Environmental Approach to Essential Fish Habitat Designation
Executive Summary
Period: 01/12/2005 – 30/11/2006

During December 2005 - November 2006, the EnviEFH Consortium carried out works in all WPs of the Project, organized its overall kick-off meeting and several other working group meetings. An extensive inventory of available environmental and fisheries datasets was performed and acquired data were organized in a commonly georeferenced GIS database (Geographic Information Systems). Specifically, environmental data, including time series of satellite imagery for the whole Mediterranean basin (e.g. sea surface temperature, chlorophyll-a, photosynthetically active radiation, altimetry, salinity and bathymetry) as well as fisheries surveyed data, including data on small pelagic (e.g. sardine, anchovy), large pelagic (e.g. swordfish, small tuna), demersal species (hake, shrimp) and certain egg-feeding parasites (e.g. *Mnemiopsis*) were uniformly processed under GIS.

The oceanographic part of the GIS database was used to derive time series maps of certain oceanic processes that affect species distribution (e.g. mesoscale thermal fronts, marine productivity hotspots, gyres). The biological part of the GIS database was combined with the environmental data and each fishery surveyed point from acoustic, plankton, and trawl surveys was linked to each of the assembled environmental parameters. Joined fisheries-environmental datasets were used to develop GAMs (Generalized Additive Models) in order to extract minimum and maximum environmental ranges that are preferred by the surveyed species. The extracted environmental ranges were applied in satellite images and those areas that included the extracted environmental ranges of all environmental parameters were mapped as EFH (Essential Fish Habitat) maps based on habitat environmental descriptors.

Initial analysis produced interesting results revealing the spatiotemporal distribution of EFH of various species and life stages. Points of interest include the EFH mapping between Western and Eastern Mediterranean for small pelagic species where, although different areas from the oceanographic perspective, EFH environmental descriptors were very similar in both areas. In addition, the EFH mapping of *Mnemiopsis* anchovy egg-feeding parasite for the whole Mediterranean basin was based on surveyed data from the NE Mediterranean but it revealed the main anchovy spawning areas in W. Mediterranean, as well. Finally, verification of GAMs-extracted anchovy habitat environmental descriptors based on NE Mediterranean surveys for 2003-2005 were applied during the 2006 survey and the forecasted EFH map was very similar with the surveyed data, a case that applies to various species groups.

During the second year of the EnviEFH Project, EFH mapping will be finalized using fishermen input and other statistical techniques (e.g. Generalized Additive Mixed Models – GAMMs) while the EnviEFH Consortium will produce a Special Issue on Essential Fish Habitats in the Mediterranean through the international journal of aquatic sciences *Hydrobiologia* (including a publication series of 25-30 contributions).