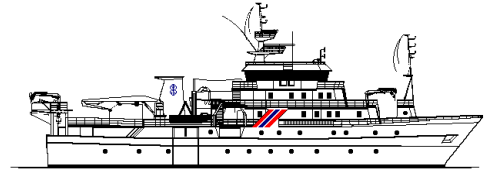


<b>Country:</b> Mozambique				
<b>Research vessel:</b> R/V DR. FRIDTJOF NANSEN				
<b>Survey number:</b> 2008408				
<b>Number of days:</b> 20				
<b>General objectives:</b> Survey of the Mozambique Channel.				
	<b>Port</b>	<b>Date</b>	<b>Coverage</b>	<b>Specific objectives</b>
<b>Departure</b>	Pemba, Mozambique	28 November 2008	International waters, Mozambique, Madagascar and French Territories	<ol style="list-style-type: none"> <li>1. To carry out a multi-disciplinary cruise that investigates the physico-chemical processes that result in eddies subsidising the regional "Life-support System".</li> <li>2. To establish the distribution and composition of organisms at a number of trophic levels relative to eddies positions.</li> <li>3. To establish, as far as possible, the productivity, diversity and biomass of the pelagic ecosystem.</li> <li>4. To establish the role of eddies in linking coastal and pelagic biomes (coupling).</li> <li>5. To define the physical and chemical nature of mesoscale anomalies.</li> <li>6. To investigate the role of eddies as dispersal agents.</li> <li>7. To investigate mesopelagic fish species diversity and abundance.</li> <li>8. To link various sources of energy and nutrition to different food-web compartments.</li> <li>9. Capacity building of ASCLME and SWIOPF trainees &amp; young scientists.</li> </ol>
<b>Arrival</b>	Durban, South Africa	17 December 2008		
<b>Cruise leader:</b> Tor Gammelsrød, Sven Kaehler (Local Leader)				
<b>Participants:</b>				
<p><b>ASCLME:</b> Agulhas Somali Current Large Marine Ecosystem, Avelino Langa,  <b>BCRE:</b> Bayworld Center for Research and Education, Tamryn Morris,  <b>IHSM:</b> Institut Haliéutique et des Sciences Marines, Doris Benivary,  <b>IIP:</b> Instituto de Investigacao Pesqueira, Bernadino Malaune,  <b>IMR:</b> Institute of Marine Research, Norway, Magne Olsen, Tore Mørk, Jarle Kristiansen,  <b>IRD:</b> Institut de recherche pour le développement, France, Jean-Francois Ternon, Pascal Cotel, Michel Potier,  <b>MCM:</b> Marine and Coastal Management, Jenny Huggett, Andre Miggel, Keshnee Pillay, Bruce Dyer,  <b>NMMU:</b> Nelson Mandela Metropolitan University, SA, Bevin O'Reilly,  <b>RU:</b> Rhodes University, Sven Kaehler, Jaclyn Hill,  <b>SAIAB:</b> South African Institute for Aquatic Biodiversity,  <b>UB:</b> Universitetet i Bergen, Norway, Tor Gammelsrød,  <b>UCT:</b> University of Cape Town, Bjorn Backeberg,</p>				





**NANSEN PROJECT**



### **Summary of the results:**

While much of the sample analysis remains to be done and data need to be put into context with the help of updated satellite imagery, preliminary results already suggest that the cruise as a whole was a success in terms of meeting its objectives.

A number of anti-cyclonic and cyclonic features were successfully transversed and their physico-chemical properties described. Cyclonic features were defined by strong central upwelling regions in terms of temperature, salinity and oxygen. The central portion of cyclonic eddies also exhibited elevated chlorophyll concentrations, presumably as a result of increased nutrient inputs and primary production. In contrast, anti-cyclonic features exhibited central downwelling and overall low biological biomass. Intermediate boundary zones between the eddies and areas close to the coast, at times also exhibited high chlorophyll biomass, but at this stage it is not possible to quantify the relative importance of new production vs coastal entrainment of "old" production in these systems. Preliminary data suggest that high chlorophyll values in the frontal regions are primarily a result of coastal entrainment. Further analysis of nutrients and stable isotopes should confirm this.

At higher trophic levels, animal biomass seemed to strongly reflect the availability of phytoplankton biomass at the base of the food-web and of prey species higher up the trophic chain. While more in depth analysis is required to confidently quantify these patterns, overall animal biomass (i.e. for zooplankton, fish, squid and birds) seemed to be highest in areas outside of the anti-cyclonic features. The one exception was that of gelatinous zooplankton, which tended to thrive in oligotrophic conditions and that was typically overestimated in wet-weight samples due to its high water content. It therefore appears, that mesoscale eddies are of prime importance to the pelagic life-support system of the Mozambique Channel by either producing or transporting nutrients and biomass into offshore environments.

Conversely, preliminary results also show that the offshore eddies may have far-reaching consequences for the coastal environment. Many of the birds, for example and the top-predator fish species such as tuna and swordfish (from acoustics) seem to aggregate and forage in areas of high eddie induced production.

Through the foraging excursions of land-based birds and through fisheries landings for human-consumption, much of the captured offshore energy is transported to the coastline or land respectively. Furthermore, surface trawls undertaken during this cruise, have clearly shown that many coastal reef fish larvae are capable of surviving eddie induced dispersal for many 100's km and perhaps even across the Mozambique Channel. This observation is likely to have far-reaching consequences for our understanding of reef-fish dispersal, recovery and management.

Overall, the cruise was able to show that mesoscale features in the Mozambique Channel play a major role in producing and transporting energy in the pelagic realm and to thereby strongly support the Channel's life support system. More in depth analysis of samples and data will additionally answer questions on physical and chemical processes, energy-flow, overall productivity and the biology of individual species and assemblages.

### **Report: status: final References:**

S. Kaehler, T. Gammelsrød, J.F. Ternon , T. Morris, M. Potier, P. Cotel, J. Huggett, B. Dyer, B. O'Reilly , J. Hill, A. Miggel, K. Pillay, B. Backeberg, A. Langa, B. Malaune, D. Benivary and M. Olsen (2008)FAO PROJECT: CCP/INT/003/NOR, Cruise reports "Dr. Fridtjof Nansen", EAF-N2008/7, 2008 **ASCLME SURVEY NO 4, Preliminary cruise report No 8/2008**, 28 November – 17 December 2008.

### **Constraints/Comments:**

