

LGN1 – LGN5

Methodological developments and requirements

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- Development of LGN
 - requirements
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LGN in brief

- Raster database (25 * 25m grid)
- Update cyclus 3-4 year LGN1-LGN5 (1986, 1992, 1995/1997, 1999/2000, 2003/2004)
- Based on satellite images, Top10Vector and visual interpretation
- 39 classes (main classes urban area, forest, water, agricultural land and nature)
- (last) 5th version of Landelijk Grondgebruiksbestand Nederland (LGN5)

Why LGN?

- Widespread application of GIS in organisations
- Improved computer capabilities made it possible to handle large multi-temporal satellite data sets
- Land use information was needed for environmental policy and spatial planning
 - Example: pollution of phosphorus in Dutch soils - depends mainly on soil type and the area corn crops

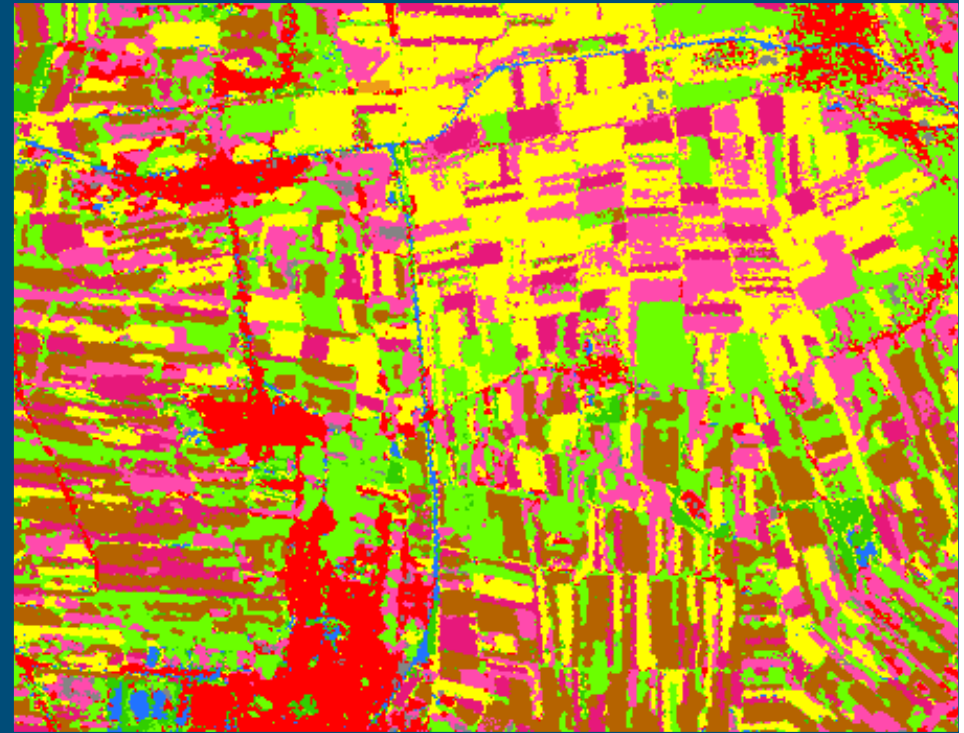
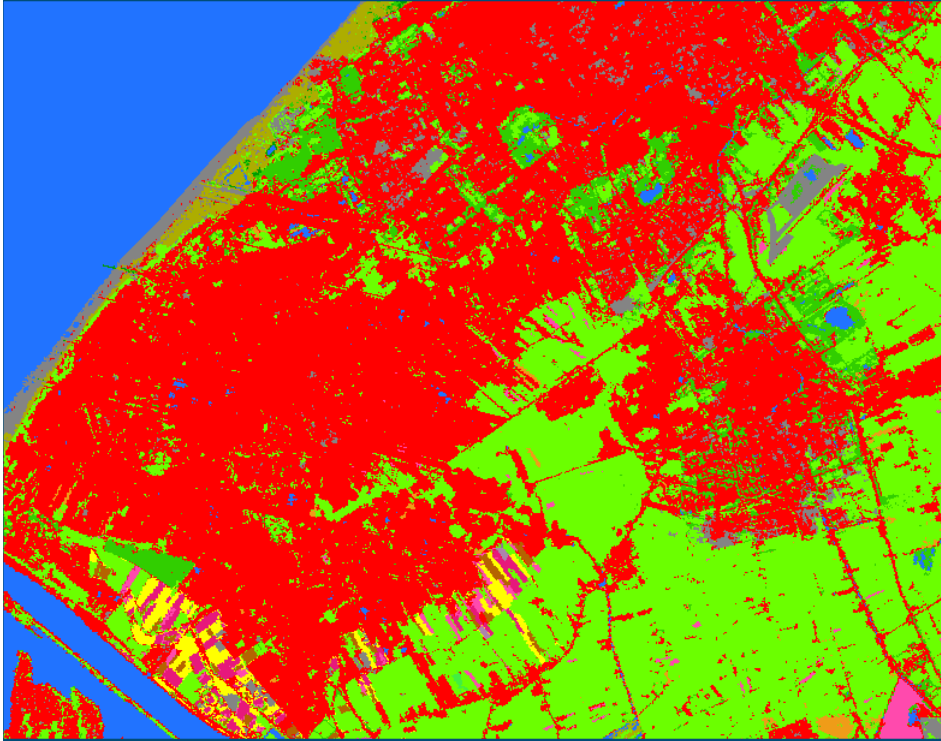
LGN1: requirements

- Raster database for use in a GIS, with a resolution of 25 meter.
- Discrimination of the major crop types
- No real accuracy requirements because the product was a first test case

LGN1: methodology

- Single TM image (August 1986)
- Supervised classification in combination with visual delineation of urban areas
- Extensive post-processing: majority filtering, clump and sieve operations

LGN1: results (1)



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LGN1: results (2)

- Nr. of classes is limited (17)
- Accuracy (67%) and reliability is poor
- Visual appearance of the database is poor
- Despite the poor accuracy, the usefulness of the product was recognised by users

LGN2: requirements and methodology

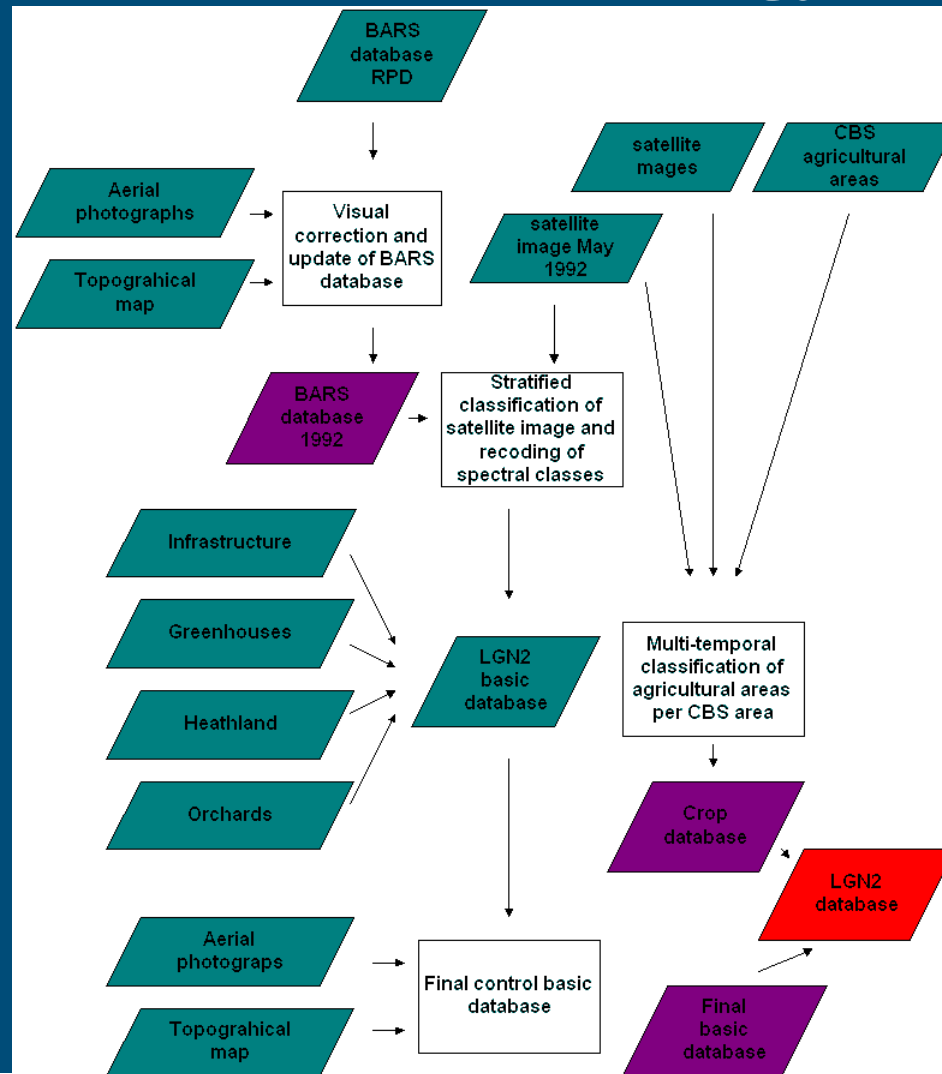
- More classes were required
- Accuracy needed to be improved



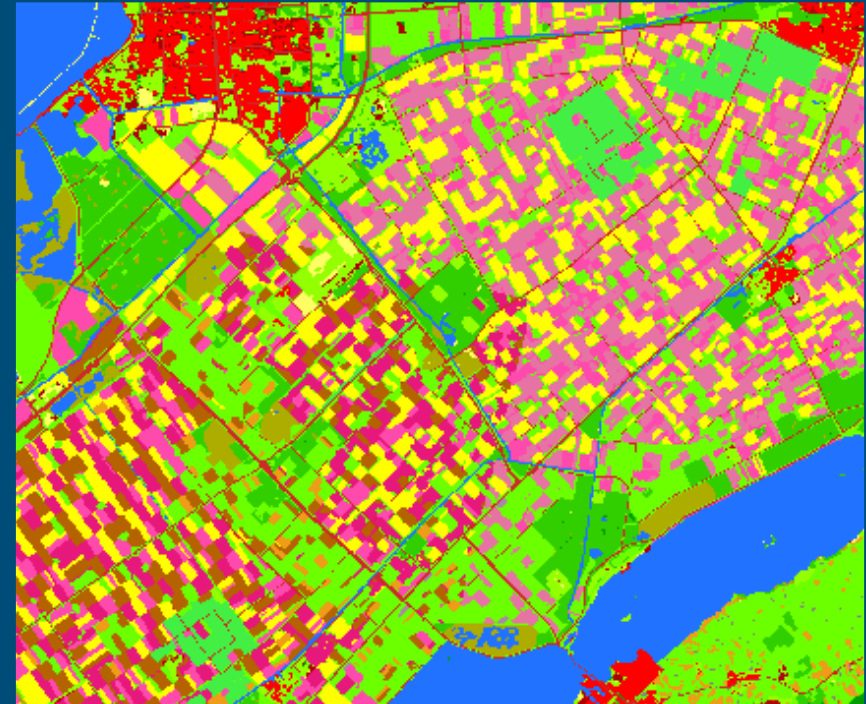
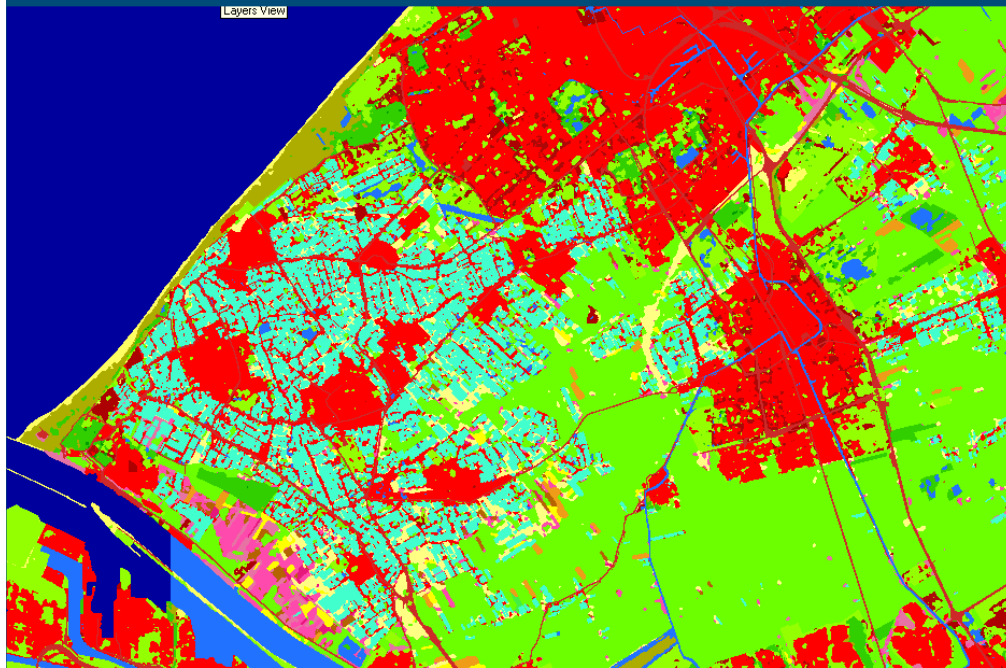
Stratified multi-temporal approach

- Multi-temporal satellite data
- Stratification using BARS database

LGN2: methodology



LGN2: results (1)



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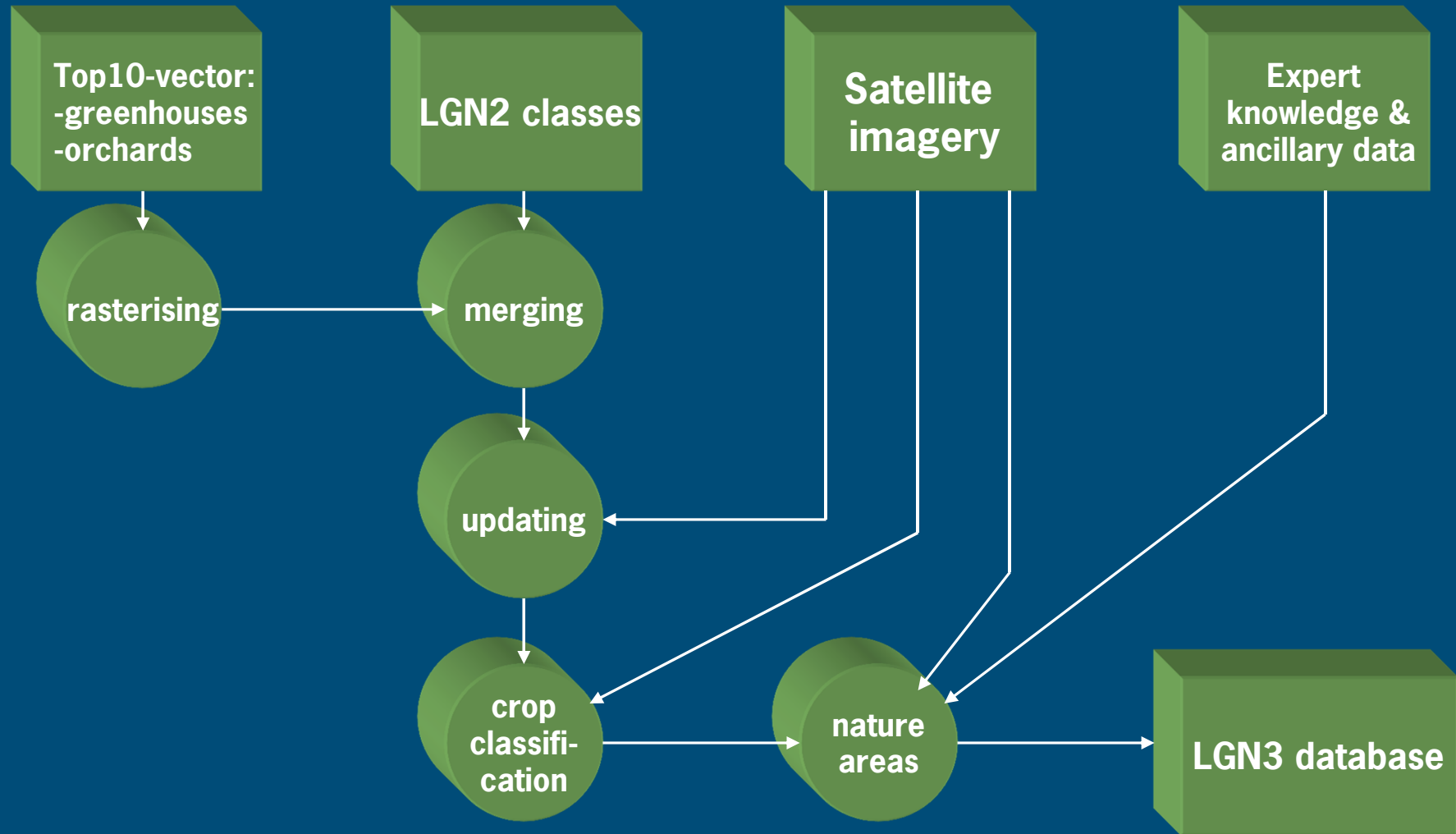
LGN2: results (2)

- Improved accuracy for the entire database
- More classes could be discriminated due to stratification
- Improved visual appearance of the database
- Problems with orchards, greenhouses and mixture classes

LGN3: requirements

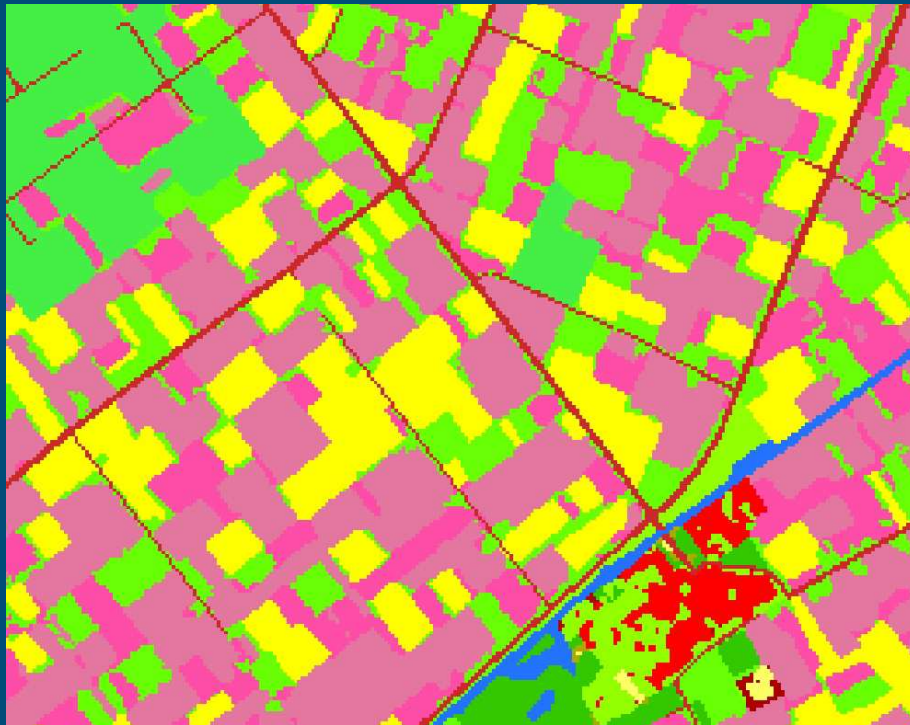
- Accuracy improvement for agricultural crops (no mixture classes)
- Accuracy improvement for greenhouses and orchards
- Improvement of the thematic description of nature areas

LGN3: methodology



LGN3: results (1) – crop classes

LGN2



LGN3



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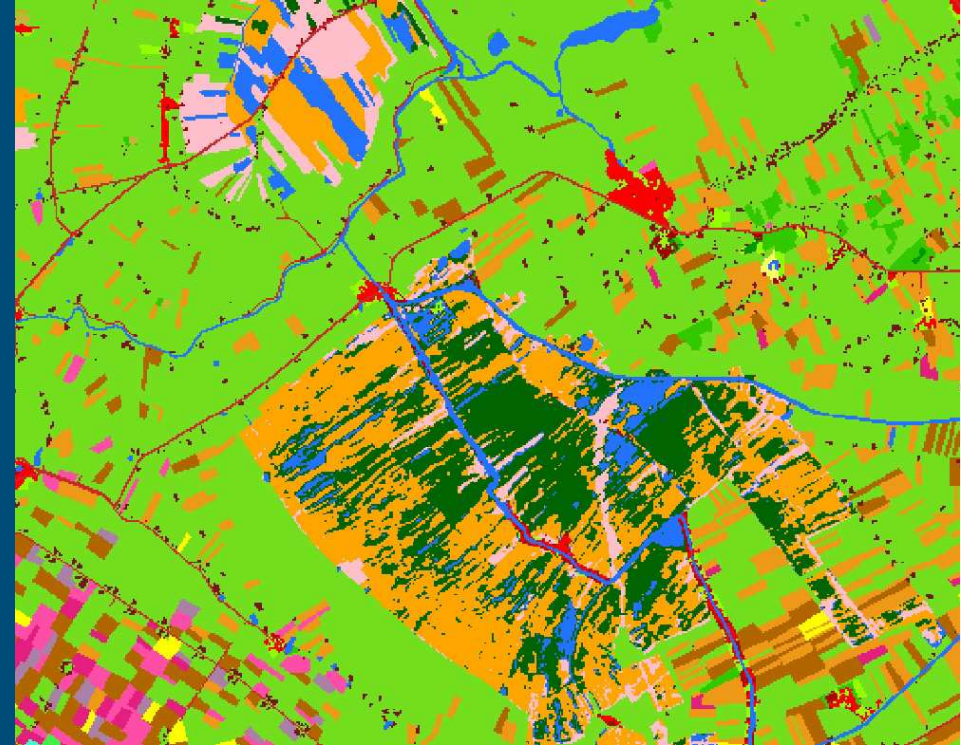
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LGN3: results (1) – nature classes

LGN2



LGN3+

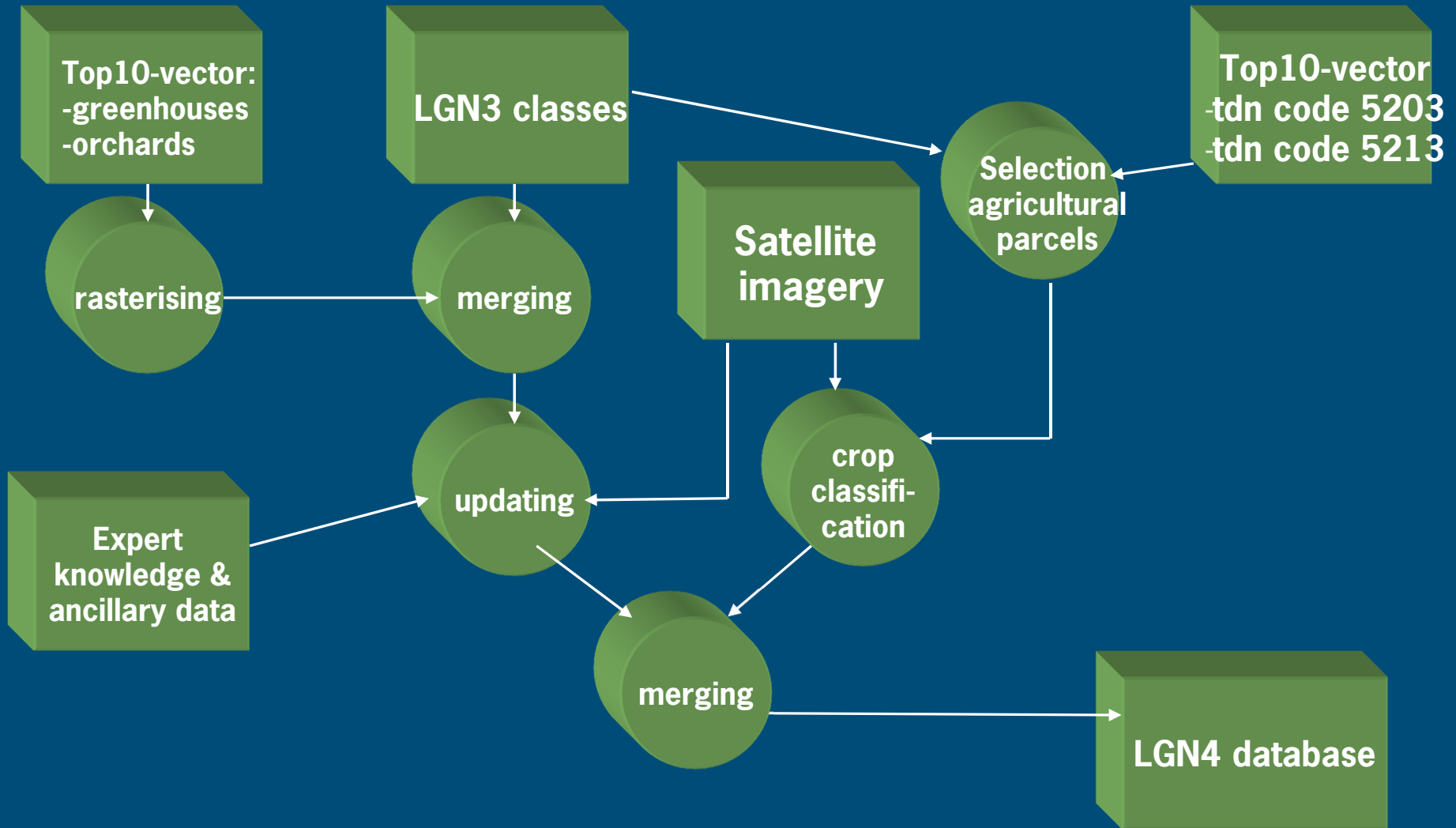


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LGN4: requirements and methodology

- Integration with Top10Vector
 - Object classification of agricultural crops
- Monitoring land use changes
 - Limited number of classes (agricultural land, urban area, forest, water, nature, orchards, greenhouses, infrastructure)

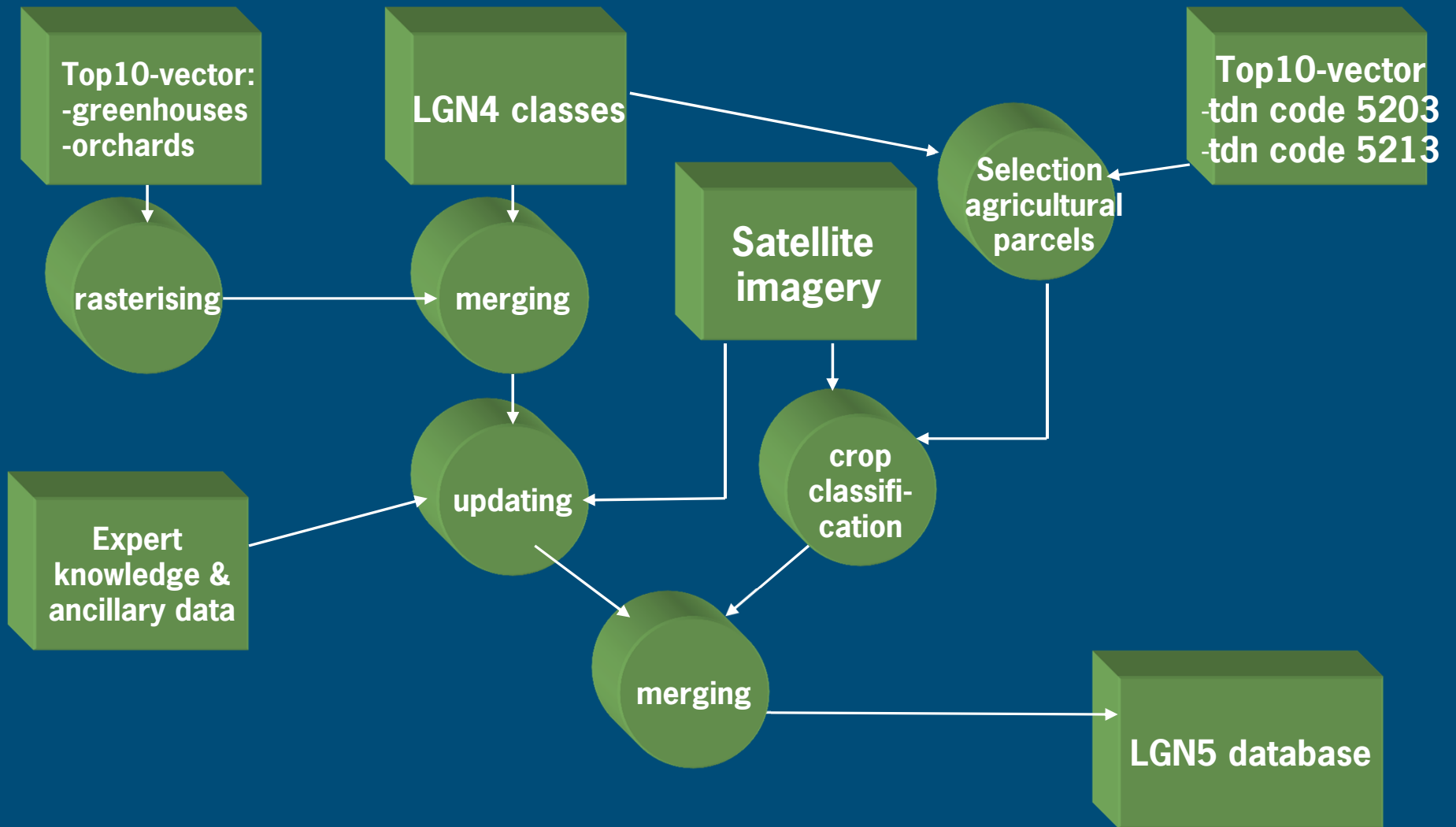
LGN4 methodology



LGN5: requirements and methodology

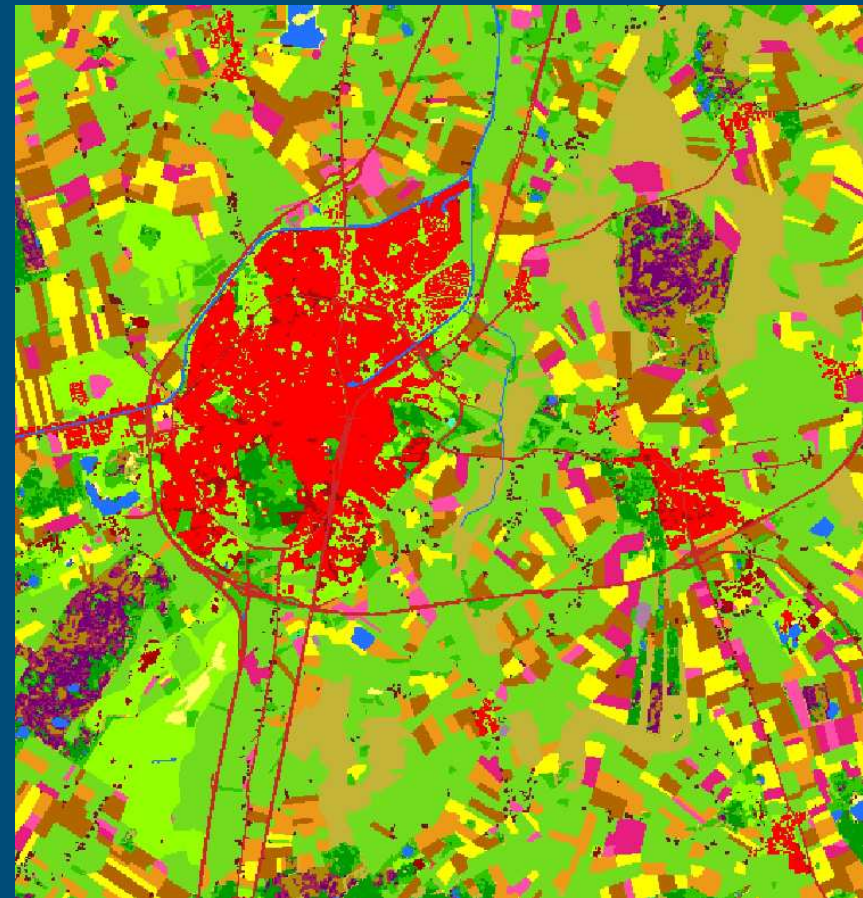
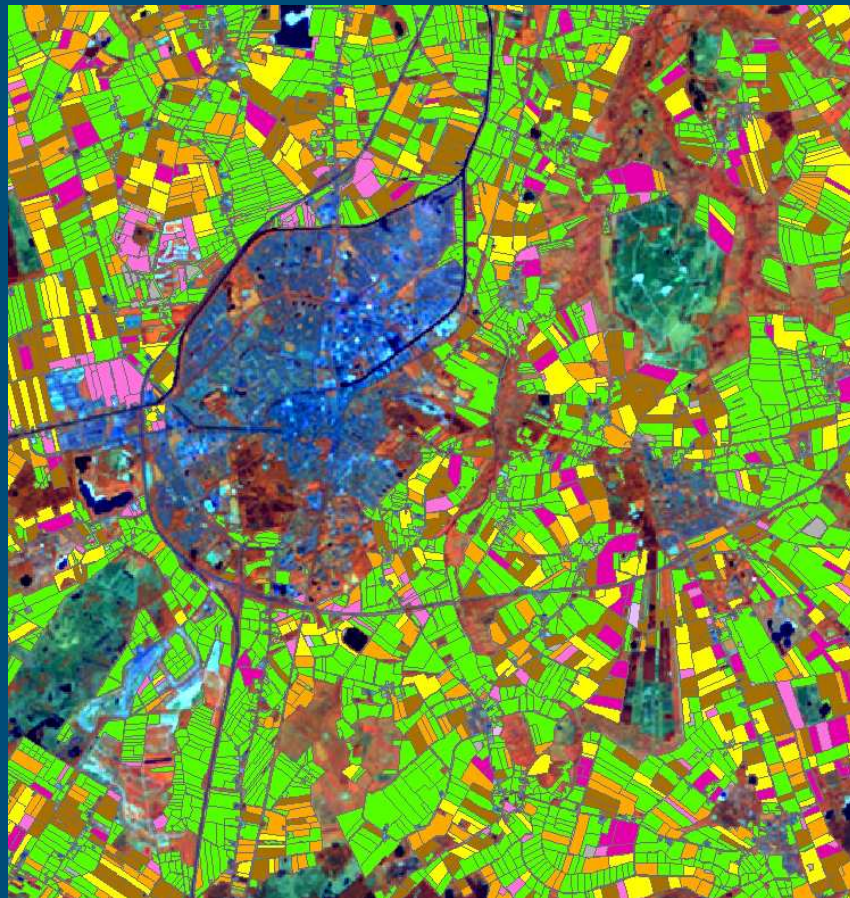
- Methodology consistent with LGN4
- Monitoring land use changes on 8 main classes
 - create large time serie (1995 – 2004)
- Obtain accuracy of LGN4
- Implementation in geodatabase

LGN5 = LGN4 methodology



LGN4=LGN5: results (1)

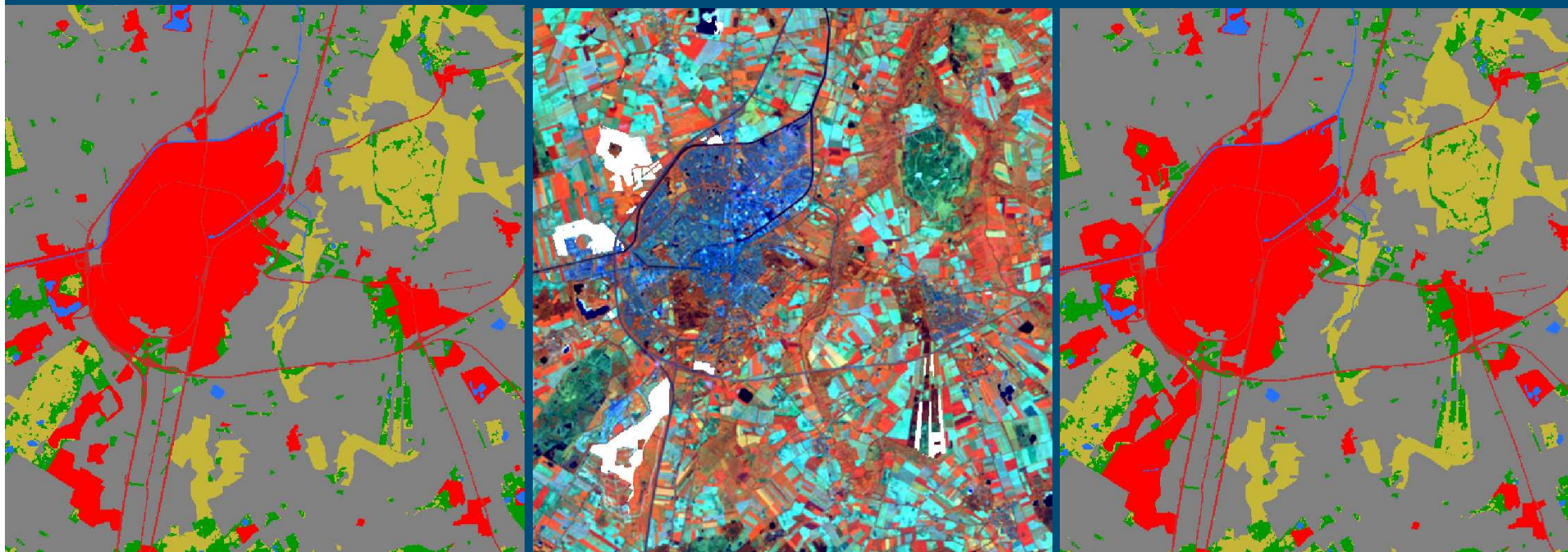
LGN5 crop database & LGN5 grid



LGN4=LGN5: results (2) monitoring database

LGN4

LGN5



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Future

- Focus on quality and continuity
- Combination LGN - HGN/GIS-nature gives new methodological opportunities
- Actualisation nature classes and tuning with other databases
- New classification techniques (SAR)
- Important new aspect: error modelling

Conclusions

- In more than 15 years time the LGN database has developed into a high quality product
- Integration of other data sources is very important for land use mapping
- Satellite images are still indispensable for mapping crops and as an absolute reference to the actual situation
- LGN4 implements integration with TOP10-vector and change monitoring
- LGN5 continues in the way of LGN4

Thank you for your attention

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