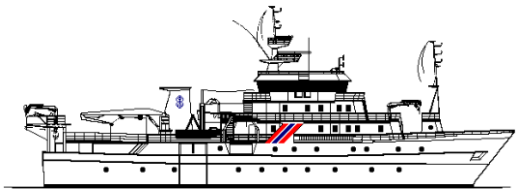
NANSEN PROJECT



Countries: South Africa, Namibia

Research vessel: R/V DR. FRIDTJOF NANSEN

Survey number: 2012401 – BCC Survey No.1

Number of days: 35

General objectives: Transboundary survey between Namibia and South Africa with focus on the shared stocks deep water hake

	Port	Date	Coverage	Specific objectives
Departure	Cape Town	24 January	South Africa, Namibia	1. To plan and conduct a transboundary survey from Cape Agulhas to Orange River to produce distribution maps and abundance estimates of the two species of hake to be later merged with similar data from a co-occurring Namibian national demersal survey, to enable complete mapping and assessment of shared stocks, thus providing a measure of the degree of sharing of the stocks at the time of the survey. 2. To collect data on the maturity stages of the hakes to check for possible spawning activity. 3. To collect other relevant data to better understand the environment impact on the distribution of hakes, and the fish community structure in the distribution areas of the hake. 4. To conduct early life investigations on hake by two 48-hours trawl stations using multisampler collecting hakes in 3 depths between Hondeklip Bay and Panther Head. 5. If time permits to collect live gobies for further studies in the lab of NatMIRC in Swakopmund.
Arrival	Walvis Bay	28 February		

Cruise leader: Oddgeir Alvheim

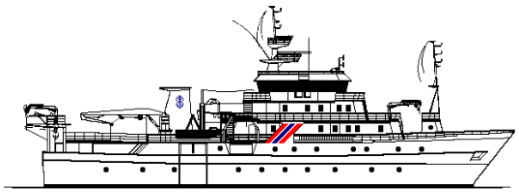
Participants:
From MCM, South Africa: Marek Lipinski (team leader).
Interns, South Africa: Nina Voogt, Kyle Cooper, Charles v d Meden and Justin Blake (24.01-28.02) Jessica Escobar, Bernadine Everett, Danielle Boyd, Melanie Smith, Laura Benneton and Dylan Cooper (24.01-01.02).
From NatMIRC, Namibia: Thea Matesu and Claudia Kanduuombe (01-28.02).
From IMR, Norway: Oddgeir Alvheim (cruise leader), Tore Mørk (instrument chief), Jan Frode Wilhelmsen

Summary of the results:

Considerations of the survey results, *M. paradoxus* 2003 - 2012

The findings from the survey 24 January-28 February 2012 combined with similar findings from the Namibian survey in the period 12 January-21 February and from the previous surveys confirms the general features as regards the distribution of *M. paradoxus* :

- Minimal spawning takes place at this time of the year, confirmed through few signs of maturing gonads.
- The early pelagic stage is mainly confined to the central-outer part of the shelf off Port Nolloth

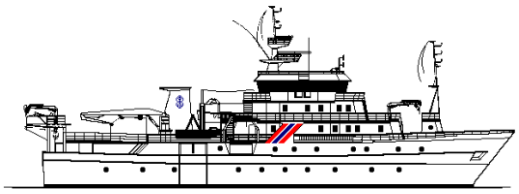


and in a small area off the Cape Peninsula.

- Juveniles between 15 and 24cm are mainly concentrated on the shelf between Hondeklip Bay and St. Helena Bay. In contrast to some earlier years there are no spill over of juvenile fish northwards over the Orange Banks into Namibia. The main gateway between Namibia and South Africa seems to be along the slope. The same pattern has been sustained in the period 2007-2012 while in the preceding years there was a continuous channel of fish extending into Namibia over the Orange Banks during the January surveys. There might though be a seasonal pattern not revealed in the timeseries as all surveys are in January-February.
- The massive migration towards the slope starts in the 25-29cm group and when the fish is bigger than 30cm this movement is mainly completed.
- The adult fish is found from Cunene in the north and southwards beyond Cape Agulhas. The biggest fish, bigger than 70cm is, in consistency with previous surveys, only recorded in South Africa.
- The main part of the juveniles is at the time of the survey in 2012 located in South Africa which holds about 70% of the non-fishable biomass (fish smaller than 36cm) while the fishable biomass (bigger than 35cm) is about evenly shared between the countries, (55% in South Africa).
- The adult part of regional standing stock has been on a rising trend in the last six years. The regional estimate of fishable biomass has increased from 110 thousand tonnes in 2006 to roundly 280 thousand tonnes in 2012, representing a 150% increase. The increase has been stronger in Namibia (190%) as compared to South Africa (130%) indicating that the stock is in a geographical expanding phase.
- Generally for all years; for the size range 55 to 60cm fish length there is an increased share of the biomass in Namibian waters compared to smaller and bigger fish classes, perhaps indicating a periodic immigration from south in terms of the life cycle.
- From 2009 to 2010 there has was recorded a major shift in the distribution of adult hake between the two countries, as the share in South Africa increased to 75%. In 2011 the pattern is back to the normal for the whole timeseries, around 50%.
- The south coast of South Africa was in 2010 covered for the first time as part of the BCC surveys on transboundary stocks in order to have full synoptic survey and to investigate to what extent the southern stock component showed connectivity to the fish on the west coast. The deep water hake in this region was estimated to 100 thousand tonnes, which represents 15 % of the total *paradoxus* 2010 estimate and 18% of the South African estimate.
- The deep water hake in this region consisted in 2010 mainly of fish in the size range 35-70cm. The young fish less than 36cm ("non-fishable biomass") on the south coast comprises less than 5% in terms of biomass of this fish in South African waters. This indicates that the southern component is mainly supplied by recruits from the west coast. The whole region from Port Alfred to the Cunene could therefore be understood as an integrated connected system as regards one unit stock of deep water hake.
- Blue Sea and "Dr. Fridtjof Nansen" use identical trawls and similar survey design and sampling protocol. The catchability coefficient in the biomass estimates applied is 0.8. Since the catchability coefficient of the trawl used on Dr. Fridtjof Nansen and Blue Sea has not been calibrated against absolute densities in the path of the trawl, the biomass estimates given here should not be considered as absolute biomass, but as indices of biomass. Thus the essential information is in relative comparisons and trends.

Repeated 48-hours trawl stations and catch of live gobies for NatMIRC:

The hake survey was interrupted for two days west off Hondeklip Bay where small juvenile deep-



water hake were found. This position is the same as a 48-hours trawl station was carried out on the survey in February-March 2009.
Another repeated trawl station was carried out in a position west off Oranjemund where Namibian hake surveys has often shown fair catches of juvenile deep water hake. A trawl haul verified juveniles in this locality and the second 48-hours trawl stations were subsequently executed.
Two successful bottom trawl hauls were done to catch gobies to keep live. About 20 gobies were picked up by scientists from NatMIRC for further experiments.

Report: status: final References:

FAO PROJECT: CCP/INT/003/NOR, Cruise reports "Dr. Fridtjof Nansen" EAF-N2012/1
T. Strømme, M. Lipinski, P. Kainge and O. Alvheim. **Transboundary survey between Namibia and South Africa with focus on the shared stocks of deep water hake. Cruise report No 1/2012. 24 January – 28 February 2012.**Institute of Marine Research, Bergen, Norway, Marine and Coastal Management**,** Cape Town, South Africa and Ministry of Fisheries and Marine Resources, Namibia. Bergen, September 2012.

Constraints/Comments: