



Provide **A**dvice for a sustainable fisheries **M**anagement **B**ased on suitable stock **A**ssessment models

Fournir des avis scientifiques basés sur les modèles d'évaluations de stocks les plus adaptés
pour une gestion durable des pêches

Authors: Eva García Isarch and Jerome Guitton

Terms of reference of the call (beginning of the story)

- The scope concerns European Fisheries
- Partners should be from european countries
- Limited budget (Max 600 000 euros)
- Other countries could be involved as external contractors and the maximum budget for external contractors is limited to 30% of the budget
- Close relationship with private company as Associated partner (no budget from AP) is welcome

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 ANAMAR (Associated partner), COSECPRO

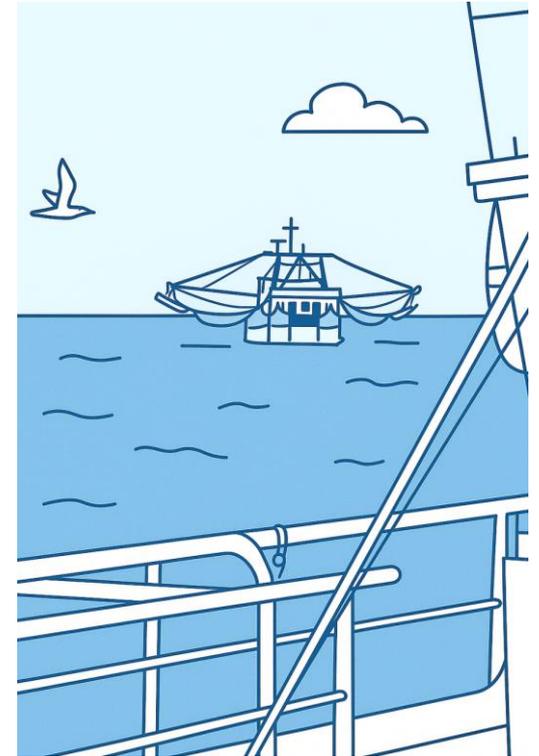
PAMBAS



Provide Advice for a sustainable fisheries Management Based on suitable stock Assessment models

Start : November 2025 / 30 months

Call: EMFAF-2025-PIA-FisheriesScienceAdvice



Improve data collection on shrimp fisheries to be able to provide a better scientific advice for management

Améliorer la collecte de données sur les pêcheries crevetières pour produire de meilleurs avis scientifique pour la gestion des pêches



CONSORTIUM

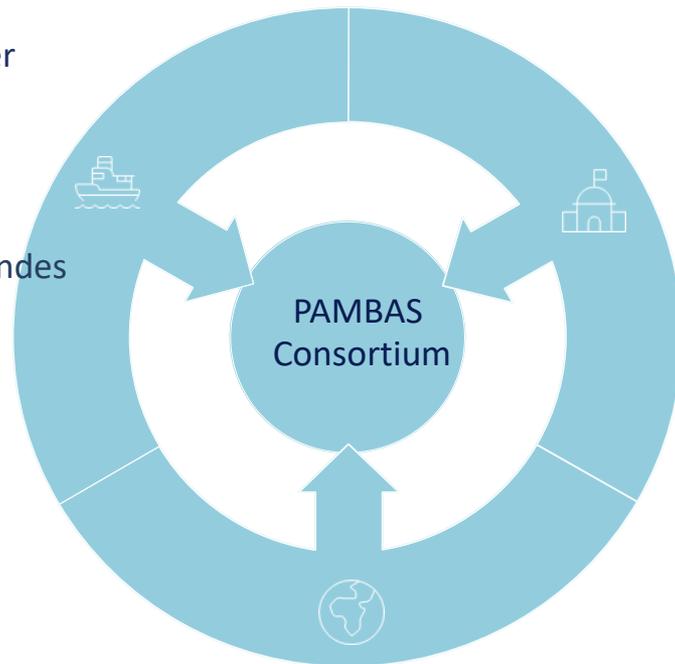
Fishing sector

ANAMAR

Spanish freezer fleet shipowner association

COSECPRO

Coopérative sénégalaise des Exploitants de Crevettes profondes



Scientific Institutions

- Institut Agro (France)
 - IEO-CSIC (Spain)
- Long experience in data collection, stock assessment, capacity building



African scientific partners

- IMROP (Mauritania)
- CRODT (Senegal)

~~INIPO~~

- CNHSB (Guinea)
- INIPM (Angola)

→ Local expertise and regional database



CONSORTIUM – Formal Contract agreement

Fishing sector

ANAMAR

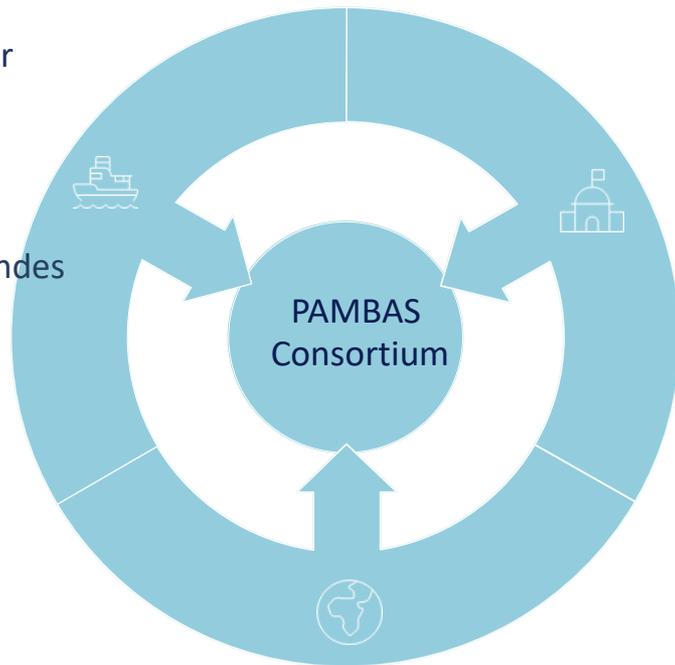
Spanish freezer fleet shipowner association

COSECPRO

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Agreement Letter to be signed (sent)



Scientific Institutions

- Institut Agro (France) • Signed
 - IEO-CSIC (Spain) • Signed
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African scientific partners

- IMROP (Mauritania) • To be signed (sent)
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CONSORTIUM – Formal Contract agreement

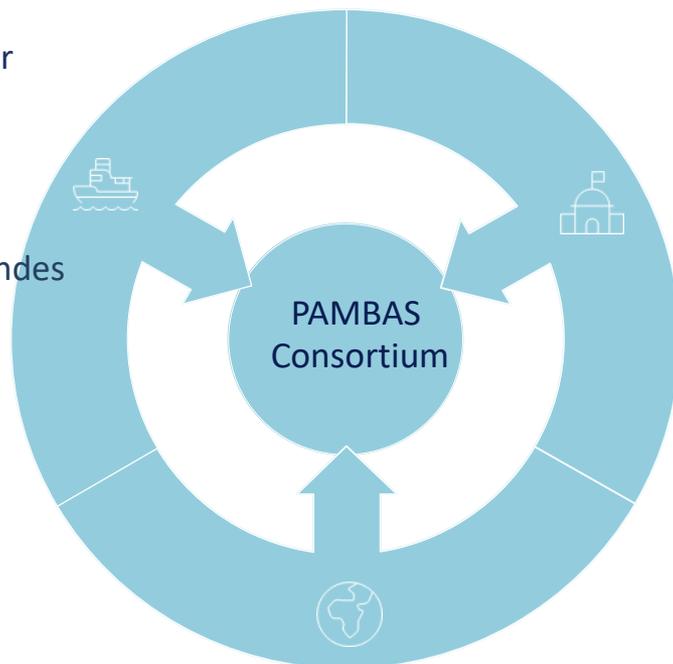
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Maxime Olmos



Nicolas Bez



BACKGROUND

Spanish shrimper fleet In W Africa operates under:

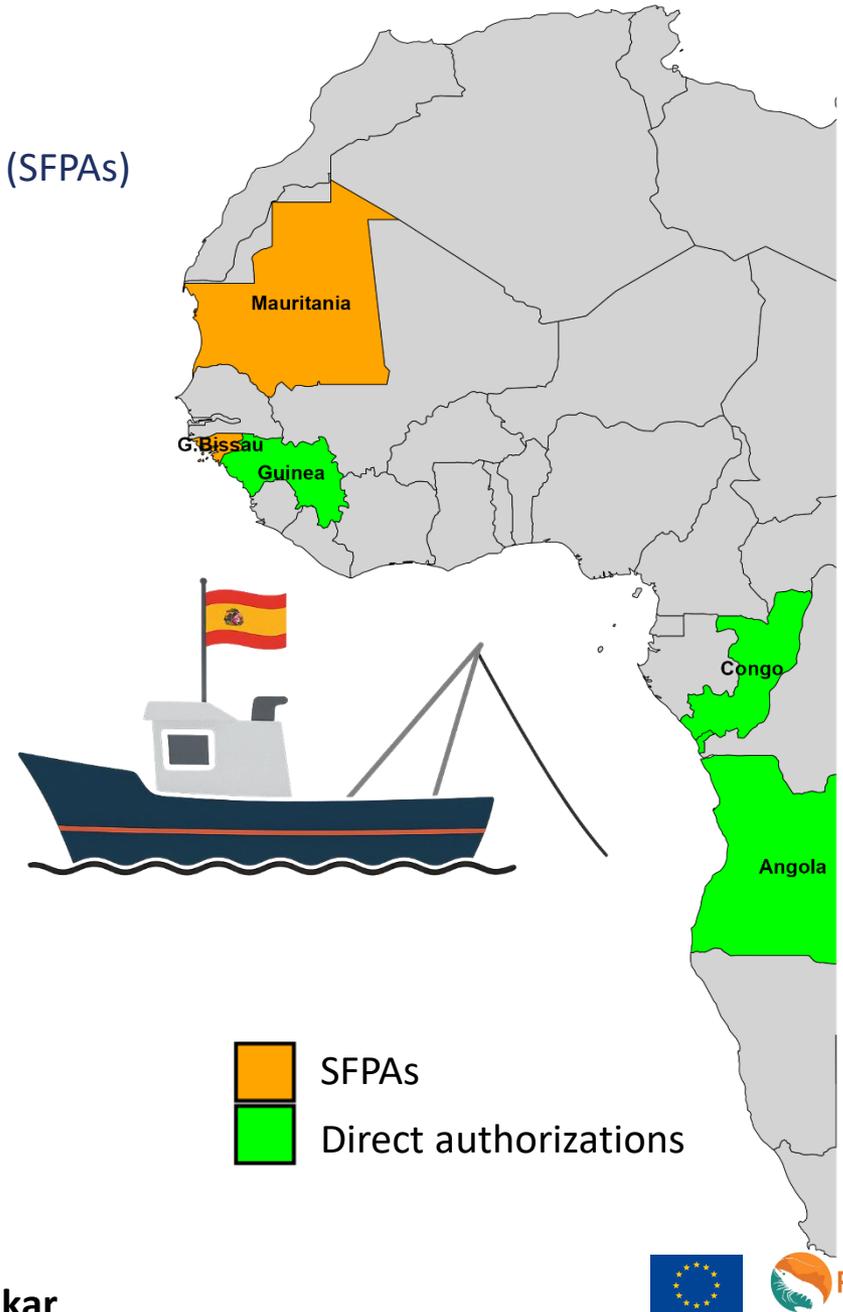
- EU Sustainable Fisheries Partnership Agreements (SFPAs)
- Direct authorizations (SMEFF fisheries)



Parapenaeus longirostris

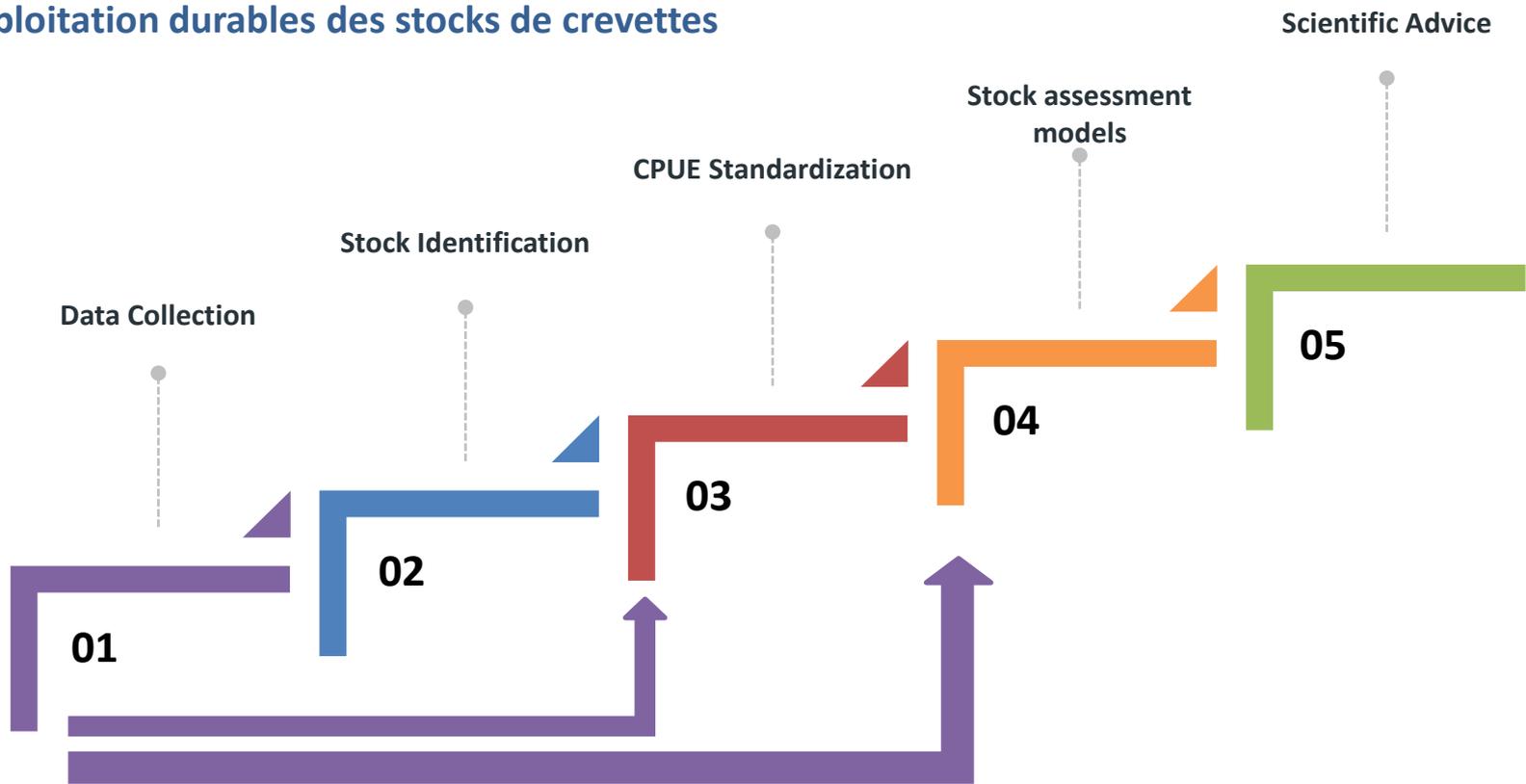


Aristeus varidens



OBJECTIVES

- Improve scientific base knowledge for management to promote a sustainable use of shrimp resources
- Renforcer la gestion des pêches basée sur la connaissance scientifiques pour promouvoir une exploitation durables des stocks de crevettes



Data collection



MANUEL À L'USAGE DES OBSERVATEURS SCIENTIFIQUES À BORD DES BATEAUX CREVETTIERS DANS LES EAUX D'AFRIQUE OCCIDENTALE



Eva Garcia-Isarch¹, Verónica Duque-Nogal¹, Djimera Lassana², Zeneida Romero¹ et Josepha Pinto³

¹ Instituto Español de Oceanografía (IEO)

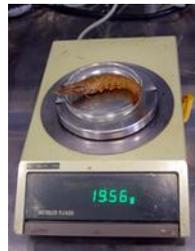
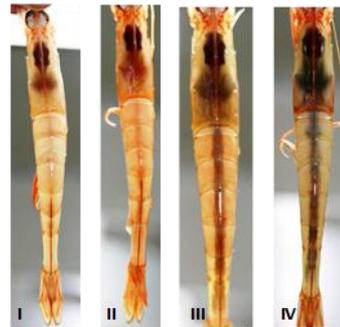
² Institut Mauritanien de Recherches Océanographiques et de Pêches (IMROP)

³ Centro de Investigaçao Pesqueira Aplicada (CIPA)

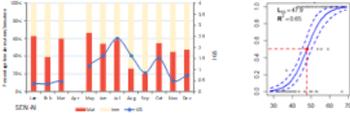
Mars 2020



Improve, strengthen and complement DCF to target specific fisheries and species
 Améliorer, renforcer et compléter la collecte de données spécifique à certaines pêcheries et stocks



Stock Identification

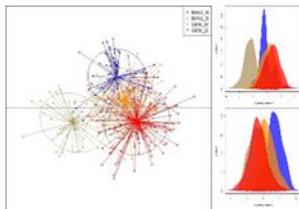


Weight parameters,
reproduction

LIFE HISTORY TRAITS (LHT)

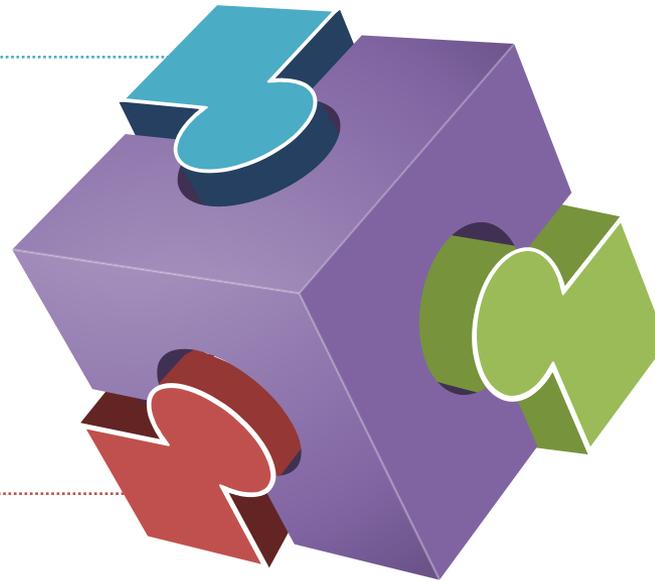
GENETICS

Microsatellite markers



To define stock identity based on biological criteria by using a set of complementary methods (**HOLISTIC APPROACH**)

Mieux définir les stocks sur des critères biologique en utilisant un ensemble de méthodes complémentaires (approche holistique)



MORPHOMETRY

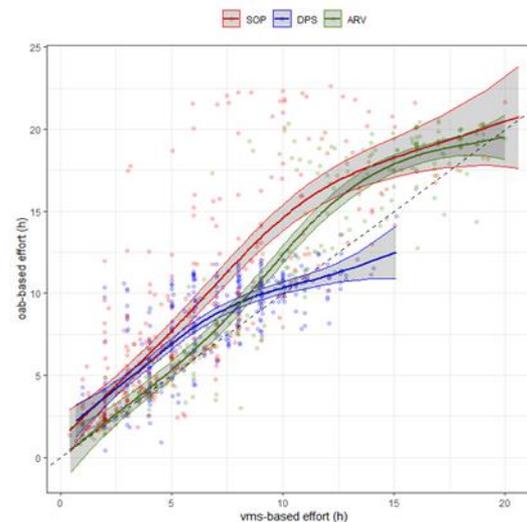
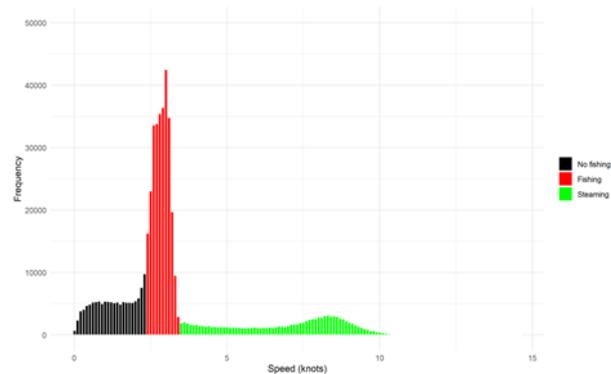
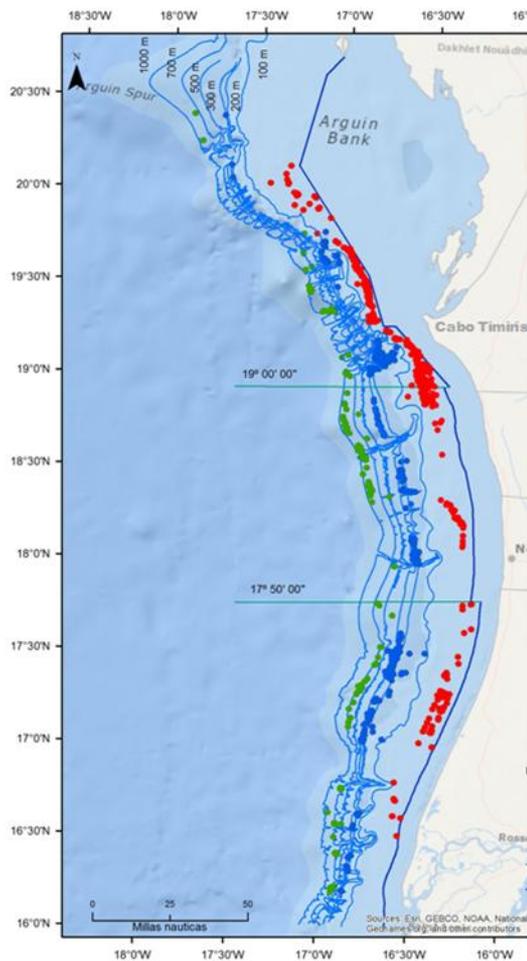
Body shape (BS)
Truss network



CPUE Standardization

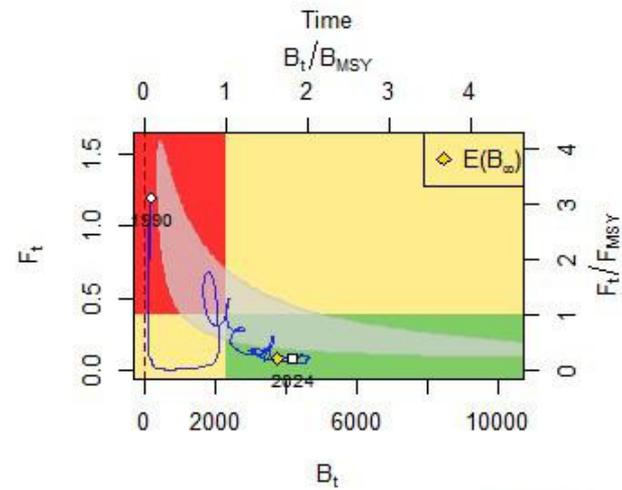
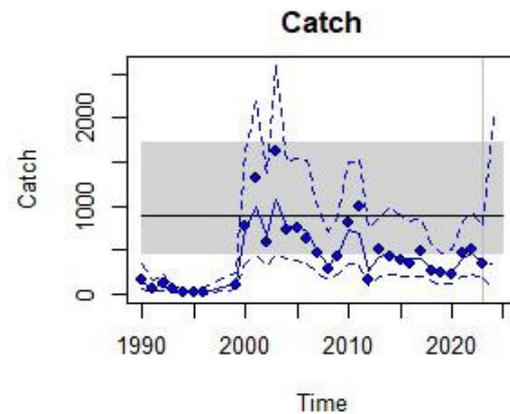
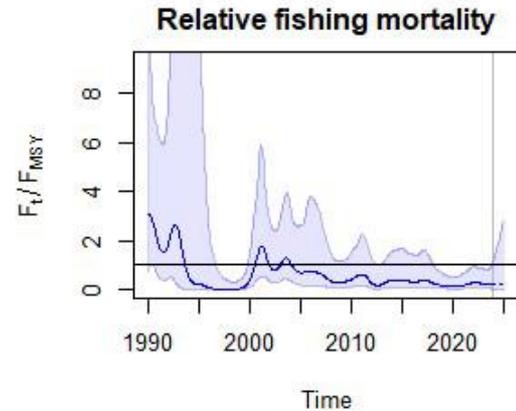
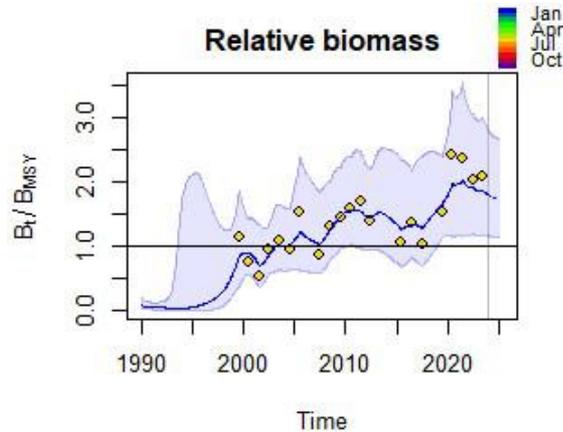
Define methodology to estimate species-specific effort in order to be able to feed stock assessment models with more accurate Abundance Indices

Mettre en place une méthode pour mieux estimer les efforts espèces-spécifiques des flotilles pour pouvoir avoir des series d'entrée dans les modèles plus pertinentes (Indices d'abondances)



Stock assessment models

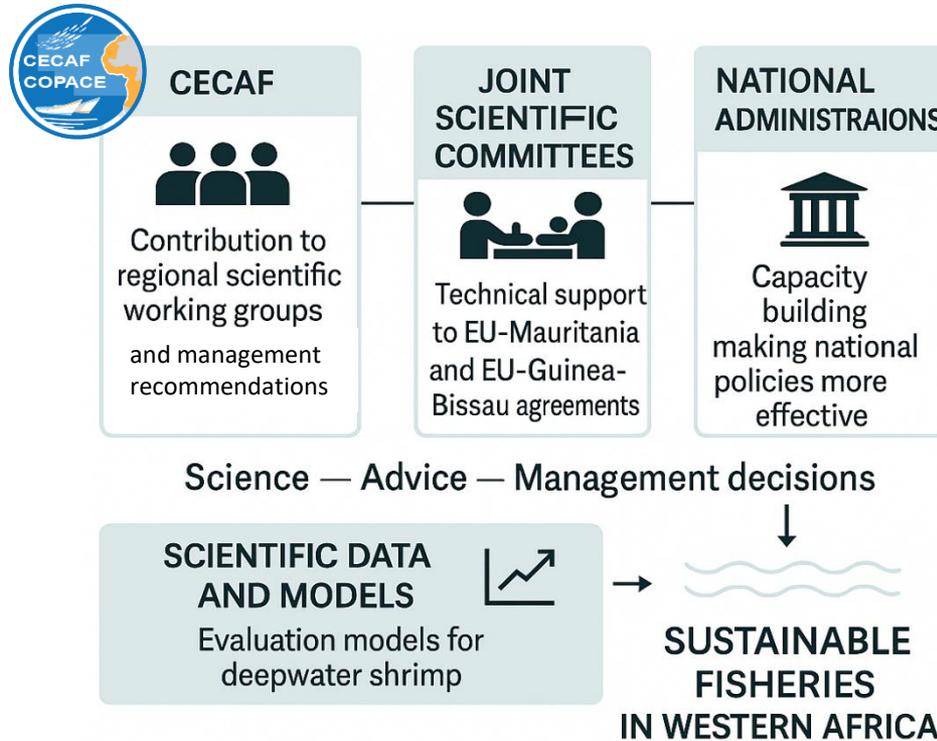
Data Limited Stock models implementation.



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Scientific advice - Dissemination

PAMBAS knowledge transfer to scientific bodies and committees in charge of fisheries governance.



Research Article Environmetrics

Received 2 September 2015; Revised 17 September 2015; Accepted 9 October 2015; Published online in Wiley Online Library: 23 November 2015

(wileyonlinelibrary.com) DOI: 10.1002/env.2219

An autoregressive model to describe fishing vessel movement and activity

P. Cloaguen^{a*}, S. Mahévas^a, E. Rivot^b, M. Wolliez^{b,c}, J. Guitton^a, Y. Vernard^d and M. P. Etienne^e

The understanding of the dynamics of fishing vessels is of great interest to characterize the spatial distribution of the fishing effort and to define sustainable fishing strategies. It is also a prerequisite for anticipating changes in fisheries's activity in reaction to management rules, economic context, or evolution of ecological resources. Analyzing the trajectories of individual vessels offers promising perspectives to describe the activity during fishing trips. A hidden Markov model with two behavioral states (steaming and fishing) is developed to infer the sequence of non-observed fishing vessel behavior along the vessel trajectory based on Global Positioning System (GPS) records. Conditionally to the behavior, vessel velocity is modeled with an autoregressive process. The model parameters and the sequence of hidden behavioral states are estimated using an expectation-maximization algorithm, coupled with the Viterbi algorithm that captures the most credible joint sequence of hidden states. A simulation approach was performed to assess the influence of contextual factors on the model parameters and of the path length on the estimation performances. The model was then fitted to four original GPS tracks recorded with a time span of 15 min derived from volunteer fishing results operating in the Channel within the IFREMER RECOPASC project. Results showed that the fishing activity performed influenced the estimator of the velocity process parameters. Results also suggested future inclusion of variables such as tide currents within the recursive approach of fisheries. Copyright © 2015 John Wiley & Sons, Ltd.

Keywords: hidden Markov model; vessels dynamics; RECOPASC; autoregressive process; Baum-Welch algorithm

Scientific articles



Work Packages leadership



WP1 - Coordination

Leader: Institut Agro



WP2 – Data collection

Leader: IEO



WP3 – Stock identification

Leader: IEO



WP4 –CPUE standardization

Leader: IEO



WP5 – Stock assessment

Leader: Institut Agro, IEO



Timetable and Budget

	2025		2026												2027												2028			
TASKS	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Data Collection																														
Stock identification																														
CPUE standarization																														
Stock assessment																														
WORKING GROUPS																														
NEWSLETTERS																														

Working groups (planned)

GT1

Kick off meeting. Shared global overview of the project. Training session for observation. Description of all activities

GT2

Feedback on activities. Data analysis. Stock assessment models. Observation adjustments. Administrative reports

GT3

Final meeting. Scientific advice. Dissemination. Administrative reports

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GT1

Place : Senegal. Participants 2 persons/ countries + Gambia. Fishermen association + IEO and IA Team.

GT2

Place : Mauritania. Participants 1 person/ countries + Gambia (?) + external expert + IEO and IA Team.

GT3

Place : Gambia. Participants 2 persons/ countries + Gambia (?) + external expert + IEO and IA Team+ Fishermen association .

Thanks for your attention

