CAPOD Funding Report

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<table>
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<tr>
<th>Event /Course Title</th>
<th>ICES Broadband acoustics training course</th>
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<td>Date of event</td>
<td>December 8-13 2016</td>
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1. Brief description of Event (50-100 words): A training course, delivered at sea on the Norwegian Research Vessel G.O. Sars by internationally-recognised experts and industry, on the theory and practice of broadband acoustics for fisheries and ecosystem studies. It involved taught classroom sessions, and also gave practical hands-on experience of broadband echosounder installation, calibration, operation and data analysis.

2. What were the benefits of attending and what did you gain from the experience in terms of transferable skills and knowledge. Recent advances in electronics hardware and computing power have enabled scientific echosounding to progress from single-frequency observations (which enable either abundance or size of targets to be determined) to broadband (which enable both abundance and size/species composition to be determined). I had previously won a NERC grant (c. £250k) to buy a broadband echosounder system (the first in the UK), but it was delivered in beta format. This course was the first globally to provide training on configuration, data collection and analysis. My participation in this course has served to keep my group at the fore internationally of this developing field. I will use the knowledge I gained to train PhD students and postdocs in my group, and collaborators throughout the UK (e.g. at British Antarctic Survey and Aberdeen University).

3. What actions will you be taking as a result of attending or by making new networking contacts. I will use the new skills that this course has given me for a) analysis of data my group is presently collecting in the Southern Ocean, and b) for collection of new data planned for funded work in the Indian Ocean and on international collaborations to be pursued during my study leave in 2018. Furthermore, I will re-engage as a UK delegate to the ICES Fisheries Acoustics Science and Technology (FAST) Working Group, which meets annually, in order to keep fully abreast of, and contribute to, ongoing developments in broadband science.

4. Can you share any additional resources produced in connection with the event (e.g. feedback from participants, training resources, website links, and additional materials. All of the teaching materials are available to me (and hence to my research group) via a dedicated training web site. In addition, I have cultivated links with academic/industry experts who will provide ongoing assistance, and have developed my network of international collaborators.

5. Tips/experience learned from the event I was able, in close to real time, to pass experience I obtained on this course to a postdoc/PhD student at sea in the Southern Ocean operating my group’s broadband system. This without doubt has contributed to the ongoing success of their operations at sea. For example, we were able to explore noise spectra and design FM transmit pulses, and apply match-filtering, to greatly increase signal-to-noise ratios in our data and hence increase the range (depth) of observation we could achieve. This will contribute hugely to our studies of acoustic Deep Scattering Layers.
6. Any additional comments or information regarding the event The course was exceptionally well run. It delivered everything I expected and more. The fact that it was run at sea, with 20+ international practitioners, meant that it was like a conference at sea. We were ‘captive’ for a week, and used that time to explore numerous collaboration opportunities.