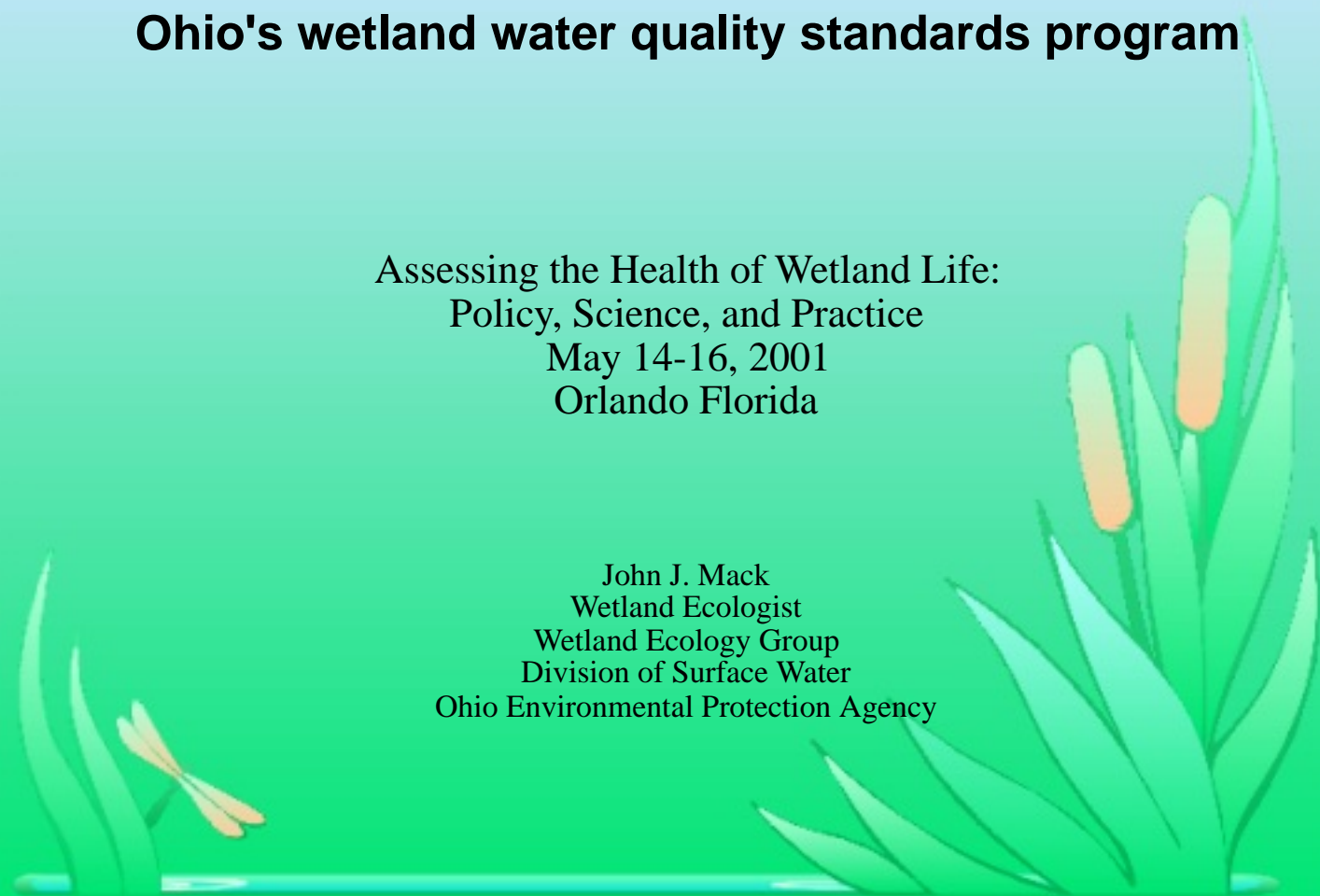


Wetland Bioassessment in a State regulatory program

Ohio's wetland water quality standards program

Assessing the Health of Wetland Life:
Policy, Science, and Practice
May 14-16, 2001
Orlando Florida

John J. Mack
Wetland Ecologist
Wetland Ecology Group
Division of Surface Water
Ohio Environmental Protection Agency



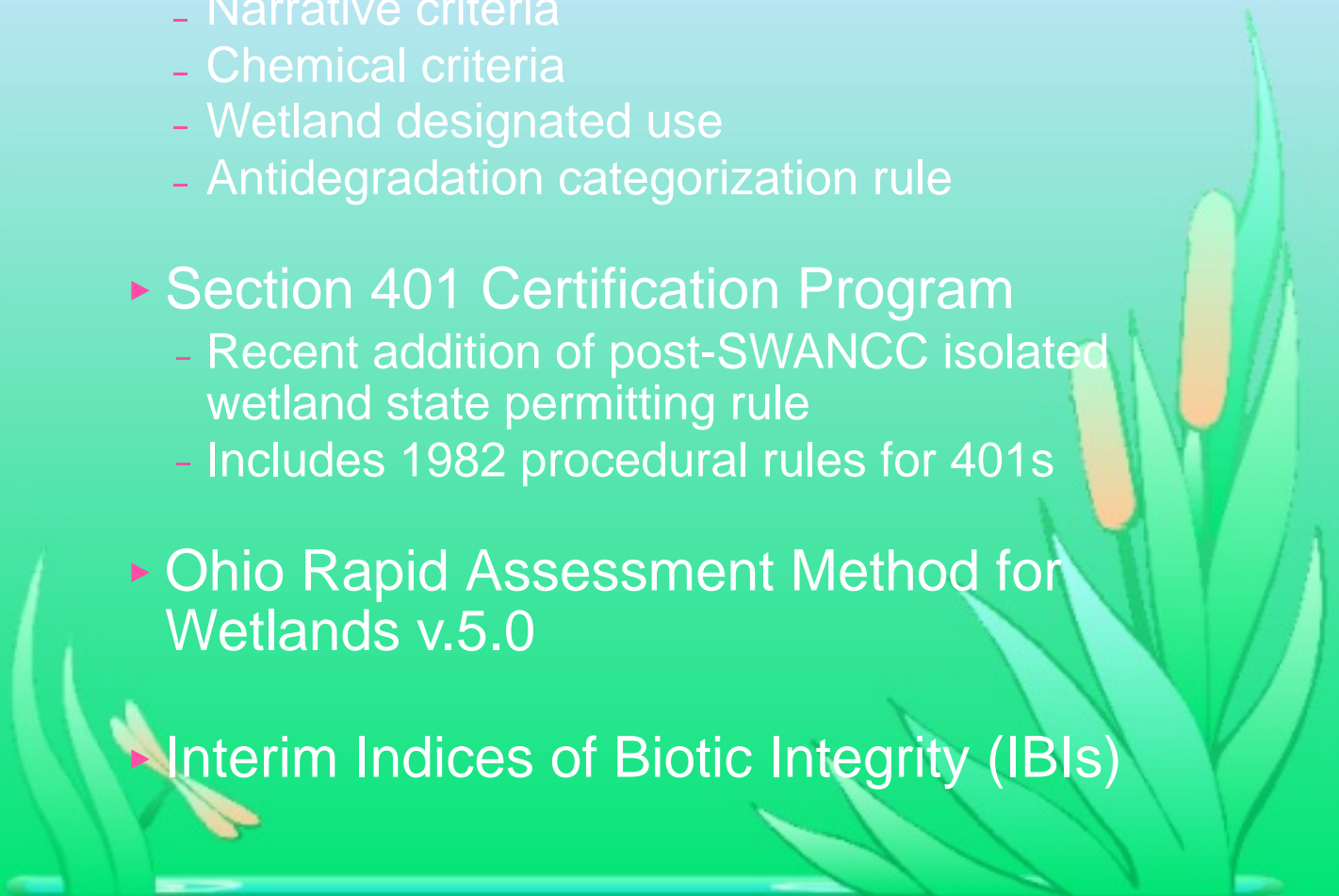
Regulatory framework for Wetlands regulation

- Section 404 of Clean Water Act.
Implemented by U.S. Army Corps of Engineers
 - ▶ Need federal permit to dredge/fill in wetlands
- Section 401 of Clean Water Act.
Implemented by the States (or Indian Tribes)
 - ▶ Need state "water quality certification" (401 Certification) before you can receive your federal Permit
- It is this certification that links state water Quality standards to federal wetland permit: Federal permit cannot cause violation of State's water quality standards
- May 1998. Ohio Adopted Wetland Water Quality Standards and Wetland Antidegradation Rule.

Ohios Wetland Water Quality Standards Program

■ Current Elements of Program:

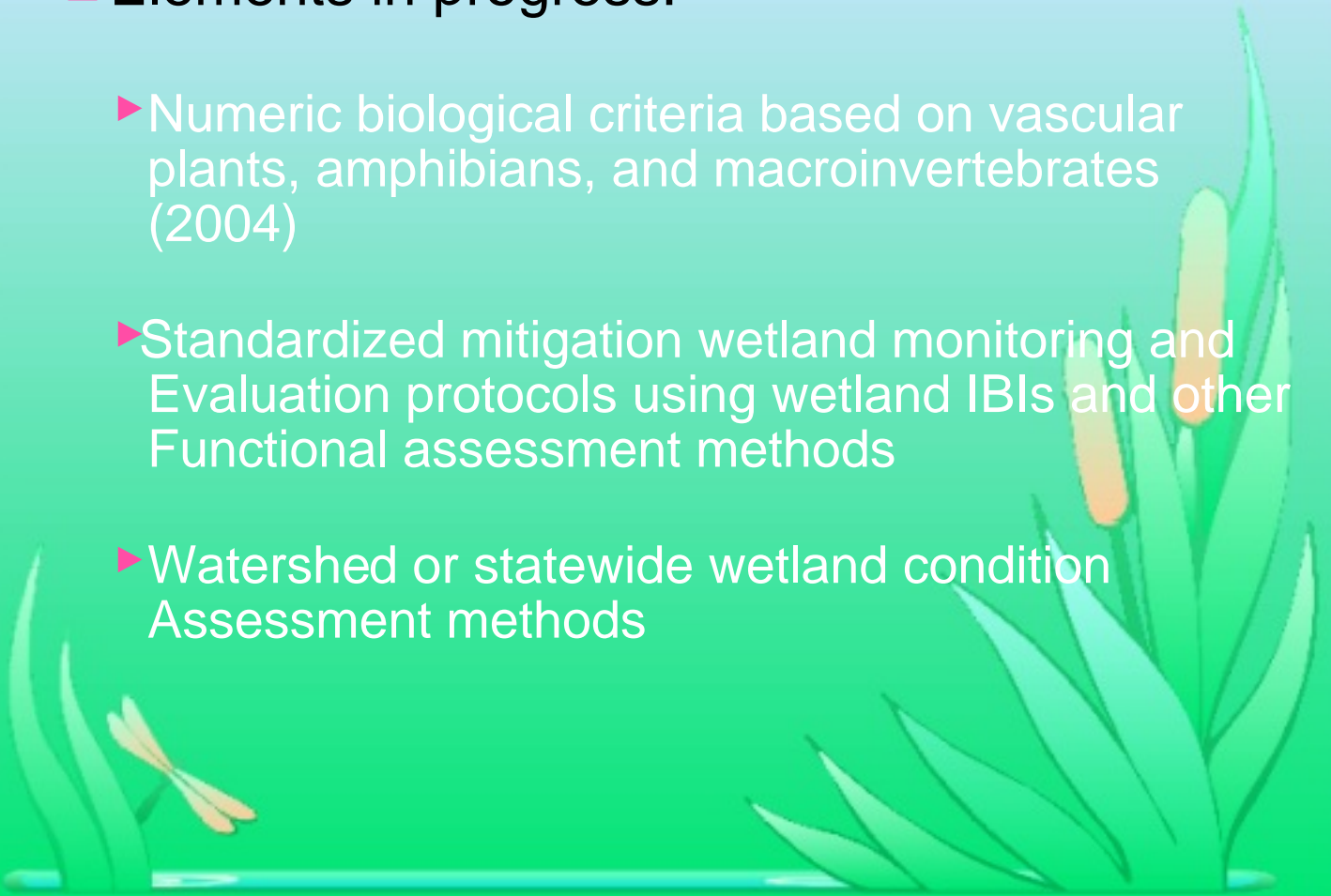
- ▶ Wetland Water Quality Standards
 - Narrative criteria
 - Chemical criteria
 - Wetland designated use
 - Antidegradation categorization rule
- ▶ Section 401 Certification Program
 - Recent addition of post-SWANCC isolated wetland state permitting rule
 - Includes 1982 procedural rules for 401s
- ▶ Ohio Rapid Assessment Method for Wetlands v.5.0
- ▶ Interim Indices of Biotic Integrity (IBIs)



Ohios Wetland Water Quality Standards Program

■ Elements in progress:

- ▶ Numeric biological criteria based on vascular plants, amphibians, and macroinvertebrates (2004)
- ▶ Standardized mitigation wetland monitoring and Evaluation protocols using wetland IBIs and other Functional assessment methods
- ▶ Watershed or statewide wetland condition Assessment methods

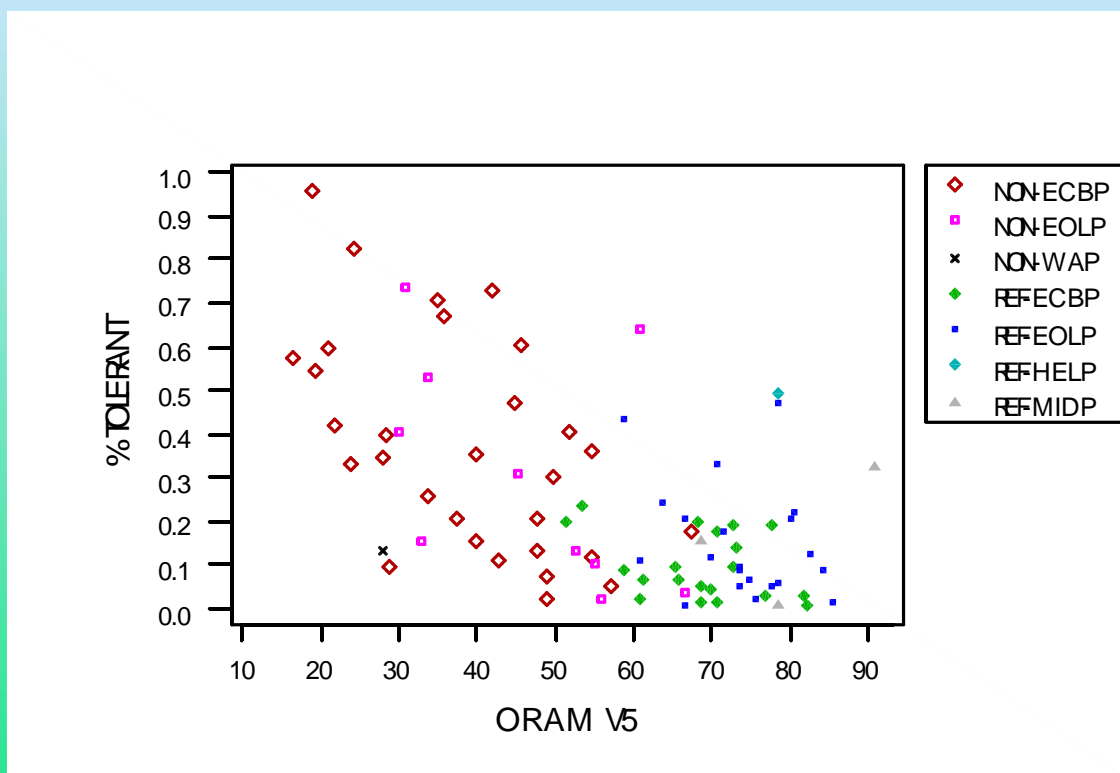


**WETLAND INDEX
(INDICES) OF
BIOTIC INTEGRITY**

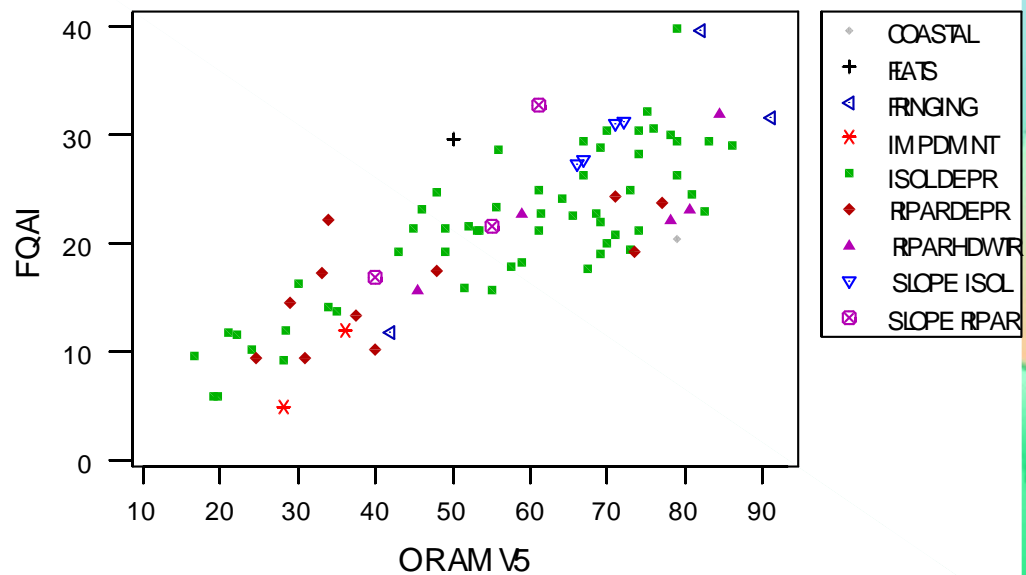
- CLASSIFICATION SCHEME
interim developed 8-15-2000
- METHODS
Finalized ca2000
- DATA COLLECTION
Ongoing since 1996-present
- ANALYSIS
Ongoing since 1996-present
- IBI DEVELOPMENT
Vegetation IBI interim 8-15-2000
Amphibian IBI summer 2001
Macroinvertebrate IBI summer 2001
- VALIDATION, REFINEMENT
Ongoing, biogeochemical, and
Landscape variable correlation under
Project 2 Grant J172 ~2001-2002



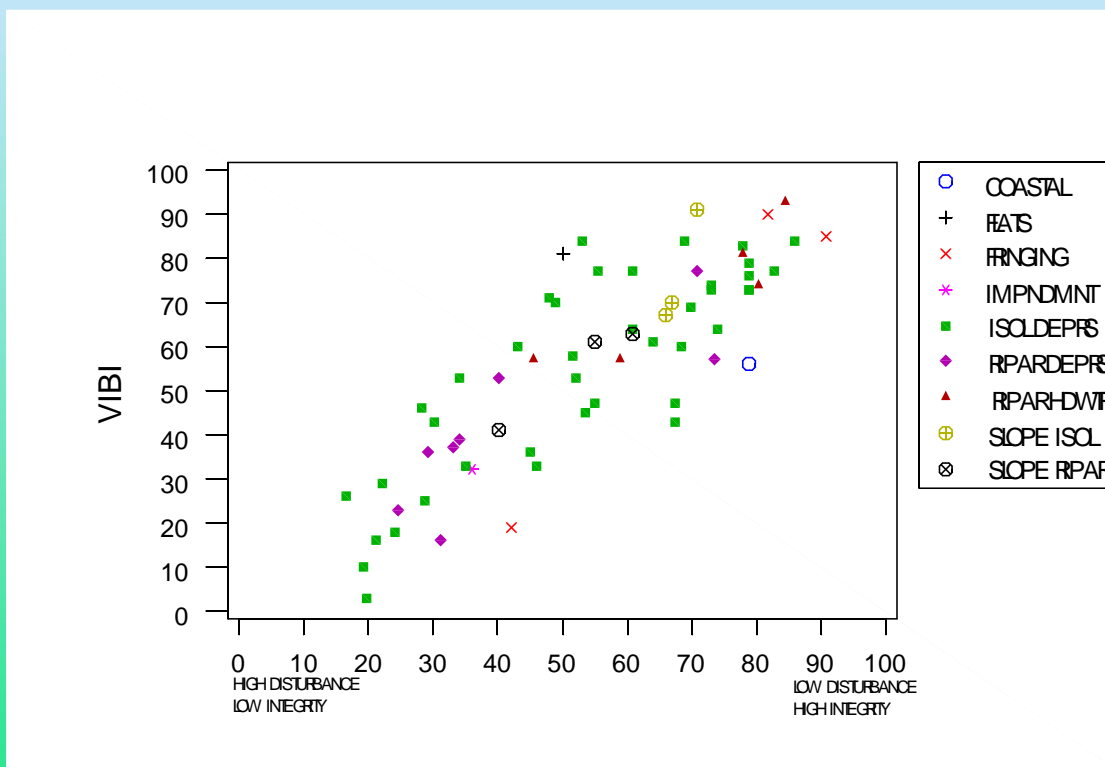
Developing Wetland IBIs



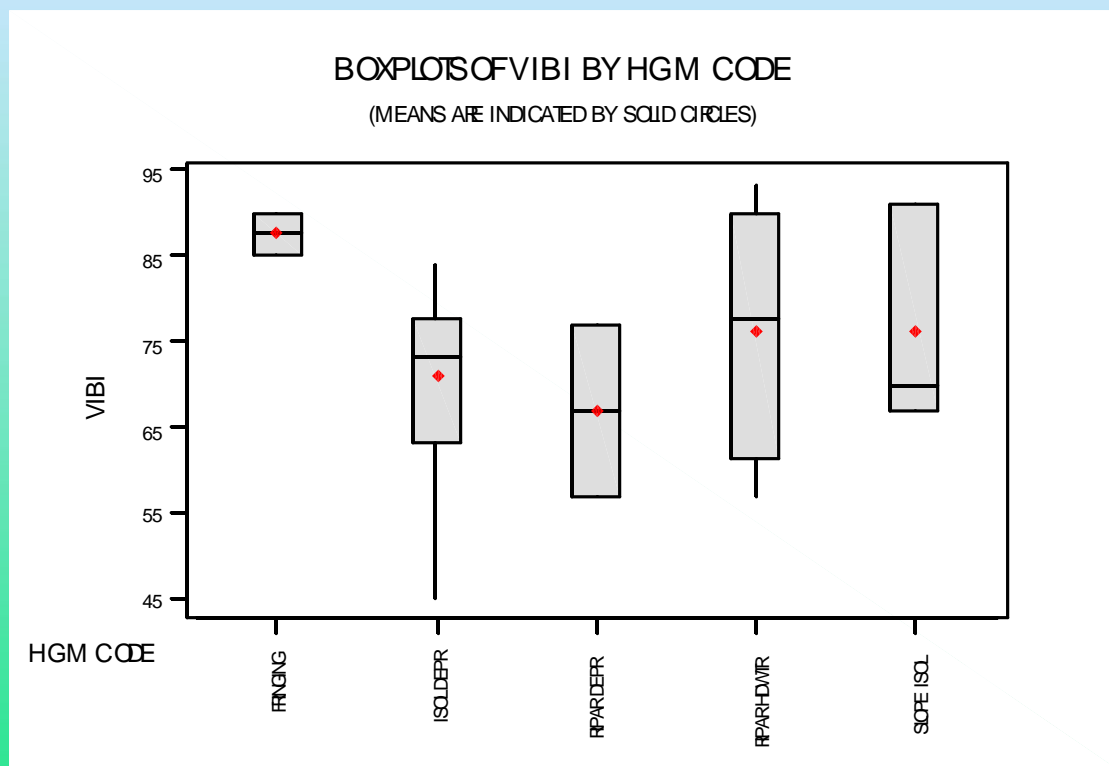
Developing Wetland IBIs



Using biocriteria to define Regulatory categories



Developing Wetland IBIs



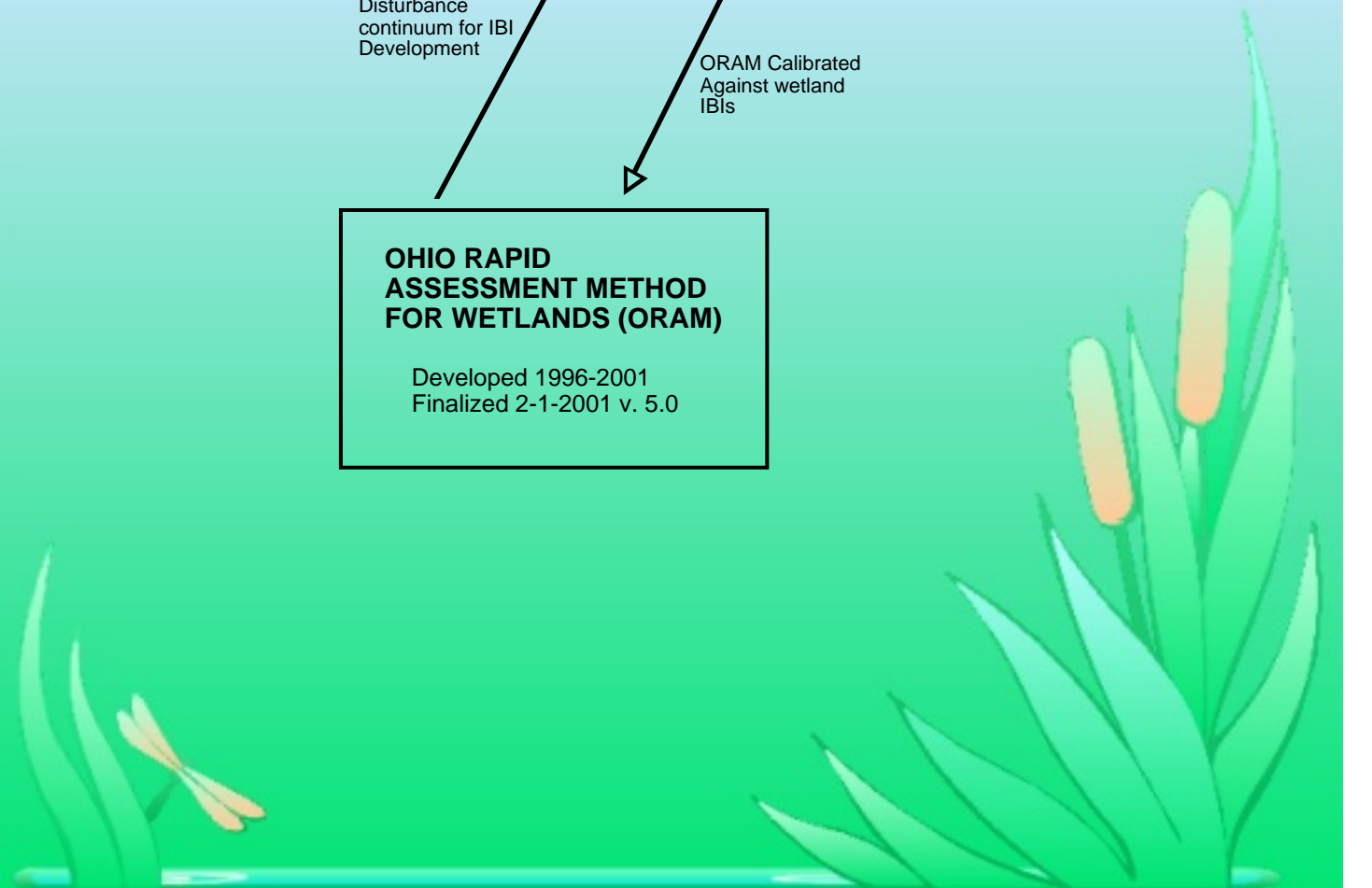
**WETLAND INDEX
(INDICES) OF
BIOTIC INTEGRITY**

Used as human
Disturbance
continuum for IBI
Development

ORAM Calibrated
Against wetland
IBIs

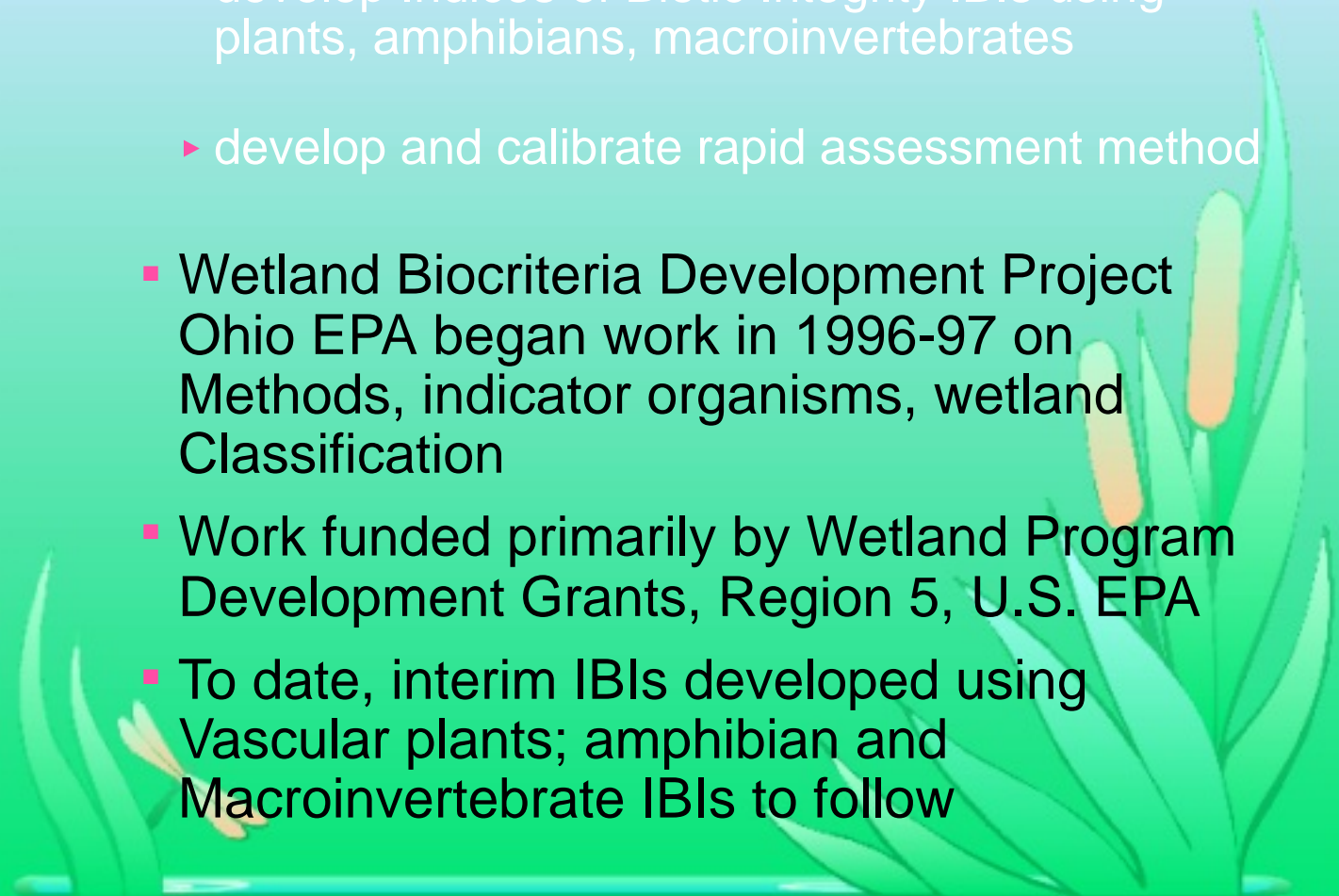
**OHIO RAPID
ASSESSMENT METHOD
FOR WETLANDS (ORAM)**

Developed 1996-2001
Finalized 2-1-2001 v. 5.0

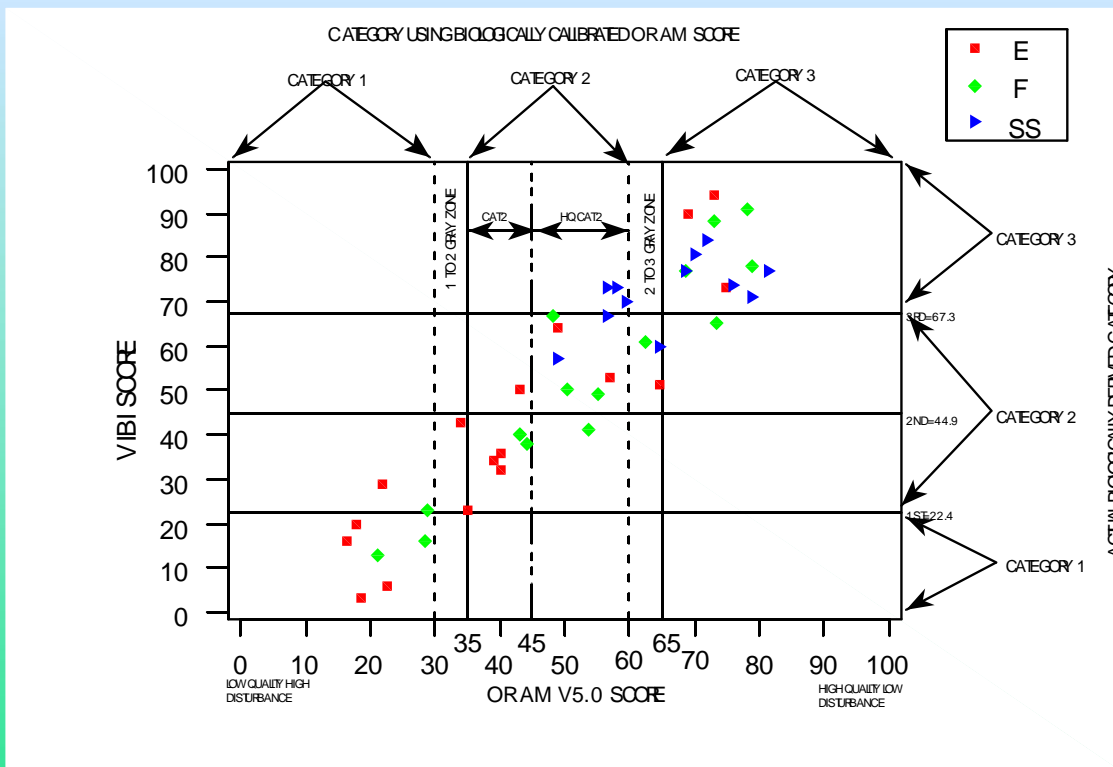


Calibration of Wetland Categories

- Major Goals:
 - ▶ *Establish "breakpoints" between wetland Categories and base regulatory decisions on Actual measures of wetland integrity and Functionality*
 - ▶ develop Indices of Biotic Integrity IBIs using plants, amphibians, macroinvertebrates
 - ▶ develop and calibrate rapid assessment method
- Wetland Biocriteria Development Project
Ohio EPA began work in 1996-97 on Methods, indicator organisms, wetland Classification
- Work funded primarily by Wetland Program Development Grants, Region 5, U.S. EPA
- To date, interim IBIs developed using Vascular plants; amphibian and Macroinvertebrate IBIs to follow



Using biocriteria to define Regulatory categories



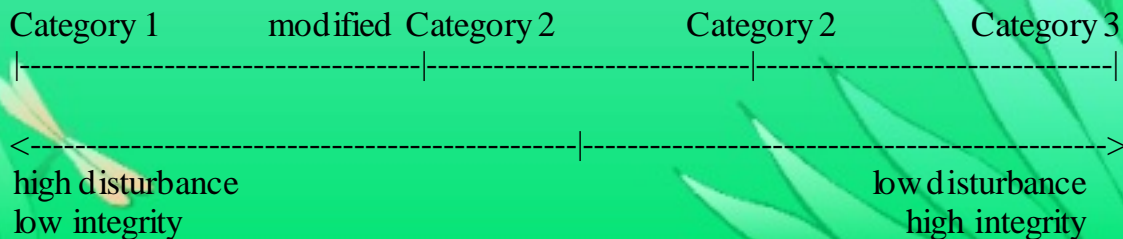
Using biocriteria to define Regulatory categories

Table 23. Interim scoring breakpoints for wetland regulatory categories for ORAM and VIBI scores.

category	VIBI score	ORAM score
1	0 - 21	0 - 29.9
1 or 2 gray zone	—	30 - 34.9
modified 2	22 - 44	35 - 44.9
2	45 - 66	45 - 59.9
2 or 3	—	60 - 64.9
3	67 - 100	65 - 100

Ohio's Wetland Categorization Scheme

- Wetlands assigned to four basic categories based on:
 - ▶ *wetland's relative functions and values, sensitivity to disturbance, rarity, and potential to be adequately compensated for by wetland mitigation*
- 3 category system with degraded but restorable 4th category, with a "high plus" option for really special sites (Outstanding National Resource Waters) assigned by separate rulemaking



ORAM used to
Define most
Wetland categories
To implement
WWQS and anti-
Deg requirements

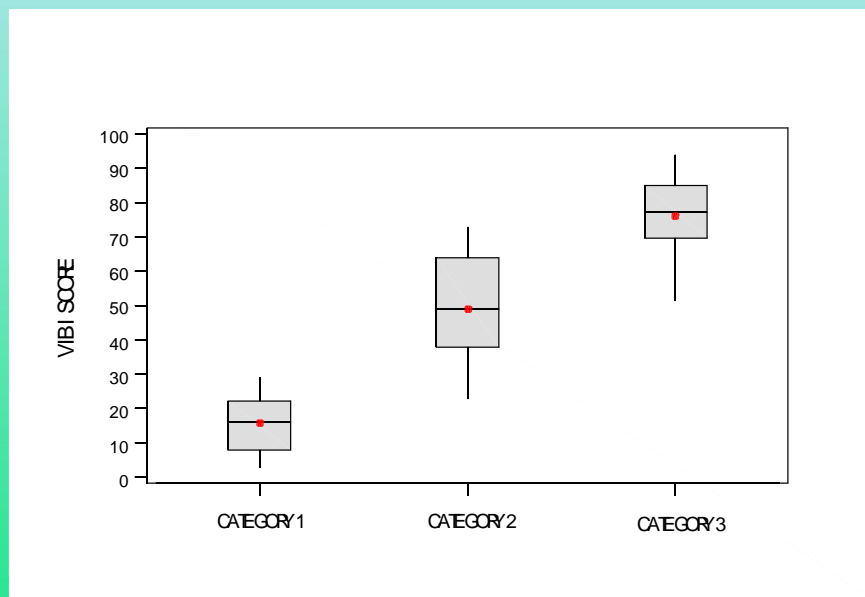
- **PERMIT DECISION-MAKING PROCESS**
- OEPA existing 401 rules ca 1980-Present
- Increasing use of antidegradation Requirements ca 1990 present

**OHIO RAPID
ASSESSMENT METHOD
FOR WETLANDS (ORAM)**

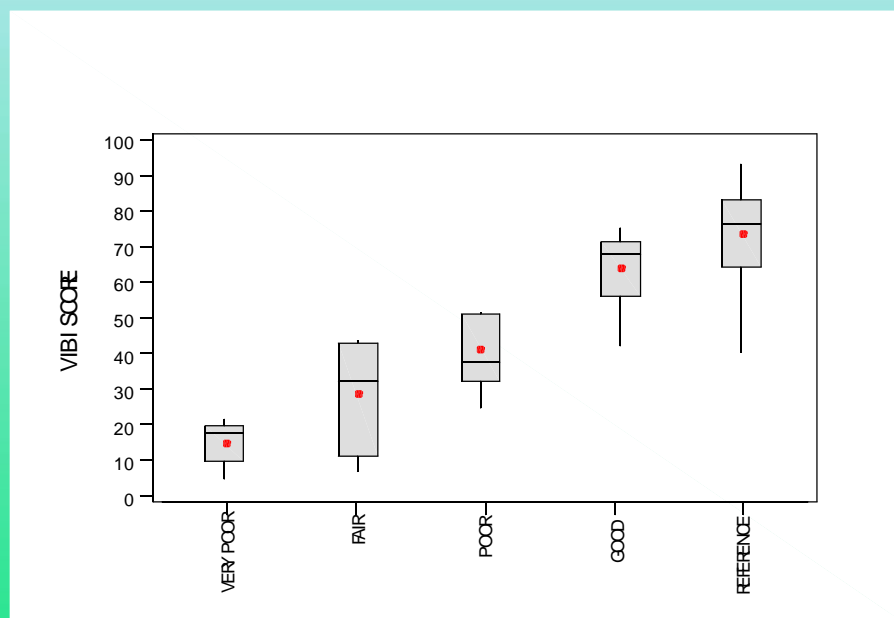
Developed 1996-2001
Finalized 2-1-2001 v. 5.0



Using biocriteria to define Regulatory categories



Using biocriteria to define Regulatory categories



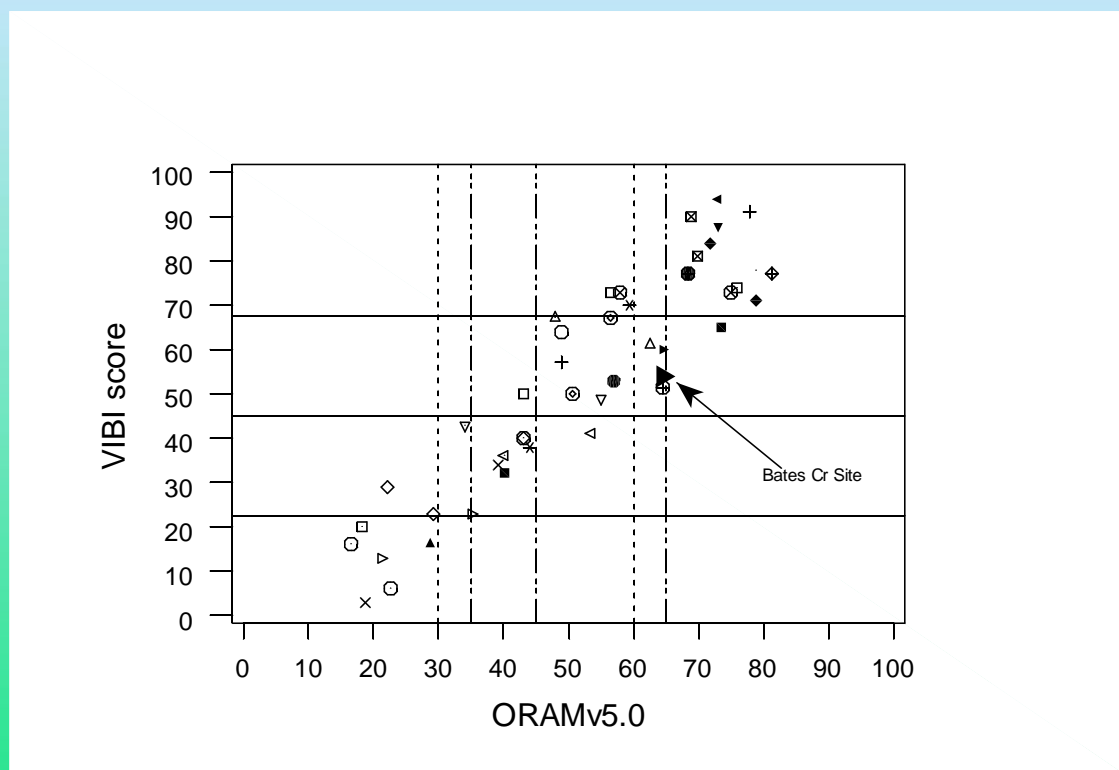
Using biological data to support Individual permit actions

EXAMPLE

- After the fact, permit for small to mid-sized headwater marsh to Cuyahoga River
- Issue: Is wetland moderate (Cat 2) or high (Cat 3) wetland? If Category 3, then NWP For action usable. If not, then individual Permit needed.
- Rapid assessment method and professional Judgment divided on category.
- Sampled using Vegetation IBI procedures:
 - ▶ Sampling in field - 3 hours
 - Experienced sampling team
 - Excluding travel time
 - ▶ Voucher review - 2 hours
 - Experienced field botanist
 - ▶ Calculation of VIBI - 0.5 hours

Using biological data to support Individual permit actions

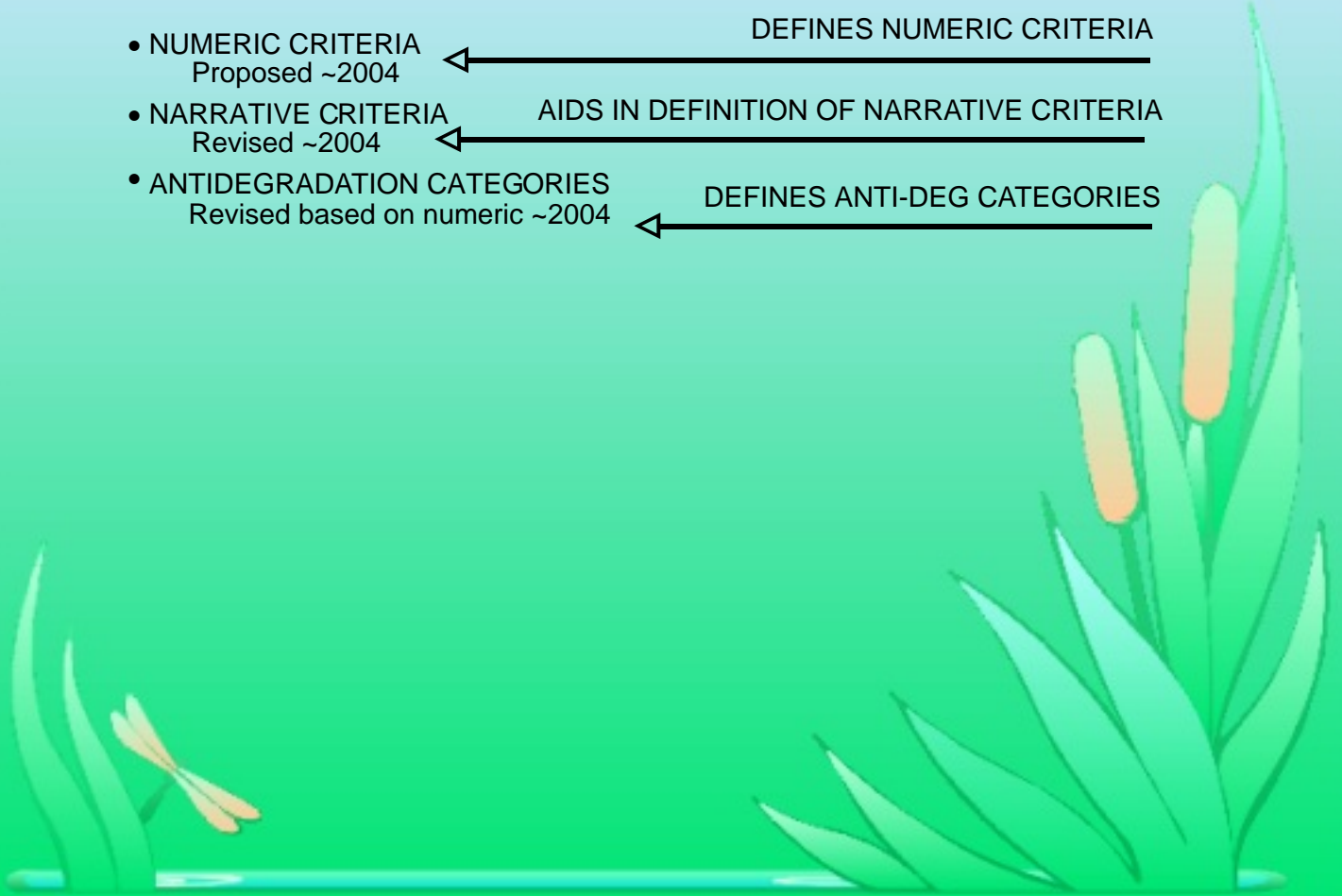
EXAMPLE



Wetland Water Quality Standards (WWQS) OEPA 5-1-1998 adopted

Mitigation ratios
Antidegradation

- NUMERIC CRITERIA
Proposed ~2004
 - NARRATIVE CRITERIA
Revised ~2004
 - ANTIDEGRADATION CATEGORIES
Revised based on numeric ~2004
- DEFINES NUMERIC CRITERIA
- AIDS IN DEFINITION OF NARRATIVE CRITERIA
- DEFINES ANTI-DEG CATEGORIES



- **WATERSHED CONDITION ASSESSMENT**

Pilot - Project 3 Grant J172
~2002-2003

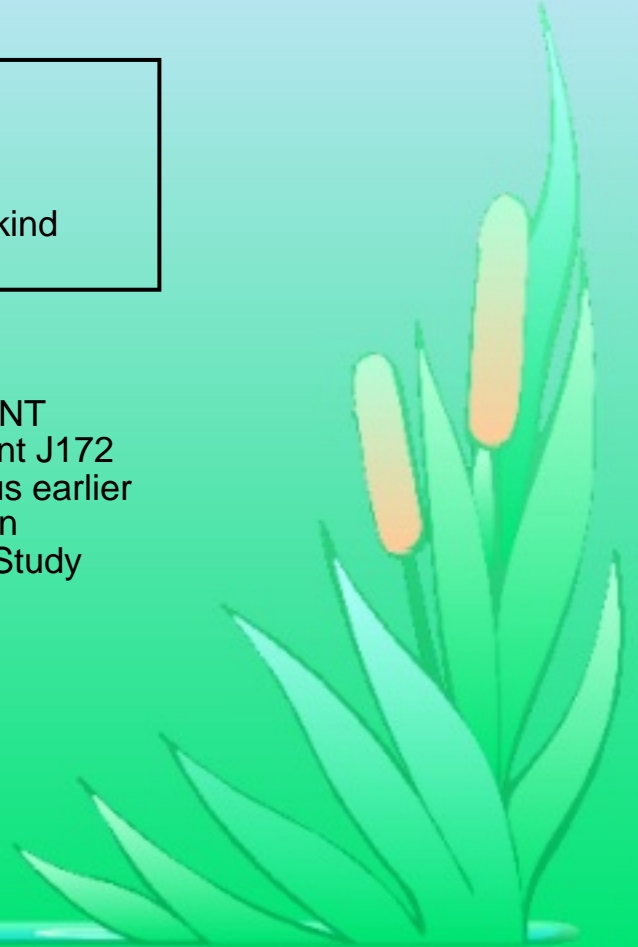
- CORRELATING STREAM HEALTH TO WETLAND HEALTH BY WATERSHED
- TMDL APPLICATIONS
- GIS APPLICATIONS
Lower Cuyahoga GIS wetland restoration suitability pilot project, 1998
- PLANNING
- TRACKING Acreage loss/gain, Function lost/gain, type loss/gain



MITIGATION WETLAND PROGRAM

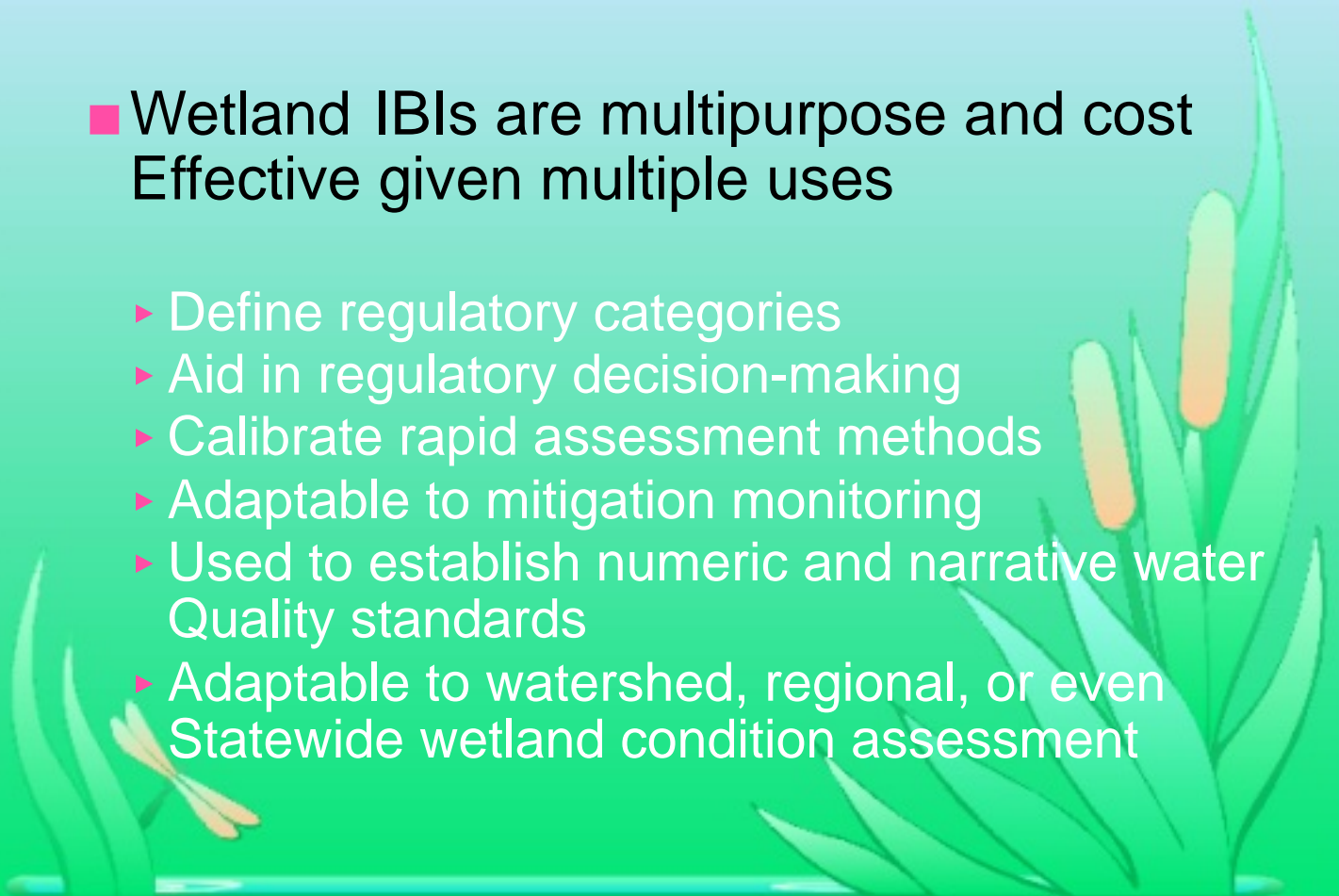
- Permit conditions
- Construction
- Inspection
- Enforcement
- Monitoring
- Performance
- Local, Regional
Functional and in-kind
Replacement

UNDER
DEVELOPMENT
Project 2 Grant J172
2001-2002 plus earlier
1997 Mitigation
Performance Study



Conclusions

- Wetland bioassessment and the IBIs
Developed from it can be the centerpiece of
A wetland regulatory program
- Wetland IBIs are multipurpose and cost
Effective given multiple uses
 - ▶ Define regulatory categories
 - ▶ Aid in regulatory decision-making
 - ▶ Calibrate rapid assessment methods
 - ▶ Adaptable to mitigation monitoring
 - ▶ Used to establish numeric and narrative water
Quality standards
 - ▶ Adaptable to watershed, regional, or even
Statewide wetland condition assessment



Web page resources

- Documents available
- Ohio EPA Division of Surface Water Web Page
- [Http://www.epa.state.oh.us/dsw/401/401.html](http://www.epa.state.oh.us/dsw/401/401.html)
- [Http://www.epa.state.oh.us/dsw/wetlands/wetland_bioasses.Html](http://www.epa.state.oh.us/dsw/wetlands/wetland_bioasses.Html)
 - ▶ ORAM Manual v. 5.0
 - ▶ ORAM Score Calibration Report
 - ▶ ORAM v. 5.0 Scoring Forms
 - ▶ ORAM v. 5.0 field form
 - ▶ ORAM v. 4.1 Scoring Forms
 - ▶ Vegetation Indices of Biotic Integrity (VIBI) for Wetlands and Calibration of the Ohio Rapid Assessment Method for Wetlands v. 5.0, August 1, 2000

