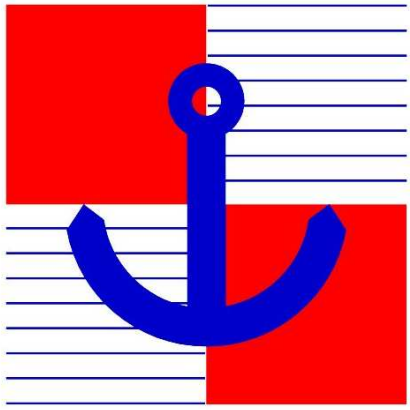
MEDITERRANEAN AND BLACK SEAS HYDROGRAPHIC COMMISSION

XX CONFERENCE

REPORT BY CROATIA

HRVATSKI HIDROGRAFSKI



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HYDROGRAPHIC INSTITUTE
OF THE REPUBLIC OF CROATIA

MEDITERRANEAN AND BLACK SEAS HYDROGRAPHIC COMMISSION

XX CONFERENCE

REPORT BY CROATIA

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1. CROATIAN HYDROGRAPHIC SERVICE

In accordance with the provisions of SOLAS Chapter V (Hydrographic Service), that are implemented in the Croatian national legislation (Low on Hydrographic Activity, 1998, 2003, 2014), Hydrographic Institute of the Republic of Croatia (CHI) carries out scientific and research work, as well as development and professional tasks relating to the safety of navigation, hydrographic-geodetic survey in the area of the national responsibility, marine geodesy, construction and production of charts and nautical publications, oceanographic research, submarine geology research, and finally publishing and printing activities. Position of the CHI in the structure of Croatian (maritime) administration is shown in Annex 1. For details see www.hhi.hr.

2. HYDROGRAPHIC SURVEY

Survey status

Hydrographic surveys conducted along the Croatian coast since the XIX MBSHC Conference were limited to selective parts of the coast and to principal ports and passages. Numerous hydrographic profiles have been surveyed in order to elaborate underwater installations. Also, a significant number of existing and new marinas (33), small ports (18), shoals and underwater rocks (14) were surveyed and new ENCs (33) were released. Annex 2 summarizes the status of hydrographic surveys in accordance with the criteria in the IHO C-55 publication. Annex 3 shows new haydrographic survey of marinas, small ports, shoals and underwater rocks

3. CHARTS

CHI produces official paper and electronic navigational charts (ENCs) covering the waters within the national responsibility. For details see http://www.hhi.hr/catalogmaps

ENCs

CHI has produced 124 navigational ENC cells mostly based on the existing paper charts.
As it was planned, the CHI achieved adequate coverage, availability, consistency and quality of ENCs by 1 July 2012. An additional project was launched in 2014 to resolve observed cross-border inconsistencies between the ENCs of different usage bands. Status of the CHI ENC production is shown in the following table:

		1 July 2008		**1 June 2011**		**1 July 2013**		**15 May 2015**		**31 May 2017**	
User band	Navigational purpose	No of Cell	Area coverage (%)	No of Cell	100%	No of Cell	Area coverage (%)	No of Cell	Area coverage (%)	No of Cell	Area coverage (%)
1	Overview	1	100%	1	100%	1	100%	1	100%	1	100%
2	General	4	100%	4	100%	4	100%	4	100%	4	100%
3	Coastal	15	100%	15	81%	15	100%	15	100%	15	100%
4	Approach	9	72%	12	84%	13	85%	14	88%	14	88%
5	Harbour	31	77%	37	80%	37	84%	39	86%	40	88%
6	Berthing	20	74%	22	91%	24	85%	24	85%	50	95%
TOTAL		**80**	**87%**	**91**	**91%**	**94**	**92 %**	**97**	**93 %**	**124**	**96%**

Annex 4 shows Croatian ENC 5-year ENC production priority plan based on new hydrographic survey - Overall. Annex 5 shows ENC 5-year ENC production priority plan based on new hydrographic survey – Regional. Annex 6 shows current ENC release status.

ENC distribution method

CHI distributes its ENCs through the PRIMAR RENC. The first Croatian ENCs were released in February 2007.
By the Navy Agreement since the end of 2016, Croatian ENCs are also available on Croatian Navy ships. In the period between the two MBSHC conferences, the CHI produced 34 new ENCs, seven ENC new editions, and 277 updates (ERs).

WMS for ENCs

CHI as a member of PRIMAR RENC actively participates in the project WMS for ENCs together with other PRIMAR member states. At the moment, CHI and a few Croatian maritime governmental organizations (MRCC, Maritime Directorate, HM Offices) and Croatian Navy use WMS for ENCs for administrative purposes (Fig. 1).

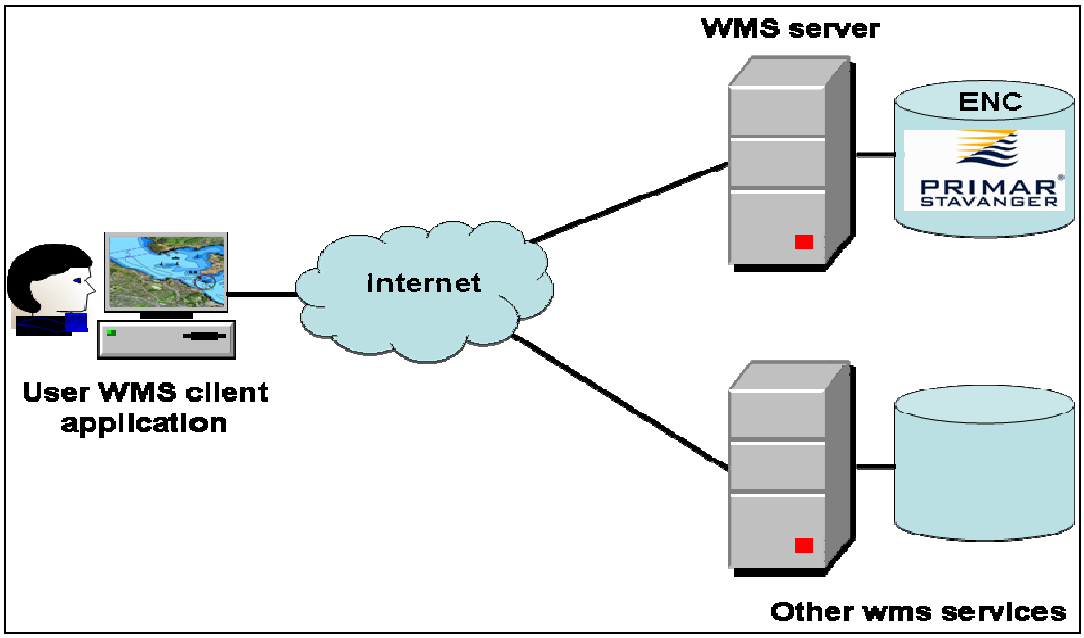


Figure 1. PRIMAR WMS for ENCs

INT ENC scheme

The current three draft proposal solution (ENC scheme for UB 1 and UB 2) for the Adriatic Sea area, which is based on HR first proposal presented during the XVII MBSHC Conference, is still under the process of harmonization between IT and HR approaching to the final solutions.

RNCs

RNCs covering the Croatian area of responsibility are available from UK HO ARCS according to a bilateral agreement.

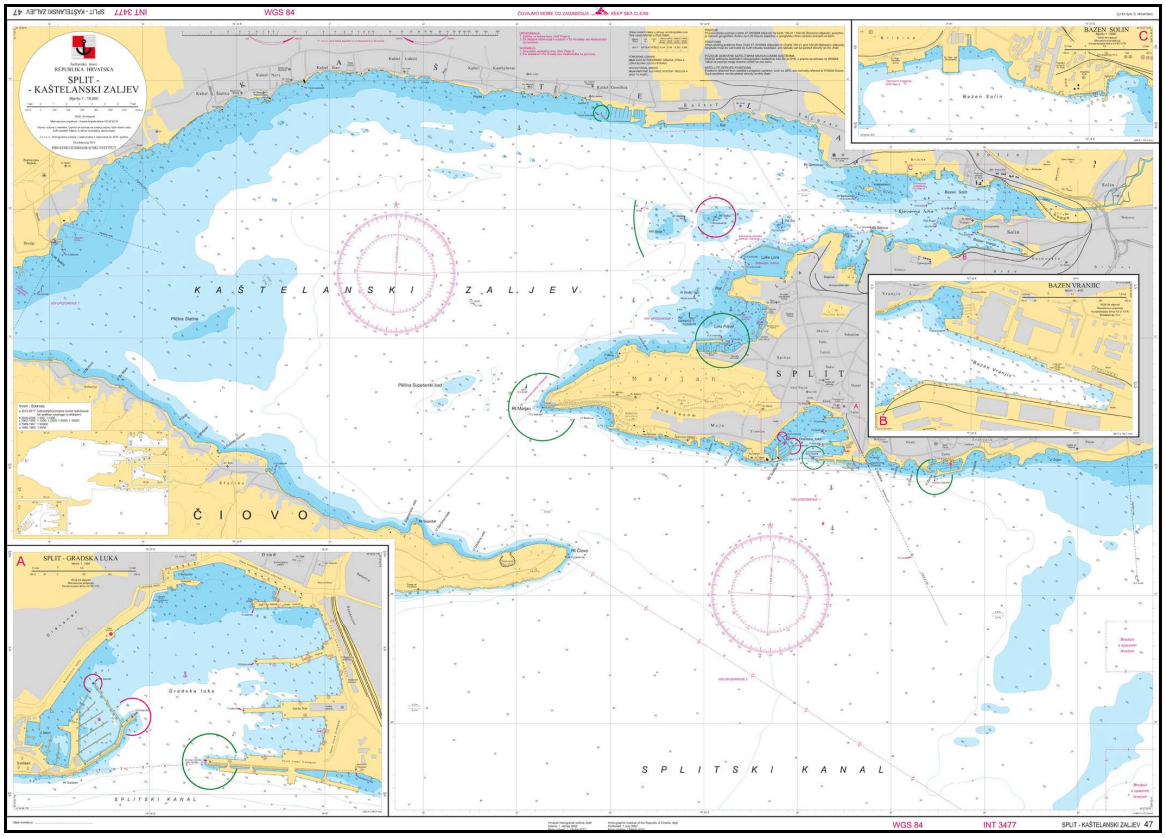
INT paper charts

HR status of INT paper charts is shown in the table in Annex 7 and on the figure in Annex 8 respectively. CHI made input of current INT Charts status using IHO INToGIS manager (figure in Annex 9).

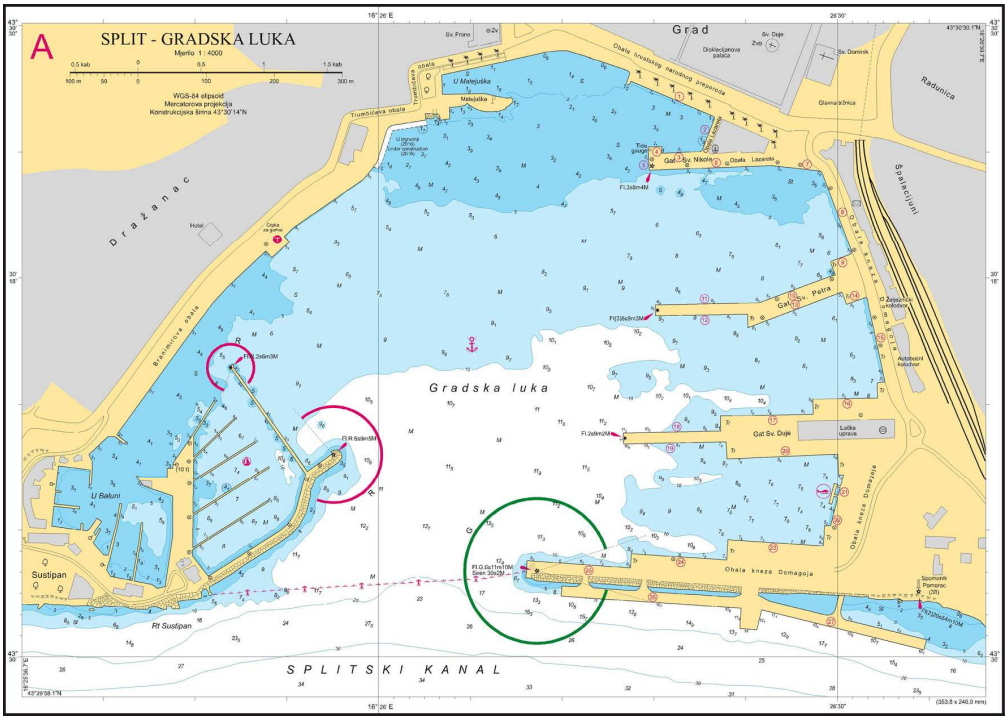
National paper charts

In the period between the two MBSHC Conferences the CHI published the following charts:

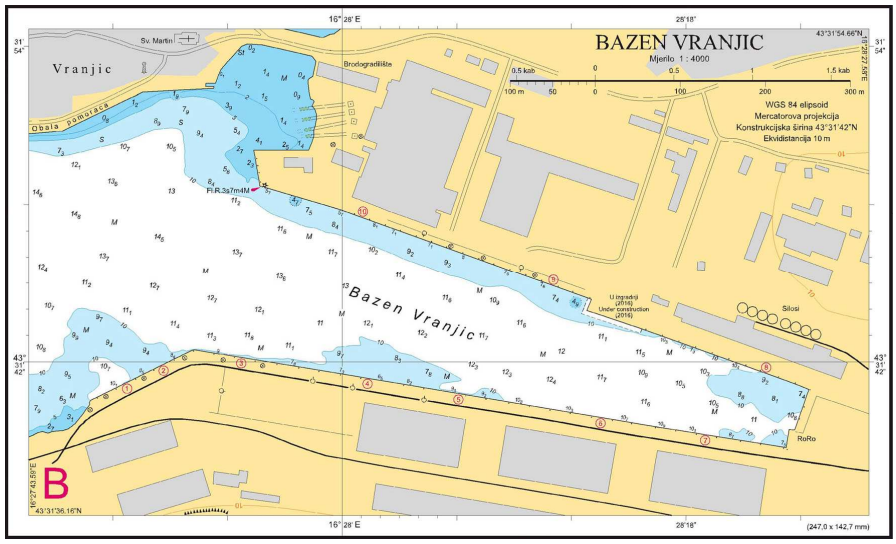
New edition



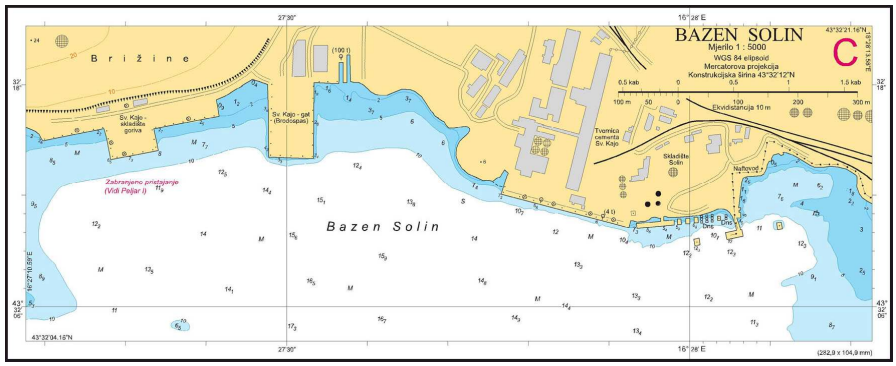
47 Split – Kaštelanski zaljev, 1:15 000



– Plan on chart 47: Split – Gradska luka, 1:4 000



– Plan on chart 47: Bazen Vranjic, 1:4 000

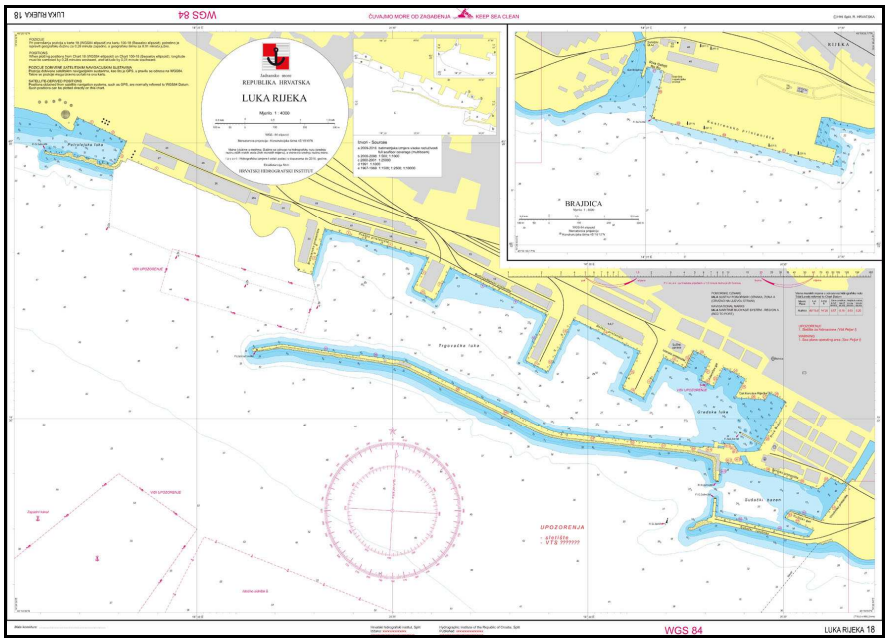


– Plan on chart 47: Bazen Solin, 1:5 000

New edition – in the finale stage of preparation

15 Rijeka, 1:15 000,

18 Luka Rijeka, 1:4 000, Rijeka – Brajdica, kontejnerski terminal, 1: 4 000,



New printing

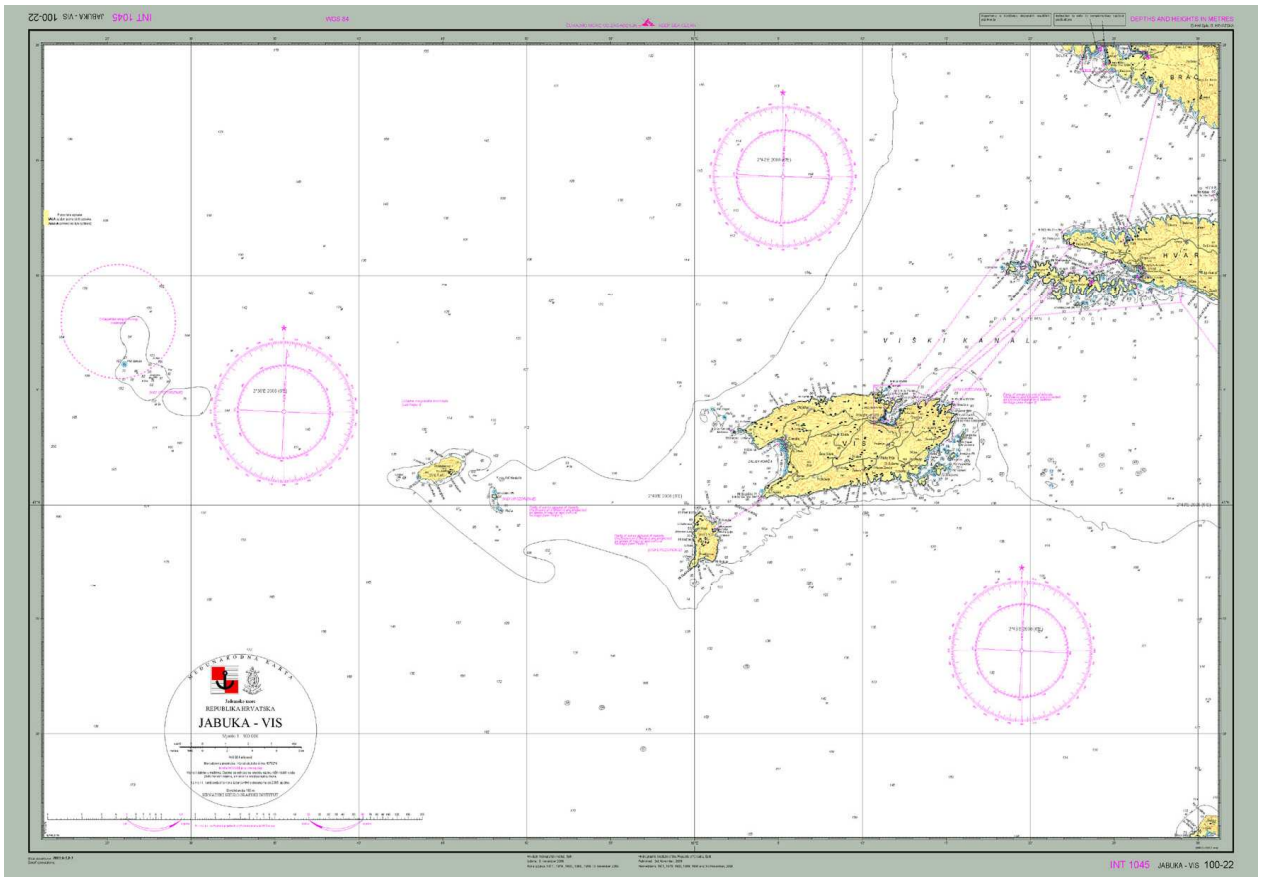
101	Jadransko more	1:800 000
100-15	Grado – Rovinj	1:100 000
100-16	Pula – Kvarner	1:100 000
100-17	Lošinj – Molat	1:100 000
100-18	Rijeka – Kvarnerić	1:100 000
100-19	Silba – Pag	1:100 000
100-20	Dugi otok – Zadar	1:100 000
100-21	Šibenik – Split	1:100 000
100-24	Palagruža – Lastovo	1:100 000
100-25	Hvar – Lastovo	1:100 000
100-26	Brač – Hvar	1:100 000
Male karte – MK I. dio		1:100 000
63	Ploče	1:8 000

533 Šibenski kanal 1:25 000 and Luka Šibenik 1:10 000

New technologies

Paper chart production from ENCs

Intensive work on acquisition of the production process of making paper charts from ENCs continues (Fig. 2). Several charts are in final phase of preparation using special software.



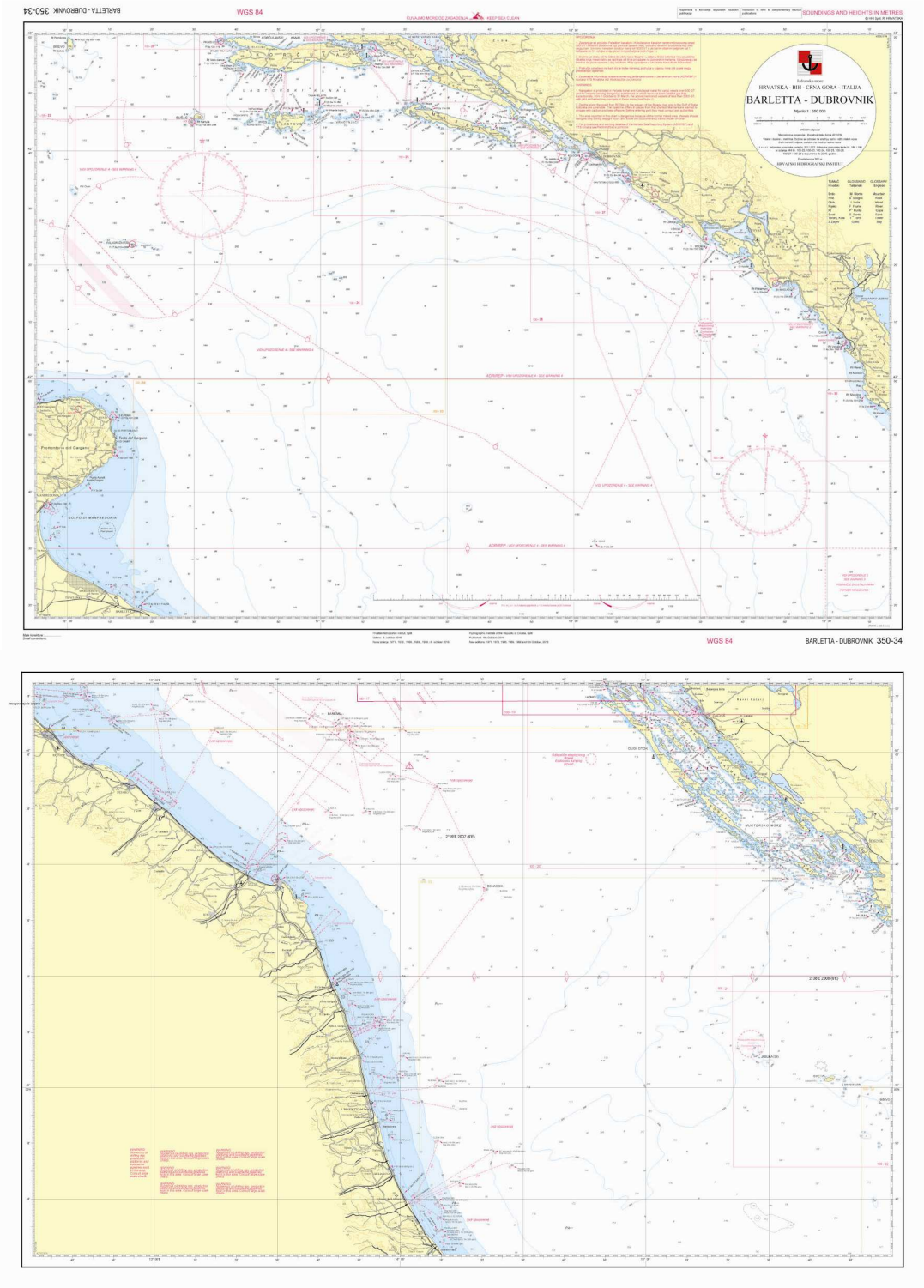


Figure 2. Charts produced from ENCs

Problems encountered

1. Some overlaps still exist between HR, IT and GR Overview and General ENCs. The process of consideration of the three current proposals is slow but still underway between IT and HR.
2. A few small thin overlap on IT/HR border are under consideration and deliberation.
3. Some inconsistencies observed between national (HR) paper charts and ENCs are under constant consideration and deliberation. Furthermore, any feedback received from users or the IHO is a matter of urgent examination and solving.

4. NAUTICAL PUBLICATIONS

4.1 National official nautical publications series

CHI nautical publications series includes the following documents (Fig. 3):

- Sailing Directions
- Sailing Directions for Yachts (two volumes in four languages)
- Lists of Lights
- Radio Service
- Nautical Almanac
- Nautical Tables
- Symbols and Abbreviations (INT 1)
- Notices to Mariners (monthly edition)
- Catalogue
- Tide Tables

Figure 3. CHI official nautical publications

4.2 Nautical publications issued

Since the XVIII MBSHC Conference the following publications have been issued:
Tide Tables:

- Tide Tables 2016**.**
- Tide Tables 2017**.**

Nautical Almanac:

- Nautical Almanac 2016**.**
- Nautical Almanac 2017**.**
- Nautical Almanac 2018**.** (in preparation)

List of Lights:

- List of Lights – Adriatic Sea - Eastern part – 2017.

Notices to Mariners - the digital version produced using dKart DNtM module is still in the testing phase.

5. MARITIME SAFETY INFORMATION (MSI)

In the Republic of Croatia MSI service is available 7/24/365. NAVTEX broadcasts are transmitted in English. MSI are transmitted regularly on VHF channels of coast radio stations. Correctness of the promulgation of information is controlled on the NAVTEX receiver and VHF station in the CHI Nautical Department (Fig. 4). There is no failure occurring during ordinary operation.

Figure 4. Equipment for monitoring the correctness of the promulgation of navigation warnings

Schedule of navigational warnings is shown in the following table 2:

NAVWARNINGS	2015 (From 31.5.2015)	2016	2017 (Until 31.5.2017)
NAVAREA	11	10	1
COASTAL	20	101	34
LOCAL	141	287	118
TOTAL	**172**	**398**	**153**

MSI messages are drafted according to IHO publication S-53 and there has been a high degree of unification and standardization achieved when it comes to general principles applied to message drafting. Hence, CHI Nautical department continuously contributes overall quality and consistency of MSI messages.

Besides, CHI Nautical department intensively cooperates with relevant factors in maritime domain such as: Harbour master offices, Coastal radio stations, Croatian VTS and MRCC, Navy, ship-owners, private boaters etc. Main goal is to ensure safety of navigation by gathering information and issuing navigational warnings. Nevertheless, CHI Nautical department cooperates with NAVAREA III coordinator Cadiz through Coast radio station Split and there were no difficulties identified in overall communication.

In the past period, since the last MBSHC Conference, Croatian NAVTEX system [Q] located on the island of Hvar to cover the area of the Croatian part of the Adriatic Sea, has improved the transmission of its NAVTEX broadcasts through reconstruction of its antenna system. Measurement results show a satisfactory strength of the electromagnetic field radiated from the renewed antenna system in the surface wave.

Preparation of project task is under way for the NAVTEX system modernization (control-communication/transmitting part). NAVTEX system modernization would include setting up of the national NAVTEX at 490kHz. The IMO Panel and NAVAREA III coordinator Cadiz have been contacted about the plan to modernize and set up the national NAVTEX at 490kHz. Besides the national NAVTEX at 490kHz, digital broadcast of MSI at 500kHz - NAVDATA is also under consideration.

6. S-55 IHO PUBLICATION

Updating information is provided as necessary.

7. CAPACITY BUILDING

7.1 New technologies

Computer and communication infrastructure

A new wireless network (WiFi) has been implemented using four wireless access points.
Print on Demand printing technology has been introduced, using a large format plotter capable of producing high-quality paper charts printed to order (Fig. 5).

Figure 5. Print on Demand

Multibeam system

The new MBS for shallow water has been installed and operated.

Side Scan Sonar equipment

Through the CORE project, the Croatian Hydrographic Institute has received a two-frequency digital Side Scan Sonar CM2 (Cmaxsonar Marine Surveillance Camera), (Fig. 6).

Figure 6. Side Scan Sonar equipment

Remotely Operated Underwater Vehicle

Through project "Jaspper" remotely operated underwater vehicle (ROV) was purchased (Fig.7). Purchase was included ROV training for the HHI personnel

Figure 7. Remotely operated underwater vehicle

WEB Services

CHI website is continuously improved (www.hhi.hr), providing a variety of new information and services, with modern design and functionality.

Online publication CATALOGUE OF CHARTS AND NAUTICAL PUBLICATIONS is updated on a regular basis (Fig. 8).

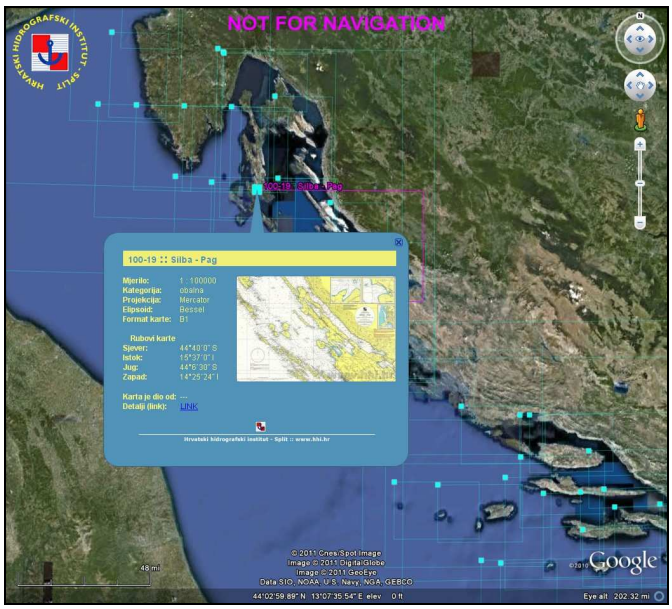


Figure 8. Online Catalogue of Charts and Nautical Publications

E-Services of Notices to Mariners and Navigational Warnings are available on the CHI website. Digital “Notices to Mariners” provide monthly updates for official editions, as well as archives of previously published digital notices (Fig. 9).

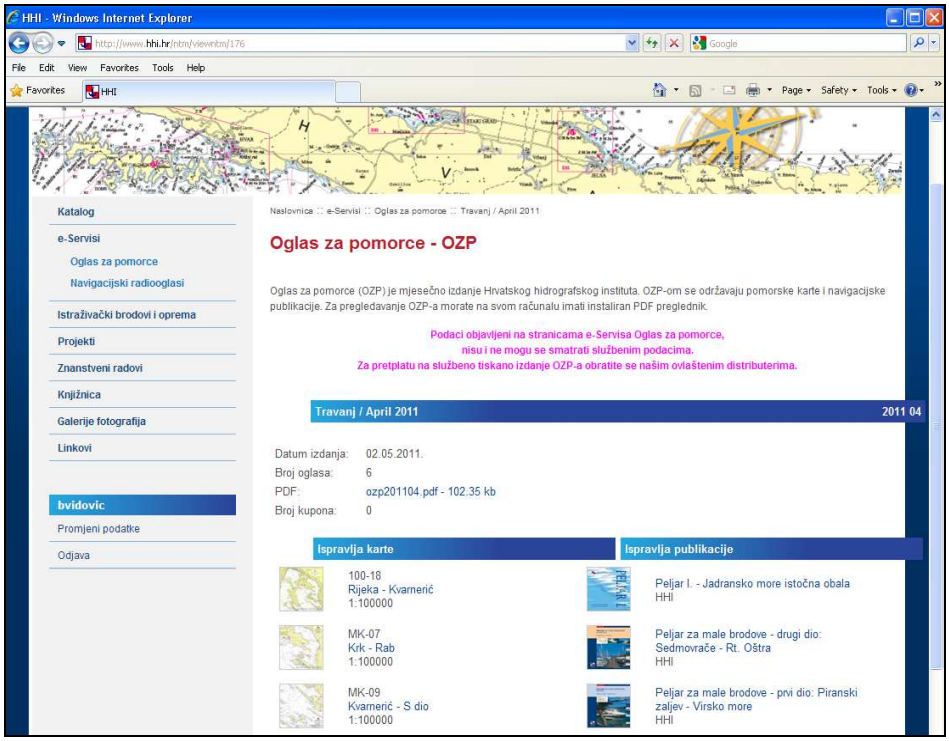


Figure 9. Notices to Mariners e-Service

Digital “Navigational Warnings” are updated promptly on the web, as soon as new information is reported and promulgated to mariners by ordinary means (NAVAREA, NAVTEX or VHF) (Fig. 10).

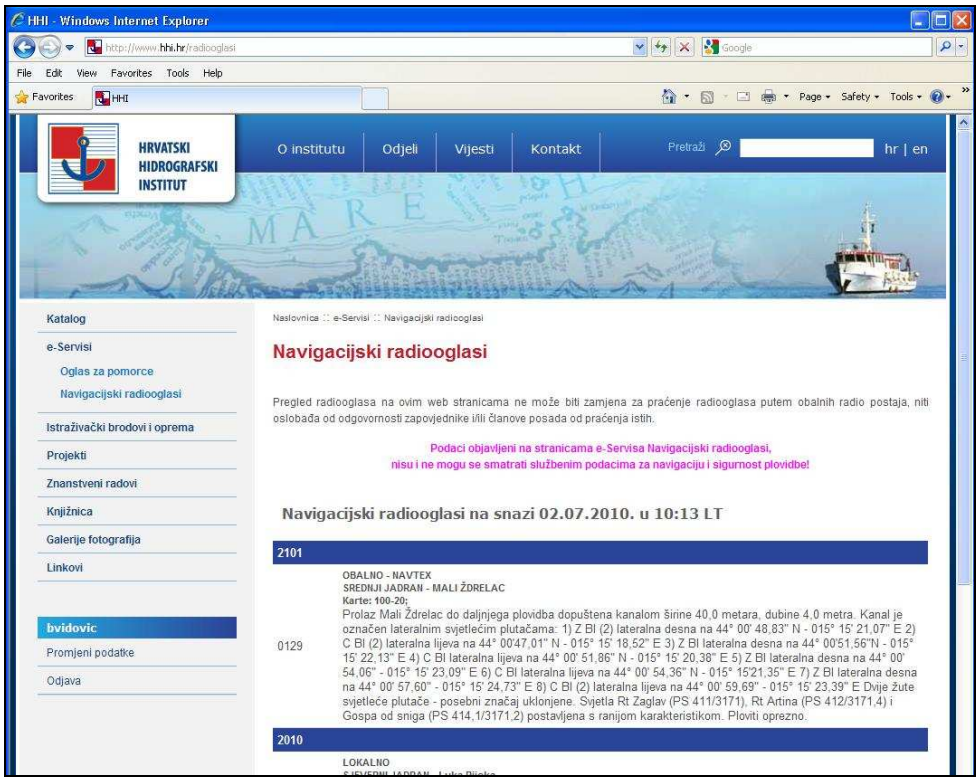


Figure 10. Navigational Warnings e-Service

Oceanographic information system

Tidal measurements

Computer software has been provided for eight tide-gauge stations and for tidal measurements and tide-gage data (Fig. 11).

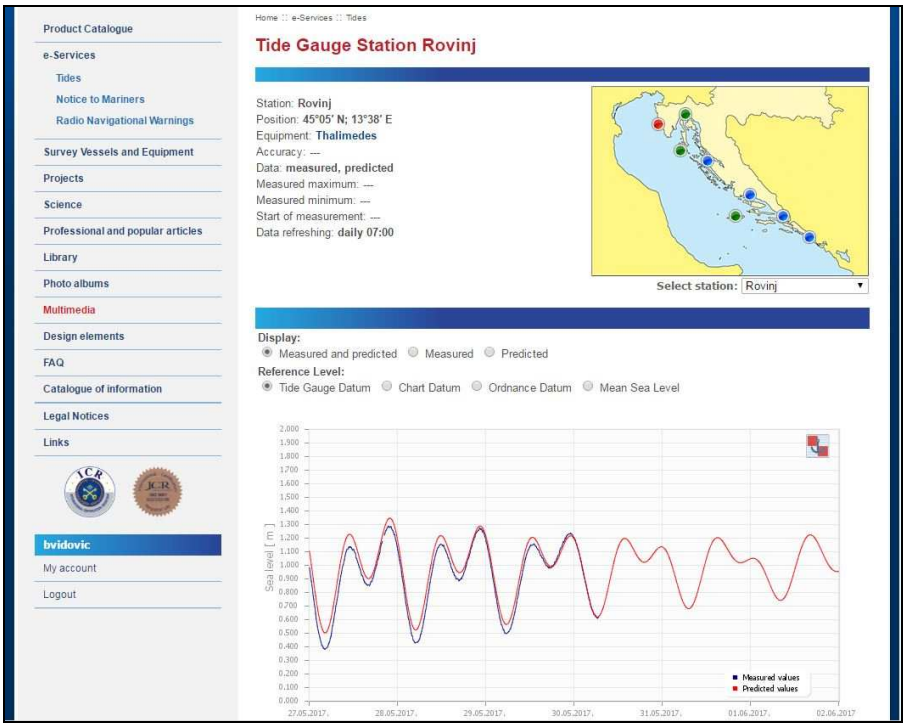


Figure 11. Tidal measurements and tide-gauge data e-Service

Wave measurements

Two Datawell DWR MkIII Waveriders have been deployed and are currently active in Ploče and near Sv. Andrija islet (Dubrovnik). They provide data in real-time and for more comprehensive analyses (Fig. 12).

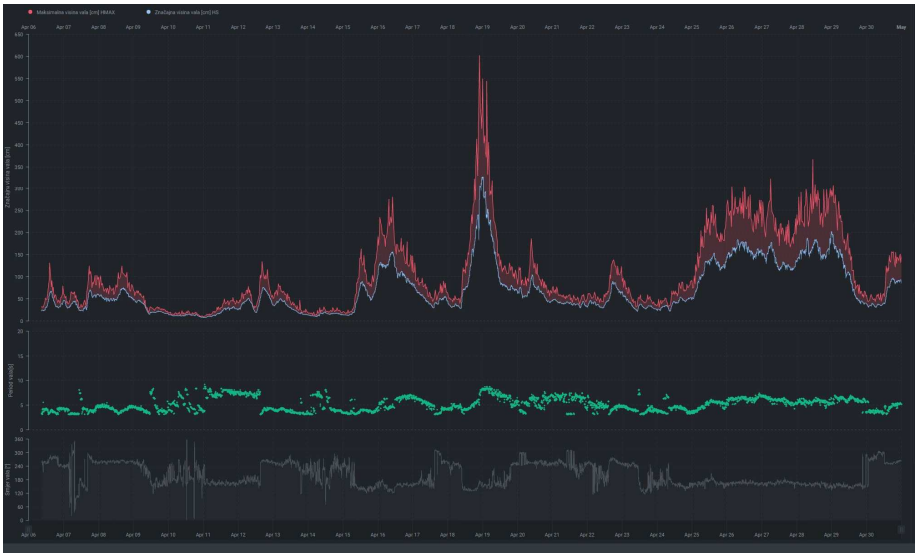


Figure 12. Wave heights, wave period and wave direction measured near Sv. Andrija island during April 2017. (maximum wave heights exceeding 6 metres).

Online Library Catalogue

Special library software package METELwin is upgraded aiming to promote the resources of the CHI Library, including several modules (cataloguing and classification, management of users' records, statistics, search of library catalogue by all criteria) to cover most library operations. This new software enables online access and search of library catalogue (Fig. 13).

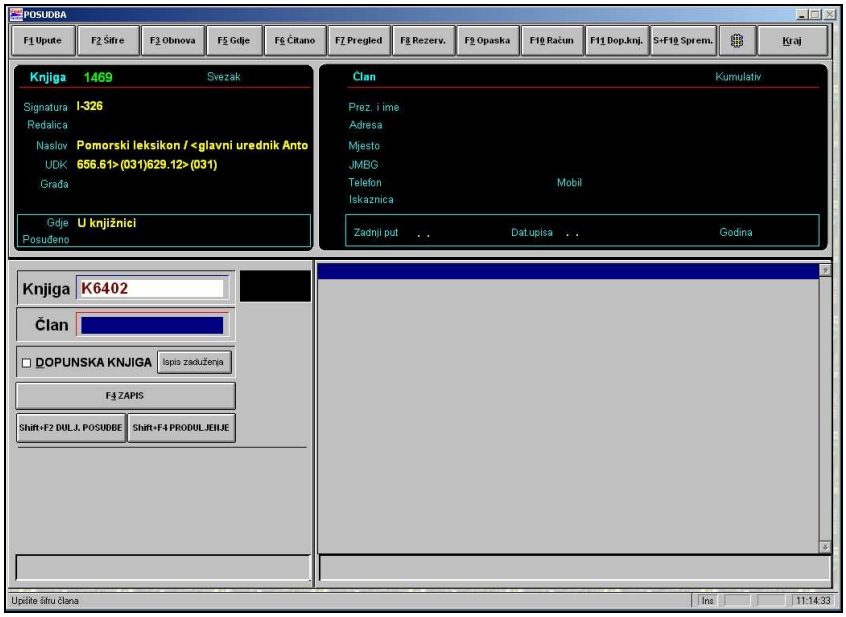


Figure 13. METELWin Application

7.2 Training

ISO Quality Management System

CHI successfully completed the process of ISO 9001:2015 certification (2016). An external audit is performed on yearly basis aiming to improve and confirm the certificate (Fig. 14)

Figure 14. CHI ISO 9001: 2015 certificate

New software training

Training is provided to the staff for all new versions of the existing software.

PRIMAR ENC Validation Course

CHI hosted a three-day international workshop organized in December 2015 together with the PRIMAR RENC (Regional ENC Coordinating Centre). The workshop presenter was Mr Stig Osaland from the Norwegian Electronic Chart Centre, a world-renowned expert in the field of electronic navigational charts (ENC) and ICT. In addition to six participants from the CHI, the workshop was attended by three representatives of the hydrographic office of Ukraine and two representative of the hydrographic office of Montenegro (Fig.15).

Figure 15. Participants of the PRIMAR ENC validation course

The theme was the ENC quality control and validation before distribution to end users using advanced ICT tools and services developed by PRIMAR in cooperation with its fifteen member states.
The workshop, consisting of nine thematic modules, each accompanied by corresponding simulation exercises with real data and validation tools, with discussions and exchange of opinions, met all expectations and achieved its objectives. All participants received certificates proving that they had mastered the usage of validation tools and ENC quality control procedures.

7.3 Bilateral Cooperation

Bilateral agreements

Activities within the bilateral agreement between Croatia and Italy that started in the period 2013-2015, are currently under the final phase of aligned between the two nations.
In accordance with the bilateral agreement in force between UKHO and CHI, intensive cooperation has been established with UKHO RT2 South Geographic Manager in order to address and harmonize various data in official charts and publications.
Custodianship Agreement with UKHO (IPS) defines the licensing process for making CHI data available to a third party, taking into account provisions of the European Public Sector Information Directive.

Bilateral and multilateral meetings

CHI - C-MAP meeting

Working session with the C-MAP representative took place on the CHI premises in November 2016.
CHI and C-MAP (former Jeppesen) have successfully cooperated more then ten years pursuant to two signed agreements. C-MAP also provides significant technical software support for the CHI through a complex process of production and maintenance of Croatian ENCs.
Main topic of the one-day session was legal issues of two signed agreements. After thematic presentations by both sides, the representatives of C-MAP and CHI reached conclusions formulated in 7 Action Items to be achieved in the forthcoming period.

PRIMAR Working Groups meeting

CHI hosted the PRIMAR two-day meeting (May 2017) of three working groups of the PRIMAR RENC (Regional ENC Coordinating Centre). Agenda of the PRIMAR permanent working groups for strategic (PSWG), financial (PFWG) and marketing (PMFG) issues was included some topical subjects.
Most important strategic issue were about the challenges that PRIMAR with its members faces in a transition to the new generation of ENC according to S-101 standard. This issue is considered to be almost equally demanding in organisational, technical-technological and financial terms as the issue of a transition from paper versions of navigational charts to digital ones (ENC). The transition issue is additionally complicated by the fact that it will be necessary to ensure maintenance and availability of both ENC generations (Dual Fuel) for several years.
Financial issues were about evaluation of the new financial model applicable since the beginning of 2017.
Marketing issues were about promotion of basic PRIMAR services (ENC validation and distribution) as well as additional ones such as ENC Inspector, ENC Pilot, WMS for ENC, ENC Update Tracker, ENC Improver, and GeoView.

Croatia, Montenegro and Norway meeting

A trilateral meeting was held between representatives of Norway, Montenegro and Croatia. It was discussed the proposal for joint hydrographic survey project to be financed from a Norway donation.

Bilateral EU projects

„Cross border joint research and awareness raising action in detecting environmental conditions. Establishing higher safety and protection measures of Maritime domain parts of Croatia and Montenegro" – CoRE

Project „CoRE" is EU/IPA project under component II, measure 1.1 Joint actions for environment, nature and cultural heritage protection. Location of the action is Dubrovačko-neretvanska County (Croatia) and Montenegrin coastal area.
Overall objective of this project is to contribute to improvement overall protection and preservation of eastern Adriatic coastline.
Specific objectives are:

- ✓ to establish safety protocols and new hydrographical maps (for waterway safety / habitat preservation researches) based on research and gathered date, concerning natural changes of coastline border in Croatia and Montenegro influenced by erosion from mainland and wave power from open sea.

- ✓ to increase general knowledge of wide groups of stakeholders on Maritime property (maritime demesne) component coast and its sustainable littoralisation .

Expected results of the project:

- ✓ project is well managed, efficient and effective, with increased institutional capacities for project management

- ✓ coastal environmental protection and preservation improved throughout cross-border institutional cooperation and mutual support, capacity building and data exchange

- ✓ established „new zero" state and safety recommendations according to collected data for delicate and changing environment of delta Neretva, (approach to port Ploče, junction of Baćina lakes and sea), delta Bojana and Sutomorska and Mogren beach and Dubrovnik city walls foundation, interpreted in form of hydrographic survey and other scientific findings.

- ✓ wide public informed on basic "rights" of a sea coast, it's formulation through Maritime domain regulations and Protocol of Integrated Coastal Zone Management.

Croatian partners on the project are: Hydrographic Institute of the Republic of Croatia (HHI), as leading partner and Institute for Marine and Coastal Research in Dubrovnik (IMP).Montenegrin partners on the project are: Institute of Hydrometeorology and Seismology of Montenegro (IHMS) and Public Enterprise for Coastal Zone Management (JPMD). Associate on the project is PAP/RAC from Split. The project started in January 2016. The estimated duration is 23 months. The total value of the project for both sides is 569.876,39 eur.
HHI has lot of benefits from the implementation of the above mentioned project. Among all, expensive and modern hydrographic and oceanographic equipment was purchased. For details see: www.projectcore.info

Side scan sonar (Fig. 16) was used for underwater hydrographic and oceanographic research in Dubrovnik area and the area of delta Neretva, (approach to port Ploče, junction of Baćina lakes and sea).

Figure 16. Side scan sonar equipment

From oceanographic equipment, Directional wave rider buoy was purchased. Directional wave rider buoy was placed near the islet Sv. Andrija in Dubrovnik area (Fig. 17).

Figure 17. Directional wave rider buoy

7.4 Status of approval of amendments to the IHO Convention

In the period between the two conferences, CHI put extra effort into communication with the competent administration aiming to speed up the bureaucratic procedure for approval of the Protocol of amendments. There is currently no information about possible prioritizing of the approval process.

8. OCEANOGRAPHIC ACTIVITIES

8.1 Oceanographic projects

CHI is involved in several oceanographic projects. The projects described below are singled out as the most interesting ones:

"Cross-border joint research and awareness raising action in detecting environmental conditions. Establishing higher safety and protection measures of maritime domain parts (emphasise on the coast) of Croatia and Montenegro – CoRE".
Geological samples were taken and analyzed during April 2017 at 17 stations near Ploče and Dubrovnik. Datawell waverider near Sv. Andrija islet and 2 Acoustic Doppler current profilers near mouth of river Neretva were deployed during April, 2017. Sea surface waves data are available in real-time and both these and sea currents data are gathered for later analysis (Fig 18).

The Port of Ploče, international cargo port having large importance for Bosnia and Herzegovina is growing. In cooperation with Port authorities, CHI now provides sea level, wave height, period and direction and wind speed and direction data in real-time and broader analysis of these (and derived) data.

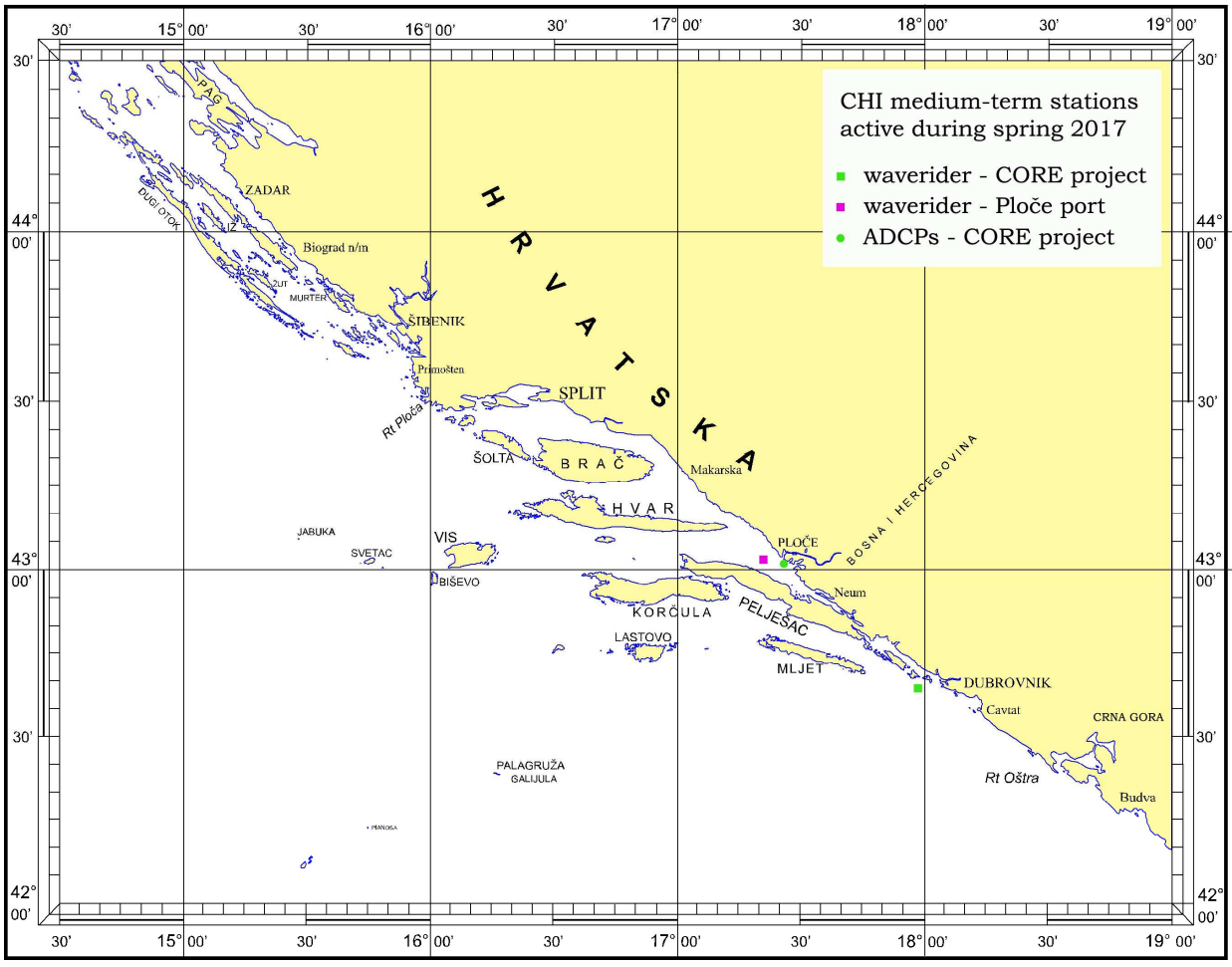


Figure 18. Geographic positions of waverider buoys and ADCP current meter stations.

There are also more than 60 smaller projects (e.g. outfall preparation studies, electric cable preparation studies...) in which oceanographic data were measured and analyzed in. As an example, in Fig. 19. is the current sedimentology chart, prepared for the Peljar publications.

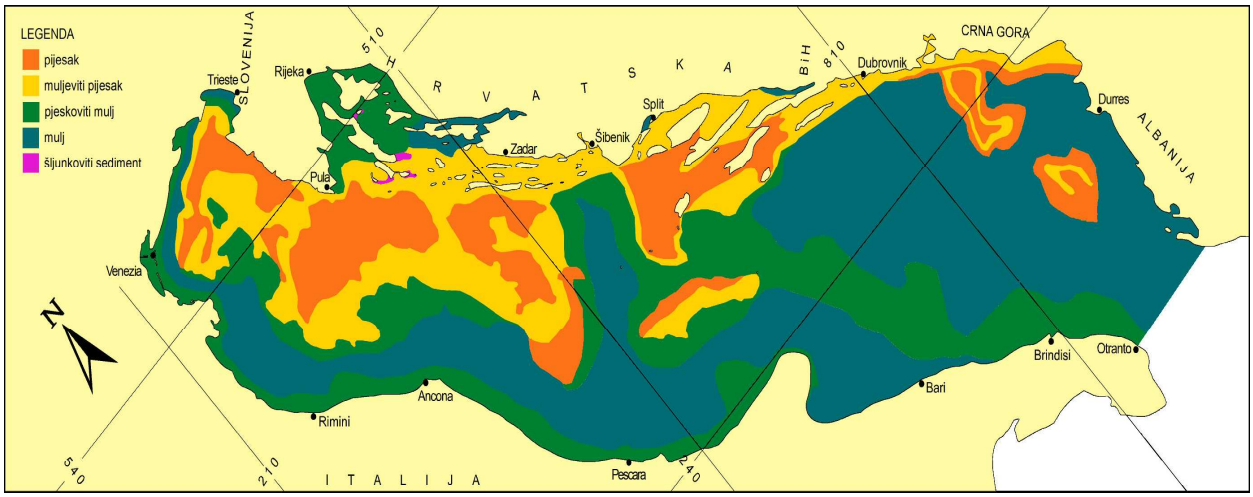


Figure 19. Sedimentology chart updated with data from a series of projects (version end 2016).

8.2 Oceanographic publications

Annual publications "Tide Tables – Adriatic Sea, East Coast" (Fig. 20) are also available in a digital format for the years 2016 and 2017.

Figure 20. Tide Tables – Adriatic Sea, East Coast

9. OTHER PROJECTS AND ACTIVITIES

National Marine Spatial Data Infrastructure – MSDI

CHI actively participates in the long-term Croatian project at national level for the implementation of national legislation relating to NSDI aiming to establish the MSDI (Fig. 21).

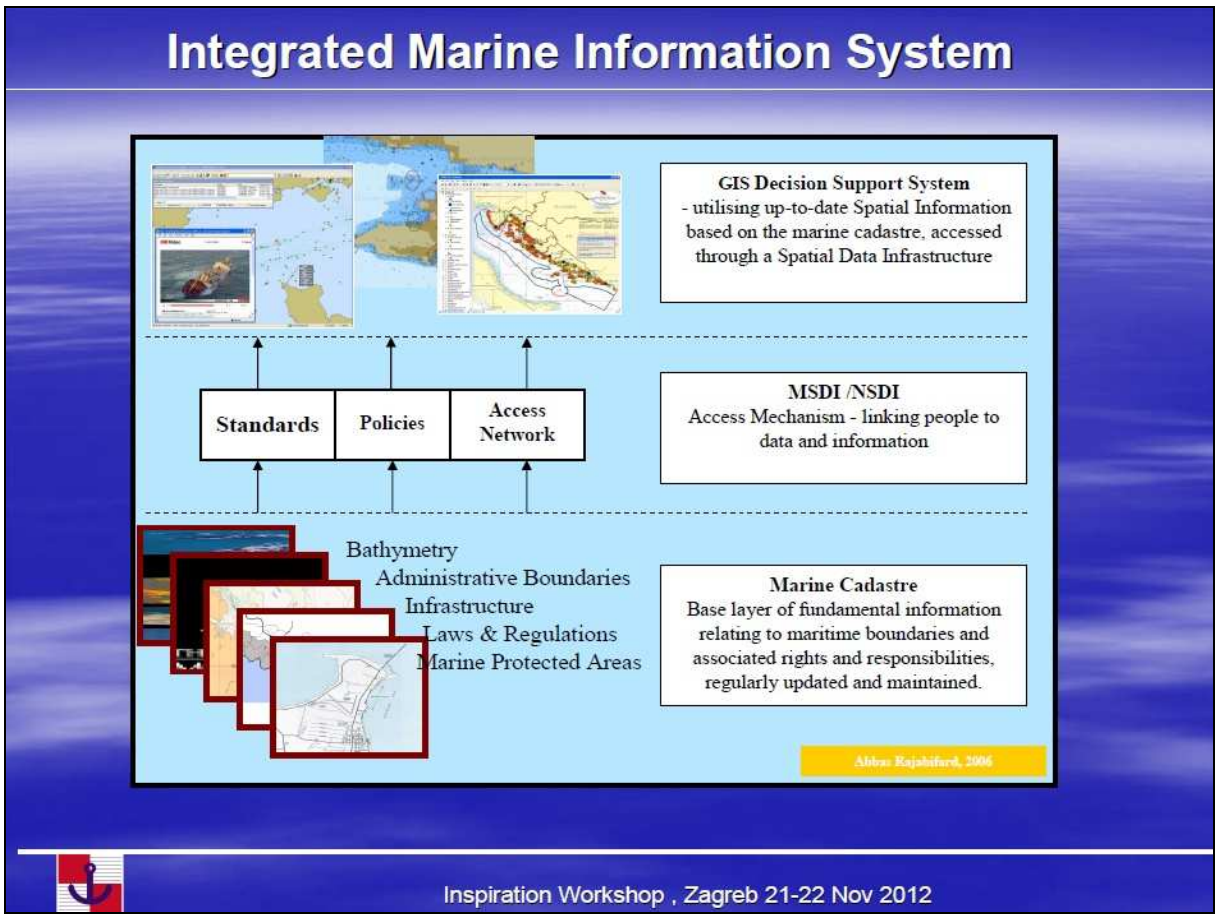


Figure21. An overview concept of HR MSDI

In Croatia, a Marine Spatial Data Infrastructure (MSDI) is component of a National Spatial data Infrastructure, so currently CHI provide Metadata to the Croatian NSDI Geoportal that serves as a starting point for accessing spatial data sources that are, according to the NSDI Act (Official Gazette 56/2013), part of National Spatial Data Infrastructure (http://geoportal.nipp.hr/en).
CHI participates in The European Marine Observation and Data Network (EMODnet) High Resolution Seabed Mapping Phase 3 Project (2017.-2020.), so it is expected from CHI to provide Metadata/Data to the EMODnet – Bathymetry geoportal (http://www.emodnet-bathymetry.eu/)
In the future CHI plans to set up a conceptual framework for Croatian MSDI with other providers of marine data and partners. That includes building MSDI reference model and evaluates Metadata & Data geo-portal.

Other

CHI continuously participates in multiple projects designated from the competent administrations providing high quality support.
CHI personnel have participated in several international scientific and technical conferences presenting hydrographic and oceanographic papers.

10. CONCLUSIONS

Under the circumstances of limited overall resources (human, material and financial), it may be concluded that in the past two-year period the status of hydrographic-navigational element of the navigational safety has been at a satisfactory level.

Entire area of responsibility of the Republic of Croatia for the hydrographic-navigational safety of vessels has been covered by relevant official editions of navigational charts and publications – paper and digital ones. This particularly applies to navigation areas of SOLAS ships.

CHI has made a significant contribution towards improving the hydrographic-navigational element of navigational safety through publishing of a number of new Croatian electronic navigational charts (ENC) based on the data obtained from the new hydrographic survey. Entire ENC folio has been made available to end users on ships and to maritime administration worldwide through a network of authorised distributors.

Since the end of 2016 Croatian ENCs have been made available on the Croatian Navy vessels through the Navy Agreement. Agreements have also been concluded with the Directorate for the Safety of Navigation of the Ministry of the Sea and the Croatian Navy on ENC usage for administrative-office purposes (WMS for ENCs).

As regards navigation areas of non-SOLAS ships, particularly the areas of navigation and stay of pleasure vessels (boats and yachts), it may be said that there is a need for improvement to current editions of official charts and publications. Most critical are those areas that have not been surveyed after interventions in the maritime demesne, and the relevant data has not been published in the CHI official editions. However, according to the IHO specifications, even in these situations the relevant information ensuring minimum requirements for safe navigation is available to users of CHI editions (descriptive warnings of interventions in non-surveyed areas that have not been displayed on charts).
In the past two-year period a significant improvement has been achieved even in these areas, because the systematic hydrographic survey included a considerable number of marinas and small harbours for which corresponding charts and ENCs were produced.

Navigational warning service is in good working order efficiently cooperating with all navigational safety entities in Croatia, its neighbouring countries and the NAVAREA III coordinator.

Paper editions of official navigational charts are updated through monthly editions of Notices to Mariners, and ENCs through weekly updates.

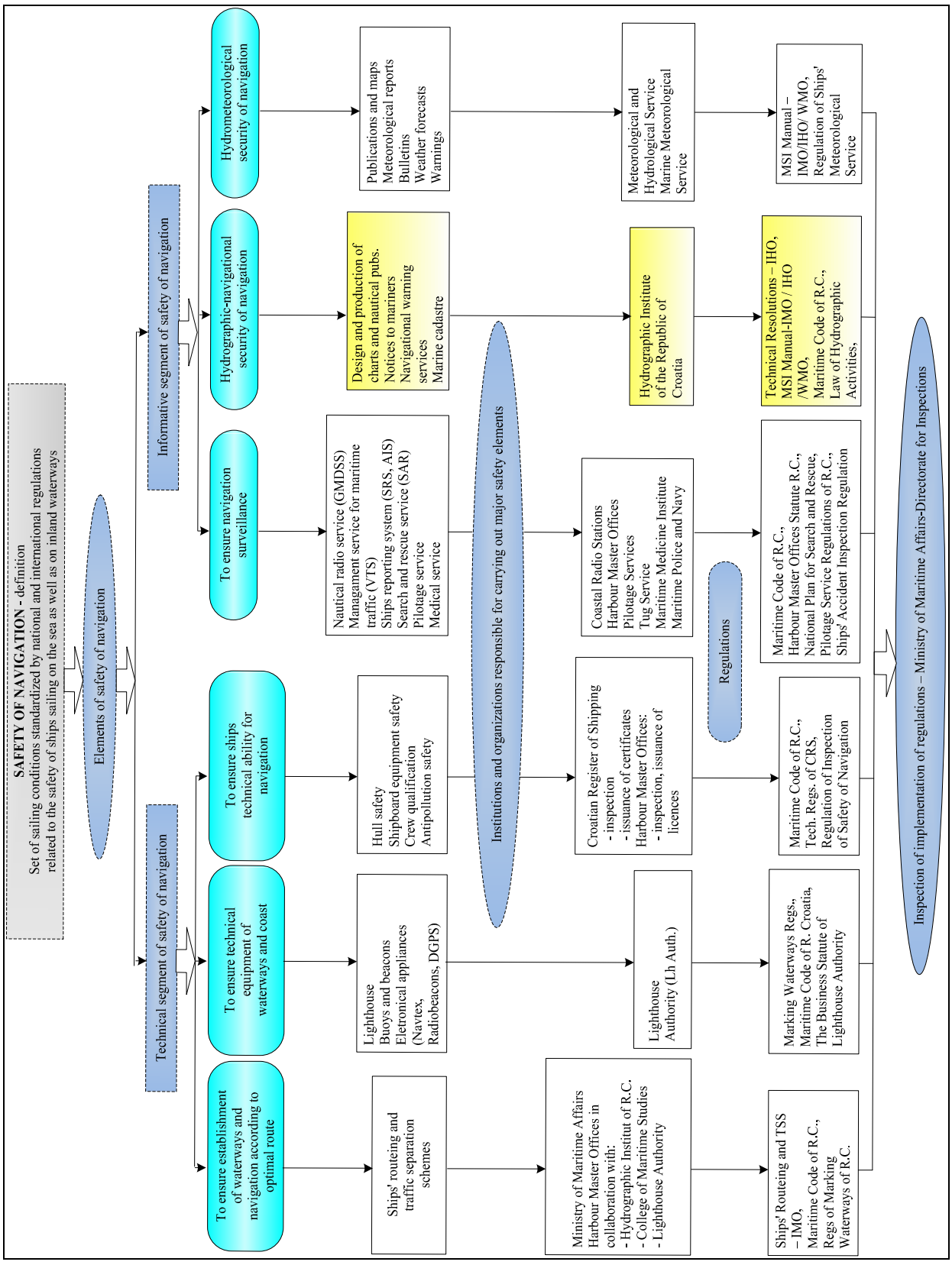
CHI has maintained a high level of technical and technological equipment by acquisition of several important systems, devices and equipment through EU funded projects. Existing software of the basic production line is regularly updated.

CHI continuously participates in multiple projects designated from the competent administrations providing high quality support. The CHI personnel have participated in several international scientific and technical conferences presenting hydrographic and oceanographic papers.

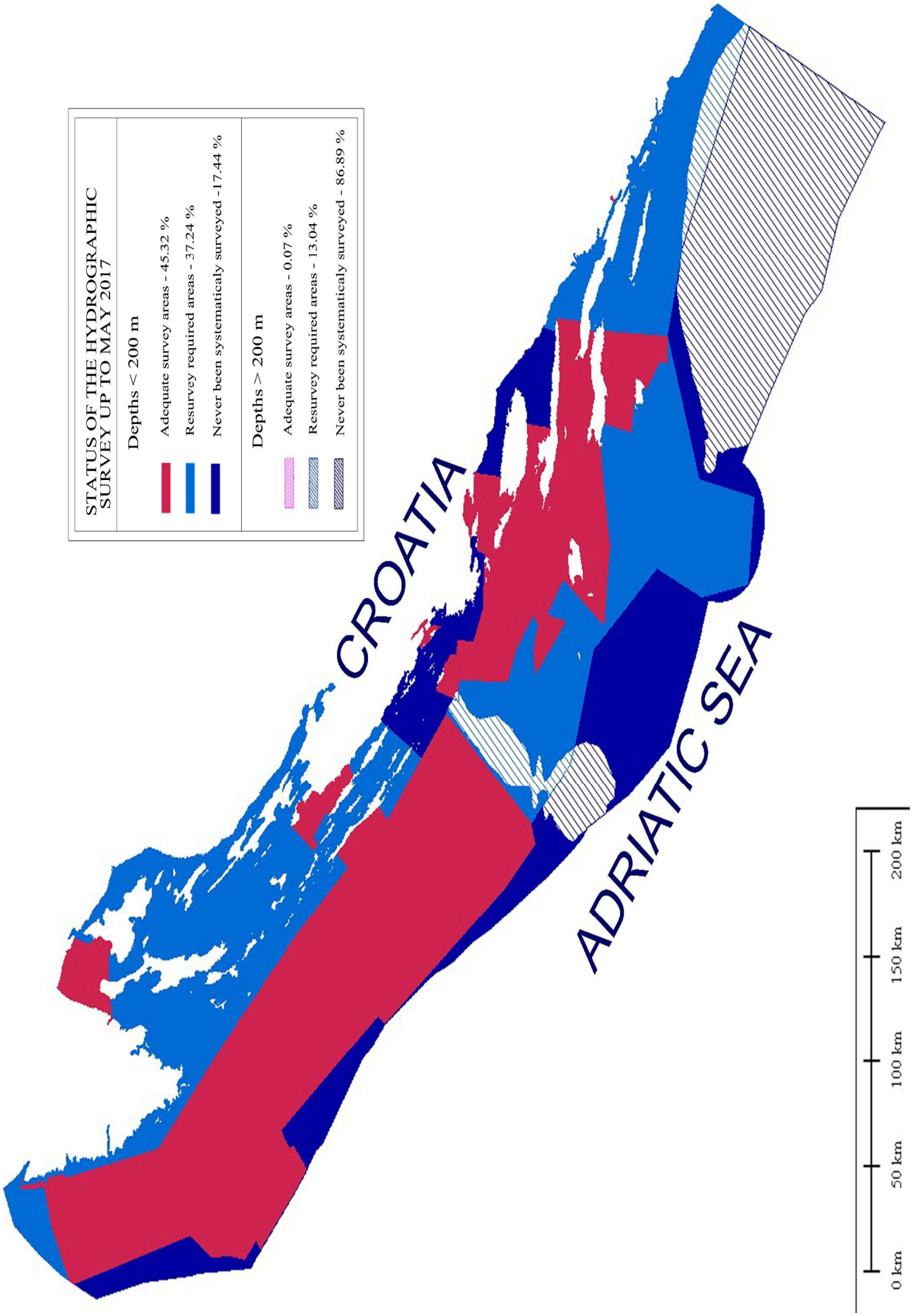
Achievement of main strategic and programme objectives in the current and next planned periods will be challenging in every respect, because it is expected to proceed in very restrictive

conditions with additional requirements and tasks. Therefore, an approach to the achievement of objectives should be based on prioritization, well organized business processes and cooperation between the personnel, as well as good cooperation with the management board and competent maritime administration.

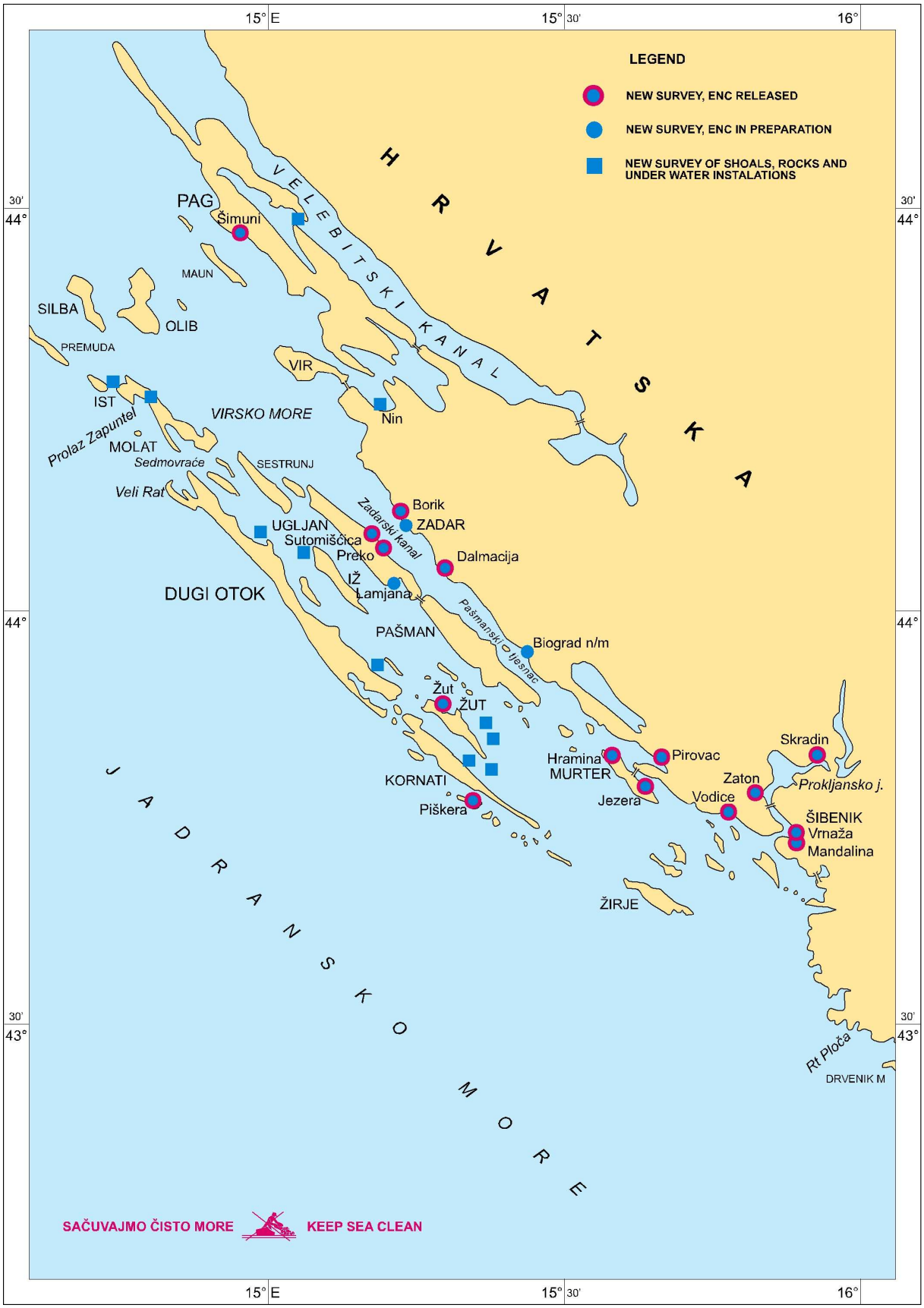
ANNEX 1 - CHI position in the structure of Croatian administration

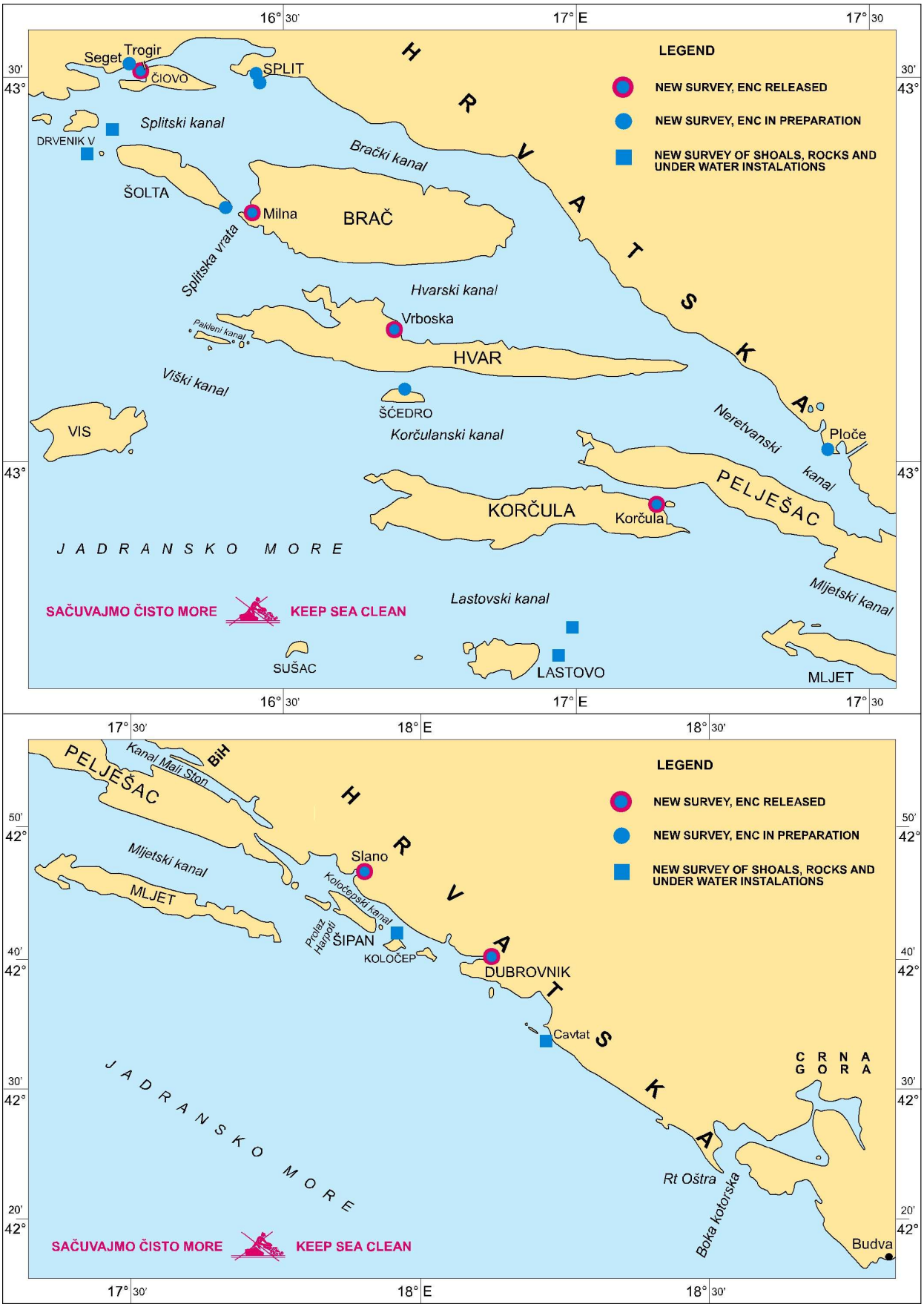


ANNEX 2 - Status of hydrographic survey in accordance with the IHO S-55 criteria

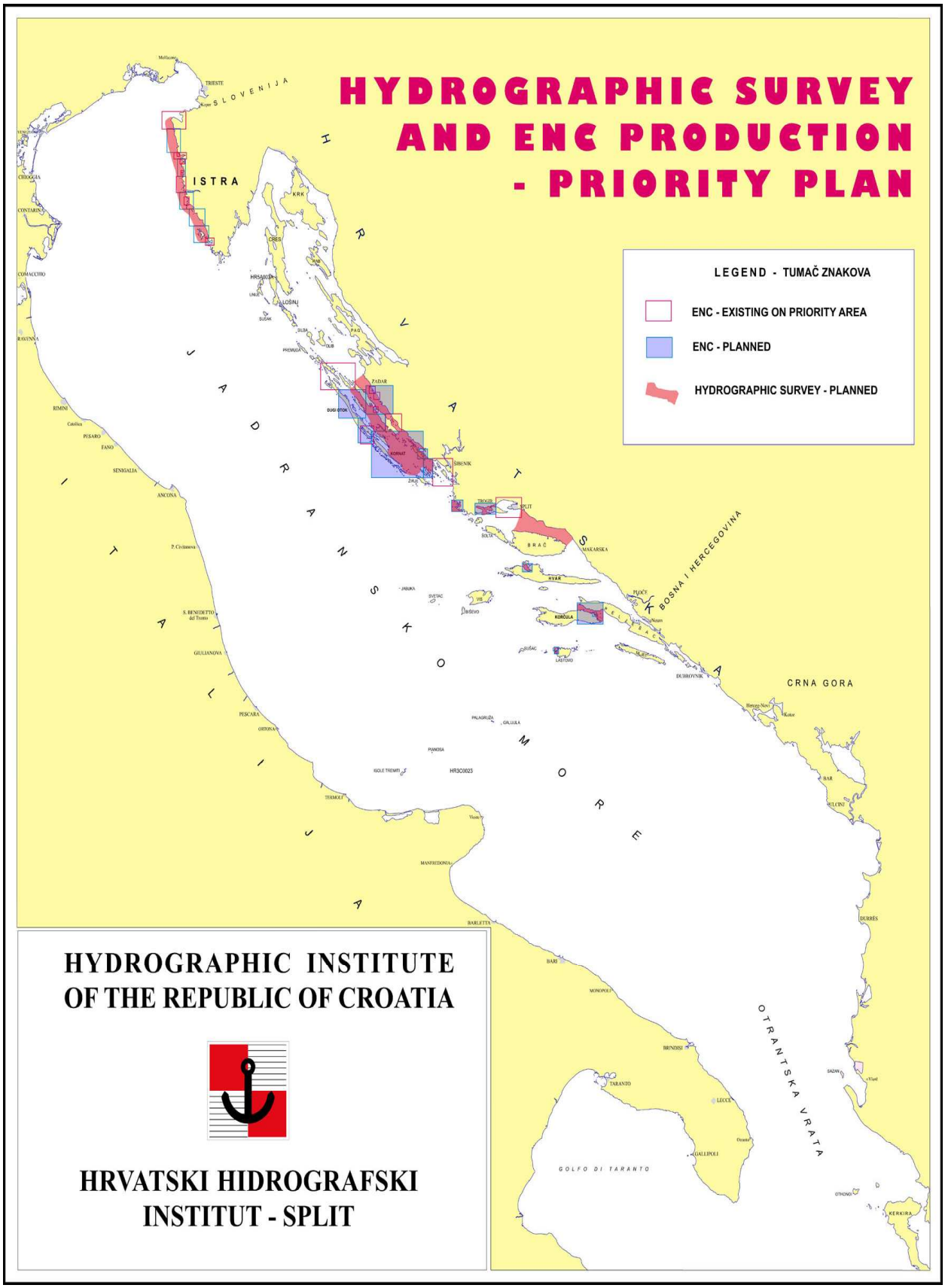


ANNEX 3 - N**ew hydrographic survey and ENC of marinas, small ports, shoals, underwater rocks and installations**

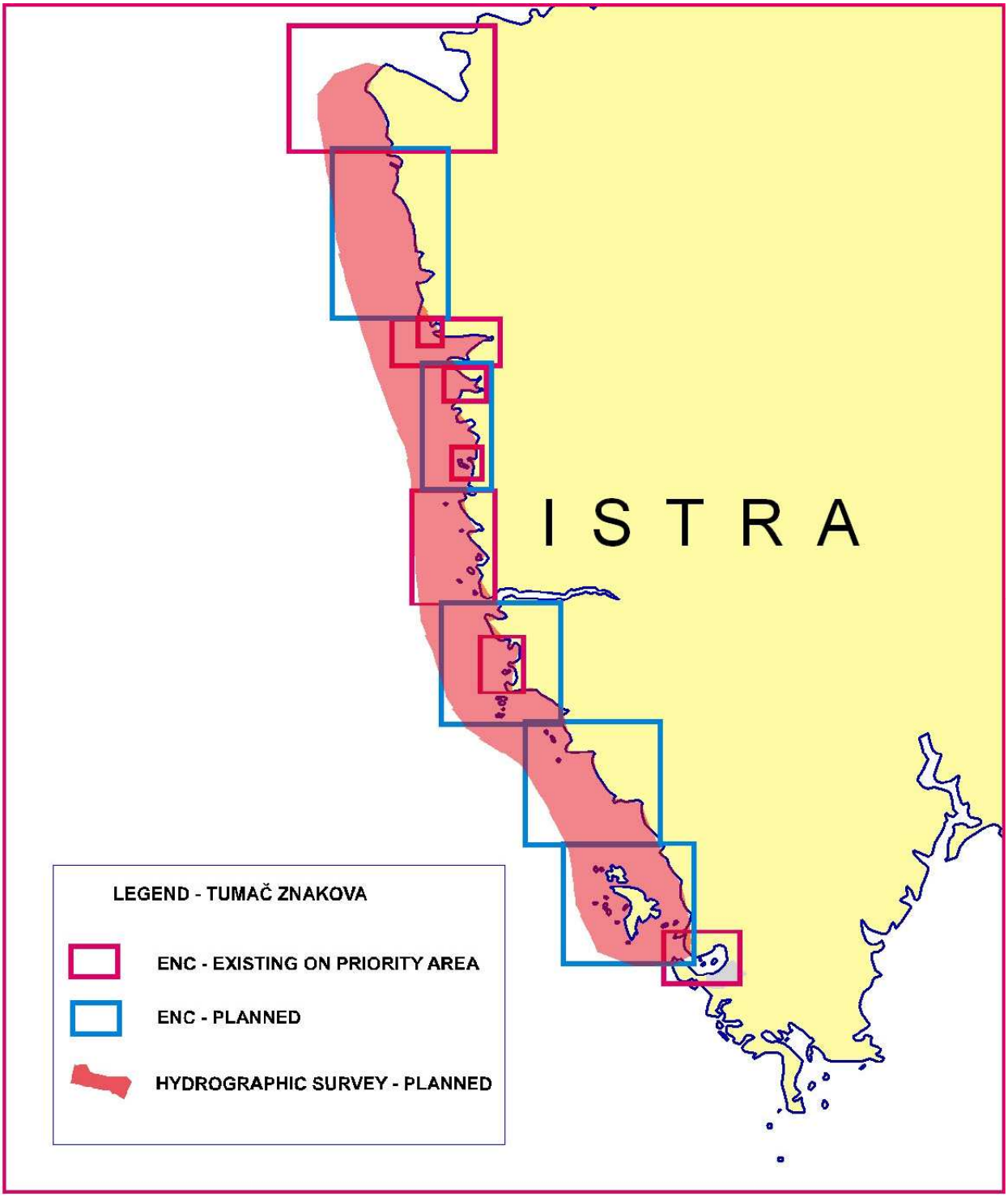

15° E
15° 30'
16°
30'
44°
44°
44°
30'
43°
LEGEND
NEW SURVEY, ENC RELEASED
NEW SURVEY, ENC IN PREPARATION
NEW SURVEY OF SHOALS, ROCKS AND UNDER WATER INSTALATIONS
HRVATSKA
VELEBITSKI KANAL
PAG
Šimuni
MAUN
SILBA
OLIB
PREMUDA
VIR
IST
Prolaz Zapuntel
VIRSKO MORE
Nin
MOLAT
Sedmovraće
SESTRUNJ
Veli Rat
Borik
ZADAR
Zadarski kanal
UGLJAN
Sutomišćica
Preko
Dalmacija
IŽ
Lamjana
DUGI OTOK
PAŠMAN
Pašmanski tjesnac
Biograd n/m
Žut
ŽUT
Skradin
Hramina
MURTER
Pirovac
Zaton
Prokljansko j.
KORNATI
Jezera
Vodice
Piškera
ŠIBENIK
Vrnaža
Mandalina
ŽIRJE
JADRANSKO MORE
Rt Ploča
DRVENIK M
SAČUVAJMO ČISTO MORE
KEEP SEA CLEAN

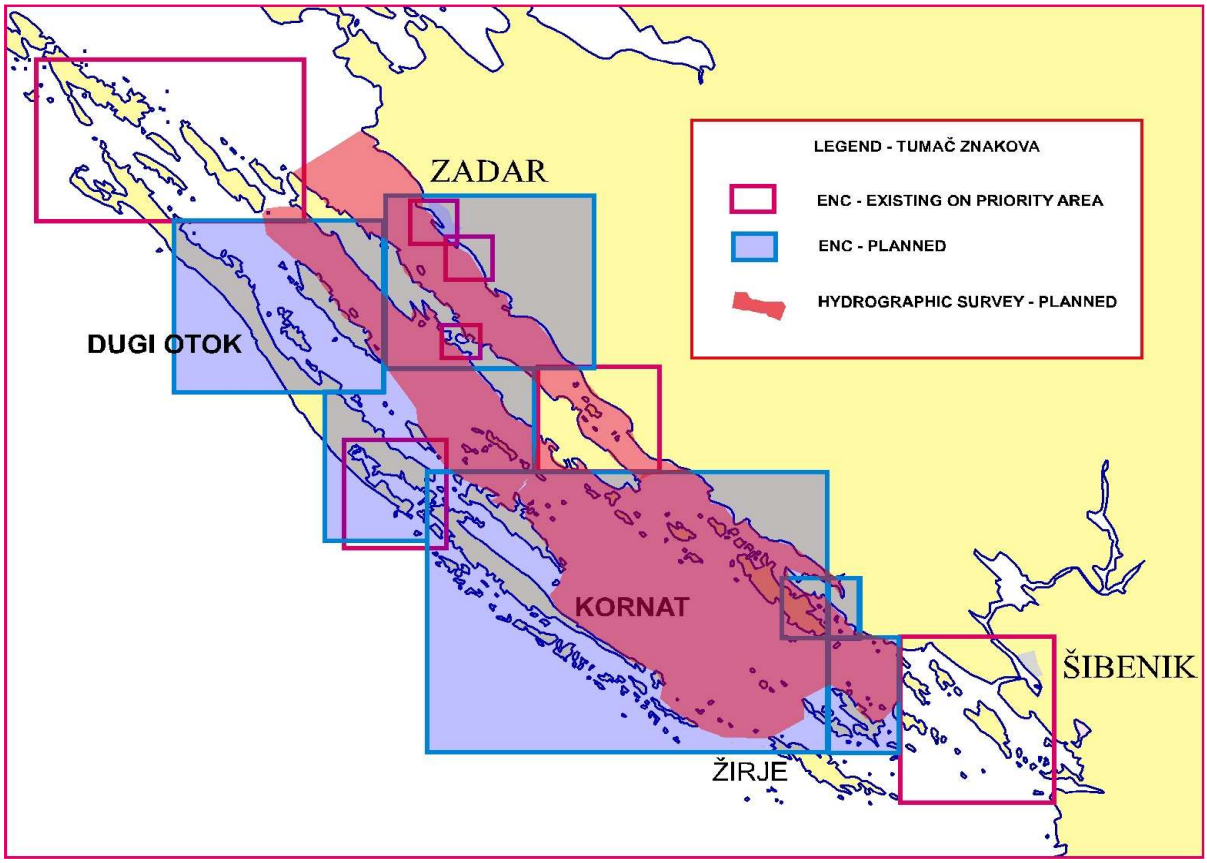

16° 30'
17° E
17° 30'
30'
43°
Seget
Trogir
ČIOVO
SPLIT
H R V A T S K A
LEGEND
NEW SURVEY, ENC RELEASED
NEW SURVEY, ENC IN PREPARATION
NEW SURVEY OF SHOALS, ROCKS AND UNDER WATER INSTALATIONS
Splitski kanal
DRVENIK V
Brački kanal
ŠOLTA
Milna
BRAČ
Splitska vrata
Hvarski kanal
Vrboska
Paklenji kanal
HVAR
Viški kanal
ŠĆEDRO
VIS
Korčulanski kanal
Neretvanski kanal
Ploče
PELJEŠAC
KORČULA
Korčula
J A D R A N S K O M O R E
SAČUVAJMO ČISTO MORE
KEEP SEA CLEAN
Lastovski kanal
Mljetski kanal
SUŠAC
LASTOVO
MLJET
17° 30'
18° E
18° 30'
50'
42°
40'
20'
BiH
Kanal Mali Ston
PELJEŠAC
Slano
Mljetski kanal
MLJET
Koločepski kanal
Prolaz Harpoti
ŠIPAN
KOLOČEP
DUBROVNIK
Cavtat
C R N A G O R A
J A D R A N S K O M O R E
Rt Oštra
Boka kotorska
Budva

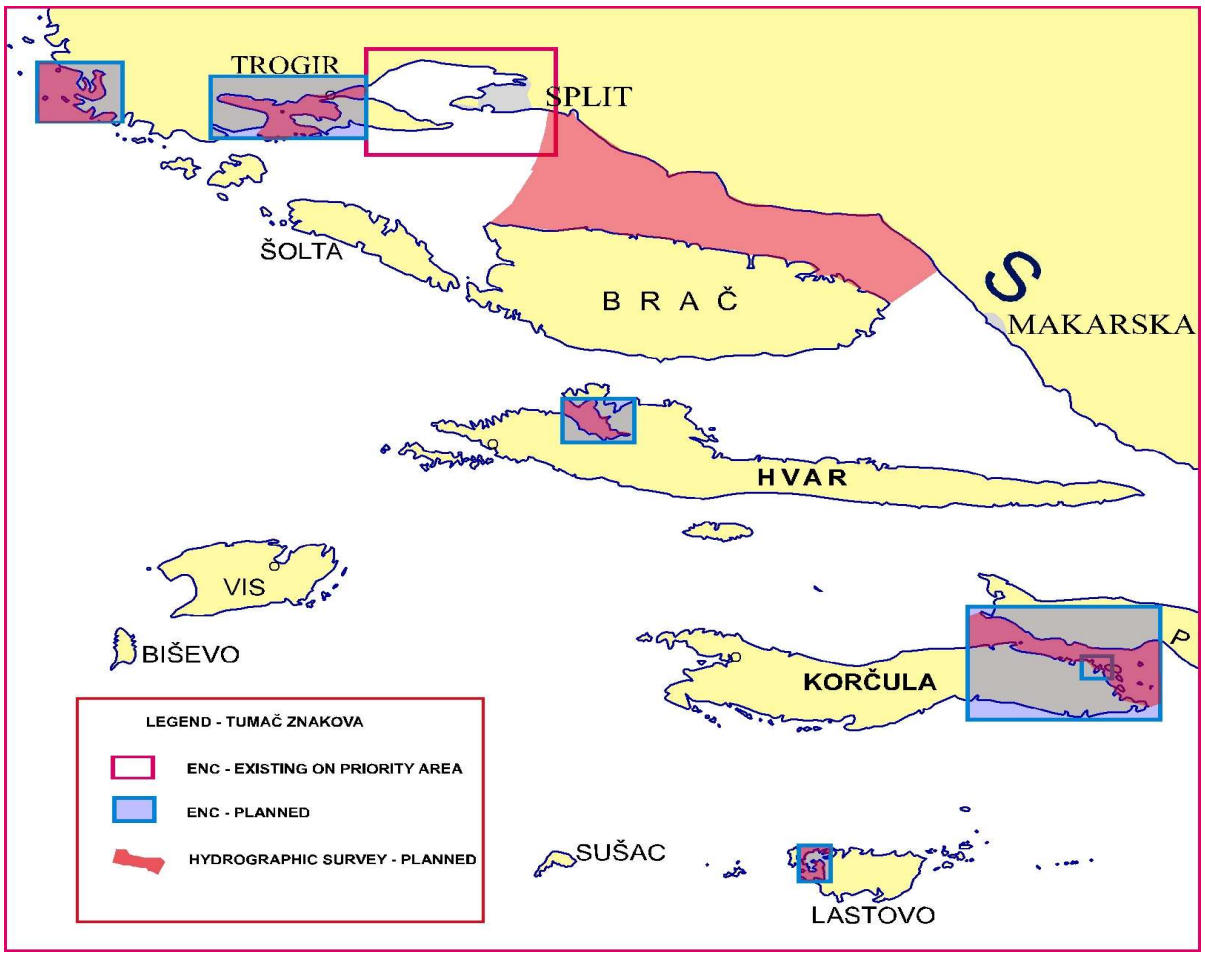
ANNEX 4 - ENC 5-year priority plan based on new hydrographic survey - Overall



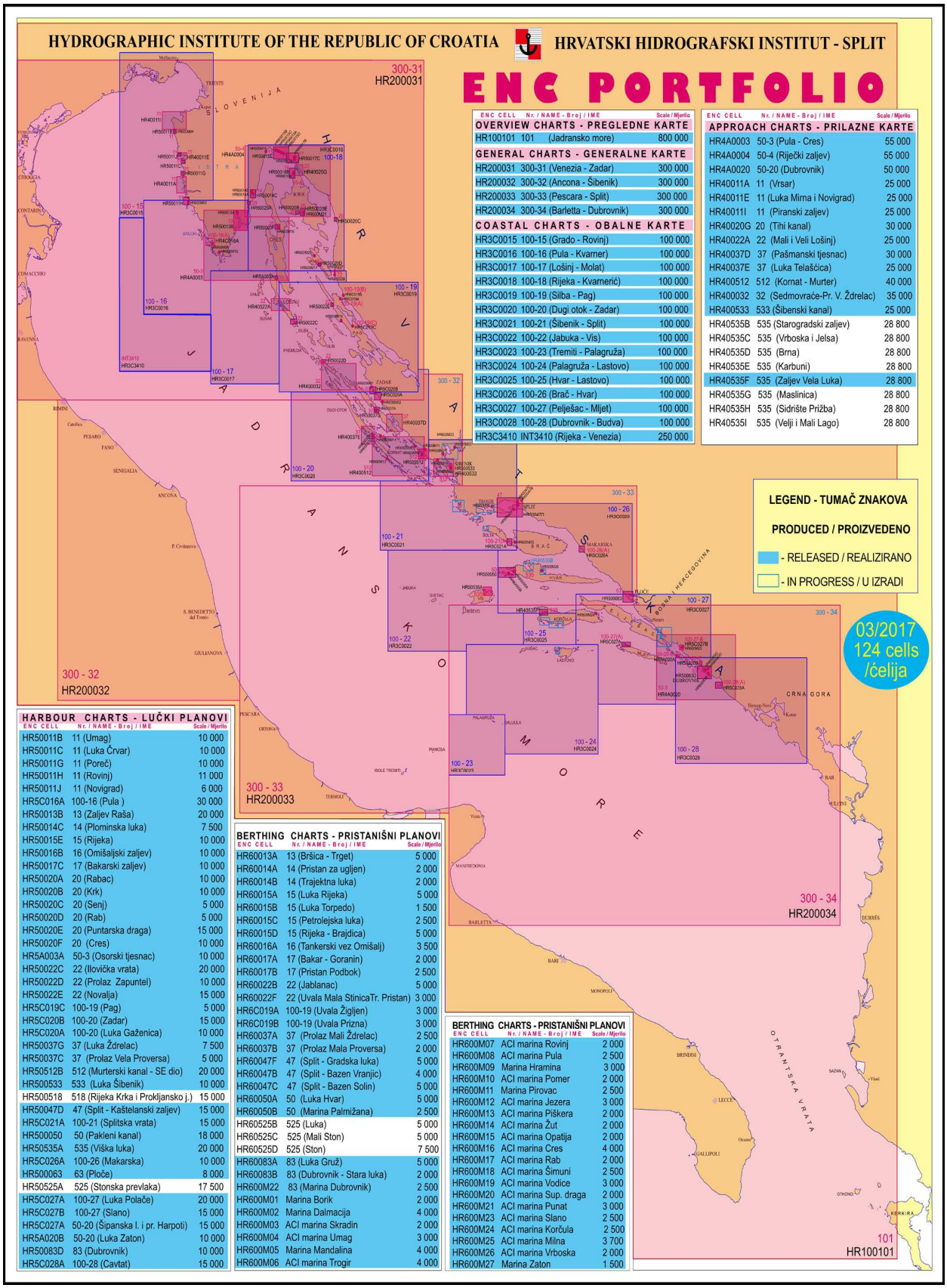
ANNEX 5 - ENC 5-year priority plan based on new hydrographic survey - Regional




LEGEND - TUMAČ ZNAKOVA
ENC - EXISTING ON PRIORITY AREA
ENC - PLANNED
HYDROGRAPHIC SURVEY - PLANNED
ZADAR
DUGI OTOK
KORNAT
ŠIBENIK
ŽIRJE


TROGIR
SPLIT
ŠOLTA
B R A Č
MAKARSKA
HVAR
VIS
BIŠEVO
KORČULA
LEGEND - TUMAČ ZNAKOVA
ENC - EXISTING ON PRIORITY AREA
ENC - PLANNED
HYDROGRAPHIC SURVEY - PLANNED
SUŠAC
LASTOVO

ANNEX 6 - Current ENC release status

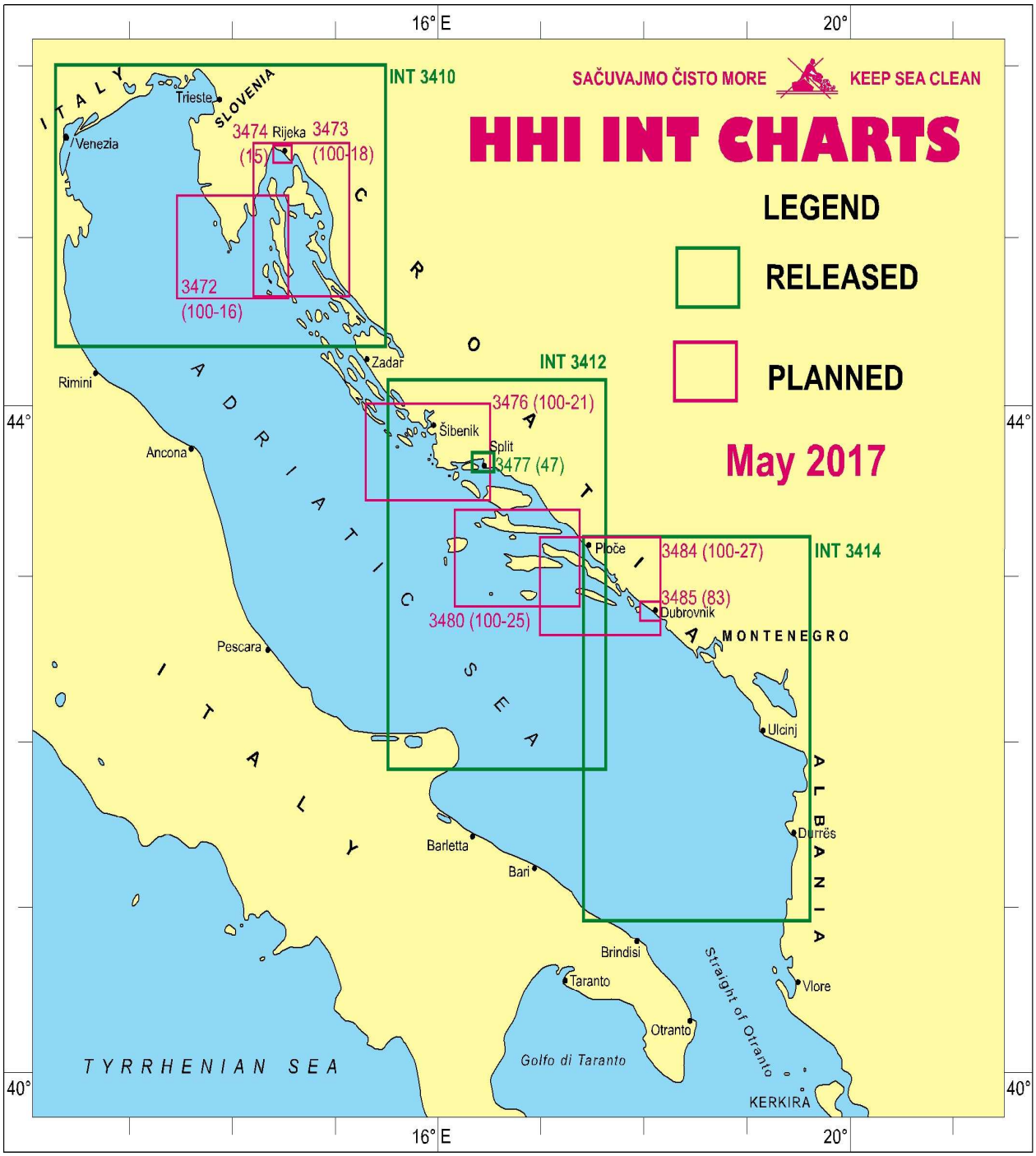


ANNEX 7 - MEDINTCHART Catalogue - HR Status - Table

INT No.	PR	Nat No.	Date		Scale		For	Printer Nation	Chart title	Chart limits				Status
			Publ	New Edition	1:	Latitude (N)				S	N	W	E	
300	IT	360	1984	1997	4 200 000	41°30'	A0	ES, FR, GB, HR	Mare Mediterraneo e Mar Nero	25°00'00"	49°50'12"	7°00'00"	42°15'18"	Available
301	IT	340	1972	1996	2 250 000	41°30'	A0	FR, DE, ES, GB, US, PT, HR	Mare Mediterraneo. Bacino Occidentale	32°45'00"	45°52'13"	6°44'00"	19°40'29"	Available
302	IT	350	1982	1997	2 250 000	41°30'	A0	FR, DE, ES, GB, US, HR	Mare Mediterraneo. Bacino Orientale	30°05'00"	43°39'15"	9°55'00"	36°19'30"	Available

INT No.	PR	Nat No.	Date		Scale		For	Printer Nation	Chart title	Chart limits				Status
			Publ	New Ed.	1:	Latitude (N)				S	N	W	E	
3410	HR		1988	2007	250 000	45°00	A0	FR	Rijeka – Venezia	44°13'00"	45°50'00"	12°08'00"	15°28'00"	Available
3412	HR		1991	2000	250 000	42°50'	A0	FR	Split – Gargano	41°40'00"	44°00'00"	15°29'00"	17°40'00"	Available
3414	HR		1998		250 000	41°55'	A0	FR	Dubrovnik – Durrës	40°45'00"	43°04'00"	17°25'00"	19°38'00"	Available
3472	HR	100 -16	1973	1998	100 000	44°50'	B1		Pula – Kvarner	44°30'36"	45°05'12"	13°15'24"	14°27'00"	Preparation
					30 000				A – Pula	44°51'44"	44°53'42,5"	13°47'20,7"	13°51'27,7"	
3473	HR	100 -18	1977	1996	100 000	44°55'	B1		Rijeka – Kvarner	44°31'24"	45°22'00"	14°09'24"	14°58'48"	Preparation
3474	HR	15	2004		10 000	45°18'	A0		Rijeka	45°16'36"	45°20'36"	14°22'36"	14°30'48"	Preparation
					5 000				A-Luka Rijeka	45°19'17"	45°20'00"	14°25'06"	14°27'00"	
					1 500				B-Rijeka - Lučica Torpedo	45°20'2,5"	45°20'8,5"	14°24'12"	14°24'25"	
					2 500				C-Petrolejska luka	45°19'56"	45°20'06"	14°24'48"	14°25'07"	
					5 000				D-Rijeka - Brajdica	45°19'00"	45°19'24"	14°27'09"	14°27'52"	
3476	HR	100 -21	1973	1996	100 000	43°35'	B1		Šibenik – Split	43°17'12"	43°51'48"	15°17'30"	16°28'00"	Preparation
					15 000				A – Splitska vrata	43°18'47,5"	43°20'16"	16°23'22"	16°25'22,5"	
3477	HR	47	2002	2017	15 000	43°30'30"	A0		Split – Kaštelanski zaljev	43°27'20"	43°33'25"	16°17'37"	16°29'48"	Available
					4 000				A – Split -Gradska luka	43°29'58,1"	43°30'30,1"	16°25'36,7"	16°26'39,7"	
					4 000				B – Bazen Vranjic	43°31'36,2"	43°31'54,7"	16°27'43,6"	16°28'27,6"	
					5 000				C –Bazen Solin	43°32'04,2"	43°32'21,2"	16°27'10,6"	16°28'13,6"	
3480	HR	100 -25	1972	2003	100 000	42°55'	B1		Hvar – Lastovo	42°38'24"	43°13'00"	16°12'00"	17°21'36"	Preparation
3484	HR	100 -27	1970	1999	100 00	42°51'	B1		Pelješac – Mljet	42°28'48"	43°03'24"	16°58'36"	18°08'12"	Preparation
					20 000				A – Luka Polače	42°46'58,8"	42°48'20,4"	17°22'26,8"	17°26'55"	
					15 000				B – Luka Slano	42°46'13,2"	42°47'21"	16°52'17,4"	17°53'49,8"	
3485	HR	83	2001		10 000	42°40'	A0		Dubrovnik	42°36'42"	42°40'48"	18°01'06"	18°01'48"	Preparation
					5 000				A – Dubrovnik -Luka Gruž	42°39'09"	42°40'02"	18°04'46"	18°05'40"	
					2 000				B – Dubrovnik -Stara luka	42°38'18"	42°38'32"	18°06'54"	18°07'10"	
					2 500				C –Marina Dubrovnik	42°40'07"	42°40'19,3"	18°07'37,2"	18°08'4,8"	

ANNEX 8 - MEDINTCHART Catalogue - HR Status – Figure



ANNEX 9 - INT Paper Charts - HR Status – IHO INToGIS manager