

MOHID Water Notebook

User Guide

v1.0

Mohid-Water-Modelling-System / MOHID_Jupyter-Notebooks

https://github.com/Mohid-Water-Modelling-System/MOHID_Jupyter-Notebooks/tree/master

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About

guifranz Update README.md · 20cc5e7 · 4 minutes ago · 32 Commits

MOHID_Lagrangian Download wind from ERA5 Reanalysis · 3 weeks ago

MOHID_Preprocessing Update MOHID_Preprocessing.ipynb · 30 minutes ago

MOHID_Water Get river data · yesterday

README.md Update README.md · 4 minutes ago

README

Jupyter Notebooks for the MOHID Water Modelling System

preprocessing jupyter-notebooks mohid

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3:35 PM
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5/27/2025

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Clone using the web URL.

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About

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About

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Name

 MOHID_Lagrangian

 MOHID_Preprocessing

 MOHID_Water

 README.md

Mohid-Water-Modelling-System/  

   https://github.com/Mohid-Water-Modelling-System/MOHID_Jupyter-Notebooks/tree/master        

 README



Below is a step-by-step guide on how to set up and launch MOHID Jupyter Notebooks for interactive computing:

1. Download and Install Miniconda:

- Visit the [Miniconda download page](#).
- Download the Miniconda installer for your operating system (Windows, macOS, or Linux).
- Follow the installation instructions to install Miniconda on your system.

2. Open the Terminal or Command Prompt:

- Windows: Open the Anaconda Prompt or Command Prompt.
- macOS/Linux: Open your preferred Terminal application.

3. Create a Conda Environment:

It's best practice to use a dedicated environment for each project. To create the MOHID environment, follow these steps:

- Download the YAML file:

 6 watching

 0 forks

Report repository

Releases

No releases published

[Create a new release](#)

Packages

No packages published

[Publish your first package](#)

Languages



Language	Percentage
Fortran	71.0%
Python	14.2%
Jupyter Notebook	14.0%
Other	0.8%

Suggested workflows

Based on your tech stack















































3:43 PM
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5/27/2025

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 README



- Download the YAML file:

Obtain the .yaml (or .yml) file that lists all required packages.

- Create the environment:

Run the following command (make sure you're in the directory where your yml file is located):

```
conda env create --file ENV_NAME
```



Replace ENV_NAME with the name of the environment you wish to create.

4. Activate the environment:

To work within the new environment, activate it by running:

```
conda activate ENV_NAME
```



Replace ENV_NAME with the name of the environment you wish to activate.

5. Launch Jupyter Notebook:

Suggested workflows

Based on your tech stack



Pylint

Configure

Lint a Python application with pylint.



Python Package using Anaconda

Configure

Create and test a Python package on multiple Python versions using Anaconda for package management.



Python application

Configure

Create and test a Python application.

[More workflows](#)

[Dismiss suggestions](#)













































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5/27/2025

Mohid-Water-Modelling-System/ | X +

https://github.com/Mohid-Water-Modelling-System/MOHID_Jupyter-Notebooks/tree/master

README

5. Launch Jupyter Notebook:

Once the environment is activated and all necessary packages are installed, launch Jupyter Lab (or Notebook) by issuing:

```
jupyter lab
```

This command will open the Jupyter interface in your default web browser. Tip: If you prefer the classic Jupyter Notebook interface, use jupyter notebook instead.

6. Open the Notebook

Within the Jupyter interface:

- Navigate to the directory where the notebook file (.ipynb) is located.
- Click on the the notebook file (.ipynb) to open it.

By following these steps, you'll have a fully functional MOHID Jupyter Notebook environment for interactive computing.

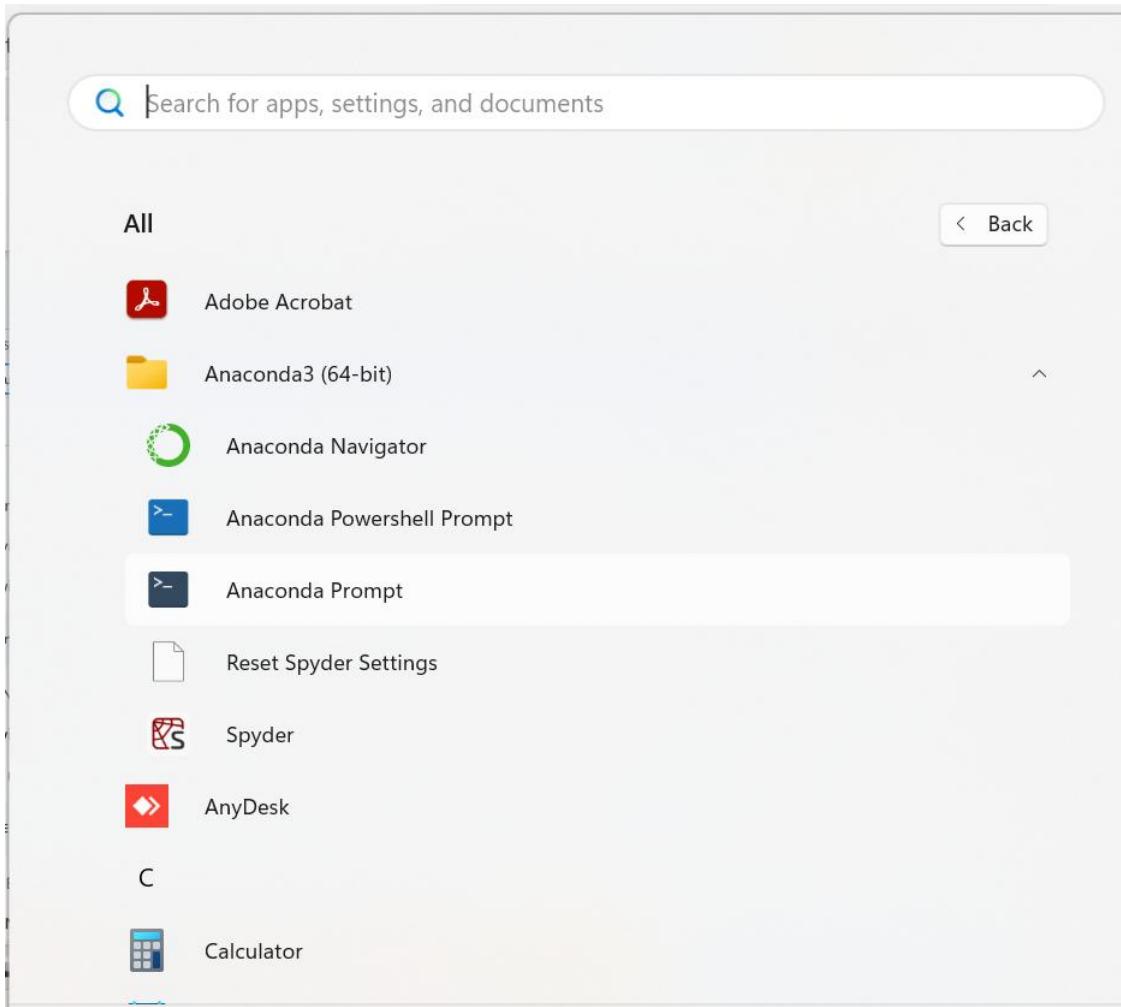


9+ 3:45 PM
ENG PTB2 5/27/2025

1. Download and Install Miniconda:

The screenshot shows a web browser window with the URL <https://www.anaconda.com/docs/getting-started/miniconda/install>. The page is titled "Installing Miniconda - Anaconda". The main content area is titled "Basic install instructions" and lists three steps: "Windows installation", "macOS/Linux installation", and "Verify your install". A sidebar on the left contains links for "Getting Started", "Tools", "Package Security Manager", "Data Science & AI Workbench", and "Reference". The "Getting Started" link is currently selected. A note in the main content area states: "On Windows, macOS, and Linux, it is best to install Miniconda for the local user, which does not require administrator permissions and is the most robust type of installation. However, if you need to, you can install Miniconda system wide, which does require administrator permissions." The browser's address bar, search bar, and various icons are visible at the top, and the taskbar with application icons is visible at the bottom.

2. Open the Terminal or Command Prompt:



3. Create a Conda Environment:

The screenshot shows a Windows File Explorer window with the following details:

- Title Bar:** MOHID_Water
- Address Bar:** OneDrive > MOHID_Jupyter-Notebooks-master > MOHID_Water
- Search Bar:** Search MOHID_Water
- Toolbar:** Includes New, Cut, Copy, Paste, Delete, Sort, View, and Details buttons.
- Table View:** A grid showing the contents of the MOHID_Water folder.

Name	Status	Date modified	Type	Size
releases	✓	5/27/2025 3:40 PM	File folder	
run_cases	✓	5/27/2025 3:40 PM	File folder	
work	✓	5/27/2025 3:40 PM	File folder	
MOHID_Water.ipynb	✓	5/27/2025 3:40 PM	IPYNB File	77 KB
MOHID_Water_environment.yaml	✓	5/27/2025 3:40 PM	YAML File	1 KB
- Left Sidebar:** Shows a list of folders and drives:
 - Conferências
 - Curriculo
 - Desktop
 - Documents
 - Doutoramento
 - MOHID_Jupyter (selected)
 - MOHID-Lagran
 - MyTools
 - Pictures
 - Projetos
 - Guilherme - Roy
- Bottom Navigation:** Includes links to Desktop, Downloads, Documents, and Pictures, along with a summary of 5 items.
- Taskbar:** Shows the Start button, a pinned folder icon with 7 items, a search bar, and various system icons (Cloud, Battery, Volume, Network, etc.). The taskbar also displays the date and time (4:14 PM, 5/29/2025).

3. Create a Conda Environment:

The screenshot shows a Windows desktop environment. At the top is a black Anaconda Prompt window titled "Anaconda Prompt - conda er". The command line shows the user navigating to a directory and then running the "conda env create --file MOHID_Water_environment.yaml" command. The process is still ongoing, indicated by the vertical pipe symbol at the end of the command line. The taskbar at the bottom features the Start button, a search bar, and various pinned icons for Microsoft Edge, File Explorer, and other applications. The system tray shows the date and time as "4:18 PM 5/29/2025".

```
(base) C:\Users\aquaf>cd C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water  
(base) C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water>conda env create --file MOHID_Water_environment.yaml  
Retrieving notices: done  
Channels:  
- conda-forge  
- defaults  
Platform: win-64  
Collecting package metadata (repodata.json): done  
Solving environment: / |
```

4. Activate the environment:

```
Anaconda Prompt  X + ▾
```

Downloading and Extracting Packages:

Preparing transaction: done
Verifying transaction: \
SafetyError: The package for jupyter_leaflet located at C:\Users\aquaf\anaconda3\pkgs\jupyter_leaflet-0.19.2-pyhd8ed1ab_1
appears to be corrupted. The path 'etc/jupyter/labconfig/page_config.json'
has an incorrect size.
 reported size: 28 bytes
 actual size: 30 bytes

done
Executing transaction: |
|
done

To activate this environment, use

\$ conda activate MOHID_Water_environment

To deactivate an active environment, use

\$ conda deactivate

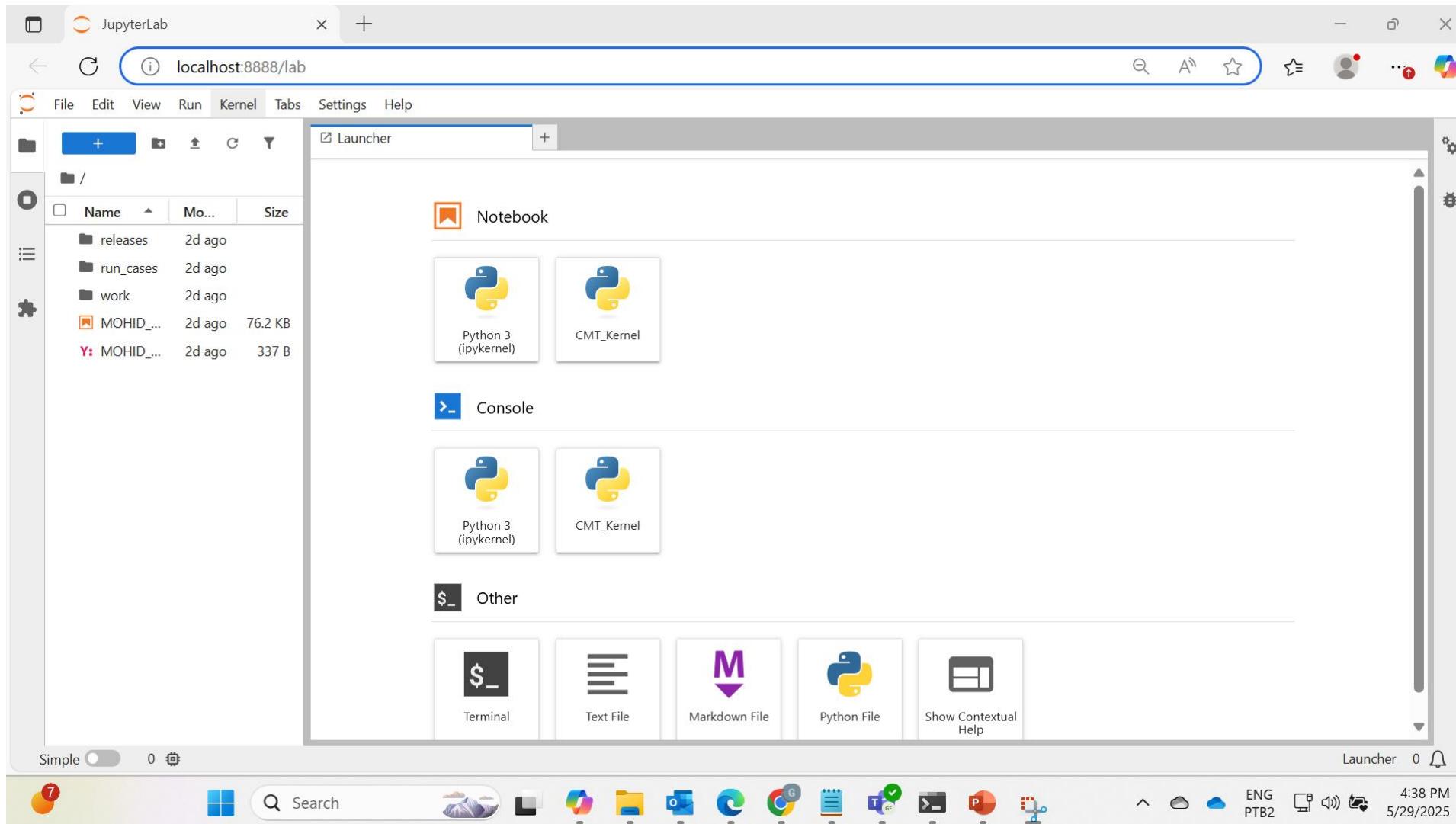
(base) C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water>conda activate MOHID_Water_e
nvironment

(MOHID_Water_environment) C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water>



4:36 PM
ENG PTB2 5/29/2025

5. Launch Jupyter Notebook



5. Launch Jupyter Notebook

The screenshot shows a Jupyter Notebook interface running in a browser window titled "MOHID_Water.... - JupyterLab". The URL in the address bar is "localhost:8888/lab/tree/MOHID_Water.ipynb". The notebook content is titled "MOHID Water" and contains the following text:

This Jupyter Notebook aims to help implement and run the MOHID Water model.

Note 1: Execute each cell through the button from the top MENU (or keyboard shortcut `Shift + Enter`).

Note 2: Use the Kernel and Cell menus to restart the kernel and clear outputs.

Table of contents

- 1. Import required libraries
- 2. General options
 - 2.1 Set run case
 - 2.2 Load MOHID griddata
 - 2.3 Plot MOHID griddata
 - 2.4 Define a bounding box
 - 2.5 Set dates
- 3. Boundary Conditions
 - 3.1 Oceanic
 - 3.1.1 Create Copernicus Marine credentials file

At the bottom of the browser window, the status bar displays "Simple" mode, "Python 3 (ipykernel) | Idle", "Mode: Command", "Ln 1, Col 1", "MOHID_Water.ipynb", and "0" notifications. The system tray at the bottom of the screen shows various icons for battery, signal, and system status.

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb Notebook Python 3 (ipykernel)

Table of contents

- 1. Import required libraries
- 2. General options
 - 2.1 Set run case
 - 2.2 Load MOHID griddata
 - 2.3 Plot MOHID griddata
 - 2.4 Define a bounding box
 - 2.5 Set dates
- 3. Boundary Conditions
 - 3.1 Oceanic
 - 3.1.1 Create Copernicus Marine credentials file
 - 3.1.2 Set CMEMS product
 - 3.1.3 Download CMEMS
 - 3.1.4 Plot CMEMS
 - 3.2 Meteorological
 - 3.2.1 Setup the CDS API personal access token
 - 3.2.2 Download ERA5 Reanalysis
 - 3.2.3 Plot ERA5
 - 3.3 Tide
 - 3.3.1 Download FES2014.zip
 - 3.3.2 Crop FES2014.hdf5 to your grid area
 - 3.3.3 Plot a specific dataset (e.g., M2 amplitude)
 - 3.4 Rivers

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

4:48 PM 5/29/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

3.3.3 Plot a specific dataset (e.g., M2 amplitude)

3.4 Rivers

3.4.1 Download river data

3.4.2 Draw markers on the map to define the river coordinates

3.4.3 Create river data file in MOHID format

4. Setup MOHID Water input files

4.1 Model

4.2 Discharges

5. Run MOHID Water

5.1 Install MSMPI (Windows)

5.2 Start Simulation

6. Visualize results

1. Import required libraries

+ 1 cell hidden

2. General options

2.1 Set run case

+ 1 cell hidden

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

4:49 PM PTB2 5/29/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

Run this cell and advance (Shift+Enter)

1. Import required libraries

```
[ ]: import copernicusmarine
import cdsapi
import os
from ipyleaflet import Map, TileLayer, DrawControl, GeoJSON, Marker
import json
import re
import datetime
import time
import numpy as np
import xarray as xr
import matplotlib.pyplot as plt
from matplotlib.colors import Normalize, to_hex
import ipywidgets as widgets
from IPython.display import display
import pandas as pd
import shutil
import subprocess
import sys
import matplotlib as mpl
from folium.plugins import MeasureControl
import glob
import zipfile
import h5py
import requests
import mathlib
```

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 8, Col 10 MOHID_Water.ipynb 0

7

4:50 PM PTB2 5/29/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

2. General options

2.1 Set run case

```
[2]: dirpath = "run_cases"  
      name = "Coastal3D_Operational"  
  
      case_dir = (os.path.join(os.getcwd(),dirpath, name))
```

2.2 Load MOHID griddata

+ 1 cell hidden

2.3 Plot MOHID griddata

+ 1 cell hidden

2.4 Define a bounding box

+ 1 cell hidden

2.5 Set dates

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

7

4:51 PM 5/29/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

2.2 Load MOHID griddata

```
# Load grid data from file  
grid_data = "Level1.dat"  
file_path = (os.path.join(case_dir, "GeneralData\\Batim\\", grid_data))
```

grid_x_coo
y_coo
n_row
start
start
start
for l
l
p
i
e
e

Batim

OneDrive run_cases Coastal3D_Operational GeneralData Batim

New Conferências Curriculo Desktop Documents Doutoramento MOHID_Jupyter MOHID-Lagrar MyTools

Level1.dat

Simple Python 3 (ipykernel) | Idle

7

4:52 PM PTB2 5/29/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

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Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

np_x = np.array(x_grid)
np_y = np.array(y_grid)

calculate the cell spacing
dx = np.abs(np_x[0][1] - np_x[0][0])
dy = np.abs(np_y[1][0] - np_y[0][0])

print(f"Loaded grid data shape: {zi.shape}")
print(f"Maximum depth: {z_max}")
print(f"dx: {dx}")
print(f"dy: {dy}")

Extracted Dimensions: n_rows=305, n_cols=232
Grid Data Length: 70760
Loaded grid data shape: (305, 232)
Maximum depth: 256.8167
dx: 0.0030000000000001137
dy: 0.0030000000000001137

2.3 Plot MOHID griddata

+ 1 cell hidden

2.4 Define a bounding box

+ 1 cell hidden

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0 4:53 PM PTB2 5/29/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

2.3 Plot MOHID griddata

```
[ ]: x_min = np.min(np_x)
y_min = np.min(np_y)
x_max = np.max(np_x)
y_max = np.max(np_y)

#extent = [x_max, x_min, y_max, y_min]

# Expand the extent by n cells in all directions
n = 5

lon_min = x_min - n * dx
lon_max = x_max + n * dx
lat_min = y_min - n * dy
lat_max = y_max + n * dy

extent = [
    lon_min, # Left
    lon_max, # Right
    lat_min, # Bottom
    lat_max] # Top

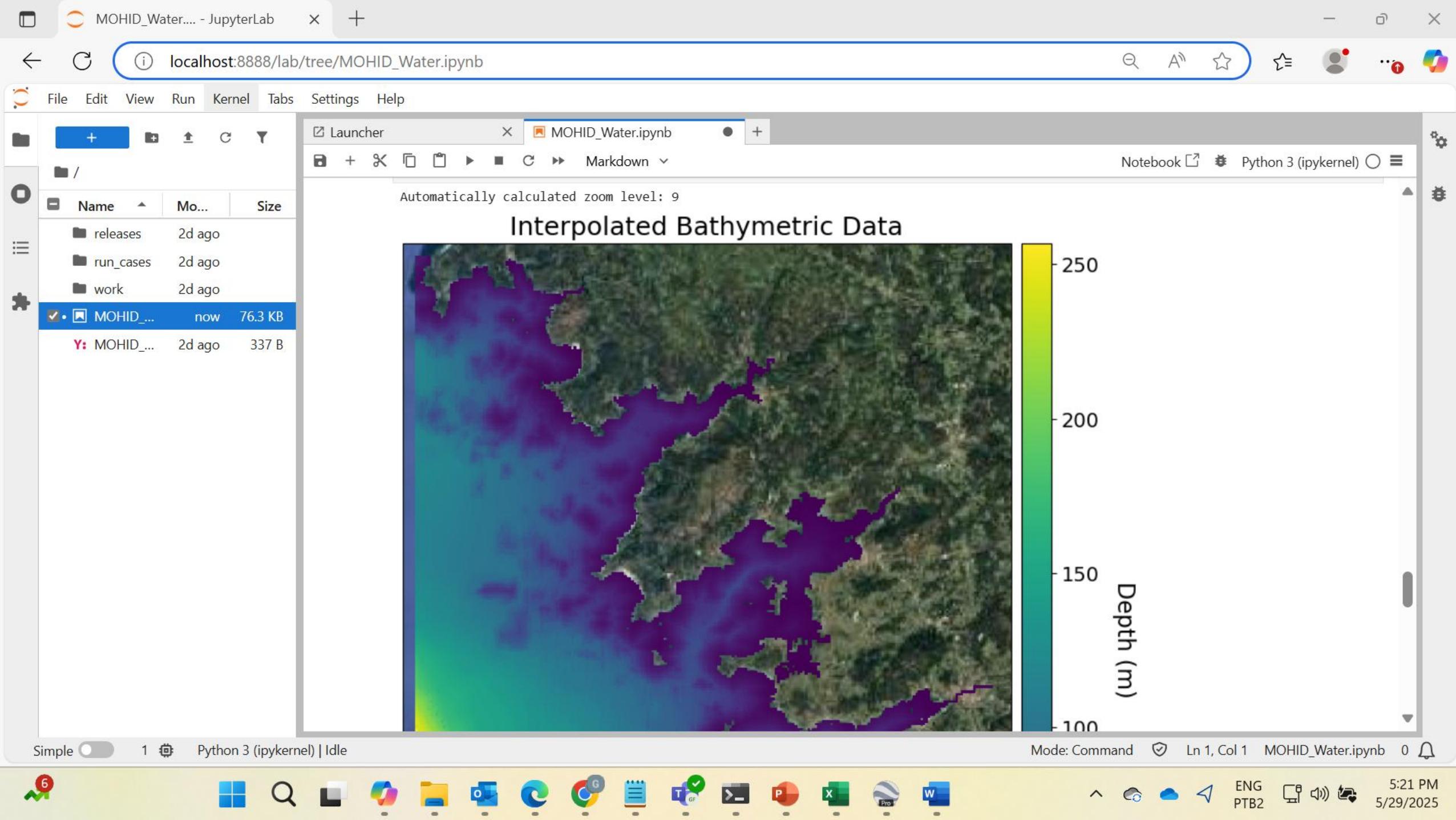
def calculate_zoom_level():
"""
Calculate zoom level based on the geographic extent.
"""

# Approximate calculation for zoom level based on extent
```

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

6

5:21 PM PTB2 5/29/2025



Coastal3D_Operational

OneDrive MOHID_Water run_cases Coastal3D_Operational

Search Coastal3D_Operational

New Sort View Set as background Rotate left Rotate right Details

Name Status Date modified Type Size

Conferências GeneralData Griddata.png

Curriculo Level_1

Desktop Documents Doutoramento

MOHID_Jupyter MOHID-Lagrar MyTools

Pictures Projetos

Guilherme - Roy

Edit

Griddata.png

Interpolated Bathymetric Data

Depth (m)

250
200
150
100
50

2198 x 2452 1 MB

3 items 1 item selected 1.03 MB Available on this device

6

5:22 PM PTB2 5/29/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

2.4 Define a bounding box

```
[5]: #Define a bounding box based on MOHID grid for boundary conditions download
np_x = np.array(x_grid)
np_y = np.array(y_grid)

c = 1.0 #degrees
min_lon=np.min(np_x)-c
min_lat=np.min(np_y)-c
max_lon=np.max(np_x)+c
max_lat=np.max(np_y)+c

print(f" Polygon Bounds:")
print(f" - min_lon (West): {min_lon}")
print(f" - min_lat (South): {min_lat}")
print(f" - max_lon (East): {max_lon}")
print(f" - max_lat (North): {max_lat}")

Polygon Bounds:
- min_lon (West): -10.302
- min_lat (South): 41.04
- max_lon (East): -7.6059991
- max_lat (North): 43.9550024
```

2.5 Set dates

+ 1 cell hidden

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

2.5 Set dates

```
[6]: #Set dates for boundary conditions download  
#Define a 5-day interval if it's the initial run for model warm-up  
start_date_str = "2025-1-1" #"%Y-%m-%d"  
end_date_str = "2025-1-6" #"%Y-%m-%d"  
  
#if daily = 1, one day per file, else just one file for the interval end_date - start_date.  
#set daily = 0 for warm-up  
daily = 0  
  
forecast = 0  
  
#The keywords below are only used if forecast = 1  
refday_to_start = 0 #0 is today, -1 yesterday, 1 tomorrow  
number_of_runs = 1 #
```

3. Boundary Conditions

+ 33 cells hidden

4. Setup MOHID Water input files

+ 5 cells hidden

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0 9:02 AM PTB2 5/30/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3. Boundary Conditions

[7]:

```
#Oceanic
backup_path_ocean = (os.path.join(case_dir, "backup", "CMEMS"))
#Meteorological
backup_path_meteo= (os.path.join(case_dir, "backup", "ERA5"))
```

3.1 Oceanic

3.2 Meteorological

3.3 Tide

3.4 Rivers

4. Setup MOHID Water input files

+ 5 cells hidden

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.1 Oceanic

3.1.1 Create Copernicus Marine credentials file

#It has to be done only once!

```
[*]: #The Login command will check your Copernicus Marine credentials and create the configuration file.  
copernicusmarine.login()
```

INFO - 2025-05-30T12:03:53Z - Downloading Copernicus Marine data requires a Copernicus Marine username and password, sign up for free at: <https://data.marine.copernicus.eu/register>

Copernicus Marine username:
↑↓ for history. Search history with c-↑/c-↓

3.1.2 Set CMEMS product

+ 1 cell hidden

3.1.3 Download CMEMS

3.1.4 Plot CMEMS

3.2 Meteorological

Simple 1 Python 3 (ipykernel) | Busy Mode: Command Ln 1, Col 51 MOHID_Water.ipynb 0 9:04 AM PTB2

9/04 AM 5/30/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.1.2 Set CMEMS product

```
#daily mean
product_id = ["cmems_mod_glo_phy-cur_anfc_0.083deg_P1D-m", "cmems_mod_glo_phy-so_anfc_0.083deg_P1D-m", "cmems_mod_glo_phy-thetao_anfc_0.083deg_P1D-m"]
start_depth = 0.49402499198913574
end_depth = 5727.9
```

3.1.3 Download CMEMS

3.1.4 Plot CMEMS

3.2 Meteorological

3.3 Tide

3.4 Rivers

4. Setup MOHID Water input files

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 5, Col 1 MOHID_Water.ipynb 0

9:05 AM 5/30/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.1.3 Download CMEMS

```
#This file can later be used as input to CMEMS2HDF5.py for operational purposes
input_file = os.path.join(os.getcwd(),"work","CMEMS","Input_CMEMS2HDF5.py")

with open(input_file, 'w') as file:
    file.write(f"backup_path={backup_path_ocean}\n")
    file.write(f"daily={daily}\n")
    file.write(f"forecast={forecast}\n")
    file.write(f"number_of_runs={number_of_runs}\n")
    file.write(f"refday_to_start={refday_to_start}\n")
    file.write(f"product_id={product_id}\n")
    file.write(f"start_depth={start_depth}\n")
    file.write(f"end_depth={end_depth}\n")
    file.write(f"min_lon={min_lon}\n")
    file.write(f"max_lon={max_lon}\n")
    file.write(f"min_lat={min_lat}\n")
    file.write(f"max_lat={max_lat}\n")
    file.write(f"start_date_str='{start_date_str}'\n")
    file.write(f"end_date_str='{end_date_str}'\n")

%cd work/CMEMS/
%run CMEMS2HDF5.py

# Return to the original directory
%cd -
```

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0 9:06 AM PTB2 5/30/2025

CMEMS

OneDrive MOHID_Jupyter-Notebooks-master MOHID_Water work CMEMS

Search CMEMS

New Sort View

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pycache

CMEMS_cur.nc

CMEMS2HDF5.py

ConvertToHdf5.bat

ConvertToHDF5Action.dat

ConvertToHDF5Action_cur.dat

ConvertToHDF5Action_so.dat

ConvertToHDF5Action_thetao.dat

ConvertToHDF5Action_zos.dat

Error_and_Messages_1.log

Input_CMEMS2HDF5.py

UsedKeyWords_1.dat

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebook...

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ? +

CMEMS2HDF5.py

```
1 import importlib
2 import Input_CMEMS2HDF5
3 importlib.reload(Input_CMEMS2HDF5)
4 from Input_CMEMS2HDF5 import *
5 import os
6 import datetime
7 import copernicusmarine
8 import shutil
9 import subprocess
10 import h5py
11 import glob

#cmems_dir = os.path.join(os.getcwd(), "work/CMEMS")
cmems_dir = os.getcwd()
print(cmems_dir)
# Define the executable path.
#exe_path = os.path.join(os.getcwd(),"releases/ConvertToHdf5", "ConvertToHdf5.exe")
exe_path = os.path.join("../..","releases","ConvertToHdf5","ConvertToHdf5.exe")

# Mapping each product into its specific subset parameters:
product_parameters = {
    "cmems_mod_glo_phy_anfc_0.083deg_PT6H-i": {"variables": ["zos"], "filename": "CMEMS_zos.nc"}, 
    "cmems_mod_glo_phy_anfc_0.083deg_PlD-m": {"variables": ["zos"], "filename": "CMEMS_zos.nc"}, 
    "cmems_mod_glo_phy-cur_anfc_0.083deg_PT6H-i": {"variables": ["uo", "vo"], "filename": "CMEMS_cur.r"}, 
    "cmems_mod_glo_phy-cur_anfc_0.083deg_PlD-m": {"variables": ["uo", "vo"], "filename": "CMEMS_cur.nc"}, 
    "cmems_mod_glo_phy-so_anfc_0.083deg_PT6H-i": {"variables": ["so"], "filename": "CMEMS_so.nc"}, 
    "cmems_mod_glo_phy-so_anfc_0.083deg_PlD-m": {"variables": ["so"], "filename": "CMEMS_so.nc"},
```

length : 8,839 lines : Ln : 1 Col : 1 Pos : 1 Unix (LF) UTF-8 IN

12 items 1 item selected 8.63 KB Available on this device

Cloud File Explorer

9:07 AM 5/30/2025 ENG PTB2

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

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Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

%cd work/CMEMS/
%run CMEMS2HDF5.py
Return to the original directory
%cd -

ooks-master\MOHID_Water\work\CMEMS\CMEMS_thetao.nc
Download successful: CMEMS_thetao.nc
Downloading: CMEMS_zos.nc for 2025-01-01 to 2025-01-06
INFO - 2025-05-30T12:10:36Z - Selected dataset version: "202406"
INFO - 2025-05-30T12:10:36Z - Selected dataset part: "default"
INFO - 2025-05-30T12:10:45Z - Starting download. Please wait...
100% [3/3 [00:02<00:00, 1.28s/it]
INFO - 2025-05-30T12:10:48Z - Successfully downloaded to C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks\MOHID_Water\work\CMEMS\CMEMS_zos.nc
ooks-master\MOHID_Water\work\CMEMS\CMEMS_zos.nc
Download successful: CMEMS_zos.nc
Executing ConvertToHDF5Action_zos.dat...
Executing ConvertToHDF5Action_cur.dat...
Executing ConvertToHDF5Action_so.dat...
Executing ConvertToHDF5Action_thetao.dat...
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water

3.1.4 Plot CMEMS

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.1.4 Plot CMEMS

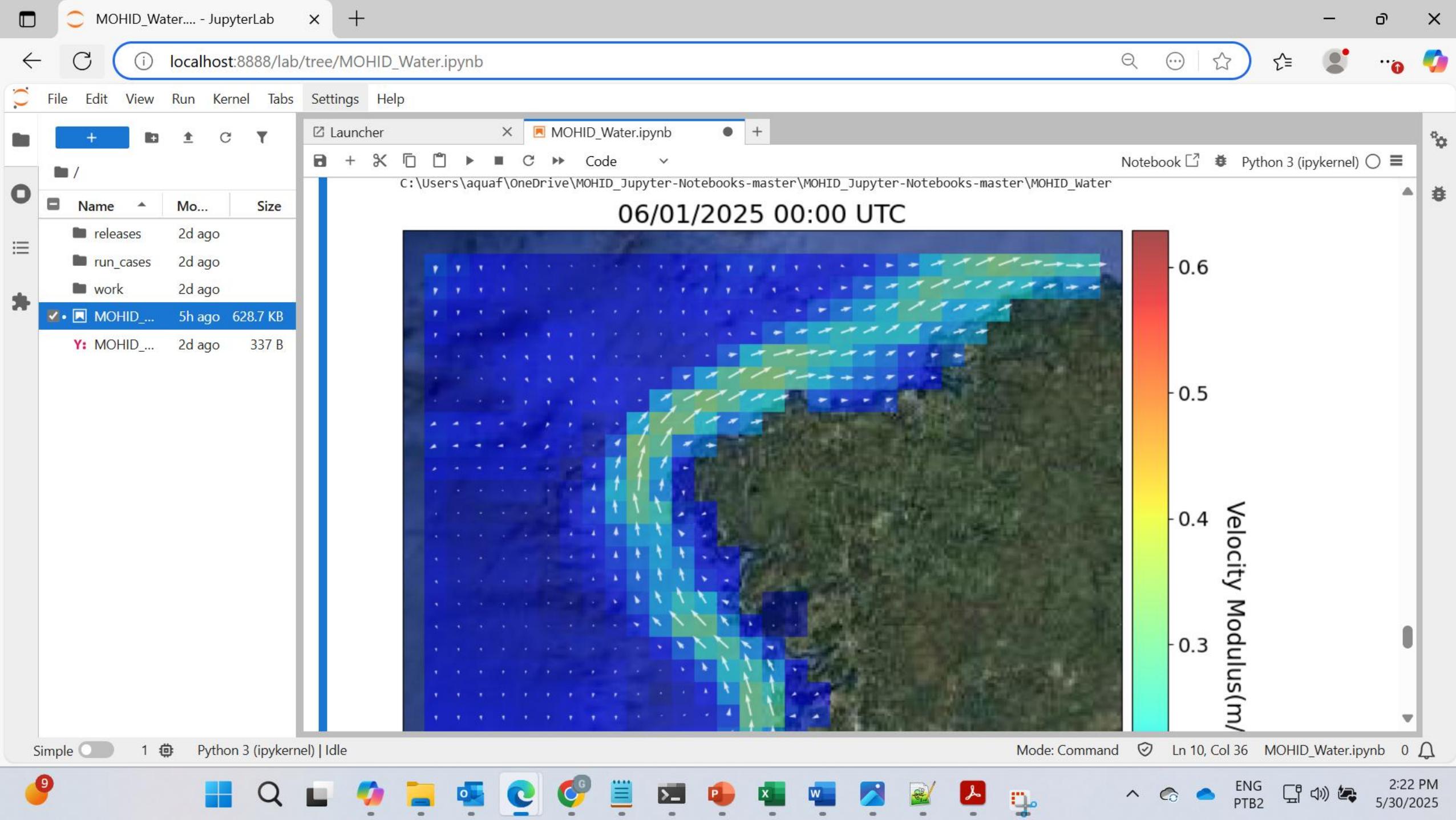
```
[*]: variable = "velocity modulus" # Change as needed  
# =====  
# DEFINE VARIABLE-LABEL DICTIONARY  
# =====  
variable_label_dict = {  
    "velocity modulus": "Velocity Modulus(m/s)",  
    "salinity": "Salinity(psu)",  
    "temperature": "Temperature(°C)",  
    "water level": "Water Level(m)"  
}  
  
variable_vector = ["velocity U", "velocity V"]  
  
label = variable_label_dict.get(variable, "Unknown Variable") # Fetch Label from dictionary  
  
# =====  
# SET-UP: Define paths and file names  
# =====  
  
start_date = datetime.strptime(start_date_str, "%Y-%m-%d").date()  
end_date = datetime.strptime(end_date_str, "%Y-%m-%d").date()  
  
if daily == 1:  
    #take the first day  
    start_date = start_date + datetime.timedelta(days = 0)
```

Simple Python 3 (ipykernel) | Busy

Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9

2:21 PM PTB2 5/30/2025



20250101_20250106 X +

OneDrive ... Coastal3D_Operational > backup > CMEMS > 20250101_20250106 > Search 20250101_20250106

New | Sort | View | ... | Details

Name	Status	Date modified	Type	Size
velocity modulus	✓	5/30/2025 2:21 PM	File folder	
CMEMS.hdf5	✓	5/30/2025 9:10 AM	HDF5 Data File	3,390 KB

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Curriculo
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9

2:23 PM PTB2 5/30/2025

velocity modulus

OneDrive > ... backup > CMEMS > 20250101_20250106 > velocity modulus

Search velocity modulus

New Sort View ...

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velocity modulus.mp4

velocity modulus_000.png

velocity modulus_001.png

velocity modulus_002.png

velocity modulus_003.png

velocity modulus_004.png

velocity modulus_005.png

velocity modulus_006.png

Desktop

Downloads

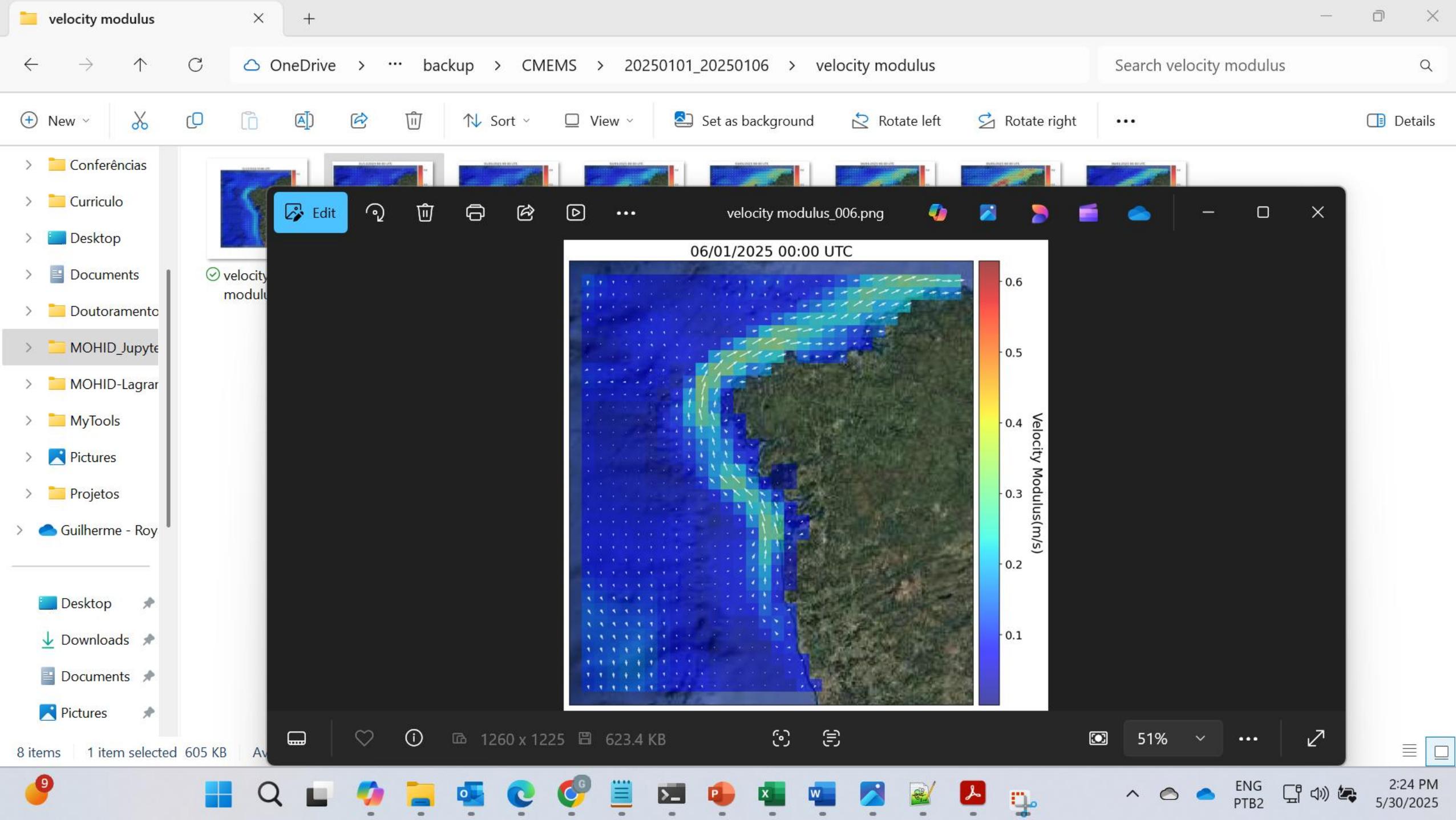
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8 items

9

2:23 PM PTB2 5/30/2025



MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.2 Meteorological

3.2.1 Setup the CDS API personal access token

It has to be done only once!

If you do not have an account yet, please register (<https://cds.climate.copernicus.eu/>). If you are not logged in, please login. Once logged in, copy the URL and key.

Create a file named .cdsapirc in your home directory.

\$HOME/.cdsapirc (in your Unix/Linux environment)

%USERPROFILE%.cdsapirc file (in your windows environment, %USERPROFILE% is usually located at C:\Users\Username folder).

Paste the URL and key into .cdsapirc file.

The CDS API expects to find the .cdsapirc file in your home directory.

3.2.2 Download ERA5 Reanalysis

3.2.3 Plot ERA5

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

7

2:26 PM 5/30/2025



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https://cds.climate.copernicus.eu/datasets



2:27 PM
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velocity modulus		aquaf										
This PC > OS (C:) > Users > aquaf >												Search aquaf
												Details
+	New											
Name	Date modified	Type	Size									
Desktop	2/28/2025 3:14 PM	BASH_HISTORY File	1 KB									
Downloads	4/11/2025 3:46 PM	PYTHON_HISTORY File	1 KB									
Documents	2/28/2025 3:11 PM	GITCONFIG File	1 KB									
Pictures	4/22/2025 3:29 PM	CDSAPIRC File	1 KB									
Music	4/22/2025 3:01 PM	CONDARC File	1 KB									
Videos												
data												
MOHID_Preproc												
UserGuides												
Tide												
Royal Haskoning												
This PC												
Network												
39 items	1 item selected	85 bytes										
8												



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2:30 PM
5/30/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

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Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.2.2 Download ERA5 Reanalysis

```
[*]: #This file can later be used as input to ERA5HDF5.py for operational purposes
input_file = os.path.join(os.getcwd(),"work","ERA5","Input_ERA5HDF5.py")

with open(input_file, 'w') as file:
    file.write(f"backup_path={backup_path_meteo}\n")
    file.write(f"daily={daily}\n")
    file.write(f"forecast={forecast}\n")
    file.write(f"number_of_runs={number_of_runs}\n")
    file.write(f"refday_to_start={refday_to_start}\n")
    file.write(f"min_lon={min_lon}\n")
    file.write(f"max_lon={max_lon}\n")
    file.write(f"min_lat={min_lat}\n")
    file.write(f"max_lat={max_lat}\n")
    file.write(f"start_date_str='{start_date_str}'\n")
    file.write(f"end_date_str='{end_date_str}'\n")

%cd work/ERA5/
%run ERA5HDF5.py

# Return to the original directory
%cd -
```

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\work\ERA5

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\work\ERA5

2025-05-30 17:30:57,301 INFO [2024-09-26T00:00:00] Watch our [Forum](<https://forum.ecmwf.int/>) for Announcements, news and other discussion topics

Simple Python 3 (ipykernel) | Busy Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9 2:31 PM 5/30/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

Code

file.write(f"\"daily={daily}\n")
file.write(f"\"forecast={forecast}\n")
file.write(f"\"number_of_runs={number_of_runs}\n")
file.write(f"\"refday_to_start={refday_to_start}\n")
file.write(f"\"min_lon={min_lon}\n")
file.write(f"\"max_lon={max_lon}\n")
file.write(f"\"min_lat={min_lat}\n")
file.write(f"\"max_lat={max_lat}\n")
file.write(f"\"start_date_str='{start_date_str}'\n")
file.write(f"\"end_date_str='{end_date_str}'\n")

%cd work/ERA5/
%run ERA52HDF5.py

Return to the original directory
%cd -

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\work\ERA5
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\work\ERA5

2025-05-30 17:30:57,301 INFO [2024-09-26T00:00:00] Watch our [Forum](<https://forum.ecmwf.int/>) for Announcements, news and other discussed topics.

2025-05-30 17:30:58,284 INFO Request ID is 339ede48-3315-484b-b21f-fc2cbd2ce083
2025-05-30 17:30:58,531 INFO status has been updated to accepted
2025-05-30 17:31:20,967 INFO status has been updated to running
2025-05-30 17:33:52,916 INFO status has been updated to successful
Download completed successfully!
Files extracted to C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\work\ERA5
Executing ConvertToHDF5Action_instant.dat...
Executing ConvertToHDF5Action_accum.dat...
Executing ConvertToHDF5Action_avg.dat...
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 14, Col 10 MOHID_Water.ipynb 0

9+ 1 ENG PTB2 3:01 PM 5/30/2025

MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

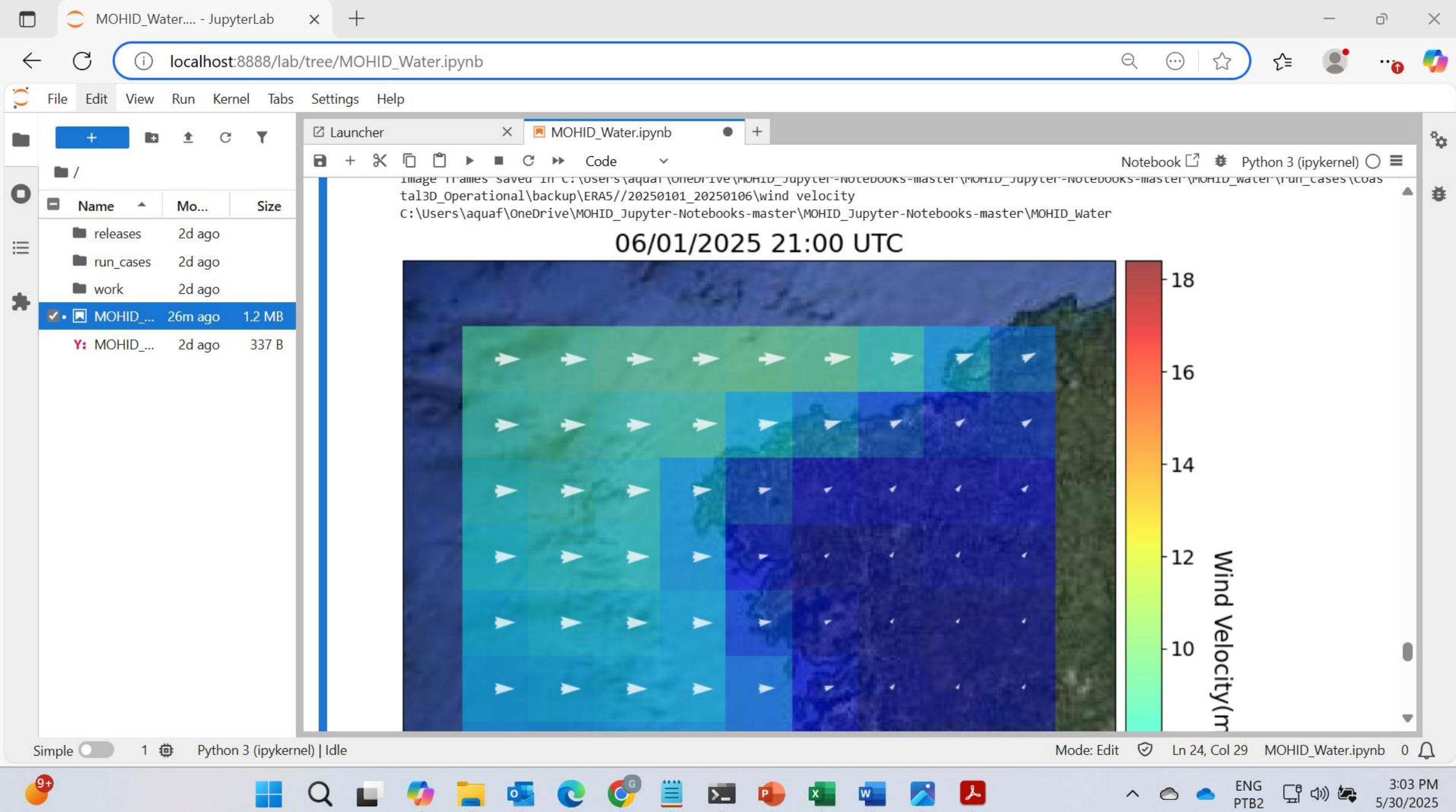
Notebook Python 3 (ipykernel)

3.2.3 Plot ERA5

```
[*]: variable = "wind velocity" # Change as needed  
# =====  
# VARIABLE-LABEL DICTIONARY  
# =====  
variable_label_dict = {  
    "wind velocity": "Wind Velocity(m/s)",  
    "air temperature": "Temperature(°C)",  
    "solar radiation": "Solar Radiation(W/m²)",  
    "albedo": "Albedo(-)",  
    "atmospheric pressure": "Atmospheric Pressure(Pa)",  
    "cloud cover": "Cloud Cover(-)",  
    "dew point": "dew point(°C)",  
    "downward long wave radiation": "Downward Long Wave Radiation(W/m²)",  
    "pbl height": "Pbl Height(m)",  
    "precipitation": "Precipitation(mm/h)",  
    "relative humidity": "Relative humidity(-)"  
}  
  
variable_vector = ["wind velocity X", "wind velocity Y"]  
  
label = variable_label_dict.get(variable, "Unknown Variable") # Fetch Label from dictionary  
# =====  
# SET-UP: Define paths and file names  
# =====  
  
start date = datetime.datetime.strptime(start date str, "%Y-%m-%d").date()
```

Simple Python 3 (ipykernel) | Busy Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9+ 1 ENG PTB2 3:02 PM 5/30/2025



20250101_20250106 X +

OneDrive ... Coastal3D_Operational > backup > ERA5 > 20250101_20250106 >

Search 20250101_20250106

New | Details

Name	Status	Date modified	Type	Size
wind velocity	✓	5/30/2025 3:03 PM	File folder	
Meteo.hdf5	✓	5/30/2025 2:34 PM	HDF5 Data File	6,893 KB

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9+

3:04 PM PTB2 5/30/2025

wind velocity

OneDrive backup ERA5 20250101_20250106 wind velocity Search wind velocity

New Sort View Details

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Wind velocity plots (3 rows, 10 columns)

1st row:

- wind velocity.mp4
- wind velocity_000.png
- wind velocity_001.png
- wind velocity_002.png
- wind velocity_003.png
- wind velocity_004.png
- wind velocity_005.png
- wind velocity_006.png
- wind velocity_007.png
- wind velocity_008.png

2nd row:

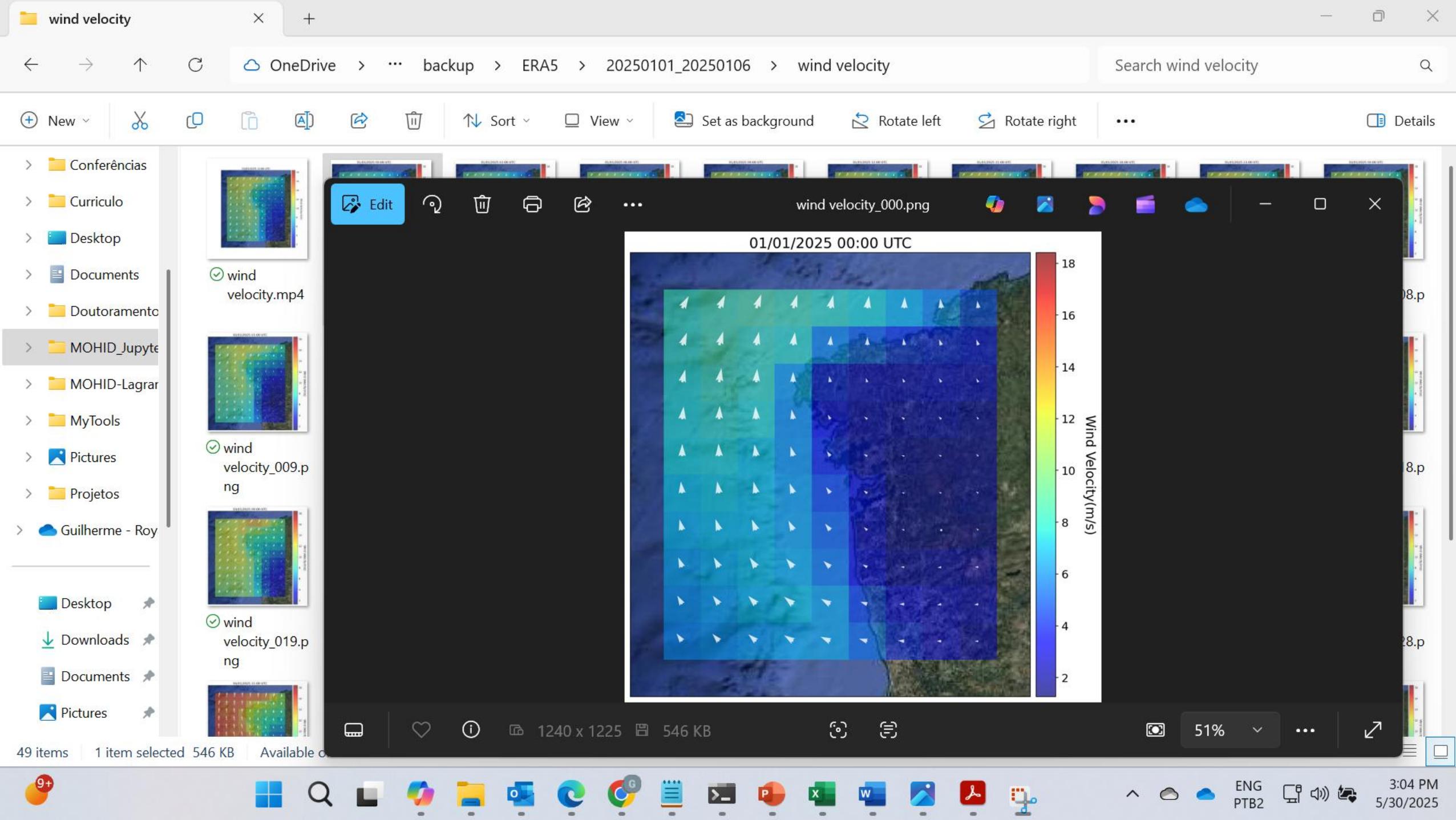
- wind velocity_009.png
- wind velocity_010.png
- wind velocity_011.png
- wind velocity_012.png
- wind velocity_013.png
- wind velocity_014.png
- wind velocity_015.png
- wind velocity_016.png
- wind velocity_017.png
- wind velocity_018.png

3rd row:

- wind velocity_019.png
- wind velocity_020.png
- wind velocity_021.png
- wind velocity_022.png
- wind velocity_023.png
- wind velocity_024.png
- wind velocity_025.png
- wind velocity_026.png
- wind velocity_027.png
- wind velocity_028.png

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- PowerPoint
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- Network
- File History
- System
- 3:04 PM
- ENG PTB2



MOHID_Water.... - JupyterLab

localhost:8888/lab/tree/MOHID_Water.ipynb

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Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.3 Tide

3.3.1 Download FES2014.zip

It has to be done only once!

```
# URL of the ZIP file.
url = "http://www.mohid.com/PublicData/Products/Software/FES2014.zip"

# Define paths using pathlib for cross-platform compatibility.
home_dir = pathlib.Path.home()
local_zip_path = home_dir / "FES2014.zip"
extract_dir = home_dir / "FES2014"

def download_file(url, save_path):
    try:
        response = requests.get(url, stream=True)
        response.raise_for_status() # Raise exception for HTTP errors
        total_size = int(response.headers.get('content-length', 0))

        with open(save_path, 'wb') as f, tqdm(
            desc="Downloading",
            total=total_size,
            unit='B',
            unit_scale=True,
            unit_divisor=1024
        ) as bar:
            for chunk in response.iter_content(chunk_size=8192):
```

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0 9+ 3:05 PM PTB2 5/30/2025

wind velocity FES2014

← → ↑ ↻ This PC > OS (C:) > Users > aquaf > FES2014

Search FES2014

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Name Date modified Type Size

FES2014.hdf5 10/3/2024 9:36 AM HDF5 Data File 9,182,283 KB

1 item

9+

4:09 PM 5/30/2025

MOHID_Water.... - JupyterLab Privacy error

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb Notebook Python 3 (ipykernel)

3.3.2 Crop FES2014.hdf5 to your grid area

```
[*]: # Provide paths to your input (original) and output (cropped) HDF5 files.
home_dir = pathlib.Path.home()
input_file = home_dir / "FES2014" / 'FES2014.hdf5'
output_file = os.path.join(case_dir, r"GeneralData/BoundaryConditions/FES2014/FES2014.hdf5")

def get_bbox_indices(lon_arr, lat_arr, min_lon, max_lon, min_lat, max_lat):
    """
    Given 2D longitude and latitude arrays, compute the row and column indices
    corresponding to the region defined by the geographic bounding box.

    Parameters:
        lon_arr : 2D numpy array of longitudes.
        lat_arr : 2D numpy array of latitudes.
        min_lon, max_lon : float, desired longitude limits.
        min_lat, max_lat : float, desired latitude limits.

    Returns:
        A tuple (row_start, row_end, col_start, col_end) for slicing.
    """

    # Create a boolean mask selecting grid cells within the bounding box.
    mask = (lon_arr >= min_lon) & (lon_arr <= max_lon) &
           (lat_arr >= min_lat) & (lat_arr <= max_lat)

    if not np.any(mask):
        raise ValueError("No grid points fall within the provided bounding box.")
```

Simple Python 3 (ipykernel) | Busy Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0 9+ 4:10 PM PTB2 5/30/2025

FES2014 FES2014

OneDrive Coastal3D_Operational GeneralData BoundaryConditions FES2014 Search FES2014

New Sort View Details

	Name	Status	Date modified	Type	Size
>	Conferências				
>	Curriculo	FES2014.hdf5		5/30/2025 4:10 PM	HDF5 Data File
>	Desktop				
>	Documents				
>	Doutoramento				
>	MOHID_Jupyter				
>	MOHID-Lagrar				
>	MyTools				
>	Pictures				
>	Projetos				
>	Guilherme - Roy				

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1 item

9+ 4:11 PM PTB2 5/30/2025

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localhost:8888/lab/tree/MOHID_Water.ipynb

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Launcher MOHID_Water.ipynb

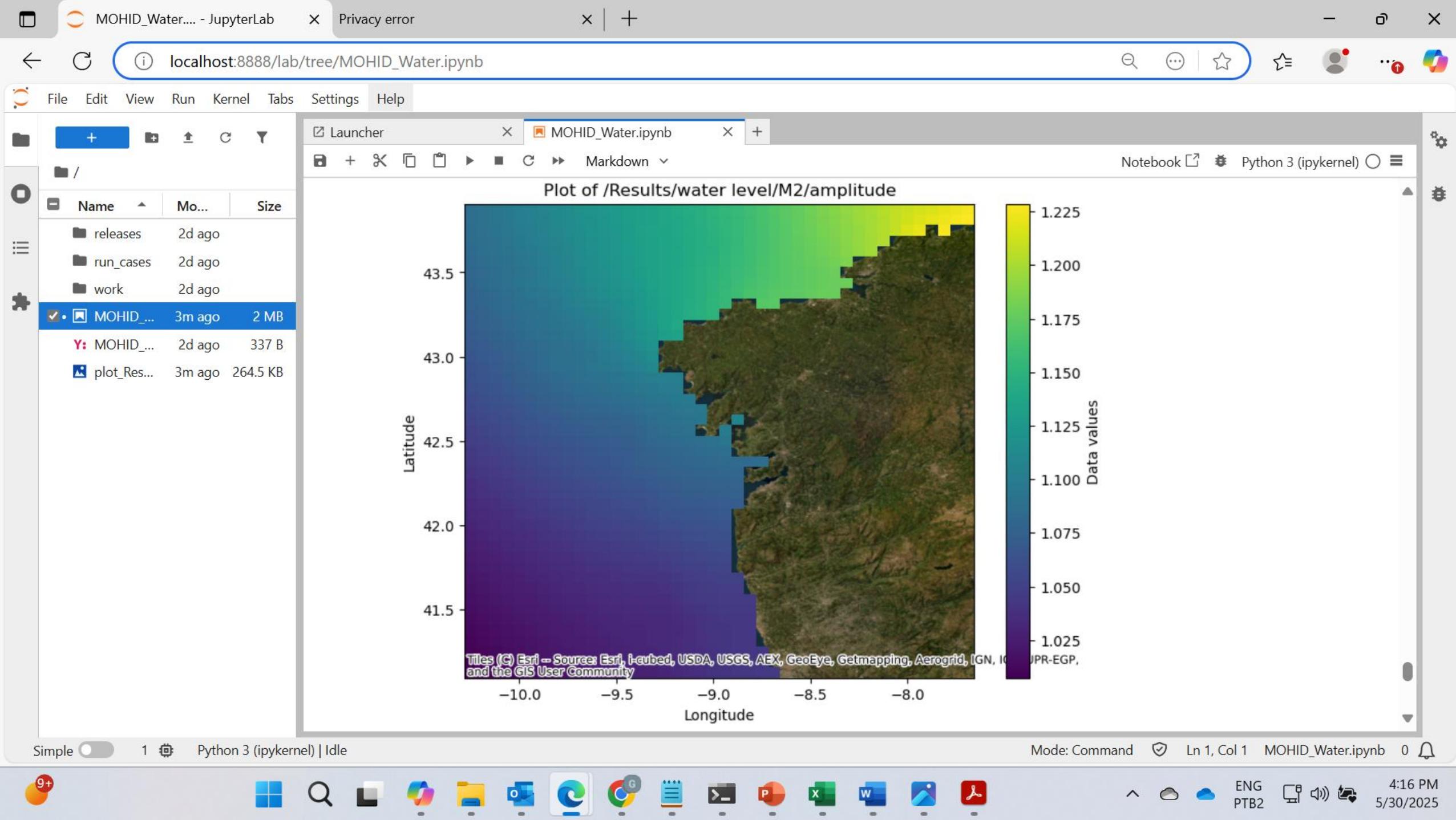
Notebook Python 3 (ipykernel)

3.3.3 Plot a specific dataset (e.g., M2 amplitude)

```
[24]: # Specify the HDF5 file path and dataset key.  
dir_path_fes = os.path.join(case_dir, "GeneralData/BoundaryConditions/FES2014/")  
file_path = os.path.join(dir_path_fes, "FES2014.hdf5")  
dataset_key = '/Results/water level/M2/amplitude' # Update as needed.  
  
with h5py.File(file_path, 'r') as f:  
    data = f[dataset_key][()]  
    print(f"Loaded dataset '{dataset_key}' with shape {data.shape}.")  
  
    # Mask invalid values below -99.  
    data = np.ma.masked_where(data < -99, data)  
    print("Applied mask for values below -99.")  
  
    # Construct an output filename based on the dataset key.  
    output_filename = f"plot_{dataset_key.strip('/').replace('/', '_)}.png"  
    print(f"Output image filename will be: {output_filename}")  
  
    lon_arr = f["Grid/Longitude"][()]  
    lat_arr = f["Grid/Latitude"][()]  
    print(f"Found coordinate arrays with shapes {lon_arr.shape} and {lat_arr.shape}.")  
  
    # Set up the figure and axis.  
    fig, ax = plt.subplots(figsize=(8, 6))  
  
    # Draw the data with pcolormesh.  
    mesh = ax.pcolormesh(lon_arr, lat_arr, data, shading='auto', cmap='viridis', zorder=2)
```

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9+ 4:29 PM PTB2 5/30/2025



FES2014 FES2014

OneDrive Coastal3D_Operational GeneralData BoundaryConditions FES2014 Search FES2014

New Sort View Set as background Rotate left Rotate right Details

Conferências FES2014.hdf5 plot_Results_water level_M2_amplitude.png

Edit plot_Results_water level_M2_amplitude.png

Plot of /Results/water level/M2/amplitude

Latitude

Longitude

Data values

1.225
1.200
1.175
1.150
1.125
1.100
1.075
1.050
1.025

Titles (C) Esri -- Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP-EGP, and the GIS User Community

2 items 1 item selected 264 KB Available on this device

9+ 4:29 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab Privacy error

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.4 Rivers

Go to the link below to get river's ID (comid) from GEOGLOWS River Forecast System:

<https://hydroviewer.geogloows.org/#lon=10.00&lat=18.00&zoom=3.00&definition=>

3.4.1 Download river data

+ 1 cell hidden

3.4.2 Draw markers on the map to define the river coordinates

+ 2 cells hidden

3.4.3 Create river data file in MOHID format

+ 1 cell hidden

4. Setup MOHID Water input files

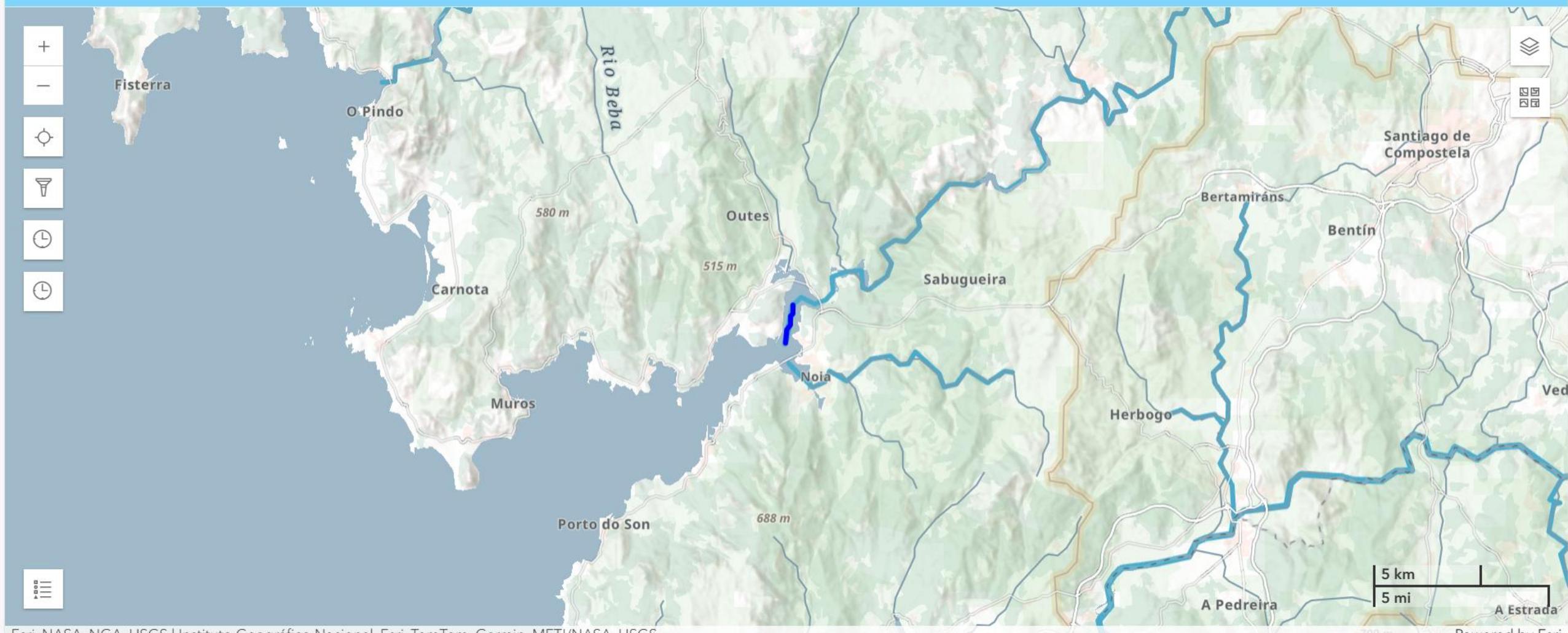
+ 5 cells hidden

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

GEOGLOWS River Forecast System



GEOGLOWS River Forecast System



Esri, NASA, NGA, USGS | Instituto Geográfico Nacional, Esri, TomTom, Garmin, METI/NASA, USGS

Powered by Esri

MOHD_Water.... - JupyterLab River Forecast System

https://hydroviewer.geogloWS.org/#lon=-8.90&lat=42.81&zoom=11.00&definition=

GEOGLOWS River Forecast System

River ID: 230182503

Forecast ✓ Retrospective ✓ Enter River ID 05/30/2025

Retrospective Simulation for River: 230182503

1 Year 5 Years 10 Years 30 Years All

Daily Average Monthly Average

charge (m³/s)

Use Bias Corrected?

SAVE FORECAST DATA (CSV) SAVE RETROSPECTIVE DATA (CSV) CLOSE

5 km 5 mi A Pedreira A Estrada

Esri, NASA, NGA, USGS | Instituto Geográfico Nacional, Esri, TomTom, Garmin, METI/NASA, USGS

Powered by Esri

9+ 4:33 PM PTB2

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.4.1 Download river data

```
# Define a unique identifier. This ID will be used to retrieve the corresponding hydrological data.
comid = 230182503 #change as needed

discharge_path = (os.path.join(case_dir, "GeneralData", "Discharges"))

# Define the initial date as timezone-aware (UTC)
initial_river_date = pd.Timestamp("2015-01-01", tz="UTC")

simulated_df = geoglops.data.retrospective(comid)
simulated_df.index = pd.to_datetime(simulated_df.index)

# Replace negative values with zero
simulated_df[simulated_df < 0] = 0

# Filter the DataFrame to include only data from initial_date onward
simulated_df = simulated_df[simulated_df.index >= initial_river_date]

# Reformat the index to remove time-of-day components while keeping timezone info
simulated_df.index = simulated_df.index.to_series().dt.strftime("%Y-%m-%d")
simulated_df.index = pd.to_datetime(simulated_df.index).tz_localize('UTC')

# Export the filtered DataFrame to CSV
simulated_df.to_csv(os.path.join(discharge_path, "{}_retrospective_data.csv".format(comid)))

# Generate and show the retrospective plot
hydroviewer_figure = geoglops.plots.retrospective(simulated_df)
```

Simple Python 3 (ipykernel) | Idle Mode: Edit Ln 2, Col 9 MOHID_Water.ipynb 0

9+ 4:34 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

+ /

Name Mo... Size

- releases 2d ago
- run_cases 2d ago
- work 2d ago
- MOHID_Water.ipynb** now 6 MB
- Y: MOHID_Water.ipynb 2d ago 337 B

Launcher MOHID_Water.ipynb +

Code

```
simulated_df.index = pd.to_datetime(simulated_df.index).tz_localize('UTC')

# Export the filtered DataFrame to CSV
simulated_df.to_csv(os.path.join(discharge_path, "{}_retrospective_data.csv".format(comid)))

# Generate and show the retrospective plot
hydroviewer_figure = geogloWS.plots.retrospective(simulated_df)
hydroviewer_figure.show()
```

Notebook Python 3 (ipykernel)

Retrospective Streamflow Simulation

Download plot as a png

Streamflow (m^3/s)

2016 2018 2020 2022 2024

3.4.2 Draw markers on the map to define the river coordinates

+ 2 cells hidden

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 9, Col 50 MOHID_Water.ipynb 0

9+ 4:36 PM 5/30/2025

Clouds ENG PTB2

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

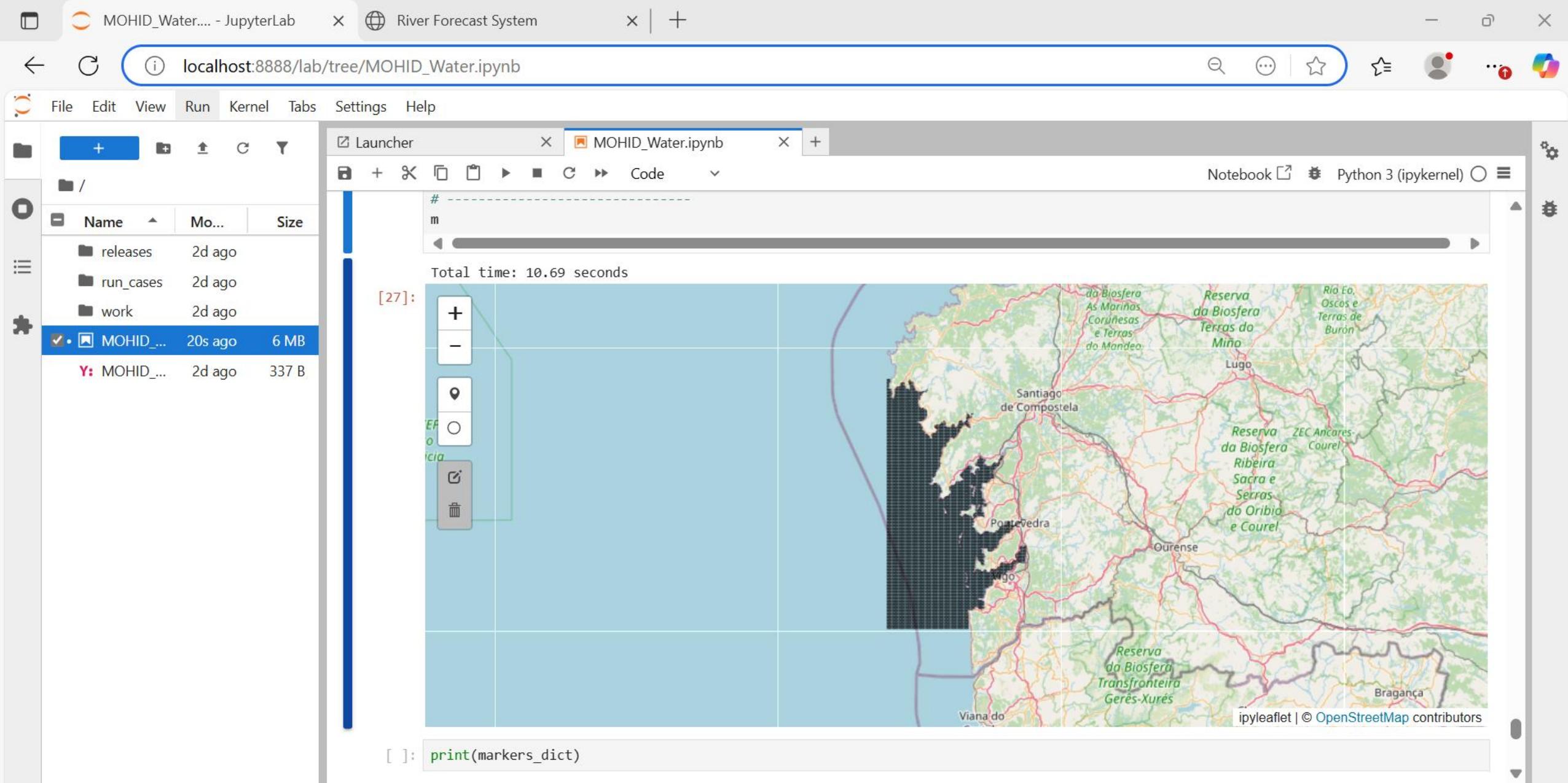
Notebook Python 3 (ipykernel)

3.4.2 Draw markers on the map to define the river coordinates

```
[27]: import matplotlib.colors as mcolors  
  
# Start timing  
start_time = time.time()  
  
LonGrid = np.array(x_grid)  
LatGrid = np.array(y_grid)  
min_lon, max_lon = LonGrid.min(), LonGrid.max()  
min_lat, max_lat = LatGrid.min(), LatGrid.max()  
  
# Create an Output widget to capture the callback prints  
output = widgets.Output()  
display(output)  
  
# -----  
# Create the map.  
m = Map(center=(LatGrid.mean(), LonGrid.mean()), zoom=8)  
marker = None # For interactive marker  
  
# Store the block (batch) Layers in a dictionary, keyed by (block_row, block_col).  
block_layers = {}  
  
# Set a block (batch) size. (This controls the spatial grouping.)  
block_size = 10 # Adjust as needed.  
  
# Precompute grid cell corners (for all cells).  
# These arrays are of shape (M-1, N-1) if LonGrid and LatGrid are shape (M, N).
```

Simple Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9+ 4:41 PM PTB2 5/30/2025



MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Total time: 10.69 seconds

[27]:

Draw a marker

[]:

```
print(markers_dict)
```

localhost:8888/lab/tree/MOHID_Water.ipynb# nel | Idle

Mode: Command

Ln 18, Col 40 MOHID_Water.ipynb 0

9+ 4:42 PM 5/30/2025

MOHID_Water.... - JupyterLab × River Forecast System × +

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

+ /

Name Mod... Size

- releases 2d ago
- run_cas... 2d ago
- work 2d ago
- MOHID... 20s ago 6 MB**
- Y: MOHID... 2d ago 337 B

Launcher MOHID_Water.ipynb +

Notebook Python 3 (ipykernel)

River name: Tambre

River ID: 230182503

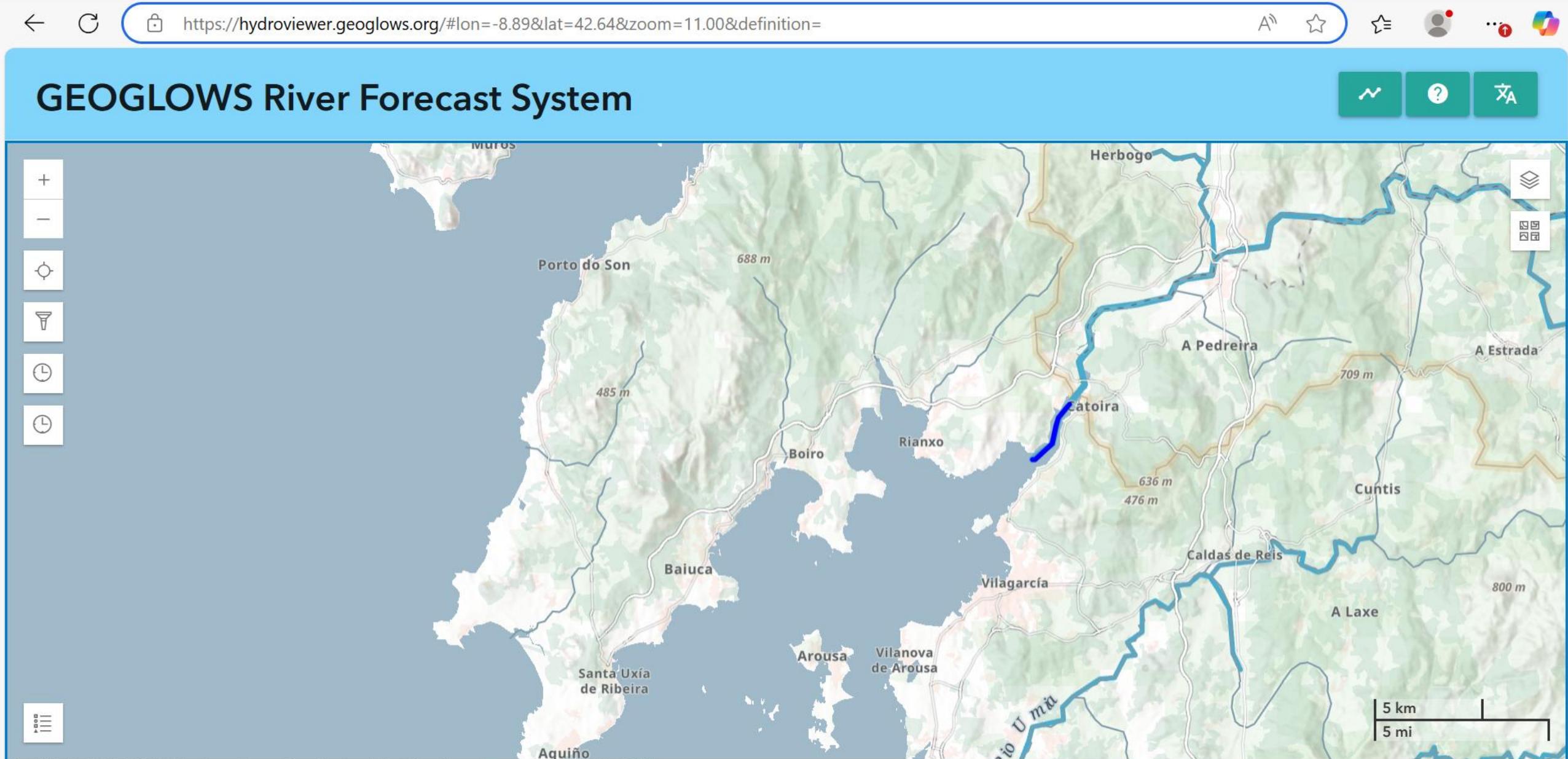
Confirm

Total time: 10.69 s Confirm

[27]:

Simple 1 Python 3 (ipykernel) | Idle Mode: Command Ln 18, Col 40 MOHID_Water.ipynb 0

9+ ⚡ 4 ENG PTB2 4:43 PM 5/30/2025



Esri, NASA, NGA, USGS | Instituto Geográfico Nacional, Esri, TomTom, Garmin, METI/NASA, USGS

Powered by Esri



4:37 PM
ENG
PTB2
5/30/2025

GEOGLOWS River Forecast System

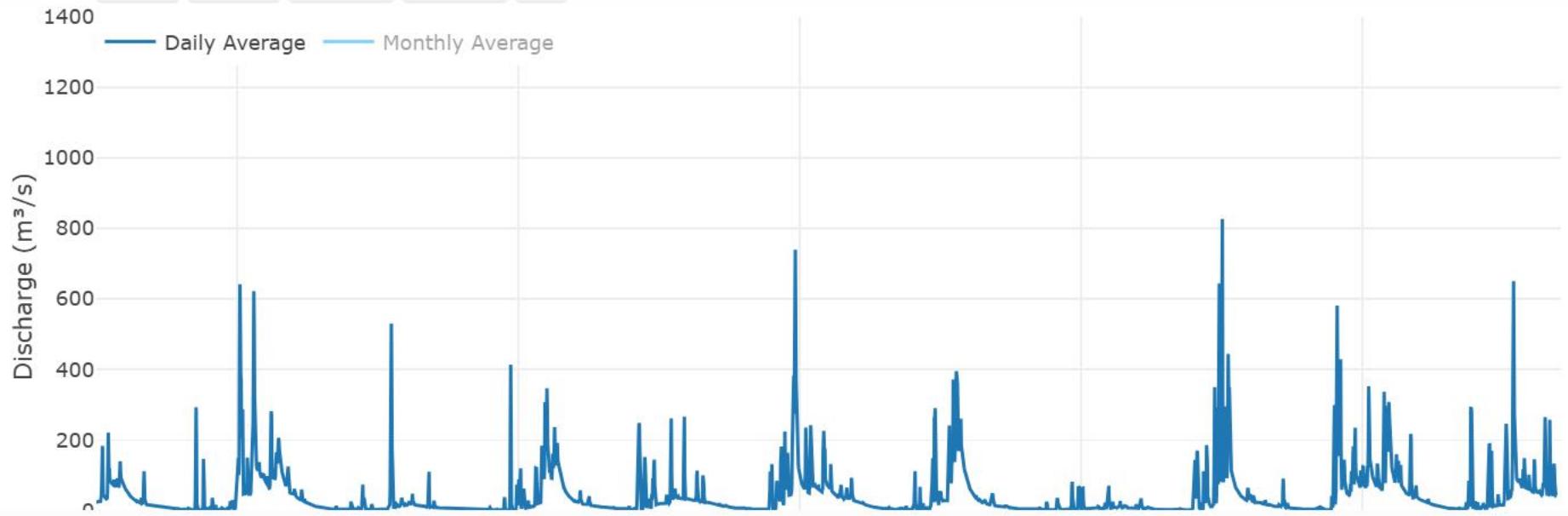
230161838

Forecast✓

Retrospective✓

Enter River ID

05/30/2025


 Use Bias Corrected?

SAVE FORECAST DATA (CSV)

SAVE RETROSPECTIVE DATA (CSV)

CLOSE

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.4.1 Download river data

```
[25]: # Define a unique identifier. This ID will be used to retrieve the corresponding hydrological data.
comid = 230161838 #change as needed

discharge_path= (os.path.join(case_dir, "GeneralData","Discharges"))

# Define the initial date as timezone-aware (UTC)
initial_river_date = pd.Timestamp("2015-01-01", tz="UTC")

simulated_df = geoglobs.data.retrospective(comid)
simulated_df.index = pd.to_datetime(simulated_df.index)

# Replace negative values with zero
simulated_df[simulated_df < 0] = 0

# Filter the DataFrame to include only data from initial_date onward
simulated_df = simulated_df[simulated_df.index >= initial_river_date]

# Reformat the index to remove time-of-day components while keeping timezone info
simulated_df.index = simulated_df.index.to_series().dt.strftime("%Y-%m-%d")
simulated_df.index = pd.to_datetime(simulated_df.index).tz_localize('UTC')

# Export the filtered DataFrame to CSV
simulated_df.to_csv(os.path.join(discharge_path, "{}_retrospective_data.csv".format(comid)))

# Generate and show the retrospective plot
hydroviewer_figure = geoglobs.plots.retrospective(simulated_df)
hydroviewer_figure.show()
```

Simple Python 3 (ipykernel) | Idle Mode: Edit Ln 2, Col 9 MOHID_Water.ipynb 0

9+ 4:39 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

Export the filtered DataFrame to CSV
simulated_df.to_csv(os.path.join(discharge_path, "{}_retrospective_data.csv".format(comid)))

Generate and show the retrospective plot
hydroviewer_figure = geoglobs.plots.retrospective(simulated_df)
hydroviewer_figure.show()

Streamflow (m³/s)

Datetime (UTC +00:00)

3.4.2 Draw markers on the map to define the river coordinates

+ 2 cells hidden

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

+ /

Name Mod... Size

- releases 2d ago
- run_cas... 2d ago
- work 2d ago
- MOHID... 20s ago 6 MB**
- Y: MOHID... 2d ago 337 B

[27]:

River name: Ulla

River ID: 230161838

Confirm

Total time: 10.69 s

Confirm

ipyleaflet | © OpenStreetMap contributors

Simple 1 Python 3 (ipykernel) | Idle

Mode: Command Ln 18, Col 40 MOHID_Water.ipynb 0

9+ 4:44 PM PTB2 5/30/2025

File Edit View Run Kernel Tabs Settings Help

+ /

Name Mod... Size

- releases 2d ago
- run_cas... 2d ago
- work 2d ago
- MOHID... 20s ago 6 MB**
- Y: MOHID... 2d ago 337 B

[27]:

River name: Ulla

River ID: 230161838

Confirm

Total time: 10.69 s

Confirm

ipyleaflet | © OpenStreetMap contributors

Simple 1 Python 3 (ipykernel) | Idle

Mode: Command Ln 18, Col 40 MOHID_Water.ipynb 0

9+ 4:44 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

TOTAL TIME: 10.05 SECONDS

[27]:

A map of the region around Galicia, Spain, showing the coastline and inland river network. Five specific locations are marked with blue pins: Tambre, Ulla, Umia, Lerez, and Verdugo. The map includes place names like Negreira, Santiago de Compostela, Melide, Palas de Rei, Sarria, Chantada, Monforte de Lemos, Ourense, Pontevedra, Marín, Ponte Caldelas, Redondela, Vigo, Ponteareas, Ribadavia, Allariz, and Cuntis.

[32]: `print(markers_dict)`

```
{0: {'location': [42.827131, -8.874738], 'name': 'Tambre', 'river_id': '230182503'}, 1: {'location': [42.67707, -8.724964], 'name': 'Ulla', 'river_id': '230161838'}, 2: {'location': [42.500172, -8.80892], 'name': 'Umia', 'river_id': '230109620'}, 3: {'location': [42.43999, -8.614011], 'name': 'Lerez', 'river_id': '230107447'}, 4: {'location': [42.307586, -8.610746], 'name': 'Verdugo', 'river_id': '230112893'}}
```

Simple 1 Python 3 (ipykernel) | Idle Saving started Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9

4:55 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.4.3 Create river data file in MOHID format

```
[ ]: import pandas as pd

for marker_id, marker_data in markers_dict.items():
    # Extract river_id with a default value if missing.
    river_id = marker_data.get("river_id", "unknown")

    # Generate filenames using f-strings.
    csv_filename = os.path.join(discharge_path, "{}_retrospective_data.csv".format(river_id))
    dat_filename = os.path.join(discharge_path, "{}_river_data.dat".format(river_id))

    print(csv_filename, dat_filename)

    # Additional variables
    time_units = "HOURS"

    serie_initial_data = initial_river_date.strftime("%Y %m %d") + " 0 0 0"

    # Get the river name from the marker data, defaulting if missing.
    river_name = marker_data.get("name", "Unnamed River")

    # markers_dict[marker_id]['location'] is assumed to be [lat, lon] so that:
    coord_x = marker_data['location'][1] # Longitude
    coord_y = marker_data['location'][0] # Latitude

    # For debugging: print out the variables:
    print(f"River Name: {river_name}")
```

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9

4:56 PM PTB2 5/30/2025

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Name	Mod...	Size
releases	2d ago	
run_cas...	2d ago	
work	2d ago	
MOHID...	now	6 MB
Y: MOHID...	2d ago	337 B

Launcher MOHID_Water.ipynb +

Markdown Notebook Python 3 (ipykernel)

```
print(f"DAT file '{dat_filename}' has been created.")
```

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230182503_retrospective_data.csv C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230182503_river_data.dat
River Name: Tambre
Coordinates: (-8.874738, 42.827131)
DAT file 'C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230182503_river_data.dat' has been created.
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230161838_retrospective_data.csv C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230161838_river_data.dat
River Name: Ulla
Coordinates: (-8.724964, 42.67707)
DAT file 'C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230161838_river_data.dat' has been created.
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230109620_retrospective_data.csv C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230109620_river_data.dat
River Name: Umia
Coordinates: (-8.80892, 42.500172)
DAT file 'C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230109620_river_data.dat' has been created.
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230107447_retrospective_data.csv C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230107447_river_data.dat
River Name: Lerez
Coordinates: (-8.614011, 42.43999)
DAT file 'C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230107447_river_data.dat' has been created.
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230112893_retrospective_data.csv C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\GeneralData\Discharges\230112893_river_data.dat

OneDrive > ... run_cases > Coastal3D_Operational > GeneralData > Discharges Search Discharges

New ▾ Sort ▾ View ▾ Details

	Name	Status	Date modified	Type	Size
>	Conferências				
>	Curriculo		5/30/2025 4:52 PM	Microsoft Excel Com...	2,860 KB
>	Desktop		5/30/2025 4:56 PM	DAT File	1,072 KB
>	Documents		5/30/2025 4:48 PM	Microsoft Excel Com...	2,855 KB
>	Doutoramento		5/30/2025 4:56 PM	DAT File	1,067 KB
>	MOHID_Jupyter		5/30/2025 4:54 PM	Microsoft Excel Com...	2,838 KB
>	MOHID-Lagrar		5/30/2025 4:57 PM	DAT File	1,050 KB
>	MyTools		5/30/2025 4:39 PM	Microsoft Excel Com...	2,898 KB
>	Pictures		5/30/2025 4:56 PM	DAT File	1,110 KB
>	Projetos		5/30/2025 4:35 PM	Microsoft Excel Com...	2,881 KB
>	Guilherme - Roy		5/30/2025 4:56 PM	DAT File	1,093 KB
	Desktop				
	Downloads				
	Documents				
	Pictures				

10 items

4:58 PM
ENG
PTB2
5/30/2025

Discharges FES2014

OneDrive run_cases Coastal3D_Operational GeneralData Discharges

Search Discharges

New Sort View

Conferências
Curriculo
Desktop
Documents
Doutoramento
MOHID_Jupyter
MOHID-Lagrar
MyTools
Pictures
Projetos
Guilherme - Roy

Name

230107447_retrospective_data.csv
230107447_river_data.dat
230109620_retrospective_data.csv
230109620_river_data.dat
230112893_retrospective_data.csv
230112893_river_data.dat
230161838_retrospective_data.csv
230161838_river_data.dat
230182503_retrospective_data.csv
230182503_river_data.dat

Details

C:\Users\aguaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebook...

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ? +

230107447_river_data.dat

```
1 TIME_UNITS: HOURS
2 SERIE_INITIAL_DATA: 2015 01 01 0 0 0
3 NAME : Lerez
4 COORD_X : -8.614011
5 COORD_Y : 42.43999
6
7 Date Flow_Modulus_[m3/s]
8 <BeginTimeSerie>
9 0 5.84
10 1 5.84
11 2 5.84
12 3 5.84
13 4 5.84
14 5 5.84
15 6 5.84
16 7 5.84
17 8 5.85
18 9 5.89
19 10 5.96
20 11 6.0
21 12 6.02
22 13 6.05
23 14 6.09
```

length : 1,096,898 lir Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 IN

10 items 1 item selected 1.04 MB Available on this device

9 4:58 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

4. Setup MOHID Water input files

```
[22]: continuous = 0 # if initial run continuous=0, else continuous=1

data_dir = os.path.join(case_dir, "Level_1", "data")
exe_dir = os.path.join(case_dir, "Level_1", "exe")
results_dir = os.path.join(case_dir, "Level_1", "res")

if not os.path.exists(results_dir):
    os.makedirs(results_dir)

if continuous == 0:
    nomfich = os.path.join(data_dir, "Nomfich_1.dat")
    run_dir = os.path.join(results_dir, "run1")
else:
    nomfich = os.path.join(data_dir, "Nomfich_2.dat")
    run_dir = os.path.join(results_dir, "run2")

if not os.path.exists(run_dir):
    os.makedirs(run_dir)

shutil.copy(nomfich, os.path.join(exe_dir, "Nomfich.dat"))

[22]: 'C:\\\\Users\\\\aquaf\\\\OneDrive\\\\MOHID_Jupyter-Notebooks-master\\\\MOHID_Jupyter-Notebooks-master\\\\MOHID_Water\\\\run_cases\\\\Coastal3D_Operational\\\\Level_1\\\\exe\\\\Nomfich.dat'
```

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#4.2-Discharges

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

4.1 Model

```
[42]: courant = 5

# calculate the cell spacing
dx = np.abs(np_x[0][1] - np_x[0][0])
dy = np.abs(np_y[1][0] - np_y[0][0])

velocity = (z_max*9.81)**0.5
dy_meters = dy * 111320 # Approximate meters per degree latitude
dt = courant*dy_meters/velocity

def find_nearest_divisor(n, dt):
    divisors = [i for i in range(1, n+1) if n % i == 0]
    return min(divisors, key=lambda x: abs(x - dt))

n = 86400
dt = find_nearest_divisor(n, dt)

print(f"Computed velocity: {velocity} m/s")
print(f"Computed dy: {dy_meters} m")
print(f"Computed dt: {dt} s")

def write_dt(file_name, dt):
    # Read all lines from the file
    with open(file_name, 'r') as file:
        file_lines = file.readlines()
```

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

9

5:11 PM PTB2 5/30/2025

data

X +

← → ↑ ↻ OneDrive > ... MOHID_Water > run_cases > Coastal3D_Operational > Level_1 > data Search data

New ▾

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MOHID-Lagrar

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26 items | 1 item selected 92 bytes | Available on this device

Name

GOTM_1.dat

GOTM_2.dat

Hydrodynamic_1.dat

Hydrodynamic_2.dat

InterfaceSedimentWater_1.dat

InterfaceSedimentWater_2.dat

InterfaceWaterAir_1.dat

InterfaceWaterAir_2.dat

Model_1.dat

Model_2.dat

Nomfich_1.dat

Nomfich_2.dat

Turbulence_1.dat

Turbulence_2.dat

WaterProperties_1.dat

WaterProperties_2.dat

Sort ▾

View ▾

...

C:\Users\aguaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebook... File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ? +

Model_1.dat

1 START : 2025 01 01 0 0 0

2 END : 2025 01 06 0 0 0

3 DT : 32

4

5

6

7

length : 92 lines : 7 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 IN

5/27/2025 3:40 PM DAT File 2 KB

9

5:13 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#4.2-Discharges

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb Notebook Python 3 (ipykernel)

4.2 Discharges

```
def write_discharge(input_file_discharge):
    with open(input_file_discharge, 'w') as file:
        # Write header lines
        file.write("IGNORE_ON : 1\n")
        if continuous == 0:
            file.write("SLOW_START : 43200\n")

        for marker_id, marker_data in markers_dict.items():
            # Extract river_id with a default value if missing.
            river_id = marker_data.get("river_id", "unknown")

            # Get the river name from the marker data, defaulting if missing.
            river_name = marker_data.get("name", "Unnamed River")

            # markers_dict[marker_id]['location'] is assumed to be [lat, lon]:
            coord_x = marker_data['location'][1] # Longitude
            coord_y = marker_data['location'][0] # Latitude

            file.write("<begindischarge>\n")

            file.write(f"NAME : {river_name}\n")
            file.write(f"K_CELL : 1\n")
            file.write(f"COORD_X : {coord_x}\n")
            file.write(f"COORD_Y : {coord_y}\n")
            file.write("VERTICAL_DISCHARGE : 5\n")
```

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0 5:13 PM PTB2 5/30/2025

data

X +

← → ↑ C OneDrive > ... MOHID_Water > run_cases > Coastal3D_Operational > Level_1 > data Search data

+ New X Duplicar Ajustar Excluir Subir

Name

- Conferências
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- Documents
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- MOHID_Jupyter
- MOHID-Lagrar
- MyTools
- Pictures
- Projetos
- Guilherme - Roy

Desktop Downloads Documents Pictures

Assimilation_1.dat

Assimilation_2.dat

Atmosphere_1.dat

Atmosphere_2.dat

Discharges_1.dat

Discharges_2.dat

Free Vertical Movement_1.dat

Free Vertical Movement_2.dat

Geometry_1.dat

Geometry_2.dat

GOTM_1.dat

GOTM_2.dat

Hydrodynamic_1.dat

Hydrodynamic_2.dat

InterfaceSedimentWater_1.dat

length : 3,363 lines : 128 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) ANSI IN

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ? + ▾

Discharges_1.dat

```
1 IGNORE_ON : 1
2 SLOW_START : 432000
3 <begin discharge>
4 NAME : Tambre
5 K_CELL : 1
6 COORD_X : -8.874738
7 COORD_Y : 42.827131
8 VERTICAL_DISCHARGE : 5
9 DATA_BASE_FILE : ../../GeneralData/Discharges/230182503_river_data.d
10 FLOW_COLUMN : 2
11
12 <<begin property>>
13 NAME : salinity
14 UNITS : psu
15 DEFAULTVALUE : 0.01
16 <<end property>>
17
18 <<begin property>>
19 NAME : temperature
20 UNITS : °C
21 DEFAULTVALUE : 10
22 !TIME_SERIE_COLUMN : 2
23 !FILENAME : ../../GeneralData/Discharges/River1Temp.dat
24 <<end property>>
25
26 <end discharge>
27
```

9 5:17 PM 5/30/2025 ENG PTB2

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#4.2-Discharges

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

5.1 Install MSMPI (Windows)

It has to be done only once!

```
[47]: # Define the URL for MSMPI
msmpi_url = "https://www.microsoft.com/en-us/download/details.aspx?id=57467"
download_command = f"powershell Invoke-WebRequest -Uri {msmpi_url} -OutFile MSMpiSetup.exe"

# Run the command
subprocess.run(download_command, shell=True)

install_command = "MSMpisetup.exe /quiet /norestart"
subprocess.run(install_command, shell=True)

check_command = "mpiexec -help"
subprocess.run(check_command, shell=True)

[47]: CompletedProcess(args='mpiexec -help', returncode=0)
```

5.2 Start Simulation

+ 1 cell hidden

6. Visualize results

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Command Ln 7, Col 1 MOHID_Water.ipynb 0 5:19 PM PTB2 5/30/2025

9

5:19 PM PTB2 5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#4.2-Discharges

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

5.2 Start Simulation

```
#print("Number of CPU cores:", os.cpu_count())
#np = os.cpu_count() - 2 #number of parallel processes you want to launch
np = 6

release = (os.path.join(os.getcwd(),"releases","MOHIDWater_v24.10_x64_MPI","MOHIDWater_v24.10_x64_MPI.exe"))
DomainConsolidation = (os.path.join(os.getcwd(),"releases","MOHIDWater_v24.10_x64_MPI","DomainConsolidation.exe"))

backup_path = (os.path.join(case_dir, "backup"))
boundary_conditions_dir = (os.path.join(case_dir, "GeneralData", "BoundaryConditions"))

file_name_meteo = "Meteo.hdf5"
file_hydro = "CMEMS.hdf5"

xmart_path = os.path.join(os.getcwd(),"work","XMART")

#This file can later be used as input to XMART.py for operational purposes
input_file = os.path.join(xmart_path,"Input_XMART.py")

with open(input_file, 'w') as file:
    file.write(f"release={release}\n")
    file.write(f"DomainConsolidation={DomainConsolidation}\n")
    file.write(f"np={np}\n")
    file.write(f"backup_dir={backup_path}\n")
    file.write(f"dir_meteo={backup_path_meteo}\n")
    file.write(f"dir_hydro={backup_path_ocean}\n")
```

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Command Ln 9, Col 88 MOHID_Water.ipynb 0 5:19 PM PTB2 9

9

5/30/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#4.2-Discharges

File Edit View Run Kernel Tabs Settings Help

+ C Launcher MOHID_Water.ipynb +

C:\WINDOWS\system32\cmd. +

```
Get meteo from: C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\backup\ERA5//20250101_20250106//Meteo.hdf5
Get oceanic boundary conditions from: C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\backup\CMEMS//20250101_20250106//CMEMS.hdf5
(MOHID_Water_environment) C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\run_cases\Coastal3D_Operational\Level_1\exe>mpiexec -np 6 "C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\releases\MOHIDWater_v24.10_x64_MPI\MOHIDWater_v24.10_x64_MPI.exe" 1>>mohid.log 2>&1
```

Simple

9

5:24 PM 5/30/2025

exe

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MO... search exe Details

+ New × OneD 1167 1168 1169 Running MOHID, please wait... 1170 Running MOHID, please wait... 1171 Running MOHID, please wait... 1172 Running MOHID, please wait... 1173 Running MOHID, please wait... 1174 Running MOHID, please wait... 1175 1176 1177 1178 1179 1180 ILS, IUS, JLS, JUS 0 306 0 233 1181 ----Current Simulation Instant----- 1182 Time Instant : 2025: 1: 1: 0:24: 0 1183 1184 1185 ----CPU Time----- 1186 Elapsed : 62s 1187 Remaining (aprox.) : 18622s 1188 Completed (%) : 0.3333 1189 Coeficient CPU / Model : 0.0433 1190 Seconds per Iteration : 1.3834s 1191 1192 ----System Time----- 1193 System time : 2025: 5:30:17:33:37 1194 End of the run : 2025: 5:30:22:43:59 1195

length : 47,813 lines : 1,290 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 IN

UsedKeyWord_5.dat 5/30/2025 5:30 PM DAT File 3 KB

UsedKeyWords_5.dat 5/30/2025 5:30 PM DAT File 2 KB

16 items 1 item selected 46.6 KB Sync pending

9 5:34 PM PTB2

exe

X +

← → ↑ C Start OneDrive > ... run_cases > Coastal3D_Operational > Level_1 > exe Search exe

+ New X D A ↻

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MOHID_Jupyter

MOHID-Lagrar

MyTools

Pictures

Projetos

Guilherme - Roy

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Pictures

Name

Error_and_Messages_1.log

Error_and_Messages_2.log

Error_and_Messages_3.log

Error_and_Messages_4.log

Error_and_Messages_5.log

Error_and_Messages_6.log

mohid.log

Nomfich.dat

run.bat

Tree.dat

UsedKeyWords_1.dat

UsedKeyWords_2.dat

UsedKeyWords_3.dat

UsedKeyWords_4.dat

UsedKeyWords_5.dat

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MO... File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ? + X

mohid.log

23361 ----- MOHID -----
23362 ----- MOHID -----
23363
23364
23365 Program Mohid Water successfully terminated
23366
23367
23368 Total Elapsed Time : 16655.04 4h 37min 35s
23369
23370 Total CPU time : 6800.09
23371
23372 ----- MOHID -----
23373 CPU usage (%) : 40.83
23374
23375
23376 Program Mohid Water successfully terminated
23377
23378 Workcycle Elapsed Time : 16507.36
23379
23380
23381 Total Elapsed Time : 16655.05 4h 37min 35s
23382
23383 ----- MOHID -----
23384 Total CPU time : 12115.69
23385
23386
23387 Program Mohid Water successfully terminated
23388 Program Mohid Water successfully terminated
23389 Workcycle CPU time : 6683.56

length : 722,362 lines : 23,475 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 IN

16 items 1 item selected 705 KB Available on this devi

9:55 AM 6/1/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

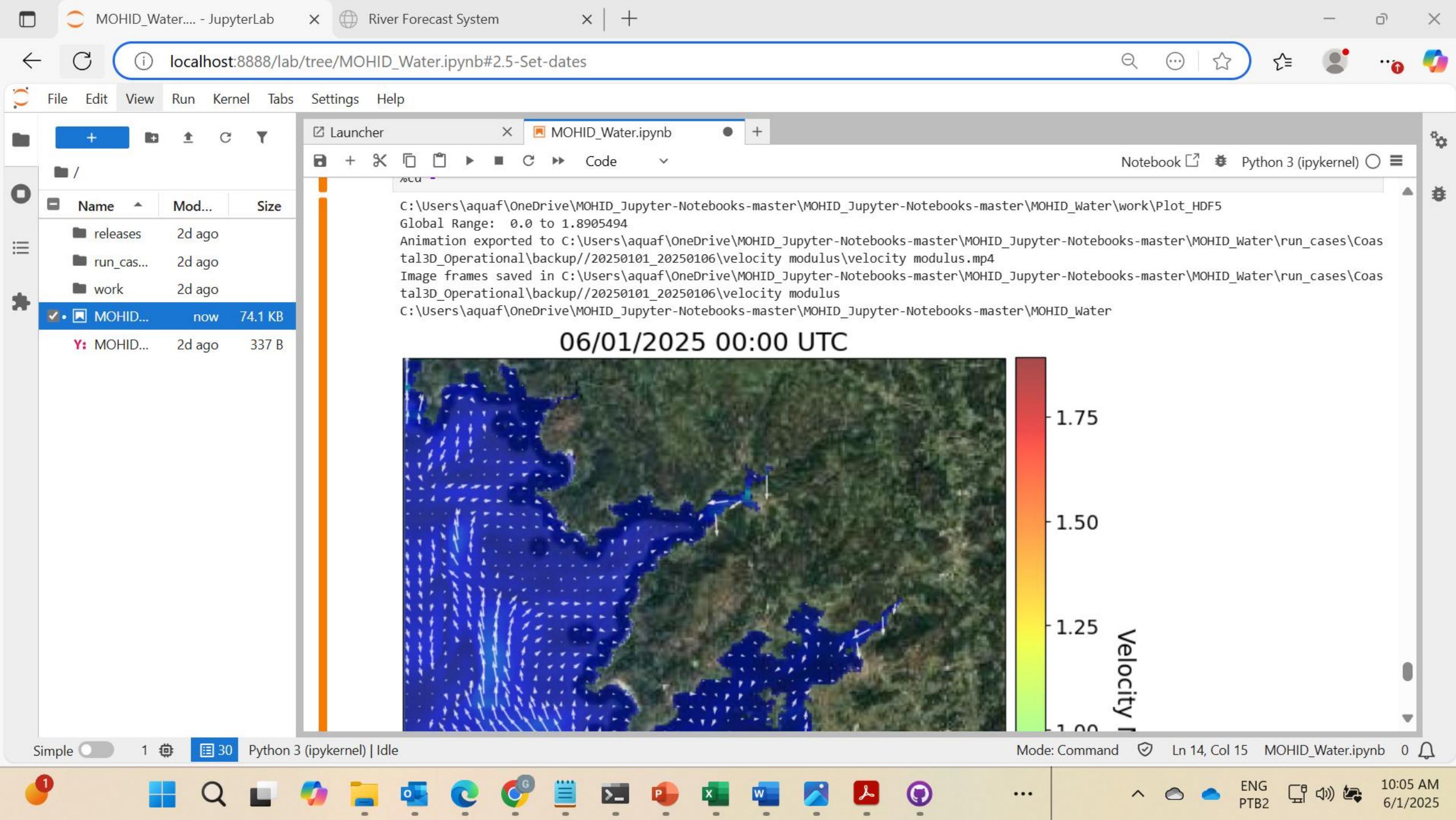
6. Visualize results

```
[8]: variable = "velocity modulus" # Change as needed  
  
# =====  
# DEFINE VARIABLE-LABEL DICTIONARY  
# =====  
variable_label_dict = {  
    "velocity modulus": "Velocity Modulus(m/s)",  
    "salinity": "Salinity(psu)",  
    "temperature": "Temperature(°C)",  
    "water level": "Water Level(m)"  
}  
  
# User-specified parameters for skipping time steps, adjusting extent, vectors, etc.  
skip_time = 1 # Sample every nth time step  
extent_cells = 1 # Number of extra cells added to the plot extent  
increase_zoom_level = 1 # Increase computed zoom level by this amount to improve background image resolution  
skip_vector = 5 # Skip factor when plotting vectors (to reduce clutter)  
vector_scale = 10 # Scale for the current vector arrows  
vector_color = 'white' # Color for the wind vectors  
transparency_factor = 0.5  
dpi = 150 #specify the DPI  
  
# Option to enable or disable vector overlay and image frame saving  
show_vectors = True # Set to False to disable wind vectors in the animation  
save_frames = True # Set to False to disable saving individual image frames
```

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Edit Ln 25, Col 82 MOHID_Water.ipynb 0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

10:04 AM 6/1/2025



20250101_20250106 X +

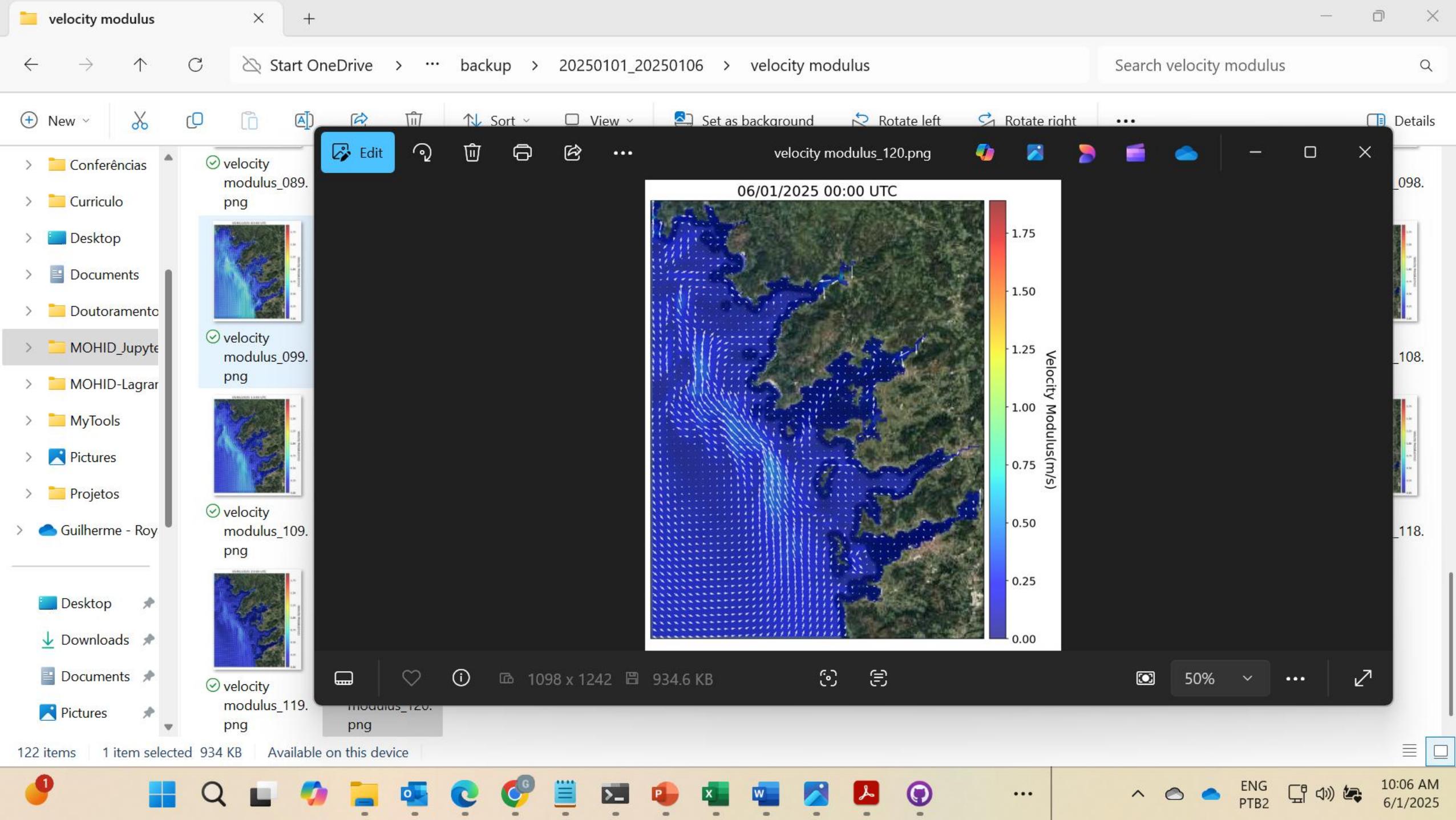
← → ↑ ↻ Start OneDrive ⌂ Coastal3D_Operational > backup > 20250101_20250106 > Search 20250101_20250106

New Sort View ... Details

Name	Status	Date modified	Type	Size
Conferências				
Curriculo	velocity modulus	6/1/2025 10:03 AM	File folder	
Desktop	Assimilation_1.hdf5	5/30/2025 10:13 PM	HDF5 Data File	55,226 KB
Documents	Atmosphere_1.hdf5	5/30/2025 10:13 PM	HDF5 Data File	236,784 KB
Doutoramento	GOTM_1.fin	5/30/2025 10:13 PM	FIN File	32,002 KB
MOHID_Jupyter	Hydrodynamic_1.fin	5/30/2025 10:13 PM	FIN File	94,946 KB
MOHID-Lagrar	Hydrodynamic_1.hdf5	5/30/2025 10:13 PM	HDF5 Data File	157,607 KB
MyTools	Hydrodynamic_1_Surface.hdf5	5/30/2025 10:13 PM	HDF5 Data File	128,215 KB
Pictures	InterfaceWaterAir_1.hdf5	5/30/2025 10:13 PM	HDF5 Data File	2,718 KB
Projetos	Turbulence_1.hdf5	5/30/2025 10:13 PM	HDF5 Data File	330,427 KB
Guilherme - Roy	WaterProperties_1.fin5	5/30/2025 10:13 PM	FIN5 File	27,303 KB
	WaterProperties_1.hdf5	5/30/2025 10:13 PM	HDF5 Data File	48,334 KB
Desktop	WaterProperties_1_Surface.hdf5	5/30/2025 10:13 PM	HDF5 Data File	92,649 KB

12 items

1 Microsoft Edge 20250101_20250106 ... ^ ⌂ ENG PTB2 10:05 AM 6/1/2025



MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

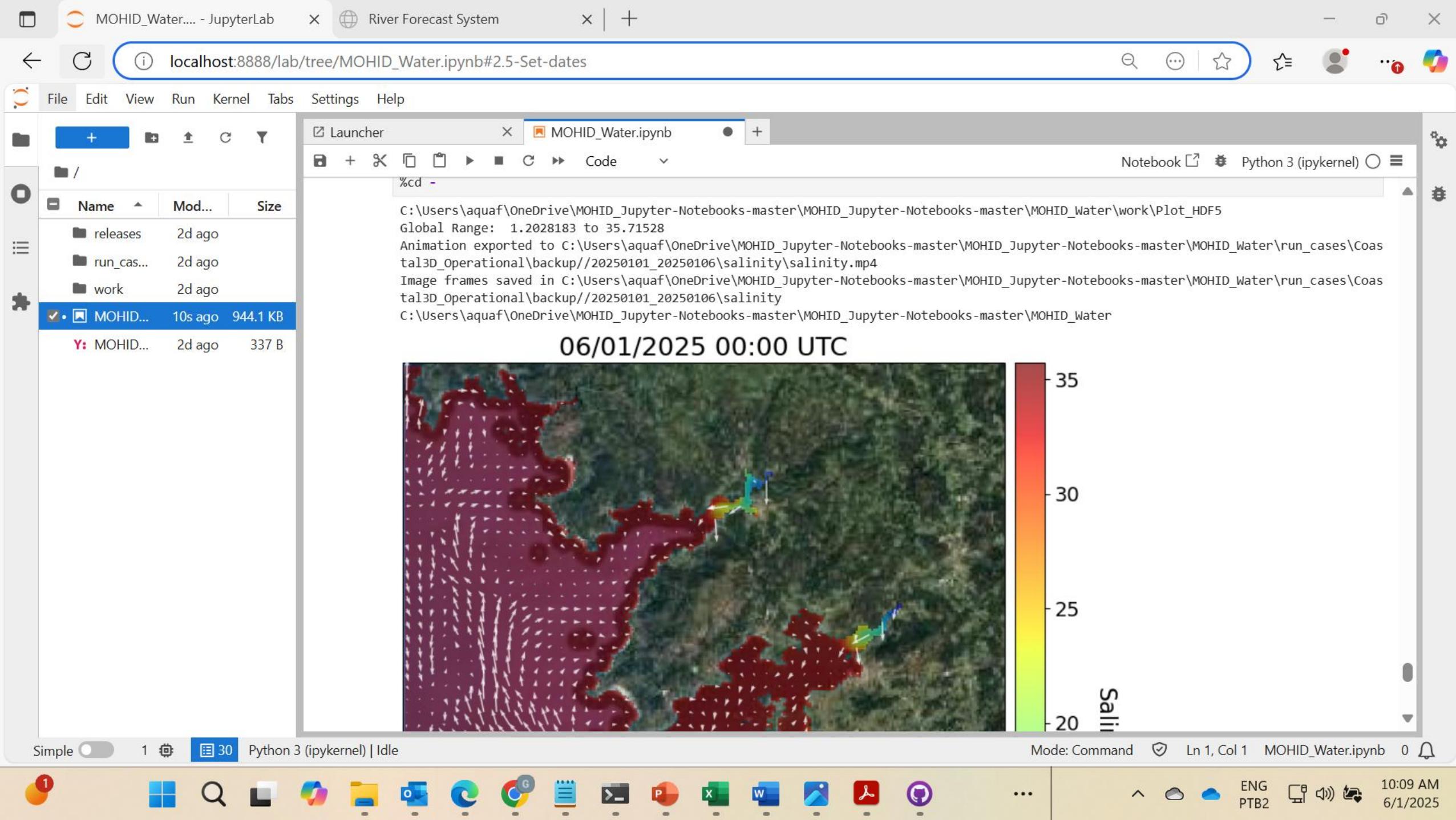
Notebook Python 3 (ipykernel)

6. Visualize results

```
[8]: variable = "salinity" # Change as needed  
  
# =====  
# DEFINE VARIABLE-LABEL DICTIONARY  
# =====  
variable_label_dict = {  
    "velocity modulus": "Velocity Modulus(m/s)",  
    "salinity": "Salinity(psu)",  
    "temperature": "Temperature(°C)",  
    "water level": "Water Level(m)"  
}  
  
# User-specified parameters for skipping time steps, adjusting extent, vectors, etc.  
skip_time = 3 # Sample every nth time step  
extent_cells = 1 # Number of extra cells added to the plot extent  
increase_zoom_level = 1 # Increase computed zoom level by this amount to improve background image resolution  
skip_vector = 5 # Skip factor when plotting vectors (to reduce clutter)  
vector_scale = 10 # Scale for the current vector arrows  
vector_color = 'white' # Color for the wind vectors  
transparency_factor = 0.5  
dpi = 150 #specify the DPI  
  
# Option to enable or disable vector overlay and image frame saving  
show_vectors = True # Set to False to disable wind vectors in the animation  
save_frames = True # Set to False to disable saving individual image frames
```

Simple 1 Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 13 MOHID_Water.ipynb 0

1 30 ENG PTB2 10:07 AM 6/1/2025



salinity X + - X

Start OneDrive > ... Coastal3D_Operational > backup > 20250101_20250106 > salinity Search salinity

New ⚙️ | Details

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MOHID-Lagrar

MyTools

Pictures

Projetos

Guilherme - Roy

Salinity maps (42 items)

Sort View

- salinity.mp4 g
- salinity_000.pn g
- salinity_001.pn g
- salinity_002.pn g
- salinity_003.pn g
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10:09 AM ENG PTB2 6/1/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

2.5 Set dates

```
#Set dates for boundary conditions download
#Define a 5-day interval if it's the initial run for model warm-up
start_date_str = "2025-1-6" #"%Y-%m-%d"
end_date_str = "2025-1-10" #"%Y-%m-%d"

#if daily = 1, one day per file, else just one file for the interval end_date - start_date.
#set daily = 0 for warm-up
daily = 1

forecast = 0

#The keywords below are only used if forecast = 1
refday_to_start = 0 #0 is today, -1 yesterday, 1 tomorrow
number_of_runs = 1 #
```

3. Boundary Conditions

+ 33 cells hidden

4. Setup MOHID Water input files

+ 5 cells hidden

Simple 1 Python 3 (ipykernel) | Idle Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

10:11 AM ENG PTB2 6/1/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

3.1.3 Download CMEMS

```
#This file can later be used as input to CMEMS2HDF5.py for operational purposes
input_file = os.path.join(os.getcwd(),"work","CMEMS","Input_CMEMS2HDF5.py")

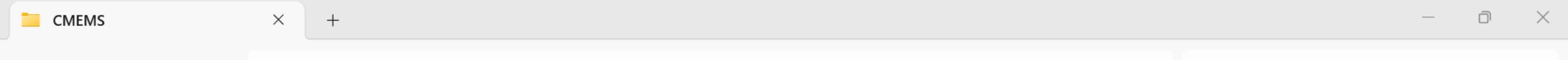
with open(input_file, 'w') as file:
    file.write(f"backup_path={backup_path_ocean}\n")
    file.write(f"daily={daily}\n")
    file.write(f"forecast={forecast}\n")
    file.write(f"number_of_runs={number_of_runs}\n")
    file.write(f"refday_to_start={refday_to_start}\n")
    file.write(f"product_id={product_id}\n")
    file.write(f"start_depth={start_depth}\n")
    file.write(f"end_depth={end_depth}\n")
    file.write(f"min_lon={min_lon}\n")
    file.write(f"max_lon={max_lon}\n")
    file.write(f"min_lat={min_lat}\n")
    file.write(f"max_lat={max_lat}\n")
    file.write(f"start_date_str='{start_date_str}'\n")
    file.write(f"end_date_str='{end_date_str}'\n")

%cd work/CMEMS/
%run CMEMS2HDF5.py

# Return to the original directory
%cd -
```

Simple 1 30 Python 3 (ipykernel) | Busy Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

1 10:12 AM PTB2 6/1/2025



	Name	Status	Date modified	Type	Size
>	Conferências				
>	Curriculo	20250101_20250106	5/30/2025 2:21 PM	File folder	
>	Desktop	20250106_20250107	6/1/2025 10:16 AM	File folder	
>	Documents	20250107_20250108	6/1/2025 10:20 AM	File folder	
>	Doutoramento	20250108_20250109	6/1/2025 10:24 AM	File folder	
>	MOHID_Jupyter	20250109_20250110	6/1/2025 10:28 AM	File folder	
>	MOHID-Lagrar				
>	MyTools				
>	Pictures				
>	Projetos				
>	Guilherme - Roy				



File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

3.2.2 Download ERA5 Reanalysis

```
[*]: #This file can later be used as input to ERA5HDF5.py for operational purposes
input_file = os.path.join(os.getcwd(),"work","ERA5","Input_ER5HDF5.py")

with open(input_file, 'w') as file:
    file.write(f"backup_path={backup_path_meteo}\n")
    file.write(f"daily={daily}\n")
    file.write(f"forecast={forecast}\n")
    file.write(f"number_of_runs={number_of_runs}\n")
    file.write(f"refday_to_start={refday_to_start}\n")
    file.write(f"min_lon={min_lon}\n")
    file.write(f"max_lon={max_lon}\n")
    file.write(f"min_lat={min_lat}\n")
    file.write(f"max_lat={max_lat}\n")
    file.write(f"start_date_str='{start_date_str}'\n")
    file.write(f"end_date_str='{end_date_str}'\n")

%cd work/ERA5/
%run ERA5HDF5.py

# Return to the original directory
%cd -
```

C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\work\ERA5
C:\Users\aquaf\OneDrive\MOHID_Jupyter-Notebooks-master\MOHID_Jupyter-Notebooks-master\MOHID_Water\work\ERA5

2025-06-01 14:45:08,688 INFO [2024-09-26T00:00:00] Watch our [Forum](<https://forum.ecmwf.int/>) for Announcements, news and other discussed topics.

2025-06-01 14:45:09,722 INFO Request ID is cf3bfdeb-393c-4774-b486-7d2a8641501f

2025-06-01 14:45:09,975 INFO status has been updated to accepted

ERA5 X +

← → ↑ ↻ Start OneDrive ⌂ run_cases ⌂ Coastal3D_Operational ⌂ backup ⌂ ERA5 ⌂ Search ERA5

New ⌂ ⌂ ⌂ ⌂ ⌂ Sort ⌂ View ⌂ ⌂ Details

Name	Status	Date modified	Type	Size
20250101_20250106	✓	5/30/2025 3:02 PM	File folder	
20250106_20250107	✓	6/1/2025 11:48 AM	File folder	
20250107_20250108	✓	6/1/2025 11:50 AM	File folder	
20250108_20250109	✓	6/1/2025 11:51 AM	File folder	
20250109_20250110	✓	6/1/2025 11:53 AM	File folder	

Conferências

Curriculo

Desktop

Documents

Doutoramento

MOHID_Jupyter

MOHID-Lagrar

MyTools

Pictures

Projetos

Guilherme - Roy

Desktop

Downloads

Documents

Pictures

5 items

1 11:55 AM ENG PTB2 6/1/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

4. Setup MOHID Water input files

```
[22]: continuous = 1 # if initial run continuous=0, else continuous=1

data_dir = os.path.join(case_dir, "Level_1", "data")
exe_dir = os.path.join(case_dir, "Level_1", "exe")
results_dir = os.path.join(case_dir, "Level_1", "res")

if not os.path.exists(results_dir):
    os.makedirs(results_dir)

if continuous == 0:
    nomfich = os.path.join(data_dir, "Nomfich_1.dat")
    run_dir = os.path.join(results_dir, "run1")
else:
    nomfich = os.path.join(data_dir, "Nomfich_2.dat")
    run_dir = os.path.join(results_dir, "run2")

if not os.path.exists(run_dir):
    os.makedirs(run_dir)

shutil.copy(nomfich, os.path.join(exe_dir, "Nomfich.dat"))

[22]: 'C:\\\\Users\\\\aquaf\\\\OneDrive\\\\MOHID_Jupyter-Notebooks-master\\\\MOHID_Jupyter-Notebooks-master\\\\MOHID_Water\\\\run_cases\\\\Coastal3D_Operational\\\\Level_1\\\\exe\\\\Nomfich.dat'
```

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

4.2 Discharges

```
[20]: def write_discharge(input_file_discharge):
    with open(input_file_discharge, 'w') as file:
        # Write header lines
        file.write("IGNORE_ON : 1\n")
        if continuous == 0:
            file.write("SLOW_START : 432000\n")

        for marker_id, marker_data in markers_dict.items():
            # Extract river_id with a default value if missing.
            river_id = marker_data.get("river_id", "unknown")

            # Get the river name from the marker data, defaulting if missing.
            river_name = marker_data.get("name", "Unnamed River")

            # markers_dict[marker_id]['location'] is assumed to be [lat, lon]:
            coord_x = marker_data['location'][1] # Longitude
            coord_y = marker_data['location'][0] # Latitude

            file.write("<begindischarge>\n")

            file.write(f"NAME : {river_name}\n")
            file.write(f"K_CELL : 1\n")
            file.write(f"COORD_X : {coord_x}\n")
            file.write(f"COORD_Y : {coord_y}\n")
            file.write(f"VERTICAL_DISCHARGE : 5\n")
            file.write(f"DATA_BASE_FILE : {os.path.join('../GeneralData/Discharges/', f'{river_id}_river_data.dat')}\n")
            file.write("FLOW_COLUMN : 2\n")
```

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Edit Ln 8, Col 14 MOHID_Water.ipynb 0

1 12:00 PM 6/1/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

5.2 Start Simulation

```
[ ]: #print("Number of CPU cores:", os.cpu_count())
#np = os.cpu_count() - 2 #number of parallel processes you want to launch
np = 6

release = (os.path.join(os.getcwd(),"releases","MOHIDWater_v24.10_x64_MPI","MOHIDWater_v24.10_x64_MPI.exe"))
DomainConsolidation = (os.path.join(os.getcwd(),"releases","MOHIDWater_v24.10_x64_MPI","DomainConsolidation.exe"))

backup_path = (os.path.join(case_dir, "backup"))
boundary_conditions_dir = (os.path.join(case_dir, "GeneralData", "BoundaryConditions"))

file_name_meteo = "Meteo.hdf5"
file_hydro = "CMEMS.hdf5"

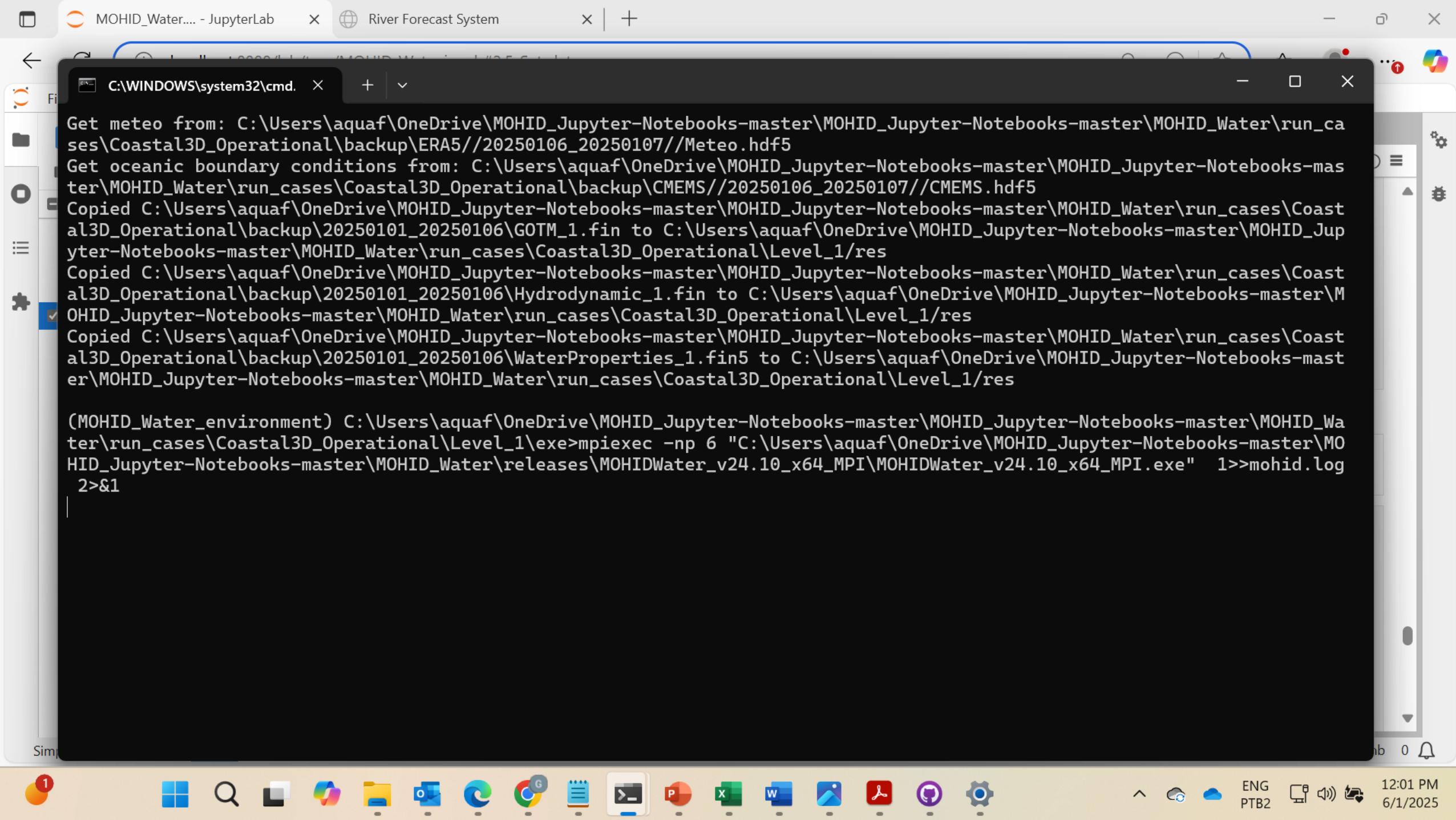
xmart_path = os.path.join(os.getcwd(),"work","XMART")

#This file can later be used as input to XMART.py for operational purposes
input_file = os.path.join(xmart_path,"Input_XMART.py")

with open(input_file, 'w') as file:
    file.write(f"release={release}\n")
    file.write(f"DomainConsolidation={DomainConsolidation}\n")
    file.write(f"np={np}\n")
    file.write(f"backup_dir={backup_path}\n")
    file.write(f"dir_meteo={backup_path_meteo}\n")
    file.write(f"dir_hydro={backup_path_ocean}\n")
    file.write(f"boundary_conditions_dir={boundary_conditions_dir}\n")
    file.write(f"exe_dir={exe_dir}\n")
```

Simple 1 30 Python 3 (ipykernel) | Idle Mode: Command Ln 2, Col 74 MOHID_Water.ipynb 0

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backup X + - ☰ ×

← → ↑ ↻ Start OneDrive ⏺ MOHID_Water > ... run_cases > Coastal3D_Operational > backup > Search backup

New Sort View ... Details

Name	Status	Date modified	Type	Size
Conferências				
Curriculo		6/1/2025 10:07 AM	File folder	
Desktop		6/1/2025 1:14 PM	File folder	
Documents		6/1/2025 2:14 PM	File folder	
Doutoramento		6/1/2025 3:13 PM	File folder	
MOHID_Jupyter		6/1/2025 4:13 PM	File folder	
MOHID-Lagrar		6/1/2025 10:28 AM	File folder	
MyTools		6/1/2025 11:53 AM	File folder	
Pictures				
Projetos				
Guilherme - Roy				

Desktop
Downloads
Documents
Pictures

7 items

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20250109_20250110 X +

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	Name	Status	Date modified	Type	Size
>	Conferências				
>	Curriculo	🕒	6/1/2025 4:13 PM	HDF5 Data File	58,526 KB
>	Desktop	🕒	6/1/2025 4:13 PM	HDF5 Data File	50,850 KB
>	Documents	🕒	6/1/2025 4:13 PM	FIN File	31,360 KB
>	Doutoramento	🕒	6/1/2025 4:13 PM	FIN File	94,909 KB
>	MOHID_Jupyter	🕒	6/1/2025 4:13 PM	HDF5 Data File	108,893 KB
>	MOHID-Lagrar	🕒	6/1/2025 4:13 PM	HDF5 Data File	27,305 KB
>	MyTools	🕒	6/1/2025 4:13 PM	HDF5 Data File	1,339 KB
>	Pictures	🕒	6/1/2025 4:13 PM	HDF5 Data File	86,608 KB
>	Projetos	🕒	6/1/2025 4:13 PM	FIN5 File	27,302 KB
>	Guilherme - Roy	🕒	6/1/2025 4:13 PM	HDF5 Data File	17,492 KB
>		🕒	6/1/2025 4:13 PM	HDF5 Data File	19,714 KB
	Desktop				
	Downloads				
	Documents				
	Pictures				

11 items

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4:21 PM 6/1/2025

MOHID_Water.... - JupyterLab River Forecast System

localhost:8888/lab/tree/MOHID_Water.ipynb#2.5-Set-dates

File Edit View Run Kernel Tabs Settings Help

Launcher MOHID_Water.ipynb

Notebook Python 3 (ipykernel)

6. Visualize results

```
[*]: variable = "temperature" # Change as needed

# =====#
# DEFINE VARIABLE-LABEL DICTIONARY
# =====#
variable_label_dict = {
    "velocity modulus": "Velocity Modulus(m/s)",
    "salinity": "Salinity(psu)",
    "temperature": "Temperature(°C)",
    "water level": "Water Level(m)"
}

# User-specified parameters for skipping time steps, adjusting extent, vectors, etc.
skip_time = 3           # Sample every nth time step
extent_cells = 1         # Number of extra cells added to the plot extent
increase_zoom_level = 1  # Increase computed zoom level by this amount to improve background image resolution
skip_vector = 5          # Skip factor when plotting vectors (to reduce clutter)
vector_scale = 10         # Scale for the current vector arrows
vector_color = 'white'   # Color for the wind vectors
transparency_factor = 0.5
dpi = 150                #specify the DPI

# Option to enable or disable vector overlay and image frame saving
show_vectors = True      # Set to False to disable wind vectors in the animation
save_frames = True        # Set to False to disable saving individual image frames
```

Simple 1 30 Python 3 (ipykernel) | Busy Mode: Command Ln 1, Col 1 MOHID_Water.ipynb 0

1 4:22 PM 6/1/2025

