



TRACK & LOC
CLS SERVICES

*Hundreds of pop-up
and internal tags
processed*

A SERVICE FOR ARCHIVAL TAG DATA PROCESSING & UNDERWATER GEOLOCATION

Environmental monitoring

Combining 35 years of Argos experience with oceanographic expertise TO IMPROVE UNDERWATER GEOLOCATION



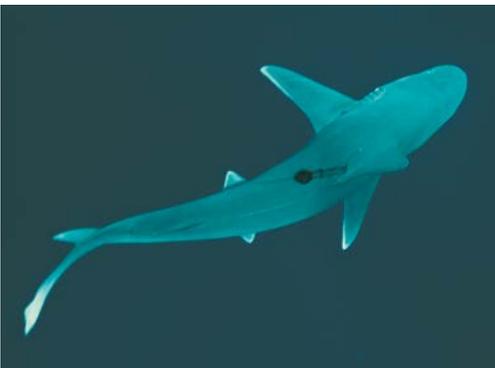
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Light-based-only geolocation is far less accurate than satellite positioning, yielding errors ranging from 1 to 5 degrees in latitude, or even worse at the equinoxes or in turbid waters.

Improved geolocation

CLS scientists actively contribute to the development of new techniques to improve geolocation. These techniques combine the following technical enhancements:

- Better precision of the animal positions estimated from light level measurements
- Animal movement models to constrain position estimates
- Matching satellite-derived sea-surface temperatures with the near-surface water temperature measured by the tag to adjust positions
- Diving depths to constrain the animal position in shallow waters
- Magnetic field intensity measurements to improve animal positions

A service for challenging data

Implementation of these improved geolocation techniques is challenging as it requires joint processing of tag measurements and large satellite oceanography data sets.

Based on its Satellite Oceanography Expertise combined with its unique experience in Argos and tag data processing, CLS provides an enhanced underwater geolocation service that works for all pop-up and internal tags, regardless of the tag manufacturer or software.

This service is dedicated to fisheries scientists and marine biologists who prefer to **focus on the ecological interpretation of tag results** rather than on the technicalities of tag data processing.

OUR SERVICE

Suited for most types of internal or pop-up archival tags, our tag data processing service includes:

■ DIRECT DATA RETRIEVAL FROM ARGOS

Pop-up tag data are directly retrieved from Argos database as part of the Track & Loc service.

■ OPTIMAL ESTIMATION OF THE ANIMAL'S PATH

■ DELIVERY OF RAW & PROCESSED DATA

Track & Loc users receive raw and processed data in standard, fully-documented formats.

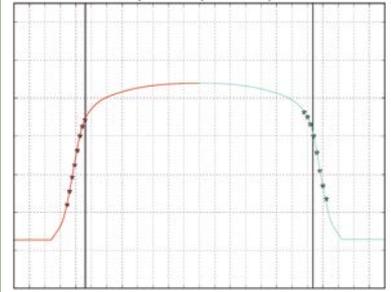
- Daily positions and associated errors
- Map of animal's track with error ellipses
- Daily maps of density distribution
- Daily maps of Satellite Sea Surface Temperature
- Min-Max depth profile
- Comparison of sea temperature measured by the tag and satellite SST at estimated position

■ DATA ARCHIVING

The tag data and related processing information are archived at CLS. Then, as geolocation algorithms evolve, data reprocessing can be achieved at minimum cost to improve data quality and homogenize data sets.

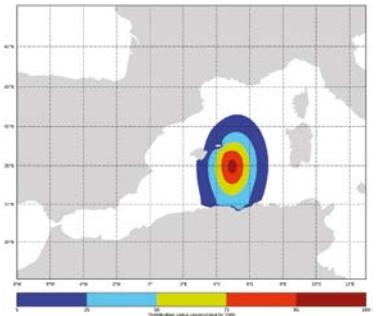
■ DEDICATED SUPPORT FOR DATA INTERPRETATION AND PUBLICATIONS

FILTERING



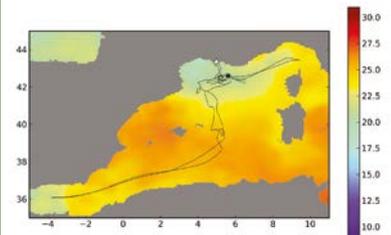
Robust sequential filtering of light levels or sunrise/sunset.

ESTIMATING SPATIAL DISTRIBUTION



Percentage of probability of animal presence.

USING TEMPERATURE AND BATHYMETRY



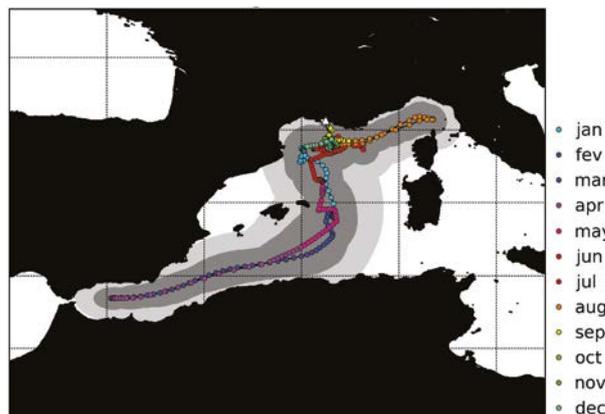
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Sea-surface temperature and bathymetry are used to constrain the animal position.

A TYPICAL TAG DATA PROCESSING RESULT

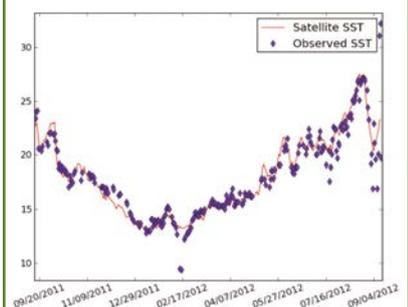
This trajectory is estimated by combining a movement model, light data, temperature measurements and bathymetry constraints.

The resulting trajectory (in color) minimizes location errors. The dark and light grey ellipses indicate the 50% and 95% confidence intervals.



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COMPARING VARIOUS OBSERVATIONS



Comparison of tag measurement and satellite measurement of sea temperature.

CLS, combining 35 years of Argos experience with oceanographic expertise

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Scientific references

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...and many more peer-reviewed articles in which our services are cited!

www.argos-system.org



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