# Alan Mearns

I am concerned that the Nutrient Reduction plan, and the Salish Sea modeling, are solely focused on phytoplankton and the presumed impact of anthropogenic nitrogen sources on phytoplankton production and DO impacts in Puget Sound. The role of ambient-plus-anthropogenic N as they contribute to supporting secondary and tertiary production...namely the entire food web of Puget Sound..is ignored. Human-sourced nitrogen could be contributing, via phytoplankton, to maintaining production of zooplankton, forage fish, mid- and top level predators (including salmon, rockfish, sea birds and orcas), as well as other primary producers, namely are needed eelgrass and kelp beds. But the contribution of human-origin N to the rest of the food web is not considered. There is at least one way to determine the role of human N and that is through looking at stable Nitrogen isotope ratios across the food web, including eelgrass and kelp beds. The justification for nutrient reduction should include looking at the worldwide literature on the contribution of human-origin Nitrogen to secondary and tertiery production as well as phytoplankton production.

I also have concerns about the basis of the dissolved oxygen criteria. Information that has yet to be brought into the development of new criteria is the data on actual field data on the abundance and diversity of fish and shellfish associated with various levels of DO. For example, NOAA Fisheries and UW have published on the relationships between near-bottom water DO concentrations and near-bottom fish and invertebrate biomasses and biodiversity. These field studies document the abundances of biota at and well below 2 mg/L, and help identify species sensitivities to various DO concentrations. These data should be captured and included in a renewed effort to revise the State's DO criteria.

Thank you for sharing these concerns as part of the review process.

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