

# CLIMAAX

## *CLIMAt*e risk and vulnerability *Assessment framework and toolbox*

18 October 2024



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**CLIMAAX**  
climate ready regions

# Housekeeping



This session is recorded



Write your questions in the Q&A box  
*or raise your hand during dedicated Q&A moment*



# Introduction to the Handbook

*CLIMAAX support*

**Christopher Polster, ECMWF**

*webinar*  
2024-10-18



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**CLIMAAX**  
climate ready regions

# Program

- **A tour of the Handbook** and our GitHub repositories
- **Support**
  - Service Desk
  - Forum and GitHub
  - JupyterHub
- **Handbook updates**
- **Q&A**



# A Tour of the Handbook



[handbook.climaax.eu](https://handbook.climaax.eu)

- **Framework**
  - Step-by-step
- **Workflows**
  - Grouped by hazard
- **Resources**
  - Supporting content
  - Technical documentation



CLIMAAX  
climate ready regions

## About us

The CLIMAAX project  
Funding opportunities  
How to start

## CRA steps

What is the CLIMAAX Framework?

Before you start

Scoping

## Risk Exploration

Risk Analysis

Key Risk Assessment

Monitoring and Evaluation

Integration in Climate Risk Management

## Risk workflows

How to use risk workflows

RIVER & COASTAL FLOODS

HEAVY RAINFALL

HEATWAVES

DROUGHTS

FIRE

SNOW

WIND

## Resources

Support

Guiding questions and answers

FAQ

Glossary

Software

Datasets

## Join the community

Community Of Practice

Contribute to risk recipes



## Risk Exploration



Risk Exploration starts with a broad screening of the risks (their underlying hazards, exposures and vulnerabilities) that are most apparent or of significant concern to key stakeholders and the wider public. A preliminary, rapid analysis of sectors (including activities, supply chains, processes, and infrastructure) and geographic areas at risk (such as ecosystems, landscapes, and communities) can be conducted based on insights from experts and stakeholders.



A deeper dive into the system aspects may highlight affected entities (key systems, elements, sectors, communities, social groups, sub-regions), functions or processes that hold significant value in the local context (e.g. stakeholder interests, community priorities or public agenda). This can reveal (transboundary) connections or dependencies which might be important for evaluating the respective risk outcome. The following subsections will now delve deeper into the screening of risks as well as the selection of workflows and climate scenarios.

## Tip

At this stage it's important to rely as much as possible on factual evidence regarding climate hazards, impacts and risks if available. The focus should especially lie on those hazards that are most likely to result in severe consequences for the region.



Contents

Screen Risks

Choose Workflow

Choose Scenario

## Guiding questions

- How is the scoping phase applied? Which parts of the scoping phase are relevant for the workflow and scenario selection?
- How does the existing stakeholder knowledge come into play?



# Framework

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## Summary videos



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### Guiding questions

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- How does the existing stakeholder knowledge come into play?

## Guiding questions

## Supporting information



# Workflows

- **Handbook:** static representation of notebooks
- **GitHub:** notebooks for download
- **Jupyter:** place to run notebooks
- Data obtained from various sources in workflows, e.g.
  - CDS
  - JRC
  - CLIMAAX cloud storage
  - ...

## Look out for links connecting the Handbook and GitHub!

- A workflow from the CLIMAAX [Handbook](#) and [HEATWAVES](#) GitHub repository.
- See our [how to use risk workflows](#) page for information on how to run this notebook.

### HEATWAVES

Repository for collaboration on workflows for the heatwaves hazard.



Part of the [Climate Risk Assessment Handbook](#).

#### Workflows

- [Urban heatwaves](#)

#### How to run

See our [how to use risk workflows](#) page in the Handbo



Download the workflows from our [HEATWAVES repository](#) on GitHub.



[Try the workflows out](#) with binder.



See our [how to](#), [software](#) and [contributing](#) pages for further information and help.

Hazard	📄	🔍	📄
RIVER & COASTAL FLOODS	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>
HEAVY RAINFALL	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>
HEATWAVES	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>
DROUGHTS	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>
FIRE	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>
SNOW	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>
WIND	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>



# Workflows: GitHub Repositories

CLIMAAX / HEATWAVES

Issues Pull requests

Code

HEATWAVES Public

main 1 Branch 2 Tags

Add file Code About

Repository for collaboration on workflows for the heatwaves hazard

handbook.climaax.eu/notebooks/work...

Readme

Apache-2.0 license

Activity

Custom properties

1 star

1 watching

1 fork

Report repository

Releases

2 tags

Create a new release

## HEATWAVES

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Notebook previews on GitHub don't render all content properly – view in Handbook!

Look out for links connecting the Handbook and GitHub!

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WIND	<a href="#">Repository</a>	<a href="#">Issues</a>	<a href="#">Pull requests</a>





# Workflows: How To Run

[handbook.climaax.eu/notebooks/workflows\\_how\\_to.html](http://handbook.climaax.eu/notebooks/workflows_how_to.html)

- Distributed via **GitHub**
- **Python** tools
- **Jupyter** notebooks
- **You need:**
  1. Jupyter server that can launch notebooks in a Python environment
  2. Git to obtain notebooks (or download from the GitHub website)
  3. User accounts for some data retrievals



# Resources: Supporting Information and Technical Documentation

- Example answers to **guiding questions**
- **Glossary** and FAQ
- **Dashboards** and explorers
- Links to **software docs**
- CLIMAAX **dataset** documentation
- How to access **support**

1.6 What is the governance context (policies, regulations, legal obligations, strategies, available time and resources etc.) of the assessment? ^

[Žilina](#) Catalunya

Žilina's governance context consists of an adaptation strategy of the Žilina city and action plan, embedded in the national adaptation strategy, action plan for the implementation of the adaptation strategy to climate change, related national policy, regulations and directives.

## IIASA Climate Solutions Explorer

The Climate Solutions Explorer maps and presents information about mitigation pathways, avoided climate impacts, vulnerabilities and risks arising from development and climate change. All the maps and graphs are available for download as well as accompanying data. Users can explore [interactive maps](#) and reports for [individual countries](#).

Watch the recording of the webinar explaining the Climate Solutions Explorer to learn more:



## Precipitation pre-calculated IDF

Intensity, Duration, Frequency:

### General

Dataset ID  
[precipitation\\_idf\\_europe](#)

Spatial coverage  
Europe

### Contents

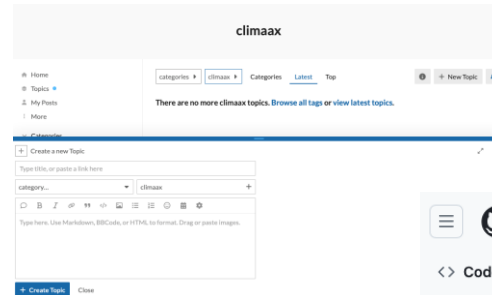
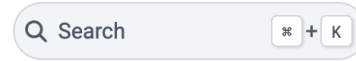
```
hazard_assessment/  
  bias_corrected/  
    ec-earth_racmo22e/  
      historical/  
        idf_24h_ec-earth_racmo22e_historical_1971-2000.nc  
        idf_24h_ec-earth_racmo22e_historical_1976-2005.nc  
        pr_annualMax_24h_ec-earth_racmo22e_historical_1971-2005.nc
```



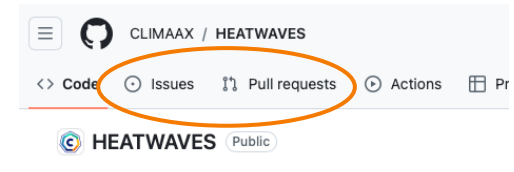
# Support Overview



- **First** point of contact: the **Handbook!**
- **Service desk** (private)
  - Single channel for contact to CLIMAAX experts
  - Ticket system
- **GitHub** and **Forum** (public)
- JupyterHub (computing resources)



forum.ecmwf.int



# Service Desk

## Service desk

For questions and support related to the CLIMAAX Handbook, including the Framework, workflows, datasets and software, as well as all services associated with your ECMWF account, the **exclusive** CLIMAAX service desk can be contacted via our support request form:

1. Go to [https://jira.ecmwf.int/plugins/servlet/desk/portal/4/create/186?customfield\\_13413=14215](https://jira.ecmwf.int/plugins/servlet/desk/portal/4/create/186?customfield_13413=14215).
2. Log in with your ECMWF account if you are not already. Information and help for the login process is available in the [user documentation](#) of ECMWF.
3. Provide a title and description of your request and make sure that the "CLIMAAX" service is selected in the list at the bottom. We recommend to also add "CLIMAAX" to the title or description of your request to make sure your request reaches the CLIMAAX team without delay.
4. Click "Create" to send the request.

The service desk team will provide a first response to eligible requests in at most 3 working days. You will receive email notifications with updates to the status of your request. Depending on the topic of the request, experts from the CLIMAAX team, e.g., the developers of a specific risk assessment workflow, are consulted when answering a request. Service desk requests are otherwise private.

### Important: eligibility

Eligibility for support through the service desk is validated via an allowlist. The allowlist is initialized with the email addresses known to us from the selection process following the open calls. To **extend eligibility** to accounts not yet on the allowlist, please inform us about the email addresses of the accounts to be added in a **service desk request from a known account**.

We recommend to register ECMWF accounts for all added email addresses *before* their addition to the allowlist. Only then can we also immediately grant permissions to access the [CLIMAAX JupyterHub](#). Email addresses added to our eligibility allowlist without a corresponding registered ECMWF account will not receive these permissions when added to the allowlist and have to ask for them explicitly via a service desk request.

Raise this request on behalf of

 Christopher Polster


Title

CLIMAAX ...

Description

Aa B I ...

Attachment *(optional)*

 Drag and drop files, paste screenshots, or  
browse

Please specify the impact of your issue *(optional)*

None

For **urgent** operational issues needing immediate 24/7 assistance choose Impact 1

Which service is your request related to? *(optional)*

- None
- CAMS / C3S
- Energy Hub
- Health Hub
- CLIMAAX
- Other



# Service Desk

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1. Go to <https://jira.ecmwf.int/plugins/servlet/desk/portal/4/>
2. Log in with your ECMWF account if you are not already. Info available in the [user documentation](#) of ECMWF.
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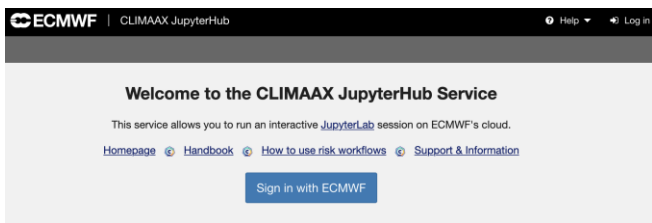
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- CLIMAAX  
 Other



# JupyterHub

climaax-jupyterhub.ecmwf.int

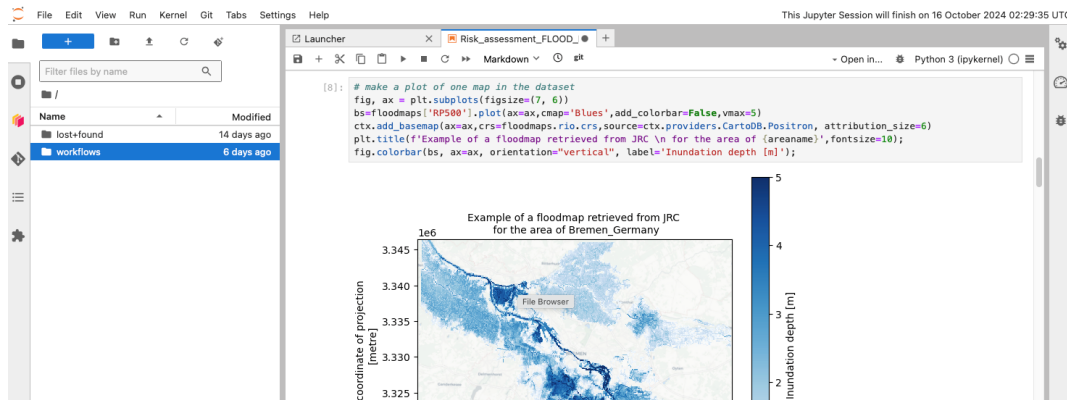


sign in

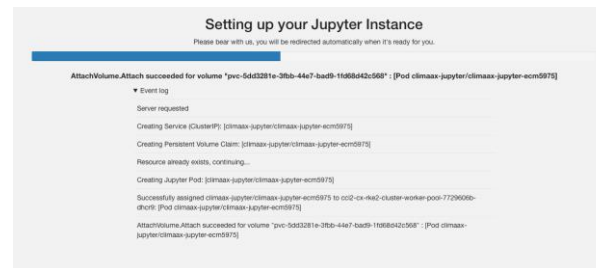
Start My Server

start  
server

also called:  
session, instance



run workflows



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File Edit View Run Kernel Git Tabs Settings Help

This Jupyter Session will finish on 16 October 2024 02:29:35 UTC

Filter files by name

Name	Modified
lost+found	14 days ago
workflows	6 days ago

workflows  
downloaded  
on *first* login

```
[8]: # make a plot of one map in the dataset
fig, ax = plt.subplots(figsize=(7, 6))
bs=floodmaps['RP500'].plot(ax=ax,cmap='Blues',add_colorbar=False,vmax=5)
ctx.add_basemap(ax=ax,crs=floodmaps.rio.crs,source=ctx.providers.CartoDB.Positron, attribution_size=6)
plt.title(f'Example of a floodmap retrieved from JRC \n for the area of {areaname}',fontsize=10);
fig.colorbar(bs, ax=ax, orientation="vertical", label='Inundation depth [m]');
```

Example of a floodmap retrieved from JRC for the area of Bremen\_Germany

complete  
environment  
for workflows



# JupyterHub

## 403 : Forbidden

You do not have access to this service.

JupyterHub is only available to registered users with access to CLIMAAX computing resources.

In order to use those services, non-registered users need to apply for access.  
Please see the [CLIMAAX JupyterHub documentation](#) for more information.

→ request additional permissions first

## Setting up your Jupyter Instance

Please bear with us, you will be redirected automatically when it's ready for you.

Spawn failed: 0/10 nodes are available: pod has unbound immediate PersistentVolumeClaims. preemption: 0/10 nodes are available: 10 Preemption is not helpful for scheduling. - Please try again later

### Event log

Server requested

Creating Service (ClusterIP): [climax-jupyter/climax-jupyter-ecm5975]

Creating Persistent Volume Claim: [climax-jupyter/climax-jupyter-ecm5975]

Waiting for a volume to be created either by the external provisioner "cinder.cs.openstack.org" or manually by the system administrator. If volume creation is delayed, please verify that the provisioner is running and correctly registered. [PersistentVolumeClaim climax-jupyter/climax-jupyter-ecm5975]

External provisioner is provisioning volume for claim "climax-jupyter/climax-jupyter-ecm5975": [PersistentVolumeClaim climax-jupyter/climax-jupyter-ecm5975]

Successfully provisioned volume pvc-aae948ba-7c43-4b29-ba77-edc9bea28104: [PersistentVolumeClaim climax-jupyter/climax-jupyter-ecm5975]

Creating Jupyter Pod: [climax-jupyter/climax-jupyter-ecm5975]

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→ try again at least twice



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## JupyterHub

The **exclusive CLIMAAX JupyterHub** provides access to a JupyterLab web interface where the risk assessment notebooks can be edited and executed on ECMWF cloud computing infrastructure.

Please note the following information on our JupyterHub setup and usage:

### Access requirements

In order to be able to use the CLIMAAX JupyterHub, you need to:

1. Have an [ECMWF account](#).
2. Activate [two factor authentication](#) on that account.
3. Be eligible for CLIMAAX support. Eligibility is managed through an allowlist, see the information on eligibility and JupyterHub access in the documentation of the [service desk](#).

Access to the JupyterHub requires that special permissions are set on your ECMWF account. If your account did not receive these permissions when added to the allowlist, you have to ask for them via a service desk request.

### Sessions and resource usage

### Persistent storage

### Software environment

### Automatic workflow downloads

Technical assistance for the JupyterHub is provided through the [service desk](#).

eligibility != permissions



## Drop-in Sessions



Every Friday 11:00 - 12:00 CE(S)T on MS Teams

- Support Q&A
- First weeks: workflow demonstrations
  - 25 Oct – extreme precipitation
  - 1 Nov – no demo, only Q&A
  - 8 Nov – urban heatwaves
  - ...

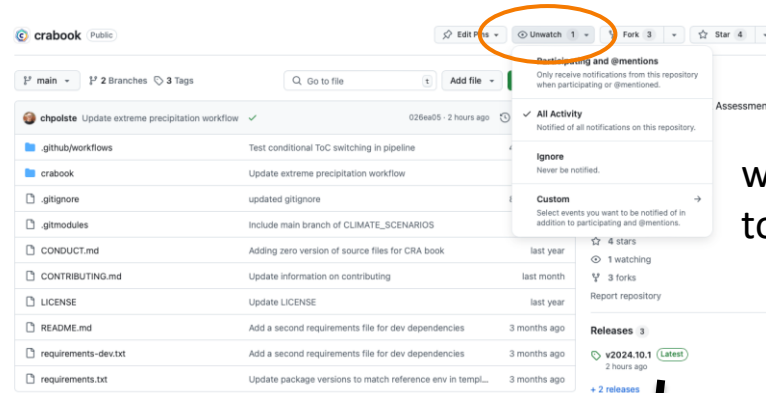


...



# Handbook Updates

- The Handbook is an **evolving document**
- You are part of the process!
- **Continuous content updates**
- Versions declared as needed, **release notes** provided
- Recent updates mentioned in drop-in sessions



watch repositories to get notifications

Releases / v2024.10.1

**v2024.10.1** Latest

chpolste released this 2 hours ago v2024.10.1 026ea05

CLIMAAX CRA Handbook v2024.10.1

- Update of HEAVY RAINFALL workflows to v2024.10.1
  - Small improvements to the text for the hazard and risk assessment sections.
  - A new version of the Catalunya example. This includes more visualisations and explanations to help users interpret the results.
  - New European datasets.
- Improved support documentation

Handbook release notes also cover workflows



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**Your responsibility  
to update own  
workflow copies!**



(no automatic updates on the JupyterHub either)







**CLIMAAX**  
climate ready regions

[www.climaax.eu](http://www.climaax.eu)

*Thanks*



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# Q&A SESSION



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