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IOC/SC-IOCARIBE/Sargassum & Oil Spills

Cartagena, April 2018
English only



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (of UNESCO)

Workshop Sargassum and Oil Spills Monitoring Pilot Project for the Caribbean and Adjacent Regions

(Mexico D.F., Mexico, May 2 – 4, 2018)

PROJECT CONCEPT NOTE

SARGASSUM AND OIL SPILLS MONITORING PILOT PROJECT FOR THE CARIBBEAN AND ADJACENT

Many of the natural resources in the Caribbean Sea marine environment are threatened by the adverse impacts of environmental changes and man-made hazards. In response, IOCARIBE of IOC UNESCO and its GOOS Regional Alliance IOCARIBE-GOOS, GEO Blue Planet, UNDP Barbados and the OECS have outlined a pilot project to support an integrated approach to monitoring concentrations of Sargassum weed and oil spills – both significant regional water-borne threats - and are seeking partners to further develop the pilot project concept and to secure funding for implementation. The ocean observing, information management, and product delivery framework developed by the pilot would be a basis for further development of other applications and serve as a starting point for expanded ocean observing efforts in the Caribbean.

Sargassum

The regional Sargassum infestation problem is well known; recent events focusing on the problem include the UWI CERMES Sargassum Symposium (2015) ¹; BVI Sargassum Regional Conference (2016) ² and a UNEP/CEP - supported technical session at the 69th meeting of the Gulf and Caribbean Fisheries Institute (2016) ³. At the 2017 Oceans Conference, the Association of Caribbean States committed to controlling the Sargassum Seaweed in the Caribbean Sea through monitoring and exploration of commercial use ⁴.

There are several projects presently funded to identify (via analysis of satellite observations) and forecast Sargassum concentrations, including Sargassum Watch, University of South Florida ⁵, and Sargassum Early Advisory System, Texas A&M ⁶. However, there is significant gap in connecting researchers developing Sargassum identification and forecasting methods with national and regional agencies challenged by dealing with the problem. At a recent GEO workshop on Sustainable Development in the Caribbean ⁷ and the 2017 GEO Blue Planet Symposium ⁸ both Sargassum infestation and Oil Spill contamination were mentioned as hazards

where the use of ocean and coastal observations would benefit society in the Caribbean Small Island Developing States. The problem was also singled out as a topic for an IOCARIBE Working Group and potential IOCARIBE-GOOS Pilot Project at the IOCARIBE XIV General Assembly in May 2017 (Recommendation SC-IOCARIBE-XIV.4)⁹.

Goals of a regional Sargassum Information System would be:

- Aggregate information from existing regional Sargassum identification/tracking/forecast systems
- Collaborate with regional interests to develop products and user interfaces for accessing information
- Develop a system to collect, store, and utilize local information (from fishermen, sailors, maritime interests, beaches, coastal managers) about Sargassum location and abundance both offshore and in the coastal zone
- Provide a widely accessible database and archive of regional Sargassum presence and impacts for integration with other regional environmental datasets for research
- Provide a regional framework for aggregating and delivering similar ocean observing products, such as oil spills

The concept directly addresses **Recommendation SC-IOCARIBE-XIV.4, SARGASSUM BLOOMS**, and brings together a number of existing research, operational, and intergovernmental entities to add value to their activities.

Oil Spills

With the exception of a small decline in the 1980s, seaborne oil trade has been consistently increasing in the last 50 years, growing from 60 to 120 million tonnes of total crude oil petroleum and gas loaded per year. Increased movements inherently imply increased environmental risk, in the form of damage or disruption to marine habitats and migration routes through noise, pollution and spills, as well as the increased risks of collisions with marine wildlife.⁹

In addition, more than one-third of oil and gas extracted today comes from offshore deposits. Offshore drilling, especially deep and ultra-deep-water drilling, faces greater technical challenges which further increase the overall environmental risks.

While the overall number of large spills is decreasing at a global scale, smaller “operational” spills from tankers, i.e. loading/discharging, bunkering, ballasting, tank cleaning, etc., are not fully observed at global scale and therefore contribute significantly to the critical degradation of the ocean environment and its biodiversity.

The Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region, also known as the Cartagena Convention, is a regional legal agreement for the protection of the Caribbean Sea. The Convention is supported by three technical agreements or Protocols on Oil Spills, Specially Protected Areas and Wildlife (SPAW) and Land Based Sources of Marine Pollution (LBS). With the exception of 3 countries, the Cartagena Convention Oil Spills protocol has been ratified by all United Nations Member States in the Wider Caribbean Region. It covers the marine environment of the Gulf of Mexico, the Caribbean Sea and the areas of the Atlantic Ocean adjacent thereto, south of 30°N and within 200 nautical miles of the Atlantic Coasts of the States.

Although this provides a comprehensive framework for the protection of the Caribbean Sea, there remains a recognition for a dynamic and integrated approach to capture and analyze current data

pertaining to oil spills both from land and marine-based sources. There is no region-wide resource available to national agencies to detect and monitor spills, to provide forecasts and warnings of impending impacts, and to determine exact sources of coastal pollution.

From an Operational Oceanography standpoint, the tools used for acquiring and delivering information and forecasts of oil spills are functionally very similar to those required for Sargassum detection and forecasting.

Pilot Project Concept

This pilot project will aim to demonstrate the utility of ocean observations and products to Countries interests by focusing on a complete end-to-end delivery of usable products for the monitoring and forecasting of Sargassum concentration and of oil spills. The Pilot Project will be based on existing technologies and activities, working to augment and improve the framework for information management and delivery and mechanisms for product development and usage. The resulting system will:

- Be based on clearly defined and specified frameworks (including the GOOS Framework for Ocean Observations)
- Result in useful products embedded as operational components of regional and national agencies;
- Build a sustainable structure of observations, data management, and product delivery that can be further utilized in other locations and for additional regional products;
- Utilize enhanced and customized realizations of existing mechanisms when possible for efficiency, engagement, and sustainability.

Project Components

- System Parameters and Design
 - Observations, based on existing activities when possible
 - Satellite data, products, and analyses
 - Field data (Offshore, Crowd Sources, Beach Observations)
 - Gap Analysis of existing activities, recommended observing / product improvements
 - Data and Information Management – framework to aggregate / deliver information that is flexible for expansion
 - Modeling and Forecasting – Existing and Gaps
 - Product Development
 - Product Visualization and Dissemination
 - Local Supporting Infrastructure (Local POCs, Product Use Training)
 - Long-term Program Management and Operational Sustainability
- User Interaction and Outreach
 - Identification of potential product users
 - Interviews to determine interest, need and potential use cases
 - Product development and design through iterative user testing and feedback
 - Outreach to potential users of the products
- Economic Impact Analyses
 - Analysis of potential value of the products

- Development of “success story” utilization of the products for policy making and/or responsive actions

Project Milestones

Project Development: February – March 2018

- Finalize pilot project concept
- Form initial project working groups (see Appendix I) to include parties responsible for project coordination, technical support/product development, user engagement and outreach
- Plan kick off workshop
- Identify web host for beta product development
- Identify funding opportunities for project implementation

Phase I: April – August 2018

- Working group meeting in March or April 2018
- Beta product development (existing observations, full data management structure, limited number of fully developed products and users, but framework in place to improve and expand)
- Initial user testing and feedback

Phase II: August 2018 – August 2019

- Conduct user outreach
- Identify success stories and applications of the product
- Identify and acquire funding for further product development
- Continue iterative user testing and feedback and finalize product
- Transition to sustained and operational system

References

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3. <http://www.cep.unep.org/summary-of-the-informal-event-and-technical-session-on-sargassum-influx-at-gcfi-69th-annual-meeting-november-2016>
4. <https://oceanconference.un.org/commitments/?id=15536>
5. <http://optics.marine.usf.edu./projects/SaWS.html>
6. <http://seas-forecast.com/#>
7. http://www.gstss.org/2018_Ocean_SDGs/
8. <http://geoblueplanet.com/blue-planet-symposiums/3rd-blue-planet-symposium-maryland-usa-2017/>
9. Fourteenth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE-XIV) Cartagena, Colombia, 26–28 April 2017
<http://unesdoc.unesco.org/images/0025/002561/256143e.pdf>
10. ITOPF Oil Tanker Spill tanker Statistics
http://www.itopf.com/fileadmin/data/Photos/Publications/Oil_Spill_Stats_2016_low.pdf

Appendix 1. Initial Working Group Members (*Draft members and roles for discussion*)

Project Coordination & Support

- Doug Wilson (IOCARIBE-GOOS)
- Cesar TORO (IOCARIBE of IOC UNESCO)
- Emily Smail (GEO Blue Planet)
- Peter Pissiersens (IODE of IOC UNESCO)
- Glenn Nolan (EuroGOOS)

Data and Product Developers/Technical Advisors

- Joaquin Trinanes (NOAA CoastWatch)
- Samy Djavidnia (GEO Blue Planet)
- Chuanmin Hu (University of South Florida, Sargassum Watch System)
- Nazeer Gopaul, Coastal Dynamics, Inc.
- Kyeong Park (or lab representative - Texas A&M, Sargassum Early Advisory System)
- Representative from the Nova-Blue Environment (Martinique)

User Engagement and Outreach

- Lorenzo Harewood (UNDP-Barbados)
- Danielle Evanson (UNDP-Barbados)
- Chris Corbin (UN Environment-CEP)
- OECS

National Ministry and Agency Representatives

- Ramon Roach (Coastal Zone Management Unit, Barbados)
- Marck Oduber (Meteorological Department, Aruba)
- Andrei Polejack (Ministry of Science, Technology, Innovation and Communication, Brazil)
- Francisco Arias (INVEMAR, Colombia)

Appendix 2. Recommended Phase I Workshop Attendees

- IOCARIBE of IOC UNESCO
 - Secretariat
 - IOCARIBE-GOOS
 - Member States' recommendations to Sargassum Working Group (SC IOCARIBE-XIV.4)
- IODE of IOC UNESCO
- UN Environment & CEP
- National Ministries and Agencies
- Caribbean Tourism Organization
- GEO Blue Planet
- OECS
- Association of Caribbean States
- UK Met Office
- NASA COVERAGE
- NOAA
- US IOOS
- JCOMM
- IMO
- UN Environment
- WMO
- EuroGOOS
- Coastal Dynamics, Trinidad
- GCFI
- SPAW RAC - Guadeloupe (Sargassum)
- RAC REMPEITC - Curacao (Oil Spills)
- Researchers
 - USF
 - Texas A&M
 - UWI CERMES
 - UNAM
 - CICESE

Appendix 3. Project Management Drivers

IOCARIBE⁹

Recommendation SC-IOCARIBE-XIV.4 SARGASSUM BLOOMS

The IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE),

Recognizing the significant negative impact elevated levels of sargassum seaweed have had on the economies of the wider Caribbean region in areas such as tourism and fisheries,

Recognizing also the challenges in understanding the cause of these events and the challenges experienced in the remediation of impacts to coastlines affected by the influx of large volumes of sargassum,

Noting that the Member States have previously supported the development and implementation of several global, regional and supra-regional IOC/IOCARIBE activities and programmes, which together could contribute to the establishment of a regional forecasting and tracking system for sargassum seaweed,

Building on the initiatives of currently underway or in development in other IOC sub-regions,

Establishes a working group to develop a strategy and action plan to improve the understanding of the occurrence of these sargassum events and invites Member States to nominate experts to the working group.

The working group will create a plan to design a forecasting and tracking system and an implementation plan, including the development of a prototype / pilot of the system to test the concept. IOC Global programmes including IODE, HAB and GOOS, OBIS and IOCARIBE programmes such as IOCARIBE-GOOS, CMA, ANCA, should contribute to and guide on best management practices for sargassum events, and on the development and operation of the tracking and forecasting system.

Recommendation SC-IOCARIBE-XIV.7 IOCARIBE-GOOS

The IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE),

Requests Member States to nominate experts to participate in an open-ended working group for the IOCARIBE-GOOS; the working group will meet annually, including electronically, in accordance with recommendations from IOCARIBE-XII;

Requests also the IOCARIBE-GOOS working group to prepare a summary of GOOS issues and advantages, based on consultations with the Argo Programme and other relevant observing programmes, for distribution to all Member States, in advance of the upcoming GOOS Regional Alliance (GRA) Forum in September 2017;

Requests further the development of pilot activities in support of the GOOS Regional Alliances, building upon Member States regional priorities and partnering with the substantial existing observing programme of the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions-CARIBE-EWS; pilots may include working with UNDP, GEO, and other partners to determine how IOCARIBE-GOOS can provide support to the proposed UNDP \$ 4 M project; and

Encourages the engagement of the private sector in GOOS initiatives by communicating the value of GOOS to commercial activities.

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