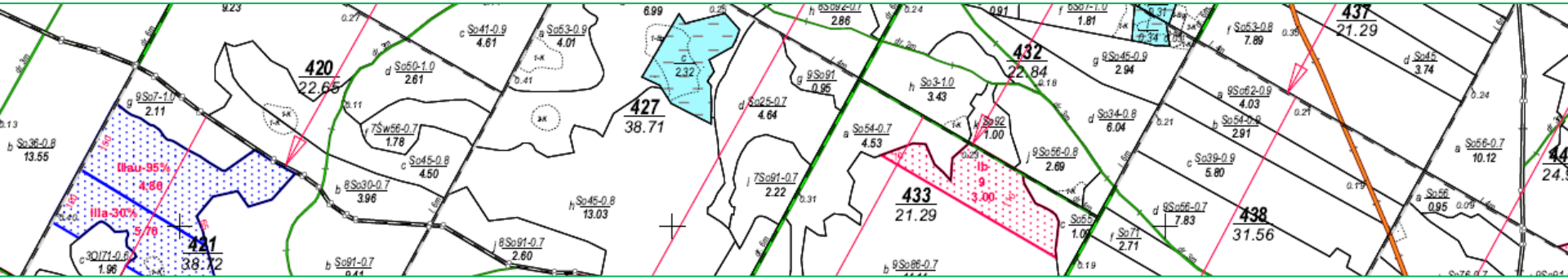


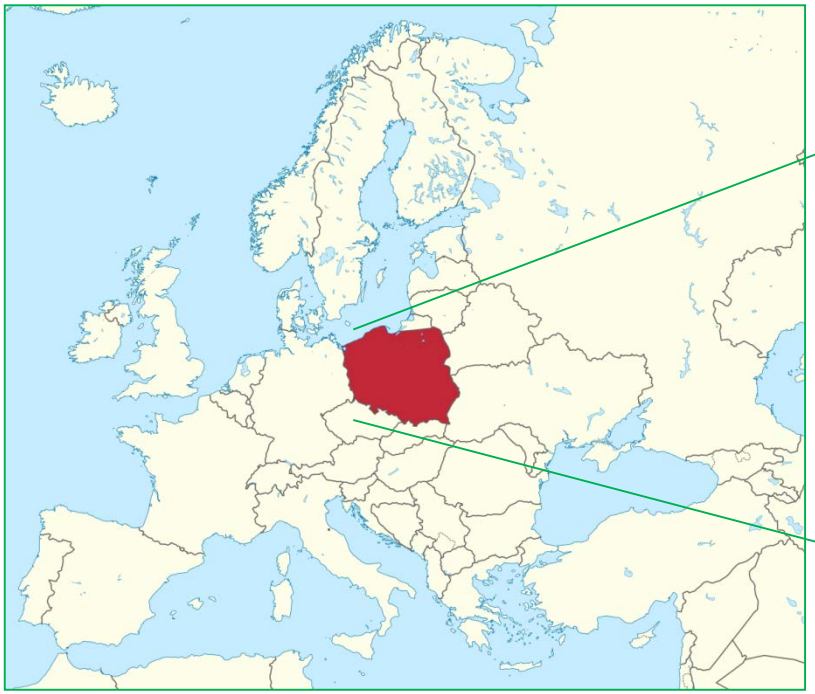
LEMAN - A Production Framework for Publishing Forestry Maps

Andrzej Talarczyk, Izabela Nalborczyk

Biuro Urządzania Lasu i Geodezji Leśnej

Forests in Poland

Poland: 312,679 km²



Forest area: 9.17 mil. ha,
forest cover: 29.4%

Bureau for Forest Management and Geodesy

Forest management planning

National Forest Inventory

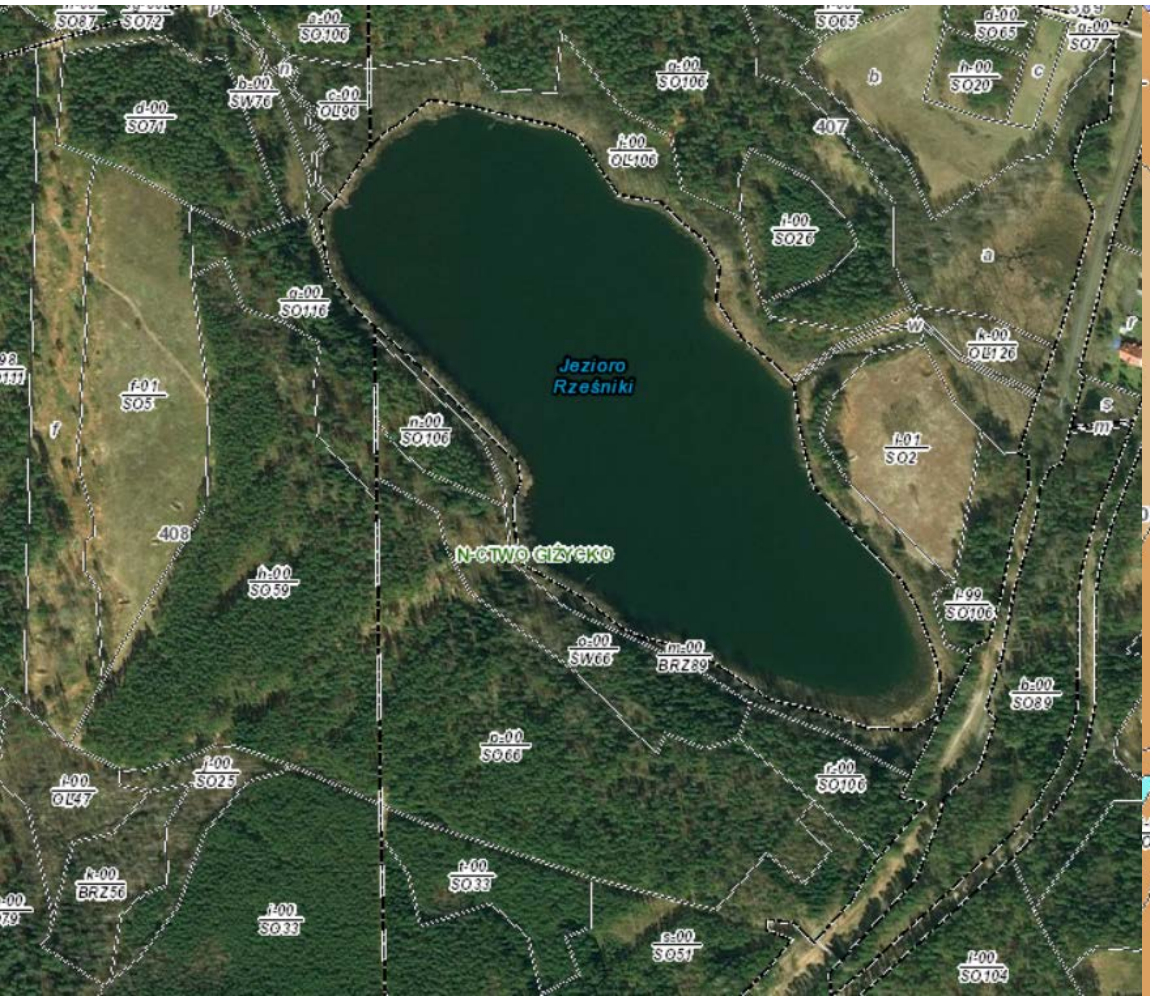
Bank Danych o Lasach

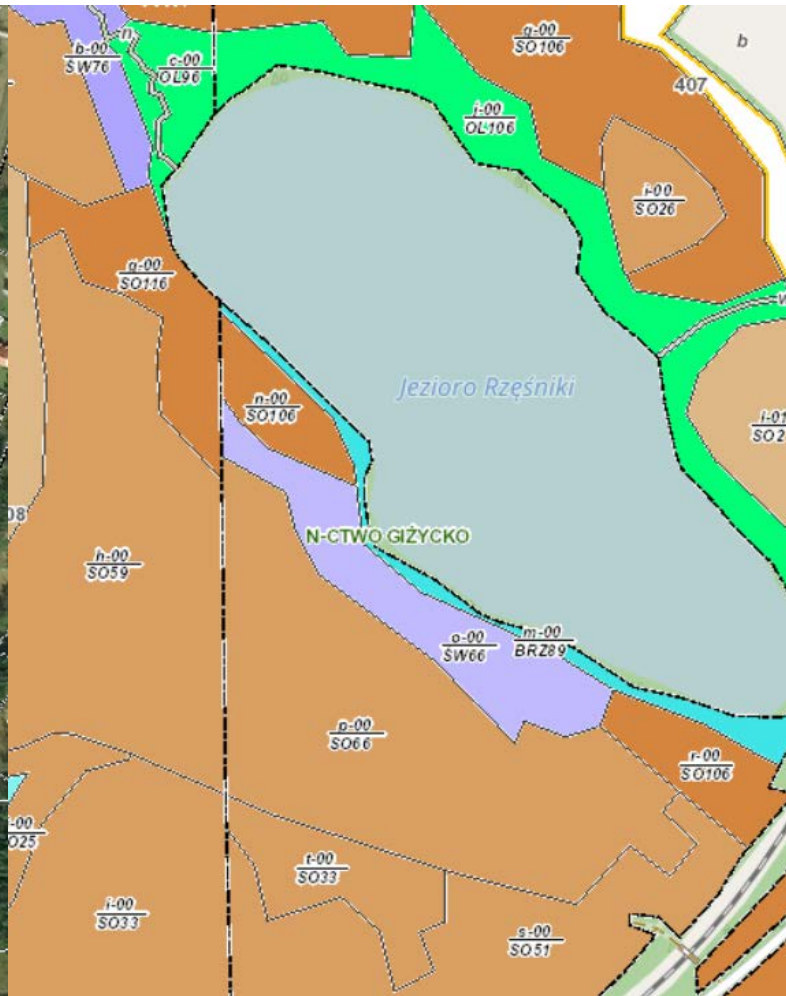
Forest Data Bank

Other tasks for the forest sector and environmental management

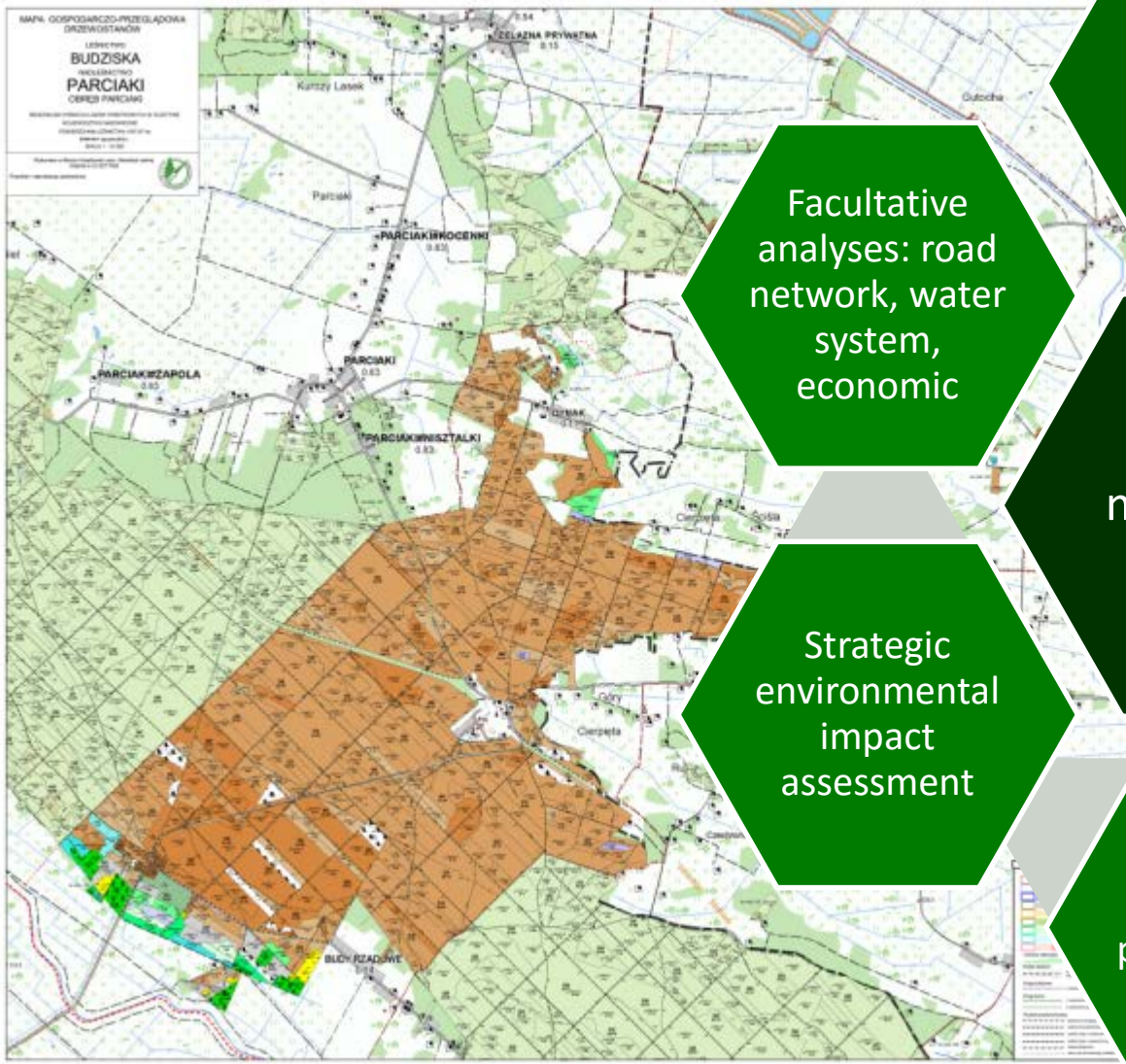
GIS in Polish forestry

Forestry was one of the first sectors of the economy in Poland to use GIS on a massive scale.





Forest management planning goals



General description

Facultative analyses: road network, water system, economic

Forest stand inventory and maps

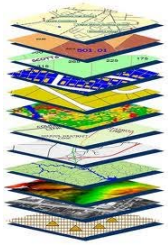
Forest management plan

Strategic environmental impact assessment

Management plans for a 10-year period (felligs, silviculture, forest protection, fire protection)

Nature protection plan

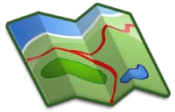
GIS-related products in Polish forest management planning



State Forests Information System

Data (geographic and descriptive)

Felling plan, nature conservation program, management guidelines

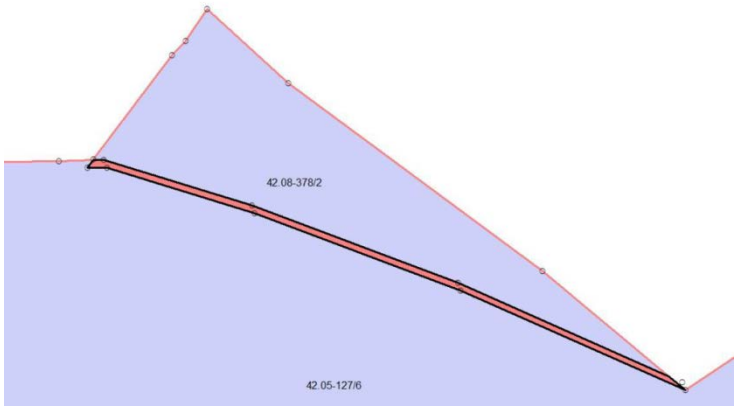


Maps

Inventory and planning → Operations

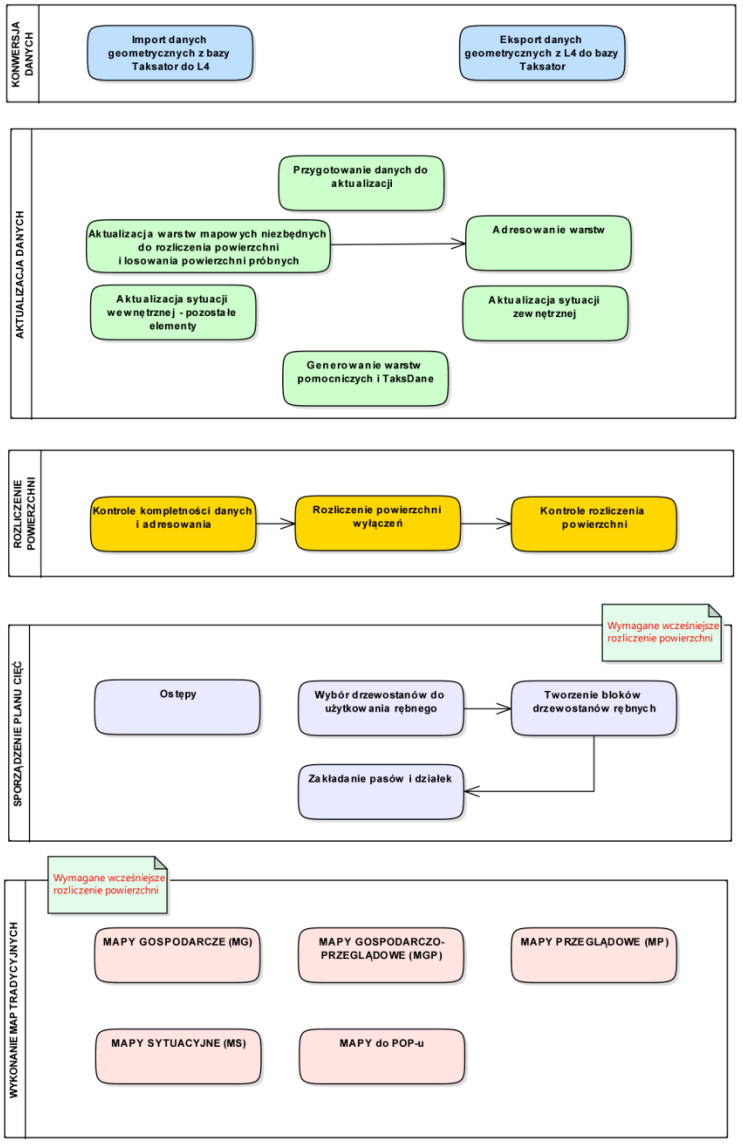
Motivation (business needs)

- **Automation of spatial data editing and cartographic production**
- **Paralel workflow of data gathering and GIS product preparation**
- **Product standardization**
- **Quality assurance**
- **Increased ergonomy**
- **External data quality checks**



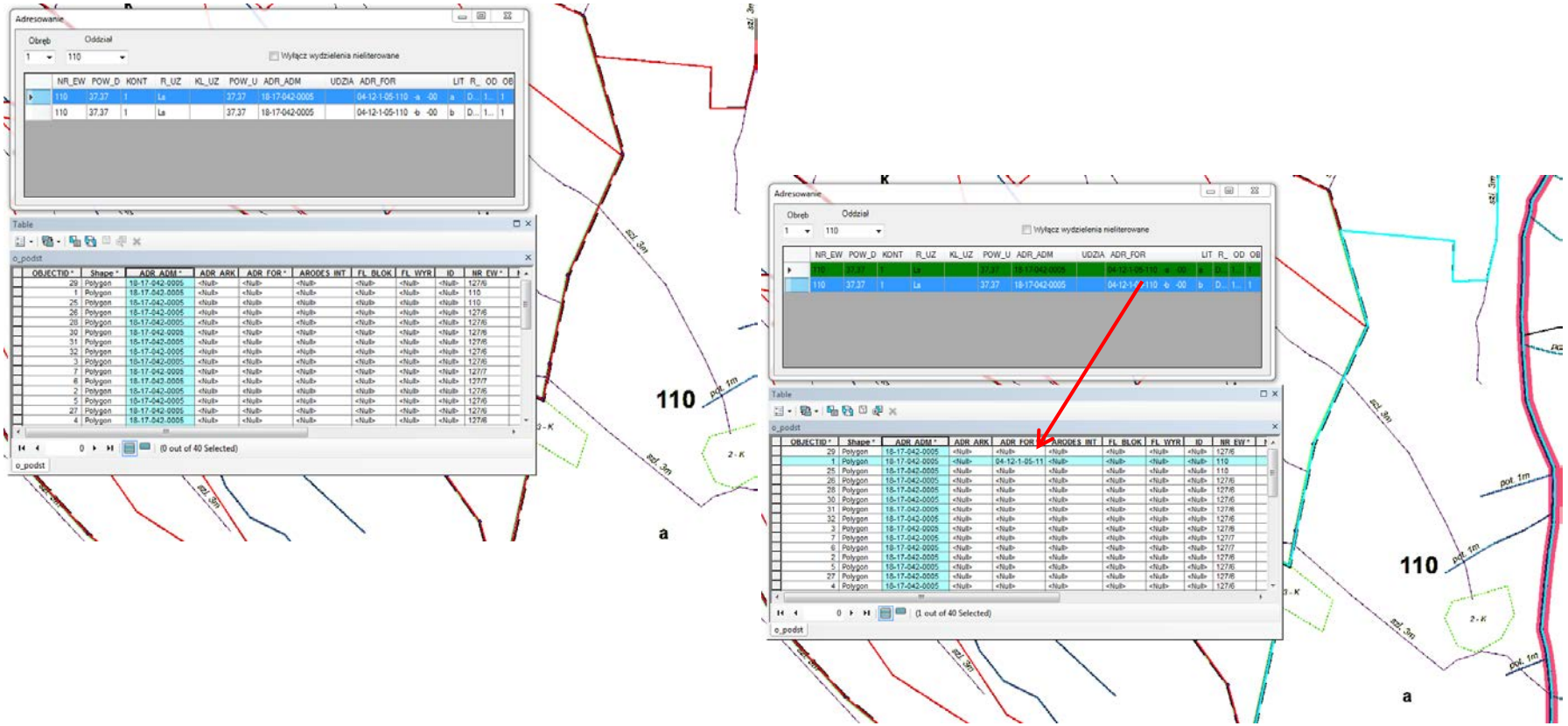
Typical workflow

- **Data conversion**
- **Data update**
- **Area size reconciliation**
- **Preparation of felling plan**
- **Preparation of cartographic products**



Spatial data editing

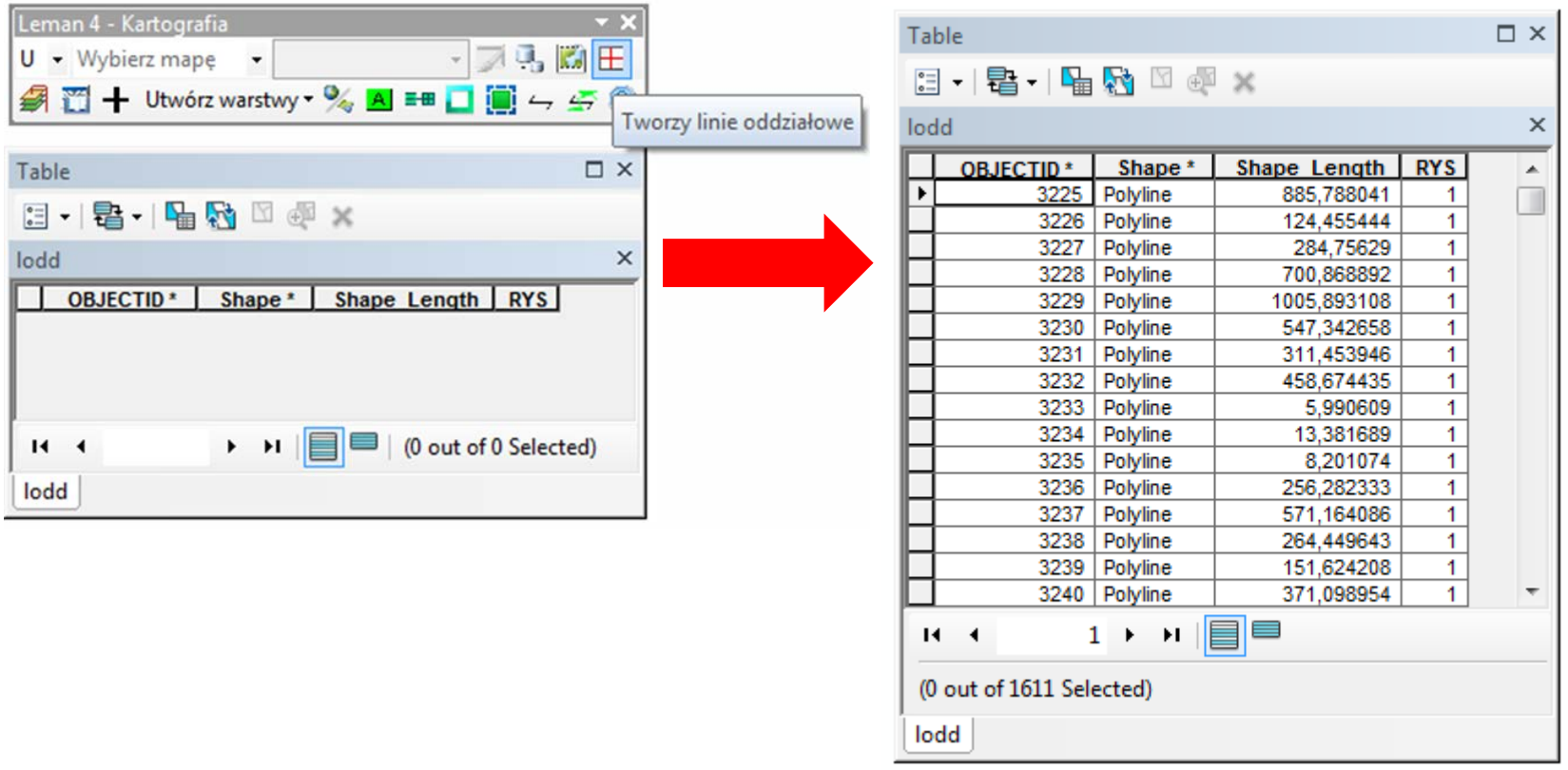
Tagging spatial objects with values from database



Spatial data editing

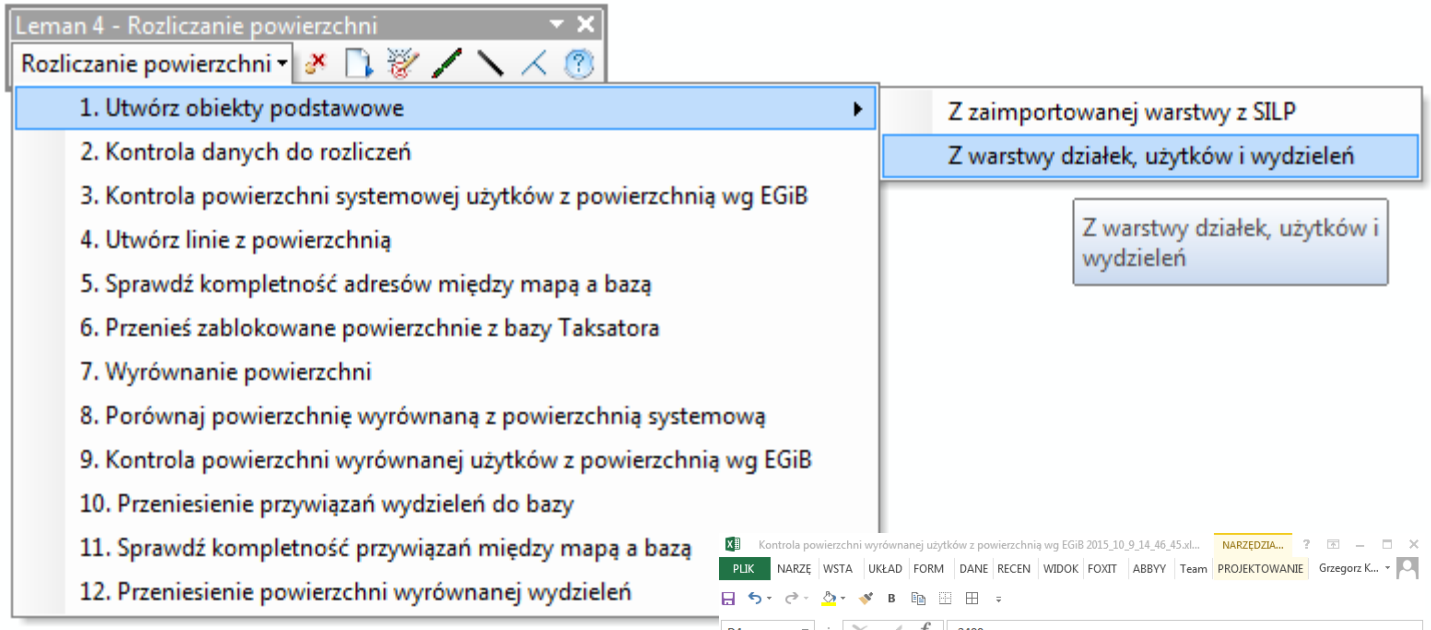
Automatic creation of child layers

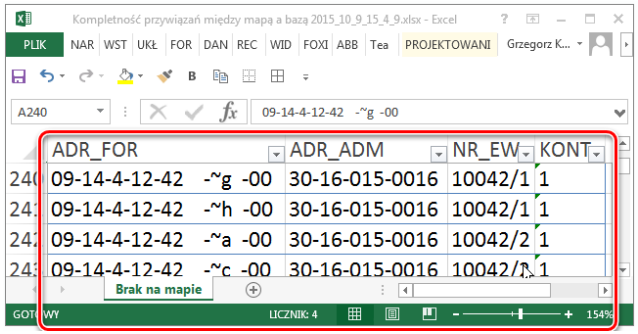
Keeping topological consistency between layers

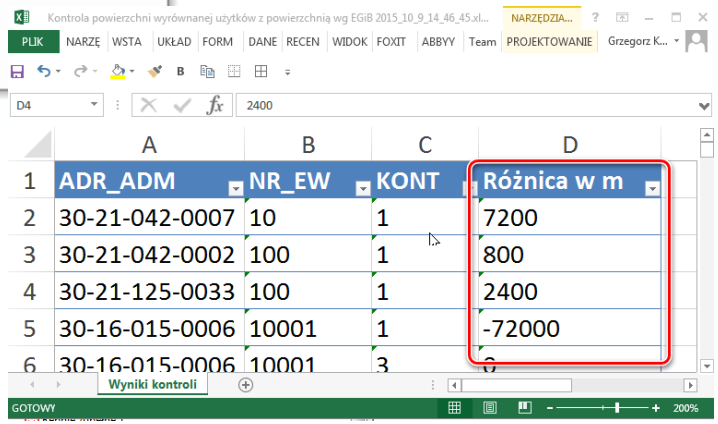


Analytical support – area reconciliation

Interface leads the user

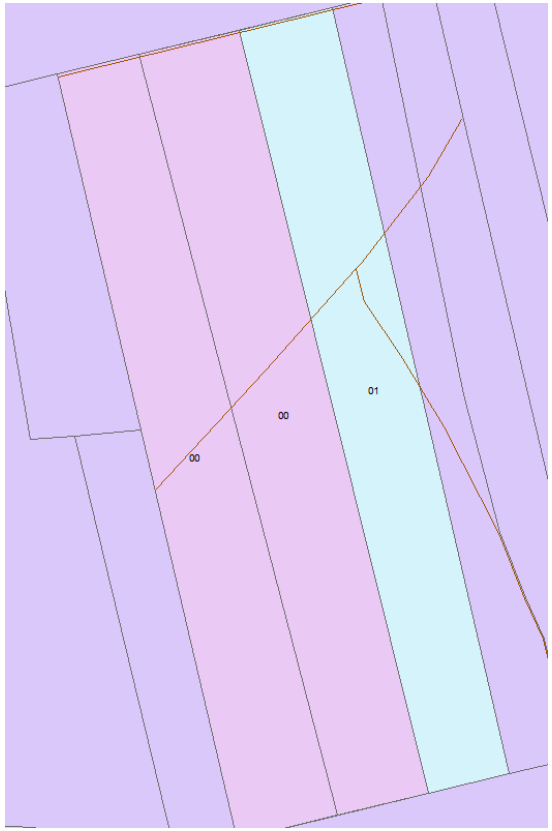


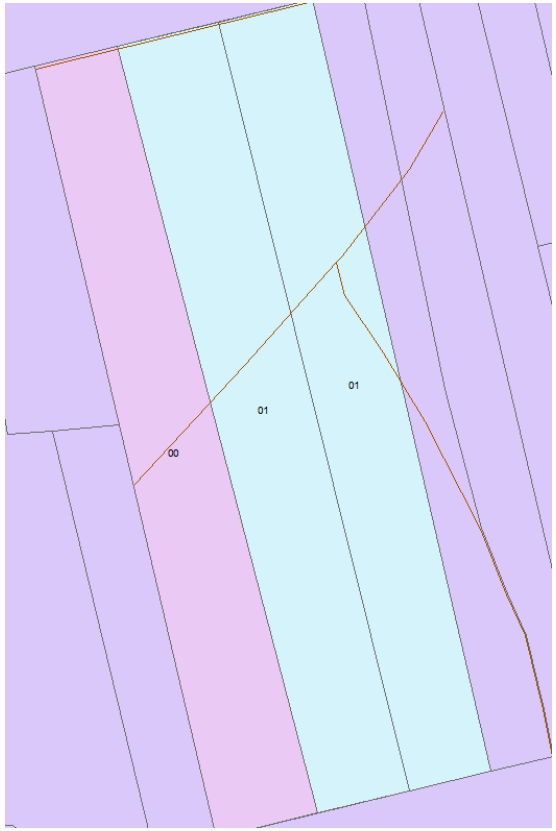


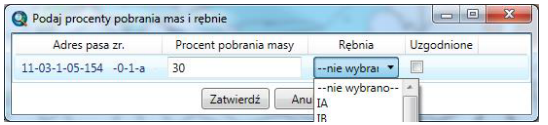


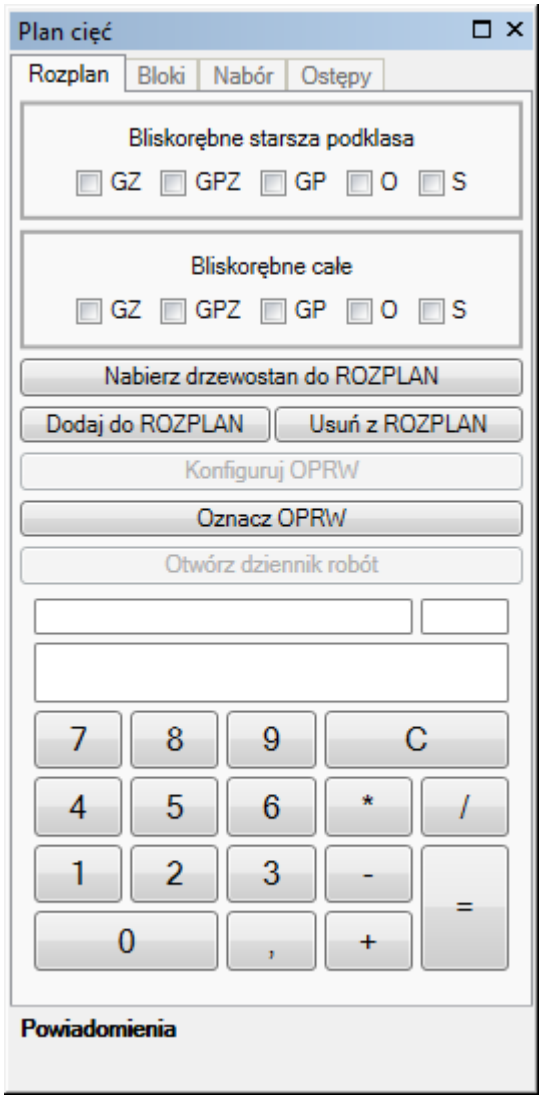
Analytical support – felling plans

Fellings plan



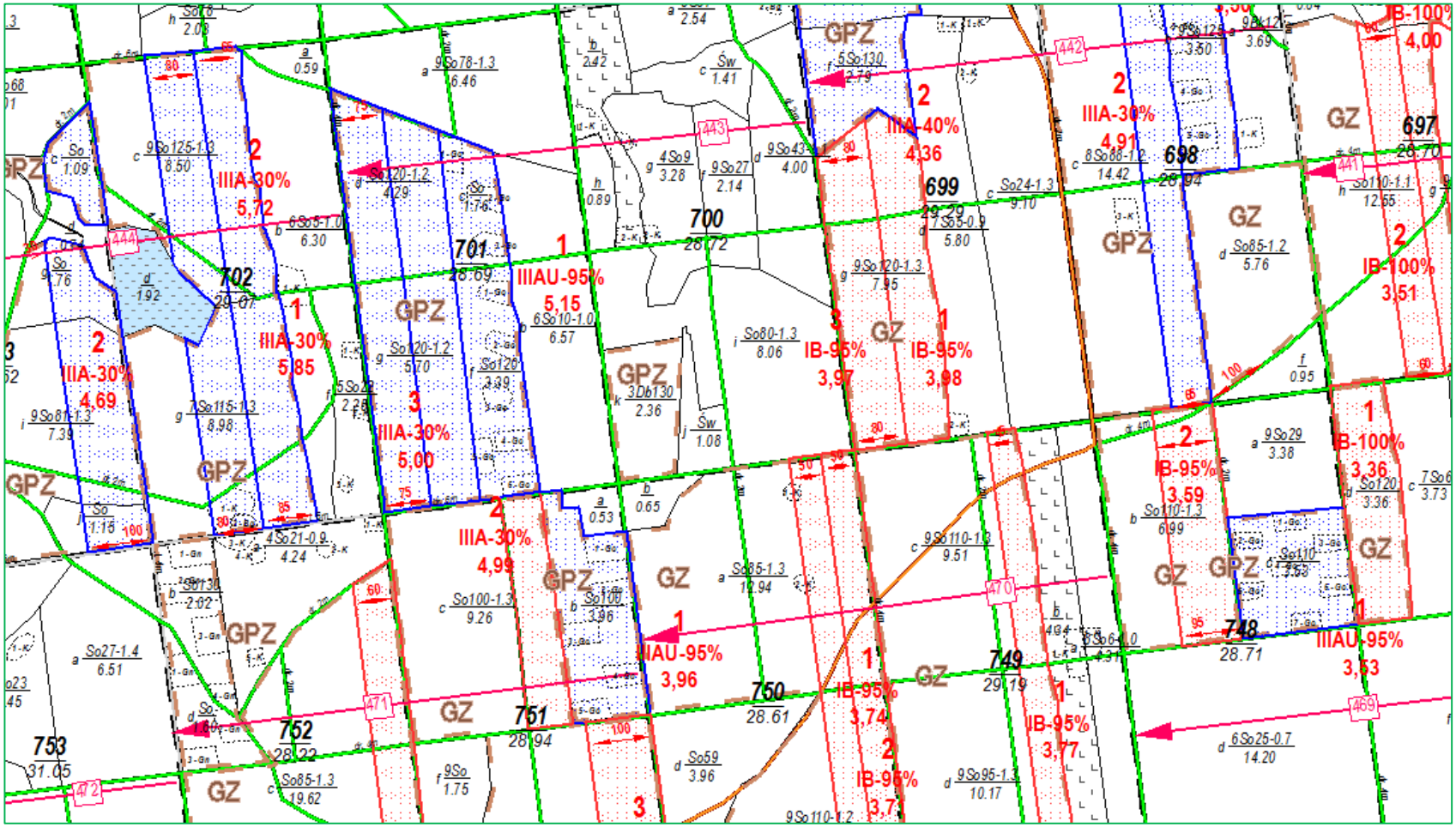






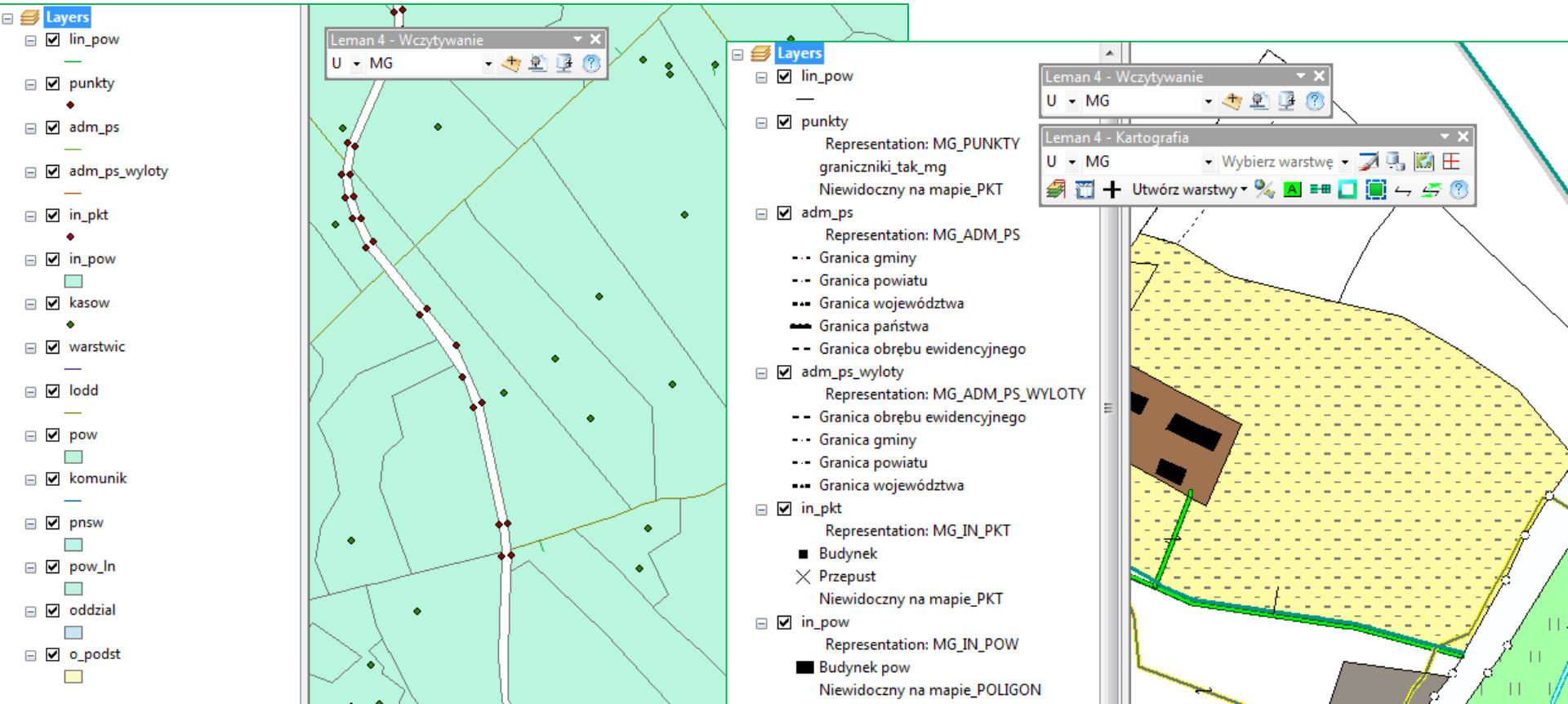
Analytical support – felling plans

Fellings plan



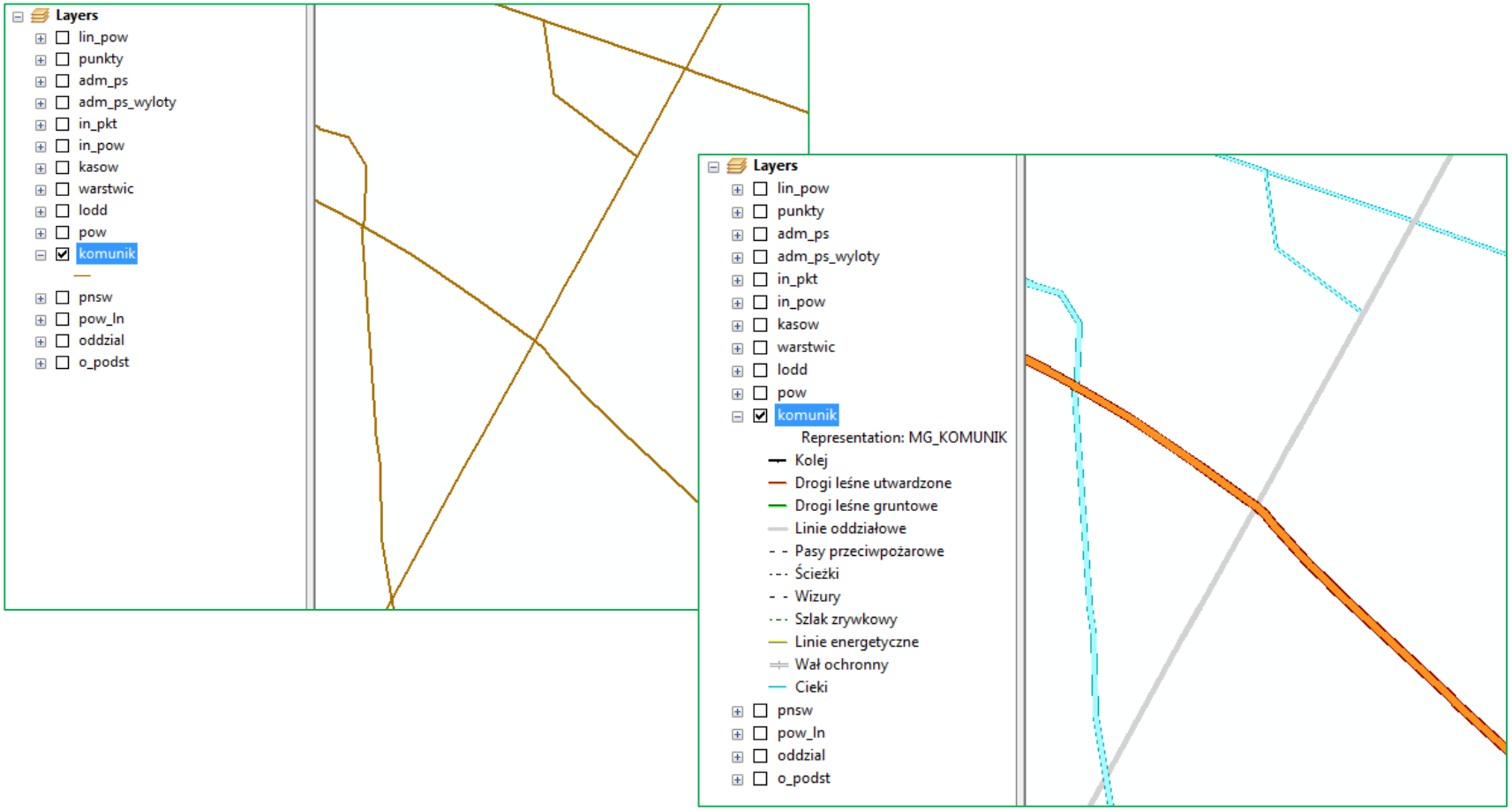
Cartography – symbols

- Cartographic representations
- Easy swapping of symbology variants
- Advanced symbolization techniques



Cartography – symbols

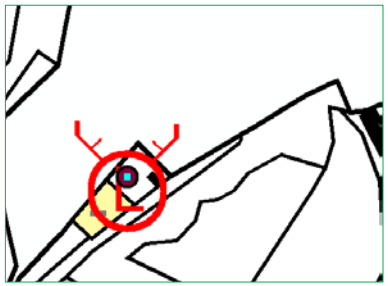
Example: communication

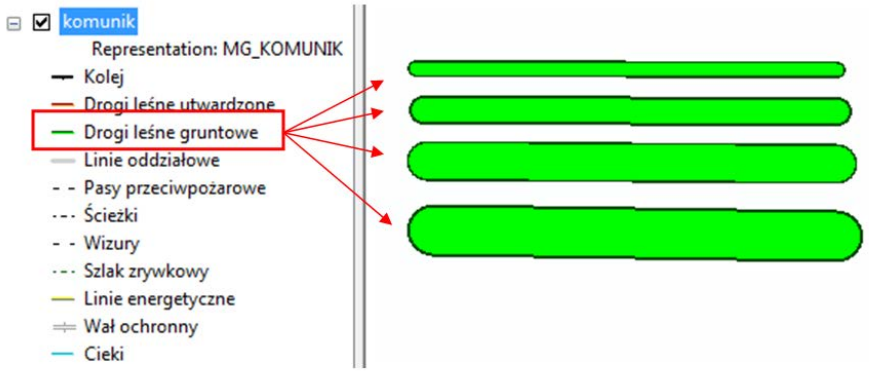


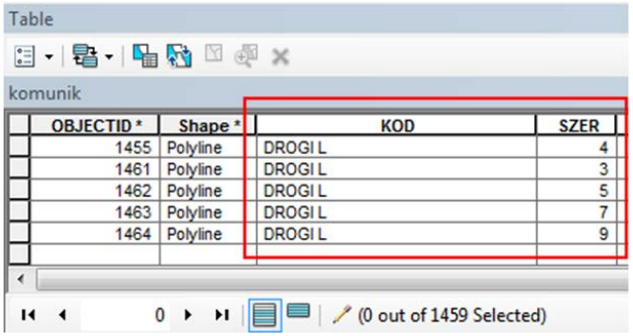
Cartography – symbols

Why cartographic representations?

- Advanced symbol placement and sizing
- Easy automated assignment of symbology to the whole map

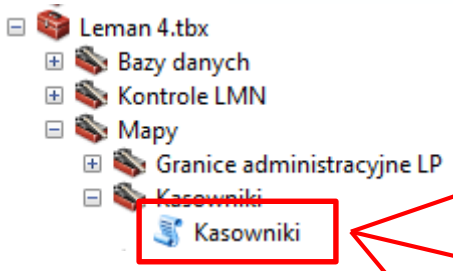


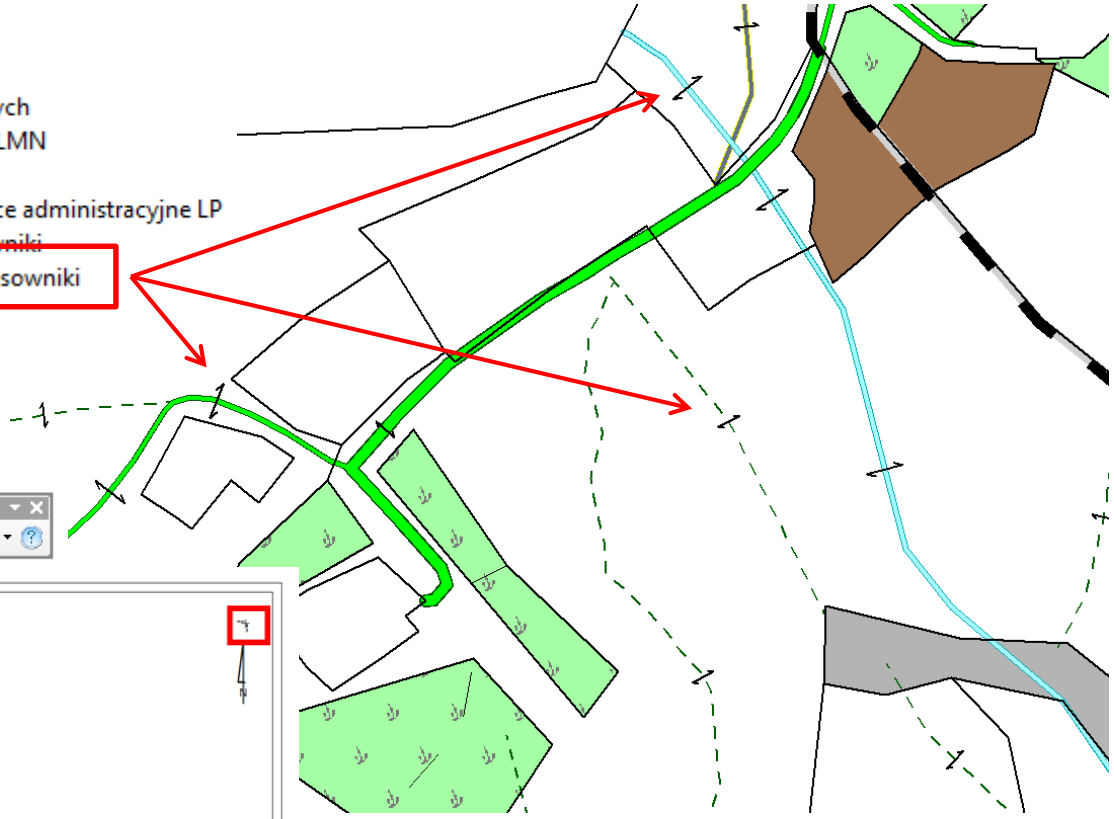




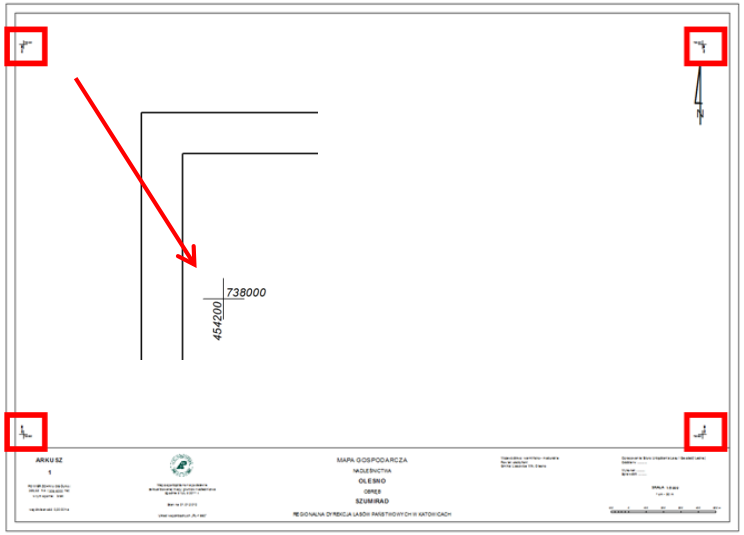
Cartography – custom symbols

„Kasownik”



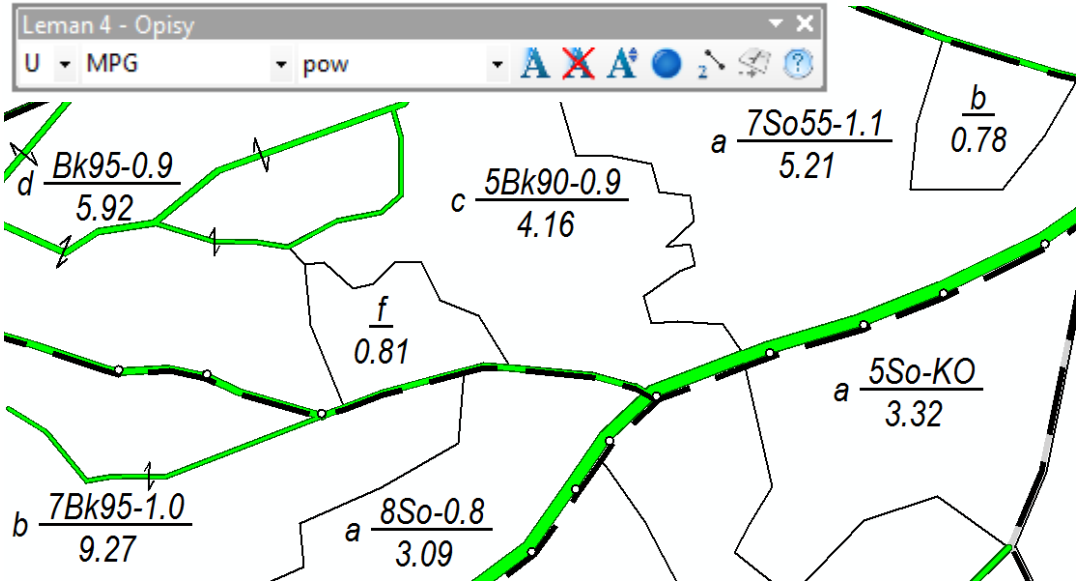


Coordinate markers



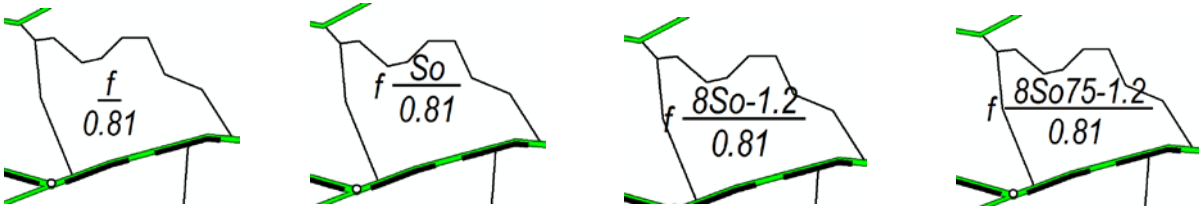
Cartography – custom labels

Custom labels for forest subcompartments



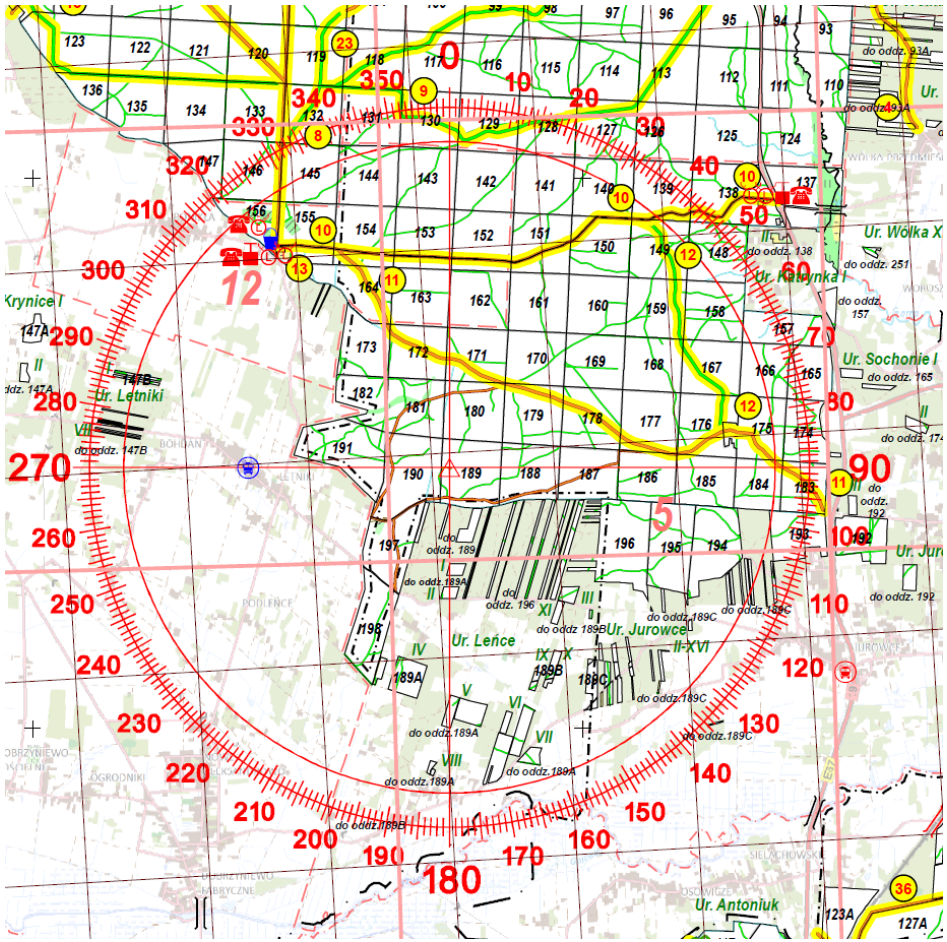
WARIANT dla MPG	Opis
0	a
1	a / 33.76
2	a Jd / 33.76
3	a 4Jd / 33.76
4	a 4Jd / 33.76
5	a 4Jd-0.7 / 33.76
6	a 4Jd120-0.7 / 33.76

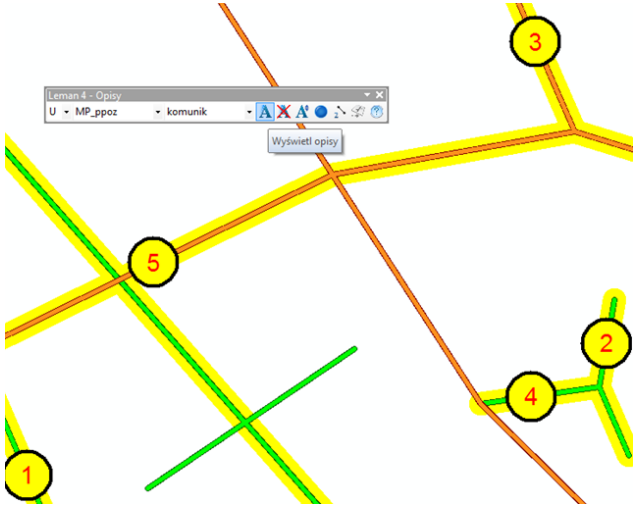
As easy to change as a mouse click

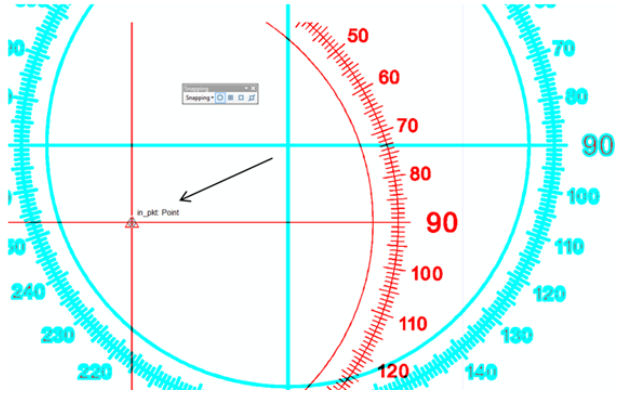


Cartography – map layouts

Specific editing and layout needs – e.g. forest fire protection map

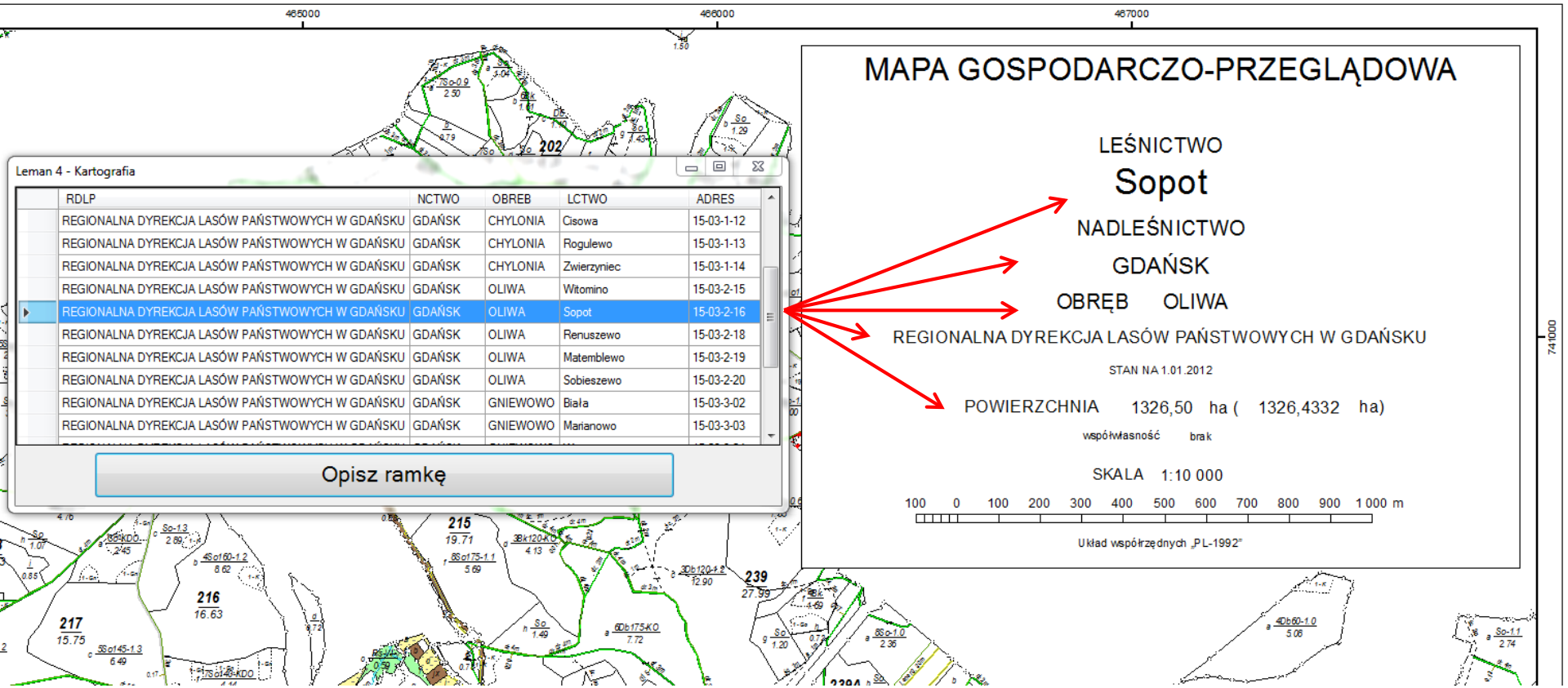






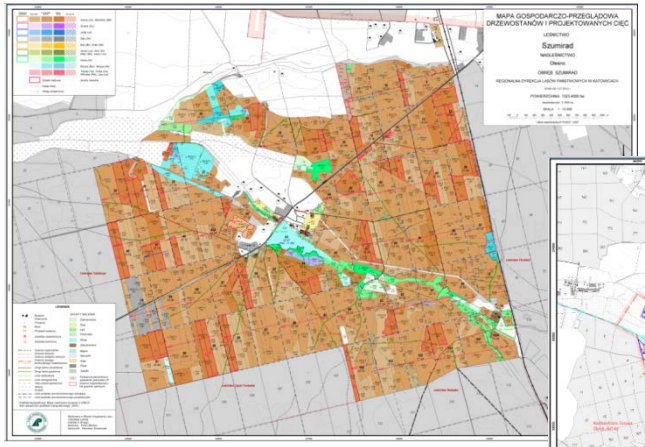
Cartography – map layouts

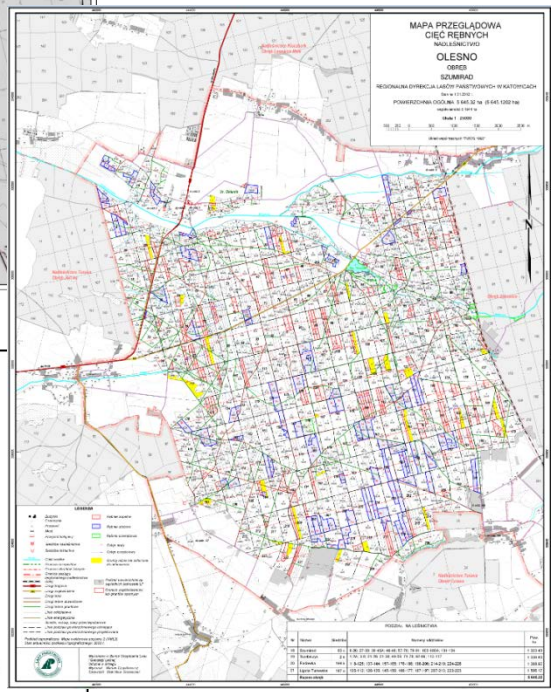
Map frame descriptions – automatic generation from database

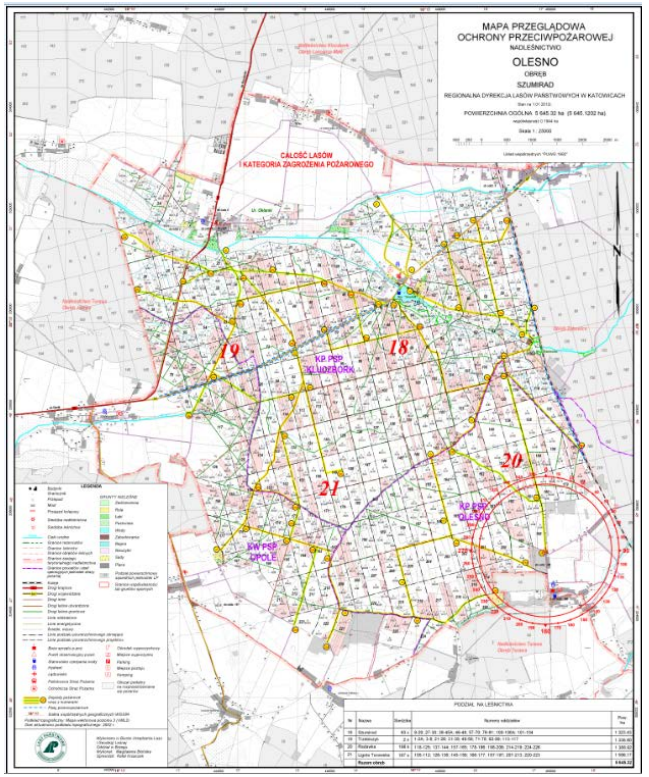


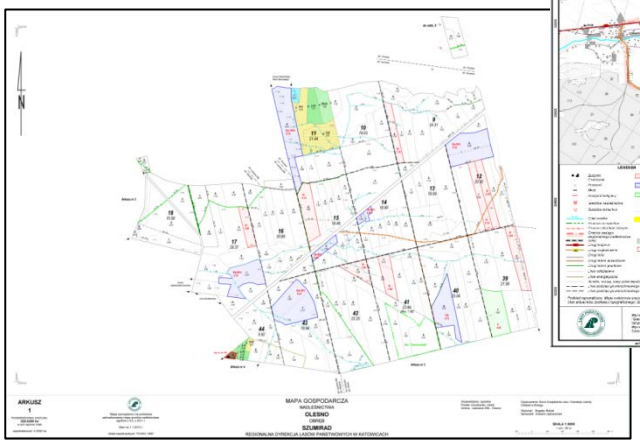
Cartography – map layouts

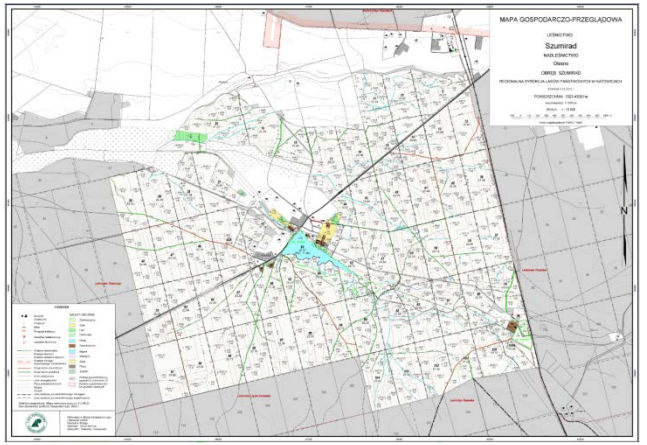
Map templates











Workflow support – projects

Tool **Project** **Product**

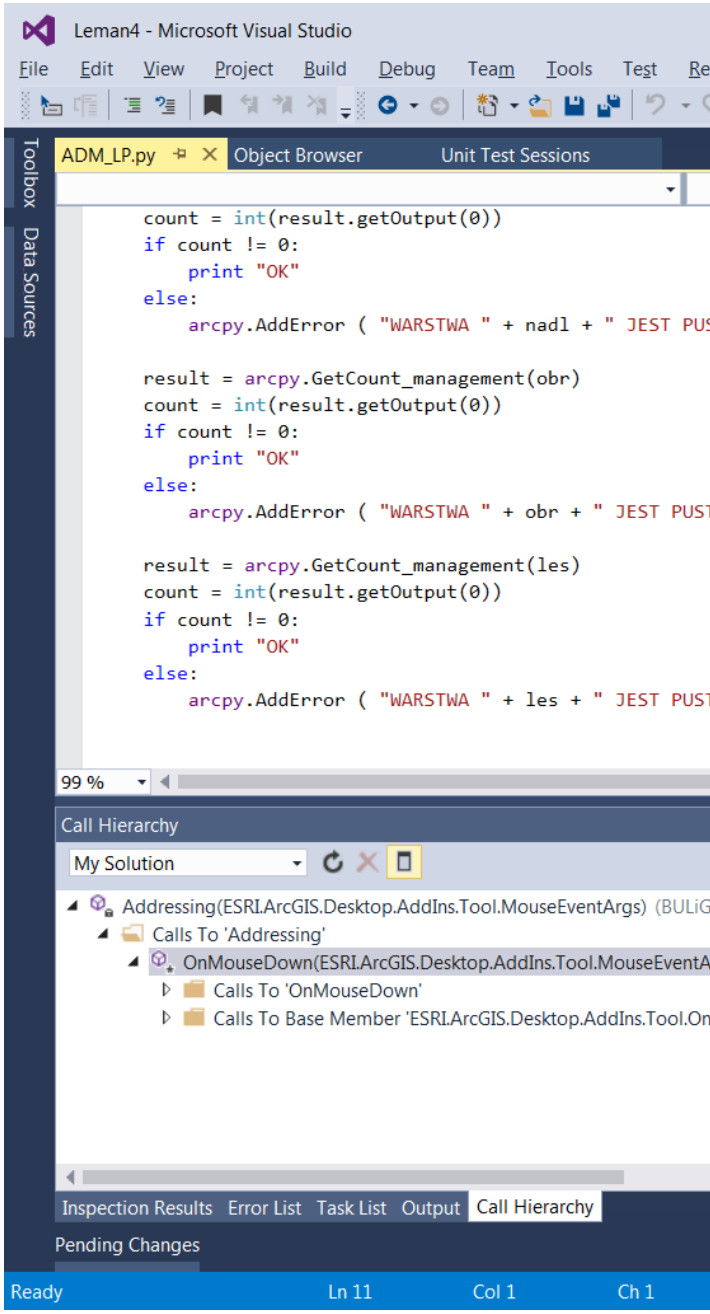
Workflow support – data exchange

Historical development

- First solutions in ArcView 3.x (Avenue)
- Big step – migration from AV3 to ArcMap 9.x
- Complete rewrite and migration to level Standard – ArcMap 10.x
- Esri Enterprise License Agreement

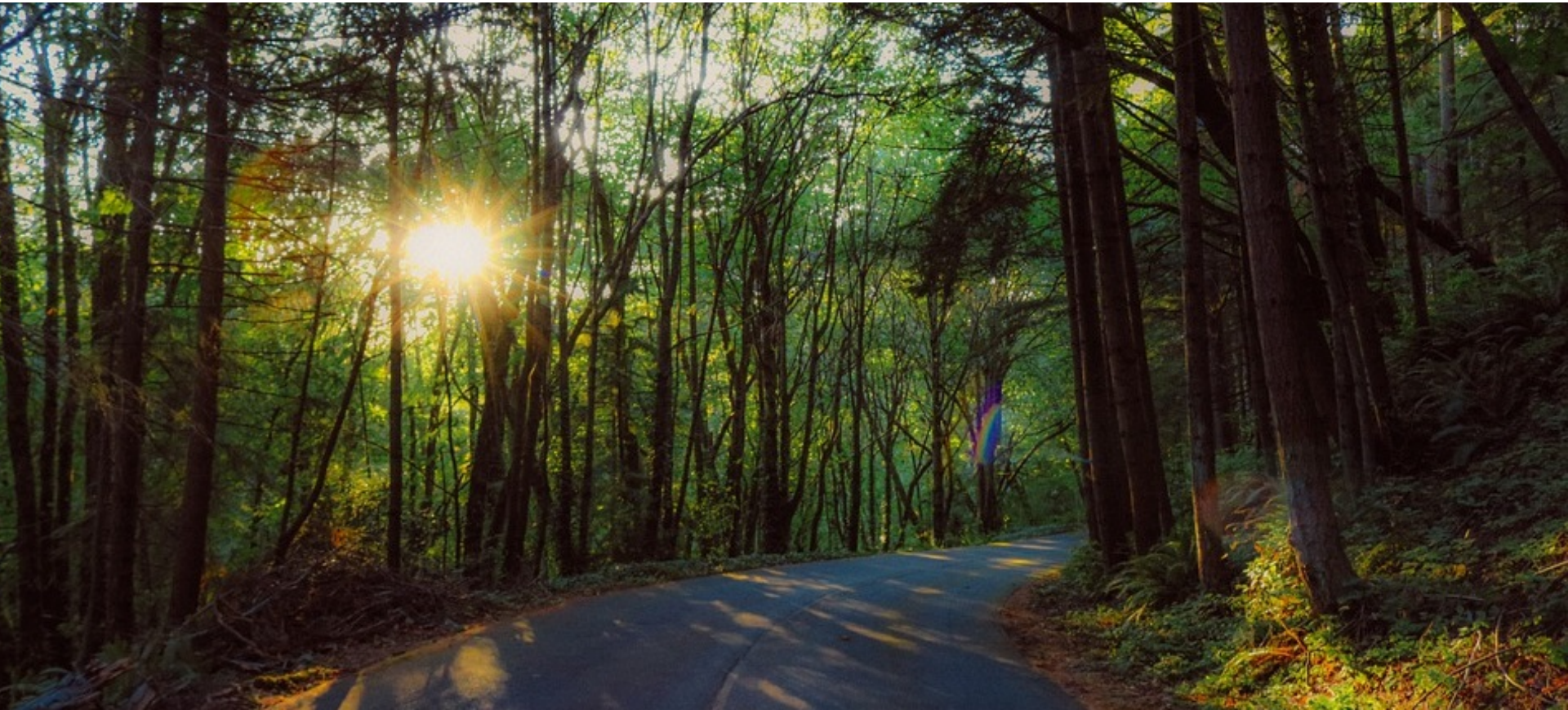
Behind the scenes

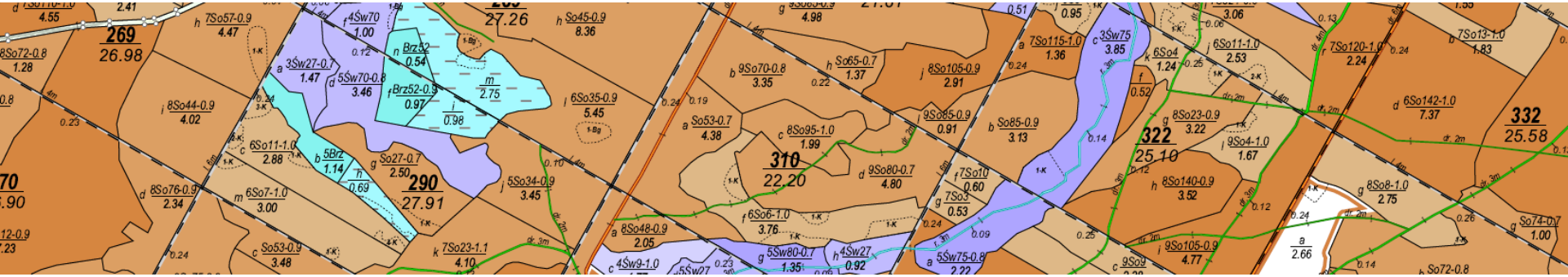
- **ArcMap Add-in**
- **ArcObjects .NET API**
- **Tools are mainly Python scripts**
- **Integration with external tools:**
  - GDAL
  - ET Geotools
  - custom .NET libraries



Future prospects

- **Migration to ArcMap 10.5 under way**
- **LEMAN Next Generation – ArcGIS Pro**





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