
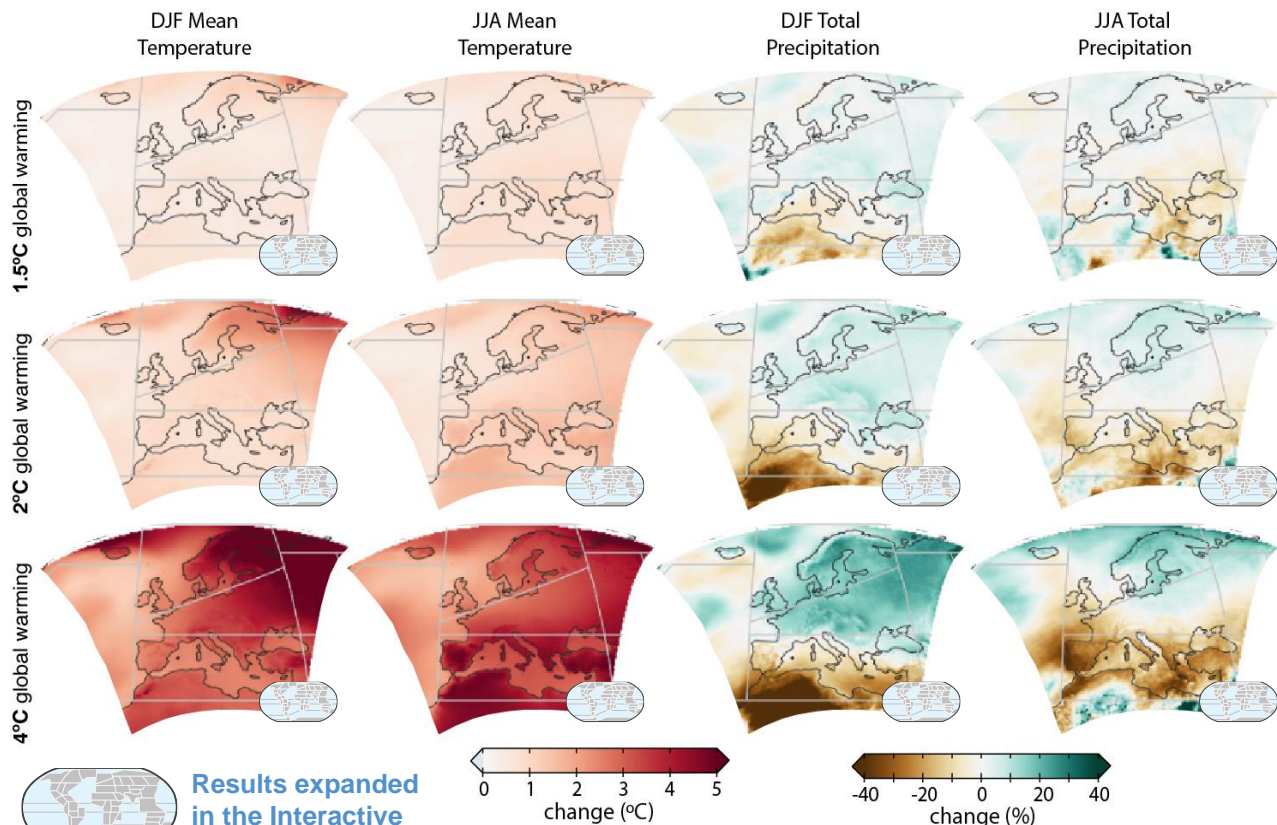


Regional fact sheet - Europe

Common regional changes

-  Regardless of future levels of global warming, temperatures **will rise** in all European areas at a rate exceeding global mean temperature changes, **similar to past observations** (*high confidence*).
-  The frequency and intensity of hot extremes, including marine heatwaves, **have increased** in recent decades and **are projected** to keep increasing regardless of the greenhouse gas emissions scenario. Critical thresholds relevant for ecosystems and humans **are projected to** be exceeded for global warming of 2°C and higher (*high confidence*).
-  The frequency of cold spells and frost days **will decrease** under all the greenhouse gas emissions scenarios in this report and all time horizons, **similar to past observations**. (*high confidence*)
-  Despite strong internal variability, **observed** trends in European mean and extreme temperatures cannot be explained without accounting for anthropogenic factors. Before the 1980s, warming by greenhouse gases **was** partly offset by anthropogenic aerosol emissions. Reduced aerosol influence in the recent decades **has led to** an observable positive trend in shortwave radiation. (*high confidence*)
-  **Observations** have a seasonal and regional pattern consistent with **projected** increase of precipitation in winter in Northern Europe. A precipitation decrease **is projected** in summer in the Mediterranean extending to northward regions. Extreme precipitation and pluvial flooding **are projected** to increase at global warming levels exceeding 1.5°C in all regions except the Mediterranean. (*high confidence*)
-  Regardless of level of global warming, relative sea level **will rise** in all European areas except the Baltic Sea, at a rate close to or exceeding global mean sea level. Changes **are projected** to continue beyond 2100. Extreme sea level events **will become** more frequent and more intense, leading to more coastal flooding. Shorelines along sandy coasts **will retreat** throughout the 21st century (*high confidence*).
-  Strong declines in glaciers, permafrost, snow cover extent, and snow seasonal duration at high latitudes/altitudes **are observed** and **will continue** in a warming world (*high confidence*).
-  Multiple climatic impact-drivers **have already** changed concurrently over recent decades. The number of climatic impact-driver changes **is expected** to increase with increasing global warming (*high confidence*).



Projected changes in seasonal (Dec–Feb, DJF, and Jun–Aug, JJA) mean temperature and precipitation at 1.5°C, 2°C, and 4°C global warming relative to 1995–2014.

Based on EURO CORDEX (40 models) using the RCP 8.5 scenario to compute the warming levels.

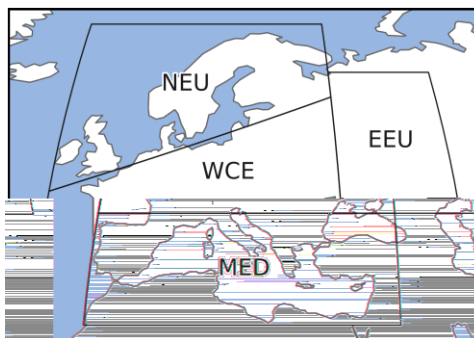
 **Results expanded in the Interactive Atlas (active links)**
interactive-atlas.ipcc.ch

Northern Europe (NEU)

- **Observed** increase in pluvial flooding **attributed** to human influence and **projected** to further increase at global warming of 1.5°C (*medium confidence*) and 2°C and above (*high confidence*).
- **Projected** decrease in river flood at global warming of 2°C and above (*medium confidence*).
- **Projected** increase in severe wind storms at global warming of 2°C and above (*medium confidence*).

Western & Central Europe (WCE)

- **Projected** increase in pluvial flooding at global warming of 1.5°C (*medium confidence*) and 2°C and above (*high confidence*).
- **Observed** increasing trend in river flooding and **projected** further increase at 2°C and above of global warming (*high confidence*).
- **Projected** increases in hydrological, agricultural and ecological droughts at mid-century warming levels of 2°C or above, regardless of the greenhouse gas emissions scenario (*medium confidence*).



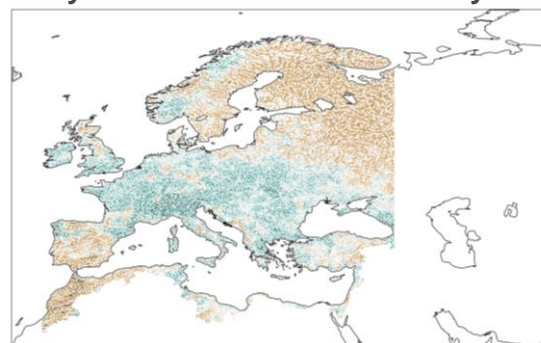
Eastern Europe (EEU)

- **Projected** increase in pluvial flooding at global warming of 1.5°C (*medium confidence*) and 2°C and above (*high confidence*).
- **Projected** decrease in river flood at global warming of 2°C and above (*medium confidence*).
- **Projected** increase in fire weather at global warming of 2°C and above (*medium confidence*).

Mediterranean (MED)

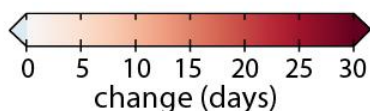
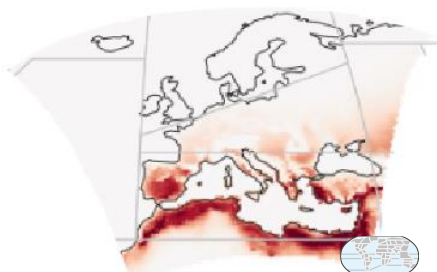
- **Observed** increase in hydrological and agricultural and ecological droughts (*medium confidence*), **projected** increase in aridity and fire weather conditions at global warming of 2°C and above (*high confidence*).
- **Projected** combination of climatic impact-driver changes (warming, temperature extremes, increase in droughts and aridity, precipitation decrease, increase in fire weather, mean and extreme sea levels, snow cover decrease, and wind speed decrease) by mid-century and at global warming of at least 2°C and above (*high confidence*).

Change in river discharge per unit catchment area corresponding to the return period of 100 years for the mid-21st century

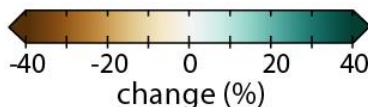
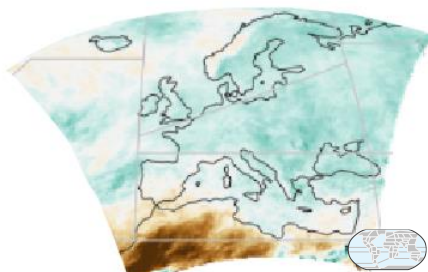


Projected changes for 2041–2060 relative to 1995–2014

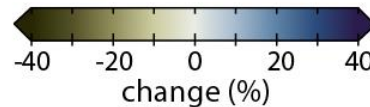
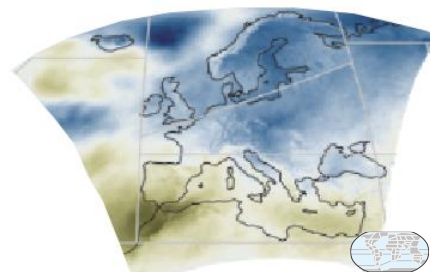
JJA Days with Daily Maximum Temperature above 35°C



DJF Maximum Annual 1-day precipitation (RX1 day)



Standardized Precipitation Index (SPI-6) drought indicator



Links for further details:

Common Changes: TS.4.3.1, TS.4.3.2.5, 11.3.4, 11.9, 12.4.5, Atlas.8.2, Atlas.8.4

Sub-regions: TS.4.3.2.5, 11.9, Tables 11.16–18, 12.4.5, Atlas.8.2, Atlas.8.4