



# Digital Twinning:

An opportunity to improve diversity and inclusivity  
in marine science

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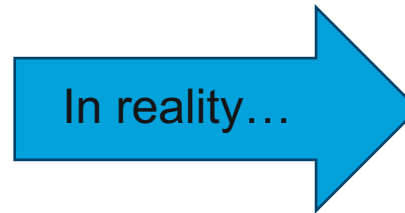
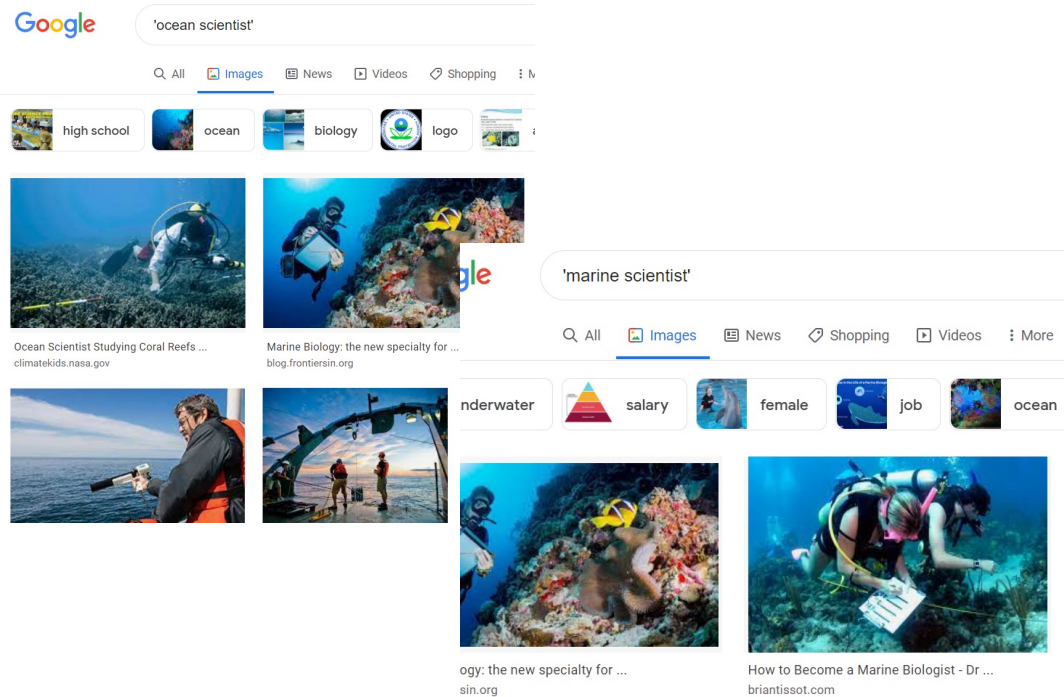
# Evaluating perceptions of job roles in marine research and raising awareness of digital twinning of the oceans to promote diversity and inclusivity in the marine sciences

## Study Motivation

- Fieldwork is seen as entry-way into marine science career
  - *Job advert and image analysis*
  - *Surveys*
- Barriers to fieldwork (not an exhaustive list...)
  - Caring responsibilities
  - Physical mobility (physically demanding and negotiation of vessels)
  - Mental health (removed from support structures, hostile environment – cold, isolated, fear of failure)
- How can we raise awareness of digital twinning as a complementary approach to traditional marine science fieldwork?



# Perceptions of Marine Science



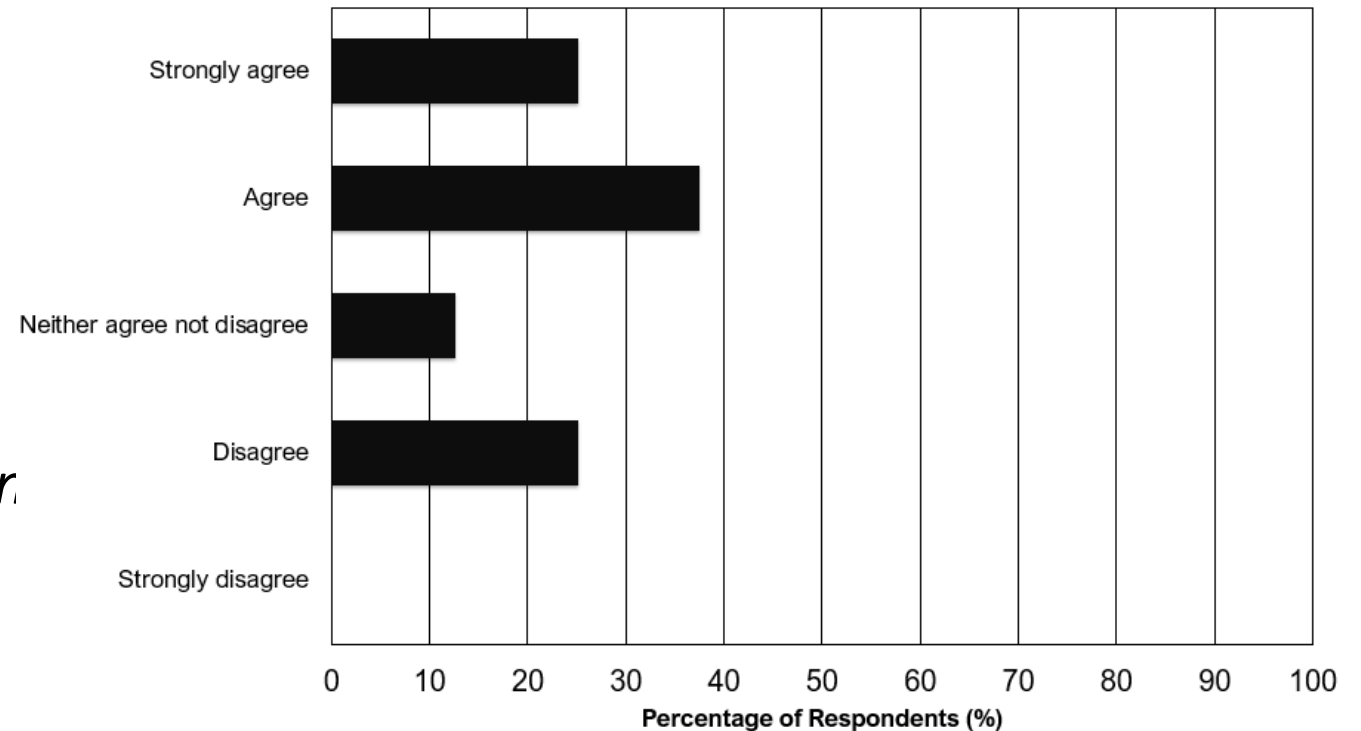
***Marketing of the discipline does not match up with the range of skills required***

***[Mol & Atchison, 2019]***

# Perceptions of Current Marine Scientists

- Fieldwork is seen as an entry-way into a marine science career
  - *'Participating in fieldwork isn't needed for a career in marine science - that's not the barrier to EDI&A. The barrier is the perception amongst ECRs that you can't be a marine scientist without doing fieldwork.'*

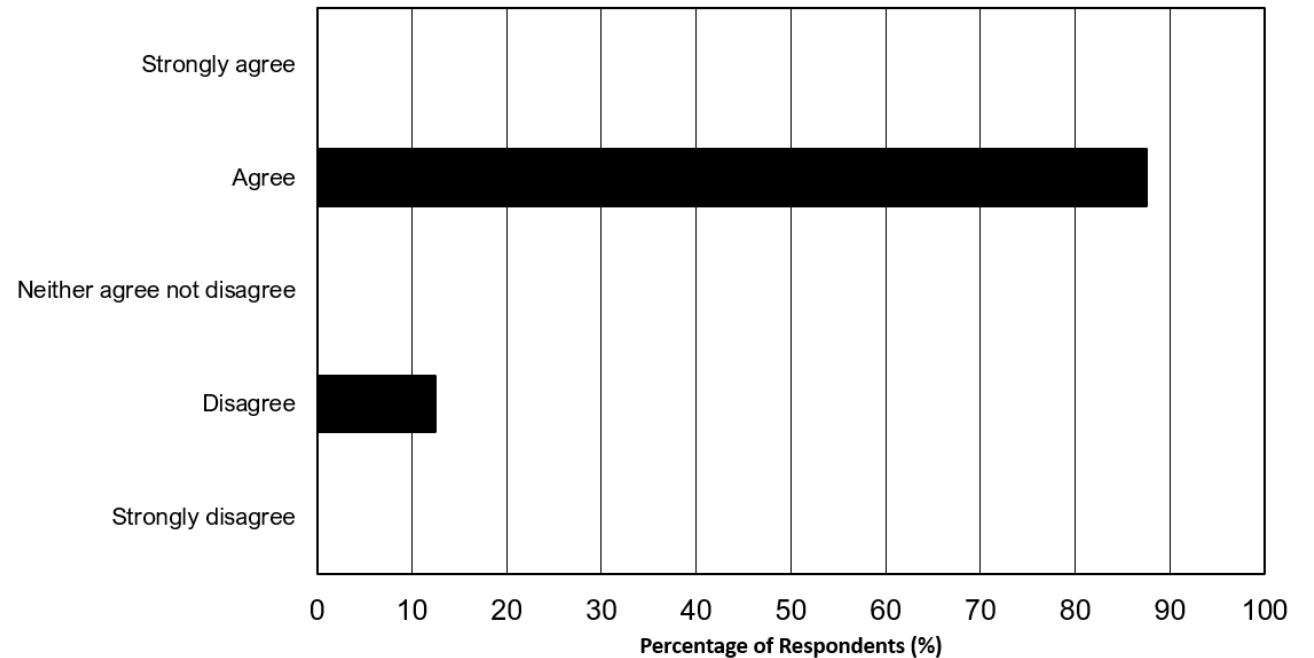
Question: In order to completely understand marine science, some time spent at sea is essential.



# Digital twins to complement traditional marine science fieldwork

- Digital twins will provide a more accessible ocean both to those in the marine science and those who interact with it
- Incorporating digital twins has to be included at the proposal stage
- Raising awareness at the senior scientists/ PIs level

Question: I can see aspects of my research that would become accessible to more individuals from diverse backgrounds through involving digital twinning.



# Digital twinning to complement traditional fieldwork

## Advantages

- More targeted fieldwork – better use of expensive ship time
- Less ship time overall? Reduce carbon emissions from fieldwork (e.g. NZOC)
- Increase participation without adding more berths on ships
- More inclusive, promoting diversity in marine sciences
- Can reduce burnout for those at sea

## Challenges

- Understanding digital twinning
- Acknowledging EDIA issues
- Changing traditional approaches and perceptions of established scientists
- Technical challenges (i.e. internet/ bandwidth)
- Different skill sets required
- Changing perceptions for students/ ECRs
- Supporting ‘upskilling’



# Key Findings

- It is perceived that fieldwork experience is required
- But scientists surveyed do see a role for digital twinning as a complement to fieldwork
- Several challenges to overcome



## Next Steps

Side Event - **Raising awareness of digital twinning as a complementary career path in marine science**

12<sup>th</sup> May 13:00-16:00 (BST)

More information: <https://ditto.geomar.de/events.html>



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