European Union

DEMERSTEM Working Group on stock assessment process

Index

Index 2
Objectives: 3
Tools used during the meeting: 4
Virtual classroom 4
Data sharing and R Package 4
Trainings: 5
R tutorial 5
Abundance indices 5
Stock assessment models 5
Data sharing: 6
Feedback: 6
Annexes: 7
Annex 1: List of partners connected (at one moment per day) 7

Objectives:

One of the objectives of the DEMERSTEM project is to review stock assessment models currently available and to identify which are relevant in the DEMERSTEM partnership context. This also includes strengthening our skills in order to be able to manage, use and understand these methods.

Due to the COVID 19 Pandemic, the meeting was held online with 3 mains objectives:

1- Analysis of scientific (surveys) and commercial fisheries data available to get abundance indices (AI)

2- Use production models to assess the stocks status of target stocks, by using the abundance indices as model inputs.

3- Further analysis with other assessment methods (SPICT and CMSY).

The meeting took place from the 1st to the 5th of February 2021.

Tools used during the meeting:

Virtual classroom

Agrocampus Ouest provided its own web conferencing tool for plenary (1) and sub sessions (3).

The Agrocampus team was composed of Jerome Guitton (DEMERSTEM coordinator), Didier Gascuel (Expert on stock assessment) and Fabien Bourinet (technical development and assistance). The Agrocampus Team was in the same physical meeting room.

Data sharing and R Package

A data call for this Working Group (WG) was sent in June 2020. This followed the first data call launched during our last WG concerning data management in Côte d'Ivoire (February 2020).

Using the data effectively received, Jerome Guitton merged the information by case study and the datasets were transmitted to each subgroup concerned:

- **Case Study Number 1:** *Epinephelus aeneus* in Mauritania and Senegal. A dataset composed of information from scientific (surveys) and artisanal fisheries was set up and sent to CRODT and IMROP partners.
- **Case Study Number 2:** *Pseudotolithus elongatus* in Guinea and Guinea-Bissau. A dataset composed of scientific (surveys), artisanal and industrial fisheries information was set up and shared as common minimum dataset for this subgroup (CIPA, CNSHB and IEO) .
- **Case Study Number 3:** Ghana/Côte d'Ivoire. Two data sets (one dataset for *Pseudotolithus senegalensis* and one for *Pagellus bellottii*) with only scientific data were set up and sent to the participants of CRO and the Fisheries Commission.

Pays\série	Campagnes	Pêche industrielle	Pêche artisanale
Mauritanie	X		X
Sénégal	X		\
Guinée Bissau			
Guinée	X	X	X
Ghana	\		
Côte d'Ivoire	X		

An R package (demerstem) is under development in order to gather and facilitate the use of methods as Delta GLM or Pseudo equilibrium models. This package is hosted on Github (https://github.com/polehalieutique/demerstem) and was installed on every participant's computers. This package will be further developed along the DEMERSTEM project.

Trainings:

R tutorial

We initially planned half a day for a common training on the use of the R software (https://www.r-project.org/) in order to have the same baseline of skills for users before using the software with stock assessment models.

The session was especially devoted to two R packages:

- **dplyr**: to manage data within R (summarize, filter, add new columns, select, etc.). This package is currently one of the most used for data manipulation and it is easy to learn for a beginner.
- **ggplot2**: this is a common library for graph production in R.

The presentation is available here : http://halieut.agrocampus-ouest.fr/demerstem/public_html/livrables/GT/GT4/pr%C3%A9sentations/2-Intro_R.pdf

The R script used for the practical exercise is available here: http://halieut.agrocampus-ouest.fr/demerstem/public_html/livrables/GT/GT4/pr%C3%A9sentations/3-Cours_R_fouille_donnees.pdf

Abundance indices

One of the first steps in the stock assessment process is the production of abundance indices (AI), which will be used as input data of the statistical models. These AI should reflect as best as possible the stock abundance evolution. They can be calculated using CPUE (catch per unit of effort) from scientific surveys of commercial fisheries observations.

The abundance indices estimation was made through Delta GLM, a well known and robust method. It can correct the bias induced by changes in fishing and sampling strategies, modifying the spatial-temporal fishing effort or the fishing pattern (i.e.: new gears or vessels). The theoretical presentation is available here:

http://halieut.agrocampus-ouest.fr/demerstem/public_html/livrables/GT/GT4/pr%C3%A9sentations/4-Didier_Delta_GLM.pdf

The practical presentation is available here:

http://halieut.agrocampus-ouest.fr/BAS/scripts/BAS_bourinet/Semaine_groupetravail/

We started with the definition of the statistical factors to be considered in GLM models (i.e.: spatial-temporal stratification or fleet segmentation). In further meetings, we will improve the stratification used in order to increase the abundance indices quality.

Stock assessment models

In spite of the initial plan, the main part of the WG was dedicated to the calculation of the abundance indices. Thus, we had to reduce the time initially planned for stock assessment models.

A theoretical presentation of the production models (dynamic and pseudo-equilibrium) was made. It is available here:

Production models: http://halieut.agrocampus-ouest.fr/demerstem/public_html/livrables/GT/GT4/pr%C3%A9sentations/6_Mod%C3%A8le_de_production.pdf

However, due to time constraints, we were not able to practice with this kind of models and therefore, this will be postponed to next working group.

Finally, we planned periodical web meetings by subgroups in order to follow the use of what was learnt and disseminated during the WG. Agrocampus Ouest will submit an agenda for sub-meeting (one or two hours, every two weeks).

Data sharing:

Several datasets were prepared before the WG. During the WG, we also identified new data to include in the dataset or some updates.

Nansen data are still not available for Mauritania, Senegal and Guinea-Bissau. We need to collect and integrate them in the database. For IMROP, it seems that the data are available. For CRODT and CIPA, we need to identify how to effectively access the data. Jérome will provide the template for Nansen data transmission.

For the *Penaeus notialis* case study (Mauritania-Senegal), IEO colleagues mentioned that commercial data series from the industrial Spanish shrimper fleet operating in Mauritania could be provided. Jérome will send the template made during GT3 for industrial fisheries data transmission.

The CRODT mentioned that long time series of Thiof (*E. eaneus*) catches should be available (artisanal fisheries from 1974 and industrial fisheries from 1971). They have not been included so far in the data sets. Jerome will contact CRODT and Modou Thiam for data transmission

For the Guinea/Guinea-Bissau case study, the CNSHB data set should begin in 1995 and not 2000 ,as it is currently. An update will be provide.

The data from CIPA are not yet available. It seems that data are available for scientific surveys and industrial fisheries but the transmission format is not correctly used. We need to improve the data transmission.

For **Ghana- Côte d'Ivoire**, we only have scientific (survey) data available. We need to ask again for commercial data.

Feedback:

A problem identified *a priori* was the limitation of an online meting due to poor internet bandwidth. However, *a posteriori* the bandwidth was not a real issue, except for Guinea-Bissau. During all sessions, a number between 18 and 23 people were effectively connected.

Other issue identified before the WG was the effective availability of the participants to attend the WG if they were in their usual working environment (and thus can be requested to deal with other working issues by their hierarchy). However, all the participants were fully available for the WG. One

solution used by the four CNHSB participants to be fully dedicated to the WG was to celebrate the meeting in a hotel, far from the CNSHB building. Although this solution was more expensive (per diem + travel), the WG was more efficient for them.

However, it is clear than we were not compliant with the initial agenda, and the reason for that was that the meeting was online. Online meetings clearly slows down the exchange rhythm and needs more pauses than physical meetings in order to keep participants attention (well known phenomenon for Agrocampus Ouest which manage a lot of students on-line since the beginning of the pandemic).

One DEMERSTEM objective is to strengthen collaborative skills between regional scientific partners. The work in subgroups during the week was a key point to reach this collaborative approach although this was definitively less efficient than it could have been in a physical meeting.

Initially, before the pandemic, we planned to invite more scientists for our WG. For example, we had planned to invite our colleagues from Gambia, although the Gambian Fisheries Department (FD) is not formally a partner of the project in spite of being involved in some activities as the stock identification of *Penaeus notialis*. In addition, we had planned to invite some colleagues from sub regional commission (SRFC, FCWC, UEMOA). Due to the pandemic and uncertainties on this online meeting, we finally decided to restrict the number of guests. Although this decision does not match with our idea of increasing the regional collaborative approach, it was circumstantial and will be tried to be solved in the future.

We also planned to do a common working group on stocks assessment methods with CECAF. CECAF Working Groups for assessment of Demersal stocks have also been postponed due to COVID. We are exploring the possibility of being involved in next CECAF Demersal Working Groups in order to suggest/provide new approaches for stock assessment. In that sense, the potential participation of Fabien Bourinet, technical assistant of Agrocampus and Jerome Guitton as DEMERSTEM coordinator will be proposed for next CECAF (demersal) Working Group.

Annexes:

Annex 1: List of partners connected (at one moment per day)

01/02/21	02/02/21	03/02/21	04/02/21	05/02/21
Lundi	Mardi	Mercredi	Jeudi	Vendredi
Liste des utilisateurs dans la conférence demerstem À 01/02/2021:15:30:23	Liste des utilisateurs dans la conférence demerstem À 02/02/2021:10:30:23	Liste des utilisateurs dans la conférence demerstem À 03/02/2021:10:35:20	Liste des utilisateurs dans la conférence demerstem À 04/02/2021:10:46:55	Liste des utilisateurs dans la conférence demerstem À 05/02/2021:11:46:10
Trié par prénom :	Trié par prénom :	Trié par prénom :	Trié par prénom :	Trié par prénom :
ato ekuban	ato ekuban	beyah	ato ekuban	ato ekuban
beyah	beyah	COULIBALY Bakari	beyah	beyah
Brahim	Brahim	DIALLO Ibrahima	Brahim	Brahim
DIALLLO Ibrahima	DIALLLO Ibrahima	Didier Jouffre	COULIBALY Bakari	COULIBALY Bakari
Didier Jouffre	Didier Jouffre	Eva	DIALLO Ibrahima	DIALLO Ibrahima
Eva	Eva	GUITTON Jerome	Didier Jouffre	Didier Jouffre
Fabien	Fabien	GUITTON Jerome	Eva	Eva
GUITTON Jerome	GUITTON Jerome	IEO	GUITTON Jerome	GUITTON Jerome
GUITTON Jerome	GUITTON Jerome	Ivone	GUITTON Jerome	GUITTON Jerome
IEO	IEO	Jeremias Francisco Intcham	IEO	IEO
Ivone	Ivone	Kamarel	Ivone	Ivone
Jeremias Francisco Intcham	Jeremias Francisco Intcham	Marta Quinzan	Jeremias	Jeremias
JOANNY	JOANNY	Modou THIAW	JOANNY	JOANNY
Kamarel	Kamarel	nicolas	Kamarel	Kamarel
Marta Quinzan	Marta Quinzan	ousmane	Marta Quinzan	Marta Quinzan
Modou THIAW	Modou THIAW	QUENUM	nicolas	nicolas
nicolas	nicolas	Samantha	ousmane	ousmane
ousmane	ousmane	Soumah	QUENUM	QUENUM
QUENUM	QUENUM		Samantha	Samantha
Samantha Vida Osei	Samantha Vida Osei		Sidi Ahmed Hemmed	Sidi Ahmed Hemmed
Soumah	Soumah		Soumah	Soumah

Derrière la connexion Jerome Guitton, il y avait Jérôme Guitton, Fabien Bourinet et Didier Gascuel dans la même salle

Aboubacar Sidibe est aussi intervenu à l'ouverture et la cloture du groupe de travail

Agrocampus Ouest :

- Jerome Guitton
- Fabien Bourinet
- Didier Gascuel

IMROP:

- Meisse Beyah
- Sid'ahmed Hemmed

CRODT:

- Modou Thiaw
- Kamarel Bâ
- Modou Thiam

CIPA:

- Jeremias Francisco Intchama
- Josepha Pinto

CNSHB:

- Mohamed Soumah
- Ousmane Tagbé Camara
- Ibrahima Diallo

Fisheries commission:

- Ato ekuban
- Samantha Osei

CRO:

- Joanny Tape
- Quenum Crespin Luc
- Bakari Coulibaly

IRD:

- Nicolas Bez

- Didier Jouffre

IEO:

- Eva García Isarch
- Marta Quinzán Rodríguez
- Ivone Czerwinski

First Program:

- Aboubacar Sidibe