3D web-based Argo Data Explorer

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Lead Institute	**OceanOPS (formerly JCOMMOPS)**
Lead authors	**Anthonin Lizé, Emanuela Rusciano, Mathieu Belbéoch**
Contributors	
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1.0	11/06/2021	Anthonin Lizé, Emanuela Rusciano, Mathieu Belbéoch	Creation
1.1	08/07/2021	Anthonin Lizé, Emanuela Rusciano, Mathieu Belbéoch	Updates of sections 1.2 and 1.3

EXECUTIVE SUMMARY

In the framework of the Euro-Argo RISE Project, OceanOPS (formerly named JCOMMOPS) participated in the WP7 to promote and improve data access and usage of Argo data, with the task 7.2.2 "Development of Argo data discovery and display tools". These tools are critical for the overall Argo Programme promotion, and educational outreach initiatives in the framework of the Euro-Argo RISE Project.

Description of the task 7.2.2:

OceanOPS was tasked to build upon its existing IT infrastructure (and its GIS engine) to develop innovative web-based display tools to promote the use of Argo data. The 3D display capacity of this engine is exploited to navigate in the Argo data set either through individual real-time profiles or gridded data products, served through the Coriolis Global Data Centre.

The deliverable D7.10 "3D Web based Argo Data Explorer" was due in 30 months from the start of the project.

Description of deliverable 7.10:

This deliverable is an online tool enabling the user to browse Argo data into a 3D engine, improving discovery and exploration through an 'in-depth' experience. The data to be displayed are fetched from a server hosted by Ifremer and no modification is applied to those values. This depth component enables a better visualisation and understanding of the trajectory of the floats.

The deliverable being an online tool will carry on being the subject of work and improvement beyond the project's scope and will be integrated in the OceanOPS' tool set.

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1 3D visualisation tool – Argo data explorer

1.1 Introduction

OceanOPS provides monitoring tools to the international community, with an emphasize on a web mapping interface to track observing facilities of the Global Ocean Observing System (GOOS), including Argo floats. In the framework of the Euro-Argo RISE project, an extension of the mapping tool has been implemented to provide an easy access to Argo data, in a 3D environment. This tool is online since end of 2019 and is continuously improved, available under the following link.

https://www.ocean-ops.org/board?t=argo&projection=3D&light=

This link works under all the main web browsers, but performances for 3D Web-GL technologies seem to be enhanced under Google Chrome. Please note also that browsing performance in 3D enabled web depends mainly on the hardware used, and the number of 3D elements displayed. This results in better performances at finer zoom level of the map (less elements displayed).

This 3D discovery of Argo data has been implemented for visual communication, outreach, and discovery activities.

This tool is an integrated part of the whole set of monitoring tools offered by OceanOPS to the GOOS community, and in particular the Argo one. Available to anyone browsing through the OceanOPS web application, it has been fostered by the Euro-Argo RISE project and will continue to be developed as far as resources enable.

A video demonstration of this tool is available under the following link: https://youtu.be/bFlnL53BgGg.

1.2 Accessing the tool

The tool can be accessed directly from the following link: https://www.ocean-ops.org/board?t=argo&projection=3D&light=

Please note that if accessing the OceanOPS application through another link, a 3D projection of the map must be enabled so that 3D data can be displayed. Browse the projection menu on the left hand side of the map and select one of the 3D projection entries.
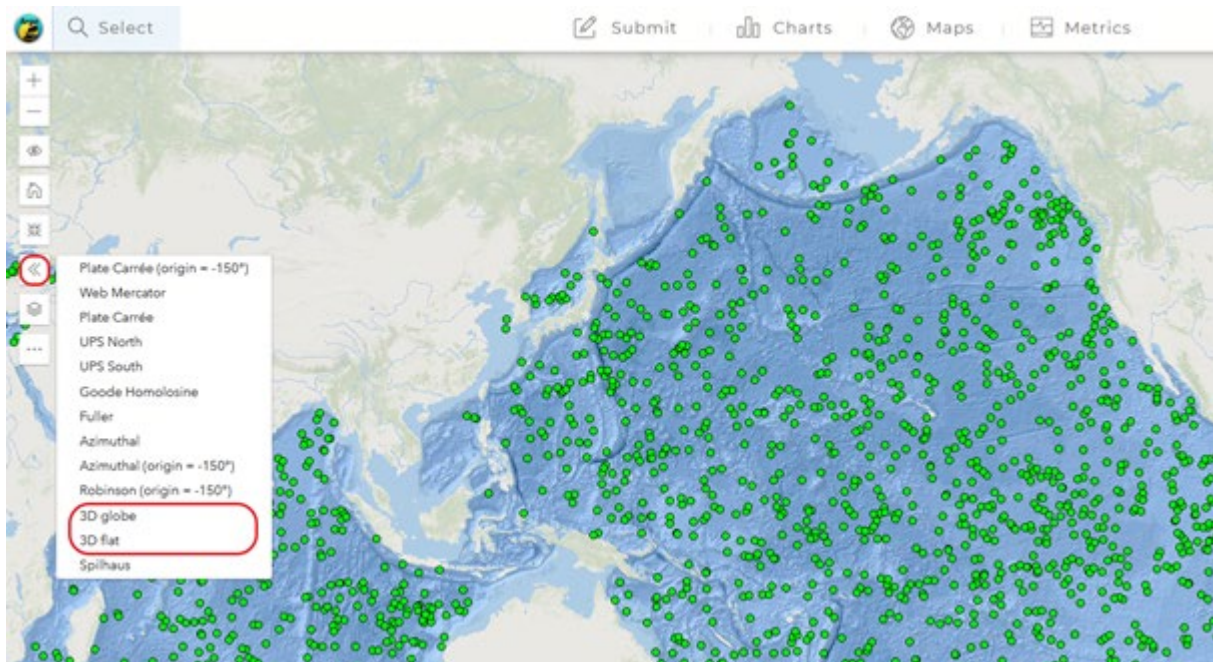
Then, there are two ways to access Argo data :

- The first one, consists in clicking on any dot visible on the map. A popup should open and propose a certain set of actions. One of them is "3D data". This will attempt to fetch the whole data set of the selected float and display it. This functionality might be slowed down if the data fetched represent a too great volume (the queried server might, in some cases, not be able to fulfill the query).
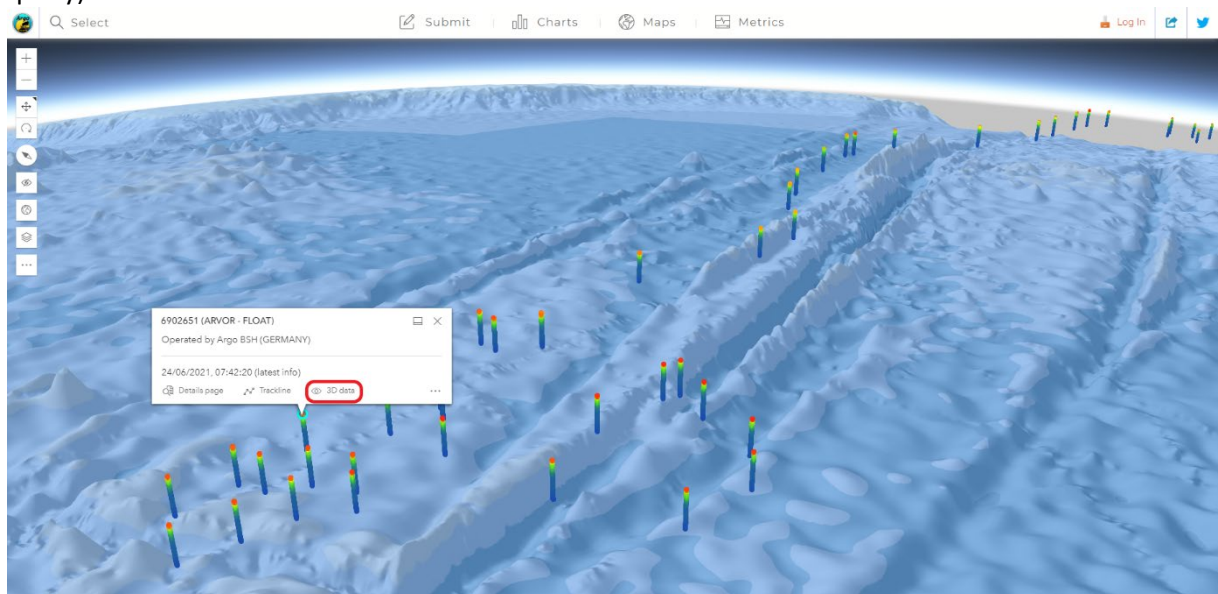
- The other way to access data in 3D in a lighter way, is to query for a specific profile data display. To do so, click any of the dot displayed on the map. In the resulting popup, click the trackline button. A trackline with dots indicating profiles location should appear.
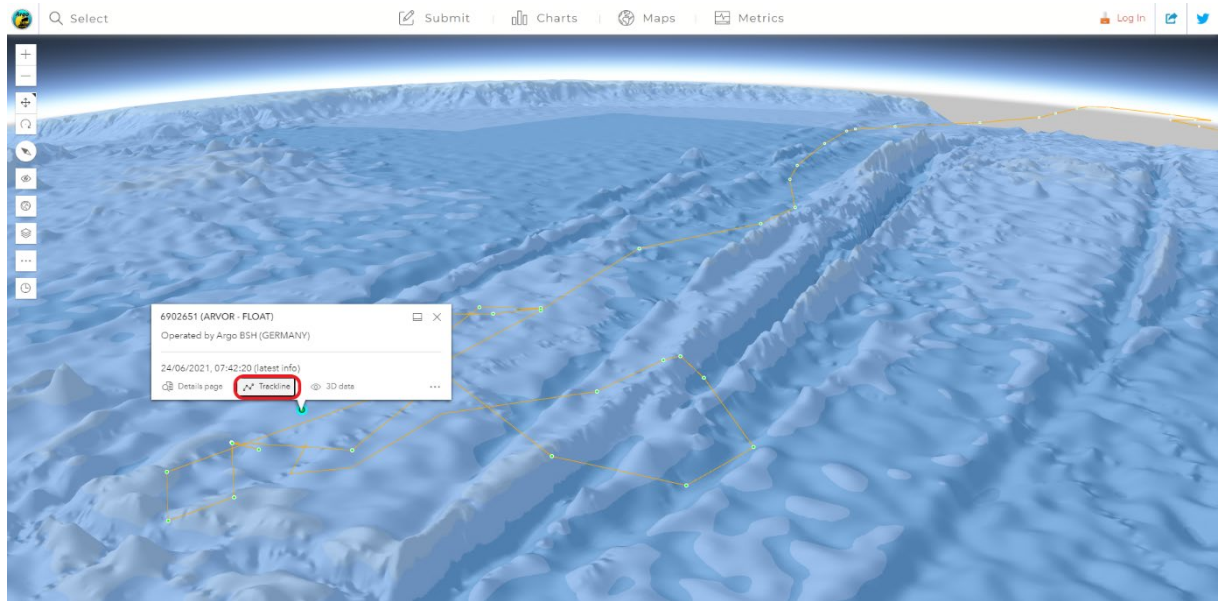
Then, clicking one each dot representing a profile location will make another popup appearing, where the action 'Show profile' is offered. This will display the selected profile data in the same 3D way.
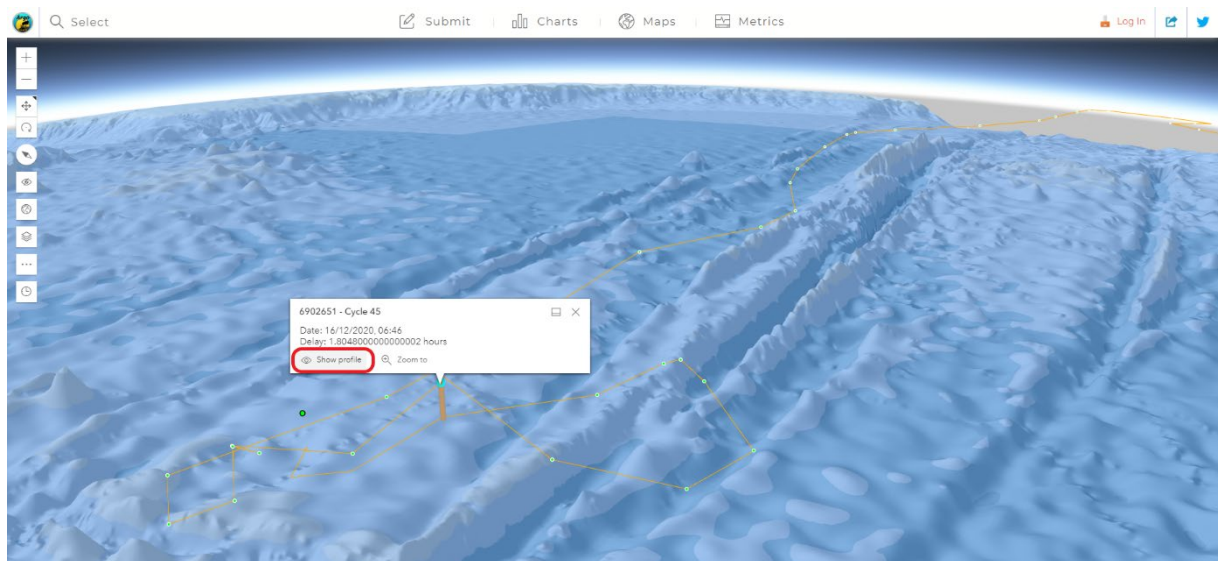
1.3 Descriptions of functionalities

The main functionalities of the tool are described in the OceanOPS websitehelp: https://trello.com/c/VIqWrxLG/47-use-the-3d-argo-data-visualisation-functionality

This page is a practical guide to help users and will be enriched with the latest updates of the tool.

1.4 Promotion of the tool

This tool has been presented and promoted a few times during conferences, workshops, etc.; including at the following events:

- EuroArgo Science Meeting, JCOMMOPS booth - November 2019, Athens (Greece)

- OceanObs 19', GOOS-JCOMMOPS booth – September 2019, Honolulu (Hawai'i)

- Esri Ocean, Weather, and Climate GIS Forum, OceanOPS talk – November 2020, online

- GOOS-Observations Coordination Group webinar, OceanOPS webinar – February 2021, online

1.5 Perspective and future evolutions

As mentionned previously in this document, this tool will be part of OceanOPS' tool set for monitoring and will be integrated, maintained and improved beyond the scope of the project.

This includes:

- Tutorials of usage through videos and training sessions

- Bug fixes and performance improvements, as far as possible

- Improvements of user guidance to access these functionalities

- Implementation of new functionalities, if defined and feasible