LANDSCAPE ANALYSIS AND ECOSYSTEM ACCOUNTING

PILOT STUDY – DANUBE DELTA

Romanian Ministry of Environment and Water Management

DANUBE DELTA NATIONAL INSTITUTE FOR RESEARCH & DEVELOPMENT

TULCEA - ROMANIA

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Iulian NICHERSU

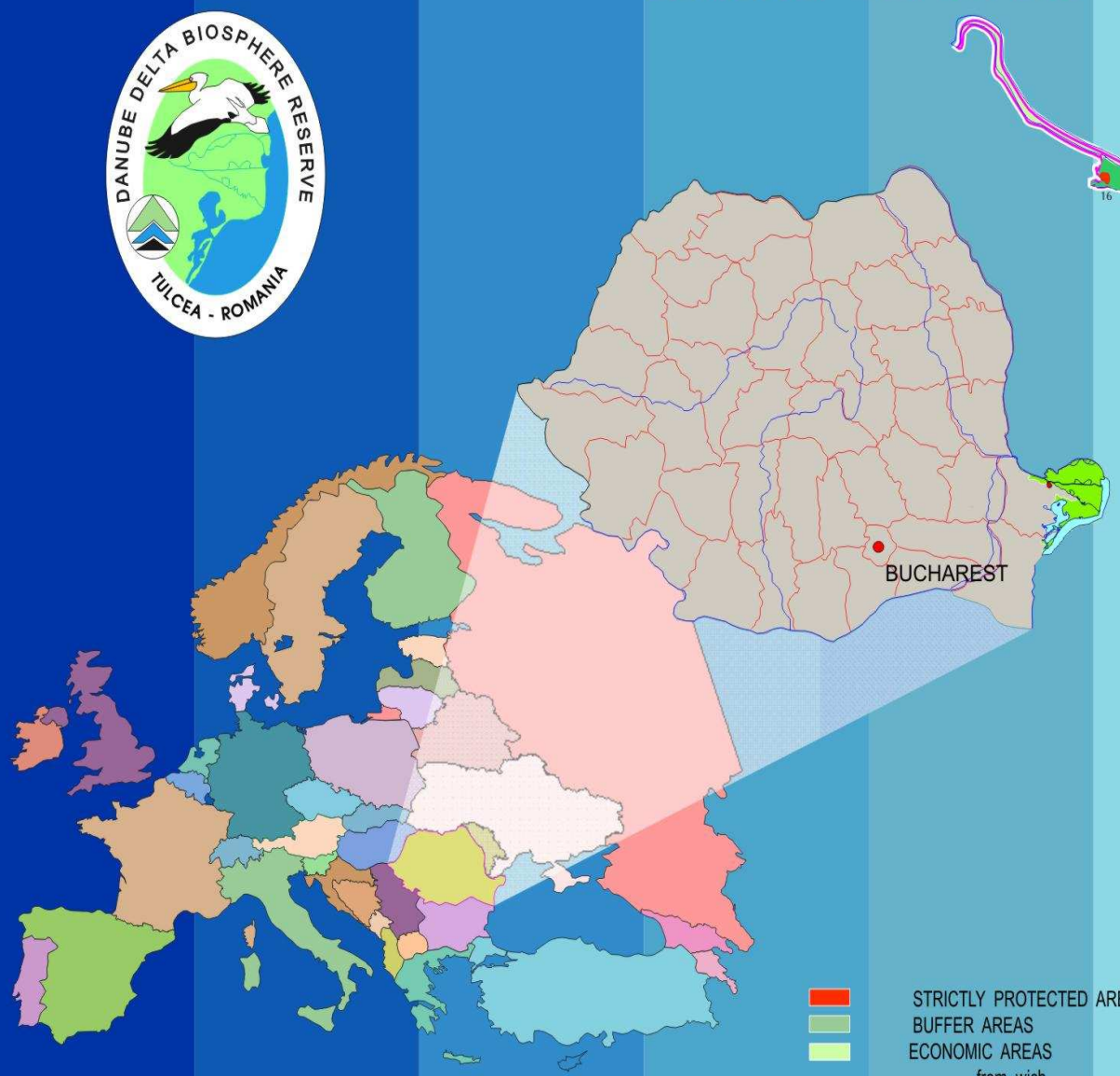
- National Centre of Reference
  in fishery and land cover
  (in support of the participation of Romania
  to European Environment Agency – EEA
  and European Environment Information and
  Observation Network – EIONET)

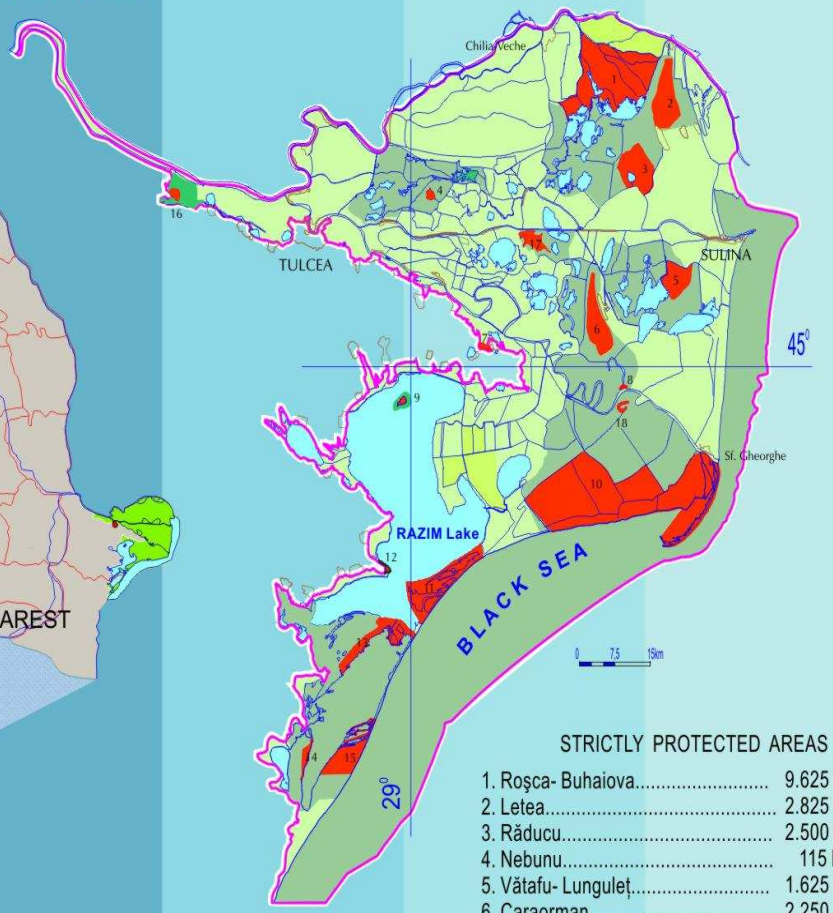
- European Centre of Excellence for
  deltas and wetlands - FPV

- Member in Association to "Autonomous University of
  Barcelona – UAB" for
  EEA European Topic Centre on Terrestrial Environment

DANUBE DELTA BIOSFERE RESERVE - 5 800 Km^2 (2.5 % ROMANIA SURFACE)

ROMANIA - 237 500 Km^2





	STRICTLY PROTECTED AREAS	50.600 HA
	BUFFER AREAS	223.300 HA
	ECONOMIC AREAS	306.100 HA
	from wich	
	RESTORATION ECOLOGICAL AREAS	11.425 HA
	DDBR LIMITS	

STRICTLY PROTECTED AREAS

1. Roşca- Buhaiova	9.625 ha
2. Letea	2.825 ha
3. Răducu	2.500 ha
4. Nebunu	115 ha
5. Vătafu- Lunguleț	1.625 ha
6. Caraorman	2.250 ha
7. Sărăturile- Murighiol	87 ha
8. Erenciuc	50 ha
9. Popina	98 ha
10. Sacalin- Zătoane	21.410 ha
11. Periteaşca- Bisericuţa- Portiţa	4.125 ha
12. Capul Doloşman	125 ha
13. Grindul Lupilor	2.075 ha
14. Istria- Sinoie	400 ha
15. Grindul Chituc	2.300 ha
16. Rotundu	228 ha
17. Potcoava	625 ha
18. Belciug	110 ha

DANUBE DELTA - BIOSPHERE RESERVE

- Part of the Man and Biosphere Programme of UNESCO since 1990
- Included in Ramsar Convention List since 1990
- Included in World Heritage List since 1990

Background

- *"The aquatic environment plays an increasing role and gets more and more importance in the modern life. The statement "there's no life without water" is as true as "there is no water without life". Life in the waters plays an important role on humans."*

NATURAL FUNCTIONS

- **hydrological:**
  - water stocking / freshet wave retaining
  - sediments transport / the shore line equilibrating
  - ground water stocking and it self cleaning
  - the equilibrium into hydrological regime / the water circuit into nature (clime improving)
- **bio-geo-chemical:**
  - the cycle of C / N / P – carbon, nitrogen, phosphorous
- **ecological:**
  - **habitats for plants and animals (for mating, nesting, food places etc.)**
  - **biodiversity reserve / genetic resources**
  - **bio-corridor**
  - **bio-productivity**
  - **the wetland as a water bird habitat**

SOCIO-ECONOMICAL FUNCTIONS

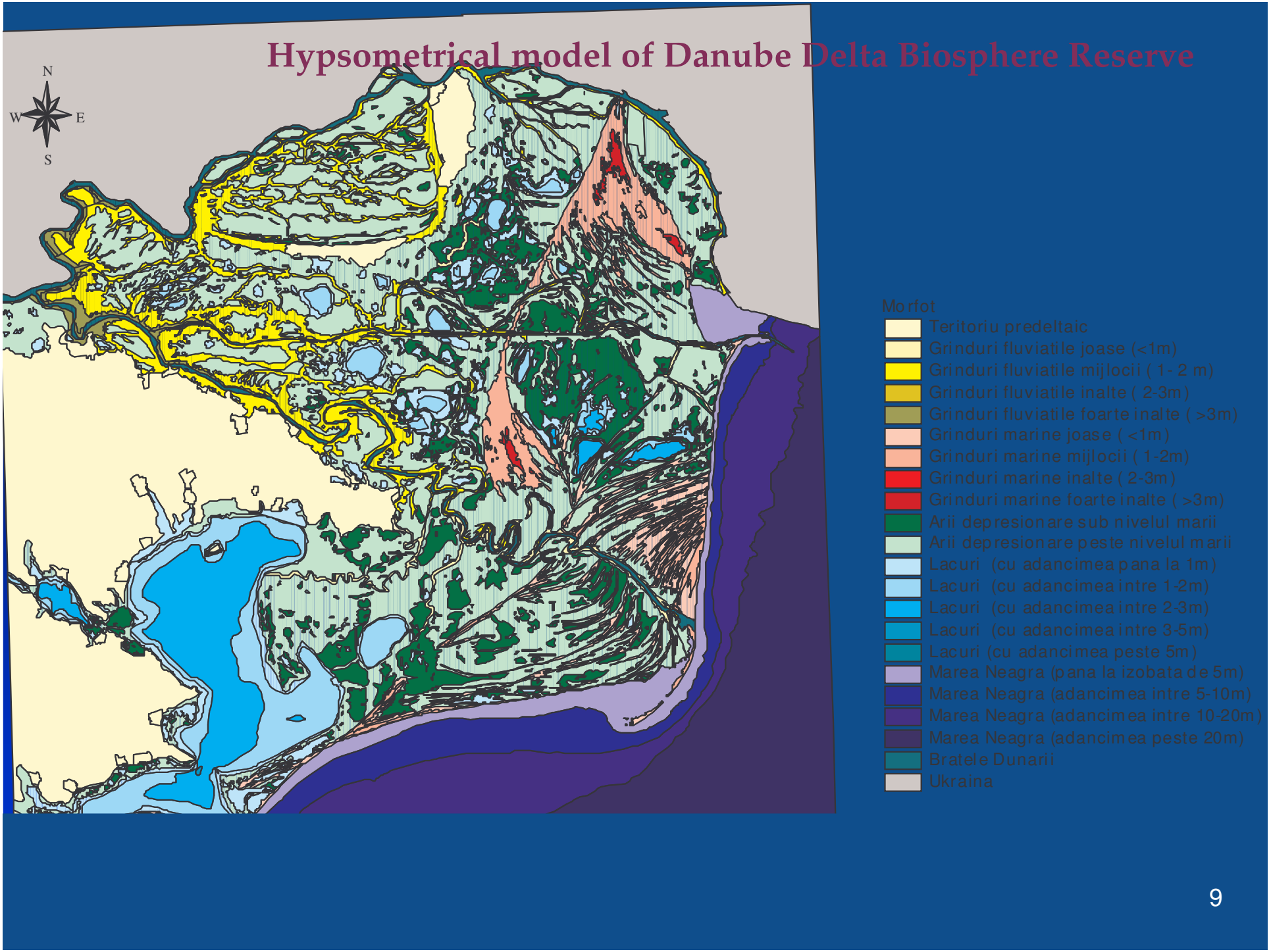
Natural functions remade, develop some material (for life as natural resources) and ideal values which the locals can take benefits and which are important for the local, regional and national economy . Through this values the wetlands are accomplishing important:

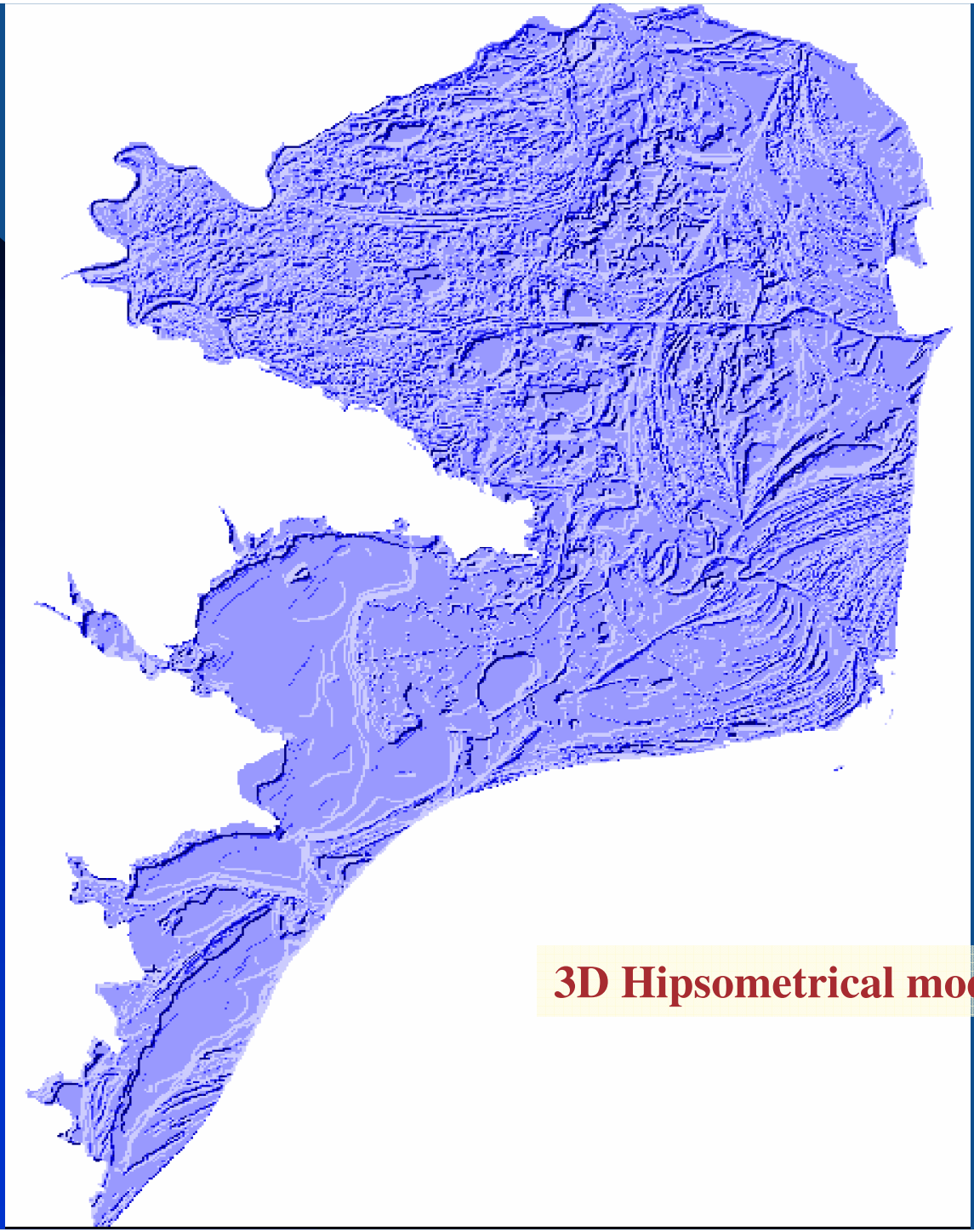
- socio-economical functions
  - navigation
  - protection against freshet
  - water use
  - fishing / pisciculture
  - reed harvesting
  - wood exploitation
  - traditional agriculture
  - animal rising
  - hunting
  - aesthetic of water courses
  - leisure area
  - ecotourism
  - ecological education

Factors and interrelations

- Morphological categories
- Flooding
- Water quality
- Climate and global changes

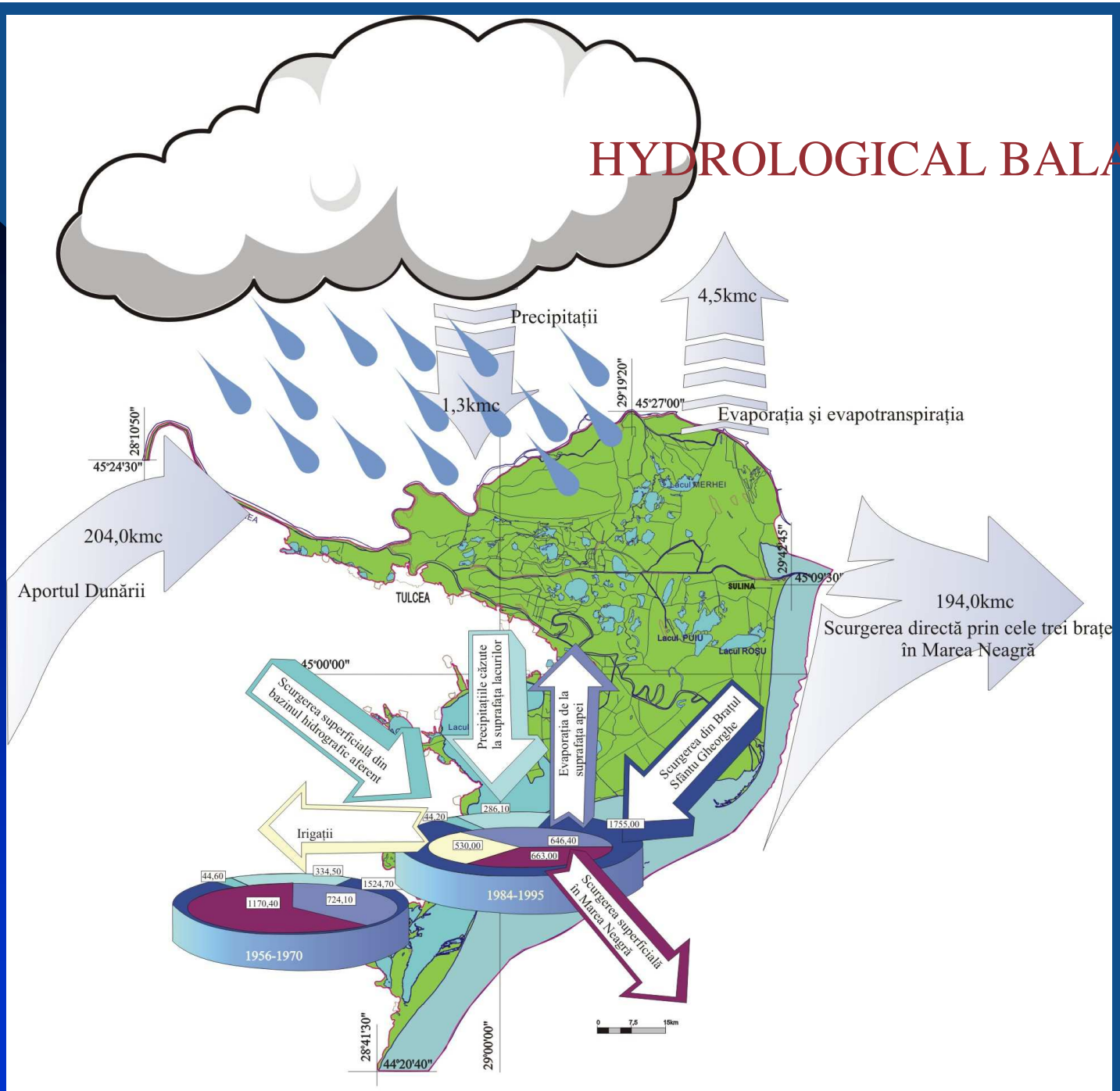
Hypsometrical model of Danube Delta Biosphere Reserve





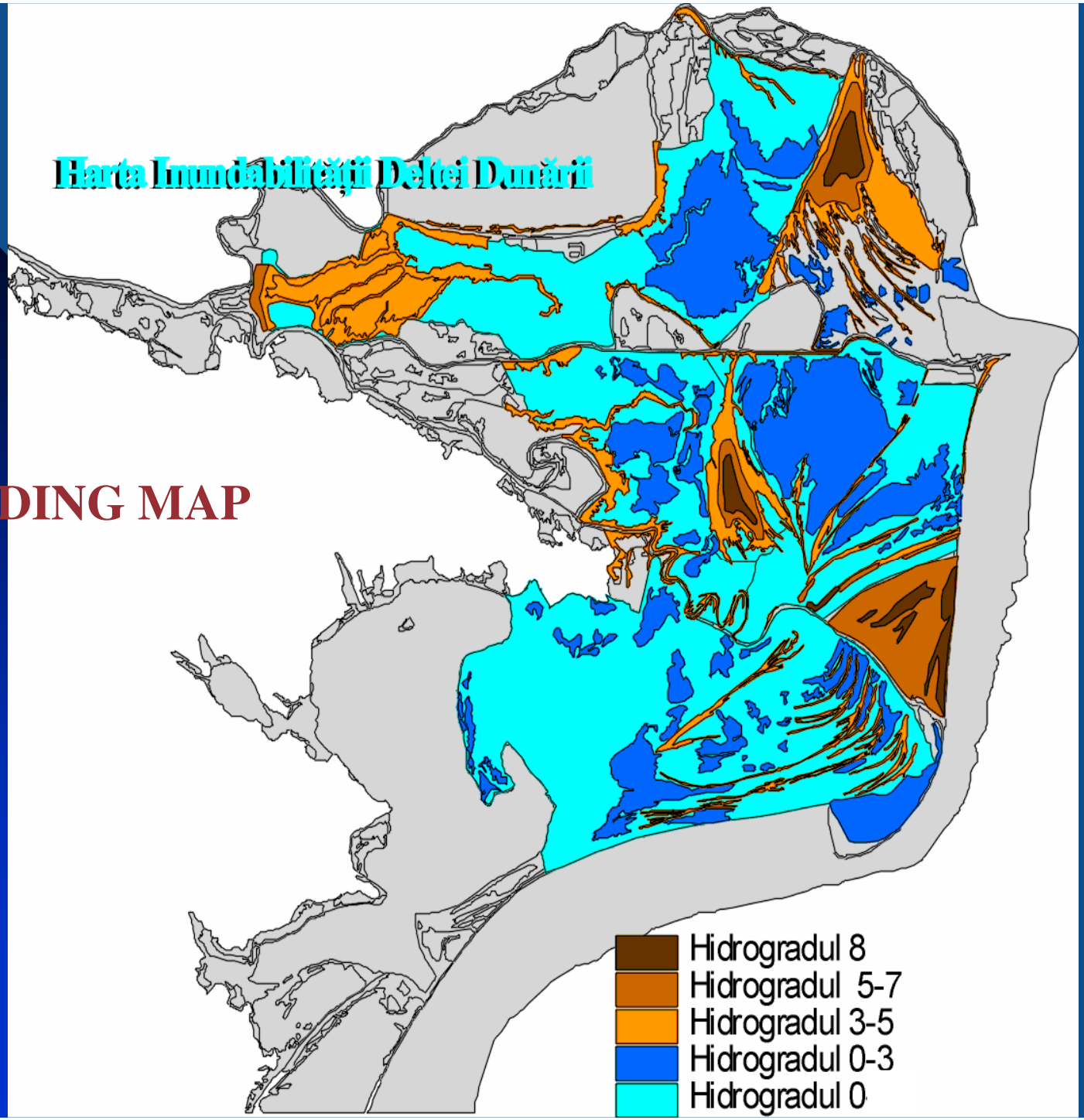
3D Hipsometrical model of DDBR

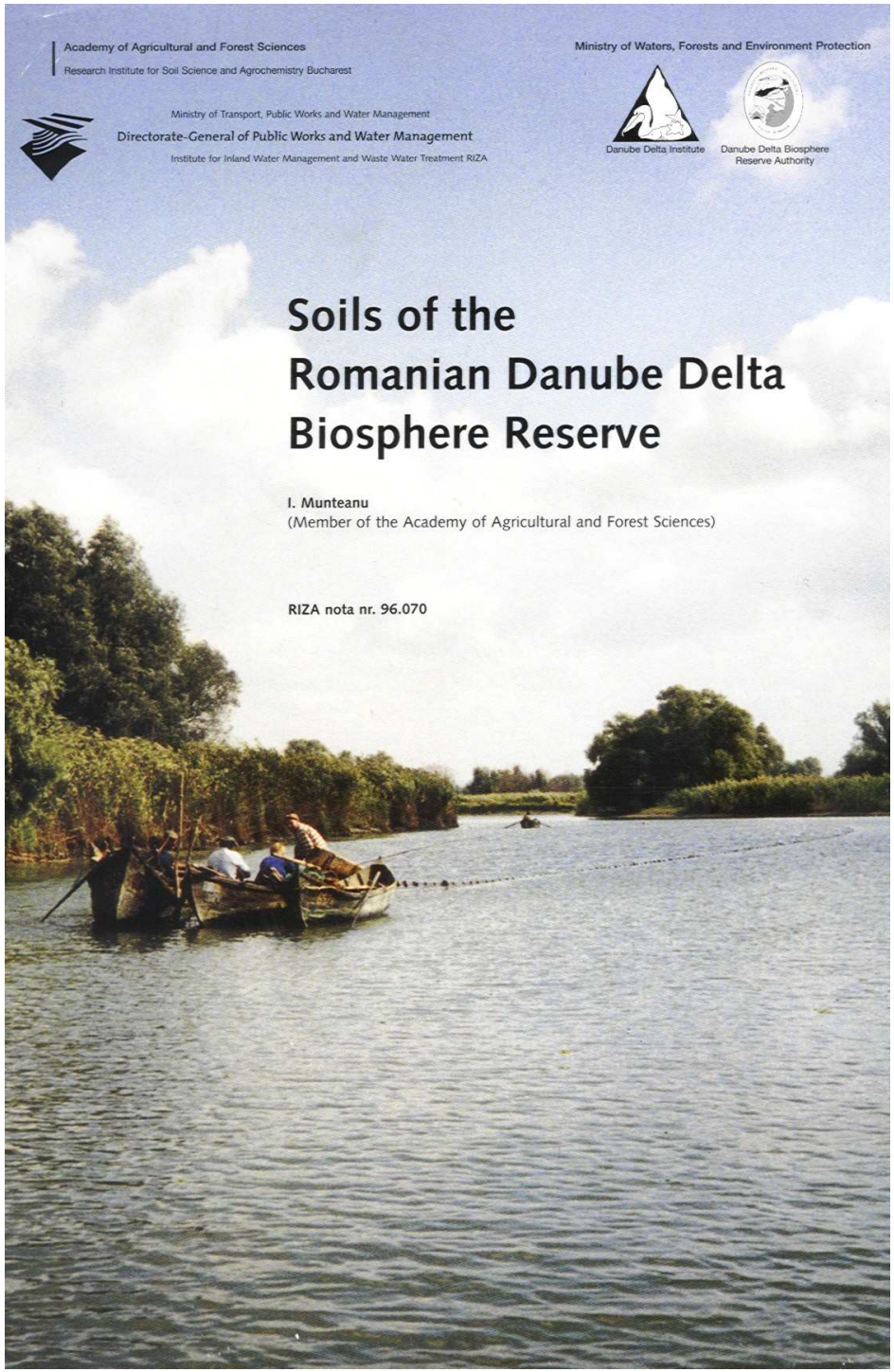
HYDROLOGICAL BALANCE

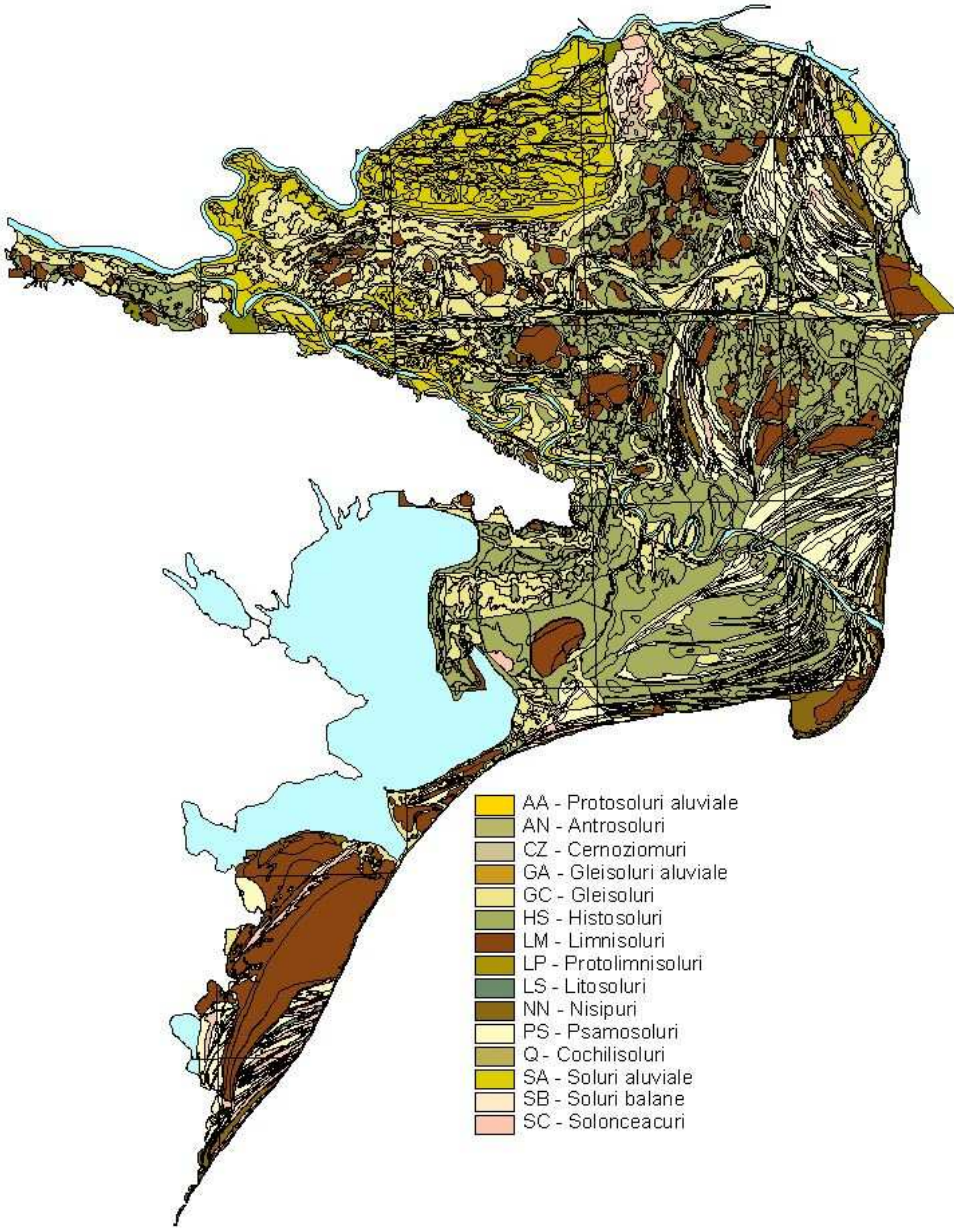


Bilanțul hidrologic al Deltei Dunării și al Complexului Lacustru Razim-Sinoie

FLOODING MAP




Academy of Agricultural and Forest Sciences
Research Institute for Soil Science and Agrochemistry Bucharest
Ministry of Transport, Public Works and Water Management
Directorate-General of Public Works and Water Management
Institute for Inland Water Management and Waste Water Treatment RIZA
Ministry of Waters, Forests and Environment Protection
Danube Delta Institute
Danube Delta Biosphere Reserve Authority
Soils of the Romanian Danube Delta Biosphere Reserve
I. Munteanu
(Member of the Academy of Agricultural and Forest Sciences)
RIZA nota nr. 96.070


AA - Protosoluri aluviale
AN - Antrosoluri
CZ - Cernoziomuri
GA - Gleisoluri aluviale
GC - Gleisoluri
HS - Histosoluri
LM - Limnisoluri
LP - Protolimnisoluri
LS - Litosoluri
NN - Nisipuri
PS - Psamosoluri
Q - Cochilisoluri
SA - Soluri aluviale
SB - Soluri balane
SC - Solonceacuri

Academy of Agricultural and Forest Sciences
Research Institute for Soil Science and Agrochemistry Bucharest

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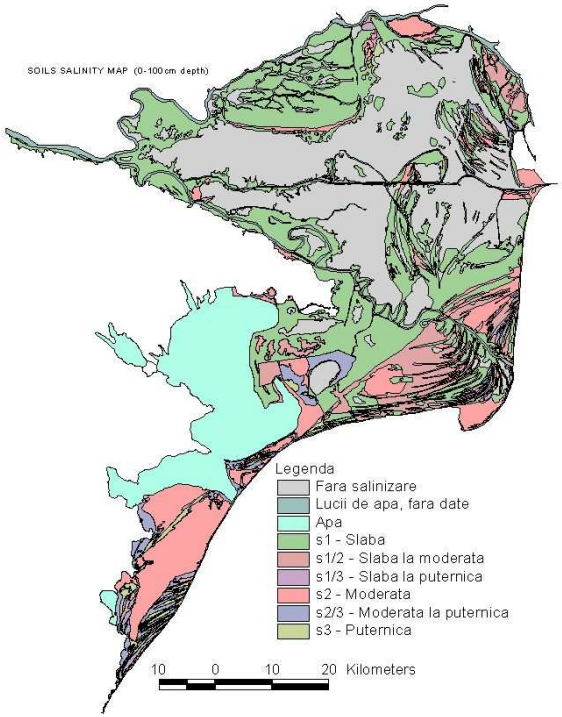
Ministry of Waters, Forests and Environment Protectio

Danube Delta - Institute

Danube Delta Biosphere Reserve Authority



THEMATIC MAP OF THE DANUBE DELTA

3) Soil Salinity

1 : 175.000

dr. I. Munteanu
Gh. Curelariu

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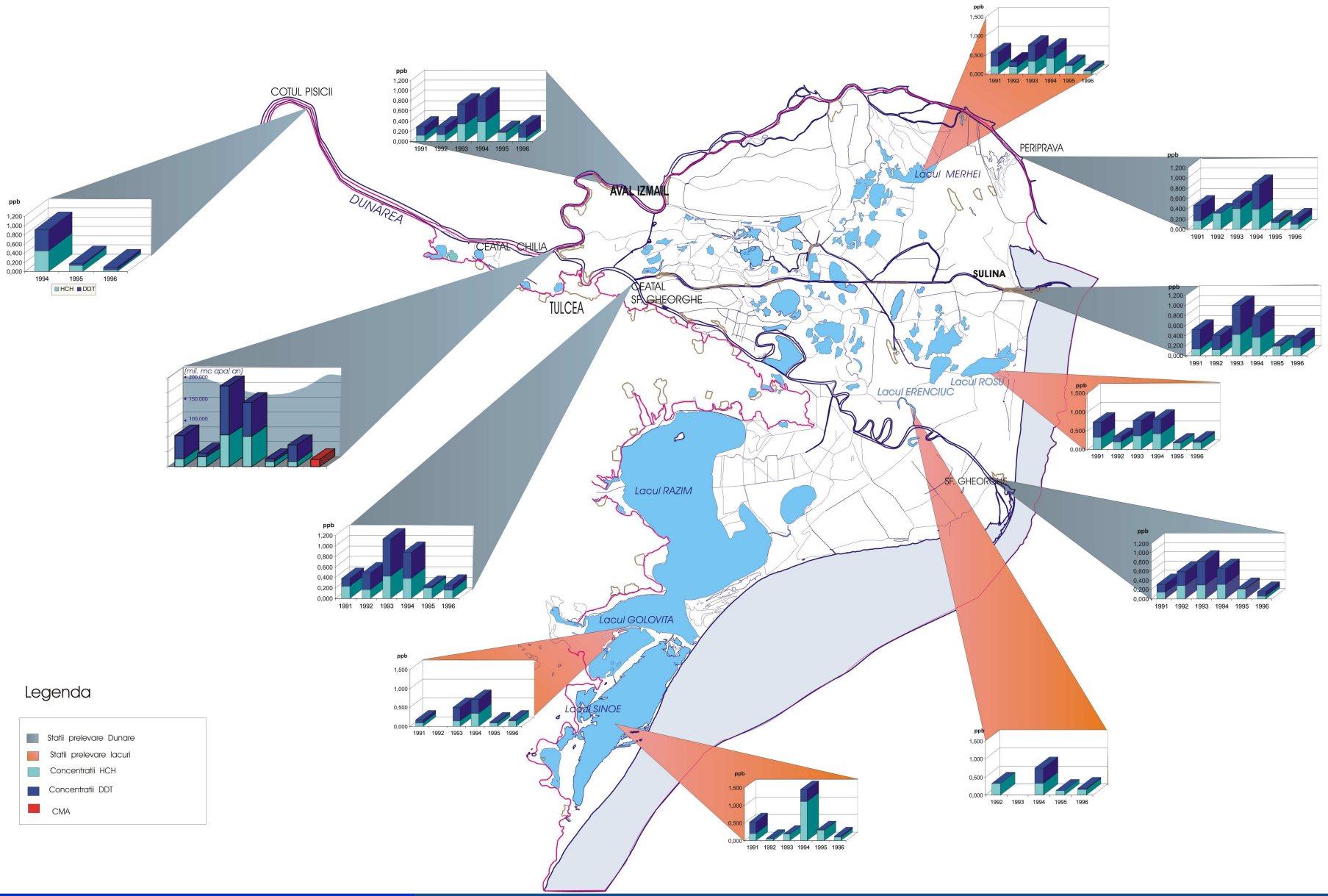
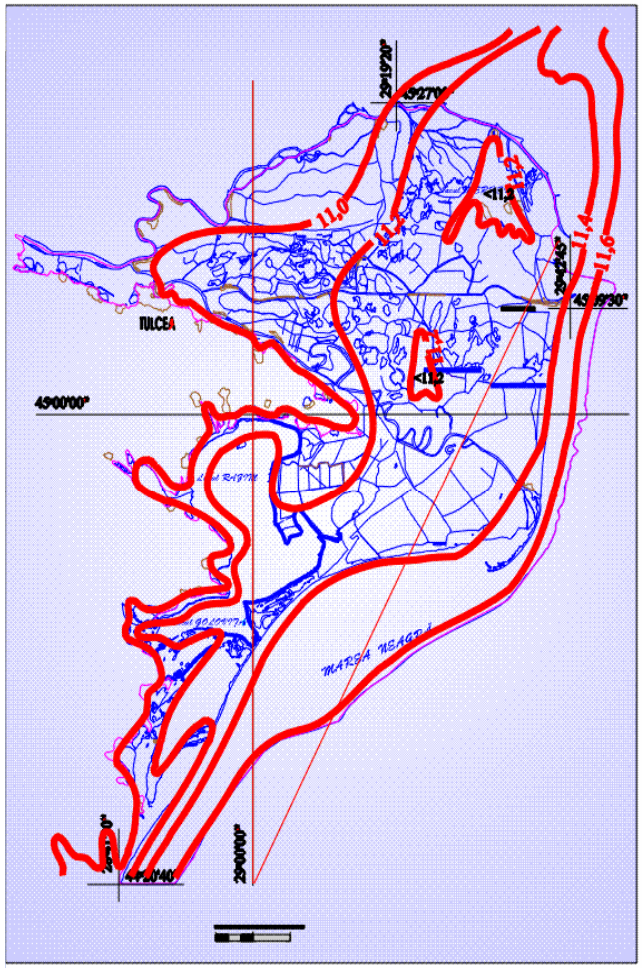
SOIL SALINITY MAP

DANUBE DELTA NATIONAL
INSTITUTE TULCEA * ROMANIA

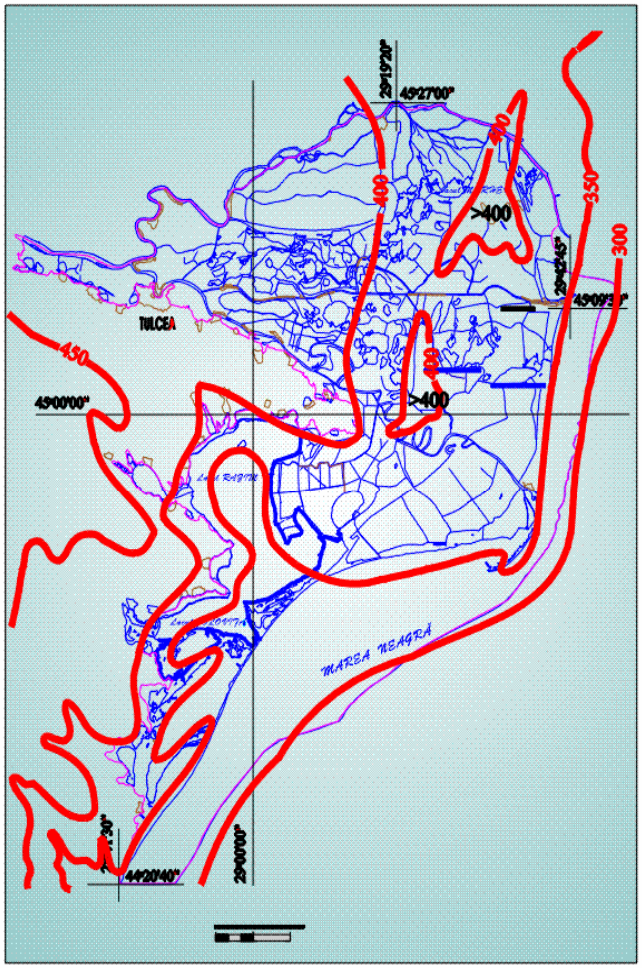
DINAMICA REZIDUURILOR DE PESTICIDE ORGANOCLORURATE IN ECOSISTEMELE ACVATICE DIN REZERVATIA BIOSFEREI DELTA DUNARII



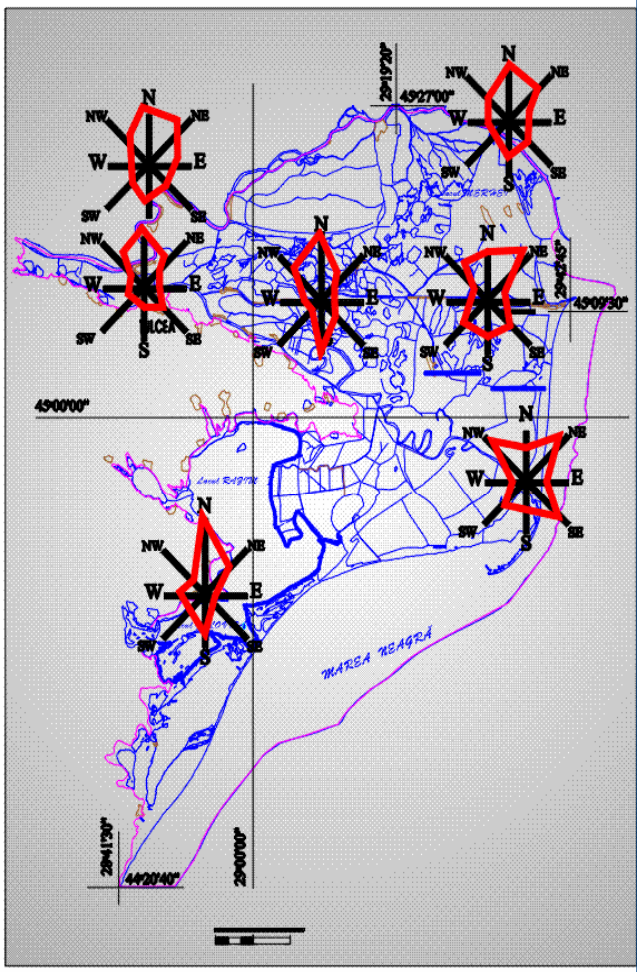
Harta repartiției elementelor climatice în Rezervația Biosferei Delta Dunării (după dr. O.Bogdan)



Repartiția temperaturii medii anuale a aerului (°C)

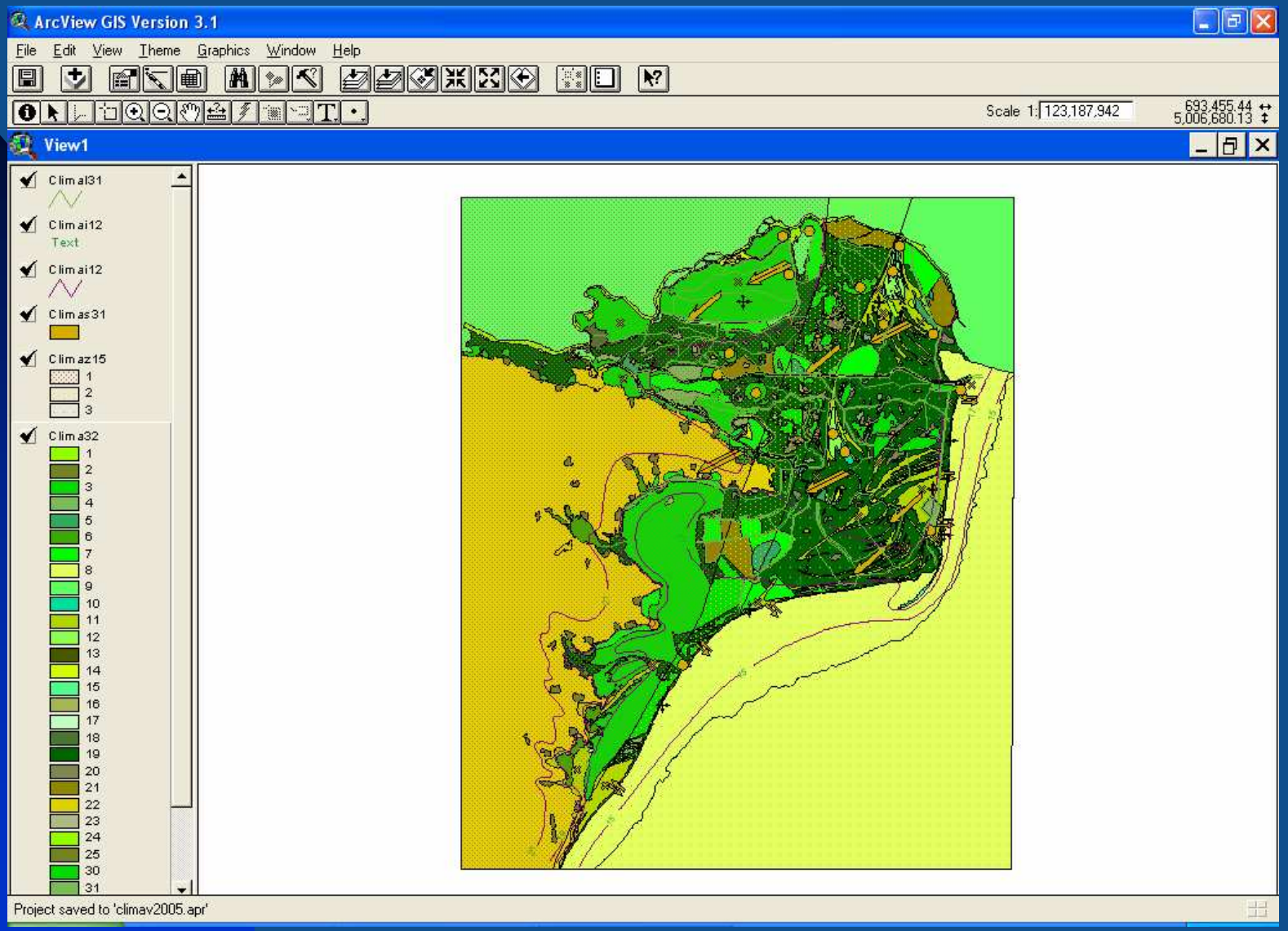


Repartiția cantităților medii anuale de precipitații (mm)



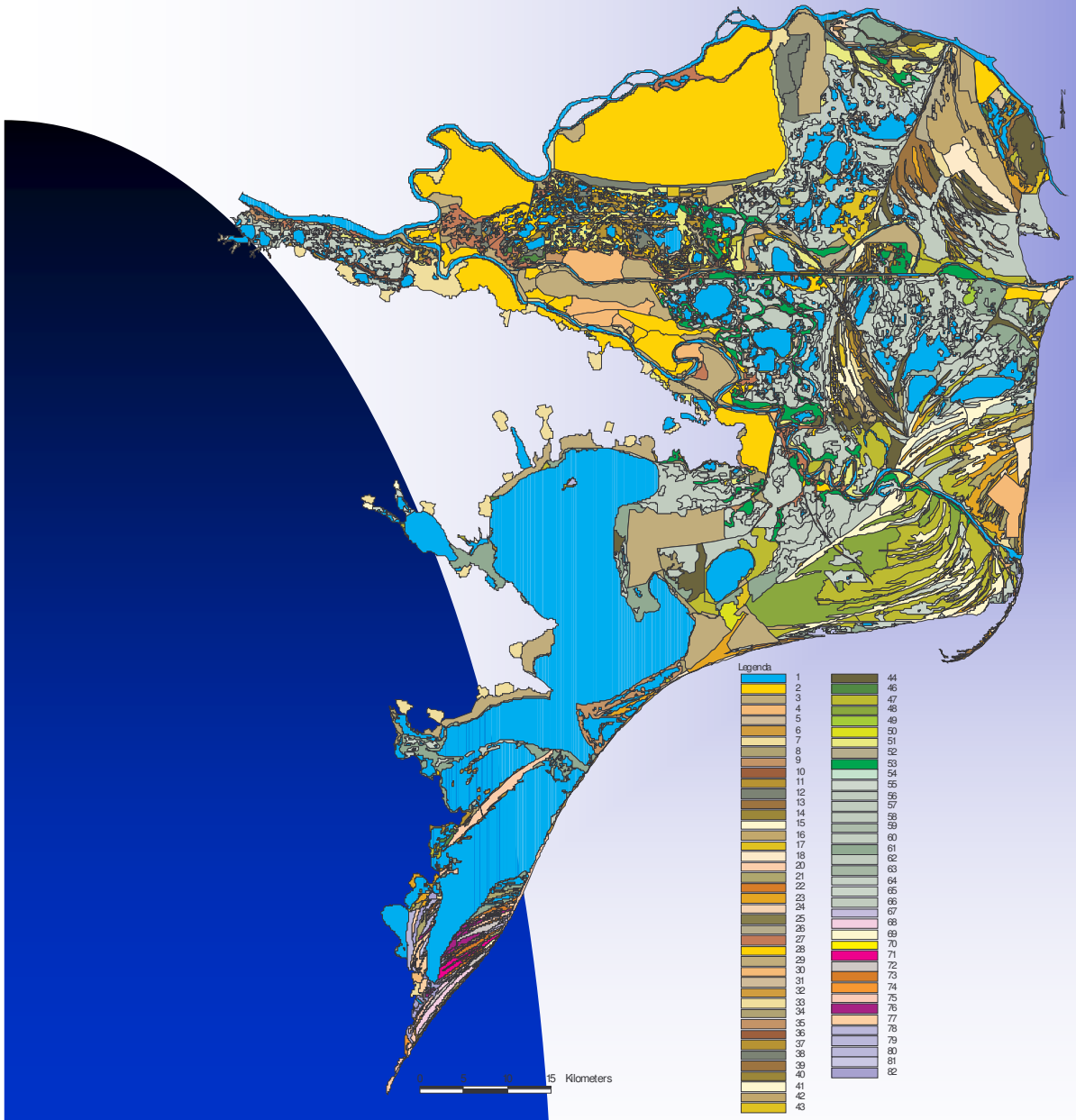
Repartiția frecvenței medii anuale a vânturilor, pe direcții

TOPOCLIMATICS MAP

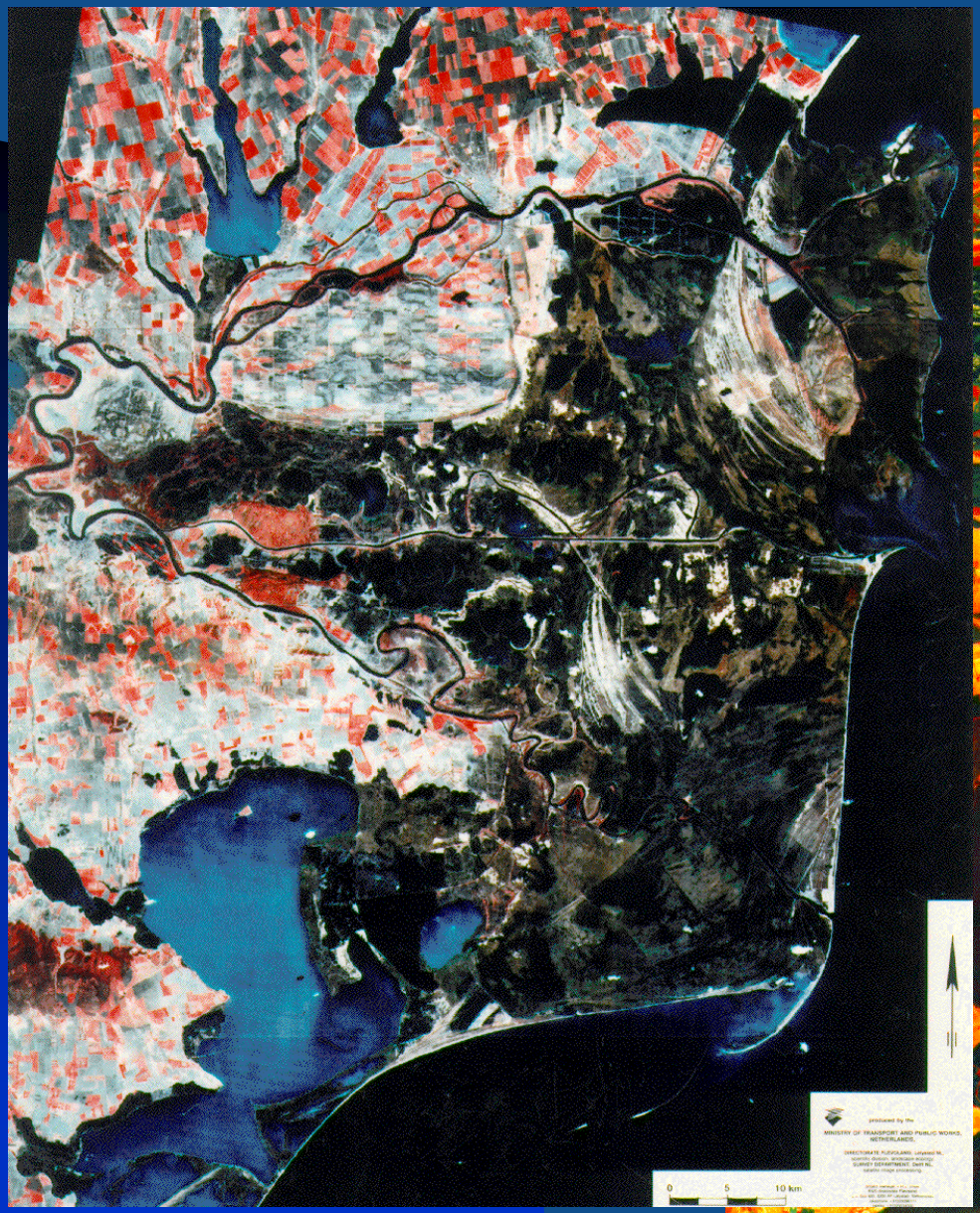


Harta Vegetatiei

Vegetation Map



5/9/2005



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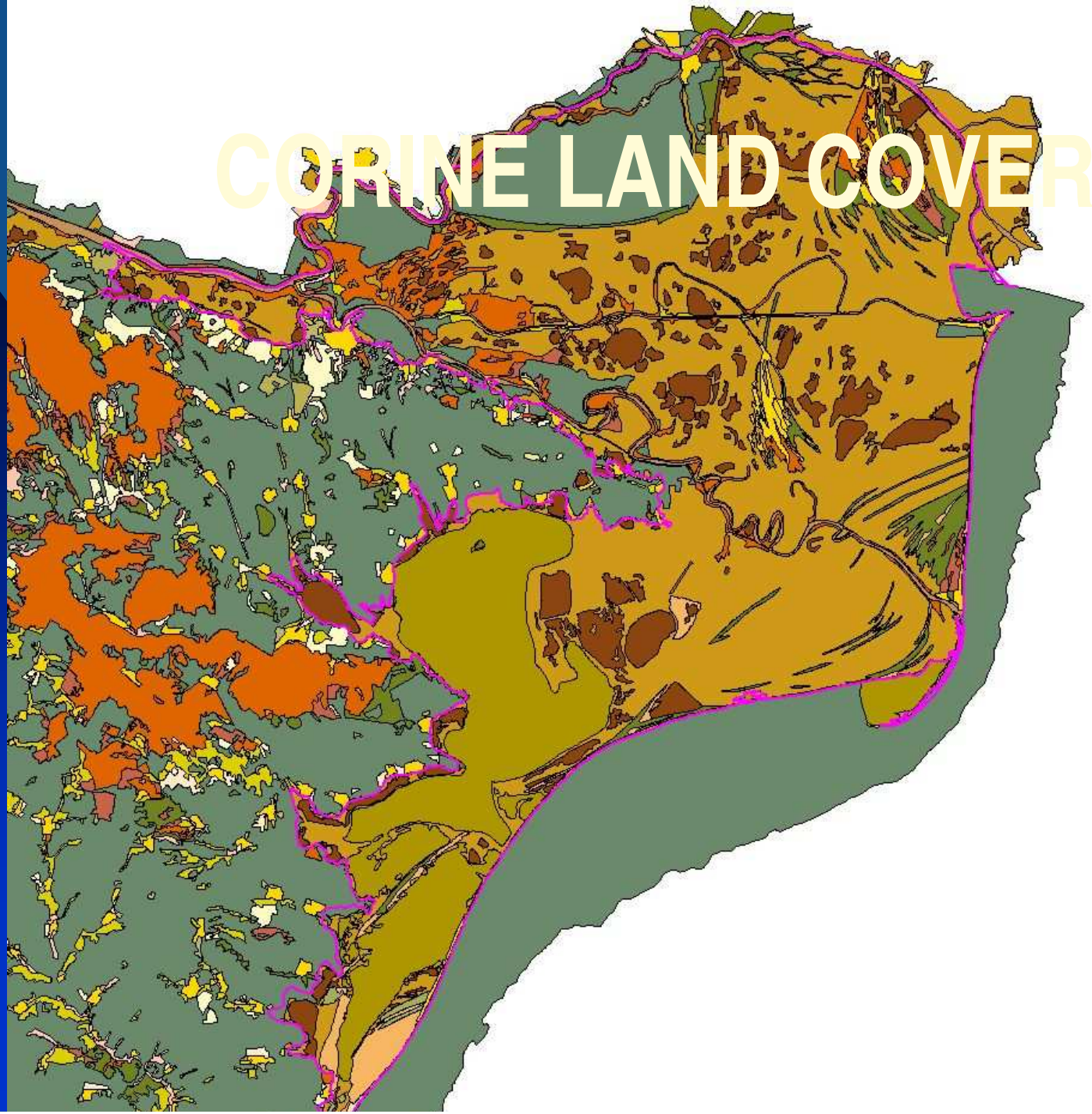
Danube Delta Biosphere Reserve

CORINE LAND COVER

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Institute for Inland Water Management and Waste Water Treatment
Danube Delta Institute
Danube Delta Biosphere Reserve Authority
ECOSYSTEMS MAP OF THE DANUBE DELTA BIOSPHERE RESERVE
1 : 175.000
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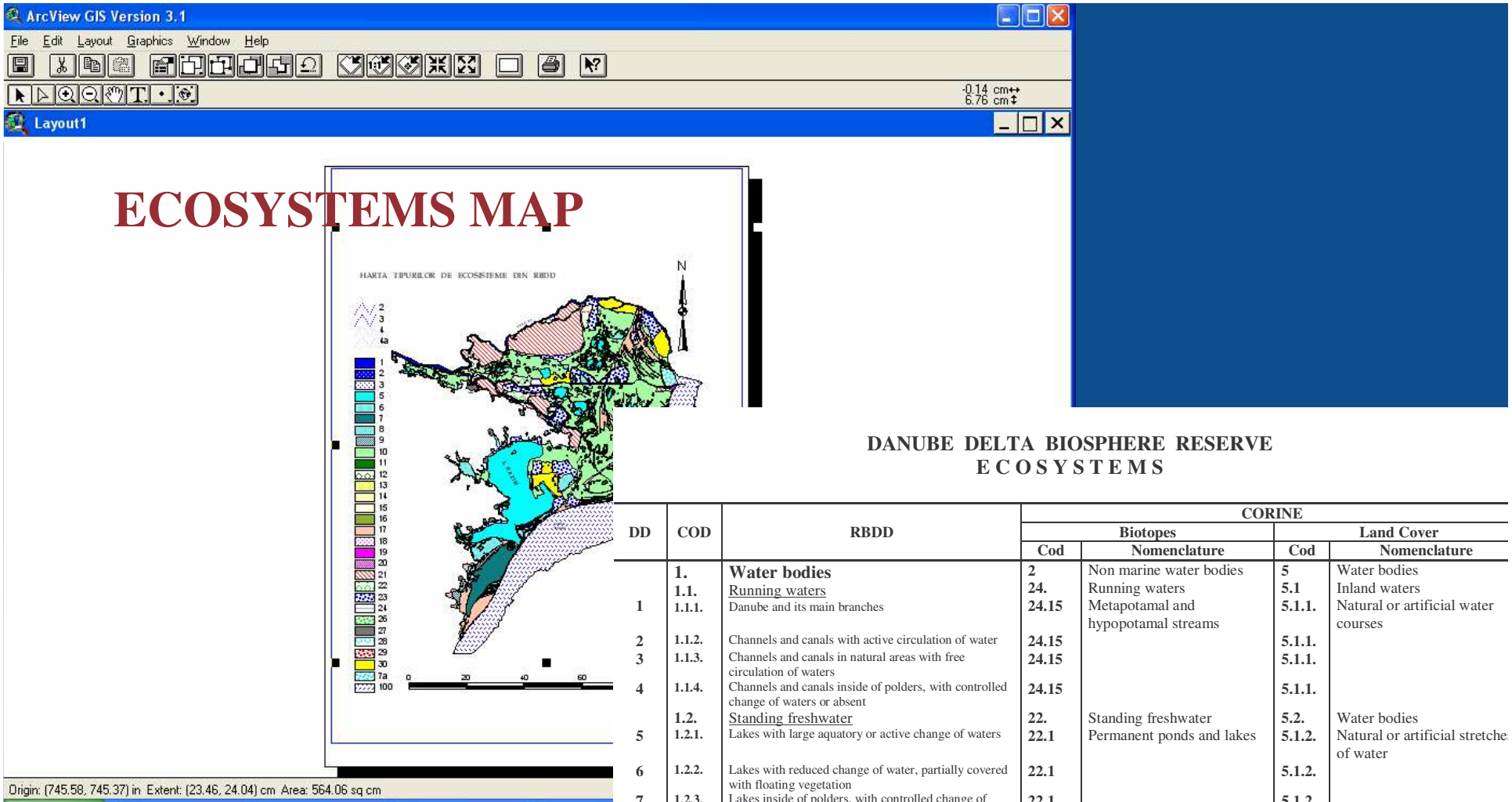
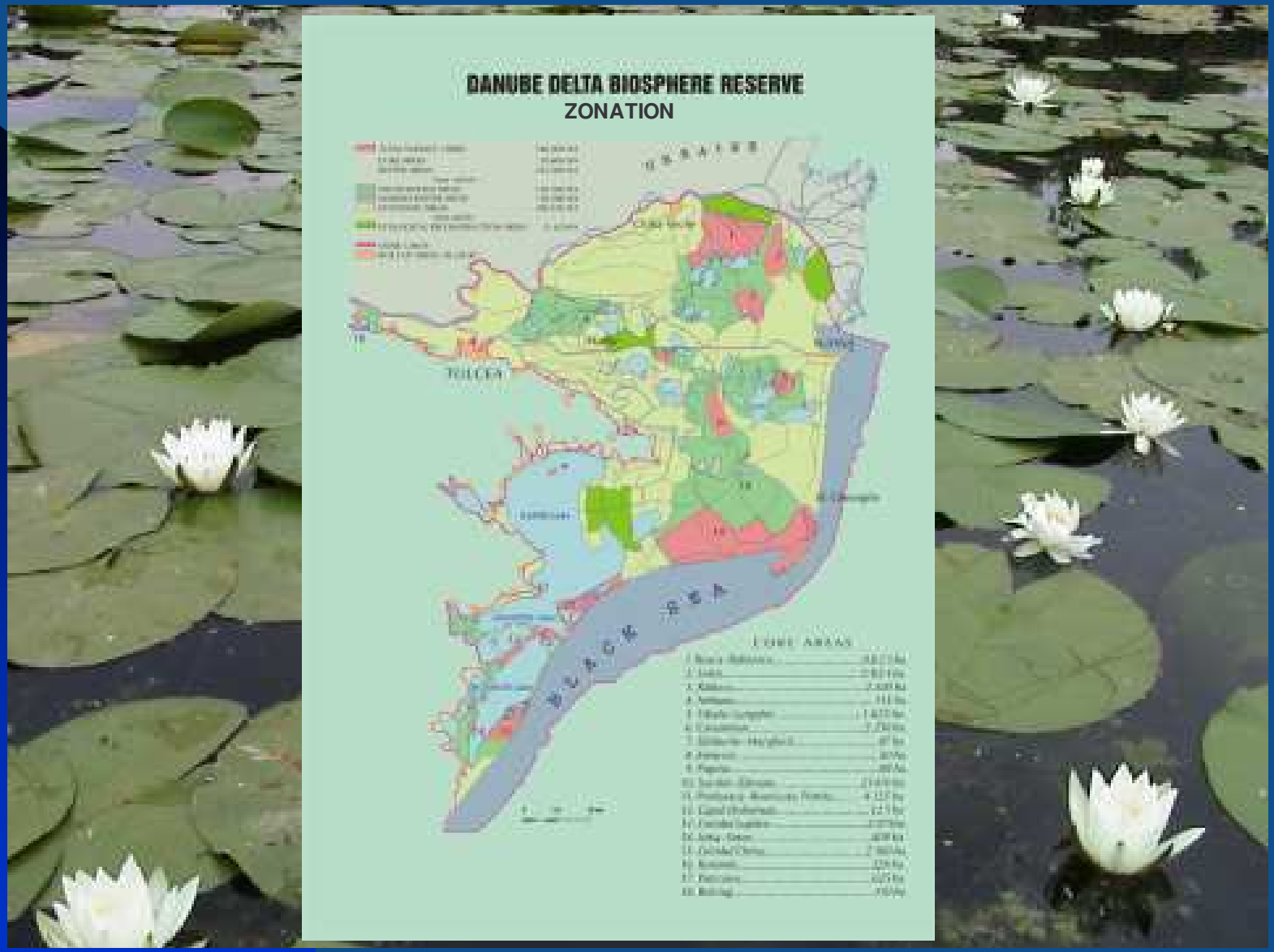
1997

ECOSYSTEMS MAP

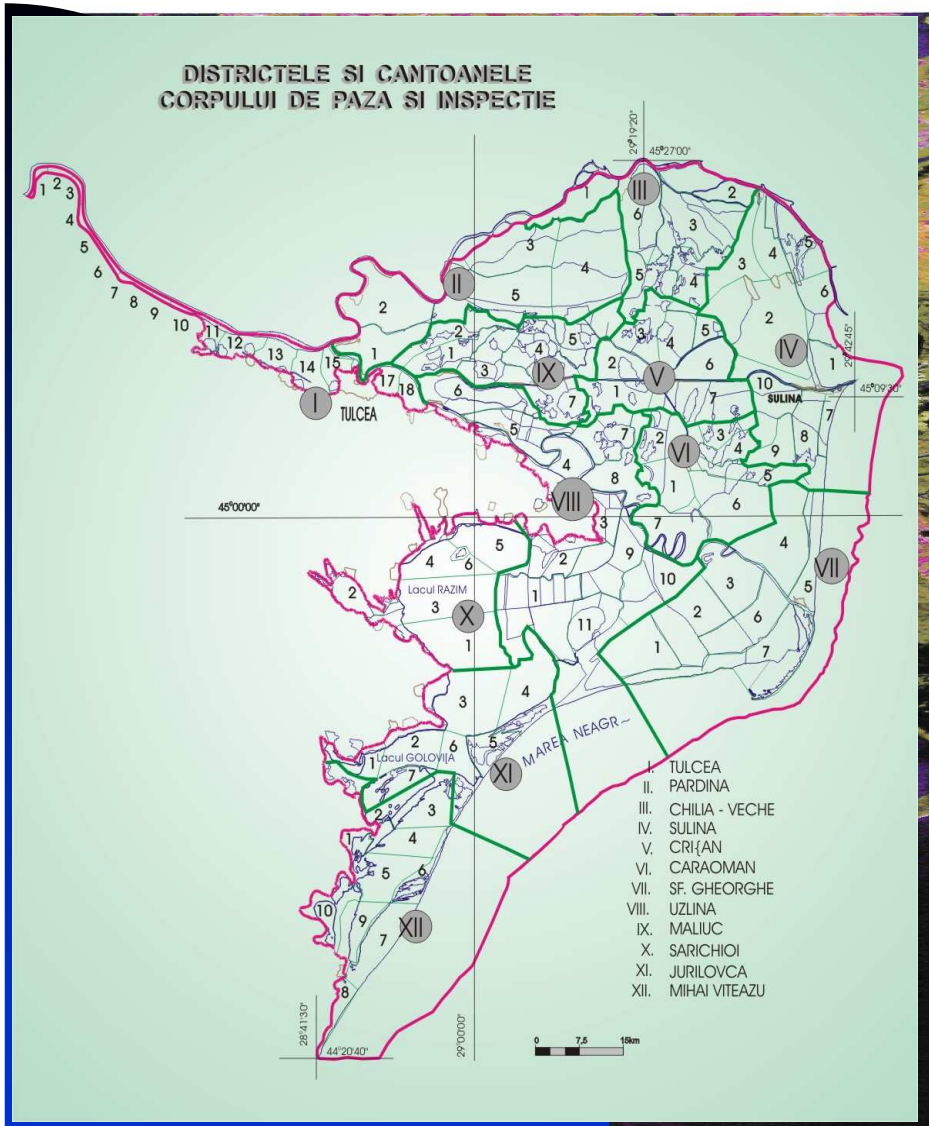


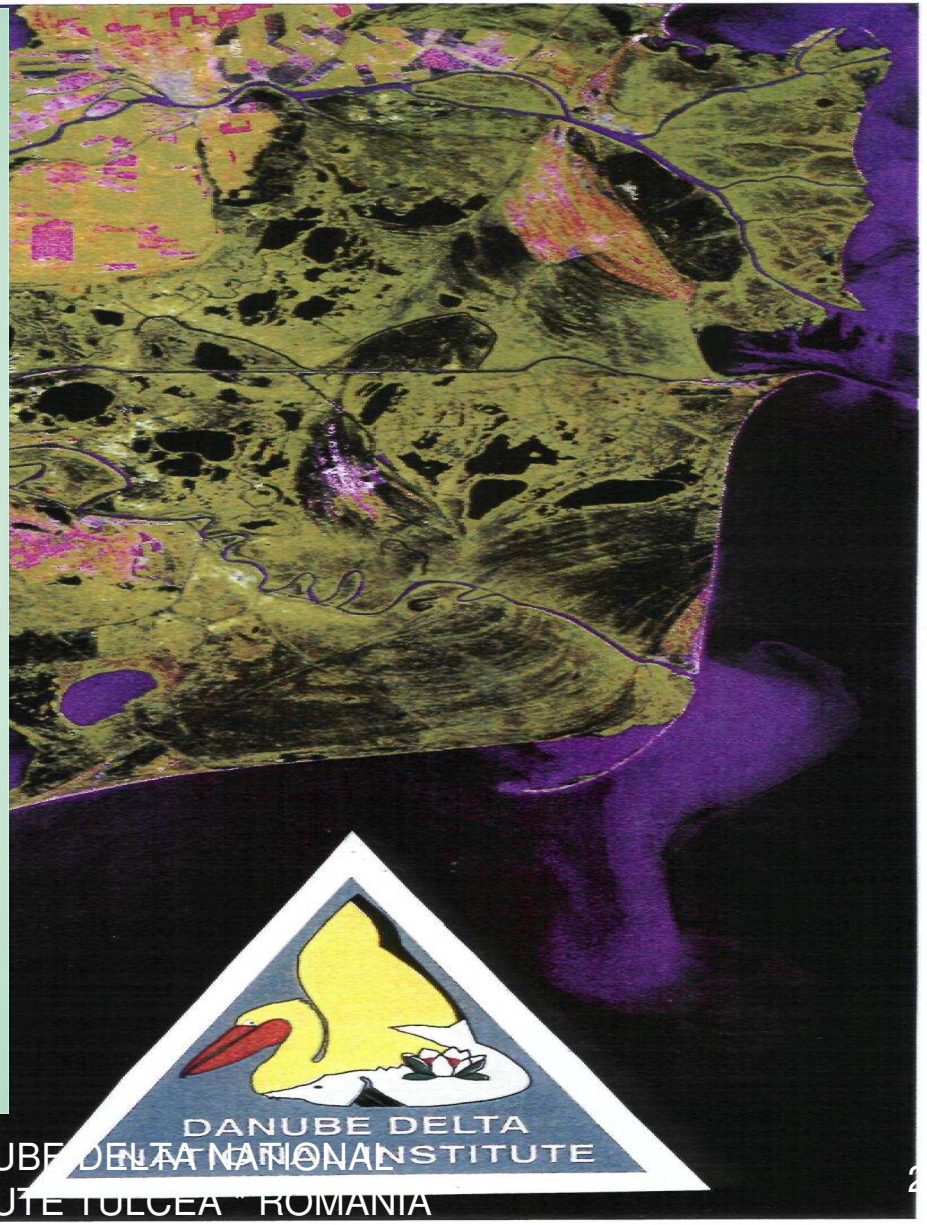
DANUBE DELTA BIOSPHERE RESERVE
E C O S Y S T E M S

DD	COD	RBDD	CORINE			
			Biotopes		Land Cover	
			Cod	Nomenclature	Cod	Nomenclature
	1.	**Water bodies**	**2**	Non marine water bodies	**5**	Water bodies
	1.1.	Running waters	**24.**	Running waters	**5.1**	Inland waters
1	**1.1.1.**	Danube and its main branches	**24.15**	Metapotamal and hypopotamal streams	**5.1.1.**	Natural or artificial water courses
2	**1.1.2.**	Channels and canals with active circulation of water	**24.15**		**5.1.1.**	
3	**1.1.3.**	Channels and canals in natural areas with free circulation of waters	**24.15**		**5.1.1.**	
4	**1.1.4.**	Channels and canals inside of polders, with controlled change of waters or absent	**24.15**		**5.1.1.**	
	1.2.	Standing freshwater	**22.**	Standing freshwater	**5.2.**	Water bodies
5	**1.2.1.**	Lakes with large aquatory or active change of waters	**22.1**	Permanent ponds and lakes	**5.1.2.**	Natural or artificial stretche of water
6	**1.2.2.**	Lakes with reduced change of water, partially covered with floating vegetation	**22.1**		**5.1.2.**	
7	**1.2.3.**	Lakes inside of polders, with controlled change of waters	**22.1**		**5.1.2.**	
	1.3.	Standing brackish and salt waters	**23**	Standing brackish and waters	**5.1.**	Inland waters
8	**1.3.1.**	Isolated lakes	**23.1**	Athalassic saline lakes	**5.1.2.**	Water bodies
	1.4.	Coastal lagoons	**21**	Coastal lagoons	**5.2**	Marine waters
9	**1.4.1.**	Connected lagoons to sea	**12.**	Sea inlets and coastal features	**5.2.3.**	Sea and ocean
	1.5.	Coastal marine zones				
10	**1.5.1.**	Semi-enclosed bays	**12.2**	Semi-enclosed coasts	**5.2.3.**	
11	**1.5.2.**	Coastal marine waters	**11.1**	Open marine waters	**5.2.3.**	


DANUBE DELTA BIOSPHERE RESERVE
ZONATION
TULCEA
BLACK SEA

DANUBE DELTA IRS SATELLITE IMAGE
BANDS 2,3,BSB FROM 31 MAY 1999

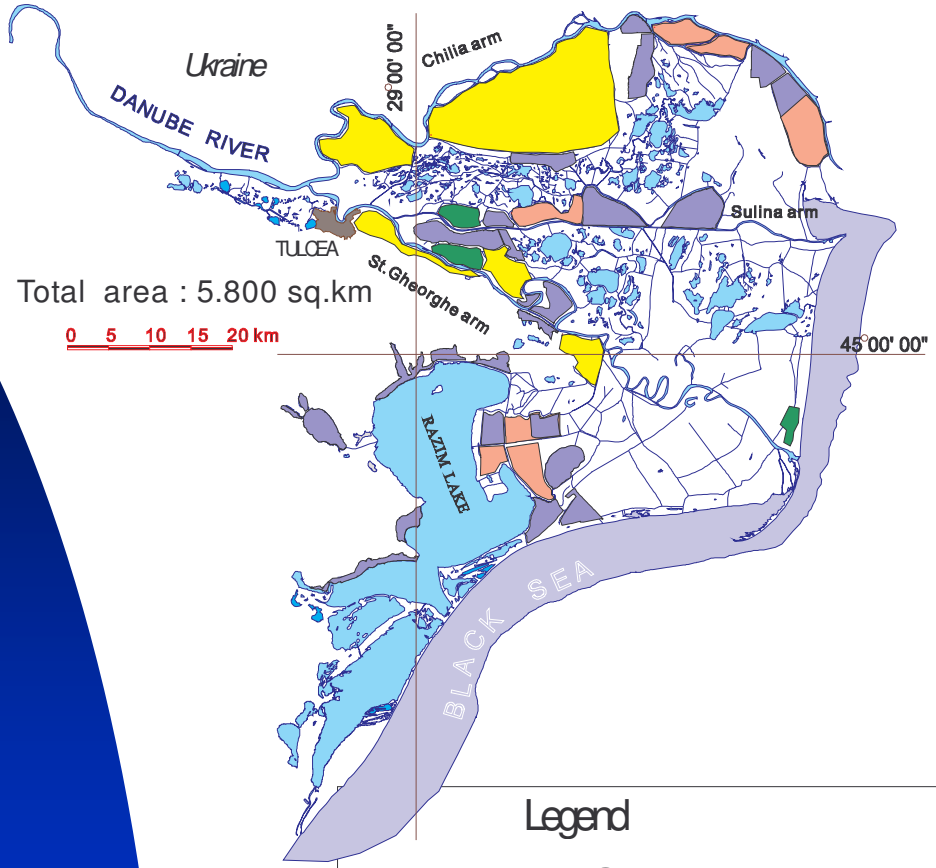




Natural Capital Structure

1. Natural and semi-natural ecological systems
1.1 River system – Danube River
1.2 Lentic systems – lakes, moor pool
1.3 Wetlands – delta, flooding areas, alluvial forests
2. Anthropic ecological systems
2.1 Agrosystems
2.2 Forest plantations
2.3 Fish ponds
2.4 Accumulation lakes

PREZENT LAND USE



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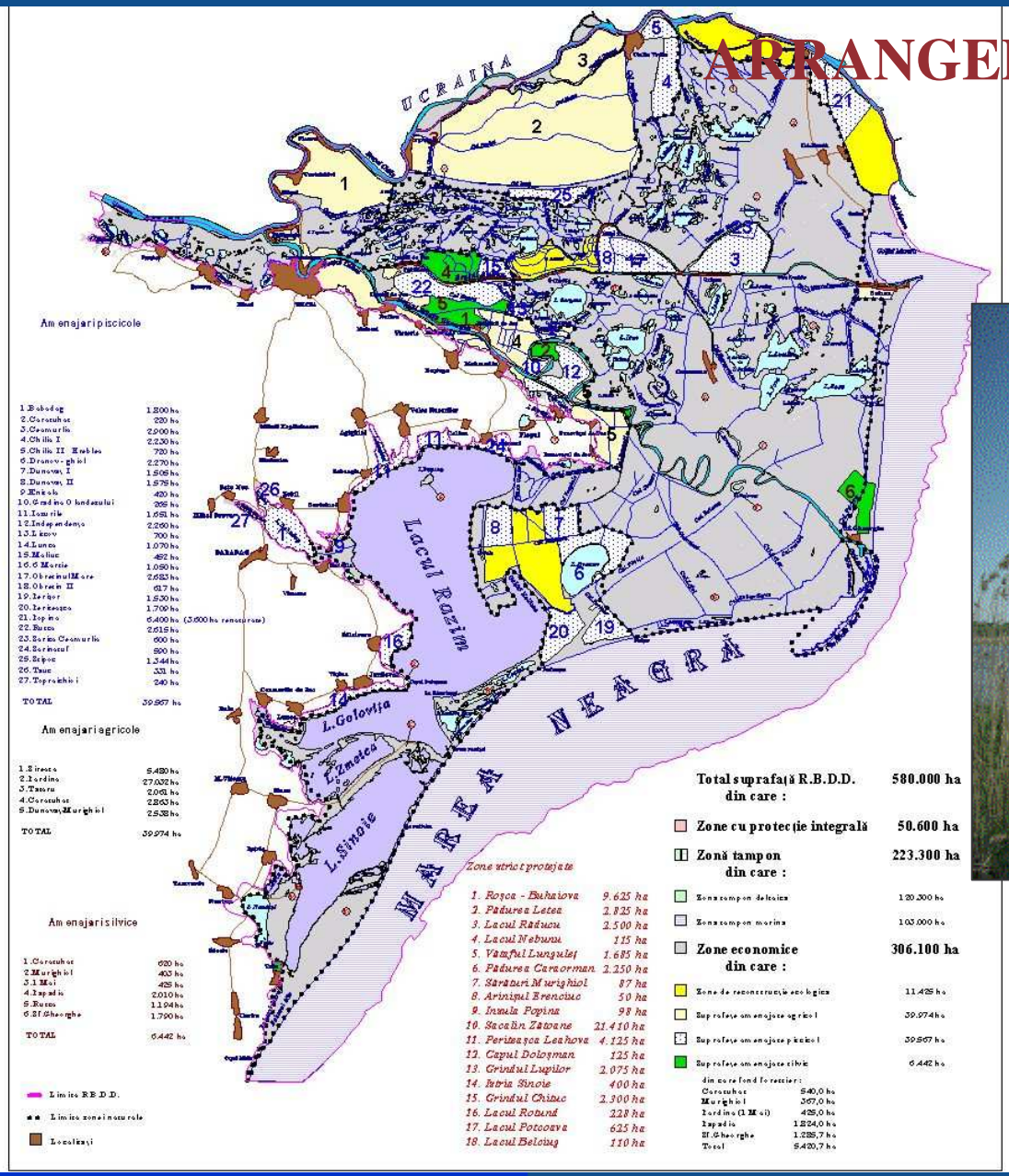
DANUBE DELTA BIOSPHERE RESERVE

ARRANGED COMPLEXES IN DDBR



LAND ZONATION

- Reed beds and fresh waters: 344,553 ha
  - Fish farms: 39,567 ha
- Marine waters: 140,492 ha
- Agricultural lands: 61,453 ha
  - Polders: 39,974 ha
- Forests: 22,796 ha
  - Polders: 6,442 ha
- Dams, buildings, roads: 3,143 ha
  - Polders: 6,442 ha
- Non-productive: 7,563 ha

NATURAL RESOURSES

THE MAIN NATURAL RESOURCES

- **Fish&fishery**
  - Total surface: 161,596 ha (17.38%)
  - Fresh water fishery
  - Migratory fishery
  - Coastal marine fishery

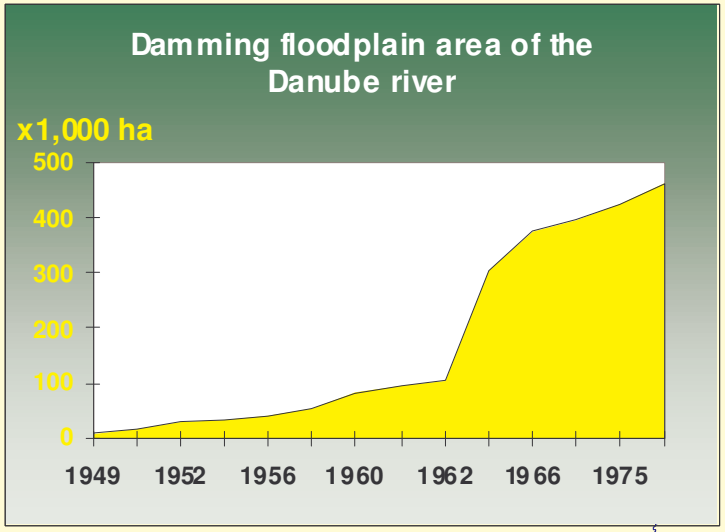
Fish&fishery: Dynamics of captures

- 10,000-20,000t (1960-1970)
- 15,000t (1970-1984)
- 5,000-6,000t (1984-1994)
- 3,000-5,000t (1994-2000)

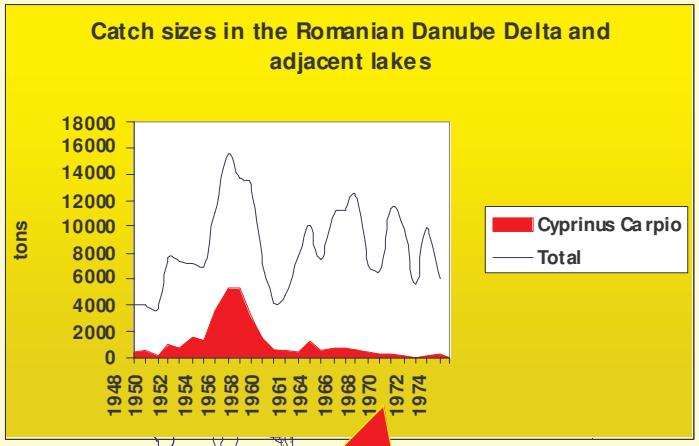
CONTROL FISHING RESULTS IN RESTORED AREAS INDICATES THE PRESENCE OF BOTH REPRODUCERS AND YOUNG FISHES

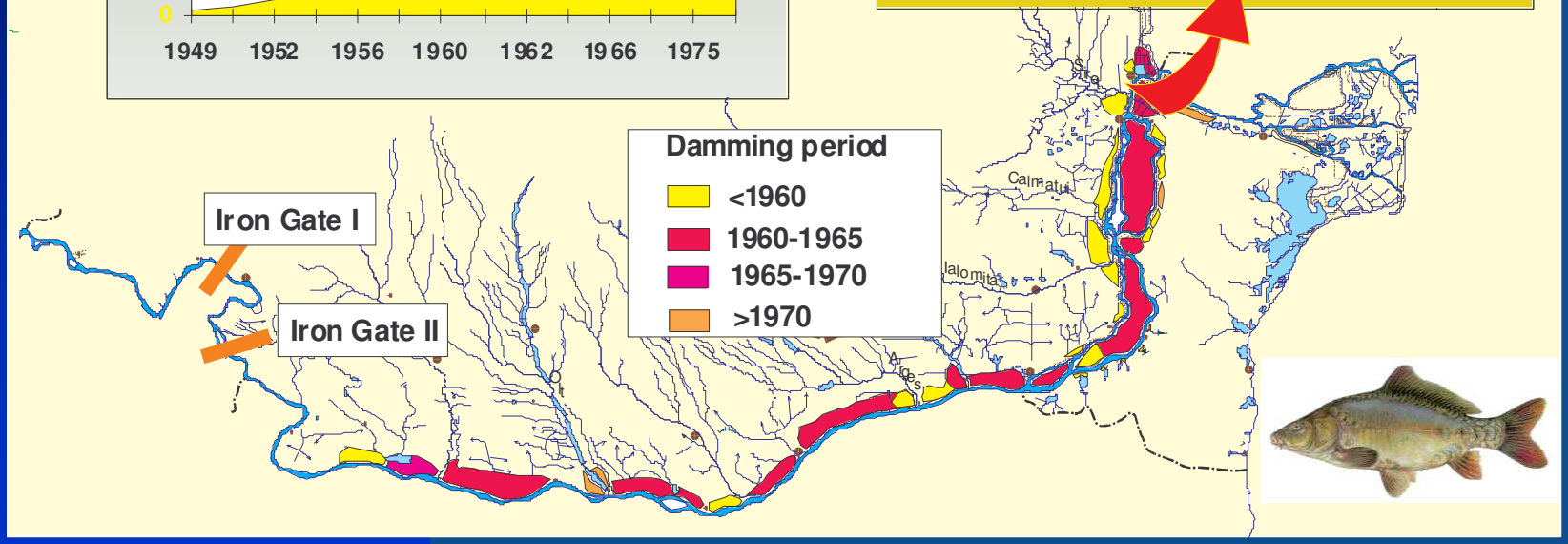
DAMMING FLOODPLAIN UPSTREAM THE DELTA

DAMMING OF DANUBE RIVER FLOODPLAIN

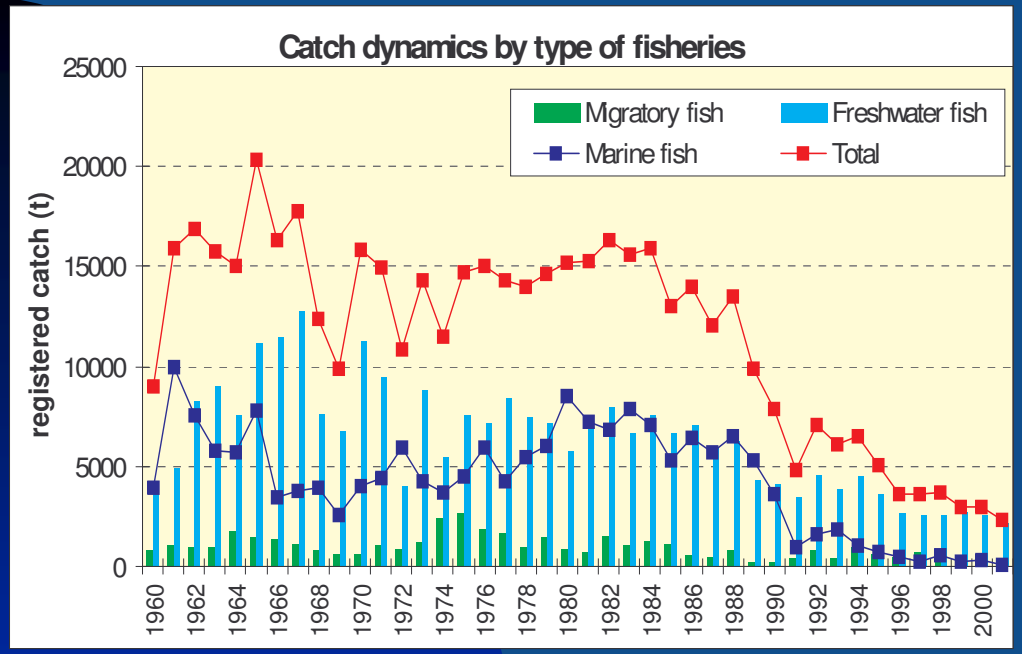


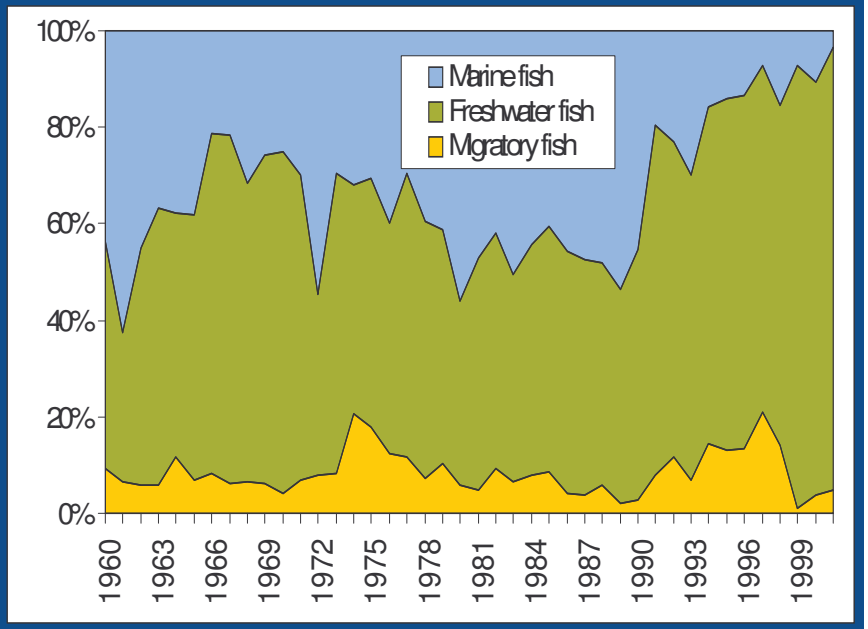
IMPACT ON DANUBE DELTA's FISHERY

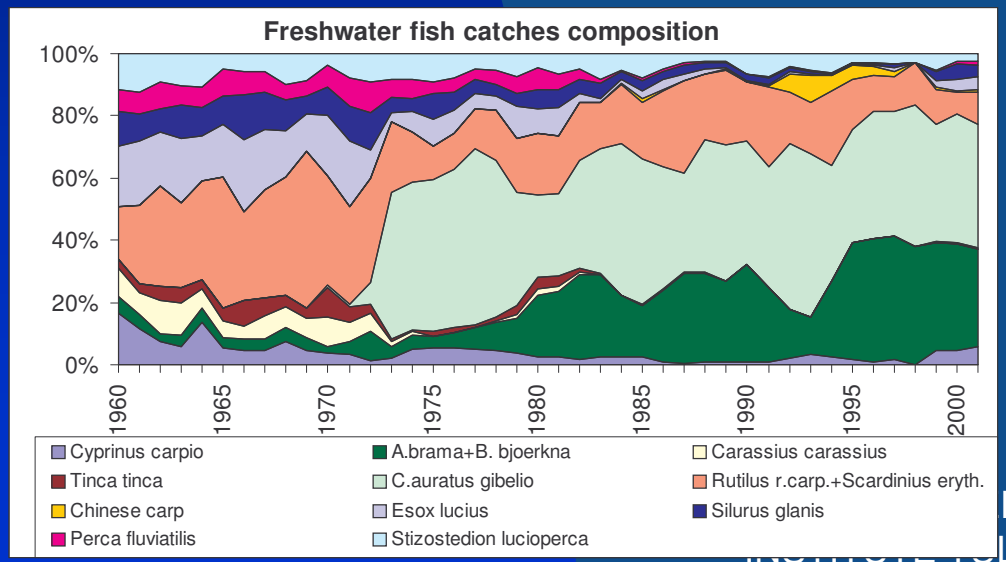


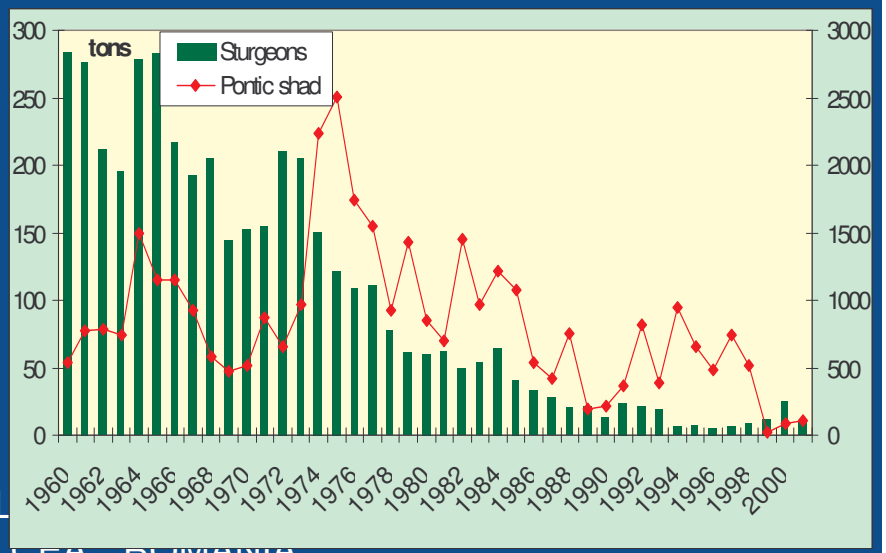


FISHERIES STATUS AND EVOLUTION - 1960-2001

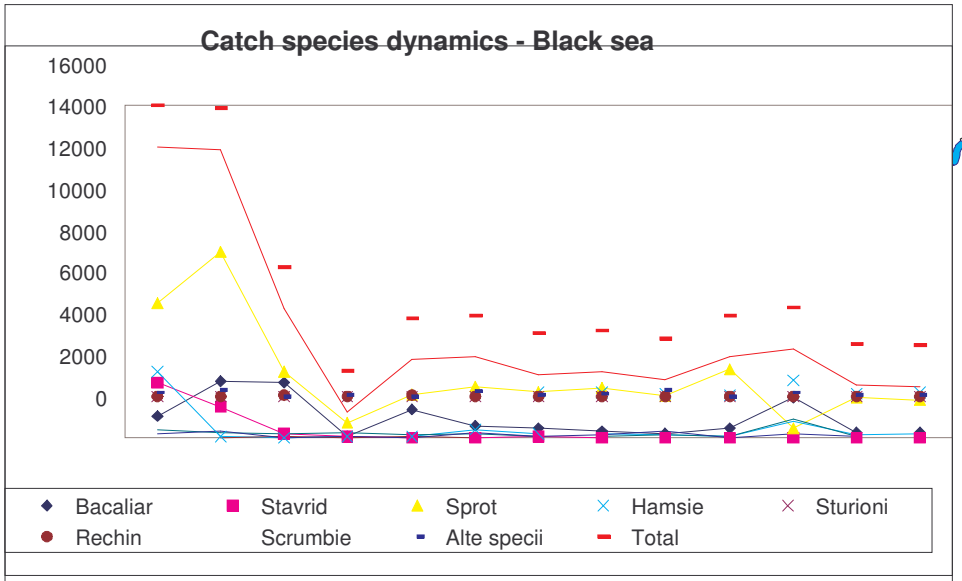


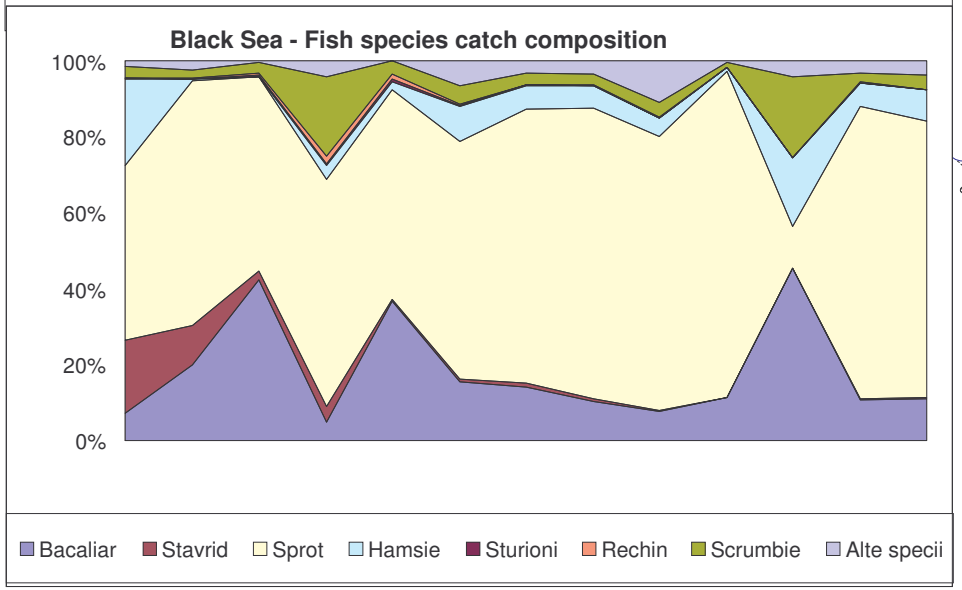


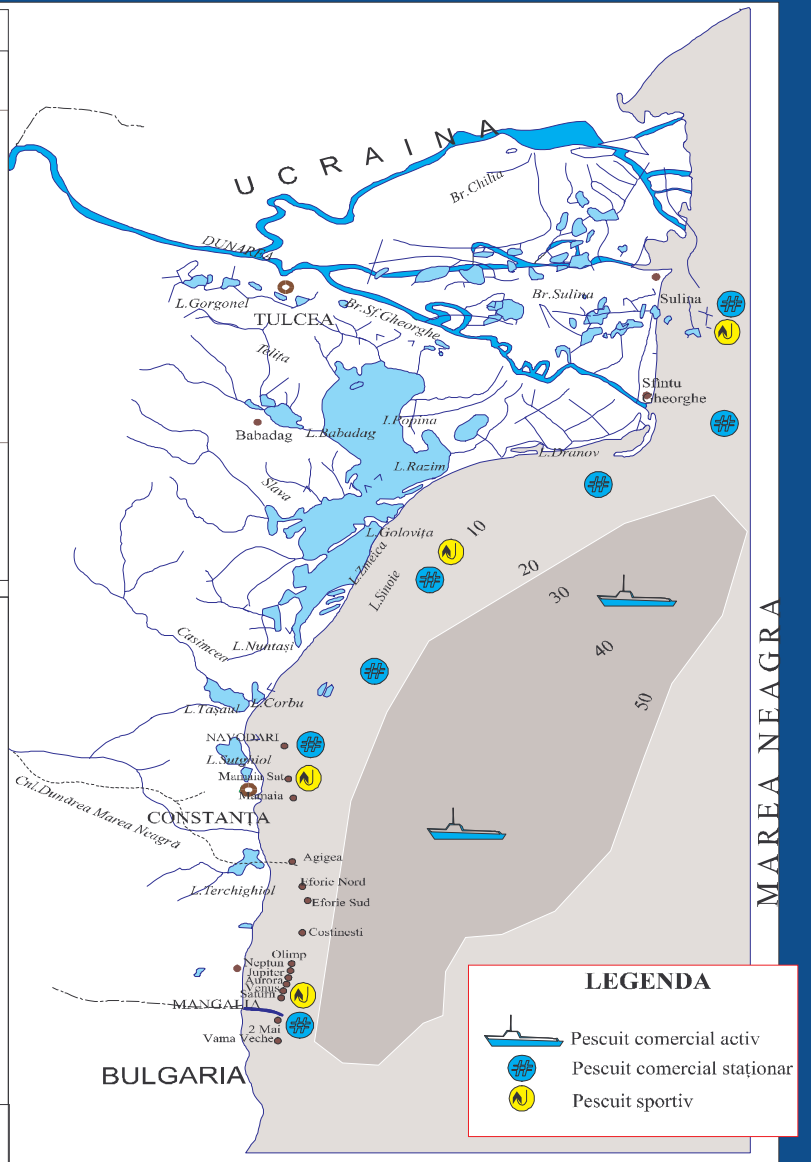




Black Sea - Fishery







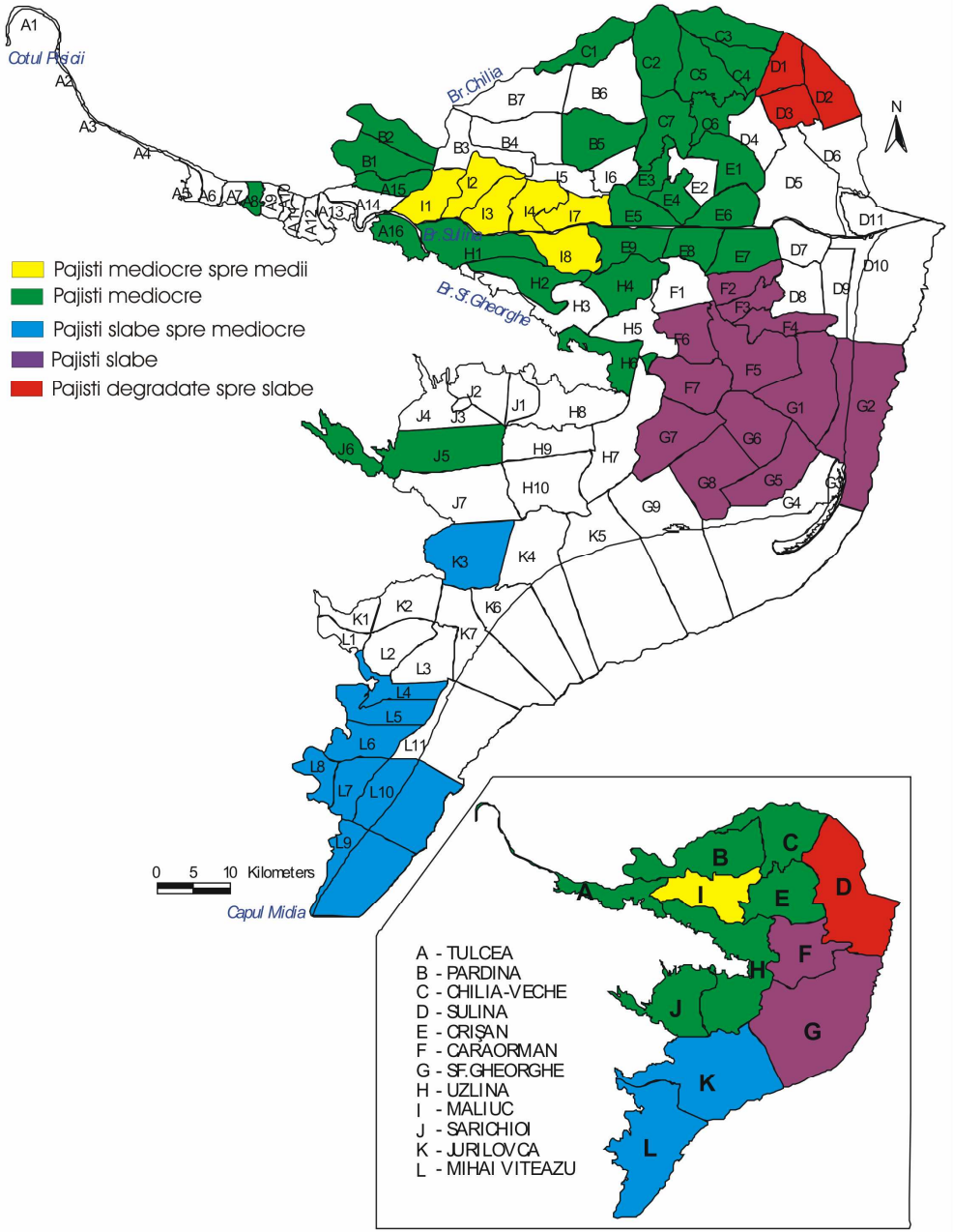
Reed

Nr. crt.	Denumirea zonei stuficole	Suprafaţa zonei [ha]	Cantitatea de stuf recoltabil [to]	Productivitatea [to/ha]
1	Şontea - Fortuna	1369.7	1498.4518	1.1
2	Matita - Merhei	4290.4	4719.44	1.1
3	Magearu	6877.3	7496.257	1.1
4	Gorgova-Uzlina	8980.6	9878.66	1.1
5	Erenciuc	1480	1628	1.1
6	Roşu-Puiu-Împuţita	7191.3	10637	1.5
7	Cordon Litoral	790.9	4071	5.1
8	Holbina-Dranov	10572.3	11523.807	1.1
9	Zmeica-Goloviţa	2200.8	11187	5.1
10	Sinoie	909.2	4568	5.0
11	Buhaz	389.8	1958	5.0
12	Somova-Parcheş	1683	1834.47	1.1
	TOTAL	46735.3	71000	1.5

Natural grassland

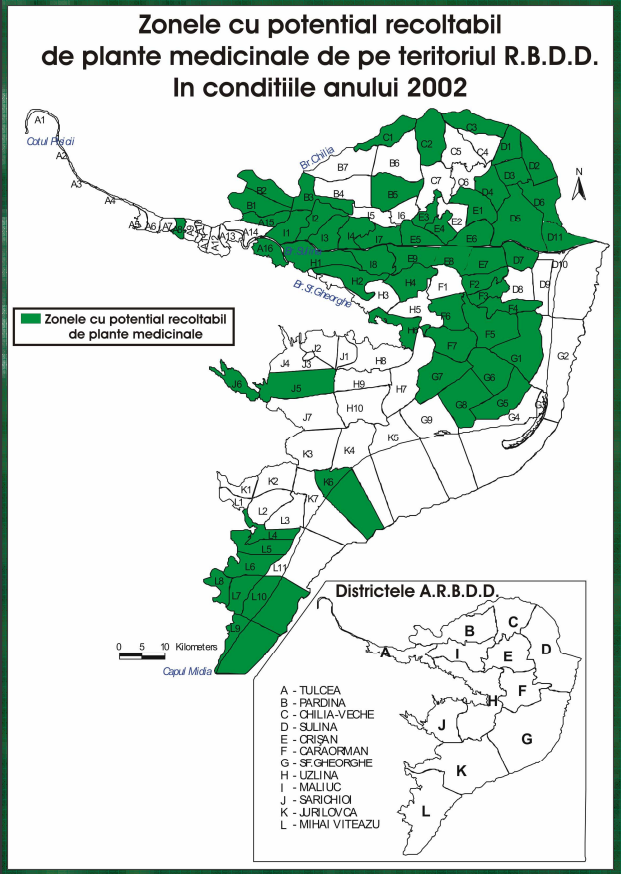
Districtul	Cantoanele cu pajisti	Suprafata [ha]	Clasa	Caracterizarea pajistii	Productia medie [to/ha]	U.V.M./ha
A - Tulcea	8, 15, 16	505,07	VI - VII	mediocra	16	0,61 - 1,00
B - Pardina	1, 2, 3, 5	2203,01	VII	mediocra	11	0,61 - 0,80
C - Chilia Veche	1, 2, 3	1692,66	VII	mediocra	14	0,61 - 0,81
D - Sulina	1, 2, 3, 4, 5, 6, 7, 10, 11	4720,49	VIII-IX	degradata spre slaba	9	0,21 - 0,60
E - CRIŞAN	1, 3, 4, 5, 6, 7, 8, 9	1168,91	VI - VII	mediocra	16	0,61 - 1,00
F - Caraorman	2, 3, 4, 5, 6, 7	1912,95	VIII	slaba	9	0,41 - 0,60
G - SF. GHEORGHE	1, 2, 5, 6, 7, 8	5364,36	VIII	slaba	11	0,41 - 0,61
H - UZLINA	1, 2, 4, 6	1540,94	VI - VII	mediocra	19	0,61 - 1,00
I - MALIUC	1, 2, 3, 4, 7, 8	1126,25	VI	mediocra spre medii	22	0,81 - 1,00
J - SARICHIOI	5, 6	81,82	VI - VII	mediocra	15	0,61 - 1,00
K - JURILOVCA	3	70,89	VII	mediocra	16	0,61 - 0,80
L - MIHAI VITEAZU	4, 5, 6, 7, 8, 9, 10	4051	VII - VIII	slaba spre mediocra	18	0,41 -0,80
TOTAL		24438,35	VII	mediocra	14,7	0,70

Categoriile de pajisti de pe teritoriul R.B.D.D.
In conditiile anului 2002



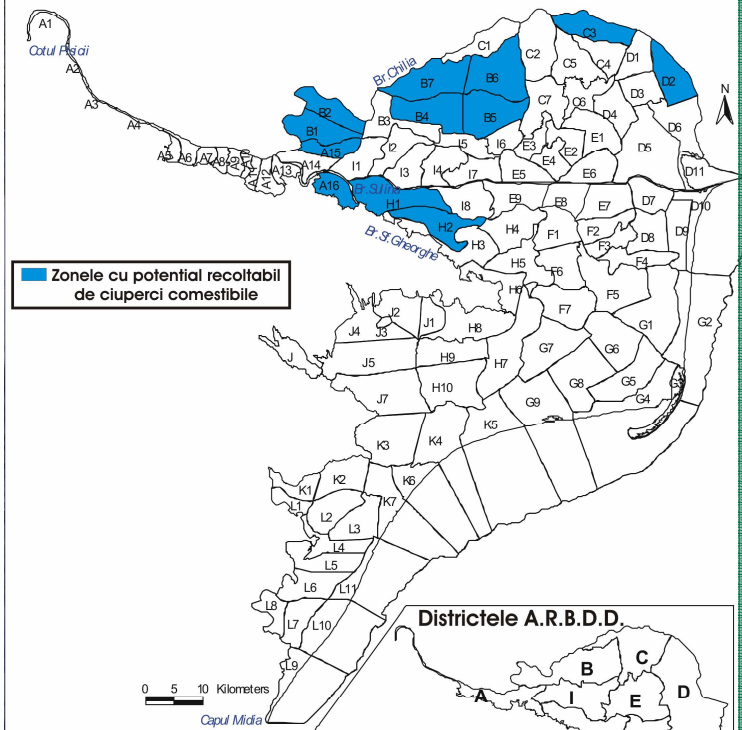
Medicinal Plants

Districtul	Cantoanele cu potential recoltabil de plante medicinale	Suprafata [ha]	Numar specii de plante medicinale	Total cantitate recoltabilă (kg s.u.)
A - Tulcea	8, 15, 16	505,07	28	1090
B - Pardina	1, 2, 3, 5	2203,01	28	930
C - Chilia Veche	1, 2, 3	1692,66	29	845
D - Sulina	1, 2, 3, 4, 5, 6, 7, 10, 11	4720,49	24	1070
E - CRIŞAN	1, 3, 4, 5, 6, 7, 8, 9	1168,91	28	920
F - Caraorman	2, 3, 4, 5, 6, 7	1912,95	30	1315
G - SF. GHEORGHE	1, 2, 5, 6, 7, 8	5364,36	29	1720
H - UZLINA	1, 2, 4, 6	1540,94	27	1225
I - MALIUC	1, 2, 3, 4, 7, 8	1126,25	31	1630
J - SARICHIOI	5, 6	81,82	27	490
K - JURILOVCA	3	70,89	22	195
L - MIHAI VITEAZU	4, 5, 6, 7, 8, 9, 10	4051	29	1420
TOTAL		24438,35	97	12850



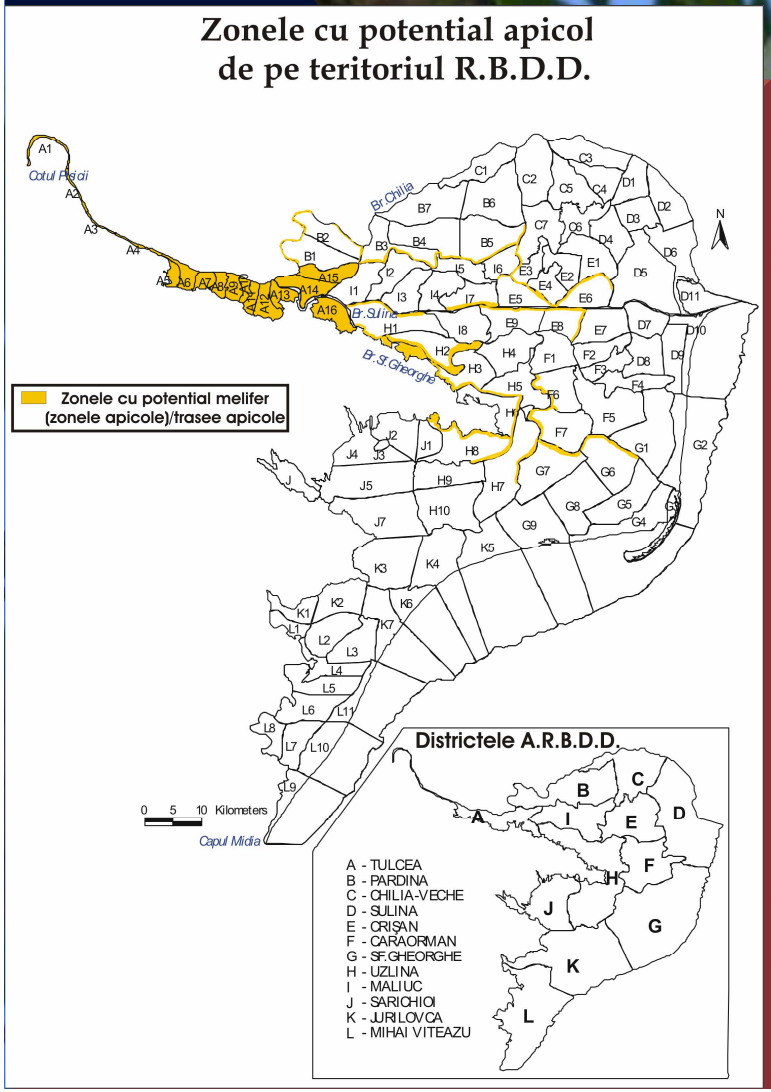
Mushrooms

Zonele cu potential recoltabil de ciuperci comestibile de pe teritoriul R.B.D.D. în conditiile anului 2002

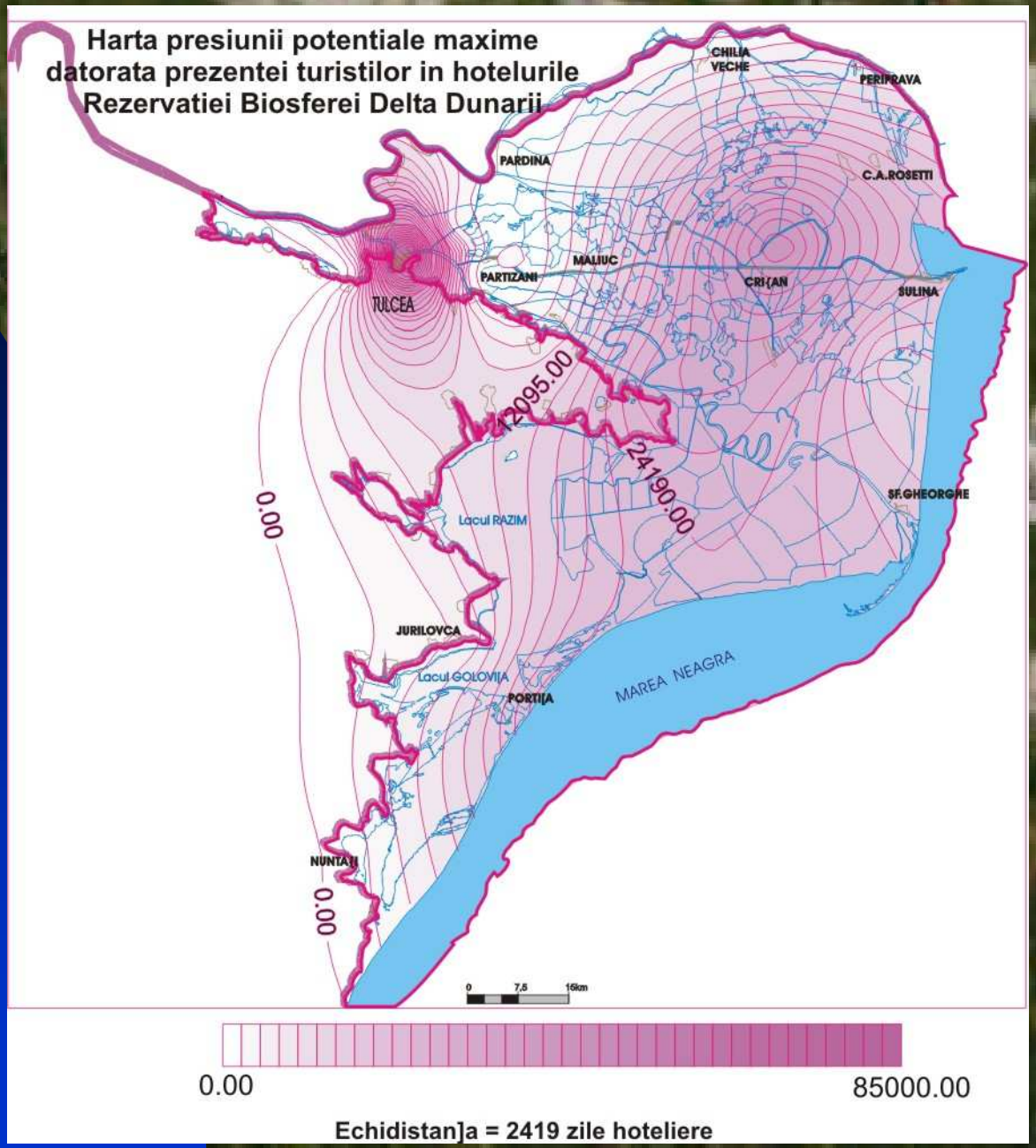


District	Cant on	Suprafaţa [Ha]	Zona	Locul	Specia	Productia totala tone / specie	Producţi a totală / canton
A. Tulcea	15	130	Pătlăgeanc a	pădure	2. A. silvaticus	13	28
					3. A. campestris	15	
	16	1890	Sălceni, Sireasa	pădure + t. agricol	1. A. arvensis	5	20
					2. A. silvaticus	8	
					3. A. campestris	7	
B. Pardina	1	1730	Sireasa	teren agricol	1. A. arvensis	9	15
					3. A. campestris	6	
	2	630	Sireasa	teren agricol	1. A. arvensis	7	10
					3. A. campestris	3	
	4	1130	Pardina	teren agricol	1. A. arvensis	13	24
					3. A. campestris	11	
	5	1180	Tatanir	teren agricol	1. A. arvensis	16	31
					3. A. campestris	15	
	6 7	680	Plopu	teren agricol	1. A. arvensis	20	37
					3. A. campestris	17	
C. Chilia	3	345	Ostrovul Cernovca	pajişti	1. A. arvensis	6	7
					3. A. campestris	1	
D. Sulina	2	420	Popina	amenajare piscicolă	1. A. arvensis	7	10
					3. A. campestris	3	
					1. A. arvensis	3	

Honey bees



DANUBE DELTA NATIONAL
INSTITUTE TULCEA * ROMANIA


Harta presiunii potentiale maxime
datorata prezentei turistilor in hotelurile
Rezervatiei Biosferei Delta Dunarii
CHILIA VECHE
PERIPRAVA
PARDINA
C.A.ROSETTI
MALIUC
PARTIZANI
CRI{AN
SULINA
TULCEA
12095.00
24190.00
0.00
SF.GHEORGHE
Lacul RAZIM
JURILOVCA
Lacul GOLOVI{A
PORTI{A
MAREA NEAGRA
NUNTA{I
0.00
0
7,5
15km
0.00
85000.00
Echidistan]a = 2419 zile hoteliere

Biodiversity and ecological dynamics in the DDBR

The DDBR is internationally reputed for its birds populations. Both in terms of sheer numbers using area and in terms of rare species including 61% from the world population of pygmy cormorant (*Phalacrocorax pygmaeus*), over 50 % of the white pelican (*Pelicanus onocrotalus*), 24 % of red breasted goose (*Branta ruficollis*), and 30 % of glossy ibis (*Plegadis falcinellus*).

Its mosaic of habitats is the richest in Romania and supports a wide variety of interesting communities of plants and animals, including many species that are important at national, regional or even global level.

Vegetation and flora

-1 689 species of plants have been identified, 285 being new for the delta and 34 new for Romania. There are three main categories of vegetation:

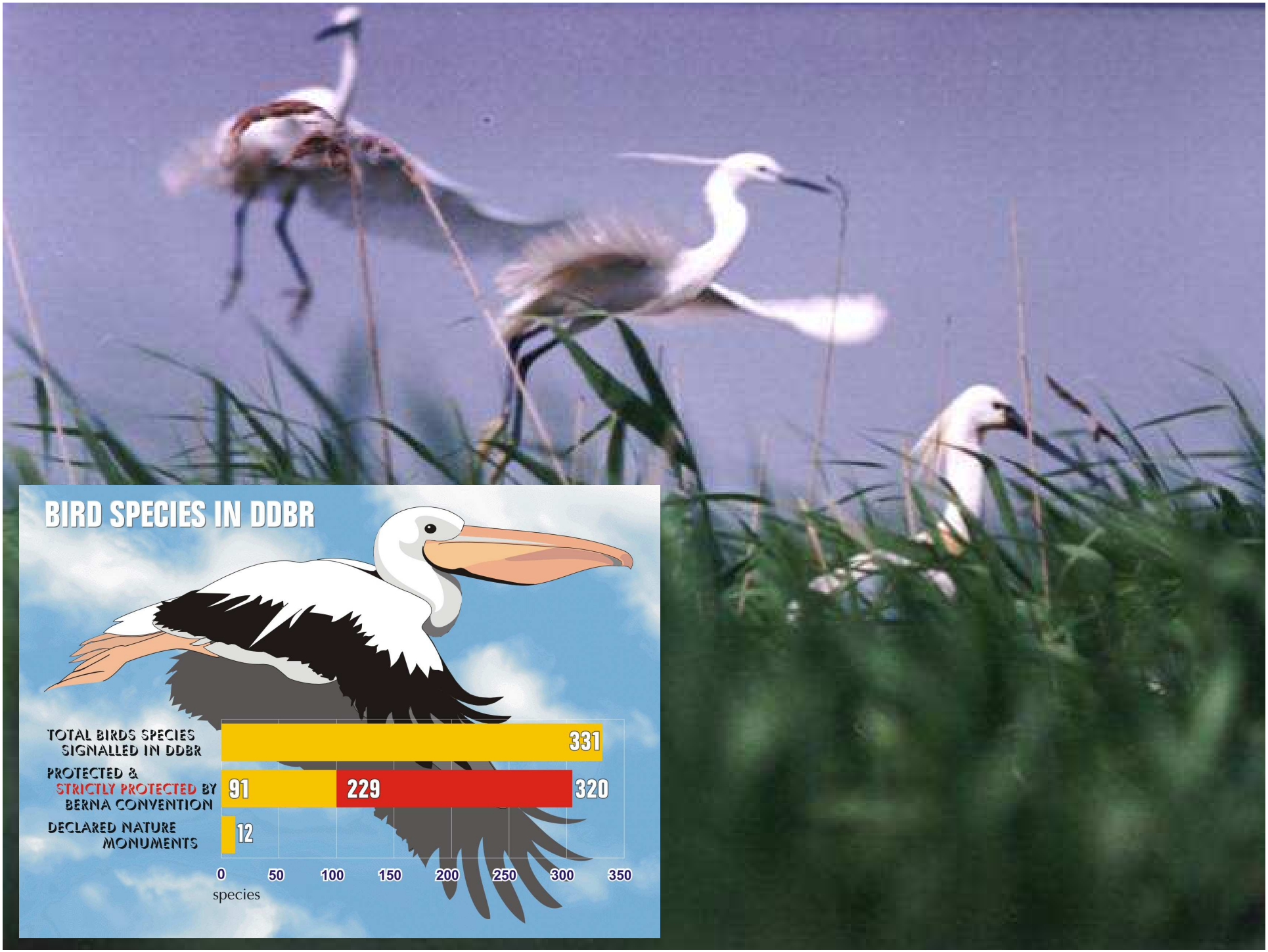
- **aquatic vegetation (floating and submerse);**
- **grassland vegetation;**
- **forest vegetation.**

Fauna

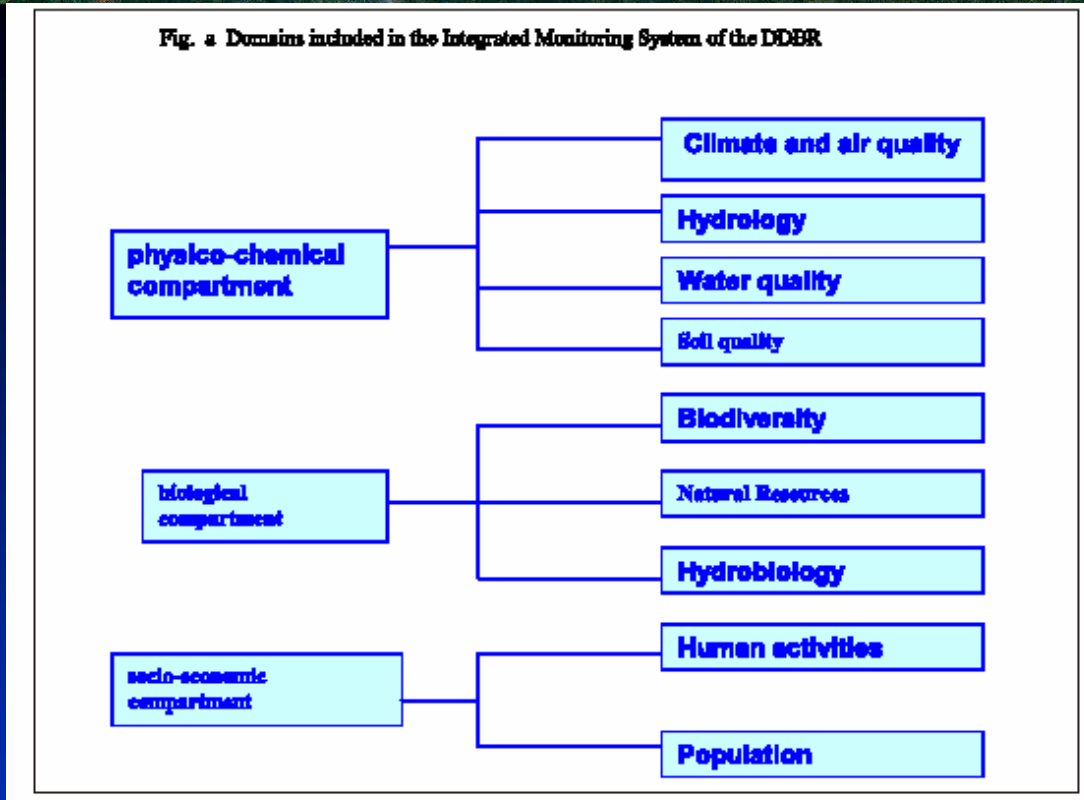
There have been recently monitored 3 460 species, 260 being new for Romania and 37 new for science.

- The best-represented group is the invertebrates one, with over 2 157 species. The second largest group are the worms, with 413 species.

- The most numerous group of vertebrates are birds, with 325 species, followed by the group of fish.


BIRD SPECIES IN DDBR
TOTAL BIRDS SPECIES SIGNALLED IN DDBR
331
PROTECTED & STRICTLY PROTECTED BY BERNA CONVENTION
91
229
320
DECLARED NATURE MONUMENTS
12
0
50
100
150
200
250
300
350
species


FLORA
Total number – 1689 species of plants
382 species are included in THE RED LIST



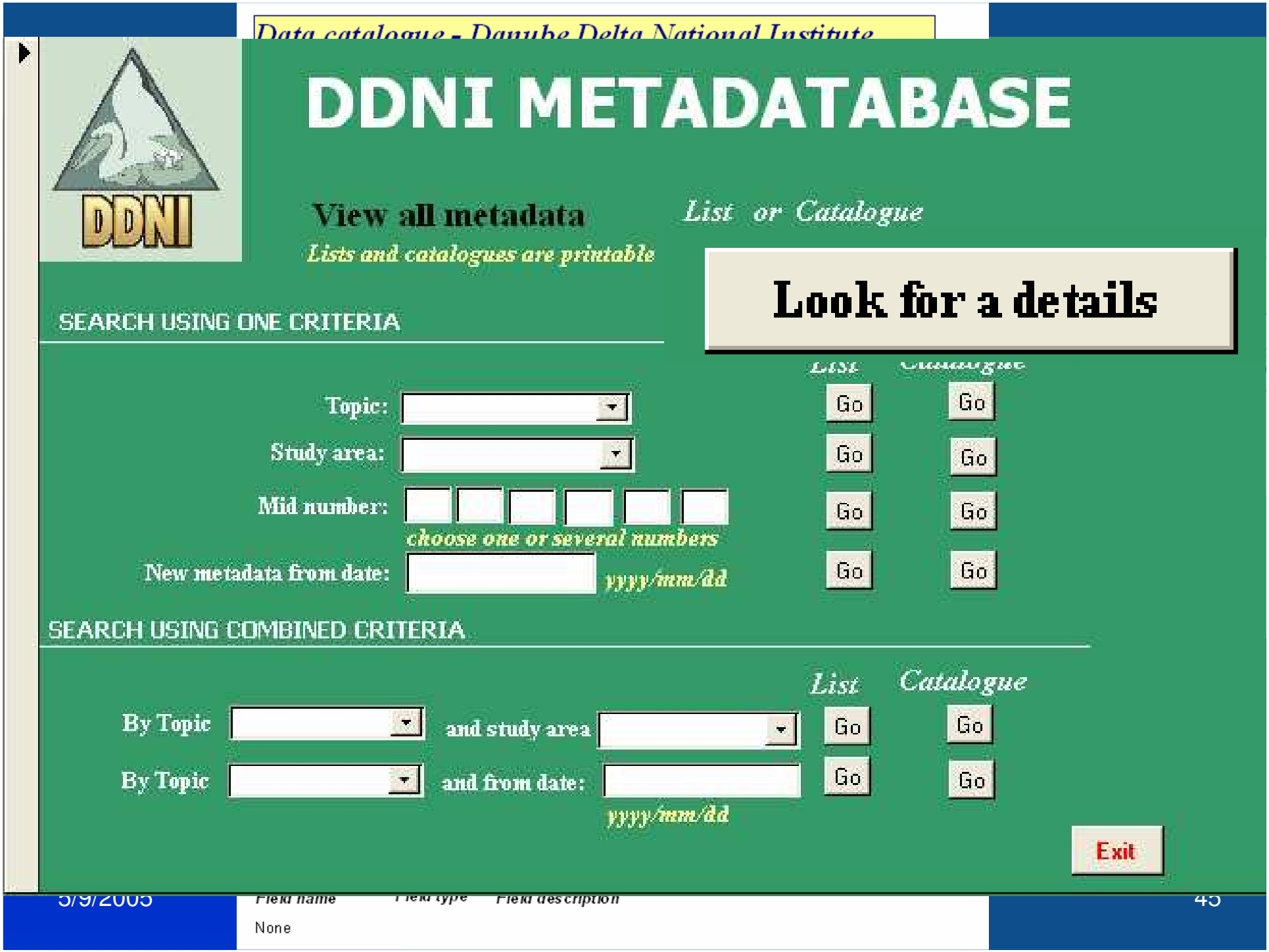
DDNIGIS: Integrated Monitoring System (IMS) For Danube Delta National Institute

Main Objectives

- Standard Methodology for sampling
- Standard Methodology for analyzing samples

DDNIGIS:IMS for Data management and visualisation

- Data organisation
- Increased dissemination and information on data
- Increase data sharing and interdisciplinary approach
- Improve research analysis and outputs production


Data catalogue - Danube Delta National Institute
DDNI METADATABASE
DDNI
View all metadata
Lists and catalogues are printable
List or Catalogue
Look for a details
SEARCH USING ONE CRITERIA
List
Catalogue
Topic:
Go
Go
Study area:
Go
Go
Mid number:
Go
Go
choose one or several numbers
New metadata from date:
yyyy/mm/dd
Go
Go
SEARCH USING COMBINED CRITERIA
List
Catalogue
By Topic
and study area
Go
Go
By Topic
and from date:
Go
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yyyy/mm/dd
Exit
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Field type
Field description
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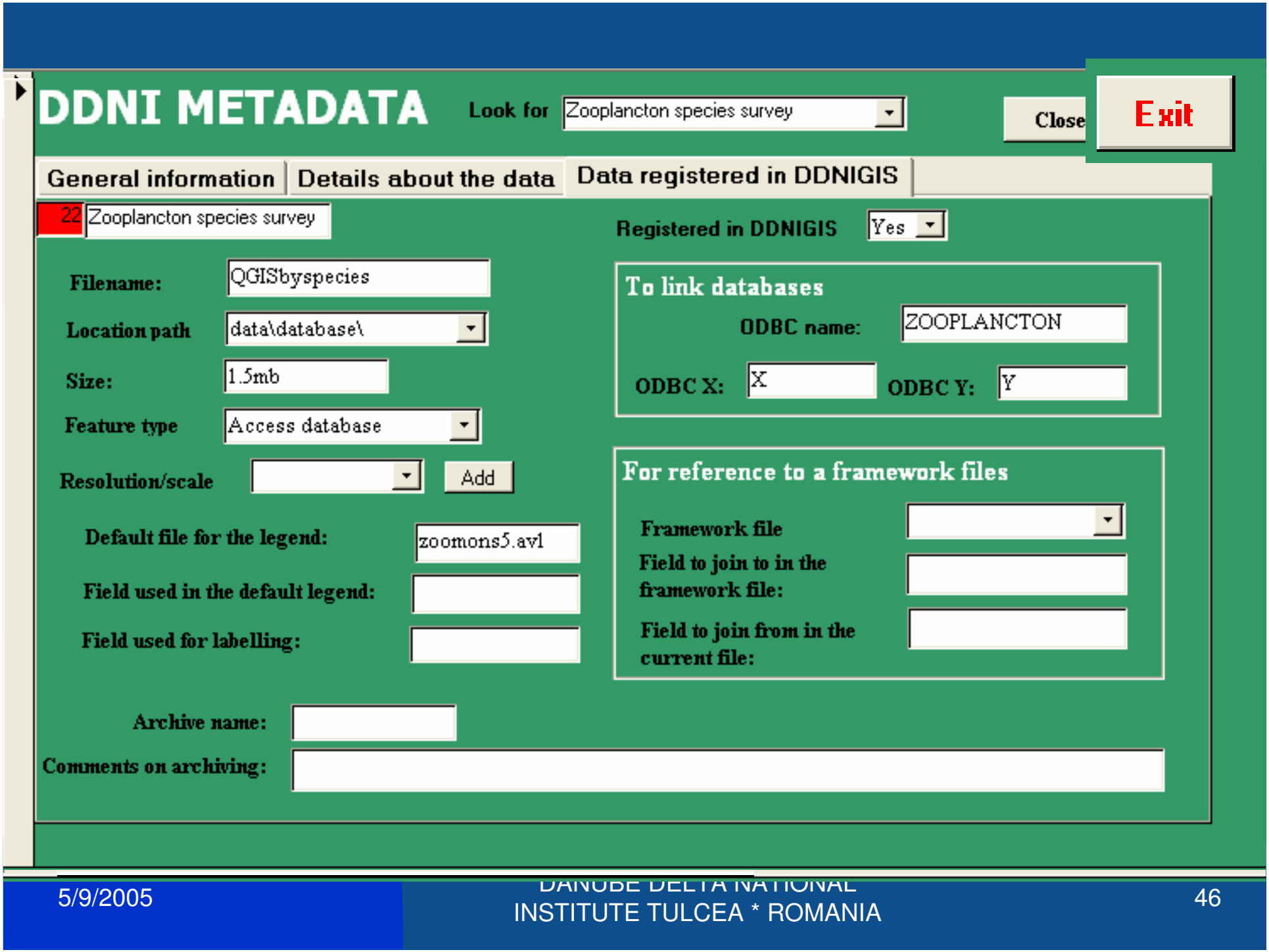
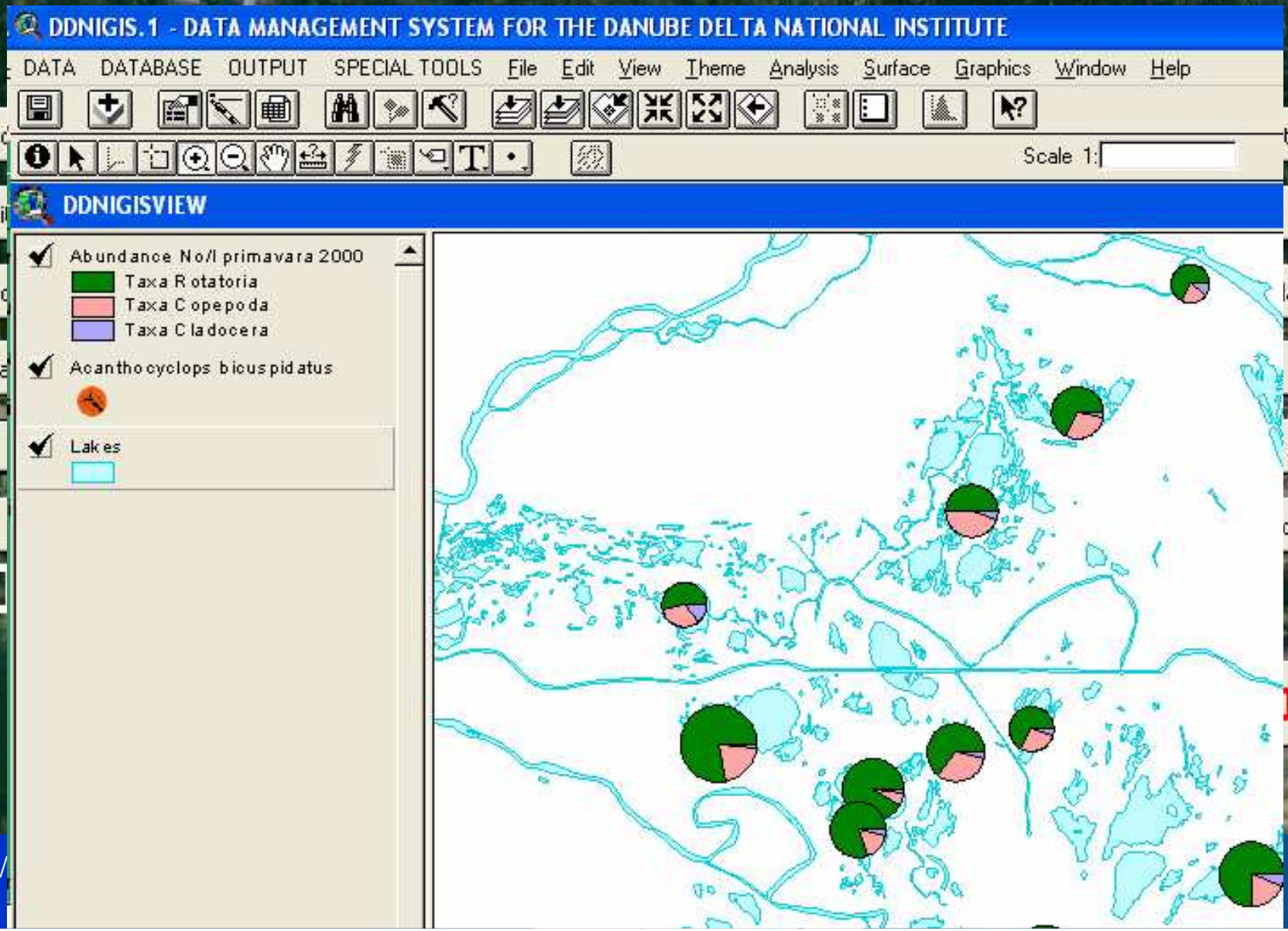

DDNI METADATA
Look for
Zooplancton species survey
Close
Exit
General information
Details about the data
Data registered in DDNIGIS
22
Zooplancton species survey
Registered in DDNIGIS
Yes
Filename:
QGISbyspecies
Location path
data\database\
Size:
1.5mb
Feature type
Access database
Resolution/scale
Add
To link databases
ODBC name:
ZOOPLANCTON
ODBC X:
X
ODBC Y:
Y
For reference to a framework files
Framework file
Field to join to in the framework file:
Field to join from in the current file:
Default file for the legend:
zoomons5.avl
Field used in the default legend:
Field used for labelling:
Archive name:
Comments on archiving:

Structure IMS DATABASES

Chemistry



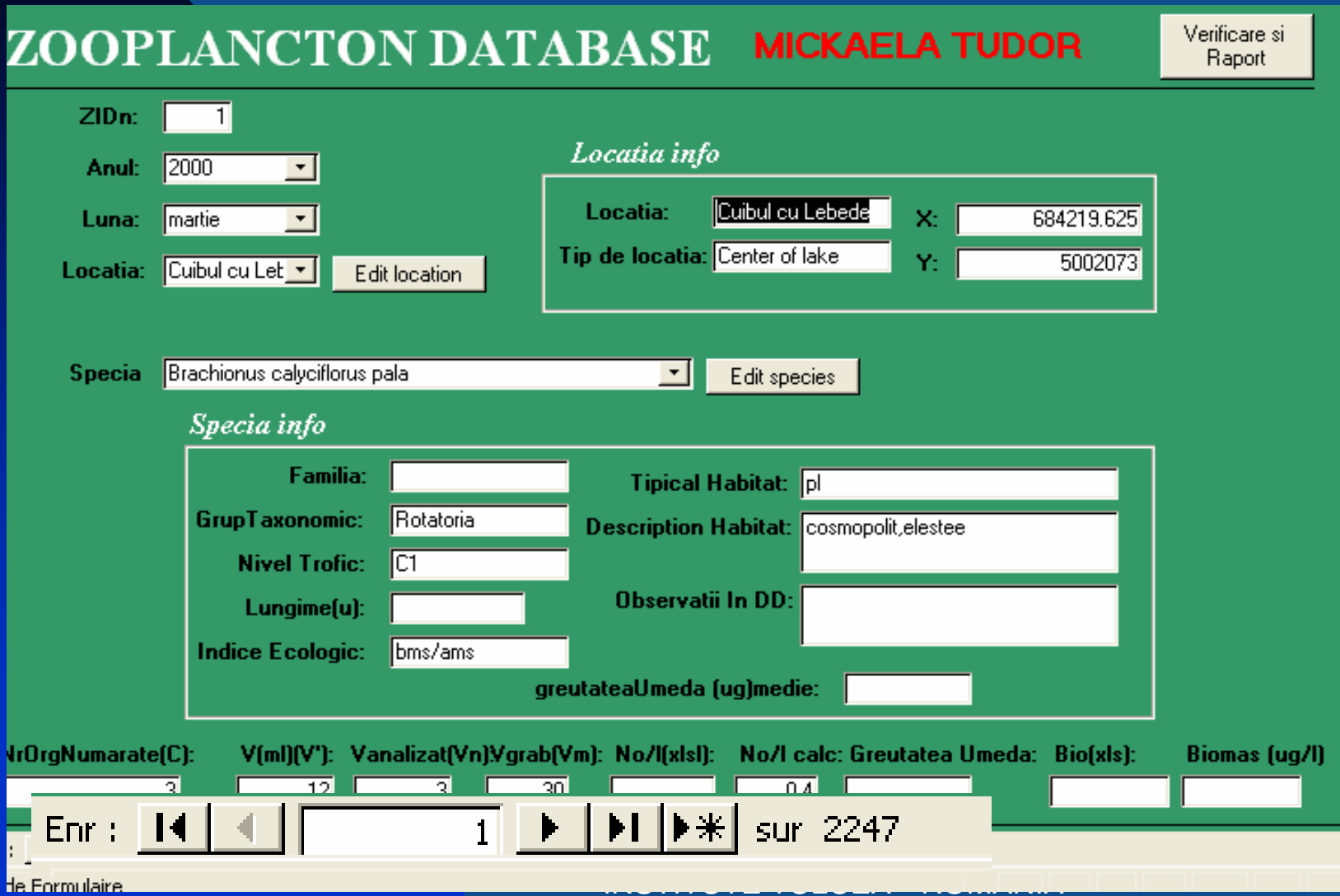
Data storage

A	B	C	D	E	F	G	H	I
Grup.tax.03.	specia	. org. numarate(	V' (ml.)	V. analizat		No/l	Greutatea u	Biomasa(ug/l)
Fam. Gastropc	Ascomorpha ecaudis	6	10	1		2	5	10
Fam. Asplanch	Asplachna sieboldi	10	10	1		3,3333333	10,5	35
Fam. Brachion	Brachionus calyciflorus amfic	9	10	1		3	2,2	6,6
Fam. Brachion	Brach angularis bidens	13	10	1		4,3333333	0,43	1,863333333
Fam. Brachion	Brach calyciflorus pala	5	10	1		1,6666667	3	5
Fam. Brachion	Brachionus urceolaris	1	10	1		0,3333333	0,3	0,1
Fam Testudine	Filinia longiseta	8	10	1		2,6666667	0,4	1,066666667
Fam. Brachion	Keratella cochlearis	4	10	1		1,3333333	0,21	0,28
Fam. Brachion	Keratella quadrata	17	10	1		5,6666667	0,2	1,133333333
Fam Synchaet	Syncheta pectinata	1	10	1		0,3333333	5	1,666666667
Fam. Brachion	Notholca labis	1	10	1		0,3333333	0,7	0,233333333
Fam. Brachion	Rinoglena frontalis	4	10	1		1,3333333	1	1,333333333
Fam Synchaet	Polyartra euriptera	17	10	1		5,6666667	0,6	3,4
						32		67,67666667
Fam Cyclopida	Stadiul nauplial	50	10	1		16,666667	0,7	11,66666667
Fam Cyclopida	Achantocyclops viridis	5	10	1		1,6666667	1,3	2,166666667
Fam. Canthoca	Chanthocamptus staphylinus	9	10	1		3	13	39
Fam. Canthoca	Atheyella trispinosa	5	10	1		1,6666667	13	21,66666667
						23		74,5
Fam. Chydorid	Cydorus sphaericus	29	10	1		9,6666667	12	116
Fam. Chydorid	Pseudochydorus globosus	5	10	1		1,6666667	18	30
Fam. Bosminid	Bosmina longirostris	6	10	1		2	10	20
						13,333333		166
GrupTax.04	Specia	. org. numarate(	V' (ml.)	V. analizat		No/l	Greutatea u	Biomasa(ug/l)
Fam. Gastropc	Ascomorpha saltans	77	10	1		25,666667	0,3	7,7
Fam. Synchaet	Polyarthra vulgaris	31	10	1		10,333333	0,600	6,2
Fam. Synchaet	Polyarthra minor	19	10	1		6,3333333	0,5	3,166666667
Fam. Brachion	Keratella cochlearis	4	10	1		1,3333333	0,21	0,28

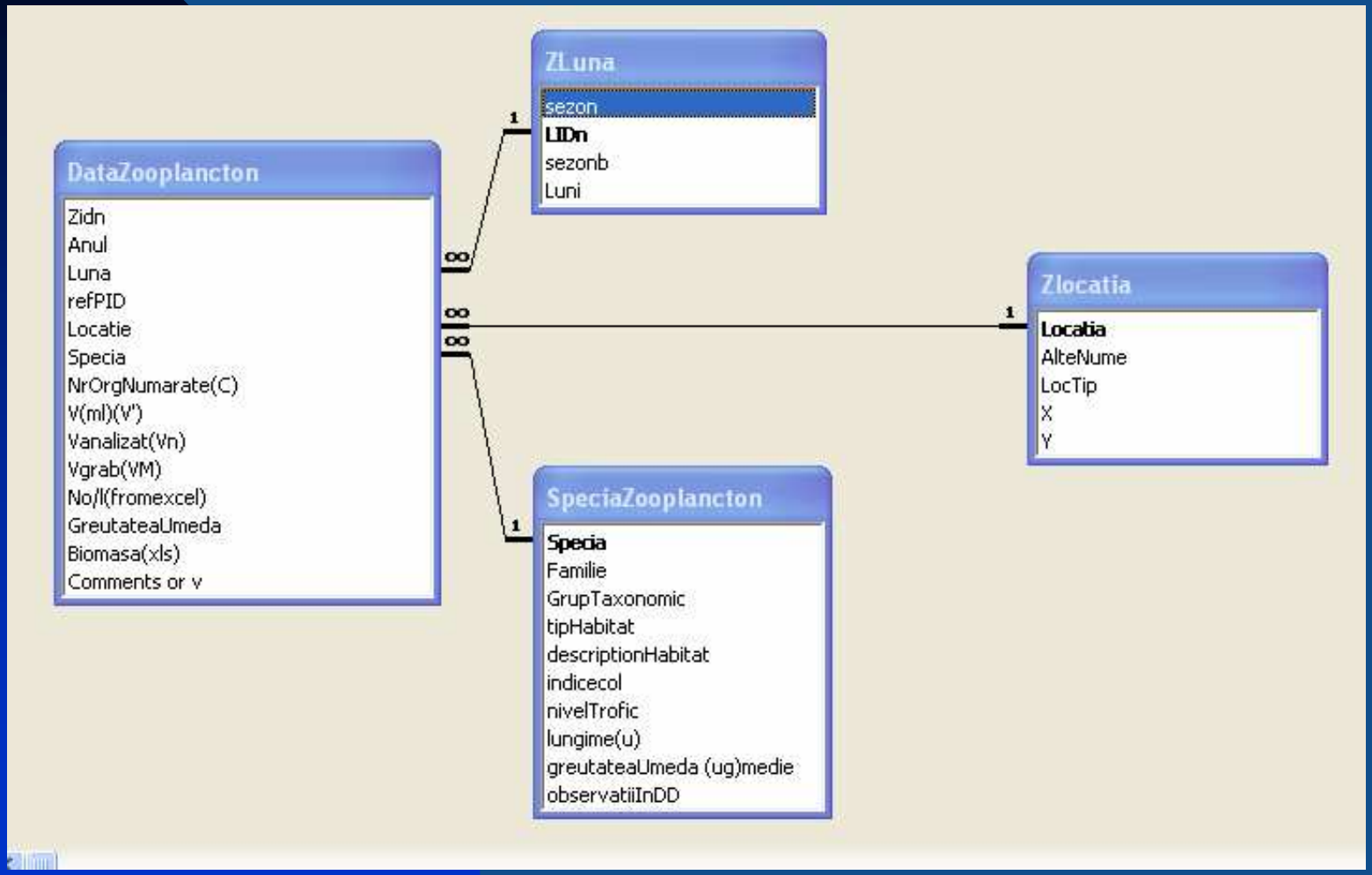
One Table by category

Year	Month	refPID	PlaceName	NrOrd	refSID	
2000	4	26	Furtuna	1	259	Asplachna herr
2000	4	26	Furtuna	3	230	Anuraeopsis fis
2000	4	26	Furtuna	4	293	Brachionus cali
2000	4	26	Furtuna		294	Brachionus cali
2000	4	26	Furtuna	5	317	Brachionus leyc
2000	4	26	Furtuna	6	440	Habrotrocha sp
2000	4	26	Furtuna	7	513	Lecane luna
2000	4	26	Furtuna	9	560	Notholca acumi
2000	4	26	Furtuna	10	566	Notholca squar

Data visualisation



Relational Database



Report and summaries- automatic

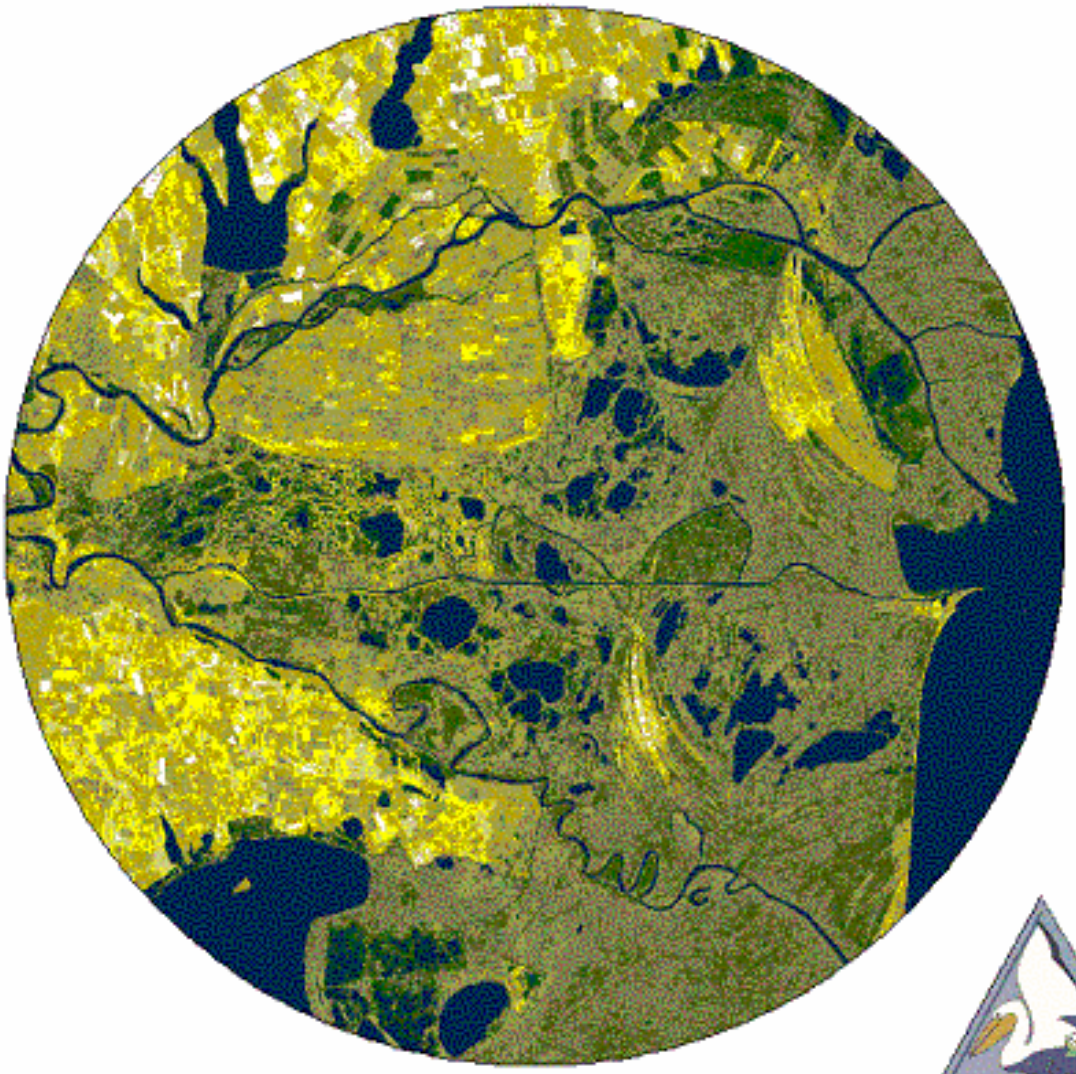
Taxa proportion by lake by season

2001

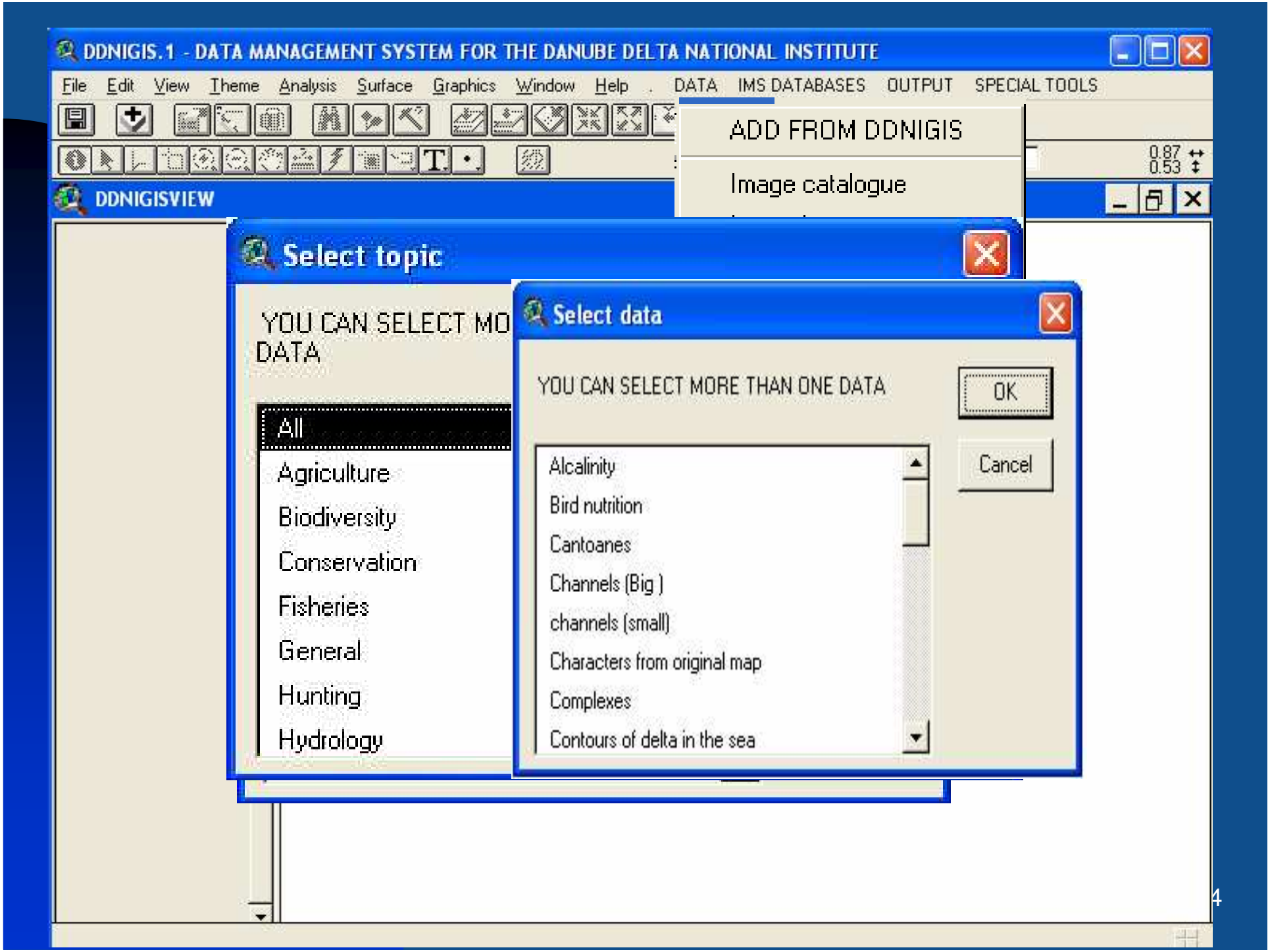
Erenciuc	*Taxa*	*Number of species*	*Abundancia (No/l)*	*Biomas*
toamna				
	Cladocera	43,75		
	Copepoda	25,00		
	Rotatoria	31,25		

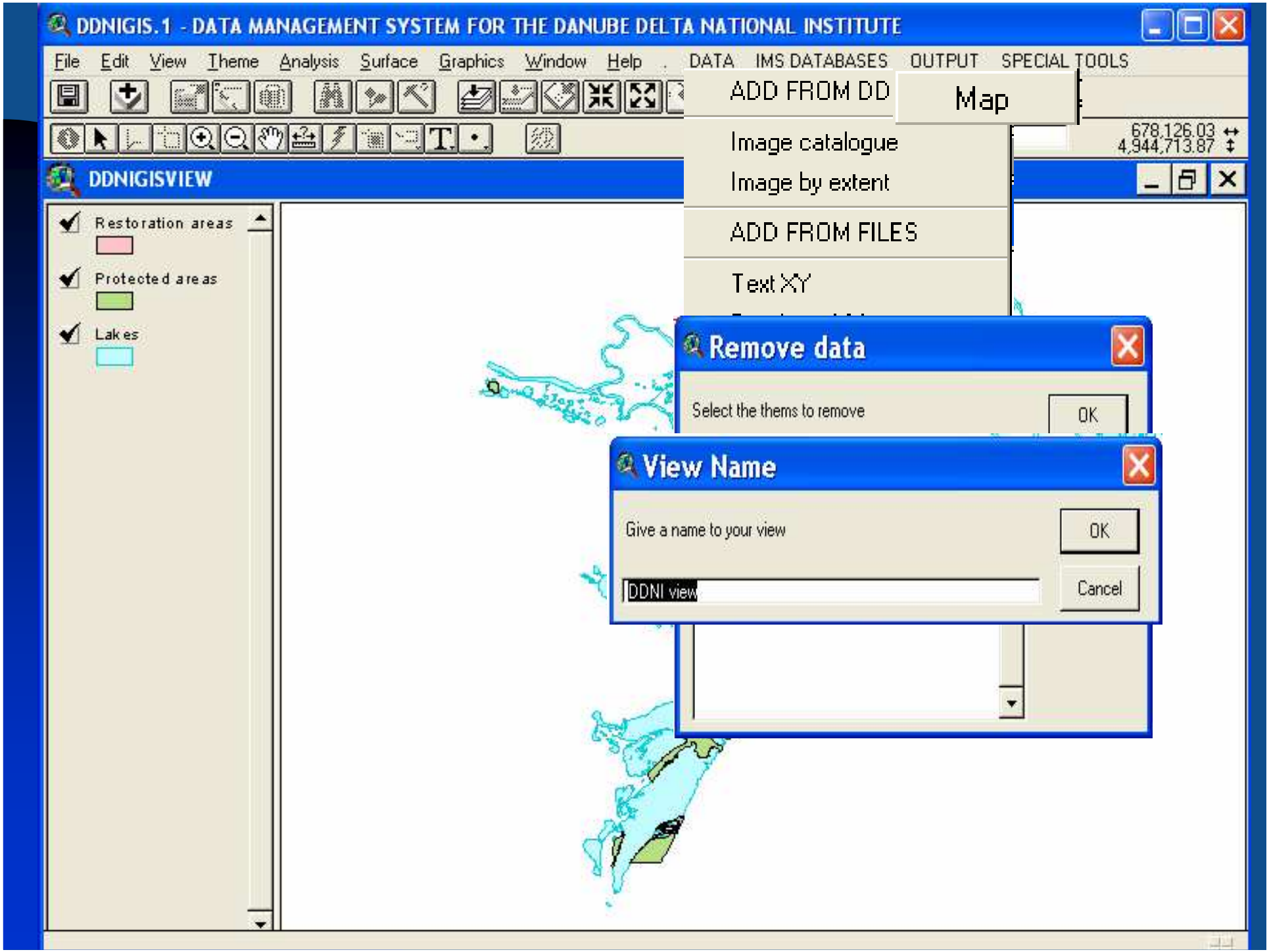
furtuna	*Taxa*	*Number of species*	*Abundancia (No/l)*	*Biomas*
primavar				
	Cladocera	21,88	37,13	65,61
	Copepoda	17,19	16,95	24,10
	Rotatoria	60,94	45,92	10,28
toamna				
	Cladocera	10,53	1,44	5,40
	Copepoda	15,79	45,32	67,48
	Rotatoria	73,68	53,24	27,12
vara				
	Cladocera	7,69	0,90	5,29
	Copepoda	7,69	61,09	84,26
	Rotatoria	84,62	38,01	10,45

DDNIGIS - DATA VISUALISATION TOOL



DANUBE DELTA NATIONAL INSTITUTE INTEGRATED MANAGEMENT SYSTEM


DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help DATA IMS DATABASES OUTPUT SPECIAL TOOLS
ADD FROM DDNIGIS
Image catalogue
DDNIGISVIEW
Select topic
YOU CAN SELECT MO
DATA
All
Agriculture
Biodiversity
Conservation
Fisheries
General
Hunting
Hydrology
Select data
YOU CAN SELECT MORE THAN ONE DATA
OK
Cancel
Alcalinity
Bird nutrition
Cantoanes
Channels (Big)
channels (small)
Characters from original map
Complexes
Contours of delta in the sea


DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help
DATA IMS DATABASES OUTPUT SPECIAL TOOLS
ADD FROM DD
Map
Image catalogue
Image by extent
ADD FROM FILES
Text XY
678,126.03
4,944,713.87
DDNIGISVIEW
Restoration areas
Protected areas
Lakes
Remove data
Select the thems to remove
OK
View Name
Give a name to your view
OK
DDNI view
Cancel

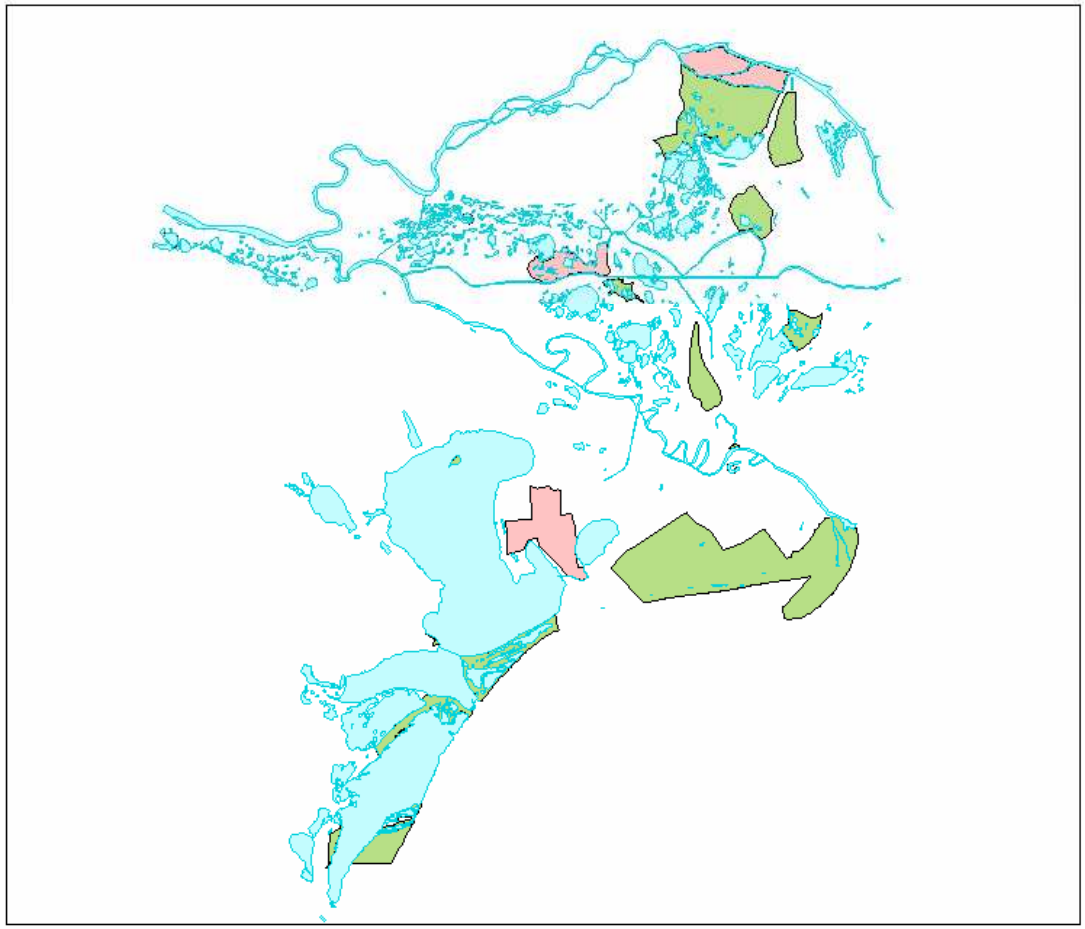
DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE

File Edit Layout Graphics Window Help

6.34 in
8.56 in

Layout for Overview of the delta

Overview of the delta



Types of data you can visualize

Polygon, line or point

Map data (vectors)

Raster (square or pixels)

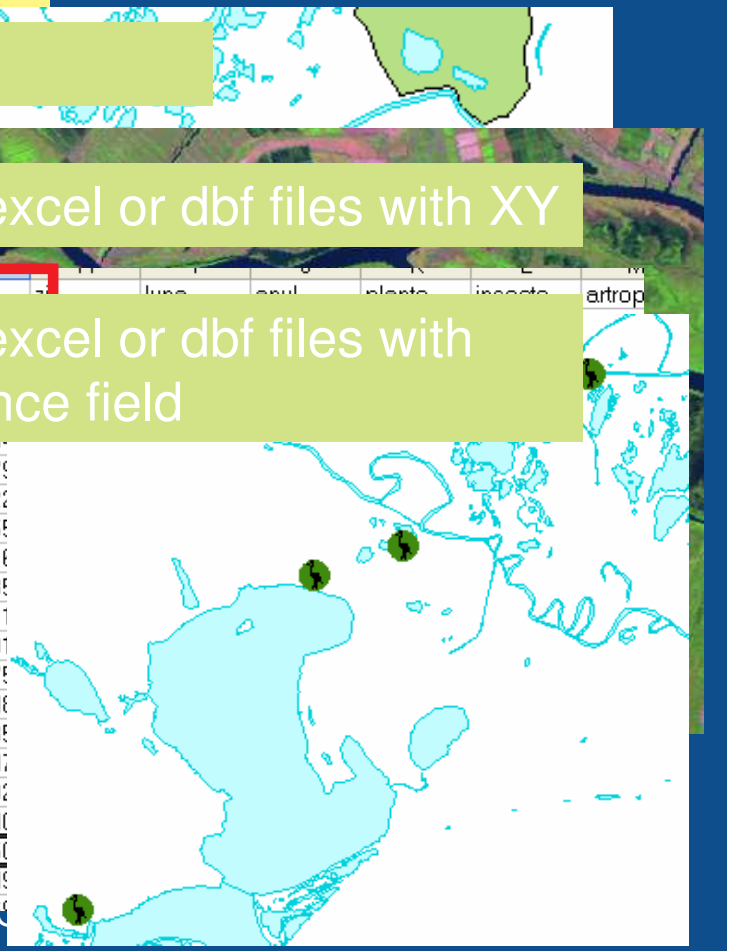
Image

Tables with XY coord.

Text, excel or dbf files with XY

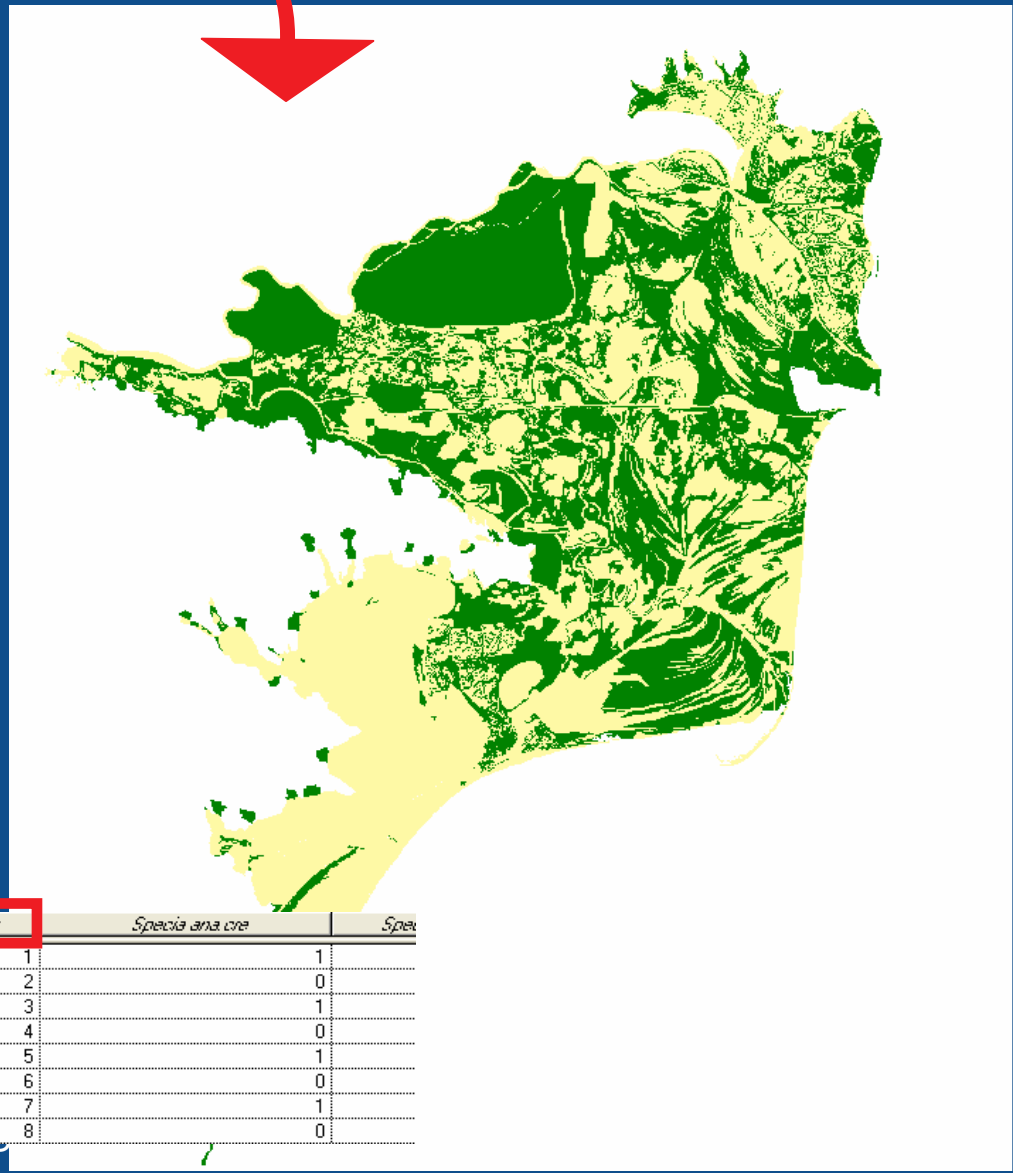
Tables with reference field similar to existing map data

Text, excel or dbf files with reference field

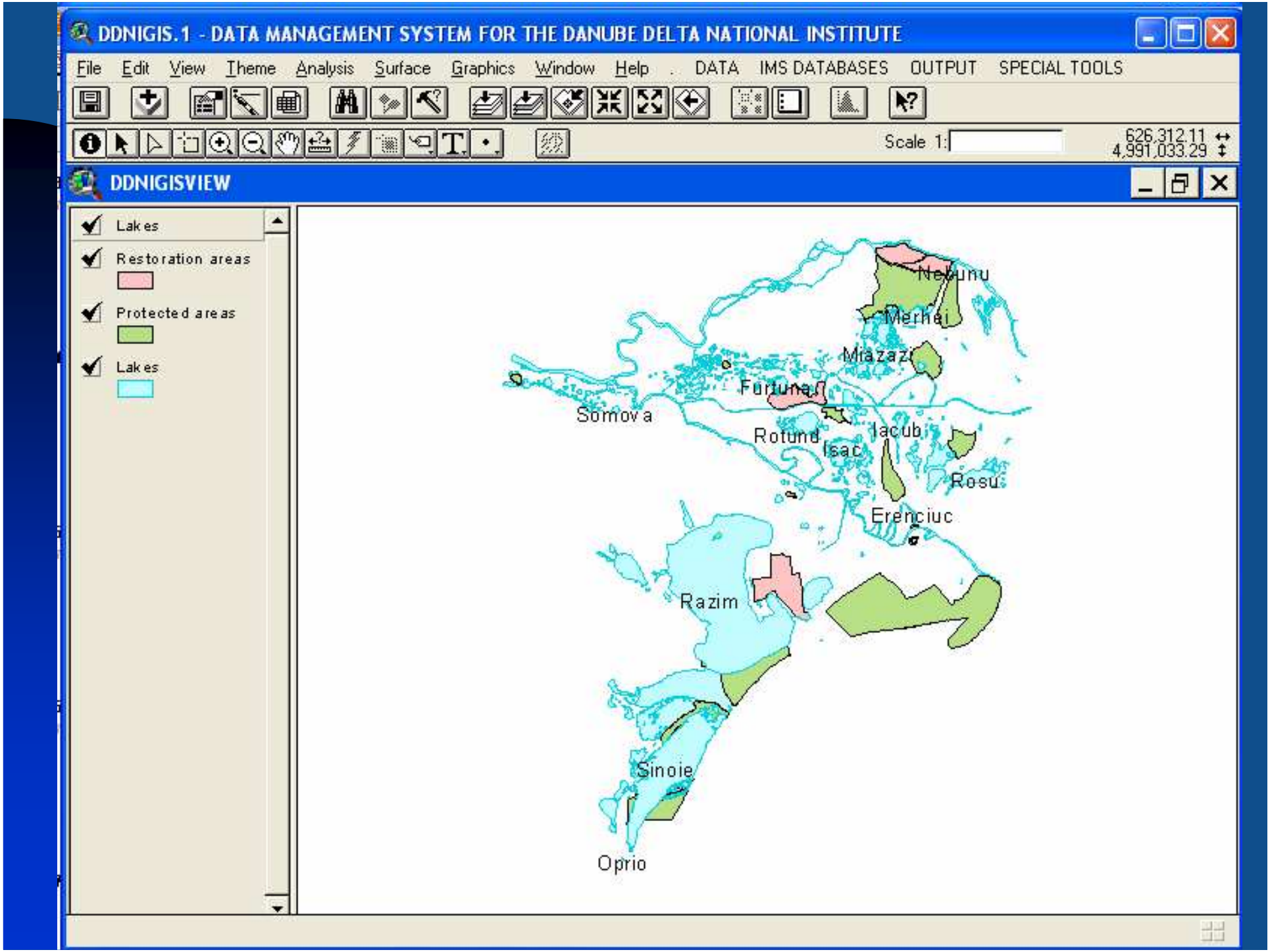


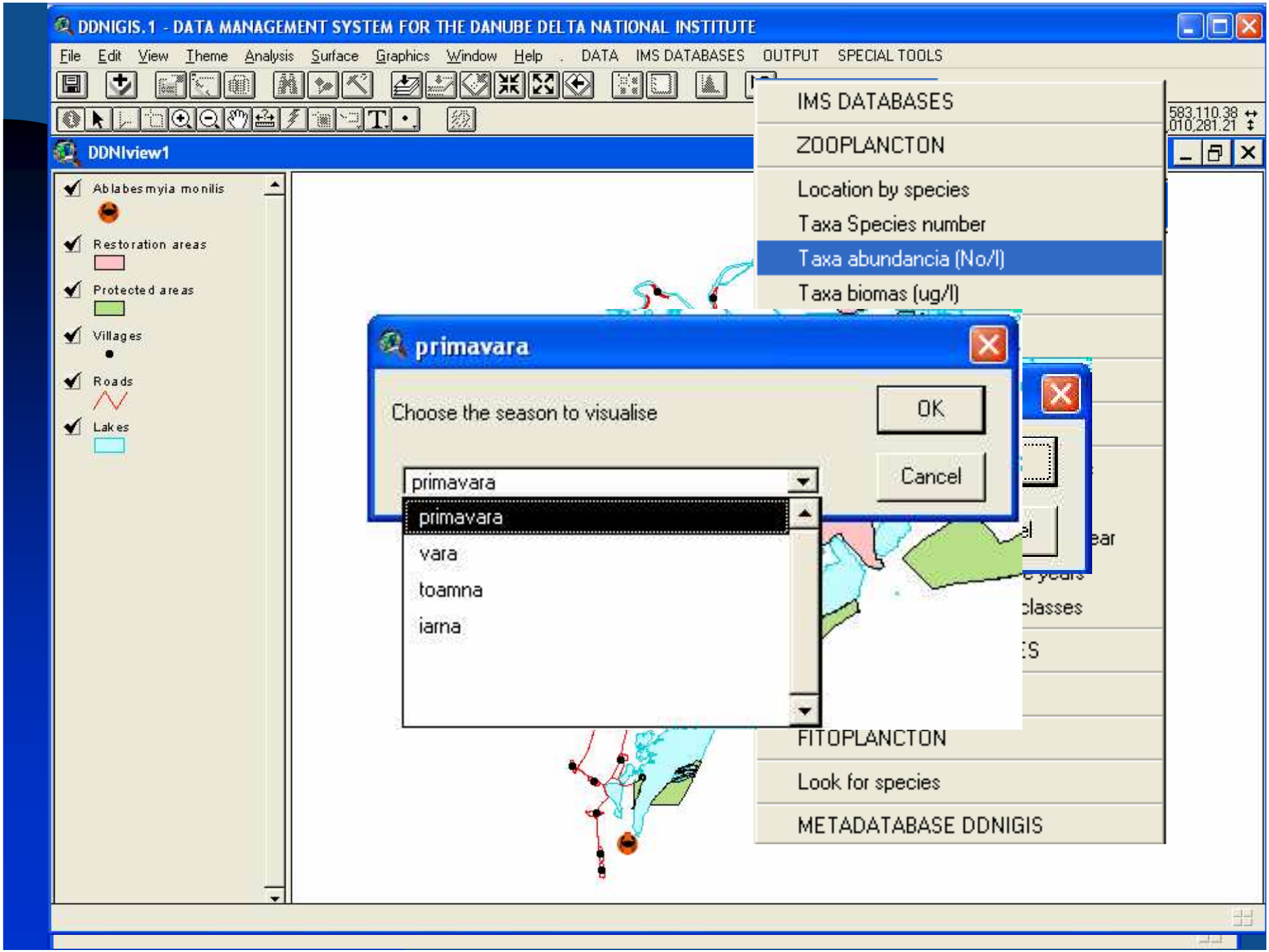
11	1165	Ana. cre.	f		Sarinasuf	634093,49066
12	1166	Ana. cre.	f		Sarinasuf	633617,57164
13	1390	Ana. cre.	f		Murighiol	640339,92784
14	1474	Ana. cre.	m		Maliuc	636949,00480
15	1475	Ana. cre.	m		Maliuc	645991,46624
16	1591	Ana. cre.	f		Sarinasuf	648133,10184
17	1592	Ana. cre.	f		Sarinasuf	649560,85891
18	1593	Ana. cre.	m		Sarinasuf	640459,01367
19	2266	Ana. cre.	m		Murighiol, elesteu	643787,40650
20	2267	Ana. cre.	m		Calica, elesteu	636063,82827
21	875	Ana. pla.	f		Baia	630857,88052

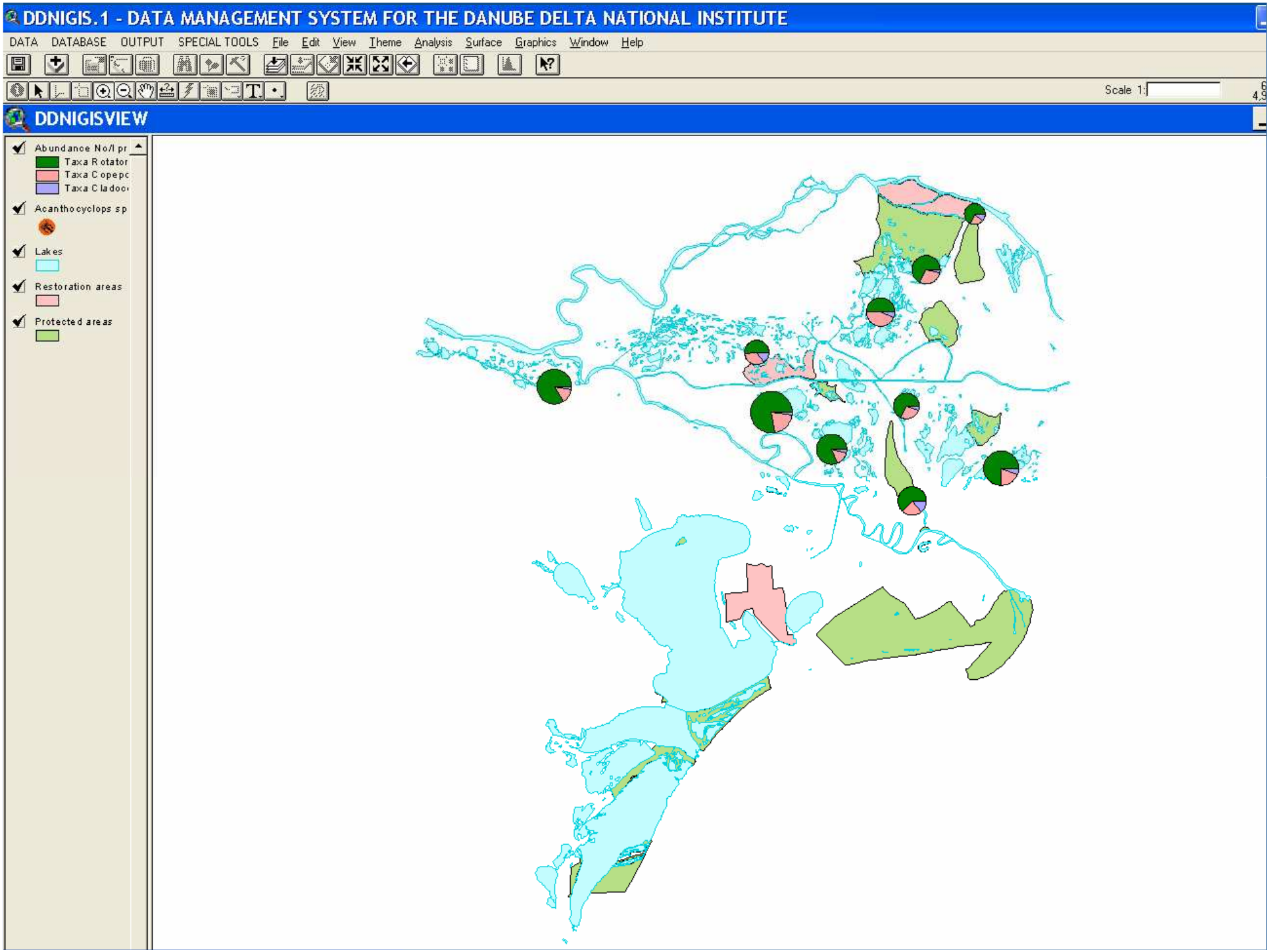
Shape	Area	Perimeter	Vegot:9_	Vegot:9_id	Vegcod	Habi	Leg	Label	Map_labe	Info	Vegetation
Polygon	[illegible]	89798.234	2	1	0	11	[illegible]	Fsc,N1	N1	Mozaic de vegetatie halofila: di	Mozaic de vegetatie halofila: depresiunile (Salicornia sp.) mult mai
Polygon	241991.125	5011.932	3	2		22	25	H1	H1	[illegible]duri pe nisipuri (Quercus ped	Paduri pe nisipuri (Quercus pedunculiflora, Fraxinus pallisiae,s.a.)
Polygon	1687480.750	21541.266	4	3	5	7	42	RS,Z-Ntb	RSz	Rogoz[illegible]i, stufarisuri si zalogi (S	Rogozuri, stufarisuri si zalogi (Salix cinerea)
Polygon	1849494.875	24586.701	5		0	19	19	Fsc,N1,HR	Nh	Mozaic de[illegible]egetatie halofila (P	Mozaic de vegetatie halofila (Petasites spurius, Eryngium maritimu
Polygon	20550.078	591.955	6	[illegible]	5	6	42	RS,Z-Ntb	RSz	Rogozuri, stu[illegible]isuri si zalogi (S	Rogozuri, stufarisuri si zalogi (Salix cinerea)
Polygon	18118.609	639.804	7	6	5	6	42	RS,Z-Ntb	RSz	Rogozuri, stufa[illegible]uri si zalogi (S	Rogozuri, stufarisuri si zalogi (Salix cinerea)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

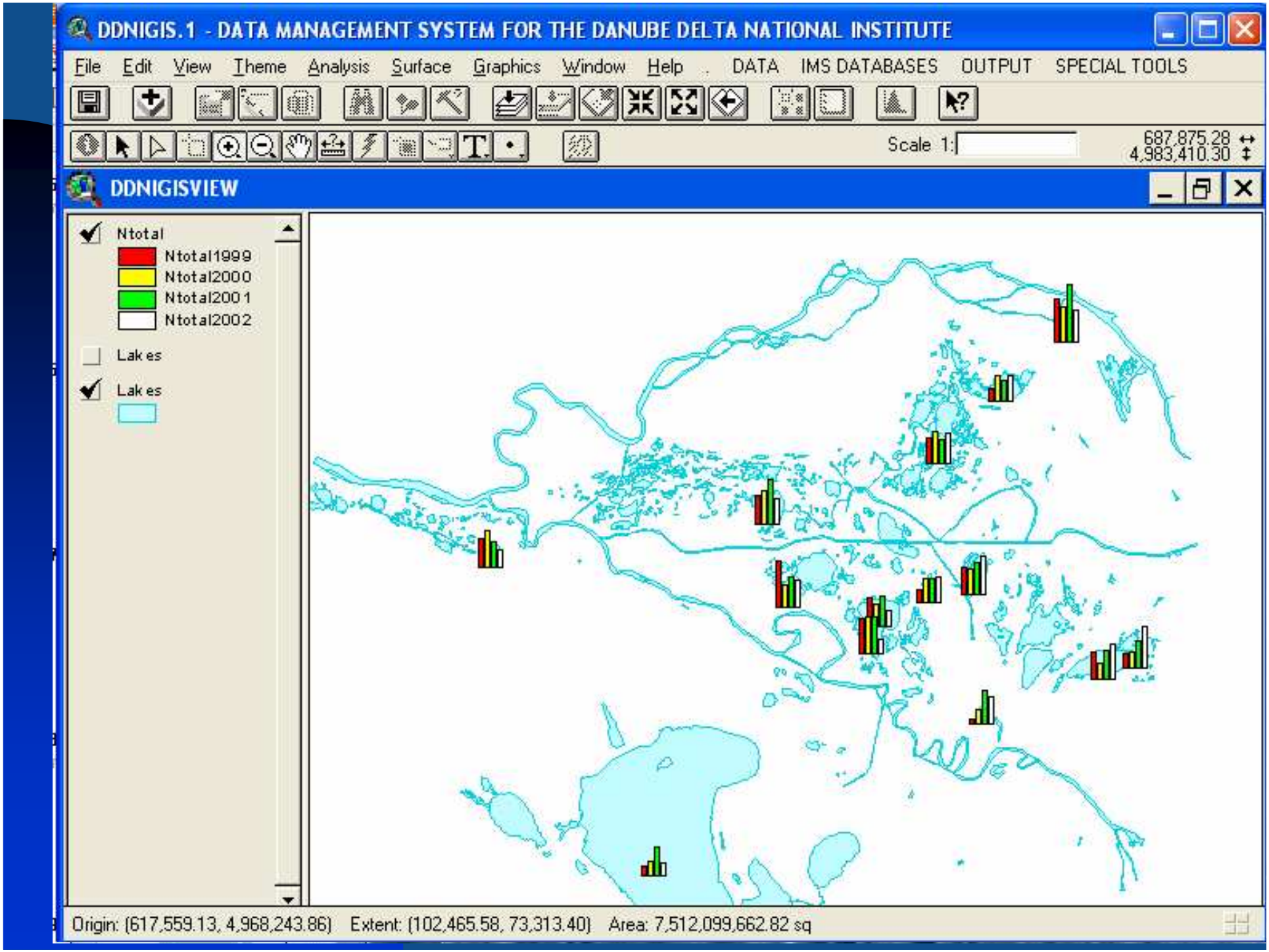


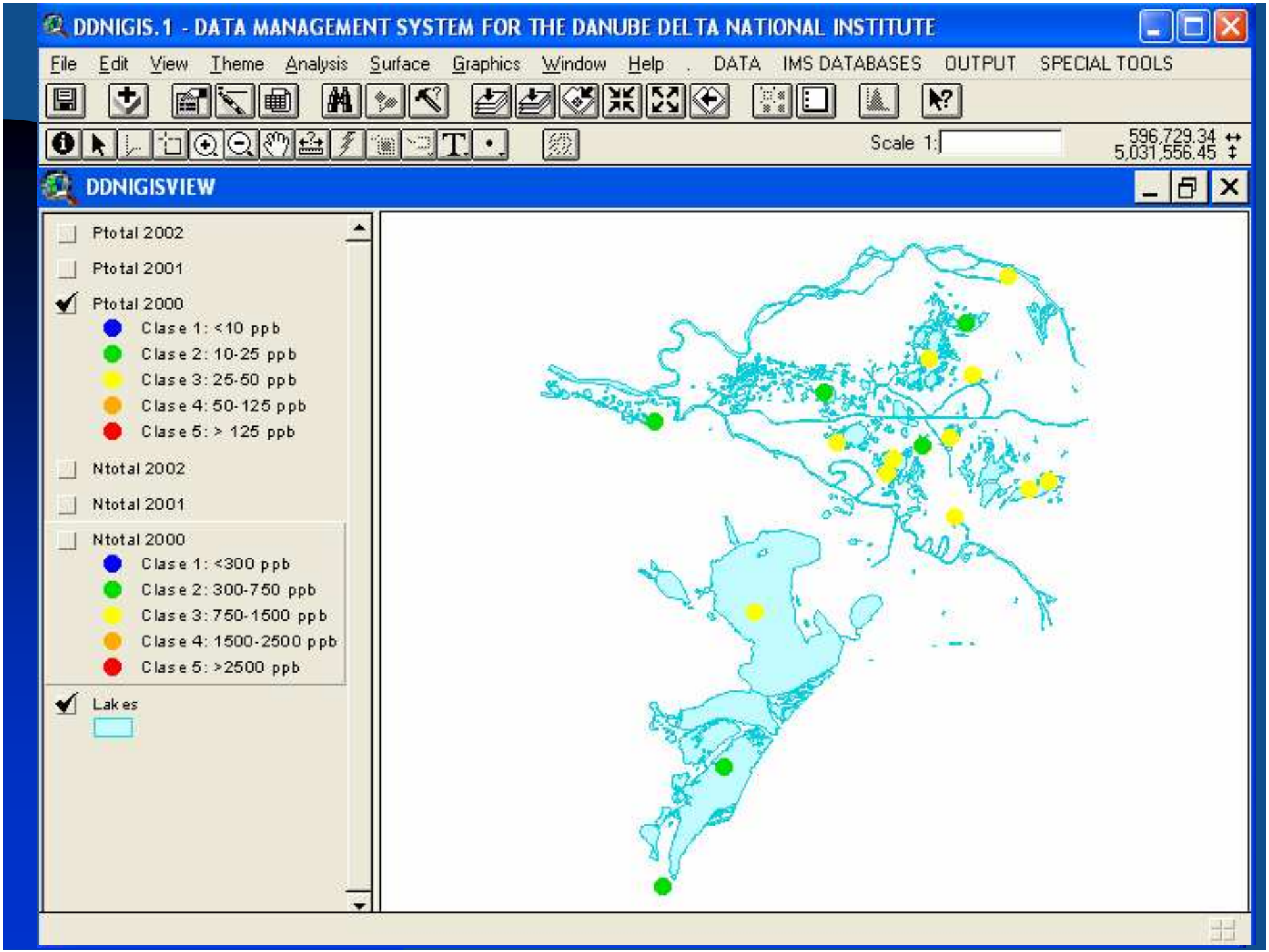
Vegetation	Leg	Specia ana cre	Spec
Apa	1	1	
Amenajare agricola	2	0	
Amenajare piscicola	3	1	
Amenajare silvica	4	0	
Vegetatie acvatica	5	1	
Vegetatie pe nisipuri litorale (Elymus giganteus, Cakile maritima)	6	0	
Sat/zona construita	7	1	
Pajisti fluviatile (Cynodon dactylon, Agrostis stolonifera, Agropyron repens, Chrysopogon gryllus)	8	0	

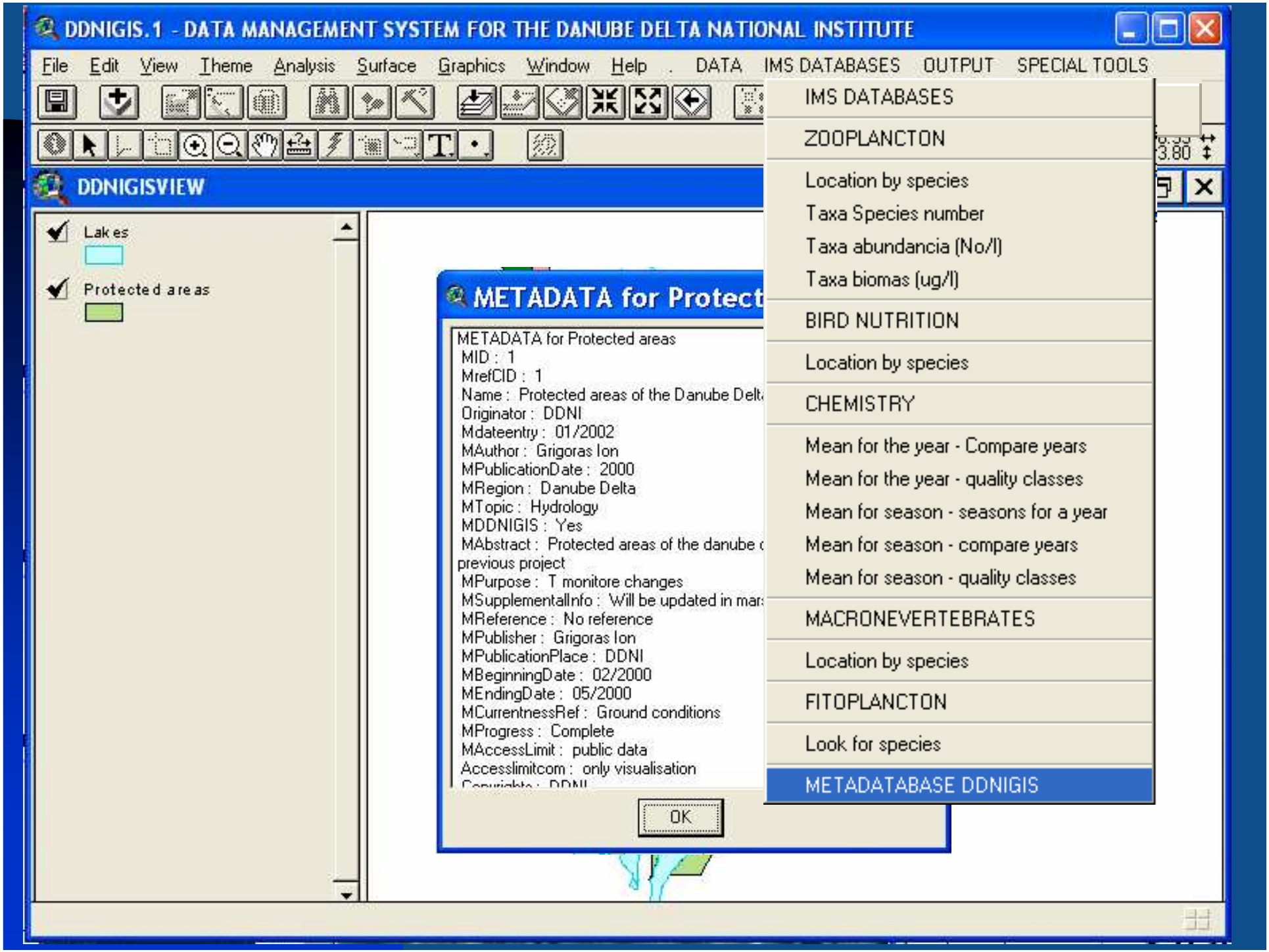

DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help DATA IMS DATABASES OUTPUT SPECIAL TOOLS
Scale 1:
626,312.11
4,991,033.29
DDNIGISVIEW
Lakes
Restoration areas
Protected areas
Lakes
Merhei
Miazaz
Fortuna
Somova
Rotund
Isac
Iacub
Rosu
Erenciuc
Razim
Sinoie
Oprio

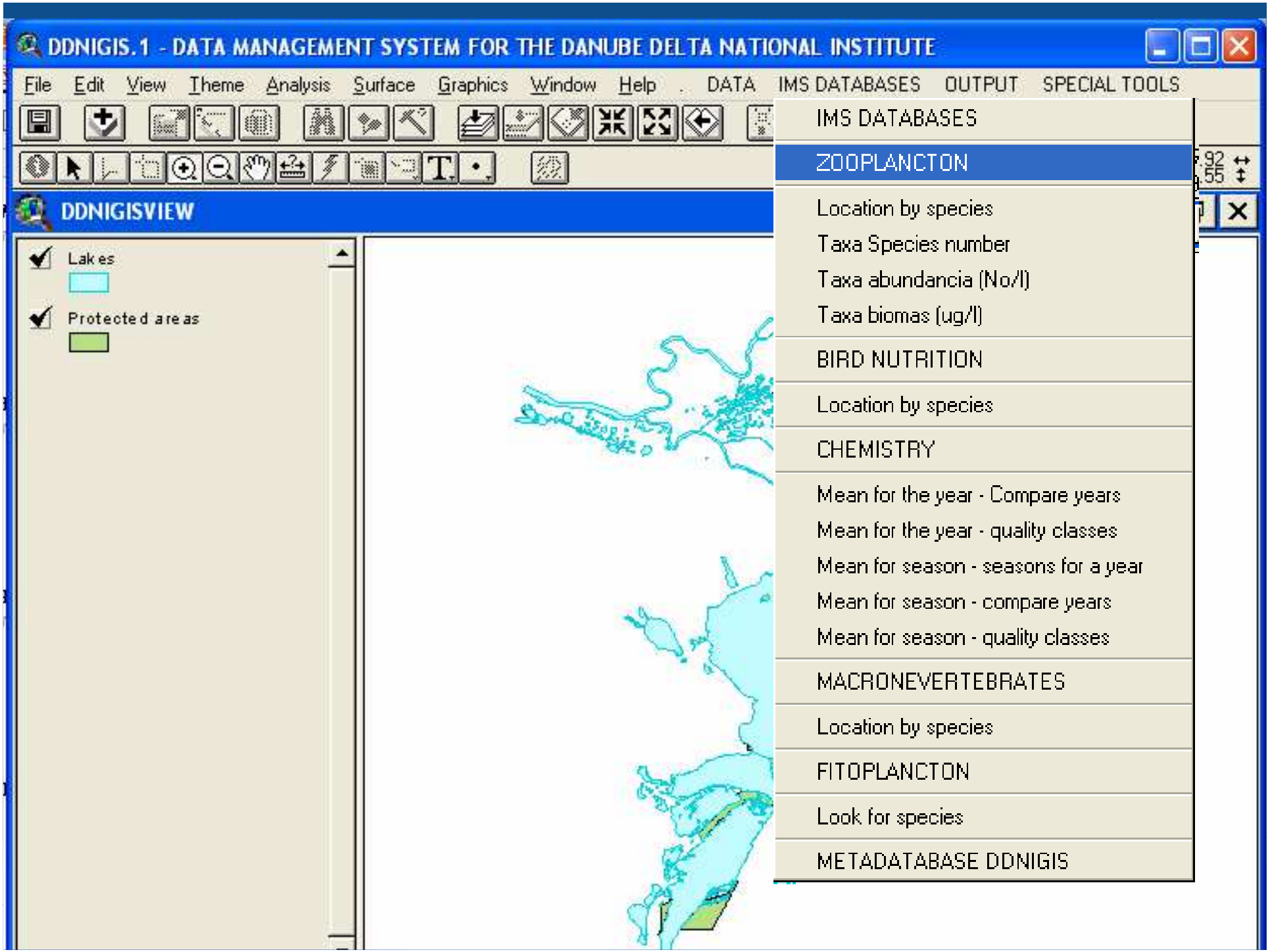

DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help DATA IMS DATABASES OUTPUT SPECIAL TOOLS
DDNIview1
Ablabesmyia monilis
Restoration areas
Protected areas
Villages
Roads
Lakes
IMS DATABASES
ZOOPLANCTON
Location by species
Taxa Species number
Taxa abundancia (No/l)
Taxa biomas (ug/l)
FITOPLANCTON
Look for species
METADATABASE DDNIGIS
primavara
Choose the season to visualise
OK
Cancel
primavara
primavara
vara
toamna
iarna

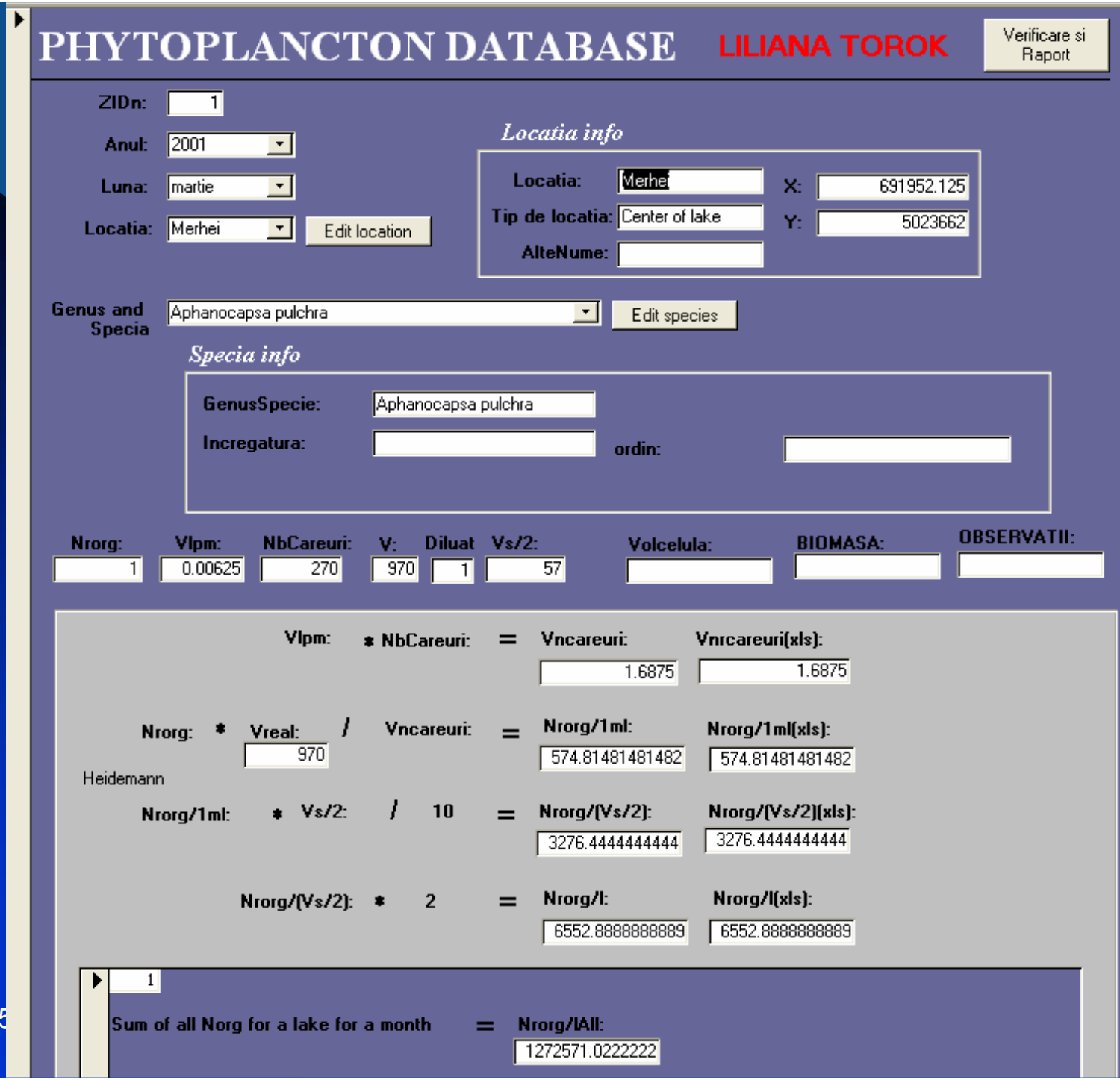

DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
DATA DATABASE OUTPUT SPECIAL TOOLS File Edit View Theme Analysis Surface Graphics Window Help
Scale 1:
DDNIGISVIEW
Abundance No/l pr
Taxa Rotator
Taxa Copepc
Taxa Cladoc
Acanthocyclops sp
Lakes
Restoration areas
Protected areas


DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help DATA IMS DATABASES OUTPUT SPECIAL TOOLS
Scale 1:
687,875.28
4,983,410.30
DDNIGISVIEW
Ntotal
Ntotal1999
Ntotal2000
Ntotal2001
Ntotal2002
Lakes
Lakes
Origin: (617,559.13, 4,968,243.86) Extent: (102,465.58, 73,313.40) Area: 7,512,099,662.82 sq


DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help DATA IMS DATABASES OUTPUT SPECIAL TOOLS
Scale 1:
596,729.34
5,031,556.45
DDNIGISVIEW
Ptotal 2002
Ptotal 2001
Ptotal 2000
Clase 1: <10 ppb
Clase 2: 10-25 ppb
Clase 3: 25-50 ppb
Clase 4: 50-125 ppb
Clase 5: > 125 ppb
Ntotal 2002
Ntotal 2001
Ntotal 2000
Clase 1: <300 ppb
Clase 2: 300-750 ppb
Clase 3: 750-1500 ppb
Clase 4: 1500-2500 ppb
Clase 5: >2500 ppb
Lakes


DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help . DATA IMS DATABASES OUTPUT SPECIAL TOOLS
DDNIGISVIEW
Lakes
Protected areas
METADATA for Protect
METADATA for Protected areas
MID : 1
MrefCID : 1
Name : Protected areas of the Danube Delt
Originator : DDNI
Mdateentry : 01/2002
MAuthor : Grigoras Ion
MPublicationDate : 2000
MRegion : Danube Delta
MTopic : Hydrology
MDDNIGIS : Yes
MAbstract : Protected areas of the danube
previous project
MPurpose : T monitore changes
MSupplementalInfo : Will be updated in mar
MReference : No reference
MPublisher : Grigoras Ion
MPublicationPlace : DDNI
MBeginningDate : 02/2000
MEndingDate : 05/2000
MCurrentnessRef : Ground conditions
MProgress : Complete
MAccessLimit : public data
Accesslimitcom : only visualisation
OK
IMS DATABASES
ZOOPLANCTON
Location by species
Taxa Species number
Taxa abundancia (No/l)
Taxa biomas (ug/l)
BIRD NUTRITION
Location by species
CHEMISTRY
Mean for the year - Compare years
Mean for the year - quality classes
Mean for season - seasons for a year
Mean for season - compare years
Mean for season - quality classes
MACRONEVERTEBRATES
Location by species
FITOPLANCTON
Look for species
METADATABASE DDNIGIS


DDNIGIS.1 - DATA MANAGEMENT SYSTEM FOR THE DANUBE DELTA NATIONAL INSTITUTE
File Edit View Theme Analysis Surface Graphics Window Help . DATA IMS DATABASES OUTPUT SPECIAL TOOLS
DDNIGISVIEW
Lakes
Protected areas
IMS DATABASES
ZOOPLANCTON
Location by species
Taxa Species number
Taxa abundancia (No/l)
Taxa biomas (ug/l)
BIRD NUTRITION
Location by species
CHEMISTRY
Mean for the year - Compare years
Mean for the year - quality classes
Mean for season - seasons for a year
Mean for season - compare years
Mean for season - quality classes
MACRONEVERTEBRATES
Location by species
FITOPLANCTON
Look for species
METADATABASE DDNIGIS


PHYTOPLANCTON DATABASE
LILIANA TOROK
Verificare si Raport
ZIDn: 1
Anul: 2001
Luna: martie
Locatia: Merhei
Edit location
Locatia info
Locatia: Merhei
Tip de locatia: Center of lake
AlteNume:
X: 691952.125
Y: 5023662
Genus and Specia
Aphanocapsa pulchra
Edit species
Specia info
GenusSpecie: Aphanocapsa pulchra
Incregatura:
ordin:
Nrorg: 1
Vlpm: 0.00625
NbCareuri: 270
V: 970
Diluat 1
Vs/2: 57
Volcelula:
BIOMASA:
OBSERVATII:
Vlpm: * NbCareuri: = Vncareuri: 1.6875
Vnrcareuri(xls): 1.6875
Nrorg: * Vreal: 970 / Vncareuri: = Nrorg/1ml: 574.81481481482
Nrorg/1ml(xls): 574.81481481482
Heidemann
Nrorg/1ml: * Vs/2: / 10 = Nrorg/(Vs/2): 3276.4444444444
Nrorg/(Vs/2)(xls): 3276.4444444444
Nrorg/(Vs/2): * 2 = Nrorg/l: 6552.8888888889
Nrorg/l(xls): 6552.8888888889
1
Sum of all Norg for a lake for a month = Nrorg/lAll: 1272571.0222222


THANK YOU