# WHAT CAN RADIOTRACERS TELL US ABOUT THE FATE OF BLACK SEA CONTAMINANTS?

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**Abstract**

It is commonplace that radiotracers are time clocks for environmental processes: they can be used to trace water masses, to quantify mixing, to assess sedimentation rates, to fingerprint sources, to study transfer of contaminants in the food chains. The application and applicability of radiotracers, combined with other markers, to the study of sources and pathways of contaminants in the Black Sea are critically reviewed.

*Keywords : Radionuclides, Models, Pollution.*

Due to its particular oceanographic features, scientists often term the Black Sea "a natural laboratory". As a side-effect of human activities, this over-sized experimental tank received two major inputs of anthropogenic radioactive tracers: (1) the global fallout, peaking in the early 1960s, following the atmospheric nuclear tests, and (2) atmospheric fallout and riverine input following the 1986 Chernobyl nuclear power plant accident. The latter event created public concern for the potential radiological effects on humans, which were finally estimated as negligible for marine exposure pathways [e.g. 1], and was at the origin of much scientific work carried out and published over the last 2 decades [e.g. 2-5, to quote only a few publications]. In addition natural radionuclides and stable isotopes have also been applied in a variety of studies [e.g. 6, 7]. The published results increased considerably the knowledge on Black Sea oceanography and on the fate of contaminants (see example in Fig.1), being of particular value due to the environmental and ecological problems facing this marine basin.

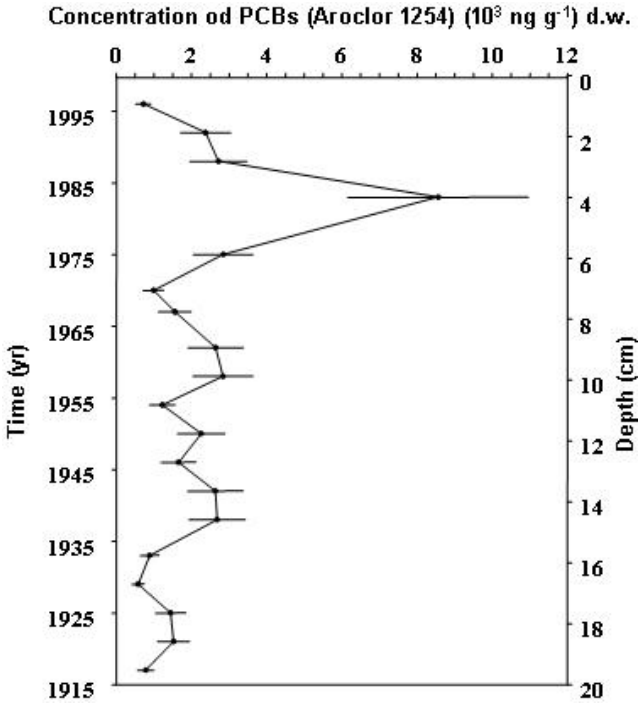


Fig. 1. The radiotracer-based reconstruction of the geochronology of PCB input to bottom sediments of Sevastopol bay, in a core collected at Pavlovskiy Cape - Southern Bay, 44$^o$37.06 N; 33$^o$32.13 E indicates a non-uniform input rate [8], attributable to various levels of economic activity in the area. Post-depositional migration of PCBs is equally observed.

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