THE UNIVERSITY OF ALABAMA | Global Water Security Center

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www.ua-gwsc.org
gwsc@ua.edu
(205) 348-5888
QL20220831-EE

Summer 2022, European Drought Affecting River Navigation, Crops, and Hydropower

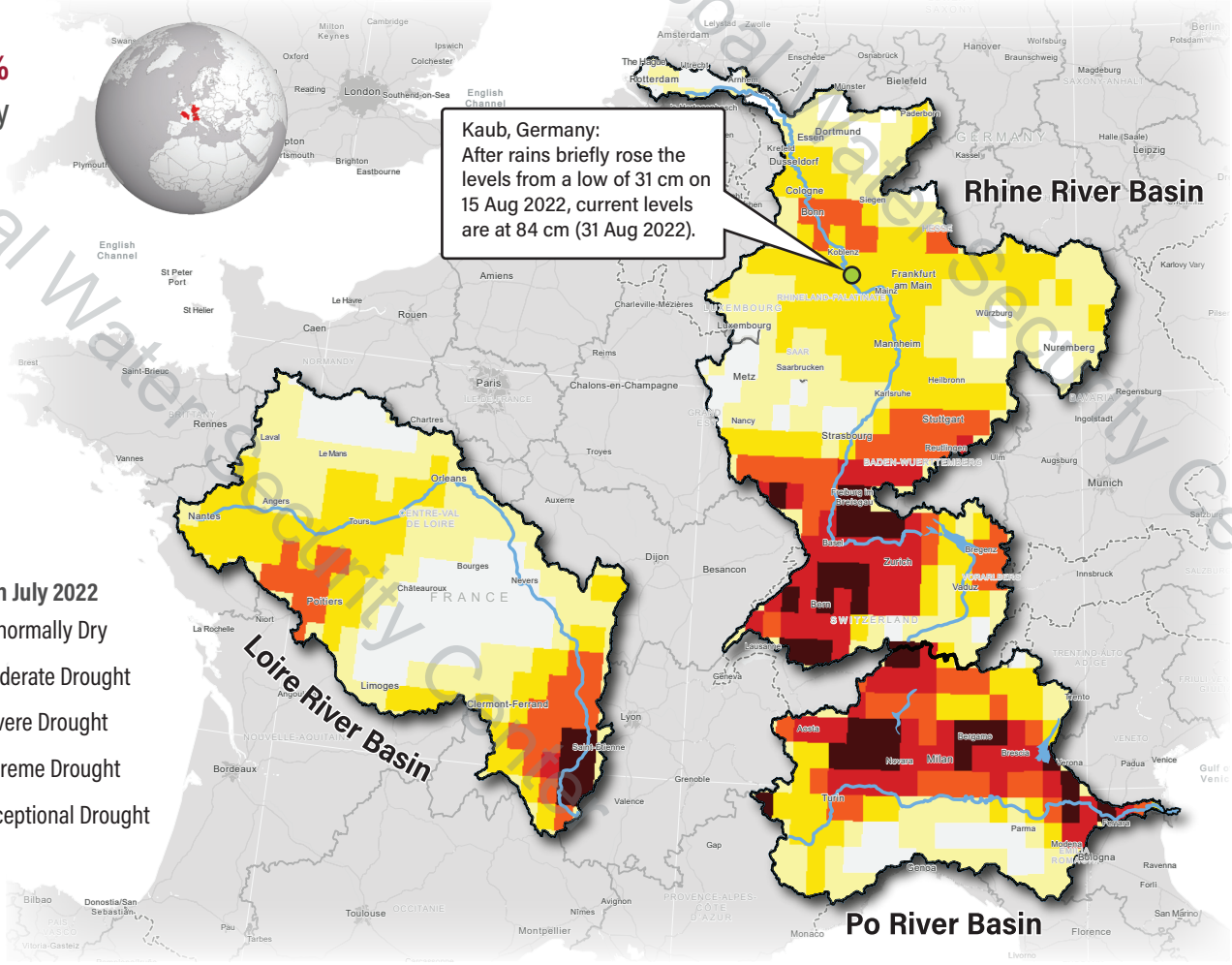
Widespread drought and heatwaves since May 2022 have reduced water levels, affecting river navigation, potential crop yields, and stored water for hydropower and cooling of power plants. Dry conditions are predicted to continue through September.

The Loire, Rhine, and Po watersheds had **68%** of average rainfall (**1783mm deficit**) from May - August 2022.

-9% - Average decline in cereal crop yields following similar droughts in Europe.

Low water levels reducing shipments as much as **75%** for ships to navigate shallow rivers. Similar events caused spikes in freight rates of cargo transport.

Three of Europe's largest rivers - The Loire, Rhine, and Po - are all facing low water levels due to drought in their river basins



Pathway to Impact

There was an average temperature anomaly of +0.9C in the Alps from Dec 2021-Mar 2022, leading to a smaller snowpack. Combined with a precipitation deficit in river basins, rivers and reservoirs are at historic lows.

Low water levels impact river navigation, hydropower and cooling, and saltwater intrusion in the river systems - limiting transportation, power production, and reducing groundwater quality.

Drought and heat have impacted crops throughout Europe. Maize in particular is projected to be down 16% from the 2021/22 harvest for the European Union.

Data: ECMWF ERA5, GDM

Sources:

Precipitation Data:
ECMWF ERA5. Generated using Copernicus Climate Change Service information [2022]

Global Drought Monitor:
Global Water Security Center. (2022). Global Drought Index. https://h2o.aer.com/drought

Streamflow Data:
The Global Runoff Data Centre, 56068 Koblenz, Germany

Text Sources:
Brás, T. A., Seixas, J., Carvalhais, N., Jägermeyr, J. (2021). Severity of drought and heatwave crop losses tripled over the last five decades in Europe. Environ. Res. Lett. 16 065012

Foreign Agricultural Service. (2022). European Production. United States Department of Agriculture. https://ipad.fas.usda.gov-/countrysummary/default.aspx?id=E4

Basemap Source:
Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community [Vector tile layer]. Scale Not Given. "Light Gray Canvas Base". September 21, 2022. https://basemaps.arcgis.com/arcgis/rest/services/World_Basemap_v2/VectorTileServer. (October 28, 2022).