Extremes WG Report

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The US CLIVAR Working Group, "Large Scale Patterns Associated with Extremes," was formed in 2012 to focus on the dynamics of short-term extreme temperature and precipitation events. Short-term events, defined here as lasting less than a week, can have severe societal impacts and are an important factor in understanding the risks of climate change--but are not well-resolved by typical monthly or seasonal analyses. Two key motivating questions for the working group are: what are the dynamics of these events and how well do current models capture the dynamics? Consideration of large-scale patterns focuses on aspects of the event dynamics that are resolvable in current climate models and a wide range of observational data sets, allowing for both model assessment and the possibility of downscaling.

The scientific objectives of the working group are: 1) assess and synthesize existing knowledge base on the links between Large Scale Meteorological Patterns (LSMPs) and short term temperature and precipitation extremes, 2) identify key questions and knowledge gaps, 3) establish a methodology and research protocols for using the LSMP approach to analyzing extremes in observations and model output, and 4) provide a preliminary assessment of the ability of current models to reproduce the correct relationship between extremes and LSMPs for North America.

The working group has addressed those objectives with a workshop, held in August 2013 in Berkley, a focus issue of CLIVAR Variations, two review papers (in progress), and by contributing to the US CLIVAR science plan. The LSMP approach shows considerable promise for addressing the two motivating questions and the workshop report contains a detailed list of recommendations for moving forward.