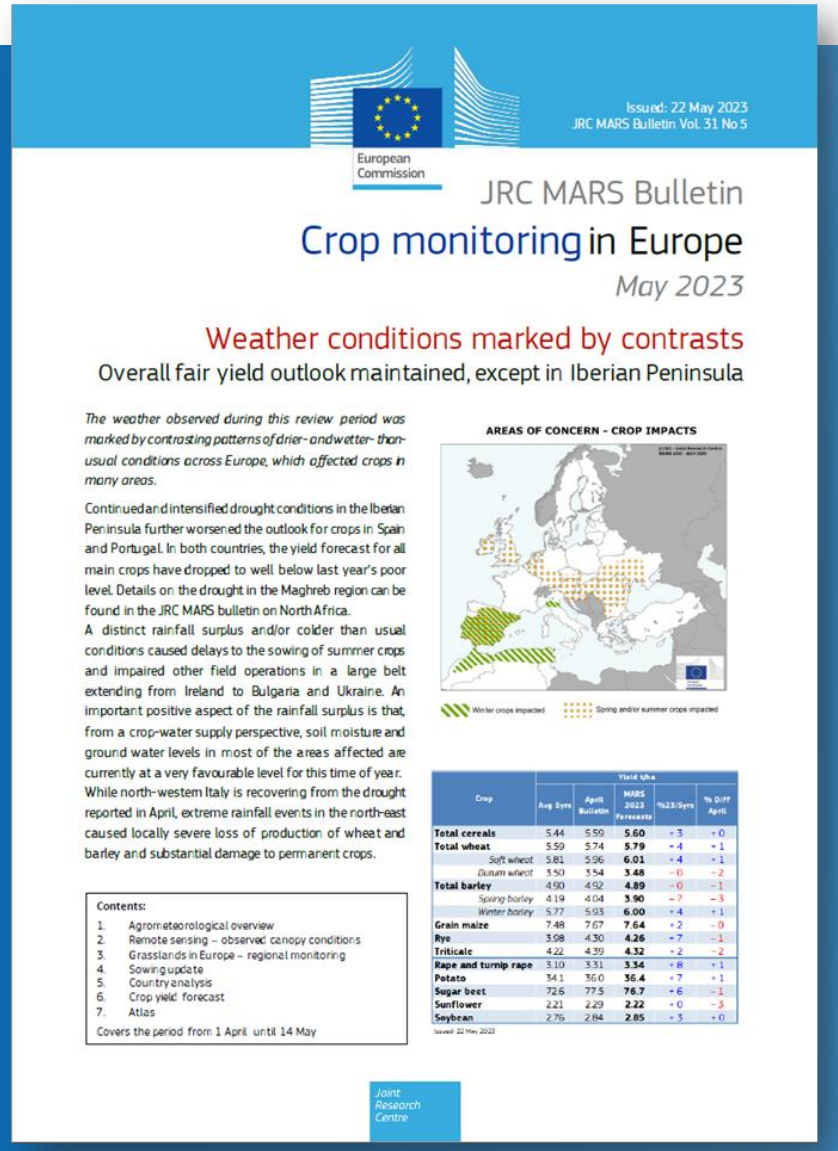
Agro-meteorological monitoring relevant for fruit supply in the EU

Market Observatory Stone Fruit

2 June 2023



Issued: 22 May 2023
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JRC MARS Bulletin

Crop monitoring in Europe

May 2023

Weather conditions marked by contrasts

Overall fair yield outlook maintained, except in Iberian Peninsula

The weather observed during this review period was marked by contrasting patterns of drier- and wetter- than-usual conditions across Europe, which affected crops in many areas.

Continued and intensified drought conditions in the Iberian Peninsula further worsened the outlook for crops in Spain and Portugal. In both countries, the yield forecast for all main crops have dropped to well below last year's poor level. Details on the drought in the Maghreb region can be found in the JRC MARS bulletin on North Africa.

A distinct rainfall surplus and/or colder than usual conditions caused delays to the sowing of summer crops and impaired other field operations in a large belt extending from Ireland to Bulgaria and Ukraine. An important positive aspect of the rainfall surplus is that, from a crop-water supply perspective, soil moisture and ground water levels in most of the areas affected are currently at a very favourable level for this time of year.

While north-western Italy is recovering from the drought reported in April, extreme rainfall events in the north-east caused locally severe loss of production of wheat and barley and substantial damage to permanent crops.

AREAS OF CONCERN - CROP IMPACTS

Contents:

Covers the period from 1 April until 14 May

Crop	Yield t/ha				
	Avg 5yrs	April Bulletin	MARS 2023 Forecasts	%23/5yrs	% Diff April
Total cereals	5.44	5.59	**5.60**	+ 3	+ 0
Total wheat	5.59	5.74	**5.79**	+ 4	+ 1
Soft wheat	5.81	5.96	**6.01**	+ 4	+ 1
Durum wheat	3.50	3.54	**3.48**	- 0	- 2
Total barley	4.90	4.92	**4.89**	- 0	- 1
Spring barley	4.19	4.04	**3.90**	- 7	- 3
Winter barley	5.77	5.93	**6.00**	+ 4	+ 1
Grain maize	7.48	7.67	**7.64**	+ 2	- 0
Rye	3.08	4.30	**4.26**	+ 7	- 1
Triticale	4.22	4.39	**4.32**	+ 2	- 2
Rape and turnip rape	3.10	3.31	**3.34**	+ 8	+ 1
Potato	34.1	36.0	**36.4**	+ 7	+ 1
Sugar beet	72.6	77.5	**76.7**	+ 6	- 1
Sunflower	2.21	2.29	**2.22**	+ 0	- 3
Soybean	2.76	2.84	**2.85**	+ 3	+ 0

Joint Research Centre

Contents

- JRC MARS AGRI4CAST
  - Meteorological Data Infrastructure
  - JRC MARS Explorer – Fruit tree monitoring

- Overview of Winter and Spring Conditions:
  - Prolonged drought conditions in Iberian Peninsula
  - Frost events with potential impacts
  - Flood events

AGRI4CAST Purpose and Objectives

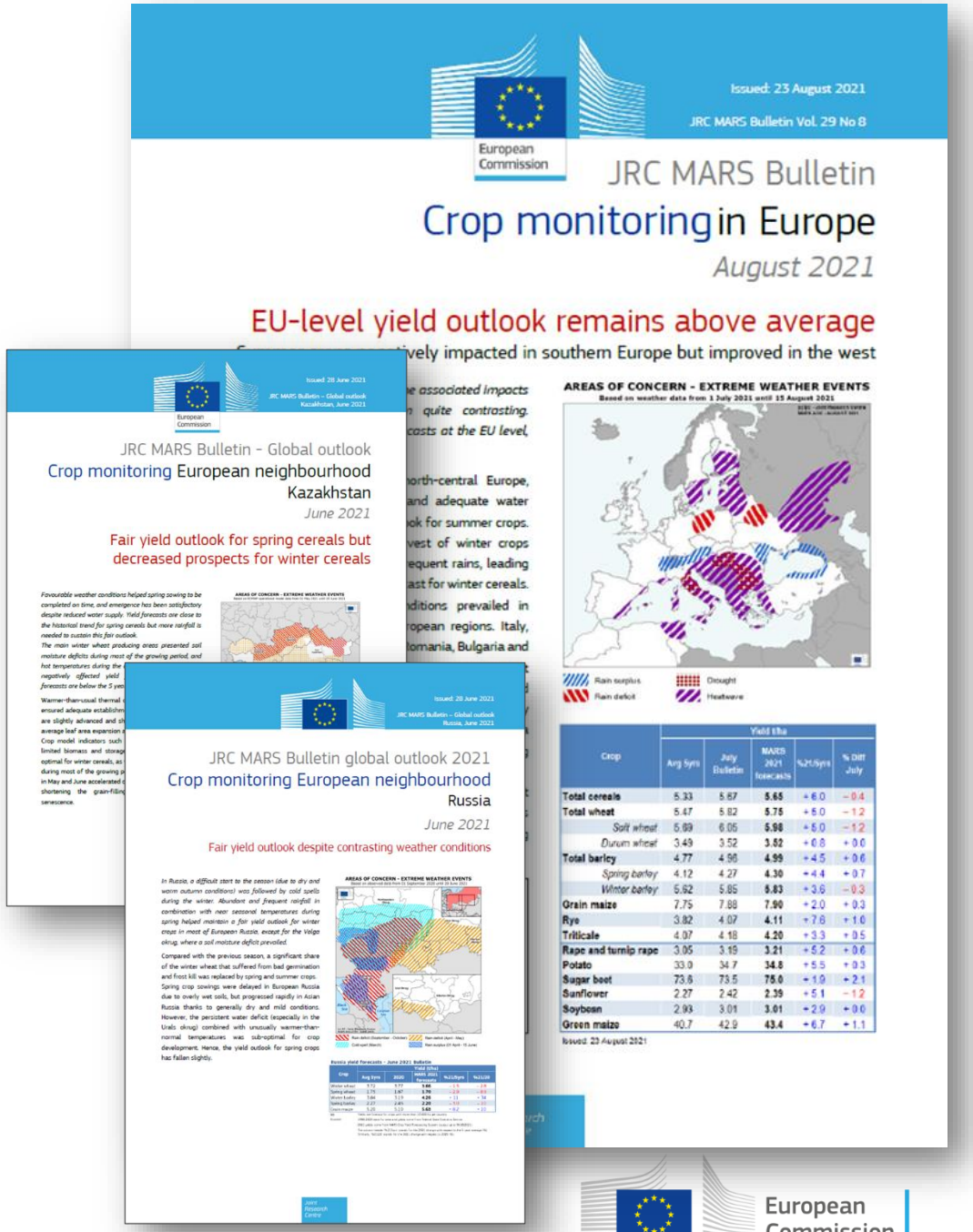
- Provide independent, timely, and accurate information on the condition of crops and crop yield forecasts for the EU and its neighbourhood, thus contributing to the transparency of market information
- Provide *ad-hoc* analysis of extreme weather situations and their impacts on agriculture

Directly implements
Article 25 of REG 2021/2116 on Monitoring Agricultural Resources (MARS)

European Commission

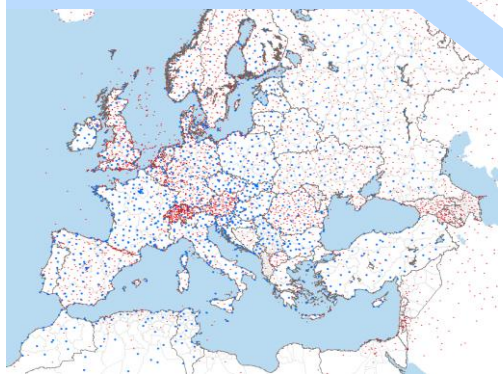
AGRI4CAST Key Products

- JRC MARS Bulletin - Crop monitoring in Europe since 1992, monthly
- JRC MARS Bulletin - Crop monitoring European neighbourhood; since 2017, 2 times per year for 5 regions
- Data, maps, and graphs in AGRI4CAST toolbox, incl. Resources Portal and MARS Explorer
- Results of *ad-hoc* analysis following requests from DG AGRI, sometimes published as Bulletin updates



AGRI4CAST Meteorological Data Infrastructure

Observed data



Model data

Weather forecast data

Near real time

Pan-European

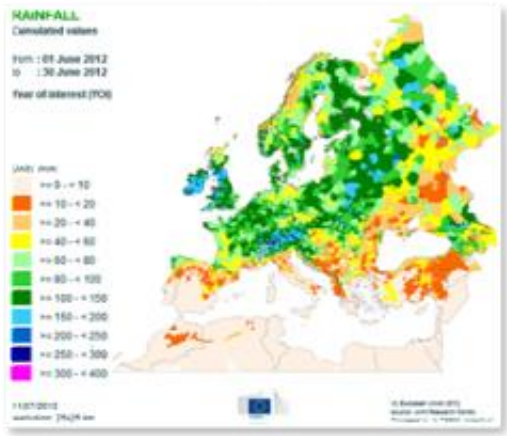
Daily

METEO DB

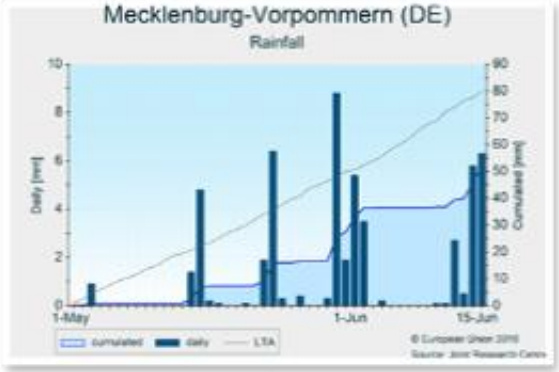
Gridded data

Aggregated data

Temperature
Rainfall
Radiation
Vapour pressure
Windspeed
Evaporation
Evapotranspiration
Climatic water balance
Snow depth



✓ Agro-meteorological analysis
✓ Crop growth models



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JOINT RESEARCH CENTRE

AGRI4CAST ToolBox

mission > EU Science Hub > AGRI4CAST Toolbox

JRC MARS Bulletins

The JRC MARS Bulletin offers in an operational context analyses and information on crop growth conditions and yield forecasts at the level of EU Member States and neighbouring countries, such as Ukraine, Russia, Turkey and the Maghreb.

We need your help: JRC MARS Bulletins Survey

The JRC MARS Bulletins Survey aims to help us better understand how you use the JRC MARS Bulletin. This will allow us to improve our service in the future. It should take less than 10 minutes of your time to complete the survey. All information collected will be anonymous, no personal information is requested.

The survey is available at 2022 JRC MARS Bulletin - Crop Monitoring in Europe Survey

JRC MARS Bulletin – Archive

This Archive stores all the JRC MARS bulletins published since 2007.

JRC MARS Explorer

The JRC MARS Explorer provides quick access to more than 2000 high-resolution maps and graphs displaying recent information on weather conditions and the progress of crop growth across the EU. This service is currently suspended and will be resumed in 2022.

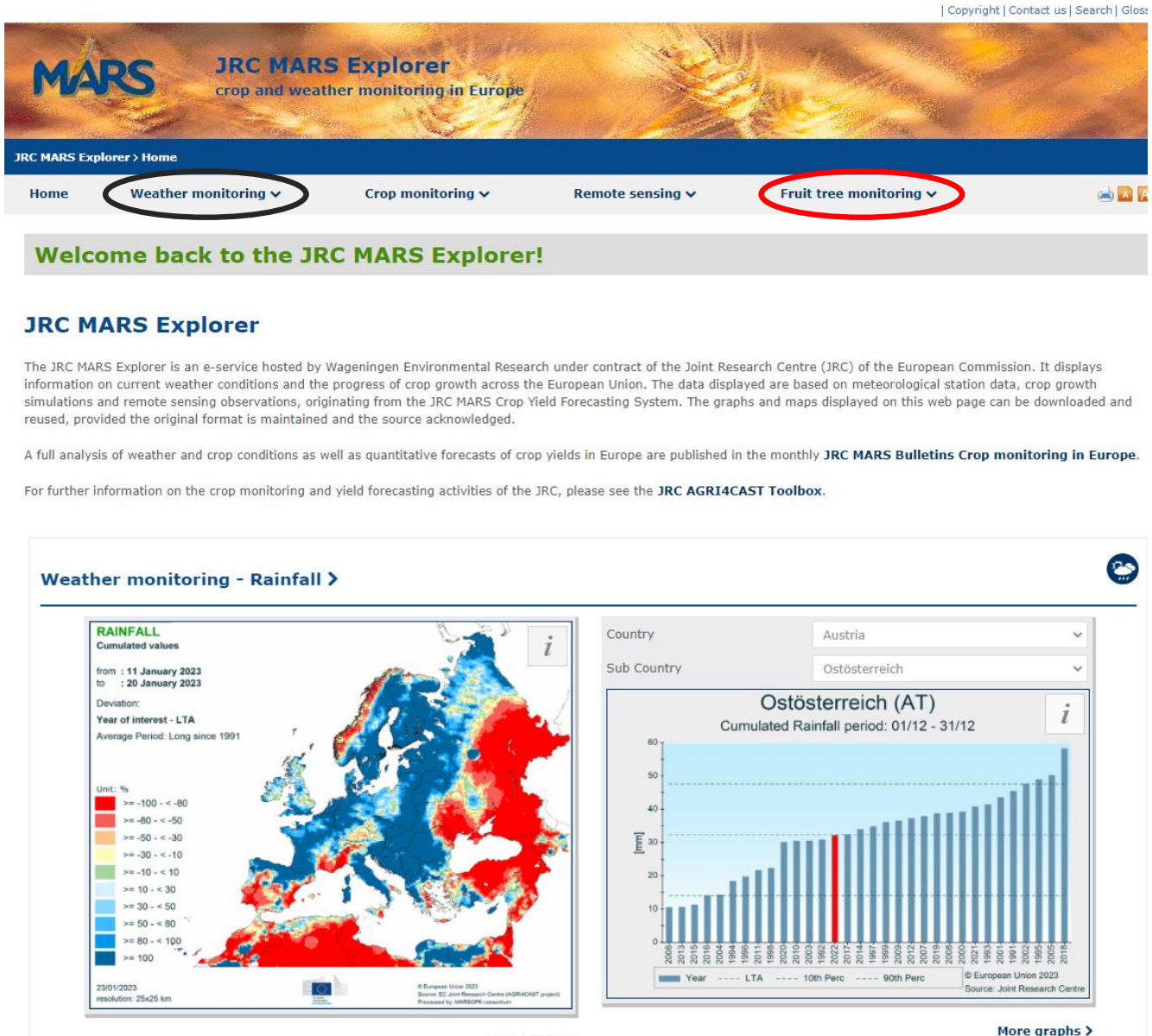
AGRI4CAST Resources Portal

Datasets of the MARS Crop Yield Forecasting System and Software developed by AGRI4CAST are made freely available to the public for access and reuse.

MARS Crop Yield Forecasting System (MCYFS) wiki

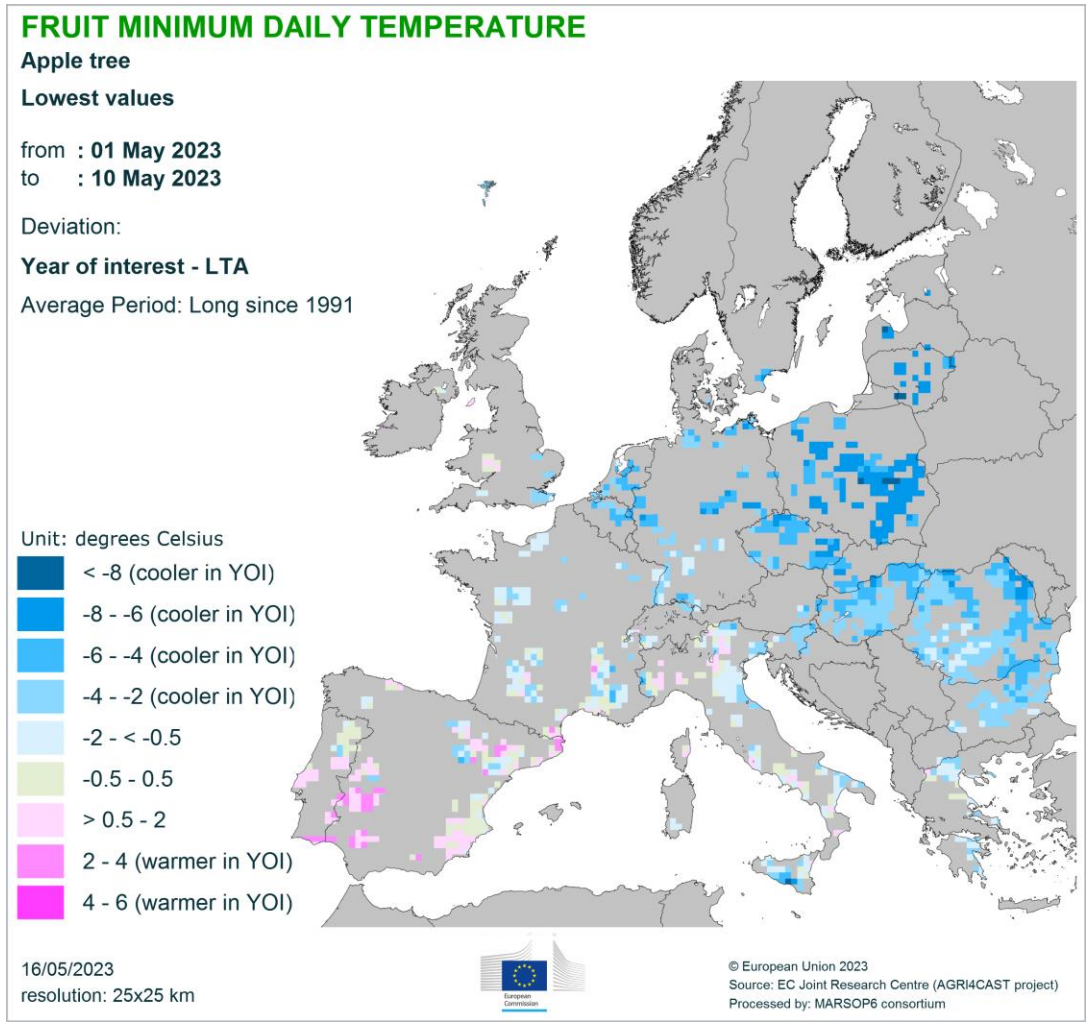
European Commission

AGRI4CAST JRC MARS Explorer: Extension for Fruit Monitoring - apples pilot study

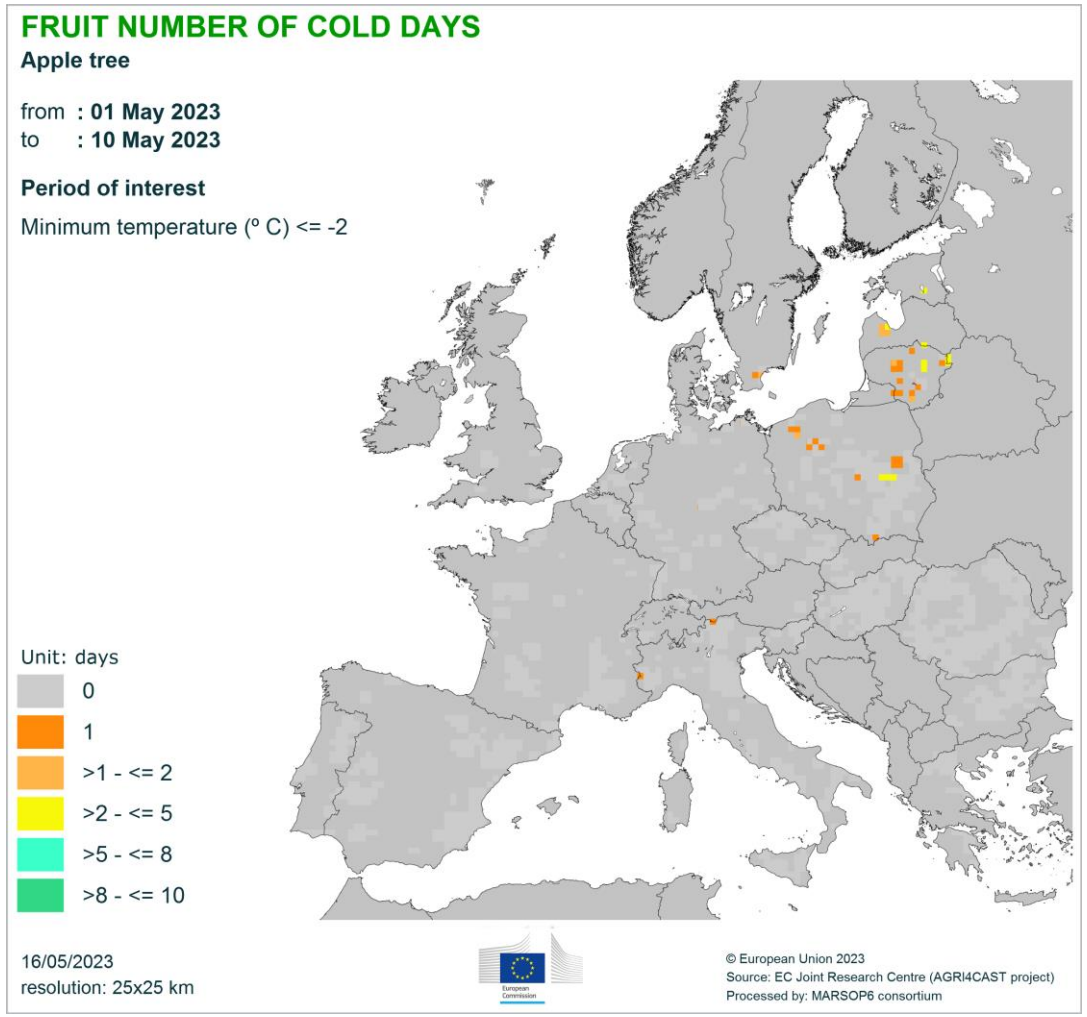


European Commission

JRC MARS Explorer, Fruit Monitoring – frost related indicators at 10-day (dekadal) time step



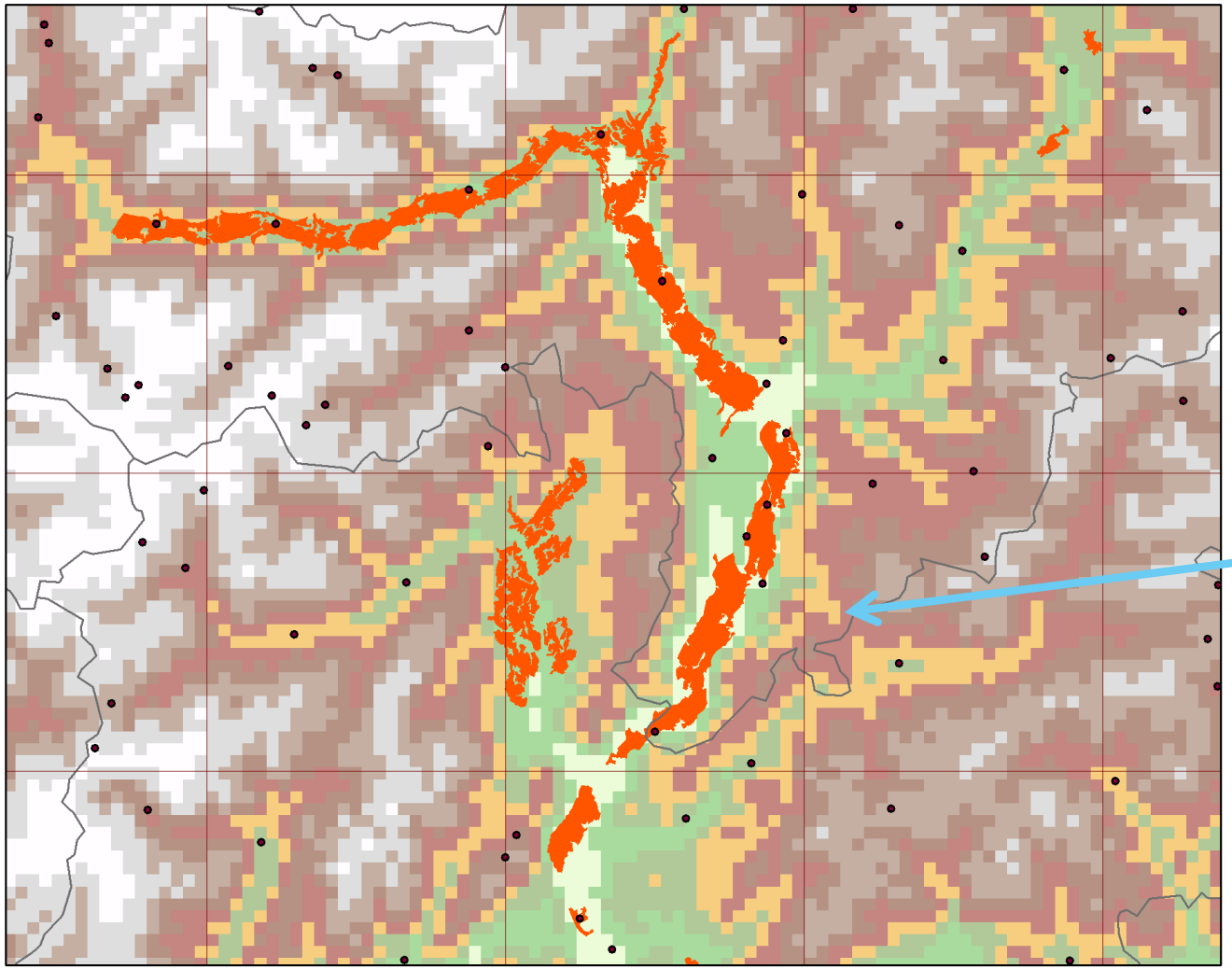
Min. daily temperature vs. LTA (Long Term Average)

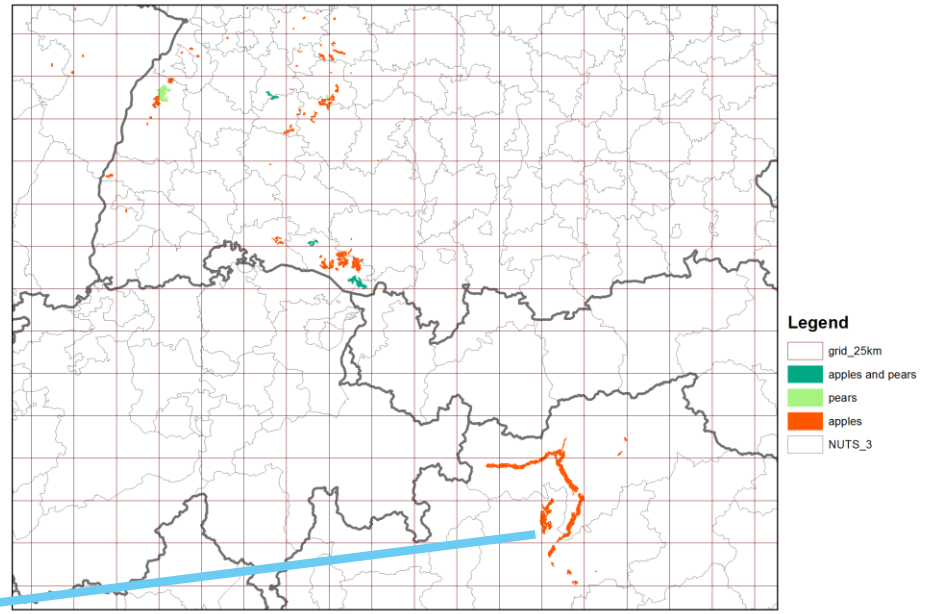


Number of cold days (min. temp < -2°C)

European Commission

Spatial variability of apple and pear orchards vs. JRC-MARS grid scale



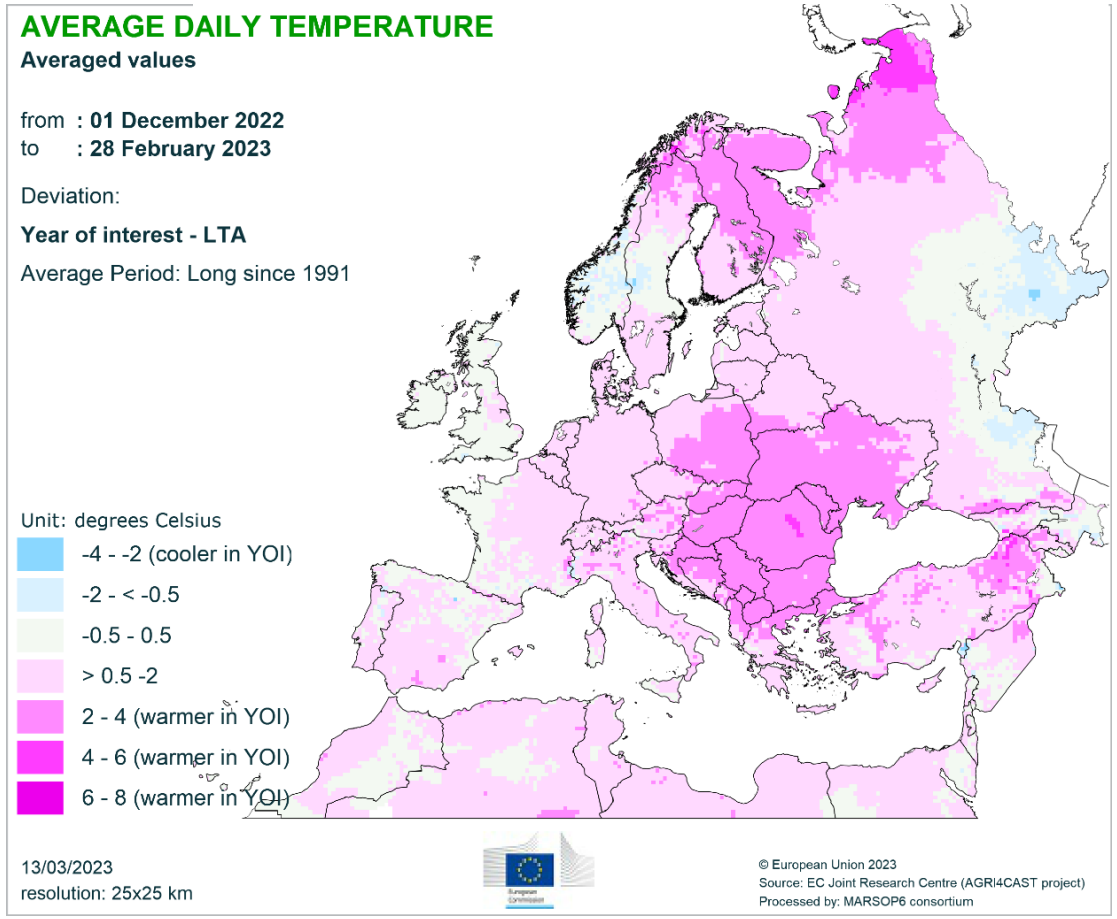


- variable agrometeorological conditions are compounded within a 25 x 25 km JRC-MARS grid cell
- no possibility of representing localized events (such as hail, local frost) at this resolution

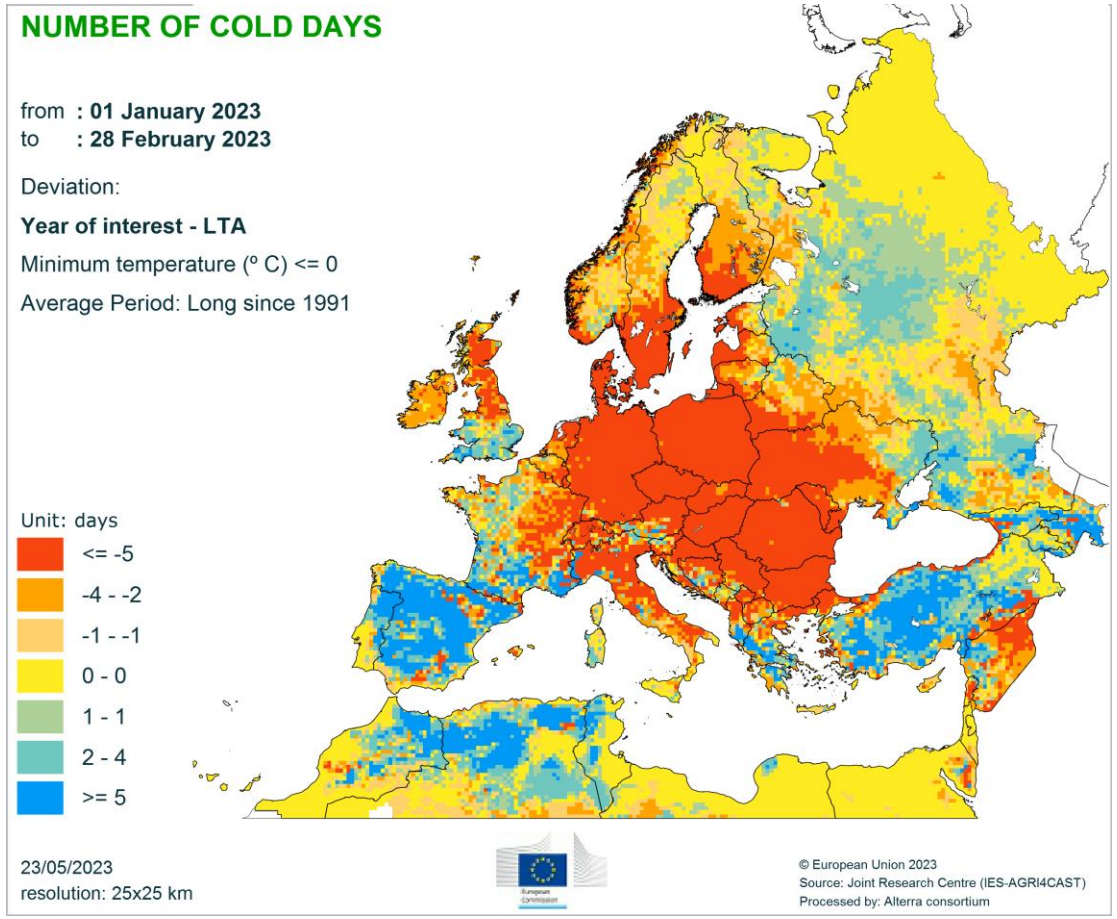
Example of spatial distribution of apple orchards in the landscape of Bolzano-Bolzen/Trento, Italy, weather station density, and associated 25x25 km weather grid used in the JRC-MARS data information system

European Commission

Winter Temperatures: Dec 2022 - Feb 2023



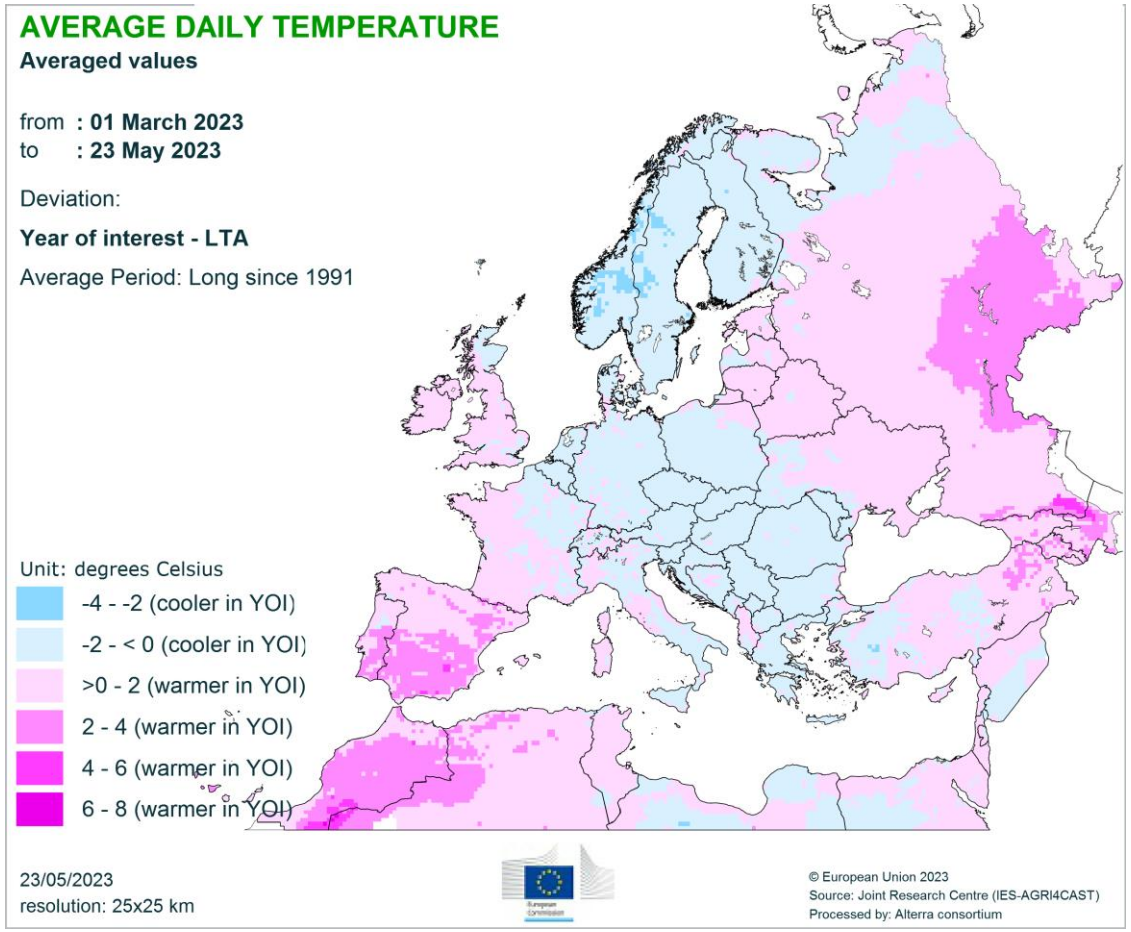
Average temperature in respect to long term average (LTA)



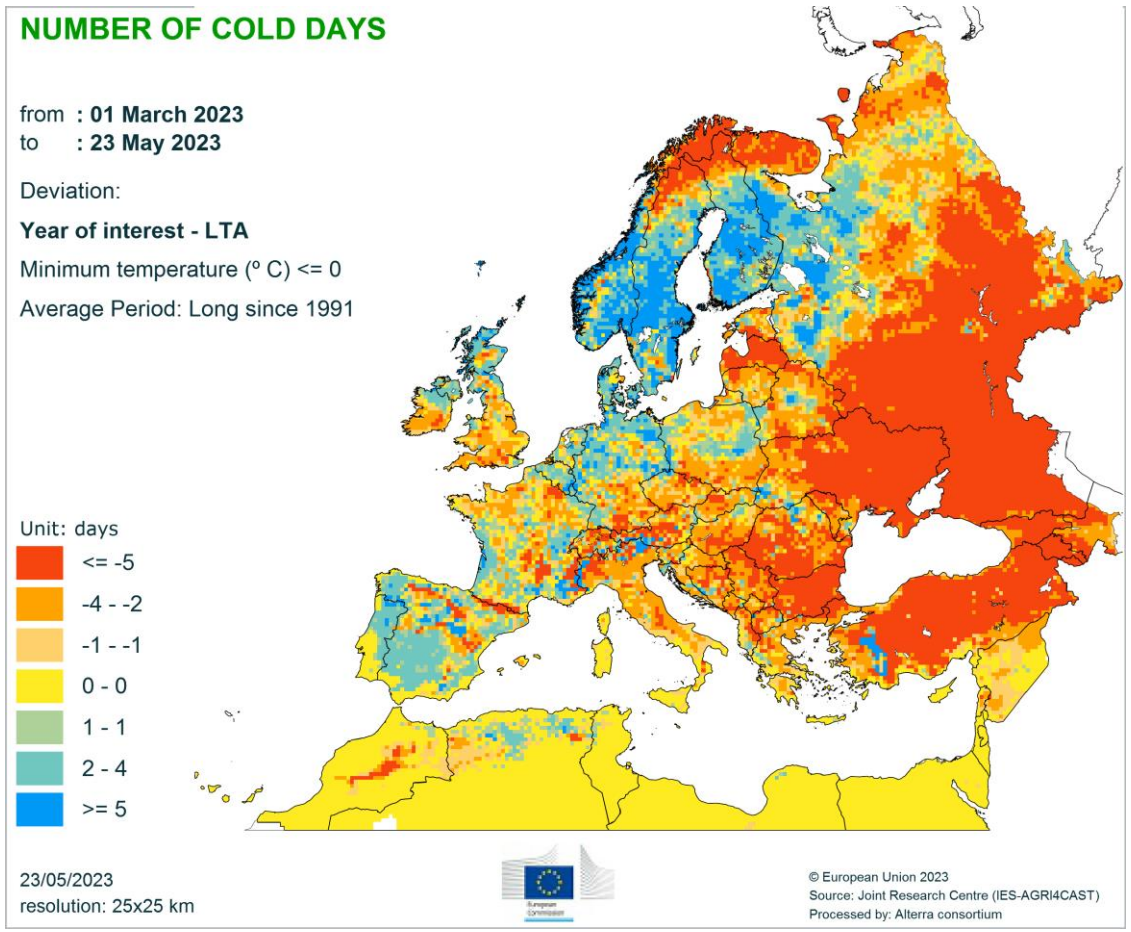
Number of cold days (with min. temperature < 0°C) in respect to long term average (LTA)

European Commission

Spring Temperatures: March - May 2023



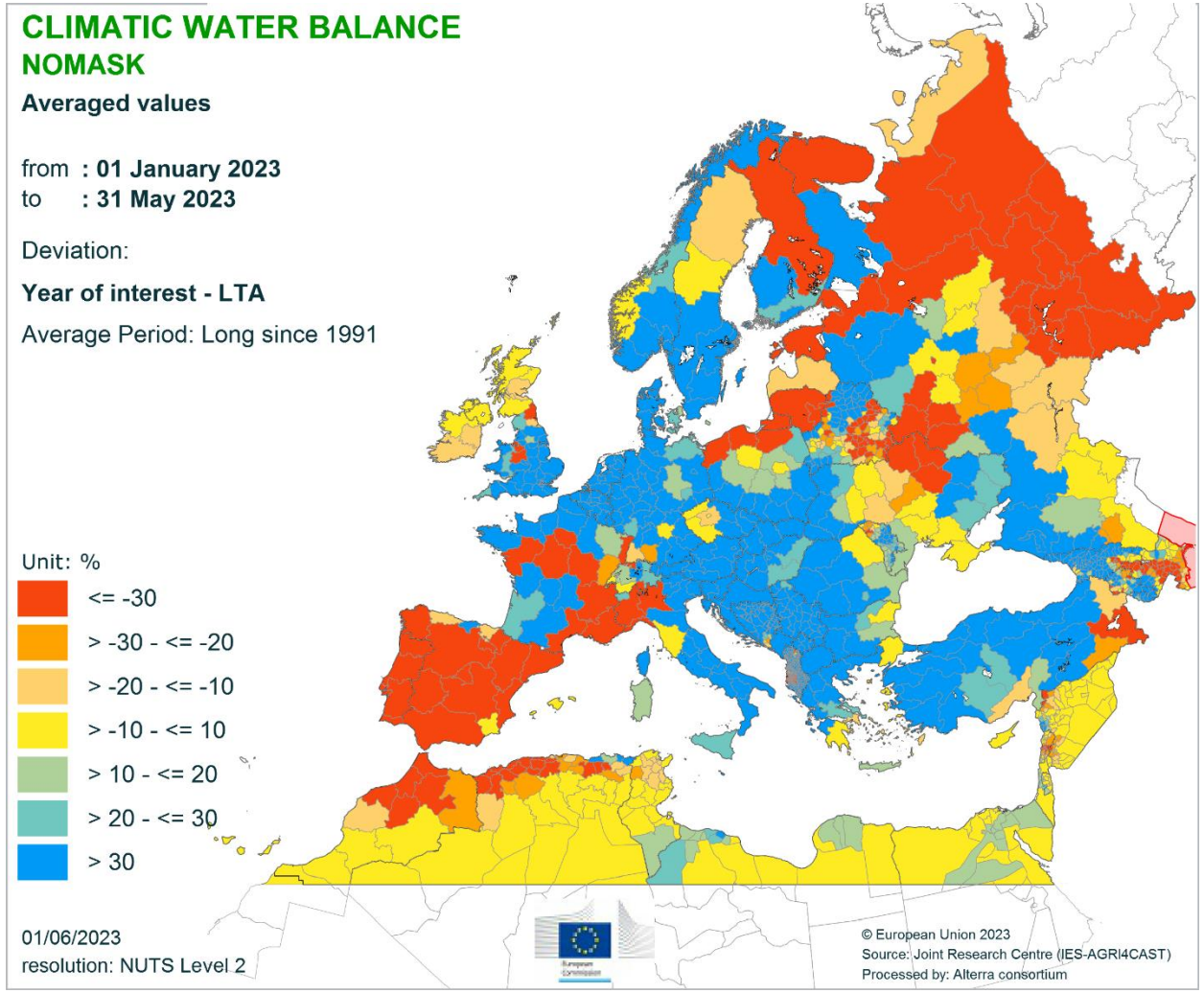
Average temperature in respect to long term average (LTA)



Number of cold days (with min. Temperature < 0°C) in respect to long term average (LTA)

European Commission

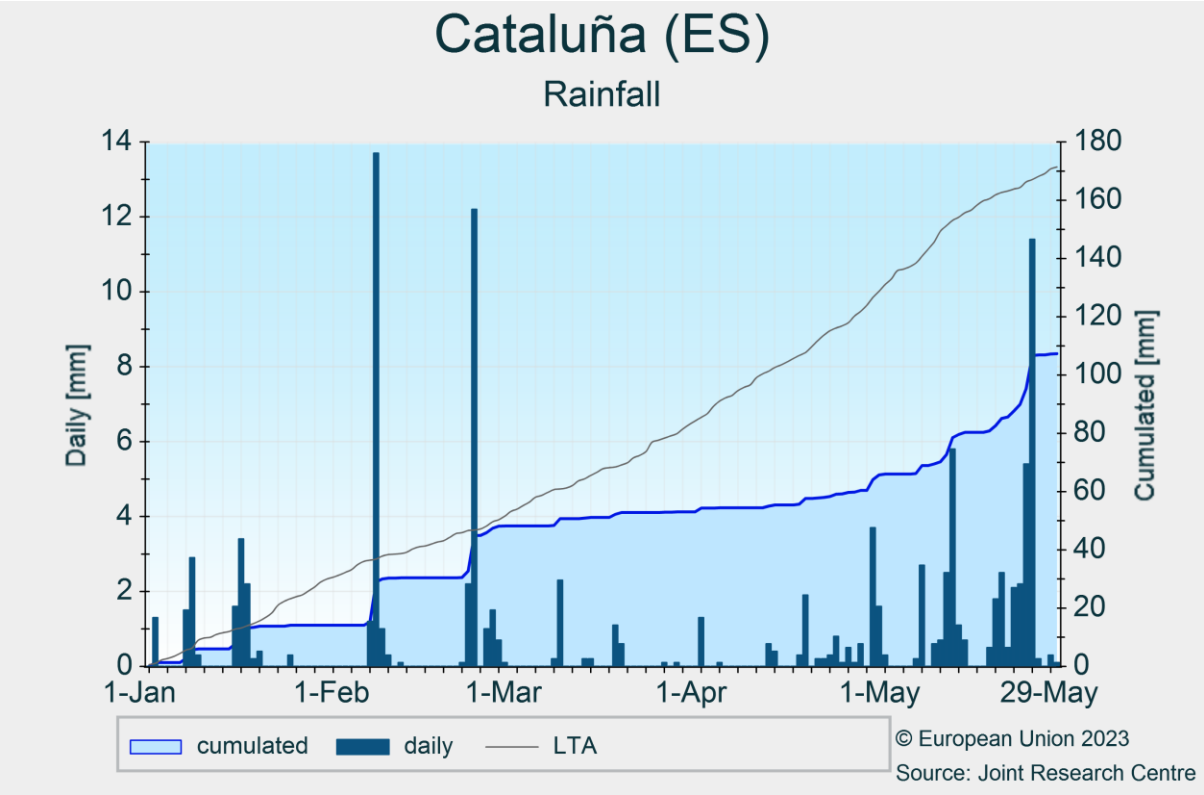
Climatic Water Balance: January - May 2023

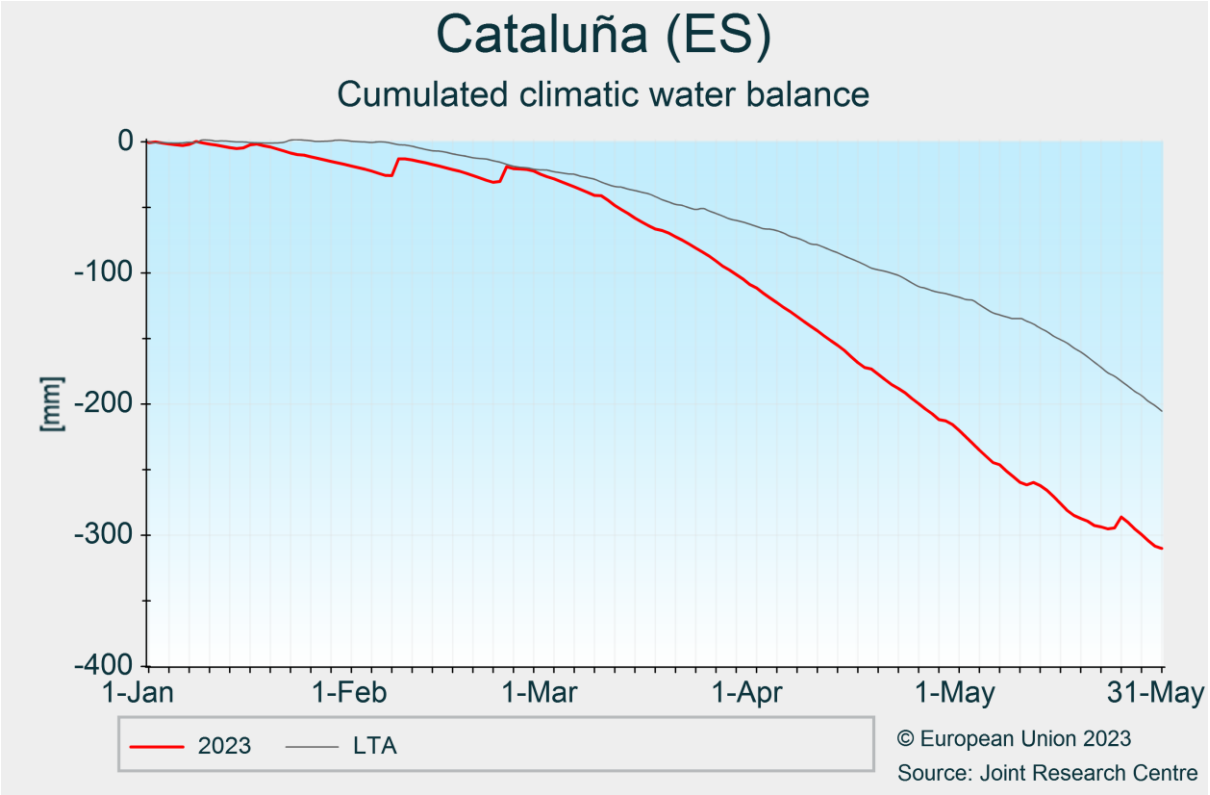


Climatic Water Balance = Rainfall – Evaporation

European Commission

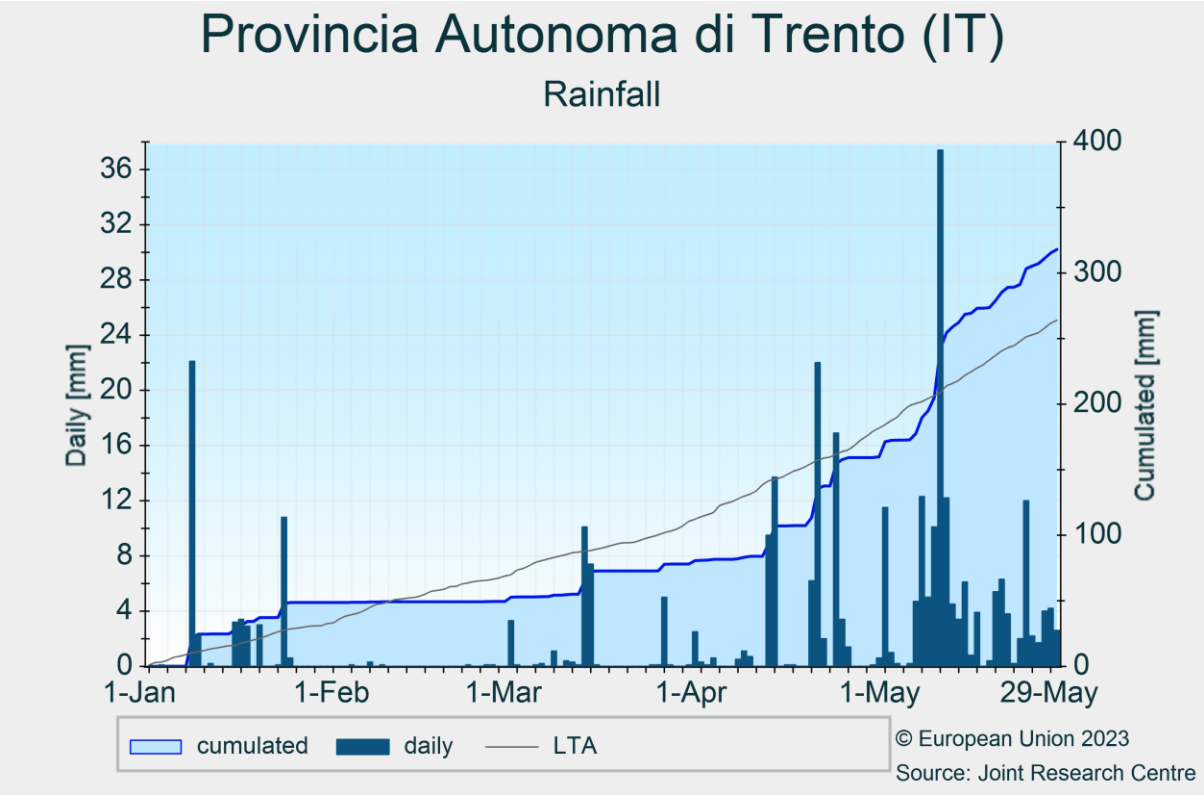
Cataluña - drought developing since January

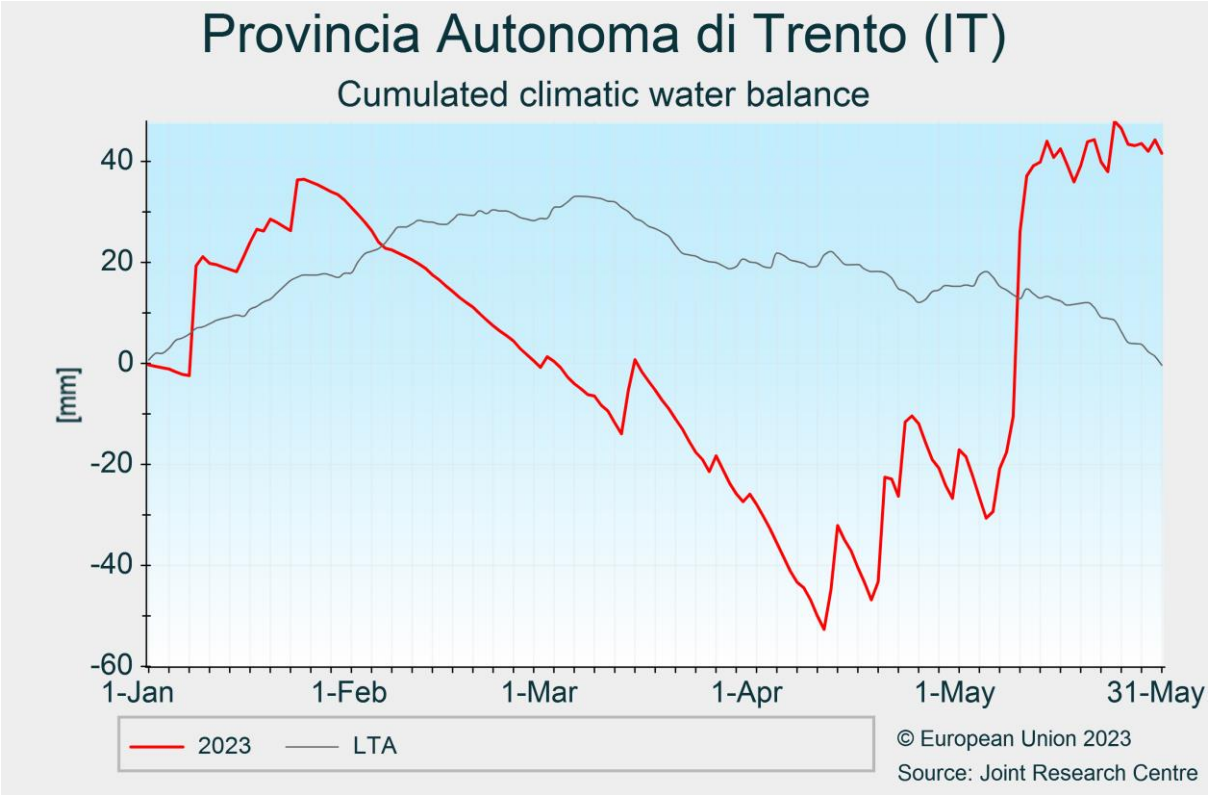




European Commission

Trento - recovery from drought





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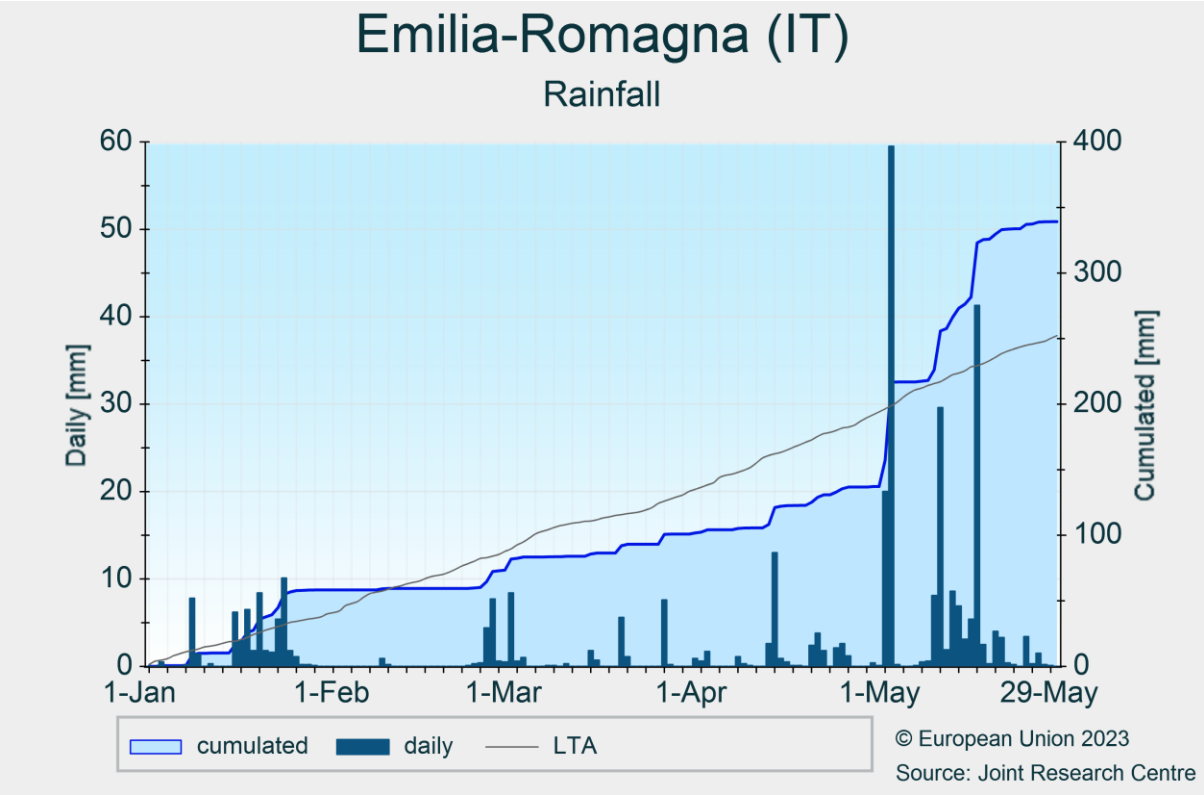
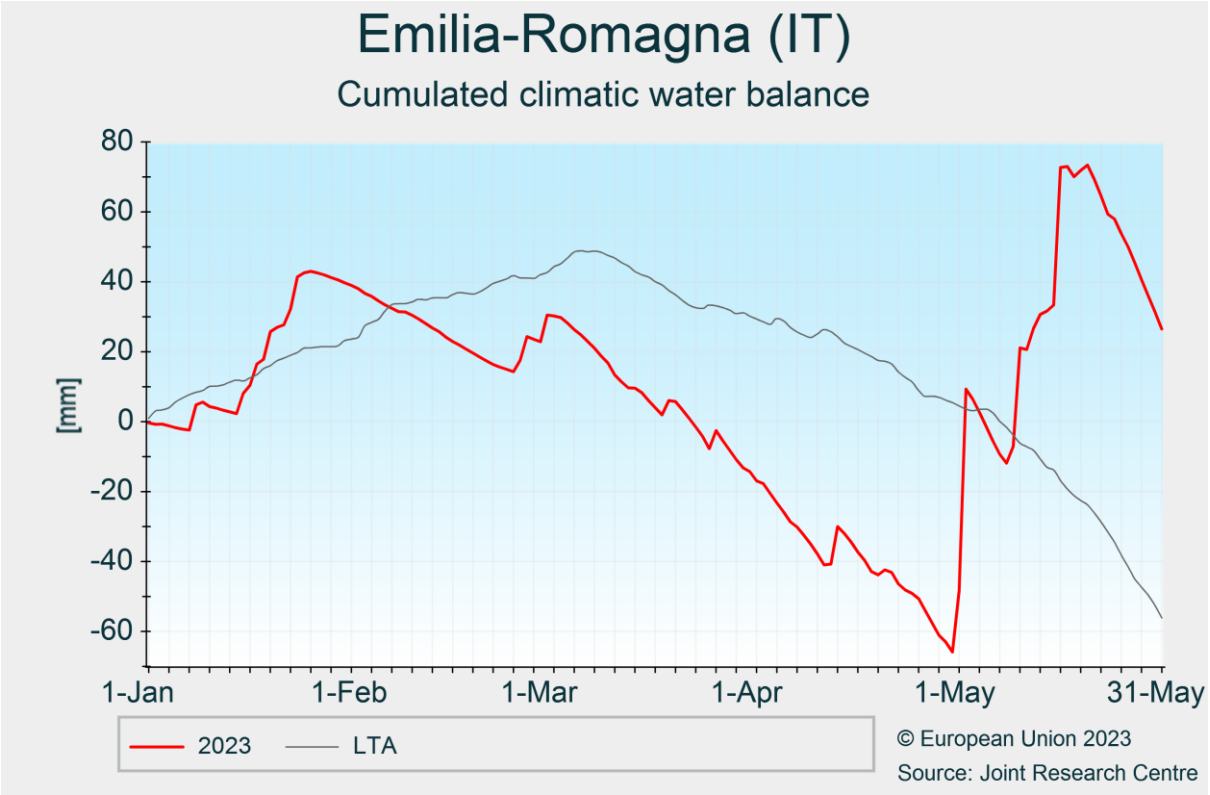
Emilia-Romagna - flood events





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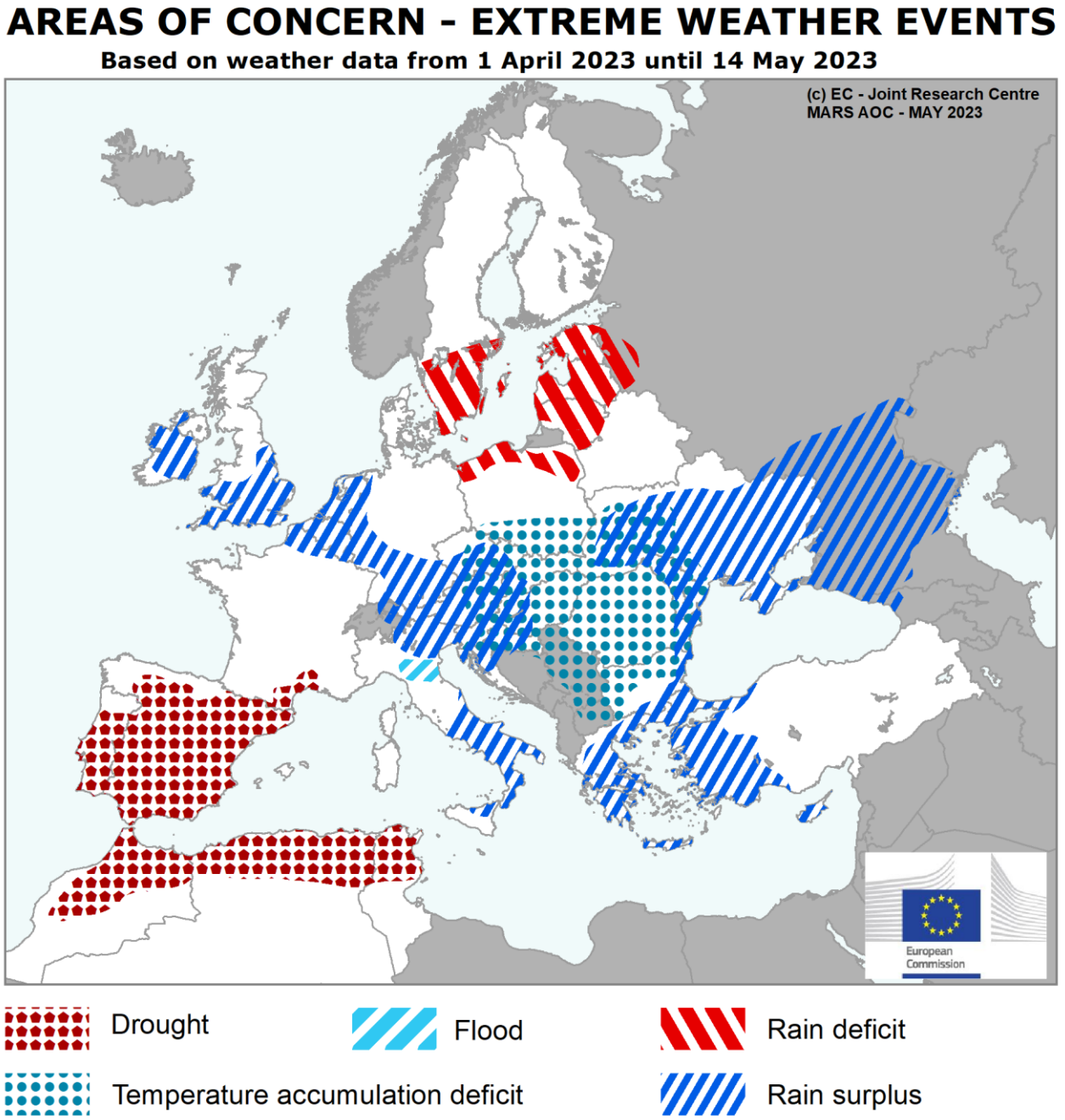
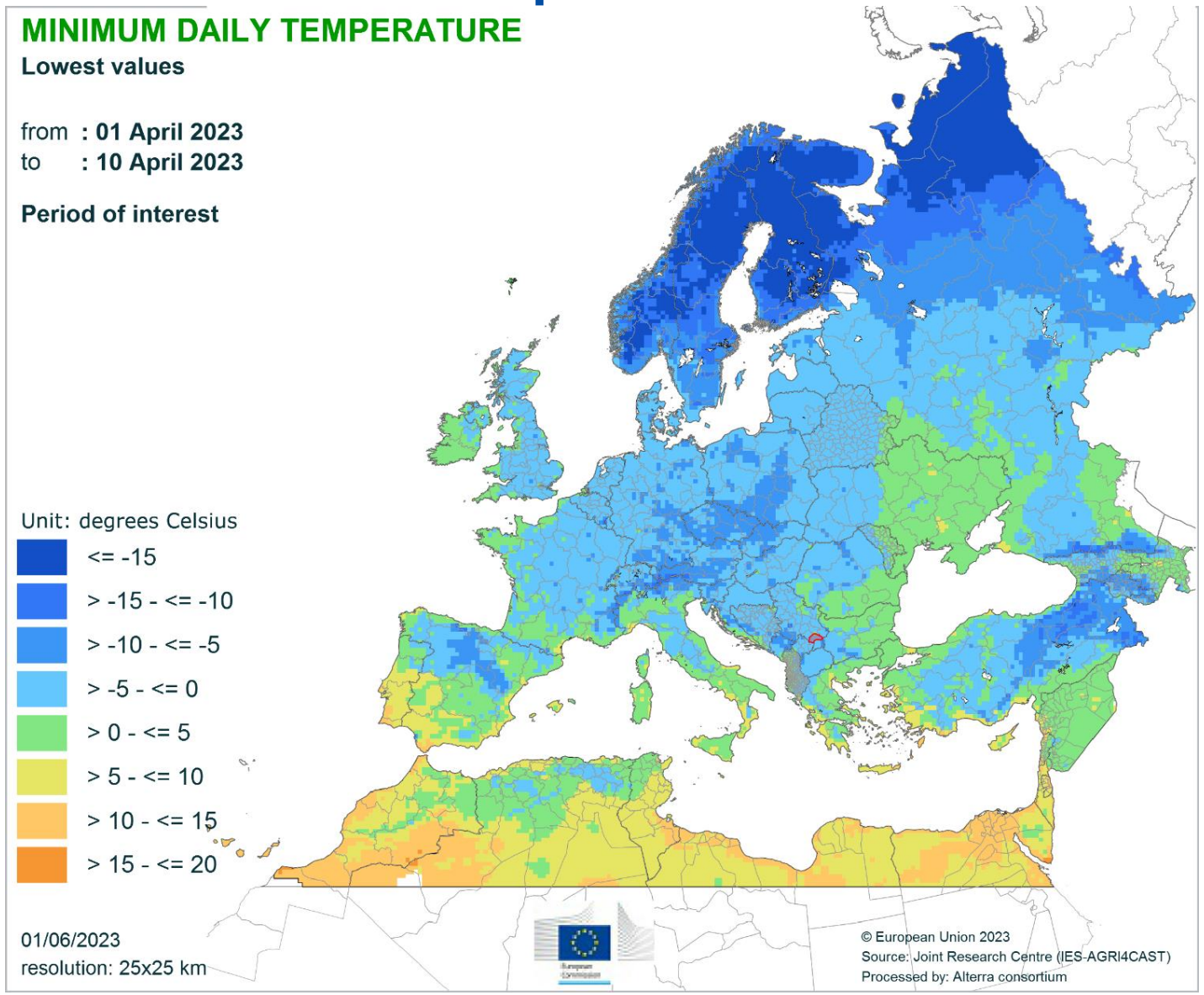
AoC Weather Events

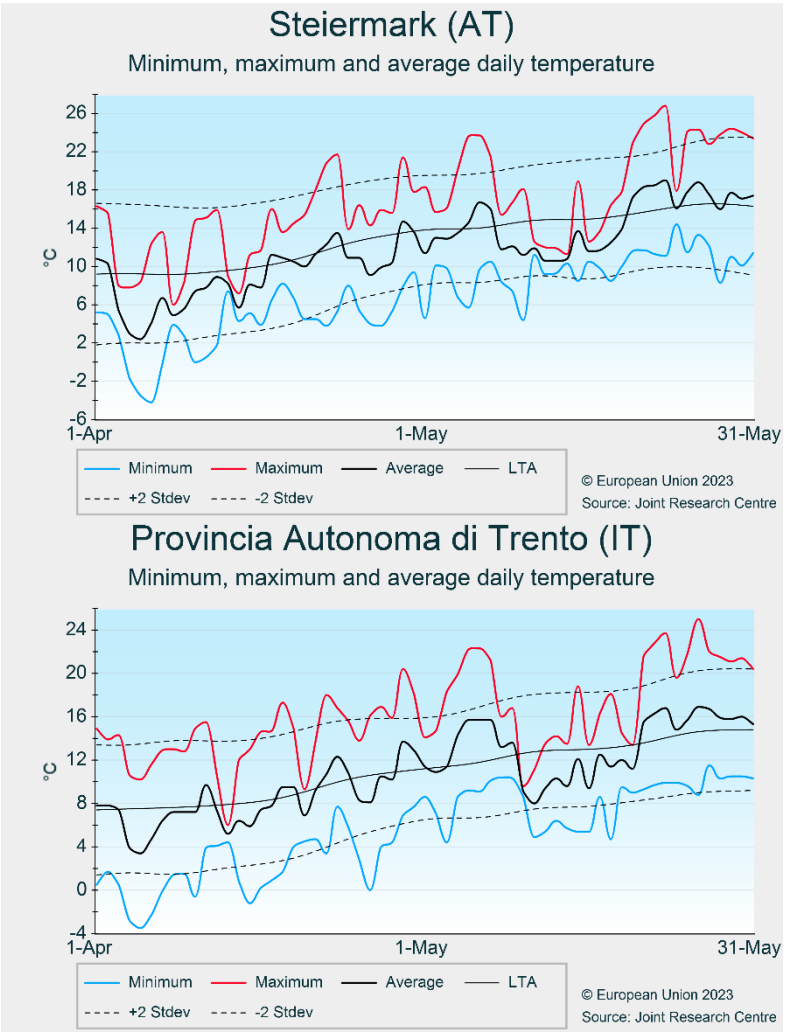
Contrasting patterns of drier- and wetter-than-average conditions, affecting winter as well as spring and/or summer crops in many regions

- **Drought**
  - Continued & intensified – Iberian Peninsula, Maghreb
  - Recovering – NW Italy
- **Rainfall Surplus / Floods**
  - Many parts of Europe experienced rainfall surplus
  - Triggering floods in some regions
- **Rainfall Deficit**
  - N Poland
  - S Sweden & Baltic Countries
- **Temperature accumulation deficit**
  - Hungary, Romania, Bulgaria, W Ukraine



Frost events with potential impacts on fruit trees – 1st dekad of April





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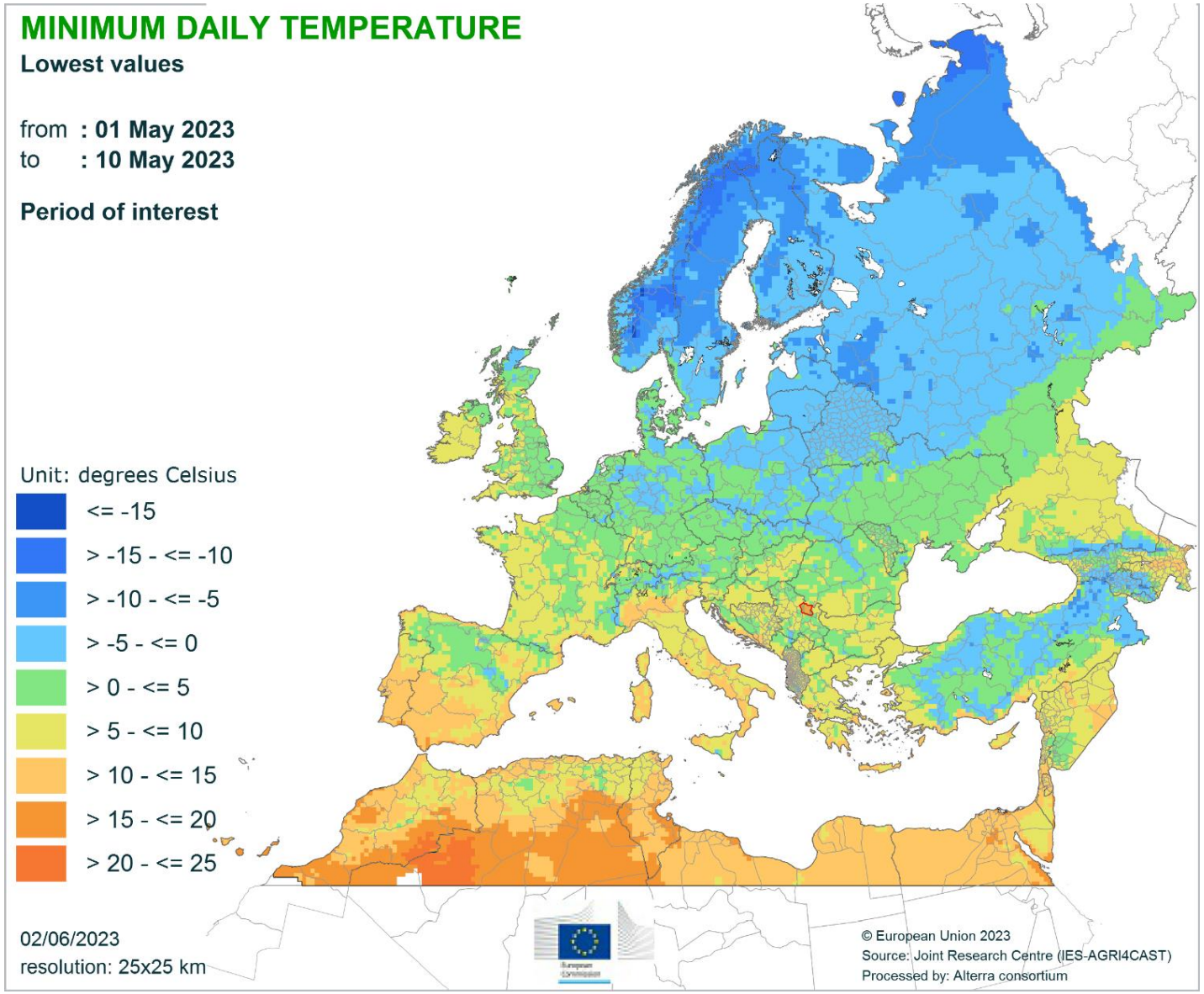
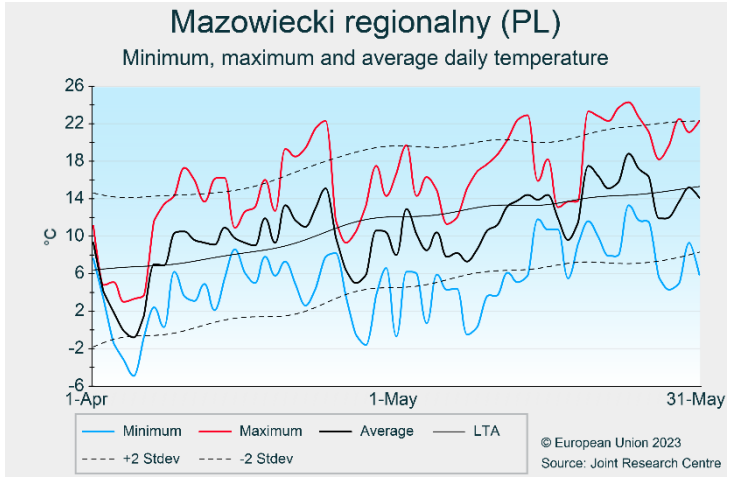
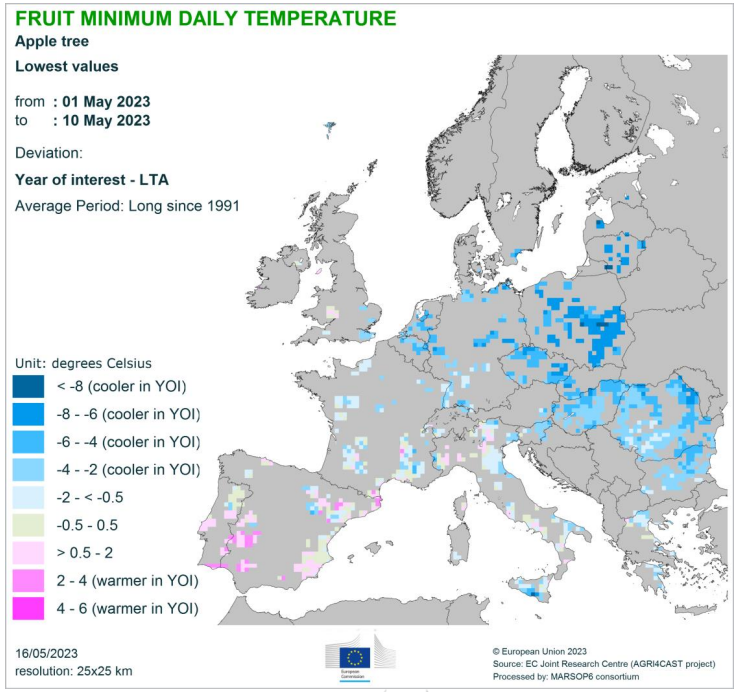
Frost events with potential impacts on fruit trees – 3rd dekad of April - 1st dekad of May







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Thank you

The AGRI4CAST team (JRC D.05)

The JRC MARS Bulletin can be accessed from https://agri4cast.jrc.ec.europa.eu/

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