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Marine mammals and tidal turbines: what are the issues of concern and how are they being resolved?

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The potential risks of marine mammals being injured by being hit by tidal-stream turbines, or of vacating significant areas in an attempt to avoid them, are among the most pressing environmental consenting issues facing this emerging family of technologies. Unfortunately, due to the inherent difficulties of studying marine mammal distribution and behaviour underwater, as well as the novelty of the machines themselves, information upon which to base robust impact assessments is extremely limited. Consequently, a variety of research projects in several countries are underway to address these data gaps and investigate different components of these questions. In this presentation we review potential marine mammal-related issues including collision and injury risks, acoustic impacts, displacement, barrier effects and attraction. We then outline what research approaches are being applied and how they relate to one another. The novelty of these challenges, especially working in waters flowing at velocities approaching research vessel speed, has prompted the development of several innovative scientific tools as well as focussing effort onto a previously little studied habitat. These efforts may also tell us much about how marine mammals use such sites, which due to increased density through geographical bottleneck effects, can be perceived as being disproportionately important. There are, however, challenges for the research community to keep pace with the industrial developments themselves, to learn from the many globally dispersed initiatives and to continue research on potential impacts once initial funded consent-to-operate licences have been issued.