

C-13: Concentration of pollutants in coastal seawater and sediments (except nutrients)

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1) General description

1.1) *Brief definition*

This indicator shows the concentration of the following pollutants in coastal seawater and sediments.

- Coastal seawaters: ammonium nitrogen (NH₄), dissolved oxygen (O₂), oil hydrocarbons (OH), phenols, synthetic surface-active compounds (SSAC), chlorinated pesticides (CP), faecal coliform, and heavy metals (Cd, Co, Cu, Cr, Fe, Hg, Mn, Ni, Pb and Zn).
- Sediments: chlorinated pesticides, oil hydrocarbons and heavy metals.

1.2) *Units of measurement*

Concentrations of ammonium nitrogen are expressed in milligrams/litre; dissolved oxygen in milligrams O₂/litre; OH, phenols, SSAC, heavy metals and CP in micrograms/litre; and those of faecal coliform in MPN (Most Probable Number) per 100 ml.

Concentrations of heavy metals, CP, and OH in sediments are expressed in micrograms/g of dry weight.

1.3) *Context*

Relation to other indicators from the Guidelines - This indicator relates to indicator "C-12: Nutrients in coastal seawaters".

2) Relevance for environmental policy

2.1) *Purpose*

The indicator provides a measure of the state of coastal seawaters and sediments in terms of pollutant concentration.

2.2) *Issue*

The presence of pollutants in coastal seawaters and sediments poses a serious risk for the ecological state of coastal waters and indirectly for human health in coastal zones (via the

food chain). Large quantities of organic matter (microbes and decaying organic waste) as well as other pollutants can reduce the chemical and biological quality of water and result in an impaired biodiversity of aquatic communities and chemical and microbiological contamination. Chemical pollution results in accumulation of hazardous substances in aquatic fauna and flora. Sources of pollution include discharges from wastewater treatment plants, industrial effluents and agricultural run-off.

2.3) International agreements and targets

a) Subregional level

The European Union has adopted the Directive 2008/56/EC establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). The Directive provides that Member States shall take the necessary measures to achieve or maintain a “good environmental status” in the marine environment by the year 2020 at the latest.

Further international agreements include: The Convention on the Protection of the Marine Environment of the Baltic Sea – HELCOM (Helsinki, 1974); the Convention on the Protection of the Mediterranean Sea against Pollution (Barcelona, 1976); the Convention on the Protection of the Black Sea against Pollution (Bucharest, 1992); the Framework Convention on the Protection of the Marine Environment of the Caspian Sea (Tehran, 2003).

3) Methodology and guidelines

3.1) Data collection and calculations

A basic monitoring programme should specify pollutants and a core list of measured substances. The number of sampling points and their spatial location should enable the collection of information on the content of pollutants throughout the gradient of loads – from background water landing sea areas to coastal seawater areas exposed to substantive anthropogenic loads. In the case of a high number of sampling points on the coastal zone, the countries should select at least five representative points for the calculation of average concentrations to have a balanced representation of water quality or sediments. In order to take into account the time mutability of the content of biogenic substances, average concentrations should be reported for designated time periods in summer and winter for ammonium nitrogen and dissolved oxygen in coastal seawaters. Methodological and metrological uniformity of surveillance and data processing should be a goal; microbiological and chemical-analytical activities should be conducted by accredited laboratories with measurement quality control systems.

3.2) Internationally agreed methodologies and standards

OECD/Eurostat Questionnaire on Coastal Waters (Table 6); International Recommendations for Water Statistics (IRWS), UNSD 2010.

4) Data sources and reporting

The countries of South-Eastern and Eastern Europe, Caucasus and Central Asia have departmental and, in some cases, national databases of the level of pollution of coastal seawaters and sediments. Several coastal countries publish data on concentrations of pollutants in seawater, including coastal waters and sediments, in annual reports on marine environment quality.

5) References at the international level

- Convention on the Protection of the Black Sea against Pollution: <http://www.blacksea-commission.org/>
- Convention on the Protection of the Marine Environment of the Baltic Sea Area: <http://www.helcom.fi/>
- Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)
- European Environment Agency (EEA): <http://www.eea.europa.eu/themes/water>
- Eurostat: <http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators>
- Food and Agriculture Organization (FAO): <http://www.fao.org>
- Framework Convention for the Protection of the Marine Environment of the Caspian Sea: <http://www.tehranconvention.org/spip.php?article4>
- GEMS/WATER Operational Guide, 3rd ed.(WHO, 1992)
- Global water information system of the Food and Agriculture Organization (AQUASTAT): http://www.fao.org/ag/agl/aglw/aquastat/water_res/waterres_tab.htm

- International Recommendations for Water Statistics (IRWS): <http://unstats.un.org/unsd/envaccounting/irws/irwswebversion.pdf>
- Sanitary norms and rules for the protection of coastal zones: <http://www.stroyplan.ru/docs.php?showitem=2846>
- Standard Methods for the Examination of Water and Wastewater, 19th ed. (American Public Health Association, 1992)
- United Nations Statistics Division (UNSD): <http://unstats.un.org/unsd/environment/>
- United Nations Statistics Division (UNSD)/United Nations Environment Programme (UNEP) Questionnaire on Environment Statistics (2013): <http://unstats.un.org/unsd/environment/questionnaire2013.html>
- World Health Organization (WHO): <http://www.euro.who.int/en/home>
- World Meteorological Organization (WMO): www.wmo.ch