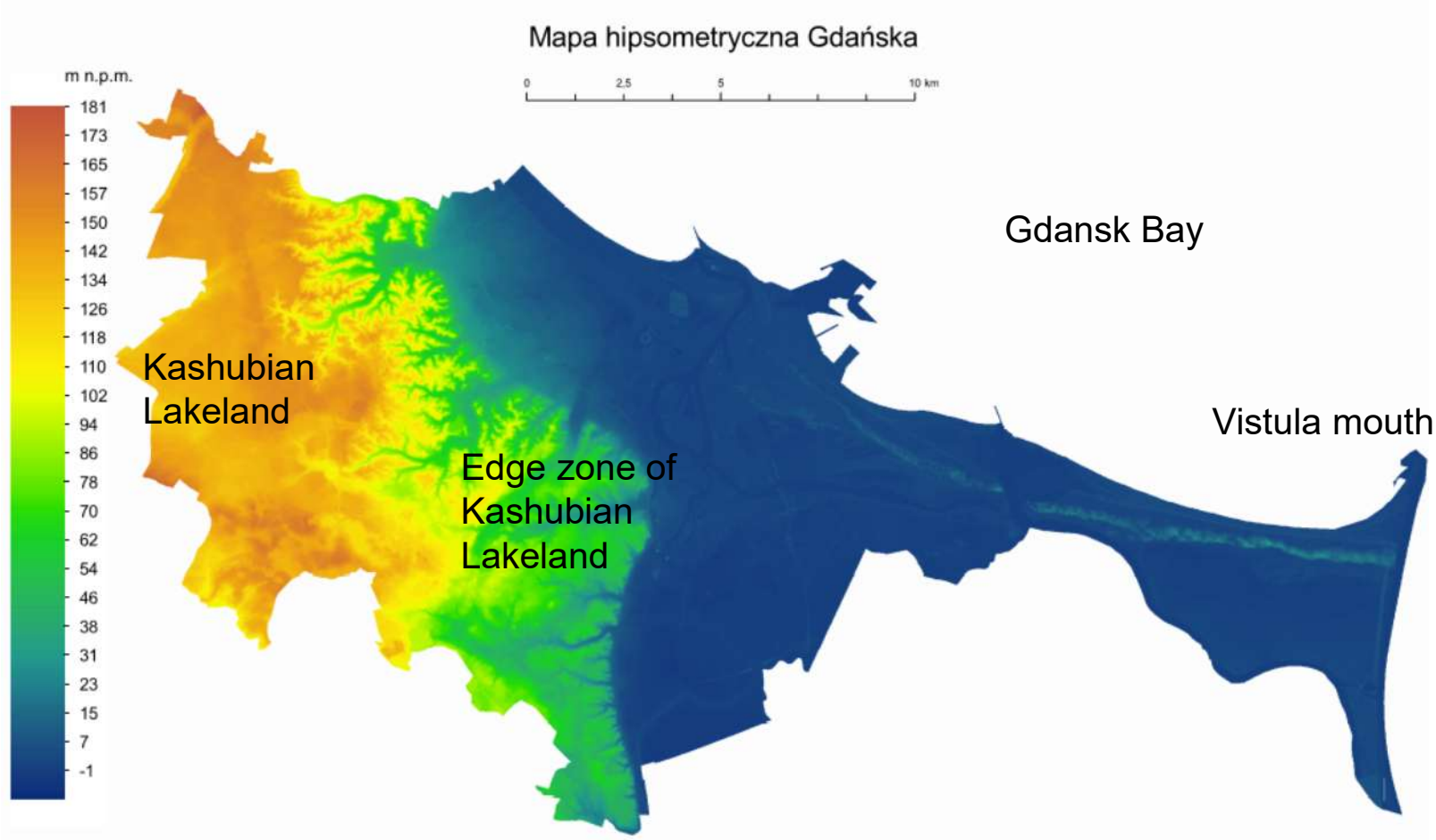
Urban streams - challenges and good maintenance practices

CONE – 2nd Workshop - Training of trainers

ONLINE | 11 of April 2025

Presenter: Wojciech Szpakowski

Geographical location



Vistula Delta Plain

Main streams - embanked

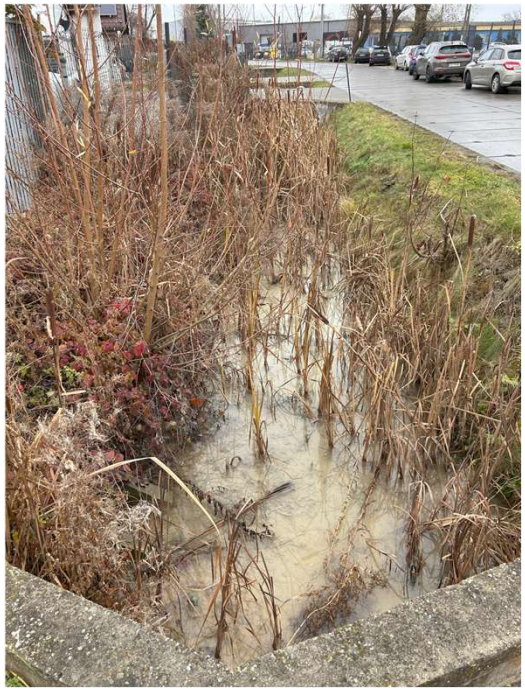
Water levels in streams above the adjacent area

Vistula Delta Plain

The only possible way to regulate waters

Transit ditches – maintaining water flow capacity

Retention ditches – maintaining retention volume



<u>Different types of ditches:</u>

dewatering (buildings)

land improvement (agriculture)

<u>Various owners:</u>

State Water Management
City
Road owners (Marshal, Voivode)
Railway
Other owners

Kashubian Lakeland

Moraine area - many no-drain areas

Clays, clays with sands dominate – rapid and large fluctuations in groundwater.

Changes in the nature of precipitation in winter lead to multi-day flooding.

Edge zone of the Kashubian Lakeland

Streams in moraine valleys require energy reduction - threshold development

Using stream valleys for other functions

Edge zone of the Kashubian Lakeland

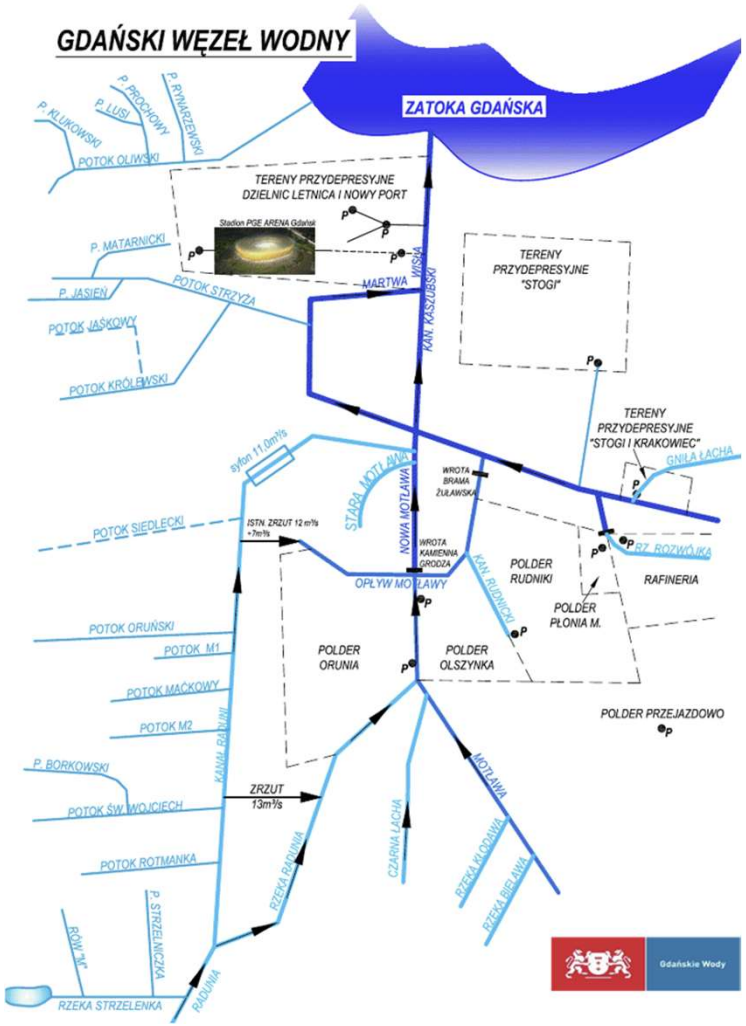
Streams in moraine valleys require energy reduction - threshold development

Flow regulation in flood protection reservoirs

Jasien reservoir: 48 500 m^3 retention capacity

Total: 56 reservoirs: about 800 000 m^3 retention capacity

Gdansk Hydrological system



Historical hydrological activities

Radunia Channel

XIV century.

Historical hydrological activities

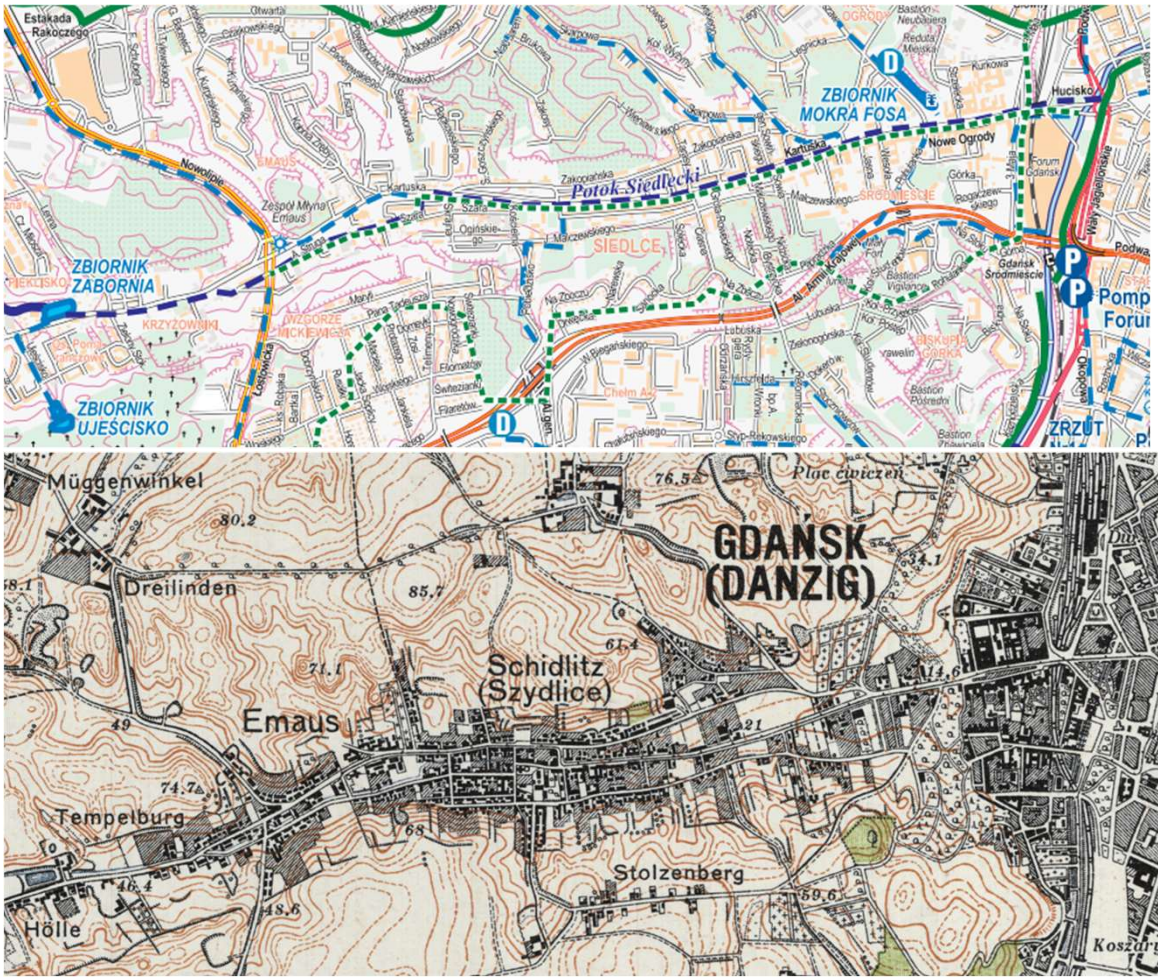
The Vistula River Mouth

Gdansk.pl ; geogdansk

Historical hydrological activities

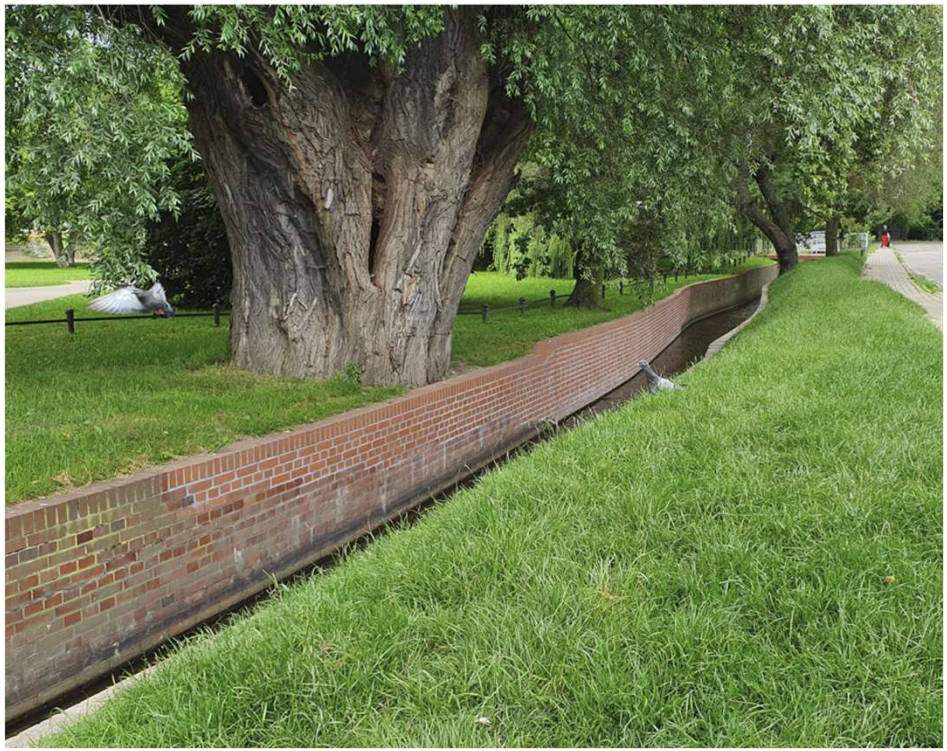
Covering streams

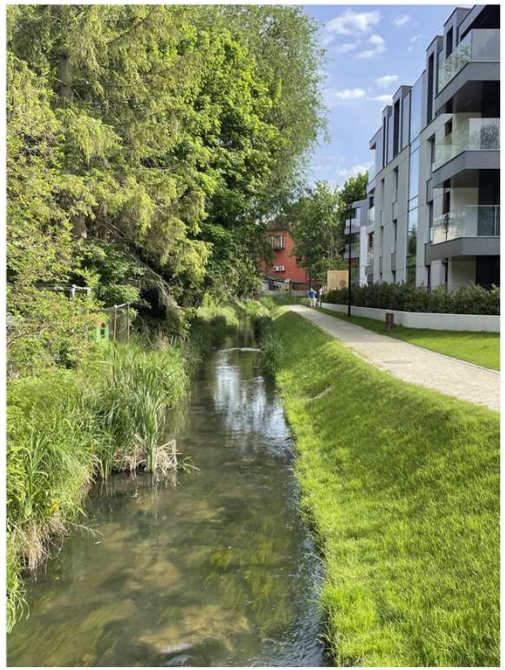
Siedlicki stream



Historical hydrological activities

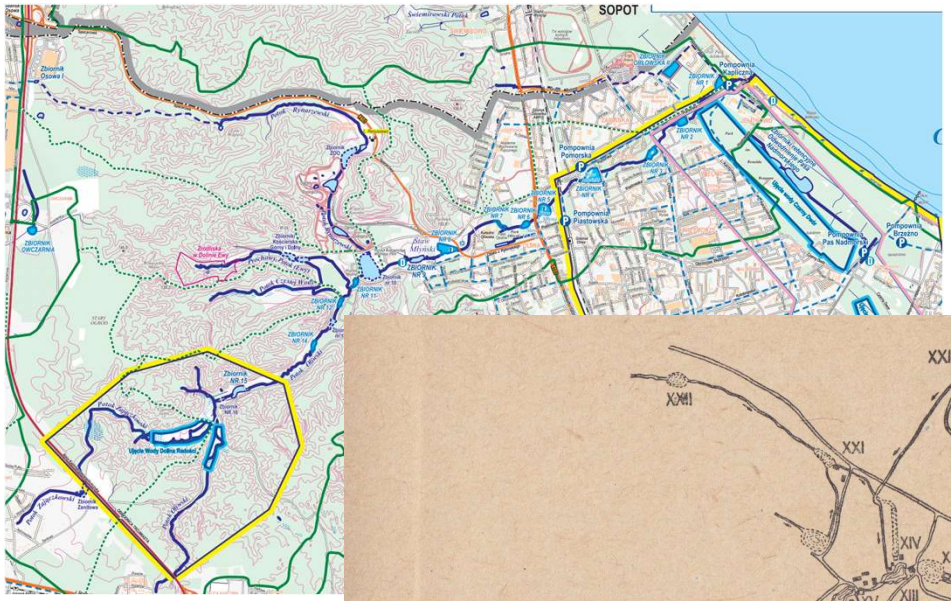
Regulations streams

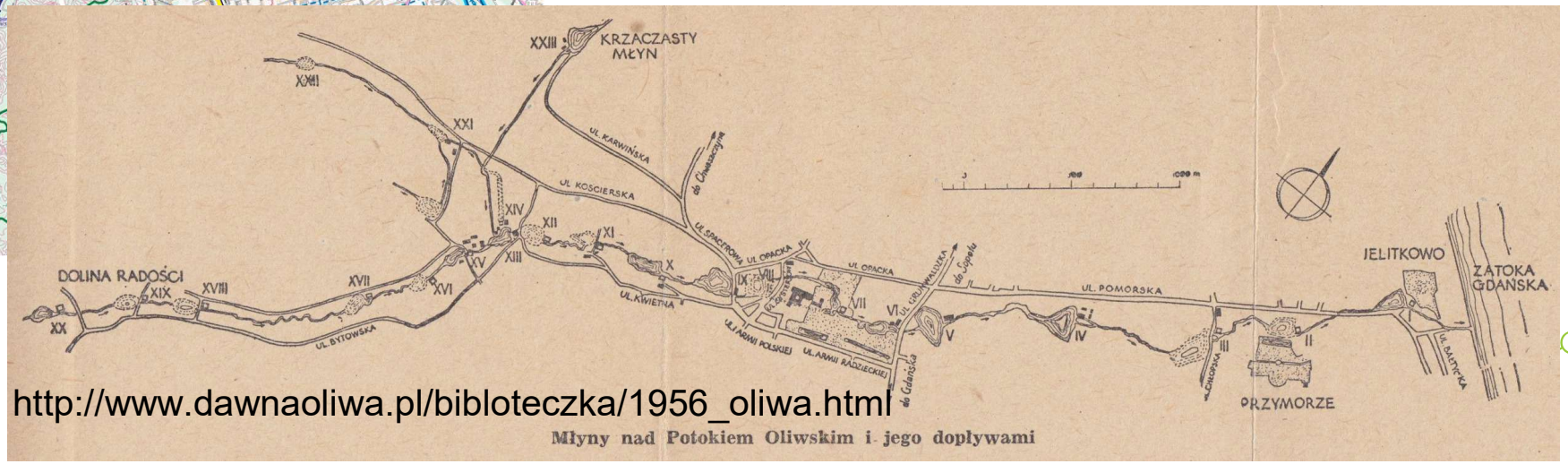




Historical hydrological activities

Oliwski stream – energy use of the stream





http://www.dawnaoliwa.pl/bibloteczka/1956_oliwa.html

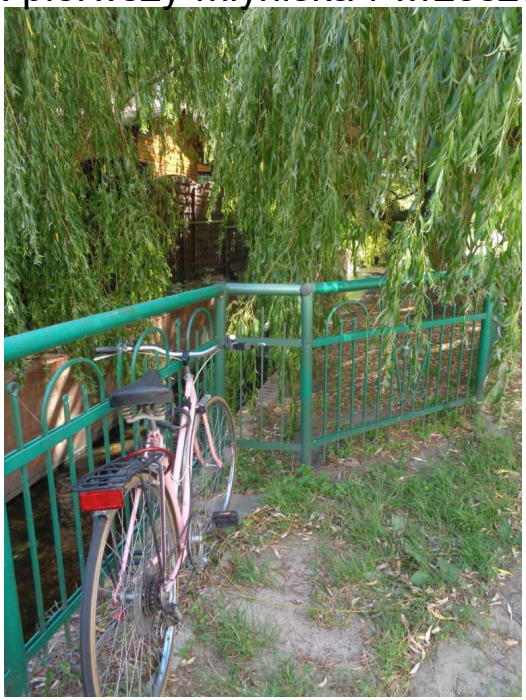
challenges in maintaining and restoring natural waters

land ownership - straightening and closing waters

Strzyża stream

https://7zdjeczgdanska.pl/2019/01/spacer-od-ujscia-do-zrodel-strzyzy-odcinek-pierwszy-mlyniska-i-wrzeszcz.html






challenges in maintaining and restoring natural waters

road and rail investments

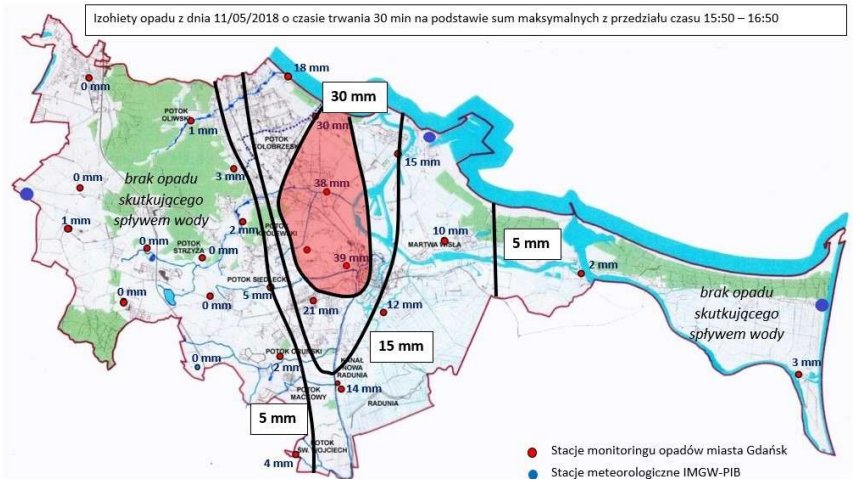
Strzyza road intersection
Canalysed stream

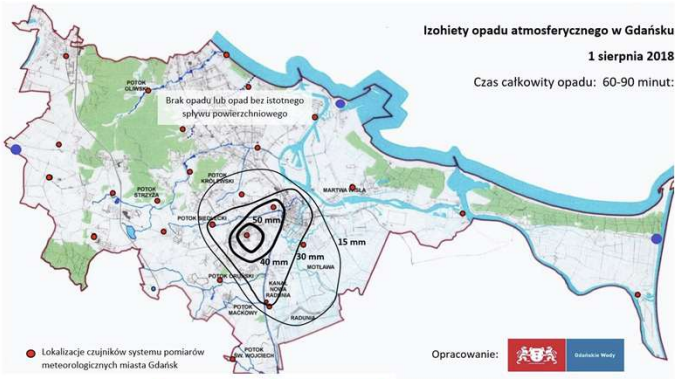
Floods 2001 and 2016

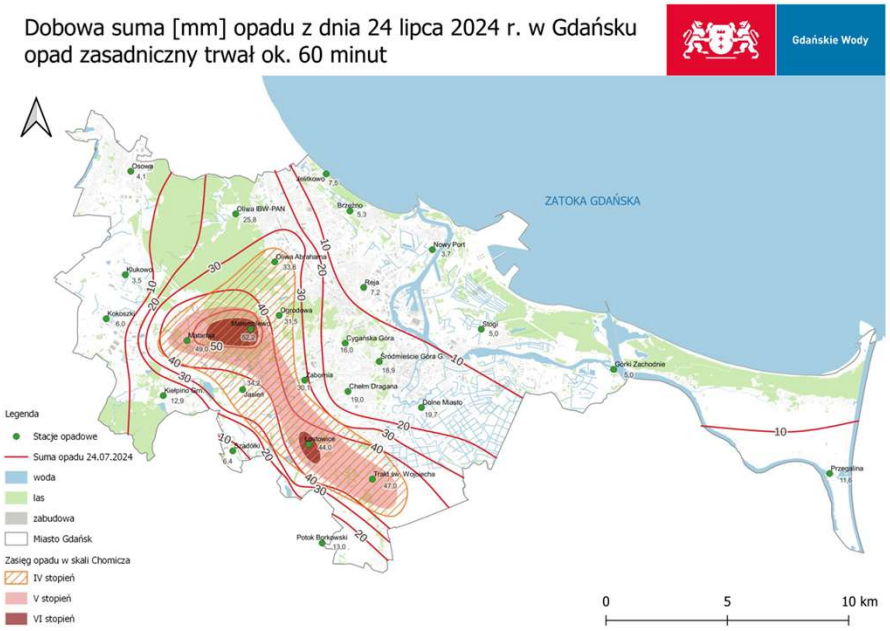
MMFoto

challenges in maintaining and restoring natural waters

Torrentian rains



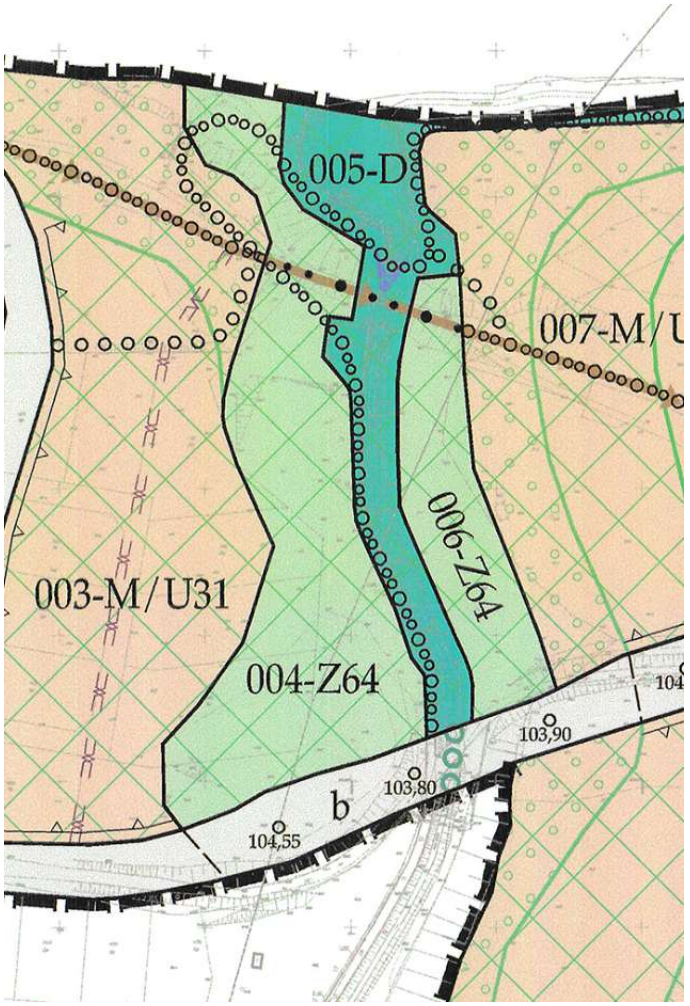




Protection of open streams

Landscape planning

D – water management
Z – greenery
M/U – apartments/services

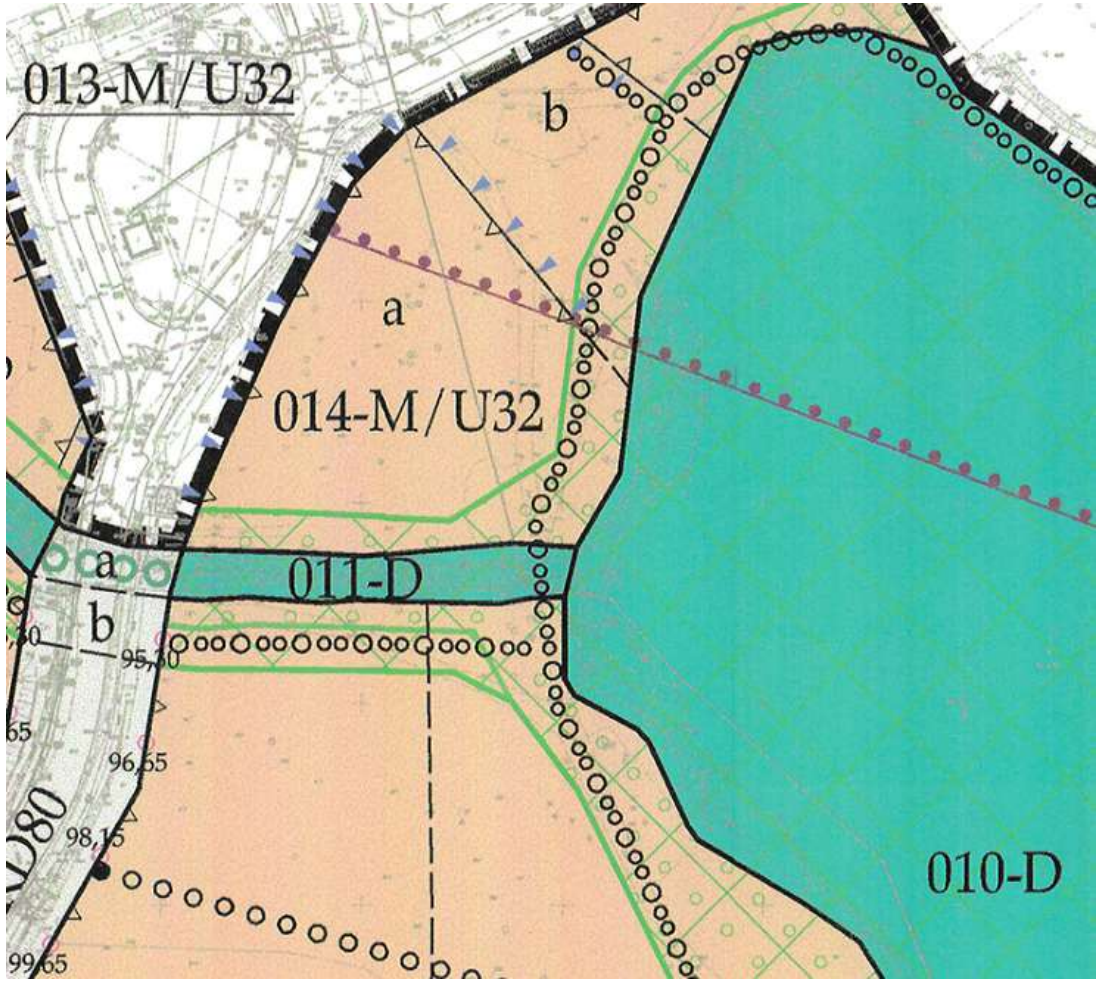


Protection of open streams

Landscape planning

D – water management
Z – greenery
M/U – apartments/services

limitation of development
in areas M/U (green line)



Protection of ponds and wetlands

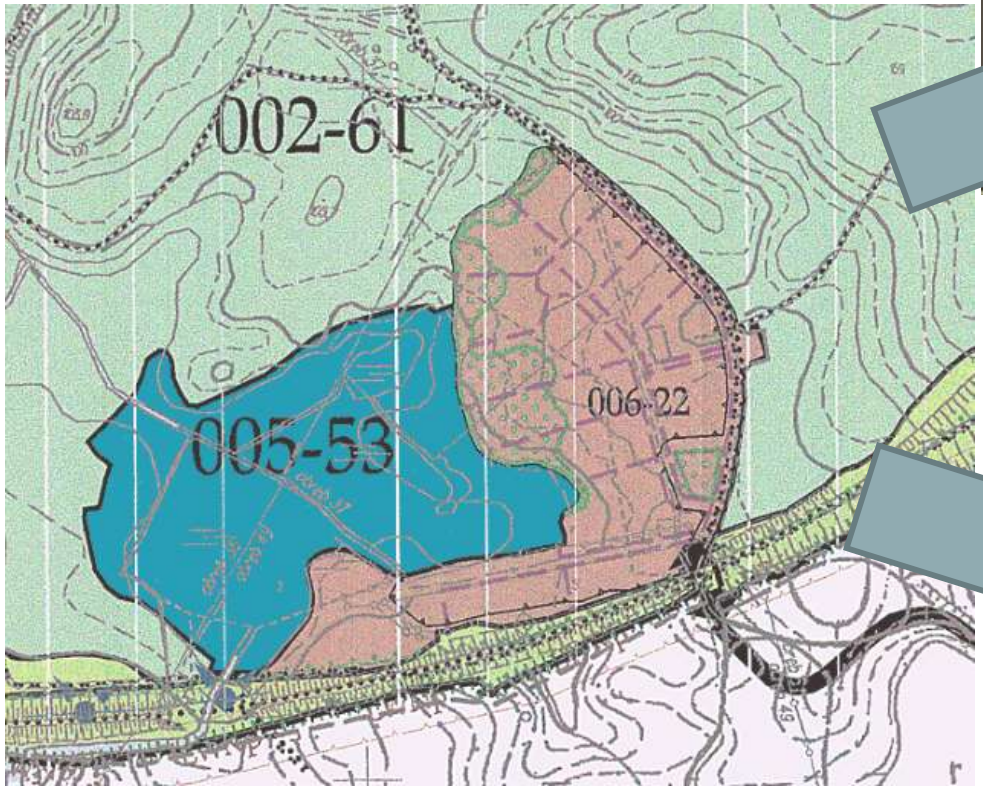
Landscape planning

Protection of ponds and wetlands

Landscape planning

Protection of reservoirs

Landscape planning



Good examples

hydraulics and hydrology - point of view

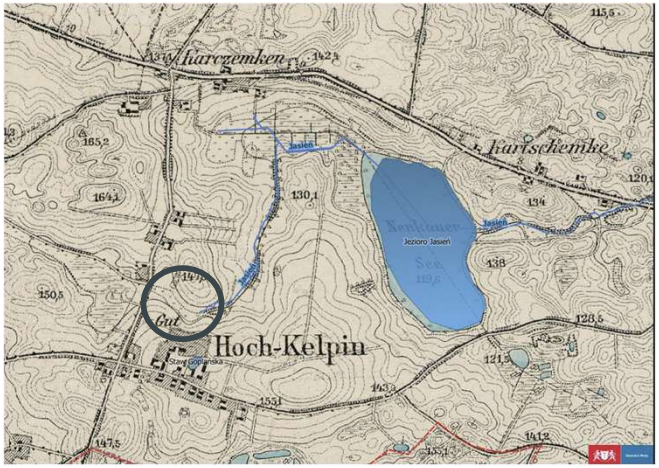
- safe delay of outflow
- avoidance of flooding
- ensuring the capacity of streams
- safe zones of overflows from streams

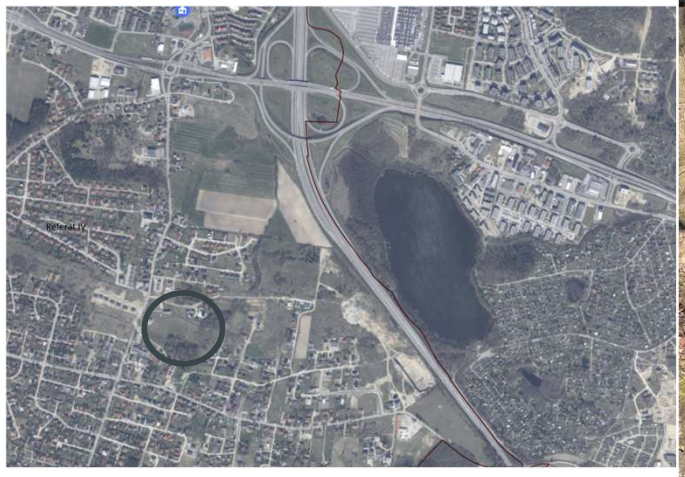
the basic problem of Gdansk's streams:
- limited capacity in the estuary zones
- the rising level of the Gulf of Gdańsk

Good examples

leaving the natural riverbed

the sources of the Jasień stream





current river network on the background of the historical map 1917

Orthophotomap 2023

Good examples

leaving the natural riverbed

streams in state and municipal forests

Smegorzynski stream

Orthophotomap 2023

Good examples

buffer zones of streams - safe spillage of water onto adjacent areas

Good examples

use of ponds and wetlands

Local rainwater reservoirs and groundwater level regulators

Good examples

ditches as pre-treatment systems

safe location for less favorable water flows

biodiversity and maintenance limited to necessary work

Good examples

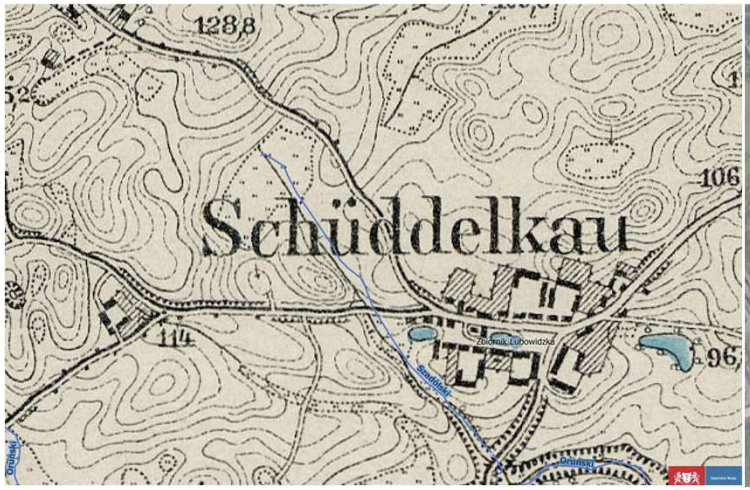
protection for the pond and wetland of runoff water in the catchment area

- Surface inflow
- Inlets

Good examples

discovering canalized streams

Szadólski stream



current river network on the background of the historical map 1917

Orthophotomap 2023

Good examples

naturalistic retention in 56 reservoirs

Good examples

https://7zdjeczgdanska.pl/2019/07/spacer-od-ujscia-do-zrodel-potoku-oliwskiego-odcinek-drugi-spokoj-i-natura-w-duzym-miescie.html

Buffer zones of the Oliwski stream

Good examples

https://www.brg.gda.pl/wizje-opracowania-i-polityki-miejskie/zielen-i-woda/1501-gdanska-polityka-wodna

Gdansk Water Policy

The basis for the management of rainwater in Gdańsk

Green retention – green infrastructure

30 mm of precipitation should be managed in the field, the rest drained to the storm water network.
Ensure the possibility of emptying facilities

Fot. Paweł Burdziakowski

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