

# NOAA's Annual & Monthly Outlooks Help Users Plan for High Tide Flooding Risks

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## **CO-OPS Helps Mitigate Coastal Hazards**





#### We Have Data & Expertise

- Real-time time water level information
- Long-term sea level trends
- Predictions!

#### **High Tide Flooding**

- Also referred to as **nuisance**, **sunny day**, or **blue sky**, or **King Tide flooding**.
- Becoming more common due to years of rising sea levels.
- Impacts are further influenced by new & full moon events, perigean cycles, or periodic weather & climate patterns, like El Niño.



## Annual High Tide Flooding Outlooks



A map showing the number of high tide flooding days at National Water Level Observation Network stations observed or projected for the selected year. Floodiv thresholds are supplied by NOAA's Office for Coastal Management.



#### How are they made?

- **Historical flood observations**, relative to established National Ocean Service thresholds.
- Oceanic Niño Index (ONI)
- 3- month average of **sea-surface temperature** anomalies.

#### What do they provide?

- The **frequency** of predicted High Tide Flooding for the coming meteorological year, May to April.
- **Regional** summaries & impact graphics.
- Flood projections by decade out to the year 2050.
- Historical flood observations to show interannual variability.
- Interactive sea level trend scenarios by station.





### **Evolving the Annual Outlook**



#### Why move away from a PDF?

- To serve a **broader audience**, more than just research.
- To provide detailed & interactive data visualizations.
- To integrate a variety of data, products, and services.
- To help coastal communities with **long-term planning.**
- To help **mitigate the impacts** of climate change & sea level rise.



### When and Where is there HTF Risk?



Sanders-Clyde School, Charleston, SC - September 11, 2014.



### Version 1: Seasonal High Tide Bulletin

#### **Seasonal NOS High Tide Bulletin - Northeast**

#### NORTHEAST OUTLOOK

Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York

#### Dates:

- March 21-24
- April 19-21
- No dates in May

#### Locations:

Tide stations at the following locations have the greatest chance of seeing high tide flooding:

- Bar Harbor, Maine; Kings Point, New York
- Visit the NOAA Coastal Inundation Dashboard for this region to view real-time water levels with forecasts out to 48 hours.

#### Why will they be higher than normal?

- In March, a perigean spring tide will occur. This is when the moon is either new or full and closest to earth. Higher than normal high tides and lower than normal low tides will occur.
- Mean sea level is typically higher in the late spring due to changing weather patterns and increasing water temperatures.

#### What kind of impact might I expect along the coast?

- Low lying areas may flood, however high tides alone will likely not cause a significant impact on the coast in most areas unless accompanied by a storm or strong winds.
- · Lower than normal low tides will also occur.



## New Monthly High Tide Flooding Outlook



• Model based on:

- Tide predictions
- o Sea level trends
- Seasonal changes in coastal sea level
- **Output:** Daily likelihood of water level exceeding NOS minor flood threshold





## Visualizing Risky Days for High Tide Flooding



ND ATMOS

### Integration with Coastal Inundation Dashboard

- Alerts when stations may experience flooding in next 48 hours.
- Banner indicates when there is potential for HTF in the next 30 days.



### Who are our stakeholders?

- Meteorologists
- Floodplain and Emergency Managers
- Land Use Planners
- Sustainability and Resilience Officers
- Coastal Practitioners
- GIS Specialists or Scientists
- Public Works Director
- Department of Transportation
- Environmental Protection Divisions



### **CO-OPS Stakeholder Engagement and Outreach**

### **Before:**

- Old school thinking: "If you build it, they will come..."
- Antiquated product enhancement strategy involving assumptions



Photo Credit: Natalie Nelson, PhD, North Carolina State University



### **CO-OPS Stakeholder Engagement and Outreach**

### After

- NOAA Service Delivery Framework
- New school thinking: "It works, because we heard it straight from the horse's mouth..."
- How does it get done?
  - Create products guided by user feedback
  - Utility of products is verified by those same users



### NOAA Service Delivery Framework for Monthly Outlook



### Identified Stakeholder Needs & Next Steps

**Need:** Information between tide stations

 Next Step: Coupling models & observations to create data between tide stations (CORA)

**Need:** Communities use different flood thresholds

- Next Step: Customizable flood thresholds
- Need: Terminology and messaging updates
  - Next Step: Technical assistance/ learning modules







## **Questions?**

#### Contact Us!

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### For more info:

- Wed. 9-9:30am in Rm 343: Talks by Greg Dusek & John Callahan about Monthly HTF Outlook research
- Thurs. 10:20-11am at NOAA Booth: Talks by Greg Dusek (Monthly Outlook) & Connor Lewis (Outreach)

