

## APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH

### 1. General Information

1.1 Cruise name and/or number:	5 Gyres North Atlantic Viking Expedition - F2014-049
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1.2 Sponsoring institution(s):		
Name	Address	Name of Director
The 5 Gyres Institute	3131 Olympic Blvd #302 Santa Monica, CA 90404	Anna Cummins

1.3 Scientist in charge of the project:	
Name:	Marcus Eriksen
Country:	US
Affiliation:	The 5 Gyres Institute
Address:	3131 Olympic Blvd #302 Santa Monica, California 90404 US
Telephone:	323-395-1843
Email:	marcus@5gyres.org

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>The 5 Gyres North Atlantic Viking Gyre Expedition will explore the presence and distribution of plastic pollution in the North Atlantic Gyre, a research expedition aboard Pangaea Exploration's sailing vessel Sea Dragon (72-foot), in June 2014 (June 7-29) from Hamilton, Bermuda to Reykjavik, Iceland. Sea Dragon will be in Reykjavik until July 4, 2014. All data collected during the voyage will compliment other research done by 5 Gyres on other oceanic research voyages. 13 crew (including two skippers, 5 Gyres Staff and voyage crew) will be aboard the vessel to carry out research and sailing needs. The Viking Expedition will include collecting surface samples of marine plastic pollution, totaling approximately 50 - 60 samples during the entire expedition (Approximately 5 - 6 samples will be taken in Iceland's Exclusive Economic Zone). Surface samples will be collected using a neuston trawl with a rectangular opening of 16 cm high by 61 cm wide, and a 3 m long 333 um net with 30 x 10 square cm collecting bag. The net is towed along the surface on the starboard side using a spinnaker pole to position the towline outside of the wave of the vessel. The vessel is kept as constant as possible and under 3 knots, measures by the onboard knot meter. The slow speed of the trawl will inhibit bycatch. No rare or endangered species will be captured. Samples focus on collection of marine plastic pollution to understand distribution and abundance. The duration of the trawl is exactly 60 minutes, recorded using a stopwatch. Samples are brought on board and transferred to a sample bottle, where they are preserved with isopropyl alcohol 90%. Samples will be taken back to California for analyses by 5 Gyres Staff. Some of the samples will be given to crew and sponsors for educational purposes. Voyage updates and preliminary research results will be posted to the 5 Gyres Blog/Website (<a href="http://5gyres.org/whats_happening_now/blog/">http://5gyres.org/whats_happening_now/blog/</a>) during the voyage. All final reports for the project will also be available at this site or on the 5 Gyres Blog. All research papers will be shared with those interested in Iceland and Bermuda.</p>

2.2 Relevant previous or future research projects:
<p>The research will be used to understand plastic pollution distribution on a global scale. Research will be coupled with oceanographic models to build a program to better estimate global distribution and densities of plastic. The purpose of this research is to build awareness and also inspire solutions towards eliminating plastic pollution in our oceans.</p>

2.3 Previous publications relating to the project:
<p>Eriksen, M., Maximenko, N., Thiel, M., Cummins, A., Lattin, G., Wilson, S., Hafner, J., Zellers, A., and Rifman, S., 2013. Plastic pollution in the South Pacific subtropical gyre. <i>Marine Pollution Bulletin</i> 68: 71-76. <a href="http://www.marcuseriksen.com/plastic-pollution-in-the-south-pacific-subtropical-gyre/">http://www.marcuseriksen.com/plastic-pollution-in-the-south-pacific-subtropical-gyre/</a> Eriksen, M., Mason, S., Wilson, S., Box, C., Zellers, A., Edwards, W., Farley, H., and Amato, S., 2013. Microplastic pollution in the surface waters of the Laurentian Great Lakes, <i>Marine Pollution Bulletin</i> 77: 177-182. <a href="http://www.sciencedirect.com/science/article/pii/S0025326X13006097">http://www.sciencedirect.com/science/article/pii/S0025326X13006097</a></p>

### 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):
Surface samples will be taken within Iceland's EEZ, along the proposed transect between the following points: 62.141612, -25.492079 64.165564, -23.390693 64.172960, -21.863595

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 I0.1.

### 4. Methods and Means to be Used

4.1 Particulars of vessel:	
Name:	SEA DRAGON
Type/Class:	Ship
Nationality (Flag state):	Cayman Islands
Identification Number (IMO/Lloyds No.):	
Owner:	Pangaea Explorations
Operator:	Pangaea Explorations
Overall length (meters):	
Maximum draught (meters):	3.40
Displacement/Gross tonnage:	57.24
Propulsion:	
Cruising:	
Maximum speed:	
Call sign:	
INMARSAT number and method and capability of communication (including emergency frequencies):	â€¢406MHz Emergency Position Indicating Radio Beacon â€¢GMDSS HF and VHF DSC systems
Name of master:	Emily Penn
Number of crew:	13
Number of scientists on board:	4

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
surface samples	Surface samples will be collected in Iceland's EEZ using a neuston net (manta trawl) with a rectangular opening of 16 cm high by 61 cm wide, and a 3 m long 333 um net with 30 x 10 square cm collecting bag. The net is towed along the surface on the starboard side using a spinnaker pole to position the towline outside of the wave of the vessel. The vessel is kept as constant as possible and under 3 knots, measures by the onboard knot meter. The duration of the trawl is exactly 60 minutes, recorded using a stopwatch. Samples are brought on board and transferred to a sample bottle, where they are preserved with isopropyl alcohol 90%.	Neuston Net (Manta Trawl) -rectangular opening of 16 cm high by 61 cm wide, and a 3 m long 333 um net with 30 x 10 square cm collecting bag

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):  
yes  
Approximately 5 to 6 surface samples will be collected in Iceland's EEZ using a neuston net (manta trawl) between June 25 and June 28. Equipment will be deployed for approximately 1.5 nautical mile or less, and sample the surface waters (to a depth of no more than 30 cm), and all samples will be kept on board and shipped back to California, though some will be given to crew for educational purposes.

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: Jun 07, 2014  
Project End Date: Jul 04, 2014

6.2 Coastal State-specific details:

Coastal Area	Estimated Entry Date	Estimated Departure Date
Iceland	Jun 25, 2014	Jul 04, 2014

**Explanation of multiple entries:**  
N/A

**Research will be performed:** between 12-200 nm

**Extent to which Iceland will be enabled to participate or to be represented in the research project:**  
5 Gyres will share all data results with any interested Icelandic officials, researchers or nonprofit organizations. 5 Gyres will present initial results from the 2014 expedition, along with results from earlier expeditions around the world to interested parties in Iceland. 5 Gyres would be interested in building relationships to document plastic pollution in the waters around Iceland.

**Name, affiliation and contact information for all participants from coastal state Iceland:**

7. Port Calls

Port	Arrival Date	End Date	Special Logistical Requirements	Shipping Agent
Reykjavik	6/28/2014	7/4/2014	Vessel Name: Sea Dragon 72-foot sail boat	Contact information: Emily Penn (emily@panexplore.com)

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.
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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).
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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.
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9.6 Proposed means of making results internationally available: All research updates, final reports, and published articles will be made public and available on The 5 Gyres Institute website and blog (www.5gyres.org). In addition, information will be shared with partnering research entities, nonprofits, scientists and those involved in Bermuda and Iceland.
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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
Proposed Cruise Track	Proposed route for 5 Gyres North Atlantic Gyre Expedition (within Iceland EEZ)	9335207500_SeaDragon_ProposedRoute_IcelandEEZ_5Gyres.pdf	May 15, 2014

