MASS VALUATION

IMPROVEMENTS FROM THE TECHNICHAL PERSPECTIVE IN THE MASS VALUATION IN SWEDEN

BRUGGE 18TH OF JUNE 2024

HANS SÖDERBLOM

VERSION 1.0

LANTMÄTERIET

TECHNICHAL IMPROVEMENTS FOR MASS VALUATION

Is the Machine Learning process a better tool for to estimate property values for taxation in Sweden compared to the present system?

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SALES VERIFICATION PROCESS

AUTOMATICAL CONTROL FOR FAMILY RELATIONS IN SALES

Sales in the mass valuation process for the assessment of single family house 2024

Code for Not Representative sale	Number of sales	%
99	2 383	0,91%
AE	963	0,37%
AP	14 985	5,71%
ES	65	0,02%
EX	3	0,00%
IA	1	0,00%
IG= Community of interest, (second level)	16 661	6,35%
LK	395	0,15%
LV	1	0,00%
S= Family relation (first level)	7 025	2,68%
TR	107	0,04%
TS	5 959	2,27%
UP1	4 270	1,63%
Representative sales	209 507	79,87%
Total number of sales	**262 325**	100,00%

AUTOMATICAL CONTROL FOR FAMILY RELATIONS IN SALES

We extract the social security number of the buyer for each transfer and put it in a special file.
This file is sent via a webservice to Swedish Tax Agency and the Civil register.

The process is a two-step process:
We get back a supplement to this file where it is clear for each social security number which relationship each social security number has in direct ascending or descending order (parents/children).

Then we make a match based on these relationships if any of these relationships' social security numbers are thus found as sellers . If, there is a relation and we mark the sale “Relation”.

We then make a new file with these relationships' social security numbers and send back once again to Swedish Tax Agency and the Civil register
We get back a completion with new relations for the previous relations. This is to find out if there might be a relation in the next level (mother + grandparents + siblings).
Here we instead mark with “community of interest”.

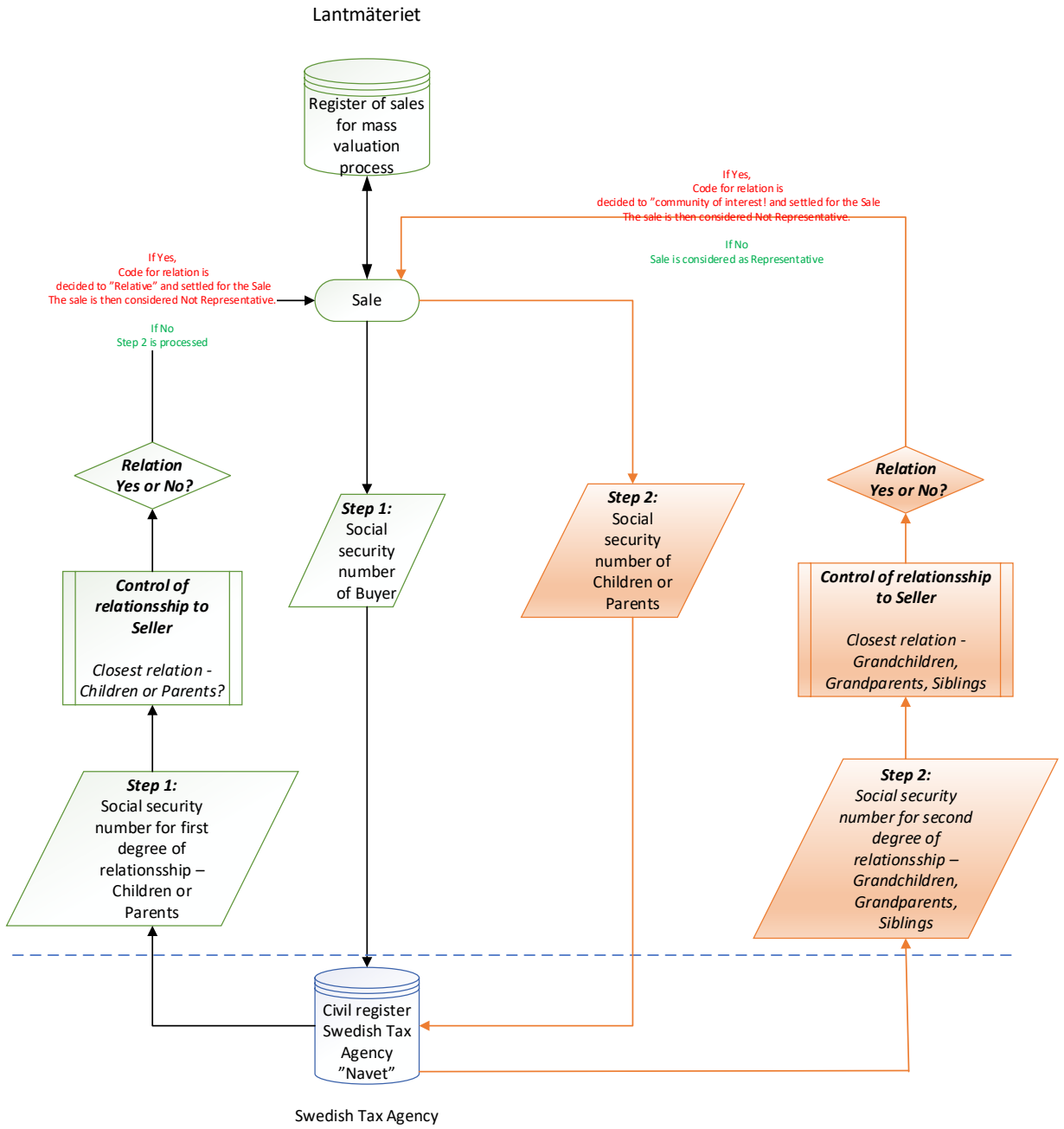
CONTROL PROCESS

Step 1
First level:

Closest relation to children or parents

Step 2
Second level:

Relation to grandchildren, grandparents or siblings



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MASS VALUATION OF FOREST PROPERTIES

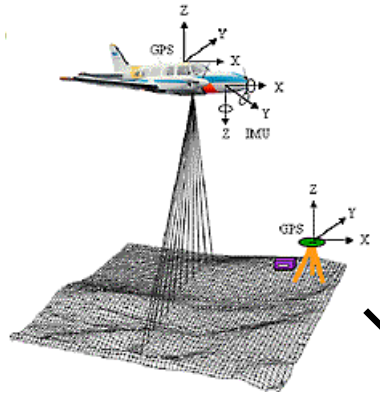
ASSESSMENT OF FOREST PROPERTIES

The standing volume of forest:

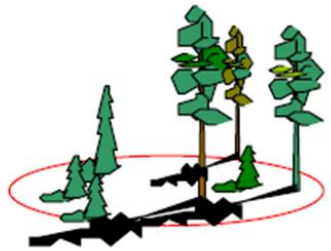
- Is a very important value factor
- Can never be determined exactly, it is only an estimate
- Is always changing over time due to growing, harvesting, storm damages, etc.
- Is difficult to estimate for the forest owner – he/she needs a recently made standwise forest management plan (which is relatively expensive) or a similar skilled estimation of the growing forest - otherwise a high risk of incorrect values of the volume

This means that modern methods that allow gathering information without asking the forest owner would mean a big improvement for both Lantmäteriet and the Swedish Tax Agency!

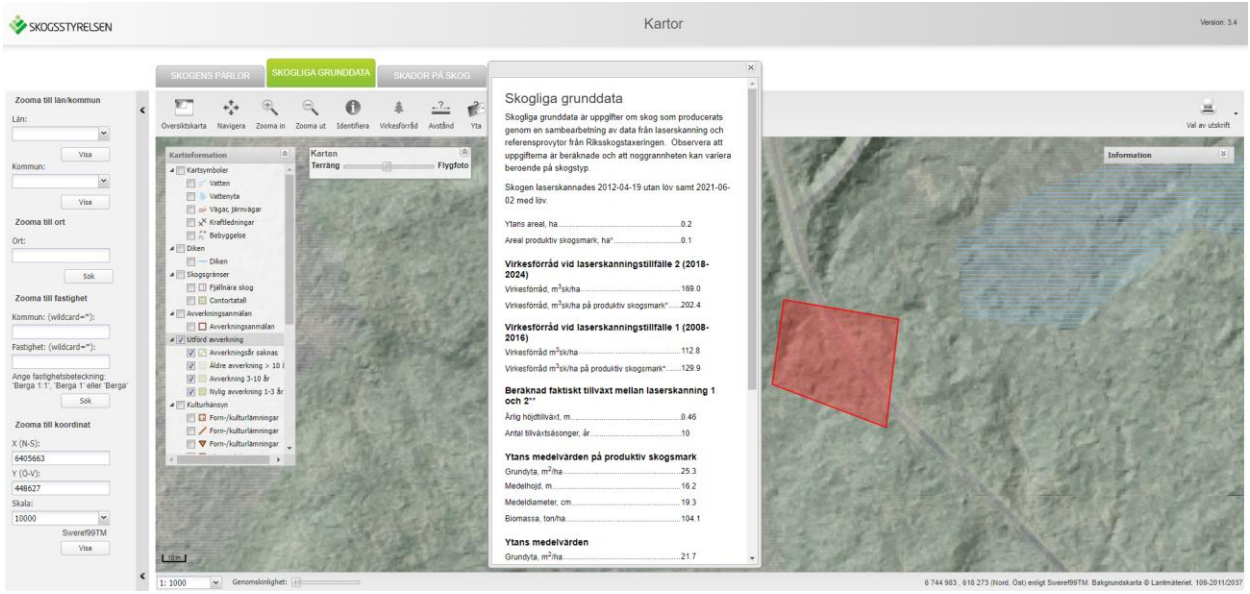
FREE NATIONWIDE ”FOREST MAP” IS AVAILABLE AT THE SWEDISH FOREST AGENCY



$$\sqrt{v_i} = \beta_0 + \beta_1 h_{p30} + \beta_2 h_{p90} + \beta_3 (h_{p90} * vr) + \varepsilon_i$$

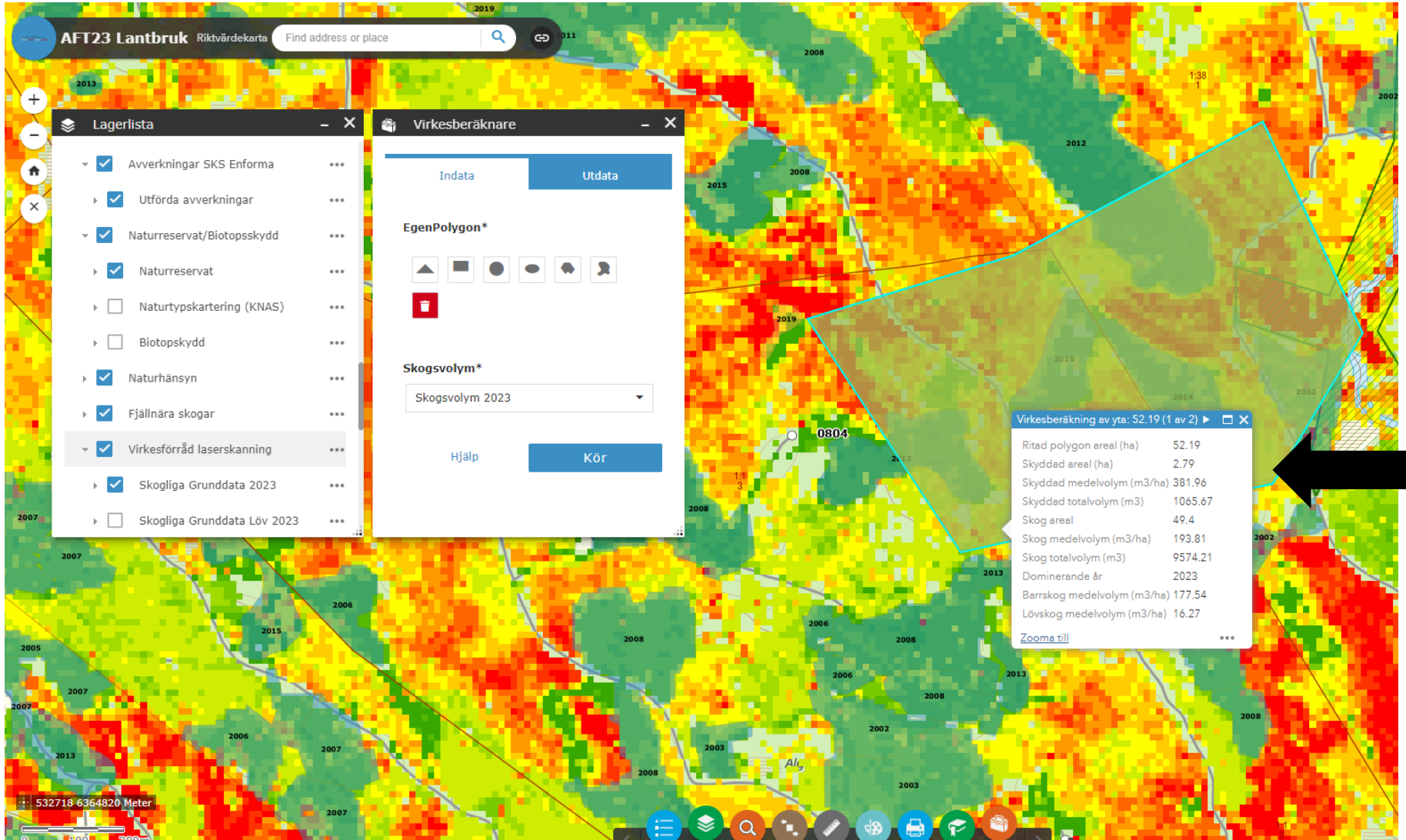


National Forest Inventory plots

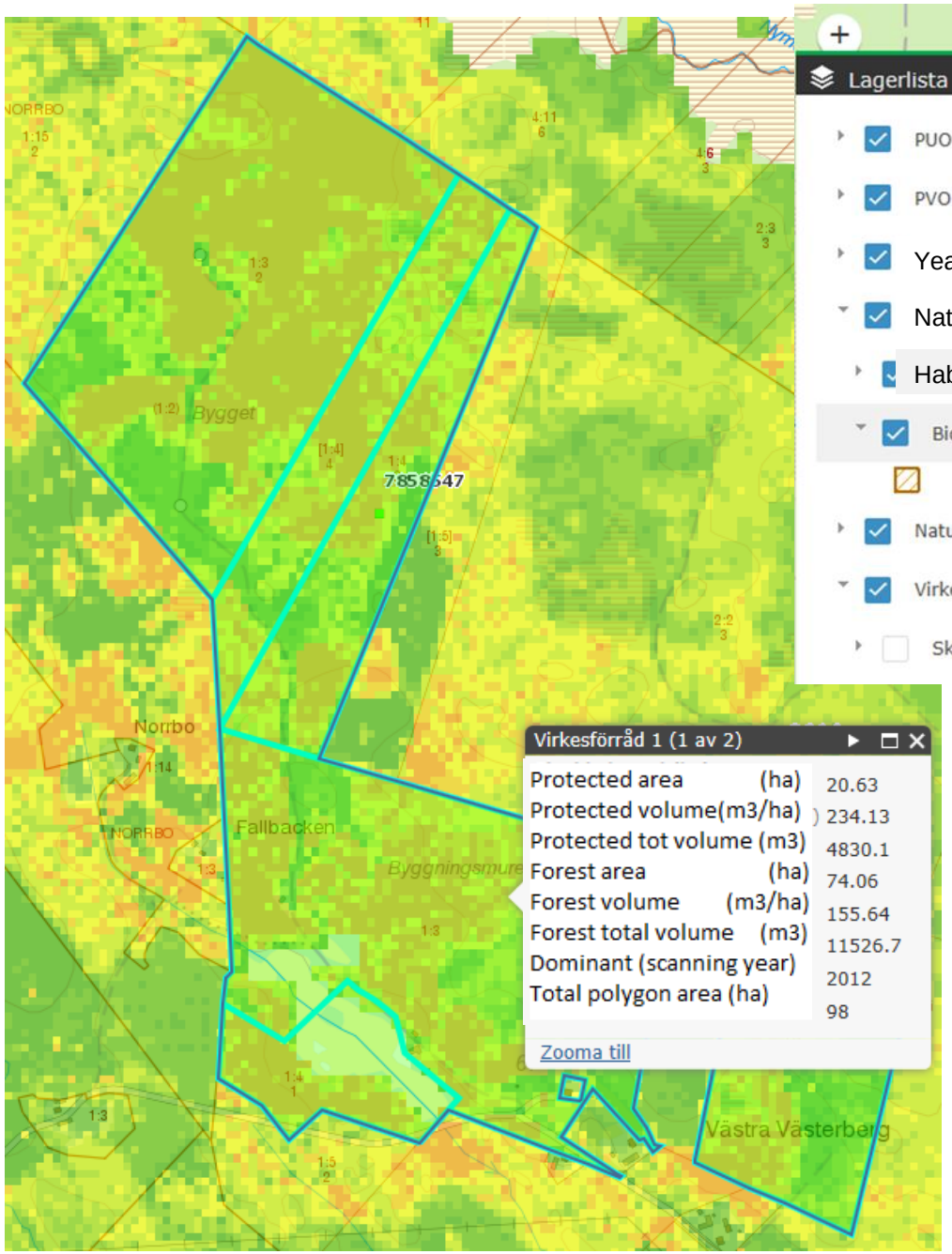


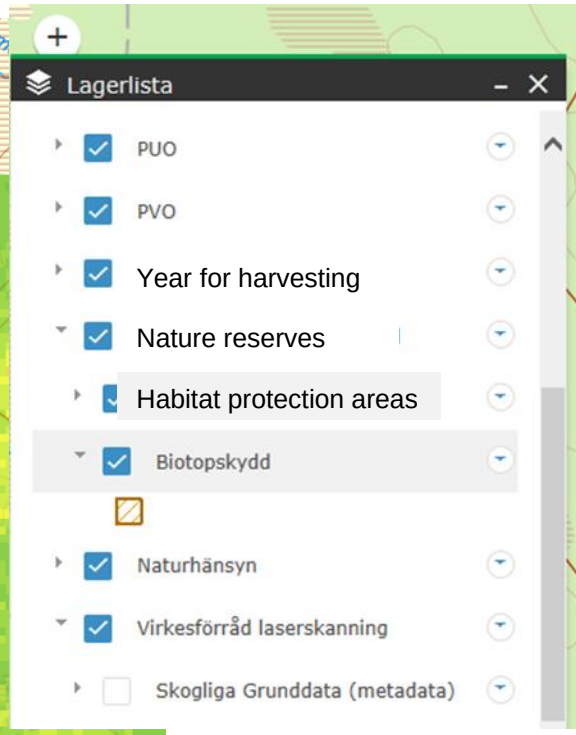
www.skogsstyrelsen.se/skogligagrunddata

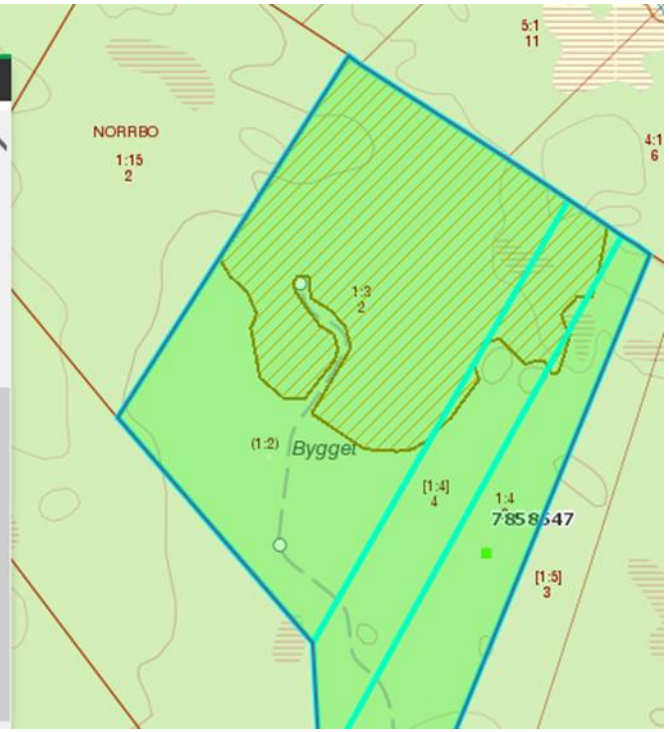
MASS VALUATION SYSTEM – TOOL FOR CALCUALTION OF GROWTHING STOCK



Polygon 52,19 (ha)
Protected area (ha)
Protected volume(m3/ha)
Protected tot volume (m3)
Forest area (ha)
Forest volume (m3/ha)
Forest total volume (m3)
Dominant (scanning year)
Total polygon area (ha)







Additional visualized information:

- Nature reservs visualized

- Habitat protection areas

- Year for harvesting

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PILOT FOR IMPROVEMENT OF VALUATION MODEL FOR SINGLE FAMILY HOUSES

SEAVIEW

Estimation if influence of seaview could be isolated as an individual adjustment factor in addition to present value factor which is distance to shoreline.

Pilot studies has been performed in different geographical areas in Sweden for to improve the technichal process.

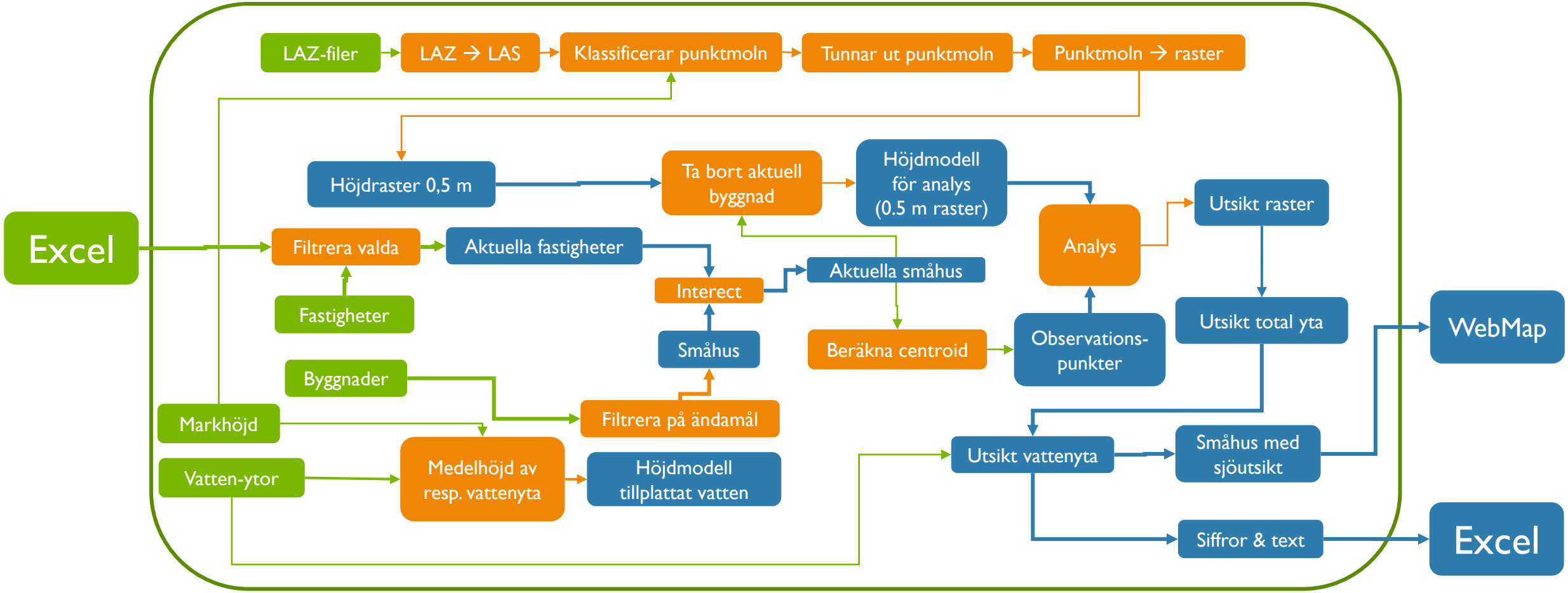
Complex digital process with different technichal steps and problems to handle.

PRECONDITIONS

Seaview is a subjective decision depending on the observer.
The preconditions used for the pilot model are:

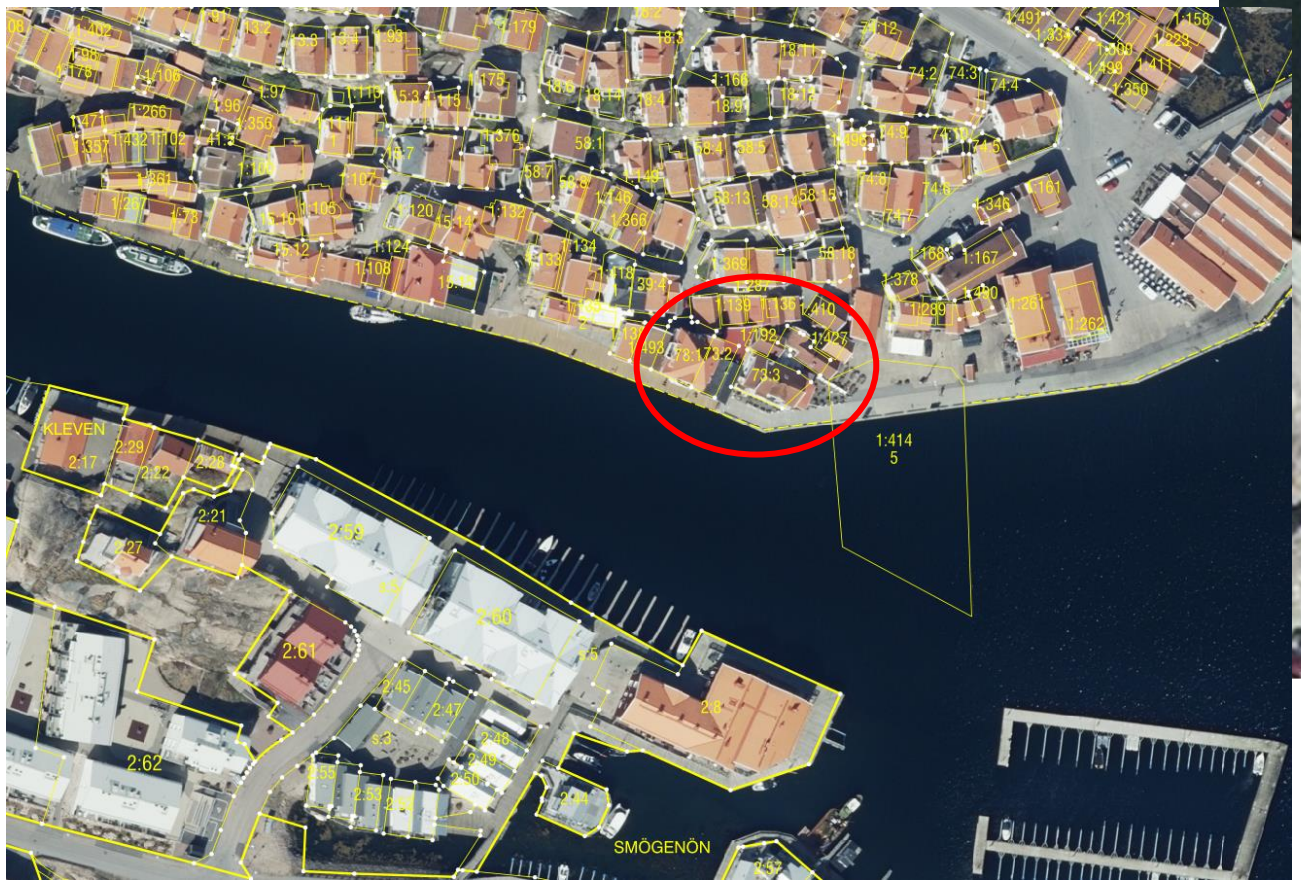
- Water surface > 2 hectar (20 000 m^2)
- Water course wider than 6 meter
- Max distance 3 km from decided point of view
- Size of available area possible to see from a point of view 2 meter above ground in the middle of a single family house.
- Size of available water area possible to see according to above by taking care of obstacles/hindrance for the view of:
  - Ground profile
  - Vegetation
  - Buildings

TECHNICHAL PROCESS



PILOTAREA VÄSTKUSTEN

3D-tool is used for visulization of possible seaview the model has interpreted.



TÄLLBERG 14:7

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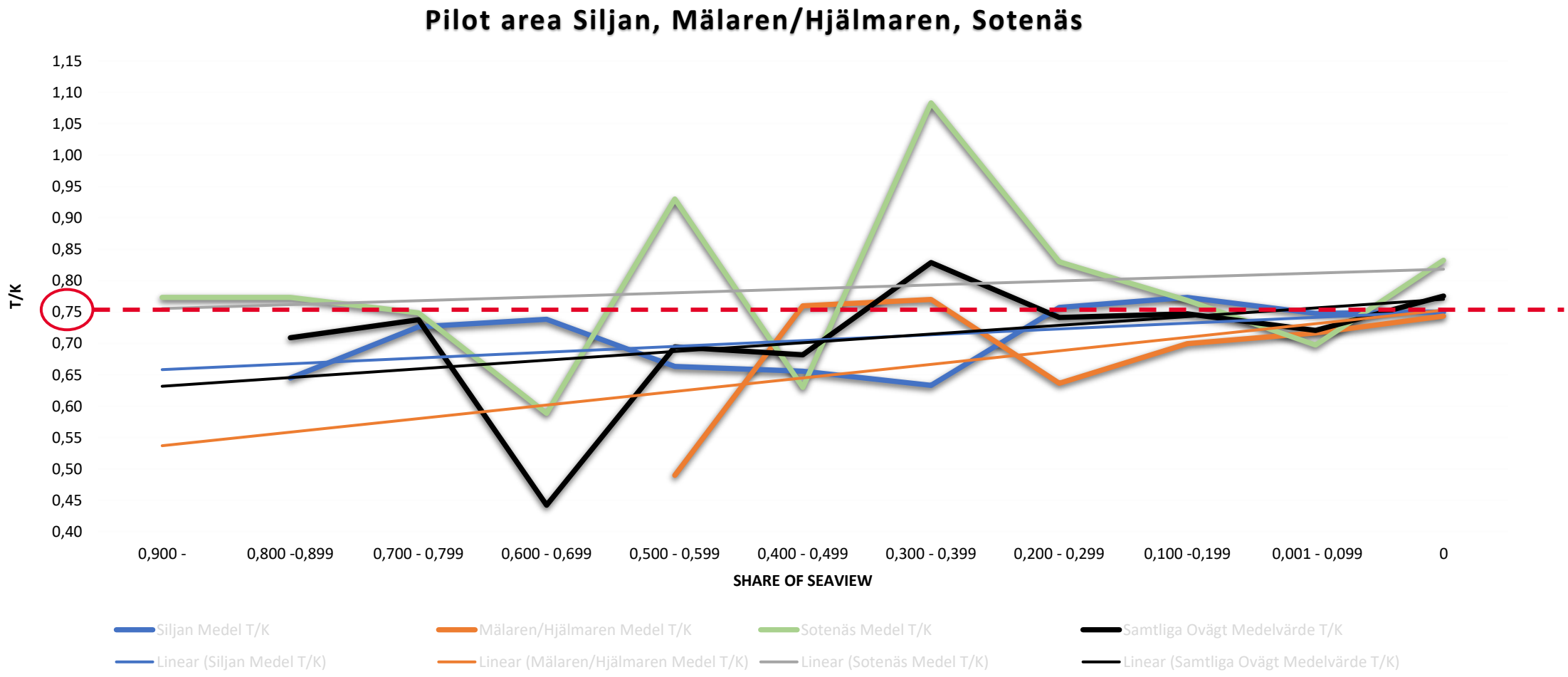
PILOTAREAS

A trend is visualized that a slight impact of seaview could be showned



MACHINE LEARNING

TECHNICHAL IMPROVEMENTS FOR MASS VALUATION

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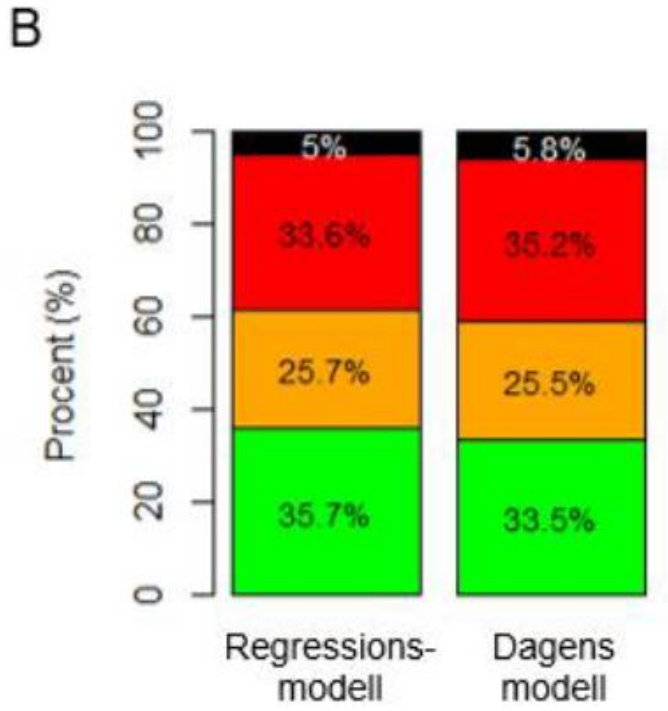
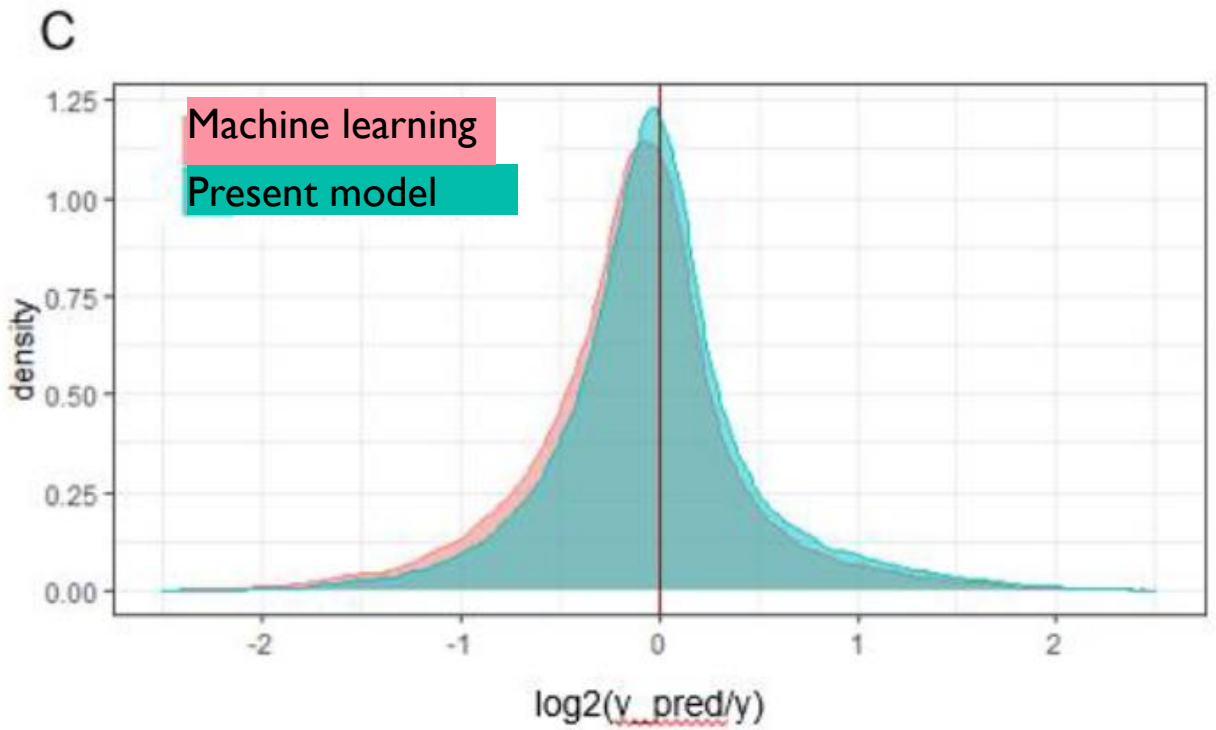
EXAMPLE: MACHINE LEARNING

Evaluation of the swedish mass valuation model for single family houses in comparison with machine learning techniques.





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