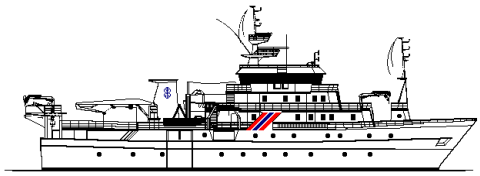
NANSEN PROJECT



Country: Ghana

Research vessel: R/V DR. FRIDTJOF NANSEN

Survey number: 2009405

Number of days: 6

General objectives:Marine Environmental Survey of bottom sediments, fauna and selected physical and chemical compounds in Ghana

	Port	Date	Coverage	Specific objectives
Departure	Tema, Ghana	3 May 2009	Ghana	The survey aims to contribute with essential information especially on the benthic communities and levels of contamination by hydrocarbons and heavy metals in the sediments to establish a baseline. The objective is to provide relevant environmental monitoring, provide elements towards an environmental monitoring plan covering the areas of concern. This will help to understand the local and remote forcing conditions in order to apply appropriate measure to deal with an eventual oil spill.
Arrival	Tema, Ghana	16 May 2009		

Cruise leader: : Bjørn Serigstad

Participants:

Sediment sampling at *Dr. Fridtfjof Nansen*

From Ghana: Emmanuel APPOH (EPA Ghana), Abdalla IBIN (EPA Ghana), John Kofi NYANTE (EPA Ghana), Lloyd Cyril ALLOTEY (University of Ghana, Dept. of Oceanography & Fisheries), Benjamin O. BOTWE (University of Ghana, Dept. of Oceanography & Fisheries), Kwame N. DAMOAH (Marine Fisheries Research Division), Reynolds OBENG (Marine Fisheries Research Division), Joseph AGGREY-FYHN (University of Cape Coast, Dept. of Fisheries & Aquatic Sciences), Edward A. AWUAH (Survey Department), Isaac LARBIE (Survey Department)
From Norway: Frøydis LYGRE (University of Bergen), Supervised by: Gisle Vassenden (UNIFOB AS) and Bjørn Serigstad (Cruise leader)(IMR)

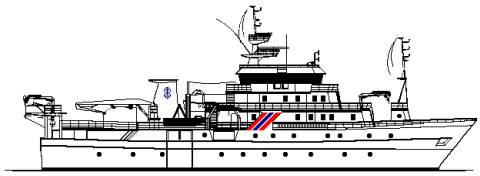
Seabed mapping with multibeam:

Alexey Andrew (Elcom/Marimeter), Atle Lagestrand (Statens Kartverk Sjø),
From IMR**:** Magne Olsen, Tore Mørk, Jarle Kristiansen, Marek Ostrowski

Summary of the results:

Oceanographic conditions:

The temperature distribution exhibits conditions characteristic to late spring, prior to the onset of upwelling season. The thermocline is depressed to a 30 m depth. The top layer is covered with light water masses, T > 28°C, S < 35.5, which originate in the western part of the Bay of Guinea basin. The thermocline slopes downward toward the coast suggesting a downwelling. At the offshore end, the vertical structure of the water column exhibits a salinity maximum, S > 36 and a drop in oxygen concentration < 3 ml l^{-1}, located just below the thermocline. These are conditions typical for this section of the eastern tropical Atlantic, dominated by the presence of South Atlantic Central Water (SACW) below the thermocline. This nutrient-rich subsurface water mass is the source of high productivity in the coastal waters during the upwelling season. The reported observations were done during beginning of May, which on the long-term seasonal scale coincides



with the onset of the upwelling. However, the depressed thermocline and low position of the SACW in the water column observed during the survey suggest that the warm season during the first part of 2009 was prolonged; and, perhaps, that the 2009 upwelling season will arrive later than usual. The fluorescence distribution supports this observation; it points to the concentration of primary productivity in the deep chlorophyll layer (DCM), located just below the thermocline. This is the expected pattern in the tropical coastal ocean during downwelling season, because the oligothrophic top layer is devoid of nutrients and the best conditions for phytoplankton growth occur at the interface between the illuminated portion of the water column and nutrient-rich SACW.

Seabed mapping with multibeam echosounder;

The multibeam survey covered an area between the border of the Ivory Coast and the Jubilee oilfield. During the survey, local scientists were trained in the sampling methodology and equipment operation.

Report: status: final References:

NORAD – FAO PROJECT 2009405, CRUISE REPORTS "DR. FRIDTJOF NANSEN", **Marine Environmental survey of bottom Sediments in Ghana. Survey of the bottom fauna and selected physical and chemical compounds in may 2009**. IMR, Norway, UNIFOB AS,SAM, Norway, Environmental Protection Agency (EPA), Ghana, University of Ghana, University of Cape Coast, Ghana, Tullow Oil, Survey Department, Ghana.

Constraints/Comments: