

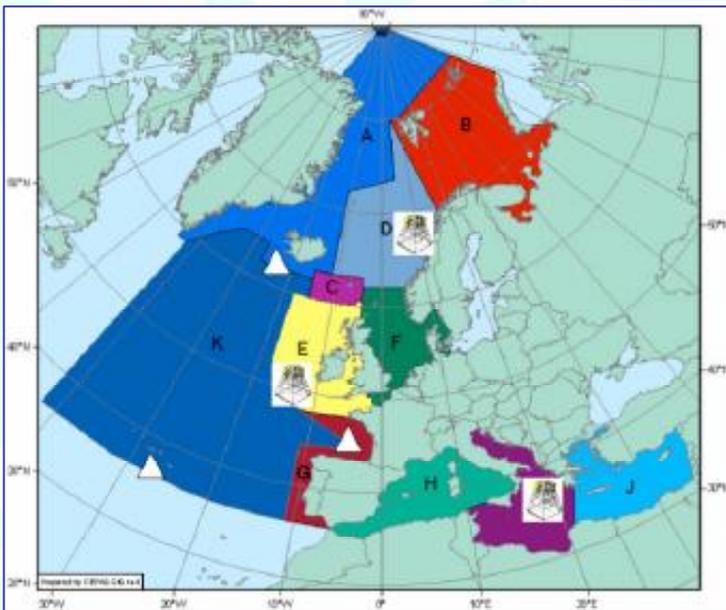
CoralFISH

*Ecosystem based management of corals, fish and fisheries
in the deep waters of Europe and beyond*

Welcome to the CoralFISH newsletter

Issue 1: September 2009

This is the first issue of our biannual newsletter intended to inform interested parties of the progress of the project in addressing some of the key policy issues related to the sustainable exploitation of deep-sea resources.



CoralFISH will examine the relationship between cold water corals, fish and fisheries in 6 European biogeographical regions. Benthic landers will be used at 3 sites.

CoralFISH is a unique collaboration between marine scientists, fisheries biologists and fishermen from ten countries. It represents an important first step towards improving the science base for the implementation of an ecosystem approach to fisheries management in the deep-sea.

CoralFISH began in June last year with a well attended and productive kick-off meeting held in Galway. Much of the meeting was devoted to planning actions for the coming year, particularly, the development of common habitat mapping and fisheries survey approaches for application in each of the six study areas. Our first major field season took place during this summer with research cruises taking place in all the principal CoralFISH study areas. Some of the highlights are described in the subsequent articles.

Fisheries management, and in particular, deep-sea fisheries management is very topical at the moment. In 2006, the UN General Assembly Resolution (61/105) called upon fisheries management organisations

worldwide to: i) assess the impact of bottom fishing on vulnerable marine ecosystems, ii) identify/map vulnerable ecosystems through improved scientific research/data collection, and iii) close such areas to bottom fishing unless conservation and management measures were established to prevent their degradation. This autumn, an important review of the progress made by States towards full implementation of the resolution will take place at the United Nations in New York. Even after three years, there is considerable uncertainty as to how the regulation should be applied - see for example the article below on problems with the 'move on' rule.

The Common Fisheries Policy is also under review. The clear failure of the policy to halt the decline in many fish stocks has led to a call for a radical shift in thinking and the placing of environmental sustainability at the centre of all new policy. Determining the contribution coral

habitats make to the overall environmental carrying capacity of a given area for deep-sea fish species will be an important outcome of the CoralFISH project.

Links with other European projects supporting the sustainable management of deep-sea resources such as HERMIONE (www.eu-hermione.net) and Deepfishman (www.ifremer.fr/deepfishman/) have been made. HERMIONE and CoralFISH recently held a joint meeting with DG Mare (Directorate-General for Maritime Affairs and Fisheries) to brief European Commission officials on new research relevant to the discussions surrounding the UNGA 61/105 review.

We welcome any feedback to any of the opinions or articles contained in this newsletter. We would also be happy to receive short articles for inclusion in our next newsletter on policy related matters relating to sustainable development in the deep-sea. Email: sadhbh.baxter@nuigalway.ie

May I take this opportunity to wish all CoralFISH participants, our sister projects and indeed all those working to improve management of deep-sea resources and biodiversity, every success over the coming important months.

Anthony Grehan
CoralFISH Co-ordinator
www.eu-fp7-coralfish.net

Inside this issue:

<i>CoralFISH: aims, methods and management</i>	2
<i>Policy matters</i>	3
<i>News from the cruises</i>	4
<i>Deepfishman</i>	6
<i>Outreach news</i>	7

CoralFISH: aims, methods and management

CoralFISH aims to support the implementation of an ecosystem-based management approach in the deep-sea by studying the interaction between cold-water coral habitat, fish and fisheries.

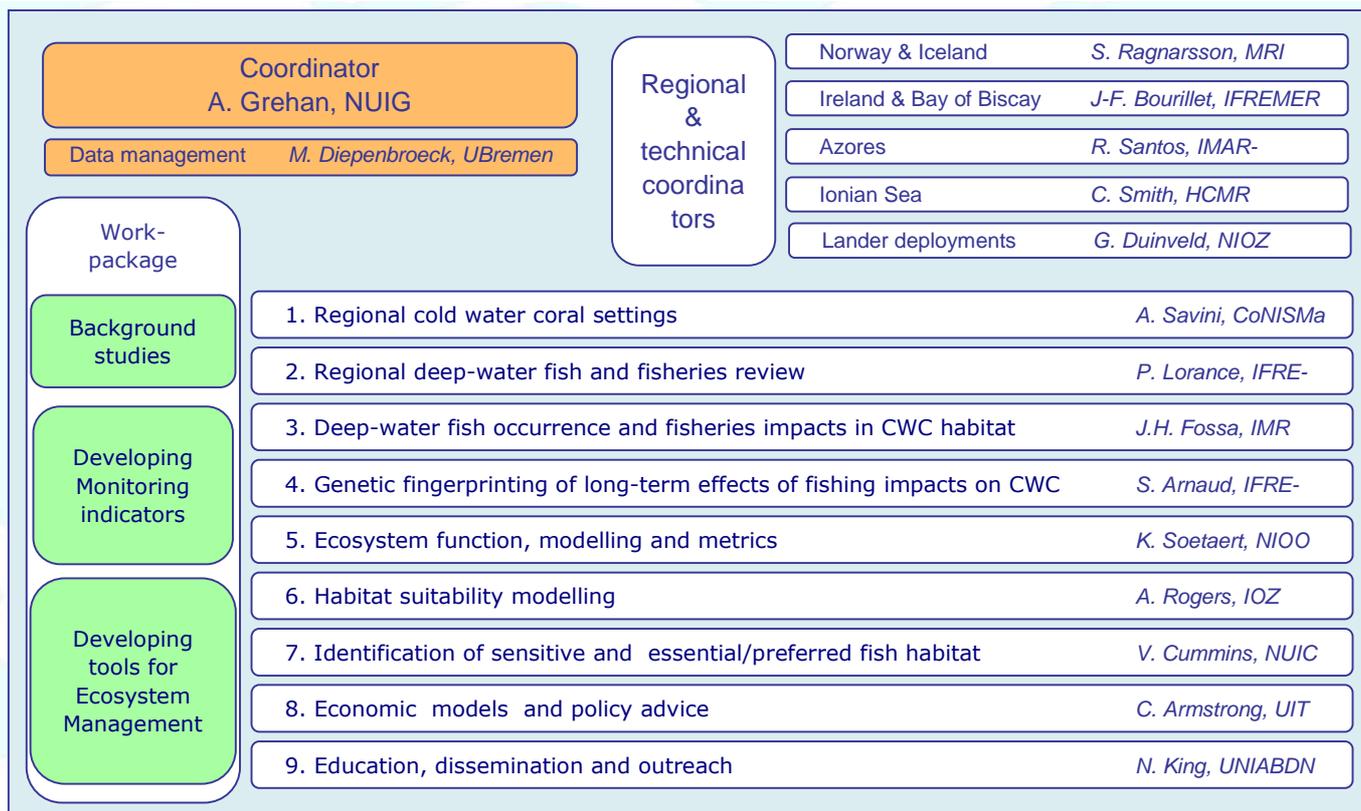
CoralFISH will:

- i) develop essential methodologies and indicators for baseline and subsequent monitoring of closed areas;
- ii) integrate fish into coral ecosystem models to better understand coral fish-carrying capacity;
- iii) evaluate the distribution of deepwater bottom fishing effort to identify areas of potential interaction and impact upon coral habitat;
- iv) use genetic fingerprinting to assess the potential

erosion of genetic fitness of corals due to long-term exposure to fishing impacts;

- v) construct bio-economic models to assess management effects on corals and fisheries to provide policy options; and
- vi) produce habitat suitability maps both regionally and in the High Seas to identify areas likely to contain vulnerable habitat to address the issues raised by the UNGA resolution.

The project is managed by an experienced steering committee (below) which meets regularly to review progress and set goals



(Left) Members of the CoralFISH consortium during the first meeting held in the National University of Ireland, Galway, in June 2008



(Right) Some of the CoralFISH consortium members found time to meet for informal project discussions during the ICES Symposium: *Issues Confronting the Deep Oceans: The Economic, Scientific, and Governance Challenges and Opportunities of Working in the Deep Sea*, held in the Azores, in April 2009 (L-R Ricardo Santos, IMAR-Azores; Anthony Grehan, NUIG; Kirsty Kemp, IOZ; Pascal Lorange, IFREMER; Fernando Tempera, IMAR-Azores)

Problems with the 'Move-On' rule - UNGA 61/105.

The United Nations General Assembly resolution 61/105 calls on States to minimize impacts to vulnerable marine ecosystems (VMEs) in the deep sea. The so called 'move on' rule has been established by Regional Fisheries Management Organisations (RFMO's) in an attempt to minimise encounters during fishing with vulnerable marine ecosystems in areas not previously fished. It is based on the premise that a fishing vessel will move a minimum distance from a location where species indicating the presence of a VME are captured by the gear. RFMOs have set threshold weights or volumes for such cases as well as distances vessels must move upon an encounter. For example, in the NAFO area, if a vessel lands on board over 100 kg of live corals or 1000 kg of sponges, it must move a minimum of 2 nm from the fished area. However, setting of threshold values for coral and sponge by-catch that trigger the move-on rule is not supported by any explicit assumptions of biomass-density relationships for a VME, nor any related assumptions about catch efficiency in fishing gear. This is problematic.

Trawling is not an efficient means of collecting coral or sponge.

Using the threshold values of 100kg of live coral or 1000kg of sponge that requires vessels to move on in the NAFO and NEAFC regions of the North Atlantic as an example, a 10% catch efficiency level for both corals and sponges, would result in 1,000kg of coral and 10,000kg of sponges being impacted. At 1% efficiency, 10,000kg of coral or 100,000kg of sponge would be impacted.

Impact on biodiversity may be high. The 'Move On' threshold in the above example concerns 'live coral'. However, the majority of reef associated species occur in the dead coral framework beneath the living coral veneer. In one of the few studies to examine the relationship between coral biomass and the diversity of associated fauna, Jensen and Frederiksen (1992) used dredges to recover coral blocks from two banks off the Faroe Islands. They counted 4625 individuals

representing 256 species on 25 coral blocks with a total weight of 18.5kg. The impact of removing 10,000kg is self-evident.

'Move-on' is not random. Fishing effort is not evenly distributed. Effectively, most deep sea fishing in the Pacific is confined to the upper reaches and summits of seamounts. Triggering the move on rule as currently implemented does not result in a random move away from the area likely to contain VMEs to an area that does not, but to another area of a seamount likely to contain VMEs. Rather, the accumulative impact of such exploratory fishing when carried out in accordance with the move on rule as promulgated has the potential to be substantial.

Alternatives to the Move On rule include prior environmental impact assessments, a ban on bottom contact fishing, regional assessments (rather than individual environmental impact assessments), and large-scale closed or protected areas as an integral and precautionary component of each regional fishery management strategy for deep sea fisheries.

Auster *et al.* (in press) Definition and Detection of Vulnerable Marine Ecosystems on the High Seas: Problems with the Move-On Rule. *ICES Journal of Marine Science*. For information contact anthony.grehan@nuigalway.ie.

Stakeholders and general public consultation on the reform of the Common Fisheries Policy

The European Commission has launched a wide-ranging debate on the way that EU fisheries are managed. The aim is to gather views from all those with an interest in the future of Europe's fisheries: fishermen, fish processors, retailers, environmentalists, consumers, taxpayers - in fact, every EU

citizen, on their visions for the future of Europe's fisheries and their ideas on how those visions can become reality. The mosaic of views that will be collected will pave the way for a substantial overhaul of the way that EU fisheries are managed. Received contributions will be published on the Internet. The closing date for submissions is the 31st of December, 2009. Further information is available from: ec.europa.eu/fisheries/reform/consultation/index_en.htm.

ICES Symposium. Issues Confronting the Deep Oceans: The Economic, Scientific, and Governance Challenges and Opportunities of Working in the Deep Sea

With support and encouragement from the International Council for the Exploration of the Sea (ICES), Governo dos Acores, Centro do IMAR da Universidade dos Acores, Departamento de oceanografia e Pescas Universidade dos Acores, the U.S. National Oceanic and Atmospheric Administration (NOAA) and CoralFISH, 170 marine scientists, engineers, attorneys, resource managers, and students from 26 countries gathered in Horta, Faial Island, Azores, Portugal from 27-30 April 2009. The international symposium brought together various sectors of the deep sea (e.g., fisheries, energy exploration and development, mining, biotechnology, ocean exploration, engineering, law, marine science), to discuss current and future needs of working and undertaking scientific investigations in the deep sea and learn of recent deep-sea technological advancements, projects, and scientific findings. The deep sea is usually defined as starting at the end of the continental shelf at a depth of 200m.

With the desire to find and develop new resources such as fisheries, oil and gas, mineral deposits, and pharmaceutical compounds, technological advancements have allowed industry and scientific

investigators to move their activities more and more into deeper water. These technological advancements represent opportunities. However, deep-water activities also represent challenges in the form of technological needs at great depths, potential environmental impacts, and governance issues ensuring that these deep-water activities are compatible with regional, national, and international laws and treaties.

Peer reviewed manuscripts from the symposium will be published in the summer of 2010 in the ICES Journal of Marine Science and oral presentations and posters can be seen on the ICES web site (www.ices.dk).

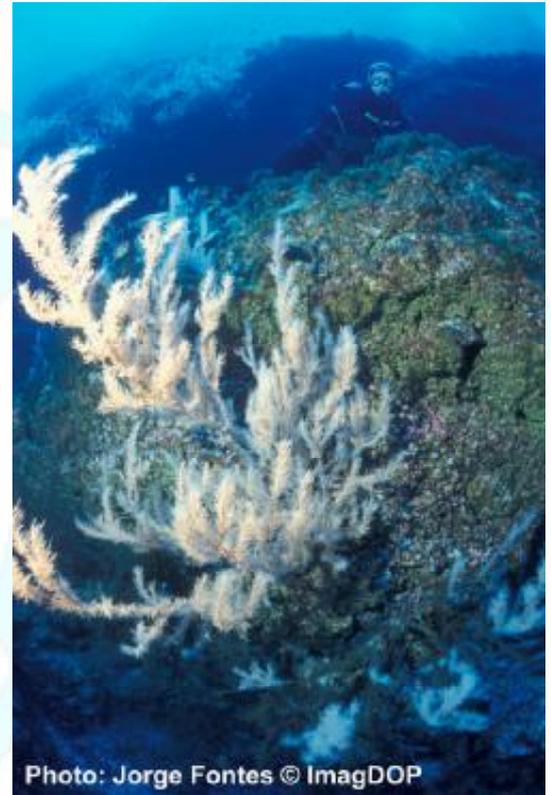
News from the Cruises

Formigas seamount: new hydrarian gardens and species revealed by DOP/UAz

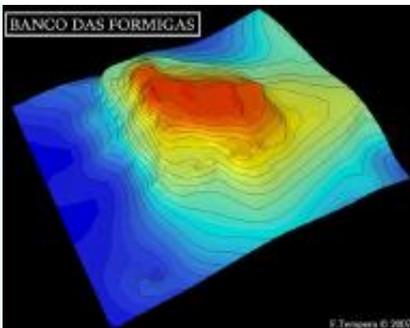
The Department of Oceanography and Fisheries of the University of the Azores (DOP/UAz) used an ROV to identify exuberant hydrarian gardens and encrusting sponge assemblages on the Formigas seamount (below). Formigas is an important seamount located on the eastern part of the Azores archipelago and is designated an SAC, an OSPAR MPA and a Nature Reserve declared under the Azorean network of protected areas. Observations were also made regarding the associated fish fauna, with a new labrid occurrence recorded for the archipelago (*Lapanella fasciata*). This species was recurrently found in close



The DOP/UAz ROV: a SeaBotix LBV300S-6, rated to 300m & equipped with 2 cameras: one colour



Infralittoral *Antipathella wollastoni* (black coral) beds in Formigas Bank (Azores).
Jorge Fontes © ImagDOP



Shaded bathymetric chart of the Formigas seamount, Azores

association with hydrarian fronds that grew to ~80 cm tall. The expedition was the first to intensively exploit the capabilities of the new ROV acquired by DOP/UAz. Surveys were successfully conducted down to 190m to survey the circalittoral assemblages in the region and identify potential coral grounds.

The colourful north Atlantic

A mid-June cruise, funded by CoralFISH and the Marine Research Institute of Iceland (MRI), explored four areas off the coast of SE Iceland: a set of parallel ridges in the Lónsdjúp trough, the shelf slope of the Lónsdjúp trough, the shelf slope in the Papagrunn region, and an area within the Skeiðarárdjúp trough. None of the areas had been positively identified as coral



Tusk (*Brosme brosme*) at sponge grounds in Papagrunn at ~700 m depth. Both tusk and ling (*Molva molva*) were commonly seen at coral and sponge grounds.

Image © .Hafrannsóknastofnunin

grounds prior to the cruise, but fisheries records and multibeam bathymetric maps suggested that they might be worth a visit. Surveys carried out

with an echosounder and cameras mounted on a remotely operated vehicle (ROV) showed there to be extensive coral grounds in the Lónsdjúp trough and slopes, with dense aggregation of corals associated with the ridges at approximately 250m water depth. The deeper (500-700m) Papagrunn region was unexpectedly rich in sponges, but had no corals. Tusk and redfish were the dominant fish species: estimates of their abundances on and off coral grounds will be carried out on a planned long-lining cruise.



Greater Fork-beard (*Phycis blennoides*) and *Pennatula* sp.

Image © .Hafrannsóknastofnunin

News from the Cruises

Sights and sounds in Norwegian waters

The Traena Reef was the target area of two concurrent IMR cruises by RV Håkon Mosby and the long-line fishing vessel MS Øyfisk for 11 days in mid June. Small (100*30*10 m) *Lophelia* reefs are widespread in the Traena deep with about 1500 reefs in the 200 km² proposed coral marine protected area (MPA). The cruises set out to estimate fish abundance and the species composition of fish in blocks with high and low density of small coral reefs and in adjacent control areas without *Lophelia* reefs. The predetermined control blocks turned out to be rich sponge grounds and new control areas were found east of the Traena Deep coral MPA. Acoustic and video surveys identified saithe (*Pollachius virens*), Norway redfish (*Sebastes viviparus*), Norway pout (*Trisopterus esmarkii*), tusk (*Brosme brosme*), blue whiting (*Micromesistius poutassou*) and rabbit fish (*Chimaera monstrosa*). Zooplankton throughout the area was mainly northern krill (*Meganyctiphanes norvegica*). Four trawl tracks, five lines and two ropes were also identified in the 23*2km video transects. The longline catch was dominated by tusk, with almost no by-catch of sponge or coral. An opportunistic acoustic survey on the Røst Reef MPA to estimate fish abundances also attributed the scattering to saithe.



Saithe abundances at the Traena Coral Reef off the coast of Norway using recordings of area backscattering strength (NASC), averaged over 0.5 nautical miles for the regional data and over 0.1 nm for the block data. The allocation of area backscattering strengths to species was made by comparison of the appearance of the echo recordings to trawl catches and video recordings.

Exploring the depths with the R/V Celtic Explorer

In April 2009, scientists and students from NUI Galway and the Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER) sailed out on a three week deep-water research expedition aboard the Irish research vessel *R/V Celtic Explorer* to study cold water coral ecosystems off the Irish and Biscay continental margins. The cruise was one of the first to deploy the new 3000m rated Marine Institute of Ireland's Remotely Operated Vehicle, the "Holland 1". The cruise aimed to collect



An antipatharian coral bush providing fishing vantage points for long limbed squat lobsters. The large red fish (*Hoplostethus atlanticus*) is an orange roughy while the fish eyeballing the camera is a *Neocyttus helgae*. The fish in front of the coral is a *Lepidion equus* while two other small fish are visible close to the base of the boulder supporting the coral.

data on coral distribution and habitat characteristics, including the hydrographic regime of hotspot areas. Additionally, it was hoped to collect some samples of living corals for genetic analysis. The ROV was equipped with a forward looking oblique camera, a vertical camera and a Kongsberg High Definition video camera, which allowed overviews of the corals and some excellent close-ups of the creatures of the deep sea. Six ROV dives were carried out. Those in the previously unexplored deep sea canyons in the Bay of Biscay revealed the presence of coral reefs there, while the two dives on the southern Porcupine Bank revealed the existence of extensive and largely pristine coral reefs on upper slopes and summits of the some 40 mounds making up the Arc Mound Province. NUIG will work with the National Parks & Wildlife Service to have the area proposed for designation as a Special Area of Conservation under the Habitats Directive.



The new Irish ROV 'Holland 1', which was used successfully in a CoralFISH cruise to the Bay of Biscay and the Irish Continental margin.

CoralFISH links EU projects: Deepfishman

CoralFISH has made links with several other EU-FP7-funded projects. Here we give a brief description of one of them – Deepfishman – which kicked-off in May.

This project, led by Ifremer, aims to identify and develop new and more effective assessment methods, reference points, control rules and management strategies for target species in the deepwater fisheries. Long term, it is intended that these monitoring and management strategies will be useful inputs to the Common Fisheries Policy.

Deepfishman Objectives:

Target species in the Deep-water fisheries have posed particular difficulties for management. Their life history characteristics makes them difficult to assess and many of these fisheries are not subject to national jurisdictions. The primary objective of the project is to identify and develop new and more effective assessment methods, reference points, control rules and management strategies to be used in the short term. The second objective is to develop a long-term monitoring and management framework to achieve reliable long-term management requirements. The project outputs will aim to provide robust guidelines for deepwater fisheries management suitable for adoption within the Common Fishery Policy.

The progress towards these objectives will be developed by examining a range of case studies selected to reflect the diverse characteristics of the different types of deep-water fishery found in the NE Atlantic. In addition two case studies outside the NE Atlantic and Mediterranean Sea are included to give a wider perception of the management and monitoring of deep-water fisheries elsewhere in the world. These studies will include an ICPC country: Namibia. Fisheries data (including all bycatch data) from case studies will be used to examine historical catch data for changes in biodiversity and to identify protocols for monitoring biodiversity (of both vertebrates and invertebrates) in the deep-water ecosystem. The socio-economic profile and projected socio-economic impact of the management strategy options will be examined for selected case studies.

The objectives of each case study are:

- To review the historical development of the fisheries and to describe the main characteristics of the fleets currently involved.
- To review the biology, ecological and other information currently available on biological parameters, including data collected on stock assessment surveys.
- To review and collate the fisheries, biological, biodiversity, Vulnerable Marine Ecosystems (VMEs) and socio-economic data, and information currently available for management and monitoring purposes, identifying strengths and weaknesses, and to identify any existing data/information not used or not fully used at present. Collated fisheries data will include all bycatch data, including other commercial and non-commercial fish species, corals, sponges and other benthos, seabirds, marine mammals and turtles.
- To review the known and likely impacts of deep-water fishing on biodiversity and to inventory and collate data on biodiversity and habitats. To identify missing data and knowledge of biodiversity, which would be required to assess biodiversity and the impact of fishing in the Case study area.
- To review the current and historical management and monitoring procedures/methods (including assessments, biological reference points, harvest control rules, measures to protect and conserve biodiversity (e.g. technical measures, Marine Protected Areas)) and status of stocks, and to identify possible improvements in the current management and monitoring framework by making better use of data currently available.

The project is developed by 13 scientific partners: Ifremer (France, coordinator), Cefas (UK), University of Iceland, IMR (Norway), Imperial college of London (UK), NatMIRC (Namibia), Tecnalia-AZTI (Spain), IPIMAR (Portugal), Marine Institute (Ireland), HCMR (Greece), IEO (Spain), MRI (Iceland), University of Portsmouth (UK).

For more information, go to:

<http://www.ifremer.fr/deepfishman/>



The CoralFISH Steering committee at their meeting in Bergen, January 2009.

Standing, L-R: Gianfranco D'Onghia, Pascal Laffargue, Alessandra Savini, Pascal Lorange, Stefán Áki Ragnarsson, Anthony Grehan, Lydia Beuck, Jan Helge Fosså, Chris Smith, Jean-François Bourillet, Gerard Duineveld, Karline Soetaert, Ricardo Santos, Claire Armstrong, Kirtsy Kemp.

Front, L-R: Fernando Tempera, Nicola King, Sophie Arnaud-Haond.

Outreach News & Events

CoralFISH goes racing...

The Volvo Ocean Race stopped over in Galway, on the west coast of Ireland, for two weeks in May-June 2009. CoralFISH was right in the middle of the race village as part of an 'Explorers' tent with the Marine Institute (of Ireland), Galway Atlantaquaria, and the Environmental Change Institute, NUI, Galway. Over 5,000 schoolchildren, and an estimated 3,000 adults visited the tent over the course of the festival. The CoralFISH cruise to the Arc Mound Province on board the R/V *Celtic Explorer* had just finished, so visitors were able to handle samples of coral rubble and deep sea sediments, and view the video highlights from the ROV 'Holland I'.



A young visitor to the 'Explorers' tent at the Volvo Ocean Race Stopover in Galway gets his hands on some coral rubble from the NE Atlantic.

...and back to school

Dr Francesco Mastrototaro from the Dept. of Zoology in Bari (and part of the CoNISMa CoralFISH team) has started a course about the sea in a school in Bari. The course will involve the first classes of secondary school of 1° level (medium school, students of 10-11 years), and the first lesson was on "Cold water corals", with a video presentation related to Santa Maria di Leuca coral bank.

In Galway, NUIG CoralFISH scientists participated in a Summer Science Camp in the 'Uni 4 U' programme run by the Access Office for children from disadvantaged schools. Pupils learned about marine food webs, and created a web for themselves (right).



Prof. Corcelli shows some coral samples to students in a school in



In the News

CoralFISH was highlighted in a EuroNEWS report on the discovery of the new coral reef province off the west coast of Ireland during the Celtic Explorer CoralFISH cruise (see report inside) which was first broadcast on the Irish

CoralFISH website

The intention is to develop the CoralFISH website as a portal. We are conscious that the public, and indeed policymakers, have a great interest in seeing examples of deep-sea biodiversity and habitats, and to that end the CoralFISH website has a dedicated Gallery that includes images and video clips from the latest research cruises. Also of interest is the section on public news items discussing deep-sea issues (*Society-In the news*), and in the same section, we have scientists 'blogging from our cruises.

CoralFISH
Ecosystem based management of corals, fish and fisheries in the deep waters of Europe and beyond

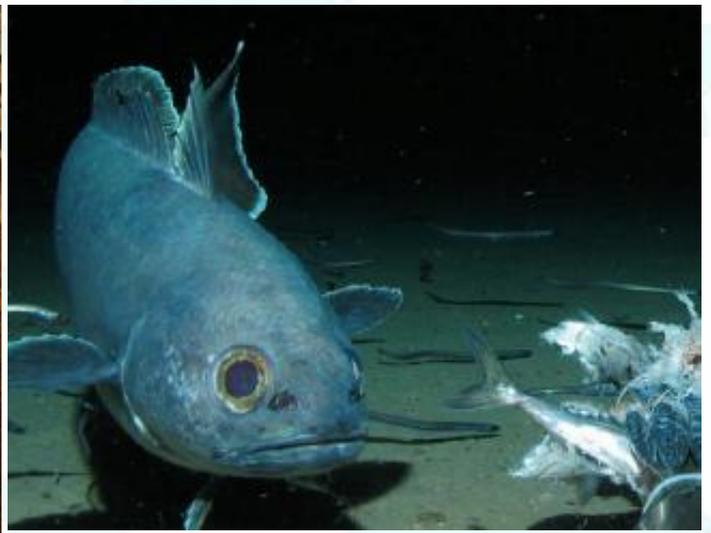
- About CoralFISH
- Consortium
- Science
- Society
- Gallery
- Opportunities
- Partners Only
- Links
- Contact us

CoralFISH Movies
Video footage highlights from some of the cruises carried out by CoralFISH researchers are available to view here.

CoralFISH Images
The following link to images from cruises and research associated with CoralFISH. (Individual galleries open in new page.)

- Iceland, June 2009
- Azores, May 2009

Latest News
A 'Cruise blog' page has been added to the 'Society' tab. Here, scientists can post news from their cruise as they are at sea.
Information regarding the First Scientific Meeting (5th-8th October) is on the [Partners only](#) section.
A [new page](#) has been added with links to CoralFISH-related articles in the mainstream press.
CoralFISH now has [videos](#) available to view.



For more information, contact the
CoralFISH Project Office

c/o Dr Sadhbh Baxter
Earth & Ocean Sciences
NUI Galway, University Road
Galway, Ireland
T: +353 91 495962
F: +353 91 494533
E: sadhbh.baxter@nuigalway.ie

www.eu-fp7-coralfish.net



Clockwise from above: Multispecific coral gardens near the Menez Gwen hydrothermal field (Azores) (SEAHMA project); A large *Brosme brosme* feeding on a smaller fish caught on this reef on the Porcupine Bank. The ROV arm is visible in the bottom right of shot (NUI Galway); Some beautiful sea anemones off the Icelandic coast (Marine Research Institute of Iceland); Common moro (*Mora moro*), with *Synbranchus kaupii* (cut throat eel or kaup's arrowtooth eel), at baited lander, Rockall (OceanLab); The bivalve *Acesta excavate*, in waters off SE Iceland (Marine Research Institute of Iceland)



CoralFISH has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 213144. Articles in this newsletter reflect the views of the authors and the EC is not liable for any use that may be made of the information contained herein.

