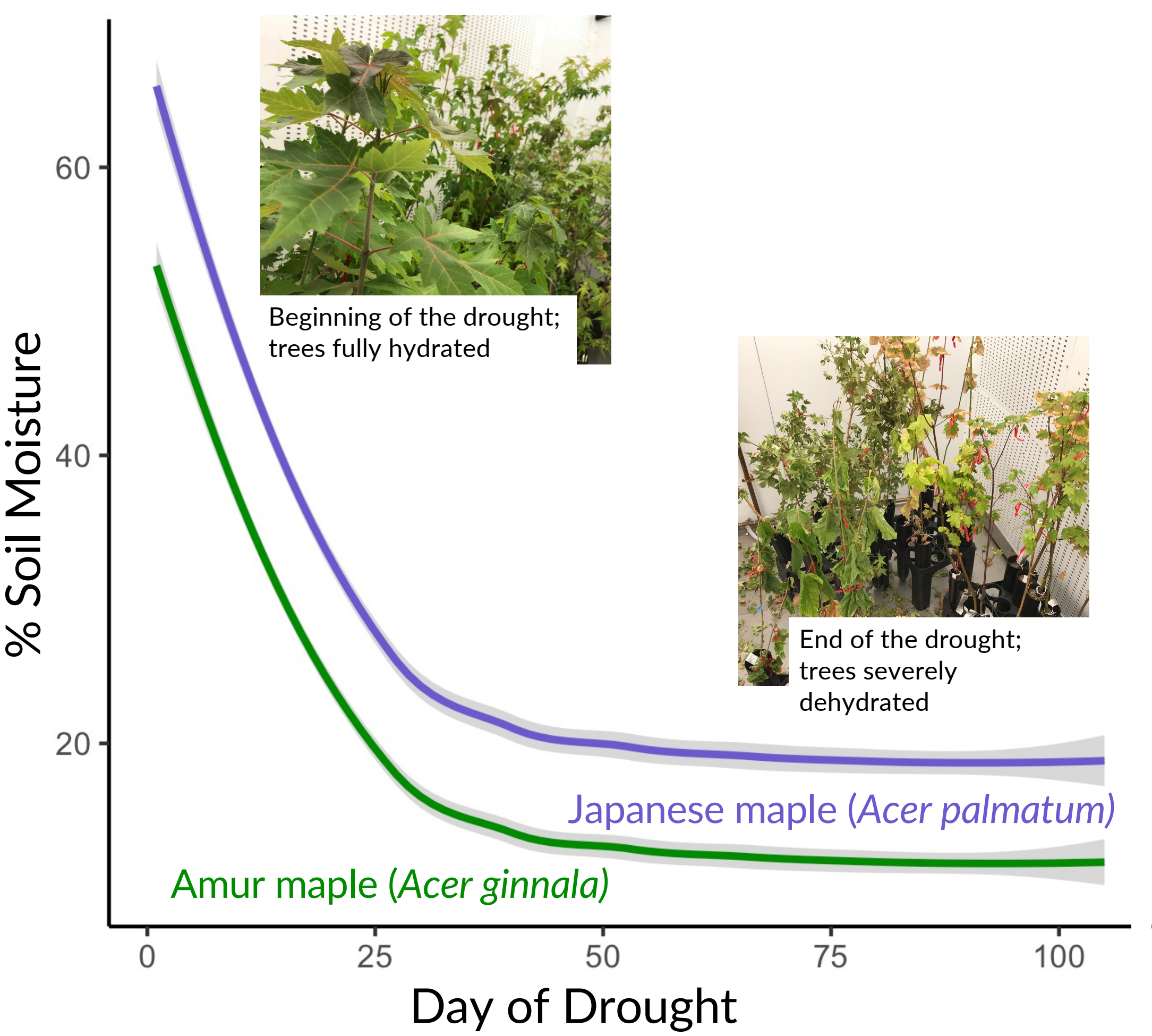


Maple species respond differently to drought

Ceci G. Williamson¹, Dr. Jake J. Grossman^{1,2}
¹Swarthmore College Biology Department, ²Arnold Arboretum of Harvard University

WHY?
Maple (*Acer*) species have a worldwide distribution and can serve as a model for the impact of climate change-induced drought on terrestrial plants. We investigated **whole-plant responses to experimental drought**.

METHODS
“Dry-down experiment” means not watering your trees. We withheld water from 19 maple species (N= 225, 4-20 indiv/spp.) until total leaf loss, at which point, we re-watered to check for resprouting.



Available soil moisture decreased over the duration of the drought.

ACKNOWLEDGEMENTS: Special thanks to all the greenhouse staff who made our experiment possible: Rhonda Hilt, Lee Toomey, Wayne Daly, and Faye Rosin.

MEASUREMENTS

Stem Water Potential
A more negative water potential indicates that the plant is working harder to draw water from the soil.

Photosynthetic Rate
The rate at which a plant assimilates CO₂.

Stomatal Conductance
This measurement of gas exchange through the plant's leaves indicates physiological activity, including water use.

Leaf Loss
Maples will sacrifice leaves to conserve water during drought.



RESULTS
Different species within the genus *Acer* responded very differently to drought stress. Both *Acer palmatum* and *Acer ginnala* are ornamental maples native to Japan and parts of East Asia, but our data show that *A. palmatum* appears to be overall more vulnerable to water stress than *A. ginnala*.
We are analyzing data across all 19 species included in the experiment. Our insights will help predict how maple-dominated forests or urban maples will respond to increased drought stress. Characterizing each species' response to water limitation allows us to forecast which species are at risk in a more drought-prone world.

