

**Ecological insights from unusual red water blooms of the photosynthetic ciliate, *Myrionecta rubra*, in the Columbia River estuary**

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**Abstract:**

The Columbia River estuary is generally considered to be a detritus-dominated system, where the development of plankton communities is curtailed by the characteristically short water residence time and growth of primary producers is limited by low light availability. Yet, expansive blooms of the photosynthetic ciliate, *Myrionecta rubra* (formerly *Mesodinium rubrum*) form each summer, where they dominate planktonic biomass in large patches throughout the estuary. No other planktonic microbe appears to be capable of blooming under these conditions.

Observations from the last five summers (2007-2011) have allowed us to generate hypotheses about the factors responsible for the initiation and termination of the bloom, as well as about their behavior and impacts on biogeochemical cycles and estuarine food webs. Understanding the factors that modulate the timing and magnitude of *M. rubra* blooms will aid in understanding fundamental aspects of bloom ecology and dynamics.