these reactors have simply been discarded at sea. In the post-9/11 era priority needs to be given to international negotiations leading to increased support for Russia's nuclear waste cleanup and the safeguarding of these wastes. This critical effort is being addressed far less comprehensively and quickly than it needs to be. Russia's understandable security agenda complicates the issues, and NATO's march eastward has very likely not helped. This is a very important paper with much sobering content. Given the extraordinary time length of the toxicity of some radioactive materials now concentrated in and around the Kola Peninsula, Barents Sea and on and around Novaia Zemlia Island regions, the "shelf life" of this chapter and hence the entire volume deserves to be and will be long indeed!

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Three major human-induced environmental degradation problems in the former Soviet Union have been on the central international stage for decades now. The first, dating from the late sixties and early seventies, was the pollution threat to Lake Baikal, the second was the shrinking of the Aral Sea, and the third has been a myriad of nuclear waste and contamination threats, triggered by the Chernobyl nuclear power plant accident in May 1986. The Baikal pollution problem was geographically confined essentially to the Russian Federation (except for some upstream Mongolian sources of water pollution in Lake Baikal's tributary basins). Its international significance, thus, was due to the prominence of Lake Baikal as the largest volume freshwater lake in the world and its renowned purity. The transnational geographical extent of Chernobyl's nuclear waste fallout instantly made it an international issue, as are the continuing Soviet-Russian nuclear waste problems, including the disposal at sea of spent nuclear waste and decommissioned reactors. The legacy of the Cold War and nuclear waste security make the Soviet-Russian nuclear waste an ongoing critical international concern.

Ironically; the disappearing Aral Sea began as a domestically confined, but interlinked, series of human-induced environmental problems. However, with the breakup of the Soviet Union, the Aral Sea Basin's problems overnight became international, affecting all five of the former Soviet Union's Central Asian Republics. In this regard, the Aral Sea Basin's environmental problems date back to Lenin's plans to transform nature in Central Asia followed up by Stalin's extensive forced development plans (never brought to fruition) to reverse the flow of major northward flowing Russian rivers to bring water to Central Asia and to divert the inflow of the Aral Sea's two major tributaries, the Syrdarya and Amudarya, for irrigation to make Central Asia into a cotton and rice producer "colony-like" region serving the textile industries and labor force of Soviet Russia's European core. These environmentally shortsighted economic development plans of the Soviet era have now raised conflicts amongst the independ-
ent five Central Asian Republics. For example, energy-starved Kyrgyzstan needed to have its river water upstream in the Syrdarya basin flow through its electricity generating turbines in the winter-time whereas downstream Uzbekistan needed these same headwaters stored for release for irrigation during the summer-time cotton and rice growing seasons.

Space does not permit a systematic review of the contents of each of the volume’s thirteen excellent chapters contributed by prominent Russian or Central Asian researchers from a variety of scientific disciplines and research institutes, all of whom have long been studying the Aral Sea’s problems. The volume’s editor, Michael Glantz, is from the National Center for Atmospheric Research (NCAR) in Boulder, Colorado. The comprehensive project, which began in 1994 with support from the United Nations Environmental Program (UNEP), treats the following aspects of the Area Sea basin’s problems: landscape changes, changes in sea water quality and quantity, variations in stream flows, changes in biota, desertification processes, regional climate change, biotic and physical changes in the deltas, human health problems, political ideological changes pertinent to the environment, fisheries, and the environmental impacts of the Karakum Canal.

Each of the authors does a remarkably good job of adhering to a systematic framework which Glantz outlines in his introductory chapter entitled “Sustainable development and creeping environmental problems in the Aral Sea region.” Not surprisingly, this framework starts with the concept of “creeping environmental problems” and moves on to an elaboration of multistage thresholds of change. These thresholds are constituted by a progression of awareness that begins with an awareness of a change in the environment, followed by awareness that this change had become an environmental problem, then awareness that the problem had become a crisis, next an awareness that the crisis called for action. The chapter ends with, and a discussion of the actions actually undertaken to address the crisis.

In summary the creeping environmental problems discussed in this highly authoritative volume include: the approximately 17-meter drop in the level of the Aral Sea in about 35 years; an 80 percent reduction in the sea’s volume; the two-thirds reduction in the area of the Aral Sea (now actually two separate water bodies); the dramatic increase in the sea’s average salinity (from about 10 grams/liter in 1960 to 60 grams/liter in 2000 whereas the average oceanic salinity is 35 grams/liter); increases in the cotton sown areas between 1940-86 ranging from 2.22-fold in Uzbekistan to 4.30-fold in Turkmenistan; increases in the land under irrigation ranging from nearly 1.83-fold in Uzbekistan to over 2.97-fold in Turkmenistan; dramatic decreases in the volumes of the Amudarya and Syrdarya discharge flows into the sea – completely disappearing in some years; steep declines in the water quality in the rivers and sea because of fertilizer, herbicide, and other pesticide contamination in the irrigation return water runoff; biologic degradation of the formerly highly productive deltas of the Amudarya and Syrdarya rivers; decimation of the fisheries; and major negative impacts on human health and highly elevated levels of disease, especially for the approximately one million people living in the semi-autonomous republic of Karakalpakstan in northwest Uzbekistan and in Dashovuz in Turkmenistan.