

# Diversion Flooding How could it affect plant growth

Dr. Jenneke M. Visser



UNIVERSITY of  
**LOUISIANA**  
L A F A Y E T T E

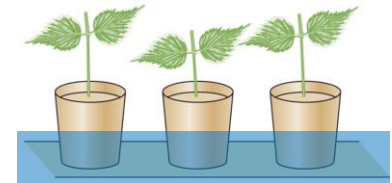
**Institute for Coastal  
and Water Research**

**School of Geosciences**

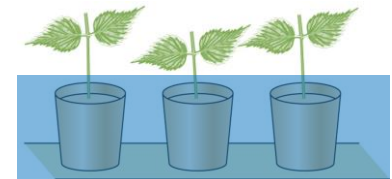
# Aspects of flooding that affect plant growth

- ▶ Plant species
  - ▶ Sensitivity to flooding
- ▶ Timing
  - ▶ Growing vs dormant
- ▶ Salinity of flood water
- ▶ Duration
  - ▶ Longer duration potentially more stressful
- ▶ Depth
  - ▶ Effect on soil
  - ▶ Effect on photosynthesis
- ▶ Interactive effects

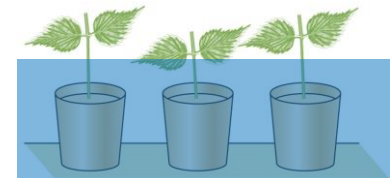
## Classic Experiments



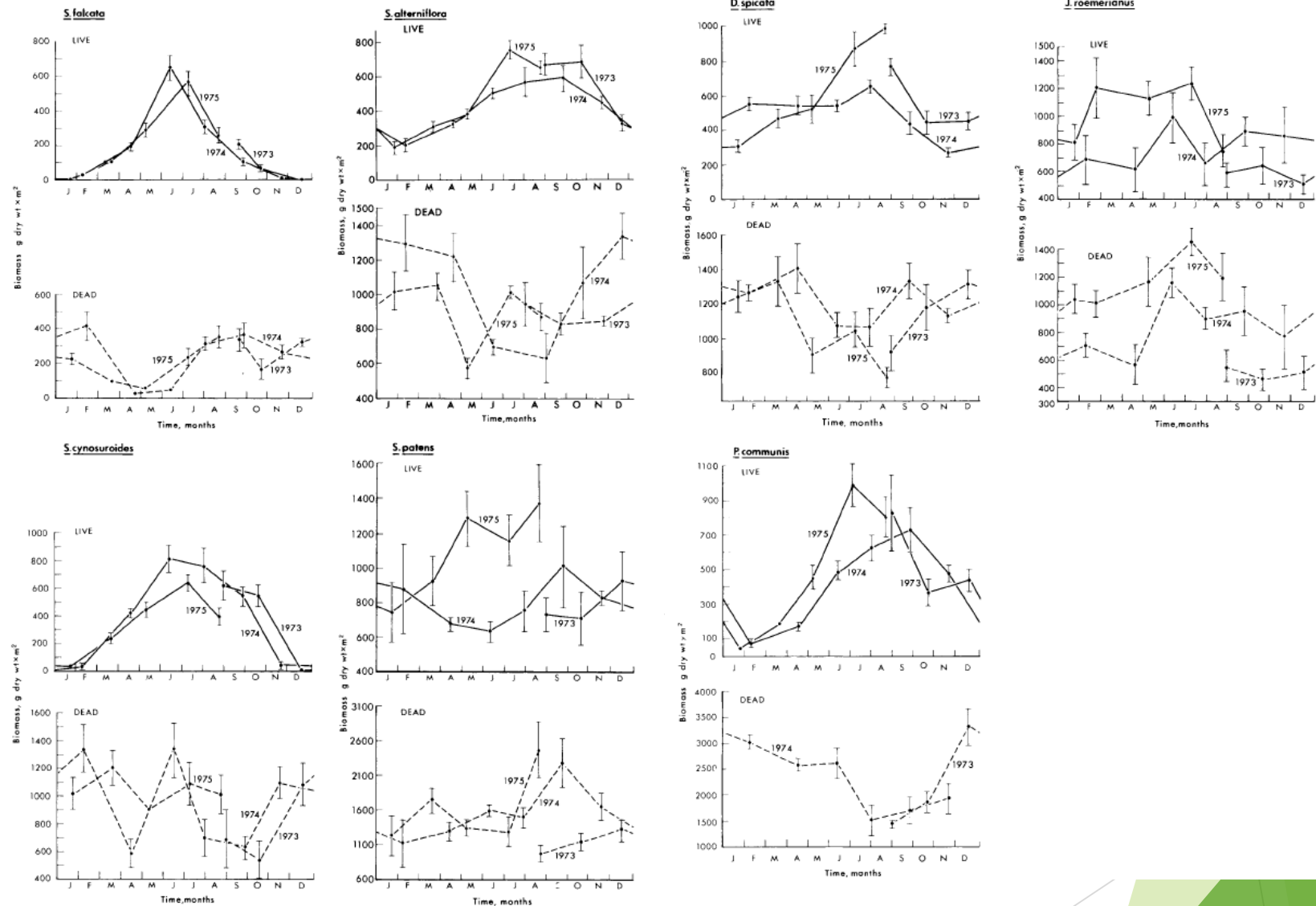
Saturated



5 cm permanent flood

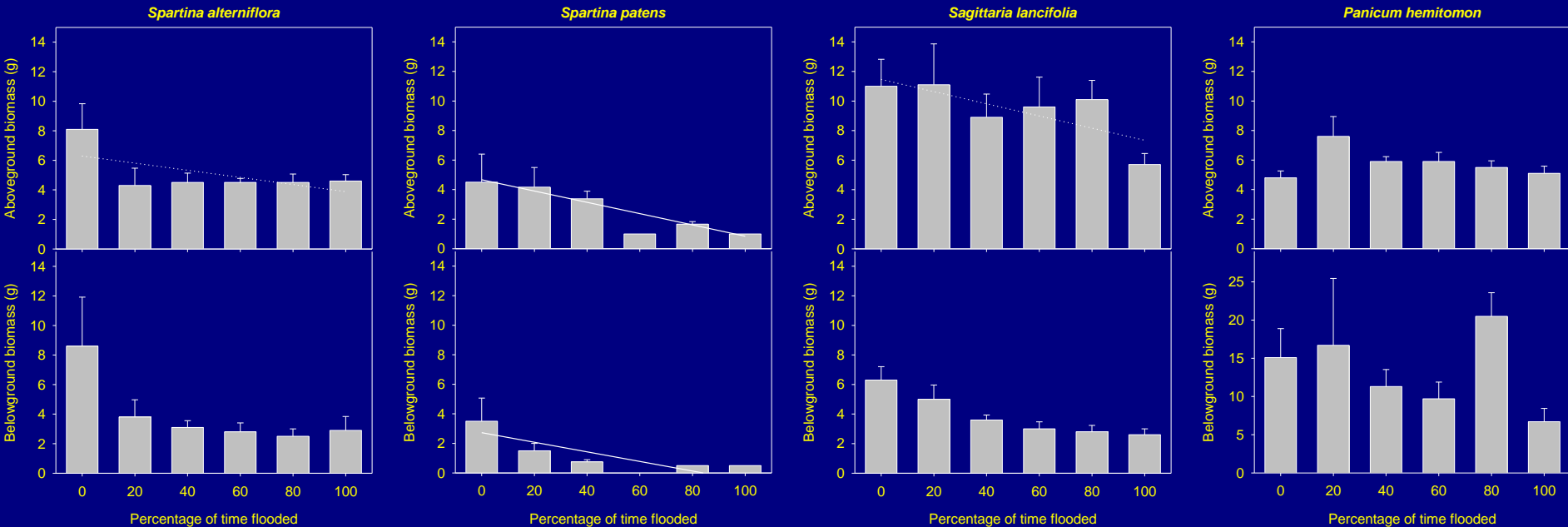


15 cm permanent flood



Aboveground Production of Seven Marsh Plant Species in Coastal Louisiana  
 Author(s): Charles S. Hopkins, James G. Gosselink, Rolando T. Parrando  
 Source: Ecology, Vol. 59, No. 4, (Summer, 1978), pp. 760-769

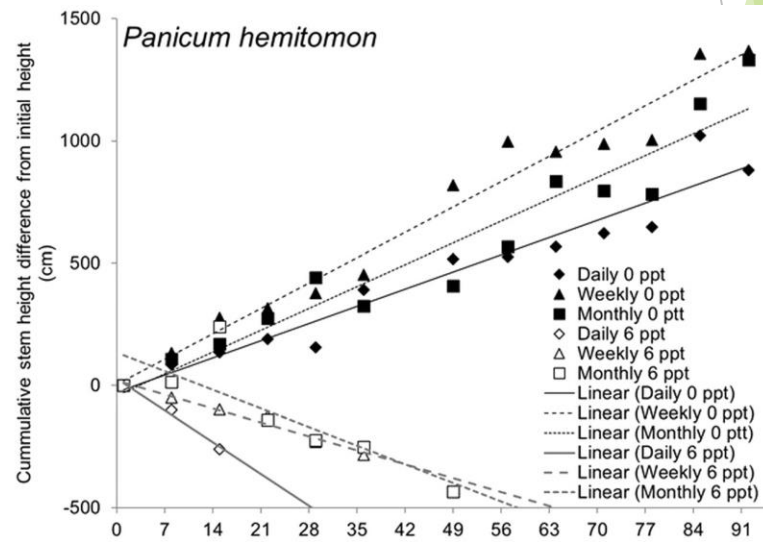
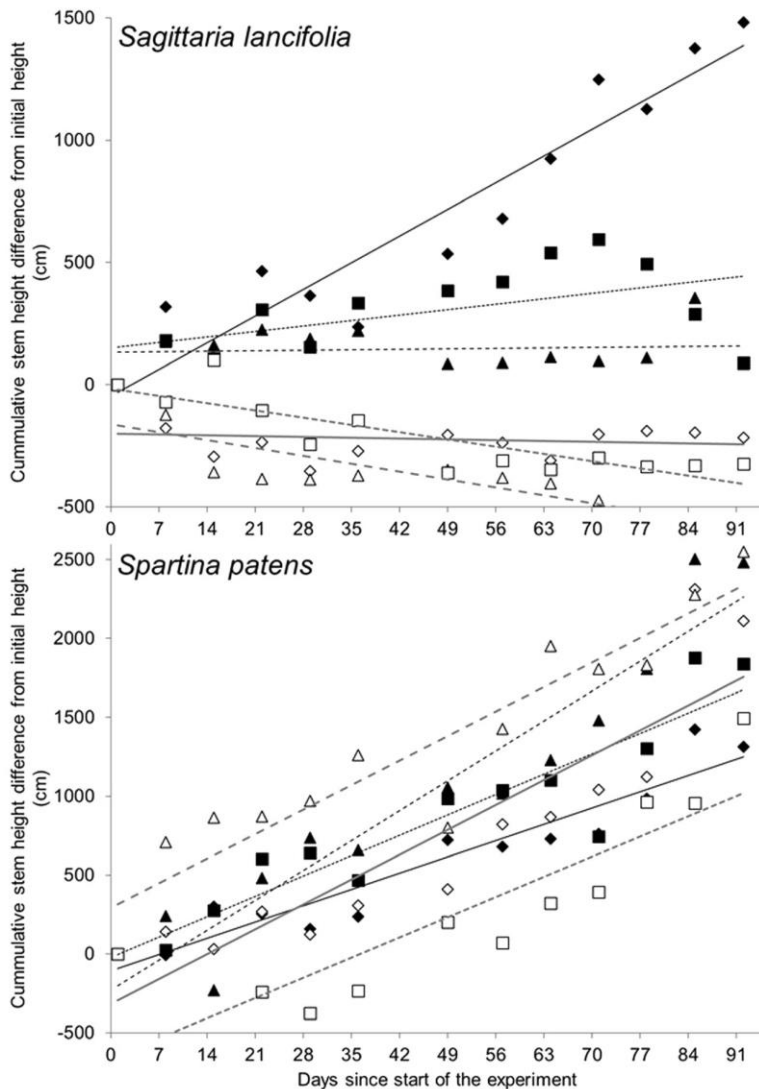
# Percentage of time flooded with fresh water



Visser, J.M. and E. Sandy 2009  
Gulf of Mexico Science

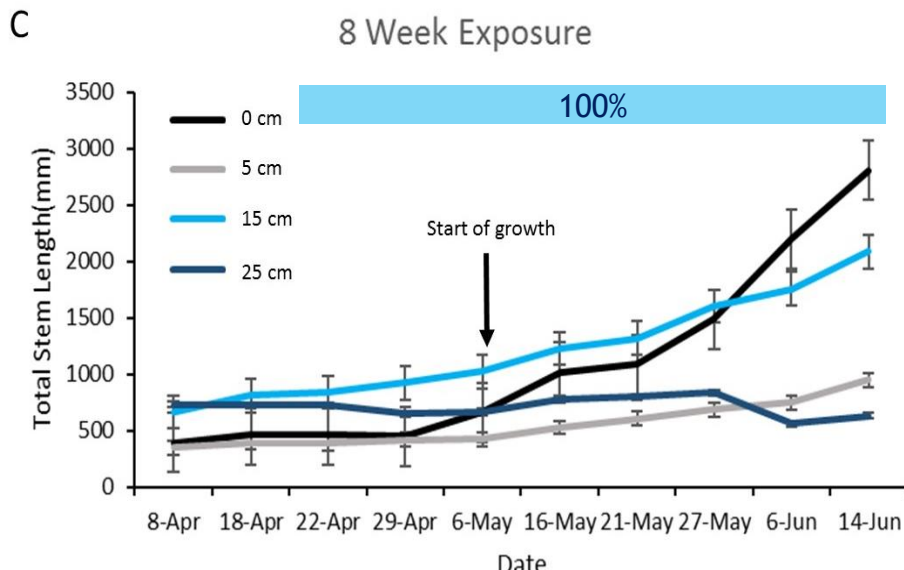
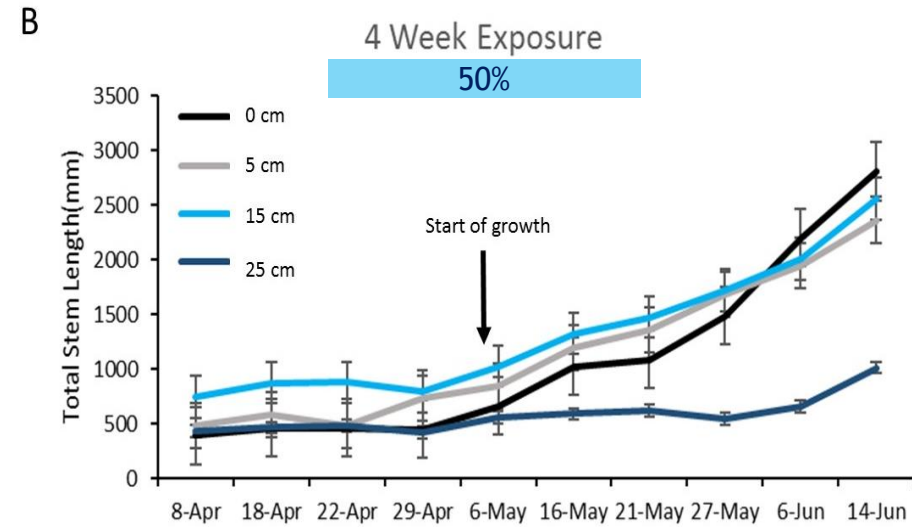
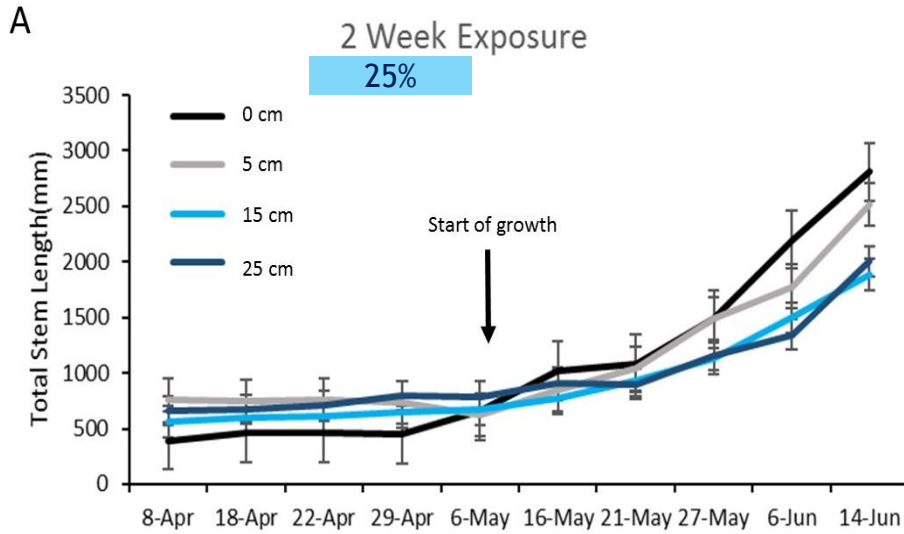
# Duration of flood events (all 50% flooded)

Visser and Peterson  
2015 Wetlands



# Timing and height of flooding *Spartina patens*

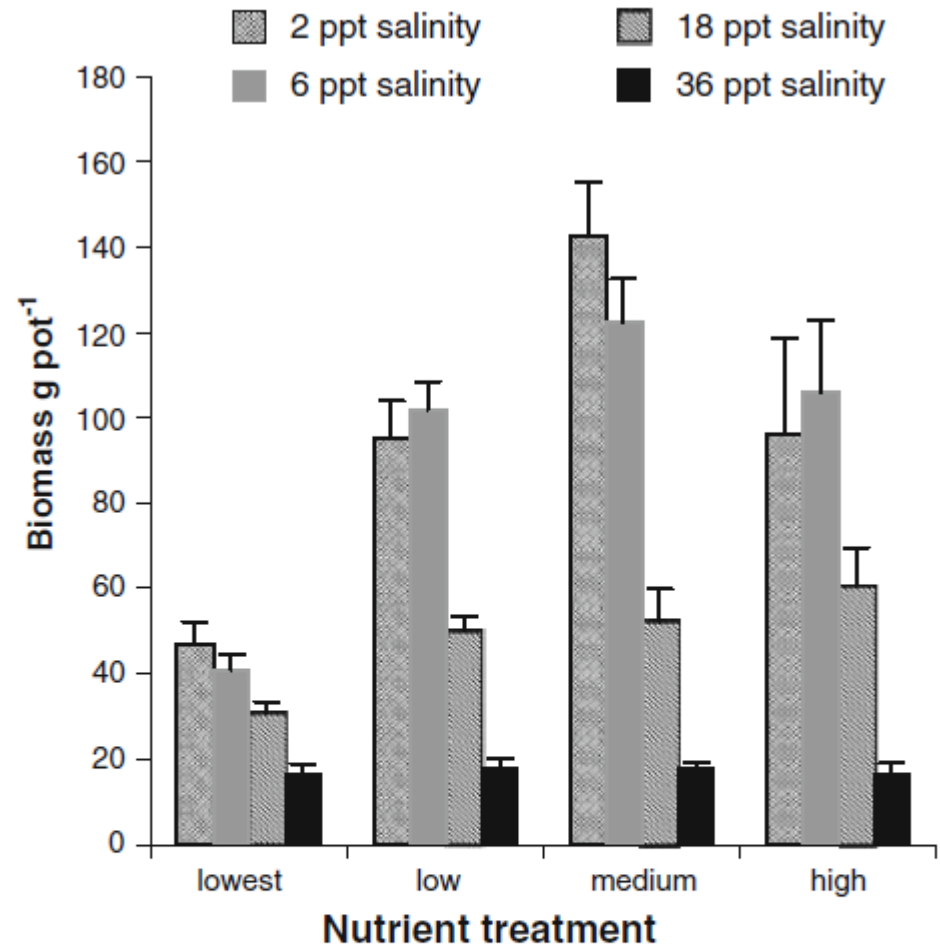
Visser and  
Landreneau  
unpublished





# Interaction effects

Merino, Huval and Nyman 2010  
Wetlands Ecology and  
Management



**Fig. 1** Mean biomass of *Spartina patens* by salinity with standard error bars in a greenhouse experiment in which water salinity and nutrient concentration varied among 128 pots. Nutrient treatments were (*lowest*) 0.49 mg N cm<sup>-3</sup> and 0.024 mg P cm<sup>-3</sup>, (*low*) 1.46 mg N cm<sup>-3</sup> and 0.073 mg P cm<sup>-3</sup>, (*medium*) 2.43 mg N cm<sup>-3</sup> and 0.120 mg P cm<sup>-3</sup>, and (*high*) 3.89 mg N cm<sup>-3</sup> and 0.190 mg P cm<sup>-3</sup>