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Stakeholder Attitudes on Sustainability and Resiliency: Lessons from Coastal New Jersey

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Sea Grant
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Barnegat Bay Partnership
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Research Objectives

- Assess critical economic vulnerabilities in the Barnegat Bay region of New Jersey
- Identify adaptation options
- Identify key options and barriers to enhancing resilience in the region
- Provide baseline for further research on economic resilience in coastal New Jersey

Background

We know relatively little about the economic impacts of climate change for sectors and regions:

- Difficulties with defining climate change – more and worse extreme events, changes in baseline weather conditions, changes in ecosystem services
- Difficulties with the issue of time – future changes are often projected onto current settlement patterns; difficulty predicting what society will look like in the future; summing up probabilities of impacts over many time periods
- Difficulties with existing methods that we use for impact assessment – premised on a stable environmental baseline (e.g. input output analysis)

Background

What we do know comes from:

1. Global and national level sectoral assessments (especially agriculture, forestry, coastal zones) (*what are the impacts*?)

1. Studies of assets at risk to particular stresses (e.g. value property exposed to sea level rise) (*what is at risk?*)

1. Studies of the economic impacts of specific, past events (e.g. damage and disruption from extreme storm) (*what are the costs?*)

1. Studies of social-economic vulnerability (*who is at risk?*)

Contribution of this study

- Paying attention to the **economic dimensions** of vulnerability and resilience
- Emphasis on **assets, activities, and vulnerable** populations
- **Stakeholder-based assessment** of economic risks and vulnerabilities
- Recognizes interactions between climate change risks and other stresses

Stakeholder-based approach

- Primary data from stakeholder interviews
  - Structured, open ended interviews (one to two hours each)
  - 29 stakeholders (individual and group interviews)
  - Sampling based on expert judgment and snowball method
  - Aimed for state, county, local reps from public and private sectors, plus reps from major industries (e.g., tourism, fisheries, real estate)
- Secondary data from:
  - U.S. Economic Census
  - U.S. Population Census
  - Industry reports (e.g. Marine Trades Association)
  - Office of N.J. State Climatologist

Interview question topics

- Key present and future climate risks
- Economic assets and activities at risk
- Populations at risk
- Implications for emergency management
- Options for adaptation of assets and activities
- Options and barriers to enhance resilience of region

A Pre-Sandy Picture of Economic Vulnerability

- Our research team was completing the final copy edit of this report when the Barnegat Bay region and the entire New Jersey shore and New York-New Jersey metropolitan area were hit by Superstorm Sandy .

Interview Findings: Climate Stresses

Extreme Weather – General Increase in Extreme Weather

- Flooding, both riverine and coastal
- More hurricanes expected
- More snowstorms expected
- Droughts and heat waves expected
- Forest fires expected

Interview Findings: Climate Stresses

Gradual Changes – observed and expected

- Sea level rise
- Marsh die-back due to salt water intrusion
- Beach erosion
- Ocean acidification
- Decrease in ocean salinity
- Temperature increases
- Out-migration of fish
- Increase in pests and invasive species

Interview Findings: Non-climatic stresses

Demographic/Social Stresses

- Population increase & high proportion of senior citizens
- Decline in environmental/climate awareness

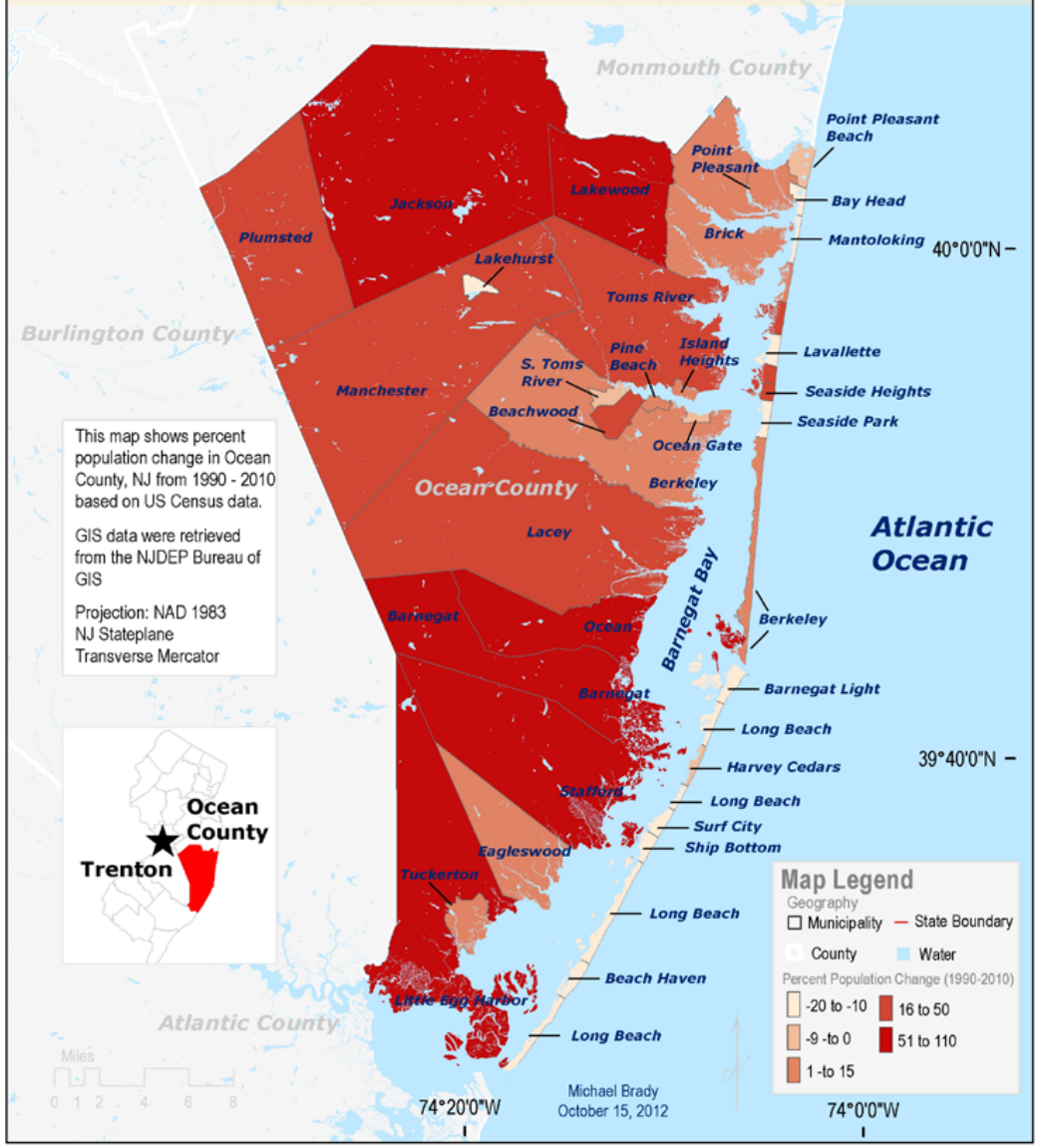
Economic Stresses

- Recession, Budget cuts
- Dependency on development and construction
- Lack of public transit
- Increased global and local demand for seafood

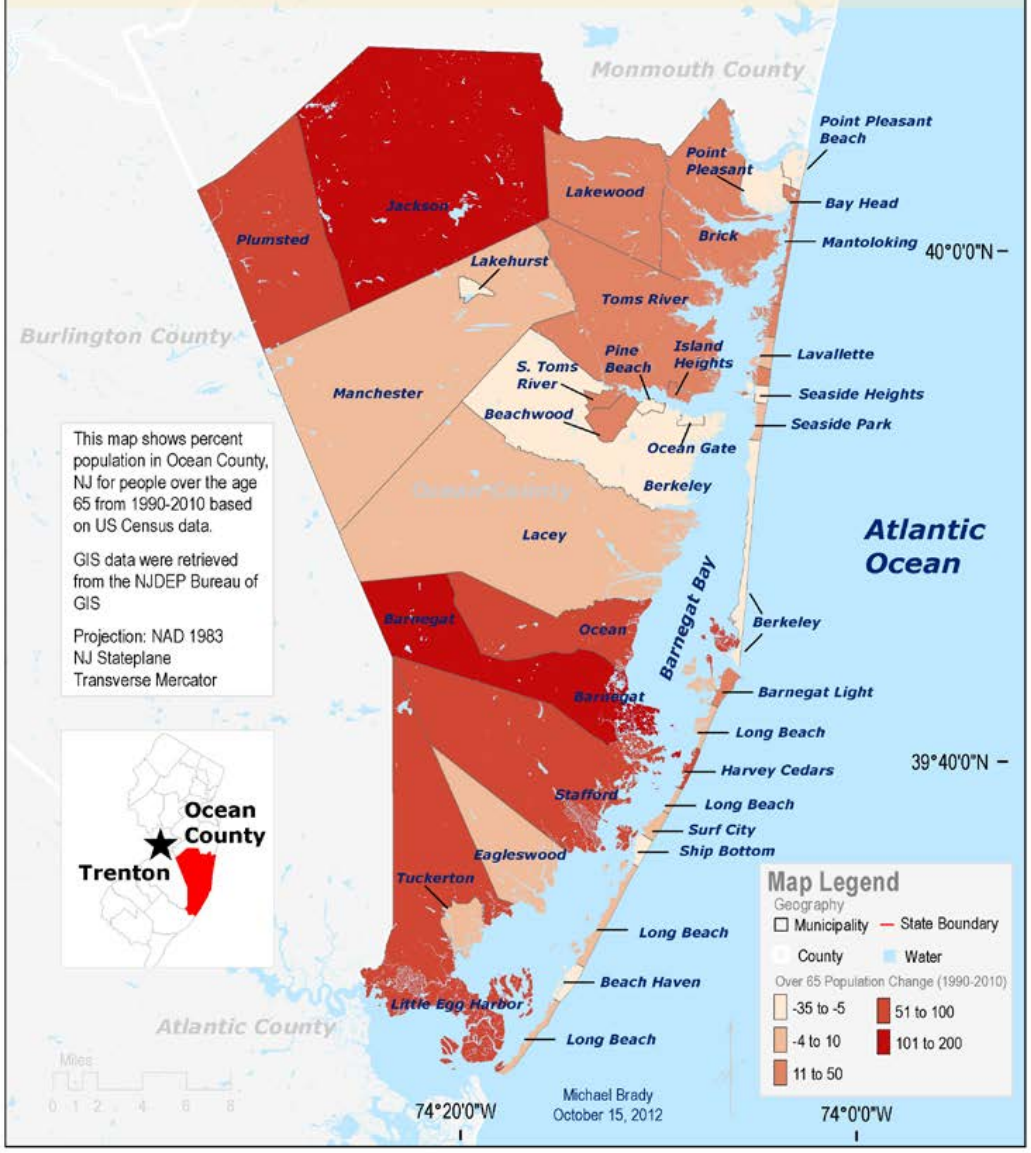
Environmental Stresses

- Development
- Pollution of Barnegat Bay
- Marsh die-off and alteration of sedimentation activity

Percent Population Change - Ocean County, New Jersey



Over 65 Population Change - Ocean County, New Jersey



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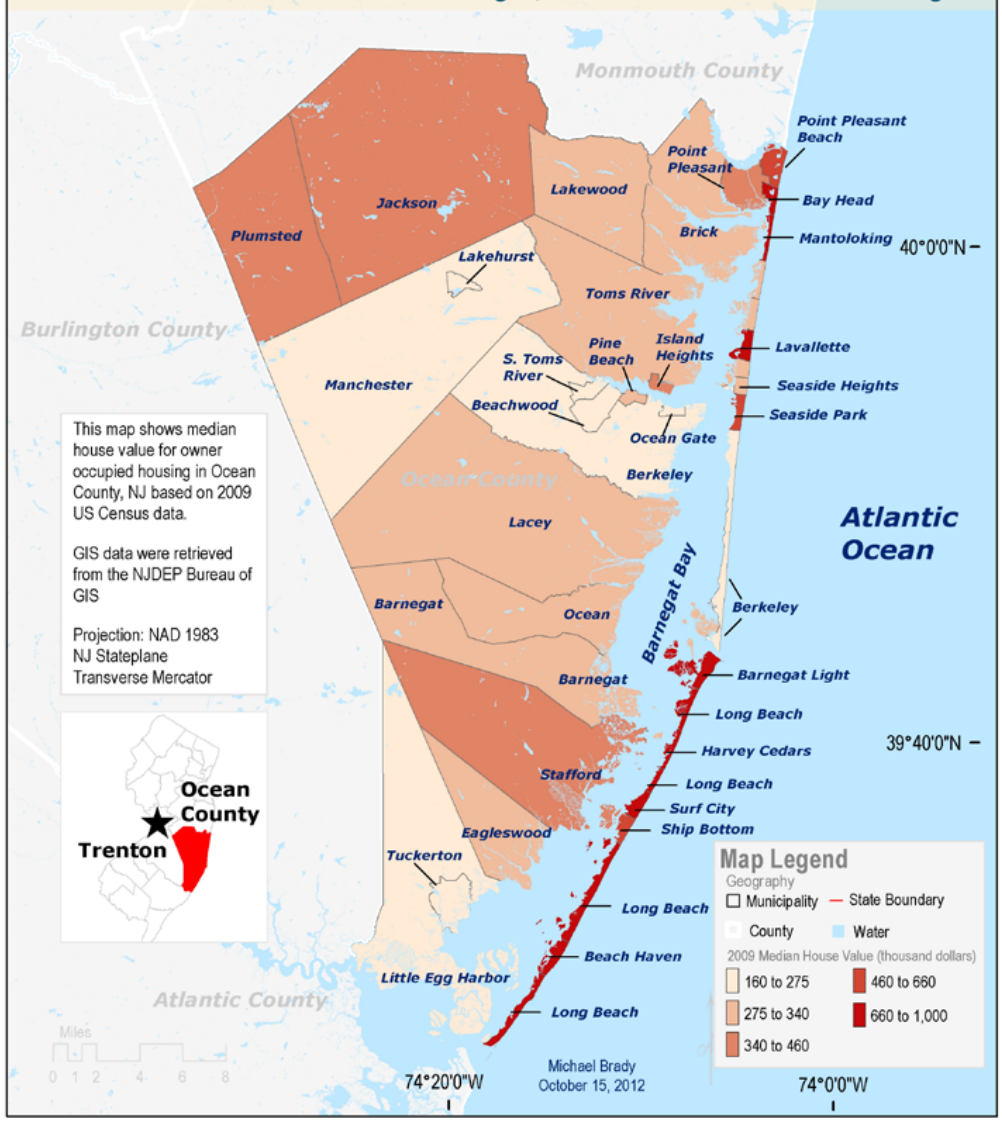
Median House Value - Ocean County, New Jersey



Interview Findings: Assets at Risk

- **Natural Assets at Risk**
  - Beaches
  - Fresh water
  - Marshes
  - Forests
  - Marine life

Interview Findings: Assets at Risk

- **Built Assets at Risk**
  - Roads, bridges and mass transit
  - Waterfront property
  - Recreational infrastructure - e.g. boardwalks
  - Tax-base of municipalities
  - Municipal facilities

Interview Findings: Activities at Risk

- Tourism
- Commercial fishing
- Recreational fishing
- Wildlife watching and park visitation
- Construction and real estate
- Insurance
- Agricultural production

Interview Findings: People and Groups at Risk (as a result of damage to assets or activities)

- Small business owners and their employees
- Commercial fishermen
- Farmers
- Low-income residents
- Low-income property owners
- Users of public amenities and parks
- Municipalities

Interview Findings: Emergency management (lessons of Irene)

- The value of preparedness
- The importance of lead time
- Cooperation of the public
- Need for vigilance in the future re: evacuations
- Difficulty of attribution of damage because Irene and Lee were so closely spaced

Interview Findings: Adaptation of Assets

- Beach replenishment/nourishment
- Shore armoring
- Retrofitting existing infrastructure and building new houses to code and raising the standards.
- New infrastructure, such as bridges, roads, floodgates and desalinization plants
- Restoration of marshes, dunes, and living shorelines
- Relocation/retreat/rolling easements
- Land use planning and control
- Insurance
- Research

Interview Findings: Adaptation of Activities

- Diversification across the economy (out of beach tourism and fisheries)
- Alternative tourism such as environmental tourism, non-beach activities, and agro-tourism
- Diversifying into multiple fisheries and aquaculture
- Infrastructural adaptations that minimize activity disruptions e.g. more indoor venues and air conditioning.
- Protecting ecosystem services

Interview Findings: Adaptation of Emergency management

- More evacuation routes
- Better coordination and communication
- Addressing special needs – evacuation and shelter
- Training of reserve personnel
- More specialized equipment – e.g. backup power

Interview Findings: Barriers to Enhancing Resilience

- **Physical and technological barriers**
  - Slow progress of SLR
  - Density of settlement
  - Limitations of engineering solutions – e.g. sea walls, bulk heads, beach nourishment
- **Political and cultural barriers**
  - Short term thinking
  - Denial of climate change
  - Lack of regional planning
  - Lack of government funding
  - Unequal sharing of burdens and benefits
  - Decreasing exposure of people to nature

Findings: Barriers to Enhancing Resilience

- **Policy and regulatory barriers**
  - Inflexible and inappropriate regulations
  - Expenses and delays in permitting
  - Too lax or laxly enforced regulations in some areas (e.g. building codes)
  - Perverse incentives and misguided policies (e.g. CAFRA as amended)
  - Assertion of private property rights to the detriment of the community
  - Difficulty in qualifying for federal disaster declaration

Findings: Options for Enhancing Resilience

- **Policy reform**
  - Change how development is regulated
  - Better enforcement of existing regulations and exercise of authority to regulate
  - Better planning, communication, regional coordination
- **Better research and information**
- **Take advantage of openings offered by catastrophic events**
- **Education** of the public about risks of climate change
- **Role for civil society** –public outreach, foster behavioral change

Lessons from Coastal New Jersey

- Stakeholders know a lot
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- There is need to make use of stakeholder knowledge of the sector and region to identify vulnerabilities, adaptation options, ways to enhance resilience, and barriers to resilience
- But stakeholders don't know everything There is tendency to suggest strategies that are familiar
- Developing an on-going rapport and relationship with stakeholders is critical for the success of these efforts.

Next Steps:

(NJ Sea Grant support)

1. Return to stakeholders for follow-up interviews:
   - What did Sandy reveal about vulnerabilities of assets, activities, populations; what did Sandy reveal about options to enhance resilience?
   - *What did we miss?*
2. Web-based survey of stakeholders in coastal NJ

   Who to focus on?

   Impacts and responses to Sandy?

Project Team Members

Barnegat Bay Team

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Sea Grant Team

All of the above, Rick Lathrop, Lisa Auermuller

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