

National Research Vessels

SHIP-TIME PROGRAMME

RESEARCH SURVEY REPORT

Survey Code:	Survey Name:	Chief Scientist/ Institution
CE14008	Transatlantic ocean climate sections (Rockall Trough and Iceland Basin)	Glenn Nolan

Section A: Award Summary

Title of Research Survey and Survey Code:	CE14008 Transatlantic ocean climate sections (Rockall Trough and Iceland Basin) <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:	13 days	
Total number of grant-aided ship-time days awarded:	13 days	
Dates of survey:	May 23 rd to June 4 th 2015	
Mobilisation/Demobilisation Ports	St. John's, Newfoundland/Galway	
Survey Personnel:	<i>No. of Scientists</i> 5	<i>No. of Students</i> 5
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 Alan Berry Joe Silke Tom Szumski Evin McGovern	M.I. M.I. M.I. M.I. M.I.		13 (all scientist s)
Students Jack O'Carroll Siobhan Hayes Emma O'Brien Dylan Ward Alan Grassie	NUIG NUIG GMIT NUIG NUIG	Under-graduate	13 (all students)

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, DOC and TA samples
- Collect grab samples at Eudoras Bank for Plymouth Marine Laboratory
- Grapple for upper section of M6 mooring at Porcupine Bank
- Collect phytoplankton samples at select locations along the extended section.
- 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)*

All times from this point forward in narrative in UTC

DAILY LOG DURING CRUISE

Note: CE14008 consists of a 4 day transit to the MAR followed by the extended 53N line across Rockall and Hatton.

May 23rd: Cleared St.John's Port at 2030 (Local) and made way to first sample station in the Charlie Gibbs Fracture Zone (52 38.508N, 33 4.025W)

May 28th: Arrived in CGFZ and completed deep CTD cast (4700m) by 2030UTC (small delay due to hydraulic pipe rupture). Proceeded to station 2 at the start of the Hatton Rockall Line.

May 29th: Arrived at station 2 at 0210 to commence main section. Wind generally southerly, less than 15 kts. Continued along section completing stations 2 through 7.

May 30th: Continued eastward along main section completing stations 8 through 13. Weather continued extremely favourable during this period.

May 31st: Completed the western section, arriving at SW Rockall Bank (station 19) at 1735). Commenced South Rockall in a SE direction, completing stations 20 and 21 by midnight.

June 1st: Continued the deeper stations of the South Rockall section, completing stations 22 to 26. Prepared for grappling the old M6 CTD mooring. Shot grapple just prior to midnight.

June 2nd: Grappling for M6 mooring in concentric circles proved unsuccessful (see separate mail thread re cable vessel "Resolute" in the vicinity during this operation). Continued CTDs on the 53N line from Porcupine shelf break to Porcupine Bank (stations 27 through 34).

June 3rd

Steamed to Galway port following completion of extended section.

June 4th: Fully demob of gear AM to Marine Institute.

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.

The extension of the Southern Rockall line to approximately 26 deg West represented a unique opportunity to gather oceanographic data from the Iceland basin to the Irish coast. The cruise was also synchronous with the French OVIDE hydrographic section that traverses from Lisbon to Iceland.

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 42 CTD sampling stations were occupied for a variety of parameters including nutrients, salinity and carbon measurements. Sampling began in the Charlie Gibbs Fracture Zone of the Mid-Atlantic Ridge and progressed into the Iceland Basin, Rockall Trough and Irish Shelf region.

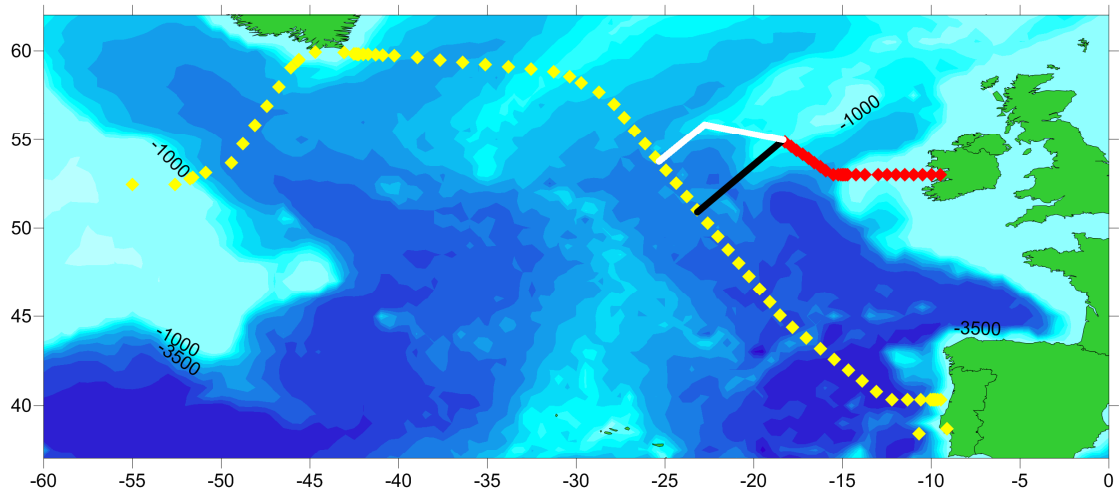


Figure 1: TransAtlantic Oceanographic station transect (May/June 2014)
White and red lines show the occupied transect. The OVIDE stations
which were sampled at the same time (by French oceanographers)
are represented in yellow.

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).

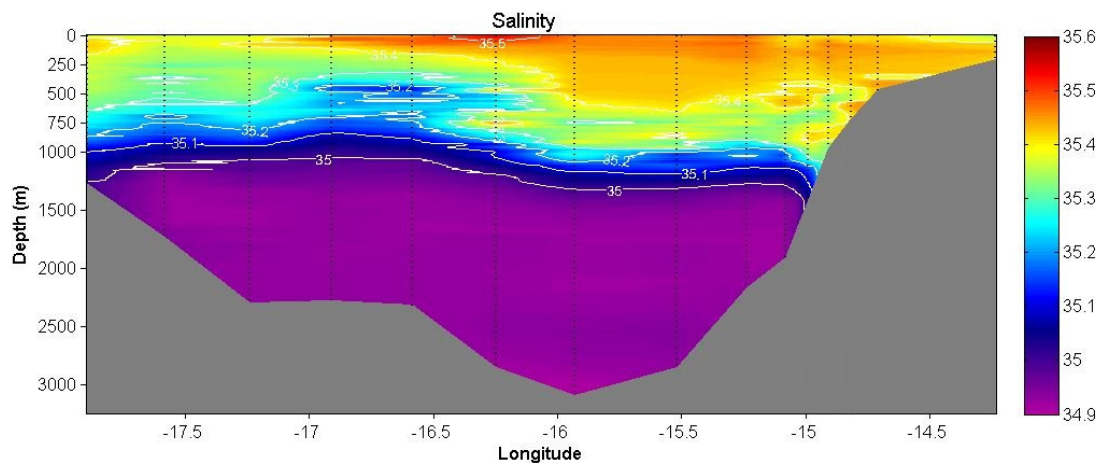
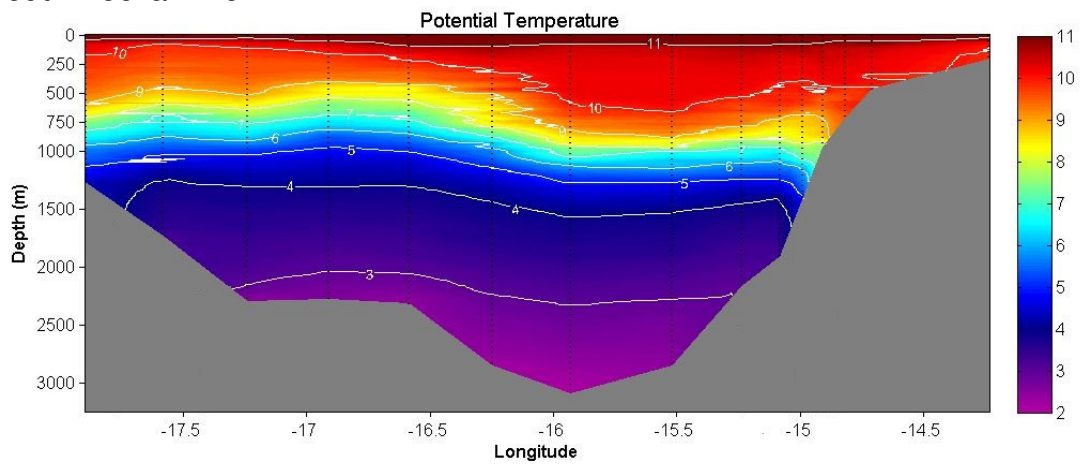
National/EU/International Research programme(s):	
Total Programme cost:	
Value to Irish partners:	
Project duration:	
Contract no.:	
Project partners:	
Project web address:	

Appendices

Please number and attach any relevant Appendices here.

Preliminary data plots from CE14_008

South Rockall line:



Extended South Rockall line:

