WEkEO Forest Monitoring 2024

Post-event report

WEkEO Implemented by EUMETSAT MERCATOR OCEAN INTERNATIONAL ECMWF European Environment Agency Funded by

MERCATOR OCEAN
INTERNATIONAL
2 avenue de l'Aérodrome de Montaudran, 31400 Toulouse, FRANCE
Tél : +33 5 61 39 38 02 - Fax : +33 5 61 39 38 99
Société civile de droit français au capital de 2 000 000 € - 522 911 577 RCS Toulouse - SIRET 522 911 577 00024

wekeo.eu
mercator-ocean.eu

SUMMARY

Introduction

Here you will find the unanswered questions of the training « WEkEO 4 Forest Monitoring » held the 16th and 18th October 2024. More than 1000 people took part of the event, hence this post-event report.

Please keep in mind that some of the questions asked were very similar, as a result we've summarized the different topics you covered in the Q&A.

We thank you again for your presence and hope to see you again !

General questions

Data & products

Concerning the data and products available : Data viewer | WEkEO

- Here you can check the full catalogue of available data
- You can see the exact description of each product
- You can vizualize them on a map
- And download them if you wish to

Download the data

How to download the data (wms, api, etc.) : WEkEO Data Download | WEkEO Help Center

- You will find several articles with the different ways to download the data
  - With the Viewer
  - Via HDA – API
- And the errors you might encounter

Virtual machines and Jupyter Notebooks Catalogue

WEkEO paid subscription & virtual machines : Computing | WEkEO

Jupyter Notebooks catalogue : Jupyter Catalog (wekeo2.eu)

Calculation and specific parameters

We also had plenty of questions about the different ways of calculating certain parameters (for example biomass calculation, photosynthesis) and so on for your projects. We invite you to look

for research papers that will provide you with a full description of their working methods and the calculations/models/data they use. You can look on ResearchGate, Connected Papers, Google Scholar and many others.

The tutorials – general questions & issues

Concerning general questions & issues about the tutorials :

- The tutorials are reviewed and made by experts, some typo errors might still be here but the tutorials that we provide to you work on the right environment with the right libraries and packages.
- The tutorials are made available a few days before the event so you have time to study them if you wish.
- Please check the documentation made available with the tutorials, all of the steps are detailed in it.
- Each tutorial to download is made with a 1-hour explanatory video (on the live session we only present a summary), we invite you to check them.
- If you still find yourself with questions about how to download the data or run the tutorial, please contact the user support team.

Technical issues during the event

About the technical issues you might have encountered (sound, image, log in to the event). All your comments have been noted, we are working to resolve these issues and we thank you for your feedback.

Copernicus Land Monitoring Service portfolio

Here is the link to the CLMS portfolio : CLMS portfolio — Copernicus Land Monitoring Service

You can find every dataset and product, you can also check the roadmap section for each of them to know about the upcoming updates, the update cycle, etc. (you have to select a product first).

DAY 1 – 16 October 2024

User testimony #1 – Rowan Fealy & Tim McCarthy (Maynooth University)

COMING SOON

User testimony #2 – Mikko Strahlendorff (Finnish Meteorological Institute)

Useful links:
Harvester Season as Copernicus C3S service
Data in action at Copernicus Observer
Harvester Seasons participated in the Copernicus Climate Change Gala at 15th of October 2021 among other successful service developments and applications within C3S. (YouTube-video)
Harvester Seasons - A forestry service supporting climate smart operations (FMI's Climate Bulletin: Research Letters)
ECMWF digital twins aid sustainable forestry operations under new Destination Earth use case

- Can we use trafficability in the Tropical Regions ?

In principle yes, but the classification was validated in Finland only and we know that the soil composition is an important factor, which we only cover a subset of options for. So for the tropics it would be best to reclassify and validate it.

- I just tried harvesterseasons.com for Eastern DRC but it gives nothing so I guess it's only for Finland, what would it take to expand it to tropical Africa ?

We cover only Europe with some neighbourhood (bbox -30..50 lon 25..75 lat. But all the snow scripts are there to setup for another region. In the repo github.com/fmidev/chile-smartmet we set the system up for a South American domain. It only took two days to do this and mainly it took time to fetch the ERA5/ERA5-Land data for the new area from cds.climate.copernicus.eu. The bias-adjustment uses 2000-2023 for this.

- What is needed to get 1 km resolution daily over a europe country ?

It is not clear what data you refer for with the resolution, over Finland trafficability is deduced in 16m resolution and for Europe in an unvalidated transfermodeling at 30m resolution. The forecast modelling is currently at ~4km for 5 days of Exremes Digital Twin weather forecasts and ~9km for the seasonal forecasts 6+ months ahead.

The machine learning based soil wetness, soil temperature and snow depth variables could be produced for a smaller area than Europe in 1km in our current 225GB/64 cpu server. One needs to adapt the get-seasonal.sh script accordingly. For 1km production over all of Europe the server would need a bit more memory.

- Can we use it in agroforestry models for monitoring ?

I am unsure what agroforestry models refers to. But of course there are ways to use it especially with the short term forecasts also for monitoring. The service however particularly wants to expand the planning horizon for forestry, to make it more sustainable.

- Is LiDAR data and SAR data is used to produce this data ?

The Air borne Laser Scanning is a key ingredient in producing the static trafficability maps at 16m resolution over Finland. These are plane based surveys, not satellite products. SAR data is fullfilling the same for the European trafficability maps at 30m, but not directly, but as an input to produce the Copernicus Digital Elevation Map.

- Do you also analyse "peat land", e.g. to find out how much carbon you can/could capture ?

Finland has a lot of peatland, which is partly used for forestry. These we do analyse for trafficability. The Carbon capture analysis was a target for our development in the E-shape project. The methodologies for this were not yet mature for a gridded system over Finland or Europe. We therefore added only the guidance documents you can find as buttons under the map. Clicking a button reveals the text, clicking again hides it again.

User testimony #3 – Gherardo Chirici (University of Florence)

COMING SOON

General questions about forest monitoring

Answers from Mikko Strahlendorff (FMI)

- What strategies are being implemented to adapt forest monitoring techniques in response to climate change and its unpredictable effects on forest ecosystems ?

The predictable effects for winter and summer conditions changing for sustainable harvesting we do address. And we extend the planning horizon to see which parcels in winter can be left for

the next summer and when the narrowing windows of winter conditions are available for the next winter.

- How can local communities be effectively engaged in forest monitoring efforts to ensure sustainability and conservation goals ?

Forestry and conservation are choices usually excluding each other. In Finland the forests are owned by over 500 000 individuals, so there are many actions to buy some forests also into conservation actions. For trafficability monitoring, we are just developing a protocol and a web app to gather in-situ observations. Lets see how this goes in a year then it is use.

- How can remote sensing be used to track the success of forest restoration projects over time ?

We are not involved in this but obviously change detection methods are available for this.

- How can forest monitoring improve the estimation of carbon stocks and fluxes to support carbon credit mechanisms?

In Finland we have a forest inventory system since 2006 based on EO (and a hundred year longer based on sampling) to do this for the economic analysis of forestry. Obviously it can be and is used for carbon credits as well.

DAY 2 : 18 October 2024

QGIS – Stefania Ciliberti (NOWSystems)

- I have successfully installed the zip plugin for QGIS that you provide in the course to load NetCDF files. I cannot find it in the toolbar.How I make it appear?

It is sufficient that you do right click in the Panel Menu (e.g., the grey bar that contains all the QGIS icons). A new big menu appears: select **Plugins Toolbar** and the icons with installed plugins in your QGIS will appear in the Panel Menu.

- This platform is very useful since im working in GIS world of work, I love wekeo. Is the basemap of this QGIS updated? how often does the basemap update?

In the proposed tutorial, I exploited OpenStreetMap. To answer your question, I suggest you to install a new plugin called QuickMapServices:

- In the Panel Menu, select ***Plugins à Select and Manage Plugins***
- A new window appears. In the search bar, type "***QuickMapServices***".
- Once selected, click on ***Install Plugin***.
- Once installed, the corresponding icons will be displayed in the Panel Menu.
- Select the icon related to QuickMapServices: once done, a new menu appears and you can select, for example, **Search QMS panel**. A list of available basemaps will be displayed. You can select for instance a basemap from Google or from NASA.
- If you would like to have always the last available basemap, you might want to select **MetaSearch** icon. It opens a new window that contains settings to define such as the URL to open for accessing the basemap.

The update of the basemap depends on the provider. Further details on basemaps to use through the plugin are available at https://plugins.qgis.org/plugins/quick_map_services/#plugin-about

- Can we acces coppernicus datasets provided by wekeo directly from QGis through online map rest or WMS/WMTS?

The answer is yes: please refer to https://docs.qgis.org/3.34/en/docs/training_manual/online_resources/wms.html to have more information about how to connect your QGIS to a WMS/WMTS server.

Thanks again for your participation 😊