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Mapping changes in surface-water extent during the 2022 hydrological drought in Germany using Sentinel-2 data

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The 2022 hydrological drought in Europe was a significant event that resulted in widespread water shortages and economic disruption. The low water levels had significant implications for supply chains, transport capacity and water quality. In this study, we used a fully automated, neural-network based processing chain to semantically segment Sentinel-2 data. The processing chain was originally developed for flood detection. To map changes in surface-water extent during the drought, we compared reference water masks of the previous two years with the extent of summer 2022.
Our results show that the drought had a measurable impact on surface-water extents across Germany, with many rivers and lakes experiencing declines. A decline can be observed in all river basins. By providing detailed maps of these changes, our study offers valuable insights into the impact of droughts on surface water extent and can help inform future drought mitigation and management efforts in the region. The results presented in this contribution indicate, that the surface water extent in Germany 2022 declined by 3.1% compared to the previous two years. The most affected hydrological catchment area was the Weser river basin, which experienced a water extent loss of 7.4%.