



the climate data factory

Journée LabEx-IPSL

Paris – 10 Octobre 2017

Harilaos Loukos, Florian Cochard, Thomas Noël



**Dealing with climate model data
is a struggle**

A world map with a blue gradient background, showing the outlines of continents and countries. The map is centered on the Atlantic Ocean.

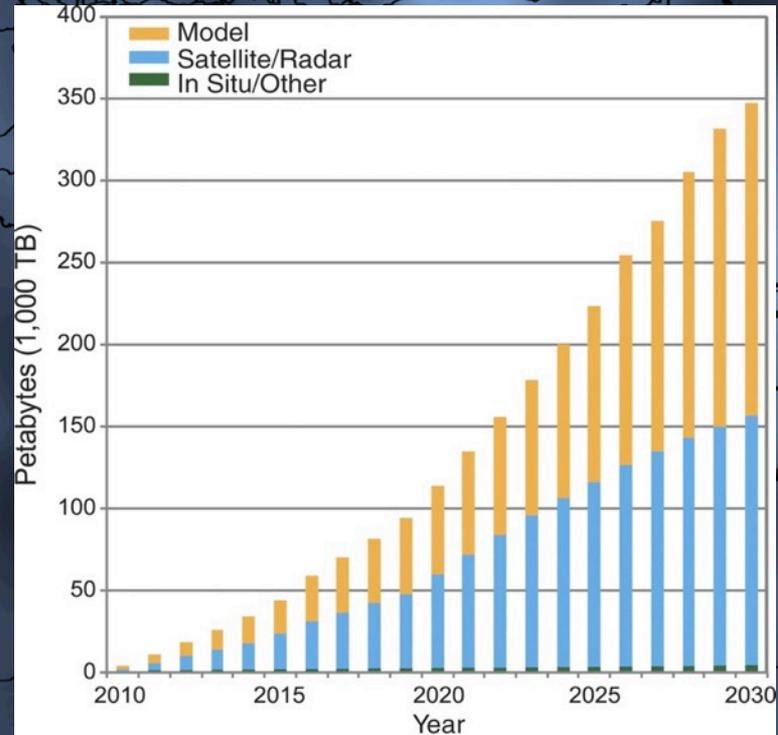
86%

of people spend more time in
preparing climate projections
data than using them

too much model data ...

«The volume of worldwide model climate data is expanding rapidly, creating challenges for both physical archiving and sharing, ..»

Climate Data Challenges in the 21st Century, J. T. Overpeck et al. 2011, Science



difficult to find and access ...

«... as well as for ease of access and finding what's needed, particularly if you are not a climate scientist»

Climate Data Challenges in the 21st Century, J. T. Overpeck et al. 2011, Science

Lawrence Livermore National Laboratory

You are at the [ESGF@DOE/LLNL node](#) Technical Support

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This search interface supports data discovery from many ESGF projects on multiple sites. Please use the "Search All Replicas" checkbox to expand the number of models available.

Enter Text: Display results per page

Show All Replicas Show All Versions Search Local Node Only

Search Constraints: * surface temperature holland

Total Number of Results: 216416
-1- 2 3 4 5 6 Next >>

Please login to add search results to your Data Cart
Expert Users: you may display the search URL and return results as XML or return results as JSON

- ACME.h1.amip.v0_3.atm.day.native.ne30.ens7**
Data Node: [esg.ccs.ornl.gov](#)
Version: 1
Total Number of Files (for all variables): 141
[\[Hide Metadata \]](#) [\[Show Files \]](#) [\[THREDDS Catalog \]](#) [\[WGET Script \]](#)

Dataset Metadata
ID = ACME.h1.amip.v0_3.atm.day.native.ne30.ens7.v1|esg.ccs.ornl.gov
Version = 1
Timestamp = 2015-11-18T16:50:01.052Z
Access = HTTPServer, GridFTP, OPENDAP
CF Standard Names = vertically-integrated_high_cloud, vertically-integrated_low_cloud, vertically-integrated_mid-level_cloud, divergence, net_longwave_flux_at_top_of_model, surface_latent_heat_flux, longwave_cloud_forcing, water_vapor_mass_in_layer, vertical_velocity_(pressure), vertical_velocity_at_500_mbar_pressure_surface, vertical_velocity_at_850_mbar_pressure_surface, reference_pressure, pbl_height, convective_precipitation_rate_(liq_+_ice), large-scale_(stable)_precipitation_rate_(liq_+_ice), total_(convective_and_large-scale)_precipitation_rate_(liq_+_ice), ls_pcw_precipitation_rate, cv_zmc_precipitation_rate, surface_pressure, sea_level_pressure, specific_humidity, specific_humidity_at_850_mbar_pressure_surface,

on different model grids ...



that need bias adjustment...

The Cryosphere Discuss., 9, 3821–3857, 2015
www.the-cryosphere-discuss.net/9/3821/2015/
doi:10.5194/tcd-9-3821-2015
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The Cryosphere
Discussions
Open Access


This discussion paper is/has been under review for the journal The Cryosphere (TC).
Please refer to the corresponding final paper in TC if available.

Improved Arctic sea ice thickness projections using bias corrected CMIP5 simulations

N. Melia¹, K. Haines², and E. Hawkins³

Earth Syst. Dynam. Discuss., 6, 1999–2042, 2015
www.earth-syst-dynam-discuss.net/6/1999/2015/
doi:10.5194/esdd-6-1999-2015
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Earth System
Dynamics
Open Access


This discussion paper is/has been under review for the journal Earth System Dynamics (ESD). Please refer to the corresponding final paper in ESD if available.

A novel bias correction methodology for climate impact simulations

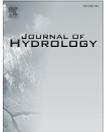
S. Sippel^{1,2}, F. E. L. Otto³, M. Forkel¹, M. R. Allen³, B. P. Guillod³, M. Heimann¹, M. Reichstein¹, S. I. Seneviratne², K. Thonicke⁴, and M. D. Mahecha^{1,5}



Contents lists available at SciVerse ScienceDirect

Journal of Hydrology

journal homepage: www.elsevier.com/locate/jhydrol



Bias correction of regional climate model simulations for hydrological climate-change impact studies: Review and evaluation of different methods

Claudia Teutschbein^{a,*}, Jan Seibert^{a,b,c}

JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 117, D23114, doi:10.1029/2012JD018192, 2012

Intercomparison of bias-correction methods for monthly temperature and precipitation simulated by multiple climate models

Satoshi Watanabe,¹ Shinjiro Kanae,² Shinta Seto,³ Pat J.-F. Yeh,⁴ Yukiko Hirabayashi,¹ and Taikan Oki³

and evaluation/quality control/sampling

Selection of Climate Models for Developing Representative Climate Projections for the Hindu Kush Himalayan Region



Consortium members



ICIMOD

teri

WAGENINGEN UR
The Quality of Life

FUTURE
International Centre for
Mountain Research

RESEARCH ARTICLE

10.1002/2015JD023656

Key Points:

- Evaluation of precipitation and temperature simulation in global climate models in central Africa
- Climate models exhibit limited skills in precipitation simulations
- Climate model selection for regional impact studies is evaluated

Evaluation of historical and future simulations of precipitation and temperature in central Africa from CMIP5 climate models

Noel R. Aloysius^{1,2}, Justin Sheffield³, James E. Sjaers¹, Haibin Li⁴, and Eric F. Wood³

¹School of Forestry and Environmental Studies, Yale University, New Haven, Connecticut, USA, ²Now at Department of Food, Agricultural, and Biological Engineering and Department of Evolution, Ecology, and Organismal Biology, Ohio State University, Columbus, Ohio, USA, ³Department of Civil and Environmental Engineering, Princeton University, Princeton, New Jersey, USA, ⁴Department of Earth and Planetary Sciences, Rutgers University, Piscataway, New Jersey, USA

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Int. J. Climatol. (2016)

Published online in Wiley Online Library

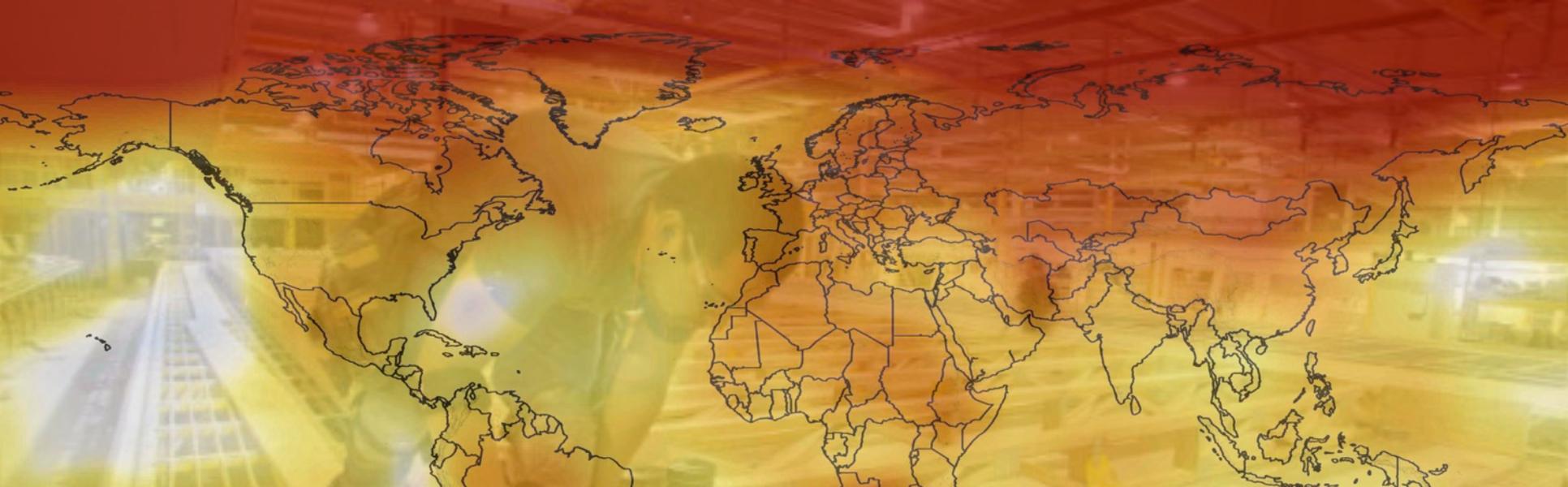
(wileyonlinelibrary.com) DOI: 10.1002/joc.4608



Royal Meteorological Society

Selecting representative climate models for climate change impact studies: an advanced envelope-based selection approach

Arthur F. Lutz,^{a,b*} Herbert W. ter Maat,^c Hester Biemans,^c Arun B. Shrestha,^d Philippus Wester^d and Walter W. Immerzeel^{a,b}



We take care of the hassle



ready to use climate model data

Raw model
Data
(CMIP5 & CORDEX)

Re-
mapped

Bias
adjusted

Quality
controlled

CMIP5/CORDEX, 6 surface variables, all RCP's & models

make it as simple as possible

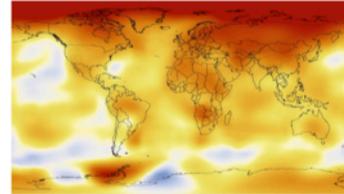


the
climate
data factory

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Ready to use IPCC climate projections

Search, select and download data and graphics for your applications in less than 2 minutes



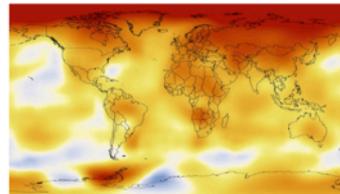
Search by location, variable, model, greenhouse gas scenario, ...



user friendly search (beta)

Ready to use IPCC climate projections

Search, select and download data and graphics for your applications in less than 2 minutes



ipsl temperature france



Products

-   Near-Surface Air Temperature over France (Europe) - Data from IPSL's IPSL-CM5A-MR CMIP5 model under RCP 4.5 (Daily, 0.50°)
-   Near-Surface Air Temperature over France (Europe) - Data from IPSL's IPSL-CM5A-MR CMIP5 model under RCP 8.5 (Daily, 0.50°)
-   Near-Surface Air Temperature over France (Europe) - Data from IPSL's IPSL-CM5B-LR CMIP5 model under RCP 4.5 (Daily, 0.50°)
-   Near-Surface Air Temperature over France (Europe) - Data from IPSL's IPSL-CM5B-LR CMIP5 model under RCP 8.5 (Daily, 0.50°)



user friendly search (beta)

Q ipsl temperature france

Scenario

- RCP 8.5 (6)
- Historical (6)
- RCP 4.5 (6)

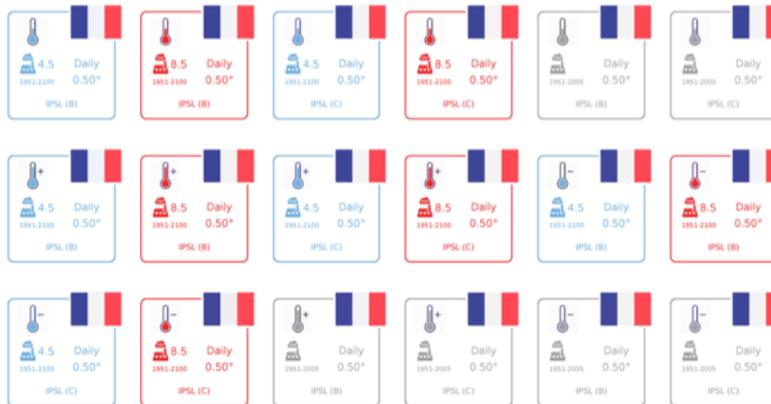
Variable

- Daily Maximum Near Surface Temperature (6)
- Near Surface Air Temperature (6)
- Daily Minimum Near Surface Temperature (6)

Earth System Model

- IPSL-CMSB-LR (9)
- IPSL-CMSA-MR (9)

Showing 18 results for "ipsl temperature france"



simple & extensive product info

A product card with a red border. It features a thermometer icon, a red '8.5' with '1951-2100' below it, a red 'Daily' with '0.50°' below it, and 'IPSL (B)' at the bottom. To the right is a small French flag with a magnifying glass icon.

Near-Surface Air Temperature over France (Europe) – Data from IPSL's IPSL-CM5A-MR CMIP5 model under RCP 8.5 (Daily, 0.50°)

A data file (NetCDF)

Reference: DAT-C5A-FRA-998d851ed829b005

Description

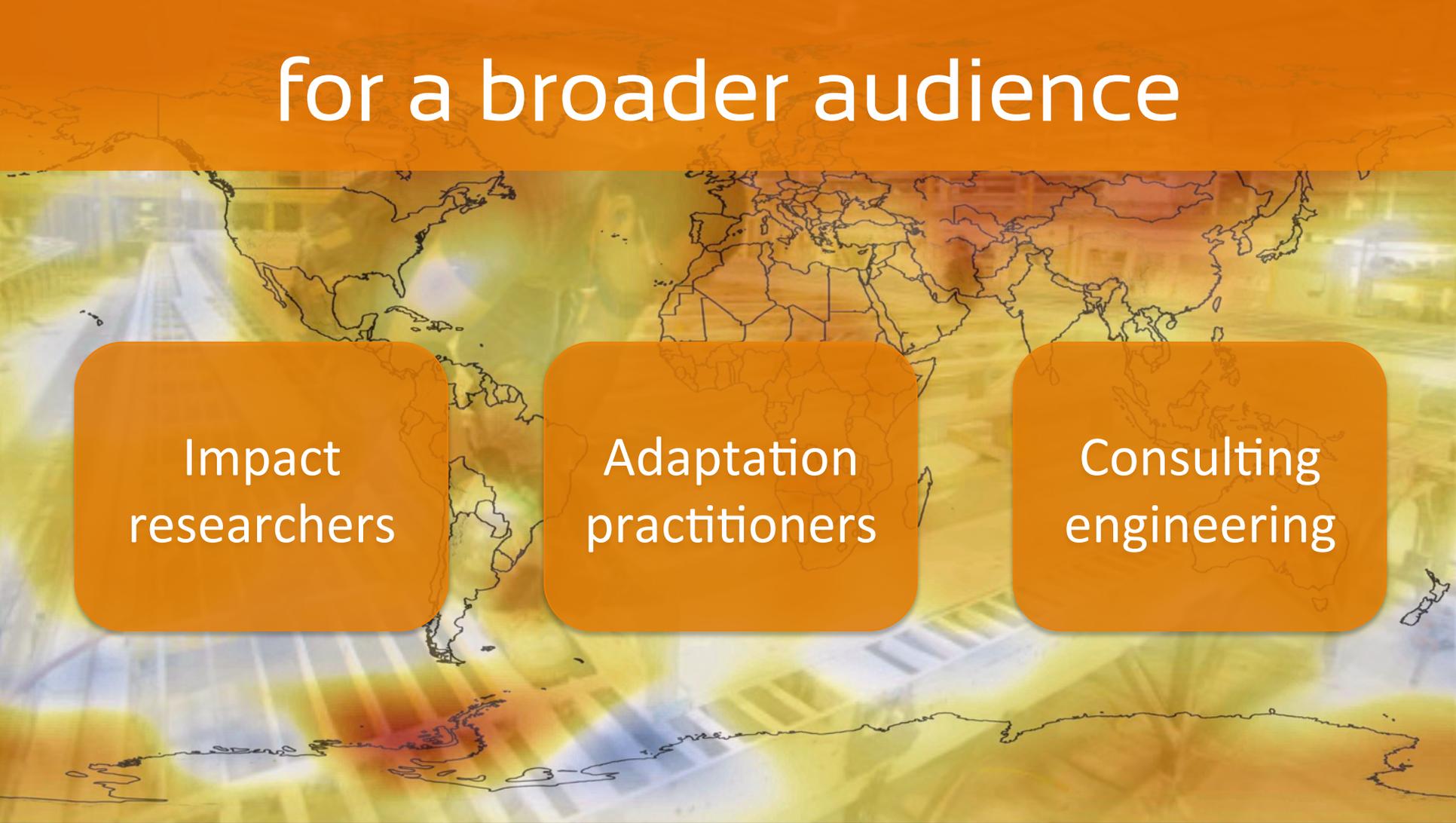
Additional information

Additional information

Product Type	Data
Experiment	CMIP5 (IPCC)
Scenario	RCP 8.5
Region	Europe
Country	France
Variable	Near Surface Air Temperature
Postprocessing	Remapped & Adjusted
Remapping method	Bicubic interpolation, wfdei
Adjustment Method	CDF Transform method, WATCH-FDEI Gridded Observations
Spatial resolution	0.50° x 0.50° Degrees
Time resolution	Daily



for a broader audience

A world map is shown in the background, overlaid with a semi-transparent orange layer. Three rounded rectangular orange boxes are positioned horizontally across the middle of the map, each containing white text. The overall aesthetic is professional and global.

Impact
researchers

Adaptation
practitioners

Consulting
engineering

chat user support



Ready to use IPCC climate projections

Search, select and download data and graphics for your applications in less than 2 minutes

Search by location, variable, model, greenhouse gas scenario, ...

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the climate data factory



Harilaos



Florian



Thomas

Ask us anything, always happy to have your feedback.

Typically replies in a few hours

Welcome to *the climate data factory*! Any questions or feedback to share? Happy to chat!

We run on Intercom

Write a reply...



help center

The Climate Data Factory Help Center

[Go to the climate data factory](#)

Advice and answers from the the climate data factory Team

Search for answers...



FAQ

Most frequent users questions



5 articles in this collection
Written by Florian Cochard



Documentation

Document related to our products



5 articles in this collection
Written by Florian Cochard, Harilaos, and Thomas Noël



Glossary

key terms related to climate change data



9 articles in this collection
Written by Florian Cochard



Harilaos Loukos

Founder

Harilaos is an entrepreneur with scientific and business expertise in the field of weather and climate services. Before tcdf Harilaos founded a weather service company that was acquired by the world's largest private weather service provider. His background is in oceanography with a PhD from Pierre et Marie Curie University at Institut Pierre Simon Laplace and a postdoc at UW and NOAA/PMEL.



Thomas Noël

Data Engineer

Thomas is an expert in climate model data management and post-processing. Before joining tcdf Thomas was a research engineer at Institut Pierre Simon Laplace developing algorithms for post processing and bias adjustment of climate model simulations. Thomas holds a PhD in Earth Sciences and Atmosphere from the University of Versailles Saint Quentin en Yvelines.



Florian Cochard

Product Developer

Florian is an entrepreneurial swiss army knife. Before joining tcdf Florian contributed to a weather insurance solution for smallholders farmers in sub saharan Africa. Florian has a background in climate physics from Pierre & Marie Curie University, a master thesis in hydro-meteorology from Columbia University and graduated in entrepreneurship from Ecole Polytechnique.



technology

REQUEST

Search criteria called facets are used to select which files to download. They can be set on command line or using a template.



ESGF NODES

SDT retrieves the certificates and builds the HTTP requests to Solr corresponding to the search criteria.

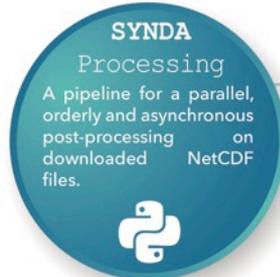


FILESYSTEM

ESGF files are downloaded using the HTTP or GridFTP protocol and managed on the local filesystem following the Data Reference Syntax.

SDT DATABASE

A SQLite database records each downloaded file and dataset. A complete dataset triggers a "dataset_complete" event, which informs the SDP module to start the pipeline.



SDP DATABASE

A SQLite database describes and follows the post-processing progress of an atomic dataset or a dataset.

WORKERS

A Python daemon deals with the database using a Remote Procedure Call (RPC) client. A "worker" is able to run Python or shell scripts.



Bias adjustment
Vrac et al 2016

Quality Control
CMOR (CF&DRS)
Tech QA (DKRZ)
Phy QA (IPSL/TCDF)



Institut
Pierre
Simon
Laplace

Où en sommes nous après 18 mois

Développements SYNDA Processing finis

1er Jeu de données ajustées CMIP5/CORDEX

Site TCDF opérationnel (beta)

Listes emails de contacts terminées

Difficultés

Formalisme Juridique

AO, licences,
accord cadre

Développement Informatique

18 mois au
lieu de 12

Financement

Faibles
ressources

Satisfaction

Appui Institutionnel

Equipe LabEx
Direction
R. Vautard
N. Papineau
H. Le Treut

Collaboration Technique

Equipe Prodiguer
Synda Processing
S. Denvil
G. Levavasseur

Collaboration Scientifique

Ajustement des
projections
climatiques
M. Vrac
R. Vautard

Suite

Lancement du marketing

E-mailing progressif, communauté impact puis consulting

Collaboration Technique: Synda processing

Maintenance/évolution, SYNDA sur AWS, Nouvelles données

Collaboration Scientifique: Ajustement de biais

- Projections climatiques: évolution méthode CDFT (M. Vrac, R. Vautard)
- Prévision décennale: H220 CLARA + collaboration J. Mignot/E. Guilyardi
- Prévision saisonnières: ?
- Prévisions sub-saisonnières 2018/20: H2020 S2S4

A landscape photograph featuring a vast field of small white flowers in the foreground, rolling green hills in the middle ground, and a dramatic, cloudy sky. The sky is filled with large, dark, textured clouds, with a bright patch of light breaking through near the center. A fence line runs across the horizon in the distance.

merci