Met Office

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CLIMATE CHANGE IMPACTS FOR UKRAINE

Headline Climate Statements

Temperature

- Ukraine and the surrounding region have warmed by almost 1.5°C over the last 30 years. 2020 was Europe's and Ukraine's hottest year on record.
- Annual mean temperatures are projected to increase by 1.2°C to 3.0°C by mid-21st century and by 1.6°C to 3.5°C by late-21st century under a moderate greenhouse gas concentration scenario (RCP4.5), compared to the late-20th century.
- Annual mean temperatures are projected to increase by 1.7°C to 4.1°C by mid-21st century and by 3.4°C to 6.2°C by late-21st century under a high greenhouse gas concentration scenario (RCP8.5), compared to the late-20th century.

Extreme Temperature

- The number and severity of heatwaves have increased in Ukraine in recent decades and are projected to further increase in the future. In a 4°C warmer world, heatwaves which previously occurred once-in-50 years may occur nearly every year.
- The number of days of frost is projected to decrease, with some areas no longer experiencing any frost days by the late-21st century.

Precipitation

- Annual rainfall is variable across Ukraine, with large year-to-year variability leading to some very wet years and some very dry years. This variability is expected to continue into the future.
- There is potential for large decreases in summer rainfall, especially for southern and south-eastern Ukraine, by the late-21st century.
- There is potential for an increase in winter rainfall, especially across northern Ukraine. Despite increasing winter precipitation, projections show potential for decreased snow cover extent and snow pack and reduced runoff from less available water during the Spring melting season in western mountainous regions in a warmer climate.

Extreme Precipitation

- The frequency and intensity of very heavy rainfall events is projected to increase by 10% to 25% by the late-21st century.

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Headline Impact Statements

Agriculture and food

- Increasing temperatures and projected increases in winter season rainfall may increase the productivity of agricultural production, though productivity increases only apply to lower warming levels associated with lower greenhouse gas concentration scenarios.
- Increasing temperatures and projected decreases in summer season rainfall are likely to result in increasing aridity and heat stress, negatively affecting agriculture and food systems over the 21st century.

Water

- Water-stressed regions in Ukraine are experiencing more prolonged heatwaves and a longer summer season than in the 20th century.
- Increased water scarcity in southern and eastern Ukraine will increase pressure on existing waterways exposing more of the population to contaminated water supplies.
- Projected decreases in snow pack in the future are likely to change the timing and amount of runoff from mountainous areas, that may reduce the risk of river flooding in some basins.

Health

- More intense and frequent heat extremes, together with declining air quality, will increase the risk of heat-related mortality and productivity losses.

Ecosystems

- Marine ecosystems and biodiversity in the Black Sea and Sea of Azov are under threat from climate change. Waters have warmed by more than 1°C in the last 20 years and under a high greenhouse gas concentration scenario warming of up to 5°C is plausible by the end of the 21st century, further threatening marine ecosystems.
- Deforestation and increasing temperatures have been linked to increased fire risk, with fires occurring more often and being more intense. Fire risk will continue to increase in the future as temperatures rise, particularly in scenarios where summer rainfall decreases.

Energy and infrastructure

- Projected increases in temperature, water scarcity and extreme events are expected to both increase demand for energy and threaten supply through placing infrastructure under stress.
- Increases in the frequency of heavy rainfall events are expected to increase the risk of flash flooding events which damage infrastructure and properties.

Changes over time

- Most negative climate change impacts projected for the 21st century are expected to be greater under higher greenhouse gas concentration scenarios.
- Impacts from climate change will be affected by a complex range of other factors, such as planning decisions and demographic change.