



## **Study of Chemical Exchange on the Water-Sediment Interface in the Black Sea: New Russian Lander**

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The results of the first applications of automatic bottom station (Lander IO RAS) for the study of chemical exchange at the water – sediment interface were obtained in the sediments of the north-western part of the Black Sea near Gelendzhik (The Blue Bay). Lander is equipped with bottom cameras, O<sub>2</sub>-sensors (optodes) and syringes for programmed water sampling from the cameras and outer water. Exposition of the lander for one day allows direct determination of fluxes of chemical elements through the interface between bottom water and the sediments. At the same time fluxes through the water-sediment interface were calculated from the differences in concentrations of these components in bottom water and pore water (Fick's law). Bottom sediments were presented by organogenic clays containing hydrogen sulphide under the surface. High activity of diagenetic processes has led to increased consumption of O<sub>2</sub> by the sediments from the bottom water (130 mM/(m<sup>2</sup> day) and high fluxes of nutrients (P: 0.8 – 2.2, Si: 1.4 - 5.0 mM/(m<sup>2</sup> day) and metals (Mn: 0.4 - 0.6, Fe: 0.04 – 1.6 mM/(m<sup>2</sup> day) from the sediments. The first figure in each interval was received from the Fick calculations, the second one - from the lander's data. The data obtained allow to give preference to direct measurements of fluxes (lander), compared with a calculation method, because the latter is not able to register bioturbation and other animal activity/. The first applications of the lander suggests the need for methodological improvements in both technical and with regard to chemical analytical support.