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Preliminary results for hydrography and circulation of the Japan/East Sea in summer, 1999

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A two-ship survey of the Japan (East) Sea was undertaken in June-August, 1999. Horizontal coverage of most of the regions was achieved. All sampling was to the ocean bottom, and every station included sampling for water chemistry as well as temperature, salinity and oxygen. At every station a complete velocity profile was collected using a lowered acoustic doppler current profiler, and shipboard ADCP data were collected while underway.

Preliminary findings form the Revelle cruise include a description of the water mass properties in terms of oxygen and nutrients as well as salinity and temperature. These features will be reviewed in the talk, including the use of deep oxygen and nutrient signals to indicate direction of flow and sources of the deep and intermediate waters. The Khromov cruise has not occurred as of the deadline for this abstract and will highlight Japan Basin circulation.

Of extra note from the Revelle data, augmenting the well-known features of the Japan (East) Sea are:

(1) a relatively large amount of nitrite in the Ulleung Basin and off the coast of Japan below the euphotic zone to about 500 meters and in a layer of about 100 m thickness at the ocean bottom at depths less than 1500 meters, coinciding with a small decrease in the (high) oxygen content and increase in the alkalinity;

(2) incursion of high salinity and warm temperatures to 500 meters depth west of Hokkaido, which is likely linked to mixing between Tsushima Current water and subpolar water, but which might also have a Tatar Strait source;

(3) major influence on the water properties, flow and subpolar front during this period by the Yamato Rise and the Noto peninsula as evidenced also in SST from satellite images;

(4) concentration of geostrophic shear in and above the pycnocline at about 200 m depth, but with weak extension of shear of the same sign to the bottom at most locations, suggesting that most flow structures extend from top to bottom;

(5) evidence of deep mixing in the northern (Japan) basin reaching 1200 meters from the bottom with the most homogeneous and coldest water in the center of the basin.