CORALFISH 2009 Cruise Report: CF0609

15-25th June 2009

Eastern Ionian, Cephalonia and Zakynthos

Dr. Chris Smith & Shipboard Scientific Crew
Hellenic Centre for Marine Research
Expedition Objectives
The general objective of the expedition was to survey and map and document cold water corals in the Ionian Sea. More specific objectives included:
- To collect multibeam acoustic bathymetry data
- To make high resolution side scan maps for target location
- To document and record cold water corals and their environment using ROV
- To characterise near bottom waters using CTD.
- To take bottom sediment samples for geophysical and biological analysis.

Cruise Participants
For a full list and dates of participation see Table 1.
- HCMR, Institute of Marine Biological Resources: Chief Scientist, scientific staff (fisheries biologists).
- HCMR, Institute of Oceanography: scientific staff (geologists, oceanographers, biologists, technical staff – Deep Tow, CTD and Box Core).
- HCMR, Underwater Activities: technical staff (ROV support and diver).
- University of Bari; fisheries biologist observer from the CoralFish partner with experience on Italian Ionian Sea coral areas

Area of Operations
The area of operations was in the Ionian Sea off the West coast of Greece and included (see Fig 1):
- West coast of Cephalonia,
- West coast of Zakynthos

Principal Equipment Deployed
RV Aegaeo (65 m)
Multibeam: Seabeam 2021 (20 KHz), hull mounted
Deep Tow: Geoacoustics Deep Tow 2000 (Side scan: 114/410 KHz; Sub-bottom: Geochirp II, 1-12 KHz)
CTD: Seabird SBE 25
ROV: DSSI Max Rover, 2000 m rated.
Box Corer: USNEL 0.1 m²

Summary of Scientific Activities
The cruise was split into two parts. The first part of the cruise was dedicated to acoustic data acquisition with multibeam and deep tow (side scan sonar and sub-bottom profiler) over the operational area. The second part of the cruise involved ROV dives to identify and document targets of interest located from the acoustic mapping, and finally limited sediment sampling with box corer.
- Multibeam: Total area coverage was approximately 1650 km². Fig 1 and Table 2 for summary.
- Deep Tow: Total area coverage was approximately 164 km². Fig 1 and Table 2 for summary.
- The Max Rover ROV was involved in 5 dives for a total duration of 918 minutes (15.3 hours). See Table 3 for summary.
- Approximately 40 megafaunal taxa were observed on the dives between 400 and 800 m depth.
- CTD profiles were undertaken at 5 sites across the area for characterisation of near bottom waters and calibration of the multibeam system. See Table 4 for summary.
- Box Cores: 2 cores were taken for seabed characterisation (geochemistry and biology) See Table 5 for summary.
- From the 10 day cruise, approximately 1.5 days were spent in transit, 1 day stopped with bad weather, 0.5 day for the mid-cruise staff changeover and 7 days spent working.

The full activities diary is recorded at the end of this report.

Public Relations Activities
- Video and photographs were taken for later use.
- Before the cruise details were announced with related publications in two Greek newspapers.
Figure 1. CoralFish June 2009 Eastern Ionian Sampling Areas

Ionian Sea Sampling Sites

Eastern Ionian Greek sampling sites

Multibeam Map created during the sampling cruise, with different deep tow areas.
Table 1. CoralFish June 2009 Participants and Dates on Board

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Institution</th>
<th>Position</th>
<th>15-21</th>
<th>21-25</th>
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<tr>
<td>1</td>
<td>Smith, C.</td>
<td>HCMR/IMBR</td>
<td>Chief Scientist</td>
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<td>2</td>
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Table 2. Acoustic Data Collection

<table>
<thead>
<tr>
<th>Date</th>
<th>Gear</th>
<th>Area</th>
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<tbody>
<tr>
<td>16.06.09 day</td>
<td>Multibeam</td>
<td>West of Cephalonia</td>
</tr>
<tr>
<td>16.06.09 night</td>
<td>Multibeam</td>
<td>SW Cephalonia to SW Zakynthos</td>
</tr>
<tr>
<td>17.06.09 day</td>
<td>Multibeam</td>
<td>SW Cephalonia to SW Zakynthos</td>
</tr>
<tr>
<td>17.06.09 night</td>
<td>Deep Tow &amp; Multibeam</td>
<td>Area 1: SW Cephalonia</td>
</tr>
<tr>
<td>18.06.09 day</td>
<td>Deep Tow &amp; Multibeam</td>
<td>Area 1: SW Cephalonia</td>
</tr>
<tr>
<td>18.06.09 night</td>
<td>Deep Tow &amp; Multibeam</td>
<td>Area 4: NW Zakynthos</td>
</tr>
<tr>
<td>19.06.09 day</td>
<td>Deep Tow &amp; Multibeam</td>
<td>Area 4: NW Zakynthos</td>
</tr>
<tr>
<td>19.06.09 afternoon</td>
<td>Multibeam</td>
<td>SW Zakynthos</td>
</tr>
<tr>
<td>19.06.09 night</td>
<td>Deep Tow &amp; Multibeam</td>
<td>Area 5: SW Zakynthos</td>
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<tr>
<td>20.06.09 day</td>
<td>Deep Tow &amp; Multibeam</td>
<td>Area 5: SW Zakynthos</td>
</tr>
<tr>
<td>20.06.09 evening</td>
<td>Multibeam</td>
<td>W Cephalonia</td>
</tr>
<tr>
<td>20.06.09 night</td>
<td>Deep Tow &amp; Multibeam</td>
<td>Area 3: NW Cephalonia</td>
</tr>
<tr>
<td>21.06.09 night</td>
<td>Multibeam</td>
<td>SW Cephalonia Area</td>
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<tr>
<td>23.06.09 night</td>
<td>Multibeam</td>
<td>W Cephalonia Area</td>
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Table 3. ROV: Max Rover Dive Summary

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Site</th>
<th>Position</th>
<th>Depth</th>
<th>Duration</th>
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<tr>
<td>CFROV01</td>
<td>21.06.09</td>
<td>SW Cephalonia</td>
<td>37 56.411 20 15.297</td>
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<td>CFROV02</td>
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<td>SW Cephalonia</td>
<td>37 58.960 20 16.446</td>
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<td>CFROV03</td>
<td>23.06.09</td>
<td>SW Cephalonia</td>
<td>38 04.051 20 16.541</td>
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<td>CFROV04</td>
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<td>38 20.421 20 22.695</td>
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<td>CFROV05</td>
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<td>SW Cephalonia</td>
<td>37 58.955 20 16.364</td>
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<td>Total 918</td>
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Table 4. CTD

<table>
<thead>
<tr>
<th>Sample</th>
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<th>Depth</th>
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<tr>
<td>CTD CF01</td>
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<td>SW Cephalonia</td>
<td>38 00.420 26 10.000</td>
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<td>CTD CF02</td>
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<td>CTD CF03</td>
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<td>NW Zakynthos</td>
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<td>CTD CF04</td>
<td>19.06.09</td>
<td>SW Zakynthos</td>
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<td>CTD CF05</td>
<td>21.06.09</td>
<td>NW Cephalonia</td>
<td>38 27.410 20 26.715</td>
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Table 5. Box Cores

<table>
<thead>
<tr>
<th>Sample</th>
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<th>Depth</th>
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<tr>
<td>BC CF-1</td>
<td>24.06.09</td>
<td>SW Cephalonia</td>
<td>37 58.992 20 16.758</td>
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<td>BC CF-2</td>
<td>24.06.09</td>
<td>SW Cephalonia</td>
<td>37 58.999 20 16.501</td>
<td>600</td>
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</table>
15.06.09 Monday
12:50 Depart Piraeus for Corinthiakos, (weather NW, F2, clear)

On Board:
C. Smith – Chief Scientist, IMBR
G. Roussakis – IO
D. Sakellariou – IO
G. Roussakis – IO
D. Ballas – IO
S. Maroulakis – IO
P. Georgiou – IO
I. Madopoulos – IO
P. Pambides – IO
P. Renieris – IO
T. Fotopoulos – IO

13:00 Scientific meeting on board (cruise aims, work to be undertaken)
15:55 Enter Corinth Canal
16:30 Depart Corinth Canal
23:00 Pass Rio Bridge

16.06.09 Tuesday
Weather NW, F3, clear
05:20 CTD CF01 SW of Cephalonia, 3000 m (multibeam calibration)
06:20 Finish CTD
Setting up multibeam
07:30 Start multibeam SW of Cephalonia, box set running north along W coast of Cephalonia,
working deep parallel lines towards shallow, approx. 200-1000 m, 20 nm long.
10:45 Finish first line, deep.
19:55 Finish first box, last shallow line, heading SE for long box W coast of Zakynthos, shallow line.
23:45 Finish first line W of Zakynthos, return parallel line deeper.

17.06.09 Wednesday
Weather NW, F3, clear
08:15 Finish 3rd Zakynthos line
12:25 Finish 4th Zakynthos Line, up at Cephalonia end, gap filling between 2 boxes SW of Cephalonia.
15:35 Finish multibeam, setting up Deep Tow box SW of Cephalonia
19:20 Setting up deep tow and dropping Tracking arm
20:15 Deploy Deep Tow Area 1, Line 1-2
00:30 Finish Line 1-2

18.06.09 Thursday
Weather NW, F2, clear
Continue deep tow
11:00 Finish Line 7-8
12:00 Start Line 6-5
15:35 Finish Line 6-5 and hauling
16:20 CTD CF02, 1065 m
17:00 Heading SE to Area 4 box (NW Zakynthos)
18:30 CTD CF03, 1300 m.
19:20 Finish CTD 03, heading to NW corner of Area 4. Italian trawler working just out of the box.
23:45 Start Line 11-12

19.06.09 Friday
Weather NW, F2-3, clear
03:34 Finish Line 11-12
06:21 Finish Line 13-14
07:23 Start Line 15-16
09:50 Finish Line 15-16 and hauling.
Area 4 general flat and featureless, small number of trawl marks seen. 2 Italian trawlers towing along the area from daylight. Started at approximately 4 nm off the coast out to 8/9 nm.

10:00 Planning survey Area 5
10:20 Heading SE to Area 5, with some multibeam collection and planning a CTD at SW corner of Area 5, then multibeam to fill in southern end of Area 5.

13:15 CTD CF04, 1262 m, SW Zakynthos.
14:10 Finish CTD 04, Heading E for multibeam extension.
14:20 Multibeam extension lines to SE of Area 5.
15:40 Finish Multibeam, heading for Deep Tow start
18:10 Deploying Deep Tow, Line 1-2
21:50 Start Line 3-4

20.06.09 Saturday
Weather NW, 1-2, clear
01:00 Finish Line 3-4
09:10 Finish Line 7-8
09:10 Start Line 9-10
12:40 Start Line 11-12
15:50 Finish Line 11-12
19:20 Finish Line 13-14, hauling Deep Tow
19:35 Deep Tow on board, heading for NW Cephalonia
21:30 Close to Italian Trawler towing 5.6 nm SSW of Cephalonia

Setting up Grid Lines for Area 3 – steep slopes and cliffs starting to slope less at 500 m.

11:50 Filling shallow multibeam gaps along the W coast of Cephalonia

21.06.09 Sunday
Weather NW, 3-4, clear
12:00 Deploy Deep Tow on Line 1-2
07:25 Finish line 5-6 and hauling clear to carefully put deep tow line on its winch.
08:05 Deep Tow on board
08:20 CTD05, NW Cephalonia
09:15 Finish CTD depart for Kilini around top of Cephalonia into the Ithaki channel.
13:45 Arrive port of Kilini, West Peleponese. Change over of scientific crew (disembark geologists, embark biologists and ROV crew).

<table>
<thead>
<tr>
<th>Disembark</th>
<th>Embark</th>
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<tr>
<td>Georgiou, P. (IO)</td>
<td>Pancucci, A. (IO)</td>
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<td>Madopoulos, P. (IO)</td>
<td>Salomidi, M. (IO)</td>
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<td>Pambides, I. (IO)</td>
<td>Kallergis, M. (HCMR)</td>
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<td>Renieris, P. (IO)</td>
<td>Manousakis, L. (IMBR)</td>
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<td>Katsaros, K. (HCMR)</td>
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<td>Vavilis, P. (HCMR)</td>
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<td>Carlucci, R. (Univ. Bari)</td>
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</table>

15:30 Depart Kilini for SW Cephalonia
20:00 On station SW Cephalonia
21:21 Deploy Max Rover CFROV01, target CF1-5
21:57 On bottom, 825 m. Crusted pockmarks
22:58 Coming up
23:40 ROV on deck
23:50 Multibeam, filling gaps in SW Cephalonia area

22.06.09 Monday
Weather W, 4, rough swell
06:00 Multibeam erratic with swell
08:00 Rough swell, bad forecast for westerlies 4-6 for next 2 days, heading for shelter East of Zakynthos
10:35 Berth Aghios Nikolas, North east Zakynthos
23.06.09 Tuesday
Weather forecast W 5, swell, but 3-4.
08:20 Depart for south west Cephalonia (running multibeam)
10:15 On station
10:58 Deploy ROV CFROV02, target CF1-L
11:26 On bottom 610 m, mostly muddy, one Lophelia and some Isidella
13:28 Coming up
14:00 ROV on deck, steaming north for other Area 1 targets
15:14 Deploy ROV CFROV03, targets CF1-11, 8, 1
15:49 On bottom, 750 m, heading east across targets.
18:45 Coming up from 410 m
19:10 ROV on deck, steaming north for Area 3
21:10 On site Area 3, west of target CF3-01
21:34 Deploy ROV CFROV04, target CF3-01
22:05 On bottom, 754 m transect up slope towards the East
23:05 Coming up from 468 m
23:30 On deck
23:50 Multibeam deep area west of Area 3

24.06.09 Wednesday
Weather NW 5-6, swell,
03:00 Too rough for multibeam, head around the top of Cephalonia for West Cephalonia
08:00 SE Cephalonia Channel W6, 2 m swell, head into Cephalonia Bay
11:30 Anchor off Luxuri, Cephalonia bay.
16:00 Depart Cephalonia Bay
18:15 On station Area 1 target CF-L
18:30 Deploy ROV CFROV05,
18:55 On bottom 636, running parallel lines to Dive 1
21:55 Coming up
22:35 ROV on deck, finished with ROV. Coral recovered on small boulder. Samples taken for further analysis (alcohol, formalin, frozen) and main colony kept in fridge for return to Aquarium.
Preparing box corer
23:15 Box Core BC CF-1
23:55 Box Core BC CF-2
00:30 Depart for Corinth

25.06.09 Thursday
12:15 Arrive Corinth
13:05 Passing through Corinth canal
16:30 Berth Piraeus
Depart Scientific Crew

26.06.09 Friday
Unloading scientific equipment
Activities Captured During the CoralFish 2009 HCMR Cruise

RV Aegaeo

Piloting through the Corinth Canal

Planning deployments

Deploying Deep Tow

Deploying CTD

Visitor in study area

Reviewing side scan targets

Max Rover ROV being recovered

ROV Pilots and Observers

Solitary *Lophelia pertusa* colony

Unknown cold water coral

Coral sampling

Sub-sampling box core

Sieving out box core

Cruise participants on the second leg (ROV transects and sampling)