

在中華民國專屬經濟海域或大陸礁層從事海洋科學研究計畫申請書
Application Form for Permission to Undertake Marine Scientific Research in the
Exclusive Economic Zone or on the
Continental Shelf of the Republic of China

壹、注意事項

- 一、依「在中華民國專屬經濟海域或大陸礁層從事海洋科學研究許可辦法」第四條規定，申請在中華民國專屬經濟海域或大陸礁層從事海洋科學研究許可者，均應事先填具本計畫申請書，並在辦法規定期限內提出申請，逾期將不予受理。
(According to Article 4 of the Regulations Governing Permission to Undertake Marine Scientific Research in the Exclusive Economic Zone or on the Continental Shelf of the Republic of China, this form is required to be filled out for application for permission to undertake marine scientific research in the exclusive economic zone or on the continental shelf of the Republic of China. Application forms received by the office after the deadline will not be accepted.) 。
- 二、臺灣地區人民計劃在中華民國專屬經濟海域或大陸礁層單獨從事海洋科學研究，需說明本計畫申請書第一至第六項 (People of the Taiwan Area intending to undertake marine scientific research in the exclusive economic zone or on the continental shelf of the Republic of China only need to explain items 1 to 6.) 。
- 三、大陸地區人民計劃在中華民國專屬經濟海域或大陸礁層與臺灣地區人民合作從事海洋科學研究，應詳細填寫本計畫申請書所有問題 (People of the Mainland Area intending to undertake marine scientific research, in cooperation with people of the Taiwan Area, in the exclusive economic zone or on the continental shelf of the Republic of China shall respond to all questionnaires of this form in detail.) 。
- 四、外國人計劃在中華民國專屬經濟海域或大陸礁層，單獨或與臺灣地區人民合作從事海洋科學研究，應詳細填寫本計畫申請書所有問題 (Foreigners intending to undertake marine scientific research, independently or in cooperation with people of the Taiwan Area, in the exclusive economic zone or on the continental shelf of the Republic of China shall respond to all questionnaires of this form in detail.) 。

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日期 (Date) : 18 Dec 2009
Revised 1/28/10

1. 基本資料 (General information)

1.1 計畫名稱 (Project name) : Impact of Typhoons on the Pacific: Glider Operations

1.2 計畫執行機關 (Undertaking institution) :

單位名稱 (Name) : Scripps Institution of Oceanography

聯絡地址 (Address) : University of California, San Diego

La Jolla, California, USA 92093-0210

單位主管 (Name of director) : Dr. Tony Haymet

1.3 計畫贊助機關 (Sponsoring institution) :

單位名稱 (Name) : U.S. Office of Naval Research

聯絡地址 (Address) : 875 North Randolph Street, Suit 1425,

Arlington, Virginia, USA 22203-1995

單位主管 (Name of director) : Dr. Terri Paluszkiwicz

1.4 計畫主持人 (Scientist in charge of the project) :

姓名 (Name) : Dr. Craig M. Lee

任職單位 (Affiliation) : Applied Physics Laboratory,

University of Washington

1013 NE 40th St

Seattle, WA 98105-6698

USA

電話 (Tel) : +1-206-685-7656 傳真 (Fax) : +1-206-543-6785

電子信箱 (E-mail address) : craig@apl.washington.edu

1.5 國內參與之科學人員名單 (Scientist(s) from Republic of China involved in the planning of the project) :

(1)姓名 (Name) Professor T.Y. Tang

任職單位 (Affiliation) : National Taiwan University

(2)姓名 (Name) : Professor Sen-Jan

任職單位 (Affiliation) : National Taiwan University

(3)姓名 (Name) : Professor I-I Lin

任職單位 (Affiliation) : National Taiwan University 1.6聯絡人 (Submitting officer) :

姓名 (Name) : Elizabeth Brenner/Rose Dufour

聯絡地址 (Address) : Scripps Institution of Oceanography

University of California, San Diego

La Jolla, California 92093-0210

電話 (Tel) : (858) 534-2841 傳真 (Fax) : (858) 822-5811

電子信箱 (E-mail address) : Shipsked@ucsd.edu

2. 計畫描述 (Description of project)

2.1 計畫背景及目的 (Nature and objectives of the project) :

ITOP aims to study the ocean response to typhoons in the western Pacific Ocean. Understanding the impact of such strong storms on the ocean will help improve track and intensity forecasts and thus benefit those living in areas subject to typhoons. The primary focus of the experiment is to improve our understanding of the cooling of the upper ocean associated with the passage of a typhoon ("cold wake"). In particular, we seek to (1) measure the formation and evolution of the cold wake via air-deployed oceanographic instruments and ship surveys, and (2) get a detailed description of the atmospheric forcing on the ocean, by measuring the atmospheric conditions before, during, and after the storm.

This project will employ long-range, autonomous gliders to sample areas that have a high probability of being subjected to typhoons. Eight gliders will be deployed between June and September from the R/V *Revelle* at locations within the operating region (please see attached chart) and will then occupy surveys designed to sample typhoons. Gliders may be deployed from multiple cruises. Gliders will be recovered in October/November at the end of the experiment. Because typhoon paths are difficult to predict, it is not possible to specify the deployment, recovery or survey locations in advance of the actual field program. We will deploy between zero and eight gliders, depending on conditions, and all vehicles will remain with the operating area specified in the attached chart.

Seagliders are small, reusable, long-range (3000 – 4000 km) autonomous underwater vehicles designed to glide from the ocean surface to as deep as 1000 m and back while collecting profiles of temperature, salinity, dissolved oxygen concentration and optical properties. Gliders steer through the water by controlling attitude (pitch and roll) and can thus navigate between waypoints to execute survey patterns; or they hold station while profiling and collect Eulerian time series as a 'virtual mooring'. Mission durations depend largely on ambient stratification and profile depth, but for this application should be approximately 6 months. Gliders are commanded remotely and report their measurements via Iridium satellite telephone at the conclusion of each dive. The vehicles also archive all data to onboard storage for delayed mode transmission or post-recovery interrogation. They use GPS navigation at the sea surface to dead reckon toward commanded targets by assimilation with a Kalman filter or through other algorithms. Navigation and knowledge of vehicle buoyancy and pitch angle allows estimation of depth-averaged current and suitably energetic vertical velocity fluctuations. Sensor suites include pressure, temperature, conductivity, Doppler sonar, dissolved oxygen, chlorophyll fluorometer, and optical backscatter. Gliders have been deployed and recovered from a wide range of platforms including small rubber boats, chartered fishing vessels and large research ships. Because the vehicles are relatively small and light, special handling gear is not required and field teams typically consist of one or, at most, two individuals. In more remote regions, we have also had significant success training local collaborators to handle field operations, eliminating the need to send highly-trained personnel from our laboratories.



Seaglider photos. The Iridium/GPS antenna sits at the end of the long tail. Sensors are carried in the two narrow, cylindrical housings in the top aft region of the glider.

2.2 過去或未來相關研究航次 (Relevant previous or future research cruises) :

None, however we will be submitting an additional request for a similar time frame.

2.3 過去已發表與本計畫相關之研究成果 (Previously published research data relating to the project) :

None

3. 研究方法 (Methods and means to be used)

3.1 船隻特性並檢附可看到船舶全身及船名之彩色照片 (Particulars of vessels. Please attach color photographs of all vessels showing clearly all the listed particular features including the names of the vessels.) Deployments may take place in the Taiwanese, Philippine or Japanese EEZs' or within international waters. Glider-based survey operations could take place in any of these EEZs, as might recoveries. We respectfully seek permission for R/V Revelle to enter the EEZs to deploy and recover gliders and to collect a small number of CTD profiles for the purpose of calibrating glider sensors, and for **gliders** to sample within the EEZs (in the area marked on the chart). Dates will extend from 11 June – 13 November, 2010.



Web link:

http://shipsked.ucsd.edu/Ships/Roger_Revelle/

名稱 (Name) : R/V Roger Revelle

類型 (Type) : Oceanographic Research Vessel

國籍 (Nationality) : USA Flag

所有人 (Owner) : On Charter to the University from U.S. Navy

管理人 (Operator) : University of California, San Diego, Scripps Oceanography
總長度 (Overall length) : 84 m. [275']
最大吃水量 (Maximum draught) : 17'
淨噸數 (Net tonnage) :
總噸數 (Gross tonnage) : 3,180 long tons
馬力 (Propulsion) : Tow 3000 hp Propulsion General Electric
Bow Thruster: 1180 hp Azimuthing jet Tyupe Elliot
Gill Model 50T 35 Propulsors:
Two 3000 hp Z-Drives Lips Type FS 2500-450/1510BO
航速 (Cruising speed) : 12 knots
最大航速 (Maximum speed) : 14 knots
呼號 (Call sign) : KAOU
通訊方式 (Method and capability of communication, including telex, frequencies) :

Email, master@rv-revelle.ucsd.edu

Inmarsat-B,

Telephone,

Indian, 011-873-336780030

Alternate, 011-873-336780020

Fax,

Primary, 011-873-336780031

Alternate, 011-873-336780021

Telex,

Primary, 336780033 (AnsBk=KAOU)

Alternate, 336780022 (AnsBk=KAOU)

Inmarsat-C, 436780010

Radio, Vessels guard standard GMDSS frequencies for calling, distress and dissemination of marine safety information.

MMSI #, 367800100

SELCAL #, 71410

Telex,

Primary, 336780033 (AnsBk=KAOU)

Alternate, 336780022 (AnsBk=KAOU)

Inmarsat-C, 436780010

Radio, Vessels guard standard GMDSS frequencies for calling, distress and dissemination of marine safety information.

MMSI #, 367800100

SELCAL #, 71410

船長姓名 (Name of master) : Captain Tom Desjardins

船員數 (Number of crew) : 22

船上科學家人數 (Number of scientists on board) : No more than 37

3.2 船上科學家及船員名單 (List of on-board scientists and crew members) :

A complete list will be provided as information becomes available.

□□ Title	□□ Name	□□ Sex	□□□□□□ Date of Birth (yy/mm/dd)	□□ Nationality	□□□□□□□□□□□□ Passport or ROC ID No	□□ mailing address
Dr.	Craig Lee	M		USA		Applied Physics Laboratory University of Washington 1013 NE 40 th St Seattle, WA 98105-6698 USA
Dr.	Hans Graber	M		USA		
Dr.	Ren-Chie h Lien	M		USA		Applied Physics Laboratory University of Washington 1013 NE 40 th St Seattle, WA 98105-6698 USA
Dr.	Luc Rainville	M		USA		Scripps Institution of Oceanograph y
Dr.	Louis	M		USA		Woods Hole

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	StLaurent					Oceanographic Institution
Dr.	Steve M Jayne			USA		

* 本表格不敷使用時請另紙繕寫 (Attach separate sheets of paper if needed)

3.3 計畫中使用其它載具名稱 (Aircraft or other craft to be used in the project) :

None

3.4 研究方法與儀器 (Particulars of methods and scientific instrument) :

樣本及資料形式 (Types of samples and data)	使用方法 (Methods to be used)	使用儀器 (Instruments to be used)
T, S, chlorophyll fluorometer, light attenuation (660nm), CDOM fluorescence, dissolved oxygen profiles	Shipboard CTD profiling	Seabird CTD and rosette
Water velocity profiles	Ship-based surveys	Shipboard ADCP, GPS, GPS attitude
Water velocity profiles	Ship-based surveys	Shipboard ADCP, GPS, GPS attitude, and <i>Revelle</i> HDSS
Metorological variables (e.g. wind speed, heat flux, air temperature, etc)	Ship-based surveys	Shipboard meteorological sensors
Underway (UW) multibeam	Swath mapping	Kongsberg EE122 150 degree swath width, 121 bathymetry beams, plus backscatter imagery

3.5 是否使用有害物質 (Indicate whether harmful substances will be used) :

None

3.6是否進行鑽探（Indicate whether drilling will be carried out）：

No drilling

3.7是否使用爆炸物（Indicate whether explosives will be used）：

No explosives will be used

3.8是否進行海洋生物、非生物資源探勘或捕撈活動（Indicate whether the project involves catching, taking or exploration of marine animals and plants）：

None

4. 儀器裝備設置計畫 (Installations and equipment)

4.1 儀器設置計畫之細節，含佈設、作業及拆除日期、確實位置及深度 (Details of installations and equipment - dates of laying, servicing, recovery; exact locations and depth) :

Gliders will operate autonomously (without the presence of the ship) between 11 June – 24 November, 2010. We request permission for them to sample within the EEZs of Taiwan, Japan and the Philippines during this period.

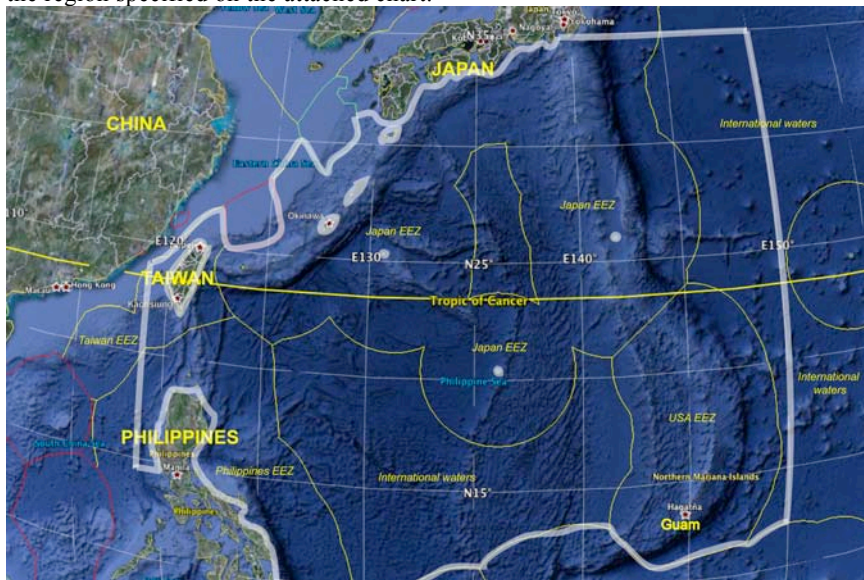
5. 地理區域 (Geographical areas)

5.1 本計畫進行之地理位置，附經緯度標示 (Indicate geographical areas in which the project is to be conducted - with reference in latitude and longitude) :

See chart below

5.2 檢附適當比例之詳細海圖，並明確標示作業區域、確實站位、研究路線及儀器裝備設置位置 (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.)

Request permission to operate gliders and collect CTD and shipboard ADCP profiles within the region specified on the attached chart.



The gray box marks the ITOP operation area- all glider activities will be confined to within this box. Although they lie within the box, some areas are excluded. Operations will not occur

within 12 nm territorial waters of Japan, within 12 nm of the Philippines or within 24 nm of Taiwan. The region north of the Ryuku Island chain that is part of the Chinese EEZ will also be excluded.

6. 時程 Dates

6.1 研究船預定進入及離開研究海域時間 (Expected dates of first entry into and final departure from the research area of the research vessel) :

R/V Revelle First entry in approximately 11 June 2010

R/V Revelle departs region 24 November 2010

Gliders are anticipated to be in the area until 24 November 2010

6.2 是否多次進出 (Indicate if multiple entry is expected) :

Proposed Time of Multiple Entries

The departure and return dates are listed above for the two cruises at the beginning and end of the experiment are : 11 June – 5 July 2010 and 24 October – 24 November 2010. R/V Revelle cruises that take place between 24 July – 23 October 2010 will be scheduled in response to passing typhoons, so it is not possible to specify dates in advance.

Gliders (8 gliders total) will conduct surveys from 11 June – 24 November 2010. However, due to uncertainties concerning glider operations and navigation, it is not possible to predict timing for glider surveys.

7. 靠港 (Port calls)

June 11, 2010: Kaohsiung, Taiwan, multiple port stops will follow.

7.1 預定靠港地點 (Dates and names of intended ports of call in Republic of China) :

Potentially port calls in Kaoshiung and Keelung, Taiwan

7.2 特殊補給需求 (Any special requirements at ports of call) :

Normal: scientific equipment loading, fueling, storage, and personnel exchange of science party and crew

7.3 船務代理公司名稱、地址及聯絡電話 (Name / Address / Telephone of shipping agent ,if available) :

We will be working with National Taiwan University, National Taiwan Ocean University, and Naval Academy of Taiwan to work out logistics and harbor needs.

Ship's Agent

Jardine, Matheson & Co

13/14F, No. 50 Hsin Sten South Road, Sec.1

Taipei, P.O. Box 81

Taiwan

Tel: 886-2 23931177

Fax: 886-2 23920435

Gen Email: operation.tpe@jm.com.tw

7.4

8. 參與 Participation

8.1 中華民國可派代表參與本研究計畫的程度 (Extent to which Republic of China will be enabled to participate or to be represented in the research project) :

Participation by Japanese, Taiwanese and Philippine colleagues encouraged

8.2 人員上下船的港口名稱及日期 (Proposed dates and ports for embarkation / disembarkation) :

Kaohsiung, Taiwan

Jun 6-14, 2010

All dates between to be determined by typhoons.

24-26 Oct 2010 and more port stop to be determined.

9. 研究樣本及成果之取得 (Access to data, samples and research results)

9.1 預計初步研究報告送交中華民國之日期 (Expected dates of submission to Republic of China of preliminary reports which should include the expected dates of submission of the final results) :

No more than 30 days from the end date of the cruise.

9.2 中華民國獲得研究樣本之方式 (Proposed means for access by Republic of China to samples) :

CD or DVD provided at conclusion of cruise, with further access to the data via internet download or CD/DVD on request.

9.3 對中華民國提供研究數據、樣本，或協助研究資料解釋的方式 (Proposed means to provide Republic of China with assessment of data, samples and research results or provide assistance in their assessment or interpretation) :

Participation in international workshops and science symposia during the analysis phase of the project phase of the project.

9.4 研究成果對國際公開的方式 (Proposed means of making research results internationally available) :

Publication in scientific journals and reports.

茲聲明以上所提供資料正確屬實

I hereby declare that the above-mentioned information is true and complete.

申請人簽章 Signature of the Applicant