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## Water quality impacts of effluent from land-based abalone farms in South Africa

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E ffluent water quality was measured at nine abalone farms in along the South African coastline. Total suspended solids (TSS) Concentrations varied markedly as a result of tank cleaning operations (median daytime TSS 10.07 mgl-1 and after-hours 0.56 mgl-1). TSS exceeded the background reference level (80th percentile) for most farms and three did not comply with the 5 mg l-1 standard. The dissolved components show very little difference between working and non-working hours signals for both raw effluent and inflow-corrected effluent (e.g. inflow-corrected NH4+ working 3.44 µmol N l-1 and non-working 3.39 µmol N l-1). NH4+ concentrations were mostly greater than background reference levels but well below the 43 µmol N l-1 standard. Inflow-corrected concentrations of nitrate, nitrite and phosphate, were low compared to NH4+ and would not pose a significant eutrophication risk. Similarly, the biochemical oxygen demand measured at three of the farms was low (median 1.31 mg l-1). At the broader ecosystem level, the annual TSS loads calculated from 2013 production data of 43 mt y-1 (west) and 369 mt y-1 (south) are, respectively, 0.35% and 2.8% of that estimated to be produced by kelp beds through natural erosion of fronds. Similarly, the dissolved inorganic N loads of 1.9 mt N y-1 (west) and 9.4 mt y-1 (south) are trivial by comparison with nitrate advected into the coastal zone during upwelling. Local abalone farms have a relatively high specific C footprint - conservatively about 44 kg CO2 kg-1 production. The present findings support a relatively low potential impact of farm effluents in this coastal upwelling environment.

## **Biography**

Michelle Pretorius has completed her MSc from the University of Cape Town and is currently pursuing her PhD at the University of the Western Cape. She holds a position as an Environmental Officer in Sustainable Aquaculture Management within the Department of Agriculture Forestry and Fisheries.

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