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Vulnerability applied to space competition between Offshore Wind Farms and commercial fisheries : discussion on the reference state of the spatial economic dependency

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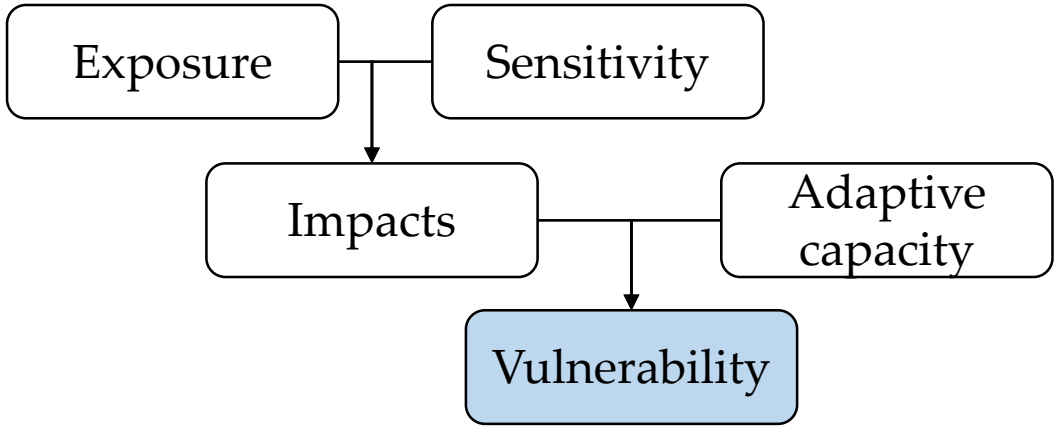
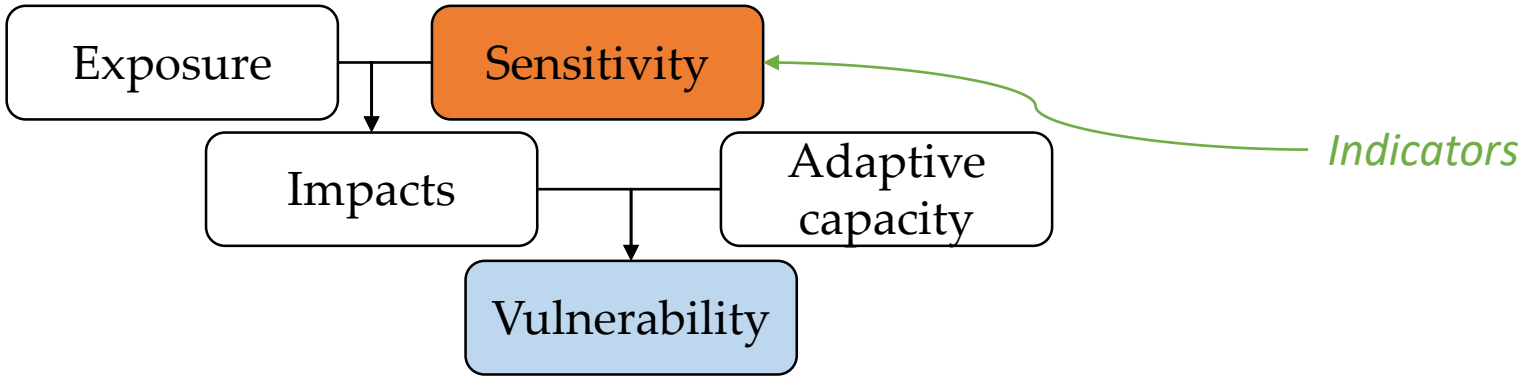
- Vulnerability is defined as ‘the extent to which the components of a system are sensitive to or unable to cope with the harmful effects of a stress factor’’ (adapted from IPCC, 2007).



- Vulnerability assessment is a **composite index** use for **help decision making** (Thiault et al. 2020)
- It has been **adapted to space competition** between fisheries and offshore wind farms (OWF) (Buchholzer et al. 2022)

- Inside composite index you can find the **spatial economic dependency**



To measure vulnerability we need representative data of the fishing activities

How do we define the reference states of the spatial economic dependency before OWF implementation ?

- **Spatial economic dependency**:

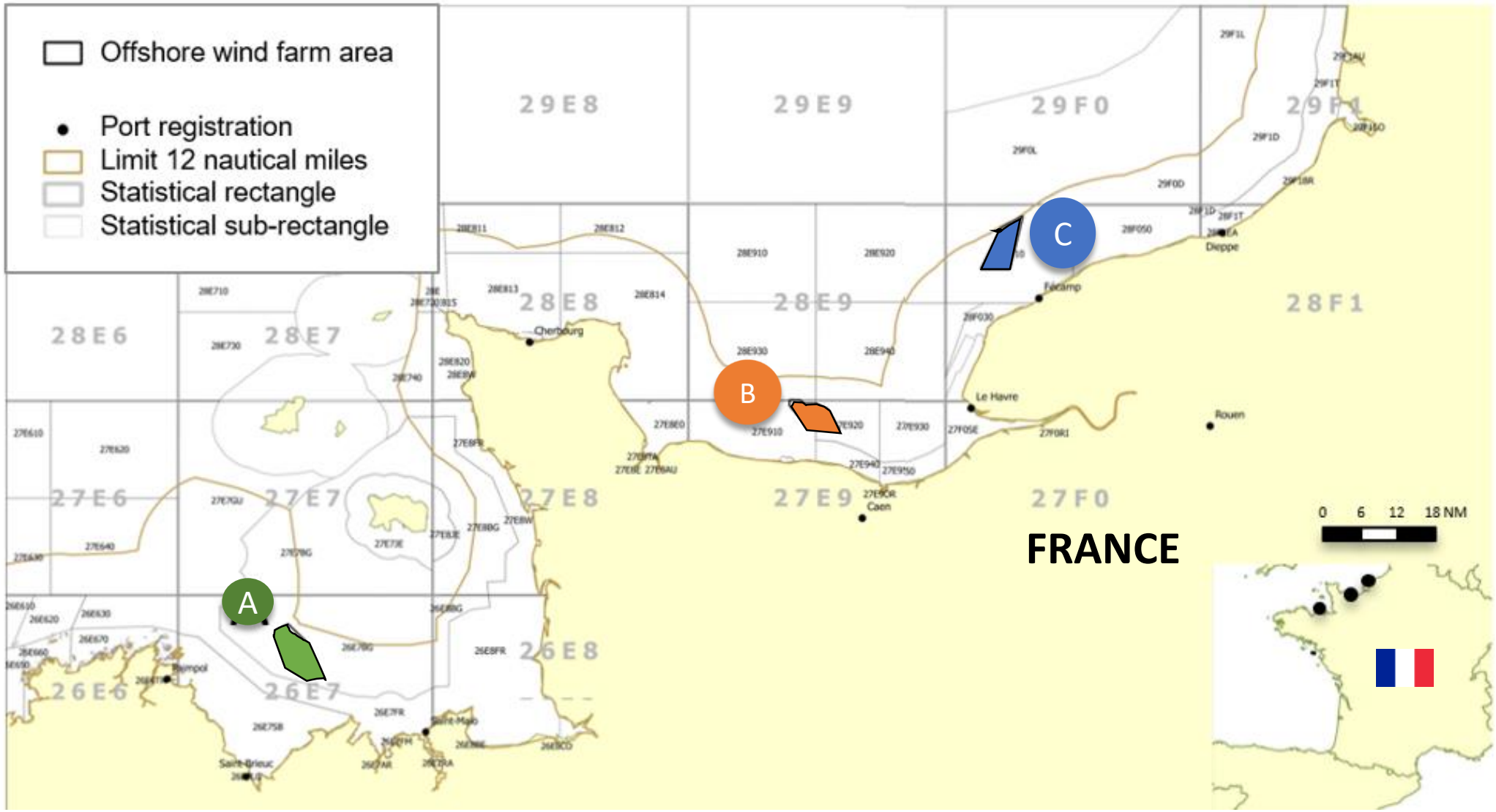
$$\frac{\text{annual income done in the specific area}}{\text{total annual income}}$$

- Aggregated data over the boats from the OWF area

- Comparison of 3 different reference states to assess the spatial economic dependency.
  - 10 years (Holsman et al. 2019), 3 years (Bonsu et al. 2024) , 1 year (Chen et al. 2020)

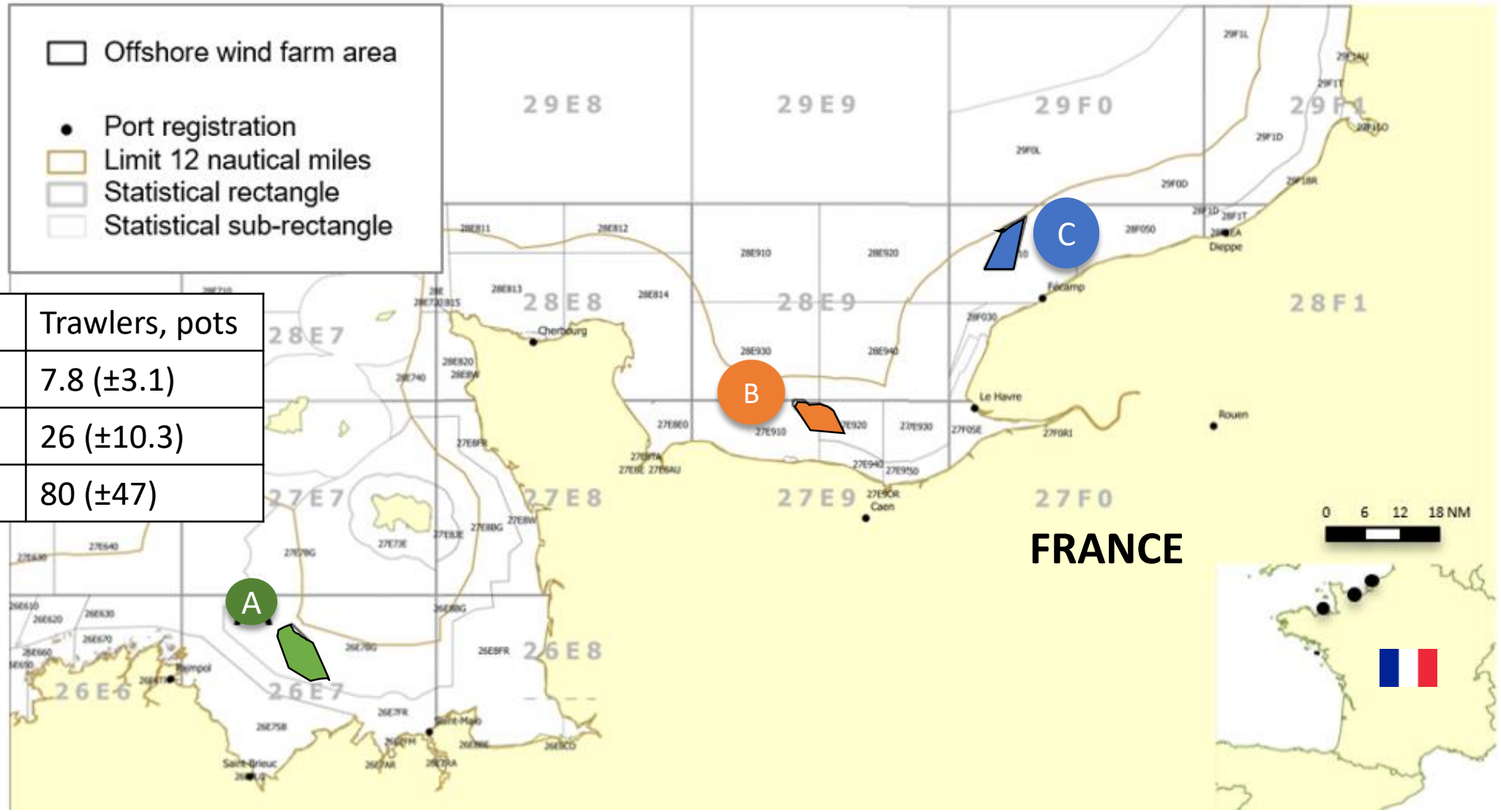
- VMS data allowing us to select vessels that operated in the OWF between 2012 and 2022.
- 10 years of the fishing activities happening in the future OWF area
- Annual catch and value data per fleet from the Ifremer fisheries database (SIH)

- 3 case studies A Saint Brieuc B Courseulles C Fécamp



- 3 case studies A Saint Brieuc B Courseulles C Fécamp

Type	Trawlers, pots
Boats	7.8 (±3.1)
Fishers	26 (±10.3)
Production	80 (±47)



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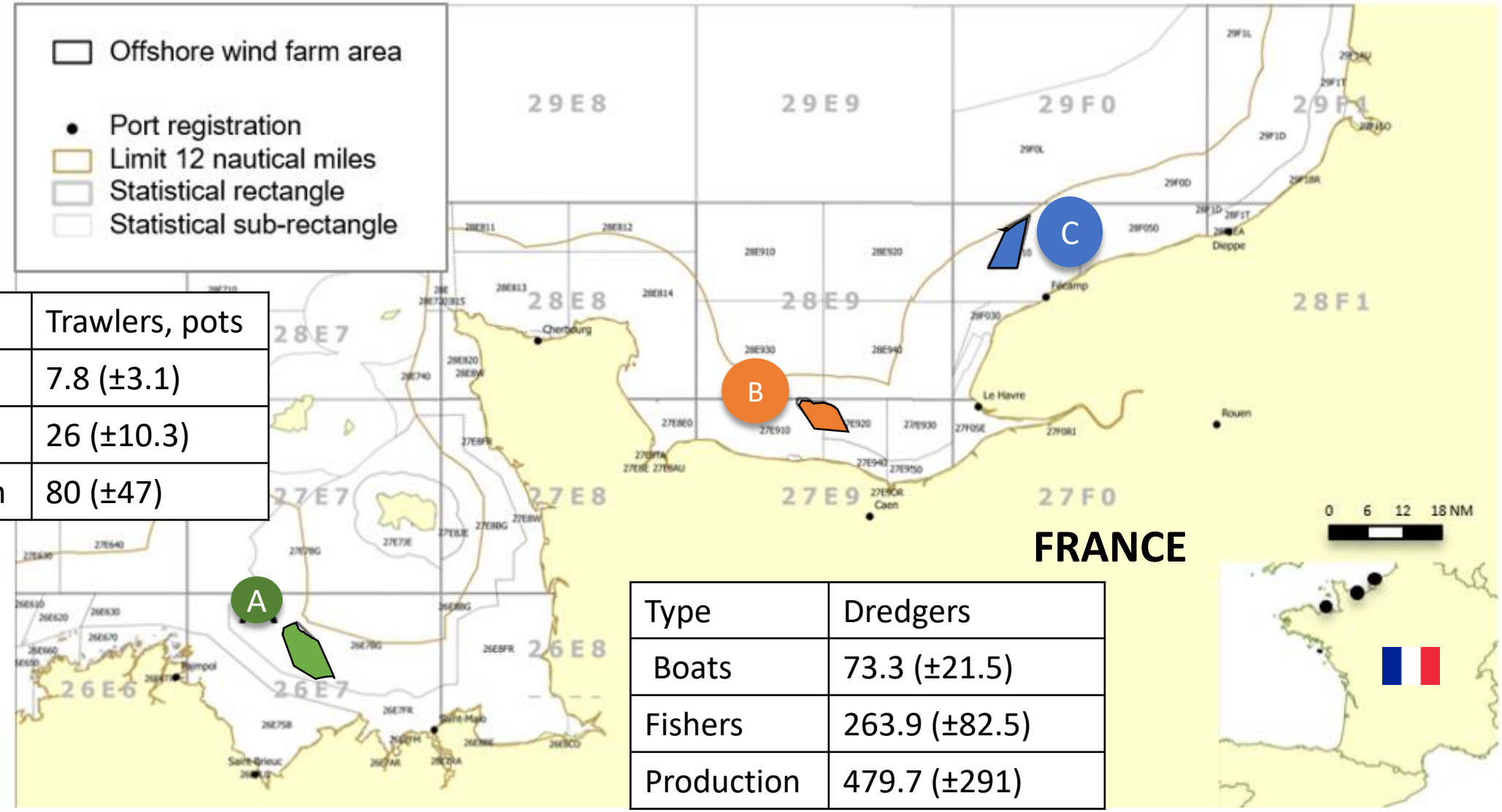
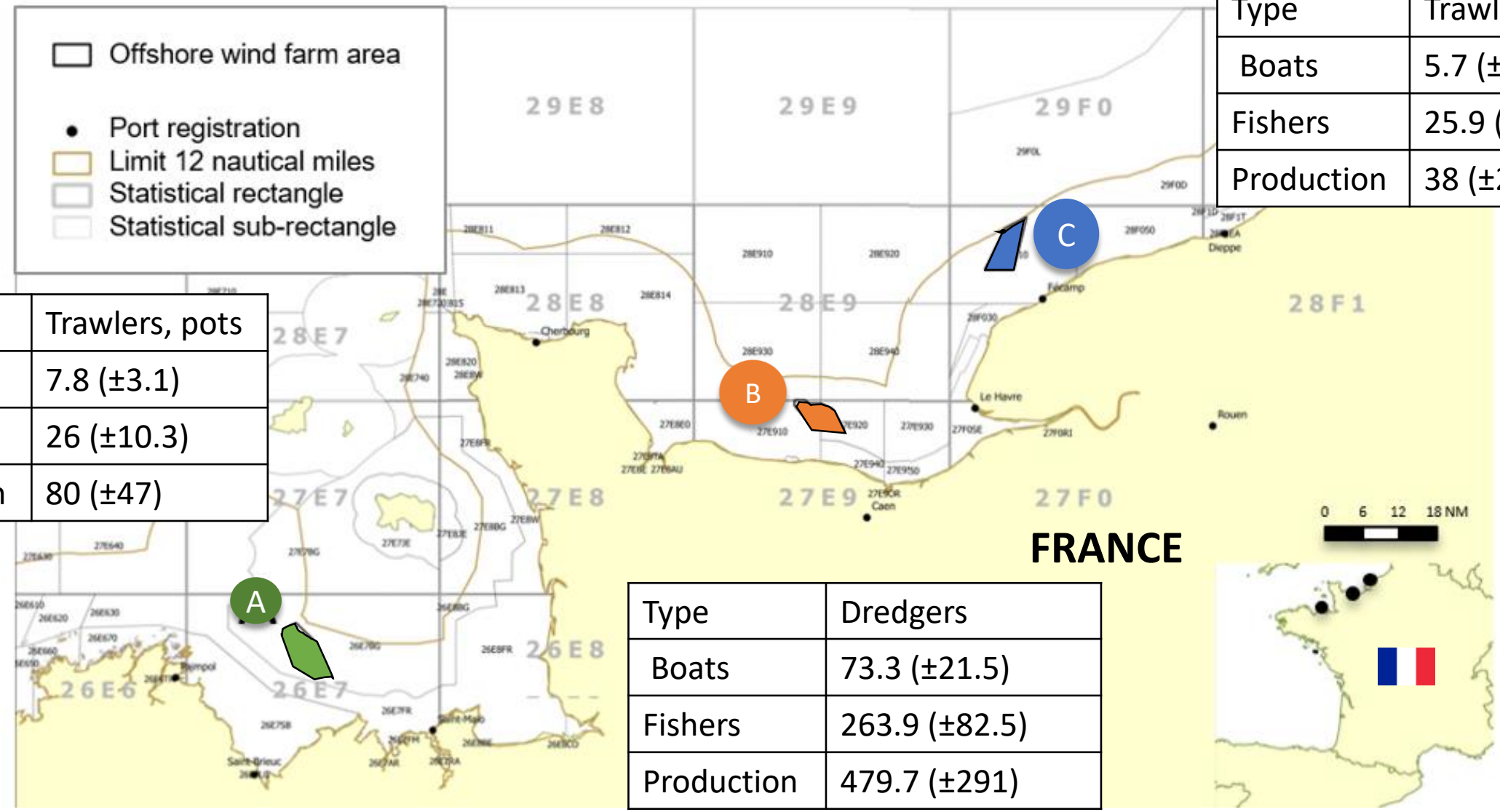


Type	Trawlers, pots
Boats	7.8 (±3.1)
Fishers	26 (±10.3)
Production	80 (±47)

Type	Dredgers
Boats	73.3 (±21.5)
Fishers	263.9 (±82.5)
Production	479.7 (±291)

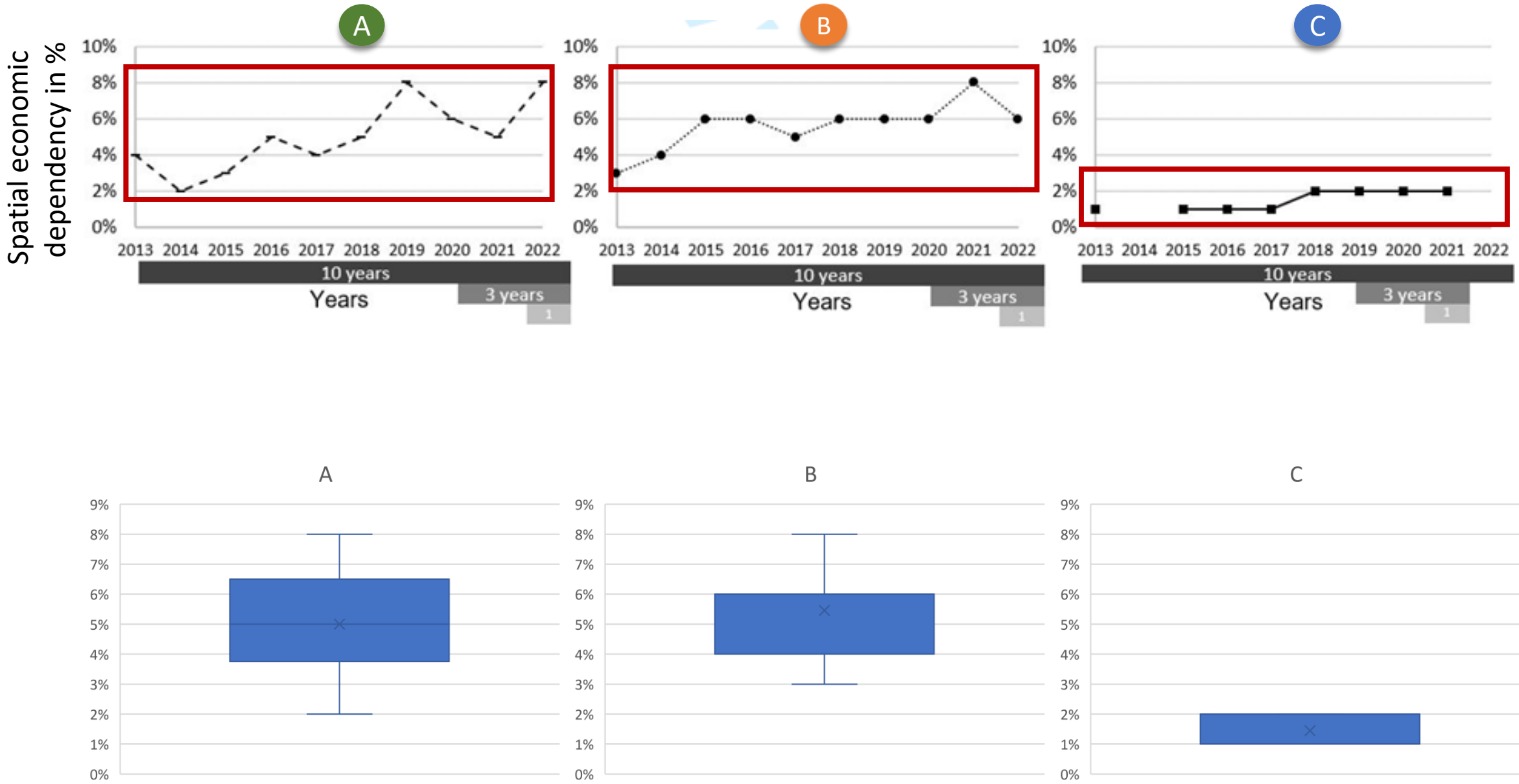
- 3 case studies A Saint Brieuc B Courseulles C Fécamp



Type	Trawlers
Boats	5.7 (±1.4)
Fishers	25.9 (±4.0)
Production	38 (±24)

Type	Trawlers, pots
Boats	7.8 (±3.1)
Fishers	26 (±10.3)
Production	80 (±47)

Type	Dredgers
Boats	73.3 (±21.5)
Fishers	263.9 (±82.5)
Production	479.7 (±291)


Spatial economic dependency in %
A
B
C
10%
8%
6%
4%
2%
0%
2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
10 years
3 years
Years
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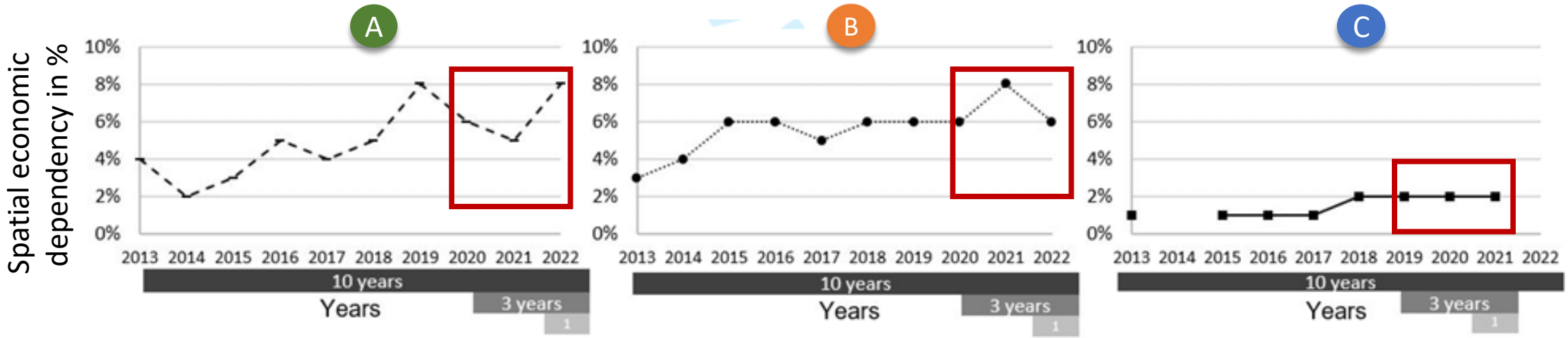
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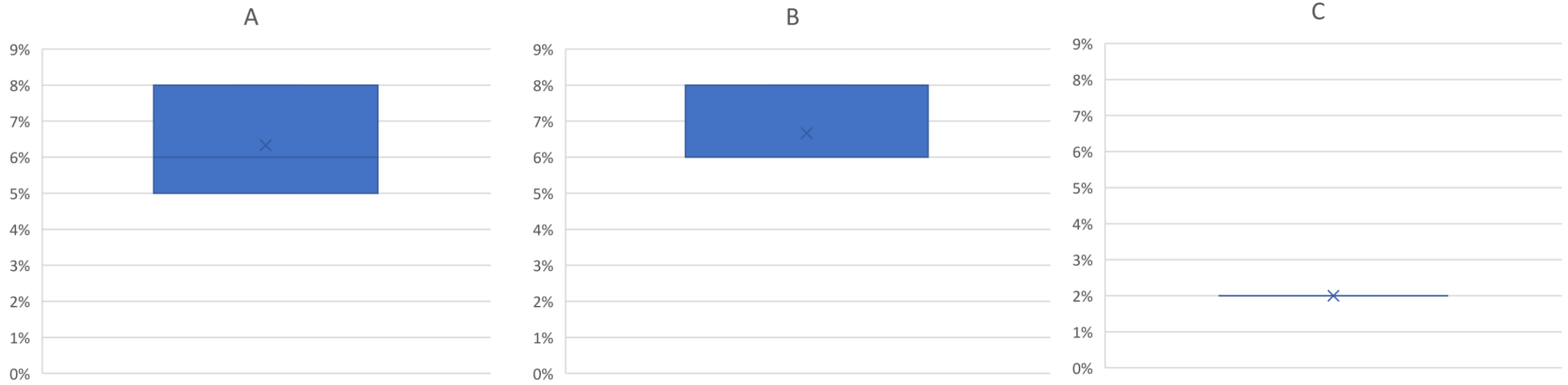
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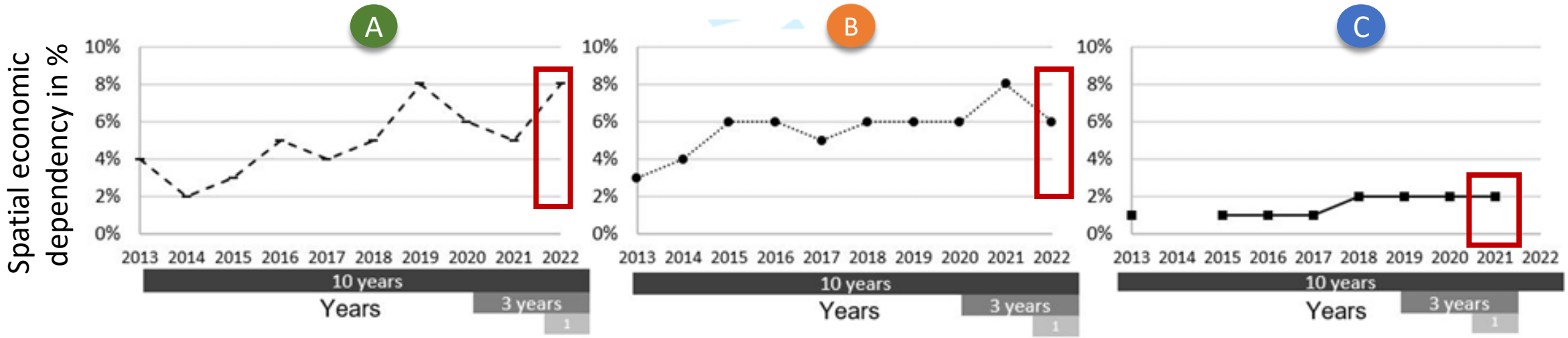


How do we define the reference states of the spatial economic dependency before OWF implementation ?

- **Spatial competition is likely to affect fishing activities** in the short term but overall expected decrease of income will be **less than 10%**
- The variability depends on the activity at each site, the reference state is worth discussing. **-> importance to be case specific**
- We suggest to take **10 years** as reference years for Saint Brieuc, **3 years** for Courseulles and **1 year** for Fécamp

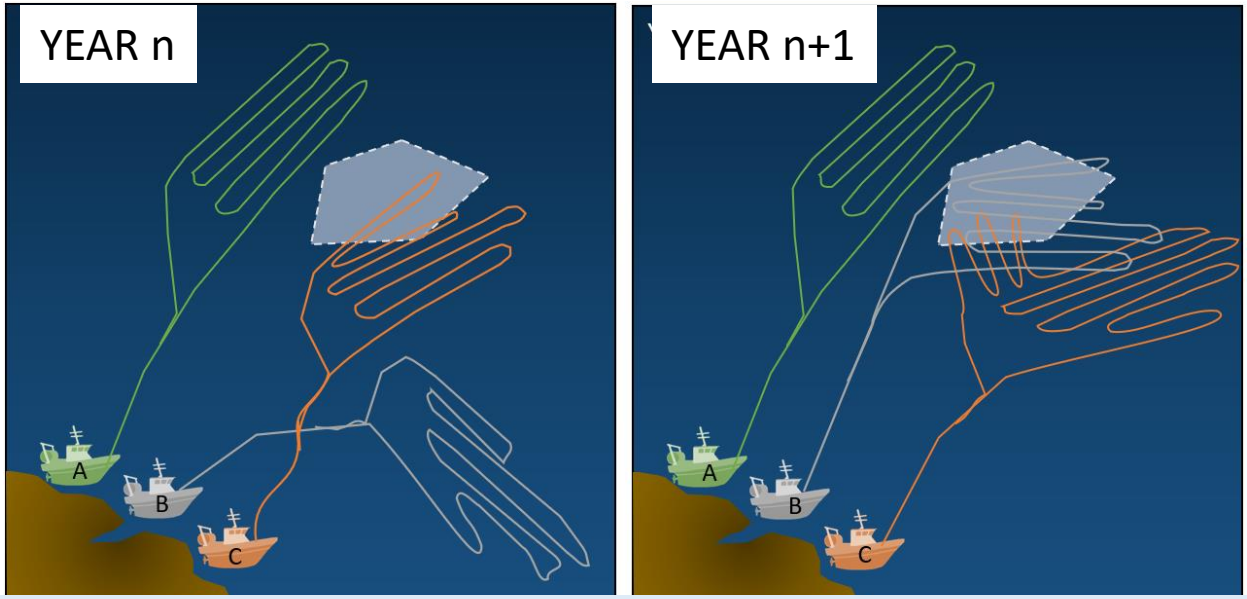
- Better reference state will help better assess vulnerability

Limits

- Fishers' risk aversion, market and environmental uncertainty are not integrated into this analysis
- Not taking in **account individual boat movement** (individual level studies)
- Not considering potential behavioural anticipation because the project (because OWF are known since 2010 so fishers may strategically catch in the area to have more compensation) **-> needs interviews**

Others

- Reference state challenges can be applied to other management areas (monetary compensation after closure)



- Other elements of spatial vulnerability deserve further investigation.
- Reviewing indicators of the composite index with empirical method focusing more specifically on
  - Behavioural anticipation - what have they done?
  - Adaptative capacity - what will they do?
  - Opportunity cost – Why do they chose to adapt one way to another?
- Focus on Courseulles with 22 interviews with fishers

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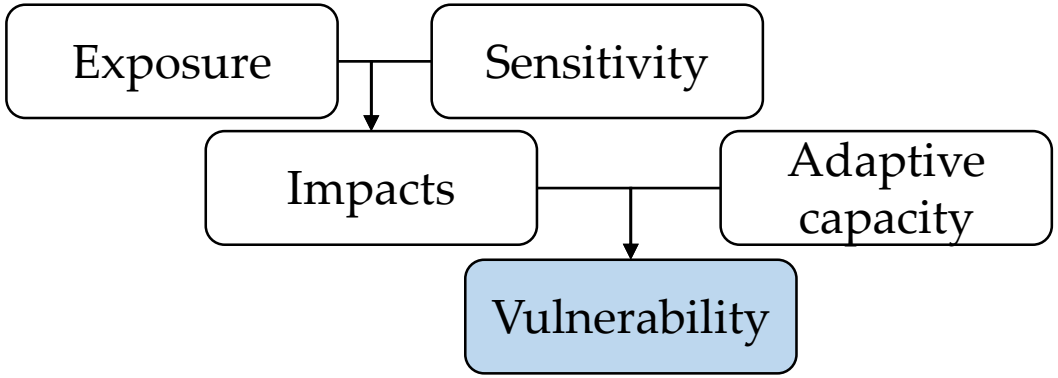
Work in progress …



Thank you for listening

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Don't hesitate to get in touch !

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