

Application for Consent to conduct
Marine Scientific Research

Date: 07/03/2018

1. General Information

1.1 Cruise name and/or number: CE18015, SEA-SEIS-D (Strictire, Evolution And Seismic hazard of the Irish offshore: deployment of broadband, ocean-bottom seismometers)

1.2 Sponsoring Institution(s):	
Name:	Dublin Institute for Advanced Studies (DIAS), Geophysics Section
Address:	10 Burlington Rd, Dublin 4
Name of Director:	Dr. Eucharía Meehan, DIAS Registrar and CEO
	Prof. Chris Bean, Head of Geophysics

1.3 Scientist in charge of the Project:	
Name:	Dr Sergei Lebedev
Country:	Ireland
Affiliation:	Dublin Institute for Advanced Studies (DIAS), Geophysics Section
Address:	5 Merrion Sq, Dublin 2
Telephone:	+353-1-653-5147 x240
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Email:	sergei@cp.dias.ie
Website (for CV and photo):	https://homepages.dias.ie/~sergei/

1.4 Entity(ies)/Participant(s) from coastal State involved in the planning of the project:	
Name:	
Affiliation:	
Address:	
Telephone:	
Fax:	
Email:	
Website (for CV and photo):	

2. Description of Project

2.1 Nature and objectives of the project:
Ireland's largest sedimentary basins and its largest natural hazards (offshore landslides) are in its vast offshore. The lack of broadband seismic sensors offshore has hindered our understanding of the deep mechanisms of the lithospheric hyper-extension that formed the basins, mechanisms of the Paleogene uplift and volcanism in and around Ireland (probably related to the enigmatic Iceland Hotspot activity), regional-scale structure and evolution of the area's crust and lithosphere, and its current deformation and seismicity.
In this project, we will deploy 18 new, broadband, ocean-bottom seismometers across Ireland's offshore, with the instruments provided by the newly established Insitu Marine Laboratory for Geosystems Research Centre. The deployment will start in September-October, 2018, and last 12-21 months, depending on whether the instruments will be retrieved in the Autumn, 2019 or Spring, 2020. Surface-wave array tomography will be performed using broadband phase velocity measurements, obtained with ambient-noise and teleseismic cross-

correlations and waveform inversions. Waveform tomography of Ireland and NE Atlantic will be performed using 3D waveform sensitivity kernels and the new NAGTEC model of the NE-Atlantic crust. An offshore earthquake catalogue will be obtained. Lithosphere-scale thermal evolution of the basins will be modelled.

In order to enhance the seismic data coverage in the western part of the region, where the north-south extent of the Irish offshore territory narrows, we would like to deploy 4 of the stations in the western part of the UK waters, in the area around the Hatton Bank.

2.2 If designated as part of a larger scale project, then provide the name of the project and the Organisation responsible for coordinating the project:

N/A

2.3 Relevant previous or future research projects:

N/A

2.4 Previous publications relating to the project:

This is a new project, deploying broadband OBS in the region for the first time, so that there are no publications on this exactly. The methods that will be applied to the data include regional and global seismic tomography techniques used in, for example:

Endrun, B., S. Lebedev, T. Meier, C. Tirel, W. Friederich. Complex layered deformation within the Aegean crust and mantle revealed by seismic anisotropy, *Nature Geoscience*, 4, 203–207, 2011.

Schaeffer, A. J., S. Lebedev. Global shear-speed structure of the upper mantle and transition zone. *Geophys. J. Int.*, 194, 417–449, 2013. [WINNER, GJI Student Author Award for best paper, 2013 (A. Schaeffer).]

3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in Latitude and longitude in decimal degrees, including coordinates of cruise/track/way points/sampling stations). Please provide coordinates in a separate excel spreadsheet.

The 4 stations in the UK waters are planned to be deployed at:

58.50N, 13.00W

58.90N, 16.25W

59.50N, 19.50W

58.00N, 22.00W

3.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical

Areas of the intended work and, as far as practicable, the location and depth of sampling Stations, the tracks of survey lines, and the locations of installations and equipment.

A map with station locations and ship tracks is attached

4. Methods and means to be used

4.1 Particulars of vessel:

Name:	Celtic Explorer
Type/Class:	Multipurpose Research Vessel
Nationality (Flag State):	Irish
Identification Number (IMO/Lloyds No.):	D100 A1 ICE CLASS ID + UMS +SCM DP (CM)
Owner:	Marine Institute
Operator:	P&O Maritime Services
Overall length (meters):	65.5
Maximum draught:	5.7m

Displacement/Gross Tonnage:	2425T
Propulsion:	2 x 1530 KW, 1000Rpm, 1 x 1020 KW, 1000 Rpm
Cruising & maximum speed:	10 & 16 knots
Call sign:	EI GB
INMARSAT number and method and capability of communication (including emergency frequencies):	00353 91 423397 / 00353 91 423433 00870 763066743 00 353 87 9678520 / 00 353 86 1735500
Name of Master:	Antony Hobin/Denis Rowan
Number of Crew:	13-15
Number of Scientists on board:	18-20 max

4.2 Particulars of Aircraft:	
Name:	N/A
Make/Model:	
Nationality (flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall Length (meters):	
Propulsion:	
Cruising & Maximum speed:	
Registration No.:	
Call Sign:	
Method and capability of communication (including emergency frequencies):	
Name of Pilot:	
Number of crew:	
Number of scientists on board:	
Details of sensor packages:	
Other relevant information:	

4.3 Particulars of Autonomous Underwater Vehicle (AUV):	
Name:	N/A
Manufacturer and make/model:	
Nationality (Flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall length (meters):	
Displacement/Gross tonnage:	
Cruising & Maximum speed:	
Range/Endurance:	
Method and capability of communication (including emergency frequencies):	
Details of sensor packages:	
Other relevant information:	

4.4 other craft in the project, including its use: N/A

4.5 Particulars of methods, full description of scientific instruments to be used (for fishing gear specify type and dimension) and location			
Types of samples and Measurements:	Methods to be used:	Instruments to be used:	To be carried out within 12nm (yes or no):

Recording of continuous seismic data by ocean-bottom seismometers	Seismic imaging and seismicity analysis using the data, after the retrieval of the instruments	NAMMU broadband ocean-bottom seismometer systems from the manufacturer K.U.M. (Germany). 18 systems in total: 14 in the Irish and 4 in the UK waters	no

4.6 Indicate nature and quantity of substances to be released into the marine environment:

No substances to be released

4.7 Indicate whether drilling will be carried out. If yes, please specify:

No

4.8 Indicate whether explosives will be used. If yes, please specify type and trade name, Chemical content, depth of trade class and stowage, size, depth of detonation, frequency of Detonation, and position in latitude and longitude:

No

5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and Anticipated timeframe for recover, as far as possible exact locations and depth, and Measurements):

The instruments will be deployed on the sea floor during the cruise between 17 September and 7 October, 2018. They will then be retrieved 12-21 months later, the dates of the retrieval cruise still to be finalized.

The deployment of each of the 4 instruments is expected to last between 0.5 and 2 hours. The systems are lowered into the water using the RV's A-frame and then sink to the seafloor. The retrieval of each instrument is expected to last between 1 and 2 hours. The release of the instruments is triggered by acoustic signal, and they ascend to the surface.

The 4 stations in the UK waters are planned to be deployed at:

58.50N, 13.00W

58.90N, 16.25W

59.50N, 19.50W

58.00N, 22.00W

6. Dates

6.1 Expected dates of first entry into and final departure from the research area by the research vessel and/or other platforms:

Deployment of the instruments: between 17 September and 7 October, 2018.

Retrieval of the instruments: to be scheduled 12-21 months after the deployment cruise.

6.2 Indicate if multiple entries are expected:

no

7. Port Calls

7.1 Dates and Names of intended ports of call:

Mob Port: Galway 17/09/2018 Demob Port: Galway 07/10/2018 No port calls during the cruise are planned

7.2 Any special logistical requirements at ports of call:

N/A

7.3 Name/Address/Telephone of shipping agent (if available):
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N/A

8. Participation of the representative of the coastal State

8.1 Modalities of the participation of the representative of the coastal State in the research Project:

n/a

8.2 Proposed dates and ports for embarkation/disembarkation:
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Embarking: Galway 17/09/2018 Disembarking: Galway 07/10/2018

9. Access to Data, Samples and Research Results

9.1 Expected dates of submission to coastal State of preliminary report, which should include

The expected dates of submission of the data and research results:
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Q4 2019

9.2 Anticipated dates of submission to the coastal State of the final report:

Final report will not be available until after the retrieval survey in 2019 (dates TBC) as data will not be accessible until then.
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9.3 Proposed means for access by coastal State to data (including format) and samples:
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Cruise report

9.4 Proposed means to provide coastal State with assessment of data, samples and Research results:
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Cruise report

9.5 Proposed means to provide assistance in assessment or interpretation of data, samples

And research results:

Cruise report

9.6 Proposed means of making results internationally available:

n/a

10. Other permits Submitted

10.1 Indicate other types of coastal state permits anticipated for this research (received or Pending):

N/A

11. List of Supporting Documentation

11.1 List of attachments, such as additional forms required by the coastal State, etc.:
Map with the proposed ship track

Signature:

A handwritten signature in purple ink, appearing to read 'S. Lebedev', with a long horizontal flourish extending to the right.

Contact information of the focal point:

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