

16th meeting of the EUWI EECCA Working Group

***Impacts of climate change on water resources
in Moldova and possible adaptation measures.
Trans-boundary cooperation in adaptation in
the Dniester river basin***

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EAP Task Force

Content

- European Union Water Initiative NPD in Moldova
- Climate change in Moldova
- Impacts of climate change on water resources and on WSS
- Possible adaptation measures: general and WSS-specific
- *UNECE/ ENVSEC project: Reducing vulnerability to extreme floods and climate change in the Dniester basin*



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EUWI NPD in Moldova in 2006-2012

On WSS:

- First phase: developing a National Financing Strategy for Urban and Rural WSS in Moldova.
- The second phase (2009-2010) was devoted to developing a mid-term Action and Investment plan
- The ongoing 3rd phase: developing an adaptation strategy for WSS to make it more resilient to climate change, and on sustainable business models for sanitation in small towns and villages in Moldova.

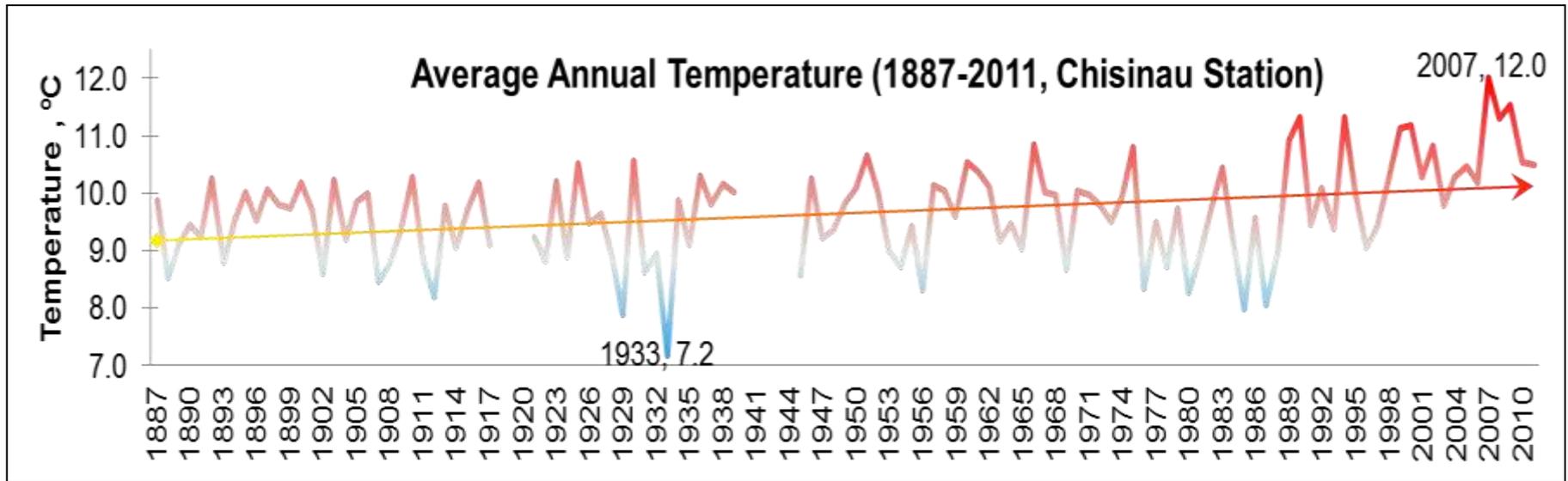
On IWRM:

- In 2006-2008: several policy packages (e.g. wastewater discharges, on river basin management authorities, etc.;
- In 2009-2010 the dialogue focused on the setting up of targets and target dates on water and health under the Protocol on Water and Health
- In 2012-2013: Action plan for the targets



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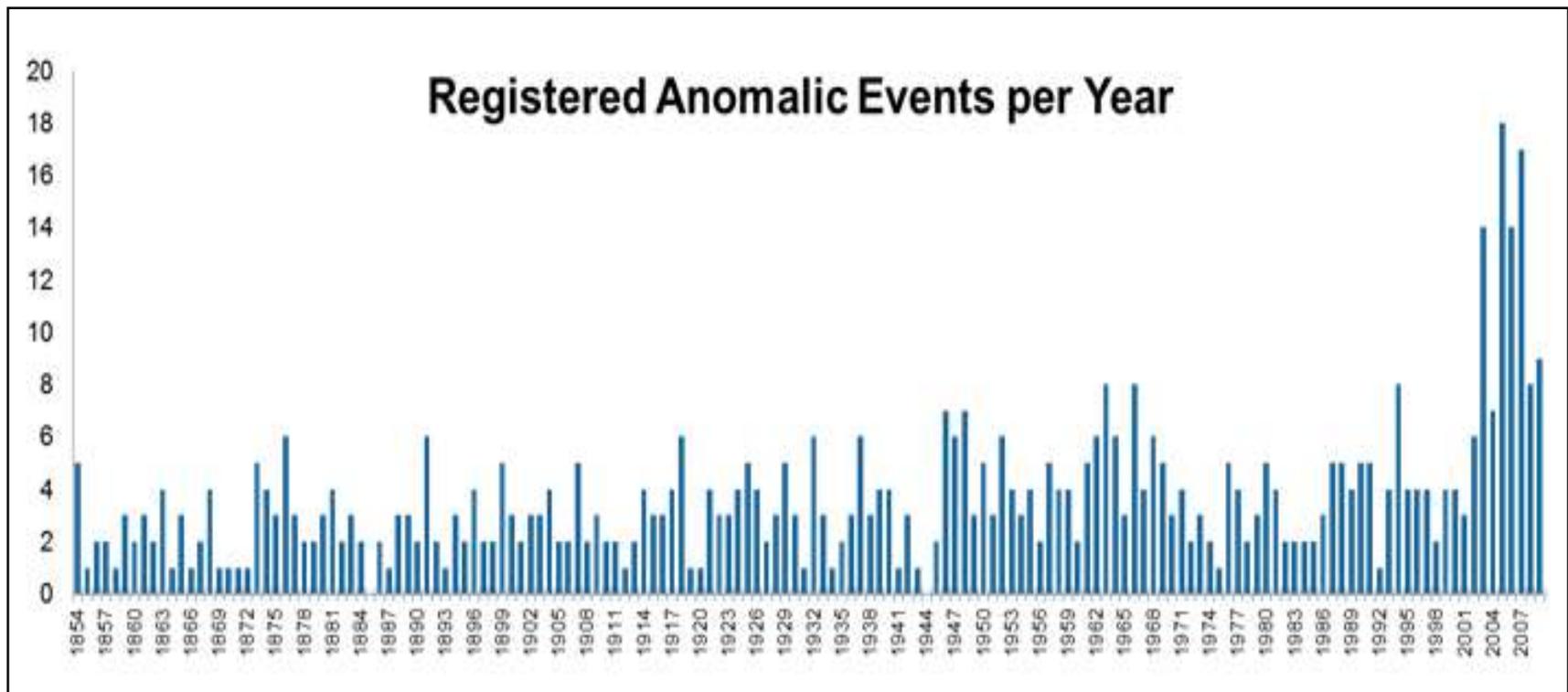
Annual average Temperature in Moldova



- Over the past 120 years, average T increased by some +1C.
- Over the last 66 years, the amount of precipitation in the northern and central part of the country has risen up to 11%, while in the Southern part of the country the amount of precipitation has decreased by 1.2%, to 658, 569 and 514 mm per annum, respectively

The number of anomalic events inrceases

The number of extreme weather events such as floods or windstorms, extreme temperature and droughts has increased substantially since 2001

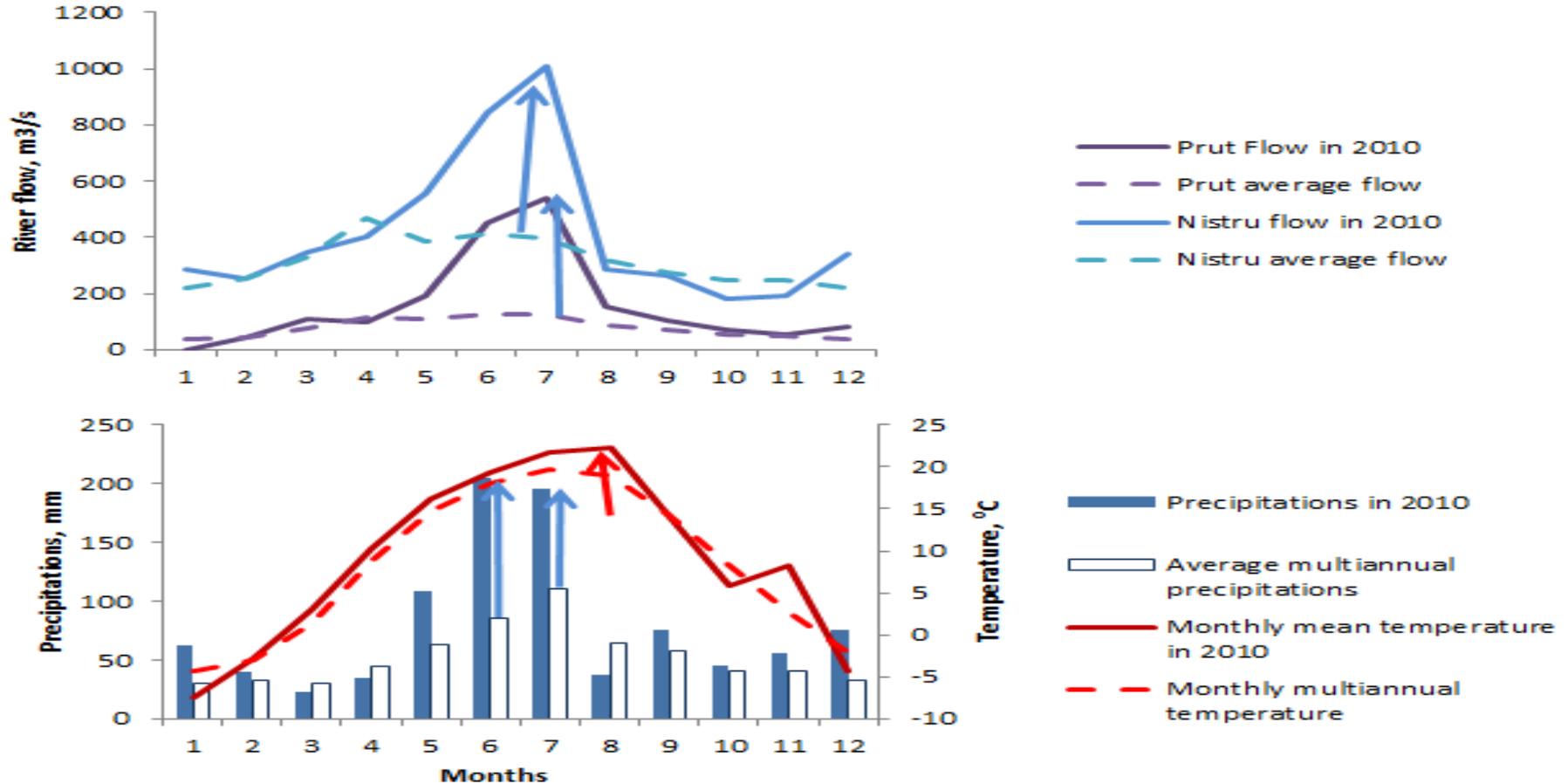


Impacts on water resources

- **Surface water quantity** (projection): no significant change in the annual flow, but peak flows will be some 20-30% higher (hence higher risk of floods), due to lower number of rainy days
- **Surface water quality**, e.g. 2007 drought: an increased content of Ammonium (NH_4) and a low content of Nitrates (NO_3) and Dissolved Oxygen
- **Ground water**, e.g. 2007 drought: : 80% of shallow wells had a significantly reduced water level and productivity, while 20% dried up completely!
- **High uncertainty remains plus Data problem :**
 - lack of data on water quality (or not reliable data)
 - not enough automatic hydro-posts



Illustration 1: 2010 flood



Data resolution problem: to assess peak flows during floods, data on daily/hourly flows is needed, while only data on monthly (!) flows is available!

Illustration 2: 2007 drought

Settlement	Rayon	Number of existing shallow wells	Number of completely dried up wells	% of total
Bocancea Schit	Singerei	7	7	100%
Cioropcani	Unghen	189	60	32%
Copance	Causeni	35	35	100%
Onitcani	Criuleni	14	14	100%
Bulhac	Riscani	31	15	48%
Dolinnoe	Criuleni	100	78	78%
Tirnova	Donduseni	493	251	51%
Tintareni	Anenii Noi	110	110	100%
Mirnoe	Taraclia	15	12	80%
Ecaterinovca	Cimisla	37	30	81%
Ghindesti	Floresti	85	70	82%
Costesti	Ialoveni	420	270	64%



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Possible adaptation measure

- **General:**
 - Establish integrated water resource management (IWRM)
 - Introduce disaster and climate risk assessment
 - Establish of a proper flood management (EIB project), etc.
- **WSS-specific (focus on “no regret” measures):**
 - Water and sanitation development/master plans based on the water resource inventory on river basin level
 - Promote efficient water use (water demand management plans and various incentives, reducing leakages etc.)
 - Upgrading existing and properly functioning WSS facilities and protecting them against flooding and direct impact of the increased river flow, etc.
- **These measures will be further assessed and adaptation strategy for WSS developed by the end of 2012** (EC (DG ENV) and OECD–sponsored project implemented through the ongoing EUWI NPD)



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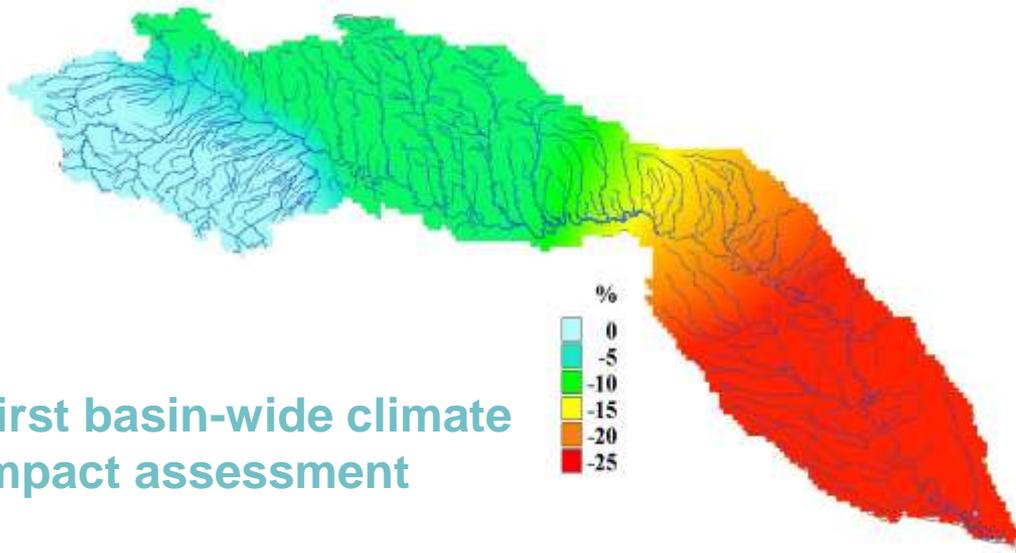
Project: Reducing vulnerability to extreme floods and climate change

- Background: Most rivers in Moldova are transboundary. 2.7 million Moldovans live in the Dniester basin. Transboundary cooperation in adaptation is necessary to prevent negative impacts of unilateral measures and increase effectiveness of adaptation
- Dniester III floods and climate project implemented by UNEP, UNECE and OSCE under ENVSEC in 2010-2012, within the Dniester III project and as part of the Water Convention programme of pilot projects
- Aims:
 - reduce risks from climate change - and specifically flooding - by improving adaptive capacity of both countries
 - expand and further strengthen cooperative management to address cross-border management of floods



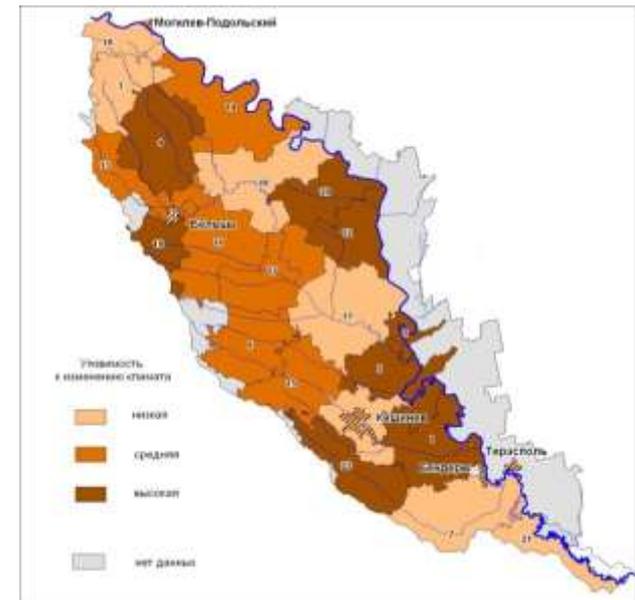
Nearly completed activities

- First basin-wide climate impacts assessment and vulnerability assessment
 - Analysis and projection of climate change impacts
 - Analysis of climate change impacts on water resources
 - Integrated vulnerability analysis



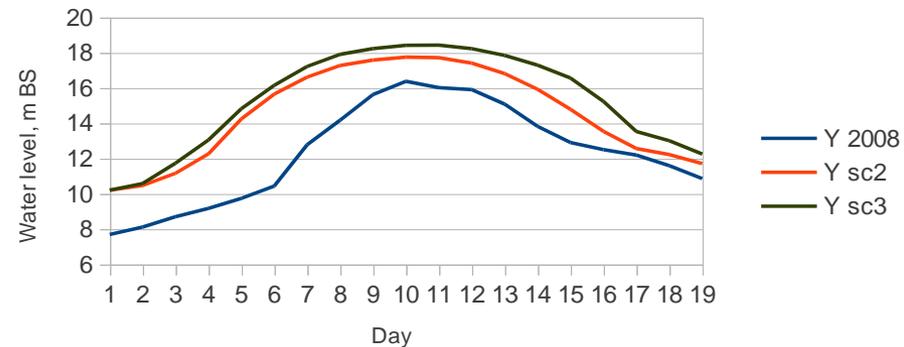
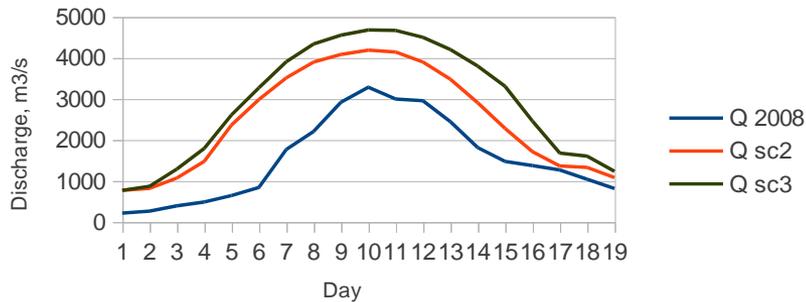
First basin-wide climate
Impact assessment

Vulnerability Index

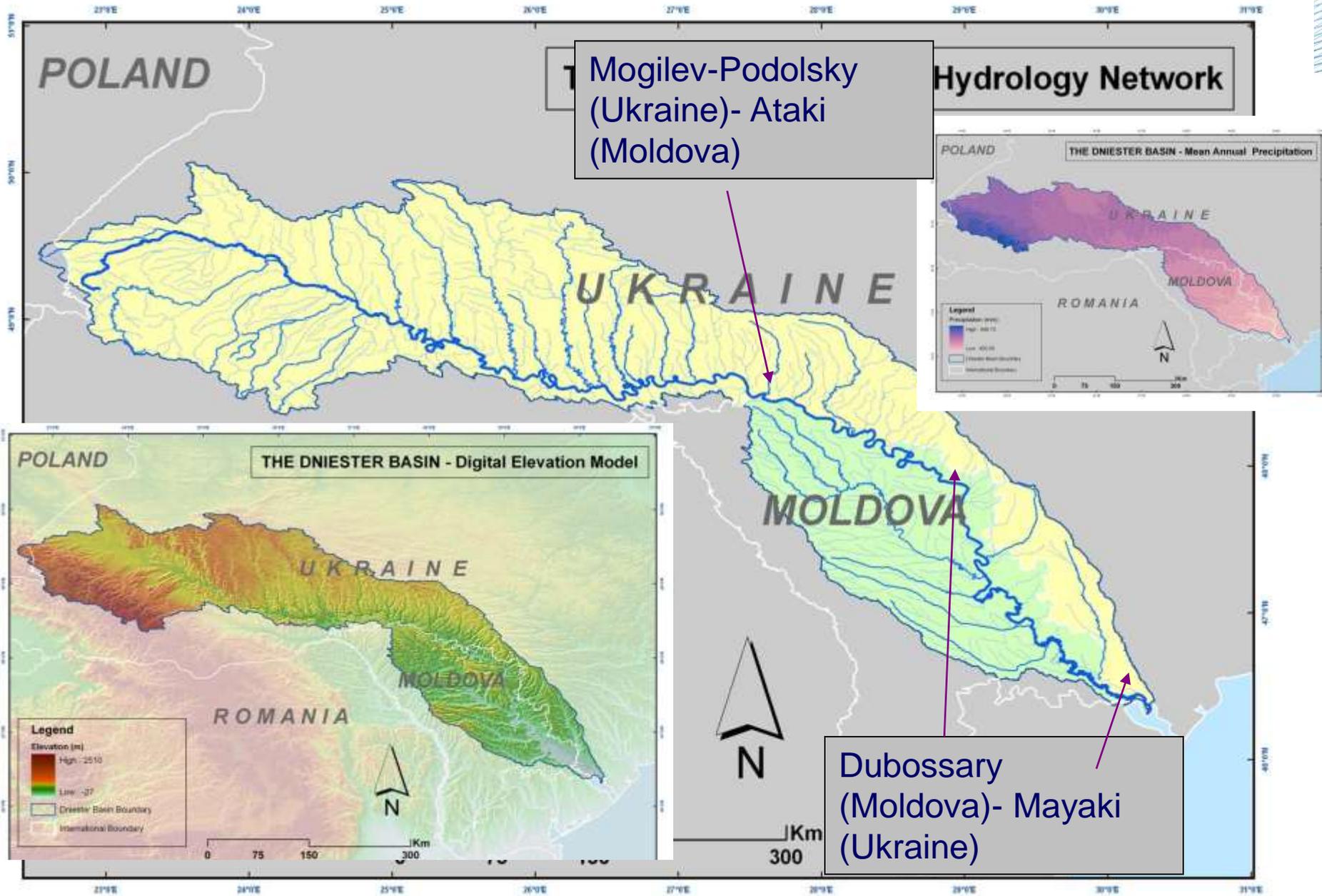


Nearly completed activities

- Modelling and mapping of flood risks in selected areas
 - Modelling of extreme flood scenarios
 - Geoinformation support and flood mapping
 - Survey of channel/ floodplain topography



• **Inauguration of a boat** funded through the Dniester III project for Moldovan fisheries services (8 June 2012)



Ongoing/planned activities

- Improved / new automated flow monitoring stations and data exchange infrastructure
 - Enhanced capacities and plans for flood risk communication on the sub-basin / local level
 - Agreement and planning of further measures for flood risk reduction- preparation of adaptation strategy/ plan
- > Cooperation/ coordination with national activities ensured through working group



Environment Division
UN Economic Commission
for Europe



Office of Co-ordinator of
OSCE Economic and
Environmental Activities

Some first lessons learnt

- In Ukraine and Moldova climate change impact assessments had been done nationally, but with different methodologies and thus different results– importance of joint scenarios, modelling and vulnerability assessment
- Importance of thorough baseline study to identify completed or ongoing projects and relevant partners to be involved
- Importance of link between political and experts' level, e.g. through creation of a working group and regular meetings
- Importance of concrete activities and involving population

THANK YOU FOR YOUR ATTENTION!

