FLOOD PULSING SYSTEM - ASSESSMENT AND CONSERVATION
(Proposal for comparative study)

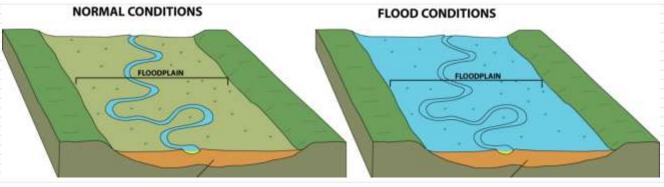**Tomasz Okruszko**
WARSAW UNIVERSITY of LIFE SCIENCES, Poland

Based on COST meeting, Madrid, 29-30/01/2020

Contents

- Context
- Proposed study
  - Idea and goal
  - Method
  - Way to go…
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- **Floodplains:** "areas periodically inundated by overflow from rivers and by snow melt, precipitation or groundwater (Junk et al., 1989)

(Romans, 2011)

  - ➢ Exchange nutrients and sediments
  - ➢ Enhance biological productivity

- Increasingly threatened -> Knowledge required for maintenance of ecosystem services
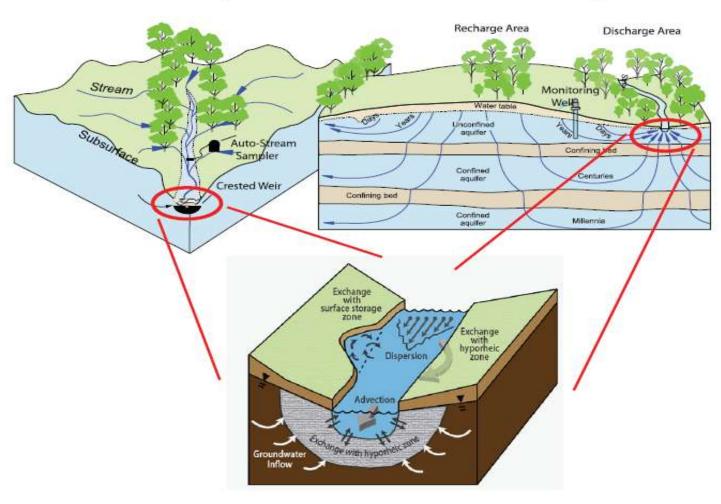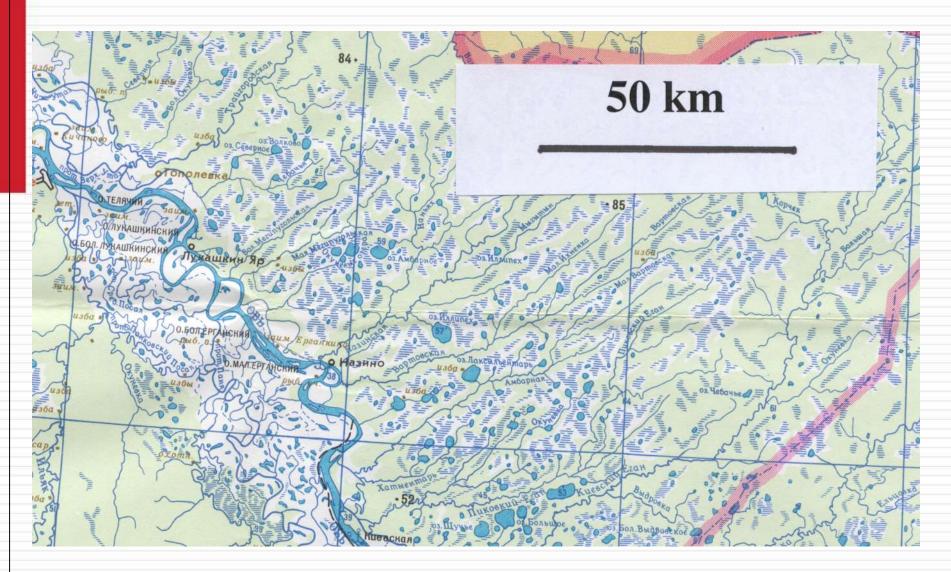
Two perspectives

Figure 4. The river corridor in relation to watershed and groundwater basin perspectives of hydrologic transport.

River corridor science: Hydrologic exchange and ecological consequences from bedforms to basins
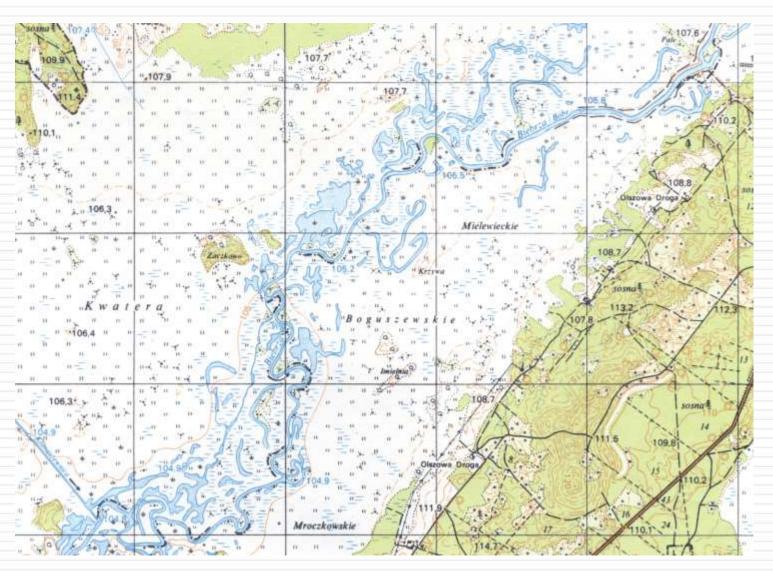
Jud Harvey[1] and Michael Gooseff[2]

A virgin river surrounded by undrained mires (Western Siberia)

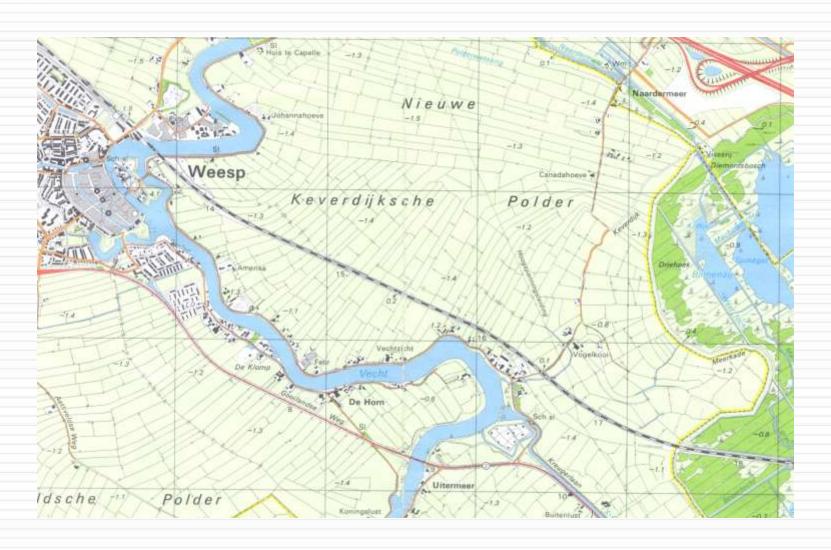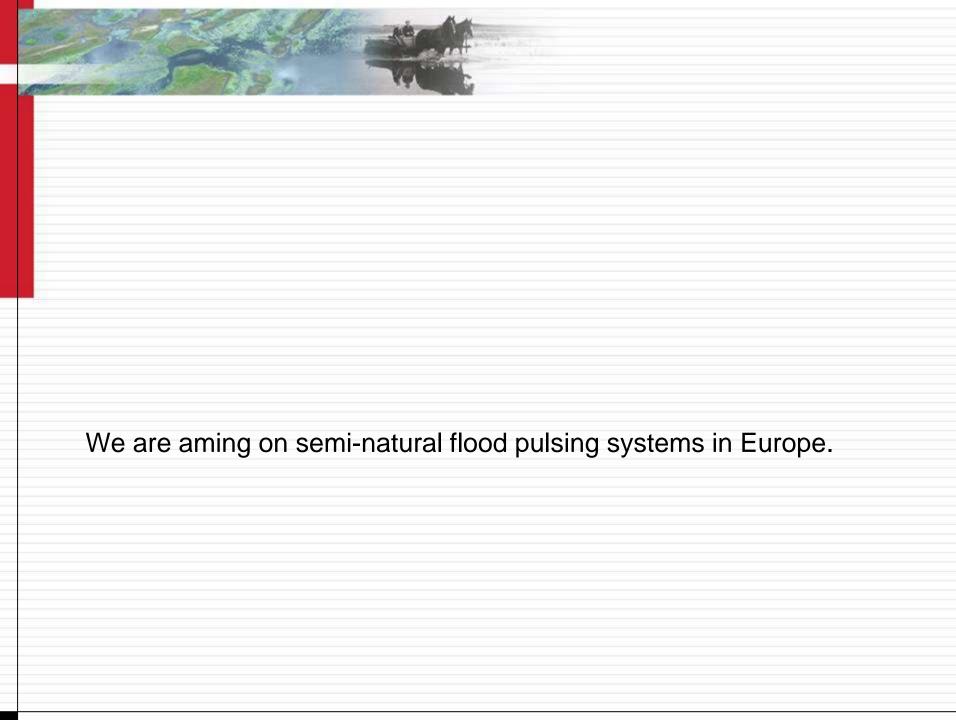**Courtesy Martin Wassen, Utrecht University**

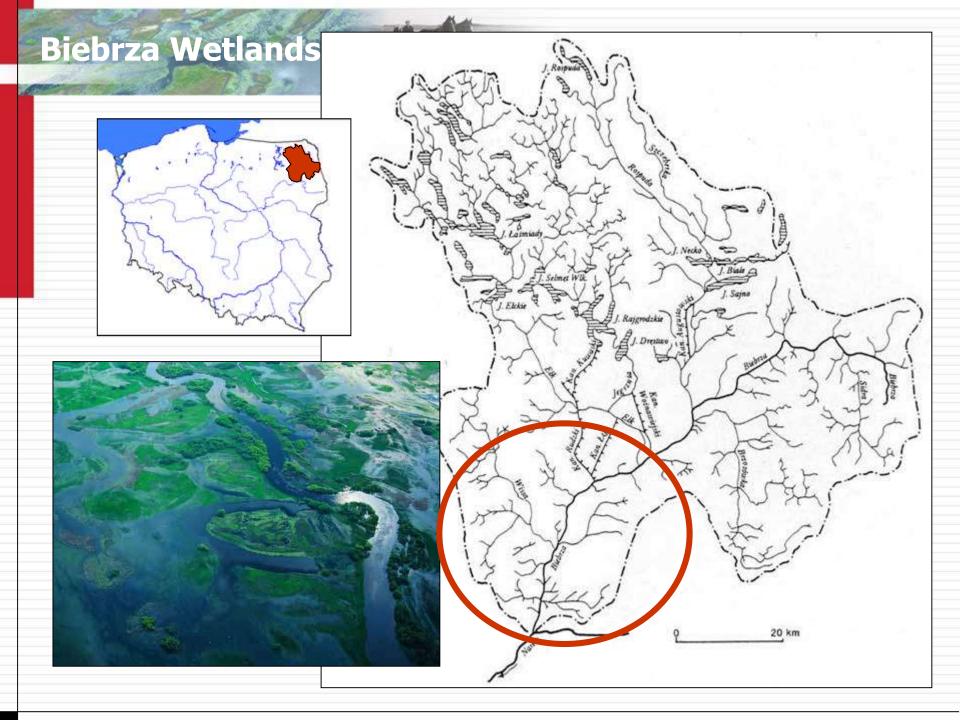# A river with little human interference (Eastern Poland)

1km

Courtesy Martin Wassen, Utrecht University

A river dominated by man (the Netherlands)

1km

Courtesy Martin Wassen, Utrecht University

We are aming on semi-natural flood pulsing systems in Europe.

Biebrza Wetlands

Short-cut study

Aims of the study – using existing pre- and post- disturbance data on flow and vegetation:

- Assessment of threshold flow (overbank) which still impacts habitat

- Identify possible causes for trajectories of floodplain vegetation change,

- Strengthening of arguments for flood pulse ecosystem protection.

Some assumptions:

- Data driven study – so extension of scientific questions depends on # and diversity of cases,

- Flood pulse should be smaller **but existing**, so semi-natural conditions still observed,

- Two observation periods min. 10 years for flow changies calculations and vegetation observations,

- Flow data in the floodplain or in the short distance allowing for extrapolation,

- Vegetation data to allow calculate different characteristics sensitive to the flow changies and time span from the disturbance.
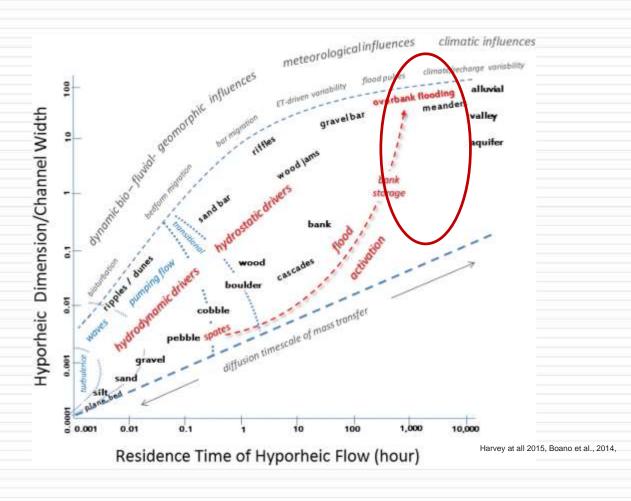
6 Times yes …

- Do I work (have data) on the active floodplain?

- Do I observe changes in vegetation on floodplain or changes in flow characteristics or both?

- Do for the pre- and post-disturbance data are available: veg map and at least 10-15 years of daily observations?

- Do the hydrology observation are based on gauge in the floodplain or upstream it (and there is no significant tributary between gauge and the area of interest)?

- Do I know the bank full flow?

- Can I calculate different characterisitcs from the vegetation maps ?

Main characteristics to be assesed

Variant	Flow	Groundwater	Humans	Vegetation	Remarks
0	Q	GQ	HP	FV	historical
1	Q'	GQ	HP	FV1	
2	Q'	GQ'	HP	FV2	
3	Q	GQ	HP'	FV3	change of land use only
4	Q'	GQ'	HP'	FV4	
5	Q'	GQ'	HP'	FV5	

	Primary variable	Addtiional	Measure of change beetween X and X'
Q	Omax, Q_{10}, $T_{inudation}$	Cumulative freequency curve	% of change, deviation
GQ	Average in mm	Groundwater use from aquifer	% of change
HP	Area and kind of		descriptive
FV	Map of vegetation		

Harvey at all 2015, Boano et al., 2014,

Headwater (1)

Headwater Transition (2)

Montane Floodplain (3)

Montane Transition (4)

Piedmont Valley Floodplain (5)

Piedmont Transition (6)
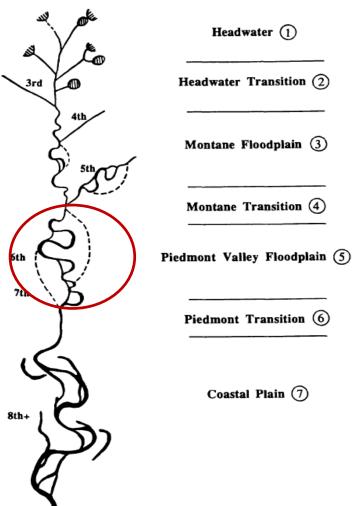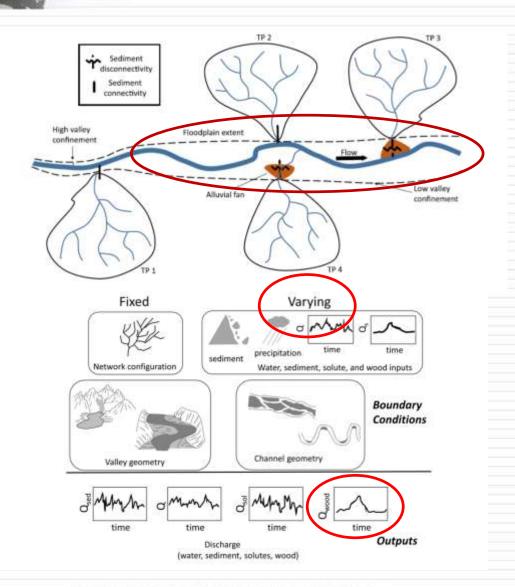
Coastal Plain (7)

FIG. 5. The hyporheic corridor of the river con-
tinuum. Strahler stream orders (3rd–8th +) are shown;
circled numbers relate major features in Figs. 5 and 6.

Result

- Aiming on paper „ Flood pulse study – European wide assessment of its impact on floodplain vegetation and use"

- 1year – so need for existing study & data,
- My guess – 15+ cases could make the job (depends on heterogeneity of sites)

If interested pls send email to:

- T.okruszko@levis.sggw.pl

- Time for decision March 18th