



## MINUTES

### *of Workshop on application of acoustic surveys in the assessment of pelagic fish stocks*

*25 – 30 June 2012*

Institute of Oceanology – BAS, Varna, Bulgaria

The Workshop on application of acoustic surveys in the assessment of pelagic fish stocks was held at Institute of Oceanology – BAS, Varna during the period 25.06 – 30.06.2012. Training covered 6 full days, including 1-day survey on board of RV “Akademik”.

The workshop was organized under Project “Strengthening the regional capacity to support the sustainable management of the Black Sea Fisheries (SRCSSMBSF)”, funded by Joint Operational Programme “Black Sea 2007-2013”. In the project activities, the training is planned under Group of activities 1: Exchange of good practices in the fields of methods and tools to assess the present state of fish stocks by scientific surveys, holistic models - Activity 3 (1.3.1).

The workshop started on 25 June 2012 and was attended by 15 participants, representing project partners. The workshop was opened by Dr. Marina Panayotova on behalf of IO-BAS and Project Coordinator. She gave the flow to the invited lecturer Dipl.-Biol. Patrick Schneider (AQUASON, Advanced Technology, Research and Consulting in Aquatic Systems, Barcelona, Spain) who gave overview about Workshop Program. The lecturer provided all necessary training materials by USB – sticks to all participants and the Echowiew software was installed on computers of all participants. The participants received also files with materials from organizers.

The training started with lectures following the training program. In the morning session, the following lectures were presented:

- Introduction to fisheries acoustics (1): Underwater sound, Basic acoustics, Acoustics terminology - General concepts.

The afternoon session continued by following two lectures:

- Introduction to fisheries acoustics (2): Echogram interpretation, Echo-counting, Echo-integration, multifrequency acoustics, Target strength.

- Survey design (1): General remarks and introduction, Survey preparations and planning, Geographical area, Time considerations.

Mr. Schneider answered to all questions, raised by the participants during the both sessions.

On 26 June, 2012, the morning session covered the following topics:

- Survey design (2): Design options, Multi-ship surveys, EDSU.
- Data analysis (1): Processing of echograms, Partitioning, Classification, Species composition, Fishing samples.

And the afternoon session, as follows:

- Data analysis (2): From echo-integrals to density estimates, Single and Mixed species.
- Data analysis (3): Abundance estimation, Map creation, Geostatistics.

The third day of the training (27 June 2012) was also dedicated to the theory of fisheries acoustics. The morning and afternoon sessions covered the following aspects:

- Data analysis (4): Precision of abundance estimates, Degree of coverage.
- MEDIAS Protocol (1 and 2).

The participants discussed in details MEDIAS protocol, which is applied in the Mediterranean and Black Sea as standard for acoustic surveys.

On 28 June 2012 was carried out 1-day survey at sea on board of RV “Akademik” for the demonstration of usage of acoustic equipment for stock assessment purposes and collection of acoustic data. Survey started at 7.00 h on board of RV “Akademik”.

In the morning session on board, eng. Veselka Marinova from IO-BAS presented the available hydroacoustic equipment on board of RV “Akademik” and made the required actions for the setting of the scientific equipment and starting of data collection process.

The day continued by presentations from partner’s Institutions, presenting the research activities in their countries concerning fish stock assessments by application of hydroacoustic method. Presentation session was chaired by Dr. Marina Panayotova (IO-BAS).

First presentation was made by Konstantin Mikhailov (IFR, Bulgaria) under the title “Hydroacoustic surveys in Bulgaria during the period 1984-1990”. IO-BAS activities were demonstrated by Dr. Marina Panayotova by presentation, named “Acoustic surveys in Bulgarian Black Sea area”. The Ukrainian experience in the field was showed by Dr. Olexandr Chashchin by presentation “The YugNIRO hydroacoustic surveys in the Black Sea”. Dr. Orhan Ak presented “Assessment of Black Sea anchovy using Acoustic method and establishing of monitoring model for national fisheries data collection program”.

All trainees participated actively in the discussions concerning past and recent studies in the Black Sea, using acoustic method for stock assessment purposes. The survey finished at 21.30 h.

Last two days of the training (29 and 30 June 2012) were dedicated to Echoview software. On 29 June 2012, Mr. Schneider presented general overview for the application of Echoview software and the exercises started, covering following topics:

- Processing of survey data with Echoview (1): View and inspect data.
- Processing of survey data with Echoview (2): Calibration.
- Processing of survey data with Echoview (3): Scrutinization

During the last day of the training (30 June 2012), the exercises continued with:

- Processing of survey data with Echoview (4): Analysis.
- Processing of survey data with Echoview (5): Multiple frequency data.
- Processing of survey data with Echoview (6): Export and further calculations.
- Processing of survey data with Echoview (7): Advanced visualization
- Processing of survey data with Echoview (8): Templates and live viewing

At the end of the day, the workshop was closed by Dr. Marina Panayotova and Mr. Schneider.

/M.Panayotova, IO-BAS/