



INSTITUTE OF OCEANOGRAPHY AND FISHERIES SPLIT,
CROATIA, since 1930 – 75 years



INSTITUTE OF OCEANOGRAPHY AND FISHERIES

Setaliste Ivana Mestrovica 63
21000 Split;

***MEDAS system for Internet
presentation, management and
validation of
Oceanographic metadata and data***

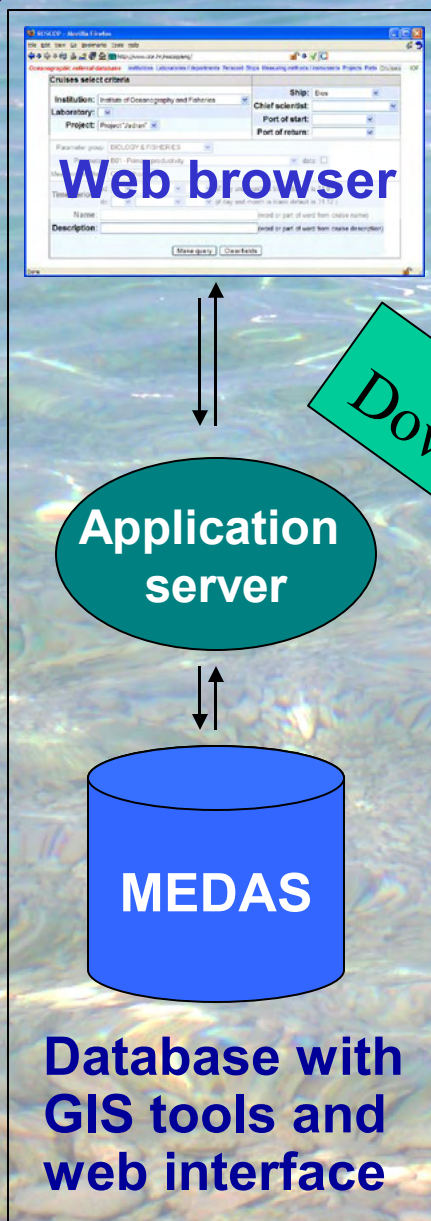
Damir Ivankovic, Vlado Dadic

Internet Users' Conference - **CUC 2005**
Dubrovnik, November 21.-23., 2005.



Database & supplayers / users

INSTITUTE OF OCEANOGRAPHY AND FISHERIES SPLIT,
CROATIA, since 1930 – 75 years



Croatian National Monitoring Programme

Systematic Research of the Adriatic Sea as a Base for Sustainable Development of the Republic of Croatia



Croatian Institutions

- ☐ Government
- ☐ Counties
- ☐ Tourists
- ☐ Decision makers
- ☐

Marine **E**nvironmental **D**atabase of the **A**driatic **S**ea
(**MEDAS**)



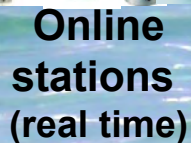
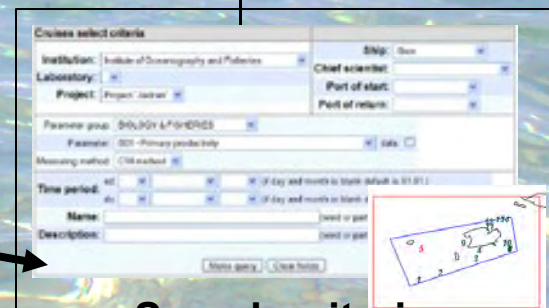


Figure 1 consists of two panels. The top panel is a vertical profile of temperature (°C) vs. depth (m). The y-axis represents depth from 0 to 20 meters, and the x-axis represents temperature from 18.0 to 20.0 °C. The data points show a sharp increase in temperature from approximately 18.5 °C at 20 meters depth to about 19.5 °C at 10 meters depth, then a more gradual increase to 20.0 °C at the surface. The bottom panel is a horizontal profile of temperature (°C) vs. time (hours). The y-axis represents temperature from 20 to 28 °C, and the x-axis represents time from 08:00 to 07:00. The data points show a diurnal cycle with a peak temperature of approximately 27.5 °C around 14:00 and a minimum temperature of approximately 21.5 °C around 03:00.

Data visualisation



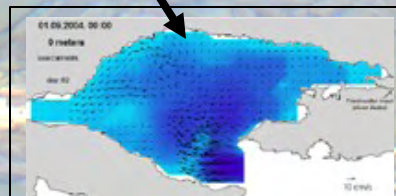
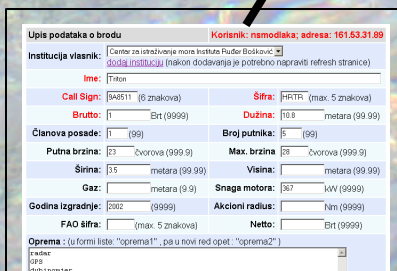
Mapping and data visualisation tools



**Search criteria,
grouping data,
statistics**



Manually inserted data



Data for running models

Data export: ↓

- MEDAR / MEDATLAS
- Excel
- Ocean Data View
- Surfer
- Arc GIS 8.1



MEDAS database - history

MEDAS - [Hidrokemijski podaci]

Postupak: Urednik | Upit | Blok | Slog | Polje | Prozor | Upute

Korisnik baze: Raz

ispis obavezo	metoda	val. fakt.
☒ Temp. mora		
☒ Slanost mora		
☒ Kisik (O2)		
☒ PH		
☒ PH ukupno		
☒ HCl koeficijent		

Izlaz u datoteku: ☐ Prikaz postaja: ☒ Period (broj godina): Cijelo

Graf: MEDAS - prikaz

Povratak:

Duzina: Sirina:

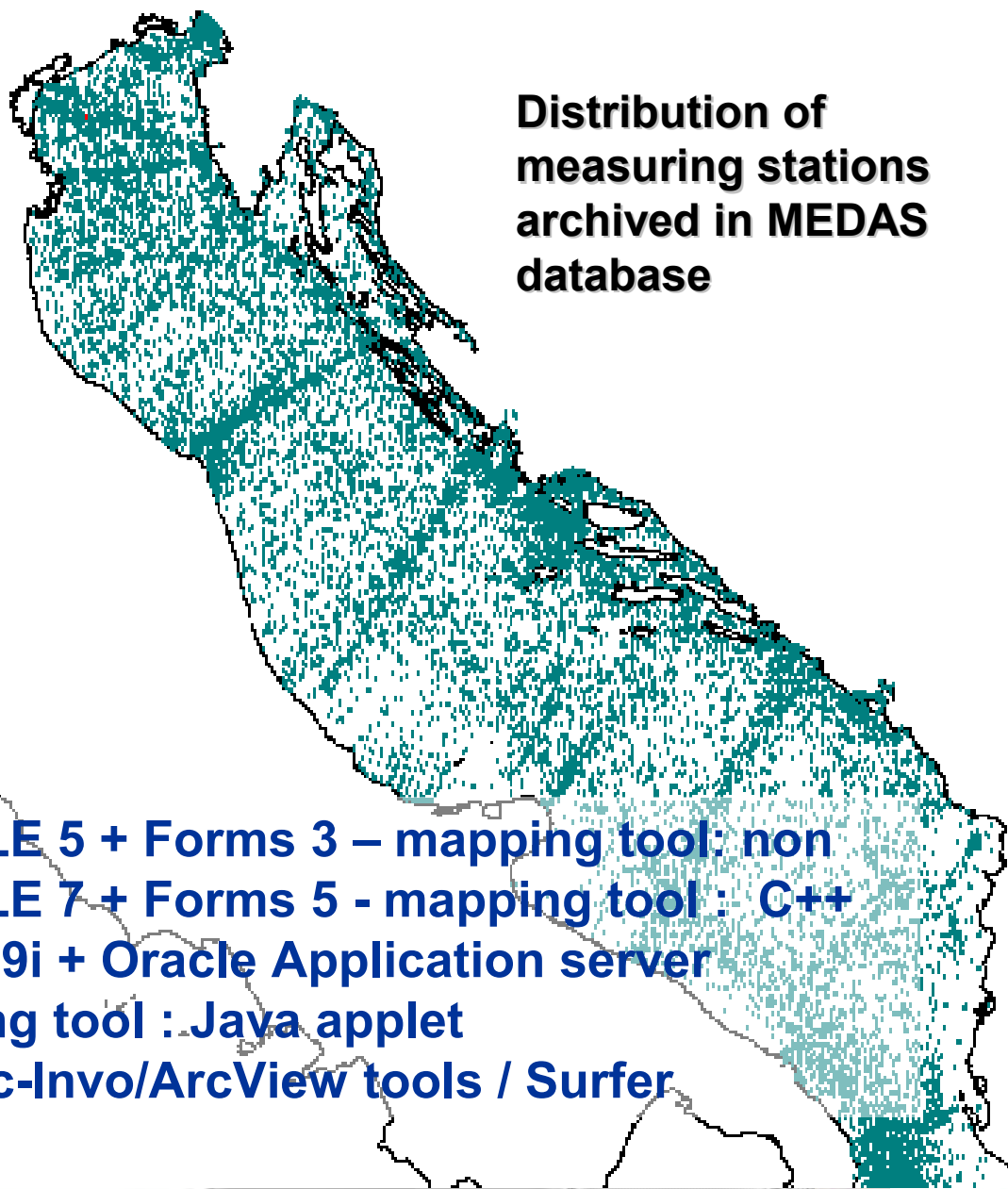
odabir kolone: dubin:

Izracunate vrijednosti	
broj podataka	16
srednja vrijednost	17.2188
maksimalna vrijednost	23.3000
minimalna vrijednost	13.7000
standardna devijacija	3.11624
varianca	9.71096

Enter value for odabir kolone

Slog: 5/14

Distribution of measuring stations archived in MEDAS database



- ORACLE 5 + Forms 3 – mapping tool: non
- ORACLE 7 + Forms 5 - mapping tool : C++
- Oracle 9i + Oracle Application server
- Mapping tool : Java applet
- GIS Arc-Invo/ArcView tools / Surfer

Why this technologies?

ORACLE 9i:

- Stability, security
- Lack of stuff (few men's show)

ORACLE

ORACLE Application Server:

- No need for client side software (only browser)
- Accessibility (different institutions, ship – GPRS)
- Easy web publishing (default)

Java applet – mapping tool and data visualisation:

- Portability (cross platform)
- Use of Client side resources
(no need for powerful server)



Disadvantages:

- Software license cost
- Instability and bugs of some Java versions
- Sometimes need for manually JVM install

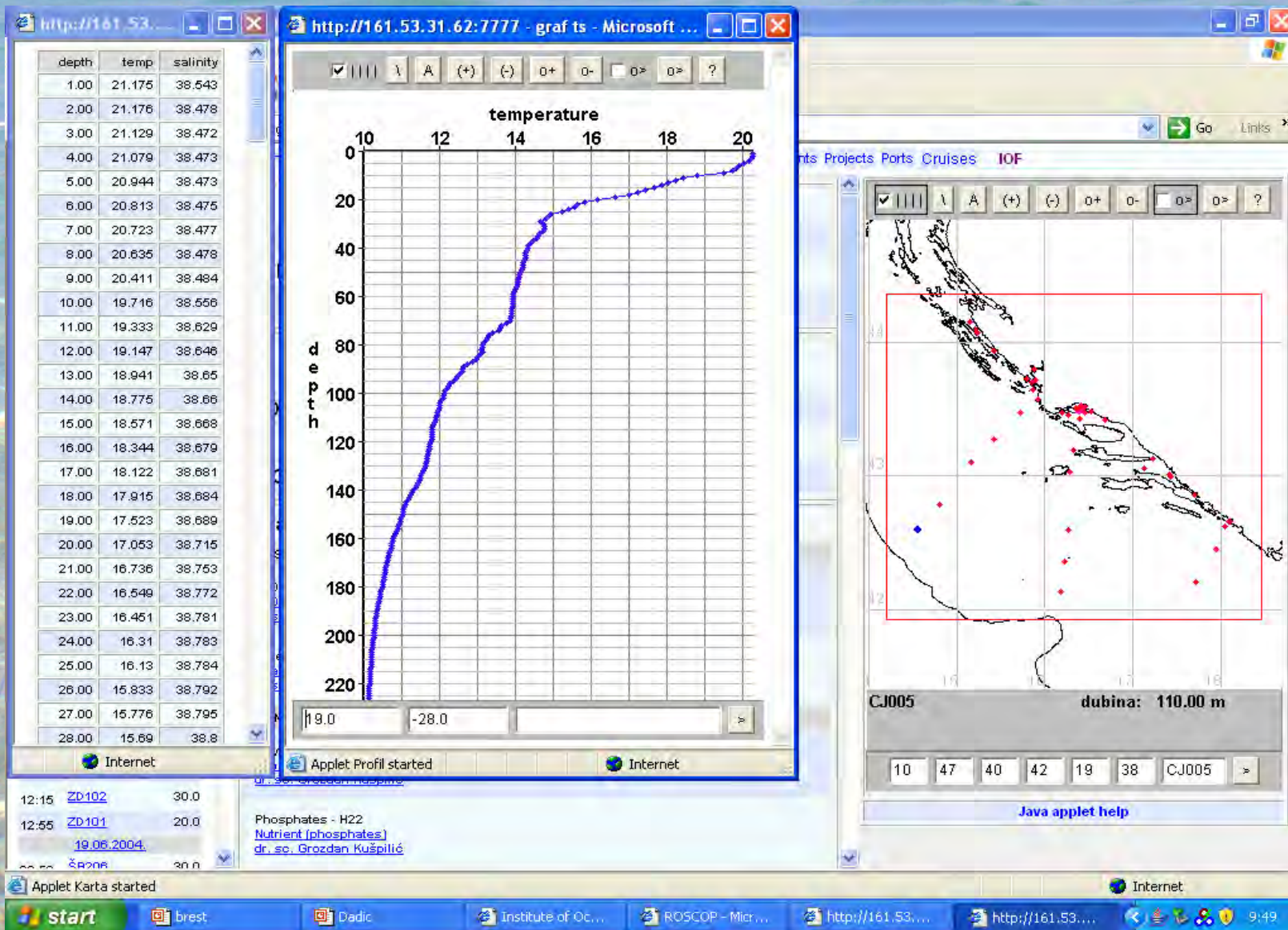


MEDAS database web interface

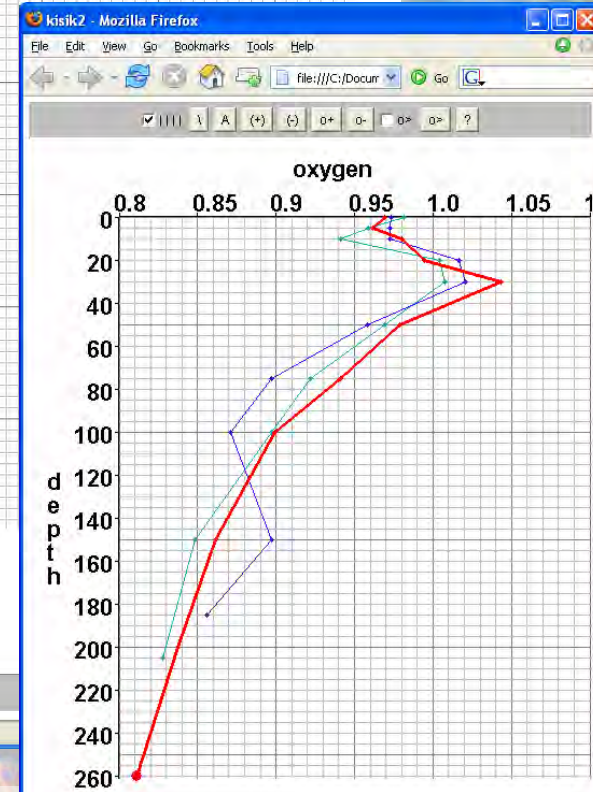
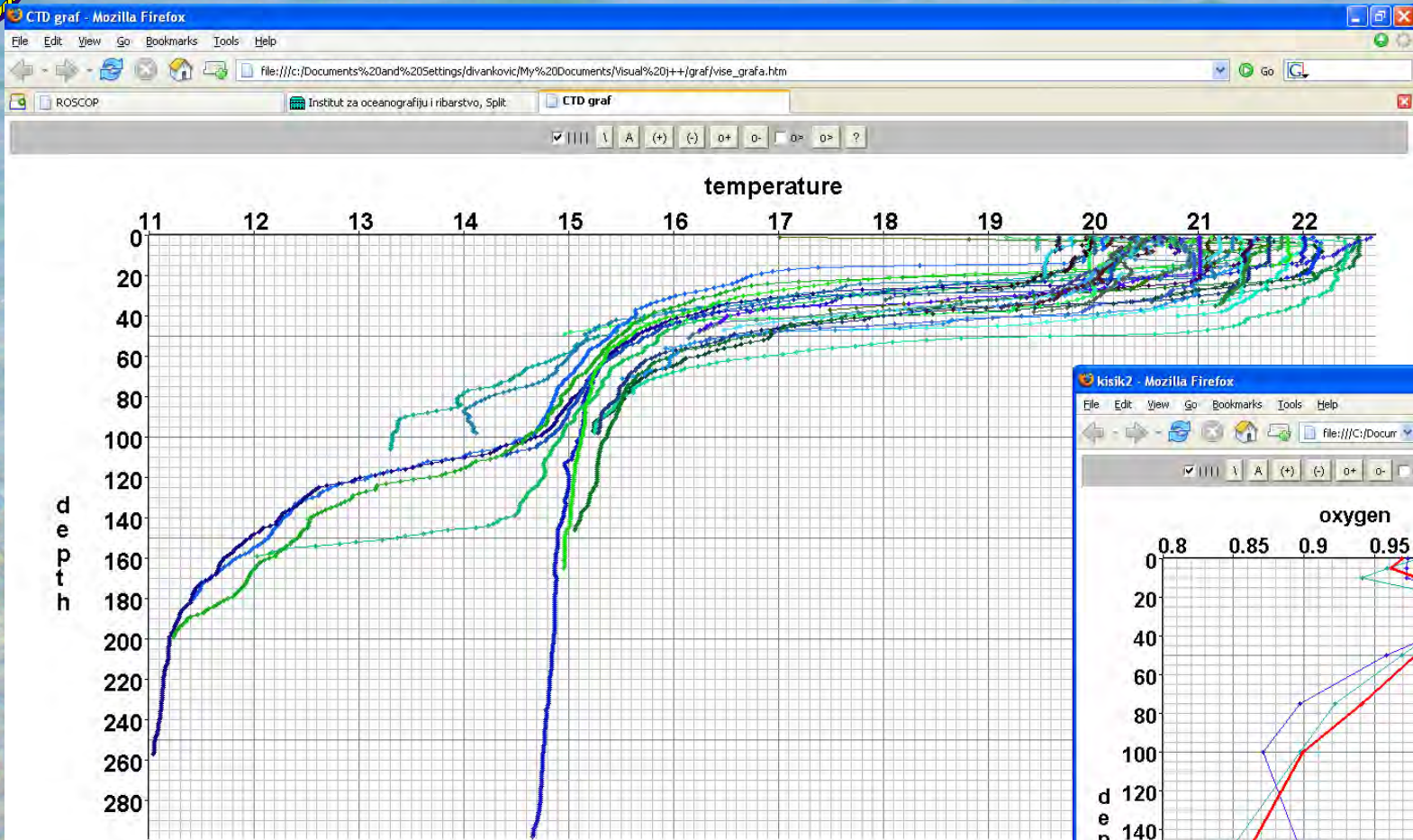




Metadata and measured data



Quality control and data visualisation



Data visualisation and quality control linked with CSR metadata – to anchorage scientist to fill CSR reports

Importance of good search criteria

ROSCOP - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.izor.hr/roscop/eng/index.html

Institute of Oceanography and Fisheries, S... ROSCOP

Oceanographic referral database Institutions Laboratories / departments Personnel Ships Measuring methods / instruments Projects Ports Cruises IOF

Cruises select criteria

Institution:

Ship: Bios

Scientist: Dadić Vlado

Date of start: Split - IOF

Date of return:

blank default is 01.01.)

blank default is 31.12.)

or part of word from cruise name)

or part of word from cruise description)

Karta - detalji 1

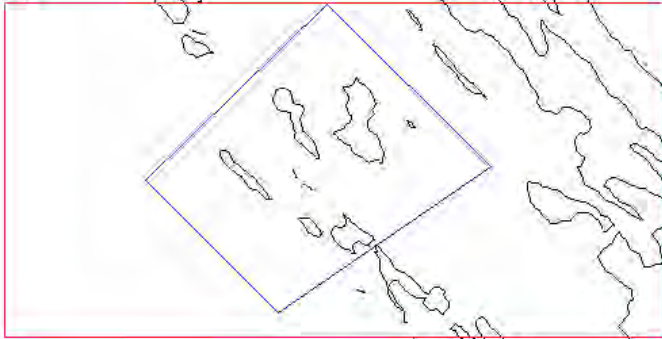
Karta Prozor Update

Karta

Coordinate

Trenutna	44.11544
pozicija:	14.79469
Kvadrant:	
44.49508	44.49508
14.28571	15.22078
44.18033	44.18033
14.28571	15.22078
Poligon:	
44.32749	44.49355
14.48435	14.74457
44.34026	44.20358
14.97781	14.67325

Jadran




Input forms

BRODOVI

IME	T* [Brt]	Duž* [m]
Navicula	1	10.80
Triton	1	10.80
Hidra	77	22.10
Vila Velebita	100	25.40
Bios	173	27.74
Naše More	240	31.35
Palagruža	300	45.00

Upiši podatke o brodu (za autorizaciju)

* T - brutto tonaža u Brt

➤ Data input through web forms (Croatian language only)

➤ Authorisation requested

➤ Basic input validation

➤ Secure protocol (https)

Ime: **Triton**



Call Sign: 9A8511

Šifra: HRTR

Brutto: 1 Brt

Dužina: 10.80 m

Posada: 1

Upis podataka o brodu

Korisnik: nsmodlaka; adresa: 161.53.31.89

Institucija vlasnik:

Centar za istraživanje mora Instituta Ruđer Bošković

[dodaj instituciju](#) (nakon dodavanja je potrebno napraviti refresh stranice)

Ime:

Triton

Call Sign:

9A8511 (6 znakova)

Šifra:

HRTR (max. 5 znakova)

Brutto:

1 Brt (9999)

Dužina:

10.8 metara (99.99)

Broj posade:

1 (99)

Broj putnika:

5 (99)

Max. brzina:

23 čvorova (999.9)

Max. brzina:

28 čvorova (999.9)

Širina:

3.5 metara (99.99)

Visina:

metara (99.99)

Gaz:

metara (9.9)

Snaga motora:

367 kW (9999)

Izgradnje:

2002 (9999)

Akcioni radius:

Nm (9999)

FAO šifra:

(max. 5 znakova)

Netto:

Brt (9999)

Oprema: (u formi liste: "oprema1", pa u novi red opet: "oprema2")

radar
GPS
dubinomjer,

Cruise report example

ROSCOP - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.izor.hr/roscop/eng/

ROSCOP Institut za oceanografiju i ribarstvo, Split

Oceanographic referral database Institutions Laboratories / departments Personnel Ships Measuring methods / instruments Projects Ports Cruises IOF

Back

Bios 15.06.04.-25.06.04.

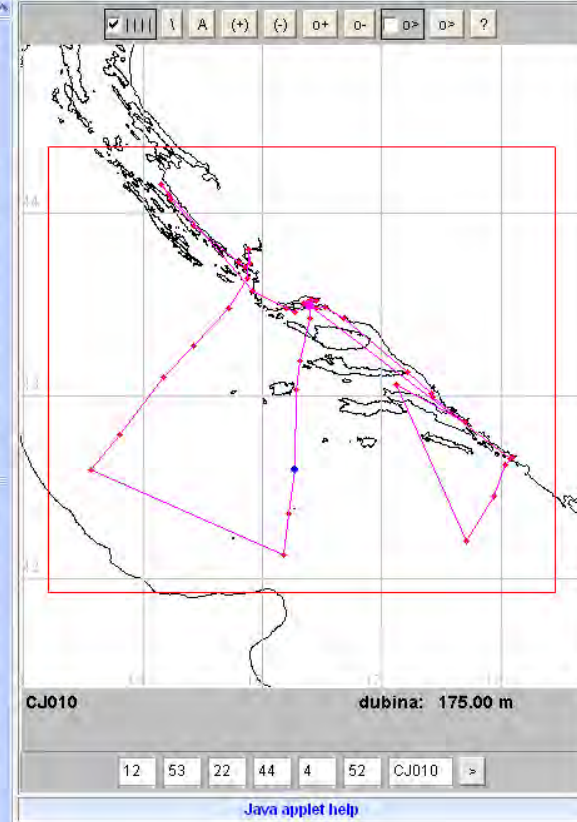
No.	name	dep.
15.06.2004.		
10:40	CJ007	50.0
12:50	CJ008	75.0
16.06.2004.		
06:20	CJ009	102.0
15:25	CJ010	175.0
17:55	CJ011	102.0
20:05	CJ012	110.0
17.06.2004.		
05:50	CJ005	110.0
08:20	CJ004	205.0
12:20	CJ003	260.0
15:40	CJ002	185.0
18:25	CJ001	168.0
20:45	SB205	57.0
18.06.2004.		
06:15	SB101	12.0
07:05	SB103	35.0
07:30	SB203	10.0
07:50	SB201	10.0
10:30	ZD105	8.0
11:50	ZD103	26.0
12:15	ZD102	30.0
12:55	ZD101	20.0
19.06.2004.		
06:50	SB206	30.0
08:55	ST201B	47.0
09:35	ST201	50.0
20.06.2004.		
07:40	ST101	35.0
08:45	ST103	15.0
09:25	ST102	28.0
09:55	ST104	20.0
14:15	ST203B	40.0
15:00	ST204	15.0
16:20	ST206	40.0
21.06.2004.		
08:30	PL101A	35.0
10:10	PL102	18.0
10:35	PL103B	18.0
12:25	PL105	8.0
22.06.2004.		
07:40	PL101B	48.0
23.06.2004.		
05:00	D1200	1200.0
14:45	D300	300.0
18:00	D100	100.0

Done

Bios 15.06.04.-25.06.04.

Cruis: Bios 15.06.2004.-25.06.2004.; Jadran, 40 stations
Chief scientist: Lambe Stojanovski, duration: 11 days
Port of departure: Split - IOR, Punta Jurana, Port of return: Split - IOR, Punta Jurana
• Croatian National Monitoring Programme - Jadran

no.	time	name	depth	longitude	latitude	no.of.par.
1	15.06.2004. 10:40	CJ007	50.0	43° 26.253'	16° 23.767'	19
2	15.06.2004. 12:50	CJ008	75.0	43° 12.285'	16° 19.021'	16
3	16.06.2004. 06:20	CJ009	102.0	43° 2.804'	16° 17.128'	19
4	16.06.2004. 15:25	CJ010	175.0	42° 36.351'	16° 16.26'	16
5	16.06.2004. 17:55	CJ011	102.0	42° 22.08'	16° 13.4'	19
6	16.06.2004. 20:05	CJ012	110.0	42° 8.31'	16° 10.42'	16
7	17.06.2004. 05:50	CJ005	110.0	42° 36.3'	14° 33.6'	19
8	17.06.2004. 08:20	CJ004	205.0	42° 47.893'	14° 48.508'	16
9	17.06.2004. 12:20	CJ003	260.0	43° 6.569'	15° 10.132'	19
10	17.06.2004. 15:40	CJ002	185.0	43° 16.92'	15° 25.15'	16
11	17.06.2004. 18:25	CJ001	168.0	43° 29.258'	15° 43.293'	19
12	17.06.2004. 20:45	SB205	57.0	43° 39.259'	15° 52.26'	16
13	18.06.2004. 06:15	SB101	12.0	43° 48.454'	15° 52.795'	16
14	18.06.2004. 07:05	SB103	35.0	43° 44.05'	15° 53.52'	16
15	18.06.2004. 07:30	SB203	10.0	43° 42.748'	15° 50.88'	16
16	18.06.2004. 07:50	SB201	10.0	43° 44.43'	15° 47.89'	16
17	18.06.2004. 10:30	ZD105	8.0	43° 56.649'	15° 25.653'	16
18	18.06.2004. 11:50	ZD103	26.0	44° 5.2'	15° 14.2'	16
19	18.06.2004. 12:15	ZD102	30.0	44° 6.811'	15° 12.575'	16
20	18.06.2004. 12:55	ZD101	20.0	44° 10.1'	15° 9.265'	16
21	19.06.2004. 06:50	SB206	30.0	43° 35.237'	15° 54.933'	16
22	19.06.2004. 08:55	ST201	47.0	43° 28.54'	16° 11.776'	16
23	19.06.2004. 09:35	ST201B	50.0	43° 28.042'	16° 16.279'	16
24	20.06.2004. 07:40	ST203B	40.0	43° 14.4'	16° 22.851'	21
25	20.06.2004. 08:45	ST103	15.0	43° 31.99'	16° 27.26'	21
26	20.06.2004. 09:25	ST102	28.0	43° 32.171'	16° 24.373'	21
27	20.06.2004. 09:55	ST204	15.0	43° 29.55'	16° 20.875'	18
28	20.06.2004. 14:15	ST206	40.0	43° 25.93'	16° 27.102'	19
29	20.06.2004. 15:00	ST204	15.0	43° 29.55'	16° 31.58'	16
30	20.06.2004. 16:20	ST206	40.0	43° 25.93'	16° 40.92'	19
31	21.06.2004. 08:30	PL101A	35.0	43° 18.3'	17° 24.639'	18
32	21.06.2004. 10:10	PL102	18.0	43° 1.502'	17° 24.639'	18
33	21.06.2004. 10:35	PL103B	18.0	43° .044'	17° 25.428'	18
34	21.06.2004. 12:25	PL105	8.0	42° 51.91'	17° 41.676'	16



CJ010 dubina: 175.00 m

12 53 22 44 4 52 CJ010 >

Java applet help



Importance of Where, What, When and Who

Oceanographic referral database Institutions Laboratories / departments Personnel Ships Measuring methods / instruments Projects Ports Cruises IOF

00:30	MP	100.0
13:00	V2 - VK -	55.0
	09.07.2005.	
09:10	Š5 -	35.0
10:00	Š4 -	59.0
10:30	Š2 -	12.0
11:00	Sb 202	32.0
11:40	Š3 -	22.0
13:30	Z3 -	23.0
15:30	Z2 -	22.0
16:30	Z1 -	33.0
	10.07.2005.	
14:40	Š1 -	35.0
15:40	Sb 102	30.0
	11.07.2005.	
10:25	S3 -	56.0
	12.07.2005.	
08:50	ST101 -	38.0
	MP	
10:05	S1 -	38.0
10:50	S4 -	15.0
11:40	ST104 -	22.0
	MP	
12:10	ST103 -	18.0
	MP	
	15.07.2005.	
14:30	S5 -	43.0
	16.07.2005.	
08:40	P1 -	38.0
10:30	P1 -	21.0
11:10	P3 -	20.0
	17.07.2005.	
14:20	P4 -	38.0
18:05	D2 -	43.0
	18.07.2005.	
09:11	D1 -	100.0
11:04	D3 -	40.0

Name: **D1 -**

Latitude: 42.6203 42° 37' 13" 42° 37.218'

Longitude: 18.08418333 18° 5' 3" 18° 5.051'

Depth: 100

Date and time: 18.07.2005. 09:11

Description: Dubrovnik - Dubrovnik

Group:

Order (No.):

Measuring parameters:

PHYSICAL OCEANOGRAPHY

CTD stations - H10
[CTD SBE 25 S.N.:2528482-0339 \(b\)](#)
[dr.sc. Mira Morović](#)

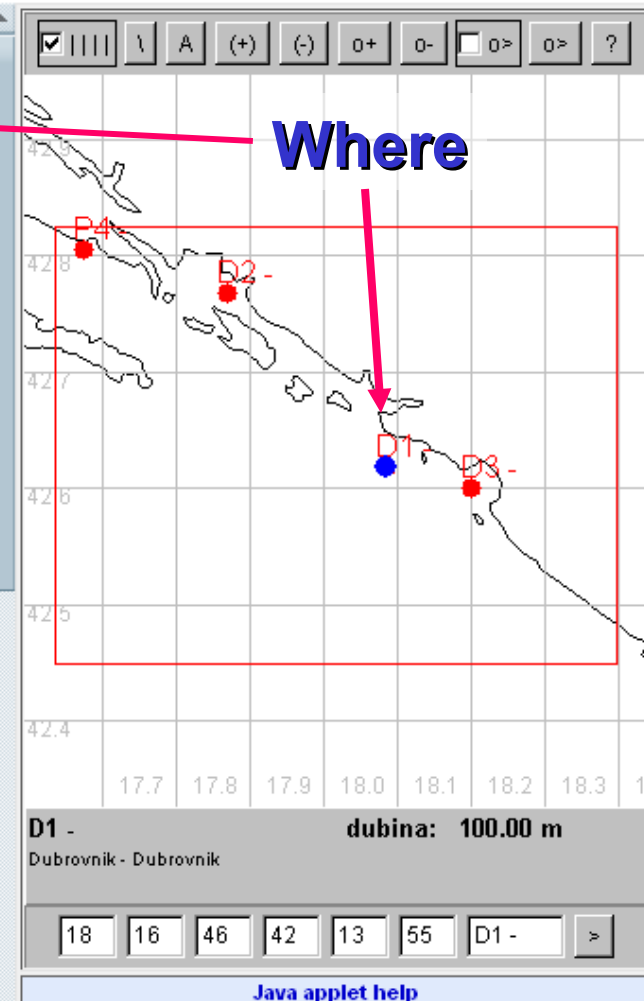
CHEMICAL OCEANOGRAPHY

Oxygen - H21
[Winkler titration](#)
[dr. sc. Grozdan Kušpilić](#)

Phosphates - H22
[Nutrient \(phosphates\)](#)
[dr. sc. Grozdan Kušpilić](#)

Total - P - H23
[Nutrients \(total - P\)](#)
[dr. sc. Grozdan Kušpilić](#)

Nitrates - H24
[Nutrient \(nitrates\)](#)

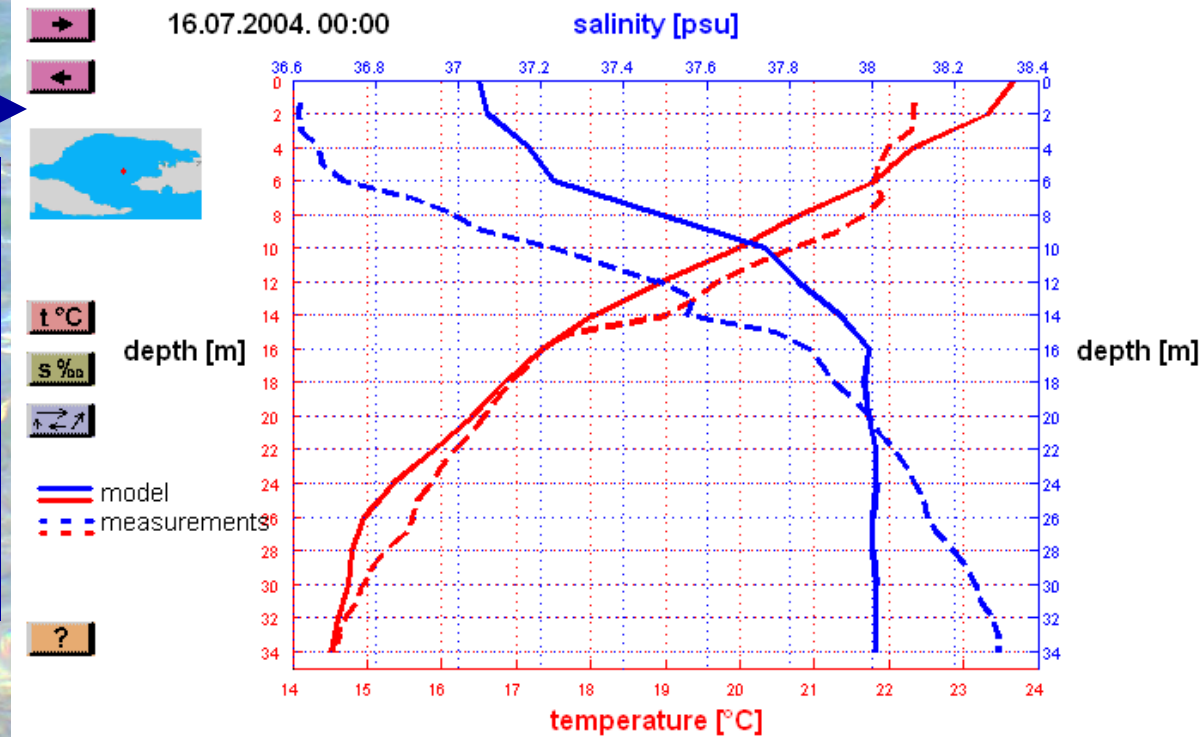
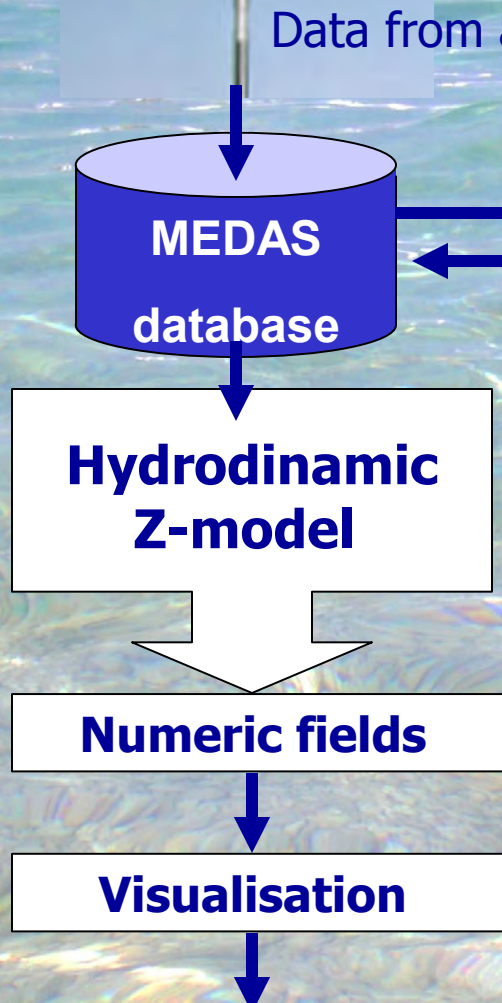


Who

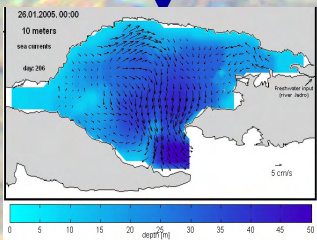
What



Real-time circulation model



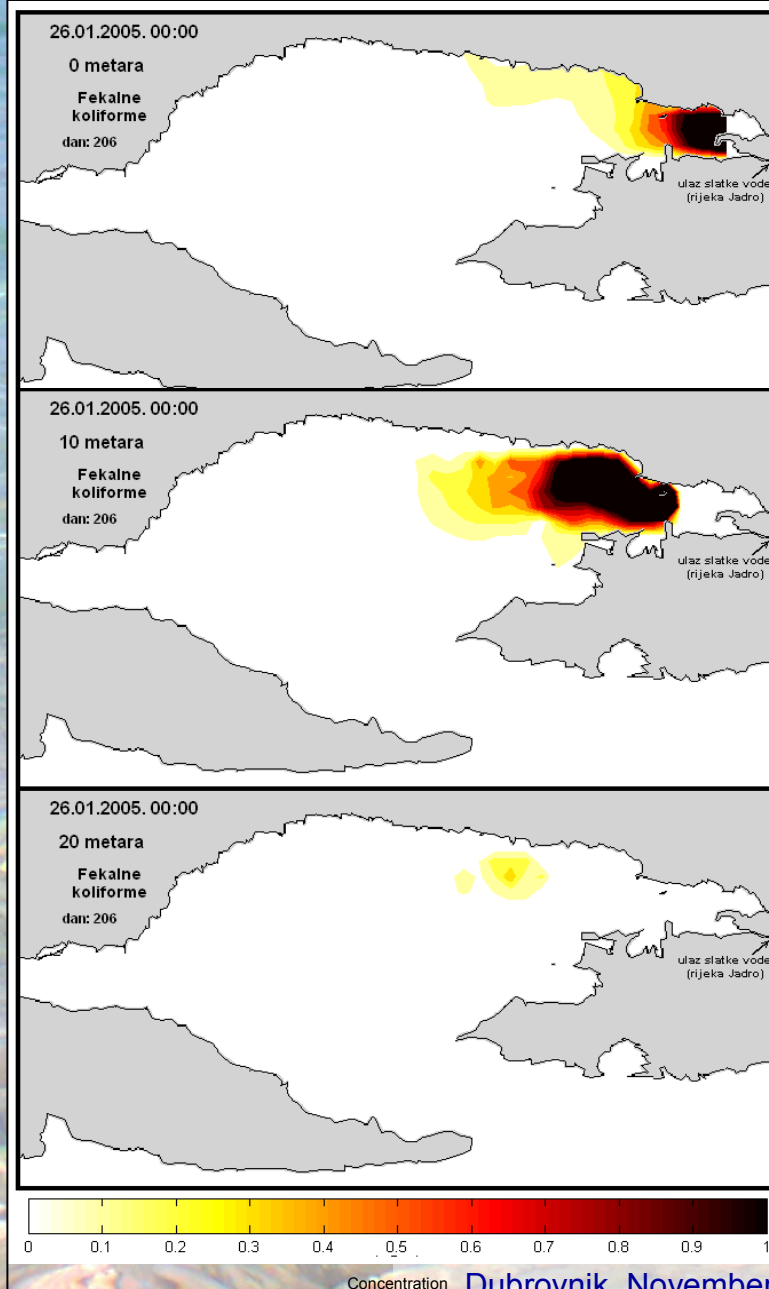
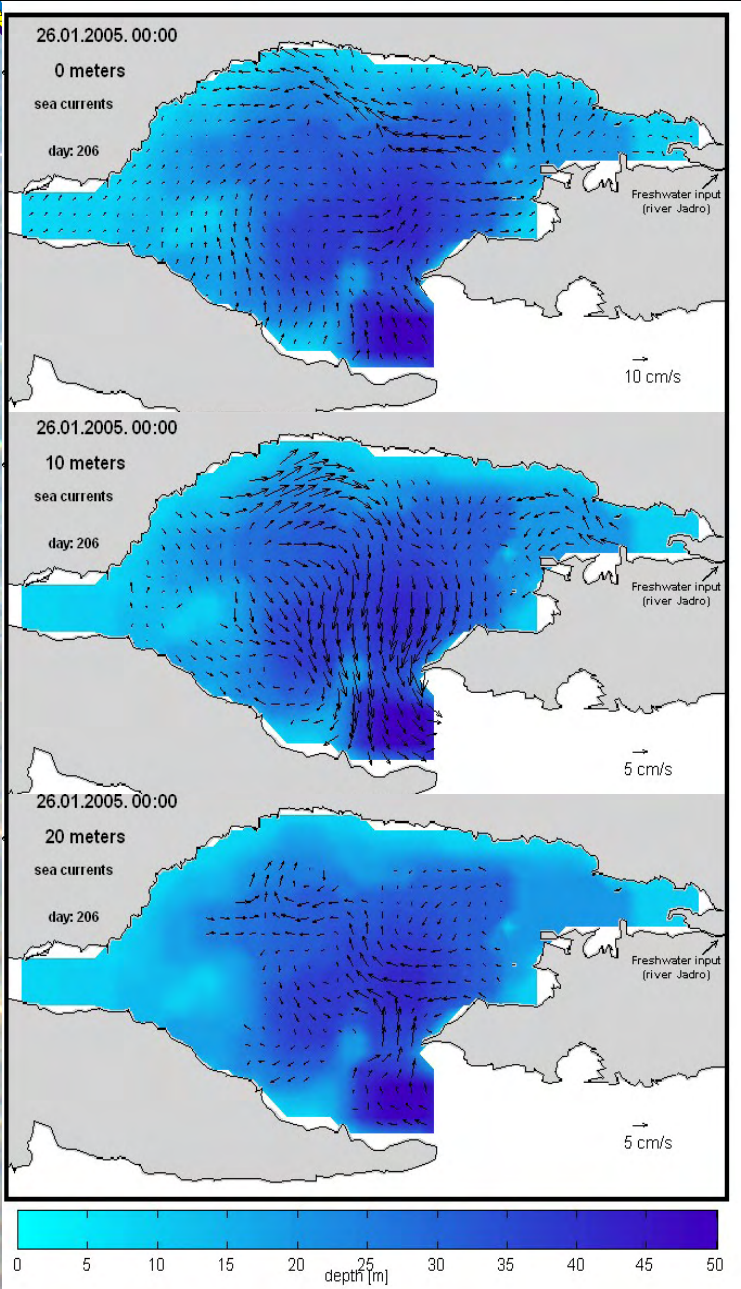
Model verification



Output

Results from model automatically published on web

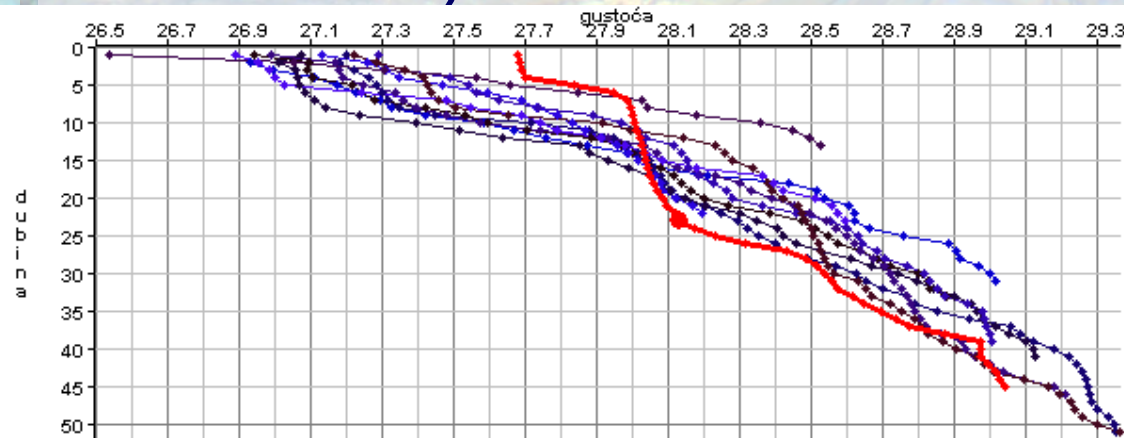
Current
fields
and
fecal
coliform





Some of benefits for Research community

- Easy and efficient way to plan, document, and control joint project with many institutions.
- Quality controlled metadata what is essential for sea research (spatial, time, and instrumentation and methods information).
- Possibility to link measured data to metadata, and quality control of measured data.
- Visualizations of spatial component (for better understanding of areas of interest), visualizations of measured data (for quality control) and various statistic reports (for analyzing data and metadata).





Future Improvements:

- Transcode all thematic databases to web environment
- Add web GIS tools' support using marine GML
- Full implementation of IOC/EU marine data dictionary
- Fully integration of marine information and data in all thematic databases
- Improvement of data quality procedures and tools for biological parameters
- Add multimedia support

