THE TIMING OF FIRE AND FLOODING INTERACT TO AFFECT SURVIVAL OF *CROTON LINEARIS,* A RARE PLANT IN PINE ROCKLANDS

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Certain ecotones experience hydrologic gradients of periodic to prolonged seasonal flooding, and plants occupying niches within these ecotones are often sensitive to the timing of fire. If dry season fires are quickly followed by flooding, then re-sprouting plants can become completely inundated. While some plants have adapted traits to survive inundation, most have high mortality unless they begin re-growing before the wet season begins and water rises. Pine rocklands of the Everglades National Park (ENP), Florida is an ideal ecosystem for examining interactions between the timing of fire and flooding and human manipulations of these disturbances. Lightning-strike fires are common, natural occurrences in pine rocklands, but fires have been suppressed in recent decades and now most fires are prescribed. Furthermore, hydrology has and continues to be human-modified in ENP, and climate change has introduced greater uncertainty in the onset of the rainy season. It is unknown how human-induced changes in fire-flooding interactions affect rare and sensitive species along hydrologic gradients. For instance, *Croton linearis* has suffered recent declines in population size, which is of serious concern to ENP ecologists because *C. linearis* is the host plant for two endangered butterfly species. We used plant demographic measurements, including survival, growth, and reproduction, collected throughout 2005-2018 to determine how timing of fire and flooding affect population dynamics of *C. linearis*. Local well data was used to determine daily water surface levels for each plant population, and fire dates were provided by ENP. We found *C. linearis* recruitment and survival declined when flooding occurred within one month of fire, especially at lower elevations. Population growth rates were greater at higher elevations where plants experienced less severe and shorter-lived flooding. Our results demonstrate that the interactive effects of human-modified fire and hydrologic regimes can have unanticipated impacts on rare plant populations along hydrologic gradients.

PRESENTER BIO: Andie Irons, a PhD student in the Fire Ecology Lab, researches rare plant demography in pine rocklands of Everglades National Park under the advisement of Dr. Raelene Crandall. Her M.S. research (SUNY-ESF) characterized riparian forest succession following flood events along the Sacramento River, California, using floodplain age maps and dendrochronology.