

**Adaptive Management and
CEAP**
**Linking Better Resource Decisions With
Accountability**

Andrew Manale

USEPA



How Can We Do Better Landscape-scale Conservation?

- How do we make better decisions in managing resources?
- How can we better use science?
- How do we demonstrate results?

In other words, how can we better account for conservation funds?



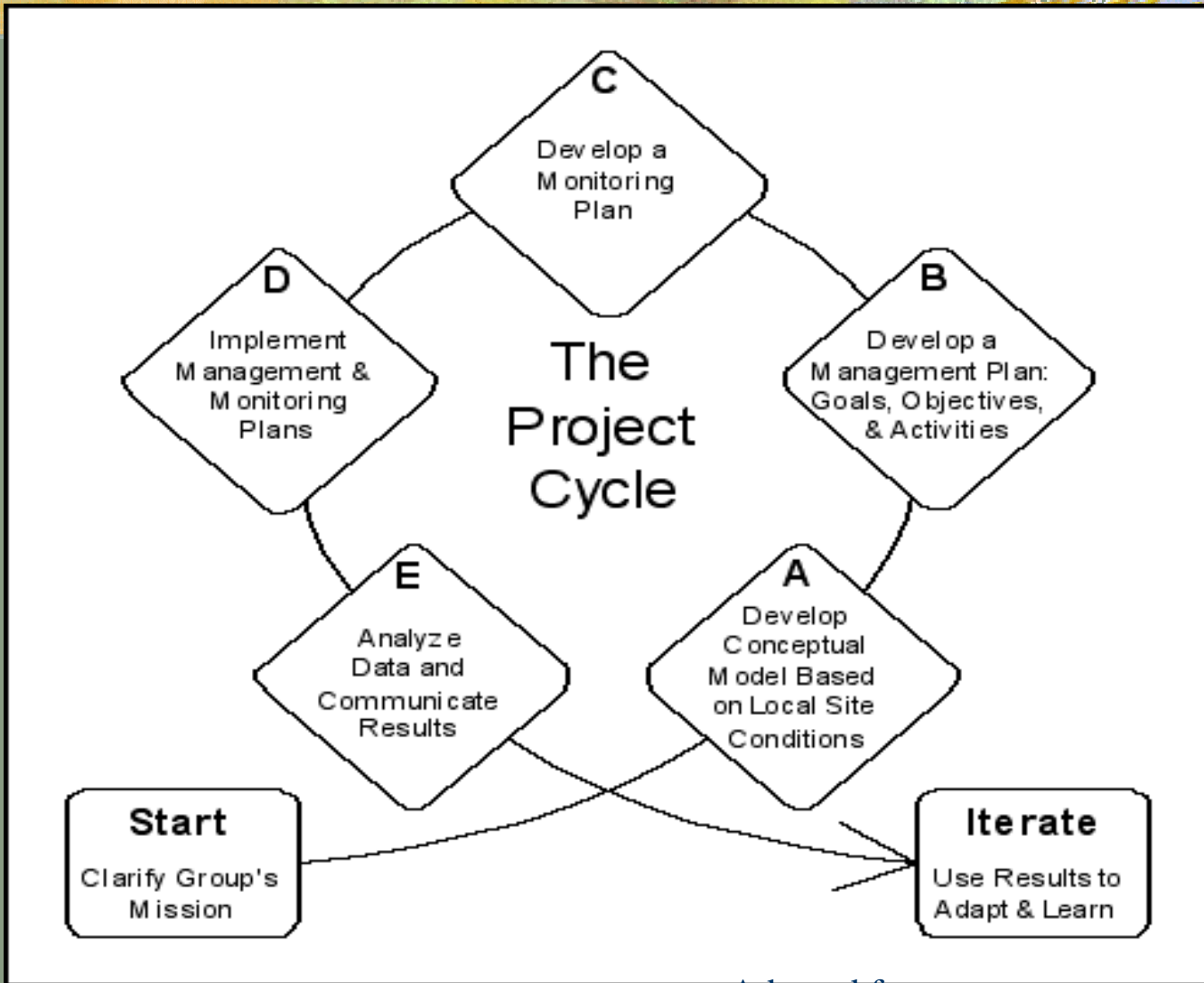
What Is Adaptive Management?

“Integration of design, management, and monitoring to systematically test assumptions in order to adapt and learn”
(Salafsky, et al 2001)



Adaptive Management? (Cont'd)

- Incorporates research into conservation action--conservation efforts as management experiments
- Takes the science of what we know (or think we know) about ecosystems and compares our expectations to monitoring results
- Modifies management decisions to achieve conservation objectives in light of better understanding of ecological processes--feedback



Adapted from
Salefsky, et al.



Why Adaptive Management?

- Improve natural resource management decisions
 - Enhances quality of the data by linking research with management (the science is never good enough)
 - Tells us what does or does not work in a timely manner



Why? (cont'd)

- Help answer the “what” and the “how” in science. In other words....
- What questions to ask
- Testable management hypotheses
- What should we expect and what to monitor for



Why? (Cont'd)

- Provide the language for communicating results (successes and even failures) to the public and to decision-makers
 - how well are we achieving short and longer term natural resource or management goals

A decorative header strip featuring a collage of nature-related images: a white starburst, green foliage, a brown bird, and blue textured patterns.

Barriers to Adaptive Management: Scientific

- **“The science is not good enough”**
- Models for adaptive management planning
 - Taking physics to biology to economics/sociology and policy—no complete linkages
 - Field or small scale intervention versus “Problemshed” not necessary synonymous with experimental field or project scale



Scientific Barriers: Examples

- Reduction in production intensity one place offset by increases elsewhere within the watershed.
- Influence of the market and federal policy on the intensity and manner of production external to project.
- Delay in impact from intervention.
 - Time to travel for some pollutants—Chesapeake bay.
 - Not detectable at small scale, is at larger scale.



Scientific Barriers (Cont'd)

- **Cost, especially of the additional monitoring**
(Gunderson)
- **Information on what to monitor**
 - Performance measures or indicators in a dynamic environment or system?
 - Management questions and what time frame and spatial scale?
 - Experiment scale versus policy scale?
 - Policy decisions generally occur at a higher geographic scale
 - County, state, or regional.



Other Barriers: Institutional

- **Lack of a clearinghouse or gateway**
 - Making the data available to others
- **Poor collaboration and coordination among resource organizations prevents....**
 - Efficient use of resources
 - Data sharing and expansion
 - Leveraging of funding
 - Joint production of spatial and temporal indicators or benchmarks



How CEAP Could Enable or Support AM

- **“Improve the science”**



How CEAP Could Enable or Support AM

- **Clearinghouse or gateway role**
 - Improve access to information across disciplines and agencies
 - Example:dynamic bibliographic research engine
 - Gateway to a large variety of datasets, biophysical, economic, and social
 - USGS
 - NAWQA, wildlife
 - EPA--wadeable stream survey
 - Georeferenced data on multiple soil, water, wildlife, air
- **Models and practice verification**
 - ARS research watersheds
- **Benchmark watershed studies**
 - Reference studies for local projects
 - CSREES studies



How CEAP Can Help (If Blue Ribbon Panel Suggestions Are Implemented)

- **Integration of research and management across multiple disciplines and agencies**
 - (Only other comparable entity or attempt was president's water quality initiative and the interagency technical committee)
- **Baseline measures for comparison of effectiveness**
 - Not just how much, but how much is necessary to achieve goal
- **Quantitative goals for change measures**
 - Measures presented in the relevant ecological and environmental context in which effects occur



Blue Ribbon CEAP (Cont'd)

- **Guidance on what needs to happen on the ground, not just what happened**
 - Design of management experiments
- **Platform for applying adaptive management to strategic resource management**
 - Change goals and strategies as new science is presented
 - Problems are solved
 - Opportunities arise



How Support AM (etc)

- **Forum or “change vehicle”**
 - **Identify and generate economic and social data on a watershed scale or NRI point referenced**
 - NASS and FSA farmer surveys on field specific information
- **Guidance for management experiments**
 - Management “experiment” questions for site-level projects
 - Vehicle for translating field data to larger scale decisions
- **Clearinghouse for information on monitoring and evaluation activities**
 - NAL dynamic bibliographies
 - Website



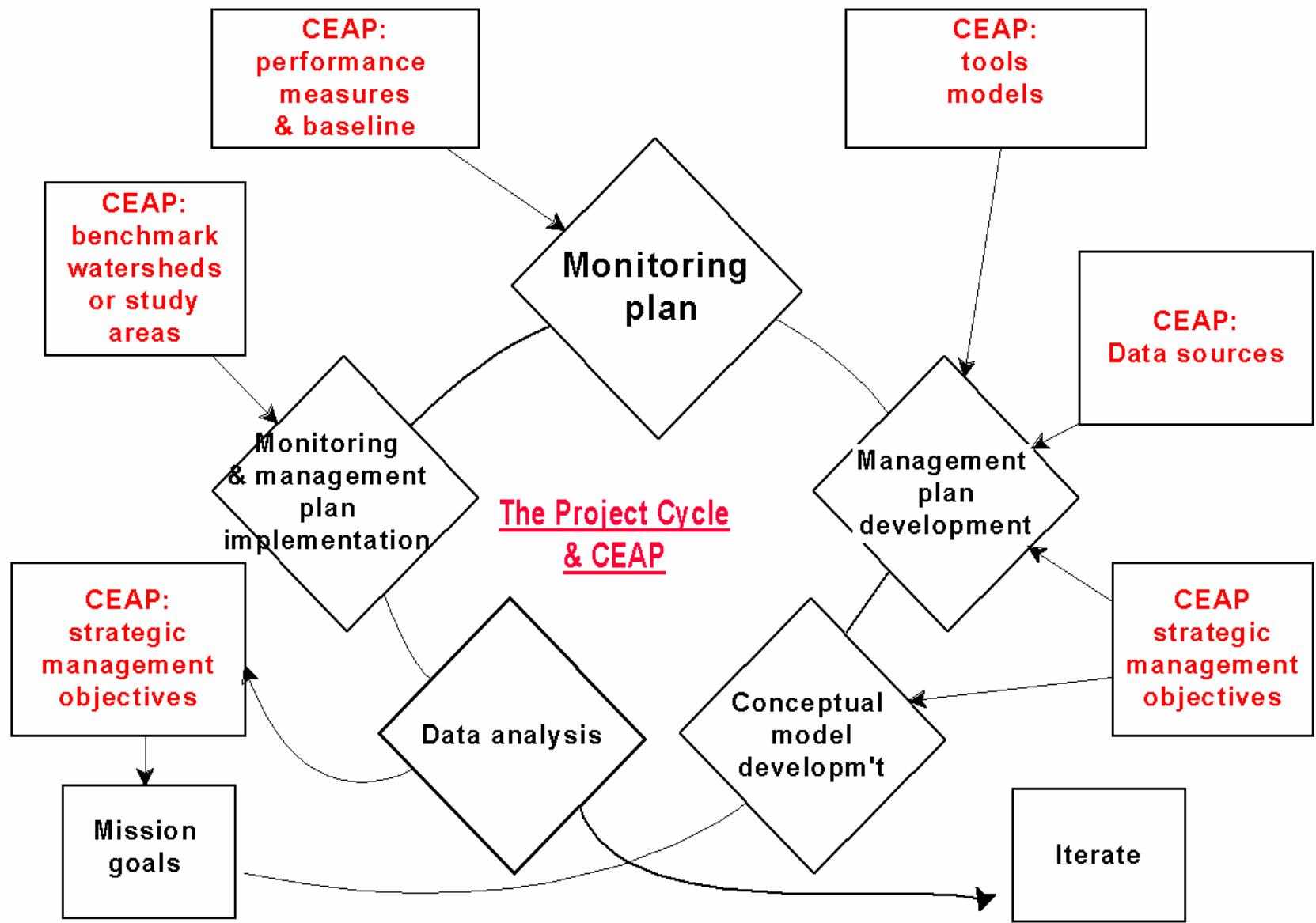
How CEAP Could Address Institutional Barriers to AM

- **Coordinate linking of project results to the larger watershed, region, or basin, or nation**
 - Scientific and management framework for interpreting results
 - Mechanism for establishing and verifying biophysical and socioeconomic linkages at various scales and functions
 - Consistent protocols
- **Vehicle for communicating research goals and results: policy-makers, the public, and funders**



How CEAP Could Address Institutional Barriers to AM (Cont'd)

- **Increase transparency of decision making**





What Needs to Happen

- **Collaborative teams**
 - Strategic components around critical regional objectives
- **Smart monitoring network**
 - Iterative process using models and national or regional scale objectives to identify where monitoring need occur
 - Monitoring and field-scale projects to verify models or allow critical and needed changes



What Needs to Happen (Cont'd)

- **Assessment of unmet needs**
 - **Geographically focused approach around national and regional goals, as close to outcome based as possible**
 - **Database of where and what interventions have occurred**
 - **Information on state of implementation or maintenance**
 - **Verification of results**
- **Resolution of confidentiality issues**



CEAP and AM: Better Accountability

- Better knowledge of expectations and responsibility makes us more accountable to the public and to decision-makers.