Climate Classification systems as a tool for representing climate change

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Current discussions about climate change usually focus on changes in temperature and precipitation independently. However, these variables are not independent when it comes to understanding potential climate impacts or for the purpose of climate change detection, and the public understands little about these interactions potentially creating opportunities of misunderstanding. The question of how to best represent climate conditions and climate change is an old one, and originates with

the development of climate classification systems many of which have been developed over the last 150 years. Of these the Köppen system is still the most widely used. However, this system, developed at the turn of the 20th century has a number of constraints in its ability to represent climate change, in particular in its ability to represent intra-annual climate variability. Thornthwaite recognized some of these limitations and developed an alternative classification proved, which proved too complex for easy use. By simplifying and modifying the Thornthwaite classification to incorporate explicit representation of intra annual climate variability, this scheme can now provide an improved way to detect and represent climate change. The talk will conclude with illustrations of how this scheme can be applied to large scale climate system analysis questions. It will also show shifts for more specific questions, such as change in urban climates relative the surrounding rural climates, based on recent urban simulations in the CESM.