

## KRAKÓW / WATER INFRASTRUCTURE AUTHORITY

# Partnership & Competence Portfolio

*Climate Change Adaptation • Stormwater Management • Blue-Green Infrastructure*

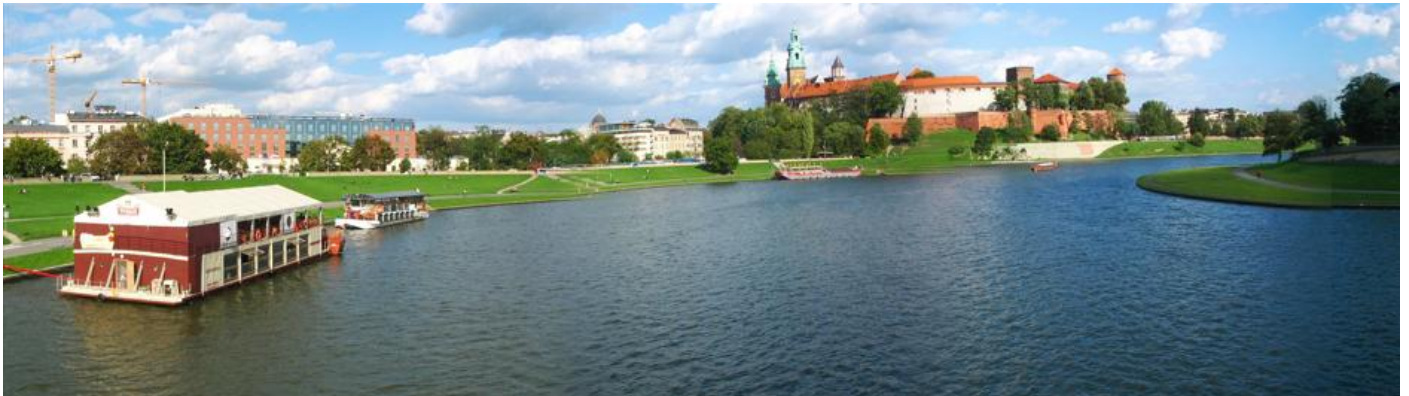


Photo by: mapelc na Freemages

### City Profile

**Kraków** is the second largest city in Poland and the capital of the Małopolska Region. It covers an area of 327 km<sup>2</sup>, is divided into 18 districts, and has a population of approximately 820,000. The actual number of infrastructure users is 1.0–1.1 million, due to commuters from the metropolitan area, tourism, and the city's role as a major academic centre.

**In 2024**, the city was visited by 14.7 million tourists, over 85% of whom were multi-day visitors. The historic city centre — including the Old Town, Wawel Castle, and Kazimierz — is a UNESCO World Heritage Site, which gives climate resilience efforts both a municipal and a broader civilisational dimension.



Photo by Dariusz Staniszewski z Pixabay

## Hydrological and Climate Profile

**Kraków** is located in the upper Vistula River basin, at the boundary between the Sandomierz Basin and the Carpathian Foothills. The Vistula flows through the city for approximately 41 km, and the hydrographic network also includes seven of its tributaries.

**The city** faces growing climate risk due to a high degree of surface sealing. In many districts, the proportion of biologically active land does not exceed 20–30%, and clay-loam soils further limit natural infiltration. As a result, a large share of stormwater flows directly into the drainage network, causing system overloads and local flooding.

**Flash floods** events are recorded in the city 5–6 times per year. These events are growing in both frequency and intensity — rainfall lasting just 15–30 minutes is enough to fully fill sewers and cause surface flooding. Kraków is classified as an area of significant flood risk, both from river flooding (Vistula, ~41 km through the city) and from urban surface runoff.

## Transformation Direction

**The key challenge** is a systematic shift in stormwater management — from rapid discharge to retaining water at the point of rainfall. Given the existing infrastructure, this process is labour-intensive and requires both investment and a change in residents' habits.

**In 2021**, Kraków introduced its own calculation methodology — the 'Kraków formula' — raising design standards for stormwater drainage by approximately 60% compared to previous norms. This approach requires retention and flow attenuation to be built into projects from the planning stage.

## Water Infrastructure Authority (WIA)

Water Infrastructure Authority (WIA) is a municipal unit of the City of Kraków, responsible for the technical and substantive implementation of stormwater management and climate change adaptation.

**The unit manages** WIA manages a stormwater drainage network of approximately 600 km in total length, of which 467 km has been inventoried in a GIS platform. WIA carries out network monitoring, hydraulic modelling, and data integration to support cost-effective and operationally optimal stormwater management across the city.

## Areas of Competence

- managing the stormwater drainage system and retention infrastructure,
- implementing sustainable water management, including stormwater retention and reuse,
- identifying critical points and risks related to drainage,
- developing and implementing nature-friendly solutions for water environment management,
- GIS-based infrastructure inventory and asset management,
- implementing participatory and educational activities on climate change adaptation.



## Key Activities of WIA

- **Slowing surface runoff** — extending the time it takes for stormwater to drain by creating rain gardens and dry retention basins with ecological functions,
- **De-sealing urban surfaces** — replacing impermeable pavements with infiltration and vegetation-based solutions,
- **Distributed retention** — building retention tanks and green roofs that retain water at source,
- **Increasing on-site infiltration** — restoring the natural water cycle in the urban catchment,
- **Education and outreach** — raising awareness of the benefits of nature-based solutions in the context of climate change.

## Project Experience

**LIFE PACT** — The City of Kraków (implementing unit: WIA) completed the LIFE PACT project under the EU LIFE Programme in international partnership with the cities of Leuven (Belgium) and Madrid (Spain). LIFE PACT developed and implemented nature-based solutions to strengthen Europe's climate resilience through water retention, urban heat reduction, and biodiversity enhancement — with active involvement of residents and stakeholders in design and delivery. In Kraków, the project included investment and replication activities such as blue-green infrastructure, rain gardens, and public space transformations aligned with residents' needs.

**Just4Care** — Kraków participates as a replicating city in the Just4Care project (European Urban Initiative programme). The project focuses on urban adaptation to climate and environmental challenges, with particular emphasis on water management and flood protection. As a replicating city, Kraków transfers proven solutions to its local context, demonstrating its capacity to work within urban networks and learn from best-practice leaders.

**AIFLOWS** — The City of Kraków (implementing unit: WIA) is applying as an operational partner — urban pilot — in the AIFLOWS project under call HORIZON-CL4-2026-04-DIGITAL-EMERGING-09 (Horizon Europe). Kraków's involvement covers: providing hydrological and drainage system data, co-developing a hazard hotspot model, validating the system at TRL7, and carrying out replication and dissemination activities. Planned start: January 2027; duration: 42 months.

In addition, the City of Kraków and the Małopolska Region carried out eg. the following projects:

**LIFE-IP EKOMALOPOLSKA – Project No. LIFE19 IPC/PL/000005**

**LIFE-IP MALOPOLSKA (Małopolska w zdrowiej atmosferze) - Project No. LIFE14 IPE PL 021**

**FLOPRES – Project No. LIFE22-CCA-SK-FLOPRES/101113988**

**LIFE DREAM CITIES – Project No. LIFE23-CCA-PL-LIFE-DREAM-CITIES/101158113**



## Openness to Innovation

Kraków actively seeks projects that combine environmental protection, climate adaptation, and innovative technology. The following City of Kraków projects illustrate this direction:

Project	Programme	Value for Kraków	Period
<b>metaCCAZE</b>	Horizon Europe	€540,537	2024–2027
<b>SCT HUB</b>	European Urban Initiative	PLN 4.6M	2024–2028
<b>ITS Development</b>	FEnIKS 2021–2027	PLN 66.9M	2025–2029

**The City of Kraków** has been implementing EU projects for over 20 years, completing approximately 500 projects across programmes including EQUAL, Interreg, URBACT, LIFE, Horizon 2020, Horizon Europe, KPO, and RPO.





## Data and Analytical Resources

Kraków holds extensive spatial and operational datasets that provide a solid foundation for research and implementation projects:

- **GIS** — inventory of the stormwater drainage network; land use, soil, and catchment maps,
- **Catchment monitoring** — monitoring covers both natural watercourse and the stormwater drainage system, using data collected from a network of water level gauges and rain gauges across the city,
- **Event reports** — documentation of flood events from 1996, 1997, 1999, 2000, 2007, 2010, and 2019.



## Partnership Strengths

- **Documented LIFE experience** — completed LIFE PACT project with partners from Belgium and Spain.
- **Scale and complexity** — city of 820,000 residents, high flood and stormwater risk profile, alongside heat risk and urban heat islands, UNESCO area.
- **Operational infrastructure** — ~600 km of stormwater drainage network managed by a single technical unit (WIA).
- **Historical data** — multi-year spatial and operational datasets available for project use.
- **Active EU ecosystem engagement** — participation in programme consortia and extensive experience in EU-funded investment delivery.
- **Established expert knowledge** — experienced team of specialists in water infrastructure, flood risk management, and climate change mitigation.



## Areas of Cooperation Readiness

The City of Kraków / WIA is ready to partner in LIFE Climate Action projects covering:

- **Climate change adaptation** — stormwater management, retention, Nature-based Solutions (NbS),
- **Urban flood risk management** — in densely built urban areas,
- **Blue-green infrastructure** — in historic and densely urbanised cities,
- **Early warning and crisis management** — systems developed in a climate context,
- **Participatory and educational processes** — for urban adaptation,
- **New technologies and innovation** — in areas related to WIA's work: stormwater network management, catchment monitoring, hydraulic modelling, decision support systems, and digitalisation of water infrastructure.