Study predicts Australian seabed response to climate change

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CSIRO scientists view a 3D model of Australia's marine territory. Simulations using Sedsim software were performed to predict the potential impact of climate change on the seabed. Image: CSIRO

(PhysOrg.com) -- CSIRO scientists have produced the first preliminary predictions of the potential impact of climate change on the Australian seabed.

The results of the five-year study predict potential high-risk areas due to seabed movement, erosion and changes in reef growth.
According to CSIRO Wealth from Oceans Flagship project leader Dr Cedric Griffiths, the interaction between the ocean and the seabed is poorly understood.

"We have more information about the surfaces of the Moon and Mars than we do about the seabed surrounding Australia, let alone the effect

that climate change may have on it," Dr Griffiths said.

"Over 92 per cent of Australia's identified oil and gas resources lie offshore, and will be produced from facilities that are connected in some way to the seabed.

"The lack of knowledge of the magnitude and location of future seabed changes is not only potentially putting our offshore infrastructures, such as petroleum pipelines and platforms, at risk, but can also cause over-design.

"This research can help companies and authorities plan and manage coastal and offshore resources more effectively."

Dr Griffiths and his team applied a numerical sediment transport model called Sedsim to ocean and seabed data, over a range of possible climate scenarios across Australia's entire marine territory. The model, further developed by CSIRO, is most often used to assist offshore petroleum exploration.

Three climate change scenarios were used to conduct simulations from 2000 to 2050.

The extreme scenario model - which assumes highest rainfall, highest sea level rise and maximum sediment flow - indicated that:

• Many offshore oil and gas development sites will be susceptible to increased erosion
• Predicted changes in cyclone activity in the Ningaloo region may cause significant damage to the reef
• Wind-driven waves and storm events in southern regions will lead to increased beach and cliff erosion
• Temperature and salinity changes in northern waters will impact

marine life.

"There are still many uncertainties about future climate change and impacts, however the research provides a useful starting point to discuss possible response strategies," Dr Griffiths said.

"It emphasises the importance of seabed evolution in managing coastal and offshore resources and infrastructure planning and design."

Sedsim has been used successfully in Germany to model coastal changes in the Baltic Sea where the coastline retreats on average 45 metres every 100 years. In Australia, the versatile model will be applied to predict the effects of various disturbances on seabed environments and develop response scenarios and coastal protection strategies.

"We hope to continually improve the model as new data are collected which will give us more accurate predictions for the future," Dr Griffiths said.

Provided by CSIRO (news : web)

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