AD-A191 765 PLANKTONIC BIOLUMINESCENCE MEASUREMENTS IN ARCTIC WATERS(U) NAVAL OCEAN SYSTEMS CENTER SAN DIEGO CA D LAPOTA FEB 88 1/1

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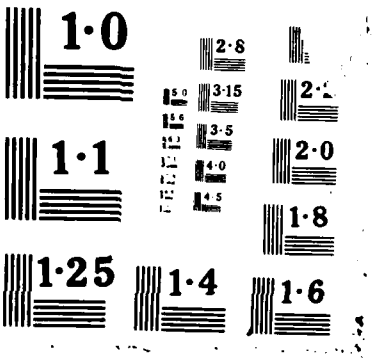
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Bioluminescence has been observed infrequently in arctic waters although recent measurements at high latitudes, even under pack ice, indicate that measured intensities are comparable to open ocean and coastal intensities. Bioluminescence measurements were conducted in the summer months of 1986 above the Arctic Circle in open water in Vestfjord, Norway and in pack ice in the Beaufort Sea, northeast of Pt. Barrow. Stations in the ice were kept open by the icebreaker USCGC *Polar Star* (WAGB 10) as the submersible bathyphotometer was deployed by the ship's hydrographic winch with a steel cable to approximately 100 meters below the sea surface. Vertical bioluminescence intensity profiles were recorded and the associated planktonic species were collected either from the effluent of the bathyphotometer or from the net tows to identify the major sources of the measured bioluminescence.

Among the Vestfjord stations, maximum bioluminescence intensity was always found within 15-30 meters below the sea surface while intensity was markedly less below 50 meters. The maximum bioluminescence intensity from all profiles ranged from $3 \times 10^8 - 2 \times 10^9$ photons $sec^{-1} cc^{-1}$ of seawater while the bioluminescence intensity at a depth of 90-100 meters ranged from $3 \times 10^{6-4 \times 107}$ photons $sec^{-1} cc^{-1}$ of seawater.

In the Beaufort Sea, distinct layers were observed within the upper 50 meters, but the measured intensity was approximately 3×10^6 photons $sec^{-1} cc^{-1}$ of seawater. In the MIZ, the maximum intensity was approximately 2×10^8 photons $sec^{-1} cc^{-1}$ of seawater 15 meters below the sea surface. Biological collections were tested on board in a laboratory plankton test chamber which identified the copepod *Metridia longa*, their nauplii, and *Protoperidinium* dinoflagellates as a few of the significant bioluminescent species.

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