First half of 2018

The first months of the year were colder than usual, but Europe was not affected as much as North America.

The second half of spring and the summer 2018 were mainly marked by an exceptional drought over Europe, leading to important vegetation anomalies and devastating fires (fires for the year 2018 will be discussed in the next bulletin).

2018 European summer drought

Unusually hot weather has led to record-breaking temperatures in Europe during spring and summer 2018 (Figure 1). One of the main cause was the jet stream being particularly weak this year, allowing areas of atmospheric high pressure to linger on the same place for long periods.
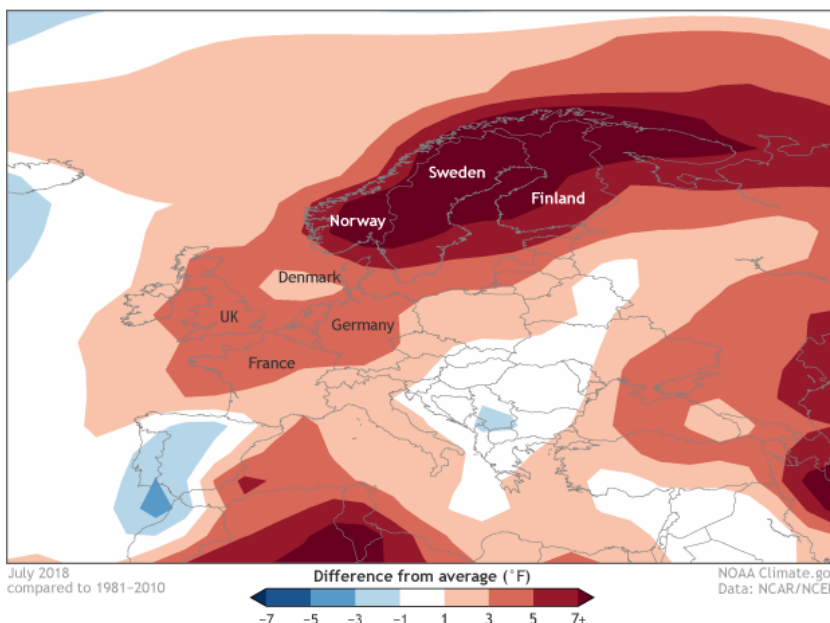

Figure 1: Difference from average surface temperature in Europe, July 2018 compared to 1981-2010 average

As a consequence, Europe faced an exceptional drought, mainly across the northern and central region (Figure 2), affecting the vegetation and biodiversity.

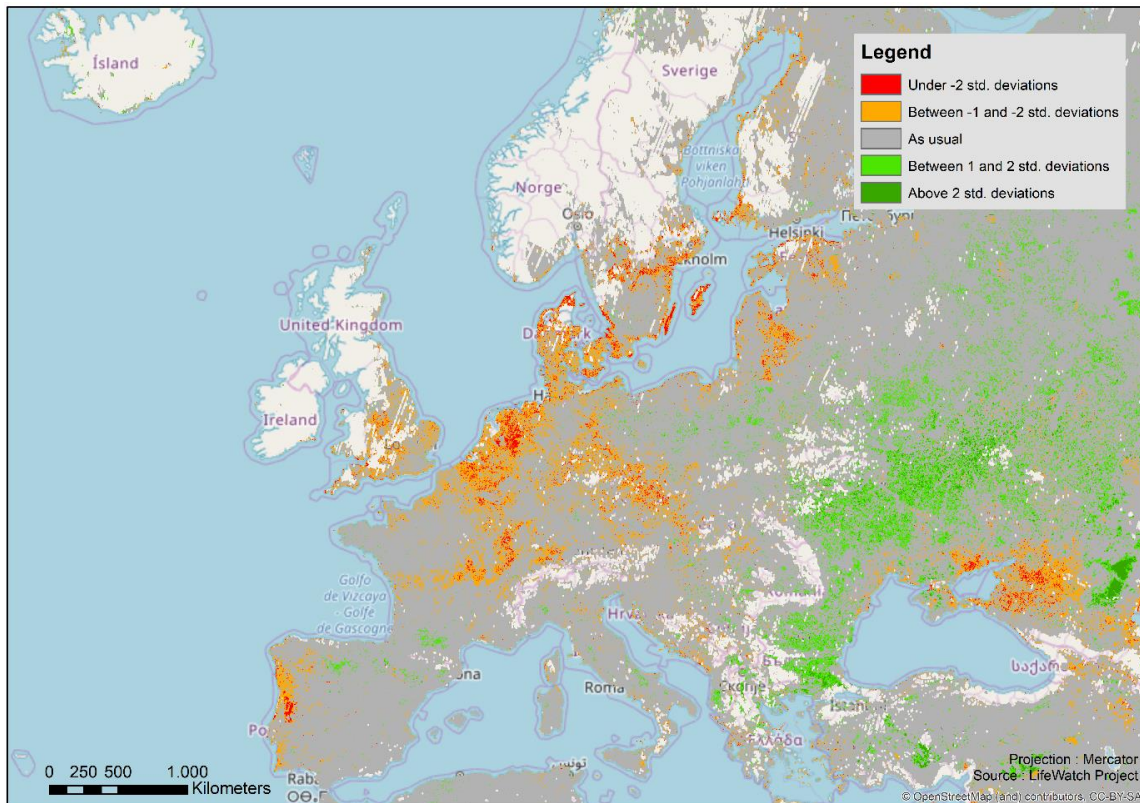Some examples are developed in this bulletin.

Figure 2: Vegetation anomalies over Europe on July 30, 2018

Impact on the butterfly population in Belgium

Butterflies are highly sensitive to climatic hazards and the high temperature in June lead to an earlier development of butterfly populations in Belgium, by two or three weeks. However, later in July, drought and the subsequent lack of vegetation resulted in an unusually low population. Indeed, the lack of vegetation caused the loss of butterfly habitats, as was with other insect species.

Each year in early August, Natagora, a Belgian environmental protection association, sets up a census operation for butterflies in gardens. The results show that despite the early development of butterflies in July, the average number of butterflies per garden was lower than previous years.

However, butterfly populations varied across the different species. The citizen-based observations indicate that species like the vulcan (*Vanessa atalanta*) or the small tortoiseshell (*Aglais urticae*), which are sensitive to heat, were less present this year, whereas others like the swallowtail (*Papilio Machaon*) or the Spanish tobacco (*Argynnis paphia*) were more prominent than previous years (Figure 3).

The wasp population was also larger in France and Belgium this summer. High temperatures in the spring provided optimal conditions for the early development of the larvae, resulting in a large population during the summer.

Figure 3: From left to right: Vanessa atalanta, Aglais urticae, Papilio Machaon, Argynnis paphia (credits : papillons.info, Jim Asher, Armagnac, Coline Buch)

Lack of vegetation also impacted birds and small mammals

In various regions, bird populations were impacted by the lack of insects. The Association for Bird and Wildlife Conservation in Zurich had to deal with 37 starved birds over the month of August, instead of isolated cases in previous years. Thrush species, such as blackbirds (*Turdus merula*) or song thrush (*Turdus philomelos*), were particularly affected. The association pointed to the low amount of insects as the main cause.

The dry up of vegetation also cause small mammals to lose their shelters, thus exposing them to predators. For example, this was the case for voles and hedgehogs in Great-Britain.

European drought had dramatic impacts on agriculture

The agronomical sector was deeply impacted by the extreme climatic conditions, all over Europe.

With the hot and dry weather since the spring, farmers are experiencing one of the worst seasons of the past decades. Most of the crops were harvested weeks before the usual date and the yields are poor. In agronomical regions such as Holland, vegetation anomalies are clearly noticeable at the end of July, showing the lack of crops due to the early harvest.
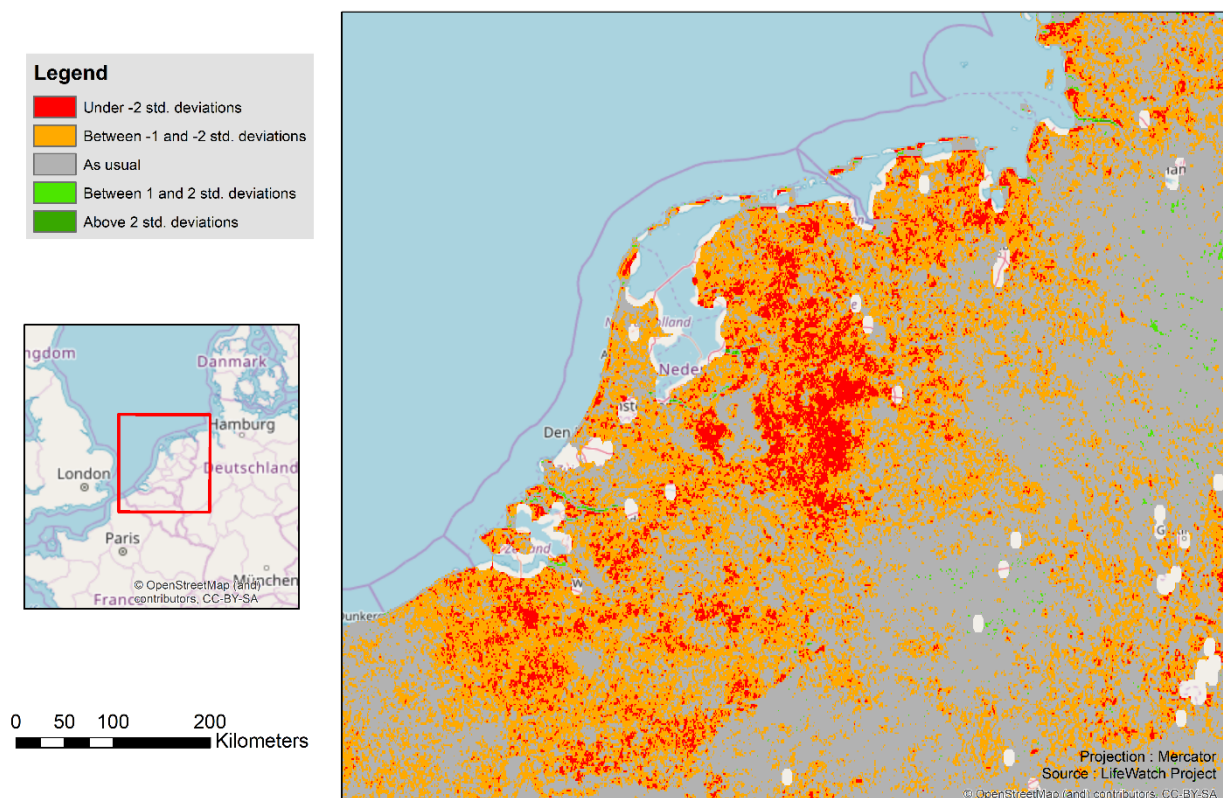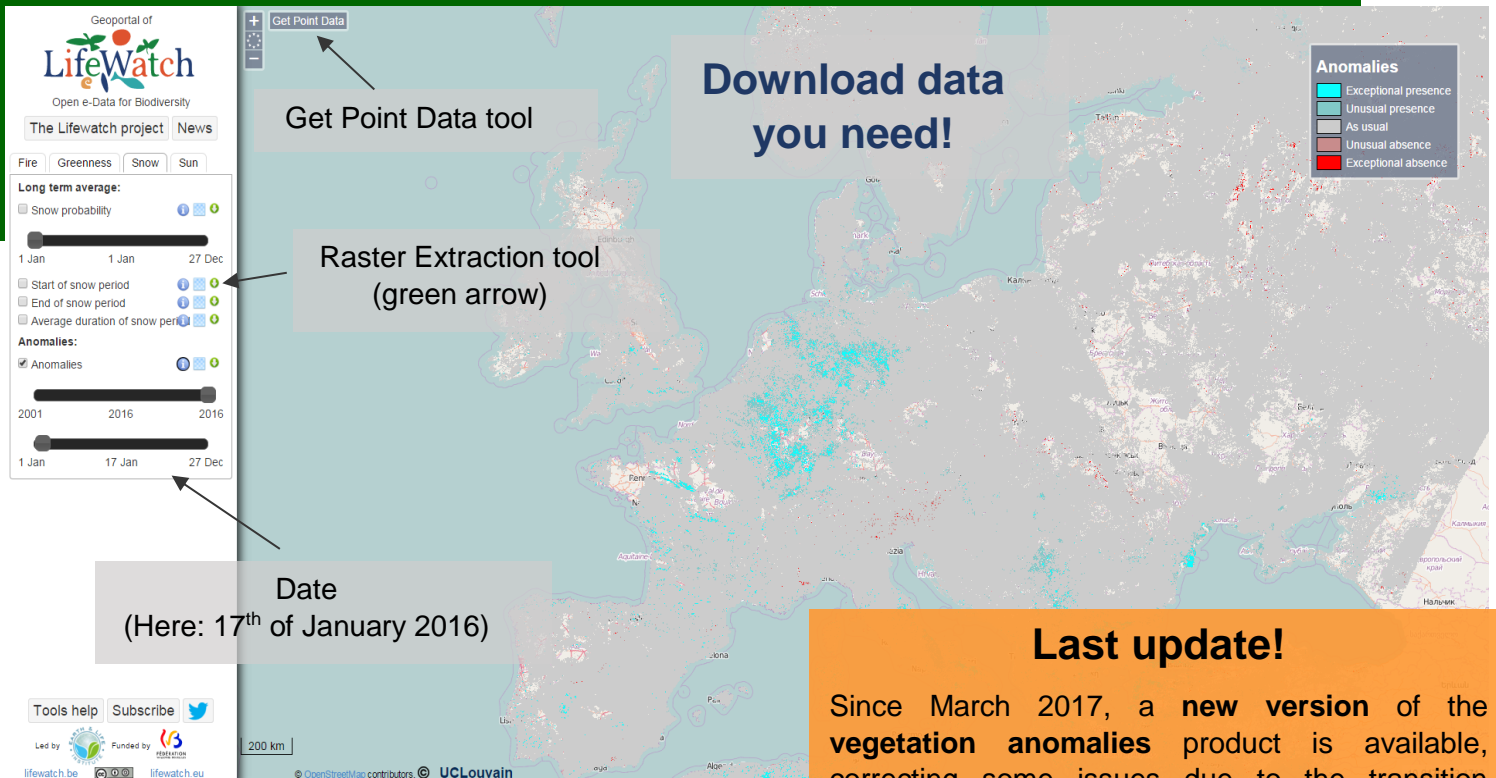

Figure 4 : Lack of vegetation in Holland on July 30, 2018

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 also 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*

Get Point Data tool

**Download data
you need!**

Raster Extraction tool
(green arrow)

Date
(Here: 17th of January 2016)

Anomalies
- Exceptional presence
- Unusual presence
- As usual
- Unusual absence
- Exceptional absence

Last update!

Since March 2017, a **new version** of the **vegetation anomalies** product is available, correcting some issues due to the transition between SPOT-VEGETATION and PROBA-V and filtering false anomalies in arid zone.

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 time 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.