Visitor use and impact monitoring at North Carolina National Estuarine Research Reserve Sites

Chelsey Walden-Schreiner, Katharine Conlon, Anna Miller, & Dr. Yu-Fai Leung
Parks, Recreation & Tourism Management Department
North Carolina State University

1 Background

- NC Coastal Reserve and National Estuarine Research Reserve Network
- Protects natural areas for education, long-term research and compatible recreation
- Preserves more than 41,000 acres of coastal land (6 NCCR Sites; 4 NCNERR Sites)
- Visitor use presents a significant management challenge
- There was a need for innovative and flexible visitor use and impact monitoring tools accessible to volunteers

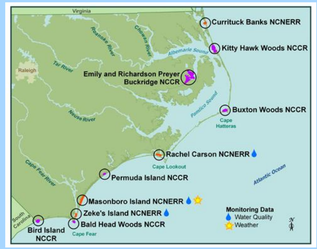
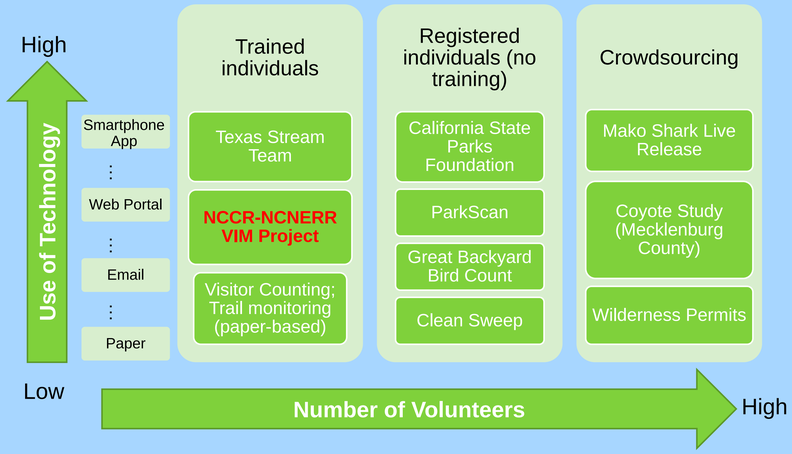


Figure 1. Map of NCCR and NCNERR Sites

2 Project Goals

1. To support management with timely and quality visitor impact monitoring data
2. To engage the public and local communities in monitoring
3. To enhance stewardship education through participatory monitoring
4. To serve as a prototype for implementation at additional sites



3 Data Collection for Indicators

1. **Dog leash non-compliance** – visitors allowing dogs to roam off leash

   Data collection:
   - Observation-based – examining dog and owner location, behavior and characteristics
   - Multiple data collection platforms (free/low cost)
     - Web-based using Google Sites and Drive (Form, Spreadsheet)
     - iPhone App: *Forms*
     - Paper version of Google Form

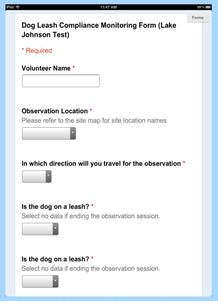


Figure 2. iPad/iPhone form for dog leash non-compliance

2. **Visitor-horse interaction** – visitors approaching and interacting with the horses on Rachel Carson Island

   Data collection:
   - Behavior observations similar to dog-leash indicator
   - 2 locations near the water hole
   - Laser rangefinder used to evaluate distance measure between the visitor and the horse
   - Camera monitoring provides additional data

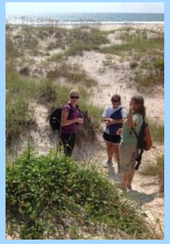
Figure 3. Horses grazing on Rachel Carson Island

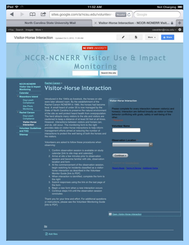
3. **Informal trail/site proliferation** – creation of informal trails in the area by visitors

   Data collection:
   - Photo-point monitoring method
     - 3 select locations
     - Permanent photo-points established
     - Photos taken facing 4 cardinal directions at fixed height
     - Extent and pattern of disturbed areas quantified from photos using a grid and percent vegetation cover class
     - Monitoring repeated every 3-6 months

Figure 4. Example of trail proliferation on Masonboro Island

4 Lessons Learned from 2013





1. Data Instrument
   - Training workshop helped capacity building and quality assurance
   - Tablets worked well in the field
     - Must be flexible if you need to change or add data on the fly
   - Open source was affordable, but difficult when applications were off the market
1. Use of Volunteers
   - Liked central website for information
     - Could supplement training with videos

5 Intended Efforts for 2014

- Monitoring protocols tested and refined
- Volunteer recruitment and training
- Data reporting and result dissemination
- Project evaluation and future planning

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