Contribution ID: **39**   Type: **not specified**

Land surface as a predictability driver in Subseasonal and seasonal Forecasts

Tuesday, 3 September 2019 11:20 (50 minutes)

Processes occurring at the land surface impact weather and climate variability in a wide range of timescales from days to millennia, making land surface models a required component of both weather and climate prediction systems. Of special relevance is the role of land surface processes involving snow, soil water and vegetation in the amplification of extreme weather and climate anomalies, such as the extreme hot summers in Europe in 2003 and 2010. Soil moisture has a long residence time, about 60 days, when compared with 10 days in the atmosphere. This leads to a considerable potential predictability induced by land surface conditions. However, this memory effect is hampered by (i) difficulties to accurately monitor surface conditions (e.g soil moisture); (ii) forecast errors (e.g. bias in precipitation) and (iii) representation of surface turbulent fluxes and soil-plant water transport. This talk will provide an overview of the current understanding of the land surface role in sub-seasonal to seasonal predictability. Particular focus will be given to observational proxies, land data assimilation and land-surface modelling. Finally, current and future challenges in the initialization and representation of surface process relevant for sub-seasoal to seasonal prediction will be presented.

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Session Classification: Session 2: Physical processes, modelling and initialization requirements