

## **Physics to fish in shelf seas: The science behind an ecosystem based approach to management of marine bioresources.**

Low Wood Hotel, Windermere; 20-21 January 2009.

### **Organisers**

Jonathan Sharples (Proudman Oceanographic Laboratory)  
Mark Inall (Scottish Association for Marine Science)  
Beth Scott (University of Aberdeen).

### **Summary**

The focus of the meeting was on making the links between fundamental physical processes in shelf seas and the distribution of important fisheries. This followed a large, interdisciplinary cruise aboard RRS *James Cook* in July 2008 funded through Oceans2025 and including work associated with a NERC/Defra Sustainable Marine Bioresources (SMB) Initiative project led by the University of Aberdeen. The workshop included many of the cruise participants, Cefas, the JNCC, fisheries observers, the Irish Marine Institute, other project leaders within the SMB initiative, and had input from the Cornish Fish Producers Organisation. An international perspective was provided by Dr. Charles Hannah (Bedford Institute of Oceanography, Halifax, Canada).

The rationale behind the workshop was that we are now recognising clear links between physical processes in shelf seas, the patchiness in marine biodiversity, and the support of important commercial fisheries. The research cruise aboard RRS *James Cook* focused on a bank in the Celtic Sea (Jones Bank, approximately 100 km west of the Isles of Scilly). Earlier work had shown the bank to be a site a particularly vigorous mixing across the thermocline, with an apparent local response in the primary production. Anecdotal observations of high fishing pressure led to an analysis of Vessel Management System (VMS) fishing vessel position information, showing the bank to be a key targeted site for fishing within the Celtic Sea. The workshop aimed to generate discussion on how top predator foraging (i.e. fishing vessels, seabirds, marine mammals) is driven by physical processes (e.g. as a progressive response from the physics through primary and secondary production, or as a direct response with physical processes aiding prey capture).

Presentations were made on several aspects of the work carried out on the cruise, and on other related SMB projects (see agenda below). Important discussion took place on several key topics:

- Contrasting fish populations between a bank and away from a bank.
- A shelf sea bank as a site of enhanced benthic biology.
- Coastal fronts as sites (often ephemeral) targeted by top predators (basking sharks, seabirds).
- Complexity as a framework for understanding and modelling marine ecosystems.
- General Additive Modelling as an approach to understanding processes impacting marine ecosystems.
- Physical processes triggered by seabed topographic features, and approaches to modelling them.
- Tactics used by fishing skippers in deciding where to fish.
- How to achieve and maintain mutually useful links between the scientists and the fishing industry.
- Joint UK-Irish research possibilities within the Celtic Sea and west/southwest approaches to the UK and Ireland.

Additional information on the meeting is available from Jonathan Sharples [js1@pol.ac.uk](mailto:js1@pol.ac.uk).

## Meeting Agenda

### Tuesday 20 January

- 0900 Welcome and background to the workshop (Jonathan Sharples).
- 0915 Introduction to Oceans2025 and CMARHAB on cruise JC025 (Jonathan Sharples).
- 0930 The Fish (Claire Embling, Inigo Martinez).
- 1000 Seabirds and marine mammals (Andy Webb and Clare Embling).
- 1030 *Break*
- 1100 Water column biochemistry (Linda Gilpin).
- 1130 The sediment biochemistry and fauna (Morten Larsen, Nicholas Owen).
- 1200 Physics – mixing, dispersion, and transports (Matthew Palmer, Mark Inall).
- 1230 Discussion
- 1300 *Lunch*
- 1400 CPR data in the Celtic Sea (David Johns).
- 1420 Primary Production in the North Sea Thermocline (Keith Weston).
- 1440 An INEXFISH approach to incorporating extrinsic drivers into fisheries management (Catherine Scott).
- 1500 *Break*
- 1530 SeaWatch – seabirds, sharks, and coastal fronts. (Russell Wynn).
- 1550 Coupling at the Rockall and Porcupine Banks, evidence and limits of evidence. (Mark Johnson).
- 1610 Discussion.

### Wednesday 21 January

- 0830 JC025 cruise meeting (discussion on publication strategies).
- 0915 Introduction to the day.
- 0930 Modelling Physical Biological Interactions: A personal perspective. (Charles Hannah).
- 1030 *Break*
- 1100 Discussion
- 1300 *Lunch and workshop ends.*

## Meeting Participants

Name	Affiliation
Jonathan Sharples	POL
Matthew Palmer	POL
Clare Davis	Univ. Liverpool
Nicholas Owen	Trinity College Dublin
Beth Scott	Univ. Aberdeen
Clare Embling	Univ. Aberdeen
Andy Webb	JNCC
Inigo Martinez	FRS
Dave Reid	Irish Marine Institute, Galway
Jim Ellis	Cefas
Jim Roberts	MRAG fisheries observer.
Mark Inall	SAMS
Vladimir Ivanov	SAMS
Angela Hatton	SAMS
Romain Pete	Montp. Univ., France
Linda Gilpin	Napier Univ.
Morten Larsen	SAMS
Claire Neil	Strathclyde Univ.
Charles Hannah	BIO, Canada
Keith Weston	Univ. East Anglia
Catherine Scott	Univ. Liverpool
Russell Wynn	NOCS
Alice Jones	NOCS
David Johns	SAHFOS
Mark Johnson	NUI Galway