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Empowering Environmental Science and Climate Change Study with DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research



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Climate Change Impact on Biodiversity Patterns | Lecce, Italy, 21-22 February 2024

Research life cycle management

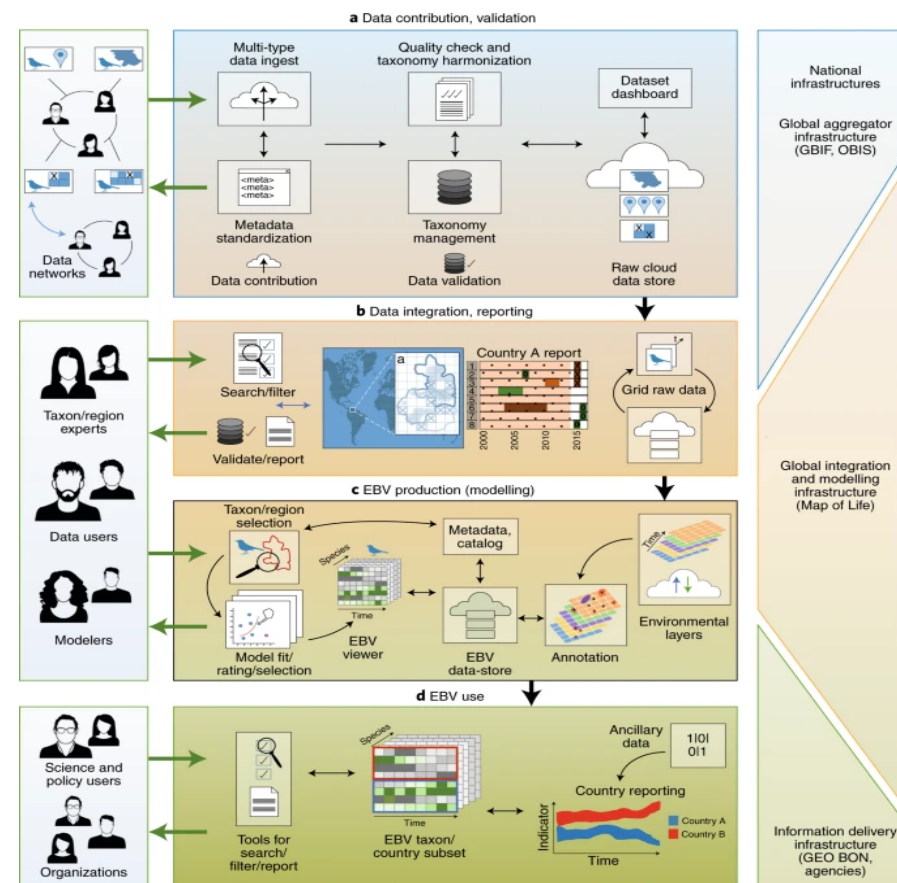
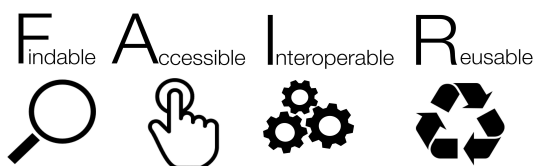
Managing climate change research in the age of big data



The climate change and biodiversity research community is broad and heterogeneous. It includes multidisciplinary scientists, national/international agencies and authorities concerned with better measurement of environmental quality.

A research cycle involving big data from different fields of science and different modelling approaches can lead to inconsistencies in results if not managed properly.

To improve the quality of our results, it is imperative to increase the FAIRness of research products.



Jetz, W., et al. (2019) <https://doi.org/10.1038/s41559-019-0826-1>

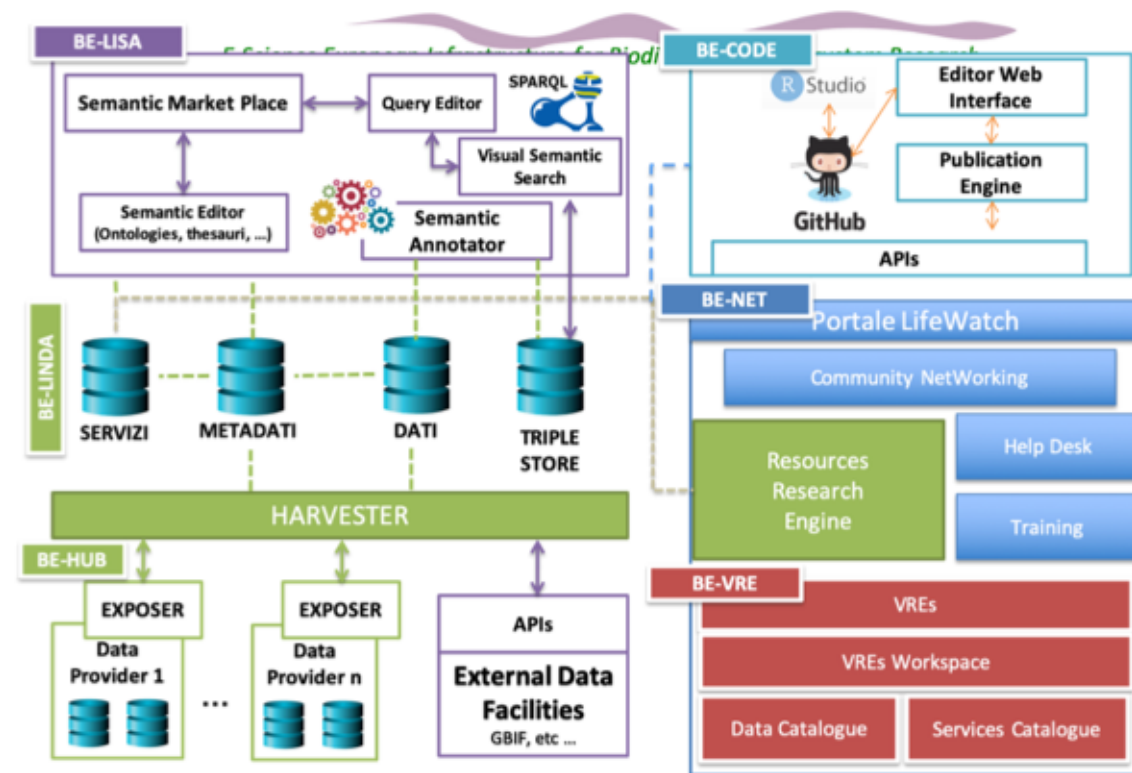


Biodiversity and ecosystem Hub



LifeWatchPLUS is a research infrastructure project led by the National Research Council (CNR)

The strategic objective of LifeWatchPLUS is to strengthen the Data Centre of LifeWatch-ITA and establish a national hub for biodiversity and ecosystem data resources and research products, creating the primary access point for data resources, e-Science applications, and services for data management, aggregation, analysis, modeling, and visualization.



Research life cycle management

Managing climate change research in the age of big data



scientific data

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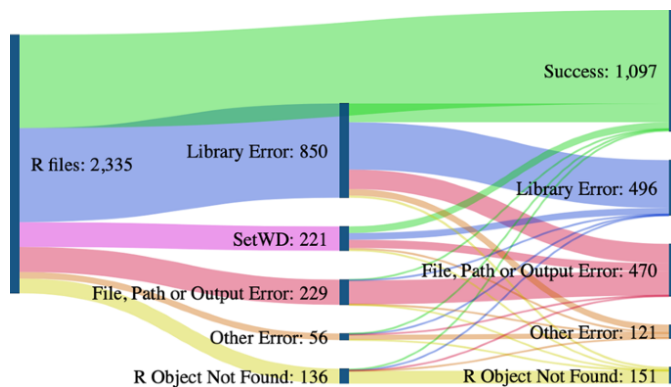
Analysis | [Open access](#) | [Published: 21 February 2022](#)

A large-scale study on research code quality and execution

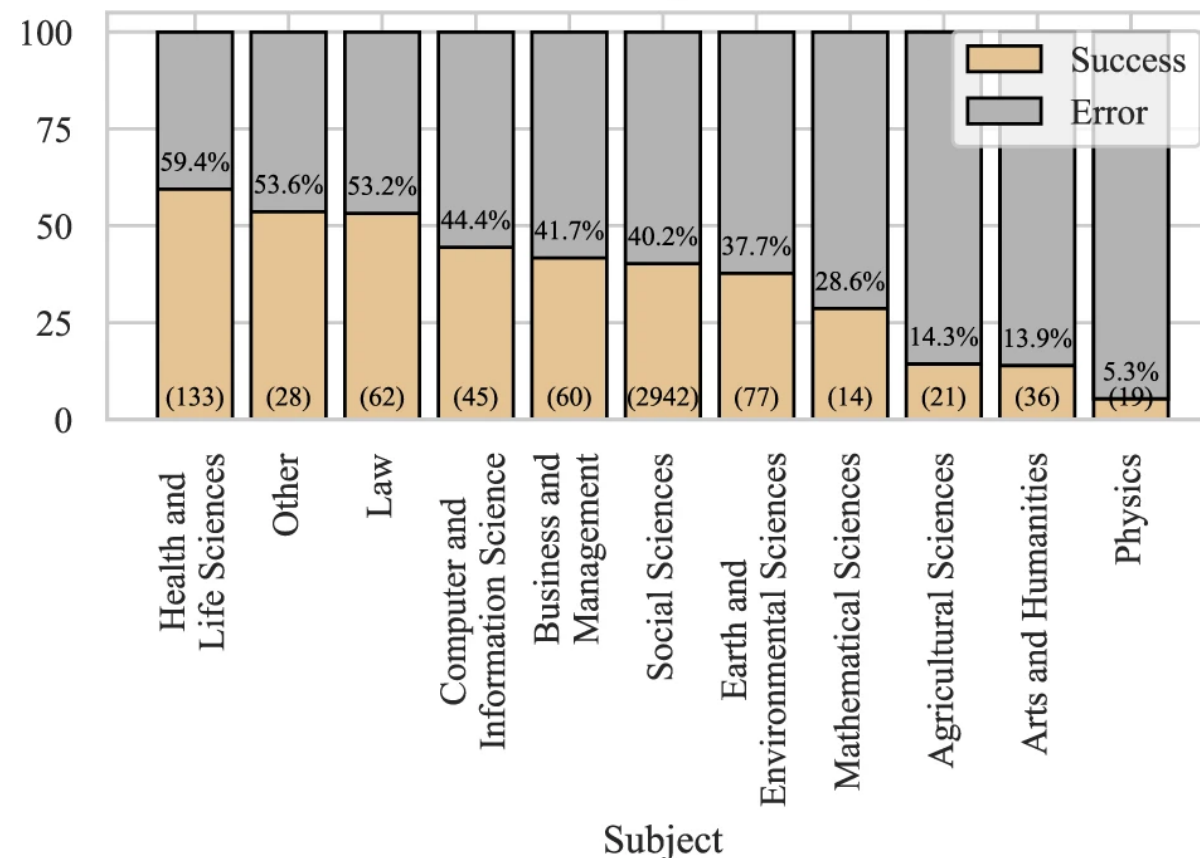
[Ana Trisovic](#) , [Matthew K. Lau](#), [Thomas Pasquier](#) & [Mercè Crosas](#)

[Scientific Data](#) **9**, Article number: 60 (2022) | [Cite this article](#)

25k Accesses | **18** Citations | **394** Altmetric | [Metrics](#)

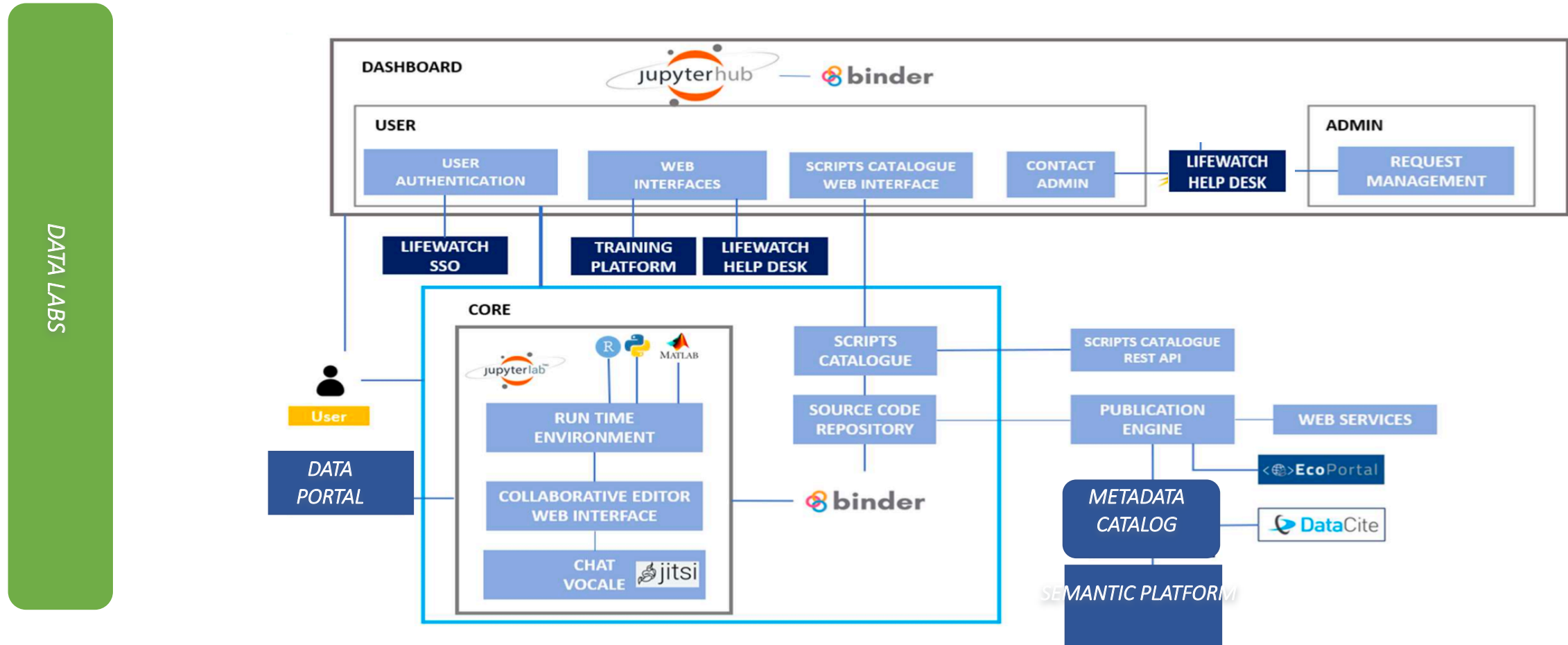


Re-execution rate per field of study



DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing project



DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing project



Projects



Services



Web Services



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DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research

Unleash the power of collaboration and coding to advance your research today!

Coding in R, Python and MATLAB with your team has never been easier.

This platform is integrated with LifeWatch, a leading portal for data-driven research. Publish your scripts and projects, and deploy web services all in one place, with the added benefit of structured web interfaces for your services thanks to the DataLabs feature. Not only does this platform promote collaboration in coding and data science, but it also aligns with FAIR (Findable, Accessible, Interoperable, Reusable) data principles and Open Science practices. Be part of a community that advances the field through sharing codes and results.

Visit the Training and Documentation sections to access detailed information about DataLabs.

Our Platform in Numbers

113 Projects

26 Published Projects

1 Users Logged In

33 Services

18 Published Services

2 Launched executions

DataLabs: LifeWatch’s Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing project



LIST OF PROJECTS

Create Project +

Title	Version	Programming language	Category	Status	Published	
Test_R_20230904	01	python-3.10.0	data validation	READY	No	⬆
sss						
Creator: Rita Emi De Matteis (ritaemi.dematteis@linksmt.it)				Open	Start ▶	⋮
test-service	1.0	python-3.10.0	data processing	READY	<div>Clone the Project</div> <div>Create a Service</div> <div>Publish a Dataset</div> <div>Publish the Project</div> <div>Publish the Script</div> <div>Archive the Project</div> <div>Delete the Project</div>	
Test_Matlab_202307191742	01	matlab-r2023a	data validation	READY		
Test_Clone_202307191631	02-cc	python-3.10.0	data annotation	READY		
Test_Clone_202307191611	02-c	python-3.10.0	data annotation	READY		
Test_CRAN_202307191055	01	r-4.3.0-cran	data cleaning	READY		

DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing project



CREATE PROJECT

Title* ?

Title

Version* ?

Version

Programming language* ?

Programming language

Creator

Francesco deleo

Category* ?

Category

Abstract* ?

Abstract

Keyword* ?

Keywords

Add new

Create



DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research



Francesco deleo

Multidecadal_surface_temperature_changes

LOADING ID: e01fc61c-14cb-4735-84f0-aacc0e2580e3

Creator: Francesco deleo Programming language: r-4.3.0-cran Version: un.2

Info

Input

Output

Warnings

Team

Statistics

Provenance

Team

Creator: Francesco deleo (francesco.d)

Name

ilaria

giuseppe

Statistics

The statistics refer to the last instance of execution of the project

Title	Value
Average CPU usage	0.02 %
Max CPU usage	0.62 %
Average RAM usage	173.34 KB
Max RAM usage	
Number of clones	
Disk space used	
Last job status	

Provenance

DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing project



Francesco deleo

Multidecadal_surface_temperature_changes

Home / Project detail view

RUNNING ID: e01fc61c-14cb-4735-84f0-aacc0e2580e3 Close

Creator: Francesco deleo Programming language: r-4.3.0-cran Version: un.2 Start project chatroom

Open Stop ... Actions

Info

Abstract

Multidecadal surface temperature changes may be forced by natural as well as anthropogenic factors, or arise unforced from the climate system. Distinguishing these factors is essential for estimating sensitivity to multiple climatic forcings and the amplitude of the unforced variability. Here we present 2,000-year-long global mean temperature reconstructions using seven different statistical methods that draw from a global collection of temperature-sensitive palaeoclimate records. Our reconstructions display synchronous multidecadal temperature fluctuations that are coherent with one another and with fully forced millennial model simulations from the Coupled Model Intercomparison Project Phase 5 across the Common Era. A substantial portion of pre-industrial (1300–1800 CE) variability at multidecadal timescales is attributed to volcanic aerosol forcing. Reconstructions and simulations qualitatively agree on the amplitude of the unforced global mean multidecadal temperature variability, thereby increasing confidence in future projections of climate change on these timescales. The largest warming trends at timescales of 20 years and longer occur during the second half of the twentieth century, highlighting the unusual character of the warming in recent decades.

DataLabs: LifeWatch’s Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing project



Multidecadal_surface_temperature_changes

Home / Project detail view

RUNNING ID: e01fc61c-14cb-4735-84f0-aacc0e2580e3 Close

Creator: Francesco deleo **Programming language:** r-4.3.0-cran **Version:** un.2 Start project chatroom

File Edit View Run Kernel Git Tabs Settings Help

Filter files by name

Name	Last Modified
/	
buildlog	3 months ago
input	3 months ago
output	a month ago
tmp	9 months ago
example.l...	3 months ago
index.ipynb	3 months ago
install.ap...	3 months ago
install.r	3 months ago
README....	3 months ago

index.ipynb

Code git

```
[3]: # Insert in this notebook your script.
#
# Note that this notebook is the entry point for any execution in Service form.
#
# Make sure to read the README.md file for more detailed information.
Last executed at 2023-10-20 09:49:26 in 11ms

[1]: getwd()

Last executed at 2023-10-20 10:36:48 in 30ms
'/home/jovyan/work'

[2]: unzip("/home/jovyan/work/input/input_data_figure_code.zip", exdir = "/home/jovyan/work/tmp")

Last executed at 2023-10-20 10:36:57 in 8.26s

[3]: setwd("/home/jovyan/work/tmp/input_data_figure_code")

Last executed at 2023-10-20 10:36:57 in 8ms

[5]: ### Generate Figures for GMST reconstruction paper: PAGES2k Consortium (2019); Nature Geoscience. RN 2019/03/29
## calculations for Figure 4 are time consuming so set the number of parallel cores to use (ncores variable line 24) to >10 or be patient.
## reconstruction results need to be downloaded separately (from the item "Reconstruction ensembles" in the same data collection in figshare).
```



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Managing service



Multidecadal_surface_temperature_changes	1.2	r-4.3.0-cran	data analysis	READY	No	⬆
<p>Multidecadal surface temperature changes may be forced by natural as well as anthropogenic factors, or arise unforced from the climate system. Distinguishing these factors is essential for estimating sensitivity to multiple climatic forcings and the amplitude of the unforced variability. Here we present 2,000-year-long global mean temperature reconstructions using seven different statistical methods that draw from a global collection of temperature-sensitive palaeoclimate records. Our reconstructions display synchronous multidecadal temperature fluctuations that are coherent with one another and with fully forced millennial model simulations from the Coupled Model Intercomparison Project Phase 5 across the Common Era. A substantial porti...</p>						
Creator: Francesco deleo (francesco.deleo@cnr.it)				Open	Start ▶	⋮
Title	v1	python-3.10.0	data processing	READY	<div>Clone the Project</div> <div>Create a Service</div> <div>Publish a Dataset</div> <div>Publish the Project</div> <div>Publish the Script</div> <div>Archive the Project</div> <div>Delete the Project</div>	
fishbase_extract	v1.1	r-4.3.0-cran	data processing	READY		
test	1.0	python-3.10.0	data cleaning, data annotation	READY		
test_mat_lab_deleo_clone	1.1	matlab-r2023a	data processing	READY		
<p>To run this script in MATLAB, follow these steps: Open MATLAB on your computer. Create a new script file and paste the above code into it. Save the script file with a ".m" extension, for example, "test_script". Make sure the directory "/home/jovyan/work/" exists on your system. Run the script by typing its name (without the ".m" extension) in the MATLAB command window, e.g., test_script. After running the script, it will plot the sine wave, display the mean value, and save the plot as a PDF file named "output.pdf" in the working directory. The script will also print a message indicating the location of the saved PDF file.</p>						

DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing service



Multidecadal_surface_temperature_service

Home / Service detail view

TO BE PUBLISHED ID: 6d7c4348-ded1-49c5-a25d-def5081f9c83 Close ×

Multidecadal_surface_temperatureService
Published - Creator: Francesco deleo Programming language: r-4.3.0-cran Version: 1.1 Start project chatroom

Actions

Info

Executions

Create an Execution

Status	Run	Started at	Finished at	Execution time	Author
✗	1	26/10/2023 09:42	26/10/2023 12:56	3h 13m 40s	Francesco deleo (francesco.deleo@cnr.it)
✓	2	26/10/2023 12:57	26/10/2023 16:49	3h 52m 27s	Francesco deleo (francesco.deleo@cnr.it)
✓	3	02/11/2023 09:39	02/11/2023 13:29	3h 50m 12s	Francesco deleo (francesco.deleo@cnr.it)

« 1 »



DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research

Managing webservice interface



Historical evolution of temporal anomalies

temperatura 1961-91

Multidecadal surface temperature changes may be forced by natural as well as anthropogenic factors, or arise unforced from the climate system. Distinguishing these factors is essential for estimating sensitivity to multiple climatic forcings and the amplitude of the unforced variability. Here we present 2,000-year-long global mean temperature reconstructions using seven different statistical methods that draw from a global collection of temperature-sensitive palaeoclimate records. Our reconstructions display synchronous multidecadal temperature fluctuations that are coherent with one another and with fully forced millennial model simulations from the Coupled Model Intercomparison Project Phase 5 across the Common Era. A substantial portion of pre-industrial (1300–1800 CE) variability at multidecadal timescales is attributed to volcanic aerosol forcing. Reconstructions and simulations qualitatively agree on the amplitude of the unforced global mean multidecadal temperature variability, thereby increasing confidence in future projections of climate change on these timescales. The largest warming trends at timescales of 20 years and longer occur during the second half of the twentieth century, highlighting the unusual character of the warming in recent decades.

Step 1 - Upload or select input files

Step 2 - Insert your email address

Run the service

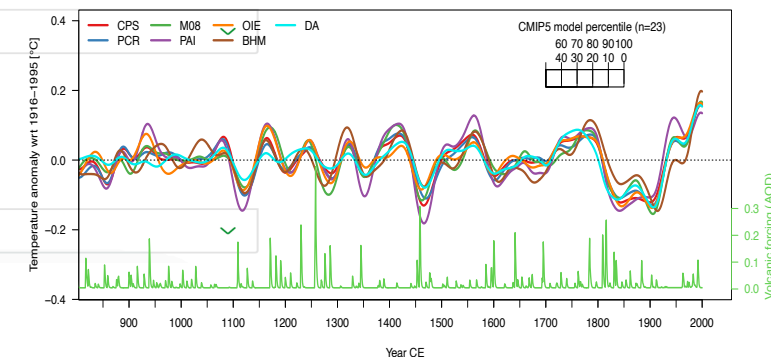
Running

View logs

You have received a mail. Don't close this page or keep the following link to access it again.

Copy link

Step 3 - Output



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HOMEPAGE

PROJECTS

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FAQS

DataLabs - Project Tutorial

Projects

new / List of Projects

This tutorial will guide you step by step on how to create and manage your projects on DataLabs: LifeWatch's Collaborative Coding Platform for Biodiversity and Ecosystem Research.

Visit the Project section on DataLabs at: <https://datalabs.lifewatchitaly.eu/dashboard/ui/project>

► Apri tutti

▼ Chiudi tutti

► Project managing

Argomento 1

► Input file

Argomento 2

► Output file

Argomento 3

► Member managing

Argomento 4

☐ CPU and RAM usage don't exceed warning levels

Login



DataLabs: LifeWatch

Collaborative Coding

for Biodiversity

System Research

Actions ▲

Publish a Dataset

Publish the Service

Delete the Service

Clone the Project

Create a Service

Publish a Dataset

Publish the Project

Publish the Script

Archive the Project

Delete the Project

Attach new file input

Select your file from your device or Data Portal

Local

Data Portal



Climate Change Impact on Biodiversity Patterns | Lecce, Italy, 21-22 February 2024

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<https://datalabs.lifewatchitaly.eu/>



LifeWatch ERIC 2024 Thematic Service Workshop Series

Thank you for your attention!
Any questions?



Taxonomy | Brussels, Belgium, 30 January 2024



Climate Change Impact on Biodiversity Patterns | Lecce, Italy, 21-22 February 2024



Animal Movement and Biologging | Ostend, Belgium, 22 March 2024



Biogeography | Bologna, Italy, 4-5 April 2024



Biodiversity Observatory Automation | Ljubljana, Slovenia, 11 April 2024



Habitat Mapping | Aveiro, Portugal, 3 May 2024

