



# XXVII FIG CONGRESS

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Geospatial excellence  
for a better living

## Surveying the Regional Need for Land Consolidation from GIS Information in Finland

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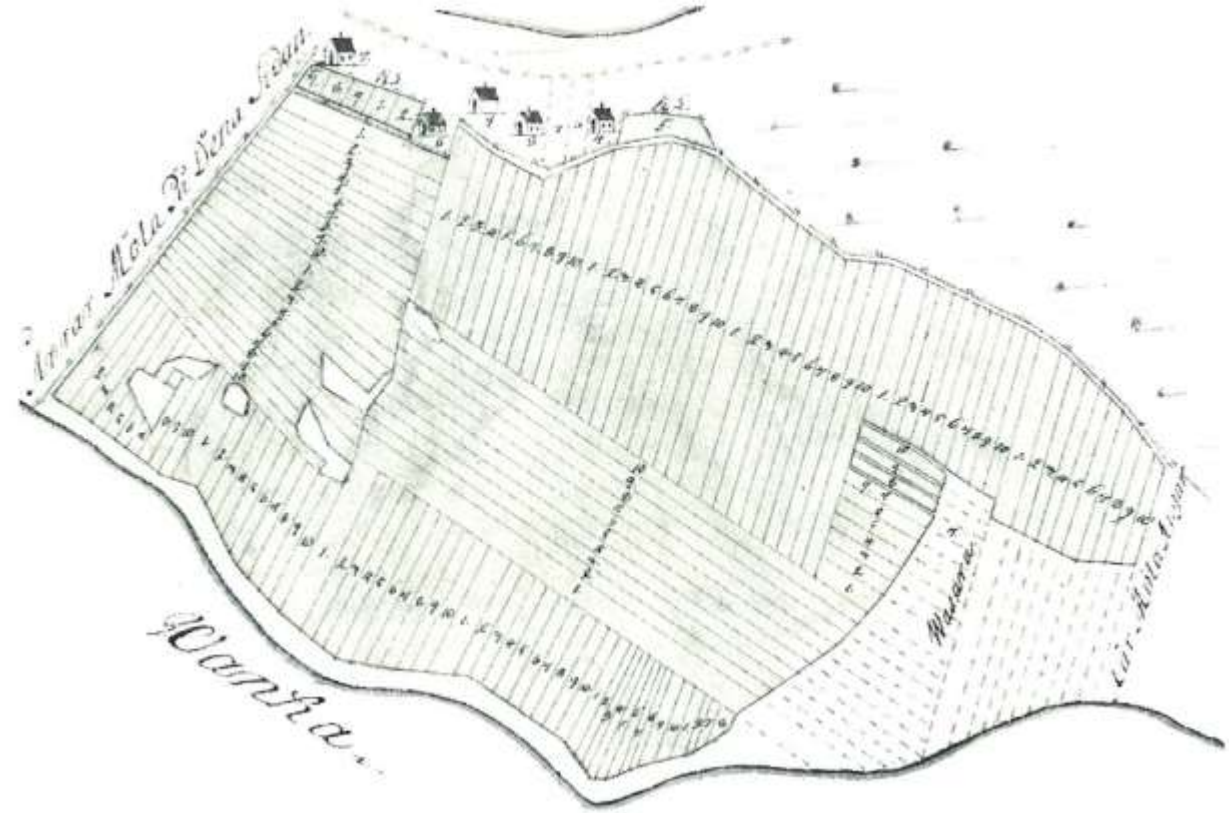


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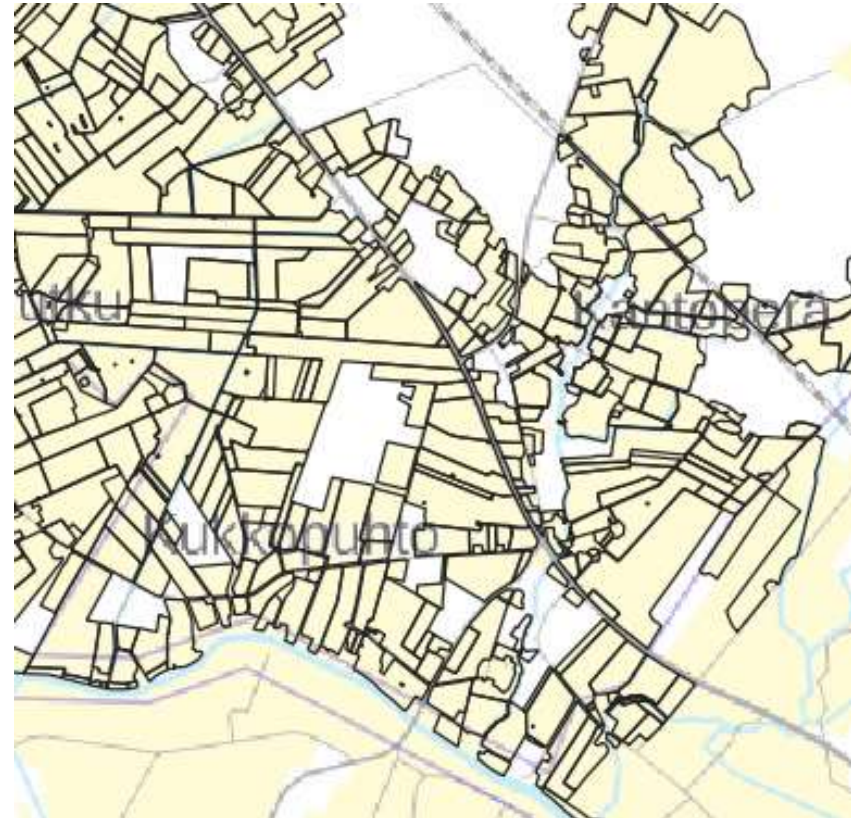
## Land Consolidation in Finland

- Long history, dating back to the 1750s
- Always a surveyor-driven process
- Currently land-owner opinions and negotiations are emphasized in the project
- Due to rapid structural changes in agriculture, the need for Land consolidations persist to this day
- Currently, 900 000 parcels and 45 000 farms in Finland
  - Avg parcel size 2,5 ha
  - Average farm size 50 hectares



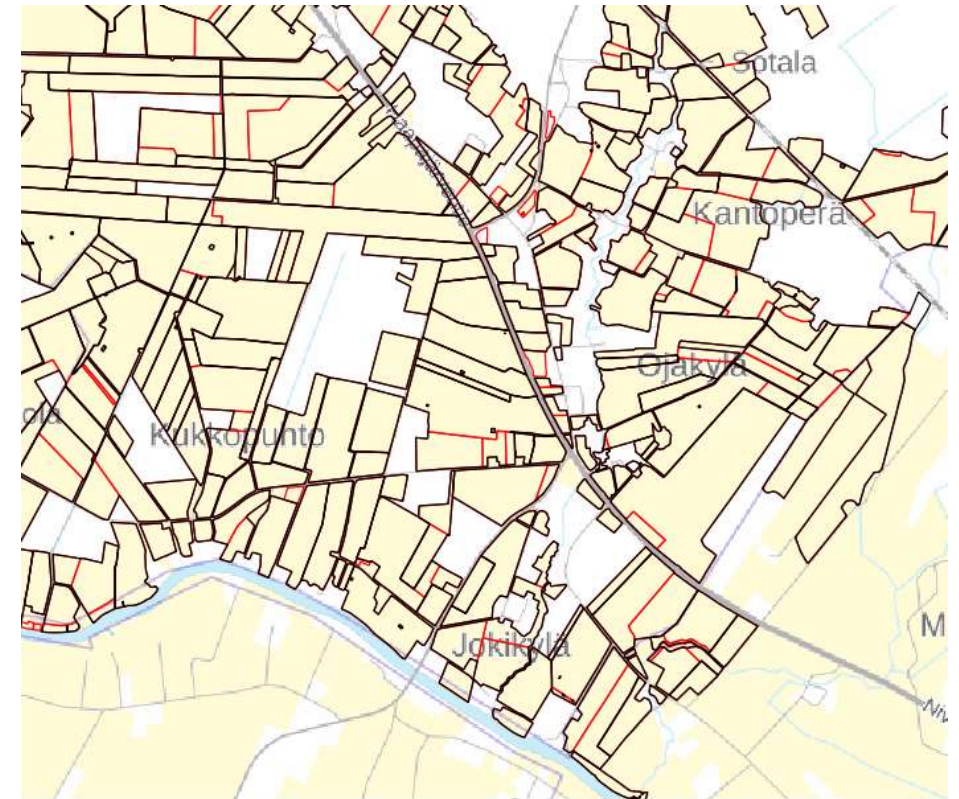
## Surveying Regional Need

- Land Consolidations need to be focused on areas where they are needed
  - But also possible to carry out
- Since 1990s, NLS Finland has developed different methods to survey regional need for land consolidations
- Current methods are GIS-based and use the EU [IACS](#) parcel registry as a basis
- Change over time is also analysed



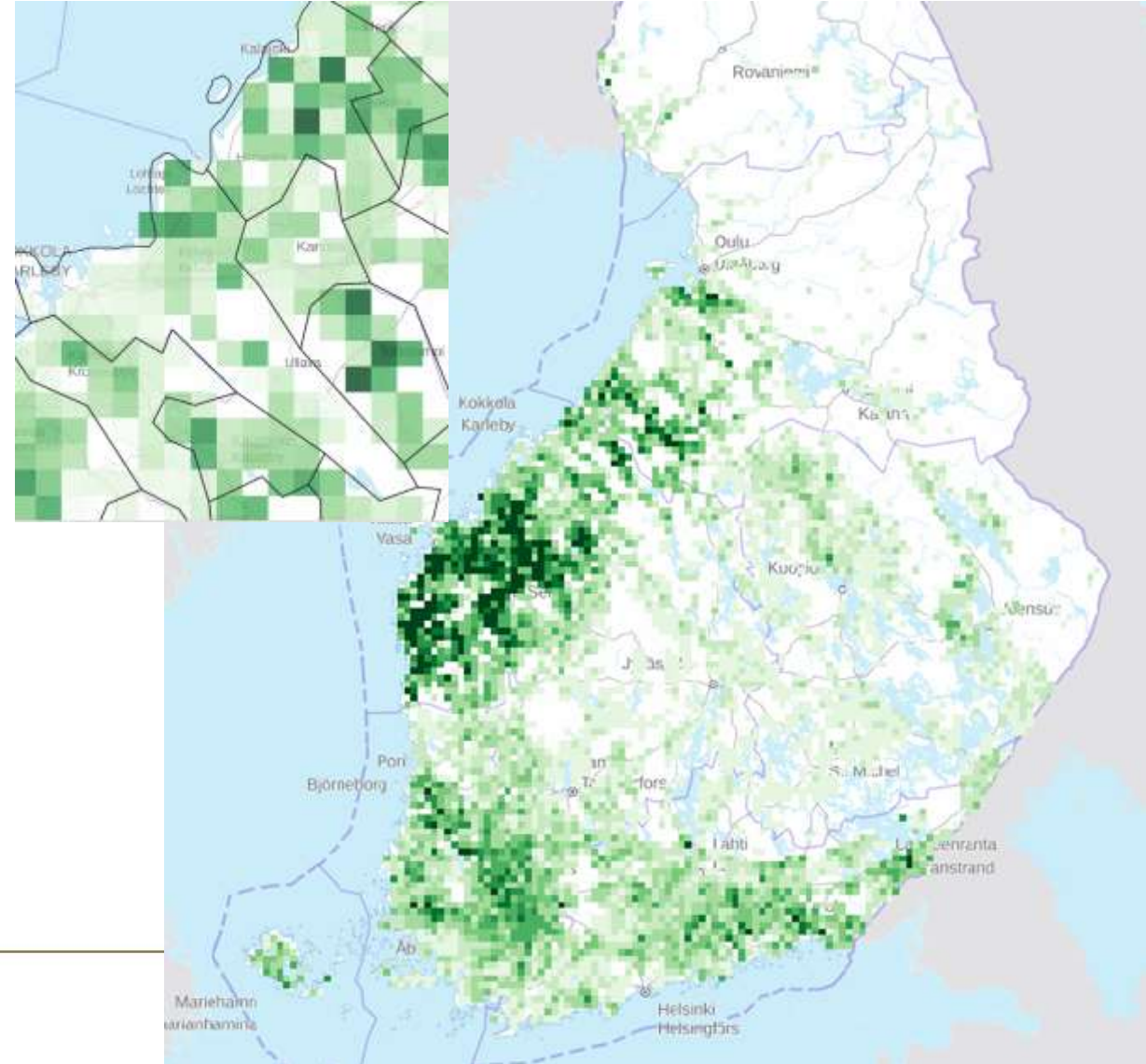
## From IACS parcels to real farming parcel

- The IACS does not represent the real parcels in usage
- The real farming parcels were created by combining parcels that are within 0.7 m from each other owned or rented by the same farmer
- This way the real parcel structure can be depicted more accurately



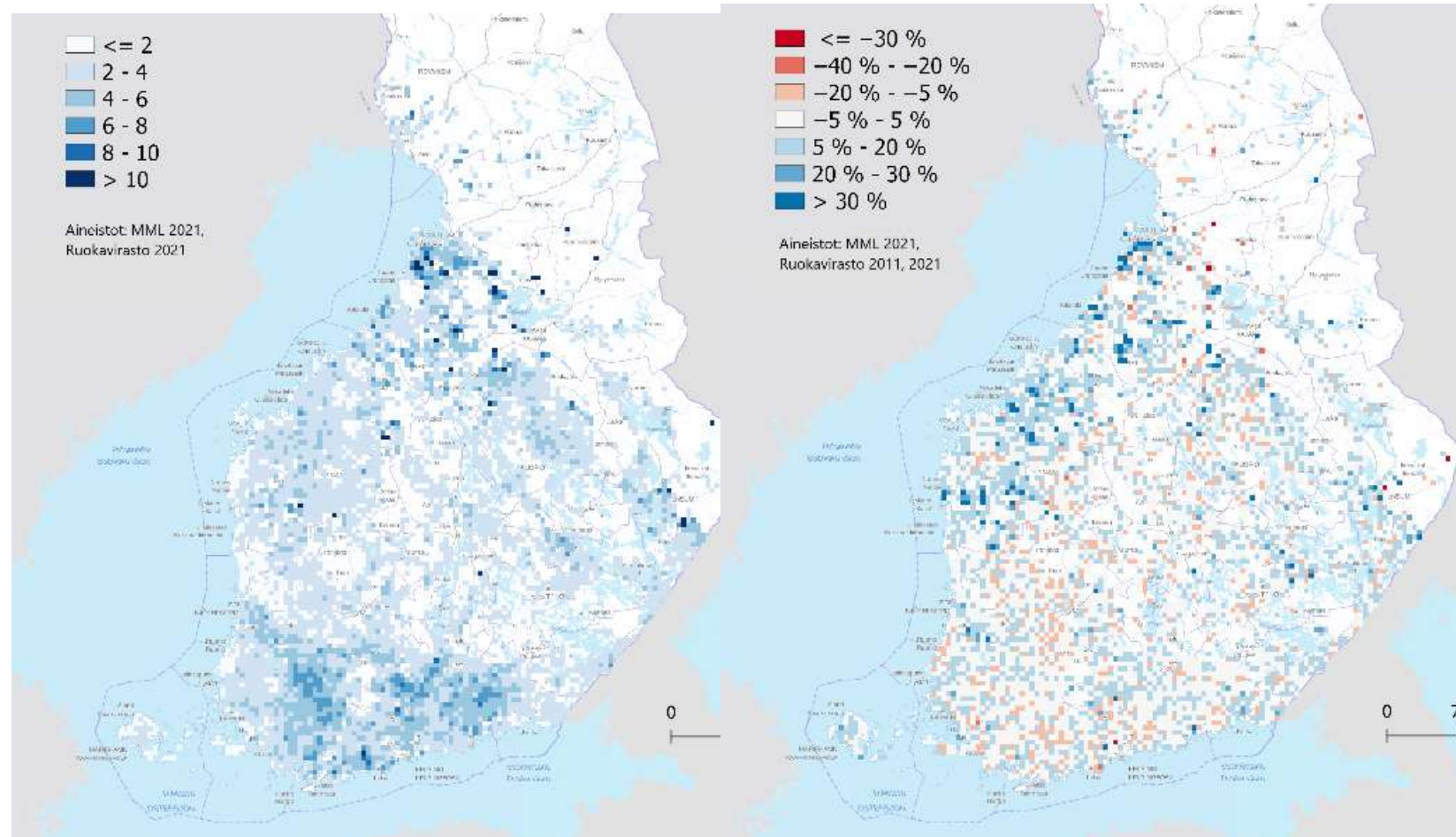
*In red the IACS borders, in black the farming borders*

- Finland was divided to grids
  - 2,5 km X 2,5 km, minimum 25 ha of fields
  - 5 km X 5 km, min. 100 ha of fields
- Grid system enables examining parcel structure down to village and even more detailed level
- Grid system made it possible to work according EU's General Data Protection Regulation GDPR – No personal information of farmers was shown



## Parcel size

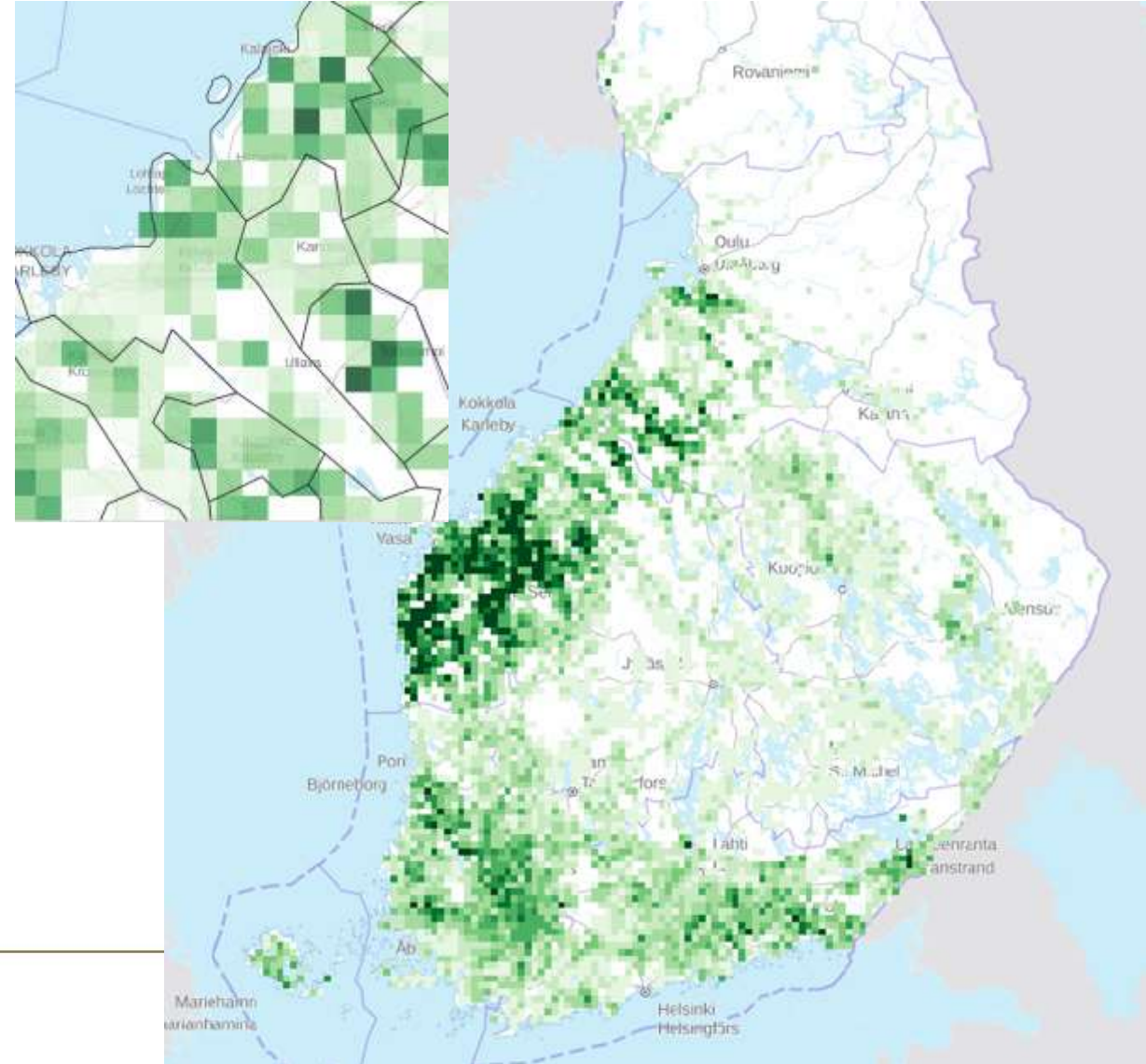
- Parcel size is an obvious starting point
- Analysing change over time can reveal problem areas



Parcel size in Finland 2020, hectares Relative change in size, 2010-2020

## Potential for parcel size increasement

- Every grid cell depicts the farming parcel size in relation to natural boundaries of parcel size
  - Roads, ditches, forests, lakes
- Darker the color, more possibilities for increasing parcel size



## Potential for farm development

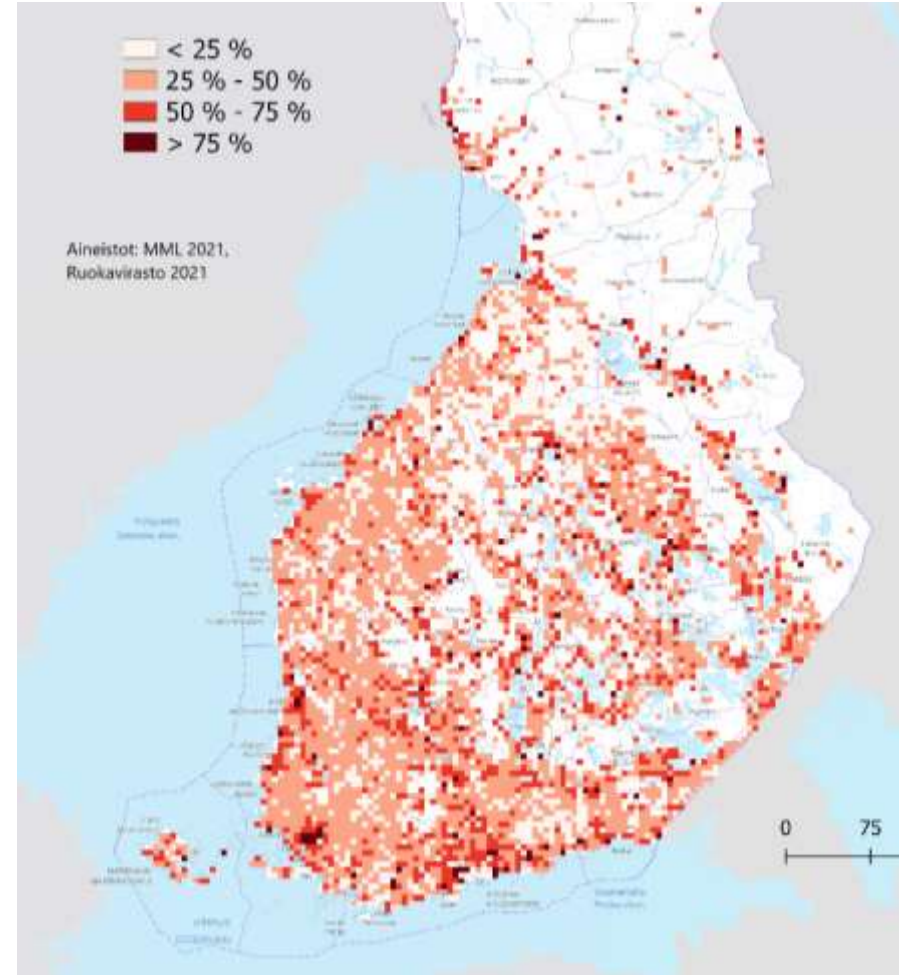
- Instead of parcels, individual farms are examined
- Consist of five variables
  - Spatial scattering of parcels
  - Average farming parcel size
  - Average distance to individual parcels
  - Potential for combining parcels
  - Parcels more than 10 km away from homestead





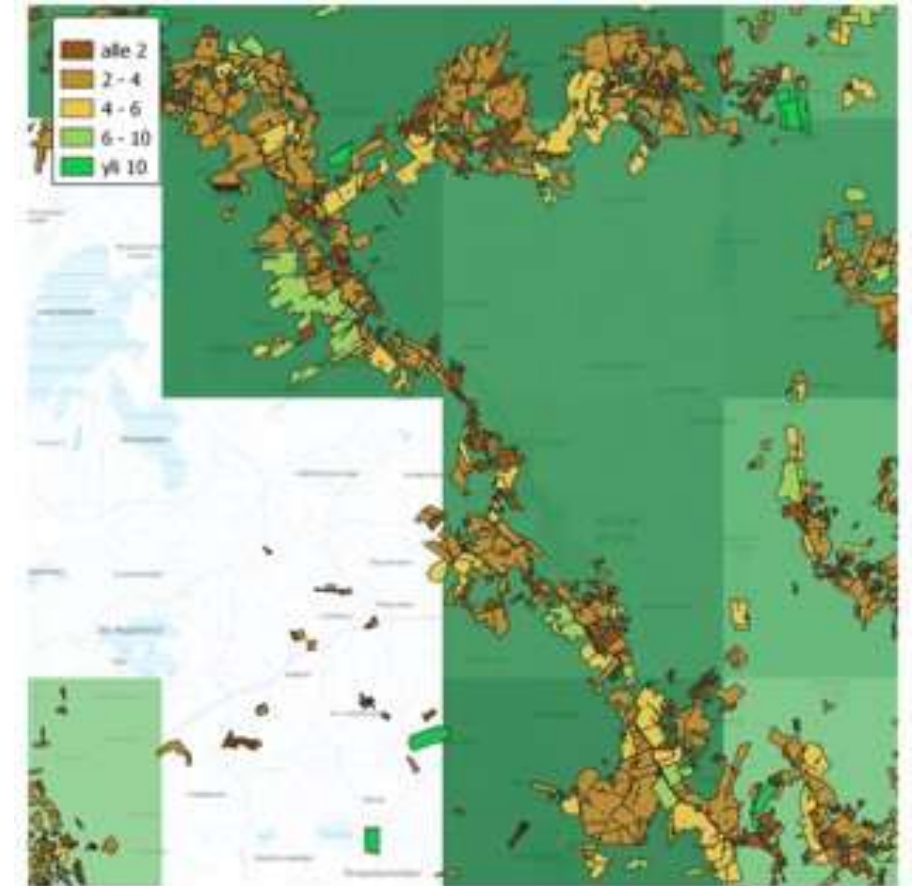
## Rental percentage

- Overall 37 % of parcels are leased
- Land consolidations are easier to carry out in areas with low amount of leased parcels
  - Farmers are more willing to improve their situation
  - Lessors are less interested, as they have stable rental income no matter what



## Concluding remarks

- Combining for example the farming parcels and development potential to a single map can give insights even on the level of a single clearing
- In the future we would like to include parcel shape also as a part of the analysis
- Incorporating, for example, rental percentage as a proxy of willingness would give more insight into the possibilities rather than just potential



Thank you for your attention!

