**Appendix 2**

**TERMS OF REFERENCE**

**CONSULTANCY SERVICES FOR COMPUTER SCIENCE - CARIBBEAN DEWETRA PLATFORM INTERN**

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);

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.

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 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.

Attachments of 1–2 years are usually undertaken by recent graduates seeking to extend their skillsets before either seeking employment or entering graduate programmes. These attachments focus on building prototypes of either new products or services. A good example is the implementation of the Wavewatch-3 software to build an operational high-resolution marine significant wave height forecasting platform for the Caribbean Sea and adjacent oceans (http://ww3.cimh.edu.bb). The young professionals support their supervisors by conducting a significant portion of the basic work required to complete and operationalise the project. Several young professionals in recent years have supported investigations into boundary problems related to climate and (a) tourism, (b) energy and (c) agriculture.

1. **Computer Science – Caribbean Dewetra Platform Intern Position**

**2.1. Background**

The Caribbean Dewetra Platform (CDP) is a spatio-temporal, decision making, data fusion platform capable of seamlessly integrating evolving hazard data, socio-economic and vulnerability information. Within the platform ground- and space-based near real-time weather observations in addition to numerical weather and wave height prediction model outputs are presented as Geographical Information System (GIS) layers. Country specific information such as but not limited to ground elevations, slopes, watershed extents, flood and landslide hazard maps, population demographics and geo-located critical infrastructure can be represented as overlays thereby increasing the quality and usefulness of the information available.

Currently, the CDP is used by the CIMH to and other agencies to monitor the evolution of adverse weather and support impact-based forecasting. Ground-based near real-time weather observations include data from several hydro-meteorological stations deployed across the Caribbean. Data from over sixty (60) stations with multiple variables are pushed to data servers at the CIMH and ingested by the CDP. The ongoing implementation of programmes with components that focus on network expansion in the Caribbean will lead to further increases in data streams. Currently, procedures to add/remove and configure stations are inefficient. In addition, administrative tools to monitor station status and performance are limited. This internship seeks to address these deficiencies to improve data ingestion workflows and management.

**2.2. Objective**

The objective of the proposed consultancy is to support the automation of automatic monitoring station configuration and data ingestion workflows within the Caribbean Dewetra Platform (CDP.

1. **Scope of Work**

The specific duties and responsibilities of the intern will include:

1. Streamline the workflow of adding and managing new and current hydro-meteorological stations on the CDP through the design and implementation of a custom web-based management interface. The web-based interface will do the following:
   * + Add new weather stations
     + Edit configuration of weather stations
     + Delete weather stations
2. Design and build an administrative management tool for monitoring the operational status and maintaining hydro-meteorological stations data ingestion in the CDP. This includes the following functions:
   * + Monitoring and reporting on data streams from hydro-meteorological stations
     + Notifying administrative users of issues with hydro-meteorological stations, e.g station stops reporting;
     + Providing detailed historical maintenance of hydro-meteorological stations such as station repair maintenance and parts replacement reports;
     + Billing and payment monitoring component for data service supporting data transfer to the CDP.
3. **Deliverables**
   1. Development and delivery of custom scripts, applications and workflows;
   2. Report documenting the work completed during the internship.
4. **Qualifications**

Candidates applying for the position should have as a minimum, a BSc degree in Computer Science and/or Information Technology.

1. **Experience**

Candidates should have strong working knowledge of common programming languages, databases and web-based applications (e.g. Python Programming Language; HTML, Javascript, CSS, PHP, MySQL and PostgreSQL databases). Experience working with GIS based technology and writing reports would be considered an asset.

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;

1. **Duration**

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

1. **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.