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Exploring fisheries dynamics according to different quota governance mechanisms: application to the bay of Biscay common sole fishery

Manuel Bellanger, Claire Macher, Mathieu Merzéréaud, Olivier Guyader

IFREMER, UMR AMURE



Outline

- Introduction
- Governance system of bay of Biscay sole quota
- Methods for impact assessment and governance scenarios
- Preliminary results of bio-economic impacts of alternative governance systems
- Conclusions / perspectives

Introduction

French context

- Gradual transfer of competence (including quota management) to Producer Organizations (POs)
- Fishing rights are not transferable
- Evolution of quota management in response to constraining quotas => PO mergers & IQ systems

Issues addressed: understanding quota management system evolutions and anticipating their bio-economic impacts

- What are the effects of quota governance on fisheries dynamics including distributive effects?
- Present work follows Macher *et al.* 2013 where quota markets were tested and investigates the effects of quota management by POs

Introduction

Case study: bay of Biscay common sole fishery

450 vessels > 1 Ton

1400 fishermen

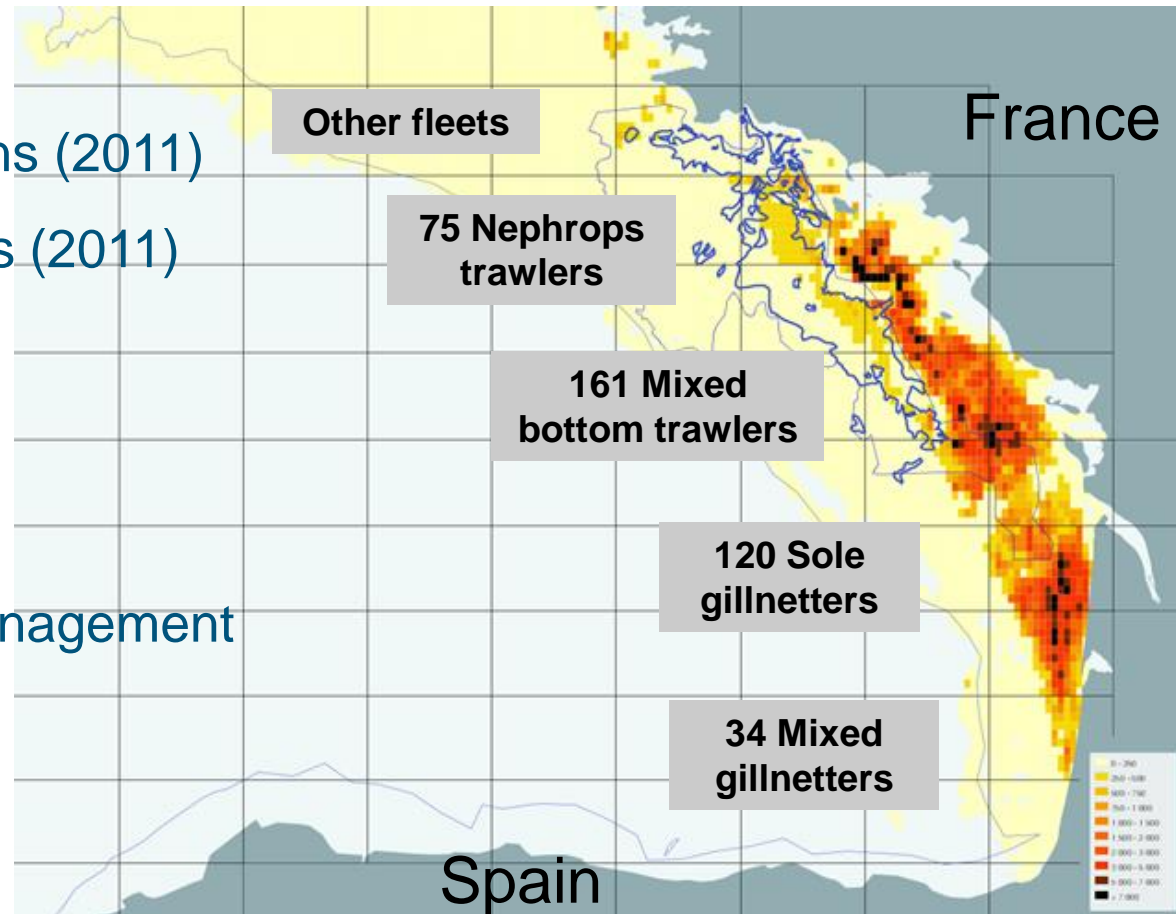
Landings = 4600 Tons (2011)

GR 191 million euros (2011)

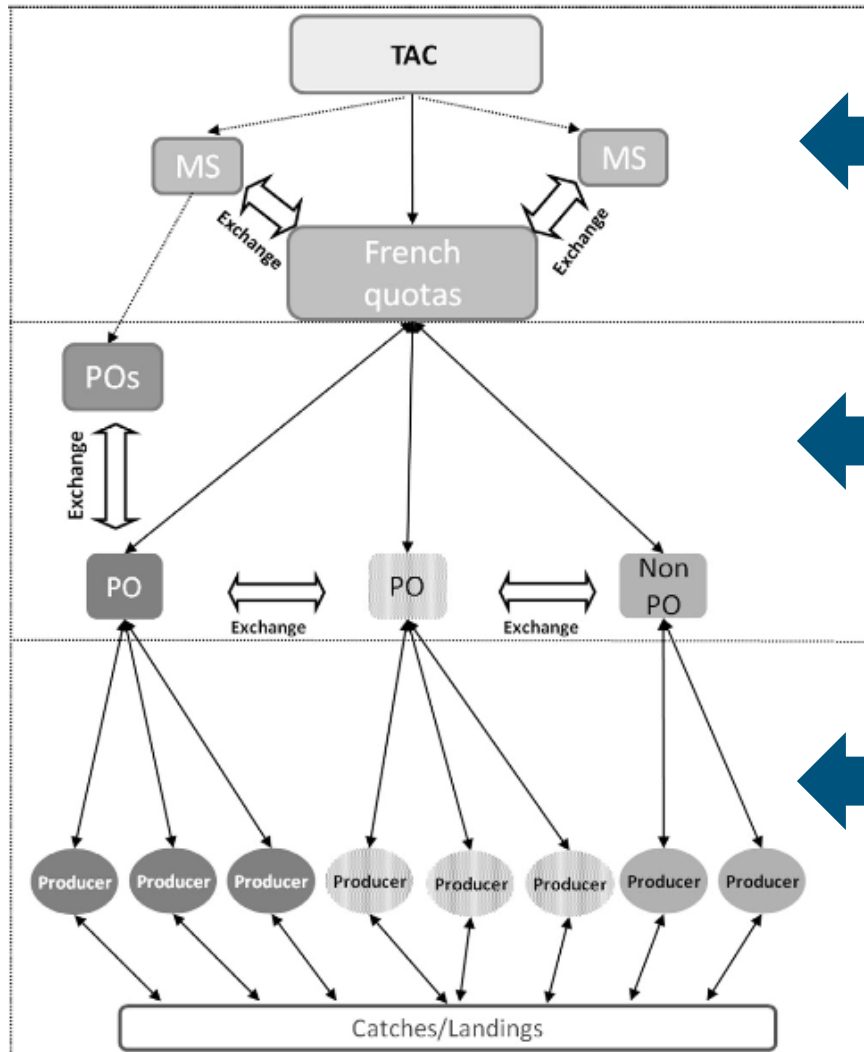
Innovative quota management

(IQ since 2006)

Sole landings 2008 (projet Gepeto)



Governance system of bay of Biscay sole quota



Member State share based on a relative stability key

Quota share by PO based on historical landings (2001-2003) of their members.

Management by POs: collective and/or individual quota allocation based on a collective-pooling management system specific for each PO

Governance system of bay of Biscay sole quota

Management by POs: Individual vs Collective quotas

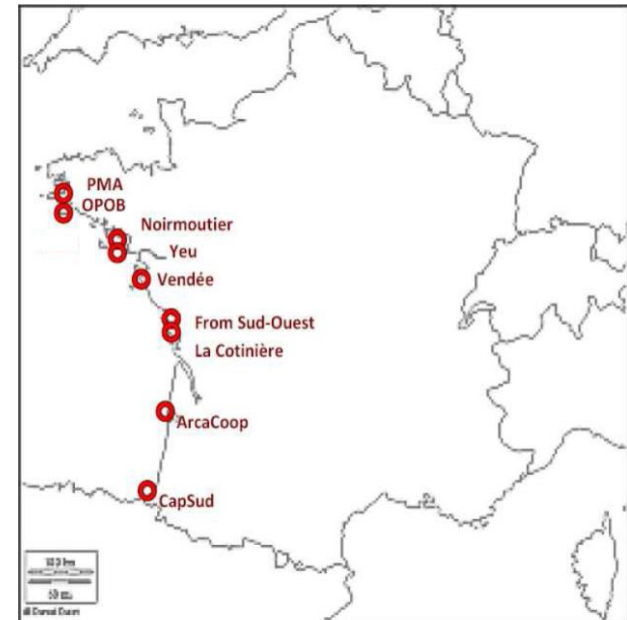
- 2006: Individual Quotas = 20% TAC
- 2011: Individual Quotas = 65% TAC

⇒ Evolution towards IQ systems as TACs become more and more constraining

Administration's demands for more transparency + PO mergers

⇒ Probable homogenisation of allocation rules

PO	Sub-groups	Quota management	Allocation criteria
PMA	Trawlers and gillnetters vessels with production >2 t	Individual quotas	Mean production by vessel 2004-2006
	Trawlers and gillnetters vessels with production <2t	Individual quotas	Package of 2 t by vessel
OPOB	Large gillnetters <18 m	Individual quotas	Package of 18 t by vessel
	Large gillnetters >18 m	Individual quotas	Package of 26 t by vessel
	Other fleets	Collective quotas	
Noirmoutier	All vessels	Collective quotas	
Vendée	All vessels	Collective quotas	
Yeu	All vessels	Collective quotas	
From Sud-Ouest	Gillnetters from royan fleet	Individual quotas	Historical basis 2001-2003
	Other fleets	Collective quota	
La Côtinière	All vessels	Individual quotas	Historical basis 2001-2003 and mean landings 2008-2010
ArcaCoop	Vessels outside the Arcachon Basin	Individual quotas	Max landings in the last 10 years by vessel
	Vessels inside the basin	Collective quota	
CapSud	Vessels targeting sole	Individual quotas	Historical basis 2001-2003
	Other vessels by-catching sole	Collective quota	

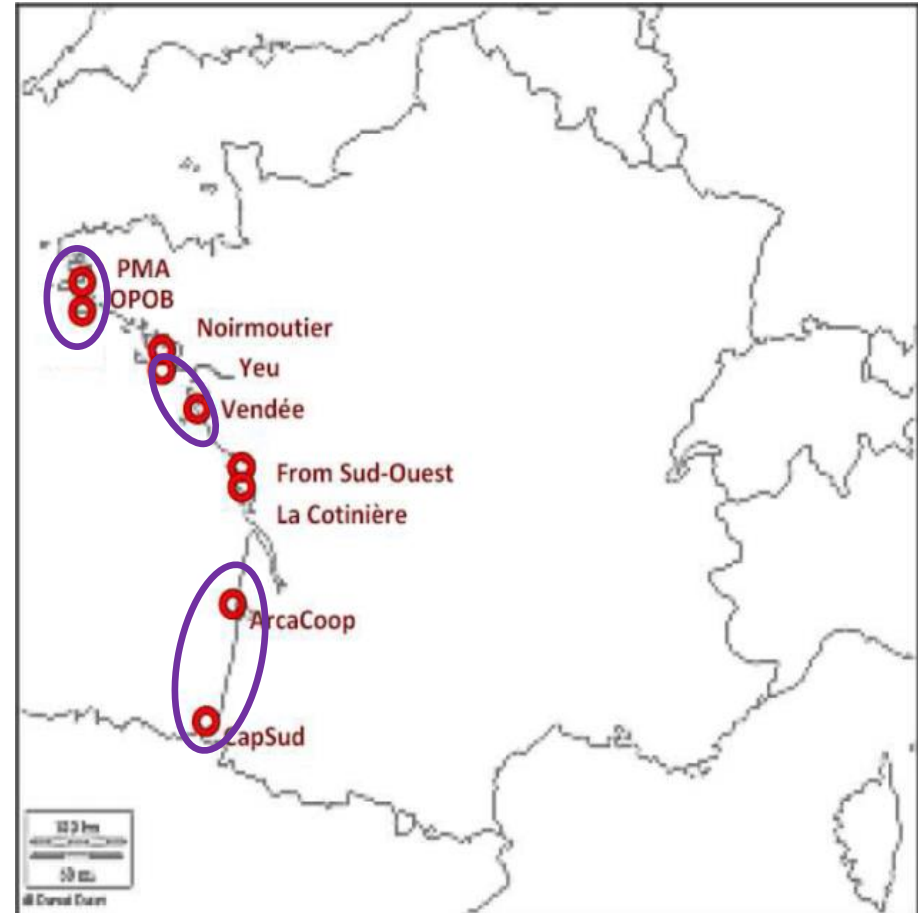


Map of Bay of Biscay POs (France)

Governance system of bay of Biscay sole quota

POs & mergers:

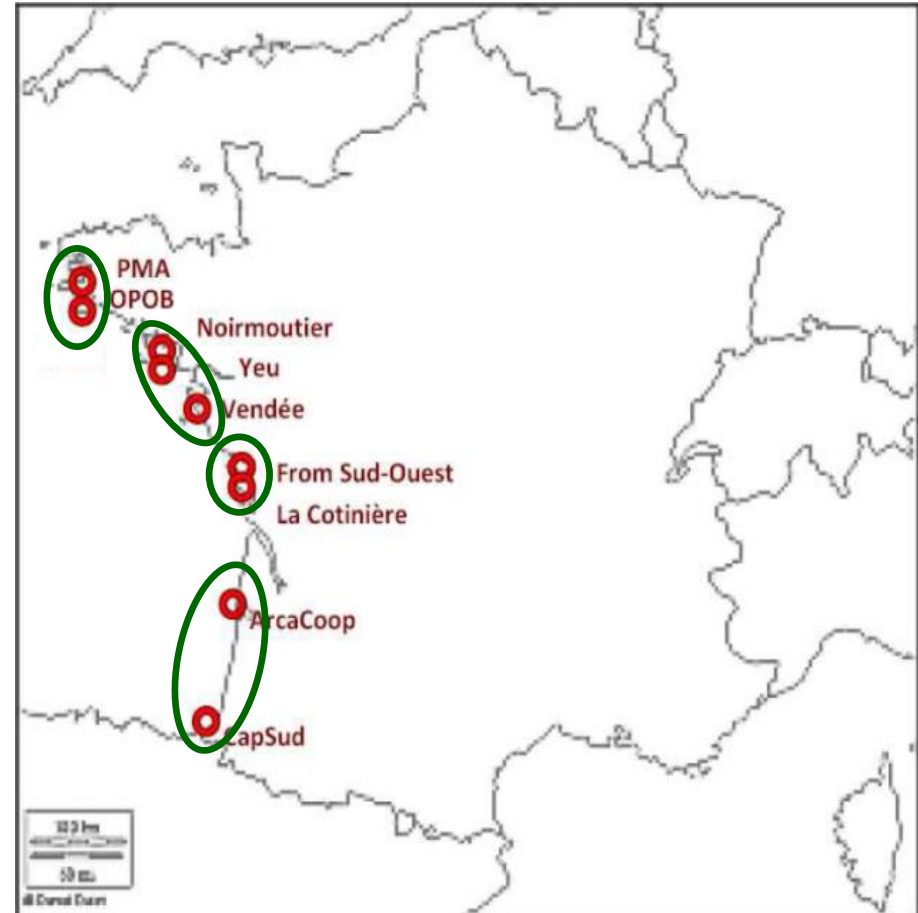
- In 2011: 9 POs operating in the Bay of Biscay
- On-going PO mergers
- Short term probable situation



Governance system of bay of Biscay sole quota

POs & mergers:

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Methods for impact assessment

- 1 An algorithm for collective and individual quota allocations
 - Adaptable rules by PO or by set of POs (merger)
 - 2 An aged-structured bio-economic model: IAM (Macher et al. 2013)
 - Multi-species, Multi-métier, vessel-scale model
 - Inputs files based on DCF data and stock assessment outputs
 - Simulation/optimization
- The model adjusts individual fishing efforts to match quota allocations derived from the algorithm

Methods for impact assessment

Inputs:

- 392 vessels **individually modelled** (+ Fother fleets):
- effort, production and economic costs structure
- Nephrops and sole parameters for stocks dynamics
- Price for sole
- Quotas & sub-quotas by POs, vessels “track records”, PO memberships

Outputs:

- Indicators on the stock status:
 - Biomass
 - Fishing mortality
 - Landings-Catches
- Indicators on the vessels' activity
 - Distribution of effort on métier sole for active vessels
- Indicators of economic performances (at fleet & vessel levels)
 - Gross value added
 - Gross cash flow
 - ...

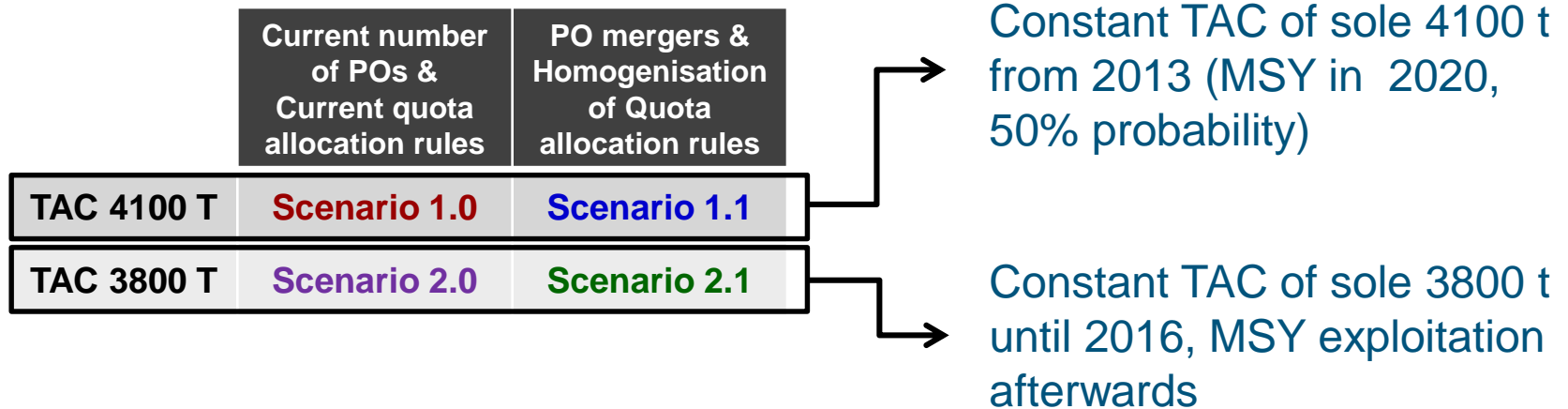
Methods for impact assessment

➤ 4 scenarios:

	Current number of POs & Current quota allocation rules	PO mergers & Homogenisation of Quota allocation rules
TAC 4100 T	Scenario 1.0	Scenario 1.1
TAC 3800 T	Scenario 2.0	Scenario 2.1

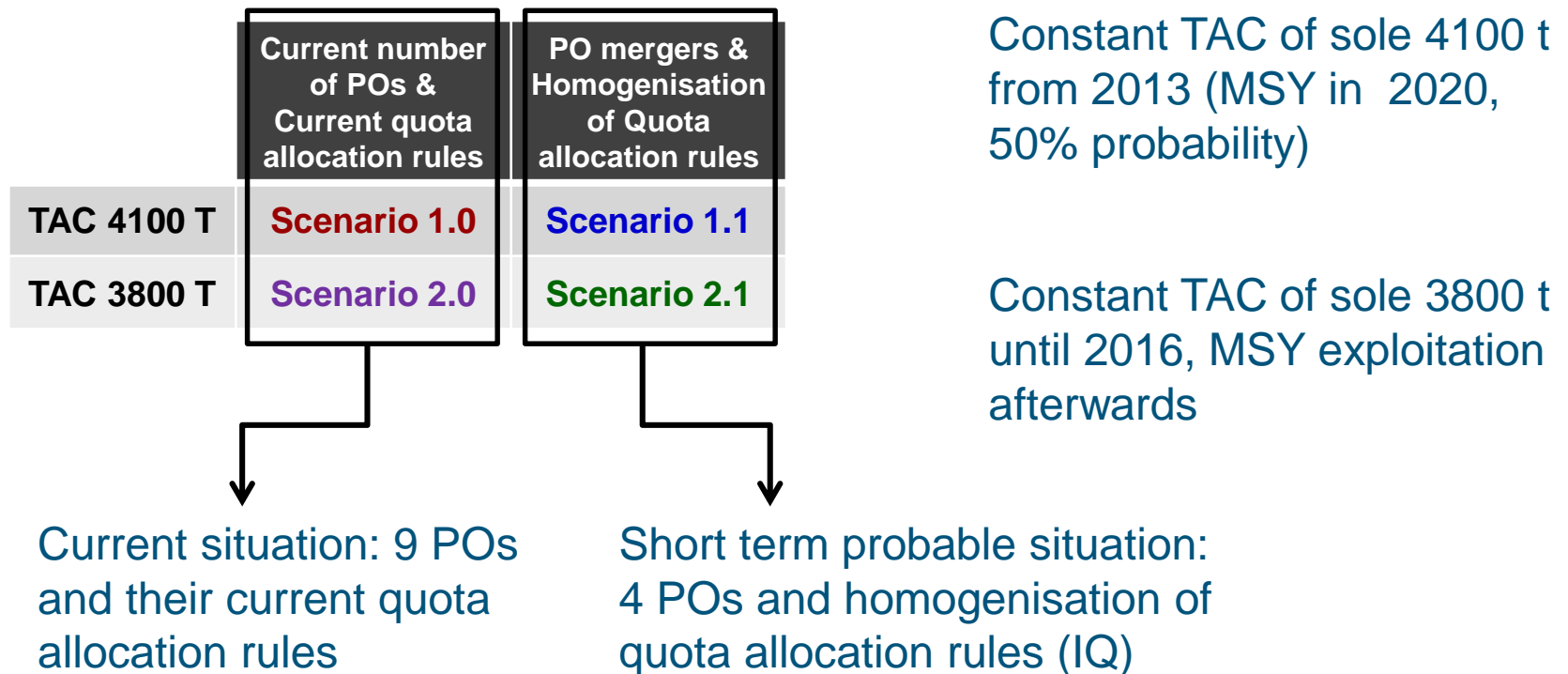
Methods for impact assessment

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Methods for impact assessment

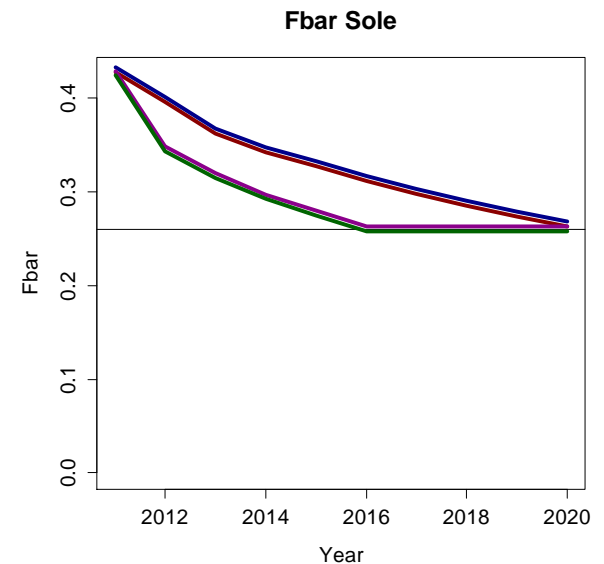
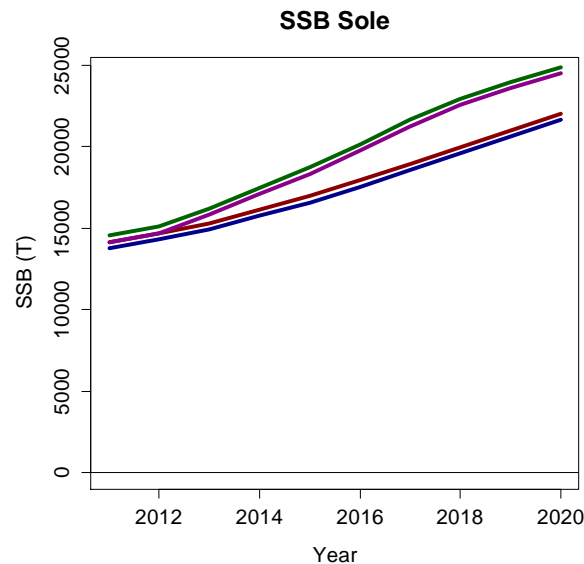
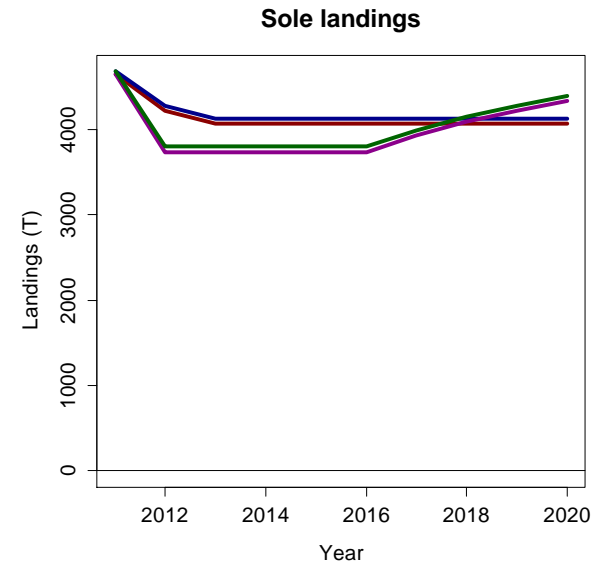
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Preliminary results

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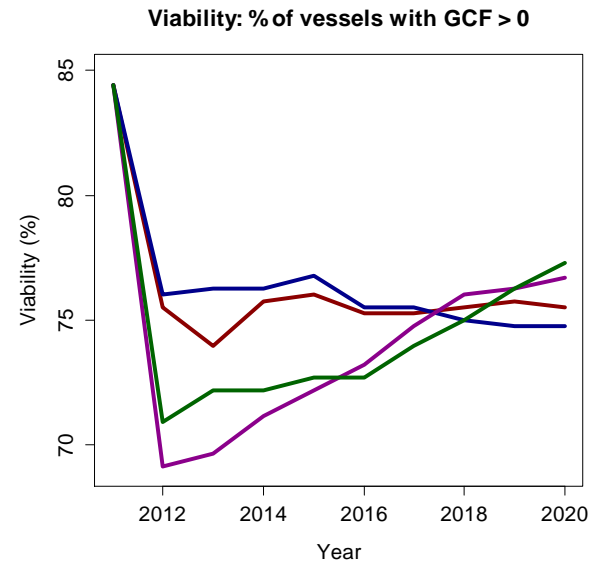
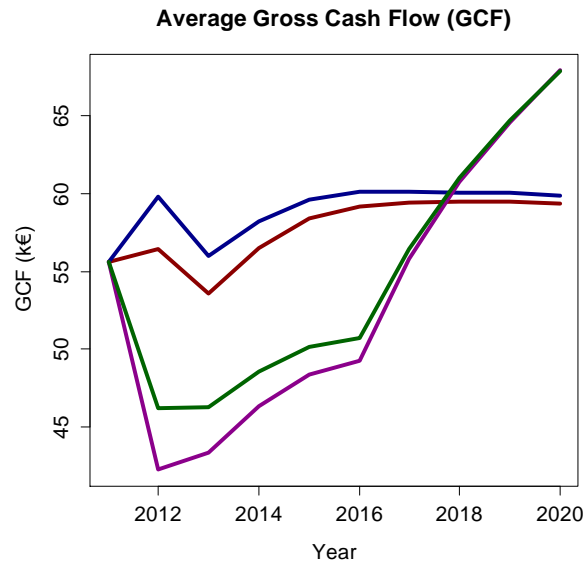
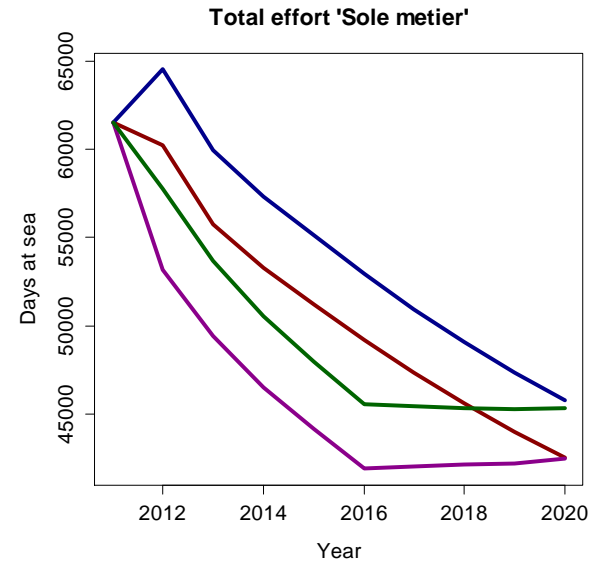
Aggregation level:

- Entire fleet
- Fleet segment
- Fleet segment * PO
- Vessel

Preliminary results

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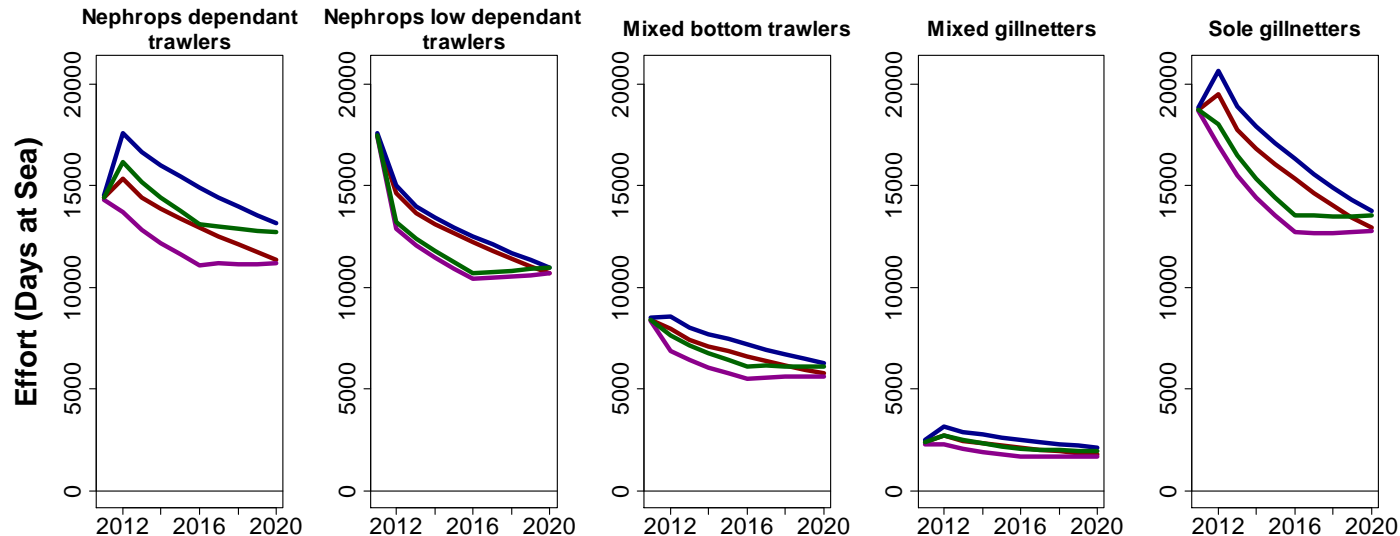
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Total effort 'Sole metier' by fleet segment



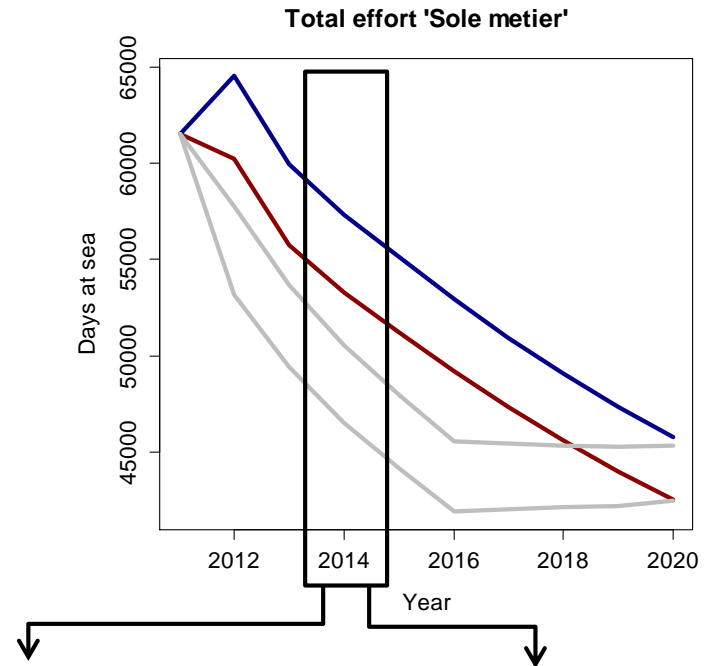
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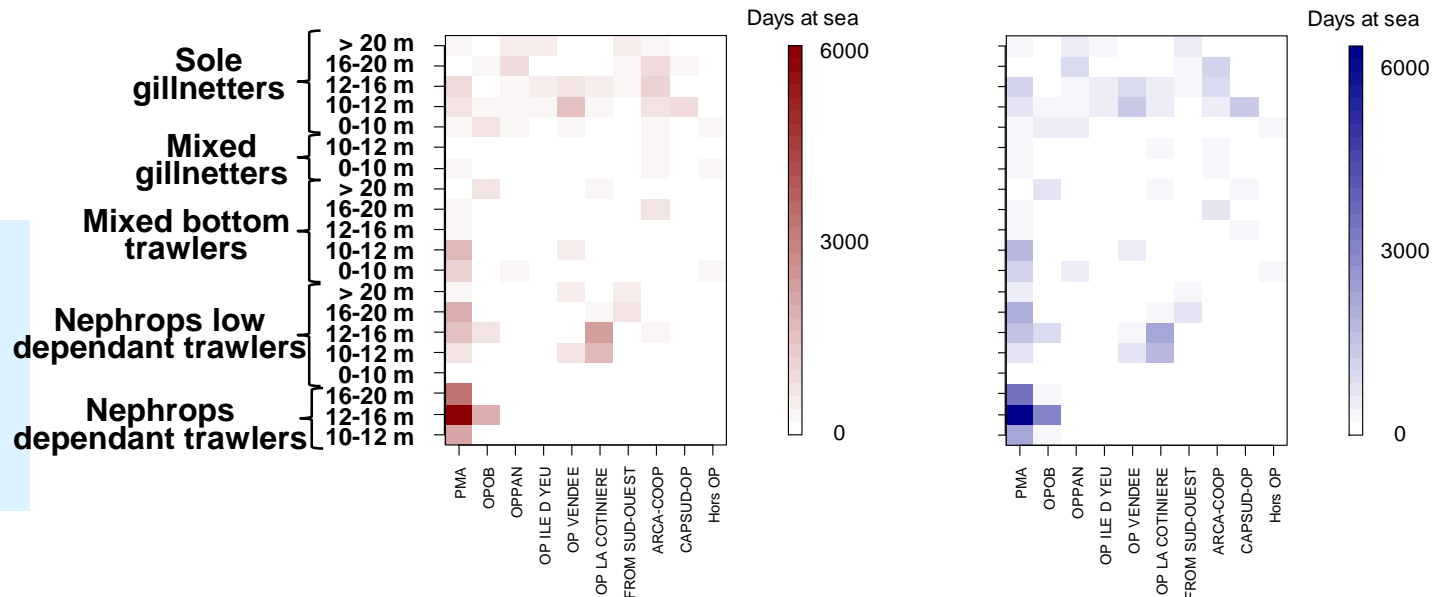
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Effort by Fleet segment-PO in 2014

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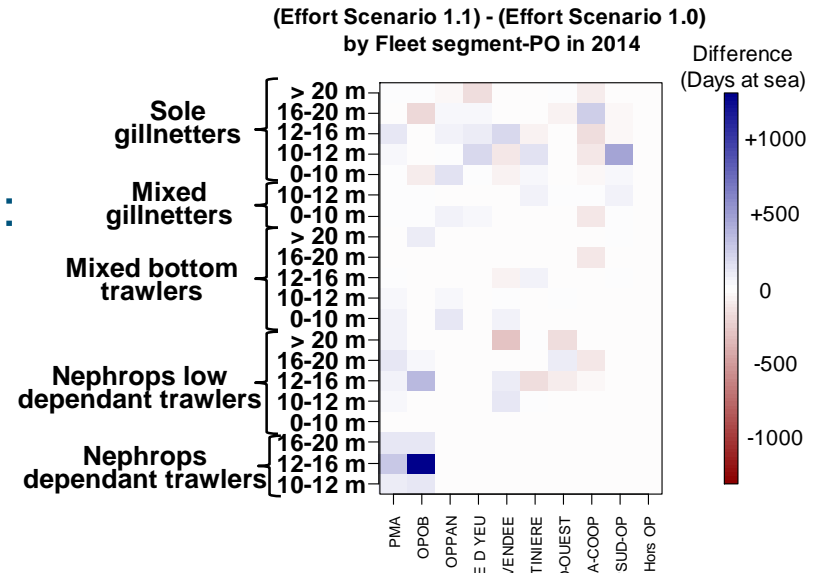
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Preliminary results

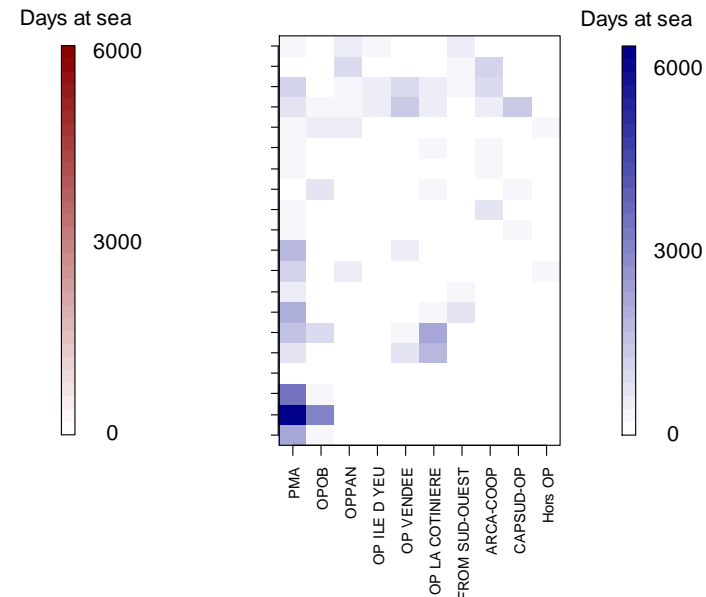
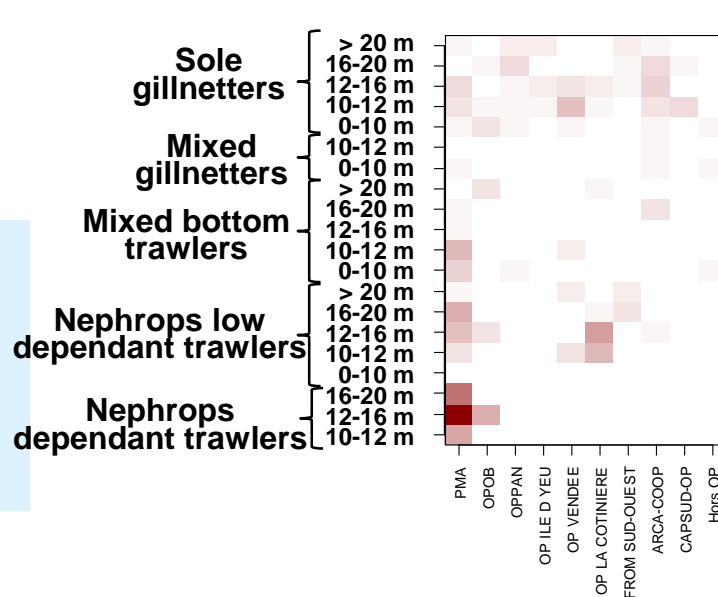
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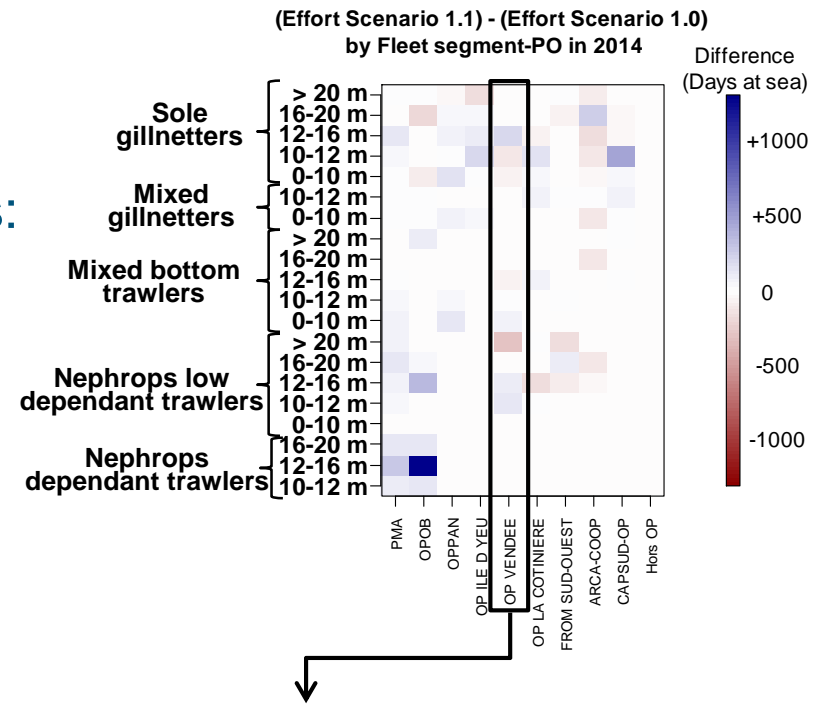
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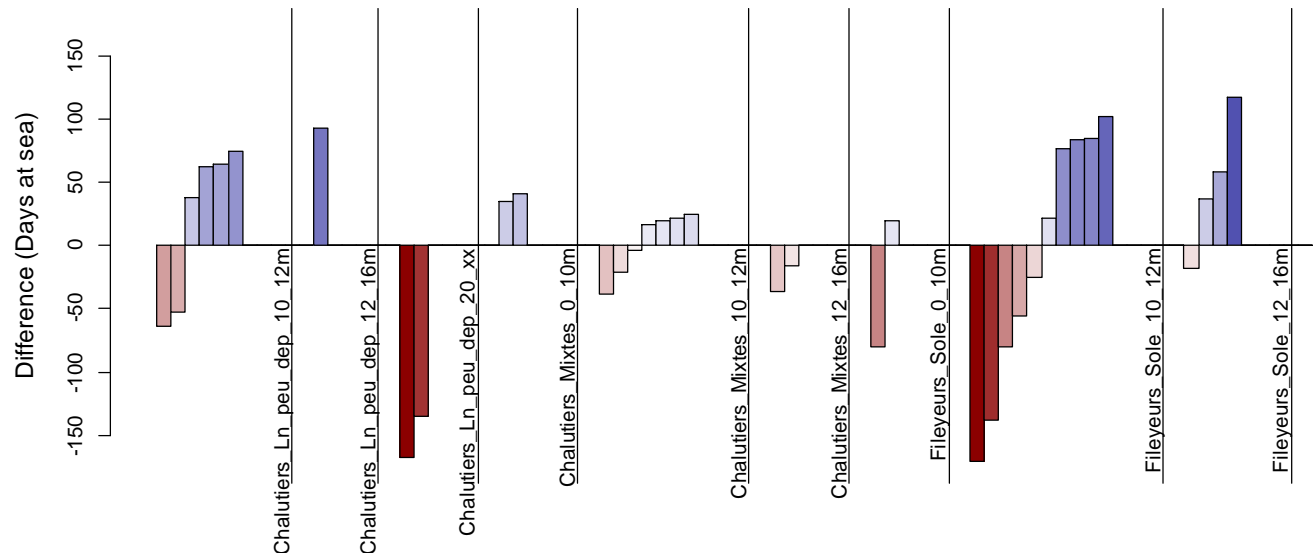
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(Effort Scenario 1.1) - (Effort Scenario 1.0)
PO = OP VENDEE



Aggregation level:

- Entire fleet
- Fleet segment
- Fleet segment * PO
- Vessel

Preliminary results

Overview

Does the governance have the potential to soften the loss in a quota diminution context?

- In average: Yes
- In terms of variance: Yes as well!

PO mergers & homogenisation of quota allocation rules: Who is winning?
Who is losing?

- North bay of Biscay POs: large sole gillnetters (>16m) would give up quota shares to small gillnetters and to trawlers
- South bay of Biscay POs: some would suffer from mergers, and viability may be a concern in a quota diminution context

Conclusion

- Results highlight inter- and intra-group differences in terms of effort and economic performances according to alternative governance scenarios
- Fleet structuration in terms of POs + their quota management systems have significant impacts on fisheries dynamics

Perspectives

- Development of the governance model: PO dynamics (mergers) and PO behaviour to be explicitly modelled
- Modelling the behaviour of producers: metier choices, adjustment of capacity, compliance with rules

Thank you for your attention