Developing A Regional Land Use Drought Index In Florida

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Introduction
Limitations of Current Drought Indices
- Data Sources
  - Most of the existing indices are calculated using climate data from the meteorological stations, which are point measurements.
  - Weather stations are scarce in remote areas and are not uniformly distributed.
- Maps of drought severity are developed based on point measurements to trace drought development in the entire region.
- Ground-based soil-moisture and evaporation measurements are accurate, but lack validity because of limited data observation (Kim et al., 2009).

Land Use Effects
- PDSI and CMI models assume parameters such as land use/land cover, and soil properties are uniform over the entire climatic zone (7000-100000 km²) (Narasimhan et al., 2005).
- Simplistic approaches that are based on measurement of rainfall deficiency, such as, SPI, Ri, RAI, and BMDI, would underestimate the severity of drought (Tsakiris and Vangelis, 2005).
- SWGIS model does not directly consider other elements of the hydrologic cycle that are critical for drought monitoring, such as, evaporation, soil moisture and land use characteristics (Keshavarz et al., 2004).

Regional Land use Drought Index (RLDI)
- To develop a regional land-use adapted drought index for State of Florida.

Methods
- The Bowen ratio is higher during drought events.
- Bowen ratio reflects the characteristics of land use.

RESULTS AND DISCUSSION
- ENSO influences the climate of the southeastern U.S. Coastal plain. El Niño years tend to be cooler and wetter, while La Niña years tend to be warmer and drier than normal in the Fall through the Spring, with strongest effect in Winter.
- Agriculture is one of the most important economic resources in Florida. Florida produced 638 billion dollars in agricultural production in the U.S. with a revenue of $1.48 trillion in 1995-96 crop year.
- Drought-induced wildfire is also a serious problem in Florida.

Conclusions
- Bowen ratio was used as an indicator to monitor drought events.
- RLDS can be used to understand local ENSO patterns on the regional scale.