Plan Overview

A Data Management Plan created using DMP Tool

Title: EUREC4A-OA

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Project Administrator: Sabrina Speich

Funder: Jpi Ocean, Jpi Climate

Grant: https://jpi-climate.eu/project/eurec4a-oa/

Template: Digital Curation Centre

Project abstract:

The exchange of heat, water and gas at the air/sea interface is key to regulating the state and evolution of our climate. Sizeable air-sea exchanges of energy and ocean-atmosphere boundary layer processes can occur on short time and small spatial scales. To initiate and support societal actions as a response to climate change, future projections of the climate system require high-resolution coupled climate model simulations. A generic challenge for high-resolution modelling is the need to resolve processes that have typically been parameterized in coarse-grid simulations. Thus, it is becoming evident that a clear lack of process understanding exists to quantitatively evaluate model predictions and projections, and to understand why different models give different answers. EUREC4A-OA will address this issue thorough advancement of understanding of non-linear and small-scale ocean-atmosphere exchanges processes and, in parallel, investigate their representation in coupled climate models of the CMIP Earth System Models (ESMs) family. EUREC4A-OA will leverage from, and contribute to, the ElUcidating the RolE of Clouds- Circulation Coupling in ClimAte (EUREC4A) initiative (Bony et al. 2017) that aims to advance understanding of the interplay between clouds, convection and circulation, and their role in climate change. The core of EUREC4A is a one-month (Jan/Feb 2020) field study in the western tropical North Atlantic Ocean where high-resolution,

synchronized observational data will be collected using cutting-edge technology on airplanes, ships, autonomous vehicles, augmented with the Barbados Cloud Observatory time series. EUREC4A-OA will add the ocean component to EUREC4A by investigating heat, momentum and CO2 exchange across the air/sea interface using innovative high-resolution ocean observations and a hierarchy of numerical simulations. Our focus is on meso- and submesoscale ocean dynamics and related atmospheric boundary layer processes. EUREC4A-OA is focused on the tropics where the primary external time scale affecting air-sea exchange is the diurnal cycle. However, the internal ocean and atmosphere dynamics convolute the diurnal, seasonal and longer time scales to climate variability. EUREC4A-OA will make use of significant observing infrastructure investments from the participating countries, augmented with cutting edge third-party autonomous observing platforms (Saildrone(c)), to enable sampling of the air/sea interface at temporal and spatial resolutions far higher than could be achieved through traditional observational approaches. Likewise, we will use an unparalleled hierarchy of numerical simulations ranging from Large Eddy Simulations (LES), including coupled ocean-atmosphere LES, to global high-resolution ocean-atmosphere simulations and Earth System Models (ESMs). The LES simulations will resolve the ocean and the ocean-atmosphere systems explicitly at scales as small as 10 meters and thus allow the direct interactions of the ocean-atmosphere systems to be studied. These will be used to inform the development and evaluation of the global, coupled Earth System Models. EUREC4A-OA will connect European specialists of ocean, atmosphere physical and biogeochemical observations and numerical modelling as well as scientists working on numerical parameterization and future projections to address four key objectives: 1) Assessing the impact of the diurnal cycle on energy, water and CO2 ocean-atmosphere exchanges and quantifying the modification of diurnal cycle and the related exchanges by meso- and submesoscale features; 2) Identifying and quantifying the processes ruling the ocean- atmosphere exchanges and uptake of heat, momentum and CO2 at the ocean sub-mesoscale; 3) Identify the various surface ocean processes (diurnal cycle, ocean nonlinear small scales, boundary layer aerosols) responsible for the atmosphere shallow convection and cloud formation; 4) Providing improved models metrics and parameterizations for the above processes to be applied to ESMs. EUREC4A-OA will deliver novel knowledge for better climate simulation and will have a significant impact on science and society.

Start date: 06-01-2020

End date: 03-30-2024

Last modified: 11-04-2024

Copyright information:

EUREC4A-OA

Data Collection

What data will you collect or create?

Observational and modelling data is used in the project.

How will the data be collected or created?

The observational data collection has been outlined in Stevens, B. et al. 2021 (https://doi.org/10.5194/essd-13-4067-2021).

The combined data set from all ships, saildrone, underwater glider observations is accessible in L'Hégaret et al. (2023) (https://doi.org/10.5194/essd-15-1801-2023)

Description of a model data set can be found in Hohenegger et al. 2023 (https://doi.org/10.5194/gmd-16-779-2023)

Documentation and Metadata

What documentation and metadata will accompany the data?

The data sets released follow international standards and the accompanied documentation (see the DOIs) also provide details about the vocabularies and standards used.

Including Open Geospatial Consortium (OGC) standards based on a consensus process across the involved experts and freely available for anyone to use to improve sharing of the world's geospatial data. They are used in a wide variety of domains including Environment, Defense, Health, Agriculture, Meteorology, Sustainable Development and many more.

Make use of CF (Climate and Forecast) metadata conventions (http://cfconventions.org) standards data distributed in netCDF format. This priority has also in mind that model-generated climate forecast data and observational data are easily compared.

Ethics and Legal Compliance

How will you manage any ethical issues?

Ethical issues are considered by the partners considering https://erc.europa.eu/manage-your-project/ethics-guidance.

How will you manage copyright and Intellectual Property Rights (IP/IPR) issues?

EU JPI-Climate initiative[1], adopted the so-called "transparency principle", committing itself with the growing demand on more openness in many aspects of public life (politics, economics, culture, and also science and research). The Guidelines on Open Knowledge [3] contribute to increase climate (change) research activities' societal impact and credibility by making them more transparent. They establish a set of recommendations to boost a more effective climate knowledge management policy in terms of openness (and particularly accessibility). These recommendations are thought for the JPI community in its widest sense.

In summary these are:
1) Internal accessibility.
2) Open licensing, based on the use of the Creative Commons (CC) “public domain” license (CC0) Open formats.
3) Open Access publishing.
4) Open Data.
5) Publishing costs

Storage and Backup

How will the data be stored and backed up during the research?

The data is stored in distributed data bases following the partner institutions and countries data management policies for observational data and model data.

How will you manage access and security?

The data access and security is according to the partner institutions and countries data management policies for observational data and model data.

Selection and Preservation

Which data are of long-term value and should be retained, shared, and/or preserved?

Details on long term curation of the data is documented for the individua data sets. In principle all data is delivered to data repositories according to the rules that apply for the partner countries and guided by the FAIR principles. In turn, all data is archived in Global Data archives (e.g. PANGAEA, SAENEO) where global and free access is ensured.

What is the long-term preservation plan for the dataset?

Question not answered.

Data Sharing

How will you share the data?

Details on long term curation of the data is documented for the individua data sets. In principle all data is delivered to data repositories according to the rules that apply for the partner countries and guided by the FAIR principles. In turn, all data is archived in Global Data archives (e.g. PANGAEA, SAENEO) where global and free access is ensured.

Similar is for model data. The results from the experiments performed with the NorESM will be archived on the UNINETT Norwegian national resource which follows the FAIR data archiving policy and will be accessible to the whole community. For the regional simulation the nomenclature and request will follow the HiResMIP PRIMAVERA protocol and be accessible first to the project members and then to the whole community.

Are any restrictions on data sharing required?

The data is free and FAIR.

Responsibilities and Resources

Who will be responsible for data management?

All partners are responsible for sharing their data and following their countries rules for long term archieving.

What resources will you require to deliver your plan?

Resources have been already included in the project staff time.

Planned Research Outputs

Data paper - "Ocean cross-validated observations from R/Vs L'Atalante , Maria S. Merian , and Meteor and related platforms as part of the EUREC 4 A-OA/ATOMIC campaign."

L'Hegaret, Pierre; Schütte, Florian; Speich, Sabrina; Reverdin, Gilles; Baranowski, Dariusz B; Czeschel, Rena; Fischer, Tim; Foltz, Gregory R; Heywood, Karen J; Krahmann, Gerd; Laxenaire, Rémi; Le Bihan, Caroline; Le Bot, Philippe; Leizour, Stephane; Rollo, Callum; Schlundt, Michael; Siddle, Elizabeth; Subirade, Corentin; Zhang, D; Karstensen, Johannes (2023): Earth System Science Data, 15(4), 1801-1830, https://doi.org/10.5194/essd-15-1801-2023

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Ocean cross-validated observations from R/Vs L'Ata ...	Data paper	2023-04-24	Open	None specified		Creative Commons Attribution Non Commercial Share Alike 4.0 International	None specified	No	No