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Wind turbine affect on ocean nutrient levels

Letter to Energy Commission. 12.4.22

These comments are, in part from a Journal of Marine Systems 2008 study. As wind machines continue to increase in size, several important research questions pertaining to wind turbine dynamics must be addressed. These questions involve the interaction of turbine dynamics with the atmosphere, wakes, and other sources of complex inflow to the rotor, as well as the high Reynolds number and aeroelastic behavior of very large and flexible machines. In addition, the dynamics associated with deployment of offshore in conditions such as extreme weather events or deployment on floating platforms with additional degrees of freedom in movement must also be explored.

1. A single wind turbine has an infinitesimal direct effect on global climate, but it also makes an infinitesimal indirect contribution to reducing climate change by slowing the growth of

atmospheric CO₂.

2. The ratio of direct to indirect effects is relevant to decisions about implementing wind power at any

scale if the objective is to mitigate climate change.

3. Wind farms may negatively affect the wind pattern and force an upper ocean divergence which will in turn influence the upwelling pattern, thereby change the temperature structure and availability of nutrients in the vicinity of the wind farm. The Central Coast of California is know to be very high in ocean nutrients, important to the health of the world's ocean.

4. The oceanic response becomes much stronger when the size of the wind farm becomes larger than the internal radius of deformation.

5. It is imperative that studies be conducted regarding the affect of extremely large turbines on ocean nutrients before considering offshore leasing.

It is imperative that ocean health be primary in the environmental impact studies, avoidance of impacts not financial payoffs.

I submitted a document on 9.12.21 with several additional concerns, especially the affect of turbines on coastal fog which protects the health of our endangered Monterey Pine forest.

Thank you, Claudia Harmon Worthen