

## **The Ski Monkey: a platform used by the Department of Environmental Affairs to advance offshore benthic research in the Western Indian Ocean**

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The development of under-water infrastructures such as baited/unbaited cameras and benthic ski or tripod cameras to document deep-water biodiversity has advanced offshore benthic research globally. The less destructive nature of benthic cameras, provide invaluable data on habitat, growth forms, associations and densities that otherwise is not obtainable from direct benthic sampling approaches such as trawling, dredges and grabs. Moreover, these tools are an excellent means to conduct baseline assessments using standardized research, crucial for long term monitoring. In 2010, the DEA acquired an underwater camera system, known as the ski-monkey, to document benthic hard reefs and aggregations on unconsolidated sediment beyond SCUBA diving depths. The ski-monkey configuration can be changed to collect video/images either in a towed position (on ski's), a vertical position (drop camera on tri-pod) or attached to the bar of a trawl net. The housing apparatus is pressure tested to approximately 700 m and this coupled with the multiple possible configurations makes this tool highly versatile, allowing for surveys to be conducted across a range of gradients. The ski-monkey system is fitted with (a) three lasers used to determine the size of animals in the field of view, and an abundance estimate in the 50 x 50 cm frame; (b) two flash lights and two 24 volt LED lights that serve to illuminate the darker depths of the ocean; (c) a detachable mini CTD that measures conductivity, temperature and depth and (d) an altimeter to record point specific depth from the bottom of the ocean. The ski-monkey also produces live feed in real time and is linked to an interior control panel to receive high definition images/videos of the benthos and associated organisms. Location and site specific geographic information is also recorded. However, despite the optimal functionality of the camera system in generating an array of data, and being less destructive, operational and technical problems have proven to be challenging. As a result, we have refined and finalized a protocol compatible to any ship operation. Here we share lessons learnt through surveying and operating the ski-monkey in different depths, terrains, environmental conditions and ship platforms. Over 50 stations have been collectively surveyed from various expeditions (e.g. IIOE2, DEA VME) which yielded the first visuals of the seabed across a 40-500 m depth range. Notable surveyed ecosystems range from the Agulhas region ( i.e: the Bank, shelf edge, hard outer shelf, and offshore hard grounds/ gravel); Canyon hard grounds in South Africa; to the Tanzanian mud belts, Mozambican sandy shelf, and the volcanic shelf off the Comoros. These underwater video/image observations are contributing to a better understanding of the deep-water ecosystems in southern Africa.

The presentation will highlight the do's and don't's of operating a deep-water camera system off a vessel platform, demonstrate the technical difficulties and how this can be overcome to make this system effective to document deep water habitats and biodiversity.

