

Fraction of Absorbed Photosynthetically Active Radiation (FAPAR)

ESSENTIAL CLIMATE VARIABLE (ECV)
FACTSHEET



GLOBAL CLIMATE
OBSERVING SYSTEM
KEEPING WATCH OVER OUR CLIMATE



ECV IN BRIEF

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



Fraction of Absorbed Photosynthetically Active Radiation (FAPAR)

Solar radiation in the spectral range 400–700 nm, known as photosynthetically active radiation (PAR), provides the energy required by terrestrial vegetation to produce organic materials from mineral components. The part of this PAR that is effectively absorbed by plants is called FAPAR. FAPAR is related to, but different from, Leaf Area Index, which describes the amount of leaf material in the canopy. FAPAR plays a critical role in assessing the primary productivity of canopies, the associated fixation of atmospheric CO₂ and the energy balance of the surface. Monitoring FAPAR provides information on the amount and health cycle of vegetation.

ECV Product¹

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQ.	RES.	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	STANDARDS/ REFERENCES
Maps of FAPAR for modelling	FAPAR is the fraction of the incoming radiation in the 400-700 nm band absorbed by the leaves, which can be used for photosynthesis. Definitions differ according to illumination conditions and leaf state.	Daily	200/500 m	max(10%; 0.05)	max(3%; 0.02)	
Maps of FAPAR for adaptation	FAPAR is the fraction of the incoming radiation in the 400-700 nm band absorbed by the leaves, which can be used for photosynthesis. Definitions differ according to illumination conditions and leaf state.		50m	max(10%; 0.05)	max(3%; 0.02)	

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 Sources²

- ▶ Copernicus Climate Change Service (C3S) data store
<https://cds.climate.copernicus.eu/>
- ▶ Satellite ECV Inventory by the CEOS/CGMS Working Group on Climate (WGClimate)
<http://climatemonitoring.info/ecvinventory>

FAPAR Satellite Image

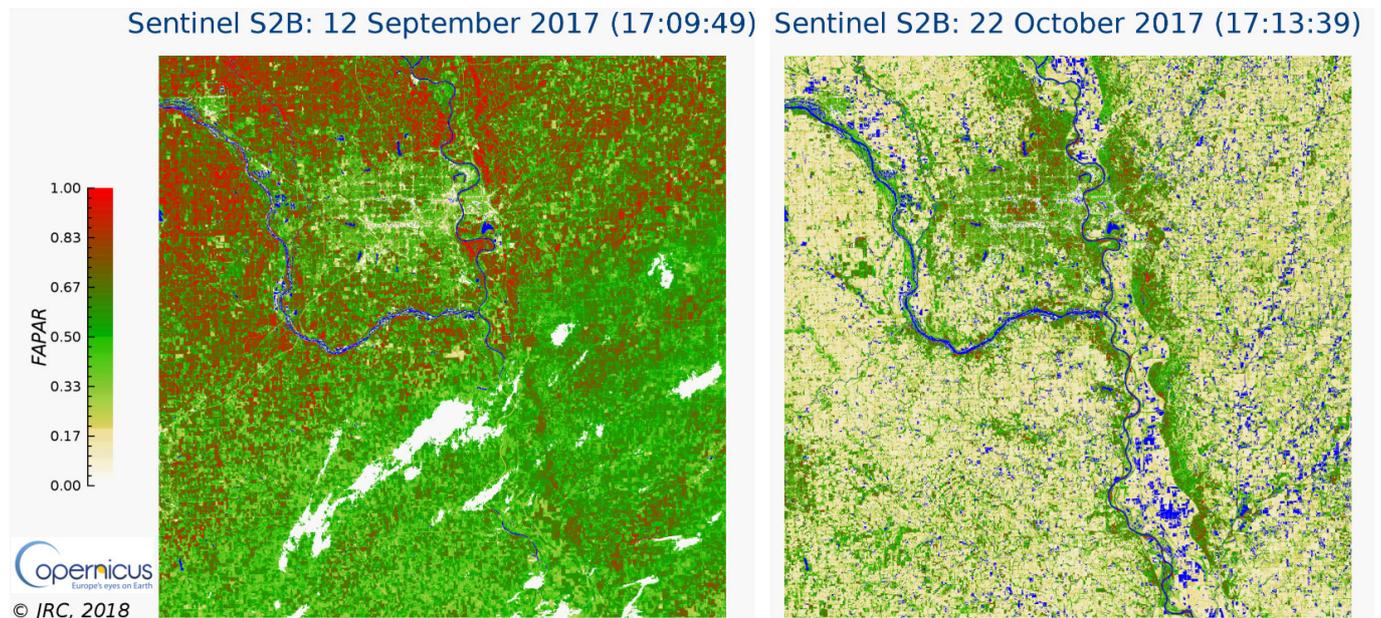


Figure : FAPAR on 12 September 2017 and 22 October 2017 of the same region. Data from Sentinel S2B MSI.

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.