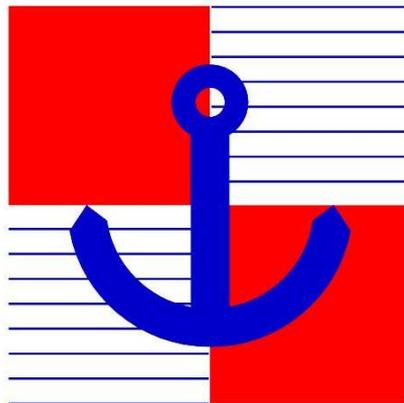


**MEDITERRANEAN AND BLACK SEAS
HYDROGRAPHIC COMMISSION**

XIX CONFERENCE

REPORT BY CROATIA

HRVATSKI HIDROGRAFSKI



INSTITUT

**GEORGIA, Batumi
30 June - 2 July 2015**



**HYDROGRAPHIC INSTITUTE
OF THE REPUBLIC OF CROATIA**

**MEDITERRANEAN AND BLACK SEAS
HYDROGRAPHIC COMMISSION**

XIX CONFERENCE

REPORT BY CROATIA

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1.	HYDROGRAPHIC OFFICE	1
2.	HYDROGRAPHIC SURVEY	1
	Survey status	1
3.	CHARTS	1
	ENCs	1
	ENC distribution method	2
	WMS for ENC.....	2
	INT ENC scheme	2
	RNCs.....	2
	INT paper charts	2
	National paper charts	2
	New technologies.....	5
	Problems encountered	5
4.	NAUTICAL PUBLICATIONS	6
	4.1 National official nautical publications series	6
	4.2 Nautical publications issued	6
5.	MARITIME SAFETY INFORMATION (MSI)	7
6.	S-55 IHO PUBLICATION	8
7.	CAPACITY BUILDING	8
	7.1 New technologies.....	8
	7.2 Training.....	12
	7.3 Bilateral Cooperation	13
	7.4 Status of approval of amendments to the IHO Convention	14
8.	OCEANOGRAPHIC ACTIVITIES	15
	8.1 Oceanographic projects.....	15
	8.2 Oceanographic publications	17
9.	OTHER PROJECTS AND ACTIVITIES	17
	ANNEX 1 - CHI position in the structure of Croatian administration	18
	ANNEX 2 - Status of hydrographic survey	19
	ANNEX 3 - ENC 5-year priority plan based on new hydrographic survey - Overall	20
	ANNEX 4 - ENC 5-year priority plan based on new hydrographic survey - Regional	21
	ANNEX 5 – Current ENC release status	23
	ANNEX 6 - MEDINTCHART Catalogue - HR Status - Table	24
	ANNEX 7 - MEDINTCHART Catalogue - HR Status - Figure	25

1. HYDROGRAPHIC OFFICE

In accordance with the provisions of SOLAS Chapter V, that are implemented in the Croatian national legislation (Hydrographic Activity Act, 1998), 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. Hydrographic activities are regulated by law. 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 XVIII MBSHC Conference were limited to selective parts of the coast and to principal (international) ports and passages. Numerous hydrographic profiles have been surveyed in order to elaborate underwater marine installations. Annex 2 summarizes the status of hydrographic surveys.

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

Until now, CHI has produced 107 navigational purpose ENC cells 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.

Current status of the CHI ENC production is shown in the following table:

		1 July 2008		1 July 2009		1 June 2011		1 July 2013		15 May 2015	
User band	Navigational purpose	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	100%	15	100%	15	100%	15	100%
4	Approach	9	72%	11	77%	12	81%	13	85%	14	88%
5	Harbour	31	77%	33	80%	37	84%	37	84%	39	86%
6	Berthing	20	74%	21	77%	22	80%	24	85%	24	85%
TOTAL		80	87%	85	89%	91	91%	94	92%	97	93%

Annex 3 shows Croatian ENC 5-year ENC production priority plan based on new hydrographic survey - Overall. Annex 4 shows ENC 5-year ENC production priority plan based on new hydrographic survey – Regional. Annex 5 shows current ENC release status.

ENC distribution method

CHI distributes its ENC through the PRIMAR RENC. The first Croatian ENCs were released in February 2007.

In the period between the two MBSHC conferences, the CHI produced three new ENCs, 57 ENC new editions, and 245 updates (ERs). Most of the existing ENCs have been updated recently applying the very complex HR VTS information (by graphical and textual presentation).

WMS for ENCs

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

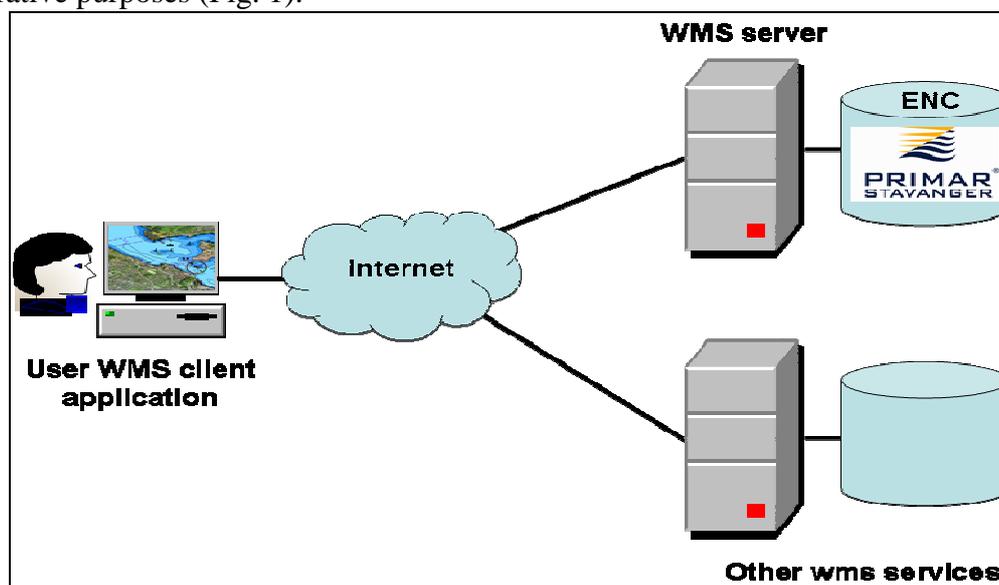


Figure 1. PRIMAR WMS for ENCs

INT ENC scheme

The current second 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 in the process of harmonization between IT and HR.

RNCs

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

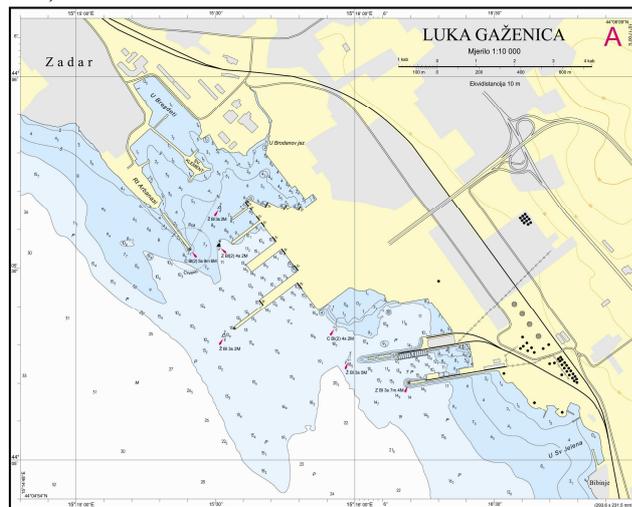
INT paper charts

HR status of INT paper charts is shown in the table and figure in Annex 6 and Annex 7 respectively.

National paper charts

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

100-20 Dugi otok - Zadar – Plan on chart:
- Luka Gaženica, 1:10 000



533 Šibenski kanal – Plan on chart:
- Luka Šibenik, 1:10 000

New editions

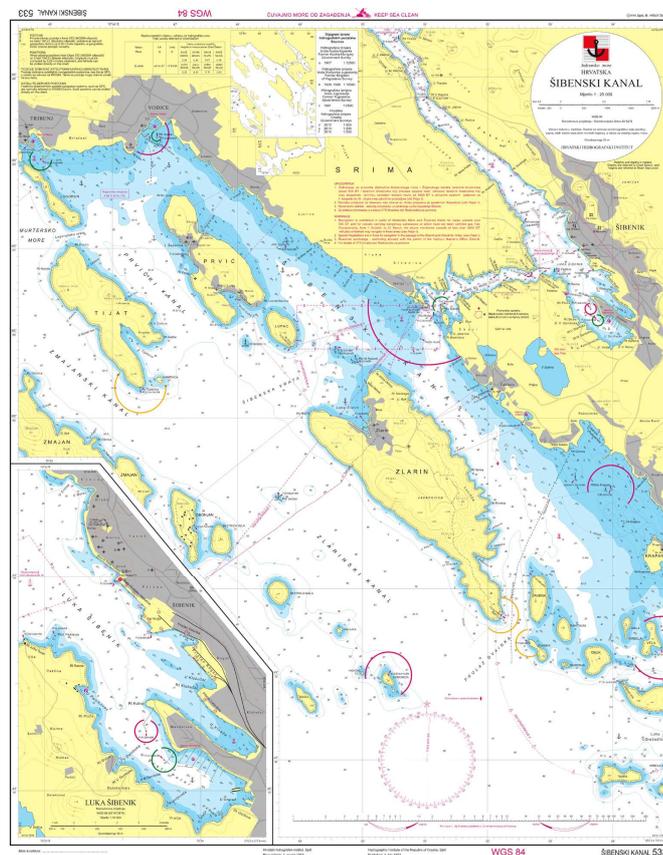
533 Šibenski kanal, 1: 25 000

15 Rijeka – Plan on chart:

- Rijeka – Brajdica, kontejnerski terminal, 1: 5 000,

47 Split – Kaštelanski zaljev – Plan on chart:

- Split – Gradska luka, 1:5 000.



New printing

101	Jadransko more	1:800 000
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
100-22	Jabuka – Vis	1:100 000
100-24	Palagruža – Lastovo	1:100 000
100-25	Hvar – Lastovo	1:100 000
Male karte – MK I i II dio		1:100 000
11 Zapadna obala Istre – Plans, Berthing - different scales		

New technologies

Paper chart production from ENC

Intensive work on acquisition of the production process of making paper charts from ENCs continues (Fig. 2). Four charts were produced using special software. Charts 100-22, 100-24, 100-19, 300-31, 300-32, 300-33 and 300-34 are under preparation.

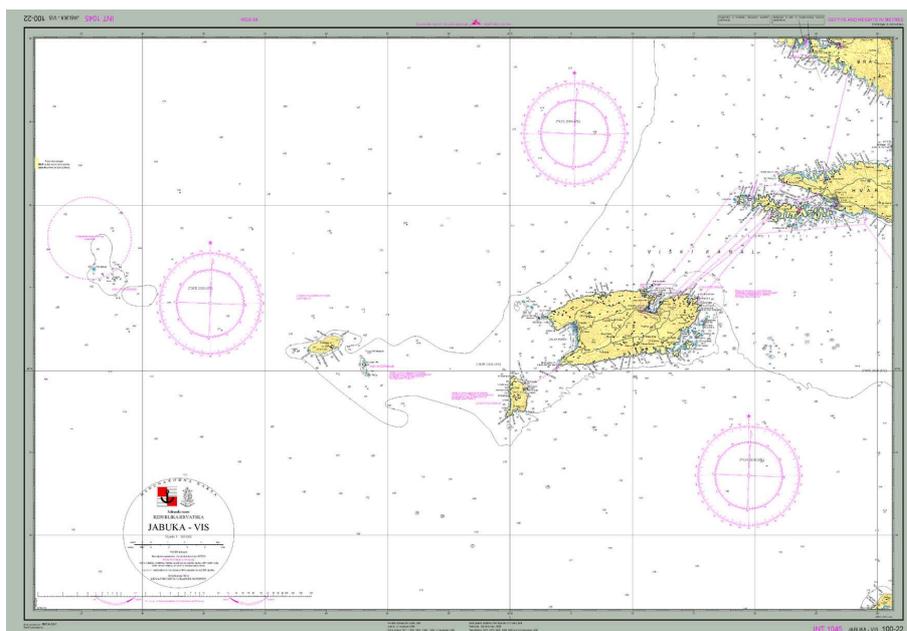


Figure 2. Chart 100-22 JABUKA - VIS produced from ENC (HR3C0022)

Problems encountered

1. Some overlaps still exist between HR, IT and GR Overview and General ENCs. The process of harmonization of the second draft proposal is slow but still underway between IT and HR.
2. 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.
3. CHI's view about the gaps in the Adriatic Sea covered by INT paper chart series (1:250 000 scale), as presented at the XVII MBSHC Conference, is still under consideration by IT and HR.

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:

- Tablice morskih mijena 2014.
- Tablice morskih mijena 2015.

Nautical Almanac:

- Nautički godišnjak 2014.
- Nautički godišnjak 2015.
- Nautički godišnjak 2016. (in preparation)

List of Lights:

- Popis svjetala i signala za maglu - Jadransko more - Jonsko more - Malteški otoci 2014.

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

5. MARITIME SAFETY INFORMATION (MSI)

Croatian NAVTEX Station has been installed on Hvar Is. (Q) since 1999 (previously Split), covering the area of the Adriatic Sea, and being maintained by coast radio station Split Radio. This station transmits messages every four (4) hours. Correctness of the promulgation of information is controlled on the NAVTEX receiver in Nautical Department of the CHI. No failure occurred during ordinary operation. Schedule of navigational warnings is shown in the following table:

NAVWARNINGS	2013 (From 31.7.2013)	2014	2015 (Until 31.5.2015)
NAVAREA	4	15	8
COASTAL	66	39	15
LOCAL	86	233	76
TOTAL	156	287	99

The most important maritime safety information – Notices to Mariners (monthly edition), 10-day bulletin of navigational warnings and the list of Temporary (T) and Preliminary (P) Notices – are available on www.hhi.hr.

In the last three months, coast radio station SPLIT RADIO was not transmitting NAVTEX messages because of repair works on the antenna system for NAVTEX transmissions.

In order to keep this important and mandatory service continuously available to mariners in the Adriatic Sea, transmissions were established through Italian coast radio station MONDOLFO NAVTEX, which took up the character (Q) and the time slot for broadcasting Maritime Safety Information (MSI) and Weather Bulletin (WB). All activities were coordinated by Nautical Department of the CHI, as national coordinator for radio navigational warnings.

NAVTEX messages were sent to the MONDOLFO NAVTEX station through coast radio station SPLIT RADIO. After completion of repair works on the antenna system, SPLIT RADIO re-established NAVTEX transmissions on 28 April 2015. Nautical Department has fulfilled its task of coordinating the activities with Italian colleagues (Italian Coast Guard Headquarters – III Department – Operation Centre – Monitoring systems Section) led by Andrea Tassara, to whom we express our sincere thanks.

Special praise for good cooperation between Croatia and Italy during the antenna system maintenance period, without endangering the safety of navigation in the Adriatic Sea, has been received from William Van-Den-Bergh, chairman of the IMO NAVTEX Coordinating Panel, UKHO, whose words are given below:

Dear Sirs,

I would like to congratulate Croatia and Italy on the very good cooperation which took place during Split Radio antenna maintenance period. It is an unfortunate fact of life that NAVTEX equipment does need a lot of care and attention, thus occasionally stations must shutdown to achieve deep maintenance or renew equipment. However, in the case of Split Radio this was done without the loss of MSI to vessels in the Adriatic Sea, by using Mondolfo station to broadcast MSI on behalf of Split station.

When GMDSS was introduced and WWNWS came into place, it was always envisaged that this manner of cooperation between Member States would exist; unfortunately, either because of equipment limitations or political differences this is not always possible. This action by Croatia and Italy is yet again a shining example of how Member States should respond and assist each other in supporting our fellow mariners at sea.

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. 4).



Figure 4. Print on Demand

Multibeam system

The new MBS for shallow water has been acquired.

WEB Services

Recently launched 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. 5).

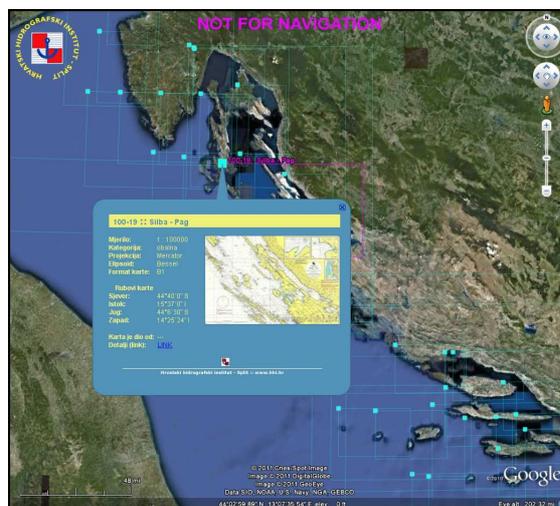


Figure 5. Online Catalogue of Charts and Nautical Publications

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. 6).

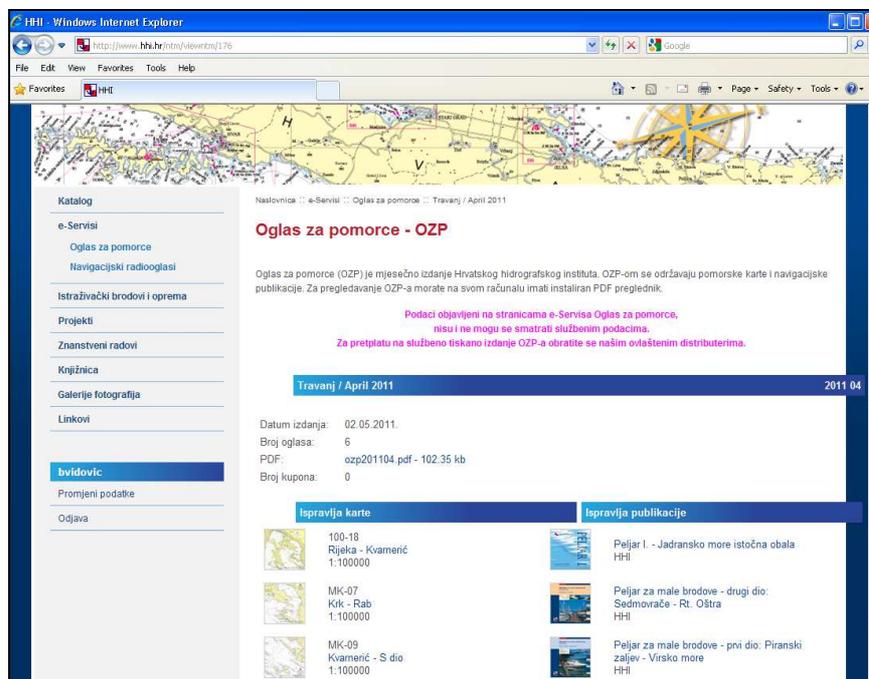


Figure 6. Notices to Mariners e-Service

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. 7).

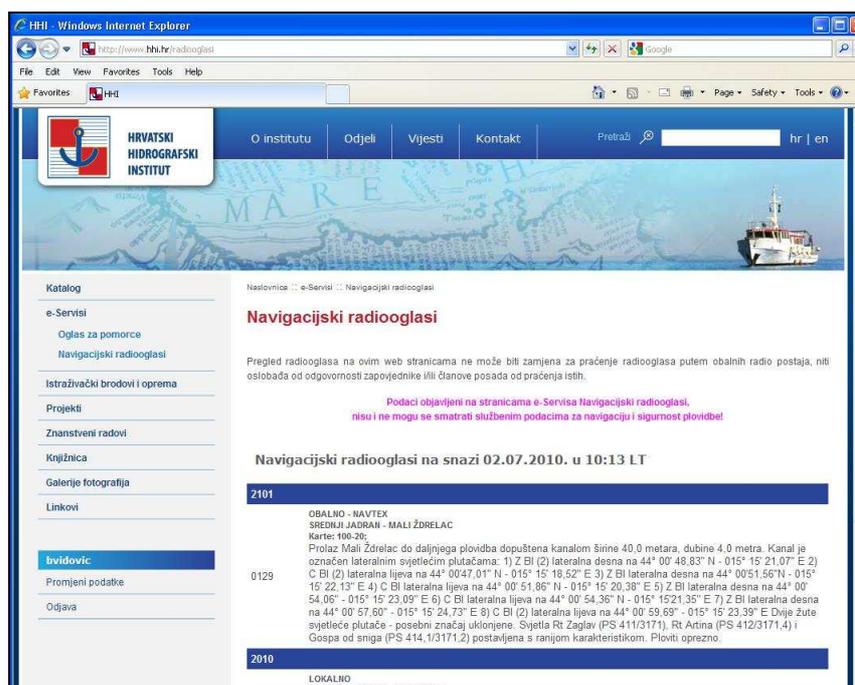


Figure 7. Navigational Warnings e-Service

Oceanographic information system

Tidal measurements

Computer software has been provided for tide-gauge stations Split (outer breakwater) and Ploče, and for tidal measurements and tide-gauge data (Fig. 8).

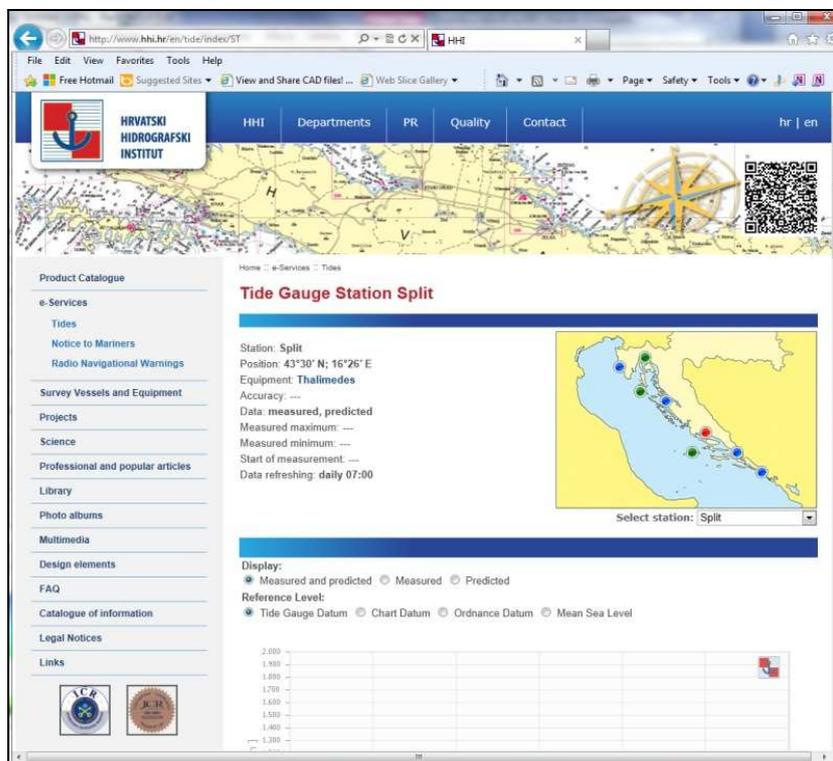


Figure 8. Tidal measurements and tide-gauge data e-Service

Wave measurements

Application displaying the positions of waverider buoys has been created with Google Earth interface (Fig. 9).

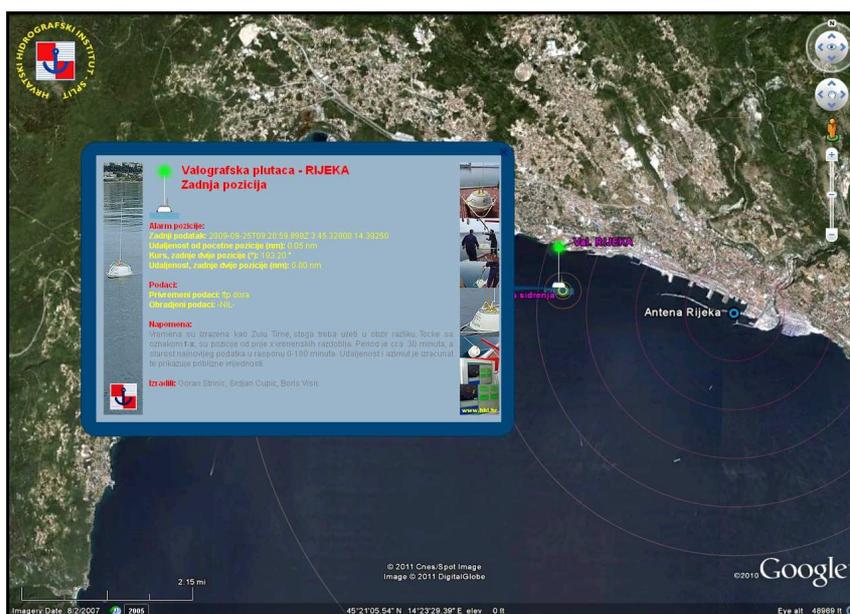


Figure 9. Waverider buoys display in Google Earth

Sea Water Transparency and Colour

Access database “Bojaiprozirnost” has been created and exported to SQL server 2008 Express database. Access to data in the database is available through a web form (Fig. 10).

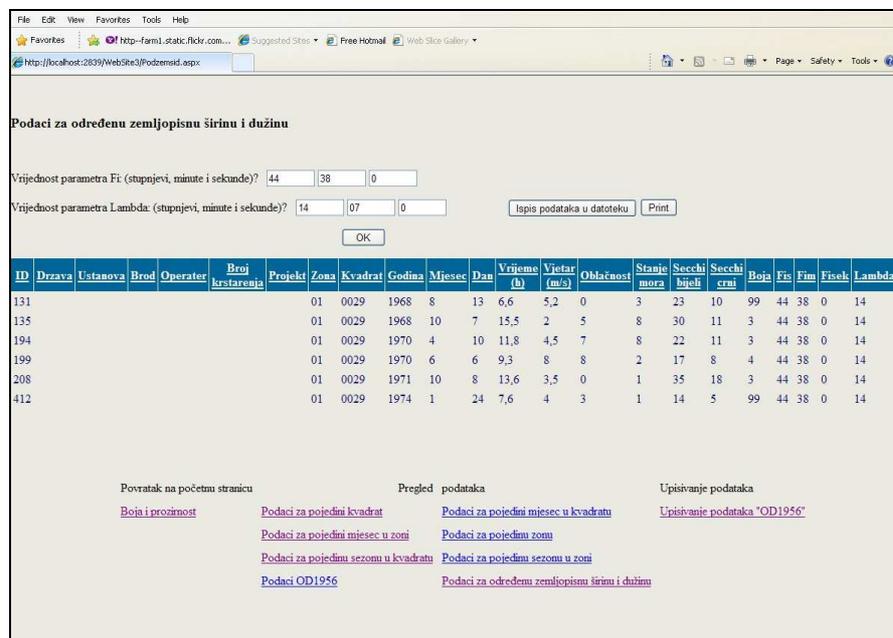


Figure 10. Database of Sea Water Transparency and Optical Properties

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. 11).

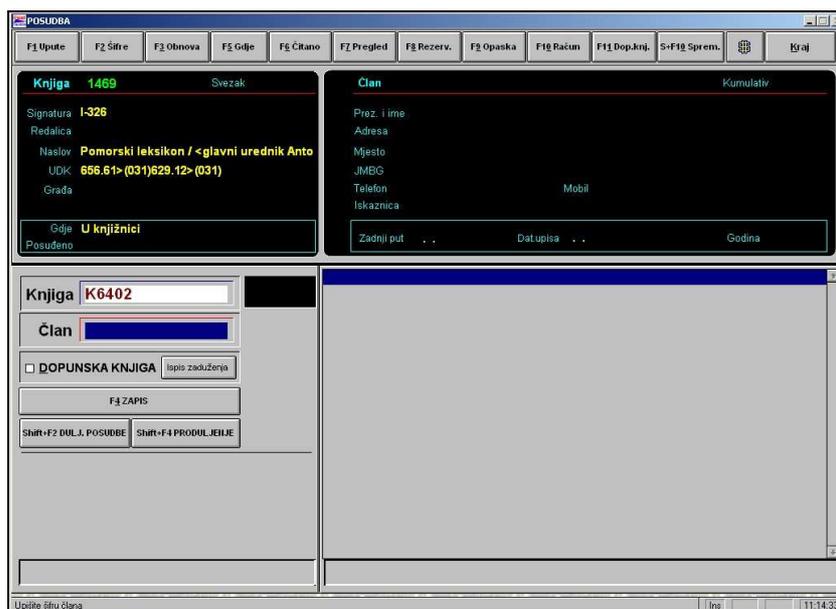


Figure 11. METELWin Application

Other projects

National (Marine) Spatial Data Infrastructure – N(M)SDI

CHI actively participates in the long-term HR project at national level for the implementation of national legislation relating to NSDI aiming to establish the MSDI (Fig. 12).

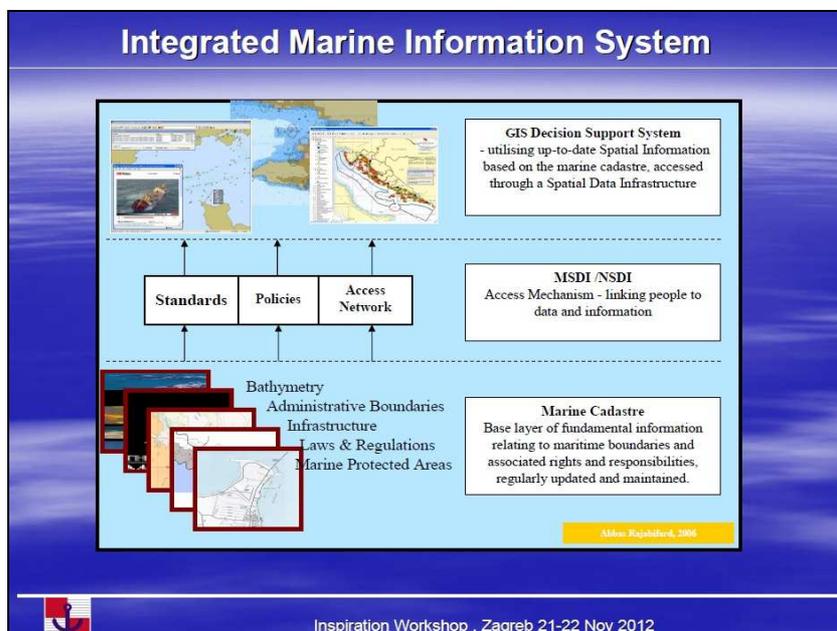


Figure12. An overview concept of HR MSDI

7.2 Training

ISO Quality Management System

CHI successfully completed the process of ISO 9001:2008 certification in June 2013. An external audit is performed on yearly basis aiming to improve and confirm the certificate (Fig. 13).



Figure 13. CHI ISO 9001: 2008 certificate

IMO Audit of Croatian Hydrographic Service

The audit of Croatian Maritime Administration was undertaken in November 2014 using fully the principles established under the *Framework and Procedures for the Voluntary IMO Member State Audit Scheme and the III Code (IMO Res. A.974(24))*. Croatian Hydrographic Service was presented to the IMO audit team in accordance with topics stated in Annex 3 of the IMO Circular Letter No. 3425. Outcomes from the IMO Audit Report point out that the CHI has successfully passed the first IMO audit.

New software training

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

PRIMAR ENC Validation Course

Organization of an ENC Validation Course for PRIMAR members has been planned for early autumn 2015, in cooperation with PRIMAR RENC, to be run by PRIMAR and hosted by Croatia.

7.3 Bilateral Cooperation

Bilateral agreements

Activities within the bilateral agreement between Croatia and Italy that started in the period 2013-2015, are currently 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 (MPA, VTS) 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 meetings

Jeppesen

Working session with the representatives of Jeppesen, Mr Michael Bergmann and Mr John Klippen, took place on the CHI premises on 8 and 9 April 2015.

CHI and Jeppesen have successfully cooperated for the past ten years pursuant to two signed agreements in force. The first agreement covers the distribution of Croatian official electronic navigational charts (ENC), and the second one covers the license usage of the CHI data in derived unofficial cartographic systems (ECS). Jeppesen also provides significant technical software support for the CHI through a complex process of production and maintenance of Croatian ENCs.

Due to accelerated development of navigation technologies, and the need for integration of single marine systems into Integrated Marine Information System according to the IMO e-navigation Strategy Implementation Plan, NHOs and hence the CHI face new ENC-related challenges.

Main topic of the two-day session was how the CHI in cooperation with Jeppesen could fulfil new requirements in a timely manner and meeting high standards. It was agreed in advance that all issues should be divided into two thematic units: legal one and technical one. After thematic presentations by both sides, a practical workshop and an extensive discussion, the representatives of Jeppesen and CHI reached conclusions formulated in 12 Action Items to be achieved in the forthcoming period.

PRIMAR Advisory Committee

CHI hosted the PRIMAR Advisory Committee meeting held in Split in November 2014.

Bilateral EU projects

1. EU/IPA project of component II (CBC), Measure 1.1. Joint Actions for Environment, Nature and Cultural Heritage.

CHI has just (May 2015) completed the implementation of the two-year EU project Joint Actions for Sea Pollution Prevention - "JASPPer". Total value of the project was € 598,339.17. The project took place in the Dubrovnik-Neretva County and on the Montenegrin coast.

All project objectives which contribute to the reduction of transboundary pollution and preservation of the marine ecosystem have been achieved.

Croatian partners in the project: Hydrographic Institute of the Republic of Croatia as functional lead partner, and Institute for Marine and Coastal Research - University of Dubrovnik. Montenegrin partners: Hydrometeorological and Seismological Service of Montenegro as lead partner, and Institute of Marine Biology in Kotor - University of Montenegro. Planned duration of the project was 24 months (May 2013 - May 2015). For details see: <http://www.hhi.hr/en/projects/viewproject/16>

2. EU/IPA - "CoRE" project - Cross-Border Programme Croatia - Montenegro

CHI has been granted a new project within IPA Cross-Border Programme entitled: "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".

Croatian partners in the project: Hydrographic Institute of the Republic of Croatia (CHI) as functional lead partner, and University of Dubrovnik – Institute for Marine and Coastal Research (IMCR). Montenegrin partners in the project: Hydrometeorological and Seismological Service of Montenegro (HMSSMN) as lead partner, and Public Enterprise "Morsko Dobro".

Total value of the project is EUR 600.474,04 of which the CHI and the IMCR have EU grants amounting to EUR 310.006,91. HMSSMN and Public Enterprise "Morsko Dobro" have EU grants amounting to EUR 290.467,13. Scheduled duration of the project is 23 months.

General aim of this project is improvement in overall protection and preservation of the Eastern Adriatic coastline.

Specific objectives of the project:

- To produce a new nautical chart based on the new hydrographic survey (waterway and habitat preservation area)
- To establish a set of safety recommendations based on the research and gathered data, taking into account natural changes of the coastline border in Croatia and Montenegro influenced by erosion and wave power
- To increase general knowledge of wide groups of stakeholders on Maritime domain (maritime demesne / component coast) and its sustainable littoralisation in the cross-border area.

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 project described below is singled out as the most interesting one:

Implementation of the Marine Strategy Framework Directive in Croatia started in March 2013 with complex oceanographic measurements in Croatian waters.

Sea temperature, salinity and density were measured in March, April, May and June 2013 at 44 CTD stations, by using standard drop-down from the surface to the bottom of the sea of the CTD probe.

Measurements of sea currents started in March 2013 by using ADCP (Acoustic Doppler Current Profiler) at 9 current meter stations (Fig. 14).

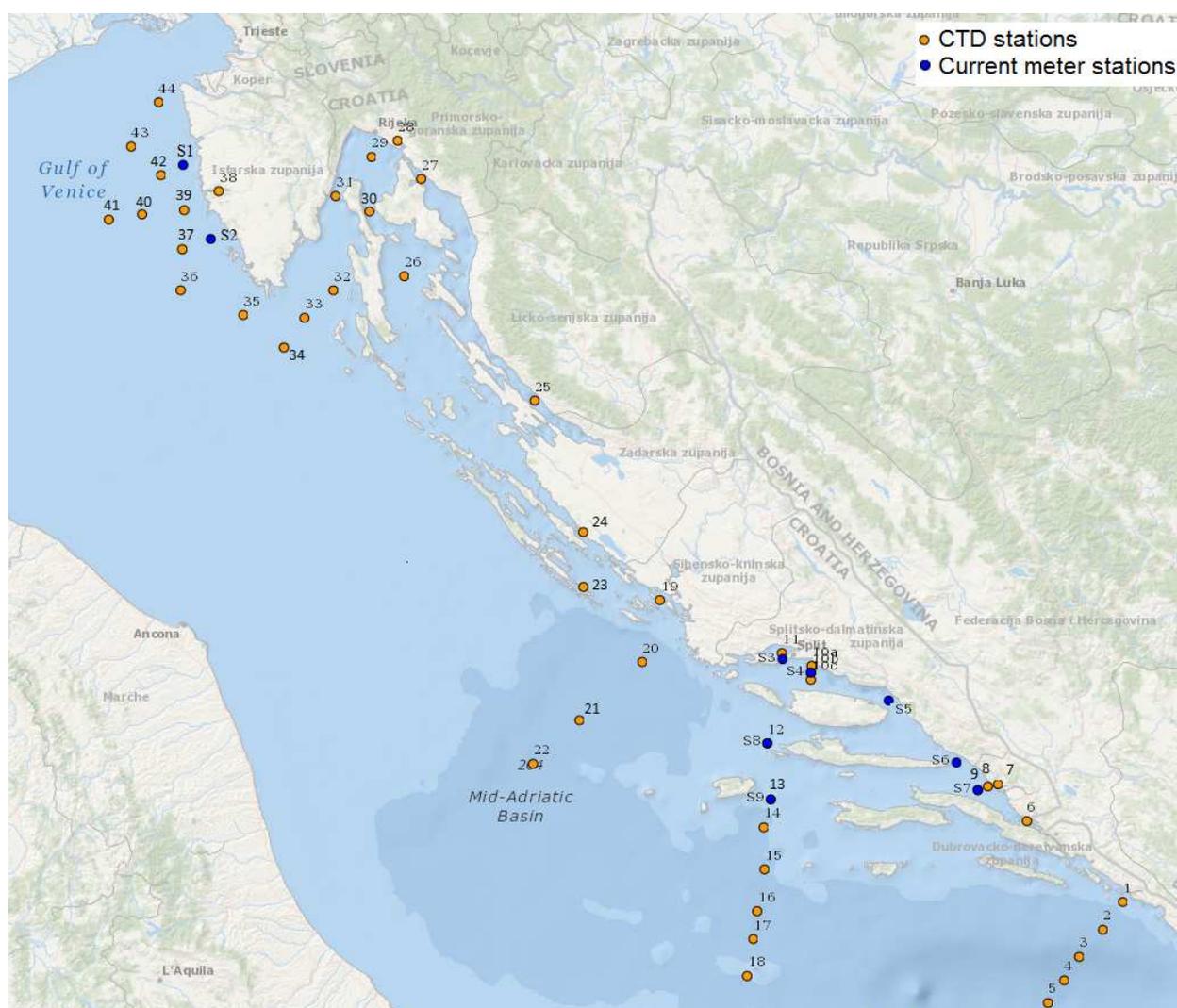


Figure 14. Geographic positions of CTD stations and current meter stations

An example of the use of numerical models in the area of strategic decision-making (Fig. 15.)

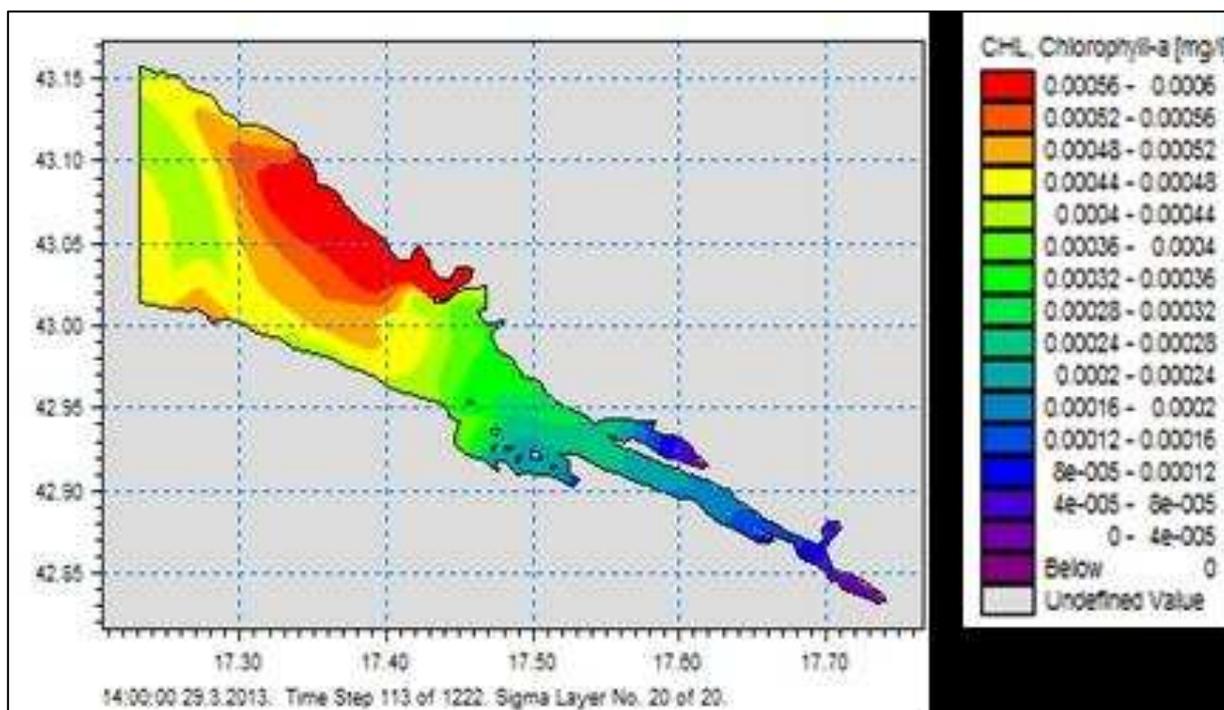


Figure 15. Display of the model results using MIKE 21/3 numerical model

Dissolved oxygen (DO), chlorophyll (CHL), NH₄, NO₂, NO₃ and PO₄ used in the model.

	INITIAL STATE mg/l	NERETVA INTAKE mg/l				INTAKE GRADAC & PLOČE mg/l
		1x	3x	5x	10x	
DO	7.9	9.4	9.4	9.4	9.4	0
CHL-a	0.0004	0	0	0	0	0
NH ₄	0.012	0.04	0.12	0.2	0.4	20
NO ₂	0.0035	0.005	0.015	0.025	0.05	2
NO ₃	0.08	0.78	2.34	3.9	7.8	10
PO ₄	0.0018	0.07	0.21	0.35	0.7	7

8.2 Oceanographic publications

Annual publications "Tide Tables – Adriatic Sea, East Coast" and "Report on Tide-gauge Measurements along the East Adriatic Coast" (Fig. 17) are also available in a digital format for the years 2014 and 2015.

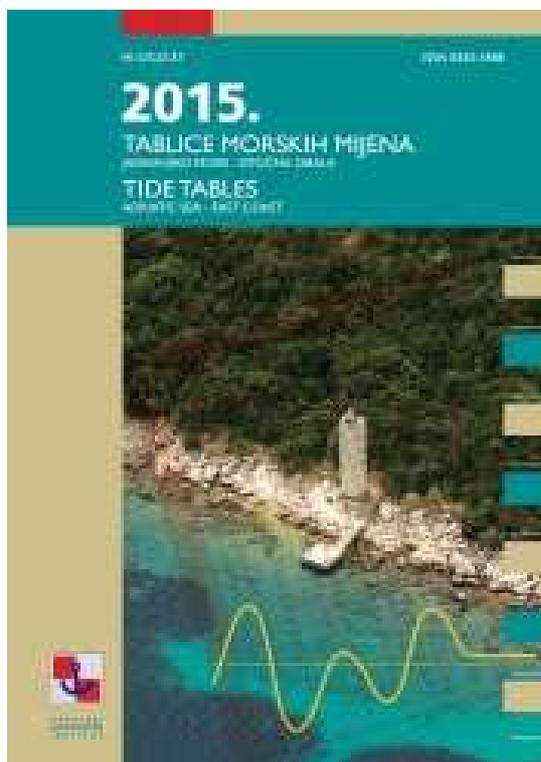


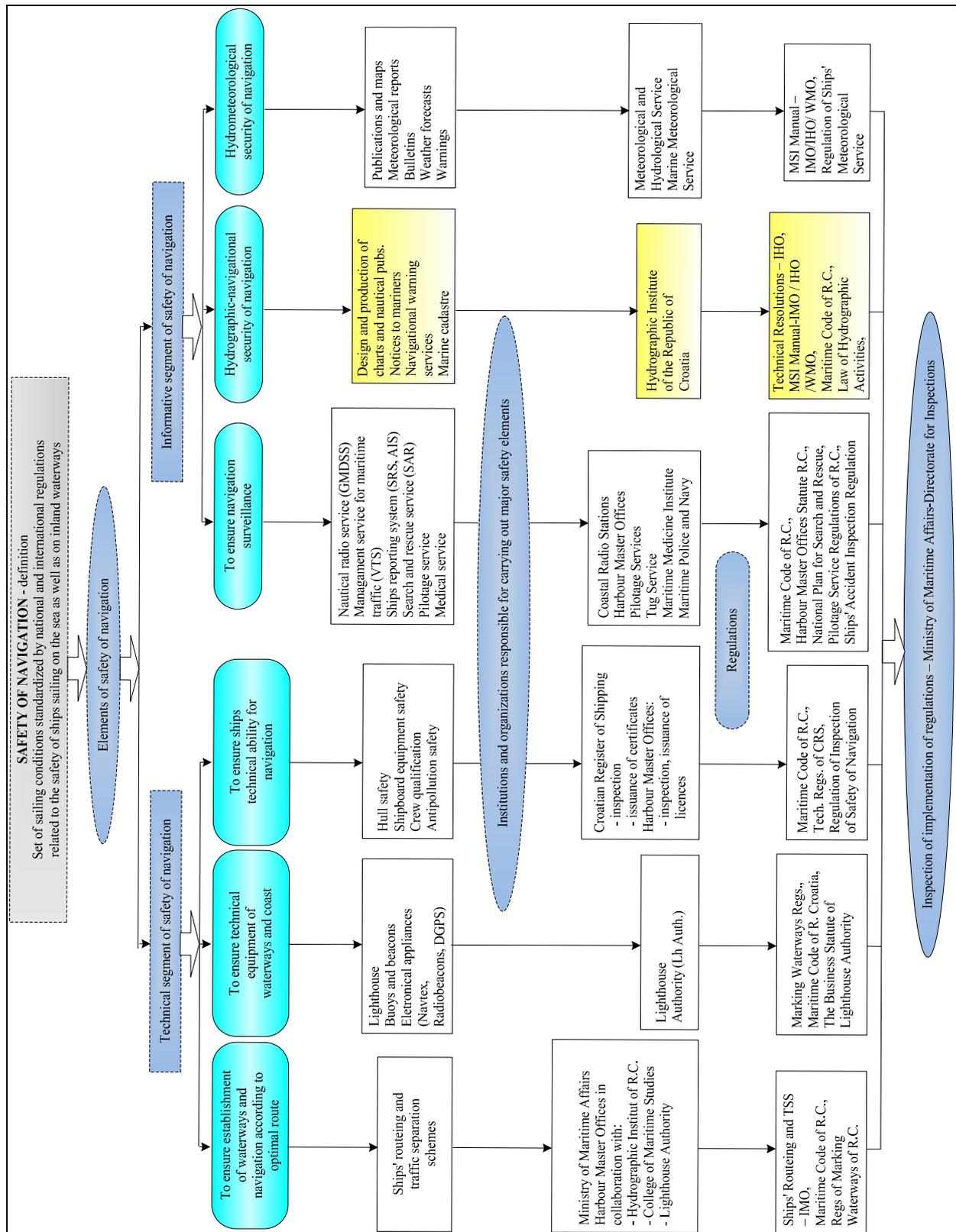
Figure 17. Tide Tables – Adriatic Sea, East Coast

9. OTHER PROJECTS AND ACTIVITIES

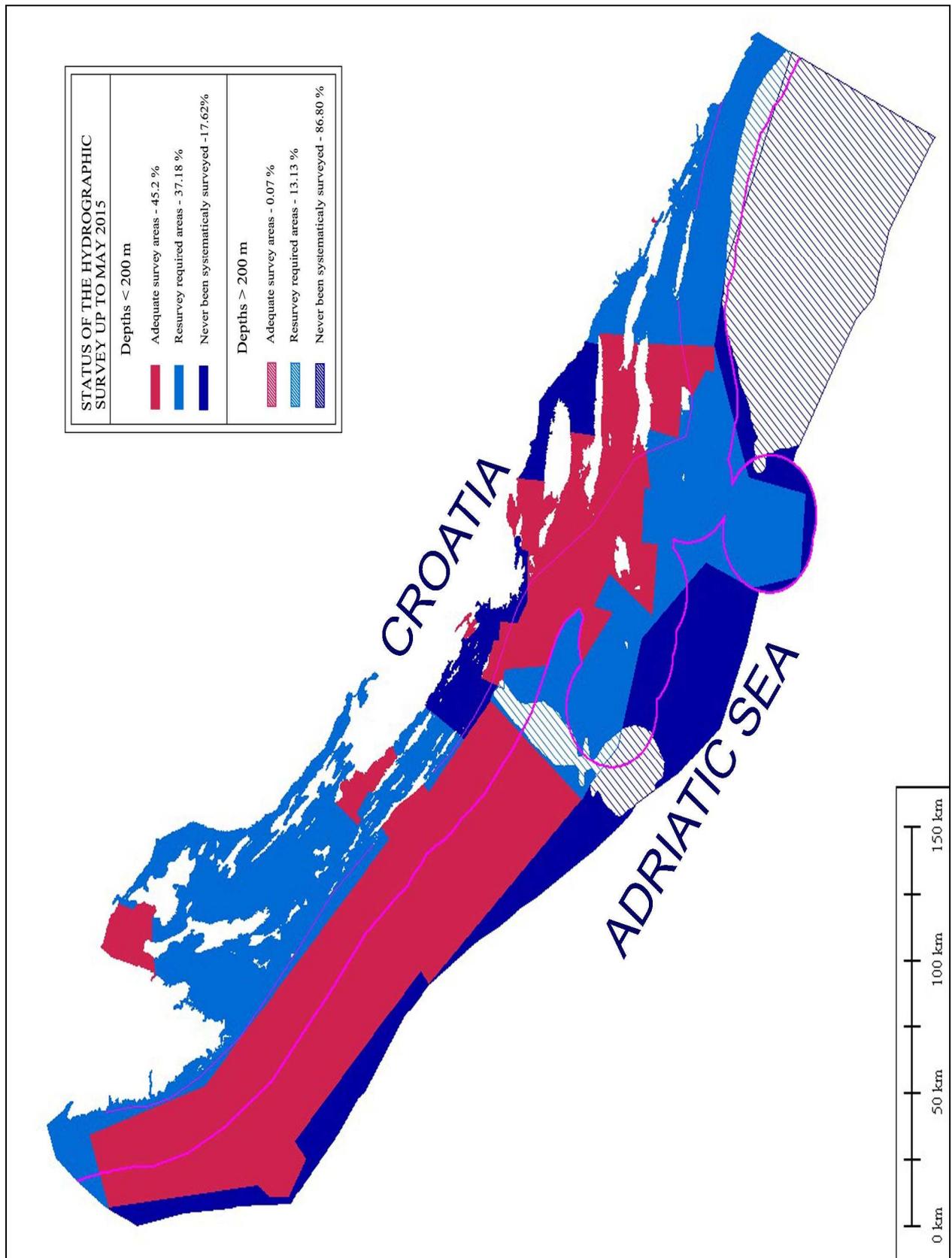
CHI continuously participates in multiple projects designated from the competent administrations providing high quality support.

CHI personnel have participated in several international scientific and technical conferences presenting hydrographic and oceanographic papers.

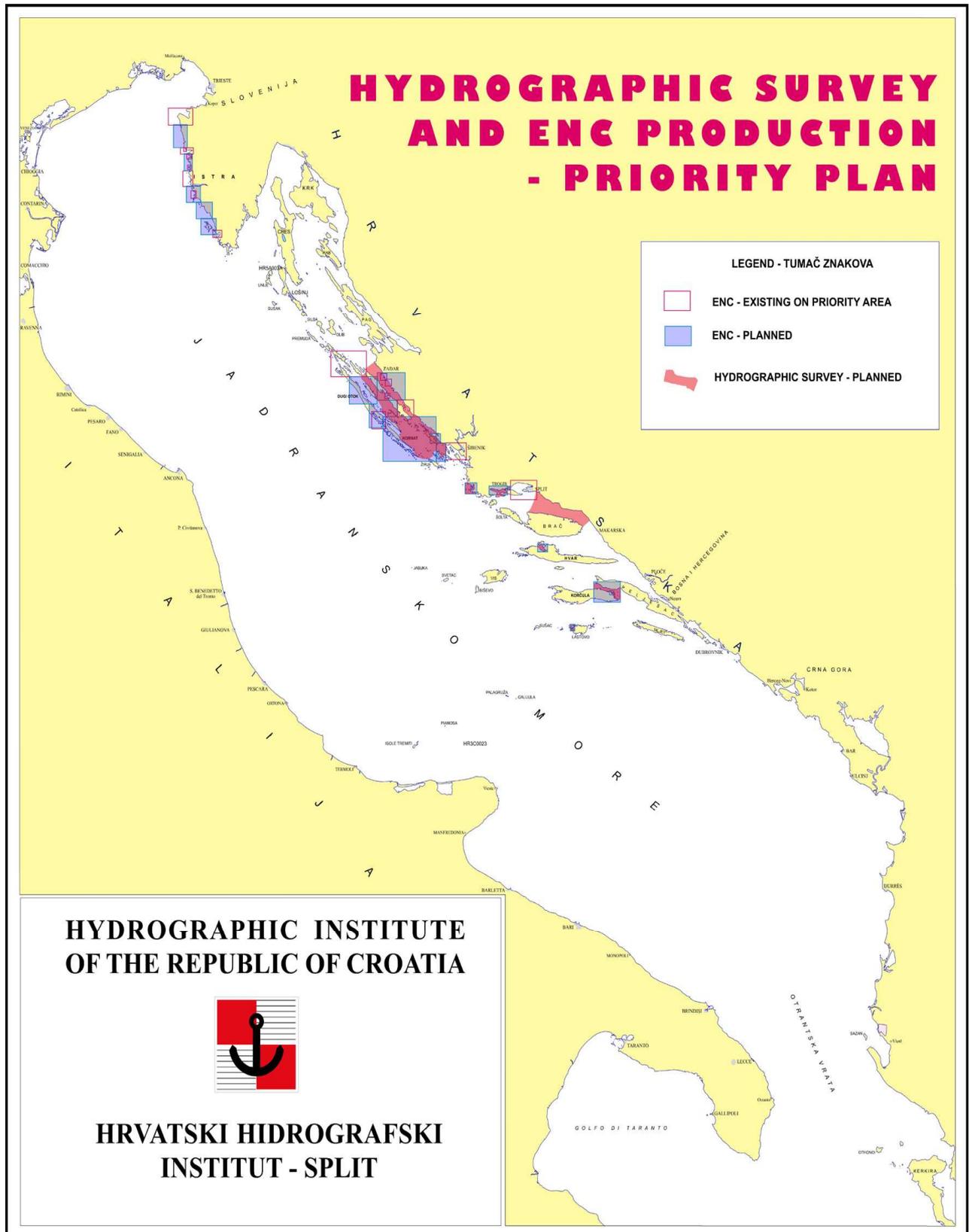
ANNEX 1 - CHI position in the structure of Croatian administration



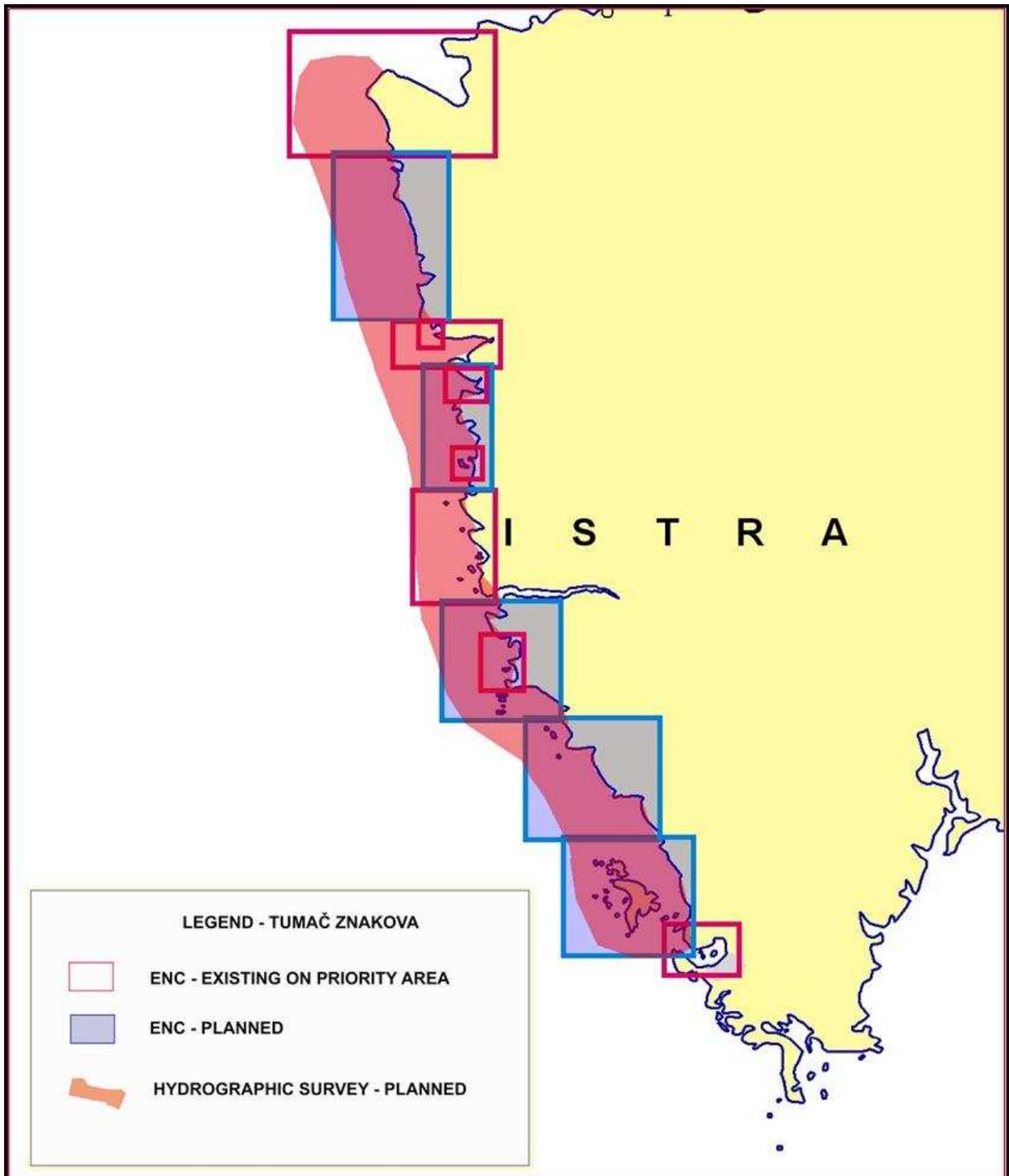
ANNEX 2 - Status of hydrographic survey

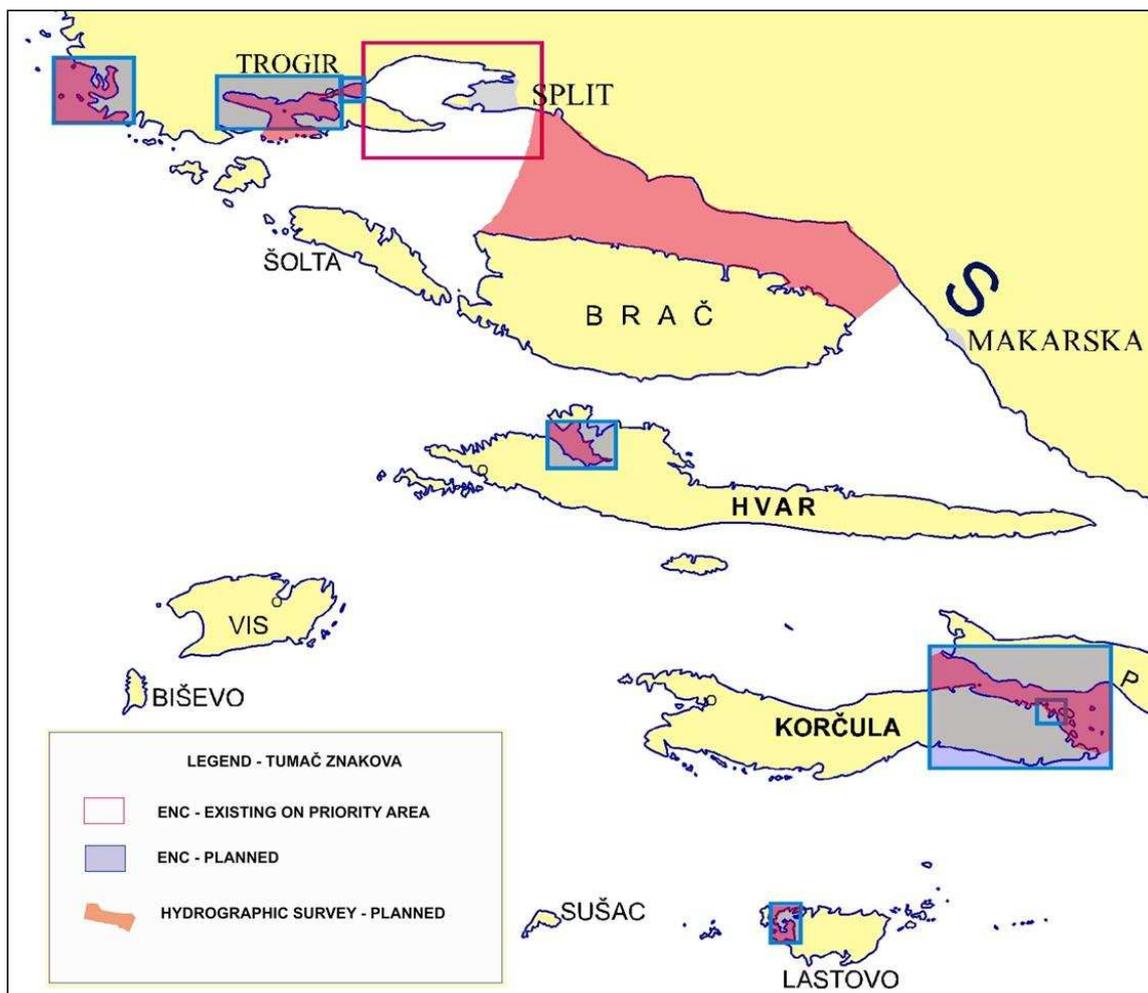
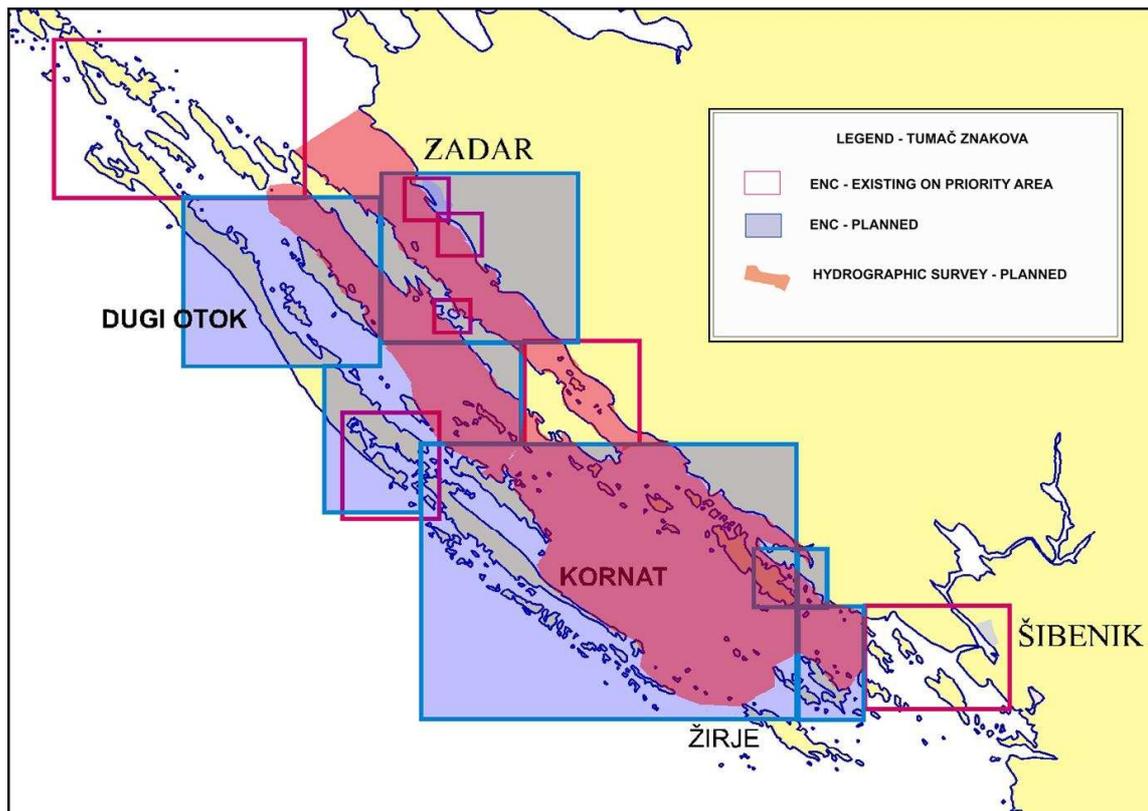


ANNEX 3 - ENC 5-year priority plan based on new hydrographic survey - Overall

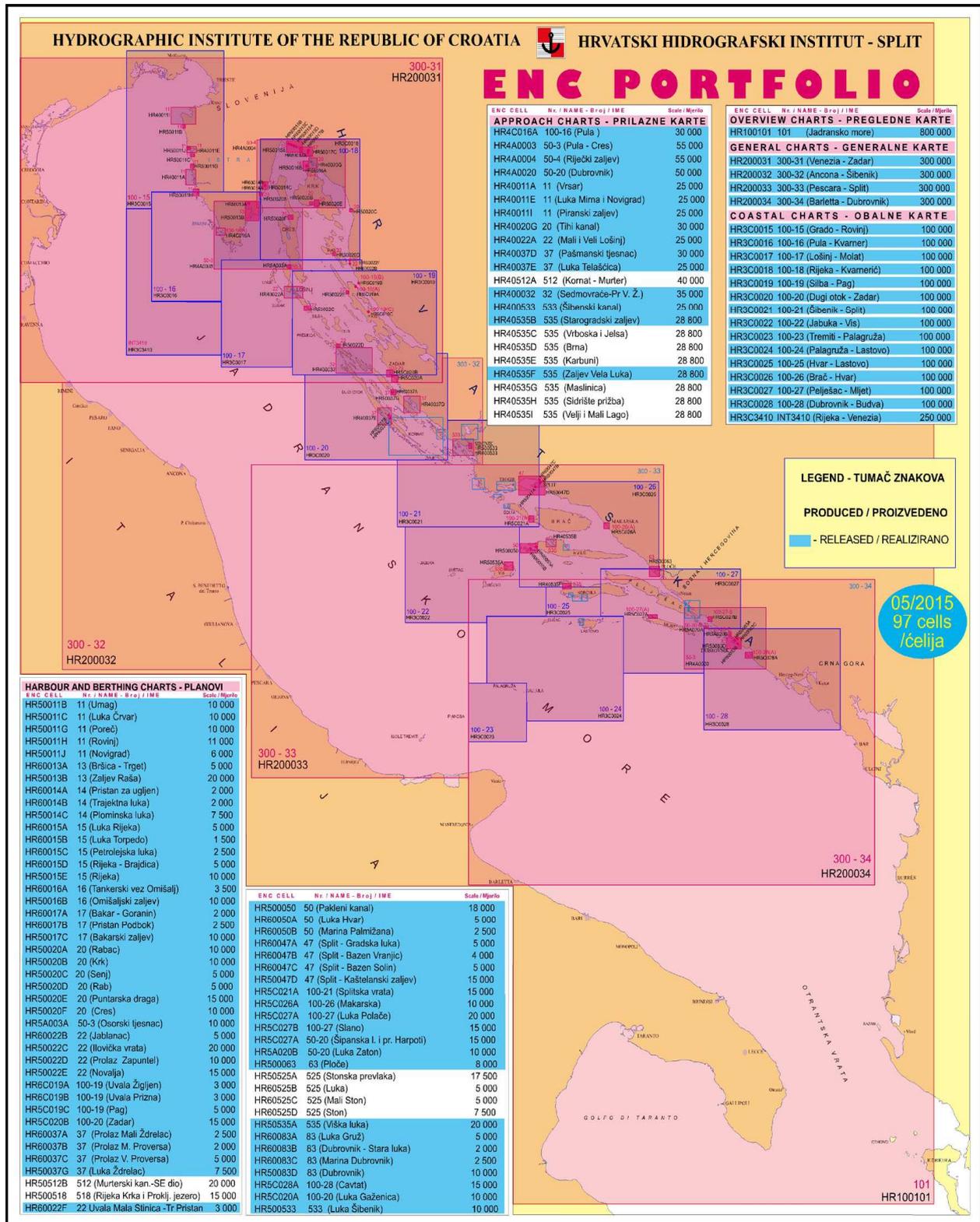


ANNEX 4 - ENC 5-year priority plan based on new hydrographic survey - Regional





ANNEX 5 – Current ENC release status



ANNEX 6 - MEDINTCHART Catalogue - HR Status - Table

INT_NO	PR	NAT_NO	SCALE		DATE		PRINT	MAIN_TITLE	CHART_LIMITS			STATUS	
			1:	LATITUDE	PUB	NEW_ED			LIMIT_S	LIMIT_N	LIMIT_W		LIMIT_E
300	IT	360	4 200 000	45°00'N	1984	1997	FR,ES,GB,HR	Sredozemno i Crno more	25°00'00"N	49°50'12"N	7°00'00"W	42°15'18"E	Available
301	IT	340	2 250 000	41°30'N	1972	1996	FR,DE,ES,GB,US,PT,HR	Sredozemno more zapadni dio	32°45'00"N	45°52'13"N	06°44'00"W	19°40'29"E	Available
302	IT	350	2 250 000	41°30'N	1982	1997	FR,DE,ES,GB,US,HR	Sredozemno more istočni dio	30°05'00"N	43°39'15"N	09°55'00"W	36°19'30"E	Available
INT_NO	PR	NAT_NO	SCALE		DATE		PRINT	MAIN_TITLE	CHART_LIMITS			STATUS	
1:	LATITUDE	PUB	NEW_ED	LIMIT_S	LIMIT_N	LIMIT_W			LIMIT_E				
3410	HR		250 000	45°00'N	1988	2007	FR	Rijeka - Venezia	44°13'00"N	45°50'00"N	12°08'00"N	15°28'00"N	Available
3412	HR		250 000	42°50'N	1991	2000	FR	Split - Gargano	41°40'00"N	44°00'00"N	15°29'00"N	17°40'00"N	Available
3414	HR		250 000	41°55'N	1998		FR	Dubrovnik - Durres	40°45'00"N	43°04'00"N	17°25'00"N	19°38'00"N	Available
3472	HR	(100-16)	100 000	44°50'N	(1973)	(1996)		Pula - Kvarner	44°30'36"N	45°05'12"N	13°15'24"N	14°27'00"N	In Preparation
								A-Pula					
3473	HR	(100-18)	100 000	44°55'N	(1977)	(1996)		Rijeka - Kvarner	44°31'24"N	45°22'00"N	14°09'24"N	14°58'48"N	In Preparation
3474	HR	(15)	10 000	45°18'N	(2004)			Rijeka	45°16'36"N	45°20'36"N	14°22'36"N	14°30'48"N	In Preparation
								A-luka Rijeka-B-Rijeka-Lučica Torpedo-C-Petrolejska luka-D-Rijeka-Brajical					
3476	HR	(100-21)	100 000	43°35'N	(1973)	(1996)		Šibenik - Split	43°17'12"N	43°51'48"N	15°17'30"N	16°28'00"N	In Preparation
3477	HR	(47)	15 000	43°30'30"N	(2002)			Split - Kaštelanski zaljev	43°28'00"N	43°34'00"N	16°17'54"N	16°30'00"N	In Preparation
								A-Split-Gradska luka-B-Bazen Vranjic-C-Bazen Solin					
3480	HR	(100-25)	100 000	42°25'N	(1972)	(1995)		Hvar - Lastovo	42°38'24"N	43°13'00"N	16°12'00"N	17°21'36"N	In Preparation
3482	HR	(154)	200 000	42°35'N	(1955)	(1975)		Peješac - Rt Oštra	42°01'00"N	43°09'00"N	16°54'00"N	19°10'00"N	In Preparation
3484	HR	(100-27)	100 000	42°51'N	(1970)	(1999)		Peješac - Mljet	42°28'48"N	43°03'24"N	16°58'36"N	18°08'12"N	In Preparation
								A-Luka Polače-B-Luka Slano					
3485	HR	(83)	10 000	42°40'N	(2001)			Dubrovnik	42°36'42"N	42°40'48"N	18°01'06"N	18°08'48"N	In Preparation
								A-Luka Gruž-B-Stara luka-C-Marina Dubrovnik					

ANNEX 7 - MEDINTCHART Catalogue - HR Status - Figure

