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## Is first-hand fieldwork still the best way into a career in marine sciences? Highlighting digital twinning of the oceans as a complementary and more inclusive pathway into a career in the marine sciences

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Participation in offshore fieldwork is a frequent pathway into a successful career in marine science due to the unique opportunities for practical skills development provided by such field experiences. However, the ability to participate in scientific research cruises can be hindered for those from certain backgrounds, such as physically disabled scientists with mobility limitations, those with caring responsibilities who cannot spend extended periods of time away from home, and early career researchers from minority groups who may perceive the limited confines of a research ship as a hostile or unwelcoming environment.

Digital twinning is a new and rapidly developing area that describes how technologies and capabilities, including modelling, remote sensing, and linking shipboard equipment to shore visually in real-time, can be intertwined with traditional offshore operations to promote inclusivity and broaden the diversity of people involved in marine sciences. Here we will present preliminary results from our project that explores whether perceptions of fieldwork as a requirement for a career in marine science exist and whether jobs in marine science explicitly require these skills and experiences. Perceptions of fieldwork were evaluated through a series of questionnaires and semi-structured interviews with prospective marine scientists at undergraduate and PhD level. Additionally, we also conducted a systematic review of advertised vacancies in marine science to determine how perceived requirements for a career in marine science differed from the advertised required skills and experience. Finally, we collated several case studies of effective use of digital twinning as a tool to enable those who cannot access offshore fieldwork to participate in scientific cruises. We aim to use these case studies to highlight the potential for digital twinning to act as a complimentary route into the field and act as an evidence base for continued investment

in, and development of, new technologies to facilitate equitable and inclusive marine science.