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Subject: Natural Conditions criteria rule-development

Thank you for the opportunity to provide comments on the proposed performance-based approach for developing site-specific natural conditions criteria for aquatic life in Washington. It is unfortunate that after more than half a century, Ecology still has marine DO numeric criteria that have no scientifically defensible biological basis. Criteria are needed that resemble what EPA developed for Chesapeake Bay, which identify different types of water bodies, that include averaging of values, that recognize lower DO conditions in deep water than surface water, and that recognize seasonal differences.

Natural conditions should only be applied when DO concentrations are lower than biologically based numeric criteria. There is no biological basis behind our current numeric criteria. Both the Extraordinary, Excellent and Good “uses” claim to be fully protective of the identical biota. That suggests that there is no need to invoke natural condition-based criteria when marine DO levels are equal to or greater than 5 mg/L.

Another approach to setting a natural condition criteria below which the human allowance would be applied, is to look at all the modeled natural condition DO concentrations for a site, and sort it from lowest to highest. Then pick the lowest 1 percentile, or lowest 5 percentile as the criteria, and when evaluating such waters, assure that it is not exceeded more than 1, or 5 percent of the time.

The subject is complex and the complexity becomes evident in the levels of detail the procedure requires. The definition of “Performance-based approach” emphasizes that it must ensure predictable and repeatable outcomes. I found the described process to be confusing and complex and I have doubts that predictable and repeatable outcomes are possible.

Ecology should test the repeatability of the process by having two different groups take on an identical task, say figuring out the natural conditions for marine DO in Carr Inlet. Leave it to each group to get their hands on relevant data and do the modeling and see what they come up with. Do not let the two groups talk to each other until they are both done. If the procedures are indeed predictable and repeatable, then they should come up with the identical result.

The Salish Sea Model shows that in many cases, the lower DO values, with the greatest impacts from human causes, are found in shallow inlets. These inlets may have slower tidal exchanges and may also have eelgrass beds. Peer review of the Salish Sea Model has shown that it is not very reliable in shallow water inlets such as Carr Inlet.

Eelgrass beds can have substantial variability in DO during the summer, due to high photosynthetic productivity in the daytime and high respiration from all the biomass in the evening. I suggest that the variability in eelgrass beds be summarized and then not have any DO criteria for eelgrass beds. The biota that thrive there are adapted to substantial and rapid changes in DO. Any efforts to define a DO criterion for eelgrass beds will confront the need for a very complex approach for evaluating compliance that will be of little value. Probably the same is needed for temperature in eelgrass beds, and shallow waters with mudflats exposed at low tide. These will warm up when exposed to the summer sun and then pass the heat on to the water when the tide comes in. Again, the biota will be adapted to the temperature changes, and it is unavoidable that really hot conditions will sometimes result in mass mortalities to benthic species. Similarly, really prolonged low temperatures can result in mass mortality to benthic species.