

Co-production of Knowledge

NAC CESU



Peter August
Judith Swift

Coastal Institute
University of Rhode Island

Thanks



Nigel Shaw
Sara Stevens
Dennis Skidds
Charles Roman (ret)

THE
UNIVERSITY
OF RHODE ISLAND
COLLEGE OF
THE ENVIRONMENT
AND LIFE SCIENCES

Judith Swift
Roland Duhaime
Chuck LaBash
Mike Bradley
Amber Neville



NAC CESU History



Established 1999
URI Host
8 Federal Partners
23 Univ & Other Partners



NAC CESU Issues



Invasive species management

Climate change impacts

Development of effective adaption mechanisms

Climate change mitigation strategies

Water quality and quantity

Environmental emergency response planning

Wildlife management and conservation of biodiversity

Ecosystem services

Development of sustainable energy systems in coastal and near-shore settings

Environmental monitoring

Data management

Nutrient enrichment and eutrophication

Overexploitation of renewable resources

Vector-borne diseases and insect pests

Protection of cultural resources and heritage



Essentials of Co-production



Long-term or intense relationship

Active participation by scientists & decision-makers

Science to support management



Case Studies



Programs

Northeast Coastal and Barrier Network, NCBN (NPS I&M Program)

Hurricane Sandy Response

FTSC – Field Technical Support Center

Format

3-4 representative tasks

How it fits within the co-production activity/relationship model

Northeast Coastal and Barrier Network NPS I&M Program



Established 1999, 32 networks across the country

Coordinate monitoring of coastal National Parks in the Northeast

4 NPS staff housed in the URI Department of Natural Resources

Numerous and diverse scientist/decision-maker relationships



I&M Tasks



Summer monitoring of salt marshes
Engage college student field crews



I&M Tasks



Scientists develop and implement monitoring protocols



Box Turtle Monitoring at William Floyd Estate

I&M Tasks



Training:

Scientists -> Decision-makers (Emerging Technologies, Climate Change Planning)

Decision-makers -> Students/Scientists (GPS, Coastal Issues, Stats, mentoring)



I&M Tasks

Communication:

Translating the science for non-scientists

URI SEACOMM – Society, Ecology, and Communication Laboratory



Northeast Coastal and Barrier Network

National Park Service
U.S. Department of the Interior
Northeast Coastal and Barrier Network



Old Inlet, Before Hurricane Sandy



Old Inlet, After Hurricane Sandy

The storm surge from Hurricane Sandy caused several breaches, or breaks, in barrier islands managed by the National Park Service, including this one at Old Inlet in Fire Island National Seashore in New York.

Elevation Mapping Helps Build Resilient Coastal Communities

When Hurricane Sandy hit the east coast of the United States on October 29, 2012, it battered coastal towns with heavy winds and a storm surge of up to 14 feet. The storm displaced more than 23,000 people and decimated critical infrastructure. With damages exceeding more than \$68 billion, Sandy was the second most costly storm in U.S. history.

Many National Park Service sites were impacted by Hurricane Sandy—including three major coastal parks, Fire Island

between 1980 and 2009, according to a U.S. Geological Survey report. This makes coastal storm response an especially urgent management issue in the mid-Atlantic region.

Coastal elevation mapping is essential to making informed decisions in response to threats to public safety, property, and critical natural resources like marine fish, mammals, and birds. By better understanding past storms and modeling future scenarios, elevation data helps



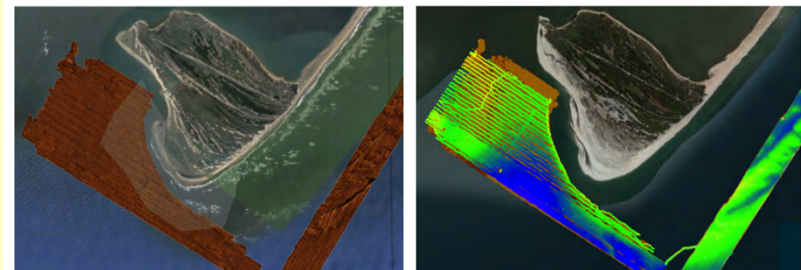
Maintenance facilities at Fort Hancock, located in the Sandy Hook Unit of Gateway National Recreation Area, were underwater and only accessible by boat after Hurricane Sandy.

Northeast Coastal and Barrier Network

National Park Service
U.S. Department of the Interior
Hurricane Sandy Science

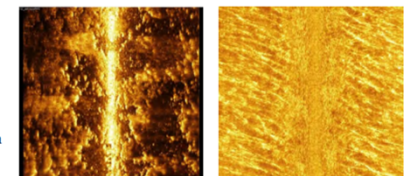
Submerged Habitat Mapping

Filling a Data Gap and Facilitating Resource Stewardship Following Hurricane Sandy



Images of the southern tip of Assateague Island National Seashore show two types of preliminary data used in developing habitat maps. In the sidescan sonar map (left), a range of gold colored tones represent various seafloor types. In the bathymetry map (right), the color scale ranges from green to blue, representing shallower to deeper water depths, respectively. Together, these maps provide a rich picture of the various habitats and their characteristics present off the coast of our parks. Credit: Art Trembanis and Doug Miller, University of Delaware.

Research teams from four institutions have been mapping the underwater habitats of four coastal National Parks in the northeast. This submerged habitat mapping effort provides researchers and National Park Service (NPS) staff with a unique view of seafloor features and habitats. The NPS is charged with protecting vast submerged areas, yet the current information base about those areas is limited. Managers need to better understand the ecosystem structure and function within National Parks - including submerged areas - and how these habitats are changing.



I&M: Co-production of Knowledge



Application	Activity	Relationship
Summer Monitoring	Rapid Assessment Process	Collaborative
Scientist-driven Monitoring	Action Research	Collegial
Training	Boundary Organization	Collegial (both directions)
Communication	Transdisciplinarity	Collaborative

Hurricane Sandy

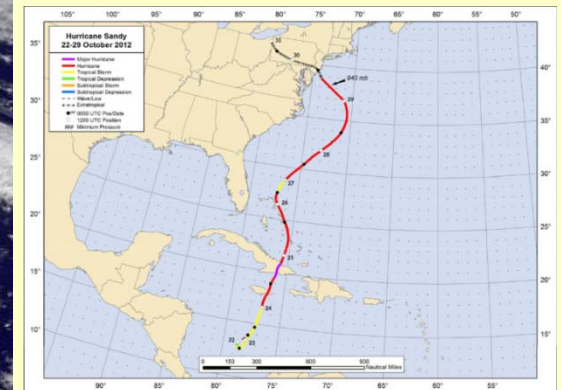


- October 2012
- NPS properties in New York, New Jersey hit hard
- CESU mobilized to rapidly engage scientific community to provide assistance to parks
- Scientists had long-term relationships with Parks and pre-storm data

Maximum Wind Gusts
75 – 90 mph

Offshore Wave Height
32.5 ft

Storm Surge
9.5 ft above normal tide



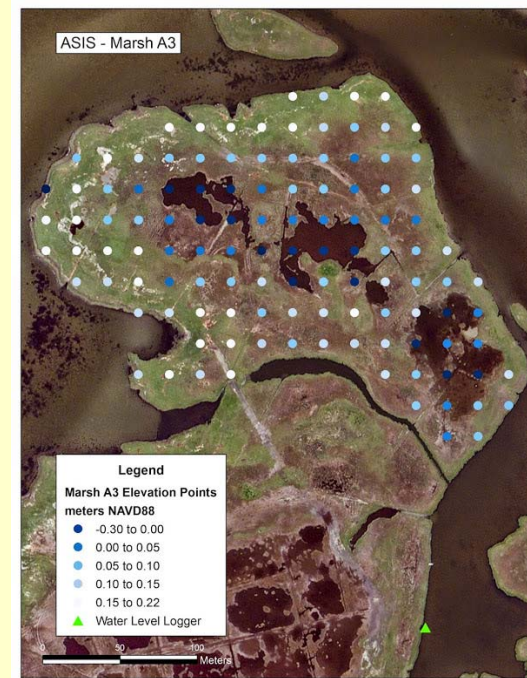
Hurricane Sandy Projects



Barrier Island Vegetation Change and Post-Storm Recovery (SUNY-ESF)

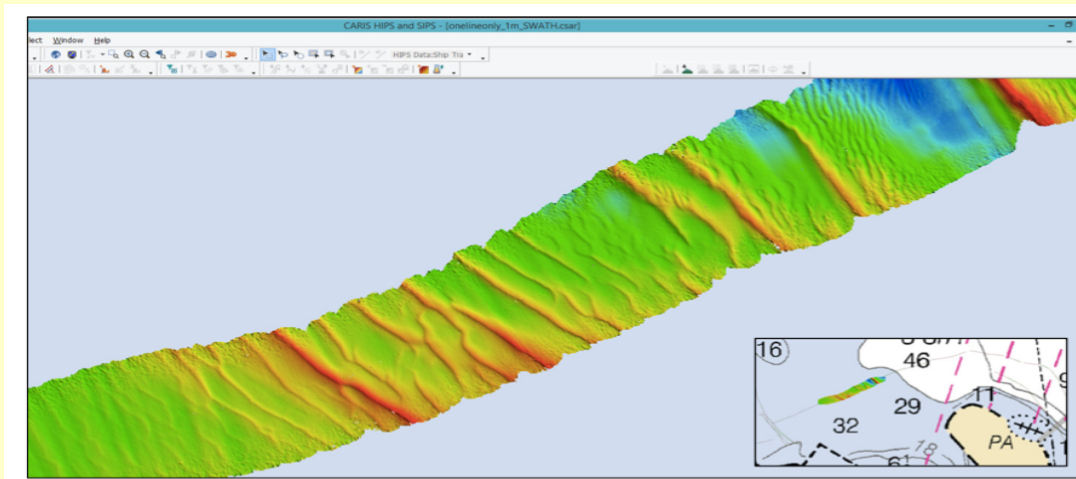


Breach Dynamics and Response of Great South Bay Ecosystem, (Stony Brook U)



Acquire High Resolution Elevation Data for Inundation Modeling; Fire Island, Gateway, Assateague (URI, Rutgers U)

Hurricane Sandy Projects



BASE surface showing bathymetry at 0.5m resolution

*Submerged Marine Habitat Mapping and Inventory
(U Delaware, Rutgers, Washington College, URI,
Center for Coastal Studies)*



Hurricane Sandy

Co-production of Knowledge



Application	Activity	Relationship
Varied Projects	Rapid Assessment Process Transdisciplinarity	Consultative/Collaborative

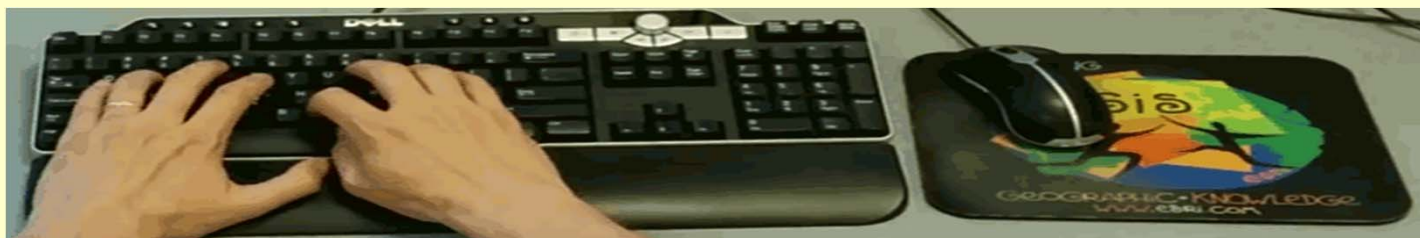
FTSC

Established 1996 by the National Park Service
Northeast Regional (NER) GIS Office

URI Environmental Data Center, supports
northern portion of NER

NCSU (SAC CESU), supports southern portion of
NER

GIS Tech Support, Database Development,
Training



FTSC



GIS Capacity

High

*ACAD, CACO,
GATE, ASIS, SHEN,
COLO, GETT, VAFO,
NERI, BLUE, GARI*

Moderate to Low

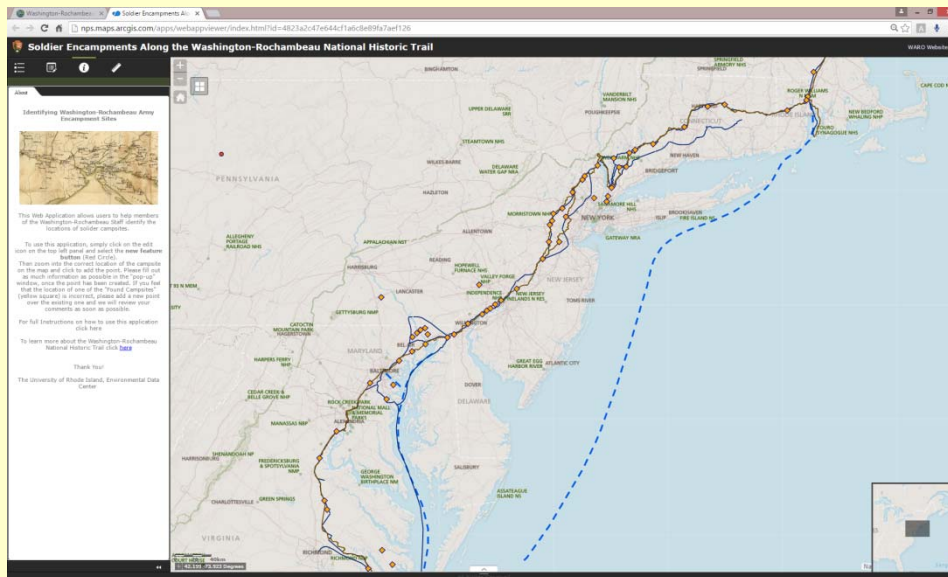
80 others!



FTSC Tasks



Mapping the Washington-Rochambeau Trail



FTSC Tasks

First Floor Elevations & Flood Risk



Aimee Mandeville, MI...   

Storm Vulnerability Assessment

Results: Potential Storm Vulnerability

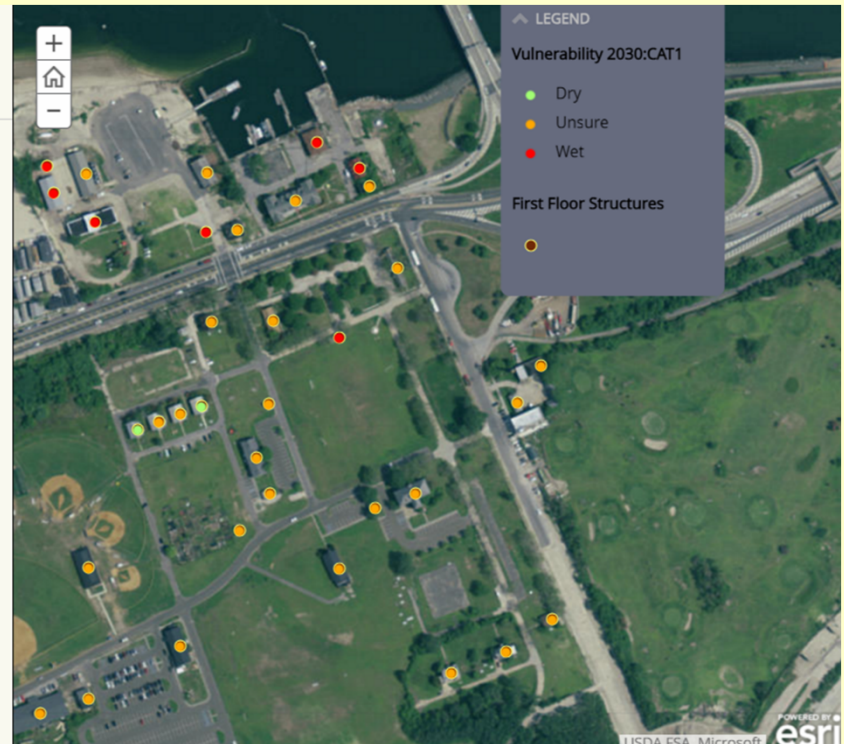
We found that projected sea level scenarios for 2030 and 2050 (low to high) had little effect on a building changing RISK code (**wet/dry/unsure**) within a hurricane category. We therefore only include the 'high' estimates for SLR at **2030 (1' SLR)** and **2050 (2' SLR)**.

Use the **CAT** LINKS below to view the building results in the map.

Zoom in on the map to view imagery.

Click on a building point to see more information in a pop-up.

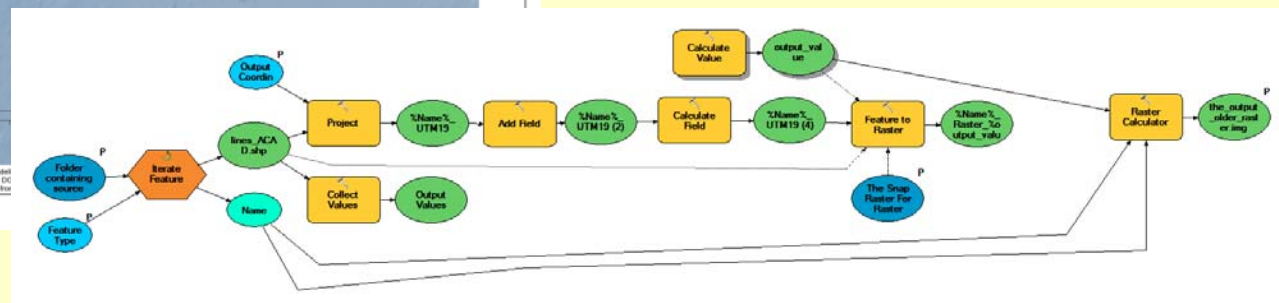
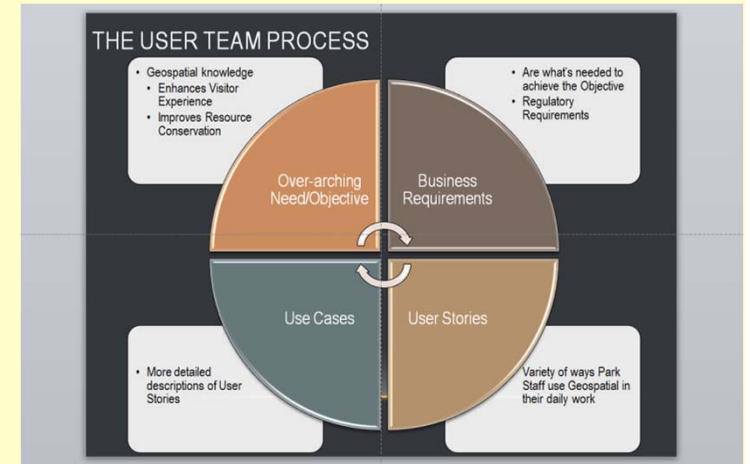
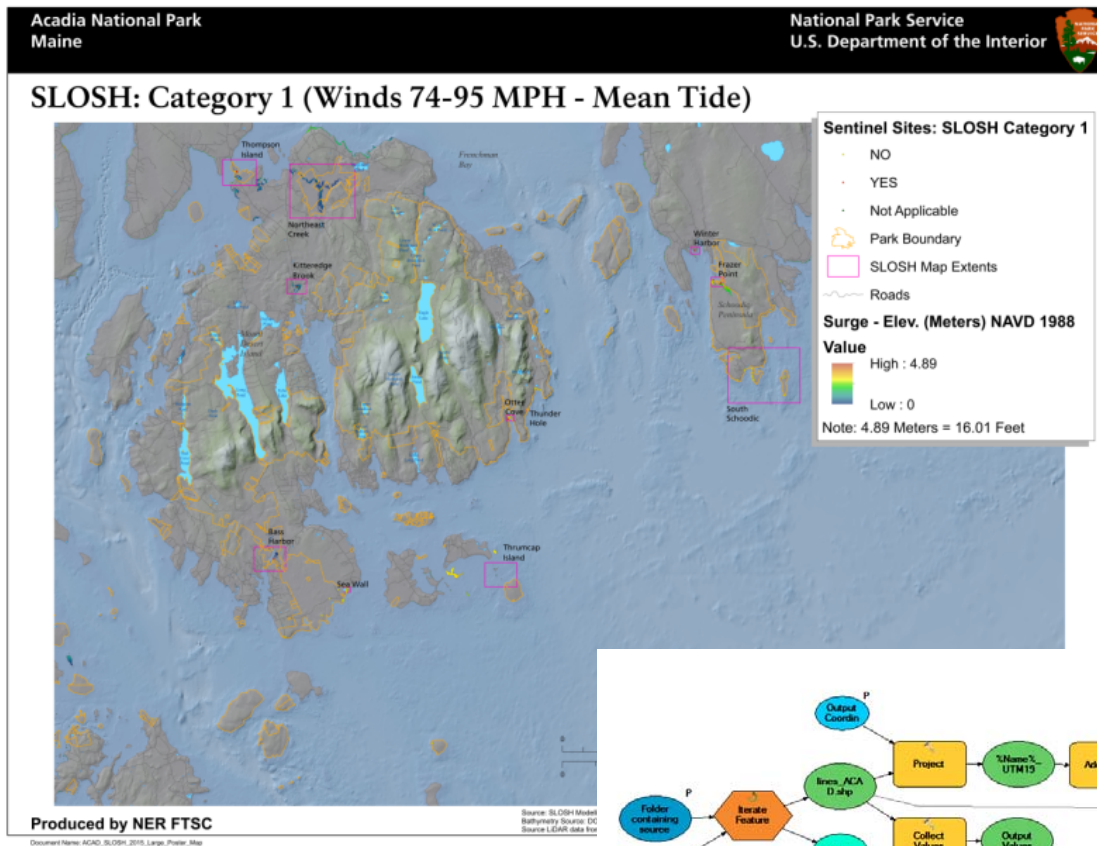
2030: [CAT1](#) [CAT2](#) [CAT3](#)
[CAT4](#)



FTSC Tasks



GIS Tech Support, Modeling, Analysis



FTSC & Co-production of Knowledge



Application	Activity	Relationship
Washington-Rochambeau Trail	Participatory Integrated Assessment	Consultative/Collaborative
First Floor Elevation Data Collection	Transdisciplinary	Collaborative/Collegial
GIS Tech Support, Modeling	Rapid Assessment Process	Consultative

Summary



CESU heavily used

Benefits scientists, decision-makers, managers, and students

Trains the next generation of natural resource stewards

Encourages and supports all possible combinations of co-production activities

