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

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RESOURCES FOR SUSTAINABLE COMMUNITIES
PROTECT. ACTIVATE. INNOVATE. THRIVE.

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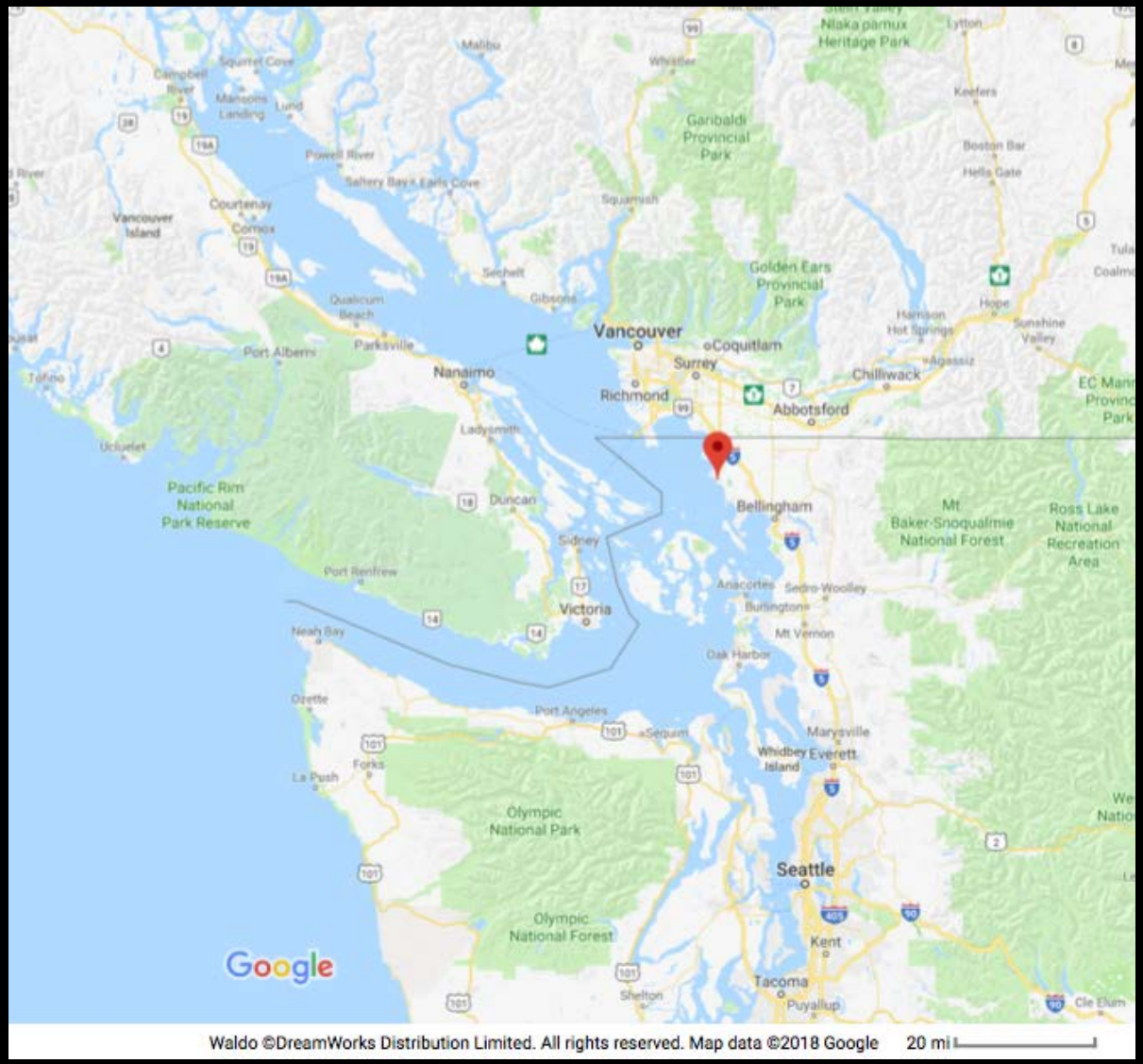
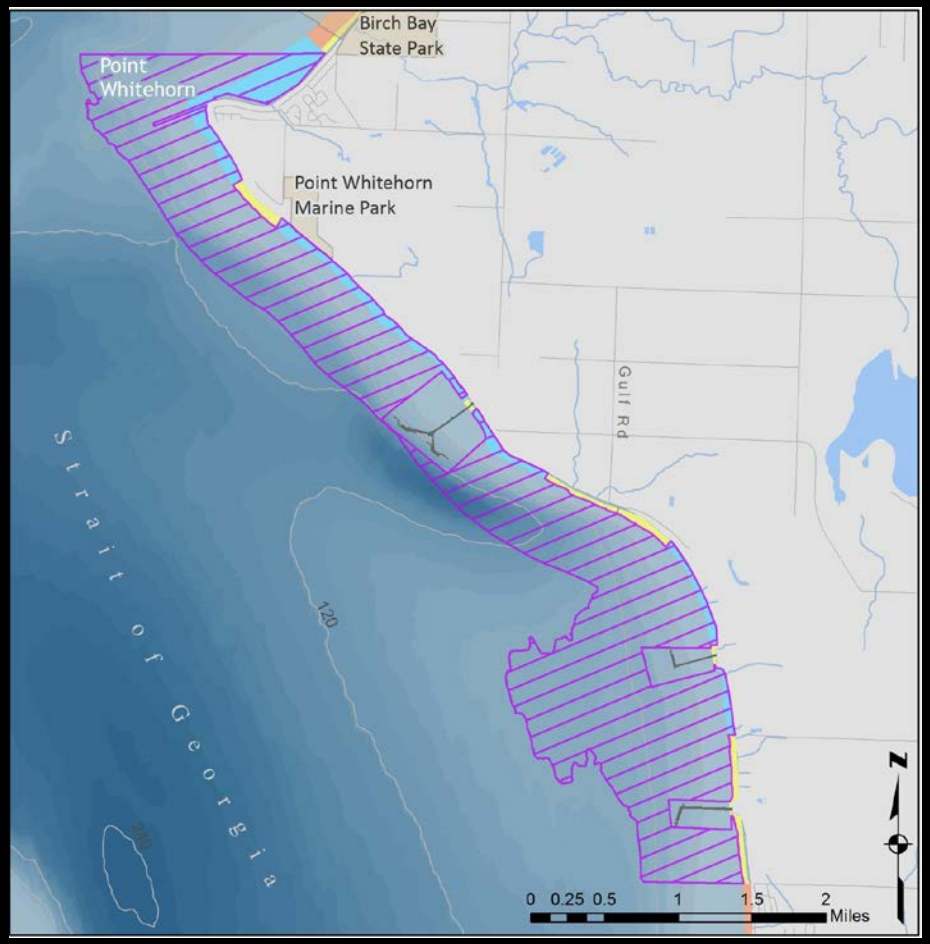
Citizen Science

- 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

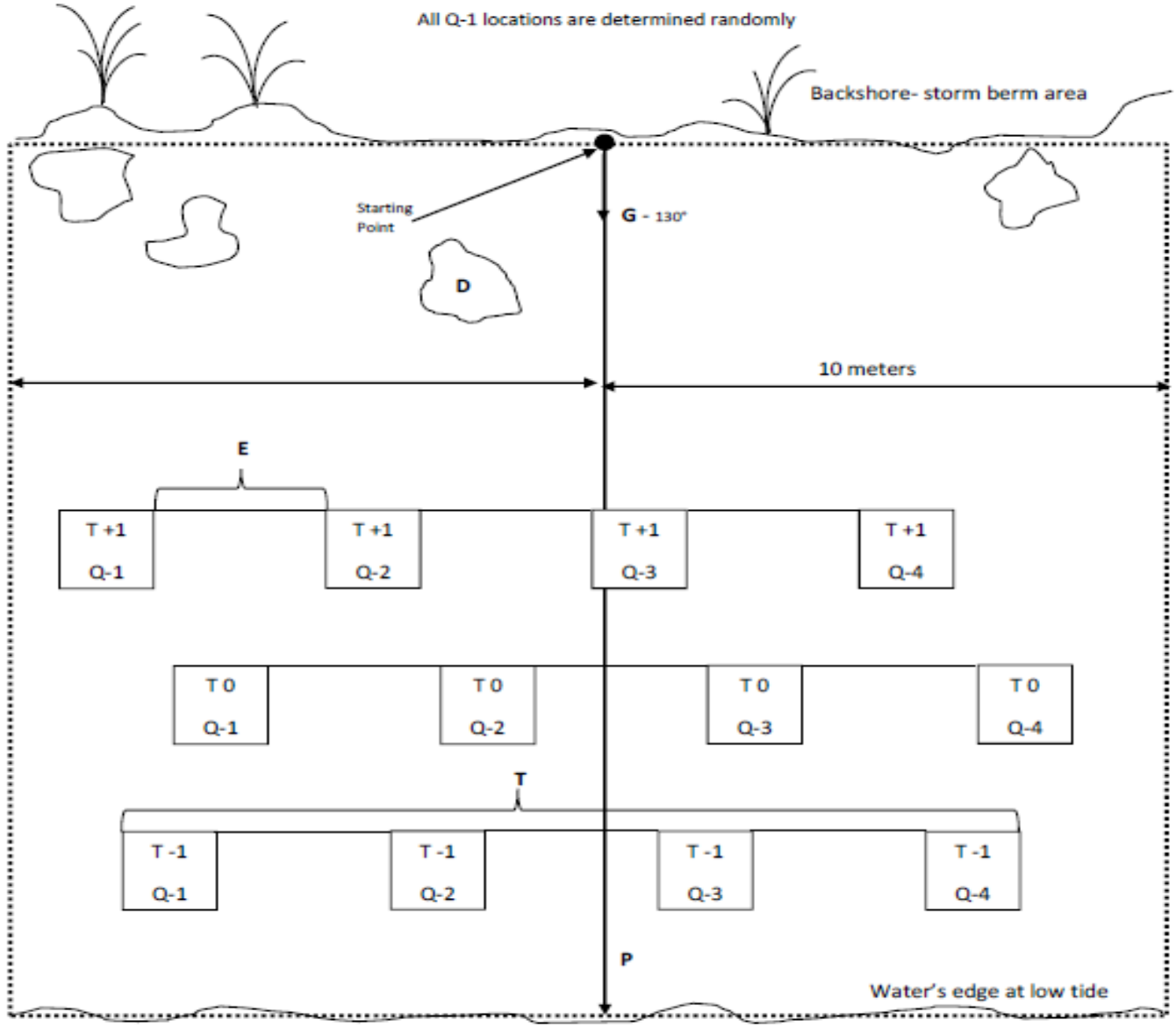
- Early detection of invasive species
- Know what's out there and in what abundance
- Data use in case of an oil spill or catastrophic event
- Fill data gaps and use to adaptively manage reserve

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

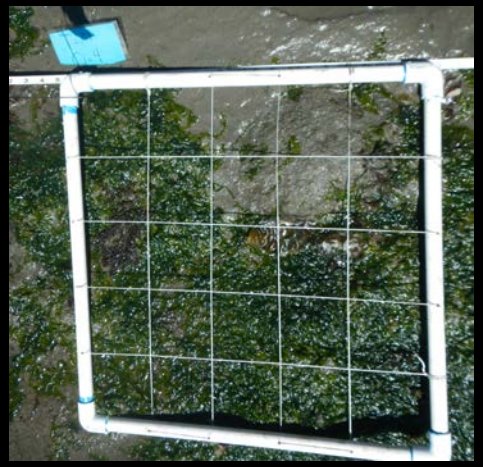
Beach Monitoring Site Layout

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)

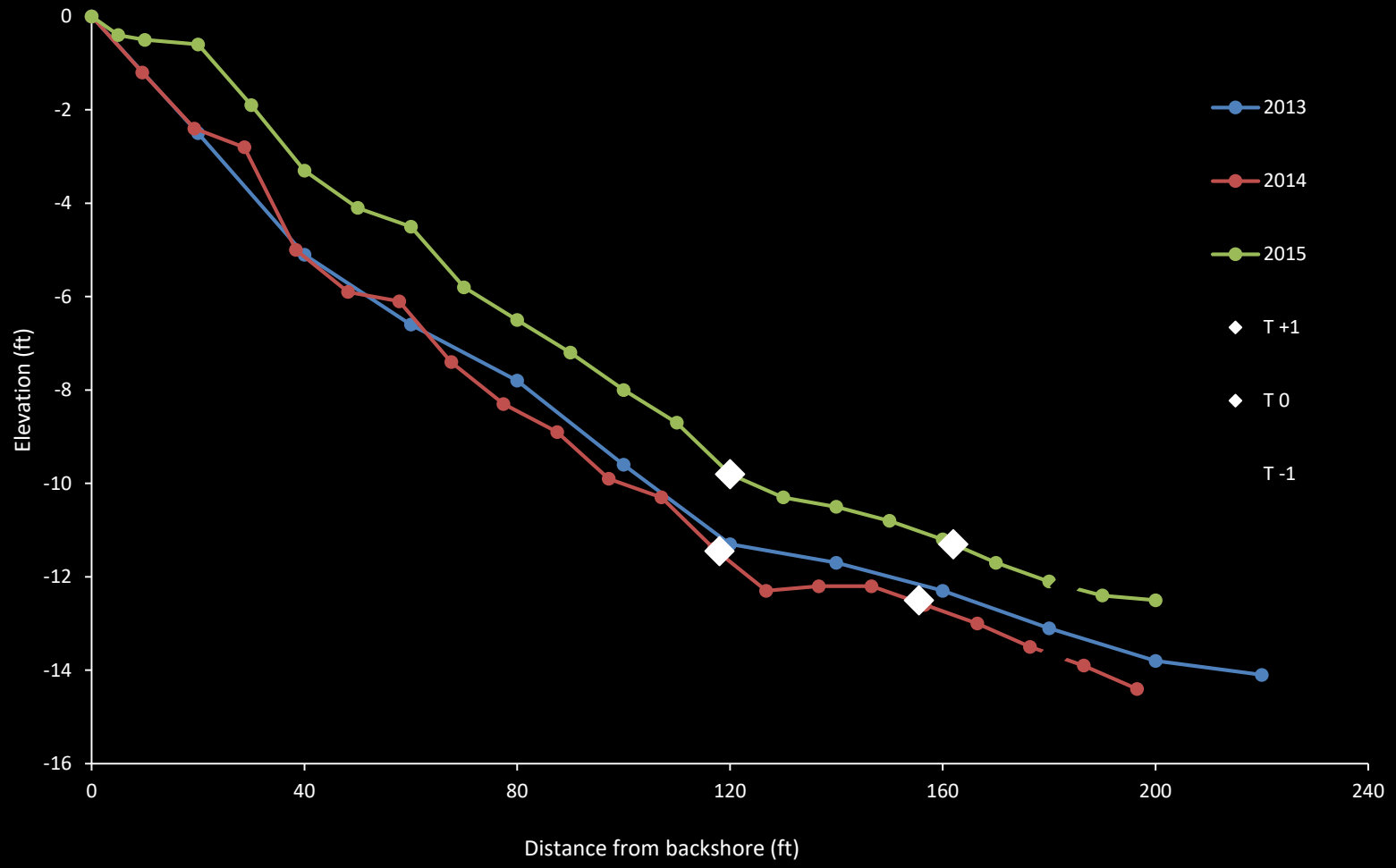


Intertidal Monitoring

- Beach elevation profile

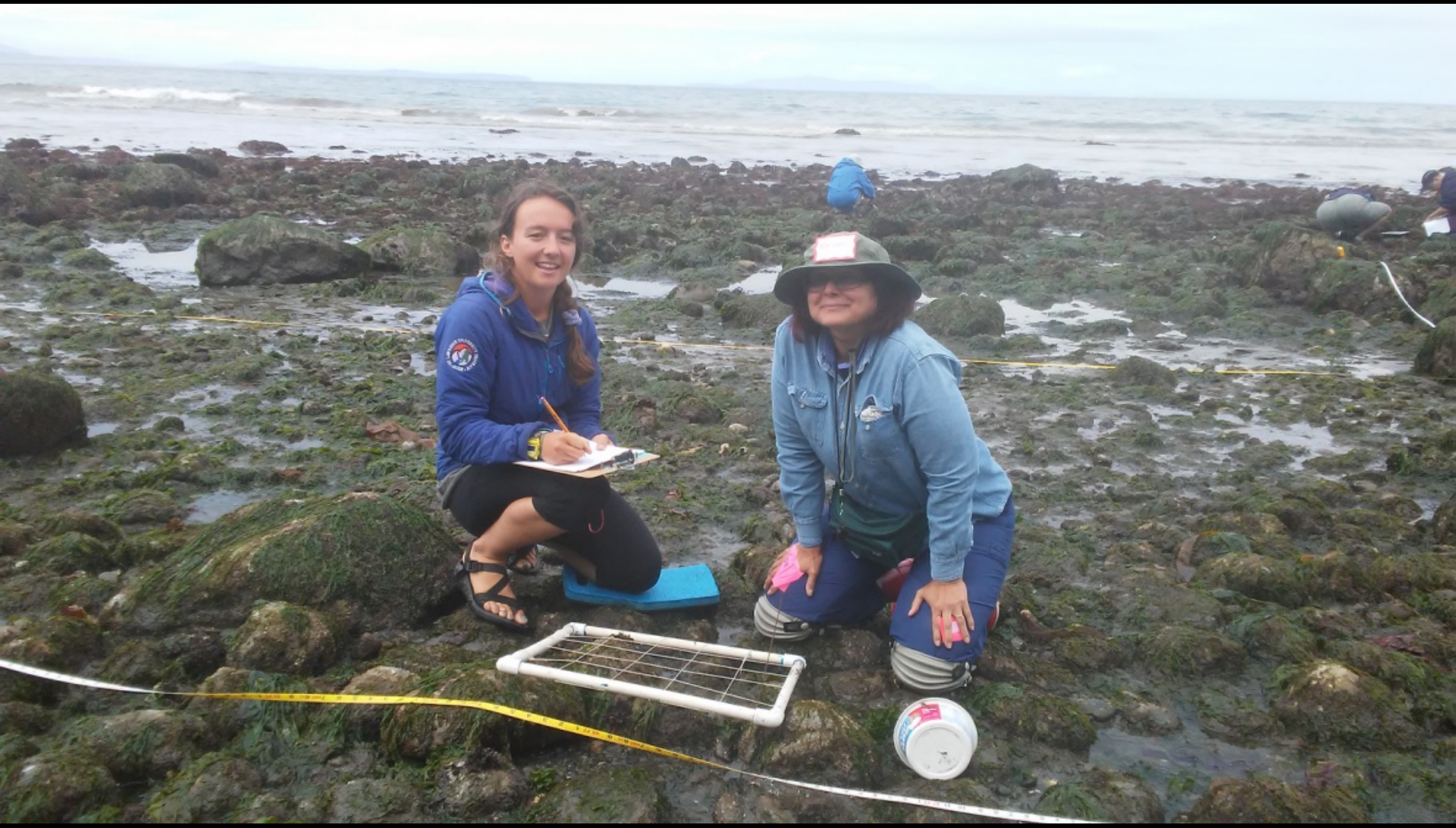
Intertidal Monitoring

- Beach elevation profile



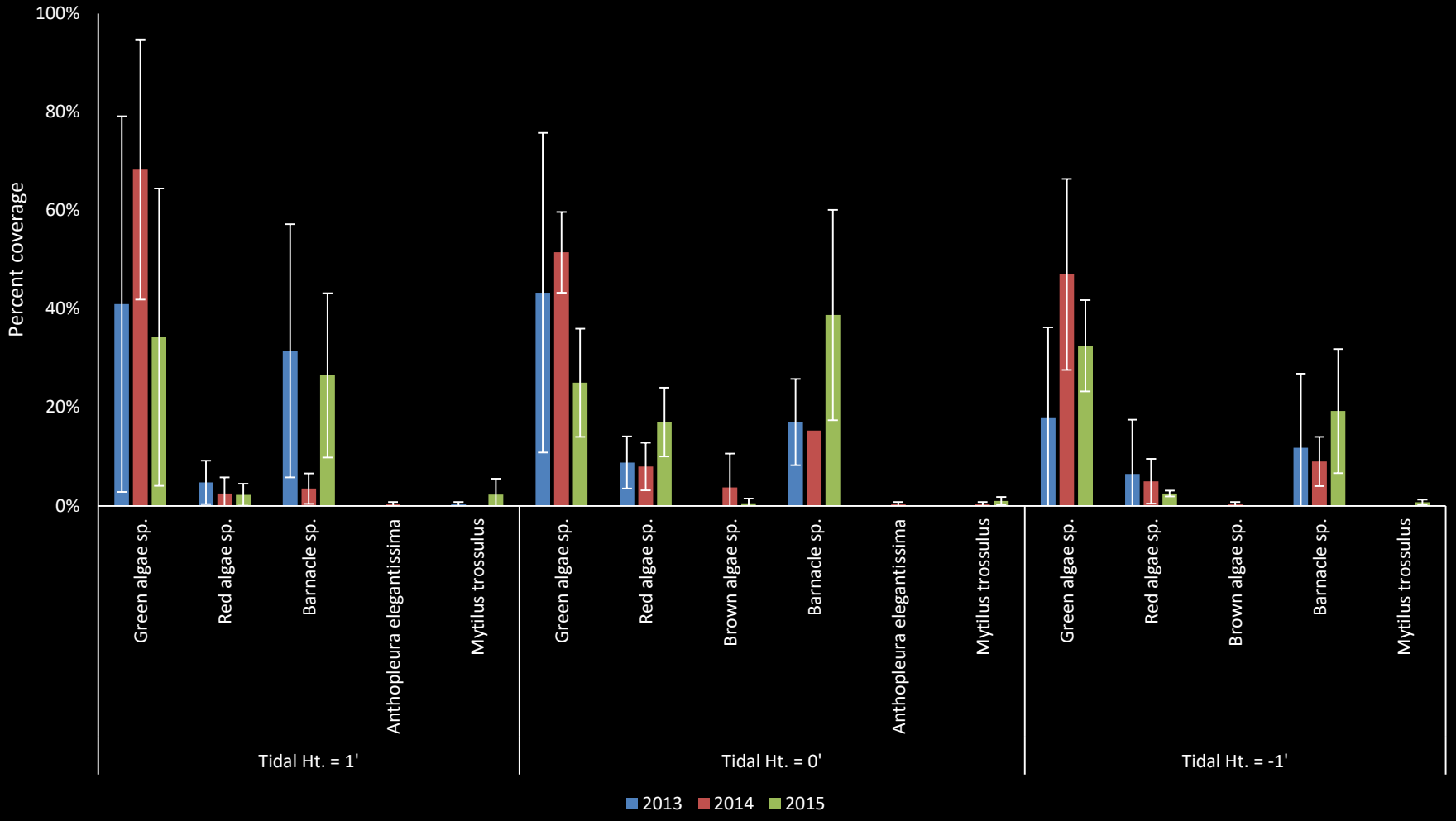
Intertidal Monitoring

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



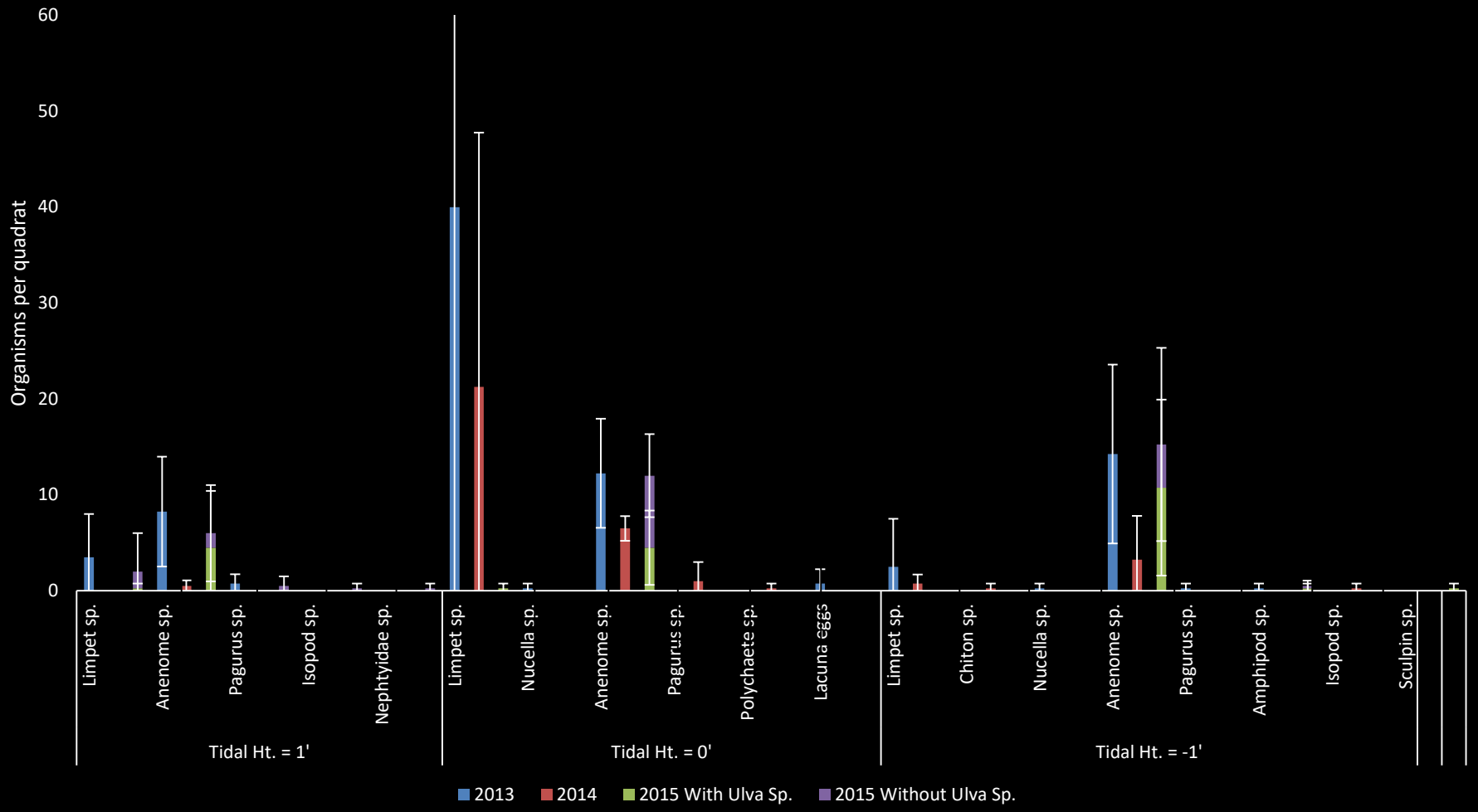
Intertidal Monitoring

- 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?

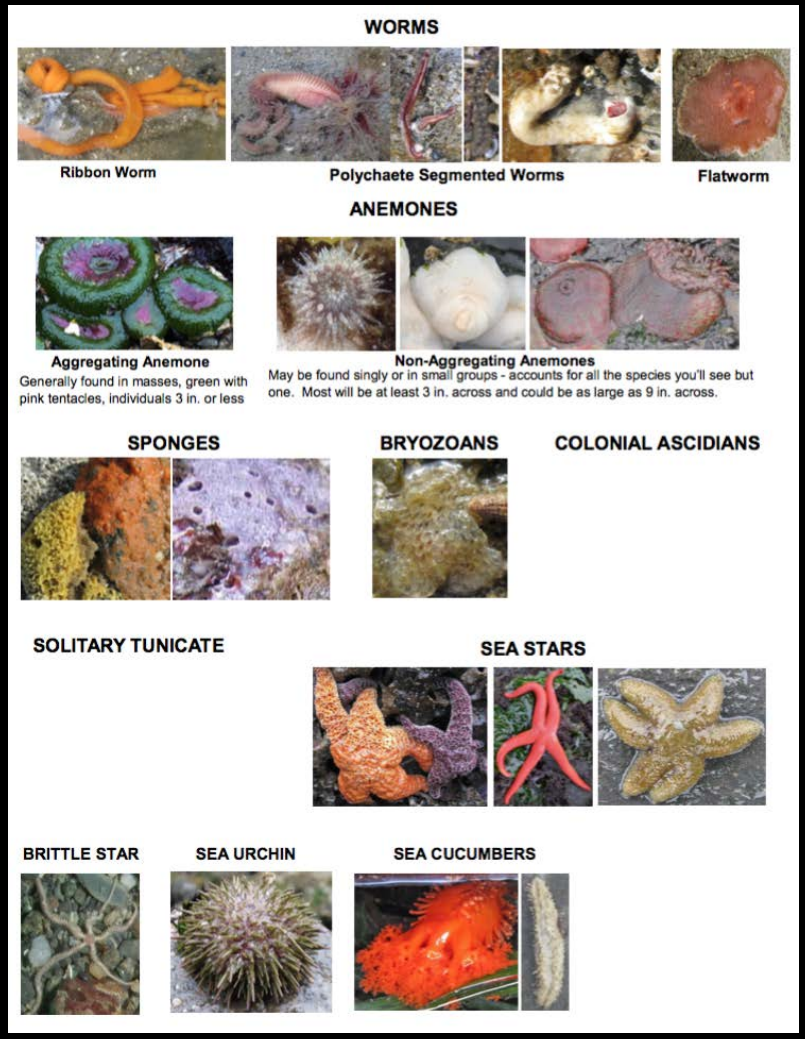
Intertidal Monitoring – Adaptive Management

- 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



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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