TOP10SMART
Multi Layer raster data for multi scale maps

SMART = Scalable Multi Allocation Raster Topography

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- Introduction
- Problem statement
- Methodology
- Conclusions
- Questions
Introduction

- Top10NL feature Geodatabase:
- Single features: areas, lines and points
- Area feature classes
  - Terrain, water, roads and houses
- Line feature classes
  - Railroads, ditches, nursery trees etc
- Point feature classes
  - Single trees, annotation, signs etc
Base map Top10NL (Westervoort)
The problem is performance…
Drawing features like polygons and lines takes a lot of time by large scales
No aggregation on the fly
We used several ArcGIS tools like

- Modelbuilder
- Python
- Arcinfo with AML (Buildvat, Shrink, joinitem for large datasets)
Methodology

- Integration of the several input Top10NL layers
- Polygon to dataraster conversion 2.5m on FID
- Filter local infrastructure and small water bodies
- Aggregation to 10ha patches with 25m raster
- Zonalmajority of aggregation result with 2.5m dataraster
- Combine the aggregation 2.5m with original
- Add line raster elements to the combine raster
- Add major roads and railway buffers to the combine raster
- Final result: **Multi Layer raster data for multi scale maps**
Fourth generation Top10Smart Raster
Integration of the several input Top10NL layers

- Using Model builder ArcMap
- Union
- Dissolve on land use
- Create unique ID from FID
Polygon to data raster conversion 2.5m on FID

- The combined polygon feature dataset was converted to 2.5m data raster on unique ID
- A Python script using raster tiles
- One output data raster with 3.5 million records
  - (buildvat in Arcinfo workstation)
Filter local infrastructure and small water bodies

- Shrink removed small roads and water bodies from the original dataraster
- The new dataraster was used to generalize land use
- Because no infra and water ditches:
  - Bigger land use patches to start
  - Less noise in the aggregation result
- Procedure was applied with AML in small tiles
  - (python was very slow)
Aggregation to 10ha patches with 25m raster

- Tried with model builder but I used AML
- From the cleaned data raster with no infrastructure and small water bodies a 25m resolution land use map was generated
- The 25m resolution map was generalized (10 ha patches)
- Final output was 2.5m raster using zonalmajority with the 2.5m cleaned data raster
Combine the aggregation 2.5m with original

- The original 2.5 m raster with 43 land use classes was combined with 7 aggregated land use classes
- Now there are two layers available. Subsequently, two more were added:
  - Top10NL (buffered) line elements were added
  - Major infrastructure with 50m buffer was added
- Colormap attributes scale groups were added
Result

- Multi Layer raster data for multi scale maps
  - Can be used in scales 1:10000 to 1:250000
  - Very fast drawing
  - Identify tool can be used on each scale
  - Much layer styles are possible
  - Looks great on all scales

- Demonstration
Demonstration Top10SMART

- Background image
- Web mapping
Top10smart of the Netherlands
Multi layer raster

- Definition: grid cells with more than one meaning
  - Aggregated land use map
  - Combination with non-aggregated land-use elements

- Advantages:
  - One grid with many applications
  - Scalable legends
  - Perfect performance with high resolution
Conclusions and remarks

- It is good because:
  - Great performance
  - Great multi scale map resolution
  - On the other hand…
  - It takes much effort to create Multi layer raster data
  - Number of legends is unlimited

- Some things did not work out so well and these were:
  - Still need AML in Workstation for some operations
  - Model builder has some limitations (multi output Mapalgebra)
Questions?