



Coeur d'Alene, Idaho  
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*Use of Biological  
Information and  
Biocriteria in  
Maine's Water  
Quality Program*

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*Presented by*

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# **Why Use Biocriteria?**

**Because they tell us things that other criteria don't.**

- Provides a direct measure of goal attainment - measure of impact**
- Integrates water quality information from multiple stressors for an extended time frame**

# **So Why Aren't Biocriteria Used?**

- **Complexity of the information -  
biomonitoring is extremely data rich**
- **Perceived conflict with existing criteria**
- **Cause and source may not be apparent -  
low enforcement value**
- **No readily available models**

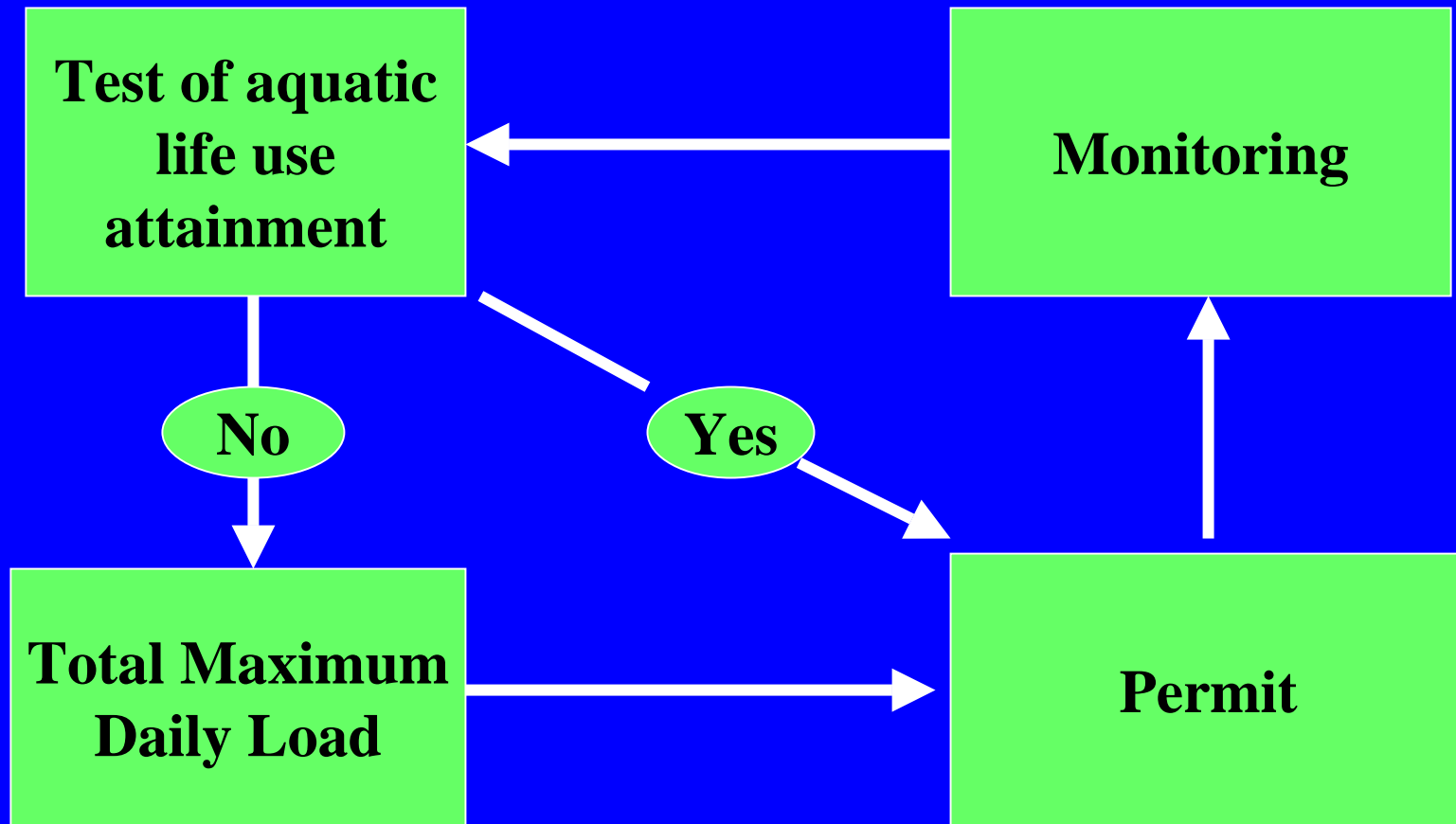
# Maine Uses Biocriteria for the Following Purposes

- **Standards (including antidegradation)**
- **Assessment**
- **Reporting - 305(b) and 303(d)**
- **Wastewater permitting - NPDES, State, TMDLs, Stormwater?**
- **Site permitting**
- **401 (Hydro) certification**
- **Enforcement**

# Assessment and Reporting

- **305(b) - 121 (28%) of 425 waterbody segments in 2002 305(b) report have biological criteria used in assessment**
- **303(d) - 42 (36%) of 117 listed river and stream segments are based on biological criteria**

# General Schematic of Permitting



# **Using Biocriteria to Set Permit Conditions**

**Case: Presumpscot River, Maine**

**highly flow regulated with pulp  
and paper, municipal and  
stormwater wasteloads**

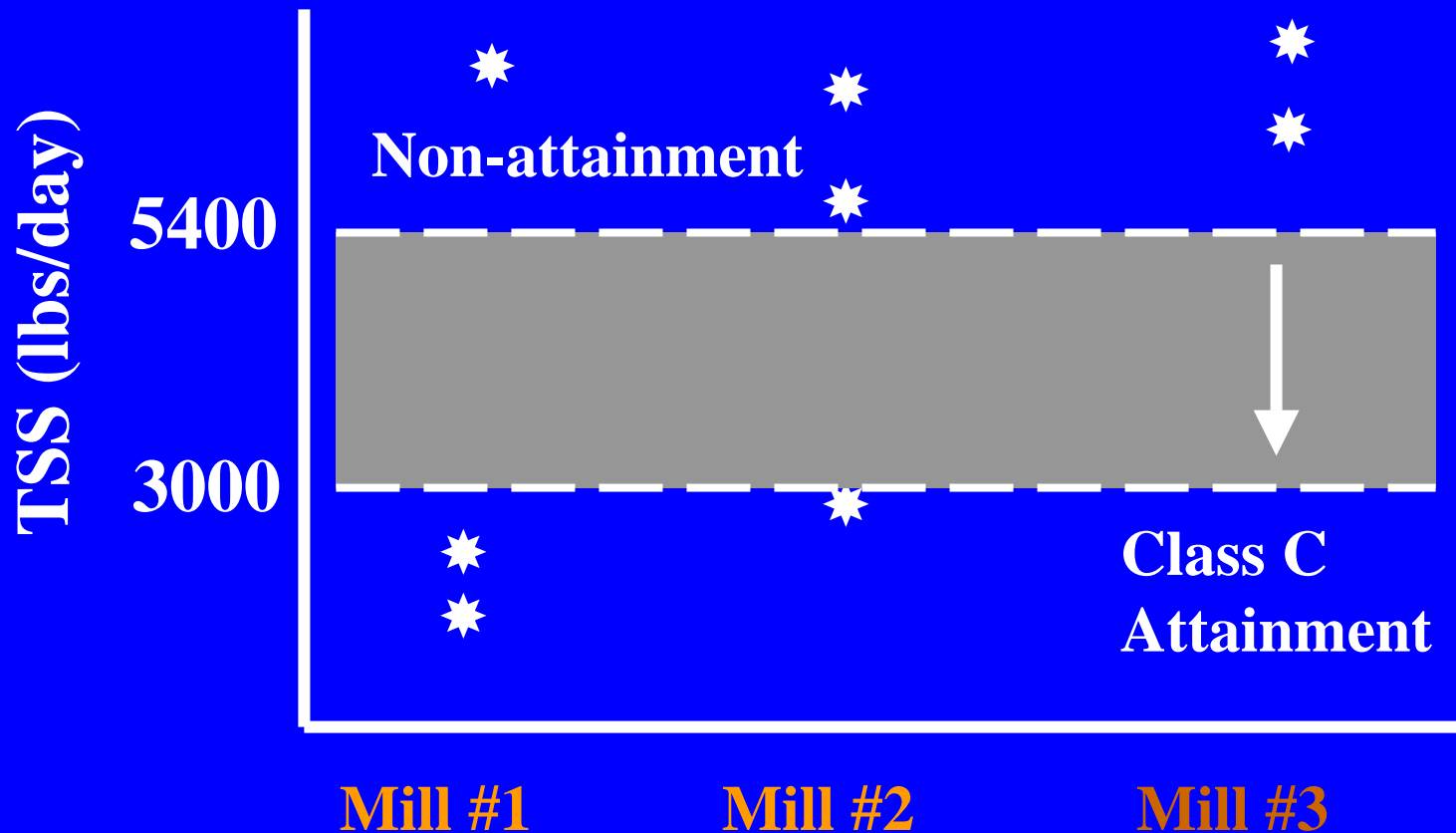




# Presumpscot River

- **TMDL evaluation determined impact from low oxygen, low flow and high suspended solids.**
- **Stressor Identification Evaluation (SIE) identified TSS as the primary agent**
- **State lacked AWQC for solids**
- **Importation of biocriteria/solids data from another river to set permit limits**

# Aquatic Life Attainment Based on Prorated TSS Loading



# **Incorporation of biocriteria as permit limits!**

## **Case: Aquaculture permitting for marine waters**

- **Pen culture - production facility, waste treatment system, and receiving water are all the same water**
- **Establishment of impact zones**
- **Establishment of biomonitoring based warning criteria and impact criteria**



# “supports all indigenous species...without detrimental change”

Metric	Warning	Impact
Redox	0 to -100mV	<-100mV
<i>Beggiatoa</i>	Visible, patchy	>50% coverage
Tolerant taxa	>80% dominance	Report
Sensitive taxa	>50% reduction	Report
Taxa richness	>25% reduction	Report

# **Using Biocriteria in Water Quality Certification Edwards Dam, Kennebec River**

- Good water quality except aquatic life goals not attained due to degraded habitat
- Impoundment prevented migration, impaired indigenous fish populations
- Certification used to force decision for dam removal



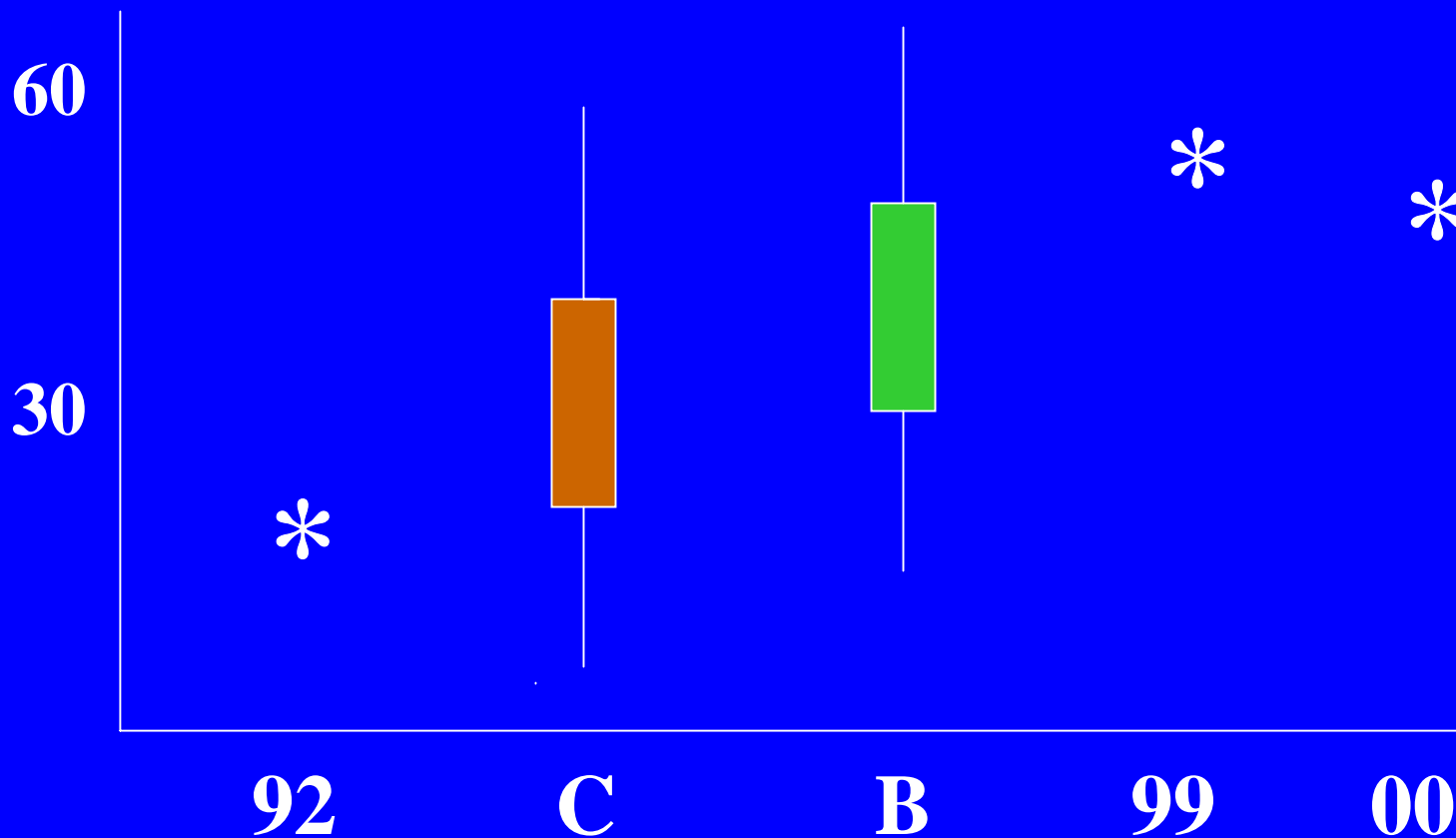






# Kennebec River - Edwards Dam

## Taxa Richness



# For More Information

- **Biomonitoring Web Site**
  - <http://www.state.me.us/dep/blwq/docmonitoring/biomonitoring/index.htm>
- **Fifteen Year Retrospective**
  - <http://www.state.me.us/dep/blwq/docmonitoring/biomonitoring/biorep2000.htm>
- **E-mail**
  - [BioME@maine.gov](mailto:BioME@maine.gov)