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Western CEDAR

Salish Sea Ecosystem Conference

2018 Salish Sea Ecosystem Conference
(Seattle, Wash.)

Apr 5th, 4:00 PM - 4:15 PM

Effective application of citizen science for adaptive management of an aquatic marine reserve

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Effective application of citizen science for adaptive management of an aquatic marine reserve



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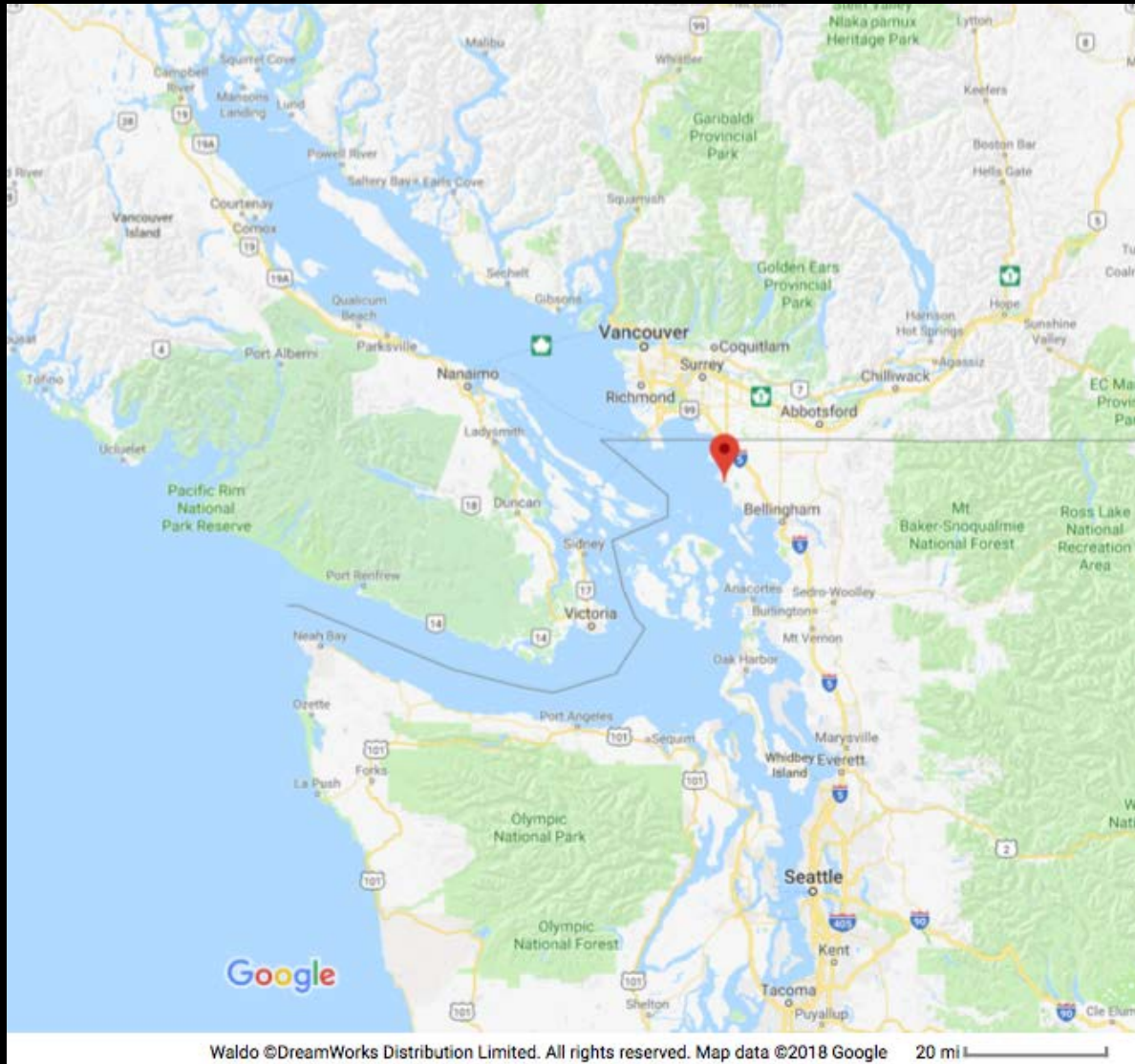
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Citizen Science

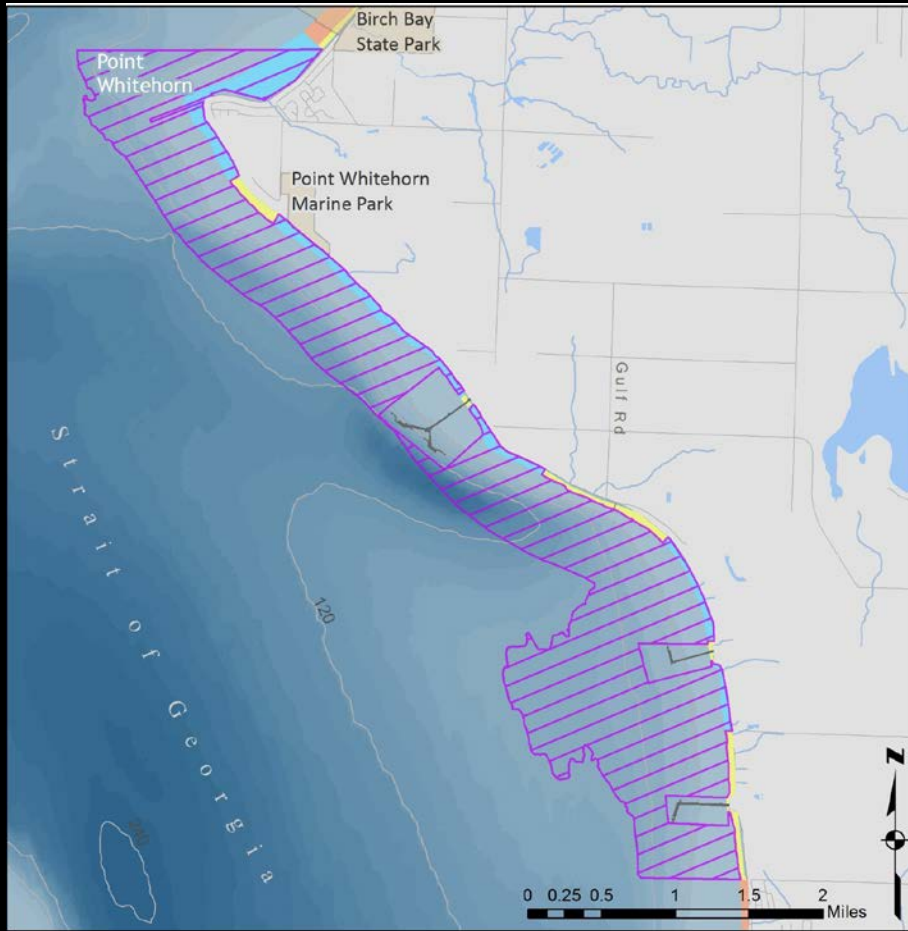
- Increasingly recognized as valuable and acceptable scientific data
- Ways to engage volunteers and build insistence in organizing
- How to integrate citizen science with policy
- Often functioning with limited resources



A Closer Look at Cherry Point



Cherry Point Aquatic Reserve



- Protect and restore important native ecosystems on state-owned aquatic lands
- Of special educational, scientific, and environmental value

Aquatic Reserve Citizen Stewardship Committees & DNR Aquatic Reserves Program



Bring together partners to inspire science-based stewardship of Washington's exceptional aquatic resources

Implementation Committee – Stakeholder Group



Intertidal Monitoring - Goals



- Measure:
 - Elevation profiles
 - Species diversity and abundance
- Education, outreach, and engagement
- Capture before/after of shoreline enhancement projects

Intertidal Monitoring - Goals



- Early detection of invasive species
- Know what's out there and in what abundance
- Data use in case of an oil spill or catastrophic event
- Fill data gaps and use to adaptively manage reserve

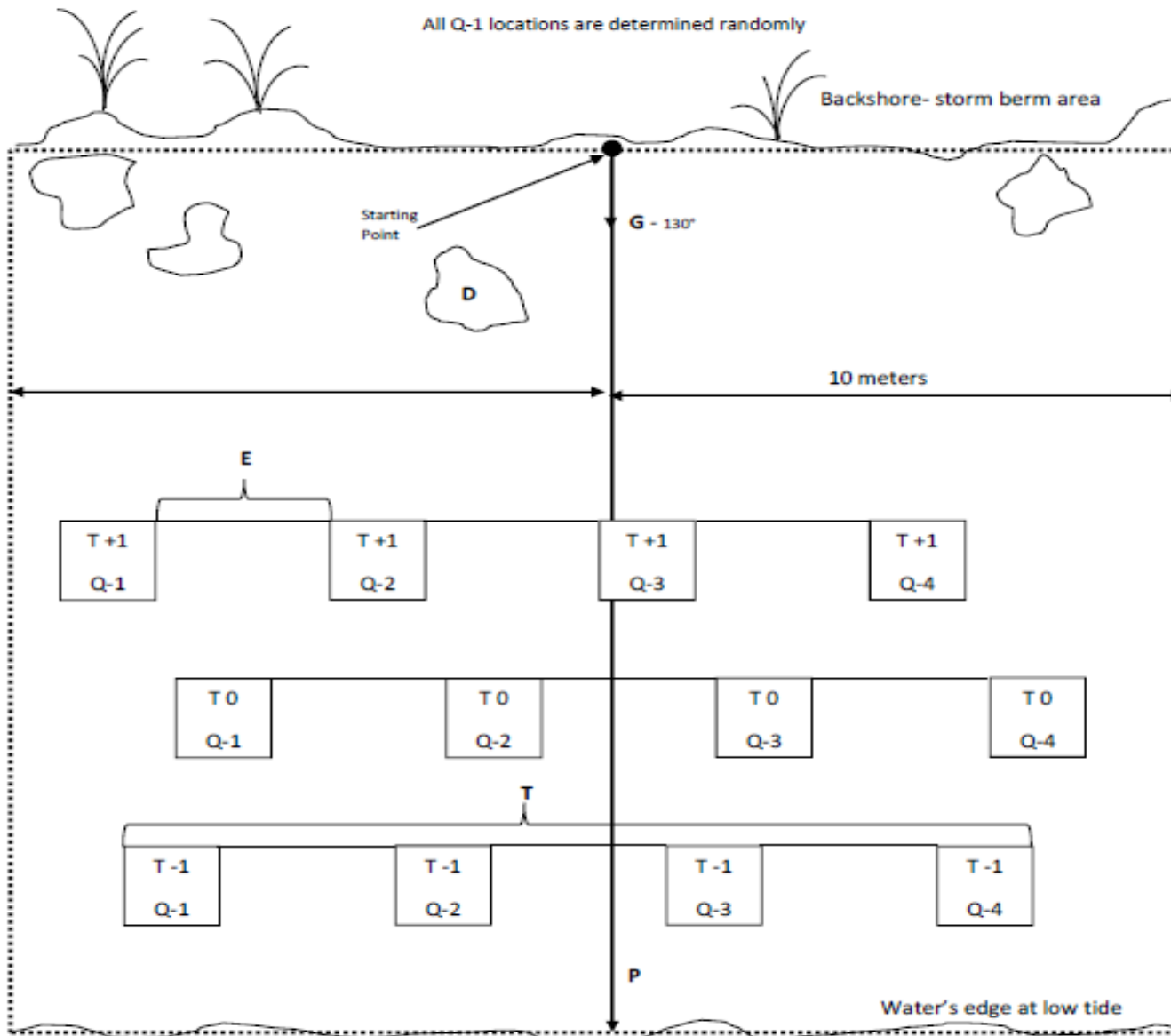
Intertidal Monitoring



- Train about 70 volunteers in Whatcom and Skagit per season
- 4 sites:
 - Barnacle Rock
 - Point Whitehorn Park
 - Intalco
 - Neptune Beach
- Each monitored once per year

Beach Monitoring Site Layout

All Q-1 locations are determined randomly



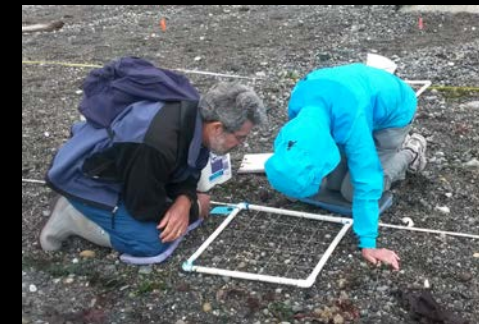
D Erratic near profile line which could be used as a vertical height reference point.

E Distance between quadrats. The four quadrats should be equally spaced along the transect line (16.5 feet apart).

G Compass heading of profile line towards horizon.

P Profile line, defined as line perpendicular to beach face from ordinary high water mark to one foot below mean lower low water or lower.

T Transect lines, defined as lines parallel to beach face at the tidal elevations of +1', 0', and -1'.



Methods adapted from Island County Beach Watchers (now known as the Sound Water Stewards)



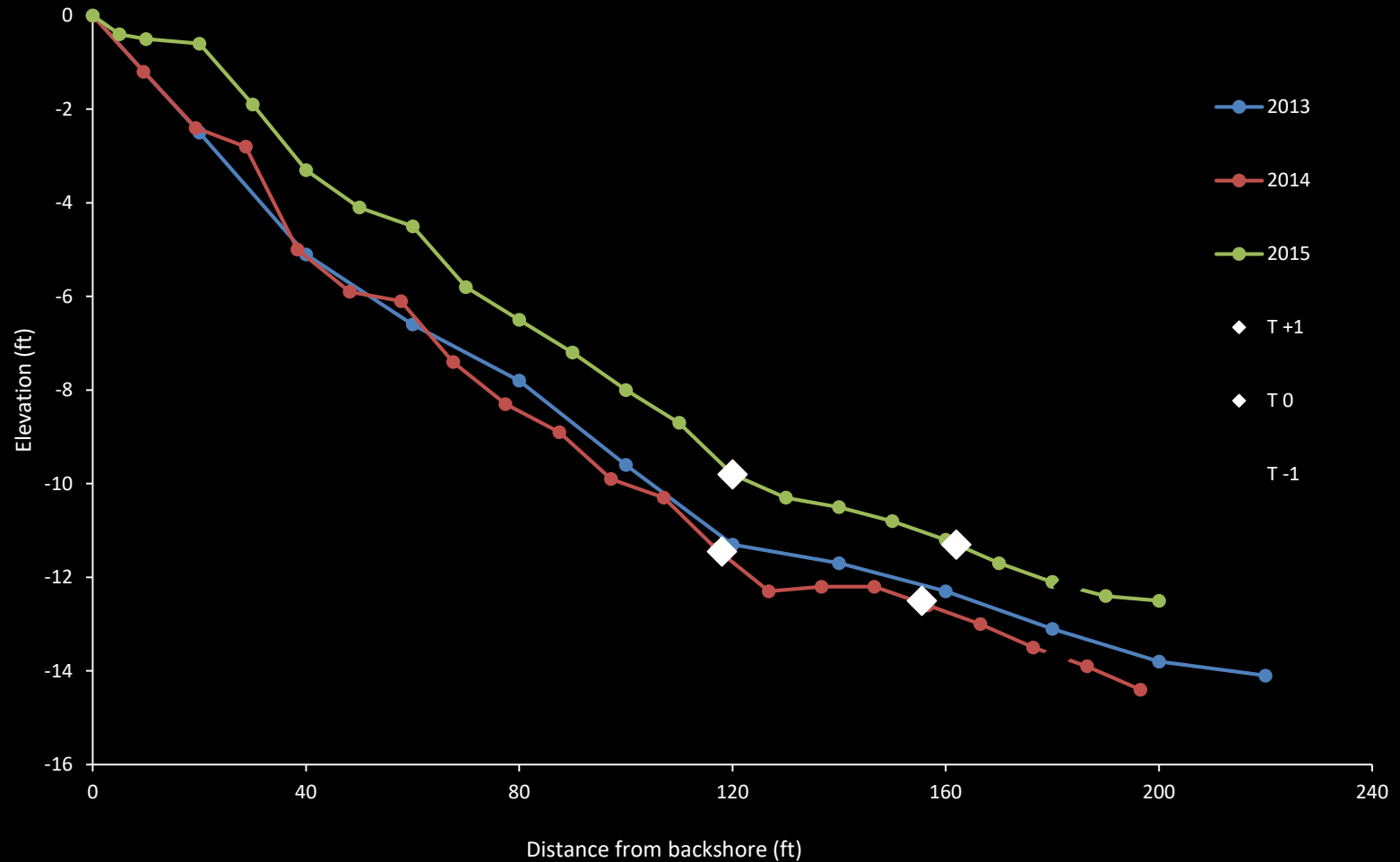
Intertidal Monitoring

- Beach elevation profile



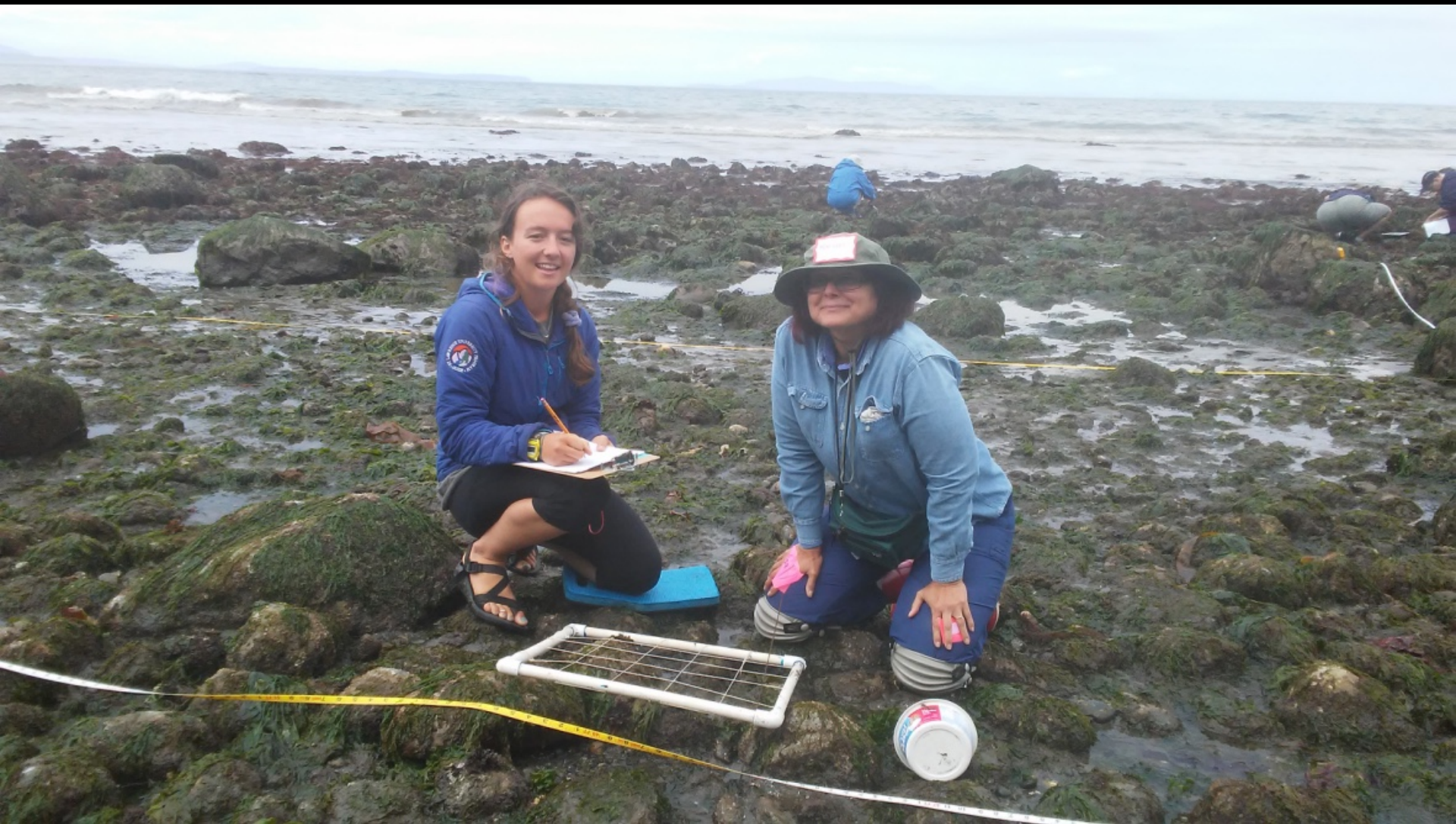
Intertidal Monitoring

- Beach elevation profile



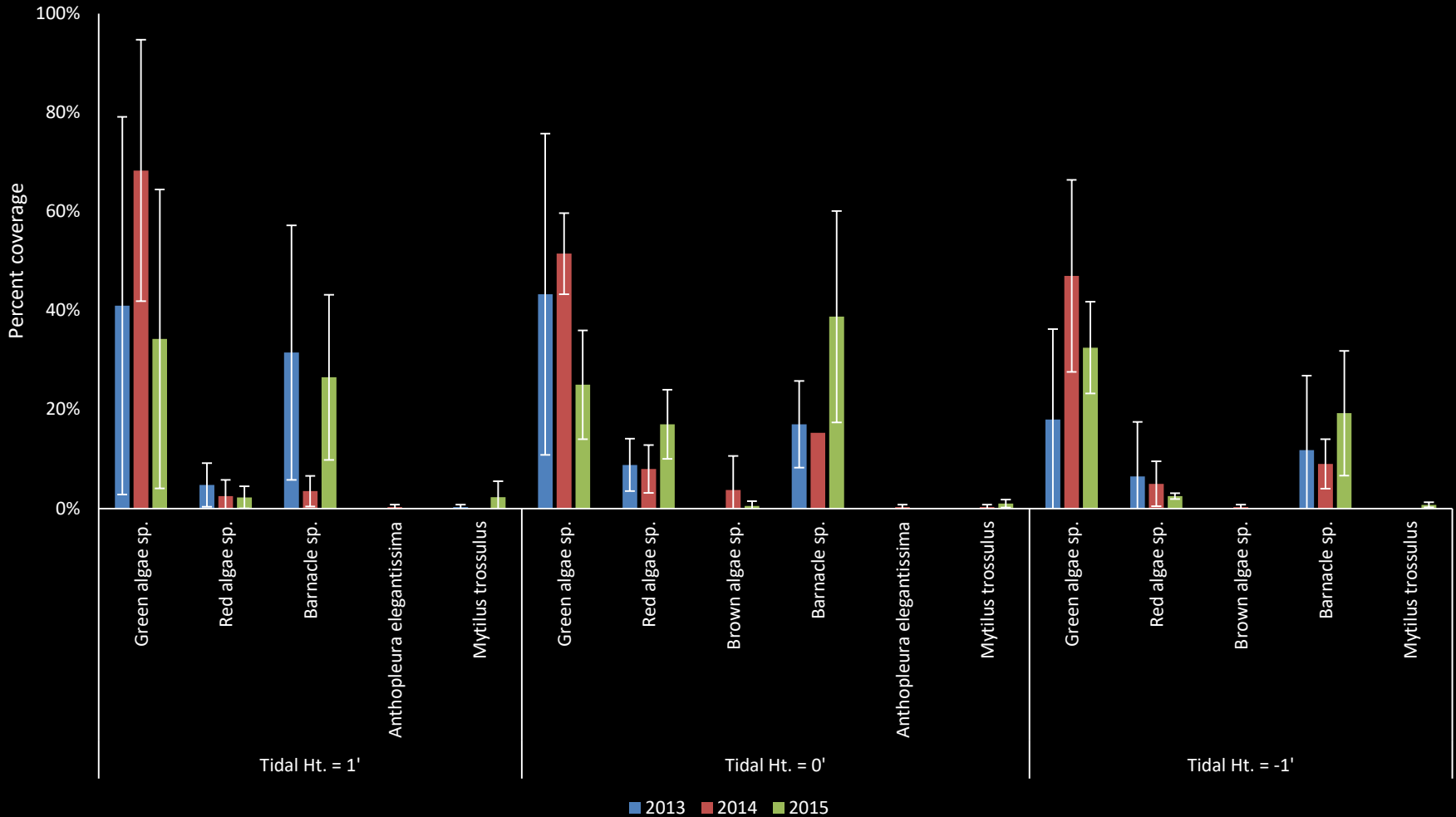
Intertidal Monitoring

- Quadrats on transects at +1 ft, 0 ft, and -1 ft tide heights



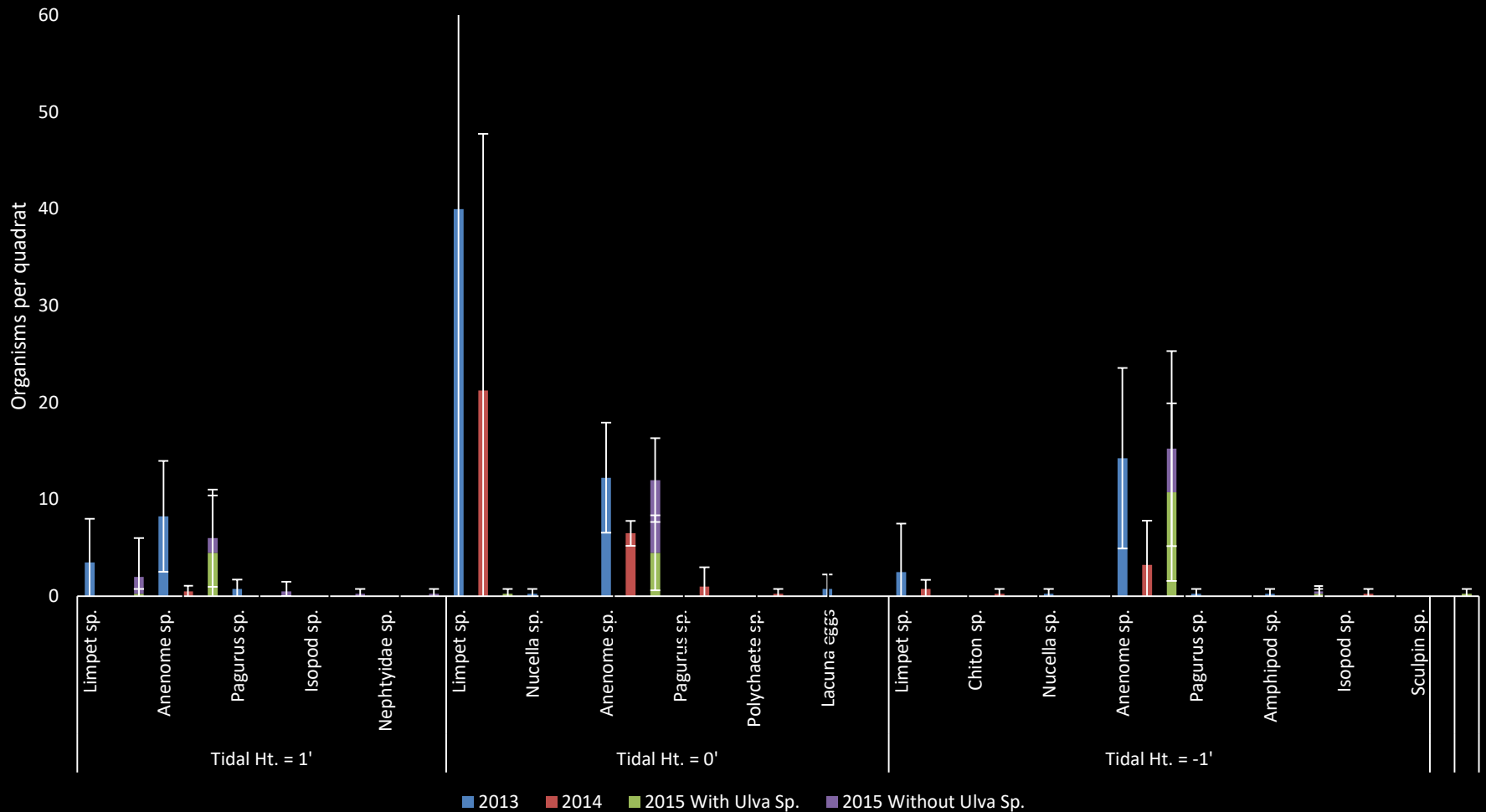
Intertidal Monitoring

- Percent cover species



Intertidal Monitoring

- Individual count species



Intertidal Monitoring

- Quality control



Intertidal Monitoring

- Species swaths



After 5 years of data collection- *But what does it all mean and why do we keep collecting it?*



- Emotional attachment?
- Volunteers think it's fun and it's a good learning opportunity?
- What data gaps are we really closing?
- Does anyone actually want our data or have confidence in it?
- Can we integrate our data into policy?

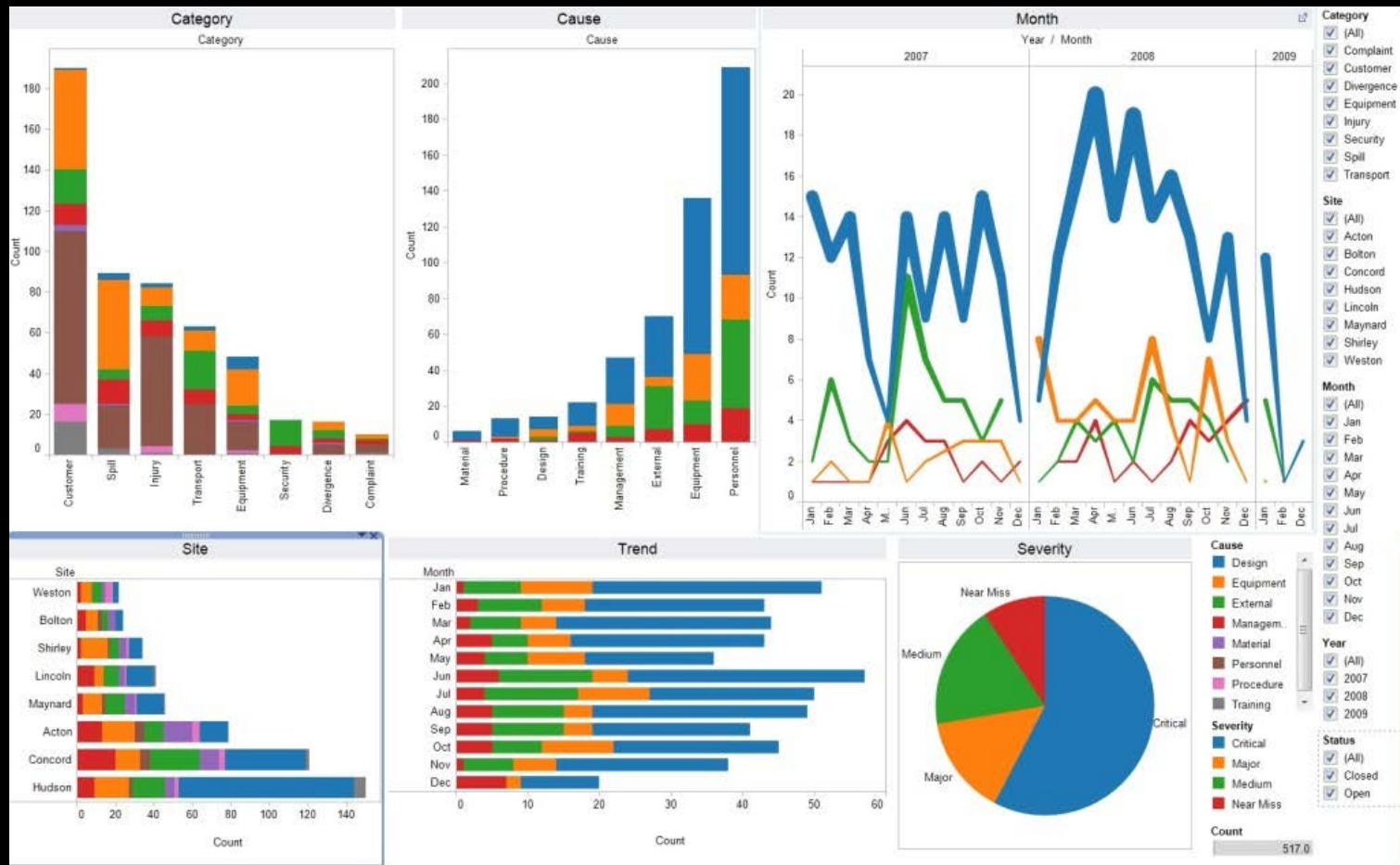
Intertidal Monitoring – Adaptive Management



- Quadrats:
 - Added quadrat per transect
 - QA/QC checks
 - Before/After Ulva species removal
 - Substrate data
 - Lumping species
- Profiles:
 - Permanent markers for starting points
- Species swaths:
 - Done by “lead naturalists”
 - Same intertidal segments sampled each year

Getting the Data Back to Volunteers

- Frequent contact
 - Interactive
- Data Visualization Software

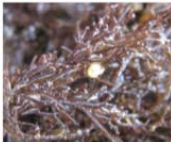


Intertidal Monitoring

SEAWEEDS



Green Seaweed



Brown Seaweed



Red Seaweed



Eelgrass

CRUSTACEANS



Barnacles



Amphipod



Isopod



Shrimp



Hermit Crab

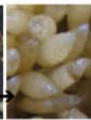


Crab

MOLLUSKS



Sometimes found with their eggs



Bubble shells are also Shelled Gastropods but the shell is hidden. If you find Bubble shells, you often see their eggs.

Shelled Gastropods



Limpets



Sea Slugs



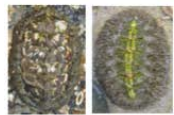
Mussels



Bivalves



Sometimes just a siphon is visible



Chitons

WORMS



Ribbon Worm



Polychaete Segmented Worms



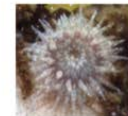
Flatworm

ANEMONES



Aggregating Anemone

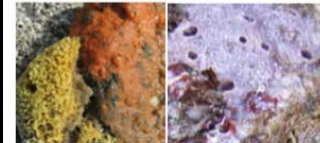
Generally found in masses, green with pink tentacles, individuals 3 in. or less



Non-Aggregating Anemones

May be found singly or in small groups - accounts for all the species you'll see but one. Most will be at least 3 in. across and could be as large as 9 in. across.

BRYOZOANS



SPONGES

COLONIAL ASCIDIANS

SOLITARY TUNICATE

SEA STARS



BRITTLE STAR



SEA URCHIN



SEA CUCUMBERS



Management Plan



- Describes primary characteristics and purpose of the reserve
- Identify activities, habitats, and species of importance
- States goals and objectives for the reserve and management actions
- Environmental protection is the highest management priority

Management Plan



- Update coming soon
- How can intertidal monitoring data be used in these updates?
- What can we do different to support the plan?
- Tie in with the DNR ANeMoNe program?

Oil Spill Response Plan



- Audubon Society's citizen science data during Gulf BP spill was very valuable
- Aim to get data accepted into oil spill response plans as past snapshots of what was there

Other Citizen Science at Cherry Point



- Sea Star Wasting Syndrome Monitoring
 - Multi-Agency Rocky Intertidal Network (MARINe)

- Marine Bird Monitoring
 - Comparable w/ Marine Ecosystem Assessment Program (MESA)



What we've learned

- Functioning with limited resources
 - Establish partnerships
 - Don't reinvent the wheel
 - Share resources
 - Seek and offer expert assistance and trainer honorarium when possible
- Trainings
 - Simplify
 - Specialize volunteer jobs
- Retaining volunteers
 - Get them excited and geared up to engage when the time comes
 - Let them work up to leadership roles or climb up
 - Get the data back in a meaningful way
- Increasing confidence in data collected
 - QA/QC measures
 - Simplifying protocol may increase your data confidence
 - Seek help from experts
 - Work with decision makers, stakeholders, and others early on to successfully use data in management decisions

Questions?



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