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Insights on flow-structure-seabed interaction gained from laboratory testing

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Offshore marine renewable energy projects require an understanding of sediment mobility as part of an agile assessment of foundation scour. Furthermore, the interaction of hydraulics and geotechnics is key to developing representative scour profiles for design as well as suitable scour mitigation measures where they are required.

At each project location seabed mobility and scour affect the performance of foundations and affect the security of high voltage subsea cables. Where the effects are known they can be addressed in design, or mitigated for during Operations & Maintenance, through monitoring and intervention as part of a Scour Management Plan.

Physical model testing is used to provide underpinning research knowledge for the process based understanding of scour, support for the development of predictive methods, and validation of designs.

The talk will present some insights gained from physical model testing at HR Wallingford's laboratory and, with reference to published data from other laboratories and field cases, cover a range of topics including:

- Scour development and sediment mobility
- Erosion testing and its application to scour modelling
- Sediment transport and bedform migration
- Scour protection and foundation performance
- UXO burial and migration

The talk will be rounded off with a summary of conclusions based on experimental evidence, and highlight some key gaps in research knowledge.