Thursday, October 11
Poster Session 4
10:30–12:00

Poster 72

THE INFLUENCE OF MESOSCALE EDDIES ON THE TIMING AND MAGNITUDE OF NORTH ATLANTIC PHYTOPLANKTON BLOOMS

The advection of nutrients and living phytoplankton cells, both horizontally and vertically, occurs on a myriad of scales in the open ocean. In the North Atlantic, this include basin-scale processes like the Gulf Stream and deep winter convection in the subarctic region. At the oceanic mesoscale, eddies and meanders with horizontal scale of O(10-100 km) account for the largest proportion of kinetic energy and are known to generate order-1 perturbation of the ambient nutrient and light field. Furthermore, non-linear mesoscale eddies, those that contain vast regions of water trapped within their interiors, act to transport ecosystems over hundreds to thousands of kilometers. These trapped ecosystems are characterized by biological and physical signatures that reflect their region of origin, but that have also undergone local modification via air-sea exchange and predator/prey interaction within the eddy. As a result of this isolation from the ambient water surrounding the eddies, the seasonal evolution of phytoplankton communities is expected to be different in eddies when compared to areas around them, as well as when comparing temporal changes in photoautotrophic communities between cyclone and anticyclonic eddies. Using a combination of satellite observations of ocean color and physics with in situ observations of stratification, I shown that the North Atlantic spring bloom begins later in anticyclonic eddies and earlier in cyclonic eddies. These difference in initiation are consistent with differential near-surface mixing observed in cyclones and anticyclones, suggesting that the influence of these eddies on mixed layer depth are related to their influence on bloom dynamics.

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