Report on the international workshop on the use of acoustic data from fishing vessels

Schiphol airport, Exchange avenue

Friday 12 June 2015

Introduction

The use of acoustic information from commercial vessels for research purposes has been discussed frequently, but in the EU progress has been limited so far. With the EFF funded research project PelAcoustics, IMARES and PFA have initiated first steps in collecting and analyzing acoustic information from commercial vessels. Globally, there are many more initiatives in using vessel acoustics (e.g. New Zealand, Australia, Canada, Peru).

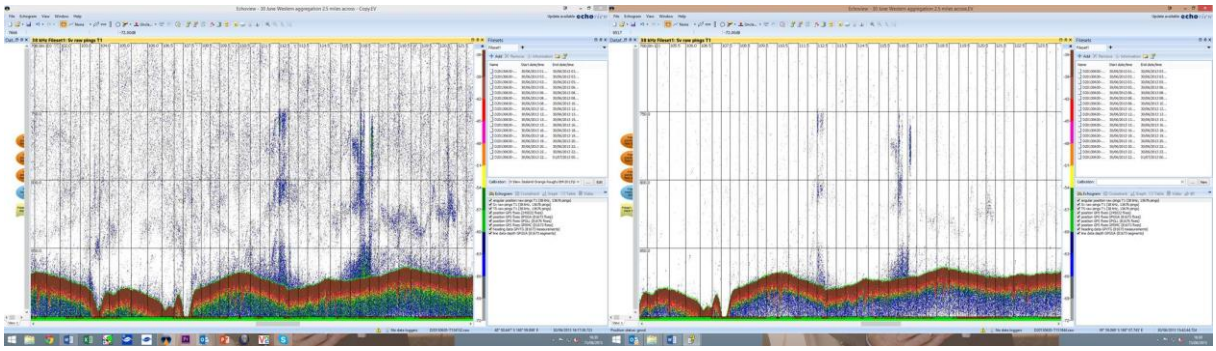
The international workshop on the use of acoustic data from fishing vessels, was organized under the auspices of the Northern Pelagic Working Group (NPWG), and brought together the global expertise on the application of vessel acoustics for research. The overarching ambition was to improve the collection, analysis and application of industry acoustic data for improved understanding of stocks and ecosystems in the EU and other areas that we are fishing in.

Participants

The list of participants is shown as an annex to the report. We were fortunate to the have the participations of many active skippers in the pelagic fishery and many scientists working on acoustics in different parts of the world.

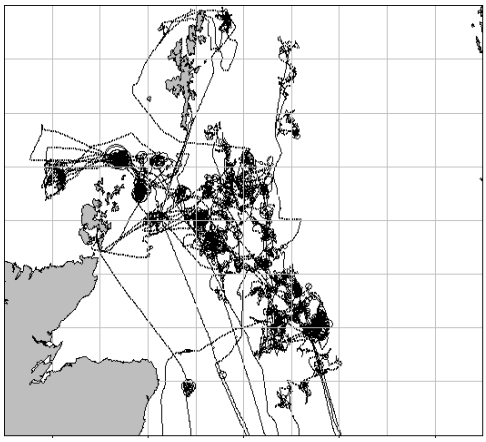
Presentations

Graham Patchell (Resource manager, Sealord, New Zealand) presented via Webex and explained the approach for their fisheries where they are collecting acoustic data during dedicated surveys and during transits to fishing grounds. Graham stressed the need for calibrating the echosounders, both for science and for the fishery, because with a calibrated echosounder “you see more fish” (see example below).



Left: calibrated echosounder (effect of the transducer sensitivity decrease taken into account). Right uncalibrated echosounder sees less fish.

Gary Melvin (DFO, Canada) explained the Canadian experience with the involvement of fishing vessels in the 4WX herring management, already since the early 2000s. This has clearly demonstrated that commercial fishing vessels can be used for scientific data collection. So far, the focus has been on stock assessment data. There are many opportunities for future cooperation and collaboration between the private and public sectors, especially in the ecosystem context (.e.g distribution and abundance of organisms in the water column, behavioural studies, sea bed mapping and classification, habitat utilization, ecosystem Production of fish and plankton, predator prey interactions like bluefin tuna and herring, etc.



Sascha Fässler (IMARES, Netherlands) discussed the approach and results of the Dutch PelAcoustics project, working with the PFA vessels. Guided calibration of echosounders is one of the elements of the project that has had mixed success so far. But according to one of the skippers this should not be a major problem in the future. In terms of analysis Sascha showed some of the current results and also highlighted the potential for combined scientific acoustic surveys with fishing industry data and for fishing vessel data with inbuild 'mini-surveys'. In the discussion, Francois Gerlotto mentioned that it would be interesting to make use of the typical 'predator' behaviour of fishing vessels (compare to 'Levy flight' theory) instead of treating it as a nuisance parameter: "there are no predators that operate standardized transects when searching. There must be information in that".

Thomas Brunel (IMARES, Netherlands) presented a simulation model to assess the capability of fishing vessel data to track the abundance of aggregating species. He demonstrated that the methodology could work fine for less aggregated species like herring and horse mackerel where substantial searching time is involved. For highly aggregated species like blue whiting it would still be a challenge to prevent bias due to overrepresentation.

Sven Gastauer (Curtin University, Australia) took us to the world of a relatively small demersal fishery in the Northwest of Australia where he works with fishers to improve their understanding of the available resources, in an area where scientific surveys are very

difficult or even impossible. Calibration of the echosounders was successful and acoustic data of good quality has been collected. Target strength measurements were successfully done with the aid of a commercial vesse. l

Francois Gerlotto (IREA/SNP, Peru) gave us a very informative overview of the acoustic data collection by the Peru fishing fleets. He showed us some of the struggles in getting the data from commercial vessels accepted in SPRFMO (for Jack mackerel) but also how the fishing companies have embraced the acoustic information which they analyse for their own purposes (better fishing). Several workshops have been held already to analyse the acoustic information collectively. The future is to use fishing vessels more and more as monitors of the oceans. Especially in areas where traditional scientific surveys are no longer feasible, such as in the South Pacific, that is just too large to carry out regular surveys. Fisheries organizations of Peru, Ecuador and Chili have initiated a programme to make sure that all data collected by fishing vessels could be used to the scientific fishery research and to assess impacts of climate change in oceans. All other fisheries are invited to join the initiative.

Conclusions

Many different topics were discussed during the workshop, all showcasing the great potential of using industry data for different purposes but especially in those areas where standard scientific surveys are weak or simply not feasible. A number of strong conclusions can be drawn from the workshop as follows:

1. The acoustic data from fishing vessels could broadly be used for two different purposes: quantitative data directed at stock estimation and stock assessment, and qualitative data on overall trends and distributions within marine ecosystems. The overall driver could be to collect data where traditional research activities cannot reach (e.g. remote areas, rough weather, many vessels at the same time).
2. Regular calibration of acoustic echosounders is a key requirement for the potential uptake of commercial acoustics for stock assessment purposes. Calibration would need to be done at least once a year with additional quick-checks to see if the instruments are working as expected.
   While the task of calibrating echosounders may seem daunting to the industry, one of the skippers who has been doing this for some year said: “you don’t have to be einstein to calibrate an echosounder”. We need investing in improving the capacity to carry out calibrations of echosounders in the industry but dedicated training and learning from best practices. The calibration workshop in Peru (8-11 september) will be a useful stepping stone in this development.
3. In the short term, we should investigate the potential contribution of the fishing industry to regular surveys (e.g. blue whiting) or in areas where acoustic surveys are lacking (e.g. horse mackerel). This could be carried out in the same way as the joint efforts on the mackerel egg survey where the industry is looking to put in ship time for survey purposes. Close coordination with ICES survey working groups will be required.

4. The initiative by the ICES Working Group on Fisheries Acoustics Science and Technology (WGFAST) to set up a dedicated subgroup on fishing vessel acoustics should be fully utilized to develop and agree protocols on the use of vessel acoustics for research. This group could map out the conditions for the uptake of vessel acoustics for research and make sure that data collected according to the protocols are appropriate and robust.
5. Acoustics data capture from calibrated fishing vessels can already already start today, if sufficient protocols are in place for recording and storing the information by the fishing companies. This can even start in the absence of a specific analytical approach or programme, because at least the data will be available for future analysis and a time-series can be derived from the data collected. Big data techniques are rapidly developing. This could provide wonderful opportunities of handling the big amounts of data that could be generated by the industry.
6. It is important to develop close and trusting relationships between industry and science. Together, we can improve the understanding of marine ecosystems and knowledge base for marine management. Developing a joint acoustic programme for the EU pelagic industry together with science is a feasible and rewarding step to take at this moment in time (maybe through H2020 or EMFF?).

We would like to thank all presenters for sharing their insights in the use of vessel acoustics for research and all participants for their active contributions to the workshop. We look forward to taking this issue (quickly) forward in the EU context.

Martin Pastoors (on behalf of NPWG)

16/6/2017

Participants

Name	Country	Sector	Company	Role	Present
Sven Gastauer	AUS	research	Curtin University	PhD	yes
Gary Melvin	CAN	research	DFO	scientist	yes
Claus R. Sparrevohn	DK	industrie	DPPO	scientist	yes
Fridi Magnusen	DK	industrie	DPPO Asbjørn HG265	skipper	yes
Ole Nattestad	DK	industrie	DPPO Ruth HG 264	skipper	yes
Ciaran Kelly	IE	research	MI	scientist	yes
Francois Gerlotto	FR	research	IREA	scientist	yes
Verena Ohms	NL	AC	PELAC	exec. Secretary	yes
Johan Muller	NL	Industrie	CV	fleet-manager	yes
Sjaak van der Plas	NL	industrie	CV SCH81	skipper	yes
Machiel Buis	NL	industrie	CV H171	officer	yes
Eric Roeleveld	NL	industrie	JZ	fleet-manager	yes
Huig van der Plas	NL	industrie	JZ	skipper	yes
Martin Pastoors	NL	industrie	PFA	scientist	yes
Arie Guijt	NL	industrie	PP ROS171	skipper	yes
Rob Banning	NL	industrie	PP	fleet-manager	yes
Bert Plug	NL	industrie	WZ SCH6	skipper	yes
Patrick Raats	NL	industrie	WZ SCH302	skipper	yes
Rob Pronk	NL	industrie	WZ	fleet-manager	yes
Reinier Hille Ris Lambers	NL	NGO	WWF	policy officer	yes
Ben Scoulding	NL	research	IMARES	scientist	yes
Bram Couperus	NL	research	IMARES	scientist	yes
Sascha Fassler	NL	research	IMARES	scientist	yes
Thomas Brunel	NL	research	IMARES	scientist	yes
Alex Wiseman	UK	industrie	SPFA	vessel owner	yes
Gerard van Balsfoort	NL	industrie	PFA	fisheries rep.	video
Graham Patchell	NZ	industrie	Sealord	fleet-manager	video
Sean O'Donoghue	IE	industrie	KFO	fisheries rep.	video
Ian Gatt	UK	industrie	SPFA	fisheries rep.	video