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The Time Of Emergence (TOE) of precipitation change Hot-spots

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The Time Of Emergence (TOE) of 14 greenhouse gas (GHG) - forced precipitation change hotspots (PSPOTs) is identified from the CMIP3 multi-model ensemble. The TOE is defined as the time in 21st century projections at which the magnitude of the ensemble mean precipitation change signal becomes greater than the corresponding inter-model standard deviation (or noise), and remains so thereafter. For the 14 PSPOTS identified, 6 have a TOE in the early decades of the 21st century (northern high latitudes, Mediterranean, and East Africa), 3 in the mid decades (East and South Asia, Caribbean) and 5 in the late decades or beyond (South Africa, Western United States, Amazon Basin, Southern Australia, Central America). The TOE is sensitive to the GHG emission scenario for some of the PSPOTS. The TOE has important implications for the predictability and detection of GHG-forced PSPOTS and for impact and adaptation studies.