

OCEAN DATA MANAGER: PRACTICAL SOFTWARE FOR OCEANOGRAPHIC SENSORS

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Abstract: Ocean Data Manager (ODM) is new free software designed in MATLAB. ODM has been developed to unify and process all data generated by a variety of oceanographic instruments. Specifically, it includes five different subprograms. This software has several applications to store, process and generate graphs from heterogeneous oceanographic data.

INTRODUCTION

Nowadays, a wide range of oceanographic instruments are available. Indeed, companies and institutions use multiple instruments (e.g. Conductivity-Temperature Profilers-CTD-, Acoustic Current Profilers-ACP-, flowmeters...) on a daily basis. Moreover, every institution and company have their own software to generate their own output files, resulting in a huge amount of files having different structures and formats.

For several years, the Institute of Marine Science of Andalucía (ICMAN-CSIC) has developed a piece of software able to unify all data coming from a variety of instruments. The name of this program is Ocean Data Manager (ODM) and it was created in MATLAB® (version 6.5).

OCEAN DATA MANAGER

ODM is a free software available at <http://www.icman.csic.es> together with the reference material [1]. This software has been designed in MATLAB, with a Graphical User Interface (GUI) which gives a more user-friendly component to the program itself. ODM presents a main screen where the links to the five subprograms are displayed. These subprograms may be used for the following actions: Import, Filter, Concatenate, Plot and Export, as shown in "Fig. 1".

Import

The import tool subprogram, which is the first module of ODM, provides the grounds for data format normalization. The subprogram has two important functions: the first deals with unifying the format file and the second with the creation of a Metadata (complementary information). It is necessary to build two MATLAB code programs, drivers, per instrument/sensor. Indeed, there are drivers for fifteen instruments although this number may be increased as each user can easily create these drivers using the guidelines described in the user's guide. After using this subprogram the user will work with .mat files.

Filter

This subprogram allows the user to remove easy-to-identify bad data. The main idea of this subprogram is to eliminate anomalous values that normally appear at the beginning and at the end of most data series. This usually happens when the user/scientist have to wait to stabilize the CTD into the water to perform a CTD cast or mooring while program and is anchorage at the beginning of the series and then when collected and discharged. These data are not deleted by the program, indeed it generates a filter to hide these data.

Concatenate

The task of this subprogram is to merge several files generated with the previous subprograms into a single file. Depending on the particular situation, being a campaign or a mooring sampling, the user will choose the appropriate button (Mooring Extend / Generate Campaign).

Plot

The plot tool provides direct graphical outputs in some common picture formats (JPEG, TIFF, PNG, etc.) as well as MATLAB figures. It is also possible to edit the final figure as it matches to the user's requirements and to export it to other standard graphical formats supported by MATLAB.

ODV Export

The ODV export tool transforms the information contained in a MATLAB data file generated after importing, filtering or concatenating, and generate as output a tab-separated ASCII file. Thanks to its internal structure this file can be plotted by more sophisticated third-party programs as Ocean Data View (ODV) created by Alfred Wegener Institute [2].

APPLICATIONS

ODM has been created to manage data files from multiples instruments. Moreover it easy generates and stores these files. At the same time, the user can take decisions in a small period of time observing the graphs or exporting data to other softwares. Two examples of this practical software are a temporal series and a CTD campaign data.

Temporal Series

One of the most important oceanographic series of data comes from moorings. Normally with this type of files it is usual to have anomalous data at the beginning and end of the series. ODM Filter removes the erroneous data. Furthermore, ODM Mooring Extend concatenates time series and generates a single file which makes the processing and plotting easier and faster.

CTD Campaign Data

Oceanographic campaigns sampling design is normally made up by several stations creating a grid. In each station the user generates a profile with a cast from the CTD instruments. ODM is a successful tool for this type of data because data can be processed directly during the campaign in a short period of time and pictures and reports easily generated. As in the case of time series, a single file may be generated, which can be successively treated with others programs to obtain graphics (eg, ODV graphs).

REFERENCES

- [1] Gutiérrez, F.J.; Roque D.; Navarro, G. (2011). Free software for managing oceanographic data, *Sea Technology*, vol. 52, (5)
- [2] Schlitzer, R., *Ocean Data View*, <http://odv.awi.de>, 2011.

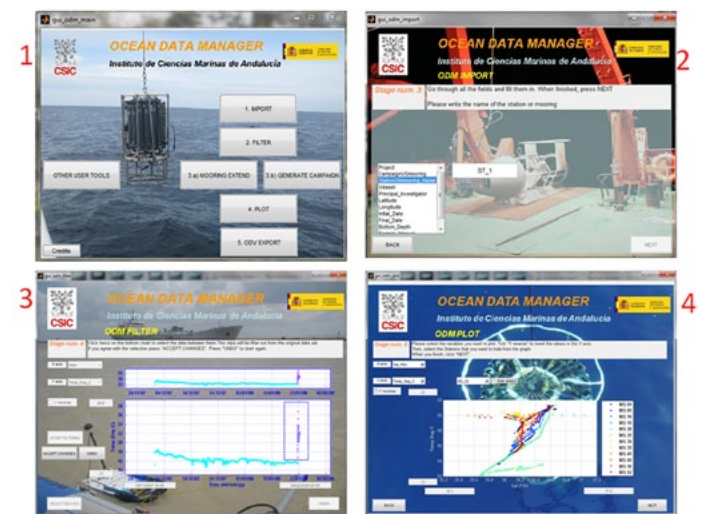


Fig 1. Several ODM screens. 1, ODM main screen . 2, ODM IMPORT. 3, ODM FILTER. 4, ODM PLOT