Intercalibration of Hydroacoustic Method for WFD Fish Monitoring

HYDROFISH

An international workshop dedicated to intercalibration of hydroacoustic methods
UMR CARRTEL - Thonon-les –Bains, 4 – 5 June 2014

Intercalibration of different hydroacoustic systems with respect to assessment of fish populations in deep lakes and reservoirs: towards a method for fish population monitoring within the WFD.

In recent few decades, hydroacoustics has become a valuable non-destructive method for assessment and monitoring of fish populations in lakes and reservoirs. Nowadays sonar systems are being easily accessible and the demands on their operating in the field and on the processing of recorded data are not that difficult thanks to recent advances in both hardware and software facilities. With the progress in acoustic equipment and processing tools the use of hydroacoustics for fish assessment and monitoring became a common technique among many groups of fish biologist in Europe. To enable comparison of results obtained by hydroacoustic surveys from different European lakes and reservoirs, the need for intercalibration study has emerged. Such intercalibration is necessary to standardize procedures of fish population monitoring within the Water Framework Directive (WFD). The Comité Européen de Normalisation (CEN) has developed a standard to sample fish in lakes and reservoirs ("Water Quality – Guidance on the estimation of fish abundance with mobile hydroacoustic methods"). The workshop is focused on intercalibration data processing from five different European countries (Hateley et al., 2013). Six different sonar systems of three manufacturers were used to simultaneously survey two parts of a deep lake and operated by their owners using their own procedures. Results have been analyzed to express metrics, such as acoustic biomass and fish abundance, in accordance with the WFD requirement. The influence of different post-processing software packages, different acoustic acquisition parameters such as sound frequency and pulse length, and processing parameters such as tracking criteria, thresholds, etc. have been studied. Also the effects of different operators, weather conditions and ways of statistical analysis have been tested.

The aim of the workshop is to present the results evaluating the precision and repeatability of hydroacoustic fish surveys in deep lake performed by different sonar systems. Recommendations on the use of this method to estimate fish abundance with mobile hydroacoustic methods will be produced and then published in peer-review journal.

HATELEY J., CLABBURN P., DRASTIKC V., GODLEWSKA M., GUILLARD J., KUBECKA J., MORRISSEY E., THACKERAY S.J., WINFIELDG I.J., 2013 Standardisation of hydroacoustic techniques for fish in freshwaters. In: Papadakis J.S. & Bjørnø L. (eds.) Proceedings1st Underwater AcousticsConference and Exhibition Inst. of Applied and Computational Mathematics, 1595-1600.

***Steering Committee**:*
Dr Vladislav Draštík (Biology Centre of ASČR Institute of Hydrobiology - Czech Republic).
Dr Jean Guillard (UMR CARRTEL -France) (jean.guillard@thonon.inra.fr)
Dr Małgorzata Godlewska (Inland Fisheries Institute – Poland).
***And the Participants of the inter-calibration**: P. Clabburn, J. Hateley, J. Kubecka, E. Morrissey E., I.J. Winfield*
***External Expert**: Dr. Helge Balk (University of Oslo, Dept. of Physics- Norway)*

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Wednesday 04 June 2014

09h:
Coffee

Opening of the meeting

09h 15:
Introduction of UMR CARRTEL (B. Montuelle) (15').

09h40:
The CEN Standard: vote and application - Where we are and what is the future (possible amendments)? (J. Hateley) (10')

10h:
Frequency responses of fish : an overview of the theory (H. Balk) (15')

10h30:
Coffee Break

11h:
Examples of in situ frequency comparisons: 70-120-200 kHz (M. Godlewska – J. Guillard) (15')

11h 30
First report and first conclusions from the inter-calibration exercise (I. Winfield) (15')

12 h
Lunch

13h30
Operator effect: based on data revisited by V. Drastik (and 3 different operators) (V. Drastik) (15')

14h00
Description of the inter-calibration data set and analysis procedures (V. Drastik)
The presentation will be organized by topic and after each topic a room of discussion will be open.

List of the parameters:

- *Frequency;*
- *Methods:*
  - *trace counting,*
  - *sv/ts approach,*
  - *SED or tracks;*
- *Beam angle effect (70 kHz);*
- *SED criteria;*
- *TS analysis;*
- *Day – Night;*
- *Basins;*
- *Weather;*
- *Repeated surveys.*

All the analysis done will be shown

16h00
Coffee Break

16h30
Continue: Description of the inter-calibration data set and analysis procedures (V. Drastik)

18 h:
Welcome reception

19h30
Dinner at restaurant

Thursday 05 June 2014

09h:
Main results of the data analysis : what we have learned from this data set and what we want to show. Brainstorming about the publication (V. Drastik)

The discussion will be open to the all the participants. The goal is to select the main results and to build the framework of a paper on the intercaliobration survey.

10h30
Coffee break

11h:
Continue- > Main results of the data analysis : what we have learned from this data set and what we want to show. Brainstorming about the publication (V. Drastik)

12h30
Lunch

14h
Future inter-calibrations - **Conclusion of the meeting**

17h
Closing of the meeting