



An initiative of the African, Caribbean and Pacific Group,  
funded by the European Union, and implemented by:



## **CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY**

### **ENHANCING WEATHER AND CLIMATE EARLY WARNING SYSTEMS AND IMPACTS-BASED FORECASTING PLATFORMS PROJECT**

#### **COMPONENT 3: ENHANCE DEVELOPMENT AND DELIVERY OF CLIMATE SERVICES TO CLIMATE SENSITIVE SECTORS**

#### **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 *EUR493,394* towards the cost of Enhancing Weather and Climate Early Warning Systems and Impacts-Based Forecasting Platforms 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 to enhance the development and delivery of climate services.

The objective of the attachments is to support the development of an ensemble of extremely high-resolution realizations for the Caribbean region that will improve bounding the uncertainty of future climates across the Caribbean to enhance future climate projection. The duration is for a period of four (4) months attachments (until December, 2020). If selected, the individual will be responsible to making arrangements to live in Barbados or Jamaica for the period of the assignment.

*The CIMH* now invites interested eligible individual young professionals to submit Expressions of Interest inclusive of a letter of motivation indicating qualifications and experience for the Climate Modelling Intern positions.

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 vacancy assignment has 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, 27<sup>th</sup> August, 2020. 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 Climate Modelling Intern" and the position/vacancy – (CIMH, Barbados) or (UWI Mona Campus, Jamaica).

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

Caribbean Institute for Meteorology and Hydrology

Husbands.

St. James BB23006

Barbados

Tel: 1-(246) 425-1362/63

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2. *Address 2*

Procurement Officer

Procurement Policy Unit

Caribbean Development Bank

P.O. Box 408, Wildey

St. Michael

BARBADOS, W.I.

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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), 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.

<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).

- 3 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 TO ENHANCE DEVELOPMENT AND DELIVERY OF CLIMATE SERVICES TO CLIMATE SENSITIVE SECTORS – CLIMATE MODELLING**

**1. Introduction**

The Caribbean Institute for Meteorology and Hydrology (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);

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 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 geomatics - 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 CIMH is currently implementing the “Enhancing Weather and Climate Early Warning Systems and Impacts-Based Forecasting Platforms in the Caribbean” project. The project is being executed through the African Caribbean Pacific (ACP)-EU-Caribbean Development Bank Natural Disaster Risk Management (CDB-NDRM) programme funded by the European Union (EU). Through this project the CIMH seeks to engage the services of two (2) interns to support climate modelling activities.

## **2. Climate Modelling Intern Positions- (1) CIMH, Barbados-based) and (2) UWI, Mona Campus, Jamaica-based)**

### **2.1. Background**

Long-term climate change and increasing climate variability represent fundamental challenges that individually and collectively threaten the long-term sustainable development of Caribbean states. Over the last two decades, it has become abundantly clear that the Caribbean region will have to focus significant efforts and resources adapting to climate change and increasing climate variability through, in part, the building of resilience in climate sensitive sectors such as agriculture, disaster risk management, water resources management and health among others. Given the limited human and economic resources of the Caribbean region, the region's adaptation strategy must be well designed and efficiently implemented to maximize the return on investment. Germain to achieving this outcome are high-resolution short-term and long-term climate projections that are appropriately scaled to address planning and development concerns down to the community level.

Over the last two decades, the Caribbean has had some success downscaling the outputs of global climate models to scales that approach those required to support national level decision-making. For larger islands, the resolutions currently being achieved using downscaling techniques may support decision making at the parish level. However, for many of the smaller islands of the Caribbean further increases in the resolution of the model outputs are required to further enhance watershed and community level adaptation. Achieving such levels of downscaling represents the current state-of-the-art in climate modeling and currently requires (i) a level of computing power that is currently not resident in any of the research centres in the Caribbean and (ii) human capacity.

In 2019, the CIMH worked with the University of the West Indies Climate Studies Group Mona (UWI-CSGM) to build capacity in several meteorological services and institutions in the region to support long term climate modeling using version 4 of the Regional Climate Modeling (RegCM4) platform. Hands-on training with the platform was facilitated using the cloud computing capabilities of Amazon Web Services. In addition to the training in how to build the climate simulations, the participants received some training in how to post-process the model outputs to generate information to risk-inform sectoral decision-making.

The positive experience with the computing facilities on the Amazon platform during the training exercise has generated significant interest in utilizing the platform to generate an ensemble of approximately 25 extremely high-resolution (approximately 4-km) realizations of future climate scenarios across the Caribbean. Such a dataset has never been generated for the Caribbean and would allow for *inter alia* uncertainty in future climate in the region to be bound. This new ambitious campaign will utilize the expertise of the staff of the UWI-CSGM, CIMH and INSMET (Cuba) as well as those trained during the 2019 workshop thereby enhancing their capacity. The post processed data will be made available to the public, the private sector, academia and governments to risk-inform sector level planning, investment and innovation at national and community scales. It is expected that utilization of the data sets will support building climate resilience from community to national levels.



## 2.2. Objective

The objective of the proposed internships is to support the development of an ensemble of extremely high-resolution realizations for the Caribbean region that will improve bounding the uncertainty of future climates across the Caribbean to enhance future climate projection.

## 3. Scope of Work

The specific duties and responsibilities of the intern will include:

- Support for the design and development of the conceptual framework for the ensemble climate runs;
- Support implementation and execution of the model runs through:
  - Building the model input files under the direction of the project scientists;
  - Monitoring the performance of the model runs and promptly reporting any challenges and concerns to the project scientists;
  - Preparation of bi-weekly reports on all aspects of the model runs;
  - Implementing the data archiving scheme agreed to by the modeling team;
  - Performing quality checks on the data generated from the model runs using the strategy agreed to by the modeling team;
  - Post-processing of the simulation data using approaches agreed by the modeling team;
  - Contributing to at least one journal article and presentation on the processes and achievements of the project.

## 4. Qualifications

Applicants should possess a minimum of a BSc degree in either Meteorology, Atmospheric Science, Mathematics and Physics with a strong background in computer programming. Persons with a BSc degree in Computer Science and considerable experience in either Meteorology or Atmospheric Science will be considered for the position. Experience modeling environmental systems, including weather and climate systems, would also be an asset. Experience with statistics, including geostatistics and ensemble methods in statistics, would be further assets.

### (i) Specific skills:

The successful candidate should possess the following skills:

- Proficiency with the Linux and Microsoft Windows operating systems;
- Experience with Linux “shell scripting”;
- Experience with NCL, IDL and GrADS;
- Experience working on computational clusters running MPI, OpenMP or similar multi-processor structures;
- Strong communication skills - oral and written;
- Self-motivated.

## 5. Duration

The duration of the internships is four (4) months (until December, 2020).

## **6. Location**

One (1) intern will be attached to the Caribbean Institute for Meteorology and Hydrology located in Barbados and one (1) intern will be attached to the Climate Studies Group, Mona within the Physics Department of the University of the West Indies.

## **7. Reporting**

The successful candidates will be required to submit monthly progress reports and a final report within 1 week following the completion of the assignment detailing the activities performed under the internship.