



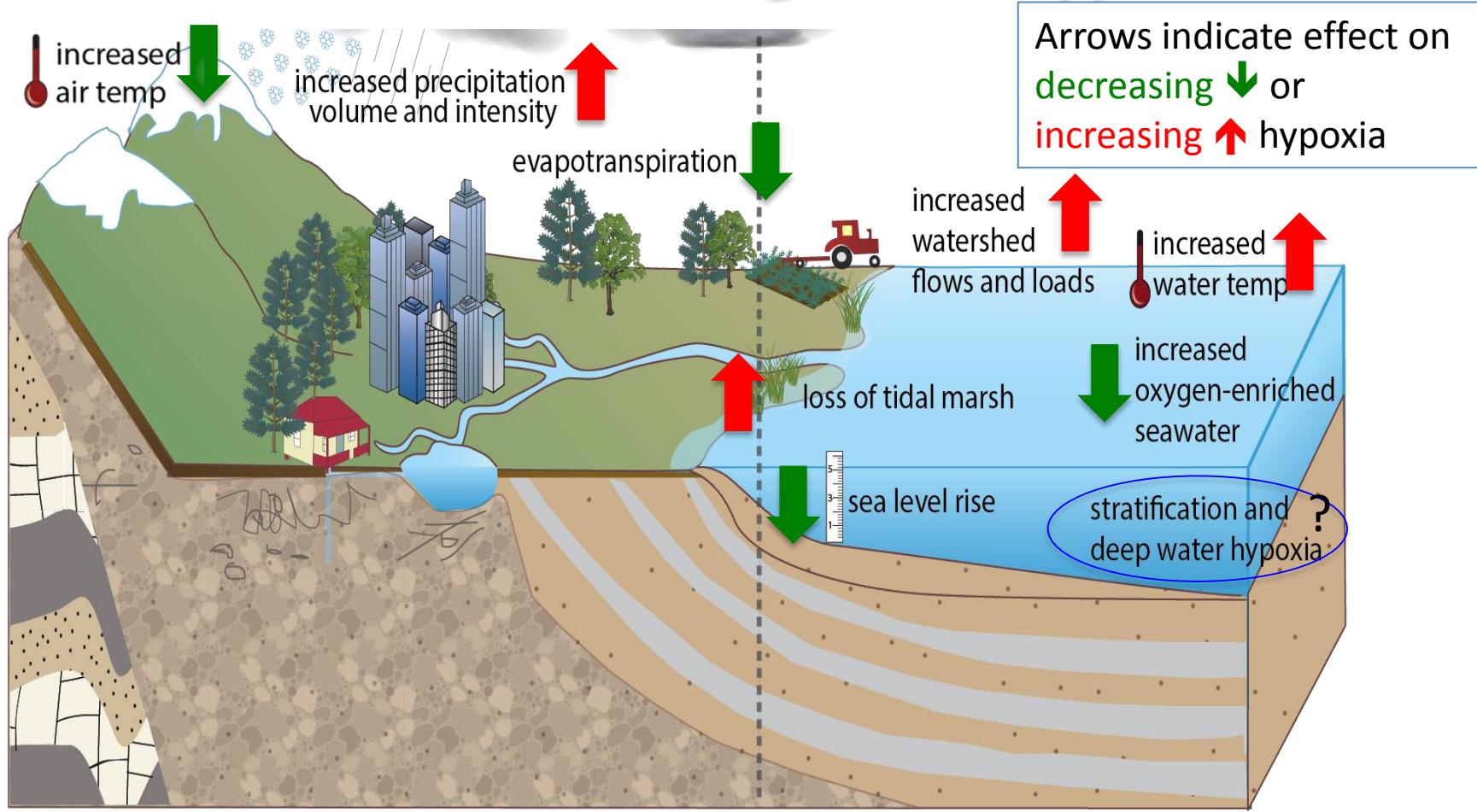
University of Maryland  
CENTER FOR ENVIRONMENTAL SCIENCE

# Global Perspectives on Effects of Climate Change on Coastal Eutrophication

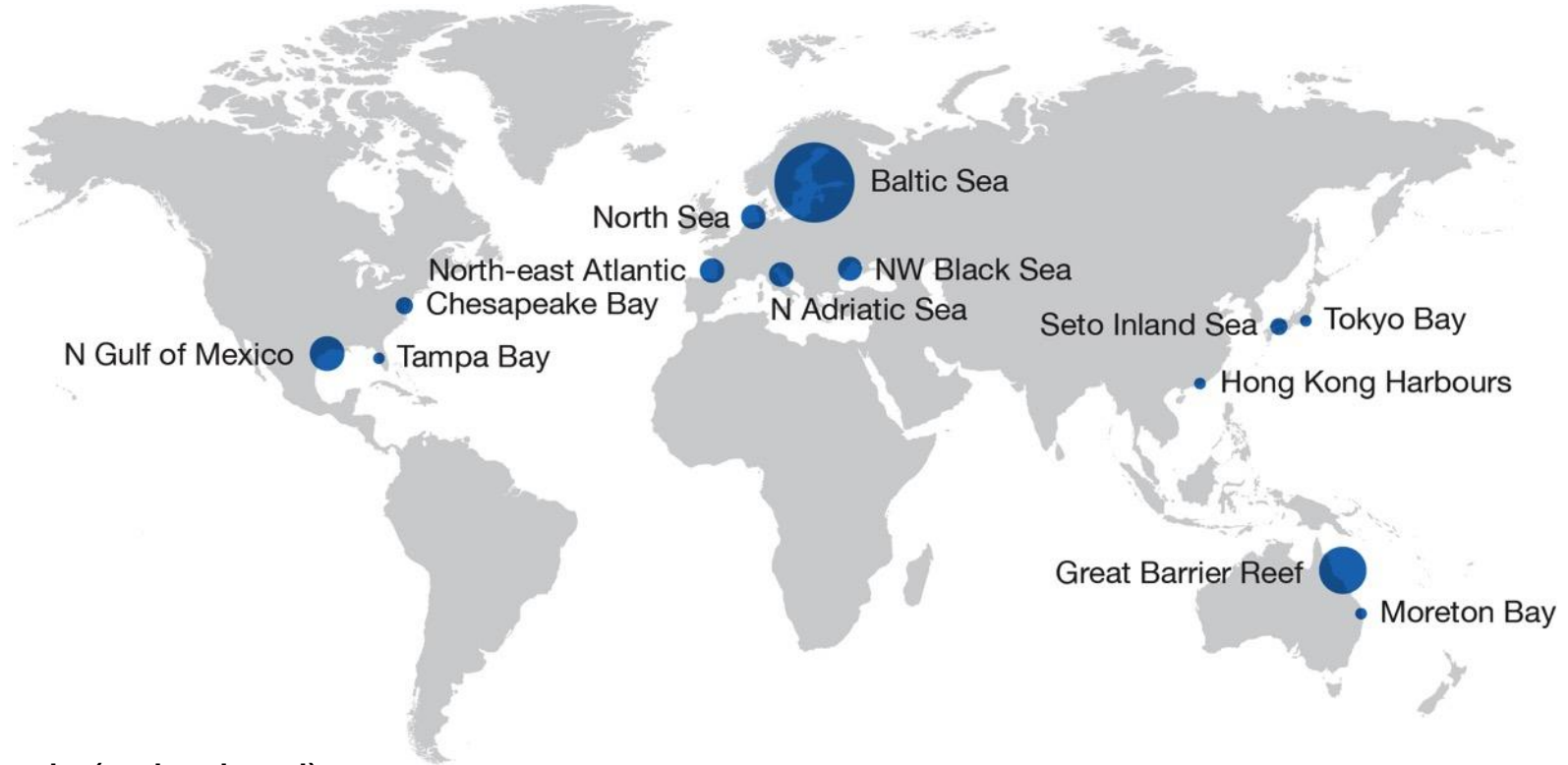
Don Boesch

Chesapeake Bay Program Climate Change Modeling 2.0  
September 24, 2018

# Effects of Climatic Changes on Hypoxia



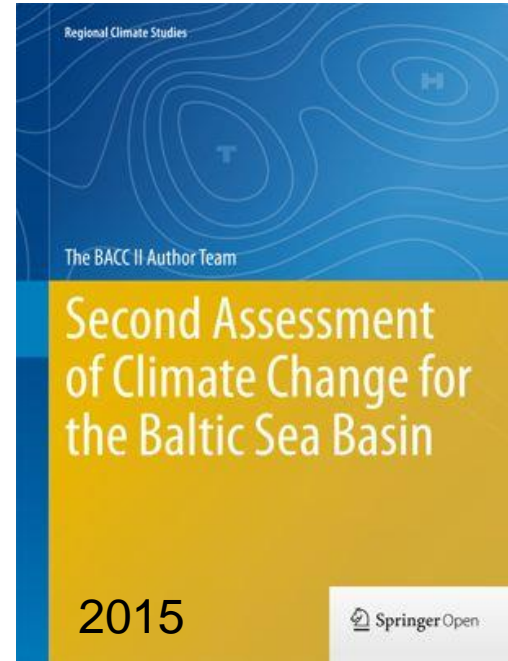
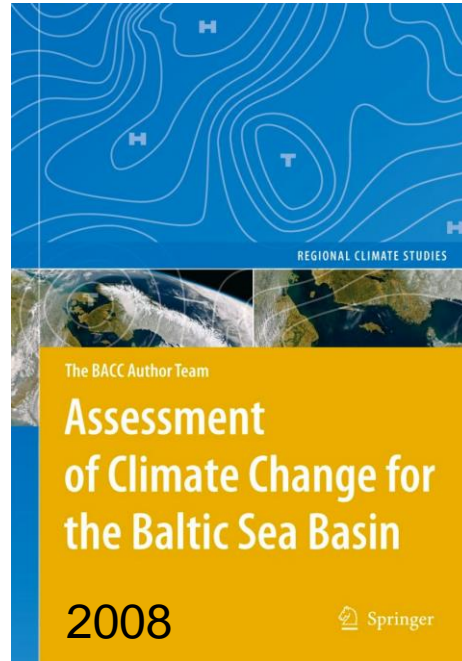
# Campaigns to Abate Coastal Eutrophication



Boesch (submitted)



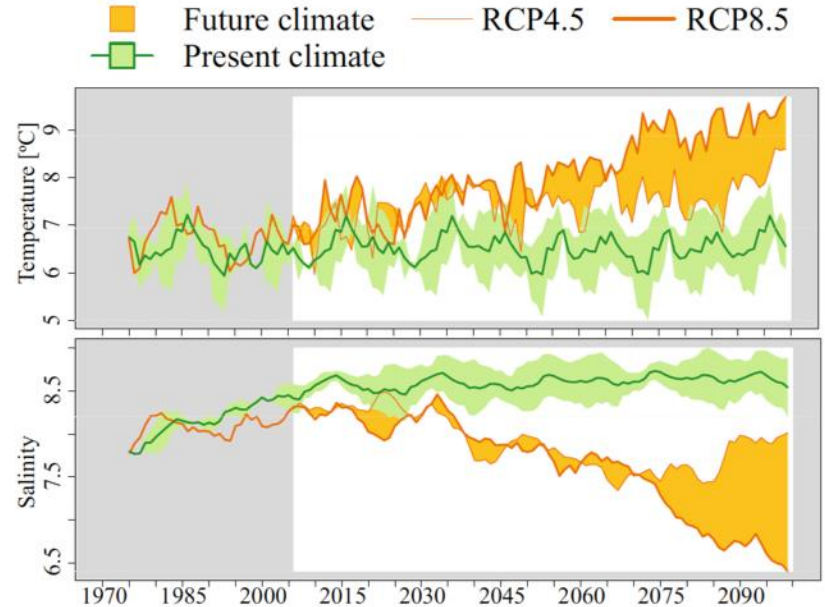
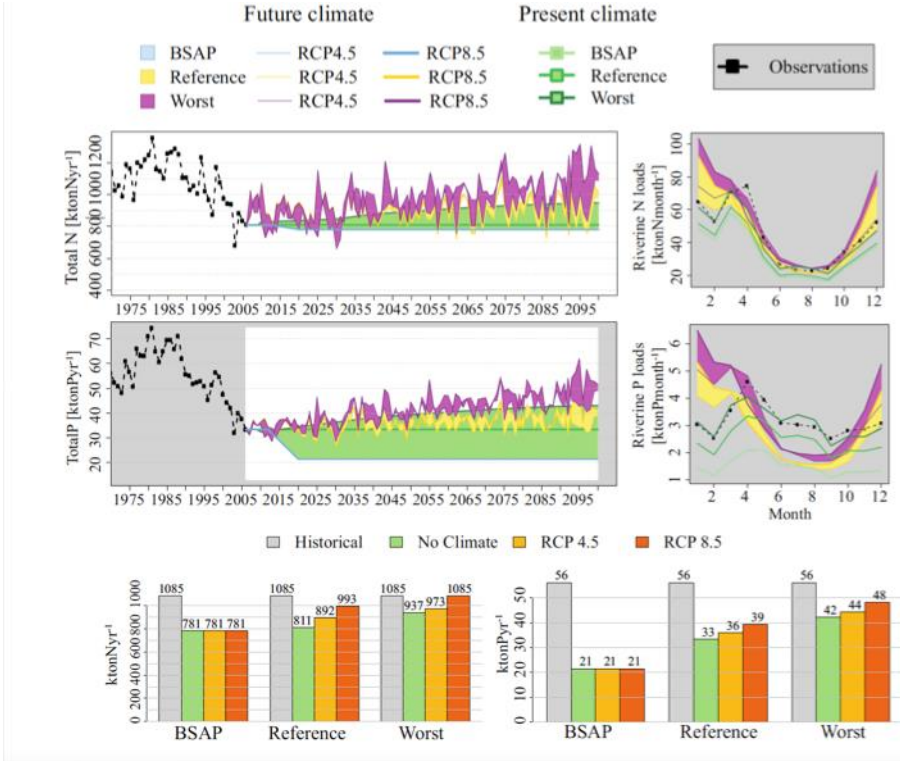
# Baltic Sea: Chesapeake's Big Sister



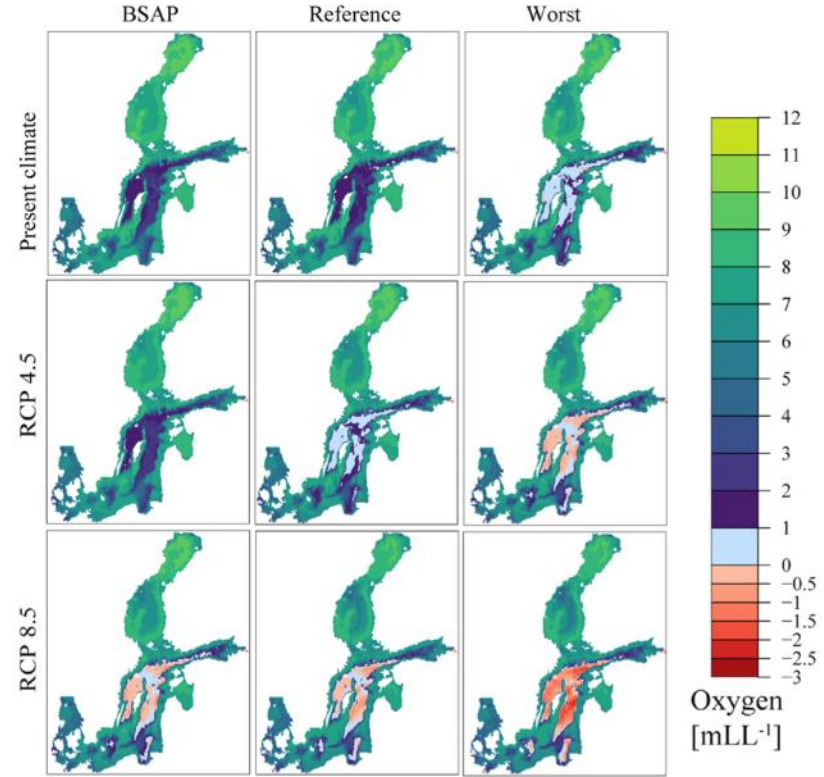
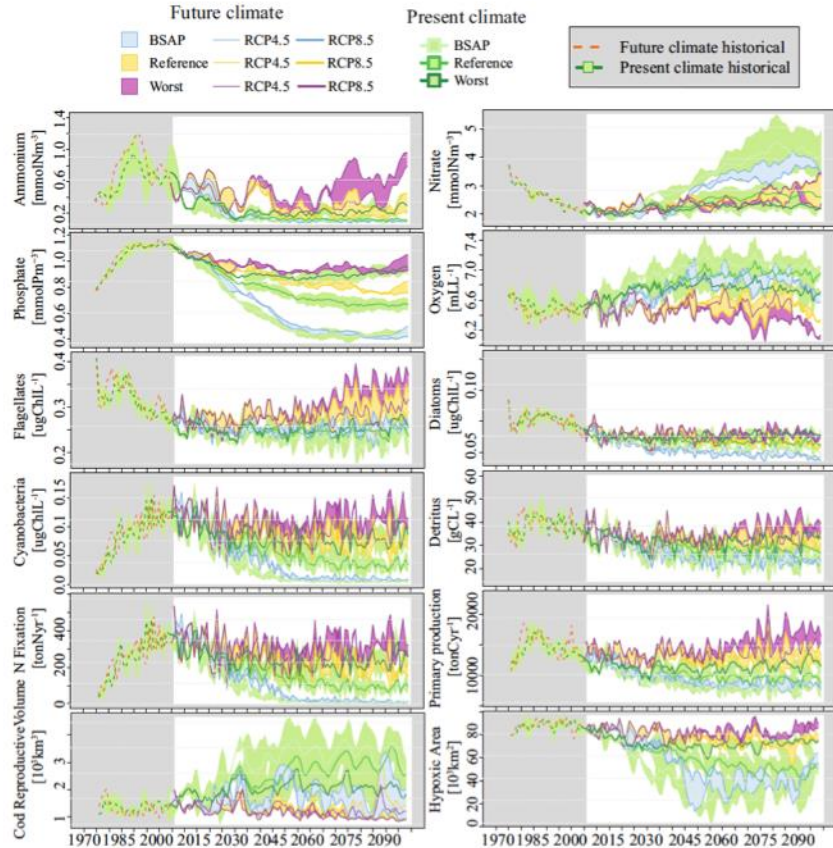
**Baltic Earth**

Earth System Science for the Baltic Sea Region

# Baltic Sea: Changes in Nutrient Delivery, T, S



# Baltic Sea: Changes in Nutrient Delivery, T, S





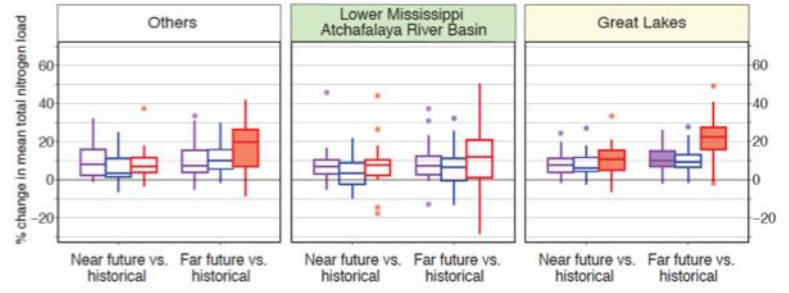
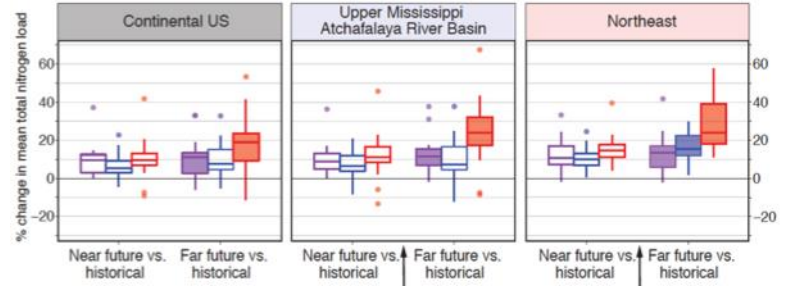
# Precipitation-driven N losses



2100  
BAU scenario



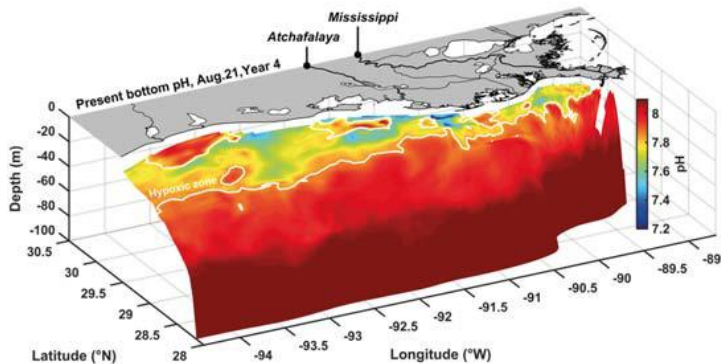
Offsetting increase in N loading would require  $33 \pm 24\%$  reduction



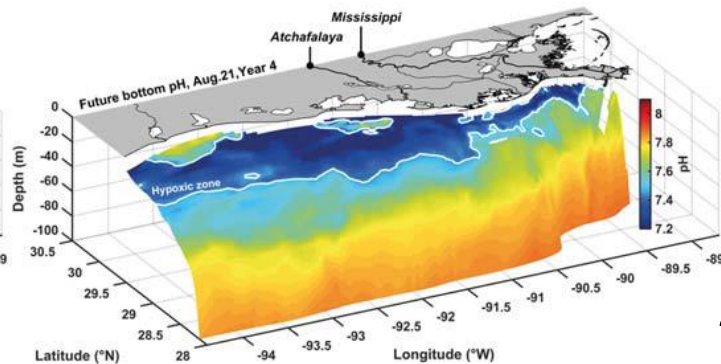
# Hypoxia and pH on Louisiana Shelf

Present

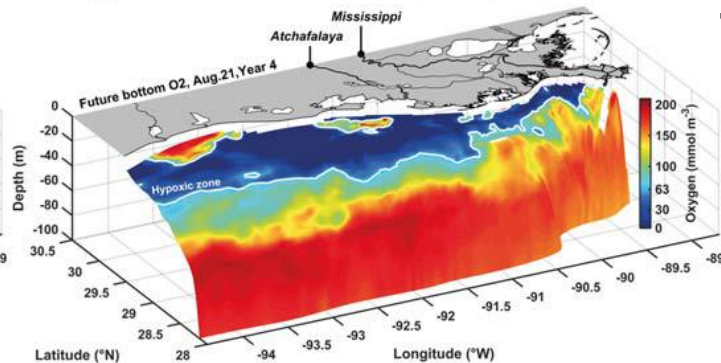
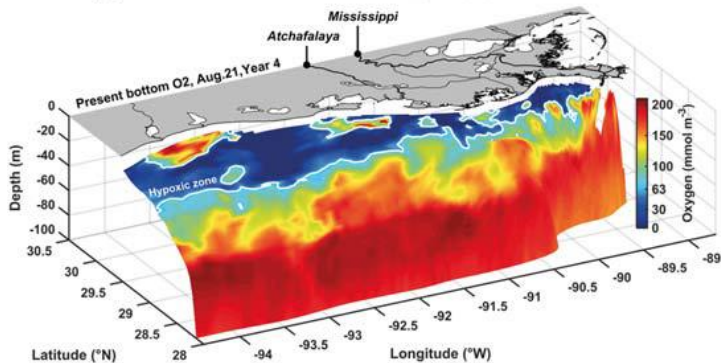
pH



Future



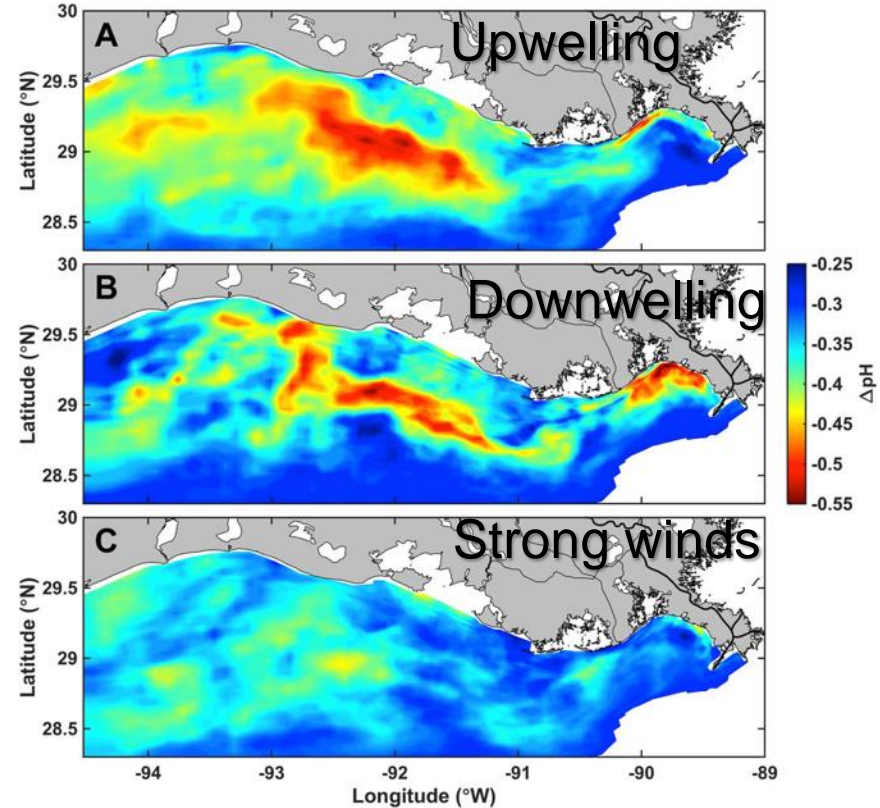
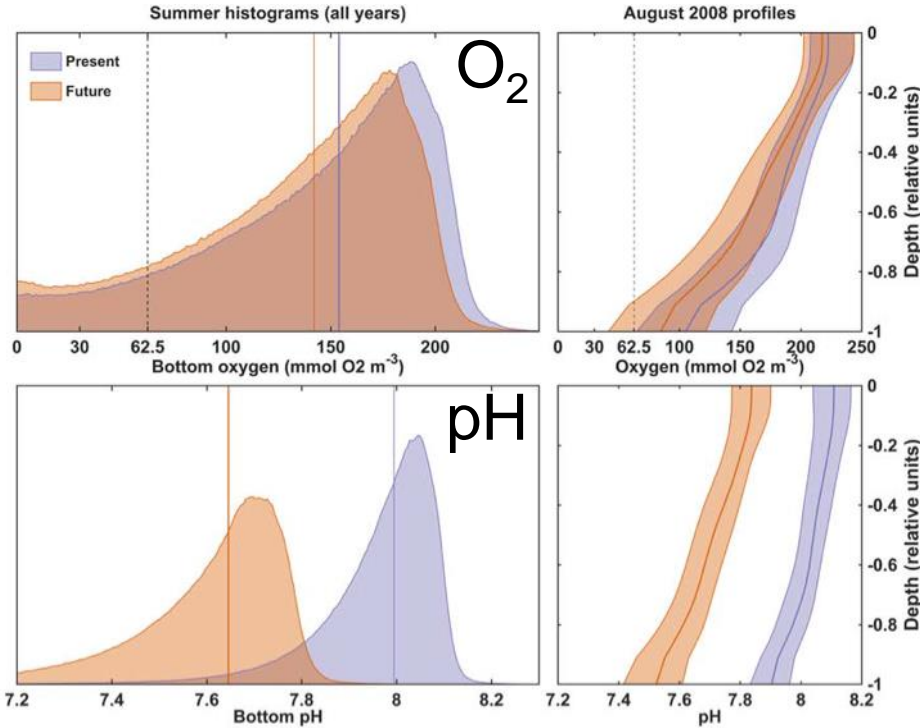
O<sub>2</sub>




2100  
+10% flow  
Same N&P



# Hypoxia and pH on Louisiana Shelf



# 2018 Update of SLR Projections for MD

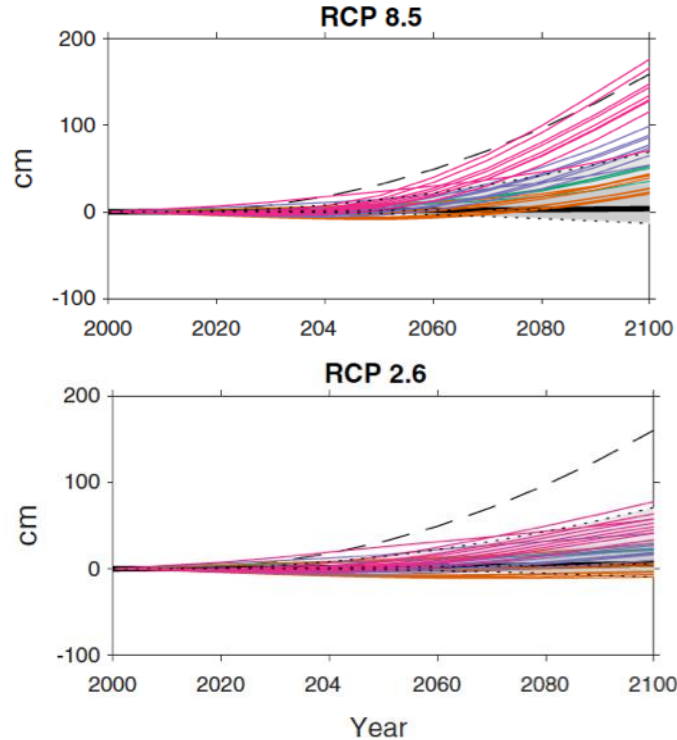


**Updating Maryland's  
Sea-level Rise  
Projections**

Scientific and Technical Working Group  
Maryland Climate Change Commission

June 26, 2013

To be updated  
Nov. 2018



Probabilistic projections  
Kopp et al. 2017. *Earth's Future*

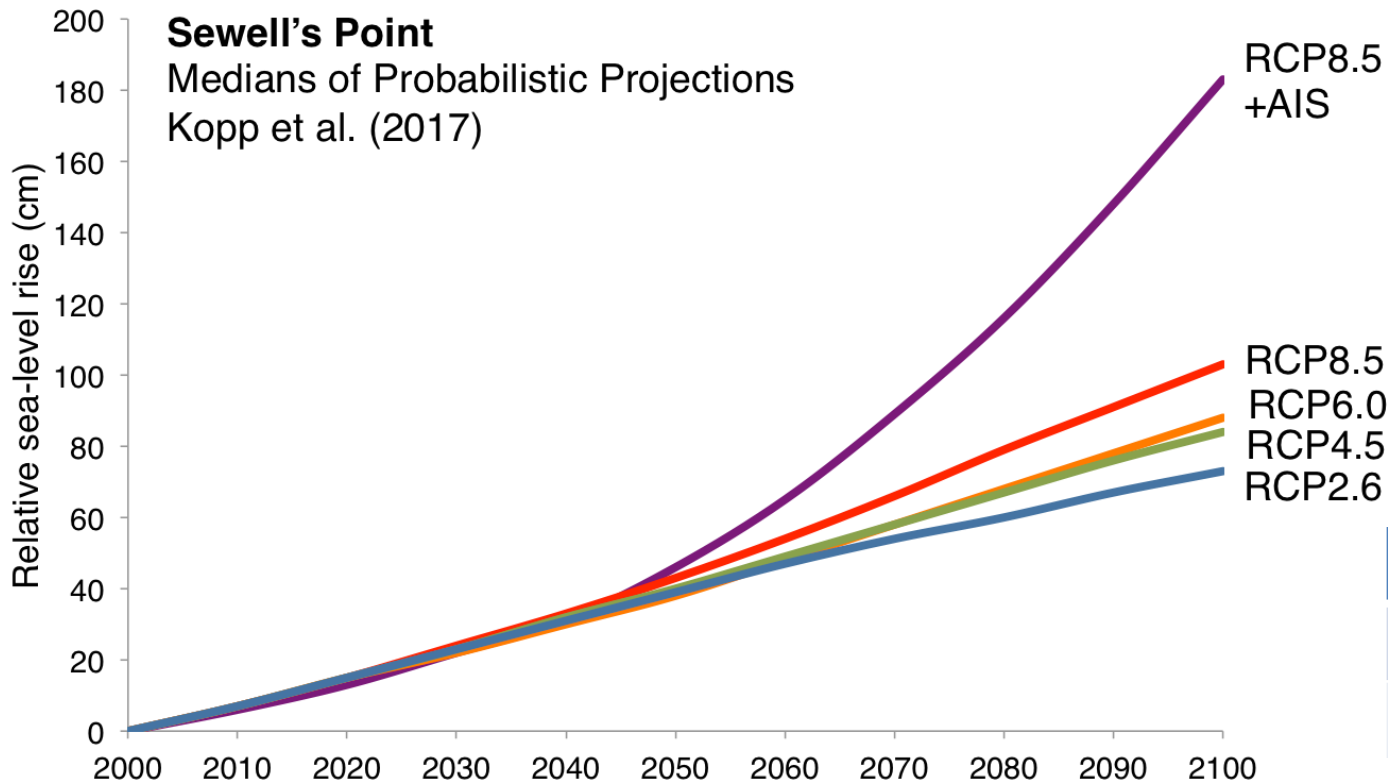
## SPR Expert Group

Don Boesch  
Bill Boicourt  
John Boon  
Richard Cullather  
Tal Ezer  
Gerald Galloway  
Zoë Johnson  
Hali Kilbourne  
Mat Kirwan  
Bob Kopp  
Sasha Land  
Ming Li  
William Nardin  
Chris Sommerfield  
Billy Sweet

# Sea-Level Rise by Model

## Sewell's Point

Medians of Probabilistic Projections  
Kopp et al. (2017)

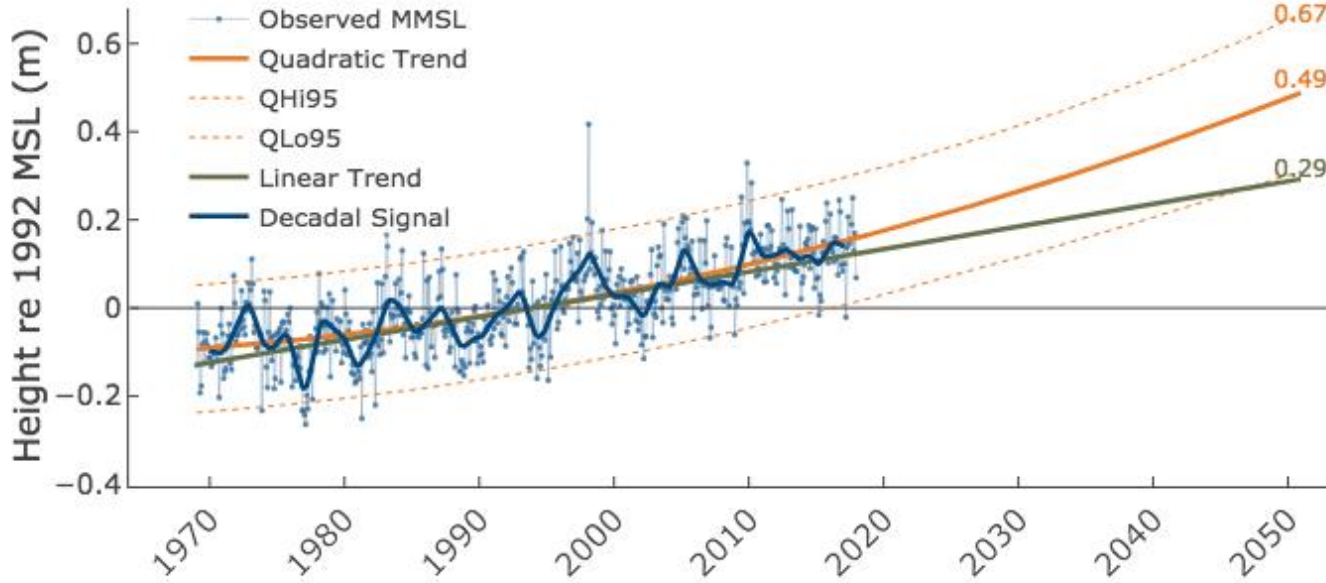


2025	0.24 m
2050	0.44-0.51 m
2080	0.60-1.16 m



# Sea-Level Rise by Extrapolation

Norfolk, VA (Sewells Point)



CBP modeling first used 0.30 m, then used 0.17 m RSLR by 2025.

	2025	2050
Linear	0.16	0.29
Quadratic	0.23	0.49

Boon and Mitchell. 2015  
*J. Coastal Res.* 36, 1295

**boesch@umces.edu**

**www.umces.edu/don-boesch**

**@DonBoesch**

