

Developing Research Projects in a Virtual Research Environment Training Module

Prepare Project: Readiness Level 0

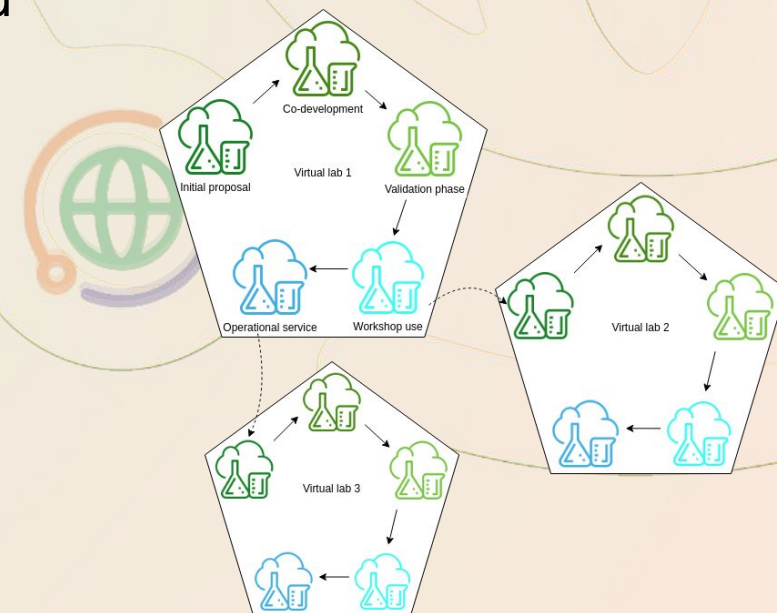
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IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System
(D.D. n. 130/2022 - CUP B53C22002150006) Funded by EU - Next Generation EU PNRR-
Mission 4 “Education and Research” - Component 2: “From research to business” - Investment
3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”

Readiness level framework

- A NaaVRE virtual lab provides a collection of research tools and assets customized for a specific research need:
 - Assets created in the virtual lab
 - Documents that support the usability of the virtual lab

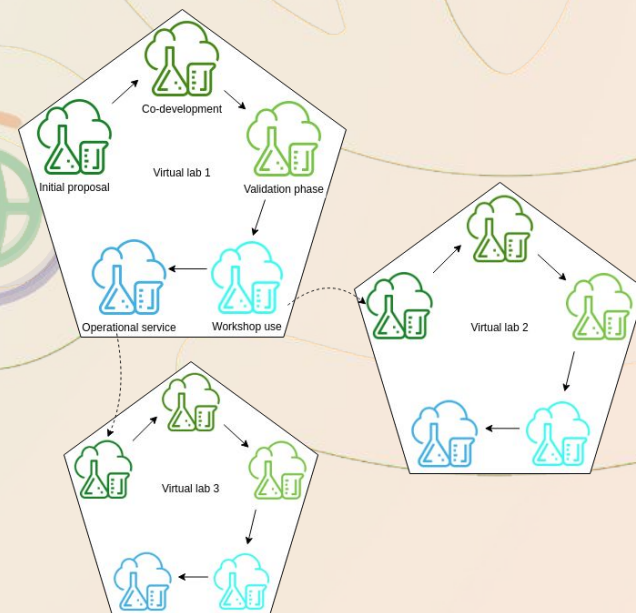


Readiness level framework: Assets & Documents

- **Assets:**
 - **The codebase:** Any code written for the virtual lab. The codebase interacts with external resources such as software libraries and external data
 - **Internal data:** Produced in the virtual lab by data processing, data analysis, and simulations
 - **Workflows and workflow components** (created by containerizing cells from the notebooks in the codebase)
- **Documents:**
 - Metadata
 - Documentation, including a tutorial

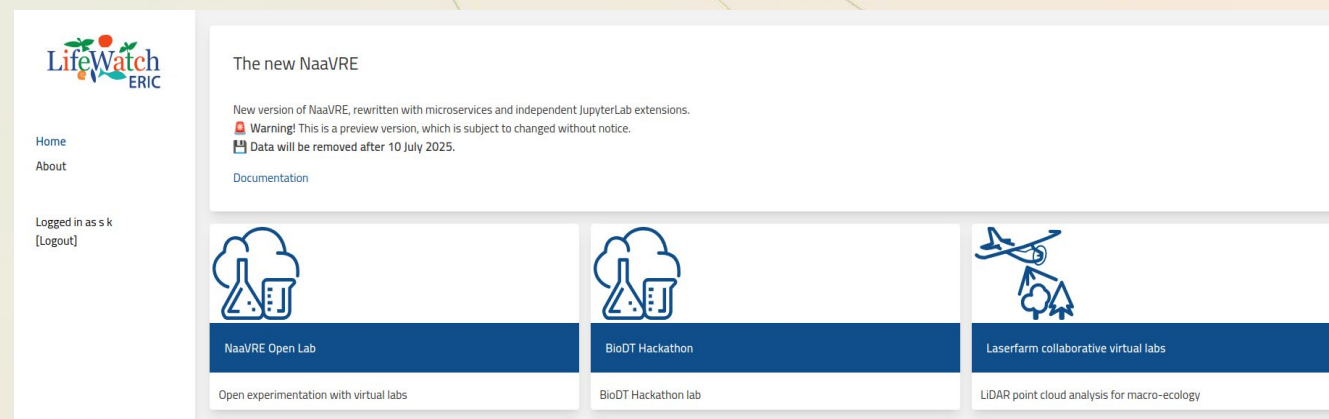
Readiness level 0

- **Feasibility:** Check if the research activity can be done in NaaVRE.
- **Team:** Team of virtual lab developers to build the virtual lab
- **Plan:** Write a development plan for the virtual lab. What scientific scenario will be investigated and what is needed to enable that?
- **Codebase:** The virtual lab coordinator will create a new virtual lab.
- **Version control:** Store the codebase on a repository with version control (e.g. git).
- **Documentation:** Pick a nice name for your virtual lab. Make sure the name won't be mixed up with other virtual labs.



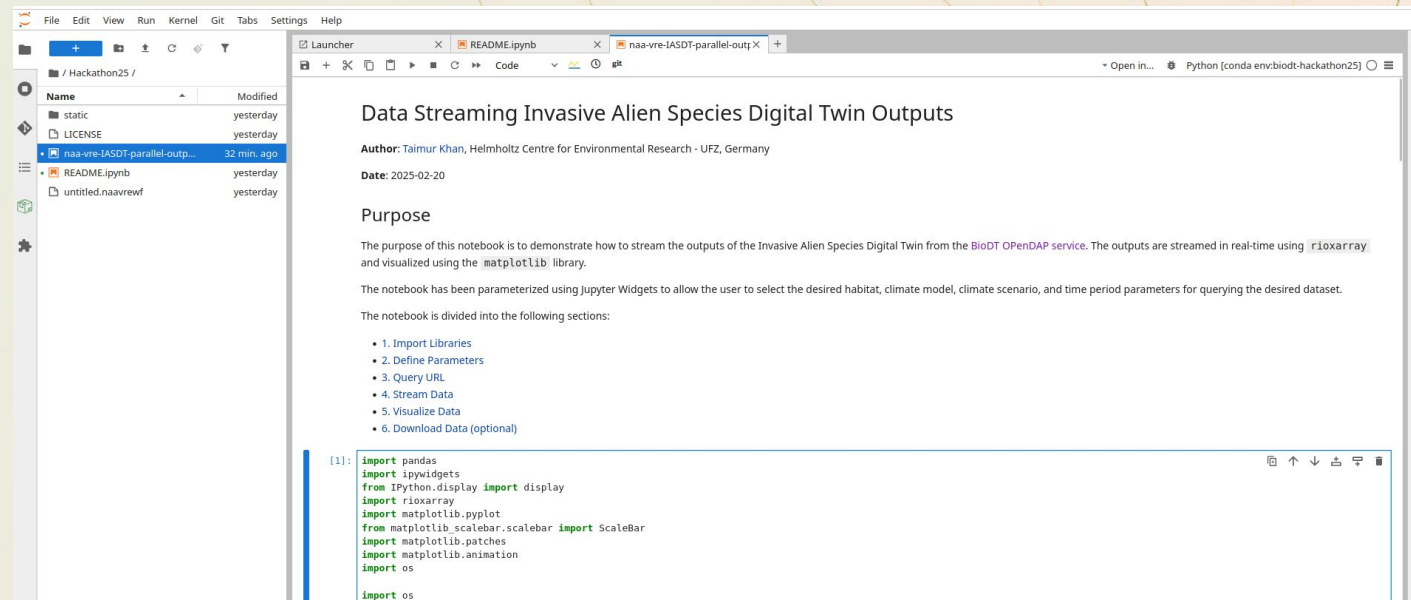
Starting point

- Get started at :
<https://new.demo.naavre.net/vreapp>
- The notebook in the BioDT lab is to demonstrate how to query, download and visualize the outputs of the Invasive Alien Species from an OPenDAP service
- Parameters:
 - desired habitat
 - climate model
 - climate scenario
 - time period parameters



The Hackathon25 Repository

- Invasive Alien Species Notebook: `naa-vre-IASDT-parallel-outputs.ipynb`
- Instructions on how to interact with MinIO cloud store `README.ipynb`

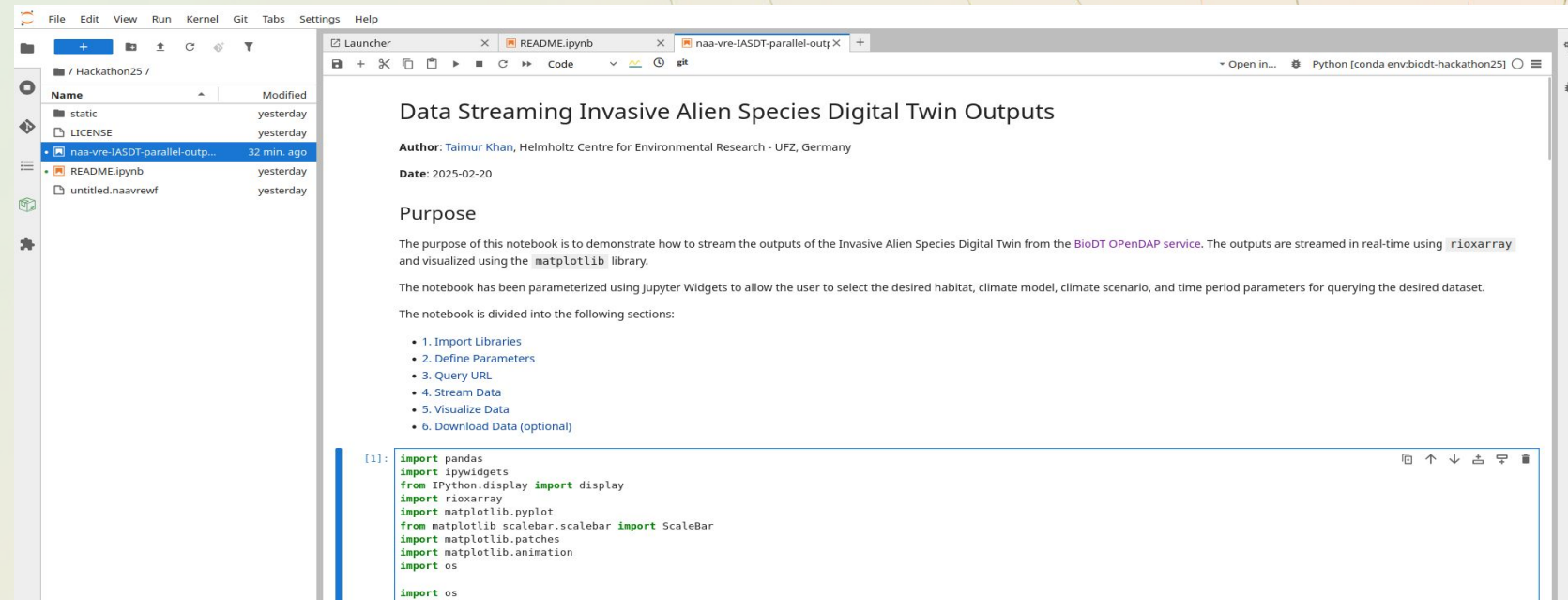


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ITINERIS

Invasive Alien Species Parameters

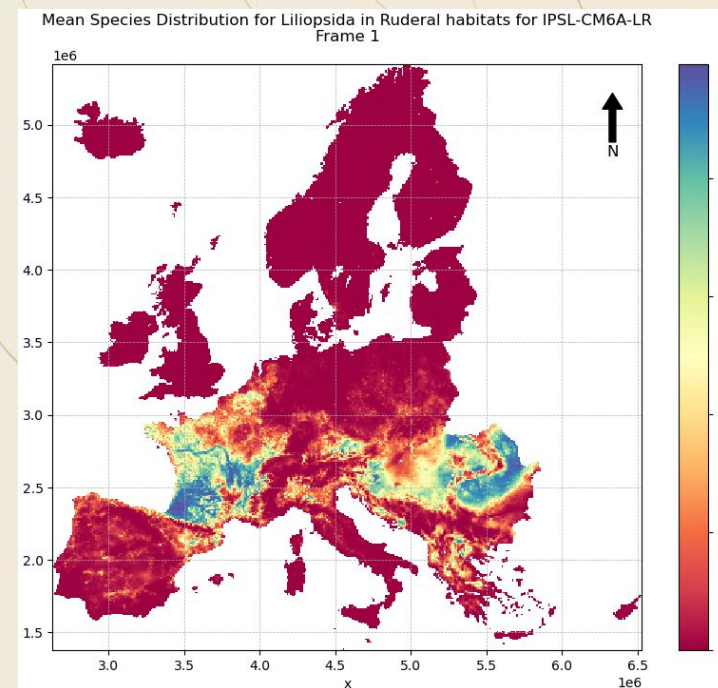
- **param_habitat_name:**
 - forests
 - open_forests
 - scrub
 - natural_grasslands
 - human_maintained_grasslands
 - wetland
 - ruderal_habitats
 - agricultural_habitats
- **param_climate_model:**
 - Current
 - GFDL-ESM4
 - IPSL-CM6A-LR
 - MPI-ESM1-2-HR
 - MRI-ESM2-0
 - UKESM1-0-LL
 - Ensemble
- **param_species_class:**
 - Liliopsida
 - Magnoliopsida
 - Pinopsida



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Invasive Alien Species Outputs

- ***_merged_output:** The Mean Species distribution
- **animated:** The Mean Species distribution animated over the years



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