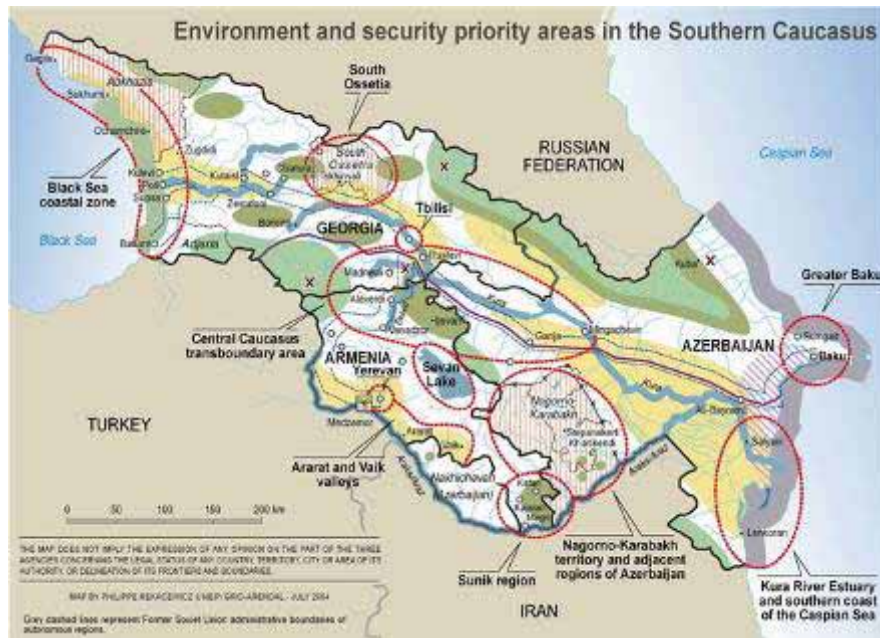




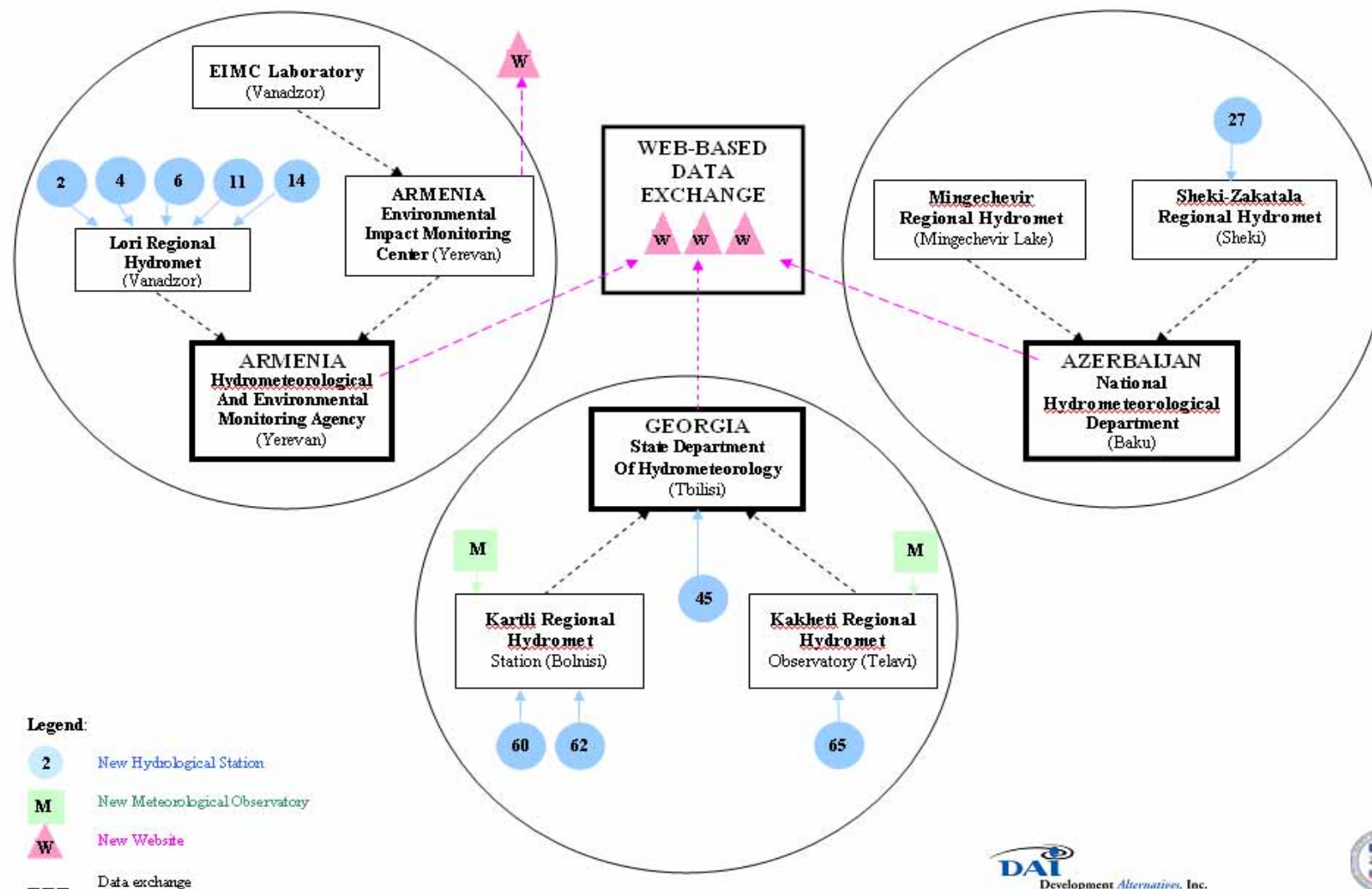
# Experience of Integration of Water Information and Data Exchange in the South Caucasus



## CAREWIB Seminar on Development Water Environment Network in the South Caucasus

by Zurab  
Jincharadze  
Tashkent, Uzbekistan  
08 April 2010

# Web Based Data Exchange Mechanism: 2000-04



**Legend:**

- 2 New Hydrological Station
- M New Meteorological Observatory
- ▲ W New Website
- Data exchange



Water Management in the South Caucasus

# Trans-boundary Data Exchange Monitoring Stations



# Website Designed to Foster Data Exchange

**Department of Hydrometeorology of Georgia**

Organization | Services | Programs | News | Maps | Data | Links | Contact Us | Language | Home

**Stations:**

- 03157, Mashavera-Kazreti
- 03143, Ktsia (Khrami) Imiri
- 83622, Kura-Tbilisi
- 85255, Alazani-Shakrani

**Hydrological Information**  
07.04.2010 (08-00)

| Stations             | Level (cm) | Discharge (cub m/s) |
|----------------------|------------|---------------------|
| Mashavera-Kazreti    | 123        | 3,81                |
| Ktsia (Khrami) Imiri | -          | -                   |
| Kura- Tbilisi        | 220        | 440                 |
| Alazani-Shakrani     | 260        | 18,0                |

• [Click here for water quality information on 2007-2009](#)

[Click here for water quantity information on 2009](#)

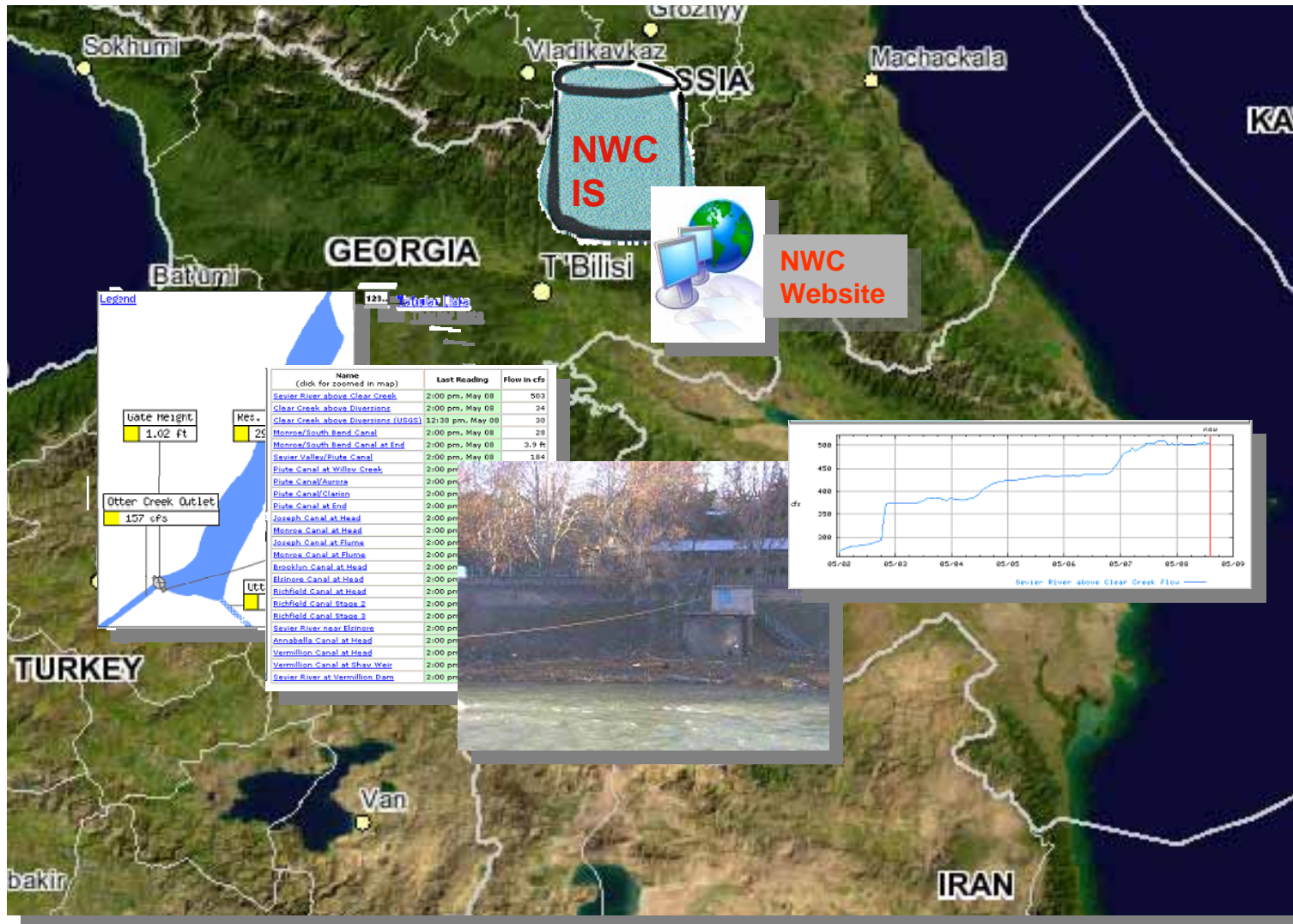
|                           |                          |                          |                          |
|---------------------------|--------------------------|--------------------------|--------------------------|
| <a href="#">January</a>   | <a href="#">February</a> | <a href="#">March</a>    | <a href="#">April</a>    |
| <a href="#">May</a>       | <a href="#">June</a>     | <a href="#">July</a>     | <a href="#">August</a>   |
| <a href="#">September</a> | <a href="#">October</a>  | <a href="#">November</a> | <a href="#">December</a> |

[Click here for water quantity information on 2010](#)

|                         |                          |                       |                        |
|-------------------------|--------------------------|-----------------------|------------------------|
| <a href="#">January</a> | <a href="#">February</a> | <a href="#">March</a> | <a href="#">April</a>  |
| <a href="#">May</a>     | <a href="#">June</a>     | <a href="#">July</a>  | <a href="#">August</a> |

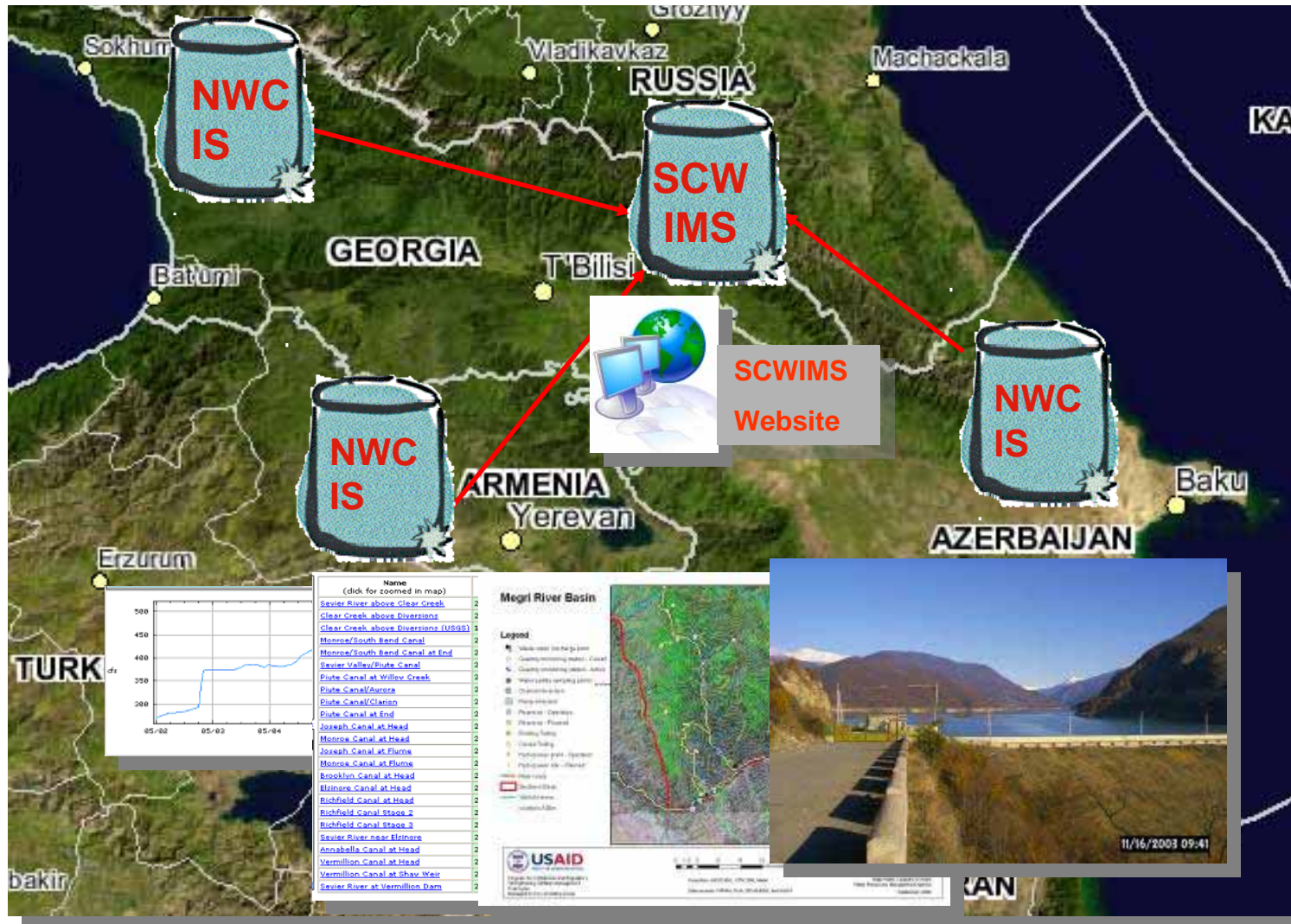


# Sharing Water Resources Information via Web Portal



\* Designed by USAID/PA regional project and CADI, Inc – Dr. Tom Sheng, USA

# South Caucasus Water Information Management System



# National Water Cadastre Information Systems

---



- A official repository of water resources data gathered from multiple sources, store under a unified database schema, at a single site.
- It provides users a single consolidated interface/portal to data for supporting water management decision-making at the central and basin levels.



# Digital Databases

## Relational Databases

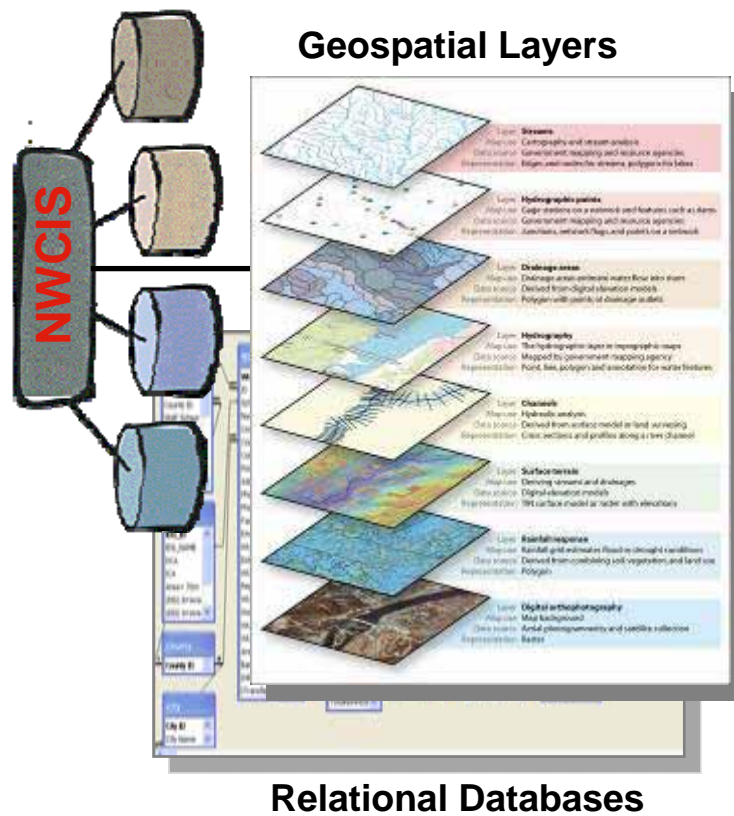


- The primary goal of a database is to provide a way to store, manage, and retrieve data that is both convenient and efficient.
- The relational database model is the most widely used data model, and a vast majority of current database systems are based on the relational model (i.e., MS-Access, MySQL, MS-SQL, Oracle, and Informix).





# Contents of the NWCIS

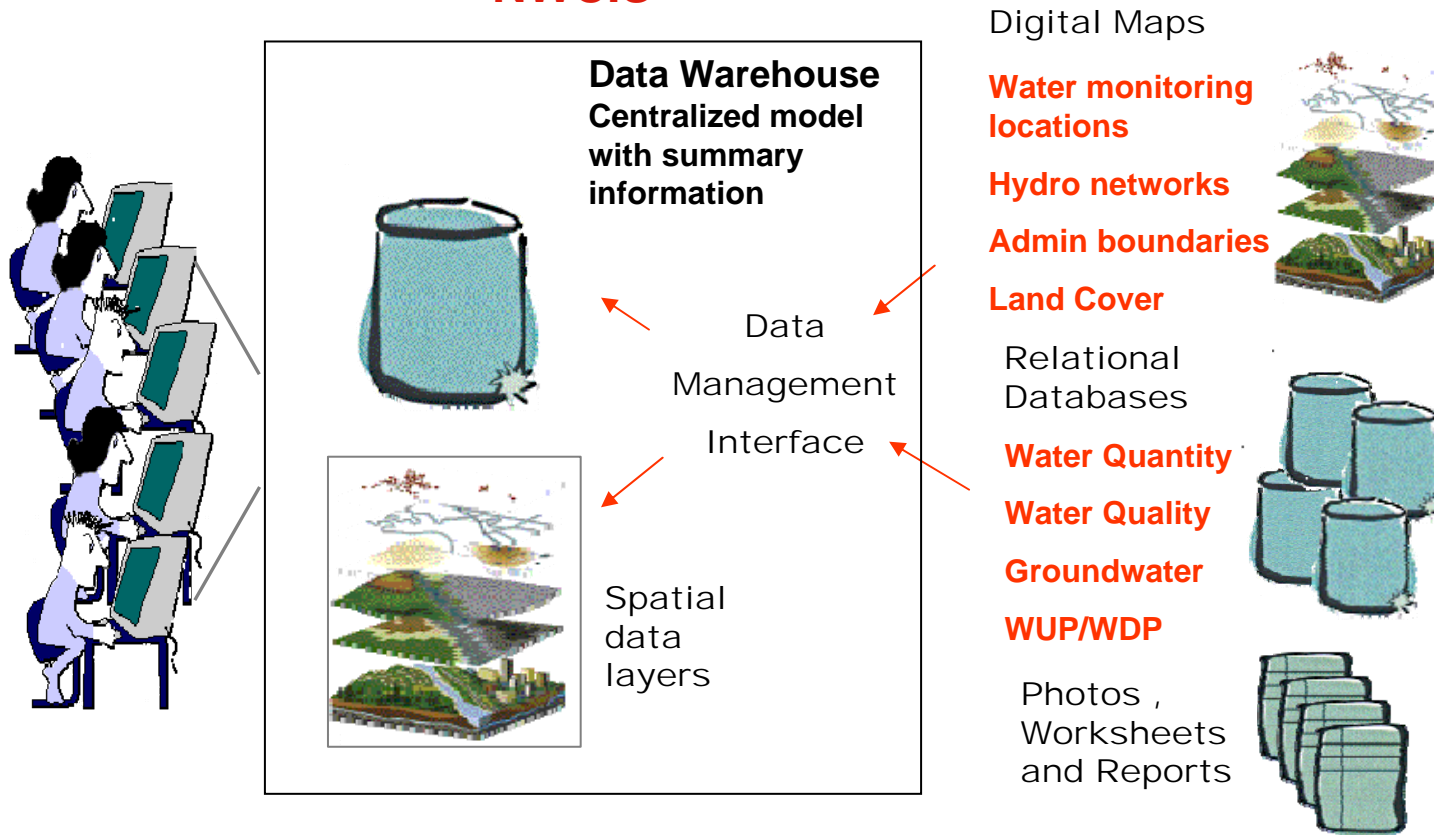


- Surface water quantity
- Surface water quality
- Groundwater levels
- Groundwater quality
- Wastewater discharge permits
- Water use permits
- Hydro-network
- Water monitoring points
- Protected areas/zones
- Basin management units
- Administrative boundaries
- Land cover

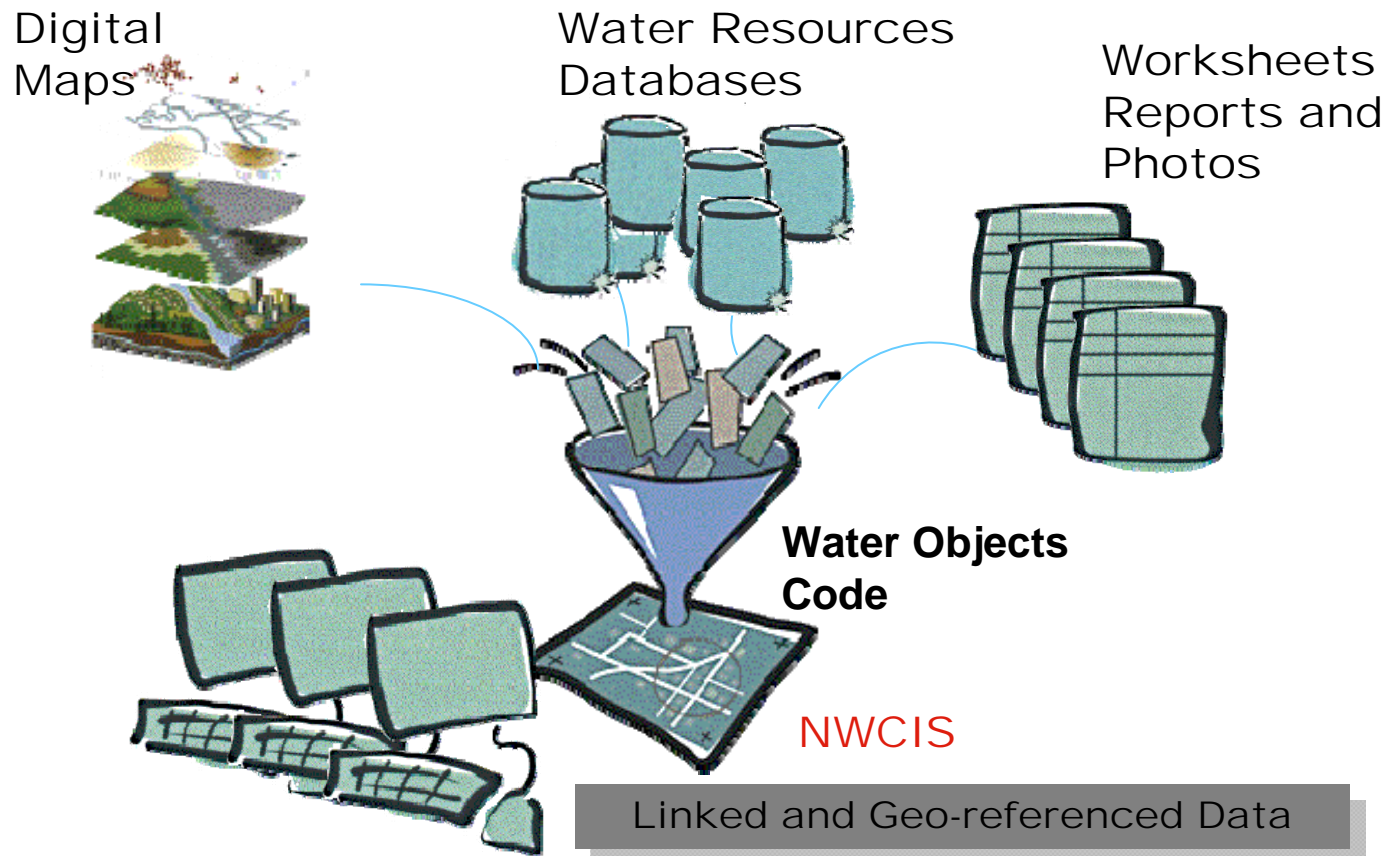


# Main Component of the NWCIS: Data Warehouse

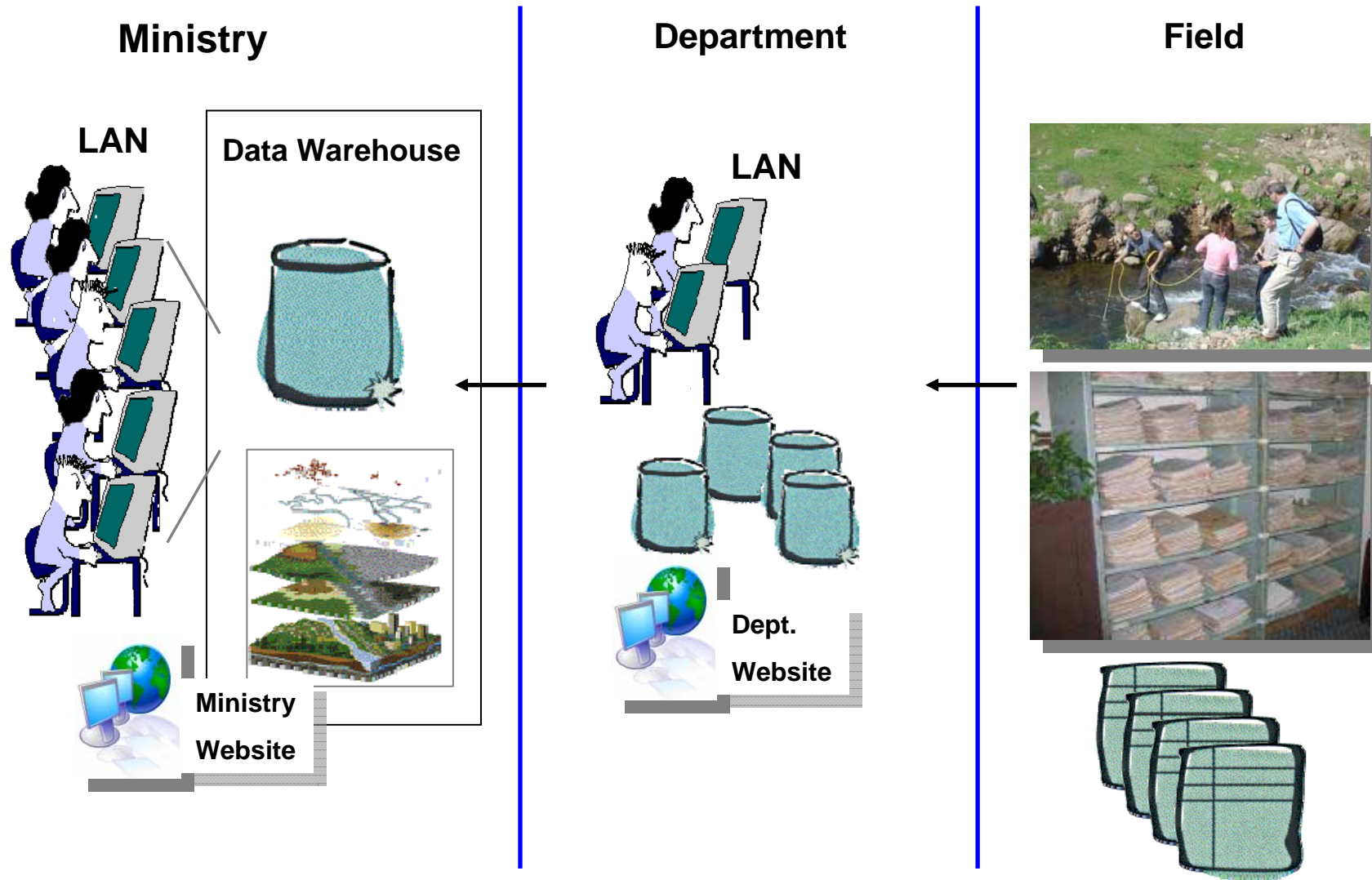
## NWCIS



# NWCIS – Linked and Geo-referenced Data via WOC



# NWCIS Layout



# NWCIS – What it does?



**NWCIS**

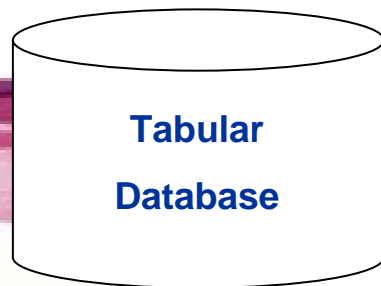
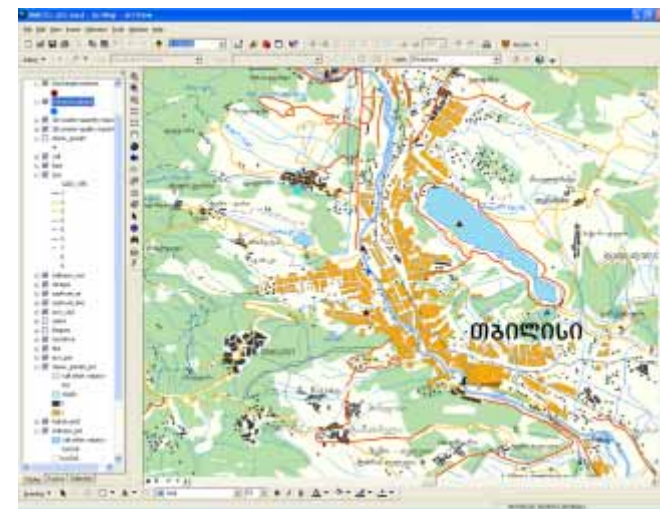
| NO | SHAPE | NO | STATUS  | SL |
|----|-------|----|---------|----|
| 15 | Point | 20 | Regular | AZ |
| 20 | Point | 21 | Regular | A7 |
| 21 | Point | 22 | Regular |    |
| 22 | Point | 23 | Regular |    |
| 23 | Point | 24 | Regular |    |
| 24 | Point | 25 | Regular |    |

|               |                 |        |
|---------------|-----------------|--------|
| at Head       | 2:00 pm, May 08 | 25     |
| t Head        | 2:00 pm, May 08 | 0      |
| at Head       | 2:00 pm, May 08 | 103    |
| Stage 2       | 2:00 pm, May 08 | 2.1 ft |
| Stage 3       | 2:00 pm, May 08 | 3.3 ft |
| at Elmore     | 2:00 pm, May 08 | 72     |
| at Head       | 2:00 pm, May 08 | 3      |
| at Head       | 2:00 pm, May 08 | 35     |
| at Shaw Weir  | 2:00 pm, May 08 | 26     |
| ermillion Dam | 2:00 pm, May 08 | 84     |

- Dynamic maps
- Geo-referenced data/information
- Customized reports
- Interactive graphs
- Engineering drawings
- Site photos



***NWCIS tabular database stores summarized information on water objects, water quantity, quality, water use permits and actual water use from different detailed databases***



# Water Use Permits Databases

The screenshot displays the 'Water Permits Database Georgia' application. The main window shows a 'Discharge Location' form with fields for 'კოდა' (Code: 0001\_1), 'დასახელებული მდინარე' (Named River: ქ. ხაოგმა), 'მდინარე' (River: ხაოგმის მდინარე), 'წყლის აღებები' (Intakes: 2 ახალი წილი), 'გრძობა' (Status: ), 'მანქანა' (Vehicle: ), 'წყლის აღების ნებისმიერი' (Any Intake: 29 0000), 'აღებვის ხელახალი (88)' (Renewal Fee (88): 1,000.00), and 'ხელახალი ხელახალი (88)' (Renewal Fee (88): 1,257.00). Below the form is a table for 'შედასაბუნებო წყლის კომპონენტების ჩამოშვების შედეგები' (Results of Discharge of Water Components):

| კომპონენტი             | შედეგები: კონც. (მგ/ლ) | სილიტი |
|------------------------|------------------------|--------|
| მეტალბარიუმის შემცვენი | 69.40                  | 3.3    |
| მეტალბარიუმის ნაშთები  | 13.30                  | 13.3   |

The 'Report - Discharge Location' window shows the following details:

- საბუნების რესურსების დაცვის სამსახური (Natural Resources Protection Agency)
- კოდა: 0001\_1
- დასახელებული მდინარე: ქ. ხაოგმა
- მდინარე: ხაოგმის მდინარე
- წყლის აღებები: 2 ახალი წილი
- გრძობა:
- მანქანის ნომერი: 29 0000
- აღებვის ხელახალი (88): 1,000.00
- ხელახალი ხელახალი (88): 1,257.00

Below the report details is a table with columns for 'საბუნების რესურსების დაცვის სამსახური' (Natural Resources Protection Agency) and various permit details:

| საბუნების რესურსების დაცვის სამსახური | კოდა  | მდინარე  | საბუნების რესურსების დაცვის სამსახური | საბუნების რესურსების დაცვის სამსახური | საბუნების რესურსების დაცვის სამსახური | საბუნების რესურსების დაცვის სამსახური |
|---------------------------------------|-------|----------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| საბუნების რესურსების დაცვის სამსახური | 00 00 | 1 14     | 3 26                                  | 1 672 00                              | 1 672 00                              | 1 672 00                              |
| საბუნების რესურსების დაცვის სამსახური | 00 00 | 3 123 00 | 3 24                                  | 0 04                                  | 3 24                                  | 3 24                                  |
| საბუნების რესურსების დაცვის სამსახური | 00 00 | 3 24 00  | 1 20                                  | 3 24                                  | 3 24                                  | 3 24                                  |
| საბუნების რესურსების დაცვის სამსახური | 11 30 | 3 04 00  | 1 30                                  | 3 24                                  | 3 24                                  | 3 30                                  |


Water Extract  
and  
Water  
Discharge  
databases



# Actual Water Use

**მთავარი მენიუ**

**ფაქტიური წყალსარგებლობის მონაცემთა ბაზა**



- წყლის გამოყენების სახელმწიფო აღრიცხვა
- წყალმოსარგებლები
- წყლის ობიექტები
- ანგარიშები
- ცნობათა ცხრილები

**გასვლა**

**წყლის გამოყენების სახელმწიფო აღრიცხვა**

წყალმოსარგებლე

**ფესვება გარემოს დაცვით ორგანიზაციაში კოდები**

|   |                      |
|---|----------------------|
| წყალმოსარგებლის წესა მიხედვით                                       | <input type="text"/> |
| ტერიტორიის  | <input type="text"/> |
| ძირითადი საქმიანობის სეც (NACE) 001-97 მიხედვით                     | <input type="text"/> |
| საკუთრების ფორმის   | <input type="text"/> |
| ორგანიზაციულ-სამართლებრივი ფორმის                                   | <input type="text"/> |
| წყალსამურნეო უბნის  | <input type="text"/> |
| წყალმოსარგებლის (საწარმოს, ორგანიზაციის) სტატუსტვის საიდენტიფიკაციო | <input type="text"/> |
| საკონტროლო კაზი   | <input type="text"/> |

**მონაცემები წყლის გამოყენების შესახებ**

წელი

წელით სარგებლობის ლიცენზიის სერია და ნომერი

წყალადება (ზედაპირული ან მიწისქვეშა)  ანგარიში შედგენილია  ბლანქზე

წყალრამება  ბლანქის ნომერი

**ფორმა 1. წყალი მიღებული ბუნებრივი წყაროებიდან, მიღებული ხსება წყალმოსარგებლისაგან, გამოყენებული ან გადაცემული**

1. წყაროს დასახელება

2. წყაროს ტიპის ან გამცემი წყალმოსარგებლის კოდი

3. წყლის ობიექტის (წყალმოსარგებლის წყაროს) კოდი

4. წყლის ხარისხის კატეგორიის კოდი

5. მანძილი (კმ) შესართავიდან

6. ხელ აღებულია ან მიღებულია წლის განმავლობაში

7. მათ შორის თვეების მიხედვით

|           |                      |        |                      |            |                      |           |                      |
|-----------|----------------------|--------|----------------------|------------|----------------------|-----------|----------------------|
| იანვარი   | <input type="text"/> | აპრილი | <input type="text"/> | ივლისი     | <input type="text"/> | ოქტომბერი | <input type="text"/> |
| თებერვალი | <input type="text"/> | მაისი  | <input type="text"/> | აგვისტო    | <input type="text"/> | ნოემბერი  | <input type="text"/> |
| მარტი     | <input type="text"/> | ივნისი | <input type="text"/> | სექტემბერი | <input type="text"/> | დეკემბერი | <input type="text"/> |

Record: 14 of 1





# Linkage of a Tabular Data to a Spatial Geo DataBase

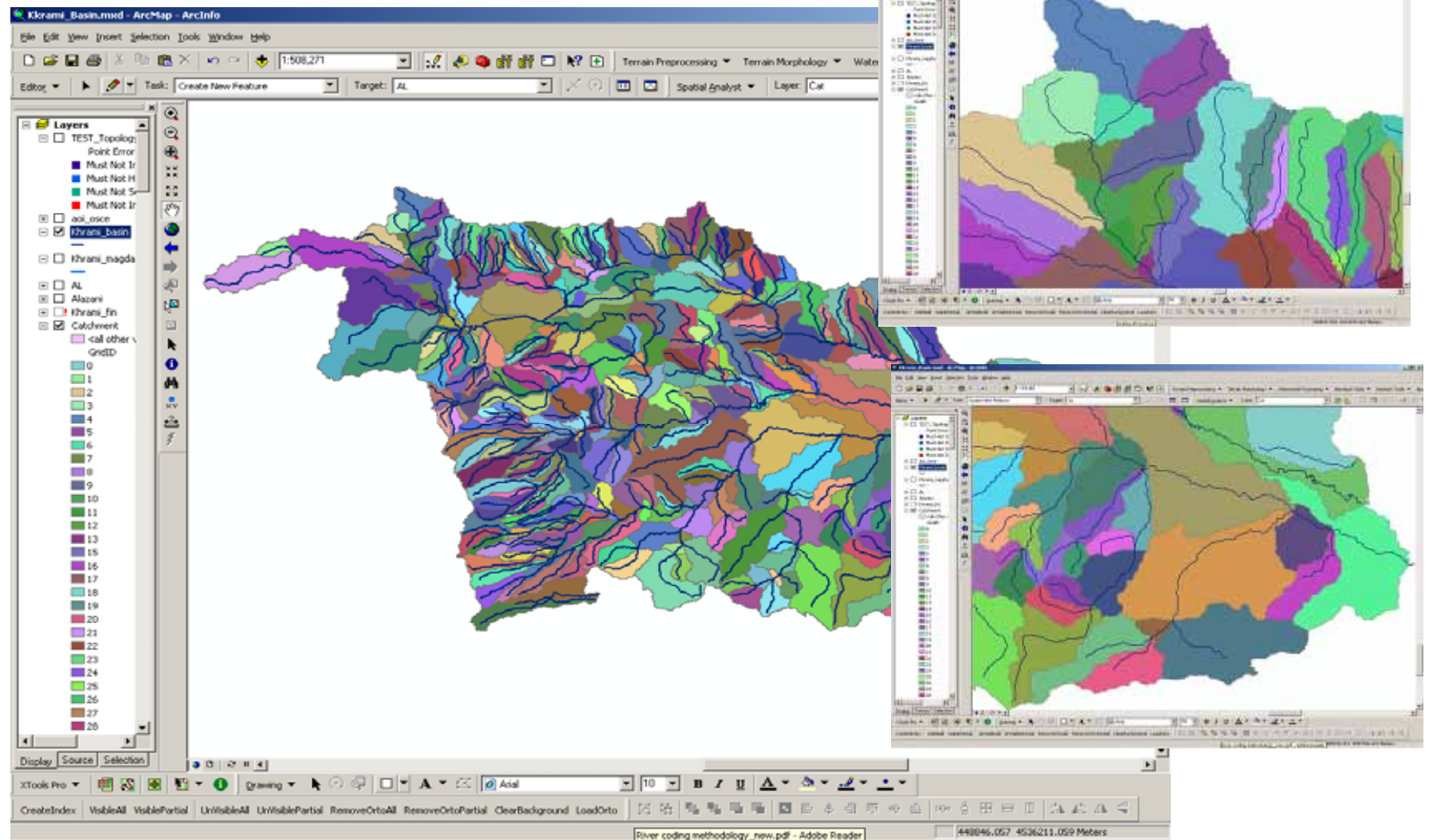
The screenshot displays the ArcGIS desktop environment with the following components:

- Map View:** Shows a geographical map with various layers. A red circle highlights a specific location on the map.
- Layers Panel:** Lists various data layers, including 'RiverArea', 'dssu\_pundAlno', 'ExtractLocations', and 'DischargeLocations'. A legend at the bottom indicates color coding for different data types.
- Extract Location Window:** A form for entering location data. The 'კოდა' (Code) field is highlighted with a red box and contains the value '10000\_2'. Other fields include 'დასახელება პუნქტი' (Point Name), 'რეგ. ახადება' (Regulation), 'გრძობა' (Length), 'განგა' (Width), and 'წყდაღებას ნებართვა' (Permit).
- Extract Permit Window:** A form for entering permit information. It includes fields for 'სერია' (Series), 'ნომერი' (Number), 'რეგისტრაციის თარიღი' (Registration Date), 'ტაბა' (Table), 'ინფორმაცია' (Information), 'ინფორმაცია ნებართვის მიმღებზე და სარეგულირებლობის დანიშნულებაზე' (Information on the permit holder and purpose), 'დაცემული' (Submitted), 'მიზანშეწონი ტაბა' (Justified Table), 'წყლის ობიექტი' (Water Object), 'მანძილი შესართავიდან (გრ)' (Distance from intake), 'პროტექცია მასილების სასაზღვრე-დამზარებელი სარეგულირებლობის' (Protection of massifs), 'ადგილმდებარეობა' (Location), 'დასახელება პუნქტი' (Point Name), 'საქმიანობის დასახელება' (Activity Name), and 'სამუშაო რეგისტრირების რეგისტრაციის თარიღი' (Registration Date).

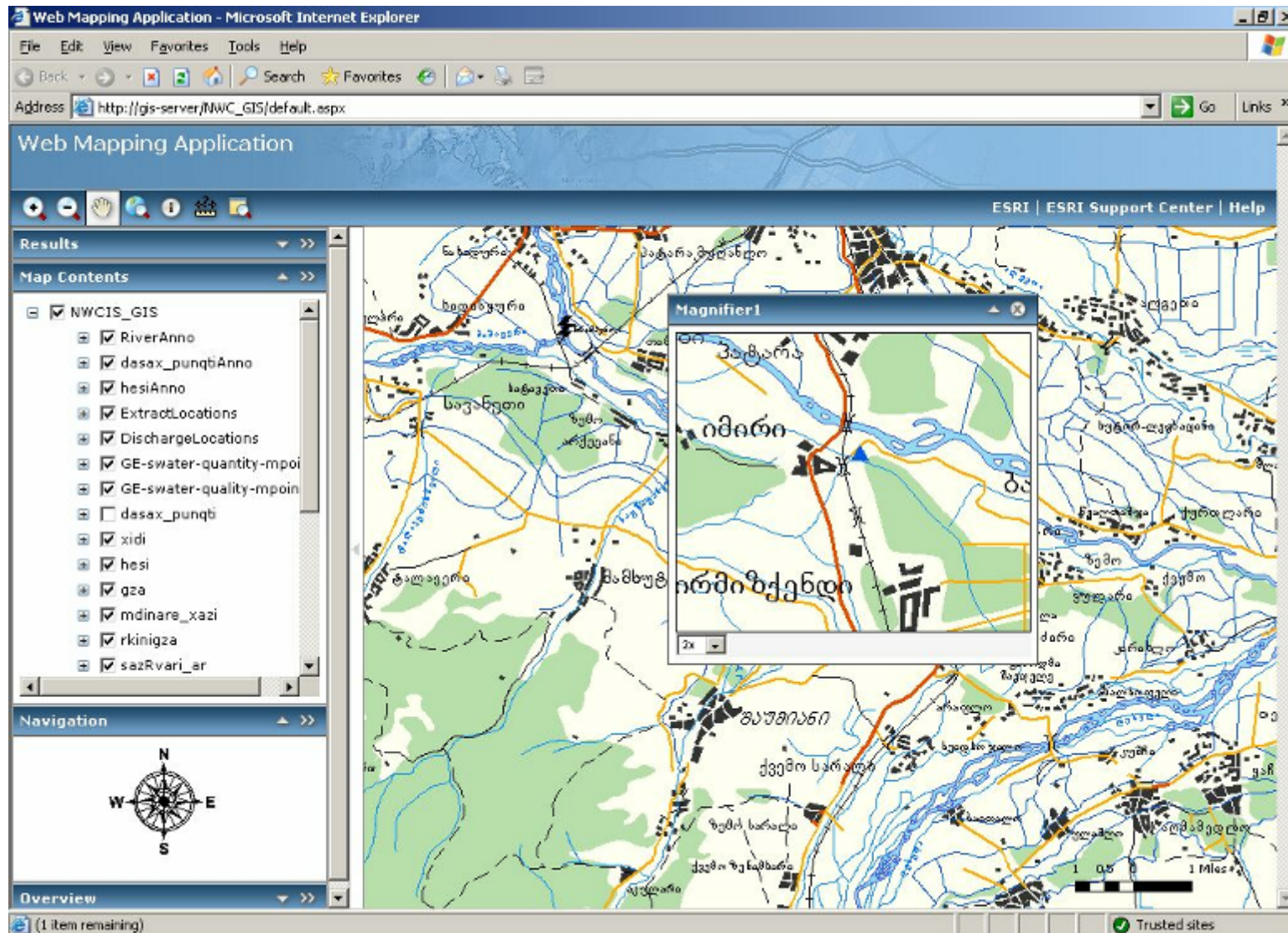




# Water Object Coding



# Template of a Regional Water Cadastre Information System



**Dniester GIS Home**

[Database](#)

[Interactive maps](#)

[Maps & Graphics](#)

[About Dniester GIS](#)

***Dniester GIS - Information management system and infrastructures for the transboundary Dniester river basin.***

[Русская версия](#)

This project, executed 2008-2009

has taken a transboundary and basin-wide approach at spatial information for the Dniester river basin. This river basin cuts through Ukraine and Moldova (including the Transnistria region) before reaching the Black Sea.

The project has been executed by national partners in Ukraine and Moldova, with support and coordination from UNEP/GRID-Arendal.

**Background**

Administrative regions, such as counties, states and countries, are not always the most appropriate for management of water related resources. Lakes, rivers and ground

water cross and span our artificial boundaries. Water management through **drainage basins** represents an alternative for our shared water resources, which has been championed by the [EU Water Framework Directive](#). Drainage basins, or watersheds, represent the land areas where all the surface water (e.g. rain) flows into a single river. These basins can vary in size, and one large basin is made up of multiple smaller basins.

To enable management, and planning, a first step is to get an overview and assemble the available data and information, to support decision-making and assessment. In practice, this means assembling basin-wide map databases on existing data, primarily from national sources, as well as from global and regional datasets. National data will need to be harmonized to establish basin-wide layers.

**Database and maps**

This website presents the resulting [national GIS database](#) (including data for download) and map outputs from this



In addition to the map graphics files, there have also been prepared an interactive map service that present the data in a more flexible way. Using this service, it is possible to create your own map, with specific styling. [Please refer to the interactive map page for more information.](#)

*Unless otherwise noted - all maps have been prepared by Zurab Jincharadze. Click on the map to download high-resolution version.*



Administrative divisions, first level



Administrative divisions, second level



Hydrochemistry monitoring stations



Topography



Flow monitoring stations



Forests





UNEP/GRID-Arendal  
CENTRAL & EASTERN EUROPE, CAUCASUS, AND CENTRAL ASIA



[Dniester GIS Home](#)  
[Database](#)  
**Interactive maps**  
[Maps & Graphics](#)  
[About Dniester GIS](#)

## Interactive map for the transboundary Dniester river basin

[Русская версия](#)

**Dniester river basin interactive map**

**Dniester river basin district information system**  
This interactive map presents the results from the Dniester basin GIS project (2008-2009) in preparing a basin-wide database and information system for river-basin management and water assessment. The map layers in this map/database were assembled from primarily national sources (Moldova, Ukraine), but also from global datasets. This map is hosted and prepared by UNEP/GRID-Arendal.

**Instructions**  
The map is powered by a Geographic Information System (GIS) data server that dynamically prepares the maps. Use the icons on the top right to zoom in and out of the map, or the hand icon to pan the view. First select your tool, then click on the map where you want the action to be applied.

[Interactive map - Dniester river basin](#)

To present the Dniester GIS database and the layers/information in the database, an interactive map service have been set up. You can manipulate the layers and the map view to create your own custom maps, or explore and browse the database.

The maps prepared from this service can be used without any restrictions and licensing. We do appreciate if you give full credit to the Dniester GIS project, and link back to the website.

For further information on the database, and the [metadata/specification](#) for individual layers, please refer to the [database page](#).

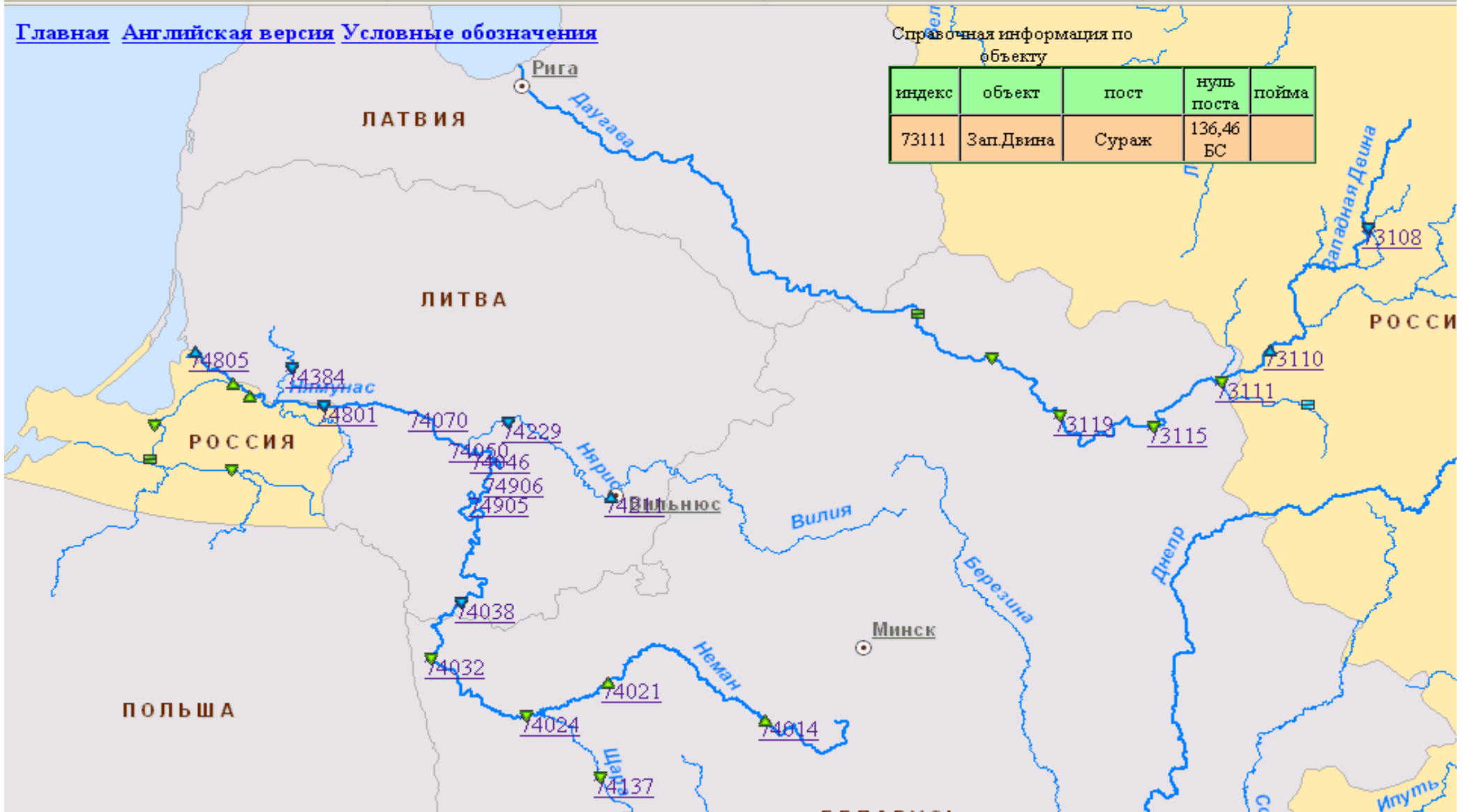
In addition to the interactive maps, there have also been prepared a set of static map graphic files, for download and use, please refer to the [maps & graphics page](#).



[Главная](#) [Английская версия](#) [Условные обозначения](#)

Справочная информация по объекту

| индекс | объект    | пост  | нуль поста   | пойма |
|--------|-----------|-------|--------------|-------|
| 73111  | Зап.Двина | Сураж | 136,46<br>БС |       |





## График хода уровней поста Витебск

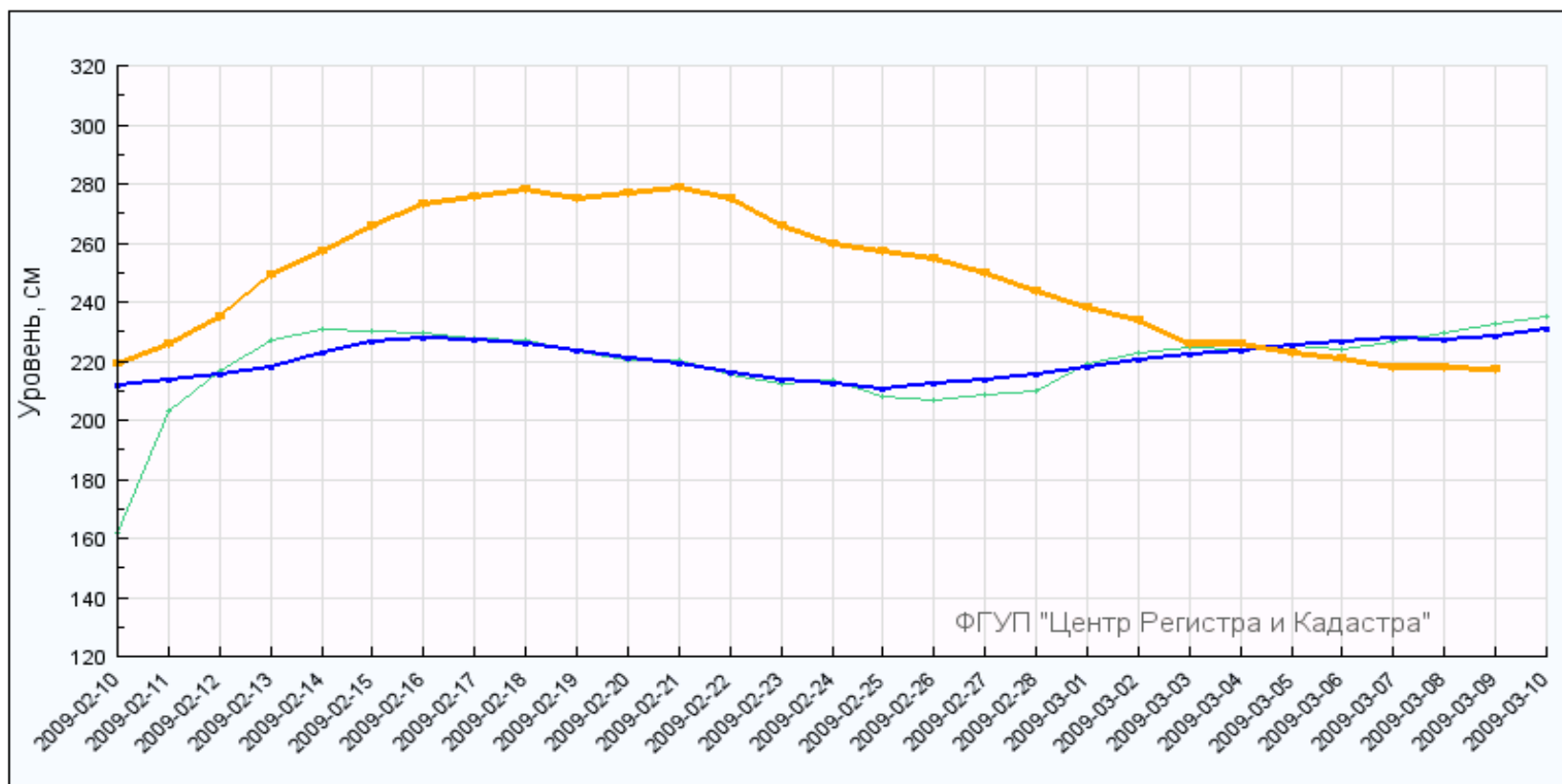
[Водный объект: Зап.Двина, нуль поста: 123,76 м;  
бассейн: , водохозяйственный участок: ]

Другие гидропосты  
водного объекта Зап.Двина:

Зап.Двина

Другие гидропосты  
водохозяйственного участка :

с. Долматово



- Формат графика:
- Изображение (статичный)
  - Flash-график
- Подогнать ось Y к данным
- Текущий уровень
  - Средний уровень
  - Средний уровень

Выбрать интервал построения графика:

ДД.ММ.ГГГГ - ДД.ММ.ГГГГ

10 .02 .2009 - 10 .03 .2009

Максимальная длина интервала построения графика составляет один год

[Просмотреть ежедневный расход](#)

\*Вычисляется по доступным наблюдениям (2001-01-11 - 2009-03-09) как скользящее среднее с окном 7 дней, дополнительно усредненное по аналогичным периодам времени в прошлом

DNIESTER BASIN WEB GIS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://102.168.0.58/DNIESTER WEB GIS/

Most Visited Getting Started Latest Headlines suggested Sites ArcGIS Server Manager

Row 1

DNIESTER BASIN WEB GIS

DNIESTER BASIN WEB GIS

Search Attributes Print

Results

Map Contents

- bounding\_line
- RBD\_Dniester
- Dniester\_Catchments
- Lakes\_Dniester
- Rivers\_Dniester
- LAKES\_out
- MAINTIENES\_out
- sea\_poly
- Dniester\_SGL
- DSMW
- Dniester\_LANDCOV
- bounding\_line
- Dniester\_Forests
- landcover
  - Artificial surfaces and urban o
  - Park and
  - Cultivated and managed area
  - Herbaceous Cover, closed-op
  - Cropland / Shrub and/or gras
  - Cropland / Tree Cover / Othe
  - Tree Cover / Other natural ve
  - Regularly flooded shrub and/
  - Shrub Cover, closed-open, de
  - Shrub Cover, closed-open, es
  - Spruce, fir, beech and spruce
  - Tree Cover, broad-leaved, de
  - Tree Cover, mixed leaf type
  - Tree Cover, needle-leaved, e
  - Water Bodies
- Dniester\_RASTER
- Dniester\_Catchments
- Dniester\_Catchments
- Dniester\_Catchments

25 Kilometers

Done

Microsoft Office Picture Manager

inbox - Microsoft O... ZOI FILES Computer Close of Windows S... ArcCatalog - ArcIn... DNIESTER BASIN W... Microsoft Office Pi...

FN 6:40 PM



DNIESTER BASIN WEB GIS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://102.168.0.58/DNIESTER WEB GIS/

Most Visited Getting Started Latest Headlines

Row 1

DNIESTER BASIN WEB GIS

DNIESTER BASIN WEB GIS

Search Attributes Print

Results

Map Contents

- Dniester\_basin\_line
- RBD\_Dniester
- Dniester\_Catchments
- Lakes\_Dniester
- Rivers\_Dniester
- LAKES\_out
- MAINTIENES\_poi
- sea\_poly
- Dniester\_SOIL
- DSMW
- Dniester\_LANDCOV
- bounding\_line
- Dniester\_Forests
- landcover
  - Artificial surfaces and urban o
  - Park and
  - Cultivated and managed area
  - Herbaceous Cover, closed-op
  - Cropland / Shrub and/or grass
  - Cropland / Tree Cover / Other
  - Tree Cover / Other natural ve
  - Regularly flooded shrub and/o
  - Shrub Cover, closed-open, es
  - Shrub Cover, closed-open, es
  - Sparse herbaceous or sparse
  - Tree Cover, broad-leaved, de
  - Tree Cover, mixed leaf type
  - Tree Cover, needle-leaved, o
  - Water bodies
- Dniester\_RASTER
- Dniester\_Catchments
- Dniester\_Catchments
- Dniester\_Catchments

Done



DNIESTER BASIN WEB GIS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://192.168.0.30/DNIESTER WEB GIS

Most Visited Getting Started Latest Headlines 100% (g) Amigos.org... Suggested Sites ArcGIS Server Manager

Row 1

DNIESTER BASIN WEB GIS

Dniester Transboundary GRID-Arendal FSR

Search Attributes | Print

Baselink

Map Contents

- Basin\_Catchment
- see\_poly
- Dniester\_MONITOR
  - RBD\_Dniester
  - Flow\_Monitoring
  - HydroChem\_Monitoring
  - Water\_Abstraction
  - Water\_Discharge\_Ukraine
  - Rivers\_Dniester
- Dniester\_HYDRO
  - bounding\_line
  - RBD\_Dniester
  - Catchment\_Catchments
  - Lakes\_Dniester
  - Rivers\_Dniester
  - LAKES\_out
  - WATERWAYS\_out
  - see\_poly
- Dniester\_SOIL
  - OSM
- Dniester\_LANDCOV
  - bounding\_line
  - Dniester\_Forests
  - landcover
- Dniester\_RASTER
  - Dniester\_Catchments

Done

Taskbar: Internet Explorer, ZOI FILES, Computer, Close of Windows S..., ArcCatalog - ArcI..., DNIESTER BASIN W..., Microsoft Office P...

System Tray: EN, 6:46 PM



DNESTER BASIN WEB GIS - Mozilla Firefox  
 File Edit View History Bookmarks Tools Help  
 http://192.168.0.30/DNESTER WEB GIS  
 Most Visited Getting Started Latest Headlines 1000000 Images... Suggested Sites ArcGIS Server Manager

Row 1  
 DNESTER BASIN WEB GIS

DNESTER BASIN WEB GIS  
 Dniester Transboundary GRID-Arendal FSR

Search Attributes | Print

**Map Contents**

- Water\_Absorption
- Water\_Discharge\_Ukraine
- Rivers\_Dniester
- Dniester\_HYDRO
  - bounding\_line
- RDD\_Dniester
- Dniester\_Calciments
- Lakes\_Dniester
- Rivers\_Dniester
- LAKES\_in
- MAINRIVERS\_out
- area\_poly
- Dniester\_BOIL
  - DSW
- Dniester\_LANDCOV
  - bounding\_line
  - Dniester\_Forests
- landcover
  - Artificial surfaces and u
  - Bare land
  - Cultivated and managed
  - Herbaceous Cover, slop
  - Crop and / Shrub and/o
  - Cropland / Tree Cover
  - Tree Cover / Other net
  - Regularly flooded shrub
  - Shrub Cover, closed-op

Magnified  
 Pidhaits

Done  
 Taskbar: Inbox - Microsoft O... ZOI FILES Computer Close of Windows S... ArcCatalog - ArcI... DNESTER BASIN W... Microsoft Office P...  
 System tray: EN 6:48 PM



DNIESTER BASIN WEB GIS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://102.168.0.88/DNIESTER WEB GIS/

Most Visited Getting Started Latest Headlines suggested Sites ArcGIS Server Manager

Row 1

DNIESTER BASIN WEB GIS

Dniester Transboundary | GRID Arcadis | ESRU

Search Attributes | Print

Results

Map Contents

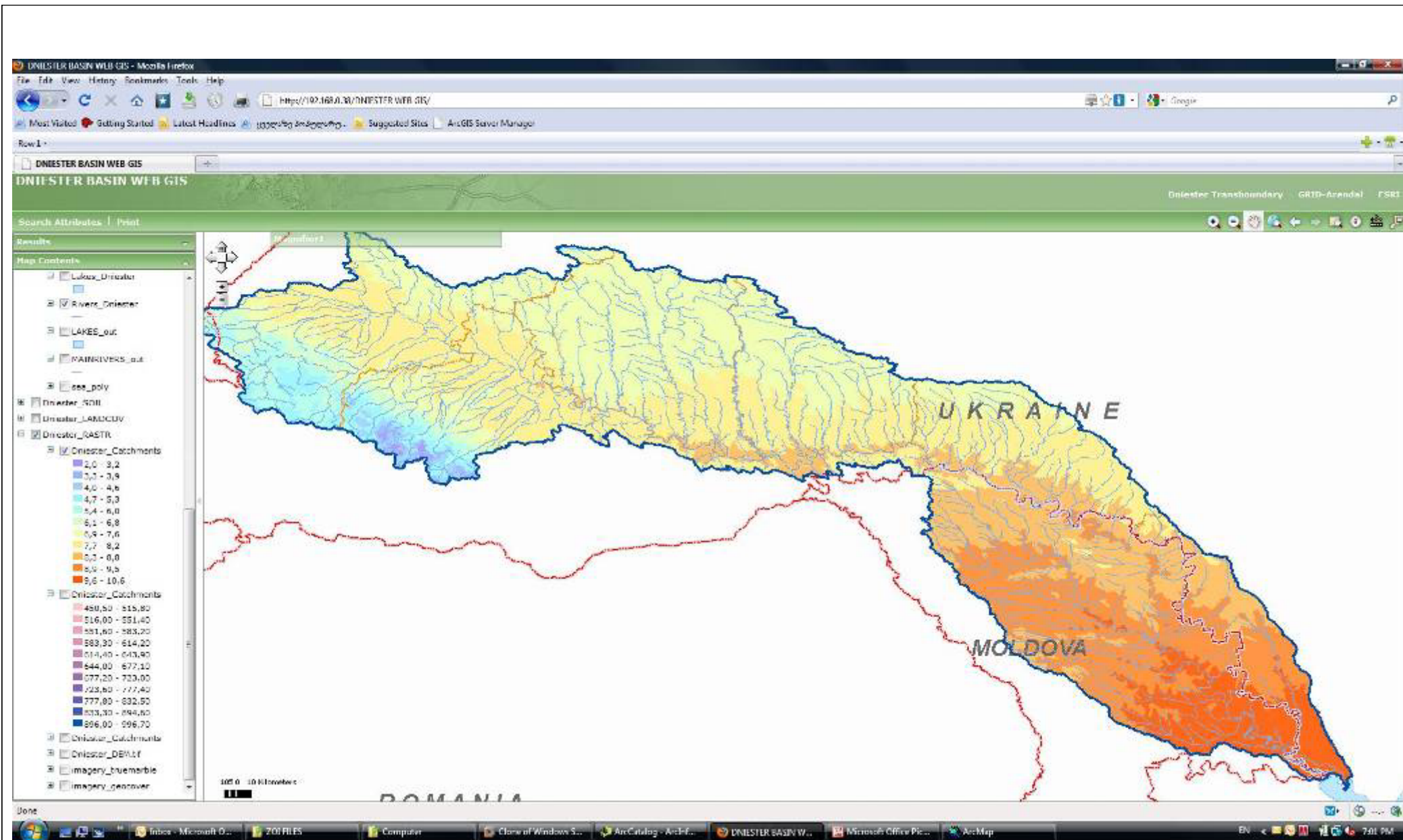
- Dniester\_AGN\_UTIL
  - bounding\_line
  - irr\_boundaries
  - RSD\_Dniester
    - Acn1
  - Railway
  - Roads
  - Gas Pipeline
  - Admin2
  - Cities
  - Towns
  - Villages
  - RSD\_mask
  - admin\_reg\_out
  - settlement\_outside
  - swa\_suly
- Dniester\_MONITOR
  - Dniester\_MONITOR
    - bounding\_line
    - RSD\_Dniester
      - Dniester\_Catchments
      - Lakes\_Dniester
    - Rivers\_Dniester
    - LAKES\_out
    - MAINRIVERS\_out

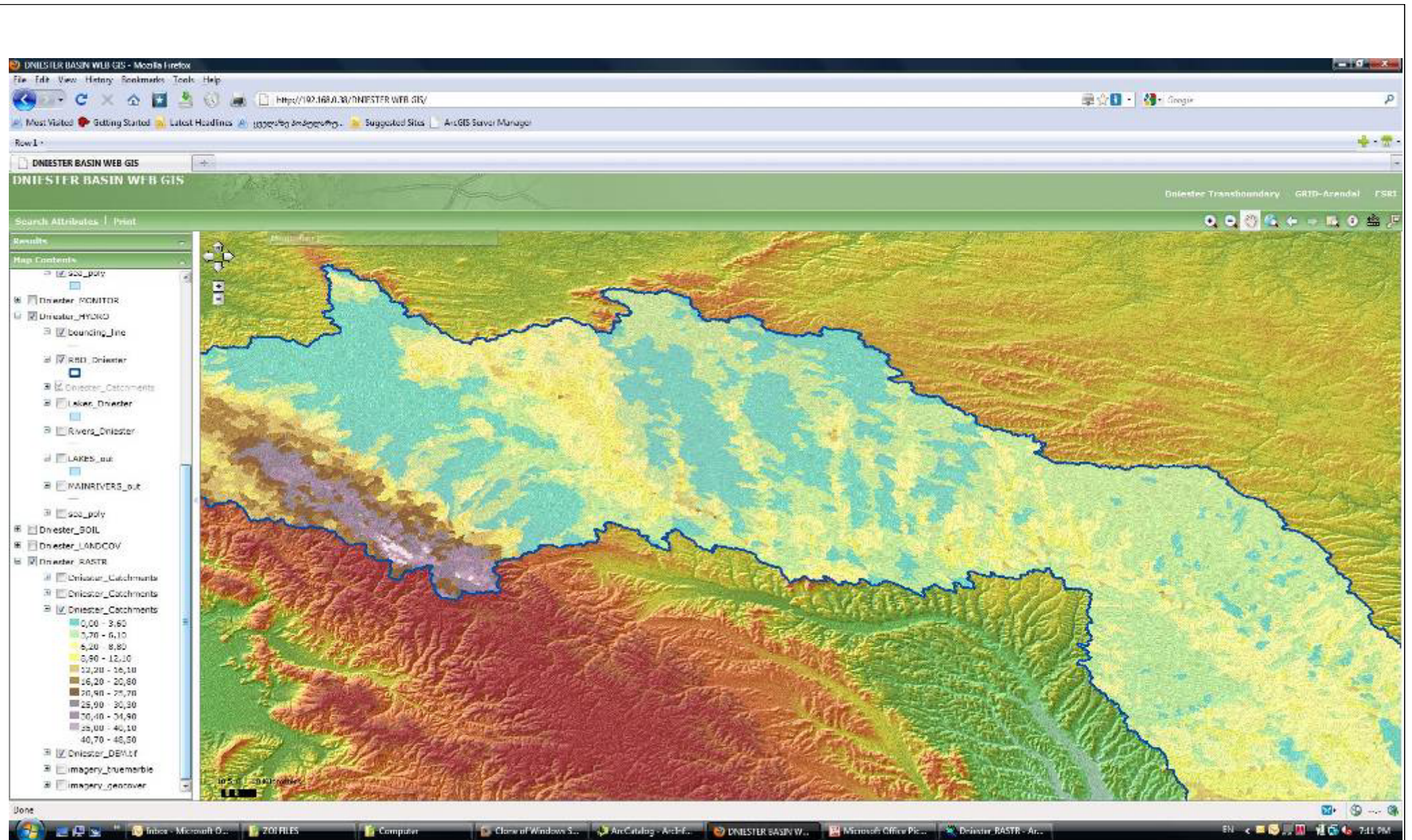
Done

Taskbar: Inbox - Microsoft O..., ZOI FILES, Computer, Close of Windows S..., ArcCatalog - ArcIn..., DNIESTER BASIN W..., Microsoft Office Pic...

System tray: FN, 6:58 PM









DNIESTER BASIN WEB GIS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://192.168.0.30/DNIESTER WEB GIS

Most Visited Getting Started Latest Headlines 100% Web Imaging... Suggested Sites ArcGIS Server Manager

Row 1

DNIESTER BASIN WEB GIS

Dniester Transboundary GRID-Arendal FSR1

Search Attributes | Print

Results

Map Contents

- Coastline
- Admin2
- Other
- Towns
- V.Rivers
- RBD\_mask
- admin\_reg\_out
- extremum\_outside
- mask\_poly

Dniester\_MONITOR

Dniester\_HYDRO

- bounding\_line
- RBD\_Dniester
- Dniester\_Catchments
- Lakes\_Dniester
- Rivers\_Dniester
- LAKES\_out
- MAINRIVERS\_out
- mask\_poly

Dniester\_SOIL

Dniester\_LANDCOV

Dniester\_RASTR

- Dniester\_Catchments
- Dniester\_Catchments
- Dniester\_Catchments
- Dniester\_DEM.tif
- imagery\_buenaerbia
- imagery\_geoserver

250,000 25 Kilometers

Done

Taskbar: Firefox, Internet Explorer, Microsoft Office, ZOI FILES, Computer, Close of Windows S..., ArcCatalog - ArcH..., DNIESTER BASIN W..., Microsoft Office Pic..., Dniester RASTR - Arc...

System Tray: EN, 7:14 PM



DNESTER BASIN WEB GIS - Mozilla Firefox  
 File Edit View History Bookmarks Tools Help  
 http://192.168.0.30/DNESTER WEB GIS  
 Most Visited Getting Started Latest Headlines 1000000 Images... Suggested Sites ArcGIS Server Manager

Row 1  
 DNESTER BASIN WEB GIS

DNESTER BASIN WEB GIS  
 Dniester Transboundary GRID-Arendal FSR

Search Attributes | Print

**Map Contents**

- Dniester\_ADV\_UTIL
  - bounding\_line
  - int\_boundaries
  - RSTN\_Dniester
  - Admi
  - Railway
  - Roads
  - Gas Pipeline
  - Adm
  - Cities
  - Towns
  - Villages
  - RDD\_mask
  - admin\_reg\_out
  - settlement\_outside
  - soc\_poly
- Dniester\_MONITOR
  - Dniester\_HYDRO
    - bounding\_line
    - RSTN\_Dniester
    - Dniester\_Catchments
    - Lakes\_Dniester
    - Rivers\_Dniester
    - LAKES\_out
    - MAINRIVERS\_out

Done

Taskbar: Inbox - Microsoft O... ZOI FILES Computer Close of Windows S... ArcCatalog - ArcI... DNESTER BASIN W... Microsoft Office Pic... Dniester RASTR - Arc... EN 7:00 PM



DNIESTER BASIN WEB GIS - Mozilla Firefox  
 File Edit View History Bookmarks Tools Help  
 http://102.168.0.56/DNIESTER WEB GIS/

DNIESTER BASIN WEB GIS  
 Dniester Transboundary | GRID ArcSDE | ESRI

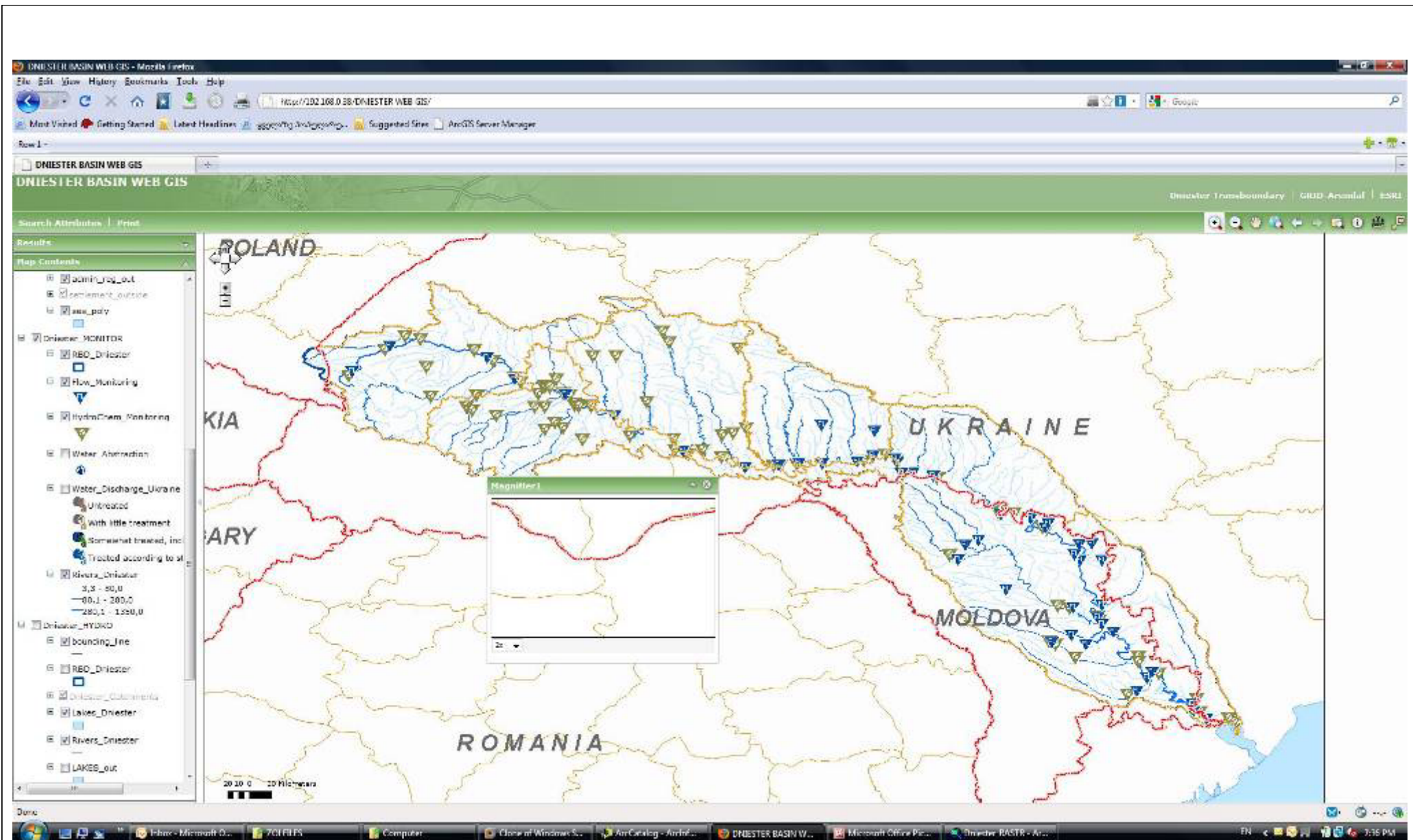
Search Attributes | Print

Results  
 Map Contents

- Dniester\_ADM\_UTIL
  - bounding\_line
  - int\_boundaries
  - RSD\_Dniester
  - Acm1
  - Railway
  - roads
    - Express Highway
    - Improved Motorway
    - Motorway
  - Gas Pipeline
  - Acm2
  - Cities
  - Towns
  - villages
  - RSD\_mask
  - admin\_reg\_out
  - settlement\_outside
  - new\_poly
- Dniester\_MONITOR
  - RSD\_Dniester
  - Flow\_Monitoring
  - HydroChem\_Monitoring

Done  
 Taskbar: Inbox - Microsoft O..., 700 FILES, Computer, Close of Windows S..., ArcCatalog - ArcP..., DNIESTER BASIN W..., Microsoft Office Pic..., Desktop BASTS - Ar...  
 System tray: EN, 7:06 PM





DNIESTER BASIN WEB GIS - Mozilla Firefox  
 File Edit View History Bookmarks Tools Help  
 http://102.168.0.58/DNIESTER WEB GIS/

DNIESTER BASIN WEB GIS  
 Search Attributes | Print  
 Dniester Transboundary | GRID ArcSDE | ESRI

Results  
 Map Contents

- admin\_req\_out
- settlement\_outside
- sea\_poly
- Dniester\_MONITOR
  - RBD\_Dniester
  - Flow\_Monitoring
  - HydroChem\_Monitoring
  - Water\_Abstraction
  - Water\_Discharge\_Ukraine
    - Untreated
    - With little treatment
    - Somewhat treated, inc
    - Treated according to st
- Rivers\_Dniester
  - 0,0 - 50,0
  - 50,1 - 250,0
  - 250,1 - 1350,0
- Dniester\_HYDRO
  - bounding\_line
  - RBD\_Dniester
  - Dniester\_Catchments
  - Lakes\_Dniester
  - Rivers\_Dniester
  - LAKES\_out

Done  
 94,50 544,000 0,000000 0,000000  
 Done

Done  
 Inbox - Microsoft O... ZOI FILES Computer Close of Windows S... ArcCatalog - ArcIn... DNIESTER BASIN W... Microsoft Office Pic... Dniester RASTR - Ar... 7:40 PM





---

***Thanks for your attention!***