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Future trends and climate feedbacks of the biological carbon pump

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The biological carbon pump is a series of processes that transfers organic carbon from the surface ocean into the deep ocean. Without it, atmospheric CO₂ levels would be ~ 50 % higher than pre-industrial levels. Despite its importance, we currently struggle to understand how the strength and efficiency of the biological carbon pump varies temporally and spatially. This makes it difficult to observe, and therefore model the pump, so our knowledge of how this important component of the global carbon cycle might respond to climate change is poor. In this talk I'll present recent progress on using autonomous vehicles to quantify variability in the biological carbon pump, discuss the current limitations in our understanding of the pump, and the implications of those knowledge gaps for robust modelling of the current and future pump.