

Water and Environmental Engineering Research Topics

Supervisor(s)	Degree	Preliminary title of research project	Brief description of project	Scholarship per year
Dr Andre Theron	MEng(R)	Theme: Waves, water-levels, climate change	Potential effects of global warming on the regional deep-water wind and wave regimes off the SA East coast & Moz.	
Dr Andre Theron & Prof Hardus Diedericks	MEng(R)	Theme: Waves, water-levels, climate change	Potential climate change effects on near-/in-shore wave climates through numerical modelling.	
Dr Andre Theron & Prof Hardus Diedericks	MEng(R)	Theme: Waves, water-levels, climate change	Assess and compare 3 wave models: SWAN, CMS Wave & ST Wave. (Why do these models give different results & which is most correct to use for design-waves (10- and 50-year return periods))	
Dr Andre Theron	MEng(R)	Theme: Sediment transport, Coastal Processes	CoastSat application (with Google Earth imagery): long-term shoreline evolution trends along the SA coast	
Dr Andre Theron	MEng(R)	<u>Other Coastal & Port Engineering - Themes:</u> Marine Structures; Shipping, ship motions, ports/harbours; Estuaries; Hydrodynamics, water quality, dilution and outfalls	The above are examples of Port & Coastal Eng. Master's topics; students may also propose their own topic, subject to approval by the supervisors. Other potential themes within this field of study include Marine Structures; Shipping, ship motions, ports/harbours; Estuaries; Hydrodynamics, water quality, dilution and outfalls	
Prof JA du Plessis	MEng (R)	Evaluation of the performance of GUSSA distribution using short record lengths	Evaluate the newly developed distribution for annual flood peaks, using short record lengths	
Prof JA du Plessis	MEng (R)	Evaluate the performance of the GUSSA distribution for the estimate of AEP>50%	Extensive analysis was done on the performance of the GUSSA distribution to estimate flood peaks for AEP < 50%, but the performance for flood peaks with an AEP<50% need further evaluation	
Prof JA du Plessis	MEng(R)	Quantify the difference between the use of AMS vs PDS in flood estimations	Investigate the difference in the estimation of flood peaks using an annual maximum series vs that of a partial duration series.	
Prof JA du Plessis	MEng(R)	Investigate the increase in rainfall intensity in SA as a result of Climate change	Climate change models predict an increase in rainfall intensity but less rainfall for the Western Cape. Analyse a representative set of rainfall data to test this prediction	
Prof JA du Plessis	MEng(R)	Investigate the difference in surity of supply of a water supply system between daily and monthly runoff modelling	It is expected that the difference between the use of daily data vs the use of monthly data might have a significant impact on the available yield from specifically smaller water supply systems. Use a number of case studies to test this.	
Prof JA du Plessis	MEng(R)	Investigate the long term impact of veldfires on runoff and peak flows.	Veldfires significantly change the characteristics of a catchment and the associated rainfall/runoff response. Use two test sites to quantify these impacts.	