



Web-based workflows to produce ocean climatologies using DIVA (Data-Interpolating Variational Analysis) and Jupyter notebooks

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The analysis tool DIVA (Data-Interpolating Variational Analysis) is designed to generate gridded fields or climatologies from in situ observations. The tool DIVA minimizes a cost function to ensure that the analysed field is relatively close to the observations and conforms at the same time to a set of dynamical constraints. In particular, DIVA naturally decouples water bodies which are not directly connected and it uses a (potentially spatial varying) correlation length to describe over which length-scale the analysed variable is correlated. In addition, DIVA can also take ocean currents into account to introduce a preferential direction for the correlation. The SeaDataCloud project aims to facilitate the access and use of ocean in situ data from 45 national oceanographic data centres and marine data centres from 35 countries riparian to all European seas. A central aspect is to provide web-based virtual research environment, where scientists can easily access and explore the data sets through the SeaDataCloud infrastructure. For users familiar with programming languages like Julia and Python, Jupyter (acronym for Julia, Python and R) notebooks provide an exciting way to analyse and to interact with ocean data. Jupyter notebooks are made up of cells that can be run individually and can contain text, formulas or code fragment. A complete notebook explains how to go from input data and parameters to a result, in this case a gridded field obtained executing DIVA. This presentation discusses this new web-based workflow for generating climatologies using DIVA. It explores its new possibilities in particular, in terms of improved ease of use and reproducibility of the results. The integration in the infrastructure of EUDAT is also addressed.