University of New Hampshire

Keeping History Above Water Conference
Portsmouth, NH

Environmental Monitoring of Natural and Developed Coastal Environments Leading to Collaboration with SBM and Portsmouth, NH

Michael R. Routhier
May 9th, 2023

Topics for Today's Talk:

Coastal Project Work Related to:

- Remote Sensing Applications

Remote sensing is the act of sensing something from a distance such as with the use of UAV, Aerial, or Satellite imagery

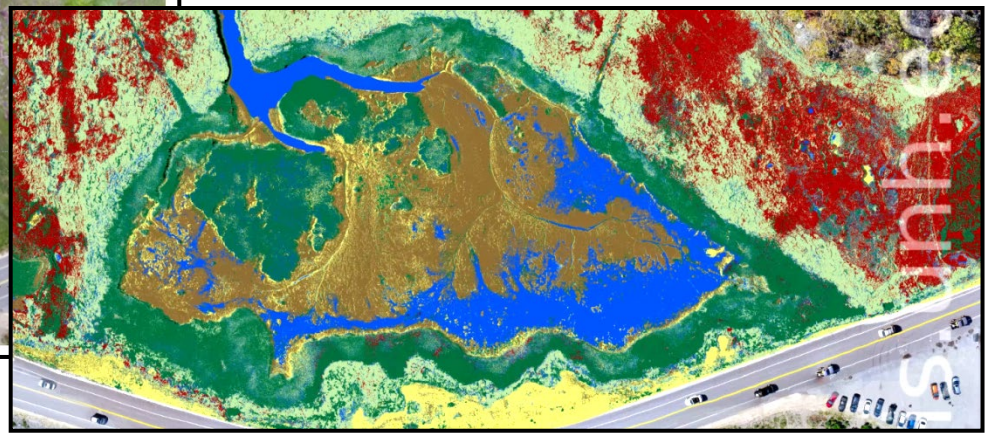
- Sensor Deployments

Sensor Deployments are networks of remote devices that measure environmental conditions such as water level, temperature, and humidity.

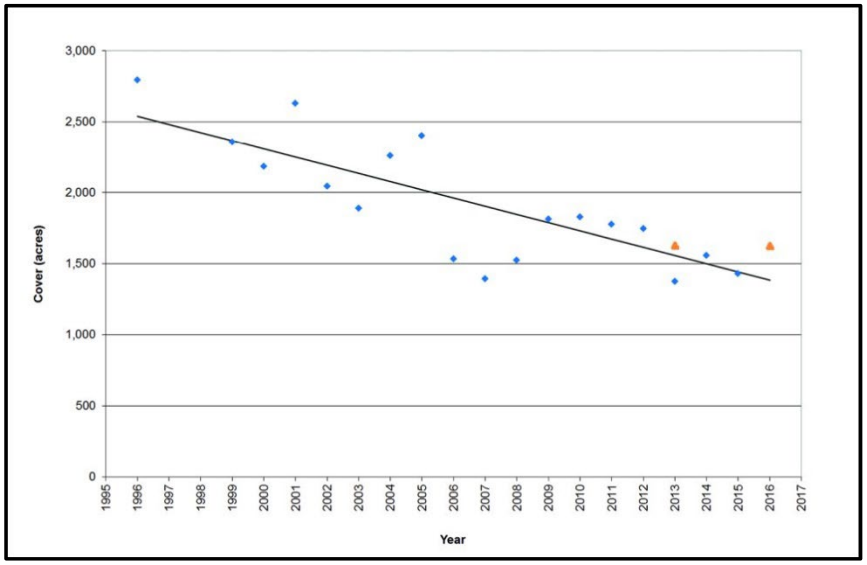
- Web Mapping Applications

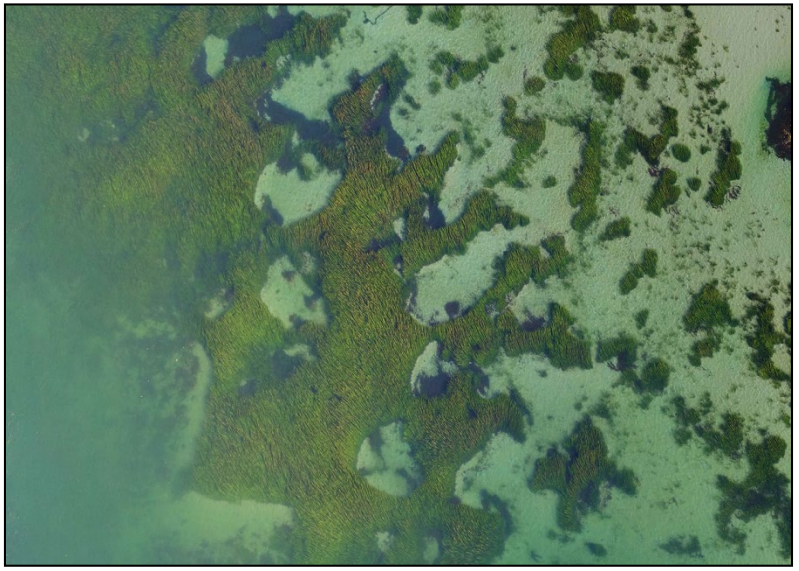
Web enabled mapping interfaces for the query, mapping, visualization, and dissemination of the streaming data.

Salt Marsh Vegetation Remote Sensing and Mapping:



Submerged Eelgrass Vegetation Remote Sensing and Mapping :

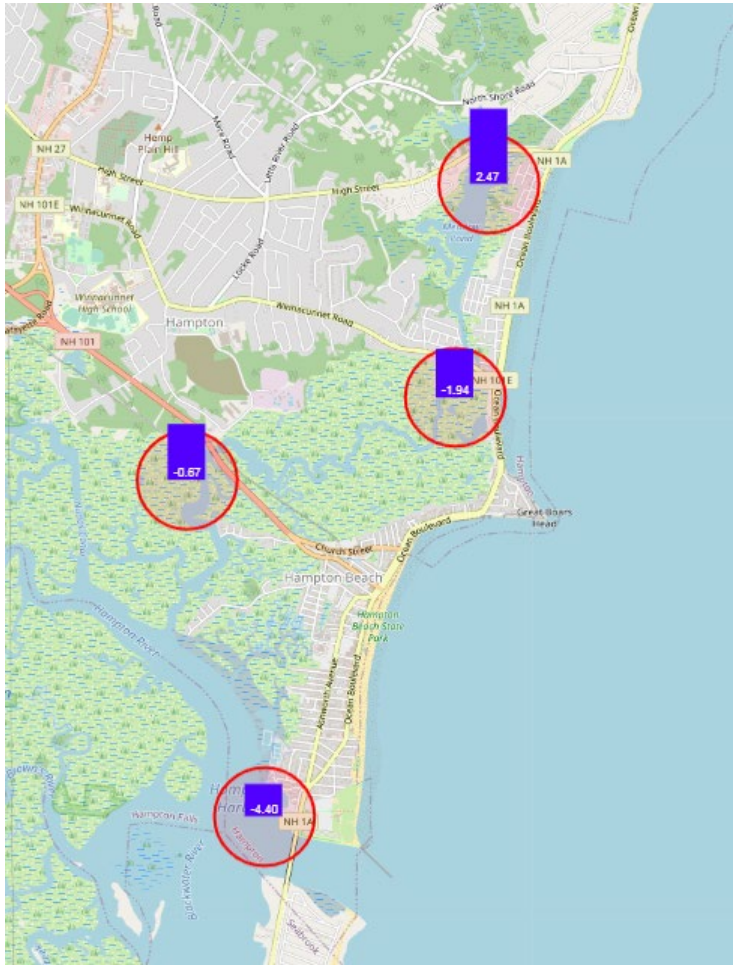




Remote Sensing of Coastal Flooding

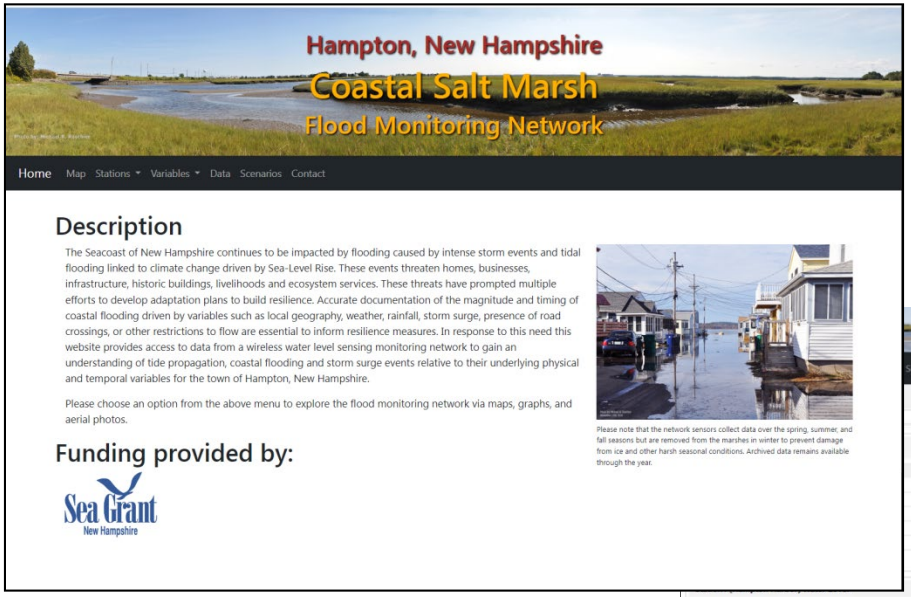
Sensor Deployments

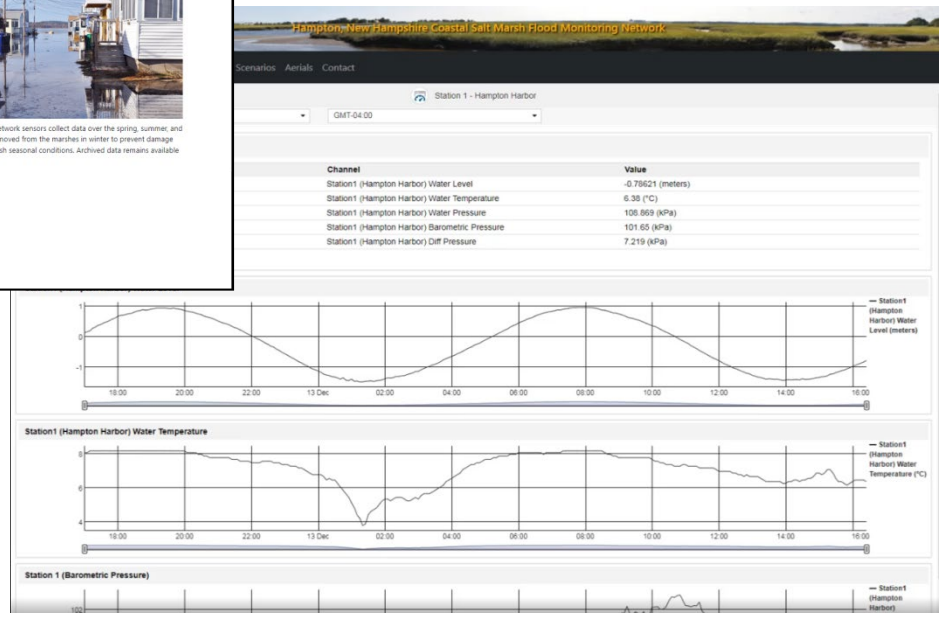
- Hampton NH 2019



Web Mapping Applications

- Hampton NH Salt Marsh Flooding Network





Remote Sensing of Developed Landscapes

Sensor Deployments

- Strawbery Banke Museum Deployment 2011

Sea-Level Rise Vulnerability Assessment of Coastal Resources in New Hampshire

Benjamin Curran
Michael Routhier
Gopal Mulukutla

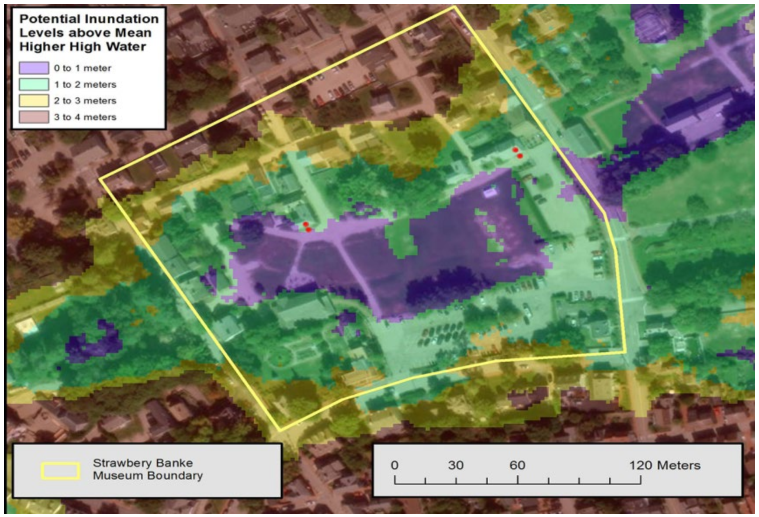
Fig. 1. Shapley-Drisco House (white building at far right), Strawbery Banke, Portsmouth, New Hampshire. Photograph by Michael R. Routhier.

As the impacts of sea-level rise increase for coastal communities, so too will the toll on the built heritage that has come to distinguish them. Fluctuations and drastic shifts in temperature, rainfall, mean global sea-level, and the frequency and severity of storms will have adverse impacts on the natural and built landscapes that define coastal cultures. Collectively, these factors will have catastrophic effects on the connectivity of many populations to their natural and cultural environments. Additionally, these factors will adversely affect the stability of the historic structures that define the flow, pace, and timbre of coastal communities. A grant from the Waitt Foundation and the National Geographic Society in 2010 enabled the beginning of a process to connect place-specific field research on climate change to culturally sensitive areas and the historic structures that will be directly impacted by climate change and sea-level rise.

Recent studies, documented in the Snow, Water, Ice and Permafrost in the Arctic (SWIPA) report, published in 2011 by the Arctic Monitoring and Assessment Programme, estimate that at current trends, global mean sea level will increase by 0.6 meters to 1.6 meters by 2100. In corroboration with the SWIPA report, the 2013 Intergovernmental Panel on Climate Change (IPCC) Assessment Report (AR) estimates an increase in mean sea level of 0.26 meters to 0.98 meters by 2100.[1] Though the IPCC's 2013 estimates are not as high as those from the SWIPA report, they represent a substantial increase from 2007 IPCC AR estimates of 0.18 meters to 0.59 meters of sea-level rise for the same time period.[2] Since 1993 the global mean sea levels have risen by approximately 3.3 millimeters per year, a rate that has doubled over the course of the last century.[3] This doubling in the rate of sea-level rise does not account

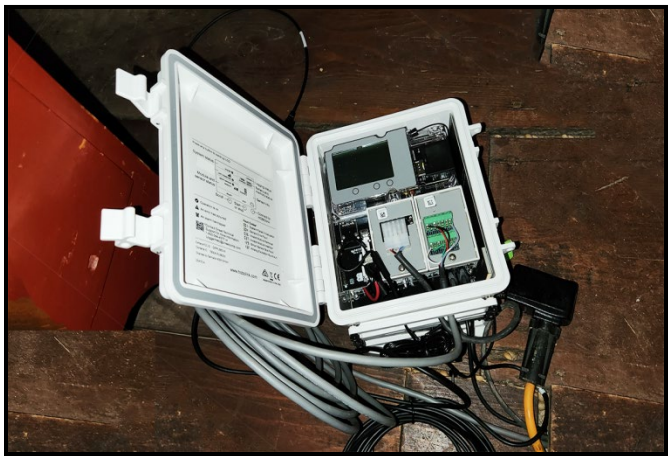
Preventative risk-evaluation measures can help to protect buildings from mean sea-level rise.

23



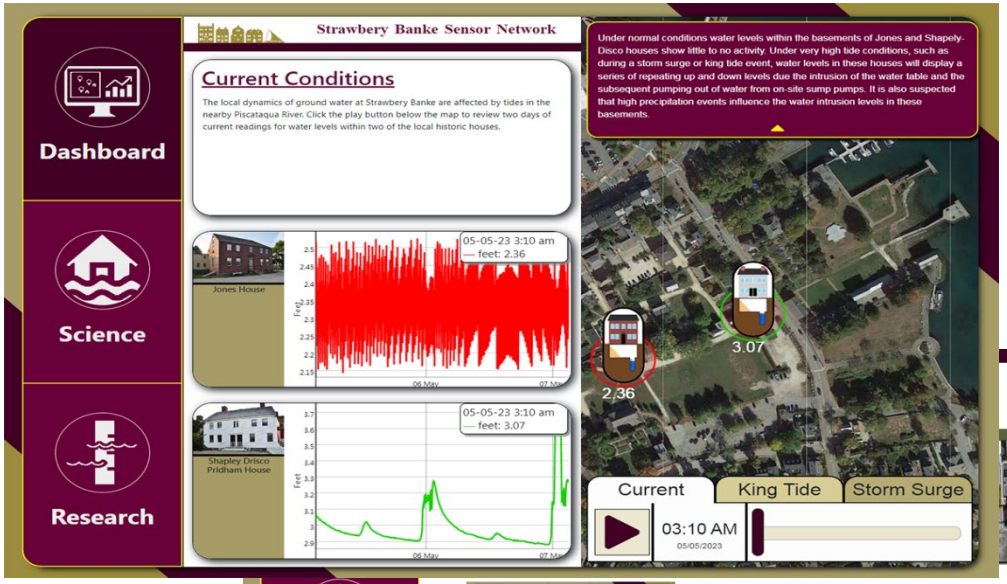
Sensor Deployments

- Strawbery Banke Museum Deployment 2022-23

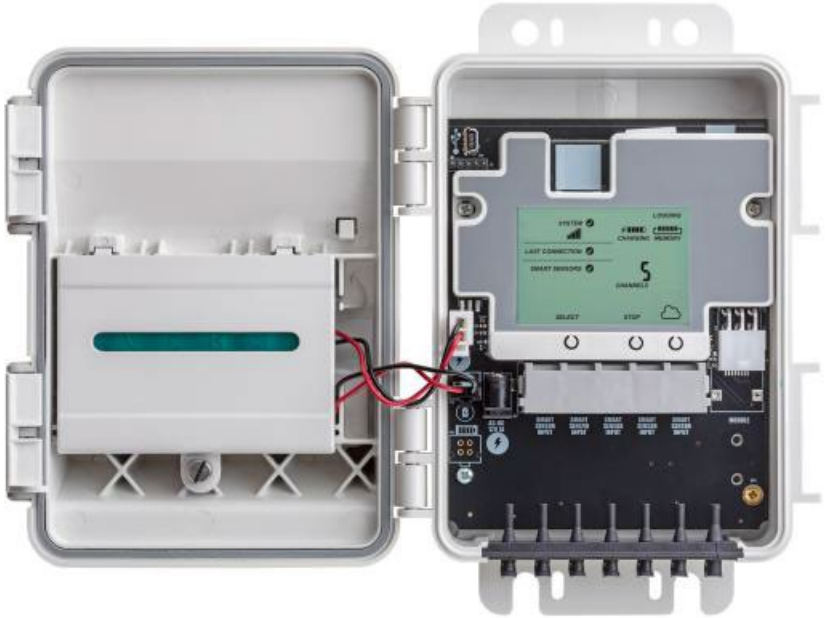


Web Mapping Applications

- SBM Water Level Monitoring Network



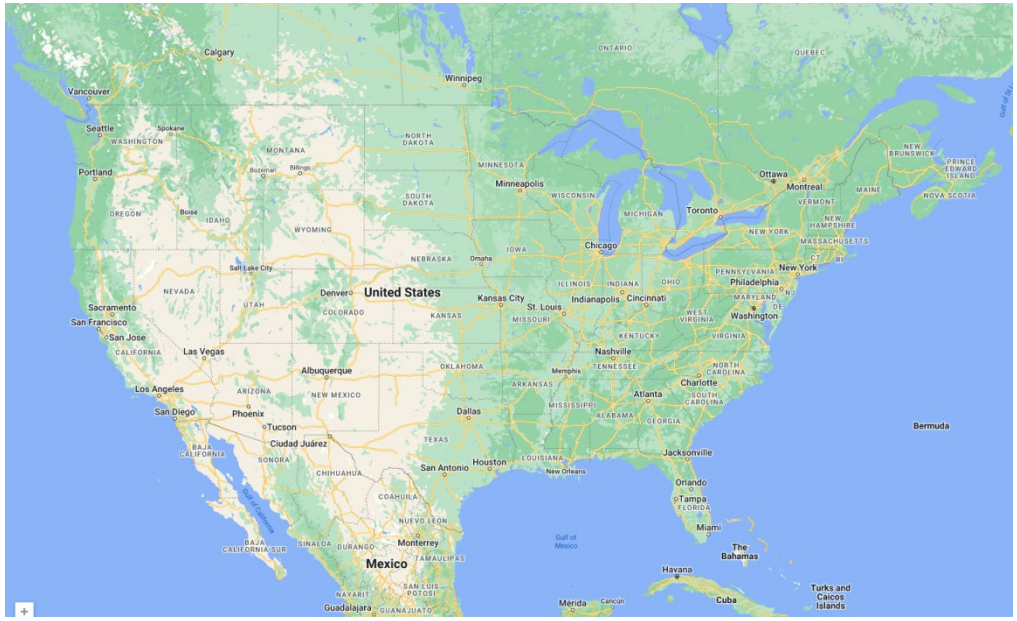
Hands On Example of a Water Level Logger and Sensor



Photos by Onset Technologies

Future Deployments

- Future Deployments in Portsmouth, NH
- Collaborations ?
- Combined Network ?



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