

IS-ENES3 Deliverable D6.2

First external review of model and tools services

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ABSTRACT

The accessibility and quality of services for European ESMs and software tools, provided collaboratively via the ENES Portal pages, have been assessed by an external reviewer. While the services appear to work well in general, some serious issues have been discovered for a subset of models and tools services. Consequently, corrective actions to improve the accessibility, completeness and clarity are suggested in order to provide high-quality help for users.

Revision table			
Version	Date	Name	Comments
0	19/12/2020	Initial draft	
1	25/01/2021	Version for internal review	
2	01/02/2021	Version after first internal review	
3	04/02/2021	Version after second internal review	
Dissemination Level			
PU	Public		X
CO	Confidential, only for the partners of the IS-ENES3 project		



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Table of contents

ABSTRACT	1
1. Executive Summary	3
2. Objectives.....	3
3. Methodology and Results	4
3.1 External Review of Services.....	4
3.2 Appointment of External Reviewers.....	4
3.3 Summarised Results of the External Reviews	5
3.3.1 General	5
3.3.2 Level 1 services for ESMs (task 1)	5
3.3.3 Level 2 services for ESMs (task 2)	5
3.3.4 ENES Portal Models&Tools (tasks 1+3).....	6
4. Conclusions and Corrective Actions	7
5. Appendix: External review by Ingo Kirchner, FU Berlin, Germany	8

1. Executive Summary

IS-ENES services for European ESMs (Earth System Models) and Software Tools have been provided to the user community for the first 18 months of the IS-ENES3 project. This is a continuation and extension of services provided in earlier phases of the IS-ENES project. The current phase includes the following installations:

- HadGEM/UKESM (ESM) by the Met Office
- EC-Earth (ESM) by the EC-Earth consortium
- NorESM (ESM) by Met Norway and UniRes
- OASIS (infrastructure tool) by CERFACS
- XIOS (infrastructure tool) by CNRS-IPSL and CERFACS
- Cylc/Rose (infrastructure tools) by the Met Office
- ESMValTool (infrastructure tool) by DLR, BSC and NleSC

Furthermore, level 1 service for CMIP6 European climate models is provided through the ENES Portal. The NEMO ocean model and the CDO tool for climate data analysis are included in the level 1 service as well, albeit not receiving IS-ENES3 funding.

The above installations constitute the service endpoints for the user communities. The main objective for the services is the easy access to information, provision of interfaces between ESM/tool developers and users, and the definition of interfaces for feedback from user communities.

2. Objectives

The overarching objective for VA1/WP6 is to maintain, extend, and improve level 1 and 2 services around European ESMs, the NEMO ocean model, and related critical infrastructure software tools. These services help to efficiently connect the respective developer and user communities and thus support the usage and development of European ESMs as well as the exploitation of climate model data.

Three tasks in VA1/WP6 are responsible for providing level 1 services for models (T1), level 2 services for models (T2), and services for infrastructure tools (T3). The main objective for all services are to provide relevant information to users of the European ESMs and tools, and ensure efficient communication between service providers (modelling groups and tool developers) and their respective user communities. All services provided in WP6/VA1 are continuously monitored (for results of the first reporting period, see D6.1).

3. Methodology and Results

3.1 External Review of Services

The VA1/WP6 description of work asks for an external review of services in order to assess the status and allow for corrective actions, where needed, during the project run time. Together with the statistics provided during the first reporting period (D6.1), the review will help to assess the visibility, accessibility, quality, and usefulness of the services offered. Two reports are expected during the course of the project, one at month 24 (i.e. this one) and another one at month 40 (i.e. April 2022).

More specifically, the external reviews are expected to

- Assess the level 1 services on ESMs, i.e. verify that ES-DOC metadata is available (at <https://search.es-doc.org>) through the ENES portal for all European ESMs and that the listed contact points are reachable and reply to specific questions about the use of CMIP6 model output (see <https://portal.enes.org/models/earthsystem-models>);
- Interact with at least one group providing level 2 service for one particular ESM or Advanced Users Service for one particular tool and provide feedback about quality of the help received;
- Check NEMO, OASIS, Cylc, XIOS, ESMValTool, and CDO web sites and report on the information and help a user can get directly on these web sites (documentation, tutorials, FAQs, user forums) or via contacts identified on these sites providing additional user support.

3.2 Appointment of External Reviewers

Two external reviewers were appointed with the task of reviewing the WP6/VA1 services described in the previous paragraph, the appointment being reported in M6.2. Neither of the external reviewers is directly affiliated with IS-ENES3.

Dr. Ingo Kirchner is a scientist, lecturer, and scientific software developer at the Institute of Meteorology, Freie Universität (FU) Berlin, Germany, since 2003. He is involved in e-learning, climate modelling and information technologies.

Paul Nolan, PhD is a Climate Science Programme Manager at the Irish Centre for High-end Computing (ICHEC), Dublin, Ireland. He has lectured on Climate Dynamics and Mathematics at University College and Trinity College Dublin for over six years before joining ICHEC in March 2013. He is currently managing four Environmental Protection Agency/Geological Survey Ireland projects in the areas of modelling the present and future climate of Ireland.

Despite the arrangement, it was learned shortly before the reviews were due, that Paul Nolan would not be able to fulfil the assignment. Because of short notice, it was not possible to select and appoint another reviewer in time. However, the review that was received from Ingo Kirchner turned out to be quite comprehensive and already included a number of points that need addressing. Hence, it was decided to continue with the improvement of VA1/WP6 services based on one received review.

3.3 Summarised Results of the External Reviews

3.3.1 General

The external review has found the services provided by VA1/WP6 to be accessible, to a good extend, for external users. Nevertheless, some serious issues were discovered, which negatively affect users in search for services for particular models/tools. Some of the problems are presumably related to unclear responsibilities for the response to service requests, while other issues can be related directly to the ENES Portal pages for models and tool. Both types of issues are detailed in the following sections. For reference, the complete external review is included in the Appendix.

3.3.2 Level 1 services for ESMs (task 1)

The reviewer contacted all seven modelling groups that provide level 1 services for their respective ESM in VA1/WP6, thereby checking the contact information given on the ENES Portal Model&Tools section. While all email addresses were up-to-date at the ENES Portal and seemed to work technically, only four groups answered:

- CNRM (for CNRM-CM; replied the same day)
- CNRS-IPSL (for IPSL-CM6; replied after 2 days)
- EC-Earth consortium/SMHI (for EC-Earth3; replied after one week)
- MetOffice (for UKESM; replied after almost two weeks)

while the contacts for CMCC-CESM2 (not a WP partner), MPI-ESM (not a WP partner), and NorESM2 (met.no) did not respond.

3.3.3 Level 2 services for ESMs (task 2)

The reviewer contacted all three modelling groups that provide level 2 service in VA1/WP6 at the email addresses given at the ENES Portal ESM pages. Unfortunately, neither the NCC Help Desk (ESM: NorESM2, WP partner: Met Norway) nor the UKESM help desk (ESM: UKMO-HC, WP partner: Met Office) responded to the reviewer's question.

The EC-Earth consortium contact (ESM: EC-Earth3, WP partner: SMHI) did reply to the message and established the contact. Upon the question to access the source code and get help with installation, the EC-Earth service contact replied that access to the source code of the atmosphere model (IFS) in EC-Earth3 is subject to ECMWF license agreements and therefore limited to members of the EC-Earth consortium. This limitation is stated on the EC-Earth page at the ENES Portal, both in the level 2 service announcement and in the model description text. Nevertheless, this implied that further assessment of the EC-Earth level 2 service could not be conducted, because the reviewer would not go through the process of becoming an EC-Earth consortium member (which is limited to institutions, not individuals).

3.3.4 ENES Portal Models&Tools (tasks 1+3)

The reviewer was asked to check the availability, completeness, consistency and clarity of the ENES Portal pages on European ESMs and Modelling groups. From the WP point of view, all pages were updated during the first 18 months of IS-ENES3 and supposed to provide the necessary information to access models and tools services (M6.1).

While all pages were indeed updated as planned, the review still brought up a number of critical points. There exist a few issues with missing or outdated information items, which were not available during the updates. This corresponds in particular to missing ES-DOC information for NorESM, which was still not available at the time of the review. The reviewer also rightly pointed out a missing ES-DOC link for CNRM-CM6-1, which has been made available after the update of the Portal pages.

The reviewer made a number of critical remarks regarding the clarity and consistency of the Portal pages on models and tools services. Issues with the clarity and consistency of the navigation structure of the pages have been already pointed out in MS6.1. However, the review shows that the attempt to improve the structure has not yet been completely successful.

4. Conclusions and Corrective Actions

The external review of VA1/WP6 services pointed out some critical issues about:

1. Missing responses to service requests
2. Incorrect or missing information on the ENES Portal
3. Unclear or inconsistent structure of the ENES Portal pages

All three types of issues will limit the accessibility of IS-ENES services for models and tools, at least for particular users. Thus, the issues have to be addressed so that services are further improved.

In order to remedy the problems, the following corrective actions will be implemented in VA1/WP6:

- Check and update service level 1 information, in particular:
 - contact information for institutions that did not respond to service requests
 - add missing ES-DOC information for CNRM-CM6-1 and NorESM
 - check if conditions for access to EC-Earth are stated clearly
- Contact WP partners and involved external institutes and discuss responsibility for service request responses
- Discuss integration of NEMO pages into model section
- Add information about the ESMValTool at appropriate tools section
- Review structure and navigation of service pages

5. Appendix: External review by Ingo Kirchner, FU Berlin, Germany

Report about IS-ENES Portal Inspection

Dr. Ingo Kirchner, 10/Dec/2020

This inspection was split into three parts:

1. verification of ES-DOC metadata through ENES portal and the contact information, check up of the reachability of contacts at service level 1
2. interaction with at least one group (EC-Earth, NorESM2, UKMO-HC) within the advanced service for model user, this includes the download, installation and application of a test experiment
3. checkup the websites about the data freshness, consistency and reachability of documentation, tutorial, FAQs and forum

I started with point 1 and 3. The outcome of point 1 was not enough for point 2. Therefore the second part could not be checked.

Service level 1 verification

For the verification of level 1 support I sent such e-mail (see the example below) to all seven model groups: CMCC-CESM2, CNRM-CERFACS, EC-Earth3, IPSL-CM6, MPI-ESM, NorESM2, UKESM. The e-mails were sent on 27th of October 2020.

Good morning,

I got information about the UKESM on the ENES portal. Is it possible to apply the model for educational purpose? What are the requirements for a 100 year sensitivity study?

*Best Regards
Ingo Kirchner*

The first answer came from CNRM-CERFACS few hours later. The IPSL-CM6 group answered two days later. The EC-Earth3 group answered on 3rd of November. The last answer was received on 8th of December from UKESM group. The other groups (CMCC-CESM2, MPI-ESM, NorESM2) ignored my request. For the verification of second level support only the EC-Earth3 group was qualified. Therefore I tried to ask more about the model code, installation and test experiments. It was not possible to get the model code without any restrictions. An institutional contract was needed. On that basis no model test without engagement was possible. The other two candidates for second level support did not respond.

Checkup of websites

The entry point to the website check was

<https://portal.enes.org/models/earthsystem-models>

On this site the model groups and tools are listed on the left side navigation. The NEMO model is outside of the classification (Earth System Model and Tool) and is listed in the navigation separately. A renaming of 'Software Tools' in 'ESM Component Models and ESM Software' should be done and then NEMO can be moved to this navigation point. In addition the NEMO can be placed in the table on the landing page of the ESMs. Here the ESMs are listed. It's is not clear why CERFACS placed 3 models on this table. It would be better and more consistent with the other ESM landing pages to see only the top model of each group there. Otherwise it is unclear from outside, which I have to contact. It follows the check up results of feature tests.

<i>ESM</i>	<i>last update</i>	<i>ES-Doc</i>	<i>Website</i>
CMCC-CESM2	24/Sep/2020	no	unspecific
CNRM-CERFACS	2/Jul,24/Sep/2020	yes (old), no (latest)	confusing
EC-Earth3	2/Jul/2020	yes	model
IPSL-CM6	24/Sep/2020	yes	Model group
MPI-ESM	24/Sep/2020	yes	institute
NorESM2	24/Sep/2020	old	no
UKESM	24/Sep/2020	yes	model

<i>Tool</i>	<i>website</i>	<i>docu</i>	<i>tutorial</i>	<i>faq</i>	<i>forum</i>
NEMO	ok	ok	ok	unclear	unclear
OASIS	ok	ok	ok	ok	ok
Cyclc	ok	ok	ok	ok	ok
XIOS	ok	yes	yes	unclear	unclear
CDO	ok	ok	ok	yes	yes
ESMValTool	missing on the portal landing page				

There are some comments to the website

- the link on the model landing pages to the main ESM Website not unified
- the layout of the contact links is not unified, missing subject at CMCC landing page
- the e-mail link to the model support is working only with registration
- the ES-DOC viewer is different between version 1.0.0 and 1.1.4. All models should be documented with the latest version
- models should be presented in that way: the latest version first, older version should be placed less dominant
- short cuts for navigation and models are different. It is confusing to name the links some times using the model groups and some times using the models. I would recommend to use the model groups generally
- the separation of NEMO in the navigation is unclear
- the XIOS tool needs some general description. Not clear what problem is solved with that tool
- XIOS documentation is not readable in browser, needs to be downloaded. That's not comfortable

Conclusions

In general the website links the major European ESM groups together and provides one central information point. The idea of a landing page for each model group helps but there is a mixing between model group and Earth System Model name. In the navigation the model groups are labelled, but the link shows a landing page of the model of this group. I can understand this, but except for the CERFACS group. Here the partitioning into different models in the navigation makes confusion.

The idea of such central website as information and support network is commendable, because the ESM landscape in Europe is very heterogeneous. But it is not only the information about the existing groups and models, more essential is the availability of the model codes. Only this makes the ESM science transparent and open. The approach with the second level support is one way, but it will not work, if the model codes are not Open Source.