NATIONAL REPORT OF KINGDOM OF SAUDI ARABIA

North Indian Ocean Hydrographic Commission 24 (2025) Meeting

NIOHC24 (2025) Meeting

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Bangkok, Thailand

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1. Introduction:

The Hydrography Executive Directorate within GEOSA is dedicated to developing and maintaining the capacity to provide high-quality, standardized, and timely hydrographic data products and services. Its mission is to ensure the broadest possible use and distribution of these marine data products, facilitated through a structured framework of Governance, Regulation, and Operational functions.

As part of its mandate within GEOSA, the Hydrography Executive Directorate serves as the UN-GGIM Water Theme Regulator, overseeing Hydrography, Hydrology, Hydrogeology, and Internal Waters.

Saudi Arabia is bordered to the west by the Red Sea and the Gulf of Aqaba and the east by the Arabian Gulf. Some of the nautical charts currently in use for these waters are based on outdated data. To address this, GEOSA has been conducting hydrographic surveys to produce up-to-date charts. The surveys of the Kingdom's waters in both the Red Sea and the Gulf of Aqaba have now been completed and work is in progress within the Arabian Gulf.

2. Hydrographic Surveys:

Modern hydrographic surveys have been undertaken from 2010 onwards and the plan is to complete surveys of the entire Saudi Marine Areas by the year 2030. All the surveys are conducted with the latest technology using bathymetric – topographic LiDAR, Multibeam Echosounders Side Scan Sonars, Sub-bottom Profilers, Position Fixing Systems and Inertial Navigation Systems, ADCPs, Tide Gauges and allied oceanographic equipment.

The dedicated Hydrographic Survey Vessel (HSV) 'Sultan' is the primary hydrographic survey platform with two hydrographic survey launches onboard. These three platforms are equipped with an extensive suite of hydrographic equipment, sensors and related systems.

Since its establishment, GEOSA has surveyed all the Saudi Marine Areas in Red Sea and the Gulf of Aqaba and produced ENCs, PNCs and CZMCs[1] at various scales.

GEOSA is planning to resurvey the coastal area in the Red Sea and Gulf of Aqaba. This resurvey aims to monitor changes in the coastline and update nautical charts that are affected by development along the coast and in shallow water areas.

[1] Coastal Zone Management Charts

3. New Charts & Updates:

In the Red Sea and Gulf of Aqaba, GEOSA-designed chart scheme includes 86 charts serving various navigation purposes, such as General Navigation, Coastal Navigation, Approaches to Ports, and Port Entry. Recently, GEOSA has expanded this collection with an additional 15 large-scale charts, bringing the total to 101 PNC and ENC charts. These new additions support recreational leisure activities and enhance the safety of navigation with the NEOM and Red Sea Global Project Areas. GEOSA has completed the production of these 15 new PNC and 15 ENC charts. Additionally, through its cooperation with IC-ENC, GEOSA has issued 49 out of 101 ENC charts for the region.

A detailed list of produced charts and issued ENCs is provided in the table below.

Red Sea & Gulf of Aqaba PNC & ENC					
Navigational Purpose	**Scale**	**Planned PNC & ENC**	**Produced PNC**	**Produced ENC**	**Issued ENC**
General	1:500,000	3	3	3	0
Coastal	1:150,000	17	17	17	0
Approach	1:50,000	58	58	58	34
Harbor	(1:10,000 ،1:15,000)	23	23	23	15
Total		**101**	**101**	**101**	**49**

An independent QC/QA, encryption and distribution Cooperation Arrangement was formalized between GEOSA and IC-ENC (UK) in 2022. GEOSA has so far submitted 49 ENC cells of 1:50,000 and 1:15000 scale to IC-ENC for validation and distribution.

4. New Publications/Updates:

- The National Tide Tables (NP-001) for 2025 have been published using validated tide data from the GEOSA National Tide Gauge Network and the Temporary Tide Stations established in the Red Sea, Gulf of Aqaba and Arabian Gulf during previous hydrographic surveying projects.
- The National Tidal Current Tables (NP-002) for 2025 have been published using ADCP data.
- Both publications are provided in soft and hard copies to Port Authorities, Government, and Private Agencies. They are also available upon request for Mariners on the GEOSA web portal (www.geosa.gov.sa).

5. **MSI:**

The National Coordinator of the Kingdom of Saudi Arabia is the Ministry of Transport/ Saudi Port Authority (MAWANI). GEOSA updates charts through liaison with MAWANI and NAVAREA coordinator using available inputs. The Chart Correction actions and validation for GEOSA's produced ENCs and PNCs remains the full responsibility of GEOSA.

6. **C-55:**

The status of the surveys of the Red Sea and Gulf of Aqaba is as follows:

A. Hydrographic Surveying:

Status of hydrographic survey of all navigable waters, including internal waters, out to the limits of the EEZ:

A = percentage which is adequately surveyed.
B = percentage which requires re-survey at larger scale or to modern standards.
C = percentage which has never been systematically surveyed.

	A	B	C
Depths < 200m	100%	16 %	0%
Depths > 200m	100%	0%	0%

B. Nautical Charting:

Status of nautical charting within the limits of the EEZ.

A = percentage covered by INT series, or a paper chart series* meeting the standards in S-4.

B = percentage covered by Raster Navigational Charts (RNCs) meeting the standards in S-61.

C = percentage covered by ENCs meeting the standards in S-57.

Purpose/Scale	A PNC	B	C
Offshore passage/Small	100%	0	100%
Landfall and Coastal passage/Medium	100%	0	100%
Approaches and Ports/Large	100%	0	100%
Percentage of Group A showing depths in metres	100%		
Percentage of Group A referenced to a satellite datum	100%		

7. **Capacity Building:**

Capacity building within the organization has been successfully achieved through the effective utilization of IC-ENC (UK)-sponsored courses, alongside knowledge transfer

during contracted hydrographic surveying projects in Saudi waters. In-house training on emerging techniques, technologies, and software is continuously incorporated as part of GEOSA's on-the-job training program.

In 2024, GEOSA organized a training course on Ocean Affairs and the Law of the Sea, which was attended by fifty (50) participants from nine (9) government departments. Additionally, an Introduction to Hydrography course was held internally for government stakeholders, further enhancing understanding of the hydrospatial discipline. Moreover, personnel attended a Maritime Safety Information (MSI) training course in Bahrain.

Looking ahead, third-party training courses have been identified, and the personnel are expected to participate in these programs in the upcoming year to continue advancing their skills and expertise.

8. Oceanographic Activities:

GEOSA collects tide, meteorological, and other oceanographic data from various sources. Most of this data is collected during hydrographic and oceanographic survey projects, while tides and meteorological data are collected in real-time from its national tide gauge network (NTGN). The real-time observations of tides and meteorology from this network are used for navigation safety, sea level studies, and to support the development of islands and coastal regions in Saudi Arabia.

Since 2016, GEOSA has been publishing Saudi Tide Tables, and since 2020, Saudi Tidal Current Tables for navigation safety in Saudi Coastal Waters. The latest publication of Saudi Tide and Tidal Current Tables (2025) is available upon request. GEOSA also supports collaborative projects for collecting oceanographic data with other agencies in the Kingdom.

9. National Spatial Data Infrastructure

The National Spatial Data Infrastructure (NSDI) in the Kingdom of Saudi Arabia is a critical initiative for managing geospatial data across the nation. GEOSA (Geospatial Organization for Saudi Arabia) serves as the benchmark organization responsible for overseeing the development and management of Geospatial Information throughout the country.

GEOSA has established 15 main thematic areas, which include topics like urban planning, transportation, and environmental management. For each of these themes, specialized working groups are formed to collaborate, ensuring a unified approach to spatial data collection, management, and application.

GEOSA is also responsible for defining the regulatory framework for each theme. This ensures consistency, quality, and standardization in the management of spatial data across various sectors.

Hydrography Executive Directorate within GEOSA as part of its national mandate is the Water Theme Regulator which covers Hydrography, Hydrology, Hydrogeology, and internal waters.

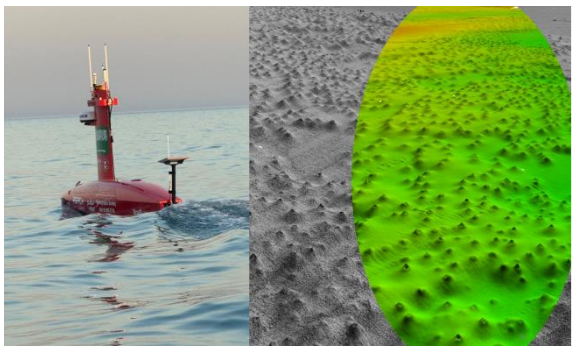
GEOSA plays a central role in the development and maintenance of a National Geospatial Platform, a comprehensive digital platform designed to provide access to geospatial data and tools. This platform is key to supporting informed decision-making across government, private sector, and research domains.

GEOSA is also responsible for developing guides, technical standards, and specifications for geospatial data, ensuring that all data collected across various themes adhere to consistent methodologies and high-quality standards.

GEOSA is central to advancing the use of geospatial data and technology in Saudi Arabia, enabling better planning, resource management, and sustainable development across sectors like water management, urban development, and environmental conservation.

10. Innovation:

GEOSA introduced innovative technologies, namely Uncrewed Surface Vessels (USVs), in support of the offshore surveying operations in Saudi Waters. This innovation enabled improved operational efficiencies, efficient use of resources, cost reductions and significant reduction in carbon emissions.



11. Other Activities:

GEOSA is also preparing customized products as per the requirement of its stakeholders (e.g. PNC & ENC designed for NEOM and Red Sea Global Projects Area). The Hydrographers and Cartographers are actively participating in the national exhibitions and seminars. GEOSA is working on integrating the Hydrographic Data Management (HDM) project with the National Geospatial Center (NGC) to make the products readily available online as part of self-sustainability.

GEOSA is collaborating with Stakeholders and Educational Institutions for sharing knowledge and hydrographic survey awareness

GEOSA is working towards production of the S-100 products using dual-fuel methodology (where S-101 & S-57 ENCs to be produced simultaneously).

12. Conclusion:

GEOSA continues to develop and gain experience in hydrographic activities by adapting state of the art technologies for hydrographic surveying and nautical publications in the Kingdom and GEOSA is committed to assure safety of navigation under IMO/IHO regulations. To date GEOSA has completed acquisition for the series of nautical charts covering the entire KSA waters in the Red Sea and Gulf of Aqaba.

In line with the “Saudi Vision 2030” Program, GEOSA is focused on participating fully with the associated objectives and goals outlined, with-in the program, in order to present world-class nautical charting and associated marine data products to benefit economical maritime services, trade, tourism, coastal zone management and the blue water economy.