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Collaborative Adaptive Management: a Process for Sustainable Watershed Management*

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*Michael Davidson

Spec Management Group and

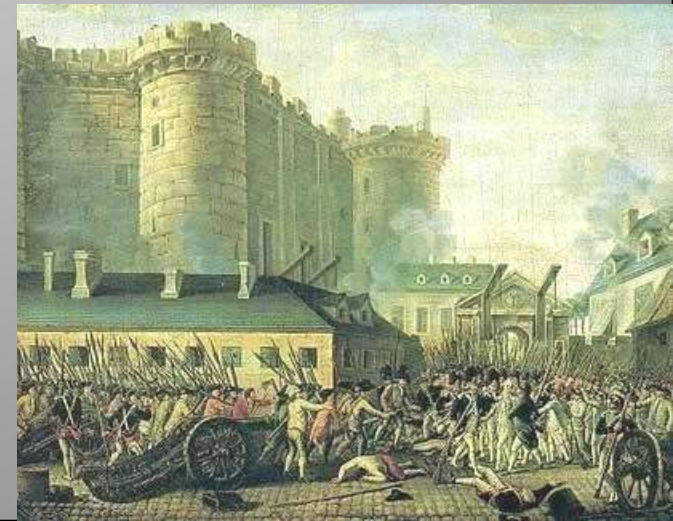
Research Fellow; AWIRU and Arava Institute for Environmental Studies

Outline

- Traditional process of management for watersheds
- Methodology of Collaborative Adaptive Management (CAM)
- A Comparison of the Two
- Concept of Adaptive Governance
- Principles of CAM for Success
- Challenges to CAM
- Summary , Conclusions, Questions

From Whom Shall We Look for Inspiration?

- "There go my people. I must find out where they are going so I can lead them"
- -Alexandre Auguste Ledru-Rollin, a politician during the French Revolution when he looked out his window

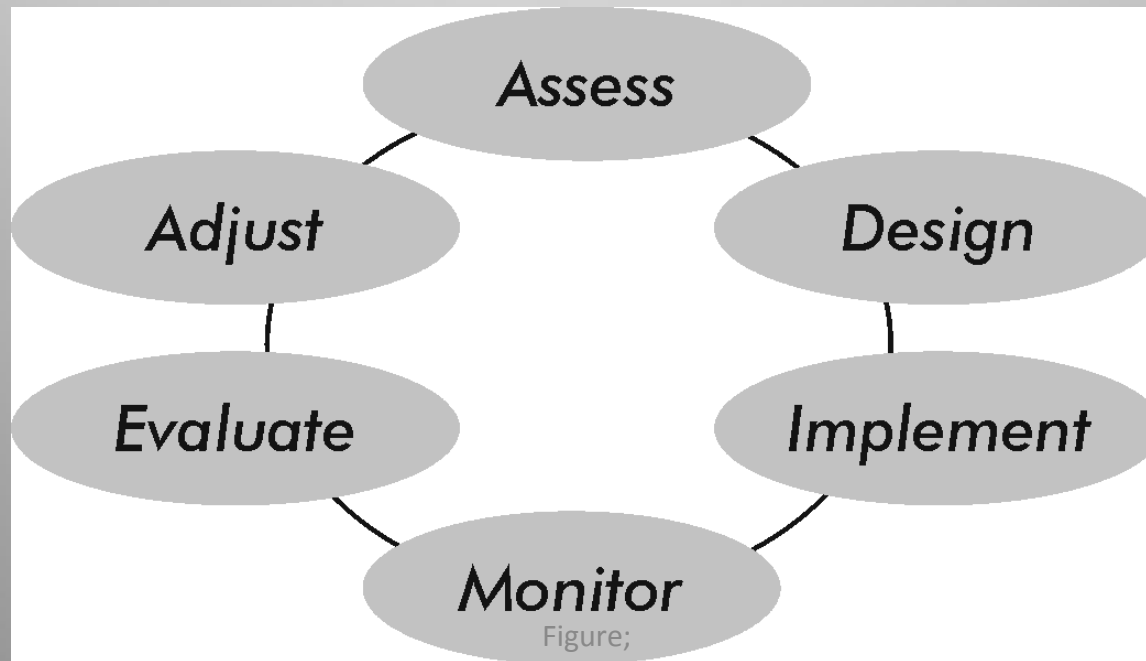


Methodology Typically Utilized to Address Issues of Sustainability

1. **Reductionist Science; focusing on narrowly defined problems and technological solutions intended to solve complex social-ecological problems.**
2. **Resource Management Myopia; a pre-occupation with notions of universal equilibrium, maximum yields and single species management.**
3. **Mismatch of Economic Assumptions and Realities; Micro-economic theory that, when employed in policy, assumes rational maximizing behavior on incremental utility analysis.**
4. **Top Down Command and Control; Bureaucratic structures that rely on top-down approached to management that are responsive only to special interests rather than outcome-oriented.**
5. **Market Fundamentalism; Political structures that are based on the myth that markets are self regulating and transparent, and**
6. **Engineering-dominated Solutions; Institutional cultures and scientific practices that have not broken free of their historical roots in engineering for simply physical systems.**

What is Adaptive Management OR Collaborative Adaptive Management?

- AM or CAM is an alternative process or methodology to traditional processes for the management or restoration of eco-systems.



Figure;

What is it NOT?

- “What we have been doing by another name”
- “Trial and Error”
- Managing “adaptively”

Where it Differs

Current Processes

- Call for high levels of predictability and agreement. Nemesis is *uncertainty*.
- Policies are treated as static solutions and institutions are commanded to support policies
- Predictions of policy performance usually generated by numerical models
- Goals are spatially and temporally convenient
- Science and Politics are antagonists

Adaptive Management

- Allows and welcomes uncertainty and calls for structured learning to address uncertainty and surprise
- Policies are treated as hypotheses. Active (social) learning by all stakeholders is currency.
- Decision-making approach is “learning-by-doing”; proactive, iterative and deliberate, learning from outcomes
- Spatial view is eco-systemic and temporal view is biological-generational
- Science and Politics are integrated

Social Learning is the “Currency” of Adaptive Management

Objective is to learn from the outcomes of implemented policies

It is structured and cyclical and involves:

1. Integrated assessment of current problems and possible solutions as perceived by different stakeholders
2. Setting goals
3. Formulation of policies that are hypothesized to contribute to reaching the goals
4. Implementation to test hypotheses through systematic monitoring and evaluation of policy outcomes, including surprises

These are not distinct states as the system pulses through alternating spurts of learning and implementing

Raadgever, Mostert, Kranz, Interwies,
Timmerman, "Assessing Management
Regimes in Transboundary River Basins: Do
They Support Adaptive Management?" in
Ecology and Society 2008

Restoration of the Eco-Systems or Watershed as Holistic Entity in Space and Time

- We are accustomed to leaving river, stream, habitat, restoration to engineers who managed that distinct part of the eco-system for a single purpose such as navigation.
- Today, eco-systems are multi-purpose, basin-wide and has to deal with human-induced change and increasing concerns about the causes and consequences of changes.
- When eco-systems are trans-boundary differences in legal frameworks, historical and cultural backgrounds and technical capabilities add to the complexity

Stakeholders

- Stakeholders today are much greater in number and variety than current institutions allow vis-à-vis access, power and policy determination.
- No single institution in the Columbia River System could represent and respond to:
 - Power Companies
 - Developers
 - Indian Tribes
 - Fishing Interests
 - Tourism and Recreation
 - Environmentalists
 - American and Canadian government authorities
- NGO's

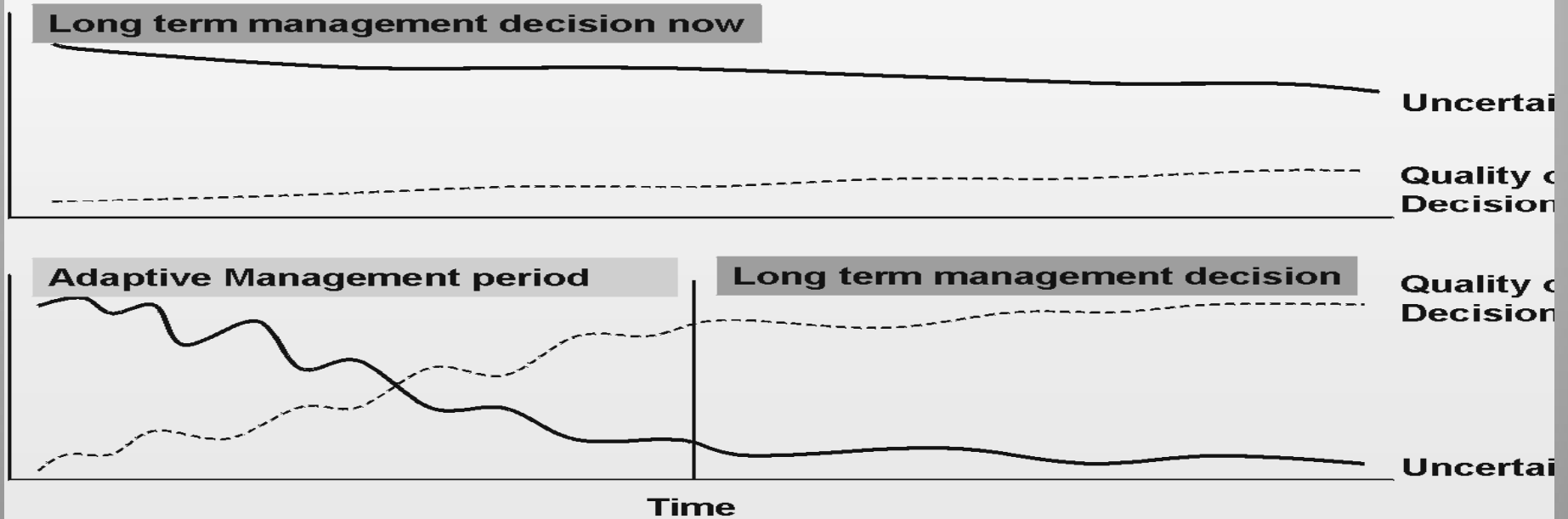
Uncertainty

To have doubted one's own first principles is the mark of a civilized man

-Oliver Wendell Holmes

- Decision-making in an atmosphere of uncertainty can foster an uninformed and distrustful public
- AM incorporates an active collaborative process for the purpose of creating an informed and contributing public, bridging gaps in communication and understanding among the public, the scientific community and the managers who are responsible for implementing the eco-system program

Benefits of Adaptive Management Experiments



Benefits of Adaptive Management in Conditions of Uncertainty

Figure 2. Upper Panel: immediately implementing the apparently 'best' long term management decision

and then monitoring its effects results in only a slow decrease in uncertainty and only slight improvements over time in decisions. Lower Panel: A deliberate, well-designed adaptive management experiment can reduce uncertainty much more quickly and result in a far superior long term management decision.

This is one of the more challenging stages in the cycle, as learning from adaptive management

Sustainability

- *"Sustainability, is better seen as a measure of the relationship between the community as learners and their environments, rather than an externally designed goal to be achieved" (Sriskandarajah et al, 1991).*
- In sustainable development everyone is a user and provider of information AND a client.
- The need to change from old sector-centred ways of doing business to new approaches that involve cross-sectoral co-ordination and the integration of environmental and social concerns into all development processes.

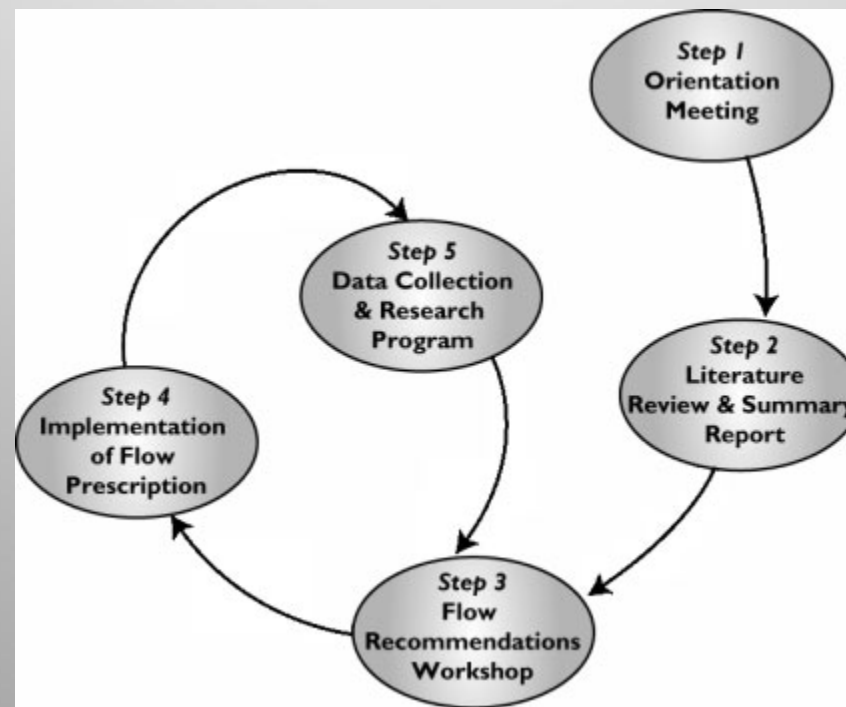
The Building Blocks of CAM

- Building Networks
- Encouraging Dialog
- Knowledge Management
- Evaluation and Reflection
- Capacity Building, Social Capital and Empowerment
- Encouraging Innovation in Sectors and Regions

Social Learning and Governance

- The concept of social (or collaborative) learning refers to learning processes among a group of people who seek to improve a common situation and take action collectively. This understanding effectively extends experiential learning into collective learning. This is a form of governance, in the sense that governance relates to how society manages to allocate resources and coordinate or control activity in society or the economy

Scientific Process for Developing Environmental Flow Recommendations



Adaptive Governance

- **FIRST ORDER:** Current governance structures created to address users of a single type (urban, industrial, agricultural, et al)

Adaptive Governance

- SECOND ORDER: New generation of institutions that to resolve collective action problems between different types of resource users
 - Eco-systems governed by multiple agencies
 - Concern with scientific uncertainties about the natural system and human institutions

Conditions for Effective Adaptive Governance

- Decisions regarding competing uses of water must involve appropriately selected and prepared stakeholders as well as elected and appointed decision makers.
- Stakeholders requiring assistance must have adequate technical support
- Supplementary problem-solving by neutral facilitators
- Defining areas of disagreement and experimentation and collaborative monitoring to resolve disagreements must be primary response to scientific uncertainty

New Water Conflicts and the Second-Order Collective Action Problem*

- 20th Century dominated by federal governance of water for development (agriculture, power, navigation)
- Last quarter of 20th Century development came into conflict with health and environment
 - US EPA, Water Act, US Fish and Wildlife etc
- Shift in political power ag to cities to suburbs where water quality and recreation rivaled economic development

Conditions of Stress

- Conflicts arise from condition of stress on the natural system, particularly from unexpected or unintended consequences.
- Realization that institutions and expertise lack capacity
- New actors
- Coordination and collaboration become needed and new institutions are created

The Success of Project Planning, Implementation and Assessment is Achieved by Applying the Following Principles of AM

- Use of scientific inquiry based approach to address structural, operational and scientific questions
- Incorporation of robustness
- Use of feedback loops
- Emphasis on open, inclusive and integrative processes
- Emphasis on collaboration and conflict resolution

Challenges to Adaptive Governance

- Representation
- Decision Process
- Scientific Learning
- Public Learning
- Problem Responsiveness

Summary

- Watersheds are challenged by human-induced change from a multiplicity of actors and the causes and consequences of these changes.
- Traditional management practices and institutions lack the capacity to address the complexity and uncertainty of the eco-system
- CAM provides a methodology to continuously improve management strategies by learning from outcomes of implemented policies
- Adaptive governance provides the framework for integrated policy management of eco-systems temporally and spatially

Questions

