



EuroGEOSS Showcases: Applications Powered by Europe

D3.2 Pilots Implementation Plans and Roadmap

e-shape



The e-shape project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 820852

ABSTRACT

This deliverable describes the implementation plans merging the initial plans from the pilots and updates out of the initial assessment and co-design initial lessons.

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| v0.x | draft before peer-review approval |
| v1.x | After the first review |
| v2.x | After the second review |
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| STATUS | | DISSEMINATION LEVEL | |
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| S1 | Reviewed | CO | Confidential, restricted under conditions set out in the Grant Agreement |
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TABLE OF CONTENTS

| | |
|--|-----------|
| | 1 |
| e-shape | 1 |
| Abstract | 2 |
| List of Figures and Tables | 6 |
| 1 Introduction | 7 |
| 2 Sprint definition and kickoff | 7 |
| 3 Sprint implementation and monitoring | 8 |
| 4 Challenges selected by the pilots | 11 |
| 5 Milestones for Sprint 1 | 14 |
| 6 Annex 1 Pilots Challenges for e-shape sprint 1 | 15 |
| 6.1 Summary dashboard of Challenges selected | 15 |
| 6.2 Detailed challenges and milestones per Showcase and Pilot, including Initial State, Final State, Means of evaluation, outcomes and milestones per challenge..... | 18 |
| 6.2.1 S1P1 GEOGLAM..... | 18 |
| 6.2.2 S1P2 EU-CAP_Support..... | 19 |
| 6.2.3 S1P3 Vegetation-Index Crop-Insurance in Ethiopia | 21 |
| 6.2.4 S1P4 Agro-industry..... | 23 |
| 6.2.5 S2P1 EO-based surveillance of Mercury pollution | 24 |
| 6.2.6 S2P2 EO-based surveillance of POPs pollution | 25 |
| 6.2.7 S2P3 EO-based pollution-health risks profiling in the urban environment..... | 26 |
| 6.2.8 S3P1 NextSENSE Solar Energy nowcasting and short-term forecasting system | 27 |
| 6.2.9 S3P2 High PV penetration in urban area ARMINES part | 27 |
| 6.2.10 S3P2 High PV penetration in urban area DLR part:..... | 28 |
| 6.2.11 S3P3 Merging offshore wind products: | 30 |
| 6.2.12 S4P1 mySPACE | 30 |
| 6.2.13 S4P2 mySITE..... | 31 |
| 6.2.14 S4P3 myVARIABLE | 33 |
| 6.2.15 S5P1 Improved historical water availability and quality information service..... | 34 |
| 6.2.16 S5P2 Satellite Earth Observation-derived water bodies and floodwater record over Europe ... | 35 |
| 6.2.17 S5P3 Diver Information on Visibility in Europe..... | 37 |
| 6.2.18 S5P4 Sargassum detection for seasonal planning | 38 |
| 6.2.19 S5P5 Monitoring fishing activity..... | 38 |
| 6.2.20 S6P1 Data for Detection, Discrimination and Distribution (4D) of Volcanic ash | 39 |
| 6.2.21 S6P2 GEOSS for Disasters in Urban Environment Sprint 1 Challenge | 40 |
| 6.2.22 S6P3 Assessing Geo-hazard vulnerability of Cities and Critical Infrastructures..... | 41 |
| 6.2.23 S6P4 Resilient and Sustainable ecosystems including Agriculture and food | 42 |
| 6.2.24 S7P1 Global Carbon & GHG Emissions :..... | 43 |
| 6.2.25 S7P2 Urban resilience to extreme weather | 44 |
| 6.2.26 S7P3 Forestry conditions | 45 |
| 6.2.27 S7P4 Hydropower in snow reservoir | 46 |
| 6.2.28 S7P5 Seasonal Preparedness | 47 |
| Annex 2 Sprint 1 Timeline as of 21 January 2020 | 48 |



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LIST OF FIGURES AND TABLES

Figures:

Figure 1: Distribution of the challenge selection from the different pilots. Some pilots committed to more than 3 challenges. 11

Figure 2: Sprint timeline. Each color represents the linkage to an e-shape Work Package. The timeline therefore provides a workplan for each Work Package's engagement. 14

Table 1: Proposed sprint challenges, cascading e-shape's KPIS..... 10

Table 2: Mapping of the selected challenges per pilot. 12



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1 INTRODUCTION

The e-shape is rich of 27 pilots driven by 54 Partners. This is a wonderful panel which is probably very representative of the full European Earth Observation community for which the project will extract the e-shape development guide.

The challenge for WP3 is then to support and guide the pilots softly without being overly too directive, in order to optimise the benefits for the project and for the partners.

The selected methodology was established in partnership with the Project Management Team, the Work Package Leaders and the Showcase Coordinators. The aim of the methodology is to:

- Deploy each e-shape Work Package support in a service-oriented approach, enabling the pilots to benefit from the wealth of expertise available in e-shape, and for the pilots to reach their target TRL.
- Enable e-shape to reach its objectives and progress in achieving its Key Performance Indicators.
- Recognize the diversity amongst pilots, and provide the pilots with the flexibility needed for the pilots to meet their own implementation agenda with their own communities or users.
- Capture the issues on which the project can support them to benefit as much as possible from the project.
- Make sure that each of the 27 pilots progresses on a regular basis for the entire e-shape runtime period.
- Observe the successes, fails, to capture lessons learned into the final Best Practices document.

2 SPRINT DEFINITION AND KICKOFF

As per the overall e-shape project plan, the implementation Work Package (WP3) is based on 2 main sprints preceded and followed by an assessment phase. Following the initial assessment implemented during the Task 3.1, WP3 has initiated the first Sprint for e-shape and the related Task 3.2. The Sprint was formally kicked off through webinar sessions organized on November 29th and December 4th.

To take into account the diversity of the pilots, in terms of platform, and level of maturity, as testified by the initial assessment, it was proposed to organize the sprint on the basis of “Challenges”.

The Challenges consist in cascading the relevant KPIs of e-shape to the pilots as per Table 1. From Table 1, O1 category is related to Co-design (WP2), O2 category is related to implementation (WP3), O3 category is related to User Uptake and Capacity Building (WP4) and O4 category is related to Sustainability and Upscaling (WP5).

Each pilot was invited to select three challenges or more. For the first Sprint, the focus has been put on the issues addressed by WP3 (Challenge Cluster O2 on Table 1), and in particular: the exploitation of the DIASes, in terms of data, services or computing capabilities, and the compliance with the INSPIRE, GEO Data Sharing and GEO Data Management Principles.

Therefore, from the at-least three challenges to be selected, one was mandatory to be selected from the O2 cluster related to Implementation, the two or more others further challenges can be taken out of any cluster.

The challenge specifications are flexible, implying each Pilot can propose its own adaptation of a given Challenge in its own context. The Challenge definition has however to be agreed by the WP3 Leader and the Showcase Coordinator.



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For each of the selected challenges, the pilots have been invited to provide an Initial State, an expected Final State, some Means of evaluation and a Final material to be produced (prototype; demo; video; poster...). Then they were invited to provide at least 2 main milestones that could be global for all challenges or per challenge.

The outcome of this phase was the formulation of 83 challenges (Annex 1) defined by:

- An Initial State,
- A Final State.
- Mean of evaluation.
- Expected outcomes.
- Internal milestone.

As summarized by Figure 1 and Table 2, it is no surprise that most of the challenges for this sprint 1 relate to O1 (co-design) and O2 (implementation):

- Co-design has been in focus of the first project period and the needs for co-design support are under scrutiny at the stage of the project.
- Implementation is in focus for this Sprint, in particular to stimulate the progressive engagement with the DIASes, one of the main issues in focus for e-shape.

The Challenge Clusters O3, related to user uptake and capacity building (WP4) and Cluster O4, related to Sustainability and Upscaling will be in focus of Sprint 2.

3 SPRINT IMPLEMENTATION AND MONITORING

From the compilation of the Milestones and Timelines proposed by each Pilot (Annex 1 and Annex 2), the sprint Timeline was built, as presented Figure 2. Two main milestones are highlighted by a red circle:

- End of April 2020 which is when WP3 should provide a draft content for the D3.3 to be discussed during the project review.
- October 2020 which is just before the GEO Week where e-shape would report progresses to the GEO community.

Based on the Timeline, the Work Packages, will have to be flexible on their activities, bringing the support to the pilots when and if needed, capturing the lessons learned at each stage, and consolidating the global knowledge progressively.

The Timeline allows guiding the Work Packages to bring their support and focus to the pilots in accordance with their development plans. The Work Packages are invited to use the timeline to schedule their activities on a monthly basis.

For each Pilot and each challenge, the Workflow involves a review of the specifications expressed by the pilots for these challenges, and assess the relevance of the contribution that can be brought by the identified Work Package.

Once the value-added of the Work Package support is established, the Work Package Leaders and the Pilot Leads should specify the nature of the support that can be provided (detailing the platforms, making sure that the webinars on compliance tools are known and sufficient, ...), as well as the return of experience that could be provided from the pilots to the project to begin building the *Pilot Sprint 1 report* (Deliverable 3.4) and the final Guide (Deliverable 3.7).



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The Sprint monitoring involves tracking progresses from the Pilots towards the achievement of their Milestones and Challenges, as well as ensuring a smooth coordination and full support of the Work Packages to the Sprint, according to the priorities identified by the Timeline.

To avoid adding too many meetings, the Work Package Leaders will participate to the Showcase meetings where the progress towards milestones will be discussed. They will take care to look for the best support activities to the Pilot and to collect the return of experience to build the Best Practices. In addition, the Work Package Leaders will have 1 telco a month to coordinate on their different activities.

With the specification of 83 challenges including 2 milestones each, the Sprint monitoring consists in tracking approximately 300 events involving the Pilot participants and Work Package Leaders. The richness of the interaction between the Pilots and the Work Package Leaders should be captured in order to consolidate the wealth of knowledge available within e-shape. Therefore, tracking and consolidation of knowledge would benefit from a platform allowing to organise the information flow between the various agents.

Discussions are ongoing between WP3 and WP1 (ARMINES, DEIMOS) on possible ways to monitor progresses through the ticketing system of the Showcase Support Service. In this configuration, each challenge would be specified as a ticket in the system, with an initial and Final State. Support from the Work Package Leaders would be coordinated through assigning the ticket to the relevant Work Package. Progress towards a milestone would be tracked through the ticket status. The workflow for the ticketing system is currently under design, for a target implementation date in March 2020.



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Table 1: Proposed sprint challenges, cascading e-shape's KPIS

| e-shape's Objectives (relevant to pilots) | e-shape's Target Outcome | e-shape's Key Performance Indicators (KPIs) | e-shape's Target values | Sprint 1 - mandatory challenge Sprint (1 to choose) - yellow - optional challenge Sprint (2 to choose) - grey | Sprint 2 - mandatory challenge Sprint (1 to choose) - yellow - optional challenge Sprint (2 to choose) - grey | Challenge # | Sprint challenge (high level description - draft) | Support WP |
|---|--|---|-------------------------------------|---|---|-------------|---|------------|
| O1 | Develop EO services with and for users | Number of user-oriented services designed (per pilot) (with various maturity level) | > 5 | | | 1 | Increase in the number of user-oriented services | WP2 |
| | | Variety of users / user needs targeted by the designed services (per pilot) | > 1 | | | 2 | Increase in the variety of users targeted by the designed service | |
| | On each pilot, get an efficient organization that enable required actors to design together (scientists, IT developers, user uptake specialists, business experts, users...) | Clear collaboration procedures linking relevant actors and adapted to each specific pilot context | 1 per pilot | | | 3 | Specific co-design process carried ; specifying collaboration procedures ; if not available so far. | |
| O2 | Exploit the IT capabilities and the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus), citizen observatories and any other existing hubs or platforms. | All pilots should exploit the IT capabilities and the wealth of data made available | 100% | Focus Sprint 1 | | 4 | Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus), citizen observatories and any other existing hubs or platforms. | WP3 |
| | Pilots ready for integration into "As A Service (...AAS)" IT infrastructure such as DIAS, NextGEOSS, ... | Preparedness Index (between 0 to 5) of pilot's integration towards "AAS" type of infrastructure such as DIAS, NextGEOSS, ... 0: Not ready, 5: fully compliant | Improvement of index for each pilot | | | 5 | Increase in preparedness index for integration into "As A Service (...AAS)" IT infrastructure such as DIAS, NextGEOSS, ... | |
| | Usage of the DIAS | Percentage of pilots deployed in a DIAS or in NextGEOSS | >30 % | | | 6 | Based on co-design analysis (WP2) and WP3 initial assessment outcomes, identify and prepare for outsourcing part of the processing chain to a DIAS infrastructure. | |
| | Services shall be in full compliance to the INSPIRE directive, GEO Recommendations on interoperability and GEO Data sharing and Data management principles | All provided pilots shall be in full compliance to the INSPIRE directive, GEO Recommendations on interoperability and GEO Data sharing and Data management principles | > 80% | | | 7 | Demonstrated compliance with INSPIRE; increased compliance on GEO Recommendations on interoperability and GEO Data sharing and Data management principles. | |
| O3 | User uptake of the pilots | No. of key organizations involved (non partners) | > 3 per showcase | Focus Sprint 2 | | 8 | Increase in the number of key organisations involved | WP4 |
| | User uptake of the pilots | No. of user communities involved (non partners) | > 1 per showcase | | | 9 | Increase in the number of user communities involved (non partners) | |
| | Undertake a series of capacity building activities with the aim to train users in a given sector on the integration of EO-based and in-situ data-based solutions in their workflow | No. of capacity building exercise | > 1 per showcase | | | 10 | Organisation of a series of capacity building activities with the aim to train users in a given sector on the integration of EO-based and in-situ data-based solutions | |
| O4 | Boost the sustainability potential of the pilots | Action to boost sustainability of the pilots | 1 per pilot | | | 11 | Carry an action to boost the sustainability of the pilots | WP5 |
| | Penetration of pilots in public and private markets | No. of entities/cases in which outputs of pilots are operationally integrated in user workflows | 30-40 | | | 12 | Increase in the no. of entities/cases in which outputs of pilots are operationally integrated in user workflows | |
| | Sustainable uptake and exploitation of the provided pilots in different markets | No. of sustainable pilots | 10 overall | | | 13 | Improvement in sustainable uptake and exploitation of the pilot in different markets | |

All the detailed challenges defined by the pilots are available in [Annex 1 Pilots Challenges for e-shape sprint 1](#)

4 CHALLENGES SELECTED BY THE PILOTS

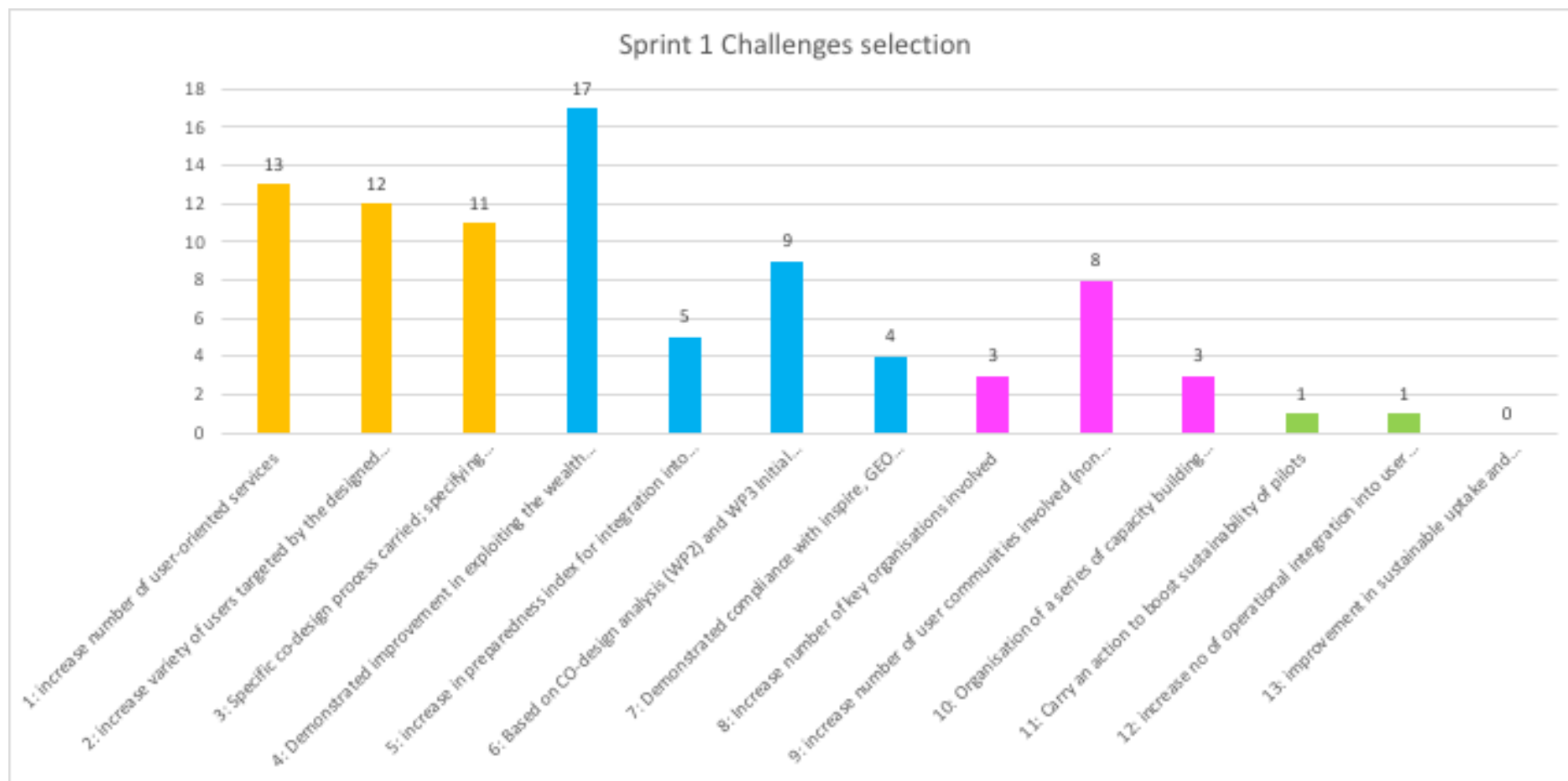


Figure 1: Distribution of the challenge selection from the different pilots. Some pilots committed to more than 3 challenges.

Legend: **Orange**: Cluster O1, related to co-design (WP2). **Blue**: Cluster O2, related to implementation (WP3). **Magenta**: Cluster O3, related to user uptake and capacity building (WP4). **Green**: Cluster O4, related to Sustainability and Upscaling (WP5).

Table 2: Mapping of the selected challenges per pilot.

| Objective | Sprint Challenge | S1 P1 | S1 P2 | S1 P3 | S1 P4 | S2 P1 | S2 P2 | S2 P3 | S3 P1 | S3 P2 | S3 P3 | S4 P1 | S4 P2 | S4 P3 | S5 P1 | S5 P2 | S5 P3 | S5 P4 | S5 P5 | S6 P1 | S6 P2 | S6 P3 | S6 P4 | S7 P1 | S7 P2 | S7 P3 | S7 P4 | S7 P5 | |
|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| O1 | #1: increase number of user-oriented services | ✓ | ✓ | | ✓ | | ✓ | | | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | | ✓ | | | | ✓ | 13 |
| | #2: increase variety of users targeted by the designed service | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | | ✓ | | | ✓ | ✓ | | ✓ | | | | | 12 |
| | #3: Specific co-design process carried; specifying collaboration procedures; if not available so far | | | | ✓ | | | ✓ | | ✓ (D) | ✓ | | | | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | | ✓ | | | ✓ | 11 |
| O2 | #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, Nextgeoss, EOOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ (D) | ✓ | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | 17 |
| | #5: increase in preparedness index for integration into "As A Service (...AAS)" IT infrastructure such as DIAS, NExtGEOSS | | | | ✓ | | | ✓ | | ✓ (A) | | ✓ | | | | | | | | | | | | | ✓ | | | | 5 |
| | #6: Based on CO-design analysis (WP2) and WP3 Initial assessment outcomes, identify and prepare for outsourcing part of processing chain to a DIAS infrastructure | ✓ | | | | | | | | ✓ (A) | | | | | | ✓ | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | 9 |

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5 MILESTONES FOR SPRINT 1

The [Annex 2 Sprint 1 Timeline on 21 January 2020](#) details all milestones on a month basis. This information is further synthesized into this timeline.

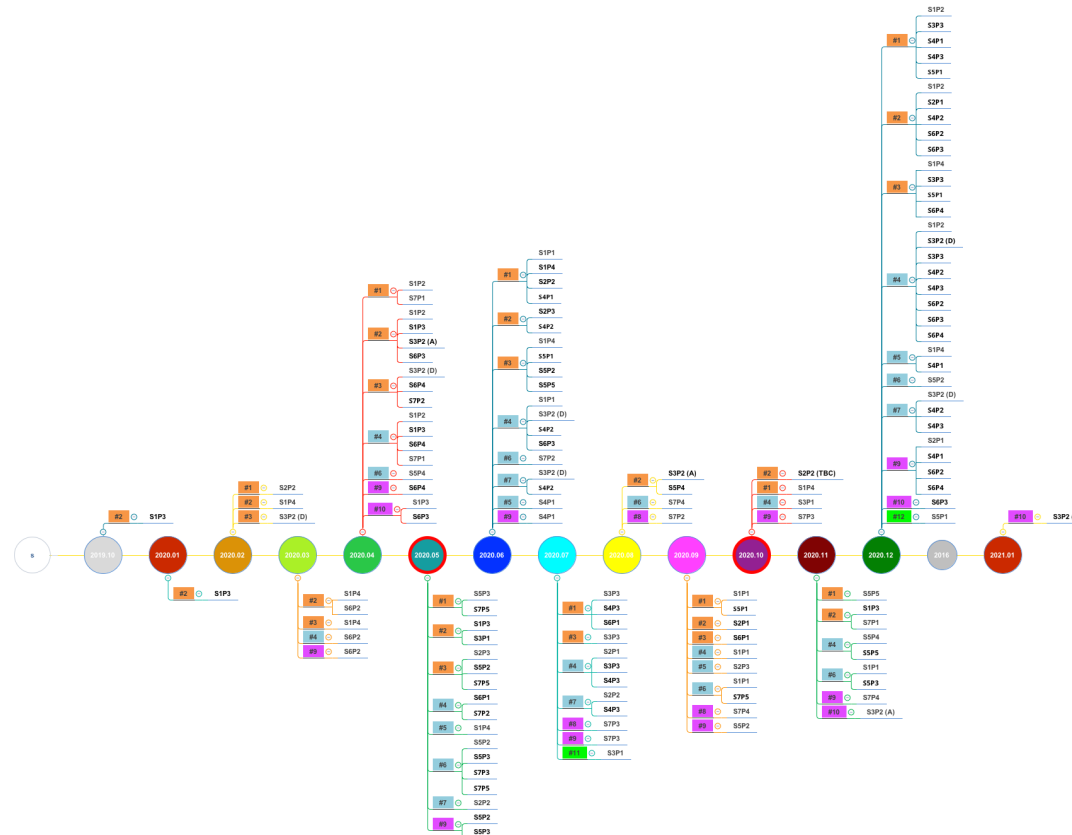


Figure 2: Sprint timeline. Each color represents the linkage to an e-shape Work Package. The timeline therefore provides a workplan for each Work Package's engagement.

Legend: **Orange**: Cluster O1, related to co-design (WP2). **Blue**: Cluster O2, related to implementation (WP3). **Magenta**: Cluster O3, related to user uptake and capacity building (WP4). **Green**: Cluster O4, related to Sustainability and Upscaling (WP5).



6 ANNEX 1 PILOTS CHALLENGES FOR E-SHAPE SPRINT 1

- Expectations from Pilots teams:

Each pilot team is requested to:

- Pick their challenges;
- Formulate their challenges in half page max; showing:
 - Initial State;
 - Final State;
 - Means of evaluation;
 - Expected outcomes: Final material to be produced (prototype; demo; video; poster...)
- Propose 2 main milestones.

6.1 Summary dashboard of Challenges selected

| Objective | Target Outcome | Key Performance Indicators (KPIs) | Sprint Challenge | S1 P1 | S1 P2 | S1 P3 | S1 P4 | S2 P1 | S2 P2 | S2 P3 | S3 P1 | S3 P2 | S3 P3 | S4 P1 | S4 P2 | S4 P3 | S5 P1 | S5 P2 | S5 P3 | S5 P4 | S5 P5 | S6 P1 | S6 P2 | S6 P3 | S6 P4 | S7 P1 | S7 P2 | S7 P3 | S7 P4 | S7 P5 | |
|-----------|---|---|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| O1 | Develop EO services with and for users | Number of user-oriented services designed (per pilot) (with various maturity level) | #1: increase number of user-oriented services | ✓ | ✓ | | ✓ | | ✓ | | | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ | | | | | ✓ | 13 |
| | | Variety of users / user needs targeted by the designed services (per pilot) | #2: increase variety of users targeted by the designed service | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | | ✓ | | | ✓ | ✓ | | ✓ | | | | | 12 |
| | On each pilot, get an efficient organization that enable required actors to design together (scientists, IT developers, user uptake | Clear collaboration procedures linking relevant actors and | #3: Specific co-design process carried; specifying collaboration procedures; if not available so far | | | | ✓ | | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | ✓ | | | | ✓ | 11 |

Feb 03, 2020 16

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6.2 Detailed challenges and milestones per Showcase and Pilot, including Initial State, Final State, Means of evaluation, outcomes and milestones per challenge

6.2.1 S1P1 GEOGLAM

In S1-P1(GEOGLAM), Copernicus data will be used in combination with ancillary datasets (e.g. crop type, soil information, and weather data) to provide detailed crop calendars. Current EO-methods are mainly based on the definition of the start, peak and end of the growing season from the NDVI-profile, and these services will be extended to other parameters such as planting and harvesting date. The first sprint will therefore focus on different aspects:

6.2.1.1 Challenge #1: increase number of user-oriented services

Development of a new EO-based service (challenge 1).

- **Initial state:** EO-based crop calendar outputs are Start of Season, Peak of Season and End of Season
- **Final state:** new metrics such as ploughing date, planting date, harvest. This will be depending on the field data that will be obtained in the other three pilots of SC1.
- **Means of evaluation:** accuracy of the extraction of the new metrics from time series.
- **Final material to be produced:** a prototype of the code will be ready at the end of Sprint 1, that can be deployed on different platforms.
- **Milestones:** (1) Calibration of methodology based on historical data - End of June; (2) Validation of methodology based on expected 2020 data - End of September.

6.2.1.2 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms

Focusing on how the integration of additional data sources can improve these methods, e.g. with AgroStac; (Challenge 4)

- **Initial state:** current crop calendar methods are purely EO-based, i.e. the metrics are extracted directly from the seasonal NDVI profile.
- **Final state:** other information sources will be included as well. These include, but are not limited to, crop type, meteorological information and Sentinel 1 data. Based on this additional information, the improvements in the estimated crop calendar metrics will be evaluated. These include the already operational metrics such as Start of Season, as the newly developed metrics from the previous challenge.
- **Means of evaluation:** comparison of the accuracy of the crop calendar metrics extracted from EO time series, with and without ancillary information available.
- **Final material:** A prototype of the methodology will be ready at the end of sprint 1, which takes full advantage of the different datasets available on the platforms. A report will be written on which ancillary data is beneficial/critical for which crop calendar metric.
- **Milestones:** (1) Pure meteo-based calendars - End of June; (2) Integrated methodology with EO + ancillary information sources - End of September.

6.2.1.3 Challenge #6: Based on CO-design analysis (WP2) and WP3 Initial assessment outcomes, identify and prepare for outsourcing part of processing chain to a DIAS infrastructure

Evaluation of the performance of this workflow on different platforms (different DIAS platforms, NextGEOSS, TEP,...), to identify potential bottlenecks for the second sprint. (Challenge 6)

- **Initial state:** Development and current deployment of these methods currently happen on local servers. The methodologies developed in the first two challenges will be deployed on several platforms, to evaluate the performance of the different platforms, ease of implementation, accessibility to external data sources, etc.
- **Final state:** Delivery of the prototypes of the crop calendar methodologies that can be deployed on an array of platforms with minimal effort.
- **Means of evaluation:** Performance of the different platforms will be evaluated on: (i) available information, (ii) timeliness of this availability for NRT applications, (iii) pricing, (iv) ease of deployment of the code, and (v) processing efficiency.
- **Final material:** Report containing the results of the comparison, highlighting which platforms are suitable for the operational deployment of the crop calendar methodologies, including potential bottlenecks and recommendations.
- **Milestones:** (1) Full implementation on 1 platform (probably NextGEOSS) - End of September; (2) translation of workflow to other platforms - End of November.

6.2.2 S1P2 EU-CAP_Support

In S1-P2 (EU-CAP), Copernicus data will be used in combination with ancillary datasets (e.g. soil maps, weather data, LPIS, crop calendars) to extract phenological stages and estimate crop yield for cotton at three different levels, at national, at regional and at local scale. The aforementioned products have been identified as critical services missing from the gaisense solution, on which this pilot builds upon. Additionally, advanced EO techniques and machine learning pipelines will be incorporated to enhance the existing services of the gaisense platform. The first sprint will focus on the following:

6.2.2.1 Challenge #1: increase number of user-oriented services

Development of new services for the gaisense solution (Challenge 1),

- **Initial state:** The gaisense *remote*, the remote sensing component of the platform, collects and processes Sentinel-2 data. The *remote* component provides: a complete picture for the cultivation (continuous monitoring), intra-parcel variability, crop classification, outlier detection, correlation with in-situ measurements. Based on the *remote* component, but also the *farm*(calendars), *field* (in-situ measurements) and *eye* (agricultural consultants) components, the gaisense solution provides solutions with respect to irrigation, health, production and pest management.
- **Final state:** Two key services, phenology extraction and yield estimation, have been identified, through an elaborate user requirements collection, as missing from the current state of gaisense. In this first sprint, the pilot will focus on the development of a first working prototype for phenology extraction service, at the national and regional scales (local scale will follow in later sprints). The phenology extraction service will provide metrics, such as rate of development and biomass of the crop, but also different phenological stages like germination, vegetative, reproductive and ripening Phase. Different Copernicus datasets and data from gaisense meteo stations will be used.
- **Means of evaluation:** Statistical accuracy results derived from the phenology extraction method.
 - Evaluation results based on field observations.
 - Based on EO-assisted photo-interpretation.
- **Final material:** A working, fully automated, first prototype for the phenology extraction pipeline, at the national and regional scales.

6.2.2.2 Challenge #2: increase variety of users targeted by the designed service

Collaboration with the Institute of Industrial and Forage Crops (Thessaly, Greece); (Challenge 2)

- **Initial state:** Currently the co-designing processes are carried out with Neupublic and GAIA EPICHEIREIN.
- **Final state:** Drafted cooperation contract ensuring the co-creation of the service with another beneficiary. Since the Institute of Industrial and Forage Crops in Greece is a key user, as research institute cooperating with many farmer cooperatives and with well-established expertise in agricultural science, will co-design and validate the produced methods of the pilot. Additionally, they will provide key data for the implementation of the described services, such as soil maps and recorded yields at the farm level.
- **Means of evaluation:** Feedback from the two end-users (GAIA EPICHEIREIN and Institute of Industrial and Forage Crops) on the delivered services in terms of utilisation, user-friendliness and efficiency. Validation of produced products via field visits and data collected by the Institute of Industrial and Forage Crops.
- **Final material:** Report on the co-design, co-creation and validation processes with the collaborating organizations.

6.2.2.3 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms

Integrating ancillary data from additional data sources of GEOS platforms (Challenge 4)

- **Initial state:** Exploring the relevant existing platforms such as the GAIASENSE smart farming system in terms of content, architecture, spatial and temporal resolution, interoperability. Current crop growth stages are delivered exclusively through the seasonal NDVI profile (Sentinel-2).
- **Final state:** More information sources will be included to provide a variety of data. Integration of the various EO and meteorological datasets.
 - a. Use and extend and in-house (NOA) umbrella API that connects to multiple Sentinel Hubs (DIAS, Open Access Hub, Hellenic mirror site) acting as a single access point for all Copernicus missions' data.
 - b. GEO-CRADLE database: Data libraries provided by Regional Data Hub (RDH) and delivered from "Improved Food Security – Water Extremes Management (IFS)" will be used. The soil spectral libraries of RDH will be explored, in cooperation with partner I-BEC, to produce soil maps, through fusion with Sentinel-2 data
- **Means of evaluation:** For 1. Showcase with appropriate metrics the enhancement in a) data availability, b) latency and c) download speed when using the umbrella API versus the Copernicus Open Access Hub. For 2. Enriched system with more datasets.
- **Final material:** A prototype of the methodology will be generated at the end of sprint 1, utilizing to some extent the aforementioned datasets.

Milestones: MILESTONE 1: Sprint interim assessment: M11 Apr 2020. Progress in parallel for the two services of phenology extraction (towards working prototype) and yield estimation (towards defining a complete methodological design), final specifications following the co-designers' requirements. MILESTONE 2: End Sprint 1: M20 Dec 2020. 1st working prototype of phenology extraction in Level-1 and Level-2 (that is national and regional scale) and completed design for yield estimation in Level-1 and Level-2 (its implementation to follow in Sprint 2).

6.2.3 S1P3 Vegetation-Index Crop-Insurance in Ethiopia

6.2.3.1 Challenge #2: increase variety of users targeted by the designed service

Transition from insurance for individual farmers to insurance for cooperatives and unions.

- **Initial State (based on WP3 assessment):** Till date, the current users were individual farmers that buy insurance from sales teams organized and put in the field by an insurance company.
- **Final state:** The larger list of users in 20 month's time will be 'groups of farmers' that are insured through aggregators, being a series of cooperatives and unions at Bekele level in selected Woredas located in specific Agricultural Commercialization Clusters (ACC's). The selected aggregators are at present being targeted through the ICIP project regarding package deals of: (i) credit, (ii) extension and (iii) Vegetation Index Crop Insurance (VICI). A sequence of training sessions of DA's (Development Agents) in specifics of VICI has just been completed and will now be followed by training of Sales Agents.
- **Means of evaluation:** JICA newsletters (see: <https://www.facebook.com/ICIP.Ethiopia>).
- **Final material to be produced (prototype; demo; video; poster...):**
 - The fact that VICI is the chosen method as national crop insurance method covering impacts by droughts.
 - A series (monthly sequence) of progress reports by ICIP on training, sales, and pay-outs (see the specific Facebook pages).
- **Two main milestones to be achieved [through the old GIACIS and new JICA partnerships]:**
 - The fact that VICI is the chosen method as national crop insurance method covering impacts by droughts (through JICA), and that contracts (collaboration) with the old GIACIS network is in place [*already achieved following specific ITC-JICA exchanges*]. *Confirmed by ICIP Newsletter No. 08 (October 2019).*
 - The start of the 2020 (actual) sales season of VICI in the designated ACC's, i.e. through ICIP in the Oromia region, and possibly also elsewhere in the Amhara region through OIC and Kifiya. *Sales season is scheduled from end Jan.2020 to end Apr.2020.*
 - The start of an explorative study concerning 'if' VICI can be fully coupled to credit schemes and to specific agronomic advice (extension aspects), plus its added value(s). *Such work is not yet scheduled; top-priority will be work that follows the expected alignment of older Spot-VGT + Proba-V NDVI data with the expected S3-SYN NDVI data.*

6.2.3.2 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms

Transition from Proba-V based to Sentinel-3 based monitoring

- **Initial State (based on WP3 assessment):** PROBA-V data captured through the EUMETCAST system were processed by mandated users in Ethiopia (= NMA) into VICI NDVI-Index data that were in-turn provided to key GIACIS-partners for operational insurance purposes.
- **Final state:** Continuation of the preparation of VICI NDVI-Index data series (starting early 2020), but now through processing Sentinel-3 Synergy-V10 data, as made available through EUMETCAST and as originally processed through the COPERNICUS services of ESA.
Note: This urgently requires an early release of properly calibrated CGLOPS NDVI V3-data; till date only beta-releases of the required product have been provided. These data have as yet no use for VICI.

- **Means of evaluation:**

- Properly calibrated, geo-referenced, and composited Sentinel-3 Synergy-V10 data are provided in a fully operational way through COPERNICUS (of ESA) by April 2020 latest.
- The provided Sentinel-3 Synergy-V10 data are added to our repositories and pre-processed to provide a continuous timeseries to the 1998-2019 COPERNICUS_VGT_PROBA_0.1 imagery as provided to us by VITO early Oct.2019 (data release candidate no.3 (rc3)).
- The NDVI-data are on a dekad-by dekad basis processed into the required VICI-data.
- The 1998-2019 NDVI (rc3) data are used to re-calibrate VICI and to re-set the trigger and exit thresholds that specify drought situations by Crop Production System Zone.

- **Final material to be produced (prototype; demo; video; poster...):** VICI data, based on Sentinel-3 Synergy-V10 imagery, are delivered on a dekad-basis to relevant users. This includes the means to download, pre-process, and interpret the NDVI data.

- **Two main milestones to be achieved:**

- Consistency between data of the old (PROBA-V) and new (Sentinel-3 Synergy-V10) platforms is assessed and documented. *This must be completed by April 2020.*
- Re-calibrated VICI trigger and exit-thresholds, denoting drought occurrence by CPS-Zone, are made available. *This must be completed by April 2020.*
- VICI product, based on Sentinel-3 Synergy-V10 data is delivered to users. *This must have started by April 2020.*

6.2.3.3 Challenge #10: Organisation of a series of capacity building activities with the aim to train users in a given sector on the integration of EO-based and in-situ data-based solutions

- **Initial State (based on WP3 assessment):**

- The NDVI-Index preparation which includes the following steps: detailed guidelines on logic, analytical steps and outputs regarding importing, cleaning, adjustments, stratifying, seasons specification, etc. up to percentile-thresholds extraction, is currently conducted at ITC.
- The NDVI-Index use, which includes the following steps: Obtaining, cleaning, and incorporating prepared tabular data into the EUMETCast/GeoNetcast/ILWIS software for automation of procedures, is currently conducted by ITC.

- **Final state:** Mekelle University staff are able to prepare the NDVI index and use the NDVI index with minimal support from ITC.

- **Means of evaluation:**

- Training conducted on NDVI index preparation, training evaluated by participants.
- Training conducted on use of NDVI index, training evaluated by participants.

- **Final material to be produced (prototype; demo; video; poster...):**

- VICI Producers Manual (know-how), with in-house prepared data processing routines (IDL/ENVI-code).
- Upgrades of all automated NDVI processing routines (GeoNetcast code).

- **Two main milestones to be achieved:**

- Training in Mekelle on NDVI-Index preparation. *This must start by Feb.2020 and must be completed by April 2020.*
- Training in Mekelle on the operational Use of the NDVI-Index. *This must start by April/May 2020.*

6.2.4 S1P4 Agro-industry

The starting point for Pilot 4 is the existing WatchItGrow (WIG) platform, which provides EO-based information to the potato growers and -industry. In the first sprint, the focus will be on extending these services to other crops and users. Key aspect will be to properly understand the specific needs of these users, and the development of new services that correspond to those different needs. In this regard, a co-design approach will be essential, where the new services will be developed in close collaboration with a select number of new potential users. The different tasks for the first sprint can be categorized as following:

6.2.4.1 Challenge #1: increase number of user-oriented services

Based on the outcomes of the co-design strategy, the identified new needs will be implemented in new services to be incorporated in the WIG platform (challenge 1)

- **Initial state:** Current services are focused on the potato growers (e.g. fertilization advice, yield prediction...).
- **Final state:** The new user needs identified in challenge 2, will be translated into new services through a co-design approach (challenge 3). At the end of sprint 1, at least one extra service will be added. If needed, existing services will be modified to the new user groups (e.g. fertilization advice).
- **Means of evaluation:** -
- **Final material:** at least one additional service added to the WIG platform, which will not be focused on the potato industry.
- **Milestones:**
 - June 2020: first prototype of new service, to be evaluated by new users.
 - October 2020: final version of new service, to be implemented in WIG as operational service.

6.2.4.2 Challenge #2: increase variety of users targeted by the designed service

Set up a close collaboration with a number of new potential users of the WIG monitoring platform (challenge 2), ensuring their involvement throughout the whole development phase

- **Initial state:** Currently, only the potato processing industry and potato farmers are involved.
- **Final state:** Ensure the involvement of other players in the potato value chain and or other industries, both within Belgium as from other European countries
- **Means of evaluation:** Number of potential users/co design, number of co-design meetings to ensure their commitment to the project for at least the duration of the sprint...
- **Final material;** report on co-design meeting with new potential users.
- **Milestones:** February 2020: Overview of interested new potential users; March 2020: Final list of new users to be included in the co-design approach.

6.2.4.3 Challenge #3: Specific co-design process carried; specifying collaboration procedures; if not available so far

Set up a clear collaboration strategy, depicting how the co-design process will be organized to ensure that the needs of these new users are properly understood and incorporated (challenge 3)

- **Initial state:** N/D
- **Final state:** Clear strategy on how to translate the new user's needs into new services. An iterative approach will be used, with feedback loops to further optimize the services to the needs.
- **Means of evaluation:** the co-design strategy will be evaluated throughout the actual co-design process to detect bottlenecks and issues. The results of this evaluation will be formulated in an evaluation report.
- **Final material:** at the beginning of the sprint, the co-design strategy will be specified in a concept note. At the end of the sprint, an evaluation report will be written on the (dis)advantages of the co-design strategy for the development of the new services.
- **Milestones:** March 2020: first meeting with new users to define user needs; June 2020: First evaluation of developed services by users; December 2020: Co-design evaluation report.

6.2.4.4 Challenge #5: Increase in preparedness index for integration into AAS IT infrastructure such as DIAS, NextGEOSS, etc.

In addition to the development of the new service as stipulated in the previous challenges, there will also be a focus on integrating components of the existing services on different platforms. Currently, all services are run in-house as the current focus is on Belgian end-users. However, with the foreseen expansion to other areas, a more agile set-up is needed, for which a transfer to online platforms is needed (challenge 5).

- **Initial state:** Current services are run in-house, including sentinel data download and pre-processing. Preparedness Index is thus 0.
- **Final state:** current services and workflow components, especially those that will be needed for the new services foreseen in challenge 1, will be transferred to one of the mentioned platforms. Preparedness Index: 3 (prototype in an operational environment).
- **Means of evaluation:** -
- **Final material:** Operational services from WIG running on one of the platforms.
- **Milestones:**
 - May 2020: identification of the platform to be used (DIAS, NextGEOSS,...).
 - December 2020: services to be transferred are operational on the platform.

6.2.5 S2P1 EO-based surveillance of Mercury pollution

6.2.5.1 Challenge #2: Increase in the variety of users targeted by the designed service

Publication of chemical transport model outputs in a data hub; involvement of other user communities to increase the number of user oriented service provided to a number of final users. ECHMERIT Hg uses as data input: ECMWF (climate), pTomcat (bromine fields), Mozart (O₃+OH fields), AMAP (Hg emissions).

- **Initial state:** Draft UI.
- **Final state:** Running UI developed according to Parties and NGOs feedbacks.
- **Means of evaluation:** Number of Parties and NGOs involved.

- **Milestone:** Design and deploy a co-designed application in support of the effectiveness evaluation of the Convention, 1st revision SEPTEMBER 2020, Final revision DECEMBER 2020.

6.2.5.2 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus), citizen observatories and any other existing hubs or platforms

Chemical transport model outputs will serve as input to build a statistical emulator exploiting the wealth of data and foster IT capabilities.

- **Initial state:** Chemical Transport Model (CTM) outputs not published.
- **Final state:** CTM outputs published.
- **Means of evaluation:** Number of scenarios (layers) published.
- **Milestone:** Start publishing CTM outputs through the GEOSS Platform and demonstrate wealth of data use, JULY 2020.

6.2.5.3 Challenge #9: increase number of user communities involved (non-partners)

Up-to now only ECHMERIT-Hg, maintained at CNR-IIA is the Chemical Transport Model involved. The objective is to involve other user communities (non-partners) that run models and develop Hg emission inventories.

- **Initial state:** ECHMERIT-Hg CTM used to produce outputs used for assessments.
- **Final state:** Multi-model and multi-database runs to produce outputs.
- **Means of evaluation:** Number of models and Hg emission databases adopted.
- **Milestone:** Run of models (developed by different communities) by adopting different databases (developed by different communities), DECEMBER 2020.

6.2.6 S2P2 EO-based surveillance of POPs pollution

6.2.6.1 Challenge #1: Increase number of user-oriented services

- **Initial state:** (based on WP3 assessment).
GMP Datawarehouse is publicly available for GMP 2 (www.pops-gmp.org). It consists of dataset collected during 2nd data collection campaign of Global Monitoring Plan.
- **Final state:** Expand the dataset of harmonisation of data - GMP 1 + GMP 2 + new data for GMP 3. New data visualisation tools for regional summaries. Adapt web application for higher amounts of data (performance, efficiency, smart algorithms).
- **Means of evaluation:** ROG members verify and use data to create Regional and global reports. Final material to be produced: Database of harmonised data, Web application with online visualizations.
- **Milestones:** Data harmonisation of GMP1 and GMP2 - February 2020. New data for GMP3 - June 2020.

6.2.6.2 Challenge #2: Increase variety of users targeted by the designed service

- **Initial state:** GMP Data Warehouse is used by data providers of regional organisational groups (ROGs) involved in Global Monitoring Plan, ROG members, secretariat of Stockholm Convention, experts and broad public. Not all of ROG data providers use GMP DWH to report their data and not all ROG members use GMP DWH to create their regional reports.

- **Final state:** Increase involvement of individual user groups, mostly ROG members to use standardised outputs of GMP DWH to prepare regional reports. Link data to GEOSS to increase data visibility and bring new users of collected data.
- **Means of evaluation:** Feedback of users - mostly ROG members when they prepare regional reports. At least 3 of 5 ROGs should use standardised products of the GMP DWH.
- **Milestones:** October 2020

6.2.6.3 Challenge #7: Demonstrated compliance with inspire, GEO recommendations interoperability and geo data sharing principles

- **Initial state:** No compliance with INSPIRE standards, poor visibility of GMP data in GEOSS.
- **Final state:** Data collected within Global Monitoring Plan campaigns are linked to GEOSS.
- **Means of evaluation:** Data are described by standardised metadata sets and are discoverable via GEOSS portal.
- **Milestone:** Prototype - May 2020, GMP 2 DWH linked to GEOSS - July 2020.

6.2.7 S2P3 EO-based pollution-health risks profiling in the urban environment

6.2.7.1 Challenge #2: Increase in the variety of users targeted by the designed service

- **Initial state:** Targeting more local-national stakeholders.
- **Final state:** We want to actively engage with UN (IGO) users, and also at the lower level with citizens themselves (associations, NGOs).
- **Means of evaluation:** Widen the types of service users.
- **Milestone:** initial contacts with IGOs and NGO level users (June 2020).

6.2.7.2 Challenge #3: Specific co-design process carries; specifying collaboration procedures; if not available so far

- **Initial state:** Preliminary discussions with some stakeholders in previous projects / identifying and beginning communications with other users.
- **Final state:** Designing a fit-for-purpose pilot service that different users/user communities were involved with in the design process.
- **Means of evaluation:** Receiving feedback from the users on how well the final outcome of the service addresses the needs identified in co-design.
- **Milestone:** Clearly identified needs by each type of user involved in the pilot (May 2020).

6.2.7.3 Challenge #5: Increase in preparedness index for integration into AAS IT infrastructure such as DIAS, NextGEOSS, etc.

- **Initial state:** Building the concept of pilot services, the details of which will point us towards identifying the correct platform (wanting input from e-shape to help identify platform, both for technical and commercial purposes).
- **Final state:** Find/select an appropriate IT infrastructure/platform to host the pilot service.
- **Means of evaluation:** Operationability/usability of the final service; users' engagement/feedback with service.
- **Milestones:** Platform selection (September 2020).

6.2.8 S3P1 NextSENSE Solar Energy nowcasting and short-term forecasting system

- **Inputs from Stelios Kazadzis**

6.2.8.1 Challenge #2: Increase in the variety of users targeted by the designed service.

- **Initial state:** SENSE solar nowcasting, was developed for Greece, Egypt and the Adriatic Sea through the H2020- Geo-Cradle project.
- **Final state:** During sprint one, upgraded computing resources to an extent that SENSE is able to run for Europe and North Africa (1.5 million simulations for photovoltaic support every 15 minutes). Addition of new products targeting new users.
- **Means of evaluation:** Real time web service evaluation. Input from new users.
- **Milestone:** Running web service. Report on new users inputs (May 2020).

6.2.8.2 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus), citizen observatories and any other existing hubs or platforms.

- **Initial state:** SENSE implementations disseminated and made open access through the Geo-Cradle's regional datahub.
- **Final state:** During sprint one nextSENSE services and outputs to be accessible and fully exploitable through the GEO-Cradle related datahub.
- **Means of evaluation:** Internal evaluation of web service. Input from existing linked end-users.
- **Milestone:** Online services and databases in terms of static and dynamic solar energy applications exploiting the nextSENSE and Copernicus capabilities (October 2020).

6.2.8.3 Challenge #11: Carry an action to boost the sustainability of the pilots.

- **Initial state:** Use of MSG satellite products for cloud properties.
- **Final state:** Demonstration of the use of INSAT3D satellite. Expansion to Asia.
- **Means of evaluation:** Peer review. Asian end user feedback.
- **Milestone:** Scientific paper. Report on the Asian end user involvement (July 2020). *Update 22.01.2020: Paper demonstrating the INSAT3D use, combined with SENSE system and Copernicus data for energy nowcasting in India was published. (<https://www.mdpi.com/2072-4292/12/2/254>).*

6.2.9 S3P2 High PV penetration in urban area ARMINES part

6.2.9.1 Challenge #5: Pilots ready for integration in AAS IT infrastructure such as DIAS, NextGEOSS (Focus Sprint 1)

Review of Challenges: 19 déc. 2019 Lionel Menard and Philippe Blanc: Updated challenges based on Skype discussion on 19 déc. 2019 .

- **Initial state:** Use of algorithms, codes, scripts and services in production on Terradue/EGI NextGEOSS platform as the basis for the development of the pilot. Preparedness index as 3 (from 0 to 5).
- **Final state:** Initial remote process (WPS) are accessible for early testing on a DIAS.
- **Means of evaluation:** Get results from a machine-to-machine remote access (WPS) deployed on the DIAS.
- **Milestones:**

- M11 - First e-shape review meeting: A clear understanding of technical and financial DIAS's offers including specifications, performances, constraints and limitations to support and hosting the pilot.
- M15 - Initial remote process (WPS) is successfully tested on a DIAS.

6.2.9.2 Challenge #6: Usage of the DIAS (Focus Sprint 1)

Review of Challenges 19 déc. 2019 Lionel Menard and Philippe Blanc: Updated challenges based on Skype discussion on 19 déc. 2019 .

- **Initial state:** DIAS's offers are identified in addition and support from WP2 (Co-design analysis) and WP3 (Initial assessment). This will help to define the proper strategy for outsourcing the process chain on the DIAS.
- **Final state:** Initial elements of the prototype including additional key needed components (Storage, availability, needed libraries, Web-based client support including JupyterHub, Lab, Notebook,...) from the DIAS offers are in place for initial testing.
- **Means of evaluation:** Get results from initial WPS based on access from Jupyter Web client deployed on the DIAS.
- **Milestones:**
 - M20 - End of sprint 1: Initial testing of DIAS including WPS, and additional needed components are successfully tested.

6.2.9.3 Challenge #10 Undertake a series of Capacity building ... workflow (Focus Sprint 1)

Review of Challenges: 19 déc. 2019 Lionel Menard and Philippe Blanc: Updated challenges based on Skype discussion on 19 déc. 2019 .

- **Initial state:** Use of algorithms, codes, scripts and services in production on DIAS as the basis for the demonstration of the e-shape S3P2 approach in the hands-on session during the master-class python session of the annual Solar Training proposed by Transvalor and MINES ParisTech.
- **Final state:** Tailored-made process based on the initial script provided at the beginning of the hands-on session are discussed by the attendees and the organizer. Feedback are provided for improvement.
- **Means of evaluation:** Feedback from the master-class python session of the annual Solar Training proposed by Transvalor and MINES ParisTech.
- **Milestones:**
 - M18 - Meeting of the Solar Training organisation team. The team will evaluate the readiness of the pilot development to be presented at the 9th Solar Training. The challenge #10 depends of challenge #5 and #6 completion.
 - M21 - Organisation of the 9th Solar Training edition organized by Transvalor and MINES ParisTech in January 2021 including the master-class python session supporting the S3P2.

6.2.10 S3P2 High PV penetration in urban area DLR part:

- Inputs from Marion Schroedter-Homscheidt (28 nov. 2019)

We reviewed your KPIs and found several of them as not being appropriate to our pilot (marked as N/A), others becoming active only later (marked as N/A yet) and 3 are left which are our focus now in Sprint 1. Please find a short description what that means for us in detail.

O1,# 1, increase number of user-oriented services .

N/A.

O1,# 2, increase variety of users.

N/A yet.

6.2.10.1 Challenge #3: O1,#3, co-design process carried

This is the ongoing focus between DLR-DFD providing Earth Observation data and DLR-VE Energy System Analysis department using the new datasets as users. Including new datasets into existing energy system analysis models is the major plan for the sprint 1.

- **Initial state:** Existing FlexiGIS at DLR-VE, satellite and airborne raw data at DLR-DFD.
- **Final state:** Raw data processed at DLR-DFD and provided to DLR-VE. Results on applicability to implement in FlexiGIS, implementation done if applicable.
- **Means of evaluation:** Prototype.

Milestones:

- M1: Data delivery to DLR-VE in Feb 2020.
- M2: First data included at DLR-VE in Apr 2020.

6.2.10.2 Challenge #4: O2,#4 Demonstrated improvement exploiting the wealth of data made available through DIAS, GEOSS platform, Nextgeoss ... and other existing hubs or platforms

Improve exploitation of UrbanTep (e.g. use of World Settlement Footprint layers, investigate the possibility of implementing pilot related views/scopes on U-TEP).

- **Initial state:** UrbanTep is available.
- **Final state:** Experience available if pilot related views/scopes can be implemented in U-TEP, if yes, a prototype is available.
- **Means of evaluation:** Prototype or Report if not possible.
- **Milestones:**
 - M1: Concept ready in June 2020.
 - M2: Prototype or report ready in Dec 2020.

O2,#5 preparedness for integration into ... DIAS, NExtGEOSS.

N/A.

O2,#6 outsourcing part of processing chain to DIAS infrastructure.

N/A.

6.2.10.3 Challenge #7: O2, #7 demonstrated compliance with inspire, GEO recommendations interoperability and geo data sharing principles

For the World Settlement Footprint layers we will analyze the possibilities how to improve the compliance with inspire and/or other relevant geo data sharing standards.

- **Initial state:** World Settlement Footprint layers available.
- **Final state:** Experience available if compliance with INSPIRE or other data sharing standards can be improved.
- **Means of evaluation:** Report.
- **Milestones:**

- M1: Concept ready in June 2020
- M2: Report ready in Dec 2020

6.2.11 S3P3 Merging offshore wind products:

- Inputs from Ioanna Karagali and Merete Badger. We aim to include more KPIs in the next assessment.

6.2.11.1 Challenge #1: Increase number of user-oriented services designed

- **Initial state:** Currently basic wind resource maps from EO data are available for offshore areas. The DTU Wind Energy portal to disseminate these resource maps is on a development state.
- **Final state:** Enhanced wind resource maps to be available from EO data, with new features such as updated information on temporal sampling, number of parameters provided and data downloading.
- **Final material:** Visual maps and files available for downloading.

6.2.11.2 Challenge #3: Clear collaboration procedures linking relevant actors and adapted to each specific pilot context

- **Initial state:** Currently there is basic collaboration between scientists that develop the existing EO wind resource products and the IT specialists that disseminate them on the webpage under development. Collaboration with business experts and final users is limited.
- **Final state:** Maximize the communication and collaboration procedures between scientists and IT developers in order to achieve maximum efficiency in the production, distribution and maintenance of the offered services.
- **Final material:** Workflows on the processing and distribution of the final products.

6.2.11.3 Challenge #4: All pilots should exploit the IT capabilities and the wealth of data made available

- **Initial state:** Currently the existing services use parts of EO data available with specific bottlenecks on processing chains.
- **Final state:** Simplify processing of data and enhance types of data used to derive the final products.
- **Final material:** Webpage with increased functionalities and frequent updates of derived products.
- **Milestones:**
 - Enhance existing services with increased functionality features and render them more visible to the public/users (expected by July 2020).
 - Develop and validate a unified wind resource product to also be made available as a new feature in the same centralized DTU Wind Energy webpage as the other services (initial development by December 2020).

6.2.12 S4P1 mySPACE

- Input from Ghada El Serafy and Anna Spinoso on behalf of S4P1 5 déc. 2019.

6.2.12.1 Challenge #5: increase in preparedness index for integration into "As A Service (...AAS)" IT infrastructure such as DIAS, NExtGEOSS

- **Initial State:** Building on the H2020 Ecopotential project achievements, mySPACE will extend the approach adopted to quantify changes in a larger ensemble of sites covering different biogeographic regions. At the moment, several services (e.g. Delft 3D, HydroPeriod) and algorithms

(e.g. Automatic inundation mapping from Sentinel2 data, DINEOF) exist, all of them with a different maturity level.

- **Final state:** Increase the preparedness index of the advanced open access algorithms (e.g. for hydroperiod calculation and services) and, as a result of Sprint 1, to have products ready to be deployed into infrastructure such as DIAS.
- **Means of evaluation:** Report on the relevant processing procedures
- **Final material to be produced (prototype; demo; video; poster...):** Advanced open access algorithms.

6.2.12.2 Challenge #9: increase number of user communities involved (non-partners)

- **Initial States:** The awareness of e-shape and myEcosystem to PA/site managers and stakeholders is still limited.
- **Final state:** The awareness will be increased by reaching out to the above mentioned users and the main users, researchers. The use of EO data to monitor relations between drivers of changes and the ecosystem state will be strengthened. The main output of Sprint 1 will be to prioritize the activities together with the increased number of users (non-partners).
- **Means of evaluation:** Users' feedback to identify ways forward in the process and possible adjustments
- **Final material to be produced (prototype; demo; video; poster...):** Dissemination material such as leaflets or newsletter

6.2.12.3 Challenge #1: Increase number of user-oriented services designed

- **Initial State:** Provided services are currently matching the needs of current users. We anticipate indeed that by increasing the number of involved communities, a series of new services will be required by PA/ site managers and other users.
- **Final state:** A series of service tailored to user needs will be co-designed with users and provided similar to inundation maps for the Kerkini Lake and the hydroperiod estimation for the Lake and surrounding wetlands.
- **Means of evaluation:** Users' feedback on the provided services.
- **Final material to be produced (prototype; demo; video; poster...):** Easily accessible and user-friendly maps and files.

2 main milestones:

- Milestone 1: Service Preparedness for DIAS integration (Dec 2020).
- Milestone 2: Clearly identification of user's needs (Dec 2020).

Indicate relevant KPI:

- KPI1: Concept for the implementation of the services in cloud environments such as DIAS.
- KPI2: Numbers of new products introduced by the co-design method for each site.
- KPI3: Number of additional users engaged.

6.2.13 S4P2 mySITE

- Input from [Doron Goldfarb](#) , [Johannes Peterseil](#) , [Vladan Minic](#) on behalf of S4P2 14 nov. 2019 :

The development of the mySITE pilot builds on the integration and linking of the existing infrastructure components DEIMS-SDR, eLTER DIP and AgroSense. At the moment, they mainly co-exist
Feb 03, 2020

independently and are fully operational within their respective usage domain. The main aim of the mySITE activities in Sprint 1 is to integrate these three components into a coherent, distributed system of interrelated services, while interoperability with the other showcase pilots shall be the focus of Sprint 2 activities. DEIMS-SDR and eLTER DIP will serve as metadata and data sources, while AgroSense will serve as data aggregator.

DEIMS-SDR will be extended to a) offer a flexible API for metadata retrieval which will support efficient provision site descriptions and dataset metadata (along with online reference to its data sources) and b) to evaluate the technical integration of additional site descriptions/catalogues such as the Common Database of Designated Areas (CDDA, including the Natura 2000 protected sites).

The AgroSense platform will be adapted to serve as a general platform “EcoSense” to explore in-situ and remote sensing data at research site level. This will enable the dynamic retrieval and display of site information provided by DEIMS-SDR in order to let users select a site of interest and retrieve related metadata on in-situ observations via eLTER-DIP. For data provided by standard services, the in-situ data can subsequently be displayed alongside remote-sensing data products, which at the Sprint 1 stage will consist of existing layers calculated for AgroSense, to be extended to mySPACE data throughout Sprint 2. Based on the planned activities and their outcomes, challenge #4 will be thus addressed by the adoption and adaptation of AgroSense to use the publicly available in-situ data sources from LTER and combine it with Sentinel based data products as well as the evaluation of options to integrate site information from other external site registries. Challenge #7 will be addressed by focusing on the implementation of INSPIRE conforming interfaces and data representations, while challenge #2 shall be achieved by unifying the user base of the three independent components and underlying communities. The main focus will be the extension from a research community based focus to protected area managers, site managers and regional stakeholders (e.g. regional planning authorities). The results of Sprint 1 will be provided in form of a working prototype.

6.2.13.1 Challenge #2: Increase in the variety of users targeted by the designed service.

- **Initial State:** research community based focus.
- **Final state:** extension to protected area managers, site managers and regional stakeholders (e.g. regional planning authorities).
- **Means of evaluation:** Provision and discussion of use cases describing the widened user base.
- **Final material to be produced (prototype; demo; video; poster...)** The prototype mentioned under challenge 4 will be the basis.

The main focus will be the extension from a research community based focus to protected area managers, site managers and regional stakeholders (e.g. regional planning authorities).

6.2.13.2 Challenge #4: All pilots should exploit the IT capabilities and the wealth of data made available

- **Initial State:** fully operational but independently existing infrastructure components DEIMS-SDR, eLTER DIP and AgroSense need to be integrated into a coherent, distributed system of interrelated services (interoperability with the other showcase pilots shall be the focus of Sprint 2) (To Be Confirmed).
- **Final state:**
 - Integration and linking of the existing infrastructure components DEIMS-SDR, eLTER DIP and AgroSense to use the publicly available in-situ data sources from LTER and combine it with Sentinel based data products.
 - evaluation of options to integrate site information from other external site registries.(To Be Confirmed).

- **Means of evaluation:** Functional state of mySITE pilot serves as proof-of-concept.
- **Final material to be produced:** provided working prototype.

6.2.13.3 Challenge #7: Demonstrated compliance with inspire, GEO recommendations interoperability and geo data sharing principles

- **Initial state** No INSPIRE conforming interfaces and data representations available at the moment (To Be Confirmed).
- **Final state;** implementation of INSPIRE conforming interfaces and data representations. (To Be Confirmed).
- **Means of evaluation:** Representatives of all pilots cross-check compliance.
- **Final material to be produced (prototype; demo; video; poster...):** Documentation of standards/best practice compliant interfaces will be included in the prototype mentioned under challenge 4.

2 main milestones:

- Milestone 1: Functional state of the redesigned DEIMS-SDR API (by December 2020).
- Milestone 2: Functional state of the adapted EcoSense platform (by December 2020).

Indicate relevant KPI:

- KPI1: Concept for the integration of elements of the CDDA (e.g. Natura2000 areas).
- KPI2: Proven functional state of redesigned DEIMS-SDR API.
- KPI3: Adaptation of EcoSense platform to retrieve and visualize site information via DEIMS-SDR on “bulk” (Map overview) and “detail” (Shape & additional metadata display for individual site).
- KPI4: Adaptation of EcoSense platform to retrieve and process site-related metadata on in-situ observations from eLTER-DIP.

6.2.14 S4P3 myVARIABLE

- Input from Nestor Fernandez: 5 déc. 2019 on behalf of S4P3.

myVARIABLE advances the development and user uptake of the Essential Biodiversity Variables (EBV) as a vehicle to promote integration of a disparity of in situ and remote sensing observations in order to deliver comprehensive biodiversity information in space and time. The development EBV-based services to support biodiversity assessments builds on three pillars: (1) Adoption of the EBVs approach by a wider community of biodiversity and data scientists in order to increase the number of compliant datasets; (2) Taking the GEO BON EBV-Portal into a fully operational infrastructure facilitating access to EBV datasets under FAIR principles and (3) Uptake by user communities involved in biodiversity policy and assessments, facilitating the use of the data through developing a new Information Standard and providing access to basic analysis tools for assessing biodiversity change.

6.2.14.1 Challenge #1: Increase number of user-oriented services designed

- **Initial state:** At present three open-access, global-scale EBV datasets have been made available through the GEO BON EBV portal. Difficulties in producing other datasets compliant with the EBV framework have limited until now the upscaling of the infrastructure, which, in turn, limits the number of users. This can be significantly improved if new open-access EBV-compliant datasets are produced and these are promoted to potential users (task of S4P1 mySpace).
- **Final state:** Increasing the number of open-access EBV datasets through the EBV Portal and providing basic analysis tools for European, national and sub-national level biodiversity change assessments.

- **Means of evaluation:** Increase in the number of EBV datasets produced and made freely available in the GEO BON EBV Portal. Implementation of user-oriented analysis tools for calculating EBV changes at Supra-National, National and Sub-national level.
- **Final material to be produced (prototype; demo; video; poster...)** Essential biodiversity data easily accessible to the users.

6.2.14.2 Challenge #4: All pilots should exploit the IT capabilities and the wealth of data made available

- **Initial state:** Certain EBV workflows have been defined for the integration of a disparity of in-situ and remote sensing observations to deliver EBV products but implementation of transparent and reproducible workflows is needed to scale up the EBV concept into full operationalisation and to expand the number of compliant datasets.
- **Final state:** Provide workflows for the production of further EBVs together with derived biodiversity datasets with spatio-temporal continuity at the European scale. These workflows use observations from Sentinel-2 and other remote sensing-based products and multiple sources of in-situ observations (e.g. distributions of species and habitat types).
- **Means of evaluation:** Publication of fully documented and reproducible workflows for at least two Essential Biodiversity Variables developed at the European level.
- **Final material to be produced:** provided working prototype.

6.2.14.3 Challenge #7: Demonstrated compliance with inspire, GEO recommendations interoperability and geo data sharing principles

- **Initial State** Identification of the need for a new metadata standard to facilitate interoperability among the different EBV datasets and to help users to assess by themselves fit-for-purpose of the different datasets.
- **Final State;** Implementation of a new EBV-specific metadata standard. The standard integrates and promotes the adoption of GEO Data Management Principles in producing biodiversity datasets.
- **Means of evaluation:** Publication of a new EBV metadata standard and implementation of the standard in the GEO BON EBV Portal.
- **Final material to be produced (prototype; demo; video; poster...)** Metadata standard and supporting online completion tool, including guidelines.

2 main milestones:

- Milestone 1: Implementation of the Minimum Information Standards for promoting compliance with GEO Data Sharing and Data Management Principles and mobilization of further EBV datasets documented according to the EBV-Minimum Information Standards. First operational version of the Standard: July 2020. Final version demonstrated in new EBV datasets: December 2020
- Milestone 2: Increase the number of services to end-users through integration of the different components of the infrastructure (VAT system, GEO server, database infrastructure and Metadata Tool): December 2020

6.2.15 S5P1 Improved historical water availability and quality information service

6.2.15.1 Challenge #1: increase number of user-oriented services

- **Initial state:** the main objective of this pilot is to improve the existing hydrological service over Europe and the globe using EO-based information, and also disseminate historical data through a web based tool.

- **Final state:** In the first development sprint, we will shall assess different EO data relevant to hydrology and water resources (i.e. evapotranspiration, snow and soil moisture) over Europe.
- **Means of evaluation:** accuracy of the hydrological model using statistical metrics (relevant to biases, variability and seasonality) from the model time series and EO data.
- **Final material to be produced:** a prototype for model evaluation and a set of best practices that indicate the EO products that could be useful for hydrological modelling applications.
- **Milestones:** Methodology to evaluate the hydrological model and fine-tune the model parameters based on EO data. An EO catalogue/database is compiled to set data useful for the hydrological applications. This will be done by the end of summer, whilst the methodology for evaluating the model will be generated by the end of this year (considering results from the model evaluation).

6.2.15.2 Challenge #3: Specific co-design process carried; specifying collaboration procedures; if not available so far

- **Initial state:** The pilot user (Geological Survey of Sweden) have signed a support letter to the pilot during the proposal stage stating their interest on the service. This service exists already and has been co-designed based on previous projects. We commit to improve the reliability of the service, being a data provider by making available the data for a number of fluxes.
- **Final state:** Define a co-design process with the users and follow it through a set of meetings, and maybe workshops that will allow us to reach trust between the service providers and users.
- **Means of evaluation:** To have a set of well-defined wish list and feedbacks from the users to drive the development of the pilot during the next development sprints. The process of co-designing is based on in-house experience with services, users and their needs. We do not expect to re-designing this, and therefore our outcomes will feed back directly to WP2 as a new knowledge.
- **Final material to be produced (prototype; demo; video; poster...):** A document with the outcomes from the feedback process.
- **Milestones:** The document will be produced in the end of the sprint (end of 2020).

6.2.15.3 Challenge #12: increase no of operational integration into user workflows

- **Initial state:** Currently the processing is done locally at SMHI environments. In-situ and EO data are also archived at SMHI for use in the investigation.
- **Final state:** We would like to be able to use the DIAS platform to select and reformat the EO data of interest and avoid hosting the data in house.
- **Means of evaluation:** Ability to process EO data on the DIAS platform, and fetched for direct use in the hydrological model.
- **Final material:** The ability to process EO data from the DIAS platform, although the current service does not dependent on.
- **Milestones:** Setup of the EO catalogue, which will include EOs from DIAS by the end of this summer.

6.2.16 S5P2 Satellite Earth Observation-derived water bodies and floodwater record over Europe

6.2.16.1 Challenge #3: Develop EO services with and for users (Number of user-oriented services designed)

- **Initial state:** Our default product consists of a database of binary flood/no flood maps over Europe covering the time period 2002 – 2019.

- **Final state:** Together with our users we would like to define a set of value adding products derived from this initial default product. Examples are: a maximum flood extent map per week/month/year, flood probability maps, flood frequency, etc. and other intermediary products such as "unclassified areas", permanent water bodies, flags informing on the data quality, etc.
- **Means of evaluation:** A count of the number of derived products and an assessment of their accuracy and usefulness by the users.
- **Final material:** Default product + n derived products will be available for selected test areas over Europe.
- **Milestone:** The GFP annual meeting takes place in June 2020. We will organize a series of workshops with selected members of the GFP by May 2020 in order to present them the default product and to collect their initial feedback and specific requirements. The results of eshape for selected test areas will then be presented at the annual meeting.

6.2.16.2 Challenge #6: Usage of the DIAS

- **Initial state:** We have currently three services implemented on the DIAS: i) an 'on demand' flood mapping service based on Envisat data (platform: ESA GPOD), ii) an 'on demand' flood mapping service based on Sentinel-1 data (platform: ESA GPOD, WASDI, Hydrology TEP) and iii) a systematic Sentinel-1 based flood mapping service covering three countries in SE Asia (platform: WASDI).
- **Final state:** We are planning to setup a new systematic Sentinel-1 based flood mapping service over Europe on NextGEOSS.
- **Means of evaluation:** The Sentinel-1 image archive over Europe (2012-present) can be processed with our software implemented on NextGEOSS.
- **Final material:** The processing chain is implemented on NextGEOSS and used to generate the flood record of Europe (including the generation of derived products defined under Challenge#3) . By the end of sprint 1 we plan to have aDIAS-generated flood record available for selected test areas over Europe.
- **Milestone:** our software should be implemented on nextGeoss halfway through the sprint so that after initial testing the data processing can start at the end of the sprint.

6.2.16.3 Challenge #9: User Uptake of the pilots (No. of user communities involved)

- **Initial state:** Currently our 3 services and derived products are used by a limited number of early adopters representing a small number of sectors.
- **Final state:** We are planning to customize our default product so that we meet there requirements of a much larger number of users representing a multitude of sectors.
- **Means of evaluation:** To evaluate of this activity we will keep track of the number of users accessing the data products and count the number of sectors they are representing.
- **Final material:** A report with an analysis of the number of users and sectors accessing the data, as well as a description of the use of the data.
- **Milestone:** Demonstration material for selected test areas will be generated halfway through the sprint and distributed to selected members of the GFP, at the GFP annual meeting in September 2020 first feedback on these data sets will be collected.

6.2.17 S5P3 Diver Information on Visibility in Europe

6.2.17.1 Challenge #1: Develop EO services with and for users (Number of user-oriented services designed)

- **Initial state:** The current state is a very small set of users in a very small geographic area, that form our testing groups.
- **Final state:** We would like a very large/wide group of recreational and commercial divers to be aware of the app and for it to be used in their dive planning. This includes users in different geographic areas. This will require both promotion off the app as well as development and validation of the visibility index for a wider set of locales.
- **Means of evaluation:** A simple count of the users of the App as well as the geographic spread of dive sites that are being checked.
- **Final material:** an analysis of the geographic spread of users of the application.
- **Milestone:** we will re-evaluate/validate the Means of evaluation at the half way mark (~May 2020) we will look at the current geographic spread of user uptake and see if we need to do more to achieve our goal.

6.2.17.2 Challenge #6: Usage of the DIAS

- **Initial state:** Currently the processing is done ad-hoc and locally at PML's premises. Data services are also hosted at PML for use within the App.
- **Final state:** We would really like to be able to move not only our data processing to the "cloud" or onto a DIAS platform we would also like to host of data services their two. This would, in theory, give us greater resilience to an increase in users as well as service stability.
- **Means of evaluation:** Our data processing is done on a/the selected DIAS platform, web services (possible WMS, WFS & WCS) are hosted and served from within the DIAS and consumed by the App.
- **Final material:** The ability to process data and server web services from a DIAS, although this will be dependent of
- **Milestone:** At the halfway point of the sprint, we would like to have at a minimum a dockerised (or other container system) version of our processing running on a DIA with access to the required data from CMEMS, this will be followed up with the creation of web services for the final milestone at the end of the sprint.

6.2.17.3 Challenge #9: User Uptake of the pilots (No. of user communities involved)

- **Initial state:** Current uptake is just our testing group.
- **Final state:** A large set of user groups, both recreational and commercial that use the app.
- **Means of evaluation:** Again, this can be based on the number of users in the app, as well as the metadata about their membership to any dive clubs or organisations.
- **Final material:** an analysis of the number of user groups that the app has by the end of Sprint.
- **Milestone:** we will re-evaluate/validate the Means of evaluation at the half way mark (~May 2020) based on the number of users at this stage we may change the mechanism for outreach.

Pilot wide milestone: All of these targets are aimed to be achieved by the end of Sprint 1.

6.2.18 S5P4 Sargassum detection for seasonal planning

6.2.18.1 Challenge #2: O1-2: Develop EO services with and for users

- **Initial state:** Existing chain retrieve satellite data from S-3, S-2, MODIS from space agencies on a daily basis. Actual service answers operational needs.
- **Final state:** Adapt the operational Sargassum detection chain for reanalysis purposes. Expand the use of EO data by using Sentinel -1 data to improve the service.
- **Means of evaluation:** Combine S-3 and MODIS for a daily merged product. Improved version of Sargassum index by August 2020.
- **Final material:** a service to answer seasonal-planning needs for the community of end-users.

6.2.18.2 Challenge #6: O2-3: Usage of the DIAS

- **Initial state:** Existing chain retrieves satellite data from S-3, S-2, MODIS directly from space agencies.
- **Final state:** Adapt the CLS operational chain and prepare for integration in a DIAS to access satellite data. Deploy the Sargassum detection chain on a DIAS.
- **Means of evaluation:** use sentinel data provided by a DIAS for the calculation of the Sargassum index. Review and acceptance of the chain ready for dockerisation at the interim meeting (April).
- **Final material:** the operational chain dockerised and deployed and operated on a DIAS.

6.2.18.3 challenge #4: O2-1: Exploit IT capabilities and wealth of data

- **Initial state:** Existing operational chain used CLS infrastructure and own tools for processing and archiving.
- **Final state:** To produce a reanalysis of Sargassum detection using Sentinel-3 and MODIS data.
- **Means of evaluation:** compute the reanalysis using a DIAS infrastructure- November 2020.
- **Final material:** a one-year reanalysis of Sargassum index on S3 -Modis.

6.2.19 S5P5 Monitoring fishing activity

6.2.19.1 Challenge #1: increase number of user-oriented services

- **Initial state:** The main objective of this pilot is to develop a web based tool to disseminate maps on fishing effort, landings, catch rates and environmental characterization for deep sea fishing areas to fisheries researchers, the fishery administration and the fishing industry. From previous projects (BIOMETORE) there was a first identification and characterization of spatial patterns of fishing activity for PT fleets in Atlantic seamounts by fishing gear type and target species done.
- **Final state:** In the first development sprint of e-shape the work developed by IPMA will be extended to: a) the full Portuguese EEZ from 2012 to 2018 for large pelagic species (tuna and swordfish); b) include products related to: i) statistics of fishing vessels operating in/crossing an AOI; ii) statistics – port of departure, landing port, type of fishing; iii) statistics fishing activity patterns, – e.g. time of longlines deployment, number of hours they remain in water, vessel speed during gear setting, vessel speed during hauling density map of locations where vessels fish for each fishing gear type, season/month and species.
- **Means of evaluation:** To have these products/services available in the new version of the web application for the defined AoI and time series - November 2020.
- **Final material to be produced (prototype; demo; video; poster...):** Web application with new products and services.

6.2.19.2 Challenge #3: Specific co-design process carried; specifying collaboration procedures; if not available so far

- **Initial state:** DGRM have signed a support letter to the pilot during the proposal stage stating that they would work closely with the development team to co-design the application and perform tests and provide regular feedback on its implementation status. DGRM also commit to being a data provider, making available the fisheries-based data from the PT fleet. It is expected in the dissemination among stakeholders of the products available through the web service. IPMA will serve as a proxy institution to the requirements of DGRM since it has been working as their preferential scientific partner for some years now.
- **Final state:** To define a co-design process with DGRM and follow it through a set of requirement definition activities, namely workshops, involving members from DGRM, IPMA and Deimos that will allow us to reach a set of final service requirements defined by . Extend the co-design process to the Regional Directorate for Fisheries in Azores (DRPA) to prepare to implement them in the second development sprint.
- **Means of evaluation:** To have a set of well-defined requirements from DGRM and DRPA to drive the development of the pilot during this and the next development sprints. First set of requirements to be concluded in June 2020.
- **Final material to be produced (prototype; demo; video; poster...):** A requirements document with the outcomes from the requirement definition process.

6.2.19.3 Challenge #4 Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms

- **Initial state:** The current version of the web based tool was developed in the scope of BIOMETORE and Seabiodata and is running on an IT infrastructure at IPMA headquarters
- **Final State:** To have the new version of the web application deployed in NextGEOSS and linked with their catalogue, ready to take advantage of the harvested CMEMS datasets (SST, Chlorophyll concentration, etc) in the next development sprints.
- **Means of evaluation:** To have the new version of the web application deployed in NextGEOSS - November 2020.
- **Final material to be produced (prototype; demo; video; poster...):** Web application online and working pre-operationally.

6.2.20 S6P1 Data for Detection, Discrimination and Distribution (4D) of Volcanic ash

6.2.20.1 Challenge #1: Increase number of user-oriented services designed

- **Initial state:** Currently the targeted user is the VAAC which is interested mainly in the EO from ground and space.
- **Final state:** Enhanced visual resource about the ash distribution as resulting by FLEXPART and SILAM dispersion model in which aerosol lidar data are assimilated.
- **Milestone:** Vertical profiles assimilated in FLEXPART and SILAM – July 2020.
- **Final material:** Visual maps about a selected case study ready.

6.2.20.2 Challenge #3: Specific co-design process carries; specifying collaboration procedures; if not available so far

- **Initial state:** Preliminary discussions with co-designer and identification of the primary user of 4d ash.

- **Final state:** Identification of needs of further potential users of tailored pilot service (e.g. numerical outputs or basic maps of affected areas and regions).
- **Means of evaluation:** Report on user needs and potential tailoring.
- **Milestone:** Meeting and discussion with co-designer and potential additional users and stakeholders. Planned some user meetings even in collaboration with other projects. – September 2020.
- **Final material: report on user needs and potential tailoring**

6.2.20.3 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, NextGEOSS, EOSC, in-situ observatories (as organized in ENVRI plus), citizen observatories and any other existing hubs or platforms.

- **Initial state:** 4D ash based currently on satellite algorithms and on aspherical particle identification based on ACTRIS aerosol lidars.
- **Final state:** During sprint 1, 4D ash services and outputs will make use of aerosol lidar observations close to volcanic area in Sicily and will exploit the potentiality of use of ceilometer data at IMO, Iceland and of satellite-borne lidar observations provided by CALIPSO. All these will be ingested into the EUNADICS-AV portal for the 4D ash service.
- **Means of evaluation:** EWS product available for INGV for a case study and feasibility of ceilometer & CALIPSO ingestion assessed.
- **Milestone:** Set up of the API services for connection between the original sources (e.g. ACTRIS datacenter, IMO and INGV local servers) and the EUNADIC-AV portal service (identified platform) – May 2020.
- **Final material:** Draft of the paper about a selected case study ready.

6.2.21 S6P2 GEOSS for Disasters in Urban Environment Sprint 1 Challenge

6.2.21.1 Challenge #2: Increase the variety of user targeted by the designed service.

- **Initial state:** Before E-SHAPE the usage of EO Sentinel data in numerical weather modelling was limited to research experiments having a low TRL.
- **Current status:** On-going dialog with Italian Civil Protection Department for pre-operational requirements of the hydro/fire-meteorological chain. Forthcoming dialog with Ligurian Region Environmental Protection Agency (ARPAL).
- **Final status:** Completed design of the hydro/fire-meteorological chain.
- **Milestones:**
 - Milestone 1: M11 - preliminary requirements collection completed.
 - Milestone 2: M20 - final requirements collected and chain design completed.
- **Final material:** minute reports of the meetings done with the Italian Civil Protection Department and the ARPAL.

6.2.21.2 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, Nextgeoss, EOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms

- **Initial state:** The EO Sentinel data are downloaded manually for each research experiment.
- **Current status:** Automatic procurement of Sentinel-1 GRD products and Sentinel-2 level 2 product already implemented during the first part of the project from Copernicus Open Access Hub over

the Italian territory. Automatic calculation of NDVI from Sentinel-2 level 2 products already implemented with calibration and geocoding of the downloaded variables.

- **Final status:** Automatic procurement of all variables needed by the hydro/fire- meteorological chain implemented with calibration and geocoding of all the downloaded variables over the Italian territory. Automatic calculation of Soil Moisture from Sentinel-1 GRD products.
- **Milestones:**
 - Milestone 1: M11 - Successful testing of daily operationally automatic download for GRD and NDVI over Italy.
 - Milestone 2: M20 - Successful testing of daily operationally automatic download for all variables needed over Italy.
- **Final material:** Report about the scripts functioning for the automatic procurement, calibration and geocoding of the aforementioned Sentinel variables.

6.2.21.3 Challenge #9: Increase number of user communities involved (non partners)

- **Initial state:** Before E-SHAPE the usage of EO Sentinel data in numerical weather modelling was limited to research experiments having a low TRL.
- **Current status:** On-going dialog with Italian Civil Protection Department for pre-operational requirements of the hydro/fire-meteorological chain. Forthcoming dialog with Ligurian Region Environmental Protection Agency (ARPAL). Ongoing selection of use cases that can be of interest for the users.
- **Final status:** Completed design of the hydro/fire-meteorological chain and first chain tests first chain tests presented to the users.
- **Milestones:**
 - Milestone 1: M11 - preliminary requirements collection completed and use case selection completed.
 - Milestone 2: M20 - final requirements collected and chain design completed and first chain test presented to the users.
- **Final material:** Minute reports of the meetings done with the Italian Civil Protection Department and the ARPAL. First report of the results obtained from the hydro-meteorological chain test.

6.2.22 S6P3 Assessing Geo-hazard vulnerability of Cities and Critical Infrastructures

6.2.22.1 Challenge #2: Increase the variety of user targeted by the designed service.

- **Initial state:** At the moment the main user of the products is the water manager entity of the Segura basin that use the InSAR derived products to improve the management of the aquifer-system.
- **Final state:** At the end of the sprint 1 the users will be also companies with linear infrastructures overs the area of interest of the case study.
- **Means of evaluation:** Number of new users of the products and number of meetings with new and potential user during the sprint.
- **Materials to be produced:** Reports of the meetings done with the potential and new users.
- **Milestones:** Initiate contacts with potential new users (Apr 2020) and initiate the collaboration with the final new users (Dec 2020).

6.2.22.2 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, Nextgeoss, EOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms

- **Initial state:** The GEP platform allow to process and download massive areas monitored with Sentinel-1. The outputs, consisting of millions of points, are difficult to manage and interpret.
- **Final state:** Semi-automatic methodology to manage and classify the GEP InSAR displacement products will be developed.
- **Materials to be produced:** Pre-analyzed results of the PSBAS-GEP processing over the case study of Murcia and Silesian coal basin.
- **Milestones:** Successful testing of the methodology designed to manage the large results from GEP processing (Jun 2020). Successful testing of the semiautomatic classification of the InSAR possible origin (Dec 2020).

6.2.22.3 Challenge #10: Organisation of a series of capacity building activities with the aim to train users in a given sector on the integration of EO-based and in-situ data-based solutions

- **Initial state:** InSAR derived results are difficult to understand and analyze, usually only useful for advanced users.
- **Final state:** Multiple users from the main stakeholders and related organisms will be able to understand and use the information given by the service.
- **Means of evaluation:** Number of capacity activities and number of participants assisted to the trainings.
Milestones: Generation of training materials from raw scientific data (Apr 2020) and organization of capacity activities (Dec 2020).

6.2.23 S6P4 Resilient and Sustainable ecosystems including Agriculture and food

6.2.23.1 Challenge #3: Specific co-design process carries; specifying collaboration procedures; if not available so far

- **Initial state:** Discussions and meetings with 2 co-designers from different communities (one from previous projects). We explored their needs and defined their requirements. We presented to them our expertise and the range of the possible solutions that we could offer.
- **Final state:** Capitalising upon existing products, services and platforms, we provide a tailor-made set of solutions to accommodate the declared needs of the end-users.
- **Means of evaluation:** Feedback from the main end-user (the insurance company INTERAMERICAN) on the delivered services in terms of utilisation, user-friendliness and efficiency.
- **Final material to be produced:** Report.

6.2.23.2 Challenge #4: Demonstrated improvement in exploiting the wealth of data made available through DIAS, GEOSS platform, Nextgeoss, EOSC, in-situ observatories (as organized in ENVRI plus) citizen observatories and any other existing hubs or platforms

- **Initial state:** Exploring the relevant existing platforms such as the GAIASENSE smart farming system in terms of content, architecture, spatial and temporal resolution, interoperability.
- **Final state:** Integration and homogenisation of the various EO and meteorological datasets (multiple time scales, spatial extents, grid resolutions, blending gridded with point data), statistical analysis, extraction of the critical climatological indices for the selected crop type (cotton) over the area of study (Rodopi, Greece), and improvement of the spatial resolution where necessary. Use

and extend the in-house (NOA) umbrella API that connects to multiple Sentinel Hubs (DIAS, Open Access Hub, Hellenic mirror site) acting as a single access point for all Copernicus missions' data.

- **Means of evaluation:** Enriched system with more datasets.
- **Final material to be produced:** Prototype.

6.2.23.3 Challenge #9: Increase number of user communities involved (non partners)

- **Initial state:** Introducing the e-shape project and the objectives of the specific pilot to the relevant user communities.
- **Final state:** The INTERAMERICAN insurance company adopts the services which will be delivered by the pilot in their business practice.
- **Means of evaluation:** Feedback from the main end-user (the insurance company INTERAMERICAN) on the delivered services in terms of utilisation, user-friendliness and efficiency.
- **Final material to be produced:** A user-friendly web system customised for the daily operations of INTERAMERICAN.
- **MILESTONE 1: Sprint interim assessment: M11 Apr 2020**

Progress in parallel for all 4 services, final specifications following the co-designer's requirements.

- **MILESTONE 2: End Sprint 1: M20 Dec 2020**

Prototype for 3 of 4 services.

6.2.24 S7P1 Global Carbon & GHG Emissions :

6.2.24.1 Challenge #1: Increase number of user-oriented services designed

- **Initial state:** No operational services for ecosystem, ocean or atmosphere domain. Different groups are willing to start to develop more service oriented approaches.
- **Final state:** Easy access to spatial data provided as a link near the user interface to download in-situ data.
- **Mean of evaluation:** Screenshot of user interface.
- **Final material to be produced (prototype; demo; video; poster...)**
- **Milestones:**
 - Upload satellite dataset in DIAS.
 - upload a model dataset (either Fluxcom or Fluxengine) in DIAS.
 - Create link in carbon portal.

6.2.24.2 Challenge #2: Increase in the variety of users targeted by the designated service

- **Initial state:** Planned key users GCP, Copernicus, IOD, ICOS CP, Scientists?
- **Final state:** Service used by inversion modeling community.
- **Mean of evaluation:** survey among modelers.
- **Final material to be produced (prototype; demo; video; poster...):**
- **Milestones:**
 - Map the needs of spatial data among modelers (verification, visualization?).
 - Raise awareness of available data among modelers (in CP-modelers meeting).

6.2.24.3 Challenge #4: demonstrated improvement in exploiting the wealth of data .. In DIAS .. Any other existing hubs and platforms

- **Initial state:**
 - FluxCOM has several versions and updating requires manual work. Aim is to develop more operational environment.
 - Only one ocean flux map available at the moment in ICOS CP. Connection between ICOS and SOCAT data?
 - Satellite anomalies for detecting sinks and sources of CO₂ is existing, but not as a service.
- **Final state:** Spatial datasets (Preferably spatially and temporally co-located) in DIAS, linked to in-situ dataset in Carbon portal
- **Mean of evaluation:** Carbon portal user statistics
- **Final material to be produced (prototype; demo; video; poster...):**
- **Milestones:**
 - Upload satellite dataset for 2018 in DIAS.
 - Upload a model dataset (either Fluxcom, Fluxengine or both) in DIAS.
 - Create connection between ICOS CP and DIAS.

Milestone defined by WP3: Plan milestones over 2020 sprint 1 period of time for the 3 challenges before 31 janv. 2020.

6.2.25 S7P2 Urban resilience to extreme weather

6.2.25.1 Challenge #3: Specific co-design process carried; specifying collaboration procedures; if not available so far

- **Initial state:** Service not yet available, first contacts with users on their needs regarding urban climate information based on seasonal forecasts.
- **Final state:** Urban climate information service including seasonal indicators taking into account user requirements and user feedback.
- **Means of evaluation:** User requirements identified, feedback from the users on usability of the service.
- **Final material to be produced (prototype; demo; video; poster...):** Report on user requirements.
- **Milestones including a targeted date:** First stage of the co-design process completed (April 2020).

6.2.25.2 Challenge #4: Demonstrated improve in exploiting the wealth of data ...

- **Initial state:** Usage of seasonal forecasts for P2 needs further processing and testing in terms of required spatial scales.
- **Final state:** Usefulness of seasonal forecasts has been assessed, data are made available via C3S/DIAS (WeKEO).
- **Means of evaluation:** Quality of seasonal forecast in terms of additional value.
- **Final material to be produced (prototype; demo; video; poster...):** Evaluation report.
- **Milestones including a targeted date:** First data evaluation (temperature) completed (May 2020).

6.2.25.3 Challenge #6: identify and prepare outsourcing part of processing chain and web service to WekEO infrastructure

- **Initial state:** Service not yet available and implemented on WEkEO, C3S seasonal forecast data not yet accessible from WekEO.
- **Final state:** Interfaces implemented, urban climate service as web service implemented and running on WekEO Server.
- **Mean of evaluation:** Test run of implemented web service.
- **Final material to be produced (prototype; demo; video; poster...):** Web service.
- **Milestone 08/2020:** Access to seasonal forecast in Weenvironment implemented (Jun 2020).

6.2.25.4 Challenge #8: Increase in the number of key organizations involved

- **Initial state:** No application yet available; collaboration with selected cities in Germany and Austria; contact to further potential cities.
- **Final state:** Interaction and close collaboration with cities in Germany, Austria and Finland.
- **Mean of evaluation:** Report on user contact and feedback.
- **Final material to be produced (prototype; demo; video; poster...):** Report.
- **Milestone including a targeted date:** Initial report on collaboration with selected cities available (Aug 2020).

6.2.26 S7P3 Forestry conditions

6.2.26.1 Challenge #6: identify and prepare outsourcing part of processing chain and web service to WekEO infrastructure

- **Initial state:** Forestry service not yet available as web service; service not yet implemented on WEkEO, instead similar service running on own servers; challenge that C3S seasonal forecast data not accessible from WEkEO; full processing maybe too heavy for WEkEO server.
- **Final state:** Web service is implemented and running on WEkEO infrastructure.
- **Mean of evaluation:** Report on web service implementation.
- **Final material to be produced (prototype; demo; video; poster...):** Web service.
- **Milestone 05/2020:** Report on interface test and implementation of web app service.

6.2.26.2 Challenge #8: Increase in the number of key organizations involved

- **Initial state:** No service yet available; contact to Finnish forest industry organisation; more potential key organizations (harvesters) have to be identified.
- **Final state:** Close collaboration and interaction with Finnish forest industry organisation; increase in the number of key organizations involved.
- **Mean of evaluation:** Report on user needs and potential tailoring.
- **Final material to be produced (prototype; demo; video; poster...):** Report on user requirements/needs and potential tailoring.
- **Milestone 07/2020:** Report on feedback of co-designer and potential additional users and stakeholders.

6.2.26.3 Challenge #9: Increase in the number of end-users involved

- **Initial state:** No service yet available; contact to Finnish forest industry organisation; end-users (harvesters) have to be identified.
- **Final state:** Web service is implemented; web-tracking of service users.
- **Mean of evaluation:** User survey.
- **Final material to be produced (prototype; demo; video; poster...):** Report on user survey.
- **Milestone 07/2020:** Report on usage analysis, support and helpdesk activation.
- **Milestone 10/2020:** Report on user survey of app users.

6.2.27 S7P4 Hydropower in snow reservoir

6.2.27.1 Challenge #6: identify and prepare outsourcing part of processing chain and web service to WEkEO infrastructure

- **Initial state:** Hydropower service not yet available as web service; service not yet implemented on WEkEO, instead similar service running on own servers; challenge that C3S seasonal forecast data not accessible from WEkEO; full processing maybe too heavy for WEkEO server.
- **Final state:** Web service is implemented and running on WEkEO infrastructure.
- **Mean of evaluation:** Report on web service implementation.
- **Final material to be produced (prototype; demo; video; poster...):** Web service.
- **Milestone 08/2020:** Report on interface test and implementation of web app service.

6.2.27.2 Challenge #8: Increase in the number of key organizations involved

- **Initial state:** No service yet available; contact to Finnish industry organisation; more potential key organizations have to be identified.
- **Final state:** Close collaboration and interaction with Finnish industry organisation; increase in the number of key organizations involved.
- **Mean of evaluation:** Report on user needs and potential tailoring.
- **Final material to be produced (prototype; demo; video; poster...):** Report on user requirements/needs and potential tailoring.
- **Milestone 09/2020:** Report on feedback of co-designer and potential additional users and stakeholders.

6.2.27.3 Challenge #9: Increase in the number of end-users involved

- **Initial state:** No service yet available; contact to Finnish industry organisation; end-users have to be identified.
- **Final state:** Web service is implemented; web-tracking of service users.
- **Mean of evaluation:** User survey.
- **Final material to be produced (prototype; demo; video; poster...):** Report on user survey.
- **Milestone 11/2020:** Report on usage analysis, support and helpdesk activation.

6.2.28 S7P5 Seasonal Preparedness

6.2.28.1 Challenge #1: Increase in the number of user-oriented services

- **Initial state:** Currently tourism indicators for climate projections available for the users, there are no sub-seasonal and/or seasonal forecast indicators developed for tourism and transportation sectors.
- **Final state:** The user-oriented service is extended with forecast indicators/products for various time-range following user requirements and indication. In addition to the indicators planned so far we will extend the range of seasonal products for touristic industry with snow cover products for ski resorts.
- **Means of evaluation:** Number of fit-for-purpose sub-seasonal and seasonal products and their usefulness for the users.
- **Final material to be produced (prototype; demo; video; poster...):** Report on the products selected
- **Milestone:** All the products are selected in collaboration with the stakeholders (Jan 2020).

6.2.28.2 Challenge #3: Specific co-design process carried; specifying collaboration procedures; if not available so far

- **Initial state:** Preliminary discussion with the users on the collaboration and their needs in terms of seasonal and sub-seasonal products.
- **Final state:** Service including a set of user-oriented tailored seasonal and sub-seasonal indicators for transportation and tourism sector designed together with the users, developed following the user needs and requirements and piloted, iterated with the users.
- **Means of evaluation:** Identified needs of the users, feedback from the users on how well the tailored service satisfies the requirements and on the usability of the service in their business.
- **Final material to be produced (prototype; demo; video; poster...):** Report on co-design process.
- **Milestone:** The first co-design process of the products ends, all the products are designed (April 2020).

6.2.28.3 Challenge #6: Identify and prepare outsourcing part of processing chain and web service to WekEO infrastructure

- **Initial state:** Service not yet implemented and available on WEkEO, C3S seasonal forecast data and ECMWF ERF data not yet accessible from WekEO.
- **Final state:** Seasonal preparedness service implemented and running on WekEO Server.
- **Means of evaluation:** Report on web service implementation.
- **Final material to be produced (prototype; demo; video; poster...):** Web service.
- **Milestone:** Report on interface test and implementation of web service (Sep 2020).



ANNEX 2 SPRINT 1 TIMELINE AS OF 21 JANUARY 2020

| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|----------|-----------|----------|-----------|-----------|-----------|----------|---|-----------|-----------|---|-----------|--|-----------|----------|----------|
| S1 P1 | | | | | | | <p>#1 new services</p> <p>(1) Calibration of methodology based on historical data - End of June</p> <p>#4: Exploiting the wealth of data</p> <p>(1) pure meteo-based calendars - End of June;</p> | | | <p>#1 new services</p> <p>(2) Validation of methodology based on expected 2020 data - End of September.</p> <p>#4: Exploiting the wealth of data</p> <p>(2) Integrated methodology with EO + ancillary information sources - End of September</p> <p>#6 prepare for outsourcing to a DIAS</p> <p>(1) Full implementation on 1 platform (probably NextGEOSS) - End of September</p> | | <p>#6 prepare for outsourcing to a DIAS</p> <p>(2) translation of workflow to other platforms - End of November</p> | | | |



| Pilot | Oct. 2019 | Jan. 2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep. 2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2021 | Jan 2021 |
|----------|-------------------------------|-------------------------------|-----------|-----------|--|--|-----------|-----------|-----------|-----------|-----------|-----------|---|----------|----------|
| S1 P2 | | | | | <p>#1: New services</p> <p>#2: increase variety of users</p> <p>#4: Exploiting the wealth of data</p> <p>Sprint interim assessment: M11 Apr 2020</p> <p>Progress in parallel for the two services of phenology extraction (towards working prototype) and yield estimation (towards defining a complete methodological design), final specifications following the co-designers' requirements.</p> | | | | | | | | <p>#1 new services</p> <p>#2: increase variety of users</p> <p>#4: Exploiting the wealth of data</p> <p>End Sprint 1: M20 Dec 2020</p> <p>1st working prototype of phenology extraction in Level-1 and Level-2 (that is national and regional scale) and completed design for yield estimation in Level-1 and Level-2 (its implementation to follow in Sprint 2).</p> | | |
| S1 P3 | #2: increase variety of users | #2: increase variety of users | | | <p>#2: increase variety of users</p> <p>The start of the 2020 (actual)</p> | #2: increase variety of users TO BE PLANNED | | | | | | | | | |

Feb 03, 2020



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|---|--|-----------|-----------|---|--|-----------|-----------|-----------|----------|-----------|-----------|-----------|----------|----------|
| | <p>The fact that VICI is the chosen method as national crop insurance method covering impacts by droughts (through JICA), and that contracts and (collaboration) with the old GIACIS network is in place [already achieved following specific ITC-JICA exchange s]. Confirmed by ICIP Newsletter No. 08 (October 2019).</p> | <p>The start of the 2020 (actual) sales season of VICI in the designated ACC's, i.e. through ICIP in the Oromia region, and possibly also elsewhere in the Amhara region through OIC and Kifiya. Sales season is yet scheduled; scheduled from end Jan.2020 to end Apr.2020.</p> | | | <p>sales season of VICI in the designated ACC's, i.e. through ICIP in the Oromia region, and possibly also elsewhere in the Amhara region through OIC and Kifiya. <i>Such work is not yet scheduled; scheduled from end Jan.2020 to end Apr.2020.</i></p> <p>#4: Exploiting the wealth of data</p> <ul style="list-style-type: none">Consistency between data of the old (PROBA-V) and new (Sentinel-3 Synergy-V10) platforms is assessed and documented. <i>This must be</i> | <p>The start of an explorative study concerning 'if' VICI can be fully coupled to credit schemes and to specific agronomic advice (extention aspects), plus its added value(s). <i>Such work is not yet scheduled; top-priority will be work that follows the expected alignment of older Spot-VGT + Proba-V NDVI data with the expected S3-SYN NDVI data.</i></p> | | | | | | | | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
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| | | | | | <p><i>completed by April 2020.</i></p> <ul style="list-style-type: none"> Re-calibrated VICI trigger and exit-thresholds, denoting drought occurrence by CPS-Zone, are made available. <i>This must be completed by April 2020.</i> VICI product, based on Sentinel-3 Synergy-V10 data is delivered to users. <i>This must have started by April 2020.</i> | | | | | | | | | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
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| | | | | | <p>#10 capacity building activities</p> <ul style="list-style-type: none"> Training in Mekelle on NDVI-Index preparation. <i>This must start by Feb.2020 and must be completed by April 2020.</i> Training in Mekelle on the operational Use of the NDVI-Index. <i>This must start by April/May 2020.</i> | | | | | | | | | | |
| S1 P4 | | | <p>#2: increase variety of users</p> <p>Overview of interested new</p> | <p>#2: increase variety of users</p> <p>final list of new users to be</p> | | <p>#5 preparedness index for integration into "As A Service (...AAS)" IT infra</p> <p>May 2020: identification of the platform to</p> | <p>#1 new services new services</p> <p>first prototype of new service, to be evaluated by new users;</p> | | | | <p>#1 new services</p> <p>final version of new service, to be implemented</p> | | <p>#3: Specific co-design</p> <p>Co-design evaluation report</p> | | |

Feb 03, 2020



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|-----------|----------|-----------------|--|-----------|-------------------------------|--|--|-----------|--|-------------------------------------|-----------|--|----------|----------|
| | | | potential users | included in the co-design approach; #3: Specific co-design first meeting with new users to define user needs | | be used (DIAS, NextGEOSS,...) | #3: Specific co-design First evaluation of developed services by users; | | | | nted in WIG as operational service. | | #5 preparedness index for integration into "As A Service (...AAS)" IT infra • December 2020: services to be transferred are operational on the platform. | | |
| S2 P1 | | | | | | | | #4: Exploiting the wealth of data Start publishing CTM outputs through the GEOSS Platform and demonstrate wealth of data use, JULY 2020 | | #2: increase variety of users Design and deploy a co-designed application in support of the effectiveness evaluation of the Convention, 1st revision SEPTEMBER 2020, Final revision | | | #2: increase variety of users Design and deploy a co-designed application in support of the effectiveness evaluation of the Convention, 1st revision SEPTEMBER 2020, Final revision | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|-----------|----------|--|-----------|-----------|--|---|--|-----------|--|-------------------------------|-----------|--|----------|----------|
| | | | | | | | | | | DECEMBER 2020 | | | DECEMBER 2020 #9 Increase Number of Communities Run of models (developed by different communities) by adopting different databases (developed by different communities), DECEMBER 2020 | | |
| S2 P2 | | | #1 new services Data harmonisation of GMP1 and GMP2 | | | #7 Compliance Prototype | #1 new services New data for GMP3 | #7 Compliance GMP 2 DWH linked to GEOSS | | | #2: increase variety of users | | | | |
| S2 P3 | | | | | | #3: Specific co-design clearly identified needs by each type of user involved in the pilot (May 2020) | #2: increase variety of users initial contacts with IGOs and NGO level users (June 2020) | | | #5 prepared ness index for integration into "As A Service (...AAS)" IT infra | | | | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|-----------|----------|---|-----------|---|---|--|---|---|---------------------------------------|--|---|--|---|--|
| | | | | | | | | | | platform selection (September 2020)#5 | | | | | |
| S3 P1 | | | | | | #2: increase variety of users Running web service. Report on new users inputs | | #11 boost sustainability Scientific paper. Report on the Asian end user involvement | | | #4: Exploiting the wealth of data Online services and database s in terms of static and dynamic solar energy applications exploiting the nextSENSE and Copernicus capabilities | | | | |
| S3 P2 | | | DLR Part : #3: Specific co-design | | ARMINES #2: increase variety of users M11 - First e-shape review meeting: A clear | | DLR Part : #4: Exploiting the wealth of data M1: Concept ready in June 2020 | | ARMINES #2: increase variety of users M15 Initial | | | ARMINES #10 capacity building activities M18 Meeting of | DLR Part : #4: Exploiting the wealth of data | ARMINES #6 prepare for outsourcing part processing chain to a DIAS | ARMINES #10 capacity building activities M21 - Organisation of the 9th Solar |

Feb 03, 2020



| Pilot | Oct. 2019 | Jan. 2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep. 2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2021 | Jan 2021 |
|-------|-----------|-----------|---|-----------|--|----------|--|---|--|-----------|-----------|---|--|---|---|
| | | | M1: Data delivery to DLR-VE in Feb 2020 | | understanding of technical and financial DIAS's offers including specifications, performances, constraints and limitations to support and hosting the pilot. DLR Part : #3: Specific co-design M2: First data included at DLR-VE in Apr 2020 | | #7 Standards Compliance M1: Concept ready in June 2020 | | remote process (WPS) is successfully tested on a DIAS. | | | the Solar Training organisation team. The team will evaluate the readiness of the pilot development to be presented at the 9th Solar Training. The challenge #10 depends of challenge #5 and #6 completion. | M2: Prototype or report ready in Dec 2020 #7 Standards Compliance M2: Report ready in Dec 2020 | M20 - End of sprint 1: Initial testing of DIAS including WPS, and additional needed components are successfully tested. | Training edition organized by Transvalor and MINES ParisTech in January 2021 including the master-class python session supporting the S3P2. |
| S3 P3 | | | | | | | | #1 new services #3: Specific co-design #4: Exploiting the wealth of data Milestone 1: Enhance existing services with increased functionality features and | | | | | #1 new services #3: Specific co-design #4: Exploiting the wealth of data Milestone 2: Develop and validate a unified wind resource product to also be made | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|----------|-----------|----------|-----------|-----------|-----------|----------|--|--|-----------|----------|-----------|-----------|---|----------|----------|
| | | | | | | | | render them more visible to the public/users | | | | | available as a new feature in the same centralized DTU Wind Energy webpage as the other services | | |
| S4 P1 | | | | | | | REVIEW OF MILESTONES #1 new services #5 preparedness index for integration into "As A Service (...AAS)" IT infra #9 Increase Number of Communities Milestone 1: Service Preparedness for DIAS integration (Dec 2020) Milestone 2: Clearly identification of user's needs (Dec 2020) | | | | | | #1 new services #5 preparedness index for integration into "As A Service (...AAS)" IT infra #9 Increase Number of Communities Milestone 1: Service Preparedness for DIAS integration (Dec 2020) Milestone 2: Clearly identification of user's needs (Dec 2020) | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|-----------|----------|-----------|-----------|-----------|----------|--|-----------|-----------|----------|-----------|-----------|--|----------|----------|
| S4 P2 | | | | | | | REVIEW OF MILESTONES #2: increase variety of users #4: Exploiting the wealth of data #7 Standards Compliance Milestone 1: Functional state of the redesigned DEIMS-SDR API (by December 2020) Milestone 2: Functional state of the adapted EcoSense platform (by December 2020) | | | | | | #2: increase variety of users #4: Exploiting the wealth of data #7 Standards Compliance Milestone 1: Functional state of the redesigned DEIMS-SDR API (by December 2020) Milestone 2: Functional state of the adapted EcoSense platform (by December 2020) | | |
| S4 P3 | | | | | | | #1 new services #4: Exploiting the wealth of data #7 Standards Compliance Milestone 1: Implemen | | | | | | #1 new services #4: Exploiting the wealth of data #7 Standards Compliance Milestone 1: Final | | |



| Pilot | Oct. 2019 | Jan. 2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep. 2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|-----------|-----------|-----------|-----------|-----------|----------|---|--|-----------|---|-----------|-----------|---|----------|----------|
| | | | | | | | | tation of the Minimum Information Standards for promoting compliance with GEO Data Sharing and Data Management Principles and mobilization of further EBV datasets documented according to the EBV-Minimum Information Standards. First operational version of the Standard: July 2020 | | | | | version demonstrated in new EBV datasets: December 2020 Milestone 2: Increase the number of services to end-users through integration of the different components of the infrastructure (VAT system, GEO server, database infrastructure and Metadata Tool): December 2020 | | |
| S5 P1 | | | | | | | REVIEW OF MILESTONE #3: Specific co-design Milestones: The document will be produced in the end | | | #1 new services Methodology to evaluate the hydrological model and fine-tune the | | | #1 new services Methodology to evaluate the hydrological model and fine-tune the | | |

Feb 03, 2020



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|-----------|----------|-----------|-----------|-----------|----------|------------------------------|-----------|-----------|---|-----------|-----------|--|----------|----------|
| | | | | | | | of the sprint (end of 2020). | | | <p>model parameters based on EO data. An EO catalogue/database is compiled to set data useful for the hydrological applications. This will be done by the end of summer, whilst the methodology for evaluating the model will be generated by the end of this year (considering results from the model evaluation).</p> <p>#12: increase no of operational integration into user workflow</p> <p>Milestones: Setup of the EO catalogue, which will include EOs from DIAS by</p> | | | <p>model parameters based on EO data. An EO catalogue/database is compiled to set data useful for the hydrological applications. This will be done by the end of summer, whilst the methodology for evaluating the model will be generated by the end of this year (considering results from the model evaluation).</p> <p>#3: Specific co-design</p> <p>Milestones: The document will be produced in the end of the sprint (end of 2020).</p> | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|----------|-----------|----------|-----------|-----------|-----------|---|--|-----------|--|-------------------------|---|-----------|-----------|----------|----------|
| | | | | | | | | | | the end of this summer. | | | | | |
| S5 P2 | | | | | | <p>#3: Specific co-design</p> <p>The GFP annual meeting takes place in June 2020. We will organize a series of workshops with selected members of the GFP by May 2020 in order to present them the default product feedback and to collect their initial requirements. The feedback and results of eshape for selected test areas will then be presented at the annual meeting.</p> <p>#6 prepare for outsourcing to a DIAS</p> <p>our software should be implemented on nextGeoss halfway through the sprint so that</p> | <p>#3: Specific co-design</p> <p>The GFP annual meeting takes place in June 2020. We will organize a series of workshops with selected members of the GFP by May 2020 in order to present them the default product feedback and to collect their initial requirements. The feedback and results of eshape for selected test areas will then be presented at the annual meeting.</p> | | <p>#9 Increase Number of Communities</p> <p>Demonstration material for selected test areas will be generated halfway through the sprint and distributed to selected members of the GFP, at the GFP annual meeting in September 2020 first feedback on these data sets will be collected</p> | | <p>#6 prepare for outsourcing to a DIAS</p> <p>our software should be implemented on nextGeoss halfway through the sprint so that after initial testing the data processing can start at the end of the sprint</p> | | | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
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| | | | | | | <p>after initial testing the data processing can start at the end of the sprint</p> <p>#9 Increase Number of Communities</p> <p>Demonstration material for selected test areas will be generated halfway through the sprint and distributed to selected members of the GFP, at the GFP annual meeting in September 2020 first feedback on these data sets will be collected</p> | | | | | | | | | |
| SS P3 | | | | | | <p>#1 new services</p> <p>we will re-evaluate/validate the Means of evaluation at the half way mark (~May 2020) we will look at the current geographic spread of user</p> | | | | | <p>#6 prepare for outsourcing to a DIAS</p> <p>At the halfway point of the sprint, we would like to have at a minimum a</p> | | | | |

Feb 03, 2020



| Pilot | Oct. 2019 | Jan. 2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep. 2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
|-------|-----------|-----------|-----------|-----------|-----------|---|-----------|-----------|-----------|-----------|-----------|--|-----------|----------|----------|
| | | | | | | <p>uptake and see if we need to do more to achieve our goal</p> <p>#6 prepare for outsourcing to a DIAS</p> <p>At the halfway point of the sprint, we would like to have at a minimum a dockerised (or other container system) version of our processing running on a DIA with access to the required data from CMEMS, this will be followed up with the creation of web services for the final milestone at the end of the sprint.</p> <p>#9 Increase Number of Communities</p> <p>we will re-evaluate/validate the Means of evaluation at the half way mark (~May 2020) based on the number of users at this stage we</p> | | | | | | <p>dockerised (or other container system) version of our processing running on a DIA with access to the required data from CMEMS, this will be followed up with the creation of web services for the final milestone at the end of the sprint.</p> | | | |

Feb 03, 2020



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
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| | | | | | | may change the mechanism for outreach | | | | | | | | | |
| S5 P4 | | | | | #6 prepare for outsourcing to a DIAS use sentinel data provided by a DIAS for the calculation of the Sargassum index. Review and acceptance of the chain ready for dockerisation at the interim meeting (April) | | | | #2: increase variety of users Combine S-3 and MODIS for a daily merged product. Improved version of Sargassum index by August 2020 | | | #4: Exploiting the wealth of data compute the reanalysis using a DIAS infrastructure re- November 2020 | | | |
| S5 P5 | | | | | | | #3: Specific co-design to have a set of well defined requirements from DGRM and DRPA to drive the development of the pilot during this and the next development sprints. First set of requirements to be concluded in June 2020. | | | | | #1 new services to have these products/se rvices available in the new version of the web application for the defined AoI and time series - November 2020 | | | |



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| | | | | | | | | | | | | <p>#4: Exploiting the wealth of data</p> <p>to have the new version of the web application deployed in NextGEOSS - November 2020</p> | | | |
| S6 P1 | | | | | | <p>#4: Exploiting the wealth of data</p> <p>set up of the API services for connection between the original sources (e.g. ACTRIS datacenter, IMO and INGV local servers) and the EUNADIC-AV portal service (identified platform) – May 2020</p> | | <p>#1 new services</p> <p>vertical profiles assimilated in FLEXPART and SILAM – July 2020</p> | | <p>#3 Specific co-design</p> <p>Meeting and discussion with co-designer and potential additional users and stakeholders. Planned some user meetings even in collaboration with other projects. – September 2020</p> | | | | | |
| S6 P2 | | | | <p>#2: increase variety of users</p> | | | | | | | | | <p>#2: increase variety of users</p> | | |

Feb 03, 2020



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|-------|-----------|----------|-----------|--|-----------|----------|-----------|-----------|-----------|----------|-----------|-----------|--|----------|----------|
| | | | | <p>M11 - preliminary requirements collection completed.</p> <p>#4: Exploiting the wealth of data</p> <p>M11 - Successful testing of daily operationally automatic download for GRD and NDVI over Italy.</p> <p>#9 Increase Number of Communities</p> | | | | | | | | | <p>M20 - final requirements collected and chain design completed</p> <p>#4: Exploiting the wealth of data</p> <p>M20 - Successful testing of daily operationally automatic download for all variables needed over Italy.</p> <p>#9 Increase Number of Communities</p> <p>M20 - final requirements collected and chain design completed and first chain test presented to the users</p> | | |



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|-------|-----------|----------|-----------|---|---|----------|---|-----------|-----------|----------|-----------|-----------|---|----------|----------|
| | | | | M11 - preliminary requirements collection completed and use case selection completed. | | | | | | | | | | | |
| S6 P3 | | | | | <p>#2: increase variety of users</p> <p>Initiate contacts with potential new users (Apr 2020)</p> <p>#10 capacity building activities</p> <p>Generation of training materials from raw scientific data (Apr 2020)</p> | | <p>#4: Exploiting the wealth of data</p> <p>Successful testing of the methodology designed to manage the large results from GEP processing (Jun 2020).</p> | | | | | | <p>#2: increase variety of users</p> <p>initiate the collaboration with the final new users (Dec 2020).</p> <p>#4: Exploiting the wealth of data</p> <p>Successful testing of the semiautomatic classification of the InSAR possible origin (Dec 2020).</p> | | |



| Pilot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
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| | | | | | | | | | | | | | #10 capacity building activities organization of capacity activities (Dec 2020) | | |
| S6 P4 | | | | | #3 Specific co-design #4: Exploiting the wealth of data #9 Increase Number of Communities Sprint interim assessment: M11 Apr 2020 Progress in parallel for all 4 services, final specifications following the co-designers' requirements. | | | | | | | | #3 Specific co-design #4: Exploiting the wealth of data #9 Increase Number of Communities • M20 Dec 2020 Prototype for 3 of 4 services. | | |
| S7 P1 | | | | | | #1 new services Compare different DIAS service providers #4: Exploiting the wealth of data | | | | | | | #2: increase variety of users Interview a modeler for need | | |

Feb 03, 2020



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| | | | | | | Compare different DIAS service providers | | | | | | of his/her group | | | |
| S7 P2 | | | | | #3 Specific co-design First stage of the co-design process completed (April 2020) | #4: Exploiting the wealth of data First data evaluation (temperature) completed (May 2020) | #6 prepare for outsourcing to a DIAS Access to seasonal forecast in Weenvironment implemented (Jun 2020) | | #8 Increase in the number of key organizations involved Initial report on collaboration with selected cities available (Aug 2020) | | | | | | |
| S7 P3 | | | | | | #6 prepare for outsourcing to a DIAS Milestone 05/2020: report on interface test and implementation of web app service | | #8 Increase in the number of key organizations involved Milestone 07/2020: report on feedback of co-designer and potential additional users and stakeholders #9 Increase Number of | | #9 Increase Number of Communities Milestone 10/2020: report on user survey of app users | | | | | |



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| | | | | | | | | Communities Milestone 07/2020: report on usage analysis, support and helpdesk activation | | | | | | | |
| S7 P4 | | | | | | | | | #6 prepare for outsourcing to a DIAS Milestone 08/2020: report on interface test and implementation of web app service | #8 Increase in the number of key organizations involved Milestone 09/2020: report on feedback of co-designer and potential additional users and stakeholders | | #9 Increase Number of Communities Milestone 11/2020: report on usage analysis, support and helpdesk activation | | | |
| S7 P5 | | #1 new services Milestone: all the products are selected in collaboration with the | | | #3 Specific co-design Milestone: the first co-design process of the products ends, all the products are designed (April 2020) | | | | | #6 prepare for outsourcing to a DIAS Milestone: report on interface test and implementation of web | | | | | |



| Pil ot | Oct. 2019 | Jan.2020 | Feb. 2020 | Mar. 2020 | Apr. 2020 | May 2020 | Jun. 2020 | Jul. 2020 | Aug. 2020 | Sep.2020 | Oct. 2020 | Nov. 2020 | Dec. 2020 | Jan 2020 | Jan 2021 |
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| | | stakehol ders (Jan 2020) | | | | | | | | service (Sep 2020) | | | | | |