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Monitoring of Radioactive Contamination of Polish Surface Waters in 2012-2013*

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Radioactive isotopes of anthropogenic origin have appeared in the environment as a result of human activities. The main sources of these radionuclides were 1) atmospheric testing of nuclear weapons done in the years 1945-1980 with particular intensity in 1951-1958 and later in 1961-1962 and 2) the Chernobyl nuclear reactor accident in April 1986. The greatest contribution to the radioactivity level in the environment caused by artificial radionuclides was done by radioisotopes of cesium (^{137}Cs) and strontium (^{90}Sr).

Monitoring of radioactive contamination in the terrestrial and marine environment in Poland was performed by Central Laboratory for Radiological Protection (CLOR) from early seventies. An extended monitoring program of radioactive contamination of Polish surface waters was carried out by CLOR since 1992, as a work done on request of the National Fund for Environmental Protection. In the frame of this monitoring the samples of water were collected twice of year (spring and autumn) from the sampling points located along two main Polish rivers: Vistula River and Odra River and in selected polish lakes situated in different part of the country.

In 2012-2013 the water samples were taken from 7 sampling points on river Vistula and her tributaries, 5 sampling points on river Odra and her tributaries and 6 lakes situated in lake districts Drawskie and Lubuskie, region of Warmia and Mazury, Suwalki region and Lublin Province. Determinations of ^{137}Cs and ^{90}Sr in twenty liters water samples were performed by radiochemical method and activity concentration of these radionuclides were measured using low level beta counter.

In 2012-2013 the average activity concentrations of ^{137}Cs in the drainage basin of the Vistula ranged from 2.99 mBq/l to 6.58 mBq/l, of Odra River from 2.44 mBq/l to 6.11 mBq/l and in lake waters varied from 1.92 mBq/l to 7.96 mBq/l. The average activity concentrations of ^{90}Sr in river waters ranged from 1.89 mBq/l to 8.00 mBq/l, and from 1.98 mBq/l to 22.84 mBq/l respectively and in water of lake from 1.69 mBq/l to 6.19 mBq/l. Both, the annual average concentrations of analysed radionuclides and the data obtained for single determinations for water do not differ from data obtained in previous years. Monitoring of radioactive substances in Polish surface waters leads to the conclusion that ^{137}Cs and ^{90}Sr contamination of rivers and lakes on the Polish area is still low. Our determinations confirm that new releases of radioactive isotopes into the environment, with a significant impact on water contaminations, were not observed in Poland.

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