Water Rennovation in Ukraine Project no. 22320101





Visegrad Fund

Hydrometry, mesurements and data processing

1-st practical school (Event-Public), Krakow, PL 22/04/2024-28/04/2024

the "Implementation Period" 04/10/2023 to 15/03/2025

dr hab. inż. Leszek Książek, prof. URK

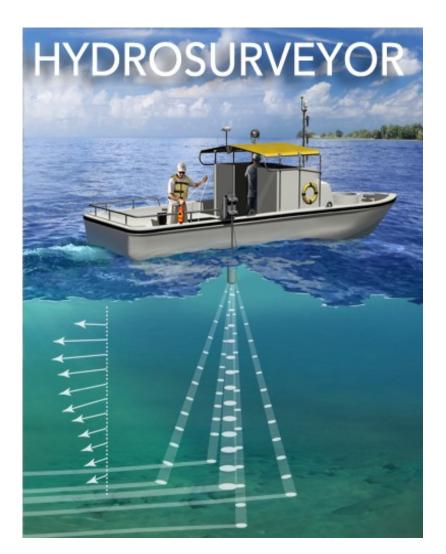
The project is co-financed by the Governments of the Czechia, Hungary, Poland and Slovakia through Visegrad Grants from International Visegrad Fund. The mission of the fund is to advance ideas for sustainable regional cooperation in Central Europe.

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hydrometry – ADCP geodetic measurements – tachimetr, GPS RTK

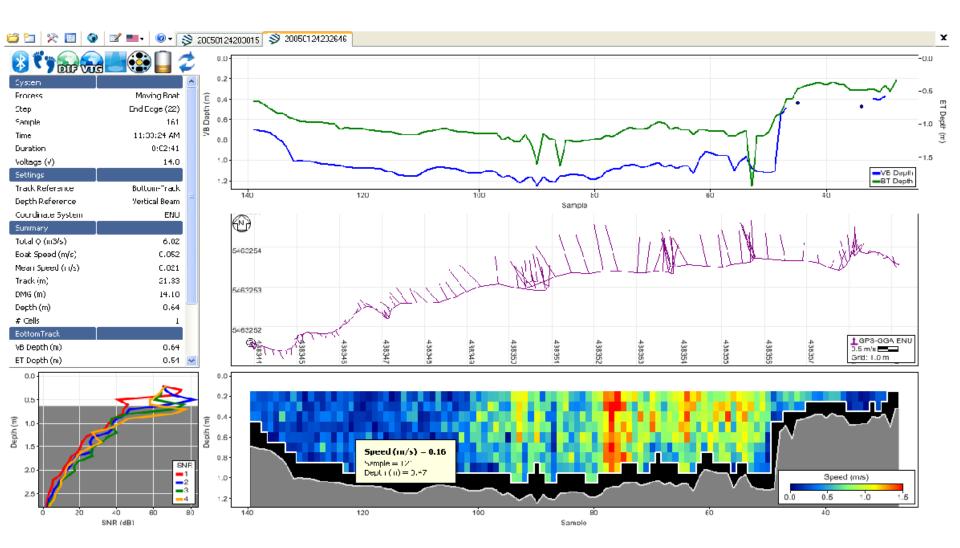






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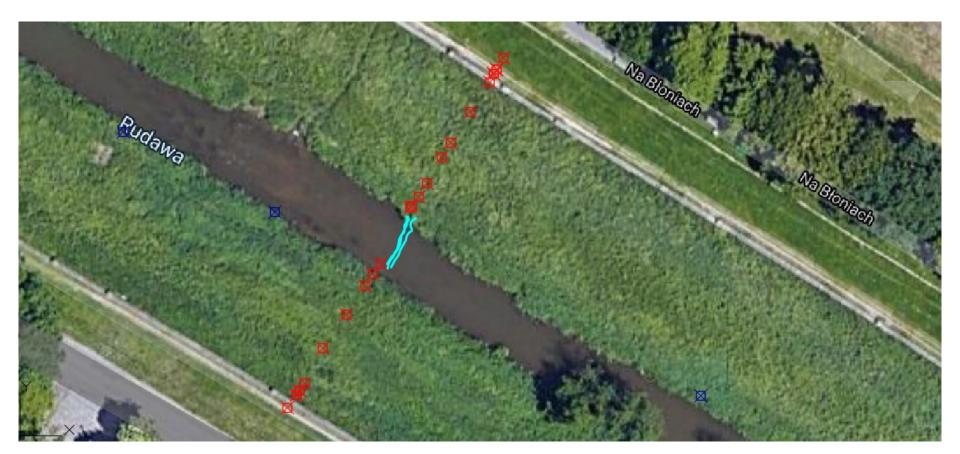
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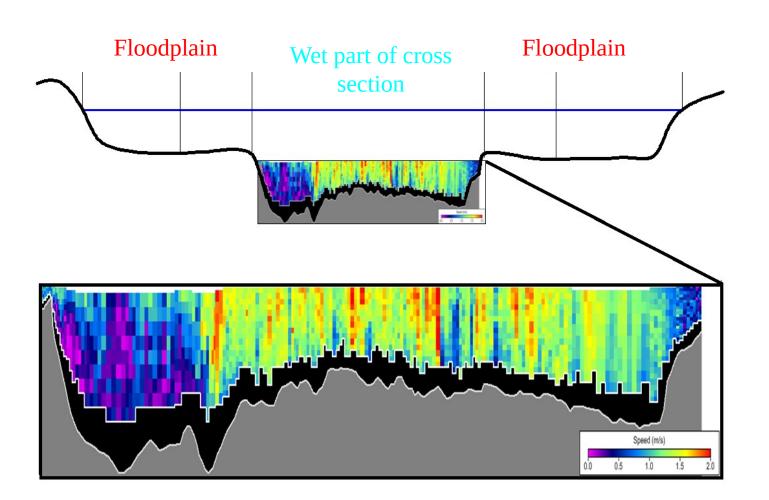


Water surface elevation Wet part of cross section Floodplains



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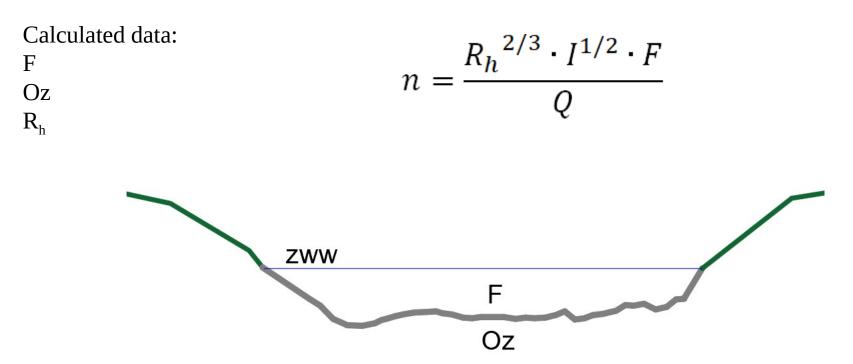
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Tasks:

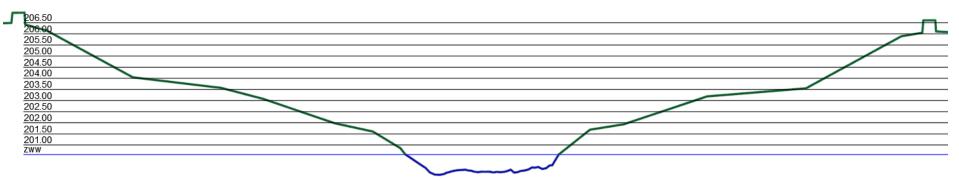
- 1. Calculation of the roughness coefficient in the river channel
- 2. Rating curve calculation

1. Calculation of the roughness coefficient in the river channel

Measured data: I=0,001 Q=4,0 m³s⁻¹



2. Rating curve calculation



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We perform calculations for fillings changing every 0.50 m

Н	F	Oz	R _h	O _{z floodplain}	n _{śr}	v	Q
[m n.p.m.]	[m ²]	[m]	[m]	[m]	[m ^{-1/3} s]	[ms ⁻¹]	[m ³ s ⁻¹]
200.57							
201.00							
201.50							
202.00							
202.50							
203.00							
203.50							
204.00							
204.50							
205.00							
205.50							

2. Rating curve calculation

For each layer we calculate the value of the average roughness coefficient Example for an elevation of 203.50 m above sea level.

$O_{z terasy 203.50} = O_{z 203.50} - O_{z zww}$								
$n_{\acute{s}r\ 203.50} = \frac{O_{z\ terasy\ 203.50} \cdot n_{terasy} + O_{z\ koryta} \cdot n_{koryta}}{O_{z}}$								
Н	F	Oz	R _h	O _z terasa	n _{śr}	v	Q	
[m n.p.m.]	[m ²]	[m]	[m]	[m]	[m ^{-1/3} s]	[ms ⁻¹]	[m ³ s ⁻¹]	
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2. Rating curve calculation

For each layer we calculate the value of the average roughness coefficient Example for an elevation of 203.50 m above sea level.

$$O_{z \text{ floodplain 203.50}} = O_{z \text{ 203.50}} - O_{z \text{ channel}}$$

$$n_{\text{sr 203.50}} = \frac{O_{z \text{ floodplain 203.50}} \cdot n_{\text{floodplain}} + O_{z \text{ channel}} \cdot n_{\text{channel}}}{O_{z}}$$

Н	F	Oz	R _h	O _{z floodplain}	n _{śr}	V	Q
[m n.p.m.]	[m ²]	[m]	[m]	[m]	[m ^{-1/3} s]	[ms ⁻¹]	[m ³ s ⁻¹]
200.57							
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