**Iris pseudacorus** germination resilience to high salinity exposure supports risk of invasive spread in tidal wetlands

Morgane B. Gillard¹, Jesús M. Castillo², Mohsen Mesgaran³, Caryn J. Futrell¹, Brenda J. Grewell¹

¹ USDA-ARS Invasive Species and Pollinator Health Research Unit, Department of Plant Sciences, University of California, Davis
² Department of Plant Biology and Ecology, University of Seville, Seville, 41080, Spain
³ Department of Plant Sciences, University of California, Davis

Contact: morgane.gillard35@gmail.com

**Context**

- Estuarine systems are threatened by biological invasions and climate change
- Sea-level rise alters salinity and inundation regimes
- Wide range of aqueous salinity concentrations in estuaries: affects the establishment of plants through their germination responses

Understanding recruitment processes is central to plant conservation strategies and invasive plant management

- *Iris pseudacorus* (yellow flag iris), native to Eurasia:
  - Invades and spreads in California wetlands
  - Reproduces mostly from seed
  - Seeds are very buoyant

**Aim** — Determine effects of salinity and water levels on the germination of *I. pseudacorus* seeds from invasive populations at extreme ends of an estuarine gradient

**Materials and Methods**

2 populations x 4 salinities x 2 water levels x 6 replicates tested in greenhouse conditions

**Experiment**

- Greatest germination in freshwater
- Very few seeds (1-3) germinated at 20 and 35 dS·m⁻¹
- The lower the salinity and the greater the water level, the faster the germination
- In some conditions, seeds from BC reached 50% of germination sooner than those from CS.

**Results**

- Good germination recovery from exposure to the highest salinity levels
- Germination percentages still significantly lower than those of seeds initially exposed to 0 dS·m⁻¹
- Seeds initially exposed to 45 dS·m⁻¹ recovered faster than those initially exposed to 25 dS·m⁻¹ (2 vs 5 days).

Invasive populations of *I. pseudacorus* can colonize new sites following potentially long-distance dispersal of buoyant seeds with currents

**High aqueous salinity exposure does not preclude germination of invasive *Iris pseudacorus***

- Salinity levels >12.5 dS·m⁻¹ inhibited germination
- Seeds exposed to seawater for 55 days germinated once exposed to freshwater