



**MARITIME  
HYDROGRAPHIC  
DIRECTORATE**

## **15TH MEETING OF BLACK AND AZOV SEAS WORKING GROUP**

# **ROMANIA NATIONAL REPORT**

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## 1. HYDROGRAPHIC OFFICE

According to the Romanian Law no 395/2004, Romanian Maritime Hydrographic Directorate is the national authority in the field of hydrography and marine cartography. Romanian Maritime Hydrographic Directorate has also the statute of Lighthouses Authority.

Maritime Hydrographic Directorate operates under the leadership of the Naval Forces within the Romanian Ministry of National Defence.

The Directorate is committed to bilateral arrangements, developed in co-operation with other international government hydrographic authorities, regarding data exchange.

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## 2. SURVEYS

### **Coverage of new surveys**

Hydrographic, oceanographic and topographic surveys were executed in the Romanian area up to the 500 m bathymetric and at this time we have completed up to 45% of the Romanian coast where the bathymetry has an effect on the safety of navigation, and several surveys were done for military exercises.

In 2020 we have performed the following surveys:

- ✓ Topographic survey of the entire Romanian coastline (yearly activity). During this activity we verify the erosion process and the effects of sediments from Danube River;
- ✓ Hydrographic and oceanographic surveys for military purposes;
- ✓ Shoreline surveys for military exercises;
- ✓ Hydrographic surveys, in order to update the national database in the following areas:
  - Mangalia Harbor;
  - Midia Harbor Approach;

Also, in 2020 we performed the specific measurements for expanding and updating the database managed by the "Department for Data Analysis and Evaluation for Anti-Mine Warfare" in order to increase the safety of navigation in the Romanian territorial waters.

Other surveys done by other national authorities based on Romanian national law:

- Surveys of Constanta and Midia Ports - done by Port Authority (the data has been provided to RO MHD);
- Navigation Channel surveys for the Danube River- done by Romanian Danube Administration.

### **Survey platforms and equipment**

The surveys were done using the following platforms and equipment:

***The Romanian Hydrographic ship Cpt.Cdor ALEXANDRU CĂTUNEANU***



Equipment: EM 3000 Multi-beam

EA 400 Single-beam

Edgetech 4200 side scan sonar

Magnetometer – Marine Magnetics

Gradiometer- Marine magnetics

This survey vessel will be retrofitted with new sensor in 2021

***Survey Launch Cpt. Cdor. ALEXANDRU CĂTUNEANU II***



Equipment: EM 3002 Multi-beam

EA 400 Single-beam

MS 1000 underwater scanner

Edgetech 4200 side scan sonar

Magnetometer – Marine Magnetics

***Survey Launch Hidrografica 3***



Equipment: EA 400 [Single-beam](#)

Magnetometer – Marine Magnetics

***Survey Launch – OCEAN 1***



Equipment: T 20 R Multi-beam

Echotrack T 20 Single-beam

Santinel V ADCP

BATS USBL

Edgetech 4200 side scan sonar

**Fixed stations:**

We have at this stage four locations for tide measurements and RTK fixed stations spread on the Romanian coast line.

**New technologies and /or equipment:**

In 2021 the *Romanian Hydrographic ship Cpt.Cdor ALEXANDRU CĂTUNEANU* will have a modernization stage in order to update the onboard research equipment to latest technologies and expand the capabilities with the following:

- Deep sea multibeam system;
- ADCP;
- USBL;
- Sub bottom profiler;
- Inertial positioning system.

**3. CHARTS**

MDH produces official standard nautical charts (SNC) and electronic navigational charts (ENCs) covering the waters within the national responsibility area. For details see: <https://www.dhmf.ro/en/>.

**ENCs**

From 1<sup>st</sup> April 2019 to 15<sup>th</sup> April 2021, MHD has increased the number of ENCs portfolio from 13 to 19 ENC cells based on existing paper charts (Figures 1-6). Since last report MHD has produced 40 updates, 13 new editions and 5 new ENC cells: RO501021, RO501022, RO600521, RO600522, RO600523, band 5 and band 6, covering Port of Constanța.

MHD intends to produce and send for distribution this year, 3 new ENC cells band 3.

Usage band	Navigation purpose	No of cells released	No of cells planned for production(this year)
1	Overview	N/A	N/A
2	General	1	N/A
3	Coastal	To be produced	3
4	Approach	6	N/A
5	Harbour	5	N/A
6	Berthing	7	N/A
<b>Total</b>		<b>19</b>	<b>3</b>



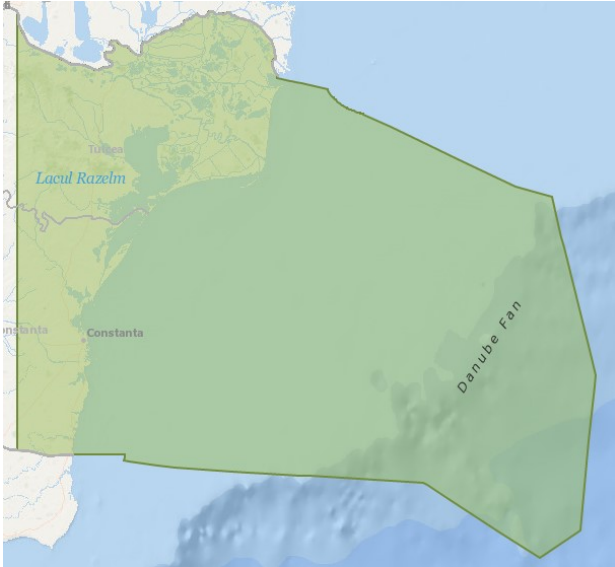


Figure 1. General band, scale 1:350000, covering Romanian Coast

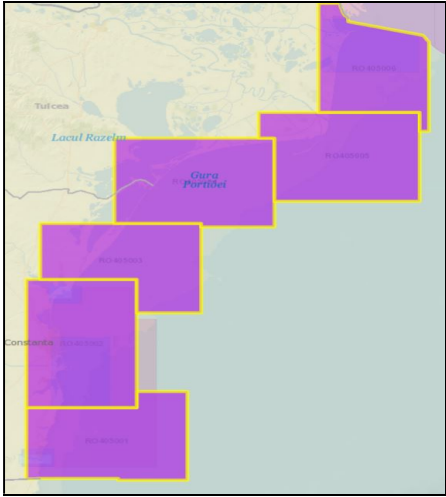


Figure 2. Approach band, scale 1:45000, covering Romanian Coast

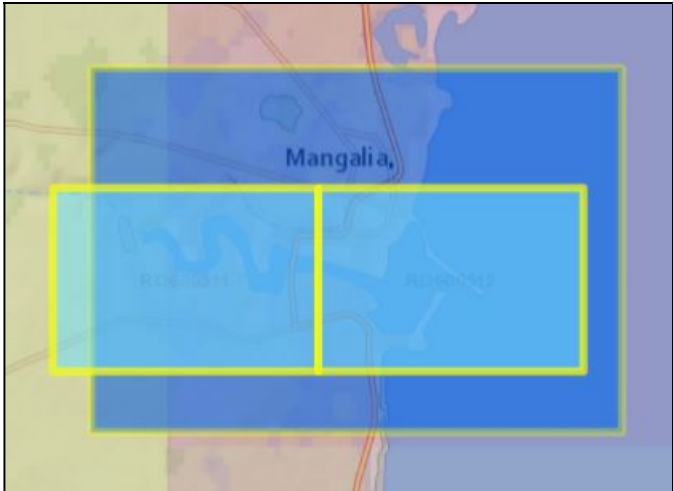


Figure 3. Harbour and berthing bands - Port of Mangalia



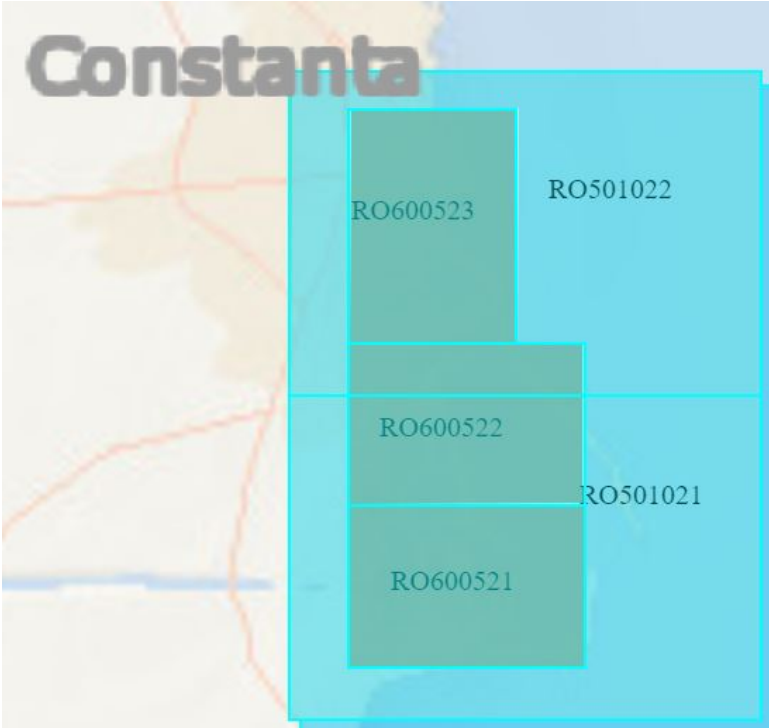


Figure 4. Harbour and berthing bands - Port of Constanța



Figure 5. Harbour and berthing bands - Port of Constanța – Zone Midia



Figure 6. Harbour band - Port of Sulina

***ENC distribution method***

MHD distributes its ENCs through IC-ENC RENC.

**RNCs**

Romania does not produce RNCs.

**INT Paper Charts**

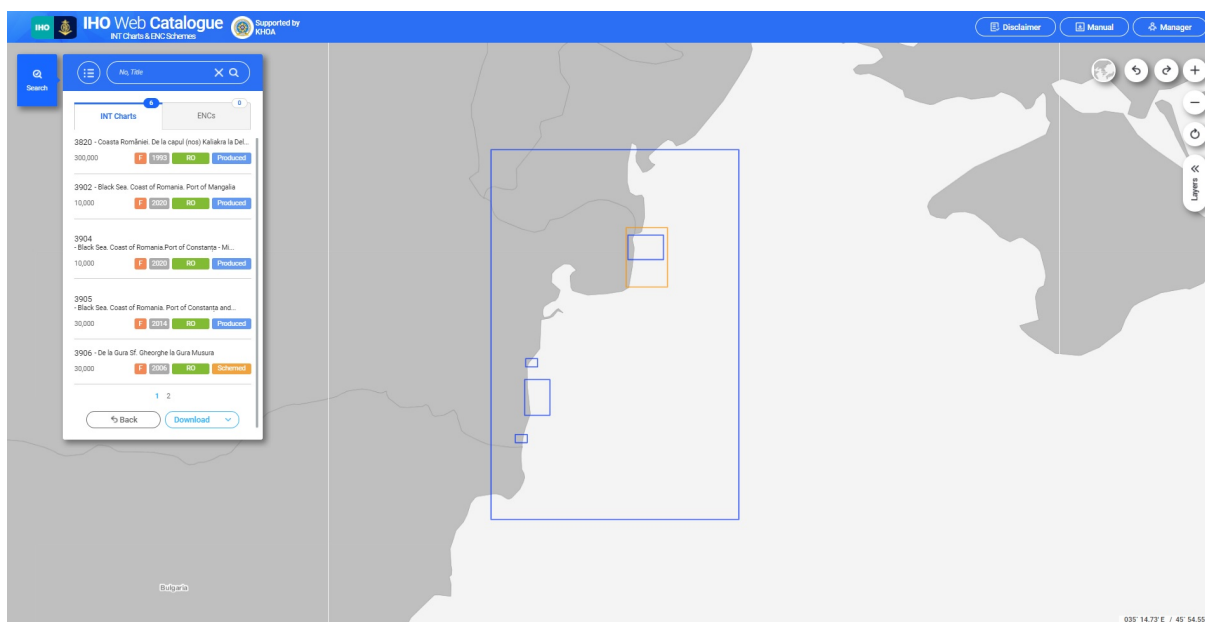
Romania has in its portfolio 6 INT numbers which cover the entire Romanian coast of the Black Sea and the Romanian ports.

The current status of INT charts produced by MHD is:

INT No.	SCALE	MAIN TITLE	STATUS	Edition Year
3820	1:300000	<i>From Kaliakra to Danube Delta</i>	Produced	2014
3902	1:10000	<i>Port of Mangalia</i>	Produced	2020
3904	1:10000	<i>Port of Constanta – Midia zone</i>	Produced	2021
3905	1:30000	<i>Port of Constanta and approaches</i>	Produced	2021
3907	1:50000	<i>From Gura Sf.Gheorghe to Gura Musura</i>	In progress	Planned for 2021
3908	1:30000	<i>Port of Sulina and approaches</i>	Produced	2021

From 1st of July 2019 to 15th of April 2021, RO MHD produced 3 new INT charts and 1 new edition of INT charts (Figures 8-11).

Details on MHD INTs (title, chart limits, current status etc.) are accessible for all chart users in IHO Web Catalogue (Figure 7).



**Figure 7. IHO Web Catalogue – Romanian INT charts**

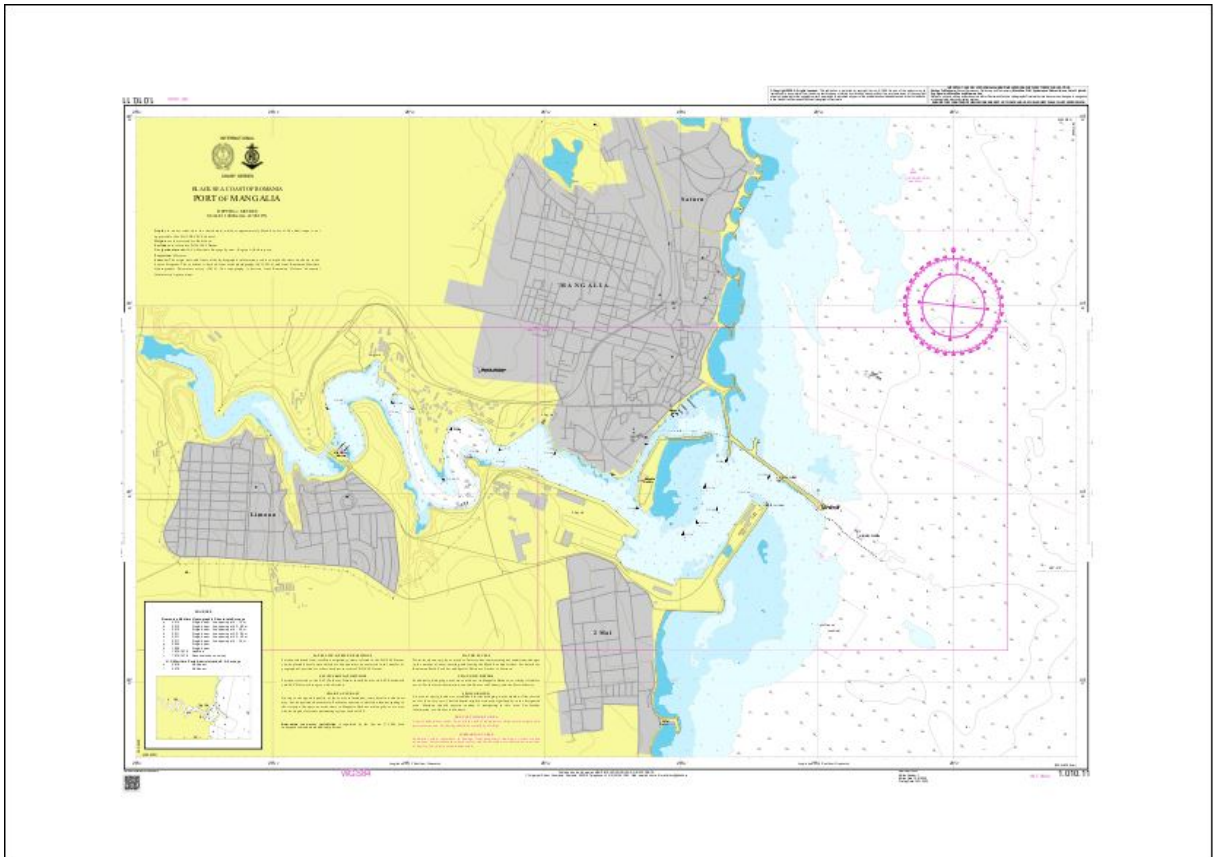


Figure 8. INT 3902 Port of Mangalia

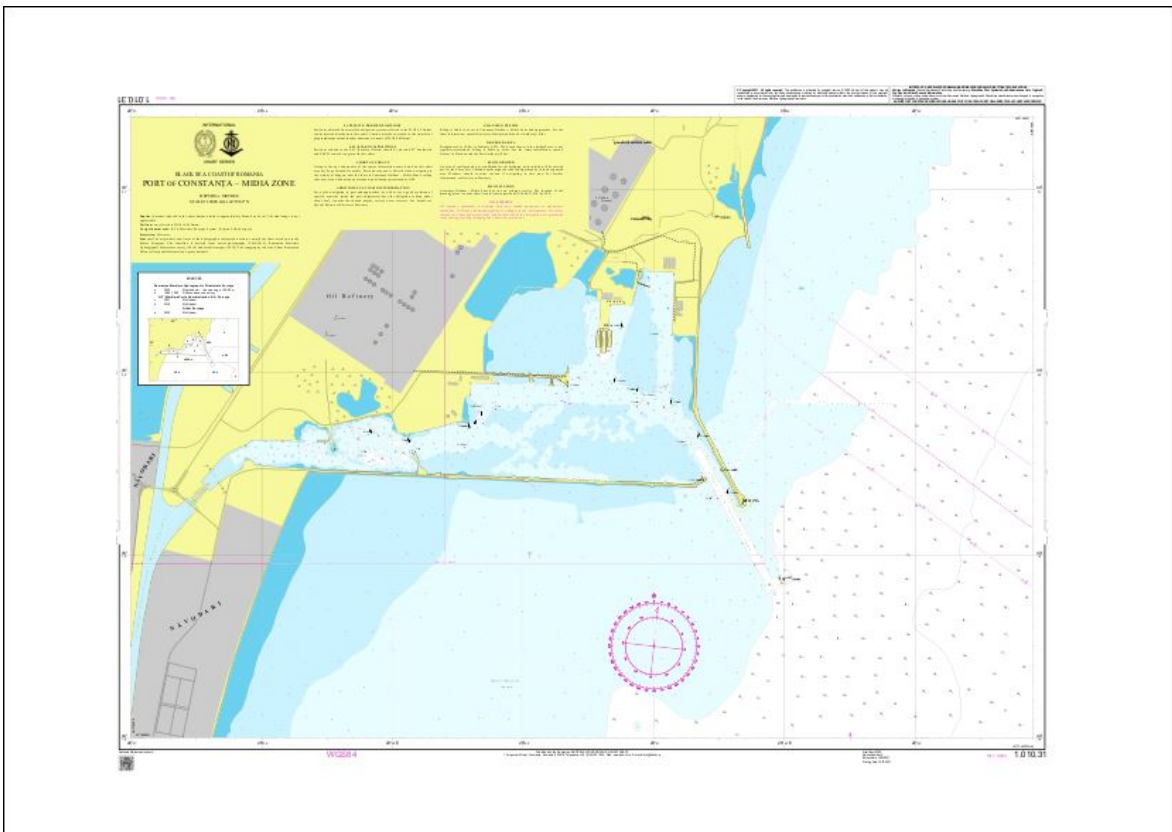


Figure 9. INT 3904 Port of Constanta – Midia Zone

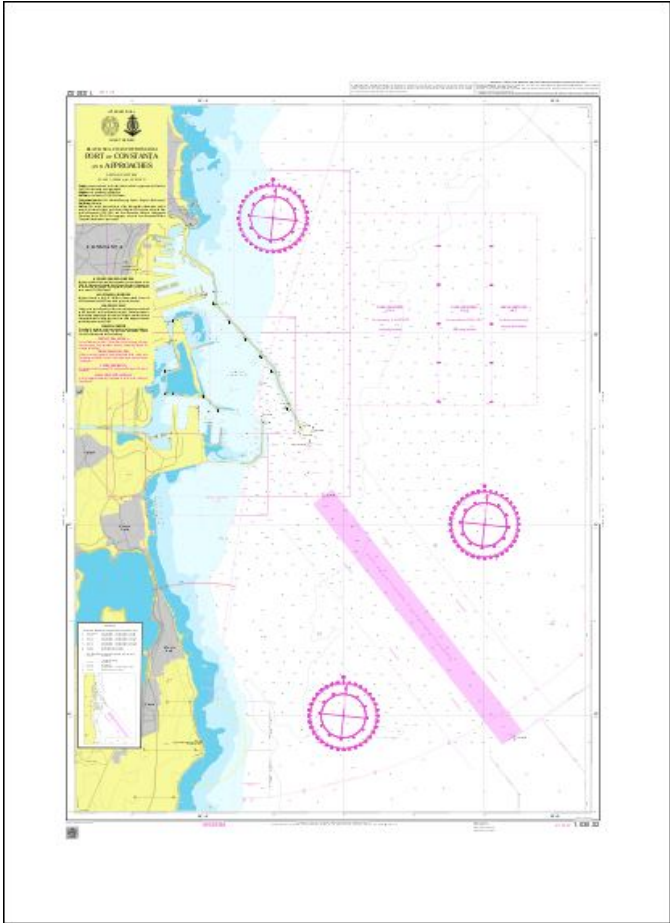


Figure 10. INT 3904 Port of Constanta and approaches

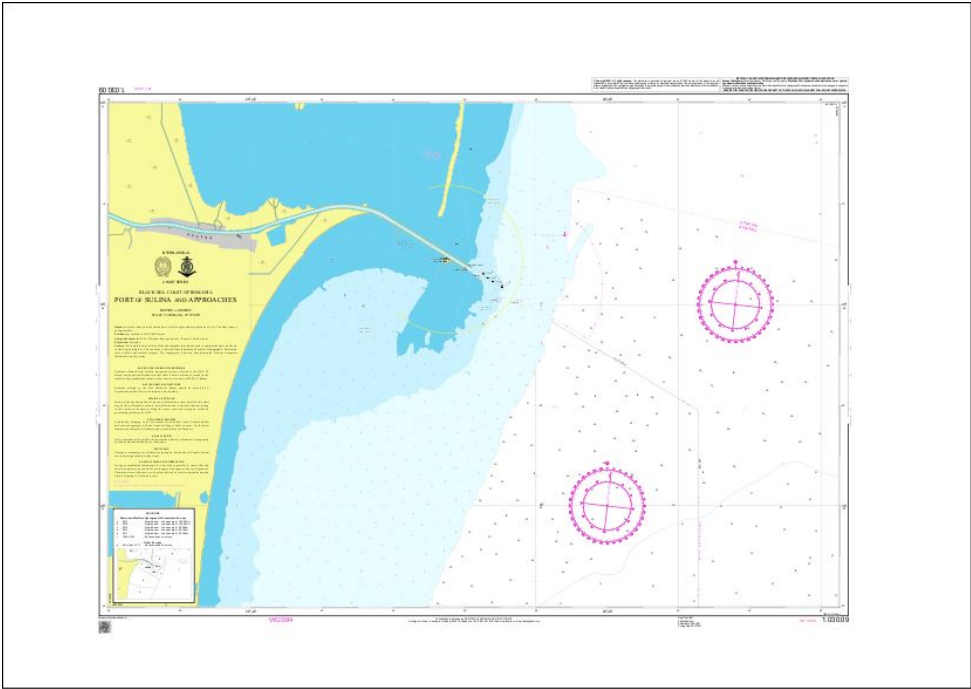


Figure 11. INT 3908 Port of Sulina and approaches

### National Paper Charts

From 1st of July 2019 to 15th of April 2021, RO MHD produced 12 new editions of national paper charts.

The Romanian national folio of paper charts consists in: 18 paper charts edition 2007 (reprinted 2009), 1 paper chart edition 2014, 8 paper charts edition 2020 and 2 paper charts edition 2021.

The datum of all charts is **WGS84**.

SCALE	NO. OF CHARTS	SCALE	NO. OF CHARTS
<b>MEDIUM-SCALE</b>	<b>13</b>	<b>LARGE-SCALE</b>	<b>16</b>
<i>Landfall Charts</i>	<b>4</b>	<i>Port Approach Charts</i>	<b>6</b>
1:750000	2	1:50000	6
1:500000	2	<i>Harbour Charts</i>	<b>2</b>
<b>Coastal Navigation Charts</b>	<b>9</b>	1:10000	2
1:250000	1	<i>Berthing Charts</i>	<b>8</b>
1:150000	2	1:5000	8
1:100000	3		
1:75000	3		

The charts issued by MHD cover all Romanian Exclusive Economic Zone and the Black Sea (Figure 12).

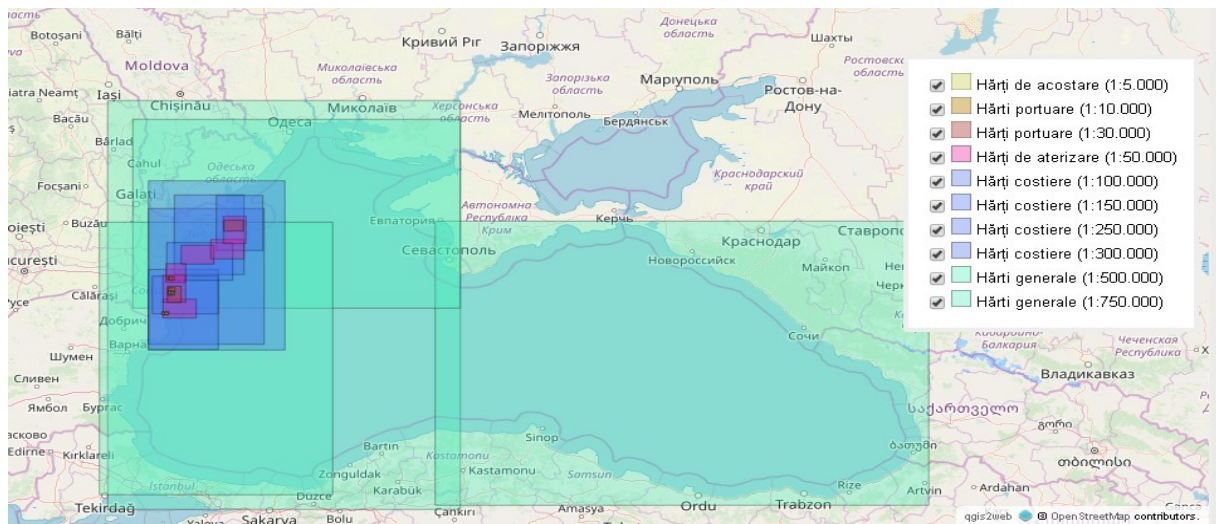






























Figure 12. MHD Chart Folio coverage of Black Sea

An intensive work is carried on by the cartographic staff of MHD to create new editions for the national paper charts with editions older than 2020.

Starting from 2020 all paper charts editions have a QR code that allow the end user to check for updates. The service is available on RO MHD Internet webpage ([www.dhmf.ro](http://www.dhmf.ro)) and became operational in April 2021.



Nr. hartă Chart No.	Scara 1: Scale 1:	Denumire Chart Title	Ediție Edition	Data ediției Edition date	Actualizări (pdf) Updates (pdf)	Hartă (jpg) Chart (jpg)
1.005.11	5 000	Portul Mangalia	2	15 IAN 2020		
1.005.12	5 000	Portul Mangalia	2	15 IAN 2020		
1.005.21	5 000	Portul Constanța	2	15 FEB 2020		
1.005.22	5 000	Portul Constanța	2	15 FEB 2020		
1.005.23	5 000	Portul Constanța	2	15 FEB 2020		
1.005.24	5 000	Portul Constanța	2	15 FEB 2020		
1.005.31	5 000	Portul Constanța - Zona Midia	3	05 MAR 2021		
1.005.32	5 000	Portul Constanța - Zona Midia	3	10 MAR 2021		
1.010.11 (INT 3902)	10 000	Port of Mangalia	1	15 IAN 2020		
1.010.21	10 000	Portul Constanța	2	15 FEB 2020		
1.010.22	10 000	Portul Constanța	2	04 MAR 2020		
1.010.31 (INT 3904)	10 000	Port of Constanta – Midia Zone	2	19 MAR 2021		
1.030.02 (INT 3905)	30 000	Port of Constanta and Approaches	2	15 FEB 2021		
1.030.09 (INT 3908)	30 000	Port of Constanta and Approaches	1	29 IAN 2021		

**Figure 13. Paper charts update service**

### Special Naval Charts

A permanent task of MHD is to produce special naval charts for the Romanian Naval Forces. Therefore, we produce many types of thematic paper charts to fulfill RO NAVY needs and also additional military layers, according to NATO standards.

### Cartographic Production

The production of paper charts with CARIS Paper Chart Composer is fully established. For ENC's CARIS S57 Composer is the production software.

Since 2017, MHD is using a large format plotter capable of printing high-quality paper charts (Figure 14).

MHD intends to introduce the Print on Demand (PoD) system, using the new A0 print system (Figure 15). This is capable of prints with high image durability and exposure to light over extended periods.



Figure 14. Plotter system



Figure 15. Digital printing system

### Problems Encountered

1. Shortage in specialized human resources.
2. A few small overlaps on Ukraine/Romania ENC's are under consideration and deliberation.

## 4. NAUTICAL PUBLICATIONS

### MHD Official Nautical Publications

Notification of the failure of lighthouses or buoys, notification of temporarily prohibited areas and all changes affecting charts in Marmara and Black Sea area are provided, monthly, to users of the marine environment through *Notices to Mariners* (Figure 16), in Romanian and English languages.

MHD publishes every year (Figure 17):

- Special Edition of Notices to Mariners
- Annex to Special Edition of Notices to Mariner
- Cumulative List of Notice to Mariners

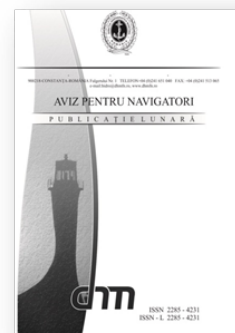


Figure 16. Notices to Mariners

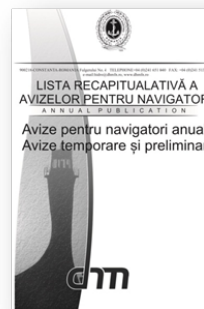
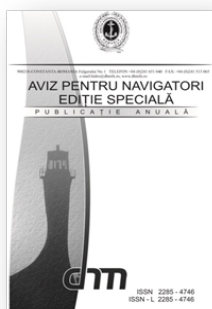


Figure 17. MHD annual nautical publications



MHD nautical publications portfolio includes the following documents:

- *Black Sea Pilot*
- *List of Lights and Fog Signals*
- *Charts and Nautical Publications Catalogue*
- *Maritime Buoyage System*
- *Symbols and Abbreviations used on Romanian Paper Charts (according to INT1)*
- *Nautical Tables*

All publications are printed in Romanian language and are available in hard copy format (Figure 18).



Figure 18. MHD official nautical publications

### **New Publication/ Edition of Nautical Publications**

Since the 21<sup>st</sup> MBSHC Conference no publication has been issued.

In the second part of 2021 are to be printed:

- Symbols and Abbreviations used on Romanian Paper Charts (according to INT1), new edition;
- Instruction for How to Keep Romanian Nautical Charts and Publications Up-To-Date.

## 5. MARITIME SAFETY INFORMATION (MSI)

### Existing infrastructure for transmission

Maritime Hydrographic Directorate is the national authority which promulgates navigational warnings and Constanta Radio is the National NAVTEX service provider.

### NAVTEX

MSI Services are provided on 7/24 basis. The Romanian navigational warnings are transmitting in English language on 518 KHz through Varna Radio KHz. Other communication systems (VHF, MF and HF) are also available to promulgate MSI warnings in Romanian language if needed.

International NAVTEX service is performed through Varna Radio (on behalf of Romania – as agreed by IMO's INTERNATIONAL NAVTEX COORDINATING PANNEL).

Coordinates – 43-04 N, 27-46 E;

NAVTEX coverage – 350 nautical miles;

MMSI - 002070810;

B1 character – [J];

Language – English;

Frequency – 518 kHz.

Graphic (UTC)	Weather Bulletins	Navigation and Storm Notices
01:30		•
05:30	•	•
09:30*	• *	•
13:30		•
17:30	•	•
21:30*	• *	•

\* - Forecast on behalf of Romania, received from Constanta Radio

Number of Coastal and NAVAREA Warnings disseminated last year by MHD are listed below:

Year	NAVTEX Warnings	NAVAREA-III Warnings
2020	97	97
2021	14	14

### MSI Equipment

MHD owns a NAVTEX receiver (NAV6/NAVTEX) from 2018, through which it can verify the promulgation of all the MSI messages, from area of responsibility (Figure 20).

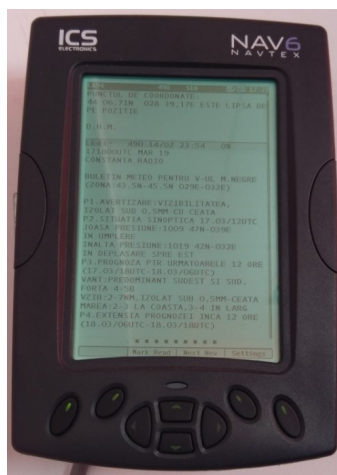


Figure 20. NAVTEX receiver

**New infrastructure in accordance with GMDSS Master Plan**

Ntr.

**Problems encountered**

Ntr.

**6. CAPACITY BUILDING**

**Training received through capacity building program**

One of our marine cartography specialists has been selected for the GEOMAC (Geospatial Marine Analysis and Cartography) training course in 2020. The training has been postponed for 2021 due to world pandemic situation.

It is the intention of the MHD to enroll other personnel in hydrographic and cartographic training in the next years.

**Training received outside the capacity building program:**

- One person attended CAT B hydrography training course at FOST(UK) in 2018

**Training needed:**

- S-100 product specification course and transition to S-100 products
- Cartographic Data Management course
- Nautical cartography and hydrography courses, cat A and cat B;
- Oceanography course;

We have only a few specialized personnel in hydrography and marine cartography. At this time, we have only 3 people that hold certification in hydrography and 2 people in marine cartography.

We have no persons specialized in oceanography.

## 7. OCEANOGRAPHIC ACTIVITIES

<b>Tide gauge network:</b>	4 water level monitoring systems in Constanta, Midia, Sulina and Mangalia
<b>Equipment:</b>	Pressure gauge Valeport tidemaster
<b>Oceanographic measurements:</b>	Oceanographic measurements were performed for: Midia, Mangalia, coastal route Constanta – Mangalia and the pouring mouth of Danube in Black Sea through Sulina and Sf. Gheorghe.
<b>Problems encountered:</b>	Lack of training courses for the oceanography personnel

## 8. OTHER ACTIVITIES

### Meteorological data collection

The meteorological data collection is done by the Meteorological Department from the RO MHD. The data is stored into a database and it's used for forecasts, mainly in support of Romanian Navy operations.

### Geospatial studies

*Erosion of the Romanian coast* (in Romanian language).

### Participation in IHO Events

MHD participated in the following IHO events since 20<sup>th</sup> MBSHC meeting:



**Figure 21** Nautical Cartography Working Group– 5<sup>th</sup> meeting (Stockholm, Sweden)



### Participation in IC-ENC Events

Through the years passed from last MBSHC meeting, representatives of MHD attended IC-ENC meetings (Figure 21):

- Technical Conference 2019 (TC04) – Panama City, Panama
- Steering Committee 2019 (SC21) – Cape Town, South Africa
- Technical Conference 2020 (TC05) – Online
- Steering Committee 2020 (SC22) – Online



Figure 22. TC-04 IC-ENC.

### Participation in Other Events

MHD personnel also participated in numerous NATO working groups such as: Geospatial Maritime WG, Naval Mine Warfare WG, Military Meteorology WG, Shipping WG, etc.

Starting up with 2019, MHD intends to participate at the following IHO Working Groups: ENCWG, NCWG, S-101PT, S-121PT and ABLOS Conference.

## 9. CONCLUSIONS

The cooperation with Hydrographic Services and national research institutes regarding the hydrographic activity represent a key point in improving the quality of hydrographic products and services in the near future in Romania. Maritime Hydrographic Directorate will continue to strengthen the cooperation in the field of hydrography and cartography with similar organizations within and outside the Black Sea.

The cooperation in the field of hydrography, marine cartography and oceanography conducted to good results on the coverage of the responsibility areas, reducing the financial and human effort involved in such activities.