



Recent bottom sediments from Chukchi Sea, sampled northeast of Wrangel Island, indicate warmer climate (preliminary results)

Elena G. VOLOGINA (1), Michael STURM (2), Alexandr N. KOLESNIK (3), and Alexandr A. BOSIN (3)

(1) Institute of the Earth's Crust, SB-RAS, Russian Federation (vologina@crust.irk.ru), (2) Eawag-ETH, SURF, Duebendorf, Switzerland (sturm@eawag.ch), (3) Pacific Institute of Oceanology, FEB-RAS, Russian Federation (aiks1986@mail.ru)

A short sediment core (37 cm long) was collected in Chukchi Sea at water depth 100 m northeast of Wrangel Island within the framework of the Russian-American project RUSALCA. Coordinates of coring site: 72°32.54'N 175°58.70'W.

The sediments consist of silty clay and clayey silt with small admixtures of sand. They contain diatoms and spiculae of sponges. The deposits are olive-gray to greenish-gray and show black spots and stripes of hydrotroilite. Magnetic susceptibility varies from 28-42•10⁻⁶ SI units, with minimum values (28-32•10⁻⁶ SI units) observed in the uppermost 0-2 cm of the core.

The generally constant magnetic susceptibility and the homogeneous lithology indicate calm conditions during sedimentation.

Recent sedimentation rates, measured by ²¹⁰Pb, average 0.7 mm/year. Thus the age of the studied sediment column is up to 530 years old, which corresponds to the Late Holocene [1].

Contents of biogenic silica (Sibio), mainly from diatoms, change from 11.14-16.00 %. Maximum values are observed in the uppermost part of the core at 0-1 cm (14.44 %) and down-core at 35 cm (16.00 %). Minimum contents correspond to core depths of 4-7 cm, 32 cm and 36 cm.

Concentration of organic carbon (Corg) and total nitrogen (Ntot) are generally well correlated with biogenic silica. Maximum contents are observed in the interval 0-1 cm (2.19 % Corg and 0.28 % Ntot), minimum concentrations at intervals 5-6 cm (1.63-1.67 % Corg, 0.20-0.21 % Ntot.) and 31-33 cm (1.35-1.60 % Corg, 0.17-0.20 % Ntot). Concentrations of Corg and Ntot are mainly constant between 7 and 30 cm. In general, contents of Ntot are very small in the sediments. C/N ratios vary between 9-10, indicating a predominance of autochthonous organic matter in the deposits.

The interval 0-1 cm corresponds to about the last 14 years. The high nutrient concentrations within this interval are caused probably by the increase of biological productivity in the Chukchi Sea increased during this time. This could be caused by the warmer climate, as evidenced by the decrease of Arctic sea ice [2]. Minimum values of Sibio (11.66 %), Corg (1.35 %) and Ntot (0.17 %) at a depth of 31-33 cm of the sediment column probably suggest low productivity, caused by the cooling during the Maunder minimum.

[1] Neustadt M.I. On problems and subdivision of the Holocene, especially in USSR // *Striae*. 1982. No. 16. P. 91-94.

[2] <http://nsidc.org/arcticseaicenews/>

The sediment core was taken during Leg-2 of the Russian-American RUSALCA-2012 cruise with "RV Khromov". Analytical work was carried out with the support of the integration project of SB-RAS and FEB-RAS No. 34.