Theme: Special Sessions
Session: TuF3 - ECOST: Societal costs of fishing public policies

Title: Decision with multi-criteria objective. Use of jointed exploitation-ecosystem dynamics models

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Abstract: Any model of an exploited ecosystem necessarily includes a representation of fisheries activity as argument(s) of the function(s) describing the state of the ecosystem. Hence the definition of this argument (e.g. effective fishing effort(s), fishing mortalities, Yields&) mainly results from the chosen ecosystem model, with a dimension generally equal to the dimension (number of components) of the ecosystem. For management purposes, this situation is very comfortable if this fishing activity is a control variable which can be fixed at some level by one decision maker and if the model of the ecosystem can entirely represent the objective of the management. If fishing units have several available tactics with different impact on the resource, their nominal activity (e.g. numbers of fishing trips) can no more be related to an exact impact on the resource. Hence, if control variables are mainly nominal activities, a given set of such activity no more corresponds to a given set of values of fishing activity in the ecosystem model. It becomes necessary to represent the decisions and the objectives of individual fishing units throughout a jointed dynamics model of the exploitation and the ecosystem. With such a model and available data, a global indicator is the set of the model parameters estimates (functions of available data). Answers to management questions are then functions of this indicator. From such a fit, we present an example with several control variables (e.g. nominal efforts and/or operating costs of various fleets), and an objective defined from several viewpoints on eco-systemic (biomass levels as indicators) and socio-economic (with incomes and nominal efforts as indicators) aspects.