Water use and drought stressed responses of four landscape trees in Florida's humid climate

**Current context**
- Residential water use, 50% of total water consumption for irrigation, often over-irrigating (FFL)
- Potentially more extreme drought occur in Florida (NOAA)
- Sandy soils with a low-water holding capacity
- Higher air temperature increases ET<sub>o</sub>
- Urban trees have many benefits in mitigating higher temperatures from climate change

**Knowledge gaps**
- Numerous studies about plant' responses to drought in arid climate, few studies in humid climate like Florida
- Few studies quantifying tree water use under drought or looking at the link between plant and climate under drought stress in humid climate

**Goal**
- To quantify the amount of water use of landscape trees in well-watered and drought conditions and
- To study the relationship between tree water status and physiological and visual quality performance under well-watered and drought conditions.
- To determine the relationship between climatic parameters and water evapotranspiration under drought stress and well-watered conditions.

**Material and Methods**
- Four popular landscaping tree species: magnolia Southern Blanchard (*Magnolia grandiflora*), holly (*Ilex* 'Nellie R. Stevens'), live oak (*Quercus virginiana*), slash pine (*Pinus elliottii*)
- Evapotranspiration: weighing lysimeter
- Tree water status: Stomatal conductance, stem water potential
- Photosynthetic and Fluorescence parameters (Fv/Fm, ETR..),
- Tree growth: leaf area, dry weight (root, shoot), root/shoot ratio
- Visual quality rating: Leaf color + SPAD index
- Weather data collection

**Sign of stress**
- Dry out: Irrigation = 0.9ET<sub>a</sub> (previous day)
- Well-watered: Irrigation = 1.2 ET<sub>a</sub> (previous day)

**Leaf color + SPAD index**