23 rd Junior Eco - Expert – Ecoproject

Our Country, Our Future, Our Responsibility

Visegrad Fund

GROUP 1: FLOODS AND DROUGHTS

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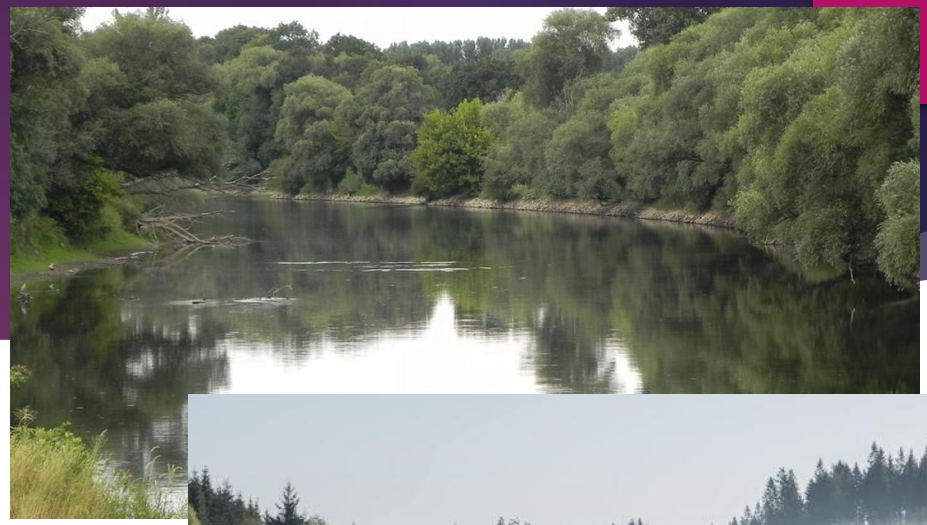
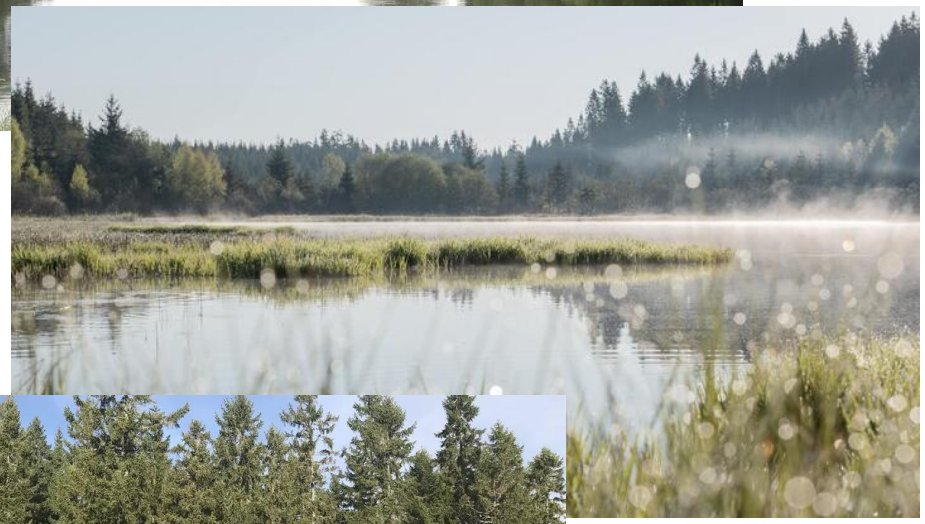
Marshes in Austria

- **Thaya Auen (lower austria)**
  - **60.000 ha**
- **Tanner-Bog (upper austria)**
  - **12.000 years old**
- **Raised Bog Garana‘s (Styria)**



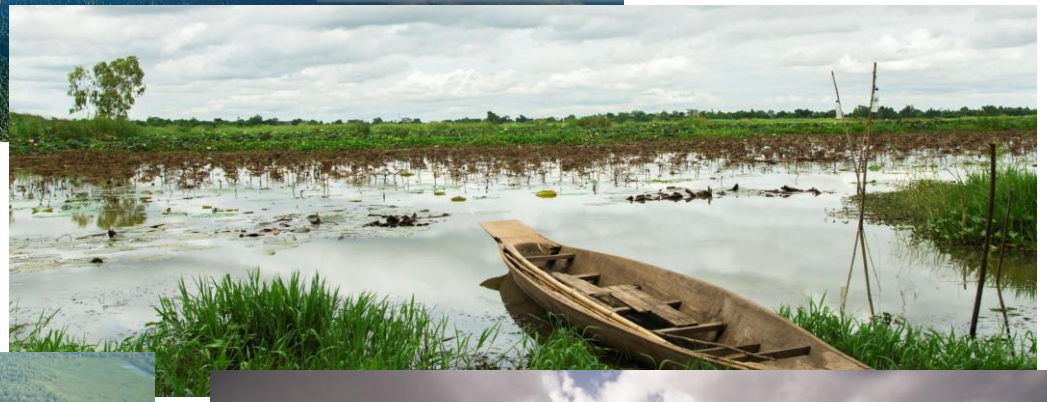


Polish marshes

- **Biebrza Marshes**
- **Łeba Marshes**
- **Celestynow Marshes**

Marshes in Hungary

- **Bugacpuszta marshes**
- **Kis-Balaton marshes**
- **Tiszató marshes**



Czech marshes

- **Borkovická marshes**

- **Šumavská marshes**

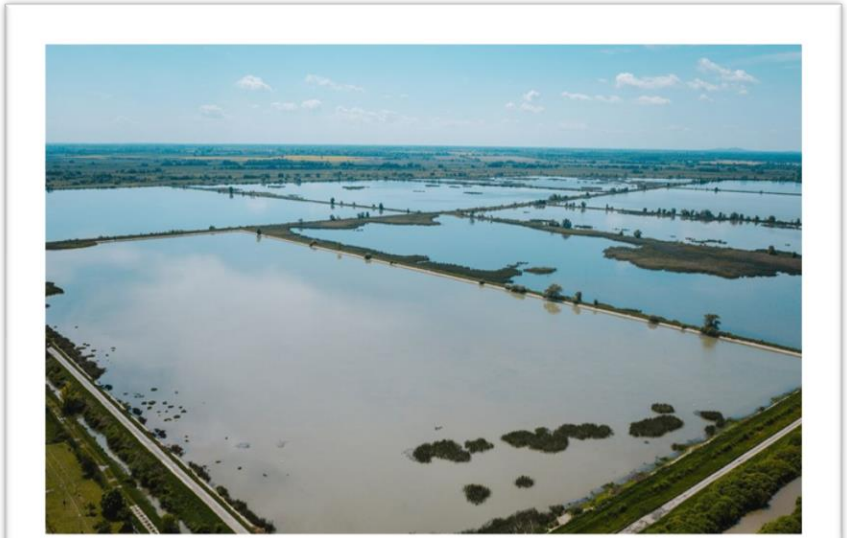
- **Krkonošská marshes**

Slovak marshes

- Parížské močiare

- Šúr

- Senné rybníky



FLOOD TYPES

- FLASH FLOODS

STORM SURGES

- RIVER FLOODS

Austrian floods

- July 2021 Bernd
- August 2002

Hungarian floods

- Budapest 1838
- Budapest 1879

Polish floods

- "Flash flood in Małopolsce (2022)
- The flood in Górki Wielkie (2011)
- Flood of the millennium in Wrocław (the Biggest flood in Poland) (1997)

Slovak floods

- 2021 THE VILLAGE OF RUDNO NAD HROMOM IN BANSKÁ BYSTRICA REGION WAS STRUCK BY A SEVERE FLASH FLOOD.
- THE FLOOD WAS CAUSED BY A BREACH IN A DAM NEAR THE VILLAGE.
- THE BREACH WAS A RESULT OF A HEAVY RAINFALL

Czech floods in Veselí nad Lužnicí

- 2010

2006

2002

Anti-flood measures

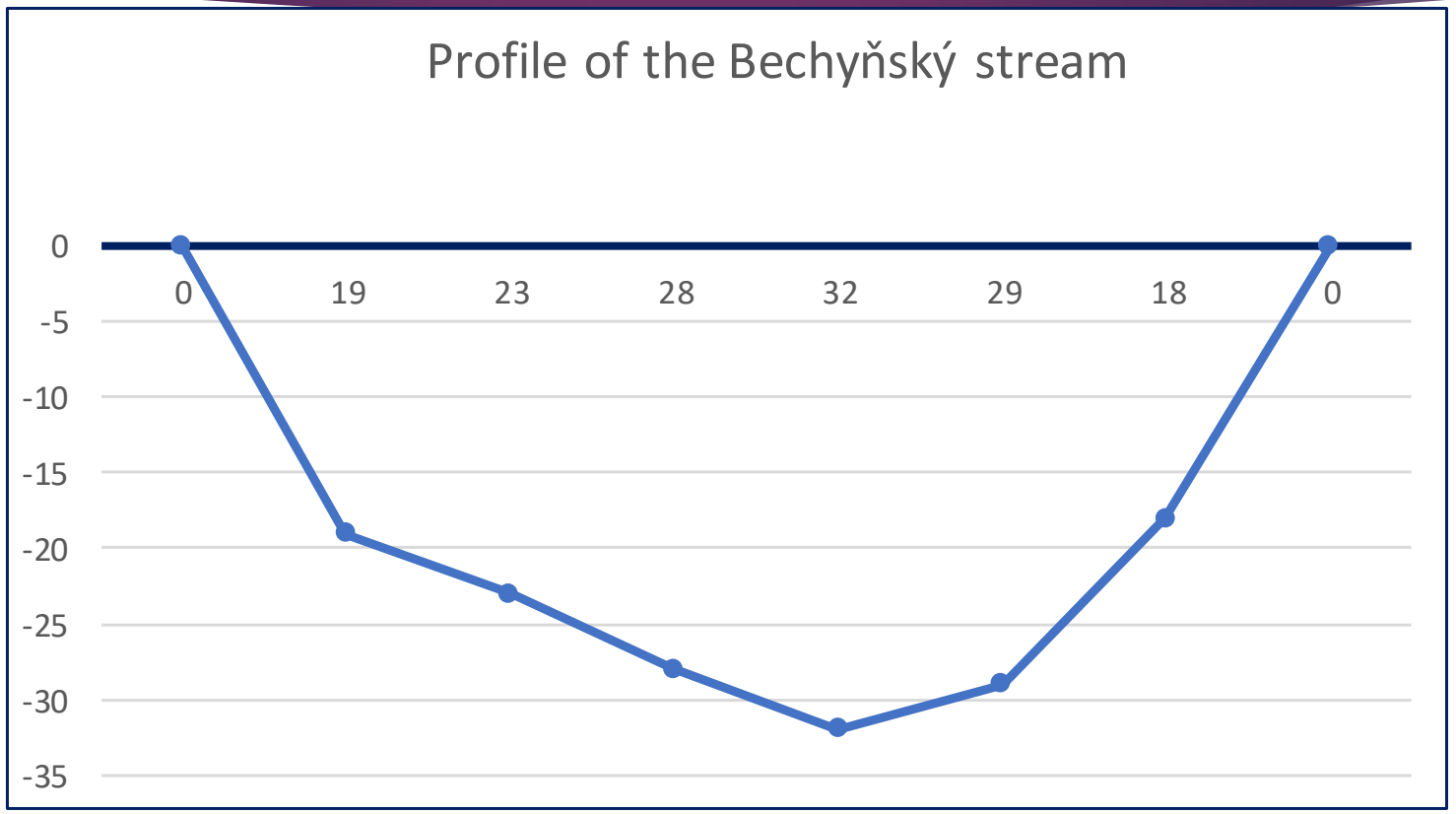
- **Regulation and supervision of waters**
- **Maintenance and development of the waterways**
- **Flood barriers**
- **Retention reservoirs and polders**
- **Support for the restoration of riverbeds and meanders**
- **Reducing soil erosion, improving water retention in the landscape, increasing the ecological stability of the landscape**
- **Wetland restoration**
- **Slowing surface runoff by marshes**

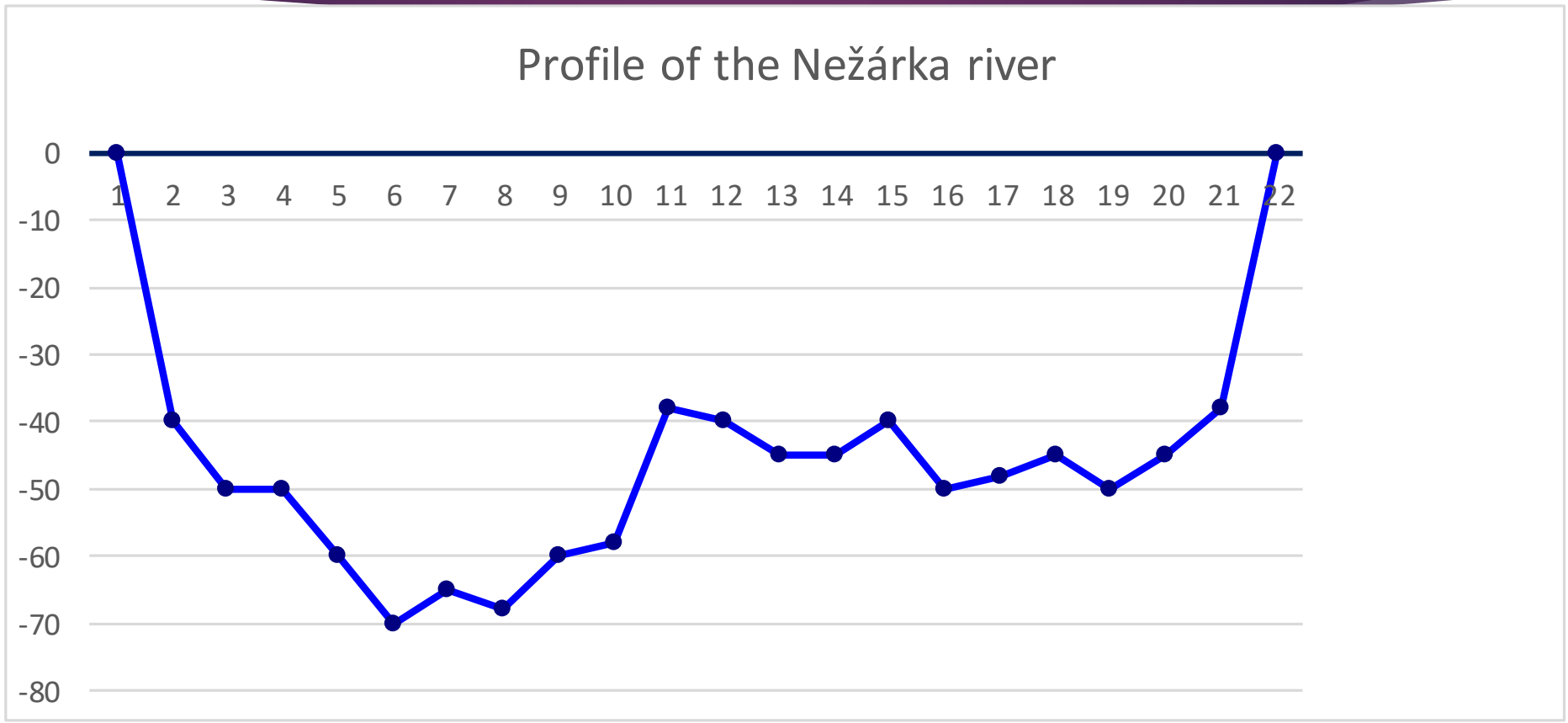
Methode of measuring flow

- **Hydrometric Propeller**
  - **It measures the depth and the width of the river**
  - **Hold the hydrometric propeller against the flow**
  - **Found the flow profile**

Profile of the river

Width (m)	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00	13,00	14,00	15,00	16,00	17,00	18,00	19,00	20,00	20,31
Depth (cm)	40	50	50	60	70	65	68	60	58	20	40	45	45	40	50	48	45	50	45	38	0


Profile of the Bechyňský stream
0
-5
-10
-15
-20
-25
-30
-35
0
19
23
28
32
29
18
0


Profile of the Nežárka river
0
-10
-20
-30
-40
-50
-60
-70
-80
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

	Measuring points											
	0	2	4	6	8	10	12	14	16	18	20	21
Revolutions (20) cm	0	36	158	157	97	206	182	52	18	11	8	0
Speed at measuring points (20) n	0	0,6	2,63	2,62	1,62	3,43	3,03	0,87	0,30	0,18	0,13	0
Measurement time												
60												

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	
Conditions hydrometric propeller	0	0,16	0,66	0,65	0,41	0,85	0,75	0,22	4,06	2,49	1,82	

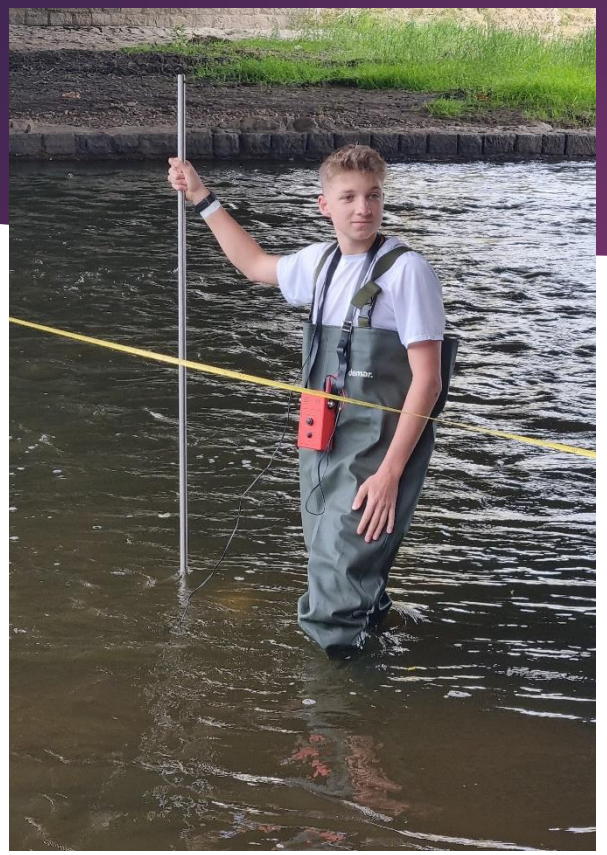
if $n \leq 0{,}62$ then $v = 0{,}2204 * n + 0{,}023$	if $n \geq 0{,}62$ then $v = 0{,}2463 * n + 0{,}007$

Flat	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
	0,2	3,15	2,54	3,03	3,88	2,34	0,7	0,29	0,19	0,04

Total flat (area) of the flow profile	16,36	m2

Flow	$Q = S1 * v1 * 2/3 + S2 * (v1 + v2) * ½ + S3 * (v2 + v3) * ½ + \ldots.. Sn * v(n-1) * 2/3$

Q	**9**	m^3/s	9309	l/day
Flow/hours	33514	m^3/hour		
Flow/day	804340	m^3/day		
Flow/week	5630380	m^3/week		
Flow/year	293584076	m^3/year		



Flow measuring

	08/2002	06/2023	Average flow
Flow	m^3/s	m^3/s	m^3/s
Bechyňský stream	132	0,88	0,67
Nežárka river	260	11,58	8,67

Drought

- Drought is the *absence* of water
- Types of drought:
  1. meteorological drought,
  2. hydrological drought,
  3. agricultural drought,
  4. socioeconomic drought

Measures against drought

- **Water management plan**
- **Increase irrigation efficiency**
- **Protection and restoration of water resources**
- **Drought monitoring and prediction**
- **Responsible water management**
- **Public education and awareness**
- **Green roofs**

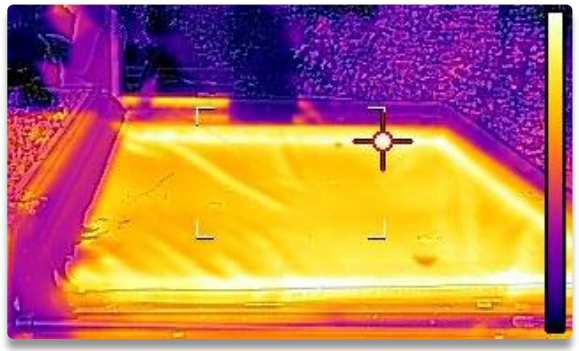
The influence of green roofs on the climate in the city

Roof with asphalt shingle

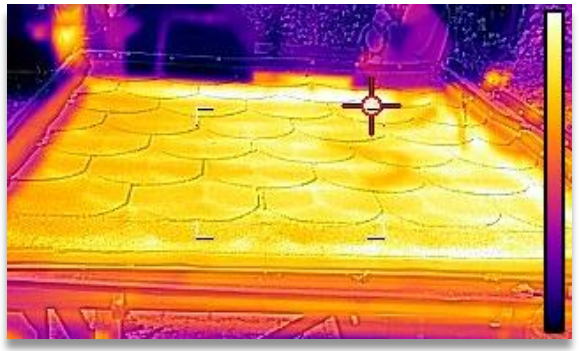
Roof with waterproofing PVC foil

Green roof

Thermal camera images



Roof with asphalt shingle

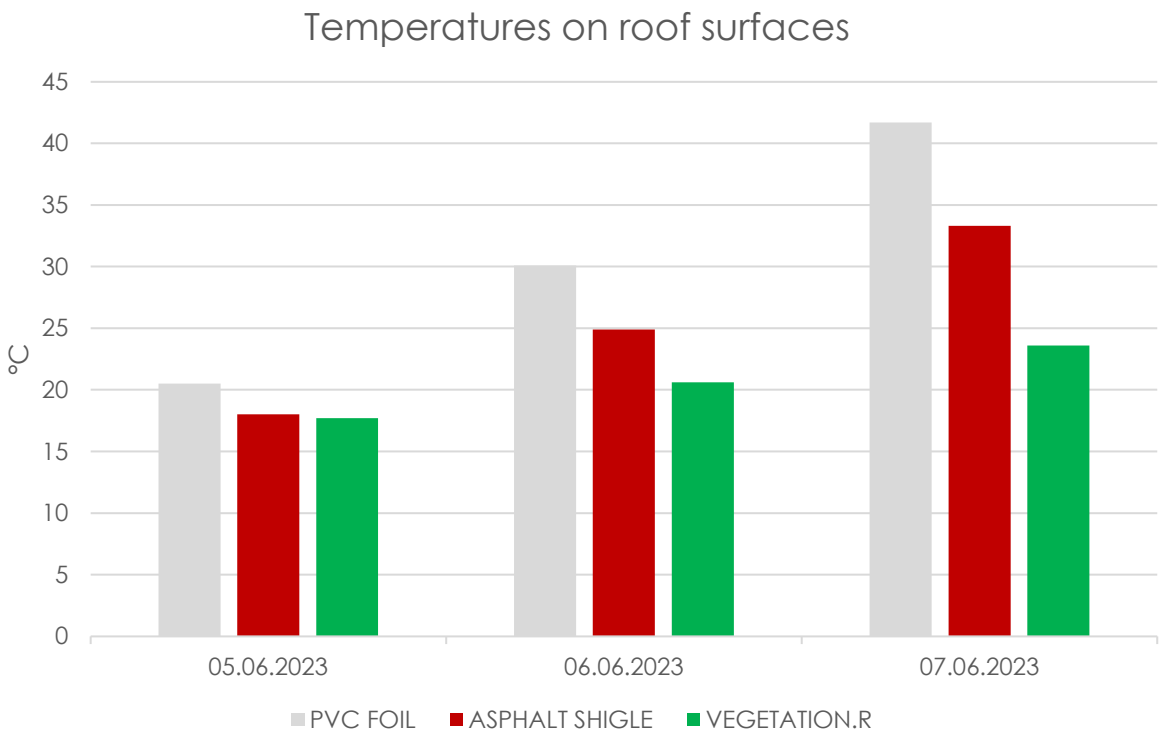


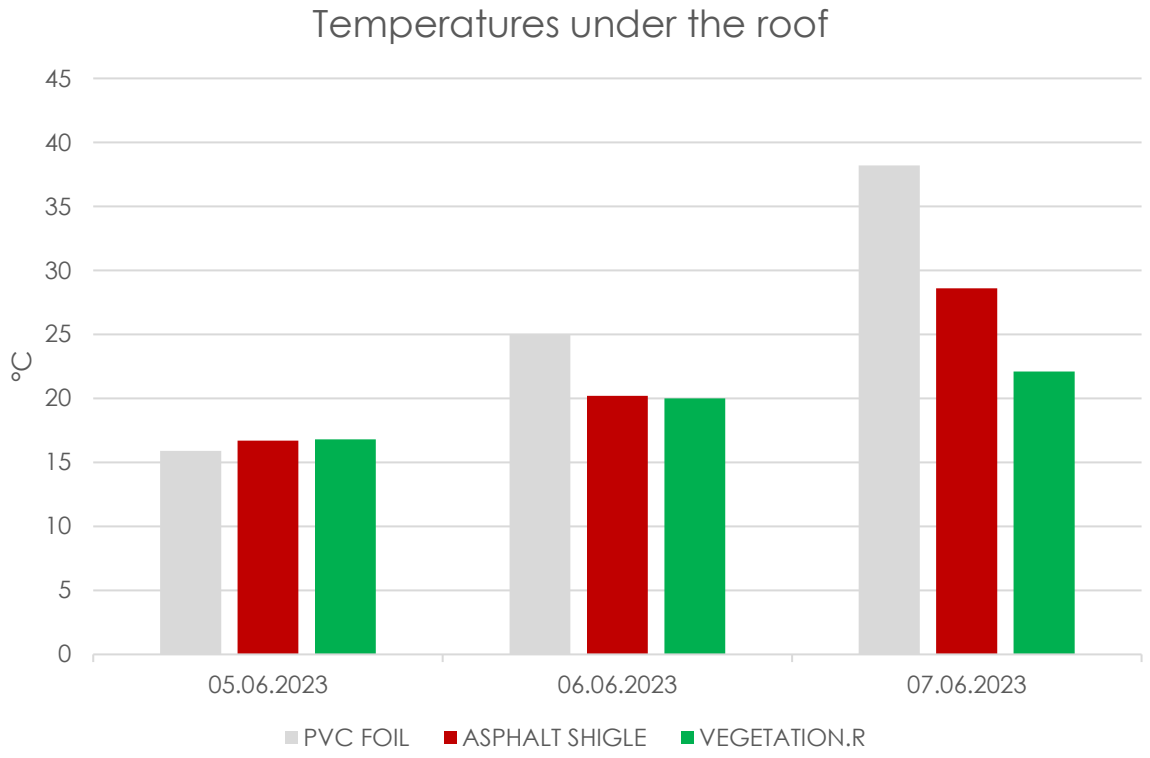
Roof with waterproofing PVC foil

Vegetation roof

Temperatures

	PVC foil		Vegetation r.		Asphalt shingle	
	top	bottom	top	bottom	top	bottom
05.06.2023	20,5 °C	15,9°C	17,4°C	16,8°C	18°C	16,7°C
06.06.2023	30,1°C	25°C	20,6°C	20°C	24,9°C	20,2°C
07.06.2023	41,7°C	38,2°C	23,6°C	22,1°C	33,3°C	28,6°C


Temperatures on roof surfaces
45
40
35
30
25
20
15
10
5
0
°C
05.06.2023
06.06.2023
07.06.2023
PVC FOIL
ASPHALT SHIGLE
VEGETATION.R


Temperatures under the roof
45
40
35
30
25
20
15
10
5
0
°C
05.06.2023
06.06.2023
07.06.2023
PVC FOIL
ASPHALT SHIGLE
VEGETATION.R

Green roofs

- help reduce heat islands.
- remove heat from the air
- reduce temperatures of the roof surface and surrounding air

THANK YOU FOR YOUR ATTENTION

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