Dinosaur Tracks Offer Window to Ancient Landscapes

Written by Kandy Curran for ScienceNetwork WA on Friday, 16 October 2015

A dinosaur track on the Broome sandstone on Roebuck Bay's coastline. *Kandy Curran*

Researchers are working to reconstruct scenes from 130 million years ago, when Australia was still connected to Antarctica and covered in towering conifer forests, via dinosaur tracks.

When the sun, moon and earth align to produce the biggest tidal range, Dr Salisbury from The University of Queensland and his team of palaeontologists, geologists and roboticists are on the exposed intertidal zone to study the coast where some 16 species of dinosaur once roamed.

The ambitious project aims to digitally catalogue remnant dinosaur tracks over an 80 km stretch of coastline and then use that imaging to reconstruct the ancient landscape that was inhabited by some of the planet's biggest dinosaurs.

These tracks are the only known evidence of dinosaurs along the Broome coast thus far, as the muddy sediment that the dinosaurs walked over has hardened to eventually form sedimentary rock.

"We also want to figure out just how many different types of dinosaur tracks there are in this area to get a handle on the significance of the footprint fauna, because to this point very little detailed work has been done," Dr Salisbury says.

With many only exposed for a few hours each day, and only a few days each year, the team have had to adopt innovative remote sensing technologies to speed up the process.

In addition to making moulds of various tracks with a quick setting silicon rubber, thousands of photographs are being taken using a conventional camera and a low-flying drone.

These images are used to create virtual 3D models that are combined with laser scans from a hand-held LiDAR unit developed by CSIRO.

Geological analysis of various rocks in the area has revealed that many of the tracks seem to occur in the same layer of sandstone, created as seasonal floods inundated low-lying sandbars and floodplains. It was over this muddy environment that the dinosaurs walked and left their tracks.

Dr Salisbury says his team is now beginning to contextualise the tracks over large geographic areas, and can better understand which direction the dinosaurs were travelling, whether they were walking or running, and if they were interacting or crossing the landscape in groups, searching for food, or trying to escape predators.

“One of the really special things about the tracks is that they're part of the creation mythology associated with indigenous law and culture in this area; they're integrated into a song cycle that extends along the coast, with the knowledge of the tracks probably extending back thousands of years".

In an effort to protect, promote and educate the public about the dinosaur tracks of the Dampier Peninsula, Dr Salisbury and members of the Broome community formed a Dinosaur Coast Management Group in 2014.

Dr Salisbury and his team have provided outstanding presentations on their research in the Science on the Broome Coast series, drawing large audiences on both occasions.

The science series, which aims to showcase the exciting research that is underway on Broome’s coast, is an initiative of the Roebuck Bay Working Group and Yawuru Land and Sea Unit, and sponsored by Inspiring Australia, Rangelands NRM through funding from the Australian Government’s National Landcare Program, the Department of Parks and Wildlife and Broome Shire Council.