Radionuclides (from Nuclear Power Plants)

Radionuclides are radioactive products from nuclear reactions. Radionuclides are a source of ionizing radiation that can cause biological impacts in humans and other species. For this analysis, the focus is on radionuclides from the routine operations of nuclear power plants in and adjacent to New Jersey. Iodine-131 is of particular interest because it is the most abundant radioactive isotope measured at nuclear power plants. While this analysis evaluates the risks from nuclear power plants, there are many other sources of radionuclides and ionizing radiation. The New Jersey Comparative Risk Project has separate analyses for Radium and Radon and for Catastrophic radioactive releases from nuclear power plants.

What’s at risk?
All species are at risk from the effects of ionizing radiation although this report focuses on the impacts to human populations. The populations at greatest risk of exposure to radionuclides from nuclear power plants are those living closest to the facilities. There is one nuclear power plant in Ocean County (Oyster Creek) and three in Salem County (Salem I and II, and Hope Creek). New Jersey is also in close proximity to nuclear power plants in other states.

What are the human health impacts in New Jersey?
Ionizing radiation is most notably associated with the induction of cancer. Other health effects include genetically associated disorders, developmental abnormalities and some degenerative diseases. While humans are exposed to levels of ionizing radiation that may result in these health affects, nuclear power plants contribute only about 0.1% of the total exposure (most exposures are from natural and medical sources) and national studies show no evidence of increased cancer or other radiation impacts in those populations living near nuclear facilities. Even accidental releases such as occurred at Three Mile Island in 1980 did not result in notable increases in health affects associated with ionizing radiation.

What’s being done?
Radiation releases from nuclear power plants are monitored by the DEP Environmental Surveillance and Monitoring Program. The data includes monitoring for specific radionuclides in the immediate vicinity of each facility. In addition, the operations of nuclear power plants, including releases, are regulated by the Nuclear Regulatory Commission. The releases from New Jersey facilities are far below allowable standards set to protect human health.