



What is Adaptive Management?

Structured Decision Making at DOI

Carl D. Shapiro, USGS
National Workshop on Adaptive Management
October 23, 2007

U.S. Department of the Interior
U.S. Geological Survey

Background

Workshop on Adaptive Management – April 2004

**Adaptive Management Working Group – May 2005
-- present**

Secretarial Order – March 2007

DOI Technical Guide – April 2007

National Workshop on AM – October 2007



DOI Workshop – April 2004

USGS to work with other DOI bureaus to convene a working group to develop a DOI definition of adaptive management.

Working group to develop guidelines for the effective use of adaptive management.

Summarize the legal concerns and issues in the application of adaptive management.

USGS to work with other bureaus, the 4 C's team, and the NCTC to develop training on adaptive management.



DOI Adaptive Management Working Group

Training

Legal Issues

Defining Success

Operations



Secretarial Order

Provides policy guidance and procedures for implementing adaptive management.

Adaptive management has great promise as an effective means to address significant resource management challenges under conditions of uncertainty.

New challenges, such as the Gulf of Mexico's Coast recovery from hurricane damage may greatly benefit from adaptive management.

The Technical Guide serves as the technical basis for decision making in adaptive management.



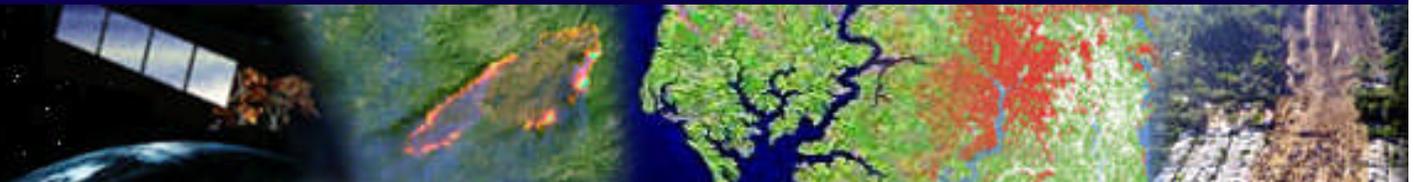
The DOI Technical Guide

What is adaptive management?

When should adaptive management be used?

How should adaptive management be implemented?

When is adaptive management successful?



What is Adaptive Management?

A systematic approach for improving resource management by learning from management outcomes.

Its origins come from the ideas of scientific management pioneered by Frederick Taylor in the early 1900's.



Adaptive Management Characteristics

Adaptive management acknowledges uncertainty

It is designed to improve system understanding in order to achieve management objectives

Adaptive management involves taking action pursuant to desired outcomes

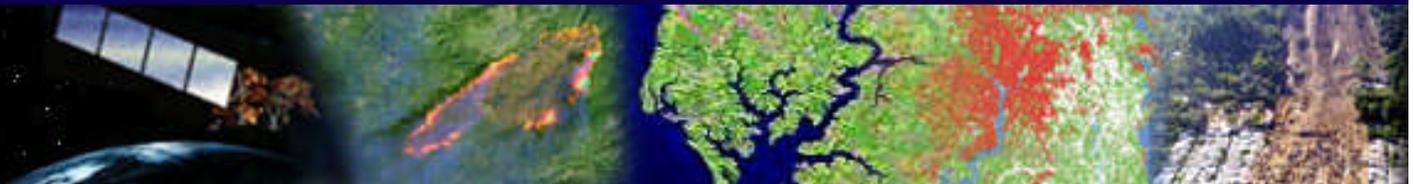
Adaptive management requires the participation of stakeholders



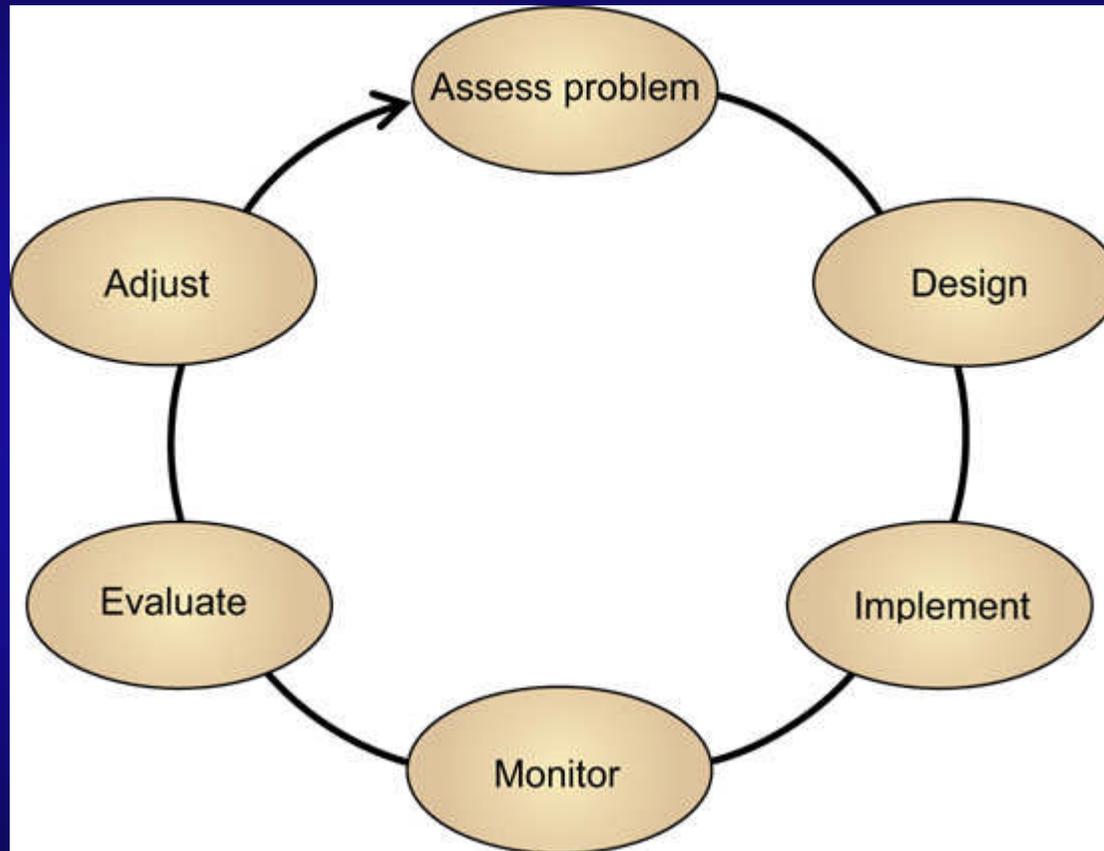
DOI Operational Definition

(adapted from NRC 2004)

Adaptive management [is a decision process that] promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders.



Adaptive Management Process



When Should Adaptive Management be Used?

Mandate or need to take action in the face of uncertainty

Institutional capacity and commitment to undertake and sustain an adaptive program



Conditions for Using Adaptive Management

- A real management choice is to be made.
- There is an opportunity to apply learning.
- Clear and measurable management objectives can be identified.
- The value of information for decision making is high.
- Uncertainty can be expressed as a set of testable models.
- A monitoring system can be established to reduce uncertainty.



Situations in which Adaptive Management Should Not Be Used

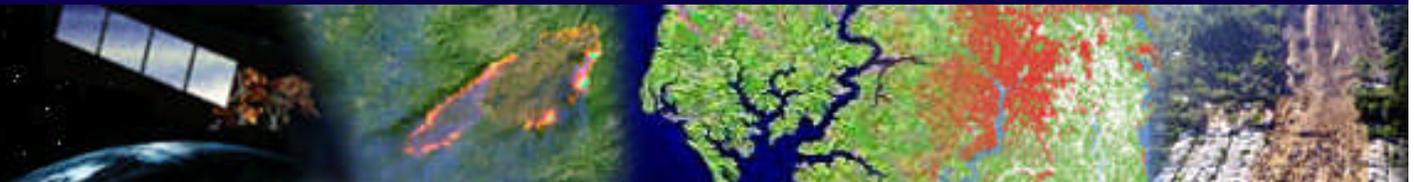
Decision making occurs only once.

Monitoring cannot provide useful information for decision making.

There are irresolvable conflicts in defining explicit and measurable management objectives or alternatives

Decisions that affect resource systems and outcomes cannot be made.

Risks associated with learning-based decision making are too high



Benefits

Provides flexibility to act in the face of uncertainty.

It is learning based.

Specifies what actions are to be taken and when.

Encourages long-term collaboration among stakeholders

Promotes optimal decision making with the information available.



Challenges

Institutional reluctance to change

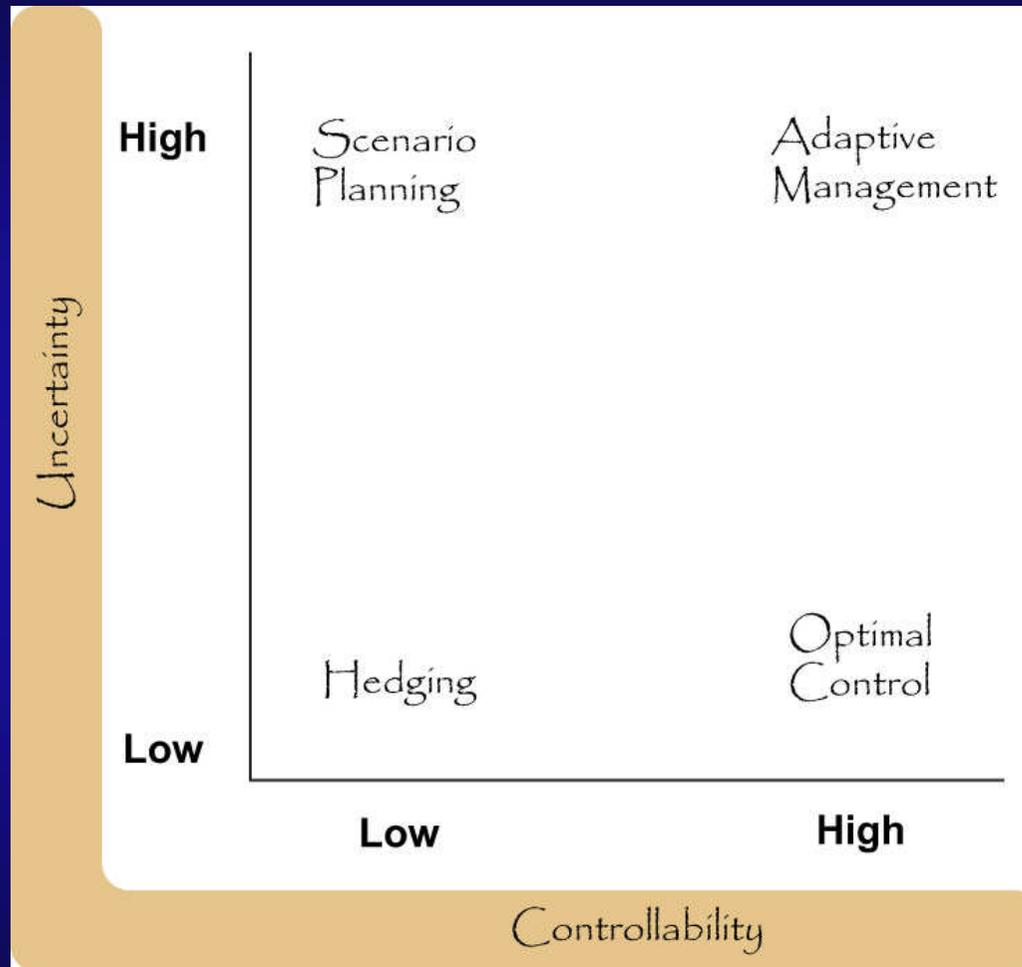
**Significant time lags between management actions
and their impacts**

Implementing AM in a complex legal environment

Collecting enough information to evaluate progress



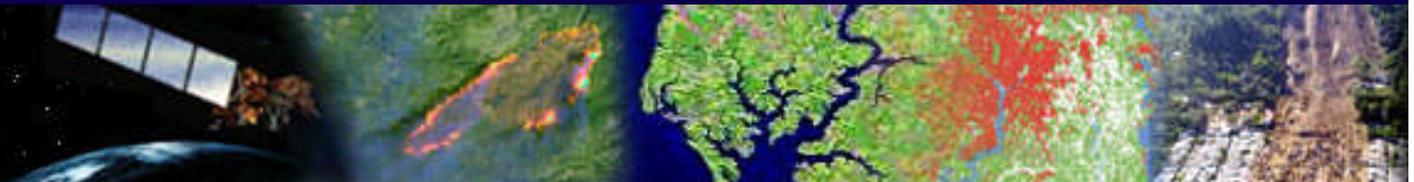
Use of Adaptive Management



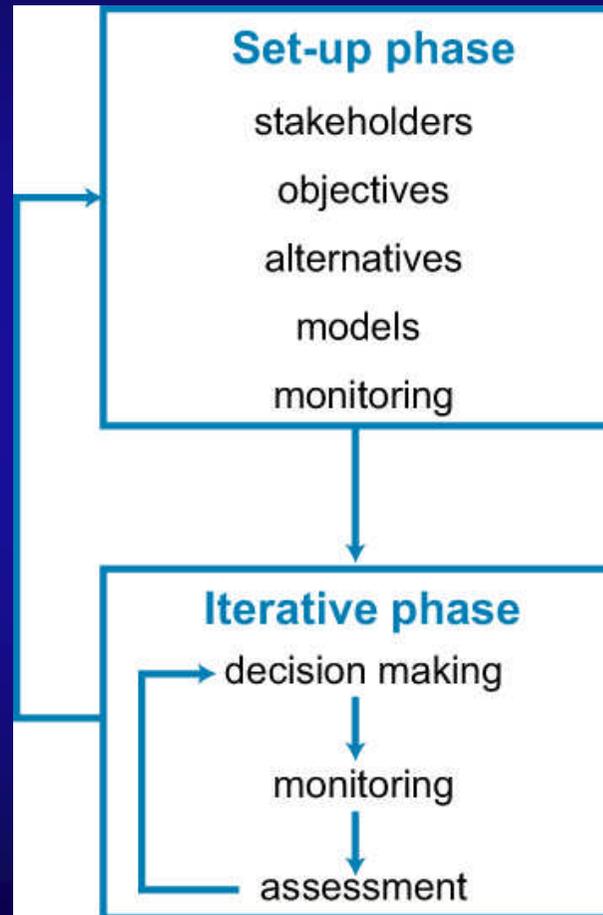
Thank you.

**Carl Shapiro, Ph.D.
USGS Geography Discipline
Reston, VA
cshapiro@usgs.gov**

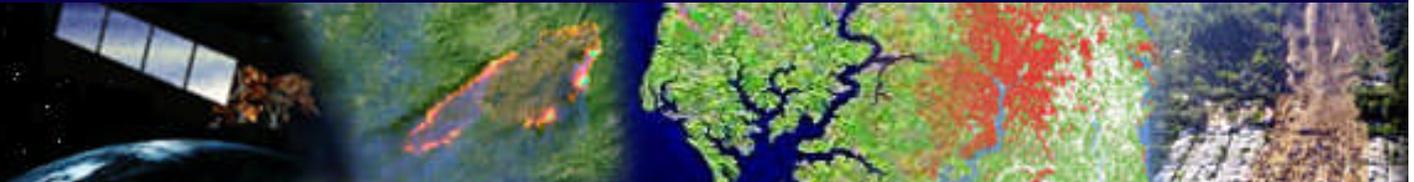
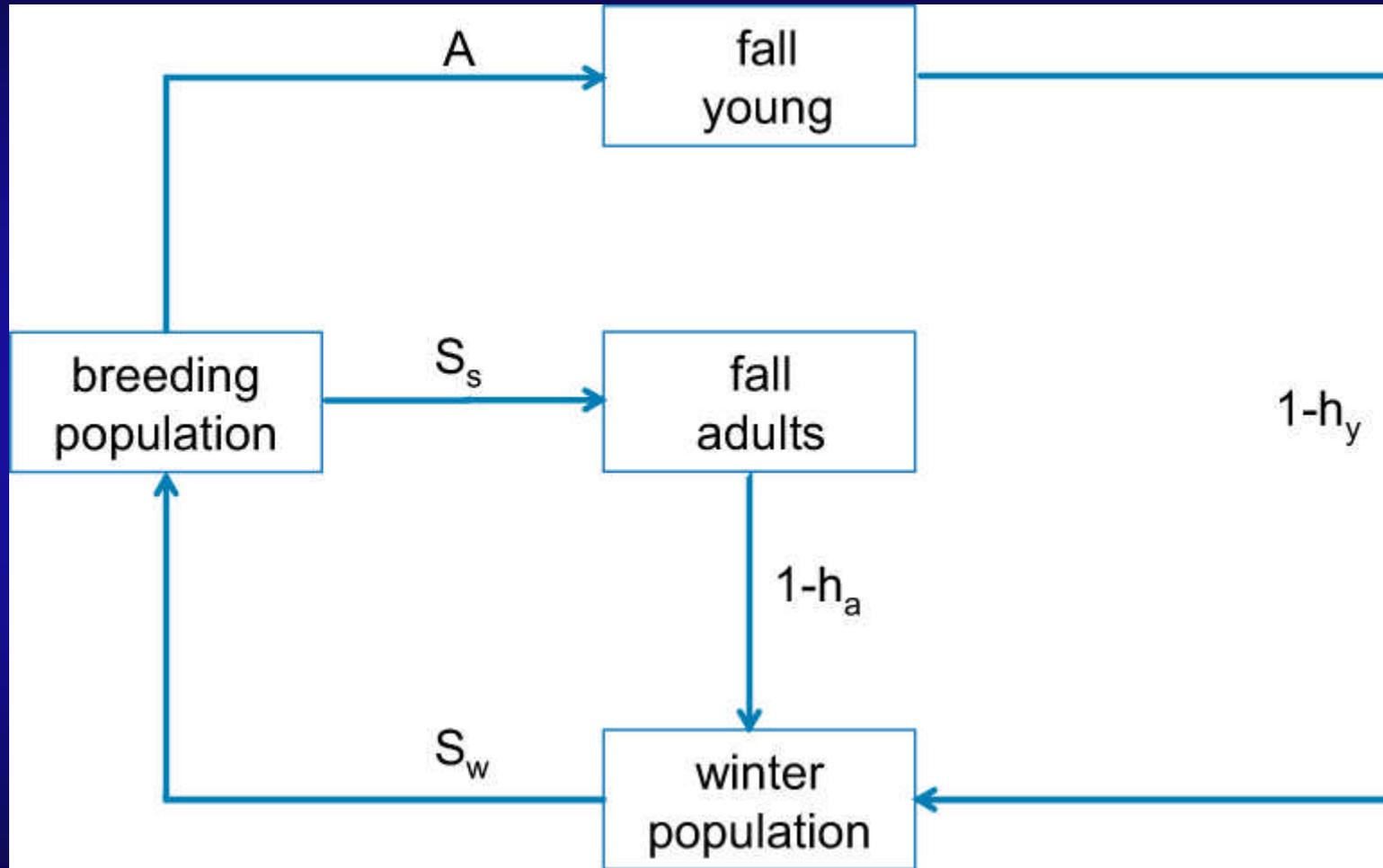
<http://www.doi.gov/initiatives/AdaptiveManagement/index.html>



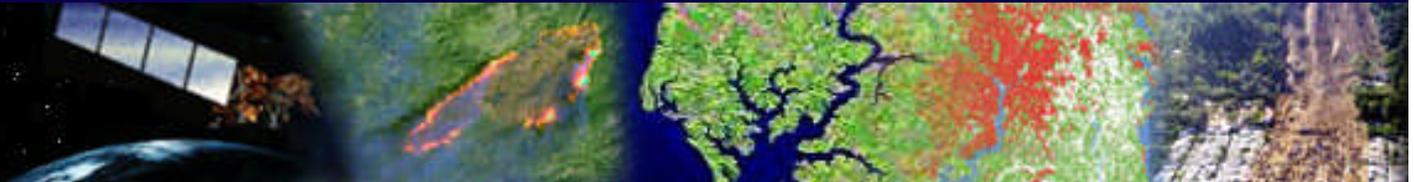
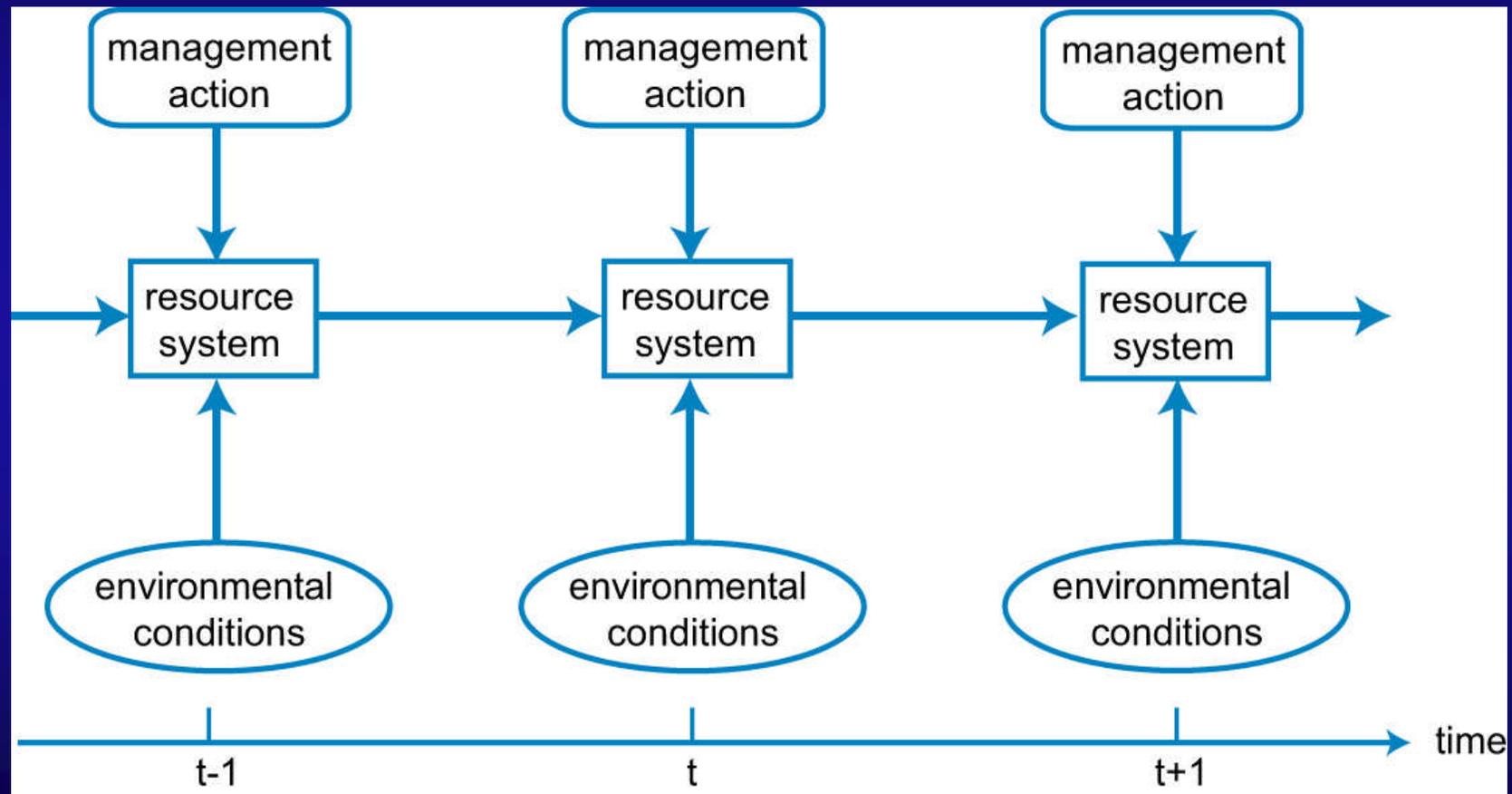
How Should Adaptive Management be Implemented?



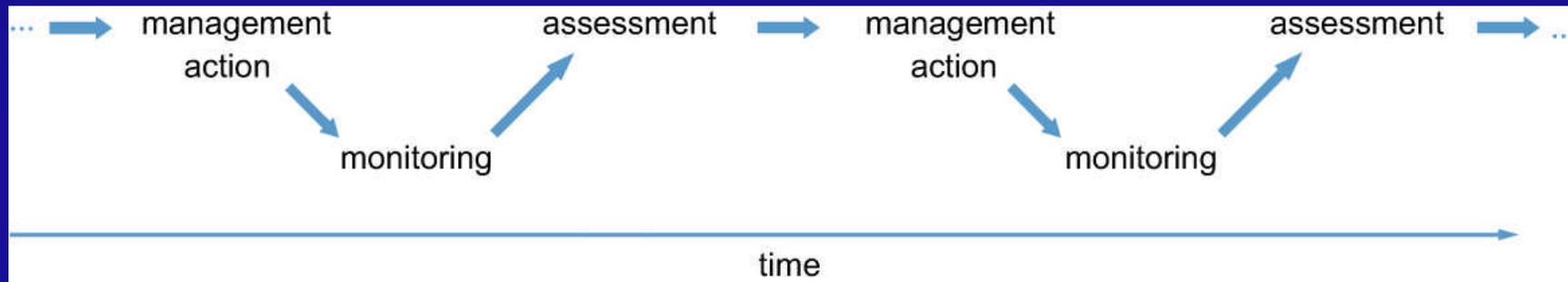
Adaptive Harvest Management Model



Change in Resource System



Iterative Adaptive Management Cycle



When is Adaptive Management Successful?

Implementation of adaptive management is successful if progress is made toward achieving management goals through a learning-based (adaptive) decision process.



Criteria for Recognizing Success

Stakeholders are actively involved and committed to the process.

Progress is made toward achieving management objectives.

Results from monitoring and assessment are used to adjust and improve management decisions.

Implementation is consistent with applicable laws.



Adaptive Management Success Model



Stakeholder Involvement

Have key stakeholders been identified?

Has a systematic process been developed that facilitates effective participation by stakeholders?

Have agreed upon lines of communication been established and is their importance to successful adaptive management processes understood?

Are stakeholders committed to the AM process including the monitoring and assessment program?

Is the adaptive management process able to adapt to changes in stakeholder and public viewpoints?



Progress Toward Achieving Management Objectives

Have explicit and measurable management objectives been identified and developed?

Are the management objectives achievable and sustainable?

Have performance metrics relating to the management objectives been developed?

Has a system of monitoring and assessment relevant to the management objectives been developed and implemented?

Have tradeoffs among management objectives been considered and they understood?



Informative Monitoring and Assessment

Will the monitoring plan support the testing of alternative models and measurement of progress toward accomplishing management objectives?

Is it clear what monitoring data need to be collected to estimate the relevant resource attributes?

Has the level of accuracy that is need been identified?

Have the expected impacts of alternative management strategies been evaluated?

Have thresholds that indicate a change in management been recognized?



Implementation Consistent with Applicable Laws

Are the applicable resource management laws and regulations understood by managers, scientists, and other stakeholders?

Have steps been taken to comply with applicable laws and regulations?

Has a process been developed to focus on compliance throughout the project life?

Is the process in compliance with specific legal mandates?

