

## KIMBERLEY TIDES

On 1 May 2002 Kimberley Society heard from Associate Professor Chari Pattiaratchi, who is from the Department of Environmental Engineering, Centre for Water Research, University of Western Australia. He spoke about Kimberley tides in the context of the tidal environment off Western Australia and he structured his superb PowerPoint presentation of more than 60 slides by dividing it into the following segments:

How are tides generated?

- History
- Tidal theory
- Tidal resonance

Tides along the North West Shelf

Tides in Shark Bay

Continental Shelf Waves

Summary

The slides from Chari's presentation can be viewed the UWA Web at [http://www.cwr.uwa.edu.au/~pattiar/Presentations/kim\\_tidesl\\_files/frame.htm](http://www.cwr.uwa.edu.au/~pattiar/Presentations/kim_tidesl_files/frame.htm) using *Microsoft Explorer*.

The presentation showed that WA has interesting tidal phenomena and that the higher tides in the Kimberley are due to tidal resonance and latitude. It also showed the extent to which continental shelf waves present connectivity between Kimberley region and other parts of WA.

In commenting on ancient theories of tides, Chari mentioned the following:

- Arabic explanation was that Moon's rays were reflected off the rocks at the bottom of the sea thus heating and expanding the water, which rolled in waves towards the shore.
- Chinese supposed that water to be the blood of the Earth with tides as the beating of the Earth's pulse or alternatively the tides were the results of Earth's breathing.
- le Galileo (1565-1642): Proposed that rotations of the Earth around and sun and on its own axis induced motions which resulted in the tides

- Descartes (1596-1650): Proposed that space was filled with ether or invisible matter. As the moon travelled around the sun, it compressed this ether in a way that transmitted pressure to the sea: the tides.
- Kepler (1571-1630): was the originator of the idea that the moon exerted a gravitational attraction on the water of the ocean which was balanced by Earth's attraction. However, none of the above theories account for the fact that there are two tides for each transit of the moon.
- Sir Isaac Newton initially proposed modern tidal theory.

The slides accessible on the UWA Web site include:

No. 29 - a dramatic satellite image of Tropical Cyclone Rosita,

No. 41 - a diagrammatic representation of tropical cyclones in the vicinity of the Kimberley in 1999–2000,

No. 42 - a satellite image of the wind field around a tropical cyclone off WA,

No. 53 - a depiction of the Cyclone Track of Naomi, which passed from north to south, crossing the coast south of Broome in December 1993,

No. 57 - a depiction of the Cyclone Track of Rosita, which passed from north-west to south-east, crossing the coast south of Broome in April 2000,

No. 61 - a depiction of the currents in the Swan River Estuary during Tropical Cyclone Rosita

No. 62 - graphs depicting the Effect of Tropical Cyclone Rosita in the Swan River Estuary in terms of salinity, temperature and water depth,

No. 65 - text that explains that, because WA is impacted on average by about five tropical cyclones per year, the resulting continental shelf waves, which last for about 10 days each, can exert an influence for about 50 days over a five-month period.

It is unfortunate that the information delivered verbally could not be captured to go with the slide presentation. The audience received excellent insight into the graphics and left the meeting much more aware of the physical attributes of both tides and tropical cyclones.

*Cathie Clement*