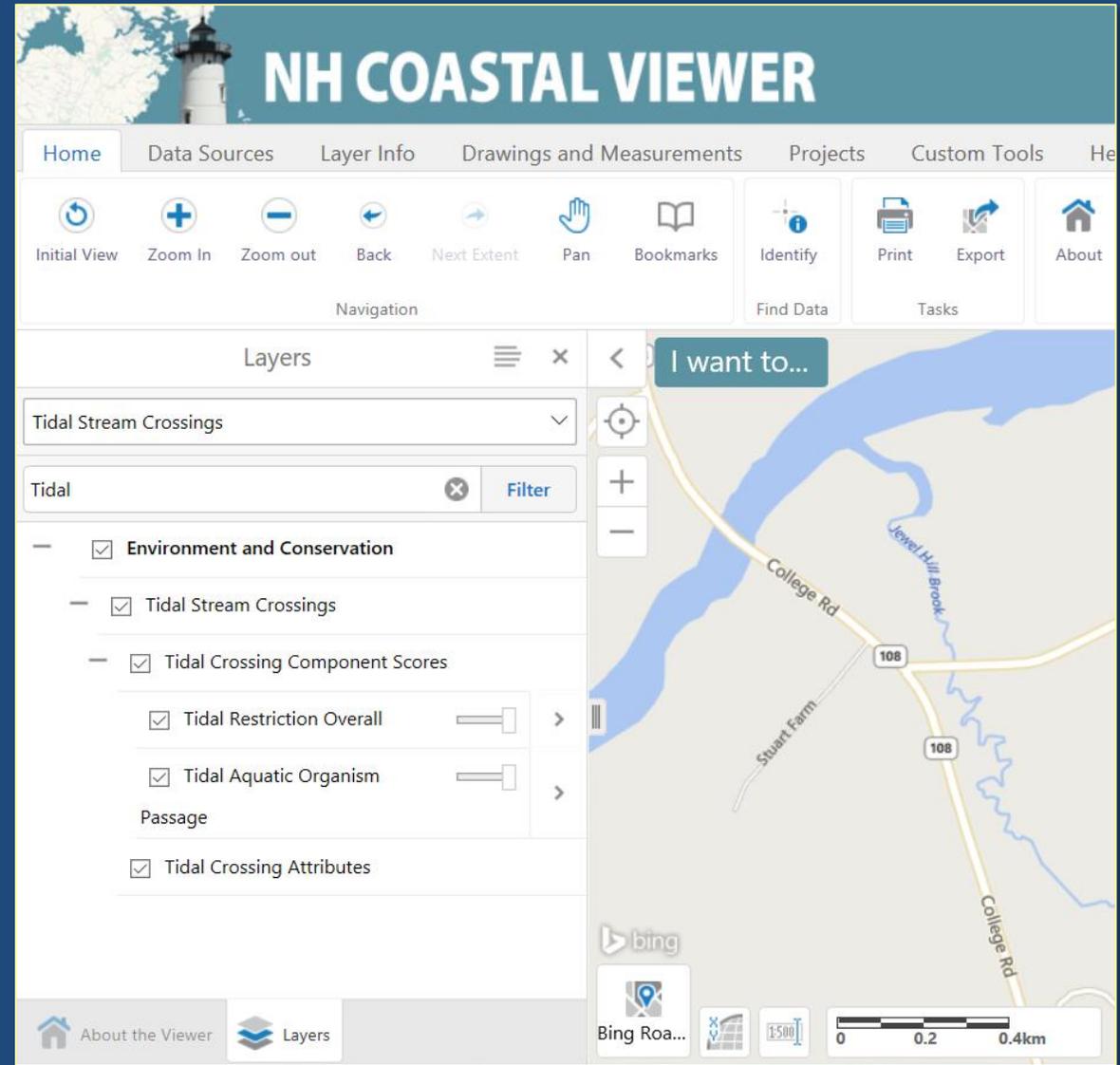
PART II: GUIDANCE FOR USING COASTAL FLOOD RISK PROJECTIONS

WORKSHEET

This worksheet is intended to help you work through the seven steps associated with the New Hampshire Coastal Flood Risk Summary, Part II: Guidance (*NHCFR Guidance*) in Coastal Zone municipalities.<sup>47</sup> The *NHCFR Guidance* provides the data needed to fill out this worksheet.

# Additional Coastal Resources

- NH Coastal Flood Risk Summary.  
Part I: Science.  
Part II: Guidance (draft).
- NH Coastal Viewer.  
Resilient Tidal Crossings Project.



# Additional Coastal Resources

- NH Coastal Flood Risk Summary.  
Part I: Science.  
Part II: Guidance (draft).
- NH Coastal Viewer.  
Resilient Tidal Crossings Project.
- NH Coastal Program.



# Summary

## 1) Vulnerability & Risk Tolerance.

Likelihood to experience and willingness to accept coastal flooding hazards.

## 2) Env-Wt 603.05 Vulnerability Assessment.

To protect and preserve natural resource function and,  
To plan, design and construct in the face of SLR.

## 3) Additional Resources.