

APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH

1. General Information

1.1 Cruise name and/or number:	NBP14-08 Dalziel - F2013-095
--------------------------------	------------------------------

1.2 Sponsoring institution(s):		
Name	Address	Name of Director
Division of Polar Programs, National Science Foundation	Timothy M. McGovern Ocean Projects Manager Division of Polar Programs National Science Foundation 4201 Wilson Blvd. Arlington, VA 22230 703.292.4248	Dr. Kelly Falkner

1.3 Scientist in charge of the project:	
Name:	Ian Dalziel
Country:	US
Affiliation:	University of Texas Institute for Geophysics
Address:	10100 Burnet Rd. Bldg. 196 Austin, Texas 78758 US
Telephone:	512-471-0431
Email:	ian@ig.utexas.edu

1.4 Entity(ies) /Participant(s) from coastal State involved in the planning of the project:	
Name:	See Section 6.2.
Country:	
Affiliation:	
Address:	
Telephone:	
Fax:	
Email:	
Website (for CV and photo):	

2. Description of Project

2.1 Nature and objectives of the project:
<p>Underway geophysics and dredging to determine nature and history of the floor of the central Scotia Sea and its influence on the onset and development of the Antarctic Circumpolar Current</p> <p>Cuncurrently on this cruise the NBP will be running its continiuous underway systems which fall under Dr. Eric Firing and Dr. Colm Sweeney whom are in the process of collecting a long term data set of ocean currents and the concentration of carbon dioxide in the atmosphere and upper ocean. This work will provide a coordinated time series of Oceanographic and Meteorological measurements with a view to clarifying and describing the role of the Southern Ocean to the global climate system.</p> <p>The projects include: O-315-N; The ADCP studies will monitor upper ocean currents by measuring the Doppler shift of acoustical backscatter.</p> <p>O-214-N; The Carbon Dioxide studies (Taro Takahashi, Timothy Newberger, Colm Sweeney) will document and monitor the concentration of CO2 in the atmosphere and upper ocean.</p> <p>The meteorological data will allow correlation of atmospheric and oceanographic parameters. Gravity, light, and position are all part of the underway shipboard systems.</p> <p>Underway seawater data measuring seawater temperature, salinity, fluorescence and transmissivity provide additional context.</p> <p>Program website is: www.usap.gov</p>

2.2 Relevant previous or future research projects:
<p>Previous: Nathaniel B. Palmer cruise 08-05 to central Scotia Sea Future: None planned</p> <p>Underways systems: Lenn, Y.-D. and T. K. Chereskin (2009) Observations of Ekman Currents in the Southern Ocean. <i>J. Phys. Oceanogr.</i>, 39, 768-779.</p> <p>Lenn, Y.-D., T. K. Chereskin, and J. Sprintall (2008) Improving estimates of the Antarctic Circumpolar Current streamlines in Drake Passage. <i>J. Phys. Oceanogr.</i>, 38, 1000-1010.</p>

2.3 Previous publications relating to the project:
2013. Dalziel, I.W.D., Lawver, L.A., Pearce, J.A., Barker, P.F., Hastie, A.R., Barfod, D.N., Schenke, H-W., and Davis, M.B. A barrier

to Antarctic circumpolar flow until the late Miocene? *Geology*, doi 10.1130/G34352.1, v. 41. 767-793.

Underway systems:

Chereskin, T. K., and G. A. Tarling (2007) Interannual to diurnal variability in the near-surface scattering layer in Drake Passage. *ICES J. Mar. Sci.*, doi: 10.1093/icesjms/fsm138.

Lenn, Y.-D., T. K. Chereskin, J. Sprintall, and E. Firing (2007) Mean jets, mesoscale variability and eddy momentum fluxes in the surface layer of the Antarctic Circumpolar Current in Drake Passage. *J. Mar. Res.*, 65, 27-58.

Lenn, Y.-D., T. Chereskin, J. Sprintall, and E. Firing. Mean jets, mesoscale variability and eddy momentum fluxes in the surface layer of the Antarctic Circumpolar Current in Drake Passage. *J. Marine Res.*, 65, 27-58, 2007.

Chereskin, T., E. Firing and J. Hummon, High Resolution ADCP measurements across Drake Passage *AGU Eos Trans.*, 81, 661, 2000

Sprintall, J. Seasonal to interannual upper-ocean variability in the Drake Passage,

J. Marine Res., 61, 25-57, 2003

For th ADCP:

<http://currents.soest.hawaii.edu/nbpalmer/>

For the PCO2:

www.ldeo.columbia.edu/CO2

3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude, including coordinates of cruise track/ way points):

South Atlantic Ocean and Scotia Sea 53-59 degrees south 33-42 degrees west

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.

Chart provided - see Section 10.1.

4. Methods and Means to be Used

4.1 Particulars of vessel:

Name:	NATHANIEL B. PALMER
Type/Class:	Ship
Nationality (Flag state):	United States
Identification Number (IMO/Lloyds No.):	IMO 9007257
Owner:	Edison Chouest Off Shore
Operator:	Edison Chouest Off Shore
Overall length (meters):	94.00
Maximum draught (meters):	6.80
Displacement/Gross tonnage:	6174.00
Propulsion:	Desiel
Cruising:	18.52
Maximum speed:	22.20
Call sign:	WBP 3120
INMARSAT number and method and capability of communication (including emergency frequencies):	2182 kHz/VHF-16 Single Side Band - 2182.0 Mgz and 4146.0 Mgz Iridium phone 808-659-5076
Name of master:	Captain Sebastian Panoi
Number of crew:	25
Number of scientists on board:	30

4.2 Other craft in the project, including its use:

None

4.3 Particulars of methods and scientific instruments:

Types of samples and measurements	Methods to be used	Instruments to be used
Dredged rock samples; magnetics, gravity, swath mapping and seismic data	Dredging; underway geophysics	magnetometer, gravimeter, hull-mounted swath mapping system, seismic reflection streamer and air guns
Continuous GPS	Establish autonomous stations (3) on island of South Georgia and offshore islets	Trimble GPS receivers
Oceanographic and meteorological measurements, temperature variability within the water column and temporal migration of oceanographic water mass boundaries, monitoring of upper ocean currents, monitoring concentration of CO2 and O2 in the atmosphere and upper ocean	The proposed continuous underway studies will provide a coordinated time series of oceanographic and meteorological measurements with a view to clarifying and describing the role of the Southern Ocean in the global climate system. The meteorological data will	RDI 150 KHz ADCP, Ocean Surveyor 38KHz ADCP, Seabird SBE21 and Seabird SBE45 thermosalinograph, Turner 10AU Fluorometer & Wetlabs C-Star Transmissometer, PCO2 Equilibrator, Biospherical GUV 511C, R.M. Young Met System, La Coste-Romberg

water column.	allow correlation of atmospheric and oceanographic parameters.	gravimeter.
---------------	--	-------------

4.4 Indicate nature and quantity of substances to be released into the marine environment:
No

4.5 Indicate whether drilling will be carried out. If yes, please specify:
No

4.6 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

4.7 Indicate whether protected species be studied. If yes, please specify:
No

5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and anticipated timeframe for recovery, locations and depth, and measurements):
No
Not at sea

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:
Project Start Date: Sep 14, 2014
Project End Date: Oct 15, 2014

6.2 Coastal State-specific details:

Coastal Area	Estimated Entry Date	Estimated Departure Date
South Georgia	Sep 14, 2014	Oct 15, 2014

Explanation of multiple entries:
Three entries in NW, SW and SE extremities of the island
Research will be performed: between 12-200 nm
Extent to which South Georgia will be enabled to participate or to be represented in the research project:
Limited only by space on board
Name, affiliation and contact information for all participants from coastal state South Georgia:
Prof. Julian Pearce, Cardiff University Dr Phil Leat, British Antarctic Survey

7. Port Calls

No port calls

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:
See Section 6.2.

8.2 Proposed dates and ports for embarkation/disembarkation:
See Section 6.2.

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:
No more than 60 days from the end date of the research as provided in Section 6.1.

9.2 Anticipated dates of submission to the coastal State of the final report:
No more than 2 years from the end date of the research as provided in Section 6.1.

9.3 Proposed means for access by coastal State to data (including format) and samples:
Data will be provided through official channels at no cost to the coastal State(s). Samples will be provided upon request.

9.4 Proposed means to provide coastal State with assessment of data, samples and research results:
Assessment of data, samples and research results will be provided at no cost to the coastal State(s).

9.5 Proposed means to provide assistance in assessment or interpretation of data, samples and research results:
Assistance in further assessment or interpretation will be provided upon request.

9.6 Proposed means of making results internationally available:
Underway data will be available through depository at Lamont-Doherty Earth Observatory, Columbia University in the City of New York
Specimens will be available through Professor Julian Pearce, Cardiff University, UK

10. List of Supporting Documentation

10.1 List of attachments, such as additional forms required by the coastal State, etc.:			
Attachment Type	Description	Attachment	Submission Date
Supplemental Material	NBP Cruise Schedule	5940000000_nbp_sched 8-21.pdf	Aug 22, 2013
Proposed Cruise Track	Proposed cruise track on bathymetric chart	5549843750_CSSII_proposedcruisetrack.pdf	Sep 06, 2013