17. CASE STUDY: DIELDRIN ATTACK IN DALYAN LAGOON

Ali Erturk¹, Robert B. Ambrose, Jr., P.E.², and Brenda Rashleigh²

¹Istanbul Technical University, Faculty of Civil Engineering, Department of Environmental Engineering, 34469 Maslak, Istanbul, Turkey
²U.S. Environmental Protection Agency, 960 College Station Road, Athens, GA 30605, USA

17.1. Background

During the first two weeks of December of 2005, NATO sponsored an Advanced Study Institute (ASI) in Istanbul, Turkey. Part of this ASI involved a case study of a terrorist attack, where a chemical was assumed to be dumped into Sulunger Lake in Turkey. This chapter documents the response developed by the ASI participants to this scenario, in terms of hydrodynamic transport, ecosystem effects, and decision making.

17.1.1. ATTACK SCENARIO

At midnight (1 March 2006 at 0:00 a.m.), 10 tonnes of 50% pure dieldrin powder was spilled into the Eastern arm of Sulungur Lake (Figure 1) in a terrorist attack. The entire load of dieldrin mixed into the water within 8 h. Dalyan Lagoon and its vicinity are well-known tourist sites, and aquaculture in the lagoon is an economically important activity.

An Emergency Response Team (ERT) was established to develop an efficient action plan that minimizes damage to human and ecosystem health. Hydrodynamics and eco-toxicology experts were involved in order to provide information about the expected transport and transformation of the contaminant in this system, and the potential toxic effects on the ecosystem. The objectives of this exercise were to prepare, run, and interpret operational toxicant models of the Dalyan Lagoon System, predict the effects of the terrorist attack, and make appropriate short and long-term recommendations to protect human and ecological health.

17.1.2. DESCRIPTION OF DALYAN LAGOON

The Koycegiz Lake-Dalyan Lagoon System is situated in the southwest Mediterranean coast of Turkey. The watershed of interest, shown in Figure 2, covers approximately 1200 km². It consists of two subsystems, Koycegiz Lake
Figure 1. Map of the lagoon and location of the toxicant spill

Figure 2. Location of Koycegiz-Dalyan Watershed and the sub-basins