

HIGHLIGHTS FROM C2SM

Climate change heightens risks for humans and nature.

Researchers at C2SM investigate the impacts of climate change on human displacement due to river floods and how tree growth in Switzerland is increasingly limited by rising evaporative demand.

PAPER: GLOBAL WARMING AND POPULATION CHANGE BOTH INCREASE FUTURE RISK OF HUMAN DISPLACEMENT DUE TO RIVER FLOODS

Every year, millions of people around the world are displaced from their homes due to climate-related disasters. Among all types of disaster, floods account for about half of all disaster displacements. In this paper, we use scenario-based projections to estimate the changing trend of river flood displacements, both globally and at the regional level, capturing the long-term dynamics of climate change and socio-economic development. We found that the risk of population displacement due to river floods rises by ~50 percent for every degree of global warming. If population growth is considered as well, the global displacement risk is significantly higher. Under a scenario with 2-2.5 degrees Celsius warming, the risk is projected to increase by ~350 percent by the end of the century. However, in the scenario that is aligned with the Paris Agreement (RCP2.6-SSP1), the risk is still rises by ~110 percent.

REFERENCE

Kam et al. (2021) Global warming and population change both heighten future risk of human displacement due to river floods. *Environ. Res. Lett.* 16 044026. doi: 10.1088/1748-9326/abd26c



Water flood at Sakon Nakhon, Thailand: Floods account for more than half of the population displacements every year among all disaster types. Source: kitsadakron/123RF.COM


TREE GROWTH IN SWITZERLAND IS INCREASINGLY CONSTRAINED BY RISING EVAPORATIVE DEMAND

Trees dynamically respond to environmental constraints throughout the growing season and across landscapes. We used a process-based forest ecosystem to assess the impacts of short-term climate variability and medium-term climate change. We focused on impacts of vapour pressure deficit (VPD), a measure for atmospheric dryness, air temperature and soil water availability, on tree growth of seven Central European species. We show that the relative importance of VPD on tree growth has increased in the last three decades. Our results can help to generate accurate species-specific risk maps for forest managers to identify areas with elevated drought and heat stress in the near future.

REFERENCE

Trotsiuk V, Babst F, Grossiord C, Gessler A, Forrester DI, Buchmann N, Schaub M, Eugster W (2021) Tree growth in Switzerland is increasingly constrained by rising evaporative demand. *J Ecology*. doi.org/10.1111/1365-2745.13712

 MORE INFORMATION
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ABOUT C2SM

C2SM aims to improve the understanding of the climate system and strengthen the predictive skill of climate and weather models. It is a joint initiative of ETHZ, MeteoSwiss, Empa and WSL.