

BALLBOY . . . The silver spinyfin is a common species in the study area. Picture: SARAH GOTHEIL

SEE-THROUGH . . . The heteropod is a predatory mollusc. Picture: ODDHEIR ALVHEIM

FLAMBOYANT . . . The splendid alfonsino is one of the species targeted by fishing companies. Picture: ODDGEIR ALVHEIM

ETHEREAL . . . A number of different kinds of octopus were photographed including this one which could be new to science. Picture: SARAH GOTHEIL

# SA-led team plumb mysteries of the deep

■ Groundbreaking expedition finishes in Bay after collecting important new data on Indian Ocean 'seamounts'

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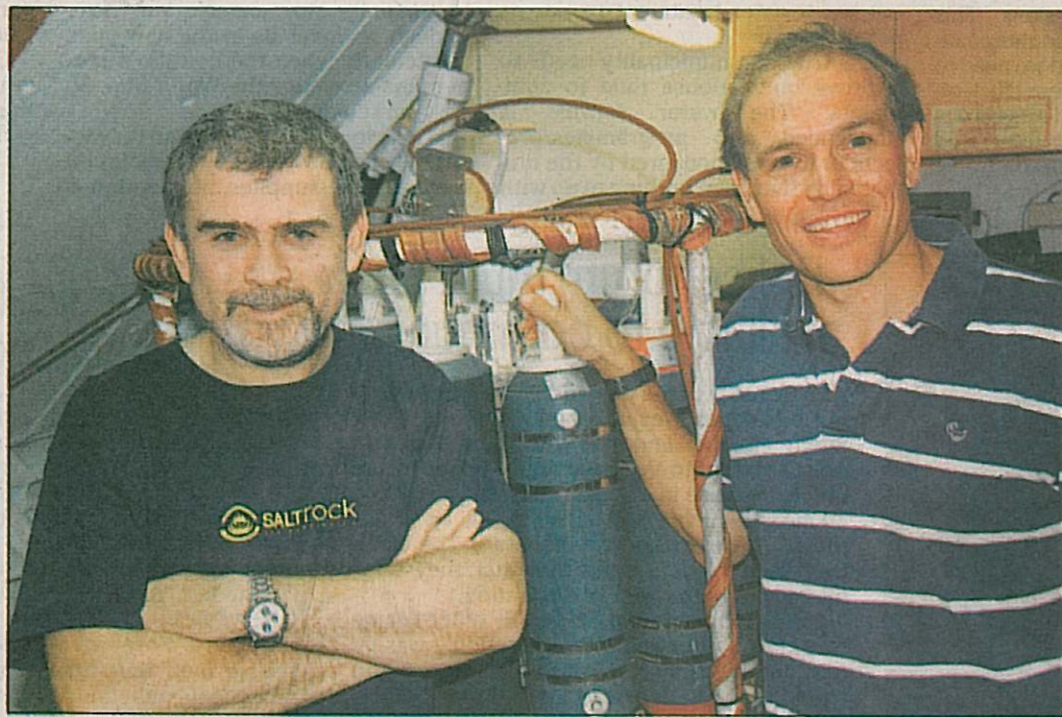
**A** MULTINATIONAL South African-led marine expedition has finished in Port Elizabeth, having collected fascinating new data on the "seamounts" of the south-west Indian Ocean, and their importance to the fishing industry. Most significantly, new details have been established of how these towering under-water peaks trap plankton, the food stable underpinning life in the sea.

Rearing from a depth of up to 6 000m to less than a 100m below the surface, the seamounts of the south-west Indian Ocean were officially discovered about 15 years ago by fishing fleets from SA and Namibia. These companies, as well as fleets from other parts of the world, then descended on these new fishery hotspots. Bottom trawling with heavy rollers ploughing through ancient coral beds caused serious damage and long-line fishing took its toll on the rich seabird population.

Realising their harvest was rapidly dwindling, the fleets agreed to partially suspend operations. Simultaneously, they called on the international scientific community to launch a study to find a way to allow fishing to continue sustainably.

Support was got from the UN and the International Union for the Conservation of Nature and funding was channelled through them from the Global Environmental Facility.

The expedition is being run under the auspices of the South African Institute of Aquatic Biodiversity in Grahamstown and Dr Tommy Bornman, a programme leader and phytoplankton specialist from the institute, was appointed to co-ordinate. Dr Tinus Sonnekus from NMMU and Dr Nkosinathi



STATE OF THE ART . . . British scientist Dr Alex Rogers (left) and expedition co-ordinator Dr Tommy Bornman are pictured here with a CTD which quantifies underwater oxygen, salinity, temperature and nutrient load. Picture: GUY ROGERS

Mazungula, also from the institute, were the other two Eastern Cape marine biologists appointed to the team.

The Norwegian government also allocated key aid in the form of the research vessel Dr Fridtjof Nansen and a crew to sail her. The ship set sail from Reunion in mid-November.

The 19-man team included scientists from Norway, Madagascar, Mauritius and Britain. The British group included top seamount specialist Dr Alex Rogers from the Zoological Society of London.

Rogers said unsustainable deep water fisheries around the world have decimated the populations of many of the fish, especially slow-growing species associated with great depths. In the south-west Indian Ocean, one of the species that has been driven to near-collapse is the orange roughy.

"Because the roughy and other fish like it grow so slowly they are especially vulnerable to over-fishing so it's important that we find a more envi-

ronmentally friendly way to run these fisheries.

"We're concerned especially at the way the bottom trawling is destroying the coral habitat."

Other interesting fish caught included the alfonsino, spiky oreo, scabbard fish, snake mackerel, deal fish (a 2m-long eel-like creature) and a 60cm pelagic armourhead (the biggest one ever caught).

Many of the fish at this depth are equipped with their own "lanterns" which allow them to hunt even in the dark depths.

Besides the specific call from the companies fishing this region, the south-west Indian Ocean is also one of the least explored corners of the world's oceans, he said.

"At odds with this; it is also

one of the few areas where fisheries are growing in scale."

The Nansen moved from Reunion south-east through tropical water all the way down into the icy southern ocean, before curving around northwest to Port Elizabeth. Eight seamounts were explored including Atlantis, "Middle of What" and Coral.

The plankton trapping phenomenon occurs when blankets of these tiny organisms drifts over the seamount. The sudden change in currents appears

to pin the phytoplankton on the leeward side of the seamount. The zooplankton, which normally has to pursue the phytoplankton up and down the water column, stays on the surface to feast - where it provides in

turn easy pickings for fish, and

they to a hierarchy of predators.

Besides sampling with trawl nets, the scientists used sonar technology to create acoustic maps of the undersea terrain and even the species of fish.

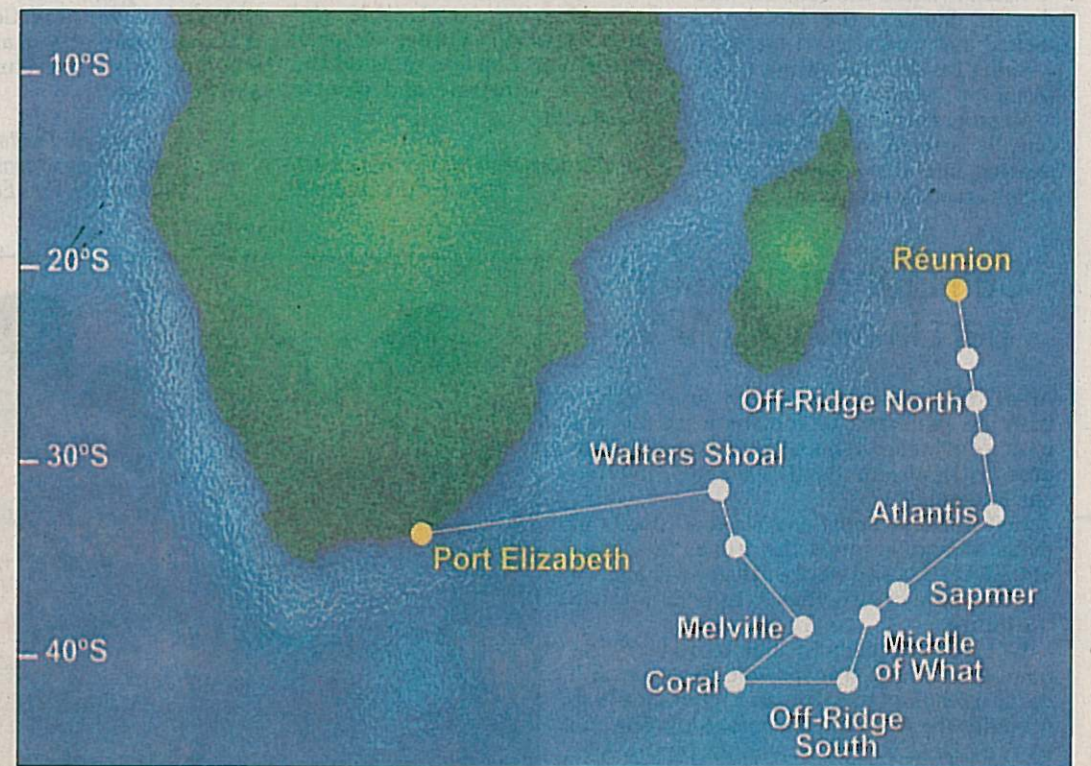
They also used an array of other instruments including a CTD, a clutch of steel collection bottles which is lowered through the water. Their progress is suspended at different levels and the lids of different bottles are opened by remote control, allowing for seawater to be collected. Back in the ship's laboratories fluorescence, oxygen, salinity and temperature for the different levels is then measured.

The number, species and behaviour patterns of seabirds were also documented during the expedition and this information will be factored into sustainable fishing proposals.

Deep sea trawl companies also use long line fishing which involves running out a line sometimes kilometres long with thousands of baited hooks. Seabirds, especially albatrosses swoop down on the bait before it sinks and many get hooked and drown.

Bornman said pirates had become a serious problem off East Africa with pirates now seizing "a ship a day", and expeditions cannot at present sail further north than Seychelles. The Nansen expedition is due to be followed up with a 2011 expedition using the British remote-controlled submarine Isis.

A report will then be compiled on the south-west Indian Ocean seamounts. It will be presented to the IUCN and, in discussion with the fleets involved and neighbouring eastern and southern African countries, a sustainable seamount fishing strategy for the region will then hopefully be devised and implemented, Bornman said.



UNEXPLORED TERRITORY . . . The map shows the route taken by the expedition team and the positions and names of the eight seamounts they explored. Graphic: LANA BREEDT



FISHY BUSINESS . . . Namibian cadet Ruben Shigwedha (left) and Riaan Cedras from the University of the Western Cape examine this unusual-looking dealfish.

**We're concerned especially at the way the bottom trawling is destroying the coral habitat**

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