

River Basin Management in Croatia

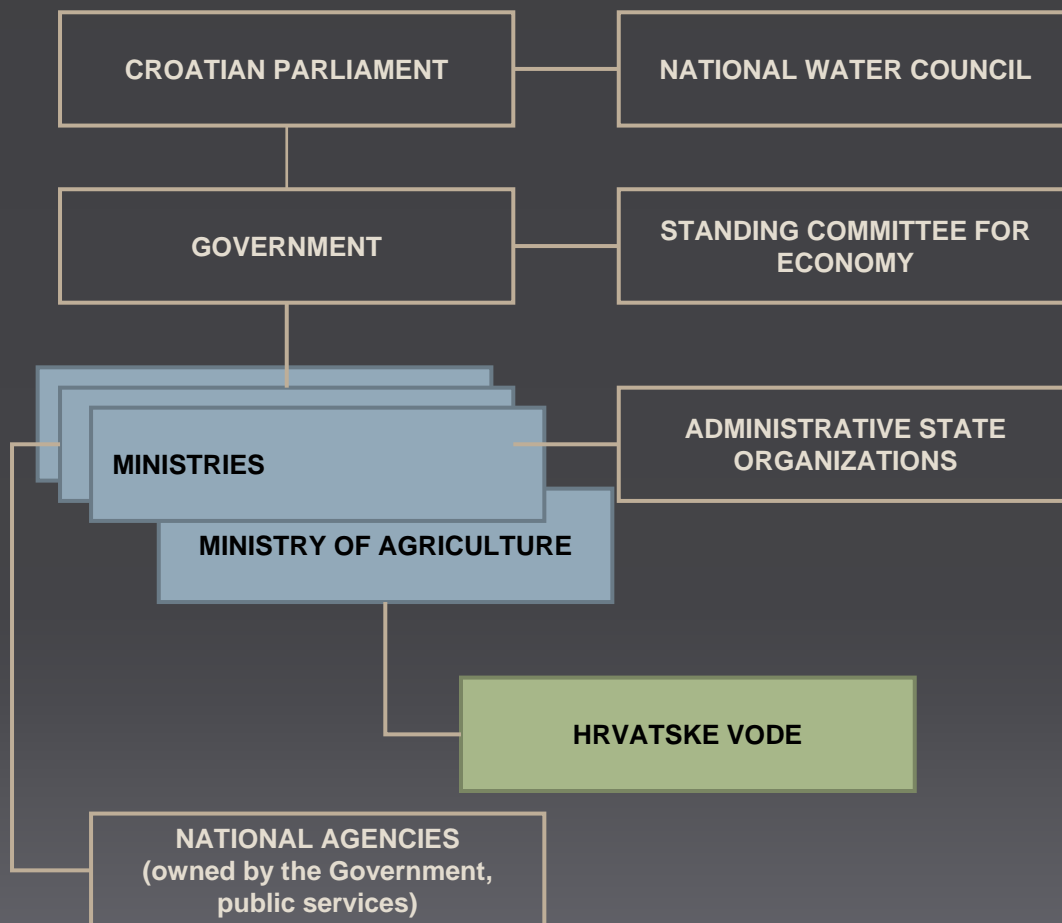
2. INTERNATIONAL RIVER BASIN MANAGEMENT HIGH LEVEL SYMPOSIUM

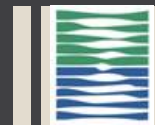
Cappadocia/NEVŞEHİR, Turkey

16 – 18 April 2013



- Water sector responsibilities are shared among:
 - Croatian Parliament with the National Water Council
 - Government of Croatia – Ministry of Agriculture and
 - Hrvatske vode as the national agency for water management

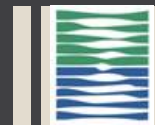




Legal status

- Hrvatske vode is:
 - Government agency
 - Non – profit
 - Non – budgetary fund
- Its management is appointed by the Government of Croatia and is shared between:
 - The General Manager with executive powers and
 - The Management Board with supervision powers, and executive powers beyond those vested in the General Manager





Mission



The mission of Hrvatske vode is to manage waters in the Republic of Croatia in order to protect human lives, health and assets from adverse effects of water and to ensure permanent availability of water by optimizing economic and environmental benefits under the principles of sustainable development.

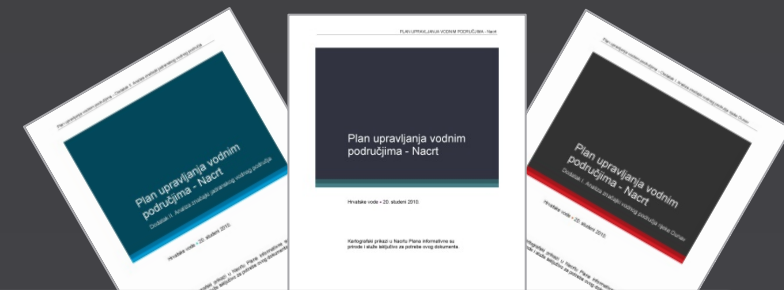


Fields of activity

The activity of Hrvatske vode is defined by the Water Act.

The activity of Hrvatske vode is water management within the scope of public authorities.

The public authorities of Hrvatske vode are:



Planning, research and studies

– in preparation of planning documents for water management

- draft Water Management Strategy;
- draft River Basin Management Plan;
- enactment of detailed plans and programmes supplementing the River Basin Districts Management Plan;
- enactment of the financial plan and the Water Management Plan.

– in survey and analytical tasks

- preparation of terms of reference, conceptual solutions, studies and investment programmes;
- review of project documents, with the exception of control of detailed designs in terms of regulations on physical planning and construction;



Fields of activity

Investments in development and maintenance of water protection structures, and cofinancing of irrigation development

– in water regulation and protection from adverse effects of water

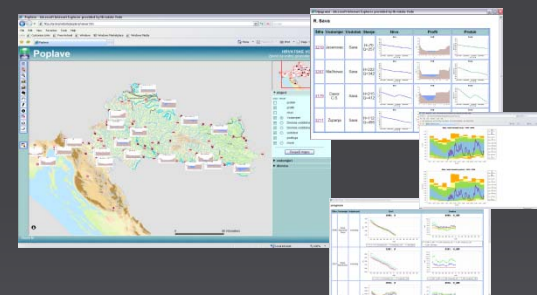
- monitoring of hydrological conditions (monitoring, data collection, analysis of water regime, forecasts, floods and droughts);
- estimation and management of flood risks;
- management and supervision, and implementation of preventive, regular and emergency flood defence;
- monitoring of the status of watercourses and the status of regulation and protection water facilities;
- investment in construction and maintenance of regulation and protection facilities;
- supervision of construction and maintenance of regulation and protection facilities.

– in amelioration drainage

- investment in construction and maintenance of basic amelioration drainage facilities;
- supervision of construction and maintenance of basic amelioration drainage facilities.

– in irrigation

- management of projects of construction of irrigation facilities owned by units of regional self-government in accordance with national programmes and projects;
- co-financing construction of irrigation facilities owned by units of regional self-government.





Fields of activity

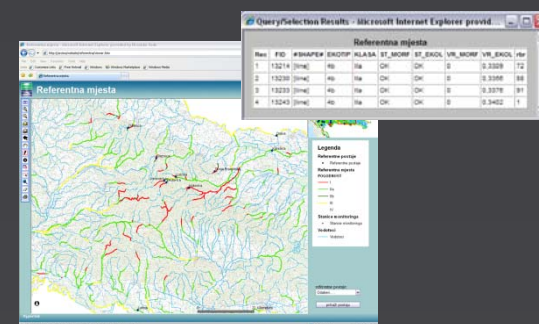
Cofinancing development of water supply and wastewater sewerage facilities

– in water use

- determining water reserves, looking after strategic water reserves, water research works;
- giving opinions on the implementation of regulations enacted by the units of local and/or regional self-government;
- taking measures to ensure intended and rational use of water;
- co-financing construction of public water supply facilities and supervision of purposeful use of funds during construction.

– in water protection

- management of water quality, implementation of monitoring of surface water and groundwater, including laboratory tasks during monitoring;
- implementation and supervision of other principal agents carrying out the implementation of the National Plan of Measures for Sudden and Accidental Pollution;
- giving opinions on implementing regulations enacted by the units of local and/or regional self-government,
- cofinancing construction of public wastewater sewerage facilities and supervision of purposeful use of funds during construction;



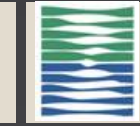


Fields of activity

Activities are performed as a public service

Other activities

- management of the public water estate;
- keeping water documents and the integrated water information system, and issuing water rights documents;
- expert tasks for the purpose of awarding concessions for waters and the public water estate;
- expert supervision of the implementation of conditions from water rights document and concession conditions (water supervision);
- calculation and collection of fees for concessions on waters and the public water estate;
- calculation and collection of water fees pursuant to the act regulating the financing of water management;
- management of special projects specified by the Water Act, implementing decisions of the Government of the Republic of Croatia or the Management Board of Hrvatske vode;
- other tasks under the competence of Hrvatske vode pursuant to the Water Act, other documents and the Charter of Hrvatske vode.



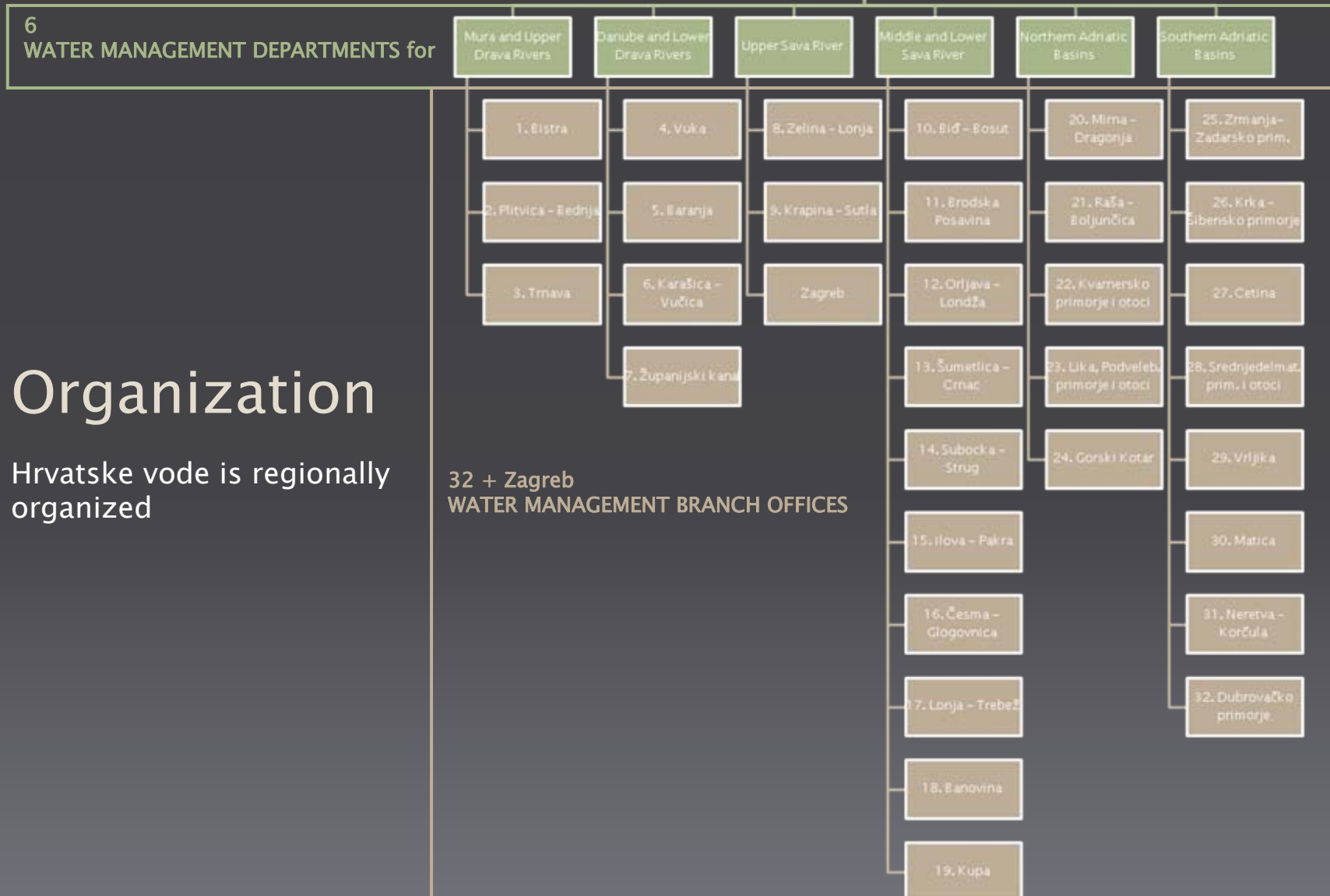
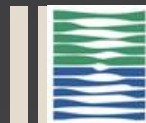
Public relations

Cooperation and consultations

- Hrvatske vode cooperates with the units of regional self-government and units of local self-government in order to achieve the common goals in water management.
- Hrvatske vode conduct consultations concerning the draft River Basin Management Plan through the River Basin District Council pursuant to the Water Act.
- Hrvatske vode cooperates with water stakeholders, non-governmental organizations and other civil society organizations in order to achieve the common goals in water management and meet socially and environmentally acceptable standards of protection of human health and assets.

Right to access information

- The right to access information in the possession of, available to or supervised by Hrvatske vode is exercised in accordance with the regulations on the right to access information.
- Hrvatske vode informs the public about significant issues concerning water management and its operations, and about problems occurring in individual cases which are of significance to the general public through the mass media, its own publications (Hrvatske vode and Hrvatska vodoprivreda) and its web page.



Organization

Hrvatske vode is regionally organized



Water Management Departments and Branch Offices seen on the map

Southern Adriatic Basins

Northern Adriatic Basins

Mura and Upper Drava Rivers

Danube and Lower Drava Rivers

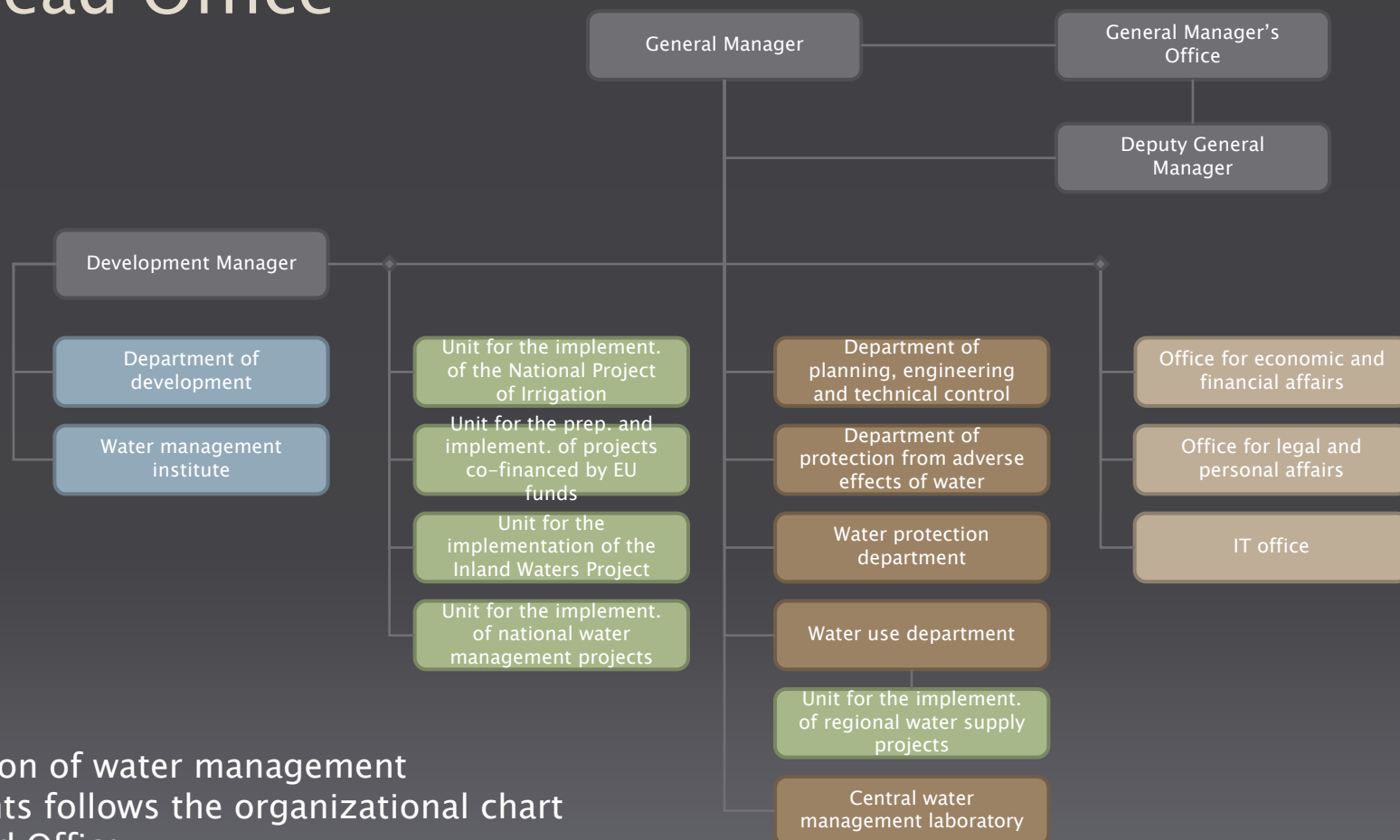
Upper Sava River

Middle and Lower Sava River

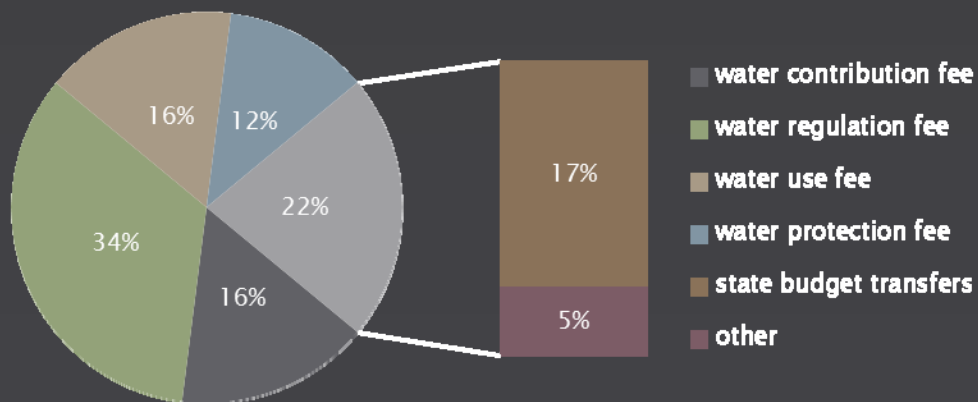
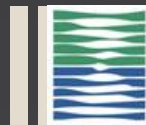




Organizational chart of the Head Office



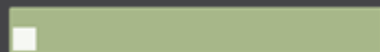
Organization of water management departments follows the organizational chart of the Head Office



Total revenues of Hrvatske vode in 2011
2,000,000,000 HRK or 280,000,000 EUR

Revenues

Original revenues of Hrvatske vode



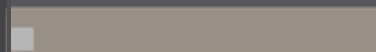
Water contribution,

Water regulation fee

Water use fee

Water protection fee

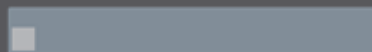
Water related revenues – regional self-government



Amelioration drainage fee,

Irrigation fee,

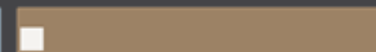
Water related revenues – local self-govern. and water utilities



Development fee,

Connection fee

Other

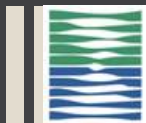


Capital project transfers (Government budget)

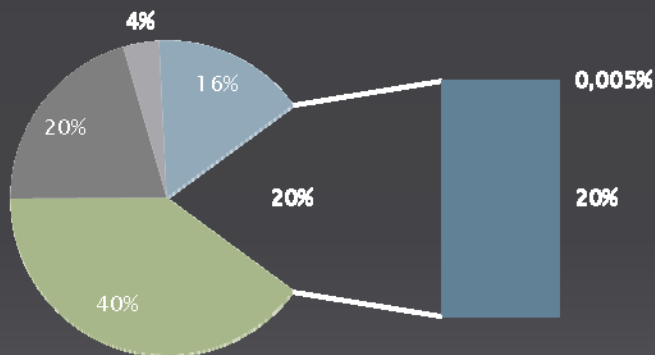
Co-financing by counties, cities and municipalities

Home and foreign loans, credits and grants

Basic characteristics of water resources in Croatia



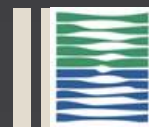
- 2 river basins:
 - Danube (Black Sea) and
 - Adriatic river basins
- The borderline between the basins is a natural barrier between the Danube basin and the Adriatic basin and is derived from hydrological and hydrogeological research



- Danube (land)
- Adriatic (land)
- Adriatic (islands)
- Adriatic (coastal water)
- Adriatic (islands not included in river basin)
- Adriatic (territorial sea)



Area	Danube	Adriatic	Territorial sea	Republic of Croatia
	km ²	km ²		
land	35,101	18,185		53,286
islands		3,262	4	3,266
sea		13,842	17,772	31,614
TOTAL	35,101	35,289	17,776	88,166



Rivers in Croatia are mostly international rivers – Croatia is a member of:

CONVENTION ON THE PROTECTION AND USE OF TRANSBOUNDARY WATERCOURSES AND INTERNATIONAL LAKES – Helsinki Convention

Republic of Croatia

CONVENTION ON COOPERATION FOR THE PROTECTION AND SUSTAINABLE USE OF THE DANUBE RIVER – Sofia Convention

CONVENTION FOR THE PROTECTION OF THE MEDITERRANEAN SEA AGAINST POLLUTION – Barcelona conv.

Danube River Basin

Adriatic Rivers Basin

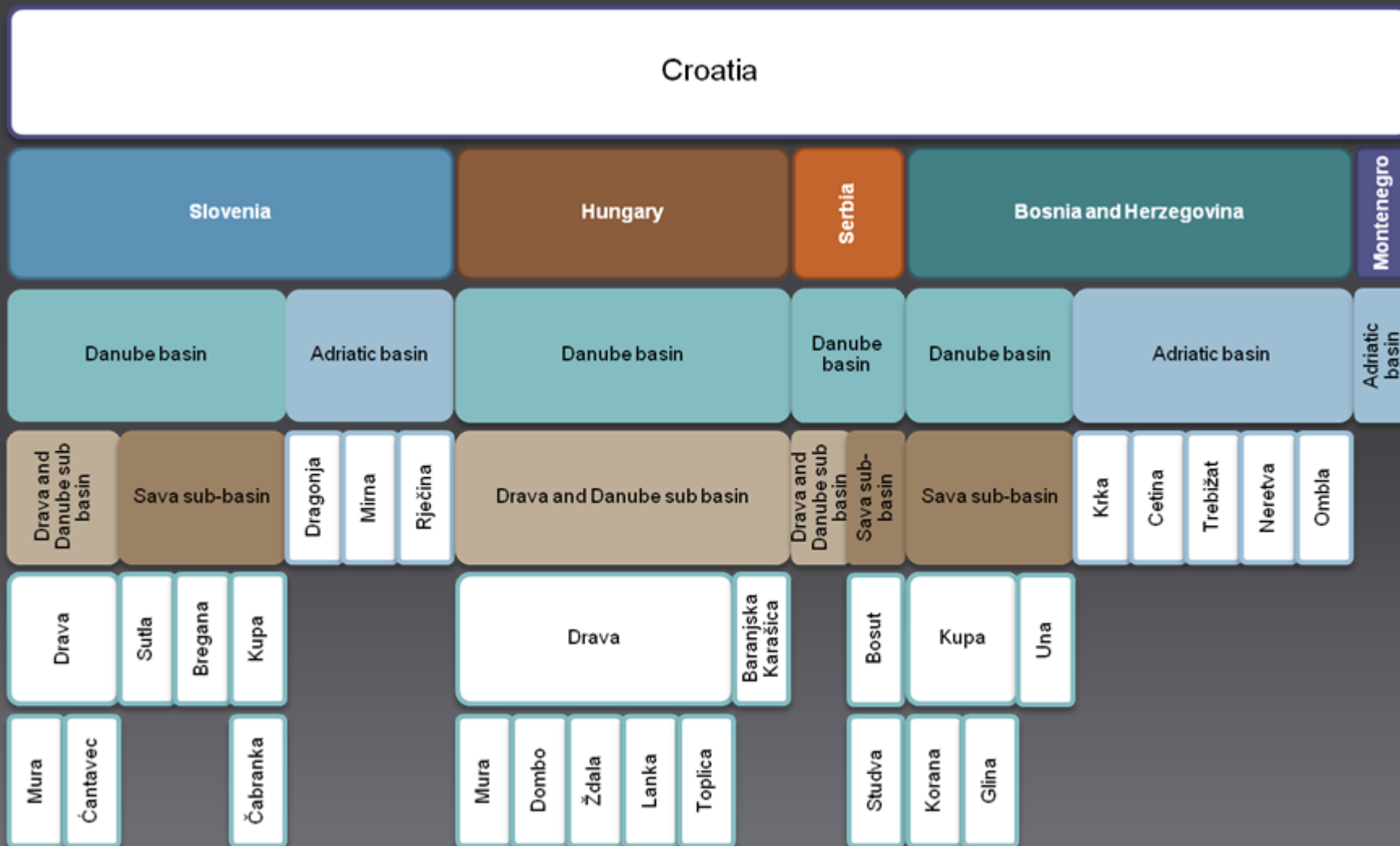
FRAMEWORK AGREEMENT ON THE SAVA RIVER BASIN

Drava and Danube Rivers Sub-Basin

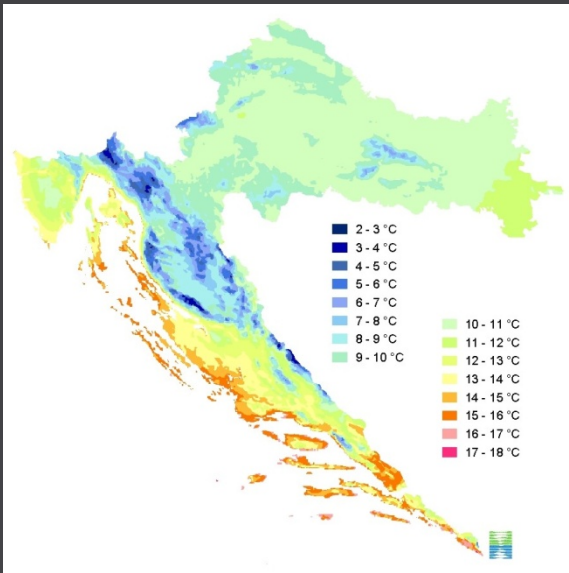
Sava River Sub-Basin



Countries sharing the rivers

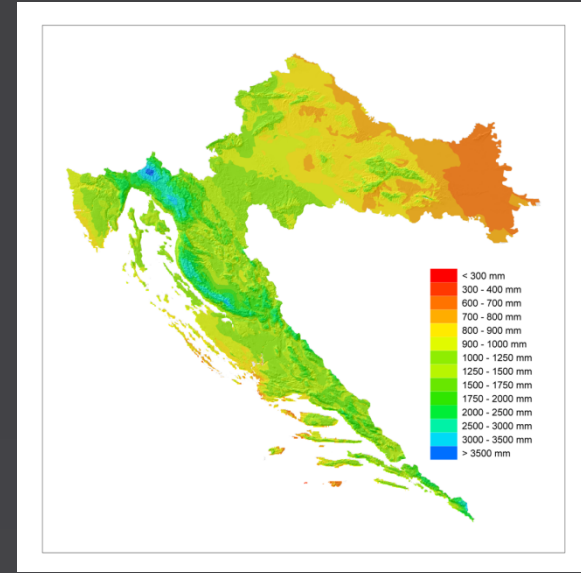


Diverse natural characteristics...

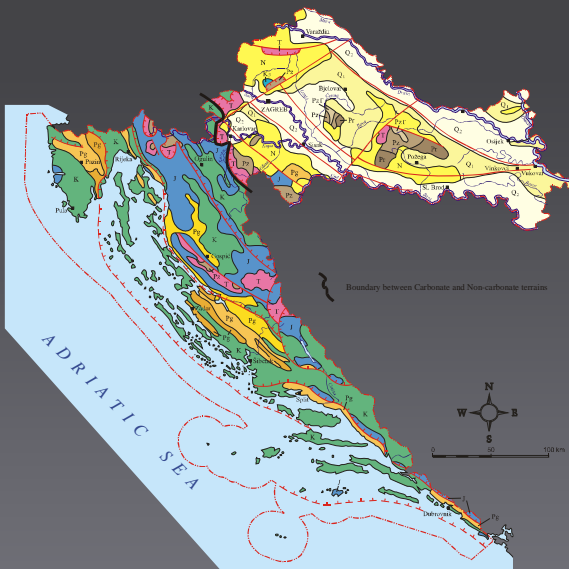


temperature regime:
Mediterranean
continental
intermediate

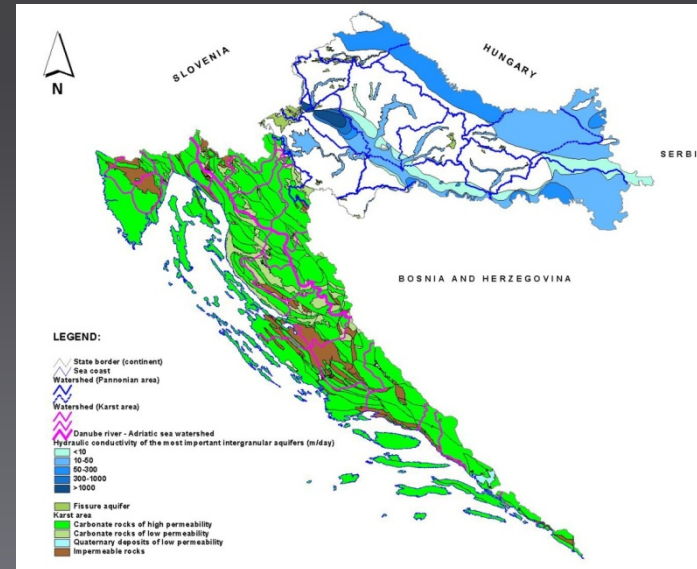
precipitation regime:
Mediterranean
continental
intermediate



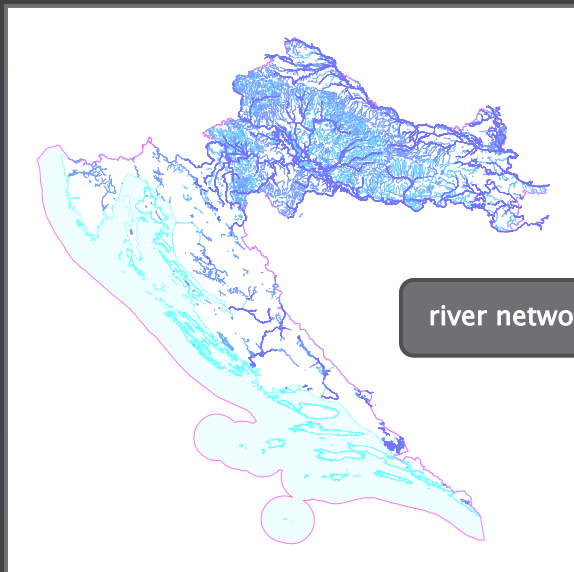
geology:
karst
alluvial



hydrogeological relations:
fractured (sinking rivers-
sources)
granular



resulting in two completely different basins



river network



surface water balance

LEGENDA:
 326 Viskite (unutrašnje) vode (m³/s)
 917 Ulaz u Hrvatsku (m³/s)
 600 Izlaz iz Hrvatske (m³/s)

Precipitation and runoff	Average annual precipitation (mm)	Average evapotranspiration (mm)	Average runoff (m ³ /s)
Sava	1,080	678	328
Drava and Danube	782	621	48
Black Sea Basin	1,001	663	376
Littoral-Istrian	1,622	814	194
Dalmatian	1,394	717	227
Islands	1,073	784	30
Adriatic Sea Basin	1,426	761	451
Croatia	1,162	700	827

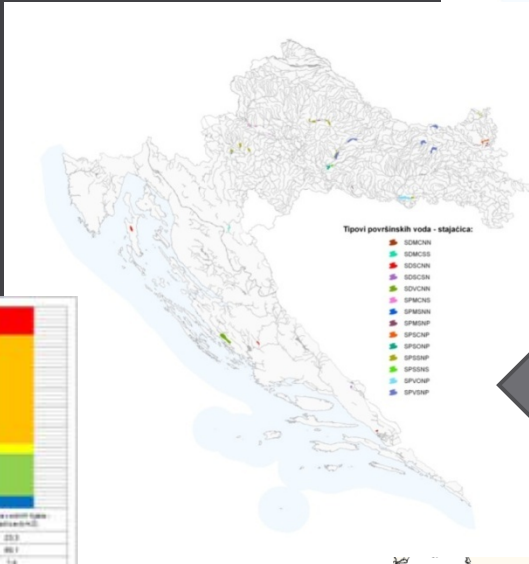
Groundwater – renewable resources		Alluvial aquifers	Carbonate aquifers	Total 10 ⁶ m ³ /year
Black Sea Basin	Sava	1,198.3	653.8	1,852.1
	Drava and Danube	802.6	7.8	810.4
Adriatic Sea Basin	Littoral-Istrian	–	2,639.5	2,639.5
	Dalmatian	–	3,831.3	3,831.3
Croatia		2,006.9	7,132.4	9,133.3

Characterization of surface waters

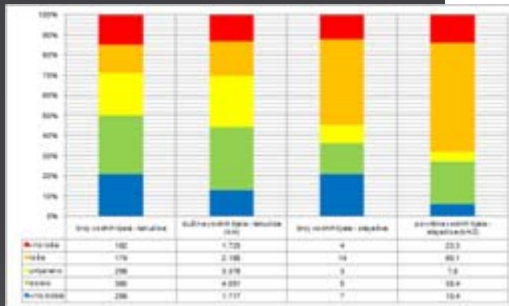
Due to natural biological and landscape diversity:

- a variety of different types of surface waters have been identified; and
- water status evaluation based on relative variance from referent type-specific conditions for each type has been carried out in the River Basins Management Plan.

53 river types

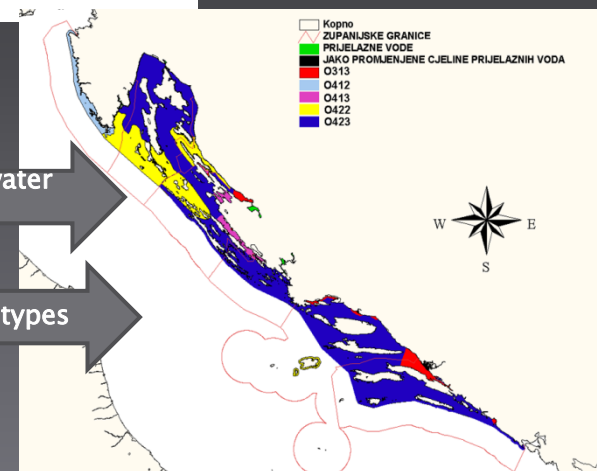


13 lake types



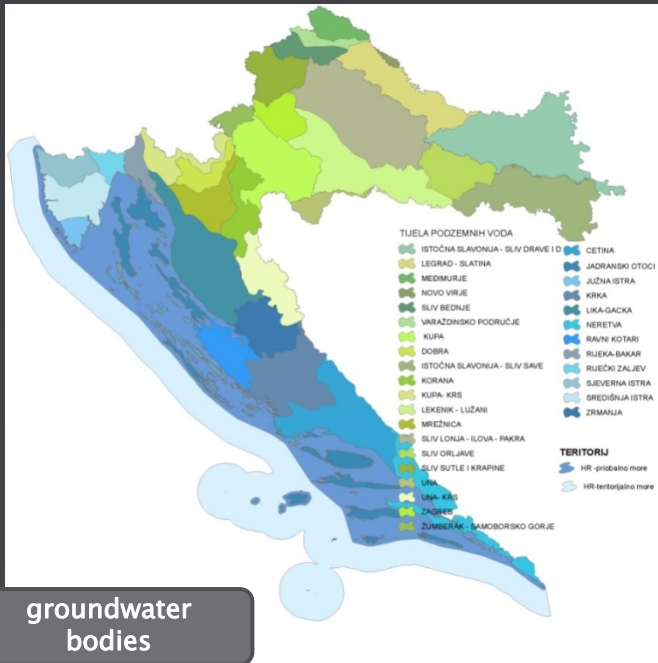
29 transitional water types

5 coastal water types

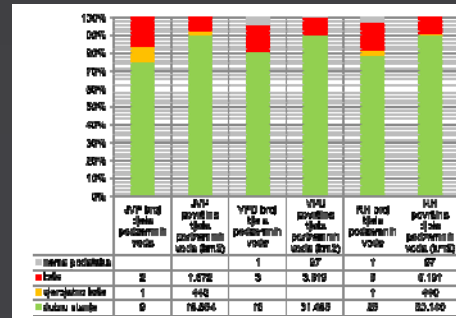


	number of water bodies	length (km)	area (km ²)
	with specified type / all water bodies		
riječ	1,234 / 2,720	13,053 / 67,020	
lake	33 / 44		167.0 / 169.6
transitional	29		
coastal	22		

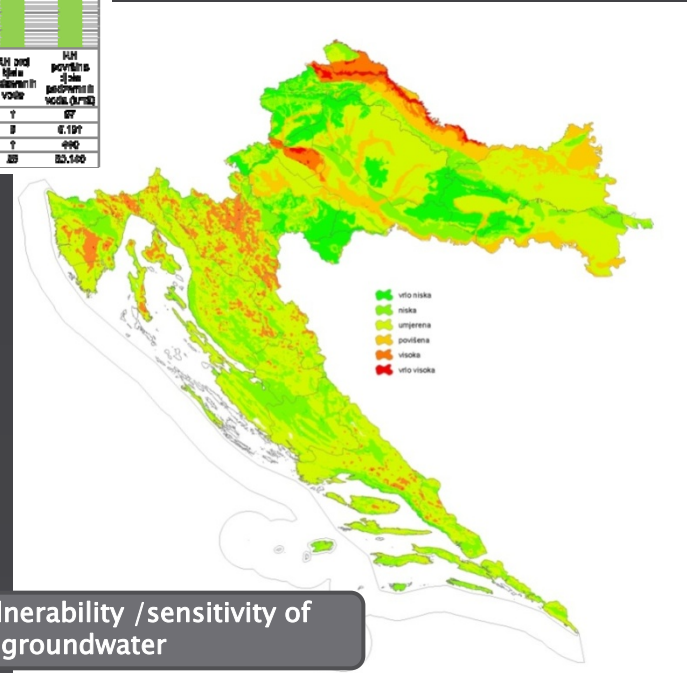
Characterization of groundwater



groundwater bodies



natural vulnerability /sensitivity of groundwater

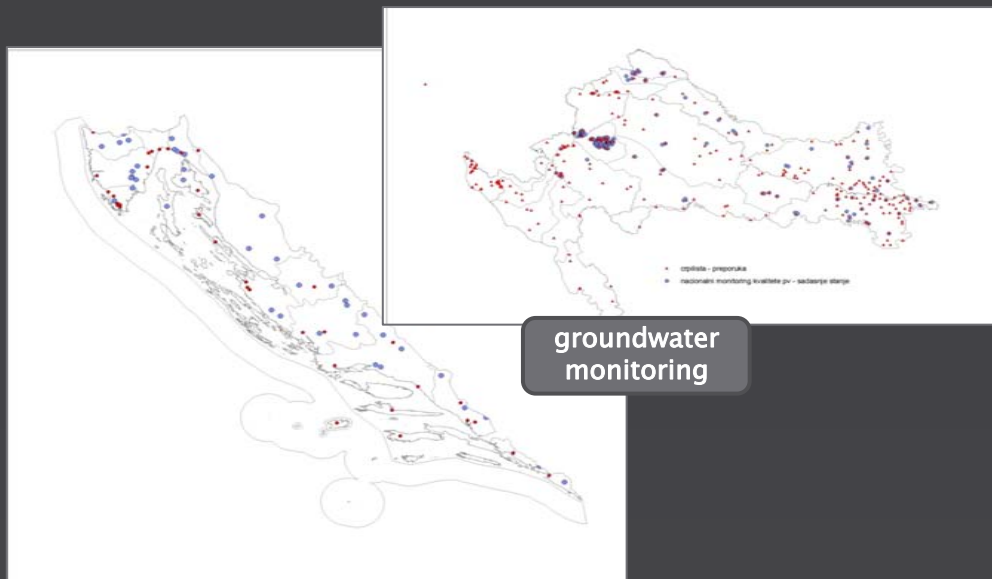
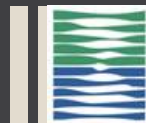


Assessment of groundwater characteristics emphasized:

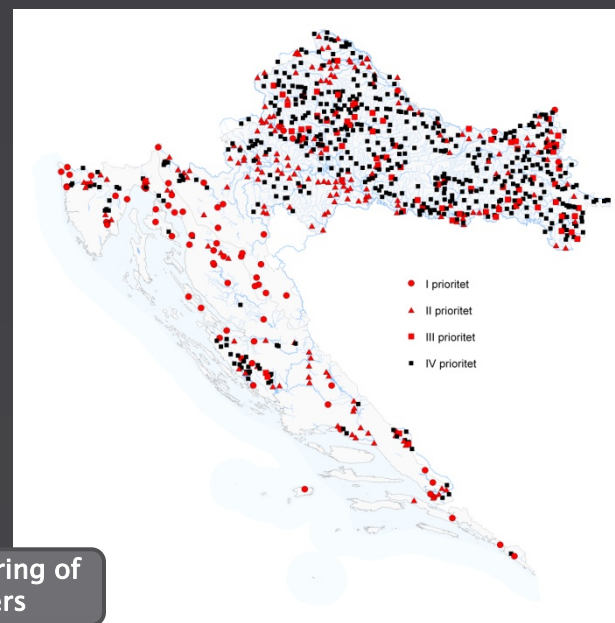
- international character and
- significant natural sensitivity of most groundwater bodies.

number of groundwater bodies	in the karst	alluvial	total	international	with significant natural vulnerability
Adriatic river basin	12	-	12	6	9
Danube river basin	5	15	20	15	15
Croatia	17	15	32	21	24

Monitoring – proposal



groundwater monitoring



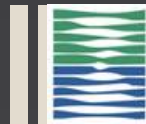
monitoring of rivers

Adaptation and expansion of monitoring is necessary for the fulfillment of requirements from the Water Framework Directive. Adjustments pertain to:

- monitoring locations; and
- monitoring programs.

	Total	Hydromorphological elements	Chemical and physico-chemical elements	Dangerous substances
1. priority group of monit. points	71	47	39	1
2. priority group of monit. points	198	61	129	20
3. group of monitoring points	79	45	68	1
4. group of monitoring points	507	220	474	9
Remaining	0	482	145	824
Total	855	855	855	855

FLOODS–Assessment of floods



Basic data



Corine land cover

Population density

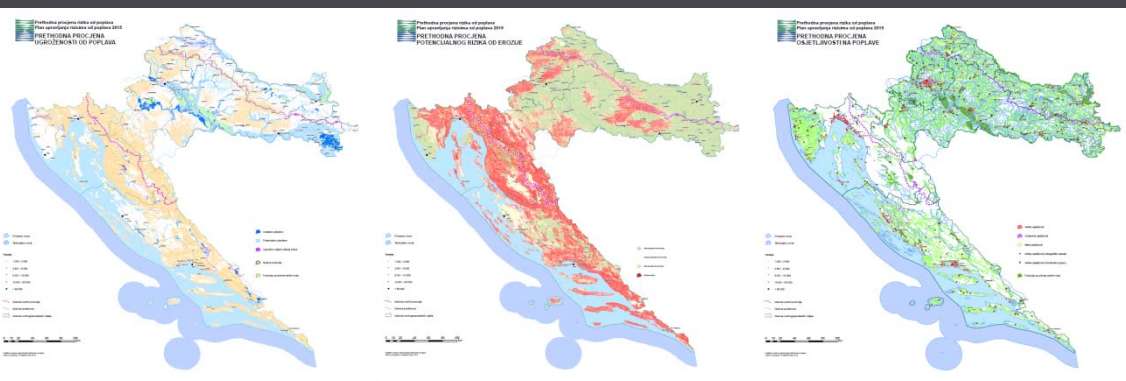
Protected areas

Flood control structures

Recent analyzed floods

Preliminary risk assessment is a combination of:

Preliminary risk components



Preliminary flood hazard

Preliminary soil erosion risk

Preliminary sensitivity to floods

preliminary flood hazard

- fluvial floods
 - regularly flooded
 - flooding due to overtopping and structural failures
- areas prone to torrents
- sea floods
- failures of high dams

preliminary sensitivity to floods (flood risk receptors)

- high (settlements, industries, landfills)
- medium (significant infrastructure....)
- low (agriculture*....)
- no (forests, bare rocks....)

Preliminary flood risk assessment

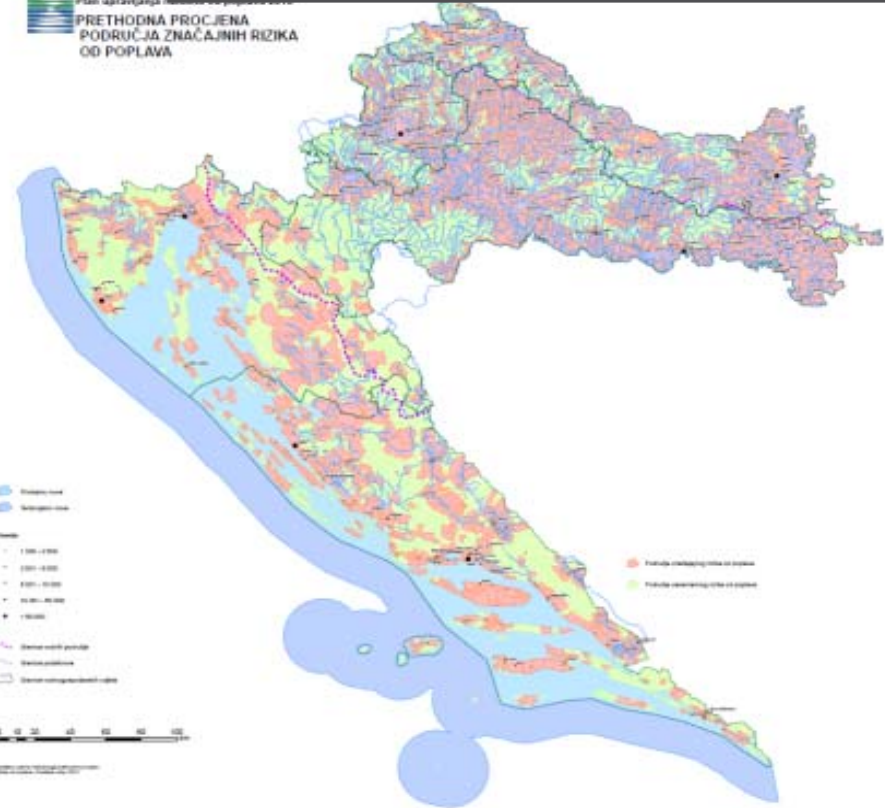
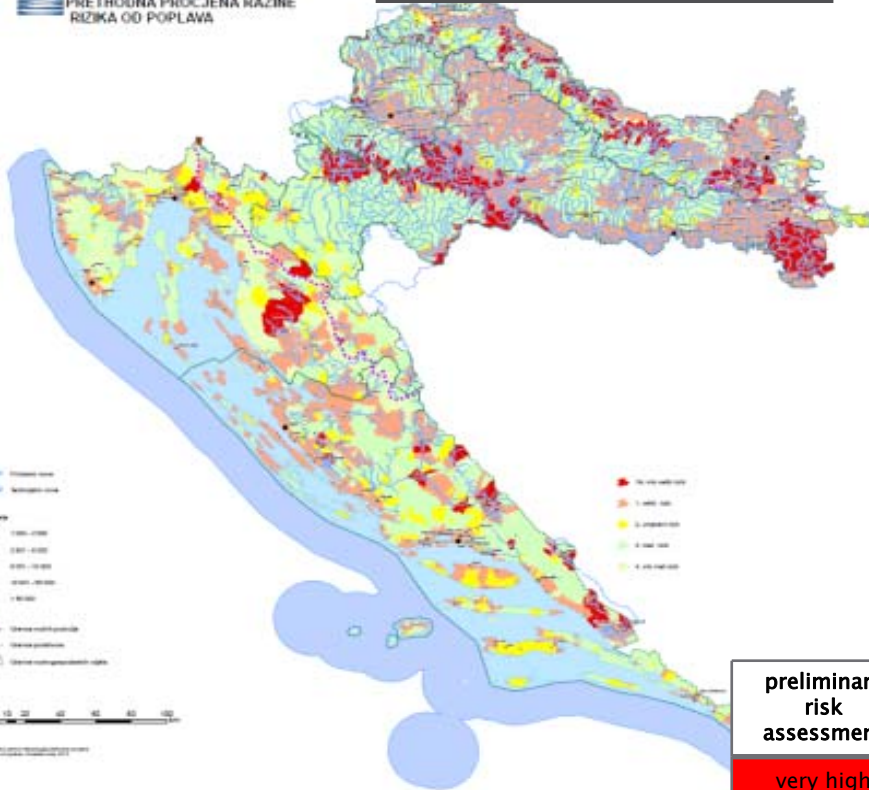


Preliminary risk level

Areas of potential significant flood risks

Prethodna procjena rizika od poplava
Plan upravljanja rizikom od poplava 2015
PRETHODNA PROCJENA RAZINE
RIZIKA OD POPLAVA

Prethodna procjena
Plan upravljanja
PRETHODNA PROCJENA
PODRUČJA ZNAČAJNIH RIZIKA
OD POPLAVA



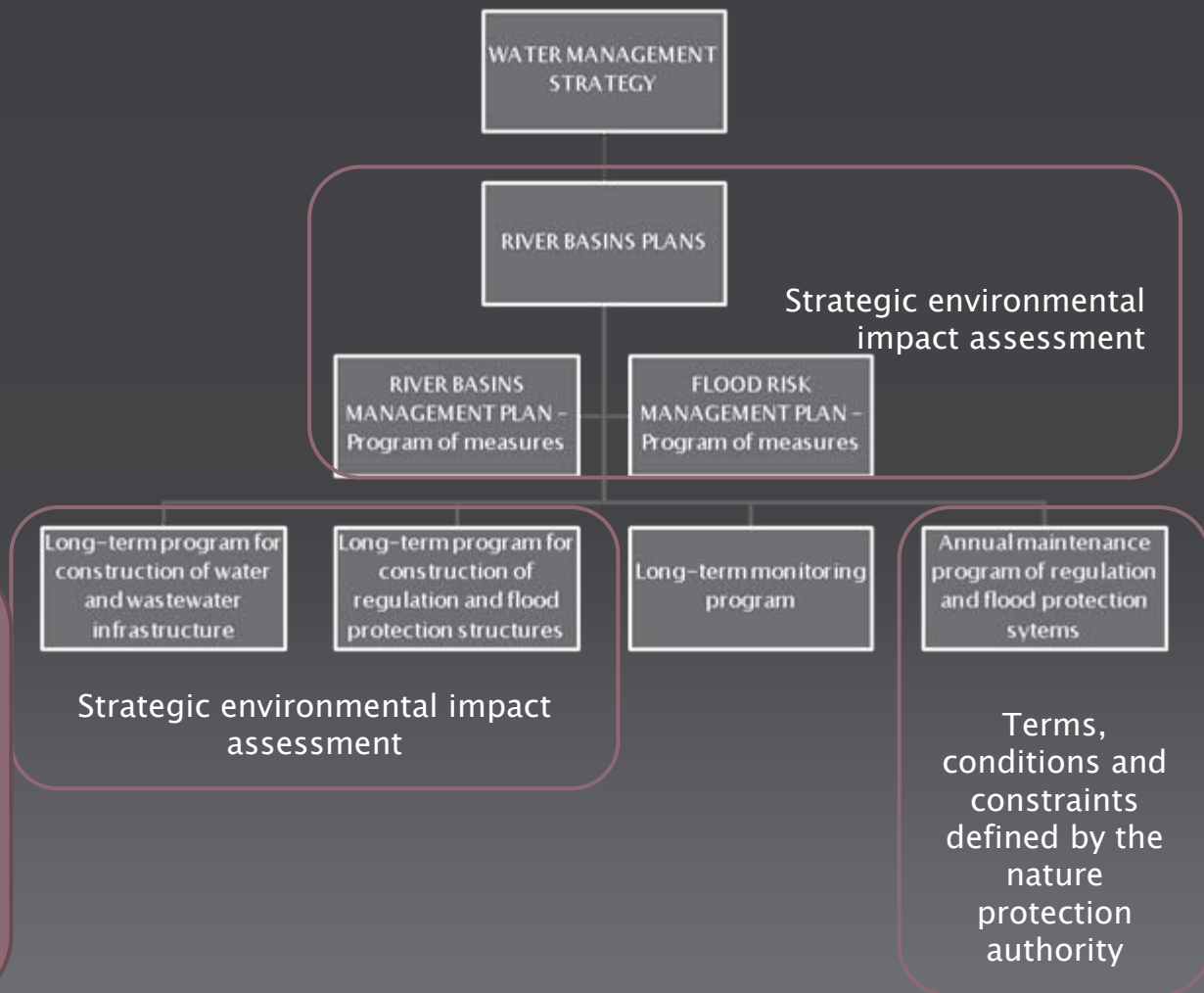
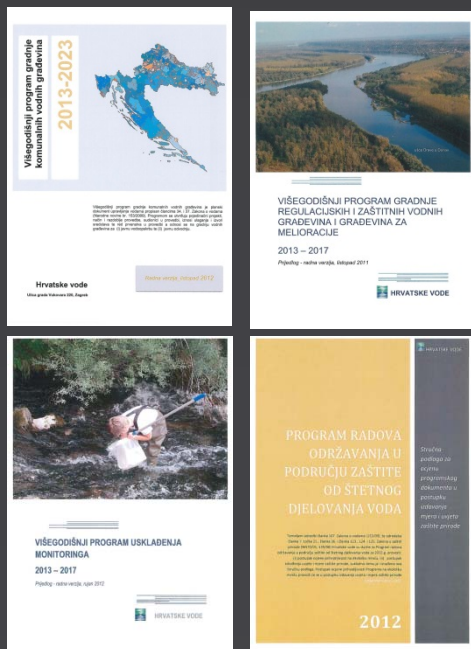
preliminary risk assessment
very high
high
moderate
low
very low

Analysis level:
Administrative area of settlement
(incl. corrections in the river basin district and islands)

Flood hazard and flood risk maps and Flood Risk Management Plan (in preparation)

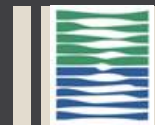


Planning implementation of the Program of measures



Public and stakeholders involvement in the preparation and adoption of plans and programs is conducted through a consultation process based on the requirements of the:

- Water Framework Directive
- Flood Directive and
- SEI Directive



Thank you.

Ministry of Agriculture; www.mps.hr

Hrvatske vode; www.voda.hr