

Science Advisory Panel Response

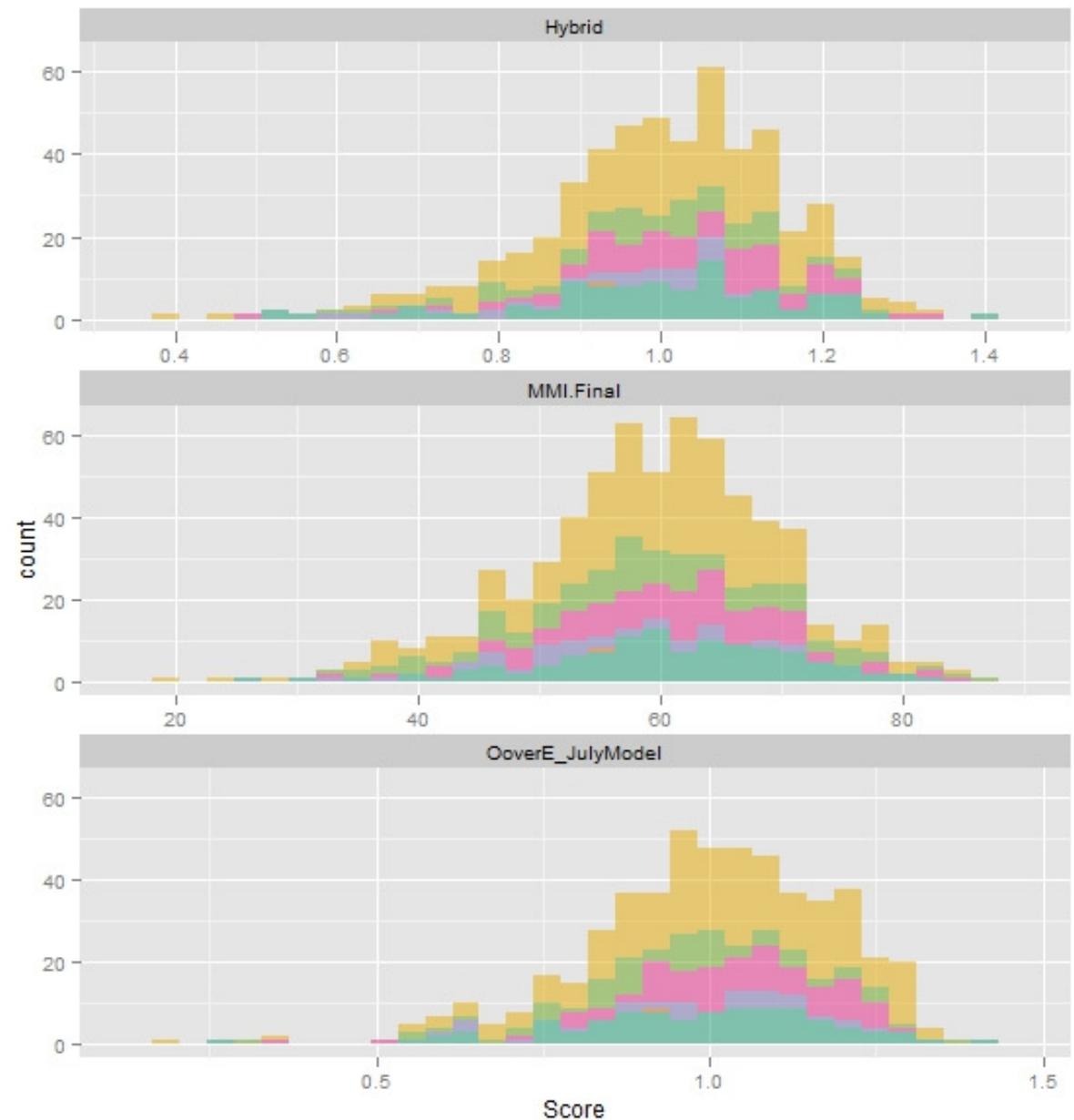
18 October 2012

Panel's Prioritization of Issues

- Scoring Tool
- Determining Scoring Tool Coverage
- Thresholds
- Causal Assessment
- Regulatory Guidance

Comparing Performance of 3 Scoring Tools

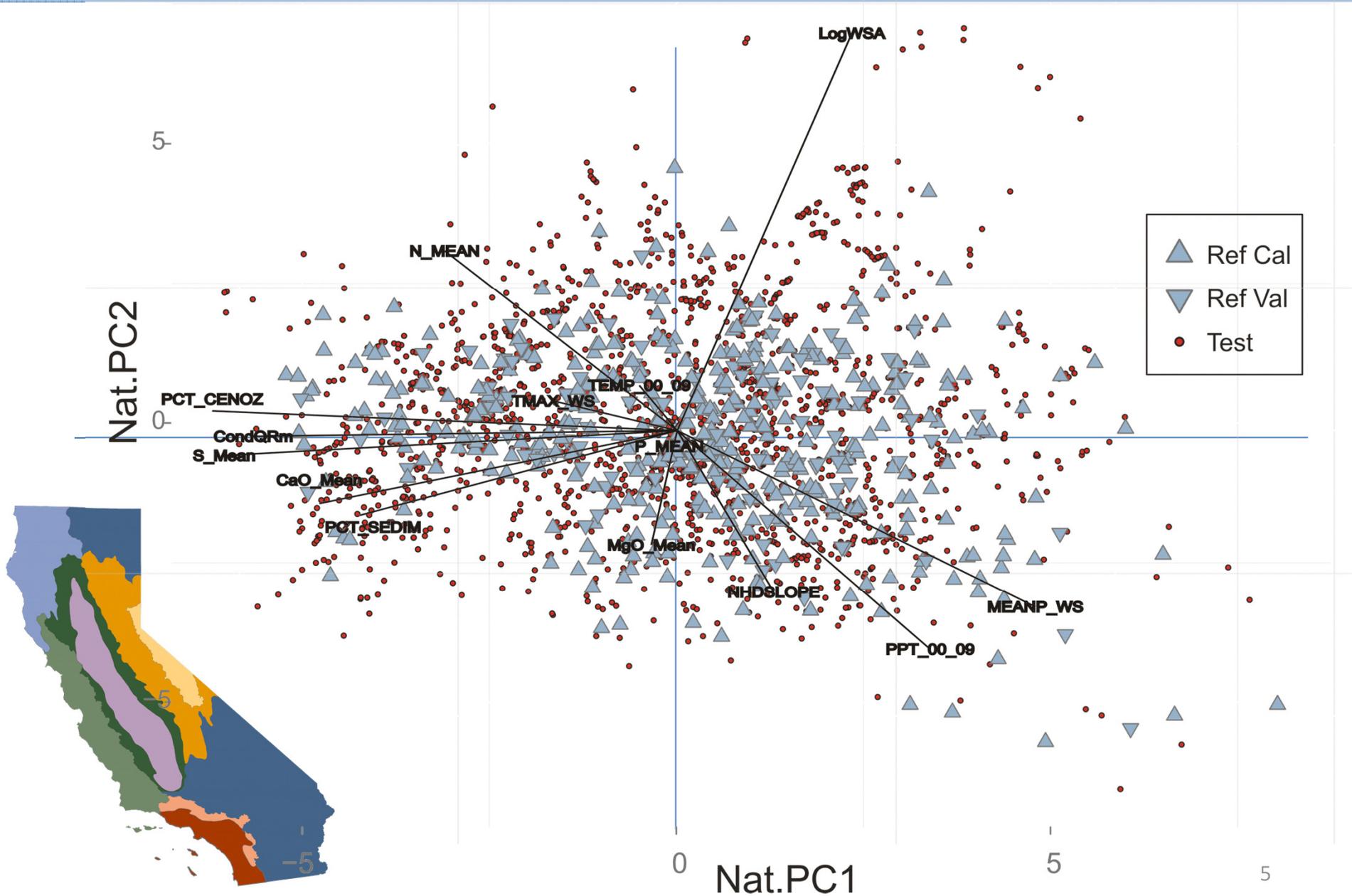
- Species Loss Index (O/E)
- Ecological Structure Index (pMMI)
- Combined Index (“hybrid”)



Scoring Tool

- The Panel supports the use of the hybrid scoring tool
 - Includes both species-specific and biological community responses
 - Science Team will need to work on developing a simple explanation of this tool
- Some additional model evaluation would build confidence
 - Independent validation data sets
 - Simulation of impairment data to test responsiveness
 - What are the actual taxa or metrics that are driving scoring tool disagreement
- The Team will need to automate the calculation of this more complex scoring tool

Multivariate view of natural diversity



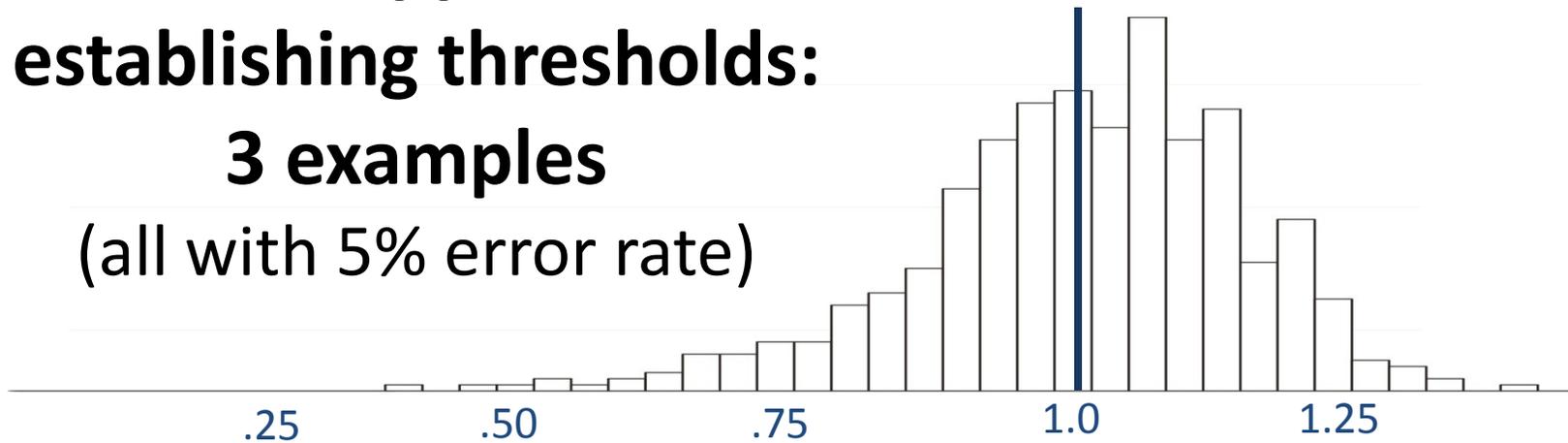
Determining Scoring Tool Coverage

- A multi-variate approach is preferred
 - Include core dimensions of natural variability that biology responds to
- Guidance should be developed for stakeholders who assert their stream is not covered by this tool
- Even for sites outside the experience of the models, assessment options are still available
 - i.e., upstream-downstream

Statistical approaches to establishing thresholds:

3 examples

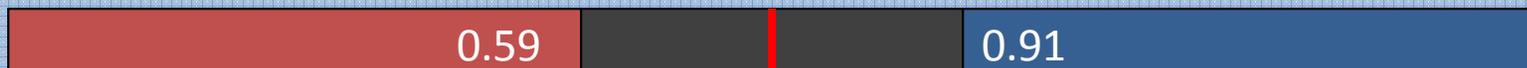
(all with 5% error rate)



95% and 85% confidence that site is not equivalent to reference



95% confidence that the 95% threshold is where we think it is



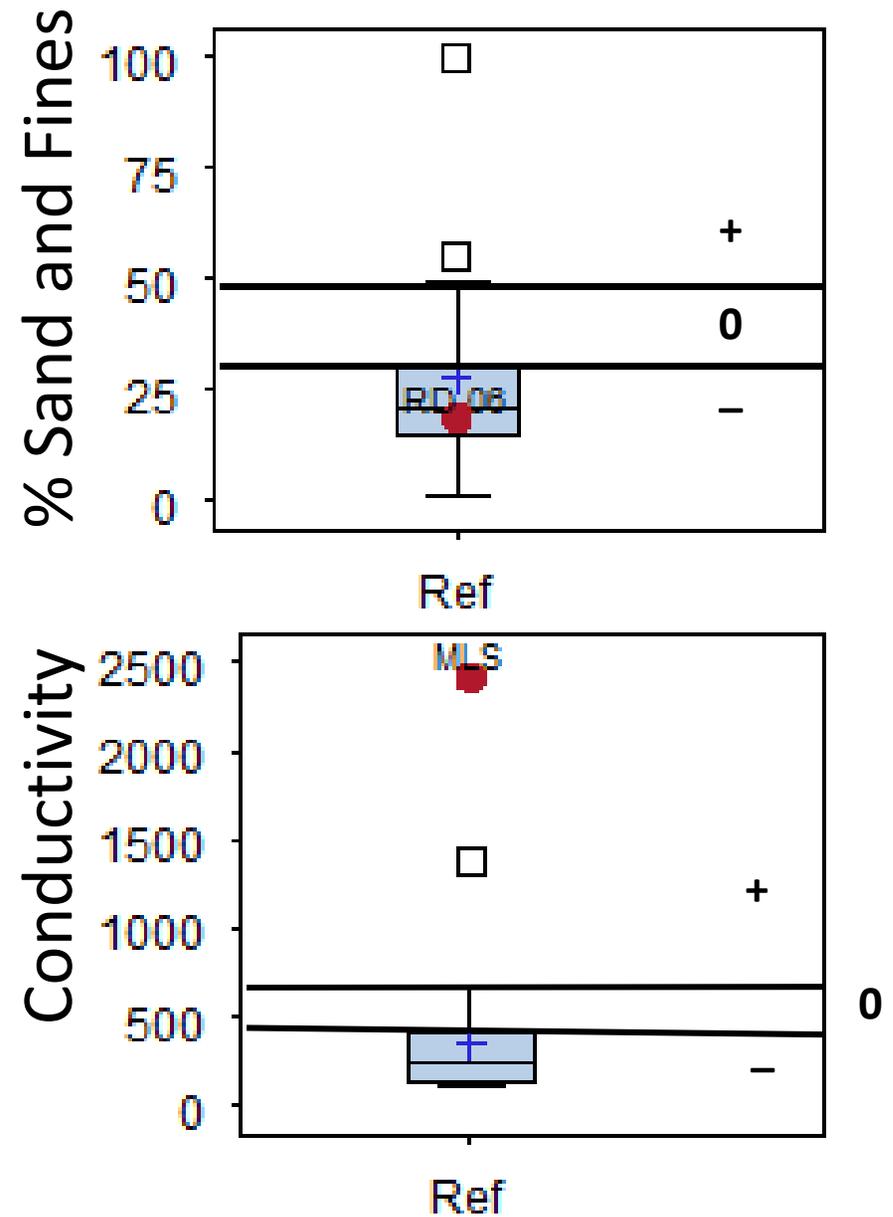
Use within-site error rate to establish uncertainty around threshold

Thresholds

- Select thresholds based on distributions of reference condition
 - Need to assure some ecological meaningfulness
 - This approach can be used for developing categories of impact
- Test site uncertainty should be included
- Incorporating multiple samples at the test site is preferable: two options
 - Binomial approach (frequency of exceedence)
 - Mean site condition
- Ensure condition is assessed consistently at all sites

Co-Occurrence Outside the Case

- Use a subset of reference sites
 - Select sites by environmental parameters
- Used slope and elevation
 - 36 samples from 24 sites



Causal Assessment

- Causal Assessment is important for progress in bio-objectives development
 - Panel recognizes that CADDIS is an imperfect tool and needs refinement
- CA needs to take advantage of its large data set to streamline causal assessment
 - This unique opportunity should reduce future costs
- CA needs to improve comparator site selection
 - Incorporate comparators outside the watershed
- CA needs to improve diagnostic tools
 - Regional response models (i.e., Relative risk)
 - Species specific response models
 - Laboratory based species sensitivity distributions

Regulatory Guidance

- CA's working definition of “perennial” and “wadeable” seem appropriate
 - This definition is the foundation of the scoring tools
- Inference of segment-scale biological condition from a single site should be done cautiously
 - Additional samples at multiple locations may be needed

Next Steps For the Science Team

- Documentation!
- Journal style articles
- Technical Reports
- Web presence

