



# Effects of Increased Flow and associated P loads on Microbial Responses

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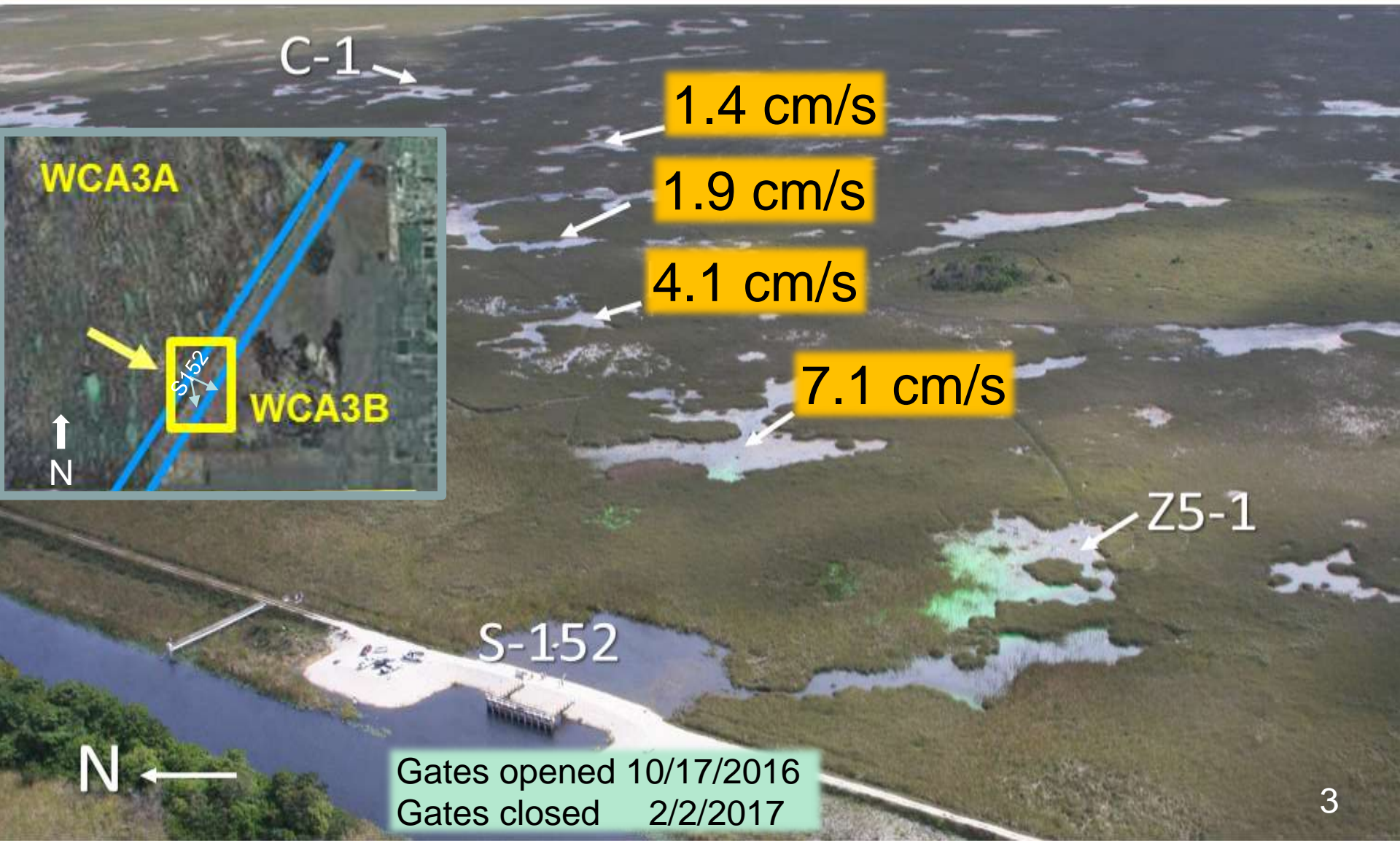
# Hypotheses

- The P-limited native Everglades periphyton community will respond quickly to changes in P load, caused by changes in flow (P supply)
  - Increased loads will increase P contents
  - Increased loads will increase primary productivity
  - If the threshold P load is exceeded, P sensitive species will be replaced by those requiring higher P thresholds





# Where: The Decompartmentalization Physical Model (DPM)





# How: Methods

## Flow

- Continuous- Acoustic Doppler velocimeters (ADV's)
- Point flow tracker measurements

## Surface Water

- TP and phosphatase activity (monthly)
- Continuous water depth
- Aquatic metabolism

## Periphyton Response

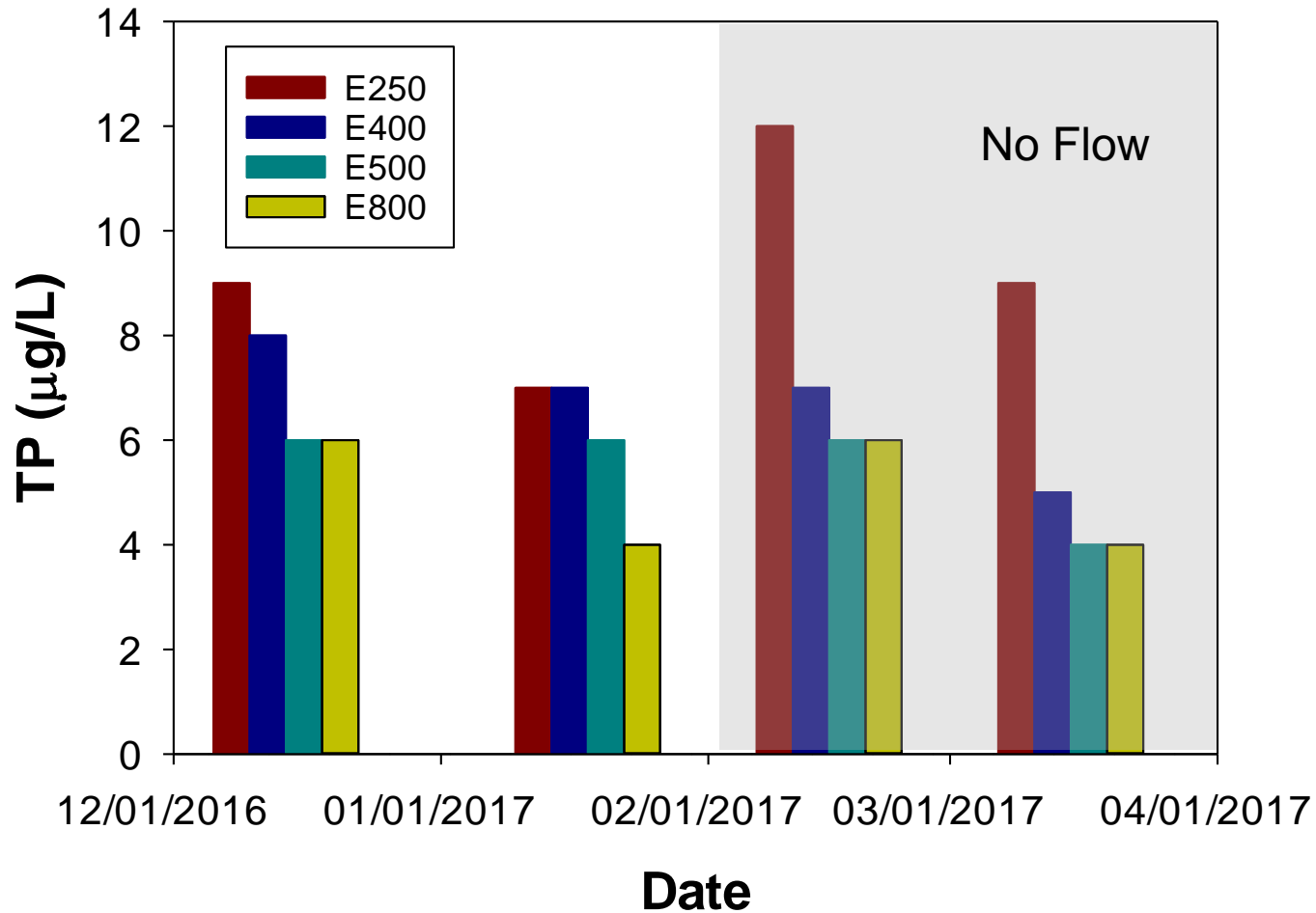
1 month deployments of acrylic plates and dowels

- Community composition
- Primary productivity
- P content
- Phosphatase activity



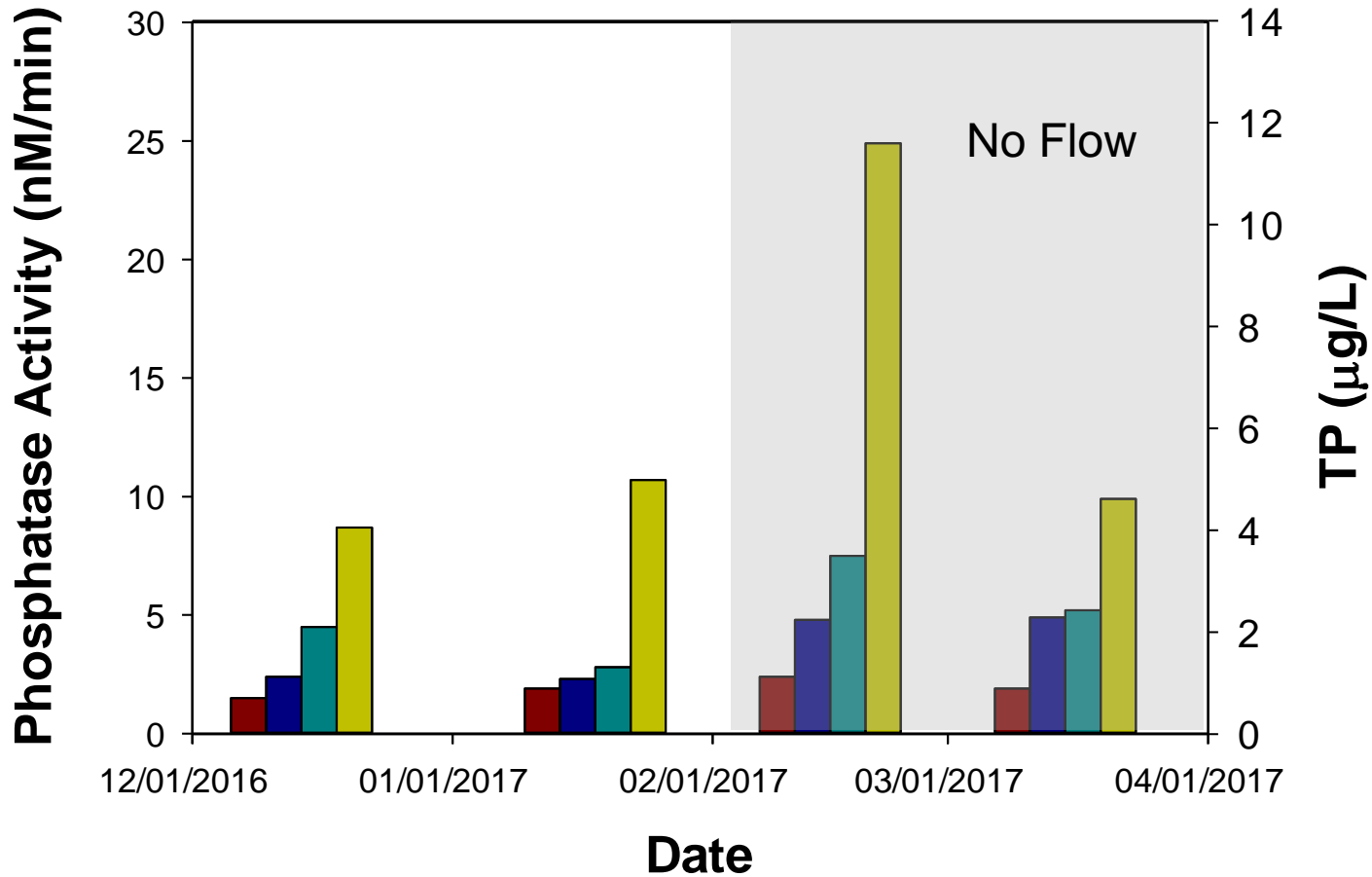


# Surface water P concentrations during and after flow





# Biological P limitation in the water column





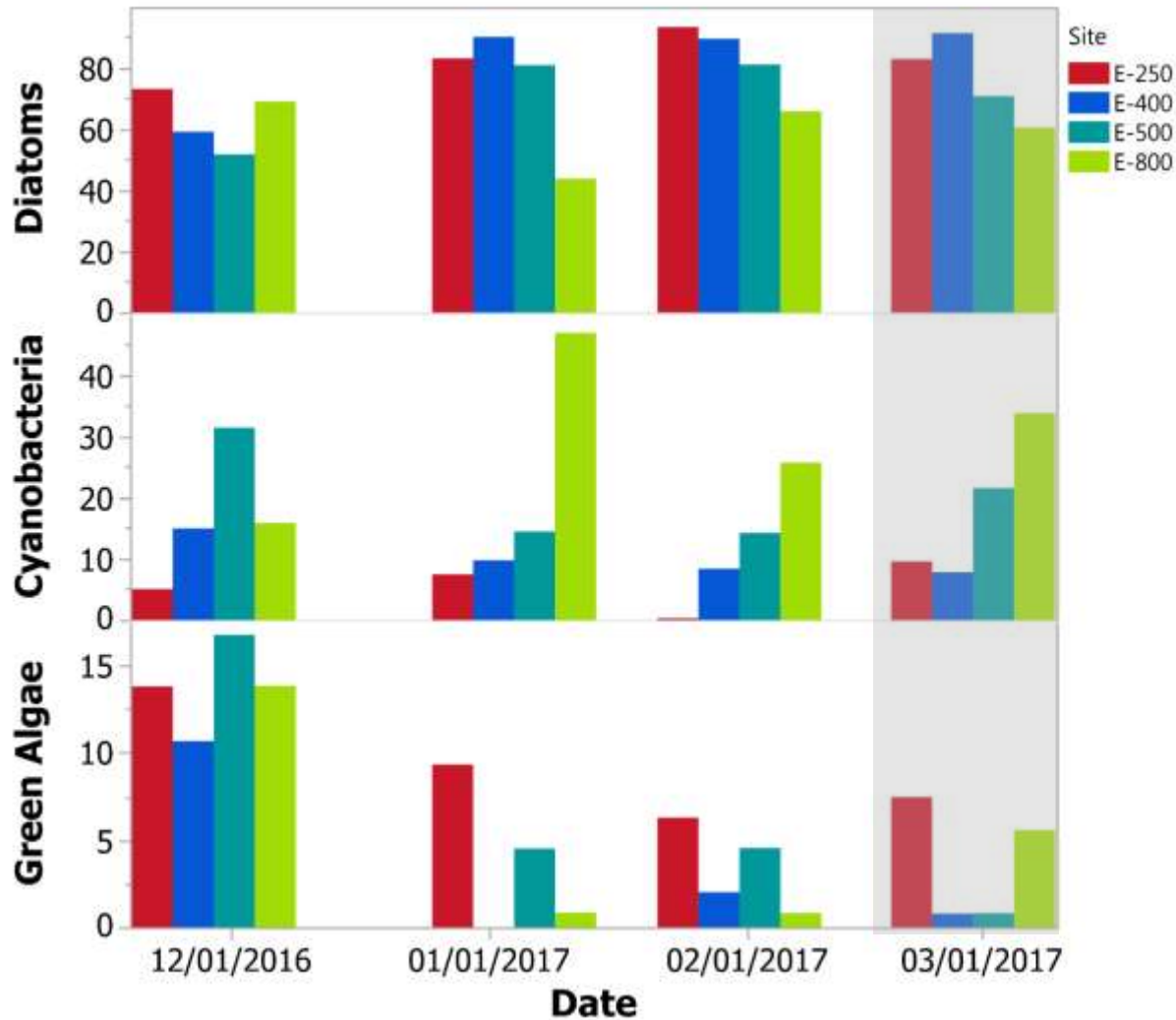


# E250- closest to inflow, less periphyton *in situ*, high accumulation





# Increased P load associated with changes in algal community





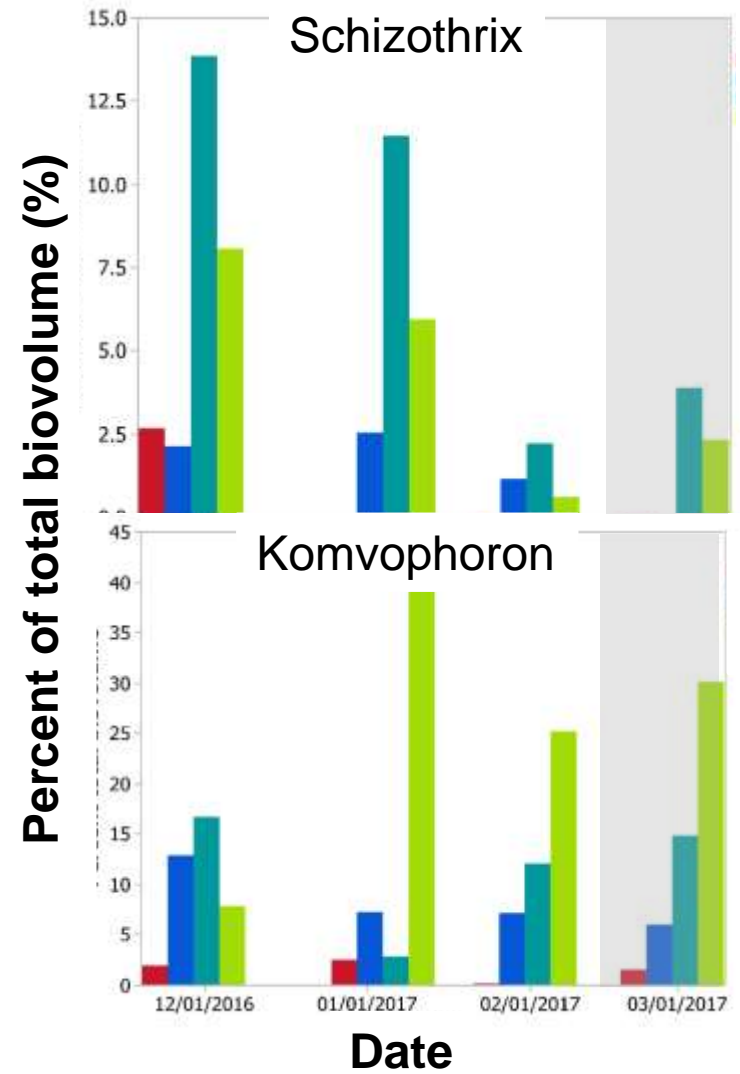
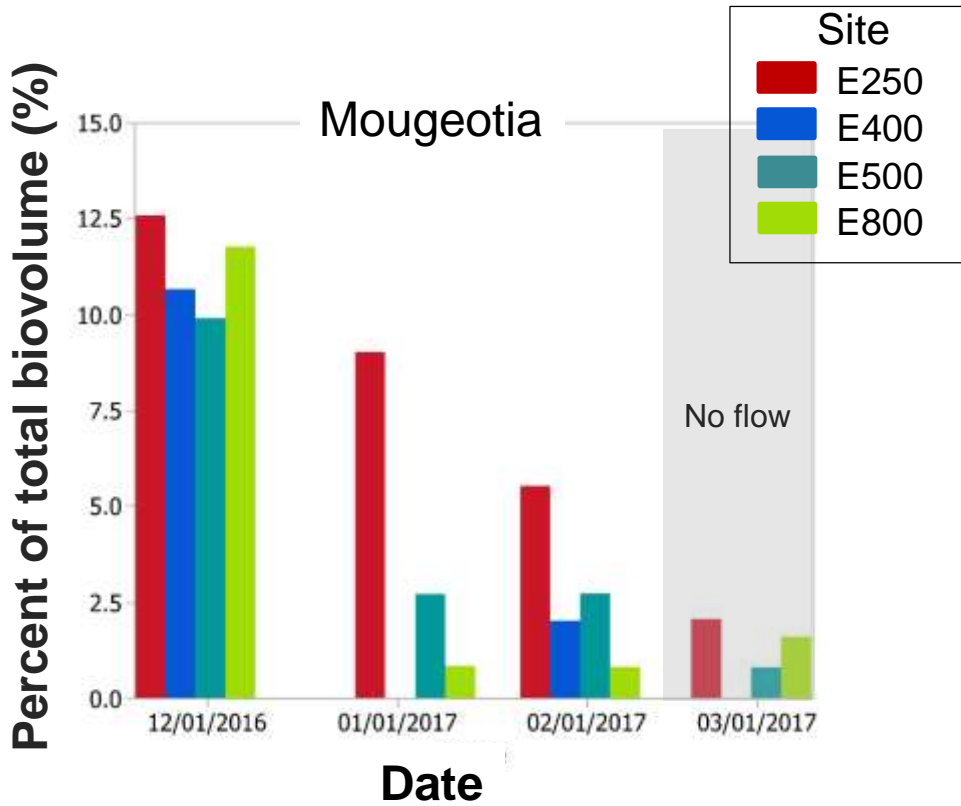


# Periphyton still dominant at low flow site





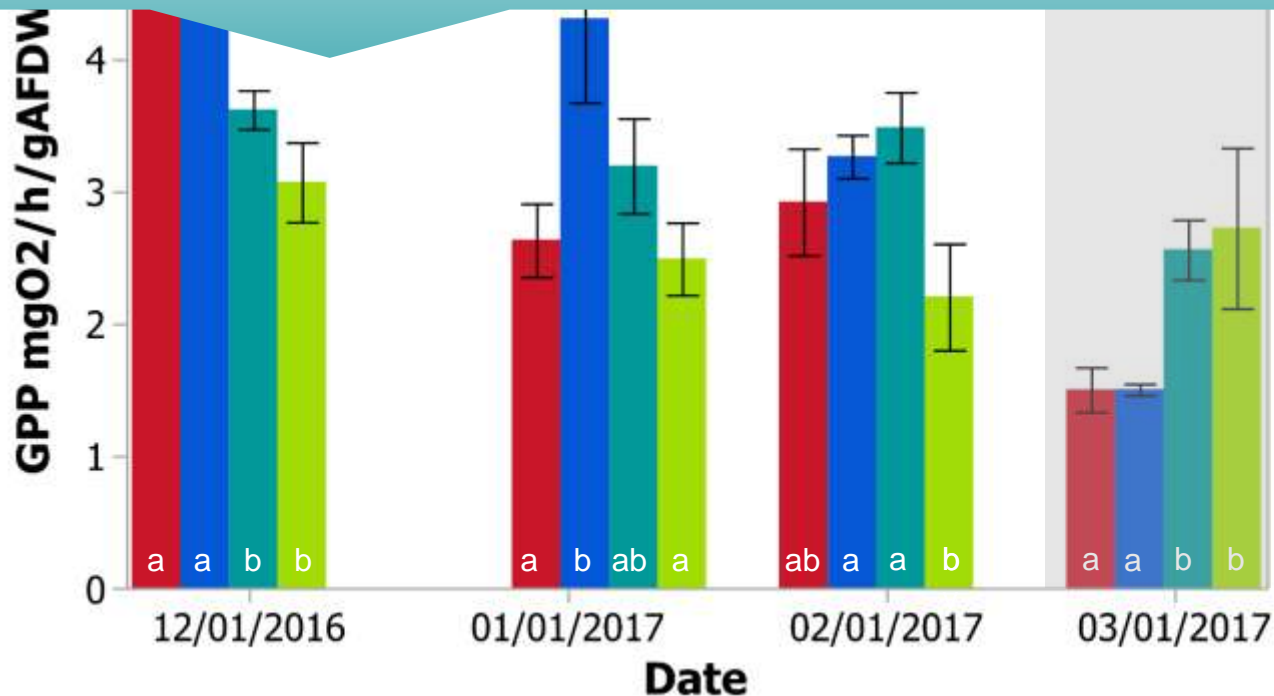
# P tolerant and sensitive responses



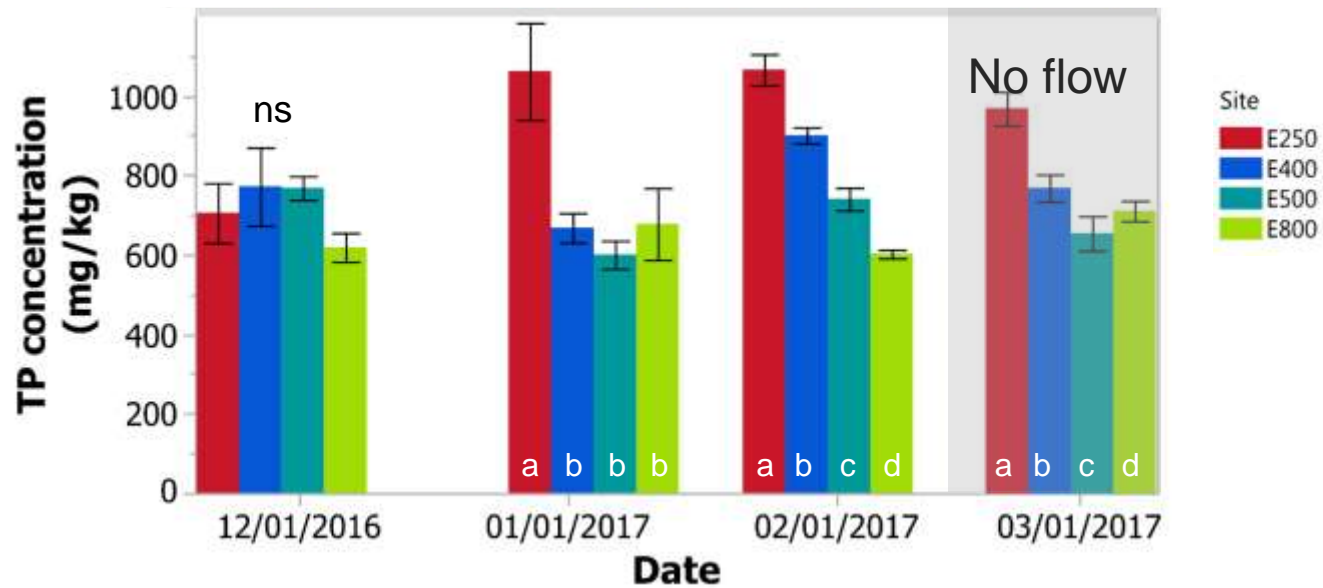


# Gross primary production response to flow

See more on ecosystem metabolism  
Erik Tate-Boldt  
This session 2:15 pm



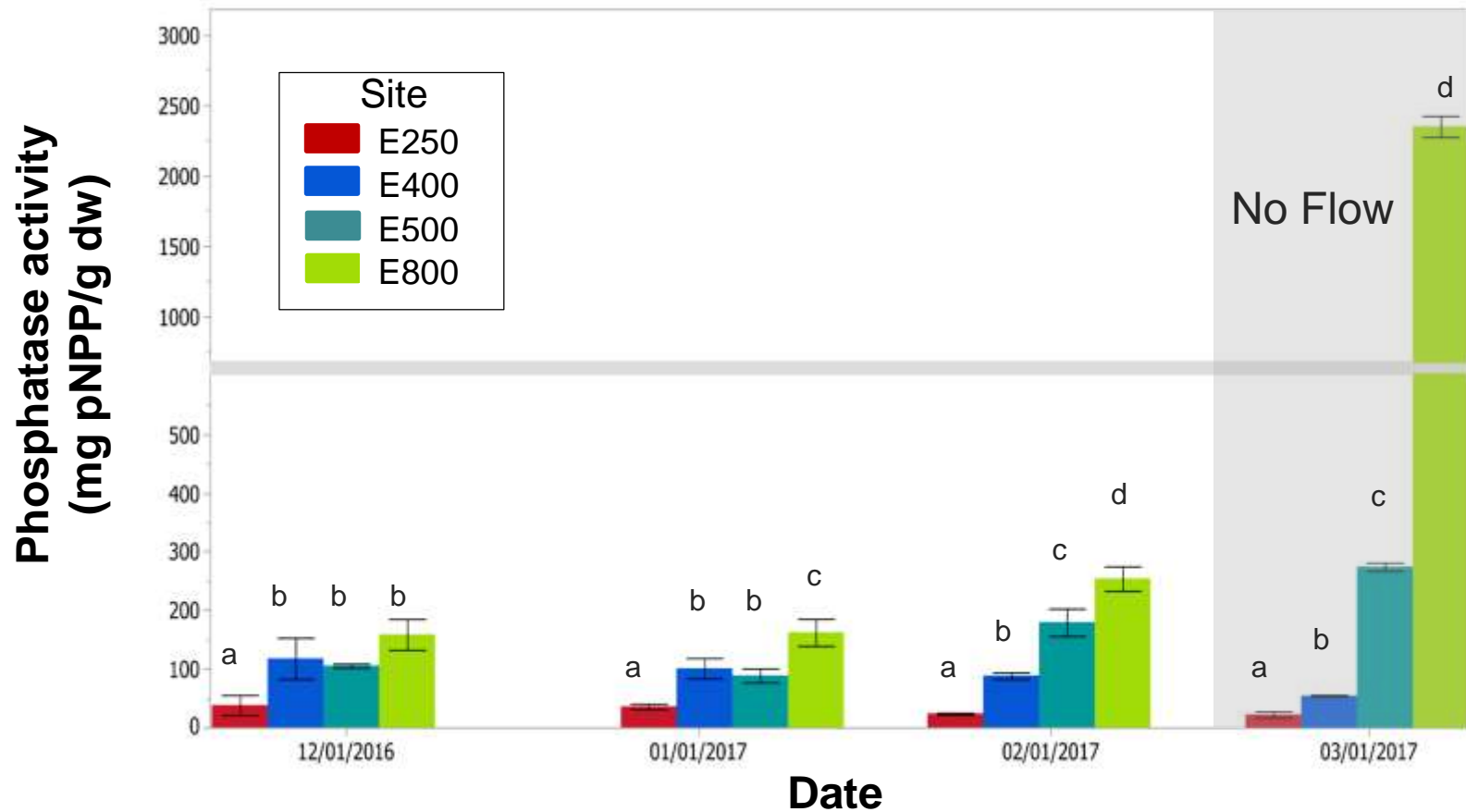
# P uptake by periphyton







# P specific responses by periphyton





# Periphyton growth pre and post flow



E250

E400

E500

E800



# Summary and next steps

- Preliminary analyses show higher flows cause significant shifts in algal community composition, metabolism and P storage- however, quantitative connections between velocity/load and response are still to be determined
- One month post-flow, many of these responses are still present, but decreasing in significance
- Need to calculate site specific TP loads to further evaluate the effects of TP
- Need to scale up effects to slough/landscape level and consider *in situ* conditions
  - Role of periphyton collapse, e.g., phosphatase at E500 vs E800





# Acknowledgements

