



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

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Asian Monsoon Variability over the Past Millennium Reconstructed from Long Tree-Ring Records: the Monsoon Asia Drought Atlas, version 2 (MADAv2)

Wednesday, January 20, 2016 - 12:00pm to 1:00pm

Room: Bannister 110

The Monsoon Asia Drought Atlas, version 2 (MADAv2), is a substantially updated and improved year-to-year reconstruction of summer drought and wetness on a 1.0° grid over Monsoon Asia. It has been developed using the same basic methodology as that used in producing the previous version (MADAv1) published in 2010 and is now based on an improved target field of self-calibrating Palmer Drought Severity Indices (scPDSI) and a significantly larger network of 453 tree-ring chronologies compared to the previous effort. Importantly, this expanded tree-ring network also includes several new long tree-ring records that extend back a millennium or more into the past. This has enabled the MADAv2 reconstructions to be usefully extended back to 1000 CE over most of the domain and thus provides estimates of hydroclimatic variability over Monsoon Asia back to medieval times. Doing so reveals occurrences of medieval megadroughts and pluvials over India and Southeast Asia with spatial resolution and detail not previously available. The recently reported early 13th century “Mongol pluvial” over Mongolia is also now described in full spatial detail. A previously reported indication of extreme wetness in 1257-58 in Southeast Asia associated with the Samalas volcanic eruption in Indonesia is also found in MADAv2 and its inferred hydroclimatic impact is described spatially. Further investigations into the links between explosive volcanism and hydroclimatic variability over Monsoon Asia are described and shown to be important contributors to Monsoon Asia hydroclimatic variability. Finally, links between MADAv2 and sea surface temperature fields in the tropical Indo-Pacific region are presented. These results indicate the rich potential of MADAv2 for data/model comparisons and for testing hypotheses to explain the physical mechanisms responsible for the reconstructed variations in hydroclimatic variability over Monsoon Asia over the past millennium.