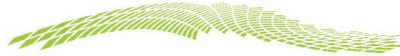




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HarmonIA



Harmonization and Networking for contaminant assessment in the Ionian and Adriatic Seas

**Evaluation of coastal vulnerability to marine pollution
dispersion on Harmonia Geoportal**

Harmonia data visualization

Strategy on risk assessment

Institute of Oceanography and Fisheries, Split, Croatia
Damir Ivanković, Ivan Vučić



Introduction

- Focus on online products
- Products available after formal ending of project
- Source of information
- Stakeholders, scientists and general public

The image displays two screenshots of the HarmoNIA GeoPortal. The top screenshot shows the main map interface with a risk index legend and a map of the Adriatic-Ionian region. The bottom screenshot shows the 'HarmoNIA data visualisation' dashboard, which includes a search filter, a donut chart showing the distribution of 101,951 total entries, and a satellite map of the region.

HarmoNIA GeoPortal on Vulnerability of coastal areas - under development

Risk index points

- 0-1
- 1-2
- 2-3
- 3-4
- 4-6
- 6-8
- 8-10
- 10-12
- 12-14
- 14-16
- 16-18
- 18-20
- 20-25
- 25-30
- 30-35
- 35-40
- 40-45
- 45-50
- 50-60
- > 60

HarmoNIA data visualisation

Year: [Dropdown]
Project / Monitoring Institute: [Dropdown]
Order: [Dropdown]
Parameter group: [Dropdown]
Parameter: [Dropdown]
Station name: [Search]
Station name: [Search]

Current position: [Dropdown]
Locations 2152, cruises 777.
Number of entries: [Dropdown]
Total entries 101951

Donut Chart Data:

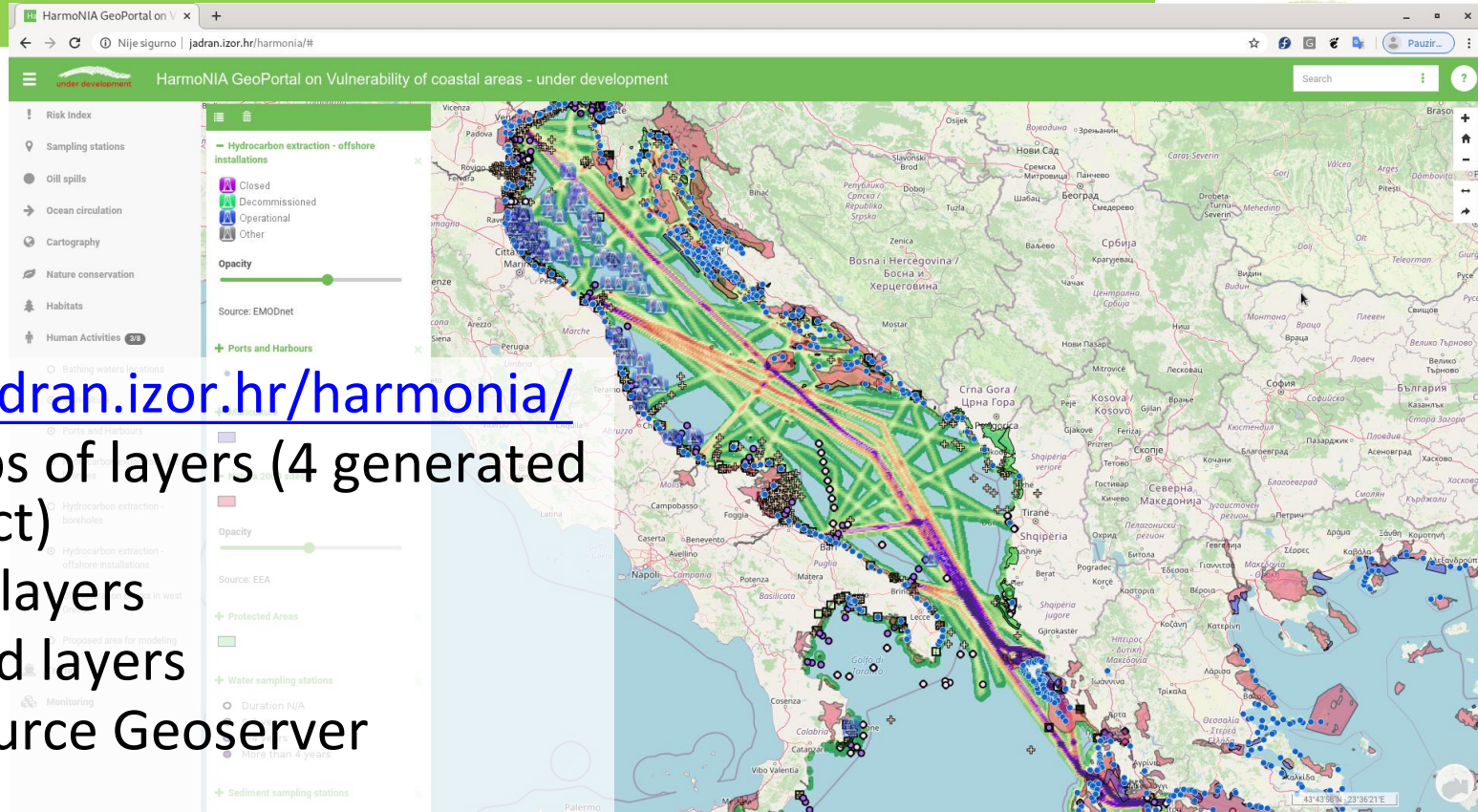
- 01 Metals and metalloids - Sediment
- 02 Metals and metalloids - Sediment $4030m$
- 03 PAHs - Sediment
- 04 Metals and metalloids - Biota
- 05 Pesticides and bioactive - Bi...
- 06 PAHs - Biota
- 07 PAHs - Biota
- 08 Polychlorinated biphenyl...
- 09 Metals and metalloids ...
- 10 Pesticides and bioactive...
- 11 PAHs - Water
- 12 PAHs - Water
- 14 Antichlorine - Water
- 15 Hydrocarbons - Water
- 17 Hydrocarbons - Water
- 19 Other organic contaminants - Water
- 20 Other

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Fund - Instrument for Pre-Accession II Fund

HarmoNIA



HarmoNIA Geoportal

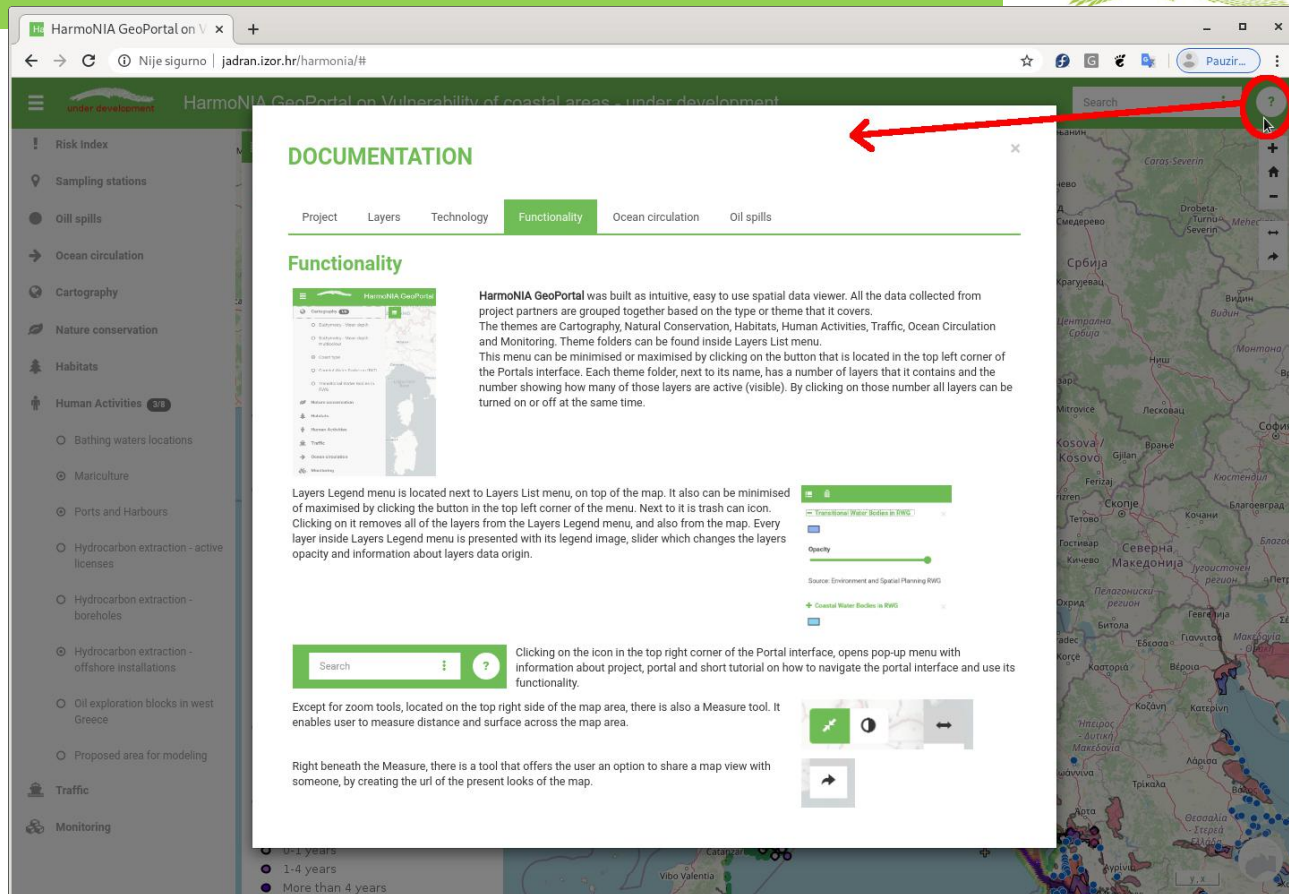


- <http://jadran.izor.hr/harmonia/>
- 10 groups of layers (4 generated by project)
- Total 58 layers
- Animated layers
- Open source Geoserver



About Geoportal and how to use it

- Help section
- Upper right corner

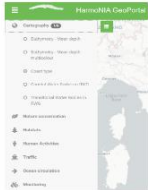


The screenshot shows the HarmoNIA GeoPortal interface. A documentation pop-up window is open, titled "DOCUMENTATION". The window has a search bar and a help icon (a question mark) in the top right corner, which is circled in red. A red arrow points from this icon to the left. The pop-up window contains the following text:

DOCUMENTATION


Project Layers Technology **Functionality** Ocean circulation Oil spills

Functionality




HarmoNIA GeoPortal was built as intuitive, easy to use spatial data viewer. All the data collected from project partners are grouped together based on the type or theme that it covers. The themes are Cartography, Natural Conservation, Habitats, Human Activities, Traffic, Ocean Circulation and Monitoring. Theme folders can be found inside Layers List menu. This menu can be minimised or maximised by clicking on the button in the top left corner of the Portals interface. Each theme folder, next to its name, has a number of layers that it contains and the number showing how many of those layers are active (visible). By clicking on those number all layers can be turned on or off at the same time.

Layers Legend menu is located next to Layers List menu, on top of the map. It also can be minimised or maximised by clicking the button in the top left corner of the menu. Next to it is trash icon. Clicking on it removes all of the layers from the Layers Legend menu, and also from the map. Every layer inside Layers Legend menu is presented with its legend image, slider which changes the layers opacity and information about layers data origin.




Clicking on the icon in the top right corner of the Portal interface, opens pop-up menu with information about project, portal and short tutorial on how to navigate the portal interface and use its functionality.

Except for zoom tools, located on the top right side of the map area, there is also a Measure tool. It enables user to measure distance and surface across the map area.

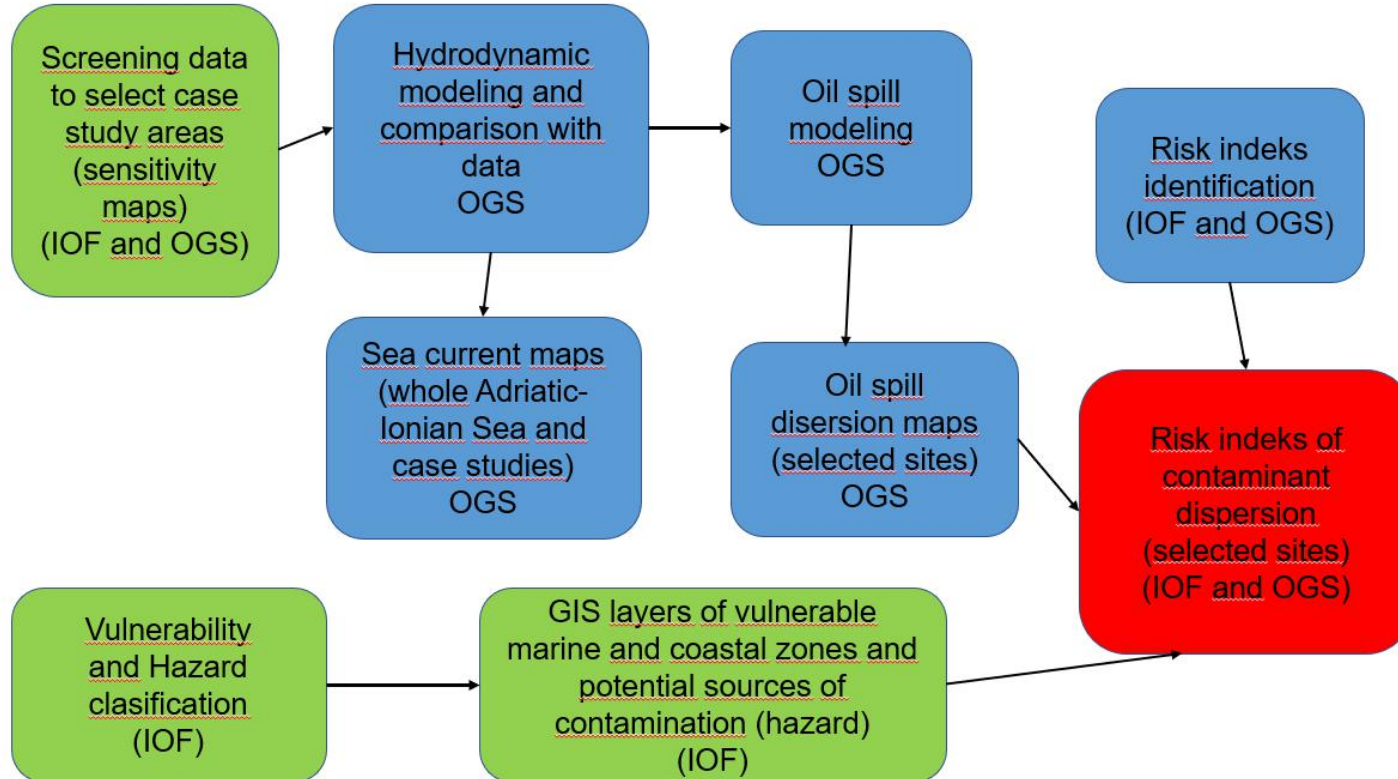


Right beneath the Measure, there is a tool that offers the user an option to share a map view with someone, by creating the url of the present looks of the map.



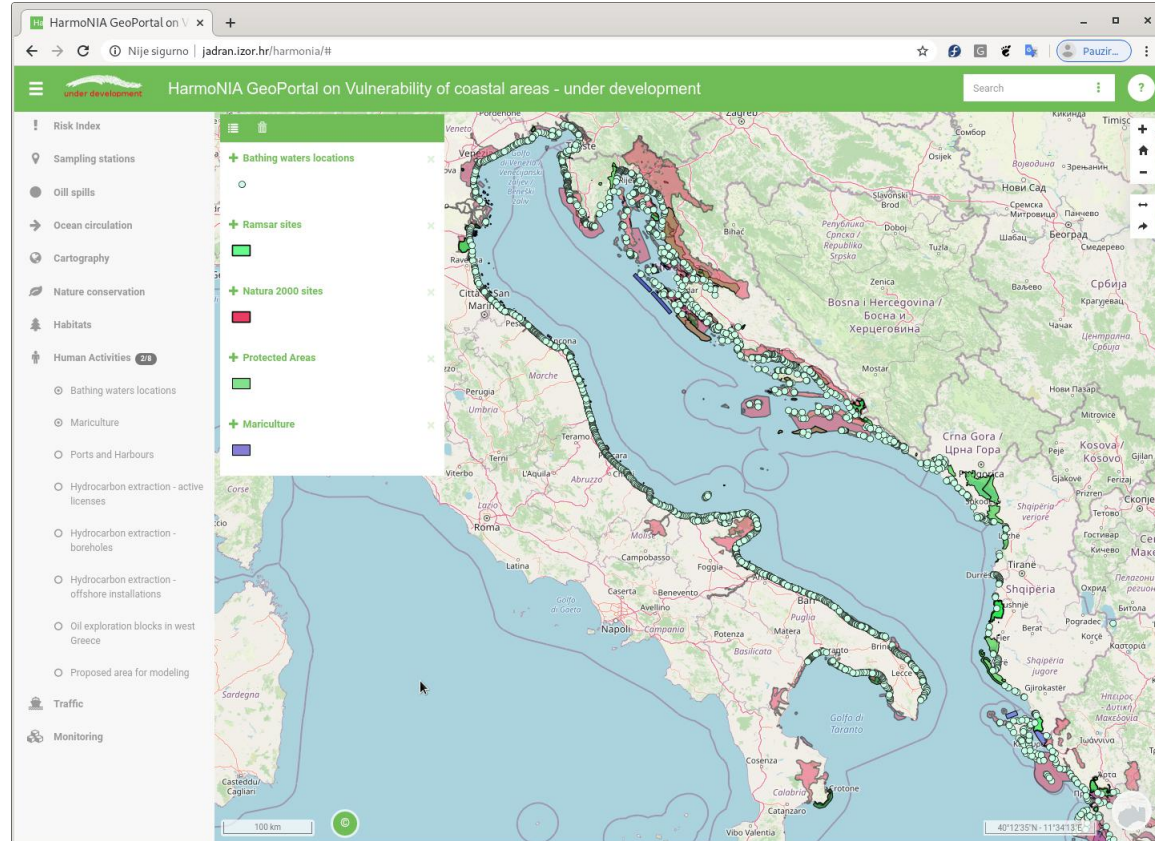


Methodology used in the oil spill risk assessment



GIS layers of vulnerable marine and coastal zones

- Mariculture
- Protected areas
 - Ramsar sites data
 - Natura 2000 data
 - National data about natural protected areas
- Areas of socio-economic value
 - Bathing Water Directive



Vulnerability index

- All Natural protected areas (weight factor 1)

- 100m buffer Index 3 (v1)

- 2000m buffer Index 2 (v2)

- 3500m buffer Index 1 (v3)

- Beaches (weight factor 1)

- 100m buffer Index 3 (v1)

- 2000m buffer Index 2 (v2)

- 3500km buffer Index 1 (v3)

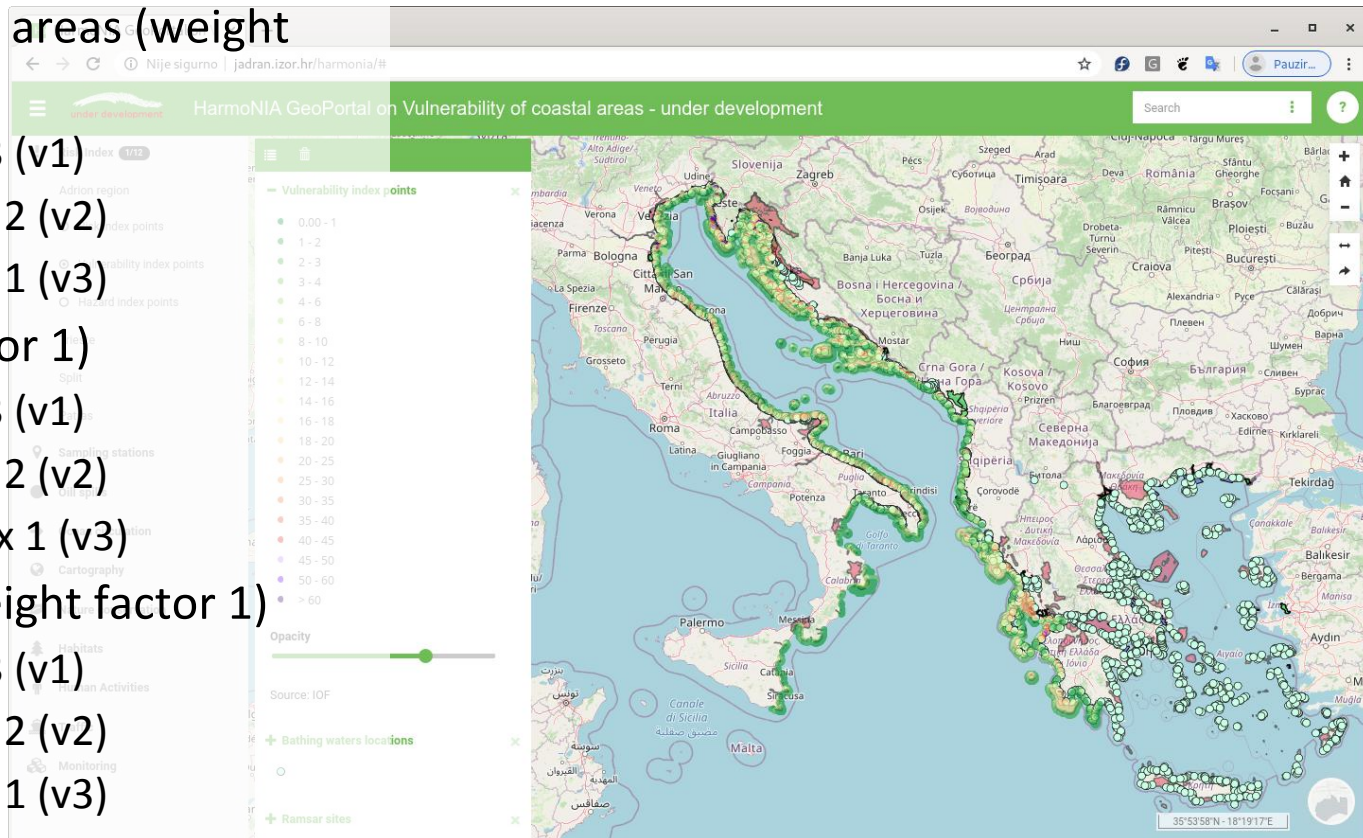
- Mariculture sites (weight factor 1)

- 100m buffer Index 3 (v1)

- 2000m buffer Index 2 (v2)

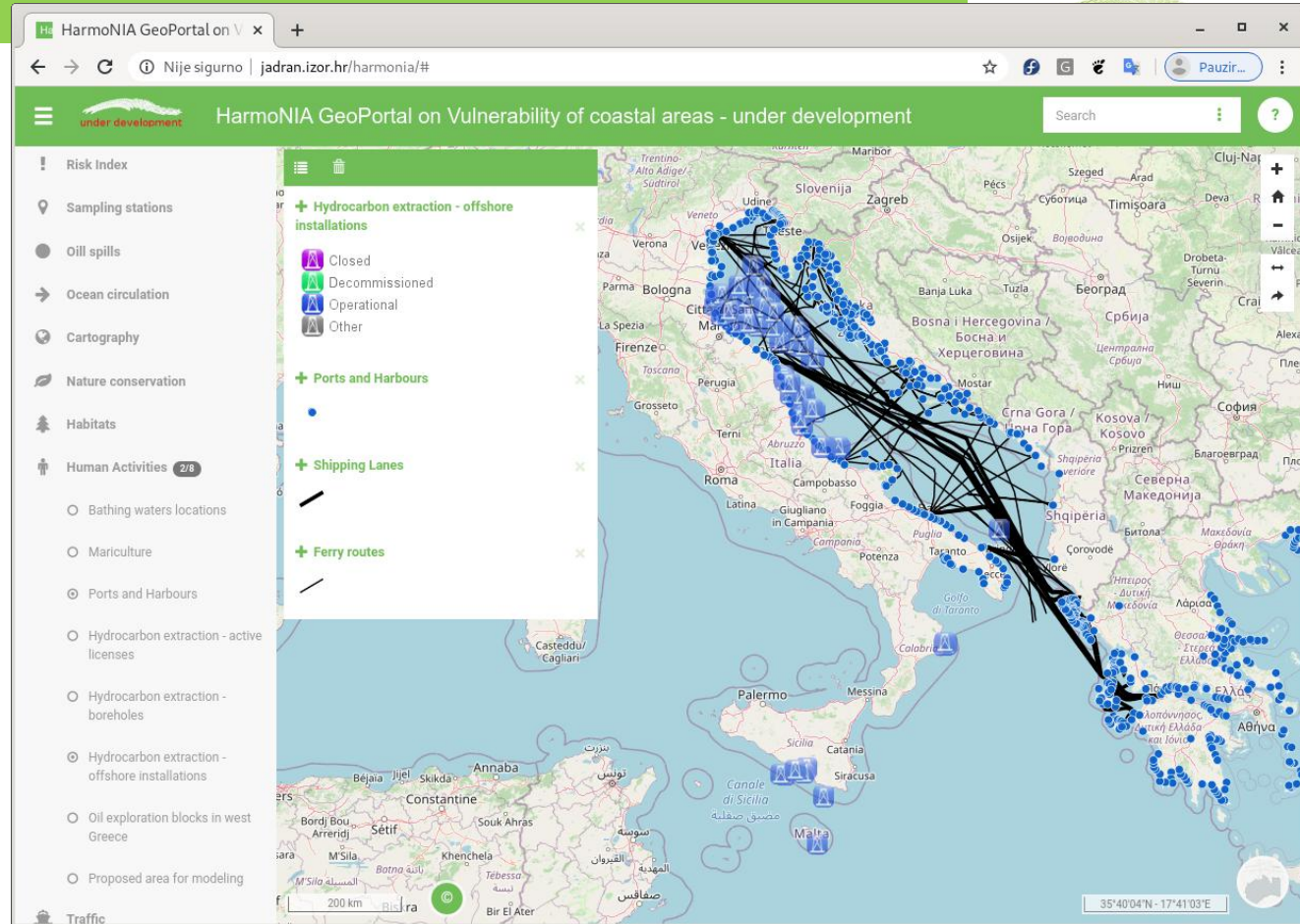
- 3500m buffer Index 1 (v3)

$$vtot=v1*3+v2*2+v3$$



GIS layers of oil spill hazard

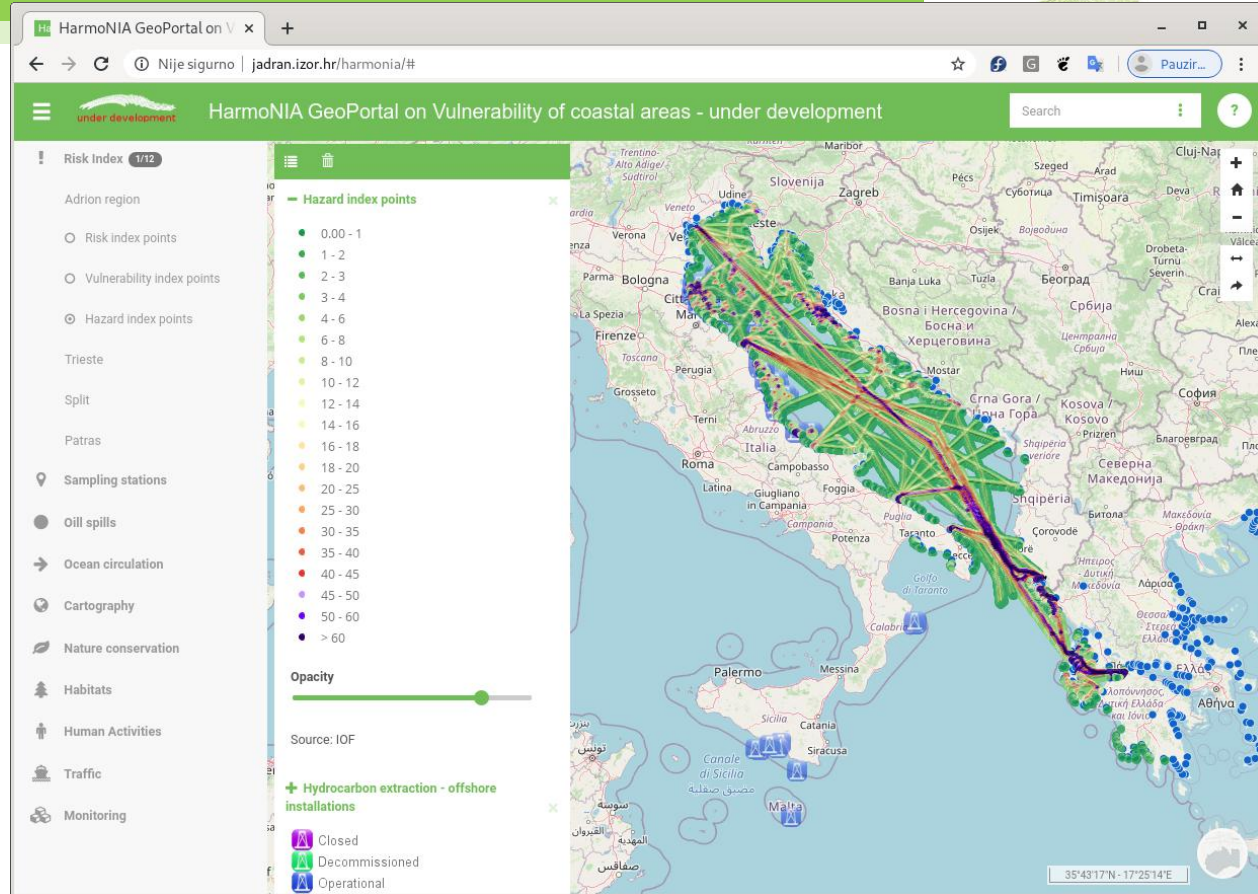
- Shipping lanes
- Ferry routes
- Ports and harbors
- Offshore platforms



Hazard index

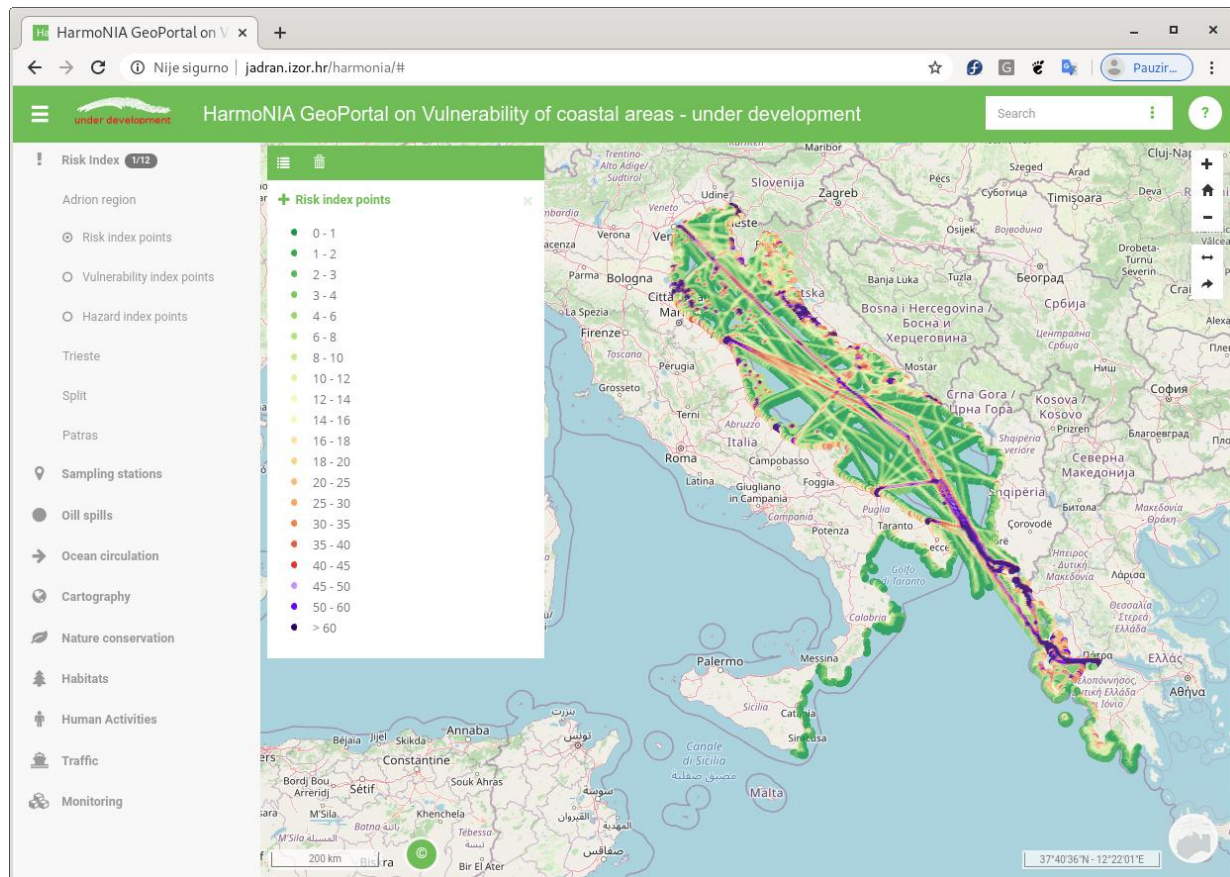
- Shipping lanes (weight factor 4)
 - 2000m buffer Index 3 (h1)
 - 3500m buffer Index 2 (h2)
 - 5000m buffer Index 1 (h3)
- Ferry route (weight factor 1)
 - 2000m buffer Index 3 (h1)
 - 3500m buffer Index 2 (h2)
 - 5000m buffer Index 1 (h3)
- Ports and harbors (weight factor 1)
 - 2000m buffer Index 3 (h1)
 - 3500m buffer Index 2 (h2)
 - 5000m buffer Index 1 (h3)
- Off shore platforms (weight factor 7)
 - 2000m buffer Index 3 (h1)
 - 3500m buffer Index 2 (h2)
 - 5000m buffer Index 1 (h3)

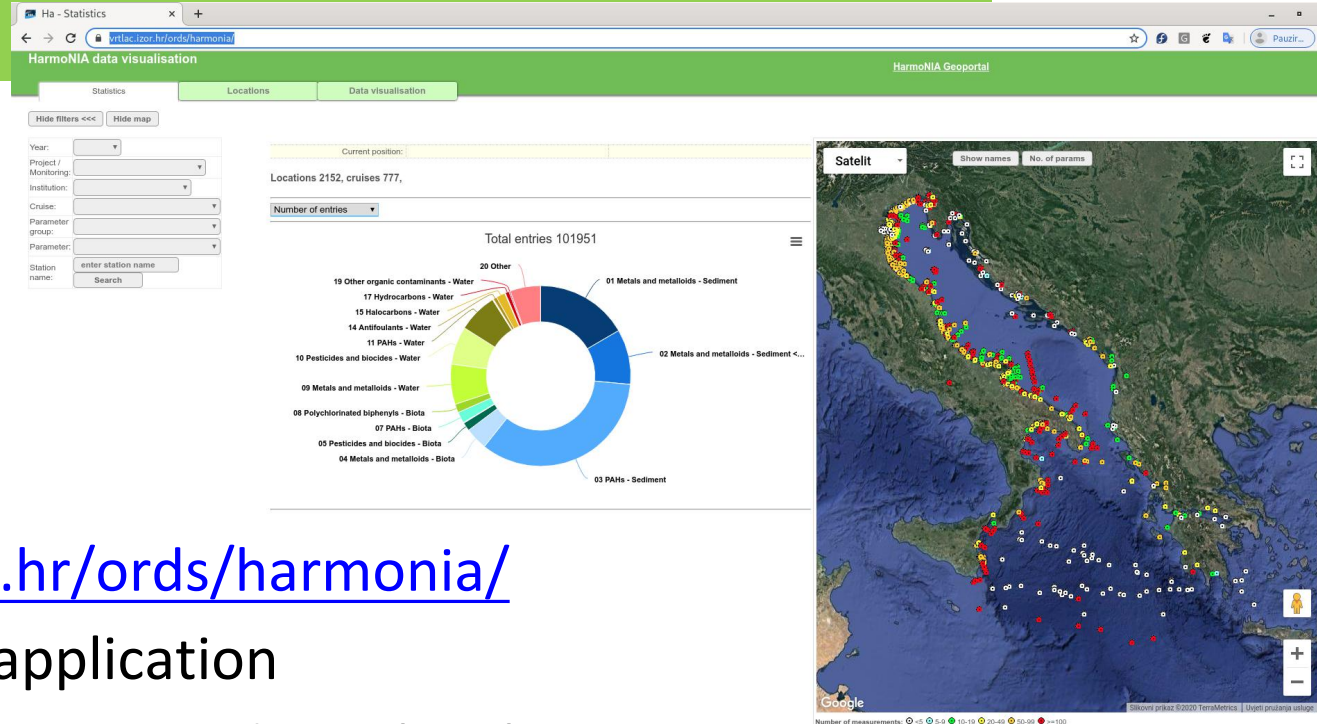
$$htot=h1*3+h2*2+h3$$



Risk index

Hazard Index +
Vulnerability Index =
Risk Index

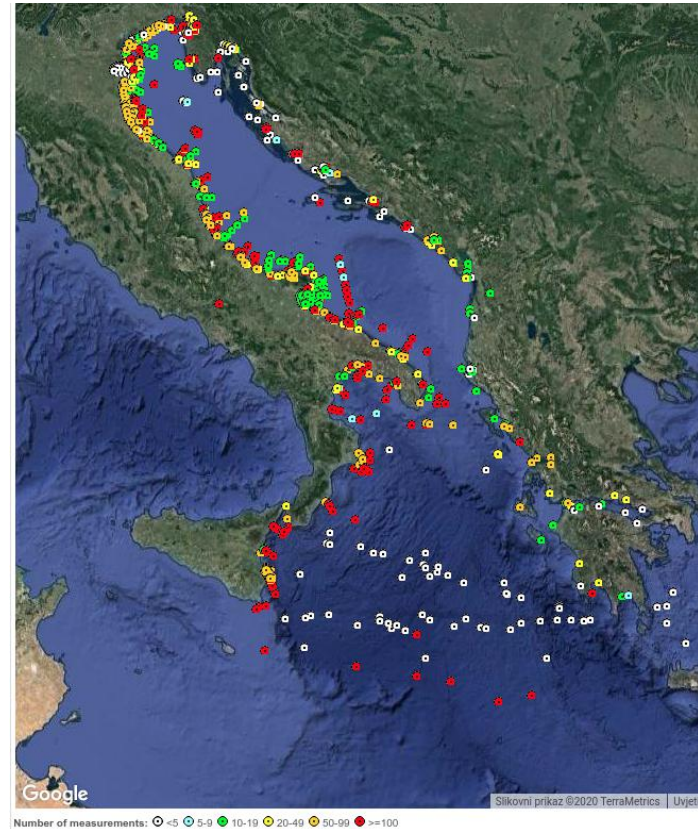




- <https://vrtlac.izor.hr/ords/harmonia/>
- A dedicated web application
- Shows station locations and graphical representations of data



- Data-sets about hazardous substances in sediment, biota and water column were prepared using the EU initiative EMODnet for the management and supply of fragmented marine data, and in the framework of HarmoNIA project.
- Data-sets cover Adriatic – Ionian Seas and the time frame is 1980-2017. These data derive from 10 different institutions.
- Data were collected in 2152 stations, sampled over 4282 times producing a final number of 101951 data values which are referred to 504 different parameters.
- All data are quality flagged according to a shared approach and quality flags can be used to filter data to visualise.
- Data-sets contain some data with access restrictions (by negotiation or academic - 6010 out of 101953). Those data are not shown as single values but are used for statistics calculations.



Users can filter data by:

- year
- project
- institution
- cruise
- parameter group
- specific parameter

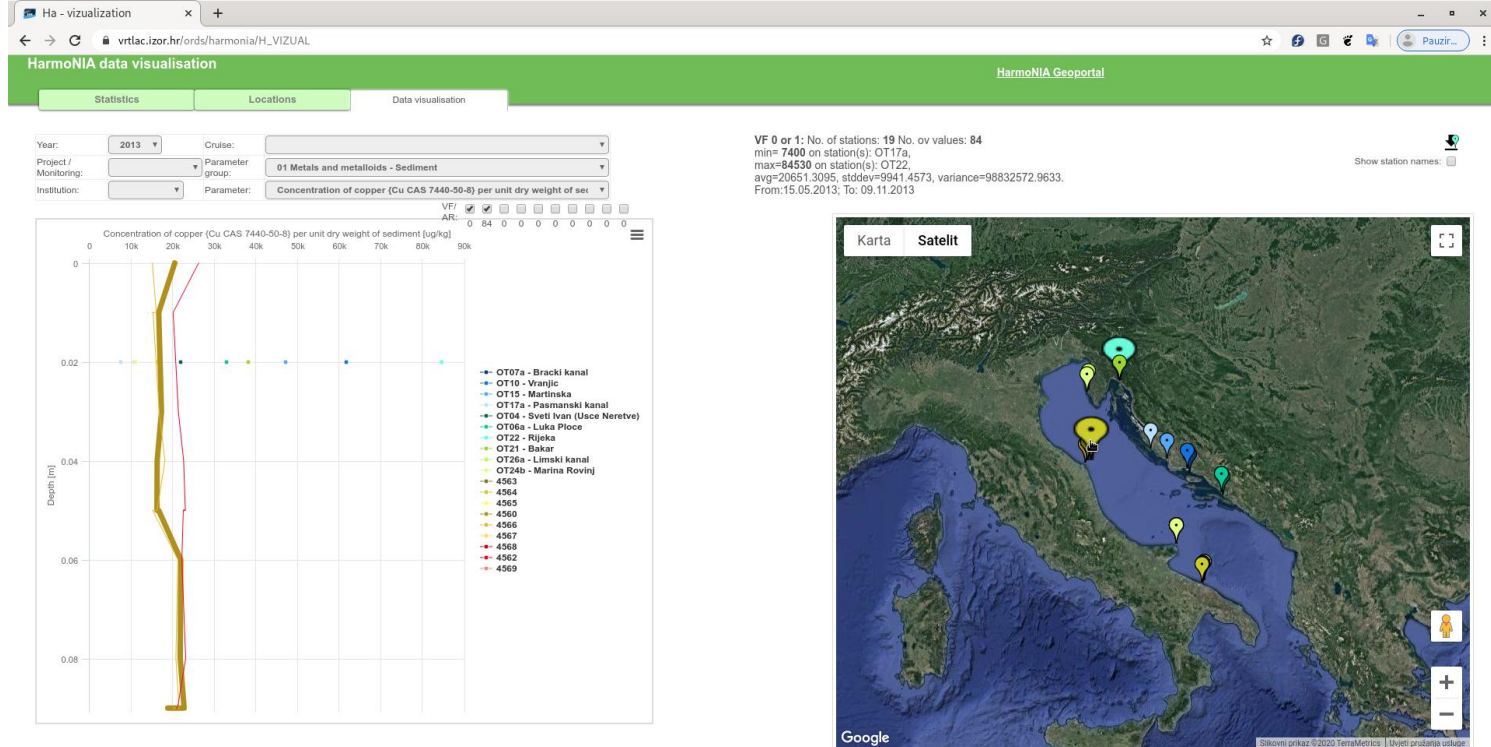
Data filter is adoptive, that means that changing each category, values in all other categories are re-calculated with values according to the new criteria

Year:	<input type="text"/>
Project / Monitoring:	<input type="text"/>
Institution:	<input type="text"/>
Cruise:	<input type="text"/>
Parameter group:	<input type="text"/>
Parameter:	<input type="text"/>
Station name:	<input type="text"/>

CIM - IRB
CNR
HCMR / HNODC
IGEWE
IMBK - IBMK
IOF
ISPRA
NIB
OGS
RIHMI-WDC

Line graph (profile)

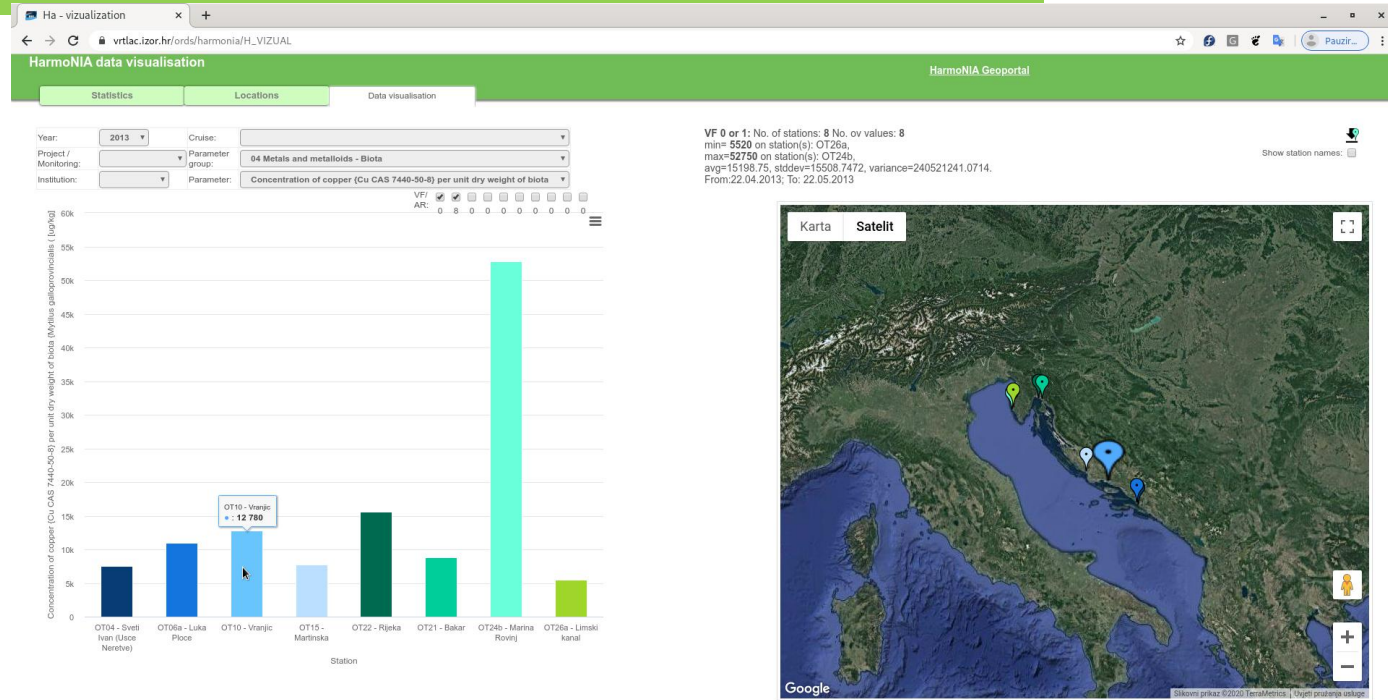
When there are values from different depths, line graph is shown with negative y axis (depth)



Data visualization - columns

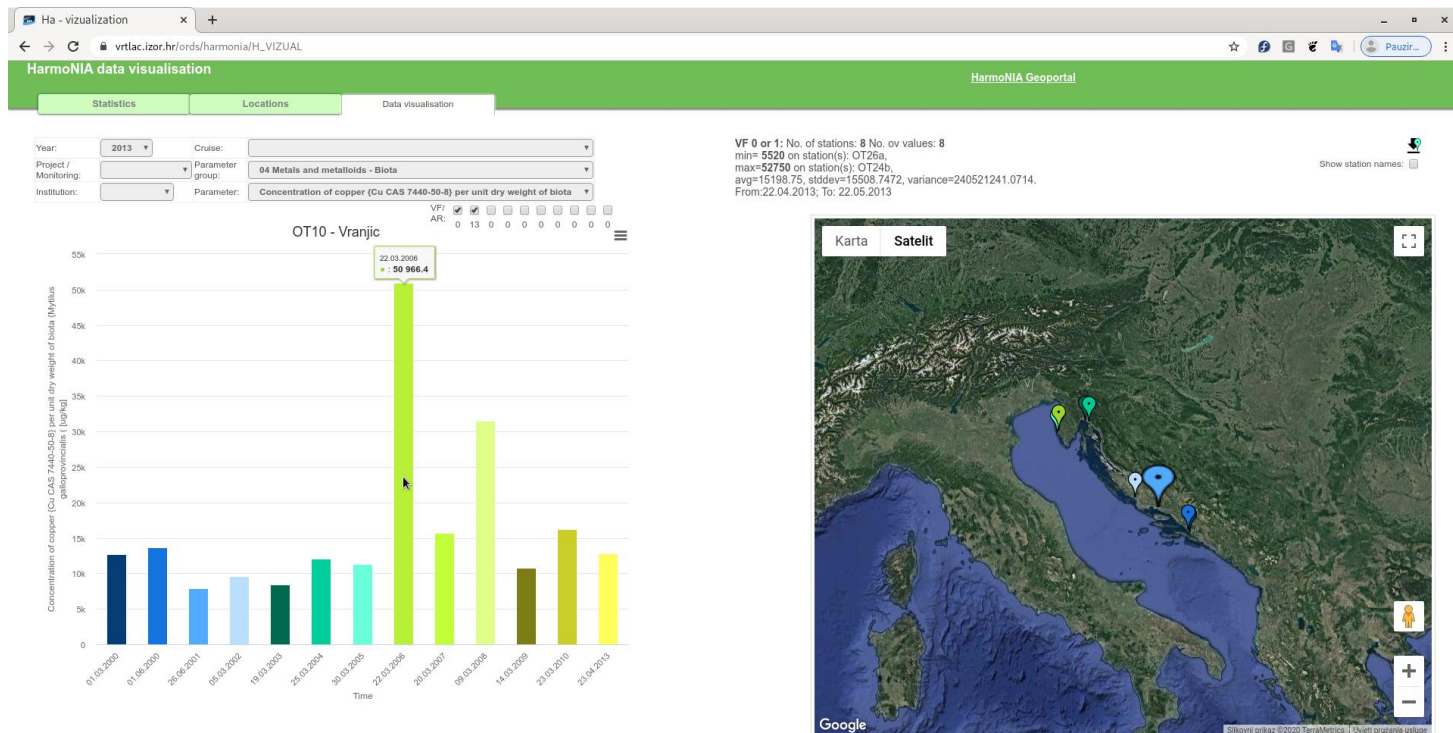
Column graph is used when visualised subset contain only one value per station

Column - location visual synchronization

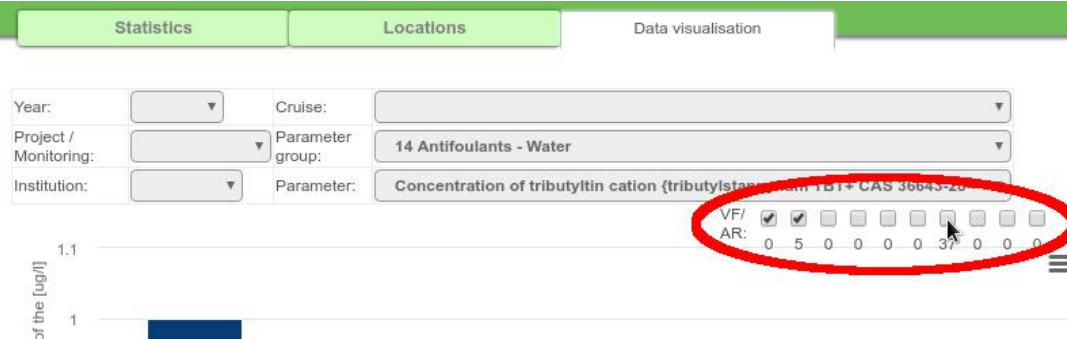


Time series

By clicking on the value in the graph user can see time series for particular station and parameter



- Validation factor and access restriction filter
- Statistics calculated only for VF 0 (not validated) and VF 1 (good value)



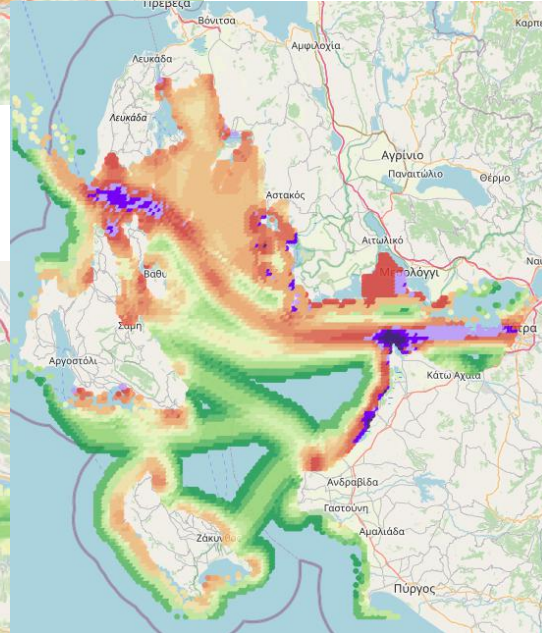
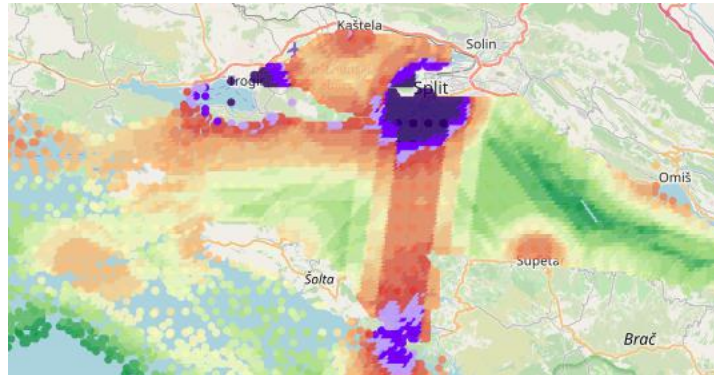
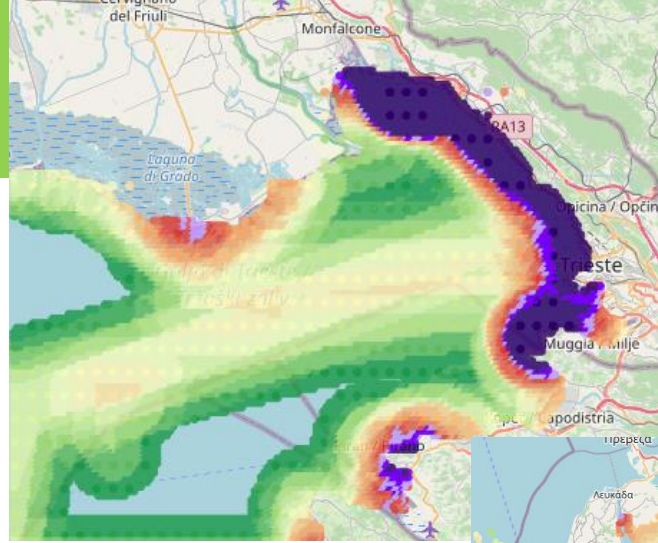
VF 0 or 1: No. of stations: 4 No. of values: 5
min= 0.02 on station(s): ITCON1517MSFD-000000,
max=1 on station(s): ITCON1517MSFD-000000,
avg=0.246, stddev=0.4232, variance=0.1791.
From:11.03.2016; To: 08.03.2017

Karta Satelit



Strategy on risk assessment

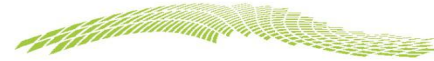
- Use of hydrodynamic modeling
- Buffer method
- Hazard and Vulnerability
- Spatial analysis
- Adoptive parameters
- Accurate input layers
- Operational





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Thank you for your attention!

