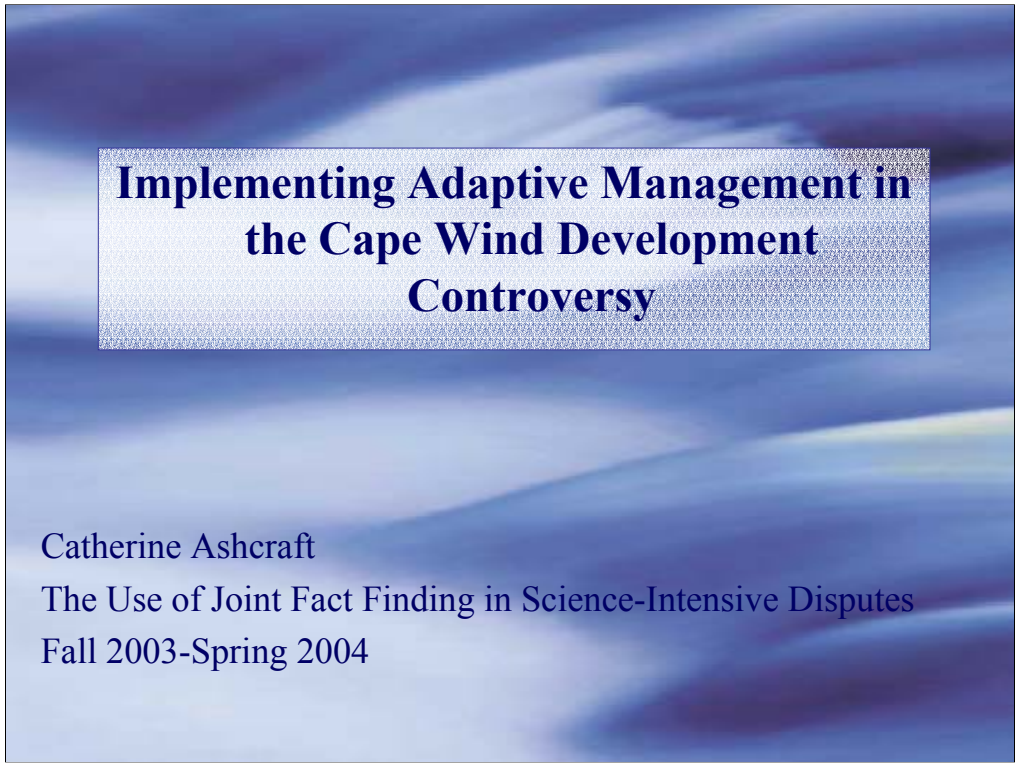


During our course we have looked at the conventional decision-making process' weak points, and the purpose of this presentation is to demonstrate how an adaptive management approach, incorporating joint fact finding principles, could be implemented to help resource managers develop effective policies.

OUTLINE

- Adaptive Management (AM)
- Comparison to conventional management approach
- Resource Management Organization for AM
- JFF in AM
- Application to Cape Wind

ADAPTIVE MANAGEMENT

Management

- Site – specific experiment in an ecosystem that provides new information
- Iterative process

AM PROCESS

- Formulate a predictive model
- Make policy decisions based on it
- Monitor outcomes
- Revise methods as data becomes available

Conventional	Adaptive Management
Seek precise prediction	Uncover range of possibilities
Build prediction from detailed understanding	Predict from experience with aggregate responses
Promote scientific consensus	Embrace alternatives
Minimize conflict among actors	Highlight difficult tradeoffs
Emphasize short-term objectives	Promote long-term objectives
Presume certainty in seeking best action	Evaluate future feedback and learning
Seek productive equilibrium	Expect and profit from change
Public provides input in pre-project discreet events	Public input is changing and frequent
Public interest perceived as aggregate	Public interest perceived as pluralistic

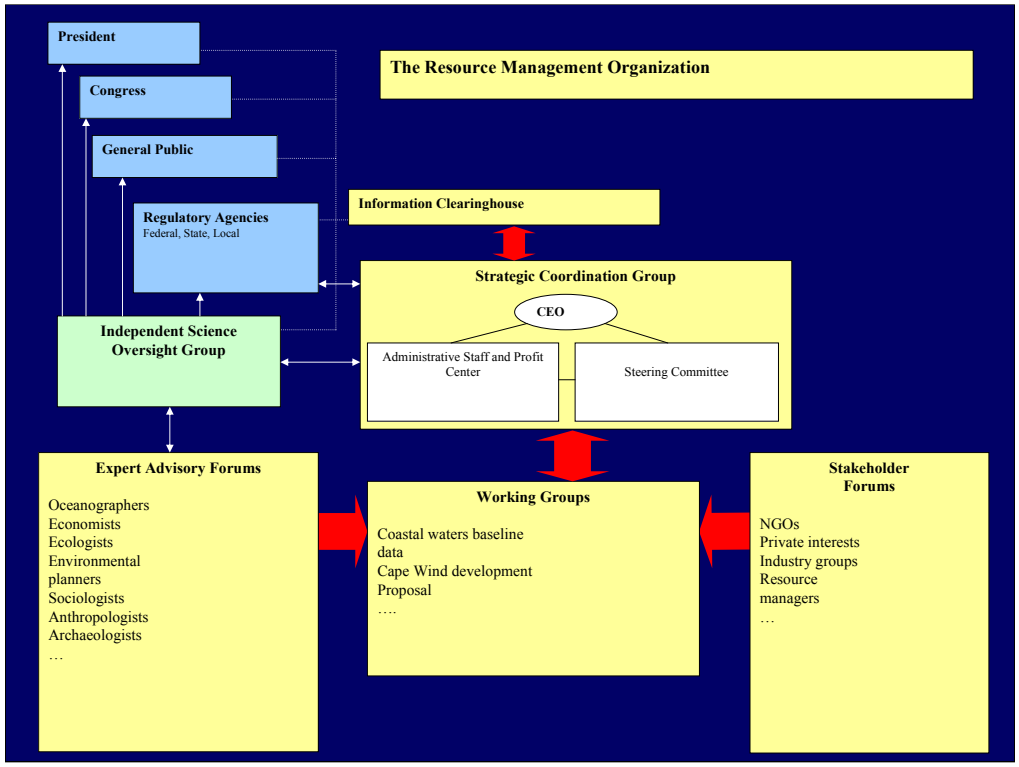
Conventional: scientific consensus about how the system operates Minimize conflict.

AM recognizes that perfect information does not exist, but that managers nevertheless must make decisions The attitude is that managers do not have to know everything about everything before they implement a program. Instead, by using a monitoring system you track the ecosystem's response to the change. Since, any management strategy can have undesirable outcomes this monitoring and evaluation process is critical.

Expectation of stasis, vs. change.

Public input frequent.

NEPA is more typically implemented through the conventional approach but I think that AM is a better approach because emphasis on monitoring and evaluation and public information and involvement match up with NEPA requirements.



The mission of this organization is to marry the operational needs of ecosystem managers and decision makers to the knowledge they need. The organization will be a meeting place for all participants, and will advance the process by which they communicate. The new resource management organization (RMO) will provide stability and continuity to counter the fluctuations inherent in other entities with changing tenures, etc.

The RMO should be a non-governmental authority that functions as a coordinated network of individuals.

RMO is comprised of five internal components, plus an independent science oversight group. The RMO is directed and coordinated by the Strategic Coordination Group (SCG). The SCG is itself made up of a Steering Committee, a CEO, administrative staff and a Profit Center.

Participation in AM will occur primarily through membership in the Steering Committee and through Working Group workshops.

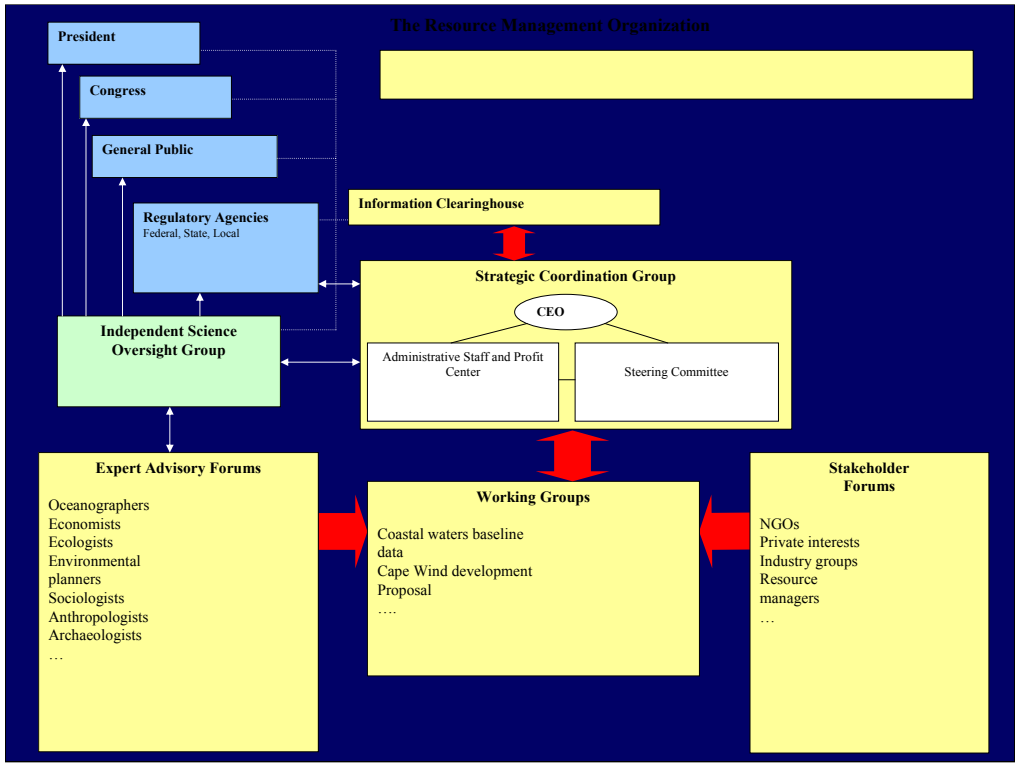
The Steering Committee is responsible for setting broad policy, funding, technical and scientific guidelines.

It is made up of long-term stakeholder representatives.

As many stakeholders as possible should be included to build trust and 'buy in' as working relationships and collaborative learning develop.

The range of potential concerns becomes an ongoing adaptive process itself, limited by practicality. Management limits and participation will have to be established by the Steering Committee. As underrepresented interests are identified, they should be invited to join the RMO. Delegates to the Committee should represent:

- local resource managers
- scientists and experts
- information specialists
- federal, state, local regulatory agencies
- private interests
- industry groups
- nonprofit organizations



Chief Executive Officer

The CEO is the resource management organization's official representative and top administrator. He or she is appointed by and accountable to the Steering Committee.

Administrative Staff and Profit Center

The administrative staff supports the CEO and the Steering Committee in day-to-day operation of the RMO.

They are the physical presence of the RMO.

They are also responsible for coordinating information exchange between the Steering Committee and the Working Groups, and ensuring that the Information Clearinghouse and Independent Science Oversight Group obtain the information they need.

The Profit Center pulls together research, development, and outreach funds from agencies and other organizations with ecosystem management responsibilities. It allocates these funds to working group projects and research as needed.

Working Groups

Working Groups are the primary forums for scientists and stakeholders to interact on a continual basis. The Working Group topics will be established by the Steering Committee, but any individual should be able to petition the Steering Committee to create a new Working Group. The Steering Committee will vote on the petition and, in conjunction with the Profit Center, will determine what funds are allocated to support the Group. In the group meetings, scientists and stakeholders will work together to transform scientific data into usable knowledge for various users and to identify knowledge gaps. Each group will be responsible for analyzing a particular set of policy options identifying measurable criteria for evaluating those options keeping track of monitoring data and evaluating progress with respect to policy objectives as defined by the Group and the Steering Committee.

Stakeholder Forums

Open participation Stakeholders participate in forums to discuss strategies, exchange information and develop research areas. The groups represented in the Steering Committee may contribute, but other groups with knowledge to share may as well.

Expert Advisory Forums

Scientists may conduct experiments, developed by Working Groups, aimed at monitoring management progress relative to specified criteria. The Profit Center funds this research, as well as approved research targeted at knowledge gaps identified by Working Groups.

They should caucus among themselves to bring peer-reviewed scientific and technical information up for discussion in working groups. the Steering Committee forms working groups to focus scientists and stakeholders on policy options facing the resource. Doesn't have to be consensual

Information Clearinghouse

The IC maintains information in a publicly accessible format on management goals, progress evaluation criteria, monitoring data, evaluation analyses, baseline data, and all data and trend analyses and modeling.

It also maintains publicly accessible information on the RMO structure (Steering Committee and CEO; ongoing, past, proposed working groups; participants), completed, current, and proposed research topics, information on any other research activities in the region, budgetary information, and funding sources.

This information should be publicly accessible to any interested party. In addition, the IC should explicitly triangulate with management agencies and the independent science oversight group to ensure that they have the data they need to evaluate the RMO's progress.

Independent Science Oversight Group

This group evaluates the effectiveness of the RMO management strategy based on information provided through the Information Clearinghouse.

The group reports directly to federal, state and local agencies with regulatory authority, the President, Congress, and the public. It will evaluate how management policies are actually performing with respect to their stated objectives.

The evaluations and recommendations will be used by the RMO to modify existing policies, and to formulate new working groups or redirect existing working groups' agendas. This process can be repeated, and will change the policy decision or permitting process from a one-time decision to an ongoing and evolving process.

The working groups use the models and hypotheses identified by the Steering Group to systematically develop and evaluate a range of predictions about key policy variables

The discussions should begin by determining what environmental indicators should be used to measure management progress.

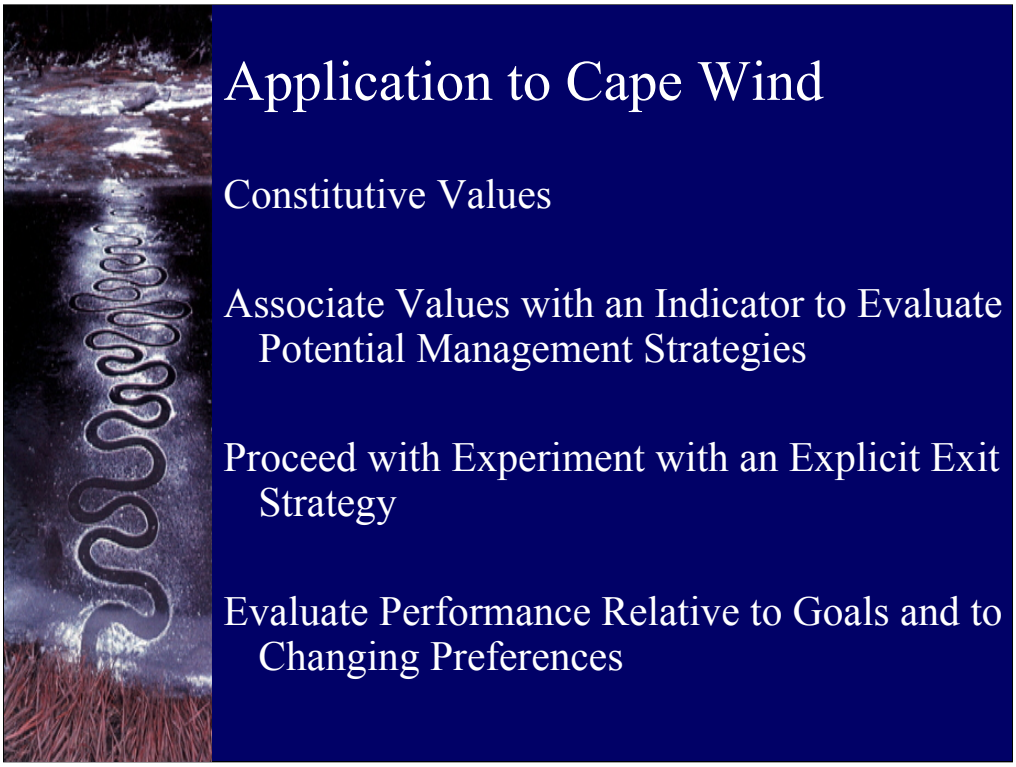
There is no predetermined number of criteria, and so any number of indicators can be used.

By adopting d*e minimis* standards for each criteria, and discussion can be limited to policies that can be anticipated to achieve thods.

Next, the group must develop experiments to establish relationships between various indicators and management goals.

In this way, problems become concrete questions about what to measure and monitor.

It is even possible that people with different values will support the same criteria. For example, people who like to fish and people who are interested in marine species conservation can agree that fish habitat is important. Without resolving their underlying differences on how to best enjoy fish, they could agree on a variable that would measure the extent to which a policy improves fish habitat.



Constitutive values are values that give a community member their sense of home. If these values were threatened, their identification with their home would also be endangered.
A strategy to include these values in the AM process is to associate them with measurable features of the environment.
Once the value can be associated with an indicator, it can be used as a criterion to evaluate potential management strategies.
The problem becomes one of finding a development path that maximizes this and other criteria.

According to an AM approach, development of the project would have to proceed in order to obtain data to measure to what extent the wind farm met community management goals- including the aesthetic criteria. The difficulty is that those who feel that the sight of the turbines will destroy their sense of place, feel that the construction of a test sample of turbines will already be destructive.

I propose that the AM approach be pursued despite such objections, but that it incorporate an exit-strategy should the project evolve into a cultural tragedy. In the true spirit of AM, the decision to develop should not be a one-time granting of an eternal permit. Instead, the permit should be issued for a period of time to be determined by a working group(s) that would enable scientific data to be collected to meet identified knowledge gaps. (Hypothetically, assume this is between 10 to 20 years.)

Within the context of the working groups, the community can discuss how they are doing in achieving stated goals and how well chosen indicators and measures seem to be tracking socially important variables.

Should the aesthetic issue remain a concern, I propose that a referendum be taken at the end of the permit period. The referendum would ask the public to explicitly evaluate, based on a set of criteria, how the development has affected their sense of place. This data would be evaluated, in the context of other criteria in order to determine the project's effectiveness at meeting development goals. Following Norton's suggestion a *de minimis* standard could be used to evaluate the referendum. If the goals were not being met, and a specified percentage of the population attested to the fact that the wind farm had destroyed their sense of place, the project could be terminated and the turbines removed. An exit strategy is important because nobody wants to create a cultural tragedy in which the community is divested of its sense of place. In this way, view shed is an easier problem to deal with than ecosystem disruption. The removal of the turbines would restore the view to its original state. While this would come at considerable cost to the developer, it is conceivable that the federal government would subsidize some of their financial loss as a test case.

However, if instead some of those who now object come to admire the turbines and associate them with their sense of place, as proponents of the project predict, then the referendum would reflect these changed values and preferences. The wind farm project would then continue. In the spirit of AM and joint fact finding, this proposal makes use of the reality that values and preferences are not fixed, but evolve in response to environmental changes.


Implementing Adaptive Management in the Cape Wind Development Controversy