

Jarvis, C.M. 2005. An Evaluation of the Wildlife Impacts of Offshore Wind Development Relative to Fossil Fuel Power Production. Master's Thesis, University of Delaware. 123 pp.

Abstract: Off the eastern coast of the United States lies a unique and untapped natural resource that has only recently been recognized: offshore wind energy. Hailed by many as a clean, virtually limitless source of renewable energy, offshore wind energy has great potential for reducing air pollution, lessening the United States' dependence on foreign oil supply, and mitigating the impacts of global climate change. The promises of offshore wind energy, however, are not without pitfalls. Potential adverse impacts on local and migrating wildlife species are frequently cited as an important issue of concern when considering the development and siting of an offshore wind facility. These concerns are not without merit: impacts to wildlife species may occur during all phases of offshore wind development, and include habitat alteration, habitat displacement, increased levels of underwater noise and vibration, and in some cases, mortality.

While public opposition to offshore wind development often focuses around concerns for wildlife species, current methods of energy production, such as fossil fuel power plants, impact wildlife species as well. These impacts include the annual entrainment and impingement of billions of aquatic organisms on a power plant's cooling water intake screens, thermal pollution resulting from the discharge of heated cooling water back into the water body from which it was withdrawn, habitat alteration from the extraction, processing, and transportation of coal or oil to a power plant, heavy metal contamination of aquatic environments from air emissions, and the acidification of aquatic and terrestrial habitats.

This thesis compares the wildlife impacts of offshore wind development to the wildlife impacts of fossil fuel power production. Such a comparison has, to date, been absent from the debate over offshore wind technology. This research attempts to better understand the wildlife impacts of offshore wind energy, and inform the debate over offshore wind power, by considering the wildlife impacts of the proposed Cape Wind facility (off Cape Cod, MA) in light of the wildlife impacts of the nearby Brayton Point power plant (Somerset, MA). These two facilities are geographically proximate and serve the same power pool. Data were obtained from existing literature, including grey literature, rather than from field measurements. Quantitative comparisons were adjusted for differences in electrical output between the two power plants.

This research concludes that from a quantitative perspective, Brayton Point has a larger impact on wildlife species than Cape Wind. The former includes hundreds of birds killed by oil spills, thousands of acres of land disturbed, and billions of fish, fish larvae, and fish eggs killed annually by entrainment, impingement, and thermal discharge. The effects of acid precipitation and heavy metal contamination are also known to have long-lasting impacts on wildlife species, including habitat exclusion, physical impairment, and reduced breeding potential. While offshore wind facilities are not without their own set of adverse impacts on wildlife species, these impacts must not be viewed in isolation. It is only when the wildlife impacts of offshore wind development are compared relative to those from fossil fuel power production can they be truly understood.