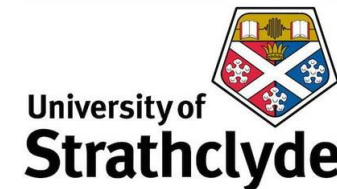# iDrive project: Intelligent Driveability Forecasting for Offshore Wind Turbine Monopile Foundations

9th Sep 2022

iDrive project: Intelligent Driveability Forecasting for Offshore Wind Turbine Monopile Foundations
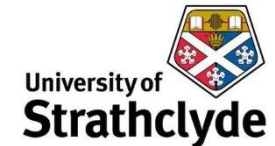
Research team

Dr Brian Sheil
Associate Professor
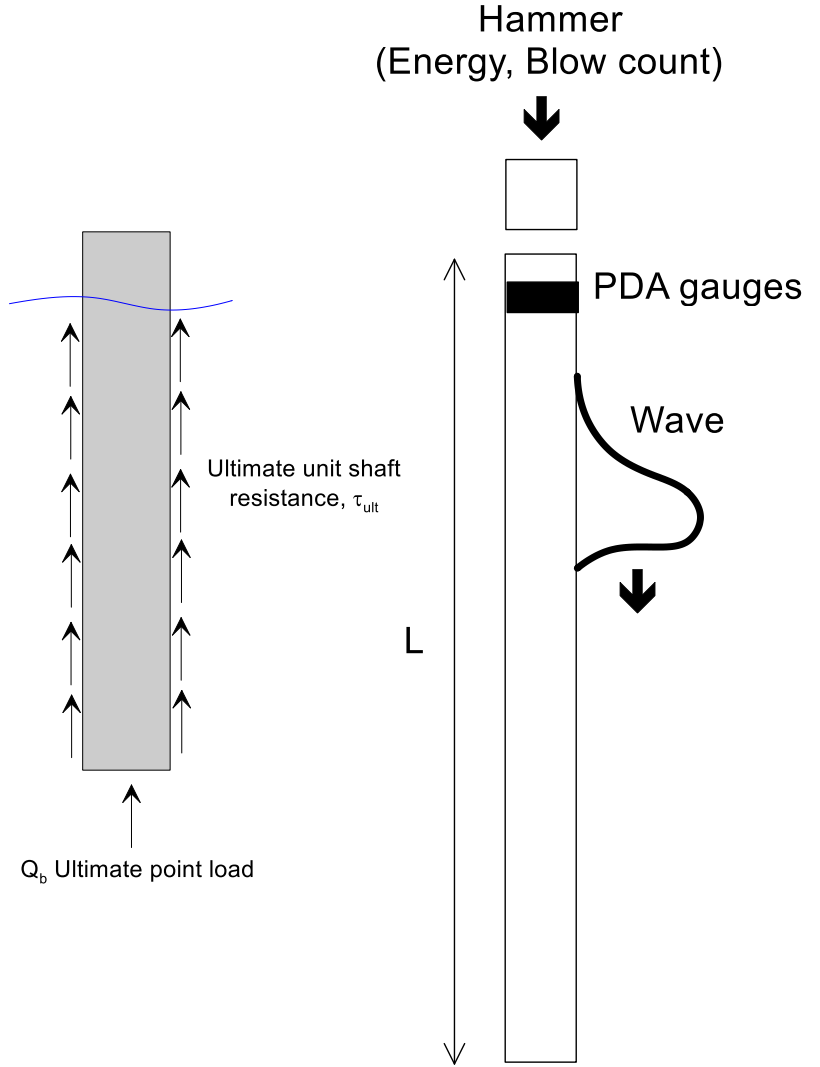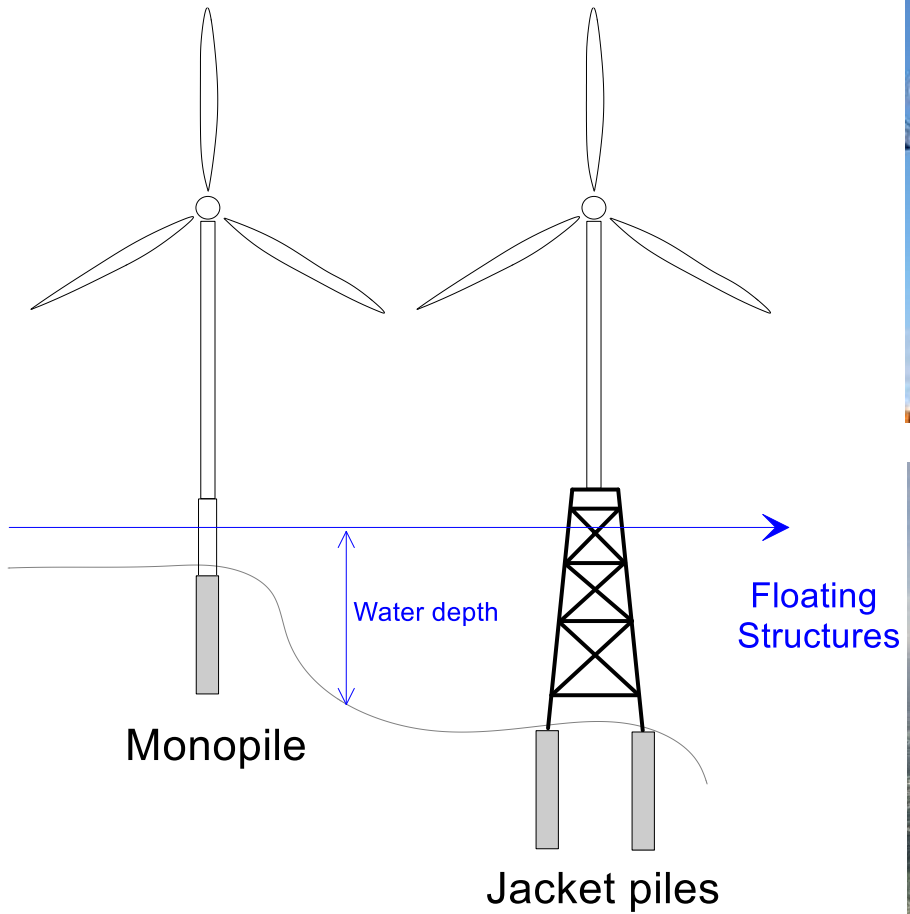RAEng Research Fellow

Dr Róisín Buckley
Lecturer

Dr Stephen Suryasentana
Lecturer
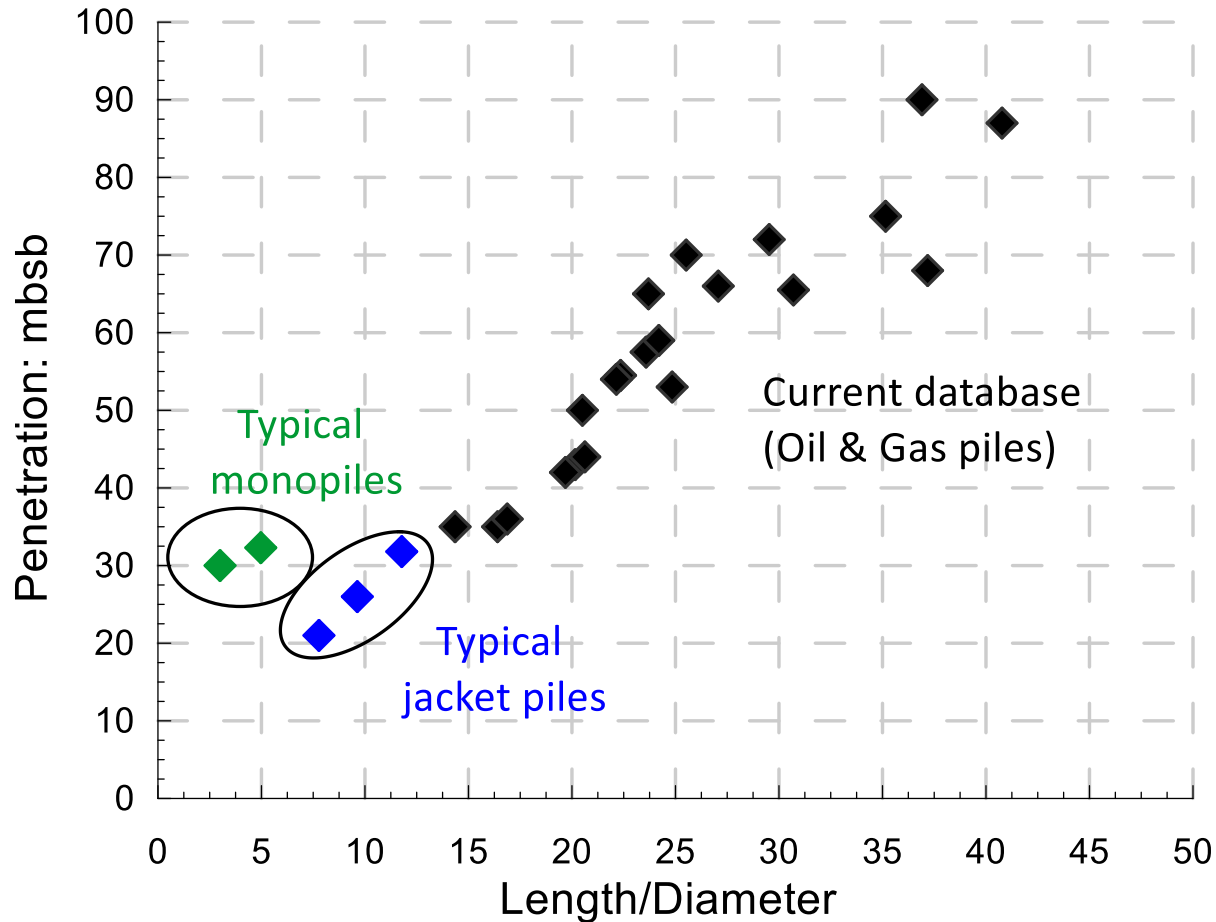
Mr Max Chen
Research assistant

Installation of offshore wind turbine foundations

Monopile

Jacket piles

Floating Structures

Water depth

Hammer (Energy, Blow count)

PDA gauges

Wave

Ultimate unit shaft resistance, τ_{ult}
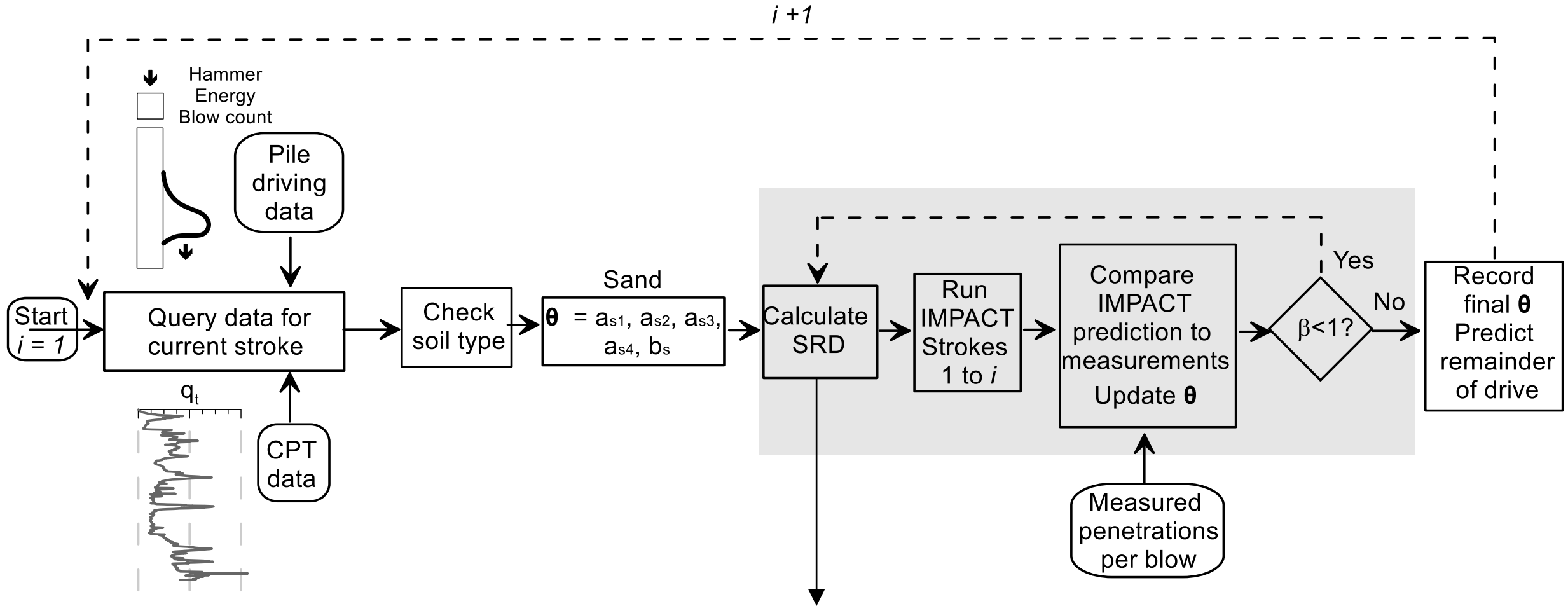
Q_b Ultimate point load

L

Current prediction methods need to be fit for purpose

- New adaptive methods required
- Large database obtained
- Ideal for machine learning
- Focus of iDRIVE project
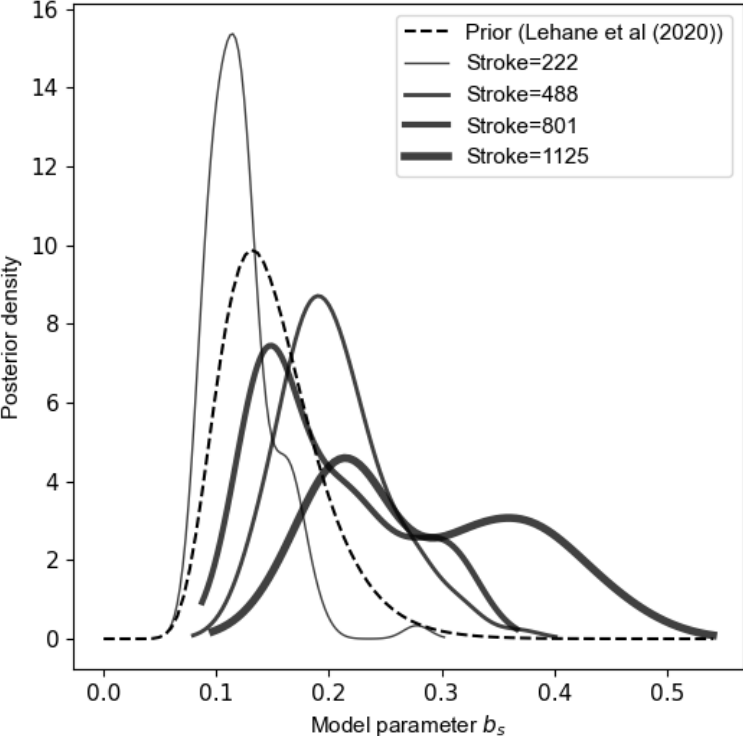
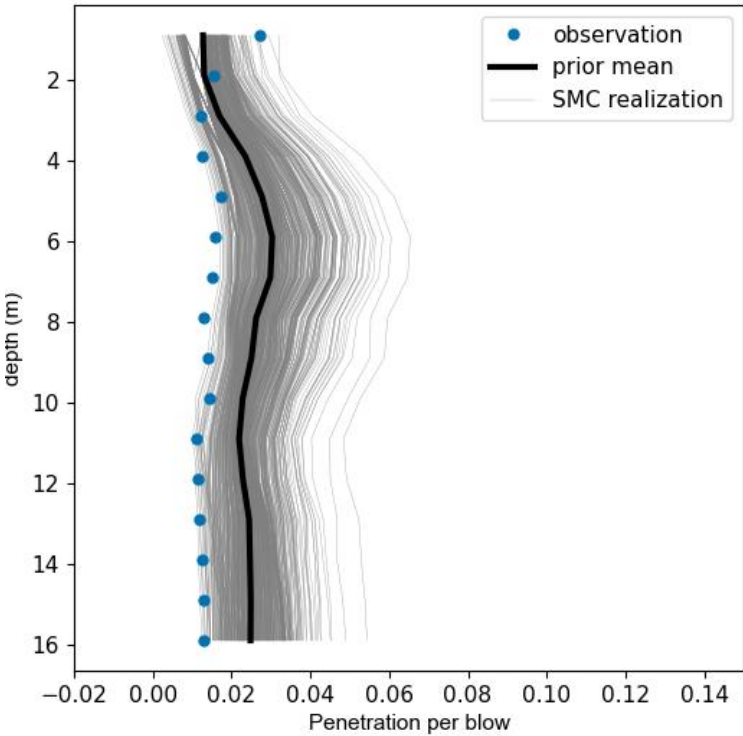# New intelligent pile driveability forecasting

Lehane et al. (2020):
$$\tau = a_{s1} q'_t \left[\max\left(\frac{h}{D}, a_{s2} \right) \right]^{-a_{s3}} \left[1 - \left(\frac{D_i}{D} \right)^2 \right]^{a_{s4}}$$

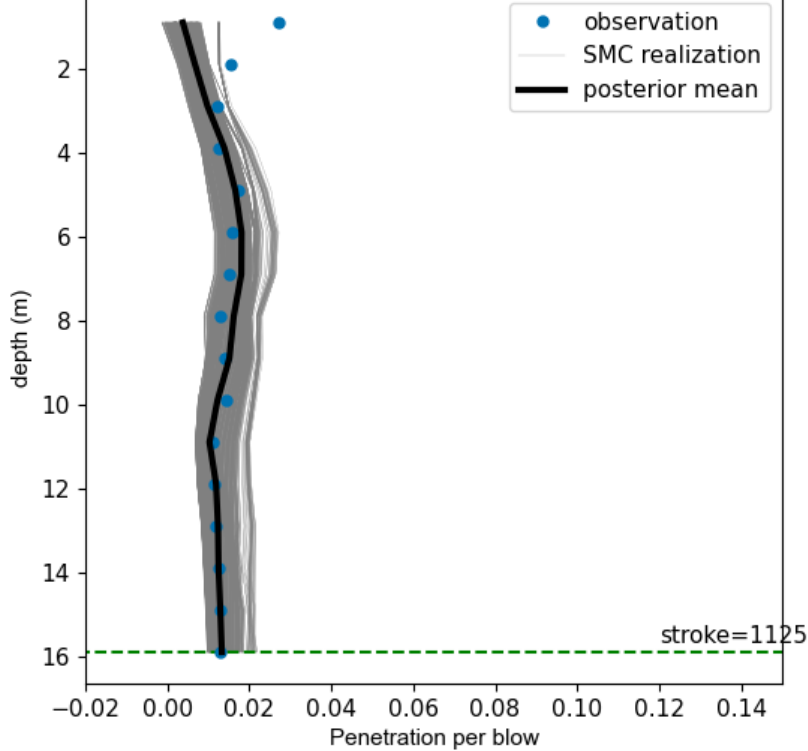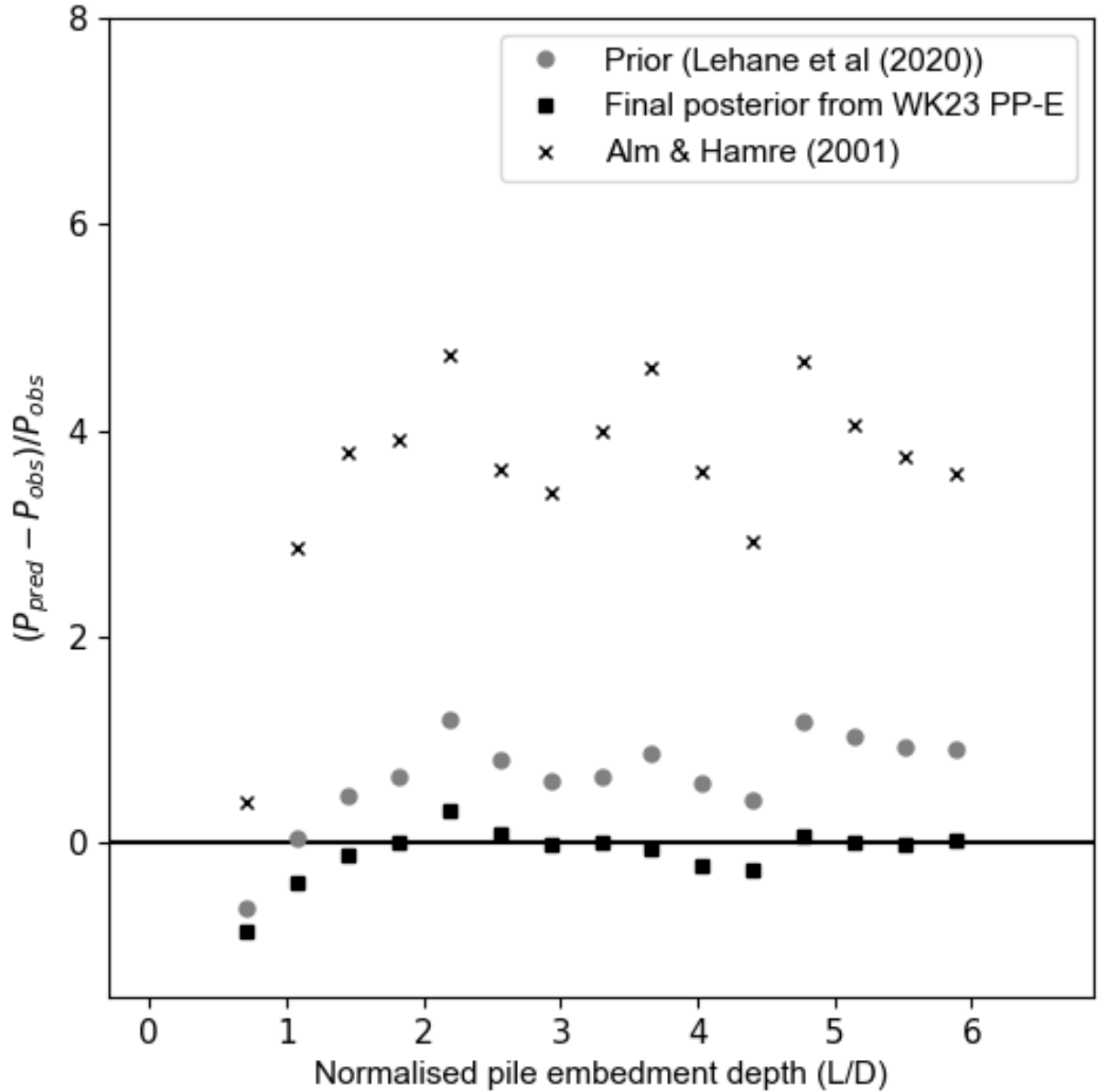# Case study: Wikinger offshore wind farm site

SRD parameter updating

Prior driveability predictions

Posterior driveability predictions

Benchmarking: 'unseen' piles

Conclusions