

Agricultural Impact of Heatwaves in Climate Change Storylines

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With an increasing probability of extreme events, their significance for agricultural production has also grown. Ecosystem models enable us to integrate current knowledge about plant-climate interactions with climate change scenarios. Since impacts of weather extremes differ depending on crop, intensity, length, and timing, a process-based approach is necessary to quantify to what extent extreme events impact agricultural production. We used the ecosystem model LandscapeDNDC to evaluate the effect of extreme conditions, like drought or intense heat waves, on agricultural production. The combination of LandscapeDNDC with pseudo-global-warming storylines is used to assess how the extreme heat wave of 2018 –2022 would have affected yields of maize and wheat in a + 2 K and +4 K warmer world. This exercise identifies which regions are most vulnerable regarding climate extremes and quantifies to what extent extreme climate events can affect crop yields compared to baseline conditions.

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