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Estimates of the Rates at Which Crude Oil Seeps Naturally Into the Oceans

The U.S. National Academy of Sciences (NAS) completed studies in 1975, 1985, and 2002 of the sources, fates, and effects of crude oil in the marine environment. One component of these studies is natural oil seeps. In 1975, the estimated rate of natural seepage of oil into the oceans ranged from 200,000 to 6,000,000 mt/a (metric tons per year), with a 'best estimate' of 600,000 mt/a. In 1985, a revised estimate ranged between 20,000 and 2,000,000 mt/a, with a 'best estimate' of 200,000 mt/a. This revised estimate did not imply that seep rates decreased, but rather reflected a different approach for making global estimates. For NAS (2002), we reassessed the global rate of crude-oil seepage. Although only a few new seeps were identified and estimates of known crude-oil deposits throughout the world have not changed greatly, new technologies, particularly remote-sensing techniques, have improved seep detection and assessment. Studies offshore from North America, particularly in the Gulf of Mexico and offshore southern California, resulted in an estimate of 160,000 mt/a for North American waters, which is only 40,000 mt/a less than the 1985 global estimate, suggesting that this 1985 global value of 200,000 mt/a was underestimated. To accommodate the new information, the 'best estimate' of the global crude-oil seepage rate was revised upward to the 1975 value of 600,000 mt/a, with a range of 200,000 and 2,000,000 mt/a, influenced by the amount of crude oil seepage estimated for North American waters and the amount ultimately available for natural seepage.