Validation of satellite derived primary production models in the Northeast Atlantic
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With all the variety of models used for calculation of primary production from remote sensing data, a choice of the most realistic one remains a non-trivial issue. The use of regional biological parameters additionally increases the degree of correspondence between a model and in-situ observations. In this work, we estimate primary production in the Northeast Atlantic Ocean in 1998 - 2005 years using three frequently used models: two models are based on the remotely measured chlorophyll-a concentration (VGPM and PSM) and one – on the remotely measured coefficient of light absorption by phytoplankton pigments (Aph-PP). The model results are farther compared with in-situ observations of primary production in the area 20° - 51°N and 10° – 40°W.

The primary production models use as the input level 3 Ocean Color data provided by the OC-CCI database (http://www.esa-oceancolour-cci.org). Photosynthetic model parameters are taken from experimental measurements of phytoplankton photosynthetic efficiency under different light conditions, obtained for Northeast Atlantic phytoplankton species.

The results show a close similarity in the patterns of primary production obtained by different models, although the absolute values in different models differ substantially. PSM model is found to describe better the observed seasonal and spatial variability of the primary production in the Northeast Atlantic as compared to the two other models. However, in most of the cases PSM slightly underestimates the production values. Use of regional photosynthetic parameters contributes to closer approximation of in-situ observations by the models.

Key words: models of primary production, the North-East Atlantic, remote sensing, chlorophyll-a, absorption coefficient of phytoplankton pigments.