

Approaches to the assessment of Areas of Biological Significance

Biological communities

Two general approaches

- Use of existing data
- Planned sampling program
- Reanalysis and Assessment of existing reports and data

Two general approaches

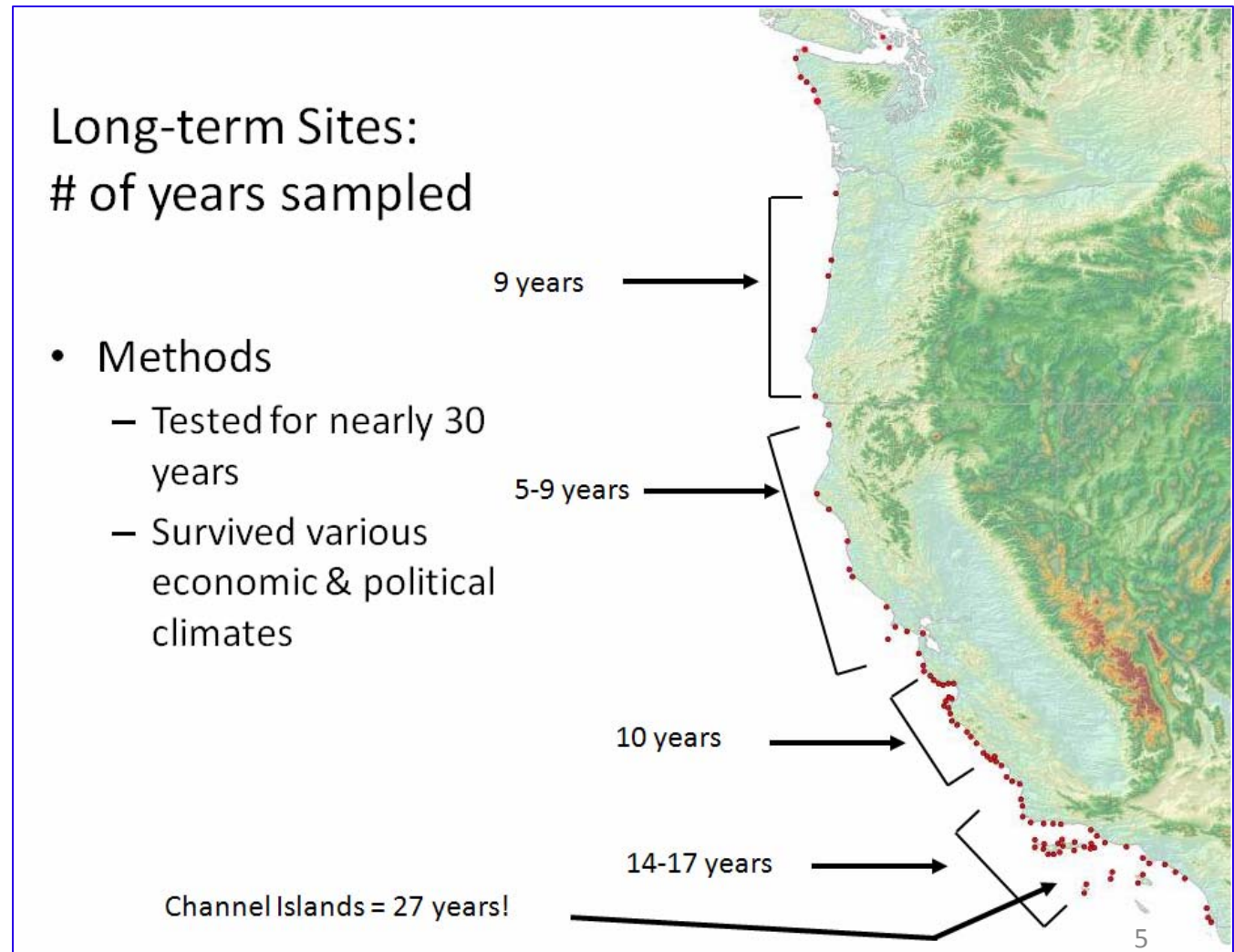
- Use of existing data
 - Advantages
 - Can be done quickly
 - Inexpensive
 - Perhaps make use of a more spatially or temporally comprehensive set of data than could be attained using a planned sampling program
 - Disadvantages
 - Almost never ‘best’ design for direct assessment of ASBS

Two general approaches

- Planned sampling program
 - Advantages
 - Sampling is directed at specific question or questions related to impacts to ASBS
 - Disadvantages
 - Usually takes longer than use of existing data
 - Usually more expensive than use of existing data
 - Will typically not have a broad temporal or spatial context – *unless sampling plans and efforts are coordinated*

Use of existing data - examples

1. Use of PISCO Biodiversity data
2. Compare sites in ASBS to those outside ASBS
3. Use ordination techniques to assess possible impacts in ASBS

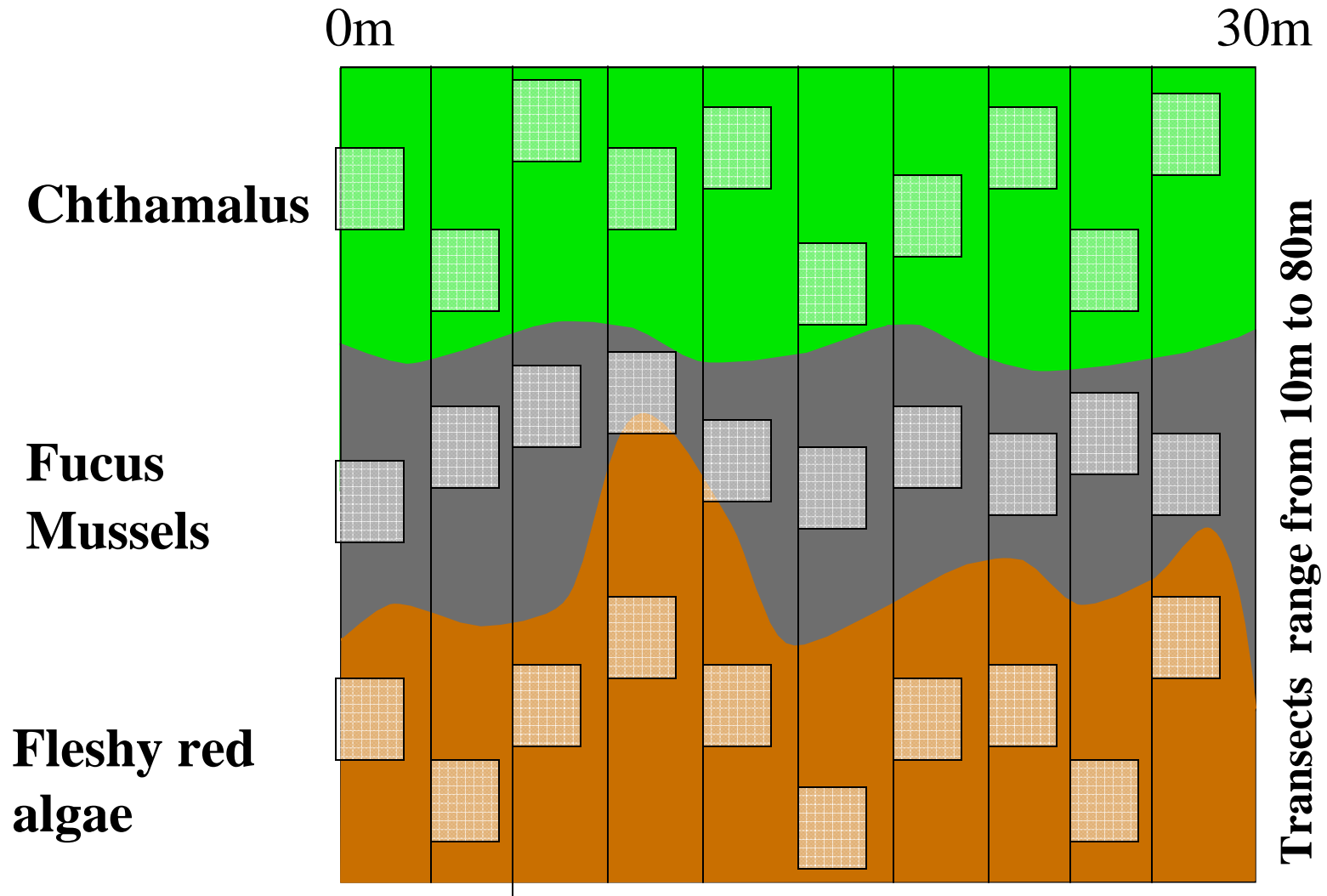


Site set-up



- 30m horizontal transect parallel to shore
- 11 vertical transects perpendicular to shore
- Transects capturing all major zones
- Characterizes area

30 meters



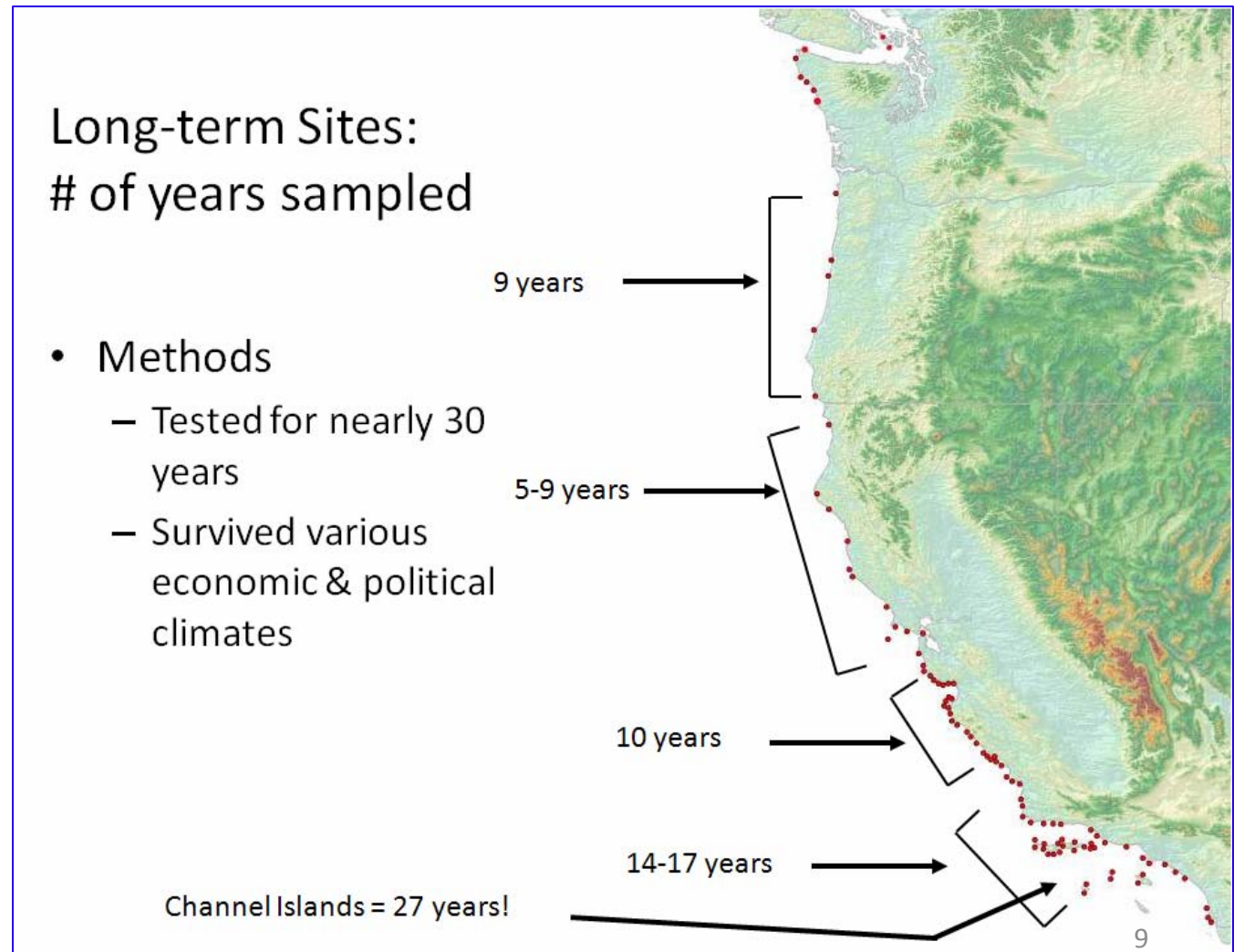
Tidal heights

- Laser leveler and sensor used
- Measurements taken along each line at appropriate intervals
- Reference tidal heights
- Topographic map of site created

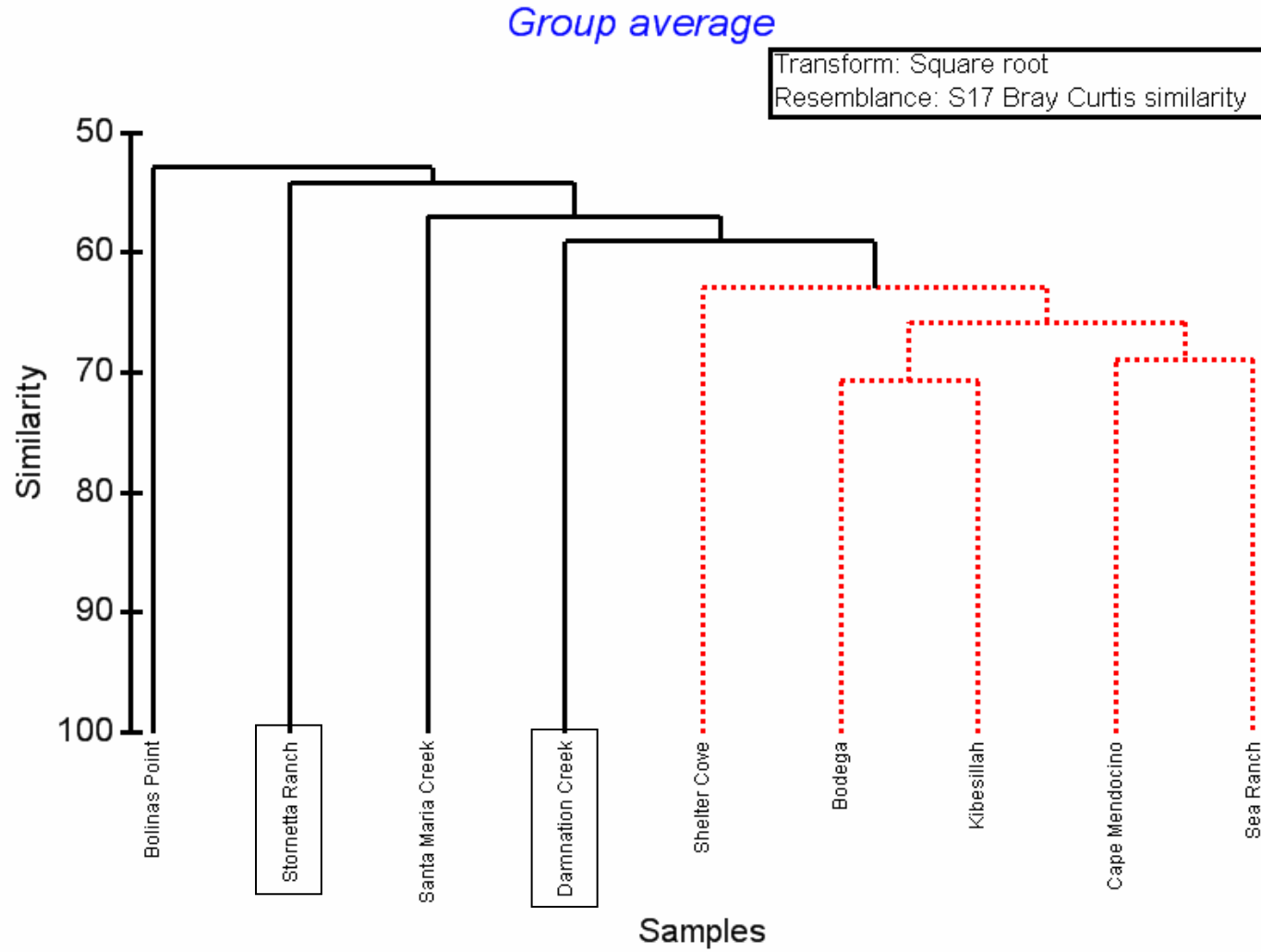


Use of existing data - examples

1. Use of PISCO Biodiversity data
2. **Compare sites in ASBS to those outside ASBS**
3. **Use ordination techniques to assess possible impacts in ASBS**

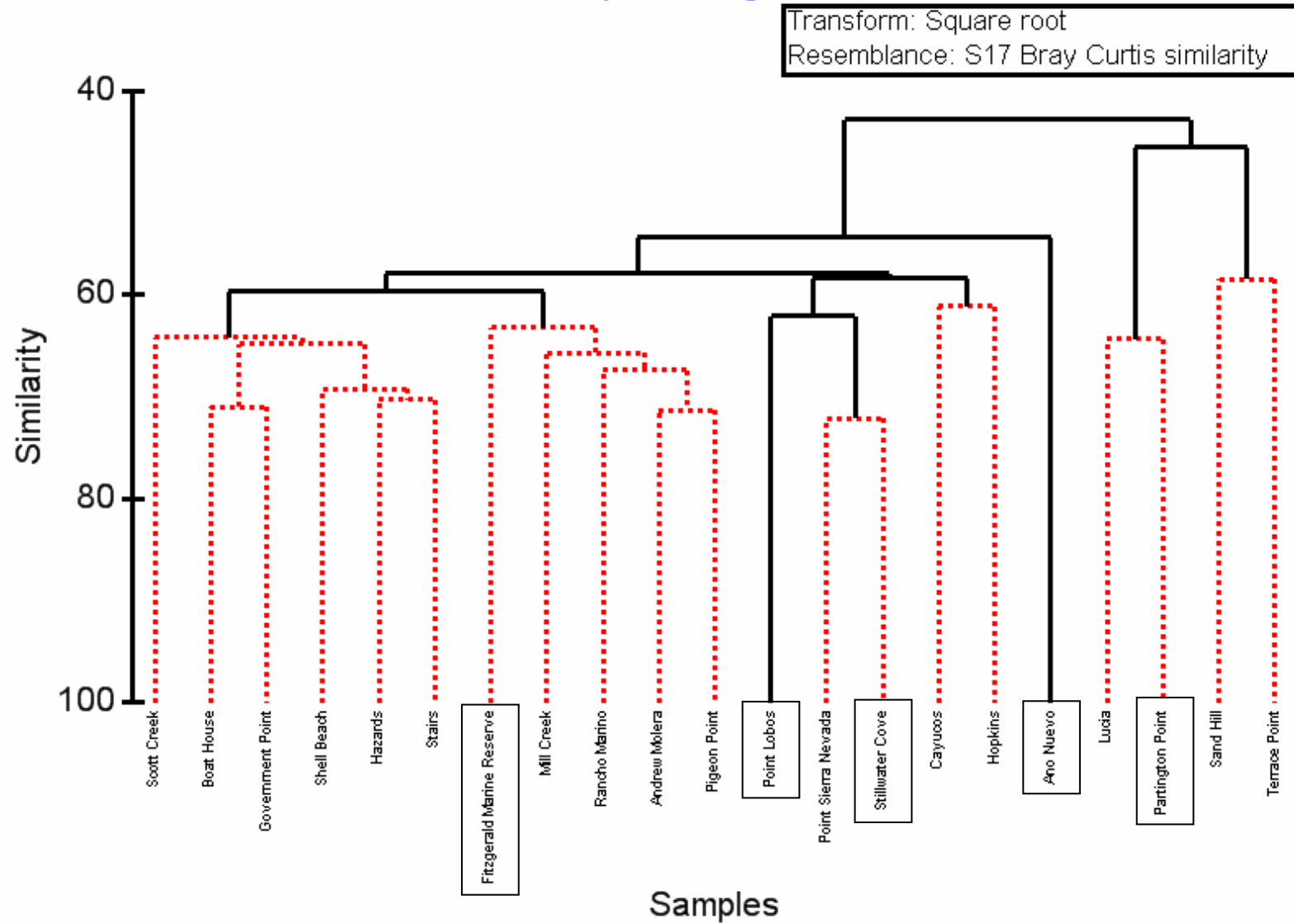


North Coast sites

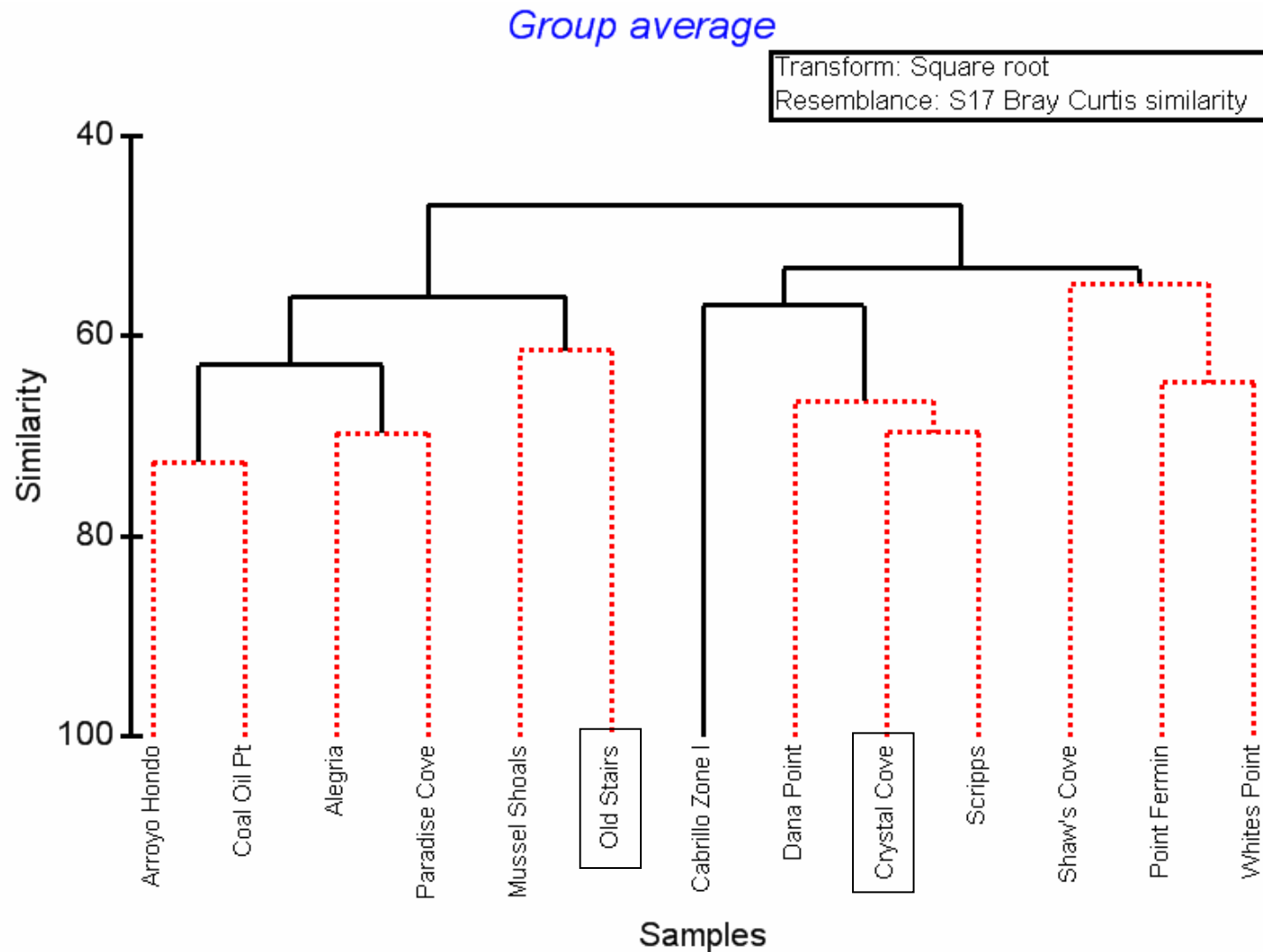


Central Coast sites

Group average

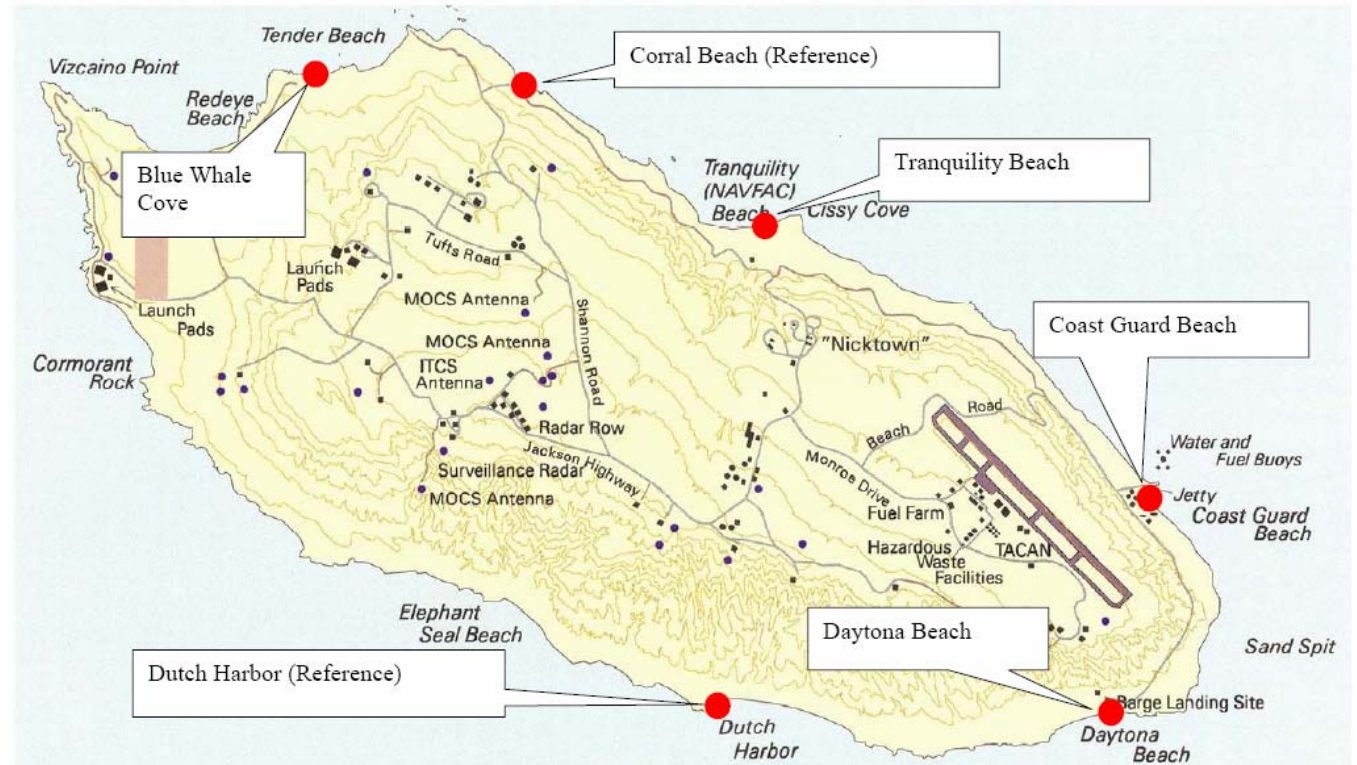


Southern California sites



Planned sampling program - examples

1. San Nicolas Island
2. Compare reference areas to those with discharges
3. Used professional judgment to assess potential impacts (see next slide)



San Nicolas Study

- Differences among sites <50% was considered natural variability
- Differences >50% were interpreted by biologists
- All such differences were interpreted as being consistent with no impact due to discharges

Reanalysis / Assessment Study

- Reanalysis – can be done when data-sets are sufficient
 - May allow for standardization of analytical methods and allow for comparison among locations
- Assessment – here we determined:
 - If sampling approach was sufficient to test for impacts due to discharges
 - If, given adequate sampling design, results were consistent with conclusions concerning impacts from discharge

Re-analysis of San Nicolas data

- Compared communities in reference and discharge sites using ordination techniques (nMDS)
- Both sessile and mobile communities were significantly different at reference compared to discharge sites. For example:
 - Limpets 2X more in reference sites
 - Urchins 72X more in reference sites
 - Mussels 6X more abundant in reference sites

Reanalysis / Assessment

- Reanalysis (ordination and comparison) done on three data sets: San Nicolas Island, Sea Ranch and Trinidad
 - Initial analyses differed among studies but datasets were sufficient to use in standardized analysis
 - In all cases there was a conclusion of no impact from the initial report
 - In all cases upon reanalysis there were marked differences between reference and discharge sites

Reanalysis / Assessment

- Assessment was done for a series of other reports: Carmel Bay, Caltrans, Alder Creek, Pillar Point, Redwoods, Hopkins, Pfeiffer, Crystal Cove.
 - Some were based on historic data-sets and opportunistic comparisons were made between reference and ASBS sites: Caltrans
 - Some were based on specific designs to assess impacts for ASBS: Pillar Point, Alder Creek, Crystal Cove
 - Pillar Point and Alder Creek were most rigorous
 - Some were based on designs or data unrelated to the question of impacts to ASBS: Carmel Bay, Redwoods, Hopkins, Pfeiffer.

Conclusions

- There is no standardized approach to the assessment of ASBS
 - This impedes
 - Determination of impacts
 - Comparisons across sites
 - Comparisons across time at sites (to address improvement or degradation)
 - Policy

Recommendations

- Standardize assessment approaches
- Require adherence to standardized approach
- First Steps
 - Convene a meeting of assessment experts
 - Give the group a specific charter
 - What sampling and assessment methodology

First Steps

- Convene a meeting of assessment experts
- Give the group a specific charter: Given a desired threshold of statistical power, what sampling and assessment methodology will most efficiently and economically allow
 - Assessment of impacts related to discharges in ASBS
 - Change in such impacts over time as remediations are implemented

Who should be part of group of assessment experts

- Lets fill this in!