

# Assessment of Open Water Quality Response to Nutrient Loads from Different Geographic Regions (geo-runs)

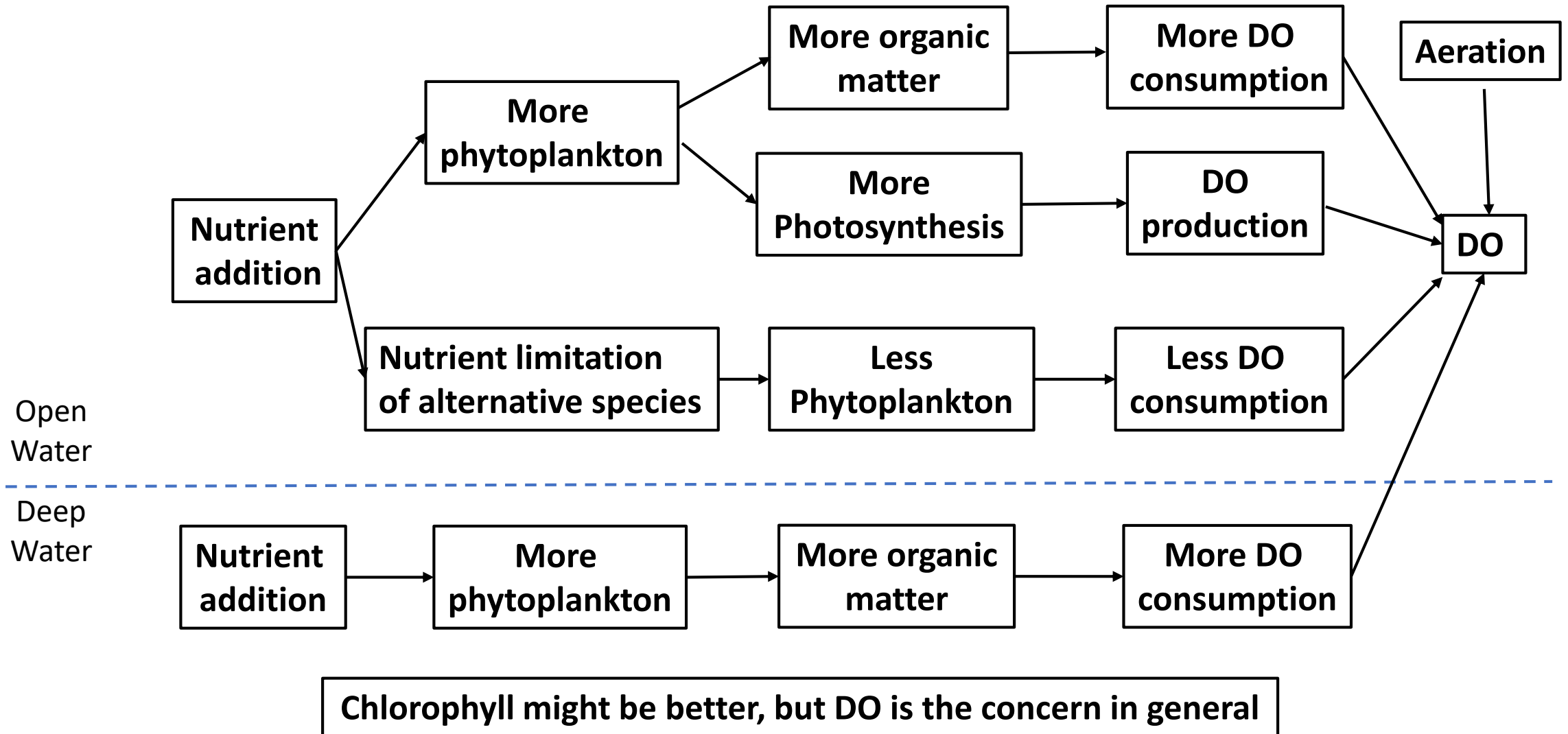
Richard Tian and  
Modeling Working Group

Modeling Quarterly Review  
10/16/2018

# Introduction

- **Geo-runs: Keep the nutrient loading constant at the TMDL level everywhere, except for a specific geographic location where N-load increased by 1 million pounds annually and P-load by 0.1 million pounds, respectively, to determine the change in DO in the main stem: Deep Water (DW) and deep channel (DC) designated use.**
- **This was done for the major basins: Susquehanna, Patuxent, Potomac, Rappahannock, York and James Rivers, West Shore and East shore.**
- **There is a desire to look at local waters (Open Water): Which nutrient sources affect my local water and to what extent my local nutrient management is beneficial?**

# More challenging for open water



# Sensitivity analysis on the quantity of nutrient addition

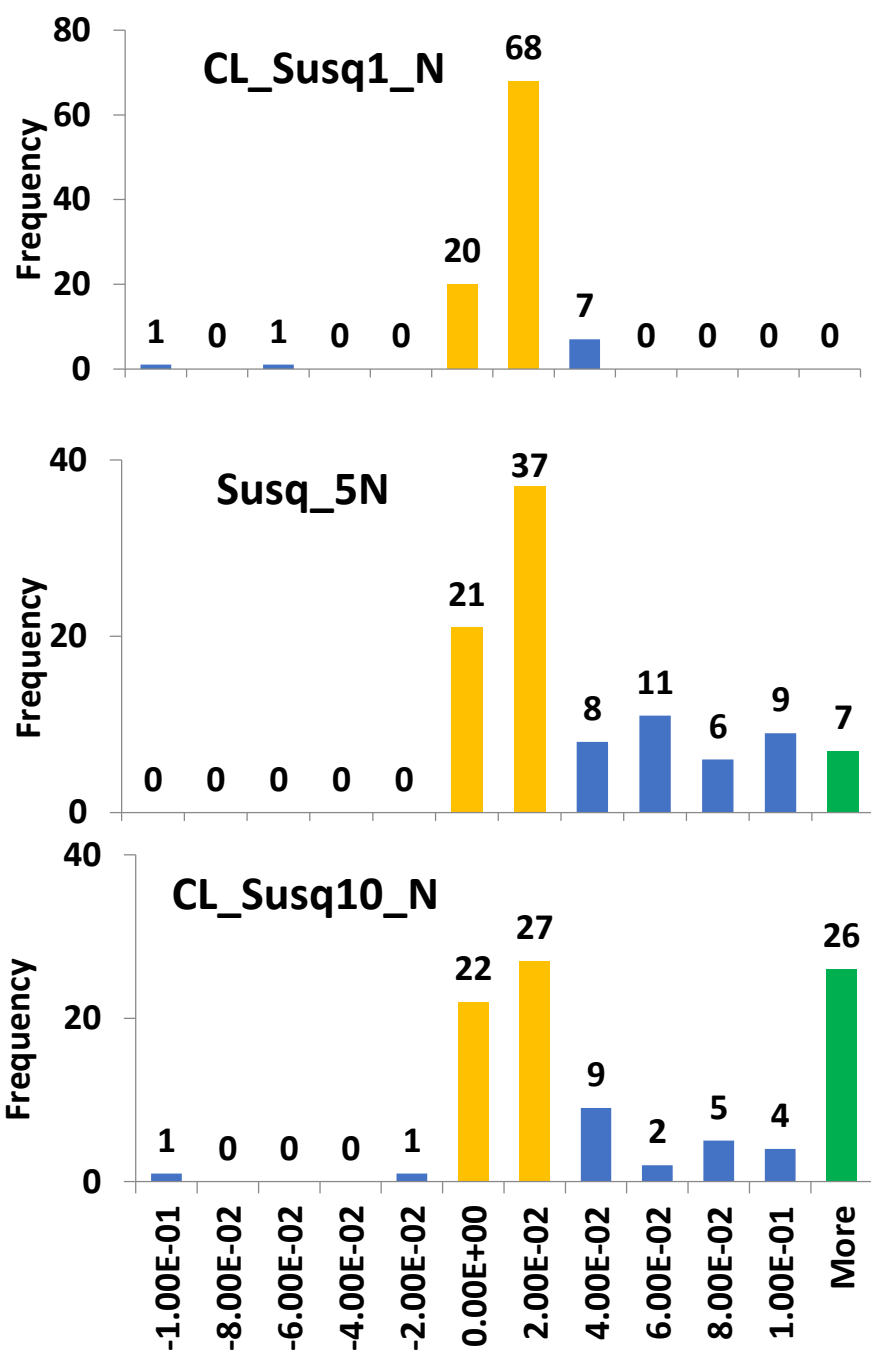
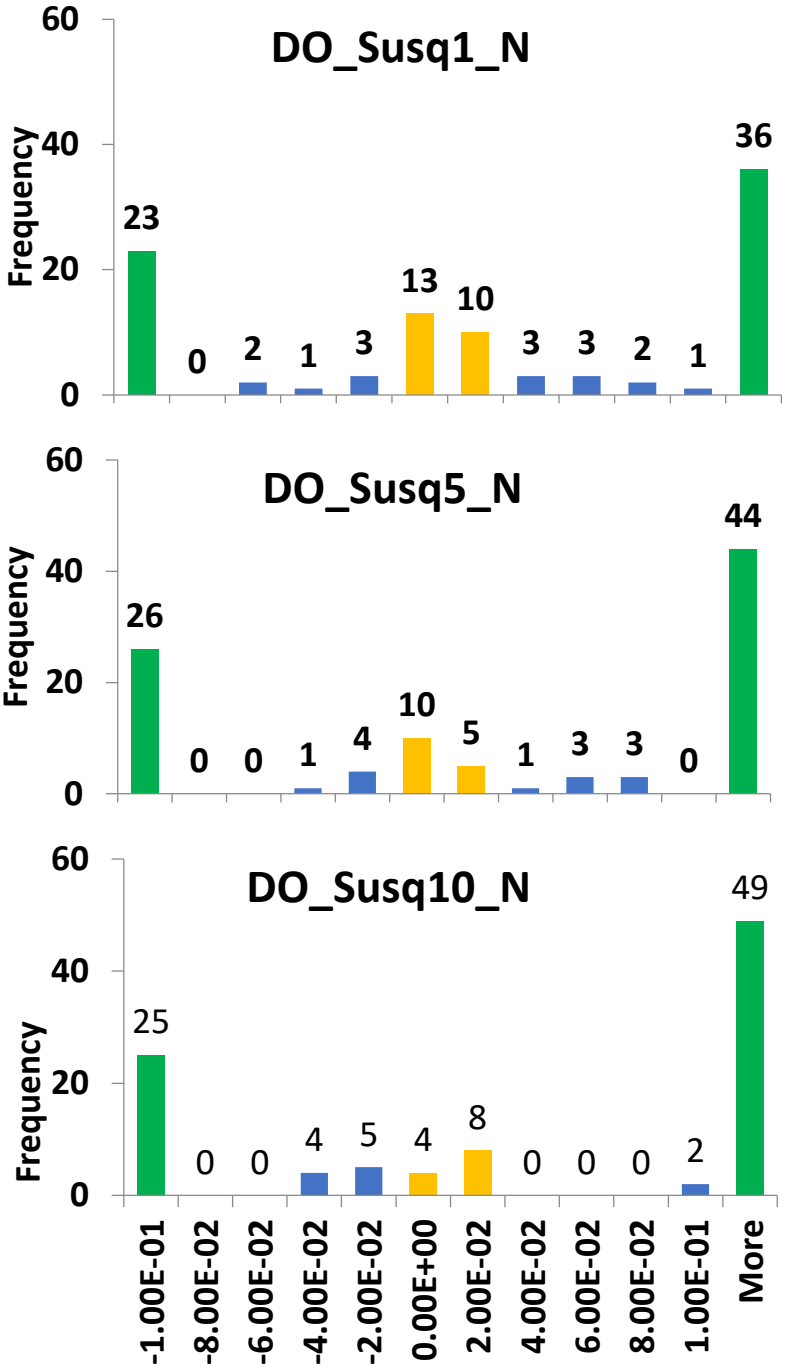
**Need better  
signal over  
the entire bay**

N addition in MM lbs	P addition in MM lbs
1	0.1
5	0.5
10	1

**Choptank  
James  
Rappahannock  
Susquehanna**

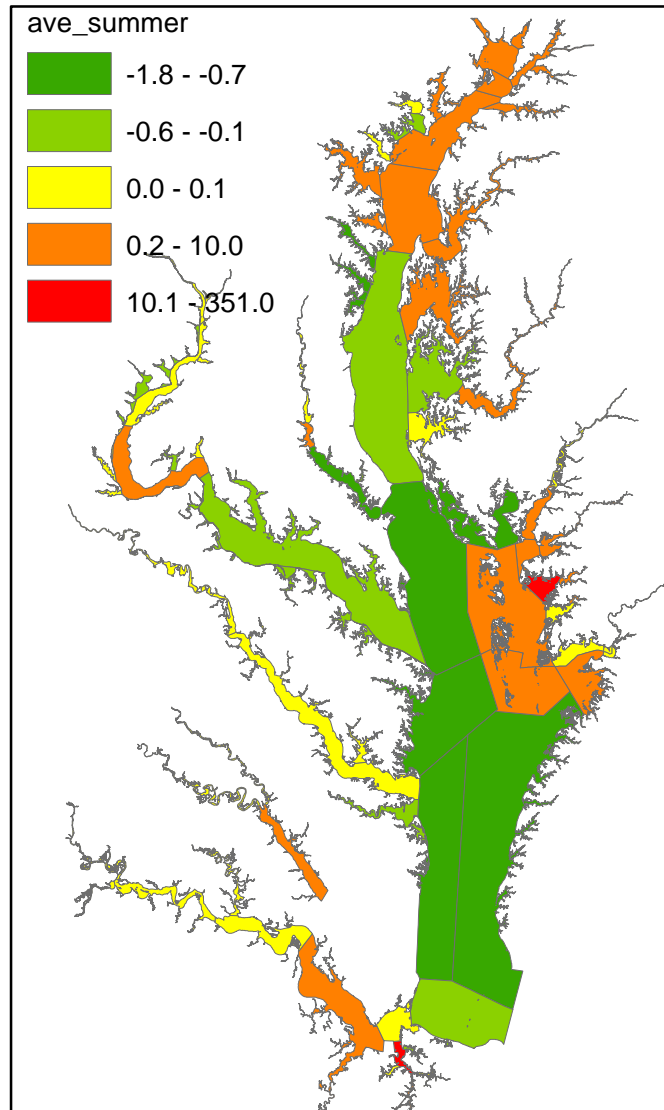


# DO and CL sensitivity in summer to N loading from Susquehanna

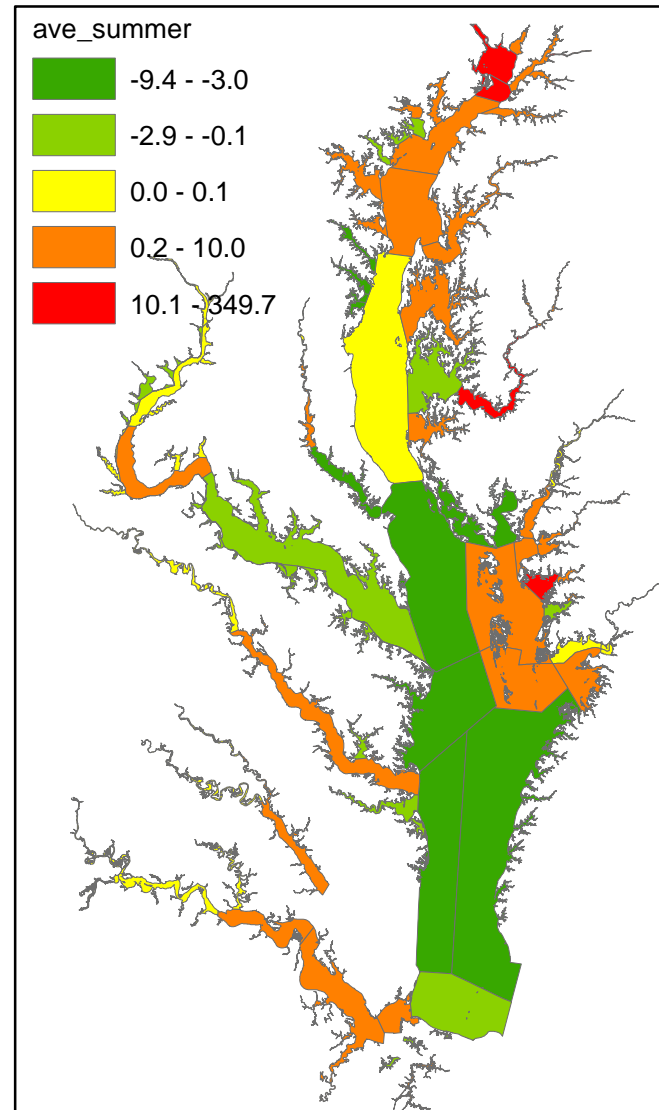


# DO sensitivity in summer to N loading from Susq

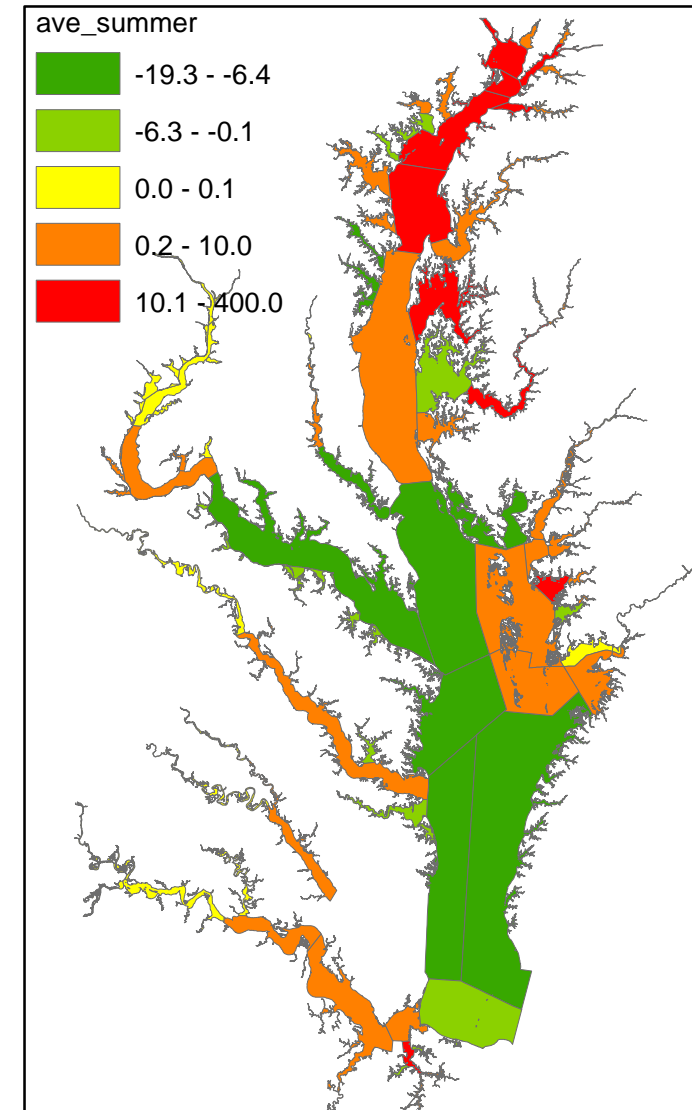
1 million N



5 million N

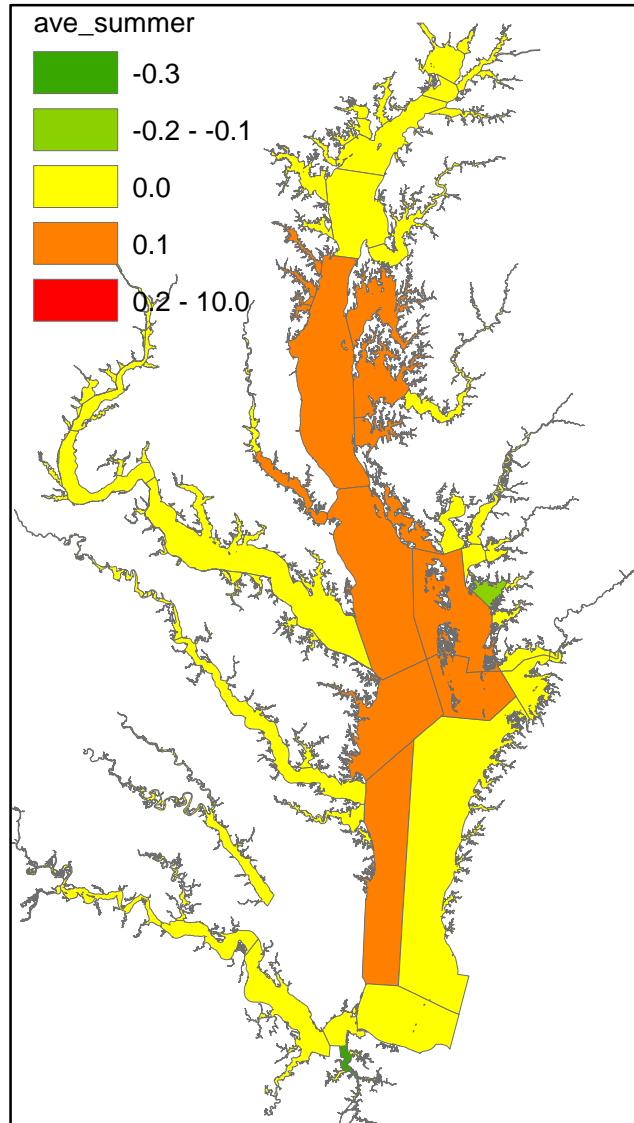


10 million N

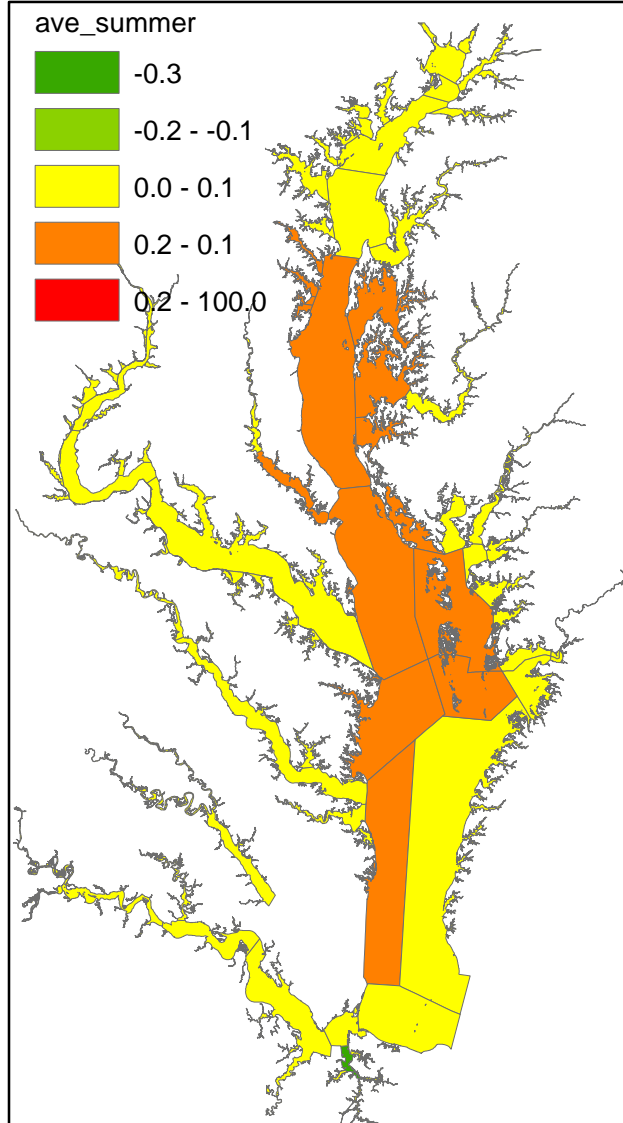


# CL sensitivity in summer to N loading from Susq

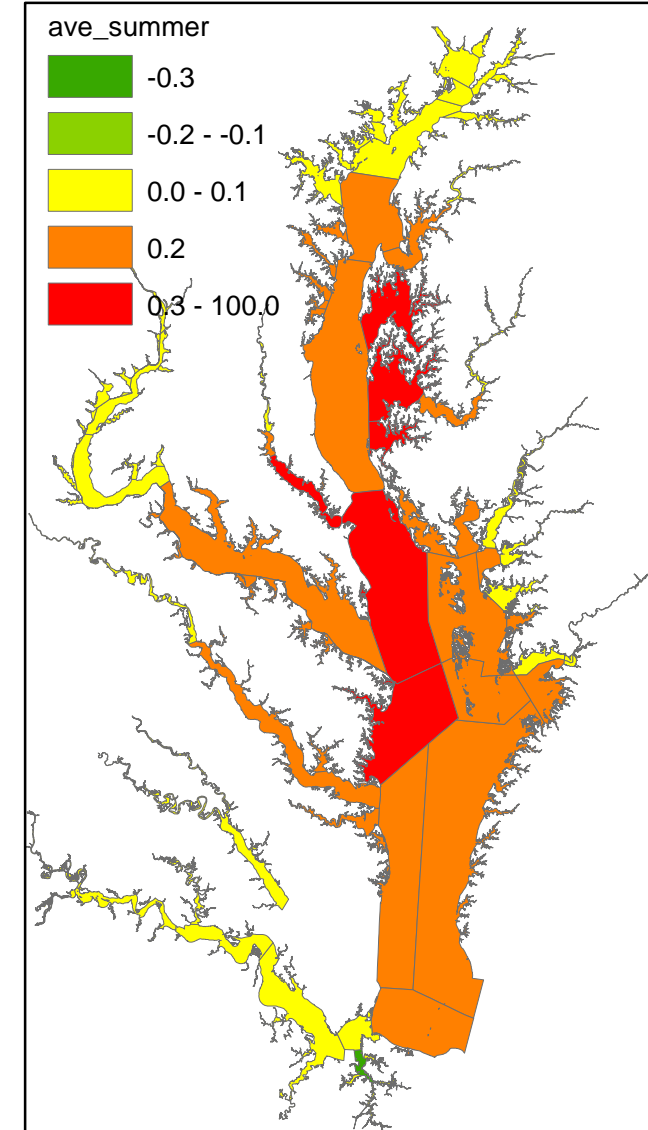
1 million N



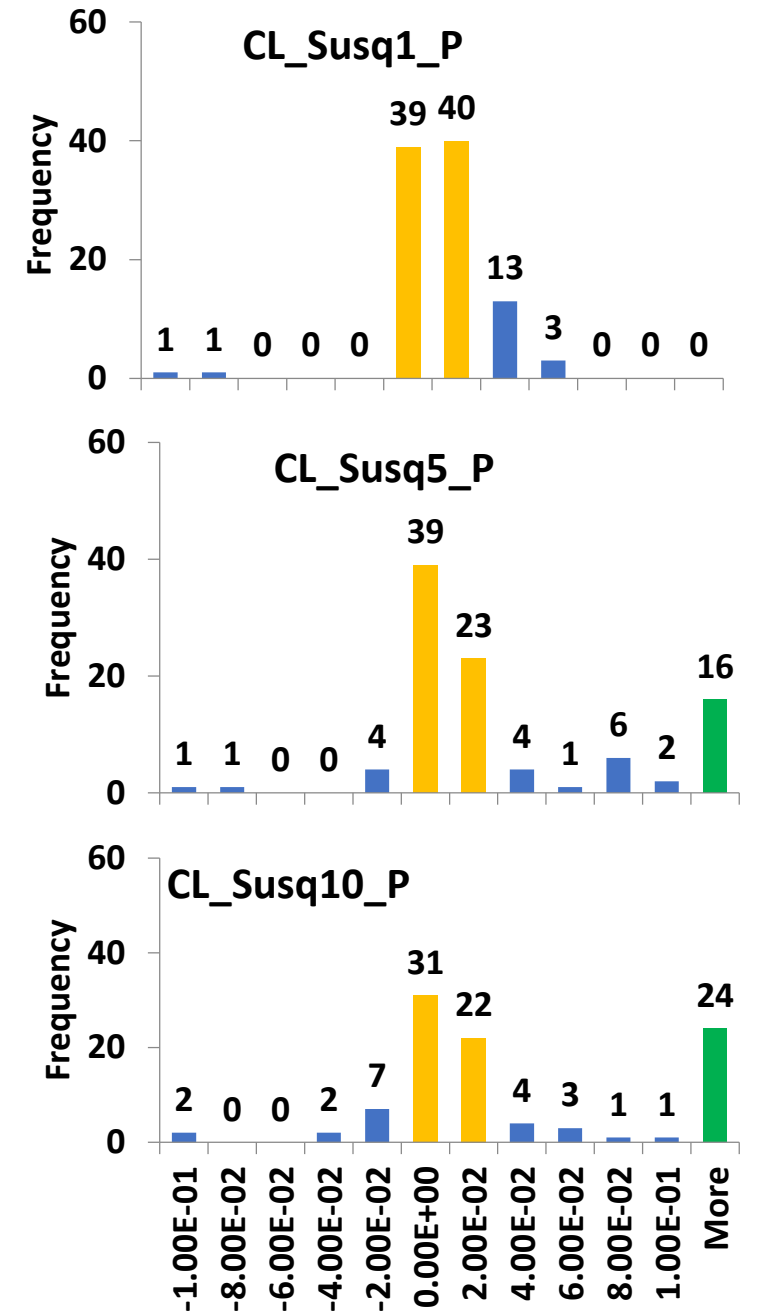
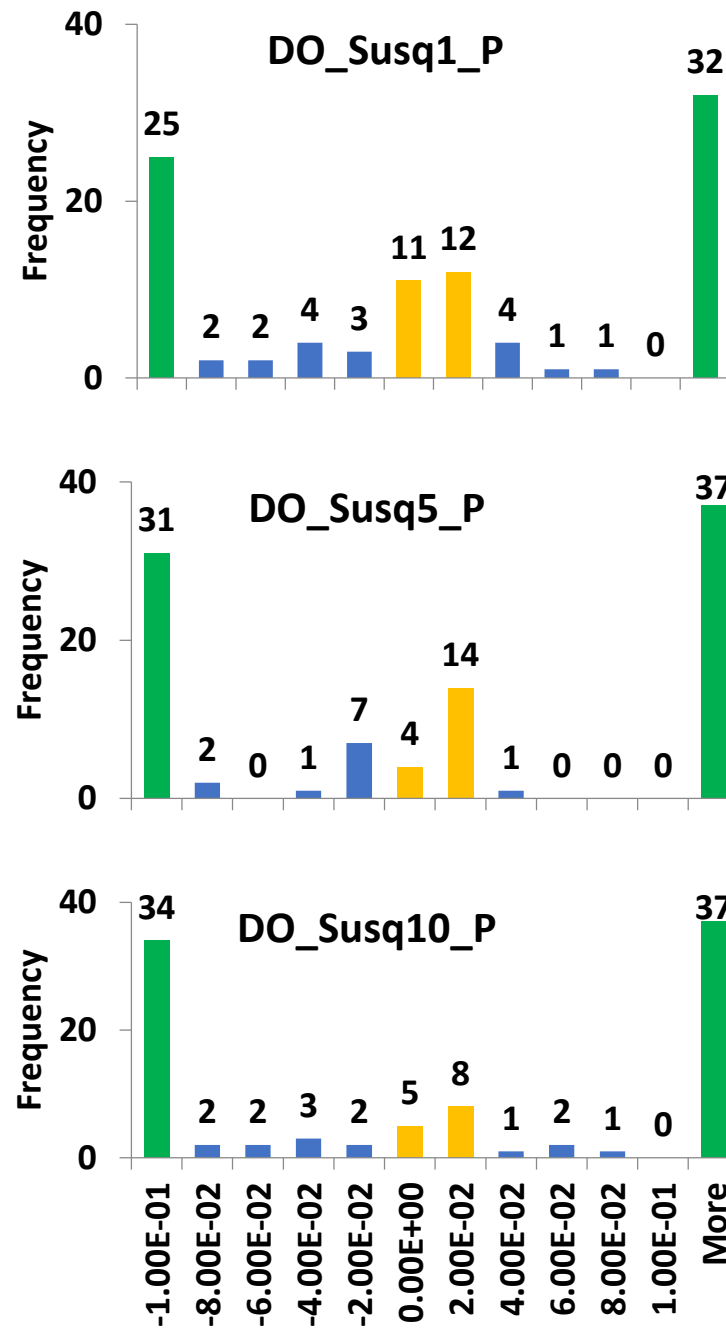
5 million N



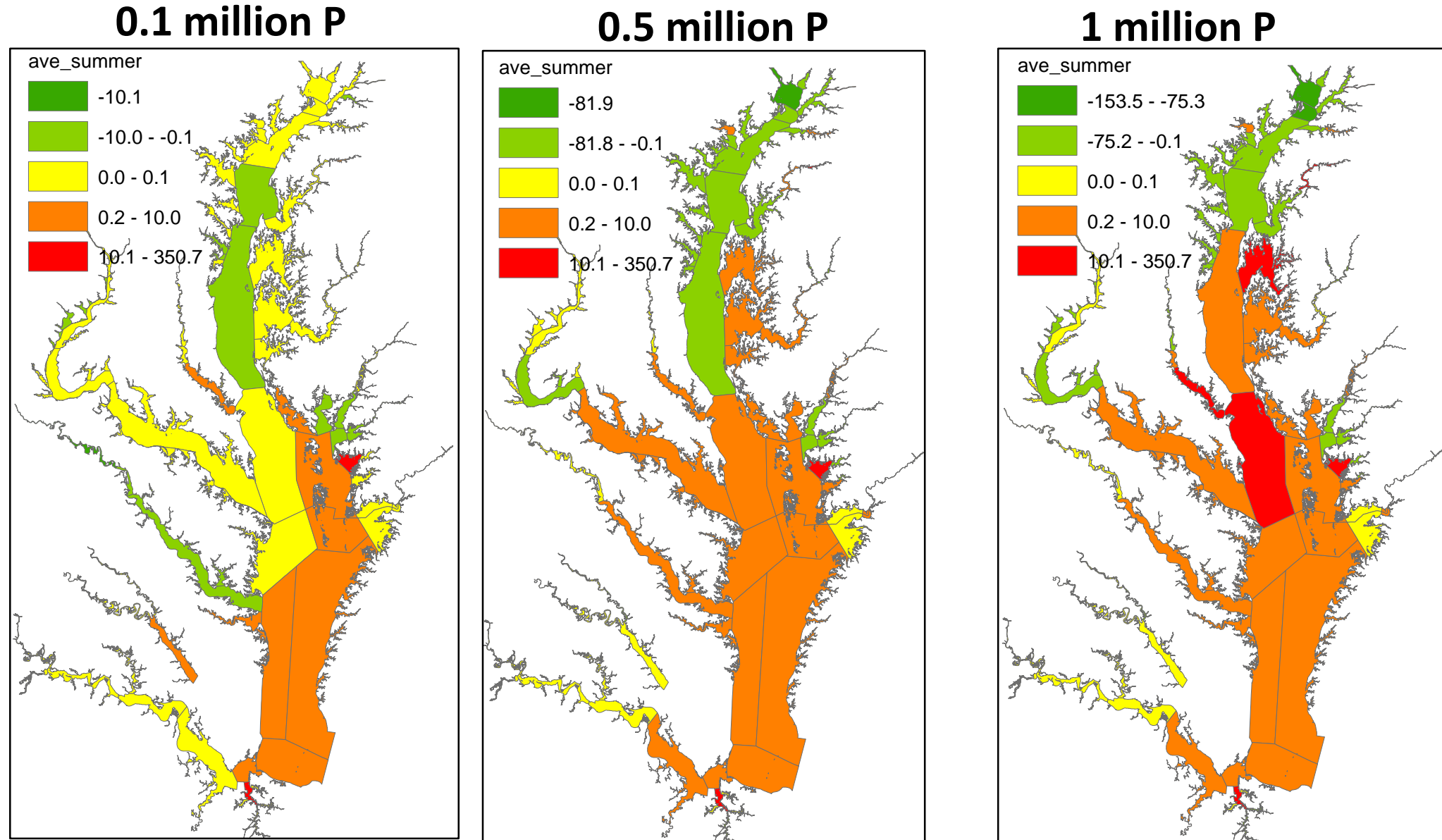
10 million N



# DO and CL sensitivity in summer to P loading from Susquehanna

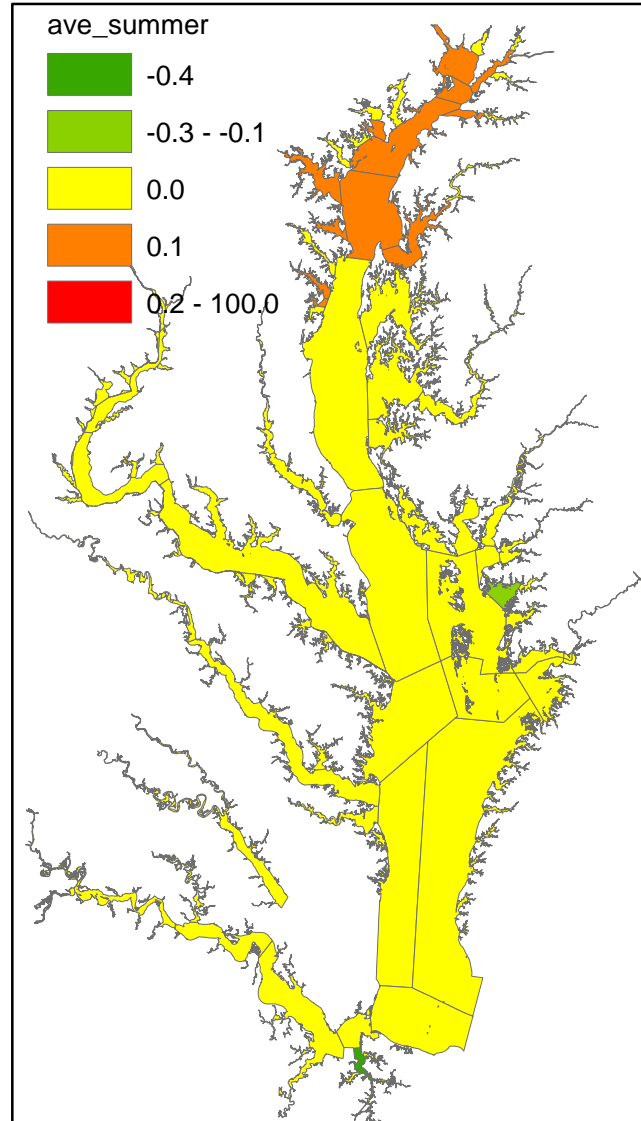


# DO sensitivity in summer to P loading from Susq

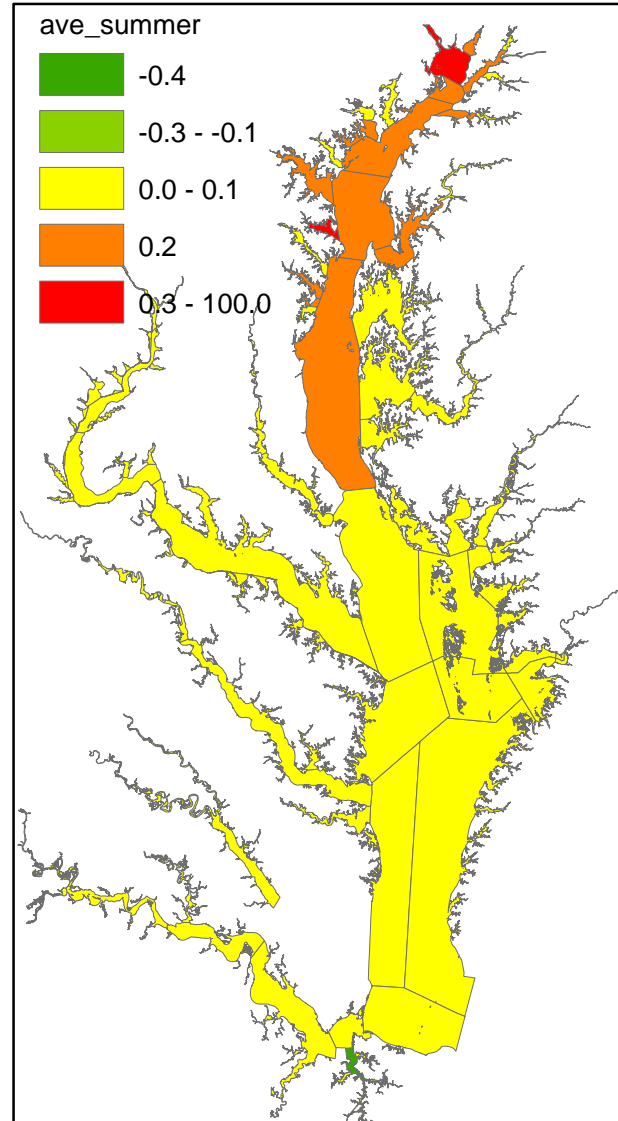


# CL sensitivity in summer to P loading from Susq

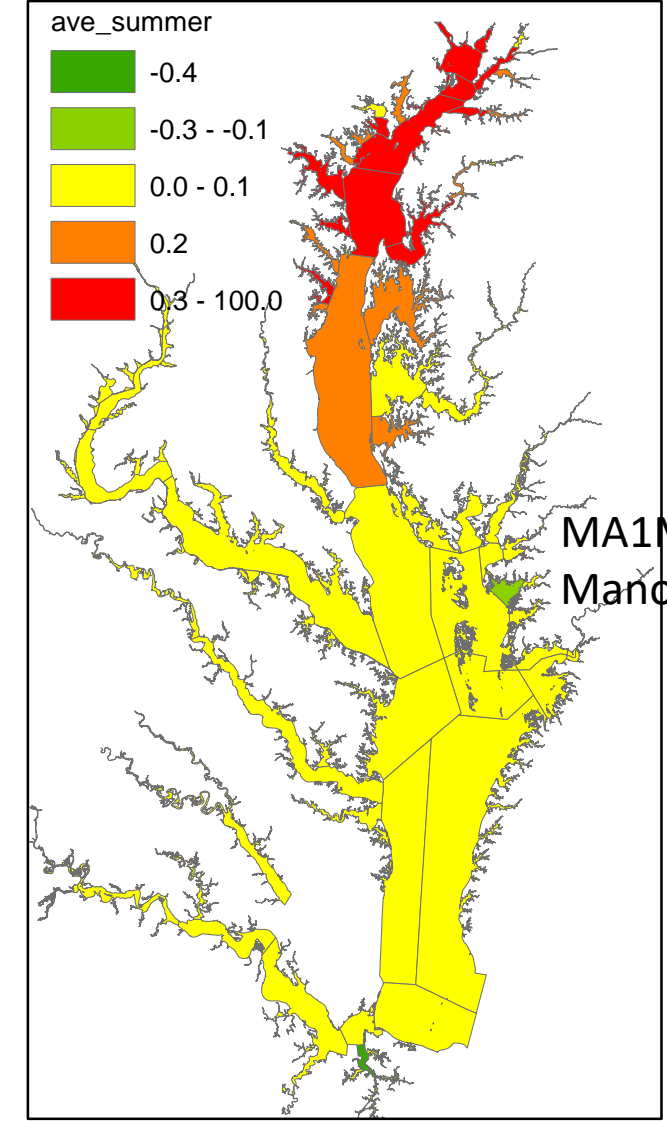
0.1 million P



0.5 million P



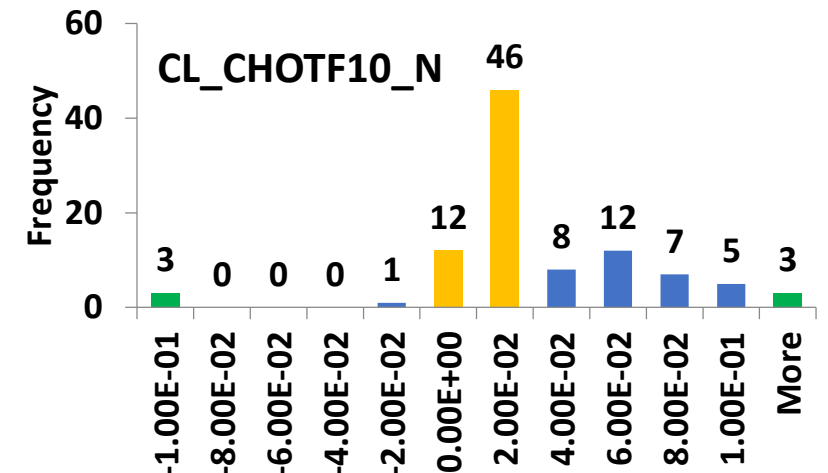
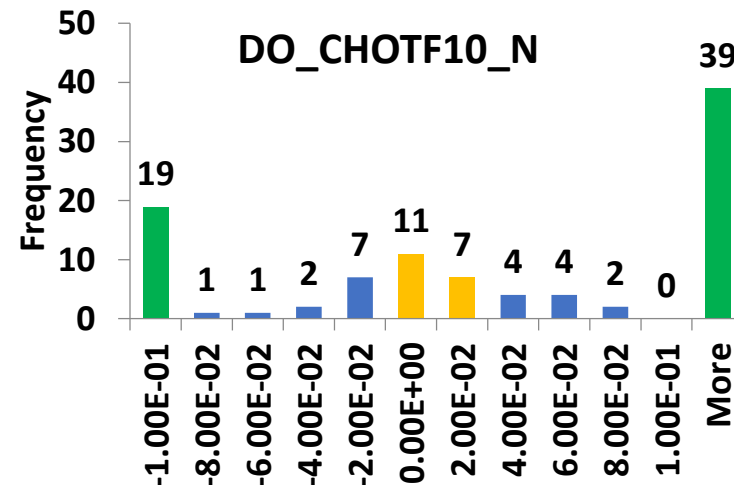
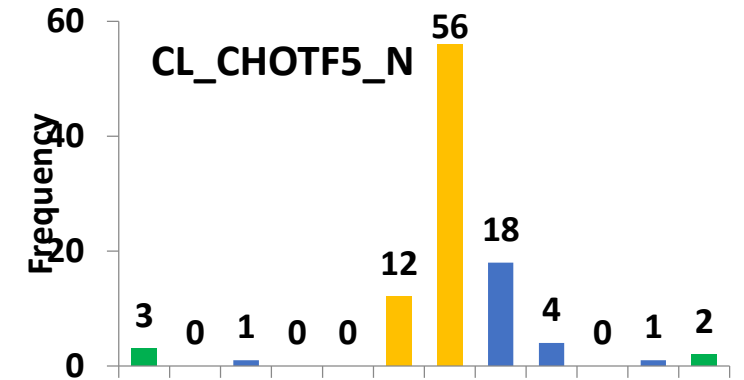
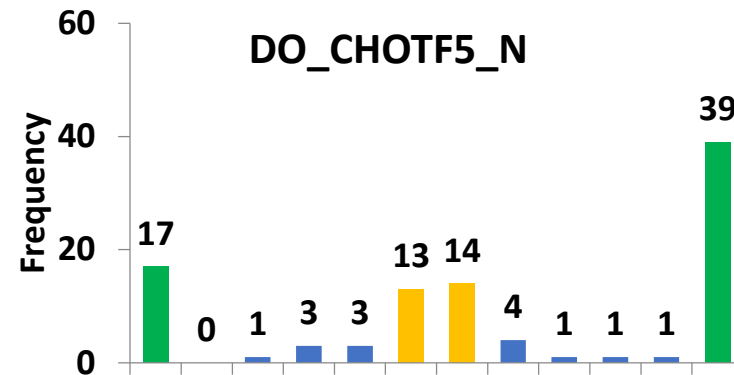
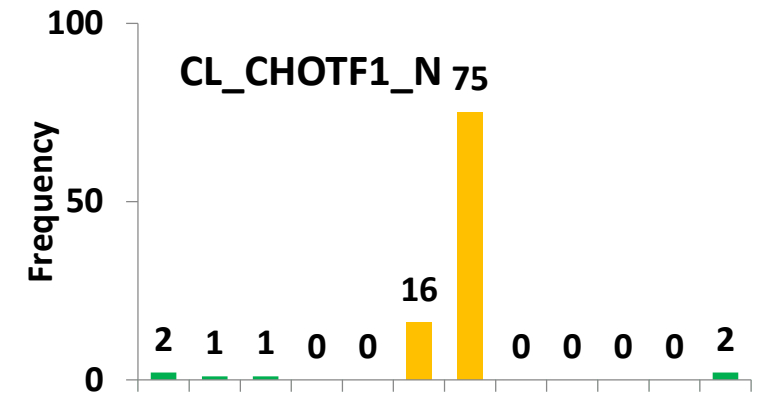
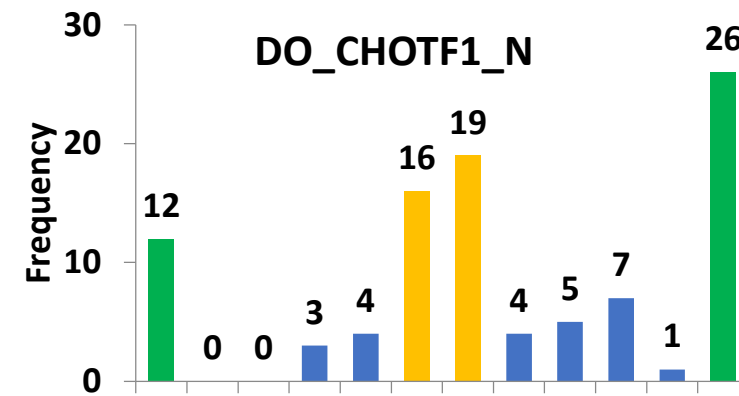
1 million P



MA1MH  
Manokin River

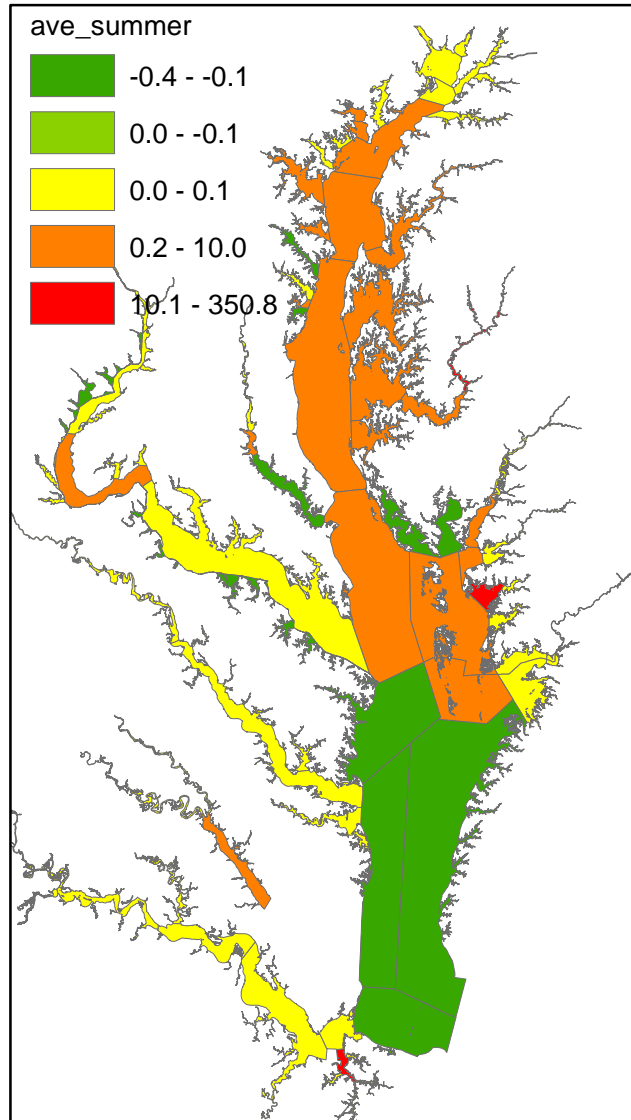


# DO and CL sensitivity in summer to N loading from Choptank tidal fresh

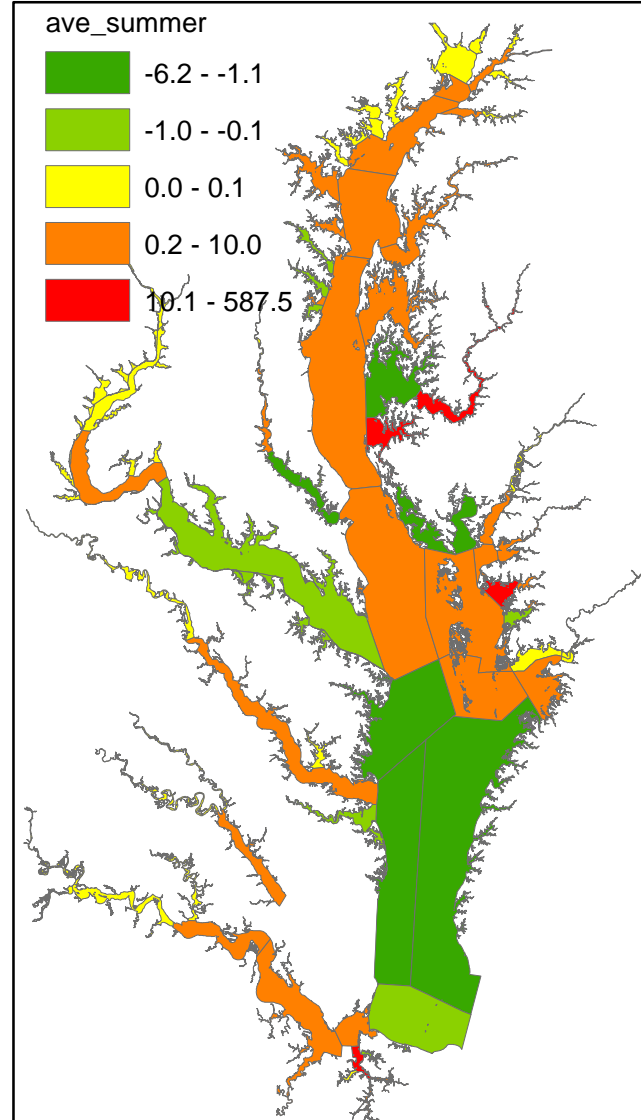


# DO sensitivity in summer to N loading from ChoptankTF

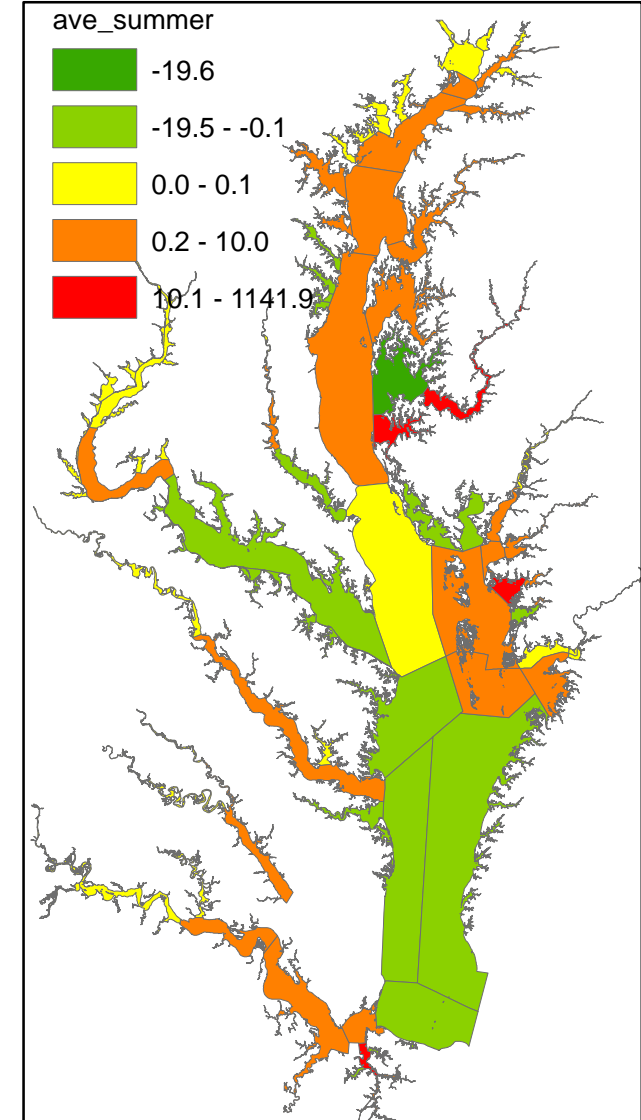
1 million N



5 million N

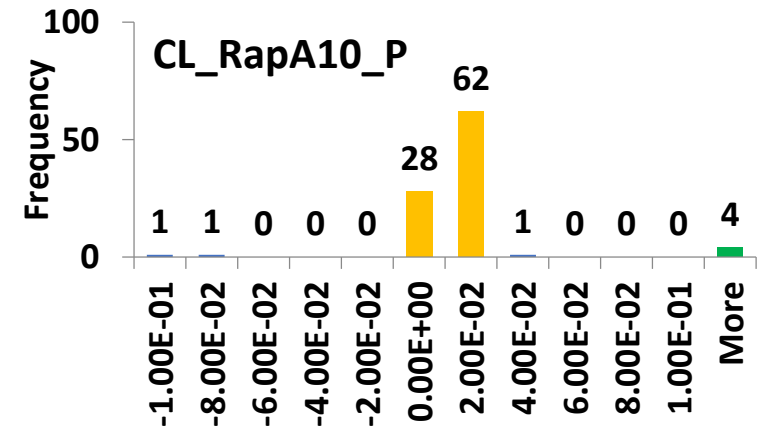
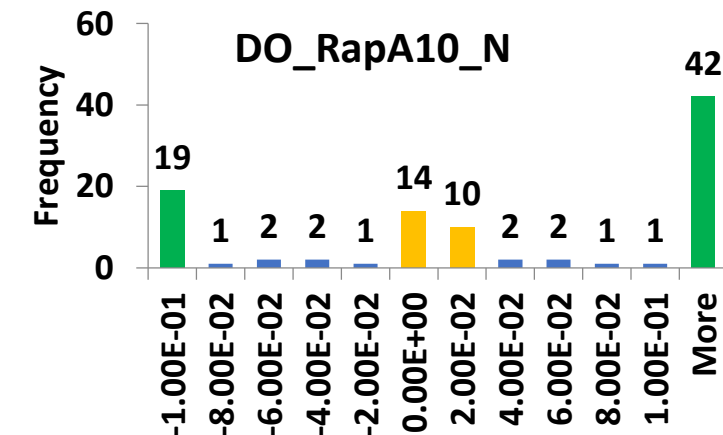
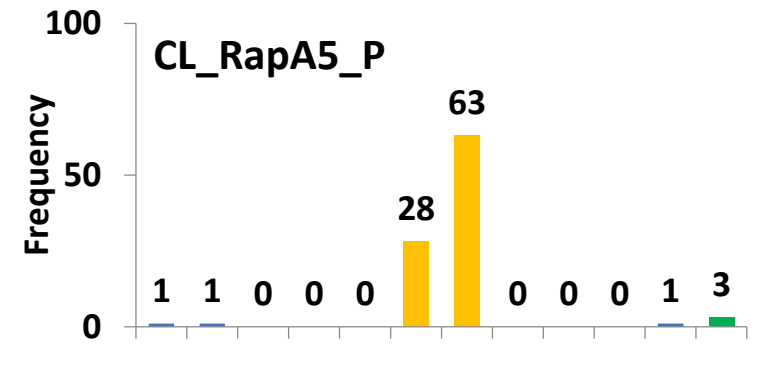
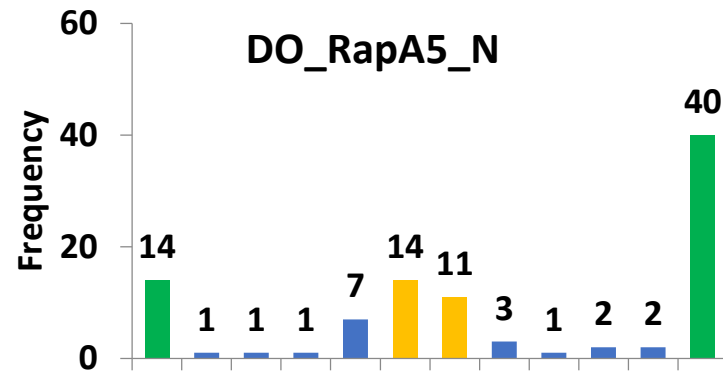
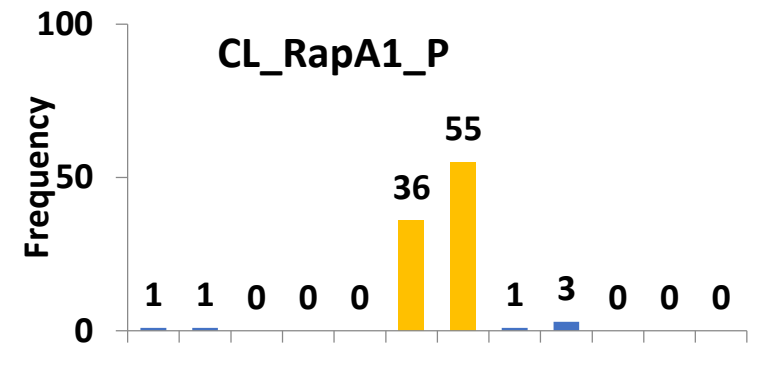
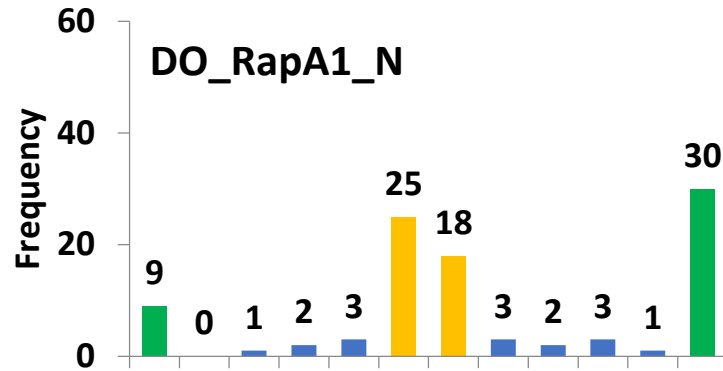


10 million N



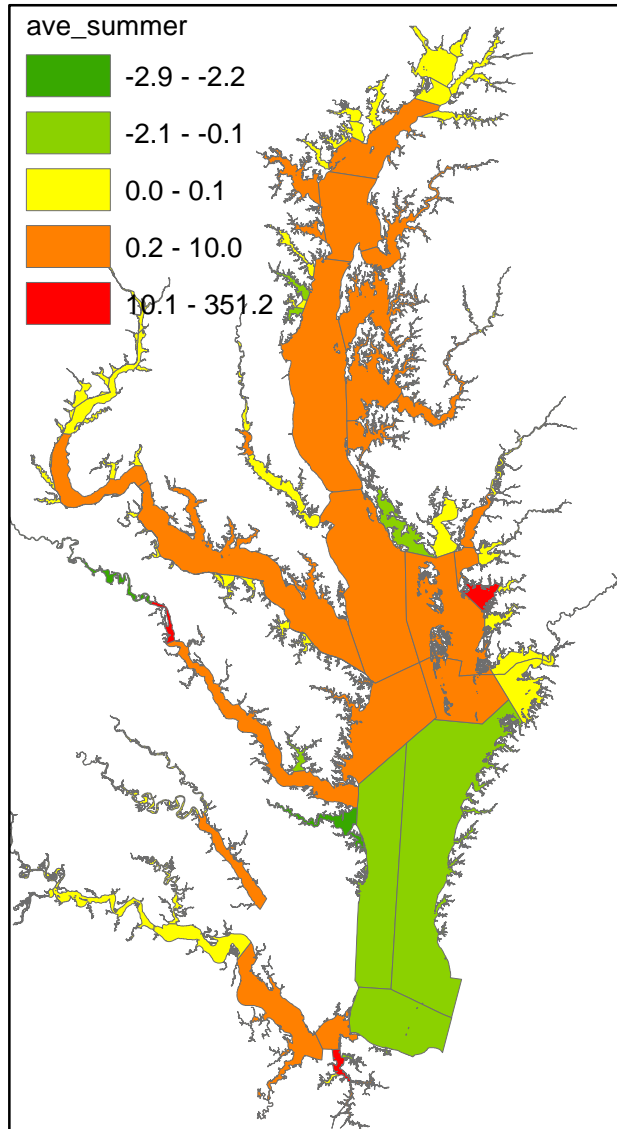


# DO and CL sensitivity in summer to N loading from Rappahannock

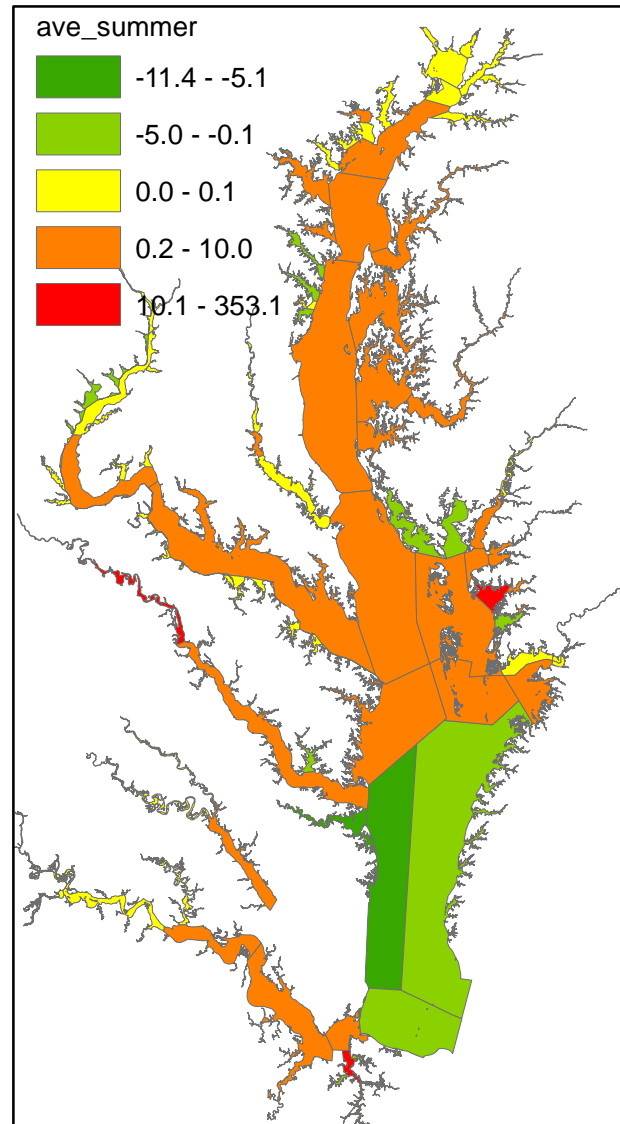


# DO sensitivity in summer to N loading from Rapp.

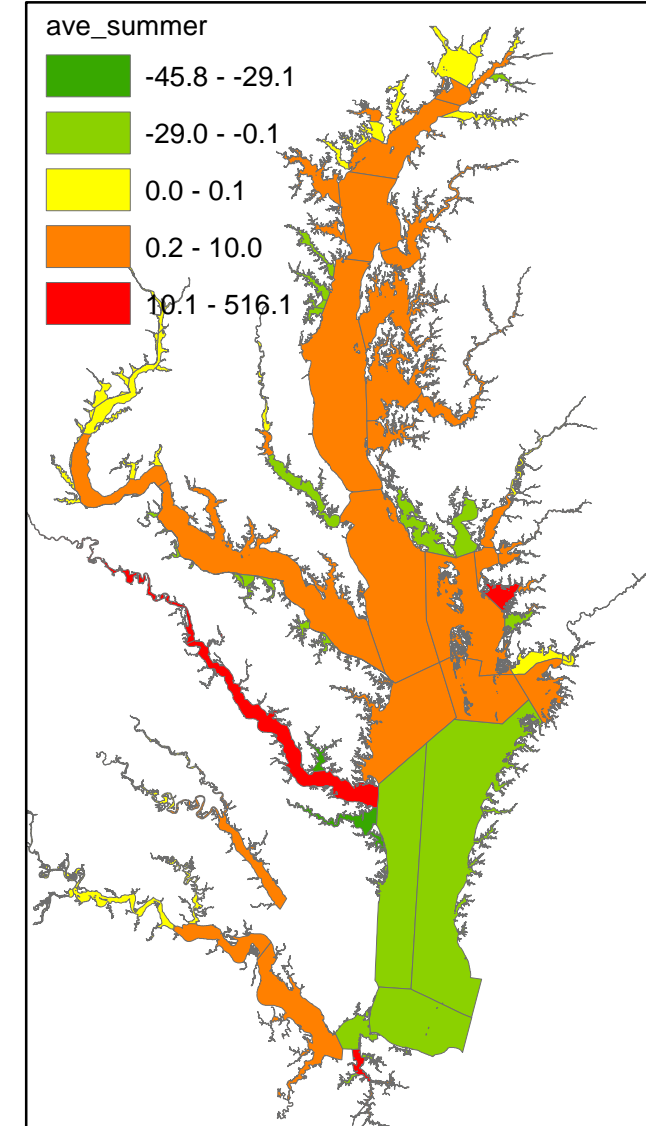
1 million N



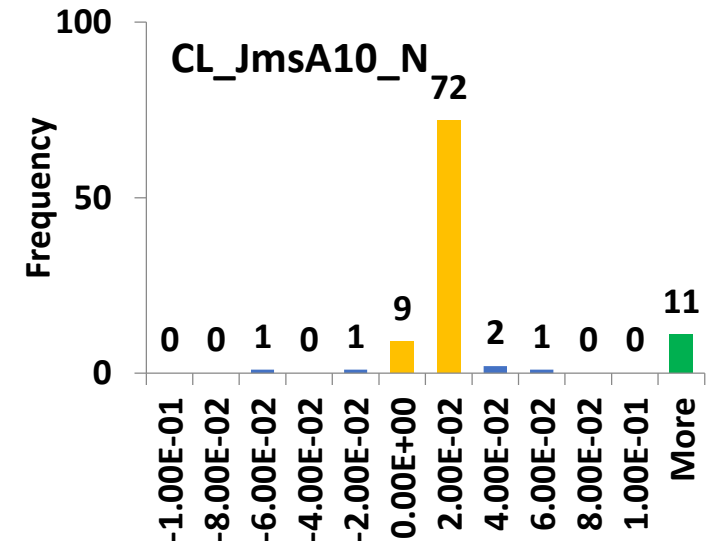
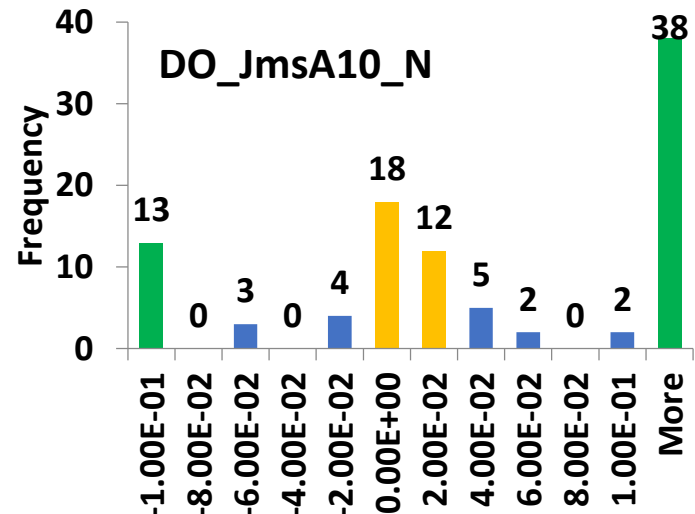
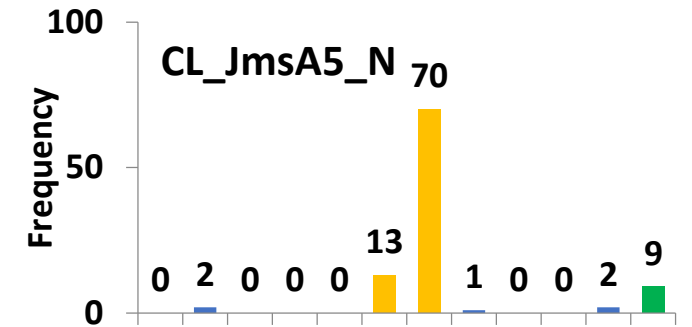
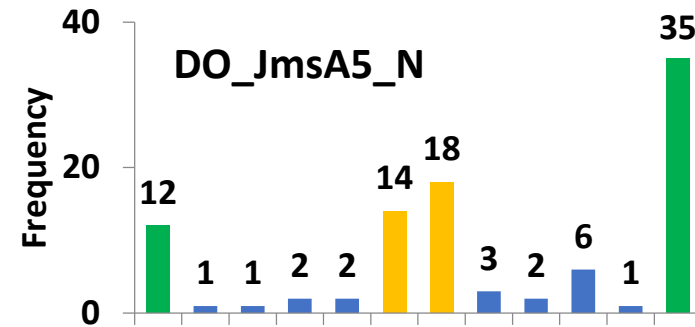
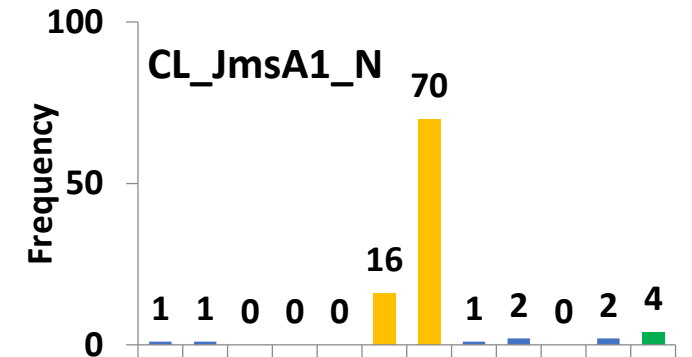
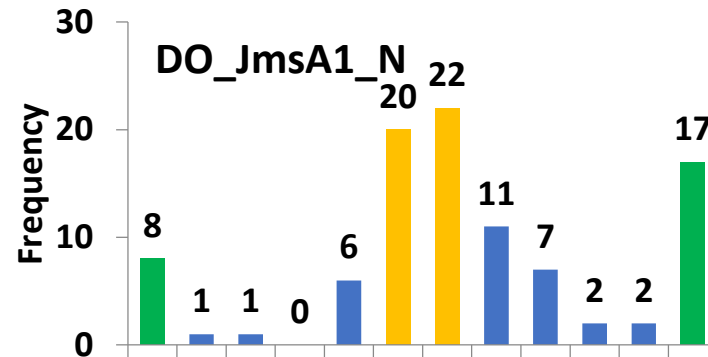
5 million N



10 million N

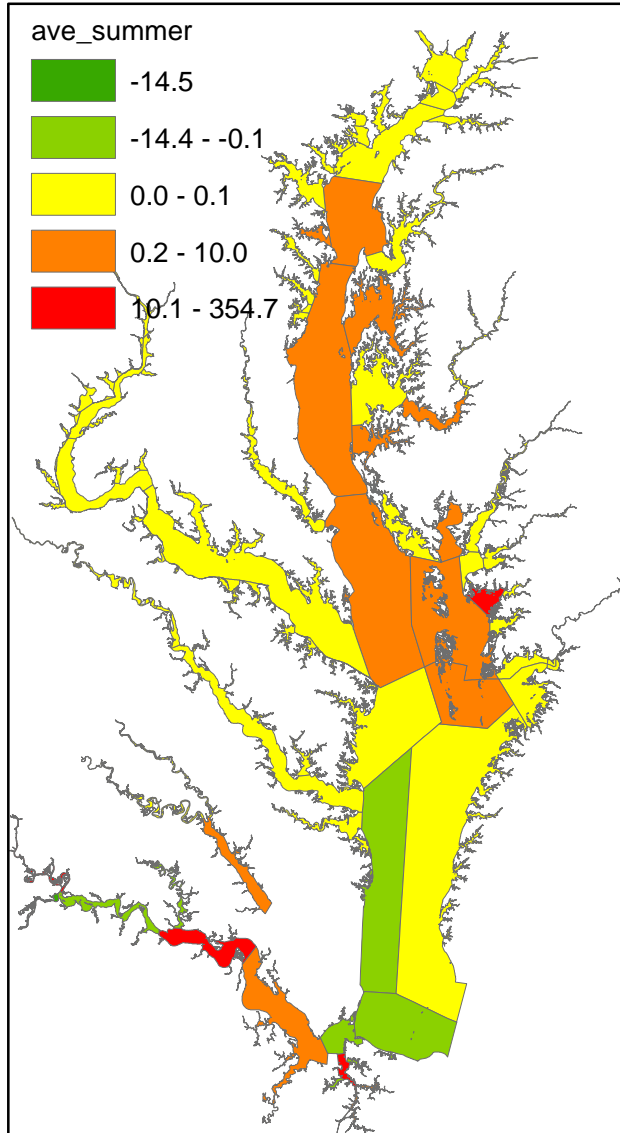


# DO and CL sensitivity in summer to N loading from the James River above fall line

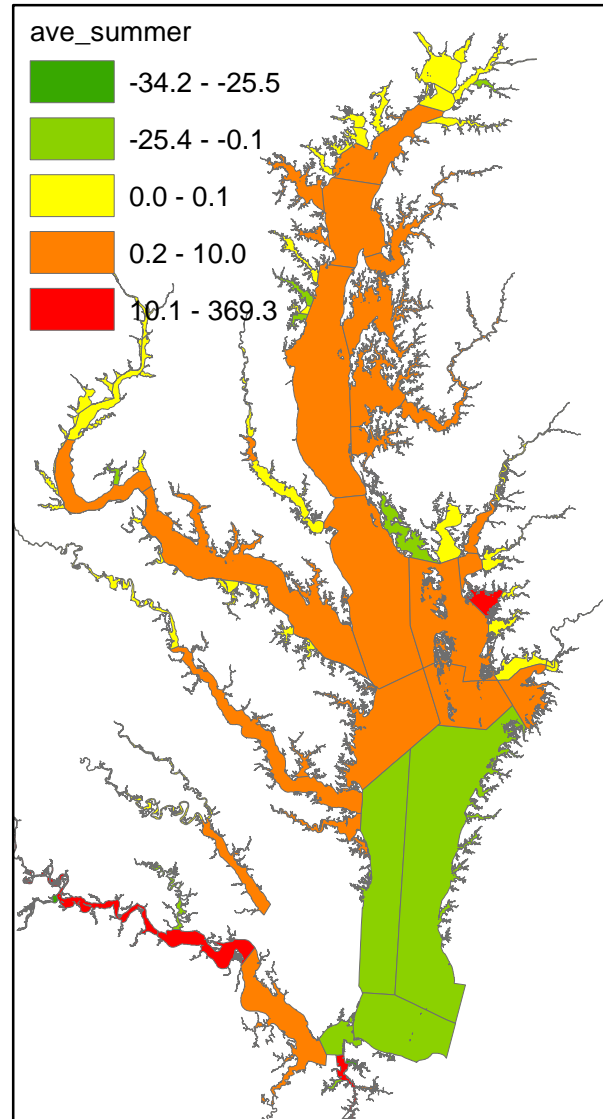


# DO sensitivity in summer to N loading from the James A

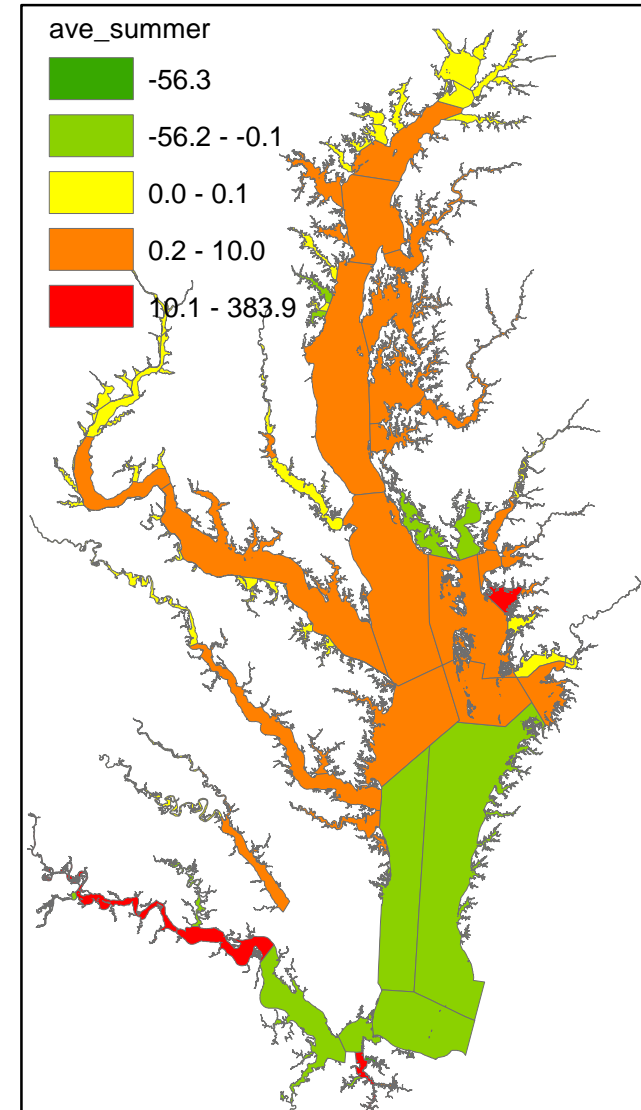
1 million N



5 million N



10 million N



# Question

1, 5 or 10 millions ?

(5 ?)