



An initiative of the African, Caribbean and Pacific Group,  
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## **CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY**

### **EXPANDED WEATHER AND CLIMATE FORECASTING AND INNOVATIVE PRODUCT AND SERVICE DEVELOPMENT AND DELIVERY IN THE CARIBBEAN PROJECT**

### **CONSULTANCY SERVICES FOR BUILDING THE CAPACITY OF YOUNG PROFESSIONALS IN CLIMATOLOGY, METEOROLOGY, HYDRO-METEOROLOGY AND RELATED FIELDS**

#### **REQUEST FOR EXPRESSIONS OF INTEREST**

The Caribbean Institute for Meteorology and Hydrology (CIMH) has received financing from the Caribbean Development Bank (CDB) in an amount equivalent to EUR773,025 towards the cost of Expanded Weather and Climate Forecasting and Innovative Product and Service Development and Delivery in the Caribbean Project and intends to apply a portion of the proceeds of this financing to eligible payments under a contract for which this invitation is issued. Payments by CDB will be made only at the request of the CIMH and upon approval by CDB and will be subject in all respects to the terms and conditions of the Financing Agreement. The Financing Agreement prohibits withdrawal from the financing account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of CDB, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the CIMH shall derive any rights from the Financing Agreement or have any claim to the proceeds of the Financing.

The CIMH, the Implementing Agency, now wishes to procure two (2) young Caribbean professionals who will support research and development activities of CIMH.

The objective of the attachments is to continue the process of developing the next generation of regional professionals specialising in climatology, meteorology, hydrology and related disciplines through

attachment and mentorship programmes focused on developing new innovative technologies and methodologies that address regional and global objectives. The duration is for a period of three (3) months attachments.

The CIMH now invites interested eligible individual young professionals to submit Expressions of Interest inclusive of a letter of motivation indicating qualifications and experience required to provide research and development activities at CIMH.

Consultants (young professionals) shall be eligible to participate if:

1. The persons are citizens or bona fide residents of an eligible country; and
2. In all cases, the consultant has no arrangement and undertakes not to make any arrangements, whereby any substantial part of the net profits or other tangible benefits of the contract will accrue or be paid to a person not a citizen or bona fide resident of an eligible country.

Eligible countries are outlined in Appendix 1 below.

The attention of interested Consultants is drawn to paragraph 1.9 of CDB's Guidelines for the Selection and Engagement of Consultants (2011), setting forth CDB's policy on conflict of interest.

The Terms of Reference for the two (2) vacancy assignments have been provided as Appendix 2. In the assessment of submissions, consideration will be given to qualifications and experience on similar assignments. All information must be submitted in English. Further information may be obtained from the first email address below between 8:00 and 16:00 hours, Monday to Friday.

Submissions in PDF format of the Expressions of Interest must be received at the email address, [projects@cimh.edu.bb](mailto:projects@cimh.edu.bb) and copied to [procurement@caribank.org](mailto:procurement@caribank.org), no later than 16:00 AST on Thursday, 1st August, 2019. The email containing each submission should include the name and address of the applicant and shall be clearly marked "Expression of Interest — **Consultancy Services for Capacity Development of Young Caribbean Professionals**" and the position/vacancy assignment for which the application is submitted.

Following the assessment of submissions, the most technically capable and appropriately experienced applicant will be invited to negotiate a contract to provide the consultancy services. *The CIMH* reserves the right to accept or reject late applications or to cancel the present invitation partially or in its entirety. It will not be bound to assign any reason for not engaging the services of any applicant and will not defray any costs incurred by any applicant in the preparation and submission of Expressions of Interest.

1. *Address 1*

Project Officer  
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2. *Address 2*

Procurement Officer  
Procurement Policy Unit  
Caribbean Development Bank  
P.O. Box 408, Wildey  
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**EUROPEAN UNION ELIGIBILITY RULES**  
**AFRICAN CARIBBEAN PACIFIC – EUROPEAN UNION**  
**NATURAL DISASTER RISK MANAGEMENT**

**PARTICIPATION IN PROCEDURES FOR THE AWARDING OF**  
**PROCUREMENT CONTRACTS OR GRANT CONTRACTS**

1. Participation in procedures for the award of procurement contracts financed under the EU Contribution Agreement for the Implementation for the Action entitled: “Africa Caribbean Pacific – European – Caribbean Development Bank (ACP-EU-CDB) Natural Disaster Risk Management in CARIFORUM Countries” (ACP – EU NDRM Resources)<sup>1</sup>, is open to international organisations and all natural persons who are nationals of, or legal persons who are established in, an eligible country.

2. Eligible countries<sup>1</sup> are deemed to be:

(a) Caribbean Development Bank member countries:

Anguilla, Antigua and Barbuda, Barbados, Belize, Brazil, British Virgin Islands, Canada, Cayman Islands, China, Columbia, Dominica, Germany, Grenada, Guyana, Haiti, Jamaica, Italy, Mexico, Montserrat, St Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, Suriname, The Bahamas, Trinidad and Tobago, Turks and Caicos Islands, the United Kingdom and Venezuela.

(b) Members of the “African, Caribbean and Pacific (ACP) Group of States”<sup>2</sup>:

**Africa:**

South Africa<sup>3</sup>, Angola, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Cameroon, Cape Verde, Chad, Comoros Islands, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Uganda, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Togo, Zambia and Zimbabwe.

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<sup>1</sup> Note some countries may be eligible by virtue of more than one category

<sup>2</sup> Cotonou Partnership Agreement of 23 June 2000 (as amended by the provisional application of Decision No 1/2000 of the ACP-EC Council of Ministers of 27 July 2000, Decision No 1/2000 of the ACP-EC customs cooperation committee of 18 October 2000, Decision No 1/2001 of the ACP-EC customs cooperation committee of 20 April 2001, Decision No 2/2001 of the ACP-EC customs cooperation committee of 20 April 2001, Decision No 3/2001 of the ACP-EC customs cooperation committee of 10 May 2001, Decision No 4/2001 of the ACP-EC customs cooperation committee of 27 June 2001, Decision No 5/2001 of the ACP-EC customs cooperation committee of 7 December 2001, Decision No 2/2002 of the ACP-EC customs cooperation committee of 28 October 2002, Decision No 1/2003 of the ACP-EC Council of Ministers of 16 May 2003, Council

Decision (EC) of 19 December 2002, Decision No 1/2004 of the ACP-EC Council of Ministers of 6 May 2004, Decision No 2/2004 of the ACP - EC customs cooperation committee of 30 June 2004 and Decision No 4/2005 of the ACP-EC customs cooperation committee of 13 April 2005).

- <sup>3</sup> Natural and legal South African persons are eligible to participate in contracts financed by the 10th/11th EDF. However, the 10th/11th EDF does not finance contracts in South Africa.

**Caribbean:**

Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.

**Pacific:**

Cook Islands, East Timor, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, the Solomon Islands, Western Samoa, Tonga, Tuvalu, Vanuatu.

**Overseas Countries and Territories:**

Anguilla, Antarctic, Netherlands Antilles, Aruba, British Indian Ocean Territory, British Virgin Islands, Cayman Islands, Falkland Islands (Malvinas), French Polynesia, French Southern Territories, Greenland, Mayotte, Montserrat, New Caledonia, Pitcairn, Saint Helena, Saint Pierre and Miquelon, South Georgia and South Sandwich Islands, Turks and Caicos, Wallis and Futuna Islands.

- (c) A Member State of the European Union:

Austria, Belgium, Bulgaria, Croatia, Czech republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

**An official candidate country of the European Union:**

The Former Yugoslav Republic of Macedonia, Turkey, Iceland, Montenegro.

**A Member State of the European Economic Area:** Iceland, Lichtenstein, Norway.

- (d) All natural persons who are nationals of, or legal persons who are established in, a Least Developed Country as defined by the United Nations:

Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Dem. Rep. Congo, Equatorial Guinea, Eritrea, Ethiopia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Djibouti, Solomon Islands, Somalia, South Sudan, Sudan, Tanzania, The Gambia, Timor-Leste, Togo, Tuvalu, Uganda, Vanuatu, Yemen, Rep. and Zambia.

- (e) Participation in procedures for the award of procurement contracts or grants financed from the Facility shall be open to all natural persons who are nationals of, or legal persons established in, *any country other than those referred to in paragraph 1, where reciprocal access to external assistance has been established*. Reciprocal access in the Least Developed Countries as defined by the United Nations (UN) shall be automatically granted to the OECD/DAC members: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

3. Services under a contract financed from the Facility may be provided by experts of any nationality, without prejudice to the qualitative and financial requirements set out in the Bank's procurement rules.

4. Supplies and materials purchased under a contract financed from the Facility must originate in a State that is eligible under paragraph 1. In this context, the definition of the concept of 'originating products' shall be assessed by reference to the Bank's prevailing procurement guidelines/procedures, and supplies originating in the EU shall include supplies originating in the Overseas Countries and Territories.

5. Whenever the Facility finances an operation implemented through an international organisation, participation in procedures for the award of procurement contracts or grants shall be open to all natural and legal persons who are eligible under paragraphs 1, care being taken to ensure equal treatment of all donors. The same rules apply for supplies and materials.

6. Whenever the Facility finances an operation implemented as part of a regional initiative, participation in procedures for the award of procurement contracts or grants shall be open to all natural and legal persons who are eligible under paragraph 1, and to all natural and legal persons from a country participating in the relevant initiative. The same rules apply for supplies and materials.

7. Whenever the Facility finances an operation co-financed with a third entity, participation in procedures for the award of procurement contracts or grants shall be open to all natural and legal persons eligible under paragraph 1, and to all persons eligible under the rules of the third entity. The same rules shall apply to supplies and materials.

**Caveat:** The Bank and EU eligibility requirements are subject to change by the Bank and the EU. The applicant is responsible for checking whether there have been any updates on the eligibility requirements, as well as the UN's list of Least Developed Countries.

TERMS OF REFERENCE

**CONSULTANCY SERVICES FOR BUILDING THE CAPACITY OF YOUNG PROFESSIONALS IN CLIMATOLOGY, METEOROLOGY, HYDRO-METEOROLOGY AND RELATED FIELDS**

**1. Introduction**

Recognising the importance of building critical mass in weather, climate and hydro-meteorological professionals to the region's resilience to climate change, increasing climate variability and extreme weather, the Caribbean Institute for Meteorology and Hydrology (CIMH) initiated a young professionals programme in 2006 focused on students in the B.Sc. Programme in Meteorology at the University of the West Indies Cave Hill Campus. The programme subsequently expanded to include individuals from different disciplines including civil engineering, water resources management, climate science and remote sensing - all closely linked to the core programmes of the CIMH. In recent years, the programme has been further expanded to include individuals from the social sciences in recognition of the fact that engaging persons in these disciplines is critical to building professional relationships that are essential for understanding and better defining sectoral needs for applications of weather, climate and hydro-meteorological information. Currently, the programme caters to young professionals in undergraduate and graduate programmes. The attachments last between three months to two years depending on the nature of the investigation.

Three-month attachments generally focus on exposing young professionals in undergraduate programmes to interesting and challenging problems with well constrained solution strategies that can be implemented in the requisite timeframe. The individuals are introduced to basic elements of research that builds their independent problem solving skills and expands their knowhow and knowledge base. The outputs from several of these attachments have been converted by the CIMH into products and services used by the international community. For example, the CIMH Terminal Aerodrome Forecast software which is used by National Meteorological and Hydrological Services (NMHSs) in the Caribbean, has been translated into Spanish, and now used by NMHSs in Central and South America started out as a summer attachment project. Several young professionals have also extended their projects into research projects for graduate degrees.

**2. About the Caribbean Institute for Meteorology and Hydrology**

The CIMH is an Institution of the Caribbean Community (CARICOM) and the technical Organ of the Caribbean Meteorological Organization (CMO). The mandate of the CIMH is “to assist in improving and developing the Meteorological and Hydrological Services as well as providing the awareness of the benefits of Meteorology and Hydrology for the economic well-being of the CIMH member states. This is achieved through training, research, investigations, and the provision of related specialized services and advice”.

In achieving its mandate, the CIMH in 1973 established an affiliation with the University of the West Indies in which its primary responsibility is the delivery of the B.Sc. programme in Meteorology in the Faculty of Pure and Applied Sciences. The CIMH is recognized regionally and globally as:

- The World Meteorological Organization (WMO) Regional Training Centre for the Caribbean;

- A centre for applied research and development in meteorology, hydrology/water resources, climatology and related areas including disaster risk reduction and impacts forecasting;
- The WMO Regional Instrument Centre for the Caribbean;
- A WMO Centre of Excellence for Training in Satellite Meteorology;
- The WMO Regional Climate Centre (RCC) for the Caribbean;
- The Caribbean Centre for Climate and Environmental Simulations;
- The Climate Data Archive for CMO Member States;
- The Pan American Centre for the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS);

The CIMH has strong collaborations with other Regional Institutions, national organizations in CMO Member States and the international community. Since 2006, the CIMH has been providing internships opportunities to graduate and undergraduate students registered at regional and international universities. While the majority of internships have supported research and development in Earth and Atmospheric Sciences, in recent years the areas of focus have been expanded to include Social Sciences, Computer Science and Information Technology. Internships commonly range from 3-months to 1-year with the potential for an increase to two years. Many interns have converted their projects to publications and conference presentations as well as M.Sc. and PhD graduate research programmes.



**Position 1:** *Hydrology Intern* - To support the characterization of exposed assets in target areas along the west coast of Barbados.

### **3. Scope of Work**

The Rapid Analysis and Spatialisation of Risk (RASOR) Platform (<http://www.rasor-project.eu/>) enables end users to perform multi-hazard risk analysis for the full cycle of disaster management including but not limited to targeted support, to critical infrastructure monitoring and climate change impact assessment. Despite the availability of operational mapping products, there is no single tool to integrate diverse data and products across hazards, update exposure data quickly and make scenario-based predictions to support both short and long term risk-informed decisions. RASOR offers a single work environment that generates new risk information across hazards, data types and user communities. A scenario-driven query system allows users to simulate future scenarios based on existing and assumed conditions, to compare with historical scenarios, and to model multi-hazard risk both before and during an event.

The RASOR platform enables users to go beyond risk identification and compute risk analyses and economic impacts regarding different hazard scenarios. The services offered by RASOR tools produce detailed and accurate risk information either through stand-alone remotely-sourced analysis or through the merging of earth observation and detailed ground-based data sets according to the needs of the end user. RASOR is fully compliant with Open Geospatial Consortium standards which promote the distribution of data and information and extensively uses web services based on free and open solutions.

The RASOR Platform was recently used to support modelling of the impact of Hurricane Matthew on the southern peninsula of Haiti. Wind fields from a numerical weather prediction (NWP) model were imported into the RASOR Platform which allowed for the computation of the impact caused by the wind gusts. Exposures were extracted from the Copernicus activation products and further characterized in the RASOR platform to assess vulnerability. The impact was computed for different sites in Haiti. For the western part of Haiti, comparison between the model estimate and the one derived from observation was within 20 percent.

The implementation of the RASOR platform for flood risk analysis requires the generation of a flood inundation field that drives the damage and loss calculations across the exposed assets. Simulated flooding depths and extents are used to estimate flood related damages and losses. These estimates require that the attributes of the exposed assets related to value and replacement cost be known and categorized. As part of the RASOR implementation in Holetown, Barbados, the CIMH categorized the building materials and usage within the target area using the RASOR taxonomy. Application of the relevant vulnerability databases and damage functions associated with the taxonomy supports the quantification of risk.

Property and replacement cost values are significantly high along the west coast of Barbados giving rise to extremely high-risk exposures. Further expansion of the RASOR platform will allow for the broader characterization of national risk and support the identification of appropriate risk transfer mechanisms.

The successful candidate will support the characterization of exposed assets in target areas along the west coast of Barbados. This information will be used to expand the application of the RASOR platform across Barbados.

#### **4. Deliverables**

- i. Inventory of exposed buildings and usage characterized within the target area using the RASOR taxonomy
- ii. GIS layer with exposed building attributes in GIS format
- iii. Modification of DTM in target area using building footprints

#### **5. Qualifications**

Candidates applying for the position should have as a minimum be enrolled in BSc degree programmes in Geomatics, Geographic Information Systems, Surveying or related discipline.

Given the regional and interdisciplinary nature of CIMH's work, the successful intern should also possess:

- Strong cultural and social IQ;
- Excellent written and oral communication skills;
- Familiarity with common GIS software packages;
- Familiarity with GPS hardware

#### **6. Duration**

The duration of the internship is three (3) months.

#### **7. Reporting**

The successful candidate will be required to submit monthly progress reports and a final report within two weeks following the completion of the assignment detailing the activities performed under the internship.

**Position 2: Meteorology Intern** – To support data mapping regarding the passage of Hurricane Maria over Dominica.

## **8. Scope of Work**

The CIMH was able to collect a vast amount of data from four automatic weather stations (AWS), numerous rain gauges and several water level stations in Dominica before, during and immediately after the passage of Hurricane Maria. The data collection is unique in that it is comprehensive meteorological and hydrological data that is a unique combination that CIMH houses and can take advantage of and will be very instructive in studying the effects of the storm on such a small island and may reveal dynamics of the storm in terms of storm wind and water damage.

The goal of the study is to compile the collected data from AWS, and other automatic and manual stations, data and personal accounts from the two Meteorological offices, pictures of the reconnaissance mission post episode and satellite data, to effectively replicate the devastating effects of the category 5 hurricane across the island of Dominica. There is the possibility of relating the weather event thresholds to damage observed during the storm. The research will involve model simulation of the event using the CIMH WRF ARW and NNM Models. The candidate will be tasked with hydro-meteorological data analysis, weather model simulation and verification. The candidate must present a paper and presentation on their findings.

## **9. Deliverables**

- i. Provide a database of archived data for the period weather and hydrometeorological data from Hurricane Maria
- ii. Have weekly meeting with the supervising meteorology, along with a bi weekly report; and
- iii. Prepare a written scientific paper and presentation on student summer project.

## **10. Qualifications**

Candidates applying for the position should be exploring applications of Meteorology in:

- areas of Basic meteorology; at minimum a successful complete of Level 1 Meteorology courses;
- at minimum a 3.00 GPA;

Given the regional and interdisciplinary nature of CIMH's work, the successful intern should also possess:

- Strong cultural and social IQ;
- Excellent written and oral communication skills;

## **11. Duration**

The duration of the internship is three (3) months.

## **12. Reporting**

The successful candidate will be required to submit monthly progress reports and a final report within two weeks following the completion of the assignment detailing the activities performed under the internship.