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Interactive comment on "Spatial and temporal trends in summertime climate and water quality indicators in the coastal embayments of Buzzards Bay, Massachusetts" *by* J. E. Rheuban et al.

Anonymous Referee #2

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General Comments This paper is well-written analysis of a 22-year citizen science water quality monitoring program in Buzzards Bay. By using principal component analysis and factor analysis, the authors present evidence of climate change (increasing summer temperatures), the dependence of water quality on geomorphology (riverine-fed systems decreased water quality), and ecosystem shifts (Chl response to nutrient loading increased). The paper is innovative in that the citizen science program provided consistent data over 22 years to find significant trends and shed some light on long-term drivers of water quality. This paper presents data and findings that are potentially useful to coastal managers in terms of offering recommendations about nutrient reductions as well as longer term impacts of climate change on these systems. As

such, the paper is topical, timely, and of sufficient quality to be accepted with minor (very minor) revisions.

Specific Comments –It is very difficult to determine if a symbol is a triangle or a circle in Fig 1. Coastline is too faint. #s of estuaries and lat/lon is hard to read. The figure can be improved with changes in font and symbol. –Figure 5: The caption states that Color and symbols indicate trend and direction? This is confusing for this first figure of this type (Figure 5) in that there is no negative slopes in the figure. I would suggest removing "and direction" from the Figure 5 caption. The captions are fine for Figures 6-8 as written. –Can you please clarify why a river-fed embayment is defined as having a standard deviation of >5 salinity units? Can some rivers have fairly constant flow so that salinities do not vary that much? Could tidal ranges lead to characterizing a site as river-fed? In general higher salinity sites have lower SD so are groundwater-fed systems simply farther downstream from freshwater sites? This definition has implications for water quality so the definition deserves further description/definition. –Could the citizen volunteers be thanked by name in the Supplement (or a few key volunteers selected by # of samples or # of years) or Acknowledgements? –Introduction Line 23-29: These conclusions are described in the Abstract and Conclusions, but do not really belong in the Introduction.

Technical Corrections –Abstract, line 10: "...little correlation between inorganic nutrients, organic matter, and chlorophyll a..." –While I can find the definitions of POC and PON, I do not see the definitions of DIN and TN.

Interactive comment on Biogeosciences Discuss., 12, 13159, 2015.