



ZNANSTVENI I STRUČNI RADOVI

2002 - 2019

Hrvatski hidrografski institut

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Znanstveni i stručni radovi

2002

Joining of Croatia in the development of the European nautical tourism

Favro, Srećko

<http://bib.irb.hr/prikazi-rad?&rad=353235>

First European yacht tourism congress Rogoznica : Croatian Paneuropean Union SPLIT , 2002. 81-89 (ISBN: 953-6921-02-2). Rogoznica, Hrvatska, 16-18.05.2002

Croatia, like all other Mediterranean countries, is tourist-orientated. After the Patriotic War Croatia started renewing intensively its nautical capacities. The Croatian nautical capacities, as recorded on 31st December 2001, are numbering 66 marines with 14, 009 berths. There are 11, 003 boats using berths throughout the year, 91% of which on the sea, 9% ashore. 14, 0594 boats and yachts have been hosted and 68, 476 boats/days realized. This was achieved with 45% boats flying the Croatian flag and the rest from the European countries. The holders of navigation permit were mostly the Germans, the Italians and the Austrians, making 85% of all foreign navigation permits in the Adriatic Sea. These three groups of tourists take precedence in everything on the Croatian coast of the Adriatic Sea. By the type of boat, about 85% marine business have been done with sailing boats and 15% with motor-boats.

Povijest izrade i tiska pomorskih karata

Jeličić, Tonći

6. znanstveno stručni simpozij hrvatskih grafičara, ur. I. Zjakic, Senj, 2002., stručni rad

Prve pomorske karte izrađivane su ručno na pergamentu. Bile su trošne i osjetljive na vlagu, a iziskivale su pojedinačnu dugotrajnu izradu. Početkom 16. stoljeća, s razvitkom tehnika drvoreza i kasnije bakroreza, dolazi do prekretnice. Karte se tiskaju u manjim nakladama, a ručno se koloriraju u kartografskim radionicama. Kvaliteta papira je još uvijek nedostatna s obzirom na uporabne zahtjeve pomorske karte. Kasniji razvoj tiskarske tehnologije, usporedo sa drugim područjima znanosti, uključujući i proizvodnju papira, tiskarskih boja i sl., omogućio je stalni napredak u izradi i kvaliteti pomorskih karata. Današnji moderni offset, sa svojim tehničko-tehnološkim mogućnostima, glavni je postupak tiska u kartografskoj reprodukciji. Karte se uobičajeno tiskaju s pet boja: crna, žuta (u nekim državama se umjesto žute koristi siva ili narančasta), plava, sepija i ljubičasta, na posebnom kartografskom papiru. Budućnost izrade "papirnatih" pomorskih karata povezana je s razvojem tehnologije printera velikih formata, posebice papira na kojemu se printa i boja koje se upotrebljavaju, prema uporabnim zahtjevima. Po ispunjavanju tih uvjeta, pretpostavlja se izradba pomorskih karata ispisom po narudžbi, tzv. print on demand, što će riješiti i problem ažurnosti pomorskih karata.

Adriatic sea level: scientific basis and managing the data

Vilibić, Ivica; Srdelić, Mladen; Vidović, Bruna; Strinić, Goran

<http://bib.irb.hr/prikazi-rad?&rad=110607>

Proceedings on GIS Odyssey 2002 / Kereković, Davorin (ur.). Zagreb : GIS Forum, 2002. 133-145 (predavanje, međunarodna recenzija, objavljeni rad, znanstveni)

This paper overviews basic findings about sea level variations, both on the global and on the local (Adriatic Sea) scales. The characteristics of tides, storm surges and seiches, and climatic sea level fluctuations are described in the text, as they act together and having impact on the coastal infrastructure, especially in the North Adriatic. Therefore, various projects have been launched, both

on local and regional (Mediterranean, Europe) scales, in order to better explore the factors influencing the sea level, as well as to make available the knowledge to the users and to the wider community. Moreover, data management is suggested herein, based both on web and GIS tools.

Modeliranje seša u luci Split

Vilibić, Ivica; Mihanović, Hrvoje

http://jadran.izor.hr/acta/hr/v43_2_5.htm

Ovaj rad dokumentira pojavu seša u luci Split. Mjerenja razine mora (tlaka), na temelju kojih su izdvojeni periodi seša, obavljana su na postaji koja se nalazi blizu ulaza u luku. Spektralna analiza ukazuje na pojavu PROUDMAN-ove rezonance na periodima između 7.7 i 28.5 min, koja je, nakon što se pojavila ispred luke, propagirala prema njenoj unutrašnjosti. Seši se opažaju na periodima od 6.5, 3.0, 1.6 i 1.15 min, što je verificirano i primjenom dvodimenzionalnog barotropnog numeričkog modela. Numerički model je primijenjen na sadašnju batimetriju luke kao i na batimetriju luke bez nautičke marine (izgrađena 1972. godine). Usporedba rezultata modela je dokumentirala utjecaj marine na svojstva seša luke. Tako su današnji osnovni (7.1 min) i prvi sljedeći (5.0) mod vjerojatno bili združeni u 6.2-min seš prije 1972. godine. Suprotno tome, 3.0-minutni seš je zadržao isti period, imajući u oba slučaja maksimalnu amplitudu na sjevernom kraju luke. Naposljetku, pojava izrazito jakih seša može ugroziti sigurnost plovidbe u luci, naročito u području nautičke marine.

2003

Kartografska reprodukcija

Jeličić, Tonći

Zbornik radova / 7. znanstveno stručni simpozij hrvatskih grafičara, ur. Z. Bolanca, 153-158, Senj, 2003., stručni rad

U radu se objašnjava pojam kartografske reprodukcije i njen povijesni razvoj. Analiziraju se klasični postupci pripreme pomorske karte i tijekom izrade kartografskog prikaza. Opisuje se upotreba reprodukcijske kamere, postupci kopiranja, priprema naljepnica (striping) i upotreba kopirnih rastera. Završno se naznačuje suvremeni postupak izrade pomorske karte, pruža se uvid u sadašnje stanje i projekciju razvoja, te se daju zaključna razmatranja. In memoriam graf.inž. Ivo Vidović

Točnost pomorskih karata i navigacijskih publikacija i utjecaj tiskarstva

Jeličić, Tonći; Bićanić, Zlatimir; Kasum, Josip

Acta Graphica 15(2003)2, 73-82, Zagreb, 2003., istraživački rad, međunarodna recenzija

Temeljni tiskani proizvodi hidrografskih organizacija su pomorske karte i navigacijske publikacije. Za hidrografske organizacije i za korisnike, nesuglasnosti njihova informacijskog sadržaja u usporedbi sa stvarnim stanjem izravna su posljedica primijenjenih procesa izrade, održavanja i promjena u stvarnosti. U informacijski sadržaj pomorskih karata i navigacijskih publikacija integrirana su inherentna i influenta odstupanja. Vremenom se točnost pomorskih karata i navigacijskih publikacija mijenja i opada. Ona je jednaka maksimalnoj točnosti primijenjene tehnologije, uključujući i grafičku, u procesu izrade, odnosno u vrijeme tiskanja. Točnost je u funkciji vremena i postupka održavanja. Uloga grafičke struke u procesu izrade je da primjenom odgovarajuće tehnologije, standardiziranjem i skraćivanjem vremena grafičkih pripremnih postupaka i tiska, utječe na povećanje točnosti pomorske karte i navigacijske publikacije.

A study of resonant oscillations in the Split harbour (Adriatic Sea)

Vilibić, Ivica; Mihanović, Hrvoje

<http://linkinghub.elsevier.com/retrieve/pii/S0272771402003049>

Estuarine, Coastal and Shelf Science. 56 (2003) , 3-4; 861-867 (članak, znanstveni)

The study examines the occurrence of Proudman resonance in front of the Split harbour (Adriatic Sea). The dataset comprises air and sea pressure (sea level) data collected at the harbour entrance during August to October 2000. The interval was characterized by rather strong synoptic disturbances that took place over the harbour. The analyses encompass empirical tools, such as timeseries analysis, high- and band-pass filtering, spectral and wavelet analyses, while the theoretical approach includes the conceptual model of the resonance. Resonance appears in front of the harbour and then propagates inward, covering periods between 7.7 and 28.5 min as a result of complex atmospheric gravity wave structure. Gain between sea level and air pressure equals 0.05-0.40 dbar/hPa (5-40 cm/hPa).

2004

Pomorske karte i navigacijske publikacije

Jeličić, Tonći

Zbornik radova 8. savjetovanja tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić", ur. Z. Bolanča, M. Mikota, 23-28, Lovran, 2004., stručni rad

U radu se definira pojam pomorske karte i navigacijske publikacije. Obrazlaže se pravna utemeljenost njihova izdavanja prema međunarodnim i nacionalnim normama, međunarodnim konvencijama, ugovorima i preporukama. Objašnjava se uloga Međunarodne pomorske organizacije (International Maritime Organization - IMO) i Međunarodne hidrografske organizacije (International Hydrographic Organization - IHO) u procesu izdavanja pomorskih karata i navigacijskih publikacija. U posebnom poglavlju opisuje se uloga Hrvatskog hidrografskog instituta, kao javne ustanove zadužene za hidrografsku djelatnost u Republici Hrvatskoj, prema Zakonu o hidrografskoj djelatnosti. Opisuje se organizacijsko ustrojstvo HHI, posebice Reprodukcijski odjel HHI i izdavačka djelatnost Instituta. Navode se vrste i podjela pomorskih karata. Obrazlažu se načini izdavanja pomorskih karata i navigacijskih publikacija, te se opisuje proces njihova ispravljanja i održavanja, način prodaje i zaštita izdanja HHI.

ESEAS-RI in Croatia: a step towards sea level service

Vilibić, Ivica; Domijan, Nenad; Leder, Nenad; Strinić, Goran; Orlić, Mirko; Pasarić, Miroslava

<http://bib.irb.hr/prikazi-rad?&rad=173627>

Systematic monitoring of sea-level fluctuations in Croatia started in 1950s, when three long-term stations (Rovinj, Split, Dubrovnik) were installed, joining the tide gauge at Bakar which was mounted already in 1929. All of these gauges have been operational till nowadays, having little or no gaps in the records, even during the war activities in the early 1990s. In addition, new stations at Sućuraj, Zadar and Ploče were installed in the last two decades, becoming members of the sea level monitoring network. However, the gauges had no digital recording till 2003, when all of Croatian tide gauges were upgraded through the ESEAS-RI and Jadran projects. All of these tide gauges are float type in stilling well, with weekly chart records, being digitized and archived as hourly values before 2003. Although the data quality is regularly checked, a number of possible systematic and random errors had been occasionally detected in the observing system, such as clock errors, charts shifts in time and height, digitisation errors, problems with ink diffusion and recording system, etc. These errors were eliminated when digital equipment was installed, consisting of A/D converters mounted on old devices, remote data acquisition system via GSM lines and operational software. Since June 2003 the sea-level data have been downloaded on daily basis, checked and stored as 1 min sea level values, enabling the analyses of high-frequency sea-level oscillations. The choice of 1 min sampling interval instead of a greater recording interval was fully justified soon, only two weeks after the upgrade. Namely, a travelling air-pressure disturbance struck the Middle Adriatic in the morning hours of 27 June 2003, and caused flooding in some areas and a severe damage of shell plants. It was shown by 2D numerical model that the disturbance excited high-frequency sea-level oscillations (0.01-0.1 min⁻¹), with the respective sea-level and current amplitudes surpassing 1 m and 1 m/s in some areas. The disturbance was captured by MedGLOSS station having 2 min sampling interval of air-pressure, being a cosine-like wave with amplitude and period of about 3 hPa and 80 min, respectively. It moved towards ESE at a speed of 22 m/s and was resonantly coupled with the gravity wave in the sea 50 m deep. This mechanism is called Proudman or open-sea resonance and, since several bays in the area have funnel-shaped form and are opened to the west, the forced wave was further amplified due to the imposed topographic constraint. In addition, the forcing atmospheric

wave and its counterpart in the sea encountered many bays and harbours while travelling over the Middle Adriatic. Having broadband spectral characteristics, they excited normal modes of the coastal basins through the mechanism called harbour or coastal resonance. Harbour resonance was particularly pronounced in Stari Grad Bay, where the disturbance excited seiches in the harbour (6.1 min) and bay (10.6 min). The seiches flooded a great part of the city, with the maximum amplitude of 120 cm, being three times larger than tides in the area. All of these mechanisms have been reproduced by a 2D numerical model, however none of them could have been verified if the tide gauges had not been upgraded thanks to the ESEAS-RI and Jadran projects.

CGPS Station collocated at Split tide gauge (Croatia)

Mihanović, Hrvoje; Leder, Nenad; Domijan, Nenad; Čupić, Srđan; Strinić, Goran; Vilibić, Ivica;
Halfdan-Pascal, Kierulf

<http://bib.irb.hr/prikazi-rad?&rad=173645>

Book of Abstracts of the Workshop on Observing and understanding sea level variations / Plag, Hans-Peter; Xiuhua Zhang (ur.). Malta : IOI - University of Malta, 2004. 25. (predavanje, međunarodna recenzija, sažetak)

In this abstract we describe collocation of tide gauge with CGPS station in Split, Croatia. The work is carried out in the frame of Work package 2 (Absolute sea level variations) and Work package 4 (Improving the sea level observing system; Task 4.3 - Co-location of Tide Gauge Stations with GPS) within the ESEAS-RI project. Split tide gauge is located in the town's port, on a small pier near Harbour-Master building. The TGBM (PN-165) was installed on the Master's building, which had been erected on the bedrock near a city center. There is also an auxiliary benchmark (R-1) on the tide gauge edifice. Historical precise leveling that took place during last 50 years did not show any significant changes in height between Harbour-Master's TGBM and tide-gauge auxiliary benchmark. It is also important to emphasize that during CROREF96-CRODYN96 GPS campaign new benchmark was established on the concrete roof of the tide gauge, and precise leveling was done. This benchmark was used to determine the height of Antenna Reference Point (ARP) above the national datum. Ashtech Micro-Z CGRS receiver with Dorne-Margolin antenna was an optimal choice for our tide gauge, which is installed in the tide gauge building powered by batteries and equipped with GSM modem for communication with the instrument and downloading the data. CGPS station was installed on 5 May 2004, and daily files (station name SPLT) are available starting from 6 May 2004 (day 126). Batteries are being replaced on weekly basis, and RINEX files obtained from the instruments are compressed using Hatanaka compression software, version 2.4. Preliminary analysis of the data showed that: - the number of measurements and the number of outliers is normal, - the mean residual for the code measurements is very good, - the mean residual for the phase measurements is acceptable. Knowing that the local geodetic network is very stable over the last 50 years the site chosen for locating CGPS antenna is very good and the data obtained by the CGPS station we hope will be substantial for the long-term analysis of the vertical land movements in this region.

Large-amplitude internal Kelvin waves trapped off Split (Middle Adriatic Sea)

Vilibić, Ivica; Dadić, Vlado; Mihanović, Hrvoje

<http://linkinghub.elsevier.com/retrieve/pii/S0272771404001714>

The paper documents the occurrence of long-period internal Kelvin waves in Split Channel in spring 2002. The analyses were performed on thermohaline and current data measured at three moorings and one hydrographic section. The internal oscillation had a period of 5–6 days, being larger just after the generation which was probably excited by the alongshore Sirocco wind. The recorded current amplitude was up to 0.3 ms⁻¹ in the surface layer, while the observed pycnocline displacement was 10–15 m. The oscillation was reproduced by one-dimensional two-layered model of a channel, imposing nodal lines at its entrances. Cross-shore properties of the oscillation, such as observed offshore decrease in pycnocline amplitude, are explained by the dynamics of an internal Kelvin wave propagating along channel boundaries, because the internal Rossby radius is smaller than the width of the channel. Conclusively, the observed oscillation probably represents the fundamental mode of internal waves trapped in the channel complex off Split.

2005

Pravni aspekt hidrografije na Jadranu

Ivančić, Paško

<http://www.hazu.hr/jzavod/www/sred/Listici/b031239h.htm>

U: Kapetanov glasnik : More je naš izbor. Broj 11 (prosinac 2005.). - str. 47-49

Hidrografska djelatnost na istočnoj obali Jadrana datira od početka 19.stoljeća, kada je prvu izmjeru napravio Charles Beautemps-Beaupre u razdoblju od 1806. do 1809. godine. U radu se kronološki predstavlja pravni aspekt hidrografije od prve izmjere 1806. do današnjih dana.

Contemporary problems of nautical tourism development in Croatia

Favro, Srećko; Glamuzina, Nikola

<http://bib.irb.hr/prikazi-rad?&rad=344360>

PROMET TRAFFIC - TRAFFICO (0353-5320) br. 2/2005 (2005); 107-112

The paper deals with the problems that have risen due to the rapid development of nautical tourism on the Croatian coast. The fact is that Croatia, unlike other Mediterranean tourist countries still do not control nautical tourism development in sense of spatial planning and implementation of specific laws. There are other problems that are generated by the growing number of tourists in Croatian marinas and uneven geographic distribution of harbours.

Ispis pomorskih karata po narudžbi (POD)

Jeličić, Tonći

Zbornik radova 9. savjetovanja tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić&", ur. Z. Bolanča, M. Mikota, 227-230, Lovran, 2005., stručni rad

Pomorska karta je pomoćno sredstvo namijenjeno navigaciji. U radu se analizira korištenje plotera u njihovoj izradi. Točnost informacijskog sadržaja klasično tiskanih pomorskih karata većih naklada, kod dužeg skladištenja (npr. više mjeseci ili godina), radi promjena u stvarnosti opada. Stoga se takve karte moraju prije prodaje ručno ažurirati prema redovitim Oglasima za pomorce (OZP). Oni se izdaju dnevno, tjedno ili mjesečno. U cilju povećanja stupnja točnosti informacijskog sadržaja pomorske karte, mogu se primijeniti nove tehnologije ispisa. Njima se omogućuje ispis po narudžbi odnosno ispis prema zahtjevu, ili na traženje (Print On Demand - POD). Dakle, tek nakon primljene narudžbe i integriranih promjena, karta se proizvodi samo u naručenom broju primjeraka. Kupac dobiva kartu ažuriranu sa datumom kupnje. Tako proizvedene karte kvalitetom ne smiju zaostajati za klasičnom pomorskom kartom proizvedenom u tehnici ofseta na kartografskom papiru. Zato valja istražiti njihove karakteristike. One se odnose na trajnost, posebne uporabne zahtjeve i različite vanjske utjecaje. U radu se opisuju testovi provedeni u zemljama gdje su papirnate pomorske karte proizvedene POD postupkom već u upotrebi. Osim tehničkih karakteristika gotove karte, istražuju se grafički materijali i tehnologija POD postupka. Navode se prednosti i nedostaci POD pomorskih karata u usporedbi sa kartama proizvedenim klasičnim načinom. Očekuje se da POD postupak proizvodnje pomorskih karata neće u potpunosti zamijeniti klasični način, nego će vjerojatno preuzeti proizvodnju karata manjih naklada i karata područja koja su podložna učestalim promjenama. Također se očekuje daljnji razvoj i primjena POD postupka, poglavito zbog brzine isporuke pomorske karte odnosno informacije krajnjem korisniku.

Novi pristup motrenju promjena razine mora u Hrvatskoj

Vilibić, Ivica; Orlić, Mirko; Čupić, Srđan; Domijan, Nenad; Leder, Nenad; Mihanović, Hrvoje; Pasarić, Miroslava; Pasarić, Zoran; Srdelić, Mladen; Strinić, Goran;

http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=255&lang=hr

Geofizika (0352-3659) 22 (2005); 21-57

Rad sadrži pregled novijih međunarodnih i domaćih aktivnosti usmjerenih prema poboljšanju mareografske mreže na istočnoj obali Jadranskog mora. Najprije su prikazani dostupni mjerni sustavi. Zatim su ukratko prikazana svojstva razine Jadranskog mora, te povijesni razvoj mareografije i istraživanja kolebanja razine mora. Sadašnje aktivnosti u tim istraživanjima prikazane u ovom radu obuhvaćaju institucionalnu strukturu u Republici Hrvatskoj, te pregled novijih projekata i programa (Europska mareografska mreža – istraživačka infrastruktura (ESEAS-RI), Mediteranska implementacija Globalnog sustava za praćenje razine mora (MedGLOSS), Morske mijene i razina Jadrana on-line, Projekt Jadran). Detaljno su prikazane aktivnosti koje su dovele do nadogradnje hrvatskih mareografa, prijenosa i obrade podataka, te internetskog prikaza podataka u realnom vremenu. Osim toga, u radu se dokumentira uspostava mjerenja vertikalnih pomaka tla, koja je inicirana postavljanjem CGPS sustava na krovu splitskog mareografa tijekom 2004. godine. Prilično truda je uloženo u spašavanje povijesnih mareografskih zapisa, koristeći digitalizaciju i skeniranje zapisa, što će spriječiti trajan gubitak podataka u slučaju uništenja originalnih zapisa. Naposljetku, prikazana su najnovija istraživanja visokofrekventnih oscilacija razine mora i rezonantnog prijenosa energije iz atmosfere u more, omogućena uspostavom 1-minutnih mjerenja na mareografskim postajama, a koja nisu bila moguća s prethodnim analognim sustavima mjerenja.

Recent sea level activities in Croatia

Vilibić, Ivica; Beg Paklar, Gordana; Čupić, Srđan; Dadić, Vlado; Domijan, Nenad; Gržetić, Zvonko; Ivanković, Damir; Leder, Nenad; Mihanović, Hrvoje; Orlić, Mirko; Pasarić, Miroslava; Pasarić, Zoran; Srdelić, Mladen; Strinić, Goran;

<http://bib.irb.hr/prikazi-rad?&rad=210443>

An overview of recent international and national efforts and activities directed towards the improvement of tide gauge network on the eastern coast of the Adriatic Sea is given in the paper. Present sea level related activities are introduced by the institutional structure in Croatia, followed by a summary of recent projects and programmes. A major technological step occurred in the sea level recording, acquisition and data storage through the upgrade of tide gauges with a/d converters and GSM communication package. Therefore, the availability of the data is shortened from a couple of months, which were needed to collect and digitise the charts, to a day, as the data is downloaded once a day. However, a number of technological problems have been recorded in the first year of operation (systematic drift at some stations, communication problems), although substantial improvements have been achieved through the upgrade of tide gauges (removal of clock errors, chart positioning and digitising errors, availability of high-frequency data, easier and cheaper maintenance). In addition, Bakar tide gauge is equipped by the KALESTO radar gauge, installed just a few hundred meters from the existing long-term station. The first year of the data has been preliminary analysed, revealing no existing problems in the radar system. The initiation of measurements of vertical land movements at the Split tide gauge has been recently achieved, as a Continuous GPS antenna and receiver (CGPS) has been installed in 2004 at the roof of the Split Harbour tide gauge. Preliminary analysis of the data, carried in the Norwegian Mapping Authority,

showed that the number of measurements and the number of outliers is normal, the mean residual for the code measurements is very good and the mean residual for the phase measurements is acceptable. In addition, a lot of effort has been put into the rescue of historical sea level records, both by digitising and scanning of the charts, which will prevent data loss in case of their ruination or disappearance. Finally, a number of web pages have been created in the last few years, comprising near-real time sea level graphs as well as general information on the sea level monitoring and research in the Adriatic Sea.

Contribution to ESEAS-RI project 2002-2005 by Hydrographic Institute of the Republic of Croatia

Domijan, Nenad; Leder, Nenad; Mihanović, Hrvoje; Čupić, Srđan; Srdelić, Mladen; Strinić, Goran; Gržetić, Zvonko; Vilibić, Ivica;

<http://bib.irb.hr/prikazi-rad?&rad=210461>

A summary of efforts and activities undertaken by the Hydrographic Institute of the Republic of Croatia and directed towards the improvement of the sea-level observing system along the eastern coast of the Adriatic Sea is given in this paper. HHI owns and operates a network of four long-term tide gauge stations (Rovinj, Zadar, Split-harbour, Dubrovnik) working continuously from 1955 until present. Within the ESEAS-RI project, from 2002 to 2005, HHI contributed in WP1 - Quality control of the sea level observations, WP2 - Absolute sea level variations and in WP4 Improving the sea level observing system. The emphasis was placed on T1.4 - Data rescue (scanning old marigrams, development of digitalization package) as HHI had approximately 210 years of analogous marigrams which were not converted into digitalised format. Another important contribution was in the framework of T4.2 Upgrading tide gauge stations. In May 2004, CGPS collocation campaign had been organized at the Split-harbour tide gauge station (T4.3 - Co-location of tide gauge stations with GPS). Finally, a software package has been created for converting collected sea-level data into the ESEAS-RI format defined for ESEAS Tide Gauge Data web site. The problems which were encountered during different stages of HHI involvement in ESEAS-RI are also going to be stressed and presented. One of the most interesting and peculiar examples was the problem with the installation of satellite telephony antenna on the roof of Split tide gauge during International Boat Show in April 2005. Between 2 and 11 April CGPS data quality was very poor, since CGPS antenna was almost completely covered by satellite dish fixed on the roof without any notice or approval.

Rezonanca luke Ploče

Vilibić, Ivica; Mihanović, Hrvoje;

http://jadran.izor.hr/acta/hr/v46_2_2.htm

U radu su opisane visokofrekventne oscilacije u luci Ploče, izdvojene iz godišnjeg niza podataka visine razine mora (ožujak 2002-ožujak 2003) mjenjenih na mareografu u luci. Analize su provedene koristeći stacionarne (spektralna) i nestacionarne (wavelet i filtriranje) analize, izdvajajući vremensku promjenjivost osnovnog seša perioda 30 minuta. Seš je izražen tijekom cijele godine, no amplituda mu je dvostruko veća (do 25 cm) za vrijeme ljetnih mjeseci. Primjenom numeričkih modela pokazano je da je seš rezultat dolazećih valova s otvorenog mora, generiranih rezonantnim procesima od strane putujućih atmosferskih težinskih valova. Nasuprot tome, vjetar ima zanemariv utjecaj na stvaranje seša. Seš može ugroziti male brodice na vezu u gradu Ploče kao i velike teretne brodove na

putu prema vezu, stoga što se u suženjima unutar luke mogu pojaviti vrlo jake struje (preko 50 cm s-1) koje mogu ugroziti sigurnost plovidbe.

2006

Mogućnosti i ograničenja prostornoga i tehničko-tehnološkog razvoja luka nautičkog turizma

Kovačić, Mirjana; Bošković, Desimir; **Favro, Srećko**

<http://bib.irb.hr/prikazi-rad?&rad=262390>

Naše more (0469-6255) 2 (2006), 1-2; 54-62

U radu se prikazuju prostorne i tehničko-tehnološke mogućnosti i infrastrukturna ograničenja u razvoju luka nautičkog turizma u Hrvatskoj. Nautički turizam vrlo je mlada gospodarska djelatnost s obilježjima klasičnog turizma i pomorstva, što je uz mnoge druge karakteristike čini posebnom. Jedna od bitnijih je da pripada elitnom turizmu, što je s kapitalnog aspekta i aspekta zaštite okoliša vrlo važno. Izuzetni ekonomski učinci i visoka profitabilnost nautičkog turizma, te brojni multiplikativni efekti, govore u prilog sve većem zanimanju za tu pomorsku djelatnost. Pojačan interes za ulaganja u nautički turizam i izgradnju luka proizlaze iz njegove visoke stope rentabilnosti kao rezultata pozitivnoga utjecaja brojnih funkcija koje se u toj djelatnosti mnogostruko generiraju. Istražuje se dosegnuti stupanj izgrađenosti kapaciteta u lukama nautičkog turizma i upozorava se na njihovu nedostatnost, osobito na otocima, gdje je taj broj još manji. Posebno se istražuju mogućnosti implementacije pontonskih privezišta u funkciji razvoja nautičkih luka na otocima. Otoci obiluju brojnim prirodno zaštićenim uvalama i mjesnim lučicama koje suo stale sustavno neobrađene tijekom dosadašnjega razvoja nautičkog turizma. Poradi toga prijeko je potrebno promišljati o budućnosti nautičkog turizma na Jadranu, posebice na otocima, zbog utjecaja na njihov cjelokupni gospodarski razvoj.

Competitiveness of Croatian Nautical Tourism

Horak, Siniša; Marušić, Zrinka; **Favro, Srećko**

<http://bib.irb.hr/prikazi-rad?&rad=315454>

Tourism in Marine Environments (1544-273X) 3 (2006), 2; 145-161

While nautical tourism is experiencing a strong demand in the Mediterranean, this growth presents a significant challenge to destination planners. The question of how well nautical tourism destinations are meeting increased demand, in terms of both capacity and quality, is of crucial importance for nautical tourism destinations and their competitiveness. While measuring destination competitiveness is a common practice worldwide, the competitiveness of nautical tourism has not received much research attention. The study reported here aims to fill gap by addressing not only the competitive position of countries in the Mediterranean, especially Croatia, but also by providing a valuable discussion on issues relating to measuring nautical tourism competitiveness. The study focused on nautical tourism supply, price competitiveness, and nautical tourists' perceptions of competitiveness. The results revealed that the natural resources and feeling of safety are strongest Croatian advantages, but this is undermined by the lower standards of infrastructure and services with accompanied lower value for money. While this, at the moment, does not appear to adversely affect demand for the Croatian nautical tourism, failure to address these issues would reduce competitiveness and threaten the long-term sustainability of nautical tourism.

Physical plans in Managing Sea and Coastal Area

Favro, Srećko; Kovačić, Mirjana

<http://bib.irb.hr/prikazi-rad?&rad=356014>

25th International conference on organizational science development Portorož : 25th International conference on organizational science development Portorož, Slovenia, 15-17.03.2006

This paper systematically and clearly indicates the negative effects in sea and coastal area and the need for systematic and multidisciplinary physical planning. The area in development plans has a double role, as an indispensable factor of socio-economic development and as the object of development processes. Development systems in the area develop and comply with each other. This indicates the fact that the area cannot be considered out of its development processes, as the development processes cannot be realised without the effects of the area. In order to achieve efficient managing of coastal and other area, it is necessary to plan the area and continuously monitor its exploitation. It is especially important for the sea and coastal areas which are great assets, and have to be protected and guarded by all means and measures. In spite of natural and historical conditions and resources, the Adriatic region is subject to harmful consequences of uncontrolled actions and other deviations in the development. This happens as a consequence of increased pressure to ecological systems, when the development of tourism, especially of nautical tourism, has to be planned systematically, so that man may preserve the quality of living, because otherwise, the development loses its meaning. Nautical tourism, with its specific activities and the need for the area, most often around the coastal line within the maritime domain, emphasises the problem of protection of the environment, which makes the physical planning one of the most important issues. Therefore, physical plans have to be subordinated to the protection and promotion of the environment, which implies efficient, but sensible managing of the coastal area.

Structure in managing port authorities of the Republic of Croatia

Jugović, Alen; Kovačić, Mirjana; **Favro, Srećko**

<http://bib.irb.hr/prikazi-rad?&rad=288798>

Tourism, Regional Development and Education : use of tradition in tourism : proceedings Tabor : Jihočeska univerzita v Českých Budejovicích , 2006. 48-56. Tabor, Češka Republika, 15.09.2006.

The aim of this paper is to emphasise the importance and the significance of organisational structure in managing port authorities of the Republic of Croatia. The importance of the organisational structure is illustrated by the fact that it is the essential basis without which even the best effect in all other managing areas will remain inefficient. In this paper the analysis of organisational structure of the Port Authority of Rijeka was performed, because it has been the first established port authority in the Republic of Croatia and serves as a model to other ports. The present organisational structure was investigated, which was then compared to the known scientific theories and theses. Besides the implemented organisational structures, the research also considers the models of organisational structures which have not been applied but may be implemented if necessary. Properly defined organisational structure contributes to the realisation of the main objectives of the organisation: it satisfies the client (user) and consequently gains profit, a primary generator of growth and development of the organisation, i.e. the port authority.

Komparativne prednosti hrvatskog litoralnog prostora za razvoj nautičkog turizma

Favro, Srećko; Saganić, Iva

<http://bib.irb.hr/prikazi-rad?&rad=355805>

Akademik Josip Roglić i njegovo djelo - Zbornik radova s međunarodnog znanstvenog skupa / Matas, Mate (ur.). - Zagreb : HRVATSKO GEOGRAFSKO DRUŠTVO SPLIT, ZADAR, ZAGREB , 2006. 387-402. Makarska, Hrvatska, 19. - 22. travnja 2006.

U prilogu su analizirani prirodni čimbenici koji hrvatskom litoralnom prostoru daju mogućnost za razvoj nautičkog turizma. U usporedbi s ostalim mediteranskim zemljama, Hrvatska ima vrlo povoljne prirodne uvjete, kao što su duga obalna crta, velik broj otoka, otočića i zaljeva pogodnih za nautičare. Uz, to klimatski uvjeti također pogoduju razvoju nautičkog turizma. Unatoč tome, nautički turizam u Hrvatskoj još uvijek nije dovoljno razvijen, ne postoji dovoljan broj marina i vezova u odnosu na druge mediteranske zemlje.

Sustainable development of nautical tourism in Croatia

Favro, Srećko; Saganić, Iva;

<http://bib.irb.hr/prikazi-rad?&rad=343859>

New Perspectives and Values in World Tourism & Tourism Management in the Future / AKTAS, AHMET prof.dr (ur.). - Alanya TURKEY : Akdeniz University, Alnya Faculty of Business , 2006. 602-620 (ISBN: 975-7666-82-3) TURK - KAZAKH INTERNATIONAL TOURISM CONFERENCE 2006 Alanya, TURKEY, 20-26.11.2006

Having in mind Croatian littoral zone with its attractive coast and islands, it can be said that nautical tourism is absolutely authentic and distinctly recognizable Croatian "tourist product". Croatia has ideal conditions for nautical tourism development, and it has a great number of advantages such as good coastline indentedness, great number of well arranged and sheltered harbours, better geographical position in relation to countries that nautical tourists come from, preserved nature, and clean sea. However, nautical tourism still hasn't reached the level of quality proportional to the available resources. It is necessary to perceive realistic needs and spatial possibilities for the development of nautical reception capacities when choosing particular locations where ports of nautical tourism will be built. During further development of the capacities for the nautical tourism, spatial and environmental goals that should ensure high-quality regional planning and sustainable development of nautical tourism without endangering basic values of the natural resource will be put in the first place. By emphasizing special importance of the environment preservation, long term use of the Croatia's most valuable natural potential – Croatian Adriatic – will be guaranteed.

Evaluating the significance of nautical tourism for tourism and economy

Bošković, Desimir; **Favro, Srećko;** Kovačić, Mirjana;

<http://bib.irb.hr/prikazi-rad?&rad=262484>

CHANGE MANAGEMENT / Vukovič, Goran (ur.). - Kranj, Slovenija : Universa V Mariboru, Fakulteta za organizacijske vede Kranj , 2006. 957-967. 25. International Conference Organizational Sciences „ ; CHANGE MANAGEMENT“ ; Portorož, Slovenija, 15-17.03.2006

In this paper the authors present clearly and concisely the significance of nautical tourism for economy and tourism. Its role in the economy is defined and the need to apply systematic approach in evaluating its effects is emphasised. Nautical tourism is one of the most pulsive kinds of tourism, which has the characteristic of recreation. It is a new socio-economic

phenomenon in our society and its future is yet to come. With its multiple effects it contributes to diverse and opulent aspect of living, urbanization and development of the space, and also has a number of other effects which are directly or indirectly related to the integral tourist humanisation of the space. Exceptional economic effects and high profitability of nautical tourism and numerous multiplicative effects best illustrate and increasing interest for this maritime activity. Increased interest in investments into nautical tourism and port construction arise from its high profitability rate which in the result of positive effects of numerous functions which are repeatedly generated in this business activity. It is exactly in nautical tourism that many business activities are intertwined and create a high nautical and tourist consumption per a boater and a vessel, on average two times higher than the consumption of the standard tourists. The author emphasises the importance of continuous research and systematic approach to evaluation of the effects of nautical tourism in this development.

Optimizacija korištenja tiskarskih sustava hidrografskih organizacija Jeličić, Tonći; Kasum, Josip;

Zbornik radova 10. savjetovanja tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić", ur. Z. Bolanča, M. Mikot, 163-168, Senj - Novi Vinodolski, 2006., stručni rad

Pomorske karte i navigacijske publikacije se izrađuju i održavaju prema međunarodnim i nacionalnim standardima, koji su djelomično obuhvaćeni međunarodnim konvencijama, ugovorima i preporukama, kao i nacionalnim propisima. Općenito vrijedi preporuka Međunarodne hidrografske organizacije (International Hydrographic Organization - IHO), da kod različitih hidrografskih organizacija u svijetu informacije sadržane u pomorskim kartama i navigacijskim publikacijama moraju biti točne i pouzdane. Svrha ovog rada je definiranje pojma tiskarskih sustava hidrografskih organizacija odnosno sustava pripreme i tiska pomorskih karata i navigacijskih publikacija. Ukazuje se na problem njihove točnosti u podsustavu tiskarskih tehnologija, čije bi rješenje mogla ponuditi optimizacija sustava. Optimizacija (engl. optimization) je maksimiziranje ili minimiziranje dane funkcije izložene određenim ograničenjima, odnosno postupak pronalaženja najpovoljnijeg rješenja tj. rješenja koje najbolje ispunjava određene uvjete. Optimizacija korištenja tiskarskih sustava hidrografskih organizacija ima za cilj odrediti najpovoljniji način provođenja tiskarskih postupaka, uz zadane troškove i raspoloživu tehnologiju. U razvoju modela optimizacije korištenja tiskarskih sustava predlaže se mješoviti pristup. Pretpostavlja se korištenje matematičkog modeliranja i razvoj potrebnih algoritama upravljanja. Drži se da je za pojedinu pomorsku kartu moguće odrediti optimalnu tehnologiju tiska uz postizanje maksimalne točnosti, i posljedično povećanje stupnja sigurnosti plovidbe.

CGPS Station collocated at Split tide gauge

Mihanović, Hrvoje; Domijan, Nenad; Leder, Nenad; Čupić, Srđan; Strinić, Goran; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=285052>

GIS Applications and Development / Kereković, Davorin (ur.). Zagreb : Hrvatski Informatički Zbor-GIS Forum, 2006. 55-61 (predavanje, međunarodna recenzija, objavljeni rad, stručni)

Split tide gauge is located in the town's port, on a small pier near Harbour-Master's building. The tide gauge benchmark PN-165 (TGBM) was installed on the Master's building, which had been erected on the bedrock near a city center. There is an auxiliary benchmark (R-1) on the tide gauge

edifice. Historical precise levelling that took place during last 50 years did not show any significant changes in height between Harbour-Master's TGBM and tide-gauge auxiliary benchmark. The benchmark established on the concrete roof of the tide gauge during CROREF96-CRODYN96 GPS campaign was used to determine the height of Antenna Reference Point (ARP) above the national datum. An optimal choice for Split CGPS station was Ashtech Micro-Z CGRS receiver with Dorne-Margolin antenna. The station is powered by external power supply and equipped with GSM modem for communication with the instrument and downloading the data. CGPS station was installed on 4 May 2004 and daily files (station name SPLT) are available starting from 5 May 2004. RINEX files obtained from the instruments are compressed using Hatanaka compression software, version 2.4 and uploaded to the ESEAS-RI Data Server (European Sea Level Service). Preliminary analysis of the data showed that the observing site was well selected, and that the measurements will enable long-term analysis of the vertical land movements in this region. The problems which were encountered during different stages CGPS collocation are also going to be stressed and presented.

Diurnal internal tides detected in the Adriatic

Mihanović, Hrvoje; Orlić, Mirko; Pasarić, Zoran;

<http://www.ann-geophys.net/24/2773/2006/angeo-24-2773-2006.html>

Strong diurnal oscillations, documented by temperature data that were collected along a submarine cliff on the Lastovo Island (southern Adriatic), are studied and compared with sea level and wind measurements at Dubrovnik and Komiža (island of Vis). Three thermistors were deployed at the depths of 15, 22 and 36m between March 2001 and March 2002. Pronounced diurnal temperature oscillations were detected at 15 and 22m during the stratified season. The correlation between the sea surface and thermocline displacements was highest in June 2001, when diurnal wind changes were not significant, while diurnal sea level oscillations achieved annual maxima. Thermocline oscillations were in phase with sea level changes. The range of diurnal sea surface variability was close to 19 cm, while the range of corresponding thermocline variability was about 5.4 m. The findings summarize the outcome of the first dedicated study of internal tides in the Adriatic.

Wintertime buoyancy forcing, changing seawater properties, and two different circulation systems produced in the Adriatic

Orlić, Mirko; Dadić, Vlado; Grbec, Branka; **Leder, Nenad**; Marki, Antun; Matić, Frano; **Mihanović, Hrvoje**; Beg Paklar, Gordana; Pasarić, Miroslava; Pasarić, Zoran; **Vilibić, Ivica**;

<http://www.agu.org/pubs/crossref/2006/2005JC003271.shtml>

Measurements performed in winter 2002/2003 and spring 2003 off the east Adriatic coast showed that the East Adriatic Current (EAC) peaked in January/February (as expected from previous findings) and again in May (not expected). The first maximum corresponded with the considerable cross-shore variability of seawater properties, the colder, fresher water prevailing close to the coast, the warmer, saltier water dominating the open sea. The second maximum coincided with the massive intrusion of warm, saline water from the south Adriatic. Meteorological and hydrologic forcing was anomalous over the measurement interval: during winter 2002/2003 the cooling and river outflows were strong, during spring 2003 the pronounced warming coincided with exceptional dryness. In order to interpret the two EAC maxima a simple numerical model reproducing response of the Adriatic-Mediterranean system to the wintertime forcing was developed. It was found that the first maximum could be related to the coastal freshwater input and offshore evaporation in the Adriatic

area, and that the second maximum was probably due to the wintertime surface cooling of the Adriatic while warmer conditions prevailed above the Mediterranean. The resulting horizontal density gradients supported two different circulation systems, one within the Adriatic, the other between the Adriatic and east Mediterranean, and they differed not only in spatial but also in temporal scales, therefore supporting the occurrence of two distinctive EAC maxima.

Pet desetljeća mareografskih mjerenja na postaji Split - luka (1956 – 2006)

Čupić, Srđan; Domijan, Nenad; Mihanović, Hrvoje; Leder, Nenad; Strinić, Goran; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=285058>

U svibnju 1929. godine Hidrografski ured mornarice Kraljevine Jugoslavije postavio je mareograf u Splitu, koji je radio sve do početka 2. svjetskog rata 1941. godine. Podaci mjerenja s ovog mareografa nestali su za vrijeme rata, međutim sačuvani su podaci srednjih vrijednosti za razdoblje od 1930. do 1938. godine. Iako je mareografska postaja Split-luka obnovljena 1946. godine postavljanjem prijenosnog mareografa tipa A.Ott-X, kontinuirani vremenski niz mjerenja započinje 1956. godine kada je u kućici ispred Lučke kapetanije postavljen stalni analogni instrument tipa A.Ott-Kempton s odnosom registriranja 1:5. Od 2002. godine mareograf se nalazi u europskoj mreži mareografa (ESEAS-RI), te je 2003. godine opremljen Thalimedes A/D pretvaračem koji omogućuje stalan prikaz mjerenih podataka na web stranici Hrvatskog hidrografskog instituta (www.hhi.hr). Postavljanjem CGPS uređaja u svibnju 2004. godine, mareograf je uključen u projekt europskog vertikalnog referentnog sustava (EVRS). U ovom radu naglašava se važnost kontinuiranog rada mareografa Split-luka.

Podaci s ove postaje važni su za sigurnost plovidbe u luci Split, a koriste se i u međunarodnoj razmjeni (promjena klime). Isto tako su bitni i za određivanje referentnih ploha pri hidrografskim i geodetskim premjerima šireg splitskog otočnog područja te za određivanje ekstremnih visina razina mora o kojima se treba voditi računa kod priobalne gradnje u cijeloj regiji.

2007

Contribution to the development of general model of management and strategic decision-making in nautical tourism ports

Kasum, Josip; Gržetić, Zvonko; Marušić, Eli;

<http://bib.irb.hr/prikazi-rad?&rad=316652>

Promet - Traffic & Transportation. 19 (2007) ; 295-299 (članak, znanstveni)

It is assumed that in strategic decision-making in managing nautical tourism ports (NTP) various decisions are made on the basis of descriptions, calculations, statistic, economic and other indicators, and also of inadequate number of precise indicators (Branch, A. E., 1998). Therefore, strategic decision-making is slightly uncertain, which, it is assumed, may be modified. This article explores the new measuring elements. They are developed on the sample of 47 NTPs in the archipelagic sea of the Republic of Croatia. It is assumed that by applying the new measuring elements it will consequently result in lowering the unreliability of strategic managing, which will eventually increase the profit of NTP.

Multiscale ENC Data Management on an Archipelagic Sea Area - Example of the East Adriatic Coast

Duplančić Leder, Tea; Leder, Nenad; Lapaine, Miljenko;

<http://journals.cambridge.org/action/displayFulltext?type=1&fid=997068&jid=NAV&volumeld=60&issueId=02&aid=997060>

Journal of Navigation. 60 (2007) , 2; 315-326 (članak, znanstveni)

This paper briefly outlines ENCs as a digital nautical chart, produced by National Hydrographic Office (HO) according International Hydrographic Organization (IHO) specifications S-57 Edition 3.1. Production of ENCs is based on the theory of multiscale data management (usage bands). Multiple representations of ENC data is controlled by SCAMIN attributes. A solution to the problem of multiscale data management as a part of ENC data production for archipelagic sea areas, using the East Adriatic Coast as an example was presented. This solution is based on a long-standing experience in the production of paper charts and recently ENC production for eastern coast of the Adriatic Sea, which is supposed to be the second largest archipelagic area in the Mediterranean. Finally, a new usage band scale range, compilation scale for all navigational purposes and method of using SCAMIN attributes for archipelagic seas were proposed.

Distribucija pomorskih sigurnosnih informacija - radiooglasa u razdoblju 2002. - 2005. godine

Kasum, Josip; Vladislavić, Kristina; Ivančić, Paško;

14th TIEMS Annual Conference 2007 Book of Proceedings page:296. - 307.

Potpuna primjena GMDSS-a zahtijeva i detaljno upoznavanje s pojmom pomorska sigurnosna informacija. Objasnjen je i pojam nacionalni koordinator za pomorske sigurnosne informacije, te je izvršena raščlamba istih. Izvršena je analiza izvornih podataka u vezi sa svojstvima distribucije radiooglasa za područje Hrvatske u razdoblju 2001. - 2005. raščlambom na: OBALNO/NAVAREA, OBALNO/NAVTEX i LOKALNO. Ukazuje se na suštinsku važnost visoke razine pouzdanosti pomorskih sigurnosnih informacija u automatiziranim tehničko/tehnološkim procesima i na upotrebu postizanja

zadovoljavajuće tehničko/tehnološke opremljenosti službi koje sudjeluju u distribuciji pomorskih sigurnosnih informacija. Analizirana problematika ukazuje na potrebu provođenja daljnjih znanstvenih istraživanja.

Swot study of the nautical tourism development in Croatia

Kovačić, Mirjana; Kesić, Blanka; **Favro, Srećko**;

<http://bib.irb.hr/prikazi-rad?&rad=355823>

26th International Conference on Organizational Science Development CREATIVE ORGANIZATION University of Maribor - Faculty of organizational sciences , 2007. 875-883 (ISBN: 961-232-185-X). Portorož, Slovenia, 28 - 30.03.2007

This paper gives clear and systematic review of the SWOT study results for the nautical tourism development in Croatia. Also, basic characteristics of developmental trends of nautical tourism in the Mediterranean are defined, as well as expected demand. The authors are doing research of the quality of stay in the ports of nautical tourism, and possibilities of the development of nautical tourism in accordance with spatial and environmental specific qualities and with the respect for laws of nature. This ensures undamaged visual identity of the coastline, and provides to the boater stay in the authentic area with all the possibilities that it can provide. Acknowledging the fact that the statistical coverage and monitoring of the nautical tourism in Croatia is incomplete, and that its effects on the environment and its economical effects can merely be estimated, the authors have participated in the Research of the nautical tourism development in Croatia. The research was conducted in counties (Croatian spatial units) during 2005 to serve the needs of making Study of the nautical tourism development in Croatia whose holder was Hydrographic Institute of the Republic of Croatia in Split. Results obtained in the research were analyzed and SWOT matrix was made as the basis for making strategic decisions for its long-term sustainable development. In doing so, SWAT matrix enables defining of the basic guidelines for the nautical tourism development in Croatia.

Importance of the safety of navigation and safety protection to nautical tourism

Zec, Damir; Kovačić, Mirjana; **Favro, Srećko**;

<http://bib.irb.hr/prikazi-rad?&rad=346015>

The International Emergency Management Society, 14th Annual Conference Proceedings The International Emergency Management Society, 14th Annual Conference Split, 12-15.10.2007.

Nautički turizam – perspektiva razvoja hrvatskog jadranskog prostora

Gržetić, Zvonko; Favro, Srećko; Saganić, Iva;

<http://bib.irb.hr/prikazi-rad?&rad=355843>

Savremene tendencije u turizmu, hotelijerstvu i gastronomiji 2007: zbornik radova Novi Sad

Pojam turizam, u svojoj suštini, predstavlja pojavu kretanja i povremenog boravka izvan mjesta stalnog boravka. Kao podgrana turističke ponude, u sklopu gospodarskog sustava, ističe se nautički turizam, kao jedan od selektivnih oblika turizma. Nautički turizam obuhvaća svako zabavno, raznorodno, znanstveno, sportsko, ribolovno i osvježavajuće kretanje vodenim morskim površinama u turističke svrhe najraznovrsnijim čamcima, jedrilicama, motornim brodicama i sl. Taj oblik turizma

je veoma privlačan jer predstavlja dinamičan oblik turističke ponude, a njegov udio u ukupnim tokovima turističkog prometa sve je veći. Nautički turizam važno je sagledati kao složeni sustav koji je vezan uz dva gospodarska područja – pomorsko i turističko gospodarstvo. Kao i svaki sustav, treba ga promatrati prvenstveno kroz njegovu temeljnu svrhu i funkcije, zatim ciljeve, aktivnosti, organizacijsku i eksploatacijsku osnovu, i u odnosu na sve njegove moguće prostorne, okolišne, društvene, gospodarske i ostale učinke bitne za cjelokupni turistički i gospodarski sustav. Postojeću klasifikaciju i kategorizaciju luka nautičkog turizma potrebno je prilagoditi sukladno postavljenim ciljevima i planiranim učincima, a sa zadaćom osiguranja održivog razvoja i očuvanja prirodne resursne osnove. Zbog svojih specifičnih prirodnih uvjeta u pojedinim razmatranjima promatrati će se primjer hrvatskog nautičkog turizma. Cilj ovog rada je orijentacija i usmjeravanje k upravljanju sustavom nautičkog turizma što uključuje integrirano planiranje svih djelatnosti unutar sustava, realizaciju i provedbu svih planiranih djelatnosti, analizu i nadzor rezultata provedenih aktivnosti, te pokretanje akcija radi ostvarenja planiranih ciljeva, odnosno postavljanja novih.

Marketing plan for the development of Nautical Port System on the Croatian Islands
Favro, Srećko; Kovačić, Mirjana; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=354885>

II Biennial International Congress (1451-5113) 9-10, Year 4. (2007); 775-783

The paper gives clear and easy to consult definitinos of marketing activities in wider terms, or promotional activities in narrower terms, which are essential to the accomplishment of marketing plan for the development of tourist ports on the Croatian islands. In that process in terms of protection of the ecosystem, the sea and marine enviroment, the construction of tourist ports should observe established requirement and measures for the protection of the sea and coastal area. New tourist ports should be built on locations which have proved to be the best solutions in terms of prodetermined criteria. The authors anlysse the main elements implying the accomplishment of marketing plan for the development of nautical port system on the Adriatic islands. They define the conception, creative solutions, feasibility programmes, and implementation, according to the defined target groups. Special consideration is given to overall activities based on the promotional mix or a blend of advertising, PR activities and events. Target groups are identified for ther diversification and specific approach and accomplishment schedule is defined. Author's systematic approach is defining the marketing plan and implementation of the marketing mix provides for the fulfilment of targeted communication and market goals.

Prirodna obilježja hrvatskog litoralnog prostora kao komparativna prednost za razvoj nautičkog turizma

Favro, Srećko; Saganić, Iva;

<http://bib.irb.hr/prikazi-rad?&rad=353279>

Geoadria (1331-2294) vol.12 No.1 (2007); 59-81

Promatrajući hrvatski litoralni prostor sa svojom jedinstvenom atraktivnosti obale i otoka, može se reći da je nautički turizam neprijeporno autentičan i posebno prepoznatljiv hrvatski „ turistički proizvod“ . Unatoč brojnim komparativnim prednostima prirodnih resursa hrvatski nautički turizam još nije zauzeo pripadajuće mjesto na tržištu nautičkog turizma Sredozemlja. Budući razvitak nautičkog turizma sa njegovim komplementarnim djelatnostima – nautičko gospodarstvo treba

promatrati kao pokretač svekolikog socijalno-gospodarskog razvoja hrvatskog priobalja i otoka, te ga pravilno dimenzionirati u skladu s nosivim kapacitetom geografske osnove u skladu s principima održivog razvoja. Primjerenom valorizacijom najvrednijeg hrvatskog resursa, obale i otoka, na načelima održivog razvoja, i dugoročno planiranim sustavnim mjerama stvorili bi se uvjeti za poboljšanje socijalno-gospodarske slike hrvatskoga jadranskog prostora.

Utjecaj tiskarskih sustava hidrografskih organizacija na vrijeme izrade i vrijeme korištenja pomorskih karata i navigacijskih publikacija

Jeličić, Tonći; Kasum, Josip;

Zbornik radova 11. savjetovanja tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić", ur. Z. Bolanča, 63-67, Zadar, 2007., izvorni znanstveni rad

Vrijeme proteklo od prikupljanja podataka i kartografske obrade do umnožavanja karte je vrijeme izrade karte. Pomorska karta bi trebala biti najtočnija u trenutku izdavanja odnosno tiska. Što je vrijeme izrade kraće, informacijski sadržaj karte u usporedbi sa stvarnošću je točniji. Vrijeme nakon izdavanja pomorske karte, njena distribucija i korištenje, dakle vijek trajanja tiskane karte bitno se razlikuje od vijeka trajanja ostalih grafičkih proizvoda. Osnovna je razlika u tome što je pomorske karte potrebno održavati kako bi bile suglasne sa stvarnim stanjem u prirodi. Uloga tiskarskih sustava u procesu od izrade do izdavanja, te korištenja pomorskih karata je da utječu na skraćivanje ukupno potrebnog vremena i posljedično na povećanje točnosti pomorske karte i navigacijske publikacije. To se postiže primjenom odgovarajuće tehnologije, standardiziranjem i skraćivanjem vremena grafičkih pripremnih postupaka, tiska i održavanja.

A reappraisal of the extreme sea levels along the Croatian Adriatic coast

Domijan, Nenad; Čupić, Srđan; Mihanović, Hrvoje; Leder, Nenad; Strinić, Goran; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=298335>

CIESM-38e Congres, Commission Internationale Pour l'Exploration Scientifique de la Mer Mediterranee / Briand Frederic (ur.). - Monaco

Sea-level time series from 1955 to 2004 relevant to the northern (Rovinj), middle (Split-harbour) and southern (Dubrovnik) part of Croatian Adriatic coast have been analysed to make estimates of return sea levels for 100-years return period. This was done by fitting observed annual sea level maxima and minima to an assumed parametric "Generalised Extreme Value" (GEV) distribution function which has three parameters. A little discrepancy in the predicted return sea levels estimates for 100-years return period exists in comparison with previous studies, due to different methodologies used in the analysis and diverse length of time series data.

Novi pristup mjerenju razine mora: primjer mareografske stanice Split-Luka

Čupić, Srđan; Domijan, Nenad; Mihanović, Hrvoje; Leder, Nenad; Strinić, Goran; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=298330>

HRVATSKE VODE I EUROPSKA UNIJA - IZAZOVI I MOGUĆNOSTI / Dragutin Gereš (ur.). - Zagreb : Sveučilišna tiskara -Zagreb , 2007. 99-106 (ISBN: 978-953-96455-9-3) (stručni rad)

Mjerenje razine mora obavlja se dugi niz godina analognim uređajima na mareografskim stanicama duž istočne obale Jadrana. Zbog određivanja izuzetno visokih razina mora vezanih uz plimotvornu silu, prisilne i slobodne oscilacije mora pod utjecajem atmosferskih čimbenika (tlaka zraka i vjetra), te zbog rezonantnih oscilacija u priobalnom području bilo je potrebno provesti osuvremenjivanje mareografske mreže s ciljem dostupnosti podataka u realnom vremenu, računanja pojedinih svojstava promjene razine mora u Jadranu te prognoze ekstremnih događaja. Na istočnoj obali Jadrana rad mareografske mreže moguće je pratiti preko web stranica Hrvatskog hidrografskog instituta što omogućava svim potencijalnim korisnicima pouzdane podatke o visini razine mora te podatke prognoziranih morskih mijena. Mareografska stanica Split – luka je od 2003. godine opremljena Thalimedes A/D pretvaračem koji omogućava minutni zapis mjerenih vrijednosti visina u digitalnom obliku, a od 2004. godine i Continuous Global Positioning System (CGPS) stanicom za određivanje vertikalne brzine pomaka tla. Na taj način uključena je u europsku mrežu European Sea Level Service – Research Infrastructure (ESEAS - RI) te omogućuje analizu problema globalnog porasta razine mora i razvoja meteorološko – oceanografskih modela nužnih za prognoziranje iznenadnog poplavlivanja priobalnih područja na istočnoj obali Jadrana.

2008

Obavezan ECDIS - korak bliže

Bradarić, Željko; Čala, Mendi; Bročić, Pejo;

<http://bib.irb.hr/prikazi-rad?&rad=398079>

Kapetanov glasnik. prosinac (2008) ; 22-26 (članak, stručni)

ECDIS je brodski navigacijski sustav za integrirani prikaz elektroničkih karata, pozicije broda te drugih informacija i uređaja u realnom vremenu. Međunarodna pomorska organizacija (IMO) odobrila je ECDIS za upotrebu kao ekvivalent papirnoj pomorskoj karti već 1995. godine. Prva faza usvajanja ECDIS-a kao obaveznog navigacijskog pomagala završena je usvajanjem usaglašenog prijedloga na zadnjem sastanku pododbora IMO-a za sigurnost plovidbe ovog ljeta. Usuglašeni prijedlog sadrži vremenski raspored za uvođenje obaveznog ECDIS-a za SOLAS brodove prema vrsti, tonaži i datumu gradnje u periodu od 2012. do 2018. godine. Očekuje se da će do izdanja ovog Kapetanskog glasnika Odbor IMO-a za pomorsku sigurnost (MSC) odobriti prijedlog NAV Pododbora.

Phytoplankton abundance and pigment biomarkers in the oligotrophic, eastern Adriatic estuary

Viličić, Damir; Terzić, Senka; Ahel, Marijan; Burić, Zrinka; Jasprica, Nenad; Carić, Marina; Caput Mihalić, Katarina; **Olujčić, Goran**;

http://bib.irb.hr/datoteka/323939.Vilicic_et_al._2008_EMAS.pdf

Environmental Monitoring and Assessment (0167-6369) 142 (2008), 2; 199-218 (znanstveni rad)

Phytoplankton distribution and environmental characteristics were determined in a shallow, highly stratified and oligotrophic estuary (Zrmanja, eastern Adriatic). Samples were collected in two contrasting seasons ; winter (February 2000), when river discharge was high, and in summer (July 2003), a period of drought. Phytoplankton distribution was closely related to salinity gradients, nutrient levels, and water residence time. Microscopic analysis revealed that phytoplankton was composed mainly of marine diatoms, dinoflagellates, cryptophytes, green flagellates, and coccolithophorids. The dominant biomarker pigments were fucoxanthin, alloxanthin and 19-hexanoyloxyfucoxanthin, while lower, but indicative contributions of peridinin and chlorophyll b were also noted. Maximum abundance and biomass were found in the middle estuary in winter and in the upper estuary in summer. The estuary is mostly P-limited. Development of chain-forming marine diatoms was evident in winter. Due to the reduced nutrient input in summer, the biomass accumulated in the upper estuary (1000 ng chlorophyll a/L) was composed mostly of nanoplanktonic unicellular diatoms, nanoplanktonic marine dinoflagellates, cryptophytes, and chlorophytes. The concentrations of about 200 ng/L hex-fuco, suggested that the contribution of prymnesiophytes to total biomass was comparable to that of diatoms and dinoflagellates. In the middle estuary and coastal sea, PO₄ and TIN were 3.5 times lower, resulting in a 5– fold decrease in biomass (< 100 ng chlorophyll a/L). The oligotrophic Zrmanja and other karstic rivers discharging in the eastern Adriatic Sea, provide insufficient source of nutrients and low productivity of the eastern Adriatic Sea.

Sustavi odijeljenog prometa u Jadranskom moru

Pušić, Danijel; Lušić, Zvonimir;

<http://bib.irb.hr/prikazi-rad?&rad=568730>

Kapetanov glasnik. 16 (2008) ; 32-33 (članak, stručni)

Posljedice pomorskih nezgoda prisiljavaju vlade obalnih država da povećaju zaštitu mora i priobalja od onečišćenja. Jedna od mjera je i organizacija pomorske plovidbe u pojedinim područjima, tj. uspostava sustava usmjeravanja i nadzora plovidbe.

Spatial and Environmental Characteristics of Croatian Adriatic Archipelago as an Important

Favro, Srećko; Saganić, Iva; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=358477>

International Conference on Studying, Modeling and Sense Making of Planet Earth Mytilene, Lesvos, Grčka, 01-06.06.2008

This paper analyses spatial and environmental characteristics of Croatian Adriatic from the aspect of nautical tourism development. Sea and coastal area are the most important natural and geographical elements for nautical tourism development. However, together with natural basis, attractiveness of Croatian coast for nautical tourism is also in its historical, cultural, social, economic, and trendy characteristics that rank this maritime zone among the most attractive nautical destinations, together with the Caribbean and Greek archipelago. This paper analyses natural basis for nautical tourism development, such as geomorphologic forms, hydrographic elements, that is physical, thermal, and chemical quality of water, and climatic characteristics (air temperature, precipitation, winds, sunny and cloudy days, air humidity). Abundance of relief forms, bays and islands is one of attractive elements for nautical and tourist navigation and stay. Indentedness and natural attractiveness of the coast enable cruising and provide good natural shelters. Boater that sails in the Croatian local waters can enjoy views of the coast that indicate longtime coexistence and harmony between man and nature. Development of nautical tourism in accordance with spatial and environmental characteristics and with respect for natural laws enables nondisrupted visual identity of the coastal area and ensures to boaters the stay in authentic area with all the possibilities that it offers. Analysis of the characteristics important for nautical tourism development will deal with the most attractive locations on the Croatian Adriatic, and it will recommend and suggest further development of all the elements of nautical tourism together with its complementary activities – nautical economy.

The importance and role of crisis management in crisis situations

Kovačić, Mirjana; Gržetić, Zvonko; Favro, Srećko;

<http://bib.irb.hr/prikazi-rad?&rad=355835>

27th international conference on organizational science development University of Maribor - Faculty of organizational sciences , 2008. (ISBN: 978-961-232-212-0).

In this paper, the authors clearly and systematically present the nature and the process of strategic management. Its importance is identified and the necessary expertise of managers at various managing levels is indicated. Problems of modern society and crisis situations (conditions) put emphasis on specific knowledge and information efficiency. The significance of making plans and decisions in various situations is particularly required in specific conditions and unstable environment when prompt actions are required. The role of management in such circumstances is decisive and dominating. The management is the beginning and the ending of responsibility, success

and failure. The author defines the kinds of plans, and particularly analyses the situational plan for prompt performance. The importance of decision-making based on ethical consideration and social responsibility is emphasised. Particular accent is placed on the importance of evaluation of the results and strategic control of the process of strategic management aimed at developing the system and minimising the risk in acting and resolving crisis situations and conditions.

Traditional agriculture as impetus for tourism development in Dalmatia

Favro, Srećko; Saganić, Iva;

<http://bib.irb.hr/prikazi-rad?&rad=372389>

INTERNATIONAL TOURISM CONFERENCE 2008: Cultural and Event Tourism: Issues & Debates Alanya, Turkey, 05-09 November 2008.

Croatian coast has traditionally been oriented towards agriculture as the most important activity for existence of its inhabitants. That also refers to Dalmatia. Because of geographic position of Croatian coast, its relief and climatic characteristics, some agricultural branches developed that have up to this day remained important for people's lives and for identification of Dalmatia. They are olive growing, grape growing, sheep breeding, pig breeding, and fruit growing. Olive growing has been traditional activity in this area since ancient times. Thanks to specific soil, climatic conditions and traditional way of processing, autochthonous sorts of wine grape give their maximum in these endemic geographical conditions. Some parts of Dalmatia have long tradition of sheep and pig breeding. Specific relief, climatic and soil conditions are ideal for growing marasca cherry used to prepare various drinks. All of this should be used to create brand of Dalmatia as an ecologically preserved area with unique geographic conditions that have created predispositions for growing field crops of exceptional quality by using traditional autochthonous ecological procedures. That can attract tourists who can see traditional way of life in this area, and also feel it.

Vision and mission of nautical tourism of the Republic of Croatia

Favro, Srećko; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=355976>

Conference Proceedings of the 17th Annual CHME Research Conference Glasgow SCOTLAND, UK, 14-16.2008

The authors analyse natural conditions as the resource basis, present development and planned activities for the development of nautical tourism in the Republic of Croatia. Owing to special and exceptional natural and artificial attractions of the coast and islands, nautical tourism is unquestionably authentic and specially recognised Croatian "tourist product". The results of the different researches articulated the main objectives of the future development of nautical tourism at the principles of sustainable development. By defining the vision and the mission of nautical tourism, guidelines will be determined for the sustainable development of nautical tourism and complementary activities – nautical economy in the following 15 years. The conclusions of the Study of development of nautical tourism were the basis for scientific analysis of this issue presented in the doctoral thesis of the author Srećko Favro, entitled "Spatial features of the Croatian Adriatic as a comparative advantage for the development of nautical tourism".

Razvoj NAUTIČKOG TURIZMA u Hrvatskoj - ekološka prijetnja

Favro, Srećko; Gržetić, Zvonko; Saganić, Iva;

<http://bib.irb.hr/prikazi-rad?&rad=372393>

GOSPODARKA REGIONALNA I TURYSTYKA IV MIĘDZYNARODOWA KONFERENCJA NAUKOWA

Kielce ISSN: 1733-4314

Croatian littoral area is distinguished by unique attraction of its coast and islands, making a geographic basis for the development of nautical tourism as an authentic and recognizable Croatian „tourist product“. What is more, it may well be said that precisely nautical tourism is the original and most distinctive trademark of Croatian tourism, especially of its most important and most valuable part – the sea and adjacent unique natural coastal and insular areas. In spite of the present achievements in the development of nautical tourism, it has not yet achieved, in many parts and as a whole, the quality level to accord with the available spatial basis. Further undefined and unorganized development may become a serious threat to the long-term preservation of quality and attraction, and to the complete desired spatial-geographic and economic evaluation. Besides evident economic and social profits that were made in the development of nautical tourism in the past period, and all its consequences, such development has also been the cause of certain disadvantages. The survey of potential negative influences of marinas on the marine environment, and on its living world, imposes the obligation to harmonize the development of nautical tourism in Croatia with other priorities, following the principles of sustainable development. By applying sustainable development model in the strategic planning for the development of nautical tourism and complementary activities, Croatian most valuable natural potential can be used over the long term to improve economic-and-social image of the Croatian nautical area (seaboard and islands).

Nautical tourism – advantages and effects of development

Favro, Srećko; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=372391>

SUSTAINABLE TOURISM III / F.D. Pineda / C.A. Brebbia (ur.). - Southampton, Boston : WIT Press, Southampton , 2008. 35-44 (ISBN: 978-1-84564-124-5).

In the last thirty years, when a more significant development of nautical tourism in Croatia started, nautical tourism has proved to be one of the most propulsive and stable forms of tourism. Using its comparative advantages, nautical tourism attracts most demanding clients and initiates a number of accompanying business activities and foreign investments. Positive effects of nautical tourism are evident at all levels, from national to local, but also at the level of business activities. Besides a series of indisputable and clear economic and social benefits realised during the development of nautical tourism and its effects, such a development led to a number of disadvantages. Possible negative effects of marinas to the marine environment and its living world necessitate harmonisation of the development of nautical tourism with other priorities, all based on the principles of sustainable development. One of the significant priorities of Croatia is environment protection. When compared to other categories of dispersed sources of pollution/contamination from urban settlements and agriculture, marinas and nautical tourism cannot be characterised as significant sources of dispersed pollution. However, marinas and nautical tourism may lead to a decrease of the seawater quality from the local aspect and of a negative influence to biological communities of marine organisms and ecosystems. Strict observance of the principles of sustainable development through implementation

of the current regulations and laws related to environment protection may ensure that marinas be a guarantor of preservation of natural values of the water area.

Ecological Evaluations of Cres - Lošinj Archipelago for the Purpose of Tourism

Saganić, Iva; **Favro, Srećko**;

<http://bib.irb.hr/prikazi-rad?&rad=419257>

TURIZAM - INTERNATIONAL SCIENTIFIC JOURNAL (1450-6661) 12, 2008 (2008); 36-45

The topic of this paper is ecological evaluation of the Cres archipelago and the way it could be used for tourism purposes. Rapid growth of population and increasing human economic activity influence the quality of the environment. That is why the concept of sustainable development has been made, as well as new kind of tourism - eco - tourism or sustainable tourism. Today there is a small number of regions with preserved nature. The Cres- Lošinj archipelago is one of them. There is a large number of preserved plant and animal species on the archipelago, as well as some rural areas with preserved local architecture. With the development of eco-tourism, this archipelago would get the image of the area with preserved and authentic natural and cultural surroundings and healthy living environment.

Nautical tourism the basis of the systematic development

Favro, Srećko; Kovačić, Mirjana; **Gržetić, Zvonko**;

<http://bib.irb.hr/prikazi-rad?&rad=372456>

POMORSTVO Journal of Maritime Studies (1332-0718) vol.22 (2008), Br./No.1; 31-51

This paper deals with the study of nautical tourism, stressing the importance of efficient management of nautical tourism as a system. Nautical tourism is a complex system requiring the use of all patterns and regularities of the general system theory and principles for the management of integrated complex systems. The study aims to identify essential elements and characteristics of the nautical tourism in Croatia. Croatia has very favourable natural conditions for the development of nautical tourism, such as a long coastline, a great number of islands, islets and bays suitable for leisure mariners, as well as favourable climatic and hydrographic conditions. Besides basic natural spatial conditions and development potentials of nautical tourism, special importance is also given to the development of complementary activities. The authors examine the possibilities for the development of such activities, defining the concept of nautical economy as a basic guideline for the future development of nautical tourism in Croatia. Special emphasis is given to the development of complementary activities on islands, and parallels are drawn between the achievements in nautical economy of Croatia and nautical economy worldwide.

Prijedlog modela odabira i primjene optimalnog potupka reprodukcije pomorskih karata i navigacijskih publikacija

Jeličić, Tonći; **Gržetić, Zvonko**; **Kasum, Josip**;

Zbornik radova 12. savjetovanja tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić", ur. Z. Bolanča, 63-67, Split, 2008., stručni rad

Tiskarski sustavi hidrografskih organizacija su sustavi kartografske i grafičke pripreme, te reprodukcije (tiskanjem ili ispisom) pomorskih karata i navigacijskih publikacija. Različiti postupci i posljedično, različito vrijeme reprodukcije pomorskih karata, ukazuju na neophodnost optimizacije postupka reprodukcije. (Jeličić T., Kasum, J., 2006). Klasični tiskarski sustav uključuje konvencionalnu kartografsku obradu originala i kopirne postupke za izradu reproduksijskog originala koji služi kao osnova za tisak. Suvremeni tiskarski sustavi koriste računalnu tehnologiju u kartografskoj i grafičkoj pripremi. Reprodukcijski originali u suvremenom postupku se umjesto klasičnim kopirnim postupcima dobivaju uređajima za osvjetljavanje na film ili direktno na ofsetnu ploču. U suvremene tiskarske sustave svrstava se i postupak ispisa pomorskih karata na ink-jet pisačima (POD - print on demand). Upravo je mogućnost korištenja različitih tehnologija reprodukcije odnosno mogućnost odabira najpovoljnije tj. optimalne tehnologije tema ovog rada. U radu se predlaže model odabira i primjene optimalnog postupka reprodukcije pomorskih karata.

Hrvatske službene elektroničke navigacijske karte (ENC) dostupne krajnjim korisnicima Čala, Mendi; Bročić, Pejo; Bradarić, Željko; Gržetić, Zvonko;

Hrvatski hidrografski institut je prema planu izdao osnovni paket od ukupno izrađenih 107 službenih elektroničkih navigacijskih karta (ENC). U paketu je 80 ćelija ENC-ova svih šest navigacijskih upotrebni skupina prema kriterijima Međunarodne hidrografske organizacije (IHO). Tako je jadranski centralni međunarodni plovidbeni pravac pokriven jednom ćelijom pregledne karte (ENC). Četiri ćelije generalne karte (ENC) pokrivaju prilazne plovidbene putove. Obalnim i prilaznim kartama (ENC) pokriveni su prilazni međuotočni plovidbeni putovi lukama, ukupno 24 ćelije. Područja šest luka otvorenih za javni promet od međunarodnog gospodarskog interesa za Republiku Hrvatsku i brojne manje luke pokriveni su planovima i pregledima vezova, ukupno 51 ćelija ENC.

Krajnjim korisnicima ENC-ovi su dostupni preko službenih centara za distribuciju ENC - norveškog Primara, britanskog IC-ENC i svjetski poznate tvrtke C-MAP by Jeppesen. Realizacijom ovog plana Hrvatska je ispunila zahtjeve iz najnovijih propisa po kojima sustavi za prikaz ENC-ova (ECDIS) i ENC-ovi postaju obvezna navigacijska pomagala za vrlo brze brodove od 1. srpnja 2008.

Tehnološki, organizacijski i financijski vrlo zahtjevni procesi u izradi, kontroli, validaciji i distribuciji službenih ENC-ova obavljani su u potpunosti u HHI-u uz pomoć Norveškog hidrografskog ureda i osoblja distributivnog centra Primara. Nabavljena je nova tehnologija, osposobljeno je osoblje HHI-a, što jamči uspjeh u budućim izazovima vezanim uz ENC-ove, a u svjetlu vrlo vjerojatnog uvođenja obveznih ENC-ova i za ostale kategorije SOLAS brodova.

Kontinuirano ispravljanje pomorskih navigacijskih karata postupkom strojne korekture na ploteru

Bročić, Pejo; Gržetić, Zvonko;

Hrvatski hidrografski institut izrađuje i održava službene pomorske navigacijske karte. Tisak karata se obavlja u tiskari HHI u Splitu, a svaka karta ima otisnut datum tiska s kojim je ispravljena (ažurna). HHI u području svoje odgovornosti ima objavljeno oko 100 različitih službenih pomorskih karata koje su u sustavu kontinuiranog održavanja. Karte se nakon tiska spremaju u Skladište karata HHI odakle se šalju po narudžbi ovlaštenim distributerima. Takvim načinom proizvodnje neke su karte u skladištu stare i nekoliko godina i imaju više ispravaka objavljenim naknadnim Oglasima za pomorce

(OZP). Isporučenu kartu iz skladišta distributeri su, po ugovoru, dužni ažurirati s posljednjim (OZP) prije prodaje krajnjem korisniku.

Ucrtavanje ispravaka se do sada radilo ručno, pa je ispravljena pomorska karta često izgledala neugledno. HHI je u dosadašnjem radu uspijevaao neke pomorske karte s puno naknadno objavljenih ispravaka (a kojih je imao u skladištu) ažurirati ofsetnim tiskom dotiskujući sve ispravke u dodatnoj (ljubičastoj) boji, i to samo za nekoliko najkritičnijih karata jer obimom posla za sve karte to praktično nije bilo moguće učiniti.

Zbog toga u HHI već nekoliko godina tražimo način kako dobiti svaku pomorsku kartu u ažurnom stanju prije prodaje distributeru odnosno korisniku (nekom vrstom strojne korekture). To znači da smo trebali organizirati i izraditi odgovarajućim softverskim programom bazu svih ispravaka za svaku kartu, naći stroj (ploter) koji taj posao može izvršiti i obučiti tim stručnjaka za taj posao.

Ispravke pomorskih karata radimo na ploteru HP Designjet Z2100 Photo koji omogućuje da svaku kartu pozicioniramo prema oznakama (paserima) na ploteru uvijek na isto mjesto, a isplotani ispravci u ljubičastoj boji postojani su na dnevnu svjetlost i imaju svojstvo vodoodbojnosti. Potpunom čitljivosti kartografskog prikaza ispunili smo uvjete upotrebljivosti pomorske karte.

Usvajanjem ovog postupka bitan pomak u kvaliteti i izgledu uočit će korisnici naših pomorskih karata a time i potpunu pouzdanost u naše službene pomorske navigacijske karte.

Numerical Modelling of the Destructive Meteotsunami of 15.7.2006 on the Coast of the Balearic Islands

Vilibić, Ivica; Monserrat, Sebastia; Rabinovich, Alexander; **Mihanović, Hrvoje**;

<http://www.springerlink.com/content/r0823243960x8454/?p=21de14a7f46d4446ac24de65c1a2de02&pi=9>

A destructive tsunami-like event (locally known as “rissaga” waves) occurring on 15 June, 2006 in Ciutadella Harbour (Menorca, Balearic Islands) is reproduced by a numerical model forced by a travelling atmospheric disturbance. The disturbance is reconstructed from microbarograph measurements, being the only available instrumental data at the time of the event. The model is verified based on two weaker 1997 events, which were recorded by a number of bottom pressure recorders operating at that time on the Menorca shelf, in Ciutadella Inlet and adjacent Platja Gran Inlet. Both 1997 events are numerically simulated and good agreement is achieved with observations in time, frequency (including eigenfrequencies of the affected inlets) and wave heights. Subsequently the same model is applied to simulate the 2006 event. The vigorous currents with speeds up to 400 cm/s are found to occur specifically at those areas of the harbour where the most severe damage and sinking of boats had been reported. Maximum simulated sea-level heights of 2.5 m were about one half of those reported by eyewitnesses. This difference is apparently caused by quality and spatial resolution of bathymetry data. However, in general, the model is capable of reproducing the event fairly well and can probably be used for future assessment and mitigation activities on the coasts of the Balearic Islands.

Summer breakout of trapped bottom dense water from the northern Adriatic

Vilibić, Ivica; Beg Paklar, Gordana; Žagar, Nedjeljka; **Mihanović, Hrvoje**; Supić, Nastjenjka; Žagar, Mark; **Domijan, Nenad**; Pasarić, Miroslava;

<http://www.agu.org/pubs/crossref/2008/2007JC004535.shtml>

Journal of Geophysical Research - Oceans. 113 (2008) , C11; S1102-1-S1102-19 (članak, znanstveni)

The paper deals with an intriguing dense-water breakout episode in mid-August 2004 which has been observed in the bottom layers of the oil rig located in the middle of the northern Adriatic. Various data (temperature series and vertical T-S profiles, currents, meteorological measurements, and satellite images) have been analyzed in order to understand conditions which preceded, were active, and followed the breakout episode. A stationary bottom pool of dense water, generated during the previous winter, has been suspected to be a source of the dense water observed during the breakout, with a permanent position established by a stationary northern Adriatic cyclonic-anticyclonic gyre system. The breakout lasted for 3 days, advecting the bottom waters more than 2°C colder than residing waters at the oil rig site. The main result of modeling experiments concerns the generative force for the observed breakout which was found to be a mesoscale storm that occurred over the open north Adriatic on 8 August 2004. The storm has been reproduced by the Coupled Ocean/Atmosphere Mesoscale Prediction System (COAMPS®) atmospheric model which was then used to force the Princeton Ocean Model (POM) at the surface. Results of simulations reveal the capability of the storm to break the thermohaline fronts through the wind-induced baroclinic transport and downwelling at the exposed shorelines. This is the first study in the Adriatic which evaluates the impact of mesoscale summer storm to the sea, driving bottom layer circulation through the convergence/divergence dynamics in addition to the direct impact on the sea surface through the wind stress forcing.

2009

Holocenski sedimentacijski procesi u akvatoriju luke Poreč Škaro, Krunoslav;

Magistarski rad. Sveučilište u Zagrebu. pp137

Usljed kasno pleistocenske-rano holocenske transgresije koja je dovela do stvaranja zaljeva današnje luke Poreč nastaje poluzatvoreno obalno područje u periodu od prije 7500 do 6500 godina BP. Geofizička istraživanja su objavljena u listopadu 2003 godine, te su prikupljeni uzorci sedimenta. Rezultati analiza ukazali su na taloženje holocenskog sedimenta debljine do 8 m, te na trendtaloženja krupnijih čestica bliže obali. Čestice sedimenta su terigenog i biogenog porijekla. Terigene čestice su siliciklastične i sitnozrnate, a u njima su ugrađeni elementi Ni, Co, Fe, mn, K, Ti, Zr, Y, Rb, te radionuklidi ⁴⁰K, ²³²Th, ²²⁶Ra i ²³⁸U. Biogenu komponentu sedimenta čine krupnozrnate i karbonatne čestice visokim udjelima Ca i Sr, a sadrži i organsku tvar. Povećana koncentracija elemenata Pb, Cu, Zn i Cr te radionuklida ¹³⁷Cs u česticama ukazuje na djelomični antropogeni utjecaj. Prisustvo ovih elemenata u dubljim slojevima sedimenta ukazuje na njegovo miješanje uslijed bio/antropoturbacije, ali i promjene u donosu zagađivala tijekom vremena. Usporedbe udjela elemenata antropogenog porijekla površinskih sedimenata akvatorija luke Poreč ukazuju na njegovo neznatno zagađenje u odnosu na druga svjetska područja. Procijenjena prosječna brzina sedimentacije u području istraživanja je u rasponu od 0, 43-1, 6mm/god.

ENC - središnja tema XVI. Konferencije hidrografske Komisije Sredozemnog i Crnog mora

Gržetić, Zvonko; Bradarić, Željko;

<http://bib.irb.hr/prikazi-rad?&rad=470253>

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 19 (2009) (članak, stručni)

Međunarodna hidrografska organizacija (International Hydrographic Organization – IHO) veći dio svojih pet temeljnih radnih programa (Working Programs) realizira radom regionalnih hidrografskih komisija (Regional Hydrographic Commission - RHC). Hrvatska kao punopravna članica Komisije za Sredozemno i Crno more (Mediterranean and Black Seas Hydrographic Commission - MBSHC) redovito sudjeluje u radu Komisije, kako u intervalu između dviju konferencija, tako i za vrijeme konferencija Komisije, koje se održavaju svake dvije godine u jednoj od država članica. Posljednja XVI. MBSHC konferencija održana je u Ukrajini, u Odesi od 22. do 25. rujna 2009. uz sudjelovanje predstavnika Hrvatskog hidrografskog instituta. Elektroničke navigacijske karte bile su središnja tema konferencije. U ovom radu prezentiraju se izvaci iz rasprava, najvažnije odluke i preporuke koje se trebaju realizirati u razdoblju do sljedeće konferencije, te aktivnosti hrvatske delegacije na sastanku Komisije.

Promet unutrašnjim plovnim putovima Republike Hrvatske

Ivančić, Paško; Vladislavić, Kristina;

Međunarodna konferencija o pomorskoj znanosti, IMSC 2009, zbornik sažetaka STR .43.

Jedan od najstarijih oblika prijevoza roba je prijevoz unutarnjim plovnim putovima rijeka. Ujedno postaje sve atraktivniji način transporta roba. Mreže europskih unutarnjih plovnih putova povezuju sve veće europske zemlje. Integracija hrvatskih unutarnjih plovnih putova u mrežu europskih

unutarnjih plovnih putova je nedovoljno razvijena. Kapacitivnost Drave, Dunava i Save kao nositelja unutarnje plovidbe I razvoj te mreže rijeka te integracije u europske koridore. Sigurnost plovidbe na razini europske mreže vodnih putova dobiva novu dimenziju uvođenjem sustava Riječnih informacijskih servisa («River Information Services» – RIS) posebice usluge praćenja i usmjeravanja plovidbe («Vessel Tracking & Tracing System» – VTS). Razvitak riječnih informacijskih servisa Hrvatska je postavila na sam vrh prioriteta u riječnom prometu.

Socio-cultural effects and consequences of construction of nautical tourism ports– Case study - CROATIA

Favro, Srećko; Kovačić, Mirjana; **Gržetić, Zvonko;**

<http://bib.irb.hr/prikazi-rad?&rad=490972>

IV Biennial International Congress „Hotel Plan 2009“. Hospitality and Tourism – Holistic Approach, Beograd IV Biennial International Congress „Hotel Plan 2009“. Hospitality and Tourism – Holistic

This paper gives systematic and laid out review of all economic effects of nautical tourism, with special emphasis on the effects of the improvement of socio-cultural living conditions of local inhabitants on the coast and islands. This is particularly important segment of the sustainable development of nautical tourism, and that is creating the economic and social necessary conditions for the life of local inhabitants employed in service industry in nautical tourism. The development of nautical tourism can also be seen as the process of social change not only of living conditions in nautical destinations, but also as stimulating process that can affect the change of social and economic structure of activities on the coast and islands. The effects of nautical tourism on particular complementary economic activities that together form nautical economy are especially important. When we are talking about the effects of nautical tourism on tourism in the whole, this implies all those activities or economic areas and their parts that are directly or indirectly connected with tourism. Authors analyze negative effects of nautical tourism, and give suggestions how they can be prevented or reduced. In that process harmonious relation toward environment is emphasized in a way that will maintain and improve service quality in order to satisfy yachtsmen's needs together with preservation of the value of the coast. Such relation of ports of nautical tourism and yachtsmen toward environment is a contribution to socio-economic prosperity of nautical destination and region where the activity takes place.

Sar system in Croatia - yachtsmen's feedback research

Kovačić, Mirjana; **Favro, Srećko;** **Gržetić, Zvonko;**

<http://bib.irb.hr/prikazi-rad?&rad=437977>

SAR SYSTEM IN CROATIA - YACHTSMEN'S FEEDBACK RESEARCH TIEMS 16 th ANNUAL CONFERENCE, ISTANBUL, TURSKA, 9-11.06.2009

The paper analyzes the results of research that was conducted in 2006 for the purpose of Study of the nautical development in Croatia. The aim of the research was to bring nautical services and nautical destination, including SAR (Search and Rescue services) to a higher level based on yachtsmen's views and suggestions. The emphasis was on the Croatian part of the Adriatic. Survey was intentionally conducted during the winter period when yachtsmen from the vacation. Topical,

questions were about specific problems and services in nautical tourism, where yachtsmen could give relevant guidelines with their answers and suggestions. Due to increased demands for overall safety and efficient control and data analysis in nautical tourism, it is very important to establish computer intergration of the system. Thus established computer connection will ensure quick and efficient decision making in order to solve crisis situations and regular system operation. Authors point out at a few ways that can be done and suggest establishing responsible subject, not only an administrative level, but also on practical level. Authors put special emphasis on the role and importance of constant communication of ports of nautical tourism with nautical market and individual nautical destination, and on communication inside the parts of the system. Establishing good communication with yachtsmen and between parts of the system stimulates competitiveness, safety, improvement of services' quality, and overall yachtsmen's satisfaction.

Review of researches on nautical tourism and nautical ports

Favro, Srećko; Kovačić, Mirjana; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=419267>

CHME 18 th ANNUAL RESEARCH CONFERENCE Brighton : University of Brighton, School of Service Management, 2009.

This paper gives review of past researches of nautical tourism and ports for mariners and their yachts in Croatia. Authors point at role and importance of nautical tourism in economic growth of Croatia. The paper emphasizes systematic approach in the research of nautical tourism, and compares it with researches in the rest of the world. Because of the specific location where activities in nautical tourism are performed and that is maritime property, more recent researches, especially planning of new locations, include scientists from fields of law, maritime affairs, technology, economy, and other fields. Nautical tourism attracts more and more attention in the whole world, as well as in Croatia, because of its importance in the economy and total tourist income, and especially because of development of new capacities for its realization on unused coastal areas. Ports of nautical tourism become specific places for realization of this selective form of tourism. In countries that have long tradition of nautical tourism there are integral programmes and systematic monitoring of the development through controlled development and management of ports of nautical tourism taking into consideration principles of sustainable development. In some countries there are also specialized research institutes or departments that monitor the phenomenon of nautical tourism and economy of nautical ports, and there are also specialized journals from that area published. Authors emphasize great contribution of Croatian and foreign authors to understanding of problems with situation of ports of nautical tourism, economic, effects of nautical tourism and possibilities for development taking into consideration environment and principles of sustainable development.

Significance and role of international standards in development of nautical tourism

Favro, Srećko; Kovačić, Mirjana; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=424113>

PROMET- TRAFFIC& TRANSPORTATION, Scientific Journal on Traffic and Transportation Research (0353-5320) vol.21 (2009); 167-174

In this paper it is studied the trends of increasing demand in nautical tourism. The increasing demand is followed by a significant increase of threats to the environment, but also to boaters and their vessels participating in nautical activities. The authors emphasise the obligation to observe safety requirements through defined and controlled procedures in marinas and at sea and implementation of international standards during the stages of organisation of nautical economy, i.e. nautical tourism with complementary activities. In paper is given an explicate the implementation of international standards for selecting locations for marinas, construction and equipment of marinas and vessels, training of boaters – skippers, business operations of subjects and objects of nautical tourism and promotion of their services. Special attention is given to safety standards and procedures during extraordinary situations at sea and in the ports. It is expected that each vessel will have a GPS (Global positioning system) device and a box similar to a black box in aeroplanes which could be used for reconstructing accidents. Radar systems, AIS system (Automatic Identification System) and systems of alarm will minimise the time for interventions. The intervention procedures at sea are currently being determined aimed at minimising the time, but improvements are still needed. Special attention is also given to activities related to resolving crisis, analysis of existing and potential causes and to defining preventive actions.

Controlled and Managed Adventure - Croatian Approach to the Development of Nautical Tourism in Croatia

Favro, Srećko; Saganić, Iva; Gržetić, Zvonko;

<http://bib.irb.hr/prikazi-rad?&rad=466920>

Turizam : znanstveno-stručni časopis (1450-6661) 13 (2010); 69-74

Ecological preservation of intact nature, of mystical and genuine Mediterranean cultural environment is the most crucial requirement for the development of nautics, but also for upgrading present capacities and complementary activities in the Adriatic. At the same time, preservation of natural beauties, intact bays, but also development of sufficient amenities in marinas for overnight stay, services and entertainment, requires such development strategy that will balance and show consideration for all these aspects. That could be called a "discretely controlled and managed adventure" that will always have the price it has deserved. One has to bear in mind, though, that boaters primarily come in order to be at sea, that a marina is a necessary element of navigation, and that boaters want to spend the major part of their time abroad, in the sphere of "adventure". The leading part in implementing this decision lies with government bodies that have to be able to adapt the boaters' desire for high services to local specific aspects. Nautics has to be administered, but administrative and expert entities have not proved to be the best solution. It may be assumed that the development of one of the institutions into a body permanently responsible for monitoring, analyses and expert proposals could be a solution that would find place in the current vacant space between performers (mostly private companies) and administration (few and inadequately qualified). Also, strict standards have to be determined and controlling system established, so that attractiveness is kept, while sustainable and controlled development of the littoral and islands is enabled.

Prijedlog unapređenja modela distribucije službenih pomorskih karata i navigacijskih publikacija i ostalih izdanja hidrografskih organizacija

Jeličić, Tonći; Gržetić, Zvonko; Kasum, Josip;

Zbornik radova / 13. međunarodno savjetovanje tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić", Senj, 63-67, 2009.

Temeljna tiskana izdanja hidrografskih organizacija su službene pomorske karte i navigacijske publikacije. Posebnost tih izdanja u odnosu na ostale tiskane odnosno grafičke proizvode je ta što je službena izdanja hidrografskih organizacija potrebno održavati. Održavanje odnosno ažuriranje je nužno kako bi pomorske karte i navigacijske publikacije i nakon tiska bile u skladu sa stvarnim stanjem u prirodi. Hidrografske organizacije su dužne uređivati i objavljivati obavijesti za održavanje koje sadrže sve informacije potrebne za održavanje. Održavanje nakon tiska, za vrijeme dok je karta ili publikacija na zalihama je obveza hidrografskih organizacija, a nakon toga održavanje je obveza distributera i kasnije korisnika. Zbog toga je potrebna organizirana mreža ovlaštenih distributera, stalna edukacija i informiranje korisnika. Hidrografske organizacije u okviru izdavačko-tiskarske djelatnosti, uz službene karte i publikacije proizvode i druga tiskana izdanja koja ne podliježu održavanju. Takva izdanja, osim preko ovlaštenih distributera, mogu se distribuirati i klasičnim načinom odnosno preko knjižara, prodavaonica u lukama, nautičkim centrima i slično. Radi se o kartama i publikacijama koje nisu za navigaciju, zatim stručnim i znanstvenim knjigama, udžbenicima i zbornicima radova, turističko-nautičkim izdanjima i ostalim izdanjima vezanim za djelatnosti hidrografskih organizacija. U ovom radu se analizira izdavačko-tiskarska djelatnost hidrografskih organizacija, pojašnjava postupak održavanja i način distribucije službenih izdanja, te se daje prijedlog modela distribucije svih izdanja u odnosu na njihovu klasifikaciju i namjenu.

Umnožavanje službenih pomorskih navigacijskih karata izdanja Hrvatskog hidrografskog instituta obzirom na suvremene tehnike

Solarić, Radovan; Bročić, Pejo; Gržetić, Zvonko;

Imanentno je pomorskim navigacijskim kartama da budu u potpunosti ažurne. Obzirom na moguće permanentne promjene na akvatoriju, potrebno je osmisliti tehnologiju permanentnog ažuriranja. Takvo se ažuriranje rješava kroz objavljivanje izmjena i dopuna u mjesečniku Oglas za pomorce (OZP). Pomorske navigacijske karte su ažurne odmah nakon tiska, a ažuriraju se prije uporabe kod krajnjeg korisnika na temelju OZP-a. Ovakav način ažuriranja pomorskih navigacijskih karta uobičajen je, a uvjetovan je tehnologijom umnožavanja (offsetni tisak). Distribucija ažurnih pomorskih navigacijskih karta omogućena je novom tehnologijom umnožavanja, tj. plotanjem na upit. Plotanje na upit podrazumijeva kvalitetno postajanje karte u vektorskom obliku i organizaciju permanentnog održavanja u ažurnom stanju vektorskog oblika karata.

West Adriatic coastal water excursions into the East Adriatic

Vilibić, Ivica; W. Book, Jeffrey; Beg Paklar, Gordana; Orlić, Mirko; Dadić, Vlado; Tudor, Martina; J. Martin, Paul; Pasarić, Miroslava; Grbec, Branka; Matić, Frano; **Mihanović, Hrvoje;** Morović, Mira;

<http://linkinghub.elsevier.com/retrieve/pii/S0924796309001456>

Journal of Marine Systems. 78 (2009) , S1; S132-S156 (članak, znanstveni)

A pool of less saline surface waters was observed in late June 2006 at the northern edge of the South Adriatic Pit (SAP). Three possible sources were considered: (1) Albanian rivers, (2) local Croatian rivers, or (3) relatively fresh West Adriatic Current (WAC) waters. Available CTD and ADCP data, together with satellite images indicate that WAC waters are the most likely source. This requires an excursion of WAC water across the width of the Adriatic and is especially surprising as low winds and

stable atmospheric conditions prevailed in mid/late June. However, quite strong NNW winds occurred during the first 12 days of June, with peak winds close to the western shore. These winds were the result of the translation of the Azorean high to the British Isles, producing strong pressure gradients over the Adriatic. The winds enhanced the WAC during early June 2006, preconditioning a cross-basin eddy circulation that appeared during the wind relaxation and calm conditions. As the unusually calm conditions persisted for more than two weeks, the WAC eddies and filaments grew freely and had enough time to reach middle east Adriatic waters. Navy Coastal Ocean Model (NCOM) simulations, using high-resolution Adriatic bathymetry and realistic atmospheric forcing show that such excursions are plausible and can occur when eddies and instabilities push WAC waters across the hyperbolic flow point separating the WAC and Eastern Adriatic Currents near the Palagruža Sill. During the latter half of June 2006, NCOM simulations show that the hyperbolic point was particularly well formed as an anticyclonic WAC, a cyclonic SAP rim flow, an anticyclonic cell southeast of Lastovo Island, and a cyclonic cell over the centre of the Palagruža Sill all bordered on each other. A simplified channel model suggests that the presence of the escarpment is a critical factor for producing cross-basin exchange of the coastal current following the relaxation of strong winds with a cyclonic wind-stress curl. However, the introduction of the Gargano Peninsula in the simulations was critical to the production of mesoscale eddies in the exchange flow, and such eddies qualitatively agree with the convoluted structures observed in satellite images.

Diurnal thermocline oscillations driven by tidal flow around an island in the Middle Adriatic

Mihanović, Hrvoje; Orlić, Mirko; Pasarić, Zoran;

<http://linkinghub.elsevier.com/retrieve/pii/S0924796309001468>

Oceanographic data collected between February and September 2006 have been examined in order to detect and interpret different physical processes in the Adriatic shelf break area. One of the main objectives was to gain more information on internal tides. The work comprised thermistor measurements carried out at the islands of Biševo, Sušac and Lastovo at 10 equidistant depths, between 4 and 40 m, on submarine cliffs opened to the southeast. Significant diurnal temperature oscillations were detected at Lastovo. The strongest variations were driven by the sea/land breezes (middle of July 2006). However, during several episodes between June and August 2006 diurnal wind forcing was not significant, whereas barotropic currents at an ADCP station close to Lastovo, as well as sea levels at Split and Dubrovnik, contained a pronounced diurnal signal. The wind and tidal influences on the temperature variability were separated by applying a multiple cross-wavelet spectral analysis with the hourly pseudo wind stress and sea level (or barotropic current) data treated as the inputs and the isotherm heights at Lastovo considered as the output. The analysis confirmed that significant correlation between tides and thermocline oscillations existed at the end of June, at the end of July and in August 2006. Diurnal internal tidal observations were consistent with simple theoretical nearresonant interaction of tidal flow with the island of Lastovo under stratified conditions, resulting in the generation of baroclinic island-trapped waves. This study revealed that even in a shallow area of high bathymetric complexity subjected to micro-tides, large amplitude internal waves at diurnal tidal frequency could be generated.

2010

Primjeri geološkog kartiranja morskog dna Jadrana

Crkorić, Ranko; Škaro, Krunoslav; Juračić, Mladen;

Knjiga sažetaka 4. Hrvatskog geološkog kongresa / Horvat, Marija (ur.). - Zagreb : Hrvatski geološki institut , 2010. 366-366 (ISBN: 978-953-6907-23-6).

U radu su prikazani novi rezultati istraživanja sedimenata i plitkog podmorja na nekoliko lokacija u sjevernom i srednjem dijelu Jadrana. Za istraživanje je korišten geološko-strukturni dubinomjer (Sub Bottom Profiler) kao metoda indirektnog opažanja morskog dna. S izvedenim indirektnim mjerenjima uporabom geološko-strukturnog dubinomjera (Sub Bottom Profiler), panoramskog dubinomjera (Side Scan Sonar) i višesnopnog dubinomjera (Multibeam Echo Sounder), snimljeni su karakteristični presjeci površine i pod površine morskog dna. Karakteristični primjeri zapisa su prikazani na priložima, zajedno s njihovim položajem na preglednoj karti. Prikazani primjeri na tim slikama samo su segmenti ili dijelovi trasa obuhvaćenih snimanjem površine i pod površine morskog dna. Presjeci pokazuju vrlo tanak ili nedostaju; ; i sloj recentnog (holocenskog) sedimenta u većini istraženog područja. Isto tako na nekim primjerima se dobro uočava recentna (neotektonska) aktivnost u priobalnom području. Izražene erozijske reljefne forme u podmorju ukazuju na dominaciju taložnih procesa tijekom pleistocena u priobalnom području. Penetracija akustičkog signala ograničena je po dubini zbog pojavljivanja osnovne stijene ili kompaktnih sedimenata.

Sedimenti podmorja i morfogeneza prostora između otoka Cresa i otoka Krka

Crkorić, Ranko; Škaro, Krunoslav; Juračić, Mladen;

Knjiga sažetaka 4. Hrvatskog geološkog kongresa / Horvat, Marija (ur.). Zagreb : Hrvatski geološki institut,. 366-366 (poster,domaća recenzija,sažetak,znanstveni)

U radu su prikazani novi rezultati istraživanja sedimenata i plitkog podmorja na nekoliko lokacija u sjevernom i srednjem dijelu Jadrana. Za istraživanje je korišten geološko-strukturni dubinomjer (Sub Bottom Profiler) kao metoda indirektnog opažanja morskog dna. S izvedenim indirektnim mjerenjima uporabom geološko-strukturnog dubinomjera (Sub Bottom Profiler), panoramskog dubinomjera (Side Scan Sonar) i višesnopnog dubinomjera (Multibeam Echo Sounder), snimljeni su karakteristični presjeci površine i pod površine morskog dna. Karakteristični primjeri zapisa su prikazani na priložima, zajedno s njihovim položajem na preglednoj karti. Prikazani primjeri na tim slikama samo su segmenti ili dijelovi trasa obuhvaćenih snimanjem površine i pod površine morskog dna. Presjeci pokazuju vrlo tanak ili nedostaju; ; i sloj recentnog (holocenskog) sedimenta u većini istraženog područja. Isto tako na nekim primjerima se dobro uočava recentna (neotektonska) aktivnost u priobalnom području. Izražene erozijske reljefne forme u podmorju ukazuju na dominaciju taložnih procesa tijekom pleistocena u priobalnom području. Penetracija akustičkog signala ograničena je po dubini zbog pojavljivanja osnovne stijene ili kompaktnih sedimenata.

Službene elektroničke navigacijske karte za potrebe pomorske administracije dostupne preko web-a

Bradarić, Željko;

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 21 (2010) (članak, stručni)

Službena elektronička navigacijska karta (ENC) od 1. srpnja 2012. postaje obvezno navigacijsko pomagalo za SOLAS brodove. Za prikaz i korištenje ENC-ova na brodu koristi se posebna konzola

izrađena prema izvedbenoj normi Međunarodne pomorske organizacije (IMO) jedinstvenog naziva ECDIS (Electronic Chart Display and Information System). Primjenom standarda za prikaz kartografskog sadržaja (Web Mapping Service) na webu omogućava se različitim potencijalnim korisnicima na kopnu pristup službenim ENC-ovima na osobnom računalu. U ovom radu prezentira se način upotrebe ENC-ova preko weba prema rezultatima projekta norveškog Primara u kojem je sudjelovao i Hrvatski hidrografski institut. Prezentira se i primjena servisa u pomorskim službama Republike Hrvatske.

Holocenska sedimentacija u akvatoriju luke Poreč

Škaro, Krunoslav; Bogner, Danijela;

<http://bib.irb.hr/prikazi-rad?&rad=533929>

Knjiga sažetaka 4. Hrvatski geološki kongres / Horvat, Marija (ur.). Zagreb : Hrvatski geološki institut, 2010. 37-38 (poster,domaća recenzija,objavljeni rad,znanstveni)

Okršen akvatorij luke Poreč izgrađen od jurskih i krednih vapnenaca, čije je poplavljanje započelo u periodu od 7500 do 6500 godina BP, poprima oblik poluzatvorenog obalnog područja. U cijelom području istaložen je pjeskoviti silt promjenjive debljine, a iznad njega siltozni pijesak. Siltozni pijesak istaložen je u obalnom dijelu, što je najvjerojatnije posljedica donosa krupnijih čestica s kopna, prisustva biogene komponente i erozije centralnog dijela područja uslijed djelovanja struja, ali i povećanog antropogenog utjecaja (odnošenje materijala). Pretpostavlja se da se glinoviti silt (zemlja crvenica) istaložio ispod pjeskovitog silta na cijelom području akvatorija, a njegova stvarna debljina nije utvrđena zbog ograničenog prodiranja akustičkog signala SBP-a kroz podlogu, kao i zbog ograničene duljine uzorkovanih jezgara sedimenta (do 1 m).

Jedan ozbiljan slučaj neusklađenosti između ECDIS-a i ENC-a

Bradarić, Željko; Čala, Mendi;

<http://bib.irb.hr/prikazi-rad?&rad=470254>

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 20 (2010) (članak, stručni)

Skoro sasvim slučajno otkrivena je nedosljednost između izvedbenog standarda za ECDIS i informacija sadržanih u elektroničkim navigacijskim kartama (ENC). Vrijednost dubine na izoliranim pličinama čija je vrijednost manja od područja okolnih dubina ako pri izradi ENC nije kodirana kao prepreka (Obstruction) ili dodatnom izobatom (Additional Depth Contour), nije se prikazivala na zaslonu u „standardnom“ i „osnovnom“ načinu rada ECDIS-a. Kada je IHO postao svjestan ove nedosljednosti koja ima vrlo veliki sigurnosni značaj naložio je svim članicama IHO koje izrađuju ENC da naprave žurnu provjeru svojih ENC-ova te da na otkrivenim slučajevima primjene kodiranje pličina koje će osigurati njihovo pojavljivanje na zaslonu u svim načinima rada ECDIS-a. U međuvremenu su izdavanjem navigacijskog upozorenja trebali osigurati informiranost korisnika o tom problemu. Hrvatska, tj. Hrvatski hidrografski institut odradili su sve prema uputama matične organizacije i riješili ovaj sigurnosni problem u roku od samo nekoliko dana. U ovom se radu opisuje zbog čega je nastao problem i na koji je način riješen.

Povijest publikacije „Znakovi i kratice na pomorskim kartama“ izdanja Hidrografskog instituta

Duplančić Leder, Tea; Leder, Nenad;

<http://bib.irb.hr/prikazi-rad?&rad=500639>

Geodetski list. Vol.64 (87) (2010) , 3; 193-215 (pregledni rad, znanstveni)

Povijest pomorske kartografije može se vrlo dobro pratiti na osnovi novih izdanja publikacije „Znakovi i kratice na pomorskim kartama“. U radu su prikazana sva izdanja ove publikacije za područje istočne obale Jadranskog mora, od prvog izdanja iz 1929. godine na jednom listu, pa sve do današnjeg 5. izdanja. Svako novo izdanje sadrži sve više znakova i kratica, a njegov je sadržaj usklađen sa svjetskim trendovima u pomorskoj kartografiji. Tako su pomorske karte, kao nijedna druga vrsta tematskih karata, ujednačene svuda na svijetu. Takva je ujednačenost postignuta zahvaljujući preporukama Međunarodne hidrografske organizacije, što je omogućilo korisnicima jednostavno čitanje i interpretiranje sadržaja bilo koje pomorske karte. U radu su, također, spomenuti kartografski ključevi izdanja IHO-a za izradu elektroničkih navigacijskih karata i INT karata.

Fortnightly oscillations observed in the Adriatic Sea

Vilibić, Ivica; Šepić, Jadranka; Dadić, Vlado; Mihanović, Hrvoje;

<http://springerlink.com/content/r4328r63772841n1/fulltext.pdf>

Ocean dynamics. 60 (2010) ; 57-63 (članak, znanstveni)

This paper documents the occurrence of strong fortnightly oscillations in the Adriatic Sea frequently observed in the current measurements. For that purpose, we analyzed half-decadal sea level series and long-term currents collected within different parts and layers of the Adriatic Sea. Harmonic analysis and band-pass filter with cutoff periods at 10 and 20 days have been applied to the series. The sea level M₂ tide is found to be the only significant tidal constituent over periods between the diurnal and semi-annual ones, having no significant phase variations in the Adriatic Sea. Moreover, the currents on periods between 10 and 20 days could only partially be explained by atmospheric forcing. The fact that they are in-phase with the M₂ tide gives a hint on a possible mechanism responsible for the generation of these oscillations. Additionally, these currents are usually strongly amplified during a weakly stratified season, indicating a baroclinic mechanism responsible for the multiplication of the fortnightly currents.

Prijedlog modela određivanja naklade službenih pomorskih karata

Jeličić, Tonći; Kasum, Josip; Vladislavić, Kristina;

Zbornik sažetaka / 14. međunarodno savjetovanje tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić", Senj, 37, 2010

Službene pomorske karte je nakon izdavanja potrebno održavati kako bi bile suglasne sa stvarnim stanjem u prirodi, odnosno pouzdane pri navigaciji. Održavanje se odnosi na vrijeme u kojem je karta na zalih kod izdavača, zatim na vrijeme distribucije i na vrijeme korištenja. U ovom radu će se istražiti utjecaj naklade na održavanje za vrijeme u kojem je karta na zalih kod izdavača. Svrha ovog rada je prijedlog modela određivanja naklade pojedine karte. Cilj istraživanja je smanjenje opsega održavanja na zalih, budući se radi o zahtjevnom održavanju velikog broja različitih izdanja. Koriste

se hipotetski podaci o godišnjim nakladama pojedine karte u desetogodišnjem razdoblju. Potreban parametar je i broj ispravaka po pojedinoj karti u istom razdoblju. Preporučenu nakladu se može izračunati tako da se broj ispravaka dovede u matematičku korelaciju sa nakladom karte.

Upotreba HP Latex tehnologije u izradi službenih pomorskih karata

Jeličić, Tonći; Kasum, Josip; Zjakic, Igor;

Zbornik sažetaka / 14. međunarodno savjetovanje tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić", Senj, 19, 2010

Službene pomorske karte moraju biti proizvedene tako da budu pouzdano sredstvo za navigaciju, a temeljnim zahtjevom se smatra njihova točnost. U cilju povećanja stupnja točnosti pomorske karte, umjesto tehnike umnožavanja u ofsetu, mogu se primjeniti nove tehnologije ispisa - ink-jet sustavi. Njima se omogućuje ispis po narudžbi (Print On Demand – POD). Karte proizvedene korištenjem POD postupka kvalitetom ne smiju zaostajati za klasičnom pomorskom kartom proizvedenom u tehnici ofseta na kartografskom papiru. Zato je potrebno istražiti njihove uporabne karakteristike. Ispitivanja provedena u ovom radu uključuju jednostavne praktične testove: na vodu, na kavu i na umakanje, te na vanjske utjecaje. U radu se koriste uzorci pomorskih karata dobiveni upotrebom HP Latex ink-jet tehnologije, koja koristi tehnologiju vodo-disperzivnih polimera sa pigmentiranim bojilima na bazi vode.

Upotrebljivost pomorskih karata nakon mehaničkih djelovanja na površini tiskovne podloge.

Jeličić, Tonći; Zjakic, Igor; Kasum, Josip;

MATRIB 2010., Zbornik sažetaka, Međunarodno savjetovanje o materijalima, tribologiji, recikliranju, str. 31 (stručni rad, međunarodna recenzija)

Razvoj tehnologije digitalnog tiska postavlja nove kvalitativne norme sukladne zahtjevima korisnika. Primjena novih tehnologija osim svojih prednosti, može dovesti i do neželjenih pojava koje mogu, u slučaju nepravodobnog otkrivanja, uzrokovati različite probleme i posljedice. Službene pomorske karte moraju biti proizvedene tako da budu pouzdano sredstvo za navigaciju, a temeljnim zahtjevom se drži njihova točnost. Primjena digitalnog tiska u odnosu na konvencionalni ofsetni tisak u proizvodnji pomorskih karata ima brojne prednosti, ali može uzrokovati posljedice koje mogu dovesti čak i do ugroze ljudskih života na moru. Pritom se misli na otiranje boje s otiska i samim time na gubitak sigurnosnih pomorskih informacija, što posljedično može utjecati na sigurnost plovidbe. Stoga se u ovom radu pružaju rezultati istraživanja triboloških svojstva površine papira za pomorske karte. Istraživanje se provodi u uvjetima kontakta s bojama konvencionalnih i digitalnih tehnika tiska korištenih u izradi pomorskih karata. Također će se prikazati usporedba njihovih uporabnih vrijednosti.

Pomorske nesreće i djelovanje međunarodne zajednice

Kasum, Josip; Ivančić, Paško; Stanivuk, Tatjana;

GIS Odyssey 2010 Proceedings: Space, Heritage & Future / Davorin Kerekovic (ur.). Zagreb : HIZ GIS Forum, Croatia, UNIVERSITY of SILESIA, Poland, 2010. 63-68 (predavanje, međunarodna recenzija, objavljeni rad, znanstveni).

U ovom radu za cilj istraživanja postavlja se istraživanje uzroka i posljedica pomorskih nesreća. Objasniti će se pojam pomorske nesreće, te utjecajni faktori njihova nastanka u uzročno posljedičnoj povezanosti. Pregledno će se analizirati promjene međunarodne pravne regulative i njihov očekivani utjecaj na povećanje stupnja sigurnosti plovidbe i smanjenje broja nesreća.

Hrvatski Jadran – Prirodna osnova kao temelj gospodarskog razvoja temeljenog na turizmu

Favro, Srećko; Gržetić, Zvonko; Božić Fredotović, Katja;

<http://bib.irb.hr/prikazi-rad?&rad=493329>

HRVATSKI JADRAN – PRIRODNA OSNOVA KAO TEMELJ GOSPODARSKOG RAZVOJA TEMELJENOG NA TURIZMU GOSPODARSKA REGIONALNA I TURYSTYKA IV MIĘDZYNARODOWA KONFERENCJA NAUKOW Kielce, Poljska, 2010

Bogatstvo reljefnih oblika, uvala, otoka i otočića, jedan je od privlačnih elemenata nautičko-turističke navigacije. Razvedena obala omogućuje zanimljivo krstarenje i pruža dobre prirodne zaklone. Jadransko more je duboko uvučeni zaljev Sredozemnog mora koji se pruža u smjeru SZ-JI. Istočna obala Jadranskog mora jedna je od najljepših i najrazvedenijih obala na Sredozemlju. Ovakav tip obale, prema konvenciji o pravu mora Ujedinjenih naroda, pripada takozvanim arhipelaškim morima. U unutrašnjim morskim vodama i teritorijalnom moru Republike Hrvatske nalazi se 1.246 otoka, otočića, hridi i grebena, po čemu je Hrvatska na drugom mjestu na Sredozemlju, iza Grčke. Duljina obalne crte hrvatskog dijela Jadrana iznosi 6.278 km, od čega 1.880 km otpada na obalu kopna, a 4.398 km na obalu otoka. Po razvedenosti, hrvatska obala je s koeficijentom 11, 10 na drugom mjestu na Sredozemlju, iza Grčke. U radu će se pružiti pregled hrvatskih primorskih županija, te ukazati na najznačajnija naselja i lokalitete u priobalju i na otocima. Uvažavajući specifičnosti i komparativne prednosti pojedinog područja ili arhipelaga dati će se pregled mogućnosti razvoja različitih oblika turizma. Ovakav pristup daje temelj za izradu lokalnih i županijskih planova održivog razvoja pojedinih područja temeljenog na djelatnostima koje na suvremen način valoriziraju povijesno prihvaćene vrijednosti prirodnog resursa.

Muzejsko-arhivski prostor Hrvatskoga hidrografskog instituta

Gržetić, Zvonko; Bročić, Pejo; Kordić, Ivana; Sarajlić, Emin;

2. hrvatski NIPP i INSPIRE dan i 6. savjetovanje Kartografija i geoinformacije; Opatija, 25-27. studenoga 2010; predavanje;

Hrvatski hidrografski institut Split baštini 150-godišnju tradiciju organizirane hidrografske izmjere istočne obale Jadrana, što podrazumijeva osim hidrografske izmjere morskog i obalnog područja i oceanološka istraživanja, kontinuiranu nautičku službu te izradu nautičkih karata i publikacija, a sve radi ostvarenja osnovnog cilja – sigurnosti plovidbe. Hidrografija kao grana primijenjene znanosti, bavi se izmjerom i opisom fizikalnih karakteristika navigacijskih dijelova Zemljine površine i od vitalne je važnosti za kvalitetno projektiranje i izradu pomorskih karata. Prva, na znanosti utemeljena hidrografska mjerenja na hrvatskoj obali Jadrana, izvršila je Francuska u doba Napoleona, pod

rukovodstvom Charlesa Beautemps-Beaupréa (1766–1854), francuskog hidrografa i kartografa, inženjera pariškog Spremišta karata i planova, preteči kasnijeg francuskog Hidrografskog instituta. Rezultati njegova rada temelj su kasnijih sustavnih istraživanja Jadrana u cjelini, što je i dovelo do institucionalizacije te djelatnosti osnivanjem Hidrografskog zavoda u Trstu 1860. godine. Sljednik te ustanove je Hrvatski hidrografski institut u Splitu, koji ove godine obilježava 150. obljetnicu organizirane hidrografske djelatnosti na istočnoj obali Jadrana. Kroz dugo razdoblje proizvodnje navigacijskih karata i publikacija, u HHI je izgrađen vrijedan arhiv vlastitih originala hidrografske izmjere, sondnih listova, te pomorskih karata u različitim mjerilima, i navigacijskih publikacija. U institutskom muzejskom prostoru sačuvani su instrumenti, uređaji i alati koji su bili u upotrebi u proteklom razdoblju, kao i vrijedni dokumenti, fotografije i povijesne karte, koji svjedoče o povijesnom razvoju Instituta i njegove djelatnosti. Kako se hidrografska mjerenja i izrada karata danas obavljaju novim tehnologijama koje se u potpunosti primjenjuju u HHI, a sačuvan je instrumentarij za rad iz prošlih vremena, pokrenuta je zamisao o osnivanju muzeja HHI, da bi se sačuvala uspomena na bogato kartografsko i hidrografske nasljeđe i u njemu prikazao tadašnji način hidrografske djelatnosti i izrade pomorskih karata. Postav muzeja, koji je u većem dijelu posvećen pomorskoj kartografiji, uključuje dio s povijesnim kartama, stare instrumente i alate, materijale i strojeve koji su se kroz povijest instituta upotrebljavali od hidrografske izmjere do konačnog proizvoda – pomorske karte. Tako su u muzeju izložene karte iz 17. stoljeća, atlas iz 1899., sondni listovi iz 1907., originalni rukopisi o istraživanju Jadranskog mora iz 1911., igle za graviranje, striping filmovi, stari tiskarski strojevi itd. U posljednjih nekoliko godina, pored fizičke zaštite starih originala i karata, obavlja se sustavno skeniranje na kvalitetnom skaneru, obrada i pohranjivanje podataka u digitalnom obliku. U muzeju je planiran i interaktivni dio s mogućnosti pregledavanja starih karata, te gledanja starih video zapisa iz raznih izvora: tv emisija i terenskih snimaka. Pristup postavu muzeja bit će omogućen i preko mrežne stranice. Muzej je smješten u zgradi Instituta, što daje odličnu mogućnost posjetiteljima, studentima i učenicima da na jednom mjestu upoznaju prošlost i sadašnjost hidrografskih i oceanografskih mjerenja i pomorsku kartografsku djelatnost. Uređenje muzeja HHI je pri samom kraju, a njegovo službeno otvaranje predviđeno je za početak 2011. godine. To će se poklopiti s očekivanim ulaskom Republike Hrvatske u EU, a upravo u muzeju bit će na jednom mjestu sublimiran dio zajedničke povijesti hidrografske djelatnosti europskih naroda na ovim prostorima.

Proces izrade Elektroničke navigacijske karte i klasične pomorske karte iz zajedničke baze podataka (ćelija HR400033, Šibenski kanal – 33)

Filipović, Valerija; Čala, Mendi; Strinić, Goran; Bradarić, Željko;

2. hrvatski NIPP i INSPIRE dan i 6. savjetovanje Kartografija i geoinformacije; Opatija, 25-27. studenoga 2010; predavanje;

Dosadašnja praksa Hrvatskoga hidrografskog instituta bila je izrada Elektroničke navigacijske karte (ENC) iz postojeće papirnate karate. Ta je praksa promijenjena i u radu se prikazuje proces izrade ENC-a, ćelije HR400033, prilazne pomorske karte, mjerila 1:25 000, u Mercatorovoj projekciji elipsoida WGS84, te proces izrade klasične pomorske karte Šibenski kanal – 33 iz odgovarajuće ćelije. Pomorska karta je jedno od osnovnih navigacijskih pomagala kojim se pomorac, odnosno navigator služi u plovidbi na brodu, a prikazuje dubine, vrstu dna, elevaciju, konfiguraciju i vrstu obale, opasnosti i pomoć u navigaciji. Plovidbeno područje koje je prikazano na ćeliji HR400033 (Šibenski kanal) obuhvaća prilaz luci Šibenik sa skupinom većih i manjih otoka (Prvić, Lupac, Zlarin, Drvenik, Krapanj) te ostalih otočića i hridi. Od važnih i iznimno zahtjevnih plovidbenih putova ističu se ovi

frekventni prilazi luci Šibenik: Zlarinski i Šibenski kanal te Kanal Sv. Ante. U skladu s trendom povećanja prometa krstarica (cruisera) u tome dijelu Jadrana, HHI stavlja visoki prioritet na izradu te karte. U sjeverozapadnom dijelu luke Šibenik nastavlja se plovidbeno područje prema Prokljanskom jezeru i rijeci Krki koja je i plovidbeni put prema marini i mjestu Skradin. To je područje poznato kao prilazni put prema nacionalnom parku „Krka“ prema kojem je promet jahti i malih brodova vrlo velik. Iako se na tom planu ne obrađuje područje Prokljanskoga jezera, ta prilazna pomorska karta Šibenski kanal – 33, ćelija HR400033, od posebnoga je značaja za nautički promet prema tom području. Na mrežnim stranicama www.hhi.hr nalazi se katalog nautičkih karata i ENC ćelija u GIS formatu. Katalog je razvijen na platformi Google Earth™ te se može upotrijebiti izravno s mrežnih stranica HHI-a. U njemu su prikazane sve karte i ENC ćelije s podacima o zahvatu i ostalim informacijama.

Possibilities and limitations in the development of selective forms of tourism in the Croatian archipelago Case Study – Istrian islands

Gržetić, Zvonko; Kovačić, Mirjana; Favro, Srećko;

<http://bib.irb.hr/prikazi-rad?&rad=469594>

Possibilities and limitations in the development of selective forms of tourism in the Croatian archipelago Case Study – Istrian islands FIRST INTERNATIONAL CONFERENCE ON ISLAND SUSTAINABILITY - ISLANDS 2010

Istrian islands are not inhabited, and besides two islands in Pula that have urban orientation, they have no alternative to tourism ; hence, it may be accepted that these islands may be used for daily accommodation of tourists. However, because of their specific features and position of each of the islands, it is necessary to make additional researches, taking into consideration the method of evaluation and presentation of the present situation, especially of current practice of their exploitation. In this paper, the authors point to the importance of the research and analysis for the purpose of development and valorisation of the islands. The directions of the future development have been defined as the main support to planning and decision-making. Analytical approach is of particular importance for the long-term development of Istrian tourism. The approach and methodology applied in the research are based on the analysis of data from primary and secondary sources. The data from primary sources indicate the current situation in the unique and distinct area of special importance. Primary sources data have been collected and processed in the Programme of sustainable development of the islands in the Istrian County. The authors have observed the data through their causal connection in the space, especially among selective forms of tourism and preservation of the environment, and socio-economic processes caused by the development of tourism. The secondary sources of data are various data obtained from the Croatian Bureau of Statistics (demographic and economic), marine and topographic charts, and results of multi-criteria site researches of Croatian archipelago. Methodological approach to the processing of various data (geographic, economic, ecological and sociological) through which main characteristics of effects of tourism to the space of the Croatian littoral are observed, is based on multi-criteria analysis. The aim of the research was to identify possibilities and limitations of further development and improvement of selective forms of tourism in the Istrian archipelago. On the basis of the researches and analyses and by applying theoretical knowledge, the authors have defined measures for qualitative development of selective forms of tourism.

Croatian Adriatic - natural resources as the foundation for tourism based economic development

Favro, Srećko; Gržetić, Zvonko; Božić Fredotović, Katja;

<http://bib.irb.hr/prikazi-rad?&rad=490808>

GOSPODARKA REGIONALNA I TURYSTYKA IV NIEDZYNARODOWA KONFERENCJA NAUKOW Kielce, Poljska, 2010

A wide variety of relief features, bays, islands, and islets is an attractive element of leisure navigation. Indented coastline provides opportunity for an interesting cruising, providing safe natural shelters. Adriatic Sea is a deeply indented gulf of the Mediterranean Sea extending in NW-SE direction. Eastern coast of the Adriatic Sea is among the most attractive and best indented coasts in the Mediterranean. According to the UN Convention on the Law of the Sea, such type of coastline belongs to the so-called archipelagic waters. In the internal waters and the territorial sea of the Republic of Croatia, there are 1, 244 islands, islets, and rocks, ranking Croatia second in the Mediterranean, after Greece. The length of coastline in the Croatian part of the Adriatic is 6, 278 km, out of which 1, 880 km account for the mainland coast, and 4, 398 km for island coasts. With a coefficient of 11.10, Croatian coastline is, after Greece, the second best indented coastline in the Mediterranean. This paper gives an overview of the Croatian littoral counties, pointing at major towns and localities in the coastal area and on islands. Possibilities for the development of different forms of tourism are examined, taking into consideration specific qualities and comparative advantages of a particular area or archipelago. Such approach provides a basis for drawing up local and county plans of sustainable development of particular areas based on the activities that evaluate historical issues of natural resources in a modern way.

The issue of coastal area management in Croatia- beach management

Kovačić, Mirjana; Favro, Srećko; Perišić, Mate;

<http://bib.irb.hr/prikazi-rad?&rad=490801>

CONFERENCE OLIBIA, SICILIA, ITALY : OLIBIA, SICILIA, ITALY, 2010

Croatia is well known for its sun, clear sea, many islets and peninsulas and these are, of course, the key elements in tourism development. All-Inclusive Coastal Management (AICM) in Croatia defines tourism as one of the most important economic activities in coastal areas. The beaches in Croatia have particular importance among other touristic resources. Natural beaches are scarce in Croatia ; coastal areas are mostly rocky or artificial beaches ; this makes natural beaches even more important. Local communities are entrusted with beach management ; this is the task they usually perform well, enuglfnig the principles of nature preservation and growing demand in touristic market. Ever growing demand for attractive locations and quality services demands holistic approach in beach management. This document analyzes beach management in Croatia, with the aim of emphasizing the necessity for sustainable management of coastal areas, especially beaches. Authors advocate systematic approach thru regulated legal and public institutions and suggest activities to be undertaken in order to improve the system of efficient beach management, by introducing quality criteria (efficiency level), including business communication. They stress out the implementation of System for support in decision-making (SSDM), as they see in it a solution for more efficient beach management, as well as the use of Geographic information systems (GIS).

Towards sustainable yachting in Croatian traditional island ports

Favro, Srećko; Gržetić, Zvonko; Kovačić, Mirjana;

<http://bib.irb.hr/prikazi-rad?&rad=488369>

Towards sustainable yachting in Croatian traditional island ports Environmental Engineering and Management Journal

Islands at the east coast of the Adriatic were the area with a poor local community. Tourism, especially nautical, ensures new way of life, including some bad experiences, too. Attention is given to permanent preservation of Adriatic islands and the sea, as the most valuable Croatian natural resource. The project defines joint activities of local self-government, private investors and the government aimed at the synergy which will ensure the conditions for long-term implementation of the sustainable development model. The presented model, based on the principles of sustainable development, defines development activities for improvement of nautical services in the Croatian Adriatic with results in the increase of the safety of boaters and their vessels. The implementation of such project ensures the improvement of economic and social situation of local island communities and of the entire Croatian coast.

Obalna crta u infrastrukturi prostornih podataka o moru

Duplančić Leder, Tea; Leder, Nenad;

<http://bib.irb.hr/lista-radova?autor=192292>

„III simpozij ovlaštenih inženjera geodezije - GIS, fotogrametrija i daljinska istraživanja u službi geodezije i geoinformatike, Zbornik radova, Hrvatska komora ovlaštenih inženjera geodezije, Opatija 22-23. listopada 2010, 120-125.

Jedan od važnijih zadataka hidrografa je određivanje obalne crte na terenu, a pomorskog kartografa njezino ucrtavanje na pomorske karte i planove. U ovom radu se daje definicija obalne crte koja je usvojena u Hrvatskom hidrografskom institutu na osnovi preporuke Međunarodne hidrografske organizacije (IHO) iz Monaka. Prikazane su geodetske metode snimanja obalne crte koje se koriste u hidrografskoj praksi, te mogućnosti kartiranja pomorskog dobra na pomorskim kartama i planovima. Opisani su faktori koji utječu na promjenjivost obalne crte. Istaknuto je da će se zbog evidentiranog podizanja srednje razine mora, koje je na istočnoj obali Jadrana još uvijek slabog intenziteta, u skoroj budućnosti morati izračunati nova obalna crta. Zaključeno je da bi bilo dobro u nacionalnoj infrastrukturi prostornih podataka koristiti jednu obalnu crtu, i na pomorskim i na topografskim kartama, kako bi korisnici mogli jednostavno i konzistentno referirati svoj objekt na području pojasa obalne zone.

Tisak na zahtjev – korak do potpune primjene u izdavanju pomorskih karata u Hrvatskom hidrografskom institutu

Bročić, Pejo; Sarajlić, Emin; Strinić, Goran;

2. hrvatski NIPP i INSPIRE dan i 6. savjetovanje Kartografija i geoinformacije; Opatija, 25-27. studenoga 2010; predavanje;

Današnjim načinom izrade službenih pomorskih navigacijskih karata pomoću računala, uz ispunjenje svih uvjeta kontrole u svakoj fazi izrade, provjere kvalitete i potvrđivanja podataka za službenu

objavu, te organiziranom službom za kontinuirano održavanje izrađene/objavljene karte, stekli su se uvjeti za umnožavanje/reproduciranje karte na pogodnom mediju za korisnika. Za službene pomorske karte, to je tisak na kvalitetnom kartografskom papiru koji ispunjava uvjete otpornosti na vodu, postojanosti kartografskog sadržaja na UV zrake i otpornosti na trganje (kidanje) i višestruko savijanje. Papirnate (analogne) pomorske karte u Hrvatskom hidrografskom institutu (HHI) proizvode se i još se proizvode ofsetnom tehnikom na kvalitetnom kartografskom papiru. Posljednjih godina, točnije od sredine 2008., HHI je započeo službene pomorske karte tiskati i s pomoću plotera. Takav način umnožavanja karata pokazao se vrlo pogodnim za neke karte zbog male potražnje na tržištu i zbog brzog zastarijevanja podataka na karti važnih za sigurnu plovidbu. Prednosti toga načina umnožavanja karata su: umnožava / reproducira se samo onoliko karata koliko je trenutno potrebno uz minimalni broj karata za skladište HHI, mogućnost da analogna pomorska karta bude otisnuta / iscrtana za samo 10 minuta nakon što je potvrđena, što je korisniku u današnje doba važno. Nedostaci tog načina umnožavanja karte su: nemogućnost reproduciranja većeg broja primjeraka u kratkom vremenu, kvalitetno iscrtavanje moguće je samo ako je karta izrađena u vektorskom obliku. Danas HHI može s pomoću plotera umnožiti oko 50% pomorskih karata iz cjelokupne svoje izdavačke djelatnosti. Za nekoliko godina to će biti moguće i za sve pomorske karte u izdanju HHI. Planira se i ostvarenje ideje o iscrtavanju pomorskih karata HHI izravno na mjestu prodaje, tj. kod ovlaštenih distributera, za što već sada postoje mogućnosti. Time će u potpunosti zaživjeti postupak tiskanja na zahtjev (print-on-demand), što će omogućiti korisniku da brzo i u svakom trenutku dobije ažurnu pomorsku kartu, čime će se poboljšati sigurnost plovidbe.

Tourism valorisation of lighthouses on Croatian islands and along the coast

Vuk Opačić, Tvrtko; Favro, Srećko; Perišić, Mate;

<http://bib.irb.hr/prikazi-rad?&rad=469335>

Island Sustainability / Favro, S. ; Brebbia, C. A. (ur.). - Southampton, Boston : Wessex Institute of Technology Press , 2010. 37-48 (ISBN: 978-1-84564-434-5).

On nowadays demanding tourism market Croatia wants to present itself not just as a country of classical "3S (sea, sun and sand)" tourism offer but also as a destination with great potential for the development of a more complex tourism product that would carry a development of high-quality sustainable tourism intended for an individual, more demanding, more educated, well-off and ecologically conscious tourist. "Robinson tourism", in which tourists search isolation and peace in intact environment, is becoming a very popular type of tourism in the world. Considering stressful living conditions in ecologically more polluted cities with a low life quality, the above mentioned is not a surprise. In order to enrich island and coastal tourism offer in the early 2000 a process of tourism valorisation of lighthouses began mostly on secluded locations of Croatian islands and along the coast. Due to the automation of light-mechanisms on numerous Croatian lighthouses there are less and less lighthouse keepers that opened the possibility to renovate apartments for tourists where once a lighthouse keeper and his family lived. For lighthouse maintenance and its tourism conversion Plovput Ltd. from Split is in charge. The company started this rent a lighthouse project that doesn't just bring profit but it also provides funds for reconstruction of these cultural heritage monuments built in the 19th century and the first part of 20th century. Today, due to this project 14 lighthouses have been integrated into this tourism offer. The main aim of this research is to define characteristics of Croatian lighthouses accommodation offer as well as main features of the structure and volume of a tourism flow in 2008.

Untouched nature-challenge to nautical tourism sustainable development

Favro, Srećko; Gržetić, Zvonko; Božić Fredotović, Katja;

<http://bib.irb.hr/prikazi-rad?&rad=469382>

ECOLOGICAL TOURISM: TRENDS AND PERSPECTIVES OF DEVELOPMENT IN THE GLOBAL WORD / Prof. ANDREY SELIKHOVKIN (ur.). - SAINT PETERSBURG

Croatia has one of the most beautiful and best indented coastlines in the world. The Adriatic Sea, its coastline and islands, whose values have been recognized on a global scale, should be holders of economic development of Croatia, particularly of its coastal and insular part. General orientation during the process of improvement of marina capacities should implement the protection of nature and originality of the Mediterranean cultural heritage. Protection of particular areas is still the basic method of preserving biological and landscape diversity. Protected areas make up the framework of overall protection and key nodes in the ecological network, representing refuges and depositories of biological diversity. The principles of sustainable development point at the need for a balanced use, occupancy, and development of the marine and coastal area, protecting the natural characteristic of the environment. This paper proposes the methodology and criteria to be applied when selecting particular locations and marinas for the construction of nautical tourism facilities.

Doprinos grafičke tehnologije u izradi pomorskih karata i navigacijskih publikacija Jeličić, Tonći; Gržetić, Zvonko; Kasum, Josip;

Space, Heritage & Future / Kereković, Davorin (ur.). Zagreb : Hrvatski Informatički Zbor-GIS Forum, University of Silesia, 2010. 49-60 (predavanje, međunarodna recenzija, objavljeni rad)

Prve pomorske karte izrađivane su ručno na pergamentu. Bile su trošne i osjetljive na vlagu, a iziskivale su pojedinačnu dugotrajnu izradu. Sve do pojave prvih tiskarskih tehnika ručno proizvedene karte su bile namijenjene i dostupne samo malom broju korisnika. U 15. i početkom 16. stoljeća, razvojem tehnika drvoreza te kasnije bakroreza i bakropisa, dolazi do prekretnice. Karte se tiskaju u manjim nakladama, a ručno se koloriraju u kartografskim radionicama. Razvoj grafičkih tehnika uvjetovao je i razvoj kartografske reprodukcije i tiska pomorskih karata. Sa mogućnošću brzog umnožavanja karte se nameću i kao tržišni artikl namijenjen širem krugu korisnika. Kroz 20. stoljeće, nakon izuma ofsetnog tiska, razvijena je klasična (konvencionalna) metoda izrade pomorskih karata. Korištenjem novih tehnologija izrade reproduksijskih originala, koje su uvjetovane primjenom računalne kartografije, krajem stoljeća razvila se i suvremena (digitalna) metoda. Današnji ofsetni tisak, sa svojim tehničko-tehnološkim mogućnostima, glavni je postupak tiska u kartografskoj reprodukciji. Nove tehnologije digitalnog tiska (ink-jet ispis) omogućavaju i najnoviju prekretnicu, a to je ispis pomorskih karata po narudžbi (Print On Demand - POD). Grafička tehnologija je kroz povijest davala sve bolju podršku u izradi pomorskih karata i publikacija. Prvenstveno se misli na točnost reprodukcije, kvalitetnija bojila i tiskarske podloge te skraćivanje vremena potrebnog za realizaciju, dajući tako siguran oslonac pomorskoj kartografiji i posljedično navigaciji u smislu sigurnosti plovidbe.

Record-breaking sea levels in the northern Adriatic on 1 December 2008

Pasarić, Miroslava; Čupić, Srđan; Domijan, Nenad; Leder, Nenad; Orlić, Mirko;

<http://www.ciesm.org>

Rapport du Commission Internationale pour l'exploration scientifique de la Mer Mediteranee, 39, 157.

Exceptionally strong storm surge that occurred on 1 December 2008, when record-breaking sea level was recorded in the Northern Adriatic, is analysed using sea-level data from tide gauges along the eastern Adriatic coast. The event was a result of fine tuning between the storm surge brought about by a series of synoptic atmospheric disturbances, the tide and the preexisting Adriatic basinwide seiche, all superimposed on a significant sea level rise due to the low-frequency atmospheric disturbance related to planetary waves, whereupon the local seiche activity additionally increased the sea level.

Gamma radiation and dose rate investigations on the Adriatic islands of magmatic origin

Petrinec, Branko; Franić, Zdenko; **Leder, Nenad**; Tsabaris, Christos; Bituh, Tomislav; Marović, Gordana;

<http://www.oxfordjournals.org/>

Radiation Protection Dosimetry, 1-9, doi:10.1093/rpd/ncp302.

Natural radioactivity of Middle-Adriatic Sea islands and islets was measured. Gamma spectrometric measurements, both in situ and in laboratory, as well as radon measurements in the seawater were performed. Activity concentrations and the associated dose rates due to naturally occurring ^{232}Th , ^{238}U and ^{40}K radioisotopes were determined. Dose rates calculated from in situ gamma spectrometry are in correlation with dose rates calculated from activity concentrations measured in collected samples of pebbles and rocks. In situ gamma ray spectrometry in the seawater has been performed, showing activity concentration of 220 and 240 Bq m^{-3} for ^{214}Bi and ^{214}Pb , respectively due to the presence of magmatic rocks in the seabed. The radium equivalent activity varied from 13 to 53 Bq kg^{-1} . These values are lower than the limit values, indicating that the radiation hazard is not significant. The highest mean activity concentrations of naturally occurring radionuclides in rock samples collected were found on the islands of magmatic origin.

Evolution of surface wave spectra in extreme sea states along the eastern Adriatic open sea and channel areas

Leder, Nenad; Andročec, Vladimir; Čupić, Srđan; Domijan, Nenad; Lončar, Goran;

<http://www.ciesm.org>

Rapport du Commission Internationale pour l'exploration scientifique de la Mer Mediteranee, 39, 135.

The process of formation and development of surface waves may be considered as a function of three basic variables: wind direction and speed, length of fetch over which the wind blows and duration of wind of a particular direction. Occurrence of a fully developed model of wind waves is unusual in the Adriatic Sea, which is a semi-enclosed sea of limited fetches. However, instrumental measurements and visual onboard observations of surface wave elements show that during strong gale force winds of longer fetches (SE, W, SW and NE) wave models of respectable dimensions may

be developed in the Adriatic Sea area. Absolute maximum of wave height in the Adriatic Sea $H_{max}=10.8$ m was measured in the north Adriatic (near station V1) and extreme expected value of wave height in the Adriatic is about 14 m.

Monthly and seasonal oscillations of the Eastern Adriatic Current

Leder, Nenad; Domijan, Nenad; Gržetić, Zvonko; Mihanović, Hrvoje; Mlinar, Marko;

<http://www.ciesm.org>

Rapport du Commission Internationale pour l'exploration scientifique de la Mer Mediteranee, 39, 134.

Eastern Adriatic Current (EAC) is a branch of the general Adriatic cyclonic circulation along the eastern part of the Adriatic Sea with predominant NW direction. It is well known that EAC varies seasonally, being strongest in winter and weakest in summer [1]. In 2007 the scientific and research program – „The Adriatic Sea Monitoring Program“ was implemented. A part of this program consisted of current measurements along the Croatian internal and territorial waters, during a year long period. The measurements started in November 2007 and finished in December 2008. They represent a novel to Croatian physical oceanography, incorporating the greatest number of stations up to date, as well as providing the longest time-series available.

Prognoza poplavlivanja hrvatske obale: zadatak operativne oceanologije

Leder, Nenad; Domijan, Nenad; Gržetić, Zvonko;

Zbornik radova „Hrvatska platforma za smanjenje rizika od katastrofa“, Državna uprava za zaštitu i spašavanje, Zagreb, 213-215.

U ovom radu dat je kratak prikaz spoznaja o procesima i uzrocima poplavlivanja priobalnih područja na hrvatskoj obali Jadrana. U nekim slučajevima ove se pojave mogu i prognozirati upotrebom asimilacijskih oceanografsko-meteoroloških modela. Iako u Republici Hrvatskoj postoji operativna oceanološka mreža mareografskih stanica, numerički modeli koji bi se koristili za operativnu prognozu visine morske razine još nisu razvijeni što bi bilo važno za upozorenja javnosti na mogućnost poplavlivanja.

Internet izdanje kataloga karata i navigacijskih publikacija Hrvatskog hidrografskog instituta

Strinić, Goran; Čala, Mendi; Bročić, Pejo; Višić, Boris;

Space, Heritage & Future / Kereković, Davorin (ur.). Zagreb : Hrvatski Informatički Zbor-GIS Forum, University of Silesia, 2010. 43-48 (predavanje, međunarodna recenzija, objavljeni rad)

Tijekom priprema za izradu Internet kataloga pomorskih karata i publikacija Hrvatskog hidrografskog instituta nametnula su se brojna pitanja pa tako i izazovi. Postojeći katalog u papirnatom izdanju (redakcijska inačica) bio je glavni izvor podataka. Tehnologija izrade Internet kataloga daje puno više mogućnosti nego tiskana inačica. Tako smo veliki značaj dali maksimalnom iskorištenju tehnologije da osim osnovnih informacija o kartama, korisnicima ponudimo više. Kako je istovremeno kreirana i aplikacija za Internet izdanje Oglasa za pomorce (OZP), mogućnost spajanja karte kao krajnjeg

proizvoda i publikacije koja ispravlja karte (OZP), pokazala se kao neizbježna potreba, ali i inovacija. Održavanje ova dva servisa podijeljeno je na dvije funkcionalne cjeline: unos podataka o kartama i publikacijama i unos sadržaja Oglasa za pomorce. Te funkcije su relacijski povezane a rade se u dva odjela: kartografskom i nautičkom. Djelatnici jednog i drugog odjela unose podatke u dvije baze koje se zatim povezuju, tako da za finalni proizvod imamo katalog proizvoda upotpunjen s podacima za ispravljanje karata i publikacija. Kao dodatni proizvod, u nastajanju je i GIS preglednik, odnosno Katalog navigacijskih karata i ENC-a razvijen na platformi Google Earth™ i Google Maps™. Ove dvije platforme su izabrane jer su lako dostupne i besplatne aplikacije. Skoro svi radni materijali i podaci potrebni za takvu vrstu kataloga već su prikupljeni tijekom priprema i projektiranja Internet kataloga.

Vanjski pojas Republike Hrvatske

Vokić Žužul, Marina; **Filipović, Valerija**;

Republika Hrvatska do danas nije iskoristila mogućnost uspostavljanja svoga vanjskog pojasa u Jadranu. Iako je Pomorski zakonik Republike Hrvatske iz 2004. usvojen nakon donošenja odluke o odgodi primjene njezinoga zaštićenog ekološko-ribolovnog pojasa u odnosu na države članice Europske unije, te nakon što je Italija u siječnju 2004. godine proširila svoja prava u okviru tzv. arheološke zone, u njega nisu unijete odredbe o tome pojasu nadzora, o čijoj korisnosti za našu državu ne treba dvojiti. U skladu s člankom 33. Konvencije UN-a o pravu mora, u prostoru širokom 12 milja u smjeru pučine od njezine državne granice na moru Hrvatska bi mogla obavljati nadzor radi sprječavanja i kažnjavanja kršenja njezinih carinskih, fiskalnih i zdravstvenih propisa kao i propisa o useljavanju, počinjenih na njezinome kopnenom području te u njezinim unutarnjim morskim vodama i u teritorijalnome moru. Primjena tih prava nedvojbeno bi osnažila sigurnost Hrvatske s obzirom na sve rasprostranjenije aktivnosti ilegalne trgovine i organiziranog kriminala na moru posljednjih godina. Temeljem članka 303. Konvencije o pravu mora iz 1982. unutar svoga vanjskog pojasa Hrvatska bi stekla i prava vezana uz zaštitu predmeta arheološke i povijesne naravi koji su nađeni u moru, uključujući i kažnjavanje počinitelja njihovoga neovlaštenog vađenja s dna njezinih unutarnjih morskih voda, teritorijalnoga mora i vanjskoga pojasa. Također, u prilog proglašenja vanjskog pojasa ispred hrvatskih obala govori i Konvencija UNESCO-a o zaštiti podvodne kulturne baštine iz 2001., kojom se naša država obvezala već 2004. godine. Prema članku 8. te konvencije, države stranke mogu regulirati i odobriti aktivnosti usmjerene na podvodnu kulturnu baštinu unutar svoga vanjskog pojasa. Budući da se u podmorju izvan našega teritorijalnoga mora, posebice uz njegovu vanjsku granicu, nalaze brojni arheološki i povijesno vrijedni predmeti, valjalo bi što prije usvojiti izmjene i dopune Pomorskog zakonika odredbama o vanjskom pojasu Republike Hrvatske, obuhvaćajući u njima sva prava koja u tome morskom prostoru spomenute konvencije predviđaju.

O granicama u sjevernom Jadranu (1948.-2009.) s posebnim osvrtom na kronološki kartografski prikaz

Gržetić, Zvonko; Barić Punda, Vesna; **Filipović, Valerija**;

Znanstveni skup Hrvatske akademije znanosti i umjetnosti Jadranskog zavoda Izazovi i perspektive u pomorskom pravu i pravu mora:Interesi Republike Hrvatske

Morske granice mogu biti granice pojedinih morskih prostora država ili crte razgraničenja morskih i podmorskih prostora između država, kada se obale država nastavljaju jedna na drugu ili leže sučelice. U ovome se radu analiziraju sve granice u sjevernom Jadranu, dakle granice pojedinih morskih i podmorskih prostora obalnih država, granice morskih područja između država te posebice sporna

pitanja razgraničenja između Hrvatske i Slovenije koje su pregovore započele neposredno nakon osamostaljenja, ali još uvijek nisu postigle konačno rješenje. Istraživanje polazi od 1948., kada je donijet prvi jugoslavenski propis, Zakon o obalnom moru Federativne Narodne Republike Jugoslavije, kojim su prvi puta povučene ravne polazne crte duž hrvatskoga dijela Jadranskog mora (čl.3.) i određena širina teritorijalnoga mora bivše države od 6 milja (čl. 5.) i završava sa 2009., donošenjem službenog e-Atlasa okolja Slovenije u kojemu je slovenska granica na moru (vanjska granica teritorijalnoga mora) ucrtana ispred hrvatske obale. Kronološki je dat kartografski prikaz svih granica pojedinih morskih područja obalnih država u sjevernom Jadranu, utvrđene (povučene) granice morskih i podmorskih prostora između tih država, stajališta Hrvatske i Slovenije o spornom razgraničenju te karte njihovih jednostranih akata.

Arhiva pomorskih karata i publikacija, muzej HHI u osnivanju Bročić, Pejo; Kordić, Ivana; Sarajlić, Emin;

Hrvatski hidrografski institut sljedbenik je Hidrografskog zavoda austrougarske mornarice osnovan 1860. u Trstu, što predstavlja početak organizirane hidrografske izmjere istočne obale Jadrana. Tijekom 150 godina izrade pomorskih navigacijskih karata i publikacija stvorena je vrijedna arhivska građa. Tako se danas u Hrvatskom hidrografskom institutu čuvaju pomorske karte različitih mjerila i publikacije vlastite proizvodnje, kao i karte prikupljene u razmjeni sa europskim i svjetskim srodnim institucijama, ne samo područja istočne obale Jadrana, nego i karata europskih i svjetskih obala i mora. Kako izrada karata i hidrografska izmjera neumitno stremlje novim tehnologijama, a kako bi se sačuvala kartografska baština, kao i stare metode izrade karata u Hrvatskom hidrografskom institutu je rođena ideja o osnivanju muzeja HHI. Kroz njegov postav bit će prikazane povijesne pomorske karte, stari instrumenti, pomagala i materijali korišteni nekada u procesu izrade karte od hidrografske izmjere do konačnog proizvoda. Prednost ovog muzeja, koji je u osnivanju, da se nalazi se u zgradi instituta, gdje će posjetitelji na jednom mjestu vidjeti povijest i sadašnjost pomorske kartografije.

2011

Seafarers Market

Galić, Stipe; Lušić, Zvonimir; **Pušić, Danijel**;

<http://bib.irb.hr/prikazi-rad?&rad=582444>

International Journal of New Trends in Arts, Sports & Science Education (IJTASE) / Teoman Kesercioğlu (ur.), New Trends on GLOBAL EDUCATION CONFERENCE - GEC-2011, Predavanje, Znanstveni

The education of seafarers is not the same everywhere in the world and accordingly the quality of future officers. This paper work displays the positive and negative aspects of study by faculty or through short courses. It will also show the number and percentage of active officers from various countries covering the maritime market. This work indicates that the nationality of seafarers has changed in the last few decades, and it also indicates the reason for decline of seafarers from developed countries. Also in this paper work we will analyze the quality of the education officer personnel through all kinds of short courses that meet a prescribed minimum standard which it's not on a par with the maritime colleges and academies. This analysis should indicate the main deficiencies in the existing education system, and the necessity of adopting new and more effective measures for better education, which leads to improved safety at sea.

Sedimentation in the Sea Area of the Poreč Harbour

Škaro, Krunoslav; Bogner, Danijela; **Gržetić, Zvonko**;

Proceedings of the Tenth International Conference on the Mediterranean Coastal Environment, MEDCOAST 11, E. Özhan (Editor), 25-29 October 2011, Rhodes, Grece, MEDCOAST, Mediterranean Costal Foundation, Dalyan, Muğla, Turkey, vol 2, 895 p.

The sea area of the Poreč harbour is semi-coastal area with the size of 383900m². In his hinterland there is no surface water streams, but has continual anthropogenic influence from the Neolithic to the present. Due to the late Pleistocene-early Holocene transgression that led to the creation of today's Poreč harbour which probably occurred between 7500 to 6500 years BP, a semi-closed area was formed. Geophysical researches are carried out in October 2003, and sediment samples were collected. Results of analyses imply Holocen sedimentation during which up to 8 m were deposited and coarsening of the sediments towards to coast. In the deepest layer of the core was deposited red soil (Terra Rossa) with the type of clayey silt sediments. Terra rossa soil is typical for the wider area. Her presence in the deepest layer of sediment may be autochthonous (not eroded) and was created in the ground phase, or the allochthonous that was caused due to erosion of the surrounding land, and then transported and deposited in the marine environment. It is assumed that the clayey silt (Terra Rosa) was found throughout the whole area, although its actual thickness was not determined. In the whole area sandy silt was deposited with variable thickness and above it is silty sand. Silty sand was deposited in the coastal area which is most likely due to input of coarse particles from the mainland, the presence of biogenic components and erosion of the central area due to the action of currents and the increased anthropogenic impact (dredging). The sea level rise led to coarsening of sediment particles.

Mjesto zakloništa za brodove u nevolji – još jedan primjer uspješnog usklađivanja hrvatskih s europskim propisima na području sigurnosti plovidbe
Bradarić, Željko;

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 22 (2011) (članak, stručni)

Završetkom dvogodišnjeg projekta Mjesto zakloništa za brodove u nevolji ova je kompleksna i osjetljiva problematika riješena pravno, organizacijski i tehnološki. Time je Republika Hrvatska ispunila obvezu iz Pomorskog zakonika iz 2004. te uskladila svoju regulativu prema zahtjevima iz smjernica 59/2002 Europske komisije. U ovom radu se prezentira metodološki pristup problematici, sažeto se opisuje hrvatski koncept mjesta zakloništa za brodove u nevolji i daje se prikaz rezultata projekta.

Informacije o hrvatskom VTS-u na službenim pomorskim kartama i publikacijama Bradarić, Željko;

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 23 (2011) (članak, stručni)

Implementacija VTS-a kao sustava namijenjenog praćenju, upravljanju i organizaciji cjelokupnog pomorskog prometa radi povećanja sigurnosti plovidbe, učinkovitosti pomorskog prometa i zaštite morskog okoliša, osim u tehničko-organizacijskom smislu, podrazumijeva i pružanje informacija o tom sustavu sudionicima pomorskog prometa. Priprema dopuna pomorskih karata i publikacija s informacijama o VTS-a odgovornost je i obveza nacionalnog hidrografskog ureda, koju obavlja autonomno prema normama Međunarodne hidrografske organizacije. U slučaju hrvatskog VTS-a, koji je trenutno u testnom radu, tu obvezu ima Hrvatski hidrografski institut. U ovom se radu, u svjetlu predstojećih obveza objavljivanja informacija o hrvatskom VTS-u u službenim navigacijskim publikacijama i na kartama, analiziraju relevantne norme Međunarodne hidrografske organizacije i daju primjeri prikaza informacija o hrvatskom VTS-u na papirnatim i elektroničkim kartama i publikacijama.

Ergonomski aspekt upotrebe boja na pomorskim kartama Jeličić, Tonći;

<http://bib.irb.hr/prikazi-rad?&rad=577767>

IMSC 2011. Zbornik radova 3. međunarodne konferencije o pomorskoj znanosti ISSN 1847-1498 / Mulić, Rosanda ; Gržetić, Zvonko ; Jelić-Mrčela, Gorana (ur.). - Split : Hrvatski hidrografski institut , 2011. 73-88. (predavanje, stručni, domaća recenzija)

Ergonomija je interdisciplinarno znanstveno područje u kojem se proučavaju načini optimalnog usklađivanja odnosa između čovjeka i radnog mjesta te uvjeta rada, a s ciljem humanizacije rada. U ovom radu se iz perspektive grafičke tehnologije istražuje ergonomski aspekt upotrebe boja na pomorskim kartama. Uvodno se daje teoretski dio odnosno definira se pojam ergonomije, proučavaju se ergonomski aspekti rasvjete, odnosi rasvjete i ljudskog vida, te utjecaj umjetne rasvjete na kolor percepciju. Pojašnjava se pojmovi boje odnosno bojila i doživljaja boje u ljudskom oku. U stručnom - grafičkom dijelu rada se objašnjavaju pojmovi kolorimetrija i metamerija boja. Razmatra se problem upotrebe boja na pomorskim kartama, obzirom na različite uvjete osvjetljenja tijekom plovidbe. To se odnosi isključivo na optimalan odabir i kvalitetnu reprodukciju boja, što je doprinos čitljivosti karte. U tom smislu se predlaže provođenje određenih istraživanja i prijedlog optimalne kombinacije boja, u skladu sa zahtjevima u konkretnim uvjetima radne okoline. Optimalnom upotrebom boja na pomorskim kartama se posljedično utječe na povećanje sigurnosti plovidbe.

Croatian Maritime Story as an Opportunity for Development of Sustainable Cultural Tourism

Franjić, Romana; Favro, Srećko;

<http://bib.irb.hr/prikazi-rad?&rad=569208>

Croatian Maritime Story as an Opportunity for Development of Sustainable Cultural Tourism; International journal of cultural studies and Tourism Research (2005-6133) Vol 4 (2011)

Cultural tourism in Croatia is not a well explored topic. Non-material traditional heritage is a vital part of the cultural tourism offer, and it must be properly interpreted. Non-material maritime heritage can help with the development of sustainable tourism along the Croatian coast and on the islands, and encourage full participation by local people in creating an authentic experience. This paper will point out a model that can popularize the maritime cultural treasure in an innovative way. The results of this paper will provide guidelines for including this heritage into a tourist destination product, realizing an income from tourism.

Analiza ispravaka malih karata

Vojković, Lea; Pušić, Danijel;

<http://hrcak.srce.hr/file/111822>

POMORSTVO Scientific Journal of Maritime Research 25/2(2011); Preliminary communication; pp. 227-238

Rad se bavi analizom ispravaka Malih karata i procesom održavanja karata. U procesu održavanja se uočava točnost kao najvažnija osobina pomorske karte te se uspoređuje pojam točnosti Malih karata u odnosu na druge karte. Definira se životni vijek Male karte zbog njene specifičnosti. Analizirani su broj i vrsta ispravaka na Malim kartama u jednogodišnjem razdoblju. Razrađen je problem smanjenja sigurnosti karte u odnosu na broj ispravaka.

History of publication “Symbols and abbreviations used on charts”

Duplančić Leder, Tea; Leder, Nenad;

25th International Cartographic Conference - Enlightened View on Cartography and GIS, Paris (predavanje, međunarodna recenzija, objavljeni rad, znanstveni)

History of nautical cartography can be traced on the basis of recent editions of the publication “Symbols and Abbreviations Used on Charts”. This paper examines editions of that publication covering the area of Eastern coast of the Adriatic Sea, from its first issue in 1929 published on one sheet, until these days. Every new edition includes more and more symbols and abbreviations, and its contents are consistent with worldwide trends in nautical cartography. In this way, nautical charts like no other thematic charts have been standardized all over the world. Such standardization has been achieved as a result of recommendations of the International Hydrographic Organization, to enable easier reading and interpreting of any nautical chart. The paper also refers to the IHO Symbols and Abbreviations for the production of electronic navigational charts and INT charts.

Delineation of coastline and marine SDI in Croatia

Leder, Nenad; Duplančić Leder, Tea;

25th International Cartographic Conference - Enlightened View on Cartography and GIS, Paris (predavanje, međunarodna recenzija, objavljeni rad, znanstveni)

One of major tasks of hydrographers is to delineate the coastline during the survey, and of marine cartographers to plot it to nautical charts and hydrographic survey sheets. This paper provides a definition of coastline adopted by the Hydrographic Institute of the Republic of Croatia on the basis of recommendations of the International Hydrographic Organization (IHO). The paper describes the coastlining geodetic methods used in the hydrographic practice. Factors that affect the variability of coastline are described. It has been pointed out that the mean sea-level increase recorded on the eastern Adriatic coast is still weak, but in the near future the new coastline should be calculated. The conclusion is that in the national spatial data infrastructure (NSDI) it is advisable to use one single coastline both on nautical charts and topographic maps, so that the users could easily and consistently refer their object in a coastal zone.

Selection of the location for nautical tourism ports in the area of Zadar County by applying Multi-Criteria analysis

Kovačić, Mirjana; Favro, Srećko;

<http://bib.irb.hr/prikazi-rad?&rad=531913>

4th Conference of the Adriatic forum, Zadar, Hrvatska, 16-18.09.2011 ISBN:978-953-7237-89-9

Nautical tourism is a part of general tourist phenomenon that has been significantly changing the structure and the character of tourist traffic for several years now. As a special form of recreation, nautical tourism denotes a wide area of activities. Except of satisfying its own needs, the nautical tourist often asks for a full service for its yachts. Besides this, the growing demand for permanent berths and the number of transit yachts pose new challenges to Croatia. The authors point out the importance of an even regional development as the basis for the economic development of Croatia. Underdeveloped areas, especially in Croatian islands are permanent factors that slow down the progress and the development of the community and the problem has to be solved by applying scientific bases. The authors are exploring possibilities for the development of nautical tourism in the area of Zadar County taking into consideration natural preconditions as well as other conditions for its development. A reached level of nautical tourism development in the area of the County is being analysed and new locations for construction of nautical tourism ports are being defined. Construction of nautical tourism port demands a complex analysis of location factors especially institutional restrictions and ecological demands of the area. The authors emphasise multi-criteria approach in selecting the location for nautical tourism ports as well as explain methods of multi-criteria analysis. They also define the criteria for the selection of the location and present the results of the survey.

Croatian maritime story as a opportunity for development of sustainable cultural tourism

Franjić, Romana; Favro, Srećko;

<https://bib.irb.hr/prikazi-rad?&rad=531915>

12th International Joint World Cultural Tourism Conference Istanbul, Turska 07-09.10.2011

Thanks to its natural and geographic characteristics, one of the most beautiful archipelagos in the world, indented deeply into the European continent, Croatia nurtures a centuries old experience of a tourist receptive country. The aristocratic experience of country-living during the rule of the Austrian-Hungarian Monarchy recognized a significant potential of the Croatian Adriatic region, and it based the affirmation of Croatia as a tourist destination primarily on the natural beauties of pristine environment, as well as a pleasant Mediterranean climate. Cultural tourism in Croatia is not a well explored topic, especially since its base is non-material cultural goods. Non-material traditional heritage is a vital part of the cultural tourism offer, and it must be properly interpreted in order to serve a purpose as an additional asset to the cultural tourism offer. Non-material maritime heritage can help with the development of sustainable tourism along the Croatian coast and on the islands, as well as encourage full participation by local people in creating an authentic experience and preservation of the unique aspects of tradition in coastal destinations. This paper will point out a model that can popularize the maritime cultural treasure, which would otherwise remain unused and familiar only to a handful of people, in an innovative way. In such a way, cultures are brought together, cultural anathemas are crushed, and people are united. Respecting the aforementioned, the execution, or implementation, has been recognized as a critical step in managing sustainable tourism, because sustainable cultural tourism will, in practice, only be as effective as the implementation itself (Go i dr. 1992). The results of this paper will provide guidelines for including this heritage into a tourist destination product, with a goal of realizing an income from tourism, whilst managing the sustainable development of tourism in which cultural goods are converted into economic goods without changing them significantly.

Picoplankton composition related to thermohaline circulation: The Albanian boundary zone (southern Adriatic) in late spring

Šilović, Tina; Ljubešić, Zrinka; **Mihanović, Hrvoje**; **Olujć, Goran**; Terzić, Senka; Jakšić, Željko; Viličić, Damir;

<http://www.sciencedirect.com/science/article/pii/S0272771410004129>

Estuarine, Coastal and Shelf Science. 91 (2011); 519-525 (članak, znanstveni)

Picoplankton distribution at the boundary zone of the southern Adriatic in May 2009 on a 75 km long shelf-continental slope transect was assessed by combining epifluorescence microscopy, flow cytometry and high-performance liquid chromatography data with hydrographic observations. The picoplankton distribution was greatly influenced by the hydrographic conditions prevailing in the southern Adriatic because of the influence of the Levantine Intermediate Water (LIW) and East Adriatic Current (EAC) forcing. Heterotrophic bacteria numerically dominated the picoplankton community through the entire transect with no significant accumulation. By contrast, picophytoplankton accumulated in the 50–75 m layer, forming a pronounced deep chlorophyll maximum. Synechococcus dominated the photosynthetic picoplankton, whereas picoeukaryotes were the least abundant. The intrusion of warm LIW observed in the layer between 100 and 350 m was followed by Prochlorococcus and Synechococcus peaks (10×10^3 cells mL⁻¹ and 90×10^3 cells mL⁻¹, respectively), as well as by the appearance of two Synechococcus ecotypes. Most picoeukaryotes were observed at the offshore stations, where geostrophic current calculation revealed the strongest EAC influence. A strong EAC spread over the central and eastern basin

created a barrier for *Prochlorococcus*, whereas the picoeukaryote maxima coincided with the core of the EAC, suggesting its persistence to hydrological instabilities.

Phytoplankton distribution across the southeast Adriatic continental and shelf slope to the west of Albania (spring aspect)

Viličić, Damir; Šilović, Tina; Kuzmić, Milivoj; **Mihanović, Hrvoje**; Bosak, Sunčica; Tomažić, Igor; **Olujić, Goran**;

<http://www.springerlink.com/content/q052j655p2784207/>

Environmental Monitoring and Assessment Volume 177, Numbers 1-4, 593-607, DOI: 10.1007/s10661-010-1659-1 (znanstveni rad)

We present the first insight to the oceanography of the southeastern Adriatic Sea, where coastal water influenced by Albanian rivers comes into contact with the inflowing oligotrophic Eastern Adriatic Current (Ionian Surface Water and Levantine Intermediate Water). A distinct plankton distribution was observed on each side of the shelf break hydrographic boundary in May 2009, during gradual warming of the surface waters. The prochlorophytes accumulated along the nutricline above the shelf and continental slope. The phosphorus limited inshore waters were dominated by a small diatom *Chaetoceros circinalis*, dinoflagellates, cryptophytes, autotrophic picoplankton, and heterotrophic nanoplankton. The offshore surface layer was characterized by bigger nanoplankton (coccolithophorids, green flagellates). Low nutrient concentrations influence relatively low productivity not only above the Albanian shelf but also further to the north along the Montenegrine and Croatian coastal Adriatic Sea.

Using Self-Organising Maps to investigate long-term changes in deep Adriatic water patterns

Vilibić, Ivica; Mihanović, Hrvoje; Šepić, Jadranka; Matijević, Slavica;

<http://www.sciencedirect.com/>

Continental shelf research (0278-4343) 31 (2011); 695-711, znanstveni rad

The paper attempts to document long-term changes in deep Adriatic water patterns by applying the Self-Organising Maps (SOM) method to temperature, salinity, dissolved-oxygen content, orthophosphate and total inorganic nitrogen profiles sampled at a single deep station in the South Adriatic Pit (SAP) over a half century (1957–2009). Seasonality observed in upper layers has been removed by the least-squares fitting of the annual and semi-annual sinusoidal functions. The sensitivity of the SOM to various parameter combinations reveals the importance of temperature, salinity and dissolved oxygen for mapping different water patterns, while nutrients have less influence on quality and applicability of SOM solutions to the extraction of characteristic SAP water profiles. The quality of fit obtained for different combination of the measured parameters introduced to a SOM suggests that the incomplete combinations of input parameters increase an imperfection in the applicability of SOMs to the dataset. Two modes of long-term changes in the SAP obtained by the SOM analyses are discussed with respect to the processes that drive the variability in the area, e.g., the Adriatic-Ionian Bimodal Oscillation: where the first mode is characterised by rapid changes in the transition of SAP water masses, observed before 1980s (less adoptable by the SOMs), and the second mode is characterised by steady transitions (better adoptable by the SOMs), observed in the 1990s and the

2000s. The SOM method is found to have certain advantages when compared to other methods that have previously been used to distinguish the Adriatic water masses, as it does not depend on predefinition of water mass sources and allows for gaps in series.

Diurnal upwelling resonantly driven by sea breezes around an Adriatic island

Orlić, Mirko; Beg Paklar, Gordana; Dadić, Vlado; **Leder, Nenad; Mihanović, Hrvoje**; Pasarić, Miroslava; Pasarić, Zoran;

<http://www.agu.org/pubs/crossref/2011/2011JC006955.shtml>

Journal of geophysical research. 116 (2011) ; C09025-1-C09025-10 (članak, znanstveni)

Diurnal coastal upwelling was previously observed when sea breezes were exceptionally strong, or when the process occurred close to critical latitudes (30°N, 30°S) where local inertial oscillations may be resonantly excited. Our data collected in the Adriatic show that the pronounced diurnal upwelling is also possible under milder wind-forcing and outside critical latitudes. It is found that the thermocline recorded in the summer of 2006 at the south coast of the island of Lastovo was subject to diurnal variability with a maximum range of about 30 m, and that the corresponding currents measured off the west coast of the island pointed to internal waves propagating around the island in a clockwise direction. We suggest that the summertime stratification occasionally promotes coastal waves that revolve daily around the island, creating the conditions needed for resonant excitation by sea breezes. Numerical modeling reveals that the 24-h waves are trapped around the island due to the influence of both the Coriolis force and bottom slope, and that the 12-h waves radiate away from the island. The biogeochemical data show that the diurnal upwelling may stimulate primary production in the area but may also adversely affect benthic organisms.

Surface current patterns in the northern Adriatic extracted from high-frequency radar data using self-organizing map analysis

Mihanović, Hrvoje; Cosoli, Simone; **Vilibić, Ivica**; Ivanković, Damir; Dadić, Vlado; Gačić, Miroslav;

<http://www.agu.org/pubs/crossref/2011/2011JC007104.shtml>

Journal of Geophysical Research. 116 (2011) ; C08033-1-C08033-14 (članak, znanstveni)

A network of high-frequency (HF) radars was installed in the northern Adriatic in the second half of 2007, aimed to measure surface currents in the framework of the North Adriatic Surface Current Mapping (NASCUM) project. This study includes a detailed analysis of current measurements from February to August 2008, a period in which three radars were simultaneously operational. Current patterns and temporal evolutions of different physical processes were extracted by using self-organizing map (SOM) analysis. The analysis focused on subtidal frequency band and extracted 12 different circulation patterns on a 4 × 3 rectangular SOM grid. The SOM was also applied on a joint data set that included contemporaneous surface wind data obtained from the operational hydrostatic mesoscale meteorological model ALADIN/HR. The strongest currents were recorded during energetic bora episodes, being recognized by several current patterns and having the characteristic downwind flow with magnitudes exceeding 35 cm/s at some grid points. Another characteristic wind, the sirocco, was represented by three current patterns, while the remaining current structures were attributed to weak winds and the residual thermohaline circulation. A strong resemblance has been found between SOM patterns extracted from HF radar data only and from

combined HF radar and wind data sets, revealing the predominant wind influence to the surface circulation structures and their temporal changes in the northern Adriatic. These results show the SOM analysis being a valuable tool for extracting characteristic surface current patterns and forcing functions.

Prijedlog modela primjene HP-Latex tehnologije ispisa u izradi službenih pomorskih karata

Jeličić, Tonći; Strinić, Goran; Sarajlić, Emin; Pogančić, Milivoj;

15. međunarodna konferencija tiskarstva, dizajna i grafičkih komunikacija Blaž Baromić 2011, Senj, Zbornik radova, ISBN 978-953-56838-1-0, str. 340-352

Ubrzani razvoj novih tehnologija tiska postavlja i nove kvalitativne norme u cilju ispunjavanja uporabnih zahtjeva pojedinih grafičkih proizvoda. Naime, primjena novih tehnologija osim svojih prednosti može dovesti i do neželjenih pojava koje mogu uzrokovati različite probleme i posljedice. Za potpunu primjenu digitalnog umjesto konvencionalnog tiska u proizvodnji pomorskih karata, potrebno je ispitati kvalitetu otisaka kako bi se minimalizirala mogućnost gubitka sigurnosnih pomorskih informacija, što posljedično može utjecati na sigurnost plovidbe. Zato su proteklih nekoliko godina u Hrvatskom hidrografskom institutu provedena istraživanja s ciljem primjene HP-latex tehnologije ispisa u izradi službenih pomorskih karata. U ovom se radu daju rezultati provedenih istraživanja i prijedlog modela primjene HP-latex tehnologije u praksi.

Usporedba simulacijskog modela sa stvarnim događajem izlijevanja nafte sa broda „Tin Ujević“ u gradskoj luci Split 22. ožujka 2010. godine

Pušić, Danijel; Popović, Ružica; Bićanić, Zlatimir;

Zbornik radova Ekologija i saobraćaj / Jusufrić, Ibrahim (ur.). Travnik (Vlašić) : Internacionalni univerzitet Travnik, 2011. (predavanje, međunarodna recenzija, objavljeni rad, znanstveni)

Onečišćenje mora je izravno ili neizravno unošenje tvari ili energije u morski okoliš. To prouzrokuje ili može izazvati pogubne posljedice na životne uvjete u moru, uz smetnje pomorskim djelatnostima, pogoršanje uporabne kakvoće morske vode i smanjenje privlačnosti morskih predjela. Za računalno predviđanje koristilo se programe GNOME (General NOAA Oil Modeling Environment) i ADIOS 2 (Automated Data Inquiry for Oil Spills). To su besplatni računalni programi, a koriste se za predviđanje utjecaja meteoroloških (vjetar), oceanografskih (struja) i drugih dinamičkih procesa na gibanje i širenje izlijevenih ulja na morsku površinu. Također i za predviđanje vremena izlijevanja iz brodskih tankova/spremnika, količine izljevene tekućine te drugih parametara. Stvarni događaj je izlijevanje dizelskog ulja sa m/t Tin Ujević, koje dogodilo 22. ožujka 2010. u putničkoj luci u Splitu. U radu se obavlja simulacija temeljem vrijednosti parametara koje vladale su na dan samog incidenta. Isto tako predstavlja se i način kako u naprijed predvidjeti gibanje ulja po morskoj površini u slučaju iznenadnog onečišćenja mora, kako kemijske i fizikalne promjene razlijevenog ulja mogu utjecati na okoliš, te kako unaprijed i pravovremeno reagirati u mogućim slučajevima.

Pomorski promet i nezgode na hrvatskom dijelu Jadrana

Lušić, Zvonimir; Pušić, Danijel; Galić, Stipe;

U radu će se analizirati pomorski promet i nezgode na hrvatskom dijelu Jadrana. Prikazati će se statistika prometa, pomorskih nezgoda, te njihovi međusobni odnosi tijekom zadnjih nekoliko godina. Pored statistike pomorskog prometa analizirati će se i mjere usmjerene prema povećanju stupnja sigurnosti pomorskog prometa, tj. mjere do sada uspostavljene, mjere koje se mogu očekivati u skoroj budućnosti, te ostale raspoložive mjere koje općenito mogu povećati stupanj sigurnosti pomorske plovidbe. Provedena analiza trebala bi ukazati na najvažnije nedostatke postojećeg sustava sigurnosti, te nužnost donošenja novih i učinkovitijih mjera za smanjenje nezgoda brodova i njihovih posljedica.

Nautical Tourism in Fostering the Sustainable Development : A Case Study of Croatia's Coast and Island

Kovačić, Mirjana; **Gržetić, Zvonko**; Bošković, Desimir;

http://www.chios.aegean.gr/tourism/VOLUME_6_No1_art12.pdf

Tourismos. 6 (2011) , 1; 221-232 (članak, znanstveni)

Sustavno i pregledno u radu se analizira gospodarski, socijalni i ekološki aspekt razvoja nautičkog turizma. Istražuju se problemi smještaja i izbora lokacije nautičke luke, te definiraju ekonomsko-politički i socio-kulturni činitelji. Posebno se naglašava važnost ravnomjernog razvoja luka nautičkog turizma kao temeljne odrednice integralnog upravljanja pomorskim dobrom. Zbog svojih višestrukih multiplikativnih učinaka nautički turizam je jedna od najznačajnijih grana turizma koja u Hrvatskoj ima velike mogućnosti razvoja. Poradi toga je istraživanje nautičkog turizma kao sustava značajno za planiranje razvojnih usmjerenja te praćenje učinaka aktivnosti poduzetih u cilju poboljšanja nautičkog proizvoda, a time i ukupnih gospodarskih učinaka od nautičkog turizma. U radu se ukazuje na važnost sustavne valorizacije nautičkih potencijala na načelima održivog razvoja te poticanje i podizanje nautičke ponude na višu razinu. Naglašava se potreba povećanja kapaciteta luka nautičkog turizma, posebno na hrvatskim otocima, čime se pridonosi povećanju standarda stanovništva u priobalnom području. Pritom se razvojni proces mora temeljiti na uvažavanju načela organizacije prostora i potreba ljudi koji žive i rade na prostoru nautičke destinacije. Primjena načela održivog razvoja pri planiranju prostornog smještaja luka nautičkog turizma ogleda se u potrebi da se razumiju vrijednosti i snage utjecaja brojnih činitelja na životno okruženje, posebice na okoliš.

Standard For Encryption And Security Electronic Navigation Charts

Pušić, Danijel; Kos, Serđo;

Global Navigation Satellite Systems – GNSS is considered a basic component in the reliable operation of electronic navigational charts. The appropriate communication connections essential for security held encryption. For the protection of official electronic charts, accepted standards of data protection and security plan was adopted. This paper will clearly analyze the way to protect the official electronic charts analyzing standard S-63 e 1.1. adopted by the International Hydrographic Organization – IHO.

Danube Story of the Vučedol Orion - Transmodern Cultural Tourism and the Transformational Power of Myth

Franjić, Romana; **Favro, Srećko**;

<http://bib.irb.hr/prikazi-rad?&rad=531910>

Contemporary Trends in Tourism and Hospitality, 2011 Stojkov, Novi Sad , 2011. 54-55 (ISBN: 978-86-7031-233-3)

The human need to travel is a fundamental need, we are all nomads at heart, but modernism and corporate culture have developed unnatural rules that separate us from ourselves. The deep rootedness of such a conquering approach is still visible today, because Europeans and European understanding of tourism is a dominant form ; eighty percent of all the world's travellers are from only a dozen countries, which we call highly developed. Therefore, tourism is an aspect of modernisation which is homogenising the world. It is therefore important that, on those journeys, tourists see opportunities to escape from everyday life and its imposed structures. Such tourism has great transformational power, as it truly brings together different cultures and worldviews, whilst offering possibilities of permeation as well as opening of the human heart and soul. Throughout history, the Podunavlje region has always been a crossroads as well as point of contact for a variety of different peoples who subsequently left behind a part of their rich cultural heritage. The cosmology of the Vučedols ancient people, which today, in the atmosphere of nearing 2012 and the prophecy of the Mayan energetic calendar, has an especially attractive place in the global offering of cultural tourism. This will be brought to mind through mythological stories and the symbolic language of the ancient calendar, the Vučedol Orion. Through cultural observation, this paper will show the model of interpretation, which views the calendar through the symbolic language of myth, as a result of a particular era, but also as a process of human creativity, which currently exists in a sense of its absolute or universal values. The Vučedol Orion and the riverbanks of the Danube has becomes an essential tourist attraction with a strong potential for the development of cultural tourism. Familiarity with the calendar retains a high degree of civilizational achievements, and the ability to calculate the passage of time which had a significant influence on the everyday life of the people.

Jadranski web preglednik hrvatskog hidrografskog instituta kao doprinos razvoju nautičkog turizma

Panžić, Tonći; Strinić, Goran;

3rd INTERNATIONAL MARINE SCIENCE CONFERENCE - IMSC 2011

Nautički turizam zbog svog značaja i dugogodišnjeg rasta (radi održavanja takvog trenda) zaslužuje dodatno ulaganje u kvalitetu pruženih informacija za nautičare. Izrada internetskog preglednika na kojem bi se nalazile sve važnije informacije za ciljanu skupinu domaćih i stranih nautičara doprinijela bi poboljšanju ponude hrvatskog nautičkog turizma a posredno i sigurnosti plovidbe. Hrvatski hidrografski institut najprikladnija je javna institucija za prikupljanje, objavu i ažuriranje tih informacija.

Tide Gauge Network of the Hydrographic Institute of the Republic of Croatia

Čupić, Srđan; Strinić, Goran; Mihanović, Hrvoje; Domijan, Nenad;

Mipro 2011 - GVS, Proceedings; Petar Biljanović, Karolj Skala - 2011 (međunarodna recenzija, predavanje); str. 339-341 ISSN 1847-3938 ISBN 978-953-233-060-1

Sea level measurements at the tide gauge stations on the eastern Adriatic coast have been conducted for many years. Hydrographic Institute of the Republic of Croatia has modernized its tide gauge network by installing Thalimedes digital instrument. Communication with tide gauge stations is performed through GSM network. Data are collected automatically on a daily basis, but there is a possibility of more frequent data collecting in special situations, such as possible flooding of the coastal area, emergency meteorological situations, assessment of risk to people and their property, as well as scientific and technical investigations. First check of the data integrity (communication availability of tide gauge stations, time gaps sequences...) is automatically performed. If a problem occurs, the system warns administrators about possible errors. The analysed data are prepared to be displayed on the HHI website. The website is currently being designed and developed for the display of predicted and measured sea level heights on the eastern Adriatic coast, and the first results are presented in this paper. Tide gauge measurements and the data obtained from such measurements are important for the safety of navigation, marine construction works, the development of oceanographic models, and for the international data exchange.

Distributed System for Remote Wave Data Collection and Visualization as a Part of Operational Oceanography in Croatia

Strinić, Goran; Čupić, Srđan; Domijan, Nenad; Leder, Nenad; Mihanović, Hrvoje;

http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5967069

Mipro 2011 - GVS, Proceedings; Petar Biljanović, Karolj Skala - 2011 (znanstveni rad, međunarodna recenzija, predavanje); str. 335-338 ISSN 1847-3938 ISBN 978-953-233-060-1

Hydrographic Institute of the Republic of Croatia has modernized its oceanographic equipment by obtaining DATAWELL DWR MKIII waverider, 0.7 m in diameter, with possibilities of measuring the wave height, direction and period. Waverider is placed in the survey area by laying it into the sea and anchoring it to the sea bottom. An anchored waverider has a certain freedom of motion. Because of the risk of losing the equipment, the HHI has developed the SMS system of alarm and graphic representation of the buoy motion in Google Earth™ application, which facilitates the buoy tracking and searching for a potentially lost buoy. The paper also describes communication technologies and methods of remote data collection and production of safety copies. Sensor of the wind speed and direction is usually installed when conducting wave measurements. By simultaneous collection of the waverider data and the wind direction and speed data, the correlation equations between parameters can be established for each location. The measured and analysed waverider data are essential input parameters for numerical models, also being important for designing coastal and marine structures, as well as for the safety of navigation at sea.

2012

Transport of dangerous substances in specific terms specialized agencies

Tadić, Joško; Bićanić, Zlatimir; **Pušić, Danijel**;

<http://bib.irb.hr/prikazi-rad?&rad=628732>

IMSC 2012 - 4. Međunarodna konferencija o pomorskoj znanosti / Mulić, Rosanda ; Gržetić, Zvonko ; Vidan, Pero ; Kuzmanić, Ivica (ur.). - Split, Predavanje, Međunarodna recenzija, Znanstveni

Transportation of hazardous substances can be done with various forms of transportation and the quality is determined by appropriate legal regulations. However, the transportation of hazardous cargo specifically, is significantly different from other modes of transportation. This paper aims to present some features in the transport of dangerous goods for this particular specialized service which could be used for the military, police, scientific research institutions, energy and other economic activities. The military component of NATO and all the corresponding parameters, for example, has means of transport, types of hazardous materials (packaging, marking, labeling), safety requirements, organization and control procedures during transport across national borders and more. Similar modes are used in most militaries.

Sustav nadzora pomorske plovidbe

Pušić, Danijel; Vojković, Lea; Bićanić, Zlatimir;

<http://bib.irb.hr/prikazi-rad?&rad=618554>

Zbornik radova Internacionalni Univerzitet Travnik / Jusufrić, Ibrahim (ur.). - Travnik - Vlašić, Bosna i Hercegovina : Internacionalni univerzitet Travnik , 2012. 235-253. Međunarodna recenzija, Znanstveni

Sustav nadzora plovidbe - Vessel Traffic Service (VTS) je usluga koju organizira i provodi nadležno tijelo s ciljem poboljšanja sigurnosti i učinkovitosti poslovanja i prometa broda kako bi zaštitili okoliš. S obzirom na to da se VTS-om uspostavlja interakcija sudionika pomorskog prometa, a prije svega zapovjednika broda i/ili časnika u plovidbenoj straži s operaterima u VTS centrima, vrlo je važno da sve informacije relevantne za uspješnu interakciju budu dostupne sudionicima u pomorskom prometu na jasan i precizan način. U tom segmentu uspostave VTS-a ključnu ulogu imaju nacionalni hidrografski uredi koji relevantne informacije o tehničkim i organizacijskim elementima VTS-a donose na odgovarajući način u službenim navigacijskim kartama i publikacijama.

Izazovi implementacije ECDIS-a

Bradarić, Željko;

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 24 (2012) (članak, stručni)

Od 1. srpnja 2012. započinje implementacija obveze opremanja određenih vrsta i veličine brodova ECDIS-om kao primarnim sredstvom za navigaciju. Uvođenje svakog novog uređaja ili sustava na brodu zahtijeva određene pripremne aktivnosti od strane nadležne administracije, brodarka i posade broda. U višegodišnjem razdoblju odobravanja ECDIS-a potvrđen je doprinos sustava sigurnoj i učinkovitoj plovidbi broda. ECDIS kao dio integriranog morskog sustava predstavlja revolucionaran preokret u vođenju navigacije u odnosu na dosadašnji način. S obzirom na sigurnosnu važnost ECDIS-a i činjenicu da se ne radi samo o jednostavnoj instalaciji nekog novog hardvera radi ispunjavanja

propisanih zahtjeva, u ovom se radu analiziraju i prezentiraju određene aktivnosti nadležnih tijela koje bi trebalo provoditi s ciljem uspješne implementacije i upotrebe ECDIS-a.

Otkrivanje i rješavanje mogućih nedostataka ECDIS-a

Bradarić, Željko;

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 25 (2012) (članak, stručni)

Opremanje brodova ECDIS-om započelo je znatno ranije nego što je to postalo obvezno od 1. srpnja 2012. Unatoč preduvjetu potpune pouzdanosti prije uvođenja obveze opremanja brodova novim uređajima, tijekom upotrebe ECDIS-a otkriveni su određeni nedostaci. Uočeno je da neki ECDIS uređaji, posebno oni ranije instalirani, ne prikazuju ispravno sadržaj ENC-ova, a u nekim slučajevima čak ni značajne sigurnosne navigacijske podatke. Problem je povezan s potrebom povremenog ažuriranja softvera ECDIS-a kako bi mogao prikazivati novije verzije ENC-ova. Nadležne međunarodne organizacije poduzele su konkretne mjere koje bi trebale pomoći u otkrivanju i eliminiranju uočenih nedostataka. U ovom radu daje se pregled poduzetih mjera s naglaskom na mogućnost i način testiranja ispravnosti rada ECDIS-a. Prikazuju se i rezultati provedenog testiranja korištenjem testnih ENC ćelija IHO-a.

Potrebe i mogućnosti uspostavljanja stalnog sustava mjerenja valova u Hrvatskoj
Mlinar, Marko; Lakoš, Miro; Čupić, Srđan; Strinić, Goran; Domijan, Nenad; Leder, Nenad; Gržetić, Zvonko;

http://www.duzs.hr/download.aspx?f=dokumenti/Clanci/Radovi_IV_Konferencija_HP.pdf

Četvrta konferencija Hrvatske platforme za smanjenje rizika od katastrofa, MMPI, Zagreb, prosinac 2012 (stručni, predavanje, objavljeno u zborniku)

Karakteristike valova mora (visina, smjer, period, snaga...) u današnje se vrijeme mjere diljem svijeta. Broj potencijalnih korisnika ovakve informacije raste svakim danom. Nekad su potrebne informacije o valnoj klimi (za projektiranja obalnih struktura, energetske postrojenja, brodogradilišta itd.) ili informacije o trenutnoj visini vala na određenoj lokaciji, a nekad prognoza visine valova (prilikom ekstremnih i opasnih događaja, npr. za procjene zabrane isplovljenja, zatvaranja luka, spašavanja na moru ili svakodnevno pri planiranju rute plovidbe trgovačkih, putničkih, odnosno turističkih brodova). Hrvatski hidrografski institut posjeduje veći dio potrebne opreme (direkciono valografe), bavi se mjerenjima valova preko 30 godina, te ima iskustvo kako organizirati, održavati i upravljati mogućom valografskom mrežom koja bi bila uspostavljena u teritorijalnim vodama RH i međunarodnim vodama Jadranskog mora. Dobiveni podaci koristili bi se za verifikaciju i kalibraciju prognostičkih valnih modela kako bi se povećala sigurnost plovidbe na moru.

Periodi vlastitih oscilacija u akvatorijima Bakra, Malog Lošinja, Ista, Starog Grada i Vela Luke

Lončar, Goran; Leder, Nenad; Paladin, Marin;

Hrvatske vode : časopis za vodno gospodarstvo. 20 (2012) , 82; 201-210 (članak, stručni)

Provedena je numerička analiza vlastitih perioda za akvatorije Bakarskog zaljeva, Luke Mali Lošinj, Široke uvale na otoku Istu, Starigradskog zaljeva i Zaljeva Vela Luka. Korišteni su dvodimenzionalni numerički modeli zasnovani na metodama konačnih razlika i konačnih volumena. Korištena su tri modela konačnih razlika. Prvi model rješava sustav jednačbi plitkoga fluida (shallow water equation SWE-FD). Drugi model rješava sustav jednačbi blagog nagiba u frekventnoj domeni (elliptic mild slope wave equation, EMS) a treći model rješava sustav jednačbi Boussinesove valne jednačbe u vremenskoj domeni (Boussines wave equation, BW). Modeli SWE-FD i EMS na otvorenim granicama koriste prisilni rubni uvjet u vidu kontinuiranog i pravilnog sinusoidalnog vala s valnom visinom 0.01m. Vlastite periode definirane su kao lokalni ekstremi u funkciji pojačanja gdje je pojačanje izraženo kao omjer valnih visina u pojedinoj točki akvatorija u odnosu na valnu visinu prisilnog rubnog uvjeta. Na otvorenim granicama BW modela primijenjen je sinusoidalni prirast razina od 0 do +0.01m tijekom 180s, te zadržavanje postignute razine od +0.01m tijekom nastavnog perioda od 12h. Na polje brzina primijenjen je radijacijski rubni uvjet koji nakon početno unesenog poremećaja omogućuje formiranje slobodnih oscilacija u modelskim domenama te definiranje spektra snage upotrebom FFT analize. Korišteni model konačnih volumena rješava sustav jednačbi plitkoga fluida (shallow water equation, SWE-FV) te na otvorenim granicama koristi isti prisilni rubni uvjet kao i model SWE-FD. Rezultati numeričkih analiza uspoređeni su s rezultatima in-situ mjerenja. Numeričkim modelima detektirane vlastite periode u suglasju su s rezultatima mjerenja a najveći stupanj korelacije između izmjerenih i modeliranih rezultata postignut je modelom BW.

Razvoj grafičke tehnologije i unapredjenje izdavačko-tiskarske djelatnosti hidrografskih organizacija

Jeličić, Tonći; Kasum, Josip; Pogančić, Milivoj;

<http://bib.irb.hr/prikazi-rad?&rad=602549>

Zbornik sažetaka 16. međunarodne konferencije tiskarstva, dizajna i grafičkih komunikacija / Mikota, Miroslav (ur.). Zagreb : Hrvatsko društvo grafičara, 2012. 319-336 (poster, međunarodna recenzija, objavljeni rad, znanstveni).

Izdavačko-tiskarska djelatnost jedna je od osnovnih djelatnosti hidrografskih organizacija. Kao doprinos njenom razvoju i unapređenju objavljeno je više stručnih i znanstvenih radova. Razvoj tehnologije grafičke pripreme i reprodukcije pomorskih karata i navigacijskih publikacija i posljedično unapređenje publikacija u izdavačkom smislu značajan su doprinos povećanju sigurnosti plovidbe.

Accuracy of coordinate transformations in GIS and AIS systems - Example of the Adriatic Sea

Duplančić Leder, Tea; Leder, Nenad;

<http://bib.irb.hr/prikazi-rad?&rad=584070>

4th International Maritime Science Conference, Book of Proceedings / Rosanda Mulić, Gržetić, Zvonko, Pero Vidan, Ivica Kuzmanić (ur.). Split, Croatia : Faculty of Maritime Studies Split,, 2012. 174-178 (predavanje, međunarodna recenzija, objavljeni rad, znanstveni).

Modern GPS equipment for geodetic coordinates position fixing is based upon worldwide used satellite positioning methods and it gives position on the global WGS datum. In the Republic of Croatia topographic maps and nautical charts have been produced on the local Helmanskoegel

datum and Bessel rotational ellipsoid. The world market offers a large number of software packages which calculate transformations from the local to the global datum, some of them being free and available on the internet. Reference geodetic coordinates shown on different datums may result in a position error of some hundred metres. Mathematical conversion of a geodetic position from one datum to another is called transformation. Among several models of transformation between the two datums, the following ones are usually used: seven-parameter also called Helmert transformation and three-parameter or Molodensky transformation. All available GIS and AIS systems mainly used two programs for coordinate transformation: PCTrans developed by Netherlands Hydrographic Service, and Geotrans - Geographic Translator, developed by the US Army Topographic Centre and National Geospatial Intelligence Agency. In this article we would estimate accuracy and usability of the programs for transformation of geodetic coordinates between local and global datums, used in GIS and AIS systems.

Integration of land and marine spatial data on the Croatian coastline

Leder, Nenad; Duplančić Leder, Tea;

<http://bib.irb.hr/prikazi-rad?&rad=584068>

4th International Maritime Science Conference, Book of Proceedings / Rosanda Mulić, Gržetić, Zvonko, Pero Vidan, Ivica Kuzmanić (ur.). Split : Faculty of Maritime Studies Split, 2012. 179-185 (predavanje, međunarodna recenzija, objavljeni rad, znanstveni).

Every maritime country has its coastal zone, which is differently defined in terms of different professions. As a physical-geographical term, coast is a part of the land in occasional contact with the sea. Coast is therefore not a line but a belt, either wider or narrower, depending on the slope of the land and the range of sea level oscillations. Because of the sea-land interaction in the coastal belt, the spatial data in that area are interconnected, usually being examined, represented or used together. Boundary between the sea and land, as shown on nautical charts and topographic maps, is not the coast but the coastline. Land data (State Geodetic Administration) and marine data (Hydrographic offices) are usually represented by means of different coordinate systems, different projections, different datums (horizontal and vertical) and different scales, to show different contents. As a result, users are not able to refer to the required object in the coastal area in a simple and consistent way. The national spatial data infrastructure (NSDI) should therefore (like in other countries) integrate land data with marine data, defining the marine spatial data infrastructure (MSDI). Integration of the land and marine data is becoming a serious problem for many countries, and just a few of them have solved it, each in its own way. This paper presents the activities of the Hydrographic Institute of the Republic of Croatia on the integration of the land and marine spatial informations and the possibilities of its implementation in Croatia.

Characterization and distribution of organic matter using specific physico-chemical methods: a case study of the southeast Adriatic continental and shelf slope (Albania)

Plavšić, Marta; Strmečki, Slađana; Dautović, Jelena; Vojvodić, Vjeročka; **Olujić, Goran**; Ćosović, Božena;

<http://bib.irb.hr/prikazi-rad?&rad=575781>

Continental shelf research. 39-40 (2012) ; 41-48 (članak, znanstveni)

In May 2009, we characterized the organic matter in the area where Albanian shelf riverine plume waters enter the Southern Adriatic Pit region. Due to stable weather and hydrological conditions at the time of sampling a longitudinal thermal front was present around the Albanian shelf break. Our measurements point to the input of inorganic nutrients, including phosphorus (average P-PO₄ concentration was 0.71 µg/L) and nitrogen (average as total inorganic nitrogen (TIN) concentration was 25.33 µg/L) due to the intrusion of Levantine Intermediate Water (LIW) through the Otranto Strait. The input of LIW brings high salinity (~38.7) water that is poor in organic matter content. Low concentrations of dissolved organic carbon (DOC) (0.7mgC/L) and particulate organic carbon (POC) (0.06mgC/L), surface active substances (SAS) (in the range from 0.025 to 0.078 mg/L eq. Triton-X-100) and copper complexing capacity (CuCC) (24 nmolCu²⁺/L) were measured in the area. All the values for DOC, POC, SAS and CuCC were significantly lower in the Albanian coastal waters than in the North Adriatic. The measurable influence of the inflowing Albanian rivers was observed from the inverse dependence of the DOC concentrations and salinity data. The Albanian rivers contribute to the elevated nutrient concentrations especially those of silicate, which displayed concentrations up to 380 µg/L in the shallowest coastal station.

Numerical modelling of an oil spill in the northern Adriatic

Lončar, Goran; **Leder, Nenad**; Paladin, Marin;

http://www.iopan.gda.pl/oceanologia/54_2.html#A2

Oceanologia 2012, no. 54(2), pp. 143-173 doi: <http://dx.doi.org/10.5697/oc.54-2.143> (znanstveni rad, CC)

Hypothetical cases of oil spills, caused by ship failure in the northern Adriatic, are analysed with the aim of producing three-dimensional models of sea circulation and oil contaminant transport. Sea surface elevations, sea temperature and salinity fields are applied as a forcing argument on the model's open boundaries. The Aladin-HR model with a spatial resolution of 8 km and a time interval of 3 hours is used for atmospheric forcing. River discharges along the coastline in question are introduced as point source terms and are assumed to have zero salinity at their respective locations. The results of the numerical modelling of physical oceanography parameters are validated by measurements carried out in the "Adriatic Sea monitoring programme" in a series of current meter and CTD stations in the period from 1 January 2008 to 15 November 2008.

The oil spill model uses the current field obtained from a circulation model. Besides the convective dispersive transport of oil pollution (Lagrangian model of discrete particles), the model takes into account a number of reactive processes such as emulsification, dissolution, evaporation and heat balance between the oil, sea and atmosphere. An actual event took place on 6 February 2008, when the ship "Und Adriyatik" caught fire in the vicinity of the town of Rovinj (Croatia) en route from Istanbul (Turkey) to Trieste (Italy). At the time the fire broke out, the ship was carrying around 800 tons of oil. Thanks to the rapid intervention of the fire department, the fire was extinguished during the following 12 hours, preventing possible catastrophic environmental consequences. Based on this occurrence, five hypothetical scenarios of ship failure with a consequent spill of 800 tons of oil over 12 hours were analysed. The main distinction between the simulated scenarios is the time of the start of the oil spill, corresponding to the times when stronger winds were blowing (> 7 m/s) with a minimum duration of 24 h within the timeframe. Each scenario includes a simulation of oil transport for a period of two months after the beginning of the oil spill.

The results show that the coastal belt between the towns of Porec and Rovinj is seriously exposed to an oil pollution load, especially a few days after a strong and persistent bora (NE wind).

Complementary facilities of nautical tourism port - what Nautical Tourism expects?

Kovačić, Mirjana; Favro, Srećko;

<http://bib.irb.hr/prikazi-rad?&rad=575106>

Complementary facilities of Nautical Tourism port - what Nautical Tourism expect?; 1st Belgrade International Tourism Conference; Belgrade, Serbia,2012; ISBN:978-86-82371-35-9

Nautical tourism is one of the selective forms of tourism that rise in the last thirty years on the foreign market as well as on domestic market. There are more and more advocates of this form of tourism mostly coming from developed countries as this form of tourism is mostly used by people having medium and high standard. In favour of that thesis is the fact that a boater during one entering the port with the yacht spends as much as 30 "ordinary" tourists. Due to that fact many countries are starting to develop nautical tourism, especially the one on rivers. Croatia, as one of maritime countries with great number of islands, has great possibilities for further development of that form of tourism. Nautical tourists nowadays has more and more demands, they expect clean see, the best organisation in nautical tourism port, but also the best food and drink, and many different activities and other special facilities for their pleasure. Authors in this paper research basic and complementary facilities that nautical tourism ports offer, define which of them the important ones are and which one are the additional ones. They also research the level of quality that has to be satisfied to attract yachters out of season as well. The purpose of this paper is to analyse the offer made by three marinas: Croatian, Italian and Spanish marina and present received results. The aim of the research is to define the role and quality of facilities of business operations of a nautical tourism port, and as a holder of the development of nautical tourism and element of integral management of maritime domain.

2013

Protection and Risks of ENC Data regarding Safety of Navigation

Kos, Serđo; **Pušić, Danijel**; Brčić, David;

<http://bib.irb.hr/prikazi-rad?&rad=633676>

Advances in Marine Navigation, 2013, Marine Navigation and Safety of Sea Transportation, 165-170, znanstveni

In accordance with SOLAS Convention amendments concerning navigational equipment (Chapter V: Safety of Navigation ; Regulation 19: Carriage Requirements for Shipborne Navigational Systems and Equipment), ECDIS (Electronic Chart Display and Information System) and ENC's (Electronic Navigational Chart) should be implemented on existing and new built cargo and passenger vessels. This process started with 1st of July 2012. In accordance with amendments, the number of vessels which should and/or must carry ECDIS equipment onboard increases significantly. It applies both on national and world fleet vessels, depending from their size and type. With the objective to protect the official electronic navigational charts, the International Hydrographic Organization adopted the security plan and standards of data protection have been accepted (IHO Data Protection Scheme: Standard S- 63, edition 1.1.1). With present, increasing expansion of internet-based communications, computer users (that could be unqualified and, even more important, unauthorized persons) are allowed to access ENC software and official electronic charts in various ways, thereby opening the possibility/opportunity of abusive actions. The proposed paper structurally analyzes the usage and security implications of mentioned, illegal software. Illegal ENC security issues are discussed in the context of safety-of-navigation related possible – real scenarios using unproven and non-validated electronic navigational charts

Ispitivanje kvalitete pomorskih karata reproduciranih Ink-Jet tehnologijom

Pogančić, Milivoj; **Mušura, Igor**; **Sarajlić, Emin**;

Zbornik radova 17. međunarodne konferencija tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić 2013." / Mikota, Miroslav (ur.). Zagreb, Senj : Hrvatsko društvo grafičara, 2013. 421-433 (poster, međunarodna recenzija, objavljeni rad, stručni)

Razvoj grafičke tehnologije omogućio je hidrografskim organizacijama da u okviru svoje izdavačko-tiskarske djelatnosti koriste nove tehnike reprodukcije. Tako se u reprodukciji službenih pomorskih karata osim ofsetnog tiska, u novije vrijeme koristi i ink-jet tehnologija. Primjena ink-jet tehnologije je započela nakon provedenih istraživanja o ispunjavanju zahtjeva specifičnih izdavačkih okolnosti i uvjeta korištenja pomorskih karata. Međutim, prilikom pokretanja serijske proizvodnje uočeni su tehnički nedostaci koji dovode u pitanje daljnje korištenje te tehnologije u spomenute svrhe. U ovom radu se istražuju uočeni tehnički nedostaci. Nakon ranije provedenih istraživanja kvalitete i postojanosti otiska, provedena su i mjerenja dimenzija karata. Istražen je utjecaj tehnologije ispisa i podloge (kartografskog papira) te korištenih računalnih programa za crtanje u kartografskoj obradi karte, utjecaj fomata zapisa datoteka za ispis i utjecaj rezolucije na kvalitetu ispisa. Zaključno je dana usporedba sa kartama proizvedenim u ofsetu te su diskutirani dobiveni rezultati.

Projekcija razvoja izdavačko-tiskarske djelatnosti hidrografskih organizacija

Jeličić, Tonći; **Gržetić, Zvonko**; **Kasum, Josip**;

http://bib.irb.hr/datoteka/666151.Jelicic_et_al_2013.docx

Zbornik radova 17. međunarodne konferencija tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić 2013." / Mikota, Miroslav (ur.). Zagreb, Senj : Hrvatsko društvo grafičara, 2013. 136-145 (predavanje, međunarodna recenzija, objavljeni rad, znanstveni)

Hidrografske organizacije izdaju službene navigacijske publikacije čija je osnovna podjela je na pomorske karte i priručnike za plovidbu. Razvoj grafičke tehnologije je omogućio "Print On Demand" pristup u izdavačkoj djelatnosti odnosno "Chart On Demand" u proizvodnji pomorskih karata i "Book On Demand" u proizvodnji priručnika za plovidbu. U novije vrijeme su u praktičnu primjenu ušle i elektroničke navigacijske karte (ENC) za SOLAS konvencijske brodove koje se koriste na ECDIS brodskim sustavima i objedinjuju karte i priručnike. Za očekivati je razvoj inačice za plovila koja nisu konvencijska u vidu elektroničkih priručnika za plovidbu "e- priručnika". U ovom radu se osim pregleda dosadašnjih načina proizvodnje, daje projekcija razvoja izdavačke djelatnosti hidrografskih organizacija u budućnosti.

**Problem preklapanja elektroničkih navigacijskih karata – jedan drugačiji pogled
Bradarić, Željko;**

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 27 (2013) (članak, stručni)

Problem preklapanja elektroničkih navigacijskih karata (ENC) različitih izdavača za isto navigacijsko područje u istoj navigacijskoj upotrebnoj skupini, značajan je jer može dovesti do otežanog ili u potpunosti nečitljivog prikaza podataka sadržanih na službenim kartama. Nadležne međunarodne organizacije kao i nacionalni hidrografski uredi poduzimaju određene mjere, koje iz raznoraznih razloga ne daju željene rezultate. U ovom se radu daje pojednostavljeni prikaz problema preklapanja uz sažetak postojećeg prijedloga rješavanja preklapanja ENC-ova za Jadransko more. S pozicije korisnika ENC-ova, posebno se analizira i prezentira moguća alternativna i praktična opcija kao privremeno rješenje problema preklapanja ENC-ova.

Spatial distribution of lead in surface and deep sediments of the semi-enclosed bay influenced by the anthropogenic activity (Kastela Bay, Croatia)

Lovrenčić Mikelić, Ivanka; Škaro, Krunoslav;

29th International Conference of the Society for Environmental Geochemistry and Health

The area around the Kastela Bay is heavily exposed to anthropogenic activities representing the sources of contaminants to the bay. We studied the spatial distribution of lead in the sediments at three depths (0–5 cm, 5–10 cm, 40–50 cm), to determine i) whether lead disperses in the bay or it accumulates on the localized sites and ii) to establish the sediment condition regarding pollution. Samples were collected on 95 sampling stations disposed in a regular grid covering the bay. Lead concentrations were measured by the energy dispersive X-ray fluorescence technique. Enrichment factors were calculated to differentiate natural and anthropogenic origin of lead. The reference element was aluminium and the reference material was the unpolluted, preindustrial sediment from the Kastela Bay. The degree of sediment pollution was also assessed using geoaccumulation indices and comparing lead concentrations with recommended values of the sediment quality guidelines. Maps of lead concentrations, enrichment factors, and geoaccumulation indices were presented. Lead concentrations were in the range <1.6–142 mg/kg. Maximum content was higher than the upper limit of guidelines recommended values (30.2 mg/kg or 50 mg/kg). Mean values of enrichment factors were in the range 3.5–6.9 and the maxima in the range 23–68, suggesting the

presence of lead from anthropogenic sources. Mean values of the geoaccumulation indices were in the range -0.065–1.6 and maxima in the range 3.9–5.4. This points to very polluted to extremely polluted sediment levels. The east part of the bay is the most polluted one. The area of polluted sediments increases with decreasing sediment depth. Lead distribution was found to depend on sediment grain size, sampling depth, and location of point pollution sources. Lead is generally dispersed in the Kastela Bay but accumulates only on a few sites.

Assessing meteotsunami potential of high-frequency air pressure oscillations observed in the middle Adriatic

Vilibić, Ivica; Mihanović, Hrvoje; Charrayre, Francois;

<http://link.springer.com/article/10.1007/s11069-013-0865-x>

High-resolution air pressure series collected from a triangle of middle Adriatic microbarograph stations between April 2009 and March 2011 have been analysed to extract the rapid pressure changes normally found during meteotsunamis. Five-minute air pressure tendencies were used to detect an event. Wavelet and cross-wavelet analysis showed that the energies of high-frequency pressure changes that occurred during the warm part of the year were an order of magnitude higher than those that occurred during the cold part of the year. Coherence between stations was normally found at periods longer than 1 h, while air pressure disturbances were dispersive and not coherent at shorter periods. This implies that the disturbances had little to no potential to generate meteotsunamis in the middle Adriatic area, as the eigenoscillations in bays and harbours of the region are over timescales of minutes up to a few tens of minutes.

Turističko i pomorsko prometno vrednovanje otoka Visa sa stajališta održivog razvoja

Vojković, Lea; Bićanić, Zlatimir; Pušić, Danijel;

http://bib.irb.hr/datoteka/633645.Turistiko_i_pomorsko_prometno_vrednovanje_otoka_Visa_sa_stajalita_odrivog_razvoja.doc

PRVA MEĐUNARODNA KONFERENCIJA O TURIZMU - ZBORNİK RADOVA. Vlašić-Travnik, BIH, 2013. 227-236 (međunarodna recenzija, objavljeni rad, znanstveni)

Predmet istraživanja je uvjetovanost pomorskih veza otoka Visa i razvoja otoka u smislu održivog razvoja. Proučavalo se strategiju razvoja turizma i drugih gospodarskih aktivnosti, te njihova povezanost s prometnim značajkama. Istražuju se oblici pomorske povezanosti koji podržavaju ideju održivog razvoja otoka i napredak otočnih društvenih zajednica. Analiziranjem broja putnika i broja stanovnika zaključilo se kako je broj putnika u neprekidnom porastu a stanovnika u opadanju. Kao rješenje povećanja broja stanovnika, te gospodarskog napretka, predlaže se uvođenje novih prometnih veza između otoka Visa i kopna i između otoka Visa i otoka Hvara. Zaključuje se kako razvitak otoka izravno ovisi o frekvenciji prometa.

Impact of the global warming on ship navigation in polar area

Galić, Stipe; Lušić, Zvonimir; **Pušić, Danijel;**

http://bib.irb.hr/datoteka/628779.IMSC_2013_Book_of_Proceedings_Rad.pdf

5th International Maritime Science Conference-Book of Proceedings / Vidan, Pero ; Gržetić, Zvonko ; Skočibušić Bukljašić, Mihaela (ur.). Split : Faculty of maritime Studies Split, 2013. 140-154 (predavanje, međunarodna recenzija, objavljeni rad, znanstveni).

Generally, navigating in polar areas has always been one of the most dangerous voyages. The main reason for the increased risk derives from ice, but also from the other unfavorable navigation conditions that occurs in the high northern and southern latitudes, for example: very low temperatures, ice-covered coastlines, sparse population, inability to escape from danger, difficult communication and positioning etc. So far, maritime traffic in area of high latitudes has been relatively small, and the main reason for this can be found in the absence of major ports in this region, and in the inability to use certain routes because of ice. However, significant changes are happening in the last few years, and those changes have announced a brand new role of polar areas in terms of new main routes for merchant ships, especially in Arctic area. These changes have occurred as a result of the increasing exploitation of mineral resources in the polar areas, the exploiting of fish stocks, development of tourism, military and political objectives, etc., including the development of modern technologies that enables us to use, and the people that are living and working in extreme polar conditions. All this is further encouraged by global warming and consequent melting of ice. Precisely, the melting of ice has opened the possibility of using new routes for ships, which today represents completely new challenges for the global shipping industry. This article handles the basic geographical and climatological characteristics of polar areas, maritime transport, and the impact of global warming on the possibility of opening new routes, including existing and upcoming changes in legal regulations for maritime navigation in this area. Special emphasis will be given to the new demands which are being placed in front of crew that are sailing in area of high latitudes.

Exceptional dense water formation on the Adriatic shelf in the winter of 2012.

Mihanović, Hrvoje; Vilibić, Ivica; Carniel, Sandro; Tudor, Martina; Russo, Aniello; Bergamasco, Andrea; Bubić, Nikola; Ljubešić, Zrinka; Viličić, Damir; Boldrin, Alfredo; Malačić, Vlado; Celio, Massimo; Comici, Cinzia; Raicich, Fabio;

<http://dx.doi.org/10.5194/os-9-561-2013>

Ocean science. 9 (2013) ; 561-572 (članak, znanstveni)

In this paper we document dense water formation throughout the Adriatic shelf and coastal area in January/February 2012, resulting in record-breaking densities observed during and after the event. The unprecedented dense water generation was preconditioned by a dry and warm year which resulted in a significant reduction of coastal freshwaters, superimposed on a long-term basin-wide salinity increase. The final event that triggered the dense water formation was an extended period of cold weather with strong and severe winds. Record-breaking potential density anomalies (above 30 kg m^{-3}) were measured at several formation sites. Accumulated surface net heat and water losses in some coastal regions exceeded 1.5 GJ m^{-2} and 250 kg m^{-2} over 21 days, respectively. Excessiveness, importance of shelf-type dense water formation and effects on the thermohaline circulation and deep aquatic systems are discussed.

Observing the bottom density current over a shelf using an Argo profiling float

Vilibić, Ivica; Mihanović, Hrvoje;

<http://dx.doi.org/doi:10.1002/grl.50215>

Geophysical research letters. 40 (2013) ; 910-915 (članak, znanstveni)

Pressure, temperature, and salinity data collected during the winter of 2011/2012 by an Argo profiling float over the Adriatic shelf were used to document the dense water formation and subsequent bottom density current (BDC) normally occurring along the shelf slope. The float was advected to the Jabuka Pit and neighboring shallow area (<275 m) after October 2010. The parking depth was set to approximately 150m, enabling the float to mostly follow the seabed between December 2011 and July 2012. The profiler measured strong spatial-temporal changes in the BDC thickness (from a few to about 50 m) and the bottom density (between 29.46 and 29.88 kg/m³). These observations show that an Argo float has the capability to observe a bottom density current and suggest that it would be possible to systematically use such floats to investigate these processes on coastal shelves.

Ciljevi, sadržaj i regulatorni okvir hidrografske službe

Bradarić, Željko; Radić, Emil;

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 26 (2013) (članak, stručni)

Hidrografska služba je skup aktivnosti koje sustavno i kontinuirano provodi nacionalni hidrografski ured ili neka druga od vlade autorizirana institucija. Osnovni cilj hidrografske službe je osiguranje dostupnosti hidrografske-navigacijskih informacija koje su u izravnoj vezi sa sigurnošću plovidbe krajnjim korisnicima na brodovima. Hidrografska služba organizira se i funkcionira kao trajna aktivnost 24/7/365. S obzirom na sigurnosni aspekt službe važno je postojanje odgovarajućeg regulatornog okvira za njeno uspostavljanje i funkcioniranje. Budući da krizno vrijeme nužno nameće i preispitivanje potrebe postojanja raznih agencija, institucija i službi, pa tako i onih čijim se radom osigurava funkcioniranje hidrografske službe, u ovom radu se prezentiraju ciljevi, sadržaj i regulatorni okvir hidrografske službe u svrhu argumentiranja potreba za postojanjem i unapređenjem iste.

Mapping the underwater sound noise and assessing its sources by using a Self-Organizing Maps method

Rako, Nikolina; **Vilibić, Ivica; Mihanović, Hrvoje;**

<http://dx.doi.org/10.1121/1.4789003>

The Journal of the Acoustical Society of America. 133 (2013) , 3; 1368-1376 (članak, znanstveni)

The study aims to provide an objective mapping of the underwater noise and its sources over an Adriatic coastal marine habitat by applying the Self-Organizing Maps (SOM) method. Systematic sampling of Sea Ambient Noise (SAN) was carried out at ten predefined acoustic stations between 2007 and 2009. Analyses of noise levels were performed for 1/3 octave band standard centered frequencies in terms of instantaneous Sound Pressure Levels averaged over 300 s to calculate the equivalent continuous Sound Pressure Levels. Data on vessels' presence, type and distance from the monitoring stations were also collected at each acoustic station during the acoustic sampling. Altogether 69 noise surveys were introduced to the SOM predefined 2x2 array. The overall results of the analysis distinguished two dominant underwater soundscapes, associating them mainly to the seasonal changes in the nautical tourism and fishing activities within the study area and to the wind

and wave action. The analysis identified recreational vessels as the dominant anthropogenic source of underwater noise, particularly during the tourist season. The method demonstrated to be an efficient tool in predicting the SAN levels based on the vessel distribution, indicating also the possibility of its wider implication for marine conservation.

2014

Tehnički prilog istraživanju alternativne tehnologije u reprodukciji pomorskih karata
Jeličić, Tonći; Pogančić, Milivoj;

<https://bib.irb.hr/prikazi-rad?&rad=730463>

Zbornik sažetaka 18. međunarodne konferencije tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić" / Miroslav Mikota, Miroslav (ur.). - Zagreb ; Senj : Hrvatsko društvo grafičara , 2014. 36-36.

Temeljna tiskana izdanja hidrografskih organizacija su pomorske karte. Razvoj grafičke djelatnosti omogućio je primjenu novih tehnologija u njihovoj reprodukciji što predstavlja unapređenje u cilju povećanja točnosti i ažurnosti karata. U tom smislu su provedena sustavna istraživanja primjene ink-jet tehnologije u kartografskoj reprodukciji. Međutim, prilikom pokretanja testne proizvodnje uočeni su određeni tehnički nedostaci, posebno dimenzionalna nestabilnost koja je dovela u pitanje primjenu odabrane tehnologije. U ovom radu se daje pregled dosadašnjih aktivnosti te predlažu daljnja istraživanja i usporedba rezultata alternativnih tehnologija. Predlaže se univerzalna testna forma koja sadržava sve karakteristične elemente karte, te mjerne oznake i kontrolni klin preuređen za konkretnu namjenu.

**Naglasci s 5. izvanredne konferencije Međunarodne hidrografske organizacije
Bradarić, Željko;**

http://upks.hr/glasnik_br29.pdf

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 29/2014 (članak, stručni)

Peta izvanredna konferencija Međunarodne hidrografske organizacije održana je u Monaku od 6. do 11. listopada ove godine. Izvanredna je jer se održala između dva petogodišnja ciklusa redovitih konferencija IHO-a kako bi se raspravljalo i odlučivalo o pitanjima čije rješavanje ne može čekati sljedeću redovitu konferenciju 2017. godine. Pamtit će se po najvećem broju sudionika do sada, posebice po broju predstavnika drugih partnerskih organizacija, a napose po brojnosti i aktivnosti predstavnika privatnog hidrografskog sektora i krajnjih korisnika. U ovom radu daje se pregled najvažnijih tema koje su bile na dnevnom redu 5. izvanredne konferencije IHO-a s posebnim osvrtom na vrlo zapažen nastup i aktivnosti predstavnika privatnog sektora vezanog uz hidrografske djelatnosti. Daje se i kraći prikaz stavova Hrvatske u vezi s najvažnijim službenim konferencijskim prijedlozima.

Overview of Standards for Electronic Navigational Charts

Lovrinčević, Dejan; Kljajić, Ivka;

<http://bib.irb.hr/prikazi-rad?&rad=713563>

Naše more : znanstveni časopis za more i pomorstvo. 61 (2014) , 3-4; 52-59 (članak, stručni)

In the early 1980s, with the rapid development of geospatial technologies the development of Electronic Navigational Charts – ENC began. With a heavy emphasis on data security, because of its navigational purpose, the implementation of ENC was approached very cautiously. One of the key features of every product, which enables easier global use, is its standardization. The paper provides basic information related to the ENC and by studying all editions of publications for ENC, the reports

of the Working groups of the International Hydrographic Organization – IHO and articles that followed the implementation process of ENC standards an overview of ENC standards is given, with the focus on two basic standards published in S-57 and S 52 publications. Also described is a new, currently under construction, standard for ENC (S-100) and the prediction of the future development guidelines with the concept of e-Navigation in mind.

Cryptophyte bloom in a Mediterranean estuary: High abundance of *Plagioselmis* cf. *prolonga* in the Krka River estuary (eastern Adriatic Sea)

Šupraha, Luka; Bosak, Sunčica; Ljubešić, Zrinka; **Mihanović, Hrvoje; Olujić, Goran**; Mikac, Iva; Viličić, Damir;

<https://bib.irb.hr/prikazi-rad?&rad=716763>

Scientia marina. 78 (2014) , 3; 329-338 (članak, znanstveni)

During the June 2010 survey of phytoplankton and physicochemical parameters in the Krka River estuary (eastern Adriatic Sea), a cryptophyte bloom was observed. High abundance of cryptophytes (maximum 7.9×10^6 cells l^{-1}) and high concentrations of the class-specific biomarker pigment alloxanthine (maximum 2312 ng l^{-1}) were detected in the surface layer and at the halocline in the lower reach of the estuary. Taxonomical analysis revealed that the blooming species was *Plagioselmis* cf. *prolonga*. Analysis of the environmental parameters in the estuary suggested that the bloom was supported by the slower river flow as well as the increased orthophosphate and ammonium concentrations. The first record of a cryptophyte bloom in the Krka River estuary may indicate that large-scale changes are taking place in the phytoplankton community. Such changes could have a major impact on the natural ecosystem dynamics and the mariculture production in the area.

Kartografska granica i cik-cak koncept kartiranja

Bradarić, Željko;

http://www.upks.hr/glasnik_br28.pdf

Kapetanov glasnik, stručni časopis Udruge pomorskih kapetana Split, br. 28 (2014) (članak, stručni)

Međunarodna hidrografska organizacija (IHO) suočena sa sporim rješavanjem problema preklapanja elektroničkih navigacijskih karata (ENC) predložila je određene izmjene nekih svojih dokumenata. Jedan od prijedloga je uvođenje pojma i definicije kartografske granice kao i cik-cak koncepta pri definiranju i ucrtavanju kartografske granice. U ovom radu autor daje sažet prikaz problema preklapanja ENC-ova i onog što se poduzima da bi se problem riješio, te daje osvrt na prijedlog IHO-a. Obrazlaže i daje prijedlog alternativnih rješenja na prijedlog IHO-a za uvođenjem kartografske granice.

Ribarske luke u Republici Hrvatskoj – javne ili privatne luke

Vojković, Goran; Grubišić, Neven; **Vojković, Lea;**

<http://hrcak.srce.hr/file/178146>

Pomorski zbornik (0554-6397) 47-48 (2013), 1; 205-213; Znanstveni, Prethodno priopćenje

Ovaj rad se bavi ribarskim lukama Republike Hrvatske koje, prema danas ustaljenoj podjeli, ulaze u luke posebne namjene. U radu se pokazuje kako postojeća i već dugo ustaljena podjela na luke otvorene za javni promet i luke posebne namjene više ne odgovara stupnju i potrebama gospodarskog razvoja Republike Hrvatske, posebno nakon ulaska Republike Hrvatske u Europsku uniju. Izjednačavanje javnog servisa kojeg luka pruža s namjenom luke (opća namjena – luka otvorena za javni promet, specijalizirana namjena – luka nije otvorena za javni promet) ograničava gospodarski razvoj te otežava provođenje temeljnih tržišnih načela Europske unije. Stoga se, koristeći ribarske luke kao primjer, predlaže temeljnu podjelu luka u hrvatskim propisima osuvremeniti. Osnovna kategorizacija luka bi trebala biti podjela na javne luke i privatne luke, ovisno o tomu pružaju li javni servis.

Geospatial data in Marine SDI service

Duplančić Leder, Tea; Leder, Nenad; Tavra, Marina;

<http://bib.irb.hr/prikazi-rad?&rad=695412>

6th International Maritime Science Conference / Vidan, Pero ; Twrdy, Elen ; Leder, Nenad ; Mulić, Rosanda (ur.). - Split : FACULTY OF MARITIME STUDIES SPLIT , 2014. 465-469.; Predavanje; Cjeloviti rad (in extenso); Međunarodna recenzija; Znanstveni

The knowledge of spatial data is necessary for a large number of human activities. A Spatial Data Infrastructure (SDI) is a data infrastructure implementing a framework of geographic data, metadata, users and tools that are interactively connected. In Croatia much has already been written about SDI, but primarily from land-based perspective. In this paper marine dimension of SDI (MSDI) that encompasses marine geographic and business information in its widest sense is described. It is pointed out that hydrography, as modern applied science, plays very important role in measurements and description of oceans and seas. Hydrographic spatial data forms the key base reference layer for the sea space in MSDI data. There are a large number of MSDI stakeholders. MSDI should be established according global, regional and national conventions and policies.

Resonant excitation of island-trapped waves in a shallow, seasonally stratified sea

Mihanović, Hrvoje; Beg Paklar, Gordana; Orlić, Mirko;

<http://www.sciencedirect.com/science/article/pii/S0278434314000272>

Continental shelf research. 77 (2014) ; 24-37 (članak, znanstveni)

Analysis of oceanographic data collected during 2006 in the eastern Adriatic Sea indicated the presence of large internal waves (with a maximum range of about 30 m) at the diurnal frequency around the island of Lastovo. The amplitude ratio and phase difference between diurnal surface tides and diurnal isotherm fluctuations changed considerably between pronounced internal wave episodes, depending on stratification properties, thus suggesting possible resonant excitation of internal oscillations. On the contrary, no significant diurnal thermocline fluctuations were observed at two other islands (Biševo and Sušac). Theoretical analysis presented here focused on the trapping of long-period internal waves around a circular island corresponding to Lastovo and confirmed that stratification properties during the summer of 2006 around the island were close to resonant ones. The analysis also showed that Biševo and Sušac are too small to support diurnal near-resonant excitation. Application of a numerical model for the current flow around equivalent circular and

elliptical islands in the stratified sea provided more details on resonant excitation. Theoretical and numerical modeling results particularly emphasized the importance of island dimensions, stratification properties (pycnocline depth and density defect) and the periodicity of the forcing. Furthermore, idealized numerical simulations demonstrated that the waves trapped at Lastovo behave as the gravest azimuthal mode of internal Kelvin-like waves, revolving in a clockwise direction around the island, and that the eccentricity of the island has almost no effect on the resonant period.

2015

Nautical tourism and analysis of marinas, boat and yacht traffic in Split - Dalmatia County

Galić, Stipe; Lušić, Zvonimir; **Pušić, Danijel**;

17th International Conference on Transport Science – ICTS 2015, Conference proceedings / Marina Zanne, Patricija Bajec, Pero Vidan (ur.). Portorož : Fakulteta za pomorstvo in promet, Portorož, 2015. 62-73 (predavanje, međunarodna recenzija, objavljeni rad, znanstveni).

Nautical tourism is one of the most competitive Croatian products. The development of nautical tourism ports in terms of macro-economic strategic plans are of significant national interest for Croatia. The nautical tourism in Croatia is becoming increasingly important, but it still does not achieve an adequate material profit considering its potential. The problem is that the current development does not have a clear concept, which leads to non-selectivity in the development and has negative environmental impacts. This article deals with statistical data referring to the selected area and the marina management in Split-Dalmatia County. Also, the analysis of boat and yacht traffic in nautical tourism within the specified area along the main and local navigation routes within Split- Dalmatia County will be presented. This article provides an overview on security measures, guidelines for listed nautical marinas as well as the implementation of the Blue Flag marina criteria.

Spectrophotometric determination and multivariate analysis of nutrients in the Zrmanja estuary

Buljac, Maša; **Olujić, Goran**; Bralić, Marija; Periš, Nenad; Čurlin, Mirjana;

<http://bib.irb.hr/prikazi-rad?&rad=763023>

In this work are presents, for the first time, spectrophotometric determination and detailed analysis of spatial and seasonal distribution of nutrients in the Zrmanja estuary. For the study period were obtained the average concentrations of nutrients: for orthosilicate from 7.98-12.35 mmol/m³, for nitrites 0.11-0.12 mmol/m³, for nitrates 5.81-11.27 mmol/m³, for ammonia 0.75-1.57 mmol/m³ and for orthophosphate 0.03-0.07 mmol/m³. The highest concentrations of orthosilicate and nitrate were recorded during the increased river flow. Phosphorous was the limiting element in the Zrmanja estuary, while the concentrations of orthophosphate through all four seasons were lower than 0.1 mmol/m³. The relationship between determined parameters was established using the multivariate analysis (Spearman's correlation coefficient and Cluster analysis). The purpose of this study is to demonstrate the influence of the sea on the distribution of the determined parameters and their impact on the ecosystem in oligotrophic estuary.

2016

ECOLOGICAL QUALIFICATION OF ISLAND VIS COASTAL WATERS ACCORDING TO THE TROPHICAL TRIX INDEX

Buljac, Maša; **Olujčić, Goran**; Bralić, Marija; Buzuk, Marijo; Vladislavić, Nives; Čurlin, Mirjana;

4th International Symposium of Environmental Management-Towards Circular Economy / Katančić zvonimir, Koprivanac Natalija, Lončarić Božić Ana, Kušić Hrvoje and Hrnjak-Murgić Zlata (ur.). Zagreb: University of Zagreb, Faculty of Chemical Engineering and Technology, 2016. str. 46-46 (poster, međunarodna recenzija, sažetak, znanstveni)

The eutrophication of coastal waters is considered to be one of the greatest threats to the health of marine ecosystems. It is described as a change in the marine food web connected to the seawater enrichment by nutrients, which can modify the carbon pathways and excessive oxygen consumption [1]. Eutrophication can happen in natural mechanisms, but also in anthropogenic influences. Natural eutrophication happens because of the increase in biological resources in an ecosystems, which is a positive appearance. Anthropogenic eutrofication is caused by irregular outcome of urban waste waters that can affect negatively on the natural balance of the ecosystem. In this investigation trophic index (TRIX) has been used to assess the ecological status of the island Vis coastal waters. The trophic index TRIX was developed by Vollenweider in 1998 for the coastal area of Emilia-Romagna (northern Adriatic Sea), and was exploited by Italian legislation to characterize the trophic state of coastal waters [1]. The TRIX index is an logarithmic formula of four state variables, which are directly related to productivity: chlorophyll-a (Chl, $\mu\text{g/L}$), oxygen as the absolute percentage deviation from oxygen saturation (DO, %), and nutritious compounds such as dissolved inorganic nitrogen (DIN, $\mu\text{g/L}$) and total phosphorous (TP, $\mu\text{g/L}$). The sea water samples were collected for four seasons of 2015 year, at standard depths (5, 10, 20, 30, 50, 75, 100 m) using a Nensen sampler. Trix calculated value based on the data obtained at the investigation station, range from 1.76 to 3.23. According to obtained TRIX values (< 4) sea water at investigation station is generally oligotrophic. [1] E. Fiori et al., Nat. Hazards Earth Syst. Sci. doi:10.5194/nhess-2016-69, 2016.

Zaštita pomorskih karata od krivotvorenja primjenom InfraReDesign tehnologije skrivene slike

Jeličić, Tonći; Žiljak Gršić, Jana; **Kasum, Josip**; Modrić, Damir;

<http://bib.irb.hr/datoteka/838372. Jelicic et al. TISKARSTVO 2016.docx>

Tiskarstvo & dizajn 2016. / Žiljak Vujić, Jana (ur.). - Zagreb :Međunarodni znanstveni skup Tiskarstvo & dizajn 2016. Poster, Znanstveni

Pomorske karte kao službeni plovidbeni dokumenti su jedno od najvažnijih navigacijskih pomagala. U cilju zaštite autorskih prava hidrografskih organizacija koje ih izdaju, te posebno radi očuvanja razine sigurnosti plovidbe, nužno je smanjiti rizik od krivotvorenja. Razvoj grafičke tehnologije i primjena znanstvenih dostignuća na području tiskarstva omogućili su primjenu zaštitnih (sigurnosnih) metoda tiska. Međutim, istovremeno je dostupnost digitalnih uređaja za kopiranje, skeniranje i softvera za obradu slike, te uređaja za digitalni tisak značajno pojednostavnila mogućnost krivotvorenja. Osim grafičke tehnologije, u ovu temu je uključeno područje grafičke forenzike koje se između ostalog bavi krivotvorinama i vještačenjem sumnjivih dokumenata. InfraReDesign (IRD) tehnologija omogućava da se primjenom postojećih konvencionalnih i digitalnih tehnika tiska podiže stupanj zaštite dokumenata te intelektualnog vlasništva na višu razinu. Mogućnost provjere dokumenata može biti uvedena primjenom specifičnog odziva bojila u vidljivom i infracrvenom (IR) području spektra. Primjenom IRD tehnologije bi se osim uloge zaštite od krivotvorenja kao dodatna dimenzija

omogućilo povećanje informacijskog sadržaja pomorske karte odnosno prikaz dodatnih informacija važnih za sigurnost plovidbe.

Prijedlog modela zaštite pomorskih karata od krivotvorenja

Jeličić, Tonći; Modrić, Damir;

http://bib.irb.hr/datoteka/838476. Jelicic-Modric_Senj_2016_FINAL.doc

Zbornik sažetaka "Blaž Baromić 2016." / Mikota, Miroslav (ur.). - Zagreb : Hrvatsko društvo grafičara , 2016. 38-38. znanstveni

Pomorske navigacijske karte u izdanju Hrvatskog hidrografskog instituta su službeni dokumenti Republike Hrvatske. U cilju zaštite autorskih prava hidrografskih organizacija koje izdaju pomorske karte, te posebno radi očuvanja razine sigurnosti plovidbe, nužno je smanjiti rizik od njihova krivotvorenja. U slučaju pomorskih karata krivotvorenje, osim ostvarivanja materijalne koristi krivotvoritelja, ima dodatnu dimenziju u ugrožavanju sigurnosti plovidbe. Naime, krivotvoritelji mogu prouzročiti mnogo veću štetu (nego eventualnu korist od prodaje krivotvorina), tako što neovlašteno umnožavaju pomorske karte koje nisu ažurne. Na taj način direktno ugrožavaju sigurnost plovidbe odnosno sigurnost života na moru. U tom smislu se predlaže tri sigurnosna elementa za osiguranje odgovarajuće zaštite: 1. u materijalu - vodeni žig u kartografskom papiru, 2. u tisku - hologram znaka HHI i 3. u bojilu - primjena IRD tehnologije skrivene slike.

Public and Private Ports in Croatian Law

Vojković, Goran; Grubišić, Neven; **Vojković, Lea;**

<http://www.fpz.unizg.hr/traffic/index.php/PROMTT/article/view/1819/1447>

Public and Private Ports in Croatian Law. // Promet - Traffic & Transportation. 28 (2016) , 3; 215-224 (pregledni rad, znanstveni)

Existing classification of the Croatian seaports does not fit the level and meet the needs of the economic development of the Republic of Croatia, particularly after the Republic of Croatia joined the European Union. Equalizing public service offered by a port with the purpose of the port itself (general purpose – port open for public traffic, special purpose – port not open for public traffic) limits the economic development and aggravates the implementation of the basic market policies of the EU. Therefore, modernisation of the basic classification of ports in the Croatian legislation is suggested. Basic categorization of ports should be as follows: public service ports, private service ports and private ports for private needs of an entrepreneur.

2017

Istraživanje primjene digitalnih tehnologija tiska u reprodukciji pomorskih karata
Jeličić, Tonći; Bolanča Mirković, Ivana; **Pogančić, Milivoj**;

<https://bib.irb.hr/prikazi-rad?&rad=895449>

Zbornik sažetaka 21. međunarodne konferencije tiskarstva, dizajna i grafičkih komunikacija Blaž Baromić 2017. / Mikota, Miroslav (ur.). - Zagreb : Hrvatsko društvo grafičara , 2017. 27-27. (znanstveni, poster, međunarodna recenzija)

U ovom radu se istražuje kvaliteta reprodukcije pomorskih karata dobivenih pomoću različitih digitalnih tehnologija tiska u cilju implementacije u izradi pomorskih karata. Za istraživanje se koriste probni otisci posebno pripremljene testne forme za pomorske karte, dobiveni različitim digitalnim tehnologijama tiska, a koje su u primjeni kod hidrografskih ureda unutar Međunarodne hidrografske organizacije. To su kod ink-jet tehnologija OCÈ ColorWave - Crystal Point tehnologija i HP PageWide XL tehnologija te kod elektrofotografije Konica Minolta KIP - LED tehnologija. Provesti će se praktični uporabni testovi odnosno simulacije stvarnih situacija, zatim ispitivanja kvalitete i mjerenje dimenzija otisaka, te usporedba dobivenih rezultata. Uzorci će se izložiti simulaciji starenja u Xenon test komori Solarbox 1500e. Cilj ovog istraživanja je stručno utemeljena preporuka za odabir i primjenu određene digitalne tiskarske tehnologije u Hrvatskom hidrografskom institutu.

Trophic index (TRIX) at selected stations of Central and South Adriatic

Jerončić, Ana; Buljac, Maša; **Olujčić, Goran**; Bralić, Marija; Buzuk, Marijo; Čurlin, Mirjana;

<http://25hskiki.org>

25. HRVATSKI SKUP KEMIČARA I KEMIJSKIH INŽENJERA s međunarodnim sudjelovanjem / Ana Šantić, Marijana Đaković (ur.). Zagreb : HKD, 2017. 233-233 (poster,domaća recenzija,sažetak,znanstveni)

As one of the indicators related to the marine ecosystem condition in the National list of indicators, trophic index (TRIX) is included [1]. The TRIX index is a logarithmic formula of four state variables, which are directly related to productivity: chlorophyll-a (Chl, mg/L), oxygen as the absolute percentage deviation from oxygen saturation (DO, %), and nutrient salts such as dissolved inorganic nitrogen (DIN, mg/L) and total phosphorous (TP, mg/L). The trophic index TRIX was developed by Vollenweider in 1998 for the coastal area of Emilia-Romagna (northern Adriatic Sea) [2] and it has been used in this research. Accordingly, sea water can be classified on a scale from 0 to 8, based on degree of eutrophication as: oligotrophic (0-4) ; mesotrophic (4-5) ; eutrophic (5-6) and extremely eutrophic (6-8). In this research trophic index (TRIX) has been used to assess the ecological status of coastal area of Southern and Central Adriatic. Data were obtained from two coastal stations (Dubrovnik-station A1 and Kaštela Bay-station A2) characterized by large loadings on the ecosystem (excessive of nutrient intake through wastewater, agriculture, industrial water etc.) and from another two coastal stations with less loadings on ecosystem (Podstrana-station A3 and Pelješac peninsula station A4). As reference stations, those located at the open sea (R1, R2 i R3). TRIX calculated value based on the data obtained at the research station, range from 2.80 to 3.60. According to obtained TRIX values (< 4) sea water at research station can be classified as oligotrophic.

Multigene phylogeny and morphology of newly isolated strain of *Pseudo-nitzschia mannii* Amato & Montresor (Adriatic Sea)

Marušić, Eli; Grbin, Dorotea; Pfannkuhen, Martin; Babić, Ivana; Mejdandžić, Maja; **Mihanović, Hrvoje**; Marić Pfannkuchen, Daniela; Godrijan, Jelena; Peharec Štefanić, Petra; **Olujčić, Goran**; Ljubešić, Zrinka;

Diatom research. 32 (2017) , 1; 127-131 (članak, znanstveni)

An increasing number of cryptic and pseudo-cryptic species have been found within many newly described diatom species. To resolve the phylogenetic relationships of the genus *Pseudo-nitzschia*, molecular markers are being widely used in combination (or separately) with different morphological characters. Sequence analysis of ribosomal DNA markers (18S, ITS and 28S) and morphological analyses of *Pseudo-nitzschia mannii* strain (CIM_D-4), isolated from the Telašćica Bay (Adriatic Sea), differentiate it from all other currently reported strains of this species.

Standardizacija boja na pomorskim kartama

Jeličić, Tonći; Modrić, Damir; **Kasum, Josip**;

<http://www.tiskarstvo.net/printing&design2017/>

Printing & design 2017 / Žiljak Vujić, Jana (ur.). Zagreb: Fotosoft, 2017. str. 50-50 (predavanje, međunarodna recenzija, znanstveni)

Prema preporukama Međunarodne hidrografske organizacije, hidrografski uredi u svijetu općenito nastoje standardizirati svoje pomorske karte i navigacijske publikacije te osigurati točnost i pouzdanost prikazanih informacija. To znači da treba osigurati kvalitetnu reprodukciju i čitljivost karte u svim uvjetima, što je osnovna zadaća grafičke tehnologije unutar sustava hidrografskih organizacija. Radna grupa za standardizaciju pomorskih karata i papirnatih karte izrađuje tehničke specifikacije za primjenu boja kako bi se izbjegle zabune i/ili greške zbog primjene različitih kombinacija boja na pomorskim kartama. U radu se posebno razmatra važnost primjene boja na pomorskim kartama, navode se međunarodna iskustva pri odabiru boja te analizira primjena boja na kartama pojedinih država članica IHO-a. Zaključno se daje stanje u vezi s primjenom boja na hrvatskim pomorskim kartama, te se predlaže postupak standardizacije kako bi hrvatske pomorske karte slijedile međunarodne trendove, uz istovremeno zadržavanje elemenata nacionalne tradicije i prepoznatljivosti.

2018

Elektronička izdanja službenih pomorskih navigacijskih publikacija
Jeličić, Tonći; Kolić, Vinka; Pogančić, Milivoj;

<https://www.bib.irb.hr/960824>

Zbornik sažetaka 22. međunarodne konferencije tiskarstva, dizajna i grafičkih komunikacija "Blaž Baromić 2018." / Mikota, Miroslav (ur.). Zagreb: Hrvatsko društvo grafičara, 2018. str. 43-44 (predavanje, recenziran, znanstveni)

Temeljem Zakona o hidrografskoj djelatnosti (NN 71/14) donesen je "Pravilnik o službenim pomorskim navigacijskim kartama i publikacijama, njihovom sadržaju, načinu i uvjetima izrade, izdavanja i održavanja" (NN 42/16). Pravilnikom se propisuju službene pomorske navigacijske karte i publikacije čija je uporaba obvezna za hidrografsko-navigacijsku sigurnost u pomorskom prometu. Sadržaj službenih publikacija određen je IHO/HR standardom za izradu pomorskih navigacijskih publikacija, koji je definiran publikacijama S-4, S-57 i M-3 od strane IHO (Međunarodne hidrografske organizacije), kako bi se osigurala ujednačenost publikacija iste namjene neovisno o izdavaču odnosno državi izdavanja. Službene pomorske navigacijske publikacije su publikacije koje prikazuju podatke važne za sigurnost pomorske plovidbe koji se zbog svog opsega ne mogu prikazati na službenim pomorskim navigacijskim kartama. Izradu, izdavanje i održavanje službenih pomorskih navigacijskih karata i publikacija u Hrvatskoj obavlja Hrvatski hidrografski institut. HHI je dužan osigurati stalnu dostupnost službenih izdanja krajnjim korisnicima kroz sustavnu izdavačku djelatnost. Službene pomorske navigacijske karte se dijele na papirnate navigacijske karte i elektroničke navigacijske karte (ENC), dok se službene pomorske navigacijske publikacije izdaju samo u tiskanom obliku. Cilj ovog istraživanja je analiza stanja sa e-izdanjima publikacija u vodećim hidrografskim uredima u svijetu, te stručno utemeljena preporuka za odabir i primjenu tehnologije za izdavanje elektroničkih izdanja Hrvatskog hidrografskog instituta.

Spektrometrijska analiza boja na hrvatskim pomorskim kartama

Jeličić, Tonći; Žiljak Gršić, Jana; Modrić, Damir;

<https://www.bib.irb.hr/1002182>

Printing&Design18 / Žiljak-Gršić, Jana (ur.). Zagreb: FotoSoft, 2018. str. 19-19 (ostalo, znanstveni)

Hidrografski uredi u svijetu nastoje standardizirati boje na svojim pomorskim kartama u cilju osiguravanja točnosti i nedvojbenosti prikazanih informacija. Standardizacija boja na pomorskim kartama obuhvaća tehničke specifikacije za primjenu boja kako bi se izbjegle zabune i/ili greške zbog primjene različitih kombinacija boja. Za pomorske karte postoje preporuke o sastavu boja koje se koriste, ali do sada nije bilo podataka o spektrografiji tih boja. Spektrografsko ispitivanje proširuje se i na blisko infracrveno područje elektromagnetskog spektra. To je polazište za standardizaciju primjene boja na pomorskim kartama. U radu se daju refleksijski spektri boja na hrvatskim pomorskim kartama, te se osim vidljivog dijela spektra po prvi put prikazuju i rezultati za dio bliskog infracrvenog dijela spektra. Dobiveni rezultati će biti osnova za uvođenje blizanaca boja kojima će se zaštititi informacije na pomorskim kartama. Krajnji cilj istraživanja je uvođenje sustava skrivenih grafičkih elemenata za proširenje informacijskog sadržaja karte, bez utjecaja na podatke koji su obavezni na kartama, odnosno njihovu vizualnu preglednost. Zaključno se analizira primjena boja na pomorskim kartama, navode se međunarodna iskustva te daje preporuka za provedbu analize primjene boja na kartama drugih država članica IHO-a.

2019

Spektrometrija standardnih boja na hrvatskim pomorskim kartama

Jeličić, Tonći; Žiljak Gršić, Jana; Modrić, Damir;

<http://bib.irb.hr/prikazi-rad?&rad=1001291>

POLYTECHNIC & DESIGN (1849-1995) 7 (2019), 1; 33-40; Znanstveni

Standardizacija boja na službenim pomorskim navigacijskim kartama u svijetu obuhvaća preporuke i tehničke specifikacije, kako bi se izbjegle zabune i/ili pogreške zbog primjene različitih kombinacija boja i time negativno utjecalo na sigurnost plovidbe. S obzirom na to da do sada nije bilo podataka o spektrografiji primjenjenih boja, provodi se spektrografsko ispitivanje kao polazište za standardizaciju primjene boja na pomorskim kartama. U radu se daju spektrogrami boja na hrvatskim pomorskim kartama, te se osim vidljivog dijela spektra po prvi put prikazuju i rezultati za dio bliskog infracrvenog dijela spektra. Zaključno se interpretiraju dobiveni rezultati primjene boja na hrvatskim pomorskim kartama te daje preporuka za provedbu spektrografije boja na kartama drugih država članica IHO-a. Dobiveni rezultati bit će osnova za uvođenje blizanaca boja odnosno sustava skrivenih grafičkih elemenata za proširenje informacijskog sadržaja karte, što je krajnji cilj istraživanja.

Spektroskopija boja na međunarodnim pomorskim kartama u vidljivom i bliskom infracrvenom području elektromagnetskog spektra

Jeličić, Tonći; Žiljak Gršić, Jana; Modrić, Damir;

<http://www.tiskarstvo.net/printing&design2019/>

Međunarodni znanstveni skup Tiskarstvo & dizajn : Zbornik sažetaka / Žiljak Gršić, Jana (ur.) - Zagreb : Fotosoft , 2019. 20-20.

Na pomorskim kartama hidrografskih ureda država članica IHO-a primjena boja je standardizirana prema preporukama i tehničkim specifikacijama za primjenu boja. Do sada nije bilo podataka o spektrografskom sastavu tih boja, te se u ovom radu po prvi put provodi spektroskopija boja na kartama država članica koje su službeno objavile sastave boja. Spektroskopija se osim vidljivog područja proširuje i na blisko infracrveno područje elektromagnetskog spektra. U radu se daju apsorpcijski spektri boja na pomorskim kartama koji mogu poslužiti kao polazište za standardizaciju primjene boja na pomorskim kartama svih članica IHO. Rezultati su polazište za uvođenje blizanaca boja odnosno za uvođenje sustava skrivenih grafičkih elemenata za proširenje informacijskog sadržaja karte. Zaključno, daje se preporuka za provedbu daljnjih istraživanja sustava zaštite pomorskih karata od krivotvorenja, što je krajnji cilj istraživanja.

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