APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH IN AREAS UNDER NATIONAL JURISDICTION OF UNITED KINGDOM

**Date : 24/4/06**

## 1 - GENERAL INFORMATION

### 1.1. Cruise name and/or number: RADPROF0706

### 1.2. Sponsoring institution :

Nom : IEO, Instituto Español de Oceanografía.
Adresse : Avenida de Brasil, 31 – 28020. Madrid (Espagne).
Téléphone : 91-597 44 43 Fax : 91-597 47 70
Directeur : Concepción Soto Calvo

### 1.3. Scientist in charge of the project :

Name: Alicia Lavín Montero.
Address : Instituto Español de Oceanografía, Centro Oceanográfico de Santander
Promontorio de San Martín, s/n. Apdo correos 240. 39080. Santander. Spain
Telephone: 942-29 10 60 Fax : 942-27 50 72
Email: alicia.lavin@st.ieo.es

### 1.4. Scientist involved in the planning of the project :

Nom : Alicia Lavín Montero (Chef de projet)
Adresse: Promontorio de San Martín, s/n. Apdo correos 240. 39080. Santander
Téléphone: 942-29 10 60 Fax : 942-27 50 72
Email: alicia.lavin@st.ieo.es

Nom : Jose Manuel Cabanas (Chef of the cruise)
Adresse: Cabo Estay Canido s/n Apdo 1552, 36980 Vigo
Téléphone: 996 492111 Fax : 986- 498626
Email: jmanuel.cabanas@vi.ieo.es

### 1.5. Submitting officer:

Nom : Alicia Lavín Montero (Chef de projet)
Adresse: Promontorio de San Martín, s/n. Apdo correos 240. 39080. Santander
Téléphone: 942-29 10 60 Fax : 942-27 50 72
Email: alicia.lavin@st.ieo.es

## 2 - DESCRIPTION OF THE PROJECT

### 2.1. Nature and objectives of the project :

The project aims at the thermohaline characterization of the zone by means of repeated hydrographical transects performed twice a year. This is a contribution for some objectives of the International program CLIVAR « Describe and understand the physical processes responsible of climate variability and its seasonal, interannual and decadal predictability".

Other objective is to describe and quantify the fluxes of energy, mass, freshwater, oxygen and nutrients in 3 or 4 boxes in the Iberian and European basin and between this and the Bay of Biscay and the Cantabrian Sea. This fluxes will be quantified by means of dynamical computations from the distribution of hydrographical properties and the mass conservation in the box

The objective of the $CO_2$ team from IIM Vigo is to quantify the meridional transports of inorganic carbon and to determine the anthropogenic carbon in the Bay of Biscay. During the second leg of the cruise VACLAN 2005, pH and alcalinity measurements will be performed. The variables in the carbonic system (pH and alcalinity) will allow to compute in a precise way the total inorganic carbon $C_T$ making use of the thermodynamical equations for the carbon cycle (Dickson, Deep-Sea Research 1981) and the dissociation constants of Mehrbach et al. (Limnology and Oceanography, 1973).

The study also includes the evaluation of plankton in the area, through the characterisation of the Dissolved Organic Matter (DOM) in the transects and the measurement of total nitrogen concentration and natural abundance of $^{15}N$ and the determination of the structure of the picoplanktonic community (<2 μm).

### 2.2. Relevant previous or future research cruises :

-RADPROF 0403: Vigo-Santander (09/04/03-17/04/03)
-RADPROF 0903: Santander-Vigo (10/09/03-20/09/03)
-RADPROF 0204: Vigo-Santander (05/02/04-13/02/04)
-RADPROF 0904: Vigo-Santander (06/09/05-14/09/04)
-RADPROF 0105: Santander-Vigo (26/01/05-4/02/05)
-RADPROF0206: Vigo-Santander (5/02/06-14/02/06)

### 2.3. Previously published research date relating to the project :

## 3 - METHODS AND MEANS TO BE USED

### 3.1. Particular of vessel

Nom :
Nationalité : Espagnol
Propriétaire : Espagnol
Opérateur :
Longueur hors-tout :
Tirant d'eau maximun:
Tonnage brut :
Propulsion :
Vitesse maximale : noeuds
Code d'appel :
Méthodes et possibilités de communication (dont telex, fréquences) :
Nom du commandant :
Nombre d'hommes d'équipage : 27.
Nombre de scientifiques embarqués : 31

Name : Cornide Saavedra
Nationality : Spanish
Owner : IEO
Operator : IEO
Overall length : 66.7 m
Maximum draught : 4.65 m Maximal displacement: 3022 t
Gross tonnage : 1113 UMS
Propulsion : 2250 CV
Cruising speed : 13 knots
Call sign : Method and capability of communication (including telex, frequencies) :

Name of master : Ernesto Fernandez
Number of crew : 27
Number of scientists on board : 31

### 3.2. Aircraft or other craft to be used in the project :

### 3.3. Particulars of methods and scientific instruments :

| Types of samples and data | Methods to be used | Instruments to be used |
|---|---|---|
| Hydrology | Vertical Profile<br>Surface Profile | Bathysondes<br>Thermosalinograph |
| Picoplankton/Chl | Flux citometry | Filtration |
| $CO_2$ measurements | Spectrophotometer | Spectre-Photometer |

| | | |
|---|---|---|
| | Potentiometer titration | Titrino Metrohm |
| Measures de courant | | Aanderaa measurement of current |
| MOD | | Filtration<br>Spectroflourometer Perkin Elmer LS50B |
| | | |

**3.4. Indicates whether harmful substances will be used :**

YES

Chemical products used:

| Usual name of the product | Chemical formula | Quantity on board and concentration | Nature<br>S : solid,<br>L : liquid<br>G : gas |
|---|---|---|---|
| **Glutaraldehyde** | **C5H8O2** | **0.05 L** | **L** |
| **Mercury Chloride** | **HgCl2** | **0.6 L** | **L** |
| **Acetone** | **CH3COCH3** | **5 L** | **L** |
| **Chlorhydric Acid** | **HCl** | **3 L** | **L** |
| **m-Cresol Purple Sodium** | **NaC2H8O** | **1 g** | **S** |
| **Para formaldehyde** | **(HCHO)n** | **0.05 L** | **L** |
| **Sodium Hydroxide** | **OHNa** | **4 Kg** | **L** |
| **Sodium Tiosulfate** | **Na2SO3** | **2Kg** | **L** |
| **Potassium Iodide** | **KIO3** | **1 Kg** | **L** |
| **Manganese Sulfate** | **MnSO4** | **4 Kg** | **L** |
| **Nitrogen liquid** | **$N_2$** | **30 L** | **L** |
| **Sulfuric Acid** | **$SO_4H_2$** | **2 Kg** | **L** |

**3.5. Indicate whether drilling will be carried out :**

NO

**3.6. Indicate whether explosives will be used:**

NO

## 4 - INSTALLATIONS AND EQUIPMENTS

**Details of installations and equipments (dates of laying, servicing, recovery, exact locations and depth)**

| | |
|---|---|
| B/O: | IEO |
| Position: | GPS |
| Acoustic: | LADCP |
| Hydrology | Thermosalinograph<br>Fluorimeter |
| Climatologic: | Meteorological Station |

## 5 - GEOGRAPHICAL AERAS

**5.1. Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude) :**

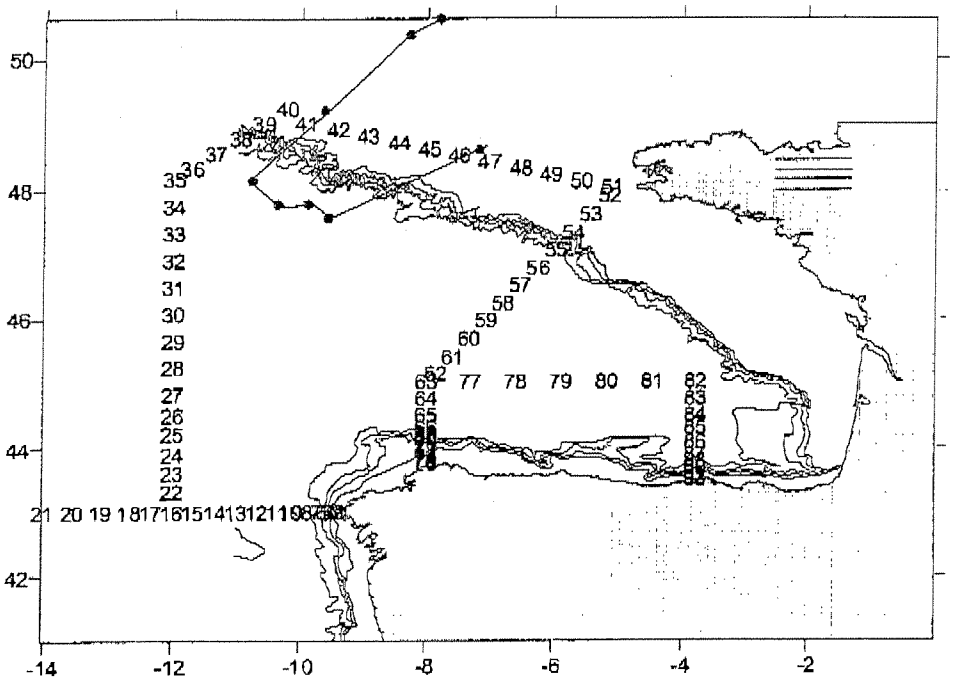
43° N – 13° 40′ W / 49° N – 10° 30′ W

**5.2.Attach chart(s) at an appropriate scale showing the geographical areas of the intended work and, as far as practicable, the positions of intended stations, the tracks of survey lines, and the locations of installations and equipment:**

**(see attached chart)**

Positions of intended stations for RADPROF0706:

| *Station* | *Latitude* | *Longitude* |
|---|---|---|
| **United Kingdom** | | |
| 42 | 48° 55.4 ' N | 9° 26.2 ' W |
| 43 | 48° 49.6 ' N | 8° 57.1 ' W |
| 44 | 48° 43.8 ' N | 8° 28.1 ' W |
| 45 | 48° 38.0 ' N | 7° 59.1 ' W |
| 46 | 48° 32.3 ' N | 7° 30.1 ' W |
| **Ireland** | | |
| 31 | 46° 30.0 ' N | 12° ' W |
| 32 | 46° 55.0 ' N | 12° ' W |
| 33 | 47° 20.0 ' N | 12° ' W |
| 34 | 47° 45.0 ' N | 12° ' W |
| 35 | 48° 10.0 ' N | 12° ' W |
| 36 | 48° 20.1 ' N | 11° 43.3 ' W |
| 37 | 48° 33.5 ' N | 11° 20.9 ' W |
| 38 | 48° 46.9 ' N | 10° 58.5 ' W |
| 39 | 49° 0.3 ' N | 10° 35.9 ' W |
| 40 | 49° 13.7 ' N | 10° 13.2 ' W |
| 41 | 49° 1.2 ' N | 9° 55.4 ' W |
| **France** | | |
| 47 | 48° 26.5 ' N | 7° 1.2 ' W |
| 48 | 48° 20.7 ' N | 6° 32.4 ' W |
| 49 | 48° 14.9 ' N | 6° 3.6 ' W |
| 50 | 48° 9.1 ' N | 5° 34.9 ' W |
| 51 | 48° 3.3 ' N | 5° 6.3 ' W |
| 52 | 47° 53.9 ' N | 5° 9.0 ' W |
| 53 | 47° 37.3 ' N | 5° 25.7 ' W |
| 54 | 47° 20.7 ' N | 5° 42.3 ' W |
| 55 | 47° 4.2 ' N | 5° 58.8 ' W |
| 56 | 46° 47.6 ' N | 6° 15.2 ' W |
| 57 | 46° 31.1 ' N | 6° 31.5 ' W |
| 58 | 46° 14.5 ' N | 6° 47.8 ' W |


50
48
46
44
42
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-12
-10
-8
-6
-4
-2

## 6 - DATES

**6.1 Expected dates of first entry into and final departure from the research area of the research vessel :**

**entry** date : 15/07/2006

**departure** date : 17/07/2006

**6.2 Indicate if multiple entry is expected :**

## 7 - PORTS CALLS

**7.1. Dates and names of intented ports of call in ..... .**
07/07/2006 ( Vigo, Spain).
21/07/2006 ( A Coruña, Spain).
29/07/2006 ( Santander, Spain).

**7.2. Any special logistical requirements at ports of call :**

**7.3. Name/Address/Telephone of shipping agent (if available)**

## 8 - PARTICIPATION

**8.1. Extent of which IEO. will be enabled to participate or to be represented in the research project :**

Electronic
Hydrology : CTD
LADCP
Picoplankton/DOM
Sampling (IEO-Univ-Vigo)
$CO_2$ (IIM-CSIC)

**8.2. Proposed dates and ports for embarkation/disembarkation :**

| | | | |
|---|---|---|---|
| **start** | date : | 07/07/2006 | Vigo, Spain |
| **end** | date : | 29/07/2006 | Santander, Spain |

## 9 - ACCESS TO DATA, SAMPLES AND RESEARCH RESULTS

**9.1. Expected dates of submission of preliminary reports which should include the expected dates of submission of the final results:**

Before January 2007

**9.2. Proposed means for access by scientific community to data and samples:**

Scientific Report in 2007

**9.3. Proposed means of making research internationally available:**

International Journals