UK BERMUDA and CARRIBEAN

NOTIFICATION OF PROPOSED RESEARCH CRUISE

GENERAL Part A

1. Name of research ship — Dana — Cruise No: 4 A

2. Dates of sailing — From 28.02.2014 To 24.04.2014

3. Operating Authority

DTU-Aqua
Charlottenlund Castle
DK-2920 Charlottenlund

Telephone: +45 35 88 33 00 Fax: +45 35 88 33 33 E-mail: aqua@aqua.dtu.dk

4. Owner (if different) .....

5. Particulars of ship:

Name	: Dana
Nationality	: Danish
Overall length	: 78 meters
Maximum draught	: 5.7 meters
Bto tonnage	: 2483
Call sign	: OXHB

6. Crew

Name of Master	Jesper Jørgen Brockstedt Rasmussen
No of Crew	12-18

7. Scientific Personnel

Name and address of Scientist in charge:

Dr. Peter Munk
National Institute for Aquatic Resources,
Section for Ocean Ecology and Climate
Technical University of Denmark
Kavalergården 6
DK-2920 Charlottenlund
Denmark

E-mail and telephone:
Tel: +45 35883409
email: pm@aqua.dtu.dk

No of Scientists:
20 scientists

8. Geographical area in which ship will operate (with reference in latitude and longitude).
The sampling is planned for the area approximately enclosed by the coordinates: (see also map below)

DecLat	DecLong
32.33	-64.75
28.7	-73
24	-73
21.8	-70
21.8	-57
25	-50
32.33	-50

The cruise will carry out a series of north-south transects in the Sargasso Sea and Mid-Atlantic. There will only be limited sampling in the southern part of the EEC of Bermuda and northern part of the Carribean.

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9. Brief description of purpose of cruise.
The stock of European eel is in dramatic decline and there is much need for understanding the oceanic part of this species' lifecycle. Intensive research in the spawning areas of the eel in the Sargasso Sea area is planned for the spring of 2014, carrying out a 2 month cruise to the area and mid-Atlantic with the r/v Dana.The research focuses on

spawning sites in relation to hydrography, the extent of larval distribution and larval drift towards the European continent. The cruise is funded by the Danish Centre for Marine Research and the Danish Carlsberg Foundation.

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10. Dates and names of intended ports of call.

The ship will arrive in Bermuda14/3 2014, and depart on the 15/3. We will use a short stay at Bermuda 6-7/4, and continue sampling towards the Azores.

11. Any special logistic requirement at ports of call: (Yes/No)

No

NOTIFICATION OF PROPOSED RESEARCH CRUISE
DETAIL

Part B

1. Name of research ship Dana Cruise No: 4 A

2. Dates of sailing From 28.02-2014 To 24-04-2014

3. Purpose of research and general methods:
Due to a dramatic decline in the recruitment and stock of European eel there is a need for improved insight into the lifecycle of eel, and an extensive research programme will be carried out during a cruise to the spawning areas in the Sargasso Sea in 2014. A consortium of Danish scientists will focus on the linkages between oceanography, biological production, eel spawning and the growth and drift of eel larvae during nearly 2 months of research.
A range of sub-projects will be carried out, including combined studies of 1) oceanographic frontal phenomena and their influence on primary and secondary production, 2) oligotrophic plankton ecosystem and its importance to eel larval feeding, 3) the distribution, species differences, growth and drift of eel larvae, 4) the genetic population structure of the species and 5) occurrence of adult eels. Methods include extensive use of satellite imagery, ship-based hydrographical measurements of water properties and currents, plankton and larval sampling, genetic analyses of plankton composition, genome analysis of eel larvae as well as hydro-acoustic techniques and fishing for adult eels.

4. Attach chart showing (on an appropriate scale) the geographical area of the intended work, positions of intended stations, tracks of surveys lines, positions of moored/seabed equipment.

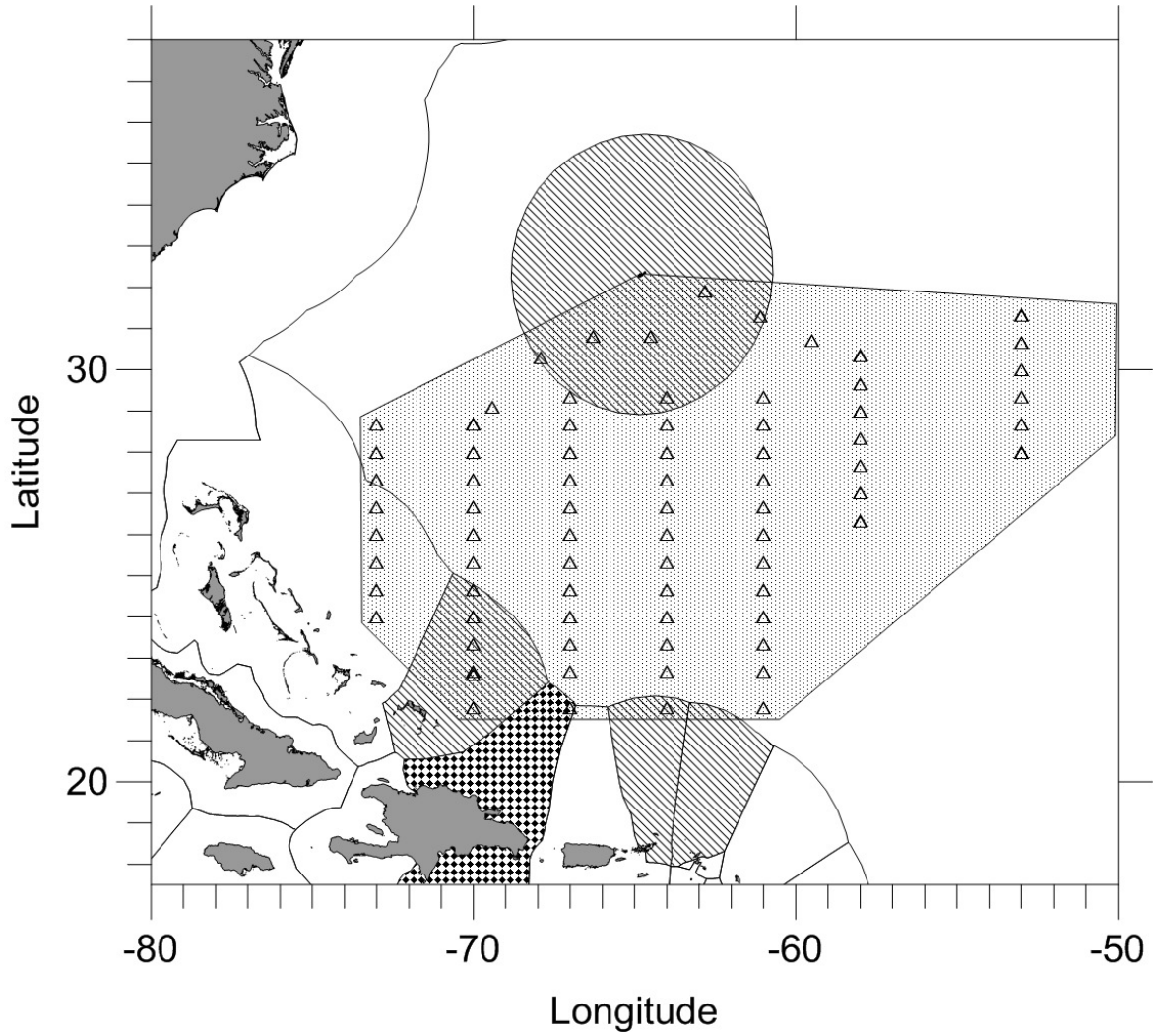

Table of planned station locations (additional stations in same tracks are expected)
DecLat Latitude in decimal degrees north
DecLong Longitude in decimal (-) degrees west

DecLat	DecLong		DecLat	Declong		DecLat	DecLong
28.66666	-73		22.66663	-67		22.66663	-61
27.99999	-73		23.3333	-67		23.3333	-61
27.33332	-73		23.99997	-67		23.99997	-61
26.66665	-73		24.66664	-67		24.66664	-61
25.99998	-73		25.33331	-67		25.33331	-61
25.33331	-73		25.99998	-67		25.99998	-61
24.66664	-73		26.66665	-67		26.66665	-61
23.99997	-73		27.33332	-67		27.33332	-61
28.66666	-70		27.99999	-67		27.99999	-61
28.66666	-70		28.66666	-67		28.66666	-61
27.99999	-70		29.33333	-67		29.33333	-61
27.33332	-70		29.33333	-64		29.1	-69.4
26.66665	-70		28.66666	-64		30.3	-67.9
25.99998	-70		27.99999	-64		30.8	-66.3
25.33331	-70		27.33332	-64		30.8	-64.5
24.66664	-70		26.66665	-64		31.9	-62.8
23.99997	-70		25.99998	-64		31.3	-61.1
23.3333	-70		25.33331	-64		30.7	-59.5
22.66663	-70		24.66664	-64		22.6	-70
			23.99997	-64		21.8	-70
			23.3333	-64		21.8	-67
			22.66663	-64		21.8	-64
						21.8	-61

Time plan for the cruise.

Date	**Description**
14-3-2014	Arrival Bermuda
	Bunkering/crew exchange
15-3-2014	Departure Bermuda
	Station sampling
6-4-2014	Arrival Bermuda
	Bunkering/crew exchange
7-4-2014	Departure Bermuda
	Station sampling

5. Types of samples required, e g Geological/Water/Plankton/Fish/Radioactivity/Isotope, and methods by which samples will be obtained (including dredging/coring/drilling).
The measurements to be made include: Physical properties of water (temperature, salinity, light penetration), chemical properties (inorganic nutrients, organic carbon content and characteristics, alkalinity) and biological measurements (on diversity, abundance and productivity of marine virus, bacteria, phytoplankton and zooplankton). Acoustics will be used for estimation of currents and fish abundances.
Sampling will be carried out with small meshed plankton-nets for zooplankton, fish larvae and small juvenile fish. In the southernmost part fishing with large pelagic nets will be carried out (this not in Bermuda zone)

6. Details of moored equipment:
No moorings will be deployed.

7. Explosives:
None will be used.

8. Detail and reference of
(a) Any relevant previous/future cruises

A cruise with hmv Vædderen in April 2007(Danish Galathea expedition) sampled in the same area. This described in Munk et al Oceanic fronts in the Sargasso Sea control the early life and drift of Atlantic eels. Proc. R. Soc. B vol. 277 no. 1700 3593-3599

(b) Any previously published research data relating to the proposed cruise. (Attach separate sheet if necessary.)

Als TD, Hansen MM, Maes GE, Castonguay M, Riemann L, Aarestrup K, Munk P, Sparholt H, Hanel R, Bernatchez, L. (2011). All roads lead to home: panmixia of European eel in the
Aarestrup K, Økland F, Hansen MM, et al. (2009) Oceanic spawning migration of the European eel (Anguilla anguilla). Science, 325, 1660-1660.Sargasso Sea. Mol Ecol 20(7):1333-1346
Albert V, Jonsson B, Bernatchez L (2006) Natural hybrids in Atlantic eels (Anguilla anguilla , A. rostrata): evidence for successful reproduction and fluctuating abundance in space and time. Molecular Ecology, 15, 1903-1916.
Andersen NG, Nielsen TG, Jakobsen HH, Munk P, Riemann L. (2011). Distribution and production of plankton communities in the subtropical convergence zone of the Sargasso Sea. II. Protozooplankton and copepods Mar Ecol Prog Ser 426:71-86

9. Names and addresses of scientists of the coastal state in whose waters the proposed cruise takes place with whom previous contact has been made:

Dr. Nicholas Bates
Bermuda Institute of Ocean Sciences
Biological Station
Ferry Reach
St.George's GE 01
Bermuda

10. State:

(a) Whether visits to the ship in port by scientists of the coastal state concerned will be acceptable.

Yes

(b) Whether it will be acceptable to carry on board an observer from the coastal state for any part of the cruise and dates and ports of embarkation/disembarkation.

Generally yes, however, accommodation is probably not available.

(c) When research data from intended cruise is likely to be made available to the coastal state and if so by what means.

Standard oceanographic data can be made available one year after the cruise by contacting the cruise leader.

SCIENTIFIC EQUIPMENT Port call: 14-15/03 – 2014 and 06-07/04. Hamilton, Bermuda

11. Complete the following table - SEPARATE COPY FOR EACH COASTAL STATE (INDICATE ´YES´ OR ´NO´)

UK Bermuda, Turks and Caicos Islands, British Virgin Islands, Anguilla.

List of all major Marine Scientific equipment it is proposed to use and indicate waters in which it will be deployed Limits	Fisheries Research within Fishing Limits	Research concerning Continental Shelf out to coastal state's margin	Distance from coast			
			Within 3 NM	Between 3-12 NM	Between 12-50 NM	Between 50-200 NM
Water sampling equipment					Yes	Yes
Vertical plankton net					Yes	Yes
CTD-sond and light meter					Yes	Yes

Towed nets					Yes	Yes
Fishing						Yes

Nina Holm Dated: 23.10.2013

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On behalf of the Principal Scientist