

# Mission statement

We carry out fundamental research at an internationally recognised standard of excellence in the areas of the mechanics of seabed sediments, offshore geohazards and in offshore foundation and engineering systems. We use our expertise to service the offshore petroleum and renewable energy industries at both a national and international level.

## GOALS

### Research Goals

The principal research aims of the Centre are to identify the key micro-structural response of natural seabed sediments and to establish quantitative links between response and performance of foundation systems and offshore infrastructure. The goals in our key research areas are.

- *Offshore sediments*: To identify the key mechanisms at a micro-structural level that dictate critical aspects of behaviour, and quantify that behaviour with scientifically sound models that capture key features of seabed sediments behaviour.
- *Offshore geohazards and seabed mobility*: To analyse and quantify risks to offshore infrastructure due to geotechnical hazards and to establish a design framework for optimising the choice of foundation and subsea engineering systems, taking risk factors into account.
- *Offshore foundations systems*: To develop conceptual models for the calculation of foundation performance, accounting for the specificity of environment, and to encapsulate these models into unified design methods.
- *Offshore engineering*: To develop coupled fluid-structure-soil models for problems such as multi-footed platforms, scour, pipeline response, deep water riser and moored systems, as well as emerging renewable energy systems.
- *Numerical modelling technology*: To develop the innovative computational techniques and tools necessary to model offshore infrastructure, with a focus on developing computational algorithms capturing multi-phase sediment response, consolidation and strain rate effects in large deformation problems.

- *Physical modelling technology*: To develop innovative physical modelling techniques that deliver research needs relevant to the complexity of offshore sediments behaviour and offshore soil structure interaction.
- *Georisk*: To develop stochastic analysis techniques accounting for natural variability of sediments properties and environmental loadings in the quantifying of risk to offshore foundations and infrastructure.

In addition to the above research aims, there are a number of broader goals that the Centre strives for:

### Service Goals

To be recognised internationally for provision of advice and specialist modelling services to the offshore petroleum and renewable energy industry and to provide a core of people with internationally recognised expertise in the area of offshore foundation systems, geohazards and engineering through PhD programs and post-doctoral training.

### Teaching Goals

To provide a stimulating atmosphere that will attract the highest quality research students at Honours and PhD level, to ensure excellent academic and technical support of their studies and to help develop the specialist offshore consultancy profession in Australia.

### Financial Goal

To attract sufficient research funding from industry and other research grants, to remain self-sufficient and to achieve the research, service and teaching goals of the Centre.