



Human-induced vegetation shifts based on bioclimatic estimates

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A fingerprint of human influence has been identified on both global changes in temperature and precipitation. It is unclear however how much changes in future vegetation distributions may be attributable to changes in temperature versus precipitation. Köppen bioclimatic classification schemes, based on observed and simulated characteristics of the annual cycles of continental temperature and precipitation, are used to evaluate climate model performance in simulating biologically important features of regional temperature and precipitation, or to understand possible bioclimatic changes in response to global warming. Here, we applied a formal detection and attribution technique based on the changes in bioclimatic repartition in order to 1) identify a human fingerprint in these bioclimatic changes, 2) understand the causes of observed bioclimatic shifts, and 3) determine the relative contributions of temperature and precipitation changes to the observed vegetation shifts. We find that the changes in vegetation distribution driven by observed temperature and precipitation are consistent with the response to anthropogenic and natural forcings over the satellite period. The individual influence of temperature and precipitation changes will be discussed.

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