

*EuroGOOS AISBL Annual Meeting
Brussels, May 19 - 22, 2015*

Institute of Oceanography and Fisheries

Split, Croatia, <http://www.izor.hr>

Prof. Vlado Dadic
Head of Croatian Marine Referral Centre



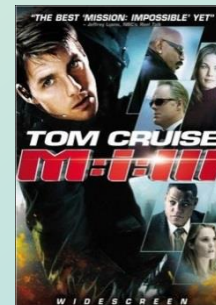
Since 1930

The Mission

IOF Mission is to exist as a **research centre of excellence** in marine sciences and fisheries, following the **international standard** in research activities, and respecting the **strategic interests** of the Republic of Croatia.

The Mission should be fulfilled through realization of:

- Strategic national and international **research activities**,
- **Curiosity-driven** and frontier **research**,
- Expertise and professional work, technological development and collaboration with business sector,
- Managing and operating **oceanographic** and **fisheries services**,
- Transfer of **knowledge** and **educational** activities.



The Institute of Oceanography and Fisheries, Split, Croatia, has been founded in 1930, following a strong demand for the research activities in the Adriatic Sea.

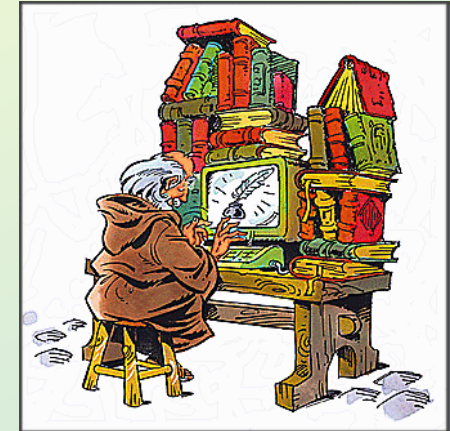
Through its **85-year functioning** in different regimes but strongly following scientific codes in conducting research activities, the Institute becomes a leading marine institution in Croatia, presently encompassing **all aspects of sea exploration**: *physical, chemical, geological and biological parameters, fisheries and aquaculture.*

- **Basic research**
- **Applied research**
- **Marine services**
- **Educational activities**
- **International collaboration**
- **Expertise and decisionmaking contributions**
- **Peer-review journal “Acta Adriatica”**
- More on <http://www.izor.hr>



Organisation:

- 8 laboratories
- Library and publishing
- I & T Centre
- General services



Human resources:

- Staff 109 (60 researchers)
(by April, 2015)



Infrastructure:

- Main and standby buildings
- Research vessels BIOS 2 and Navicula



International Collaboration and Programs

IOF is the member and IOF experts are national representatives in:

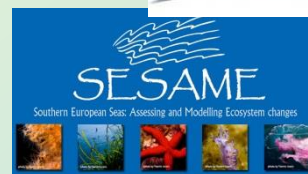
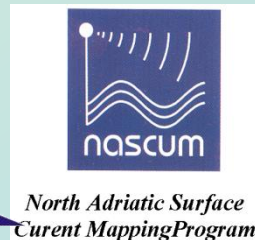
- European Marine Board
- UNESCO Intergovernmental Oceanographic Commission (IOC):
 - Croatian National Oceanographic Data Centre (NODC)
 - *IODE (IOC) data exchange, IPHAB (algae blooms), ICG NEAMTWS (tsunamis)...*
- General Fisheries Commission for the Mediterranean (GFCM)
- International Commission for the Conservation of Atlantic Tunas (ICCAT)
- International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM)
- MONGOOS, FAO ADRIAMED, EU MEDITS, SIPAM, ...
- **Altogether IOF experts are national representatives in about 20 and members in about 30 international programs**



International Research Projects

IOF International Position

- FP5 to FP7 projects (AQUAMED, MEDATLAS, SEASEARCH, ECOOP, SESAME, SUSTAINAQ, MAMA, SeaDatNet, SeaDataNet2, PARASITE, CREAM, PERSEUS, EMODNET Chemistry, EUROFLEET-2)
- USA NOAA/NWS projects (TMEWS), USA NSF (EACE, ITHACA, MEDUSA)
- Interreg-PHARE projects (ADRIA-SAFE, AiA, NASCUM, ...)
- IPA CBC projects (HAZADR, BALMAS, DeFishFear)
- Unity Through Knowledge (UKF) projects (for young scientists)
- Multilateral projects (FAO AdriaMed, ADRICOSM, MEDITS, MEDUSA, ...)
- Bilateral projects (HR-USA, HR-IT, HR-France, HR-Slovenia, HR-Austria)
- Other (UNEP, COST Actions, ...)



Educational Activities

- IOF is one of the organising institutions of doctoral studies “Applied Marine Sciences” and “Oceanology”
- IOF Scientists actively participate and coordinate undergraduate and graduate studies held by University of Split (“Ocean Biology and Ecology”, “Sea Fisheries”)
- IOF Scientists are adjunct lecturers in different undergraduate and graduate studies of Croatian Universities

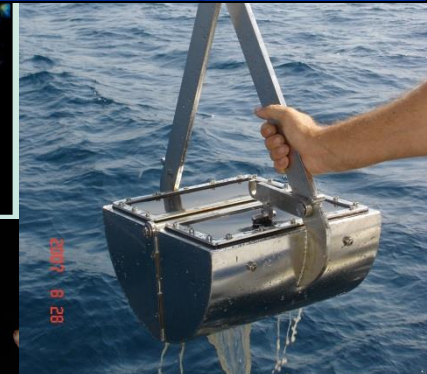
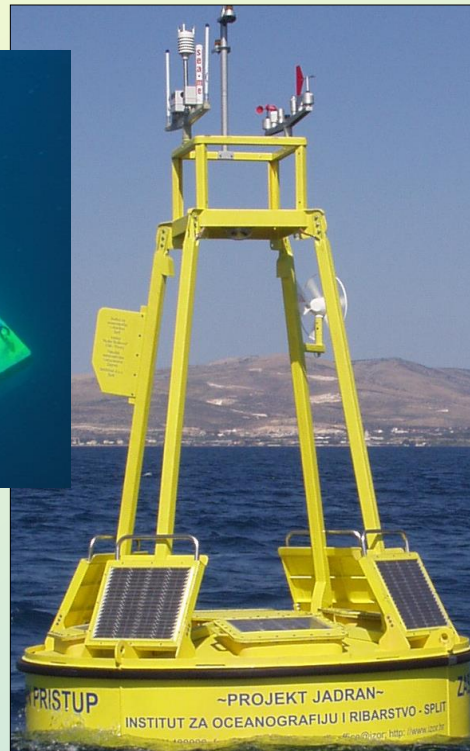


Major research fields:

- **Oceanography** (Physical, Chemical, Biological, Sedimentology, Ichtyology)
- **Fisheries** (Coastal, Pelagic, Demersal, Aquaculture, Management)
(i.e. 65 years seasonal profile: Central Adriatic - Croatia-Italy)

Also present:

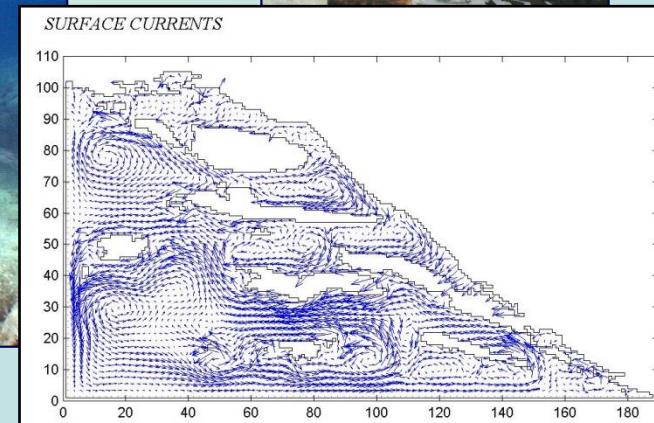
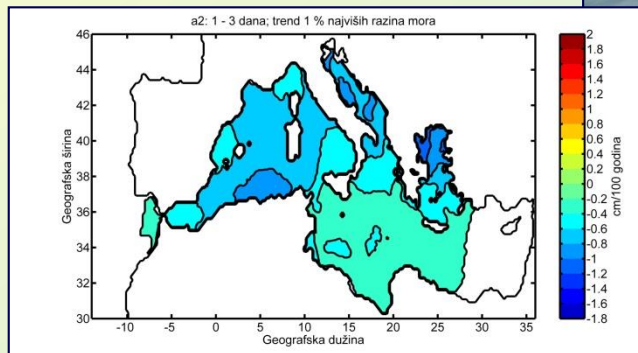
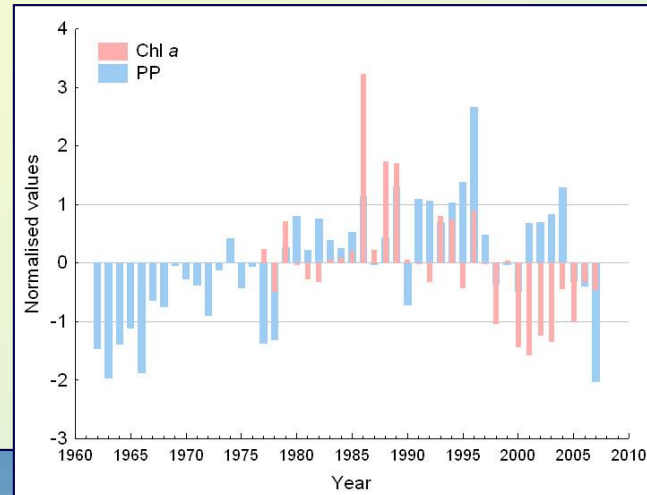
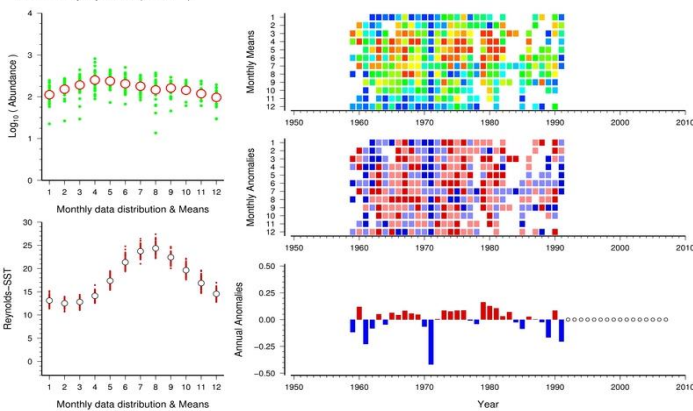
- **Biomedicine Sciences** (Veterinary Sciences)
- **Technical Sciences** (Ocean, Environmental Engineering)



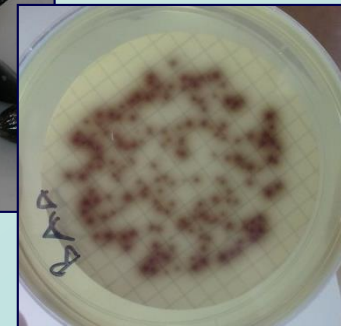
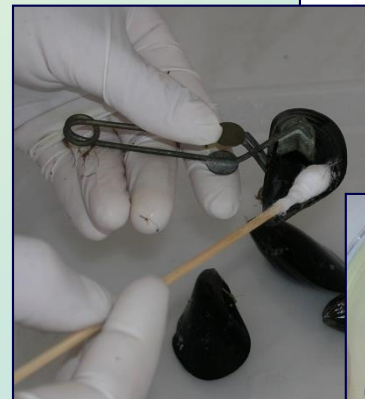
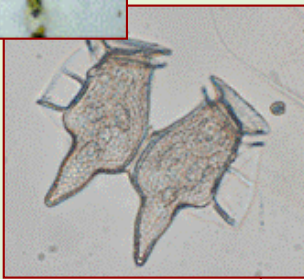
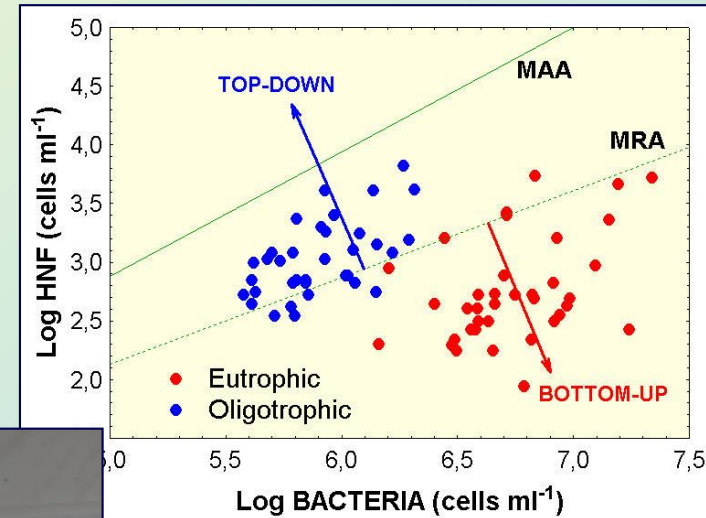
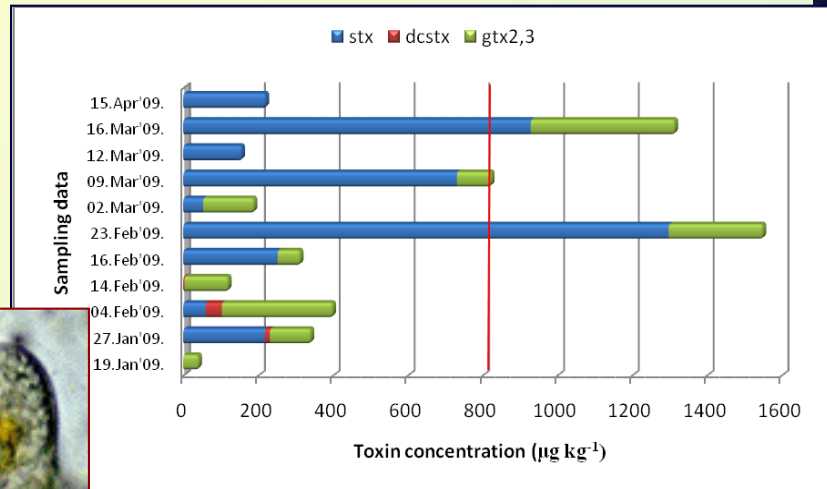
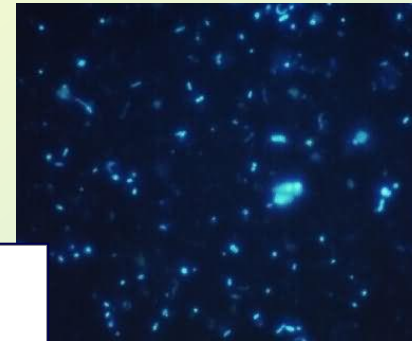
- Climate ecosystem studies
- Natural hazards
- Unusual ecosystem threats

Stonjica (Central Adriatic Sea)

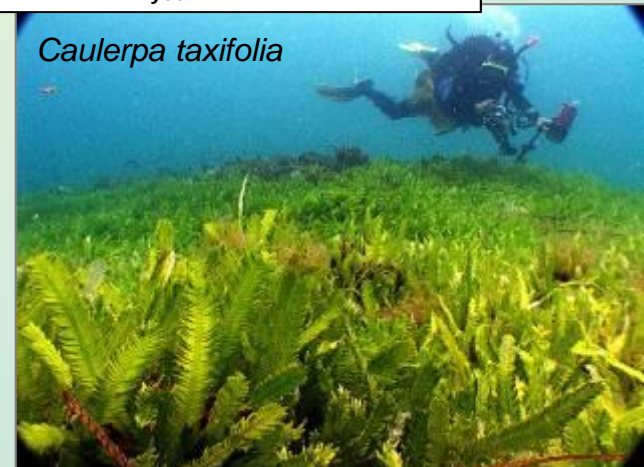
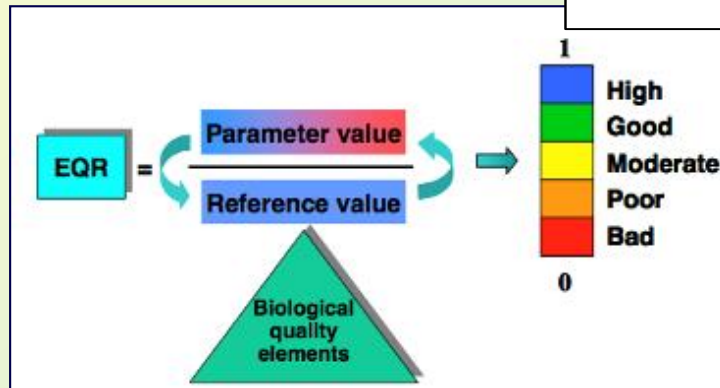
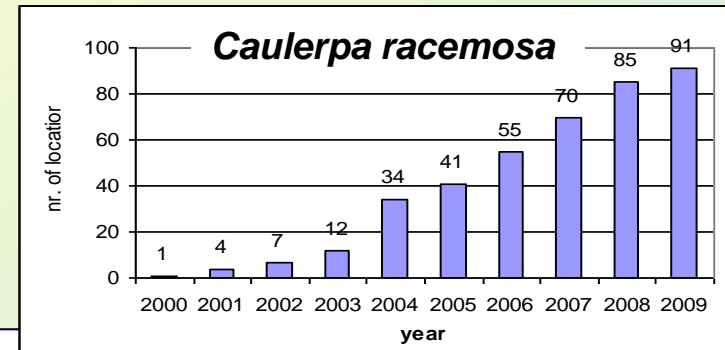
Total Copepoda ($N\ m^{-3}$)



- Microbial food web
- Toxic algae and shellfish toxicity



- Invasive and alien species
- Taxonomy, bioindicators
- Changes in ichthyofauna
- Lessepsian migrations



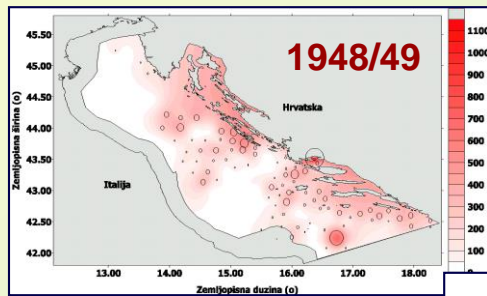
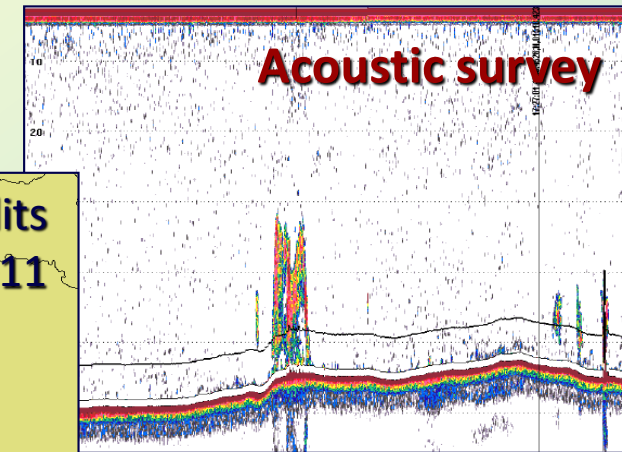
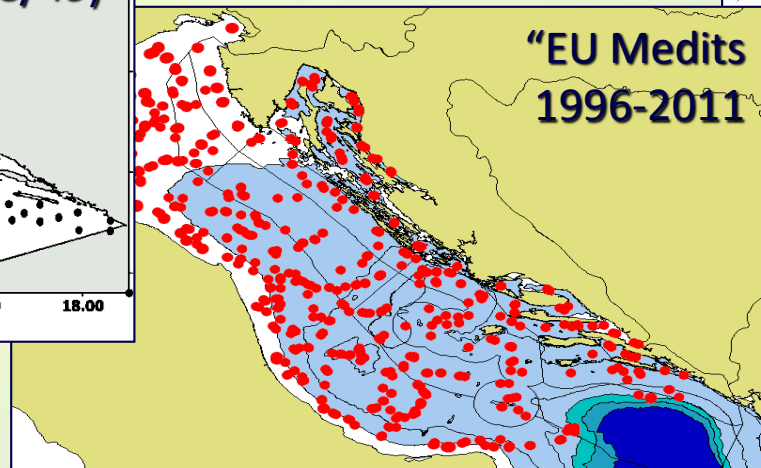
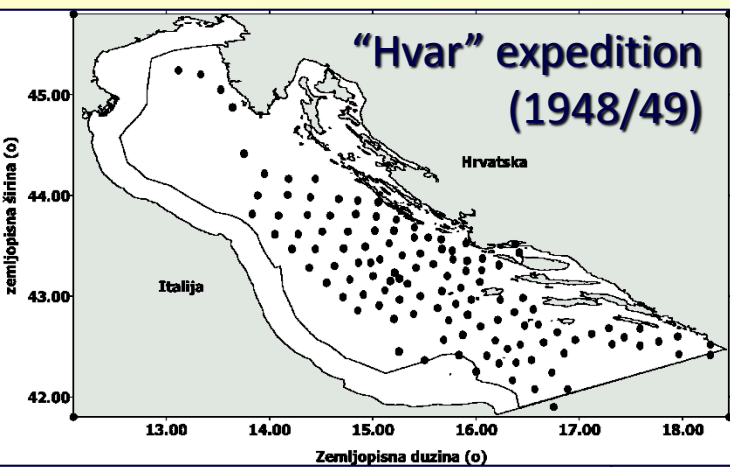
From ballast waters



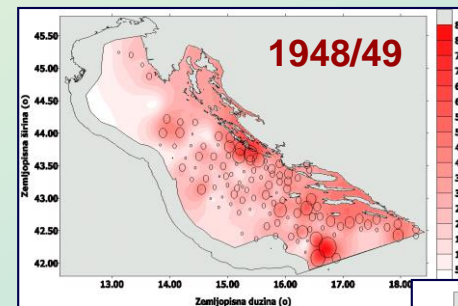
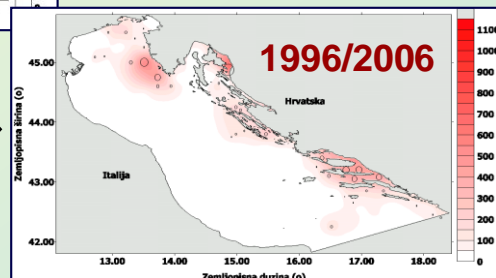
Elates ransonnetii



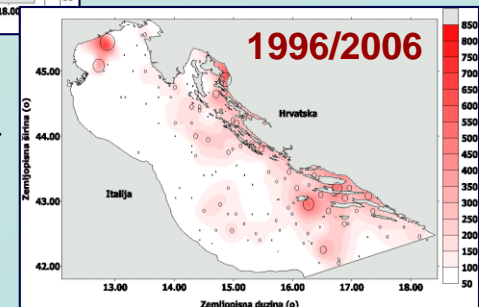
➤ Coastal, demersal and pelagic fisheries



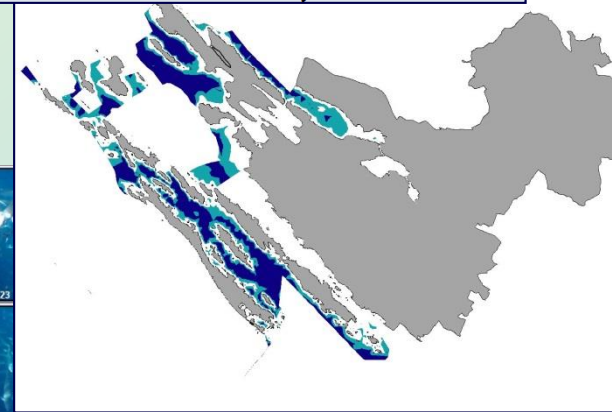
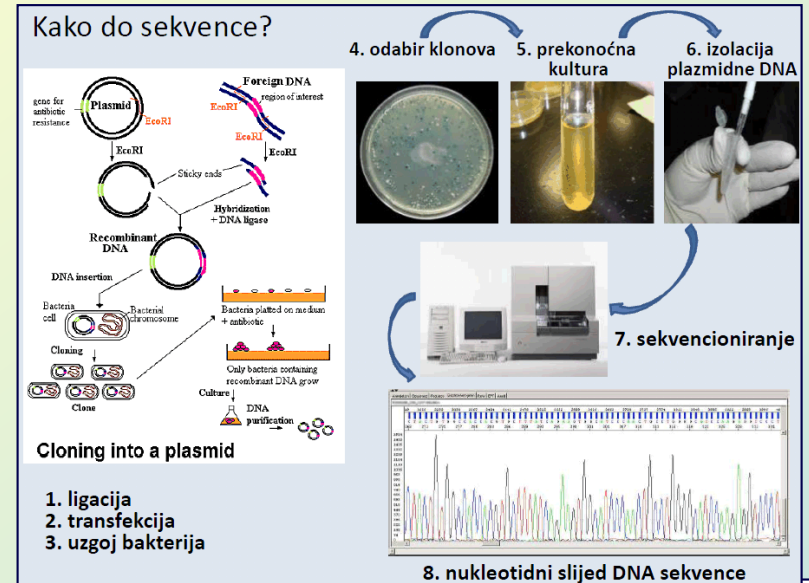
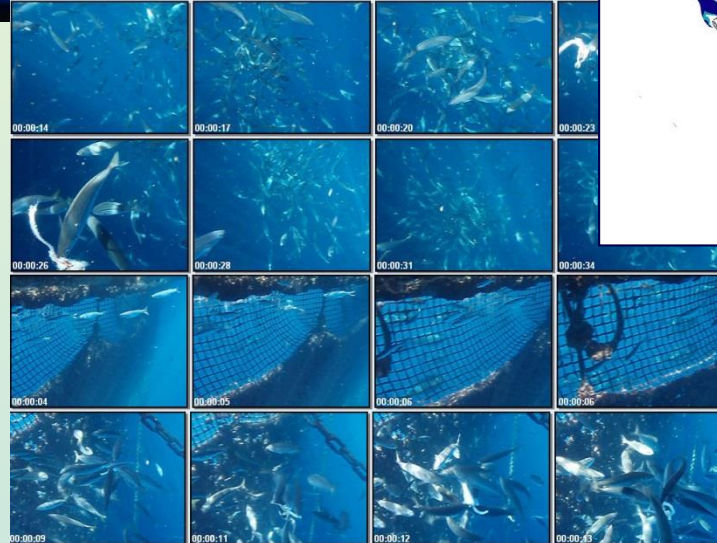
Selachians



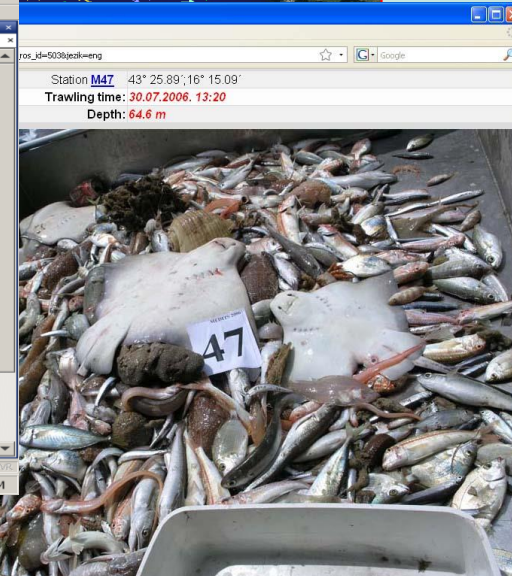
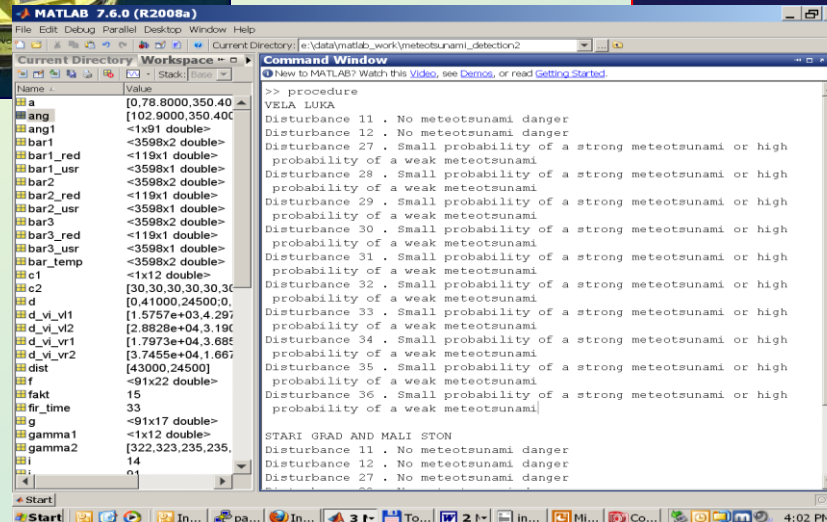
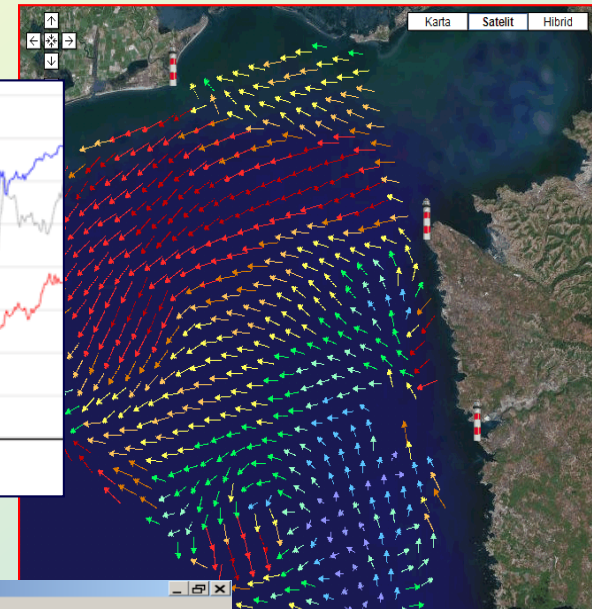
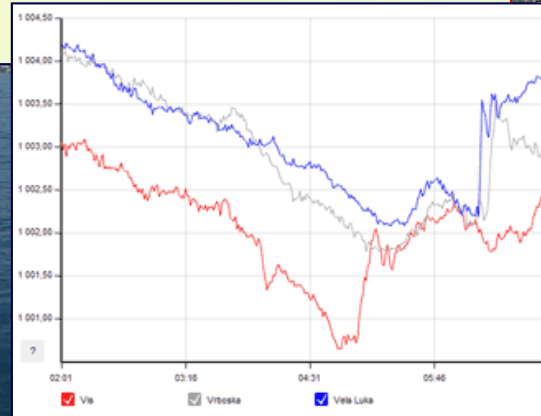
Commercial species



- Aquaculture sustainability
- Ecological implications
- Biomarkers, pathogens



- Oceanographic instrumentation
- Real-time oceanographic systems
- Database and products

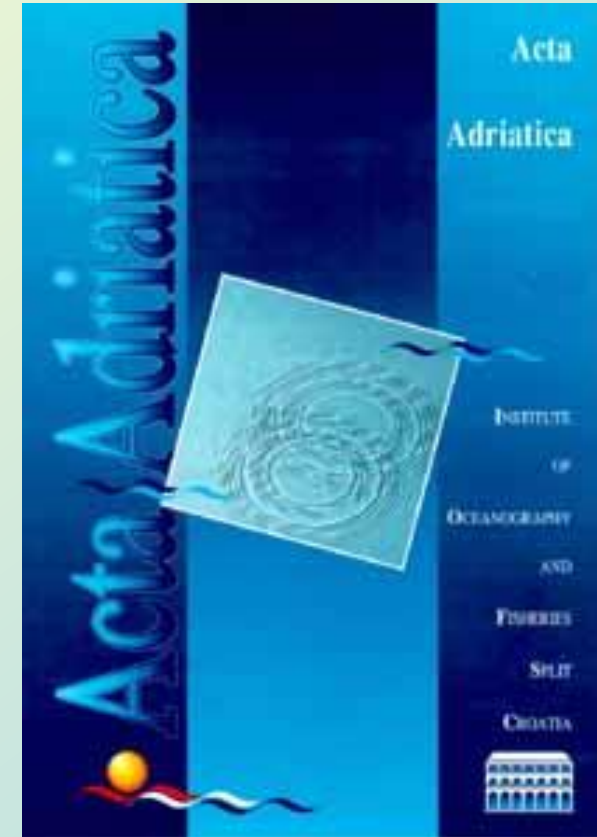


Publication Activities



Institute has been publishing the journal *Acta Adriatica* for the past 83 years (since 1932).

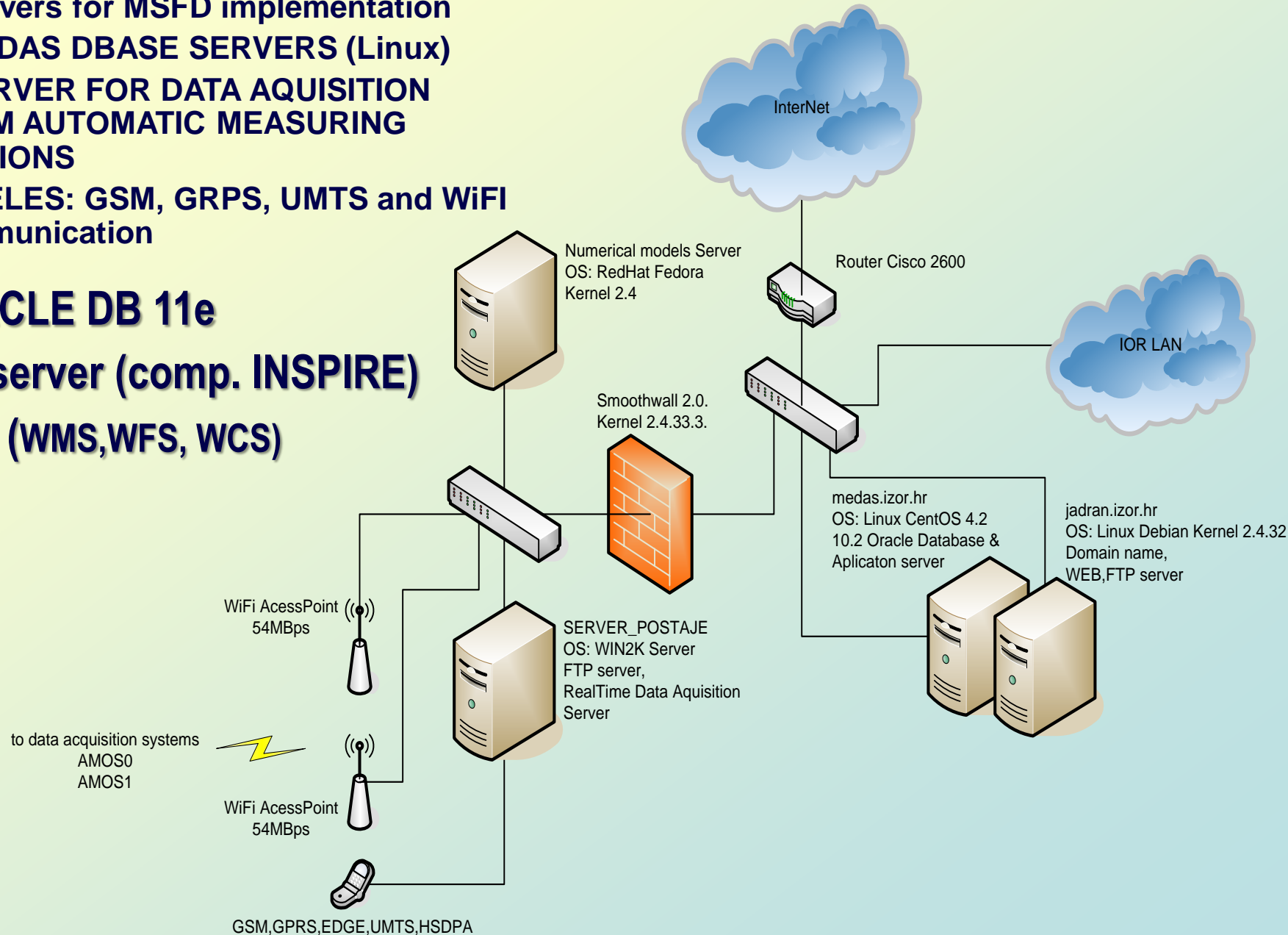
Publishes original scientific contributions on the oceanography and marine fisheries.



- International editorial board
- Indexed in Web of Science

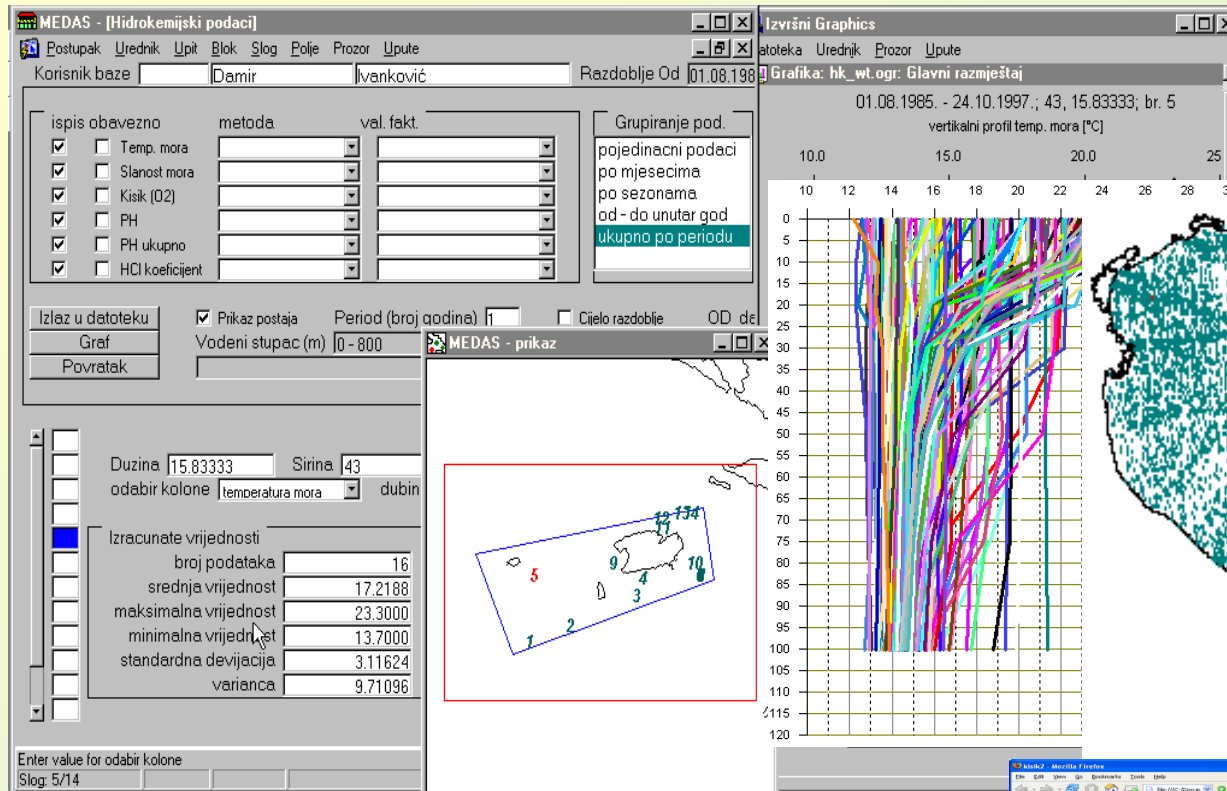
IOF – IT CENTER

- **ORACLE DB 11e**
- **Geoserver (comp. INSPIRE)**
(WMS,WFS, WCS)



MEDAS

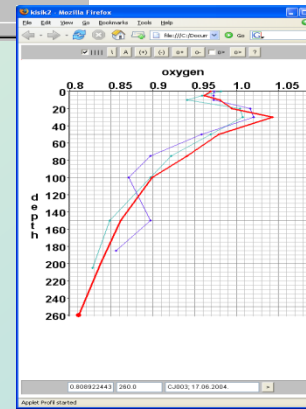
Marine Environmental Database of the Adriatic Sea



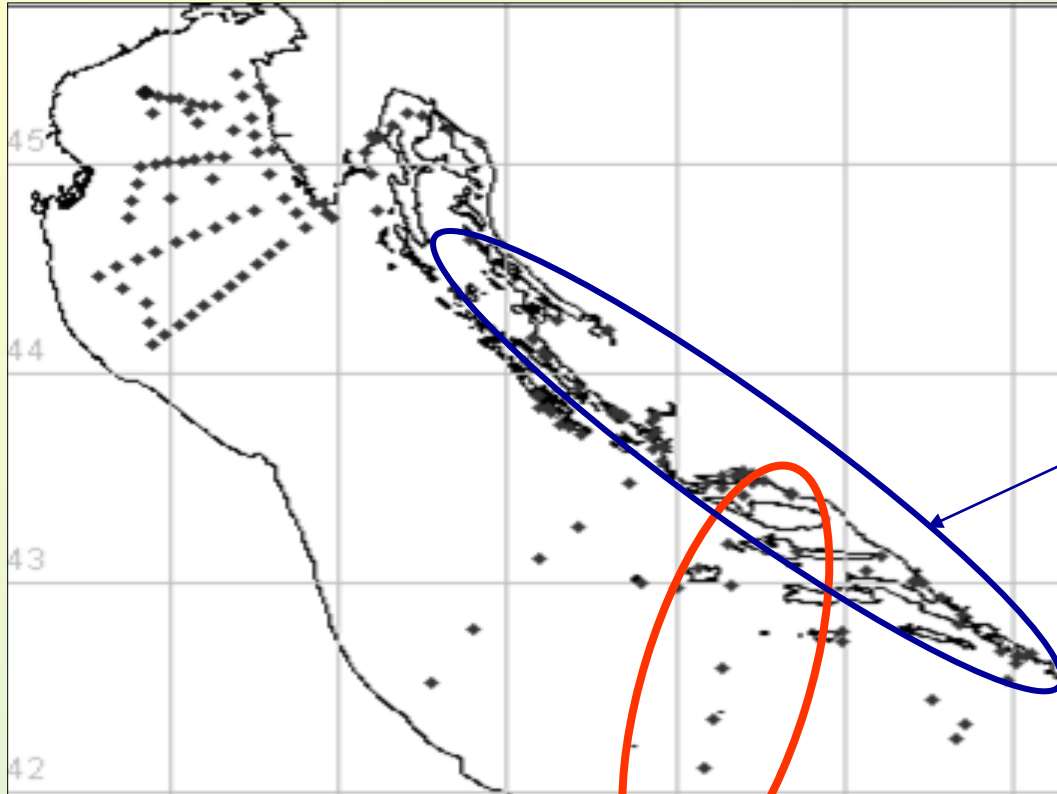
**43483
stations
278545
profiles**

Include parameters:

- Physical
- Chemical
- Biological
- Fisheries & aquaculture



Long term monitoring programs



Coastal Sea
7 times per year
(40 years)

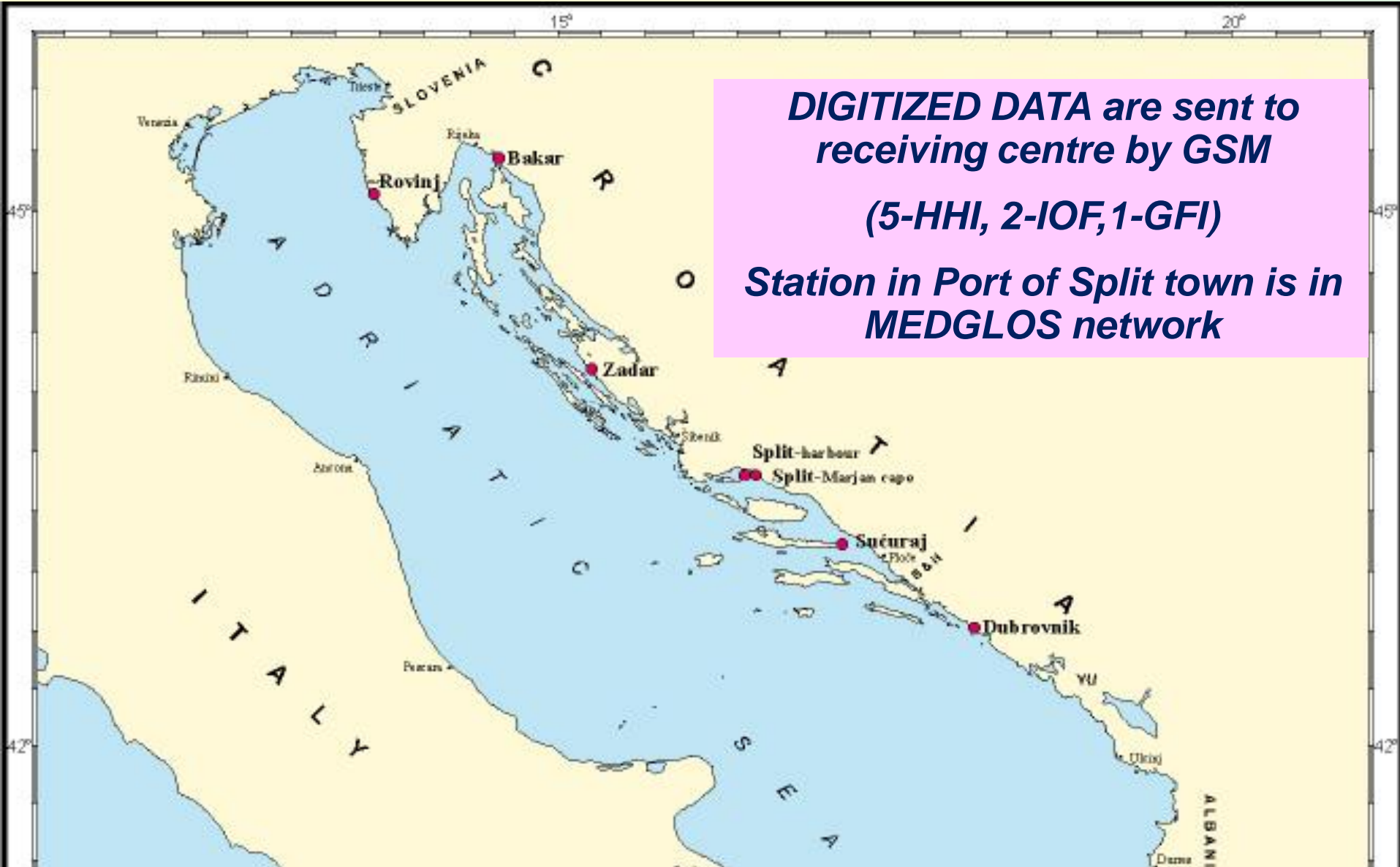
Split-Monte Gargano Profile (monthly and
seasonal) (Palagruza sill) – (65 years)

NATIONAL NETWORK OF SEA LEVEL STATIONS

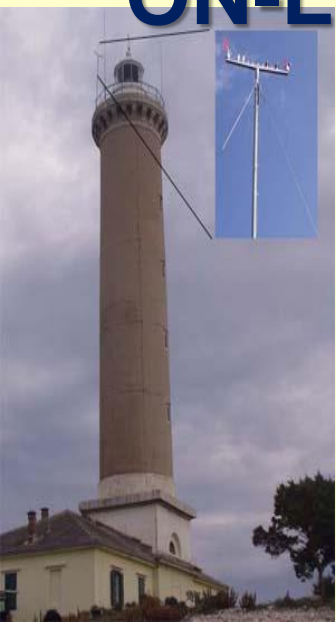
***DIGITIZED DATA are sent to
receiving centre by GSM***

(5-HHI, 2-IOF,1-GFI)

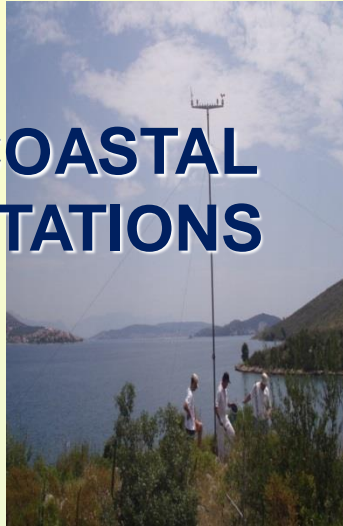
***Station in Port of Split town is in
MEDGLOS network***



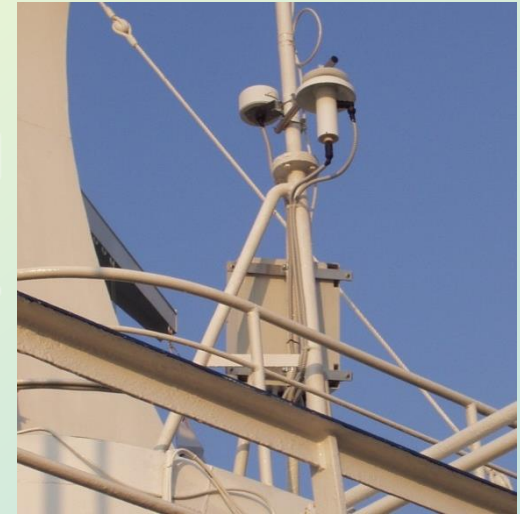
ON-LINE MEASURING INFRASTRUCTURE



**COASTAL
STATIONS**



**STATION ON
SHIP OF
OPORTUNIT
Y**



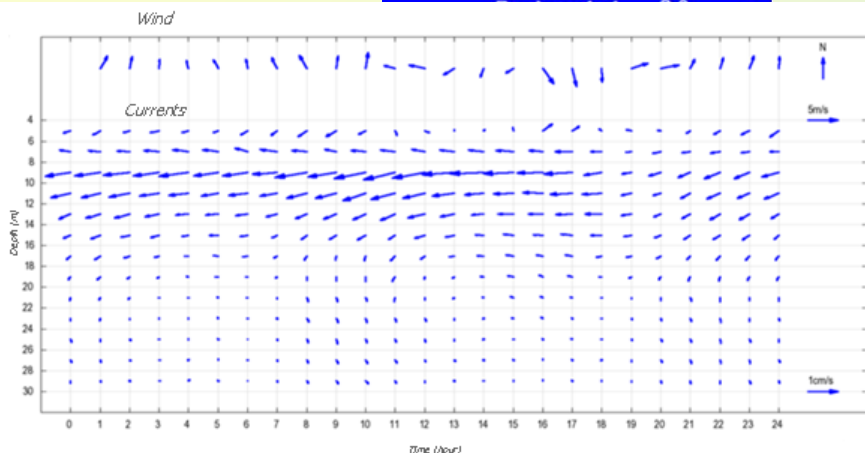
**CURRENTS PROFILE
MEASUREMENTS BY MOVING VESSEL**



Oceanographic buoy(s)

Output
results

Jadranka	
08.07.2014. 08:34	
Air temperature	20.3 °C
Relative Humidity	46.2 %
Air Pressure	1020.0 hPa
Wind direction	231.2 °
Wind Speed	8.5 m/s
Water Temp	23.5 °C
Wave direction	162.5 °
Maximum wave height	0.46 m
Wave direction spread	70.0 °



Meteo sensors:

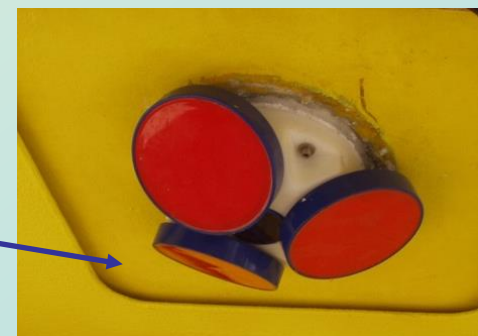
- Vaisala VTX100
- Aanderaa sensors



**Waverider
TRIAX**

Oceanographic sensors & instruments

- Temperature
- Salinity
- Oxygen Sea CAT-37
- Turbidity
- Chlorophyl_a (Wet Lab)



Current measurements:

- Nortek Profiler
- RDI 300 Monitor

SEA SURFACE CURRENTS BY HF-radars



HAZADR

Hrvatska verzija

Marine surface currents map (last data)

Time axis for current month

Surface currents as GIS layer

About HAZADR project

Involved institutions

Croatian team

Picture galleries

Data download

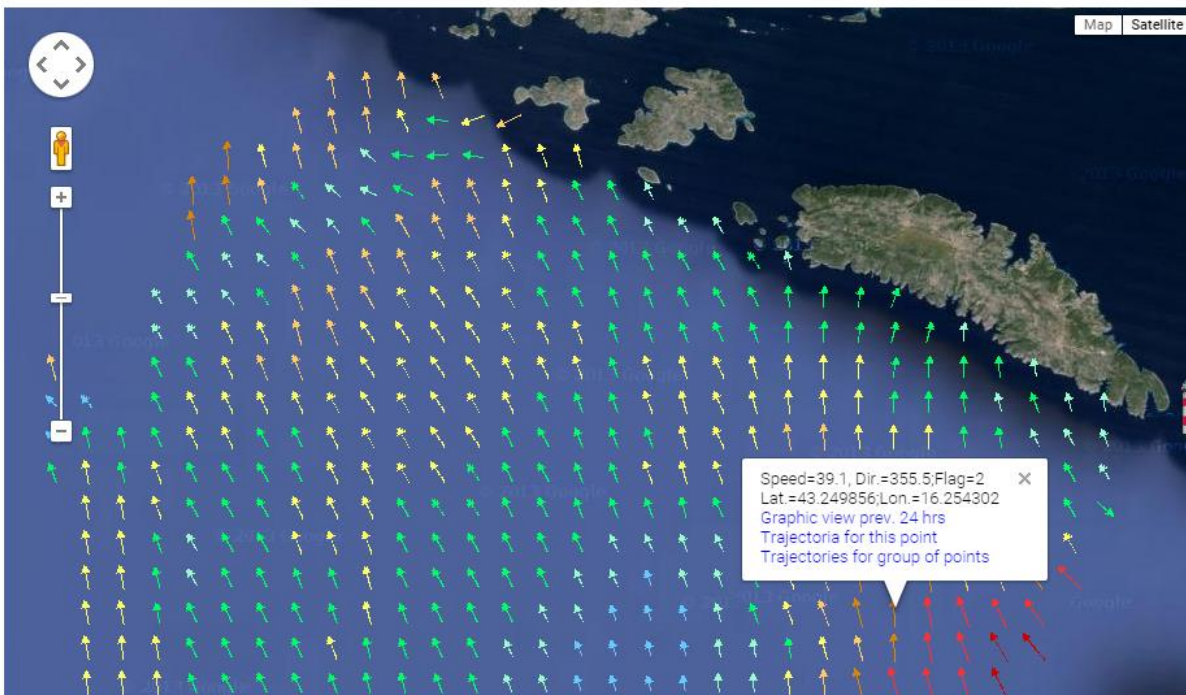
Main project page

Radio Wave Oceanography

Project NASCUM



This website has been produced with the financial assistance of the IPA Adriatic Cross-Border Cooperation Programme. The contents of this website are



Map Satellite

Marine currents map measured by HF radars

Hour - Hour +

29.01.2015.
18:30

29.01.2015 17:30 UTC

For all data
(flags 0-5)
Data rate: 98.3%

Last 24 hours

Trajectories

quality control flags

0 none (0)

1 best (0)



HAZADR

Hrvatska verzija

Sea current trajectories (HF output results)

Marine currents map measured by HF radars
Trajectories
Use time axis to select wanted time
By clicking on the arrow on currents map You can get trajectories for wanted point

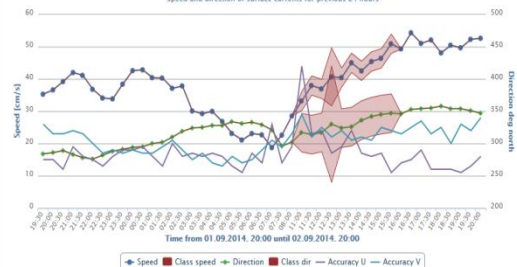
Time from:
06.08.2014. 13:00
to:
07.08.2014. 12:00



HAZADR

Hrvatska verzija

Latitude: 43.3038516919, Longitude: 16.1430671002
Speed and direction of surface currents for previous 24 hours



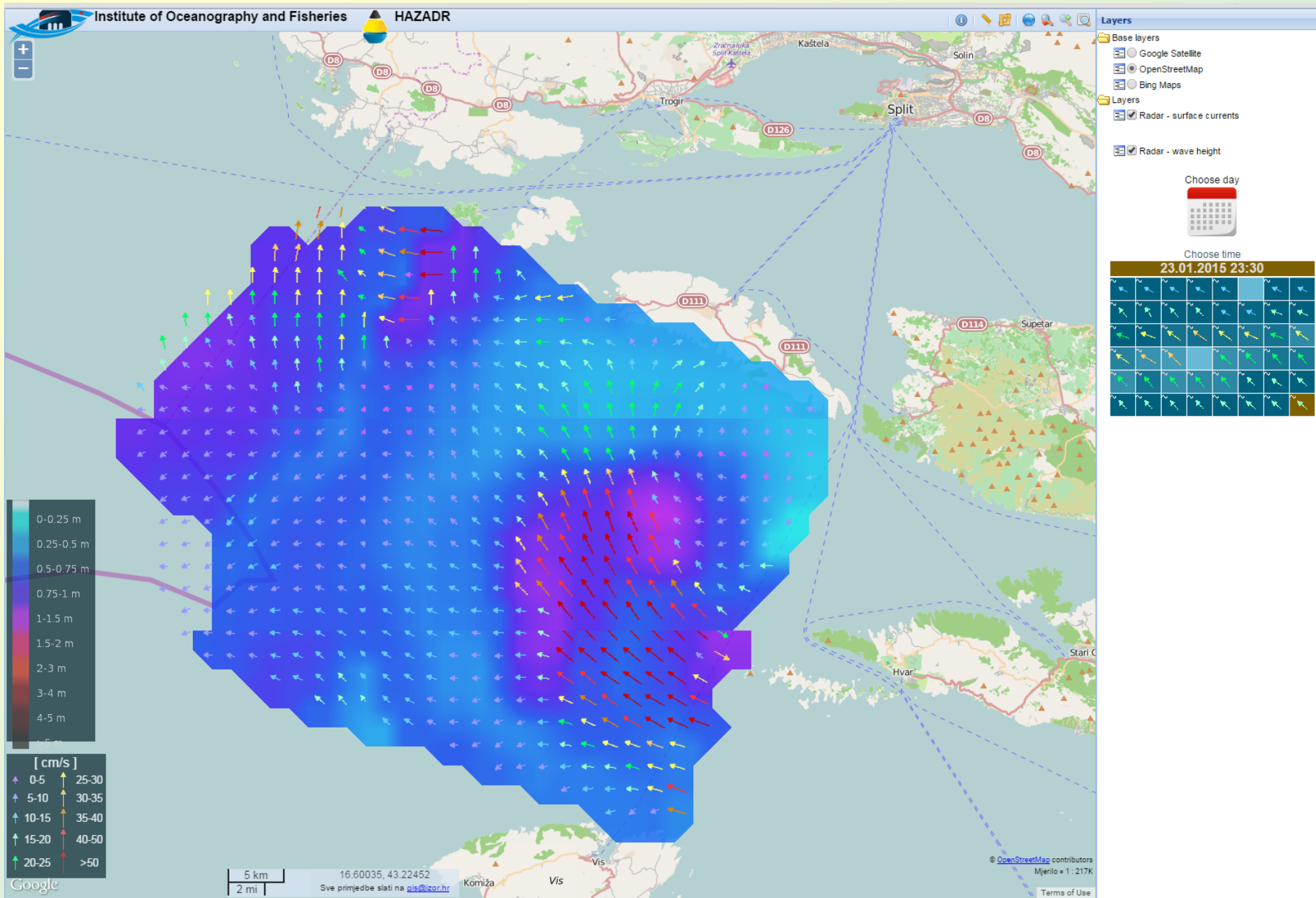
Back



This website has been produced with the financial assistance of the IPA Adriatic Cross-Border Cooperation Programme. The contents of this website are

STRENGTHENING COMMON REACTION CAPACITY TO FIGHT SEA POLLUTION OF OIL TOXIC AND HAZARDOUS SUBSTANCES IN ADRIATIC SEA

SEASURFACE CURRENTS AND WAVES PRESENTING BY WEB GIS



High precision air pressure monitoring by microbarographs (meteocunami studies)

Microbarograph measurements



Map showing stations locations



<http://www.izor.hr/barograph/>

About the project

Stations map

Data

All stations graph

○ Last 24 hours

○ Last hour

○ Daily averages

Vis

○ Time axis

Hvar - Vrboska

○ Time axis

Vela Luka

○ Time axis

Sponsored by:
Ministry of Science,
Education and Sports of
the Republic of Croatia
Research Project
Grant 001-0013077-
1122
IT Project Grant
2008-012

Microbarograph measurements



About the project
Stations map

Data

All stations graph
Last 24 hours
Last hour

Daily averages

Vis

Time axis

Hvar - Vrboska

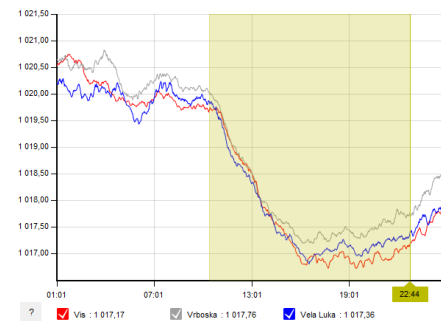
Time axis

Vela Luka

Time axis

Sponsored by: Ministry
of Science, Education
and Sports of the
Republic of Croatia
Research Project Grant
001-0013077-1122
IT Project Grant 2008-
012

chart by amCharts.com
Air pressure [hPa] from 09. 02. 2012. 01:00 until 10. 02. 2012. 01:00



Air pressure tendency

Air pressure is reduced to the mean sea level.

Microbarograph measurements



About the project
Stations map

Data

All stations graph
Last 24 hours
Last hour

Daily averages

Vis

Time axis

Hvar - Vrboska

Time axis

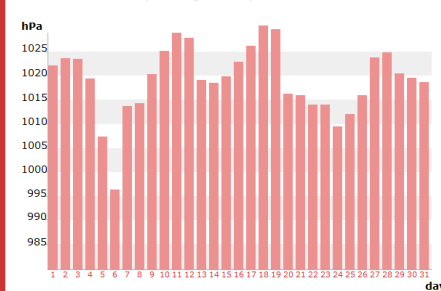
Vela Luka

Time axis

Sponsored by: Ministry
of Science, Education
and Sports of the
Republic of Croatia
Research Project Grant
001-0013077-1122
IT Project Grant 2008-
012

Microbarograph: Vrboska Year: 2012 Month: 01

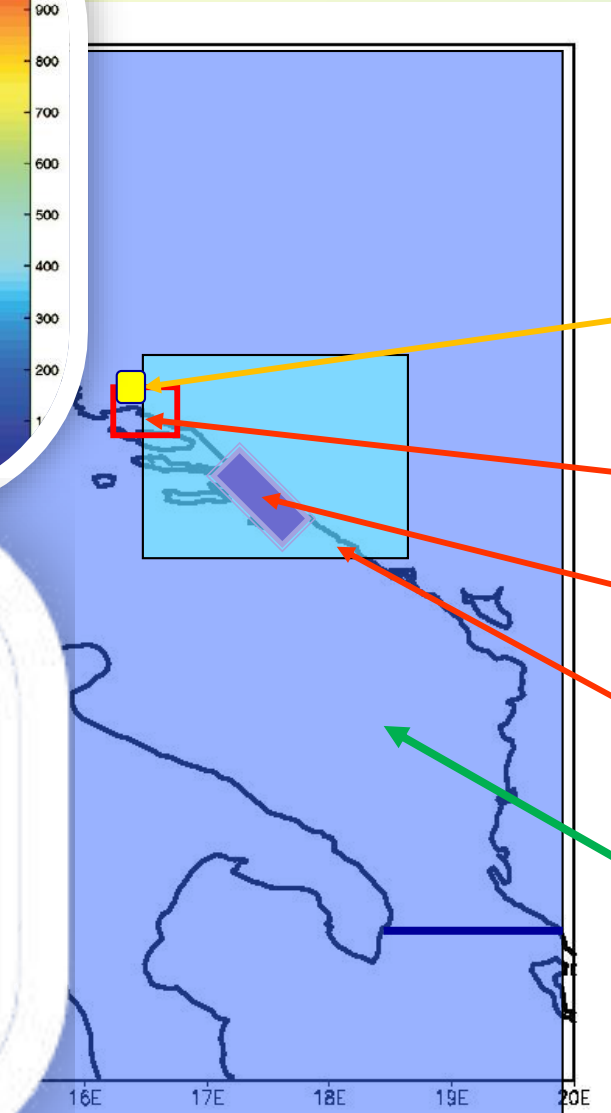
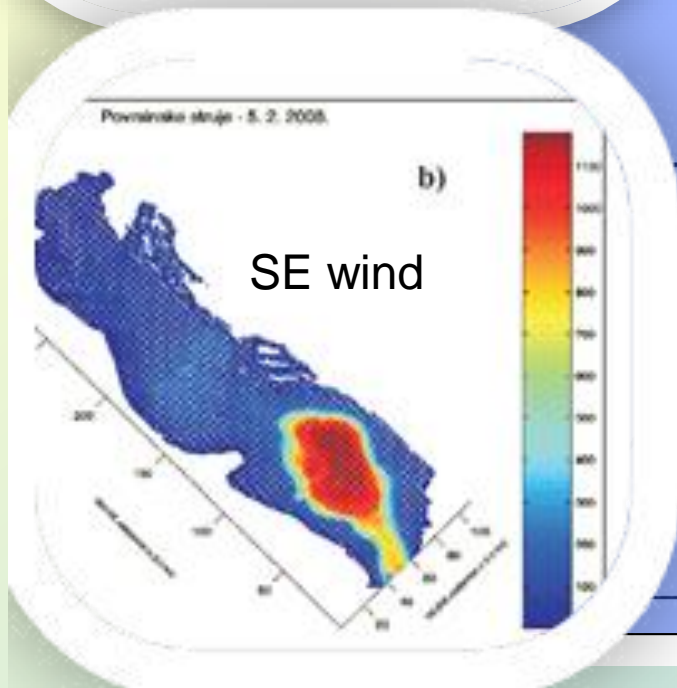
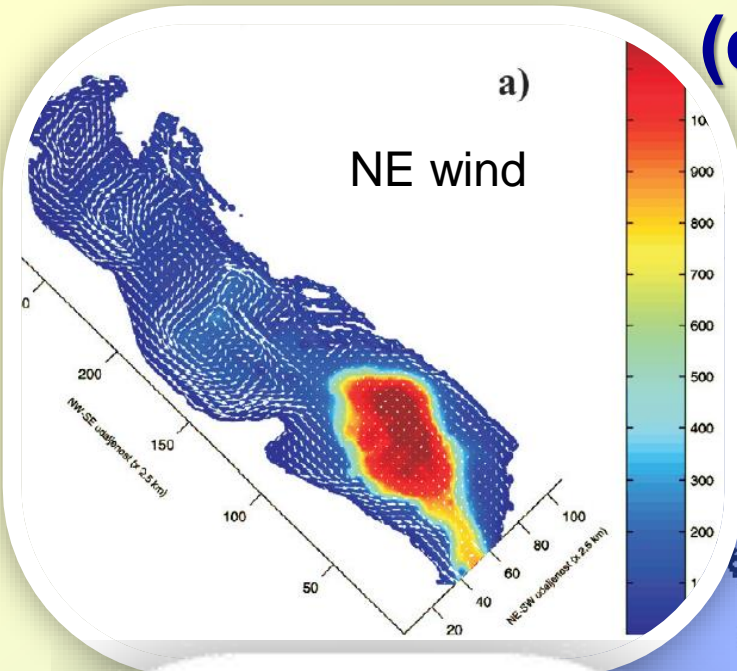
Vrboska- Daily average of air pressure for 01.2012.



Average month value: 1019.39 hPa
Min. value: 989.28 hPa (06.01 03:06, 06.01 03:07, 06.01 03:08)
Max. value: 1032.85 hPa (18.01 20:43, 18.01 20:44, 18.01 20:45, 18.01 20:47, 19.01 00:33, 19.01 00:34) < Back

NUMERICAL MODELING (POM; ROMS; Z)

(downscale nesting)



Bridge Ciovo
50 m

Kastela Bay
100 m

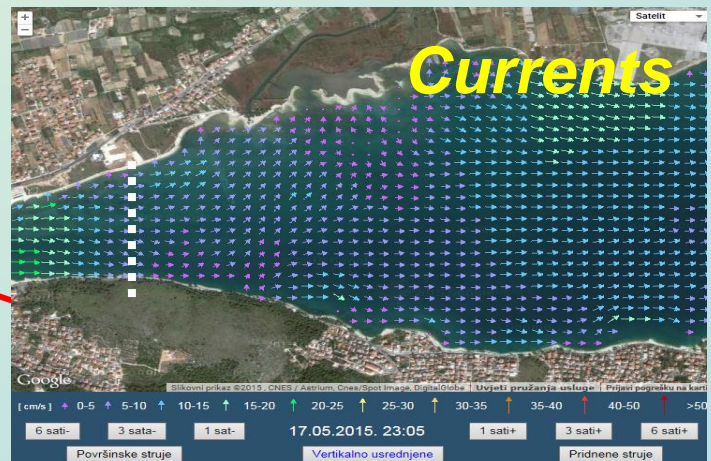
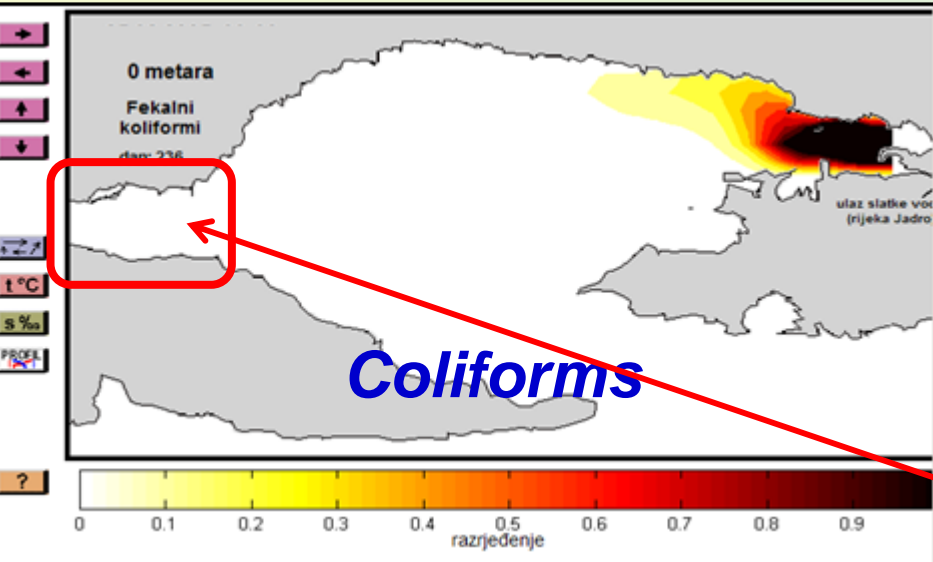
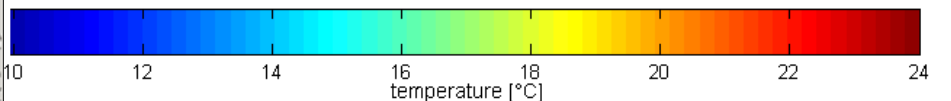
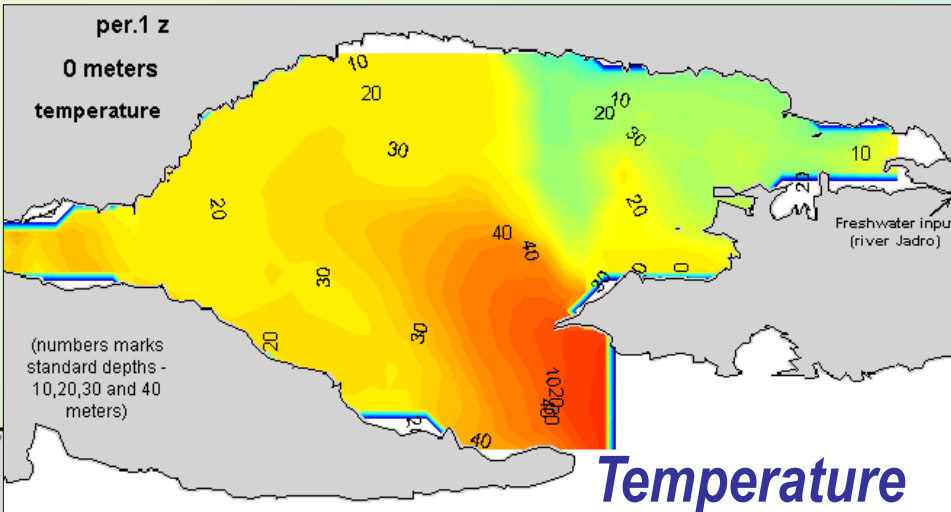
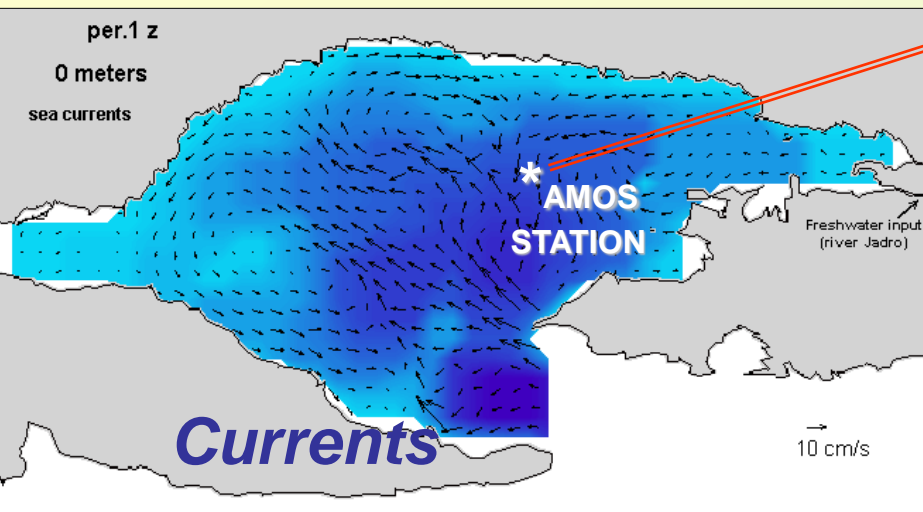
Neretva mouth
250 m

Split region
1 km

ADRIATIC
2 km

Currents, temperature and coliforms fields in the Kaštela Bay obtained by POM model

Model verification by data from AMOS



IOF - Croatian Marine Referral Centre (CEA/EEA) since 2012

Coordinate implementation of EU MSFD in Croatia:

- Initial assessment (2012): WT, WB, ASSESSMENT AREAS**
- Good environmental status (2013)**
- Marine monitoring program (2014)**

Developed WEB DATABASES:

- Ecological status of marine indicators**
- Water quality at the Croatian beaches**
- Reporting EEA about IA, GES and MONITORING**

MARINE ENVIRONMENT INDICATORS (for Croatian Environmental Agency)



+ Popis pokazatelja

+ Neaktivni pokazatelji

Godina:

Pretraga pokazatelja:

EIONET tablice

O bazi podataka

Preglednici geografskog informacijskog sustava (GIS) Agencije za zaštitu okoliša

Statistika pristupa bazi

+ Mjerni sustavi u realnom vremenu

Prikaz zadnje izmjenjene ocjene kvalitete mora za kupanje

+ Priručnik za krajnjeg korisnika

Primjedbe i sugestije

Upis
Pregled

Promjena/upis podataka (zahtjeva autorizaciju)



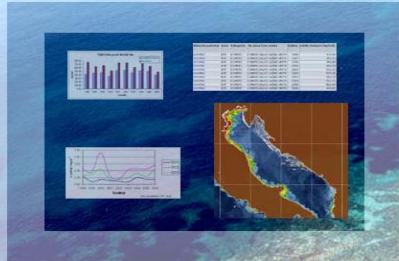
Razvoj i održavanje: IOR Split

Baza podataka i pokazatelja stanja morskog okoliša, marikulture i ribarstva

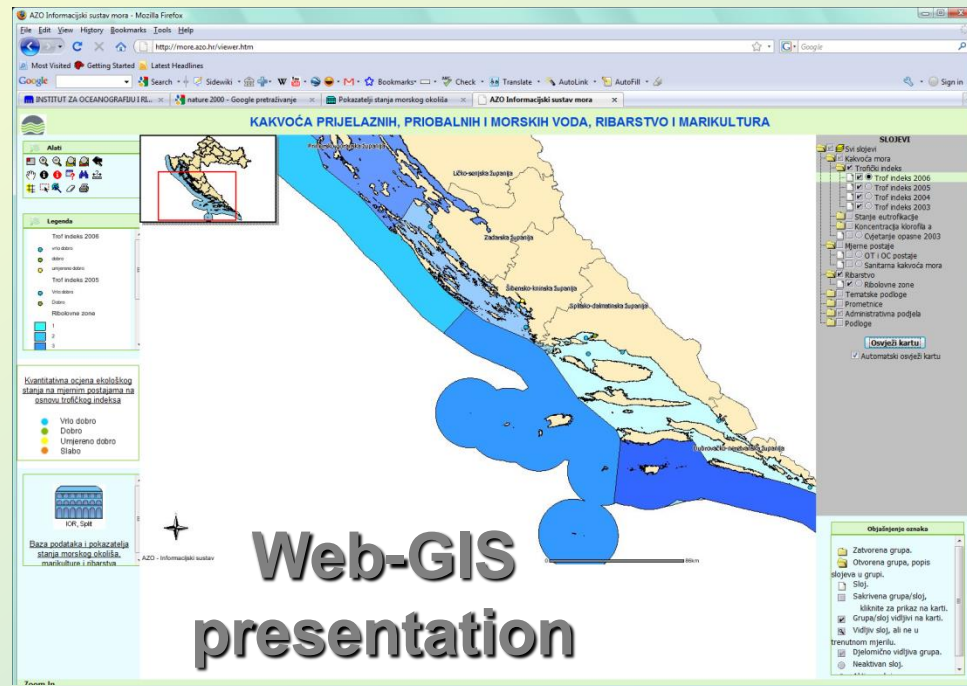
IOR Split
CIN Rovinj
Hrvatske vode



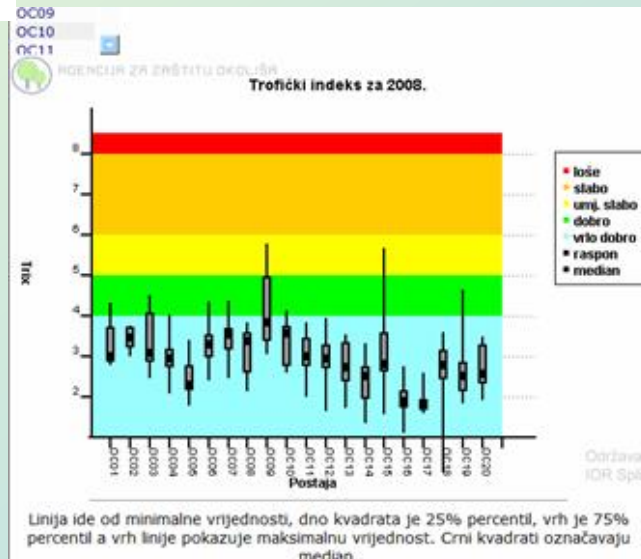
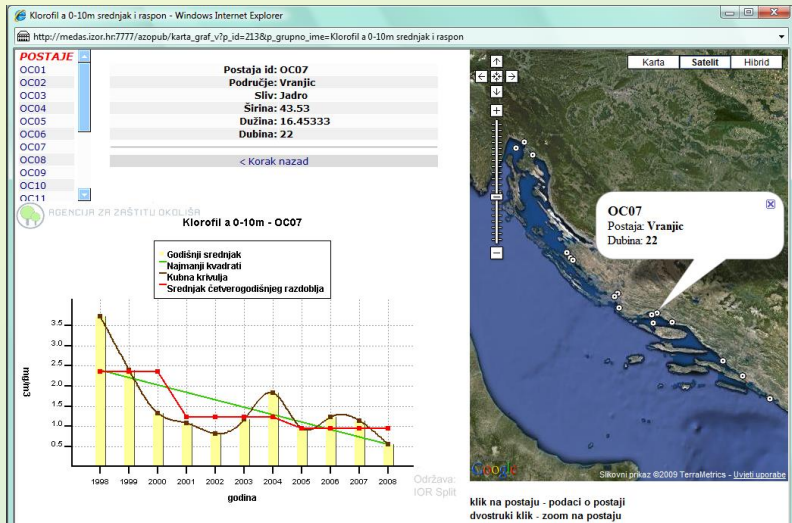
Dobrodošli na stranice baze podataka i pokazatelja stanja morskog okoliša, marikulture i ribarstva



Preporučena rezolucija minimalno 1024*768
Za punu funkcionalnost potrebno je omogućiti Popup prozore za server medas.izor.hr
Za pregled grafičkih prikaza potreban je Java dodatak



Web-GIS presentation



SEA BATHING WATER QUALITY IN CROATIA

(For Ministry for enviromental protection)

http://www.izor.hr/bathing/index.html

File Edit View Favorites Tools Help

Google Search

Sea bathing water quality on beaches in the Repu...

Google™ This page is in English. Translate it using Google Toolbar? [Learn more](#)

Ministry of Environmental Protection, Physical Planning and Construction
MINISTARSTVO ZAŠTITE OKOLIŠA, PROSTORNOG UREĐENJA I GRADITELJSTVA

Hrvatska verzija

Sea bathing water quality on beaches in the Republic of Croatia

Choose location*

Swimming season:
2009

Monitoring no:
1 2 3 4 5 6 7 8 9 10

Sampling points search

+ Counties

Criteria:
Croatian Regulation
EU Directive

Monitoring results

Contact:
Ministry of Environmental Protection, Physical Planning and Construction
DIRECTORATE FOR ATMOSPHERE AND WASTE MANAGEMENT
Department for Sea Protection
Užarska 2/I, HR-51000 Rijeka
Head of Department: Nevja Kružić, B.Sc. Civ.Eng.
Tel: +385 51 213-499
Fax: +385 51 214-324
nevia.kruzic@mzopu.hr

Data management: IOR Split

*Hierarchical location organisation - first choose County, after that City/Municipality and at the end the exact location. You can also find the location by typing a part of the location name into the search field or by clicking on the map.

Sea bathing water quality on beaches in the Republic of Croatia

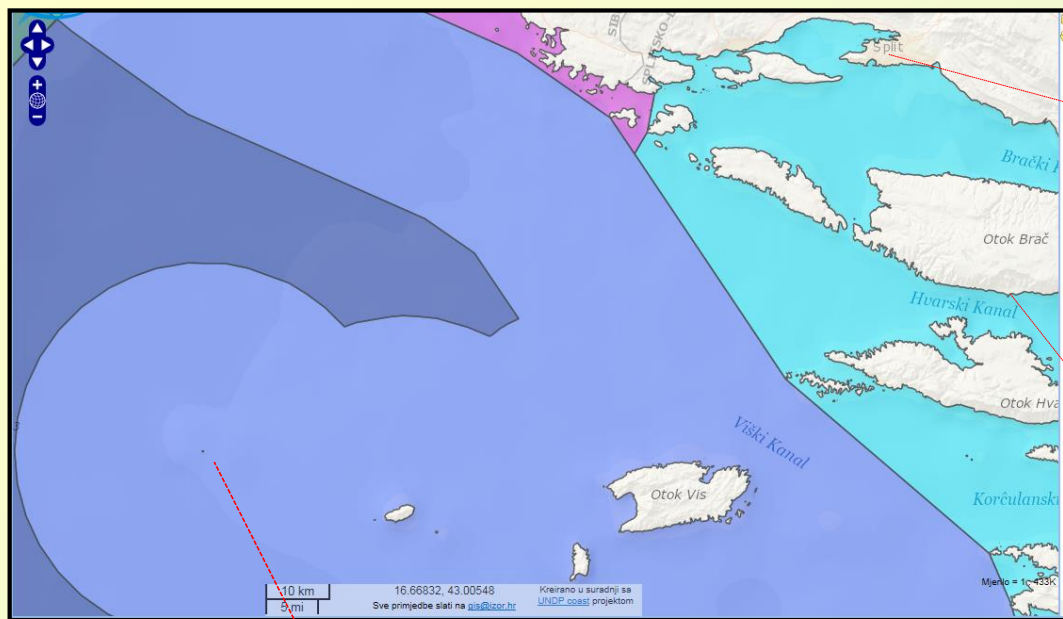
Legend: ● excellent ● good ● sufficient ● poor
click on location - show data, doubleclick - zoom to location
Quality monitoring from 31.08.2009. 08:30 until 17.09.2009. 11:45

SPLITSKO - DALMATINSKA ŽUPANIJA - SPLIT
Plaža: ŽNAN
Grad: Split
Područje:
Županija: DALMATINSKA ŽUPANIJA
Broj točaka mjerenja:
Objekti:
Grance plaže
Ispusti
Preljev
Morske barijere
cafe bar
spasilačka služba
tuš
dječje igralište
sport na kopnu
klupa
parkiraliste
pomoćni objekt
kanta za otpad

Imagery ©2009 TerraMetrics
Terms of Use

IOF RT/NRT/DT DATA AND PRODUCTS

- 1. Automatic stations (buoys, coastal stations, VF radars, microbarographs, tide gauges).**
- 2. Regular monitoring program by R/V (*monthly or seasonally depending of transect*)**
- 3. Numerical modelling output results**



Thank you :)