Environmental condition of the Georgia surface and coastal zone waters

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State of the sea depends on many factors. Among them particularly important are rivers discharge, sewage waters, industrial waters and shipping processes.



There are approximately 26,060 rivers in the country with total length of 59,000 km. Most of these rivers (97.3%) are less than 10 km long.

Georgia's rivers drain into the Black Sea (18,109 rivers – 70%) and Caspian Sea (7,951 rivers – 30%).

The country is rich of water resources: The amount of water discharge per sq. km. (820 thousand t.) is 2.5 times more the world average.

33% of water resources are ground waters, which are of highest quality for potable consumption.

Notwithstanding the fact that Georgia is rich of water resources, there are some problems and constraints on the way of effective use of these resources. Primary reason is that the water is unevenly distributed between the Eastern and the Western parts of the country - 78% of water resources are concentrated in the West, while 60% of industrial facilities, 85% of irrigated land and 62% of population is concentrated in the East of the country.

Distribution of water resources in Georgia



Nowadays, only surface and Black Sea water quality and partly hydrological monitoring programmes are running. The water quality program includes the measurement of hydrologycal water quality elements in 43 sampling (monthly) surface water stations and 5 sea stations (quarterly) the whole Georgia.



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The National Environmental Agency (hereafter Agency) carries out the water quality program.



The Agency participates in the scientificresearch works in the fields of hydro meteorology and environment pollution monitoring, also in the international projects in the frames of its competence.



The Black Sea Monitoring Division (BSMD) of the National Environmental Agency conducted sampling on seasonal basis, at the stations in Georgian territory of the Black Sea at point in the sea located at approximate 1 nautical mile (1.85 km) from the coastal line.

The physical parameters of the samples are evaluated on site, while the chemical and biological composition are evaluated in Laboratory.

The monitoring results are sent to the Black Sea Commission every year.



The main sphere of competence of the Black Sea Monitoring Division (BSMD) are as follow:

- Assessment of anthropogenic impact on environment;
- Monitoring over the Black Sea, Its coast ecosystems, rivers and biodiversity of onshore water reservoirs, research of various components of water ecosystems (zoo plankton, macrozoobenthos, fish fauna and others) and based on it, elaboration of conclusions, recommendations and proposals;
- Monitoring of physico-chemical, biological environment pollution.



It is understandable, that only accurate and precise data can be used to evaluate the state of the water bodies and based on that to take mitigation measures to protect the water resources in Georgia and to prevent their deterioration

Participation of Agency's laboratory into the intercalibration exercises and their good results are warranty of fail-safety of research results

BSMD rivers monitoring stations



Surface water quality control elements

- Temperature
- pH
- suspended loaded
- conductivity
- oxidation reduction potential (ORP)
- dissolved oxygen (DO)
- biological oxygen demand (BOD₅)
- carbon dioxide (CO₂)/carbonate (CO₃²⁻)
- ammonia (NH₄⁺)
- nitrite (NO₂⁻)
- nitrate (NO₃⁻)
- silicate (SiO₃²⁻)
- phosphate (PO₄³⁻)
- sulfate (SO₄²⁻)
- chlorides (Cl⁻)
- bicarbonate (HCO₃-)
- total hardness
- calcium (Ca²⁺)
- magnesium (Mg²⁺)
- iron (Fe²⁺)

Content of phosphates in some Black Sea basin rivers



Average content of phosphates in some Black Sea basin rivers, mg/l

Kintrishi	Khoroliskali	Qubaskali	Barckhana	Chorokhi
0,06	0,29	0,30	0,54	0,05

Content of nitrates in some the Black sea basin river's water

■ 2006 ■ 2007 ■ 2008 2009 ■ 2010 ■ 2011



Average content of nitrates in some Black Sea basin rivers, mg/l

Kintrishi	Khoroliskali	Qubaskali	Barckhana	Chorokhi
1,83	3,38	5,55	5,14	1,68

Georgian Black Sea costal zone monitoring stations



Sea water quality control elements and sampling depth

- temperature
- Salinity
- Conductivity
- pH
- Suspended solids
- dissolved oxygen
- ammonia (NH₄⁺)
- nitrite (NO_2^{-})
- nitrate (NO₃⁻)
- silicate (SiO₃²⁻)
- phosphate (PO₄³⁻)
- sulfate (SO₄²⁻)
- chlorophyll a
- bacterium
- zooplankton
- phytoplankton
- zoobenthos

surface / middle (20m) surface surface surface

Water quality condition in Batumi station (2010-2012)

	Surface	Middle (20m)
Salinity, ‰	17,1	17.5
dissolved oxygen, %	106	102
ammonia (NH ₄ +), μmol/l	1.3	0.9
nitrite (NO ₂ -), μmol/l	0.5	0.5
nitrate (NO ₃ ⁻), μmol/l	1,7	1,3
silicate (SiO ₃ ²-), μmol/l	5.5	3.7
phosphate (PO ₄ ³⁻), µmol/l	0.5	0.5
chlorophyll a, μmol/l	75.5	29.6
Suspended loaded. mg/l	3.0	1.9

SKALAR SAN^{plus} ANALYZER



AAS 600, Perkin Elmer



BSMD environmental pollution monitoring laboratory equipment

LS 45, Perkin Elmer



Field fluorometer 10-AU



Dissolved Oxygen Analyzer





BSMD environmental pollution monitoring laboratory equipment



BSMD environmental pollution monitoring laboratory equipment

Thank you for your attention!