



## **Rivers of the Russian Black Sea Coast: Can their Impact on the Sea be Quantified?**

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As an enclosed sea, the Black Sea is particularly sensitive to anthropogenic and climate impacts on the discharges from tributary rivers. About 80% of the total freshwater runoff into the Black Sea is associated with only a few large rivers such as Danube (57%), Dnepr (13%), Rioni (4%), and Dniestr (3%). Perhaps for this reason, the role of more than 1000 smaller rivers is often neglected and poorly explored. None of the large rivers belongs to the Russian sector of the Black Sea. However, there are many small rivers running into the sea in the area, and several medium-size rivers bringing to the sea about 7 km<sup>3</sup> of fresh water annually. How significant is the impact of this continental water on the sea? A pilot survey aimed at quantifying this impact was realized onboard R/V Ashamba in June, 2006, in the areas adjacent to the mouths of 3 medium-size and 2 small Black Sea rivers, namely, Pshada, Mezyb, Vulcan, Teshebs, and Ashamba. The boat was equipped with CTD and ADCP profilers, an optical spectrophotometer, and fluorescent lidar. The latter yielded very high resolution distributions of chlorophyll and dissolved organic matter in the surface layer. The results of the observations indicate that considerable signatures from the river runoff are identified in the adjacent areas of the sea at spatial scales of a few km. The signal is seen in the thermohaline structure, dissolved organic matter and phytoplankton patterns, and also in the sea color. Furthermore, the ADCP measurements of currents suggested that there may be a significant dynamical influence of the freshwater plumes on larger-scale shelf circulations. Quantitative details for each of the explored river mouths are presented in this paper.