



Caribbean Coastal Ocean Observing System, Inc.

Tuesday, June 26, 2018

Prof. Julio M. Morell
University of Puerto Rico – Mayaguez Campus
Principal Investigator / Executive Director
“CARICOOS: Enhancing Coastal Intelligence for the US Caribbean”

Dear Julio,

Attached FINAL report for the period from June 1st, 2017 to May 31th, 2018.

Due to the confusion caused after Hurricane Maria passed through Puerto Rico, some activities were rescheduled, others will be completed soon.

After compiling all the documentation, we submit the corresponding FINAL report.

Cordially,

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Ruperto Chaparro
President / Principal Investigator

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Edwin Velez
Administrator / Treasurer



Caribbean Coastal Ocean Observing System, Inc.

Final Progress Report June 1st 2017- May 31st 2018

Award Number: NA16NOS0120026

“CARICOOS: Enhancing Coastal Intelligence for the US Caribbean”

Subaward Number: 2017-2018-001 – CARICOOS, Inc.

Period: June 1st 2017 to May 31st 2018

Financial

During the period covered from June 1, 2017 to August 31, 2017, CARICOOS, Inc. worked under a no cost extension for the 1st year of the “CARICOOS Enhancing Coastal Intelligence for the US Caribbean” project.

From September 1st to November 10th, we operated with discretionary funds accumulated from our past year indirect costs. On November 10 we received the transfer of funds corresponding to the 2nd quarter of 2017 (September, October and November).

TABLE 1 includes the budget submitted and approved for all the quarters totaling \$370,184. No funds were requested for the first quarter since we projected to work under a no-cost extension from June to September 2017 as previously established.

TABLE 1 – BUDGET BY QUARTERS



Budget CARICOOS Inc.- by quarters - 2017-2018

		1st Quarter Jun-Aug	2nd Quarter Sep-Nov	3rd Quarter Dec-Feb	4th Quarter Mar-May	All Quarters	
Personnel							
Chairman Compensation	\$7,000	\$0.00	\$2,333.33	\$2,333.33	\$2,333.34	\$7,000.00	
Administrator (\$25/hr)	\$12,304	\$0.00	\$4,614.00	\$3,076.00	\$4,614.00	\$12,304.00	
H. Performance Computing Specialist (\$6,417/m)	\$57,750	\$0.00	\$19,250.00	\$19,250.00	\$19,250.00	\$57,750.00	
Administrative Assistant (\$15/hr)	\$20,250	\$0.00	\$6,750.00	\$6,750.00	\$6,750.00	\$20,250.00	
DMAC Coordinator (\$4,167/m)	\$37,500	\$0.00	\$12,500.00	\$12,500.00	\$12,500.00	\$37,500.00	
Total Personnel						\$134,804	
Travel							
All Travel	\$3,000	\$0.00	\$1,000.00	\$1,000.00	\$1,000.00	\$3,000.00	
Total Travel						\$3,000.00	
Supplies							
Office Supplies	\$5,000	\$0.00	\$1,666.66	\$1,666.66	\$1,666.68	\$5,000.00	
Total Supplies						\$5,000.00	
Contractual							
Legal and Auditing Fees	\$6,000	\$0.00	\$2,000.00	\$2,000.00	\$2,000.00	\$6,000.00	
Web product development	\$20,000	\$0.00	\$5,000.00	\$10,000.00	\$5,000.00	\$20,000.00	
PO Commercial Divers	\$80,000	\$0.00	\$0.00	\$80,000.00	\$0.00	\$80,000.00	
General Assembly Venue	\$20,000	\$0.00	\$0.00	\$10,000.00	\$10,000.00	\$20,000.00	
Total Contractual						\$126,000.00	
Other							
NFRA IQOS Assoc_ Restricted Membership	\$10,000	\$0.00	\$10,000.00	\$0.00	\$0.00	\$10,000.00	
Office maintenance	\$4,000	\$0.00	\$1,333.33	\$1,333.33	\$1,333.34	\$4,000.00	
Outreach	\$5,000	\$0.00	\$1,666.66	\$1,666.66	\$1,666.68	\$5,000.00	
Board / Officers / Office Insurance	\$10,000	\$0.00	\$0.00	\$1,000.00	\$9,000.00	\$10,000.00	
Participant Support Costs	\$10,000	\$0.00	\$3,333.33	\$3,333.33	\$3,333.34	\$10,000.00	
Cloud Computing	\$15,000	\$0.00	\$5,000.00	\$5,000.00	\$5,000.00	\$15,000.00	
Emergency Response (Special Award Cond. 5)	\$20,000.00	\$0.00	\$20,000.00	\$0.00	\$0.00	\$20,000.00	
Total Others						\$74,000	
Total Direct Costs		\$342,804	\$0.00	\$96,447.31	\$160,909.31	\$85,447.38	\$342,804.00
Modified Total Direct Costs for IC computation		\$273,804	\$0	\$91,780.65	\$156,242.65	\$80,780.70	\$273,804.00
Indirect Charges		\$27,380	\$0.00	\$9,178.07	\$15,624.27	\$2,578.07	\$27,380.40
GRAND TOTAL		\$370,184	\$0.00	\$105,625.38	\$176,533.58	\$88,025.45	\$370,184.40
Modified Total Direct Cost Calculation							
	TDC	\$342,804.00					
	PART. SUPP.	(10,000.00)					
	OFFICE RENT	(4,000.00)					
	BUOYS	(55,000.00)					
	MTDC	\$273,804.00					

Hurricane Maria and the effects on the work and objectives of CARICOOS Inc:

In the November report we explained how the impact of Hurricane Maria affected our services by damaging or destroying equipment, limiting basic services such as electricity, water, communications and infrastructure among others.

TABLE 2

Table 2 shows a summary of all activities, some already completed and others to be completed:

BUDGET LINE	PROPOSED FINISHING DATE	DATE FINISHED	FUTURE DATE
Personnel	May 31 st 2018	Unfinished	Continue through a NCE
Travel	May 31 st 2018	On or before May 31 st 2018	N/A
Materials/Supplies	May 31 st 2018	On or before May 31 st 2018	N/A
Legal	May 31 st 2018	Unfinished	Continue through a NCE
Web Product Development	May 31 st 2018	Unfinished	Continue through a NCE
P.O. Commercial Divers	February 2018	Unfinished	Continue through a NCE
General Assembly Venue	May 31 st 2018	June 1 st 2018	N/A
IOOS Membership	November 30 th 2017	By November 30 th 2017	N/A
Office Maintenance	May 31 st 2018	Unfinished	Continue through a NCE
Outreach	May 31 st 2018	On or before May 31 st 2018	N/A
Board / Officers Insurance	May 31 st 2018	By January 2018	N/A
Part. Supp. Costs	May 31 st 2018	On or before May 31 st 2018	N/A
Cloud Computing	May 31 st 2018	Unfinished	Continue through a NCE

Achieved Goals

After a great effort on the part of the working team of CARICOOS-UPRM and CARICOOS Inc, we are pleased to say that we were able to complete most of the programmed objectives according to the approved budget.

- Travel:** Four trips were made to represent CARICOOS at different venues including the IOOS Assembly at the USVI. We also had representation at the DMAC meetings at Seattle and Maryland, and at the symposium of Sargasso and Oil Spills in Mexico
- Materials and Supplies:** Necessary materials and supplies to support the CARICOOS-UPRM work were acquired.
- Legal:** A new contract was renegotiated with the legal firm Marichal, Hernandez, Santiago & Juarbe LLC. It was necessary to continue with the services of the firm since they were dealing with the transactions for the tax exemption as a Nonprofit Organization under section 501 (c) (3) of the Internal Revenue Code.
- General Assembly Venue:** Even though Hurricane María damaged many hotels, we managed to celebrate with great success the CARICOOS General Assembly. Hurricane Maria caused damage in many hotels, and others that had not suffered damages were occupied by personnel for disaster relief. The assembly was held on June 1, 2018, almost 1.5



months after the planned date. Also we managed to celebrate a mid-term meeting with the Board of Directors on January 2018, almost 5 months after the scheduled date.

5. **IOOS Membership:** IOOS membership was renewed.
6. **Outreach:** To learn about stakeholders needs and preferences services were contracted to carry out interviews through the beaches of Puerto Rico.
7. **Board / Officers Insurance:** Insurance policies regarding “*Errors and Omissions*” and that for “*Directors and Officers*” were renewed.
8. **Participant Support Cost:** All costs of participants attending the general assembly were covered by CariCOOS Inc.
9. **Cloud Computing:** Since last December 2017, we covered the cloud space costs through Amazon Web Services. The purpose is to keep the data of the products on the CARICOOS.ORG website secure, and accessible from anywhere. This assures us the continuity of the services.
10. **Emergency Response:** As previously stated, the passage of Hurricane Maria caused destruction all over our island. The CARICOOS equipment including weather stations were no exception and as a result equipment and materials were acquired promptly to guarantee continued services.

Pending activities

1. **Web Product Development:** The “CariCOOS Beach App” product is expected to be completed by the end of summer. This product which provides information about weather conditions at more than one hundred beaches of Puerto Rico and the USVI will be available for free on Andriod and IOS platforms.
2. **P.O. Commercial Divers:** A purchase order was completed for the removal and replacement of CARICOOS buoys, to provide the required annual maintenance. These maintenance activities will be completed during the summer.
3. **Cloud Computing:** Management of data and payments for Amazon Web Services will be continued.
4. **Personnel:** Provide funding for the necessary services to continue normal operations.
5. **Legal:** Provide funding for pending legal services.
6. **Office Maintenance:** Provide funding for the rent of office space for the staff and equipment.

To continue with the services detailed above, a No Cost Extension request was made until September 30th, 2018.



TABLE 3 – TOTAL EXPENSES ACCUMULATED UNTIL MAY 31ST, 2018



Budget CARICOOS Inc. - Monthly Expenses - May 2018

APPROVED BUDGET			BUDGET EXPENSES		
Personnel			ACTUAL EXPENSES	ACCUMULATED EXPENSES	BALANCE AVAILABLE
Chairman Compensation	\$7,000		\$2,333.34	\$7,000.00	\$0.00
Administrator (\$25/hr)	\$12,304		\$2,212.50	\$11,787.50	\$516.50
H. Performance Computing Specialist (\$6,417/m)	\$57,750		\$7,060.00	\$41,560.00	\$16,190.00
Administrative Assistant (\$15/hr)	\$20,250		\$2,527.50	\$14,220.00	\$6,030.00
DMAC Coordinator (\$4,167/m)	\$37,500		\$3,900.00	\$33,060.00	\$4,440.00
Total Personnel		\$134,804			
Travel					
All Travel	\$3,000		\$1,213.62	\$6,430.29	-\$3,430.29
Total Travel		\$3,000			
Supplies					
Office Supplies	\$5,000		\$851.53	\$6,957.22	-\$1,957.22
Total Supplies		\$5,000			
Contractual					
Legal and Auditing Fees	\$6,000		\$0.00	\$3,483.40	\$2,516.60
Web product development	\$20,000		\$6,250.00	\$12,500.00	\$7,500.00
PO Commercial Divers	\$80,000		\$0.00	\$34,487.50	\$45,512.50
General Assembly	\$20,000		\$25,706.65	\$30,573.14	-\$10,573.14
Total Contractual		\$126,000			
Other					
NFRA IOOS Assoc_ Restricted Membership	\$10,000		\$0.00	\$9,000.00	\$1,000.00
Office maintenance	\$4,000		\$0.00	\$0.00	\$4,000.00
Outreach	\$5,000		\$681.81	\$4,057.81	\$942.19
Board / Officers / Office Insurance	\$10,000		\$0.00	\$8,573.00	\$1,427.00
Participant Support Costs	\$10,000		\$40.00	\$5,739.15	\$4,260.85
Cloud Computing	\$15,000		\$2,617.77	\$12,072.22	\$2,927.78
Emergency Response (Special Award Cond. 5)	\$20,000.00		\$0.00	\$20,000.00	\$0.00
Total Others		\$74,000			
Total Direct Costs		\$342,804	\$55,394.72	\$261,501.23	
Modified Total Direct Costs for IC computation		\$273,804	\$55,354.72	\$221,274.58	
Indirect Charges		\$27,380	\$5,535.47	\$22,127.46	
GRAND TOTAL		\$370,184		\$283,628.69	\$86,555.71
Modified Total Direct Cost Calculation					
	TDC	\$342,804.00			
	PART. SUPP.	(10,000.00)			
	OFFICE RENT	(4,000.00)			
	BUOYS	(55,000.00)			
	MTDC	\$273,804.00			



DMAC-Webpage Subsystem

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PROGRESS REPORT FOR THE PERIOD JUNE 1 2017 - MAY 31 2018

Based on the Rescoped Workplan for FY17 (Tier 1 level funding) for the current funding cycle

Enhancing coastal intelligence in the US Caribbean archipelago: The Caribbean Coastal Ocean Observing System (October 26, 2017 version)

LONG-TERM GOALS

(No change from previous)

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.

(May be appropriate to include excerpt from section 2.3 Operate an efficient CARICOOS DMAC subsystem)

MILESTONES / TASKS

The level of granularity of the Milestones/Tasks herein considered matches the Rescoped Workplan for FY17. Enhanced task resolution is provided in the DMAC-Webpage Subsystem Milestones spreadsheet (May 31, 2018 version; included).

Note that in September 2017 Puerto Rico was struck sequentially by Hurricanes Irma and Maria, Maria being a major (Cat 5) storm. Never seen before catastrophic impacts on PR and the suspension of essential services (power, water, internet) resulted in the temporary cessation of CariCOOS activities and our relocation to on-campus office space. As of December 2017 we were still occupying temporary facilities and working on the restoration of our observational assets.

Since September 2017 Juan Gonzalez is no longer a member of the DMAC team. His departure will our effectiveness/productivity in several areas of expertise, namely: AWS cloud setup and configuration, cloud HPC, modeling and Python programming among his other numerous skills.



WORK COMPLETED

By Year-1 (FY17) Rescoped DMAC Subsystem Milestones

1. Irma Maria data mining and synthesis
 - We added/completed the following data sets to our ERDDAP (<http://dm2.caricoos.org/erddap/info/index.html?page=1&itemsPerPage=1000>): WeatherFlow Mesonet, WindNet, UMaine and VI coastal buoys and the Rincon wave buoy. Collaborated with Patricia Chardon on the hurricane period synthesis report. Still working on the compilation of data time series that have been forensically extracted from the various platforms/sensors by the corresponding data providers and equipment manufacturers.
2. Moving HPC assets to operational location
 - Completed. Jose Torres brokered an agreement with the Electrical Engineering Department to host our servers at their on campus Data Center facility. No cost impact to CARICOOS. Production servers located at Mayagüez CARICOOS's Data Center has been successfully relocated after Hurricane Maria. Parma was shutdown and remains at the CID until a decision is made as to its future utilization. At the moment, servers at Magueyes Facility remains at our CARICOOS office. (Subsystem task 4)
3. HPC/IT infrastructure assessment
 - Assessment of current computational resources has been completed, however, a decommissioning schedule is still pending. (additional details in Subsystem task 4.5)
4. Fully populate CARICOOS ERDDAP with operational models (SWAN, WRF, ROMS/FVCOM)
 - SWAN has been available through ERDDAP for a while. Operational ROMS and FVCOM runs are still under development. WRF output needs to be re-written for ERDDAP compliance but first, the grid projection issue needs to be resolved by the modeling group. (Subsystem task 3)
5. CARICOOS en español (Subsystem task 9.1)
 - Completed prior to the General Assembly in late May.
6. Continue current CARICOOS DMAC and Regional DAC efforts as detailed in the SOP
 - Recurrent and ongoing.
 - Underwent a successful IOOS-DMAC review in June
 - Attended OBIS/MBON workshop in Seattle in February
 - Attended IOC/IOCARIBE meeting on sargazo and oil spills in Mexico City, in early May
7. Custom text data product development in response to stakeholder needs
 - Collaborated in the development/implementation of the CARICOOS Beach App
 - A Boating App is in the works for next FY
8. Continued improvement and debugging of our recently launched web page



- Recurrent and ongoing.
 - Revamped X-Y plots implemented and enabled.
9. Entries/holdings/queries in the IOOS Registry and Catalog will be increased while achieving full compliance with IOOS DMAC metadata, file and data discovery standards and checks
- Ongoing but partly delayed
 - IOOS Compliance Checker v. 4 analysis of our holdings is in progress
10. Attend IOOS DMAC meeting
- Jose and Capella attended the meeting in May.
11. Continue operating DMAC and computational infrastructure
- Ongoing.
12. Maintain and enhance new CARICOOS website
- Ongoing. See tasks 5 and 7.
13. Achieve cloud-based computing and improve HPC infrastructure
- HPC cloud sever is in place and fully operational at AWS. Main issue at the end of FY17 is funding for AWS HPC server utilization. Funds need to be allocated towards FVCOM, WRF, SWAN and ROMS development and operational execution.
14. Historic data archival
- Ongoing but delayed due to adversity.
 - UMaine is still developing NCEI compliant file versions prior to archival at NCEI.

MAJOR OUTCOMES

The major outcomes from the DMAC-Webpage Subsystem during the reporting period are 1) establishing an effective HPC presence in the cloud, 2) successful test of our webpage and THREDDS cloud servers which remained in continuous operation during our local hurricane downtime, 3) the addition of most observational metocean data sets to our ERDDAP, 4) a successful IOOS-DMAC PO review in June, 5) Attended two DMAC-relevant national or international meetings 6) Successfully completed server relocation from Mayaguez CID office to Electrical Engineering Data Center facility to restore production server functionality after Hurricane Maria and 7) Collaborated in the development/implementation of the CARICOOS Beach App and of the revamped X-Y functionality. Despite the environmental hardship DMAC continued to operate while data and products are being provided to our stakeholders.

RELATED PROJECTS

None.



PUBLICATIONS & PRODUCTS

No publications. Web-based Operational Status Panel implemented in collaboration with P. Chardon (http://52.55.221.16/CariCOOS_Status/ASSETS_STATUS FIGURE.png).

DMAC / WEBPAGE SUBSYSTEM						
Milestone/Task status by 5/31/2018						
Status	Milestone/ Tasks	Start Date	End Date	Task Lead	% Complete	Notes
1 Set up administrative email and Dropbox accounts for all subsystems						
On Going	1.1 Email Distribution Groups			J. Torres		The UPRM email system does not provide for a centralized way to manage this. We are currently using individual email groups.
On Going	1.2 Dropbox accounts			Sylvia R.		Deemed unnecessary.
2 Optimization of AWS server assets						
		6/01/17	5/31/18			
On Going	2.1 Use and configuration optimizations	6/01/17	*	J. Torres, J. Capella		open ended - recurrent
Not Started	2.2 dm1 THREDDS upgrade and addition of ERDDAP	11/01/17	2/28/18	J. Capella		dm1 TDS fixed, upgrade postponed and so was ERDDAP.
Complete	2.3 AWS HPC setup	6/01/17	9/30/17	J. Gonzalez, J. Torres	95%	Currently operational, further use depends on pending budgetary allocation.
Complete	2.4 AWS HPC remote on/off capability	8/01/17	9/14/17	J. Gonzalez, J. Torres	100%	Implemented and operational.
	2.4.1 Remote on/off documentation instructions setup	08/01/2017	1/31/18	J. Torres		Documentation and instructions had not been completed prior to Juan's departure.
On Going	2.5 Estimate optimal cost effectiveness of AWS resources	6/01/17	*	J. Torres		Actual cost has been determined, need to stick to budget. Jose has full cost breakdown for several contract and use options.
On Going	2.6 Assist in the migration of operational models to AWS: FVCOM, ROMS, SWAN & WRF	6/01/17	5/31/18	J. Capella, J. Torres		Ongoing, main issue is funding of the AWS HPC server.
3 THREDDS and ERDDAP Content (dm1 & dm2)						
		6/01/17	5/31/18			
On Going	3.1 Full model input/output integration to TDS and ERDDAP	6/01/17	5/31/18	J. Capella, J. Torres		SWAN is fully integrated. Has not been possible to aggregate WRF so not on ERDDAP. FVCOM is still in development. ROMS is not operational.
On Going	3.2 Provide similar content in dm1 and dm2	6/01/17	5/31/18	J. Capella, J. Torres		Completed for data holdings, WRF output, SWAN output. RTOFS only on dm1.
4 Relocation of CID-205 server assets						
		9/01/17	5/31/18			Monzon is not a short/mid term option





Completed	4.1	Scout candidate locations in CID or UPRM	8/01/17	10/31/17	J. Torres	100%	Completed.
Completed	4.2	Scout candidate locations in Magueyes	8/01/17	10/31/17	J. Torres	100%	Completed.
Completed	4.3	Provide recommendations and plan to management	10/01/17	11/30/17	J. Torres	100%	Completed.
Completed	4.4	Implement Relocation Plan	12/01/17	3/31/18	J. Torres, J. Capella	100%	Completed by October 2017.
In Progress	4.5	Plan for the decommissioning and replacement of IT infrastructure	3/01/18	5/31/18	J. Torres, J. Capella	25%	Analysis in progress. Needs assesment keeps changing.
	5	Incorporate Crown Bay, VI data streams to our THREDDS/OpenDAPP and web page	10/01/17	2/01/18			data issues are currently being handled by D. Wilson and need to be resolved
Not Started	5.1	THREDDS/OpNDAPP	*	*	J. Capella		Delayed due to Hurricane Impacts. Need input from VI.
Not Started	5.2	ERDDAP	*	*	J. Capella		Delayed due to Hurricane Impacts. Need input from VI.
Not Started	5.3	Webpage	*	*	Rafols M.		Delayed due to Hurricane Impacts. Need input from VI.
	6	Solve data storage issues locally and at AWS	1/01/18	5/31/18			
Not Started	6.1	Develop a data storage policy (document) for modeling IO and observational data	1/01/18	5/31/18	J. Capella, J. Torres		Data and model output storage policies have been developed and discussed with the modeling groups. Need to generate a formal document.
Not Started	6.2	Implement the data storage policy	4/01/18	5/31/18	J. Torres, J. Capella		In progress.
	7	DMAC procedures	6/01/17	5/31/18			
On Going	7.1	Maintain logs and documentation for all IT and DMAC procedures	6/01/17	5/31/18	J. Capella, J. Torres		Ongoing.
On Going	7.2	Attend to day-to-day webpage and DMAC issues	6/01/17	5/31/18	J. Capella, J. Torres		Ongoing.
On Going	7.3	Follow the DMS Plan and steer through IOOS PO guidande	6/01/17	5/31/18	J. Capella, J. Torres		Ongoing.
On Going	7.4	Attend Annual Meeting and monthly webinars	6/01/17	5/31/18	J. Capella, J. Torres		José and Capella attended the 2018 annual meeting in May.
	8	WRF output to THREDDS and ERDDAP	1/01/18	3/31/18			
Not Started	8.1	re-grid WRF output to create THREDDS and ERDDAP aggregations	1/15/18	5/31/18	J. Capella, P. Chardon		In Juan's absence this item has been delayed. Consulted fellow DMAC leads during the May meeting and there is no simple solution. The consensus calls for full data set re-gridding.
	9	Webpage improvements	9/01/17	3/31/18			
Not Started	9.1	Web Page Spanish translation	1/01/18	3/31/18	?		Completed in time for the General Assembly.
On Going	9.2	Webpage technology transfer document	6/01/17	5/31/18	J. Torres		Ongoing.
On Going	9.3	Upgrade webpage x-y plots	?	?	Rafols M		Completed in time for the General Assembly.

