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Commercial Shipping and Offshore Wind: A Costs-Benefit Analysis of Modifying Shipping Routes in the Mid-Atlantic

The US mid-Atlantic ocean waters are highly utilized areas that are increasingly required to accommodate a diverse range of human uses, with commercial shipping being one of the major and growing sectors. Consequently, the mid-Atlantic is home to numerous seaports, accessible to more than 60% of the US market, and the commercial shipping industry that provides invaluable services reaching far beyond the region's boundaries and generating significant revenues for state and local governments. The region is also rich with offshore wind resource, and several wind power projects are already in different planning stages. Conflicts between wind development and coastwise shipping are a pivotal area of concern due to the shipping industry's sheer volume, rate of growth and importance to the US economy. Already, due to poorly informed initial site-selection, some wind energy lease areas were proposed to be located either in or at the seaward terminus of existing navigational Traffic Separation Schemes (TSSs). Other lease areas were placed near or in the traditional vessel routes used on Atlantic coastwise transits. This has created unnecessary controversy and confusion among the shipping industry, offshore wind developers, and the public, and delayed offshore wind development off of some states. These and other potential conflicts will have to be resolved before rapid deployment of offshore wind facilities can commence.

In this study, I will determine whether directing ships to transit farther offshore results in net societal benefits and thus whether modification to the current vessel routes is justified. More specifically, I will determine whether additional costs that will accrue to the shipping industry in the form of increased labor and fuel costs are lower than the cost savings from developing offshore wind projects in shallower waters (cheaper foundations, lower transmission, and operations and maintenance costs). The proposed methods include: 1) GIS analysis using Automatic Identification System (AIS) shipping data to identify suitable areas in deeper waters for ships to transit and 2) cost-benefit analysis to identify and compare the direct costs for the shipping industry and the cost savings for the wind projects. Furthermore, additional analysis of indirect costs and benefits will be conducted regarding the differences in external effects of shipping and offshore wind power, such as changes in emission levels due to longer vessel voyage times, displaced emissions through wind-generated electricity, and health effects caused by additional emissions from the shipping sector.