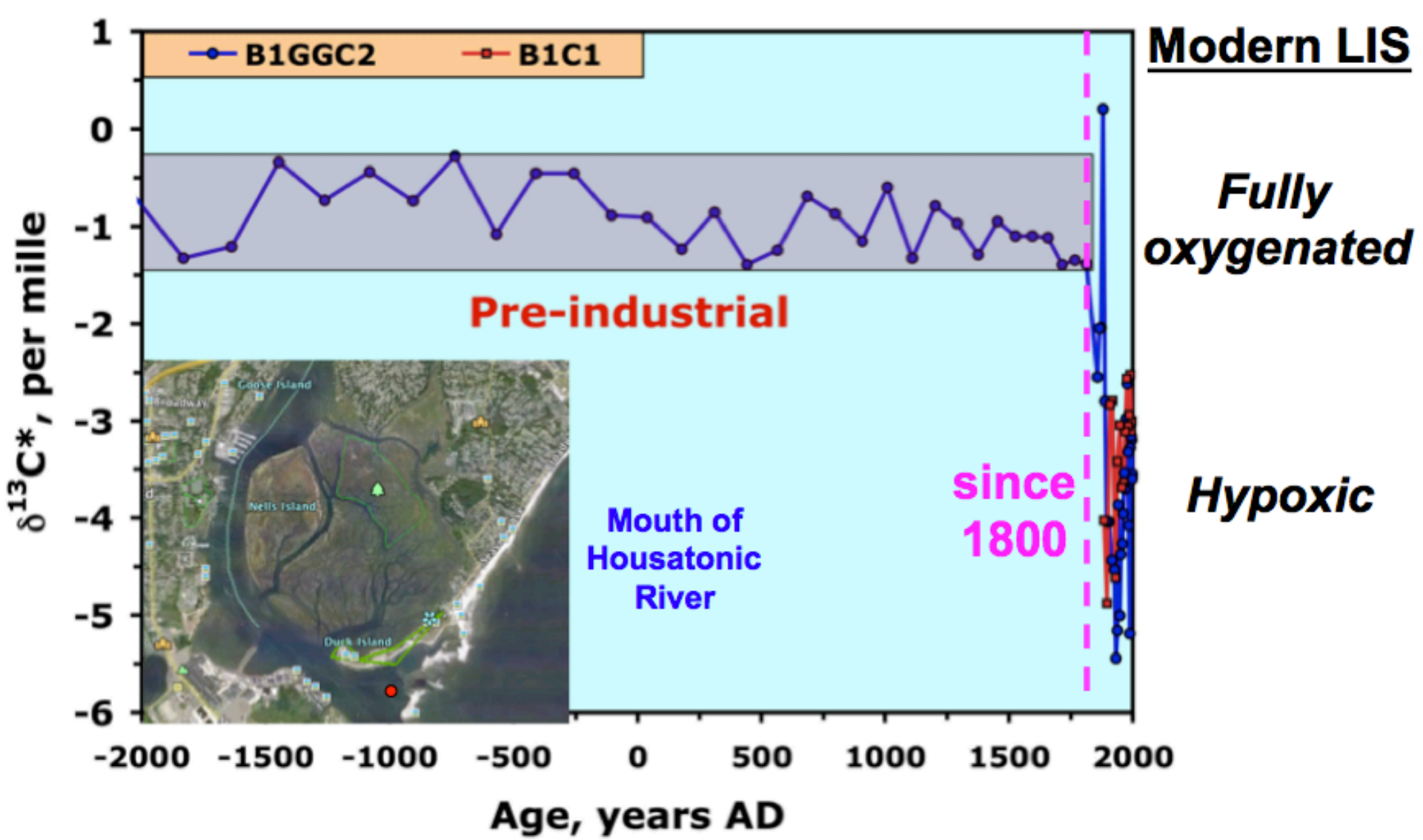
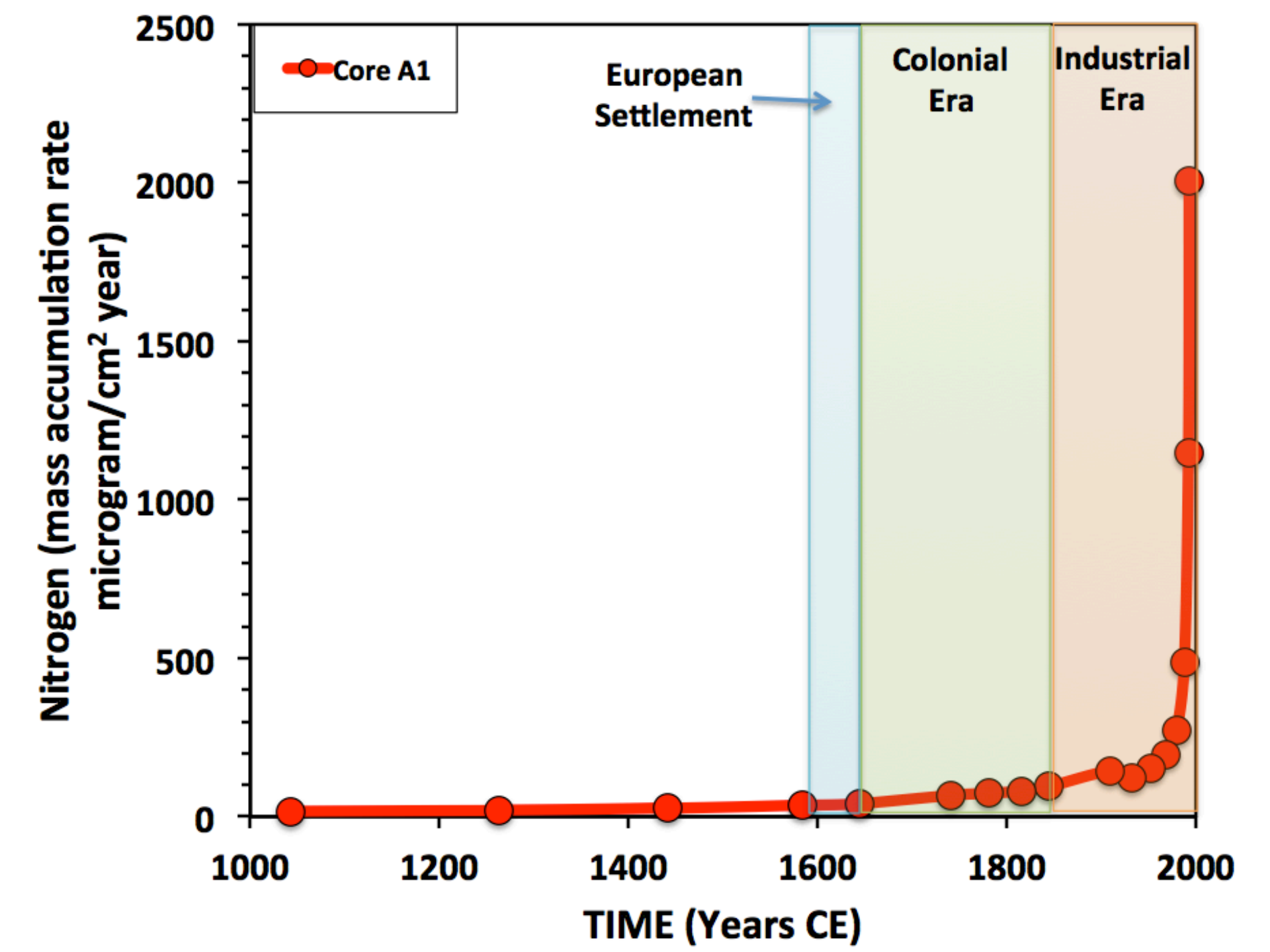


Isotopic tracer for water paleo-oxygenation*

*Varekamp and Thomas


Core A1
European Settlement
Colonial Era
Industrial Era
Nitrogen (mass accumulation rate microgram/cm² year)
2500
2000
1500
1000
500
0
1000
1200
1400
1600
1800
2000
TIME (Years CE)

UCONN

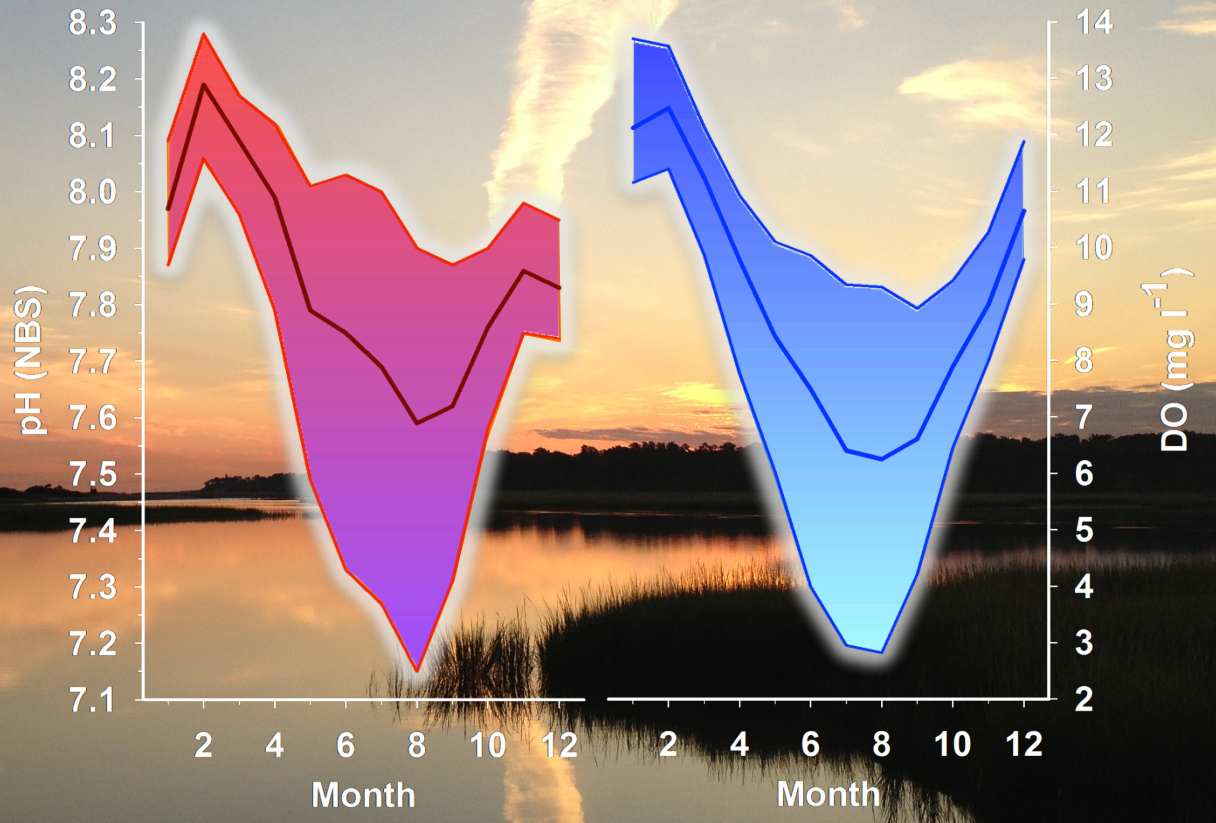
Combined effects of low pH and low O_2 on coastal organisms

- **Individual effects of hypoxia and acidification studied**
- **But both conditions occur together**
- **Both exacerbated by eutrophication**

Perhaps effects worse than additive

Sometimes …

1 + 1 > 2



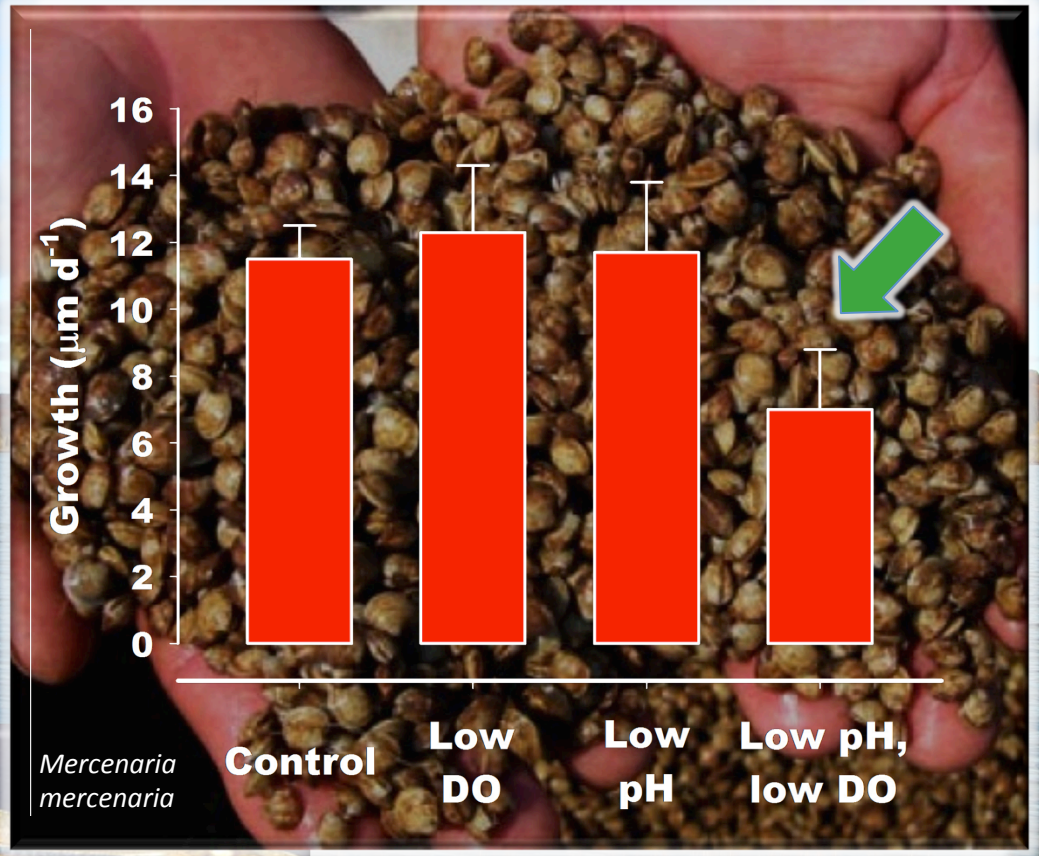
Baumann et al. Estuaries & Coasts 2015

Are pH and O_2 effects simply additive?

Not necessarily
(synergistic)

1 + 1 > 2

Primary concern with stressors like pH & O_2



Mumford Cove, Groton, CT

Gobler et al. PLOS One 2014, Depasquale et al. MEPS 2015

Monitoring pH and oxygen conditions in Mumford Cove

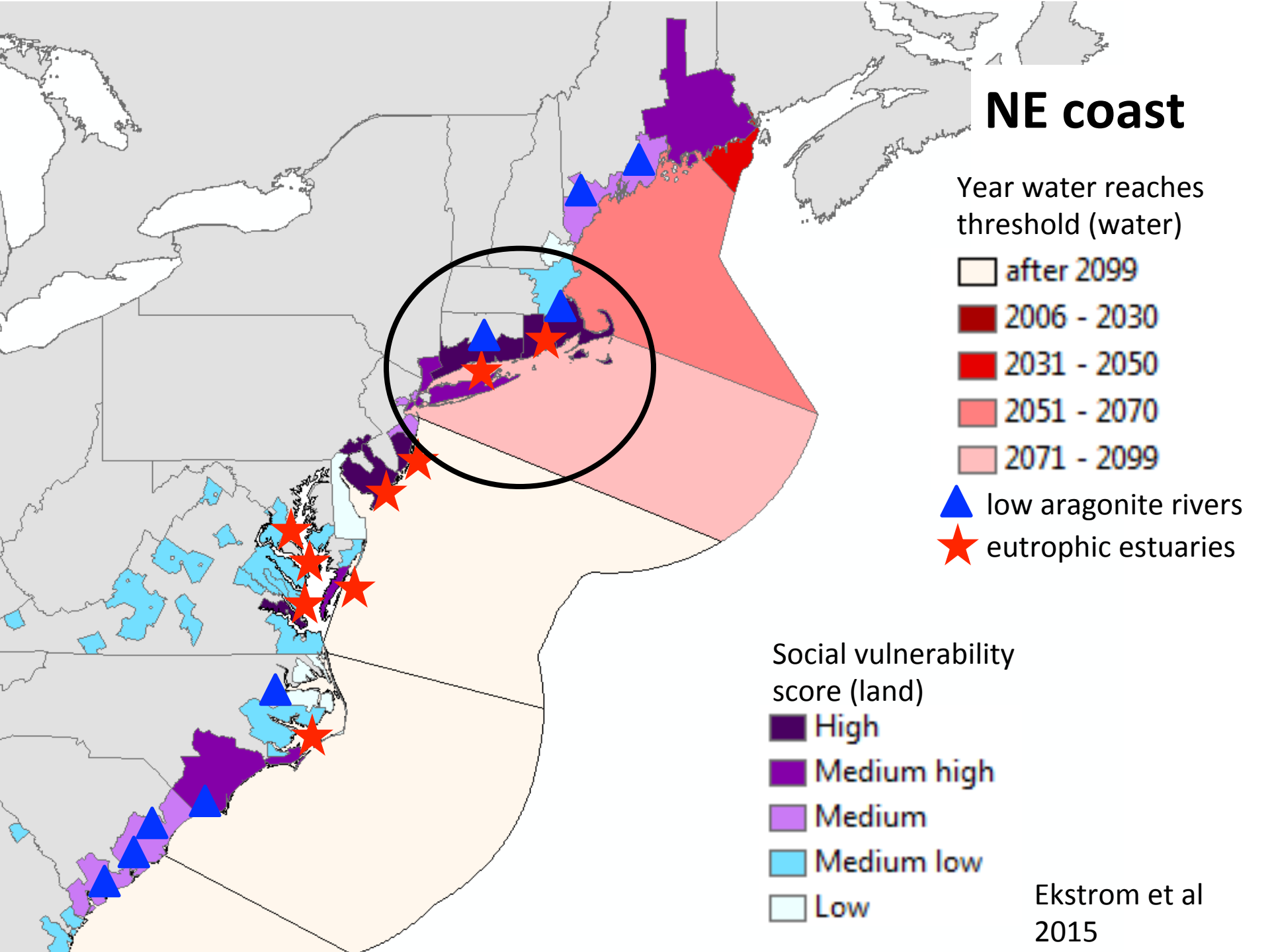
Eureka Manta2 multiprobe

- **Important local study site (buoys)**
- **Starting experiments on local fish populations**
- **Needed: high-resolution data on pH and oxygen variability**

Available actions

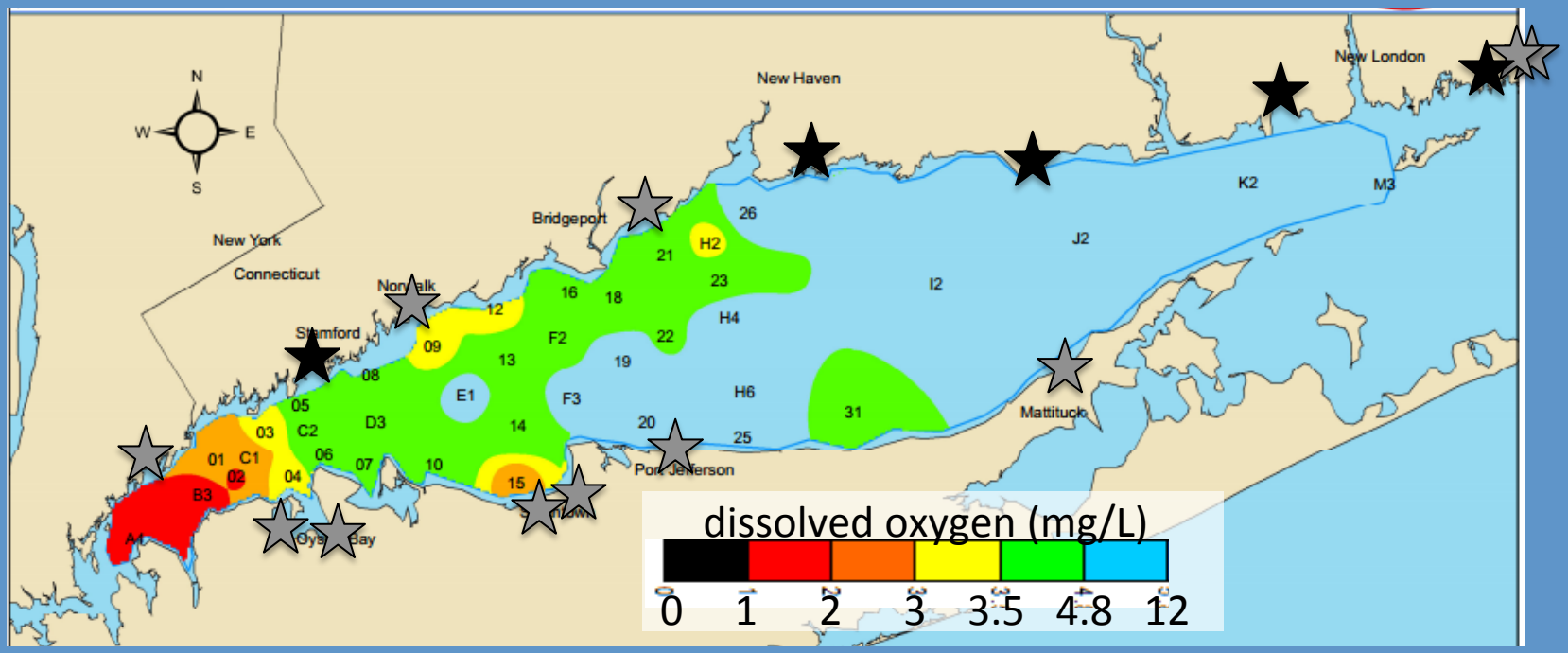
Set precautionary limits to nutrient input

Mumford Cove, Groton, CT


NE coast
Year water reaches threshold (water)
after 2099
2006 - 2030
2031 - 2050
2051 - 2070
2071 - 2099
low aragonite rivers
eutrophic estuaries
Social vulnerability score (land)
High
Medium high
Medium
Medium low
Low
Ekstrom et al 2015

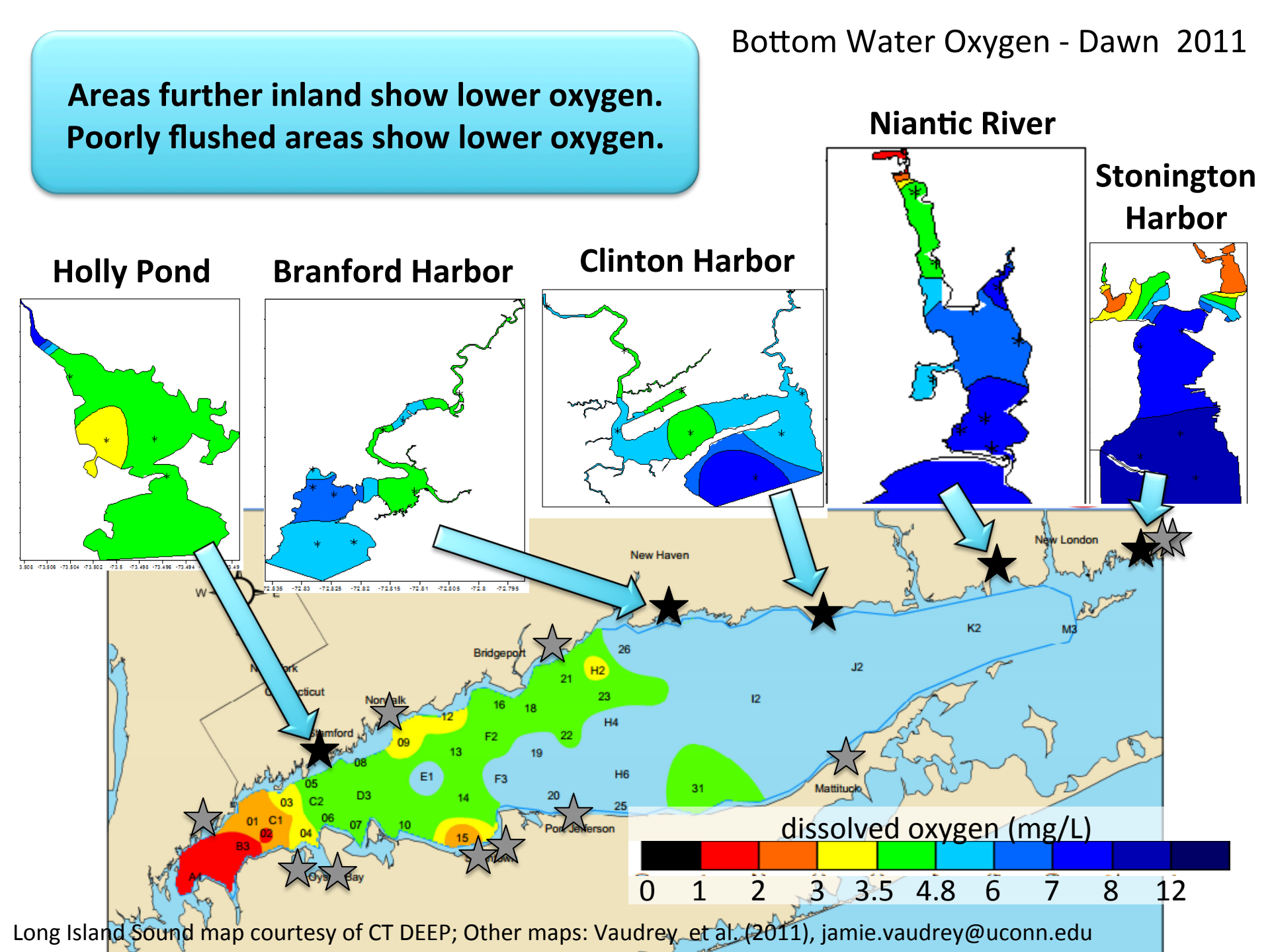
What is the condition of bays and harbors of Long Island Sound?

> 80 embayments (bays and harbors)



Bottom Water Oxygen - Dawn 2011

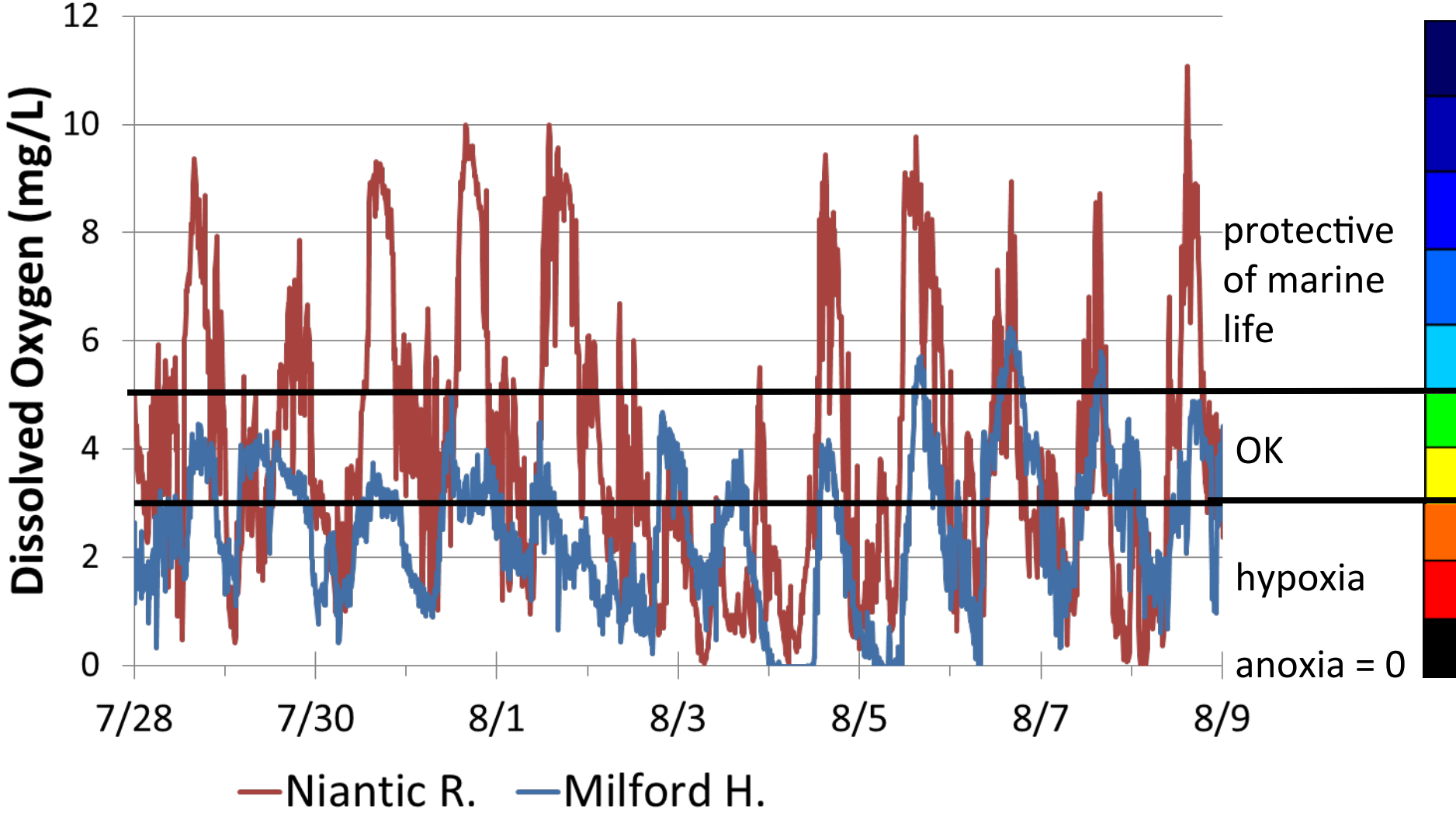
Areas further inland show lower oxygen.
Poorly flushed areas show lower oxygen.



Long Island Sound map courtesy of CT DEEP; Other maps: Vaudrey et al. (2011), jamie.vaudrey@uconn.edu

Bays are "panting."
Big swings between highs and lows are hard on marine life.

July 28 – August 9, 2014
Oxygen recorded every 15 minutes.



Vaudrey et al. (2015), jamie.vaudrey@uconn.edu