SCIENCE ADVICE SUPPORTING IMPLEMENTATION

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Three Science Advisory Considerations

- Definition of correct task for Advice
  - How large a step is possible?
  - Which things are science, which are not?
- Preparedness of Science to Advise
  - Which can be done well now? Which cannot?
- The culture of the advisory – management interactions
  - How do we blend the different cultures of fisheries and “environmental health” advisors?
  - Threats to the legitimate role of Science.

Refining the Advisory Question

- Are we considering:
  1. Managing an activity in an ecosystem context
  2. Integrated Management of multiple activities
  3. Inclusive governance with shared power
- All three are important, but THEY ARE NOT THE SAME
  - Each has value alone as well as together.
  - Pace of change in Integrated Management (IM) and Inclusive Governance (IG) may not be fast!
  - Large and immediate role for science advisors in #1

Moving on Ecosystem Approach

- Progress is possible NOW on moving management of individual human activities in the sea onto better ecosystem foundation.
  - Waiting for IM and IG will delay necessary - and **possible** - conservation actions.
  - Moving to IM will NOT lose ground gained on Ecosystem Approach to single activities.
    - Lessons learned can be transferred and extended.
  - Moving to IG the dialogue leading to compromise and trade-offs may be different, but not the ecological understanding informing the dialogue.

Components of Science Advice on Implementing Ecosystem Approach

- Three types of ecosystem considerations in management of a human activity:
  - Taking account of environmental forcing on the ecosystem properties being used
    - "input" of the ecosystem to the human activity
  - Taking account of interactions of other species with the species being used-also "input"
  - Taking account of how the use of an ecosystem property changes the ecosystem
    - "output" of human activity to the ecosystem

Preparedness of Science to Provide Advice

KNOWLEDGE IS INCOMPLETE ON ALL TOPICS IN ECOSYSTEM APPROACHES, BUT WE NEED TO USE WHAT WE DO KNOW!

- ENVIRONMENTAL FORCING :
  - We know a lot about patterns in the natural forcers
  - We know many useful things about how populations and communities respond to the environment
  - CAPABILITY EXISTS TO PROVIDE MUCH USEFUL ADVICE
  - CAPABILITY BEING USED IN SOME CASES

Preparedness of Science to Provide Advice (2)

- ECOSYSTEM EFFECTS OF HUMAN ACTIVITIES
  - SCIENCE ADVISORY BODIES HAVE PROVIDED REVIEWS AND USEFUL ADVICE ON (*inter alia)* :
    - FISHING WITH SEVERAL GEARS
    - SOUND USED IN SEISMIC EXPLORATION
    - NEAR-FIELD EFFECTS OF AQUACULTURE
  - **ALL HAVE MANY UNCERTAINTIES but direction of necessary mgmt responses usually clear**
  - **ALL YIELD CLEAR AND USABLE ADVICE**
  - CAPABILITY EXISTS TO DO SIMILAR ADVISORY REVIEWS ON MANY OTHER ACTIVITIES
    - NOT ALWAYS CLEAR WHO SHOULD **ASK** FOR OR **RECEIVE** THE ADVICE

Preparedness of Science to Provide Advice (3)

Indirect effects of human activities mediated by predator – prey – competitor interactions

MUCH LESS SCIENCE CAPACITY TO PROVIDE ADVICE ON THESE FACTORS

- Reliable models require more knowledge to build and more data to assign values than exist for most systems (Uncertainty begets Indeterminacy)
- Models which don't need such information are unreliable for all but gross questions
- Management needs level of detail and time frames of less than a decade that are largely unavailable at present

Changes to Advisory Cultures

There ARE different disciplinary cultures between science advisors and those receiving the advice in policy & management (personal observation)

- Fisheries Advisors need to place their work in spatial contexts (Regional and Sub-regional)
- Environmental Advisors need to address non-point source issues and work at scales of management, not just ecological processes
- **The best of the two cultures have to be identified, blended & capacity increased–**
- **NOT proving easy.**

Risks in the Advisory Process

- The lack of truly integrated ecosystem advice can be exploited by science advocates
  - Beware of choosing the desired policy outcome and build selective case for the crisis that justifies it
    - Not justified when industries or governments do it; not justified when anyone else does.
  - For science advice to deserve privileged role in policy and decision-making, advisors must strive for impartiality and objectivity
    - (social constructionism notwithstanding)
  - This may be significant challenge in providing sound science basis for Ecosystem Approach to Policy and Management of human activities in the sea.

Actions to Move Forward

- Facilitate integrative global or regional marine assessments by broad-based teams of policy-independent but governance-supported experts (PIGS)
  - Consolidate knowledge & identify key ecosystem components, relationships, and pressures
  - Develop, test, and adapt “structured” approaches
- Establish credible, neutral process or body for provision of peer-review and integrated science advice on marine conservation and sustainable use (IPCC model?)
  - What ARE the threats? What actually does mitigate?
  - As governance evolves value will only increase. (foster change?)
- Build better links between existing science advisory bodies and experts in social sciences

THANK YOU