Luke
NATURAL RESOURCES
INSTITUTE FINLAND

Forest Monitoring to support national and European forest strategies

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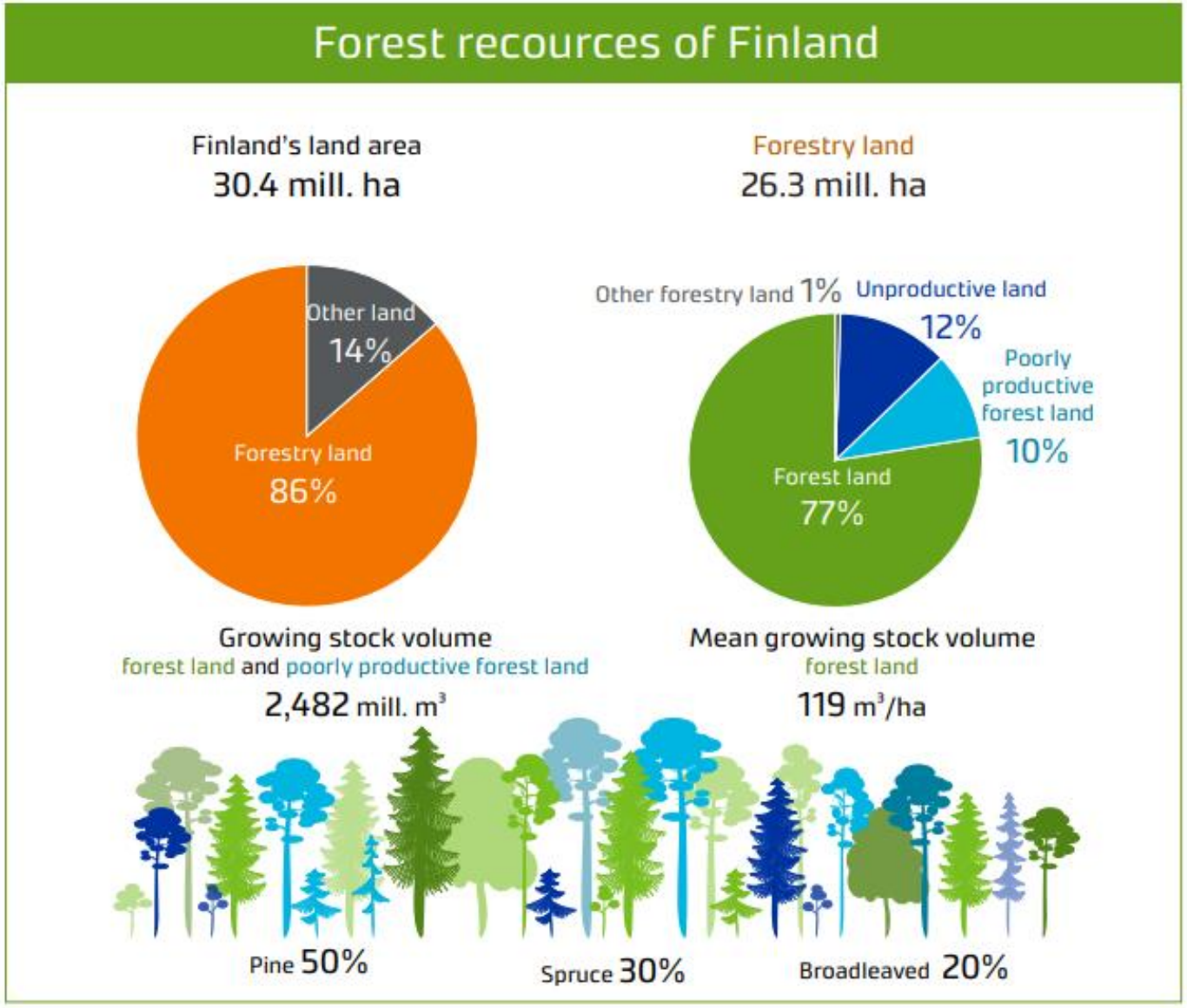
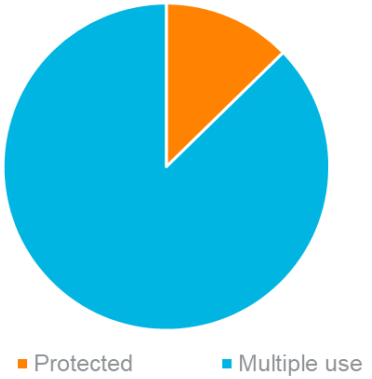


E-yearbook 2020 Luke

12.7 % of forests are protected



Inventory systems in Finland

I National forest inventory (NFI)

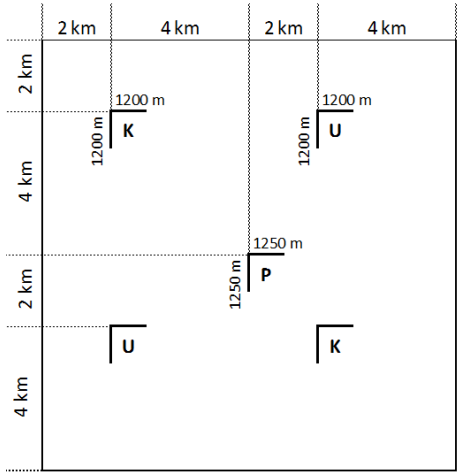
- Implemented by Natural Resources Institute Finland

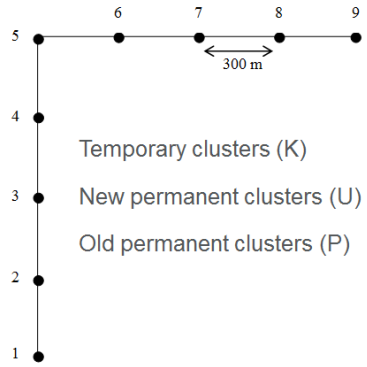
II Forest management inventory

- Implemented by Finnish Forest Centre + companies

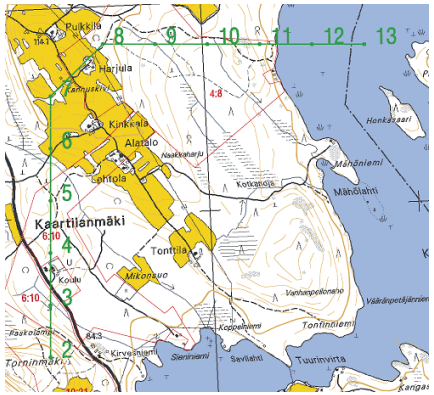
National Forest Inventory is statistical sampling

Field observations on sampled locations





For further information see e.g. Vidal C. et al. (eds.), 2016: National Forest Inventories - Assessment of Wood Availability and Use. Springer International Publishing, Switzerland 2016.

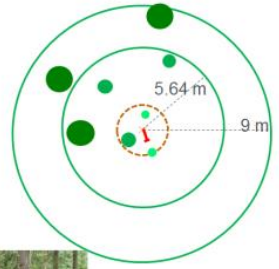


NFI Field measurements

Tree measurements on fixed area plot
Radius 9 m if $d_{1.3} \geq 95$ mm
Radius 5.64 m: 45 mm $\leq d_{1.3} <$ 95 mm

Dead tree mesurements
Radius 7m

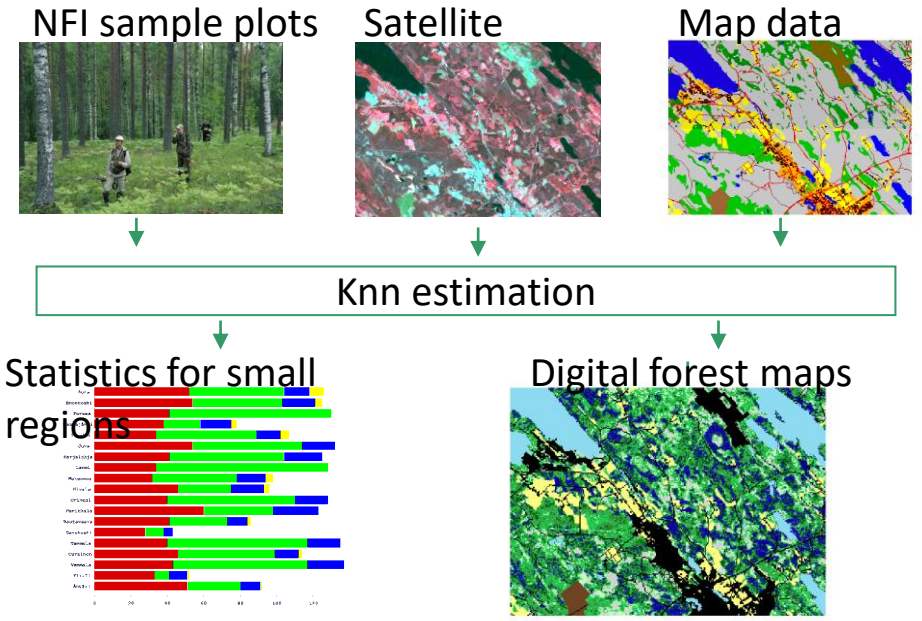
Stand description
More than 100 variables describing site, growing stock composition, management, damages…



NFI today

- Statistical sampling and extensive field measurements still the core of NFI
  - Statistics for regions on forest resources and state of forests
  - Typically 5 year moving averages
- Role of remote sensing substantial
  - Wall-to-wall forest resource maps biannually

- Information needs increased
  - Forest damages
  - Forest biodiversity
  - CO2 removals and emissions

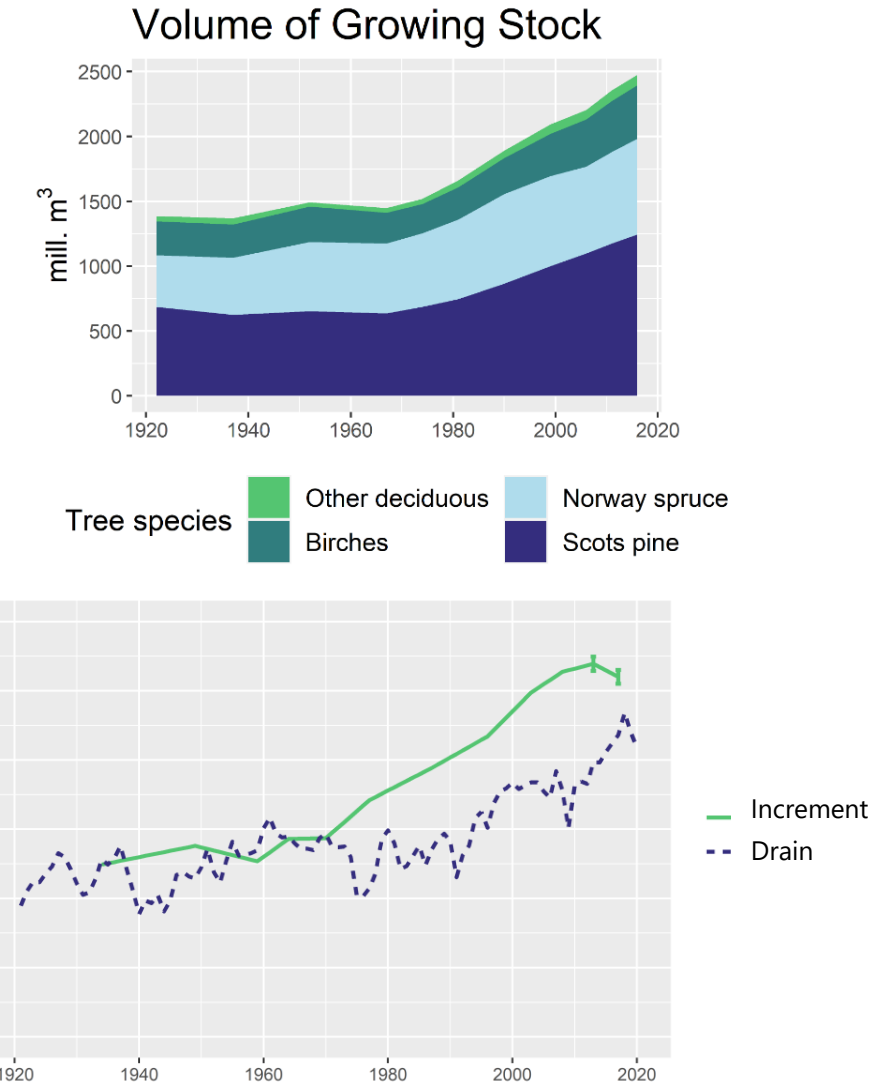


What data NFI produce?

- Forest resources: volume/biomass of growing stock, annual increments, harvests/total drain
- Area by land use class, forest type, tree species, site class, ownership category, age or development class…
- Quality of forest management practices
- Forest damage/disturbance

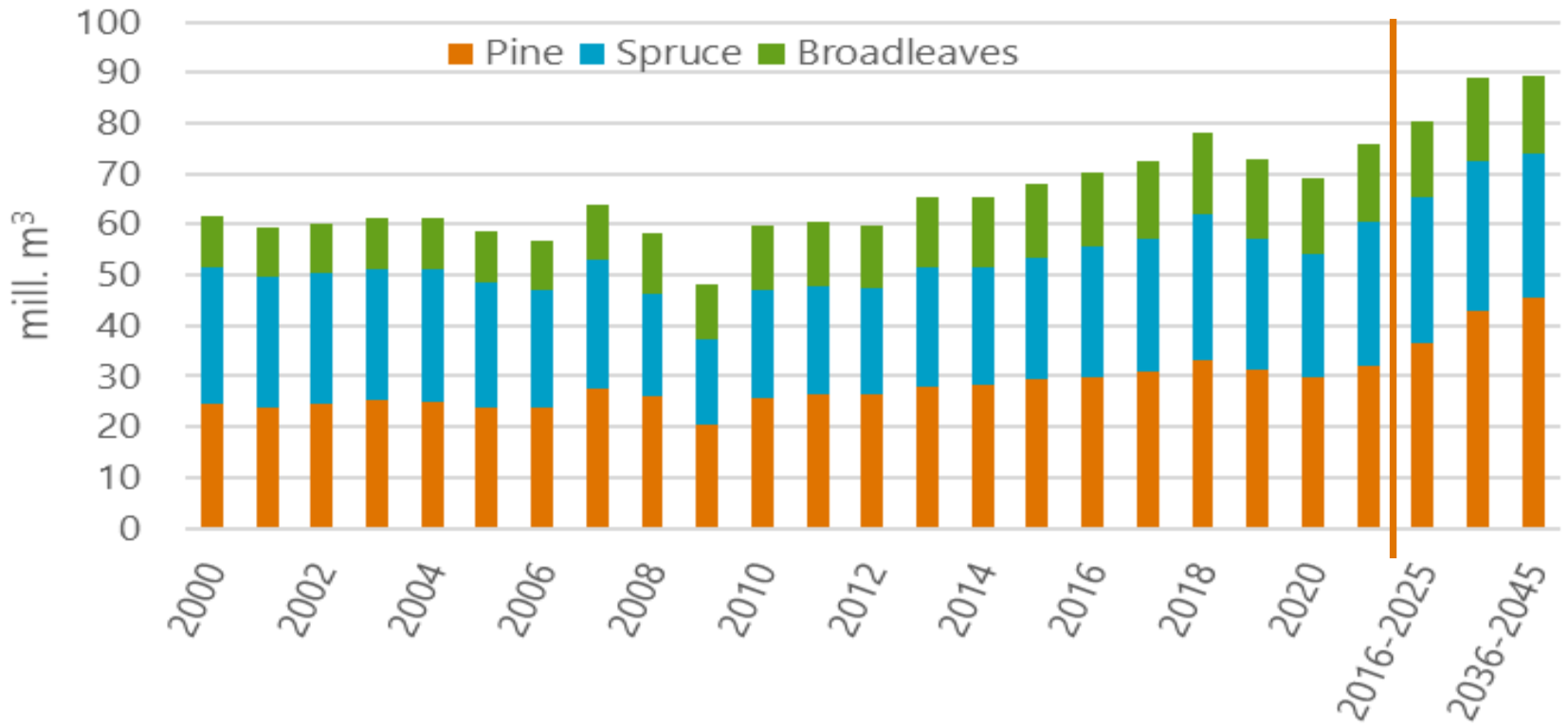
- Sustainable cutting level, CO2 removals/emissions of forest/LULUCF

Important element: reliability of the estimates



Scenario modeling is important part of NFI data use

Removals 2004 – 2017 and maximum sustained yield 2015-24, 2025-34, 2035-3044

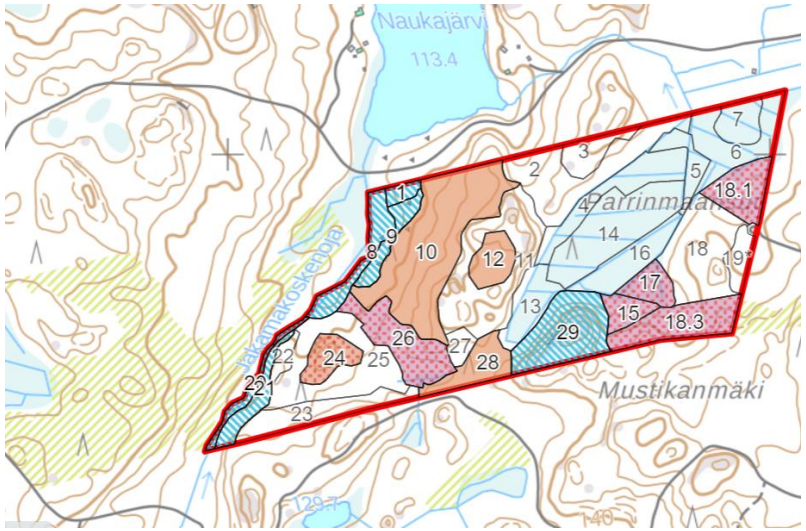


What data management planning inventories produce?

- Forest stand/polygon/pixel level estimates of forest resources

Data for

- the forest owner to plan management of the forest at stand level
- the forest authorities to check planned management activities
    - In addition to other map data
- industry to plan buying and harvesting of timber



Do we need European forest monitoring?

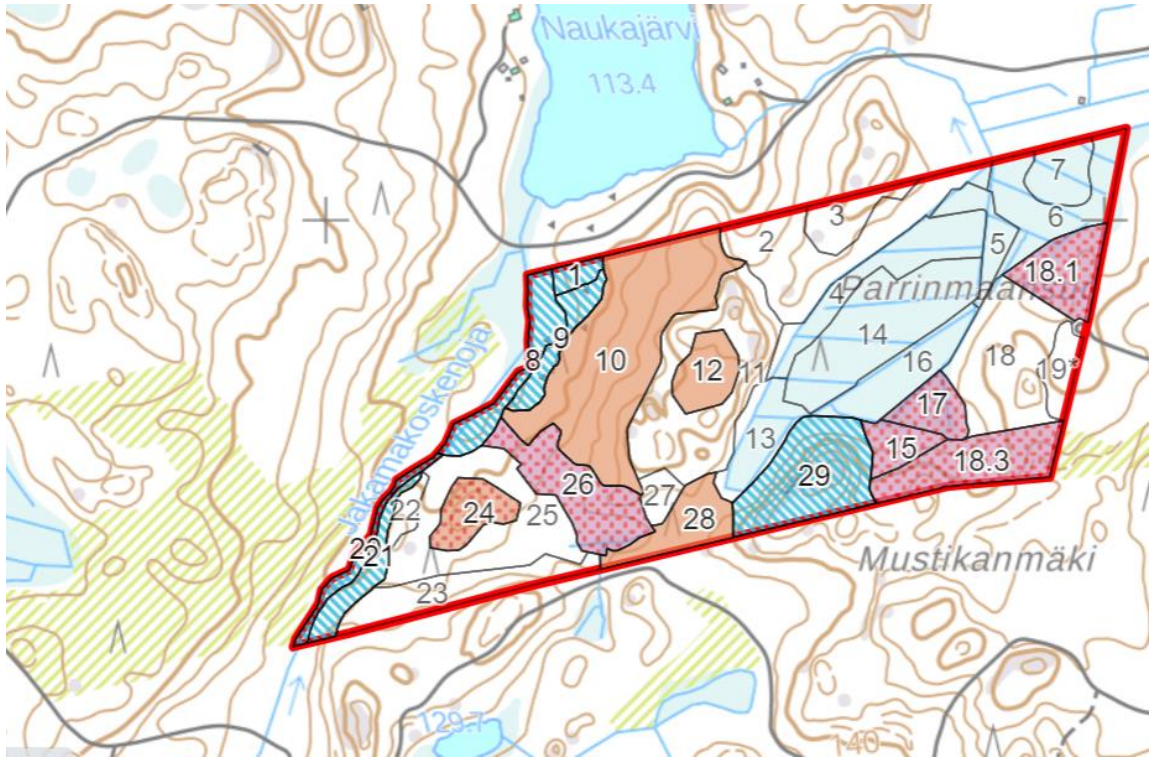
- National forest policies are based on reliable data on forest resources, state of forests, biodiversity and socio-economic data
  - How about European forest related policies?
- Monitoring the success of forest related policies needs forest monitoring data

Can NFI's serve European level forest monitoring? Indicators in the EU restoration regulation proposal

Indicator	In NFI	Comment
Standing deadwood	x	
Lying deadwood	x	
Share of forests with uneven aged structure	x*	Common definition missing
Forest connectivity	x**	Produced for Forest Europe by JRC
Common forest bird index		Bird Life produces
Stock of organic carbon		Extremely costly to directly monitor changes
Share of forests dominated by native tree species	x	
Tree species diversity	x	Common definition missing, influenced by plot size

Stand level information

- Aim: to provide detailed forest information at forest holding and stand compartment level
  - For the forest owner to plan forest management operations
  - For the industry to plan timber procurement
  - For forest authorities to monitor the use of forests and nature protection



Conclusions

- Forest related policies need to be based on forest and socio-economic data
- Monitoring the success of policies needs statistical data at relevant level
  - Biased data are dangerous
  - Analyses of changes: reliability of estimates need to be known
- Information needs at the policy level are continuously increasing, even faster then the inventory techniques
  - Continuous NFI is the ideal solution to produce annual statistics and to cope with changing information needs
- European level forest monitoring can be based on NFI's of the Member States

Thank you!

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