NATIONAL REPORT OF THE REPUBLIC OF GHANA-

16TH CONFERENCE OF THE EAtHC

1. HYDROGRAPHIC OFFICE

As a coastal state and a contracting party to the International Convention on the Safety of Life at Sea Convention (SOLAS), Ghana has the responsibility to provide hydrographic and nautical services for the safety of navigation and in support of other marine purposes. This and other coastal state functions are performed through the cooperation of member government organizations namely, the Ghana Maritime Authority (GMA), Ghana Ports and Harbours Authority (GPHA), Ghana National Petroleum Corporation (GNPC), Ghana Navy, Ghana Meteorological Agency (GMet), Lands Commission, Fisheries Commission, Hydrological Services Department (HSD), Environmental Protection Agency (EPA), Volta River Authority (VRA), Petroleum Commission, University of Ghana and the Regional Maritime University.

It is against this background that the National Hydrographic and Oceanographic Committee (NHOC) was formed to formulate national hydrographic standards and co-ordinate hydrographic activities to avoid duplication of work by the various agencies.

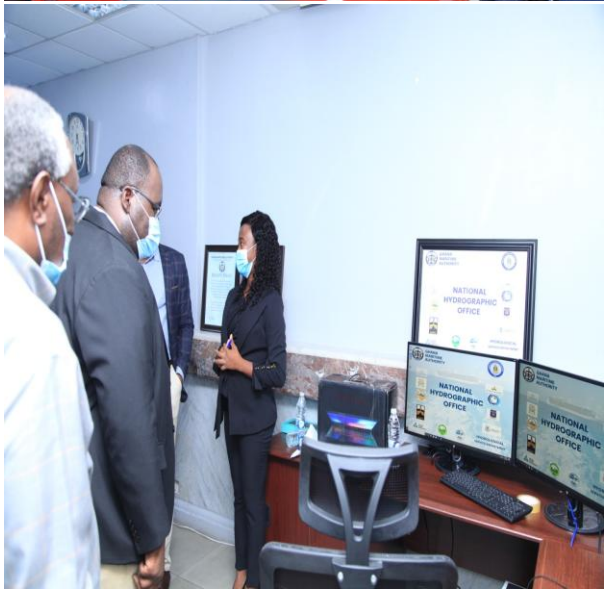
The NHOC supported Ghana's efforts towards the ratification of the IHO Convention. Since becoming a member of the IHO, Ghana has set up the National Hydrographic Office (NHO) to help meet the country's hydrographic needs. The opening ceremony of the National Hydrographic Office (NHO) was held on 1st December, 2020 at the head office of the Ghana Maritime Authority (GMA).

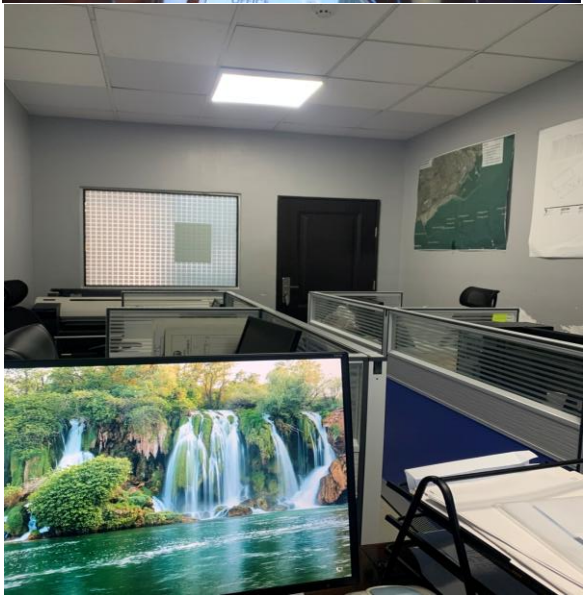
This ceremony marked the beginning of a roadmap towards the operationalization of Ghana's first inter-agency office for hydrographic services.

The National Hydrographic Office (NHO) is the centre for development of hydrography, collation of hydrographic, oceanographic and relevant marine data for the production of nautical charts as well as dissemination of Maritime Safety Information.


GHANA MARITIME AUTHORITY
IHO
OPENING OF THE NATIONAL HYDROGRAPHIC OFFICE
Petroleum Commission
UNIVERSITY OF GHANA
The Regional Maritime University (RMU)
GNPC
VOLTA RIVER AUTHORITY
Date: 1st December,2020.
Time: 10:00am.
Venue: GMA Head Office
HYDROLOGICAL SERVICE DEPARTMENT


NATIONAL HYDROGRAPHIC OFFICE


NATIONAL HYDROGRAPHIC OFFICE



2. SURVEYS:

New surveys covering completed port expansion works in the Ports of Tema (Terminal 3) and Takoradi (New Bulk Jetty) were first undertaken in 2019. Charts covering the expanded ports at Takoradi were subsequently updated by the UKHO in 2020. Surveys to update these charts are currently ongoing.

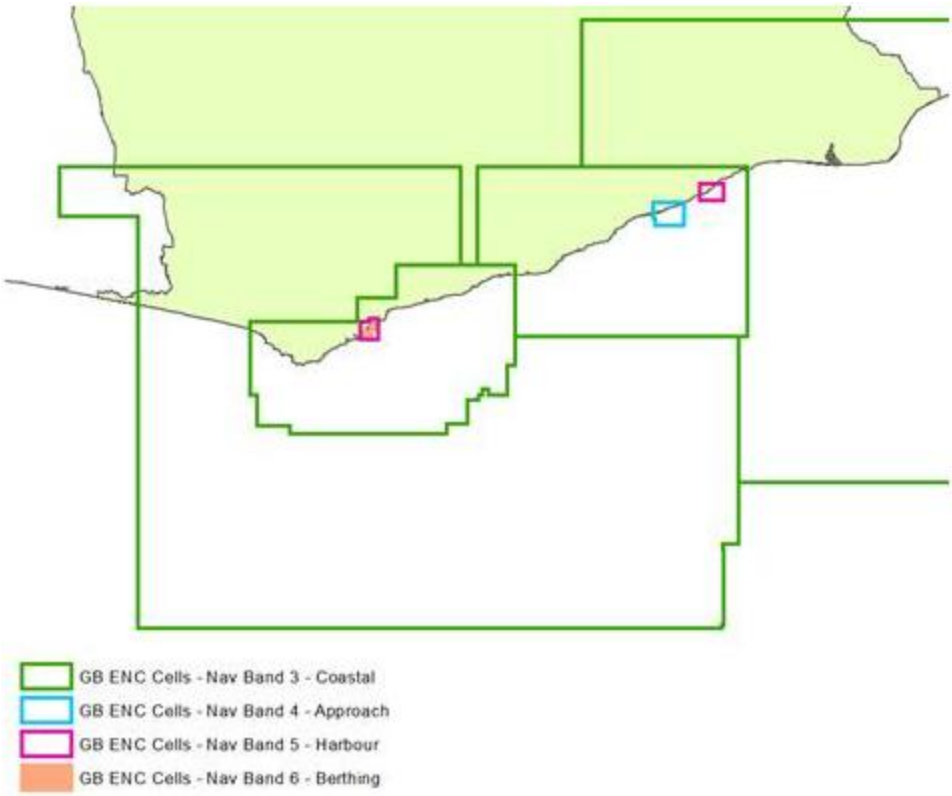
Survey data covering the Government of Ghana's ten (10) fish landing sites project under construction along the coastline of Ghana has been received from the contractors and are currently being validated for incorporation into the next chart updates.

3. NEW CHARTS AND UPDATES

As a result of the port expansion projects in Tema and Takoradi Ports, two new charts were published through the existing cooperation with the United Kingdom Hydrographic Office (UKHO).

The details of Ghana's chart coverage are as follows:

New charts & updates	GB3112 Harbours in Ghana (Takoradi Harbour and Sekondi Naval Harbour) published 25/05/2020
	GB1391 INT 2882 Port of Tema published 21/05/2020
ENC coverage	Band 3 [GB303113, GB301384, GB303432, GB301383] - Full coverage Band 4 [GB41380D] - Coverage related to potential user requirements Band 5 [GB501391, GB503102] - Coverage related to potential user requirements Band 6 [GB63102A, GB63102B] - Coverage related to potential user requirements
Gaps	No ENC coverage of Axim Bay and Cape Coast Anchorage
Overlaps	**None**



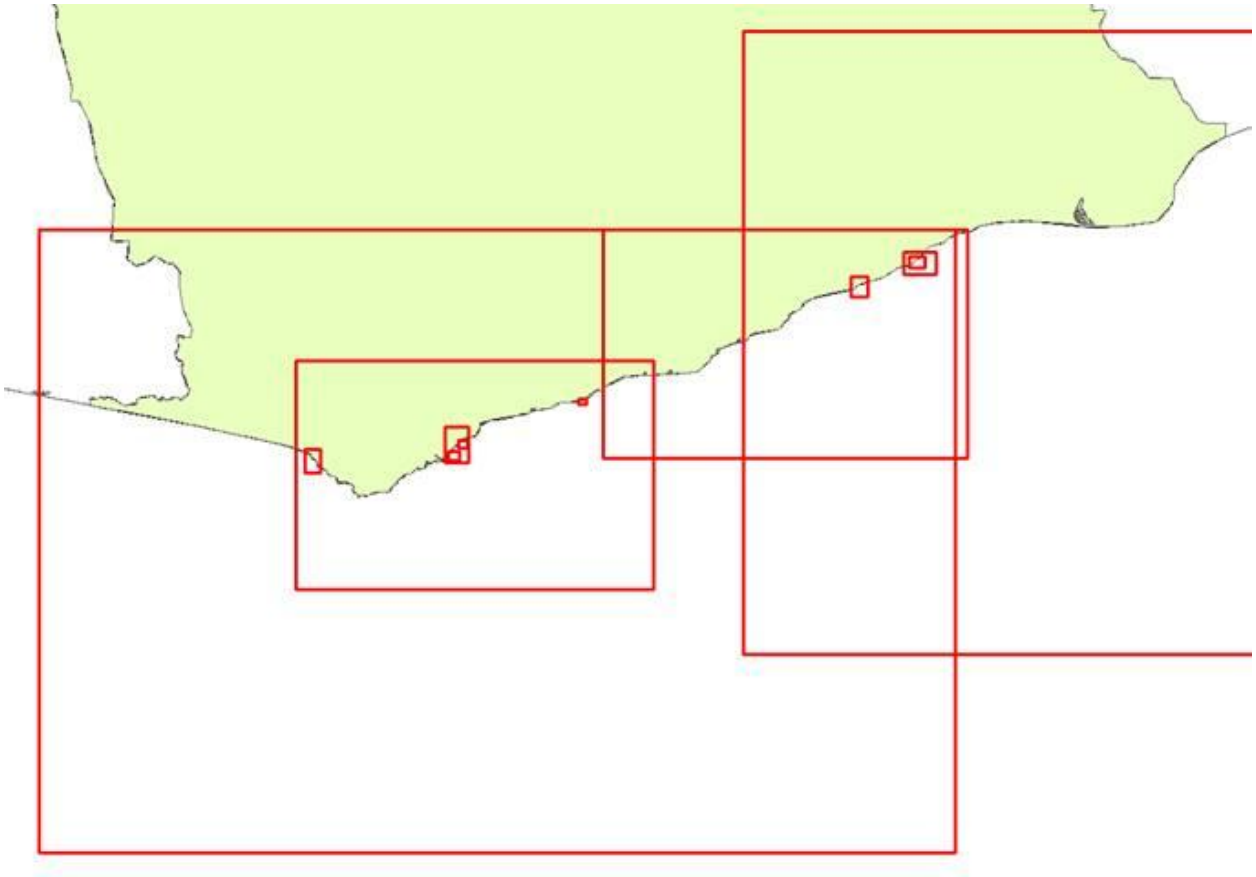
ENC distribution method

The International Centre for ENCs (IC-ENC) and the UKHO VAR under the AVCS brand.

RNCs	GB3112 Harbours in Ghana (Takoradi Harbour and Sekondi Naval Harbour) GB3113 Cape Three Points to Saltpond (Axim Bay and Cape Coast Anchorage) GB1391 Port of Tema GB3102 Takoradi and Sekondi Bays GB3432 Saltpond to Tema (Accra Roads) GB1383 Lagune Aby to Tema GB1384 Tema to Cotonou
INT charts	GB3112 (To be INT2877 at next NE) GB1391 (INT 2882) GB3102 (INT 2876) GB1383 (INT 2806) GB1384 (INT 2807)

National paper charts

- GB3113
- GB3432



Other charts, e.g. for pleasure craft

Q6114 Maritime Security Chart – West Africa including Gulf of Guinea

Challenges and achievements

The national hydrographic database of Ghana is in the developmental stages. Data collection and data management capacity challenges exist.

4. NEW PUBLICATIONS AND UPDATES

New Publications	None
Updated Publications	NP1 Africa Pilot Volume 1 Edition 19 (2020)

5. MSI:

This is a Vessel Traffic Management and Information System.

It is an electronic surveillance system used in tracking maritime activities along the coast of Ghana.

The VTMIS system consists of the following:

A) Four (4) Control Centres.
   - National Control Centre (VTMIS Central) at the Head Office
   - Tema Control Centre
   - Takoradi Control Centre
   - Ghana Navy Control Centre (Naval Headquarters)

B) Eight (8) Remote Sensor Sites (RSS) in eight (8) coastal towns covering the entire coast of Ghana

C) Three (3) Remote Base Station (RBS) located along the Inland waterway

D) Ten (10) Monitoring Stations provided for selected stakeholders

The remote sensor sites are equipped with sensors that are used in the tracking of vessels.

Sensors including the AIS – Automatic Identification System which covers a range of 70 nautical miles

Radar – Radio Aid for Detection and Ranging, ranges up to 70 nautical miles

LRIT – Long Range Identification and Tracking system, ranges over 1,000 nautical miles radius

CCTV – Closed Circuit Television, 15 nautical miles range

VHF and the DSC system – Digital Selective Calling System, which is part of the GMDSS – Global Maritime Distress and Safety System, a marine communication and equipment protocol set up by the international community to assist vessels at sea, has a range of over 60 nautical miles. It also assists with the monitoring of key offshore installations.

The system also provides broadcast of Maritime Safety Information (MSI) services such as Navigational Warnings and Notices to Mariners to vessels, for their prompt onboard decision making.

There's collaborating with other stake holders such as the Ghana Navy, GPHA, GHANA IMMIGRATION SERVICE, FISHERIES COMMISSION, CUSTOMS, MARINE POLICE among others, to ensure safety of navigation and security in our maritime domain.

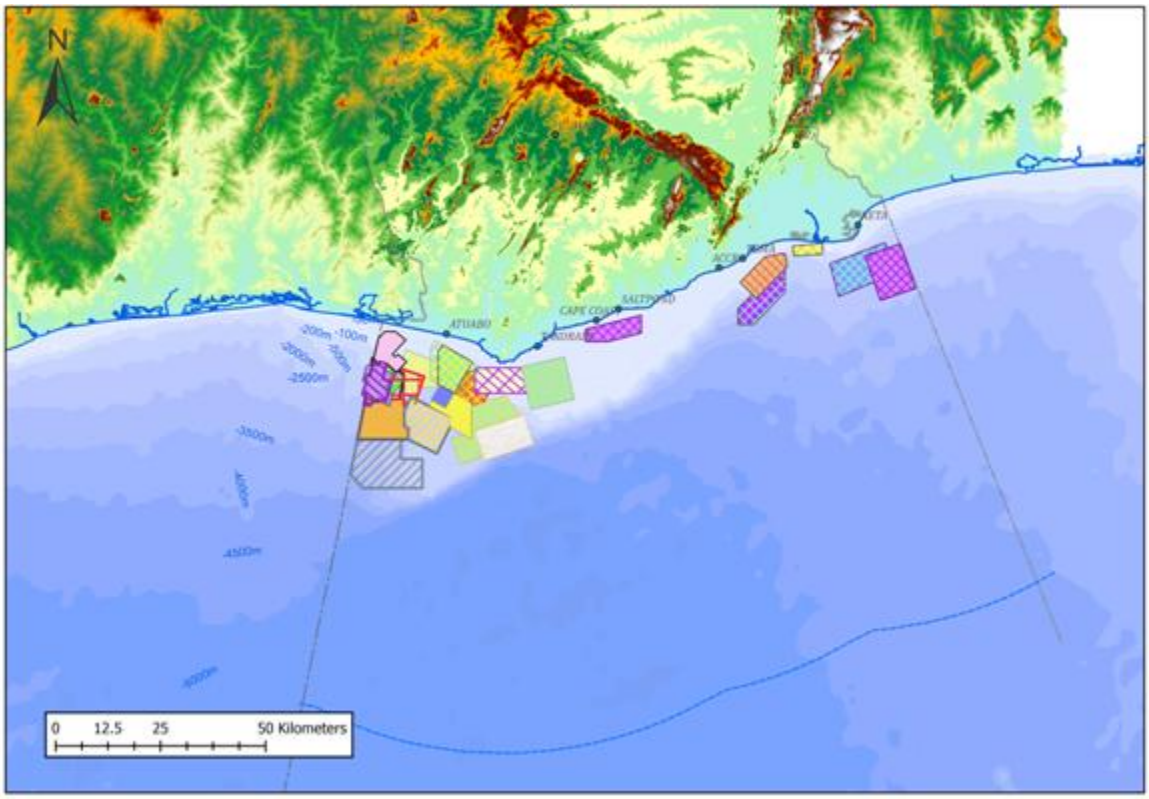
There is a prospect of upgrading the system for better and effective performance.

There is also a proposal for Drones (UAV) to be purchased soon to enhance surveillance capability.

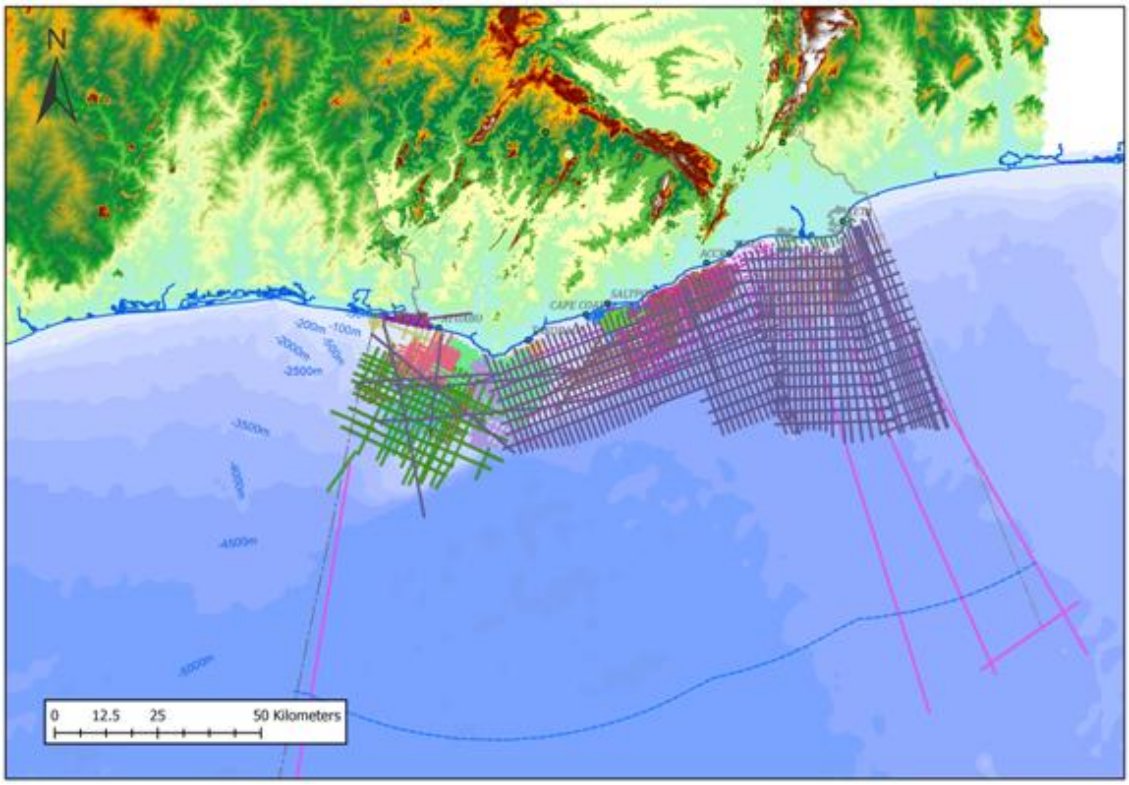
6. C-55:

In addition to hydrographic surveys, Ghana has substantive seismic survey coverage. The details are as follows:
Total EEZ
= 237,835 km2
2D Seismic Length=41,022km
3D Seismic Area= 27,610.6 km^2

Combined coverage area = 97,966km^2 = 41.19% of the EEZ
Water depths and other relevant information are being extracted accordingly.



Map showing 3D seismic survey coverage



Map showing 2D seismic survey coverage

Navigational Information	Status	Notes
Local warnings	YES	VHF
Coastal warnings	YES	VHF
NAVAREA warnings	YES	NAVAREA COORDINATOR
Information on ports and harbours	YES	Passed to UKHO

7. CAPACITY BUILDING

Ghana through the RMU has plans to develop programmes in BSc Hydrography, IHO Cat B. and MSc Applied Nautical Science and Hydrography. The necessary approval processes for Accreditation from the National Accreditation Board are underway.

With regards to the IHO Cat B. course, the Nautical Science Department of the RMU in the past had been in contact with IHO for the necessary amendments for the approval of IHO required subjects. However, the issue of adequate resource persons in Hydrography became a challenge for the institution therefore the programme stalled half-way, however, it is being worked on. There are plans at RMU to revisit and introduce the IHO Cat. B course. This is being achieved through the yearly Coastal Oceanographic Environment Summer School in Ghana (COESSING) since 2015. This approach is providing a different perspective for the future students in Hydrography to develop interest and acquire background knowledge to support the tasks, duties and responsibilities in the study of Hydrography.

There are also plans to apply a Training Ship model where cadets will be introduced to the real time features of Hydrography components during on board training. There are several initiatives in the offing by the Government of Ghana and RMU for a Training Ship from South Korea.

The vessel will facilitate hydrographic efforts as follows:

To collect, with systematic surveys at sea, along the coast and inland, geo-referencing data for:

- Shoreline configuration, including manmade infrastructure for maritime navigation i.e. all those features on shore that are of interest to mariners
- Depths in the area of interest (including all potential hazards to navigation and other marine activities)
- Sea bottom composition
- Tides and Currents
- Physical properties of the water column
- processing the information collected and collaborate with the National Hydrographic Office in order to create organized databases for the production of thematic maps, nautical charts and other types of documentation.

The Department of Marine and Fisheries Sciences (DMFS) at the University of Ghana is concerned with teaching, training and research in Marine and Fisheries Sciences with

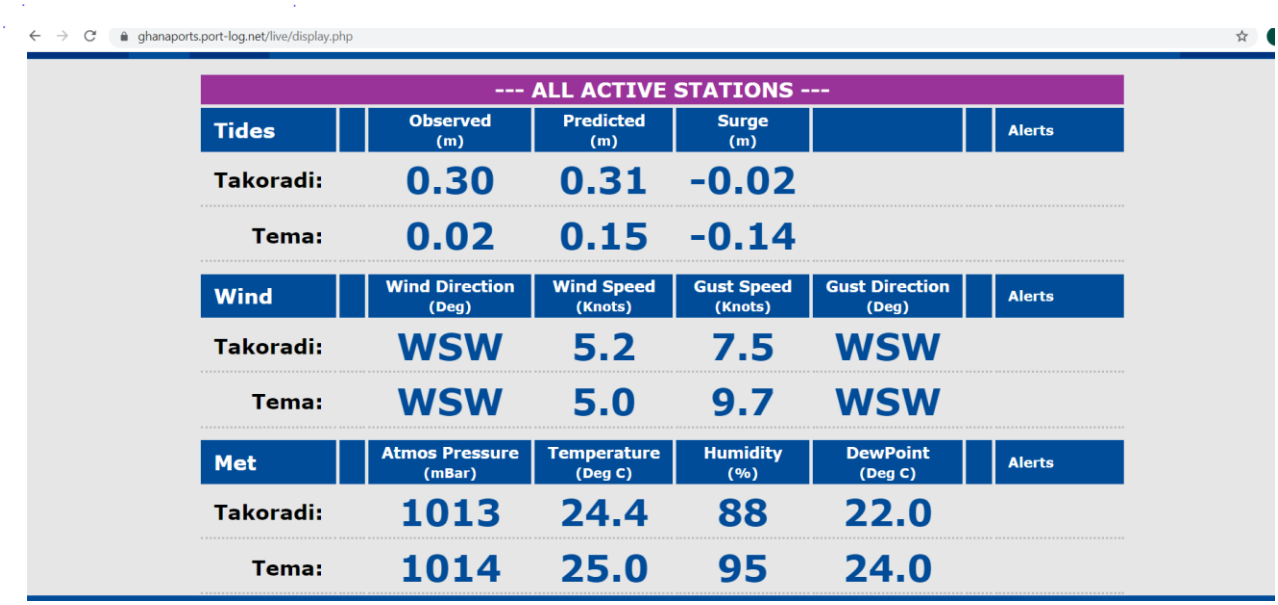
broad interest in understanding the functioning of marine ecosystems and human interactions with it. The DMFS has also hosted several short-term training programmes and workshops in partnership with collaborators from countries in Africa, Europe, America and Asia towards building capacity in climate change and its impacts on coastal and marine environment, assessment and sustainable exploitation of marine resources, blue economy, and marine pollution. The DMFS needs training in hydrography as it lacks capacity in this area.

8. OCEANOGRAPHIC ACTIVITIES:

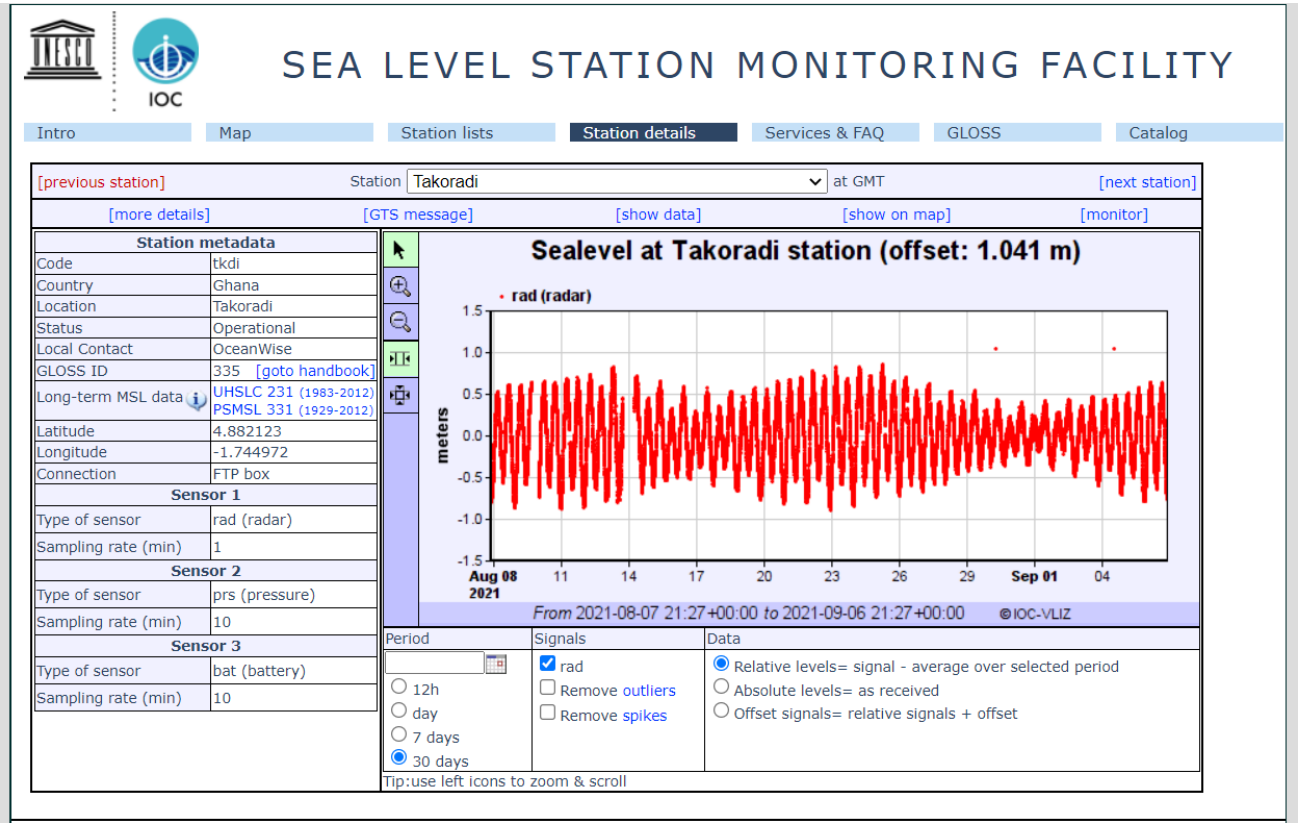
The DMFS has established partnerships and collaborations which provide opportunity for the collection of hydrographic/oceanographic and hydrographic conditions (temperature, salinity, oxygen, chlorophyll, nutrients, pH, current speed and direction etc.) in our coastal waters. DMFS, in collaboration with GMES & Africa Marine Project and Services, provides ocean surface parameters derived from satellite measurements and models, and processes fishing vessel traffic data to generate various products, which are useful for identifying major fishing grounds, estimating fishing effort, and detecting un-cooperating fishing vessels. Part of its mandate include monitoring and forecasting oceanography variables and ocean conditions, monitoring coastal vulnerability, mapping potential fishing zone and monitoring fishing vessels at sea, as well as mapping coastal ecosystems/habitats.

Tide gauge network

Two (2) tide and weather monitoring stations were installed by the Ghana Ports and Harbours Authority (GPHA) at the Ports of Tema and Takoradi in July 2019. Each monitoring station comprises a pressure and radar tide gauge and an automatic weather station measuring wind speed and direction, air pressure, temperature and relative humidity and dew point.



Data transmission is by telemetry via the local cellular network and Meteosat-11 satellite. Data transmitted via the cellular network is transmitted to the UK-based OceanWise Limited's online hosted Port-Log system. Data transmitted via Meteosat-11 is relayed over the WMO Global Telecommunication System (GTS) to PSMSL.



9. SPATIAL DATA INFRASTRUCTURES:

Ghana through the Lands Commission of the Ministry of Lands and Natural Resources has drafted the NSDI Policy to guide the NSDI, which is undergoing cabinet approval processes.

Ghana's NSDI Policy comprises three main components namely; Geodetic Reference Network, National Data Infrastructure and Survey and Mapping.

Meteorological data collection

Observed Parameters

- Sea Surface Temperature
- Tidal Gauge
- Wave Surge
- Visibility
- Tidal waves/tidal heights
- Wind Speed
- Wind direction
- Cloud height
- Thunderstorm

Models

- Significant wave height
- Current
- Swells height
- Swell period
- Salinity

10. INNOVATION

Due to delicate maritime operations, risk assessments are conducted frequently.

11. OTHER ACTIVITIES

Preparation for responses to disasters

Ghana has a National Oil Spill Contingency Plan which it deploys through the EPA in the event of Oil and Chemical Spill disasters. National Disaster Management Organization (NADMO), Ghana Navy, Ghana Police Service and other institutions of state also have specific roles under their establishing laws on preparation and response to disasters.

The Maritime Pollution Act, 2016 also addresses issues of maritime disasters.

Environmental protection

The Maritime Pollution Act, 2016, Act 932 provides for the prevention, regulation and control of pollution arising from maritime activities in areas within Ghana's maritime jurisdiction and for other related matters. The Ghana Maritime Authority is the regulatory body for this Act. The GMA collaborates with the EPA and other relevant agencies in this regard.

The applicable laws on issues of environmental protection in the marine and coastal environment employed are the Environmental Protection Agency Act, 1994 (Act 490), Maritime Pollution Act, 2016 (Act 932), Environmental Assessment Regulations, 1999 (LI 1652), among others.

Engagement with the Maritime Administration

The National Hydrographic and Oceanographic Committee (NHOC) under the auspices of the Ghana Maritime Authority provides the platform for engagements with all relevant Government organizations involved in hydrography, cartography, oceanography and related disciplines.

Magnetic and gravity surveys

In March this year, geodetic controls were intensified throughout the country in order to provide a robust geodetic network coupled with gravity data from the Geological Survey Department. The various computations have been done and submitted to Survey and Mapping Division (SMD) of Lands Commission for quality control. The final reports will be produced by the end of year. Some private Continuous Operating Reference Systems (CORS) in addition to SMD CORS were integrated into the network of controls.

World Hydrograpy Day

Considering the importance of hydrography to national development, the Republic of Ghana being a member of the International Hydrographic Organization (IHO) and cognizant of the need to promote hydrography commemorated the World Hydrography Day to publicize and garner support for the sector through a series of activities including:

- Launch and Press Forum
- Institutional visits
- Ship visit
- Conference

The celebrations were organized by National Hydrographic and Oceanographic Committee (NHOC) under the auspices of the Ghana Maritime Authority.

It was launched by the Director General of the Ghana Maritime Authority, Mr. Thomas K. Alonsi and climaxed with a conference featuring all the key decision makers in the industry. The keynote address was delivered by the Minister of Transport, Honourable Kwaku Ofori Asiamah.

It is envisaged that the awareness created will encourage all stakeholders to contribute their quota to the development of hydrography in Ghana with the support of the IHO.

12. CONCLUSIONS

As the host nation for the Regional Maritime University, efforts are being made to augment training with the establishment of the National Hydrographic Office for the development of hydrography in general.

As an initial measure, it is recommended that the country is supported through the following ways:

- Technical cooperation with the IHO and established Hydrographic Offices
- Training including in-country training sessions

Ghana is pleased to be a member of the IHO and EAtHC. We are looking forward to fruitful collaborations towards the growth of the sector in Ghana and the sub-region.