Climate Change and Waters

3rd international ASTRA conference
Ryga, 10-12 May, 2007

Climate change impact in the Gdansk region – vulnerability of water system and spatial planning

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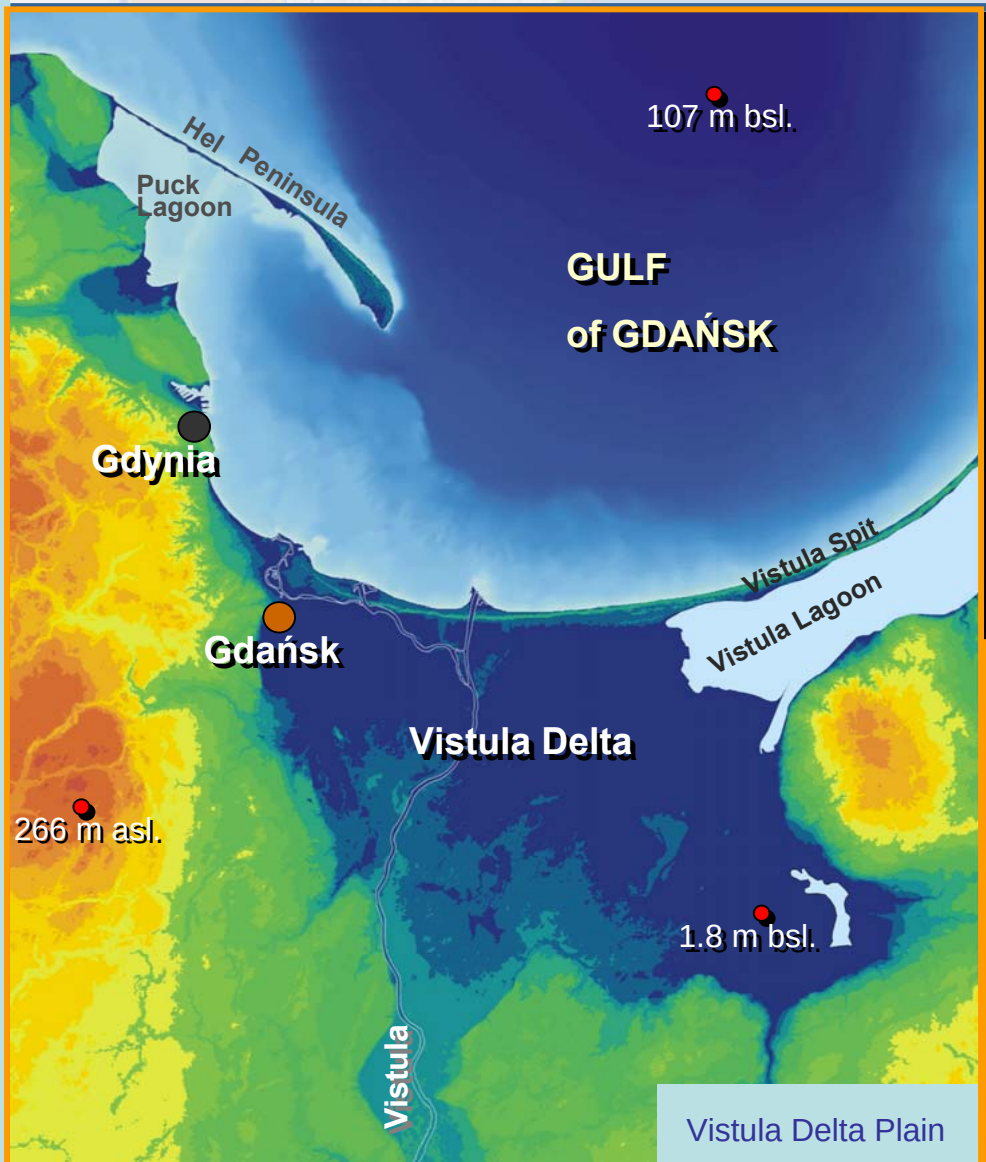
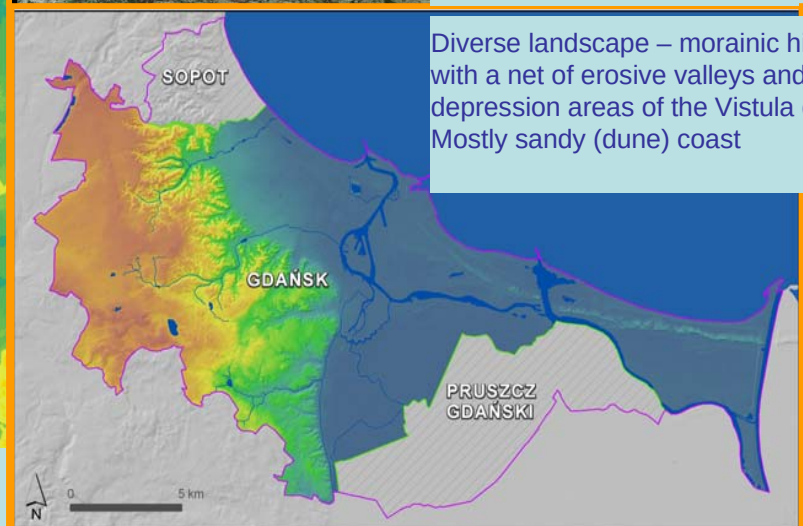
Gdansk case study area



Vistula Delta Plain

Southern Baltic coast



Diverse landscape – morainic hills with a net of erosive valleys and depression areas of the Vistula delta
Mostly sandy (dune) coast

Climate change and waters in the Gdansk csa

Surface waters

– mostly in the aspect of flood protection and adaptation to climate change:

- sea level rise
- higher probability of extreme events occuring (i.e. storms surges, heavy precipitations)

Groundwaters

– mostly in the aspect of water supply for Gdansk (18,3 mln m3 of drinking water production per year, what stays for 71%, comes from groundwater intakes)

– second aspect is increase of possibility of groundwater inundation due to rising of groundwater drainage base (sea level rise)

Surface waters

Gdansk is one of the most flood prone areas in Poland, simultanously it's one of the best protected – it has nearly 700 years of experience with living under flood risk.

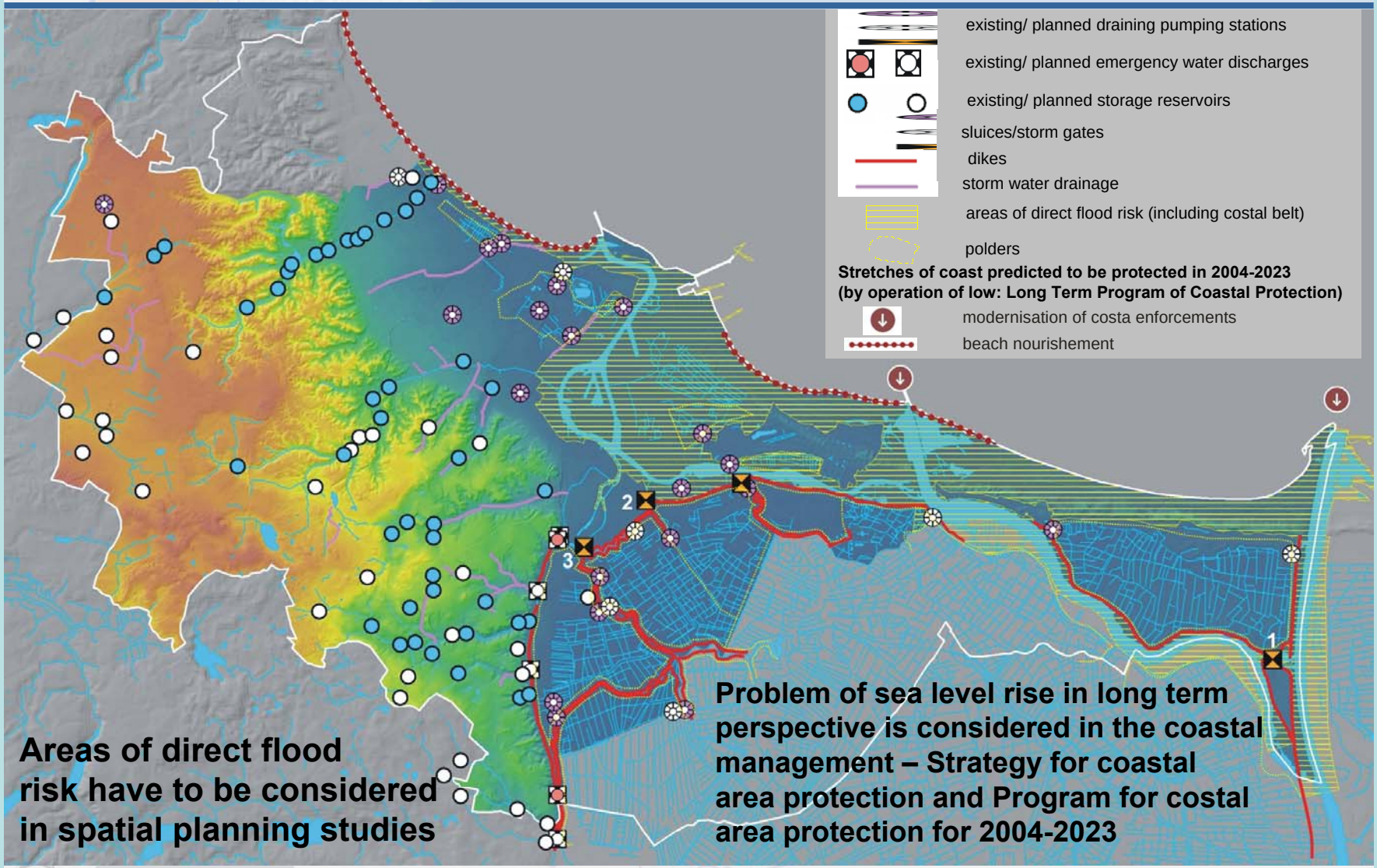
There is a net of flood protection infrastructure as dikes, ditches, culverts, sluices/storm gates, pumping stations and storage reservoirs, however they still need to be renovated and reconstructed

Flood protection and drought impact prevention are public tasks, realized by governmental and local administration

At the moment there have been indicated areas of direct flood risk, which according to the legislation have to be considered in spatial planning studies – special land use regulations:

- Regional Board for Water Manageement - river basins
- Maritime Office - coastal belt

Flood protection in Gdansk



On the basis of the project of „Study on preconditions and directions of spatial development for Gdansk" Gdansk Development Agency, 2007

Surface waters

According to the EU Flood Directive by the 2015 there must be prepared complex study concerning all kinds of risk in relation to the area of its occurence, including information about the areas at risk due to long-term prognosis (of climate change).

ASTRA results → **Supporting information and tool for respective authorities in the process of planning and decision making**

How to adapt to climate change impact on groundwater system?

There could be indicated substitute sources of drinking water - this is the worst, most time- and money consuming scenario in realization

In the ASTRA we are working on **groundwater vulnerability map** which in a final version can be a tool for further analysis.

Factors considered during the map elaboration:

- areas affected by sea level rise according to SEAREG scenarios
- identified endangered groundwater intakes
- groundwater resources and geological and hydrogeological conditions schema
- extraction from endangared intakes and percent of drinking water users
- other threats, as i.e. flood risk, salt water intrusions

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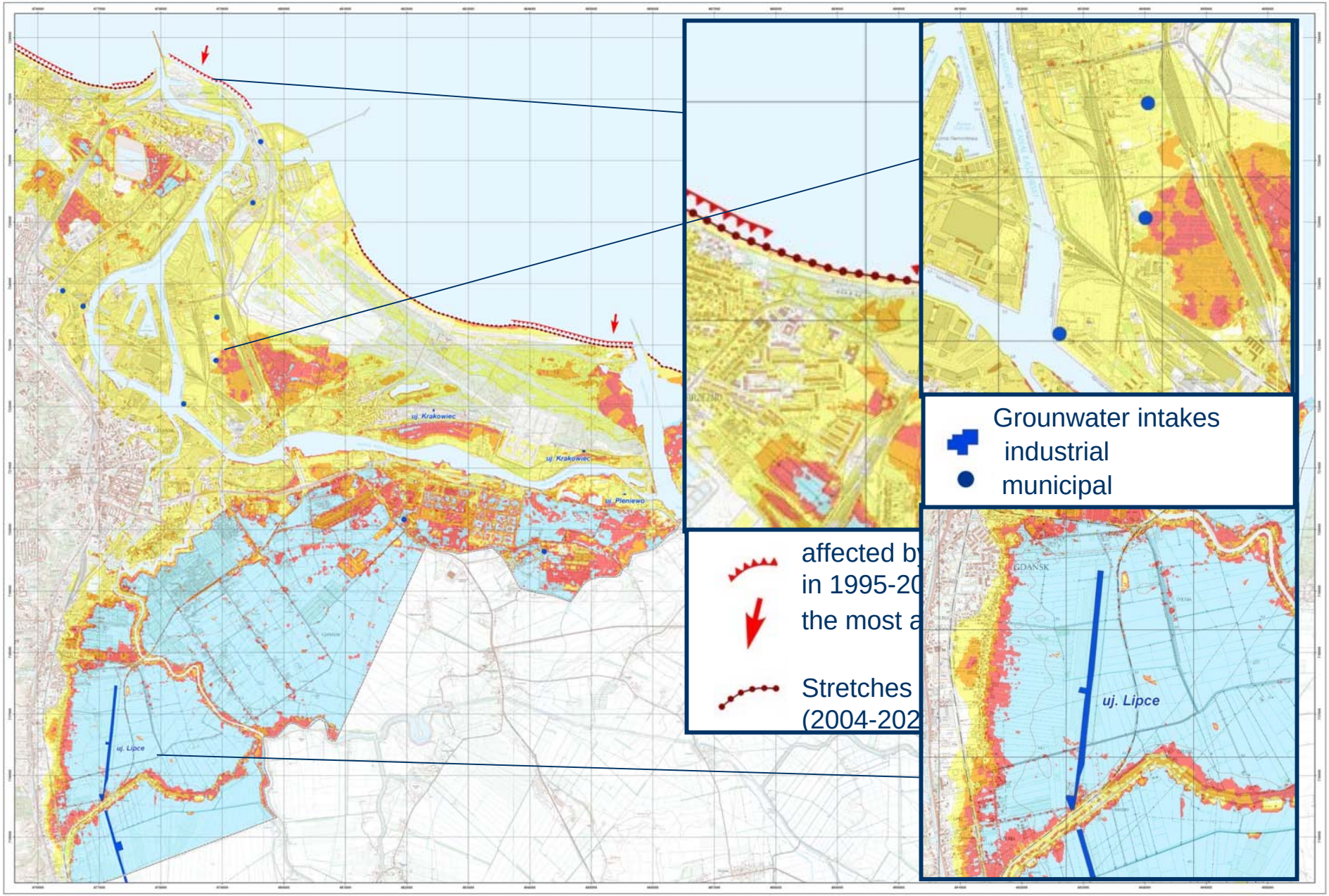
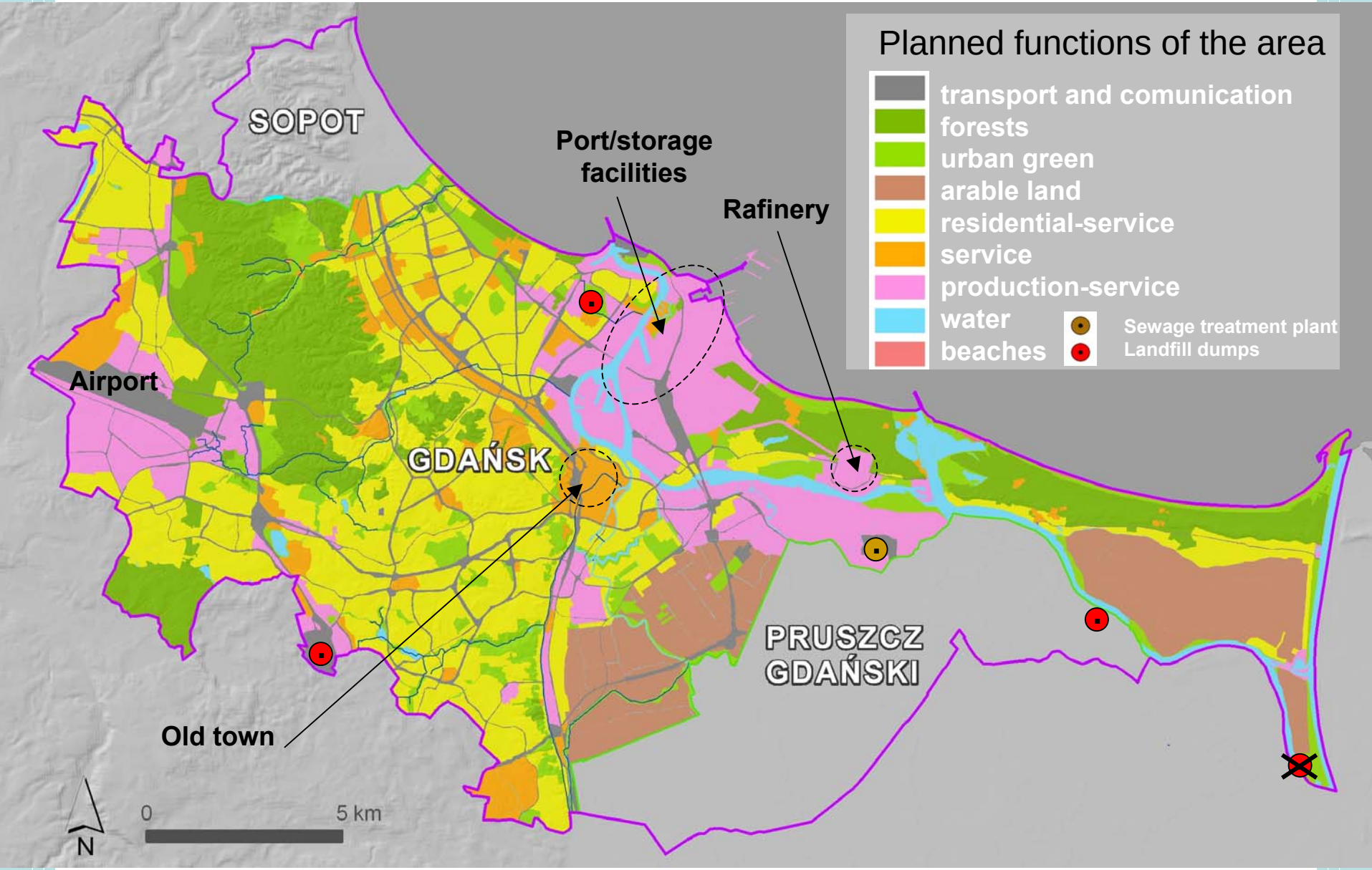
ODDZIAŁ GEOLOGII MORZA

Gdańsk – areas vulnerable to climate change (SLR, floods)

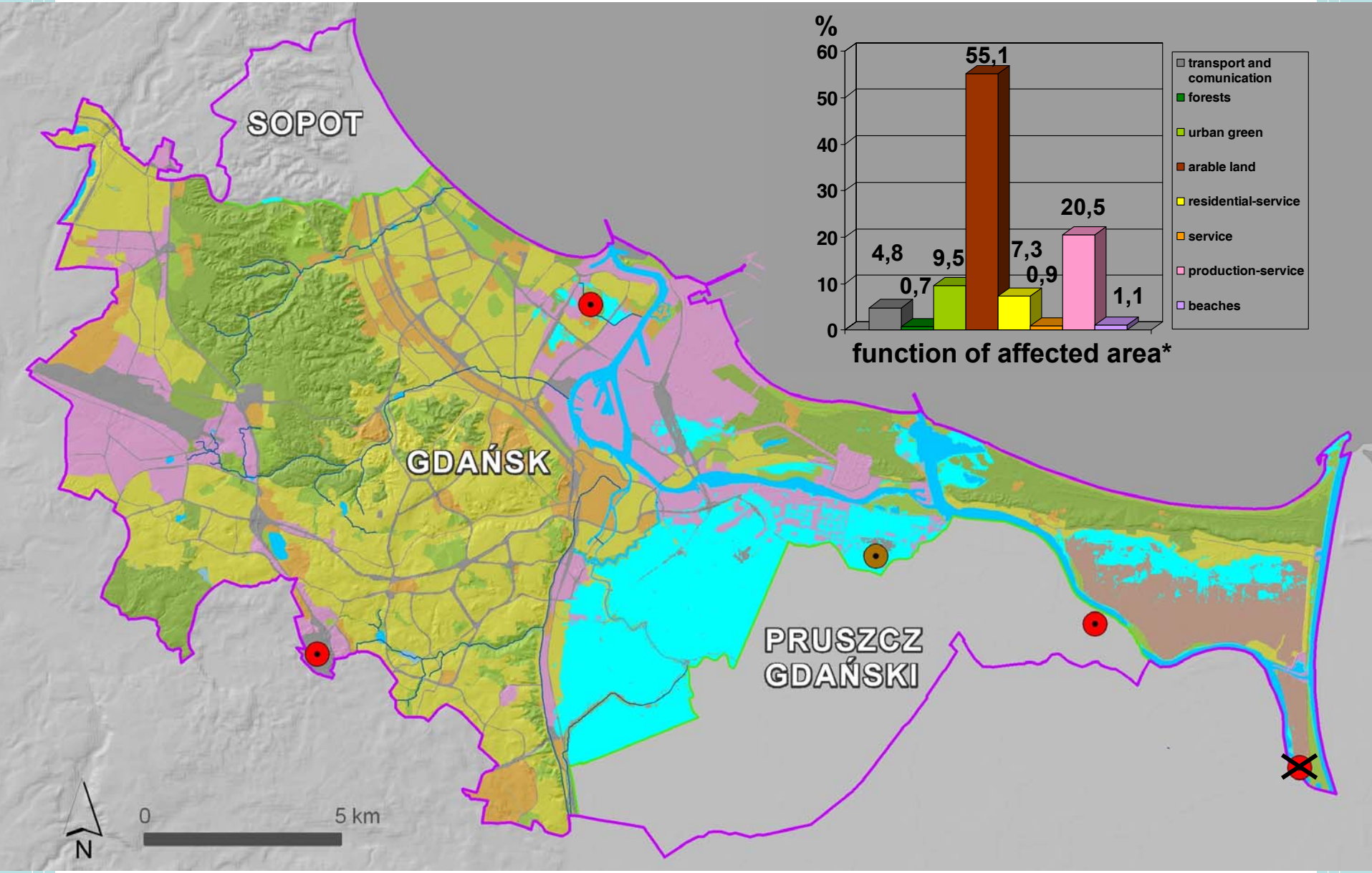


Directions of spatial develoment in Gdansk - project



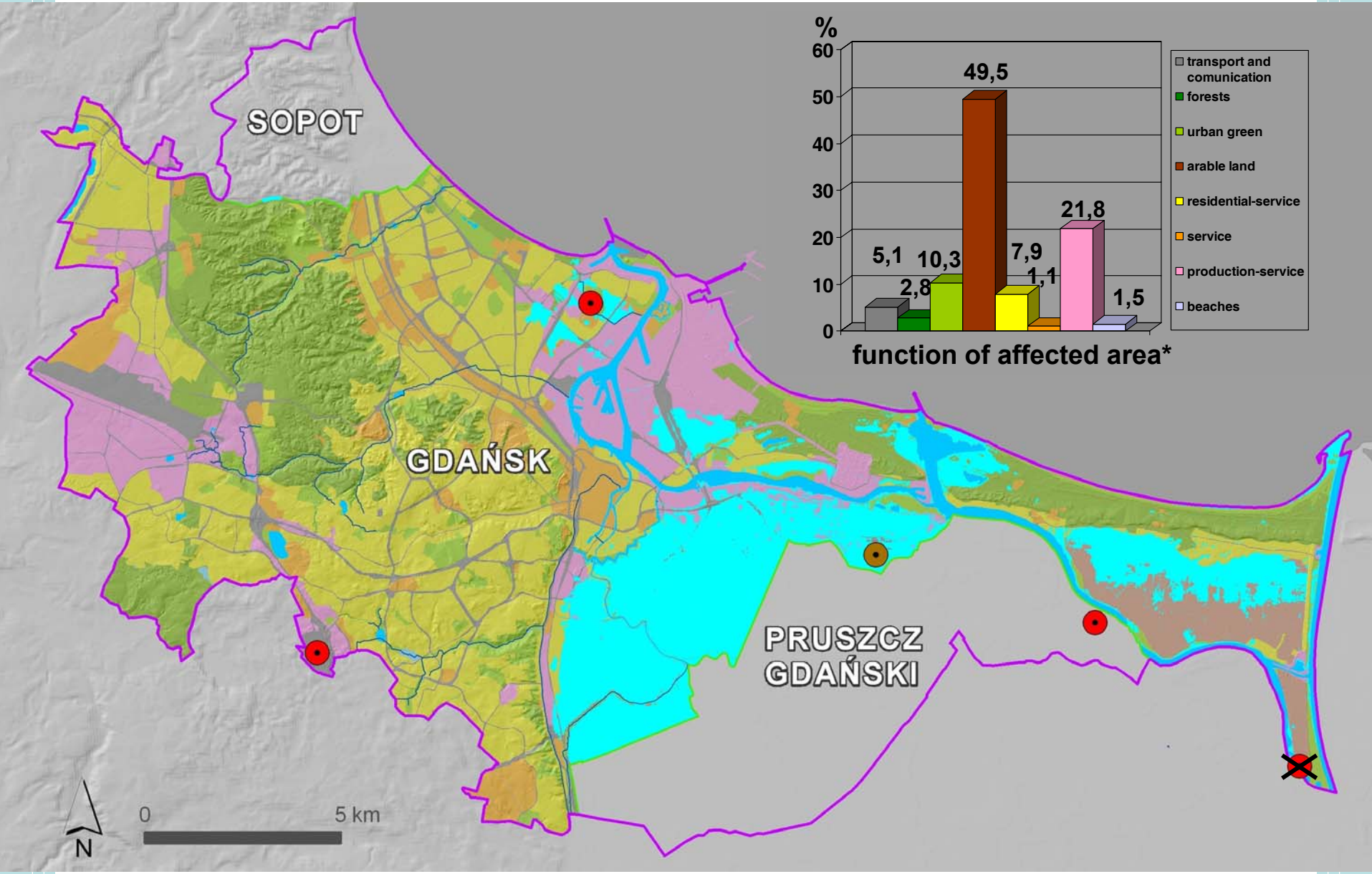
On the basis of the project of „Study on preconditions and directions of spatial development for Gdansk” Gdansk Development Agency, 2007

SLR potentially affected areas of Gdansk – 0,5 m scenario (SEAREG)



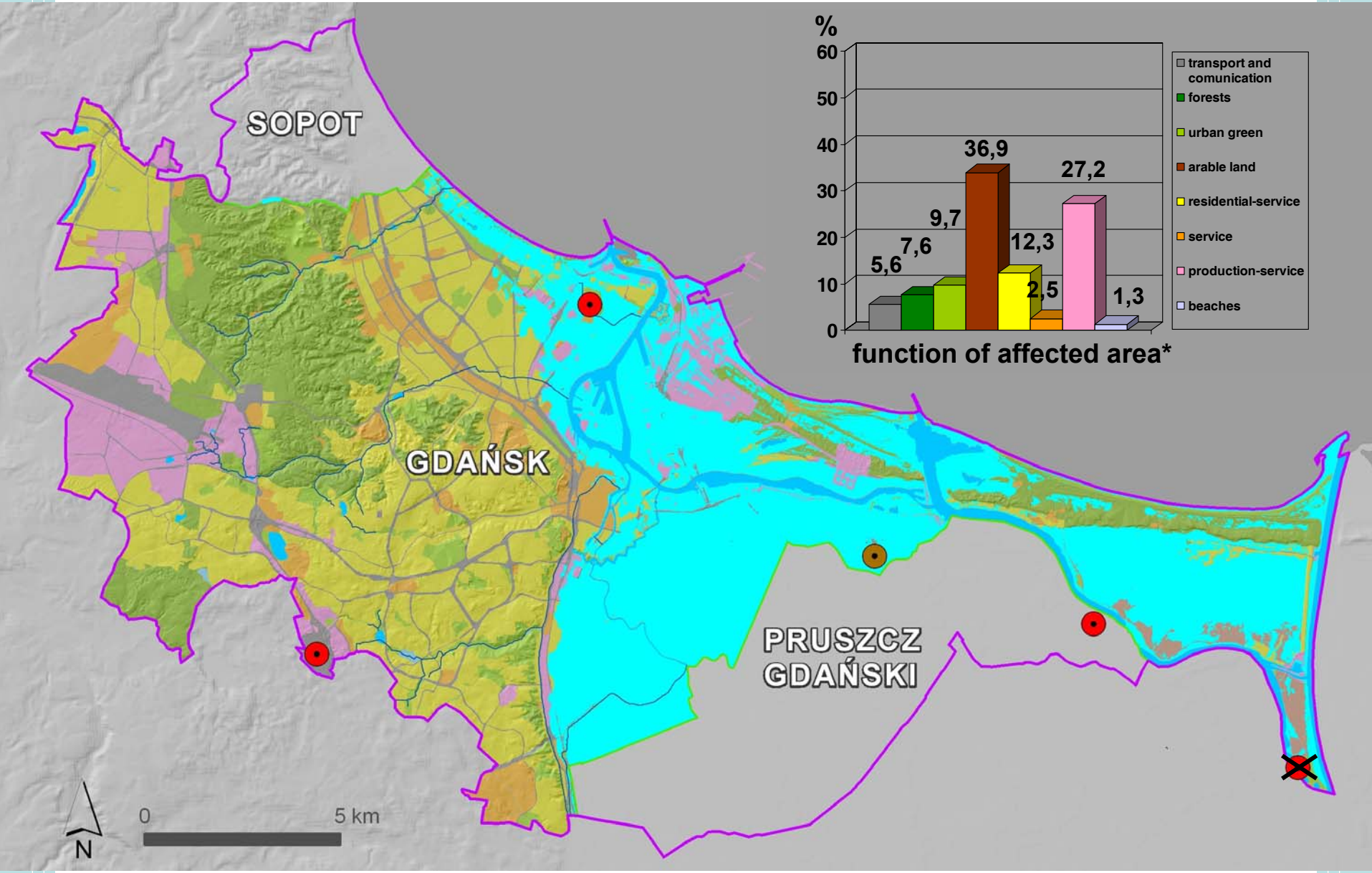
* excluding water

SLR potentially affected areas of Gdansk – 1,0 m scenario (SEAREG)



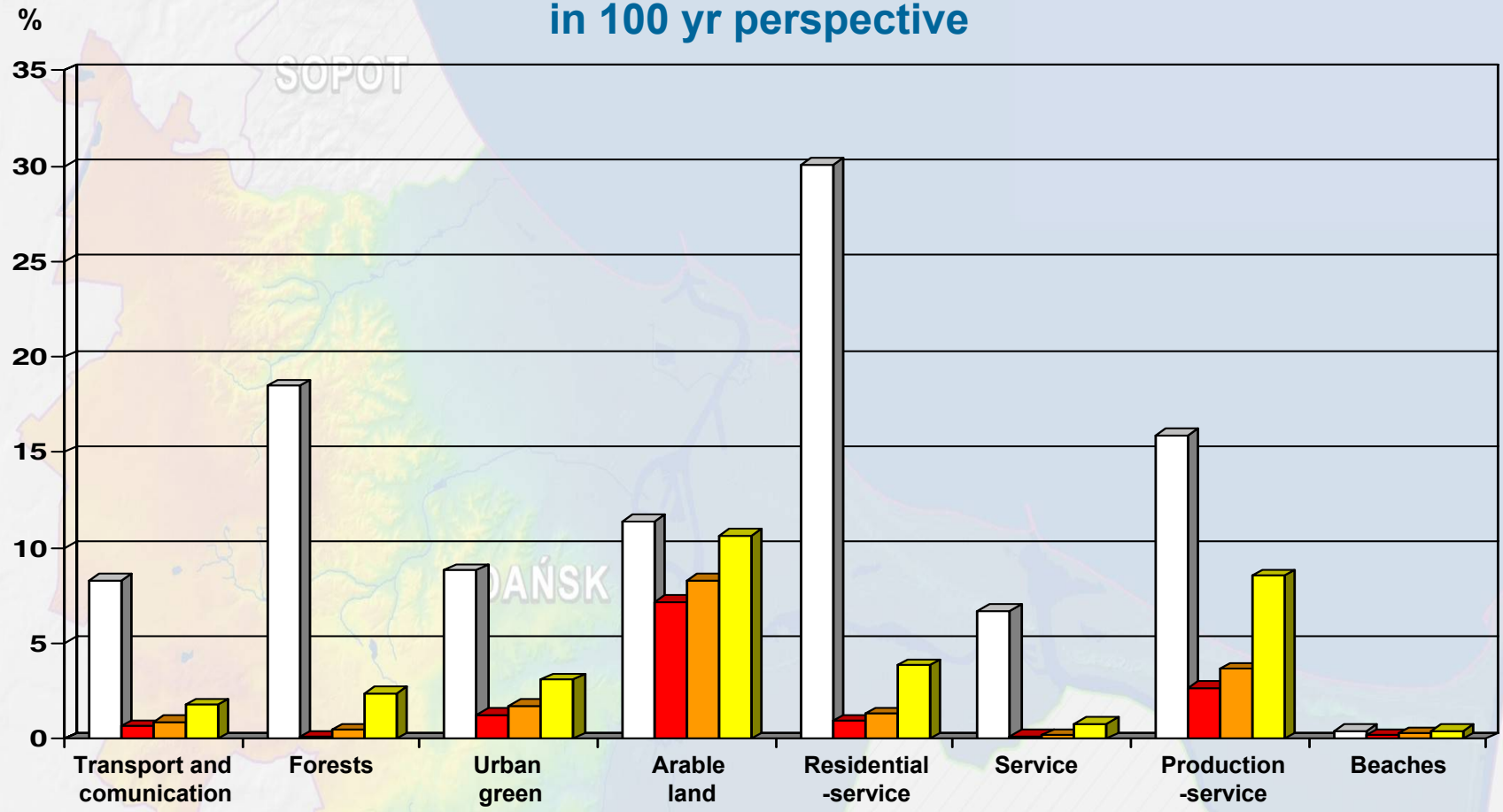
* excluding water

Areas potentially affected by sea level rise– 2,5 m (SEAREG: 1m SLR+ 1,5m storm surge)

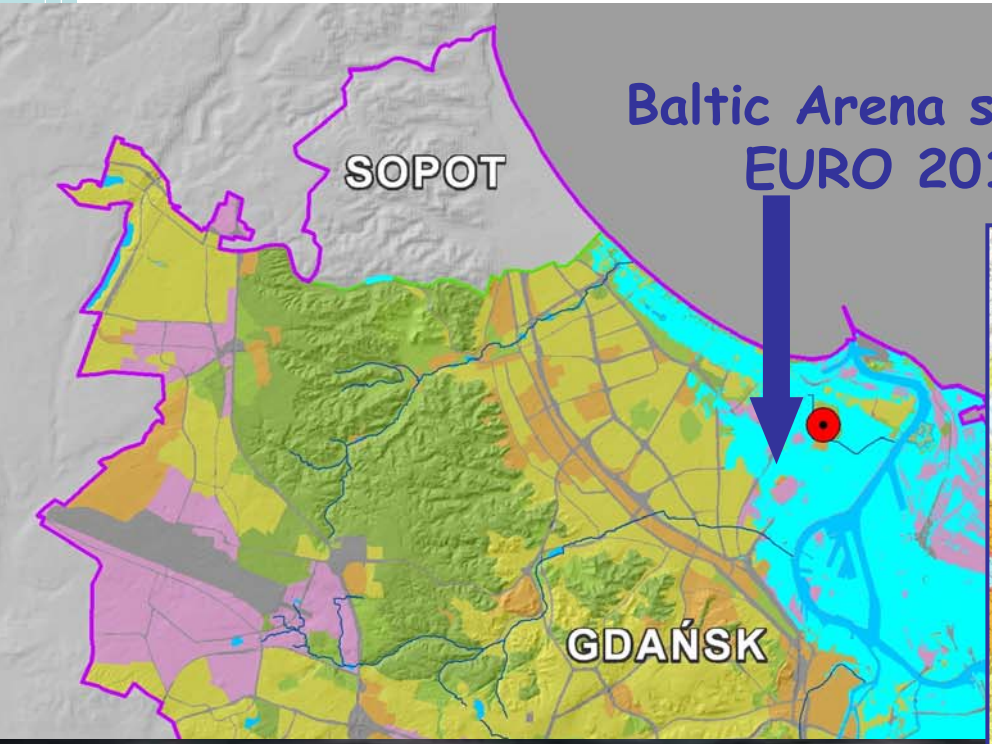


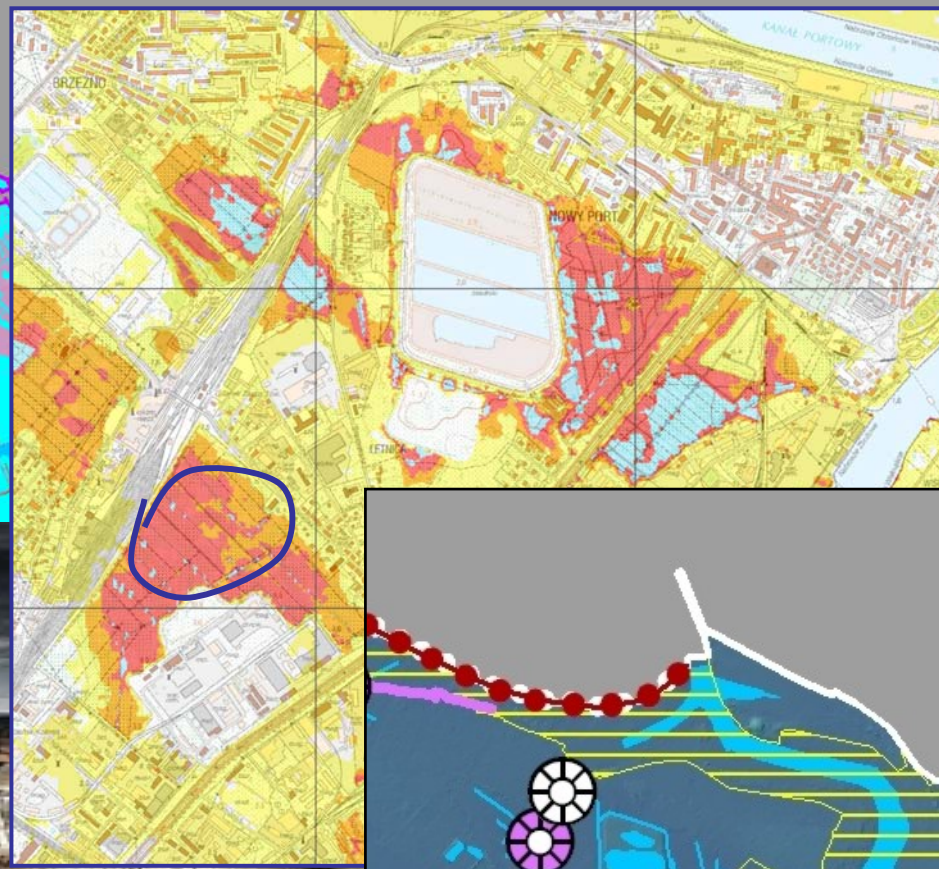
* excluding water

SLR potentially affected areas of Gdansk – comparison of three cases in 100 yr perspective

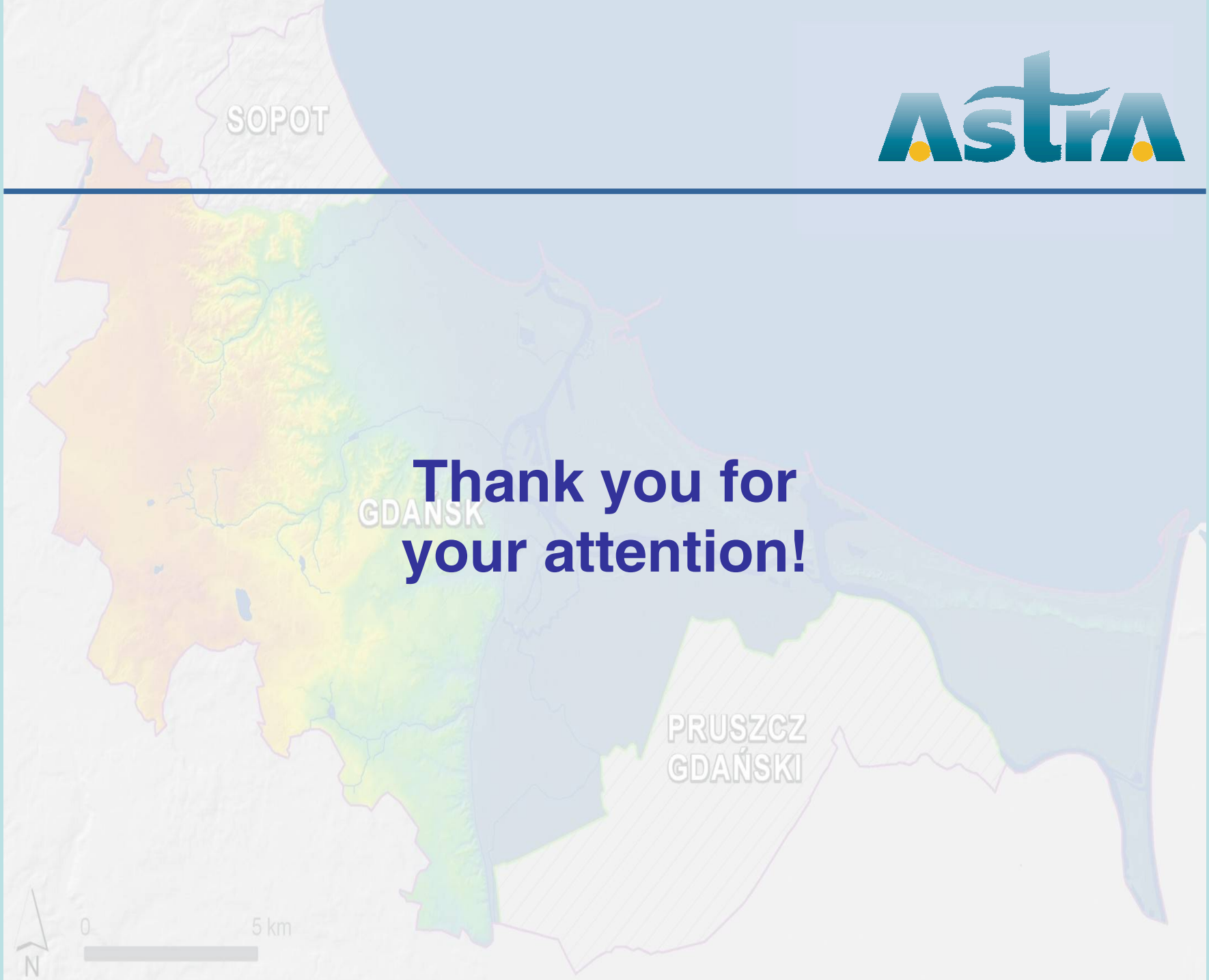


Baltic Arena stadium
EURO 2012





http://www.e2012.gdansk.gda.pl/artykuly.php?nr=4



Thank you for your attention!