



SPRING 2017 SEMINAR SERIES

DEPARTMENT OF OCEAN, EARTH, AND ATMOSPHERIC SCIENCES
3PM – ROOM 200 IN THE OCEANOGRAPHY/PHYSICS BUILDING
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“Biogeography, biogeochemistry, transport and fate of particulate carbon associated with the Great Calcite Belt.”

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ABSTRACT

The Great Calcite Belt (GCB) is a coccolithophore-rich region within the highly dynamic Antarctic Circumpolar Current (ACC) waters of the Southern Ocean (SO). I will present observations of the GCB from multiple field campaigns within the Atlantic and Indian sectors of the SO. I will first show the vertical and horizontal gradients of nutrients, chlorophyll, particulate inorganic carbon (PIC), biogenic silica and particulate organic carbon within the Atlantic and Pacific sectors of the GCB. Both satellite- and ship-derived concentrations of PIC in the GCB are highest in the Patagonian Shelf region and decrease to the east around the SO with lowest concentrations observed in the eastern Pacific sector of the SO. Highest concentrations of coccolithophores are associated with the SubAntarctic Frontal region. Indeed, PIC concentrations are directly associated with high-velocity waters of the ACC. The abundance and biomass of general taxonomic groups of phytoplankton (not just coccolithophores) will be presented, illustrating their biogeography within the GCB and strong associations with the dynamic hydrography. Regarding the fate of the PIC, there are strong biogeochemical changes as well as changes in the particle size distribution as particles sink below the euphotic zone, that appear to be associated with remineralization and re-packaging of particles. Moreover, there is an overall northward transport of PIC from the GCB associated with a) the highly concentrated, PIC-rich GCB waters of the Patagonian Shelf as well as b) the formation of PIC-rich eddies off of the SAF that carry PIC from the GCB, northwards.

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