Leaf Area Index

ESSENTIAL CLIMATE VARIABLE (ECV) FACTSHEET

GLOBAL CLIMATE OBSERVING SYSTEM
KEEPING WATCH OVER OUR CLIMATE

WMO IOC International Science Council UN environment

ECV IN BRIEF

Domain: Terrestrial
Subdomain: Biology
Scientific Area: Biosphere
ECV Stewards: Nadine Gobron
Products: Maps of LAI for modelling
Maps of LAI for adaptation

Leaf Area Index

The Leaf Area Index (LAI) of a plant canopy or ecosystem, defined as one half of the total green leaf area per unit horizontal ground surface area, measures the area of leaf material present in the specified environment. On sloping surfaces, the leaf area should be projected to the underlying ground along the normal to the slope. This dimensionless variable varies between 0 and values of about 10 or so, depending on local conditions. It partly controls important mass and energy exchange processes, such as radiation and rain interception, as well as photosynthesis and respiration, which couple vegetation to the climate system. Hence, LAI appears as a key variable in many models describing vegetation–atmosphere interactions, particularly with respect to the carbon and water cycles.

ECV Product[1]

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQUENCY	RESOLUTION	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	STANDARDS/ REFERENCES
Maps of LAI for modelling	**Effective Leaf Area Index**	Daily	250m	max(15%)	max(10%; 0.25)	
Maps of LAI for adaptation	**Effective Leaf Area Index**	Daily	50m	max(15%)	max(10%; 0.25)	

[1] Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements until 2022. More information on: gcos.wmo.int and climatedata.wmo.int.

Data Sources[2]

- Copernicus Global Land Service providing bio-geophysical products of global land surface

http://land.copernicus.vgt.vito.be/PDF/portal/Application.html#Home

- CEOS Working Group on Calibration and Validation, Land Product Validation Subgroup

https://lpvs.gsfc.nasa.gov/producers2.php?topic=LAI

- Satellite ECV Inventory by the CEOS/CGMS Working Group on Climate (WGClimate)

http://climatemonitoring.info/ecvinventory

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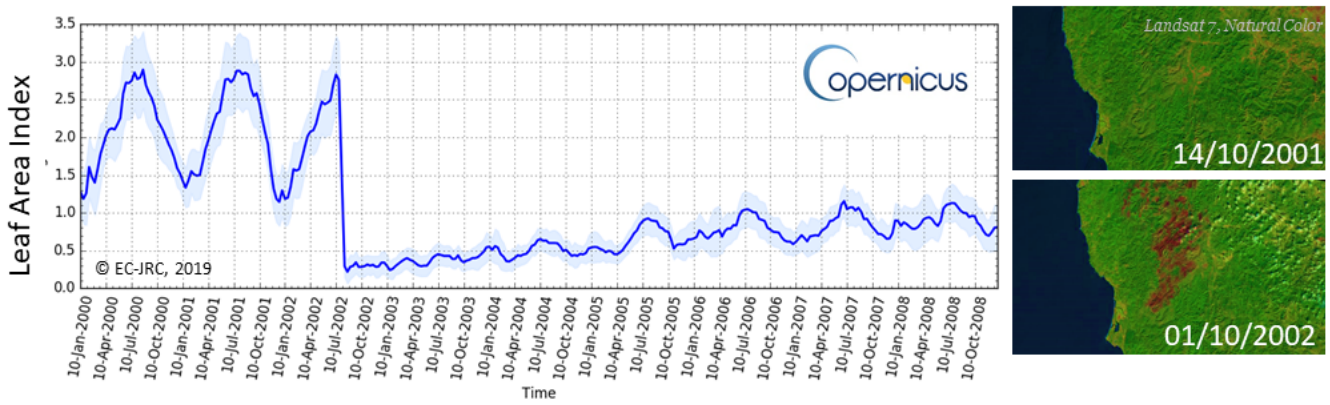

Figure: Time series of LAI (from Copernicus Global Land Service), spatially averaged over 6 x 6 km^2, around the Pearsoll Peak, Oregon, United States (42°18'N; 123°51'W). In June 2002, a big fire event occurred. The error bars correspond to the spatial standard deviation around the central pixel. Landsat 7 images from https://earthexplorer.usgs.gov/.

[2] This list provides sources for openly accessible data sets with worldwide coverage for which metadata is available. It is curated by the respective GCOS ECV Steward(s). The list does not claim to be complete. Anyone with a suitable dataset who would like it to be added to this list should contact GCOS.