Theme session B

Operationalizing ecosystem-based fisheries management

Conveners: Tim Essington (USA), Kristin Marshall (USA), Christian Möllmann (Germany)

Scientists and managers have long recognized that fisheries management should consider interconnections between fishing, fished species, humans, and the well-being of the larger marine environment. Yet, the path to implementation of ecosystem-based fisheries management (EBFM) remains murky.

An effort is underway to create a practical blueprint for EBFM, in particular an outline of the components of effective Fishery Ecosystem Plans (FEPs) using existing data. FEPs typically encompass and add information to traditional fishery management plans and are intended as an early step toward EBFM. A review of FEPs reveals that plans differ substantially and there is no standard for what they should contain. Operationalizing EBFM will thus require a scientific dialogue that builds on the concept of FEPs.

Papers are therefore welcome on practical methods to incorporate the following into management action or policy change:

- Trophic interactions
- Bycatch and technical interactions
- Habitat
- Environmental and oceanographic factors
- Human well-being and social and economic equity
- Trade-off analysis

The Theme Session included 20 oral talks (and additional 13 posters) which dealt with a wide variety of topics related to implementing EBFM. The Theme Session began with an introduction to the Lenfest Fishery Ecosystem Task Force (Essington – B:01), an effort to operationalize EBFM in the US out of which the Theme Session was developed. Further talks within the Theme Session summarized parts of the work conducted by the project, e.g. a review of global case studies that identifies common approaches to EBFM (Koehn – B:03) and a further review on the role of ecosystem information in US fish stock assessments for fisheries management (Marshall – B:09). A related presentation summarized the general implementation state of and strategy for EBFM in the US (Link – B:07).

A number of studies tackled the difficulty of including environmental information in fish stock assessment routines. While the study by Marshall *et al.* (B:09, see above) demonstrated the increasing use of environmental information in the US stock assessment process, a further review study concluded that globally ecosystem drivers of stock production are rarely implemented in tactical fisheries management (Skern-Mauritzen – B:05. Examples on how to overcome this deficit and to use ecosystem information in today´s fish stock assessment were provided for the Baltic Sea (Neuenfeldt – B:13) and the US (Methot – B:08).

A further set of presentations dealt with specific themes in relation to fisheries management including bycatch mitigation strategies (Murray – B:33), spatial

management approaches (Marzloff – B:12) how participatory methods involving the fishing industry can contribute to new selective fisheries methods (Svensson – B:10). Eventually a new spatially explicit management approach using real time incentives was demonstrated for the mixed groundfish trawl fishery in the Western Baltic Sea (Rau – B:11).

A further group of presentations showed the results of studies dealing with specific methodology related to EBFM approaches. Approaches were presented demonstrating ways to identify switch points (Karr – B:02) and thresholds (Tam – B:04) in ecosystem indicator variables. Furthermore, a novel methodology to identify optimal sets of those indicators was demonstrated (Dempsey – B:19) and a review on Ecological Risk Assessment approaches was presented (Samhouri – B:18). Eventually the use of sets of multiple models in EBFM approaches was exemplified for the US East coast Georges Bank ecosystem (Fay – B:17) and the US West coast Pacific sardine fishery (Francis – B:15).

A last set of presentations dealt with the bridging the gap between ecological and social objectives in EBFM (Bundy – B:06), the need for common sense in EBFM approaches (Bianchi – B:20) and a road map for the development of EBFM in NAFO (Kenchington – B:14).

Overall the scope and variety of the contributions to this Theme Session met well the expectations of the conveners. The Theme Session nicely covered the wide variety of problems in implementing EBFM worldwide, but gave at the same time an overview of the many ongoing developments in the field ranging from methodological indicator and modelling approaches to inter- and transdisciplinary approaches addressing participatory and coupled social-ecological studies. This Theme Session hence covered the state-of-the-art in operationalizing EBFM approaches and provided valuable information and ways forward for developing the Ecosystem Approach within the ICES realm.