Presented at

Great Rivers Reference Condition Workshop

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Sponsored by

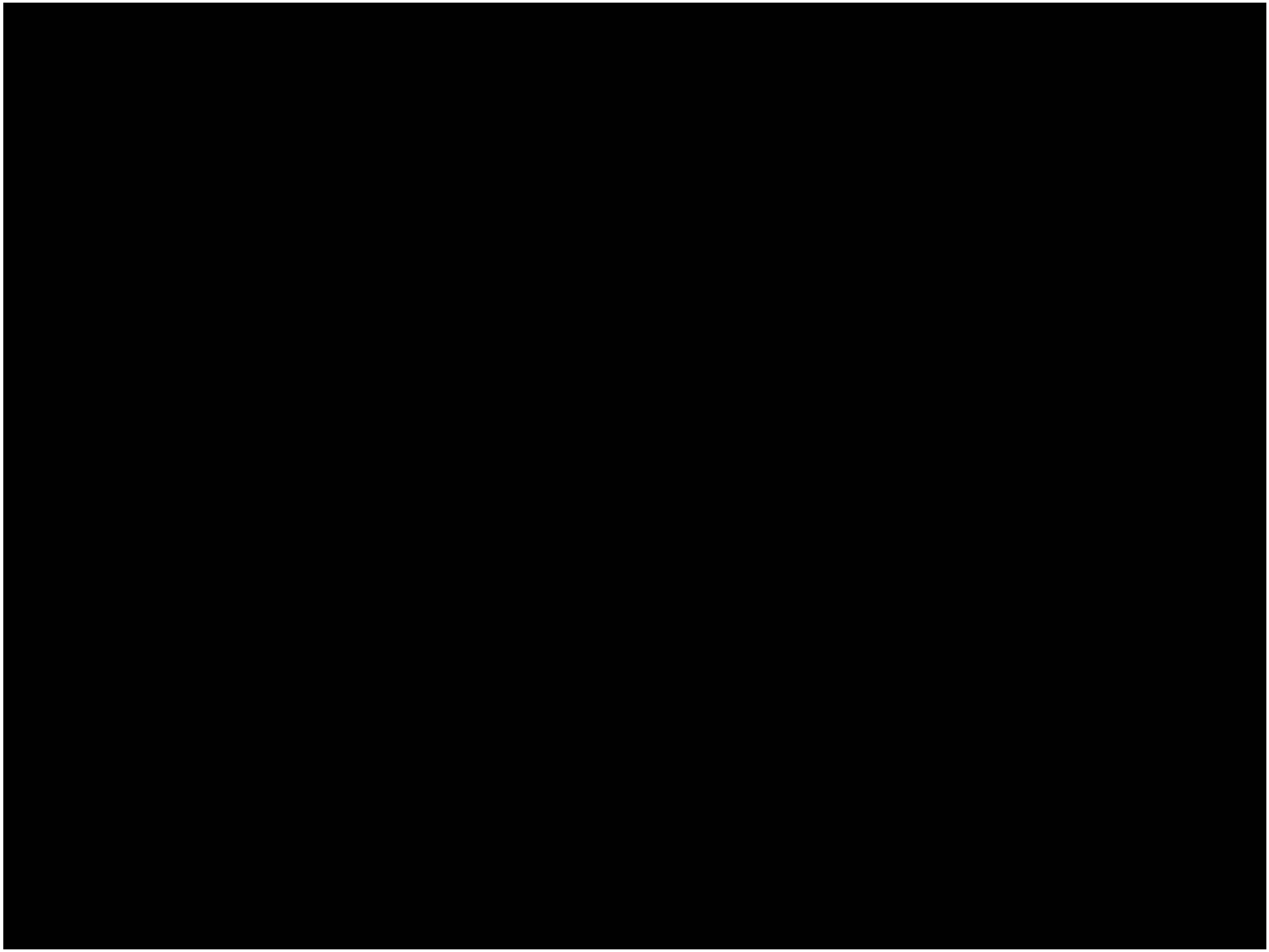
The U.S. Environmental Protection Agency and The Council of State Governments

Reference Condition on Great Rivers

Will we know it when we see it?

Beginning the biocriteria development process…

Biocriteria Development



IBI Development

- Began in 1991
- Ohio River lacks reference sites representative of *pristine* conditions.
- Recognized that most alterations are *permanent* in nature.
  - Hydrologic and channel modifications associated with dams
- Adopted the use of least-impacted sites as a surrogate for reference
  - Lowers the ceiling a bit
  - Measure status against ‘best attainable condition’

IBI Development

- Nighttime Electrofishing
  - 1991-2001
  - 709 sites
    - 391 sites failed to meet the criteria
    - 318 sites used for criteria development

Least-Impacted Criteria

- Least-Impacted sites are:
  - at least 1 Km upstream or downstream from the restricted areas around navigational dams;
  - at least 1.61 Km downstream from any point source discharge;
  - at least 500m from a tributary mouth;
  - free of any other major sources of possible disturbance within the sampling zone (barges, fleeting areas, heavy shoreline modifications etc);

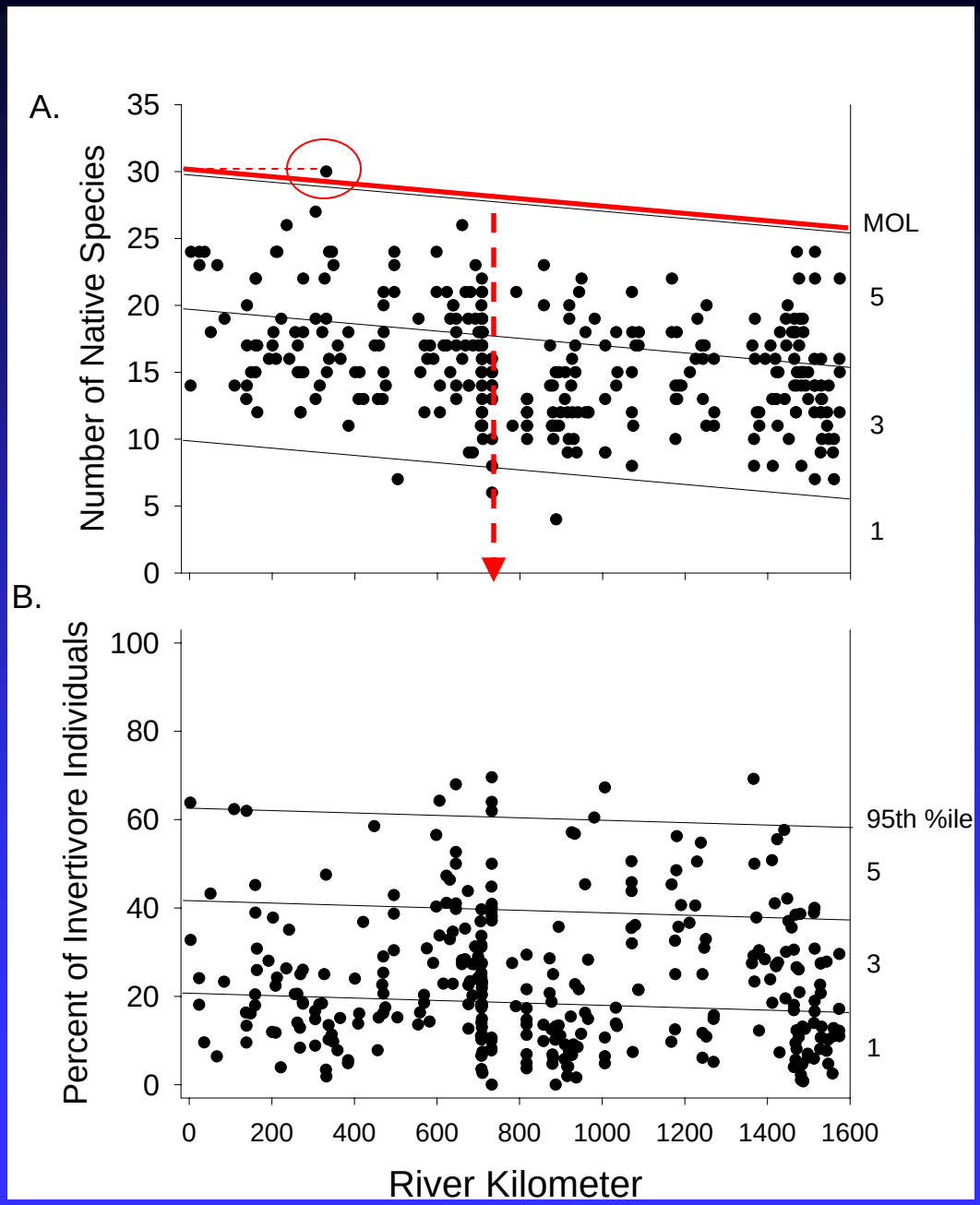
Modifying IBI Scoring Procedures

Limited Historical Information

Lack of Reference Sites

IBI Scoring Procedures

- First step to 'make up for' a lack of reference sites
  - Species richness metrics
    - Maximum Observed Value
      - Used instead of 95th percentile
        - Trisected beneath
  - Percentile Metrics
    - Standard 95th percentile procedures
      - Fausch et al (1984)



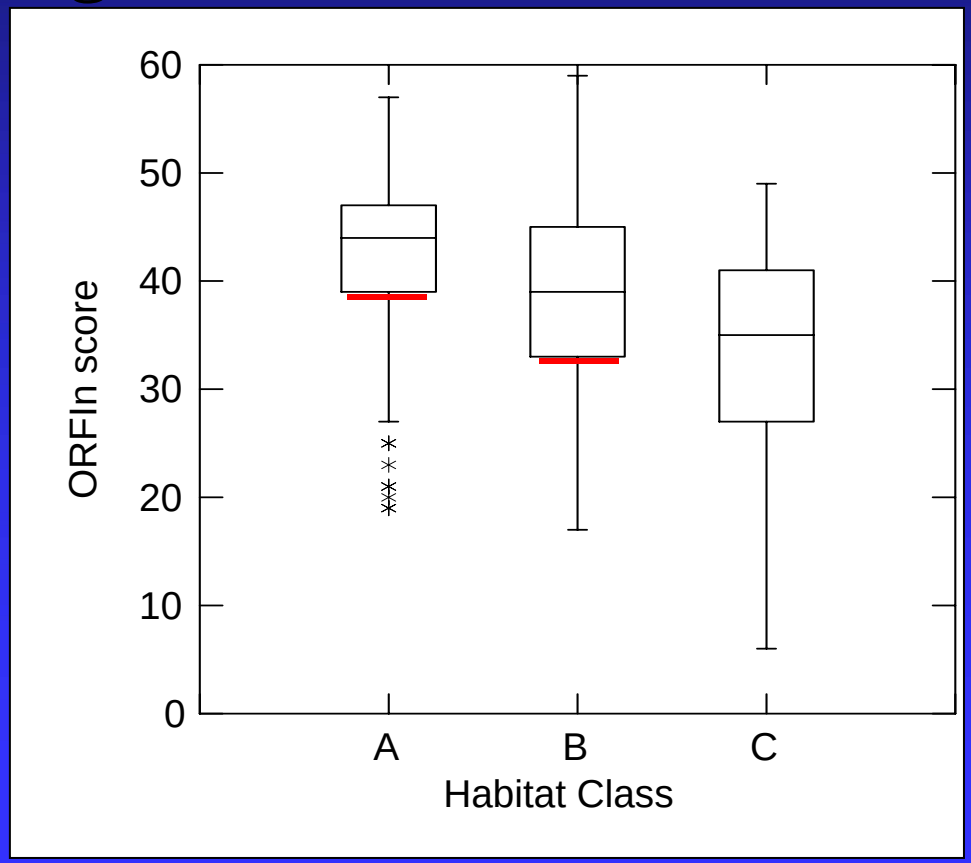
Our use of the IBI

Refining the bioassessment process…

- Criteria for Pass/Fail
- Observed –vs- Expected (reference)
  - Is there a difference?

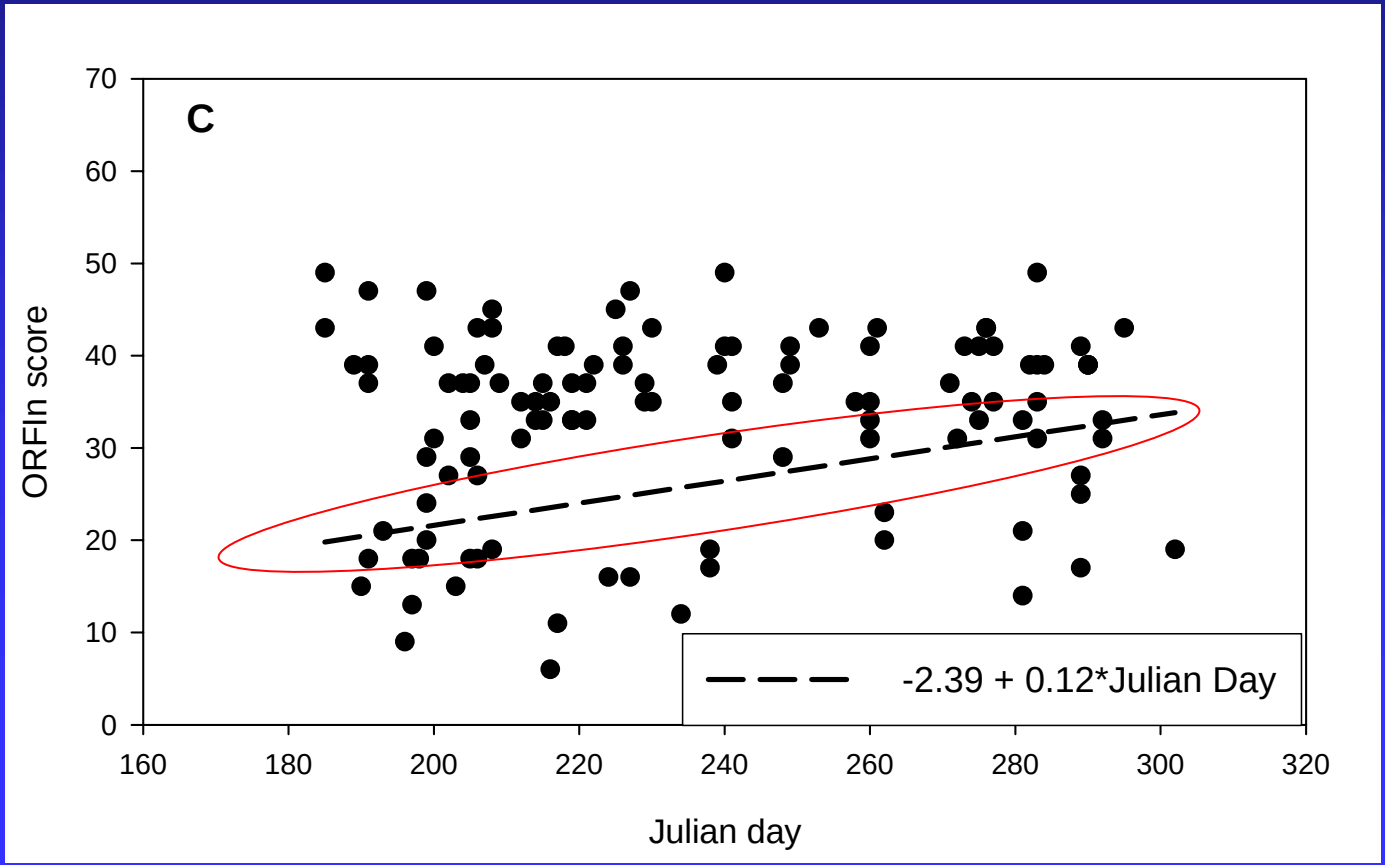
IBI response to:

- Changes in microhabitat



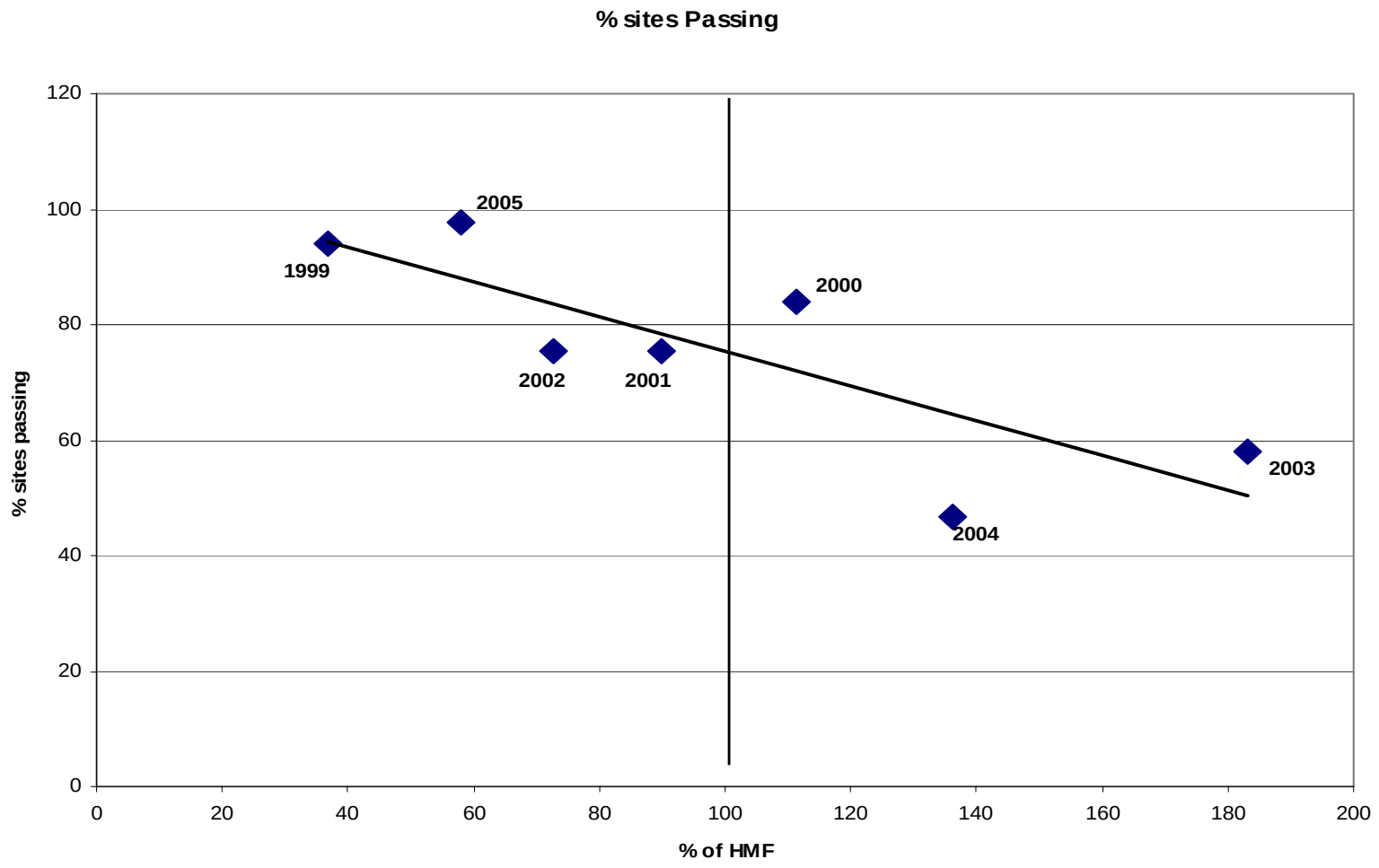
IBI response to:

- Seasonal changes



IBI response to:

- Changing flow conditions



Where are we now?

- We have:
  - Calibrations for microhabitat
  - Seasonal calibrations
  - Spatial calibrations
- We are:
  - Developing flow specific calibrations

Where are we now?

- We are better positioned and equipped to detect differences between reference (least-impacted) and impaired condition.

- But -

- We still might not be measuring the right things (abiotic factors) at the right scales.
- Need a better understanding of these abiotic factors in order to determine what is most important and what truly is a least-impacted condition.

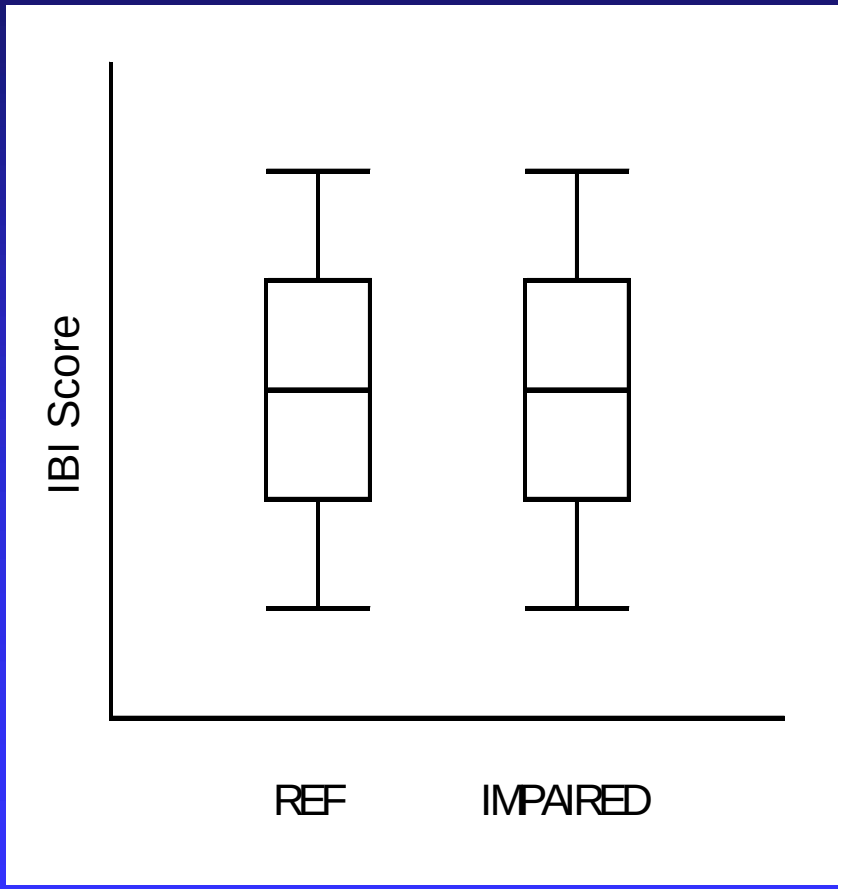
Summary of Lessons Learned

Increasing Resolution

- Assessment sensitivity increases as we gain a better understanding of (and incorporate into the process) all variables that potentially influence indicator variables.
  - 'Natural' factors
    - Habitat
    - Flow
    - Season
  - Disturbance factors

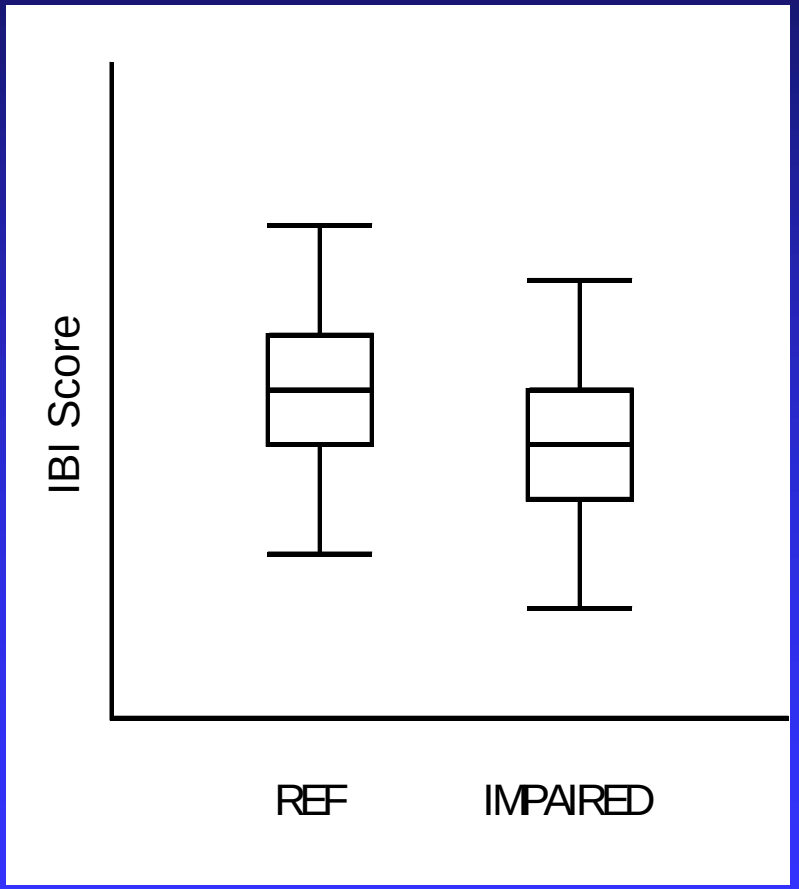
The assessment process…

- Incapable of detecting a difference between reference and impaired communities if information is lacking.



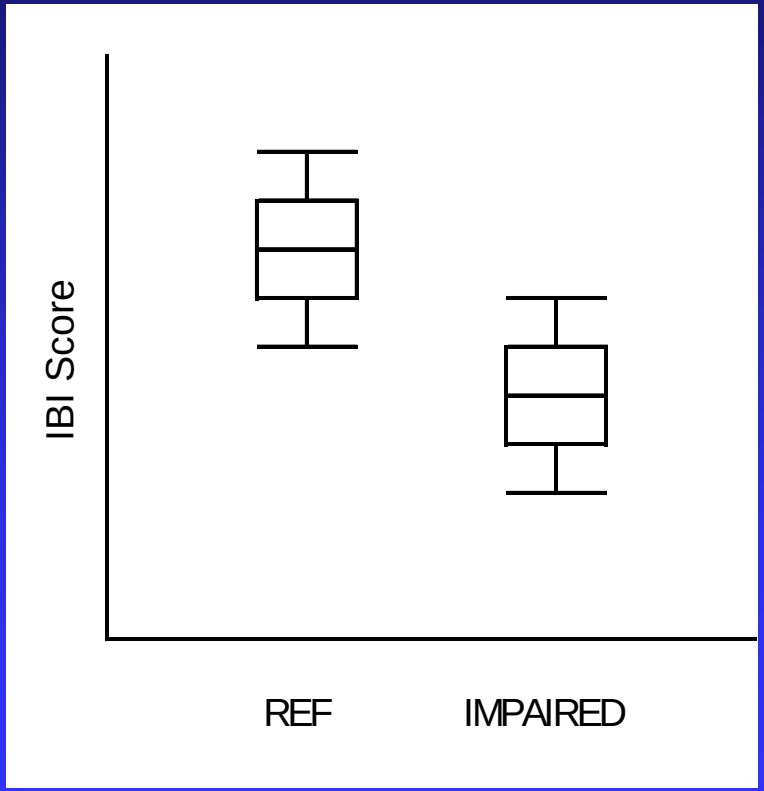
The assessment process…

- Resolution increases as additional variance is accounted for.



The assessment process…

- The more variance that can be accounted for, the greater the resolution and the greater our likelihood of detecting differences between reference condition and observed condition.



Reference Condition on Great Rivers

Will we know it when we see it?

Maybe…if we:

- measure the right things;
- at the right scales;
- have enough data to account for and remove major sources of variance;

What does this mean to GRE?

- We may not know enough about what really matters.
  - Are we going to measure the right things at the right scales?
- We may not have enough data.
  - Enough data to really develop a picture of reference condition;
  - Enough data to fully account for and incorporate all of the variance outside of that caused by the ‘impairment’ in question.

Questions?