CM-code: ICES CM 2019/H: Drivers of sustainability in fisheries for non-quota and data-poor species

Title of abstract

Three Monte-Carlo methods for data-limited stock assessment

Names of authors

Giuseppe Scarcella, Rainer Froese, Henning Winker, Gianpaolo Coro, Nazli Demirel, Cristina Garilao, Athanassios C. Tsikliras, Donna Dimarchopoulou, Manuel Dureuil, Daniel Pauly

Abstract

The maximum sustainable yield (MSY) is the paradigm of EU (e.g. CFP, MFSD) and non-EU policies and legal frameworks (e.g. Law of the Sea, UNCLOS 1984). It commits signatories to exploit fisheries resources at a level that is consistent with its target. However, information on the status of exploited stocks relative to MSY reference points is in most cases poor, because the data required for full stock assessments have not been collected and/or are inaccurate. Methods that make the best use of the available data, combined with general knowledge and Monte Carlo approaches, have recently been developed based on fish population dynamics research (surplus production methods). These methods include CMSY for catch data, LBB for length frequency data, and AMSY for abundance data (either commercial CPUE or fishery-independent survey data). In this study the three approaches were applied to examine and compare outputs, trends of exploitation level, and biomass at sea for numerous stocks – characterized both by a data-rich and a data-poor situation – distributed in several areas. The accuracy and effectiveness of these methods and their ability to provide scientifically sound management advice are compared and discussed.

Keywords: biomass depletion, data-poor stocks, healthy size structure, Monte-Carlo methods, proxies for MSY

Contact author: Giuseppe Scarcella, National Research Council (CNR) - Institute for Biological Resources and Marine Biotechnologies (IRBIM). Italy, giuseppe.scarcella@cnr.it