

## **Dambos: Natural Sediment and Pollutant Traps in Darwin Harbour Catchment**

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- Speaker:** Dr Muhammad Nawaz  
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- Chair:** Professor Bob Wasson  
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NUS
- Date/Time:** Friday, 15 January 2016, 3.30pm – 5.00pm
- Place:** Earth Lab (AS2 02-03), Department of Geography, NUS

### Abstract

Dambos are shallow, seasonally waterlogged valleys without river channels that provide pathways for water to the harbour. There are currently a series of intact dambos within the Darwin Harbour region, which protect the harbour by filtering sediment and pollutants.

Top soil tracer data analysis shows that dambos trap up to 80 per cent of fine sediment, organic material, metals and nutrients that can harm the ecosystems of the harbour. Dambos are important geomorphic features and their high sediment trap efficiency makes them a good candidate for conservation in the face of any forthcoming development proposals for the catchment.

This research leads to a conclusion that the fine sediment being transported in the creeks and rivers that flow into Darwin Harbour comes from channel erosion rather than from sheet erosion of the hillslopes. The contribution of sheet erosion of hillslopes to sediment input to Darwin Harbour is about 20%. This is an important conclusion for the land manager that is based on comparison of the concentrations of  $^{210}\text{Pb}_{(\text{ex})}$  and  $^{137}\text{Cs}$  in the creeks, rivers and corresponding hillslopes for a large set of samples taken in consideration of the spatial variation of the catchment. Both  $<63\ \mu\text{m}$  and  $<20\ \mu\text{m}$  fraction size render the same results i.e., the sediments transported to the Harbour consists of approximately 80% from channel erosion and approximately 20% from sheet erosion of the hillslopes.

### About the Speaker

**Dr Muhammad Nawaz** is a geomorphologist with expertise in Geographic Information System (GIS) and Decision Support Systems (DSS). Since 1993, Dr Nawaz has served in several different universities including Punjab University in Pakistan, and the Faculty of Geoinformation Science & Earth Observation (ITC), University of Twente in Netherlands. He has vast experience and knowledge in design, development, delivery, coordination and teaching of courses related to Physical Geography, GIS and Environmental Science to undergraduate, graduate and postgraduate level students.

Dr Nawaz has over 20 years of research over a broad range of issues relating to catchment management and sustainable development. Before joining NUS, Dr Nawaz worked as Lecturer in Environment Science eLearning at Charles Darwin University, Australia and before this he has worked as Associate Head/Assistant Professor at GIS Centre, University of the Punjab, Pakistan. He has conducted multi-disciplinary research in several catchments including Darwin Harbour and Daly River catchment, Australia, Mangla Reservoir catchment, Pakistan and Saddang Watershed, TanaToraja, South Sulawesi, Indonesia.

Dr Nawaz's expertise includes sediment source identification, multicriteria evaluation, and GIS applications in decision making. Dr Nawaz has been awarded a doctorate degree in Earth and Environmental Science from the Charles Darwin University, Australia, Master of Science in Geoinformatics from the International Institute of Geo-Information Science and Earth Observation (ITC) – University of Twente, the Netherlands, Master of Science in Geography from the University of the Punjab, Pakistan and Bachelors of Science in Geography, Chemistry and Zoology from the Bahauddin Zakariya University, Pakistan.

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