

September, the 1st, 2014

## OCEANOGRAPHIC CRUISE

### ON THE R/V ANTEA

*Application for consent to conduct marine scientific research in*

**ANGUILLA Exclusive Economic Zone**

*Four French research vessel operators (CNRS, IFREMER, IPEV, IRD), under the supervision of the National Research and Education Ministry, have created on the 1st March 2011, a single fleet administration entity in a form of a Unité Mixte de Service (Combined Unit Service - UMS). The UMS has been created on March 03rd 2011.*

*This operational entity aims at:*

- *Create and implement the integrated programming of the fleet vessels and equipments*
- *Elaborate a prospective work, fix and coordinate a fleet evolution scheme on a national level*
- *Coordinate the institutes fleet investment policy*

*The fleet gathers ocean going vessels and their associated major mobile equipment (all ocean but ice covered) together with coastal vessels and station vessel, for a continuous investigation capacity from shore to offshore.*

## GENERAL INFORMATION

### *Institution in charge*

*Name:* Institut de Recherche pour le Développement (IRD)  
*Address:* IRD - 44 boulevard de Dunkerque CS 90009  
13572 Marseille cedex 02 - France  
*Phone:* +33 4 91 99 92 00  
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*Director* Mr. Michel Laurent

### *Person in charge of the application*

*Name:* Yves Gouriou / Dominique Lopes  
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### *Scientist in charge of the project*

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Noumea cedex, Nouvelle-Calédonie  
*Phone:* +687 26 07 87  
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*Email:* Cecile.fauvelot@ird.fr

### *Collaboration with relevant country*

*Name:* Professor Richard Preziosi  
*Address:* Centre for the Genetics of Ecosystem Services  
Faculty of Life Sciences  
The University of Manchester  
C.1250 Michael Smith Building  
Oxford Road  
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## PROJECT DESCRIPTION

### Nature and objectives of the project

In the context of Caribbean coastal and marine ecosystems alteration, estimating connectivity between reefs / islands and exploring the role of this connectivity in the maintenance of species and ecological functions is urgent to provide guidelines for protecting and managing Caribbean marine biodiversity and resources. The campaign PACOTILLES take places across eleven islands of the Lesser Antilles (Anguilla, Antigua and Barbuda, Saba, Montserrat, Guadeloupe, Dominica, Martinique, St Lucia, St Vincent and the Grenadines, and Grenada) and consists of two LEGS, the first focuses on the study of biodiversity and population connectivity of species known as generalist of fringing reefs, while the second is dedicated to the study of biodiversity and population connectivity of species typical of underwater caves of the Lesser Antilles. Using three main stands representative of the benthic compartment (corals, sponges and macroalgae, whose functions differ in the ecosystem and are indicators of the health of coral reefs), the main objectives of PACOTILLES are for each taxonomic group: 1) to establish a taxonomic inventory throughout the eleven islands where knowledge remains patchy or non-existent, 2) to estimate the cryptic diversity, 3) to establish reference collections and conduct molecular and metabolomic analysis and, 4) to complete the population sampling already available in some sites in the Caribbean for genetic analysis of population connectivity and evaluate multi-scales populations genetic diversity and structure among sites for these species, 5) contribute to the identification of endemic areas through different methods of biogeographic analyzes. Operations at sea are based solely on underwater SCUBA dives during which underwater visual census, inventories, photographs and sample collection will be made. Four study sites are currently planned around Anguilla.

### Relevant previous or future research cruises

BIBELOT (Scientist in charge: Cécile Fauvelot) Loyalty Islands, New-Caledonia, south Pacific, 14-28 February 2014, R/V ALIS.

### Previously published research date related to the project

Becking LE, Cleary DFR, de Voogd NJ, Renema W, de Beer M, van Soest RWM, Hoeksema BW (2006) Beta-diversity of tropical marine assemblages in the Spermonde Archipelago, Indonesia. *Marine Ecology* 27: 76-88.

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Bouchon C., Portillo P., Bouchon-Navaro Y., Louis M., Hoetjes P., Brathwaite A., Roach R., Oxenford H., O'Farrell S., Day O. 2008a. Status of coral reefs of the Lesser Antilles after the 2005 coral bleaching event. Pp 85-103. In : Wilkinson C., Souter D., (eds). Status of Caribbean Coral reefs after bleaching and hurricanes in 2005. Global Coral Reef Monitoring Network, and Reef and Rainforest Research Centre, Townsville, 152 pp.

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**Please indicate the level of implication of the concerned country in this request**

An English PhD student, Sarah Griffith, from the University of Manchester is participating in this campaign (supervisor: Richard Preziosi). Her project is investigating the effects of genetic diversity in marine sponges on the composition of their tissue bacterial communities, and associated animal assemblages. As sponges are prone to experiencing mass mortalities, she is also studying the effects of genetic variation on resistance and resilience to perturbation. Finally, she is looking at the distribution of genetic diversity in sponge species across the Caribbean region to determine how the populations are structured and connected on a variety of spatial scales. This campaign is therefore a unique opportunity to complete her sample collection.

Additionally, a place will be set free onboard for a local scientist for each LEG (9 scientists are currently planned, while it is possible to host 10 scientist onboard) in order to involve in this project a scientist from each concerned country (and possibly more people if they do not stay on the boat and can join us with their boat, or during daytrip). We are currently contacting scientists and / or marine parks of different countries for logistical support in the field and for involvement during the process data acquisition and sample collection.

For now, we had a positive feedback for the involvement of Professor Clare Morrall, Department of Biology, Ecology and Conservation and St George's University, Director of the Marine Biology Program, and Professor Cristofre Martin, Department of Biochemistry, School of Medicine Chair, Department of Biology, Ecology and Conservation at St. George's University, Grenada. One of them will participate to at least a part of the field trip.

All data acquired during this campaign in Anguilla EEZ will be fully made available to the country.

## DESCRIPTIVE OF THE VESSEL

<b>Particulars of vessel:</b>	
Name:	<b>ANTEA</b>
Type/Class:	Catamaran
Nationality (Flag State):	French
Identification Number (IMO/Lloyds No.):	9128506
Owner:	IRD (Institute of Research of the Development)
Operator:	GENAVIR
Overall length (meters):	34.95 m
Maximum draught:	3.323 m
Displacement/Gross Tonnage:	67.8 T
Propulsion:	2 Volvo engines (2x 660CV) base Mitsubishi type D25-MS 970 Kw at 1650 t/mn
Cruising & maximum speed:	9 and 11 knots
Call sign:	FNUR
INMARSAT number and method and capability of communication (including emergency frequencies):	<a href="mailto:an.commandant@antea.ird.fr">an.commandant@antea.ird.fr</a> (F77) +870 7 645 446 88 Telex Inmarsat C 0584 4 228 111 xx (xx = 10 or 11)
Name of Master:	Not known at this date
Number of Crew:	13
Number of Scientists on board:	10

## METHODS AND INSTRUMENTS USED

### Aircraft or other craft to be used in the project

None

### Particulars of methods and scientific instruments

Types of samples and data	Methods to be used	Instruments to be used
Coral, algae and sponges sampling	Underwater collection	Scuba diving
Coral, algae and sponges inventories	Underwater visual censuses	Scuba Diving

### Indicates whether harmful substances will be used

On board, Ethanol will be used for sample preservation, but there will be no contact of such with environment

### Indicate whether drilling will be carried out

No

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

None

## ACCESS TO DATA, SAMPLES AND RESEARCH RESULTS

### **Expected dates of submission to relevant country of preliminary reports which should include the expected dates of submission of the final results**

A report with preliminary data regarding the study sites and species list can be submitted to the relevant countries in September 2015.

### **Proposed means for access by national scientists to data and samples**

Databases containing species list per study site.

### **Proposed means of making research internationally available**

Publication in international scientific journals.



## GEOGRAPHICAL AERAS

Indicate geographical areas in which the project is to be conducted (with indication of latitude and longitude and water depth)

Operations	Latitude	Longitude	Profondeur Water depth
Scuba Diving	18°17'46.15"N	62°56'26.21"O	3-30 m
Scuba Diving	18°10'27.45"N	63° 4'28.45"O	3-30 m
Scuba Diving	18°10'10.81"N	63° 9'59.16"O	3-30 m
Scuba Diving	18°14'57.49"N	63° 3'18.14"O	3-30 m

Attach chart(s) at an appropriate scale showing the geographical areas of the intended work and, if possible, the positions of intended stations, the line tracks and locations of moorings and possible observatories (indicate the duration)



Diving sites are indicated with red dots. May be subject to change according to weather conditions and additional information regarding the diving sites that may be provided by local partners.

## DATES

### Chronology of the cruise, including port calls

The campaign is currently scheduled between April 21<sup>st</sup> and May 10<sup>th</sup> of 2015 for the Leg 1 and between May 13<sup>th</sup> and June 2<sup>nd</sup> of 2015 for Leg 2 (see table below).

#### Leg1

<b>Day</b>	<b>Port : Embarking/Disembarking/Call</b>	<b>Date of departure</b>	<b>Date of arrival</b>
J1	Pointe-à-Pitre	2015/04/21	
J2	Martinique	2015/04/22	2015/04/21
J3	St Vincent		2015/04/22
J4	St Vincent		
J5	St Vincent	2015/04/25	
J6	Grenada		2015/04/25
J7	Grenada		
J8	Grenada	2015/04/28	
J9	St Lucia		2015/04/28
J10	St Lucia	2015/04/30	
J11	Dominica		2015/04/30
J12	Dominica	2015/05/02	
J13	Antigua	2015/05/03	2015/05/02
J14	Barbuda	2015/05/04	2015/05/03
J15	Anguilla		2015/05/04
J16	Anguilla	2015/05/06	
J17	Saba	2015/05/07	2015/05/06
J18	Montserrat	2015/05/08	2015/05/07
J19	Pointe-à-Pitre		2015/05/09

#### Leg2

<i>day</i>	<b>Port : Embarking/Disembarking/Call</b>	<i>Date of departure</i>	<i>Date of arrival</i>
J1	Fort de France, Martinique		2015/05/13
J2	Martinique		
J3	Martinique	2015/05/15	
J4	St Vincent		2015/05/15
J5	St Vincent	2015/05/17	
J6	Grenada		2015/05/17
J7	Grenada		
J8	Grenada	2015/05/20	
J9	St Lucia		2015/05/20
J10	St Lucia	2015/05/22	
J11	Dominica		2015/05/22
J12	Dominica	2015/05/24	
J13	Antigua		2015/05/24
J14	Antigua	2015/05/26	
J15	Anguilla		2015/05/26
J16	Anguilla	2015/05/28	
J17	Montserrat		2015/05/28

J18	Montserrat	2015/05/30	
J19	Guadeloupe		2015/05/30
J20	Guadeloupe	2015/06/01	
J21	Martinique		2015/06/01

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

Since the order of the study sites may be subject to change due to weather conditions or due to a possible late consent to work in the EEZ of another country, we are asking for a permission to work in the EEZ of Anguilla for the entire period the campaign will last, that is to say from April 21<sup>st</sup> to June 2<sup>nd</sup>, 2015.

<b>Date of entry</b>	21 <sup>st</sup> April 2015
<b>Date of departure</b>	02 <sup>nd</sup> June 2015

**Indicate if multiple entries is expected**

Multiple entries are indeed planned: one during LEG1, and one during LEG2, but as previously stated, we would rather ask the permission to work in the area for a larger period in order to cope for field trip area related to weather conditions or any other reason.

## PORTS CALLS

**For each port-call of concerned country please indicate**

<b>Name of the port</b>	<b>Any special logistical requirements at port of call</b>

**Contact of the Maritime Agent**

Not known at this date.

## PARTICIPATION

### Extent of which the country will be enabled to participate or to be represented in the research project

NB: On request of the concerned authorities, an observer will be embarking on board during the cruise.

An English PhD student, Sarah Griffith, from the University of Manchester is participating in this campaign (supervisor: Richard Preziosi). Her project is investigating the effects of genetic diversity in marine sponges on the composition of their tissue bacterial communities, and associated animal assemblages. As sponges are prone to experiencing mass mortalities, she is also studying the effects of genetic variation on resistance and resilience to perturbation. Finally, she is looking at the distribution of genetic diversity in sponge species across the Caribbean region to determine how the populations are structured and connected on a variety of spatial scales. This campaign is therefore a unique opportunity to complete her sample collection.

Additionally, a place will be set free onboard for a local scientist for each LEG (9 scientists are currently planned, while it is possible to host 10 scientist onboard) in order to involve in this project a scientist from each concerned country (and possibly more people if they do not stay on the boat and can join us with their boat, or during daytrip).

All data acquired during this campaign in Anguilla EEZ will be fully made available to the country

## SCIENTIFIC AND TECHNICAL STAFF

### LEG1

<i>Surname</i>	<i>First name</i>	<i>Nationality</i>	<i>Position</i>	<i>Institution</i>
<b>FAUVELOT</b>	<b>Cécile</b>	French	Researcher	IRD Nouméa, Nouvelle-Calédonie
<b>PAYRI</b>	<b>Claude</b>	French	Researcher	IRD Nouméa, Nouvelle-Calédonie
<b>BOUCHON</b>	<b>Claude</b>	French	Researcher	Univ Antilles Guyane Guadeloupe
<b>BOUCHON</b>	<b>Yolande</b>	French	Researcher	Univ Antilles Guyane Guadeloupe
<b>ZEA</b>	<b>Sven</b>	Colombian	Professor	Univ. Santa Maria Colombia
<b>De VOOGD</b>	<b>Nicole</b>	Dutch	Researcher	Naturalis, Leiden, Netherlands
<b>ERESKOVSKY</b>	<b>Alexander</b>	Russian	Researcher	CNRS-IMBE, Marseille, France
<b>AZEVEDO</b>	<b>Fernanda</b>	Brazilian	Researcher	Univ Rio de Janeiro, Brésil
<b>BENZONI</b>	<b>Francesca</b>	Italian	Researcher	Univ Milan Bicocca Italie
<b>JAPAUD</b>	<b>Aurélien</b>	French	PhD Student	Univ Antilles Guyane Guadeloupe

### LEG2

<i>Surname</i>	<i>First name</i>	<i>Nationality</i>	<i>Position</i>	<i>Institution</i>
<b>PEREZ</b>	<b>Thierry</b>	French	Researcher	CNRS-IMBE, Marseille, France
<b>CHEVALDONNE</b>	<b>Pierre</b>	French	Researcher	CNRS-IMBE, Marseille, France
<b>RUIZ</b>	<b>Cesar</b>	Brazilian	PhD Student	CNRS-IMBE, Marseille, France
<b>KLAUTAU</b>	<b>Michelle</b>	Brazilian	Professor	Univ Rio de Janeiro, Brésil
<b>DIAZ</b>	<b>Cristina</b>	Venezuelan	Ass.Professor	Université de Floride, USA
<b>GRIFFITHS</b>	<b>Sarah</b>	English	PhD Student	University of Manchester, UK
<b>THOMAS</b>	<b>Olivier</b>	French	Professor	UMR7272, Univ Nice, France
<b>CHENESSEAU</b>	<b>Sandrine</b>	French	Technician	CNRS-IMBE, Marseille, France

\* The list will be updated 2 months prior the cruise.