Systems Approach to Geomorphic Engineering

Debbie Larson Salvatore
U.S. Army Corps of Engineers/Institute for Water Resources
Systems Approach to Geomorphic Engineering (SAGE)

• Promotes the integration of green and gray solutions for coastal protection

• Understands shoreline changes in the context of natural coastal processes

• Builds partnerships to research, plan, design, and fund projects that increase the resilience of coastal communities
Multiple Lines of Defense

HEALTHY ESTUARY

1. Offshore Shelf
2. Barrier Islands
3. Sound
4. Marsh Landbridge
5. Natural Ridge
6. Highways
7. Flood Gates
8. Levees
9. Pump Station
10. Elevated Building
11. Evacuation Route
SAGE is a community of practice

- Collaborative effort between federal and state agencies, non-governmental organizations, academia, and private business & engineering firms

Among others...
National Work Groups

- Science and Engineering
- Metrics
- Policy
- Finance
- Communications
Regional Pilots

- Develop communities of practice that advance a regional approach to living shorelines and other natural features
  - Expand knowledge base of practitioners
  - Demonstrate the value of collaboration
  - Lead to increased number of projects

- Locations:
  - San Francisco Bay
  - Barnegat Bay
  - Chesapeake Bay
Regional Pilot Goals

• Build a Community of Practice
  • Bringing together knowledge and expertise across all sectors

• Establish a regional plan
  • Applying knowledge from Community of Practice to set regional goals
  • Identifying priority areas

• Implement plans
  • Identifying funding sources (public and private)
Barnegat Bay, NJ

- 75 mi² estuary, situated between the mainland and barrier islands
- Wetland loss and shoreline erosion
- Assembled a Community of Practice
- Developed a regional strategy that identifies priority areas and funding needs
- Received a FHWA Green Infrastructure Grant to conduct research in one of the priority areas
Great Bay Boulevard Project

- Investigate physical conditions that initiate flooding
- Determine influence of the natural wetland system in protecting the highway
- Provide recommendations for use of green infrastructure solutions to lessen frequency and severity of flooding
- Work with FHWA and SAGE Finance Group to get the preferred option constructed
Science and Engineering

• Design criteria for living shorelines

• Value of ecosystem and coastal protection services

• Data needs
  • Wave attenuation over marshes
  • Long-term monitoring efforts

• Metrics for evaluating success of living shorelines
Policy

Permits!

- Easier to get a permit for hard structures than living shorelines
  - Communicate with regulators
  - State and Regional General Permits
  - Nationwide Permit B for living shorelines
Conservation Finance

- New opportunities in conservation finance
- Linking coastal conservation projects with investor expectations
- Challenges to conservation finance growth
- Potential investment mechanisms
- Paradigm shifts necessary to reduce impediments for investors
Building a Community of Practice

• Duplication of efforts
  • A lot of momentum around living shorelines, but not enough communication
  • Understand all the stakeholders and projects within a region before starting a new initiative

• Leadership
  • States need to be the leaders
Questions?

SAGE Website: http://sagecoast.org

Debbie Larson-Salvatore
U.S. Army Corps of Engineers
debbie.larson-salvatore@usace.army.mil