

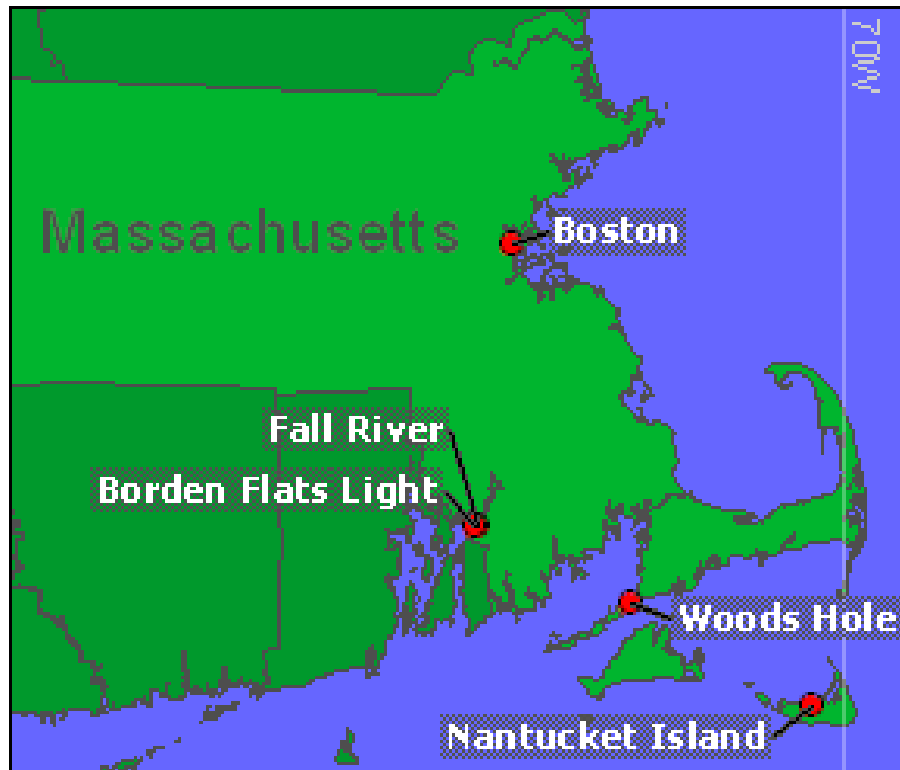
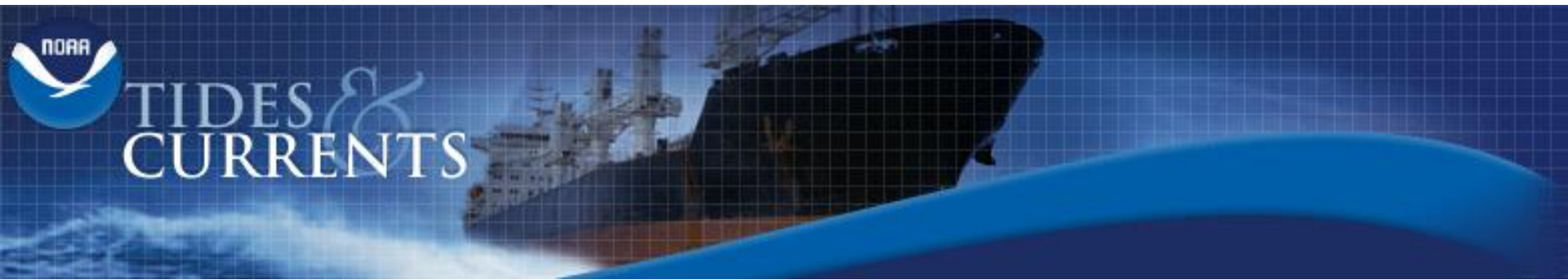
# Identifying Sea Level Rise Projections & Impacts for Coastal Planning



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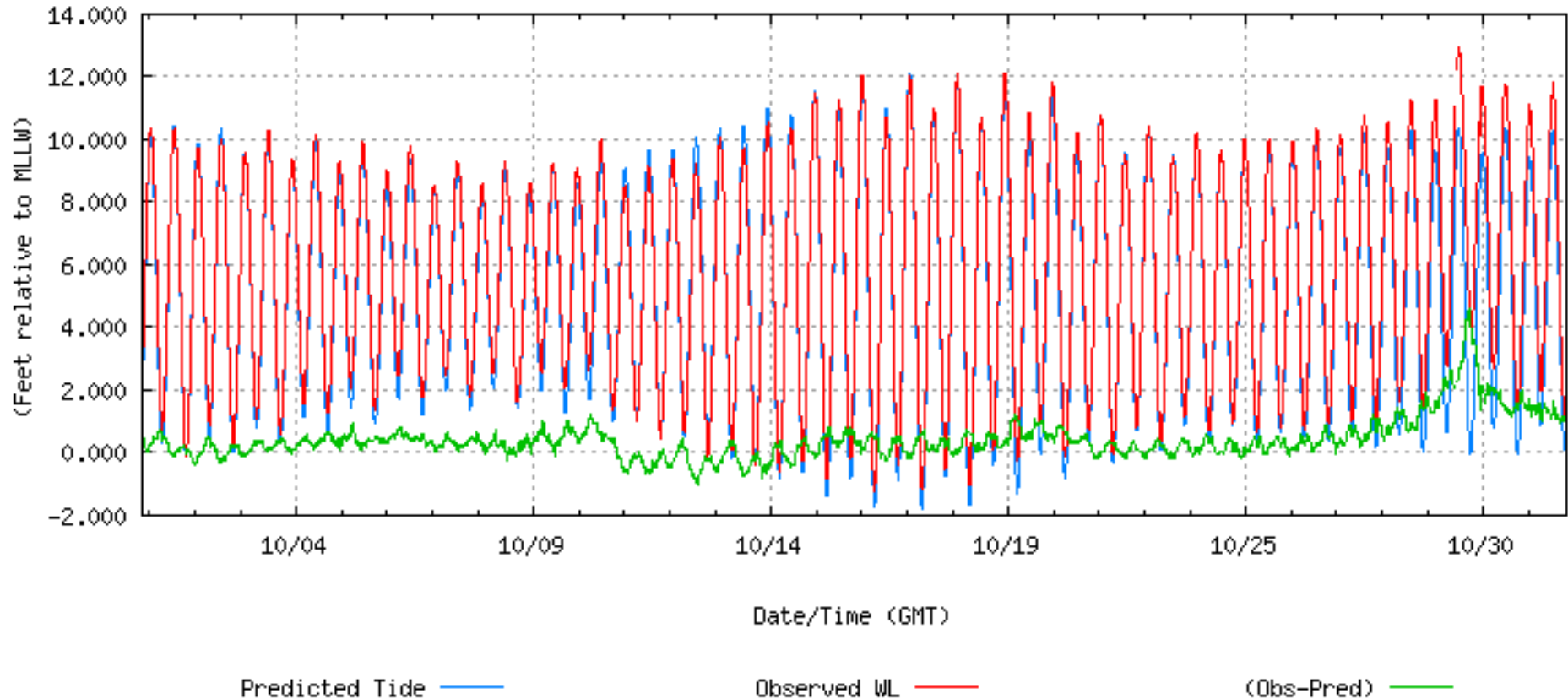
# NOAA Tide Data



- Monitor, assess, and distribute tide data
- Local sea level measured at tide stations – record water height relative to specific points on land (bench marks)
- Trends used for coastal mapping

# Current Sea Level Trend (Boston)

NOAA/NOS/CO-OPS  
Preliminary Water Level (A1:1) vs. Predicted Plot  
8443970 Boston, MA  
from 2012/10/01 - 2012/10/31

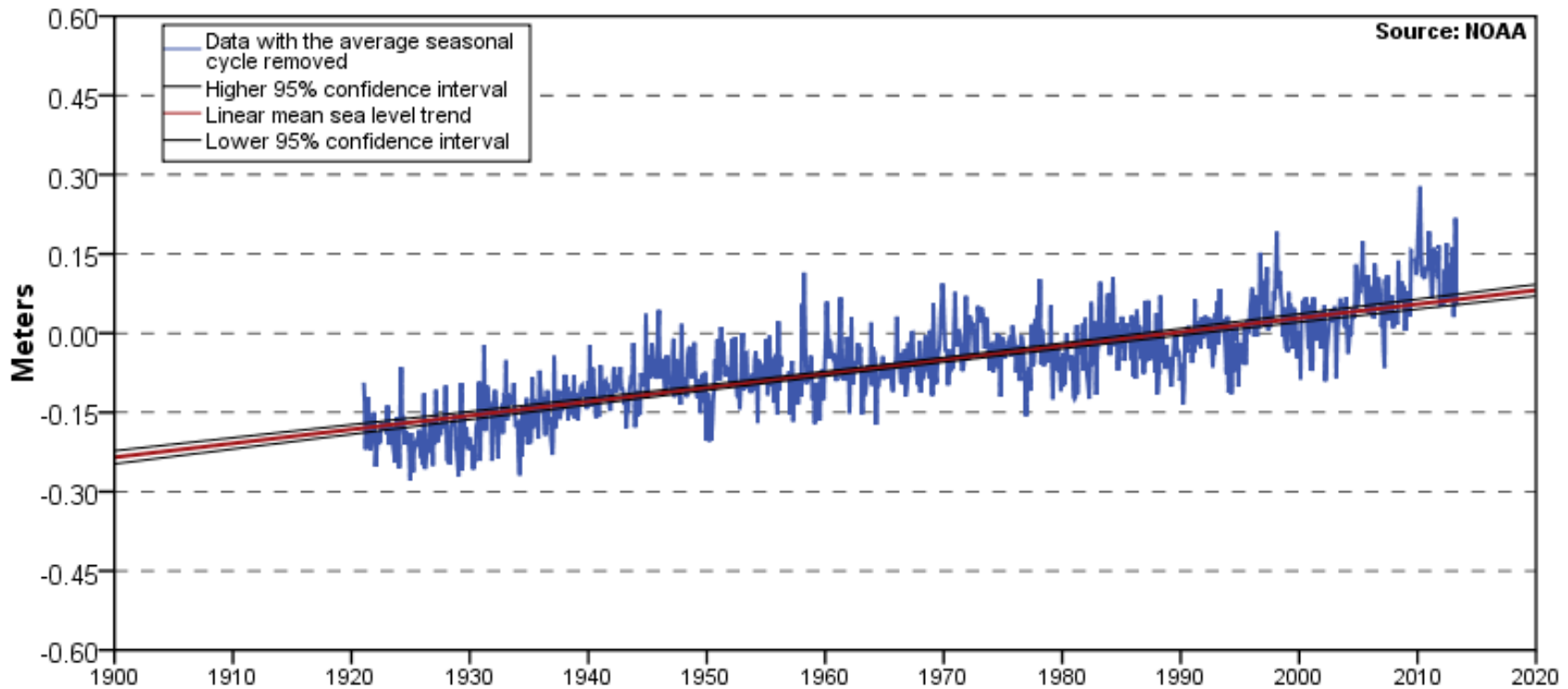


- Monthly mean sea level without regular seasonal fluctuations
- Long-term linear trend (30+ years)

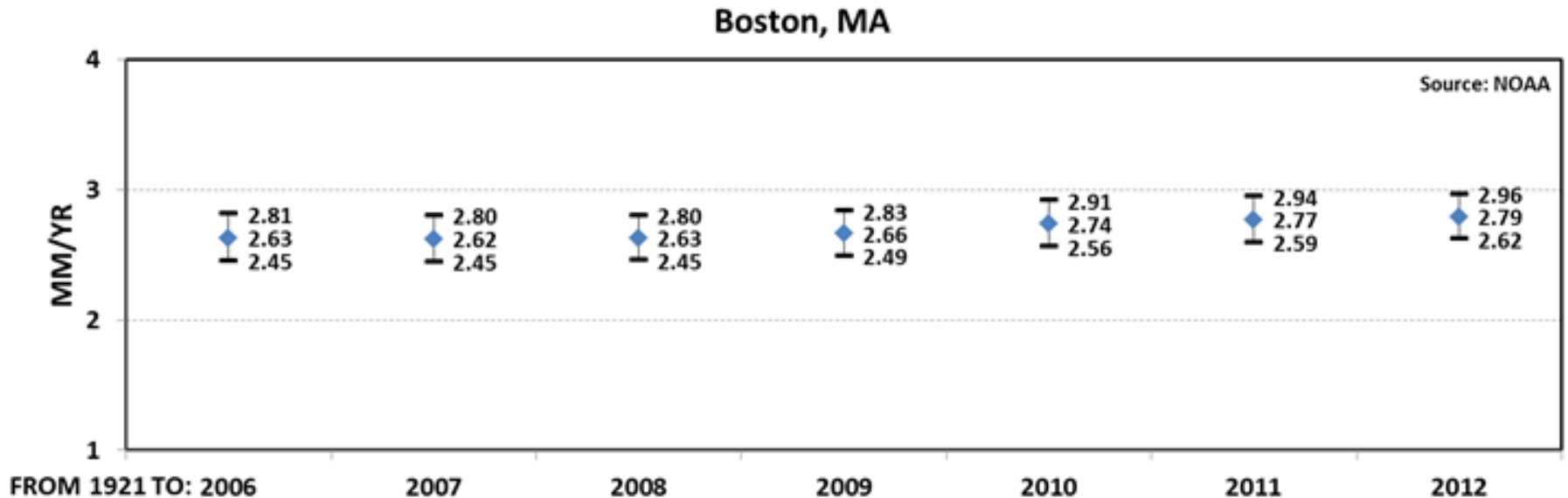


# Historic Rate of Sea Level Rise (Boston)

- Mean range (MHW-MLW) = 9.5 feet
- Record = 1921-2012 (91+ years)
- Sea level rise = 0.9 feet/100 years



# Historic Sea Level Trends From 1921 to 2006-2012 (Boston)

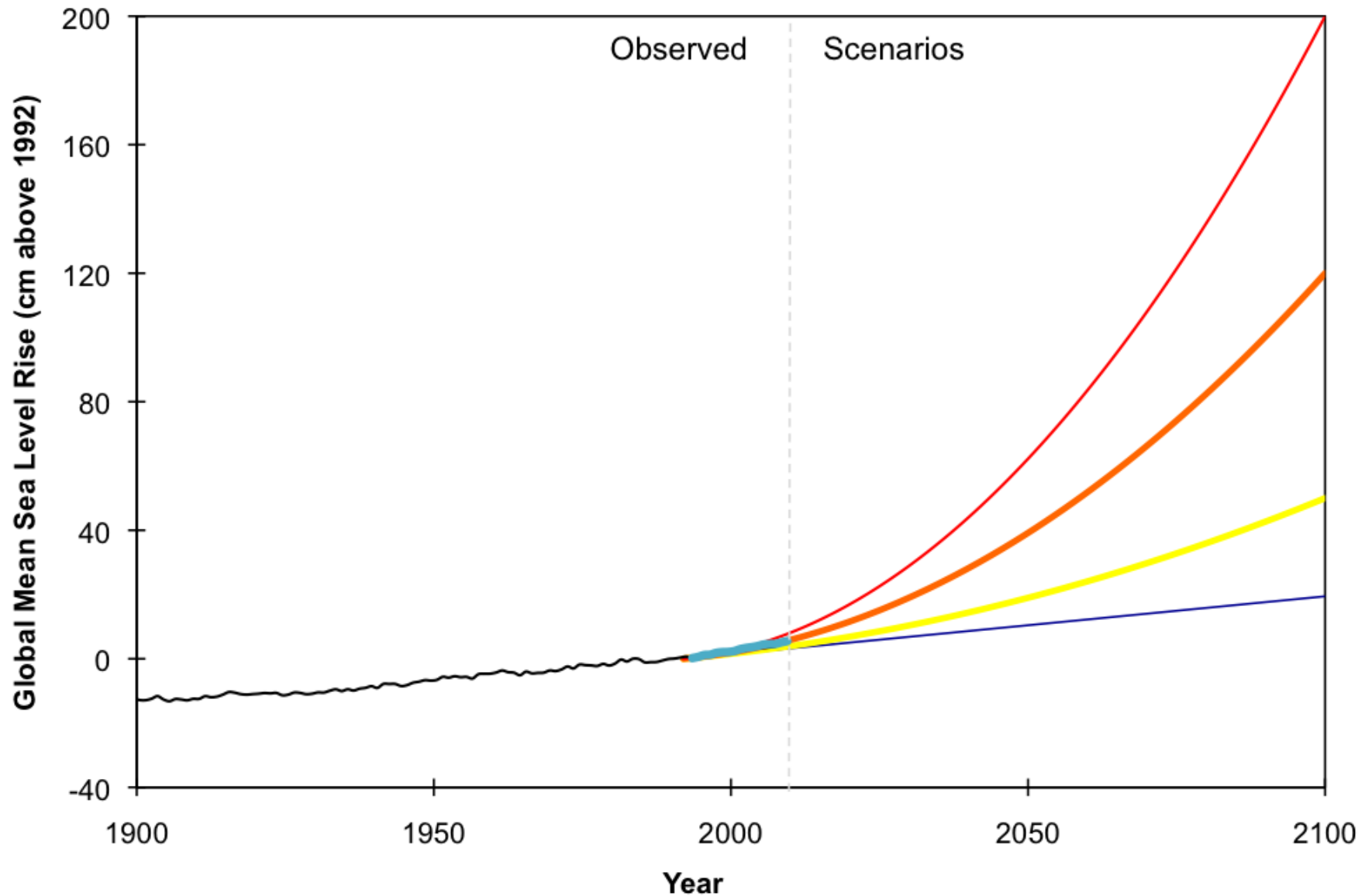


- Linear mean sea level rates (◆) & 95% confidence intervals (mm/yr) calculated from 1921 to recent years (2006-2012) at the NOAA Boston tide gauge station
- Values are trend of entire data period up to that year

# Historic Mean Sea Level Trends for MA Tide Gauge Stations

Station	Mean sea level trend & 95% confidence interval		Period	Century rate (ft/100 yrs)
	(mm/yr)	(in/yr)		
Boston, MA	$2.79 \pm 0.17$	$0.11 \pm 0.007$	1921-2012	0.92
Woods Hole, MA	$2.81 \pm 0.19$	$0.11 \pm 0.007$	1932-2012	0.92
Nantucket, MA	$3.52 \pm 0.42$	$0.14 \pm 0.017$	1965-2012	1.15

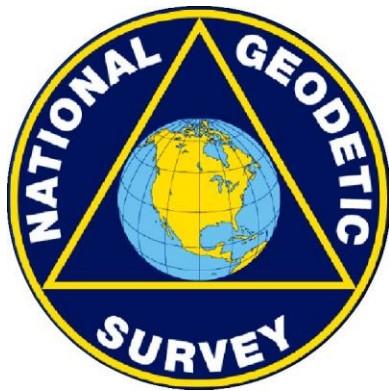
# Sea Level Rise Projections (National Climate Assessment)







# Mean Higher High Water Datum



MHHW	=	10.27 feet (3.131 meters)
MHW	=	9.83 feet (2.996 meters)
NAVD88	=	5.46 feet (1.666 meters)
MSL	=	5.20 feet (1.585 meters)
MTL	=	5.08 feet (1.550 meters)
NGVD29	=	4.65 feet (1.418 meters)
MLW	=	0.34 feet (0.103 meters)
MLLW	=	0.00 feet (0.000 meters)

# NOAA Sea Level Rise Layers & Viewer

[www.csc.noaa.gov/digitalcoast/tools/slrviewer](http://www.csc.noaa.gov/digitalcoast/tools/slrviewer)

## Tools

### Sea Level Rise and Coastal Flooding Impacts Viewer

NOAA Coastal Services Center

Overview

In Action

Support

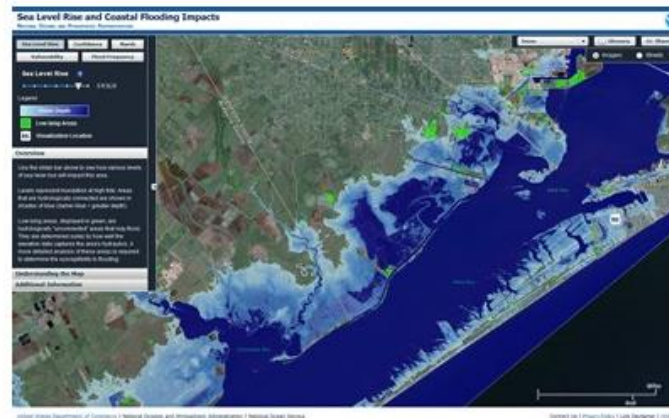
Get It Now

#### Overview

[View the current status of the tool.](#)

Being able to visualize potential impacts from sea level rise is a powerful teaching and planning tool, and the Sea Level Rise Viewer brings this capability to coastal communities. A slider bar is used to show how various levels of sea level rise will impact coastal communities. Completed areas include Mississippi, Alabama, Texas, Florida, and Georgia, with additional coastal counties to be added in the near future. Visuals and the accompanying data and information cover sea level rise inundation, uncertainty, flood frequency, marsh impacts, and socioeconomics.

Launch Now



#### Features

**Displays** potential future sea levels

**Provides** simulations of sea level rise at local landmarks

**Communicates** the spatial uncertainty of mapped sea levels

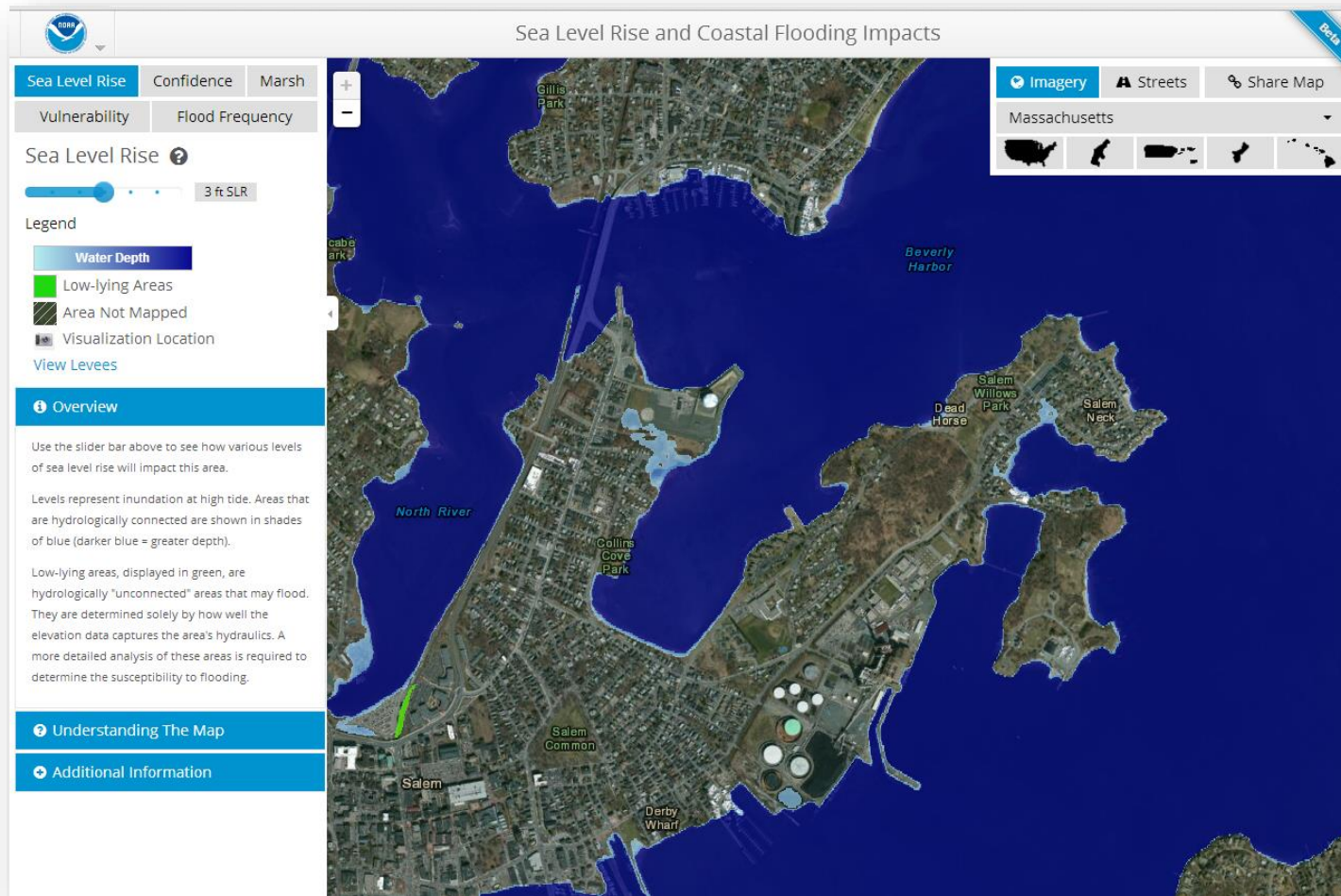
**Models** potential marsh migration due to sea level rise

**Overlays** social and economic data onto potential sea level rise

**Examines** how tidal flooding will become more frequent with sea level rise

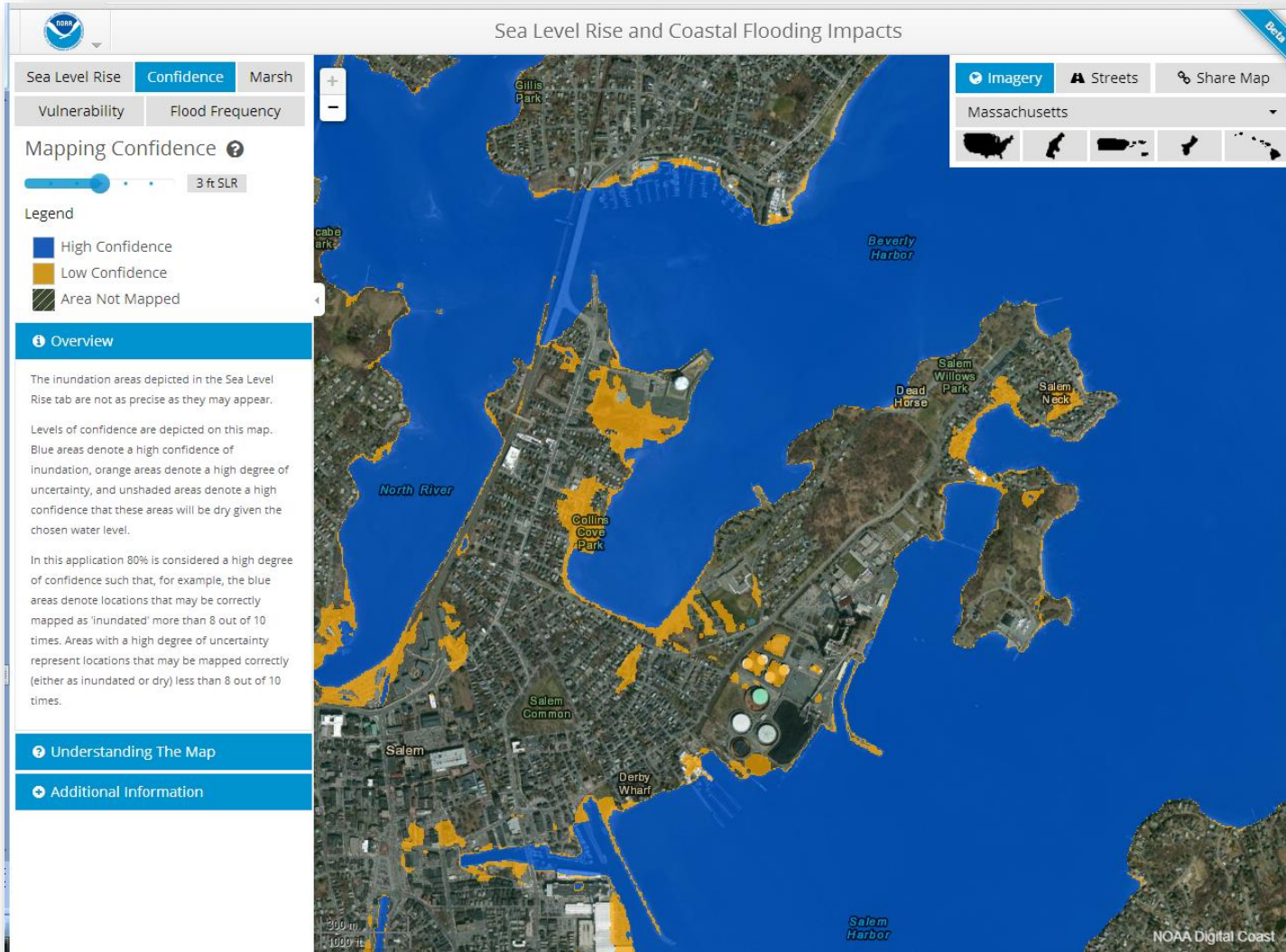
# Sea Level Rise Inundation

- Visualize impacts of mean higher high water + 1' SLR scenarios (up to 6') overlaid on aerial imagery, street map & terrain map
- Images of SLR on structures will illustrate site-specific impacts



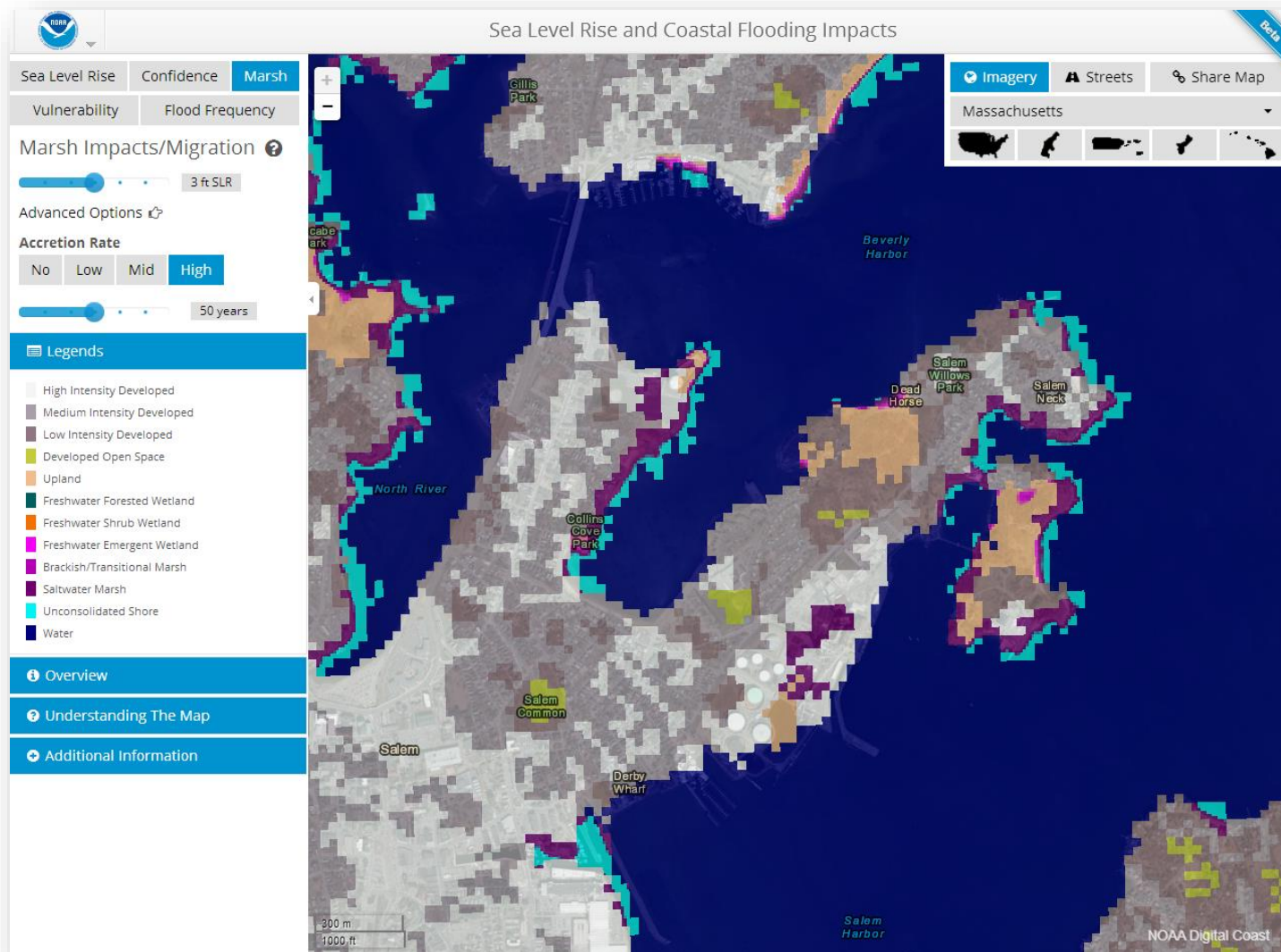
# Mapping Confidence

- Visualize mapping confidence (80%) of inundation area based on uncertainty of elevation data & MHHW tidal surface



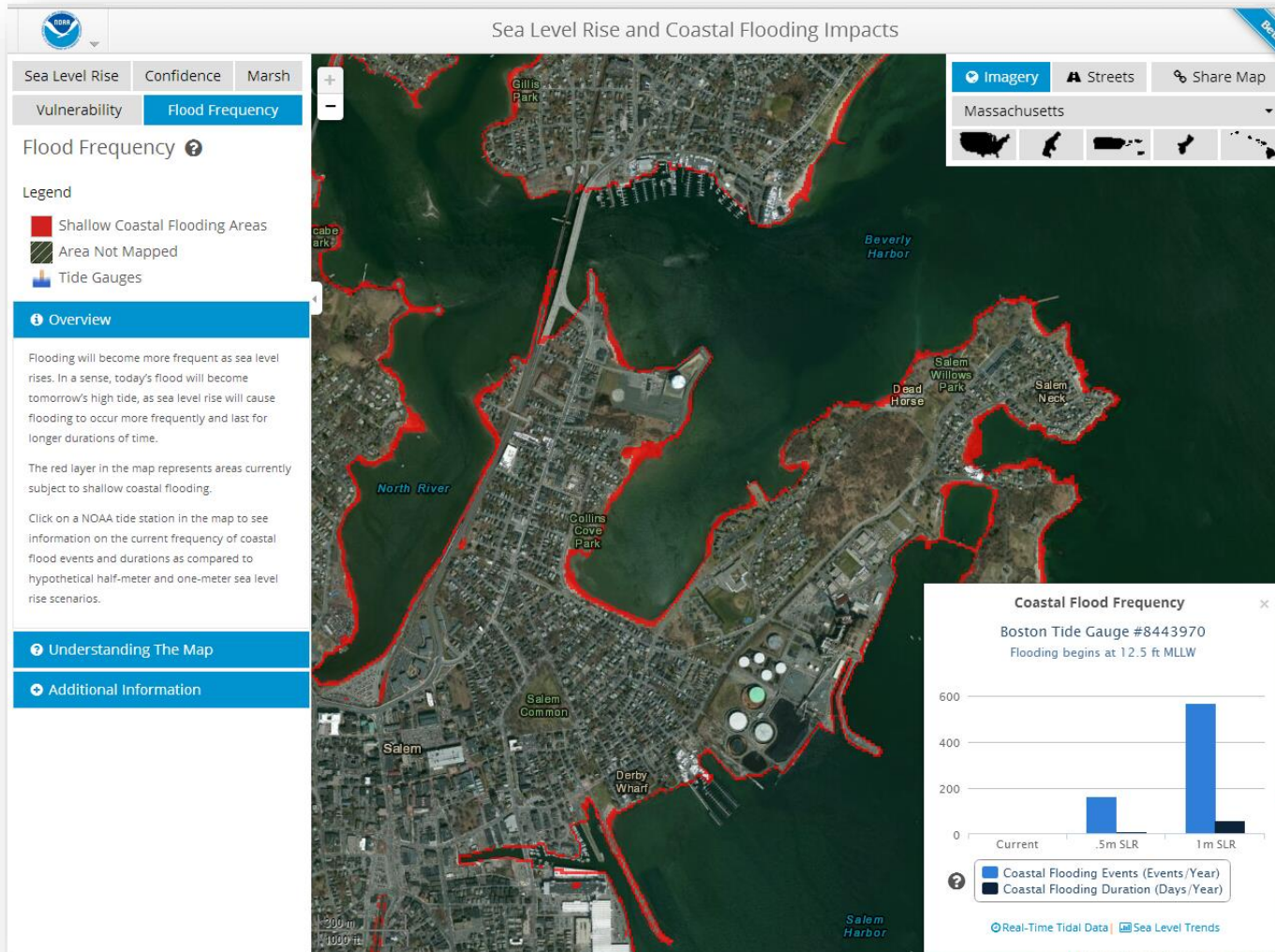
# Marsh Impacts/Migration

- Visualize impacts of SLR scenarios on marshes using Coastal Change Analysis Program data & accretion rates (2, 4, 6 mm/year)



# Coastal Flood Frequency

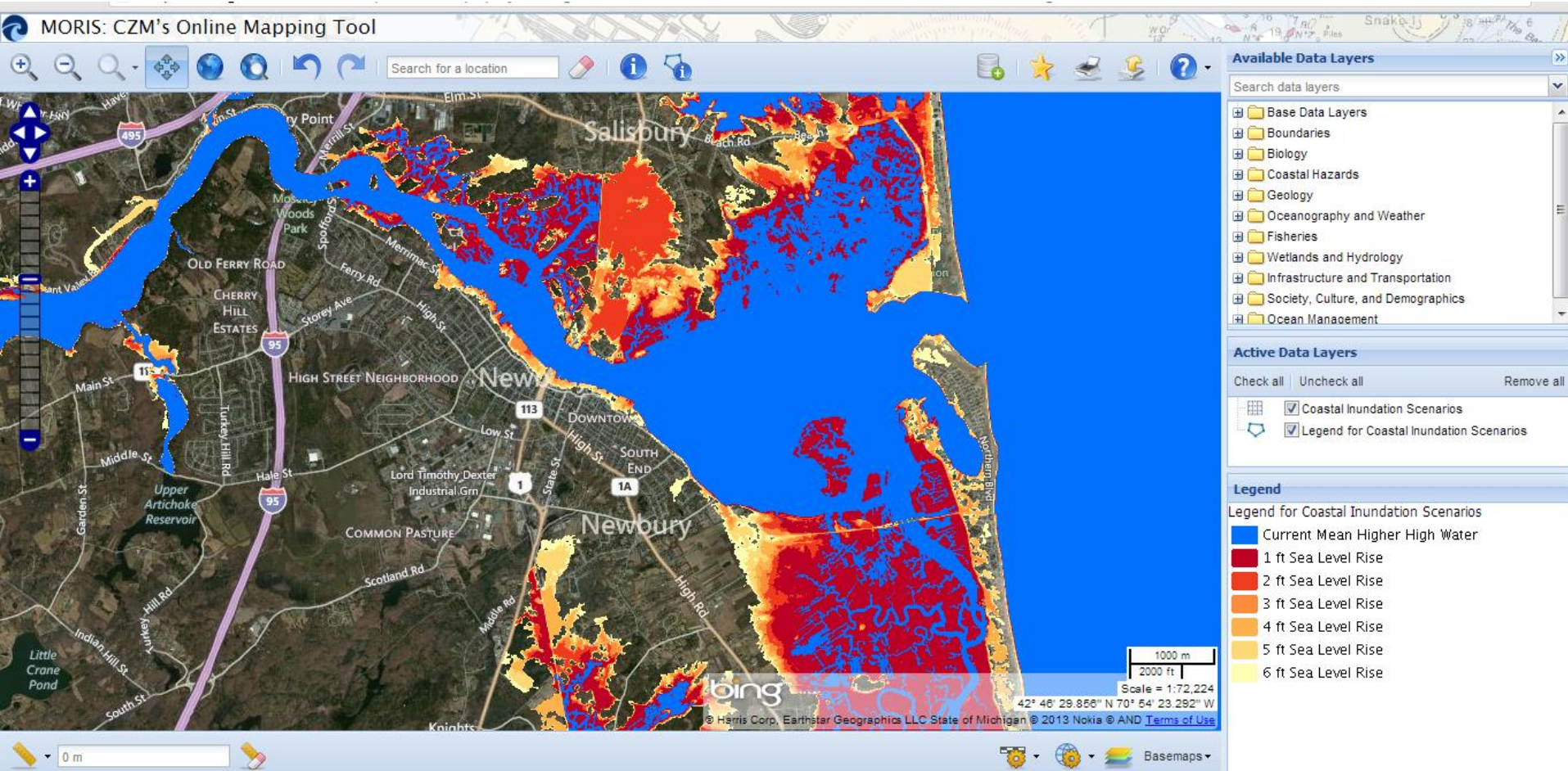
- Communicate that today's flood is tomorrow's high tide
- 2007-2009 observed water level data to show increased frequency of everyday flooding



**National Weather  
Service Coastal Flood  
Warning Areas**



# Coastal Inundation Scenarios in MORIS



[www.mass.gov/eea/agencies/czm/program-areas/stormsmart-coasts/vulnerability/slr.html](http://www.mass.gov/eea/agencies/czm/program-areas/stormsmart-coasts/vulnerability/slr.html)

# Other Data & Tools

