This presentation will address the development of a multi-scale drought monitoring tool for North America based on remotely sensed estimates of evapotranspiration. The North American continent represents a broad range in vegetation and climate conditions, from the boreal forests in Canada to the arid deserts in Mexico. This domain also encompasses a range in constraints limiting vegetation growth, with a gradient from radiation/energy limitation in the north to moisture limits in the south. This feasibility study over NA will provide a valuable test bed for future implementation world-wide in support of proposed global drought monitoring and early warning efforts. The Evaporative Stress Index (ESI) represents anomalies in the ratio of actual-to-potential ET (fPET), generated with the thermal remote sensing based Atmosphere-Land Exchange Inverse (ALEXI) surface energy balance model and associated disaggregation algorithm, DisALEXI demonstrated that ESI maps over the continental US (CONUS) show good correspondence with standard drought metrics and with patterns of antecedent precipitation, but can be generated at significantly higher spatial resolution due to a limited reliance on ground observations. Unique behavior is observed in the ESI in regions where the evaporative flux is enhanced by moisture sources decoupled from local rainfall, for example in areas where drought impacts are being mitigated by intense irrigation or shallow water tables. As such, the ESI is a measure of actual stress rather than potential for stress, and has physical relevance to projected crop development. Because precipitation is not used in construction of the ESI, this index provides an independent assessment of drought conditions and will have particular utility for real-time monitoring in regions with sparse rainfall data or significant delays in meteorological reporting. The North American ESI product will be quantitatively compared with spatiotemporal patterns in the NADM, and with standard meteorological, remote sensing and modeled drought indices that are routinely produced over NA. Importantly, the robustness of these various indicators will be assessed in their ability to anticipate and correctly diagnose known drought events (as recorded in the NADM archive).