

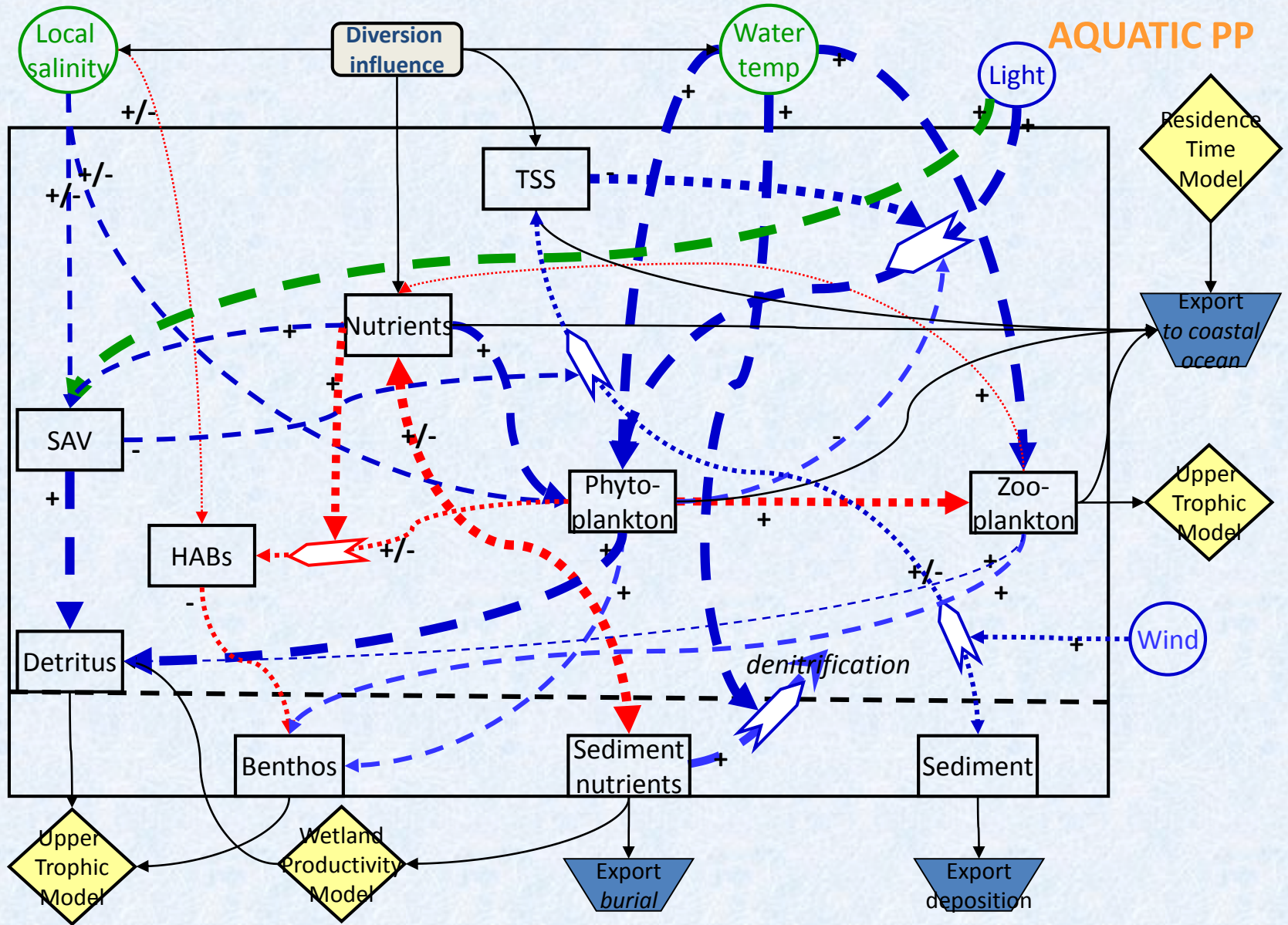


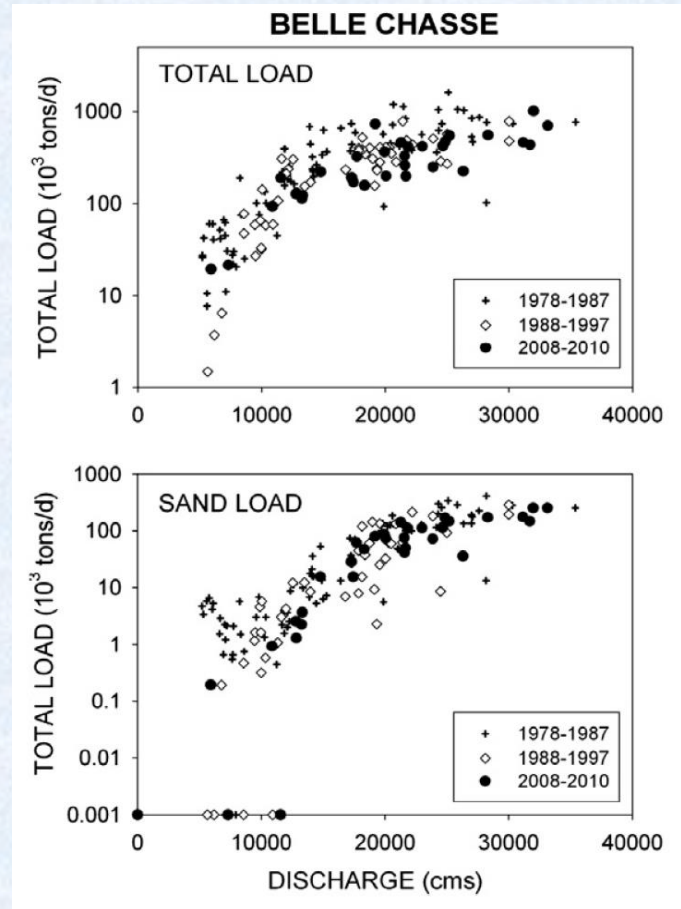
# **Effects of Sediment Diversions on Water Quality in Deltaic Louisiana Estuaries**

**Dubravko Justic**

**Department of Oceanography and Coastal Sciences, School  
of the Coast and Environment, Louisiana State University,  
Baton Rouge; [djusti1@lsu.edu](mailto:djusti1@lsu.edu)**

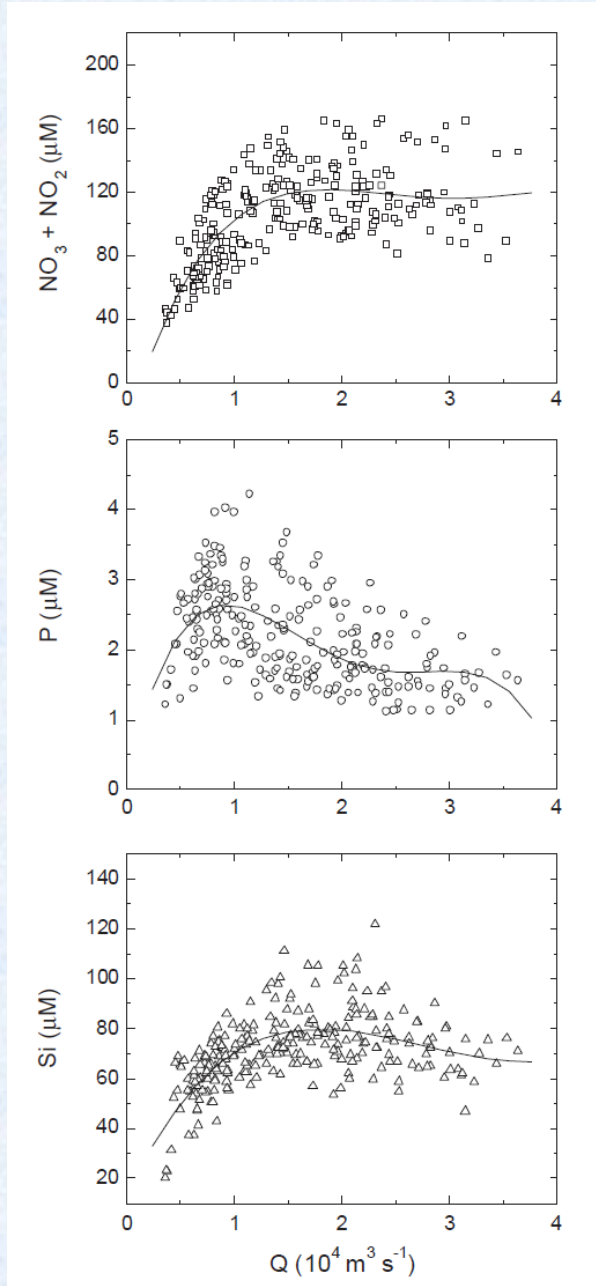
**Expert Panel on Diversion Planning and Implementation (Meeting #4)  
February 12, 2015**



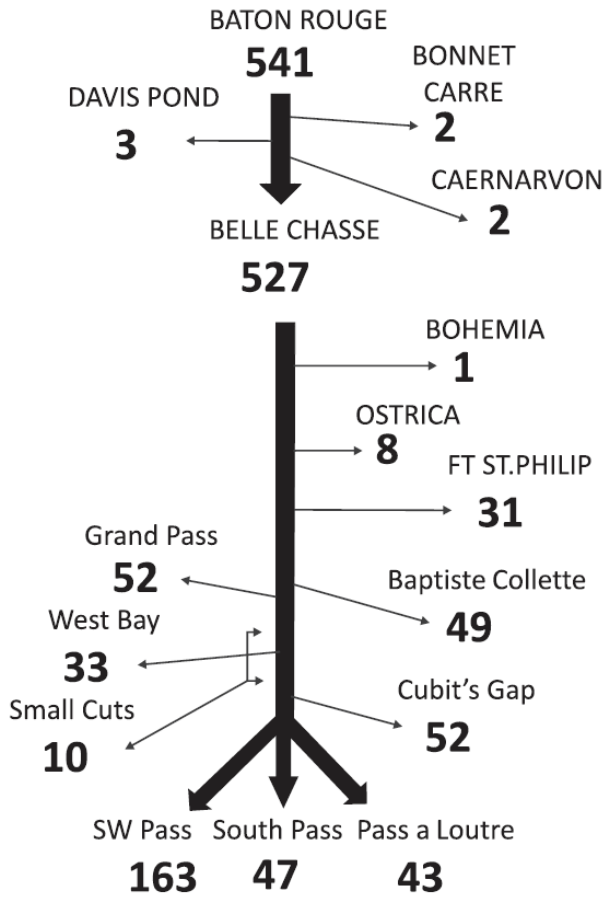


Allison et al. (2012)

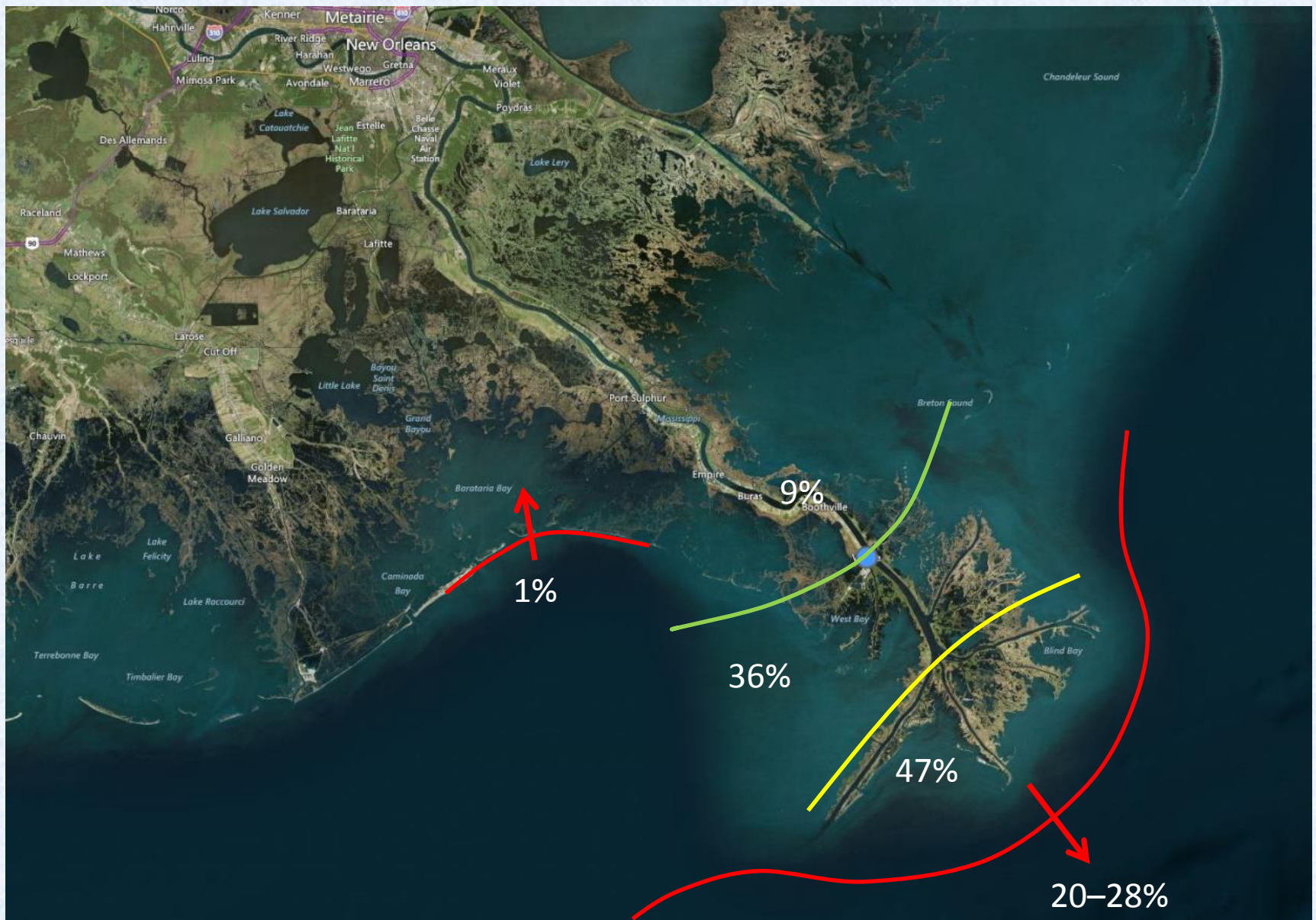
Justic et al. (2005)



# Water (cubic km/y)

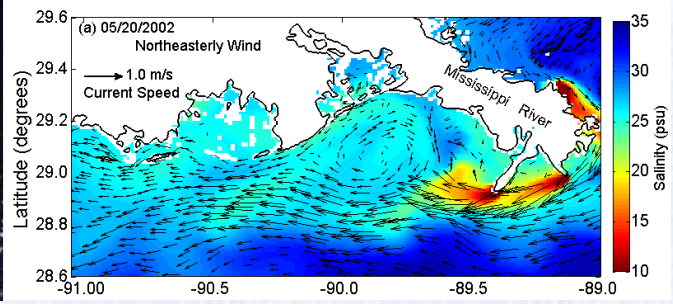
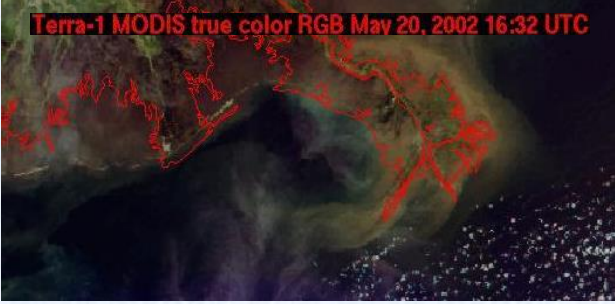


Allison et al. (2012)

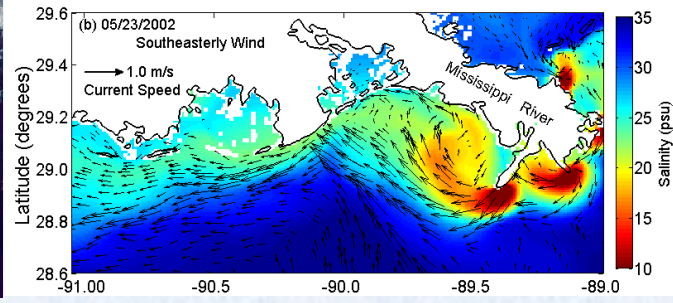
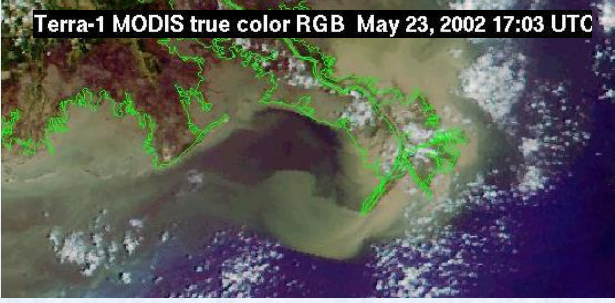


Das et al. (2011, 2012), Wang and Justic (2009), Justic et al. (in preparation)

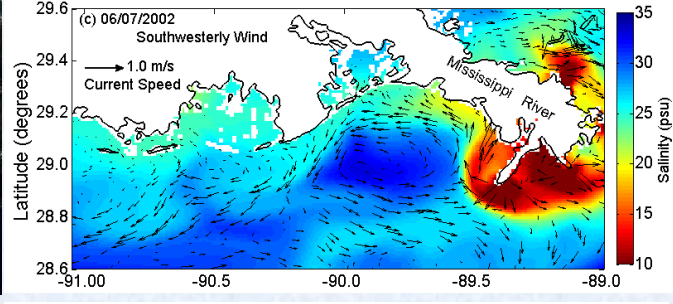
%MR Discharge



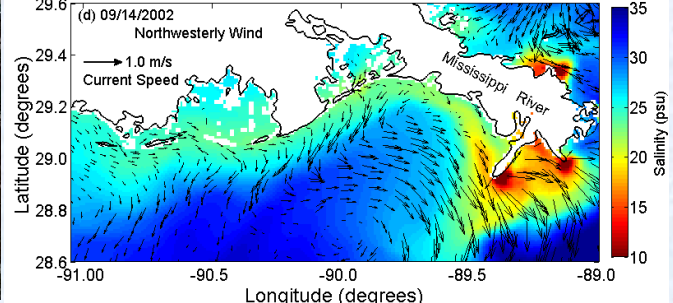
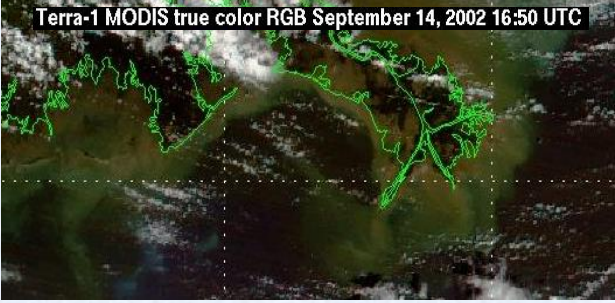
33%



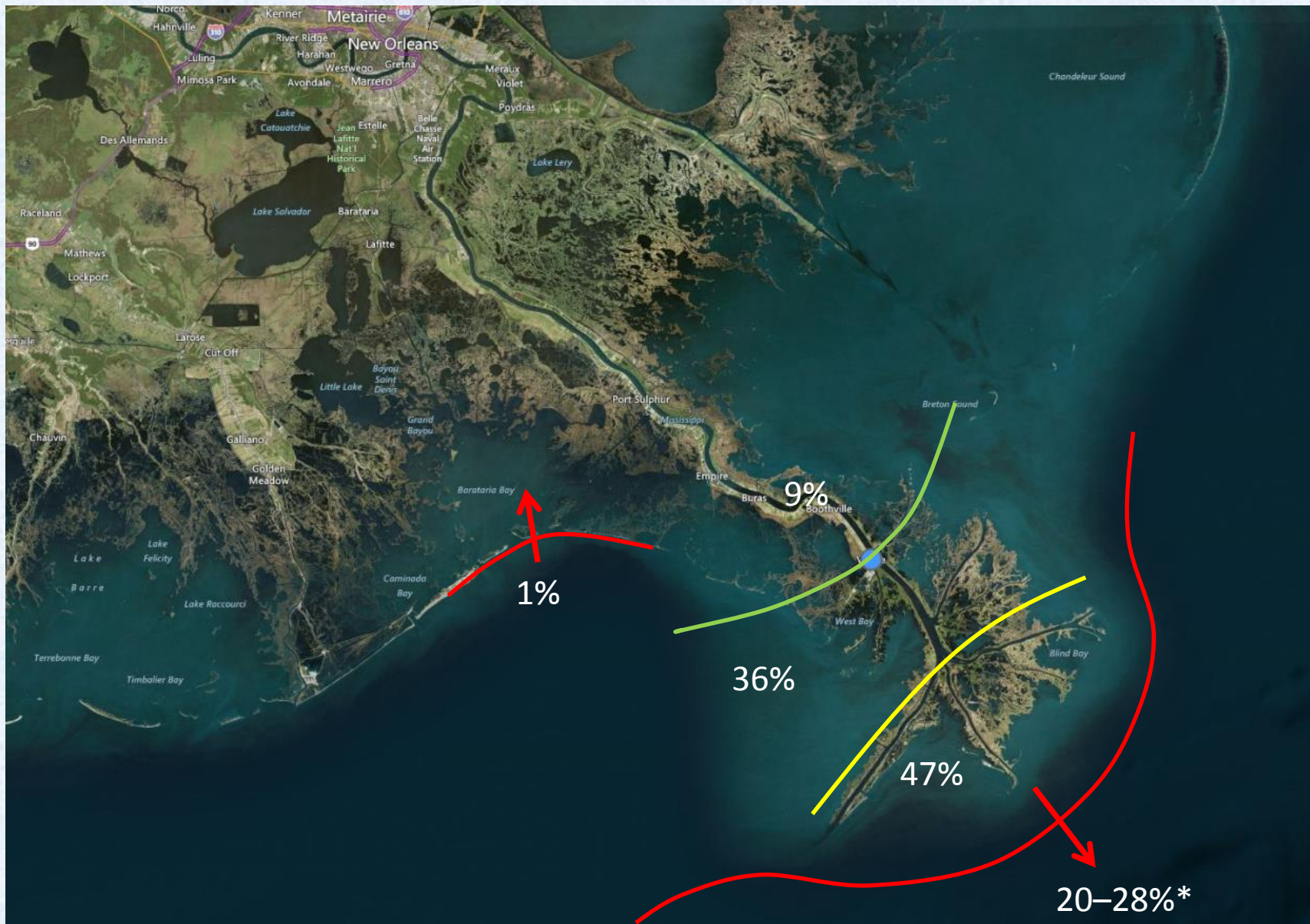
17%



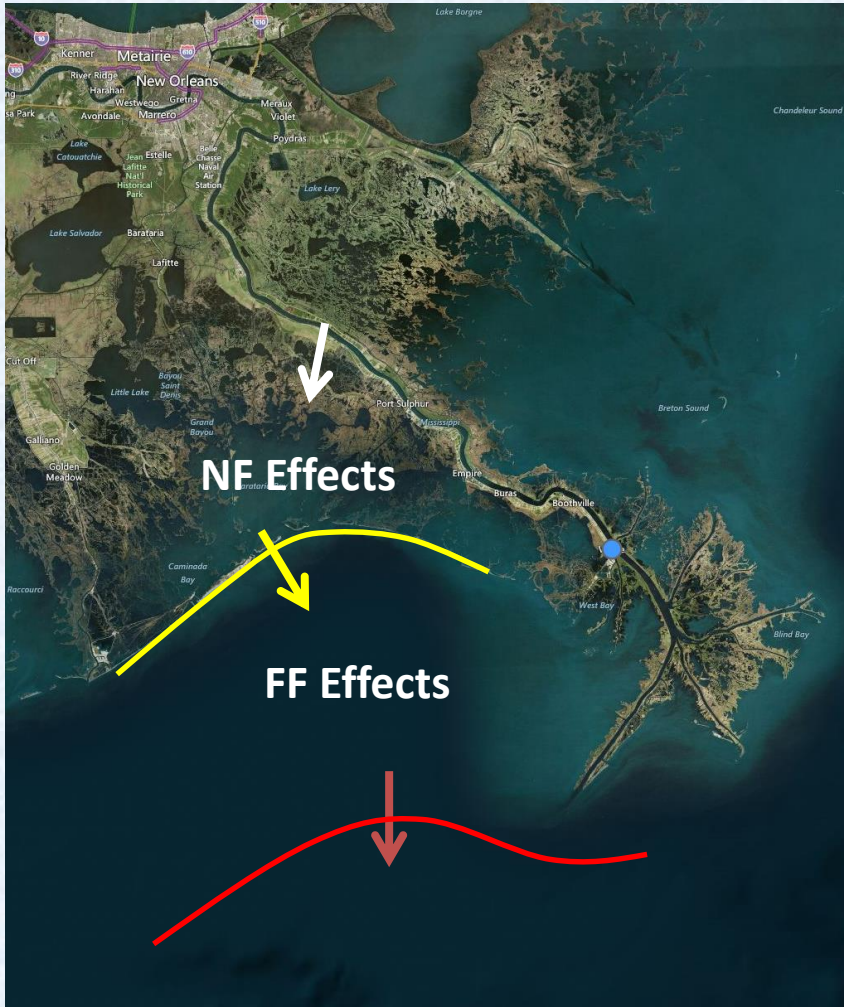
39%



11%



\* - about the same as the increase in NRC predicted under the 2012 Master Plan for Sustainable Coast (Rivera et al., 2013)



NF Effects = f(Freshwater Res. Time)

$$\text{FRT} = (S_0 - S) / S_0 * (V / Q)$$

Lower Barataria Bay (Das et al., 2010):

$$V = 1.7 \times 10^9 \text{ m}^3$$

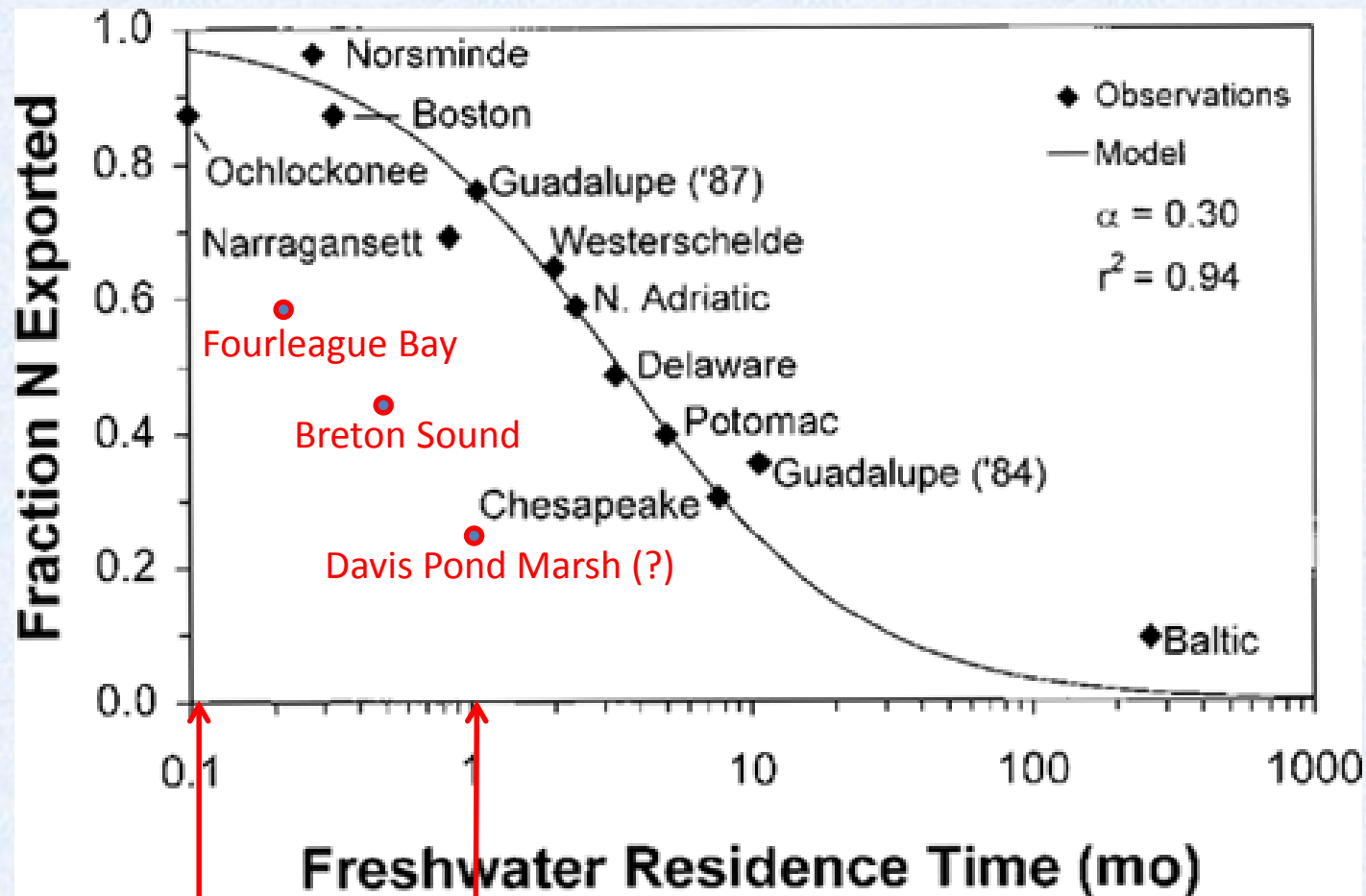
$$S = 12.5$$

$$S_0 = 25$$

$$\text{FRT@}300 \text{ m}^3 \text{ s}^{-1} = 33 \text{ days}$$

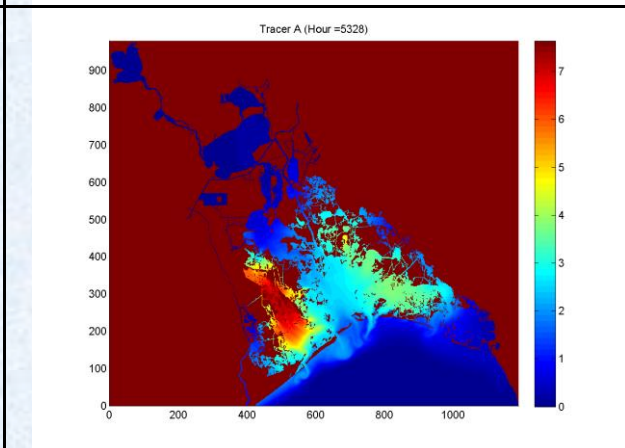
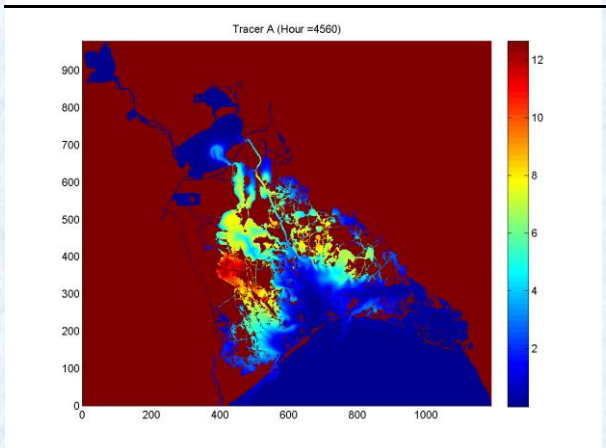
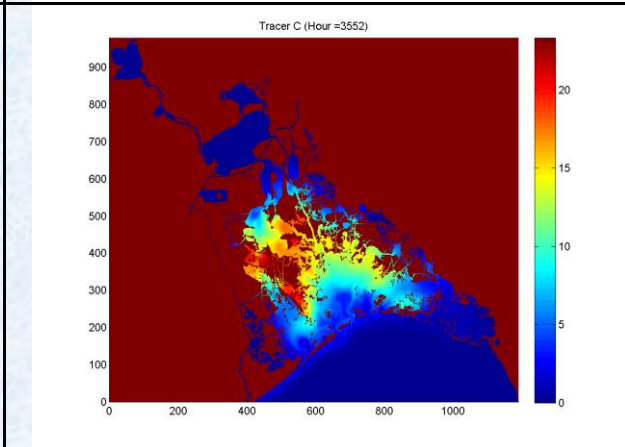
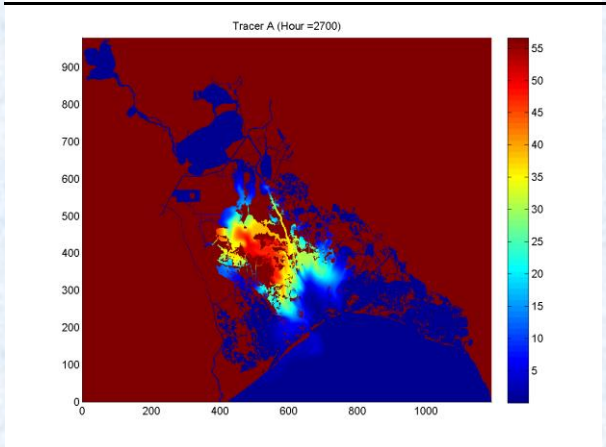
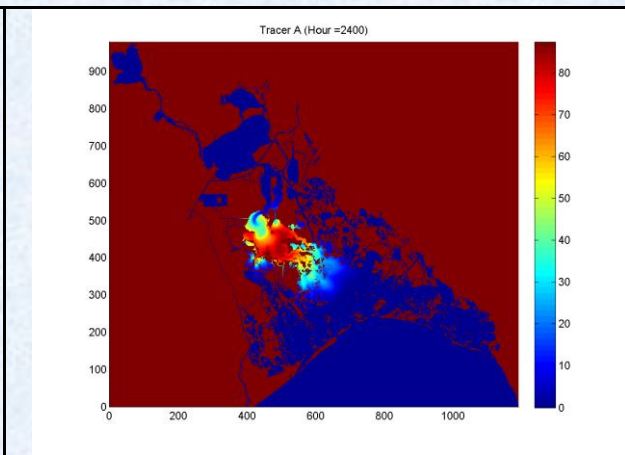
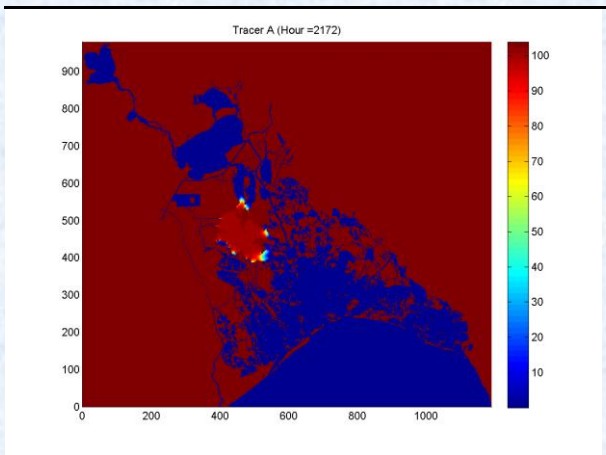
$$\text{FRT@}3,000 \text{ m}^3 \text{ s}^{-1} = 3.3 \text{ days}$$





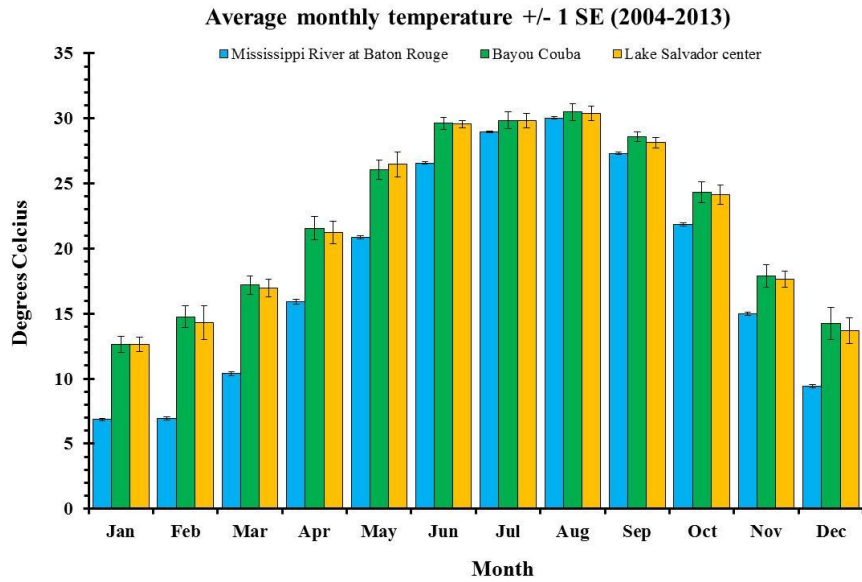
LBB 3,000 m<sup>3</sup> s<sup>-1</sup>

LBB 300 m<sup>3</sup> s<sup>-1</sup>



LBB Residence times:  
< 1 to 14 days

Das (2010)  
Justic et al. (in preparation)



Data sources: R. E. Turner, LSU, USGS, prepared by E. M. Swenson, LSU

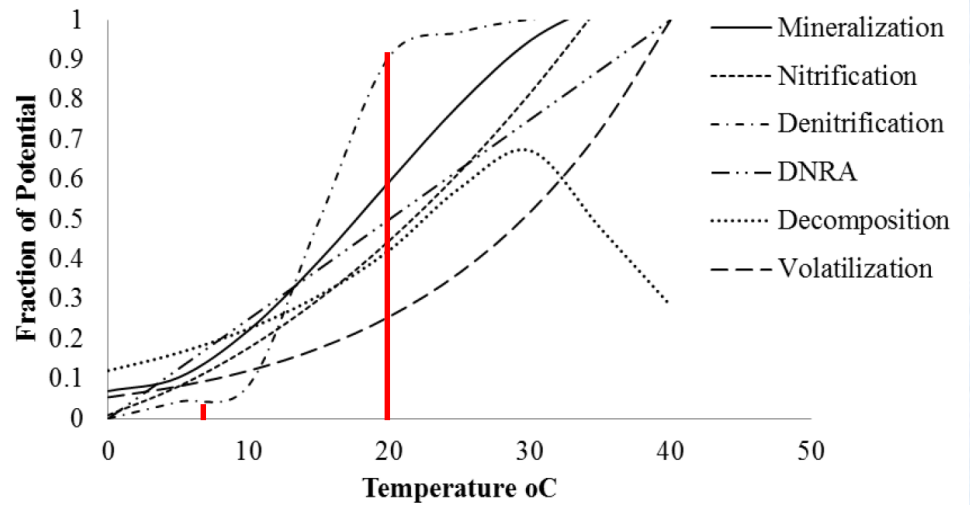
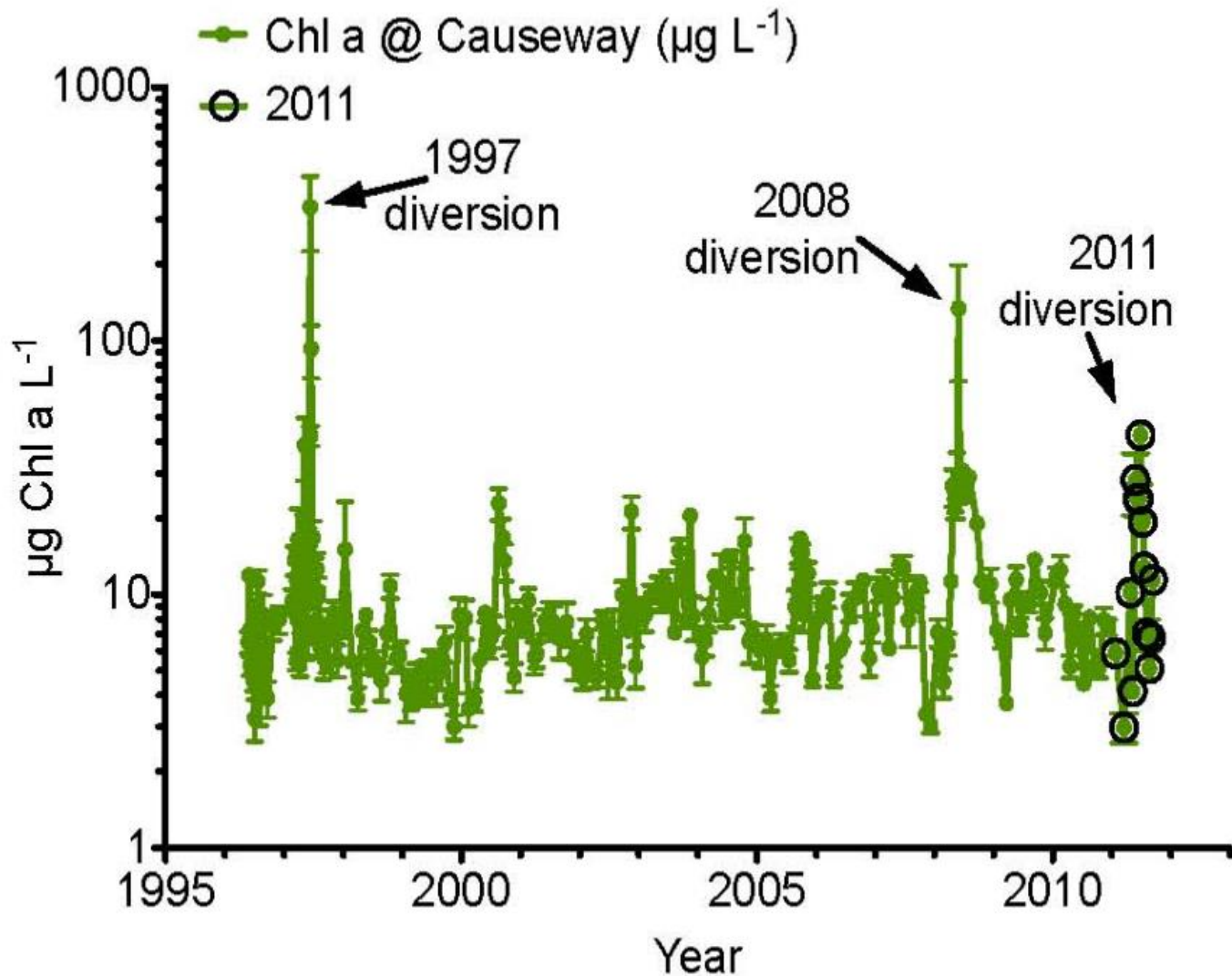
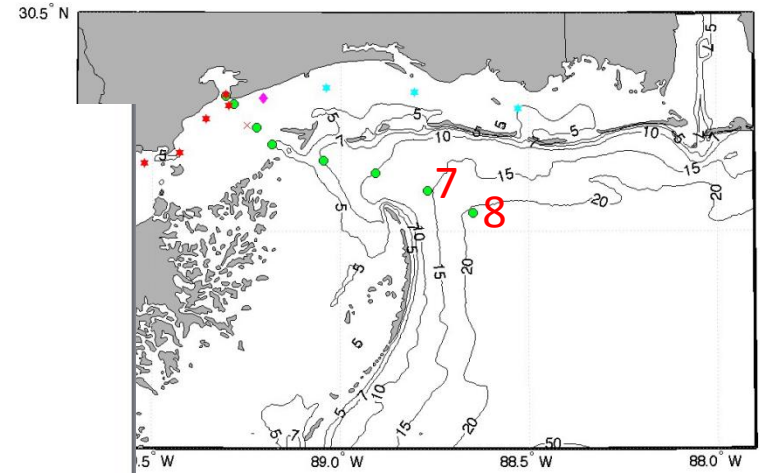
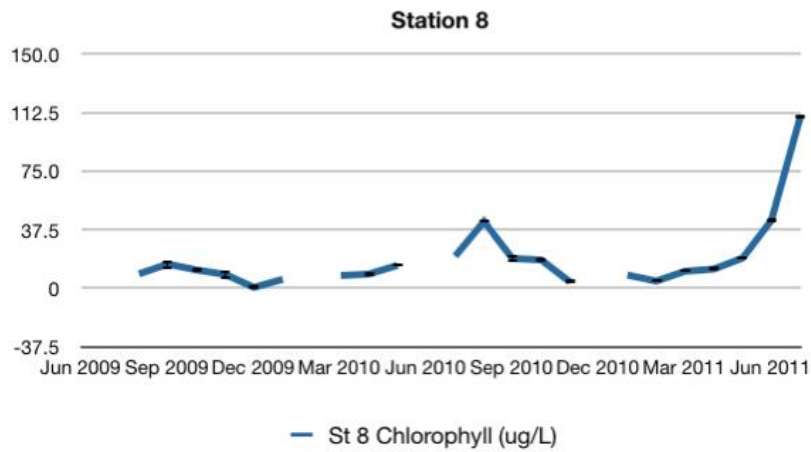
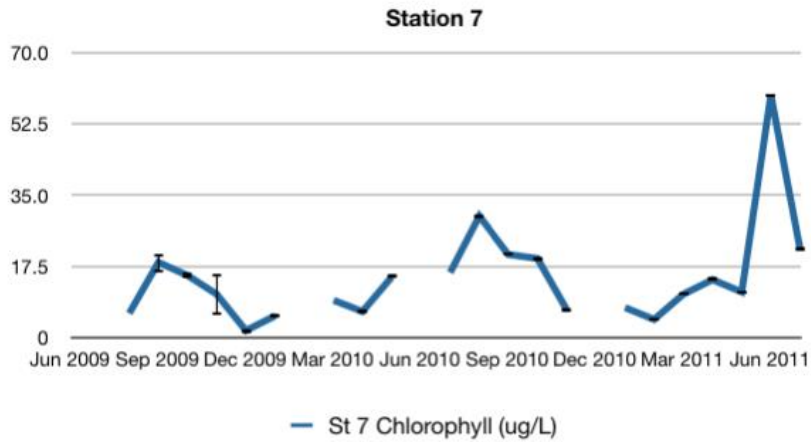


Figure 10. Modeled temperature effects on potential biogeochemical rates.

Branoff (2009)



Source: RETurner; LSU Department of Oceanography and Coastal Sciences  
Funding: Lake Pontchartrain Basin Foundation and NOAA Event Response



Source: S. Howden (personal communication)

# Discussion points

## Near field:

- Salinity, temperature and residence times
- Nutrient concentrations and ratios
- Phytoplankton biomass
- HAB potential

## Far field:

- Nutrient concentrations and ratios
- Spatial patterns in productivity and hypoxia

## Acknowledgements

- NOAA CSCOR (NGOMEX, MULTISTRESS)
- BP/GOMRI (Coastal Waters Consortium)
- NSF/USEPA/USDA (PULSES)
- USDA/USEPA (NUMAN)