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The WECAFC-FIRMS Collaboration
Author: Nancie Cummings, WECAFC-FIRMS Regional Focal Point

Supporting regional needs in strengthening data collection for management and Decision Support System

This report provides information on WECAFC-FIRMS collaborations in the region since FIRMS SC 9. Section I provides general background on the WECAFC-FIRMS collaboration. Section II provides information on activities relating to improvements in data, statistics, and assessment capacities conducted under Phase I (2015-2016). Section III provides information on activities undertaken during Phase II (2017 to date). Section IV characterizes future planned activities of the WECAFC-FIRMS collaboration and Section V summarizes the collaboration and key initiatives.

I. Background

The need for improving fisheries information in the WECAFC region has been reiterated on several occasions. The inadequacy and gaps in basic information on fisheries data and statistics has been noted as a significant problem and deterrent of advancing management of fisheries resources in the WECAFC region. Most recently WECAFC 14 & 15 further recognized the need for improving information on fisheries data and statistics (February 2012, March 2014). As a response WECAF 15 endorsed the WECAFC – Fisheries and Resource Monitoring System (FIRMS) Partnership (<http://wecafc.org/en/statistics-info/firms.html>). The WECAFC-FIRMS “Partnership”, established by the FAO with direct involvement with the FIRMS Secretariat, would facilitate a variety of significant improvements in the region focusing on fisheries including:

- a. Development of and advancing Fisheries Inventories and Marine Resources Summaries in the region for key fisheries and marine resources.
 - o Providing critical inputs on data and statistics for use by managers for monitoring and management through fisheries inventory and marine resource fact sheet inputs
 - o Providing the minimum information sharable publicly share in absence of other information
 - o Providing managers a minimum level of monitoring on status of exploited resources in the absence of any formal regional database.

- Providing for the dissemination of high level fisheries information via inventories and fact sheets, that become the drivers of developing formal stock status thus enhancing upstream the data value adding chain

- b. Promotion of the development of a functional pilot database (RDB) through the “Partnership” targeting five shared regional stocks (Spiny lobster, Queen conch, Flying fish, Billfish, Shrimp and Groundfish) allowing for:
 - Establishment of a reliable source for stock assessment, monitoring, and management inputs through minimum data inputs
 - Provision of a cost effective system for monitoring and assessing stock status through collaborative WECAFC – FIRMS Partnership activities

- c. Support of regional governance through a collaborative task force bringing a set of complementary skills and knowledgeable of all Caribbean Fisheries issues including:
 - Western Central Atlantic Fishery Commission (WECAFC) and FIRMS Secretariats,
 - Caribbean Regional Fisheries Mechanism (CRFM),
 - Organización del Sector Pesquero y Acuícola del Istmo Centroamericano (OSPESCA)
 - WECAFC-FIRMS Regional and Sub regional Focal Points, and
 - a focal point for SICA-OSPESCA

- d. Establishment of partnerships with other important regional initiatives (e.g., CLME+ project Strategic Action Plan - SAP)
 - Leveraging ongoing and future fisheries activities with the “Partnership”
 - Enabling increased efficiencies of the Partnership through collective engagements of active groups focusing on relevant and key regional topics reflecting priorities of the SAP regionally
 - Harnessing collaborative skills on fisheries data and statistics issues and incorporation into development of initiatives to advance the regional quality of basic information fisheries for use in management, monitoring and stock assessment

To further emphasize the need within the region for improvements in fisheries information on data and statistics WECAFC 16 further stated “The Commission agreed that statistical information is essential for the functioning of a regional fishery body (RFB) and that a future regional fishery management organization (RFMO) in the WECAFC region will have serious challenges if Members pay insufficient Attention to stocks and fisheries data and statistics, including the quality of information. “

II. Recent progress towards development of a regional database (RDB) - FIRMS Phase I

2.1 Regional WECAFC-FIRMS DATA WORKSHOP (January 2016)

A regional WECAFC-FIRMS DATA Workshop convened in Barbados in January 2016. This workshop was a cornerstone of the WECAFC-FIRMS Partnership action on “Strengthening national data collection and regional data sharing through FIRMS to support priority regional fishery management plans in the WECAFC area”. The primary aims of the workshop were:

- Identification of needs, gaps and deficiencies in regional data collection, sharing and capacity.
- Consensus on minimum elements and best practices for data collection, data sharing, data harmonization, and IT requirements for a regional database.

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- Definitions of basis for an action plan and road map for building capacity and strengthening national data collection and working groups in support of fisheries management
 - Finalization and publishing of FIRMS inventories (with Spanish translations)
 - Foundations for prototype of a regional database (RDB) and consensus

Through discussions on a variety of fisheries topics (data collection, data sharing, and governance) participants identified critical needs in the region and developed consensus recommendations for implementation of Phase I of the RDB. The workshop was sponsored by the EC DG MARE. This initiative started in May 2015 as a collaborative process among regional organizations WECAFC-CRFM-OSPESCA and their Member States towards supporting initially three priority Fishery Management Plans (Flying Fish, Queen Conch, Spiny Lobster) with the minimum data needed to assess stocks and implement adaptive management strategies. The workshop was attended by 13 Countries, two EU overseas territories, four regional organizations.

Main Products of the workshop were:

- a. Consensus of minimum data requirements for stock assessment and management and needs for data sharing
 - Identified prototype for regional database, data sharing policy to be reviewed by WECAFC Scientific Advisory Group (SAG) and other relevant working groups in the region
- b. Development of work plan for FIRMS Phase I to enable the RDB including:
 - Detailed review of capacity building needs (statistical, data collection, logistical)
 - Developed matrix of prioritizations for data collection
 - Proposed TORs for working groups to advance data and statistics
 - Workshop Report (<http://www.fao.org/3/a-i5789e.pdf>)

2.2 Implementation of WECAFC-FIRMS RDB Phase I activities

Subsequent to the January 2016 regional data workshop, multiple activities were undertaken by the WECAFC-FIRMS taskforce towards advancing the RDB. These included mainly conducted in 2016 or early 2017 and were:

- a. Development of new inventories for several countries including:
 - Bahamas spiny lobster
 - Trinidad and Tobago Gillnet and line flying fish and associated pelagics fishery
 - Tobago =Trinidad and Tobago Dolphinfish fishery
 - Saint Kitts and Nevis Queen conch fishery
 - Saint Kitts and Nevis Spiny lobster fishery
 - Turks and Caicos Islands Lobster fishery
 - Saint Vincent and the Grenadines Queen conch fishery
 - Saint Vincent and the Grenadines Lobster fishery
 - Saint Vincent and the Grenadines Large pelagics fishery

Appendix 1 provides a comprehensive listing of completed inventories.

- b. Project Concept notes for three national data collection system capacity building -
A mission was organized in October 2016 to review priority actions identified for three countries (Belize, St. Lucia, and St Kitts and Nevis) to draft project concept notes for strengthening national data collection systems (capacity training, logistical):

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- Saint Lucia : <https://goo.gl/r8JyZE>
 - Saint Kitts and Nevis : <https://goo.gl/zKNDT3>
 - Belize : <https://goo.gl/kyA3je>
- c. The development of the Bahamas Fisheries Management Information System (FisMIS) which begun under the FAO Technical Capacity Programme (TCP) project with the primary goal to support the certification of the lobster fishery, was finalized and resulted in the implementation of a new centralized information system supporting a new data collection framework (DCF). The new DCF proposed improved methodologies to monitor the main types of commercial fisheries, with a logbook proposal for industrial like vessels (Motherships) and a sample based survey for small-scale like fisheries (e.g., dinghies). (FisMIS – <http://data.d4science.org/workspace-explorer-app/?folderId=M1FkNG0vMIFIUXRLVks5RHplcFN4djRIK01FaUE5U0JDOUJVa2J4ZkpvNFFXTncyajNoaXdYV0k3YW00SUNMZg>)
- It is noted that the Bahamas FisMIS project activity was not a dedicated FIRMS Phase I RDB project. However the FisMIS project is referenced in the context as a regional activity having direct relevance and significance to contribution in the overall strengthening of key fisheries information needed for improving regional fisheries management.
- d. Endorsement of WECAFC Fisheries Data and Statistics Working Group (FDS WG) by the WECAFC Commission (June 2016, <http://www.fao.org/3/a-i6031t.pdf>)
- e. Draft of the WECAFC Data Collection Framework (DCF) sections was effected:
- Draft minimum requirements for data in support of fisheries management with a proposal for regional classification (*priority species, regional list of gear type and vessel type, geospatial classification for statistical fishing areas*) (<https://goo.gl/YMNsNx>) and 2) draft minimum needs for stock assessment (*proposal of standard models depending on available data*). (<https://goo.gl/AJCW5U>). Discussions also took place on data sharing needs and principles. These activities provide the initial guidelines for sound data collection and sharing ensuring adopted standards and definitions will be followed.
- f. Draft of a regional logbook template proposal was developed. A review of worldwide logbook templates was conducted to facilitate in developing a template for Caribbean fisheries that would satisfy minimum data requirements for key fisheries information needed for effective monitoring and management, optimize data collections to minimize stakeholder burden while also providing relevant statistics for use in stock assessment.
- g. Dissemination of information on the WECAFC-FIRMS Partnership and the regional RDB project was made available to multiple groups via:
- The iMarine Gateway, data infrastructure was used by the Task force to collate and disseminate multiple products from the FIRMS Phase I project (<http://www.i-marine.eu/Content/About.aspx?id=6cc695f5-cc75-4597-b9f1-6ebea7259105&menu=1>). The open and publically available data e-infrastructure enables a cost-effective and facilitated retrieval, access, collaborative production and sharing of information and tools. Enabling improved access of fisheries information regional managers, scientists and the public optimizes IT issues while offering real – time accounting of important data.
 - Products of the WECAFC-FIRMS project shared through the iMarine gateway included the January 2016 WECAFC-FIRMS Data Workshop report and conference materials
 - External participation by the two task force member contributed to in-person real time communications on the WECAF-FIRMS Partnership (e.g., poster presentation at the GCFI Annual conference in November 2017 and brochures disseminated (GCFI, Panama 2016)

- CRFM promoted the ‘Partnership’ through the CRFM online News Portal emphasizing the need to capitalize on opportunities for Member States to strengthen data collection and management systems through the use of modern technology, such as smartphones and wireless communications to bridge gaps in the system (
 - The task force provided additional information on the RDB project at the meeting of the FIRMS Secretariat with CRFM Executive Director November 2016 (Belize)
- h. Development of a project concept note for proposal to EU for funding of FIRMS Phase II to continue advancing the RDB towards a fully functional RDB. A proposal was drafted by FAO Fisheries Information Aquaculture Statistics (FIAS), reviewed by the taskforce and submitted for funding and accepted in December 2016.
- i. WECAFC-FIRMS BlueBRIDGE VRE activities:

Initiatives were undertaken by the task force in considerations of exploring benefits of the EU Horizon 2020 BlueBRIDGE for furthering improvements in regional technical capacity and stock assessment:

- The 1st meeting of the External Advisory Board (EAB) of the BlueBRIDGE project took place in February 2016. The meeting was attended by the newly appointed WECAFC representative. Primary areas of interest to the WECAFC region concerned enhancing assessment and training capacity within a virtual research environment (VRE, <http://www.bluebridge-vres.eu/about-bluebridge>).
- Activities were undertaken during the fall of 2016 to identify specific stock assessment models for use within the BlueBRIDGE VRE environment that could benefit WECAFC stock assessment researchers and managers.
- Two stock assessment models were identified which characterize the primary data types available in the WECAFC region for data limited fisheries (CMSY utilizing catch only or catch and CPUE and also a data limited model using length composition,). The ability of regional experts to explore such models would significantly 1) enhance the ability of regional stock assessment analysts to utilize standard assessment tools used worldwide and 2) provide a collaborative environment for regional experts and managers to evaluate resource manages, and 3) improve efficiencies in developing real-time management advice.

III. WECAFC-FIRMS activities towards advancing the pilot RDB towards a fully functioning RDB – WECAFC-FIRMS Phase II

- a. Implementation of the WECAFC-FIRMS Project Phase II: it was proposed to
 - Extend the RDB to include the shrimp and ground fish as priority species to enable synergies with the project being supported under the UN, UNEP Caribbean and North Brazil Shelf Ecosystem (CLME+) Strategic Action Program (SAP)
 - Extend the RDB to include billfish as priority species to enable synergies with the Caribbean Billfish Project (CBP) supported under the Global Environmental Fund project (GEF)
- b. In March 2017, the RDB data and statistics task force held a coordination meeting to lay the ground work for further tasks to advance the RDB and move into Phase II. The Caribbean data and statistics coordination meeting (DSCM) aimed to concretely review on-going projects to identify similar, convergent or over-lapping activities, identify and discuss collaboration principles, propose synergies and collaboration and define a work plan for implementation of joint activities. Specific outputs the DCCM aimed for

included:

- Develop an inventory of fisheries projects / initiatives that emphasized projects that included a data and statistics component thus targeting activities with high probability of impacting improvements in basic fisheries data
- Develop an inventory of statistics/data management related activities with identified synergies or complementarities realizing the potential for increases in efficacies through capitalizing on such strong collaborations
- Develop a 2 year collaboration plan with co-funded activities thus prioritizing initiatives short term while recognizing the long-term planning also
- Identify and develop a list of prioritized gaps/needs as part of a longer term vision

Products of the DSCM included:

- Inventory of fisheries products thus providing the initial minimum data for the region for informing status, monitoring and management
<https://docs.google.com/document/d/1MOSBXTpVYNw3WVAyj6527lp32Qh3SL9wYbsi1pvHpMU/edit?usp=sharing>
 - Analytical Matrix developed to guide further implementation and planning of the FIRMS Phase II:
https://docs.google.com/spreadsheets/d/1MLLeDHFqCdi2zdHB_93IdPLepRWarsfS-oMcqkZSR8bY/edit?usp=sharing
 - Draft report of the Coordination Workshop (June 2017)
- c. Further liaison of the task force with the Caribbean Large Marine Ecosystem (CLME) and Recreational Billfish Project took place for:
- Extension of the RDB and the task force to the OSPESCA region and the CLME+ Project
- d. A Draft “*Communication and Visibility Plan*” was developed and submitted to the FAO Technical Cooperation Department for the implementation of the WECAFC-FIRMS Phase II project in the system (May 2017). The objectives of the Communication and Visibility Plan are:
- Raise awareness on the existence of the recently endorsed WECAFC Commission Working Group on Fisheries Data and Statistics (WG FDS) to the fisheries sector stakeholders in the Caribbean Region,
 - Expose WGFDS activities to a broad audience not limited to the fisheries sector and:
 - *Caribbean fisheries specialists community, such as fisheries management experts or officers, fisheries statistician, stock assessment experts*
 - *Caribbean fisheries national and regional policy makers*
 - *Broader fishing industry stakeholders (fishers, processors-traders-retailers involved in the seafood value adding chain) and NGOs/iNGOs*
 - Raise awareness on the availability of regional WECAFC data and information in the Regional Database (RDB).
- e. Translation of the FIRMS website to Spanish was made possible through the efforts of the FIRMS program, in the context of the WECAFC-FIRMS phase I project which highlighted the importance of a Spanish version of FIRMS for extending use of FIRMS to Latin American countries Members of WECAFC and OSPESCA. This activity is referenced on the high relevance attached to the objectives of the RDB project towards providing and disseminating high quality information to stakeholders on a variety of information relating to fisheries management and stock assessment. Such enhancements

in the dissemination capacities of basic data on fisheries inventories to the Spanish speaking national and regional experts will have added value for fisheries management.

- f. The RDB task force developed draft 2 of the Data Collection Framework guidelines document and further revised the logbook proposal (June 2017). The DCF and the logbook proposal would serve to characterize the structure of the RDB data collection system, provide guidelines on best practices for data collection and lay the groundwork for data collection instruments (e.g., logbooks) ensuring data regional collection is optimized while following well established standards.

- g. WECAFC – FIRMS BlueBRIDGE VRE Phase II work:
 - o RDB component in support to DCF: a workshop was held in March 2017 with FI FIAS, CNR and BlueBRIDGE experts to discuss options for RDB functionalities to support creation of data call template by the Regional Data Manager and upload of corresponding data by the National Data Manager. The goal was to technically discuss user friendly tools and interfaces to manage data structure and data upload agnostic from the actual data structure definition (compliant with any type of data defined in the DCF). Further discussions were held with the different actors to validate the most suitable options. Developments are undergoing for the template manage, consultant still needs to be recruited to build the user friendly interface on the top of the VRE services.
 - o RDB component in support to stock assessment:

The task force continued the activities initiated in late 2016 with the BlueBRIDGE VRE. A consultant was identified in mid-2017 and worked with the Regional focal point towards four aims:

 - Porting the stock assessment CMSY (Froese et al. 2016) stock assessment model into the DLMtool (<http://www.datalimitedtoolkit.org/>) data limited modeling framework inside the BlueBRIDGE infrastructure
 - Conducting a management strategy evaluation (MSE) using the CMSY model within the VRE
 - Identifying a second stock assessment model (length based) and porting into MSE analyses within the VRE
 - Developing software tools for use in publishing stock assessment model results within the VRE (e.g., development of R shiny applications)

Products of the WECAFC-FIRMS BlueBRIDGE VRE stock assessment component activities include:

- o CMSY code operative in the BlueBRIDGE Stock Assessment VRE was reviewed to identify potential for run-time improvements thus increasing success for implementation within the VRE
- o Discussions between the CMSY developer and the FIRMS BlueBRIDGE VRE team took place regarding VRE implementation; such collaborations aided in rapid identification of relevant issues/challenges of model implementation regarding run-time needs within MSE
- o The project contractor developed an R-shiny interface for use with the length based indicator assessment model within the VRE- the R-shiny tool will directly enhance automatic model result summarization thus enhancing real-time stock assessment work capacity
- o A presentation was developed characterizing the future plan of work for the June 2017 BlueBRIDGE technical committee meeting and presented remotely by the consultant

IV. Other WECAFC-FIRMS collaboration activities planned during the coming period:

- a. Continued development of new inventories
- b. Updating fact sheets, including FIRMS status/trend indicators
- c. Kick off of RDB phase II
- d. Finalizing the WECAFC Data Collection Framework (DCF) and data collection logbook guidelines documents and necessary modules
- e. Development of RDB data sharing guidelines
- f. Formal implementation of the WECAFC Fisheries Data and Statistics Working group (February 2018)
- g. Formal review of the WECAFC DCF and logbook guidelines by regional working groups

V. Summary

Key strategic activities recently undertaken in the WECAFC region having direct impact on catalyzing significant improvements in the basic fisheries information in the region were described. The WECAFC-FIRMS “Partnership” was formulated in response to the general need for fisheries improvements in the region as highlighted by the EC DG MARE. Developed out of the “Partnership” were specific collaborative initiatives facilitated by a governing task force the latter established by FAO with direct involvement of the FIRMS Secretariat. These initiatives laid the foundation for development of a regional database that will provide the minimum data requirements for monitoring and management of shared regional resources. Synergistic activities focusing on marine resources which are the priorities of the Strategic Action Plan adopted at regional level have been prioritized and are being implemented. Key to the successful implementation of the WECAFC-FIRMS “Partnership” will include continued collaboration, coordination and liaison across the multiple initiatives concerning regional data and statistics.

VI. References

DLMtool. Data Limited Modeling Toolkit. (<http://www.datalimitedtoolkit.org/>).

Froese, R., Demirel, N., Coro, G., Kleisner, K. M., & Winker, H. (2016). Estimating fisheries reference points from catch and resilience. *Fish and Fisheries*.

Appendix 1: FIRMS inventories completed for the WECAFC region.

a. Bahamas:

Bahamas Lobster fishery <http://firms.fao.org/firms/fishery/970/en>

Bahamas Nassau Grouper fishery <http://firms.fao.org/firms/fishery/971/en>

Bahamas Queen Conch fishery <http://firms.fao.org/firms/fishery/969/en>

b. Trinidad and Tobago:

Trinidad and Tobago Dolphinfish fishery - Tobago <http://firms.fao.org/firms/fishery/974/en>

Trinidad and Tobago Gillnet and line flyingfish and associated pelagic fishery – Tobago
<http://firms.fao.org/firms/fishery/973/en>

c. Saint Kitts and Nevis:

Saint Kitts and Nevis Oceanic pelagic fishery <http://firms.fao.org/firms/fishery/982/en>

Saint Kitts and Nevis Queen conch fishery <http://firms.fao.org/firms/fishery/981/en>

Saint Kitts and Nevis Spiny lobster fishery <http://firms.fao.org/firms/fishery/983/en>

d. Turks and Caicos:

Turks and Caicos Islands Lobster fishery <http://firms.fao.org/firms/fishery/986/en>

Turks and Caicos Islands Queen Conch fishery <http://firms.fao.org/firms/fishery/985/en>

e. Saint Lucia:

Saint Lucia Flyingfish fishery <http://firms.fao.org/firms/fishery/906/en>

Saint Lucia Lobster fishery <http://firms.fao.org/firms/fishery/907/en>

Saint Lucia Queen conch fishery <http://firms.fao.org/firms/fishery/975/en>

Saint Lucia Large pelagic fishery <http://firms.fao.org/firms/fishery/976/en>

Saint Lucia Shark fishery <http://firms.fao.org/firms/fishery/977/en>

Saint Lucia Whelk fishery <http://firms.fao.org/firms/fishery/978/en>

Saint Lucia Sea urchin fishery <http://firms.fao.org/firms/fishery/979/en>

f. Saint Vincent and the Grenadines:

Saint Vincent and the Grenadines Large pelagics fishery

<http://firms.fao.org/firms/fishery/994/en>

Saint Vincent and the Grenadines Lobster fishery <http://firms.fao.org/firms/fishery/993/en>

Saint Vincent and the Grenadines Queen conch fishery

<http://firms.fao.org/firms/fishery/992/en>