EGU General Assembly 2022

Session BG4.2 : EGU22-4664

Spatial and temporal distribution of physical and CO_2 properties in the English Channel based on voluntary observing ships between 2006 and 2021.

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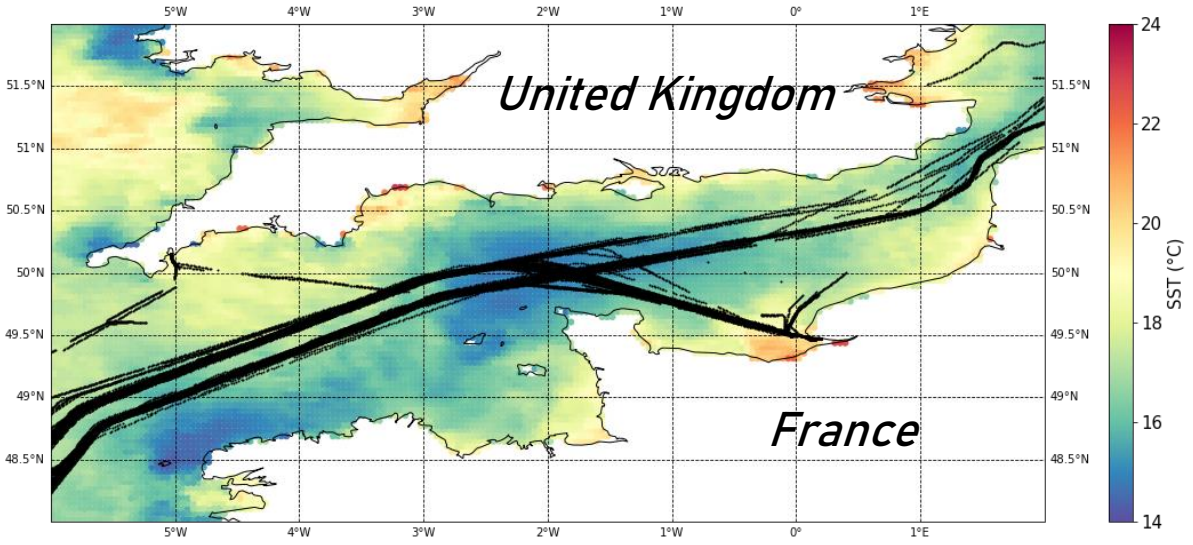
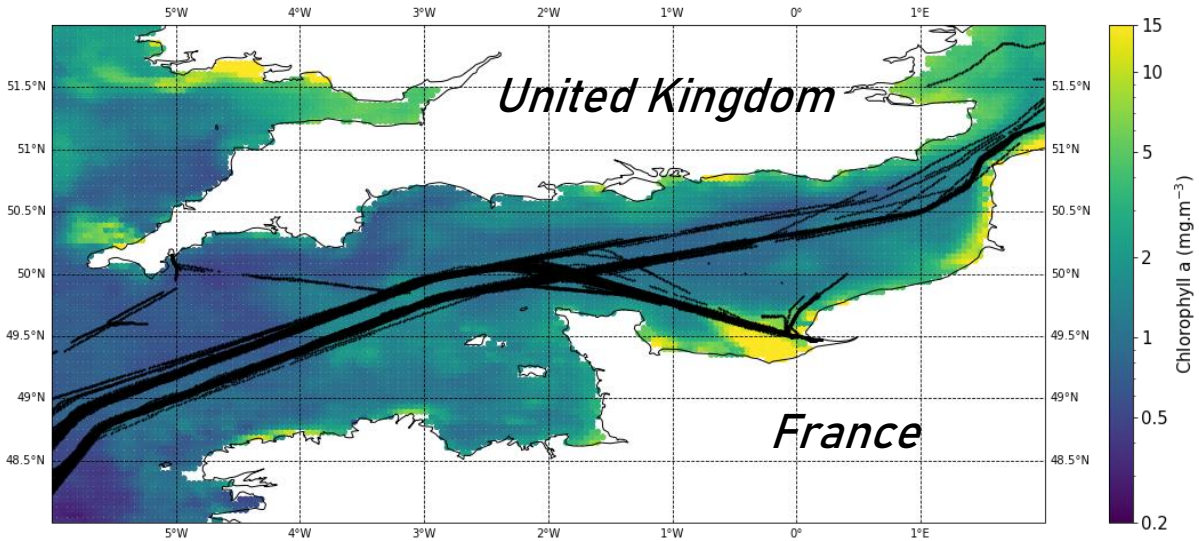
The English Channel



July 2021 mean SST and Chl-a from MODIS-Aqua

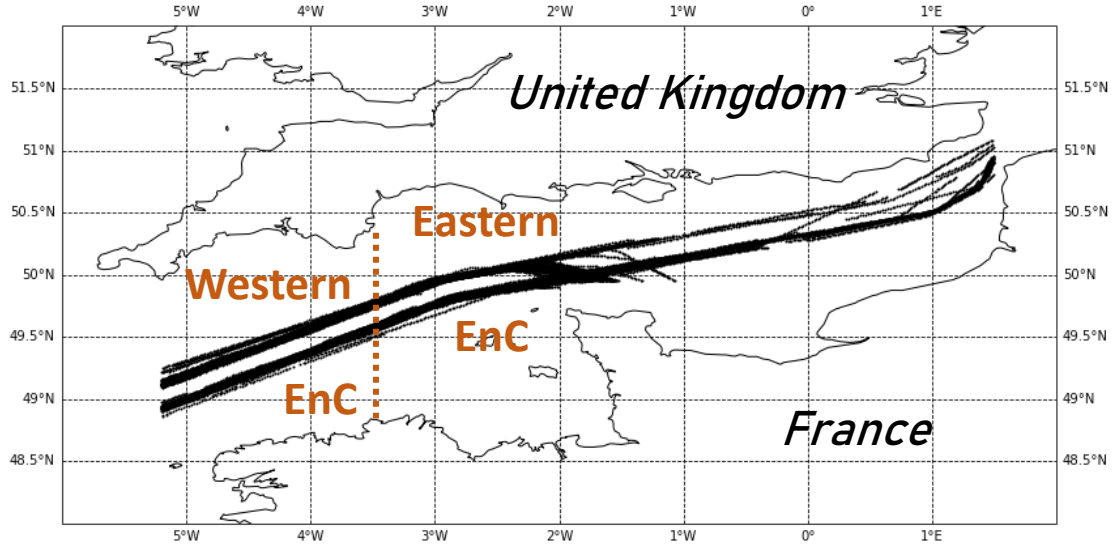


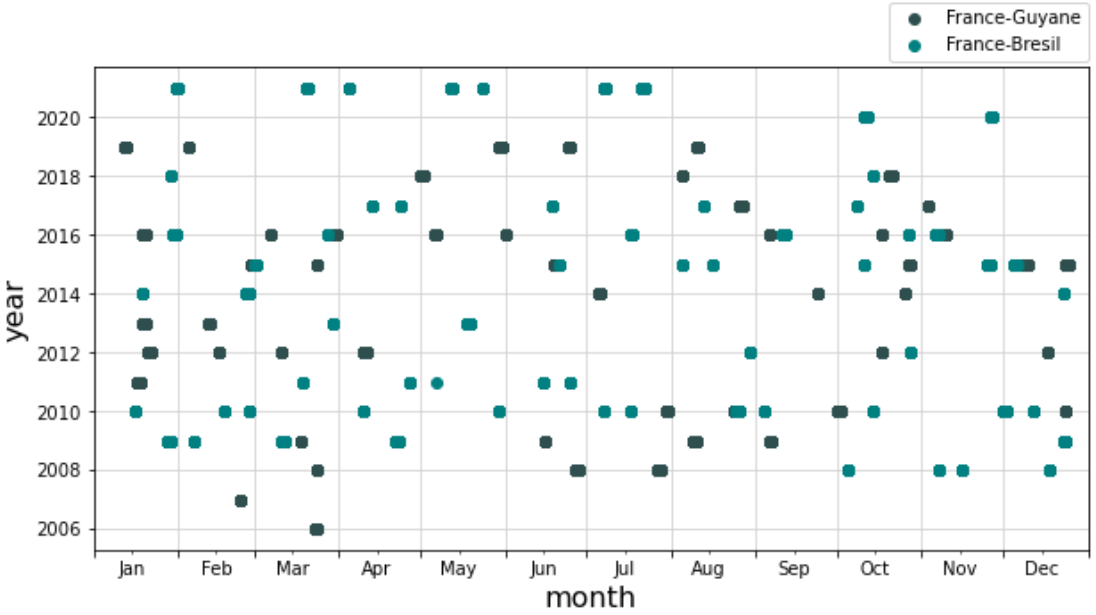
Important role of the continental shelves on the balance of air-sea CO_2 exchanges

The English Channel

- Strong variability in physical and biological parameters
- Spatial and seasonal variation in CO_2 source/sink
- Few studies on longitudinal variability and long-term evolution of physcial and CO_2 parameters

Study area and methodology





In-situ data

Voluntary Observing Ships

- From 2006 to 2021
- Lines France-Brésil (ICOS) and France-Guyane
- 111 transects

- SST
- SSS
- fCO_2

Satellite data

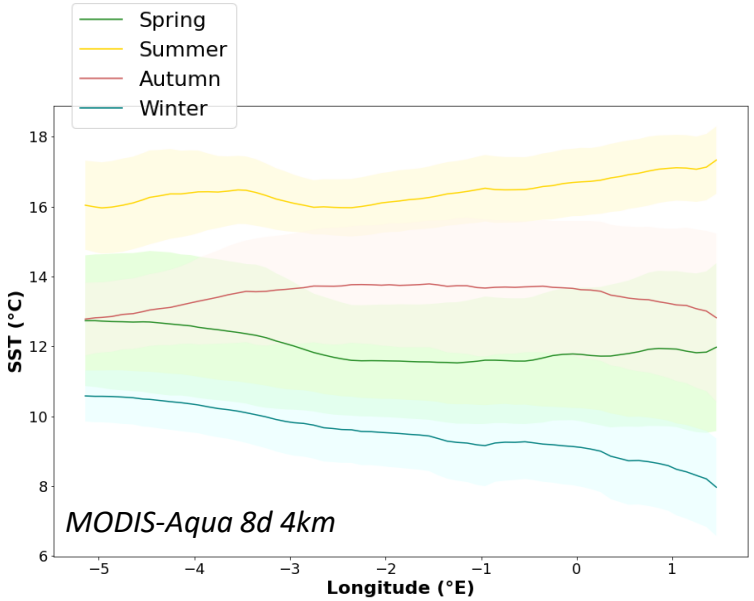
MODIS-Aqua

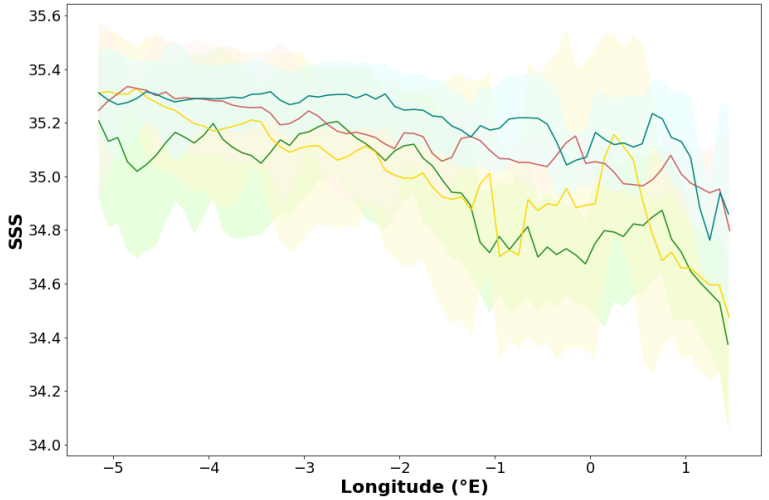
- Chlorophyll a
- SST

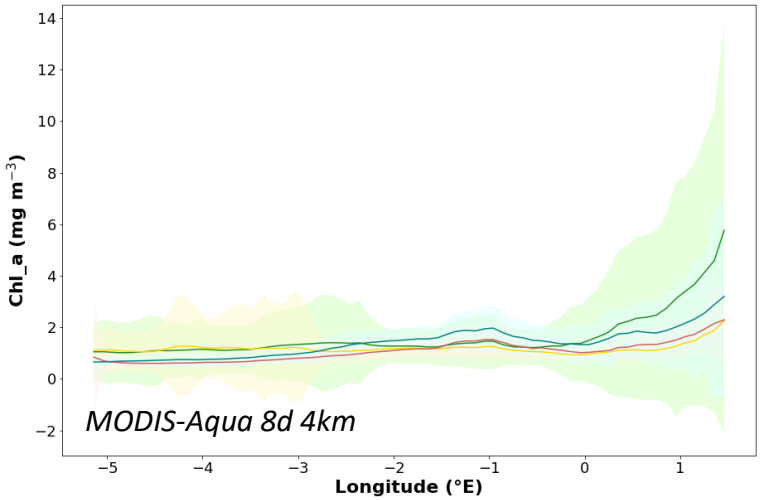
Two regions

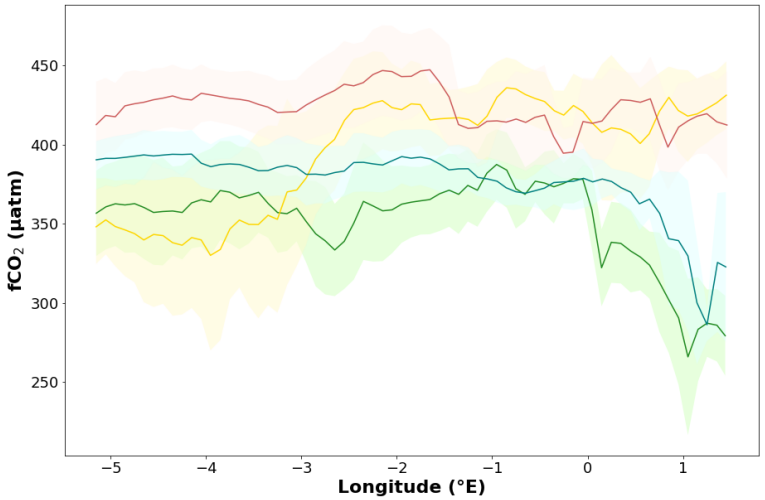
- Western English Channel (5.2°W – 3.5°W)
- Eastern English Channel (3.5°W – 1.5°E)

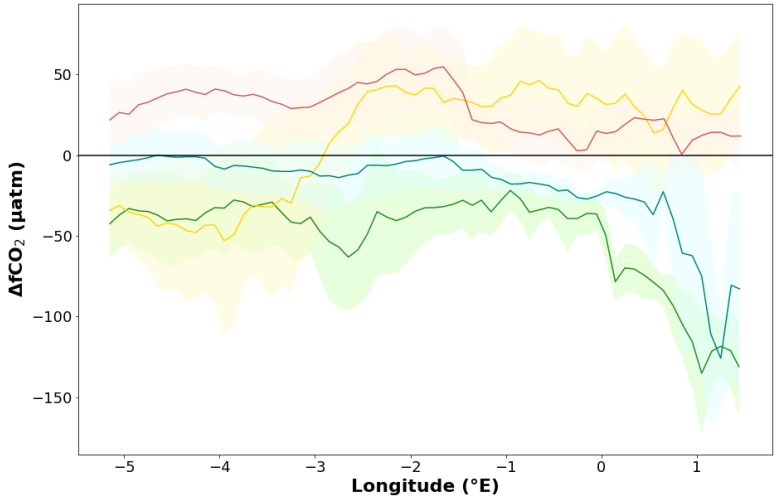
Longitudinal distribution of SST, CO_2 and Chlorophyll a







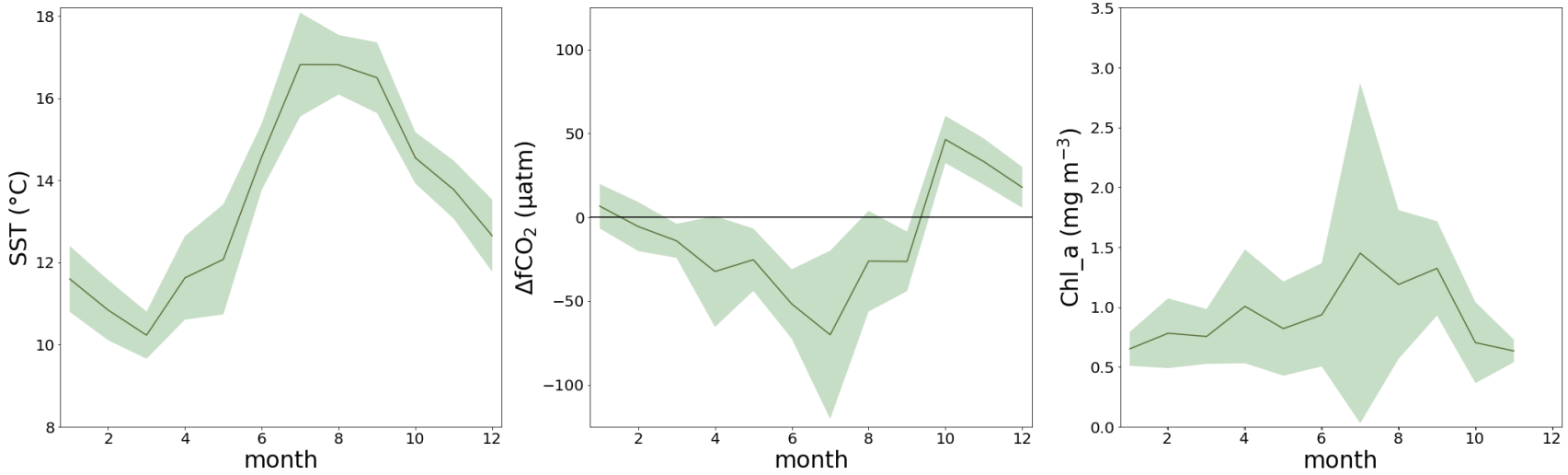




- Strong SST seasonality
- Spatial variability of CO_2 sources and sinks as well as Chl-a
- East/West difference in the parameters variability

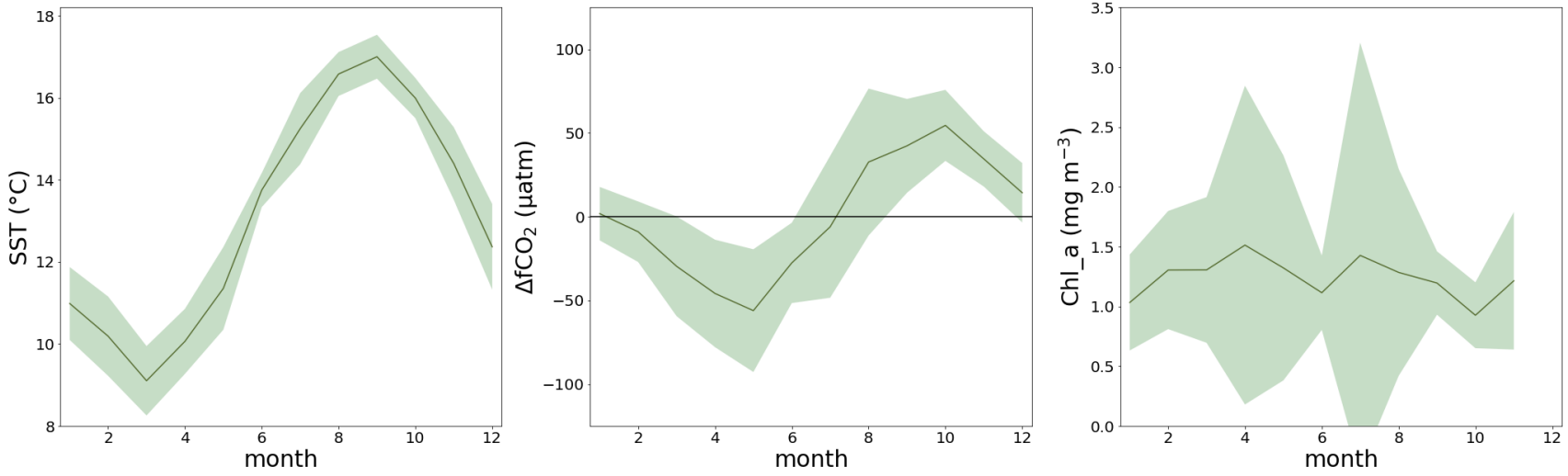
East/West difference in the seasonal variability of CO_2 and Chl-a

Western English Channel



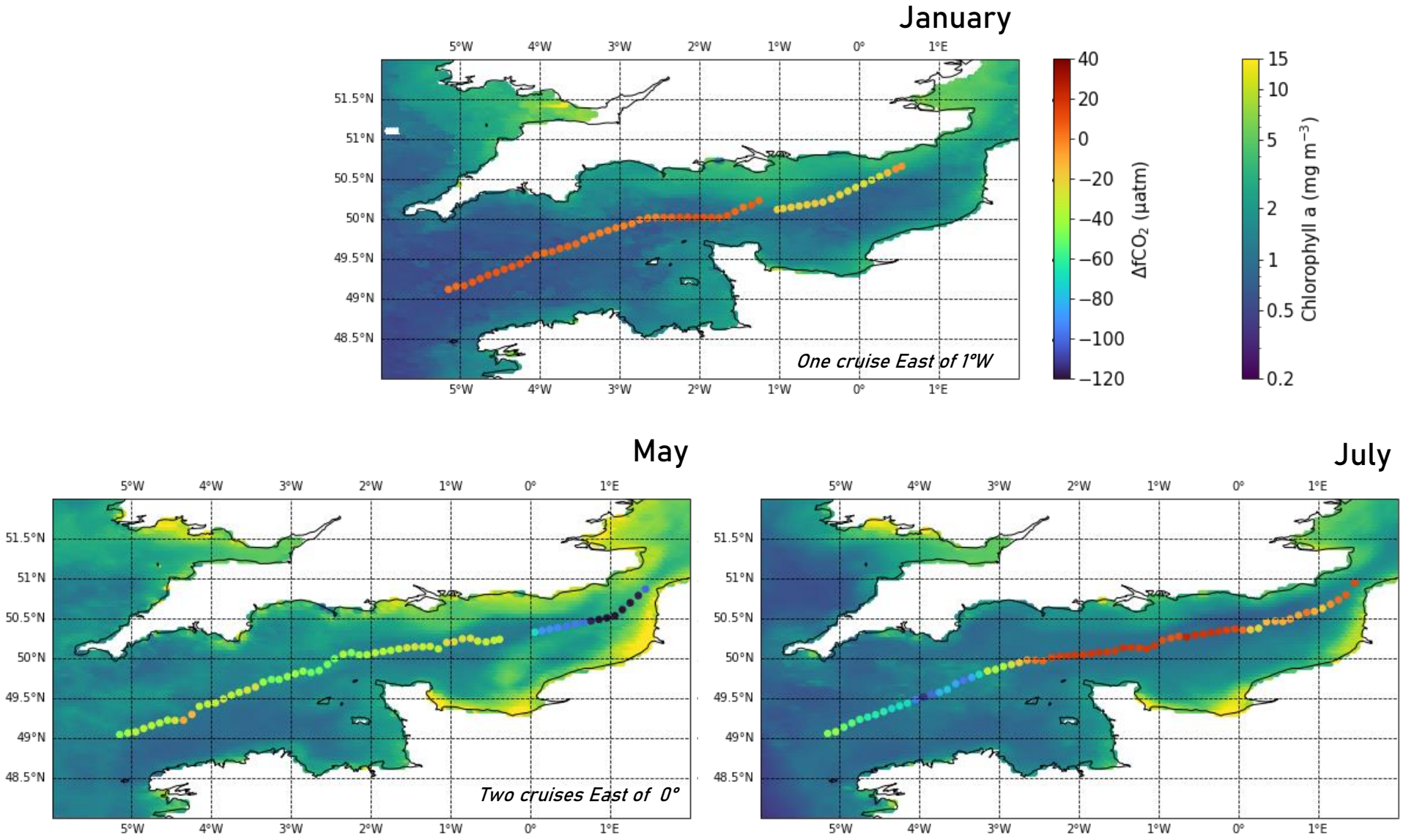
- Minimum ΔfCO_2 in July coinciding with peak Chl-a
- Mean annual ΔfCO_2 = **-12,30 µatm**

Eastern English Channel



- Minimum ΔfCO_2 in May
- High Chl-a seasonal variability
- Mean annual ΔfCO_2 = **0,54 µatm**

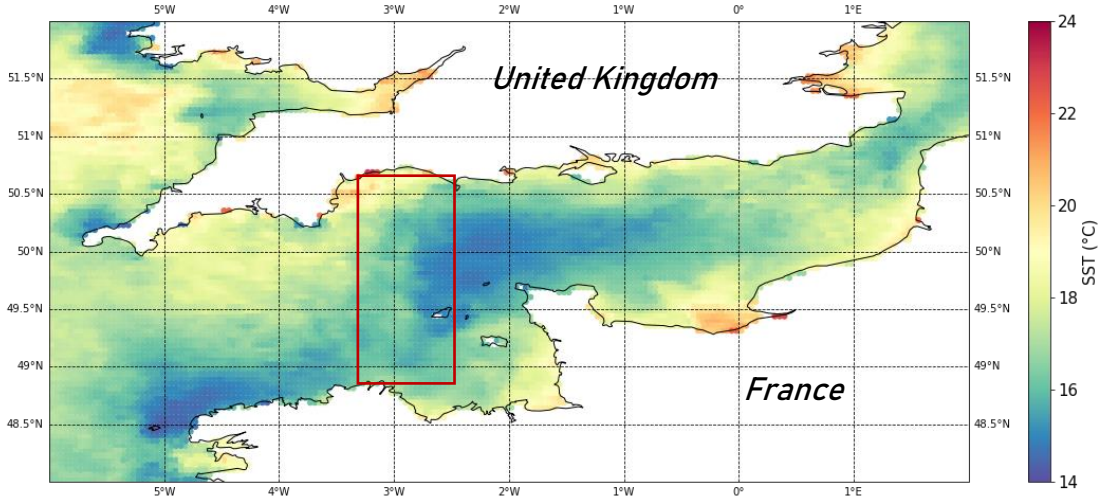
Seasonal variation in ΔfCO_2 between 2006 and 2021



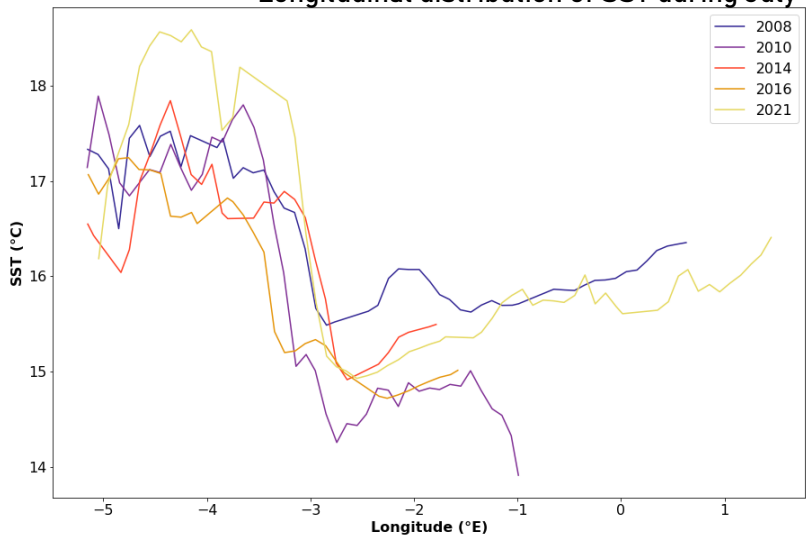
Study of relation between parameters and smaller-scale effects

Strong SST gradient during July at 3°W

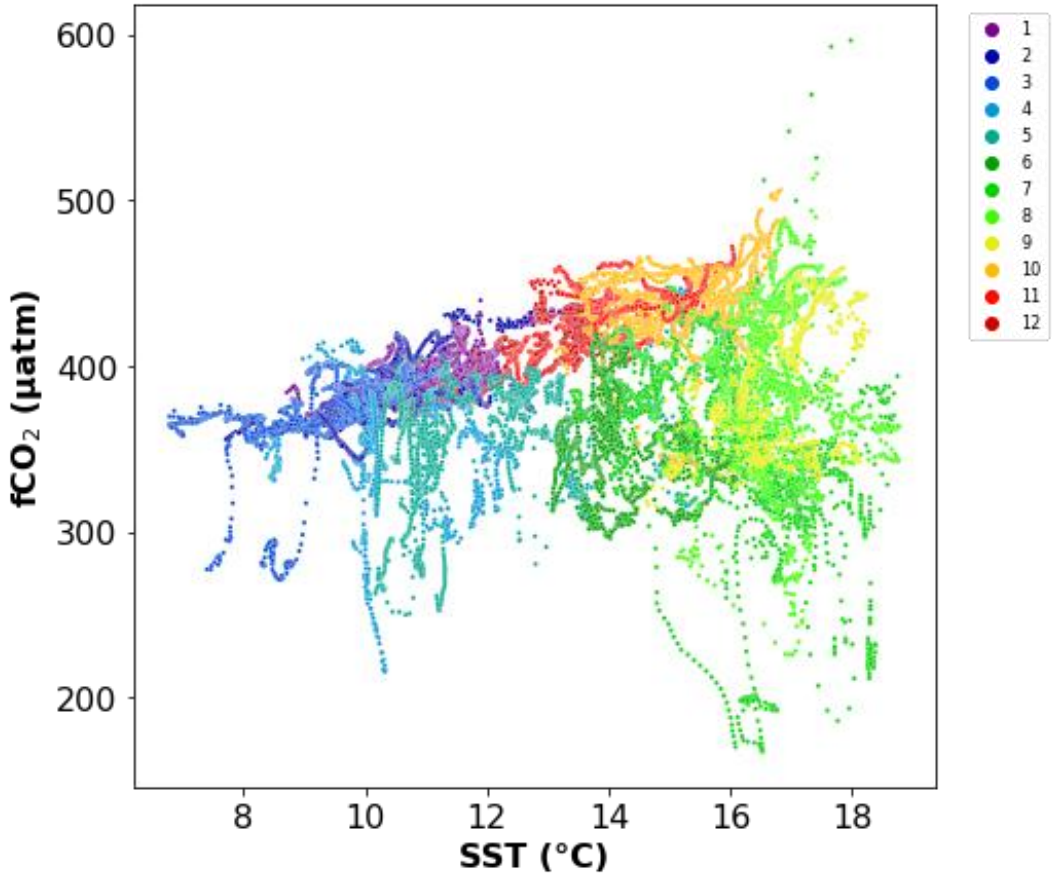
July 2021 mean SST from MODIS-Aqua



Longitudinal distribution of SST during July



Relationship between parameters



Conclusion and perspectives

Longitudinal variability of physical and CO_2 parameters as well as biological activity

East/West difference in seasonal CO_2 variability and annual air-sea CO_2 exchanges

More local or punctual signal to explore to better understand the relations between parameters

Assessment of the long-term evolution of physical and CO_2 parameters as well as acidification

Working with SOCAT dataset to increase spatial and temporal resolution