The EBM Toolbox: Tools for ecosystem-based fisheries management

Editor's note: The goal of The EBM Toolbox is to promote awareness of software tools for facilitating EBM processes, and to provide advice on using those tools effectively. It is brought to you by the EBM Tools Network (www.ebmtools.org), a voluntary alliance of leading tool users, developers, and training providers.

By Sarah Carr

In ecosystem-based fisheries management (EBFM), tools are needed to help assess and plan for the impact of fisheries on natural and human systems. Such tools may include:

- Models of ecosystem structure and function
- Simulations of how fisheries management actions would affect ecosystem structure and function, and
- Simulations of how changes in ecosystem structure and function would affect ecosystem services and human communities.

Tools to perform these functions have been developed for a variety of intended users. Some commonly used tools include:

- **Coastal Transects Analysis Model** (http://fishbase.sinica.edu.tw/report/t/home.htm) - A free, on-line visualization and decision-support tool for describing and analyzing interactions between natural and human systems, with an emphasis on fisheries and aquatic resources. It is available in two forms: a basic model that utilizes descriptive information about a coastal area and is appropriate for data-poor areas, and an advanced model for users with detailed information about their coastal area.
- **Ecopath with Ecosim** (www.ecopath.org) - A free suite of ecosystem modeling tools that can be used to evaluate the ecosystem effects of fishing and explore management policy options. It is one of the most user-friendly and least data-intensive of the whole-ecosystem models (models that represent all trophic levels) but still requires data that may be difficult to obtain in data-poor areas (e.g., species abundance estimates).
- **Atlantis** (www.csiro.au/science/ps3i4.html) - A free whole-ecosystem model intended for use in management strategy evaluation. It incorporates sub-models for the marine environment (physical and biological components), industry (including pollution, climate change, and fishing fleet dynamics), and management actions (including gear restrictions, days at sea, quotas, spatial and temporal zoning, discard restrictions, size limits, and bycatch mitigation). Calibration and use of Atlantis can be time- and data-intensive, and it is generally not suitable for data-poor areas.

To learn more about marine ecosystem models and their applicability to EBFM, we suggest "Models for an ecosystem approach to fisheries" published by FAO (www.fao.org/docrep/010/a1149e/a1149e00.htm).

(Sarah Carr is coordinator for the EBM Tools Network. Learn more about EBM tools and the EBM Tools Network at www.ebmtools.org. Sign up for Network updates and contact Sarah atwww.ebmtools.org/contact.html.)