

climate change initiative

→ CLIMATE MODELLING USER GROUP

Vegetation phenology study and vegetation/hydrometeorology study

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CMUG Integration Meeting – 16 October 2024



Ongoing

WP5.2

Impacts and evaluation of vegetation phenology changes on observed and modelled land-atmosphere processes.



Task 5.2.1: Testing and feedback on preliminary LAI datasets



Main outcomes provided in the deliverable:

- Continuous exchange of information and feedbacks between users and developers;
- Request of clumping index to compute true LAI from the provided effective LAI;
- Preparation of spatial aggregation tool for LAI data;

Further details at WP5.2 poster and in Deliverable D2.0bv1(5.2.1)





Task 5.2.1: Testing and feedback on preliminary LAI datasets

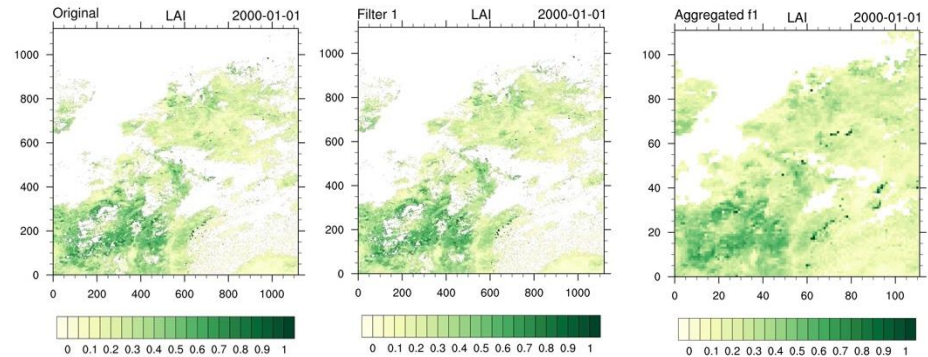


- Filter the data base on quality;
- Weighted aggregation based on relative error;

Main outcomes provided in the deliverable:

- Continuous exchange of information and feedbacks between users and developers;
- Request of clumping index to compute true LAI from the provided effective LAI;
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$$LAI_{agg} = \frac{\sum_i (LAI_i / LAI_{re,i}^2)}{\sum_i (1 / LAI_{re,i}^2)}$$



Further details at WP5.2 poster and in Deliverable D2.0bv1(5.2.1)





Task 5.2.2: Analyses of relationships between phenology and land-atmosphere processes



Vegetation



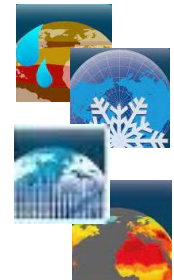
Identify phenophases



Land cover
Biomass



Identify regions



soil moisture
Snow
Water vapour
Land Surface
temperature



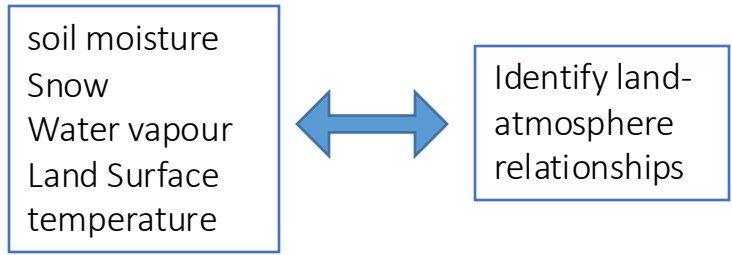
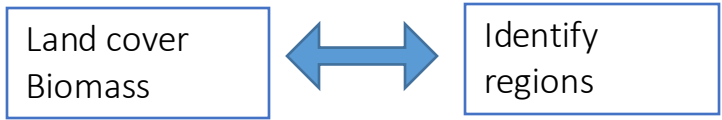
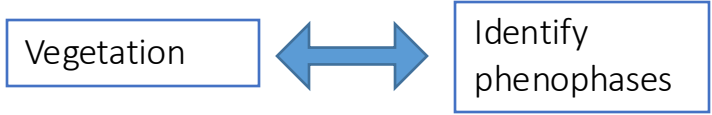
Identify land-atmosphere relationships

Further details at WP5.2 poster



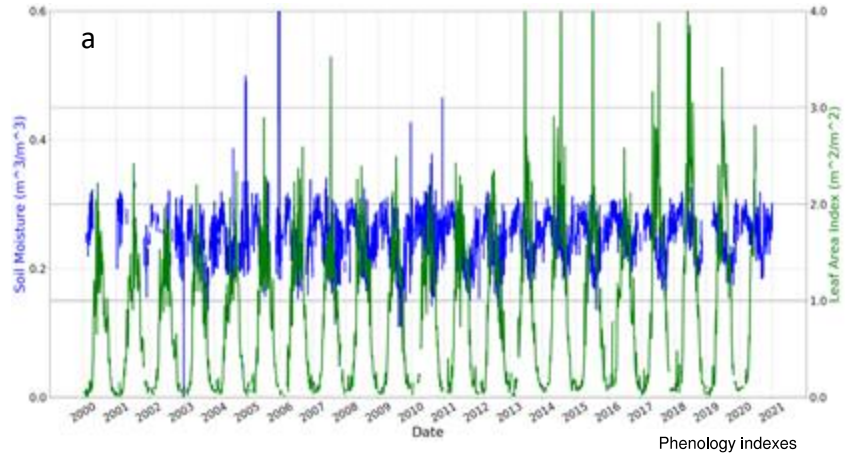


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Further details at WP5.2 poster

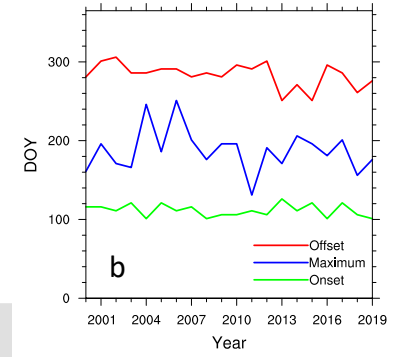
Preliminary evaluations:



Comparison between

a) LAI and SoilMoisture time series;

b) Phenology indexes timeseries.





Ongoing

WP5.2

Impacts and evaluation of vegetation phenology changes on observed and modelled land-atmosphere processes.

Vegetation
Study



Future

OWP5.2

Impacts and evaluation of vegetation phenology changes on observed and modelled land-atmosphere processes
– part 2



GOAL

Are ESMs able to capture the observed relationships and sensitivities between phenology and land-atmosphere processes?

Where, when and why are these modelled well or poorly?



Indicators and assessment from WP5.2 on CCI data



Apply to ESMs simulations, as done with offline simulations (e.g. Peano et al., 2021)





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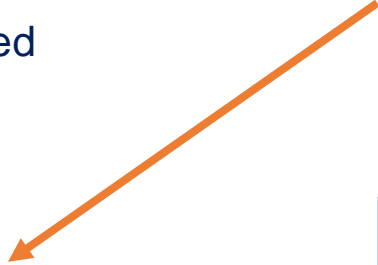


Indicators and assessment from WP5.2 on CCI data



Apply to ESMs simulations, as done with offline simulations (e.g. Peano et al., 2021)

Organize into ESMValTool Recipe to be used with future ESM simulations





Ongoing

WP5.2

Impacts and evaluation of vegetation phenology changes on observed and modelled land-atmosphere processes.

Vegetation
Study

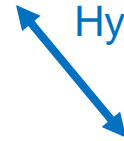


Future

OWP5.2

Impacts and evaluation of vegetation phenology changes on observed and modelled land-atmosphere processes
– part 2

Hydrometeorology
Study



Future

OWP5.9

Assessment and evaluation of the role of vegetation on hydrometeorological processes in CMIP models



GOAL

Do ESMs capture observed spatio-temporal relationships between vegetation and hydrometeorological conditions?

Which locations and biomes exert a strong influence on vegetation-atmosphere exchanges of water and energy in CMIP ESMs?



Assess relationships between water availability (land + atmosphere), snow distribution and timings, and vegetation distribution and timings





Courtesy of Virginia Ninni

