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| **Testing the robustness of optimal access vessel fleet selection for operation and maintenance of offshore wind farms** |
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| **Abstract** | Optimising the operation and maintenance (O&M) and logistics strategy of offshore wind farms implies the decision problem of selecting the vessel fleet for O&M. Different strategic decision support tools can be applied to this problem, but much uncertainty remains regarding both input data and modelling assumptions. This paper aims to investigate and ultimately reduce this uncertainty by comparing four simulation tools, one mathematical optimisation tool and one analytic spreadsheet-based tool applied to select the O&M access vessel fleet that minimizes the total O&M cost of a reference wind farm. The comparison shows that the tools generally agree on the optimal vessel fleet, but only partially agree on the relative ranking of the different vessel fleets in terms of total O&M cost. The robustness of the vessel fleet selection to various input data assumptions was tested, and the ranking was found to be particularly sensitive to the vessels' limiting significant wave height for turbine access. This is also the parameter with the greatest discrepancy between the tools, implying that accurate quantification and modelling of this parameter is crucial. The ranking is moderately sensitive to turbine failure rates and vessel day rates but less sensitive to electricity price and vessel transit speed. |
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