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The impacts of hydrogen sulphide and low oxygen on inshore marine species

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Severely low dissolved oxygen in inshore waters is experienced at times in all three Benguela countries. The harm caused to inshore organisms is visibly and economically apparent in mortalities of rock lobster, molluscan shellfish and fish. Hydrogen sulphide occurs most regularly along the Namibian coast. Monitoring of dissolved oxygen in inshore waters is carried out in all 3 countries.

In Angola inshore water is monitored from Luanda Bay, Lobito and Namibe; and opportunistically wherever and whenever a mortality or bloom is observed. Temperature, dissolved oxygen and phytoplankton are recorded. The most recent low-oxygen events were recorded in 2011 with fish-kills in September in Luanda Bay and October in Tombwa Bay. No events were recorded in 2012.

In Namibia daily sampling at jetties and fortnightly sampling of sea farms in the Walvis Bay-Swakopmund and Lüderitz areas, carried out by the Ministry's mariculture staff, avails realtime information on dissolved oxygen, hydrogen sulphide and other environmental parameters (temperature, phytoplankton, pH, secchi, nutrients). Monitoring information and close interaction with the mariculture industry has resulted in farmers devising workable mitigating measures to deal with intense events. Following devastating events in Walvis Bay in 2009 (April to May) and 2010 (April) there have been no serious events from 2011 to date.

In South Africa monitoring of inshore waters takes place in high-risk areas and is intensified during events. Plans are in place to handle mass mortalities that involve beach strandings and wash-ups.

Both in situ water quality monitoring during events and experimental work has shown that decreased oxygen concentrations and sulphide levels affect species differently, so that "event" type mortalities depend on the affected animal species. For example Namibian farmed oysters can tolerate up to 5 days of no oxygen and hydrogen sulphide. In Angola fish mortalities in Luanda Bay occur when oxygen levels fall below 2ml/L in surface water, and this is commonly associated with algal bloom decay. In South Africa the commercial west coast lobster is severely affected by low oxygen in the St. Helena Bay to Lamberts Bay area.

Despite better understanding of the environmental conditions that lead to and precipitate mortality events in the three countries, prediction of their exact timing and particularly intensity – which would be of most use to management -remains difficult.