



A Web Processing Service to compute dynamical properties of the atmospheric circulation

Nikolay Kadyrov (1), Davide Faranda (1), Soulivanh Thao (1), M. Carmen Alvarez-Castro (2), and Pascal Yiou (1)

(1) Laboratoire des sciences du climat et de l'environnement (LSCE), CEA/CNRS/IPSL, Gif-sur-Yvette, France, (2) Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC), Bologna, Italy

We present updates on the Web Processing Service (WPS) Blackswan. The general idea of a WPS is to let scientists remotely perform analyses on the server side with HPC facilities without downloading vast amount of data. Blackswan is part of the framework *birdhouse* which delivers tools for the development of web processing service applications for climate data analysis. Blackswan primarily focus on providing methods for the study of climate extremes. In particular, the method of the analogues of circulation was integrated into Blackswan and could be applied for extreme event attribution studies using either NCEP/NCAR Reanalysis or CMIP5 simulations.

Here, we present a new methodology that has been integrated into Blackswan: the computation of dynamical indicators for the analysis of atmospheric circulation. The indicators, namely local dimension and persistence, were introduced by *Faranda et al.*, and were since then applied in a variety of studies. They provide synthetic information about the rarity and the predictability of a peculiar state of the system. We illustrate how WPS could facilitate the application of such methods for different case studies and a variety of datasets (climate models runs and reanalyses). The process allows to easily select different domains of interest, seasons or temporal periods. As output, it produces daily values of the instantaneous dimension and persistence with plots and detailed statistics compiled in one HTML web-page. We will give an overview of the service and of this new process along with usage examples.

Links:

* Faranda, D. *et al.* Dynamical proxies of North Atlantic predictability and extremes. *Sci. Rep.* **7**, 41278; doi: 10.1038/srep41278 (2017) <https://www.nature.com/articles/srep41278>

* Web Processing Services for extreme weather event assessments

<https://meetingorganizer.copernicus.org/EGU2018/EGU2018-15807.pdf>

* <http://bird-house.github.io/>

* <https://github.com/bird-house/blackswan>