

HUMAN HEALTH AND ENVIRONMENTAL DISASTERS

This lecture course will examine six of the world's worst man-made disasters caused by human error, expediency, greed or other reasons. We will review the historical background, causes, the health and environmental effects, the legal responsibility to victims, and ramifications and/or regulatory changes due to each disaster. Chemical toxicity to humans and environmental species will be also be examined. The first lecture will be an introduction to the discipline of toxicology (for background see the slides at <https://www.toxicology.org/education/edu/educators.asp>), using examples of different toxins from among those experienced in the disasters. The remaining lectures will include an in-depth presentation of the details of each disaster. No knowledge of science is required. The final lecture will be a discussion of the course.

The following major disasters will be covered:

- Minamata Bay, Japan, 1950s: From 1932-1968 Chisso Chemical plant knowingly dumped methyl mercury into Minimata Bay, killing fish due to mercury poisoning and contaminating the food supply, harming people. Many people consuming the fish developed a neurological disorder, named "*Minamata Disease*." There were thousands of injuries and hundreds of deaths and birth defects.
- Seveso, Italy, 1976: On July 10, 1976 an explosion at the Icmesa chemical plant accidentally released a toxic cloud containing one of the most lethal substances known, dioxin. Thousands of animals and birds died and hundreds of residents were sickened. The release of the cloud and the eventual disposal of contaminants is a story of coverup and intrigue.
- Niagara, NY, USA, 1978: The Hooker Chemicals and Plastics Corporation dumped 21,800 tons of chemical wastes, including polychlorinated biphenyls, dioxins and long-acting pesticides into a 16-acre ditch, called Love Canal, from 1942-1958 in Niagara, NY. The city bought the land contaminated for a new school. The discovery and aftermath of the pollution occurred from 1978 to 1985. Numerous children and adults were harmed, ultimately resulting in multi-million-dollar lawsuits and the EPA's establishment of the Superfund Act with Love Canal as a cleanup site.
- Bhopal, India, 1984: On December 2-3, 1984 an explosion at the Union Carbide Corporation chemical plant released the deadly gas, methyl isocyanate, exposing 500,000 people living nearby and producing 3,787 deaths and permanently disabling effects in ~3,900 survivors. An investigation determined that numerous safety violations were present at the plant.
- Chernobyl, Ukraine, 1986: The Chernobyl disaster was caused by a nuclear accident that occurred on April 26, 1986, at the No. 4 reactor in the Chernobyl Nuclear Power Plant, near the city of Pripjat in the north of the Ukrainian SSR. It is considered the worst nuclear disaster in history and was one of only two nuclear energy accidents rated at seven—the maximum severity—on the International Nuclear Event Scale (the 2nd was the 2011 Fukushima Daiichi nuclear disaster in Japan).

- Deepwater Horizon, Gulf of Mexico/USA. On April 20, 2010 an explosion on the Deepwater Horizon oil rig, operated by BP, caused a fire and release of 4.9 million barrels of oil in the Gulf of Mexico. It is considered to be the largest marine oil spill in the history of the petroleum industry. The well was sealed on Sept. 19, 2010, but not before devastating marine life, birds, coastal shores and the water itself. BP was fined \$5.5 billion under the US Clean Water Act.

A reference list will be distributed using available online sources and documents. No books will be required.

Leader: Dr. Myra L. Weiner is a well-known, board-certified toxicologist who worked for a major chemical company for 30 years, then as an independent consultant. She was responsible for evaluating the safety of a variety of products (pesticides, food additives, industrial chemicals, and consumer products) for regulatory agencies and clients.

Mondays: 1:00 to 3:00 p.m., 8 weeks: February 22 through April 12

Maximum: unlimited