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GIS Platform for Orange Poland

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Agenda

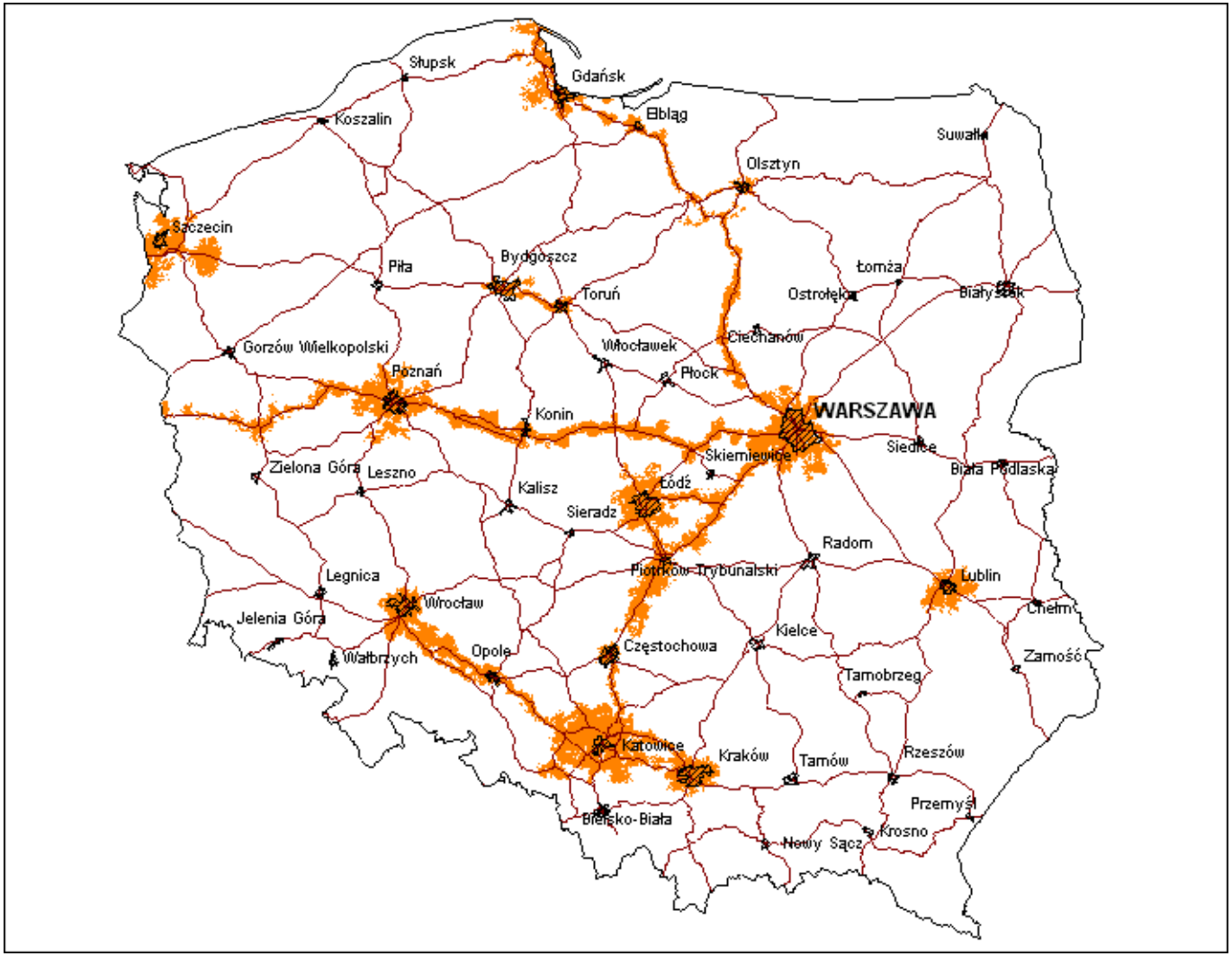
- Orange Poland Network History – now and before
- GIS Database – acquisition and verification, ArcGIS Server
- Cellular Network Planning – ArcGIS Desktop
- Network Optimization and Managing – data access and presentation through ArcGIS Server (GLOBUS application)

Orange Network History

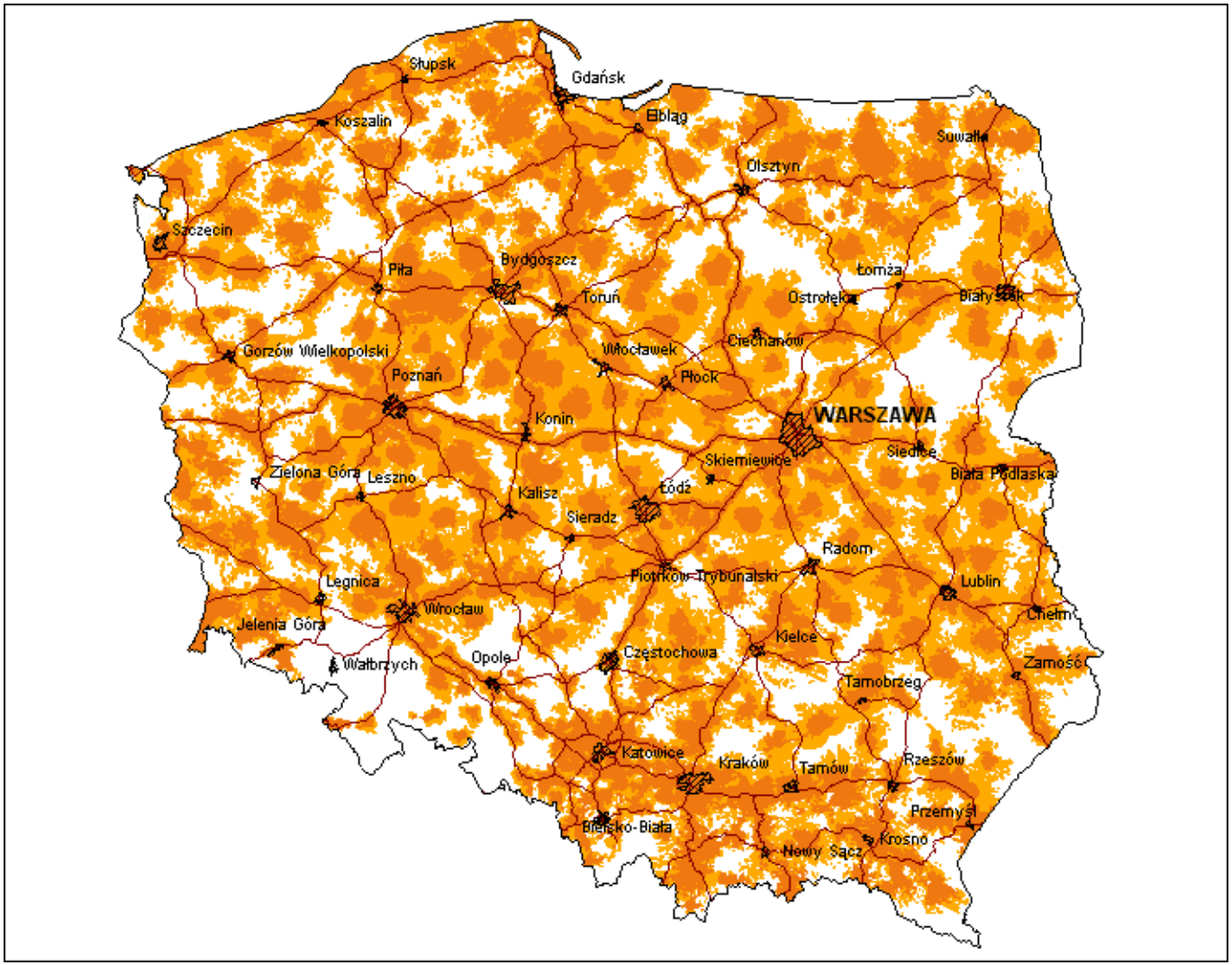
Orange Network History

- March 1st 1998 – Idea network launched
  - One band only – GSM 1800
- March 1st 2000 – dual band network GSM 900/1800
- Nowadays – 2G and 3G network
- Internet access through:
  - GPRS, EDGE, UMTS, HSDPA
  - CDMA – the biggest area coverage in Poland

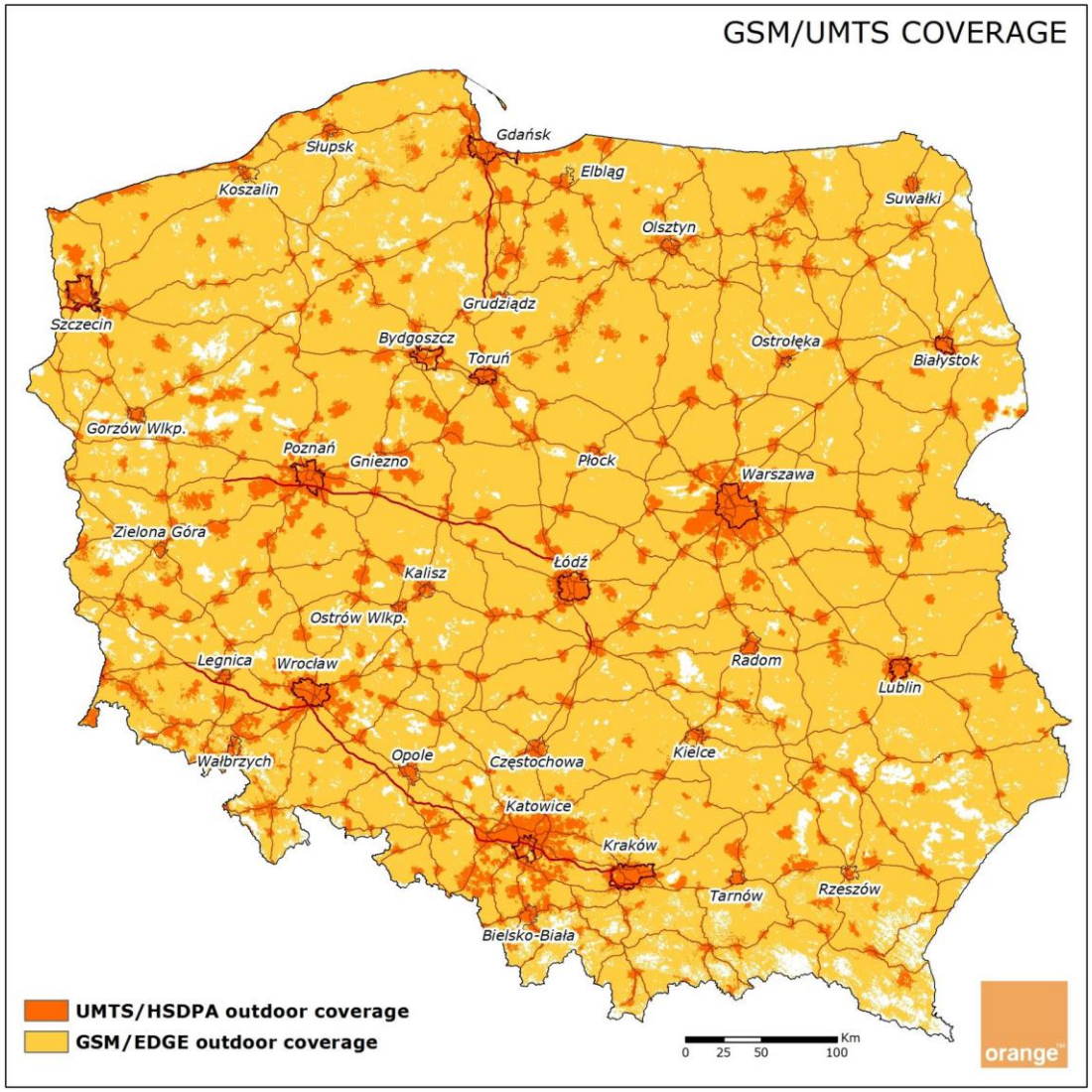
Coverage for February 2000



Coverage for March 2000



GSM / UMTS Actual Coverage



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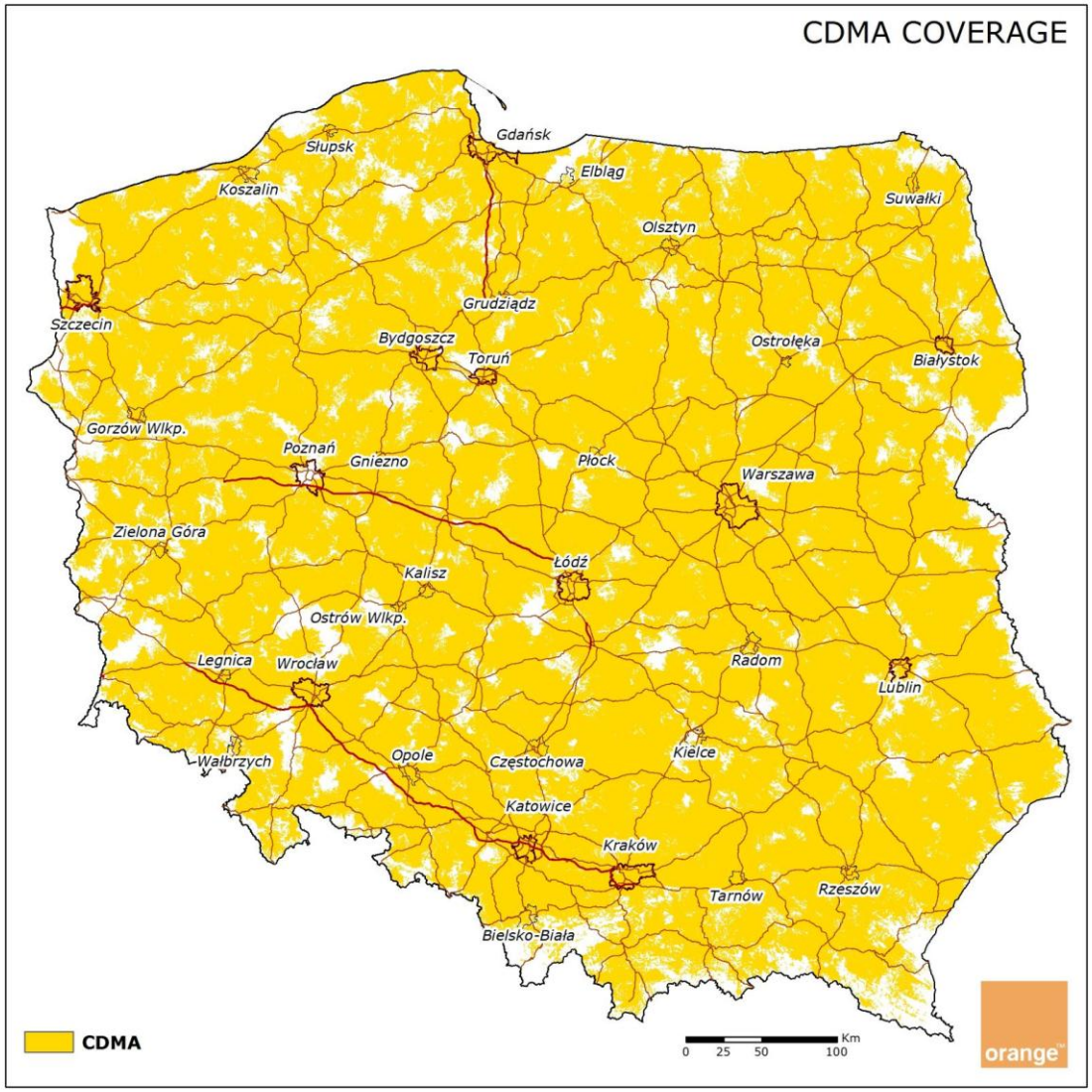
CDMA Actual Coverage



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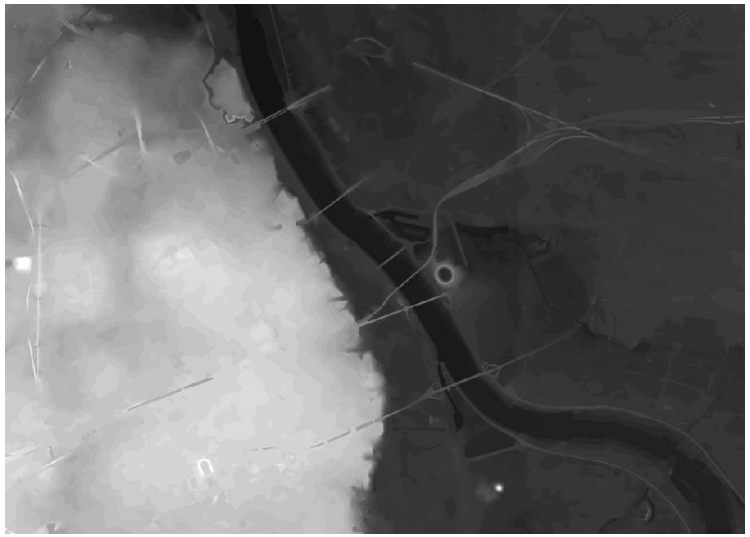
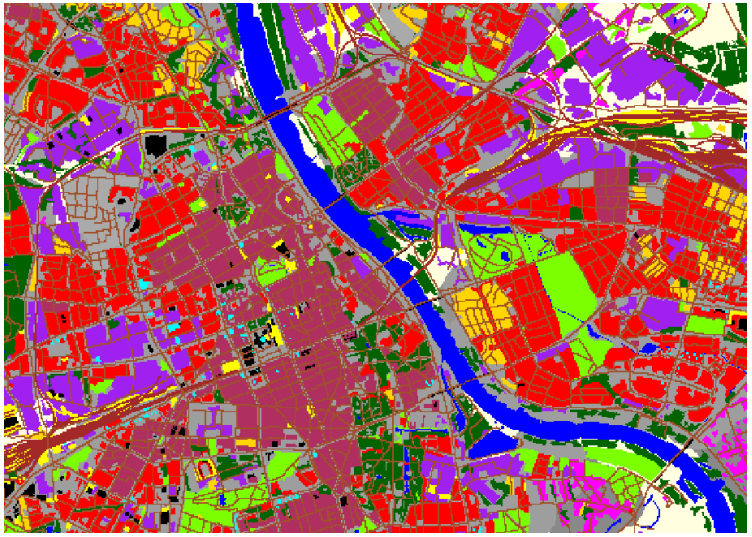
GIS Database

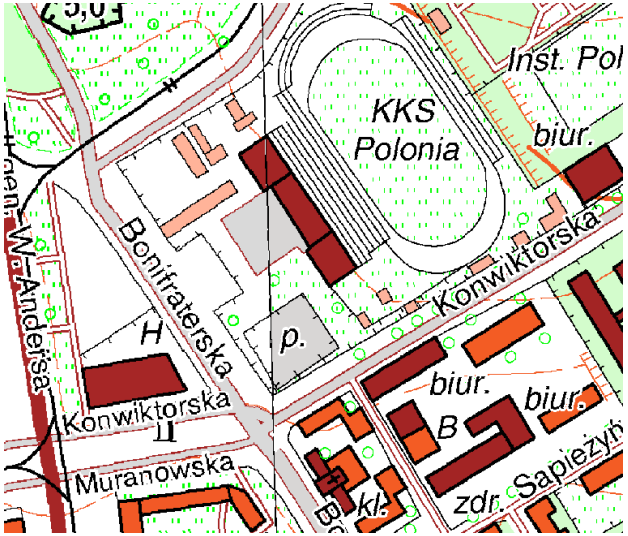
Spatial Data for Network Planning

- Clutter map
- Digital Terrain Model / Digital Elevation Model
- Vector city plans
- 2.5D buildings models
- Roads and railways
- Ortophotomaps
- Administrative borders
- Hydrography, forestry, touristics areas
- Scanned topographic maps

Spatial Data - Rasters

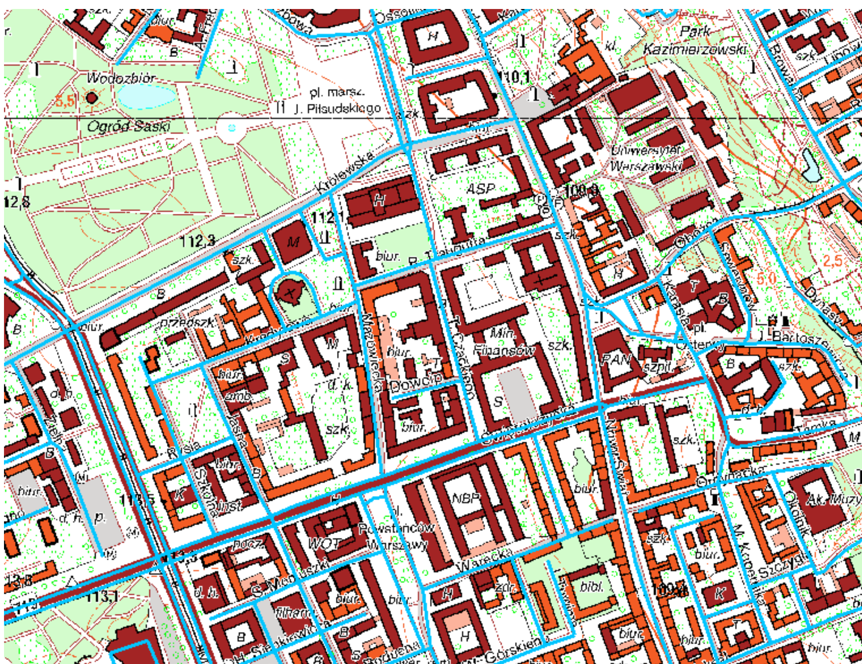






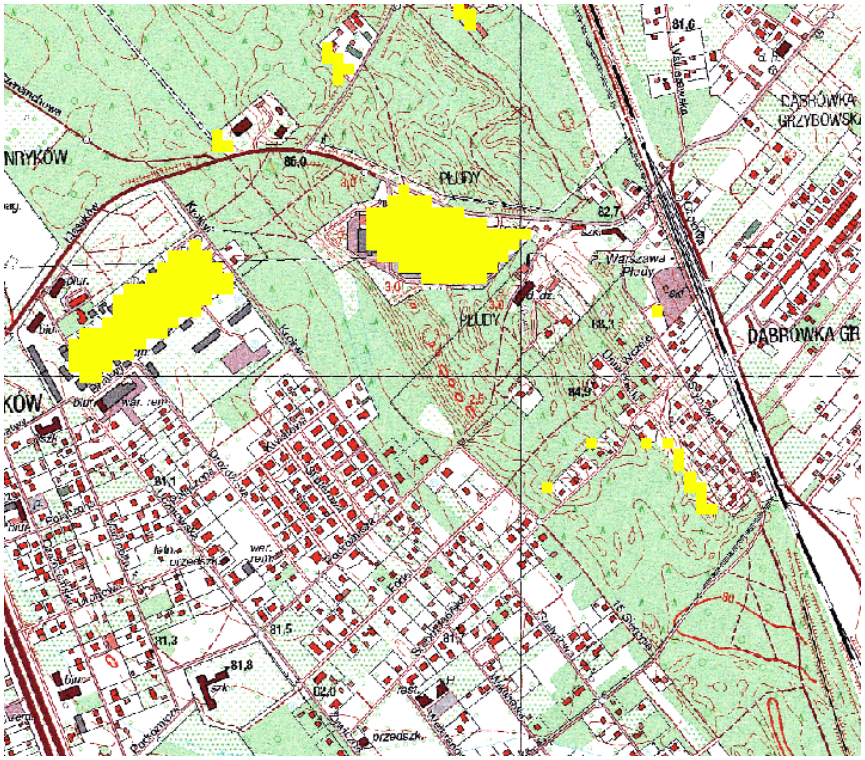
Data Verification

- Comparing with existing, accurate data i.e. road network with GPS measurements or with topographic background



Data Verification

- Implementing topology rules for vector data – ArcInfo, geodatabase
- Using Map Algebra included in Spatial Analyst extension for change detection analysis



GIS Database – ArcGIS Server

- 70% speed increase of data access
  - SDE Raster Catalog – all topographic maps available in the market 1:10k, 50k, 100k
  - Geometry indexing – spatial index
- Releasing significant data space in regional servers
- Data access through spatial views
- Integration with a relational Orange network elements database
  - Presentation of all network elements that have spatial coordinates acquired

Cellular Network Planning

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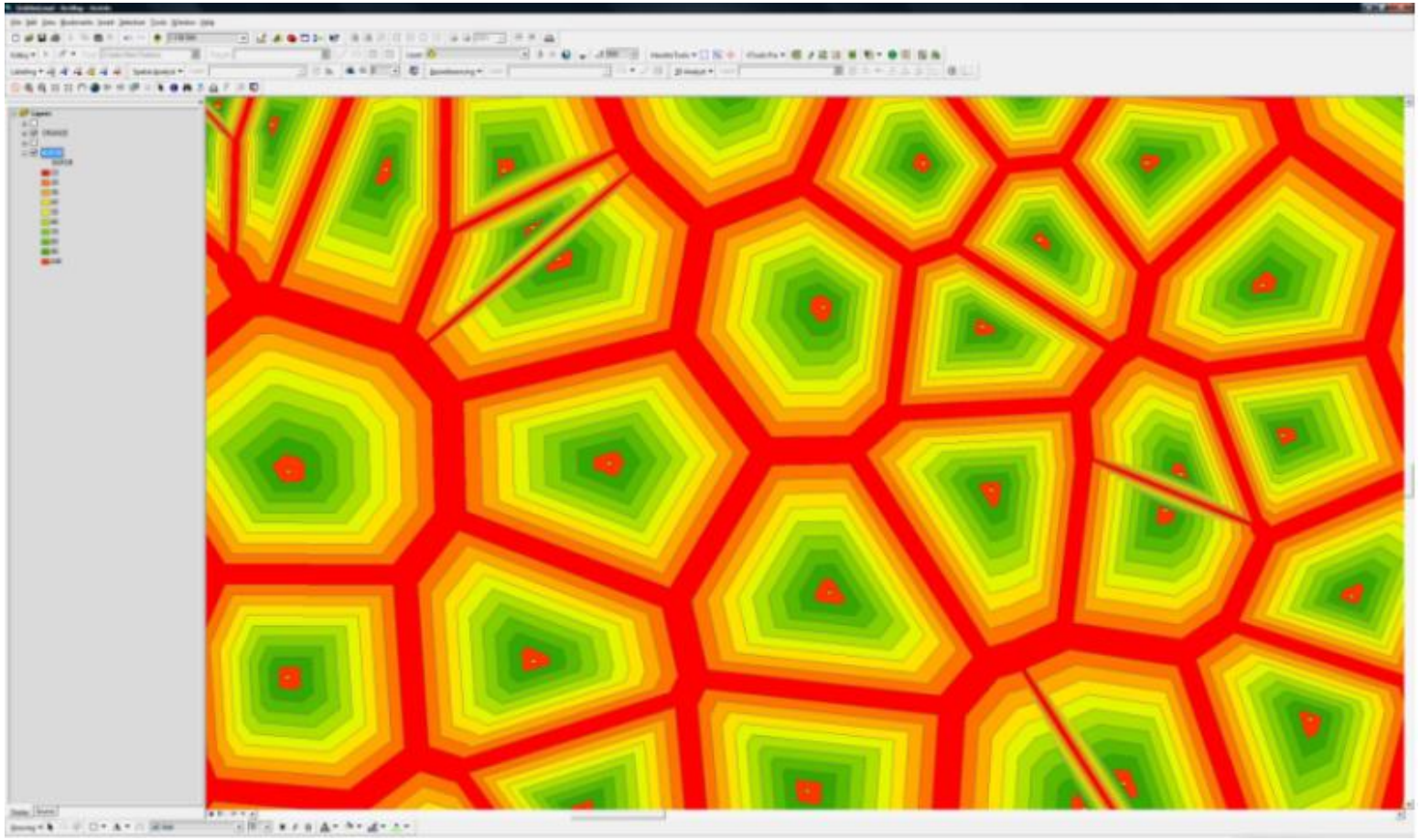
Cellular Network Planning

- Taking advantage of spatial database thanks to analysis and functions included in ArcInfo and its extensions
- Geoprocessing models – realization of geomarketing assumptions
- Choosing the best location of base station – suitable income for a company guaranteed

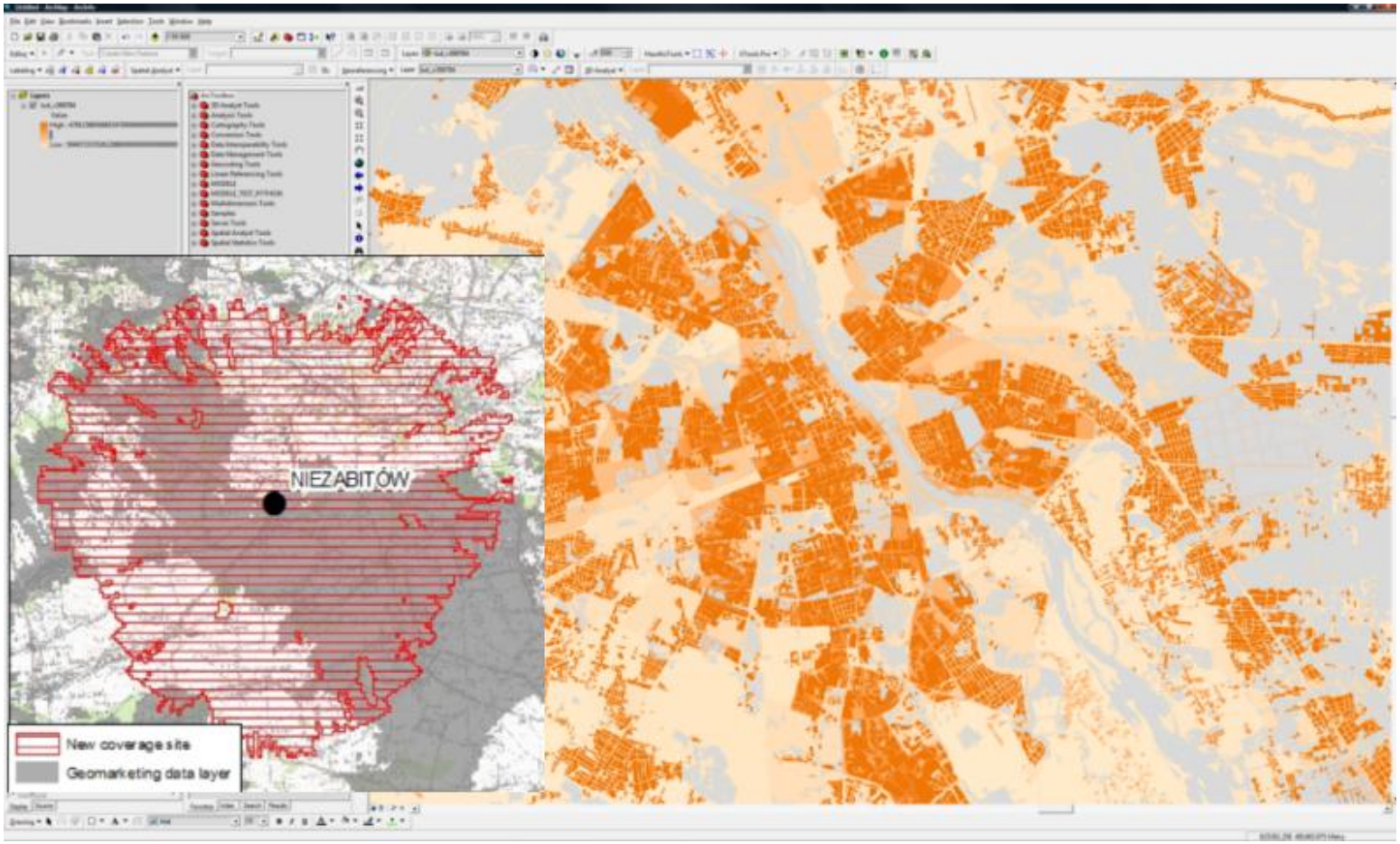
Cellular Network Planning

- Voronoi buffers



Cellular Network Planning

- Optimizing base station location – map of marketing potential



GLOBUS Application

GLOBUS

- WWW application– VB.NET, JavaScript, ArcGIS Server, Microsoft Windows Server
- Network elements visualization on any background map
- Objects fast search
- Querying network coverage
- Verification of network rollout plans
- Statistics visualization and retrieving

GLOBUS

- Cache layers – optimum data presentation, basemap layers
- Access personalization – user accounts management through Oracle database
  - User profiles responsible for a site context
- Geocoder – geocoding addresses

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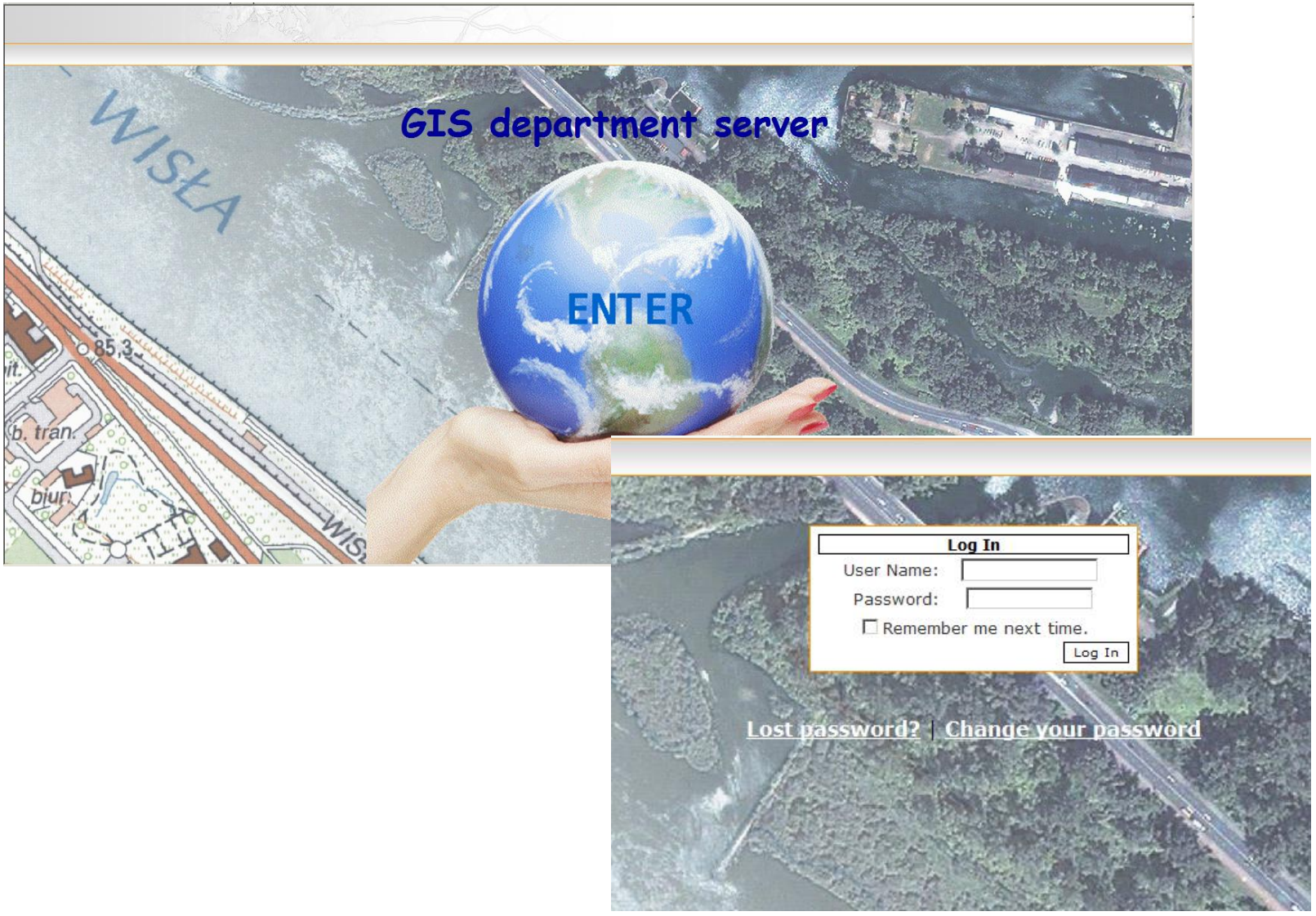
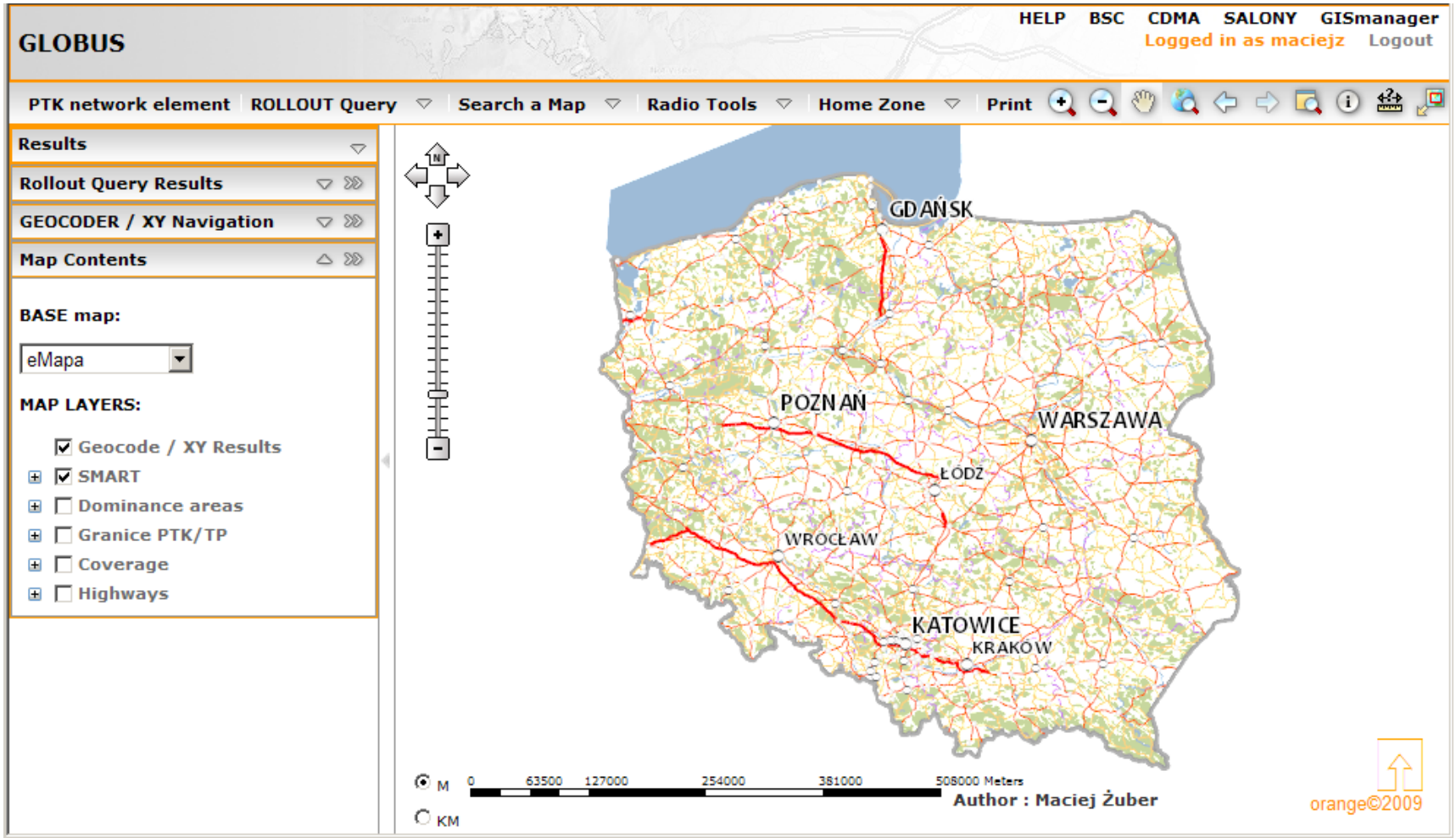
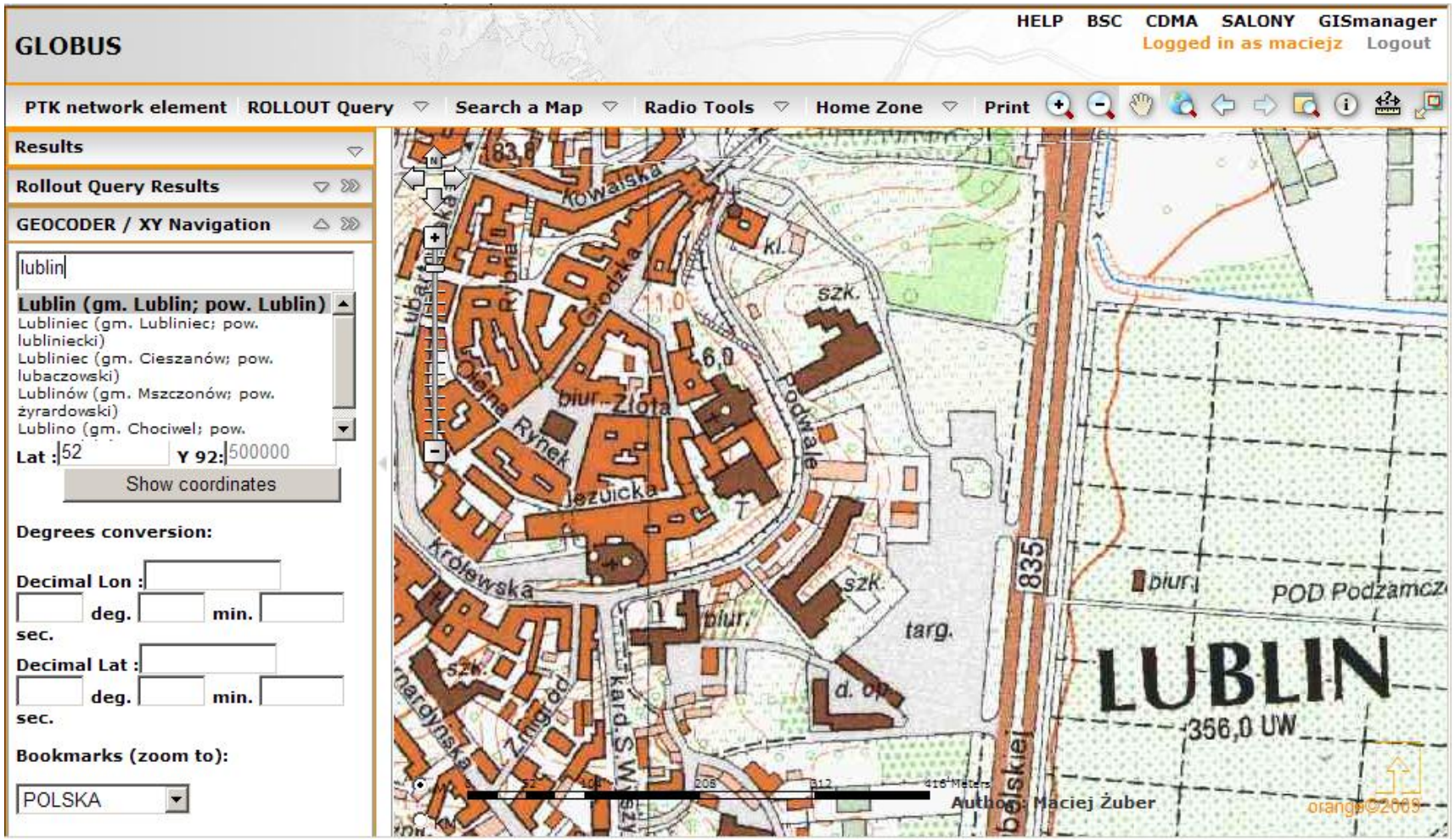
GLOBUS – Login Page



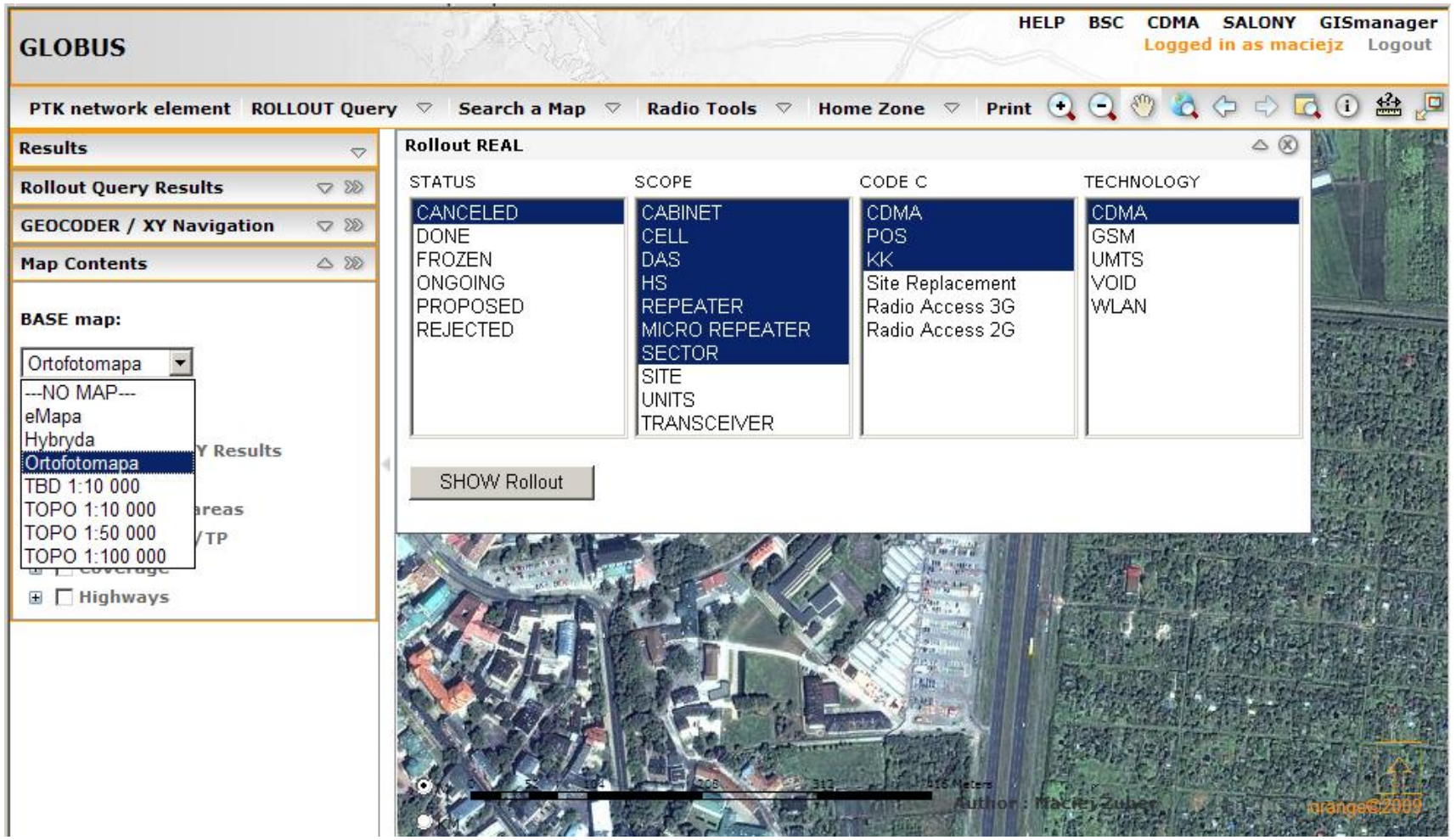
GLOBUS – Main Window



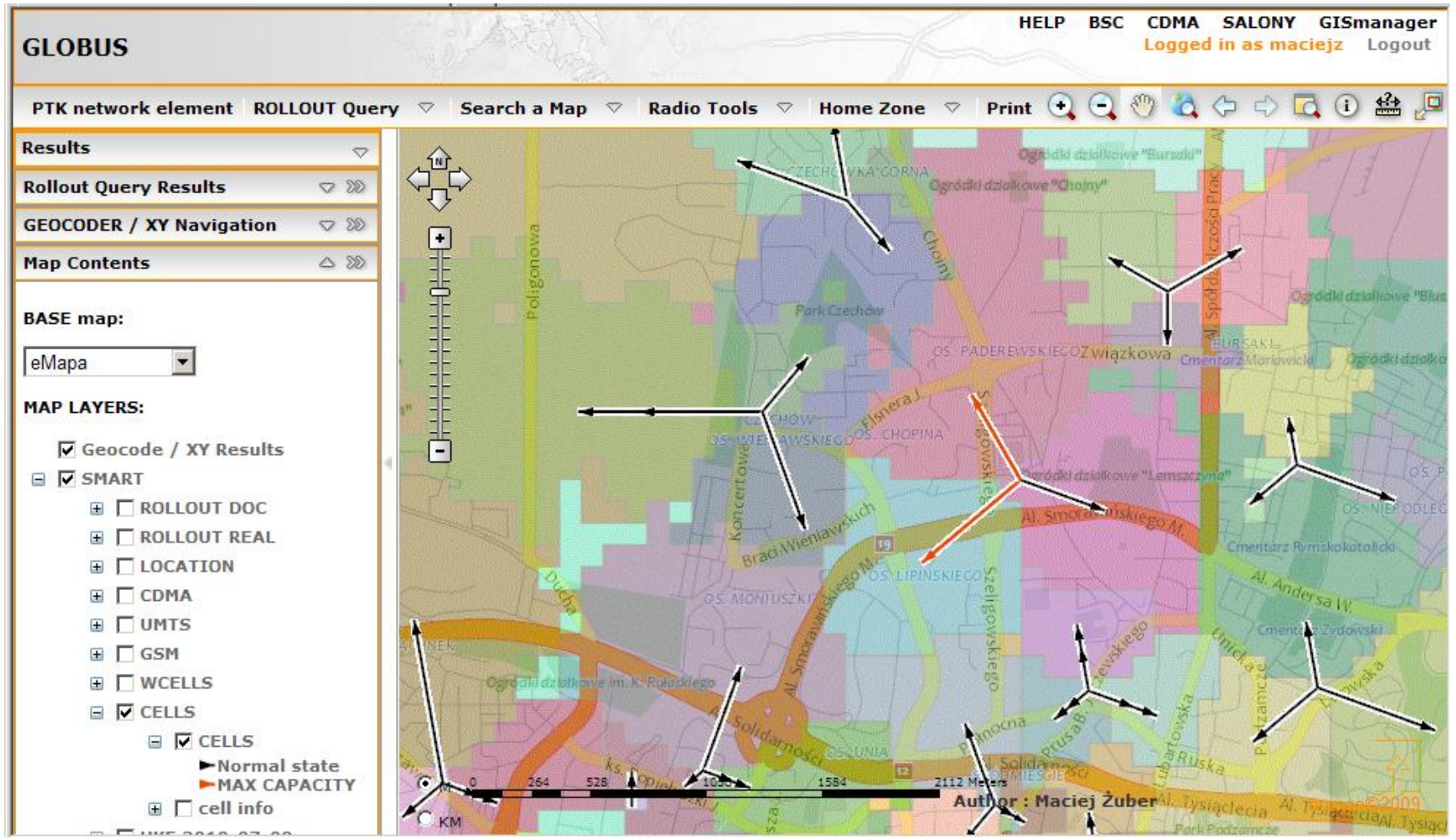
GLOBUS – Geocoder



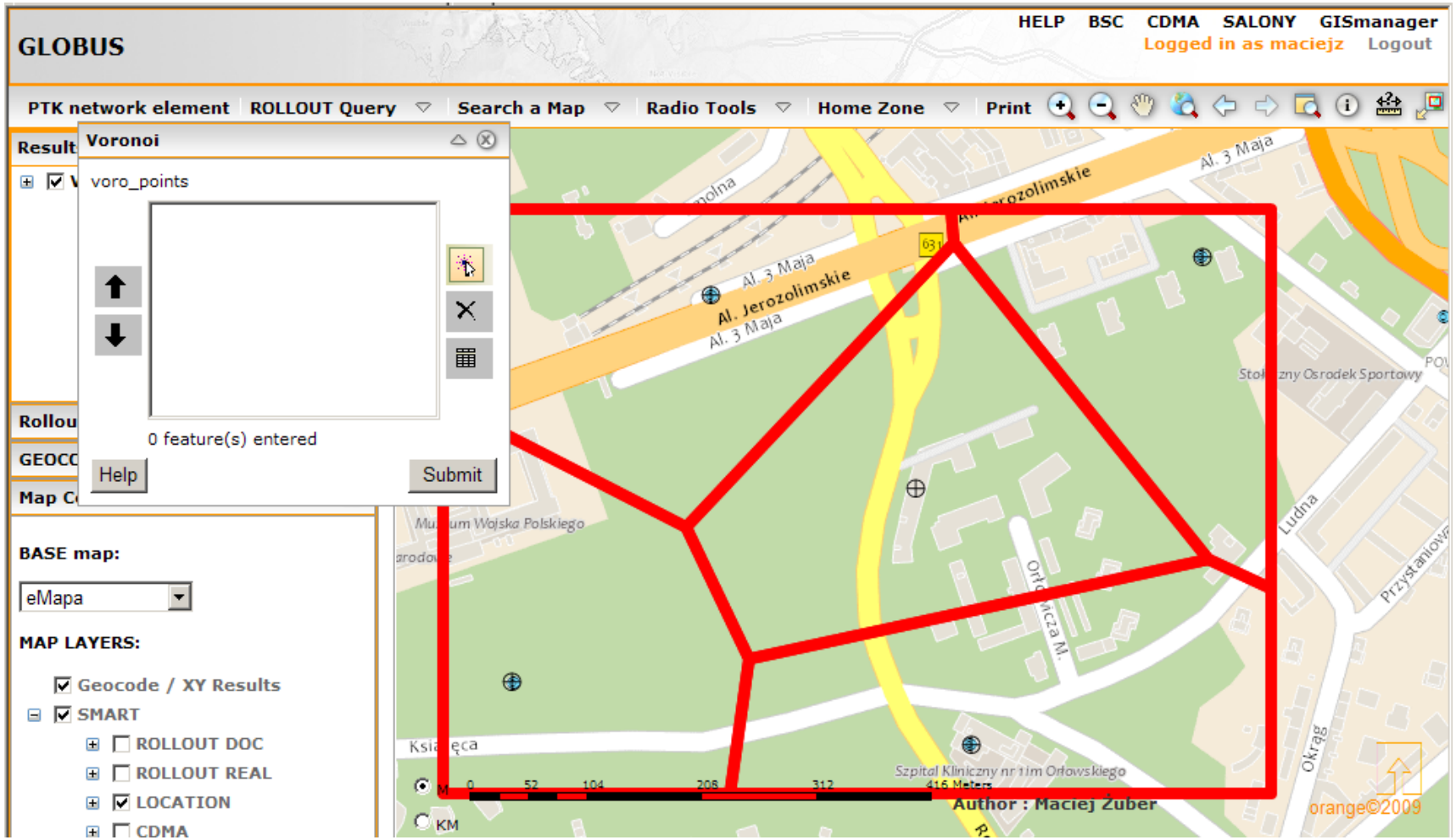
GLOBUS – Queries



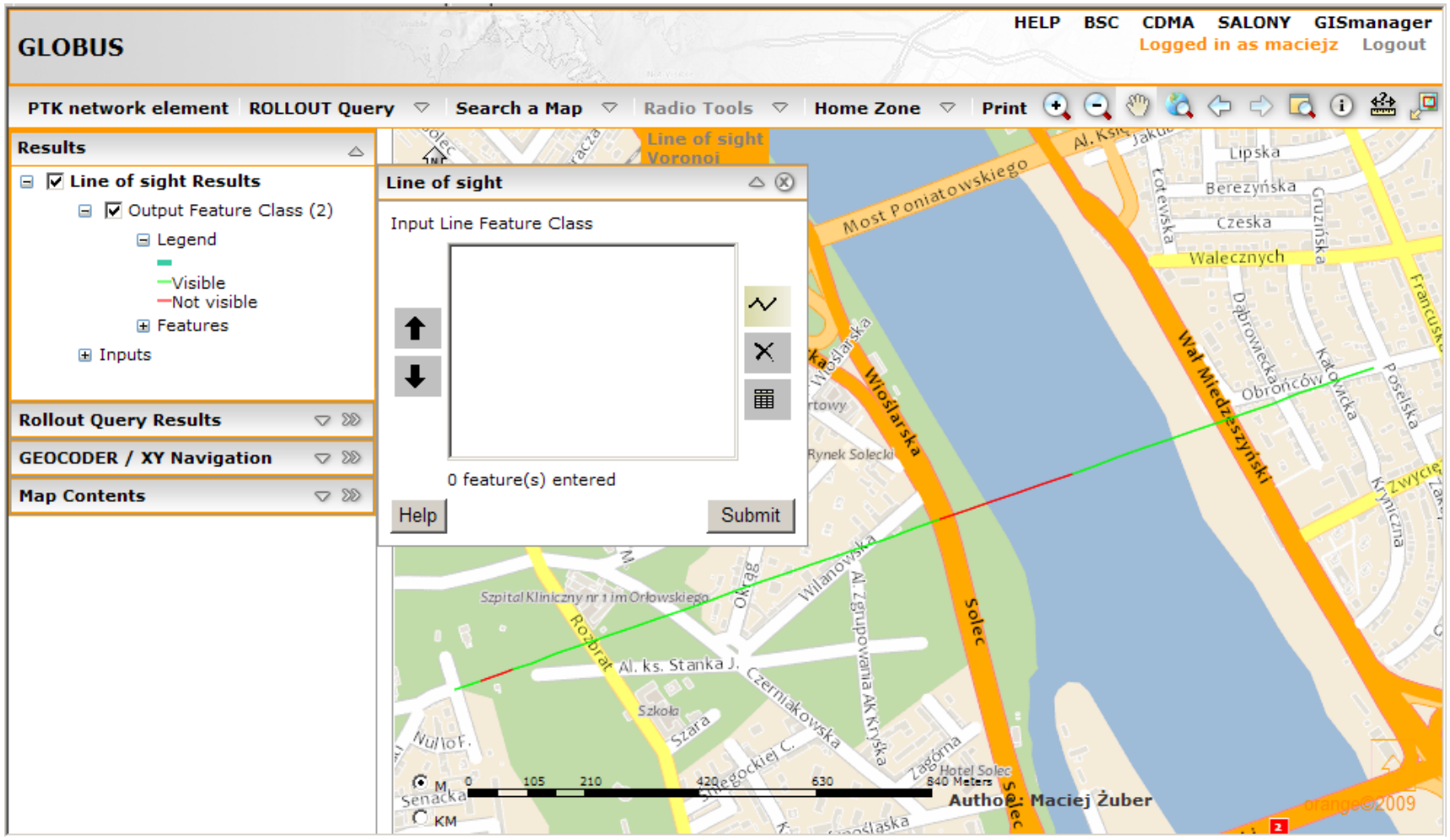
GLOBUS – Statistics



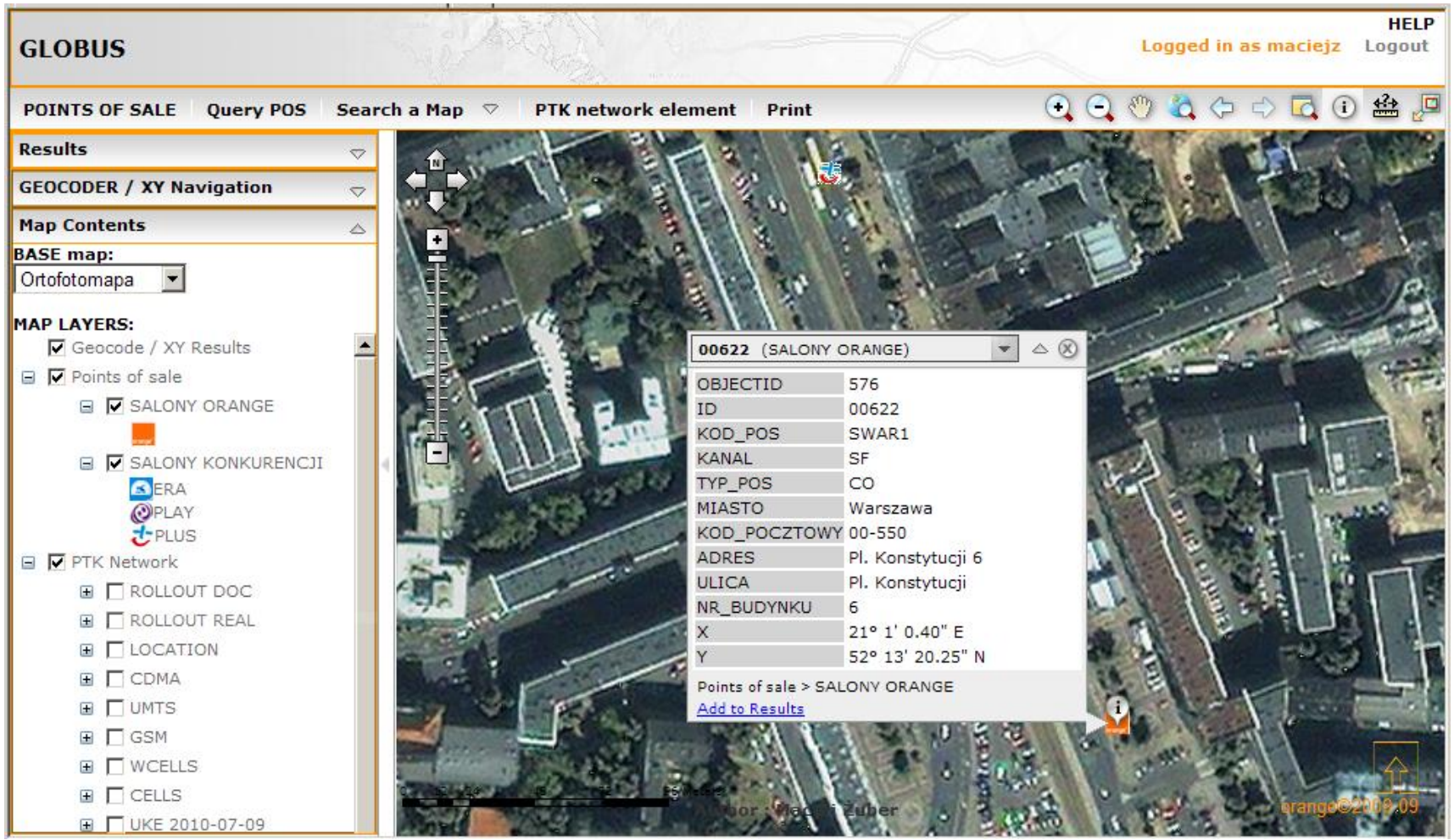
GLOBUS – Voronoi Diagram



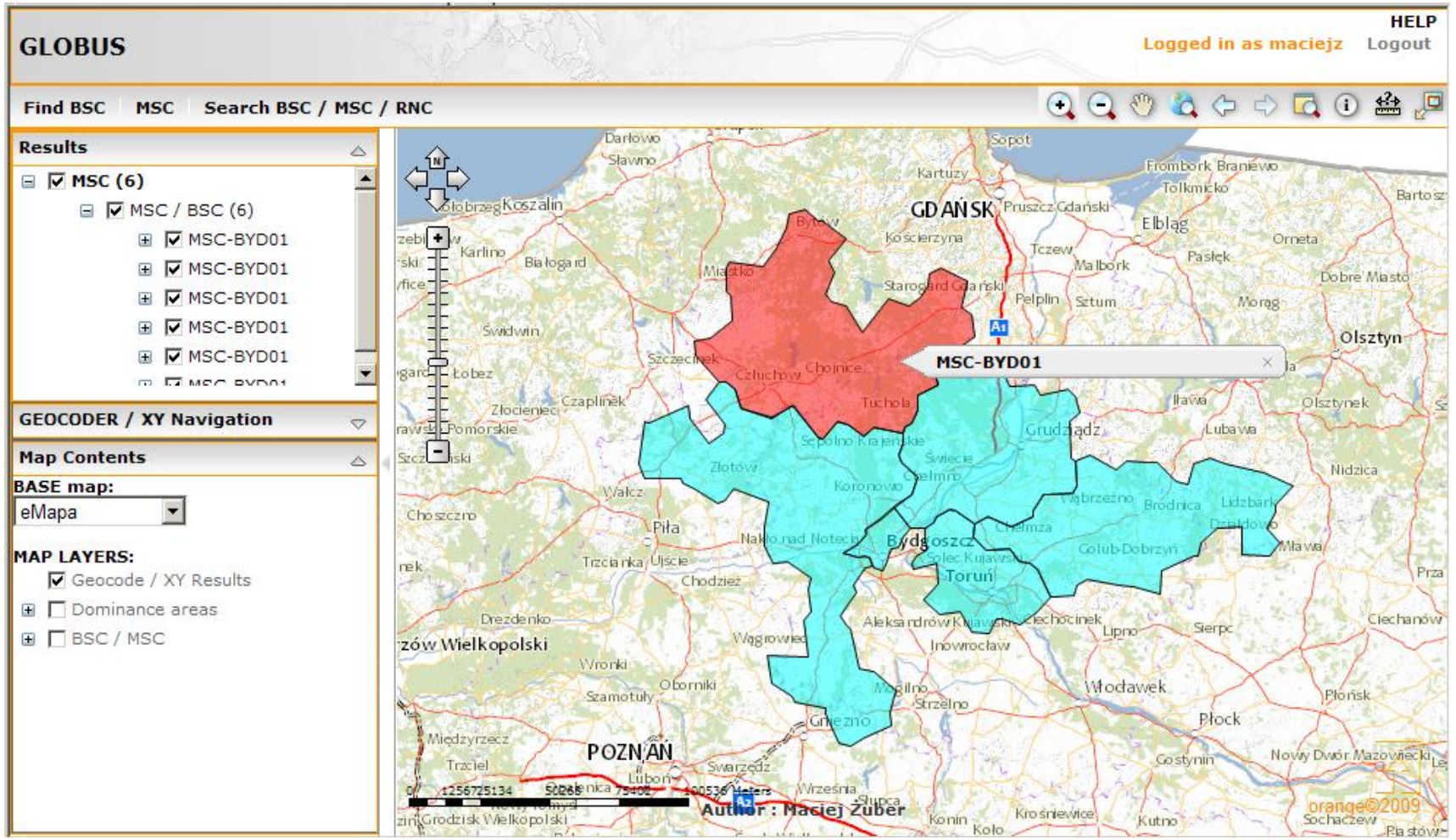
GLOBUS – Line of Sight



GLOBUS – Personalization



GLOBUS – Personalization



Summary

Summary

- ArcGIS Server is an efficient way of access to spatial data across all departments in the company.
- Reliable geographical data and ArcGIS capabilities = accurate network planning
- Processes automation = costs optimization
  - Budget control
  - Services development cyclical reporting

the future’s bright, the future’s Orange

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