

Beaufort Gyre Exploration Project: Dispatch 24: Nutrients in the Canada Basin

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We are travelling on the shelf break to Prince Patrick Island today. The ice has been heavy and the Louis keeps bumping along through the ice. Tomorrow there will be two, maybe three more stations worth of test tubes waiting in the refrigerator for nutrient analysis. The heavy ice, which causes much bumping and vibration, adds to the challenges of analysing samples on sensitive instruments in the labs.

Nutrient analysis is performed on a Three Channel Continuous Flow Autoanalyzer. Sample and reagents are mixed in glass coils and a colour is developed for nitrate + nitrite, silicate and phosphate, respectively. The coloured solutions are detected in a colorimeter and digitally logged and concentrations calculated on a computer program. We prepare all our standards and reagents on board the ship. There are reference samples we analyse to maintain control of the analysis and therefore produce high quality data.

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The Autoanalyzer is tested at the Institute of Ocean Sciences Lab prior to shipping via flat deck truck to St. John's Newfoundland where it is then loaded onto the Louis S St. Laurent Ice Breaker. It is a long ride from Sidney, British Columbia to St. John's and we are always amazed that all the instruments shipped this way operate up here in the far North on board a ship.

Nutrients are the basis for sustaining all living things. Our vegetable gardens require nutrients: N, P, K (nitrate, phosphate and potassium) while in the ocean the phytoplankton (microscopic plants) require three main nutrients: N, P, Si (nitrate, phosphate and silicate). We measure these parameters along with dissolved oxygen, temperature, salinity, alkalinity, and many others to describe the different water masses swirling around into the Beaufort Gyre. The deep Canada Basin is not a highly productive ocean in terms of available nutrients. It does receive a good punch from the North Pacific, through Bering Strait, and another supply from the Atlantic Ocean flowing over the Siberian shelves. There are also sources of nutrients from river waters flowing into the Canada Basin from North America and Eurasia.

Well, that's about all I have to say for nutrients today.

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