

***Reinvigorating  
Environmental Assessment  
for Better  
Environmental Decisions***

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# ***Why a New Theory?***

- Environmental assessment has not been as successful as it should be
- Only in part because of lack of good science
- More due to practices that do not compel appropriate decisions
- Need a theory of practice, starting with first principles
- Derive a framework from that

# Coeur d'Alene River Basin



# *Opinions of Assessment*

- Assessments
  - drive environmental management decisions
    - Technocratic ideal
  - inform environmental management decisions
    - NRC 1983-2009
  - delay environmental management decisions
    - M. O'Brien 2000
  - provide a forum for stakeholder influence
    - Presidential/Congressional Commission 1997
    - Holder 2004
  - provide a mask for political processes
    - Cashmore et al. 2008

# ***Basic Assumptions (Axioms of the theory)***

1. Assessments inform environmental management decisions
2. Assessments are science-based
3. Management decisions accommodate multiple goals and constraints

# ***Principles from Axiom 1***

1. Assessments are comparative
2. Assessors must know about the decision, the decision maker(s), and the bases for the decision
3. The form of the assessment results must be appropriate to the decision
4. Assessment results must be understandable by the decision maker
5. Assessments must convey the importance and urgency of the results
6. Resources are limited

# ***Principles from Axiom 2***

1. Science explains the past or predicts the future
2. Scientific quality must be assured
3. Assessors must be unbiased

# ***Principles from Axioms 1 & 2, jointly***

1. Assessment must be based on causal relationships
2. Uncertainty is always present and must be presented in a way that is useful to the decision
3. Policy is input to assessments, not generated by assessors

But assessors must translate into operational terms

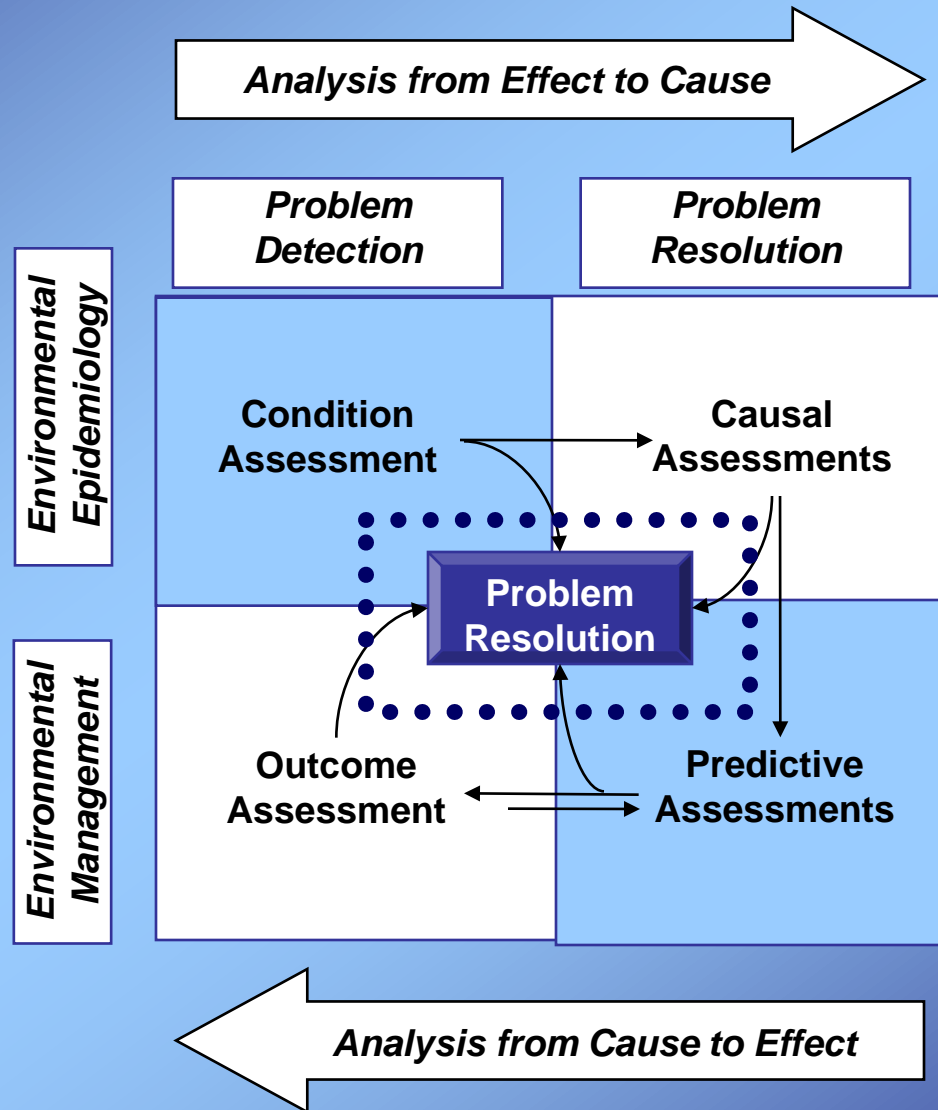
# ***Principles from Axiom 3***

1. Assessments must integrate across sources of information
2. Assessments must integrate across disciplines
3. Assessments must integrate across scales and levels of organization

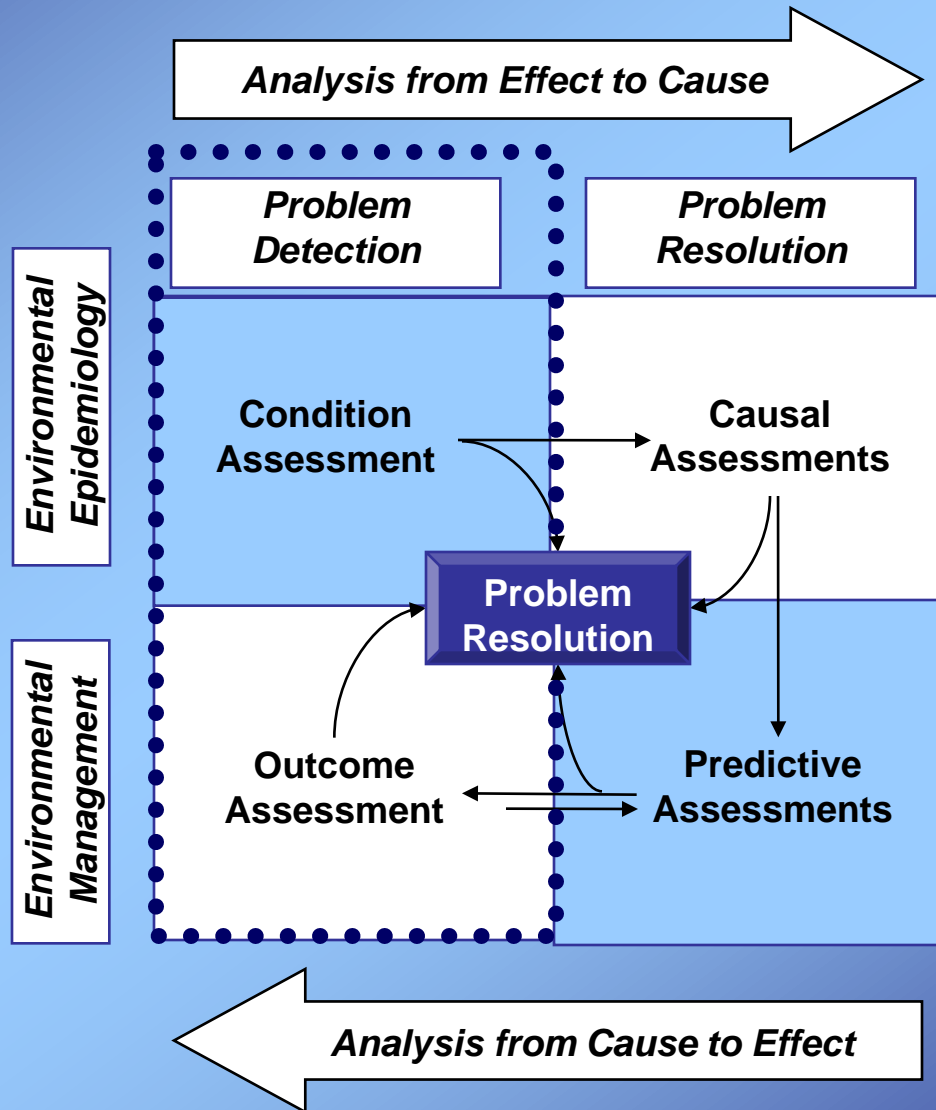
# ***Why a New Framework?***

- Prior frameworks were not focused on resolving environmental problems
- Prior frameworks did not recognize
  - Multiple types of decisions
  - Multiple types of assessments

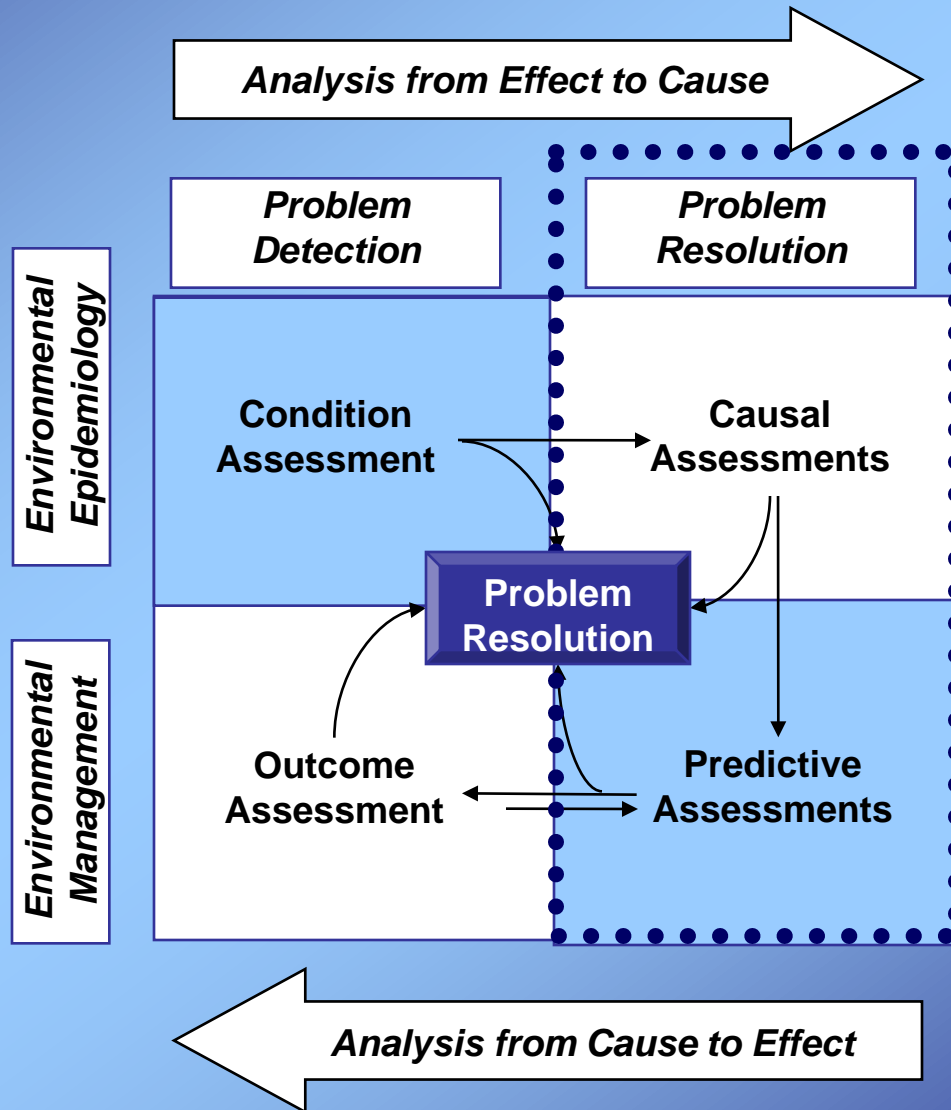
# The Basic EA Framework



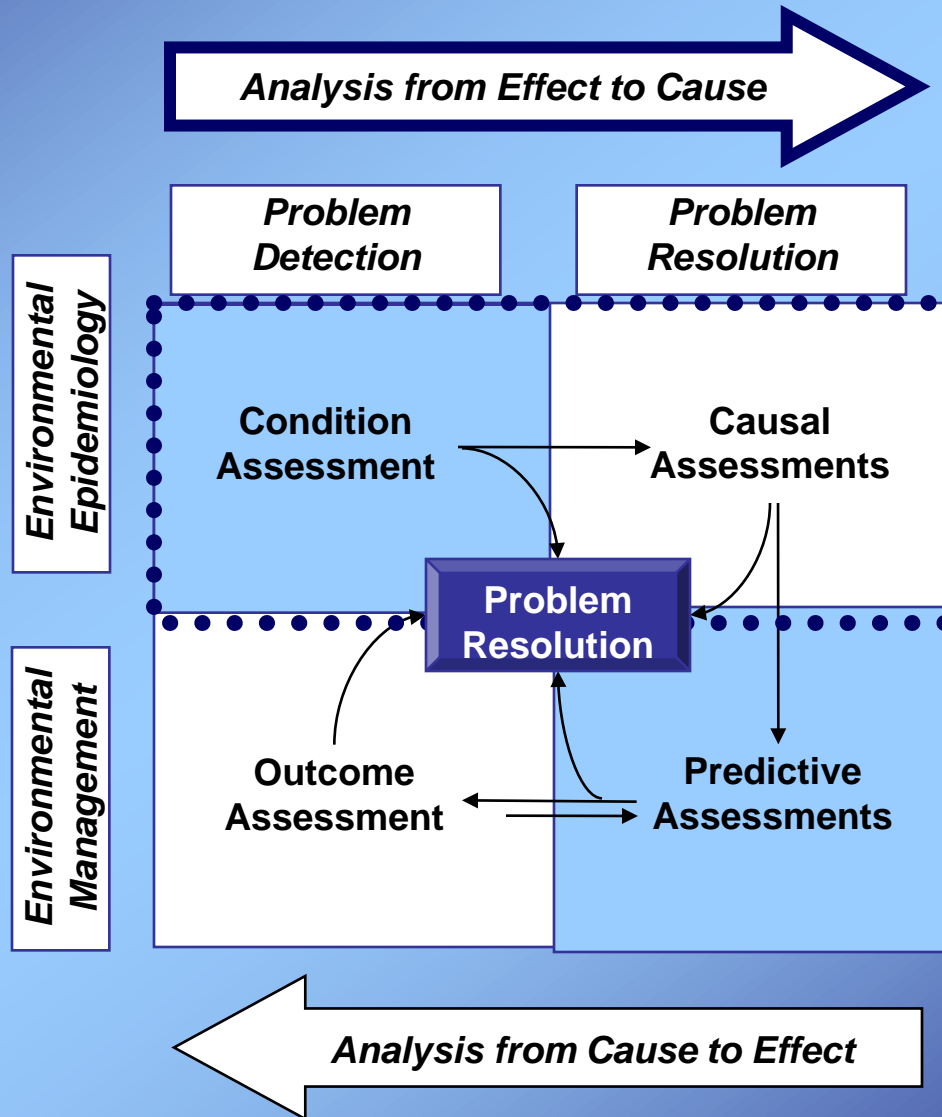
# The Basic EA Framework



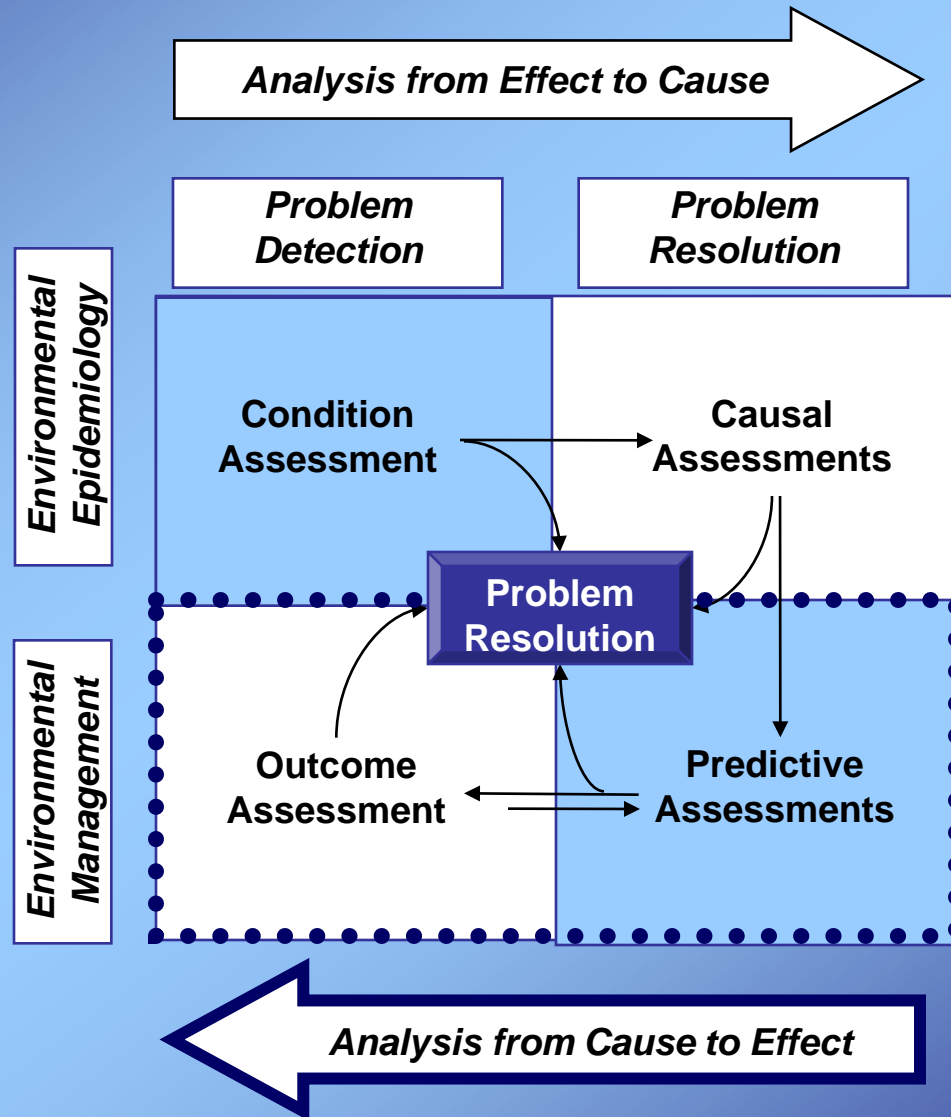
# The Basic EA Framework



# The Basic EA Framework



# The Basic EA Framework



***Problem Detection***

***Problem Resolution***

***Environmental  
Epidemiology***

**Condition Assessment**

**Chemical**

**Physical**

**Biological**

**Causal Assessment**

**Cause**

**Source**

**Problem  
Resolution**

**Risk**

**Outcome**

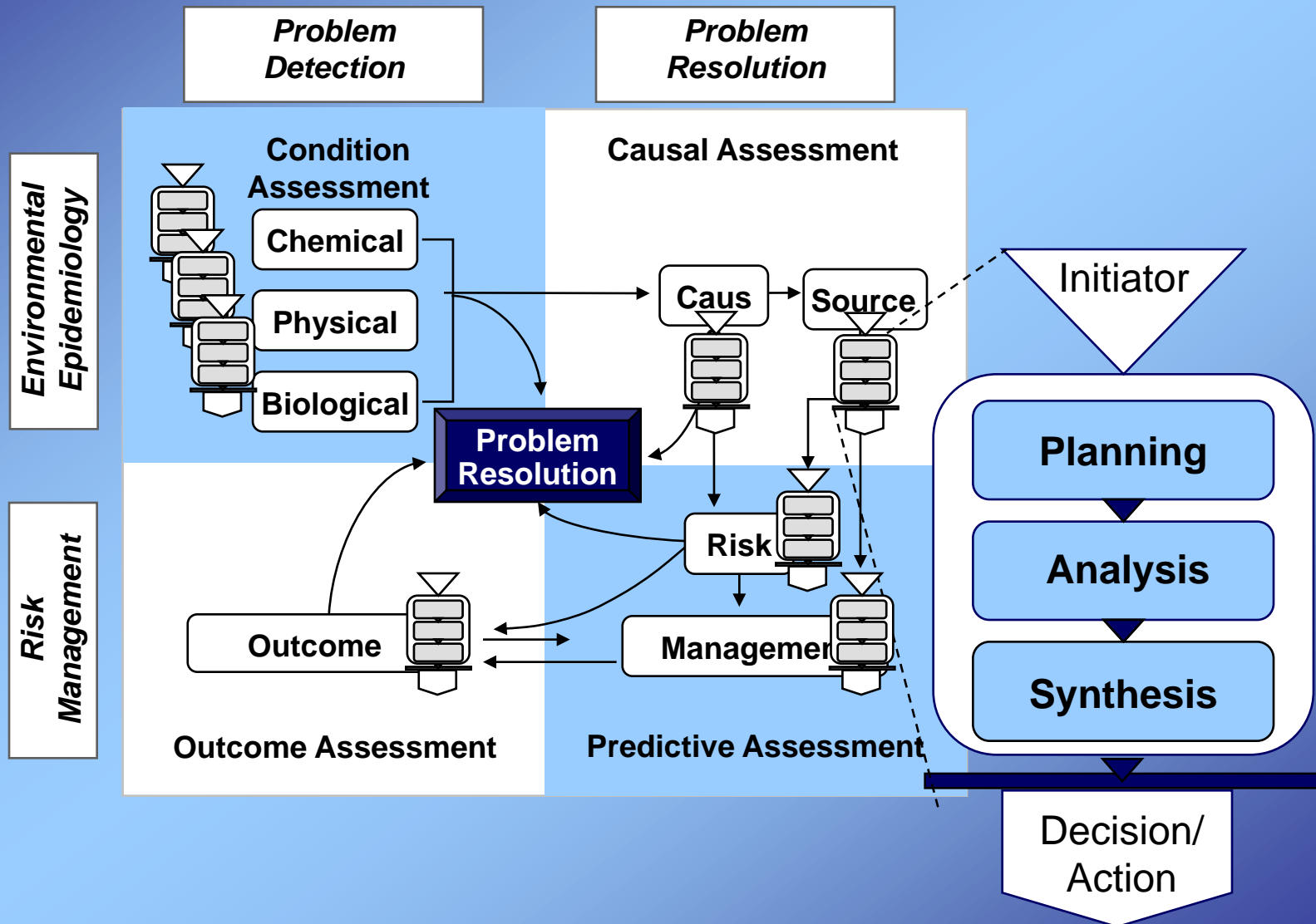
**Management**

**Outcome Assessment**

**Predictive Assessment**

***Environmental  
Management***

# A Common Substructure



# ***Advantages of the Theory and Framework***

- It keeps assessors focused on supporting decisions that lead to resolution of an environmental problem
- It emphasizes the need to fully employ available science throughout the process
- It encourages integrated assessments that provide a consistent input to management decisions
- It may unify diverse assessment frameworks and practices

# ***What are the Impediments?***

- Assessor/Manager interactions often not built into the processes
- Managers are reluctant to clarify their decision criteria
- Assessors are focused on quality science
  - Peer review encourages that
- Assessors worried about political influence
- Assessors not aware of decision
- Both can be inflexible
  - RPGs at Coeur d'Alene

# ***Assessors Must Provide***

- Good Science
- Useful Science
- Compelling Science

# ***Decision Makers Must Provide***

- Willingness to engage with science
  - provide policy
  - understand the results
  - use the results
  - show how scientific information influenced their decision

# **Better Environmental Assessments For Better Decisions for a Better World**

