



CARICOOS

CARIBBEAN COASTAL OCEAN OBSERVING SYSTEM

CARICOOS Regional Ocean Partnership - Data Sharing Initiative

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LONG-TERM GOALS

Enhance CARICOOS's capabilities to share and integrate federal and non-federal data sources to support coastal and ocean management efforts in the Caribbean region. The ROP Data Sharing Initiative's long-term goal strengthens and expands CARICOOS' services in the Caribbean region while providing high priority data and products to coastal managers and stakeholders.

MILESTONES / OBJECTIVES

1. Review and document previous Caribbean ROP activities (2013-2015)
2. Characterize existing regional data sharing capabilities and identify additional capacity needed in the region.
3. Host workshops with Puerto Rico and USVI stakeholders to identify and prioritize ocean data needs and challenges.
4. Organize and host meetings with CARICOOS board members and scientists, coastal managers and regional and extra-regional experts to define feasible approaches to the acquisition of data required and the construction of pertinent data products.
5. Develop a road plan toward CROP goals to be followed in the US Caribbean region.

WORK COMPLETED

1. Continued ROP virtual needs assessment with coastal managers and key stakeholder from federal and state agencies, maritime operations, ecosystem restoration, academia and research, private, tourism and recreational sectors. This formal consultation took place concurrently with the CARICOOS 2020 needs assessment and allowed identification and prioritization of data needs and challenges in the US Caribbean region.
2. Completed the development and published the *CostaVisPR: Vista Aerea de la Transformacion costera de Puerto Rico* web tool that allows users to visualize changes in coastal areas of Puerto Rico since 1930 using georectified aerial imagery. Coastal landcover changes can be related to processes such as coastal erosion, extreme events and coastal development, among others. The web viewer was developed through a collaboration between the Interdisciplinary Center for Coastal Studies (UPRM CIEL), Sea Grant and the CARICOOS ROP project.

3. *Puerto Rico High Resolution Wave Atlas*– The numerical modeling component of the atlas has been completed and a preliminary version of the interface has been developed, including a web interface that allows for downloading of 40 years of wave data at hundreds of output locations on the 20-meter and 100-meter depth contour. A preliminary version has been uploaded to <http://www.canalsresearch.com/wave-climate-atlas>, but official migration to its final URL (www.caricoos.org/waveatlas) as well as further development of the interface has been delayed and will be completed around February 2021 in collaboration with Candela creative Group.
4. Reviewed and approved the *CARICOOS CROP Data Portal* Beta version (<http://crop.caricoos.org>) and initiated final tool development. The data portal integrates approximately 60 products within five main categories: Marine Resources, Emergency Response, Tourism & Recreation, Climate Change and Maritime Operations.
5. Advanced development of the *Ecosystem Restoration, Conservation and Monitoring* web mapping tool. A survey was developed and distributed among stakeholders and natural resources managers and scientists. A webinar was conducted to distribute the survey and to receive survey and mapping products feedback from participants. A total of 52 survey entries were collected representing 22 different organizations (NGO's Private, Academia, Government). The monitoring component represented 75% of the entries, restoration (69%) and conservation (44%). An [ArcGIS Online web mapping application](#) was developed to distribute the survey results and provide a platform to evaluate current project information.
6. The previous ArcGIS interface developed as part of the original Caribbean CROP efforts from 2013-2015 has been recovered by mining and identifying the original GIS data (110 layers). The data was verified for completion, included in an ArcGIS Online web service and organized into original CROP categories. Metadata was also verified and uploaded with data layers. An ArcGIS Online Web Mapping Application was developed to include the CROP original layers for Puerto Rico and USVI. CROP layers were edited for symbology, renaming and attributes to improve performance and facilitate data use.
7. Initiated Caribbean MBON targeted outreach efforts with key stakeholders to develop awareness of MBON as a tool that facilitates the use of biological data in research and decision-making agendas and the use of MBON data portal mapping application. A demo webinar titled: *Visualizing the Puerto Rico [long-term] Coral Reef Monitoring Program (PRCRMP) data in the MBON Data Portal* was provided to key staff in sponsor agencies and to potential data users and data owners. The webinar was recorded and is available on the CARICOOS YouTube channel.
8. Advanced the water quality virtual buoys project. A proposal by B. Barnes and C. Hu (USF Bio Optical Lab) titled "*Establishing Satellites Based Virtual Buoys to Assess Water Quality in Coastal Puerto Rico and USVI*" was received and a subaward agreement was initiated at UPRM. A kmz file was produced with 20 Virtual Buoy stations at selected locations within marine reserves, river plumes, fisheries areas of concern, and/or collocated with existing CariCOOS buoys. At each station, MODIS data will be used to derive water quality products including SST, PAR, Absorption coefficient due to colored dissolved organic matter (a_{CDOM}), Chlorophyll_a concentration, turbidity, and diffuse attenuation coefficient for downwelling irradiance at 488 nm [$K_d(488)$].



MAJOR OUTCOMES

- Advanced the CROP needs assessment and identification of data needs priorities with coastal managers and key stakeholders from various sectors.
- Developed and published *CostaVisPR* an aerial viewer of coastal landscape transformation for Puerto Rico.
- Concluded the *CARICOOS CROP Data Portal* Beta version and initiated production phase.
- Initiated final stages of the *Ecosystem restoration, conservation and long term monitoring* web map tool product development and maintenance phase, and final distribution platforms on the CARICOOS website.
- Initiated the final stages of the evaluation of the original Caribbean CROP GIS layers from inclusion/removal, evaluate layer groups and symbology and final distribution platforms on the CARICOOS website.
- Initiated Caribbean MBON education and outreach efforts with key stakeholders.
- Generated subaward between UPRM and the USF Optical Oceanography Laboratory for establishment of 20 virtual buoys at critical sites in PR and USVI.

RELATED PROJECTS

High-resolution wave climatology study for Puerto Rico (Miguel Canals - DNER CZMP). Developed climatology being used to develop the **Very High-Resolution Wave Climate Atlas for PR**.

Caribbean MBON (Miguel Figuerola – DNER CZMP). Facilitated integration of the Puerto Rico Coral Reef Monitoring Program data into MBON data portal. The Caribbean MBON improves accessibility of biological datasets of interest to stakeholders and provide regional expertise in regard to OBIS, MBON and derived applications.

CHANGES/PROBLEMS

The COVID 19 outbreak forced postponement of ROP workshops and training programs in PR & USVI.

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

- Develop Coastal Landscape Transformation Tool for USVI.
- Develop High-Resolution Wave Atlas map interface for US Virgin Islands.
- Finalize web interface of the Puerto Rico High-resolution Wave Climate Atlas
- Resume workshops and training sessions with coastal managers in PR and USVI.
- Complete development of CARICOOS CROP Data Portal
- Final publication of the ecosystem restoration, conservation and monitoring projects web map tool.
- Continue and expand MBON-targeted outreach efforts and identification of additional data providers and priority data sets to be submitted to OBIS USA and the Global Biodiversity

Information Facility (GBIF) repositories for ingestion into the MBON Data Portal tools to expand biological data visualization in the US Caribbean.

PUBLICATIONS & PRODUCTS

- Interactive Tool: *Aerial View of Coastal Landscape Transformation Tool for Puerto Rico*: <http://CosaVisPR.org>
- Demo Webinar: *Visualizing the Puerto Rico [long-term] Coral Reef Monitoring Program (PRCRMP) data in the MBON Data Portal* - <https://www.youtube.com/user/Caricoos>