Sargassum Breakout Summary

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

• Design a Sargassum forecasting and tracking system and an implementation plan, including the development of a prototype / pilot of the system to test the concept.

• The 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
Potential Users of a Sargassum Forecast System

- Authorities / Municipalities managing beaches and natural resources
  - Managers
  - Emergency Responders
  - Coast Guard Navigational Safety
- Private Sector
  - Hotels
  - Other Tourism
  - Commercial Fisheries
- Policy makers (National / Regional /Local)
  - Environmental authorities
  - Public Health
- Residents / Coastal Communities
  - Including Recreational fishers, surfers, sailors
- National Finance Ministries (who have to pay or authorize planning and response)
- Researchers
- Sargassum Collecters / Processors / Exploiters [need to identify]
  - Exploitation underutilized because quantity seen as unpredictable
General User Needs for the System

- Need to develop governmental Policy and Coordinated Approach
- Need a coordinated response methodology and SOP, including
  - Best practices
  - Coordination of all shared information
  - List of capabilities by nation
  - Several OECS countries are creating coordinated Management Plans
- Intergovernmental group should co-ordinate
  - Can use Cartagena Convention
  - Roles and responsibilities
  - Procedures
    - Preparation
    - Response
    - Infrastructure needed and cost
- Need to develop and compile a complete user list
- Desirable to have Historical Baseline of Impacts
  (Chaunmin Hu has history of satellite abundance)
- Map of areas most affected
- Document social and economic impacts and responses
User Requirements

Emergency Responder example
- Need Long Range Forecasts
  - Would like 3 Months to prepare
  - Probability
  - Volume / Abundance
- And short term Forecasts
  - By beach or region
  - A few days (1-5) in advance
- Include Probability
- Desired Level of information sharing may vary among users
- Most users fall into the Long Range and/or Short-term categories

Should WG consider another User Group?
System Components - Observations (Remote Sensing)

- **Processed images** available from multiple providers
  - Based on various platform sources
  - Providing levels of resolution, confidence, latency
  - Created with varying levels of automation / human interaction
  - Common data exchange formats well-established

_A commodity with ongoing R&D to improve_
System Components - Field Data

- Useful to confirm and document nearshore presence and abundance
- Sources
  - Fishermen
  - Ferries, Cruise Lines, other commercial marine
  - Hotels and beachfront establishments, Citizens, Scientists
  - Aerial surveys (Coast Guard, UAVs)
- Need comprehensive data base for all types field observations
- Include many levels of information for broad usage and ability to deal with all
- Need collection protocols, including metadata
- Useful for
  - Biodiversity
  - Model / Analysis validation
  - Documentation for socio-economic impacts
- Access / inclusion of existing data sets

**ACTION:** Begin program to record, collect, archive Field Observations

Determine protocols, methods, and how to distribute information to potential contributors / users

Develop data collection application

Identify Managing Organization and Host
System Components - Data and Information Management

- **Raw/Processed satellite data** comes from space agencies and satellite operators / downloaders
  - Accessed by Processed Image providers
- **Clearinghouse (Distributed) for Satellite Processed Images and Analyses (Detection)**
  - Provides Information to initialize forecast models
- **Large scale Ocean and Atmosphere Model** access for forecasters
- **Managed database of Field Observations** (CMA?)
- **Clearinghouse (Distributed or Single) for model / forecast outputs**
  - Common Format
  - Including all necessary data for products
- **Targeted forecast products** for delivery to users
- **Archives**

- **Access to research data sets**
- **Access to ancillary data sets** (i.e. Fisheries, MBON, etc.)

- Requires IGO to ensure full regional / transnational data aggregation and access

- **Address Best Practices** including metadata, QA/QC
System Components - Modeling and Forecasting

- Medium to Long Range forecast models are somewhat specialized (non-operational) and still under development.

- Lack of adequate small (coastal) scale models
  - Local Capacity
  - Inadequate forcing fields and domain (Bathymetry) information

- Need Local / Regional Capability
- Need higher resolution image products at forecast model initialization time

Need higher resolution dedicated satellite [Elon Musk]

Optional testing of operational ROMS in PR/USVI/BVI system?
Product Development and Creation

- Simple Delivery – Coral Watch template
- Includes range of products targeted at range of users
  
- Landsat (High Resolution)
- Modis (Lower Resolution)
- Ocean Model based
- Coastal model based
  
- Hurricane model template – tracking cone probabilities, intensity (abundance)
  
- Product Visualization and Dissemination
  - When to put out forecast, through what mechanism
  - Regional Clearinghouse (provide consistency and QC)
  - Generally available to all?
  - Push to agencies and subscription services
  - With whom do we actually engage / who should respond
Science Gaps and R&D topics

- Understanding Sargassum developmental biology, ecology and impact on environment
- Improved models – eddy resolving climatology forced for longer period forecasts.
- Try hindcasting to evaluate data on Sargassum growth
- In situ measurements of Sargassum growth
- Do Sargassum mats behave like Lagrangian particles?
  - Smart drifters embedded in sargassum?
- Importance of Land-based / other nutrient sources
- Research on climate / interannual variability causes of abundance / location
- Multivariate analysis with Tropical Atlantic conditions / circulation / EKE
- Biodiversity changes associated with Sargassum presence / abundance
Action – Suggest a result of this conference include a version of Chuanmin Hu graphic and statement concerning high Risk in 2018