Rewitalizacja małych rzek w dużych miastach województwa śląskiego - potrzeby, doświadczenia, perspektywy

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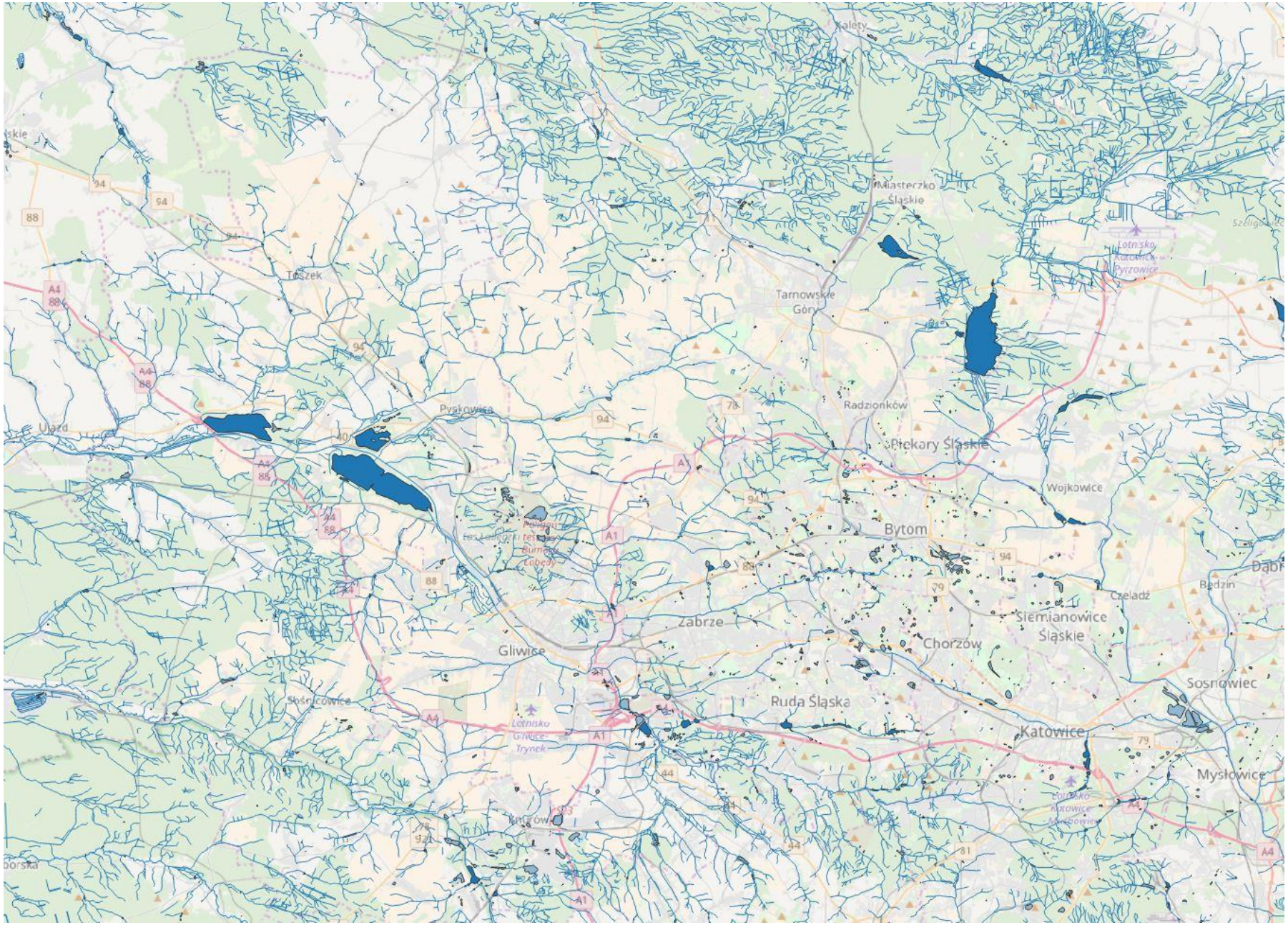
Urząd Marszałkowski Województwa Śląskiego, Katowice 13 czerwca 2018

The GZM area (central part of Silesian voivodship) is located on the main watershed of Poland, and therefore there are no large rivers here

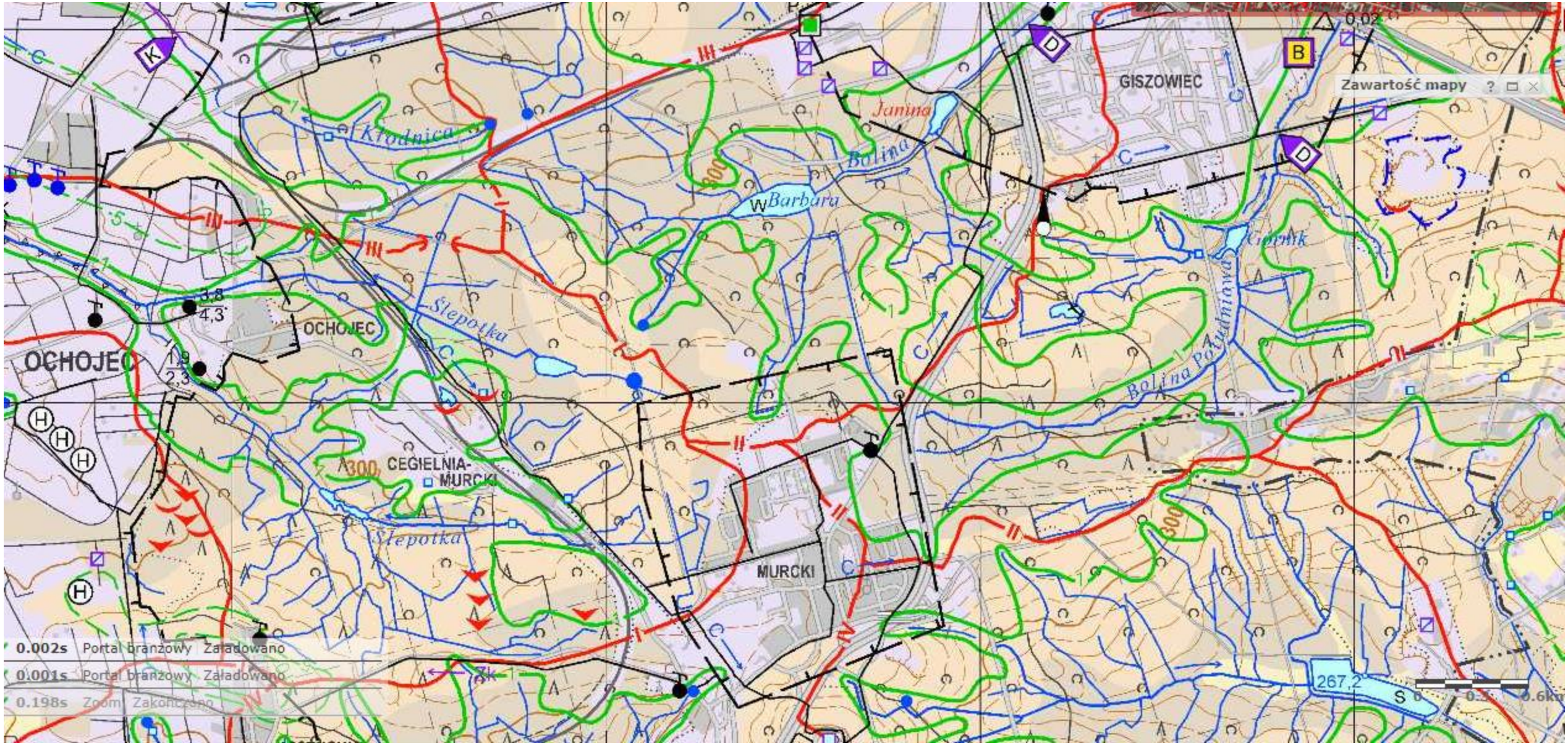
Mining and urbanization have made the natural network significantly impoverished

However, there are at least several hundred small watercourses of potential importance as urban Blue-Green Infrastructure assets

There are at least about 1000 surface water reservoirs, mostly in the valleys of rivers and streams, often in connection with mining and industrial activities



Numerous local streams still exist even in areas heavily transformed by mining and urbanization, such as the city of Katowice



In the channels of urban streams engineering solutions introduced in the industrial era dominate, especially in the 1960s and 1970s. They are already generally in poor technical condition.

New hydrotechnical equipment serves only to protect the troughs from damage during freshets and to drain excess water as quickly as possible.

Solutions for aesthetics, accessibility or habitat diversity are not introduced.

There are still numerous illegal discharges of untreated municipal sewage to municipal streams. In some cities, leakage of combined sewers is also a problem.

Where the channell enforcements have been destroyed, erosive processes occur, sometimes with high intensity.

In the suburban areas, there are still sections of watercourses, especially near sources, with the natural shape of channell.

The urban stream corridor should be a multi-functional public space with high landscape and aesthetic values

The access to the watercourse should be easy, and the use of the site should be comfortable and safe

Local watercourses should also be the base of the natural system of the city

Therefore, spatial and functional continuity of local stream corridors is of particular importance

Water-Festival in Leipzig...

…. and *why* not, for example, on Kłodnica, the Gliwicki Canal, Brynica or Przemsza?

https://www.ebookers.com/travel-blog/wp-content/uploads/2016/07/Water-Festival.png

The easily accessible high-quality blue-green public spaces are increasingly perceived as an important criterion for choosing a place to live.
In the near future, this may be a very important factor determining the renaissance of the cities of the Śląskie Voivodeship, including GZM, and stopping the outflow of people to other regions of the country.

System conditions	Stormwater management	Urban stream corridor management
Previous thinking and practice	Stromwater is a problem and a source of threats. That is why strormater must be carried out as quickly as possible outside the city.	The river - just an extension of the sewage system discharging sewage, storm water and various pollution outside the city The stream corridor - a "shameful" part of the city and, at the same time, a reserve of land for urban development
Consequences: current status of rainwater management, and the way of using stream corridors	Surface water drain system designed only for efficient and possibly rapid drainage of water together with pollution to rivers and streams	River channels - extremely transformed: widened, deepened, straightened, enclosed with concrete or other durable material Some floodplains - raised by filling for the needs of urban development, with no compensation for water storage capacity, Some stream corridors permanently abandoned as unattractive River and bottom sediments are heavily polluted

System conditions	Stormwater management	Urban stream corridor management
Needed thinking and practice 	Storm water is an element of the urban water cycle. It feeds the urban stream's ecosystem The management of rainwater serves not only to avoid / solve problems, but also to achieve tangible benefits	Stream corridor is to be an attractive public space, providing ecosystem services, including those related to water The stream corridor is to be used in such a way that the value of nearby properties can increase, and their safety from flooding increases
Desired actions and target status 	Storm water collected on site and used in the local catchment Bioengineering solutions for pre-treatment, retention and / or infiltration of stormwater into the ground (both in new and retrofitted drainage system) Excess storm water efficiently discharged into the river	The stream is free from pollution, and it is fed with clean drainage water The river corridor is free from buildings Functional continuity of the river corridor is preserved or restored Access to the stream is convenient and safe The stream and its corridor functions as a possibly complex ecosystem

Management challenges of urban stream corridors in the GZM region

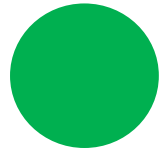
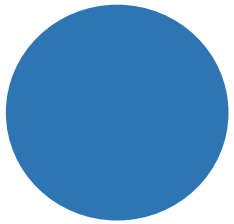
CURRENT STATUS:

„Problematic" or "shameful" sites, often under urbanization pressure

DESIRED STATUS:

High-quality blue-green public spaces, the pride of the city

Important space for wildlife and biodiversity
Space of big capacity for safe storage of excess storm water discharged from urban areas

Aspects of use	Current status	Current trend of changes	Desired trend of changes	Desired status
URBAN STREAM CORRIDORS AS PUBLIC SPACES				
URBAN STREAM CORRIDORS AS BICYCLE / WALKING ROUTES				
URBAN STREAMS AS SAFE SPACE FOR RECRECATION				
URBAN STREAMS AS ECOLOGICAL CORRIDORS				
URBAN STREAMS AS A SPACE FOR BIODIVERSITY				
URBAN STREAMS AS RECEIVERS OF URBAN POLLUTION (storm overflows, discharges from treatment plants, illegal discharges, polluted storm water)				

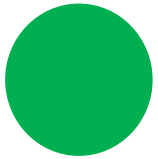
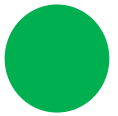
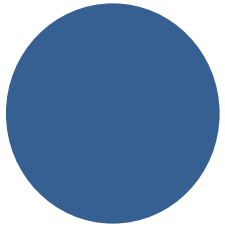
Management challenges of urban storm water in the GZM region

DOMINATING SOLUTIONS:

"GRAY" infrastructure: networks and collectors, usually underground, draining (with possible pre-treatment, sometimes also retention), all captured storm water outside the city

DESIRED SOLUTIONS:

BLUE-GREEN infrastructure: multifunctional solutions (including retrofitting already existing drainage system) combining the use of storm water with a safe drainage of excessive water, enriching urban landscape and public spaces, mitigating the effect of urban heat island and supporting the city adaptation to climate change

Aspects of use	Current status	Current trend of changes	Desired trend of changes	Desired status
USE OF EXCESSIVE WATER ON SITE OR AFTER DISCHARGE				
INFILTRATION TO THE GROUND				
RETENTION IN THE CATCHMENT (including retention in the drainage system)				
CAPTURE BY PLANTS (WILD GROWING AND GREENERY)				
RETENTION IN THE CORRIDORS OF STREAMS (including ponds and wetlands)				
DRAINAGE TO RIVERS OR TO TREATMENT PLANTS				

Only one practical activity was implemented in the GZM area for revitalization of urban stream corridor.

It was the REURIS project (2009-2012), under which a 0.5 km section of the Ślepiotka corridor in Katowice was revitalized.

Revitalisation of Urban River Spaces

REURIS

Project areas in Poland, the Czech Republic and Germany

Katowice: Ślepiotka river

Bydgoszcz: Bydgoszcz Old Canal

Brno: Old Ponávka

Plzen: Junction of Úslava and Mže

Stuttgart: Feuerbach

Aufbauwerk Leipzig: Thostgrundbach

Leipzig: Karl -Heine -Canal

Revitalisation of Urban River Spaces

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www.reuris.gig.eu

Revitalisation of Urban River Spaces

REURIS

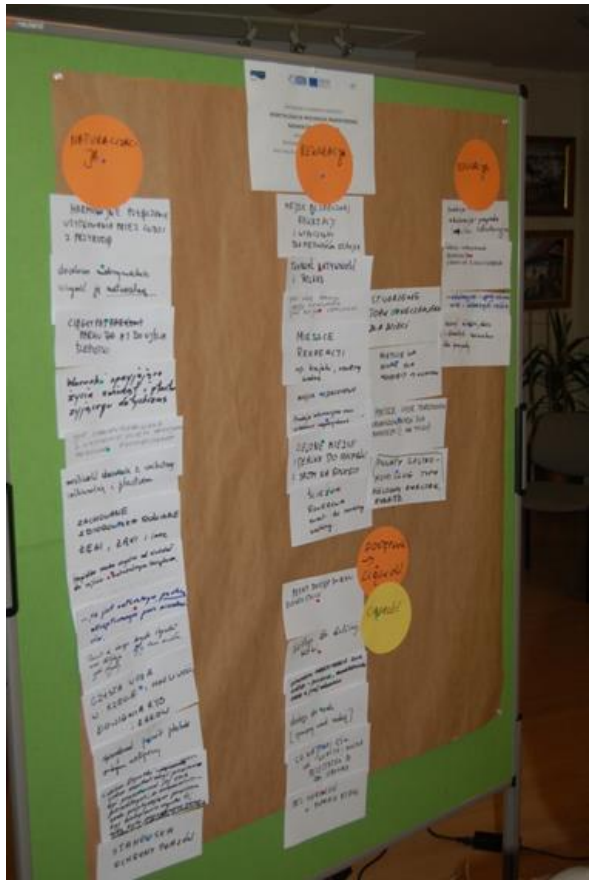
REURIS

REvitalisation of Urban RIver Spaces

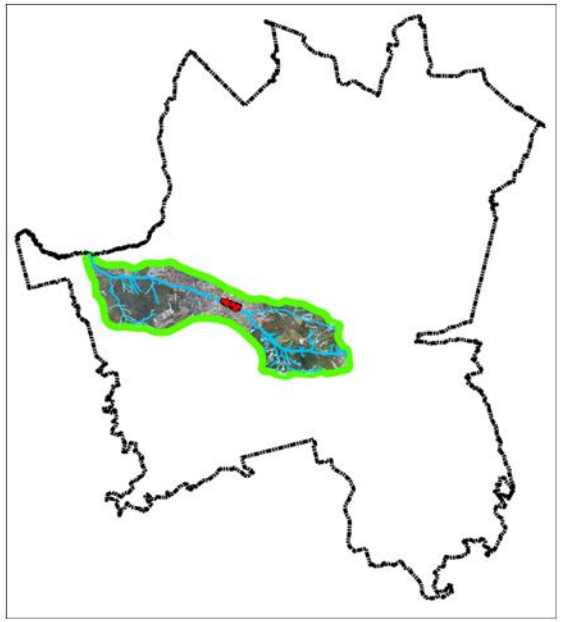
A Project under the

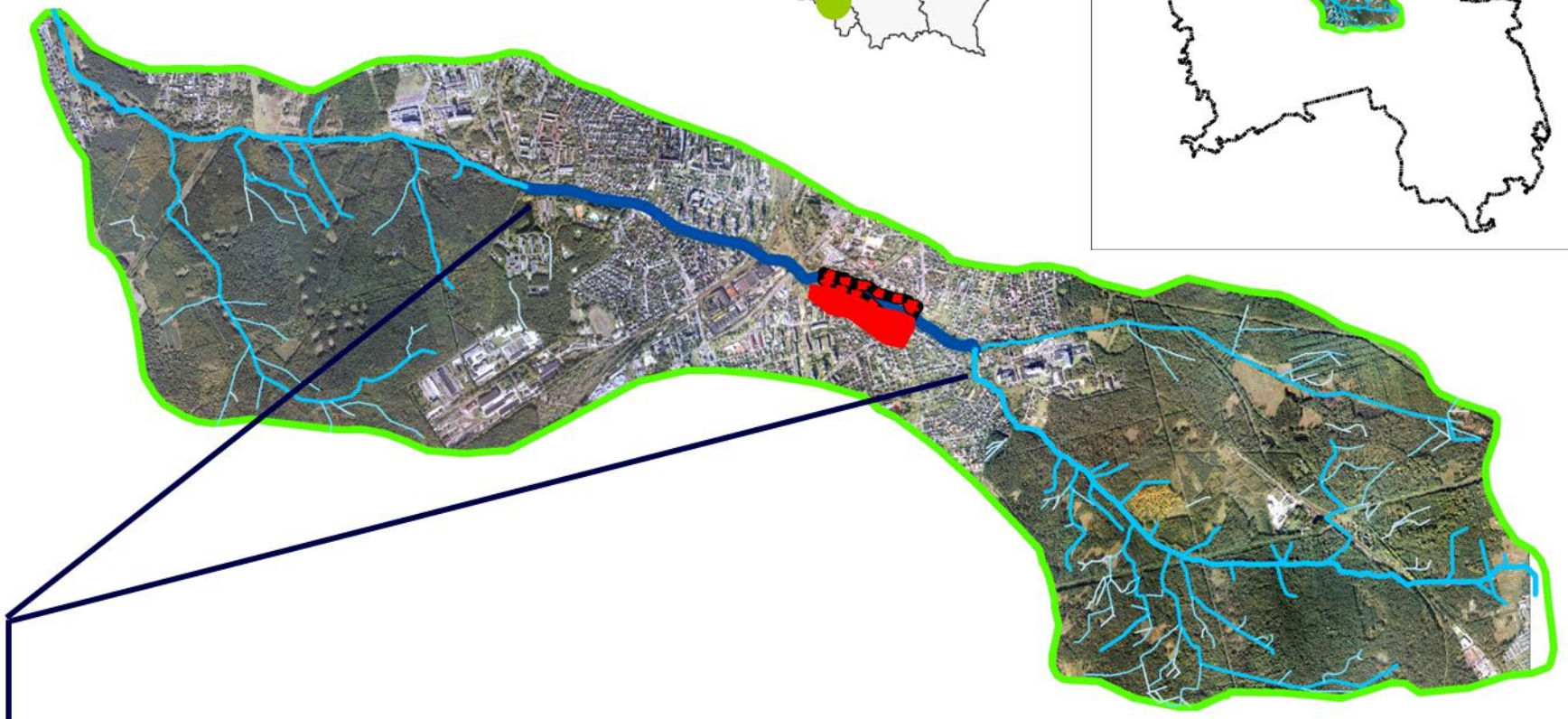
CENTRAL EUROPE
COOPERATING FOR SUCCESS.

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND



Location of Ślepiotka catchment and revitalisation action area in Katowice





The stretch for restoration of river corridor in urbanized area (marked in dark blue) and pilot investment area (in red)

Criteria for ranking of potential revitalisation sites in Slepiotka valley

A. Expected restoration of natural habitats and close-to-nature habitats

A.1. Morphologic improvement of watercourse and its floodplain

A.2. Natural or close-to-nature habitats to be restored: length of revitalised river channel

A.3. Natural or close-to-nature habitats to be restored: area of the river floodplain

A.4. Proximity of existing natural habitats or close-to-nature habitats

B. Sources of pollution

B.1. Water pollution from municipal sources

B.2. Water pollution from industrial or mining sources

B.3. Old landfill sites

C. Conflicts with existing/planned land use

C.1. Conflictions with intentions regarding development of transport infrastructure

C.2. Conflicts with agriculture and/or forestry

C.3. Conflicts regarding planned housing development and municipal infrastructure

D. Expected social benefits

D.1. More space for recreation

D.2. Improvement of conditions for environmental education

Criteria	Paramerters	Score
A.1. Morphologic improvement of watercourse and its floodplain	No improvements	0
	Improvement by one level regarding WFD	2
	Improvement by two levels regarding WFD	3
A.2. Natural or close-to-nature habitats to be restored: length of revitalised river channel	River channel will no be revitalised	0
	Below 100 m	1
	Below 500 m	2
	Over 500 m	3
A.3. Natural or close-to-nature habitats to be restored: area of the river floodplain	Floodplain will not be revitalised	0
	Below 1,000 m^2	1
	Below 5,000 m^2	2
	Over 5,000 m^2	3
A.4. Proximity of existing natural habitats or close-to-nature habitats	None in neighbourhood	0
	In neighbourhood	3
B.1. Water pollution from municipal sources	Very difficult to eliminate	0
	Difficult to eliminate	1
	Possible to eliminate	2
	No pollution	3
B.2. Water pollution from industrial or mining sources	Very difficult to eliminate	0
	Difficult to eliminate	1
	Possible to eliminate	2
	No pollution	3

REURIS pilot action in Katowice: Valley of Ślepiotka stream

Before: abandoned site

After: flowery meadow

The channel of the stream repaired with use of natural material incl. stone, wood and native plants

Umocnienia brzegów

Zabudowa terenów miejskich powoduje, że na
dachów, dróg, parkingów i kanalizacji deszcz
do gruntu. Gwałtownie wezbrana woda niszcz
umacniane. Najlepiej, aby umocnienia te były
betonowe. Całkowita renaturyzacja potoków
się gospodarować wodami deszczowymi zam

W wyniku regulacji dokonanej w latach 70-tych ubiegłego stulecia koryto Ślepiotki znalazło się w okowach betonu. Z biegiem dziesięcioleci umocnienia burt brzegowych stopniowo ulegały destrukcji. Postępowała ona szczególnie tam, gdzie płyt betonowych nie zdołały poprzerastać korzenie drzew. Dzieła zniszczenia dokonało w maju 2010 roku gigantyczne wezbranie, być może największe w skali dwóch ostatnich stuleci. Pojawiło się kilka wyrw brzegowych o szerokości większej niż szerokość koryta. W niektórych miejscach skala dewastacji była tak duża, że następne poważne wezbranie mogło spowodować znaczne szkody w przyrodzie i infrastrukturze dna doliny.

Dokonano napraw brzegów tak, by stały się one nie tylko trwałe, ale także ładniejsze, bezpieczniejsze i bardziej dostępne dla ludzi. Zastosowano naturalny kamień i drewno w przyjaznych środowiskowo konstrukcjach technicznych. Przyjęte rozwiązania powodują, że z czasem ukształtują się tutaj siedliska przyjazne zwierzętom i roślinom wodnym. Nowe umocnienia uzupełniono poprzez obsadzenie roślinami typowymi dla brzegów rzek: tatarakiem, kosaćcem, turzycą, krwawnicą i innymi.

Revitalisation of Urban River Spaces REURIS · CENTRAL EUROPE COOPERATING FOR SUCCESS. · EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND · KATOWICE · GIG

REURIS pilot action in Katowice: Main results of local community interest:

- **restored stable plant cover with use of native plant species (perennial plants, trees, shrubs);**
- **river channel modified with use of soil bioengineering methods (natural stone, native plant species) for habitat diversity increase and for establishment of buffer-zone protecting river water from contaminants;**
- **created quasi-natural wetland for increase of retention capacity and for water/amphibious habitat creation;**
- **educational path constructed for public access,**
- **increased possibility to manage water in sustainable way, including improvements of existing stormwater effluents as well as hydraulic continuity established between restored wetland and river channel**
- **created attractive, blue-green public space**
- **publicly agreed goals and the range for long-term revitalisation activies (stream corridor length c.a. 6km)**

Revitalisation of Urban River Spaces

REURIS

URBAN RIVERS - VITAL SPACES

MANUAL FOR URBAN RIVER REVITALISATION

IMPLEMENTATION, PARTICIPATION, BENEFITS

CENTRAL EUROPE
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.

Karin Lange, Sylke Nissen (eds.)

URBAN RIVERS - VITAL SPACES

Guide for Urban River Revitalisation

KATOWICE NEWSLETTER
No. 2 / October 2009

REURIS
Revitalisation of Ślepiotka River

PILOT PROJECT:
Revitalisation of Ślepiotka River

Regional cooperation and public involvement

Meetings with local support group (stakeholders, decision makers) are targeted on two topics: pilot investment and common vision of river corridor in a part of the city. Such a meeting is not only element of collecting needed information for proper planning/designing, but also is a very important element of building long-term revitalisation strategy (*above on left: one of a dozen meetings, Katowice-Ligota, April 2009*).

The designer of pilot investment: Arch-Urbs Ltd. constantly cooperates to Katowice Municipality and to GIG, e.g. by participation in local meetings (*above on right: a meeting of designers, GIG, Municipality representatives and inhabitants of Ochojec, valley of Ślepiotka, September 2009.*)

The research team from GIG constantly supports designers. The results of study works, e.g. local inventory of natural resources, hydrogeological data etc., are being afforded onboard (*right margin, upper photo*).

GIG team on time of botanical survey in pilot investment area

Group of students from Leipzig and REURIS team on time of field visit in Slepiotka valley in Ochojec

Presentation to other Project Partners (PPs)

Ślepiotka valley was visited by all PPs on time of Opening Conference (end of February). After that, on time of Governing Committe (CG) in middle May, PPs visited the area of pilot investment. In August the area was visited by group of students from Leipzig University (one of PPs) and the preliminary concept of investment was shown to them by Arch-Urbs and REURIS team (*right margin, lower photo*).

Recognition of revitalisation state-of-the-art in Poland

More than 20 revitalisation projects implemented or planned for urban river spaces in South part of Poland are under analysis. The methodological framework agreed with Bydgoszcz Municipality (other Polish PPs, preparing a study for North of Poland) includes direct visits and surveys with use of a special form. The data, e.g. from Łódź, Bełchatów, Opole, Olkusz, Kraków regions support REURIS team in Katowice in elaboration of good revitalisation strategy (*below from left: partially revitalised valleys of rivers Rakówka in Bełchatów and Sokołówka in Łódź*).

For further information please contact

Revitalisation of Urban River Spaces (REURIS)
www.reuris.gig.eu

Revitalisation of Ślepiotka River (pilot project of Katowice)

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REURIS NEWSLETTER
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REURIS

Urban Rivers – Vital Spaces

Cooperating for Success

CENTRAL EUROPE
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This project is implemented through the CENTRAL EUROPE Programme co-financed by the ERDF

Implemented measures or expected impact from revitalisation of Slepiotka corridor in terms of REURIS GUIDELINES	Pilot investment	Long-term program
1. Enhancing functionality of the watercourse as an ecosystem		
1.1. renewal of the dynamic water regime of watercourses		
1.1.1 increasing the morphological diversity of the river bed – increasing discharge diversity and its dynamics	v	v
1.1.2 modification of the sediment regime through a suitable longitudinal profile of the watercourse	-	v
1.1.3 lengthening of watercourses	-	-
1.2. renewal of minor watercourses		
1.2.1 removal of the channelled underground stretches of the watercourses and preventing further channelling	-	v
1.2.2 shallowing of the river beds	v	v
1.2.3 loosening or re-meandering of straightened river beds of minor watercourses, if possible, according to their historical development	-	v
1.3. increasing biodiversity of the biotopes in the alluvial plains		
1.3.1 improving local habitats responding to local conditions of river valley	v	v
1.3.2 removal of invasive plant species	v	v
1.3.3 support reintroduction of native plant species and habitats	v	v
1.4. providing migration permeability of watercourses		
1.4.1 fish passages	-	-
1.4.2 transversal objects (stepped weirs and chutes), and technical alternations (shallow water column and high flow speed) to the watercourse	-	v

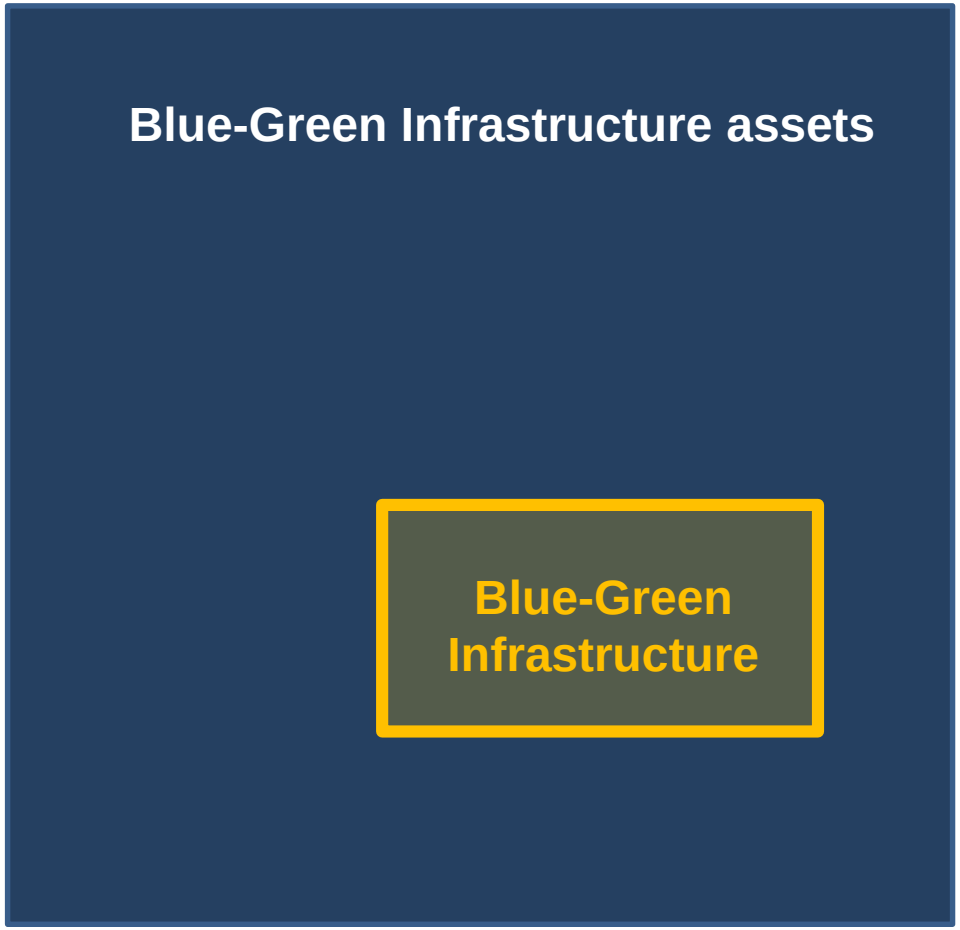
Implemented measures or expected impact from revitalisation of Slepiotka corridor in terms of REURIS GUIDELINES	Pilot investment	Long-term program
1. Enhancing functionality of the watercourse as an ecosystem		
1.5. preference of nature-like adaptations over technical modifications to the landscape	v	v
1.5.1 supporting the self-cleaning capacity of watercourses	v	v
1.5.2 addition of water infrastructure (building separated sewer systems, wastewater treatment plants)	-	v
1.5.3 pre-treatment of rainwater before it reaches the river	v	v
1.5.4 elimination of pollution sources	-	v
1.6. renewal and enhancement of the supplementary plant cover		
1.7.1 trees, shrubs, reed beds, littoral vegetations, water plants etc.	v	v

Implemented measures or expected impact from revitalisation of Slepiotka corridor in terms of REURIS GUIDELINES	Pilot investment	Long-term program
2. providing flood protection		
2.1. mitigating the risk of flood damage		
2.1.1 adopting the idea that rivers need more space	-	-
2.1.2 avoiding artificial elevation of terrain due to building development in active flood zones	-	v
2.2. increasing the retention capacity of the landscape		
2.2.1 allowing the natural overflow of rivers into the alluvial plains	-	-
2.2.2 renewal and creation of wetlands, where is possible	v	v
2.2.3 implementing elements of the systems of ecological stability	v	v
2.3. decreasing direct outflow from the drainage area (especially important for small rivers / small watercourses)		
2.3.1 increasing the rate of rainwater infiltration in the area by allowing its infiltration into the soil profile	-	v
2.3.2 increasing the rate of rainwater retention in the area	-	v
2.3.3 reuse of excessive rainwater in household and municipal sector	-	-
2.4. decreasing the rate of water outflow from the drainage area		
2.4.1 increasing the coarseness of the alluvial plain – using natural coarser lining reduce water flow rate	-	-
2.5. technical measures to catch extreme flow rates		
2.5.1 retention tanks and dry polders in river valley	-	-
2.6. aesthetic cultivation of technical flood measures	-	-

Implemented measures or expected impact from revitalisation of Slepiotka corridor in terms of REURIS GUIDELINES	Pilot investment	Long-term program
3. increasing the residential, cultural and recreational value		
3.1. water as a major landscaping feature of the urbanised space		
3.1.1 using the alluvial plains of watercourses as a significant urban space with a unique potential for recreation and leisure	-	-
3.1.2 increasing the aesthetic value of residential and recreational sites	-	v
3.2. placing sport & recreational paths (greenways) along watercourses		
3.2.1 combined paths for pedestrians, cyclists, in-line skaters and other non-motorised users, following the terrain in the alluvial plains	-	v
3.2.2 improving local connections of urban area with surrounding open spaces	v	v
3.3. placing sport & recreational facilities in the alluvial plains		
3.3.3 aluvial plains as places of final destination along the sport & recreational paths, for short-term recreation of the public	-	v
3.4. placing supplementary infrastructure		
3.4.1 information system along the sport & recreational paths (signposts, information boards, panels along educational paths providing information about natural and cultural features and values in the area)	v	v
3.4.2 street furniture	-	v
3.4.3 placing artefacts and temporary exhibitions (a cultural/historical aspect)	-	-
3.5. providing public water access		
3.5.1 play facilities providing interaction with the water element	-	v
3.5.2 fishing	-	-
3.5.3 allowing direct public access to water / to the river	-	v

Implemented measures or expected impact from revitalisation of Slepiotka corridor in terms of REURIS INTERNATIONAL GUIDELINES	Pilot investment	Long-term program
3. increasing the residential, cultural and recreational value		
3.6. tree planting and landscaping		
3.6.1 differentiated watercourse solutions in the urbanised area vs. open space	v	v
3.6.2 planting of tree lanes along sport & recreational paths	-	v
3.6.3 creating new parks	v	v
4. sustainable use of watercourses and their alluvial plains		
4.1. public involvement in green space management and policy-making	v	v
4.2. improving the applicability of the land use planning process in terms of flood control and watercourse protection		
4.2.1 using the instrument of land use planning to apply the above-mentioned principles for revitalisation of watercourses in urbanised area	v	v
4.2.2 developing more detailed rules for the use of built-up areas concerning risk of flooding	-	v
4.2.3 building of social consensus around actions and engineering measures oriented on public benefit	v	v
4.3. setting the guidelines for the placement of small water turbines on watercourses	-	-
4.4. setting the rules for water withdrawing and division of water to ensure sufficient discharges for dynamic water regime of watercourses	-	-
4.5. minimising conflicts with infrastructure (bridges, roads, pipelines, etc.)	-	v

Urban stream corridors in Silesian voivodship, and especially in GZM, are just potential assets for Blue-Green Infrastructure

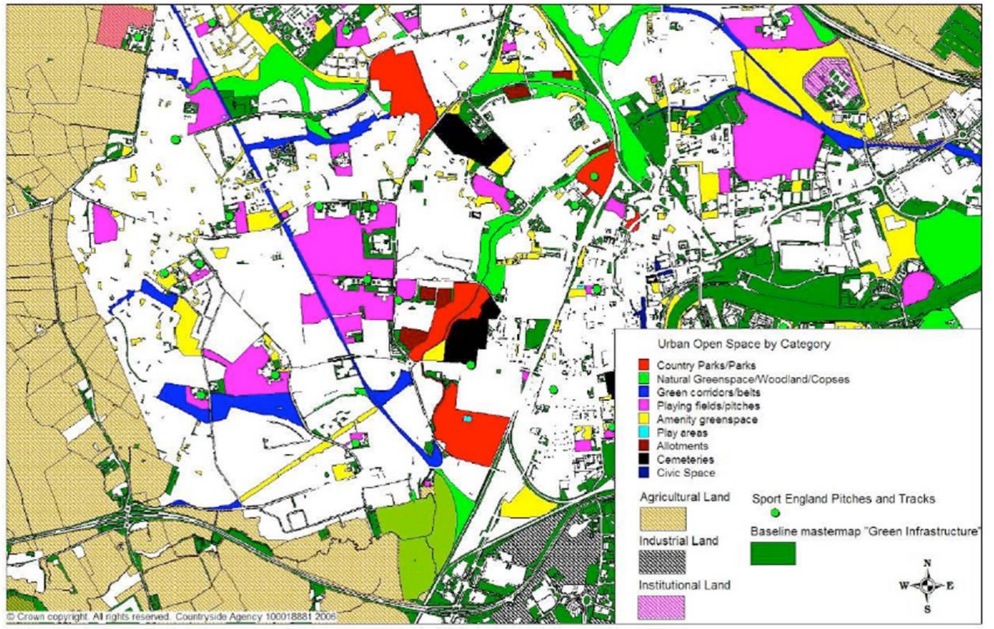


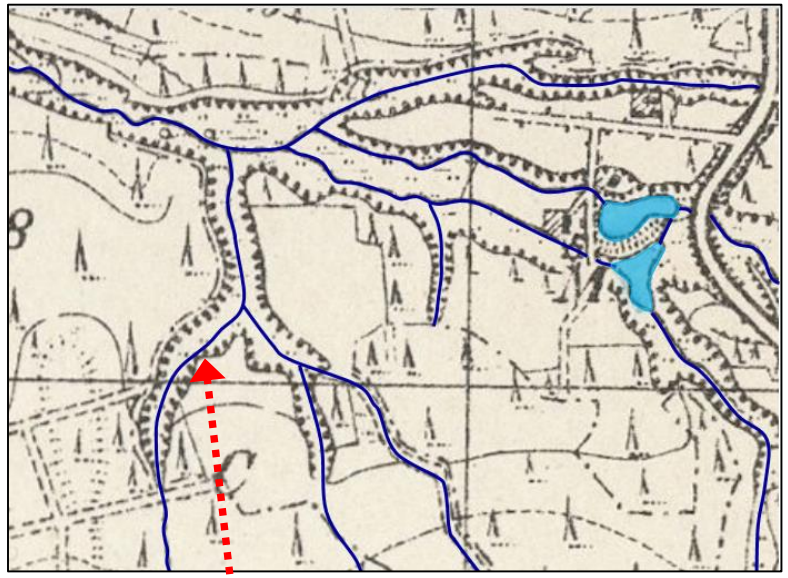
An urgent task is the inventory of Blue-Green Infrastructure assets, including watercourses and reservoirs - both those that are already multifunctional public spaces, as well as those that have yet to be adapted.

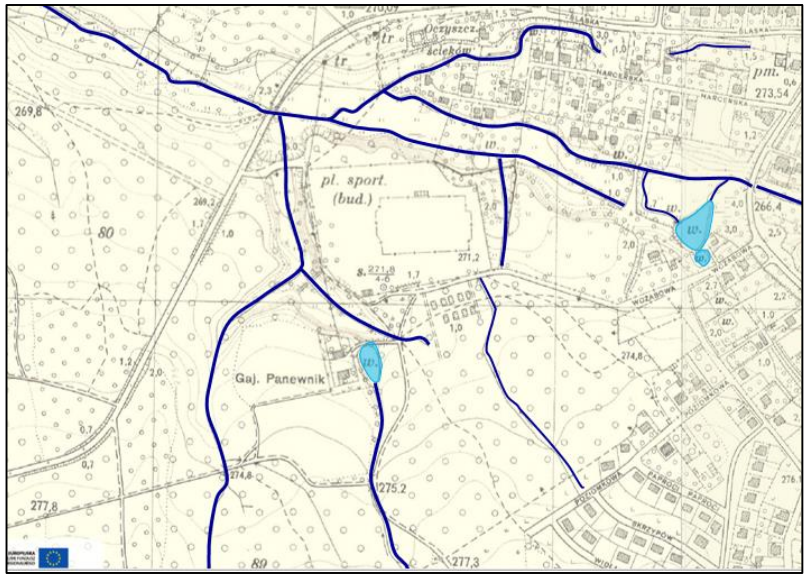
In order to do this, we need firstto set inventory criteria in the aspect of ecosystem services, as well as the needs and possible directions of revitalization.

We need to:

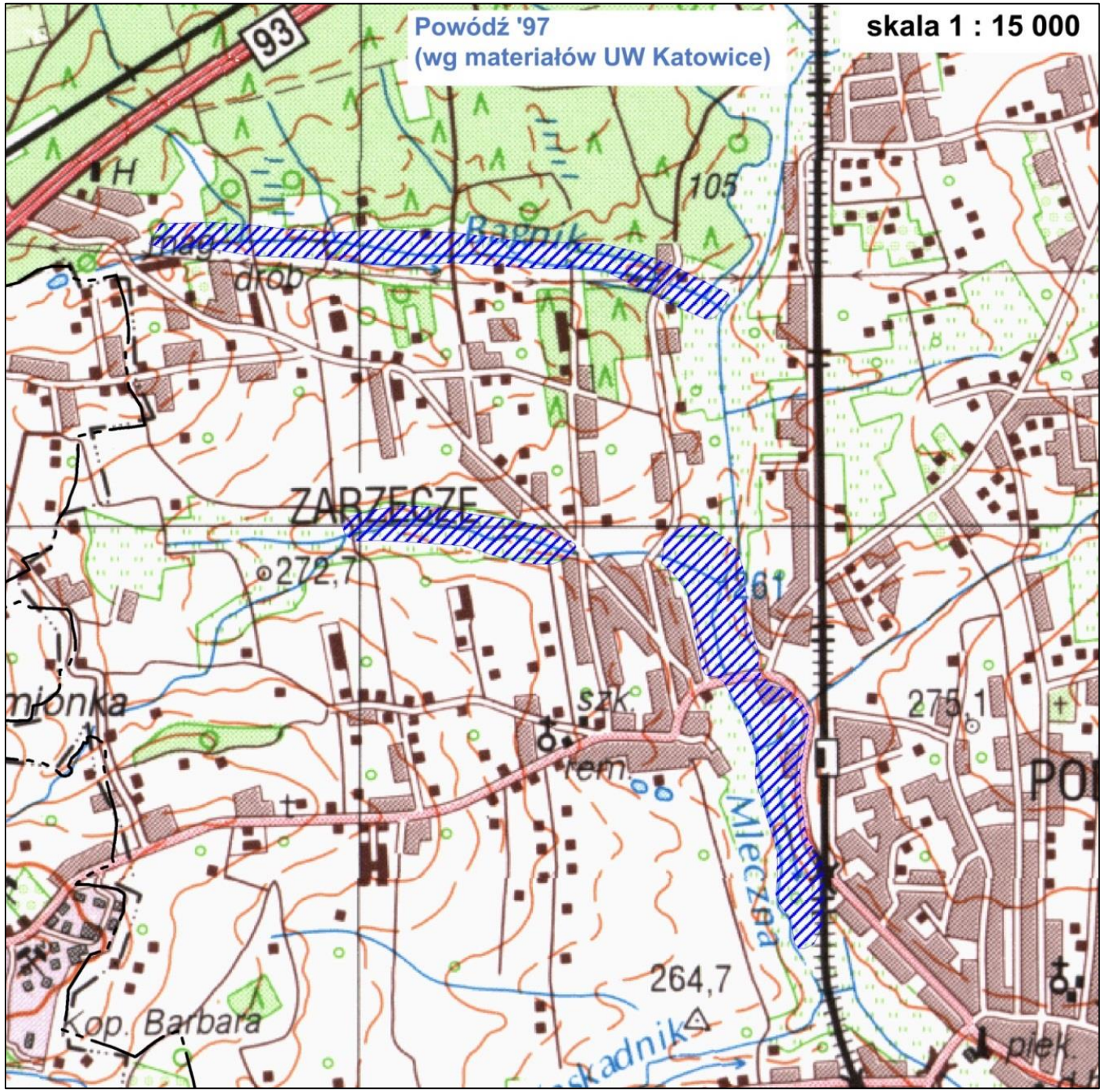
- **give an unambiguous classification of B-GI assets and assign them layers in the spatial information system**
- **develop a digital map of B-ZI resources based on all available spatial, natural and geoenvironmental data,**
- **assess B-GI assets taking into account the following contexts: economic, social, urban, environmental, financial and legal,**
- **use the result of the assessment of B-GI assets in the integrated policy of urban development as well as urban functional areas**







Some sections of streams covered in collectors deserve daylighting



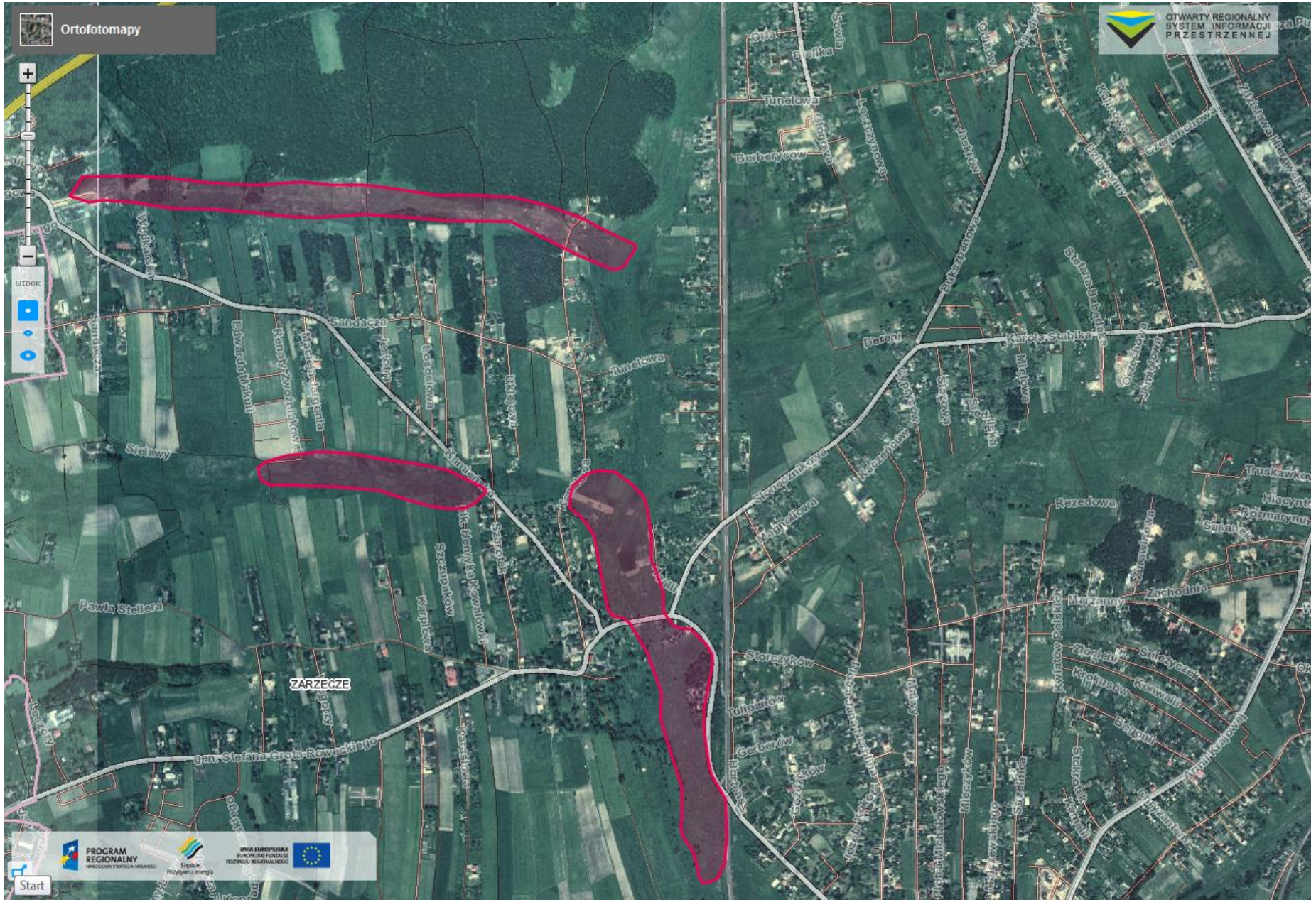
Forgotten (?) information about the extent of urban flood in the Mleczna valley (Katowice) in 1997

A fragment of the map prepared by the crisis headquarters at the Katowice Governor after the flood of 199

according to the Study of Spatial Development of the Silesian Voivodeship, Wisła River Basin, GIG-Ład, Katowice 2001, commissioned by the Marshal of the Voivodship)

Satellite image: 1996;

central and southern part of the Mleczna catchment, the areas flooded in 1997 in

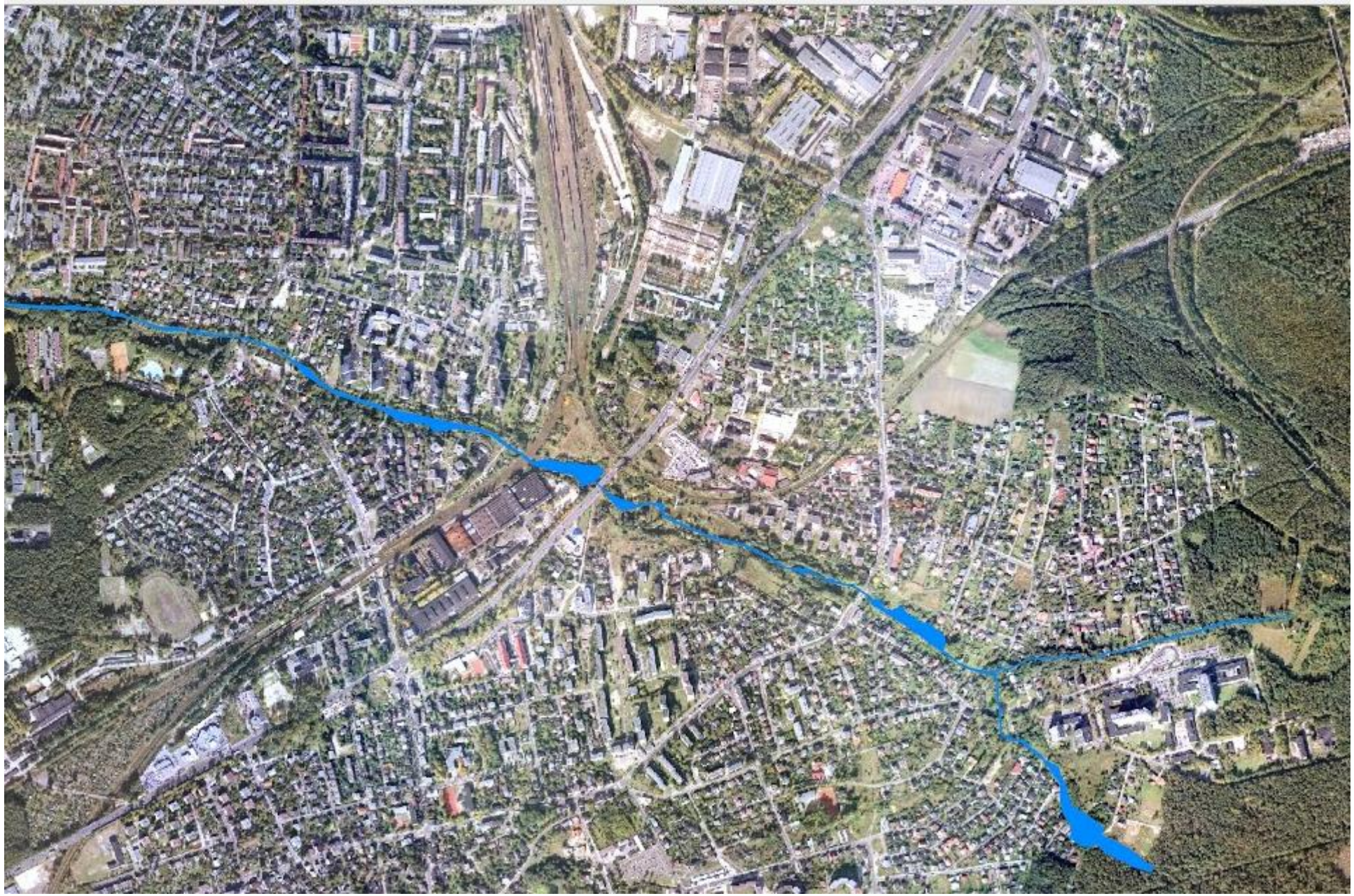


Satellite image: 1996; central and southern part of the Mleczna catchment, the areas flooded in 1997 in

Only major rivers are included in flood risk maps in the ISOK system

Kłodnica and Ślepiotka in Katowice - flood risk 0.2% (once every 500 years) - Ślepiotka "safe" ??? (according to ISOK)

During the flood in 2010, Ślepiotka left the banks. The range of flooding was documented by the REURIS research team on several hundred photographs, film and on the digital map



During the flood in 2010, Ślepiotka left the banks. The range of flooding was documented by the REURIS research team on several hundred photographs, film and on the digital map

Urban flood in Ślepiotka valley, Katowice 2010 (from the REURIS project archive)

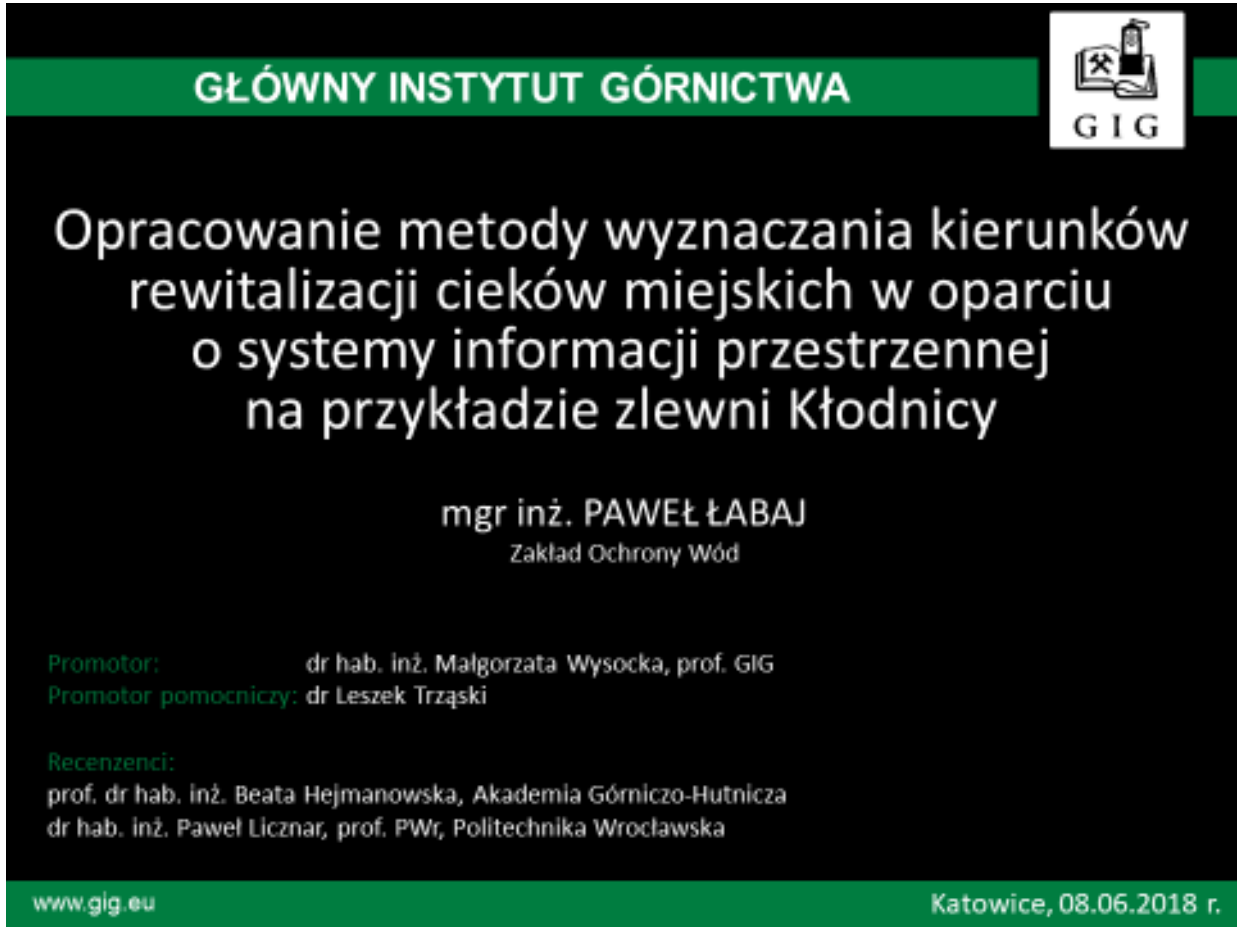
Urban stream and urban flood …

We must equip urban digital platforms with tools for:

- **Programming and designing the management of stream corridors in a manner integrated with the management of rainwater throughout the catchment area**
- **Generation of environmental scenarios regarding the watercourse and its catchment (eg simulation of the change of the extent of flooding caused by the anticipated increase in urban development and the catchment sealing)**

Simulation of urban flood event caused by heavy rainfall, aking into account the change of conditions resulting from the planned development (PCSWMM software)

In the Central Mining Institute, a doctoral dissertation on the method of using spatial information systems and satellite images for diagnosing the morphological status of urban streams has recently been defended



This method makes it possible to predetermine the directions of the urban stream corridor revitalization

Zakres stosowalności metody

Cieki miejskie:
stopień uszczelnienia zlewni przekracza 10%.

Stopień uszczelnienia:
stosunek powierzchni nieprzepuszczalnych (*parkingi, budynki, drogi, podjazdy i chodniki*) **w zlewni do jej powierzchni całkowitej.**

Metoda przeznaczona jest dla małych cieków, o powierzchni zlewni < 25 km^2.

Istnieje możliwość stosowania metody dla większych rzek.

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Using this method, research procedures can be shortened, including limiting the number and time of field tests as well as related costs

Przykład zastosowania metody

- Potok Bielszowicki - prawobrzeżny dopływ Kłodnicy
- ciek miejski znacznie przekształcony
- powierzchnia zlewni: 14,95 km^2, stopień uszczelnienia: 24%
- badany fragment: 5,24 km

Wykazano, że możliwymi do wdrożenia są:

rewitalizacja korytarza cieku oraz

przeciwdziałanie nadmiernej erozji brzegowej.

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Opis metod badawczych

Metoda River Habitat Survey (RHS)

- reprezentatywny odcinek badawczy o długości 500 m,
- obserwacje w dwóch etapach:
  - na profilach kontrolnych równomiernie rozmieszczonych wzdłuż badanego odcinka
  - syntetyczna ocena całego odcinka badawczego

wynik badań:
- ok. 400 parametrów opisujących hydromorfologię koryta
- wskaźnik jakości siedliska HQA, wskaźnik modyfikacji siedliska HMS

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Will this method be used for the assessment of Blue-Green Infrastructure assets of our cities?

An opportunity has just emerged, because works on the Study of conditions and directions for spatial development of the GZM area have been launched.