

## **The Impact of SST and Vegetation Changes on Long-Term Drought**

Siegfried SCHUBERT

([siegfried.d.schubert@nasa.gov](mailto:siegfried.d.schubert@nasa.gov))

Global Modeling and Assimilation Office, NASA/Goddard Space Flight Center, Greenbelt, MD 20771

Max SUAREZ, Philip PEGION, Randal KOSTER and Julio BACMEISTER

A number of recent studies have shown the importance of tropical Pacific sea surface temperature (SST) variations in producing drought or pluvial conditions over the southwestern and central United States. There is also evidence from both model and observational studies that Atlantic SST variability is an important factor in some regions though the results so far are less definitive than for the Pacific. In addition, it is likely that the overall warming of the oceans in recent decades plays an important role. In this study we examine the role of global SST and land conditions in the development and/or maintenance of multi-year drought over North America and other drought prone regions of the world. Specifically we carry out a number of AGCM experiments in which an atmospheric general circulation model is forced with the three leading patterns of annual SST variability consisting of a global warming pattern, a pan-Pacific pattern, the Atlantic multi-decadal oscillation, and various combinations of the three patterns. We will highlight the role of each pattern in producing drought, the dynamical mechanisms linking the SST anomalies to regional drought, and the role of soil moisture feedbacks in amplifying or maintaining the drought conditions. Further experiments will be discussed that examine the impact on drought of 20th century vegetation changes.