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)

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

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
## I&M: Co-production of Knowledge

<table>
<thead>
<tr>
<th>Application</th>
<th>Activity</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer Monitoring</td>
<td>Rapid Assessment Process</td>
<td>Collaborative</td>
</tr>
<tr>
<td>Scientist-driven Monitoring</td>
<td>Action Research</td>
<td>Collegial</td>
</tr>
<tr>
<td>Training</td>
<td>Boundary Organization</td>
<td>Collegial (both directions)</td>
</tr>
<tr>
<td>Communication</td>
<td>Transdisciplinarity</td>
<td>Collaborative</td>
</tr>
</tbody>
</table>
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

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

Co-production of Knowledge

<table>
<thead>
<tr>
<th>Application</th>
<th>Activity</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varied Projects</td>
<td>Rapid Assessment Process Transdisciplinarity</td>
<td>Consultative/Collaborative</td>
</tr>
</tbody>
</table>
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
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

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

2050 Results:
FTSC Tasks

GIS Tech Support, Modeling, Analysis
<table>
<thead>
<tr>
<th>Application</th>
<th>Activity</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington-Rochambeau Trail</td>
<td>Participatory Integrated Assessment</td>
<td>Consultative/Collaborative</td>
</tr>
<tr>
<td>First Floor Elevation Data Collection</td>
<td>Transdisciplinary</td>
<td>Collaborative/Collegial</td>
</tr>
<tr>
<td>GIS Tech Support, Modeling</td>
<td>Rapid Assessment Process</td>
<td>Consultative</td>
</tr>
</tbody>
</table>
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