

Site Risk Assessment

Monitoring and analysis of environmental conditions surrounding aquaculture sites for evidence-based management of potential risks

The NextOcean Site Risk Assessment service features three components:

1. the MetOcean data, which provides maps of environmental conditions including winds, currents, surface temperature, sea level and tidal elevation;
2. Oil spill detection, which offers both historical maps and a daily monitoring service.
3. Marine heatwave early warning, providing advance notification of anomalous increases in temperatures that will impact the marine environment.

These three components can be purchased individually, to assess various environmental threats according to organisational needs. The Site Risk Assessment service can benefit the following users:

Aquaculture Companies

- ✓ MetOcean forecasts, marine heatwave early warning, and oil spill detection allow monitoring so that cages can be secured, protected, or submerged.
- ✓ Historical MetOcean, marine heatwave and oil spill detection can be used to assess the conditions over a long time period for an area under consideration for a new aquaculture site.

Insurance Companies

- ✓ Using both the MetOcean, oil spill data, and the new early warning for marine heatwaves, they may be better able to assess the risks associated with operating a fish farm.

Maritime Regulatory Authorities

- ✓ Historical data can be used to assess the long-term conditions for an area under consideration for aquaculture activity.
- ✓ The oil spill service allows authorities to assess the historical impact from maritime traffic on both the environment and human activity in the area (e.g. aquaculture, coastal tourism) in order to support regulation and control.

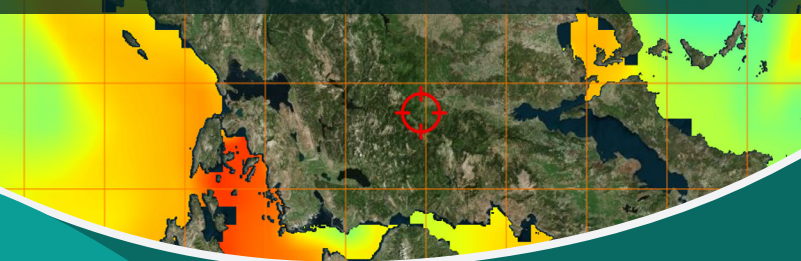
Aquaculture Service Providers/Consultants

- ✓ By integrating NextOcean data into their own systems and platforms, service providers or software developers can build monitoring capabilities into their own client offerings.
- ✓ Consultants may conduct risk assessments on behalf of their aquaculture clients.



Scan or click to
access NextOcean
services

Sea surface temperature map from the MetOcean service

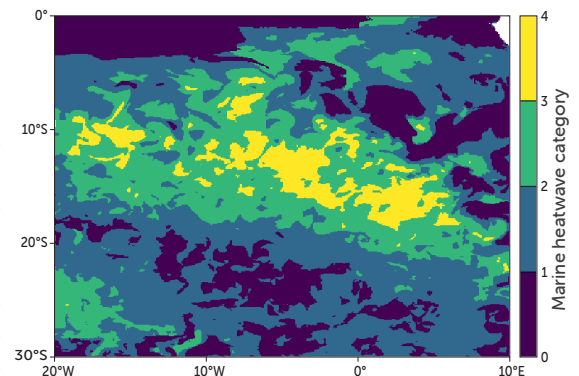


Service specifications

Key specifications	Marine heatwaves early warning	Oil spill occurrence atlas	Oil spill monitoring near real time	MetOcean service																				
Data/satellites used	CLS marine heatwave indicator calculated from CMEMS global model	Sentinel 1 Synthetic Aperture Radar (SAR) data		Meteorological and oceanographic datasets from CMEMS, NOAA and CLS																				
Spatial coverage	Global	Mediterranean Sea	Global	Global coverage																				
Spatial resolution	1/12° or ~ 8km	10 metres		<table border="1"> <thead> <tr> <th>Product</th> <th>Resolution</th> <th>Update</th> <th>Coverage</th> </tr> </thead> <tbody> <tr> <td>Sea surface temp.</td> <td>2-4km</td> <td>Daily</td> <td>Global</td> </tr> <tr> <td>Ocean currents</td> <td>12.5km</td> <td>Daily</td> <td>Global</td> </tr> <tr> <td>Weather forecast</td> <td>12.5km</td> <td>Daily</td> <td>Global</td> </tr> <tr> <td>Sea level anomaly</td> <td>12.5km</td> <td>Daily</td> <td>Global</td> </tr> </tbody> </table>	Product	Resolution	Update	Coverage	Sea surface temp.	2-4km	Daily	Global	Ocean currents	12.5km	Daily	Global	Weather forecast	12.5km	Daily	Global	Sea level anomaly	12.5km	Daily	Global
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Frequency	Daily 5 day forecast	Historical maps showing the occurrence of oil spills for up to one year in the past can be ordered.	1-2 updates/week. Oil spill detection delivery ~4 hours after image capture. Frequency can be increased using commercial data	NetCDF format																				
Data format from NextOcean store	NetCDF format	Meta4 file linking to WMS data (png image)		Not available																				
Visualisation in NextOcean Portal	Not available	Not available		Yes (CLS Motu API)																				
Data feed via API	Yes (CLS Motu API)	Available																						

Early warning of marine heatwaves is of critical importance to any form of aquaculture activity as the fish growth and survival are directly linked to environmental conditions such as water temperature. By knowing in advance the level of risk due to exposure to a heat wave, fish farm managers can plan the appropriate action such as adapting the feeding strategy or in the worst case scenario moving the cages to a less exposed area.

To allow for an early warning system, the daily sea surface temperature prediction is derived from the CMEMS global forecast model and compared to a historical mean. When the temperature at a given location exceeds a predefined threshold over a specified time (5 days), a risk indicator is calculated based on the intensity of the event (in time and excessive heat). Users are provided with a dataset file over a specific geographic area for the next 5 days enabling the visualization of the risk indicator with the appropriate software/web-based interface.



Marine heatwaves detected in a user-specified area.

Watch

...explanatory videos



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