Weather-making high-pressure systems predicted to intensify as a result of increasing greenhouse-gas concentrations

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(Phys.org)—High-pressure systems over oceans, which largely determine the tracks of tropical cyclones and hydrological extremes in much of the northern hemisphere, are likely to intensify this century, according to a Duke University-led study published online this week in *Nature Geoscience*.

The study's findings suggest that as summertime near-surface high-pressure systems over the northern Pacific and Atlantic oceans strengthen, they could play an increasingly important role in shaping regional climate, particularly the occurrence of drought and extreme summer rainfall, in coming years.

Wenhong Li, assistant professor of earth and ocean sciences at Duke's Nicholas School of the Environment, and colleagues used climate model simulations to predict future changes in the strength of the annually occurring North Atlantic Subtropical High, also known as the Bermuda High, and the North Pacific Subtropical High.

According to the simulations, these high-pressure systems will intensify over the 21st century as a result of increasing greenhouse-gas concentrations. The simulations suggest that an increase in the land-sea thermal contrast – the difference between ocean and land temperatures, as Earth's climate warms – will fuel the systems' intensification.

Li's co-authors on the new study are Laifang Li, a PhD student at Duke's Nicholas School; Mingfang Ting of the Lamont-Doherty Earth Observatory at Columbia University's Earth Institute; and Yimin Liu of the Chinese Academy of Sciences' Institute of Atmospheric Physics.

They used climate model simulations from the Intergovernmental Panel on Climate Change Fourth Assessment Report and 40 years of precipitation data from the European Centre for Medium-Range Weather Forecasts for the months of June, July and August to conduct their research.

More information: The full study is online at www.nature.com/ngeo/journal/va … t/full/ngeo1590.html

Provided by Duke University

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