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Forest data ecosystem – how to collect, share and collaborate

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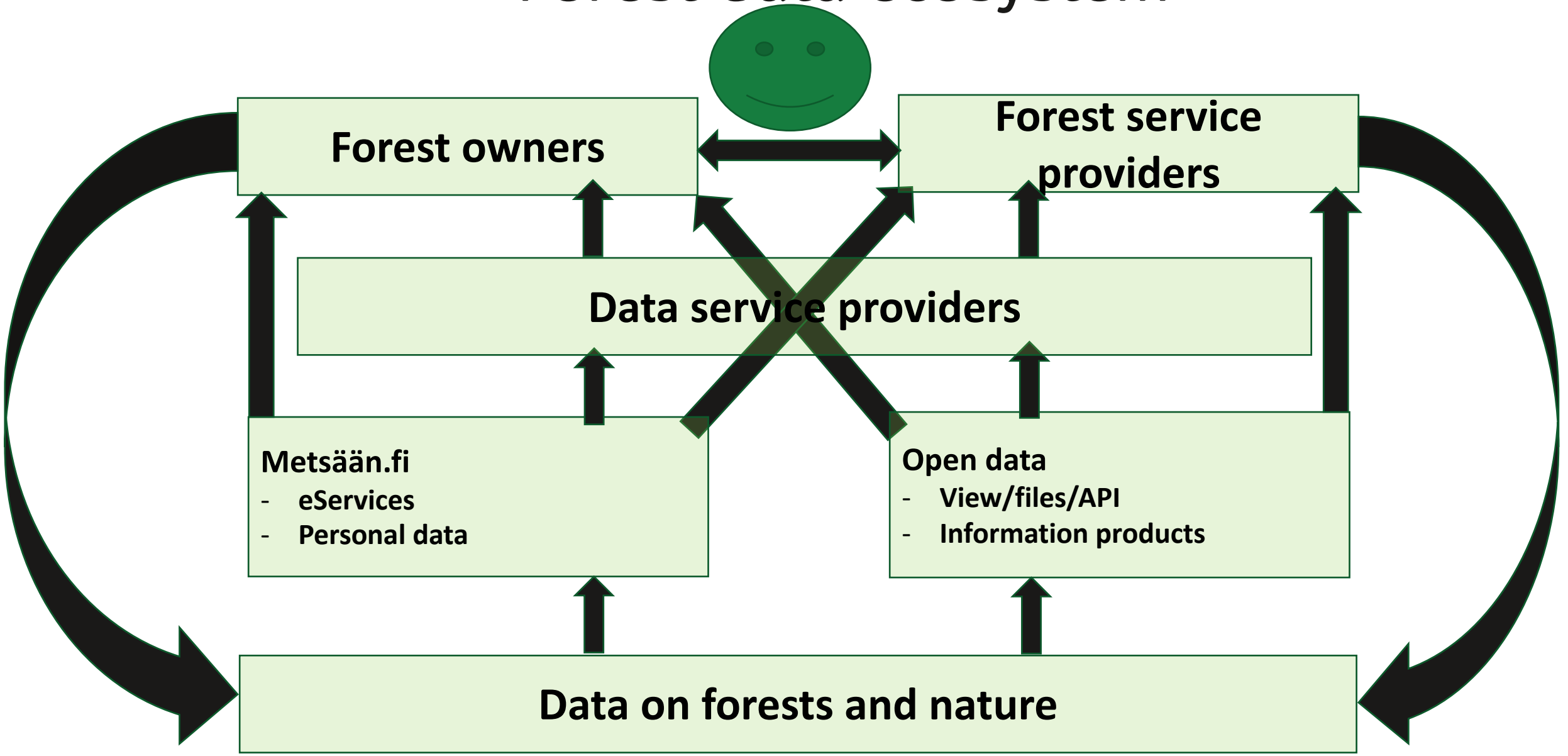
Forest data ecosystem



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Forest Inventory

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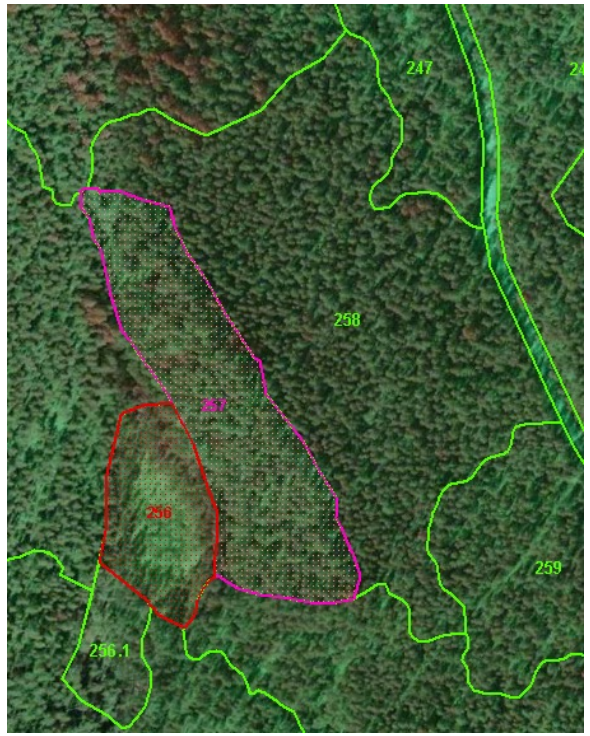
Forest Inventory (1/2)



”Quality increases and workload decreases in forestry operations using FFC’s forest data”

Product

- Timber estimates to forest stands
- Relatively accurate data (best in this planet)
  - Total volume +- 9-11 % (RMSE%)
  - DBH +- 7-9 %
  - Density +- 8-10 %
  - Height +- 3-5 %
- Simulation of forestry operations and annual growth of the trees
- Environmental values are also included
- Other byproducts like estimation units, CHM or harvestability maps (carrying capasity of the soil).
- https://arcg.is/1jCLmb0

Use cases of our product

- Operational forestry
  - Timber procurement
  - Forestry planning
  - Securing important habitats in harvesting
- Enforcing legislation
- Marketing
- Battling against wildfires
- Recruitment
- …

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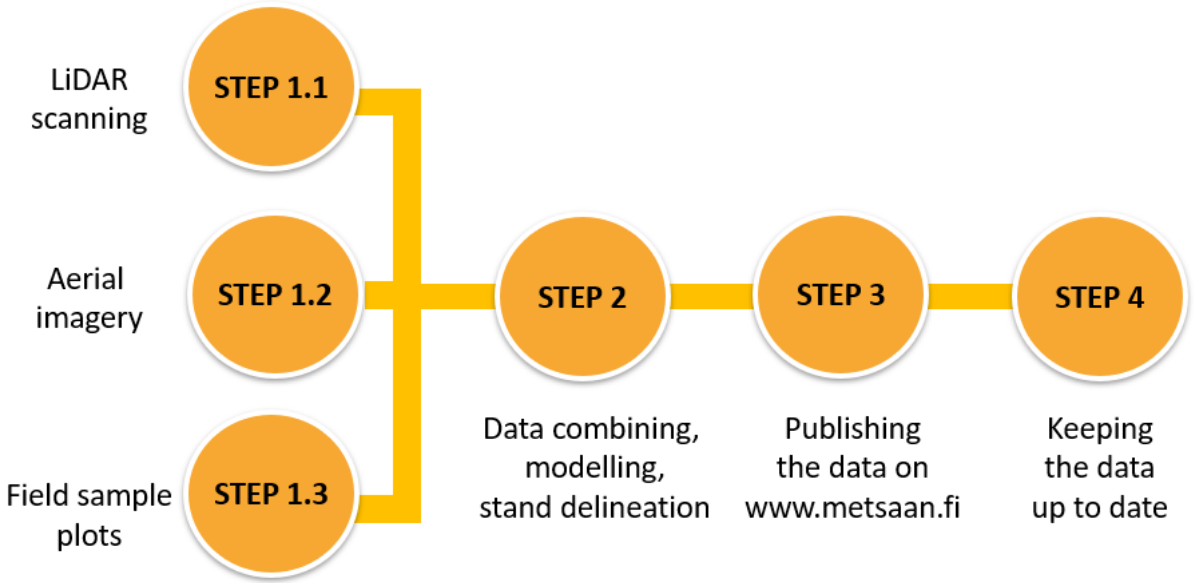
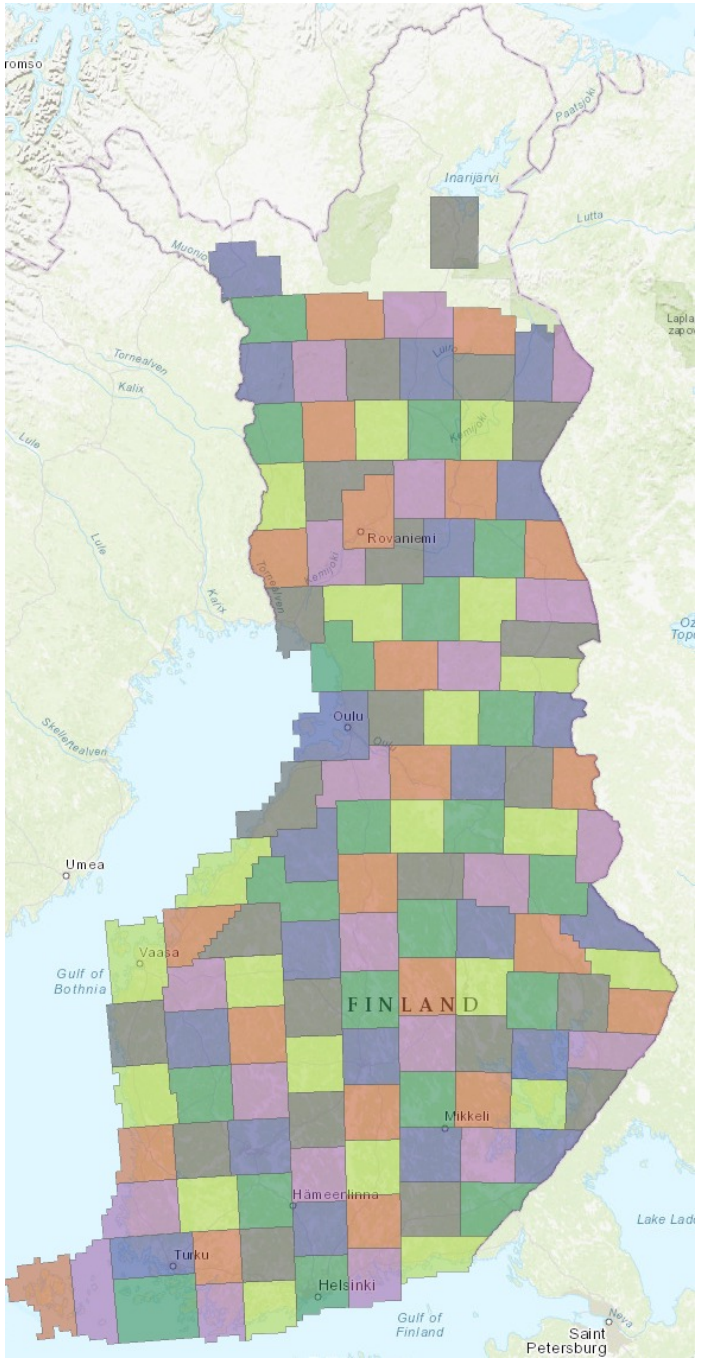
Forest Inventory (2/2)





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Sharing is caring

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How to share the data?

- Two main branches
  - Closed (including personal data) -> Metsään.fi eService
  - Open -> metsäkeskus.fi web pages

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No personal data according to the GDPR

- No personal data, like names of individuals or organizations.
- Data is so called ”information about the environment”.

- Personal data is behind strong identification in Metsään.fi eService. Private forest owners can use Metsään.fi without any charge.

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Availability

- www.metsakeskus.fi – Avoin metsä- ja luontotieto (pages only in Finnish)
- Four main themes
  - Forest data
  - Environmental data from forested areas
  - Information how forests are used in Finland
  - Structure of ownership of forest in different regions
- Map Services

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Datasets 1/2

- Forest Stands, 16,8 million hectares and 12,1 million individual stands
  - Standing timber, silvicultural and loggin suggestions, history of forestry operations on stands, soil and environmentally important habitats.
- Grid cell data to a 16 by 16 meter grid. About 30 million hectares, 1 195 million individual grid cells
  - Timber and soil info
- Field reference sample plots, ~ 134 000 pcs.
  - Timber-, soil- and location data
- Canopy Height Models (CHM)
  - Height raster of vegetation

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Datasets 2/2

- Forest Use Declarations, 12,2 million hectares,
  - Operation type, timestamp (arrival), planned operation for soil cultivation and forest regeneration operations.
- Subsidy applications (Kemera)
  - Type of work. Tending of young seedlings, ditching, timestamps, area

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Other Data products by the Finnish Forest Center

- Examples
  - Data products for tending nature values
  - Data products for silvicultural operations in peatlands
  - Predictions of near future logging amounts in Finland
  - Summary of private forest owners in Finland

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Specifications of data services

- Map services
  - Viewing applications that can be consumed from web browser
- Datasets
  - Pre-built file packages on different scales
    - Map sheet, municipality, province
      - GeoPackage, XML, GeoTIFF
    - HTTP/FTP
- Web Interfaces
  - National Forest Data Standard (xml)
  - OGC standardit: WM(T)S ja WFS sekä ArcGIS REST
- APIs
  - GP interfaces

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Terms of Use

- All dataset are published under Creative Commons Nimeä 4.0 license (CC BY 4.0). Free usage in any imaginable way, it is mandatory to give credits to FFC.
- Guided by the Act on Forest Information System.

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Benefits to our customers

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Benefits to our customers

- Dataset are easily available from our servers.
- Our clients have seen a substantial decrease in field work.
- Our stand level data is used as a basic data in forest planning.
- Marketing of foresty related services is efficient using our data.
- Totally new businesses has emerged.

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Collaborate

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Updates from the field

- Data from forest machines
  - Kaato –system (”fell down”)
- Silviculture actions
- Notifications from Metsään.fi

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The Future

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The Future

- Second forest inventory round has started in 2020
- We have seen an increase in the accuracy of standing timber estimates. At the moment the accuracy of estimates by variables are:
  - Total stem volume 6-10 % (RMSE%)
  - Density (basal area) 7-12 % (RMSE%)
  - Diameter 8-9 % (RMSE%)
  - Height 3-4 % (RMSE%)
  - Separation of treespecies (pine, spruce, broadleaved) works well
- Still in developement:
  - Estimation of individual tree groups
  - Estimation of different variables related to biodiversity
  - Automatisation of the prosesses in data production
  - Enhancing collaboration

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Thank You!