NEXT OCEAN

CLEAR INSIGHTS INTO FISHERIES AND AQUACULTURE

Characterisation of Fishing Areas

Identification of areas of potential tuna aggregation based on ocean front detection to reduce fuel consumption and search time, reduce bycatch and support fisheries management

Characterisation of Fishing Areas (CFA) is a service from NextOcean that identifies areas of potential fish aggregation using environmental information from satellite observations. Forecasts of productive tuna fishing grounds can be used to inform commercial fishing companies, while historical data can indicate good sampling locations for stock assessment studies. The Characterisation of Fishing Areas service can benefit the following users:

Commercial Fishing Companies

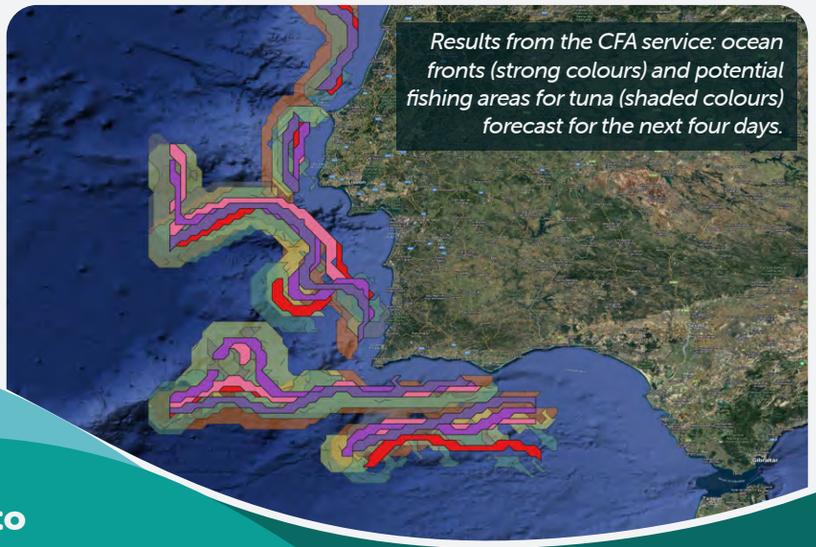
- Provides captains with intelligence on where and when they may find productive tuna fishing areas.
- This increases the efficiency of fishing operations, reducing time at sea, fuel costs and carbon emissions by shortening the search for fishing grounds.
- Fishing in high concentration areas of the target species should increase catch per unit effort, reduce bycatch, benefitting the sustainability of fish stocks and helping to maintain biodiversity.

Fisheries Management Organisations

- The time and location of fish nursery grounds can vary with changes in oceanic conditions. Understanding these environmental changes are key to standardisation of fish catches and inform a more accurate stock assessment.

Fisheries Consultants/ Service Providers

- Provide intelligence to commercial fishing companies to support optimal fishing activities.
- Advise on stock sampling locations for fisheries management and conservation organisations.



Results from the CFA service: ocean fronts (strong colours) and potential fishing areas for tuna (shaded colours) forecast for the next four days.

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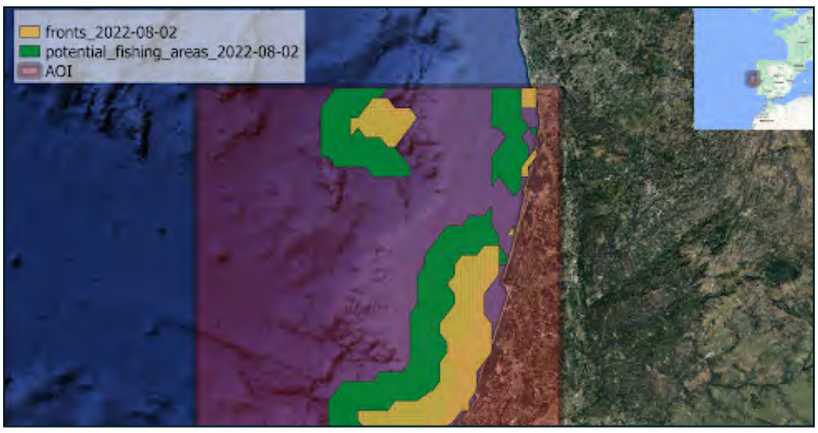
NextOcean v1 release. January 2024.

Service specifications

Key specifications	Characterisation of Fishing Areas
Temporal coverage	2007-present Forecasts up to 4 days in to the future
Temporal resolution	Daily updates
Spatial coverage	Data instantly available for tuna in the NE Atlantic, with other areas and species potentially available on request
Spatial resolution	5.5km x 5.5km
Downloadable data files from NextOcean store	Shapefiles of ocean fronts and potential fishing areas for tuna for the current date, plus forecasts for the next 4 days
Visualisation in NextOcean portal	Available
Data feed via API	Available
Satellite data used	Copernicus Marine Service European Ocean Sea Surface Temperature Copernicus Marine Service ocean colour data (chlorophyll) from the Sentinel 3 OLCI sensor



The CFA service uses satellite data to identify waters with environmental conditions that are likely to be favoured by pelagic fish in the North Atlantic.

The service currently focuses on tuna in the NE Atlantic. Tuna are a visual predator which prefer clear waters in productive regions. The algorithm used is based on scientific knowledge developed by the service provider[1].

Sea surface temperature data derived from satellite observations enable us to identify ocean fronts, which are associated with higher productivity, making them an ideal feeding ground for fish. This is coupled with satellite chlorophyll data to identify clearer waters which are favoured by tuna.

The service is being developed to incorporate additional species and regions, following users requests. New features, namely historical density maps of ocean fronts and potential fishing areas, are to be provided in the upcoming service releases.

The map-based outputs can be viewed in the NextOcean portal as well as downloaded as shapefiles. The CFA service has a daily time series of conditions going back as far as 20 years to identify long-term trends and predict future changes. Daily forecasts extend up to 4 days into the future.

[1]Santos, AMP, Fiuza, AFG, Laurs, RM. 2006. Influence of SST on catches of swordfish and tuna in the Portuguese domestic longline fishery. International Journal of Remote Sensing, 27.15: 3131-3152, doi: 10.1080/01431160600567811

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