Using video game technologies to better understand impacts of offshore wind on marine life

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Understanding and modelling the impact of offshore wind on marine life can be complicated due to the nature of Ecological data. We currently rely on snapshot surveys from digital/visual aerial or boat-based surveys, or tracking data which are limited in scope. These data are then used to parameterize collision risk models, which also have several inherent disadvantages including: a lack of transparency, assumptions about parameters, and unexplored uncertainties stemming from statistical distributions associated with the physics of bird collisions. Digital twin and video game technologies have advanced rapidly in the past two decades, with much of the work on digital twins coming to light in the past 3 - 5 years. Because of the in-built physics of video game engines and ability to integrate these with digital twins of natural environments, collision risk modeling can now be performed in a way that removes uncertainty and helps with stakeholder engagement through visual story-telling. Here, we discuss the progression of collision risk modelling from early days of Excel spreadsheets, to R-based packages for coding, to digital twins and how they are changing the face of CRMs and thus the environmental impact assessment process as well as our understanding of how marine birds are impacted by offshore wind development.