

Estimating potential stump harvest from multiple data sources - an example from a county in southern Sweden

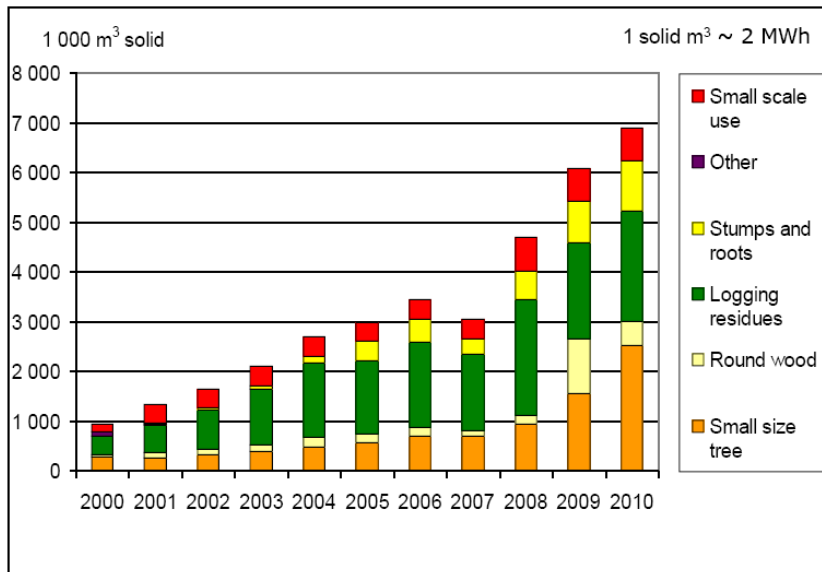
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Stump harvesting

- Has quite an importance in Finland
- Almost non-existing i Sweden
- What i s the potential?
- How can you estimate it?

Raw material of forest chips



Supply chain of stumps



Crusher



Kronoberg county in southern Sweden



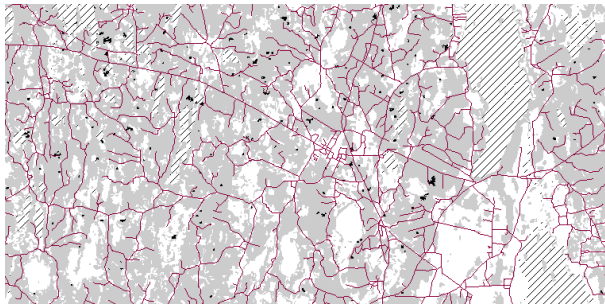
- Area 942 000 ha
- 75 % forest
- MAI ~6 m³/ha

Covering data available

- Combining NFI-plots and satellite data.
- 25x25 raster grid
- Using kNN to find best fit
- Using imputation for data
- Volumes of different species, Age

Harvesting potential

- Constructing stands by automatic segmentation
- Assigning harvesting probability for each stand
- Assign harvesting or no harvesting during next 5 years



Calculating extraction and long haul distances

- Utilizing also land use map for extraction distances (e.g. you can not extract across water)
- Road map was utilized for long haul distances

Restrictions

Environmental

- No harvesting in Nature reserves
- No harvest of stumps closer than 20m of water
- Leave 25% of stumps

Economical

- Only spruce stumps
- Standing spruce volume $>200 \text{ m}^3$

Results

- Annual stump volume available: 90 000 m³
- Annual energy from stumps available: 190 GWh

But...

- Stump extraction is very controversial due to unclear environmental effects
- As most (80%) of the forest land belongs to small private holdings (mean area of 40 ha), interested utilizers have to persuade those to get access.
- And we have very little knowledge if the owners are interested or not