

# Using grid data to locate specific cultural landscapes

Grete Stokstad

Norwegian Forest and Landscape Institute

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# Outline

- Background
- Study area
- The idea/model
- Data and quality
- Database
- An example
- The road ahead



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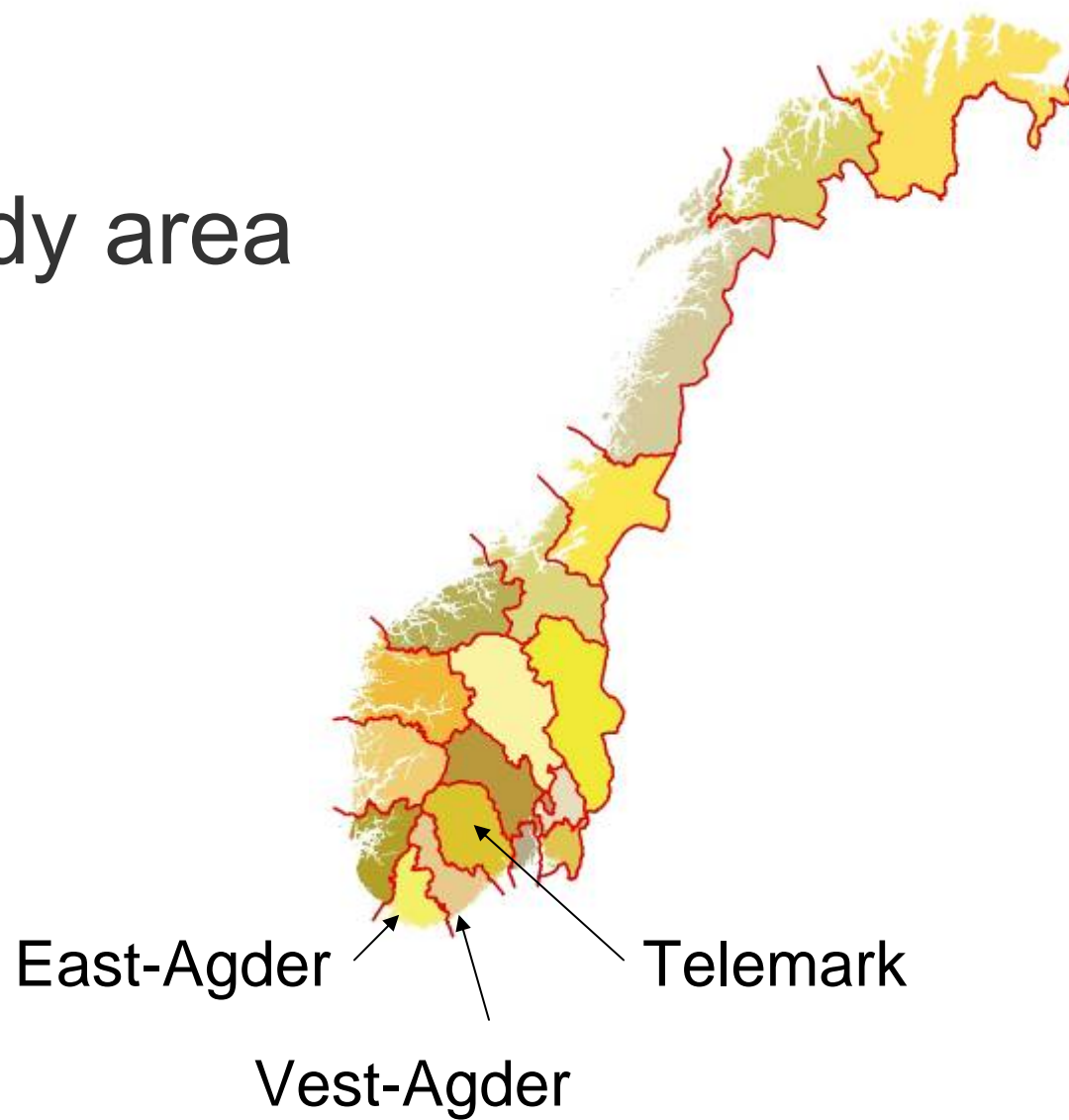
# Background

- > Initiation of a local farm support system to promote/compensate for management activities that preserve the cultural landscape (RMP).
- > It is a payment that only qualifying farmers will receive.
- > It is a regional subsidy, designed locally (county) to meet the local needs and to be able to maintain interesting cultural landscapes (- on a national scale as well as locally valuable landscapes).



- > How do we distinguish a valuable cultural landscape from other landscapes
  - > TODAY: To some extent based on case handlers judgment.
- > Question: Can we distinguish valuable cultural landscapes with use of objective criteria?
- > The choice of criteria may never be objective. However, can we shift the discussion:
  - > FROM who is getting support
  - > TO a discussion of choice of criteria such as the size of fields in relation to edges, topography, or the number of archeologically interesting places.

# Study area





# The idea or tool!

## Database

North	East	NUmber of old houses	Area with pasture
1	1	$X_{1,hus}$	$X_{1,dabeite}$
1	2	$X_{2,hus}$	$X_{2,dabeite}$
1	3	$X_{3,hus}$	$X_{3,dabeite}$
2	1	$X_{4,hus}$	$X_{4,dabeite}$
...	...	...	....



Calculated index for cell j:  $y_j = f(x_j, \text{old house } X_j, \text{area pasture})$

North	East	Value
1	1	$y_1$
1	2	$y_2$
1	3	$y_3$
2	1	$y_4$
...	...	...

Calculated  
value





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## Reference group

What is interesting to  
include in the database?

What should/could be  
used to rank areas?



# Calculation of index to rank areas - some alternatives



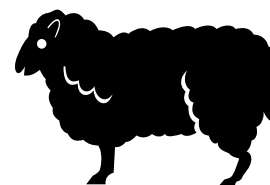
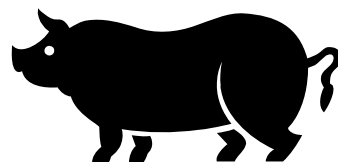
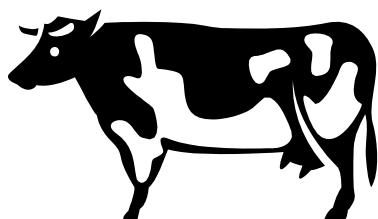
Count the number of times the cell has a value within a given range (0/1)

Predict the probability that a cell belongs to a particular quality grouping.

This method requires that we have enough quality controlled cells to estimate a model.

# Requirements to a tool

- > Pick out cells that meet some requirements, as for example the index calculation
- > Visualize the data in the database by using maps
- > Calculate the total amount of potential selected areas, number of buildings, animals etc. witch are within the selected areas.



## Data in the database – and some examples

# Database

Land capability classification-(1:5000) (MARKSLAG)

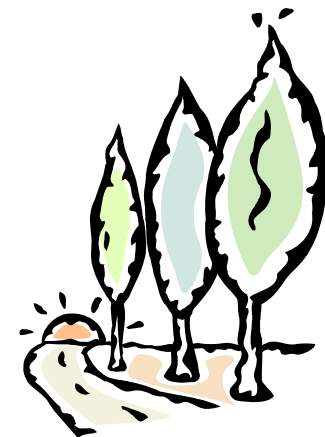
- Farm land, 3 types of surface:
  - Arable land
  - Area that may be harvested mechanically, but it is not arable land
  - Pasture, area not suitable for mechanical harvesting or ploughing
- Forested areas and other types of areas ...

Calculations based on land capability classification:

- Hix (identical neighbouring points)
- Shannon diversity index
- Length of edges between farm land and other surface types
- Farmed area with slope (topographical model and land cover)

# Database - continued

- Farm buildings (GAB)
- Old farm buildings – (SEFRAK)
- Application for farm subsidies (PT-2006)
  - Farm location
  - Number of animals per farm
  - Crop type with sum area per farm
- Archaeological registrations (Askeladden) – several types
- Nature database (protected areas)
- Stone fences and solitaire trees
- Roads





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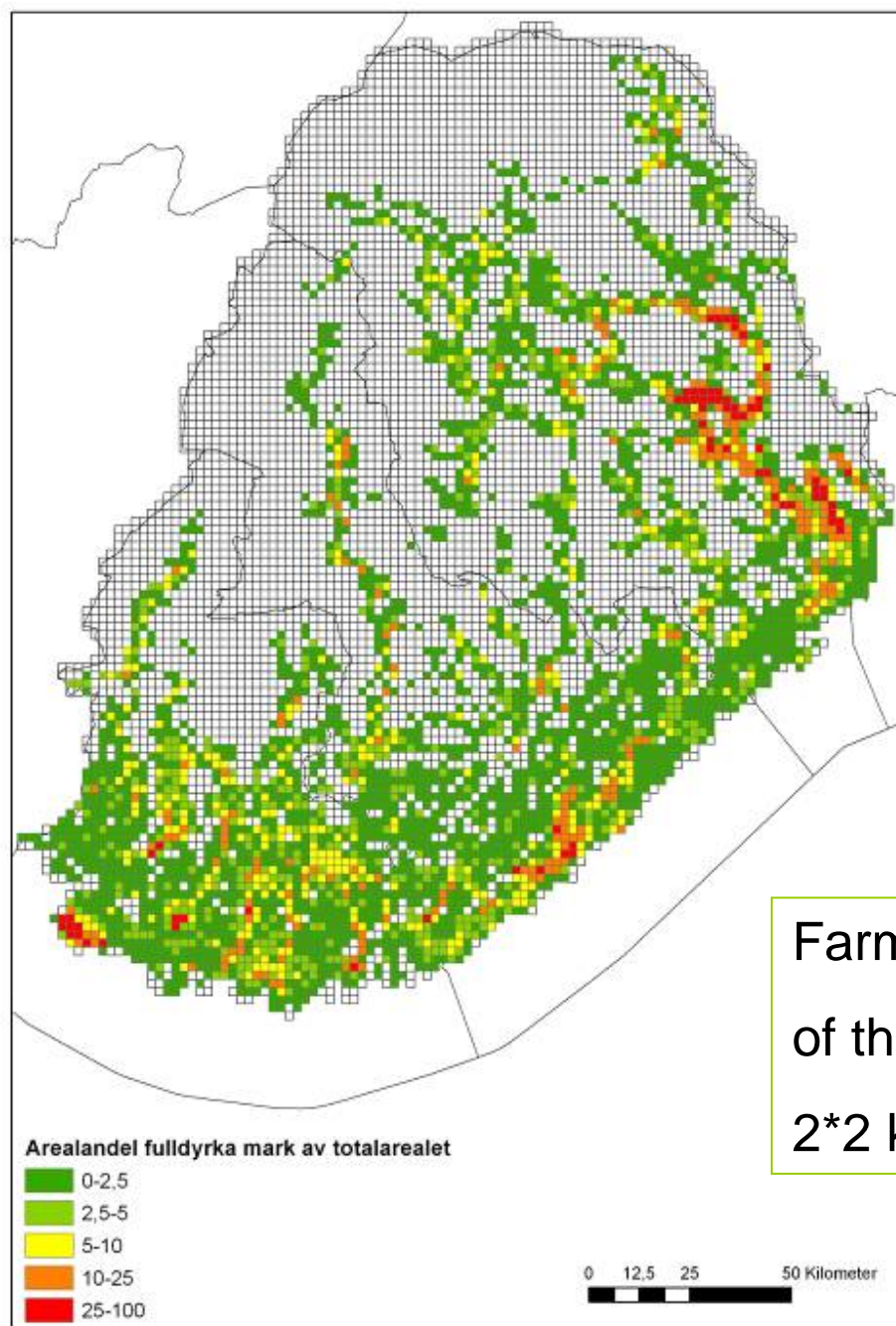
## Grid size

We have used 2 km \* 2 km and 1 km \* 1 km.

For data such farm density and number of animals, should we use larger areas, for example 3\*3 km for each 1\* 1 km cell.



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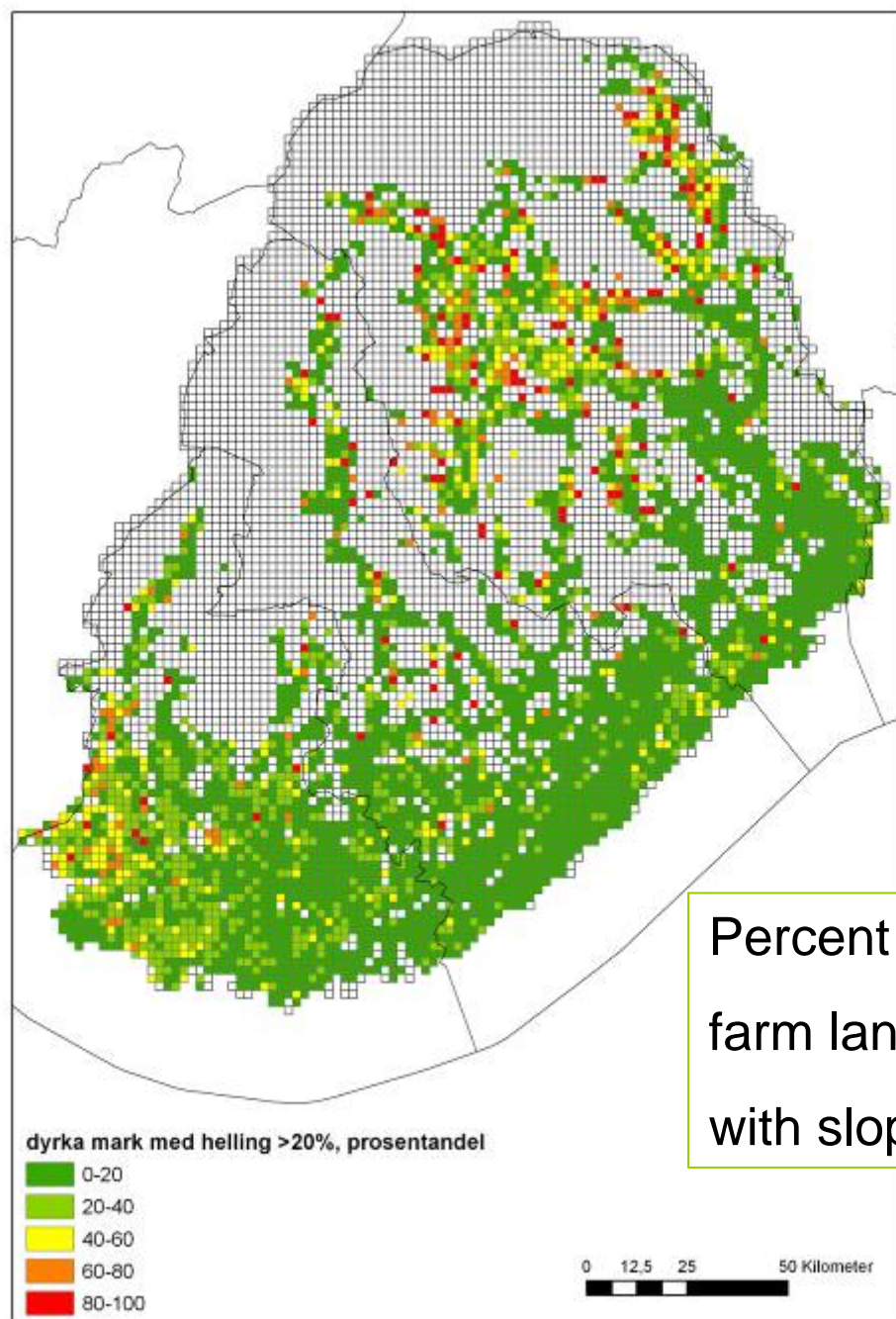


Farm land as percent  
of the total area,  
2\*2 km grid





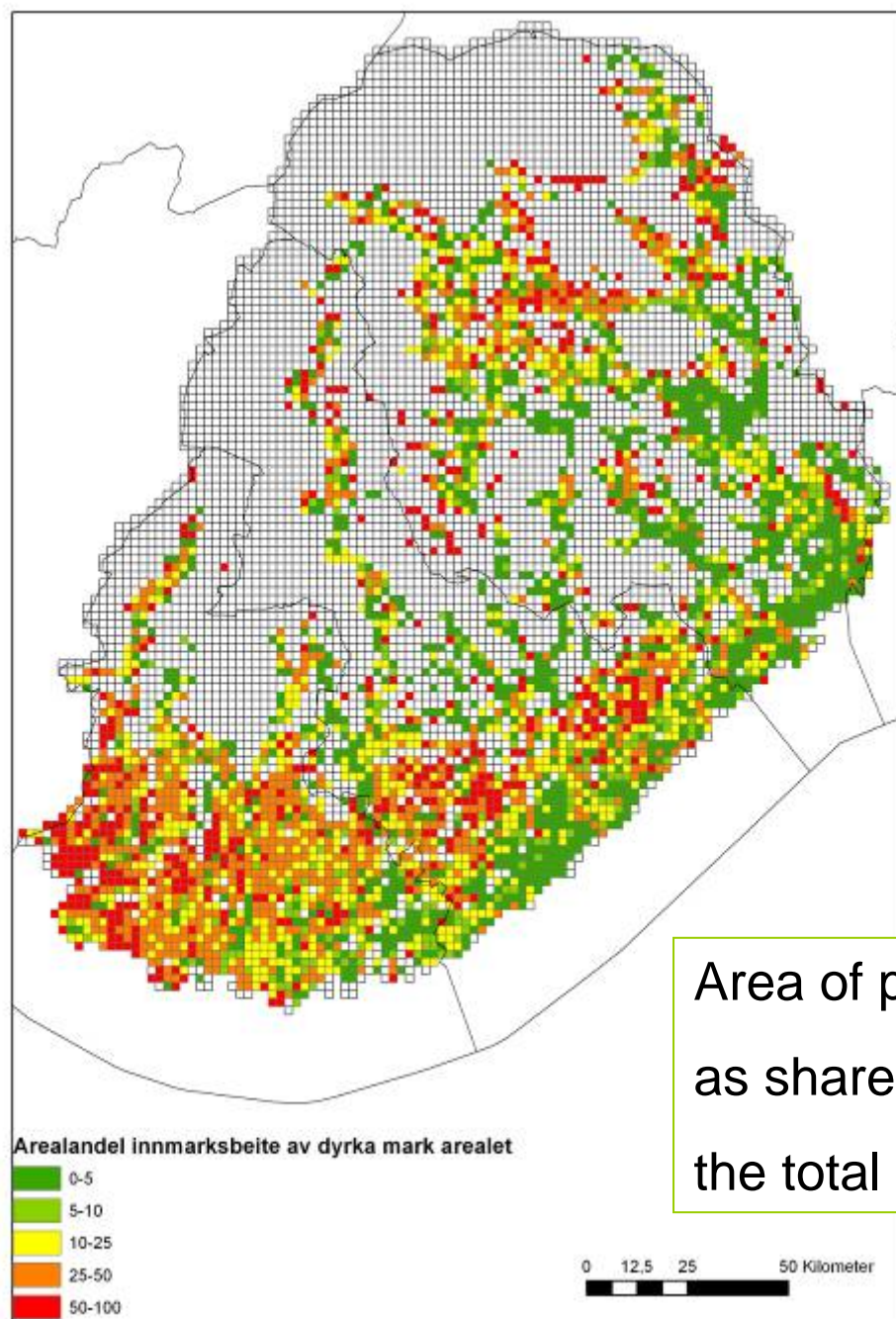
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Percent of area with  
farm land  
with slope > 20%



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Area of pasture,  
as share of  
the total farm land

Data quality – example stone fences





How is the quality?

An example







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## Selection: Valley and mountain districts

Share of cells that satisfy the criteria (%YES)

		Criteria	%YES
1	% pasture of famed land	20%-70%	26
2	Length of stone fences, m	150-1300	21
3	Number of old farm buildings	>0	56
4	Types of land cover (max 14 groups)	>2	100
5	% of famed land with slope > 20 %	> 20%	35
6	Water and famed land in the grid	Yes	92
7	Old farm building / all farm buildings	> 0,3	48









# Morgedal



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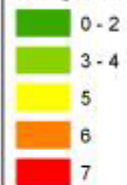
	Morgedal	Select 1	Select 2
% pasture of farmed land	18,6	15%-30%	15%- <b>100%</b>
Area with pasture, m <sup>2</sup>	64153		
% farmed land wit slope > 20 %	6,73	<b>5-100%</b>	5-100%
Length of edges of farm land, m	9612		
Length of stone fences, m	1200	1000- 1300	<b>150-1300</b>
Old farm houses (SEFRAK)	21	>15	>15
# of land cover types (14 groups)	10	>=8	>=8
Old farm buildings/farm buildings	0,3	> 0,25	> 0,25
Both water and farmed land in the grid	1	1	1



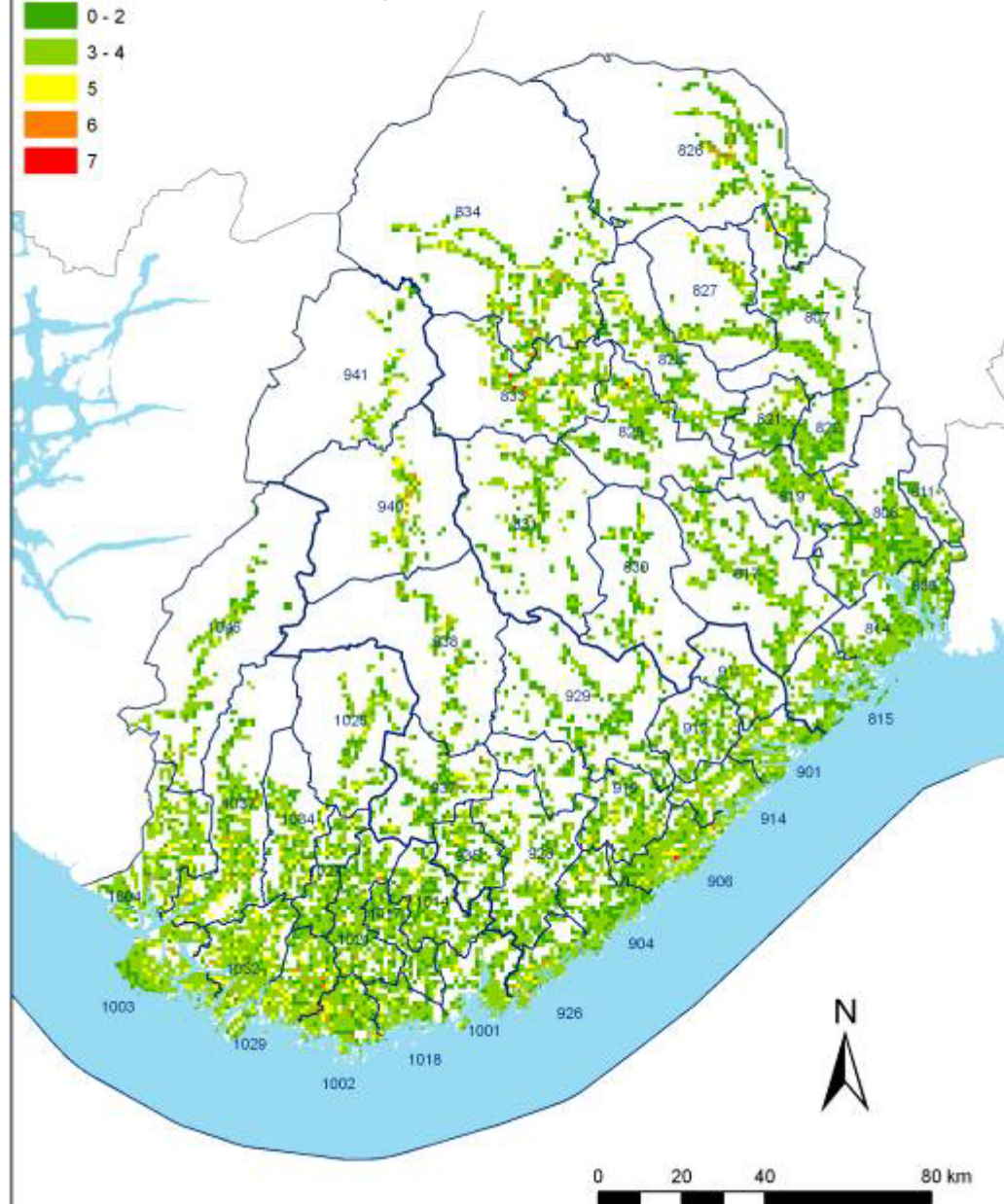
Tegnforklaring

1 km rutenett

Morgedal utvalg

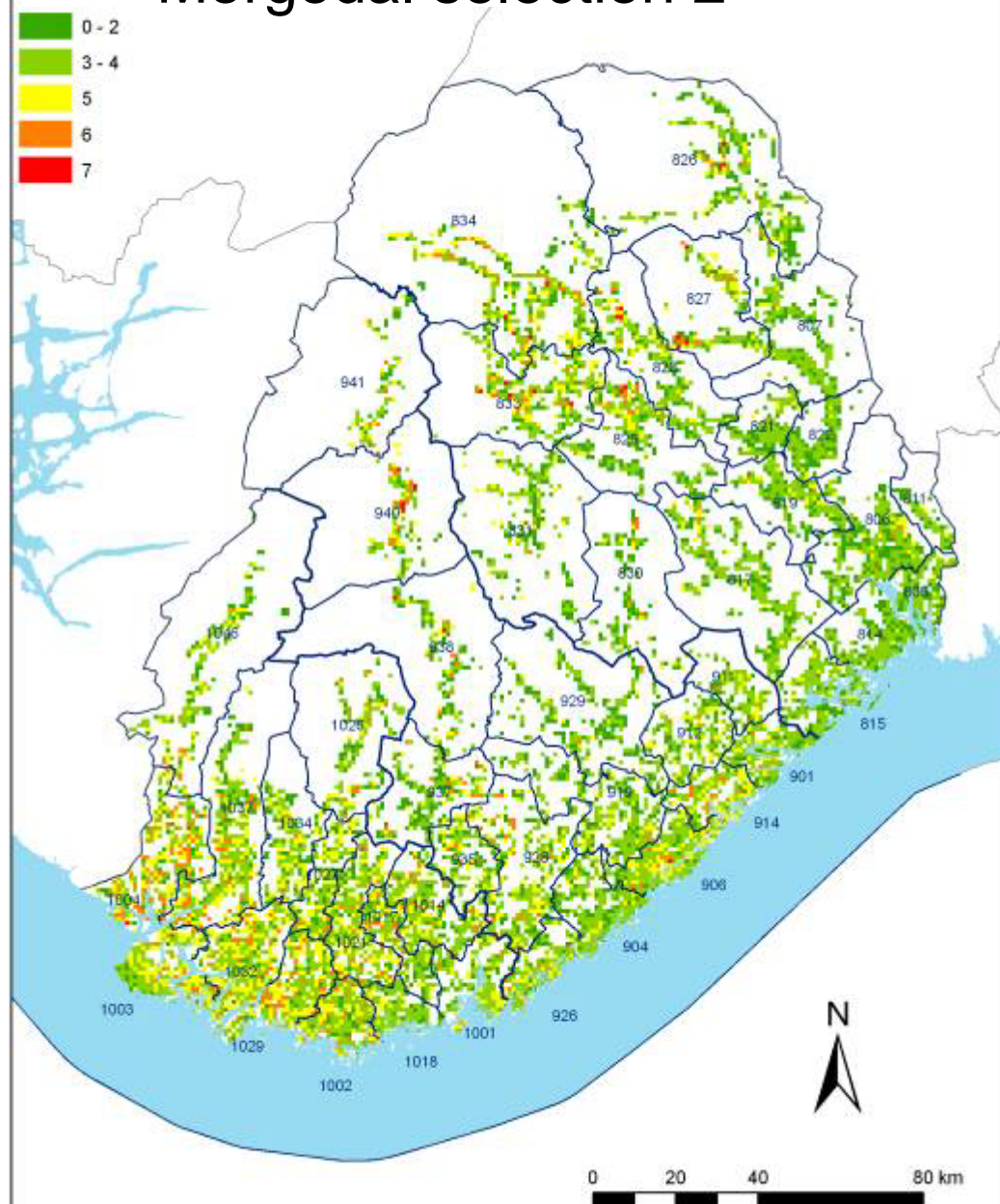


# Morgedal selection 1



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## Morgedal selection 2



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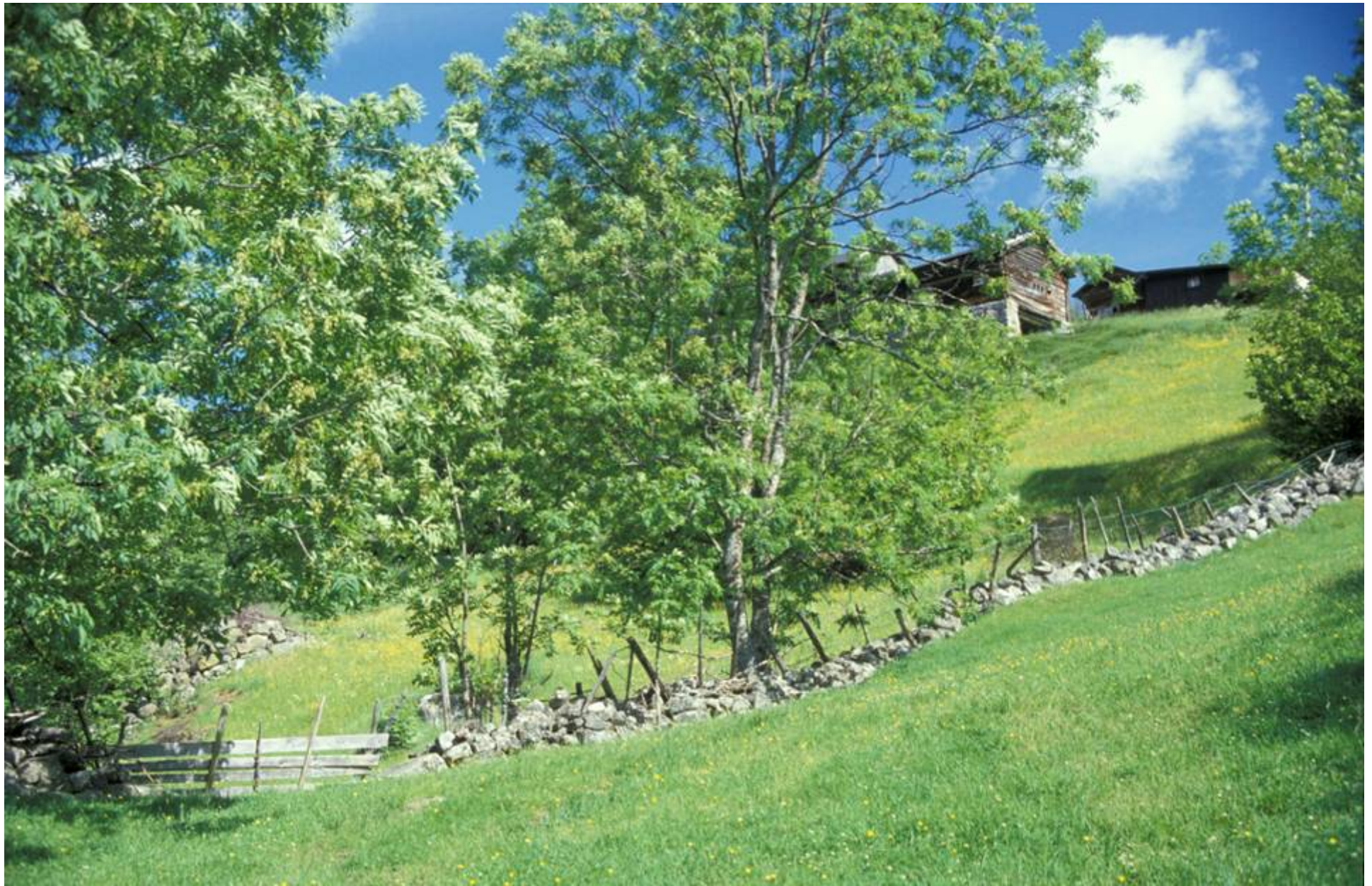
# Arendal



# Åsgrend in Tokke







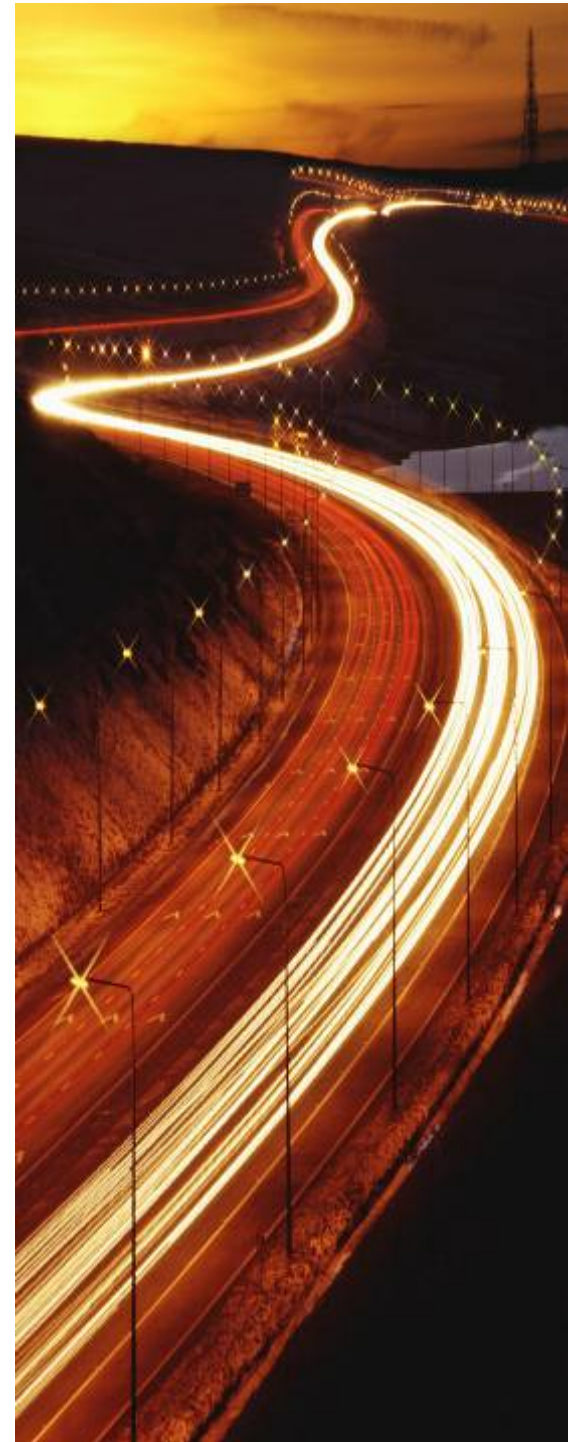
Åsgrend in Tokke (photo Oskar Puschmann)

## Other locations

- We have also looked at some other areas:
  - A typical scenic landscapes along the coast
  - An valued area in the forest region
- Hix and diversity index are not easy to explain nor understand, however they tend to vary between the different location we have studied.



The road ahead



## Lessons learned

- Visualisation of the data directly from the database was valuable for the reference group.
- One should look within (farming) regions (somewhat homogeneous areas).
- Multiple grid sizes and aggregated data must be available for a given cell.
- We can find similar cells – we can pin point where to take a closer look.
  - We will probably be better at finding typical areas than special rare and interesting features.
- Data quality is an issue to look into ....

# Implications for future work

- We need to know what we are looking for!
- We need a better theoretical foundation for what we are looking at.
- What we “value” and want to maintain needs to be defined.

Thus: How is the relationship between  
data we may measure and the quality of:

- Biodiversity
- Scenic beauty
- Accessibility
- Authentic cultural landscape





Morgedal (photo Oskar Puschmann)