The continentally and shallowness of the Sea of Azov is the reason for the variability of the hydrochemical regime associated with changes in weather conditions, the volume of river flow, the influx of salt water and anthropogenic pollution.

UNDERLYING ISSUES
Remote sensing data provide regular data on sea temperature, as opposed to salinity data determined in situ.

One of the methods for obtaining salinity values based on empirical regression relationships of bio-optical parameters supplied by satellites is the use of MODIS data, which make it possible to study the distribution of the most important water mass parameters at the regional scale.

GOALS
Obtain a dataset of regional biooptical parameters; Establish regression relationships between in situ data and regional bio-optical parameters; Verify the reconstructed salinity against long-term average salinity trends in situ.

STUDY AREA AND DATASETS

SUB-REGIONS:
- AZ1 - shallow part, Taganrog Bay 37.7 - 39.3°E, 46.7 - 47.3°N;
- AZ2 - central part;
- AZ3 - deep-water part, the Kerch Strait and the adjacent part of the Black Sea 35.3 - 36.6°E, 45.5 - 45.7°N.

DATASETS:
- Regional satellite products obtained from standard MODIS-Aqua/Terra products available on the resource: oceancolor.gsfc.nasa.gov;
- Oceanographic Database of the SSC RAS for 1913 - 2006 atlass.ssc.ras.ru/azs/azs-invent.html;
- Oceanographic Data bank of the MHI RAS;

BIOOPTICAL PARAMETERS:
- $a_0(678)$ is the light absorption coefficient by phytoplankton at 678 nm;
- $TCH$ is the sum of chlorophyll-a concentration and pheopigments;
- $a_{abs}(438)$ is the light absorption coefficient by all optically active components at 438 nm;
- $a_{Chl}(438)$ is the light absorption coefficient by colored detrital matter at 438 nm;
- $b_{bp}(438)$ is the particle backscattering coefficient at 438 nm.

Table: Generalized linear regression equations

**SPRING**
- $a_0(678)$, m$^{-1}$; $TCH$, mg m$^{-3}$
  - $y = (0.038 \pm 0.008)x + (-0.334 \pm 0.132)$
  - $y = (0.041 \pm 0.024)x + (-0.355 \pm 0.250)$

**SUMMER**
- $a_{abs}(438)$, m$^{-1}$; $a_{Chl}(438)$, mg m$^{-3}$; $b_{bp}(438)$, m$^{-1}$
  - $y = (2.442 \pm 0.110)x + (-20.940 \pm 2.594)$
  - $y = (-1.894 \pm 0.081)x + (-16.500 \pm 1.004)$
  - $y = (-0.192 \pm 0.073)x + (3.654 \pm 0.515)$
  - $y = (-0.287 \pm 0.303)x + (4.710 \pm 3.816)$
  - $y = (-0.261 \pm 0.071)x + (4.217 \pm 0.548)$
  - $y = (-0.082 \pm 0.029)x + (1.006 \pm 0.334)$
  - $y = (-0.043 \pm 0.029)x + (0.561 \pm 0.296)$

Figure 2. Linear regressions between regional biooptical products and in situ salinity data for the AZ2 with the correlation coefficients (R) and data volume (N) in the summer season.

Figure 4. Results of recovering salinity fields from $a_0(678)$, $a_{Chl}(438)$ and $b_{bp}(438)$ in AZ2.

Figure 5. Cluster analysis of reconstructed salinity by Pairs of biooptical parameters.

CONCLUSIONS
- Result of the analysis of various approaches in obtaining generalized empirical (regression) equations showed the possibility of using a single general equation in the spring and summer seasons;
- Comparison of the average values of salinity restored demonstrates good agreement with the observed trends;
- Spatial maps of salinity in the Sea of Azov based on reconstructed values are shown.

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