

Unravelling the complex interplay between competition for land and water, drought and conflict



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Point of departure of the project

1. Existing research has started to identify conditional and indirect relationships between climate, drought and conflict (see Koubi (2019) *ARPS*)
 - The agricultural sector is highlighted as key actor
 2. Existing research focuses on historical relationships but typically offers no explicit consideration of changes in future risk
 3. Existing long-term conflict projections do not consider the interplay between socioeconomic and climatic changes
- Here, we aim to estimate future changes in conflict risk as a function of socioeconomic and climatic changes

Will climate change lead to more armed conflict?



Bernie Sanders ✓
@SenSanders

Följ

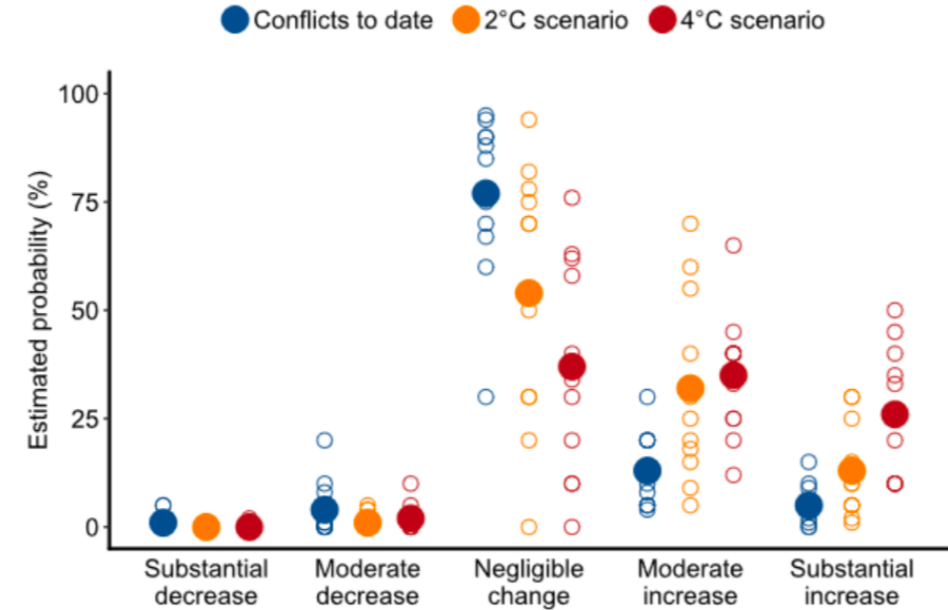
Climate change is one of the greatest threats to global security. As we see more drought, as poor people are not able to grow the food they need, there will be migrations of millions of people all over the world. That is why we need a Green New Deal.



Climate Change Will Increase Risk of Violent Conflict, Researchers

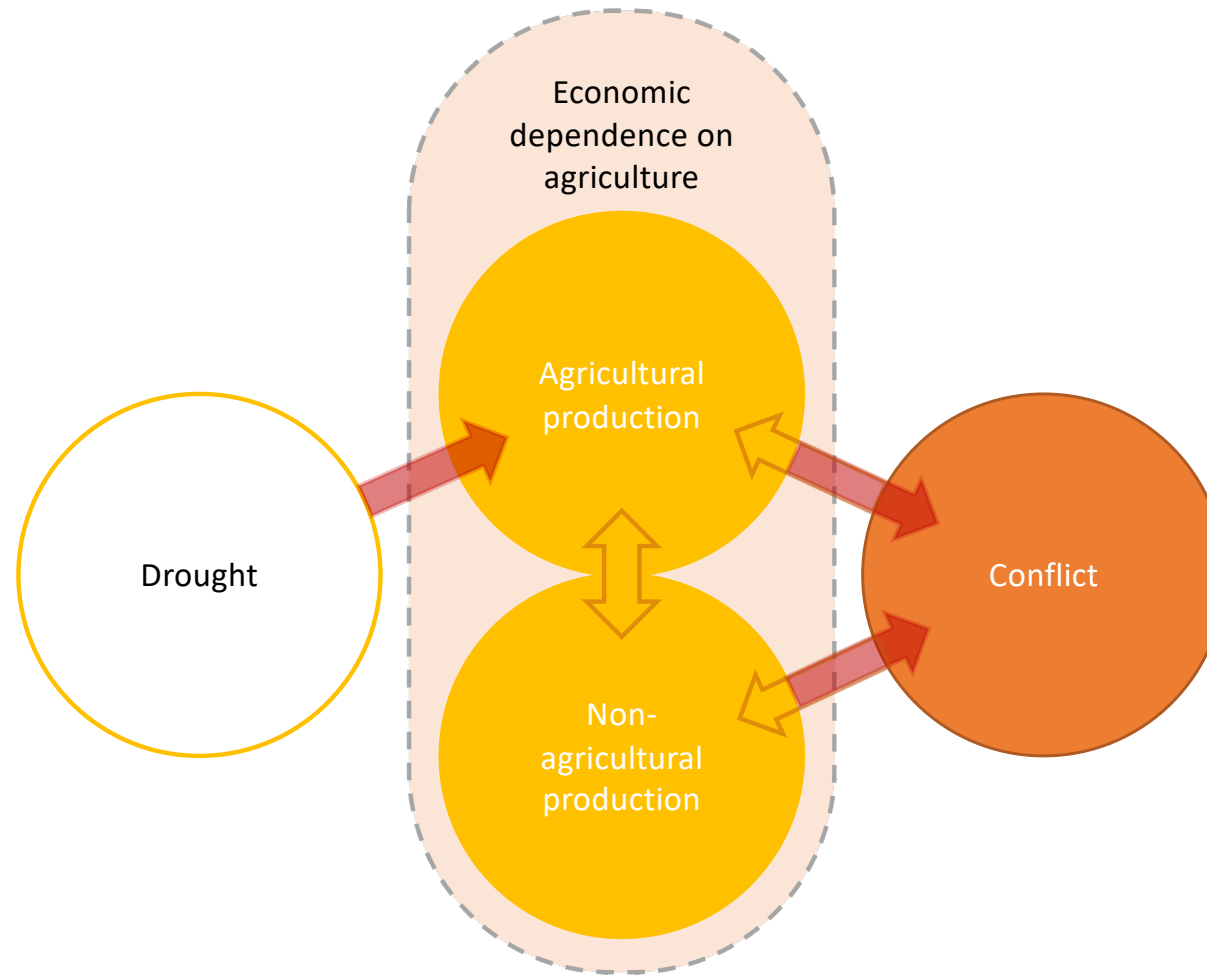
Stanford convened top experts in climate and conflict, with a wide range of views, to see where they agree about climate change's impact on global security.

insideclimatenews.org



Mach, K. J., Kraan, C. M., Adger, W. N., Buhaug, H., Burke, M., Fearon, J. D., ... von Uexkull, N. (2019). *Climate as a risk factor for armed conflict*. *Nature*, <https://doi.org/10.1038/s41586-019-1300-6>

Theoretical framework: A climate-conflict trap?



Do this link really exist?

Research Design

Exogenous variables from SSP-RCP scenarios

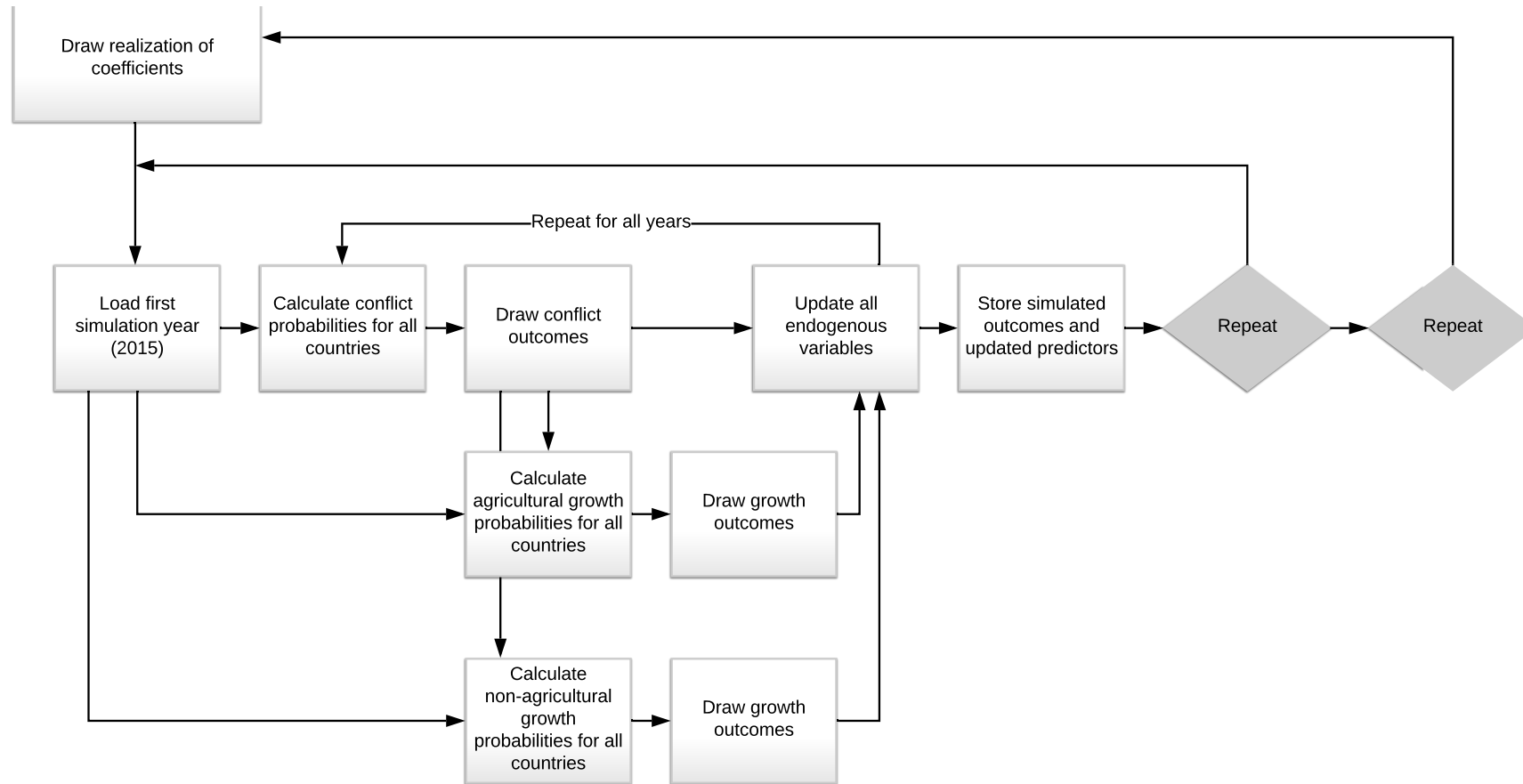
- Population growth
- Educational attainment
- Drought: Soil moisture deficits over croplands

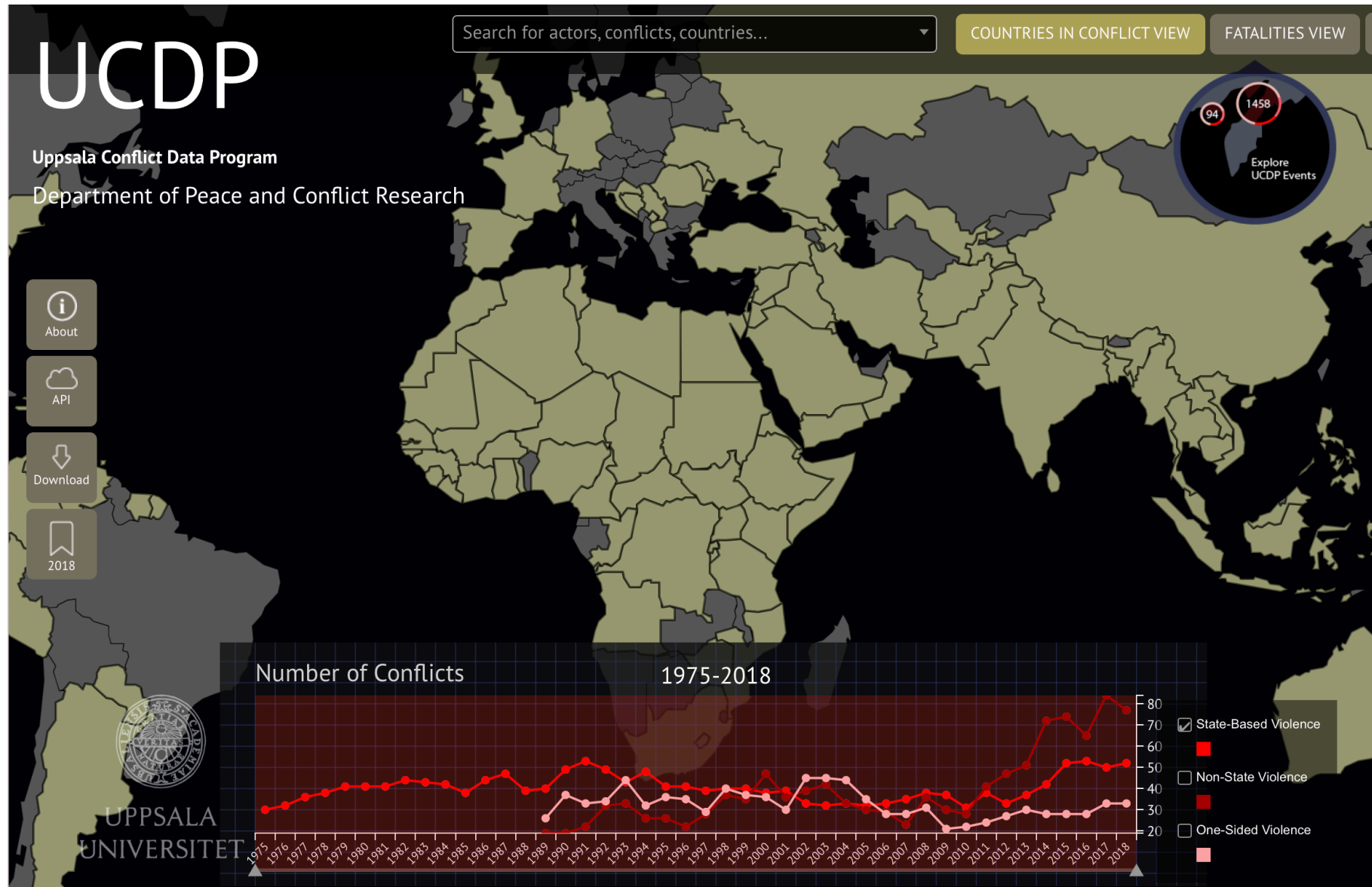
Endogenous variables estimated

- Growth in agricultural GDPpc
- Growth in non-agricultural GDPpc
- Armed conflict

Training period: 1979-2014
Projections: 2015-2099

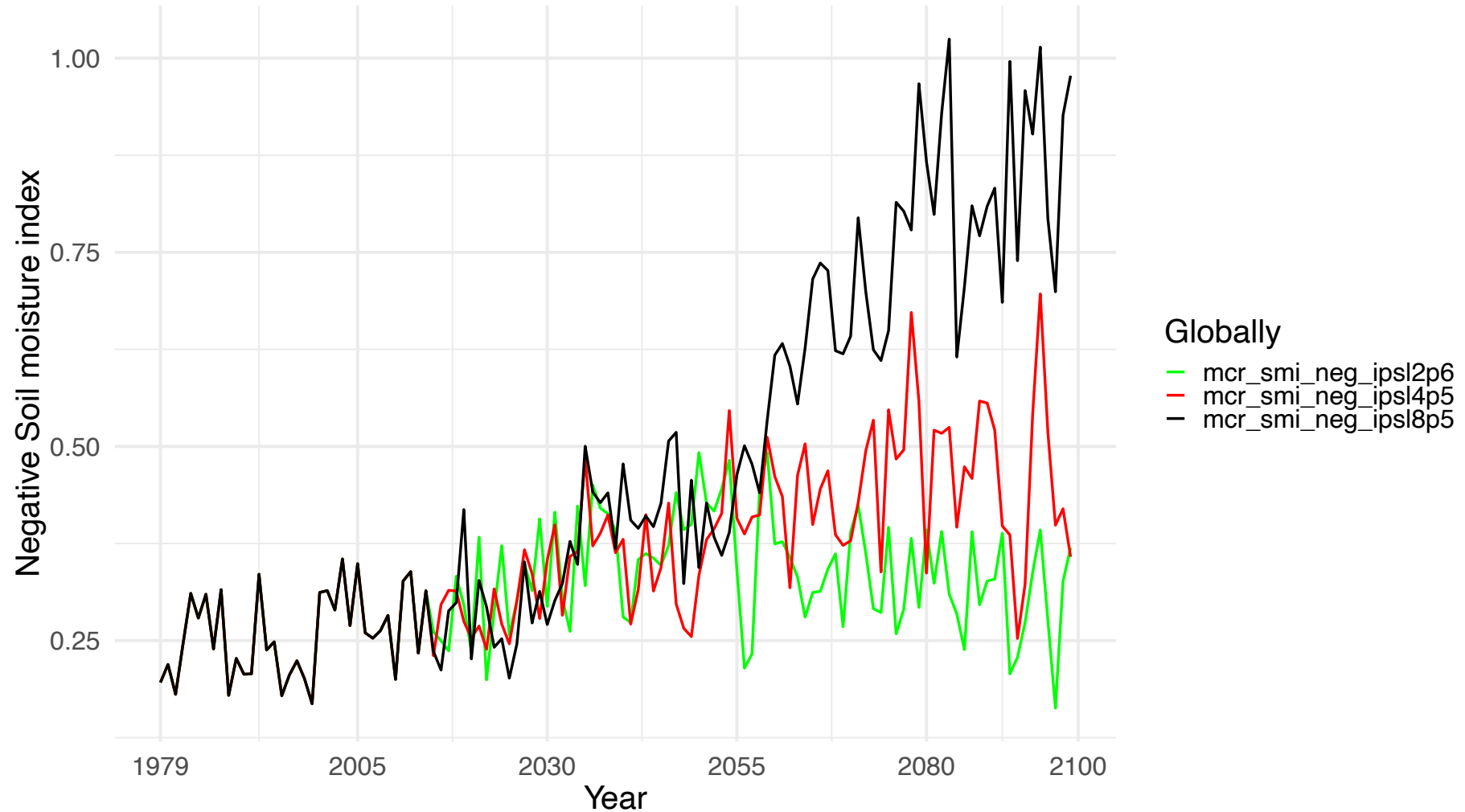
Dynamic simulations



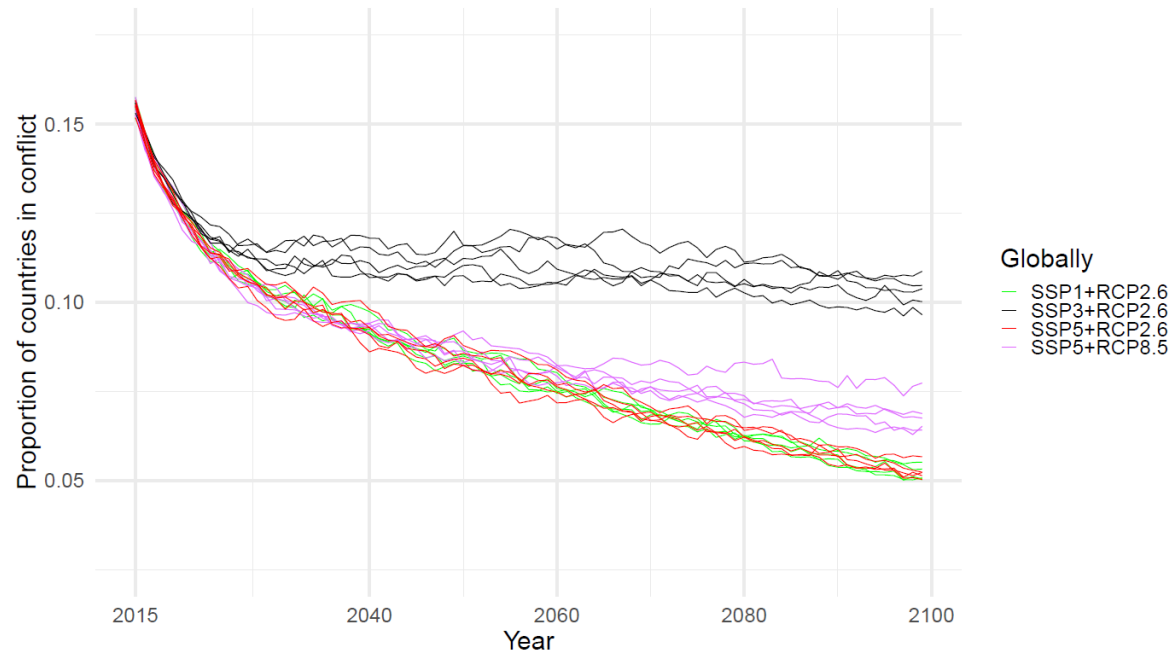


Data from Uppsala Conflict Data Program, focus on "State-based violence" (Civil conflict) fought between government and at least one rebel group resulting in at least 25 battle-related deaths per year. (E.g. Syria)

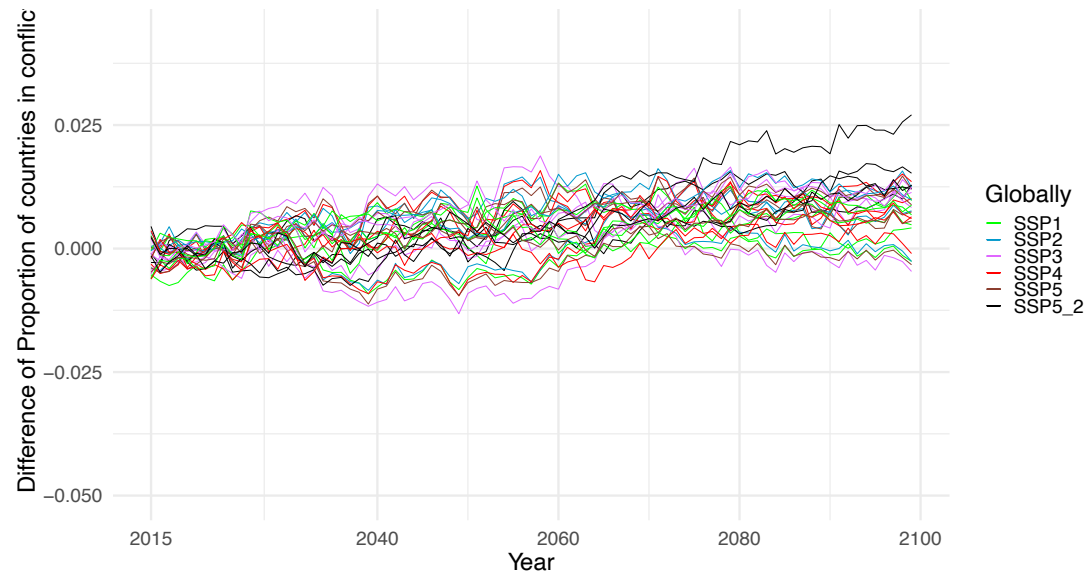
Drought projections for different RCPs



Outlooks of conflict

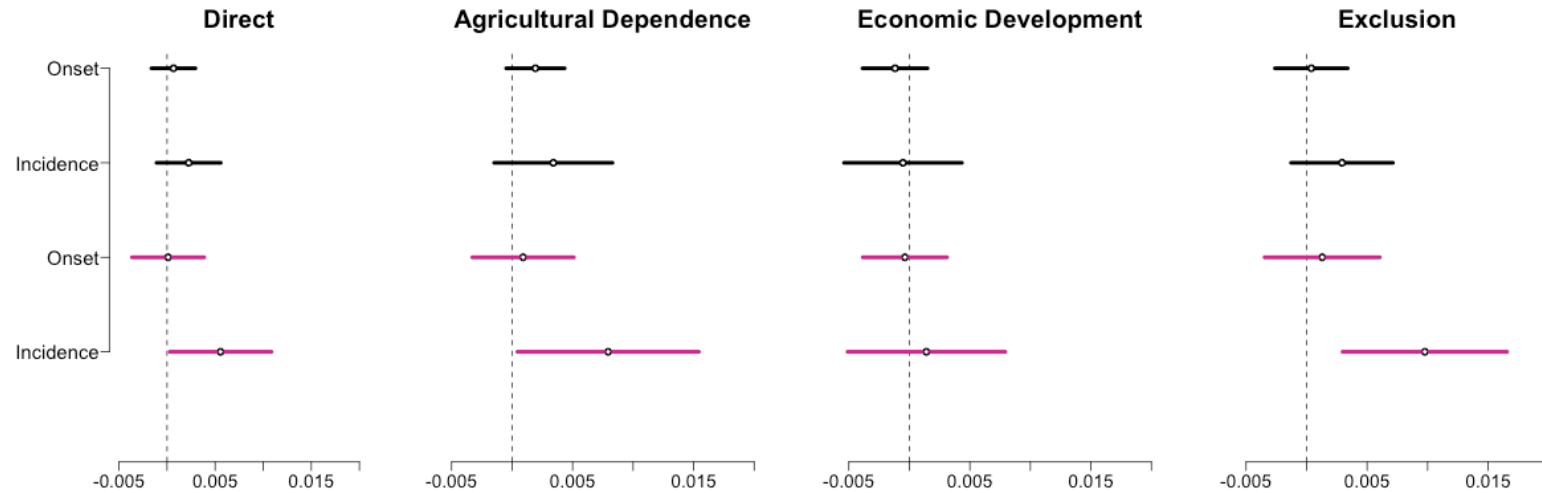


Conflict
projections
select
scenarios

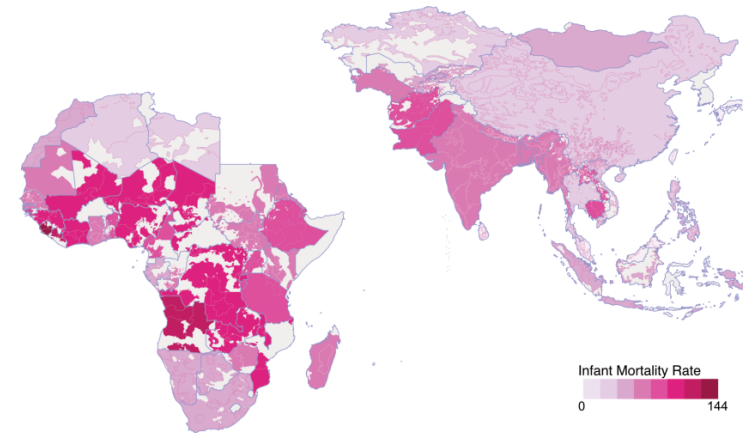


Differences in
proportion in
conflict for higher
emission vs
"Paris" scenario

Evidence of drought conflict links in vulnerable contexts



- Growing-season drought has no significant effect on civil conflict outbreak.
- Yet, it sustains civil conflict violence in the contexts of political marginalization and agricultural dependence in poor countries



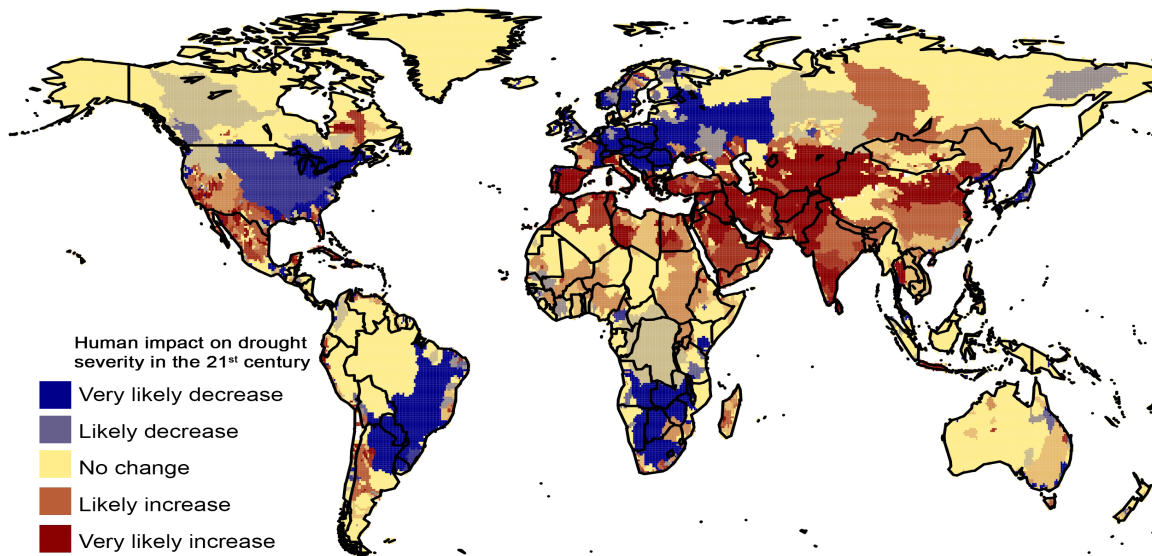
von Uexkull, et al. (2016). Civil conflict sensitivity to growing-season drought. *Proceedings of the National Academy of Sciences*, 113(44), 12391–12396.

Conclusions

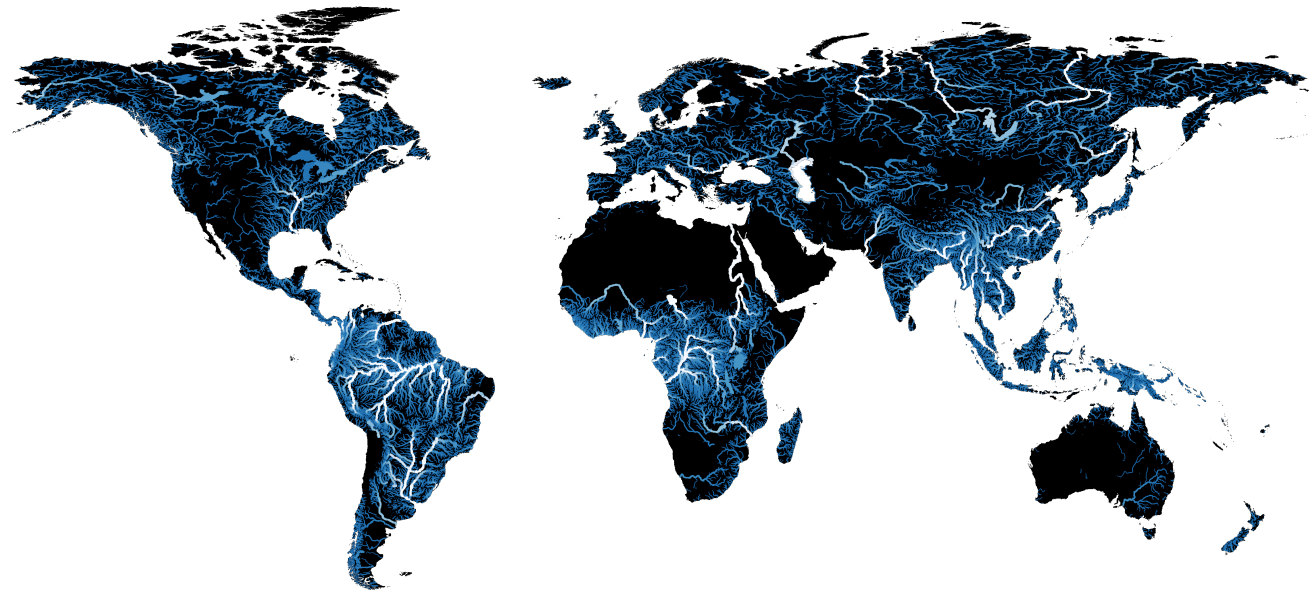
- Increasing drought is expected to alter conflict occurrence
- Impacts of increased drought occurrence might be balanced out by improvements in social economic conditions
- Long-term impact of drought on land use and hydrology is currently not included in conflict projections

Ongoing steps

- Global drought impacts simulations
- Historic and future land use simulations
- Improved understanding of land surface – conflict feedbacks



Wanders, N. & Wada, Y. 2015. doi:10.1016/j.jhydrol.2014.10.047



Sutanudjaja, E. H., et al. 2018, doi:10.5194/gmd-11-2429-2018