MOHID Notebooks

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Jupyter Notebooks

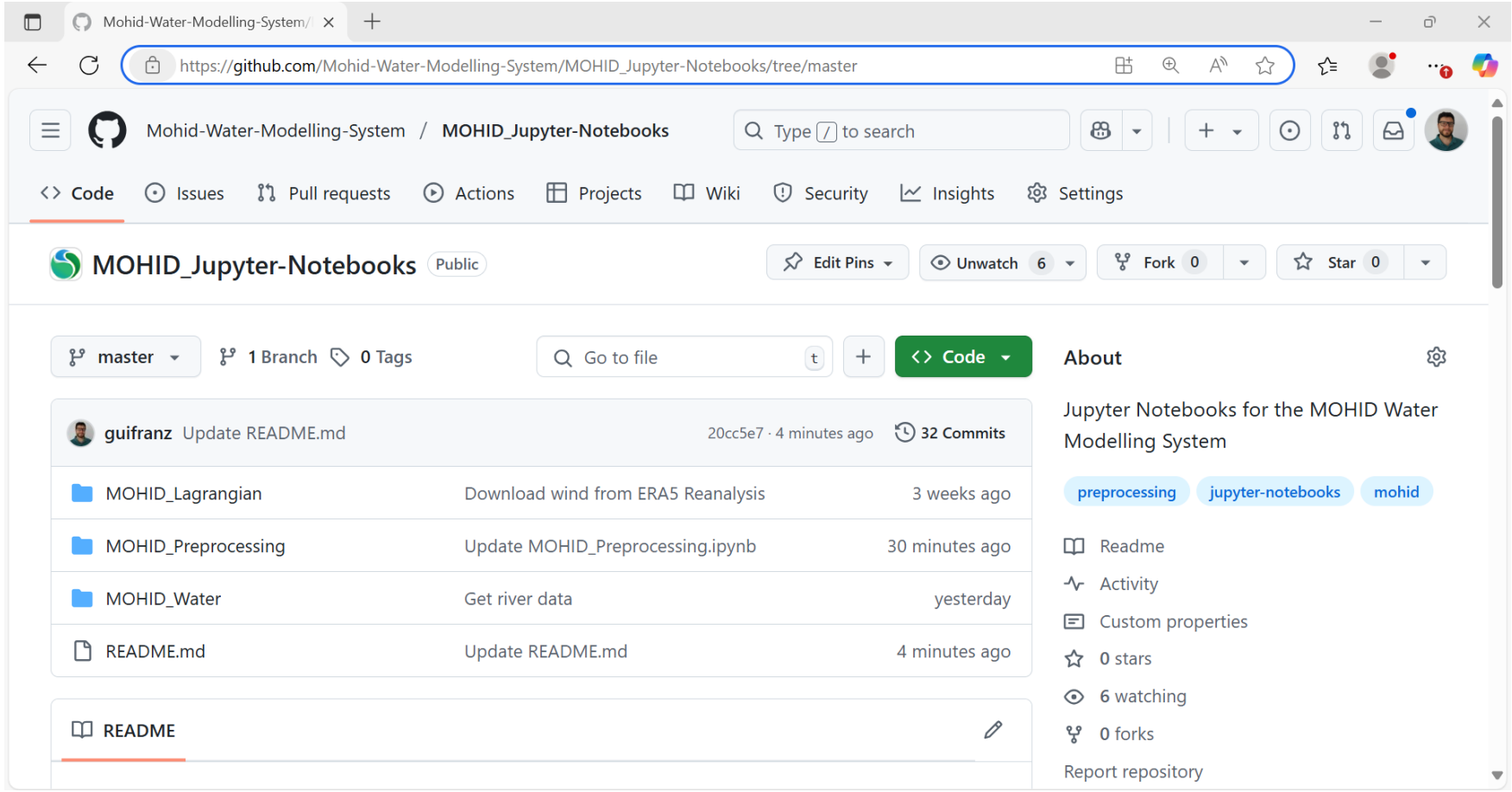
- **Interactive and Flexible Environment**
  - Combines live code, narrative text, and visualizations in one document.
  - Supports multiple programming languages (e.g., Python, R, Julia).

- **Cell-Based Structure**
  - Divides content into independent cells for code or rich text (Markdown).
  - Allows immediate execution and visualisation of outputs.

- **Reproducible Research and Collaboration**
  - Embeds explanations alongside analysis, enhancing clarity and reproducibility.
  - Enables the sharing of fully annotated documents easily.

Available on the MOHID GitHub repository

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



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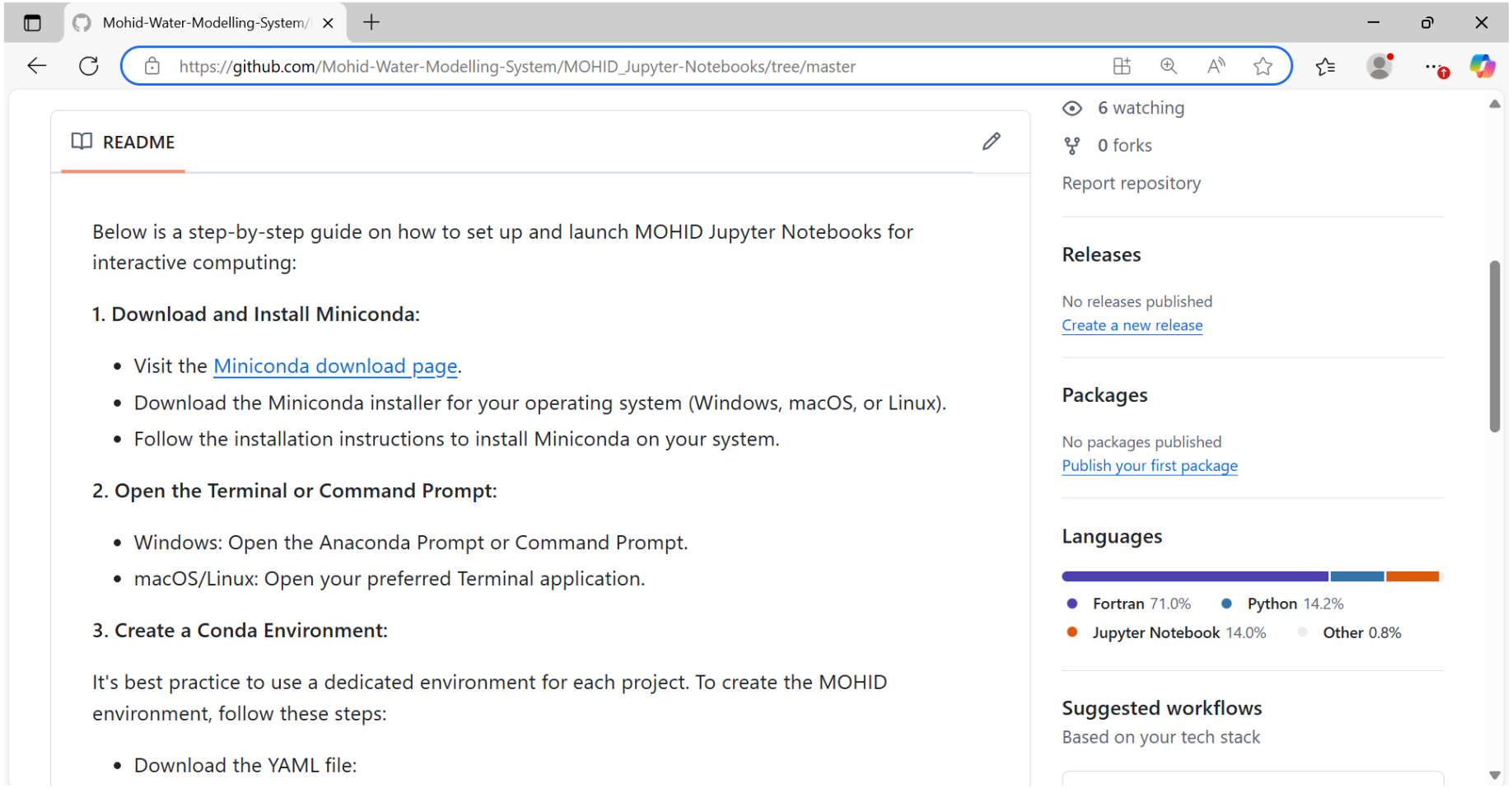

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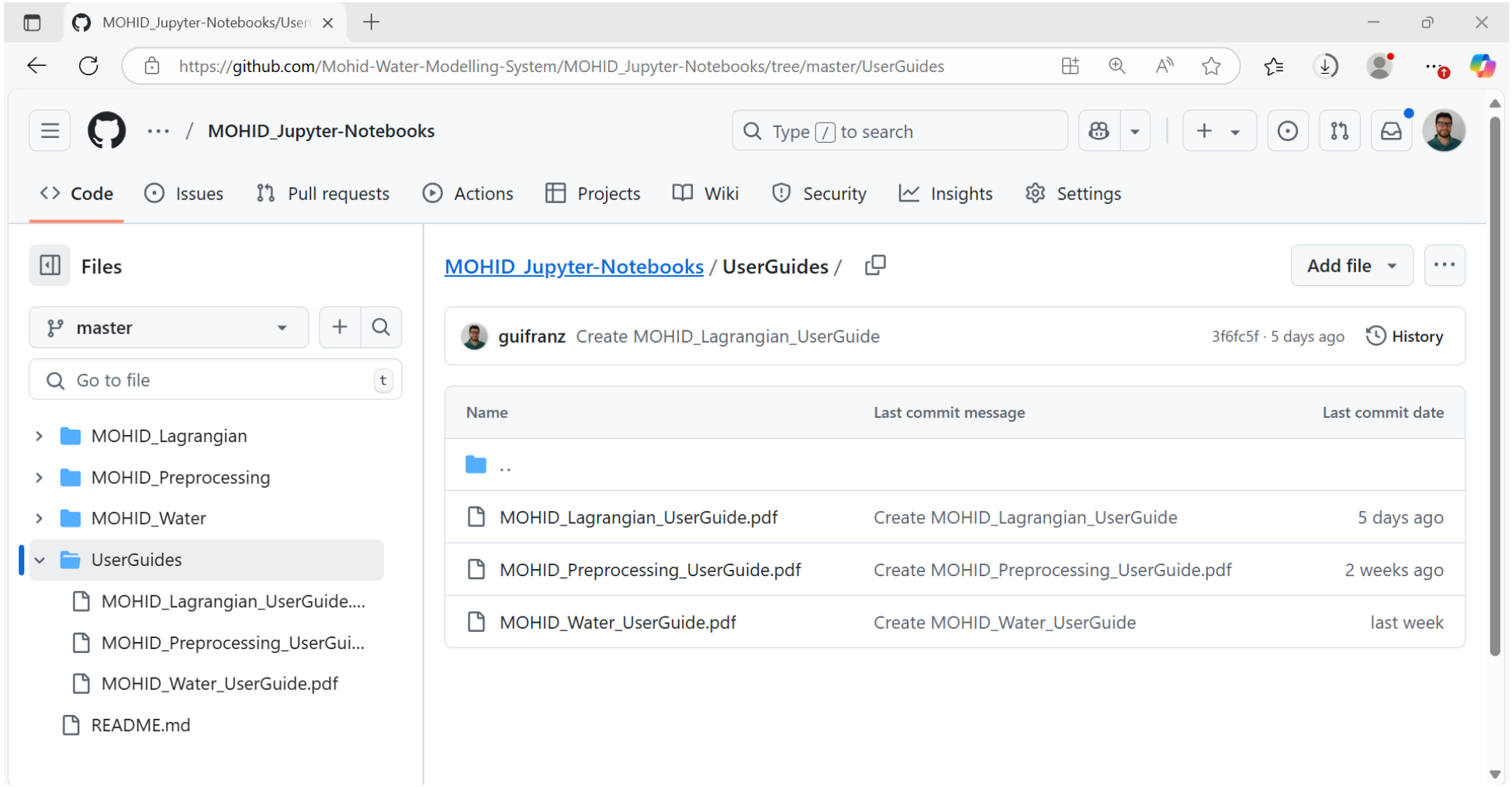


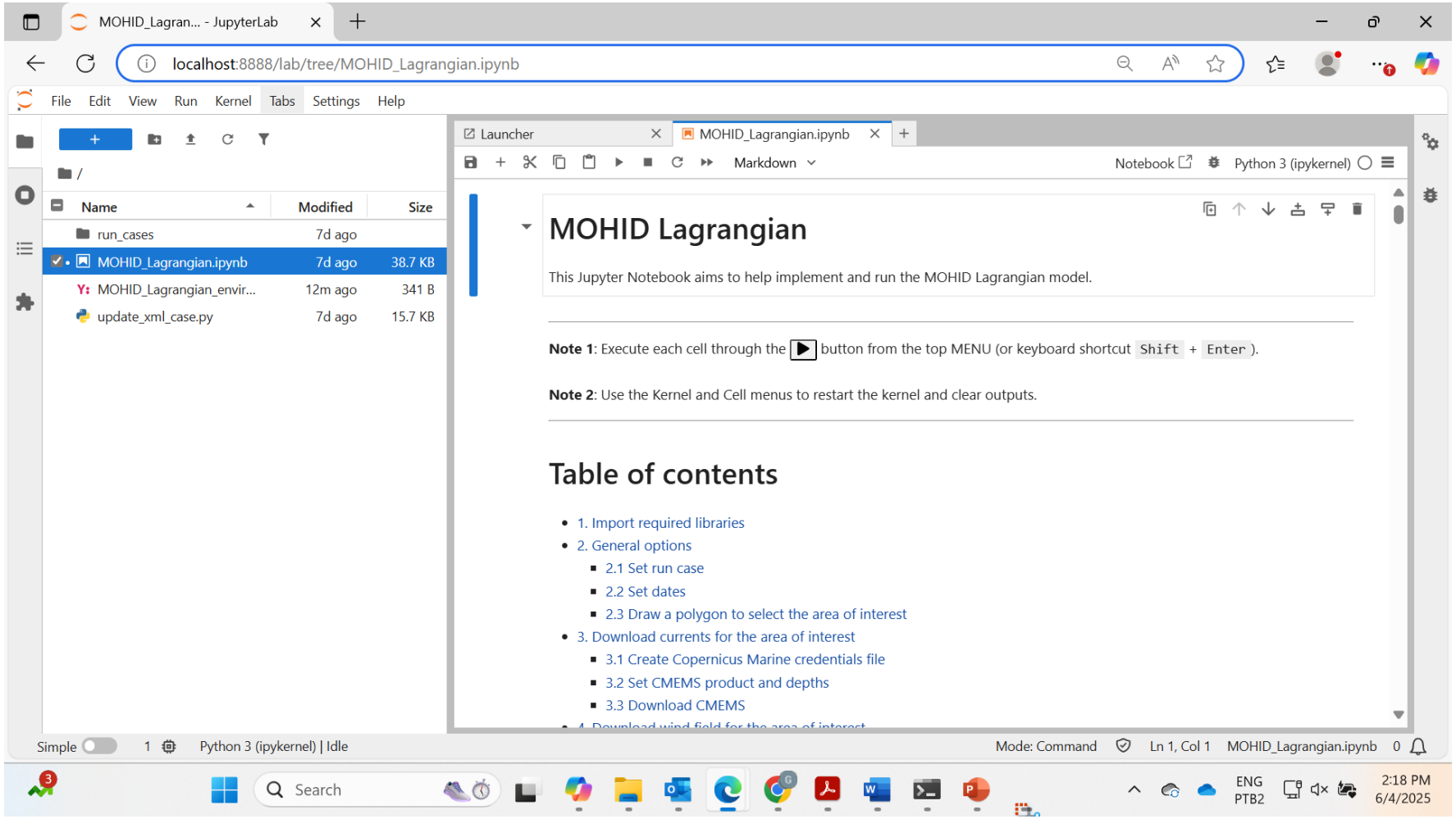
MOHID Lagrangian Notebook

- Lagrangian models use hydrodynamic and wind fields to calculate the movement of material systems, such as marine debris.

- The execution of the Lagrangian model is independent of the source of the hydrodynamic and wind fields.

- A Jupyter Notebook was developed to help users of the MOHID Lagrangian model explore available hydrodynamic and wind fields online, where Copernicus products play a key role, or use their own solutions, e.g., based on MOHID Water.

MOHID Lagrangian Notebook



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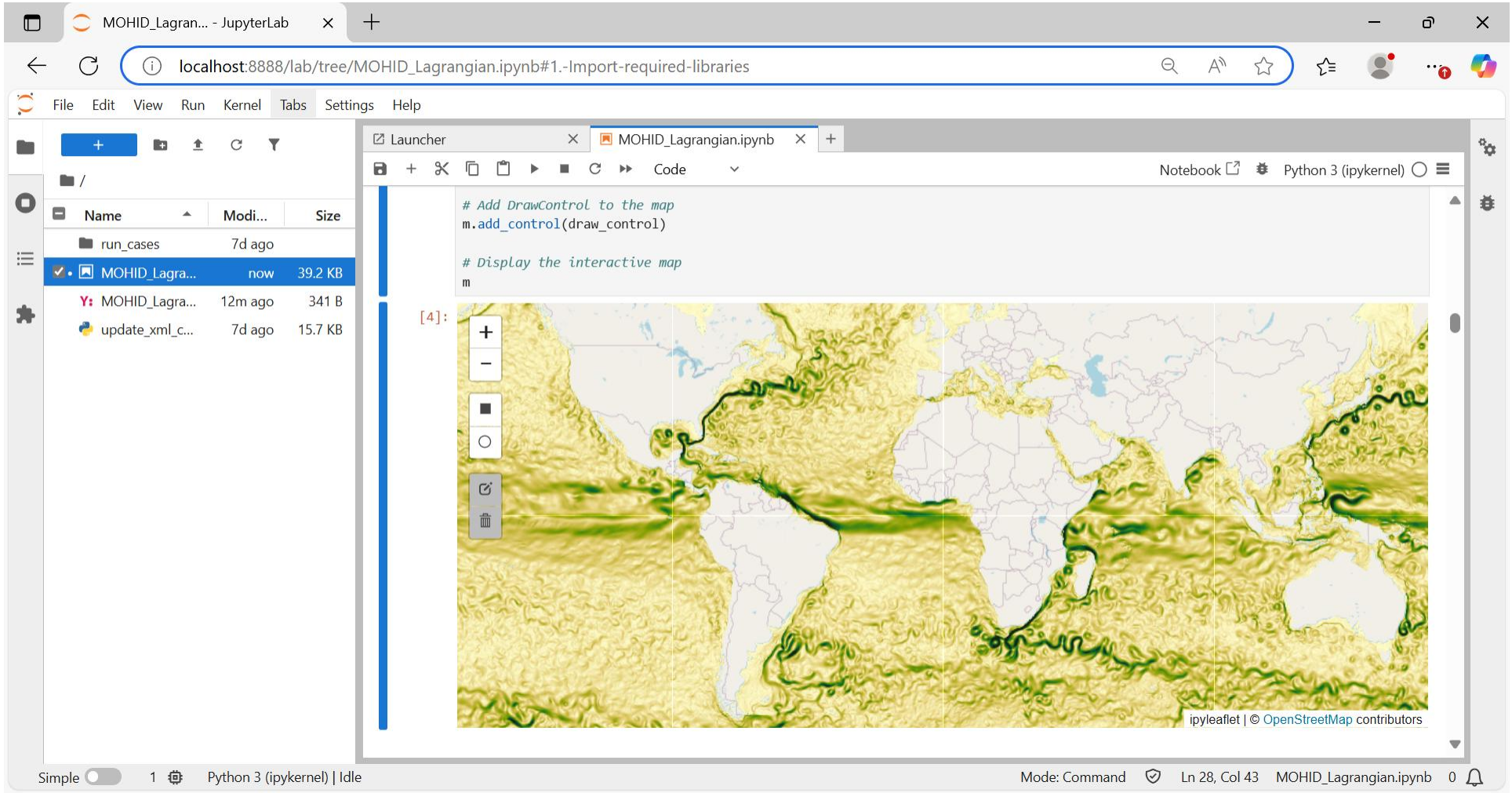

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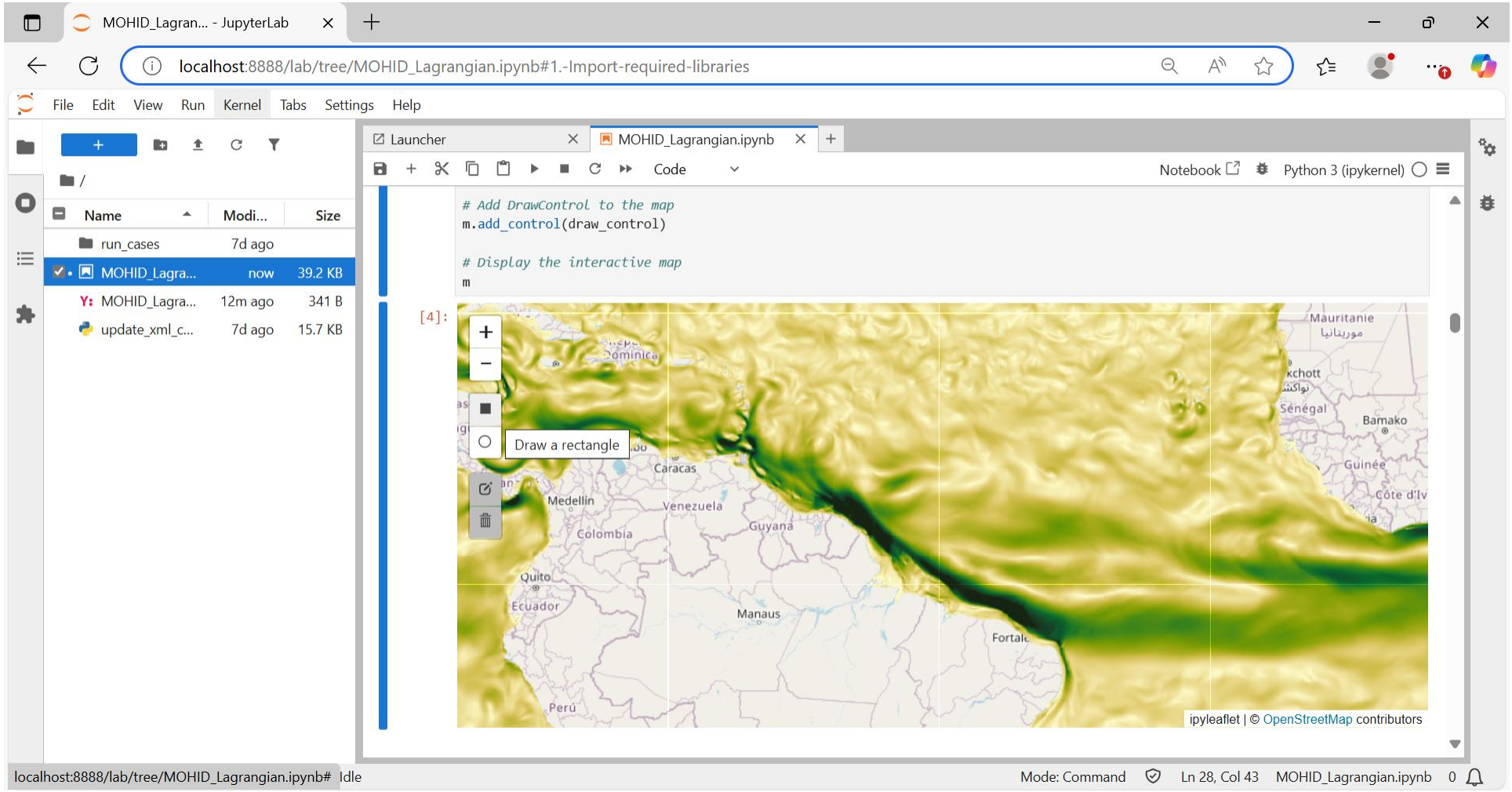

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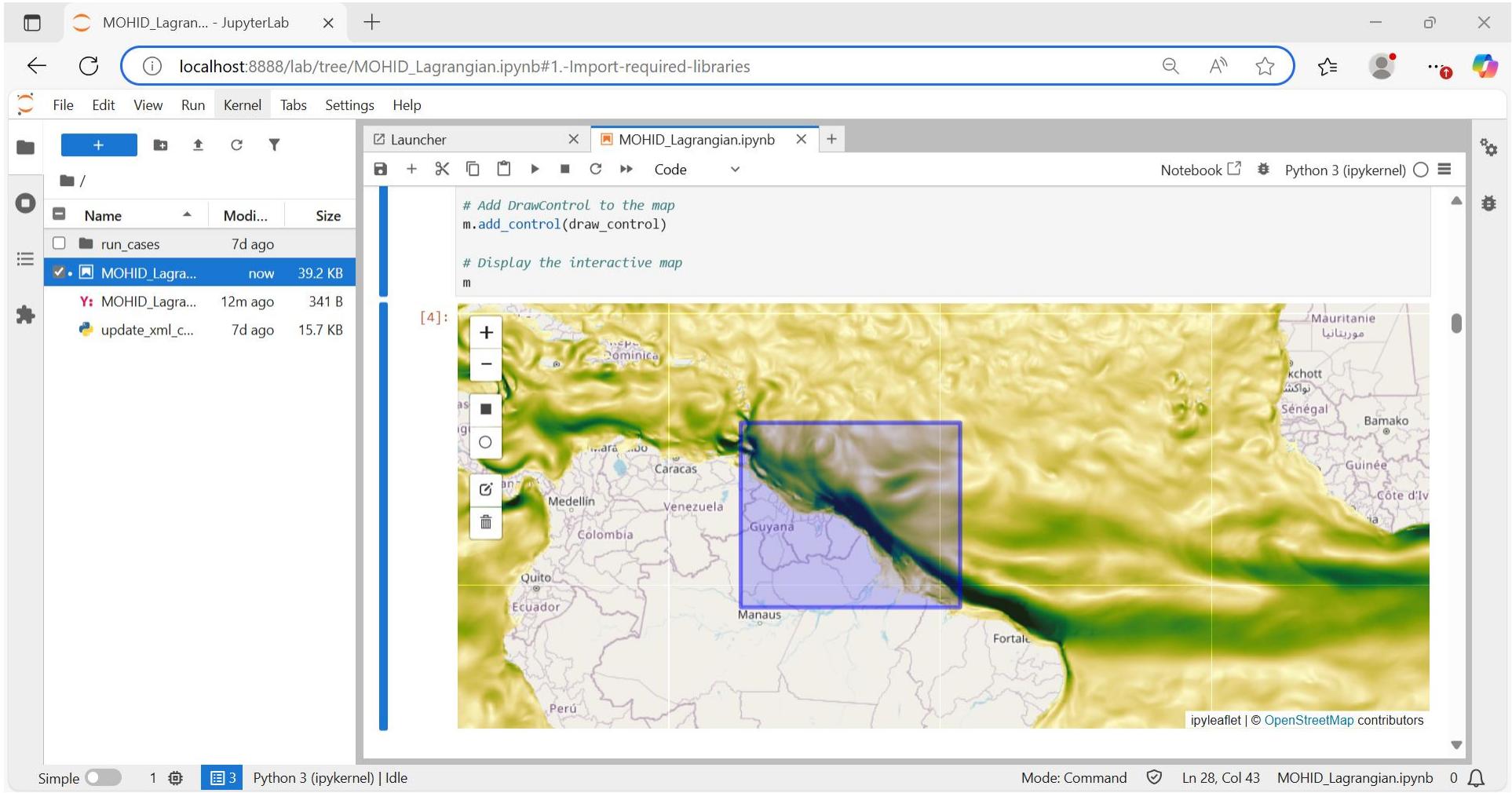

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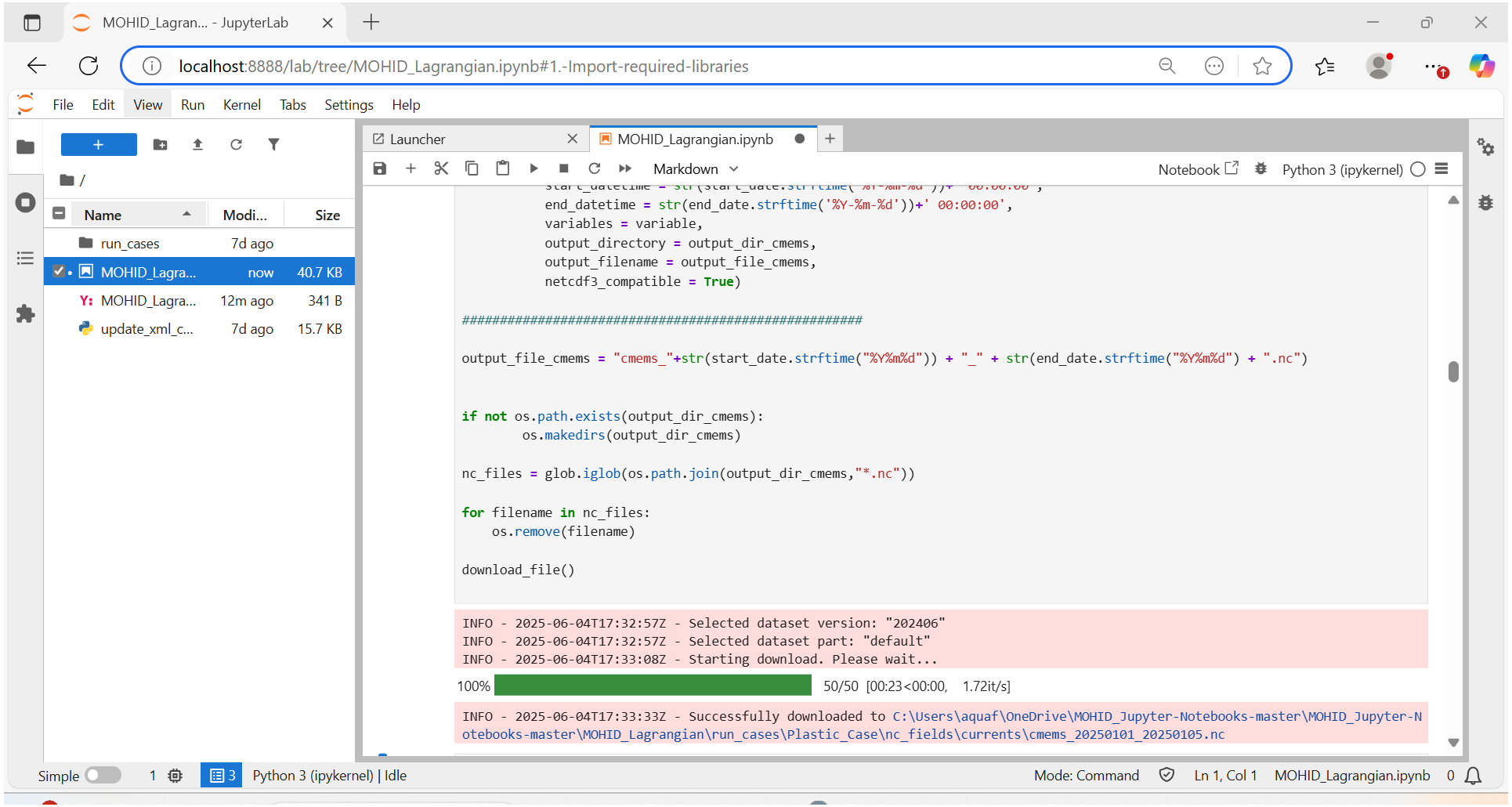

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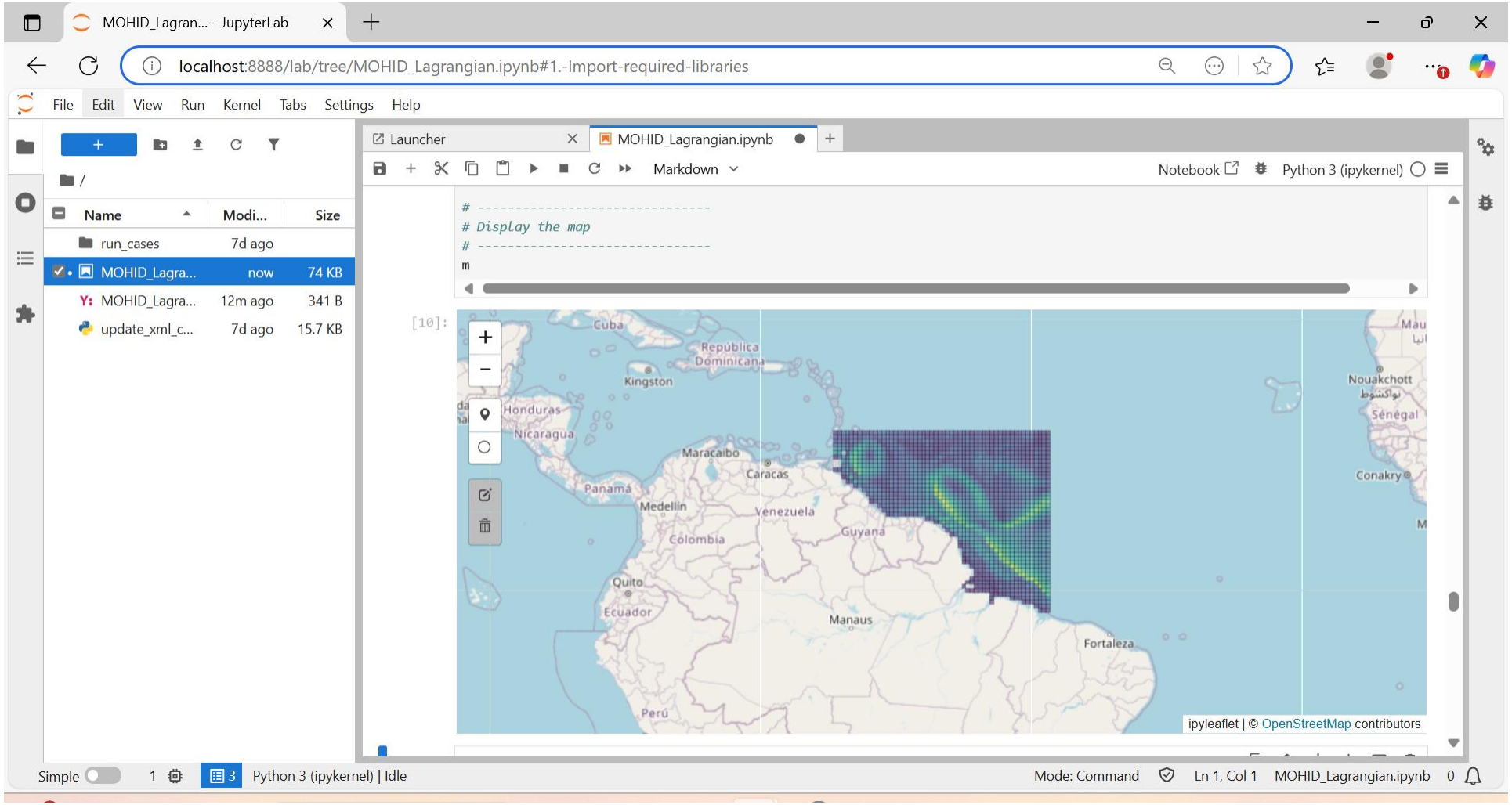

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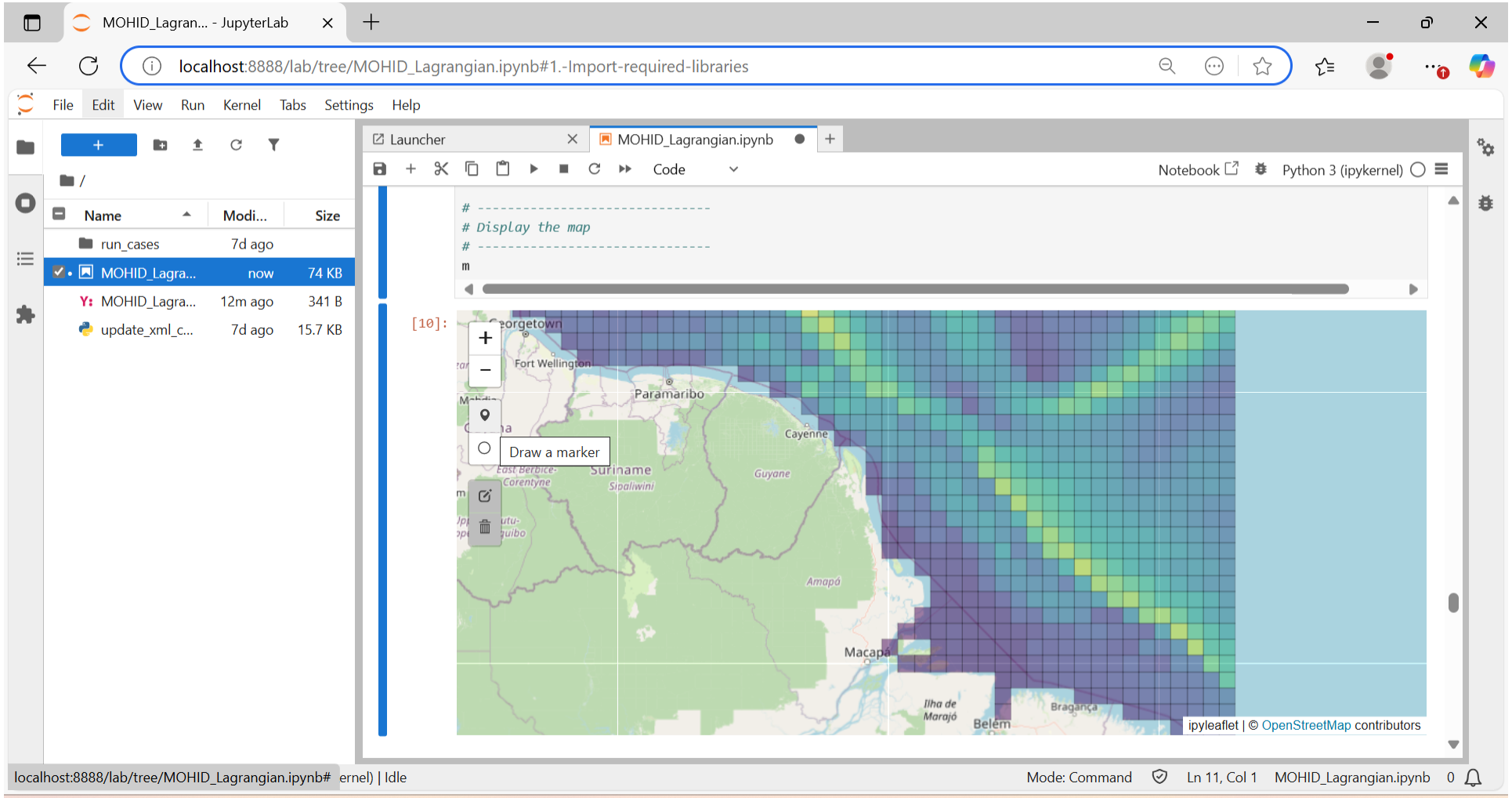

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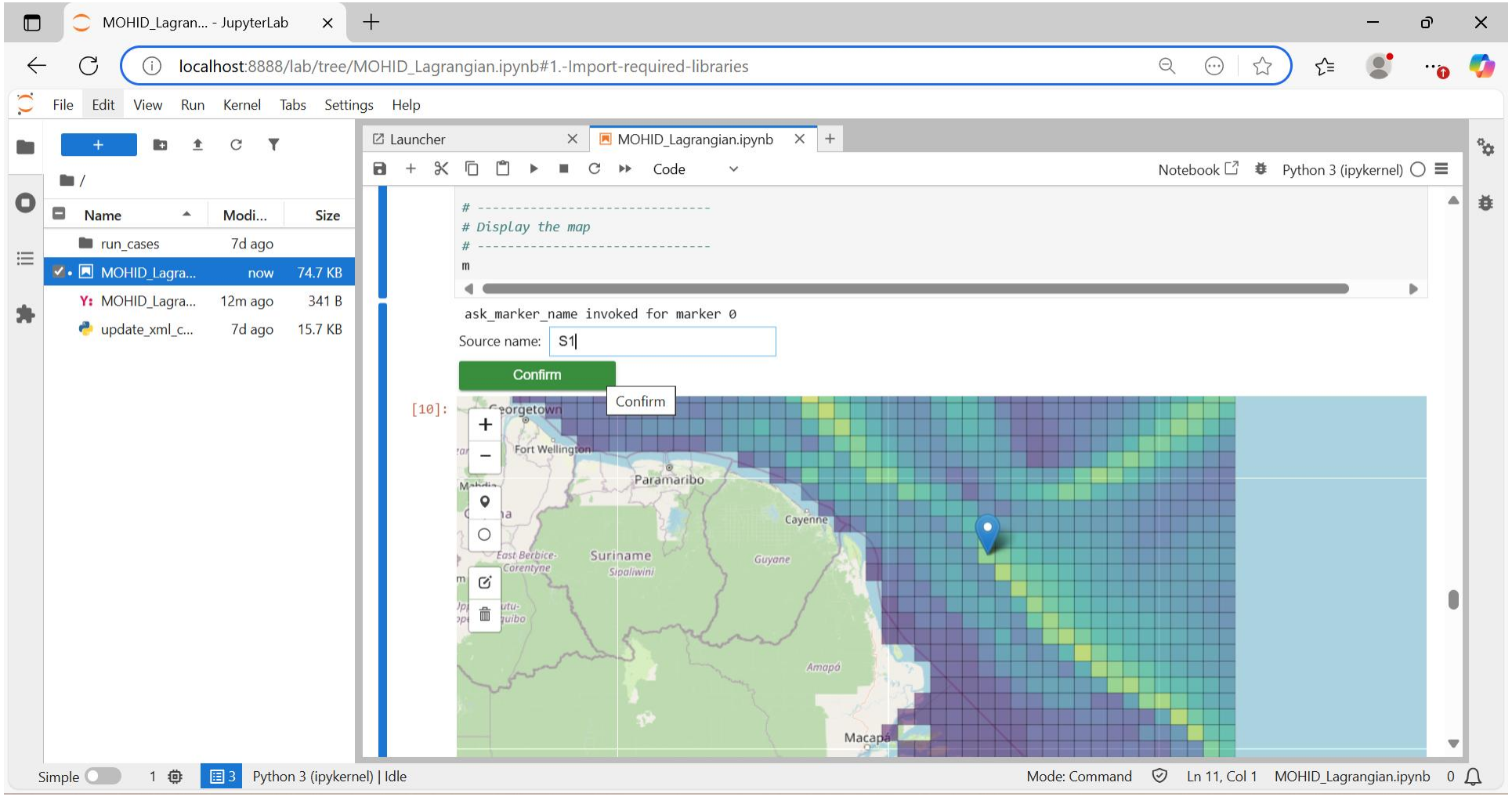

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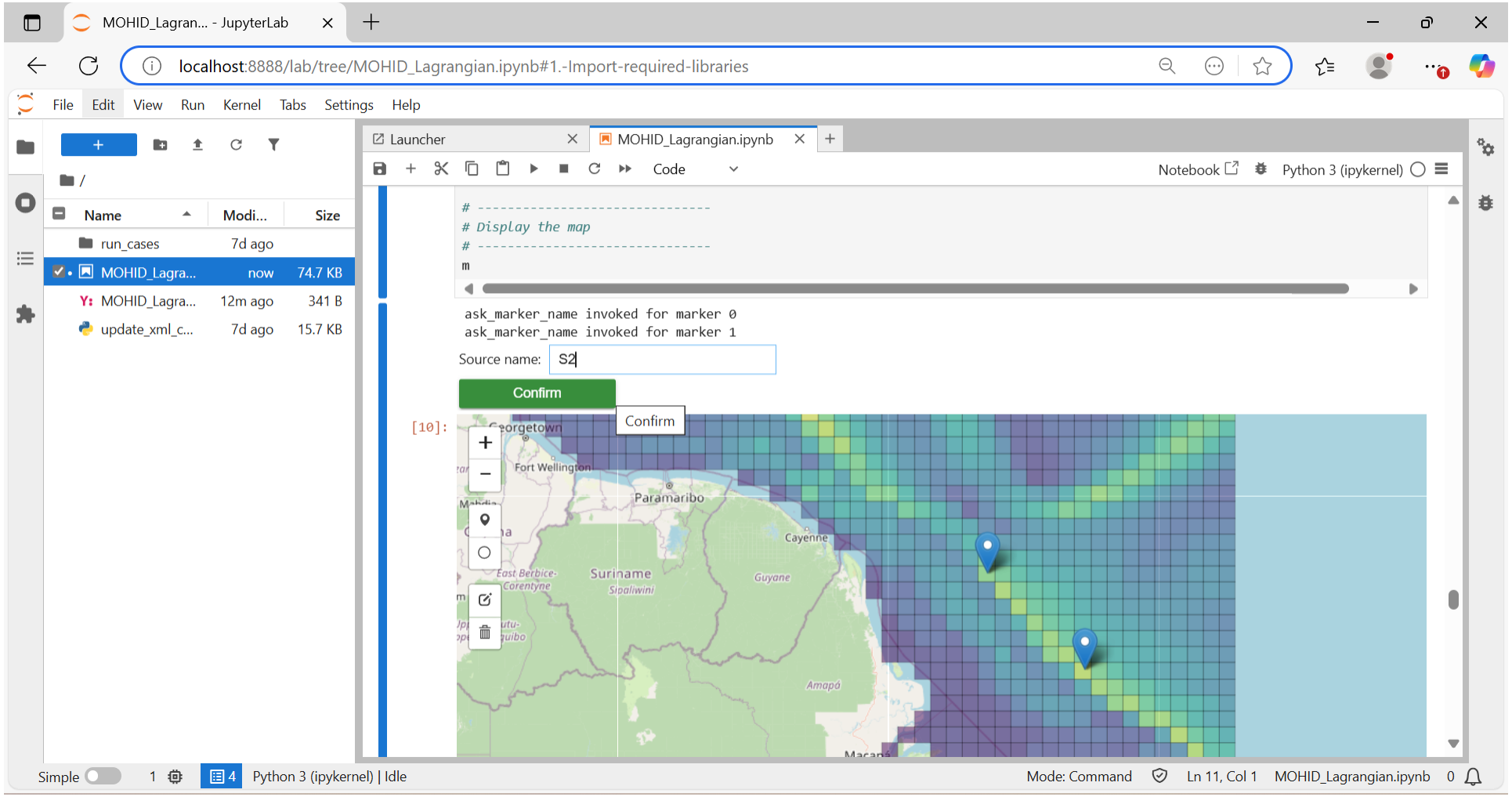
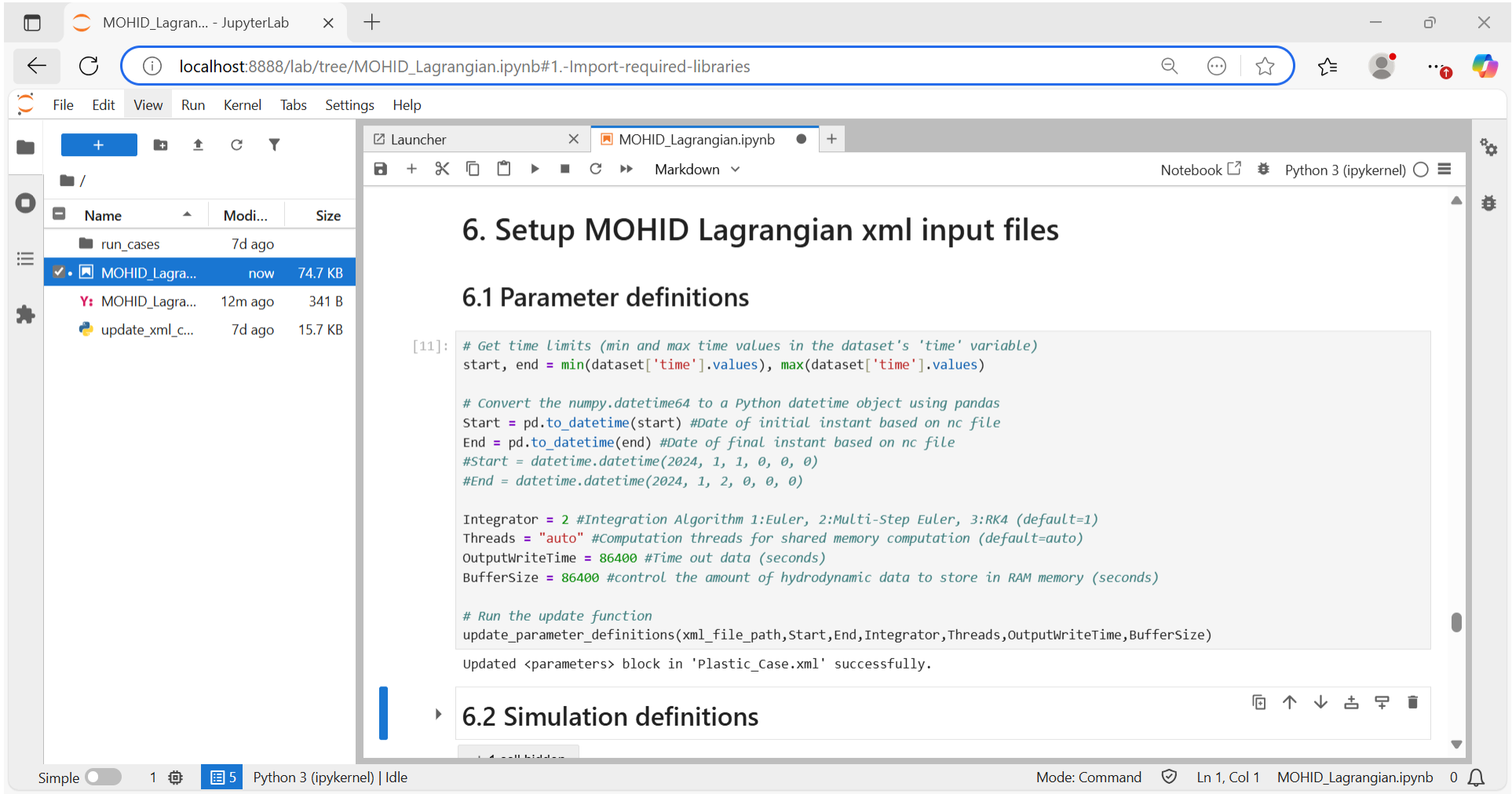


Run and visualise results



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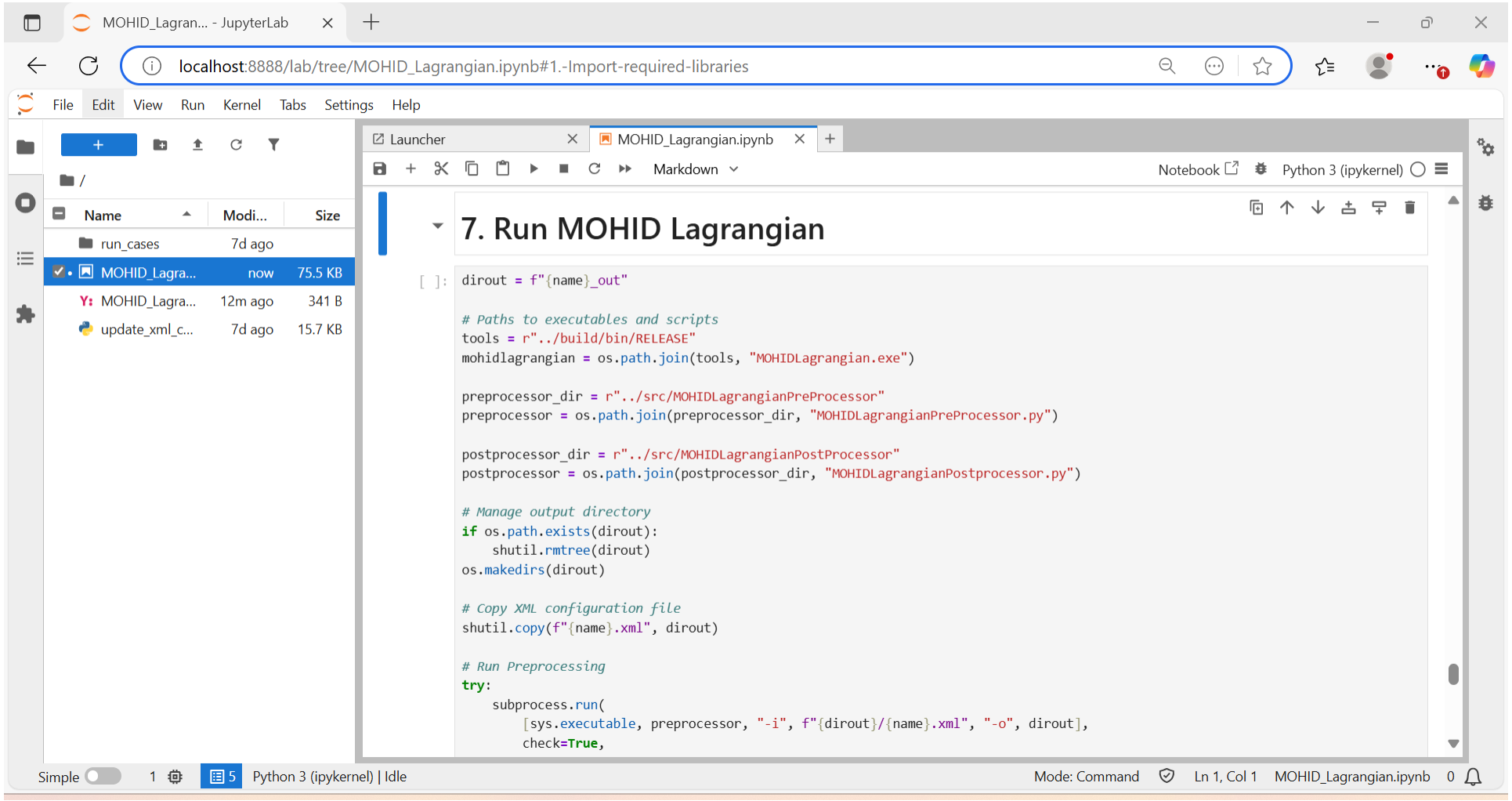

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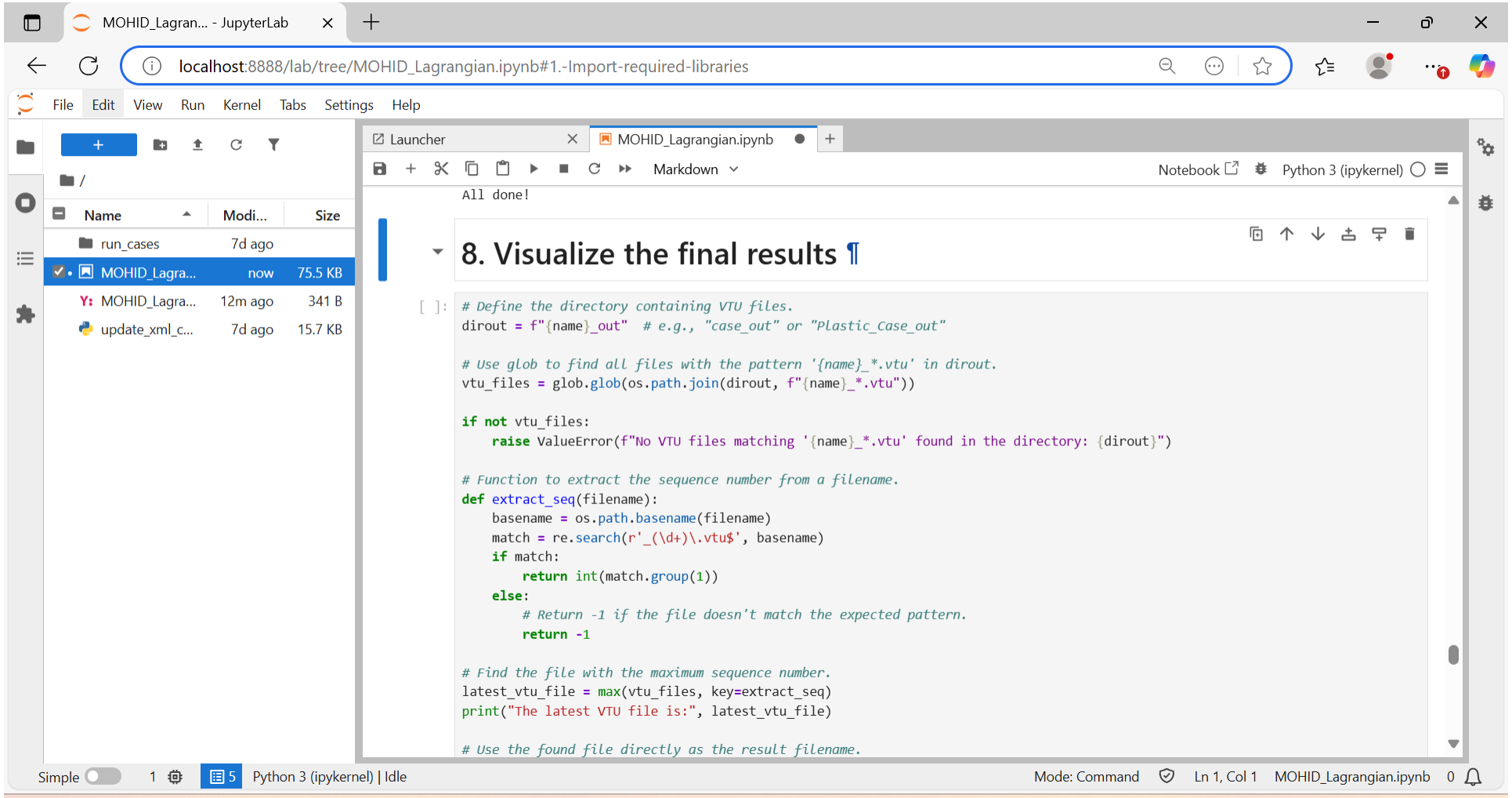

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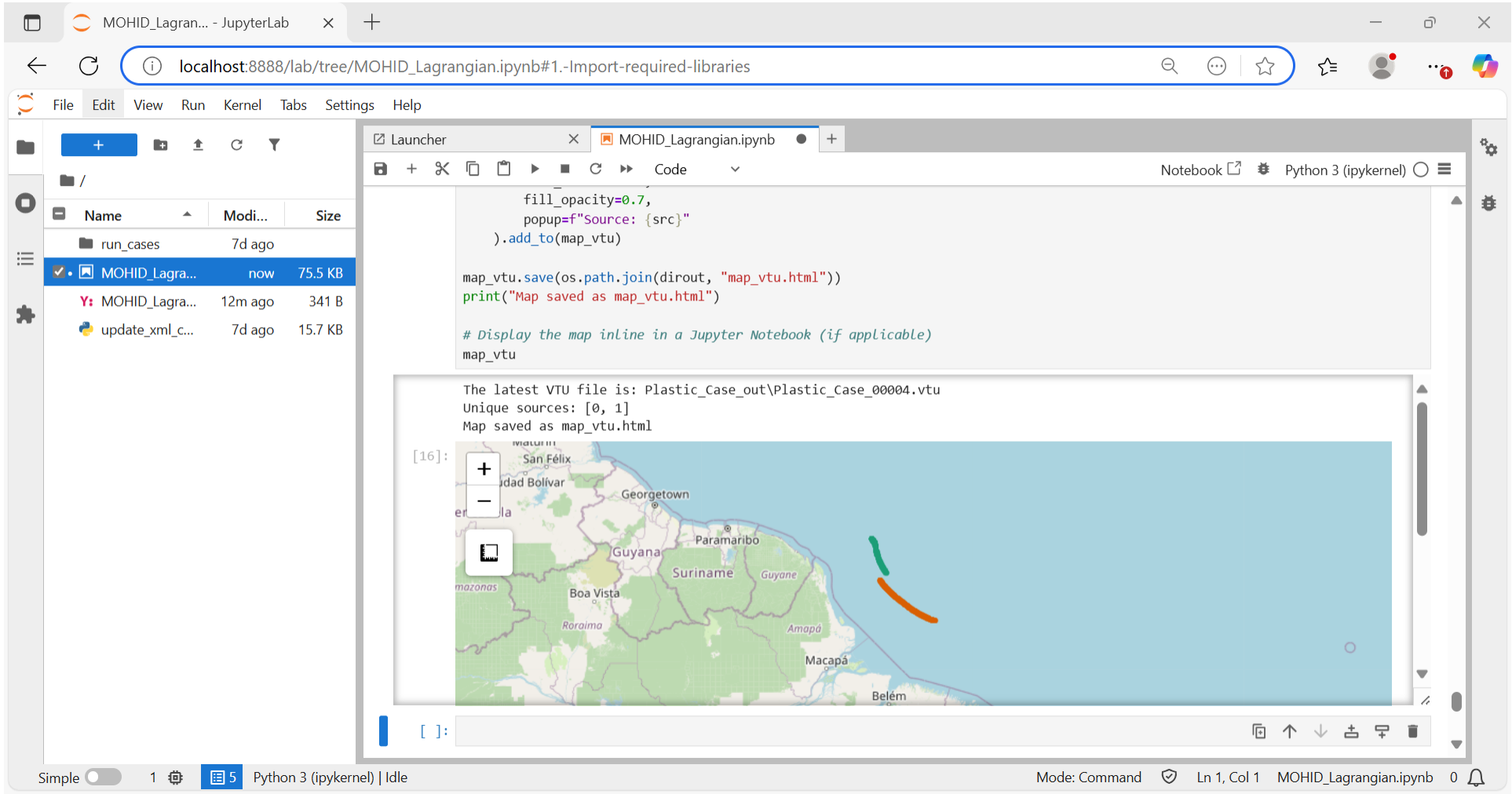

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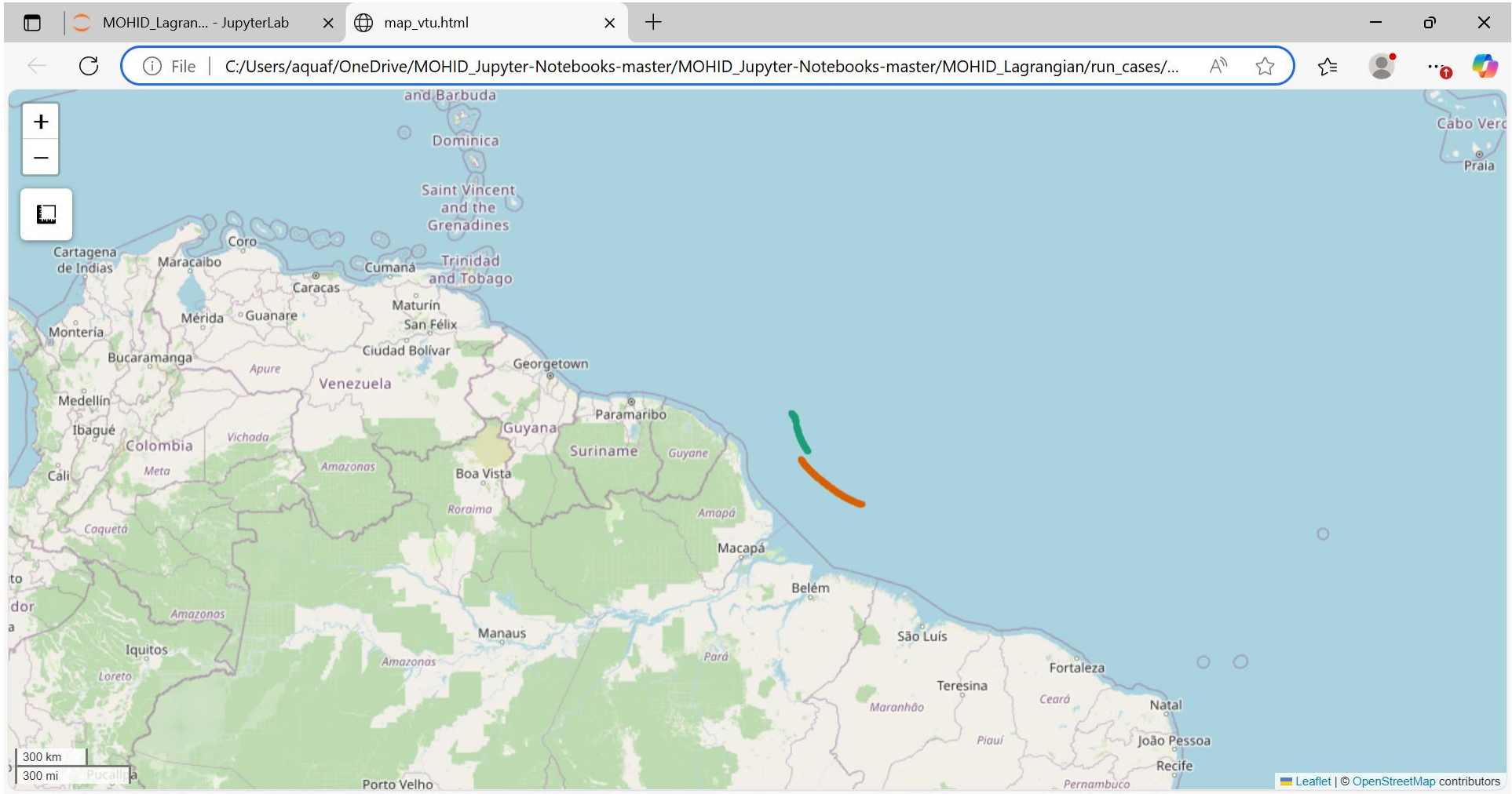
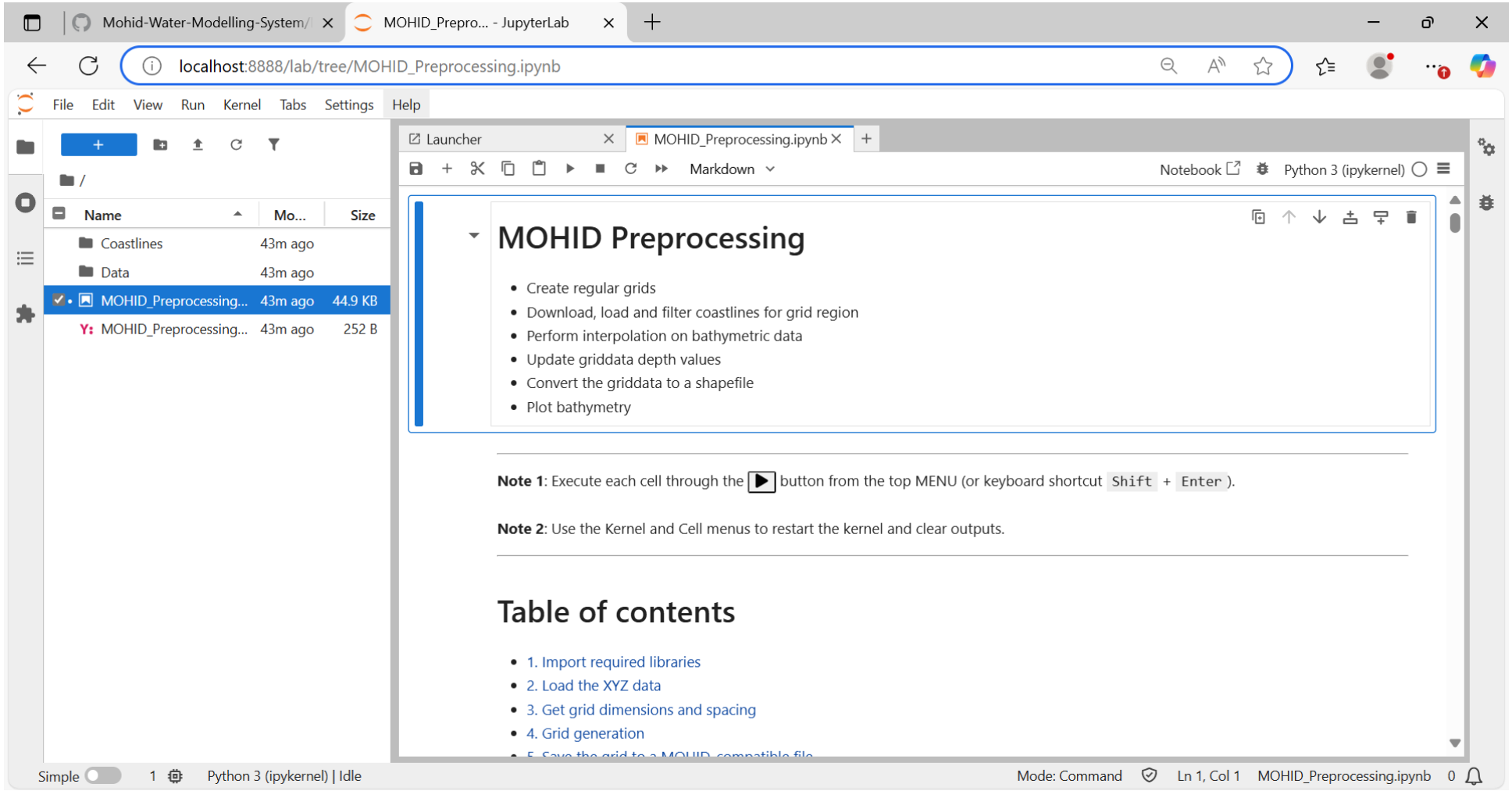


MOHID Preprocessing Notebook



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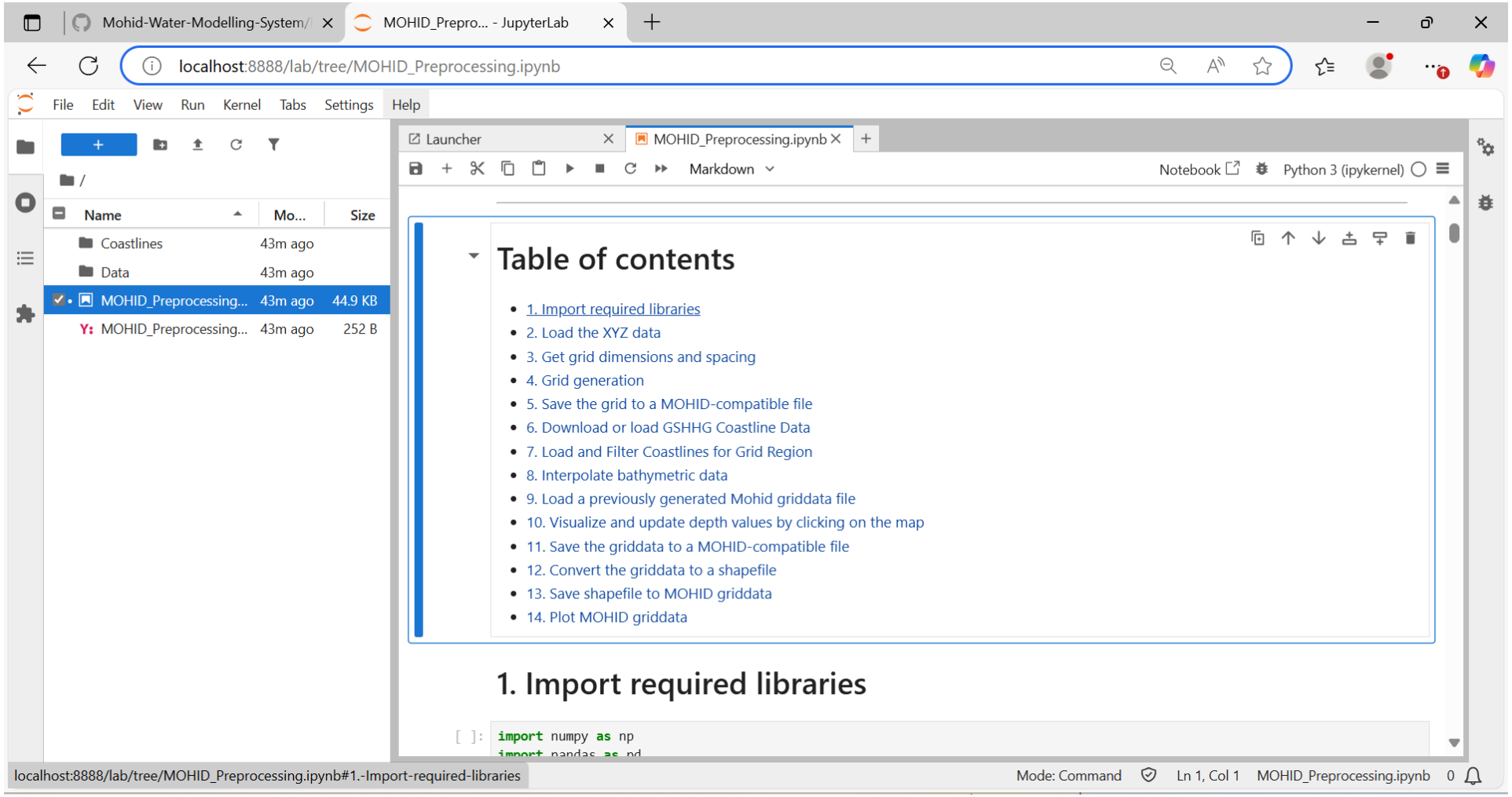

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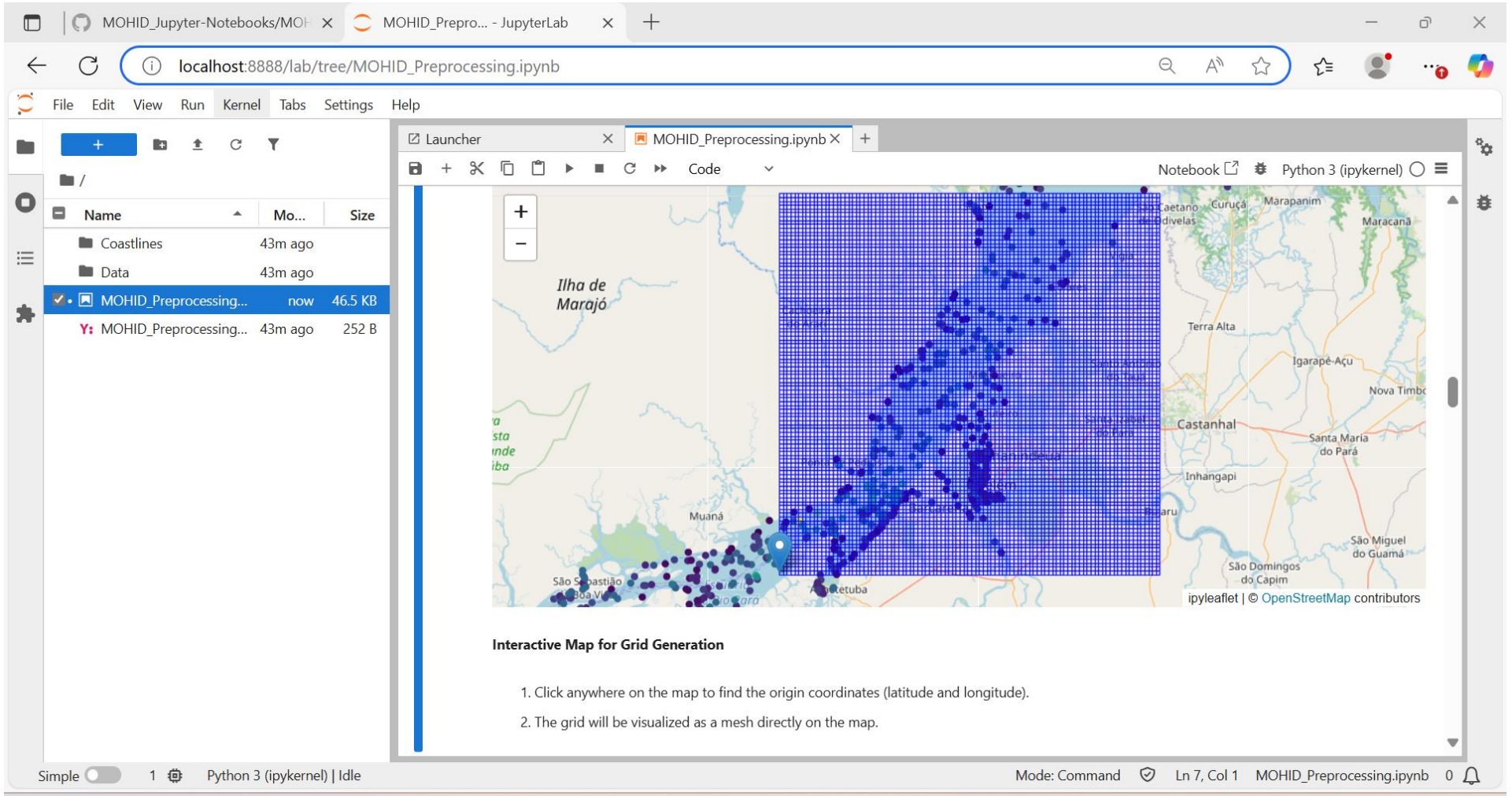

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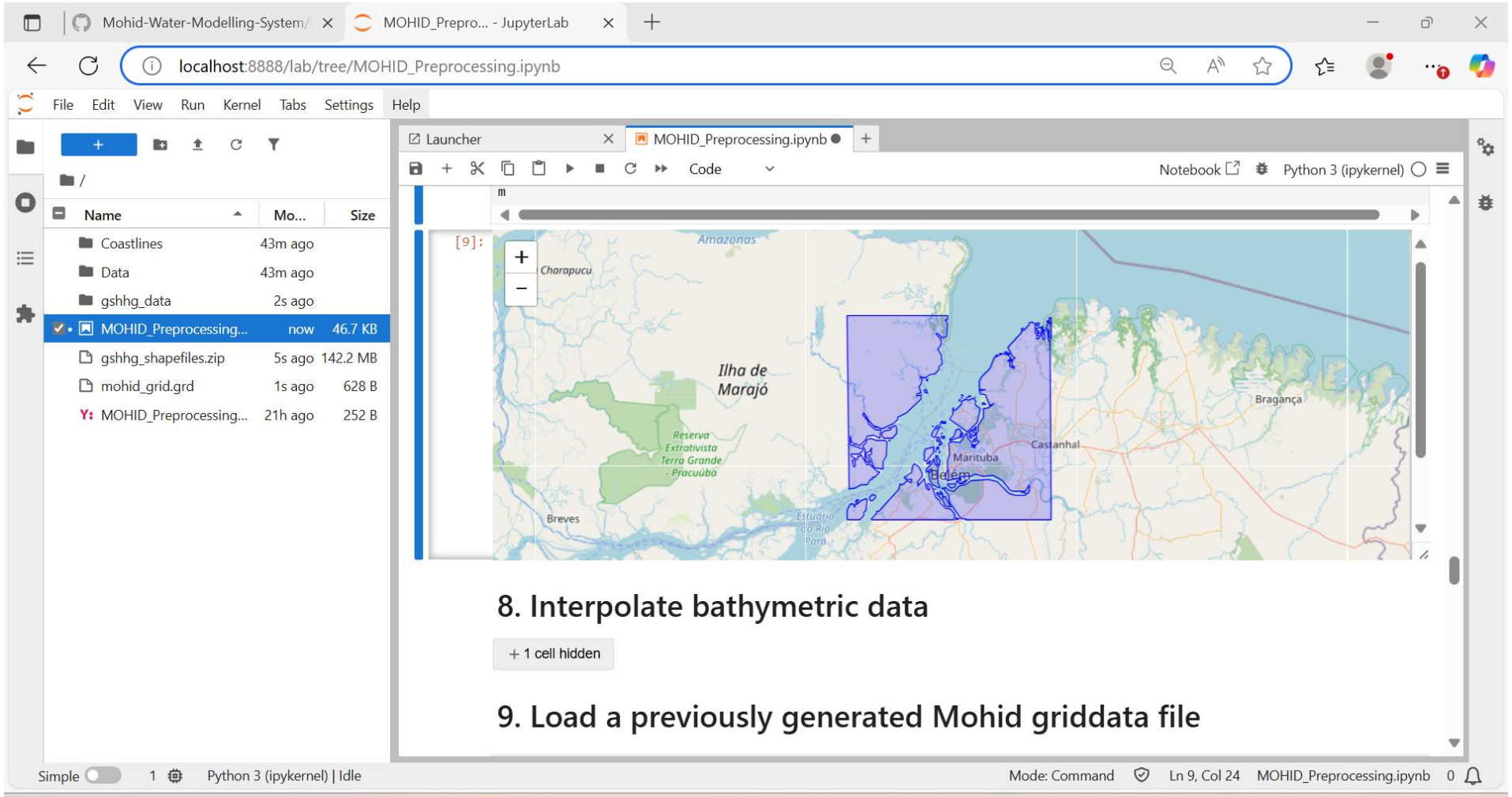

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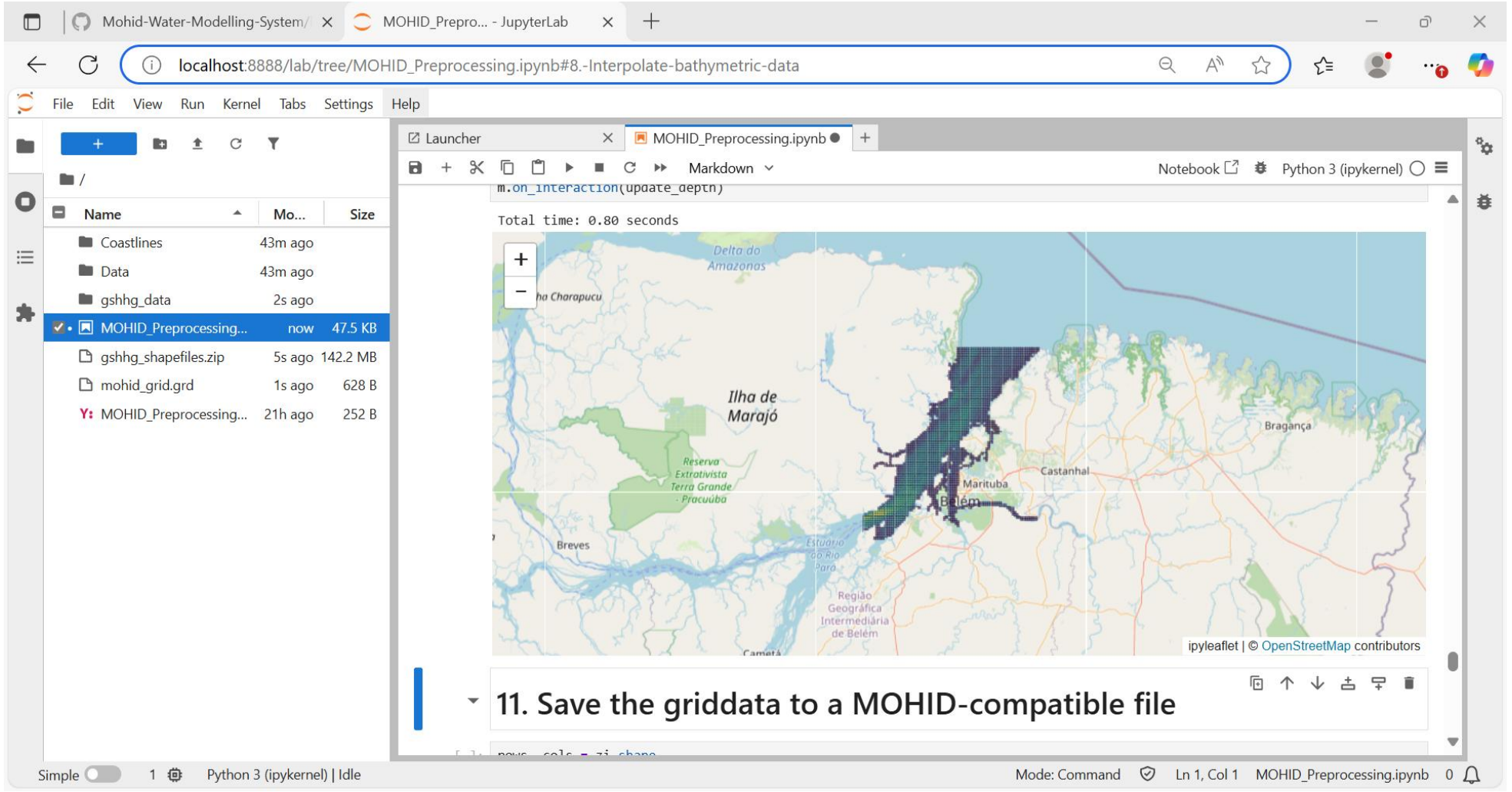

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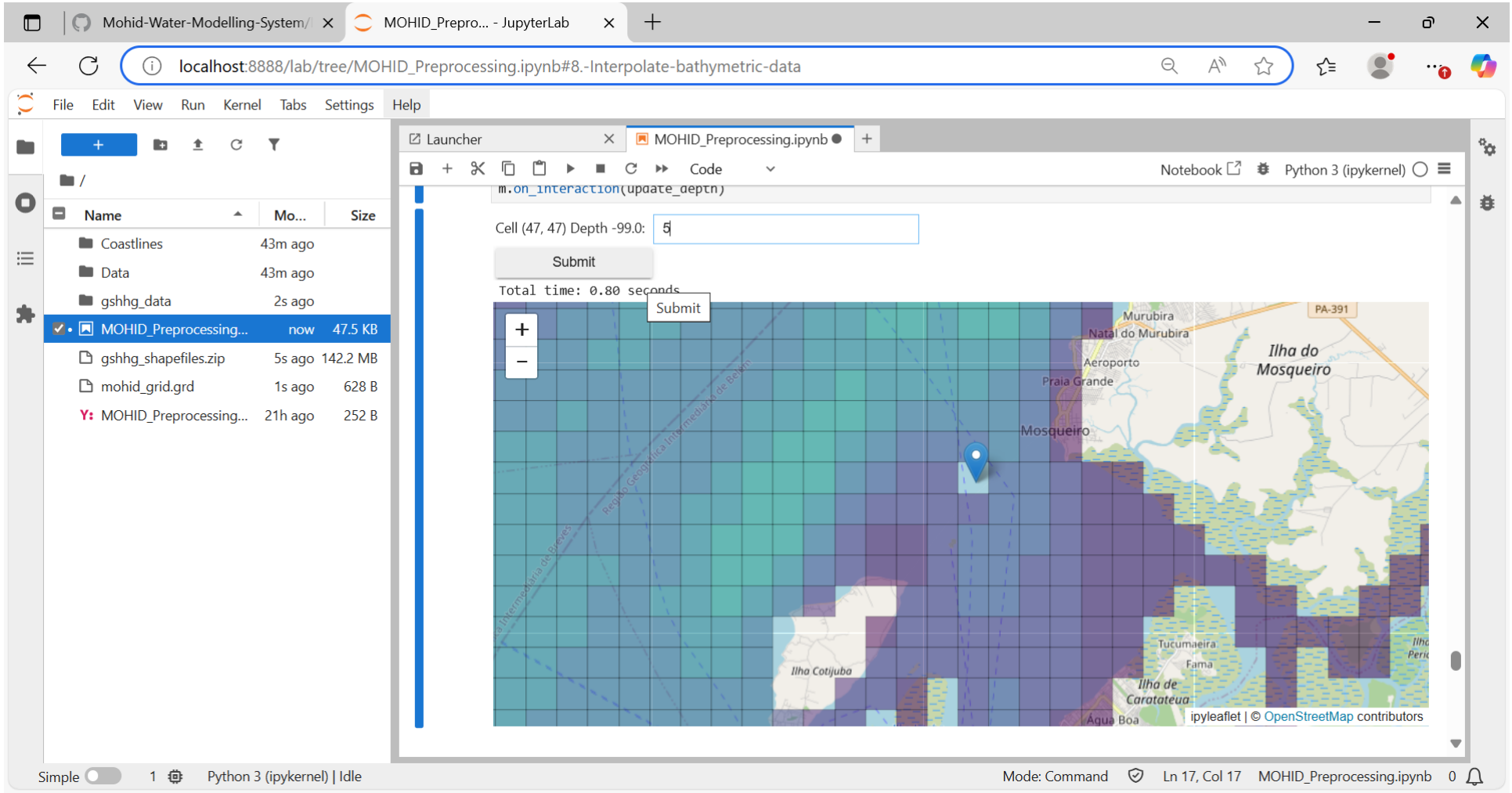

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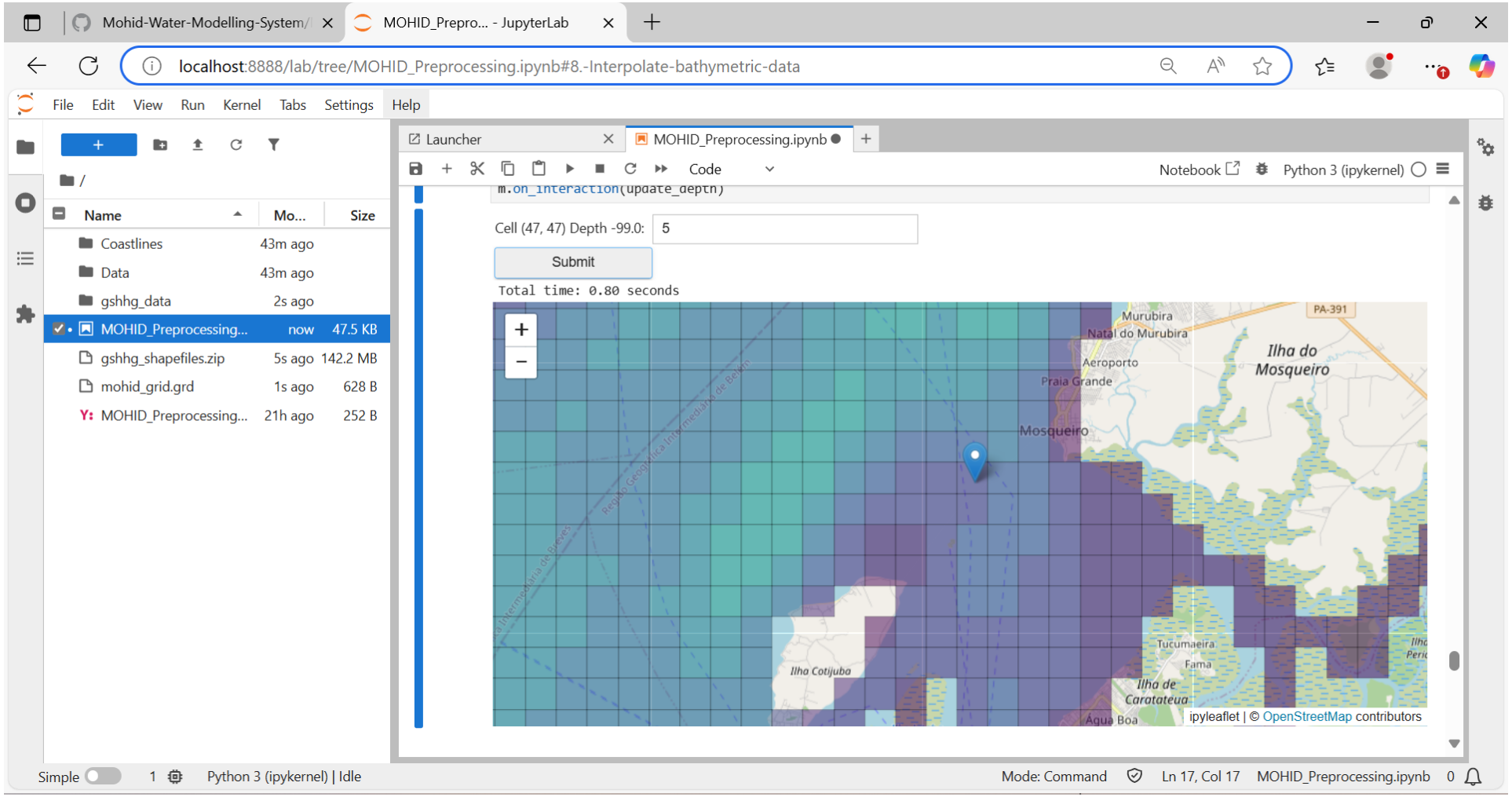

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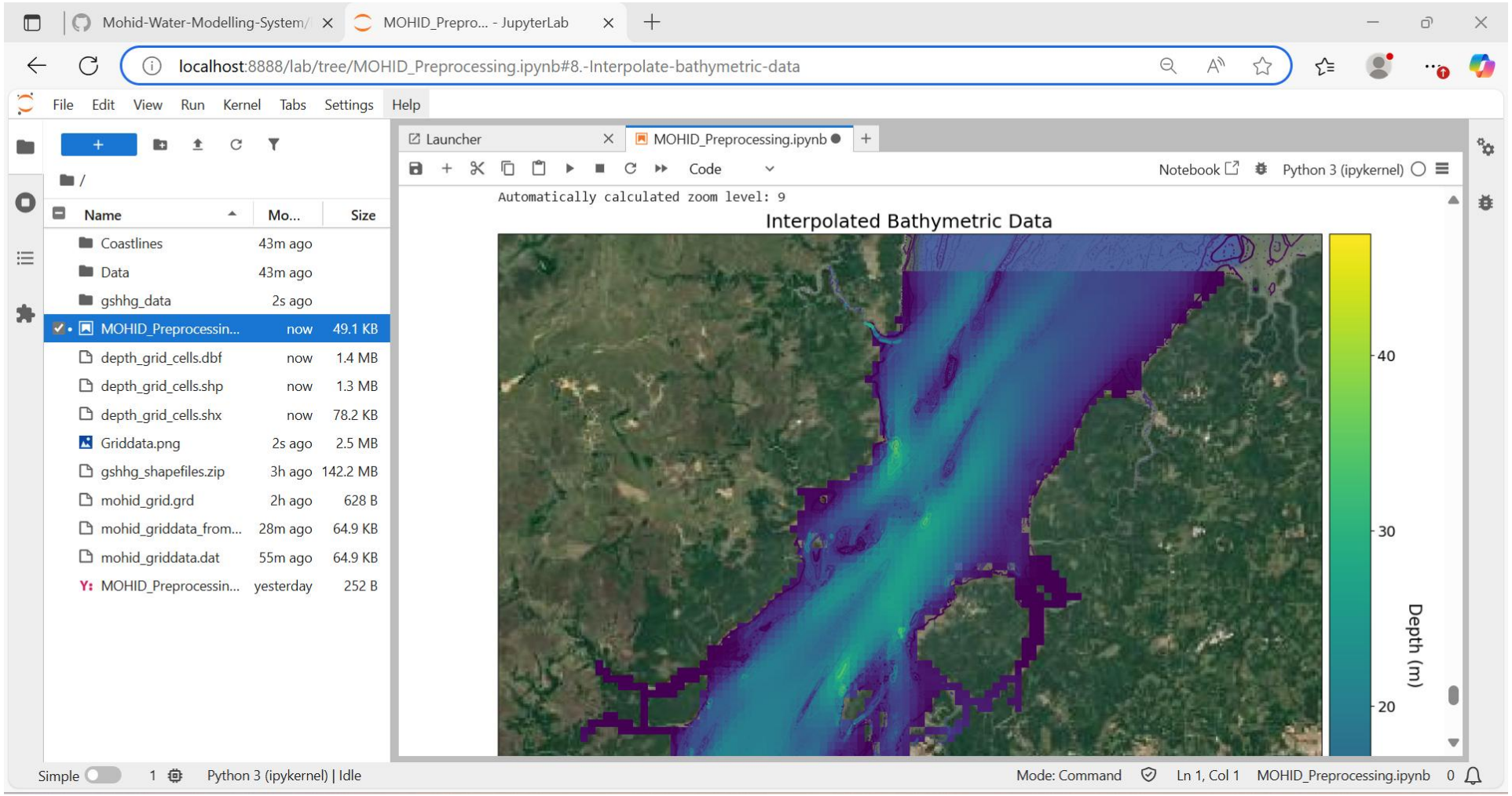

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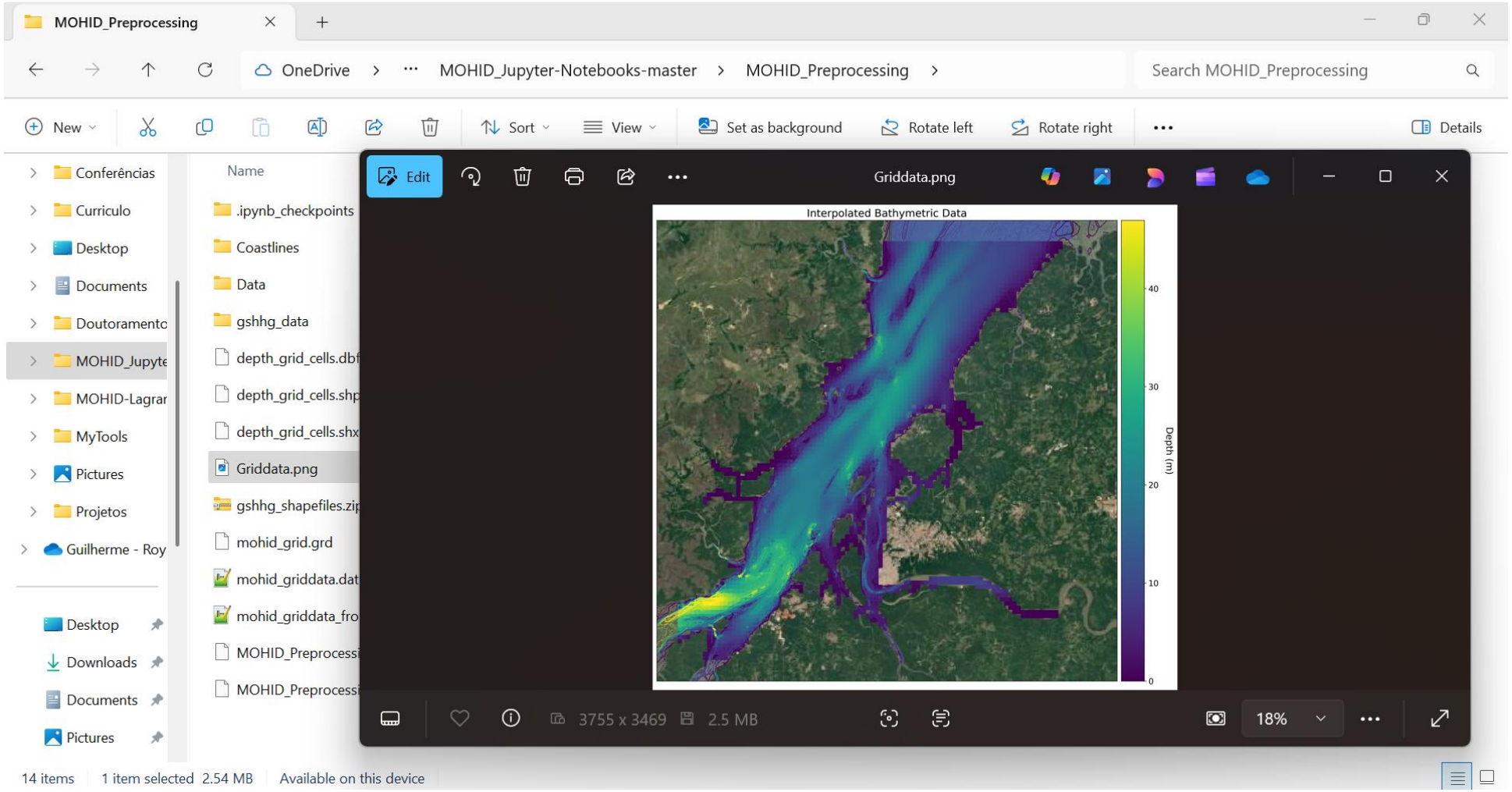

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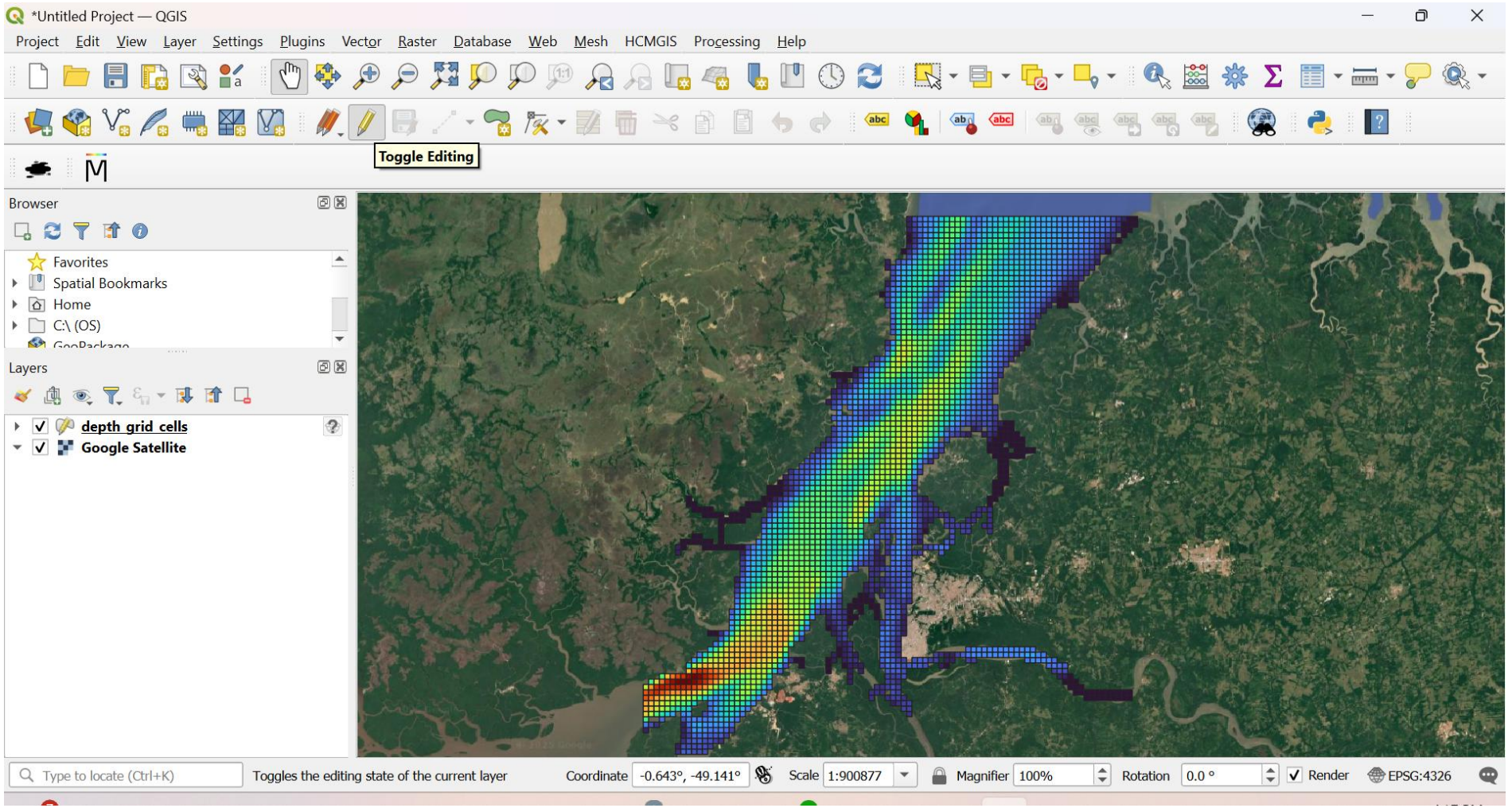

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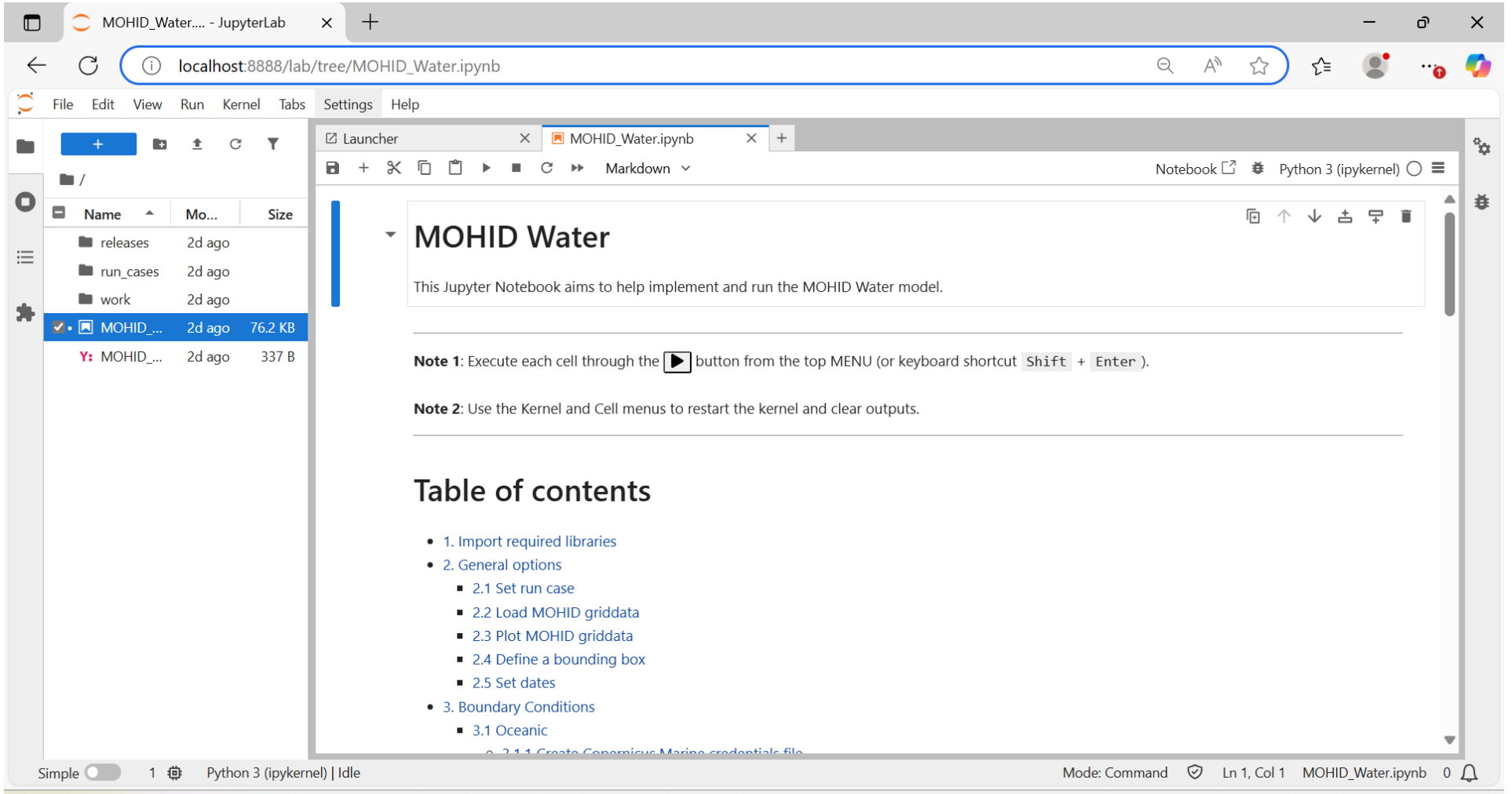

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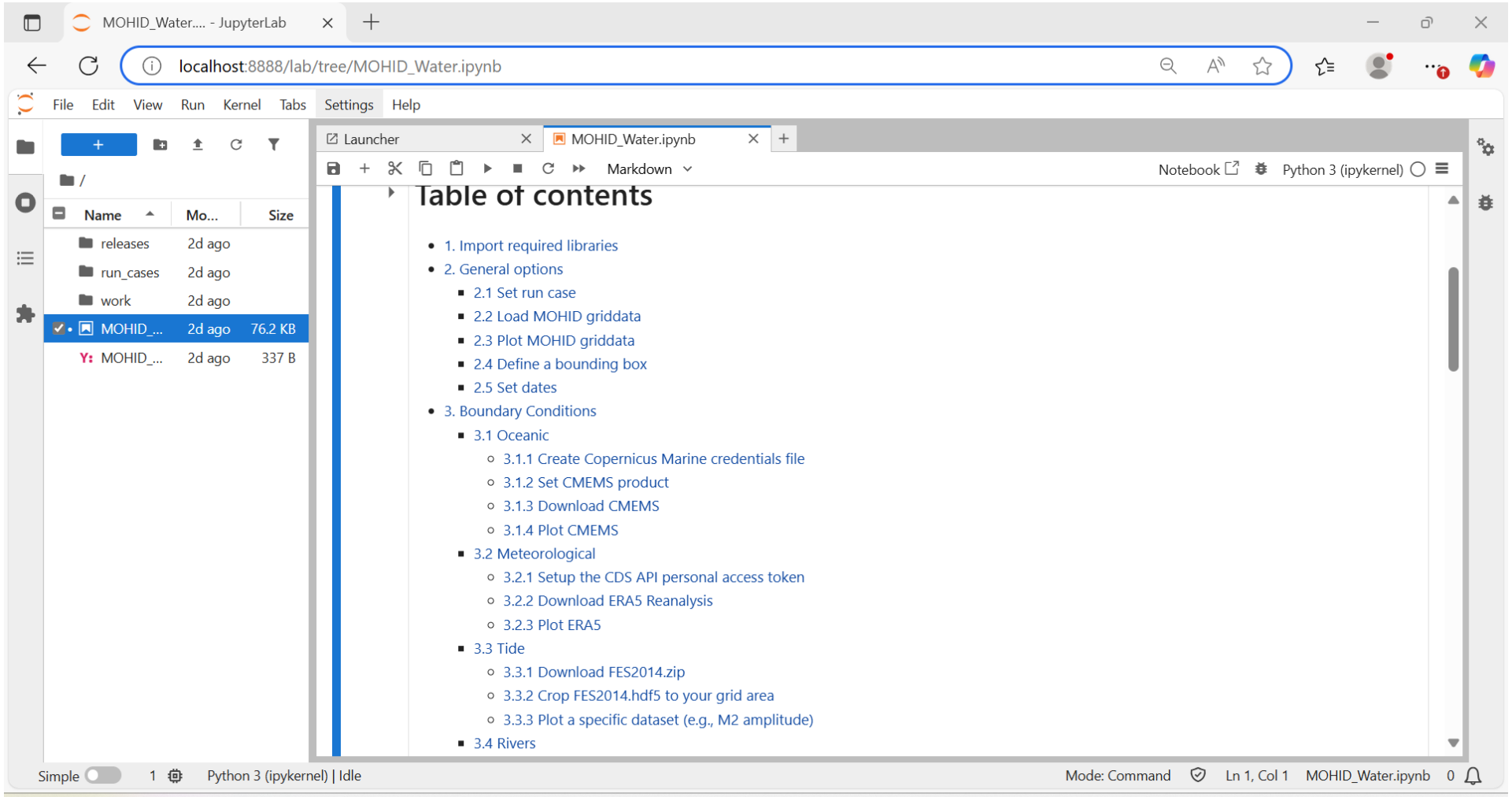

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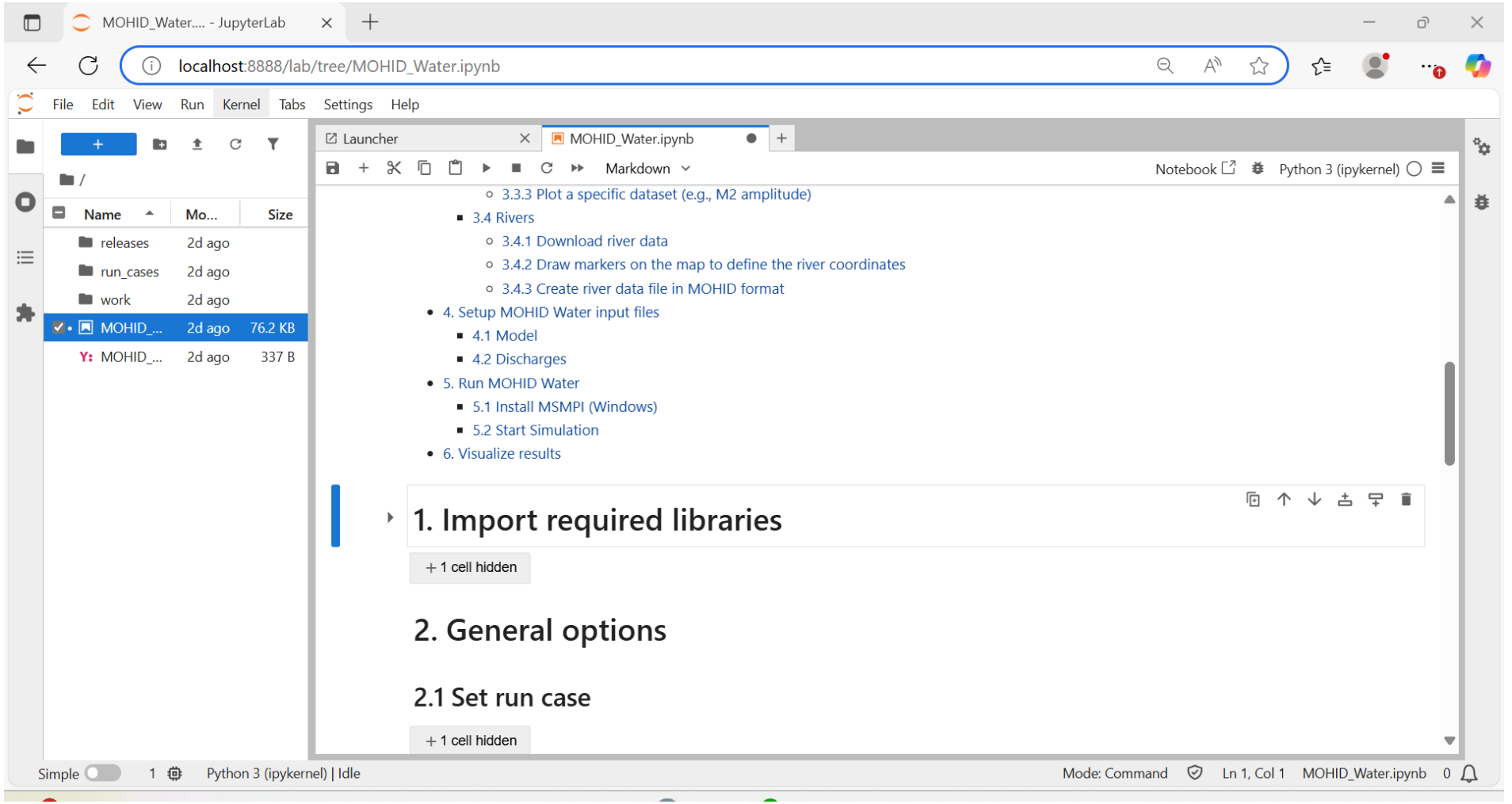

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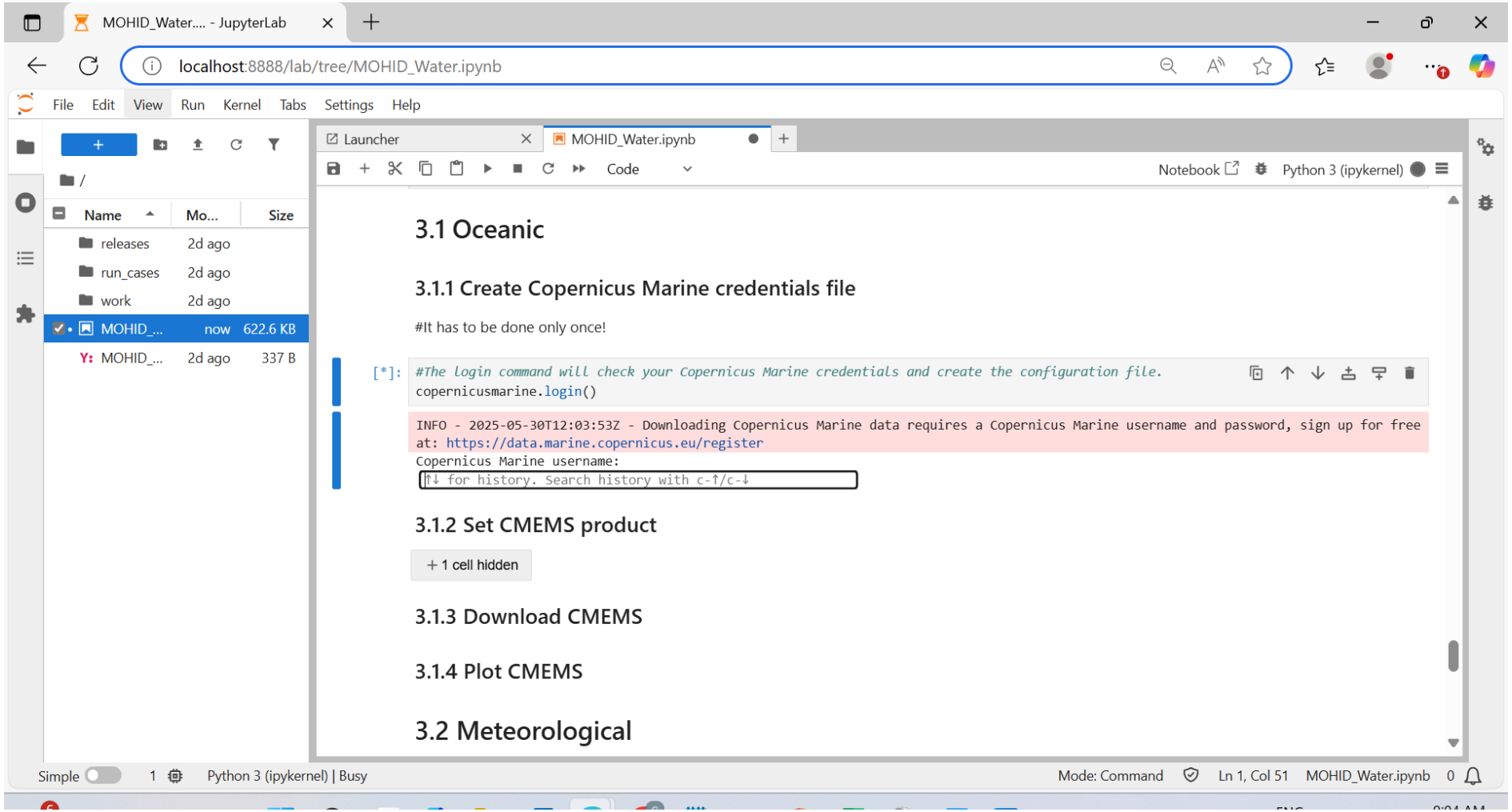

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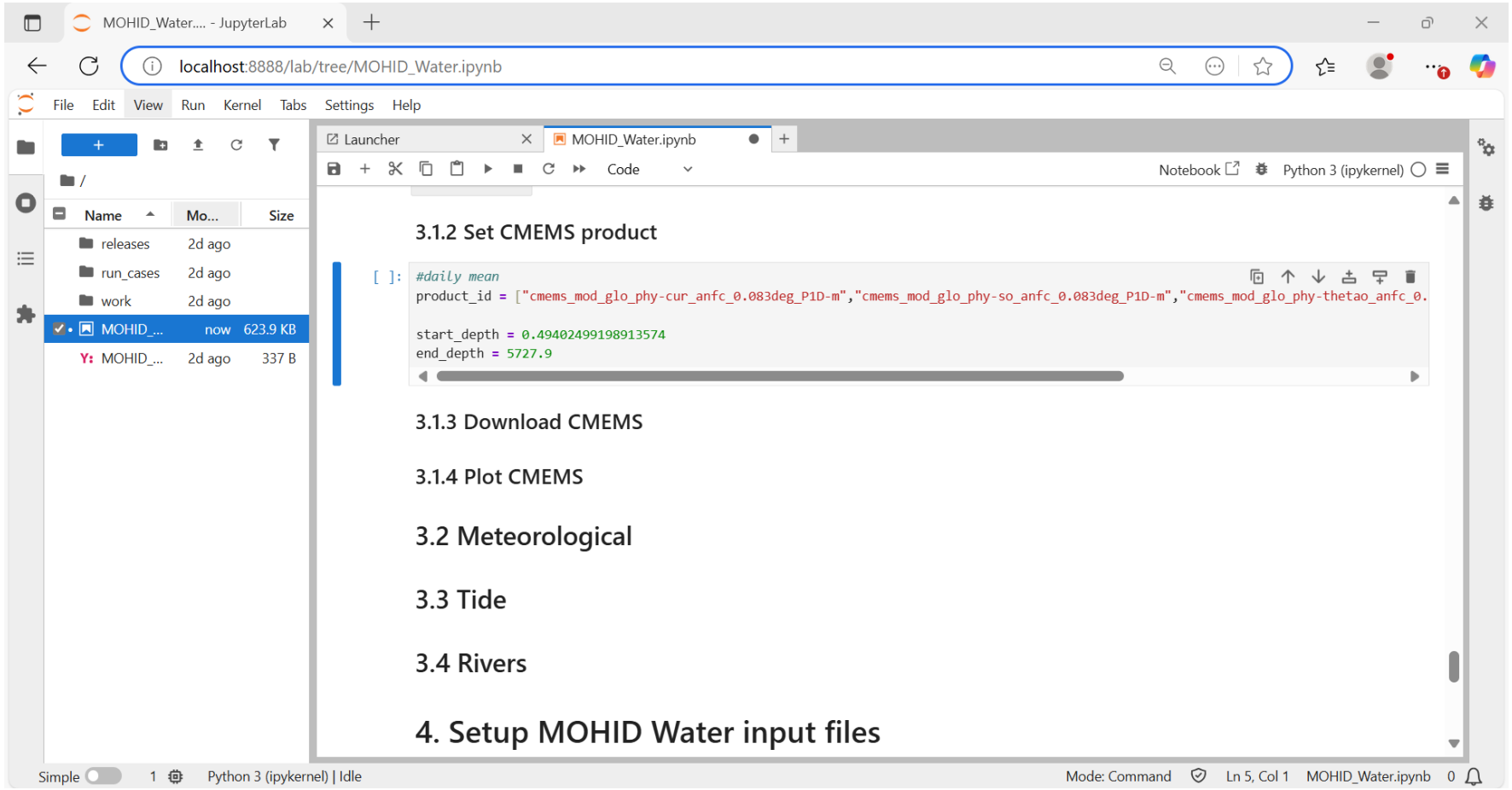

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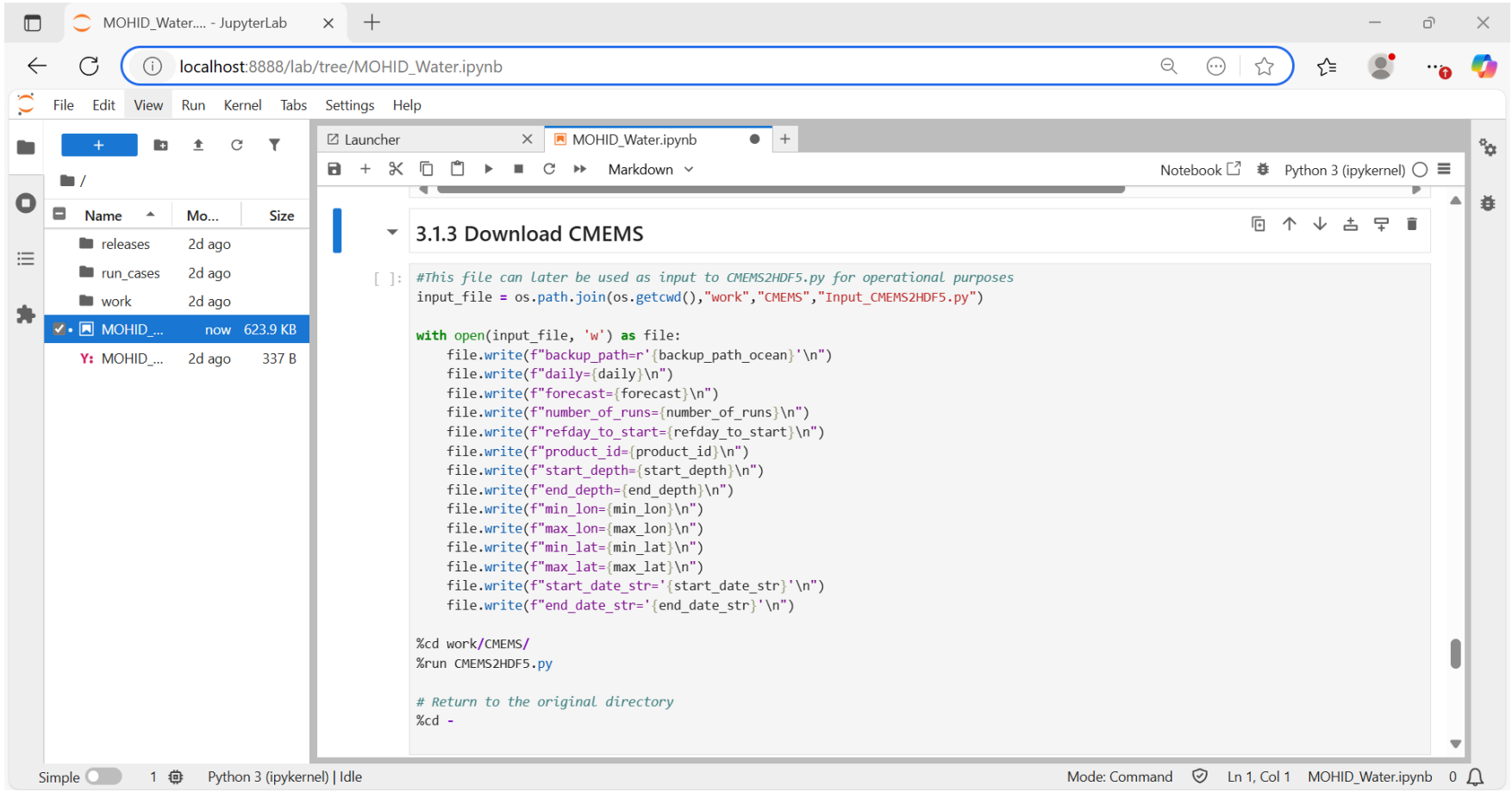

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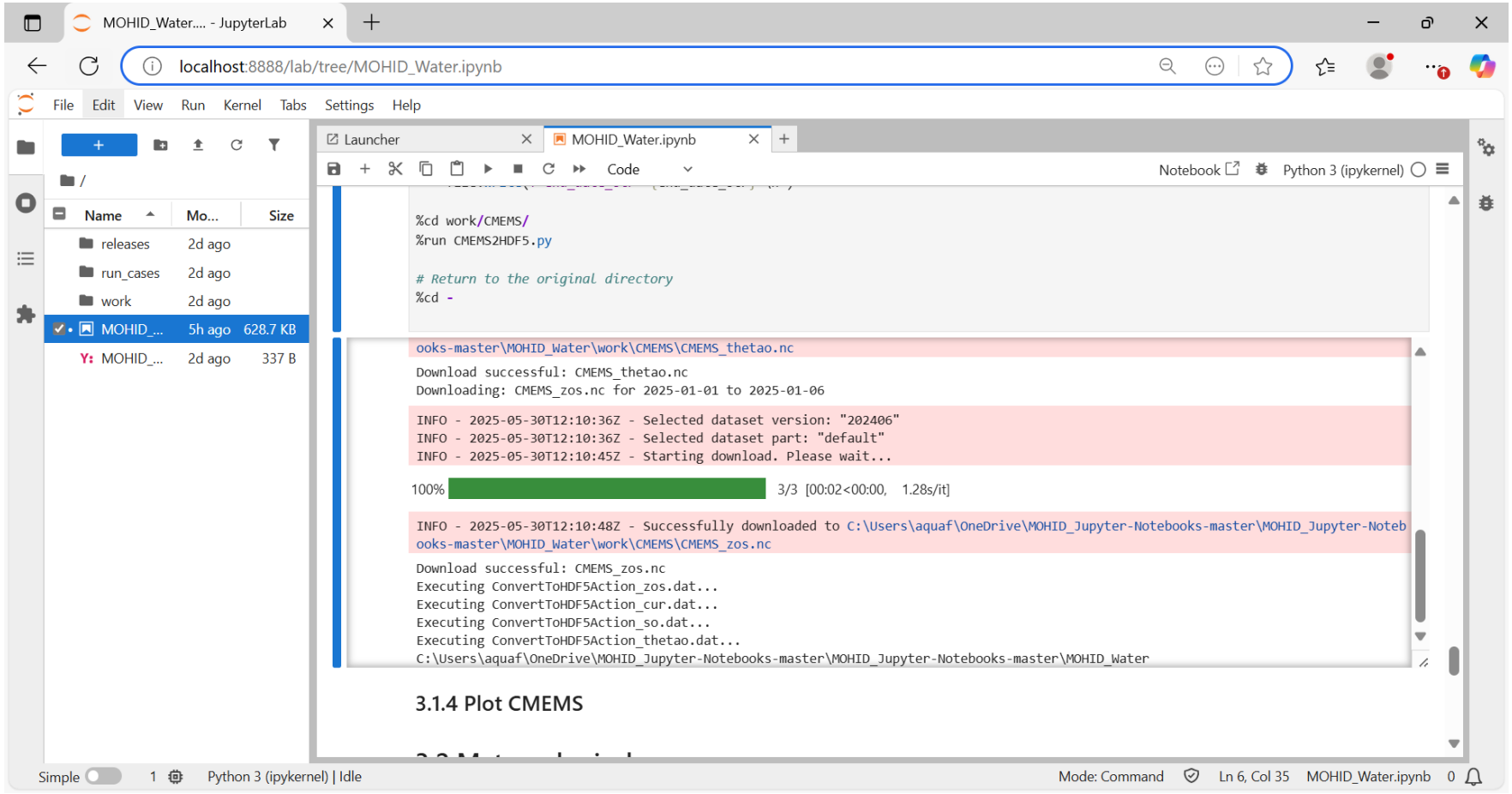

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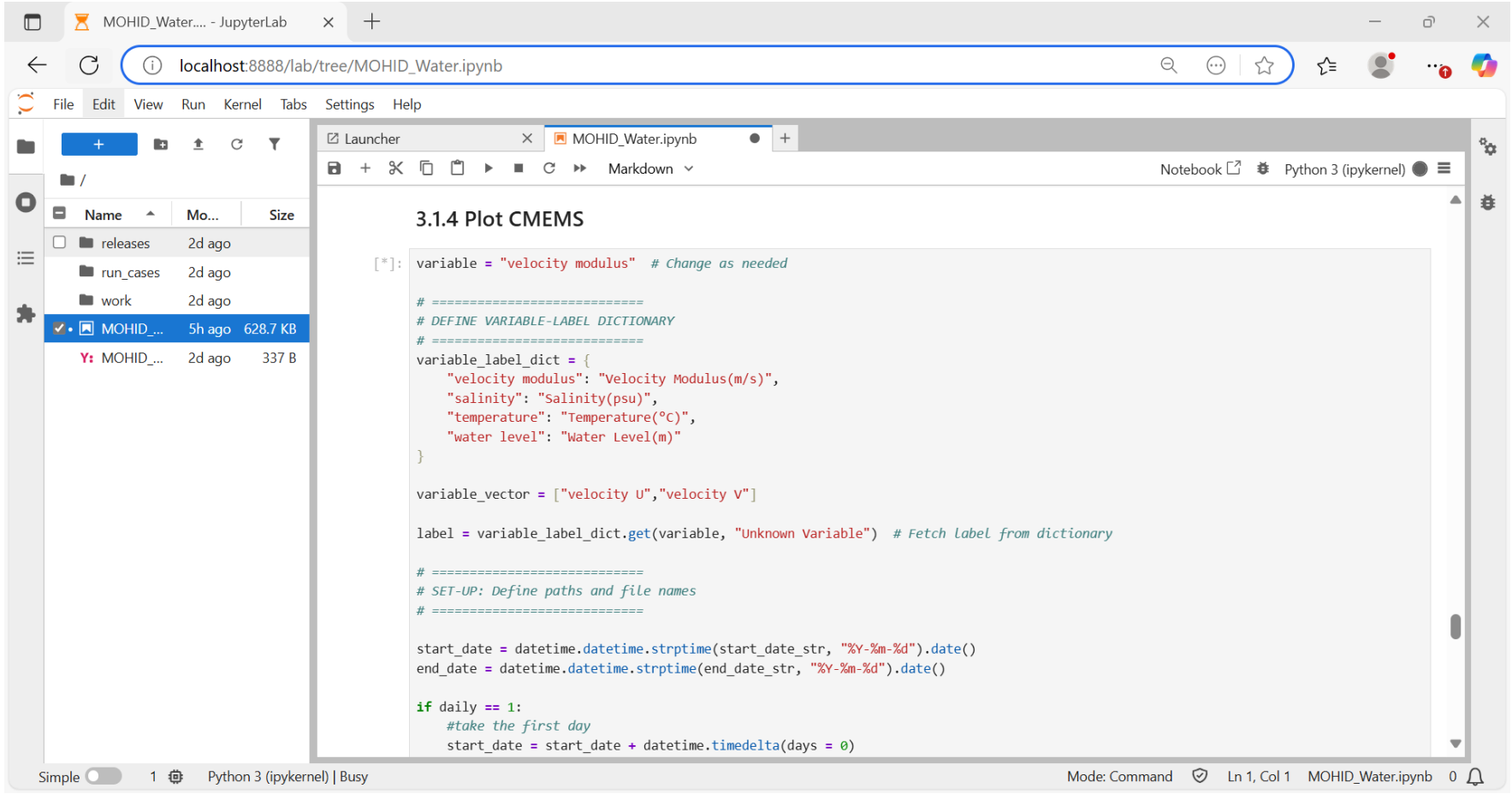

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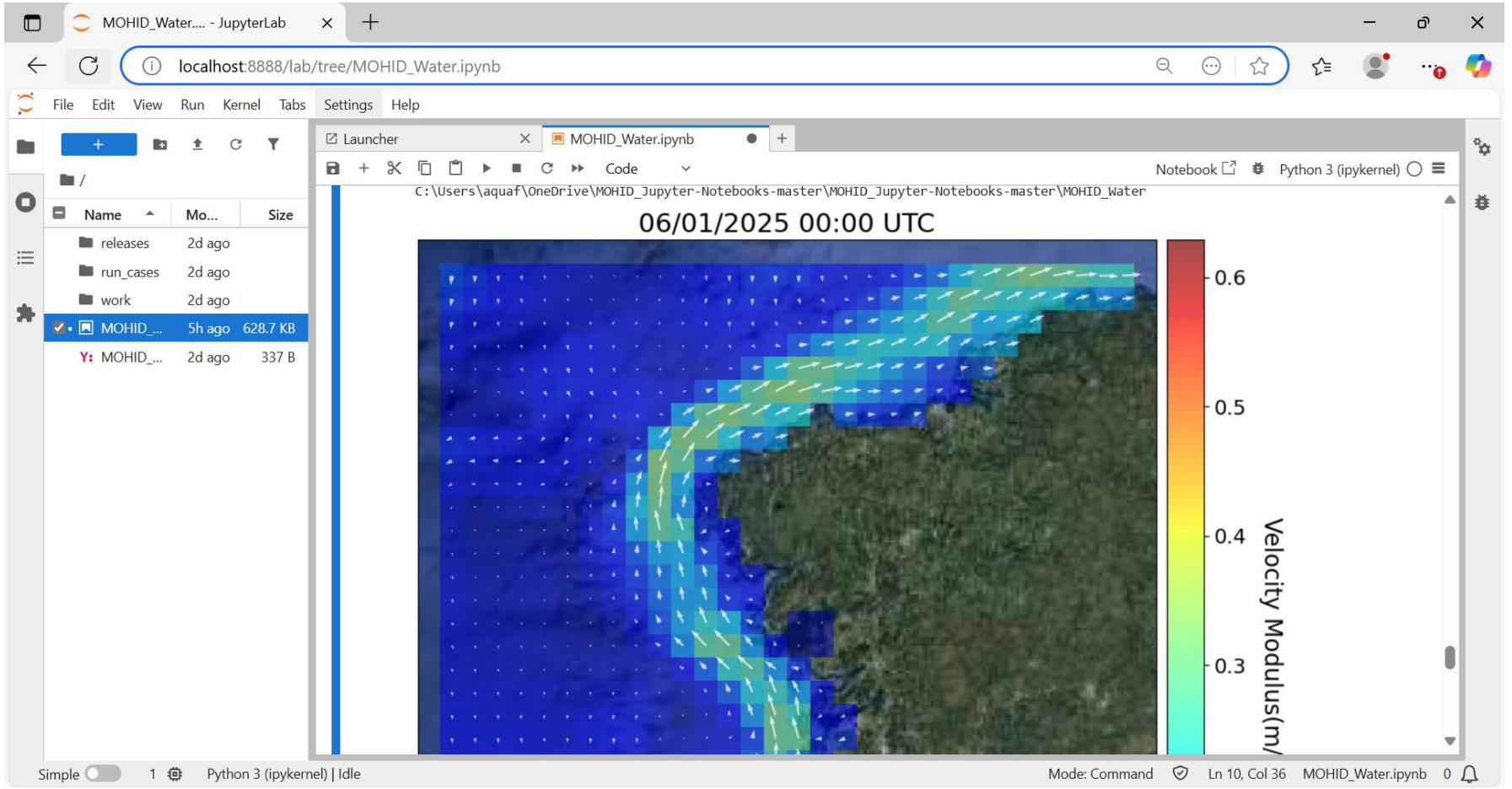

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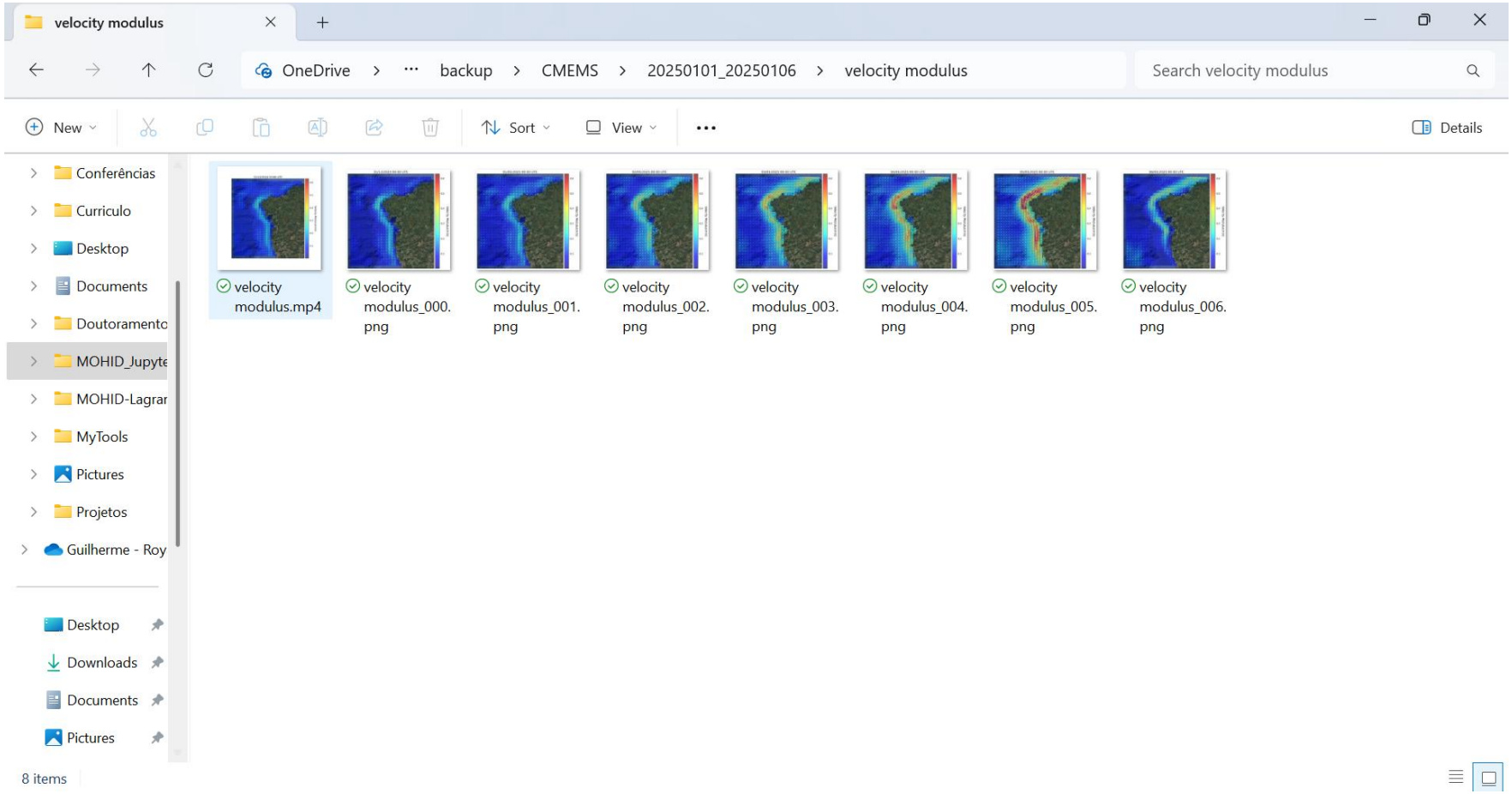

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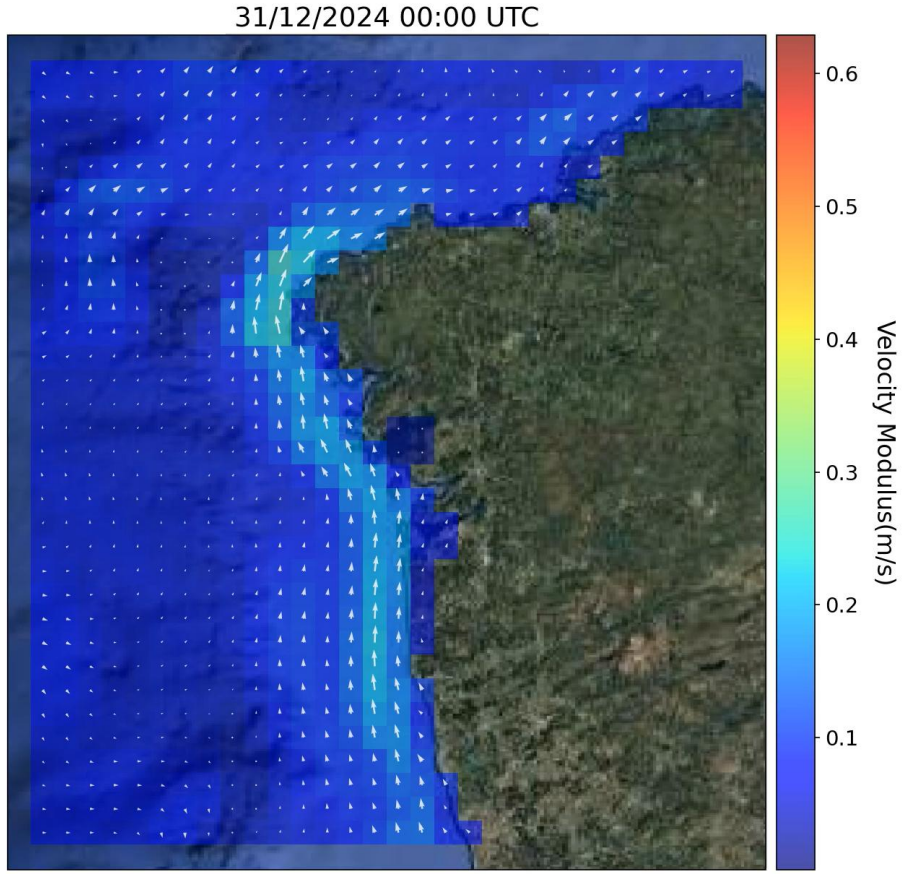

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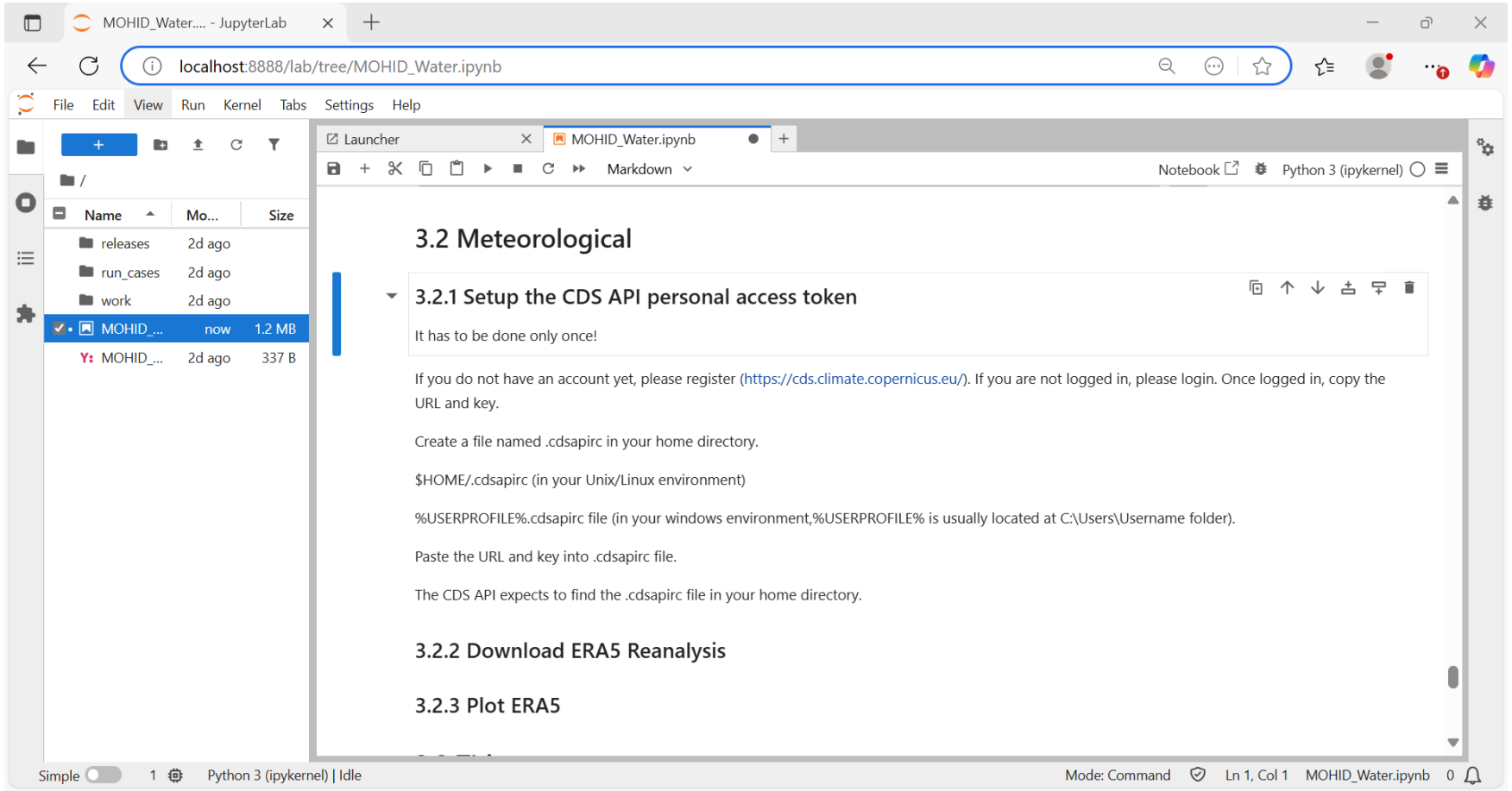

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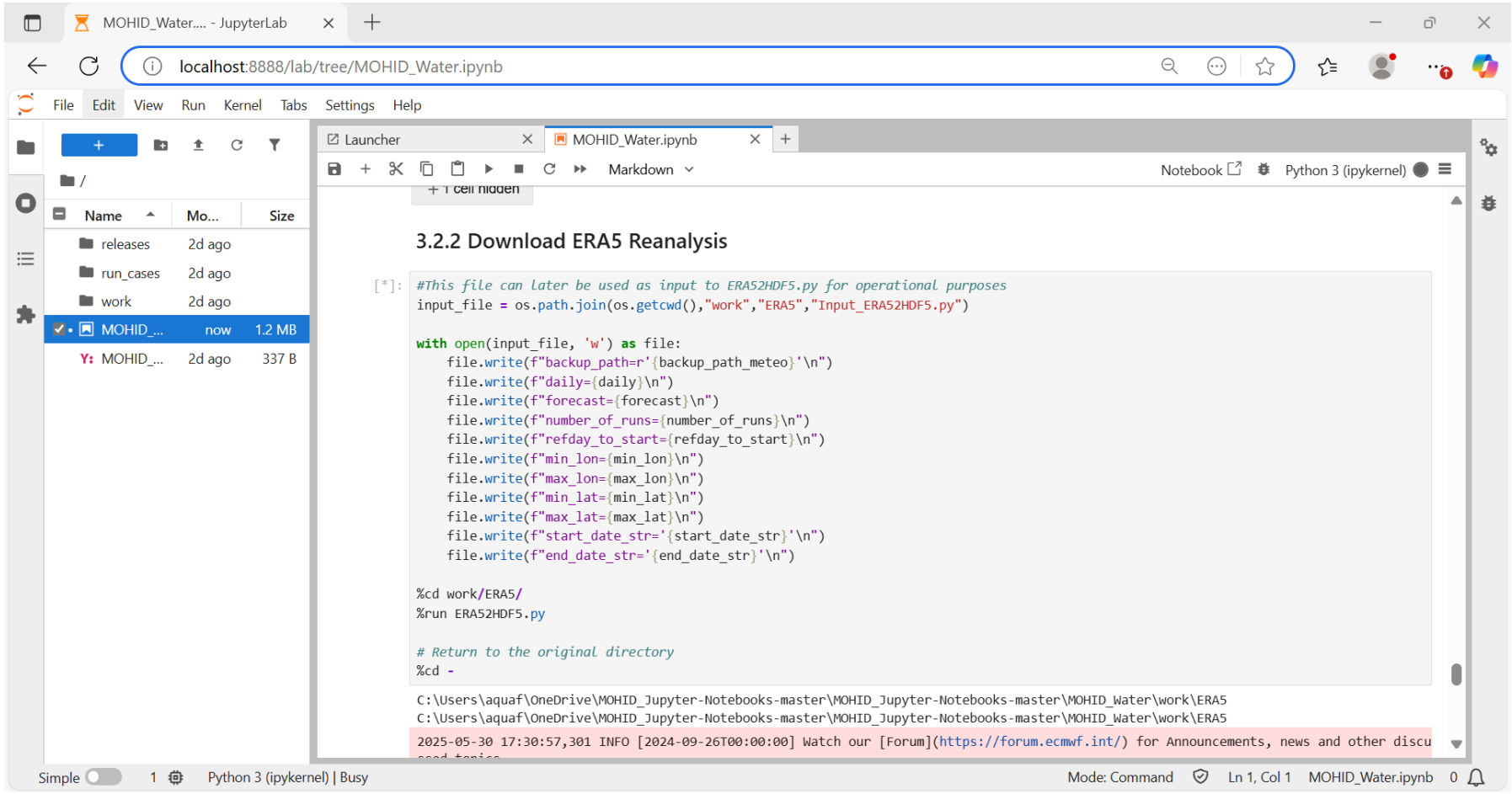

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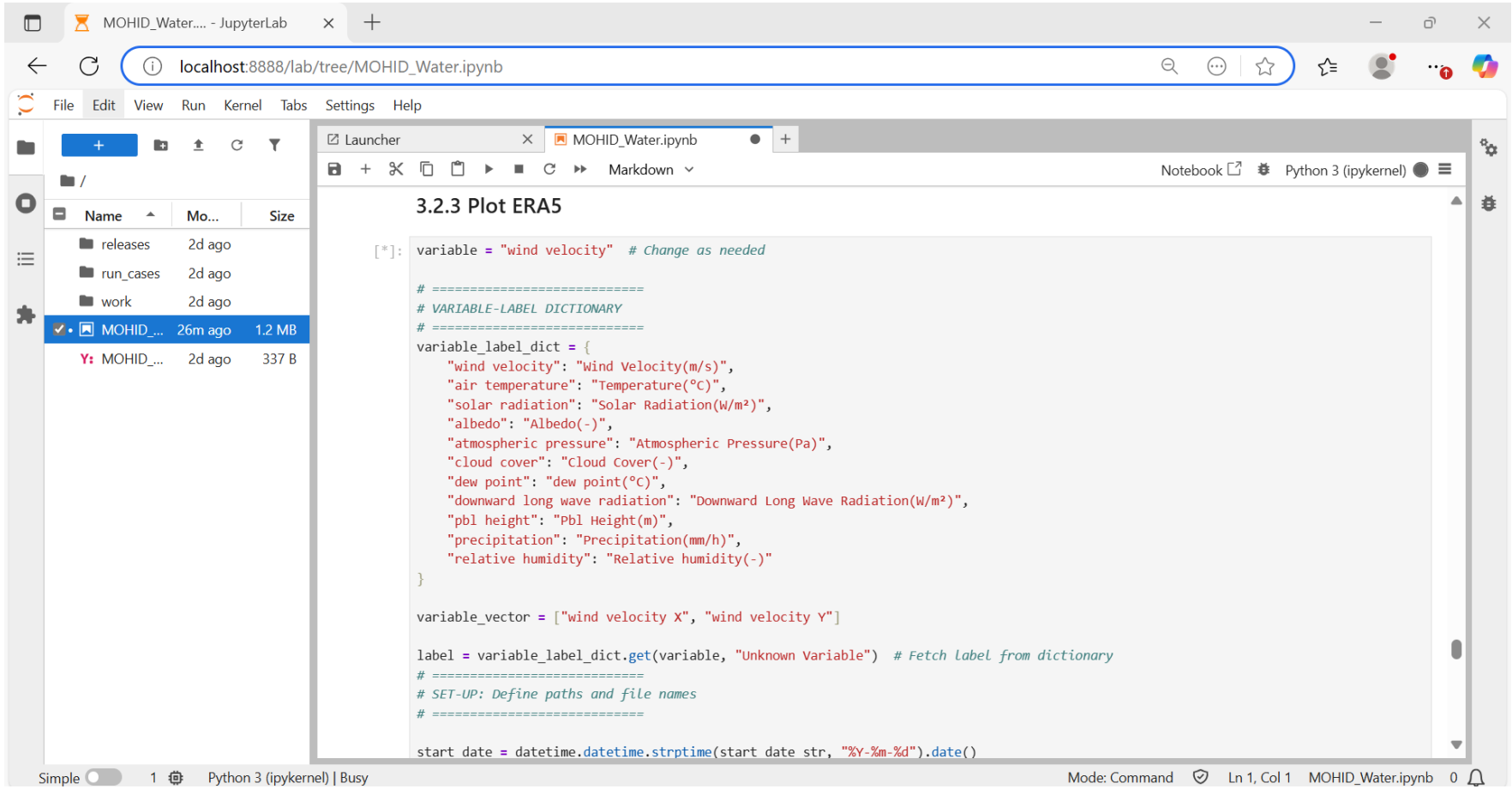

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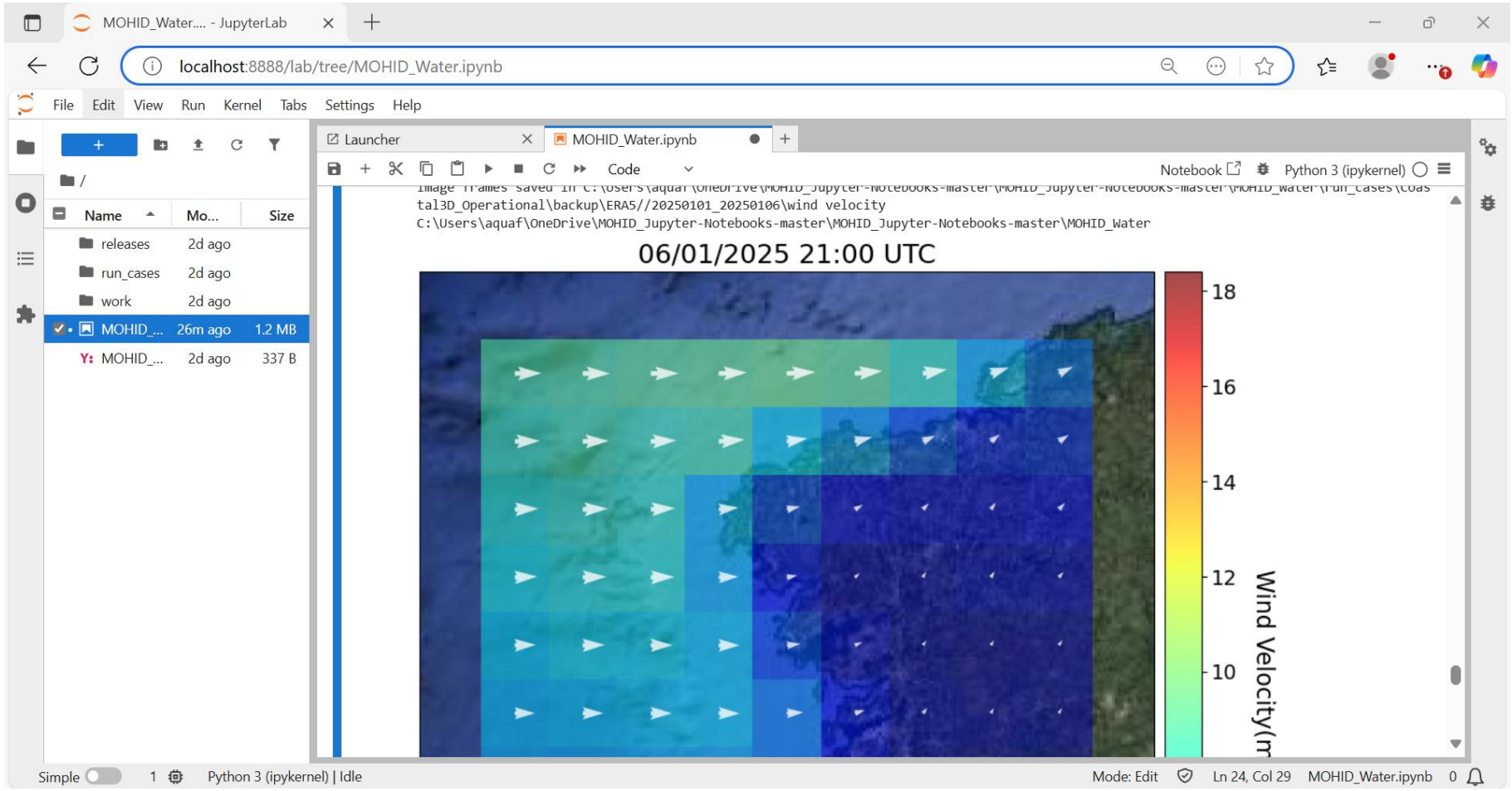

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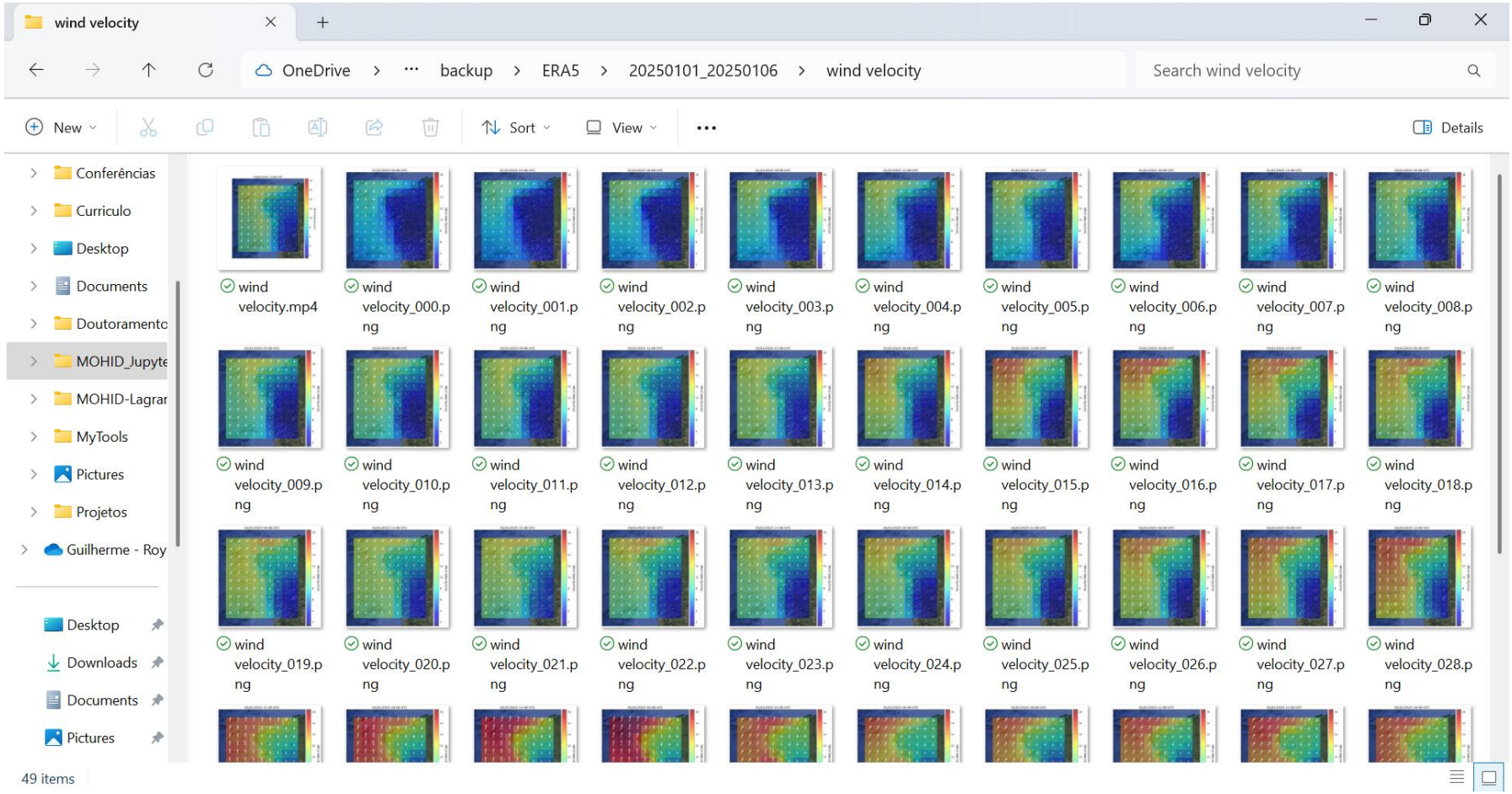

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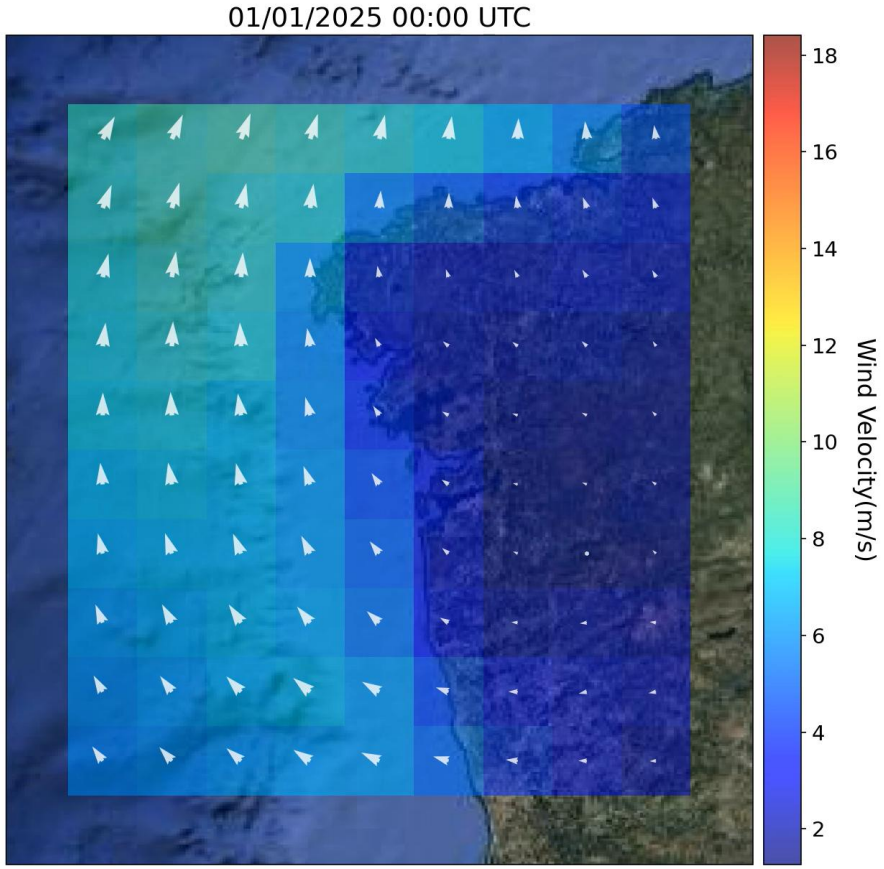

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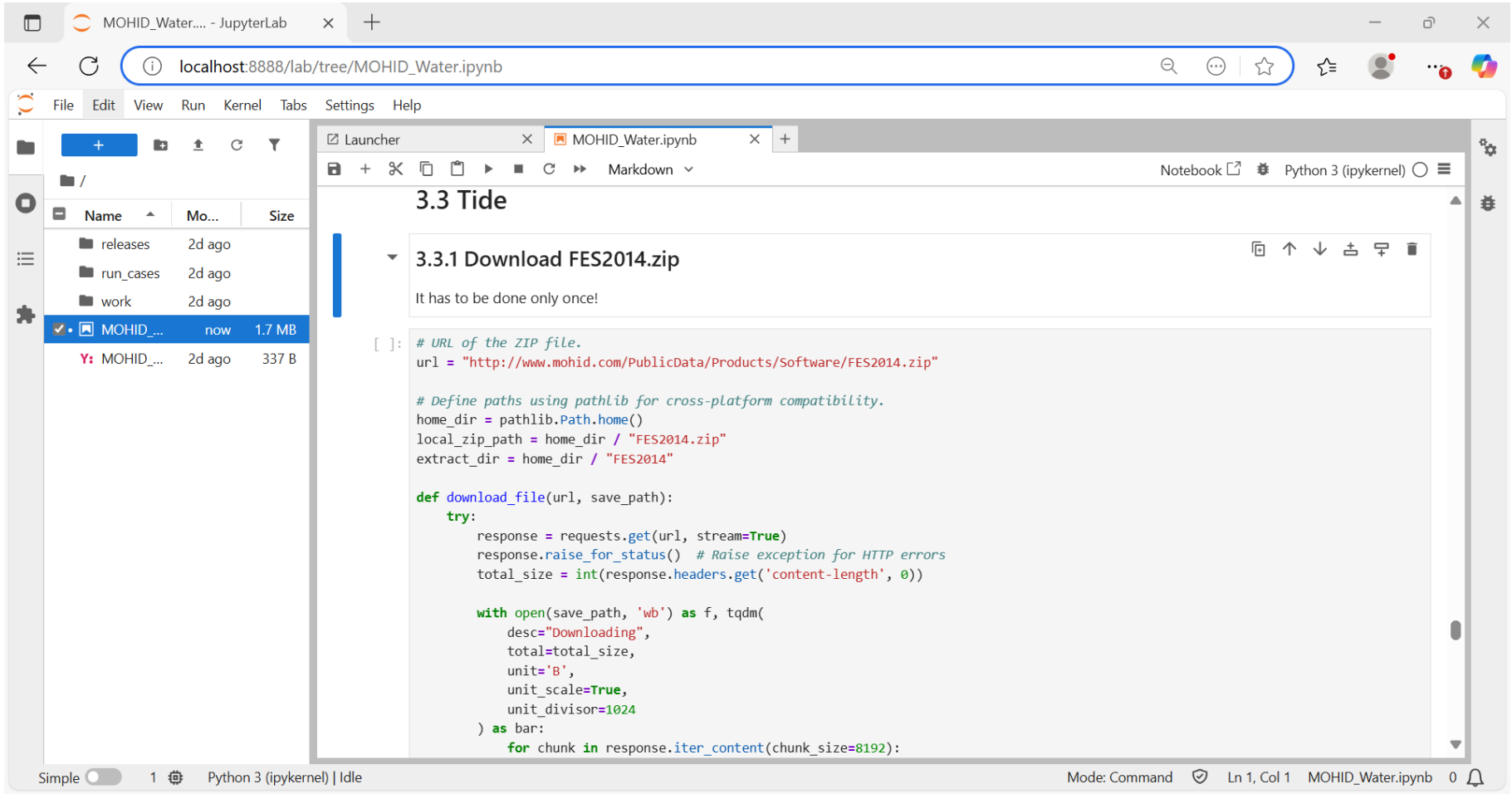

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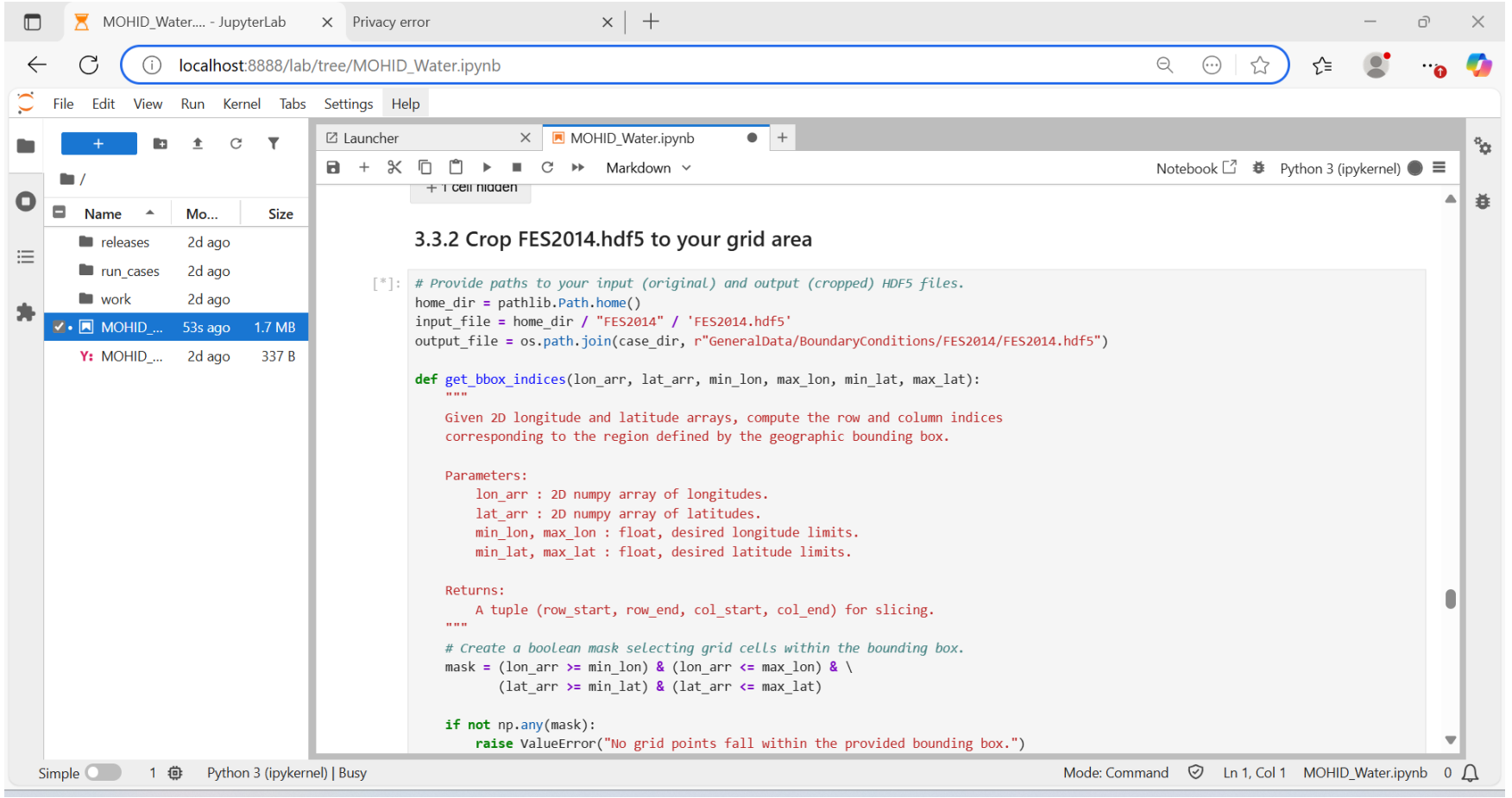

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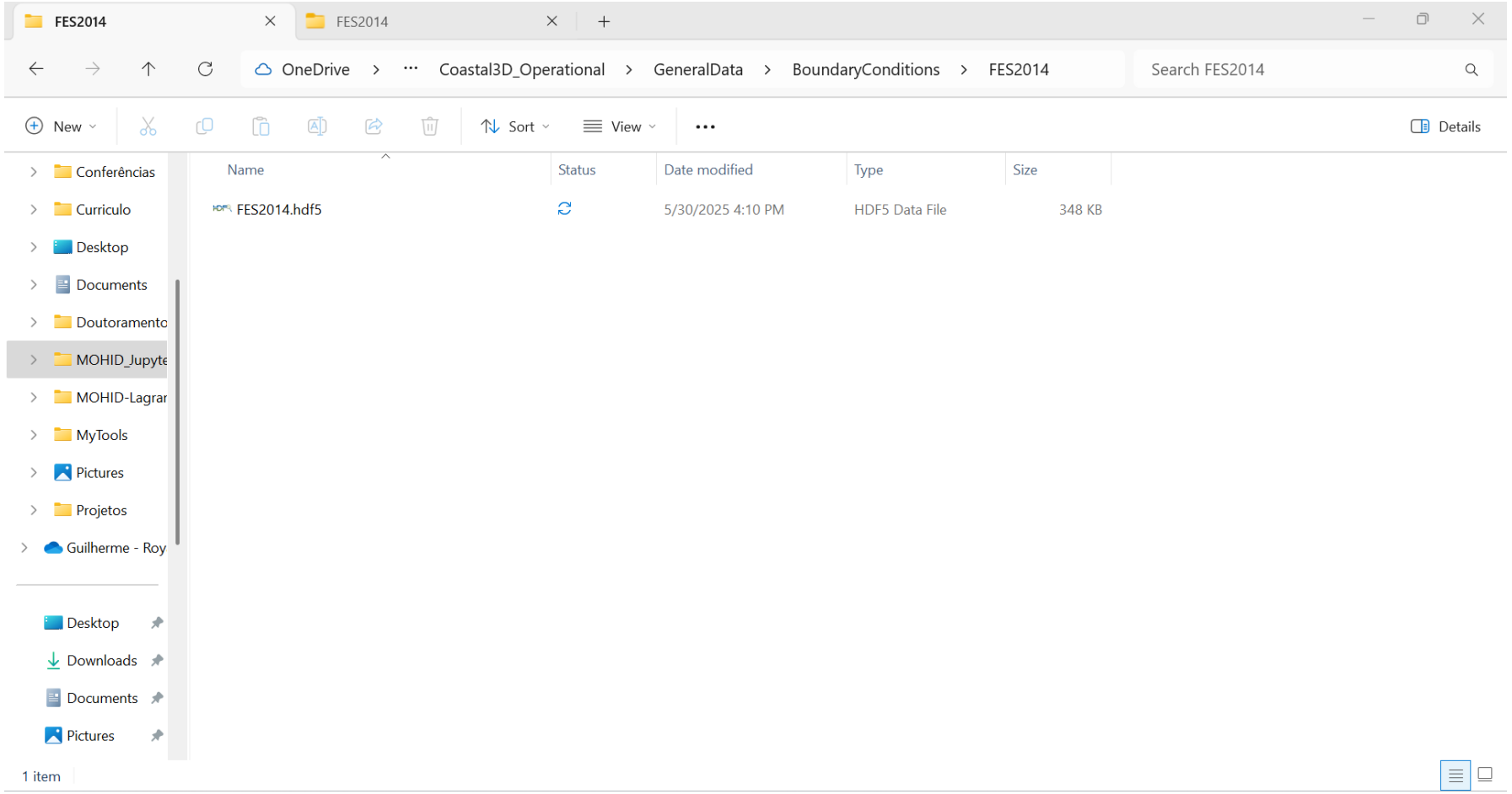

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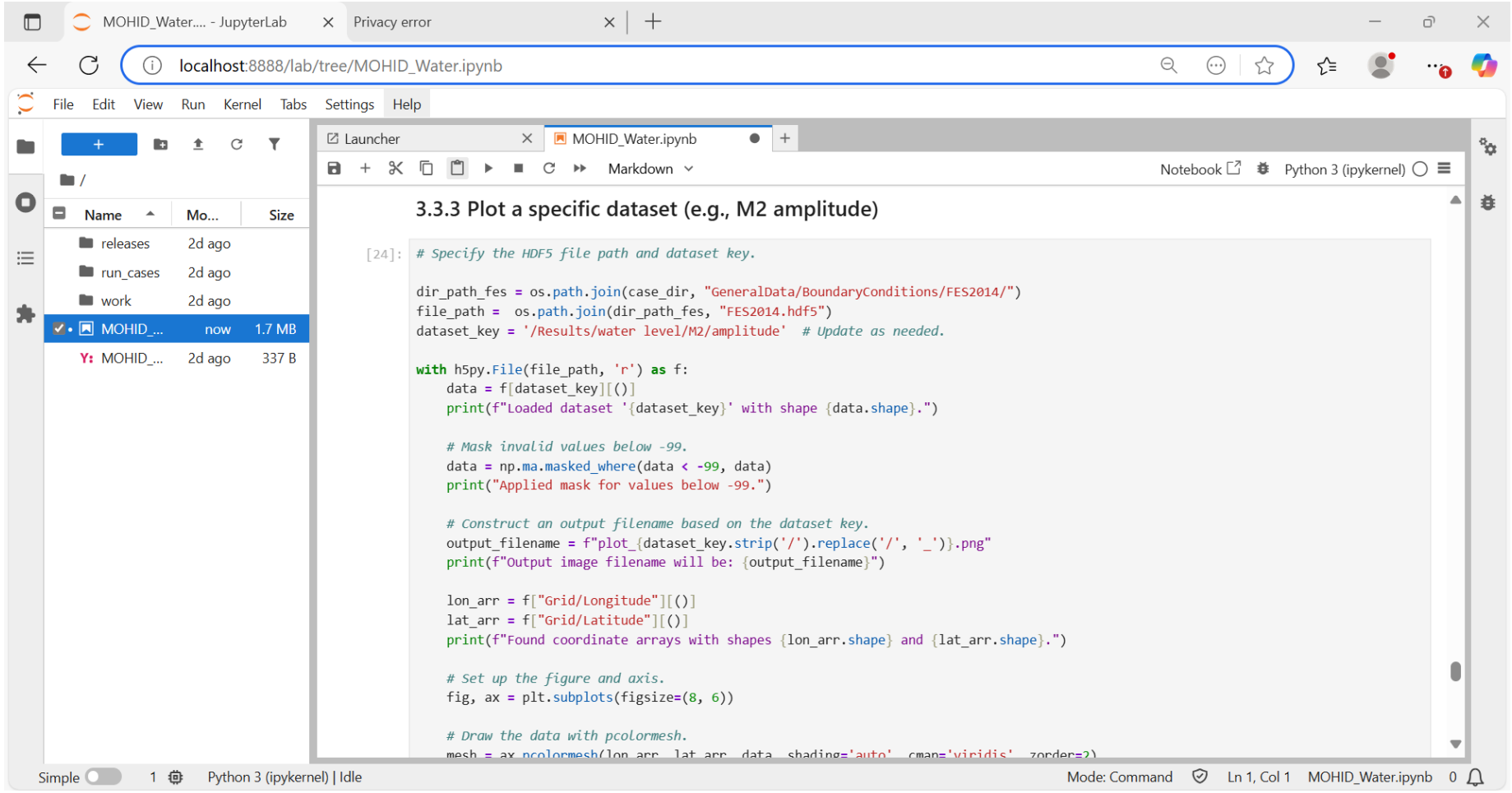

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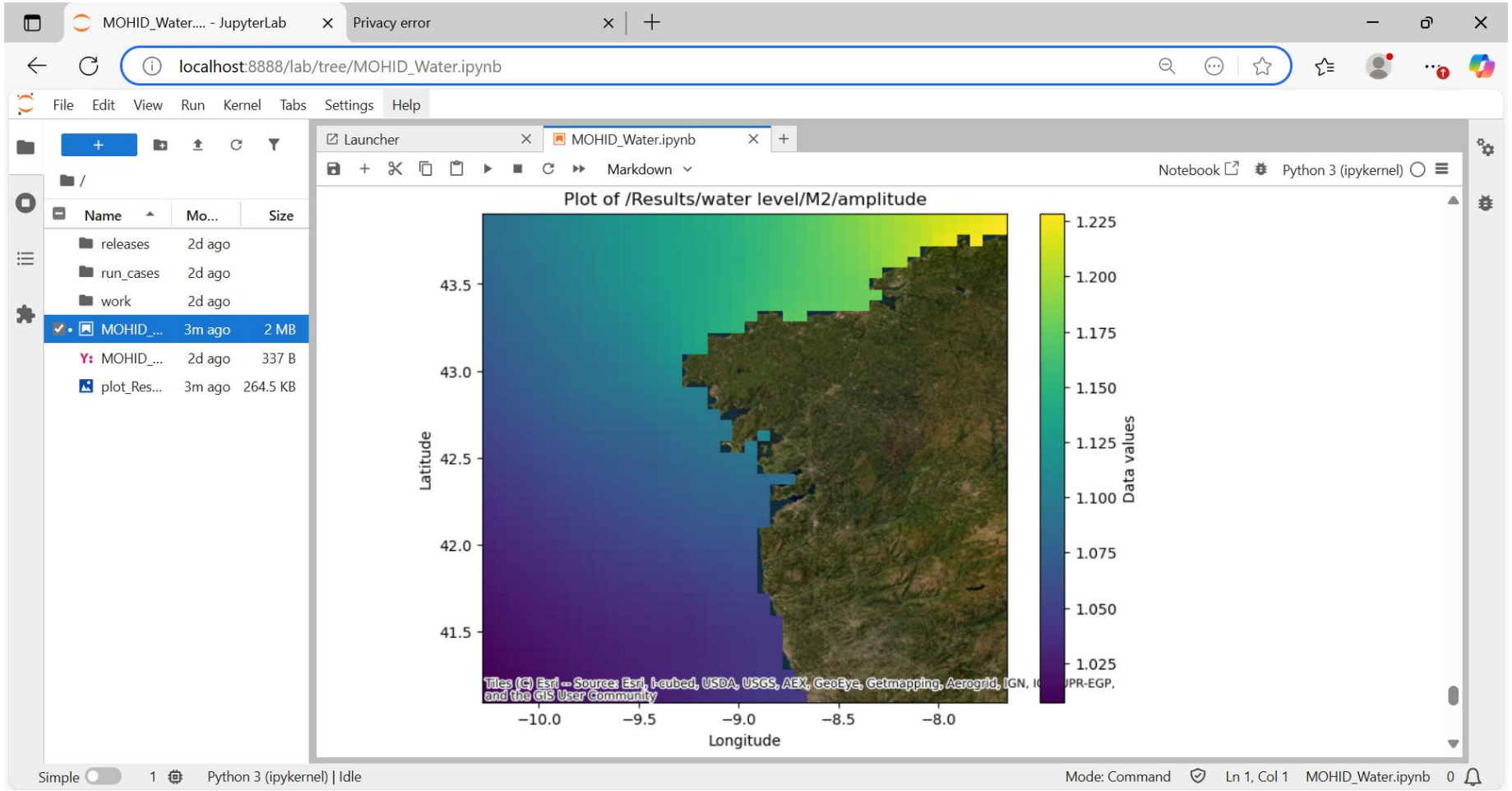

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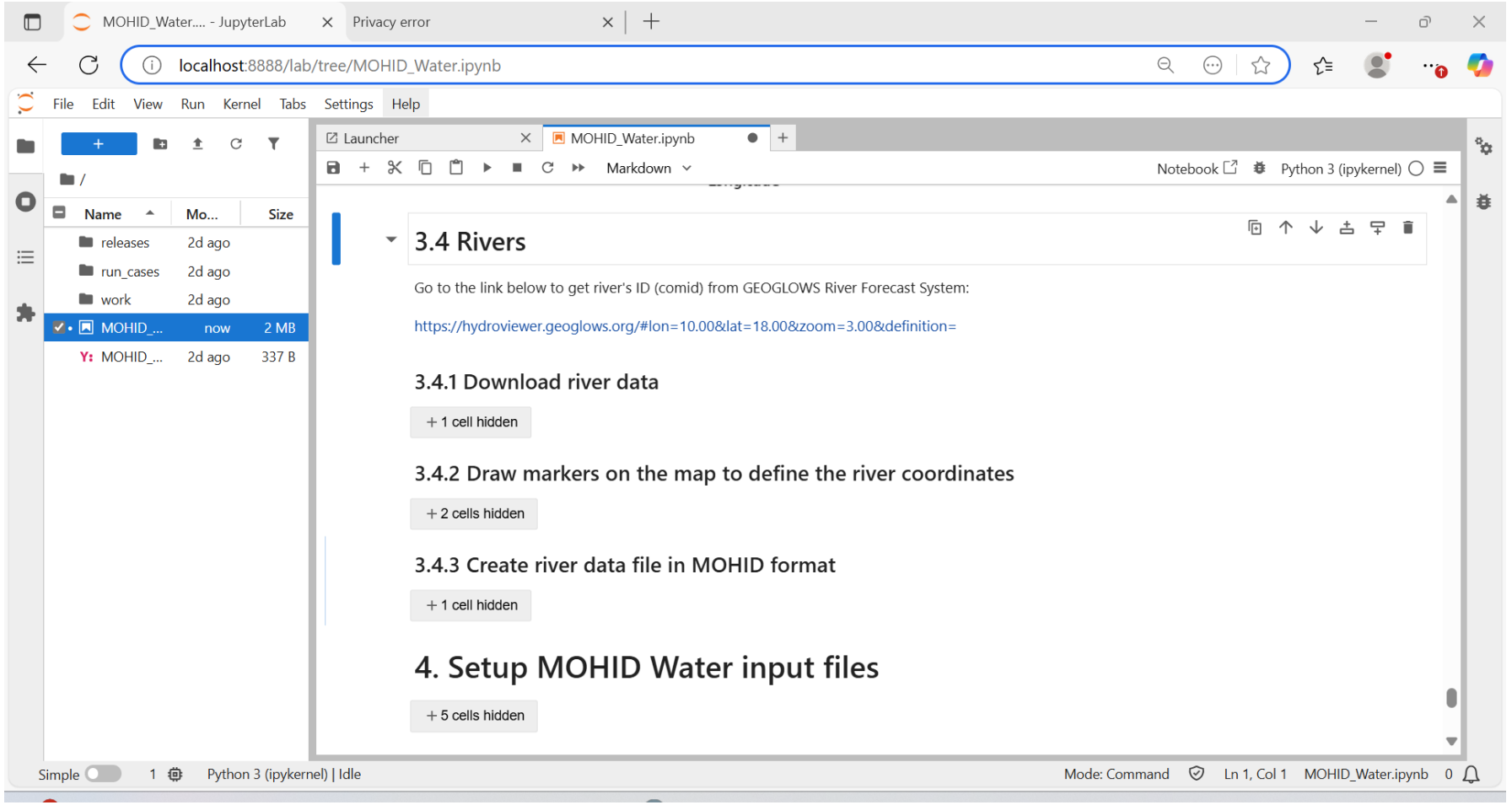

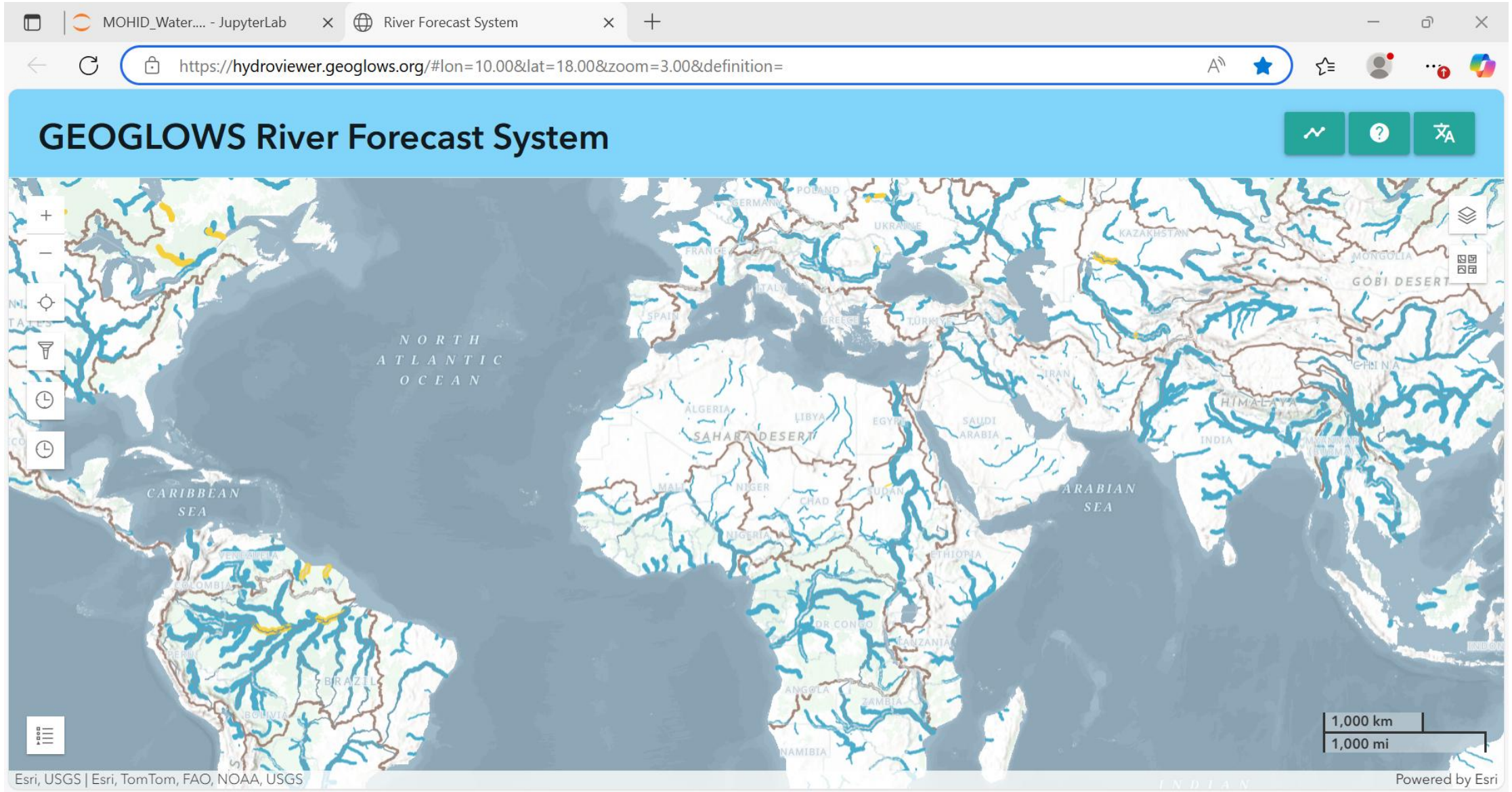
MOHID_Water.... - JupyterLab
River Forecast System
https://hydroviewer.geoglows.org/#lon=10.00&lat=18.00&zoom=3.00&definition=
GEOGLOWS River Forecast System
NORTH ATLANTIC OCEAN
CARIBBEAN SEA
ARABIAN SEA
SAHARA DESERT
GOBI DESERT
HIMALAYA
1,000 km
1,000 mi
Esri, USGS | Esri, TomTom, FAO, NOAA, USGS
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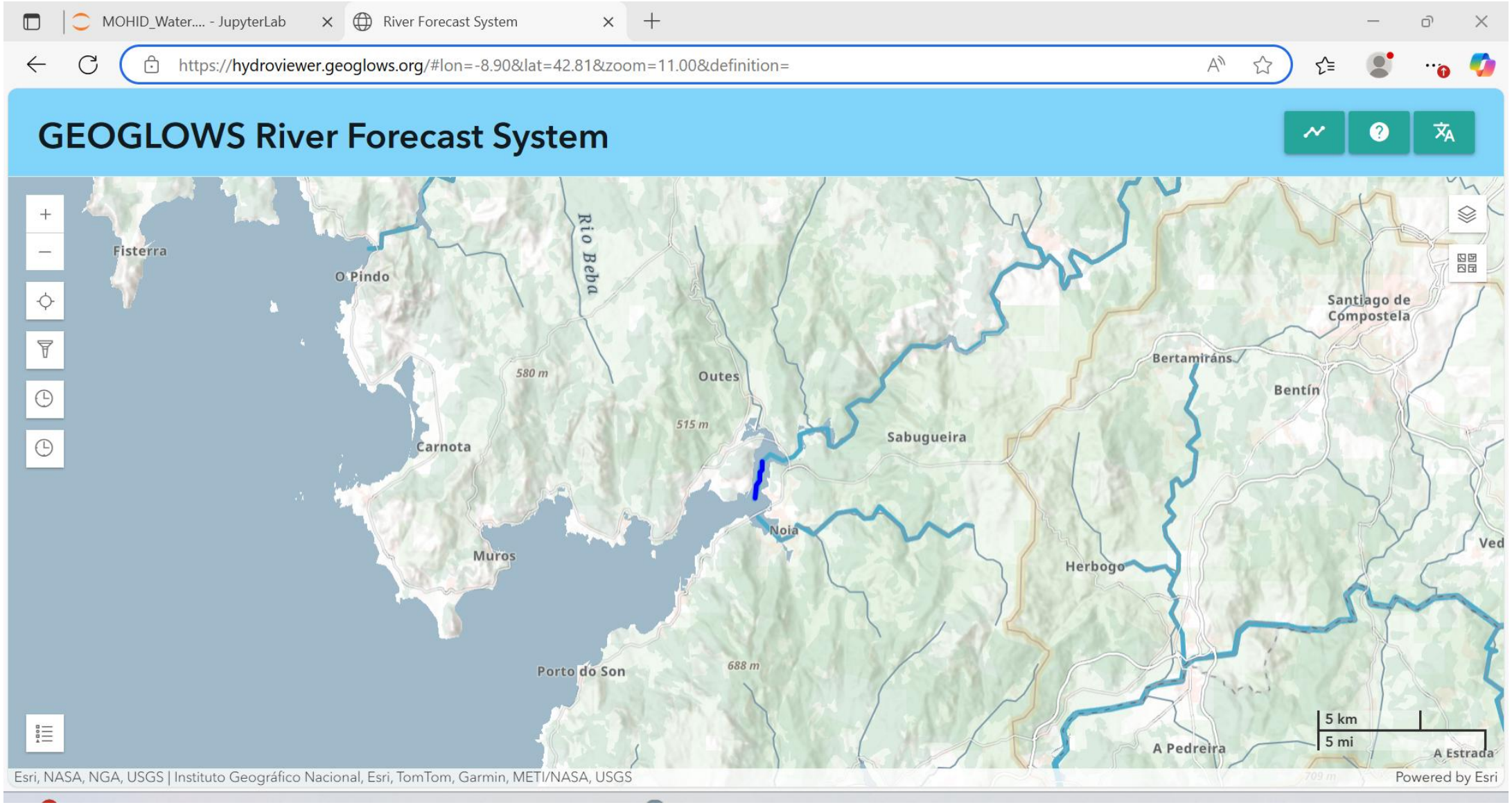
MOHID_Water.... - JupyterLab
River Forecast System
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Fisterra
O Pindo
Rio Beba
580 m
Outes
515 m
Carnota
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Noia
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Porto do Son
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Santiago de Compostela
Bertamiráns
Bentín
A Pedreira
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Esri, NASA, NGA, USGS | Instituto Geográfico Nacional, Esri, TomTom, Garmin, METI/NASA, USGS
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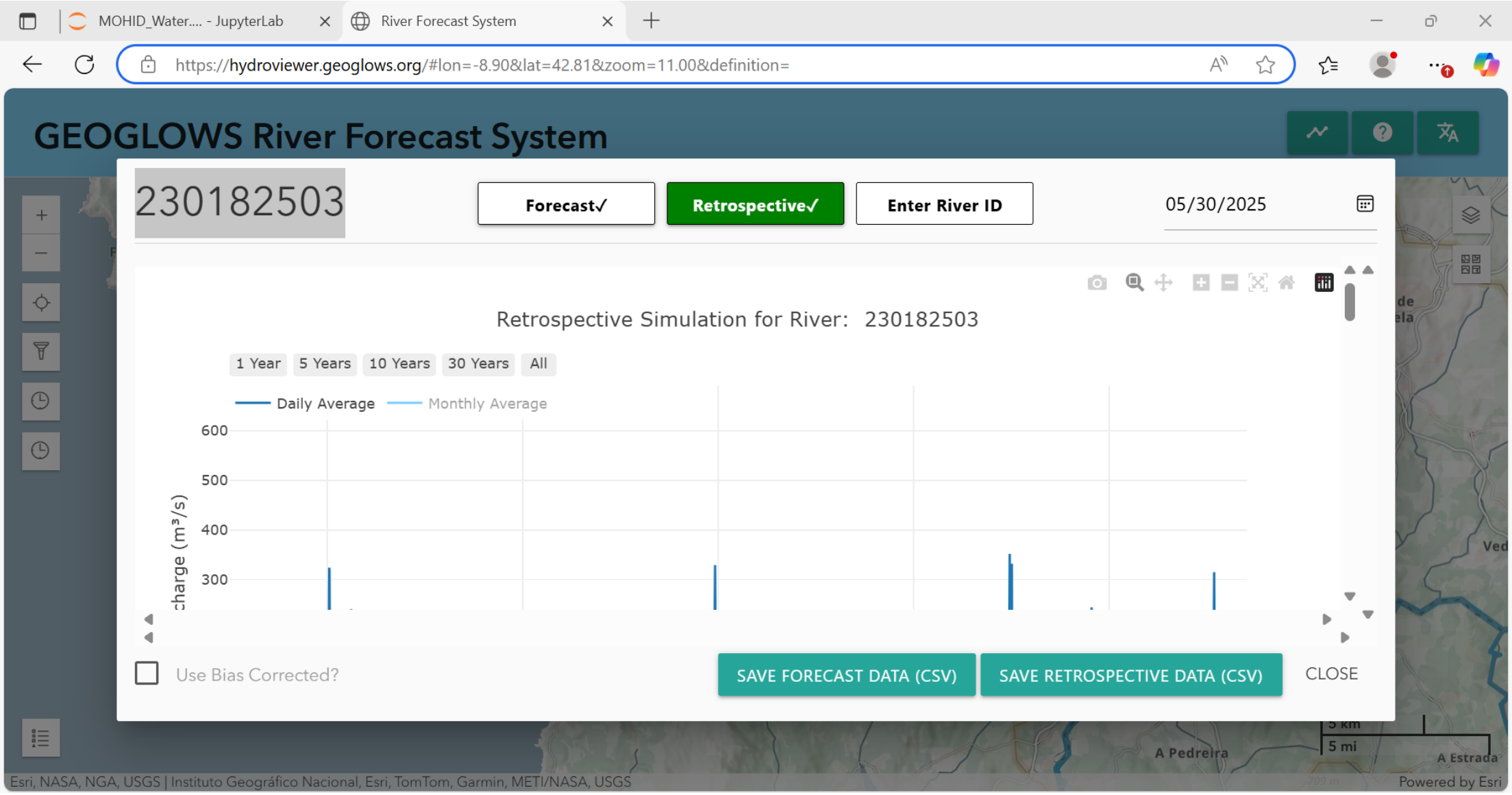
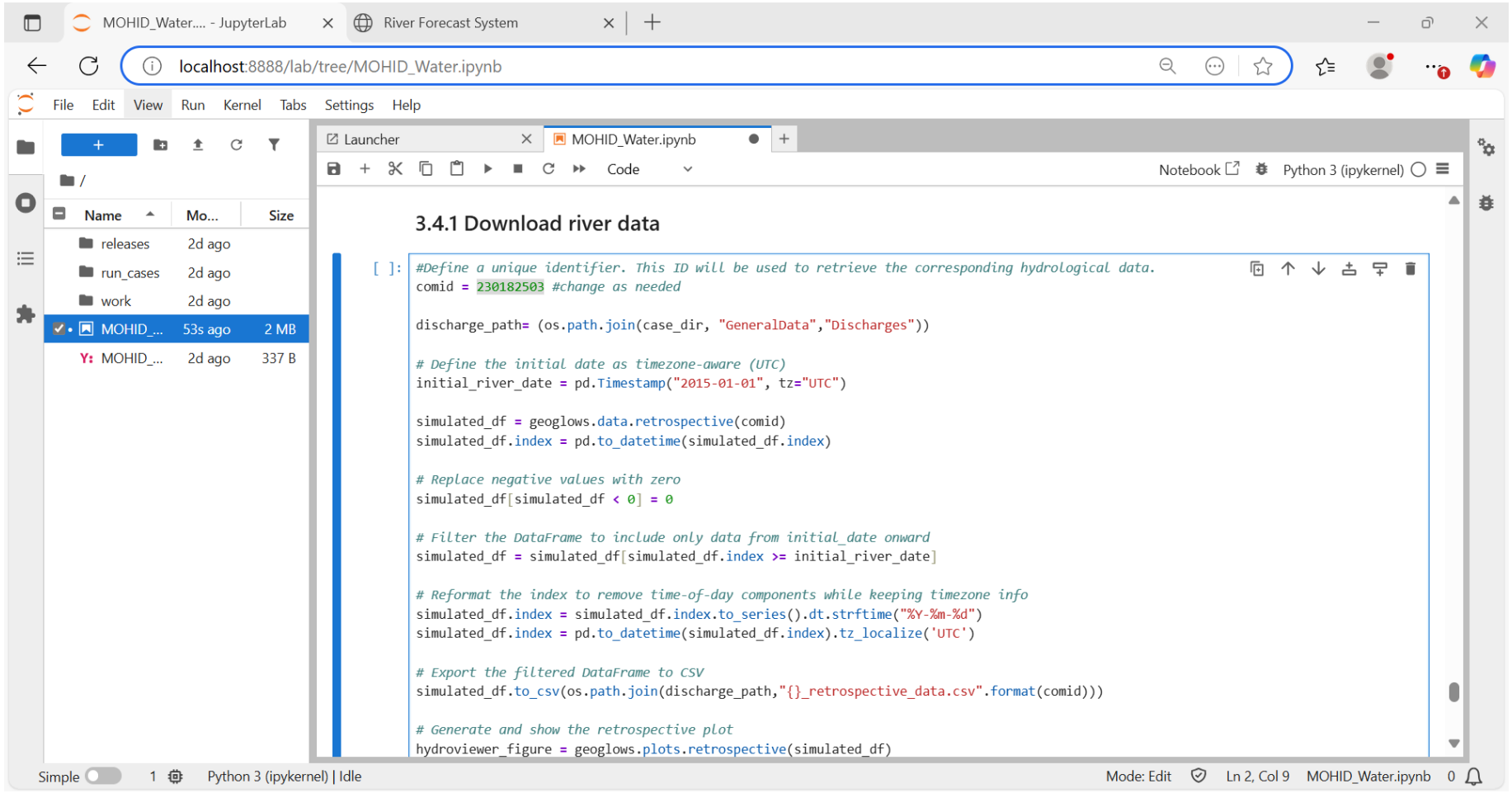

MOHID_Water.... - JupyterLab
River Forecast System
https://hydroviewer.geoglows.org/#lon=-8.90&lat=42.81&zoom=11.00&definition=
GEOGLOWS River Forecast System
230182503
Forecast✓
Retrospective✓
Enter River ID
05/30/2025
Retrospective Simulation for River: 230182503
1 Year
5 Years
10 Years
30 Years
All
Daily Average
Monthly Average
600
500
400
300
charge (m³/s)
Use Bias Corrected?
SAVE FORECAST DATA (CSV)
SAVE RETROSPECTIVE DATA (CSV)
CLOSE
A Pedreira
A Estrada
5 km
5 mi
Esri, NASA, NGA, USGS | Instituto Geográfico Nacional, Esri, TomTom, Garmin, METI/NASA, USGS
Powered by Esri

MOHID Water Notebook



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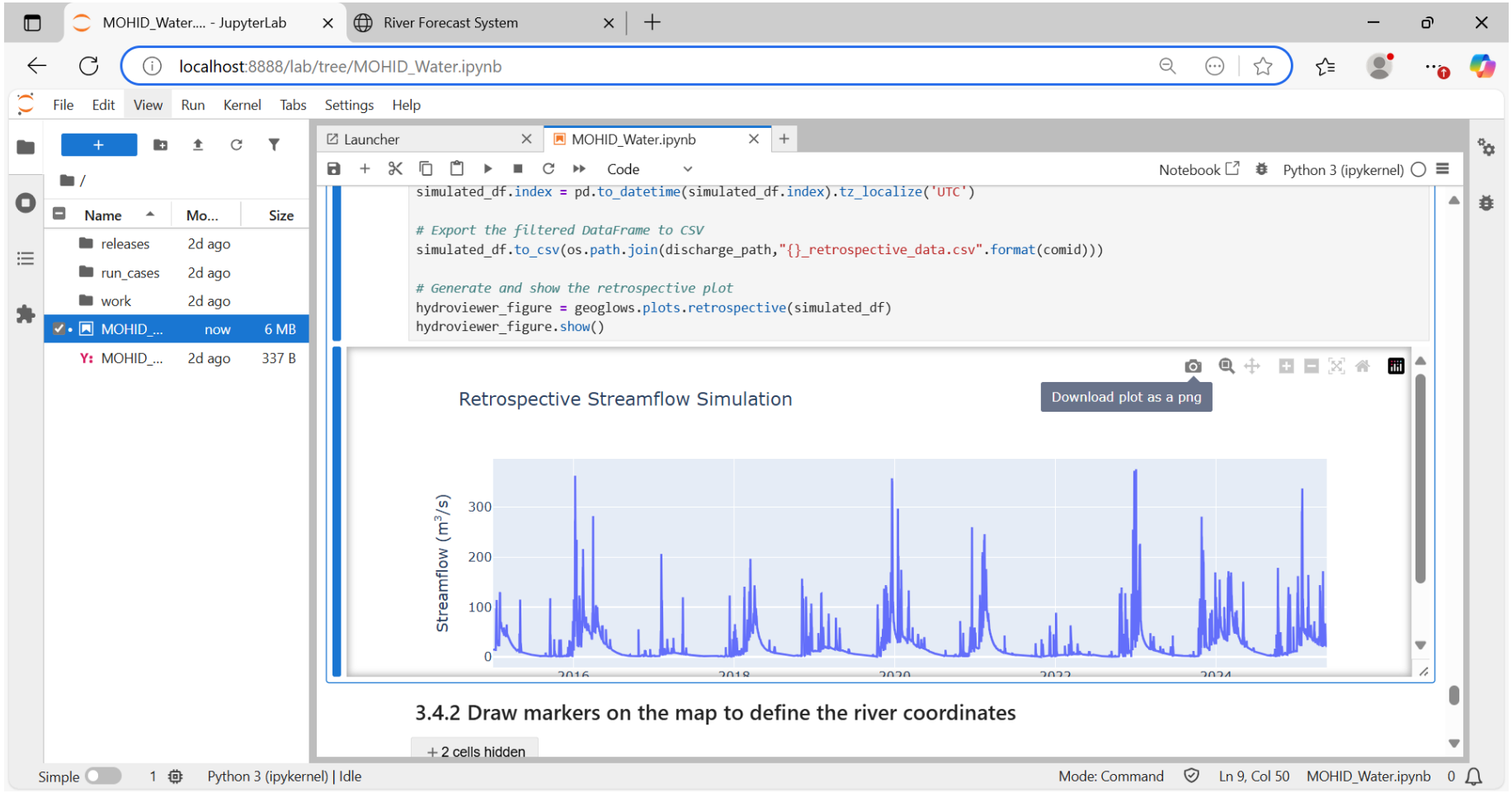

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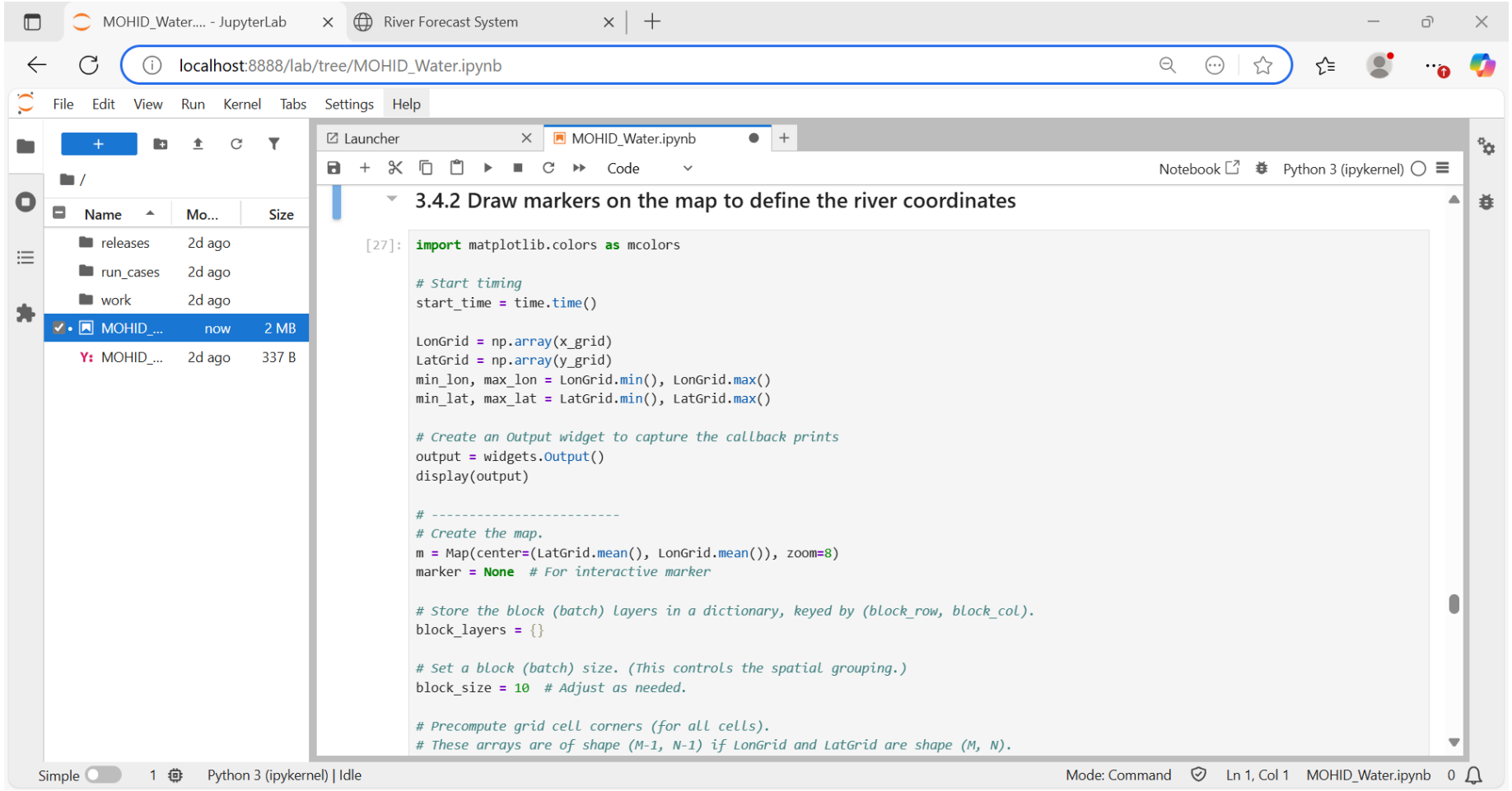

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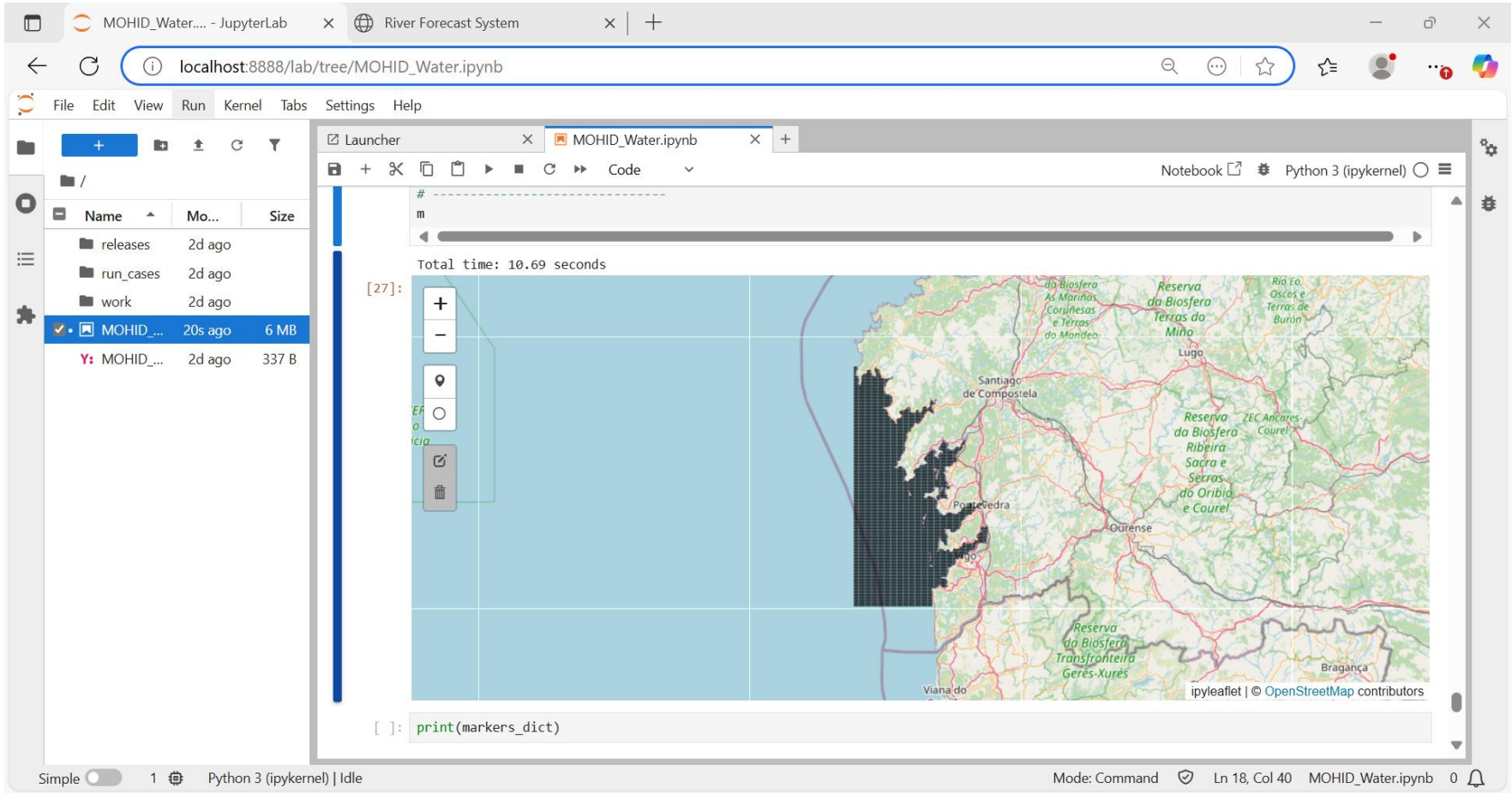

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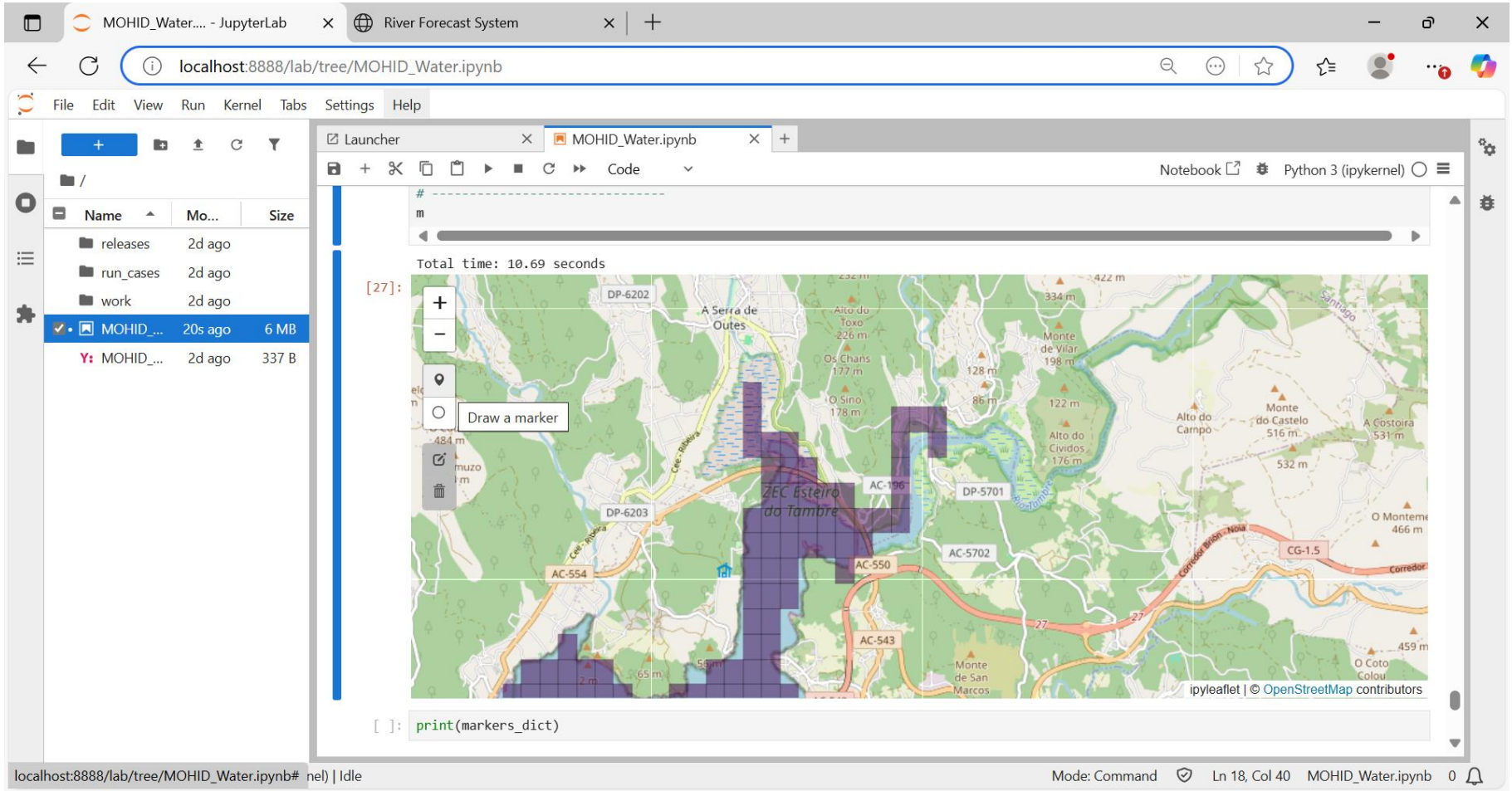

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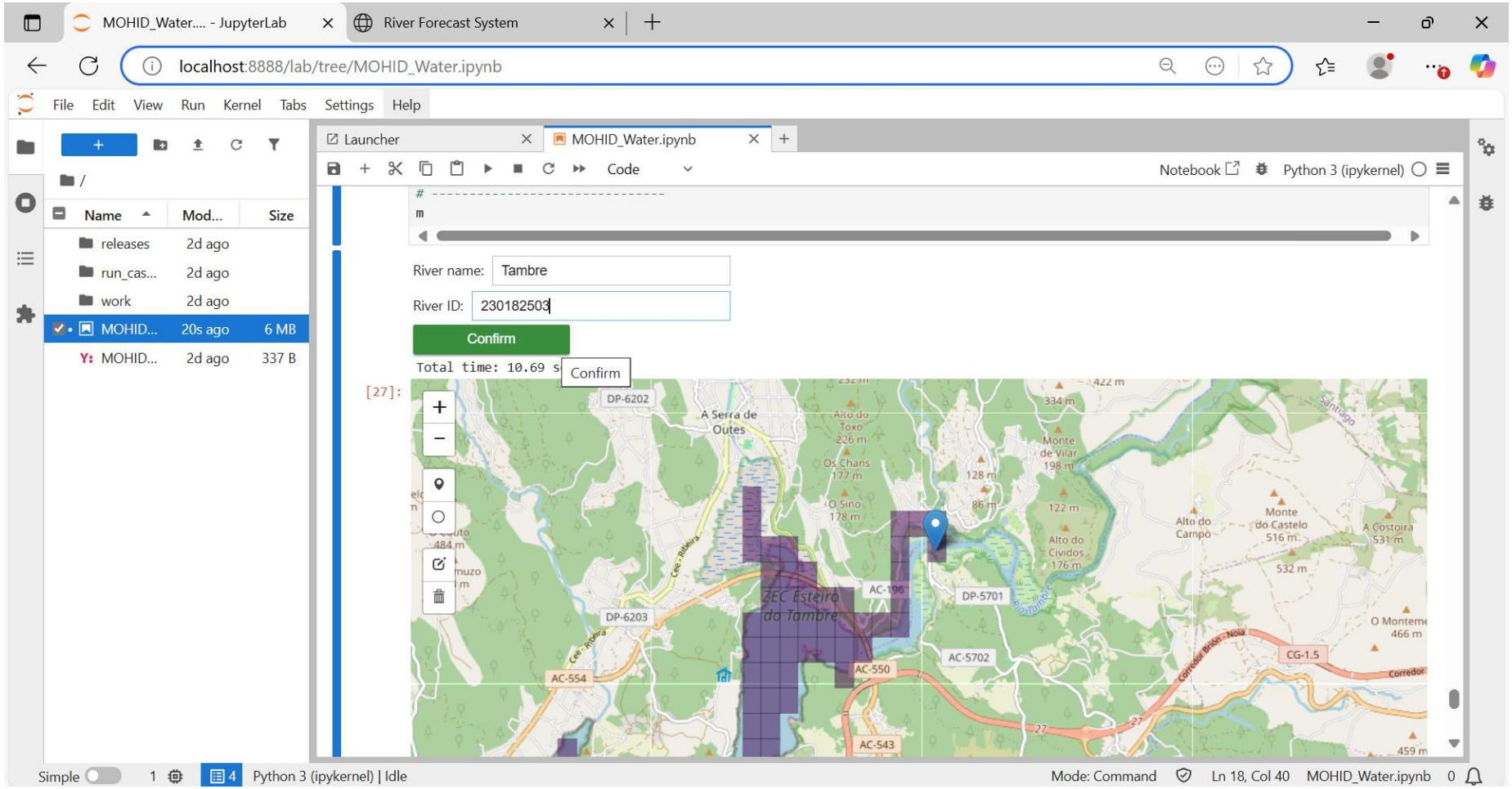

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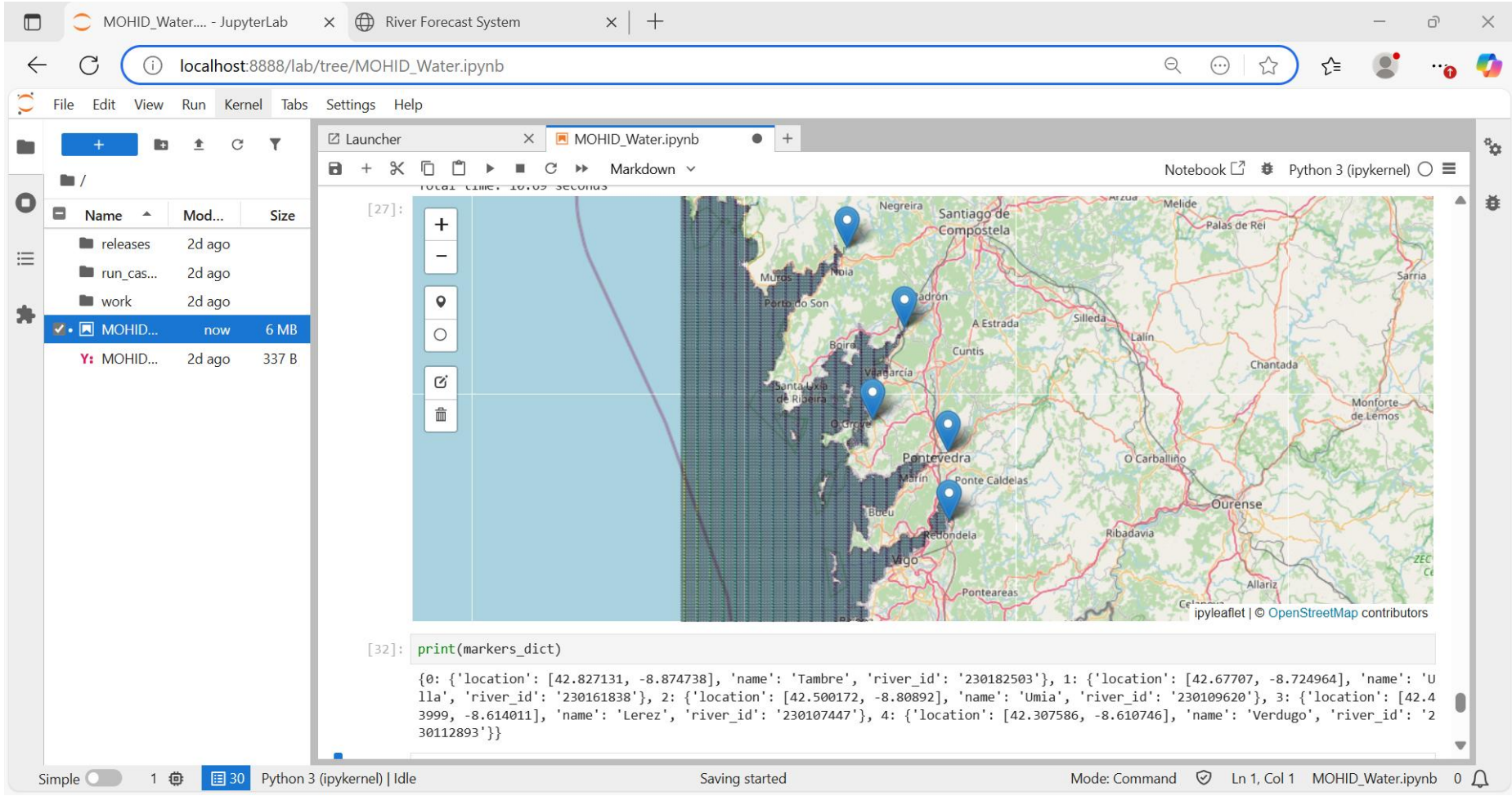

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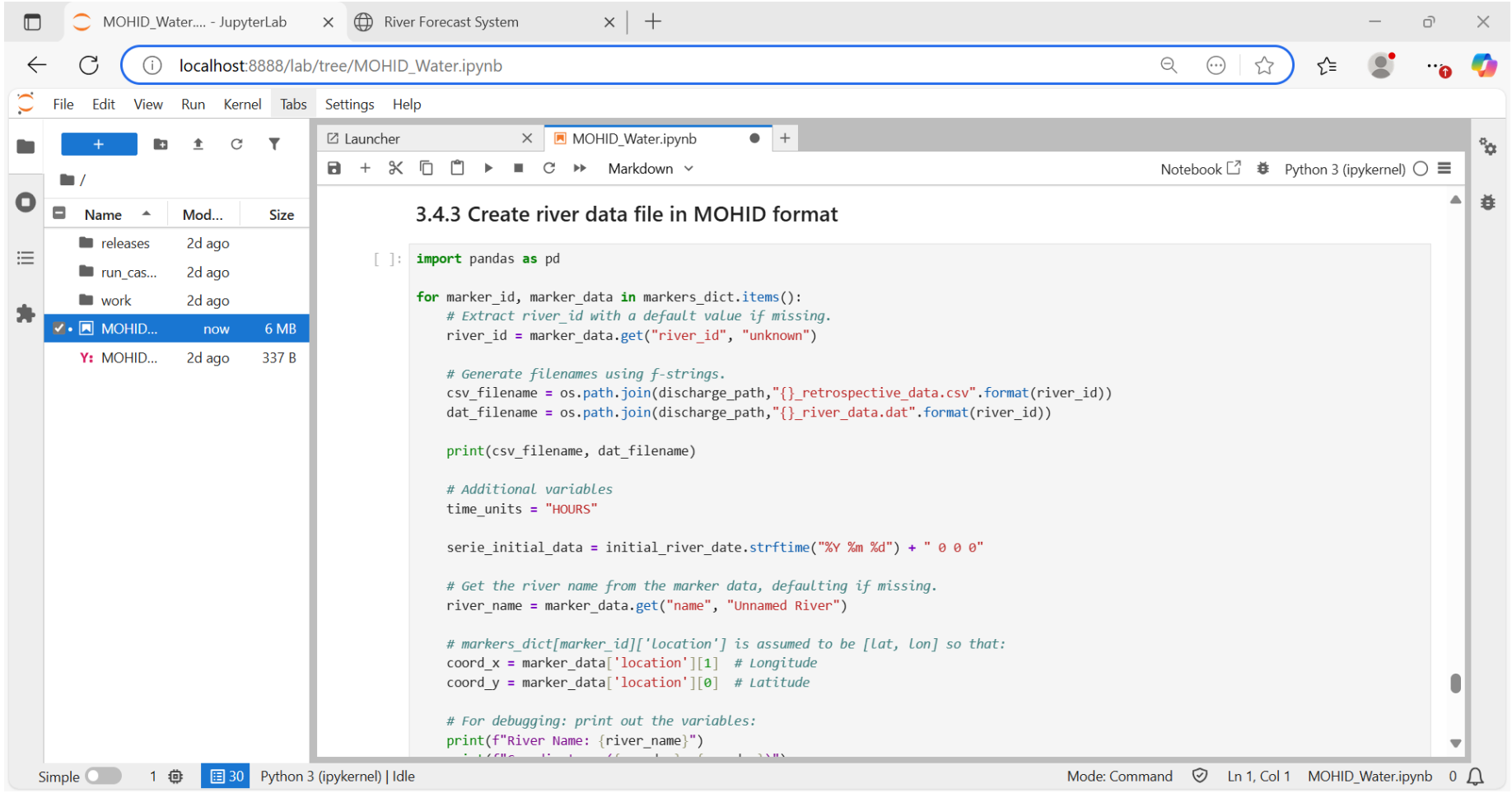

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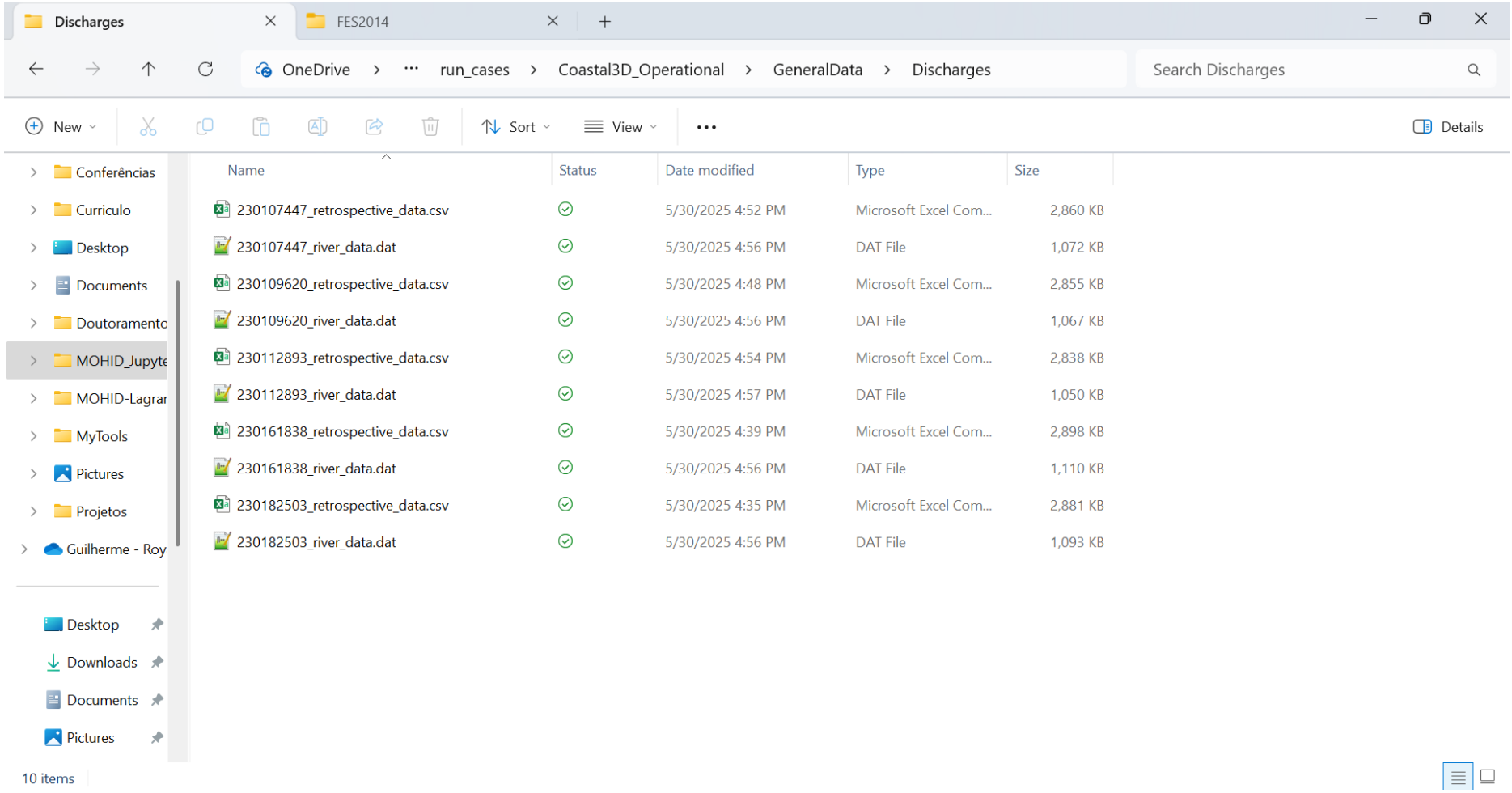

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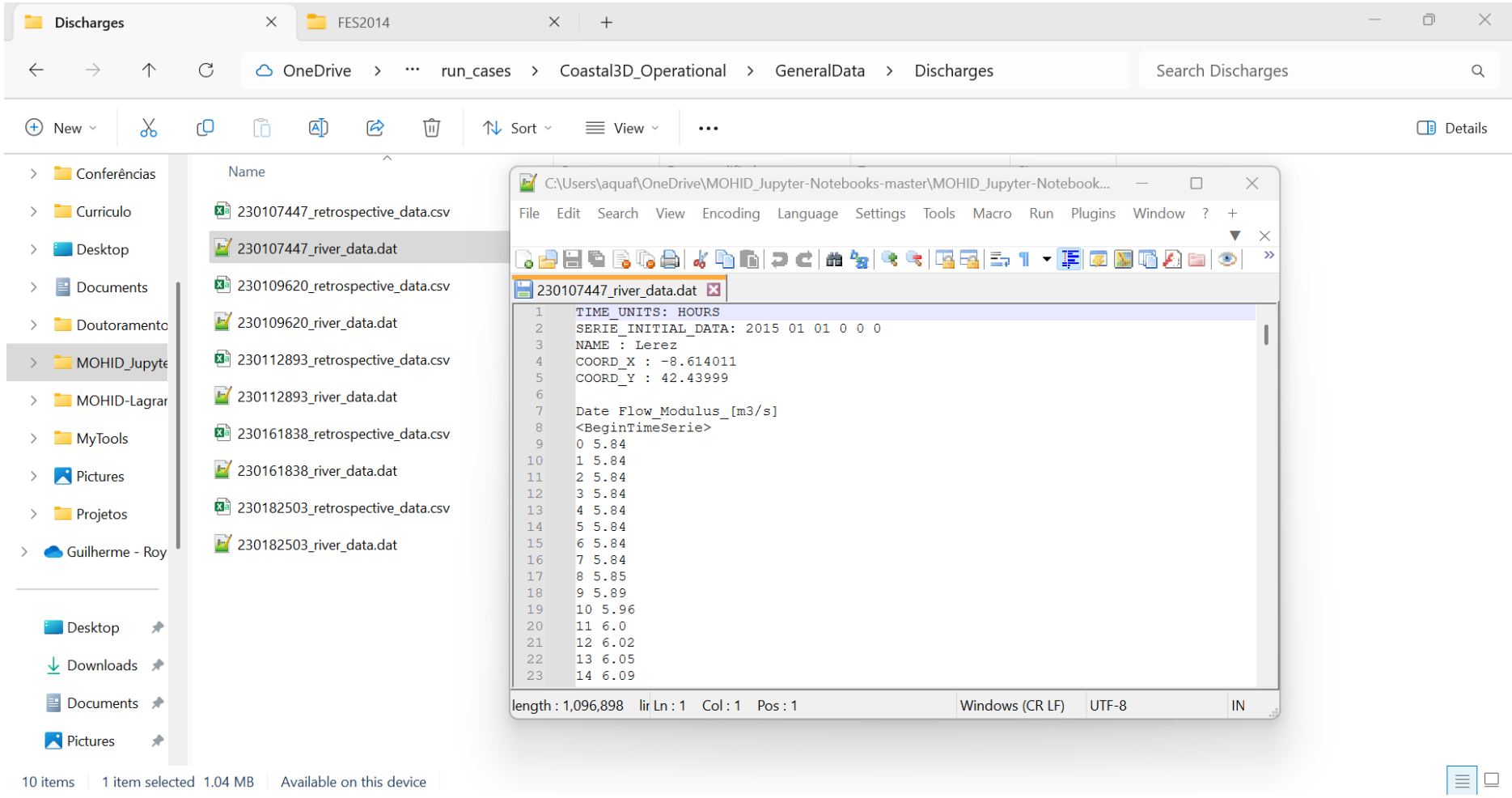

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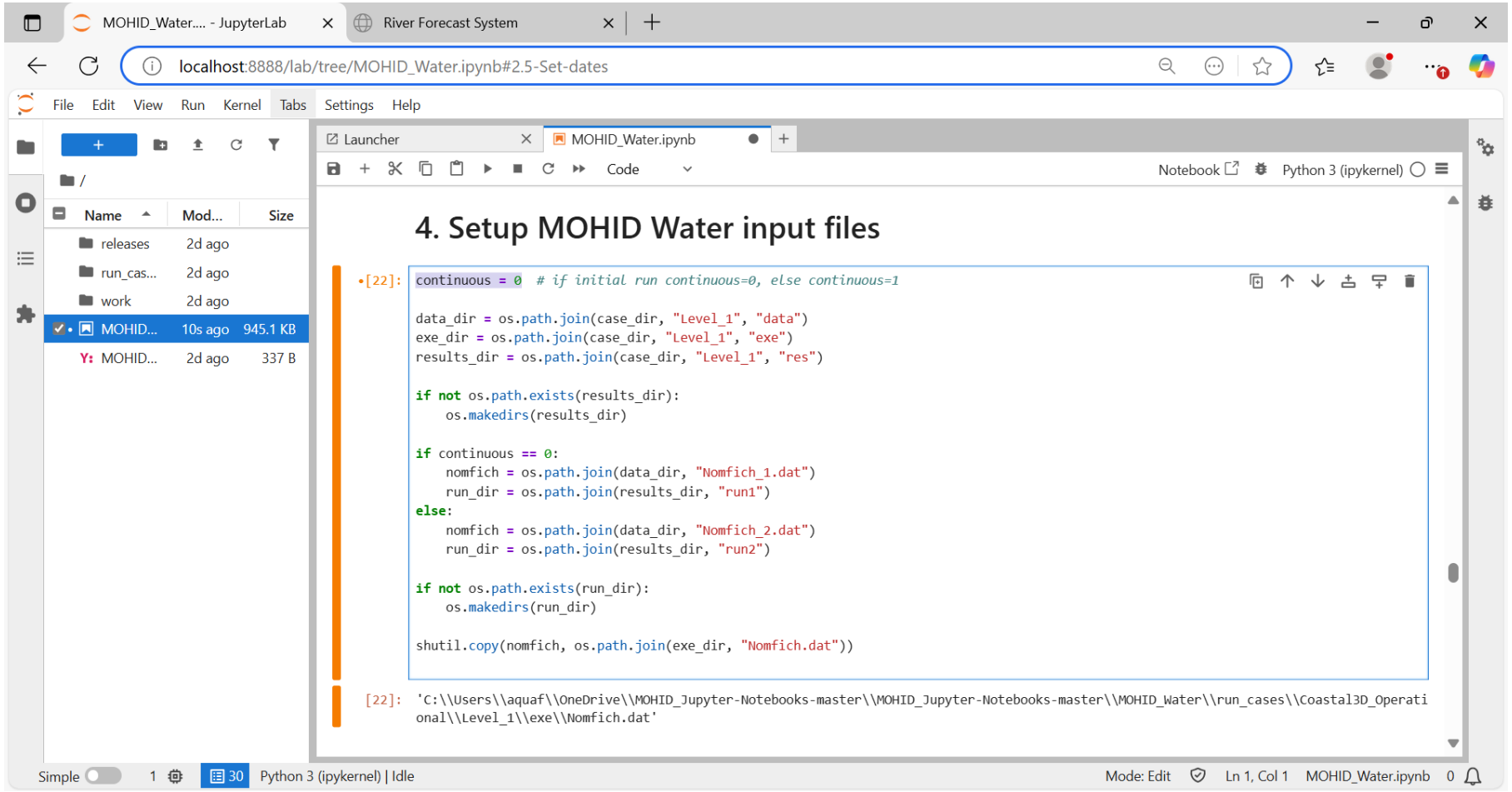

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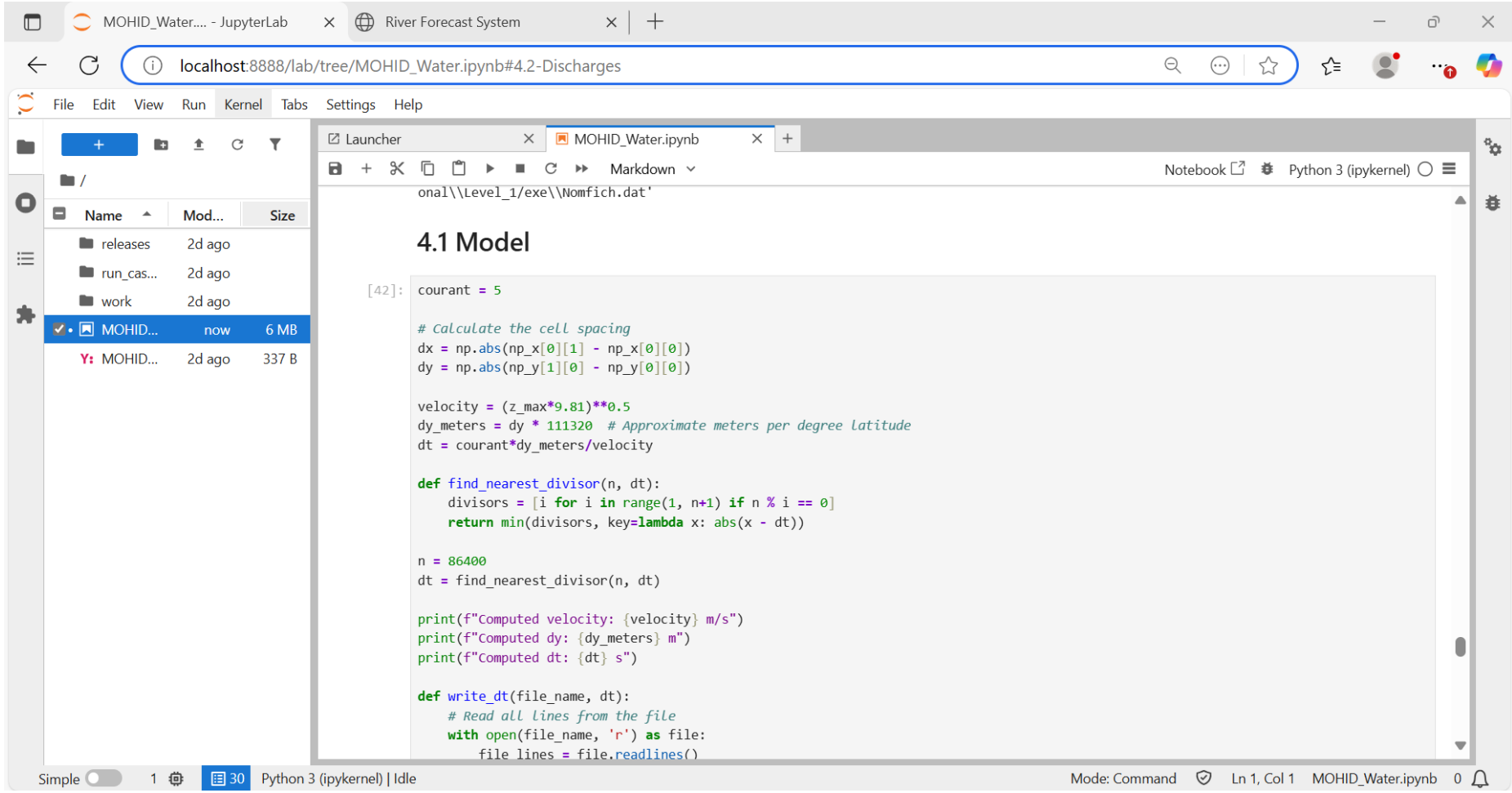

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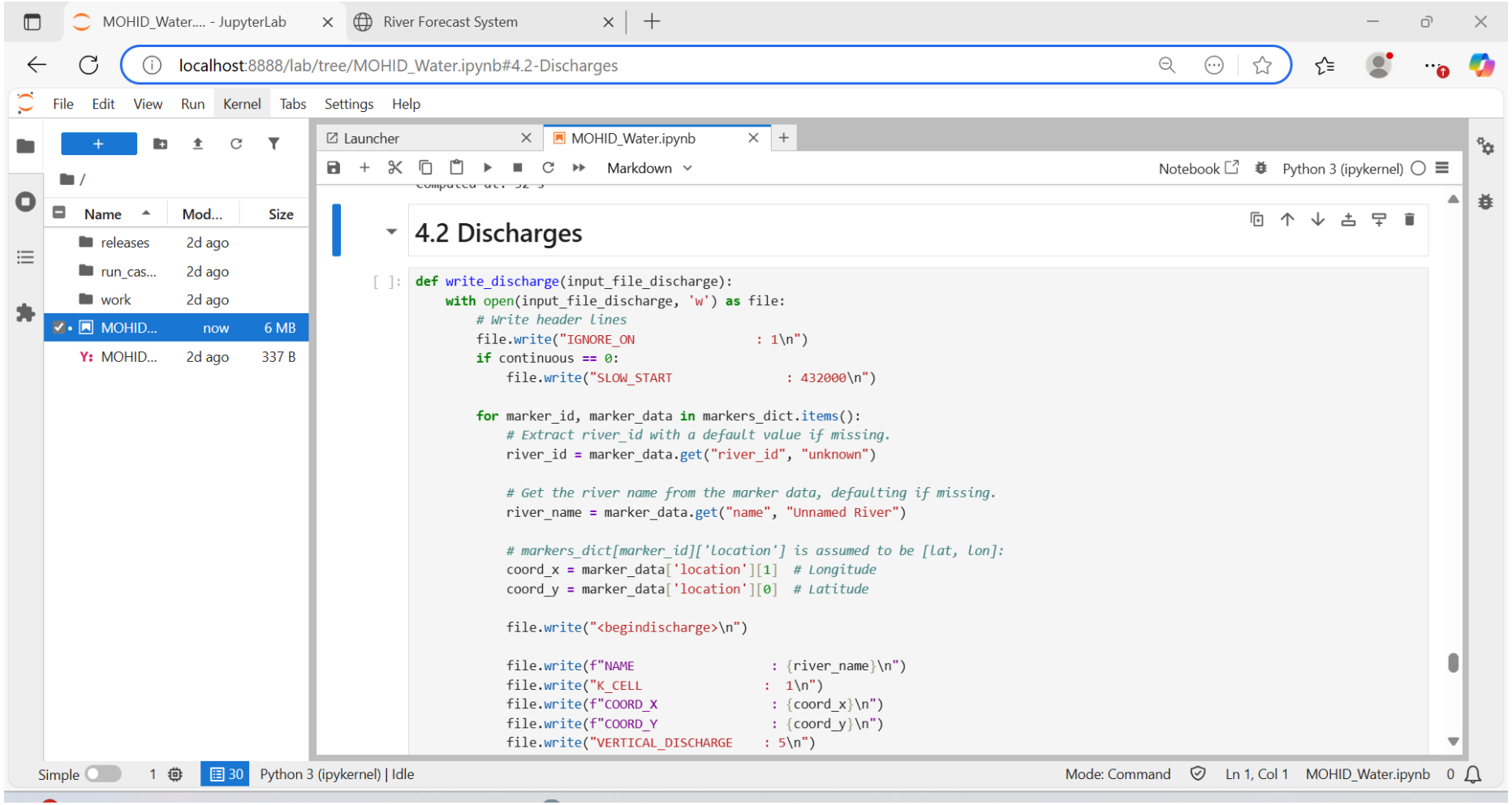

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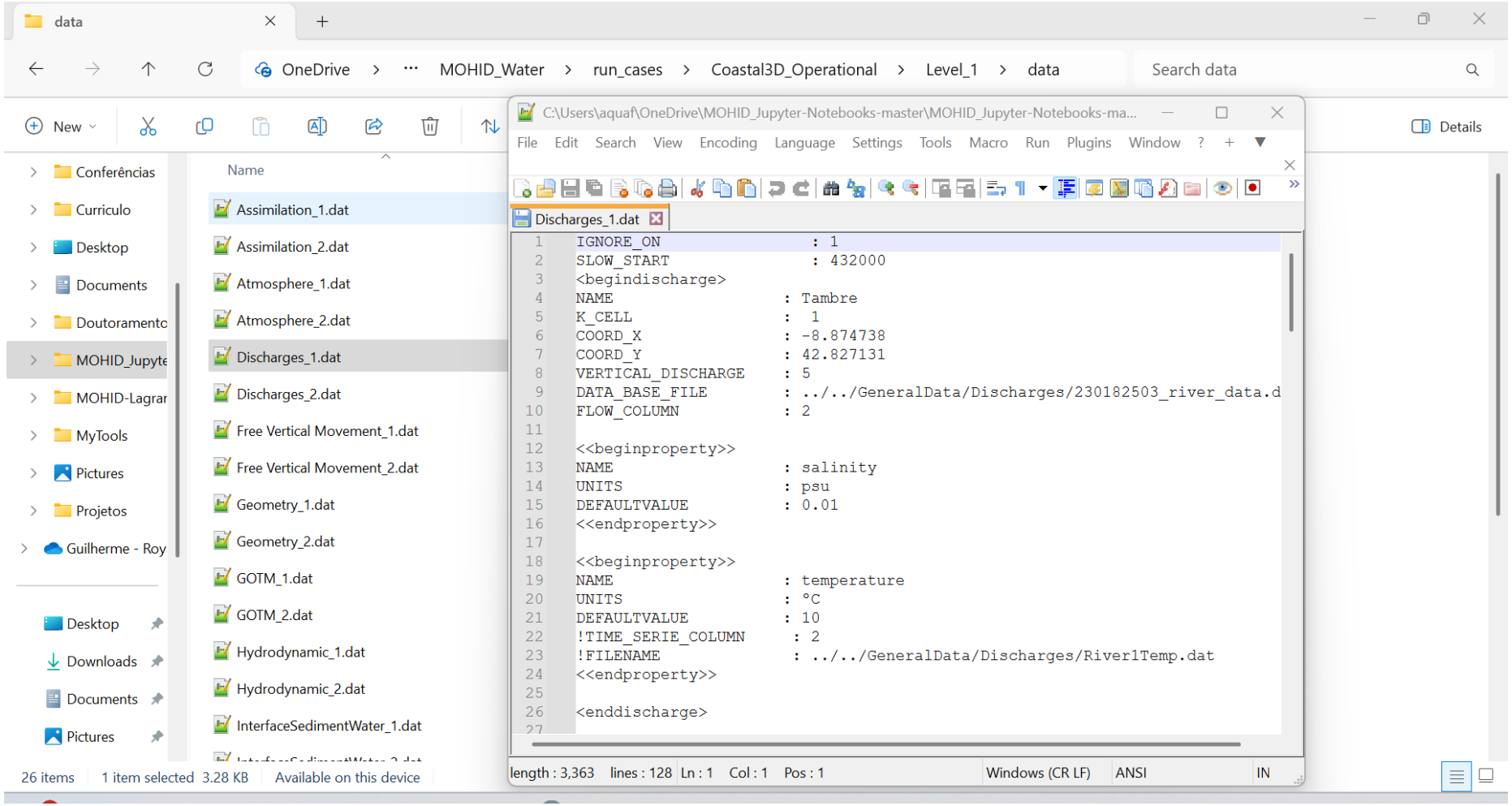

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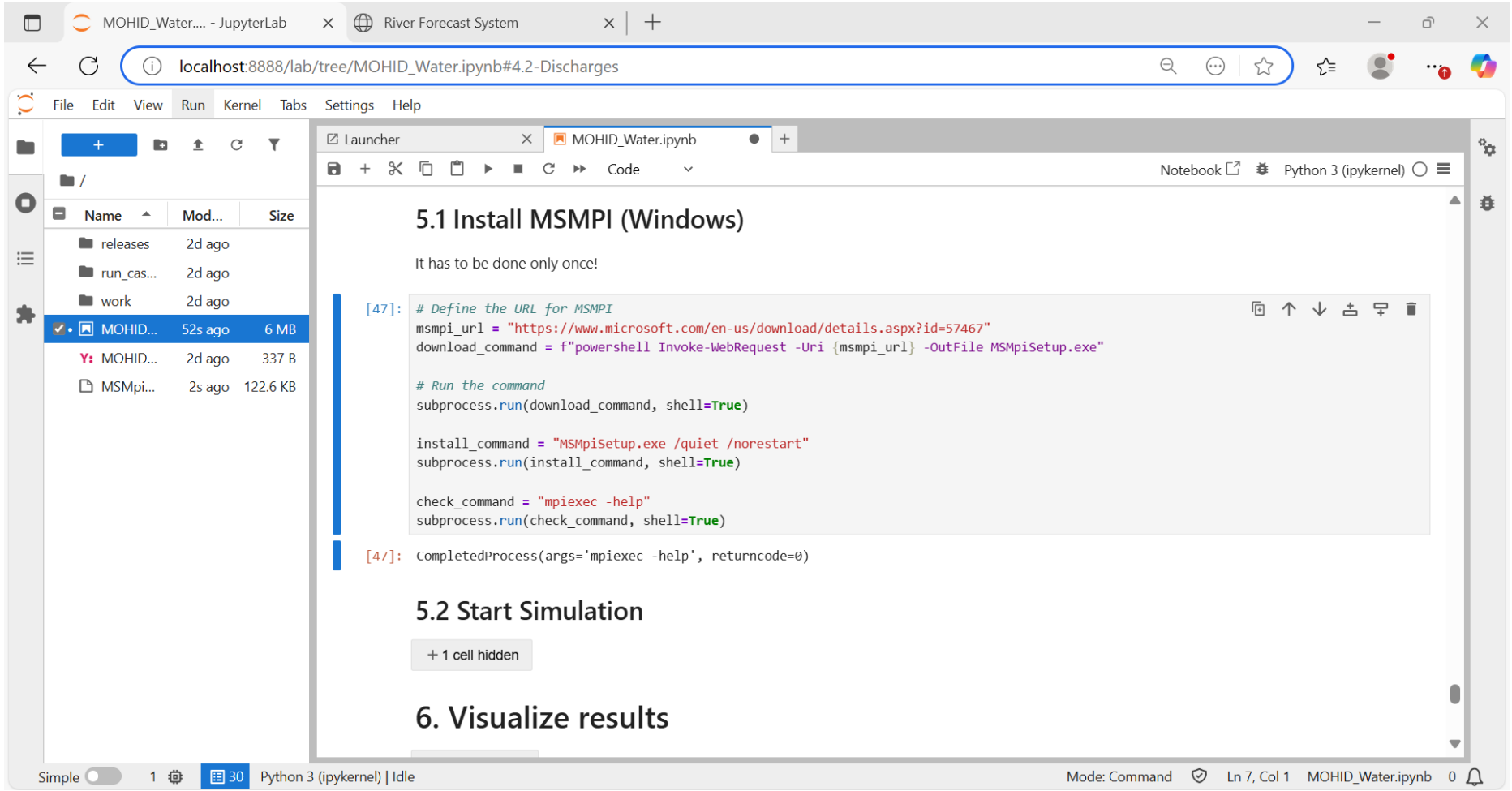

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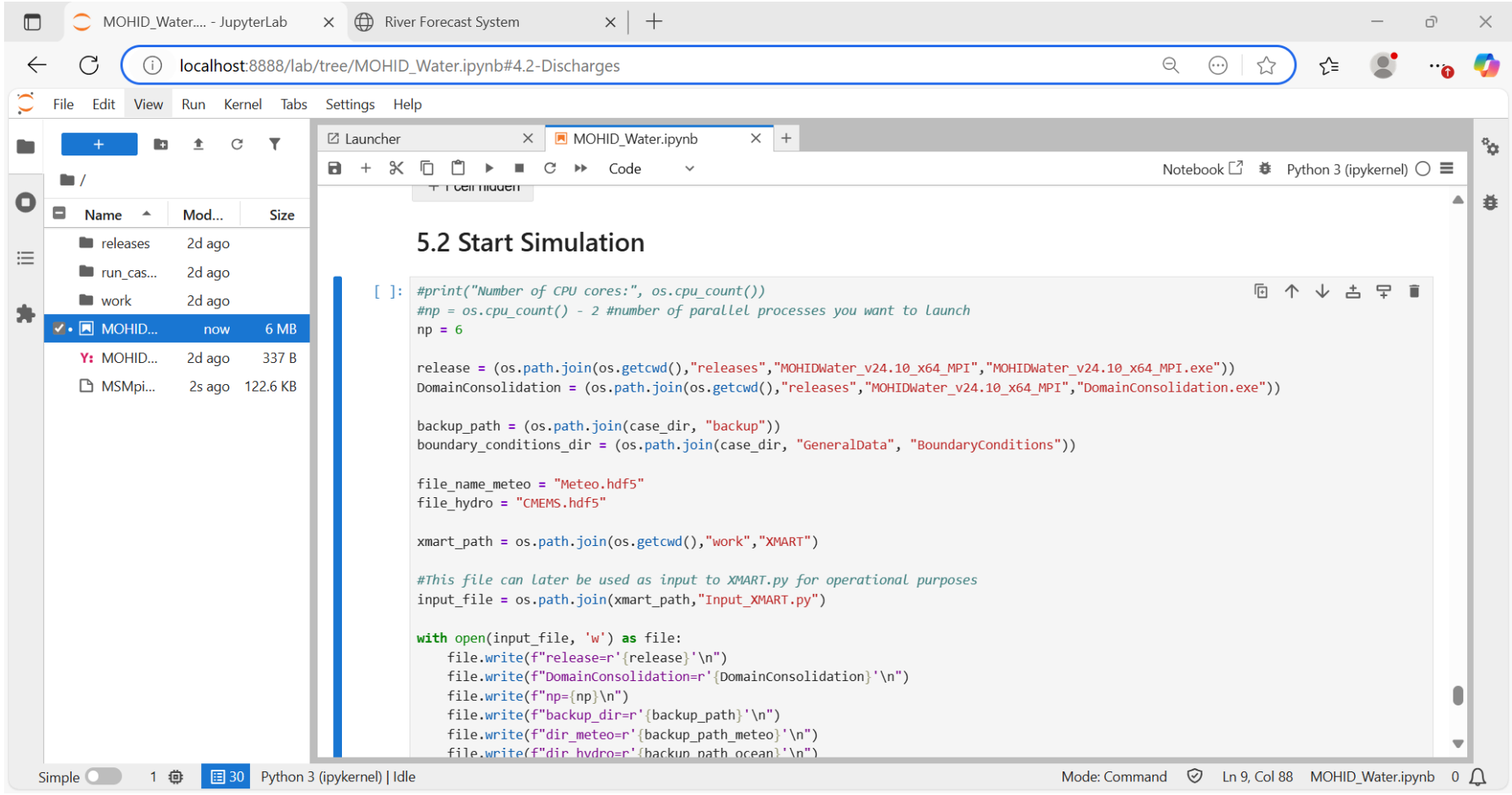

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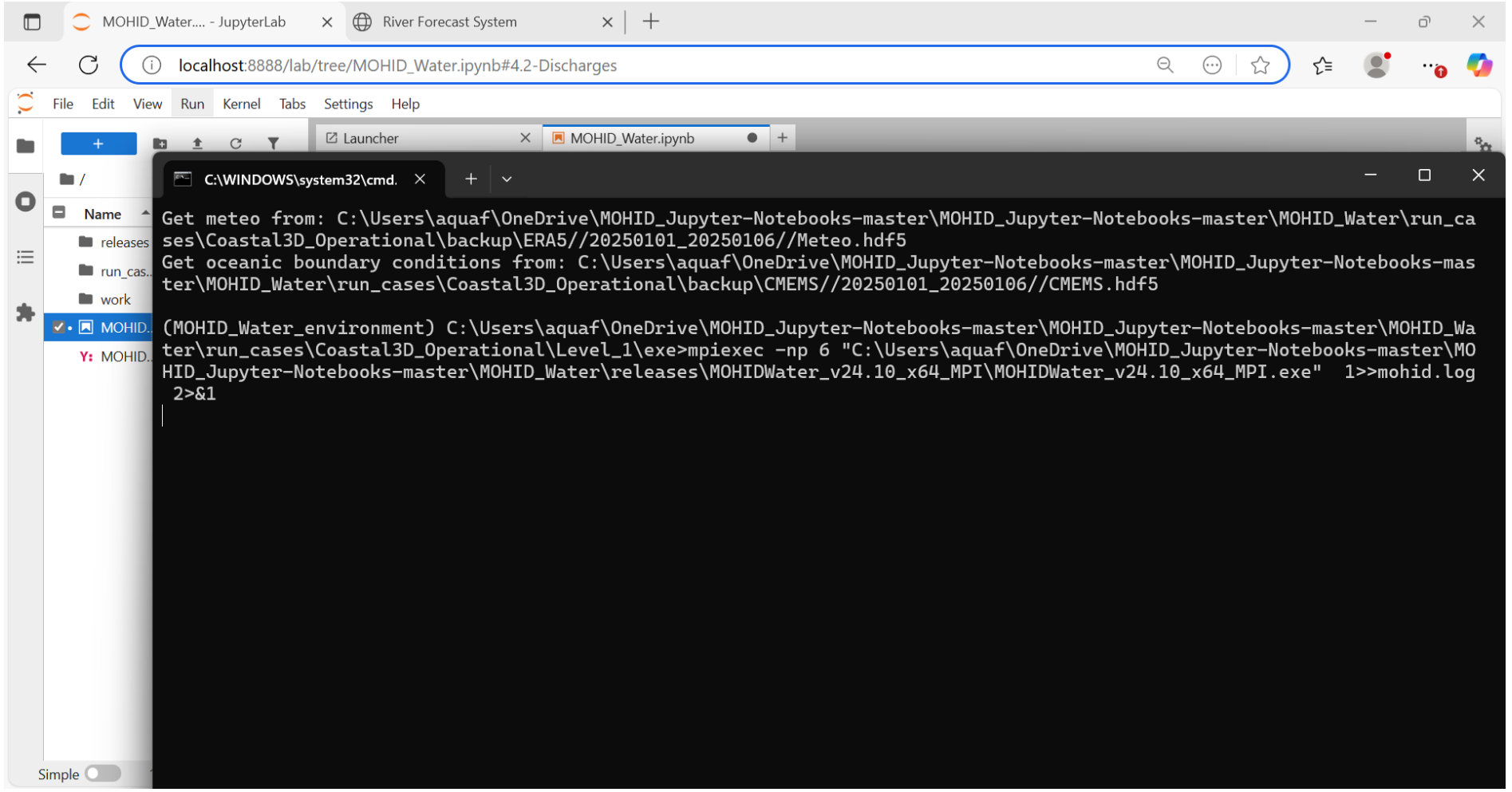

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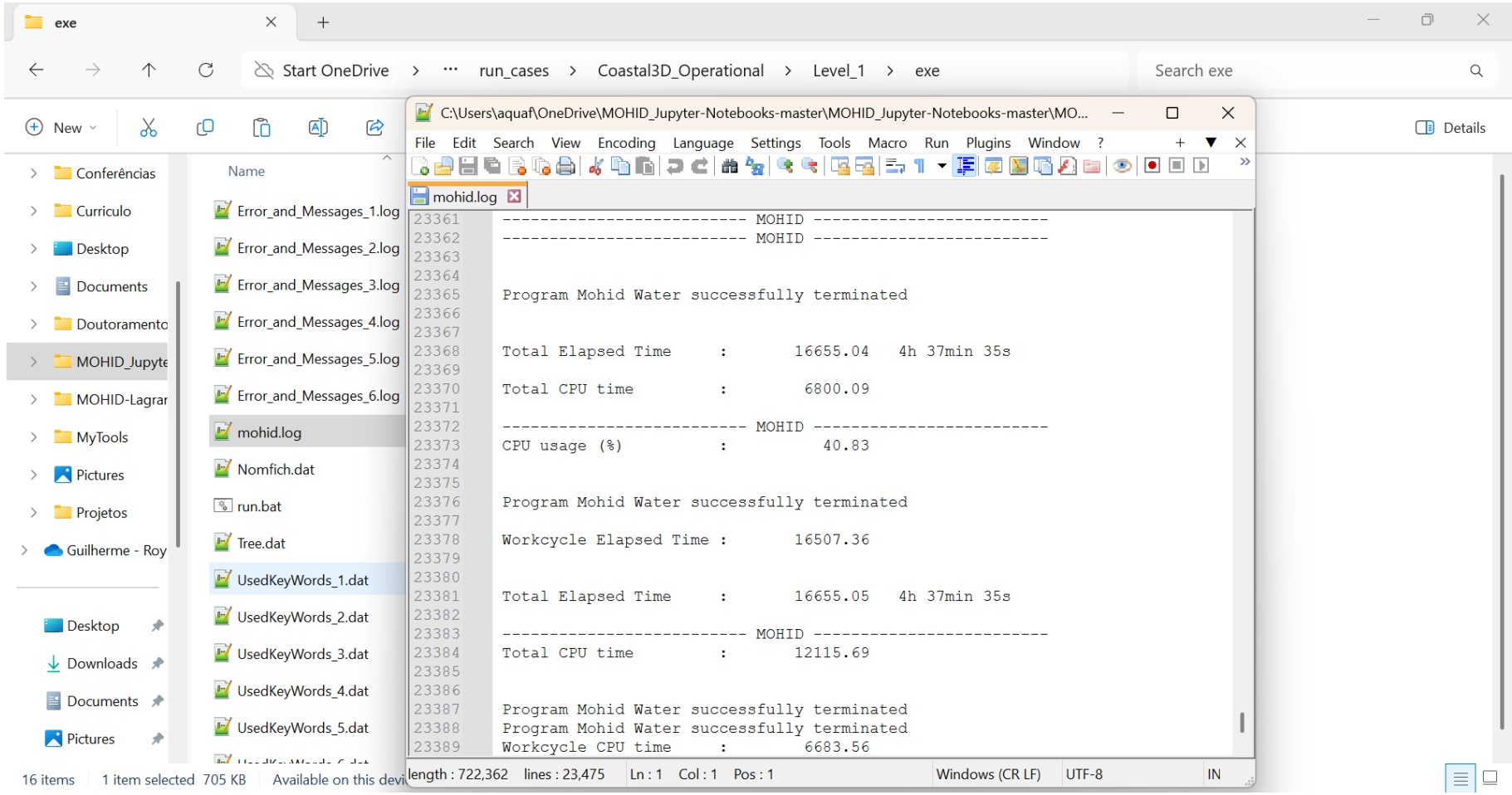

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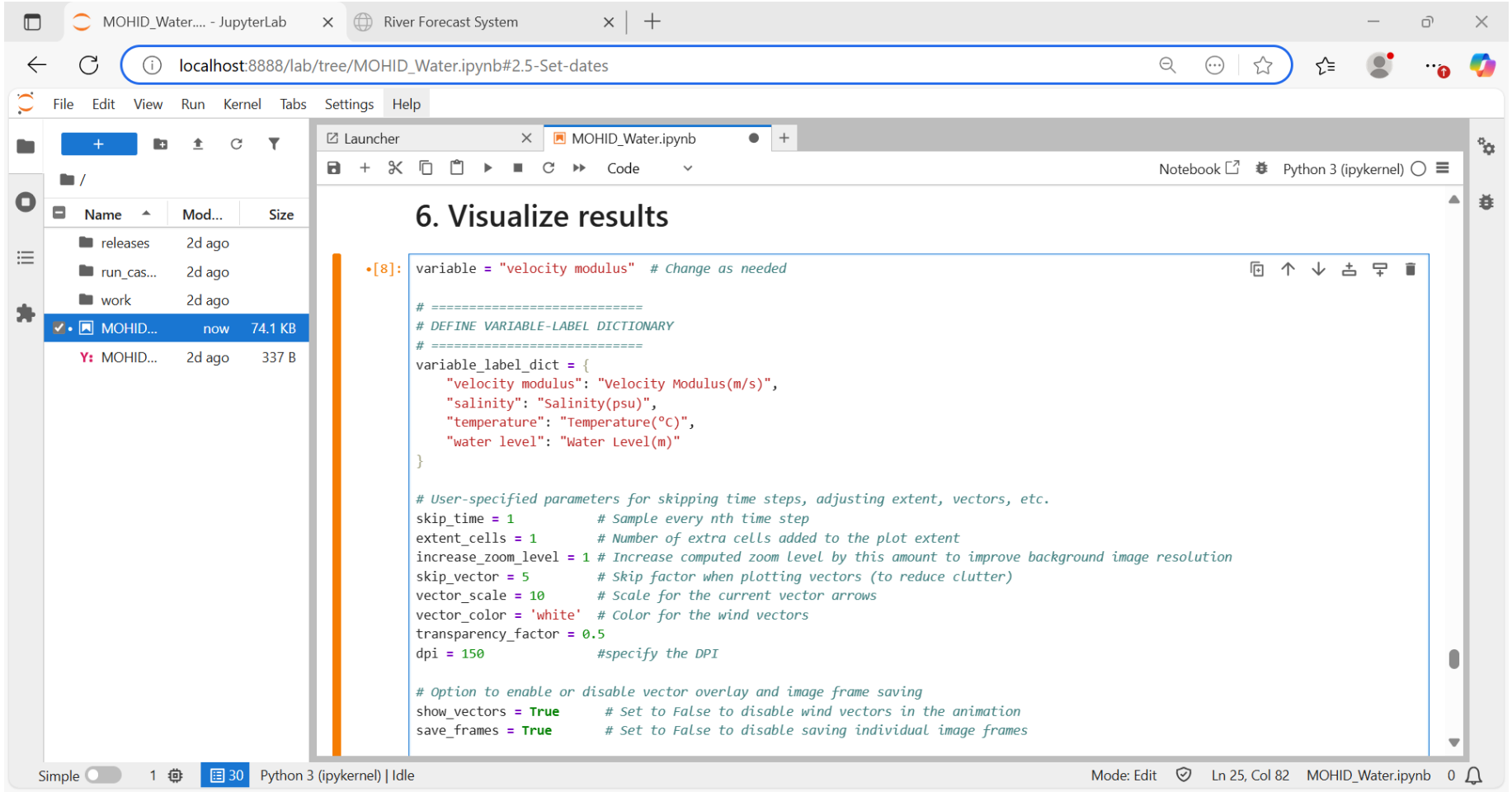

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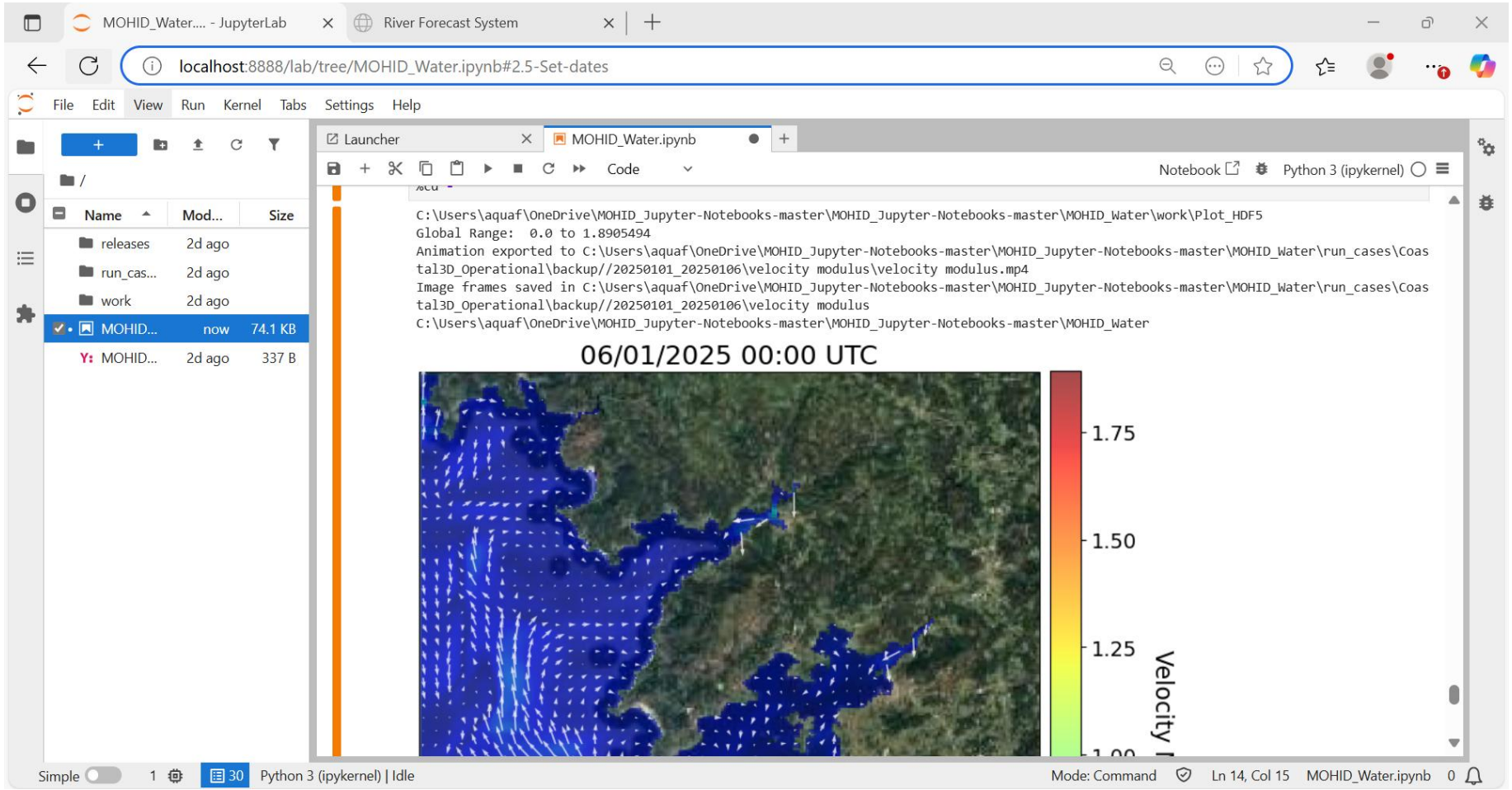

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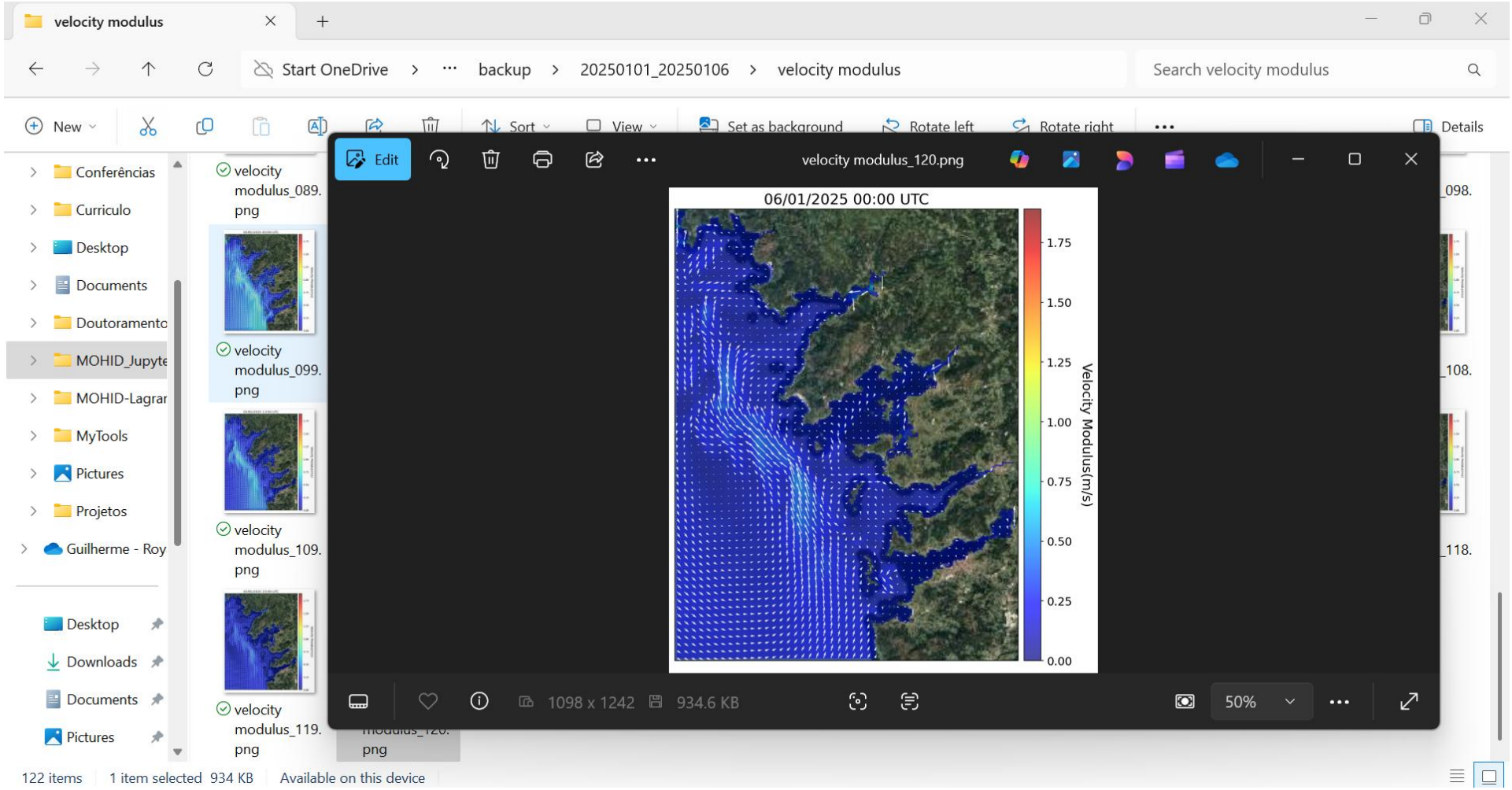

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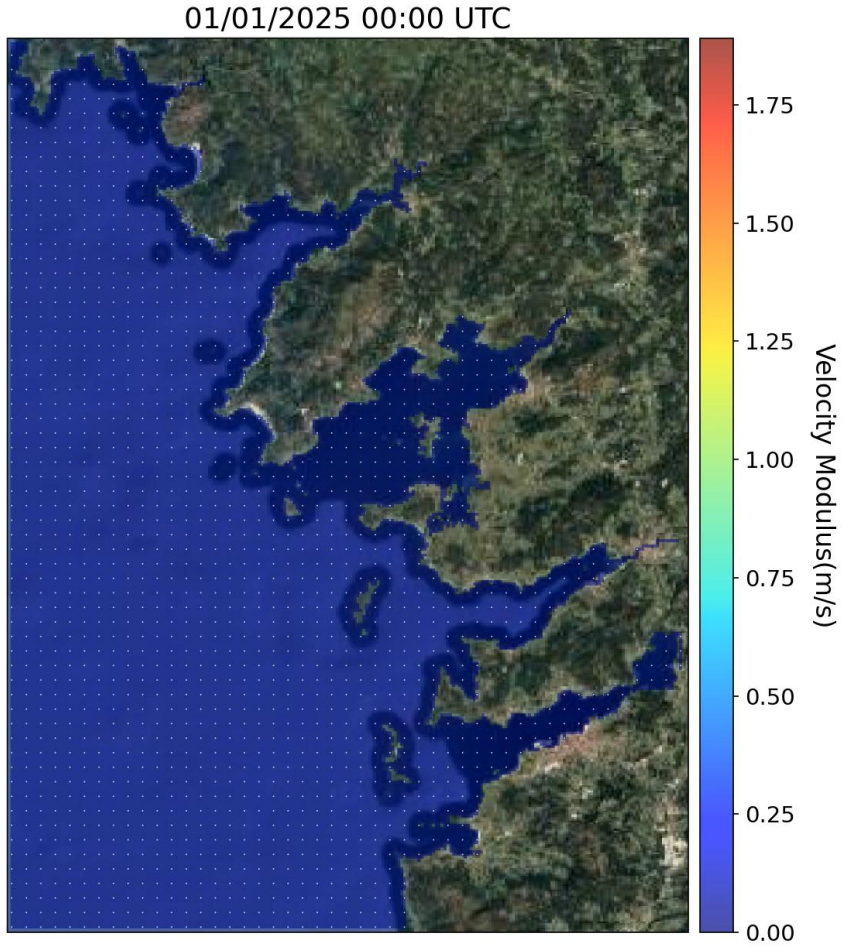

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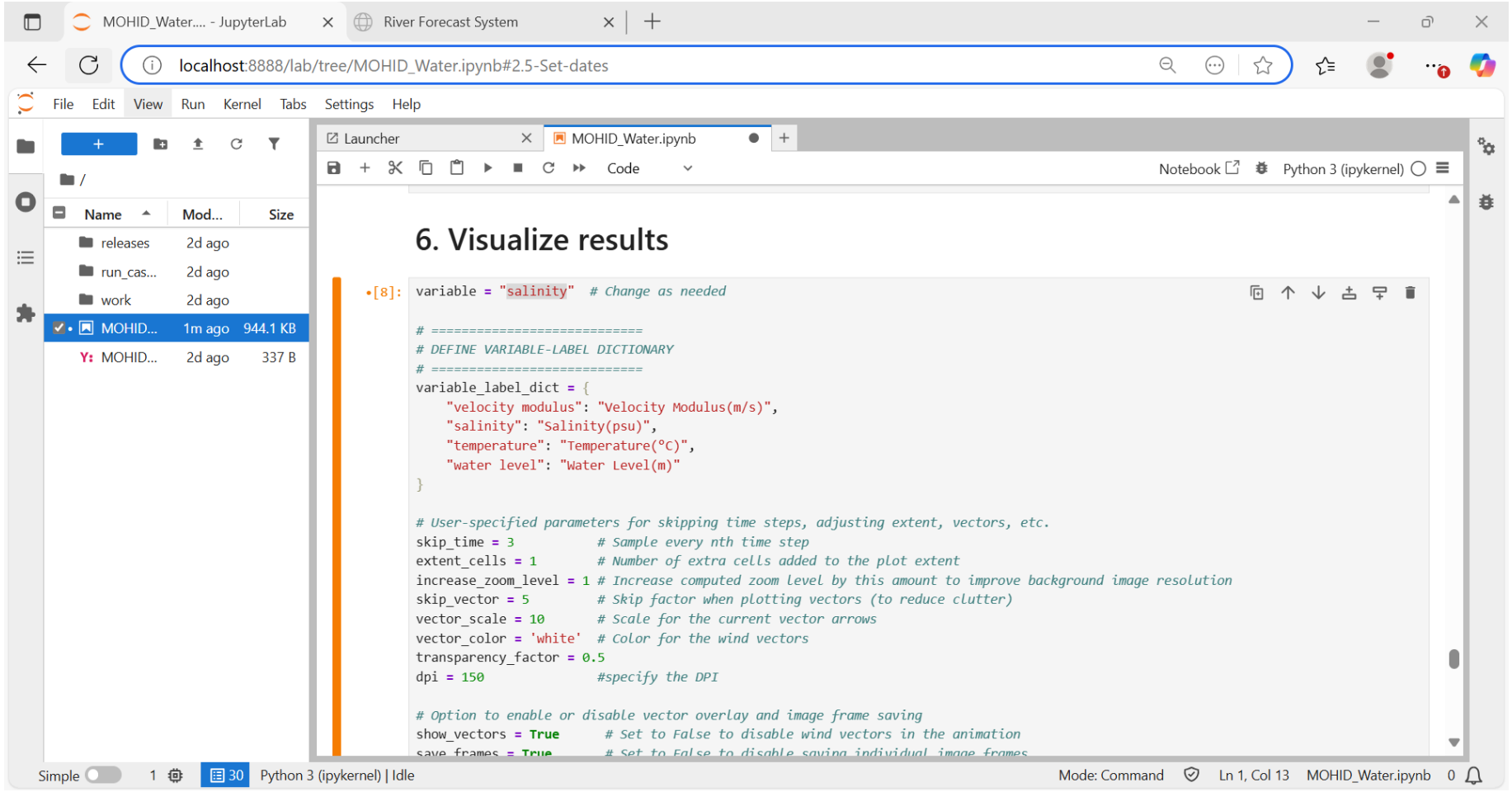

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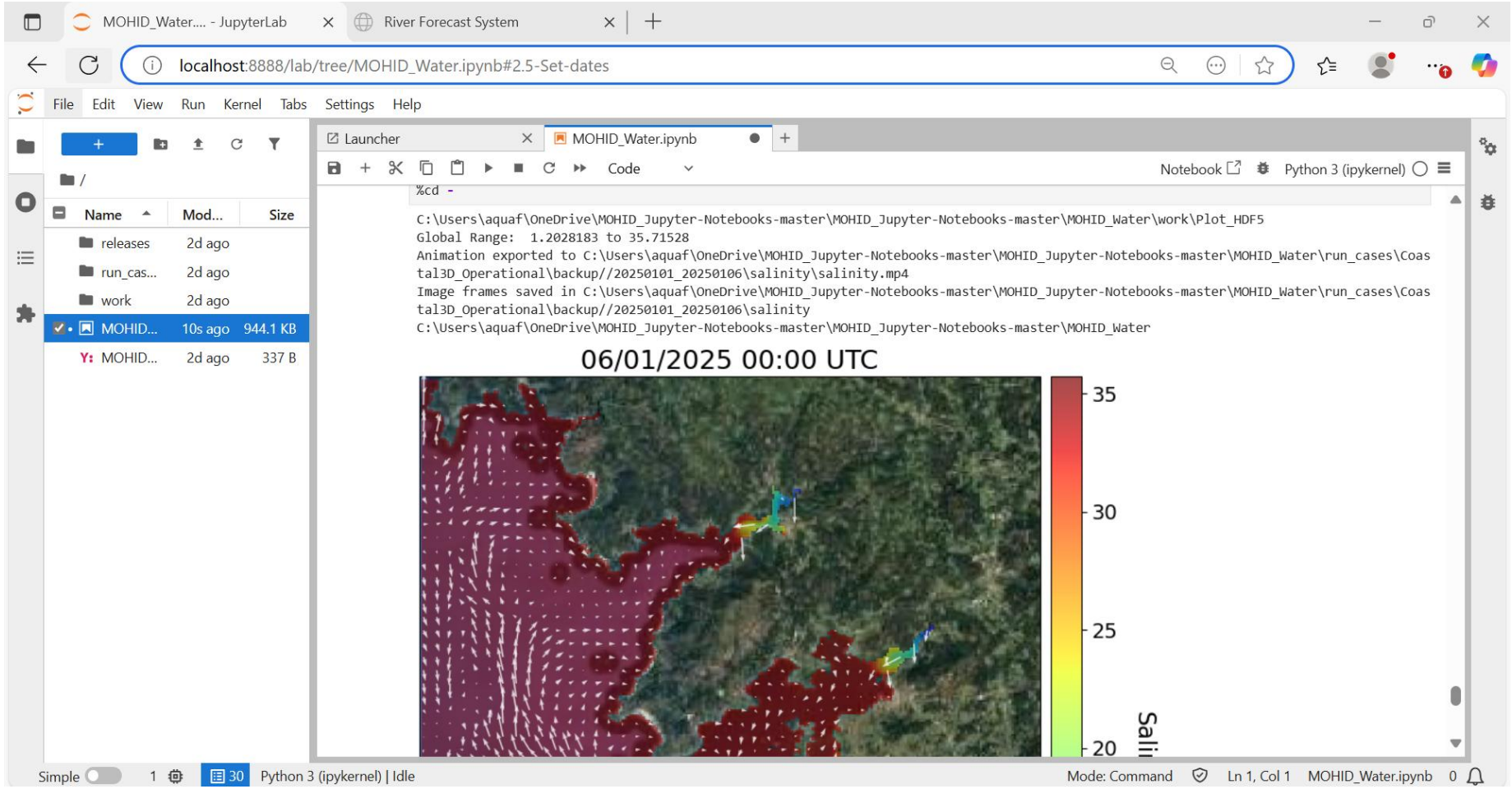

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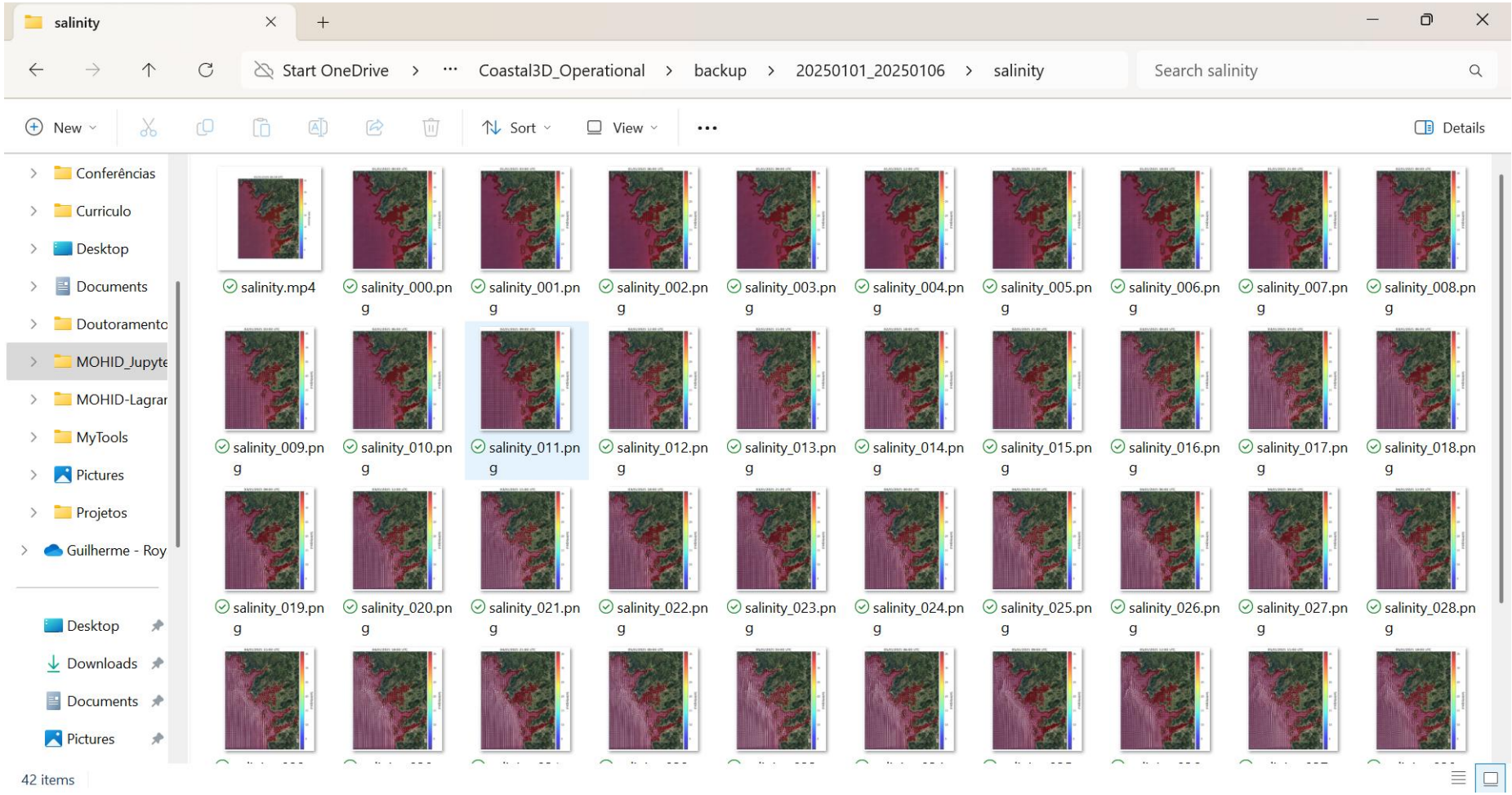

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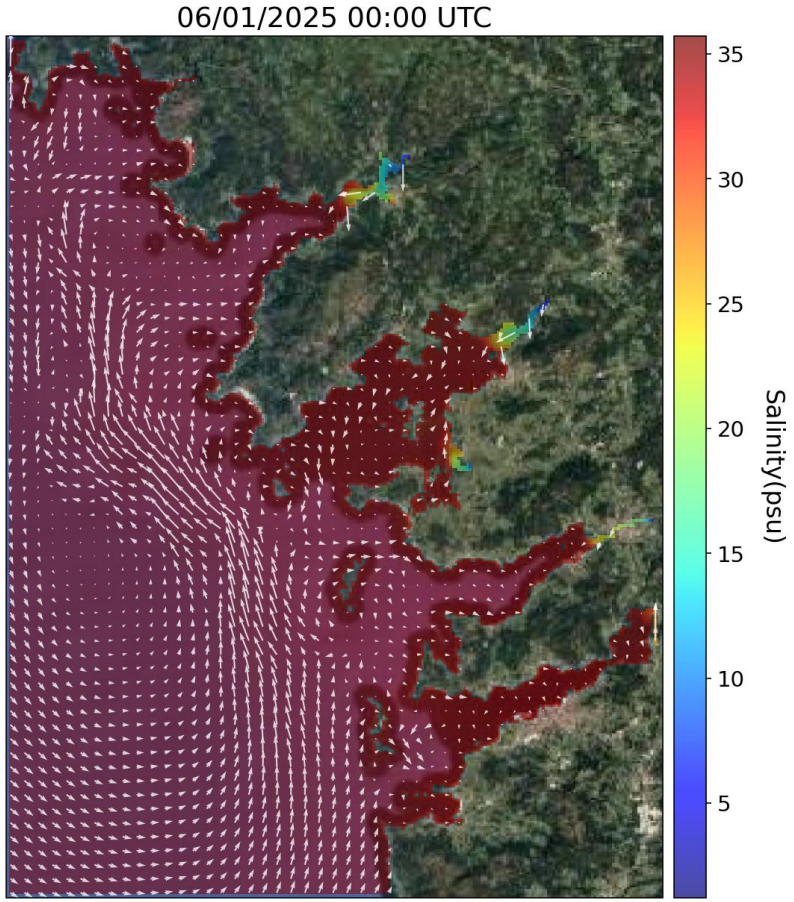

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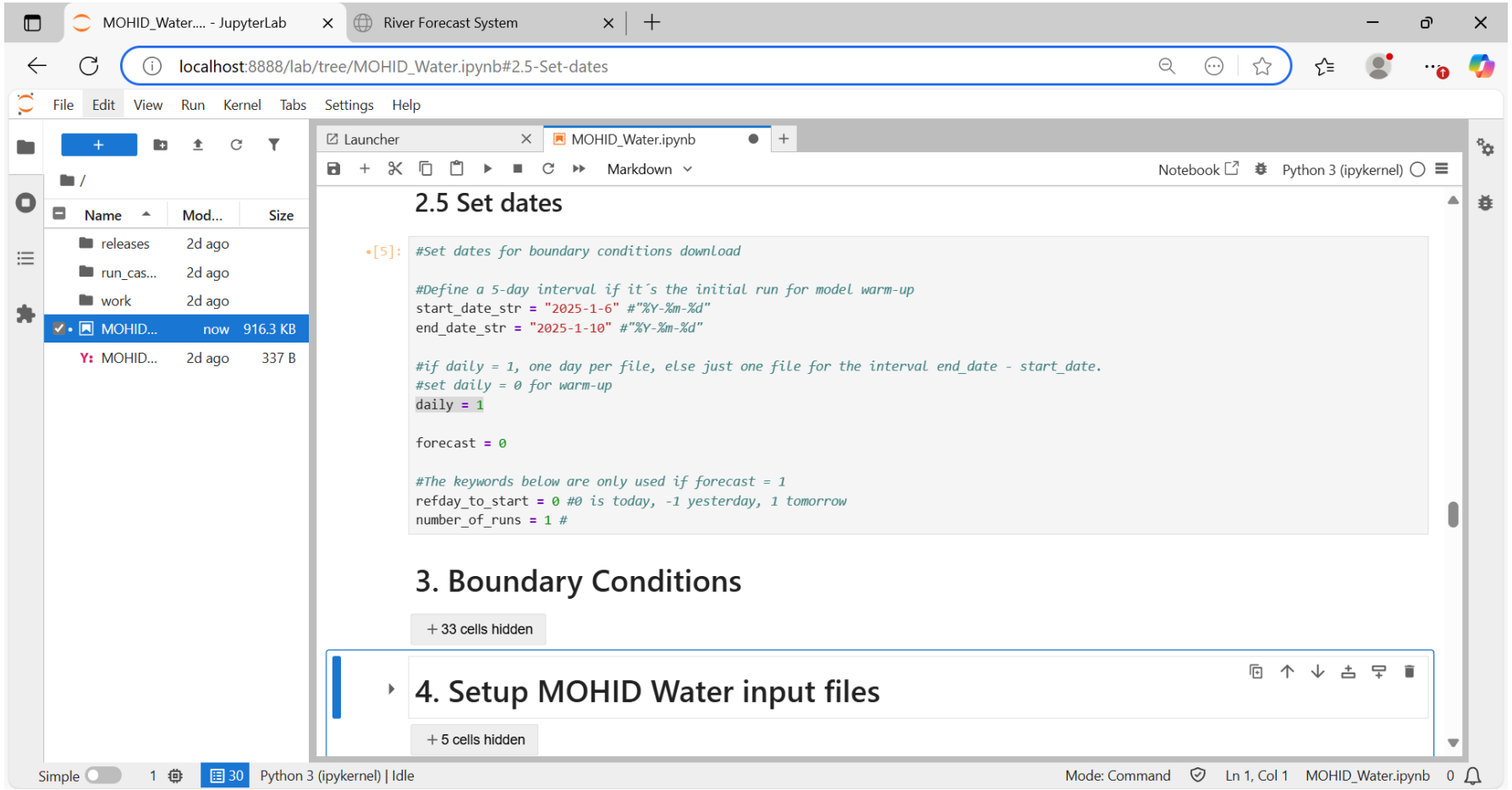

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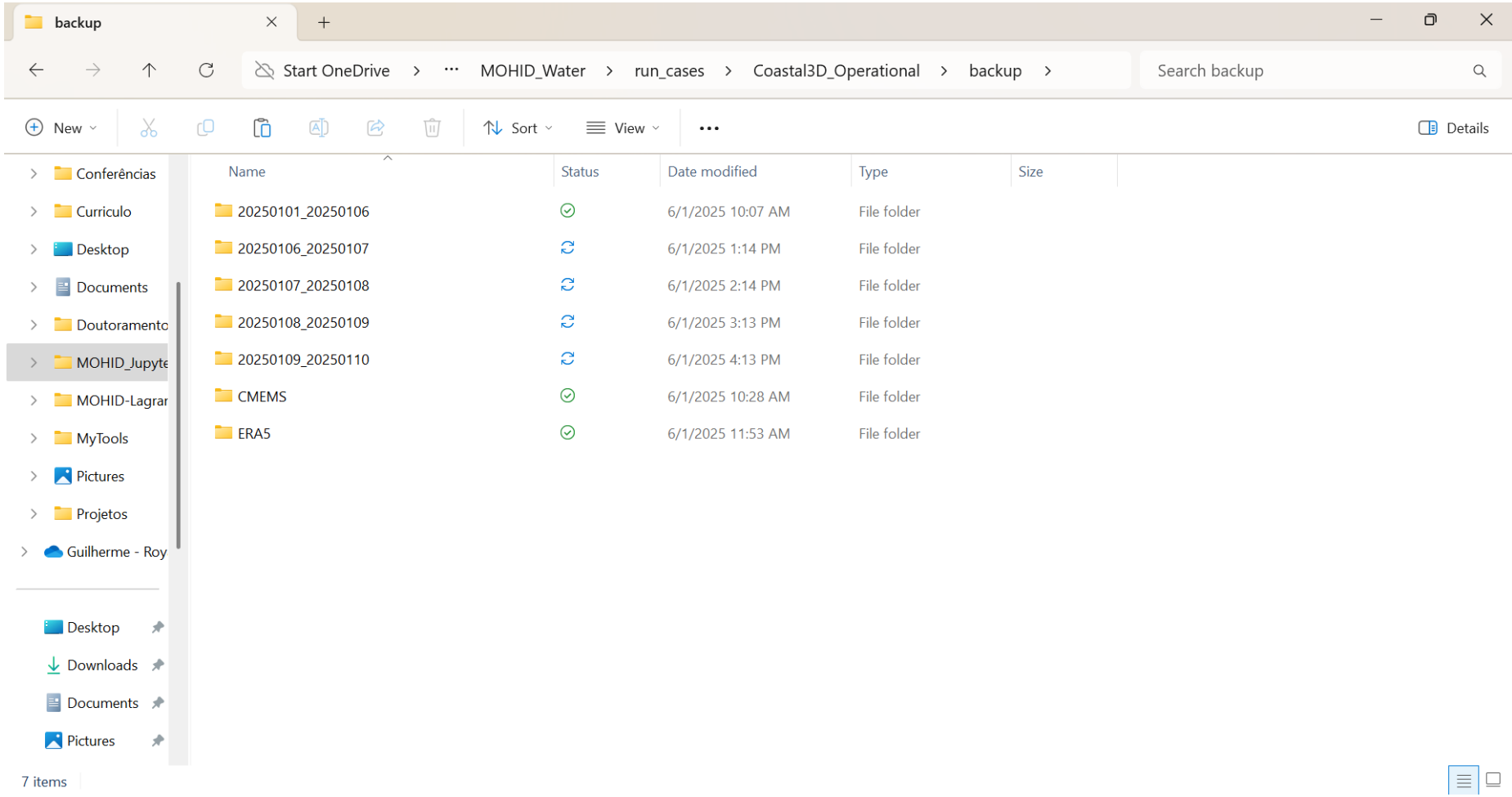

Next step

- MOHID_Postprocessing Notebook
    - Time series
        - Extract time series
        - Plot time series
        - Compare with measurements
        - Statistics
        - Harmonic Analysis
    - 2D Maps
        - Plot 2D Maps
        - Statistics
        - Plot vertical cuts
        - Export to Geo-tiffs
        - Animations

Future possibilities of Notebooks

- MOHID_Oil
- MOHID_HNS
- MOHID_Sediment
- MOHID_WaterQuality
- MOHID_Outfall
- …

Thank you!

For additional information, please contact:

guilherme.franz@aquaflowconsultoria.com