Narragansett Bay –

"*Living and dying by the choices [we've] made...*"

- George Jones

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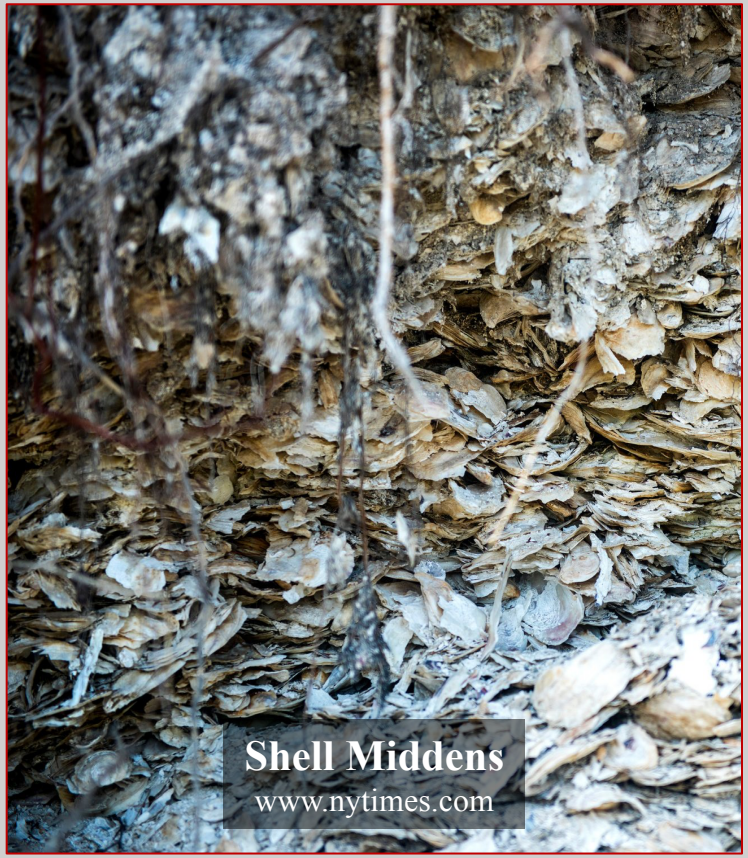
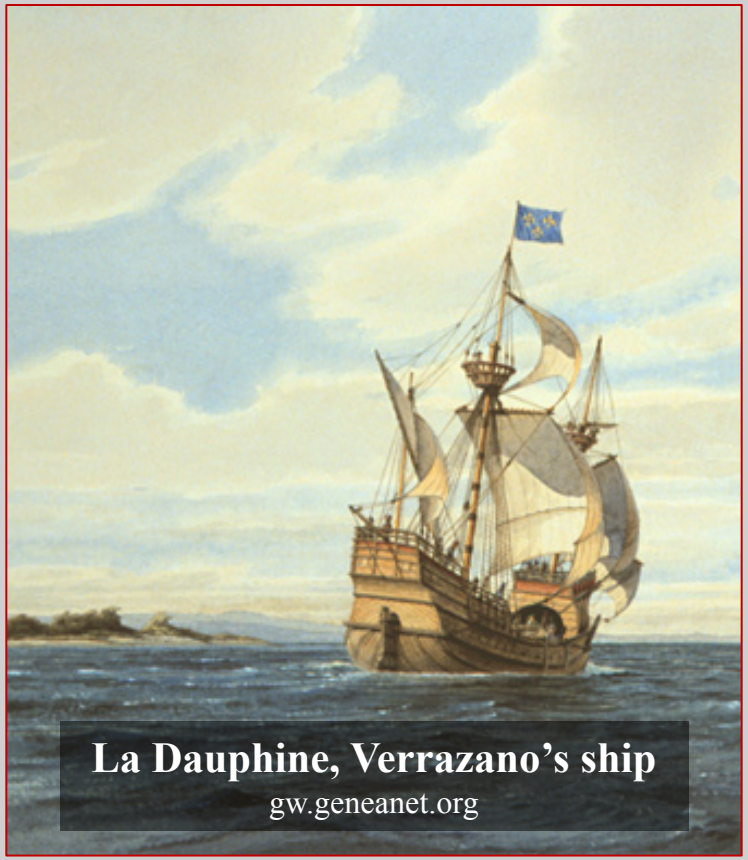
NASA satellite photo of Narragansett Bay – NASA from www.nbep.org

"This history of ...Narragansett Bay has been the product of circumstances large and small, of the geology of the watershed and the genius of individuals."

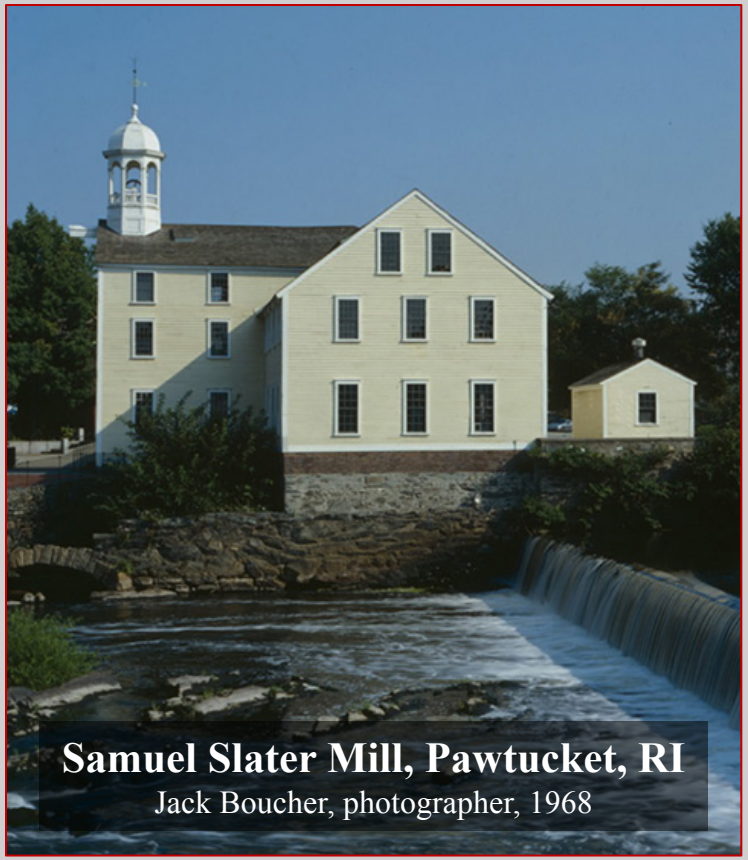
-S.W. Nixon (1990) History of metal inputs to Narragansett Bay



Shell Middens
www.nytimes.com

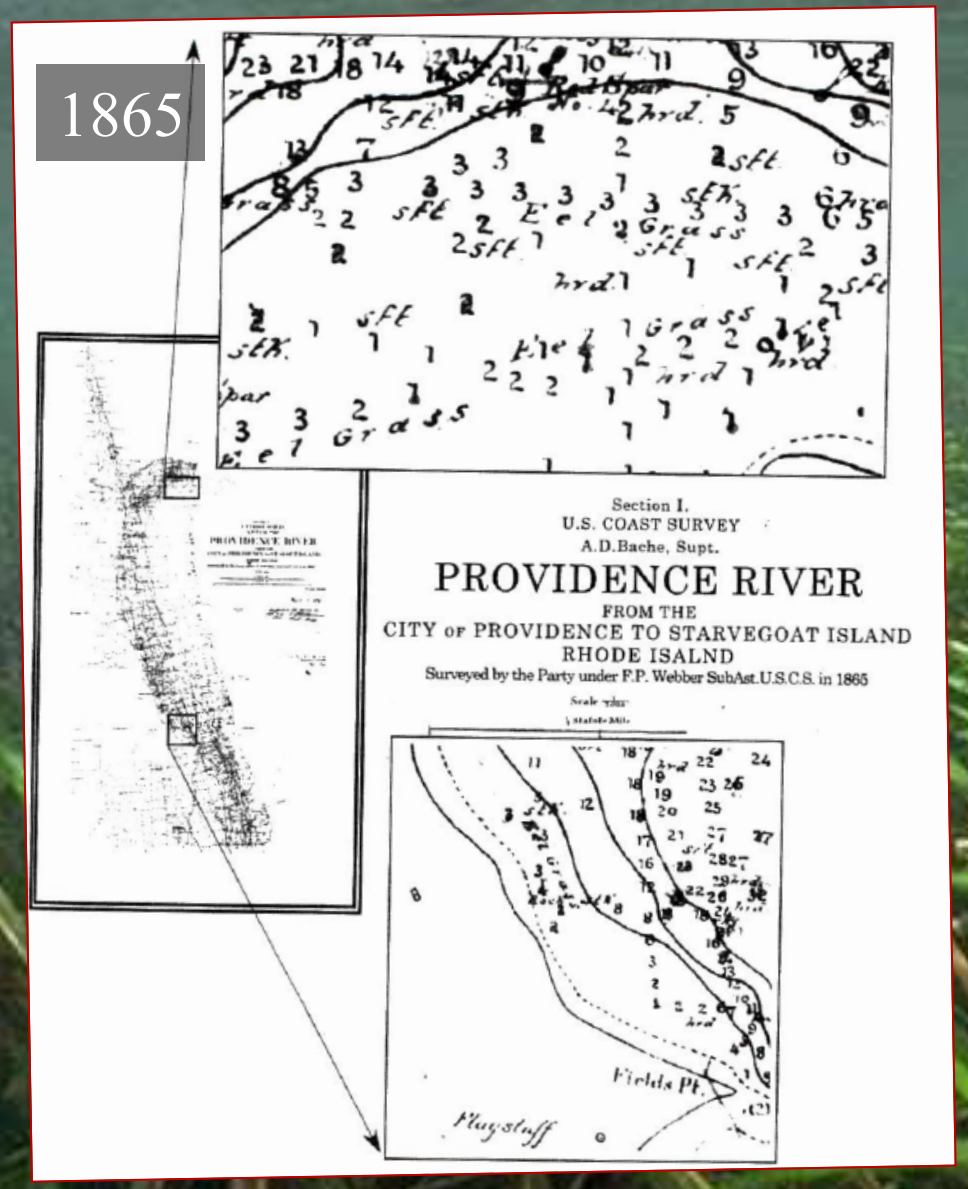


La Dauphine, Verrazano's ship
gw.geneanet.org



Samuel Slater Mill, Pawtucket, RI
Jack Boucher, photographer, 1968

1865



1871

1901 → *"...the beaches within a quarter of a mile of the sewer outfall are usually covered with foul-smelling slime and collections of sewage refuse.... Before the Fields Point sewage station was put into operation this shoal was a famous natural oyster bed, but it has been abandoned for a number of years."* (Fuller 1905)

Nixon et al. (2008)

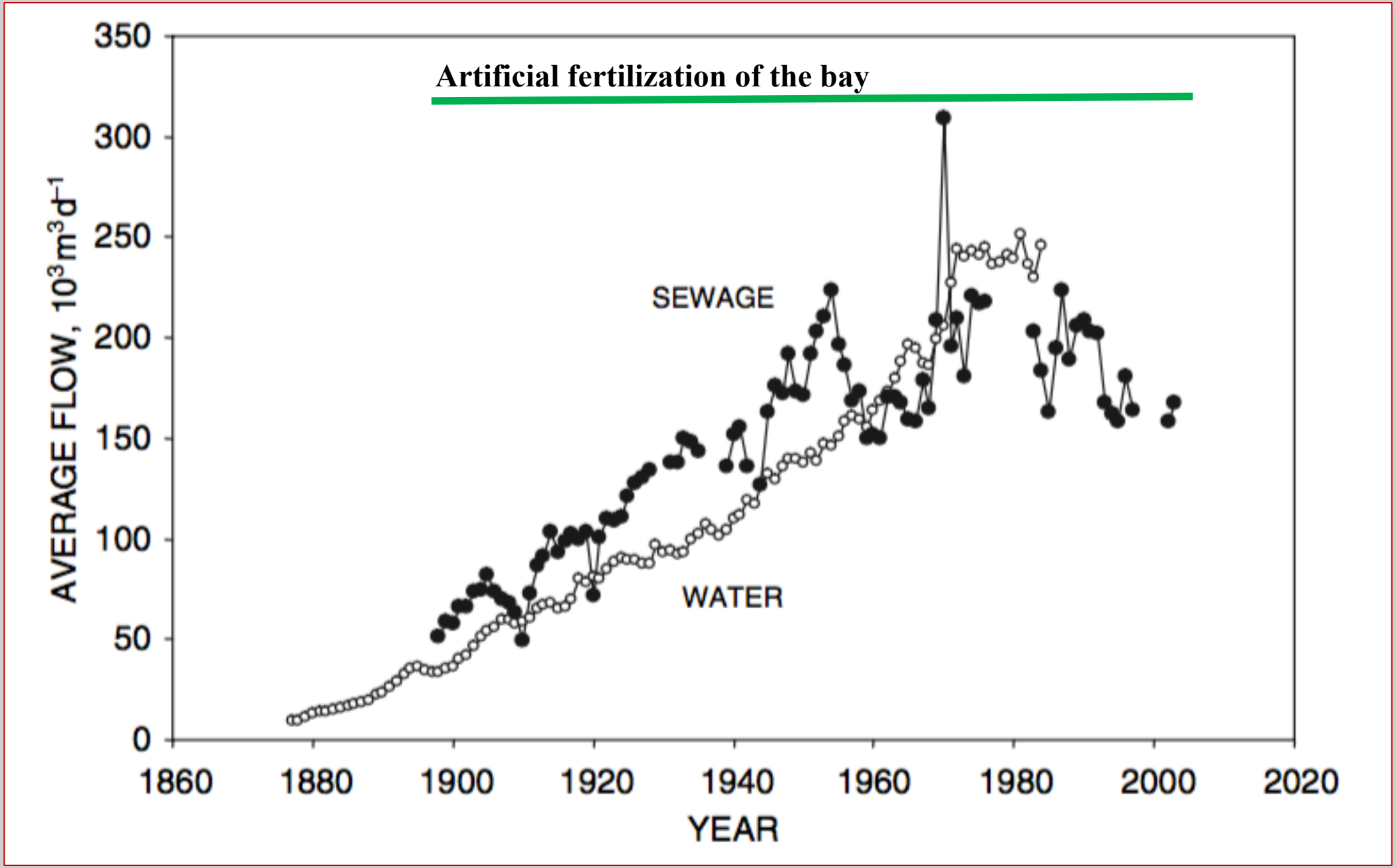
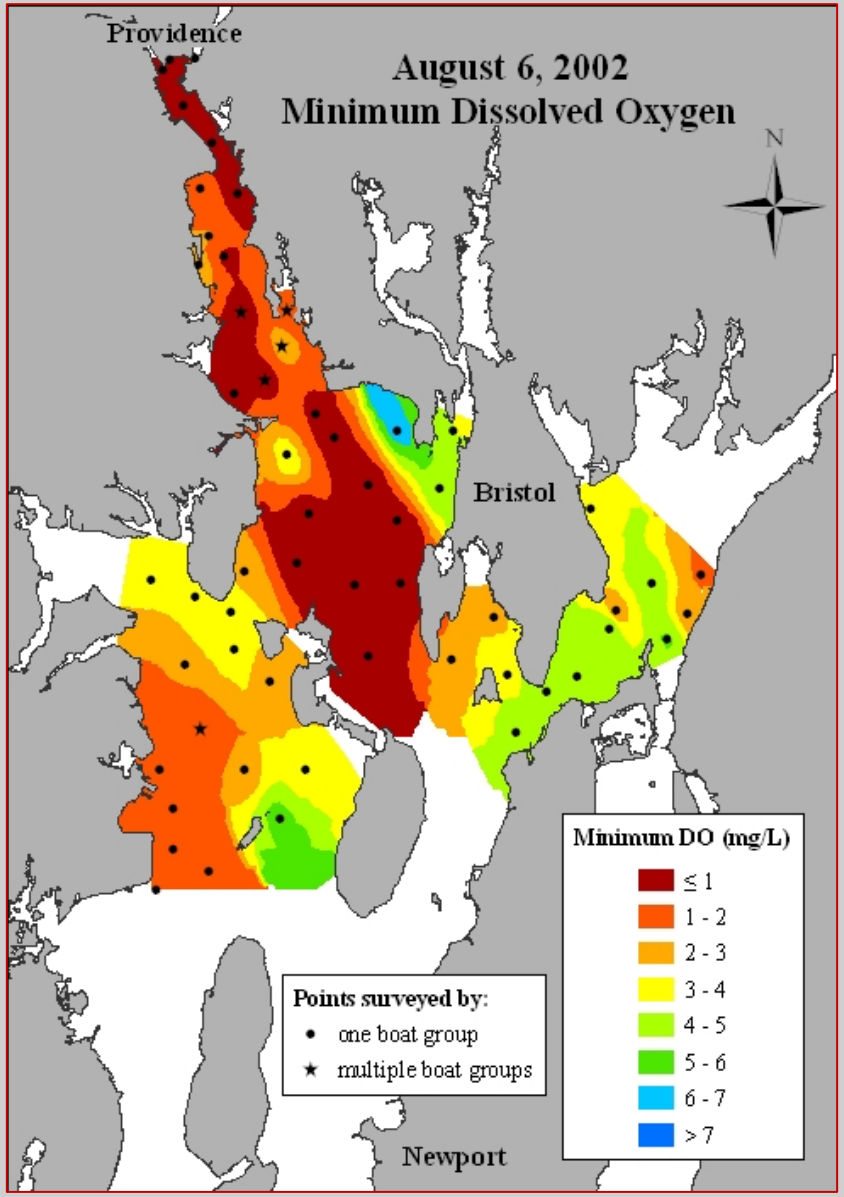
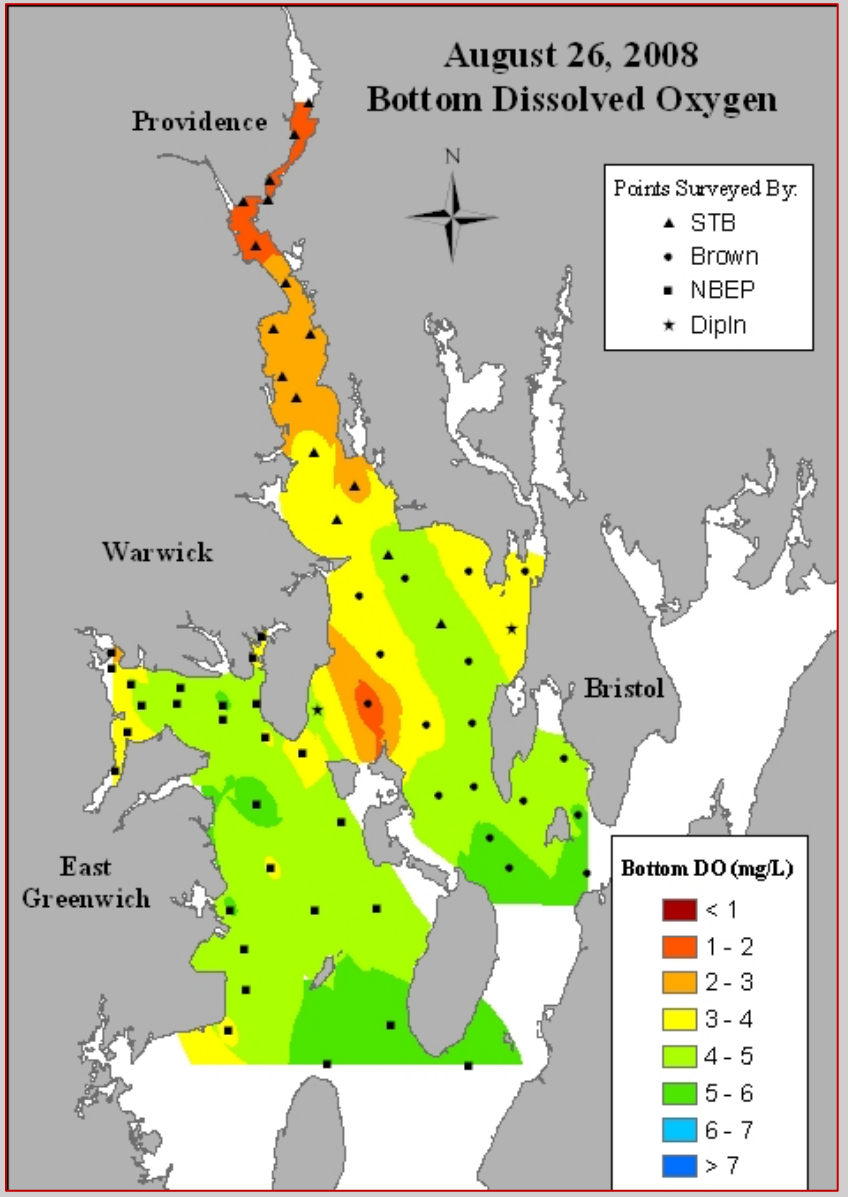


Figure from Nixon et al. (2008)

Low Oxygen Conditions in Narragansett Bay

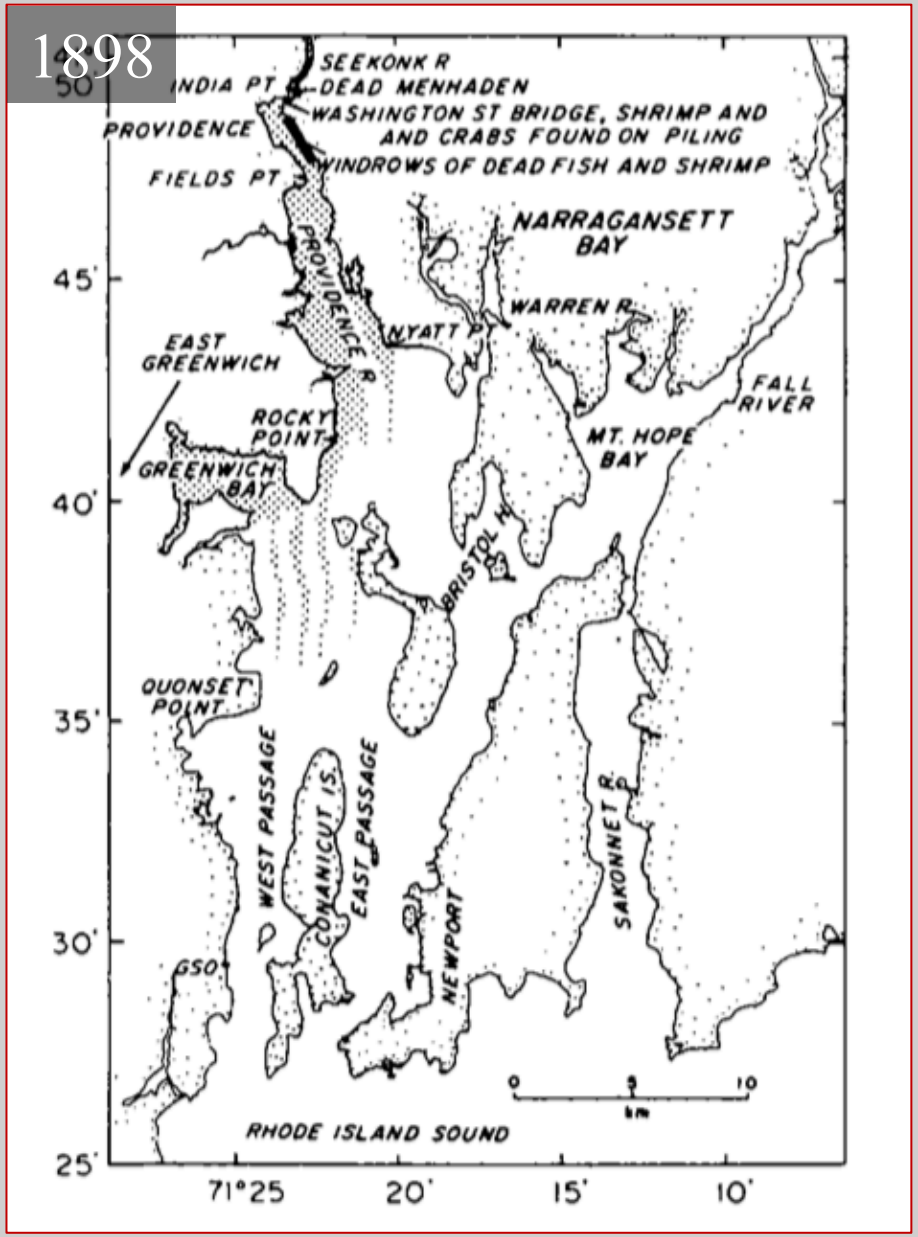




http://www.geo.brown.edu/georesearch/insomniacs

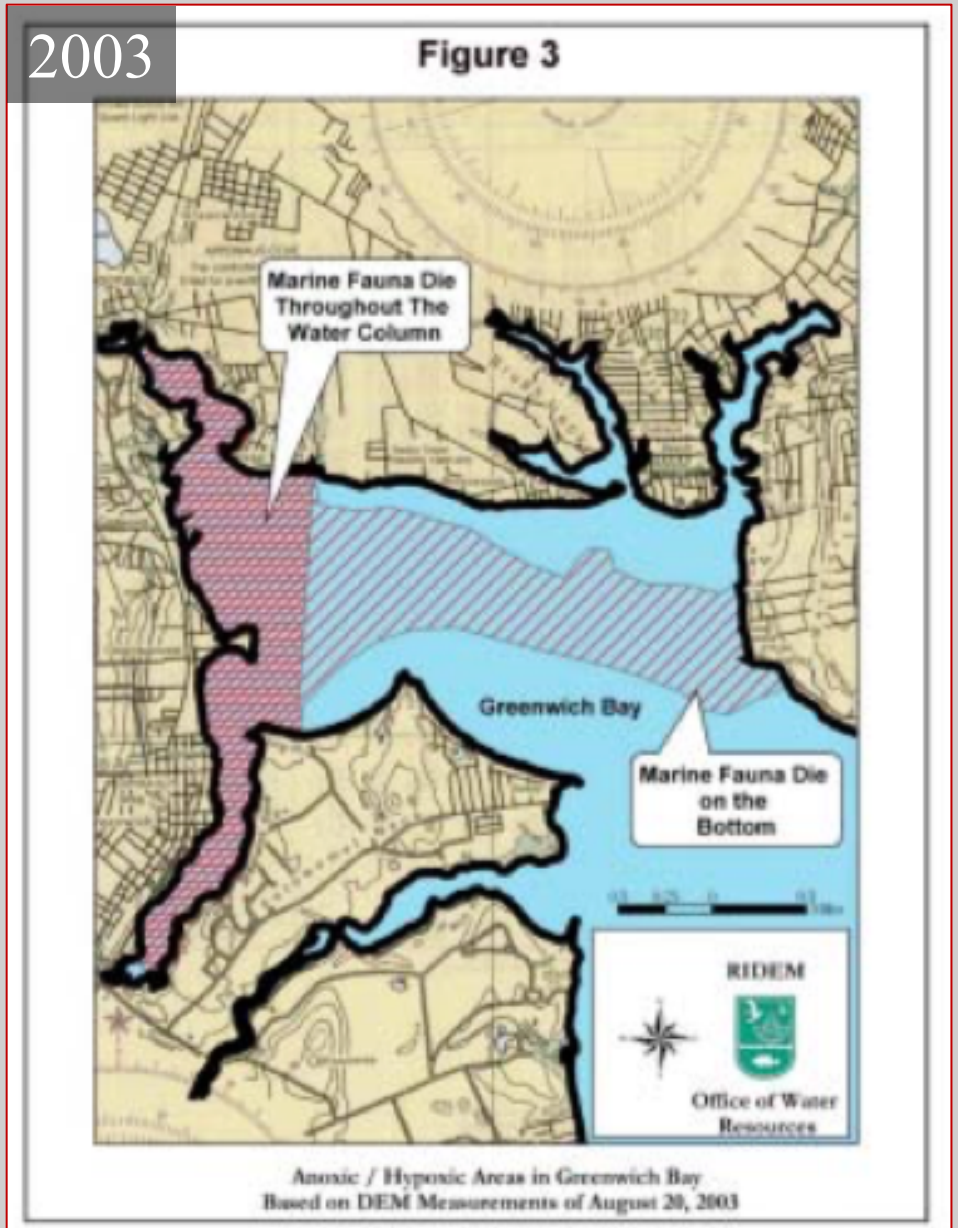
Fish kills in Narragansett Bay

1898



Nixon 1989

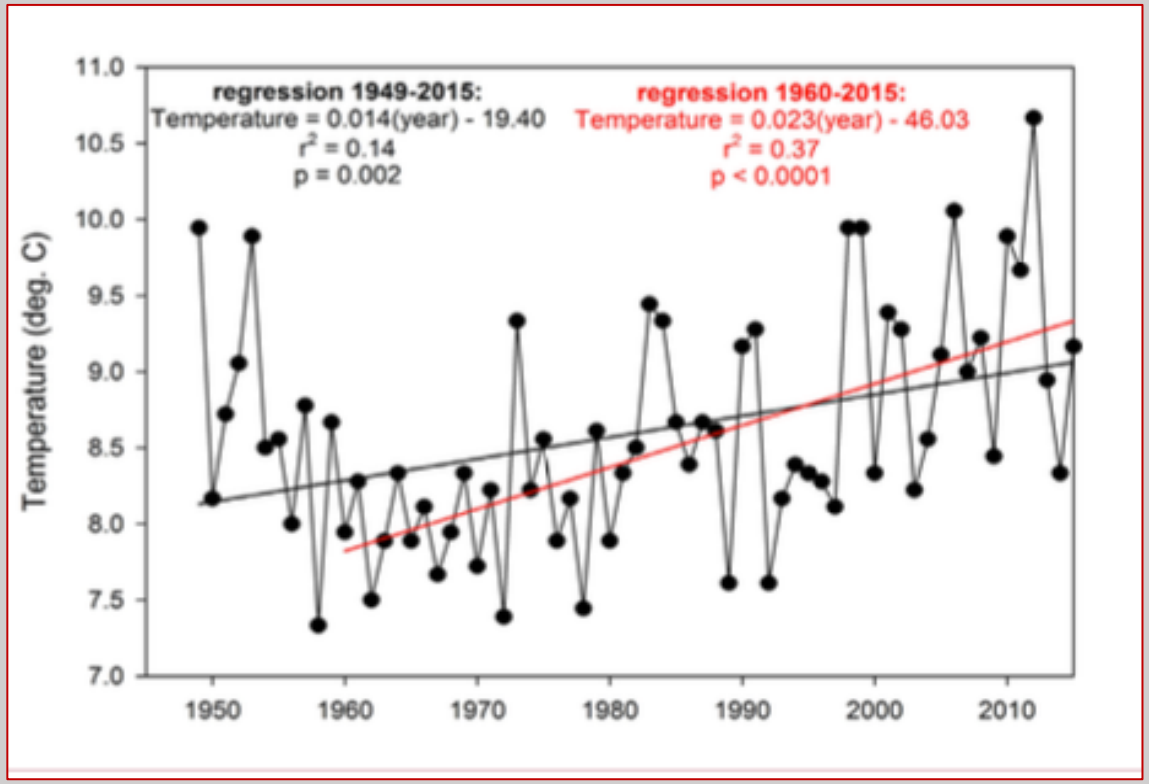
2003



RIDEM 2003

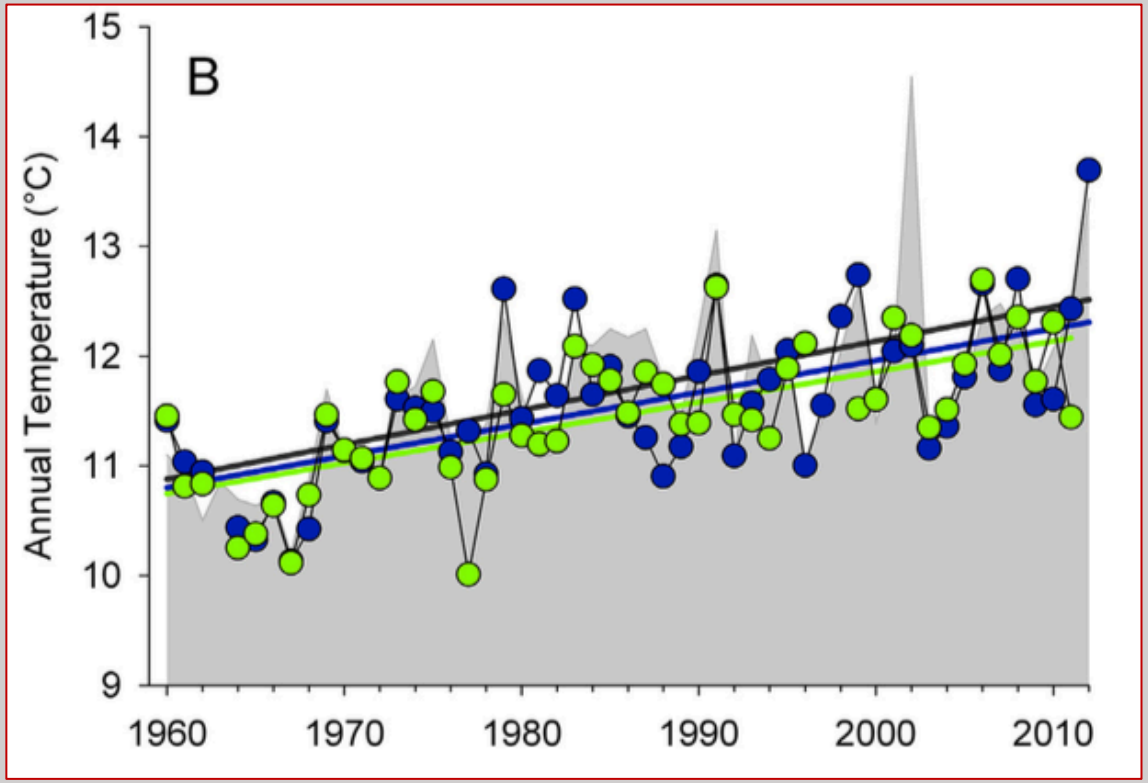
Climate Change and Narragansett Bay: warmer

Total **air** temperature increase across the watershed–
1.3 ˚C to 1.7 ˚C (1960 – 2015)



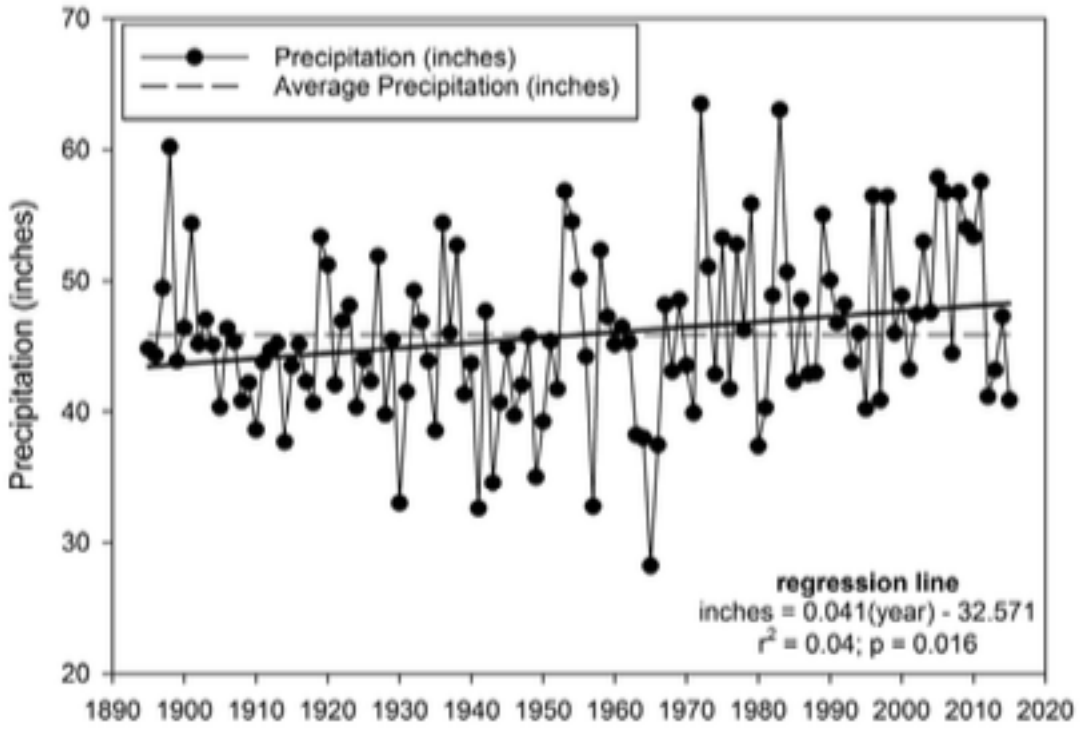
NBEP (2017)

Total **surface water** temperature increase – 1.5 to 1.6 ˚7



Fulweiler et al. (2015), NBEP (2017)

Climate Change and Narragansett Bay: wetter and stormier

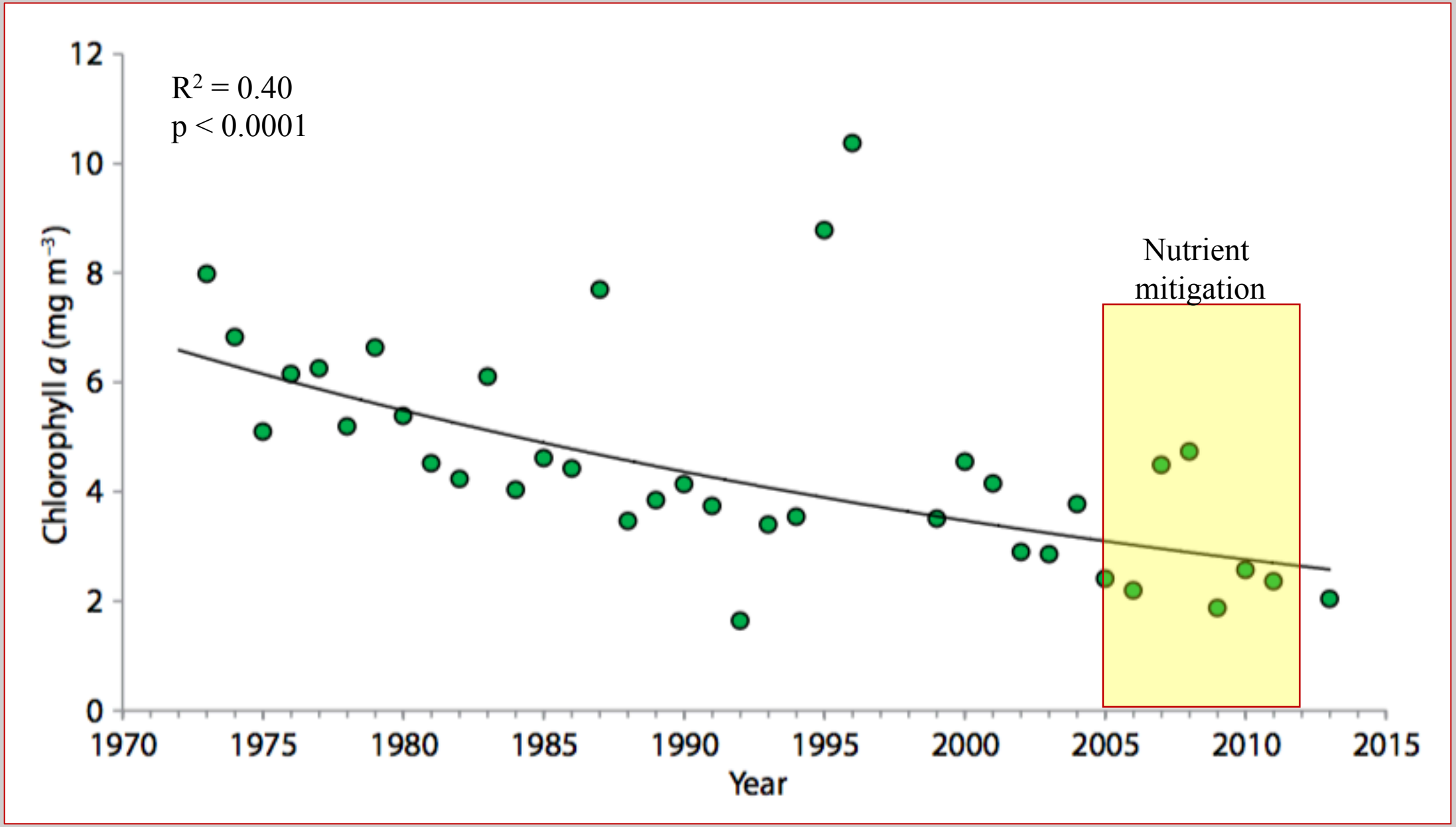


Average annual rainfall has increased 0.4 to 0.7 inches per decade since 1895

Annual precipitation falling during intense storms has increased 71% since 1965

NBEP (2017)

Oligotrophication of mid-Narragansett Bay



Data from:http://web.uri.edu/plankton/

Grand Challenge (& Grand Opportunity):

Quantify the impacts of changing climate and decreased nutrient loading.