COMPASS
EBM Consensus Statement

- Place based
- Focused on sustaining valued ecosystem services by protecting ecosystem structure and function,
- Recognizes internal and external linkages of the whole system, and
- Specifically considers economic, social and institutional aspects of the system

Essential conditions if an ecosystem-based initiative is to succeed

United Nations Environment Program. 2006. *Ecosystem-based management: Markers for assessing progress.* 58pp. unep/gpa, The Hague

1. Unambiguous goals
2. Well-informed stakeholders
3. Delegation of authority and financial resources to sustain implementation
4. Capacity within implementing institutions

hypothesized essential elements of Ecosystem Based Management

holistic vision / plan

comprehensive description of system, articulation of multiple management objectives

community

effective engagement of policy makers, managers, stakeholders, scientists

process

effective adaptive management

foundation

legal framework, management institutions, financial resources, effective communications

CCMP/EBM development

1. Articulate program goals
2. Develop system level model for goal attainment
3. Assess current management efforts – identify gaps
4. Develop management strategy
5. Develop monitoring program
6. Assess performance
7. Manage adaptively

WATERS

Vision: Achieve and maintain the water quality and quantity necessary to support the living resources of the Albemarle-Pamlico ecosystem.

Goal 1: Maintain, enhance, or restore water quality to support natural and human communities.

A. Maintain the condition of "high quality waters" as defined by North Carolina & Virginia [e.g., Outstanding Resource Waters, Shellfish "Class A" Waters].

B. Improve* water quality in impaired waters as defined in the states' 2008 Impaired Waters List. (* Improvement defined uniquely depending on whether impairment is biological, chemical, or physical)

Goal 2: Maintain or restore sufficient water quantity to support natural and human communities.

A. Maintain or restore hydrologic regimes necessary to support aquatic, riparian and floodplain communities.

B. Maintain sufficient groundwater levels to support aquatic and wetland communities.

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Success implementing EBM requires a **theory of change**

What must be done to produce the necessary and desired outcomes?

Adequately articulated, the theory of change:

- organizes action
- enables monitoring
- facilitates adaptive management

Look at example models

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Maintain, enhance, and restore water quality to support natural and human communities

- *Maintain high quality waters*
    - Nutrient concentrations (N of particular interest)
    - Turbidity and suspended sediments
    - Toxicant concentrations including sediment metals and dioxin
    - Biological oxygen demand
    - Number and type of point source polluters
    - Land use (nonpoint source pollution)
    - Salinity
    - Fecal contamination
    - Incidence of hypoxic and anoxic events
    - Incidence of algal blooms
    - Incidence of fish and shellfish disease outbreaks
    - Incidence of fish and shellfish kills
- *Improve water quality in impaired waters*
    - Change in status of use (not a 1994 indicator)
- *Improve groundwater quality*
    - Nutrient concentrations (N of particular interest)
    - Turbidity and suspended sediments
    - Toxicant concentrations
    - Number and type of point sources
    - Land use (nonpoint source pollution)
    - Salinity
    - Fecal contamination

Develop monitoring program

- Monitoring reflects management priorities
- Monitoring designed to reduce uncertainty in system model
- Indicators link condition and management efforts
- Monitoring data is appropriate to decision thresholds for adaptive management

STAC activities

1. Review and add to list of factors potentially influencing goal attainment
2. Provide input on factor ranking
3. Develop indicator suite for goal monitoring

EBM - Landscape Scale Focus

Optimistic model

- Integrative science leads to developing comprehensive plans
- Coordination among agencies leads to consistent actions

Pessimistic model

- Development interests dominate leading to reluctance to impose costs
- Institutional barriers result in failure to cooperate

Adapted from: Judith Layzer. 2008. Natural Experiments: Ecosystem-based management and the envrionment. The MIT Press. Cambridge, MA.

EBM - Stakeholder Collaboration

Optimistic model

- Trust transforms interests and leads to innovation
- Agreement on science basis leads to feasible, well-founded plan
- Involvement reduces challenges

Pessimistic model

- Consensus seeking leads to lowest common denominator
- Socio-economic interests dilute precaution
- Special interests resurface impeding implementation

Adapted from: Judith Layzer. 2008. Natural Experiments: Ecosystem-based management and the environment. The MIT Press. Cambridge, MA.

EBM - Adaptive Management

Optimistic model

- Emphasis on flexibility promotes ‘better-than-minimum’ performance
- Monitoring informs practice ensuring use of best available understanding

Pessimistic model

- Flexibility facilitates evasion by laggards
- Managers resist adjustments and development interests prevail

Adapted from: Judith Layzer. 2008. Natural Experiments: Ecosystem-based management and the envrionment. The MIT Press. Cambridge, MA.