

Implementation of the Flood Directive in Romania

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PROVISIONS AND DEADLINES OF DIRECTIVE 2007/60/CE

PFRA shall be reviewed, and if necessary updated, by 22 December 2018 and every six years thereafter.
FHRM shall be reviewed, and if necessary updated, by 22 December 2019 and every six years thereafter.
FRMP shall be reviewed, and if necessary updated, by 22 December 2021 and every six years thereafter.

STAGE
3 Flood Risk Management
Plan Elaboration (FRMP)
DECEMBER 2015

STAGE
2 Flood Hazard and
Risk Maps Elaboration (FHRM)
(maps produced for areas with
potential significant flood risk)
DECEMBER 2013

STAGE
1 Preliminary Flood
Risk Assessment (PFRA)
Designation of Areas with
Potential Significant Flood Risk
DECEMBER 2011

**Implementation stages of
Directive 2007/60/EC**

IDENTIFICATION OF THE SIGNIFICANT HISTORICAL FLOOD EVENTS

Inventory of major floods that occurred in the past and ...

Criteria for identification of significant historical floods (hazard + consequences)

Zone afectate de inundații istorice semnificative
(Preliminary Flood Risk Assessment - PFRA)



Ungaria

Republica Moldova

Ucraina

Serbia

Bulgaria

Marea Neagră



Hydrologic criteria

$$Q_{\text{recorded}} > Q_{\text{max}10\%}$$



Damage criteria

- Victims > 10 ;
- Social objectives > 2
- Economic objectives > 10
- Cultural objectives > 1
- Roads > 200 km ;
- Houses > 100/event
- IPPPC objectives > 1

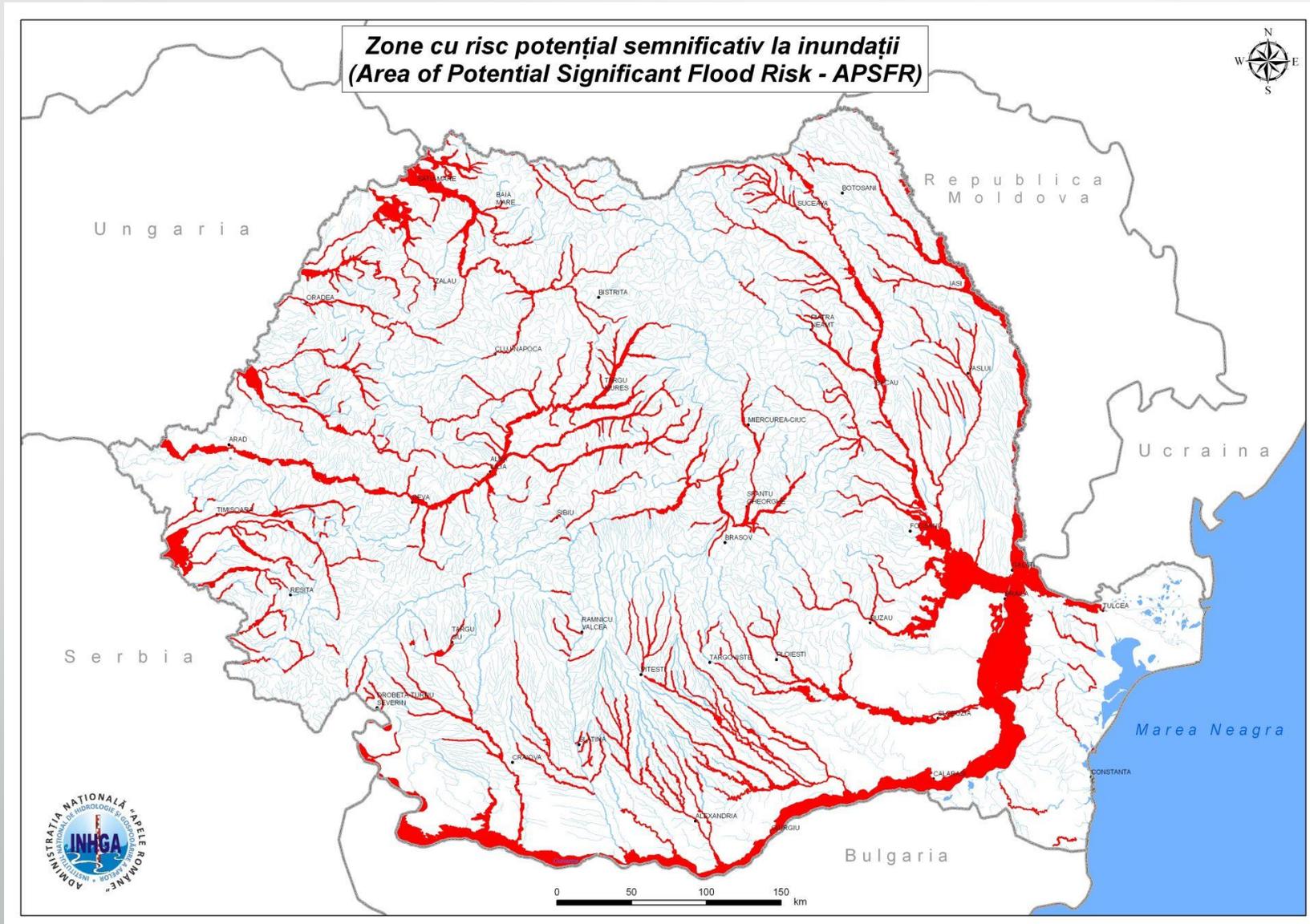


Significant Event



39 events at national level
(inland rivers), 2 events
for Danube River

DESIGNATION OF AREAS WITH POTENTIAL SIGNIFICANT FLOOD RISK



375 APSFR for inland rivers and 24 APSFR for Danube River

INTERNATIONAL COORDINATION AND REPORTING OF P.F.R.A.

💧 Several meetings were held with the neighbouring countries, regarding information exchange about the preliminary flood risk assessment and the assessment and management of flood risks in transboundary regions.

💧 Upload of Preliminary Flood Risk Assessment (P.F.R.A.) on EIONET site – 19-22 March 2012.

PFRA

- 39 events at national level (for internal rivers)
- 3 events for Danube (1998, 2006, 2010)

APSFR

- 375 APSFR for internal rivers – L = 16.400 km (~20 % of cadastred river length of Romania)
- 24 APSFR for Danube – L = 1100 km

FLOOD HAZARD MAPS

Romania uploaded the required information (XML and GIS files, as it is stated in the Flood Directive), on the [Central Data Repository – EIONET](#), for all the 11 River Basin Administrations (RBA) and 1 for the Danube river on **22 of March 2014**

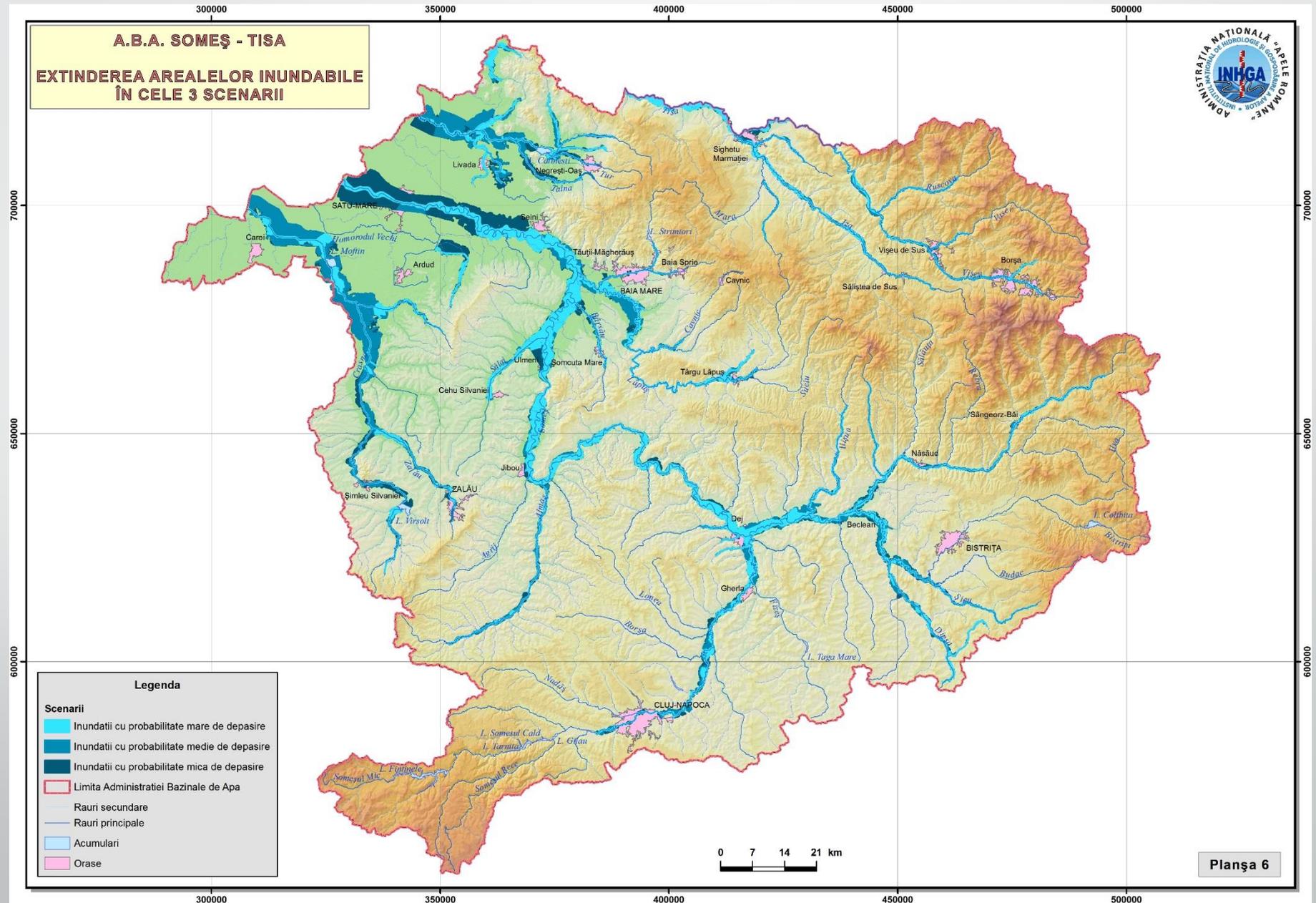
INLAND RIVERS (Scenarios 0.1%, 1%, 10%)

- result of the on-going **National Programme Plan for floods prevention, protection and mitigation** (P.P.P.D.E.I.) - financed through state budget and Environmental SOP (covers 76 % of reported APSFR) – NIHWM scientific coordination.
- **343 river courses => 16.400 km covered by FHRM**

DANUBE RIVER (Scenarios 0.1%, 1%, 10%)

- result of the **Danubefloodrisk project** (South East Europe – Transnational Cooperation Programme, 2009 – 2011).
- **1074 km river length covered by FHRM**

FLOOD HAZARD MAPS



Agreed depth classes:

1 - <0.5 m

2 - 0.5 m – 1.5 m

3 - > 0.5 m

FLOOD RISK MAPS – QUALITATIVE APPROACH

In order to detail the vulnerability to floods expressed through different elements which lie inside the flood-prone areas, each type of CORINE Land Cover classes is ranking based on **expert judgment**. The rank indicators vary from 0 to 3

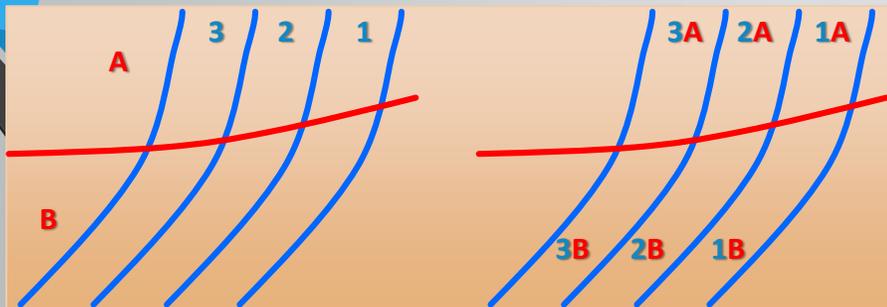
RISK ASSESSMENT -
QUALITATIVE
APPROACH

HAZARD
ASSESSMENT

RISK
ASSESSMENT

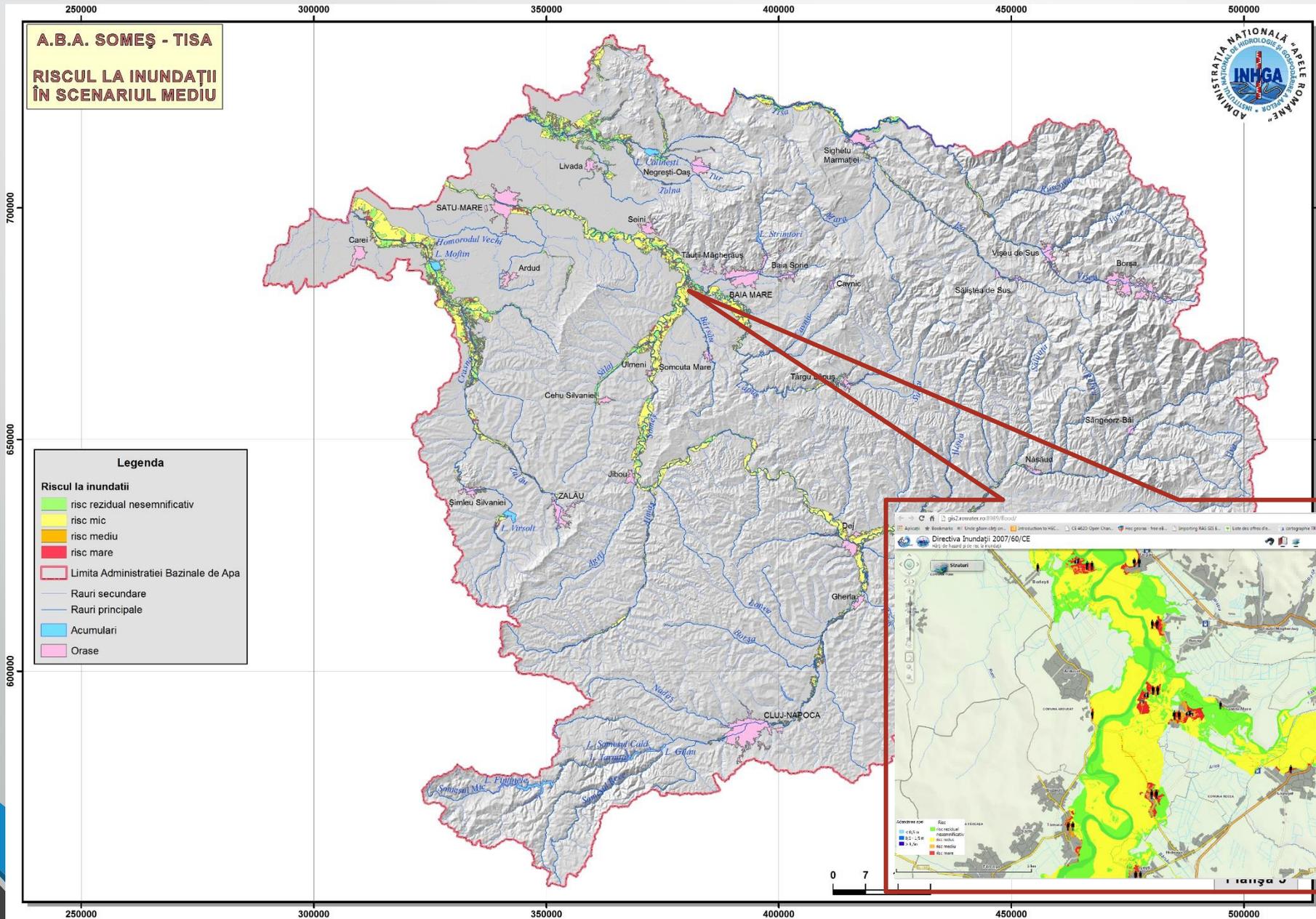
HAZARD (10,100,1000 YRS)		
INDEX	LEVEL OF MAGNITUDE	DEPTH
H1	LOW	<0.5 m
H2	MEDIUM	0.5-1.5m
H3	HIGH	>1.5m

RISK		VULNERABILITY			
		V1	V2	V3	
		LOW	MEDIUM	HIGH	
HAZARD	H1	LOW	R1	R1	R2
	H2	MEDIUM	R1	R2	R3
	H3	HIGH	R2	R3	R3



CLC code	CLC class		Risk class corresponding to depth class		
	Old class	New class	Low	Medium	High
			<0,5	0,5-1,5	>1,5
111	Spatiu urban continuu		2	3	3
112	Spatiu urban discontinuu si spatiu rural		2	3	3
112A	Spatiu urban discontinuu si spatiu rural	Agricol si alte terenuri la marginea localitatii	0	1	2
121	Unitati industriale sau comerciale		3	3	3
122N	Retea de cai de comunicatie si terenuri asociate	Autostrazi, EU, National, Gari	3	3	3
122J		Judetean	2	3	3
122C		Comunal, altele	2	2	3
122S		Strazi si altele	2	3	3

FLOOD RISK MAPS



Legenda

Riscul la inundatii

- risc rezidual ne semnificativ
- risc mic
- risc mediu
- risc mare

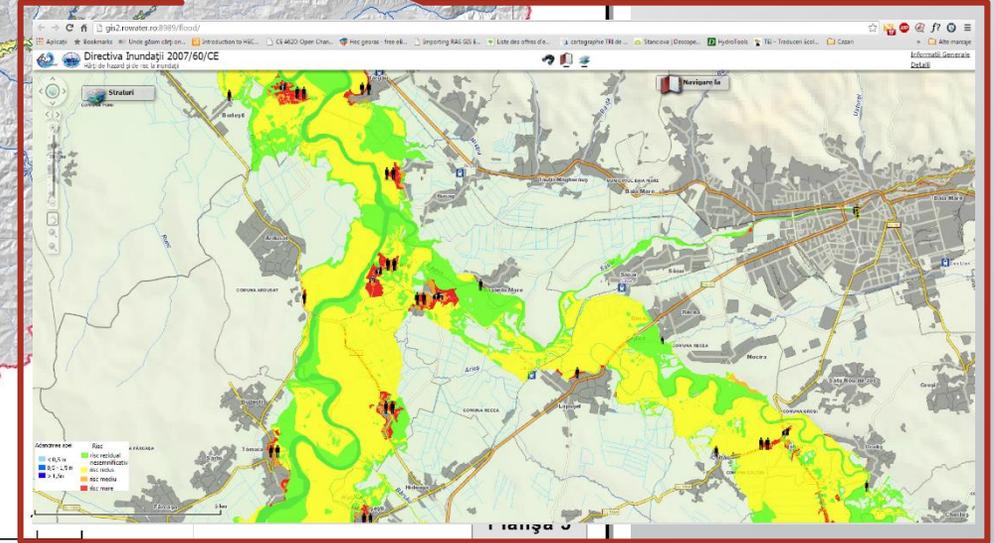
Limita Administratiei Bazinale de Apa

Rauri secundare

Rauri principale

Acumulari

Orase



WEB PORTAL

STATISTICAL INFORMATION – NATIONAL LEVEL (medium scenario 1%)



Almost 4 % (~ **818.000 inhabitants**)
of total population of Romania
is situated in flooded area.

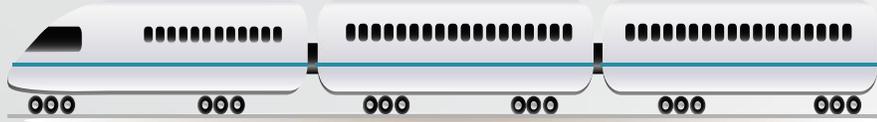


32 IED installations are situated in flooded areas



469 protected areas
are at flood risk

STATISTICAL INFORMATION – NATIONAL LEVEL (medium scenario 1%)



Around 6% from the **national railway network** can be affected from floods occurred one in 100 years.



~ 700 km



~1300 km



~ 1000 km



Length of **different road categories** under the risk of flood (Q1%)

		 PARIS	 ROME
Biserici	Muzee	 ATHENS	 LONDON
286	13	Monumente	
		15	

Cultural heritage – 286 churches, 13 museums and 15 cultural monuments, can be flooded in case of flood event with a 100 years return period.

FLOOD RISK MANAGEMENT PLANS

A. Establishment of WGs at the national level: 11 River Basins Administration, N.A. Romanian Waters and National Institute of Hydrology and Water Management and **organization of the working meetings dedicated to F.R.M.P. elaboration**

B. Organization of public debates dedicated to F.R.M.P. elaboration: public consultations (Ministry of Environment Waters and Forests), **debates in academic environment** (Technical University of Environment and Civil Engineering)

C. Elaboration of the Framework-Methodology for Flood Risk Management Plans Development

Content of Framework Methodology for Flood Risk Management Plans Development	
Chapter 1	The concept of flood risk management
Chapter 2	The purpose and objectives of the Flood Risk Management Plan
Chapter 3	Information required for the development of Flood Risk Management Plan
Chapter 4	Structure and content of Flood Risk Management Plan at R.B.A. level

FLOOD RISK MANAGEMENT PLANS

D.Content of the Flood Risk Management Plan for all the 11 River Basin Administrations

Chap. 1 : River Basin general presentation

Chap. 2 : Flood risk at the River Basin Administration level

Chap. 3 : Description of the flood risk management objectives

*Chap. 4 : **Sinthesis and prioritisation of the proposed measures*** → ON GOING

Chap. 5 : Description of the progress implementation monitoring

Chap. 6 : The abstract regarding the public information and consultation

Chap. 7 : The list of competent authorities

Other chapters (if it is applicable)

Description of cost – benefit methodology, when is available, used in the transnational context;

Description of the coordination process at international basin level;

Description of the coordination process with W.F.D. (2000/60/CE Directive).



FLOOD RISK MANAGEMENT PLANS

CHAP. 4 : SYNTHESIS AND PRIORITISATION OF THE PROPOSED MEASURES

Realised:

- **Catalogue of measures**
 - Measures proposed follow the 5 areas of action closely linked to the cycle of flood risk management: *Prevention, Protection, Preparedness, Public awareness of flood risk, Restoration / Reconstruction*;
 - 69 measures examples;
 - special attention was given to the **nonstructural measures**;
- **Selection and preliminary evaluation of measures at the River Basin Administration level**
 - Evaluation based on social, technic, economic, environment, cultural heritage criteria

On going:

- **Prioritization Methodology of the Flood Risk Management measures**

Thank you for your kind attention!

