Debriefing slide WP2

Fanny Adloff & Michael Lautenschlager

Final General Assembly
16-18 January 2023
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From Jan. 2022 to Dec. 2022

- Task 1: Governance and Task Forces (UREAD)

- HPC TF: Synthesis paper on resource commitment between CMIP5 and CMIP6
- Data TF: Discussion and specification of the next generation ESGF architecture & engagement with the development of the US ESGF 2.0 proposal

- Task 2: Innovation (UKRI)

- Meeting to update the current innovative activities in IS-ENES3

- Task 3: Sustainability (DKRZ)

- Design of the ENES-RI has been finalised
- Implementation of the ENES-RI is ongoing.

- Task 4: Strategy (UREAD)

- Bilateral telco with European modelling institution were carried out.
- Draft of the Foresight infrastructure strategy for the European Earth System Modelling community is being finalised before starting iterations.

IS-ENES3 has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824084

Debriefing slide WP2

Fanny Adloff & Michael Lautenschlager

Final General Assembly
16-18 January 2023
Toulouse

Work progress - Main achievements

Deliverables

- D2.1 Infrastructure Strategy for Earth System Modelling for 2022-2032 - ongoing
- D2.2 The ENES-RI Sustainability Plan - done
- D2.3 The "Final Report on Innovation Activities" - to be finalised
- D2.4 Final report on governance activities - to be submitted end Jan 2023

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Debriefing slide WP3-NA2

Janette Bessembinder

Final General Assembly
16-18 January 2022
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to January 2023

- Task 1: Widening the user base for science and societal innovation
  - Schools organized in Romania (May 2022) and in Prague (November 2022)
  - Webinar and workshop on Introduction to ESMValTool- (June 2022)
  - Webinar: Introduction to the IS-ENES3 climate for the data services for the EU Outermost territories (October 2022)
  - Planning of short courses at 3 Dutch universities on a.o. C4I (February 2023)
  - Slightly less short events are organized, but the ones in Romania and Prague were much longer (3-4 days). COVID-19 made it difficult to organize events at location during 2 years
  - D3.5 with description and evaluation of the short trainings, webinars, schools almost finished. Many people in Eastern Europe reached, also a considerable number of people from the VIA community, more difficult to reach people from commercial organisations

- Task 2: Training and resources: nurturing the community
  - « Data school » organized in Athens in September 2022 with 36 participants
  - Session organized at EGU 2022; were some results of further elaborated case studies were presented from the virtual schools on « Climate data for Impact Assessments »
  - D3.2 almost finished: description and evaluation of the « Data School » and the schools on « Climate data for Impact Assessments »

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Debriefing slide WP3-NA2

Janette Bessembinder

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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to January 2023

- Task 3: Community standards

- Collection of all information on organized online workshops and other activities and writing of M3.4 (Summary of workshops on standards). This milestone is delivered much later, partly due to the difficulties organizing workshops due to COVID19
- Collection of all information and writing of D3.3 (Standards synthesis). This milestone is delivered much later, partly due to the difficulties organizing workshops due to COVID19

- Task 4:User feedback and requirements

- Collection of information from all WPs on user requirements and writing of D3.6 (overview of user requirements)

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Debriefing slide WP3-NA2

Janette Bessembinder

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Work progress - Main achievements

Deliverables and Milestones

D3.1 Initial requirements on model evaluation (ready, 2021)
D3.2 Synthesis on climate and impact and climate data schools (almost ready, January 2023?)
D3.3 Standards synthesis (almost ready? Beginning 2023)
D3.4 CMIP documentation requirements (2021)
D3.5 Synthesis on activities to broaden community (almost ready, January 2023?)
D3.6 Overview of user requirements (almost ready? Beginning 2023)

M3.1 Report on user requirements (2020)
M3.2 First school on climate and impacts (2021)
M3.3 Synthesis of first short events to broaden community (2021)
M3.4 Summary of workshops on standards (almost ready, January 2023?)
M3.5 Workshop on climate indices (2021)

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Debriefing slide WP4-NA3

Mario Acosta/Jean-Christophe Rioual

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16-18 January 2022
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- Task 1: Development of a new Quality assurance approach for the NEMO consortium

- Development of new knowledge exchange tools for NEMO developer: Discourse and Zulip
- Improved testing frameworks (NEMO SETTE) with a particular focus on performance testing with BSC and CMCC contributions
- Publication of *Gitlab good practises for NEMO developers*

- Task 2: Building a new community around a European Platform for Sea Ice modelling in NEMO

- Further advancement of the sea ice chapter of the NEMO Development Strategy (NDS) with positive reviews from the NEMO Science Advisory Committee (SAC)

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Debriefing slide WP4-NA3-name

Mario Acosta/Jean-Christophe Rioual

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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- Task 3: Complex Coupled Systems HPC performance evaluation

- Preparing GMD and HPC-TF papers for publication.
- Organizing next steps for future collections and analysis through new projects coming.

- Task 4: Machine Learning and Technology Tracking

- This activity is now closed and there was no additional work during the Reporting Period.

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Debriefing slide WP4-NA3-name

Mario Acosta/Jean-Christophe Rioual

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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- Task 5: Community Workshops

- Organisation of the sixth workshop on coupling technologies for earth systems models

- Task 6: Innovating with software and HPC industry

- Discussions in preparation for deliverable report

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Debriefing slide WP4-NA3-name

Mario Acosta/Jean-Christophe Rioual

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Work progress - Main achievements

Deliverables and Milestones

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Debriefing slide WP5-NA4

Phil Kershaw/Klaus Zimmermann

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Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- Task 1: Project Management for ES-Doc (IPSL)

- Weekly ES-DOC telcos
- Liaising between the ES-DOC team and the WIP, attending regular WIP meetings
- Working with IPSL to prioritise and optimise staff time
- Set up of the CMIP7 Documentation Task Team

- Task 2: Defining an Architecture for Future Data Services (UKRI)

- Ongoing work as co-chair of ESGF Executive Committee to agree, co-ordinate and plan technical developments for the infrastructure, in particular work with new partners from US ESGF 2.0 project
- Co-ordinated with partners for evaluation of prototype STAC search system
- Co-ordination with node administrators for rollout of ESGF Future Architecture release
- Worked with XC and wider community to plan ESGF Hybrid meeting, January 2023
- Networking activity with EGI/EOSC

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Debriefing slide WP5-NA4

Phil Kershaw/Klaus Zimmermann

Final General Assembly
16-18 January 2023
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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 3: Defining and communicating European priorities for ESGF (DKRZ)

- Networking and participation to the newly active ESGF Compute WG
- DKRZ and CEDA leadership of and coordination with ESGF compute working team on use the Roocs WPS in ESGF federation.
- Organise technical meeting with members of new DOE ESGF 2 project together with other international partners
- Organise ESGF hybrid meeting coinciding with the General Assembly meeting in January

- Task 4: Defining requirements and establishing the roadmap of an innovative IS-ENES compute service (CMCC)

- This activity ended in March 2022 with the delivery of the MS21/M5.4 “Compute service roadmap”

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Debriefing slide WP5-NA4

Phil Kershaw/Klaus Zimmermann

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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 5: Technical standards and an architecture for plugin diagnostic tools (BSC)

- Finalization of D5.2, giving a standard for plugin diagnostics developed in collaboration between ESMValTool and CliMAF

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Debriefing slide WP5-NA4

Phil Kershaw/Klaus Zimmermann

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Work progress - Main achievements

Deliverables

- D5.2 Technical Standards for Diagnostic Tools
- D5.3 Architecture Design Plans
- D5.6 ES-Doc Governance

Milestones

- MS21/M5.4 Compute service roadmap

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Debriefing WP6/VA1

Uwe Fladrich (SMHI) / Eric Maisonnave (CERFACS)

Work progress - Main achievements

Significant results and achievements RP3 (2022)

Task 1: Maintaining and monitoring the ENES ESM resources (L1)

- Models&tools pages re-launced (is.enes.org) and updated
- ES-DOC information monitored and complemented (expected complete 2/2023)
- L1 services externally reviewed

Task 2: Services for European ESMs (L2)

- 9 released versions of ESMs and NEMO in 2022
- high level of developer-user interaction monitored and maintained
- L2 services externally reviewed

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Significant results and achievements RP3 (2022)

Task 3: Services for European infrastructure tools

- OASIS Dedicated Support
  - 3 new supports provided at DWD (vector machine compliance); Météo-France (wave model interface); SMHI (Python tool for interpolation weights computation)
  - final summary report
- Active user support (AUS) for XIOS, Cylc/Rose, ESMValTool, CDO
  - 39 released versions of tools
  - hundreds of support issues processed
  - thousands of developer-user interactions in forums and on mail
  - improved documentation and high visibility on open platforms (e.g. Github)

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Debriefing WP6/VA1

Uwe Fladrich (SMHI) / Eric Maisonnave (CERFACS)

Work progress - Main achievements

Deliverables and milestones

Delivered in RP3:

- D6.4 *Report on new OASIS coupled models/interfaces*
- D6.5 *Second external review of model and tools services*
- D6.6 *Third periodical report on service statistics for models and tools*

Upcoming:

- M6.4 *ENES ESM resources updated, RP3*

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Debriefing slide WP7-VA2-name

Stephan Kindermann/Alessandro Spinuso

Work progress - Main achievements

Significant results and activities in RP3

- **Task 1: ESGF Data Dissemination, Long Term Archival and User Support (VA)**

  - ESGF services at DKRZ moved to a virtual machine environment
  - DDC CMIP6 subset long term archival complete
  - “Beyond DDC data” CMIP6 Long Term archival a bit delayed (-> Feb. 23) due to new HSM backend problems (Stronglink)
  - Data Ingestion for CCMI 2022 and SNAPSI; publication of SNAPSI reference data (http://dx.doi.org/10.5285/540a4c4cdfa6497993bbfa7c3e3df51a)
  - Support for creation of user accounts on C4I v2 workspaces, using the new ESGF IdeA AAI
  - Migration of C4I user registration/SSO to the IdeA AAI production deployment
  - Web Analytics in C4I based on GDPR Matomo with Events Tracking support for REACT front-end.

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Debriefing slide WP7-VA2-name

Stephan Kindermann/Alessandro Spinuso

Final General Assembly
16-18 January 2023
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- **Task 2: Compute Services (VA) - —Comp1**
  - provisioning of WPS (roocs) compute web service as part of VA service offering (at some sites (DKRZ))
  - extended user support material (jupyter notebooks etc.)
  - demonstrated and used at ENES summer school in Athens
  - ESMValTool: Development and maintenance of diagnostics used in the portal that enriched the collection of results displayed. The diagnostic portal was advertised during the ESMValTool workshop (June 2022)
  - C4I : Computational KPIs redefined and implemented in C4I v2, by exploiting Provenance information.

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Debriefing slide WP7-VA2-name

Stephan Kindermann/Alessandro Spinuso

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16-18 January 2023
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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- **Task 3: Virtual workspaces (TNA) - —Comp2**

  - supported last (5th) TNA applications (5 groups)

- **Task 4: Support for CF convention and Data Request**

  - Working with the CMIP International Project Office to establish the CMIP7 Data Request Task Team
  - Update to CF Standard Name table (March 2022)

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Debriefing slide WP7-VA2-name

Stephan Kindermann/Alessandro Spinuso

Final General Assembly
16-18 January 2023
Virtual

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- **Task 5: ES-DOC extensions for CMIP and other community projects**

  - ES-DOC support
  - work on establishing CMIP7 documentation Task Team

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Debriefing slide WP7-VA2-name

Stephan Kindermann/Alessandro Spinuso

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Work progress - Main achievements

Deliverables and Milestones

D7.4 Second external review report for ENES CDI services (Sept 22, in progress, waiting for reviewers' feedbacks)

D7.6 Third KPI and TNA report for ENES CDI services (information collection started)

M7.4 Complete ENES-CDI long term archival for CMIP6 (Dec 22, moved to Feb 23, ongoing)

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Debriefing slide WP8-JRA1
Models, tools and HPC

Sophie Valcke, Italo Epicoco

Final General Assembly
16-18 January 2022
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Sept. 2022

- Task 1: Improving Nemo computational performance

- NEMO code optimizations (redesign of the communication strategy for the halo update, mixed precision) released with NEMO official release 4.2.0 (03/2022)
- Validation tests of the NEMO SETTE package (reproducibility, restartability) performed with success
- The AutoRPE tool (for transforming parts of the code from double to single-precision) refactored to be ready for runs on platforms different from Marenostrum and optimised to run faster and with a smaller number of iterations.
- A new branch created on nemo git repository to host mixed precisions developments including preliminary changes necessary to run with AutoRPE; evaluation of the tool on the Zeus HPC platform (BSC - CMCC collaboration)
- Evaluation of the performance analysis on the last version of NEMO code has been carried out using the Extrae/Paraver tools in collaboration with BSC on Marenostrum4 machine

- Task 2: Developing the unified European platform for sea ice modelling

- SI3 code developments (Rothrock (1975) ice strength formulation, Flocco et al. (2010) topographic melt-ponds, conservation checking) released with NEMO 4.2 official release
- Validation of SI3 NEMO 4.2 code (reproducibility, restartability, conservation)
- Release of SI3 NEMO4.2 documentation on Zenodo (https://zenodo.org/record/7534900#.Y8GIF-xKg-Q)

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Debriefing slide WP8-JRA1
Models, tools and HPC

Sophie Valcke, Italo Epicoco

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 3: OASIS3-MCT development
- New environment to adapt the mask of an atmosphere model taking into account the coastline of the ocean model so as to be able to have well-posed conservative problem.
- Compilation and testing environment upgrade
- Migration from buildbot to nitrox for automated suite testing
- Bug fixes: support for multiple grids per partition, add missing pyoasis exception imports, load balancing freezing when all processes are not implied in the coupling

- Task 4: XIOS development
- Reorganization of XIOS SVN repository
- Official release of XIOS3-beta version (http://forge.ipsl.jussieu.fr/ioserver/browser/XIOS3/stable/xios3.0-beta) :
  - improved code readability, reliability and evolutivity
  - rationalisation and improvement of the grid distribution for lower memory consumption
  - new HPC service-oriented infrastructure for improved support of large ensembles and artificial intelligence methods.
- New version dr2xml V3.0: use outside the CMIP6 Data Request context, new diagnostics
- Stabilization of XIOS3, integration into IPSL model, validation by comparison with XIOS2 results.
- Characterization of performance improvement and memory fingerprint reduction (up to a factor 3) on NEMO use case.
- Consolidation of new feature for "HPC services" and coupling functionalities.

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Debriefing slide WP8-JRA1
Models, tools and HPC

Sophie Valcke, Italo Epicoco

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 5: Cylc/Rose development

- First official release of Cylc 8 and Rose 2 announced in July 2022 including
  - Porting to Python 3
  - old PyGTK GUIs replaced with a new web User Interface
  - new Terminal UI making use of the Urwid library (https://urwid.org/)
  - supports of platforms that consist of a group of hosts and a shared “job runner”
  - Upgrade of Rose for installing and running the workflows
  - new scheduling algorithm “spawn on demand”
  - improving support for required and optional outputs
  - Major overhaul of Cylc User Documentation
  - adoption of modern packaging systems (Conda and Pip)

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Debriefing slide WP8-JRA1
Models, tools and HPC

Sophie Valcke, Italo Epicoco

Work progress - Main achievements

Deliverables and Milestones

- Recall: D8.2 on OASIS3-MCT_5.0 was delivered in December 2021
- D8.4 Cylc / Rose Development Summary delivered in June 2022
- D8.3 on XIOS 3.0-beta and dr2xml V3.0 delivered in September 2022
- D8.5 “Update of the NEMO code” delivered in November 2022
- MS34/M8.5 Documentation of the NEMO sea ice model planned before end of January

IS-ENES3 has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 824084

Debriefing slide WP9-JRA2-eval

R. Kazeroni (DLR) – S. Loosveldt Tomas (BSC)

Final General Assembly
16-18 January 2023
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 1: Coding Workshops and Coordination of ESMValTool activities

  - Hybrid 3-days coding workshop organized by the DLR in June 2022
  - In-person meeting between ESMValTool and Iris developers during the Oct. 2022 workshop organized by the MetOffice
  - Regular WP9 coordination telcos
  - Transfer of WP lead activities at BSC from Kim to Saskia

- Task 2: Technical Improvements of the ESMValTool

  - ESMValTool v2.5, v2.6 and v2.7 releases
  - Continuous development of the ESMValTool via public collaboration on GitHub
  - General maintenance of environments, local and package-level on conda feedstock
  - Enhancement and improvement of automated testing, including a tool for comparing recipe runs to runs with a previous version
  - SciTools/iris v3.3.0 release with improved functionalities beneffiting ESMValTool
  - Development of the SciTools-incubator/iris-esmf-regrid package

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Debriefing slide WP9-JRA2-eval

R. Kazeroni (DLR) – S. Loosveldt Tomas (BSC)

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16-18 January 2023
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 3: Data processing and reformatting

  - New interface for downloading and reformatting observational datasets finished and merged into the public ESMValTool
  - Support added for several observational datasets

- Task 4: Seamless evaluation with the ESMValTool

  - Fixed bugs related to the timerange tag developments that allow for a more flexible handling of the time coordinate
  - Developments to enable the support for CORDEX data merged into the public ESMValCore

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Debriefing slide WP9-JRA2-eval

R. Kazeroni (DLR) – S. Loosveldt Tomas (BSC)

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16-18 January 2023
Toulouse

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 5: Enhancing the use of the ESMValTool for model development

  - Work on reformatting routines for native output from the models EMAC, ICON and CESM2 models
  - Updates in the mapgenerator package used to plot the monitoring diagnostics
  - Extension of the monitoring diagnostics to enable comparison against reference observational datasets
  - Technical paper on the Evaluation of Native Earth System Model Output with ESMValTool accepted for publication (Dec. 2022)

- Task 6: Coupling of externally developed diagnostics and metrics to the ESMValTool

  - Work on several diagnostics and merging of the first diagnostics developed for the IPCC AR6 report into the public ESMValTool

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Debriefing slide WP9-JRA2-eval

R. Kazeroni (DLR) – S. Loosveldt Tomas (BSC)

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16-18 January 2023
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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 7: Coupling of ESMValTool to the ESGF

  - Central installation of released versions of ESMValTool deployed at CEDA-Jasmin and DKRZ-Levante, including a Jupyter kernel for the DKRZ Jupyterhub
  - Maintenance and improvement of the data download from ESGF nodes

- Task 8: Distributed ESMValTool computing and calculations on user demand

  - Maintenance and improvement of the testing

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Debriefing slide WP9-JRA2-eval

R. Kazeroni (DLR) – S. Loosveldt Tomas (BSC)

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Work progress - Main achievements

Deliverables and Milestones

Upcoming:

- D9.5 - Final IS-ENES3 ESMValTool version (March 2023)

Delivered before RP3:

- D9.1, D9.2, D9.3, D9.4
- M9.1, M9.2

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Debriefing slide WP10-JRA3-name

Paola Nassisi/Christian Pagé

Final General Assembly
16-18 January 2023
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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 1: Core data distribution services

- Continuous CMIP6 data publication from ENES nodes in several MIPs.
- Generalisation of catalogues engines: `intake-esm` generation pipelines (DKRZ, IPSL), STAC API deployed in test (DKRZ, CEDA), plans to include STAC in some ESGF data services (Data Statistics, Synda).
- Main ESGF data services updates
    - ESGF Data Statistics improved version (beta) with new cross-project section of the GUI.
    - ESGF Data replication `synda` refactoring is ending and will be rebranded into `esgpull`.
    - CMIP6 PID service migrated to new cloud platform (DKRZ).

- Task 2: Develop a compute layer for processing and analytics for CMIP6 and CORDEX

- Activities on the Roocs WPS in terms of i) deployment of Roocs WPS instance for ESGF/C4I at IPSL and CEDA, ii) coordination with KNMI to deploy the WPS interface into the CMCC Analytics Hub (integration with C4I planned before March), iii) update of the WPS functionalities needed by C4I, iv) update of the provenance provided by Roocs for C4I requests.
- Release of several icclim versions with many new features and enhancements.
- Serverless Implementation of C4I workspaces via SWIRRL AWS, offering self scaling compute capabilities to accommodate more users (done via Serverless EKS).

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Debriefing slide WP10-JRA3-name

Paola Nassisi/Christian Pagé

Final General Assembly
16-18 January 2023
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Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec.. 2022

- Task 3: Improve the user interface and functionalities of the climate4impact platform for the impact communities

- Intuitive search interface with adapting grouping and scoping of variables according to relevance and availability. Switch to an extended and more comprehensive variable selection is provided as option.
- Analytic Workspaces characterised by common notebook services, integrated with Git and reproducibility controls via interactive exploitation or provenance information.

- Task 4: Integrate the newly developed data compute services for data analytics into the climate4impact platform

- Integration of WPS as part of a C4I data subsetting workflow. Subsetting interfaces allow users to setup the parametrisation of data subsetting workflows which populate the analytics workspaces.
- Users can visualise which of the ESGF nodes expose the WPS and configure C4I to searches on those, obtaining eventually subset data via the WPS workflow.
- Notebooks and Workflows run on dedicated AWS serverless resources.

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Debriefing slide WP10-JRA3-name

Paola Nassisi/Christian Pagé

Final General Assembly
16-18 January 2023
Virtual

Work progress - Main achievements

Significant results and activities in RP3 (including deviations from Description of Activities) – From January 2022 to Dec. 2022

- Task 5: ES-DOC extensions for CMIP and other community projects

- Release of several CIM documents:
  - CMIP6 conformance to experiential requirements
  - Machine description used in the context of CMIP6.
  - CMIP6 model performance.
- Automatic linking of Simulation and Ensemble descriptions via the “further_info_URL”
- Technical documentation and deployment recipes of ES-DOC software stack completed and available at https://technical.es-doc.org/
- Errata UI 2.0 designed and developed in collaboration with the WIP and Copernicus, and deployed in TEST.

- Task 6: Tools, services, information models for data standards

- Report on Data Request Schema 2.0:
  - Mission statement for the Data Request.
  - Strategic and technical requirements.
  - Stripping out unneeded “requirements”
- Creation of CLIX-META public repository of master list of CF and other metadata for climate indices.
- Support for implementation of new climate indicators in ICCLIM (Task 4)

IS-ENES3 has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 824084

Debriefing slide WP10-JRA3-name

Paola Nassisi/Christian Pagé

Final General Assembly
16-18 January 2023
Virtual

Work progress - Main achievements

Deliverables and Milestones

- D10.4: CMIP6 documentation [October 2022] → Postponed to January 2023
- D10.5: Final release of the ENES CDI software stack [March 2023]

- MS40: Update of the climate indicators/indices and file metadata specifications and tools [February 2023]

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