

## THE KIMBERLEY COASTLINE, SCULPTED BY MEGA-TSUNAMIS

On 5 June 2013, our speaker was **Dr Phillip Playford AM** who has worked for both Federal and Western Australian governments as well as the petroleum-exploration industry. He is a former Director of the Geological Survey of WA, and his principal geological research has been in the Canning and Perth Basin areas as well as the Shark Bay area.

Phillip Playford's interest in mega-tsunamis started during a 1977 geological survey that passed by Legendre Island near Dampier in the Pilbara region. He first noticed the tsunami deposits on this island, the only limestone island in the archipelago.

To give a better understanding of the scale of these boulder deposits and at times the distance from the shoreline, Phillip showed a number of photographs. Some were taken from ground level with colleagues standing alongside to demonstrate the size of the boulders. Others were taken from the air to give some perspective to the distance the boulders had been pushed inland.



A 700 tonne boulder 15m above and 150m inland from present sea level, Dirk Hartog Island, Shark Bay. Courtesy of Dr Playford.

Boulder deposits attributed to tsunamis occur at many places along the Kimberley coast, and are thought to have been partly responsible for the intensely jagged nature of that coast. Good examples of such deposits are known at Cape Domett (at the mouth of Cambridge Gulf), West Cape Bougainville and Walmesly Bay (either side of Admiralty Gulf), Lamarck Island (in York Sound), Camden Harbour, and Raft Point.

Comparable tsunami deposits, in the form of huge blocks of limestone lying on flat karstified surfaces, are known from behind coastal cliffs on Dirk Hartog, Dorre, Bernier, and Koks Islands in Shark Bay, Point Quobba on the mainland beside Shark Bay, and Barrow Island and Legendre Island off the Pilbara coast. These mega-tsunami deposits are among the largest known in the world. Some of the boulders that they contain weigh more than 700 tonnes. The boulder deposits at Legendre Island have been reliably radiocarbon dated as about 3,000 years before present.

The origin of the mega-tsunamis is unknown. Each has conceivably been initiated by subduction faulting off the Indonesian Archipelago, an asteroid striking the Indian Ocean, massive slumping of sediments on the continental slope, abrupt movement along faults off the WA coast, or underwater volcanic activity.

These mega-tsunamis were catastrophic events that are likely to have resulted in the deaths of thousands of Aborigines then living in the coastal areas. Aboriginal tradition tells how about 300 people died, and only two survived, when a huge wave (tsunami) passed over the Montgomery Islands, off the West Kimberley, during the early 20th century. If mega-tsunamis, comparable with those that struck the Kimberley, Pilbara, and Shark Bay coasts during the recent past, were to be repeated today, they would have major impacts on communities, towns, and industries in the coastal areas involved.

*Susan Clarkson*