UKRAINIAN RIS ACTIVITIES

Danube Information System Conference 15
Budapest,
8th – 9th of December 2015

Igor Gladkykh, ONMA, Odessa
Nick Golodov, SHS, Kiev

Data warehouse
4
Danube waterway

Data warehouse for Danube waterways

A Project of the FORUM GIS DONAU

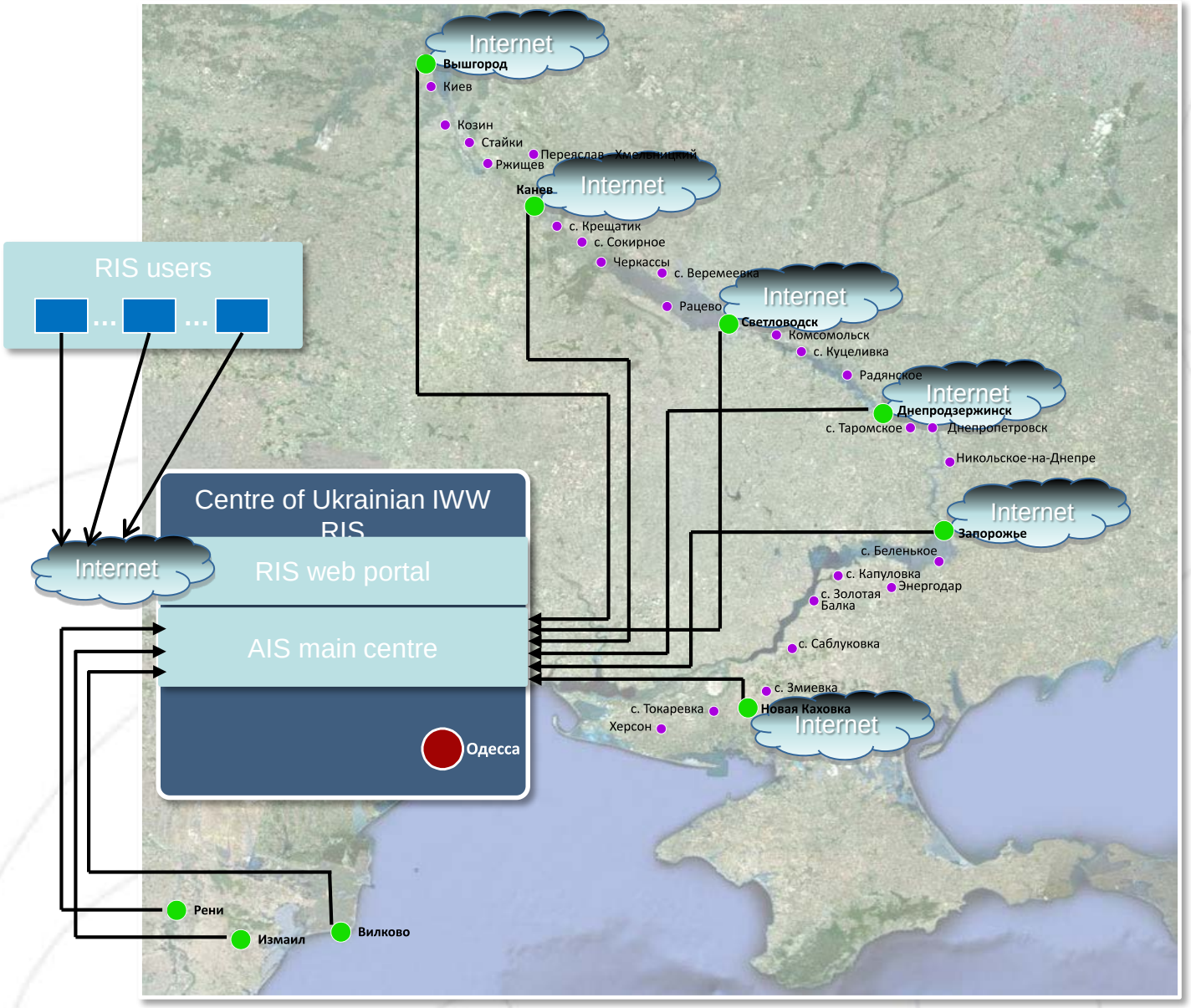
Under patronage of the Danube Commission

Subsidised in Germany and Austria by CADSES

CENTRAL ADRIATIC DANUBIAN SOUTH-EASTERN EUROPEAN SPACE

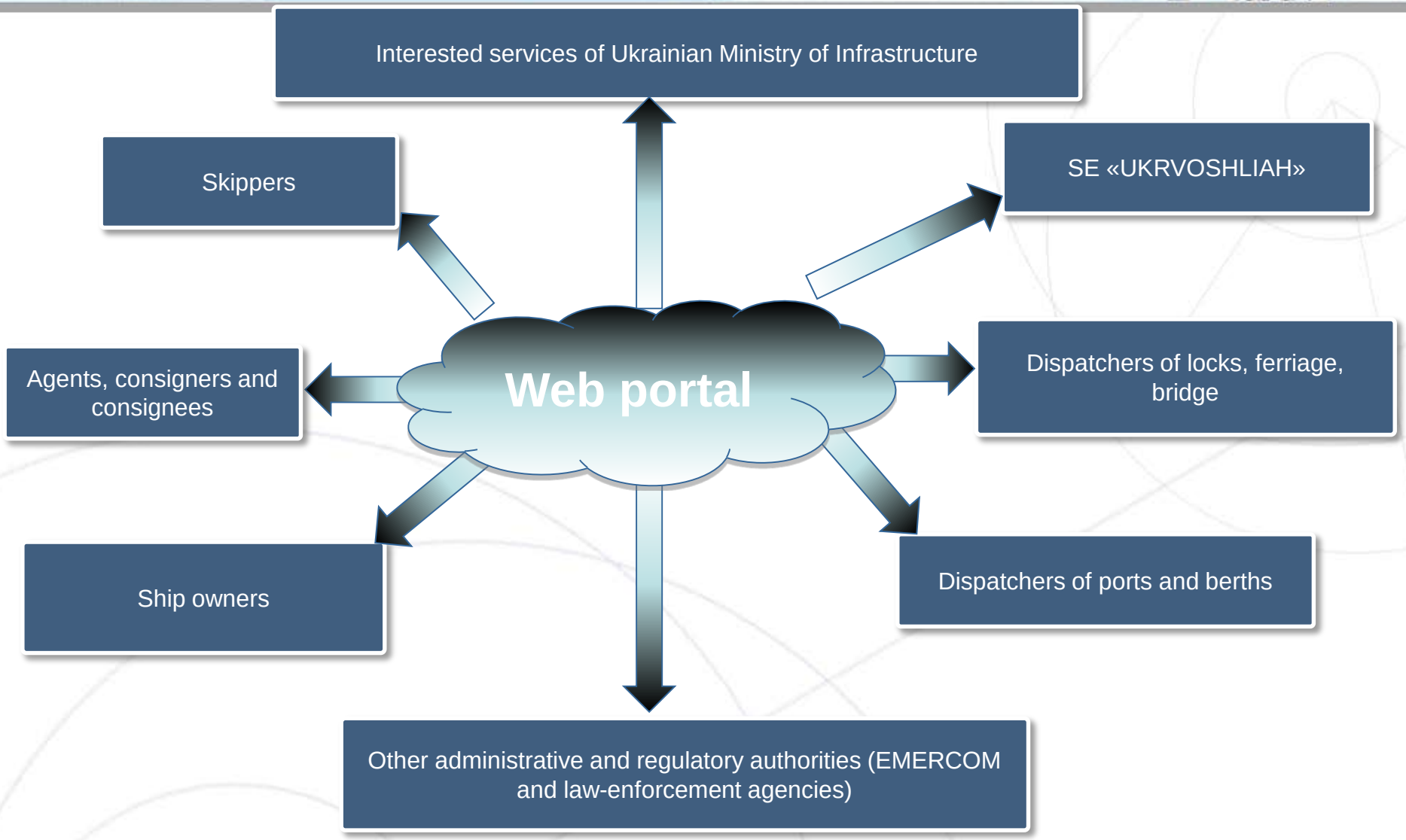
RIS Structure

Data warehouse for Danube waterways



- RIS centre
- RIS subcentre
- ARTP (automated radiotechnical post of AIS BS)

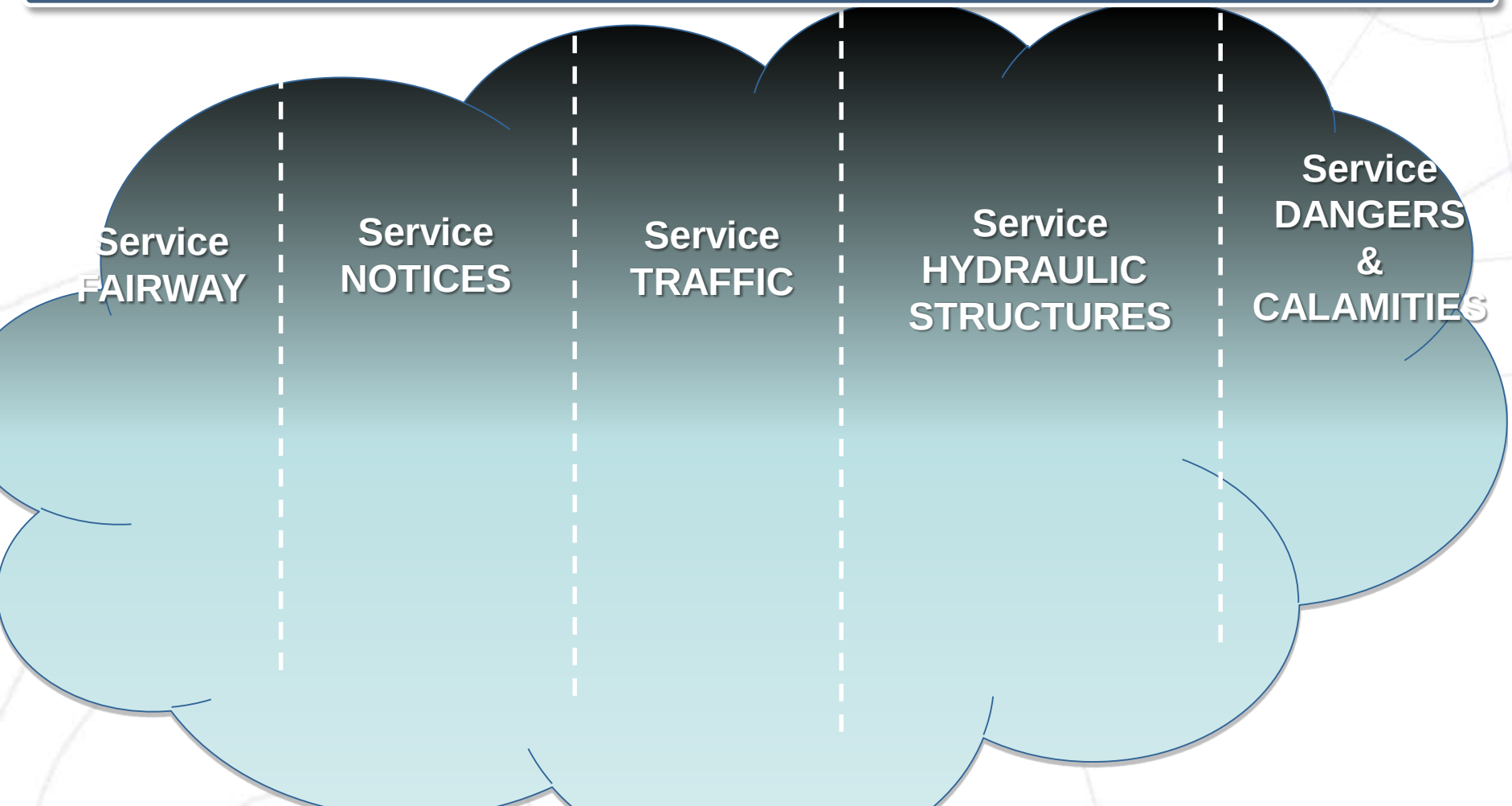
Users of web portal information services



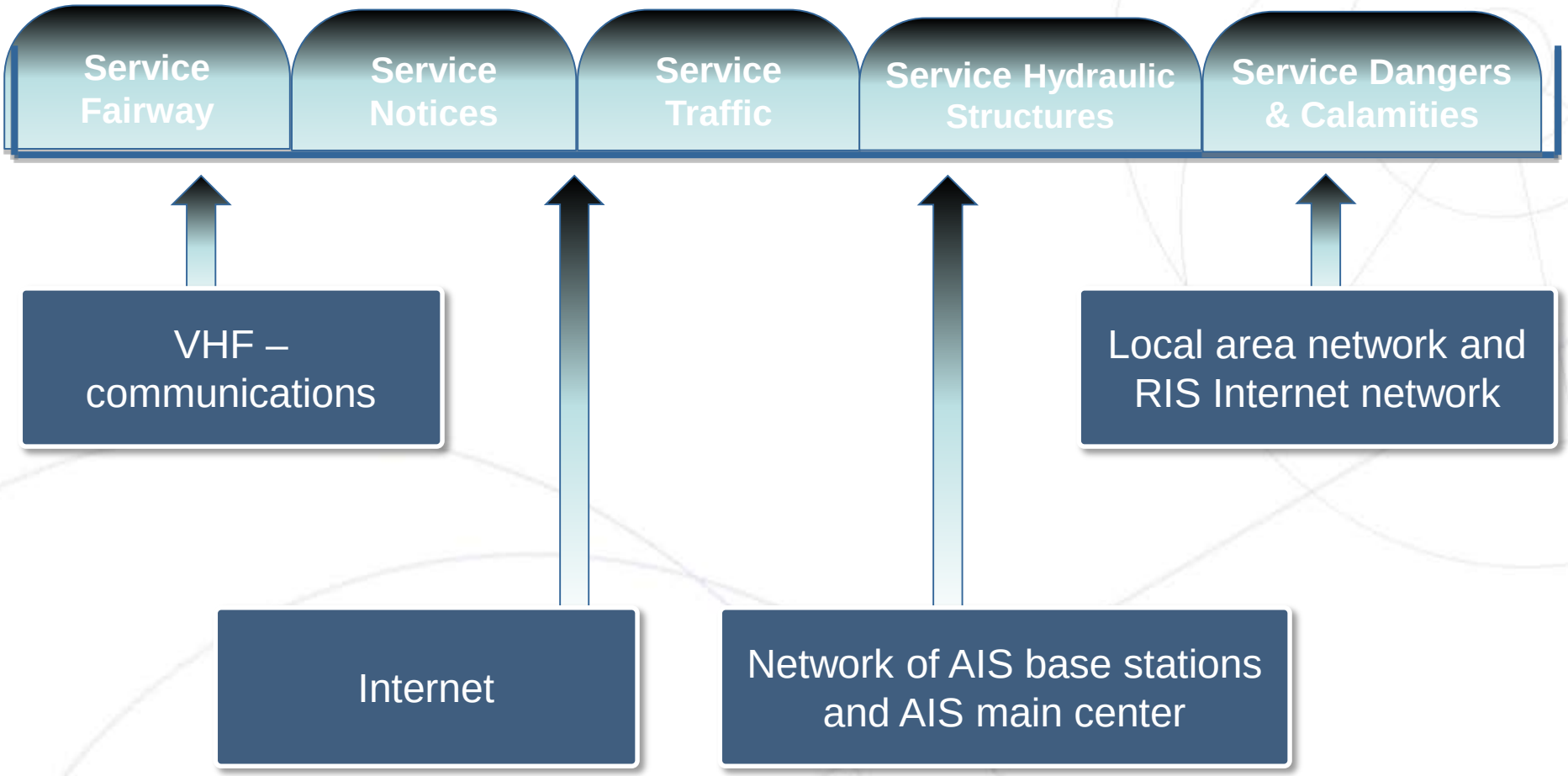
Web portal structure

Data warehouse for Danube waterways

River information services are implemented as individual pages accessible to users of the portal information services.

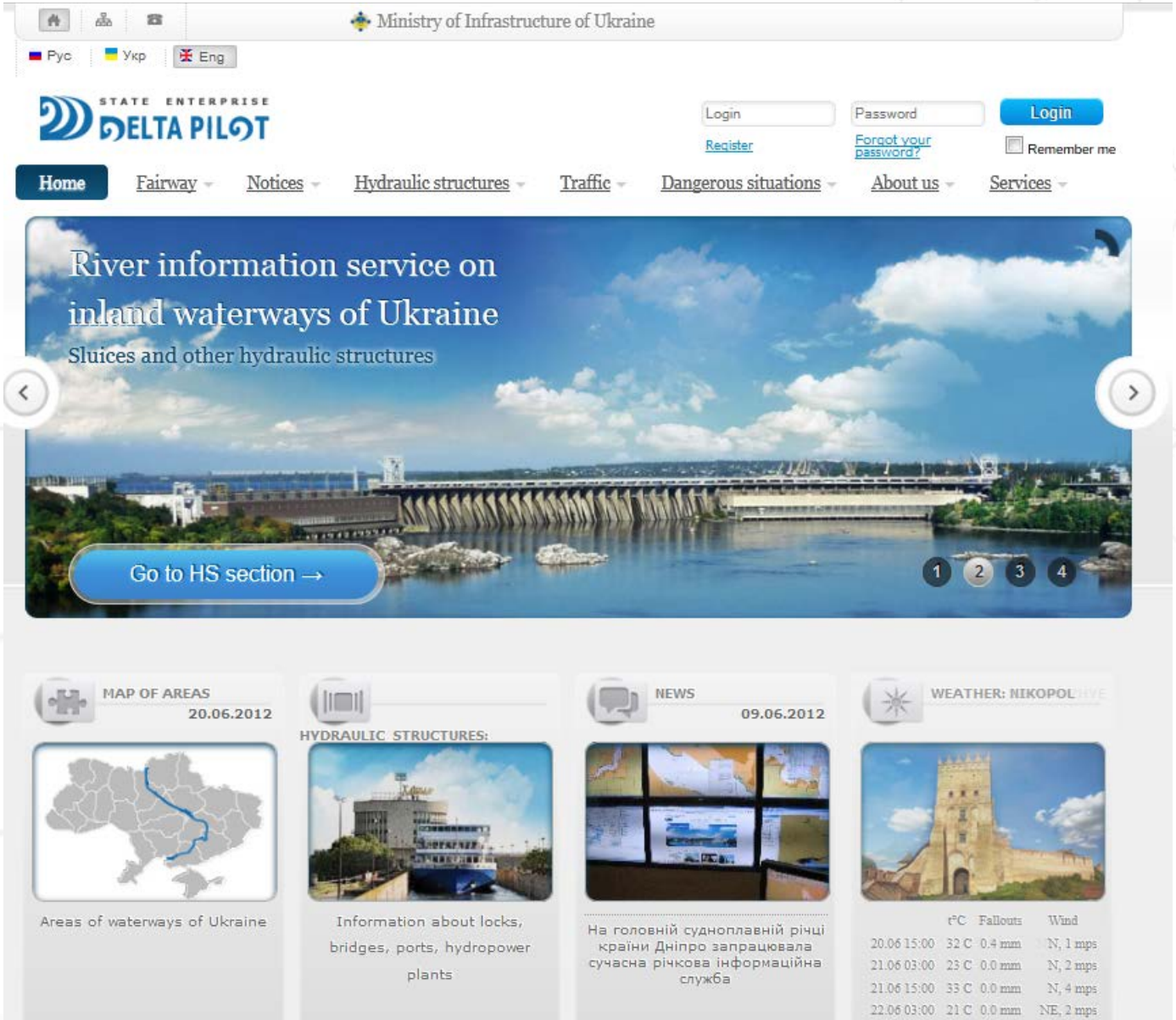


Technical solutions used by RIS services



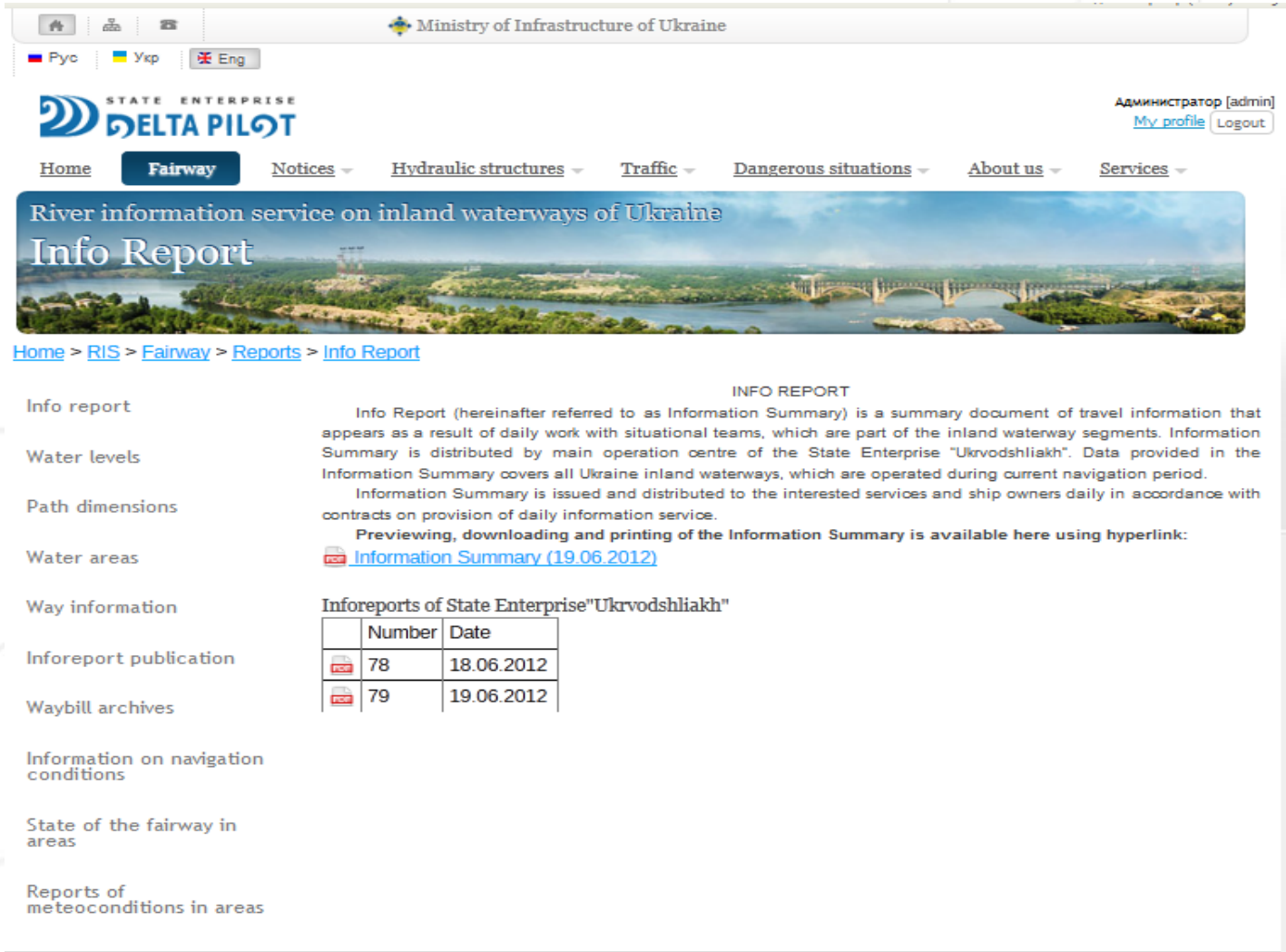
Portal main window

Data warehouse for Danube waterways



Service «Fairway» at web portal

Data warehouse for Danube waterways



Info report

Data warehouse 4 Danube waterway

Info report

Data warehouse for Danube waterways

Ministry of Infrastructure of Ukraine

Рус Укр Eng

Access in MOVEMENT service is on individual register at ukrris@ukr.net

INFO REPORT

Info Report (hereinafter referred to as Information Summary) is a summary document of travel information that appears as a result of daily work with situational teams, which are part of the inland waterway segments. Information Summary is distributed by main operation centre of the State Enterprise "Ukrvodshliakh". Data provided in the Information Summary covers all Ukraine inland waterways, which are operated during current navigation period.

Information Summary is issued and distributed to the interested services and ship owners daily in accordance with contracts on provision of daily information service.

Previewing, downloading and printing of the Information Summary is available here using hyperlink:

Information Summary (25.05.2015)

Home Fairway Notices

Fairway Notices

- Info report
- Water levels
- Path dimensions
- Inforeport publication
- Information on navigation conditions
- State of the fairway in areas
- Reports of meteoconditions in areas
- Water areas
- Maps

Areas of waterways of Ukraine

ports, hydropower plants

р. Днепр

INFORMATION SUMMARY (5/25/2015)

River Information Service on inland waterways of Ukraine

DELTA-PILOT BRANCH SE USPA RIS

Address: 1265026, Tamozhennaya square, 1-g, Odessa, Ukraine
Phone/fax: (048) 729 39 77
Mobile: (067) 518 81 01
E-mail: ukrris@ukr.net

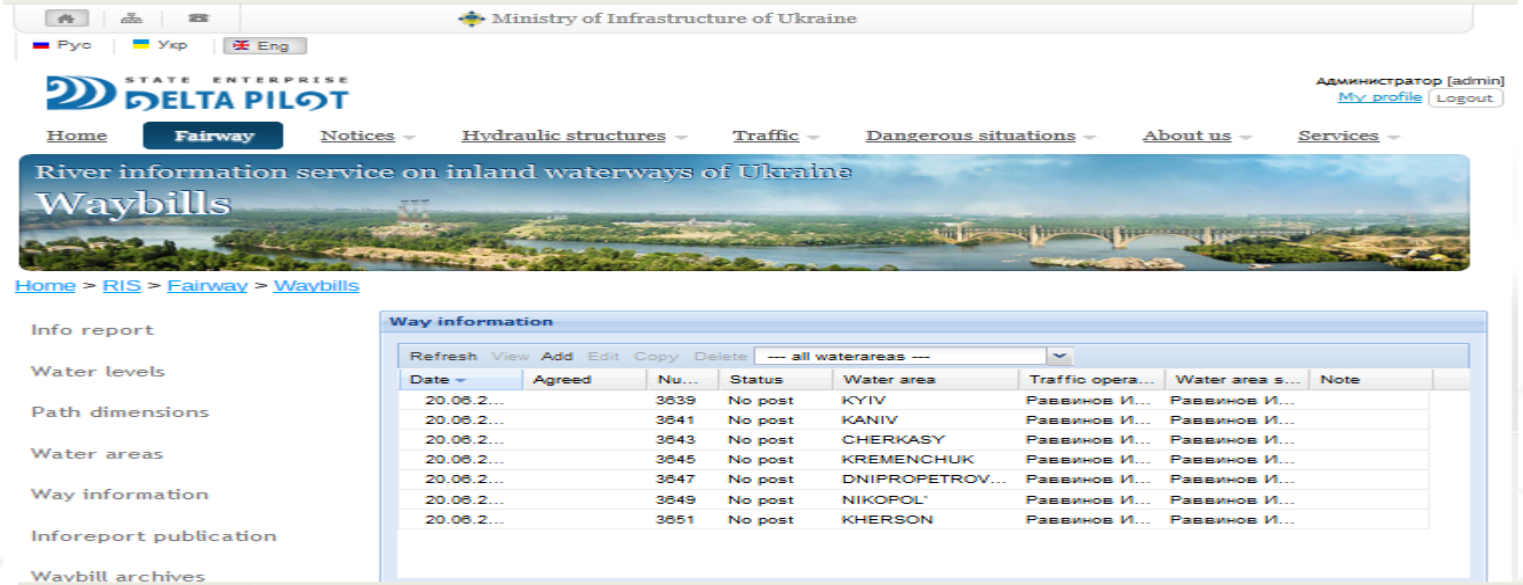
1. Water level conditions, Dnipro river, 8 a.m.

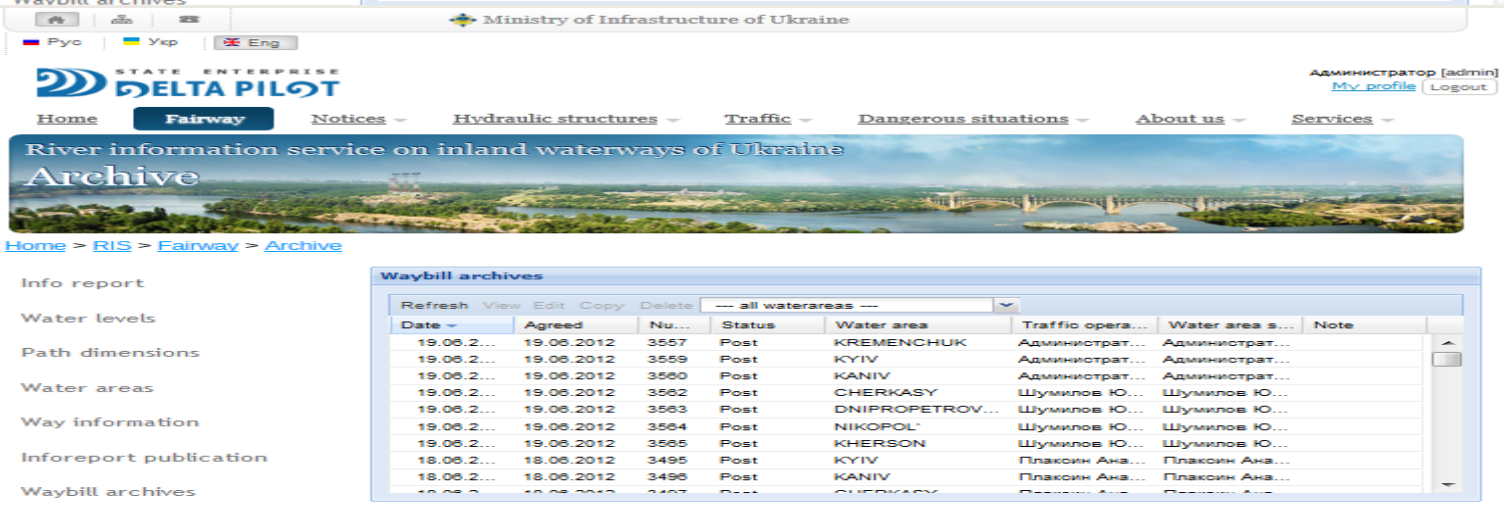
Name of water stations	Water above projected level, Headwater/ Tailwater elevation, m	Rising + Recession –	Ice phenomena Ice thickness
Nedanchychi	103.72	-0.02	
Kyivska Hydroelectric Power Station, Headwater	102.99	+0.06	
Kyivska Hydroelectric Power Station, Tailwater	91.40	-0.04	

Data warehouse 4 Danube waterway

Service «Fairway» at web portal

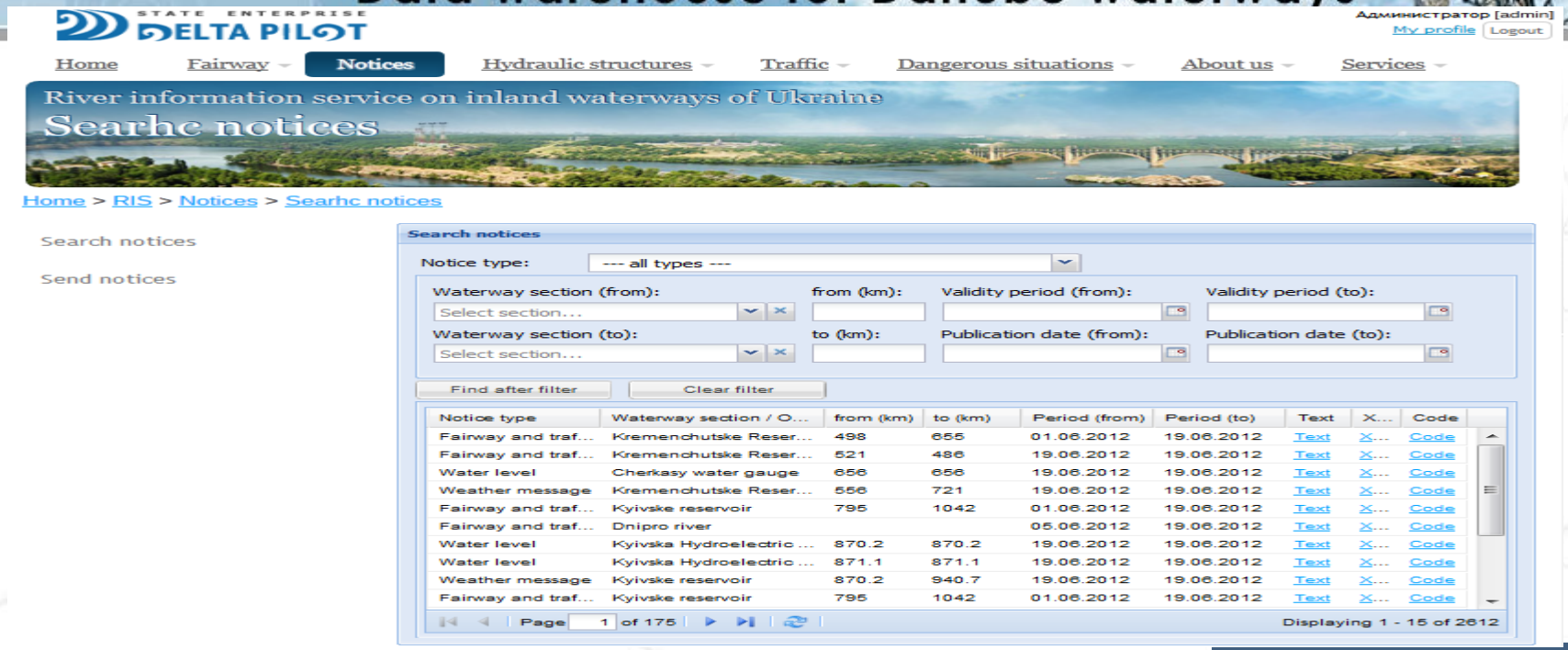
Data warehouse for Danube waterways



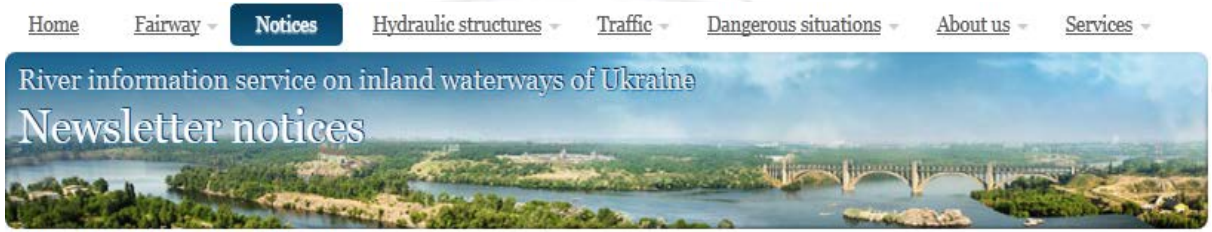


Service «Notices» at web portal

Data warehouse for Danube waterways

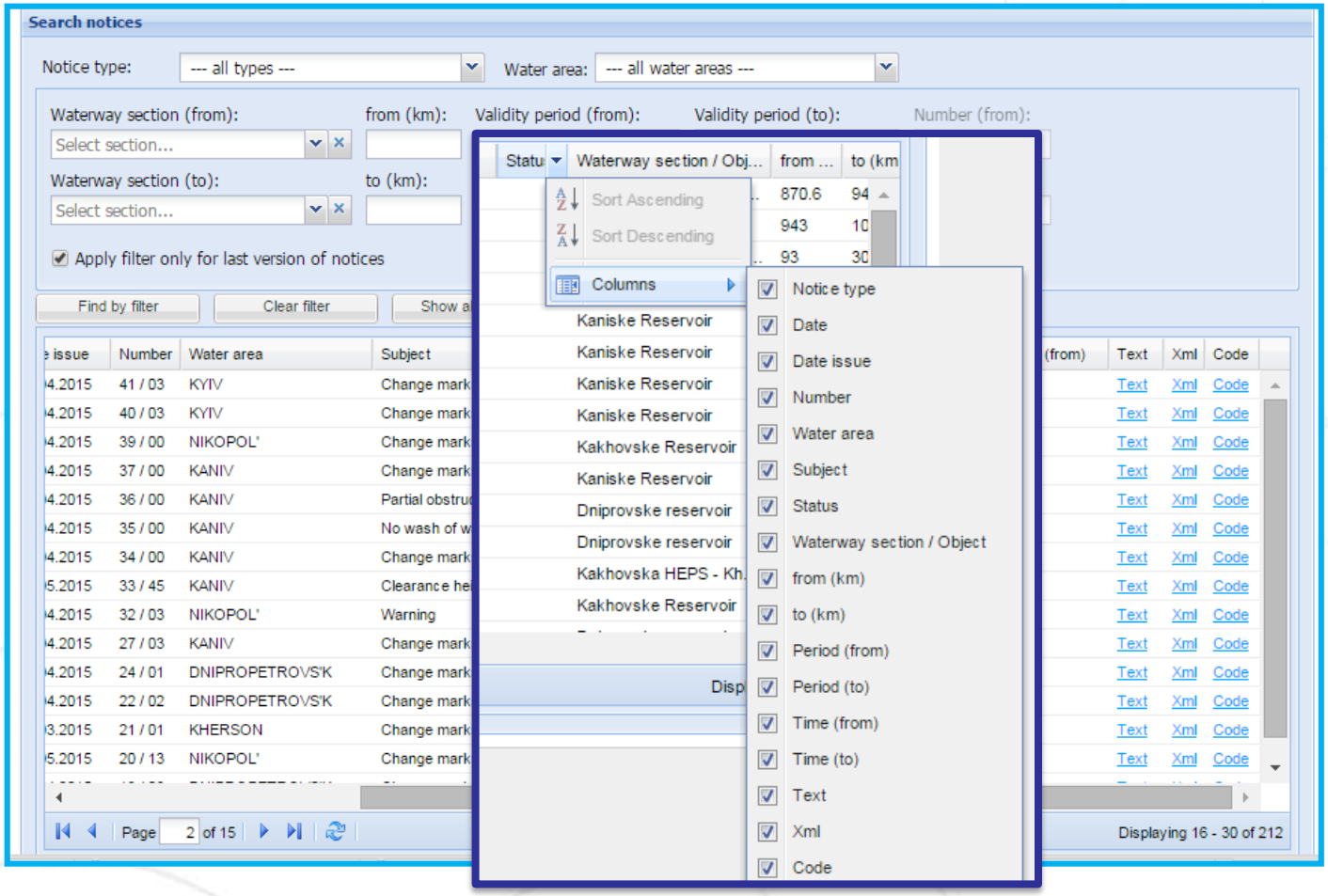


Search notices



Send notices

Status NOTICES



web-portal notices formats

Data warehouse for Danube waterways

Text format

The notice to Skippers is available for region – "Danubian waterway area" in country Ukraine in the original language Russian, which has been compiled by RIS Ukraine on 01 May 2015 at 11:07 AM o'clock

The fairway and traffic related message No 48/01 in the year 2015.
Subject: change marks.
Published by the RIS Center.
Reason for the message: others.
This message is valid in the period from 01 May 2015 for all vessels (moving in all directions).
Limitations for the fairway 'Reni roadstead - Izmail roadstead', 106 km.:
- Continuous from 01 May 2015 would take place the following limitation: special caution all
Additional text in national language: Река Дунай. Килийское гирло. Буй красный № 106 (106 км) отсутствует на штатном месте.
Судоводителям соблюдать осторожность

XML format

```
▼<RIS_Message>
 ▼<identification>
    <from>RIS Ukraine</from>
    <originator>State hydrographic service of Ukrain
    <country_code>UA</country_code>
    <language_code>RU</language_code>
    <date_issue>20150501</date_issue>
  </identification>
 ▼<ftm>
    <year>2015</year>
    <number>48</number>
    <serial_number>01</serial_number>
   ▼<target_group>
      <target_group_code>ALL</target_group_code>
      <direction_code>ALL</direction_code>
    </target_group>
    <subject_code>CHGMAR</subject_code>
   ▼<validity_period>
      <date_start>20150501</date_start>
      <date_end>99999999</date_end>
    </validity_period>
```

CODE format

♦ RIS message:
- (Identification section):
  - Sender of the message: RIS Ukraine
  - Originator of the information: State hydrographic service of Ukraine
  - Country where message is valid: Ukraine
  - Original language: Russian
  - Date of issue: 01 May 2015 11:07:44
- Fairway and traffic related message:
  - Year: 2015
  - Number (of the notice): 48
  - Serialnumber: 01
  - (Target group section):
    - Target group code: All
    - Traffic Direction code: All directions
  - Subject: Change marks
  - Period of validity:
    - From (yyyymmdd): 01 May 2015
  - Contents: Река Дунай. Килийское гирло. Буй красный № 106 (106 км
штатном месте.
Судоводителям соблюдать осторожность
  - Notice source (authority): RIS Center
  - Reason of notice: Others
  - Waterway or fairway section:
    - (geo information of waterway or object):
      - Identification: 233

View notices

NtS of Water levels

WATER LEVELS

SE "Ukrvodshiah" receives information on water levels at navigable rivers of Ukraine from main (reference) water gauges under agreement with Ukrainian hydrometeorologicalcentre of the Ukrainian Ministry for emergencies and popular protection from Chernobyl catastrophe protection.

Main operation centre of the SE "Ukrvodshliah" receives hydrological information at Ukrainian water gauges daily once per diem before 11-00 as per 8-00 a.m.

Data provided in table correspond to water levels at 08-00 a.m. of the current day.

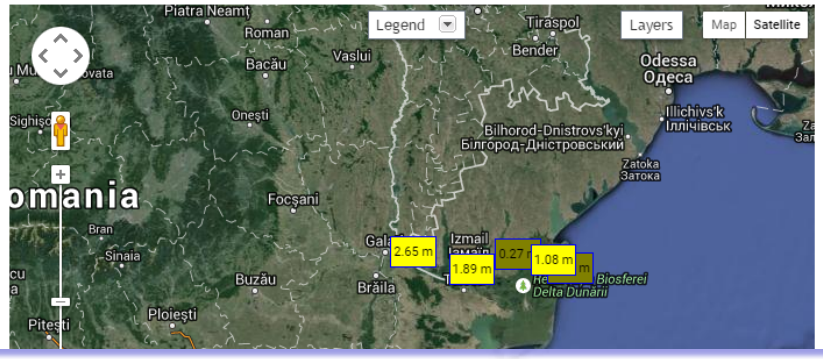
Note: to see diagrams of the water level variations follow link in the name of each water level gauge.

Sort by: (•) Name ( ) Downstream ( ) Upstream

River: ( ) All rivers ( ) Dnipro (•) Danube

Report in PDF format

Tide gauge	21.05.2015		22.05.2015		23.05.2015		24.05.2015		25.05.2015		26.05.2015		24h	
	m	+/-	m	+/-	m	+/-	m	+/-	m	+/-	m	+/-	m	+/-
Tide gauge Izmail	2.17	-0.03	2.11	-0.06	2.02	-0.09	1.96	-0.06	1.89	-0.07				
Tide gauge Reni	3.02	-0.1	2.91	-0.11	2.78	-0.13	2.71	-0.07	2.65	-0.06				
Tide gauge Vilkovo	1.2	+0.07	1.15	-0.05	1.13	-0.02	1.13	0	1.08	-0.05				
Гирло Измаил														



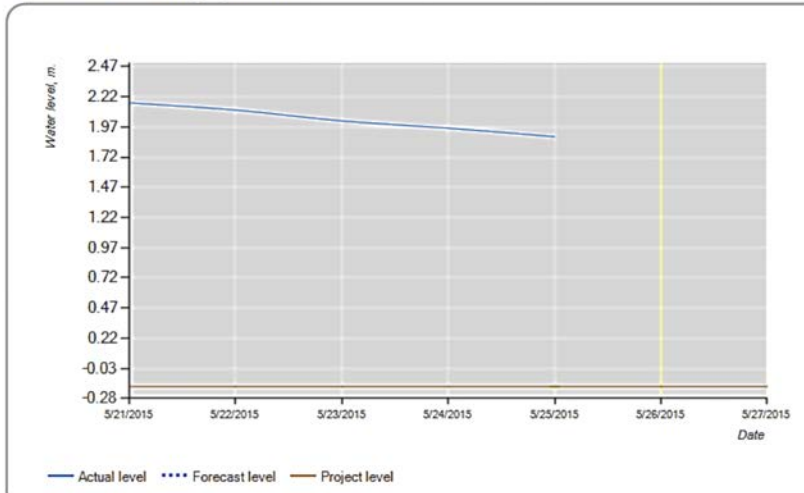
Report in PDF format

Tide gauge: Izmail

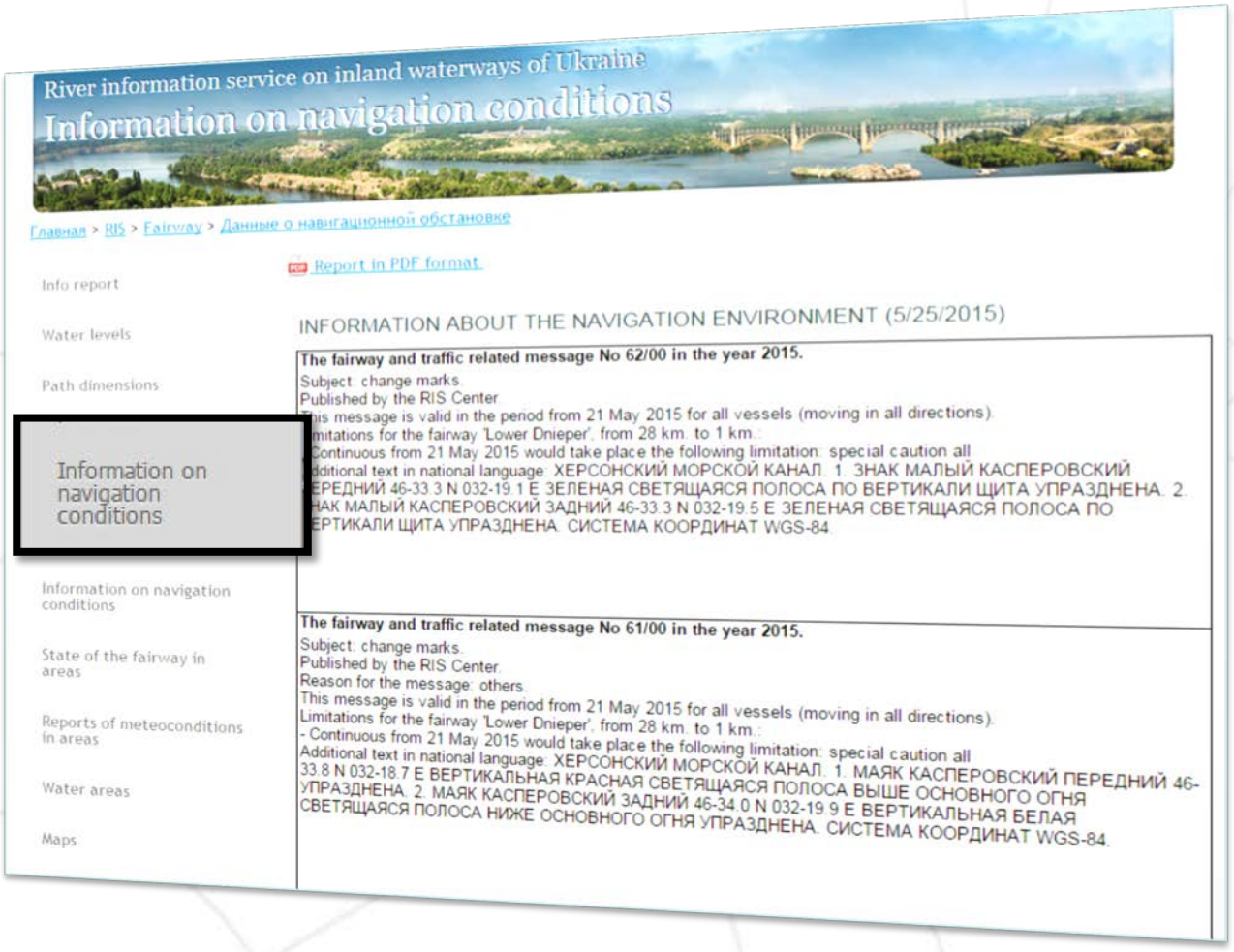
Location: 93.6 км. (Danube)

Project level -0.18 m (Kronstadt Tide Gauge)

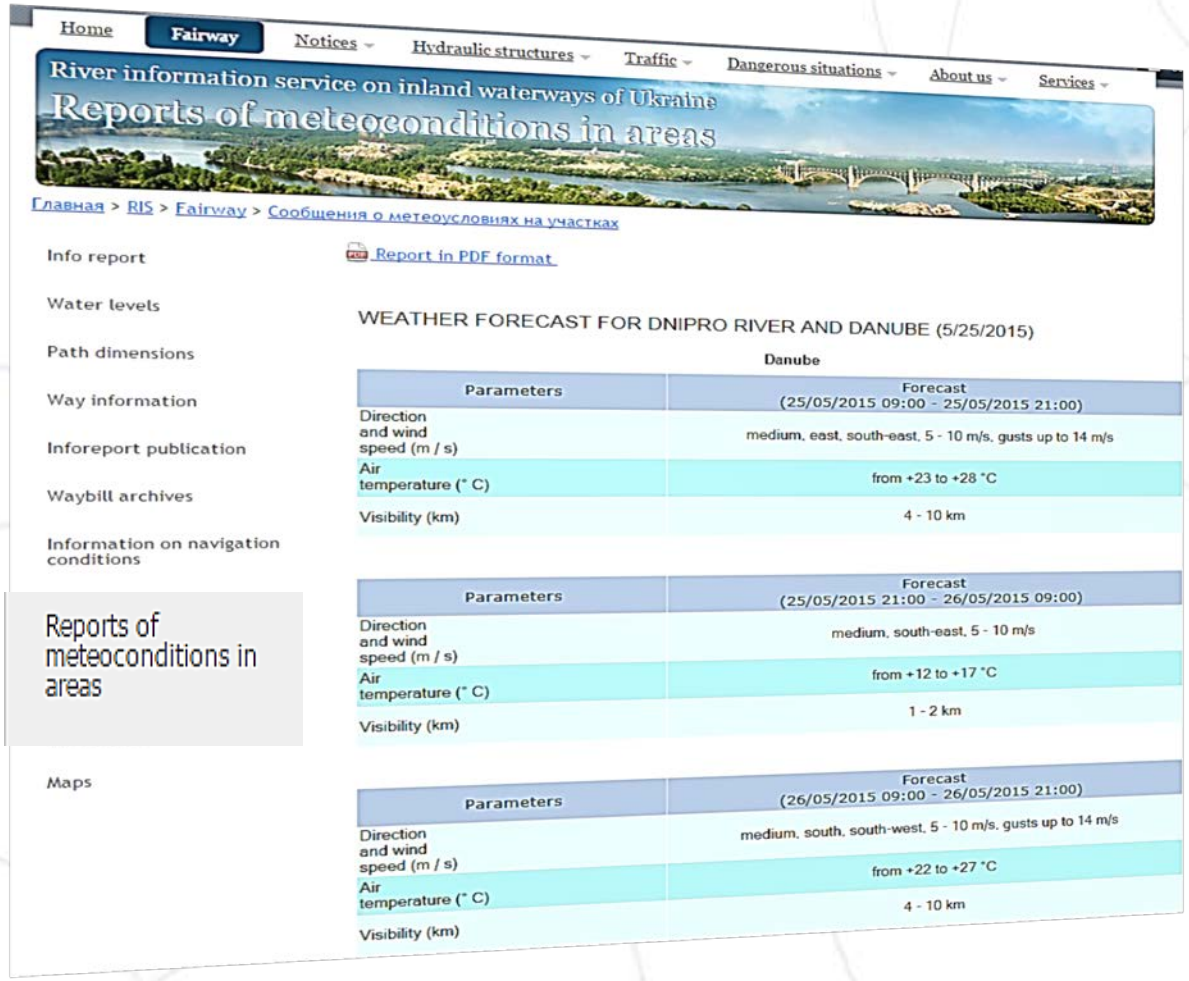
Graph of water level at tide gauge Izmail



NtS of Information on navigation conditions



NtS of Reports of meteoconditions in areas



Service «Hydraulic Structures» at web portal

Data warehouse for Danube waterways

Home | Fairway | Notices | **Hydraulic structures** | Traffic | Dangerous situations | About us | Services

River information service on inland waterways of Ukraine

Locks

Home > Hydraulic structures > Locks

- Locks
- Bridges
- Ports
- Hydroelectric Power Stations

Show as: ○ Table ◉ List

Sort by: ◉ Name ○ Downstream ○ Upstream

Dniprodzerzhynskyi Lock

Area ..... **Dnipropetrovsk waterway area**

Position ..... **Dniprodzerzhynsk, 1, Riepina Str., 51918, Ukraine**

Zaporizkyi lock

Area ..... **Nikopol waterway area**

Position ..... **Zaporizhzhia, 69006, Ukraine**

Locks

Service «Hydraulic Structures» at web portal

Data warehouse for Danube waterways

STATE ENTERPRISE DELTA PILOT

admin | Password | Login

Register | Forgot your password? | Remember me

Home | Fairway | Notices | **Hydraulic structures** | Traffic | Dangerous situations | About us | Services

Home > Hydraulic structures > Bridges

- Locks
- Bridges
- Ports
- Hydroelectric Power Stations

Show as: Table List

Sort by: Name Downstream Upstream

Kiev bridge at lock head

Area ..... Kyiv waterway area

Position ..... Dnipro

Moscow bridge

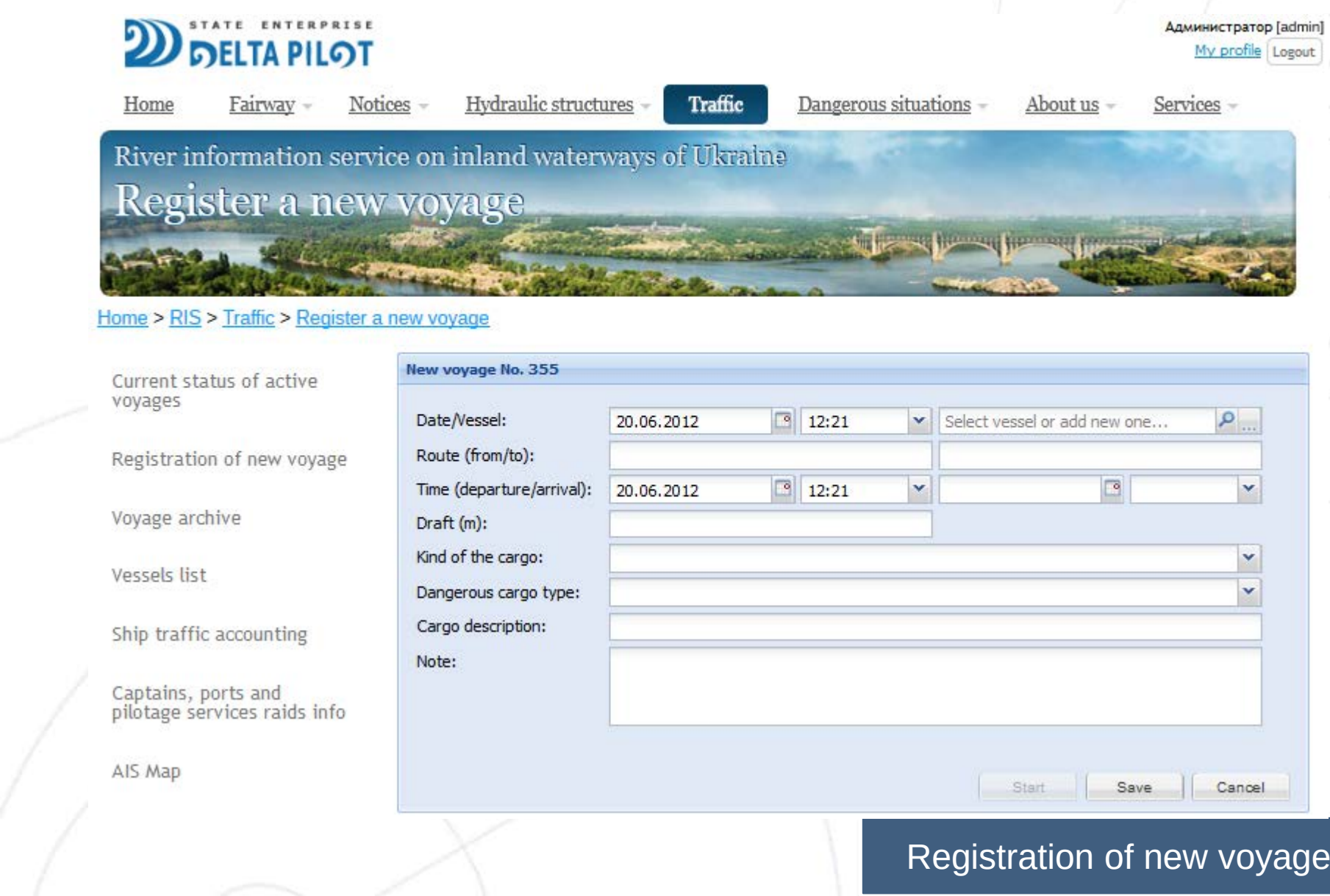
Area ..... Kaniv waterway area

Position ..... Dnipro

Bridges

Service «Traffic» at web portal

Data warehouse for Danube waterways



Registration of new voyage

Service «Traffic» at web portal

Data warehouse for Danube waterways

River information service on inland waterways of Ukraine

Current status of active voyages

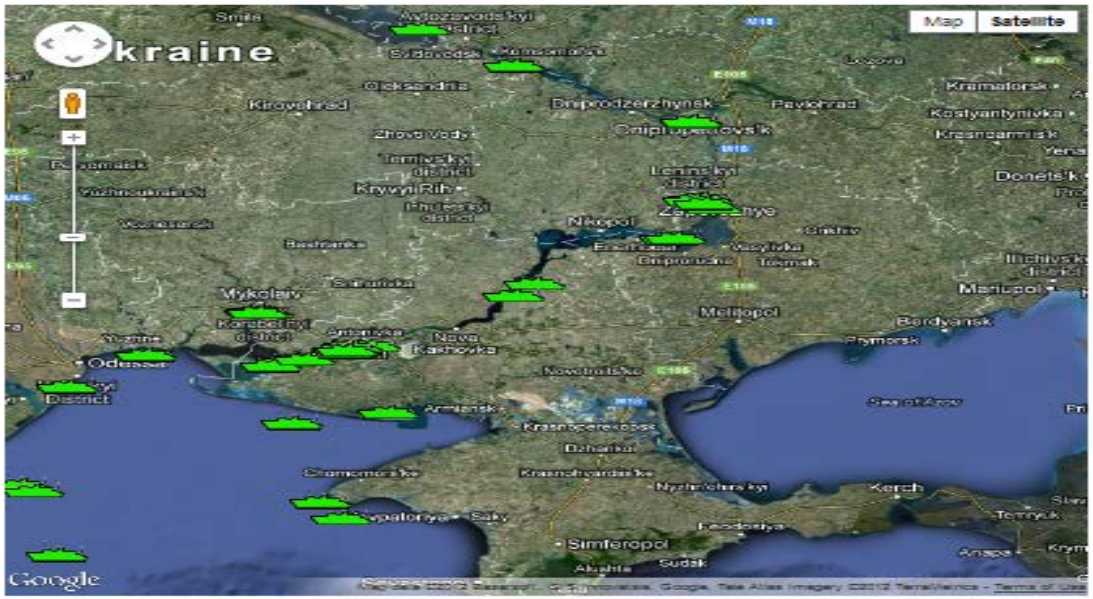
Home > RIS > Traffic > Current status of active voyages

- Current status of active voyages
- Registration of new voyage
- Voyage archive
- Vessels list
- Ship traffic accounting
- Captains, ports and pilotage services raids info
- AIS Map

Current status of active voyages

Refresh Show on the AIS map

Date	Vessel	Section
20.06.2012 12:22:...	BORISPOL	Kremenchutske HEPS - 82 km of ...
20.06.2012 12:22:...	DEFNE K	Zaporizhya river port
20.06.2012 12:22:...	VOLGOBALT 218	Kherson river port
20.06.2012 12:22:...	DNIEPER PRINCESS	Kyiv river port
20.06.2012 12:22:...	SANTA ELENA	Kakhovska HEPS - Kherson
20.06.2012 12:22:...	KOMKOV	Kherson river port
20.06.2012 12:22:...	KAMENEC-PODOLSKIY	Kherson river port
20.06.2012 12:22:...	Окси 56	Kherson river port
20.06.2012 12:22:...	Нибунюм 2	Zaporozhya lock



Actual vessel location (dispatcher data)

Marking transmitting vessel on IECDIS

VHF/ATIS – ECDIS/AIS integration allows marking of the transmitting vessel on electronic chart by blinking mark

Inland ECDIS (Edition 2.3)

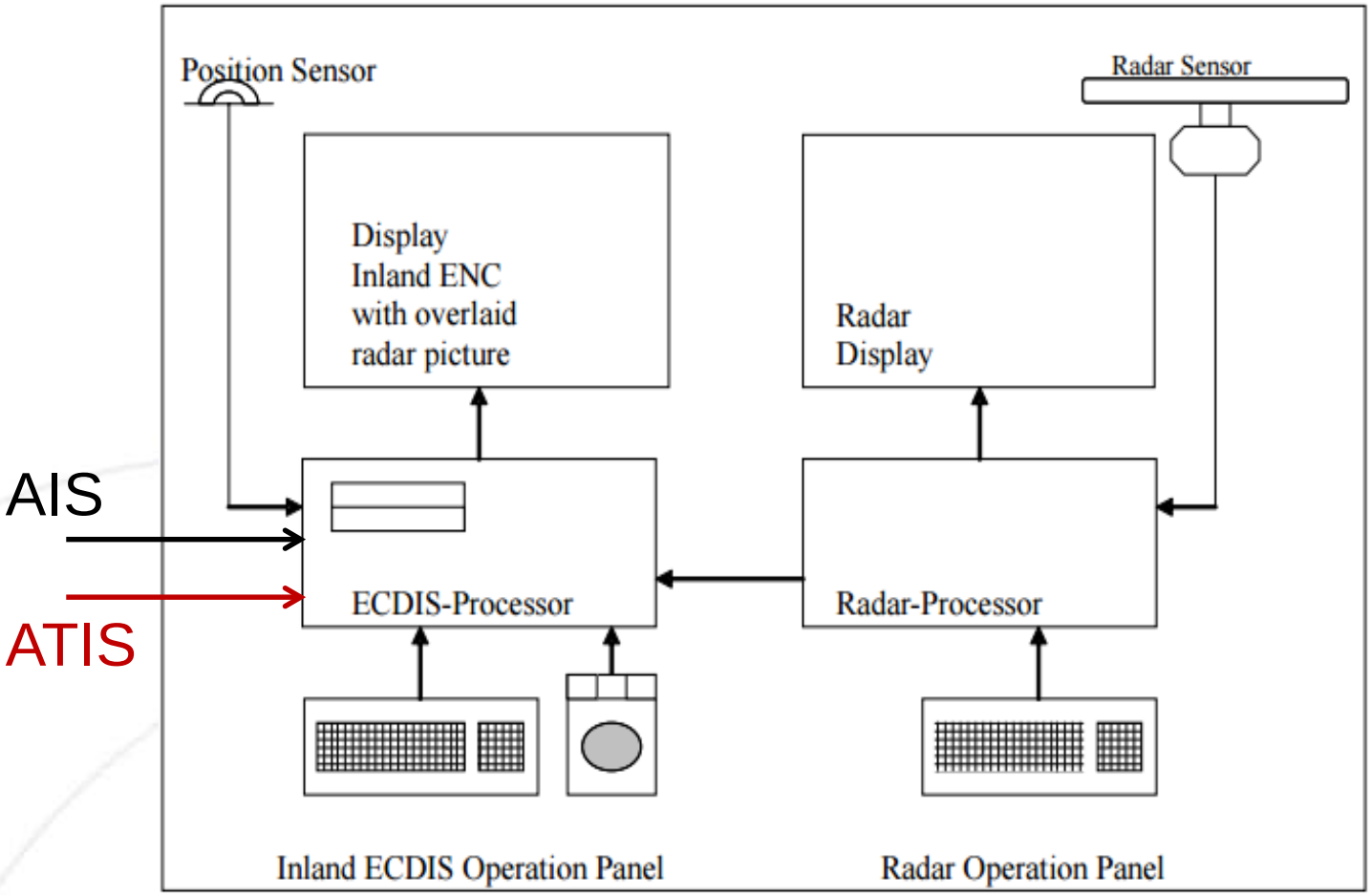
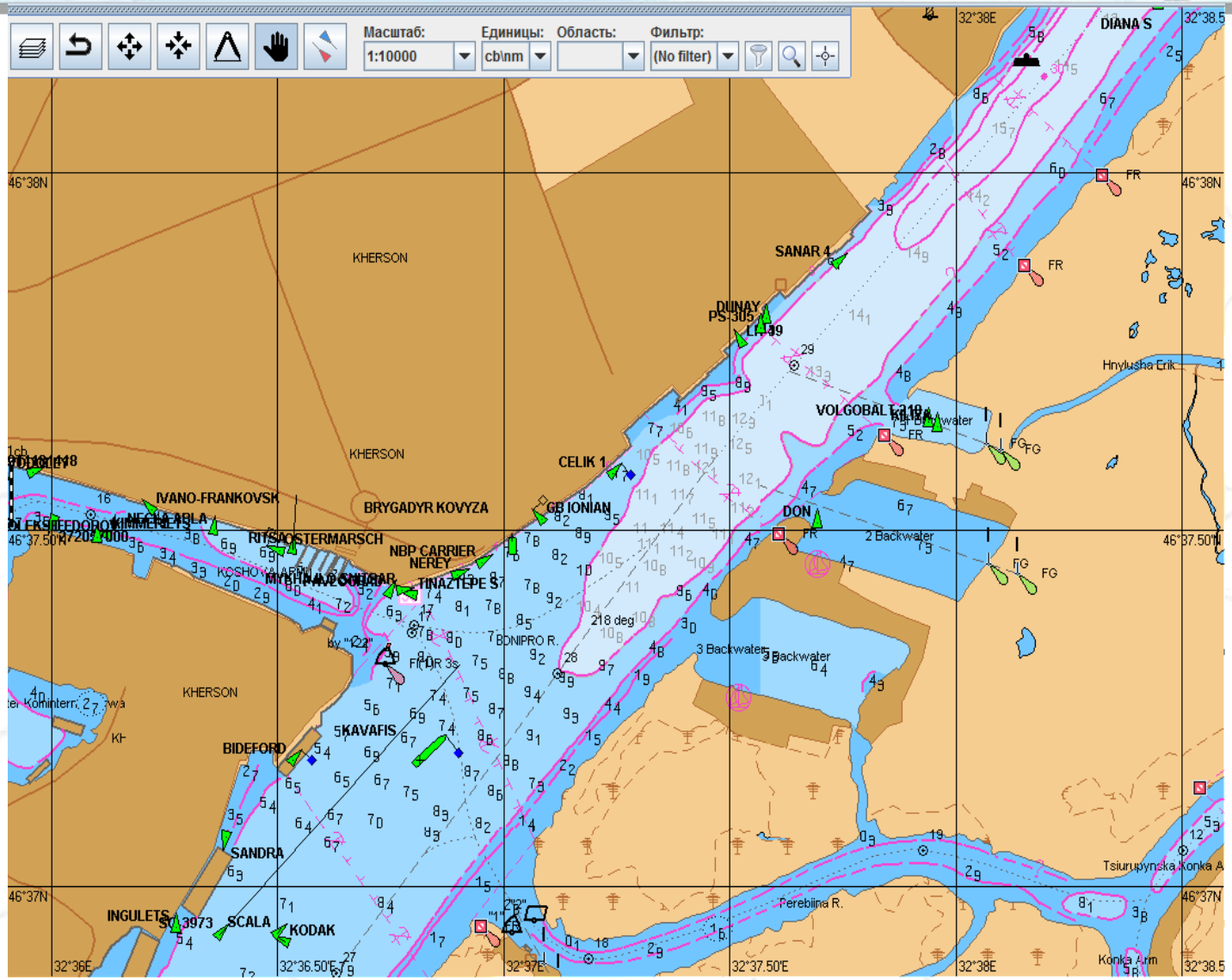


Fig. 2: Inland ECDIS equipment, self-sufficient system with connection to radar

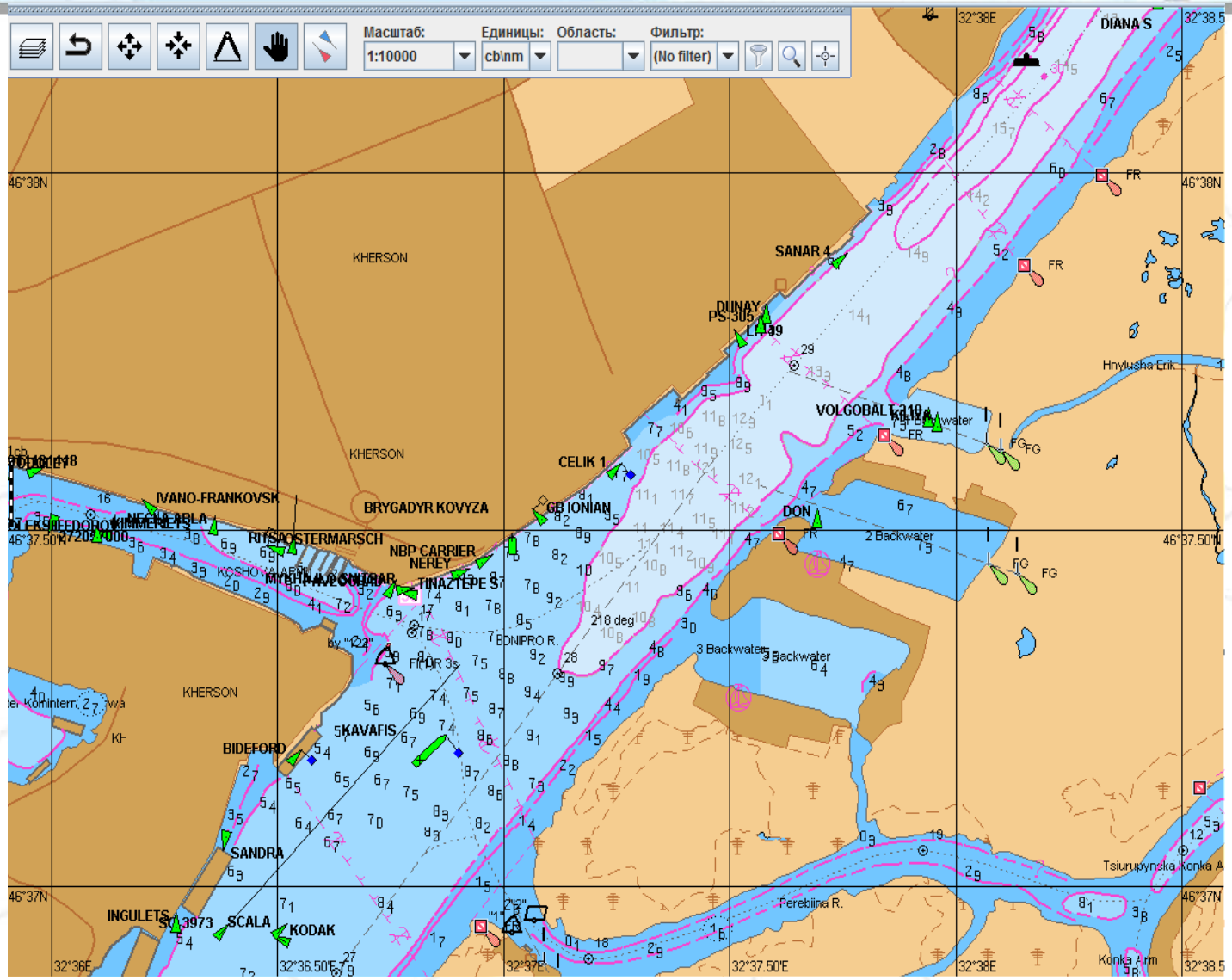
The range of operation for AIS and VHF/ATIS is the same, therefore in IECDIS charts AIS&ATIS marks are harmonize

VHF/ATIS - ECDIS Integration (1)



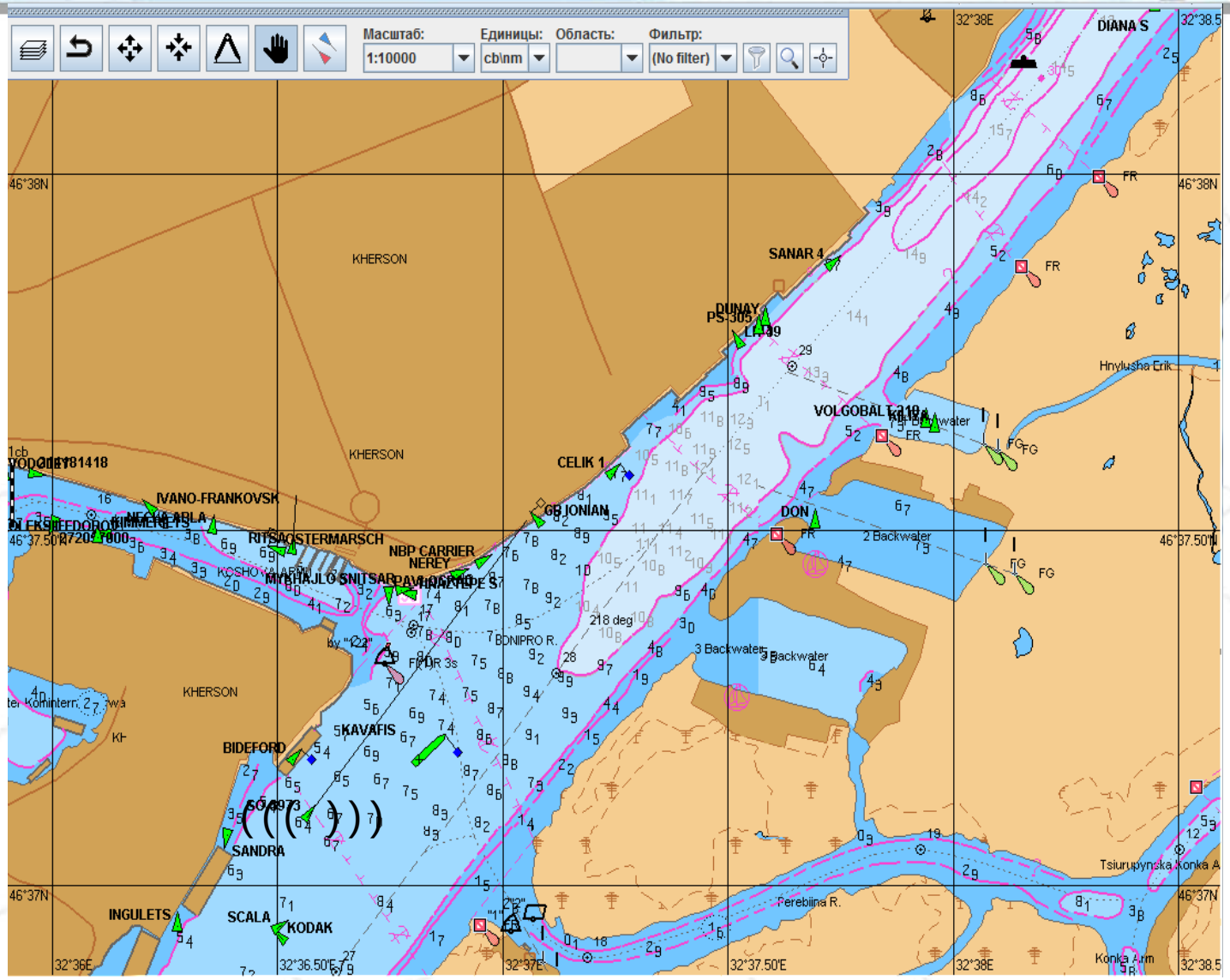
VHF/ATIS - ECDIS Integration (1)

Data warehouse for Danube waterways

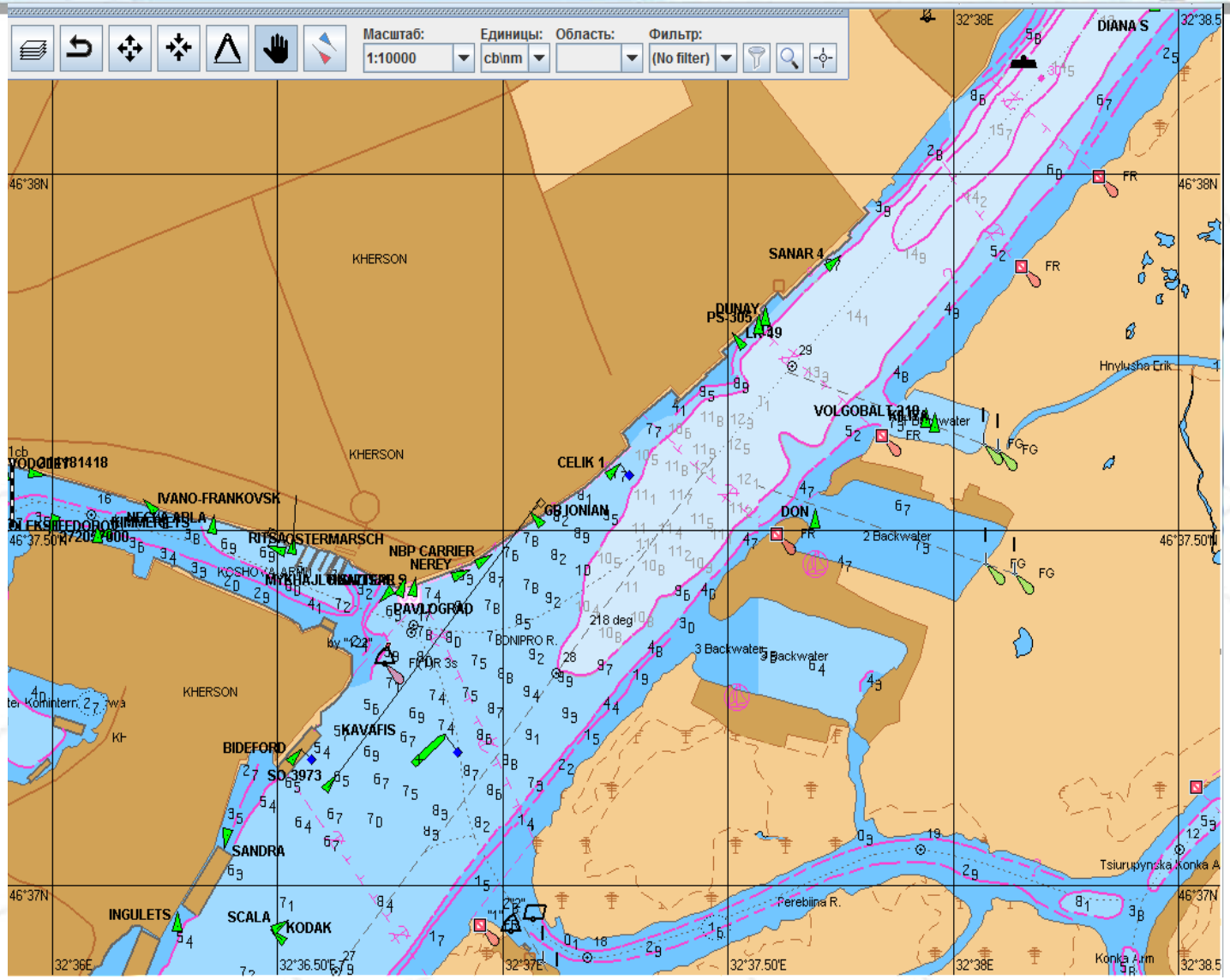


VHF/ATIS - ECDIS Integration (3)

Data warehouse for Danube waterways

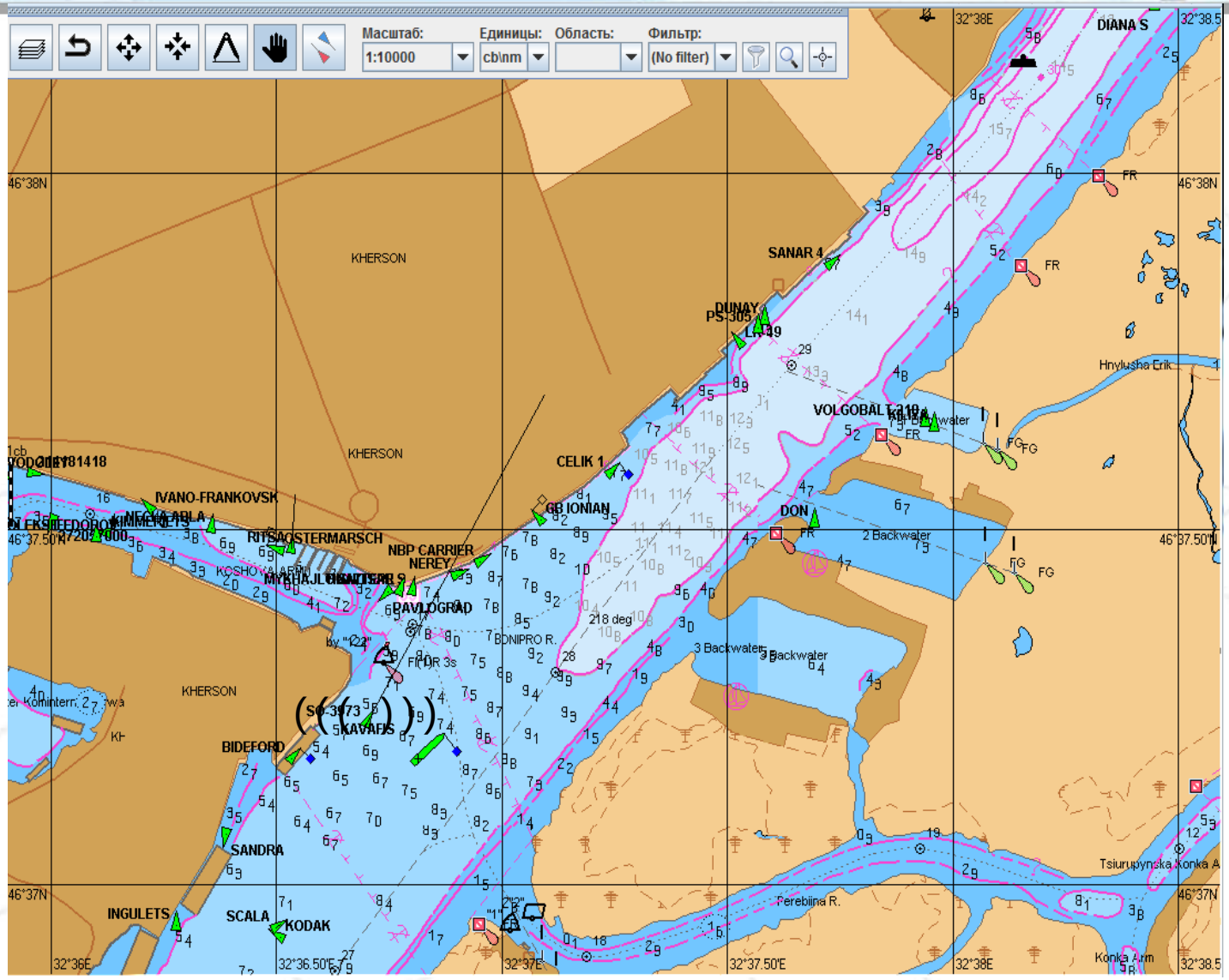


VHF/ATIS - ECDIS Integration (4)

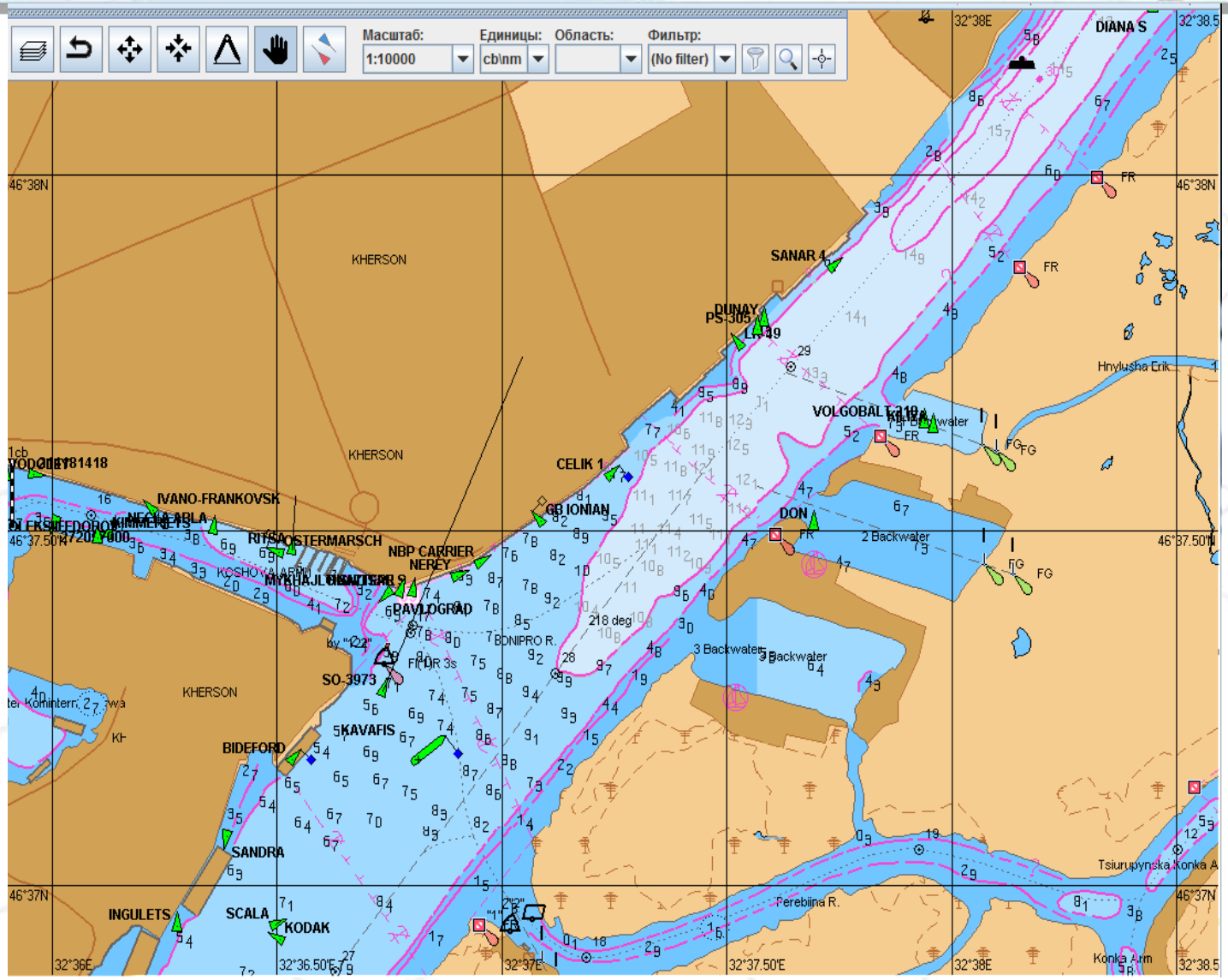


VHF/ATIS - ECDIS Integration (5)

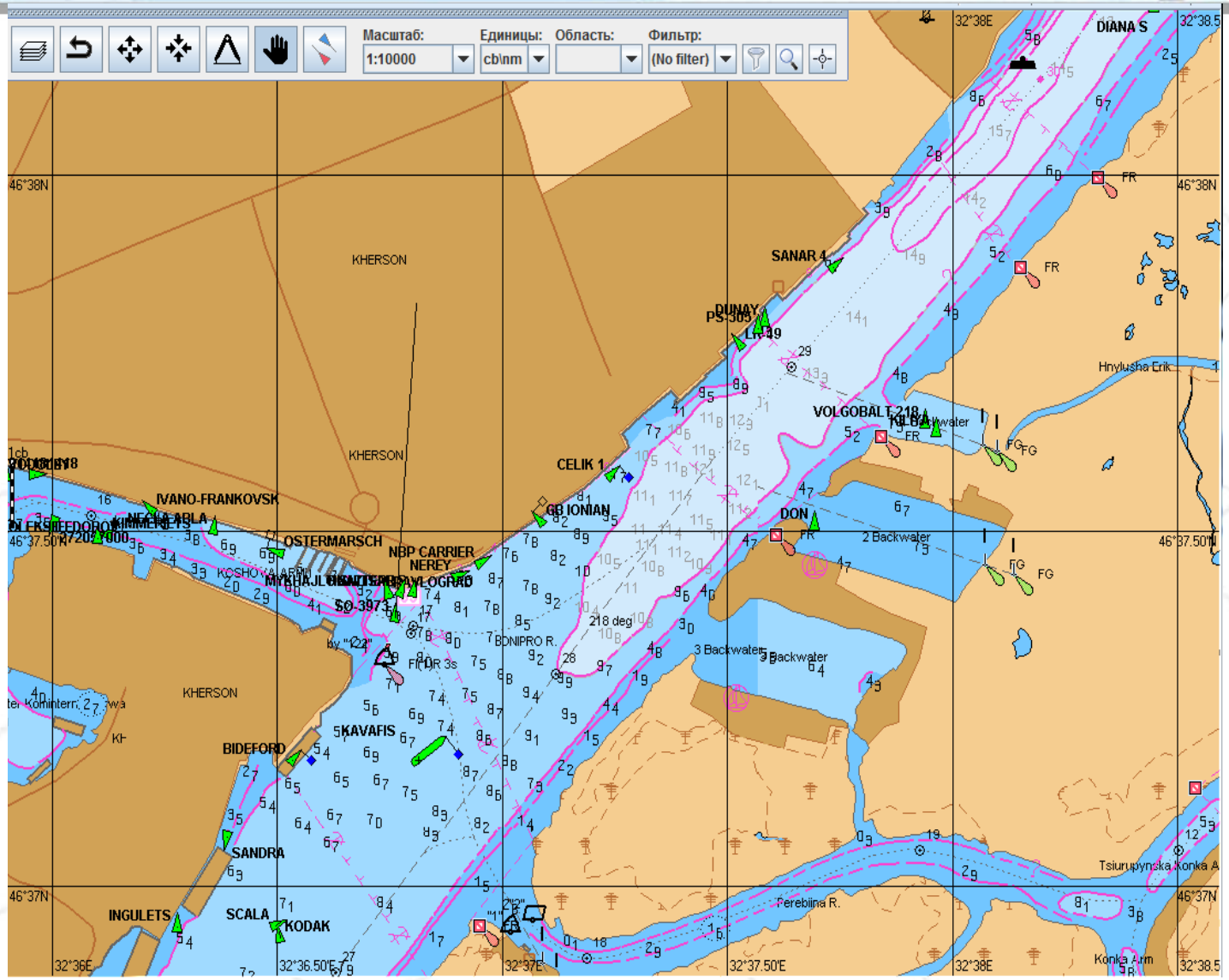
Data warehouse for Danube waterways



VHF/ATIS - ECDIS Integration (6)



VHF/ATIS - ECDIS Integration (7)

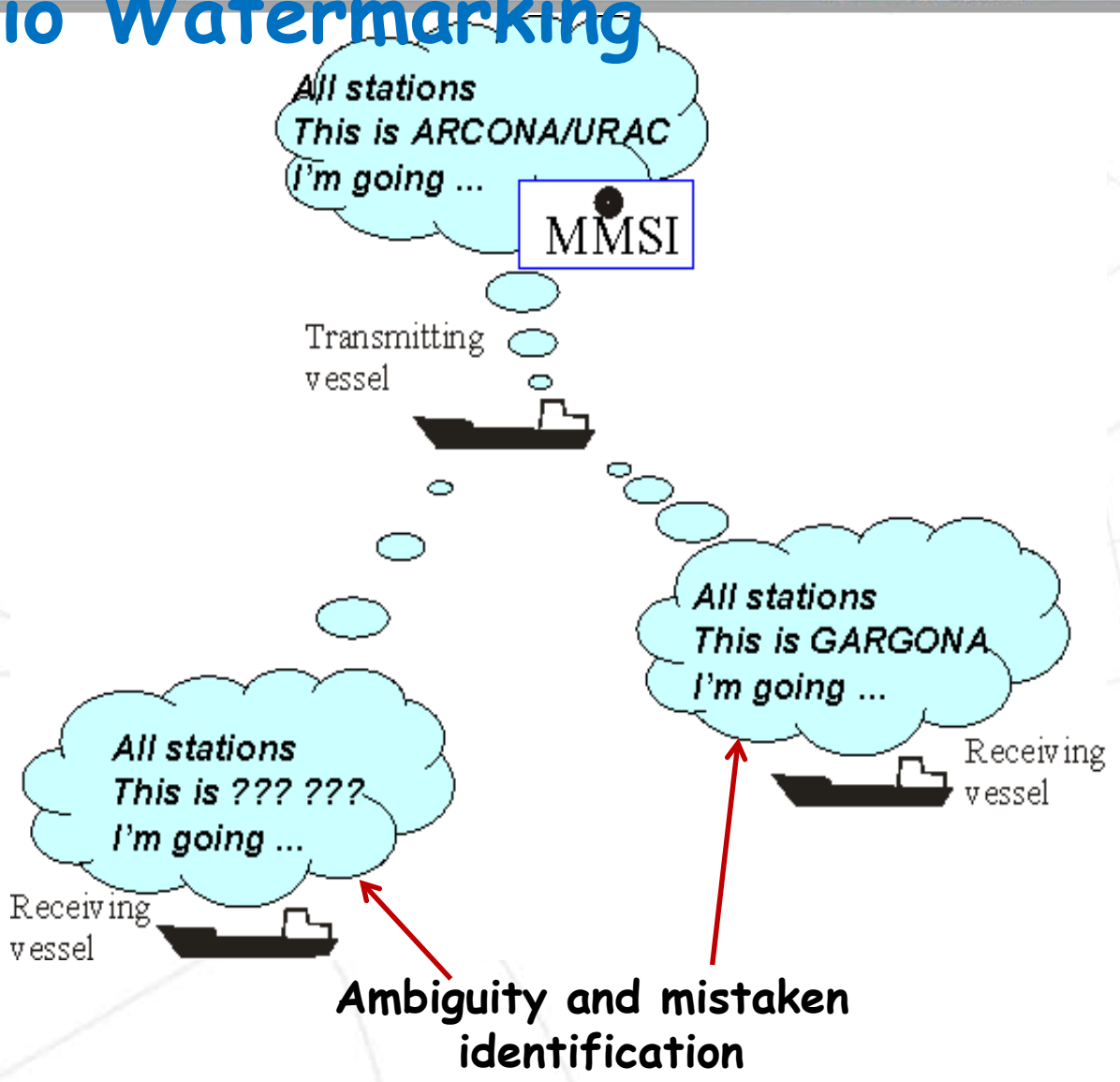


Application of audio watermarking (AWM) technology in marine/river VHF radiotelephony

The Proposed Solution: Audio Watermarking

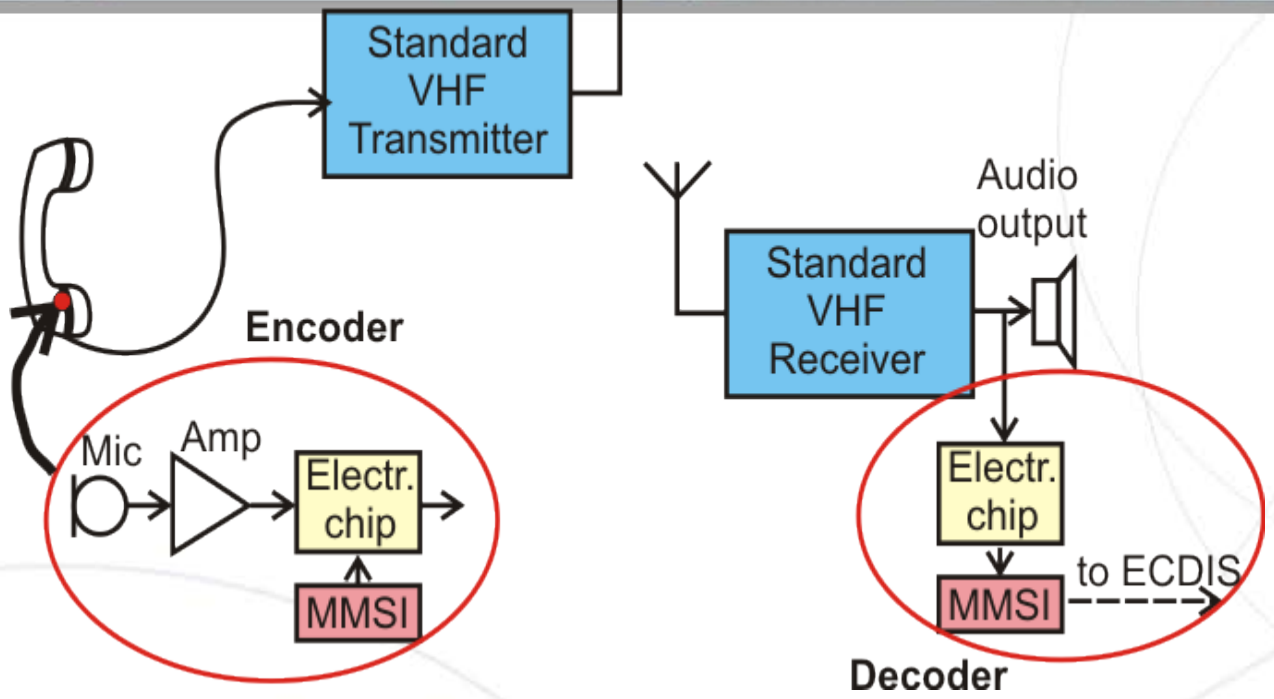
MMSI (Maritime Mobile Identification Number) is **embedded directly into audio signal.**

It allows realising **Automatic Identification** of transmitting station



Practical Realization

Data warehouse for Danube waterways



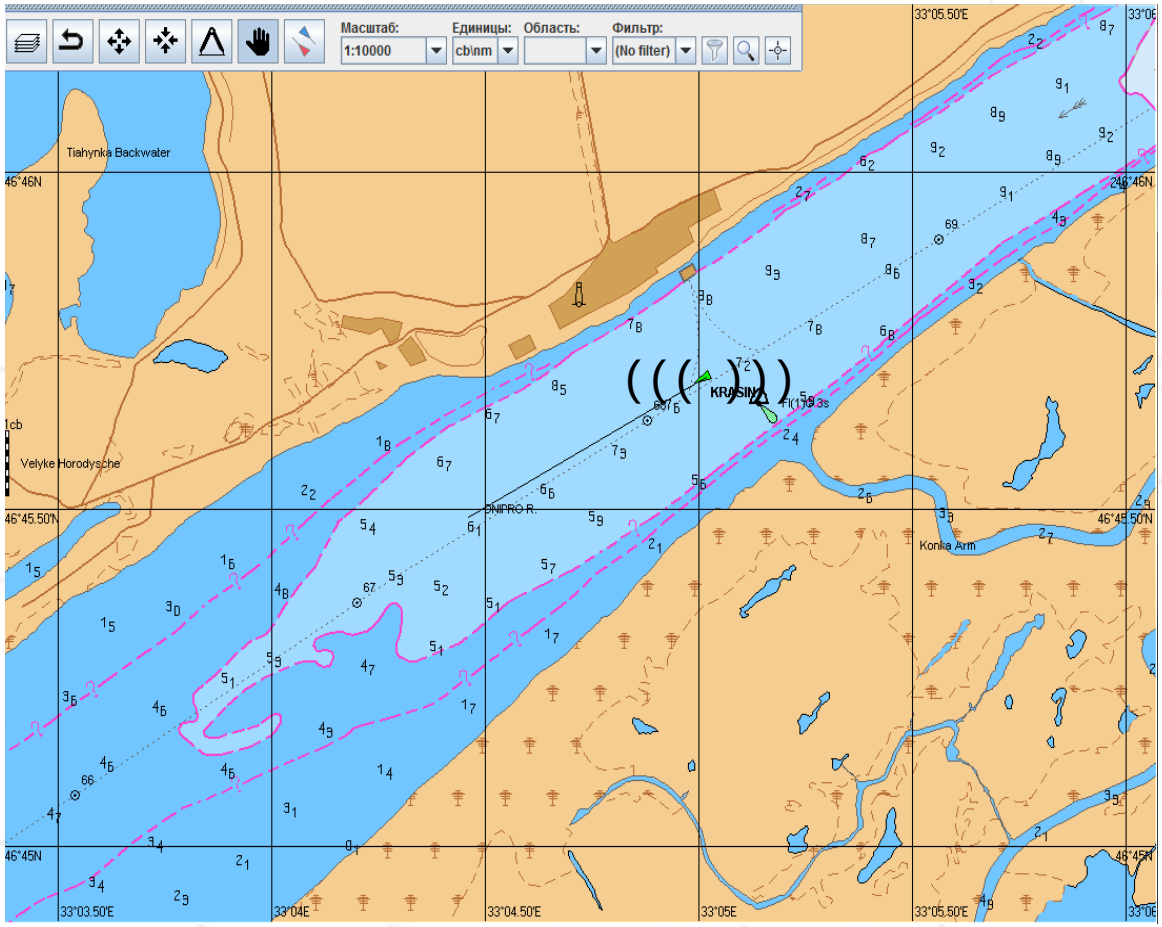
Application in VHF telephony for Automatic Identification

- ✓ No changes in existing radio installations;
- ✓ Full compatibility, preserving all operational procedures;
- ✓ Most suitable for sea-river navigation areas

Another application of Audio Watermarking:

Subtitle for on-line R/Telephony

THIS IS KRASIN I'M HEADING TO THE OLD BERTH



*Speech recognition is necessary at the transmitting

Using AWM in NtS and ERI

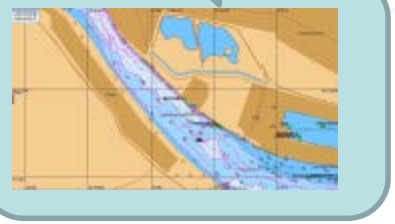
NtS

RIS index

encoding

IENC

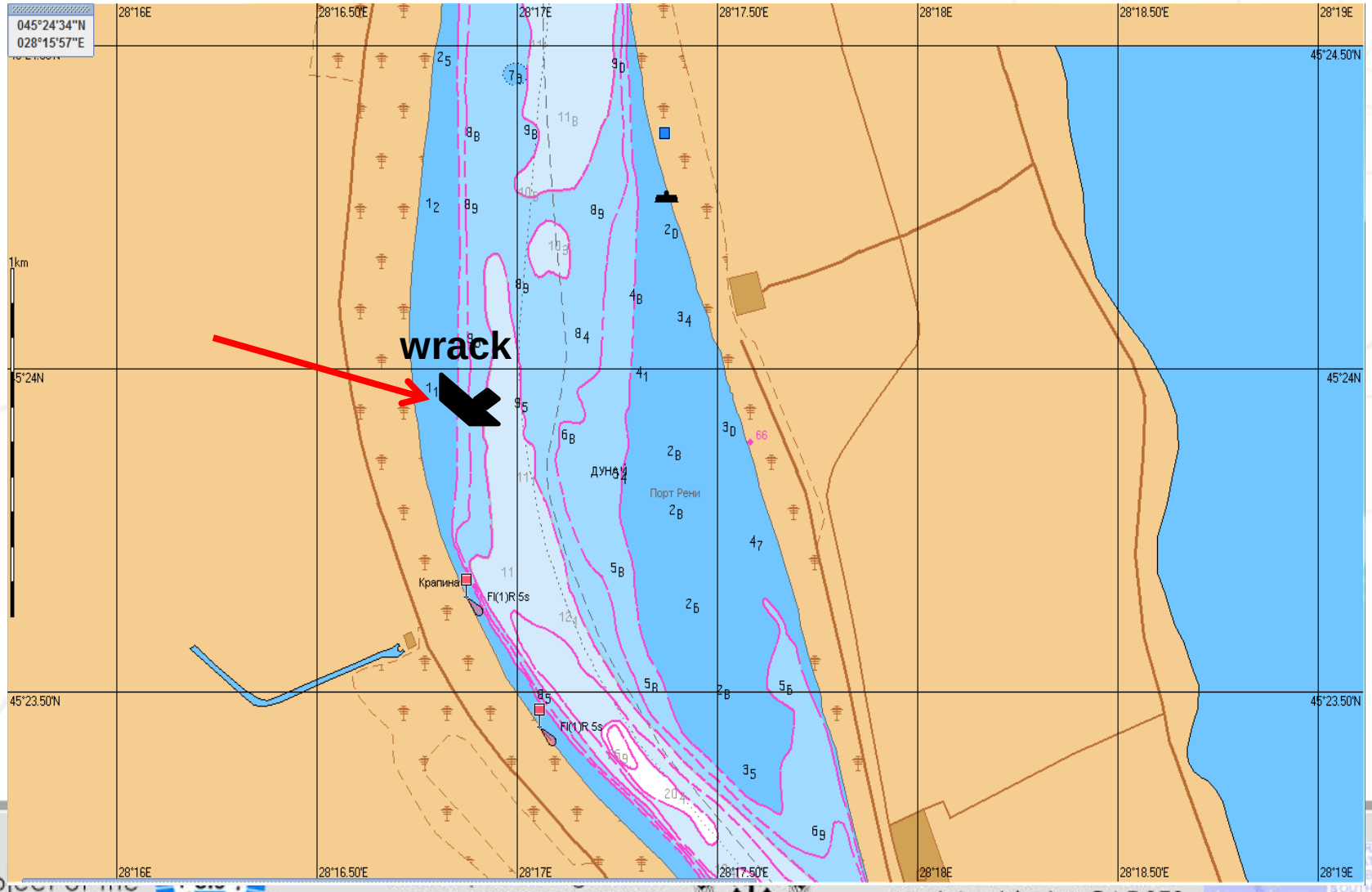
IMAGE/symbol



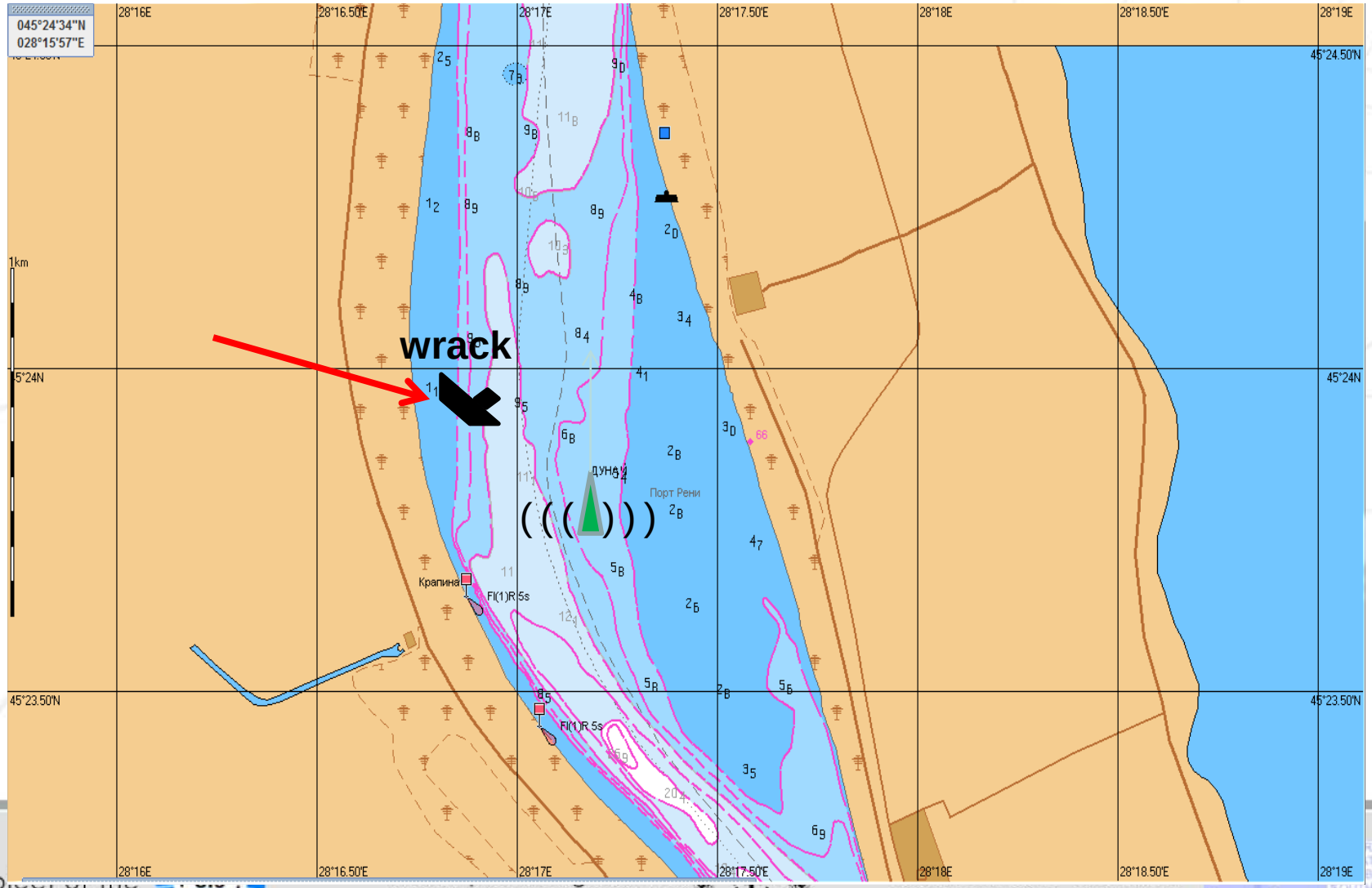
Sunken small craft on the right side of the fairway at the Danube, river-km 66

AWM

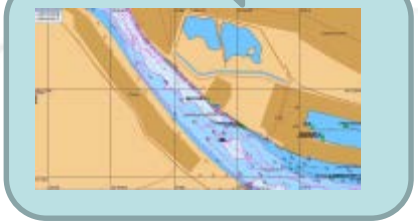
Sunken small craft on the right side of the fairway at the Danube, river-km 66



Sunken small craft on the right side of the fairway at the Danube, river-km 66



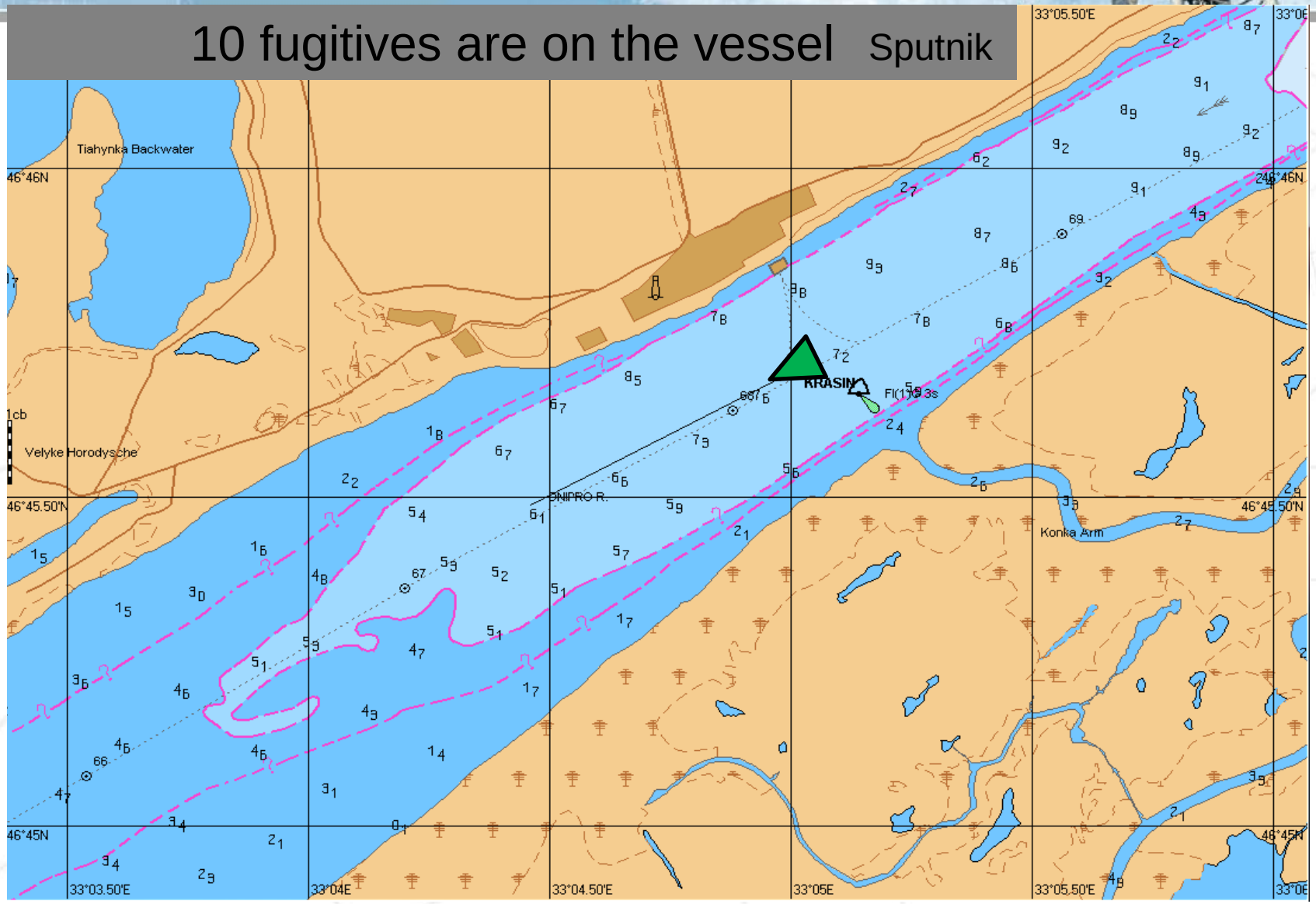
ERI → RIS index encoding → IENC → IMAGE/symbol



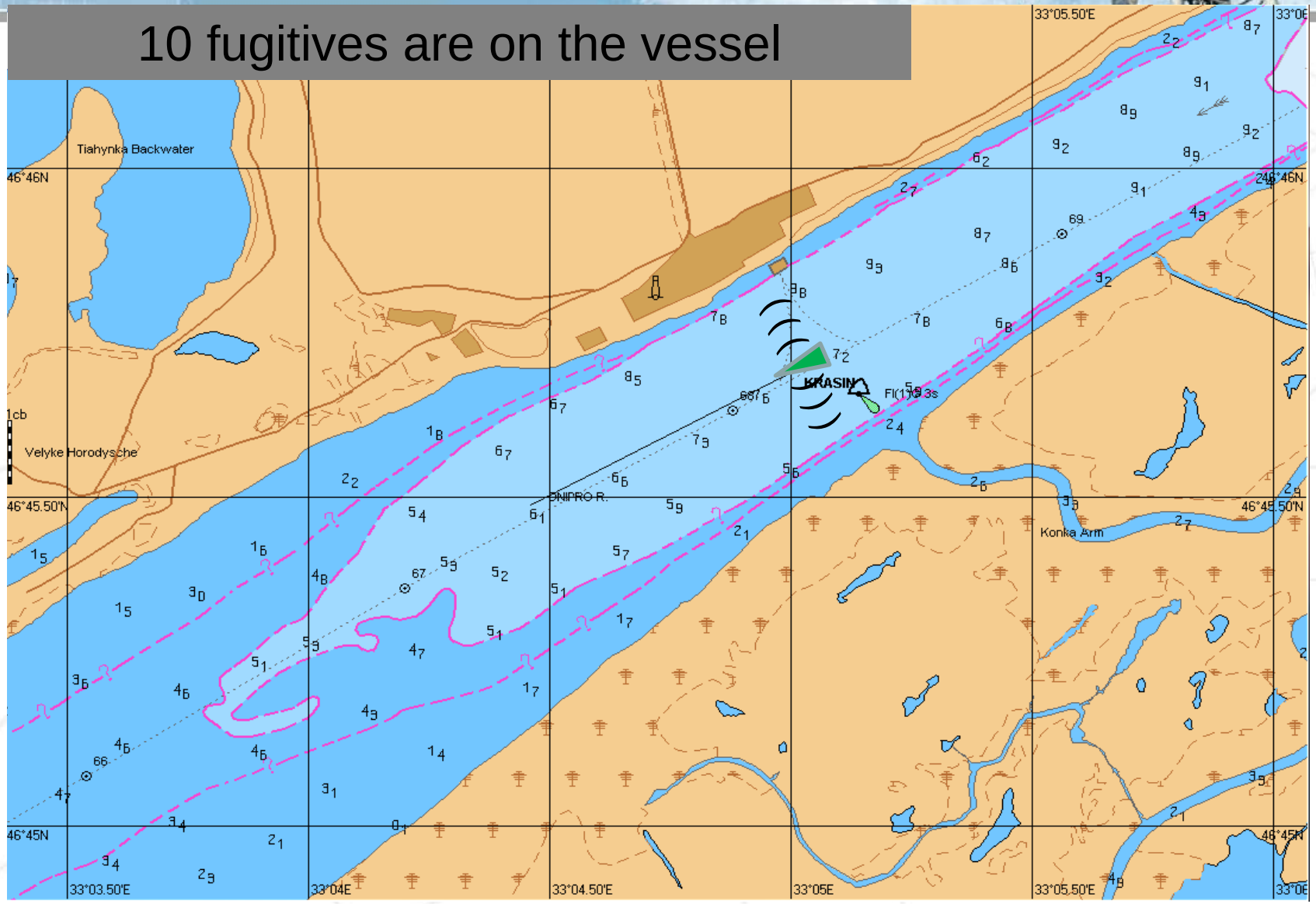
10 fugitives are on the vessel “Sputnik”

AWM

10 fugitives are on the vessel Sputnik

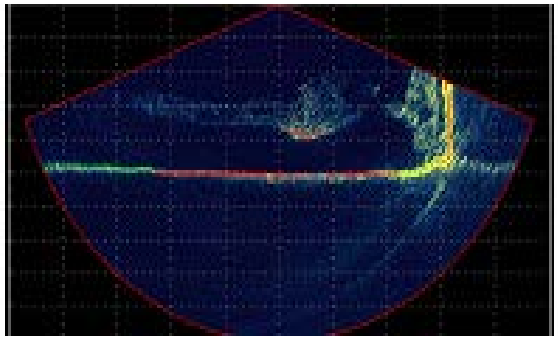


10 fugitives are on the vessel

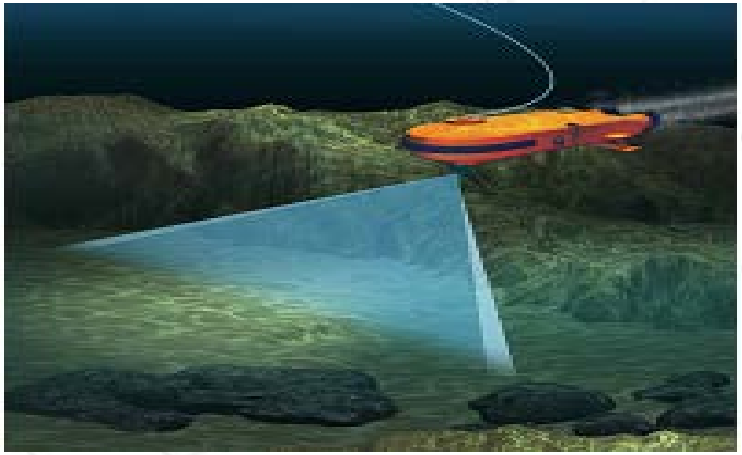


Data warehouse for Danube waterways

Data warehouse for Danube waterways



Raw beam formed water column data output provides increased functionality for Sonic Wideband Multibeam Echo Sounders with the ability to collect simultaneous and co-registered bathymetry, back-scatter and water column backscatter data for variety of applications including pelagic fisheries habitat mapping, methane seep investigation and more.



LLC TRADE MARINE

Hydrometeorological Buoy

Communication options:

- Inmarsat-C satellite (geostationary)
- IRIDIUM (low orbit satellite)
- 10/100base-TX Ethernet (TCP/IP)
- WLAN
- Serial line (proprietary or PPP protocol) over any of the serial ports
- GSM telephone
- GPRS
- UHF/VHF radio

Parameter
Directional wave sensor
Surface current
Wind speed/direction sensor
Surface temperature and salinity
Air pressure sensor
Air temp/humidity sensor
Visibility
GPS unit
Flash light
Options
Option: Current profiler
Option: Argos tracker

Wind speed/direction

The wind speed and direction is calculated from a 10 minute time series sampled at 1Hz. The direction is a vector average value and the gust is the highest 3 sec value in the sampling period. The sensor is mounted on the sensor carrier arm 2,5m above the sea level.

Air temperature/air humidity

The air temperature senor and air humidity sensor are mounted in the mast about 2,5m above the sea level

Air pressure sensor

The air pressure sensor is located inside the buoy instrument container. The sensor has free access to the outside through the battery venting system.

Directional waves

The wave sensor is integrated with the data logger. The directional waves are sampled at 1 Hz every hour providing a time series of 1024 data points to be analysed both in the time and frequency domain. A large number of parameters are derived describing the sea state. The wave time series is stored in the logger for further offline analysis on shore. Selected parameters are included in the buoy message and transmitted to shore in near real time.

Visibility

The visibility sensor is located on the sensor carrier and transmits an infrared light beam. If fog or haze is present, forward scattered light from the particles will be detected by the photocell thus giving a signal with good correlation to the visibility in the ambient air. The measurement is included in the buoy message.

Current meter and sea temperature

The current meter is located in one of the wells in the buoy hull. Using the acoustic signal the current speed and direction is measured 2m away from the buoy. A 5 min average current speed and direction is calculated. The current meter includes a temperature sensor, providing the sea temperature. The readings are included in the buoy message.

Option: Current profiler

The current profile sensor will be mounted in one of the wells in the buoy hull. The current will be sampled for a 5 min period and the average speed and direction at selected depths will be derived from the time series.

Option: ARGOS Tracker

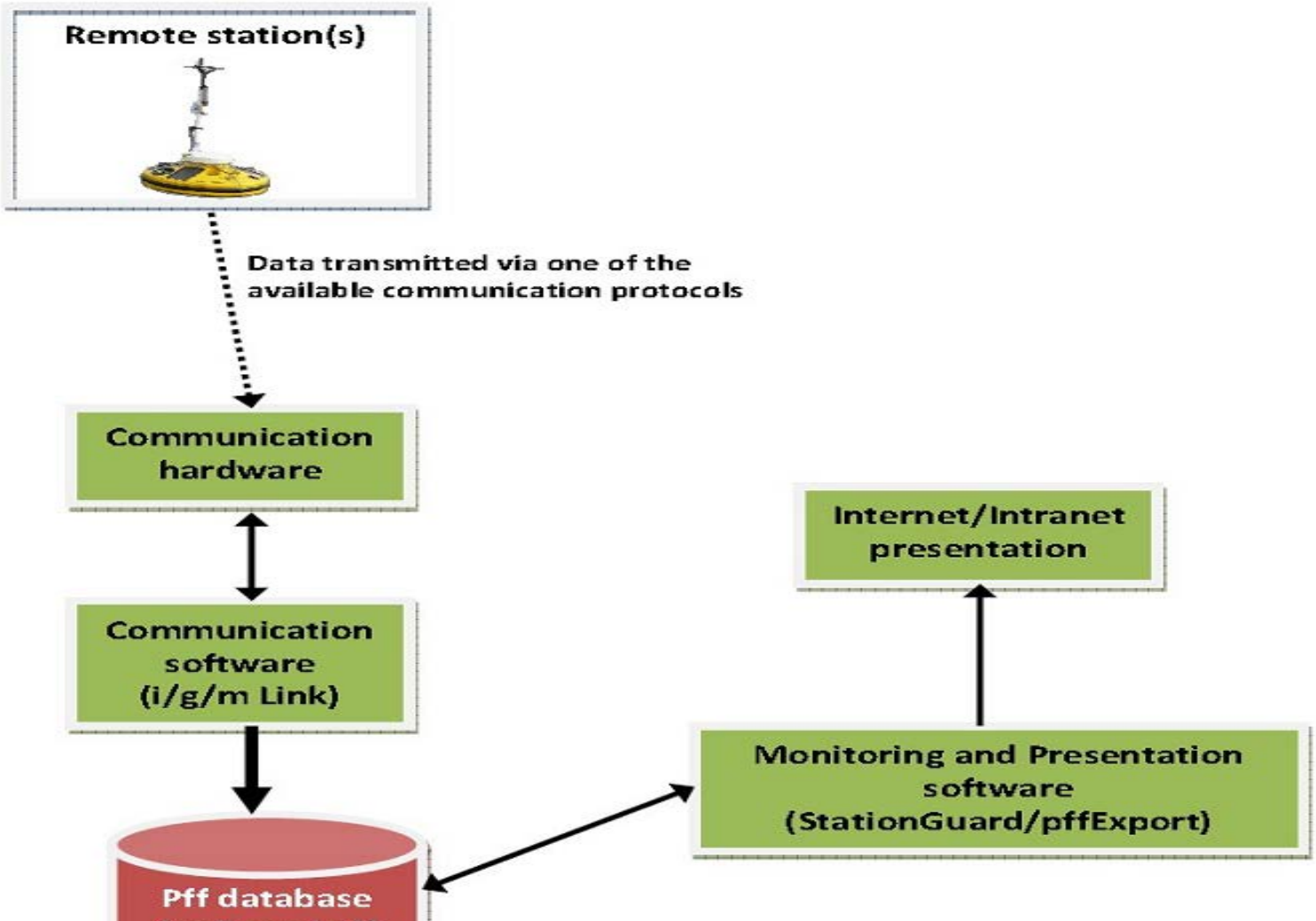
The tracker is hidden in the buoy hull and will be activated is the buoy drifts out of position. The monitoring service is done by CLS on a subscription basis.

Option: AIS unit

The AIS unit sends position information to passing vessels and/or the local AIS base station. The system minimises the risk of interference with nearby vessel traffic.

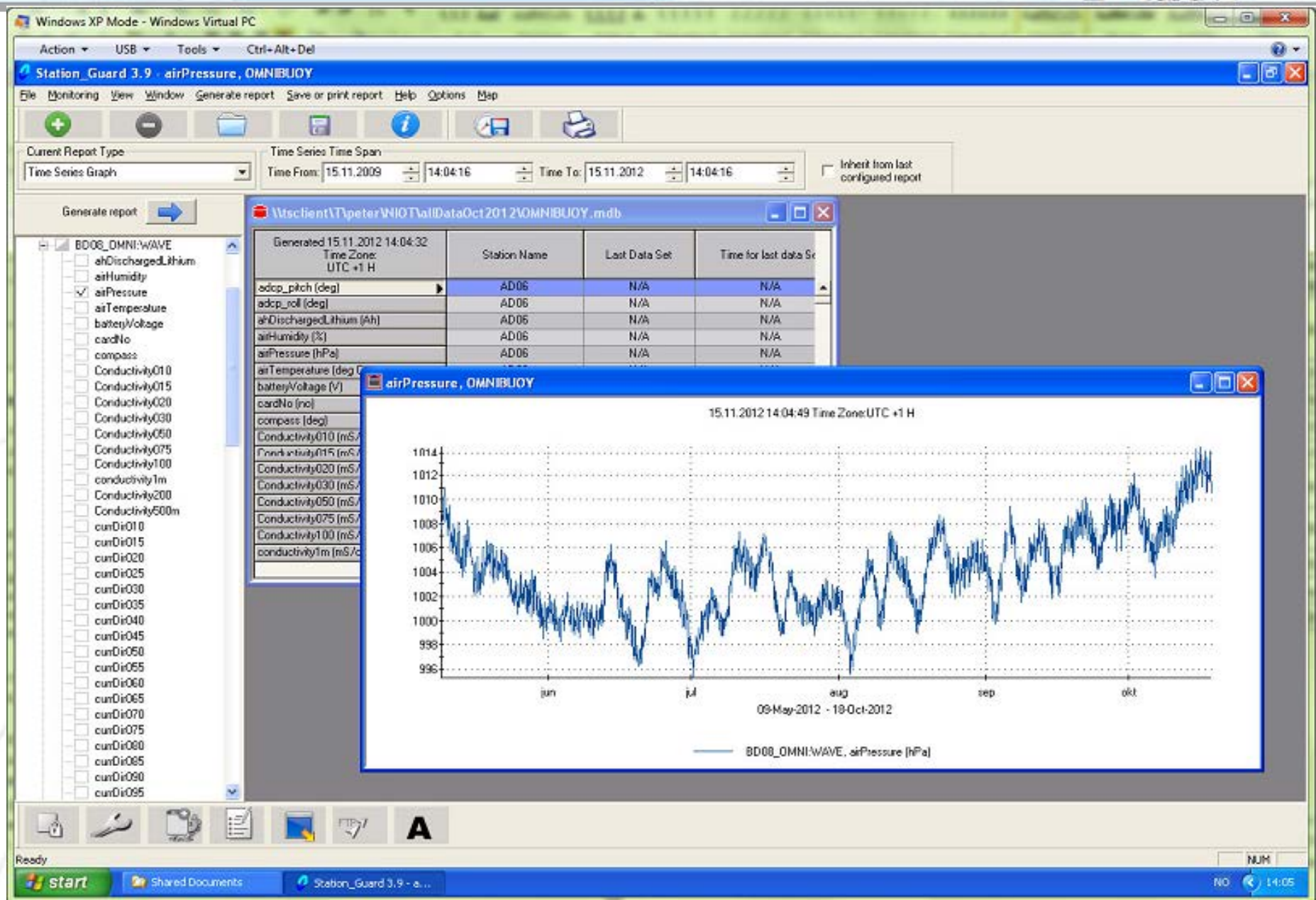
Data warehouse for Danube waterways

The measured parameters are packed into a binary string together with message id, time tag and several buoy house hold parameters, comprising the buoy message in PFF format. PFF is the acronym for Packed File Format. The binary format ensures minimum satellite traffic cost.



Data warehouse
4
Danube waterway

Data warehouse for Danube waterways



UKRAINIAN RIS ACTIVITIES

Thanks for your attention

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