



## **MOODA, a comprehensive tool to analyze EMSO ERIC data**

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The EMSO ERIC is a European environmental research infrastructure distributed throughout European seas, from the North Atlantic across the Mediterranean to the Black Sea, at 11 key environmental sites whose overall objective is to record at Essential Ocean Variables (EOV's) to respond to the societal challenges in global change issues.

This work presents MOODA (Module for Ocean Observatory Data Analysis), an open-source python package that allows to create, open and analyse data files from different scientific instrumentation, platforms, and formats, to generate quality control of data and to create graphs. The package, developed in the framework of the H2020 project EMOSDEV, has been conceived mainly for oceanographers and marine science students.

In MOODA, data is structured in WaterFrames. A WaterFrame, an extension of the DataFrame data structure included in Pandas, the popular data analysis library for Python. The WaterFrame object contains a Pandas DataFrame and two dictionaries, allowing to include relevant metadata of the acquired observations of the EMSO ERIC nodes. The WaterFrame, allows using a DataFrame of Pandas without losing the metadata information, which is essential for different processes (mainly data quality control). MOODA has been designed to be scalable, being able not only to process data from EMSO ERIC but also other ocean data platforms such as EMODNET. MOODA is provided as a standalone framework, and it contains a Graphical User Interface (GUI) to be used for non-Python users. However, MOODA can also be delivered as a service.