

# **The Bioassessment Program Review**

## **Critical Technical Elements of *Wetland Bioassessment***

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NEBAWWG

@ NEIWPC

**“The majority of arguments in environmental management involve information uncertainty”**

**Dave Courtemanch, Maine DEP**

- **Uncertainty determines the vulnerability of:**
  - any associated decision
  - protection, restoration and management plans
  - early intervention; environmental outcomes
  - cost effectiveness of investments
  - litigation and court decisions

# 2013 Stream bioassessment document

(144 pgs)

EPA

EPA 820-R-13-001

## Biological Assessment Program Review: Assessing Level of Technical Rigor to Support Water Quality Management

February 2013



# Region 1 Streams Baseline Critical Technical Elements Evaluation

- 2006-2010
- Six New England States
- 2-3 days
- Staffing → 9 staff  
Max → 14 staff
- Total staff participating → 12

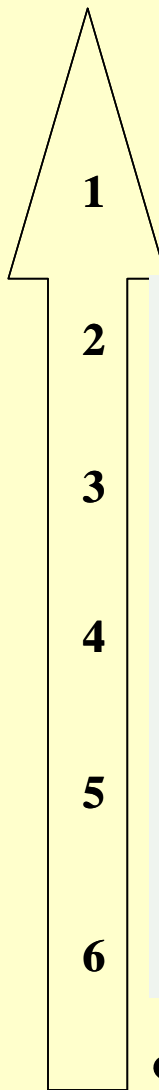
~30 US stream  
bioassessment programs  
have been reviewed

# Critical Technical Elements Evaluation

## (Yoder and Barbour)

		Foundation Elements	Building Blocks	Dependent on Other Elements
Design	1. Temporal coverage		✓	
	2. Spatial coverage		✓	
	3. Natural Classification	✓		
	4. Criteria for reference sites	✓		
Methods	5. Reference conditions			✓
	6. Taxonomic Resolution	✓		
	7. Sample collection	✓		
	8. Sample processing	✓		
	9. Data Management	✓		
Interpretation	10. Ecological attributes	✓		
	11. Biological endpoints			✓
	12. Diagnostic capability			✓
	13. Professional review		✓	

**BIOLOGICAL CONDITION GRADIENT (BCG)**



**Level 4**

**Level 3**

**Level 2**

**Level 1**

1

100

*Natural  
Condition*

*Excellent*

2

3

4

5

6

**Strong technical  
programs reduce  
uncertainty and  
optimize biological  
condition**

0

*Changes*

*Poor*

**CAPACITY TO EXPRESS INCREMENTAL CONDITION**

*HIGHEST*

**(RESOLUTION OF ASSESSMENT)**

*LOWEST*

# What's the difference?

## Core Elements Framework

- Big picture planning and guidance document
- Broadly applicable wetland program objectives
- A menu of program-building activities

## Bioassessment Program Review

- A detailed, standardized technical audit
- A program-specific roadmap to highlight strengths and prioritize developmental needs
- Pinpoints where a specific program is in relation to where it wants to go

# Tasks: WPDG Wetland Program Plans

- “Develop site methods and Index of Biological Integrity (IBI's) for other wetland types”
- “Develop data management system for monitoring data”
- “Establish narrative criteria that qualitatively describe the condition or functions necessary support a designated use”
- “Develop a wetland anti-degradation policy framework”



## MAINE Wetland Program Plan

### List of Planned Activities (2011-2016) by Core Element

#### EPA Core Element Framework , Element 1: Monitoring and Assessment:

*Maine Goal 2: Increase the knowledge base about Maine's wetlands through surveying, monitoring, research, and assessment to establish wetlands condition, identify trends, and the causes and sources affecting wetlands change*

*Maine Goal 6: Develop and maintain a wetland program, including a geospatial database, to track historic wetland loss, wetland compensation, and other wetland areas placed in permanent conservation, and use the data base to assess and evaluate progress*

#### Maine Objective 2: Implement a sustainable monitoring program consistent with the wetlands monitoring strategy

Responsible agency(s)	Completed Activities	Planned activities	2011	2012	2013	2014	2015	2016	Potential Partners
MDEP Biomonitoring Unit	Biomonitoring data housed in Oracle database and integrated with other DEP water quality data. Data available to the public via C... Earth.	<b>Update and maintain...</b> data in... corrected		X	x	x	x	x	MDEP EGAD coordinator and office of Information Technology
MDEP Biomonitoring Unit	Developed macroinvertebrate metrics, tolerance values and environmental inference models to evaluate wetland condition. Incorporated land use/land cover data into analyses	<b>Construct and test linear discriminant model to predict attainment</b> with aquatic life based on macroinvertebrate metrics, tolerance values and statistical models to evaluate wetland condition and predict attainment with aquatic life criteria.	x	X					
MDEP Biomonitoring Unit	Completed draft Biological Condition Gradient model for wetland macroinvertebrates.	<b>Refine BCG model</b> for macroinvertebrates using new data		X					EPA Region 1, NEBAWWG

**CEE #9 DATA MANAGEMENT**

**CEE #6, 8, 11, METRIC DEVELOPMENT**

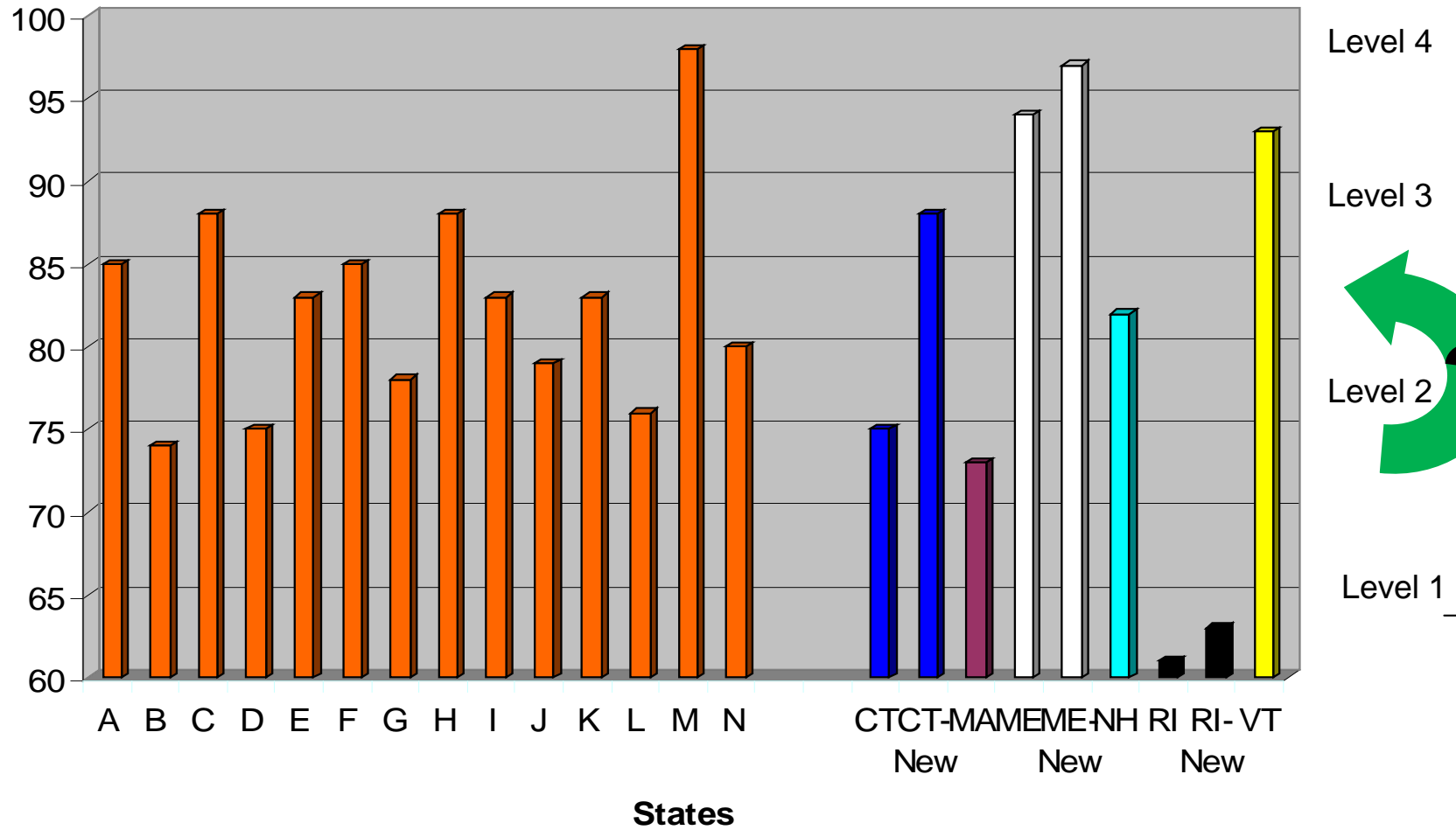
**CEE #10 ECOLOGICAL ATTRIBUTES**

# **Bioassessment Program Review**

- **Fosters continuous program improvement**
- **Prioritize R&D needs; justify funding requests**
  - **Promotes intra/inter-agency dialogue**
- **On-site bioassessment program evaluation**
  - **2-3 days**
- **Includes taxonomy, sampling design, WQS, flow of information, permitting, management,**
- **Assess capacity to support all WQ management information needs**

# 2010 Review of Critical Elements for Bioassessment Programs

## Region 1 and Other Regions



# 2008 Connecticut

**INITIAL DEVELOPMENT PHASE**  
0-18 MONTHS

**1. Establish Conceptual Foundation**

- Science
- Policy

**Start-Up Tasks: Initial Technical Development Tasks**

**Acquire Staffing**

- Professional biologists with taxonomic expertise & training
- Database technicians (field work, lab tasks)

**Acquire Facilities & Equipment**

- Outfit laboratory and field facilities
- Office equipment
- Database support infrastructure

**Methods Development**

- Review and select candidate methods
- Consider MQO/DQO needs
- Test methods for applicability
- Analyze test results – select methods

**Done**

**Done**

**In process**

**Deficient**

**INITIAL IMPLEMENTATION PHASE**  
12-24 MONTHS

**2. Merge Scientific & Policy Foundations**

**Start-Up Tasks: Initiate Monitoring Strategy**

**Initiate Field Sampling**

- Review spatial designs
- Develop MQO and QAPP
- Develop sampling plans in accordance with monitoring strategy
- Pilot assessments
- Consider spatial stratification issues
- Develop and test reference condition approach
- Select sites
- Develop index development and calibration strategy

**Assessment Issues**

- Use data for "makeable" decisions
- Initiate exploratory analysis of biological responses to stressors

**Done**

**Done**

**Deficient**

**Deficient**

**Partial**

**INITIAL ASSESSMENT PHASE**  
18 MO – 6 YEARS

- Link conceptual TALU tiers to regional BCG conceptual model
- Evaluate data
- Develop

**Program Implementation**

**Biocriteria Development**

- Select candidate metrics and/or assessment tools
- Develop narrative narratives
- Test metrics and develop calibrated indices
- Evaluate

**5. Application in WQ Management**

**Water Quality Program Support**

- Develop capacity to support WQ programs (MQO/UAA, TMDLs, permitting)
- Formalize and increase water quality program support capacity (biological data should support more decisions)

**Not started**

**Not started**

**FULL ASSESSMENT PHASE**  
5 – 10+ YEARS

**Evaluate for consistency with existing WQS framework**

**Draft or refine narrative ALU descriptions**

**Program Maintenance**

**Biocriteria Development**

- Refine metrics and develop calibrated indices
- Develop benchmarks for calibrated indices according to classification scheme and by management
- Link to TALUs via BCG

**Water Quality Program Support**

- Fully functioning bioassessment program supports WQS (UAAs, ALU, biocriteria, basic program needs (303d))
- Program dev't should be fully integrated with existing biological database supports tool, criteria, & policy dev't. (ongoing)

**Not started**

**Not started**

# 2010 Connecticut

