The first part of 2016 shows extended vegetation anomalies while snow anomalies were sparse:

- High vegetation greenness observed in Southern Alps valleys from mid-January to the mid-March.
- An early start of vegetation period induced anomalies in South-East Europe from mid-Feb. to mid-April.
- Exceptional snow cover occurred in Dinaric Alps in the last week of April 2016.

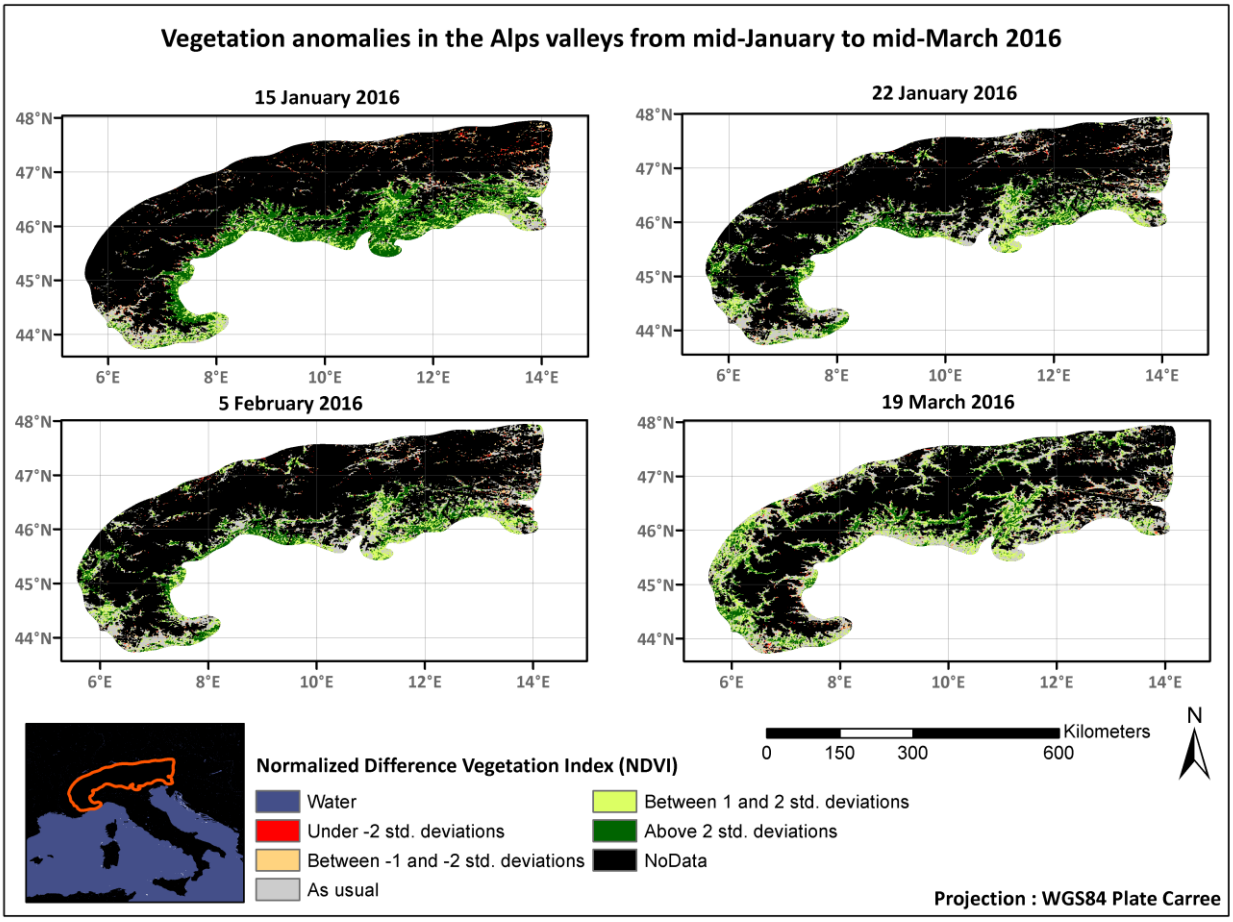


Figure 1: Vegetation anomalies in the Alps valleys at four dates between Mid-January and mid-march 2016.

Higher than usual vegetation greenness in Italian Alps valleys:

The mild wheater of this winter has affected the vegetation in the valleys of the Alps, where there was more green vegetation than usual (Figure 1). Vegetation anomalies lasted for two months from mid-January to mid-March 2016.

This kind of mild weather favors the growth of vegetation at higher altitude among other things by extending the season of vegetation. This extention allows some species to grow and reproduce in ecological niches of higher altitude.

Currently, there is a shift in the vegetation successions in the Alps because of the elevation of temperature induced by the climate change. Many plant species are concerned by this shift which threatens biodiversity in mountain ecosystems (S. Normand et al., 2009, Importance of abiotic stress as a range-limit determinant for European plants: insights from species responses to climatic gradients, *Global ecology and biogeography*, Vol. *18(4)*, 437-449.).

Large anomalies of vegetation from mid-February to mid-April 2016 in Carpathian Mountains:

From mid-February to mid-April, higher than usual vegetation greenness has been observed over large areas of the Carpathian Mountains and more generally in all South-East Europe. The extent and strength of anomalies were particularly large during March and April 2016. Observed NDVI values were above the upper limit of the 95% confidence interval over large areas (Figure 2).

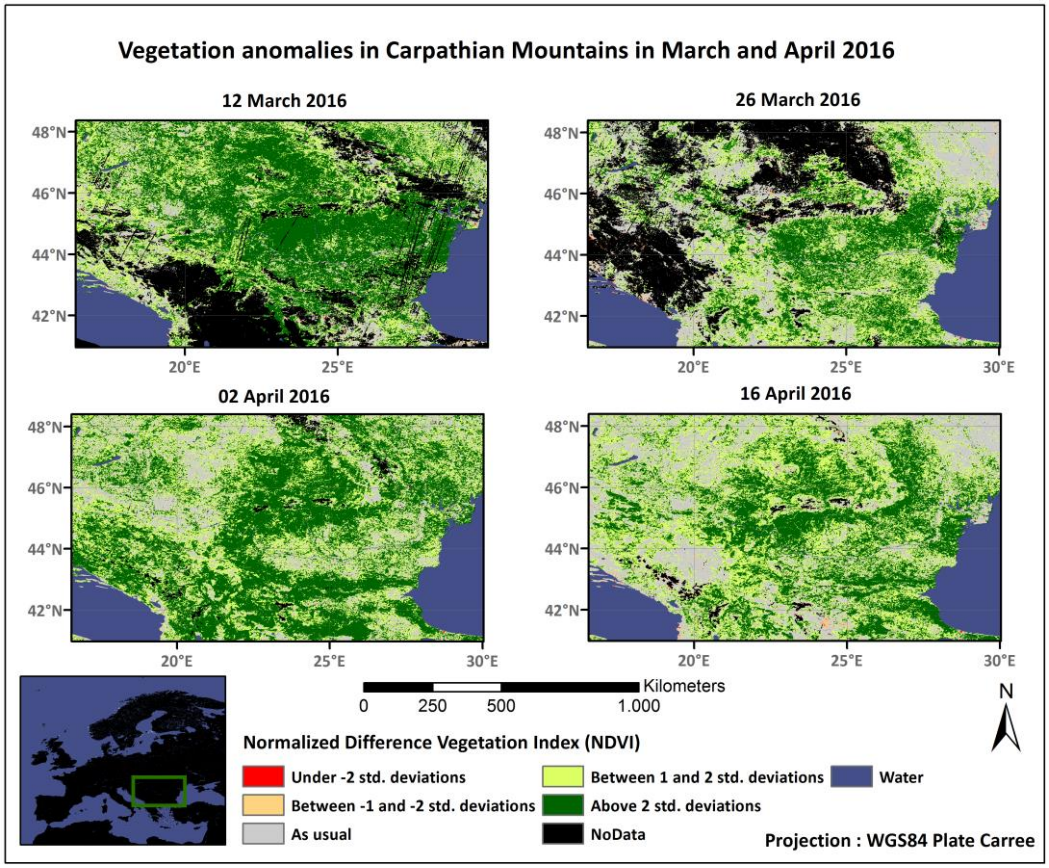


Figure 2: Vegetation anomalies in South-East Europe in March and April 2016.

It seems that the high vegetation index values (NDVI) values are due to a persitant anomaly of temperature in the whole region. Mean air temperatures from mid-February to mid-April were at least 3°C above the mean climatology (1981-2010) in the region (Figure 3).

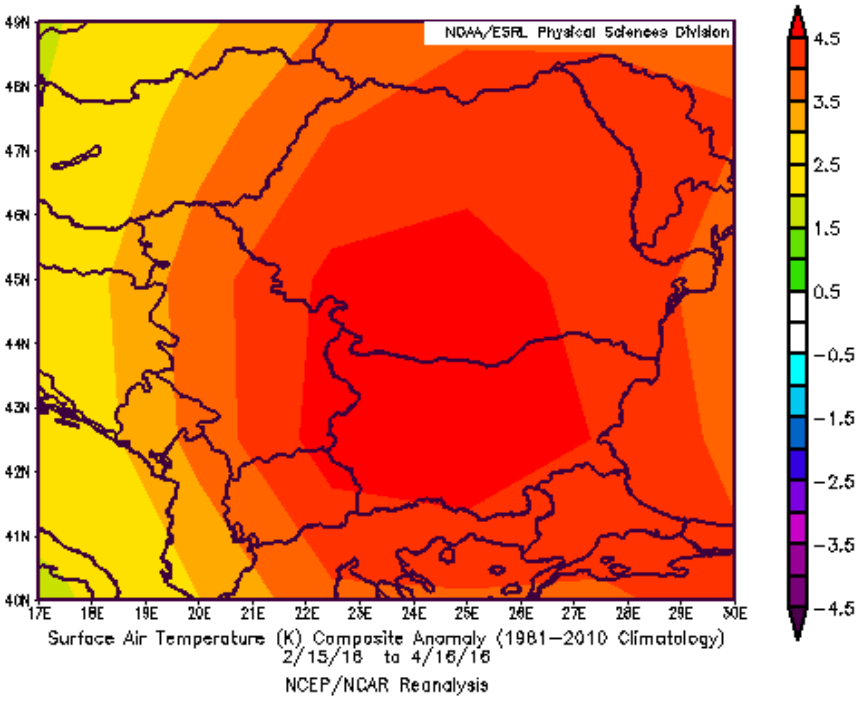


Figure 3: Surface air temperature anomaly between the 15/02/2016 and the 16/04/2016 in South-East Europe. This figure comes from the NCEP/NCAR Reanalysis 1981-2010 Climatology.

Vegetation anomalies in the first half of 2016 were exceptionnaly extented and strong. In addition to Alps valleys and South-East Europe, anomalies happened in Turkey, France, Belgium, Sweden, Finland, etc. This kind of pattern has never been seen before during the research period.

LifeWatch
E-Science European Infrastructure for Biodiversity and Ecosystem Research
Bulletin of Land Surface Dynamics
First half of 2016

Important snowfall in Serbia, Bosnia and Montenegro on the last week of April 2016:

During the last week of April 2016, large unusual snowfalls occurred in Dinaric Alps covering Serbia, Bosnia Herzegovina and Montenegro. Most of Slovenia was under 25 cm of snow and up to 40 cm in mountain areas.

These snowfalls were particularly exceptional considering the period of the year when they occurred. As a result, it has affected numerous plant species during their flowering period.

For example, flowers of some species of Orchids and Liliaceous (For instance: *Anacamptis pyramidalis*, *Erythronium dens-canis* L. and *Orchis provincialis* Balb. ssp. *Pauciflora*) from the natural park of Diokovo in Croatia (Highlighted in orange on Figure 4) were covered by snow during part of their usual their flowering period (which takes place between March and June).

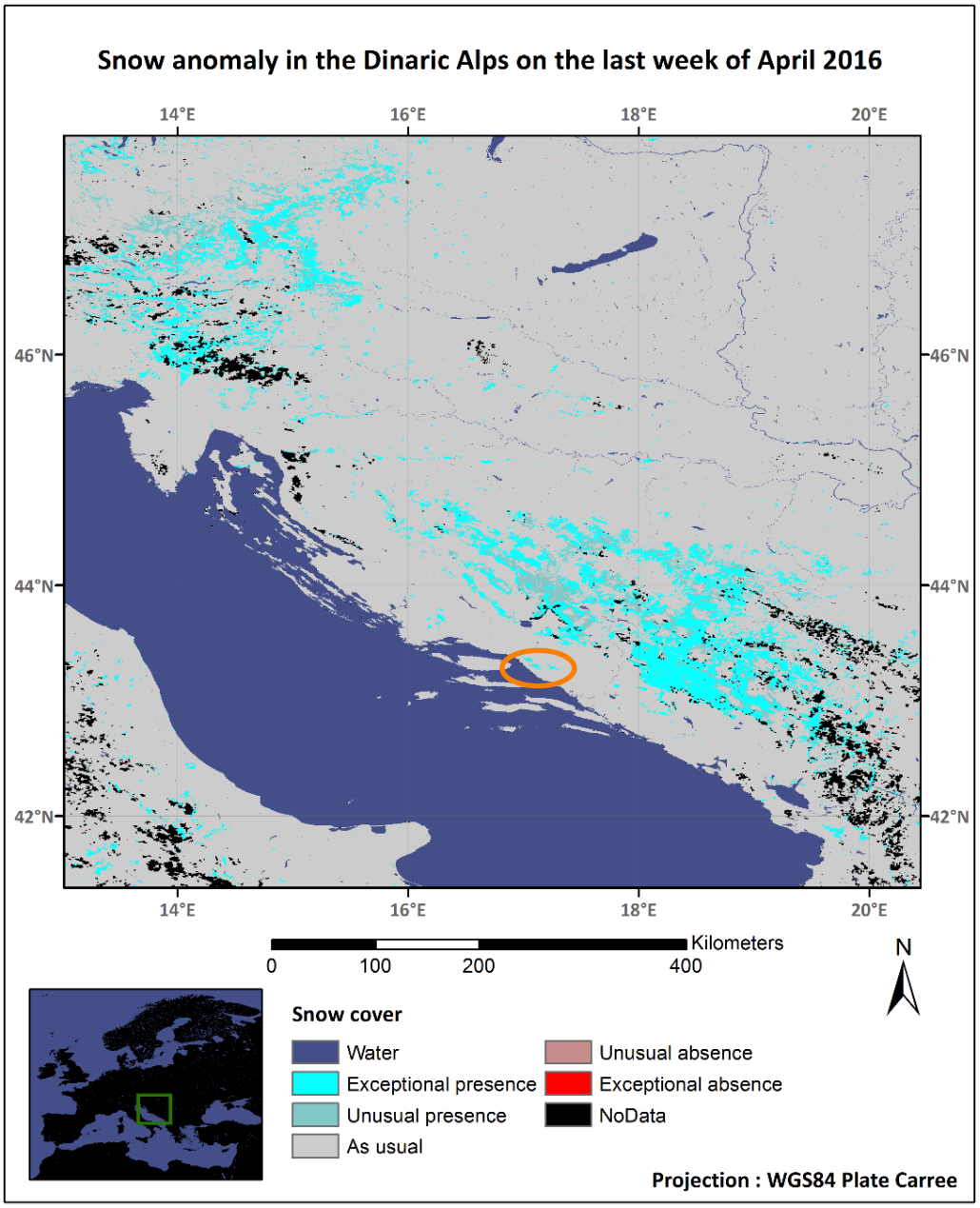


Figure 4: Snow anomalies in Dinaric Alps on the last week of April 2016.

Anacamptis pyramidalis

Erythronium dens-canis L.

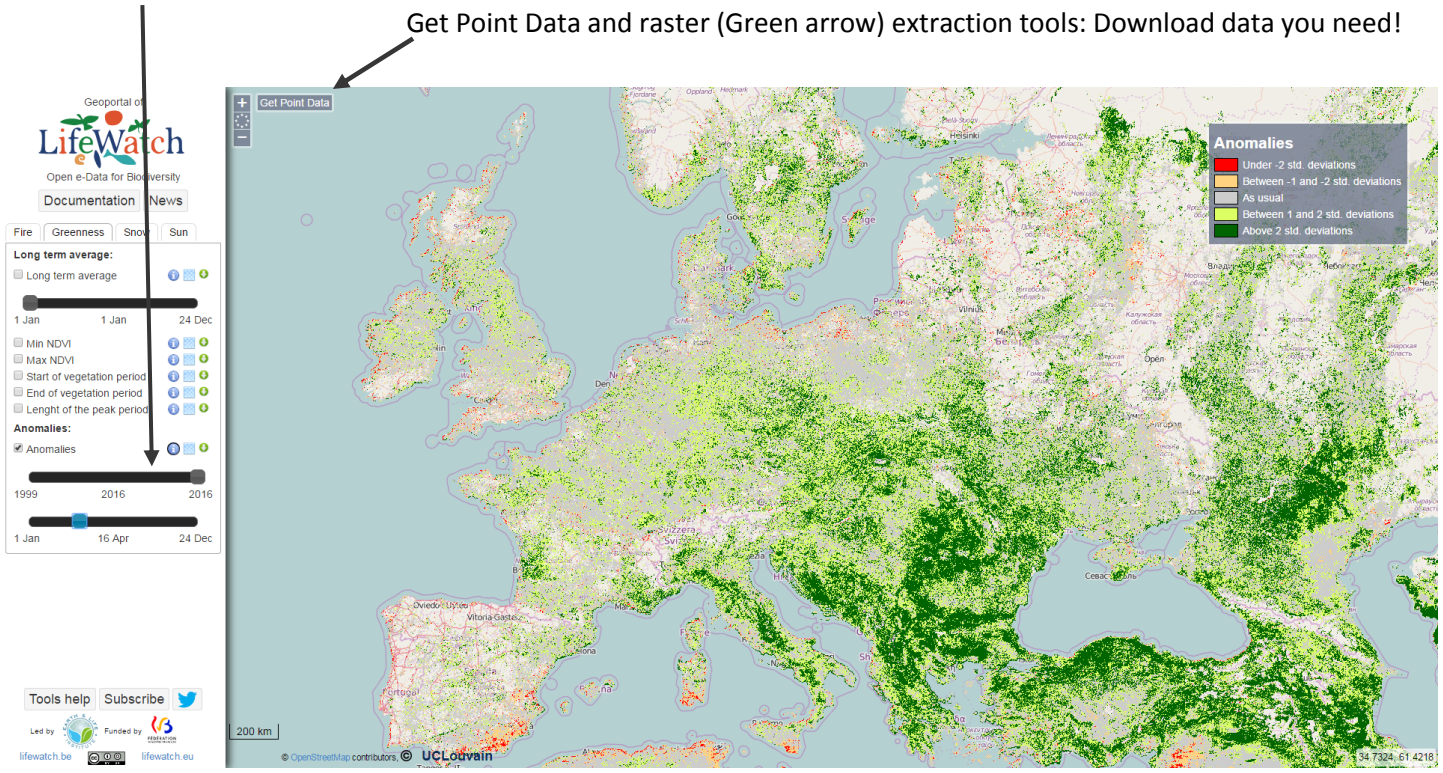
Orchis provincialis Balb. ssp. pauciflora

Web portal to view and download data

All this information (and more) can be visualized from the web portal where a point based and a raster (.tif) extraction tools are provided (see below): *www.uclouvain.be/lifewatch*. All data are available at least from 2001 to present and are regularly updated. Follow us on Twitter to get the latest news @LifeWatch_WB. For comments, suggestions or unusual data request, contact us at *lifewatch@uclouvain.be*

Date (Here: 16th of April 2016)

Get Point Data and raster (Green arrow) extraction tools: Download data you need!



LifeWatch: Biodiversity and Ecosystem research

LifeWatch Wallonia-Brussels is one of the Belgian contributions to the European Research Infrastructure Consortium for Biodiversity and Ecosystem research (LifeWatch). It is funded by the Fédération Wallonie-Bruxelles. Information about the Belgian contributions to LifeWatch can be found on *www.lifewatch.be*

Lifewatch is one of the most ambitious European initiatives for the study of biodiversity and ecosystems. LifeWatch is not a research project, but an infrastructure that offers services and tools to the scientific community, the policy makers and the public. In addition, LifeWatch will provide opportunities to construct personalized 'virtual labs', also allowing entering new data and analytical tools. More information about LifeWatch can be found on: *www.lifewatch.eu*

Methods

The summarized land surface dynamics are developed from remote sensing time series of daily global observations by satellites. The times series allow to derive average state of variables at any given time of the year. Data can be compared to this average to highlight anomalies. The average state of variables is developed within the CCI Land Cover project *http://www.esa-landcover-cci.org*. Metrics and anomalies are then derived in the frame of the Lifewatch-WB project. Data from the Belgian satellite Proba-V are used to continue the vegetation greenness time series after the end of SPOT-VEGETATION.