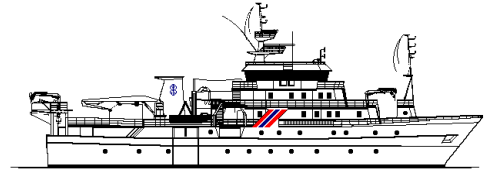


<b>Country:</b> Namibia, South Africa				
<b>Research vessel:</b> R/V DR. FRIDTJOF NANSEN				
<b>Survey number:</b> 2009404				
<b>Number of days:</b> 18				
<b>General objectives:</b> Transboundary survey between Namibia and South Africa with focus on spawning and the early life history of hakes				
	<b>Port</b>	<b>Date</b>	<b>Coverage</b>	<b>Specific objectives</b>
<b>Departure</b>	Walvis Bay, Namibia	30 March 2007	Namibia, South Africa	<ol style="list-style-type: none"> <li>1. To plan and conduct a transboundary survey between Cape Agulhas and Lüderitz to produce distribution and abundance maps of eggs and larvae from <i>M. capensis</i> and <i>M. paradoxus</i>. Approximate age of eggs and larvae will be determined during the survey in order to assist in the tracing of the geographical origin of the spawning.</li> <li>2. To sample the adult population of <i>M. paradoxus</i> at the outer shelf and slope to check for maturity stages in order to localise spawning grounds geographically.</li> <li>3. To check the gonadosomatic index of a representative sample of the females in order to backcalculate the main spawning period.</li> <li>4. To collect relevant environment data to better understand the environmental impact on the distribution of hakes and on the drift lanes for eggs and larvae. Possible retention mechanisms that would facilitate aggregation of post larvae close to the nursery grounds will be looked for.</li> <li>5. To collect genetic samples of the two species of hake at adult and juvenile stage, to look for genetic robust identifiers to assist in the species differentiation of eggs and larvae.</li> <li>6. Collect benthic samples to study the effects of trawling on the species composition, diversity, abundance and biomass of benthic macrofauna (from benthic grab samples and invertebrates retained in the trawl net) and fish assemblages (from trawls)</li> </ol>
<b>Arrival</b>	Cape Town, South Africa	16 april 2007		
<b>Cruise leader:</b> Erling Kåre Stenevik				





**NANSEN PROJECT**



### Participants:

**From MCM, South Africa:** Marek R. Lipinski, Hans Verheye, Larry Hutchings, Sharon du Plessis  
**From UCT, South Africa:** Lara Atkinson, John Field, Samuel Kakambi Mafwila,  
**From NatMIRC, Namibia:** Victor Hashoongo, Twalinothamba Akawa, Erasmus Kakonya,  
**From IMR, Norway:** Erling Kåre Stenevik (cruise leader), Oddgeir Alvheim, Tore Mørk, Ann-Kristin Abrahamsen.  
**From UiO, Norway:** Anne Lise Fleddum, Anders Bjørgesæter  
**From University of Bremen, Germany:** Britta Grote.

### Summary of the results:

#### General pelagic trawl results

Trawling depth varied from 20 to 100 m, and bottom depth from 137 to 182 m. There were no juvenile hakes in these catches. Species present were jelly (242 kg), *Maurolicus muelleri* (49 kg), *Trachurus capensis* juveniles (0.011 kg, 10 individuals of 5 cm Lt), and then single juveniles of *Helicolenus dactylopterus*, *Engraulis encrasicolus*, *Todarodes angolensis* and *Argonauta hians*.

#### General bottom trawl results

All trawls were made in deep waters: 344-553 m. Total catch was 9105.619 kg. During this particular cruise benthic fauna was also recorded to some detail, therefore number of items on the species list was on average far greater than during previous cruises, in some instances exceeding 50 entries. *Merluccius paradoxus* (main object of the survey) occurred in all bottom trawls (total catch of large fish was 1595 kg or 17.5% of the total catch; total catch of small fish was 2720.2 kg or 29.9 % of the total catch; juveniles were sporadic in only three trawls, 105 individuals weighing 1.067 kg). The background species for *M. paradoxus* surveys, *Helicolenus dactylopterus*, was present in all but two trawls. Catch of *M. capensis* was small (62 kg of 18 large individuals, i.e. 0.7% of the total catch). This result reinforces the view that large *M. capensis* in the area of research is scarce.

#### Results of maturity analysis

There were no runnings *M. paradoxus* present in the catches. There were only two mature females. In four surveys of Dr. Fridtjof Nansen, 4601 adult females of *M. paradoxus* were checked for maturity; only 12 individuals were found mature or running (spawning), i.e. 0.26%. This clearly indicates that either spawning is extremely patchy and/or fits into narrow temporal windows, or (as is more probable) occurs off the bottom and therefore bottom trawl can only scoop stray fish and this itself is rare.

#### Results of biological and genetics analyses

Genetic samples were transferred to the University of Stellenbosch; results are not available as yet. Likewise, otolith readings are not as yet available. Investigated fish were mostly adults; only one analysis of juveniles was done. These juveniles varied between 12 and 20 cm Lt and 3 out of 10 were feeding on euphausiids. Investigated adults varied between 34 and 78 cm. Maturity of females was mostly 5 and 6, therefore gonad weights were mostly small. Stomachs were mostly everted, therefore it is difficult to estimate feeding intensity. Food constituted mostly crustaceans

#### Report: status: final References:

E. Kåre Stenevik, H. Verheye, M. Lipinski, L. Hutchings, J. Field, L.J. Atkinson, S. K. Mafwila and O. Alvheim (2007). **BENEFIT SURVEY NO. 4 2007-TRANSBOUNDARY SURVEY BETWEEN NAMIBIA AND SOUTH AFRICA WITH FOCUS ON SPAWNING AND THE EARLY LIFE HISTORY OF HAKES**, Cruise Report No 4 2007, 30 March – 19 April 2007, Institute of Marine Research, Bergen, Norway, Marine and Coastal Management, Cape Town, South Africa, University of Cape Town, Cape Town, South Africa. Bergen, May 2007

### Constraints/Comments:

