**Remote sensing for vegetation monitoring**

**Activity 2: Exploring vegetation productivity in Europe with the *Copernicus Land Monitoring Service (CLMS)*** *(approx. 30 minutes)*

**Copernicus** is the Earth Observation component of the European Union’s space programme, looking at our planet and its environment for the benefit of Europe’s citizens.

The **Copernicus Land Monitoring Service (CLMS)** - <https://land.copernicus.eu/en> - provides geographical information on land cover and its changes, land use, ground motion, vegetation state, water cycle and earth surface energy variables for both Europe and the entire globe.

**Objective:**

Gain an introduction to how satellite remote sensing research supports the understanding and monitoring of vegetation trends using the *Copernicus Land Monitoring Service* map viewer. Students will explore a variety of approaches and products used to map key bio-geophysical variables, including vegetation properties, indices, seasonal trajectories, phenological patterns, and productivity, enhancing their understanding of how Earth observation contributes to environmental monitoring.

* Lauch the **Copernicus Land Monitoring Service (CLMS**) Map viewer: <https://land.copernicus.eu/en/map-viewer>
* From the headings at the left, expand **Bio-geophysical Variables**, and then **Vegetation**.

**The Plant Phenology Index (PPI):** The Plant Phenology Index (PPI) is a satellite-derived vegetation index designed to closely reflect the **photosynthetic activity and biomass** of vegetation. PPI is linearly related to **leaf area** and **chlorophyll content**.

1. **Total productivity - global dataset**

Provides the growing season integral computed as the sum of all daily Plant Phenology Index values between the dates of the season start and end.

* Expand **Vegetation Phenology and Productivity Parameters**
* Check the box **Total Productivity 2023-preent (raster 300m) global** to view this data
* This provides the **growing season** integral computed as the **sum of all daily Plant Phenology Index values** between the dates of the **season start and end**.

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1. **Plant Phenology Index - Europe**

* Close all datasets.
* Expand **Vegetation Seasonal Trajectories**
* Check the box **Plant Phenology Index Seasonal Trajectories 2017-present (raster 10), Europe, 10-daily** to view this data. This is a filtered time series with a regular 10-day time step.
* Zoom in on an area you are familiar with, e.g. where you live.
* Click the clock icon next to the data layer to open the **time slider**.
* You now see a time slider with the **date** of the data viewed. A screenshot of a calendar

  AI-generated content may be incorrect.
* Click the “**play button**” for a 10-day step animation.
* You can clearly see with this amination the time lapse of the vegetation growing seasons.

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With such data, we can analyse trends in the timing of the **start** of the growing season, the **length** of the growing season, **end** dates of the growing season, **geographical shifts** of productive areas etc.