



United Nations  
Environment Programme

Distr.  
LIMITED

UNEP(DEPI)/CAR WG.39/INF.6  
25 June 2018

Original: ENGLISH

Fourth Meeting of the Scientific, Technical and Advisory Committee (STAC) to the Protocol concerning Pollution from Land based Sources and Activities in the Wider Caribbean.

Panama City, Panama, 18 to 20 July 2018

**REPORT OF THE WORKING GROUP ON ENVIRONMENTAL MONITORING  
AND ASSESSMENT**

*For reasons of economy and the environment, Delegates are kindly requested to bring their copies of the Working and Information documents to the Meeting, and not to request additional copies.*



## **REPORT OF THE WORKING GROUP ON MONITORING AND ASSESSMENT LAND BASED SOURCES PROTOCOL**

**Working Group (WG) Members:** Stephanie Adrian (Chair) – US; Linroy Christian (Chair of Data Sub-Group - Antigua and Barbuda; Marion Besancon – France; Frank Grogan – Guyana; Richard Nelson, Eromonsele Akhidenor, Lisa Kirkland and Danneille Townsend – Jamaica; Ana Karen Embarcadero Luna and Maria del Carmen Porras Perez Guerrero – Mexico; Andrew Horan, Troy Pierce, Hugh Sullivan, and Van Reidhead – US; Marlen Perez – RAC-CIMAB; Darryl Banjoo – RAC-IMA; Marko Tosic – EAFIT University, Colombia

Consultants: Sherry Heileman (Principal); Liana McManus (data analysis advice, data analysis for continental countries and French Guiana, socio-economic indicators and chapter)

**Workgroup focus** – The WG focused on the continued development of the State of the Convention Area Report (SOCAR). Post-3<sup>rd</sup> STAC, the WG focused on: developing a methodology for analyzing the water quality data, continued gathering of national water quality data from the Parties and non-Parties, QA/QC and analyzing the data, determining how to present the results in the report, resolving several issues with the data, and the actual drafting of the report. The WG Data Sub-group, led by Dr. Linroy Christian, held teleconferences to make decisions related to specific parameters that were considered to be difficult to put into ranges of good-fair-poor.

### **Updates on activities and outputs approved by the LBS Parties at the LBS COP3 in Cayenne, French Guiana:**

- For this round of SOCAR, LBS STAC Recommendations and/or COP/IGM Decisions will be adhered to. In terms of the data involved in SOCAR, this means:
  - a. SOCAR will focus only on original LBS parameters, as applied to ambient coastal water quality. These are:
    - Chlorophyll a
    - Turbidity
    - pH
    - Salinity
    - Temperature
    - Dissolved Inorganic Nitrogen (DIN) (NOT Total Nitrogen)
    - Dissolved Inorganic Phosphorus (DIP) (NOT Total Phosphorus)
    - Dissolved oxygen
    - Fats, Oil and Grease
    - Biochemical Oxygen Demand (BOD)
    - Total Suspended Solids (TSS)
    - Enterococcus or E.coli

- Results for other parameters covered in the national data sets will be given in appendices.
  - a. Chlorophyll a, dissolved oxygen, DIN, DIP will keep cut-values for Good, Fair and Poor states, as endorsed by the STAC and approved by the LBS COP and IGM (see 2014 STAC report, page 26)
  - b. DIN and DIP will be used instead of Total Nitrogen (TN) and Total Phosphorus (TP). DIN and DIP are better indicators in assessing levels of eutrophication potential and monitoring ambient water quality. At the next LBS STAC, the group will make a case for further discussion on DIN and DIP as it relates to TN and TP.
  - c. pH and turbidity will not have cut-values, only acceptable ranges as endorsed by the LBS STAC and approved by the LBS COP and IGM (see 2014 STAC report). The acceptable ranges will signal as “acceptable” if these meet the limit or “poor” if these do not. Turbidity will only be applied to coralline waters.
  - d. TSS is also an ambient water quality parameter and for ambient TSS we will show only patterns for coralline areas and not use cut values and ratings.
- Parameters such as Enterococcus, E. coli, fats, oil and grease, BOD, and TSS will be applied in the SOCAR using acceptable ranges for ambient water quality. Data submissions for effluent waters will also be acknowledged in the report.
  - a. It is suggested that for Enterococcus and E. coli, when applied to ambient water quality standards, we need to document what method was used (MPN or Membrane Filtration/CFU), and the SOCAR will need to reflect these in comparison to international standards such as WHO and USEPA specifically for those methodologies.
- To further address the issue of ambient waters and effluent standards, the history behind the 2014 STAC recommendations on cut values will be discussed in relation to the decision to follow through with it for the current SOCAR.
- Acceptable ranges in the STAC report will not be adjusted based on national standards, since the ranges have already been endorsed by the STAC and approved by the LBS COP and IGM. However, recommendations will be made to the LBS STAC for revising the acceptable ranges to include national standards as feasible.
- Criteria for standards and classification of waters should include potential impacts on ecosystems and associated ecosystem goods and services. We suggest that this be included in the recommendations chapter, as a follow on from a previous section on LBS Protocol history and behind the effluent standards, LBS STAC recommendations, etc.

### **Progress since STAC 3 related to the SOCAR:**

- Submission of national water quality data by 20 countries and territories.
- Completion of all computations of water quality data, following quality control/quality assurance of the data.
- Vetting of water quality results by the respective countries that submitted data. These results consist of national and sub-national averages for all the LBS parameters and other commonly covered parameters. There were no major objections to the results.
- Established cut values and ranges agreed upon for the LBS parameters.
- Estimates of nutrient loads from watersheds to coastal area for each SOCAR sub region obtained (modelled results),.
- Identification of indicators and assembly of data sets for the socio-economic chapter.
- Design of maps and other graphics for the SOCAR and contracting of CATHALAC for mapping and other services.
- Drafting of SOCAR chapters.

### **Challenges encountered:**

- Not all countries could provide national data for the SOCAR due to a number of factors including lack of monitoring programs, data only existing within non-government institutions, and data sensitivity issues. No data was received from countries in sub region II.
- Inconsistencies among data sets (e.g., uneven coverage of LBS parameters across countries, different parameters being monitored, use of different units).
- No GIS coordinates for sampling sites (some countries), needed for mapping.
- For some countries, GIS coordinates for sampling sites and water quality data are provided in separate files, which required some time and effort to merge them.
- Errors and inconsistencies in GIS coordinates provided.
- Absence of metadata (some countries) and description of sampling protocol. A description of the sampling protocol, including the statistical framework used in choosing sampling sites and sampling times, should accompany data sets. This would allow analysts to provide credible statements about the extent to which the analyzed data set is representative of particular geographies for specific time periods.
- Small number of samples and sampling sites for certain parameters (some countries).
- One country requested that its data for nutrients be omitted due to low confidence level in the data, which reduced the availability of data for nutrients.
- Missing data for one of the two seasons for certain parameters (some countries).
- Editorial errors in the data (e.g., using a comma instead of a decimal point; letter ‘o’ instead of zero ‘0’; wrongly placed decimal point), which required a significant amount of time to examine and clean the data sets before analysis.
- Because of scale issues, it is difficult to display the water quality results in maps at the sub regional or regional levels. Instead, maps will be prepared at the individual country level.

- Significant delay in issuing contracts (CATHALAC and SOCAR consultant) has delayed progress

**Potential LBS STAC Recommendations to the 3<sup>rd</sup> LBS COP for consideration:**

- Consider developing a recommendation that shows a commitment to addressing land based sources of marine litter which aligns with the UN Environment emphasis on marine litter and plastics.
- Support efforts to set up or strengthen national water quality monitoring and assessment programs that, at a minimum, monitor for SOCAR parameters.
- Harmonization of monitoring programs and protocols for LBS parameters, including data quality assurance.
- Continue work on refining the cut values as better data becomes available.
- Understand what data sources exist in countries and agree that certain non-governmental entities can serve as official data sources for the purpose of the LBS reporting.
- Suggest a new role for the Working Group post-SOCAR that would allow them to continue to provide technical advice and guidance going forward in support of the SOCAR results and recommendation, particularly with regards to strengthening and building water quality monitoring programs throughout the Wider Caribbean Region.
- Identify and share opportunities for synergies with other projects in the region aimed at increasing WQ monitoring capabilities, laboratory capacity and technical assistance both within existing programs such as IWECO and CLME+, as well as future projects.
- Identify gaps and barriers that prevent countries from establishing water quality monitoring and assessment programs in order to help target available