

Objective 3:

IS-ENES3 will support the exploitation of model data by both the earth system science community and the climate change impacts community

WP10/JRA3:

ENES Climate Data Infrastructure software stack developments

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11 Partners

KNMI (37), CERFACS (36), CNRS-IPSL (21), CMCC (19),
UKRI (17), SMHI (12), UREAD-NCAS (10), UC(10),
DKRZ (7), BSC (3), LIU (2)

Main goal, approach and context

This WP will **evolve** and **consolidate** the **ENES climate data infrastructure software stack** according to the overall project objective #3, *IS-ENES3 will support the exploitation of model data by both the earth system science community and the climate change impacts community.*

Driven by user requirements gathered in **WP5/NA4**, this WP will **design and develop the software stack** regarding the key services offered by the **ENES CDI** in **WP7/VA2** and deployed at European data centers.

The involved software components are developed and maintained as **open source** efforts by the **IS-ENES partner institutes** as well as the **international ESGF developer community**.

The activities will be performed by also taking into consideration efforts ongoing in the wider **European „data“ ecosystem** and will look forward to the **EOSC roadmap** and **evolution** as well as to the **Copernicus landscape**.

WP Objectives

- Systematically improve and consolidate the IS-ENES CDI software stack as a basis for a **sustainable, streamlined and scalable climate model data distribution solution** for users in the climate modeling as well as climate impact research and modeling communities;
- Provide an **interoperable** and **flexible computing layer** supporting scientific data analysis and processing within the infrastructure, by evolving existing solutions towards an integrated set of processing related service offerings for end users
- Support **interoperability** of data files and archives for automated data processing
- Evolve the **climate4impact** platform towards a **climate data analytics portal** for impact scientists.
- Maintain and develop the **ES-DOC international documentation infrastructure** to support **CMIP6** and other **MIPs** as well as expand the scope of documentation to **new areas** for the climate modelling process, including model evaluation.

WP Tasks

1. Core Data Distribution Services

- Participants: CNRS-IPSL, DKRZ, UKRI, CMCC, BSC, LiU, UC - Effort: 33PMs)
- The goal of Task1 is to systematically **improve the data storage and distribution of Climate Model data infrastructure** components as a basis for a **sustainable, streamlined and scalable climate model data distribution solution** for the ENES community.

2. Develop a compute layer for processing and analytics for CMIP6 and CORDEX

- Participants: CMCC, DKRZ, UKRI, KNMI, CERFACS - Effort: 25PMs)
- This task will target the **core** part of the **scientific data analytics and processing layer** to fully address **computing needs** and move forward a **sustainable and integrated data analytics and processing model**.

WP Tasks

3. Improve the user interface and functionalities of the climate4impact platform for the impact communities

- Participants: CERFACS, KNMI, UC - Effort: 32PMs)
- This task will work on **consolidating** and **extending the climate4impact front-end**, incorporating lessons learned from current interface and user communities

4. Integrate the newly developed data compute services for data analytics into the climate4impact platform

- Participants: KNMI, CERFACS, SMHI - Effort: 38PMs)
- This task will work on **integrating into climate4impact the newly developed data compute services for data analytics**. It will also take into account the newly developed **Copernicus C3S tools and platform**.

WP Tasks

5. ES-DOC extensions for CMIP and other community projects

- Participants: CNRS-IPSL, UKRI, UREAD-NCAS - Effort: 35PMs and subcontr.)
- The main goal of this task is to **address future capabilities of ES-DOC**.

6. Tools, services, information models for data standards

- Participants: UKRI, CNRS-IPSL, SMHI, UREAD-NCAS, CERFACS - Effort: 19PMs)
- The aim here is to create a clearing house with vocabularies from different system components (e.g. ES-DOC, CF, ESGF).
- The requirements for the CMIP data request schema and tools will be reviewed through a dedicated workshop in WP3/NA2.
- This task will draw on user/community input from a dedicated workshop in **WP3/NA2** to develop schema and tools for handling requirements for climate indicators and for configuration of metadata used in workflows and data publication, with implementation in ICCLIM.

Deliverables

- D10.1 (Tasks 1 to 6, mo 18 - CMCC): Architectural document of the ENES CDI software stack
- D10.2 (Tasks 1 to 6, mo 24 - KNMI): First release of the ENES CDI software stack
- D10.3 (Tasks 1 to 6, mo 36 - CNRS-IPSL): Second release of the ENES CDI software stack
- D10.4 (Task 5, mo 46 - CNRS-IPSL): CMIP6 documentation
- D10.5 (Tasks 1 to 6, mo 48 - CERFACS): Final release of the ENES CDI software stack

Milestones

- **M10.1 (Tasks 1 to 6, mo 14 - CMCC):** Technical requirements on the software stack
- **M10.2 (Task 6, mo 18 - UKRI):** CMIP data request schema 2.0
- **M10.3 (Task 6, mo 24 - SMHI):** Climate indicators/indices and file metadata specifications and tools
- **M10.4 (Task 6, mo 48 - SMHI):** Update of the climate indicators/indices and file metadata specifications and tools

WP Issues to be addressed

- **BOG discussions:**
 - Compute service roadmap and strategy
 - Synchronization with NA and VA WPs
 - ENES CDI and overall landscape
 - Climate4Impact strategy considering C3S & EOSC offerings (ECAS, ...)
- **Risks:**
 - Requirements for software components (e.g. services, tools, and interfaces) related to operational data archives are not well defined.
 - Work closely with **WP5/NA4** and **WP7/VA2**
 - New software components (e.g. compute services) could not meet users expectations and/or could not be adopted by a large user base.
 - **Prioritization** of requirements and **start from existing efforts**
- **Cross-cutting aspects:**
 - Day 2 and Day 3 discussions on innovation, sustainability

WP First actions planned and main deadlines

