

Review Comments of Dr. Wm. J. Wiseman, Jr., Office of Polar Programs, National Science Foundation, 9-12-07

Review of the Draft Report of the EPA Science Advisory Board Hypoxia Advisory Panel

This report represents a prodigious effort by the panel members. It reads well and represents an objective summary of the state of the science, at least for the portions within my expertise, and makes well-founded recommendations for future activity. My principal concern is that, given the present federal and state budgets, it may not be politically possible to address each recommendation immediately. It would seem to be most helpful if the panel could prioritize their recommendations to indicate which activities and actions have the most need for immediate implementation and which offer the greatest potential for improved understanding for the investment.

Throughout the document, there are numerous references to the plume, as well as to a coastal current. It would be helpful to have a clear definition of what the panel considers to be the limits of the plume. There are many different definitions in the literature.

On page 21, equation 1 does not clearly separate surface and body sources and sinks of oxygen. Term 6 is a surface source/sink only, while term 8 is a body source of oxygen. Term 7 involves both body and surface sinks. This could be made clearer.

In the key findings, on page 31, the second bullet suggests retrospective and prognostic modeling studies of altered flow diversions. It might be useful to include scenarios of altered nutrient supply to the associated river mouths, as well. This would be useful to suggest whether hypoxia truly is a recent problem, as well as to indicate the interactions of river flow diversions and altered management scenarios in the MRB.

Bullet 4 on the same page emphasizes the importance of understanding the controls on vertical mixing in the NGOM. Lateral mixing processes may be equally important. Equation 1 on page 21 suggests that alongshore and cross-shore dispersion coefficients are of equal magnitude. This is, I believe, not yet demonstrated and likely untrue. While some important processes associated with cross-shore dispersion may, ultimately, be captured by models, it is unclear that present models do this well. Thus, the effects of these processes must still be parameterized. Our understanding of these processes does not allow this parameterization to be performed with any confidence at this time.

The following is a list of editorial comments or minor questions.

P(age)1, L(ine)6: To my knowledge, the areal extent of the full hypoxic region has not been mapped with sufficient frequency to understand its temporal variability. The few times that it has been mapped more than once per year, the maximum extent was in late summer and there are physical and biological reasons to expect this to be the time of greatest extent. This implies that the observed extent of the hypoxic zone each year is only a conservative estimate of its maximum. The areal extent may be larger.

P5,L42 thru P6, L4: Because human responses are unpredictable, care must be exercised throughout to speak only of scenario modeling, rather than predictions.

P11,L2 change 'Unites' to 'United'.

P11,L4: change 'Two thirds' to 'Roughly two thirds'. The correct percentages are presented later in the document.

P19,L35 & 36: 'sufficient oxygen', sufficient for what?

P20, Key findings lines 1 & 2: 'data are consistent with increased hypoxia' refers to what aspects of hypoxia? Rates of occurrence? Duration? Minimum oxygen levels?

P21,L19 & 35: line 19 ignores the important dependence of mixing on time.

P25,L15: Maps of observed surface salinity and satellite images of chlorophyll and SST show the same distinct plumes, e.g. figure 9 of the report. This is not just a modeling result.

P27,L21: change 'theseis' to 'these'.

P33,L18: remove the carriage return that puts 'figure 7' on the next line.

P34,L19: 'Near inshore' makes no sense. Either nearshore or inshore is, I believe, intended.

P38, first line in box: change 'events in throughout' to 'events in'.

P39,L45 thru P40,L30: these lines are redundant with line 13 thru 43 on page 39.

P44, L30: 20076 should be 2006 or 2007.

P44,L32: I do not find a reference for Dagg et al. with a date of 2006 in the references.

P47,L19: change 'biologically' to 'biological'.

P49,L1: change 'productivity that have' to 'productivity have'.

P56,L1: Again, it is not clear that July is always the time of maximum extent of hypoxia, although it is when we have the most data.

P84, second line in box: change 'river' to 'rivers'.

P92,L19: change 'would' to 'would be'.

P124,L2 & 3: Monitoring at appropriate intensities is recommended. These intensities and durations are not defined. One important message from long-term monitoring sites is that the strongest signal following modifications to a region may be a transient with a duration of many years. It might be good to indicate that these monitoring efforts must continue for extended periods to allow discernment of the true long-term effects.

P156,L39: change 'loss nitrate' to 'loss of nitrate'.

P158,L16 thru 30: change 'NO3' to 'NO₃' everywhere for consistency with the preceding text.

P171,L9: change 'AFOs' to 'AFO'.

P172,L3: change 'place in at' to 'place at'.

P176, line 8 in the box: change 'co-sighting' to 'co-siting'.

P149,L1: What is the 51st state?

P205,L12: 'use less' to 'use is less'