

UKZN research on the sardine run

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Friday, 20 July 2007
Last Updated Tuesday, 29 July 2008

{mosimage width=250}The annual movement of South African pilchards, *Sardinops sagax*, up the east coast of South Africa remains a poorly understood phenomenon. The sardine run project, headed by Professor Victor Peddemors, aims to improve our understanding of this event by analysing oceanographic, aerial, point and ship-based survey data sets in conjunction with satellite imagery. The intention is to develop a predictive model that may be useful in managing this spectacular phenomenon. Predator behaviour around 'baitballs' is being studied, using underwater footage obtained during the run, to determine whether there is any structure in these feeding events.{mosimage width=450}

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{mosimage width=220}The project is in its fifth year of data collection. These data are being analysed by PhD student, Sean O'Donoghue. Findings from the various data sets include:A 20 year large scale aerial survey data set found a significant inverse correlation between pilchard distribution and sea surface temperature, but no correlation was found between pilchard distribution and chlorophyll-a concentrations. Common dolphin (*Delphinus capensis*) and Cape gannet (*Morus capensis*) distributions were significantly correlated with each other and with pilchard distribution. The study confirmed the seasonal appearance of pilchards on the KZN coast during June/ July with sighting rates of common dolphins and gannets increasing from Durban to Port St Johns. The distance from shore at which pilchards were sighted decreased from Port St Johns to Durban with more than half of all sightings occurring within 1km of the shoreline along the coastline between Scottburgh and Durban.In 2005 an hydro-acoustic cruise was conducted upon the R.V. Africaner by Marine and Coastal Management to determine the distribution of clupeid assemblages across the continental shelf between Cape Town and Richards Bay. Very few pilchards, or other clupeid species, were found across the shelf between Richards Bay and Port St Johns. Within this region shoals of clupeids were only recorded by the working boat, which operated within the 30m isobath. Clupeids shoals were detected further offshore with increasing latitude, which supports the findings of the 20 year data set.

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{mosimage width=220}Fine scale movements of pilchards and predators during the sardine run are being investigated using a combination of fine-scale aerial and point survey data sets. From 2004 to 2006 aerial surveys were conducted using either gyrocopters or micro-light aircraft to record the daily movements of animals along the eastern Cape coastline between Kei River Mouth and Port Edward.

Point surveys were conducted to investigate the distribution and movement of animals every half hour at the following locations: Morgan Bay, Hole in the Wall and Waterfall Bluff. During the point surveys various tracklines were obtained using a theodolite and a correlation was found between fine scale Cape gannet and common dolphin distribution.

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During the 2007 sardine run the emphasis shifted towards collecting underwater footage of predators feeding upon 'baitballs' (a small pocket of fish that has been separated from the main shoal, around which predators can patrol while making occasional feeding lunges). Out of a possible 14 days, 11 were spent at sea off Port St Johns, with 9 baitballs being observed and 265 minutes of footage obtained in High Definition format. Initial impressions are that when there are only a few predators on a baitball e.g. a dozen common dolphins and a few diving gannets, then there tends to be structure in the feeding bouts. After resting at the surface for a few minutes common dolphins usually initiate a feeding bout and gannets appear to utilise the fish escape response to increase their chances of prey capture. With an increase in predator numbers this structure appears to break down. Another interesting observation made during the field trip was the regular occurrence of bottlenose dolphins at depths exceeding 30m. This contradicts the current understanding of bottlenose dolphin distribution. Furthermore, the sighting of 'White Fin' a Ballito resident bottlenose dolphin suggests that these animals may be a lot more mobile along the South African coast than previously thought.