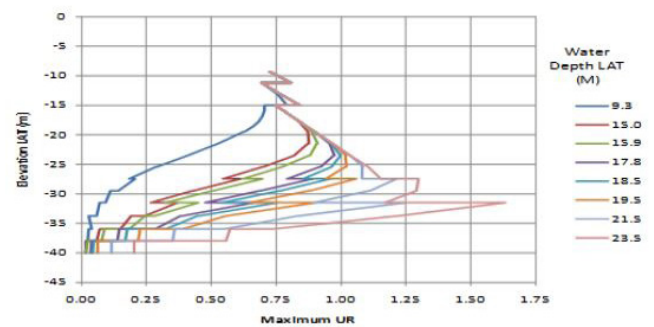
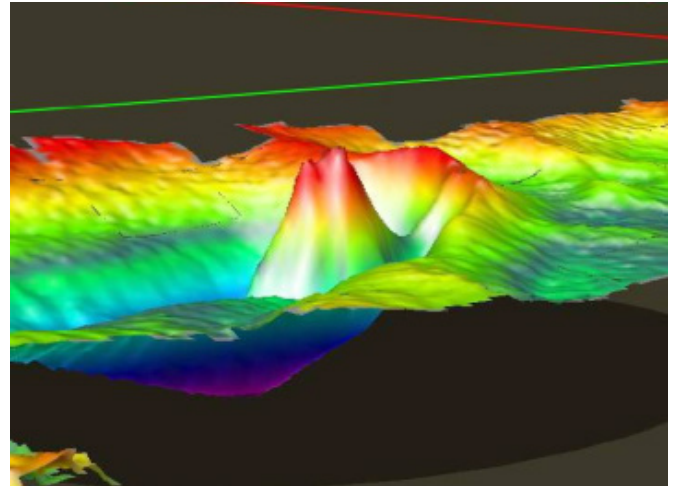


MMI assessed the risk posed to the foundations of offshore wind turbines by increased levels of scour.

Whenever structures are installed on the seabed in areas where there are tidal or other flows, there is the possibility of scour. The designers of offshore wind farms allow for scour in the design of foundations. However, the levels of scour experienced are sometimes greater than those they anticipate.

MMI performed analysis of the foundations at an offshore windfarm where the rate of scour was higher than that anticipated in the design. The work had three objectives;

- To understand the risks of resonance, whereby the natural frequency of the wind turbine structure approaches its rotor's rotation frequency - a consequence of the increased length of the turbine's cantilever due to the seabed scouring away
- To understand the risk of overstressing the turbine structure and the risk of loss of overall foundation integrity
- To determine if remotely monitoring changes in the natural frequency of the wind turbines could be used as a reliable indicator of the level of scour of the foundations



The work concluded that:

- The natural frequency of the turbine structure could be used as an indicator of water depth or amount of scour at the foundation
- That all of the potential problems, e.g. resonance, over stress of structure and loss of foundation integrity will occur at similar levels of scour

