

Globally Observed Teleconnections in a Hierarchy of Atmospheric Models - GOTHAM

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Extreme climate events regularly impact millions of people living in vulnerable regions. These climate events can span a wide range of timescales: from being relatively short-lived (e.g. hurricanes), through to long-term shifts in regional weather patterns (e.g. desertification). Depending on their nature extreme climate events can affect countries in variety of different ways, impacting: agriculture (e.g. crop yields), infrastructure (e.g. roads), health (e.g. infectious disease) and energy (e.g. hydro-electricity) sectors.

The origins of these extreme events need not be restricted to the regions most affected by them. For instance, variability in the stratosphere is linked with tropospheric circulation regimes within the tropics and high latitudes. Stalled mid-latitude Rossby waves can link simultaneous and opposite-signed climate extremes in geographically separated regions. And slow changing climate patterns in the North Pacific can influence the timing and extent of the East Asian monsoon. By recognising the non-local links in climate extremes, one can better tailor and coordinate regional climate services.

GOTHAM represents an ambitious international research programme to gain robust, relevant and transferable knowledge of past and present-day patterns and trends of regional climate extremes and variability of vulnerable areas identified by the IPCC, including the tropics and high-latitudes. The project aims to contribute to the overall challenge of developing climate services with a focus on the role of teleconnections in climate variability and predictability. Specifically, GOTHAM is assessing the potential for improved season-decadal prediction using a combination of climate models, citizen-science computing and advanced statistical analysis tools.

Keywords: complex networks, teleconnections, extreme events, citizen science, climate models