



Changes in Arctic Surface Waters Reconstructed from Drifting Sea Ice

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As sea ice drifts across the Arctic Ocean interior, it thickens in annual growth layers, archiving the oxygen-18 of surface waters along its path. Because Arctic water masses are clearly defined by their oxygen-18 signatures, spatial and temporal variations in their distribution can be reconstructed from the values archived in the sea ice, coupled with surface ocean measurements. Between the 1980's and 1990's reconstructions show the enhanced inflow of Atlantic Water, diminished influence of the Bering Inflow, and the eastward shift in off-shelf transport of river water. These water masses have a major influence on the Arctic environment and are connected to the thermohaline circulation of the world ocean. Future sampling of sea ice can help to construct a comprehensive and synoptic view of surface ocean water masses within the ice-bound Arctic interior, and allow early detection of changes occurring under the ice.