

# Nuisance Flooding and Pavement Impacts

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University of New Hampshire





- NOAA Flooding Severity Categories: Minor, Moderate, and Major Flooding
- **Minor Flooding** is defined as: Minimal or no property damage, but possibly some public threat
- Sea level rise is also contributing to an increasing frequency of tidal floods (i.e., “sunny day”, “recurrent”, “shallow coastal”, and “nuisance” flooding), occurring more often during seasonal high tides and/or minor wind events.

Landing Road, Hampton March 2018

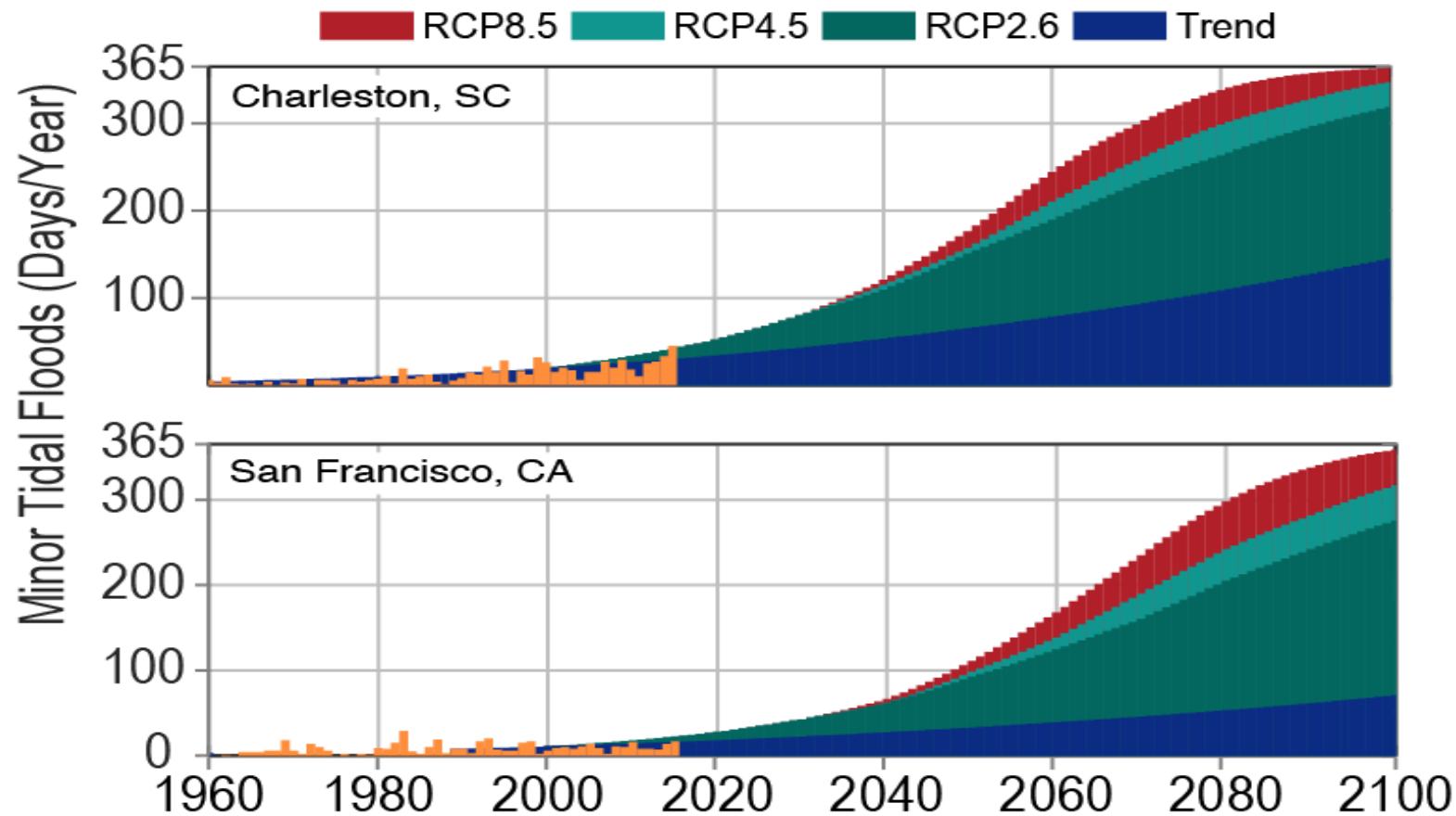
Photo Credit: Diane Shaw





• Hampton Beach, January 2018

# *“Nuisance Flooding” is Increasing Across the United States*



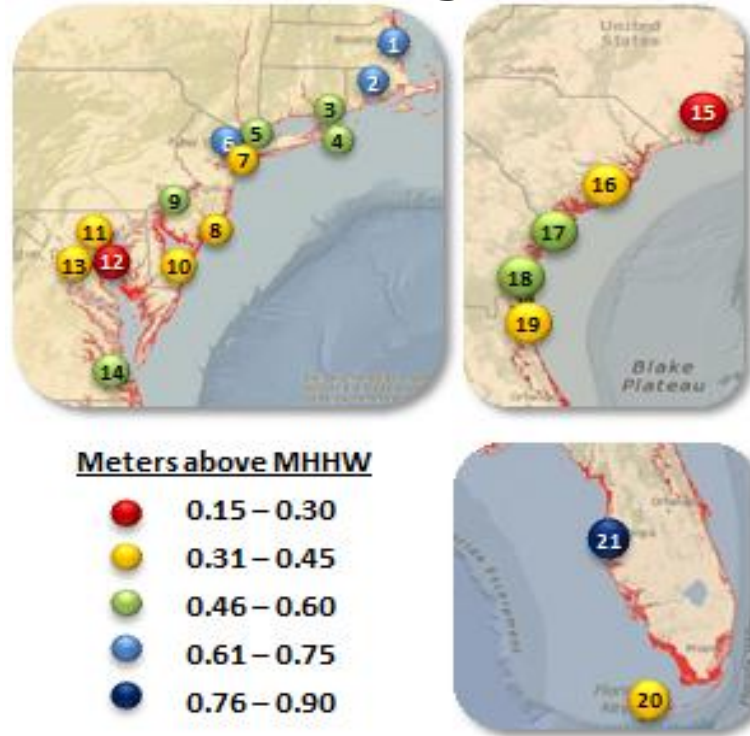
In Charleston NC each event costs \$12.5 M



# Recent and Future Outlooks for Nuisance Flooding Impacts on Roadways on the US East Coast

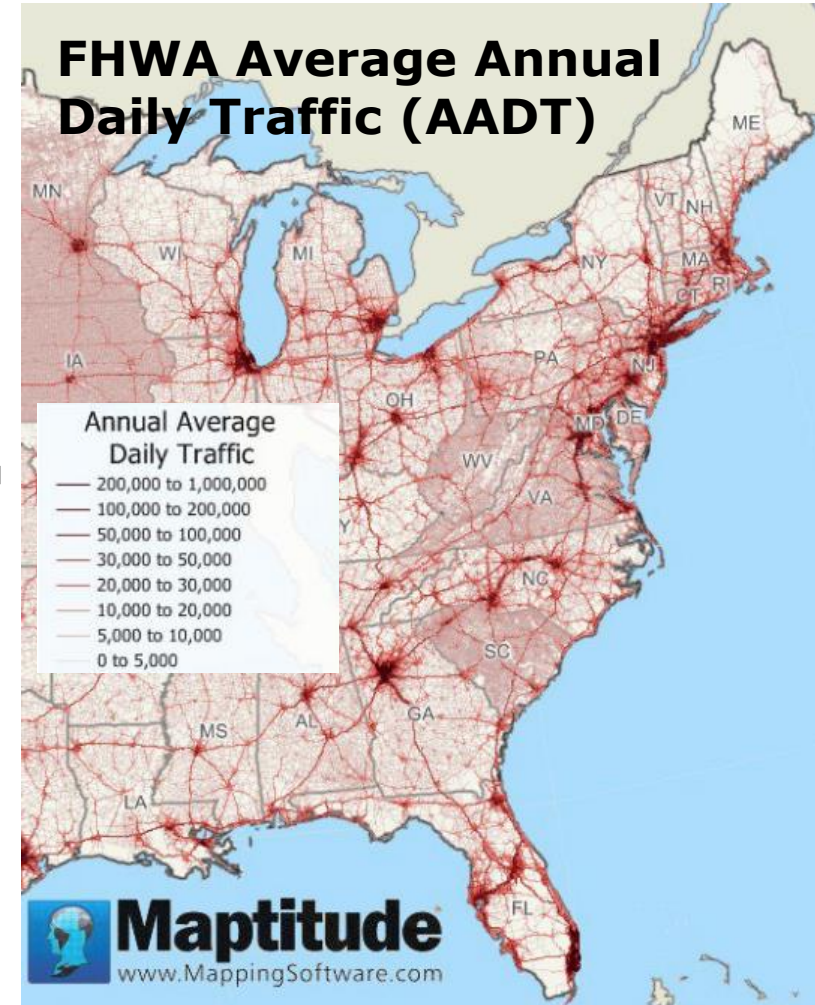
Jennifer M. Jacobs, Lia R. Cattaneo, William Sweet, and Theodore Mansfield, TRR 2018

## NOAA Tide Gauges



NOAA water level (tide gauge) locations showing NOAA-defined nuisance flood levels above the 1983–2001 MHHW datum (colored dots) and coastal areas below the nuisance elevations and potentially at risk (red contours) (adapted from Sweet and Park 2014).

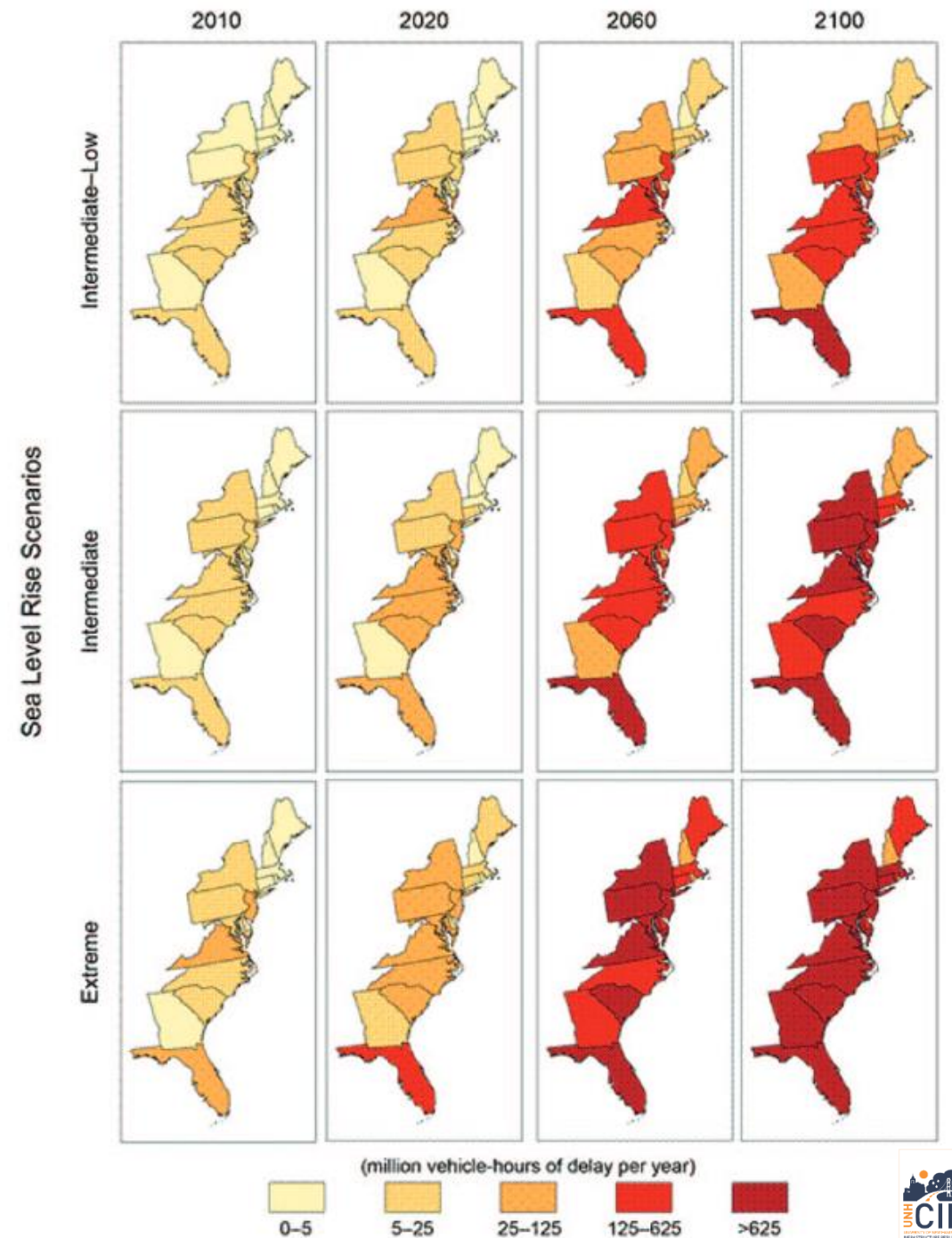
## FHWA Average Annual Daily Traffic (AADT)



Map: Created with Maptitude Mapping Software by Caliper, November 2017

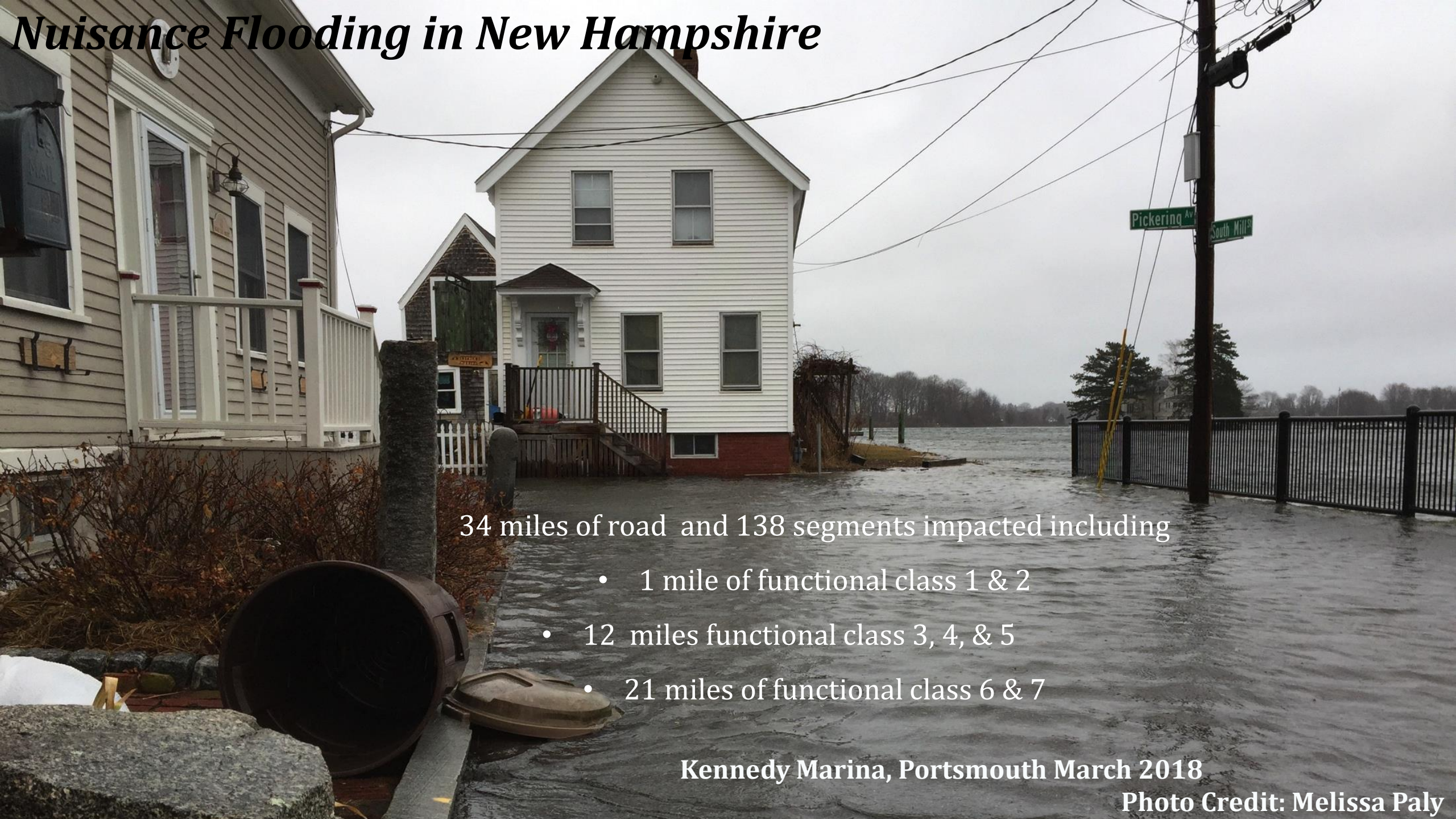
# Nuisance Flooding Findings

- 7,508 miles of roadways including over 400 miles of interstate roadways are threatened.
- From 1996-2005 to 2006-2015, there was a 90% average increase in nuisance floods.
- Total induced vehicle-hours of delay due to nuisance flooding currently exceed 100 million hours annually.
- Nearly 160 million vehicle-hours of delay across the East Coast by 2020 (85% increase from 2010); 1.2 billion vehicle-hours by 2060 (126% increase from 2010); and 3.4 billion vehicle-hours by 2100 (392% increase from 2010) are projected under an Intermediate Low sea level rise scenario.





# *Nuisance Flooding in New Hampshire*



34 miles of road and 138 segments impacted including

- 1 mile of functional class 1 & 2
- 12 miles functional class 3, 4, & 5
- 21 miles of functional class 6 & 7

**Kennedy Marina, Portsmouth March 2018**

**Photo Credit: Melissa Paly**



# Nuisance Flooding in New Hampshire

Boston has the nearest NOAA Tide Gauge Station (8443970)

Nuisance Level (m, MHHW)	Obs. 2000	Obs. 2010	Intermediate Low			Intermediate			Extreme		
			2020	2060	2100	2020	2060	2100	2020	2060	2100
0.68	2	6	10	53	115	16	155	359	40	364	365



Yacht Club on Landing Rd

Photo credit: Rebecca Irelan, N.H. Sea Grant



# *Nuisance Flooding Best Practices?*



Photo credits: Rebecca Irelan, N.H. Sea Grant, Diane Shaw, Melissa Paly, Elizabeth Dinan, Lisa Graichen, Joanna Raptis, and Kim Reed



# *Nuisance Flooding Best Practices?*



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# ***Nuisance Flooding Best Practices?***



**Photo credit: NH DOT**





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Graichen, Joanna Raptis, and Kim Reed**

