SORS/WomenInBSC: A Web of Tele-Connections: How the Combined Effect of Climate Drivers Influences Seasonal Rainfall Patterns

Objectives

Abstract: There is on-the-ground demand to improve forecast skill of anomalous precipitation events, which would provide decision makers with the means to support their communities. This study investigates anomalous rainfall events that are often caused by cross-time scale interactions of large-scale climate modes of variability, such as the Madden Julian Oscillation (MJO) and El Niño-Southern Oscillation (ENSO). First, this research focuses on furthering the understanding of how to identify the independent and joint rainfall signals contributed by (in this case) the MJO and ENSO based on observations and, second, identifies if rainfall signals can be explained through a linear or nonlinear cross-timescale interference analysis. Here, composites of rainfall anomalies are created from separate ("independent") and joint ENSO and MJO occurrences. The independent composites suggest that it is possible to identify the individual signatures from several climate drivers on observed rainfall. However, joint analyses expose distinct ENSO- and MJO-related rainfall distributions that cannot be seen when an independent composite analysis is conducted. Generally speaking, global precipitation variability can be a result of both linear and nonlinear crosstimescale interactions of these (and other) modes of climate variability, depending on their magnitude and when and where the interaction occurs. The methodology is a completely general approach and can be used to analyze other climate drivers or modes of variability at global or regional scales.

Note: This is a two-part seminar. The first one (Wednesday) introduces the cross-timescale theoretical framework and tools, while the second one (Thursday) focuses more on a particular application of interest: cross-timescale interference between the Madden-Julian Oscillation, the Indian Ocean Dipole and El Niño-Southern Oscillation.

Short Bio: Laurel DiSera is interested in understanding how climate impacts society, especially in Latin America. As a Climate and Society scientist, Laurel desires to

learn more about the impacts of different climate phenomena occurring at different timescales, also known as cross-timescale interference, and how these impacts affect livelihoods at a local level. She also assess ways to improve climate communication among local and multilateral organizations. Laurel conducts her research at the International Research Institute for Climate and Society, part of the Climate School at Columbia, and in partnership with the School of International and Public Affairs (SIPA).

In her previous work during her Master's and at the IRI, Laurel spent time in Guatemala working to increase climate knowledge throughout the country, specifically with locals in rural regions. Following this, she switched gears to focus on how Aedes-borne diseases in the Americas and worldwide are impacted by climate. Through this research, she focused on assessing and improving the skill of Subseasonal to Seasonal (S2S) forecasts to better understand how models can be used by decision makers to improve the livelihoods of their constituents.

For more information, please contact Laurel ldisera@iri.columbia.edu directly, or Ángel G. Muñoz angel.g.munoz@bsc.es

Speakers

Speaker: Laurel DiSera, The International Research Institute for Climate and Society (IRI). Columbia University Climate School. New York, USA. and Department of Earth and Environmental Sciences (DEES). Columbia University. New York, USA
Host: Angel Garikoitz Munoz Solorzano, Climate Services ES group Established Researcher, ES, BSC

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