

The Usefulness of Regional Biocriteria for Setting RAP Restoration Goals

CABB

Edward T. Rankin

Center for Applied Bioassessment
and Biocriteria



Dr. Tom Simon

U.S. Fish and Wildlife Service

Rankin@Ilgard.ohiou.edu

QHEI@aol.com

Midwest Biodiversity Institute

The Midwest Biodiversity Institute, Inc., incorporated in 1997, is an umbrella organization currently consisting of 124 institutions and corporations and its primary affiliate, the Ohio Biological Survey. The membership of MBI and OBS, encompassing 12 states and the Province of Ontario, overlap to a great degree, with institutions and corporations from outside of Ohio joining MBI and becoming affiliates of OBS. MBI is a 501(c)(3) nonprofit corporation, which is governed by a Board of Trustees.



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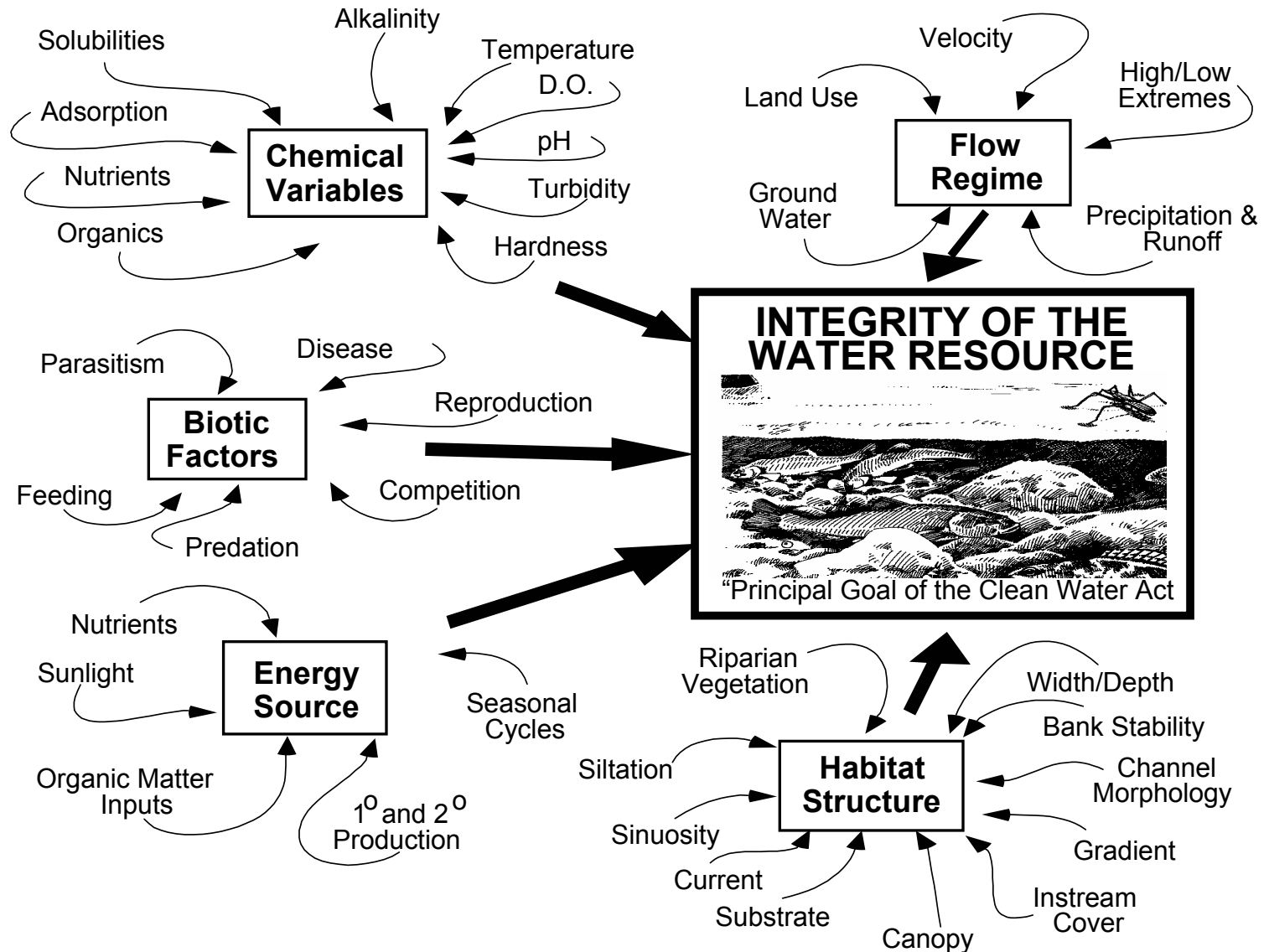
- The Center for Applied Bioassessment and Biocriteria (CABB) was established in July 2001 as an applied research organization for the purpose of improving the use of biological assessments and biocriteria in and among State, Federal, and local government agencies and institutions and non-governmental organizations. CABB is a 501(c)(3) nonprofit corporation.



OBJECTIVES

- Describe the rationale behind the use of Ecological Recovery Endpoints
- The use of multi-metric indices and key species concepts in the determination of Ecological Recovery Endpoints

The Five Major Factors Which Determine the Integrity of Aquatic Resources

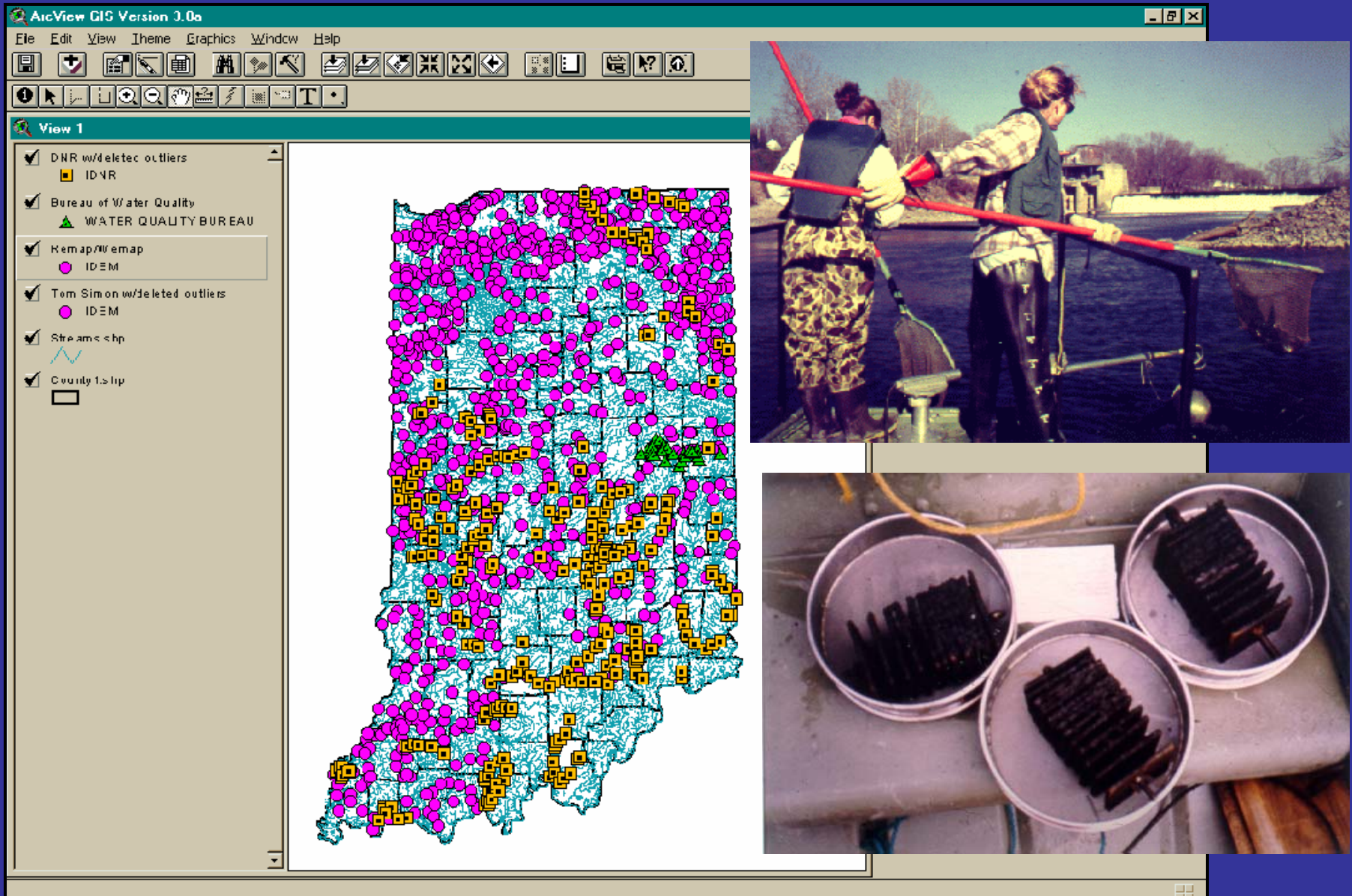


Biological Integrity: Putting Theory Into Practice

Essential Elements of the Regional Reference Site Approach

- **Biological Performance** - need ways to measure (e.g., IBI, ICI, BI, RIVPACS, etc.).
- **Natural Habitats** - come to grips with the attainability issue (e.g., “least impacted” reference sites).
- **Region** - need to stratify and account for natural variability (e.g., ecoregions and tiered uses).
- Reference site “re-sampling” to account for broad scale, long term changes in attainable conditions.

REFERENCE CONDITION STUDY 1990 - 1998

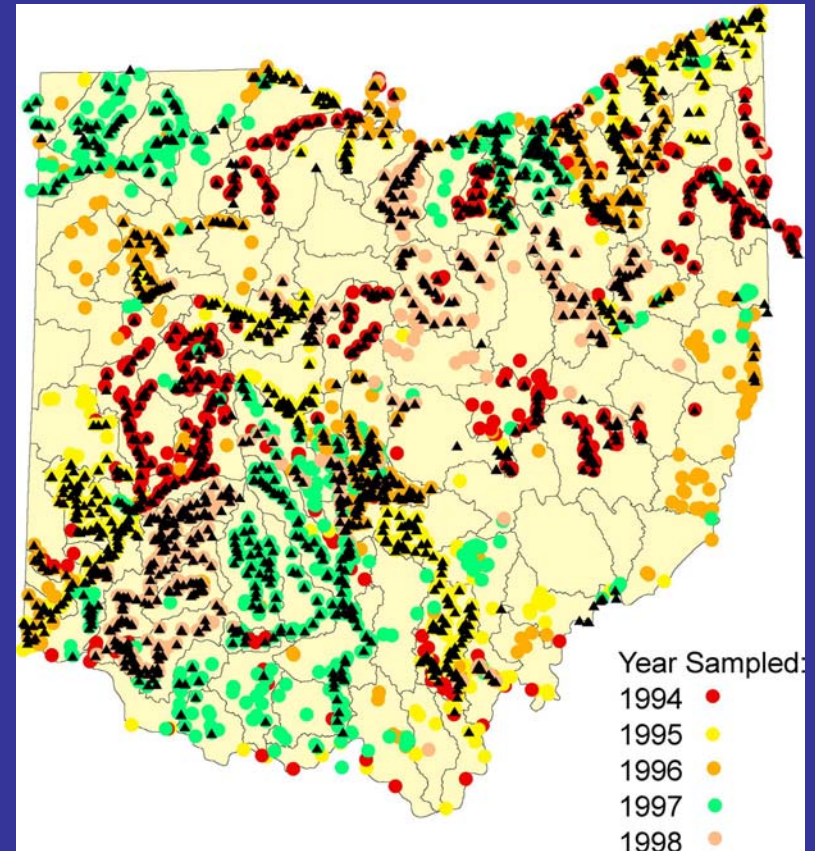




Standardized Electrofishing Methods

Fish Community Data

- Late 1970s to present
- Approximately 20,000 samples
- Nearly 8,000 unique stations
- 162 species collected
- 7.9 million fish processed



Advantages of Use Regional Reference Data as Basis for Setting Restoration Goals

- Biological Integrity Measures Proving Extremely Useful Across US and elsewhere
- Provides Consistent Basis for Analyzing WQ Trends
- Provides Context for Interpreting Impairments
- In Ohio, Application of Tiered Aquatic Life Uses and Antideg Tiers Provide Ability To Prioritize Consistently (U.S. EPA Workgroup on Tier Aq Life Uses)
- Brings With It Useful Biodiversity Data
 - Concept of Key Species

OHIO SPECIFIC TEMPLATE FOR STRATIFICATION

Warmwater Lotic Systems

Primary HW Streams
(<1-3 mi²)

Class A

Class B

Class B Modified

Class C

Headwater Streams
(1-20 mi²)

EWH

WWH

MWH

2 Types:
-Channel mod.
--Non acidic MD

USH

LRW

2 Types:
-Drainage maint.
-AMD

Wadeable Streams
(20-300 mi²)

EWH

WWH

MWH

2 Types:
-Channel mod.
--Non acidic MD

USH

LRW

2 Types:
-Drainage maint.
-AMD

Large Rivers
(>200-300 mi²)

EWH

WWH

MWH

3 Types:
-Impounded
-Channel mod.
--Non acidic MD

LRW

1 Type:
-Other (case specific)

Great Rivers
(>6000 mi²)

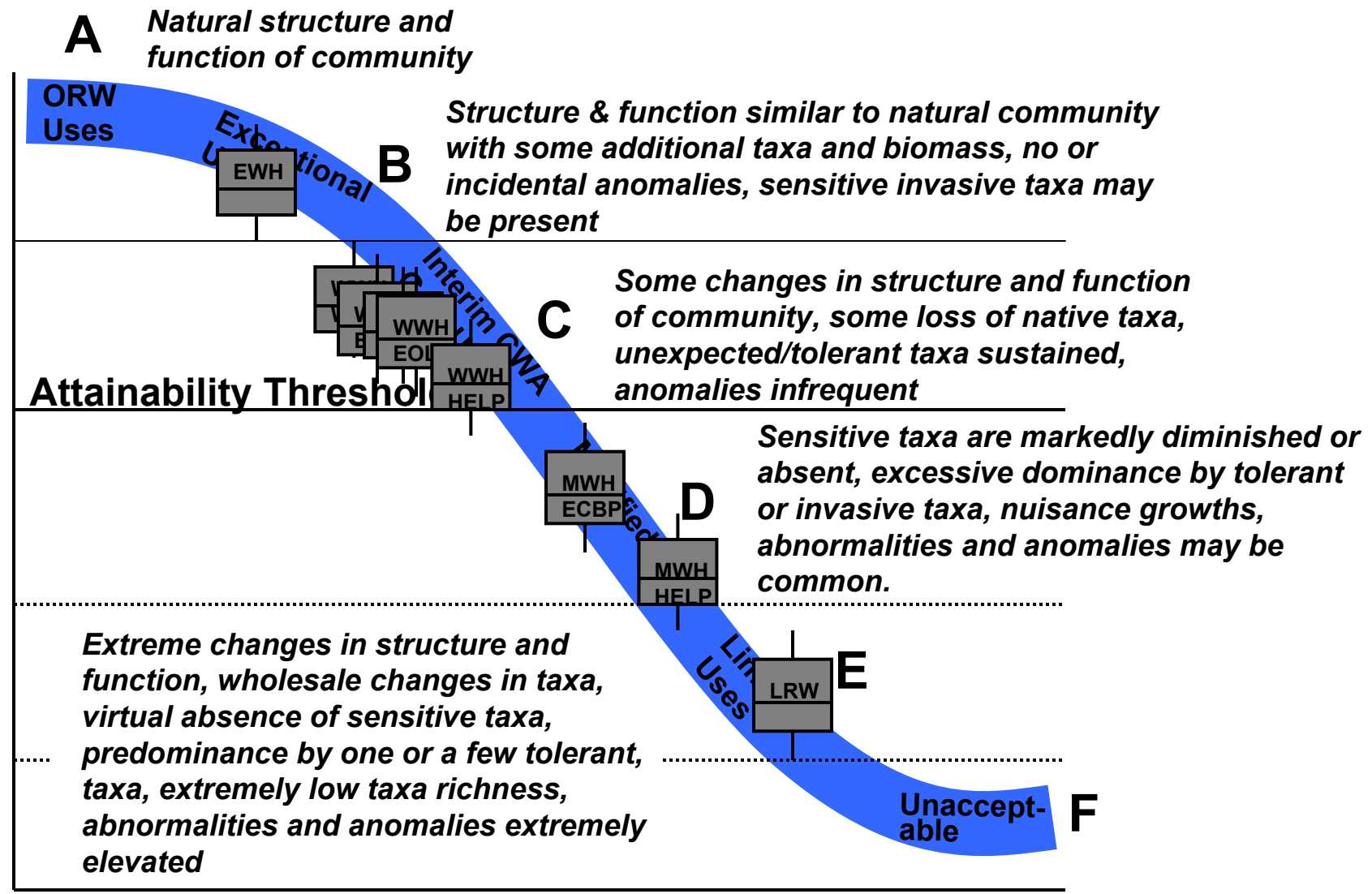
Shoreline Habitat Types (A,B,C)

Modified Habitat

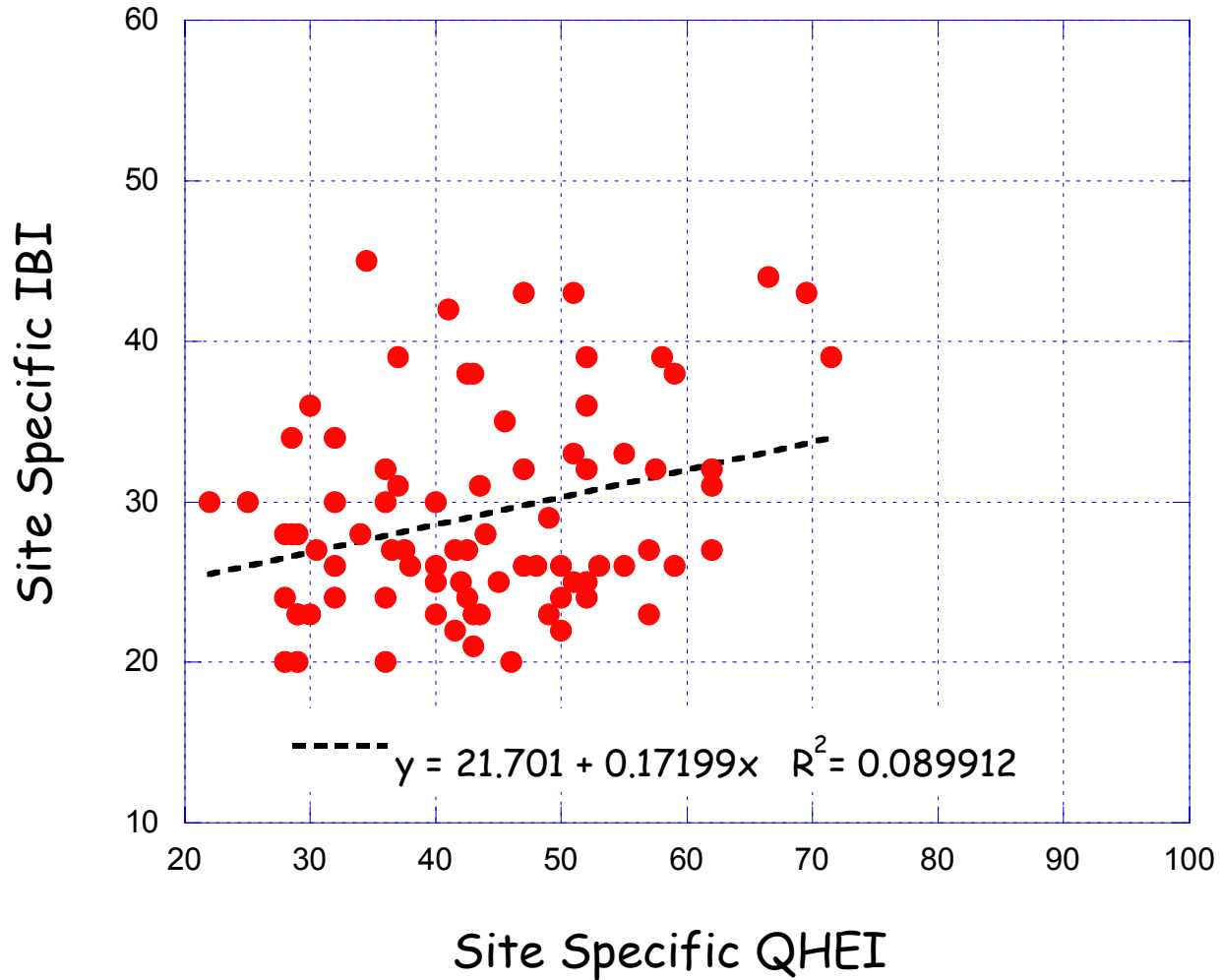
- Adopted in WQS**
- Assessment Tool**
- ORSANCO**

Biological Condition

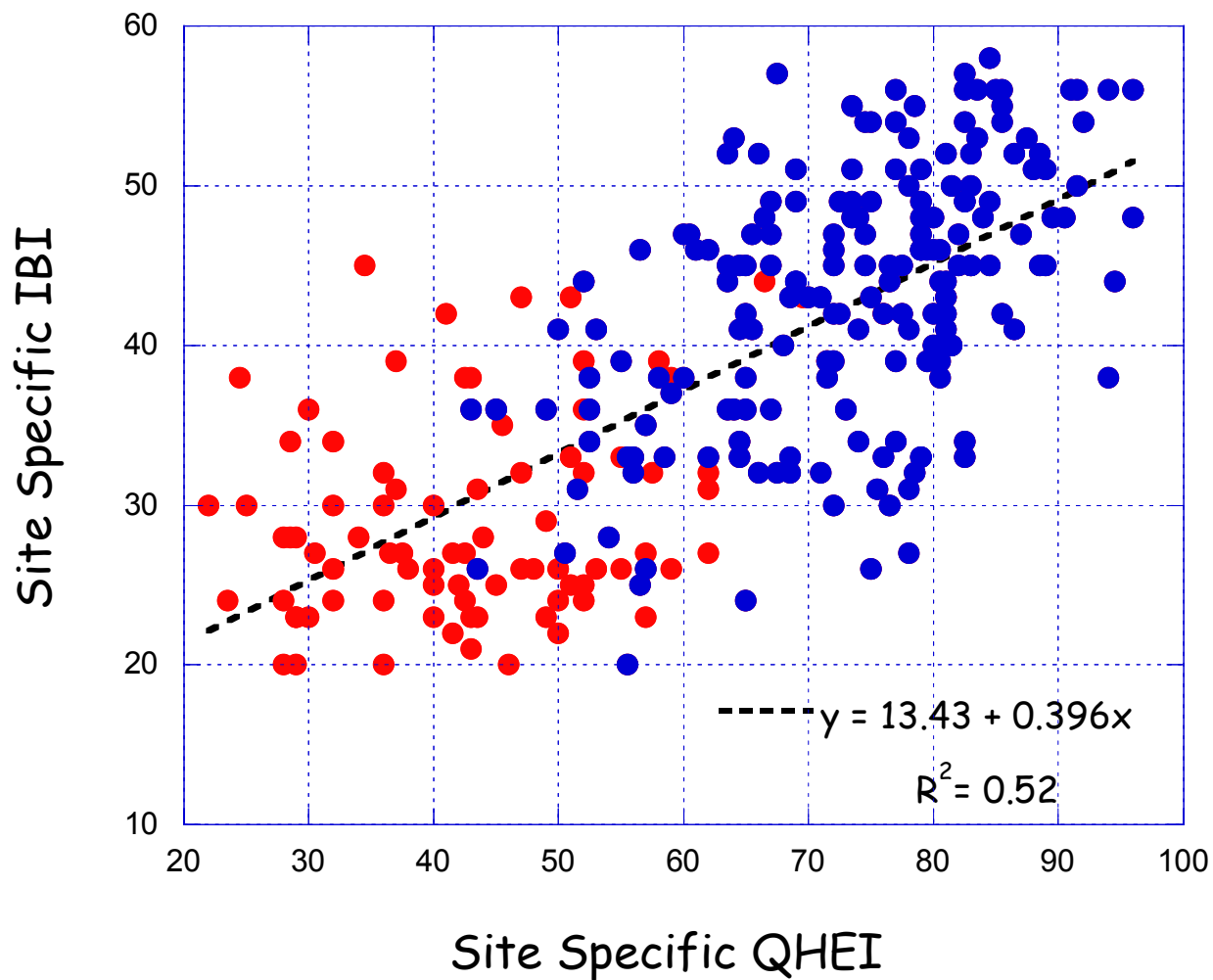
[Calibrated Index – IBI Wading Site Type]



Data by Site All Years
ECBP & HELP Ecoregions
MODIFIED Reference Sites ONLY

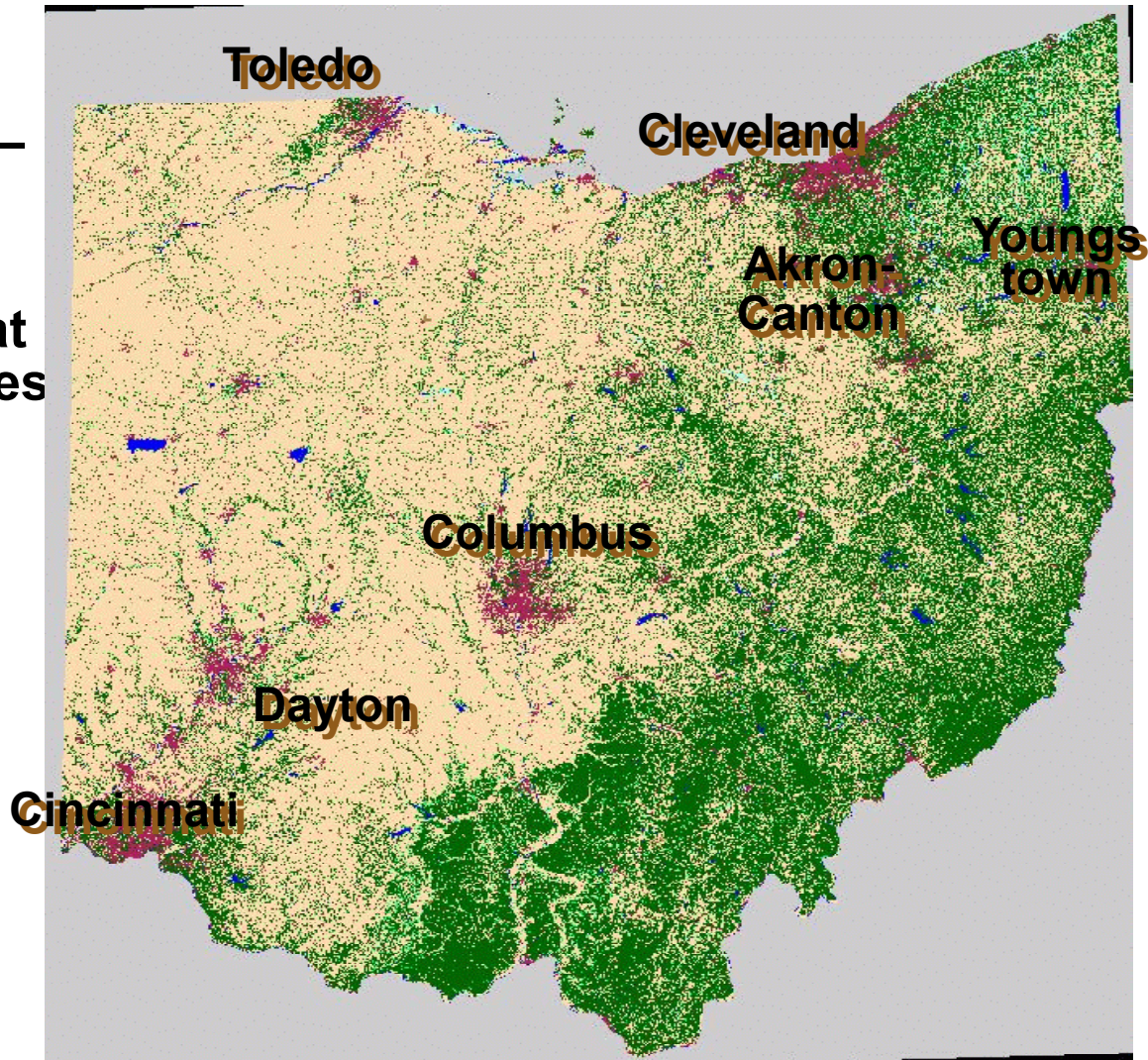
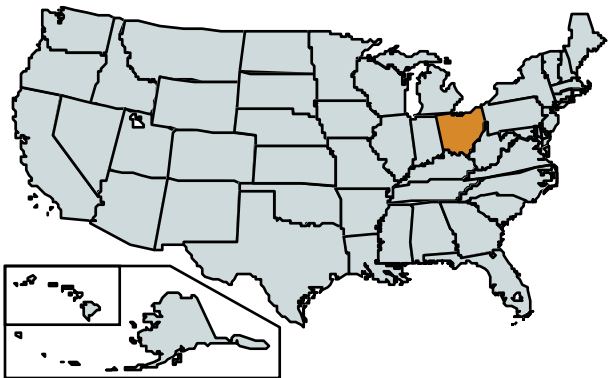


Data by Site All Years
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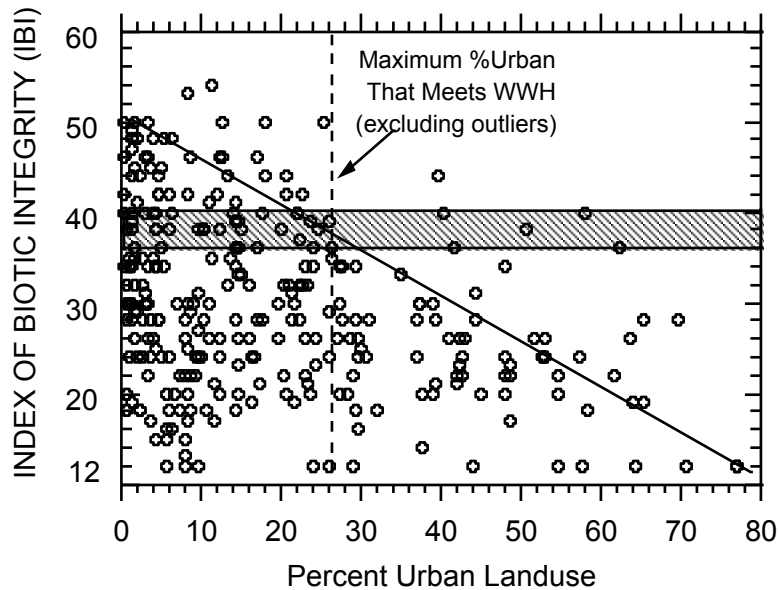


Ohio Urban Stream Assessments

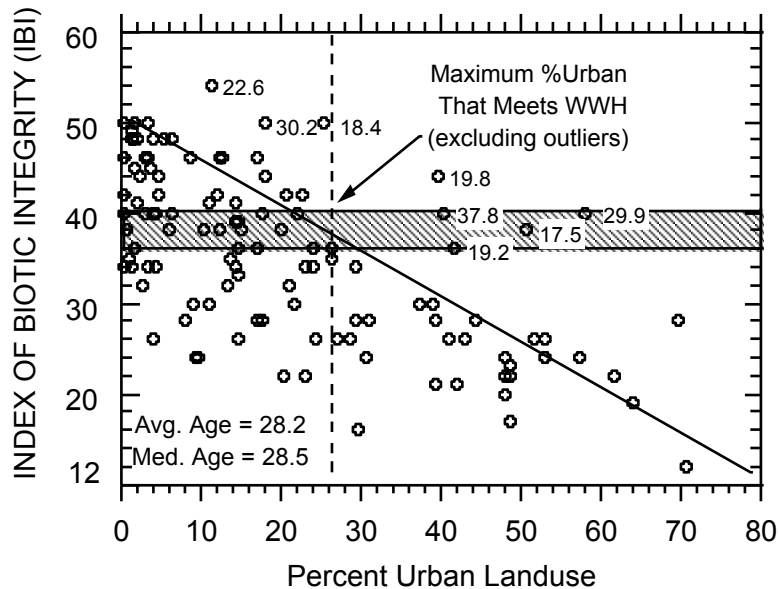
- Major metropolitan areas of Ohio.
- Fish assemblage and habitat sampling at >300 stream sites generally <20-100 m².
- IBI vs. urban land use and 8 different impact types
- Focused assessment of suburban watersheds with recent development.



ALL IMPACT TYPES



SELECTED IMPACT TYPES



IBI vs. % Urban Land Use

- Typical threshold for WWH attainment at 25-30% urban land use.
- No attainment at >60% urban land use.
- Attainment "outliers" occur at 40-60% urban land use.
- Characteristics common to outliers are good riparian, sustained flow, or <20 years of urban development.
- Removal of habitat, sewer overflow, and legacy impacts helped clarify IBI/urban land use relationship.

