

Post-Sandy Assessment of Living Shorelines:

Valuing the Multiple Benefits Provided by Green Infrastructure

Peter C. Wiley

Tuesday November 4, 2014

*Restore America's Estuaries 7th Annual Summit on
Coastal and Estuarine Restoration*

and

The 24th Biennial Meeting of The Coastal Society

Sandy



(Reuters/Lucas Jackson)

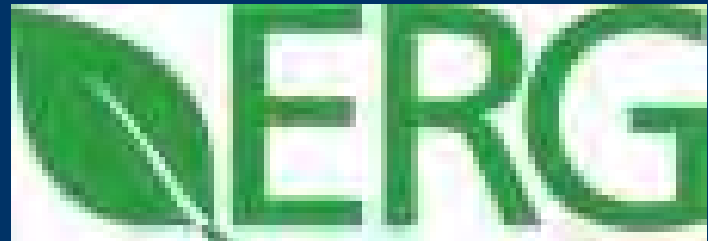
Ecosystem Services



Forsythe NWR. USFWS

NOAA and ERG

- **NOAA and ESV**
- **Disaster Relief Appropriations Act 2012**
- **Eastern Research Group**



Project Goals

- **Methods Development**
- **Estimates of economic value**
- **USACE & NFWS restoration projects**

Partners

- US Army Corps of Engineers
- US Fish and Wildlife Service
- The Nature Conservancy



Partner Engagement

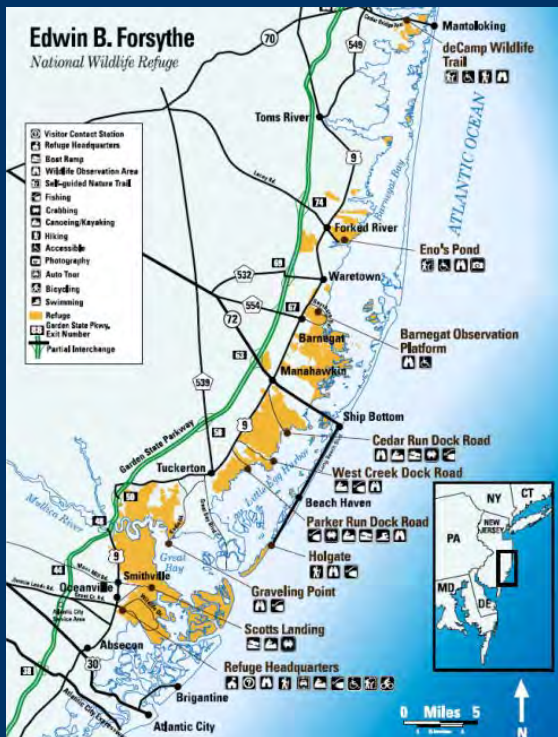
- **Information exchange**
- **Usefulness to current/future restoration**
- **Common need for methods, valuation info**

Project Steps

- **Potential restoration efforts**
- **Select study sites**
 - Geographic (state, urban/rural)
 - Relevancy
 - Breadth
- **Identify stakeholders, services**
- **Methods**
- **Implementation**

Forsythe NWR

- 50 miles, 47,000 acres
- ~100,000 visitors each year
- Managed for salt marsh, coastal forest and wildlife
- Heavy damage from Sandy
- Ongoing climate work



Forsythe NWR – Debris Removal

- **Restoration focused on Brick Township, NJ**
- **300 tons of debris removed**
- **Ecosystem Services**
 - Recreation
 - Water purification
 - Carbon sequestration

Forsythe NWR – Salt Marsh

- **Restoration**

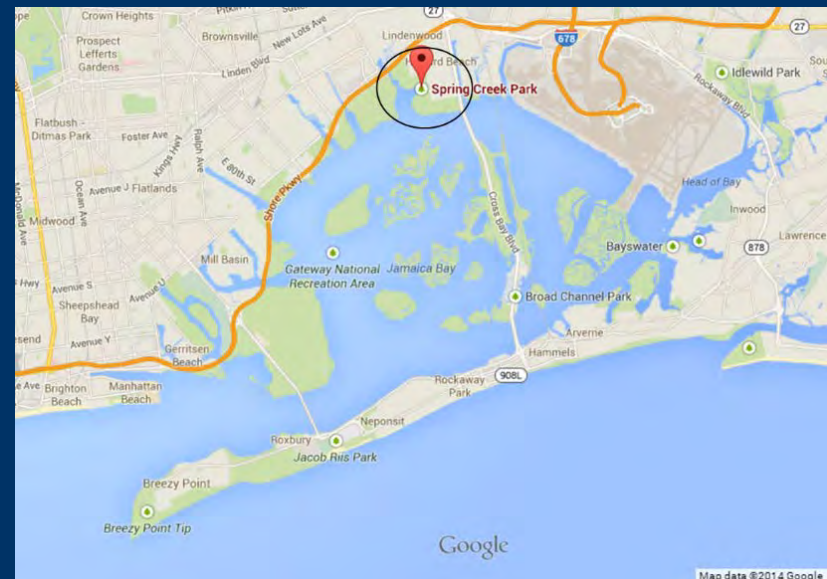
- Enhance salt marshes to increase storm protection as well as other ES values
- Involves raising the elevation
 - natural flooding regime
 - Restore tidal flow

- **Services**

- Recreation, flood protection, water purification, carbon sequestration

Jamaica Bay – Spring Creek Park

- **Howard Beach Section of Queens**
- **Saline with freshwater input**
- **55 acres of marsh with some vegetated uplands and dunes**
- **Sandy damages to marsh**



Spring Creek Park

- **Restoration Options**

- Re-contouring uplands
- Restoration with dredged material

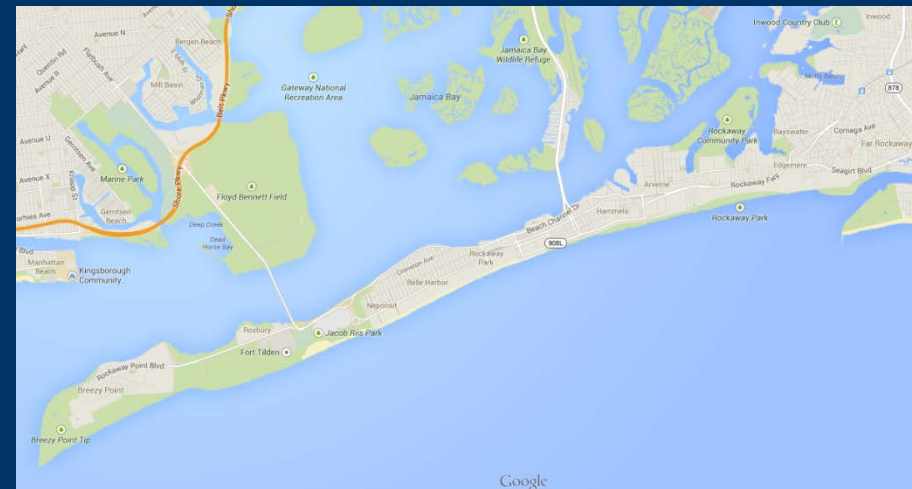
- **Services**

- Recreation
- Fisheries habitat
- Bird habitat
- Storm protection
- Water purification



Rockaway Beach

- On the Rockaway Peninsula
- Attracted 300 mil + visitors in 2013
- Sandy Damage
 - Severe erosion
 - Boardwalk damaged



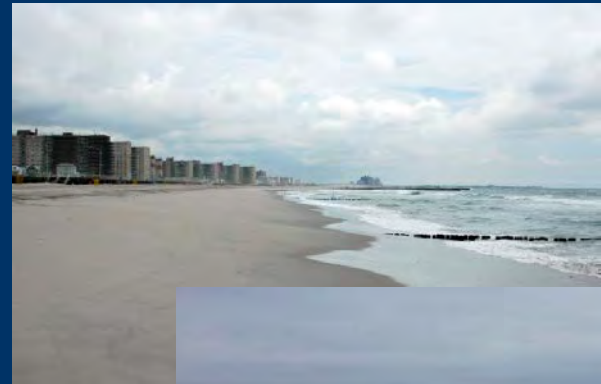
Rockaway Beach

- **Restoration**

- Beach replenishment to 1970 profile including berm
- Dune enhancement and dune grass
- 300 million cubic yards of sand

- **Ecosystem Services**

- Recreation
- Wildlife maintenance
- Flood protection



Methodology

- **Contingent valuation**
- **Formulating restoration scenarios in terms of changes in ES**
- **Based on outcomes of restoration work**
- **Allows the assessment of a range of options**

Sample

- **Sample based on study sites**
 - Brooklyn-Queens boroughs (possibly broader)
 - Areas surrounding Forsythe NWR
- **Based on stakeholder groups who benefit from the ecosystem services**

Living Shorelines



- **Breadth of services provided**
- **Resiliency in the face of both natural disasters and SLR**
- **Living shoreline benefits information applications**

Questions?

Thanks!

Pete Wiley

NOAA Office for Coastal Management
peter.wiley@noaa.gov