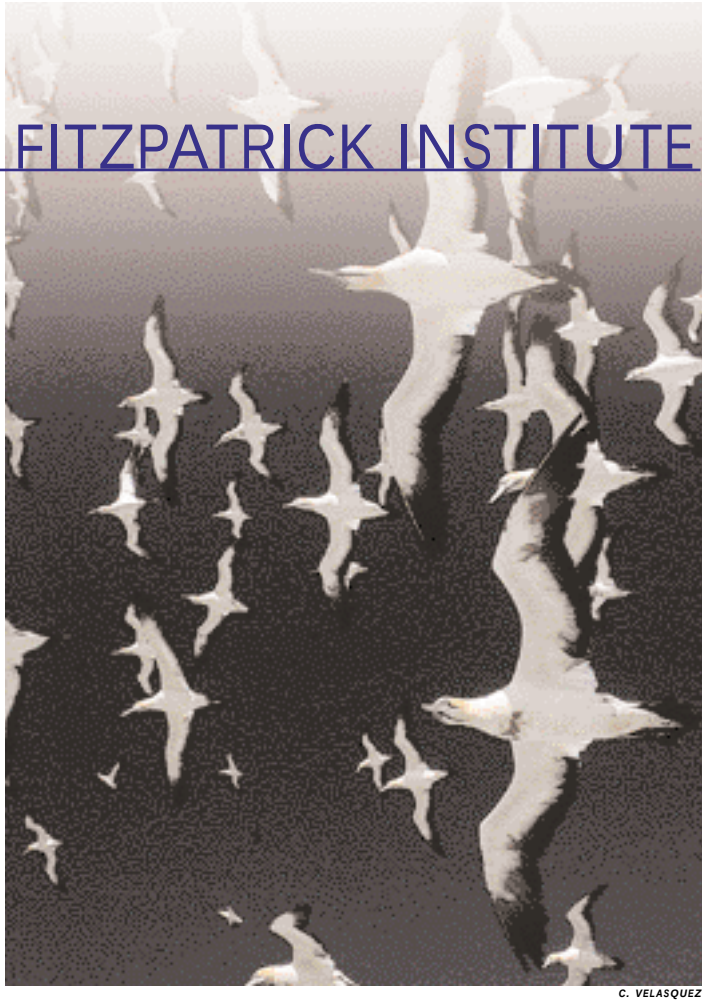
Hi-tech gannets



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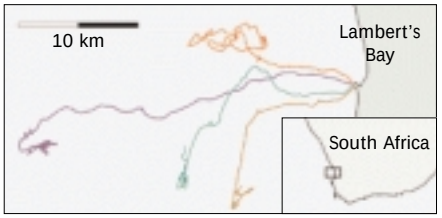

The foraging tracks of four gannets from Lambert's Bay, showing the initially direct commuting flight, then more convoluted flight when foraging.

Studying the foraging ecology of Cape Gannets *Morus capensis* is important in two ways. Firstly, the ease with which gannets catch pelagic fish such as pilchards and anchovies is useful to fisheries biologists wanting to assess the abundance of these commercially important fish. Secondly, gannets compete with pelagic fisheries, and overfishing has been blamed for recent population decreases in the species. Understanding how gannets forage will allow informed decisions to be made on how best to reduce the overlap between fisheries and gannets.

There have been several studies of Cape Gannet foraging, ranging from routine sampling of diet as a fisheries management tool to radio-tracking foraging birds. You might think that there was little more to learn about their foraging behaviour, but think again. Recent developments in miniaturised data-loggers are opening new windows on the lives of seabirds at sea.

A joint South African–French collaboration programme recently brought David Grémillet (Centre National de la Recherche Scientifique) and Yan Ropert-Coudert (National Institute for Polar Research, Japan) to work at the Fitztitute with Peter Ryan. They came equipped with some of the latest gadgets, namely GPS loggers from Switzerland and acceleration meters from Japan. In an attempt to learn more about the birds' fine-scale foraging behaviour, these were attached to adult gannets breeding at Malgas Island and Lambert's Bay.

The GPS loggers store positional fixes obtained from the GPS satellite network every second, allowing unprecedented detail on the birds' movements. The fixes are accurate to a few metres, enabling researchers to measure the birds' speed and direction while they are both commuting and foraging. Researchers can even use the birds to gather oceanographic information, such as sea temperature, by attaching small thermometers to their legs.

The acceleration meters are perhaps even more remarkable. These devices, smaller than a penlight battery, measure acceleration in two axes up to 32 times per second. They are so sensitive that they can detect each time a gannet flaps its wings, allowing a detailed study of flight strategies in relation to feeding activity. They also measure the forces associated with plunge-diving and, combined with information on the maximum depth attained, enable the mechanics of plunge-diving to be thoroughly investigated.

Previous studies have shown that breeding gannets often travel more than 200 kilometres to feed, with birds from Malgas Island routinely commuting around Cape Point to feed in False Bay and on the Agulhas Bank. During January and February 2002, all gannets foraged within 100 kilometres of their breeding colonies, starting to look for fish within 20 kilometres of the island – remarkably close to home considering the large concentrations of birds that range over these waters every day. This suggests that there was plenty of food around during our study. Commuting birds typically travelled at 55 kilometres per hour, but peak speeds of up to 100 kilometres an hour were recorded. Plunge-dives attained depths of five to eight metres. Perhaps the most interesting result was that birds had two peaks in foraging activity: one shortly after leaving the colony, followed by a period sitting on the water, then another bout immediately before returning home. These probably represent the bird first foraging for itself, digesting the meal, then foraging for the chick.

Routine deployment of these new devices, coupled with information on prey caught, will provide an extremely powerful tool for sampling the availability of pelagic fish. These data will be of use both to fisheries managers and for ensuring the conservation of Cape Gannets. □

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