

# CGFS 2018 - Survey Report

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## 1. Rationale of the survey

The English Channel is a sector strongly influenced by fisheries, mostly for France and UK but also more widely for Northern European countries. The ecological and economic impacts of the exploitation of fisheries resources must be estimated in order for the fishing activity to stay sustainable while accounting for resources limitation and its effect on the environment. To answer this need, E.U. member states have to carry out sea surveys in order to estimate the abundance and distribution of fish stocks, independently of commercial fisheries data.

To achieve this objective, the CGFS (Channel GroundFish Survey) is part of the European program monitoring fish resources, which gather data relative to the exploited stocks (abundance, spatial distribution, maturity, age/size structure, recruitment index). Each year in autumn, about 74 stations are sampled with a standard high vertical opening bottom trawl (GOV 36/47) in the Eastern English Channel, and the haul is processed to produce the required data. The time series initiated in 1988 is used every year by European stock assessment working groups to derive the exploitation state of the main commercial fish species. From 2018 onwards the CGFS sampling area has been extended towards the Western English Channel where about 48 stations are sampled with a bottom trawl adapted to the hard substrate of this area (GOV 36/49).

Carried out on the R/V Thalassa since 2015, the CGFS offers the possibility to sample the entire ecosystem and to have a better understanding of it, answering both the MSFD requirements and the need of an ecosystem approach of fisheries at the European scale. Thus, using punctual sampling and en-route recording devices, the CGFS survey allows measurement and analysis of the physico-chemical properties of the water (hydrological probes), the phytoplankton (niskin bottle) and zooplankton communities (plankton nets), the fish eggs abundance (CUFES egg pump), the species composition and size structure of demersal community (GOV trawls), and visual observation of top predators. Furthermore, punctual acoustic boxes are conducted to better characterize sediment type at fine scale.

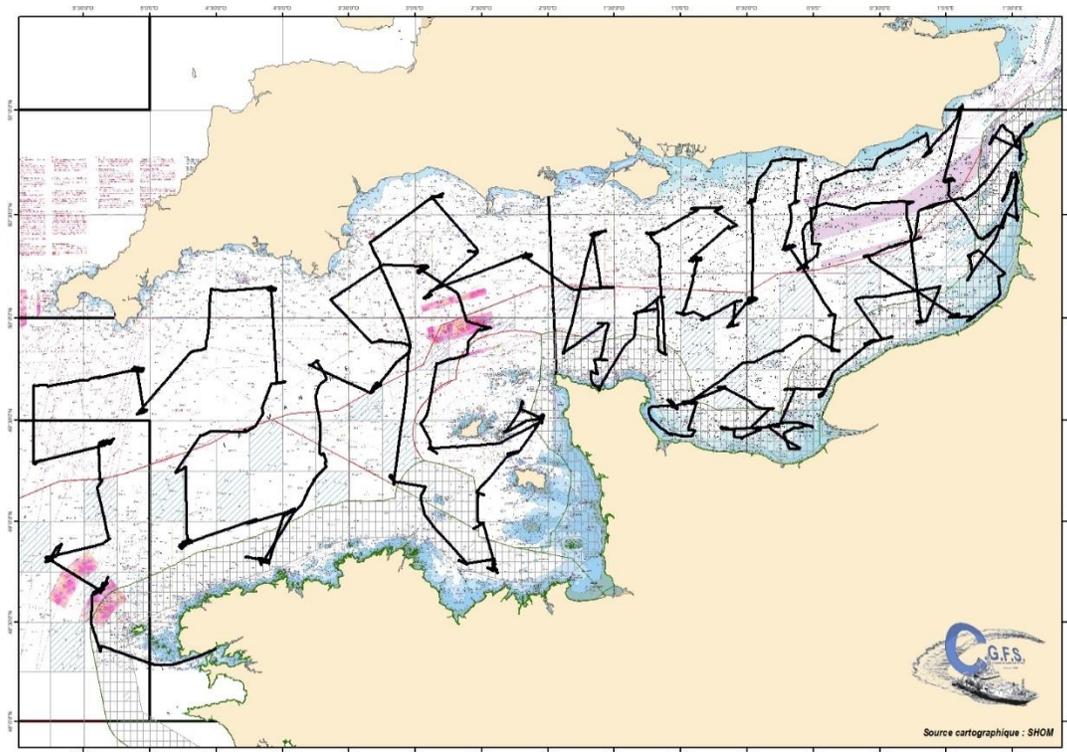
## 2. Survey trajectory and sampling stations

The survey was divided in two parts. During the first part the R/V Thalassa left Brest on the 11<sup>st</sup> of September 2018 to sample the Western English Channel (between 6°W and 2°W). A call was planned in Cherbourg. The second part began the 27<sup>th</sup> of September to sample the Eastern English Channel (between 2°W and 2°E). The survey ended on the 12<sup>nd</sup> of October 2018 in Boulogne sur mer.

The following number of stations were sampled (Figure 1):

- 74 trawls in the eastern English Channel with GOV 36x47
- 48 trawls in the western English Channel with GOV 36X49
- 129 hydrology stations (deploying hydrological probe and fluoroprobe, niskin bottle at sub-surface or at mid-depth, plankton WP2 net, and phytoplankton net)
- 33 stations sampled in the Eastern English Channel with the MANTA net, in order to collect microplastics
- 248 samples of sub-surface water, in order to get fish eggs, along the vessel trajectory in the eastern English Channel
- 27 acoustic boxes

During daylight, two observers were also continuously recording seabirds and marine mammals, boats and drifting marine litter. Around 200 marine mammals, 10000 sea birds, 32 Bluefin tunas and 200 drifting marine litters were observed during the survey.



*Figure 1: R/V Thalassa route during the CGFS 2018 survey, starting from Brest (southwest) and ending in Boulogne-sur-Mer (Northeast).*

### 3. Preliminary results

#### 3.1 Fish community

The trawl geometry of the 36X46 GOV net used in the Eastern English Channel was recorded at each haul, and was around 4.7 meters for the vertical opening and 16m for the horizontal opening. In the Western English Channel, the 36X49 GOV net used had around 5.5m for the vertical opening and 19.4m for the horizontal opening. The preliminary results concerning the spatial species composition of the catch are shown in figure 2. This year is characterized by a high dominance of pelagic species as horse mackerel (*Trachurus trachurus*), sprat (*Sprattus sprattus*) and mackerel (*Scomber scombrus*) in both areas. Concerning the eastern English Channel we observed a difference between dominance in biomass and dominance in abundance (Fig.3), especially for the sprat very abundant but with a low mean weight. At the opposite the mean weight of mackerel is high, explaining its importance in term of biomass compared to abundance. It is worth noting that whiting (*Merlangus merlangus*) is relatively important both in biomass and abundance. We can see the same pattern in the western English Channel (figure 4) for pelagic species, and we can note that whiting is also important in term of abundance, but less in biomass (included in the “others” group) while haddock (*Melanogrammus aeglefinus*) appears important in term of biomass (i.e. displays a high mean weight).

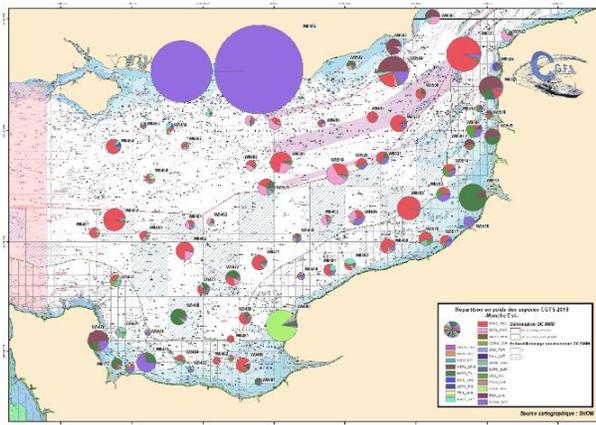


Figure 2a: Species composition of the catch in the Eastern English Channel

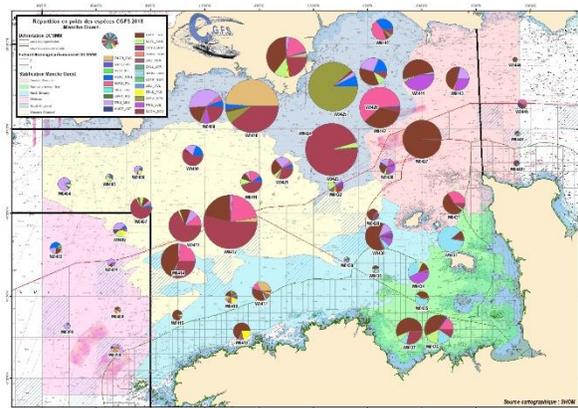


Figure 2b: Species composition of the catch in the Western English Channel

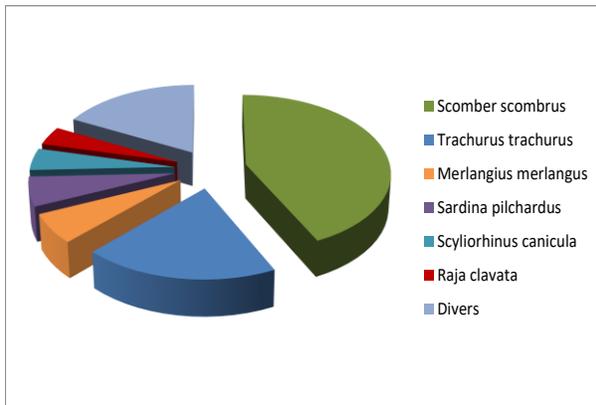


Figure 3a : Fish dominance in biomass in the Eastern English Channel

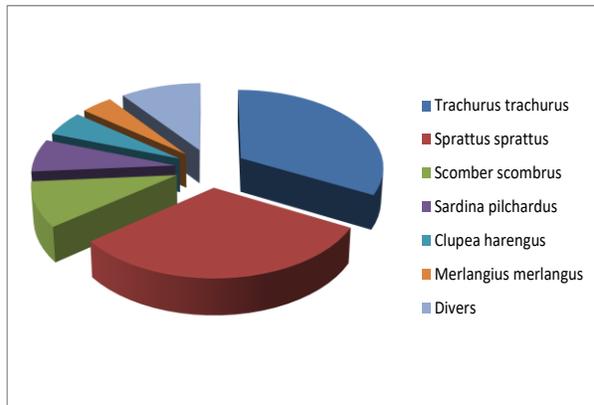


Figure 3b : Fish dominance in abundance in the Eastern English Channel

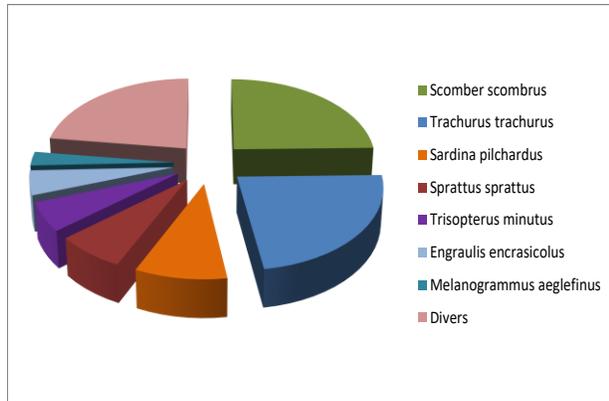


Figure 4a: Fish dominance in biomass in the Western English Channel

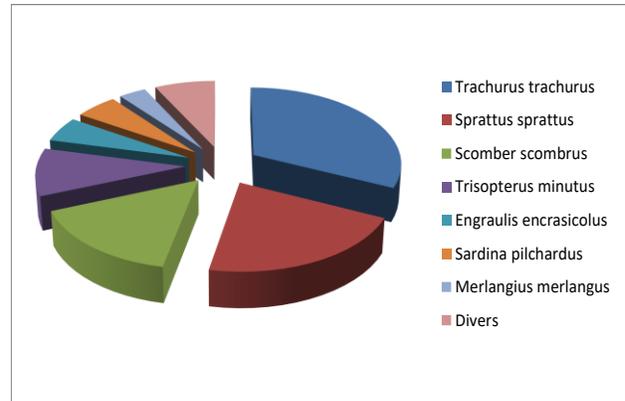


Figure 4b: Fish dominance in abundance in the Western English Channel

Concerning the occurrence (Fig.5), among the most widely distributed species in both areas we find the horse mackerel, present at almost all stations, which is one of the most important species in dominance. Some other species appear to be highly frequent in both areas: *Allotheutis sp.*, *Scomber scombrus*, *Zeus faber*, *Chelidonichthys cuculus*, *Scyliorhinus canicula*, *Sardina pilchardus*, *Trisopterus minutus*.

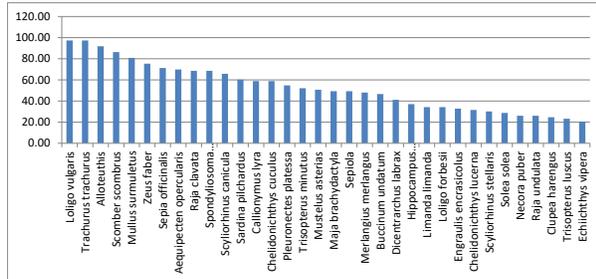


Figure 5a: Fish occurrence in the Eastern English Channel (>20%)

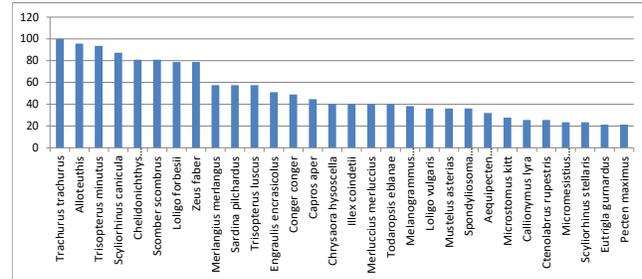
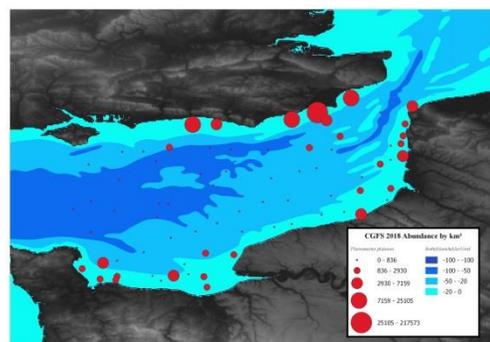
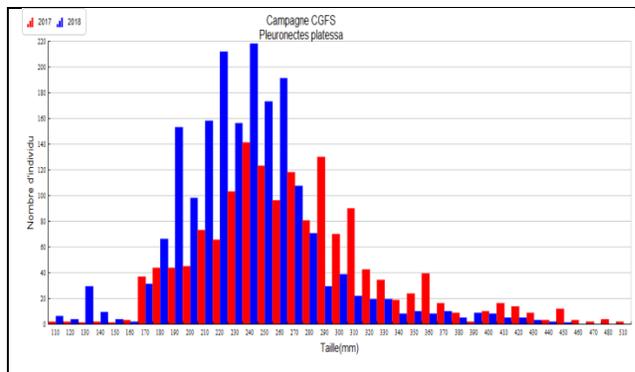
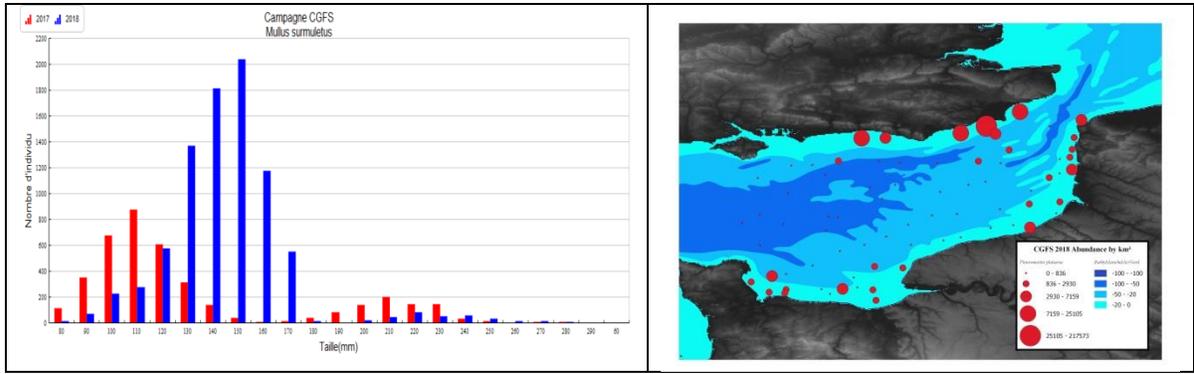


Figure 5b: Fish occurrence in the Western English Channel (>20%)

At each trawl station, fish were sorted and identified, before being measured to the nearest inferior centimeter. As an example, size distributions of the coastal species plaice and red mullet are averaged over the Eastern English Channel and presented in figure 6. The length distribution of common plaice is almost the same as last year, but with a higher proportion of smaller individuals. Concerning the striped red mullet the number of fish caught is higher than 2017, but concerns larger individuals. Indeed, the length distribution shifts from a mode being around 11 cm towards 15 centimeters.





**Figure 6:** Size distribution and spatial distribution (abundance by km<sup>2</sup>) of the 2 species assessed by WGNSSK<sup>1</sup> in the VIII ICES area: plaice (top) and red mullet (bottom). Comparison between 2017(in red) and 2018 (in Blue)

During the survey, some biological samples were taken on some fish caught by the GOV trawl, and consists mostly of otolith sampling. (Table 1).

**Table 1:** Number of fish used for otolith, scale or illicium sampling, per species

Species	Number
Whiting	1012
Cod	12
Pouting	188
Monkfish	11
Red gurnard	240
Red mullet	242
Seabass	270 (scales)
Plaice	587
Sole	164
Haddock	325
Megrim	18
Hake	136

<sup>1</sup> ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak

### 3.2 Benthic invertebrates community

Despite the difference between the two ground gears used (and an *a priori* smaller catchability of the GOV 36/49 used in the West), concerning the benthic invertebrates caught by trawling, the Western English Channel is slightly richer than the Eastern English Channel with respectively 107 and 100 specie. The specific composition of main benthic invertebrates is completely different between the two areas (Fig.7), with urchin and sponges dominated in the Western area, while the Eastern English Channel is dominated by brittle star, mussel and urchin in a lesser extent.

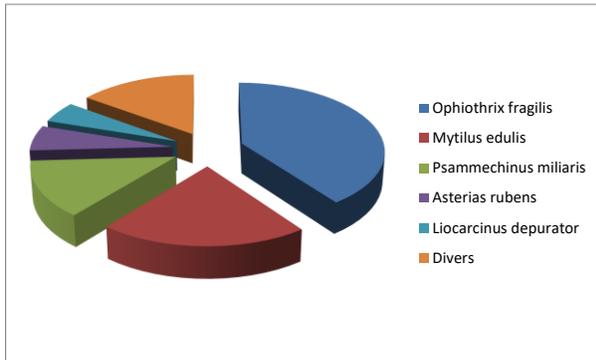


Figure 7a: Benthic invertebrates distribution in the Eastern English Channel

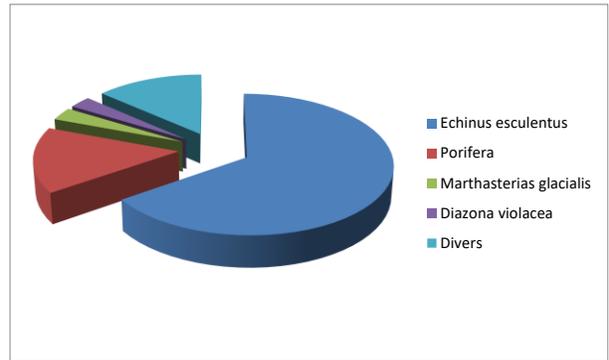


Figure 7b: Benthic invertebrates distribution in the Western English Channel

High biomasses of benthic invertebrates are mainly localized in the Bay of Seine in the Eastern area (fig 8). These concentrations are substantially smaller in the western part, apart from a strong concentration observed in front of the city of Roscoff.

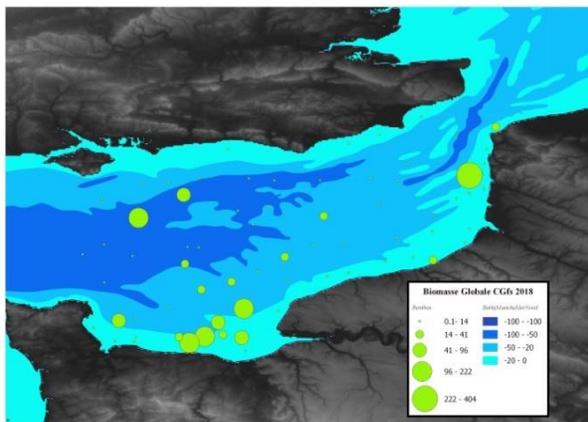


Figure 8a : Benthic invertebrates distribution in the Eastern English Channel

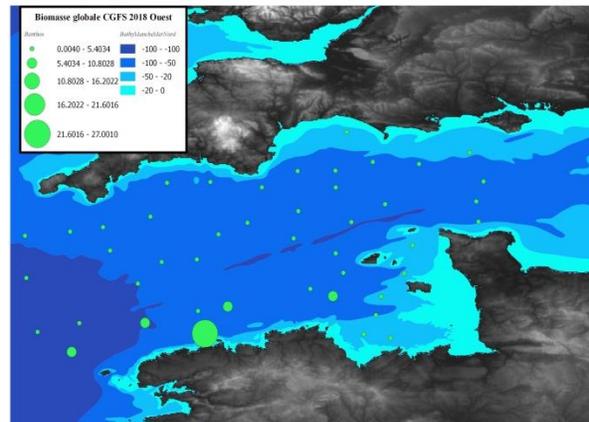


Figure 8b : Benthic invertebrates distribution over the entire Western English Channel

## 4. Data collected

Different kinds of data were collected. Some of them have been analyzed onboard, others via samples to be analyzed later in the laboratory. According to the type of data, different scientists are in charge of data storage and analysis gathering:

- Abiotic environment: E. Antajan (IFREMER – [Elvire.Antajan@ifremer.fr](mailto:Elvire.Antajan@ifremer.fr))
- Phytoplankton: E. Antajan (IFREMER – [Elvire.Antajan@ifremer.fr](mailto:Elvire.Antajan@ifremer.fr))
- Zooplankton and gelatinous organisms: E. Antajan (IFREMER – [Elvire.Antajan@ifremer.fr](mailto:Elvire.Antajan@ifremer.fr))
- Fish: M. Travers-Trolet and F. Coppin (IFREMER – [Morgane.Travers@ifremer.fr](mailto:Morgane.Travers@ifremer.fr), [Franck.Coppin@ifremer.fr](mailto:Franck.Coppin@ifremer.fr))
- Top predators: G. Dorémus (Univ. La Rochelle – [gdoremus@univ-lr.fr](mailto:gdoremus@univ-lr.fr))
- Benthic invertebrates: N. Desroy (IFREMER – [Nicolas.Desroy@ifremer.fr](mailto:Nicolas.Desroy@ifremer.fr))
- Microplastics: M. Le Moigne (IFREMER – [Morgan.Le.Moigne@ifremer.fr](mailto:Morgan.Le.Moigne@ifremer.fr))

For further details on data collected or analysis to come, please contact the corresponding scientist in charge and/or Morgane Travers-Trolet ([Morgane.Travers@ifremer.fr](mailto:Morgane.Travers@ifremer.fr)) for any queries regarding this survey.