

A new feedback on climate change from the hydrological cycle

P.D. Williams¹, E. Guilyardi^{1,2}, R.T. Sutton¹, J.M. Gregory^{1,3}, G. Madec²

¹*University of Reading, Reading, UK;* ²*Universite Paris VI, Paris, France;* ³*Hadley Centre for Climate Prediction and Research, Exeter, UK*

An intensification of the hydrological cycle is a likely consequence of global warming. But changes in the hydrological cycle could affect sea-surface temperature by modifying diffusive ocean heat transports. We investigate this mechanism by studying a coupled general circulation model sensitivity experiment in which the hydrological cycle is artificially amplified. We find that the amplified hydrological cycle depresses sea-surface temperature by enhancing ocean heat uptake in low latitudes. We estimate that a 10% increase in the hydrological cycle will contribute a basin-scale sea-surface temperature decrease of around 0.1°C away from high latitudes, with larger decreases locally. We conclude that an intensified hydrological cycle is likely to contribute a weak negative feedback to anthropogenic climate change.

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