

National Research Vessels

SHIP-TIME PROGRAMME

RESEARCH SURVEY REPORT

Survey Code:	Survey Name:	Chief Scientist/ Institution
CE12_001	Standrad Oceanographic Sections in the Rockall Trough	Glenn Nolan

Section A: Award Summary

Title of Research Survey and Survey Code:	CE12001: Standard oceanographic sections in the Rockall Trough <input type="checkbox"/>	
Co-Ordinator/ Chief Scientist:	Glenn Nolan	
Vessel used for ship-time:	<i>RV Celtic Voyager</i> <input type="checkbox"/>	<i>RV Celtic Explorer</i> <input type="checkbox"/>
Total number of days at sea:	10 days	
Total number of grant-aided ship-time days awarded:	10 days	
Dates of survey:	January 3 rd to 12 th 2012	
Mobilisation/Demobilisation Ports	Galway/Killybegs	
Survey Personnel:	<i>No. of Scientists</i> 9	<i>No. of Students</i> 1
Final Report Completed by:	Glenn Nolan	Date:

Section B: Description of the Research Survey

B1 Overview of survey personnel

Names	Institute/ Department/ Course	Position (undergraduate/ post graduate etc)	Number of Days
Scientists Glenn Nolan Xavier Monteys Liam Curran Fiona Grant Ronan O'Toole Sheena Fennell Margot Cronin Tomasz Szumski Conor Cooney	M.I. G.S.I. M.I. M.I. G.S.I. M.I. M.I. M.I. M.I.		10 (all scientist s)
Students Annette Wilson	NUIG	Postgraduate	10

B2 Objectives

Briefly outline the overall objectives of the research survey.

Please state if objectives have changed from the original proposal. If survey included a training element please outline clearly.

Cruise objectives:

- Collect CTD profile data along the standard offshore sections to include:
 - Nutrient sampling
 - Salinity samples
 - DIC, TA, DOC, TOC ,DO samples
- Collect grab samples at key locations on the Irish shelf
- Deploy offshore weather buoy at Belmullet
- Deploy ADCP at WETS Belmullet site
- Recover existing Wavescan buoy at Belmullet
- Collect multi-beam bathy data in the vicinity of Inishturk and Inishboffin.

No change to survey objectives from original proposal.

B3 Overview of research survey

*Provide a narrative overview of the research survey including survey timelines
The information provided in this section should not exceed 5 pages (excluding tables and maps)*

January 3rd and 4th: Awaited suitable weather window for cruise to begin. Actual sea state of ca. 9m and storm force winds on these days precluded the possibility of CTD work.

Jan 5th: Cleared port at 1230 and after a brief issue with the bottle fire controller on the primary CTD made way to station 1 south of Inisheer. Winds of 25kn SW and wave heights around 5m encountered on this station. Started first CTD on 53N line at 1628 and proceeded along 53N line completed stations 1-4 by midnight.

Jan 6th: Continued along 53N line towards Porcupine for the remainder of this day with a combination of CTD and day grab samples. Completed stations 5-10 by midnight.

Jan 7th: Continued along 53N line over Porcupine Bank and shelf break. Weather much calmer AM today. Completed stations 11 to 18 during the remainder of the day.

Jan 8th: Continued along S.Rockall line until 1600 when weather conditions made maintaining DP difficult. Stations 19 to 22 were completed during this period. After examining forecast, decided to proceed for N.Rockall line to avail of a break in the weather AM on January 9th. Commenced steaming to N.Rockall at 1615.

Jan 9th: Arrived on N.Rockall line at 0525 and started CTD line. Wind building up through course of day. Completed stations 23 to 29 before the vessel had problems holding on DP. Postponed sampling at ca. 1800 to await improvement in weather.

Jan 10th: Weather conditions had improved sufficiently by 0235 to restart CTD sampling. Continued CTDs across N.Rockall until 2000 when a decision was made to complete rock dredging work for GSI at N.Porcupine. Expected back on CTD line at 2000 Jan 11th.

Jan 11th: Arrived at N.Porcupine rock dredge station at 0830 and commenced sampling activity. Completed rock dredging at ca. 1300 and proceeded to N.Rockall section to complete CTD line. Restarted CTDs on N.Rockall line at 2220 completing stations 34 and 35.

Jan 12th: Continued eastward on N.Rockall line completing stations 36 after bad weather meant the 500m station could not be sampled (winds gusting 50 knots). Proceeded to Belmulletts WETS site to deploy ADCP. ADCP deployed at 0440 at position 54° 16.56N, 10° 16.56W.

0500:Proceeded to Killybegs for demobilisation.Arrived in Killybegs at 1200.

B4 Benefits, impact and contribution of the outputs to marine research and the marine sector in general.

Outline clearly the specific outcomes and benefits of the research survey.

The information provided in this section should not exceed 1/2 page (excluding tables and maps)

The generation of long-term time series to monitor ocean climate is at the heart of understanding the likely impact of future ocean climate scenarios on key marine sectors eg. Fishing, aquaculture, wave energy, environmental protection, coastal flood defense. Providing for sustainability in these sectors is a key element in the recently published Sea Change Marine research and innovation strategy. This work helps define the likely future ocean climate these marine sectors will have to contend with in terms of water temperatures, wave heights, tidal surges and nutrient and plankton concentrations.

While not glamorous in its own right, it is widely accepted that re-occupying hydrographic sections to examine year-to-year changes in ocean climate is one of the key elements required in climate change programmes. This is essential in preparing the marine sector as our ocean climate is modified.

This work has already enabled Ireland to be part of large EU programmes on collapse of the thermohaline circulation in the NE Atlantic and in the international ARGO programme.

Capacity building

The team involved have spent the past decade developing the capacity to acquire this standard section data and to ensure that the data is utilised as rapidly after collection as is feasible. Capacity was developed further by training upcoming undergraduate and postgraduate students on this cruise so that in time they will be in a position to lead such programmes and provide assessments of ocean climate on an ongoing basis.

Dissemination

Data from this cruise are disseminated using a variety of methods. In the first instance the data are provided to the ICES Working Group on Oceanic Hydrography of which Ireland is a member (and co-chair). This group produces the ICES Report on Ocean Climate which is widely disseminated among the ICES fisheries and environment communities. The report is available on the ICES website (www.ices.dk)

Where new discoveries are made we endeavour to disseminate this information through MI and national seminars and in the production of peer reviewed scientific publications.

We also disseminate the information via the Marine Institute website where individuals request the survey data on completion of the cruise. There is ongoing work to make the data and plots available using an OpenDAP server coupled with applications such as Google Earth and NASA WorldWind.

Improved understanding of ocean climate

The proposed data collection on this cruise is designed to gather and establish baseline oceanic weather and oceanic conditions (eg. Malin Head station). It is in this overall context that we can establish the oceanic baseline from which future changes can be assessed.

We combine measured data with modelled data in an overall assessment of wave climate, tidal surges, sea level and temperature and salinity regimes. In some cases the data are used to validate models which can then be used to model

future climate scenarios out to 2100 under varying Greenhouse Gas Emission scenarios.

Promoting multi-disciplinary and inter-institutional research collaboration

This research brings together the two key oceanographic groups in Ireland from the university and government sectors. The university researchers are focussed on the pure research elements of the cruise while Marine Institute scientists are focussed on the long-term monitoring of Ireland's ocean.

These cruises have had a climate focus since 2006 and the Marine Geology team from the Geological Survey of Ireland will collect cores for climate purposes during this programme. This provides a link between palaeoceanography and modern measurements of ocean currents and water masses. The team also hopes to collect hydrographic data from the Irish shelf region filling gaps in the INFORMAR data coverage

Analysis of seabed samples collected during the cruise are publically disseminated through the INFOMAR program GIS web portal. Additionally, these results are key to feed into current major marine EU mapping projects such as EMODNET (<http://www.emodnet-geology.eu/>)

The cruise also enables baseline cetacean sightings to be made in the deep water west of Ireland.

The cruise incorporates physical, chemical and biological data gathering. In summary this cruise has active participation of a government agency (MI), a government department (DCENR-GSI), a 3rd level research group (NUIG) and a Non-governmental Organisation (IWDG) fulfilling a truly inter-institutional role and includes oceanographers, plankton ecologists, fisheries scientists (migratory and key commercial species) and marine technicians, thus fulfilling a truly multi-disciplinary role.

B5 Data

Provide a description of the data collected from the research survey, the usage of the data and how it will be stored.

The information provided in this section should not exceed 1/2 page (excluding tables and maps)

A total of 36 CTD sampling stations were occupied for a variety of parameters including nutrients, salinity and carbon measurements. Grab sampling and rock dredging was conducted at a number of additional stations on behalf of the GSI.

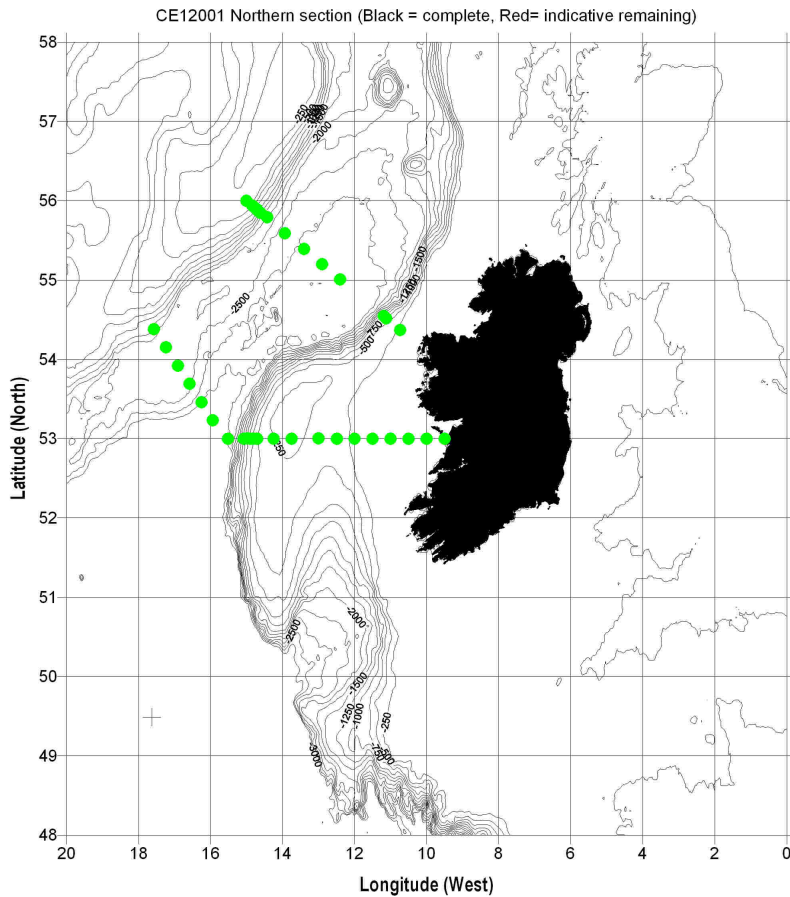


Figure 1: Stations occupied on Cruise CE12_001

Preliminary CTD plots are included in appendix 1. All data freely available through Marine Institute data request service: DataRequests@marine.ie

B6 Contribution to marine research programmes

Outline specific National/EU/International research programmes this survey supported. Please include the funding sources for these programmes as well as the total amount of funding leveraged (Repeat the table below, if necessary).

National/EU/International Research programme(s):	
---	--

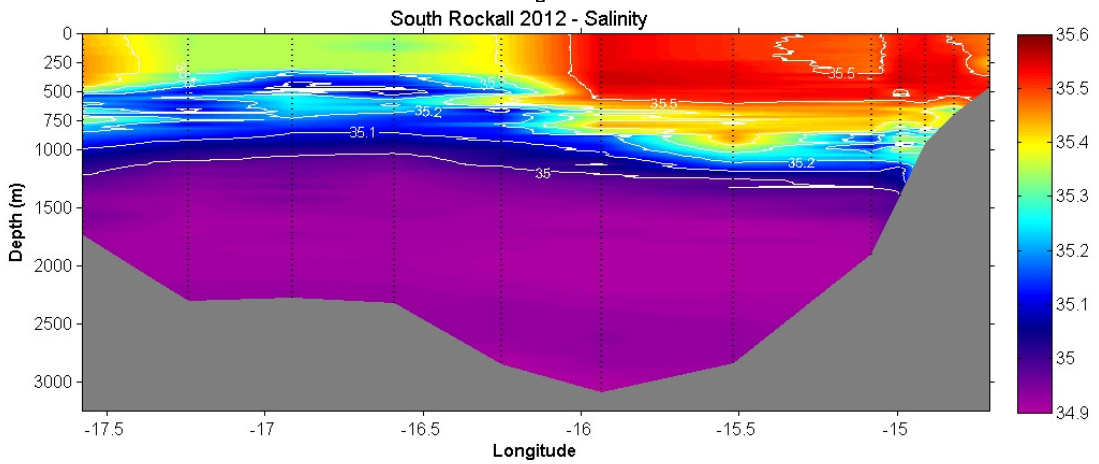
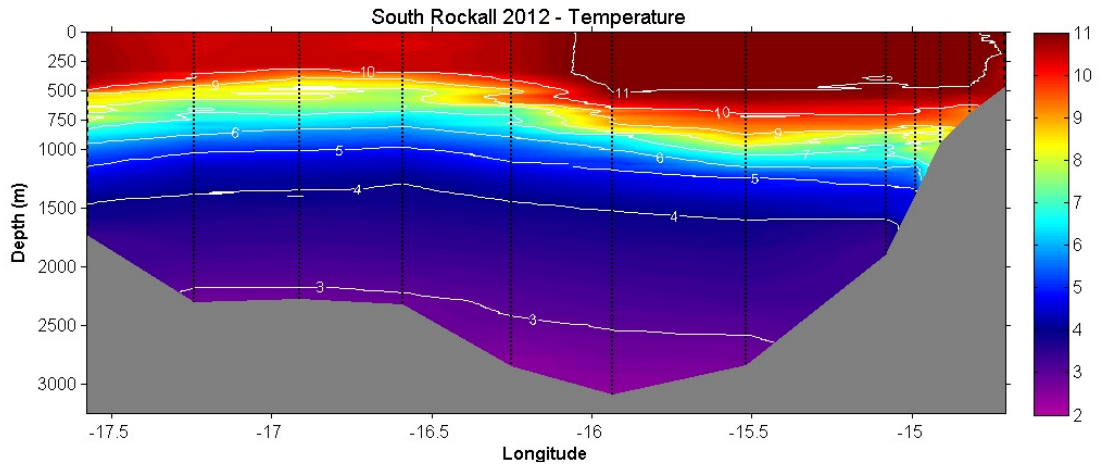
Total Programme cost:	
Value to Irish partners:	
Project duration:	
Contract no.:	
Project partners:	
Project web address:	

Appendices

Please number and attach any relevant Appendices here.

Preliminary data plots from CE12_001

South Rockall line:



North Rockall line:

