

DMAC-Webpage Subsystem

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Performance Period: June 1, 2020 – November 30, 2020

CONTEXT FOR THE REPORTING PERIOD

Following up from the Dec. 2019 – May 2020 report the current reporting period continued to be characterized by the occurrence of major environmental events that have impeded our access to the workplace and prompted a virtual workplace culture in CARICOOS. From December to February (and still ongoing at lesser intensity) PR experienced an earthquake sequence that caused power outages, damage to structures and locked down our workplaces pending safety inspections. Furthermore, in response to the COVID-19 pandemic the government of PR established a residential lockdown and curfew on March 15. To this date the lockdown and curfew continue. We have all been working from home since the lockdowns started. A very active hurricane season, albeit with no direct hits in our region, contributed to the environmental turmoil.

Given these hostile working conditions our modest goals for this reporting period basically sought to

- maintain continuity in the operational status of our webpage and of our data servers,
- to complete the generation of a suite of PRRMP products for the IOOS-MBON portal,
- continue AWS Glacier archiving of modeling output
- maintain as primary/operational the THREDDS/ERDDAP/HPC instances in the Cloud (at AWS).

Note that this report is very similar to the December 2019 – May 2020 report given the similar contexts. DMAC workloads and expectations have been reduced to accommodate the new working conditions.

LONG-TERM GOALS

CariCOOS DMAC long-term goals are aligned with the stated IOOS DMAC Mission: “To promote broad access to and use of ocean and coastal data for the benefit of stakeholders, NOAA, and other IOOC agencies” (IOOS DMAC Vision Document Draft as of March 3, 2016). Our regional mandate makes us the stewards of ocean observations in the US-Caribbean-EEZ while our unique geographical location allows us to look beyond the US-EEZ and seek the additional long-term mission/goal of providing a leadership DMAC role in the international Caribbean domain. Our new role in NOAA as the Caribbean Regional Information Coordination Entity, or RICE, formalizes our status among non-federal observing organizations who are recognized as meeting federal standards for data gathering and management.

MILESTONES / OBJECTIVES

The level of granularity of the **Status of Milestones** herein considered matches the CARICOOS 2019_2020_MILESTONES.pdf document.

As a behind the scenes technical group our objectives are to keep CARICOOS running as a full fledged member of the IOOS RA community and to discharge our DMAC responsibility towards the CARICOOS region to the best of our abilities.

WORK COMPLETED (Status of Milestones)

1. Add ROMS and FVCOM model output to CARICOOS ERDDAP as these models become operational
 - ROMS is still not operational. Development of an operational version is being performed by Dr. Juan Gonzalez. We have aggregated historical ROMS output from previous versions and this is currently being served in our ERDDAP exclusively for testing purposes. We are ready to proceed with new operational ROMS output as soon as it becomes available.
 - An operational version of FVCOM is currently executing in our local servers and model output is being displayed in our webpage (<https://www.caricoos.org/currents/forecast/FVCOM/PRVI/Currents>) We need to figure out how to serve unstructured operational model output in THREDDS and ERDDAP.
2. Attend IOOS DMAC meeting
 - The 3-day 2020 DMAC Virtual Annual Meeting (Oct. 13 - 15, 2 - 5 PM ET) was conducted virtually in October 2020. Jose Torres and Jorge Capella both attended the meeting sessions fully while Miguel Figuerola was invited to present on the recently uploaded OBIS/MBON Puerto Rico Coral Reef Monitoring Program (PRCRMP) database.
3. Develop a data portal to provide real-time acidification data collected by La Parguera Map CO2 buoy and derived ecosystem metabolic rates
 - Slow progress, delayed.
 - We started pushing the development of this product more effectively during the latter part of this performance period.
4. Hosting of CARICOOS interns
 - Jose Santiago was retained by CARICOOS under Work-Study status and assigned to the DMAC-Biological Data Initiative (see item 5 on this list). Miguel Figuerola, a former intern, has been retained under contract to CARICOOS as head of the Biological Data Initiative for CARICOOS-DMAC.
5. Review, process and enter regional biological dataset into OBIS/MBON. Supported when Supplemental Funding as it becomes available. May undergo a training phase for CARICOOS staff and possibly a contractor.

- The huge Puerto Rico Coral Reef Monitoring Program (PRCRMP 1999-2019) data set was processed into OBIS USA and MBON. PRCRMP data visuals were developed jointly with IOOS-MBON and AXIOM.
 - These tools are found in the IOOS-MBON portal by searching for PRCRMP (mbon.ioos.us).
 - CARICOOS-DMAC is fully committed to the discovery of and processing other regional data sets. The USVI Territorial Coral Reef Monitoring Program and a fisheries independent larval stock assessment conducted following the SEAMAP protocol are currently under evaluation for translation through Darwin Core/OBIS/MBON. We seek to develop a capacity-building effort by linking this process with interested graduate students from the UVI so they become knowledgeable about the Darwin Core standard and MBON.
6. On-going, continuous or recurrent DMAC/IT tasks (**no significant changes made to previous version**)
- Compliance with IOOS DMAC metadata, file and data discovery standards and checks
 - Continue CARICOOS DMAC and Regional DAC efforts as detailed in the RICE DMS Plan
 - Continue operating DMAC and computational infrastructure
 - New AWS ERDDAP instance installed (dm2 died early in the pandemic).
 - J. Torres addressed numerous hardware and software issues during this reporting period.
 - Historic data archival
 - J. Toreres participated in UPR-AWS workshop on storage strategies, and established local AWS contacts.
 - We continue processing low-priority model output for AWS Glacier storage.
 - José Torres has developed significant expertise into AWS issues through personal contacts with AWS technical staff and through participation in AWS educational activities.
 - Maintain and enhance CARICOOS website
 - Host and website capacity upgrades to provide for anticipated growth
 - Maintain the HPC infrastructure
 - HPC models soon to become the primary operational versions
 - NetCDF output generation has been activated for SWAN and WRF
 - Technical transfer to in-house IT, improvement and debugging of our web page

MAJOR OUTCOMES

- PRCRMP data visuals were developed jointly with IOOS-MBON and AXIOM.

- The new ERDDAP instance at AWS is fully functional.

RELATED PROJECTS

None.

CHANGES/PROBLEMS

See **CONTEXT FOR THE REPORTING PERIOD** section above.

WORK PLAN FOR UPCOMING PERFORMANCE PERIOD (Dec. 1, 2020 – May 31, 2021)

We plan to focus on those milestone/objectives that have been delayed:

- Get back on track after the pandemic
- Locate and evaluate new USVI biological datasets
- The MAP CO2 portal needs to move forward
- Fully populate the new AWS ERDDAP

PUBLICATIONS & PRODUCTS

- OBIS USA PRCRMP dataset citation
 - Department of Natural and Environmental Resources of Puerto Rico (2019) Puerto Rico Long-Term Coral Reef Monitoring Program Database Compilation (1999-2019). [indicate subset used]. Ocean Biogeographic Information System. Dataset. <https://obis.org/dataset/52f99f08-fc90-4684-aea8-a015150968ea>
 - URL: https://www1.usgs.gov/obis-usa/ipt/resource?r=prcrmp_database
- Technical manual for the processing of biological datasets is on the works

Data Management and Communications (DMAC) Subsystem

Point of Contact: Jorge E. Capella

PROGRESS REPORT FOR THE PERIOD JUNE 1, 2020 - NOVEMBER 30, 2020

Our long-term goals have not been altered over the reporting period. CARICOOS DMAC long-term goals are aligned with the stated IOOS DMAC Mission: “To promote broad access to and use of ocean and coastal data for the benefit of stakeholders, NOAA, and other IOOC agencies” (IOOS DMAC Vision Document Draft as of March 3, 2016). Our regional mandate makes us the stewards of ocean observations in the US-Caribbean-EEZ while our unique geographical location allows us to look beyond the US-EEZ and seek the additional long-term mission/goal of providing a leadership DMAC role in the international Caribbean domain. Our role in NOAA as the Caribbean Regional Information Coordination Entity, or RICE, formalizes our status among non-federal observing organizations who are recognized as meeting federal standards for data gathering and management. The CARICOOS DMAC subsystem is now fully integrated into the IOOS-DMAC Service Oriented Architecture (SOA) and operating as the Regional Data Assembly Center (DAC)..

DMAC Progress and Challenges

Following up from the Dec. 2019 – May 2020 report the current reporting period continued to be characterized by the occurrence of major environmental events that have impeded our access to the workplace and prompted a virtual workplace culture in CARICOOS. From December to February (and still ongoing at lesser intensity) PR experienced an earthquake sequence that caused power outages, damage to structures and locked down our workplaces pending safety inspections. Furthermore, in response to the COVID-19 pandemic the government of PR established a residential lockdown and curfew on March 15. To this date the lockdown and curfew continue. We have all been working from home since the lockdowns started. A very active hurricane season, albeit with no direct hits in our region, contributed to the environmental turmoil. On the bright side, our Cloud (AWS) assets (THREDDS and HPC servers) have remained fully operational during these difficult times and a new ERDDAP instance is in place. The huge Puerto Rico Coral Reef Monitoring Program (PRCRMP 1999-2019) dataset was processed into OBIS USA. OBIS/MBON PRCRMP data visuals were developed jointly with IOOS-MBON and AXIOM.

Given these hostile working conditions our modest goals for this reporting period basically sought to

- maintain continuity in the operational status of our webpage and of our data servers,
- to complete the generation of a suite of PRRMP products for the IOOS-MBON portal,

- continue AWS Glacier archiving of modeling output
- maintain as primary/operational the THREDDS/ERDDAP/HPC instances in the Cloud (at AWS).

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Status of Contribute-Data requirements

1.1. Open Data Sharing

CARICOOS continues serving regional data openly through web page Data Download interfaces, webpage products, dual THREDDS/OPeNDAPP servers and ERDDAP interface. Note that with the loss of a local THREDDS/ERDDAP server during the pandemic we have temporarily lost redundancy. As stated above, CARICOOS DMAC finished OBIS and MBON processing of the PRCRMP dataset while continuing with the identification of other suitable regional biological datasets.

1.2. Data management planning and coordination

The Data Management System (DMS) Plan has not undergone substantive changes. Refer to CARICOOS DMS Plan for details on the management and delivery of CARICOOS-related data.

http://about.caricoos.org/wp-content/uploads/2016/10/CARICOOS_DMS_Plan_Final_2017_Revised_Final.pdf

1.3. Provision of data to the Global Telecommunication System (GTS)

With the exception of the XCUL WeatherFlow weather station all metocean data from currently operational observational assets are uploaded to the GTS either directly by CARICOOS or through NDBC. We are keeping abreast of NOAA plans to perform GTS data harvesting from ERDDAP servers as a means of correcting the XCUL ID Code problem.

1.4. Data access services

CARICOOS keeps providing a Data Access page and dual/redundant THREDDS/OPeNDAPP access as well as links to the data pages of the HFR DAC, the Glider DAC and for AOML drifter. Data may be accessed in NetCDF and/or text format depending on the data type. Data access from NetCDF source files through CARICOOS THREDDS/OPeNDAPP servers is the preferred method; however, csv text files are available for near-realtime data. Our ERDDAP interface further accommodates other graphical and numeric format preferences for select models and data streams.

The <http://dm2.caricoos.org/erddap/index.html> THREDDS/ERDDAP server is down at the moment (undergoing repairs) but has been replaced with an AWS Cloud server dm1.caricoos.org for THREDDS and dm3.caricoos.org for ERDDAP.

1.5. Catalog registration

CARICOOS is registered in the IOOS Registry.

1.6. Common data formats

The two most common data formats are NetCDF and text csv. See 1.4 above.

1.7. Metadata standards

CARICOOS conditions all subcontracted data providers to follow current metadata and data discovery standards.

1.8. Storage and archiving

The Archival section of the DMS Plan provides details of CARICOOS Request to Archive documentation at NCEI. We are proceeding with the AWS Glacier archival of non-essential model output to AWS Glacier.

1.9. Ontologies, vocabularies, common identifiers

CARICOOS needs to increase efforts towards NetCDF file compliance as assessed through the use of the IOOS and NCEI compliance checkers. This effort is ongoing.

1.10. Consideration for Long-term Operations / Meeting DMAC requirements

Please see the DMS Plan.

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Itemized Completed Tasks as per Internal DMAC Milestones/Tasks

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