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