ICES Theme Session L

 Pelagic ecosystem dynamics from integrated monitoring surveys

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The session was attended by 50-60 participants and covered major issues relevant to pelagic research surveys including implementation, data use and technological developments. Presentations generally showed examples of: (1) increased data potential from such surveys, if additional, new and sometimes increasingly cost-efficient sensors are used; (2) combining data from different existing surveys and monitoring programs; (3) new dedicated and integrated survey programs; and (4) additional sampling platforms that are used opportunistically in order to extend the temporal scale of monitoring.

Paper L:01 outlined how a standard fisheries survey developed into one of the best known examples of an multidisciplinary monitoring platform, collecting data on all components of the ecosystem. Paper L:09 used this experience to develop methods to summarise such versatile data for creating habitat maps. Some of the unique insights that these integrated surveys provide were explained in Paper L:04 which focused on the ecology of hotspots where physical constraints generated biological aggregations across ecosystem compartments, from plankton to fish and birds. Paper L:02 integrated a large global multi-scale monitoring program which included fixed stations and satellites with fisheries surveys. In the example fisheries survey data were combined to multi-scale data from other sources to understand fish recruitment variability. Other presentations showed examples of the joint collection of fish and environmental parameters on research surveys and its different applications to understand the ecology of migration (papers L:03, L:16), spawning (L:14, L:16) or predation (L:10) patterns. Other topics covered dealt with the vertical distribution and its effects on catchability in bottom trawl surveys (fish above the trawl) as well as in acoustic surveys (dead acoustic zone close to bottom) and examples were provided on how to combine both methods to best assess semi-pelagic fish stocks distributed on bottom and in the water column (L:06, L:14, L:15). Presentation L:08 explored statistical methods to deal with missing data in valuable long-term (survey) time series and L:07 demonstrated direct applications of the use of integrated survey data to validate complex ecosystem models. The final part of the session included integration of new techniques in monitoring. New acoustic technologies which aimed at improving the understanding of the composition of plankton layers were presented (L:12, L:13) and new image technologies demonstrated the capacity to identify and measure living organisms *in situ*. Another innovative technology presented was the use of genetics to identify presence of a target species in the stomach content. Other than providing possible measures of biodiversity in plankton communities, these ever improving methods find applications in studies on foodweb interactions where they were previously not possible (L:11).

The discussion focussed on ways to design integrated monitoring to address particular objectives as well as make best use of vessel resources. The need for (additional) coverage of relevant spatial and temporal scales was highlighted and a potential solution could be the use of opportunistic sensor platforms. In particular, it was suggested that fishing vessels should be used more to survey large areas while research vessels could be used for high-resolution but finer space-time scales and process studies. Another important issue raised was the amount of data collected by research surveys generating large data flows and the unique opportunity to characterise biodiversity. Finally, poster L:12 was awarded an honorable mention by the Awards Committee.