

Structure for National Reports to Regional Hydrographic Commissions (Reference: IHO Resolution 2/1997 as amended (last amendment IHO A-2))

Executive summary

HYDROGRAPHIC OFFICE / SERVICE:

The National Hydrographic Office (NHO) is located at the Ghana Maritime Authority.

The National Hydrographic and Oceanographic Committee (NHOC) which is made up of representatives from the hydrographic and oceanographic sectors, has developed the national hydrographic strategic framework for the NHO.

SURVEYS:

Coverage of new surveys

Since the last conference, the two major ports have been resurveyed and local charts have been produced. Data will soon be forwarded to the UKHO for update of Ghana's charts.

The Government of Ghana has embarked on a project to develop ten (10) coastal fishing ports and fish landing sites along the entire coast of Ghana. The project is about 90% complete. Out surveys for the FLSs have been submitted.

New ship:



A new ship, Yaa Asantewaa, has been acquired for patrols and in support of other marine purposes.

It is a Mersey Class Patrol Vessel/Mother ship designed and built to achieve the following requirements:

- Stay at sea for 14 days, accommodate 10 crew and 12 guards with maximum speed of 35 knots among others.

It is equipped with the following communication and navigation equipment: open array radar, chart plotter, GPS, forward scan transducer, VHF MF/VHF DSC, AIS, among others.

Crowdsourced and satellite-derived bathymetry:

Crowdsourced Bathymetry (CSB) data are obtained from merchant vessels as well as the Maritime Authority's vessels and processed. CSB data is useful in assessing the existing data on nautical charts and for the identification of changes.

Challenges and achievements

Manual acquisition of data due to the lack of data loggers for the automatic transmission of data from vessel to shore hampers data collation processes.

NEW CHARTS AND UPDATES:

ENC distribution method

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

Challenges and achievements

Scheduled surveys for updating the charts could not be completed due to the breakdown of the MB1 multibeam echo sounder. It has been difficult to get the needed parts for the repair of that particular MB system since it is out of production. Processes are underway to procure a new sounder for the port.

NEW PUBLICATIONS/UPDATES

Radio Signal publication ALRS Vol.6 (8)

Means of delivery: Digital

MSI:

Existing infrastructure for MSI dissemination-

The Vessel Traffic Management and Information System (VTMIS) is operational at the four (4) Control Centres and performs the following functions, among others:

- Broadcast warnings
- Provide surveillance and situational awareness services

Permanent and Temporary Notices to Mariners/Navigational warnings are promulgated via the VTMIS and E navigation system.

MRCC

The Maritime Rescue Coordination Centre (MRCC) TEMA, Ghana is located in same building with VTMIS East Control Centre at Chemu Lighthouse Yard at Tema New Town.



Geographical Location: Latitude 5°33.59'N longitude 000°12.13'W

Watchkeeping: (9GP-88) maintains a continuous listening watch on all international maritime distress frequencies including full DSC facilities (on VHF only at the moment).

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

Contact

Name	MRCC TEMA
MMSI	996271131
Call Sign	9GP-88
VHF Channel:	Ch.16, DSC Ch.70
Telephone	+233 302 953 129
Telephone	+233 302 953 134
Telephone	+233 302 953 138
Telephone	+233 302 953 140
Telephone	+233 303 211 781
Telephone (Cellphone)	+233 203 820 565
Telephone (Cellphone)	+233 545 515 844
Email	mrcc@ghanamaritime.org
Website	www.ghanamaritime.org

Challenges and achievement

Some of the components of the VTMISS are not working.

CAPACITY BUILDING:

Offer of and/or demand for Capacity Building

Capacity building in hydrographic surveying and further training in cartographic knowledge in ENC production as well as USV/ASV operations are required.

Training received, needed, offered:

Ghana participated in the IHO Training for Trainers (TFT) Programme in Basic Hydrography (Cat C) sponsored by the Republic Of Korea from 1 – 12 November 2021. Ing. Isaac Yirenkyi, the Hydrographer of the Ghana Ports and Harbours Authority was nominated to represent Ghana.

A staff of the Ghana Maritime Authority, Hydrography and Navigation Services Department (HNS), has received full scholarship from the IHO - NIPPON FOUNDATION GEOMAC PROJECT to undertake training in Marine Cartography and Data Assessment in the UK from 1st August-16th December, 2022.

The Lands Commission has supported a member of staff to receive training in hydrography at the University of Plymouth, UK, in 2021/22.

Upon successful return, the staff will be part of the change management team of the Commission and also join the Trainer of Trainee's team to train middle workforce personnel in hydrography.

The Department of Marine and Fisheries Sciences (DMFS) at the University of Ghana continued to undertake teaching, training, and research in Marine and Fisheries Sciences. As an Ocean Teacher Global Academy (OTGA) centre, the DMFS offered short-term training in oceanography and fisheries towards capacity building in Africa and other developing countries.

In house training

Students from technical universities in Ghana pursuing a programme in surveying visited the port to have a day's exposure in practical hydrographic surveying. Discussions are ongoing with lecturers from the Geomatics Engineering Department of the University of Mines and Technology (UMaT), to introduce the Cat C programme as an elective course for final year students. This we believe will generate the needed interest for students to pursue hydrography as a career option.

The hydrographic section of GPHA organized a training session on the efficient use of the Hypack hydrographic software (18-22 July, 2022). It was in line with capacity building efforts for effective delivery of services. The training was done by a staff from software developer, Xylem, Inc.

OCEANOGRAPHIC ACTIVITIES:

The DMFS continues to engage partners and collaborators to expand the collection of hydrographic/oceanographic data (temperature, salinity, oxygen, chlorophyll, nutrients, pH, current speed and direction etc.) fishing vessel traffic and activities in the Gulf of Guinea. The DMFS is monitoring ocean conditions and assessing shoreline change, coastal erosion and flooding. The DMFS is working together with the National Intergovernmental Oceanographic Committee (IOC) of UNESCO and NHOC to address the Ocean Decade Challenge for Africa.

Tide gauge network:

The two tide gauges at the Ports are functional.

Challenges and achievements

The lack of adequate expertise in hydrography and inadequate resources to collect oceanographic data are major challenges. Despite these challenges, the DMFS in collaboration with the Global Monitoring for Environment and Security (GMES) and Africa project has contributed to increase the information management, decision-making and planning capacity of ECOWAS institutions mandated for coastal and marine resource management, by enhancing access to and exploitation of relevant Earth Observation (EO) data. The beneficiary coastal countries in West Africa include Benin, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Senegal, Sierra Leone, and Togo.

SPATIAL DATA INFRASTRUCTURES:

The Lands Commission under the Ministry of Lands and Natural Resources has drafted the National Geospatial Policy to guide how spatial data is collected, stored, manipulated and disseminated in Ghana. The Policy was sent to Cabinet for approval in 2019. It has been reviewed and awaiting Cabinet approval since the old Cabinet was dissolved and a new one was inaugurated in 2021.

The Geospatial Policy comprises the National Spatial Data Infrastructure (NSDI) Policy, Geodetic Reference Network Policy and Survey and Mapping Policy. The National Geospatial Policy covers all aspects of spatial data capture, processing and dissemination.

Ghana is a member of the EAthC MSDI Working Group.

INNOVATION:

Risk assessment: risk assessments are conducted frequently.

OTHER ACTIVITIES:

Magnetic and gravity surveys

From March 2021 to date, legacy geodetic controls (1st, 2nd and 3rd order) were re-observed with GNSS throughout the country to provide a robust geodetic transformation model between the Ghana National Coordinate System and the World Coordinate System. Gravity data from the Geological Survey Authority was integrated. The computation of the observations and data will enable the transformation parameters to be calculated, adopted and published for use in the country. The various computations have been completed and submitted to the Survey and Mapping Division (SMD) of the Lands Commission for quality control. The final reports which are yet to be produced are expected by end of year. Some private Continuous Operating Reference Stations (CORS) and SMD CORS were integrated into the network of controls. SMD and GPHA have discussed the establishment of CORS close to the tide gauges to monitor deformation in terms of movement in the earth's crust. The data from the CORS, in addition to the tide readings will support gravity surveys.

International engagements

Ghana and Togo have identified the position of the common primary reference boundary pillar, which was established between the gates at the Ghana-Togo border. The experts from both countries undertook independent geodetic observations from both sides and prepared a comprehensive report taking into consideration the observations done by each country. The report has been submitted to the technical committee formed by both countries. The definition of the line extending from the boundary pillar to the ocean is yet to be done.

World Hydrography Day

World Hydrography Day celebration was observed on 21st June, 2022 at the Ghana Maritime Authority. The Director General delivered the keynote address.



He emphasized the value of the oceans to the existence of life on earth and the key role of hydrography in providing the needed baseline information for the management of ocean resources. He highlighted the crucial role of hydrography to attaining the vision and mission of the UN ocean decade.

The Director General reaffirmed the GMA's commitment to providing the necessary support towards building the National Hydrographic Office in terms of expertise and resources.

In line with the above commitment, two qualified staff are being recruited.

National Hydrographic Strategic Framework workshop

The NHOC conducted a residential workshop to develop the National Hydrographic Strategic Framework.



Tidal flooding

NHOC conducted preliminary investigations into tidal flooding occurrences in a coastal town.



ACADEMIC PUBLICATIONS

- Foli, B. A. K., Appeaning Addo, K., Ansong, J. K., & Wiafe, G. (2022). Evaluation of ECMWF and NCEP reanalysis wind fields for long-term historical analysis and ocean wave modelling in West Africa. *Remote Sensing in Earth Systems Sciences*, 5(1), 26-45.
- Adeaga, O., Folorunsho, R., Foli, B. A. K., & Akinbaloye, O. (2021). Assessment of Shoreline Change Along the Coast of Lagos, Nigeria. *Remote Sensing in Earth Systems Sciences*, 4(3), 186-198.
- Foli, B. A. K., Ansong, J. K., Addo, K. A., & Wiafe, G. (2022). A WAVEWATCH III® model approach to investigating ocean wave source terms for West Africa: Non-linear wave-wave interaction source terms. *Applied Ocean Research*, 127, 103289.
- Foli, B. A. K., Ansong, J. K., Addo, K. A., & Wiafe, G. (2022). A WAVEWATCH III® Model Approach to Investigating Ocean Wave Source Terms for West Africa: Input-Dissipation Source Terms. *Remote Sensing in Earth Systems Sciences*, 1-23.
- Foli, B. A. K., Williams, I. K., Boakye, A. A., Azumah, D. M. Y., Agyekum, K. A., & Wiafe, G.

(2021). Earth Observation Services in Support of West Africa's Blue Economy: Coastal Resilience and Climate Impacts. *Remote Sensing in Earth Systems Sciences*, 1-12.

- Kpobi, E. K., Foli, B. A. K., Agyekum, K. A., & Wiafe, G. (2022). Development of a Raspberry Pi-Based Remote Station Prototype for Coastal Environment Monitoring. *Remote Sensing in Earth Systems Sciences*, 5(1), 14-25.
- Azumah, D. M. Y., Foli, B. A. K., Williams, I. K., Agyekum, K. A., Boakye, A. A., & Wiafe, G. (2022). Capacity Strengthening Towards Application of Earth Observation Tools and Services to Enhancing Marine and Coastal Areas Management in West Africa. *Remote Sensing in Earth Systems Sciences*, 5(1), 46-58.

CONCLUSION

The EAthC is kindly invited to take note of the report.