Forests and forest management in Slovenia

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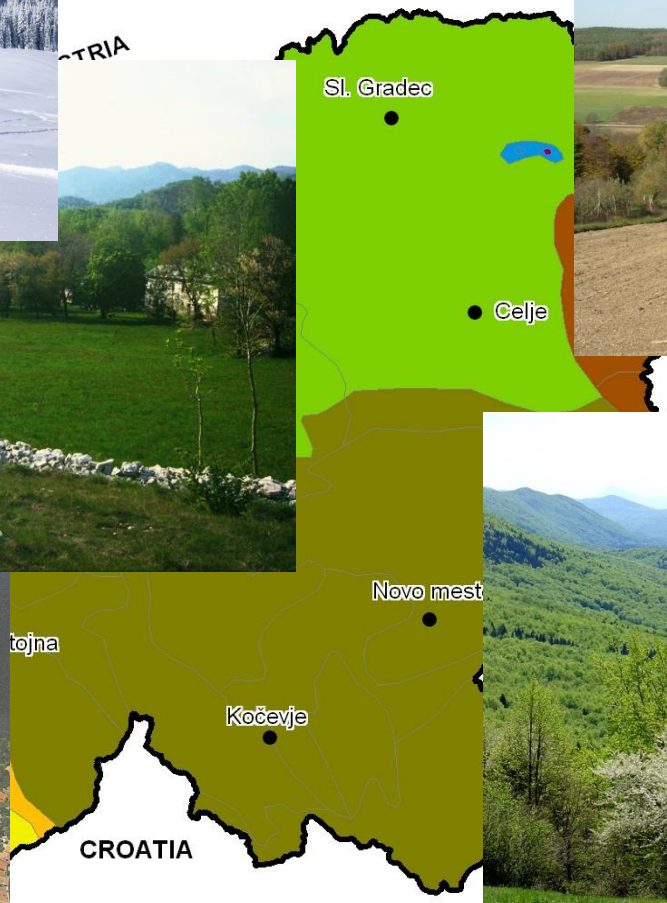
ZAVOD za GOZDOVE SLOVENIJE
Slovenia Forest Service

Forests; essential element of landscape

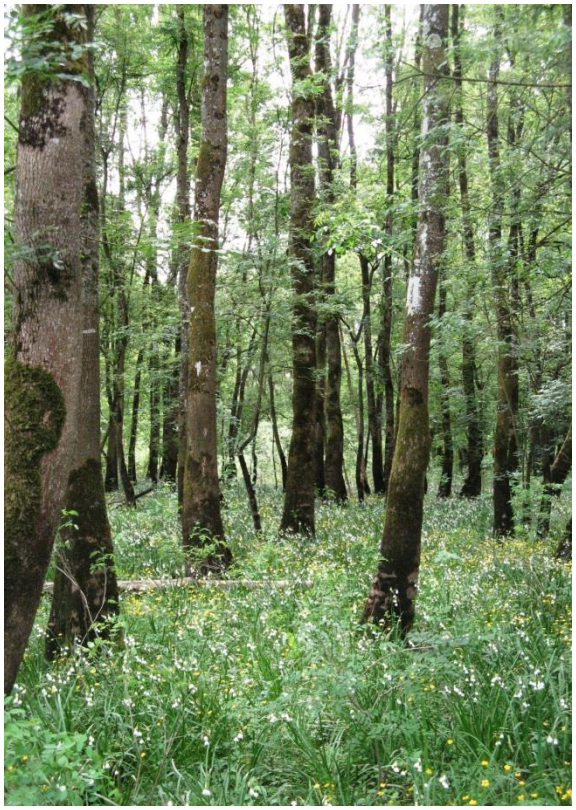
- Slovenia is 4th of the most forested countries in Europe.
- Forests covers 1,2 mio ha, which is 58 % of Slovenian territory.

Variety of natural conditions in a small area



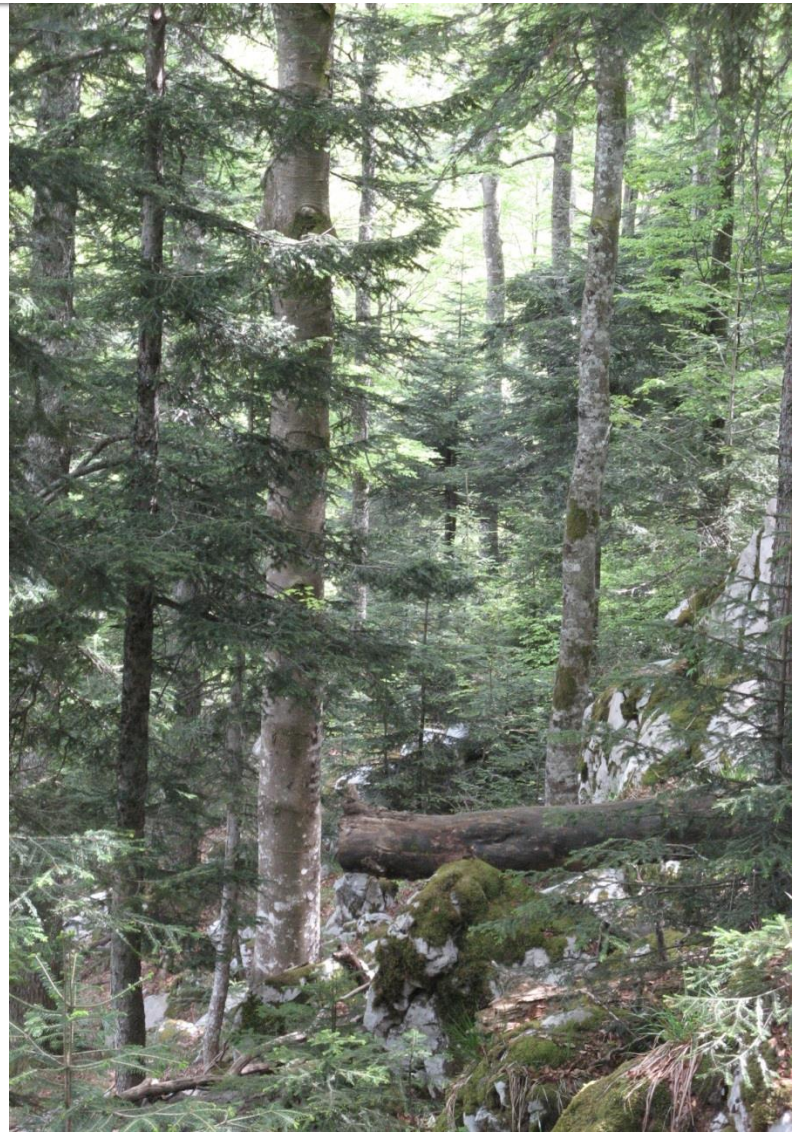
Result: great variety of forest types

Most Slovenian forests are located within the area of beech, fir-beech and beech-oak sites

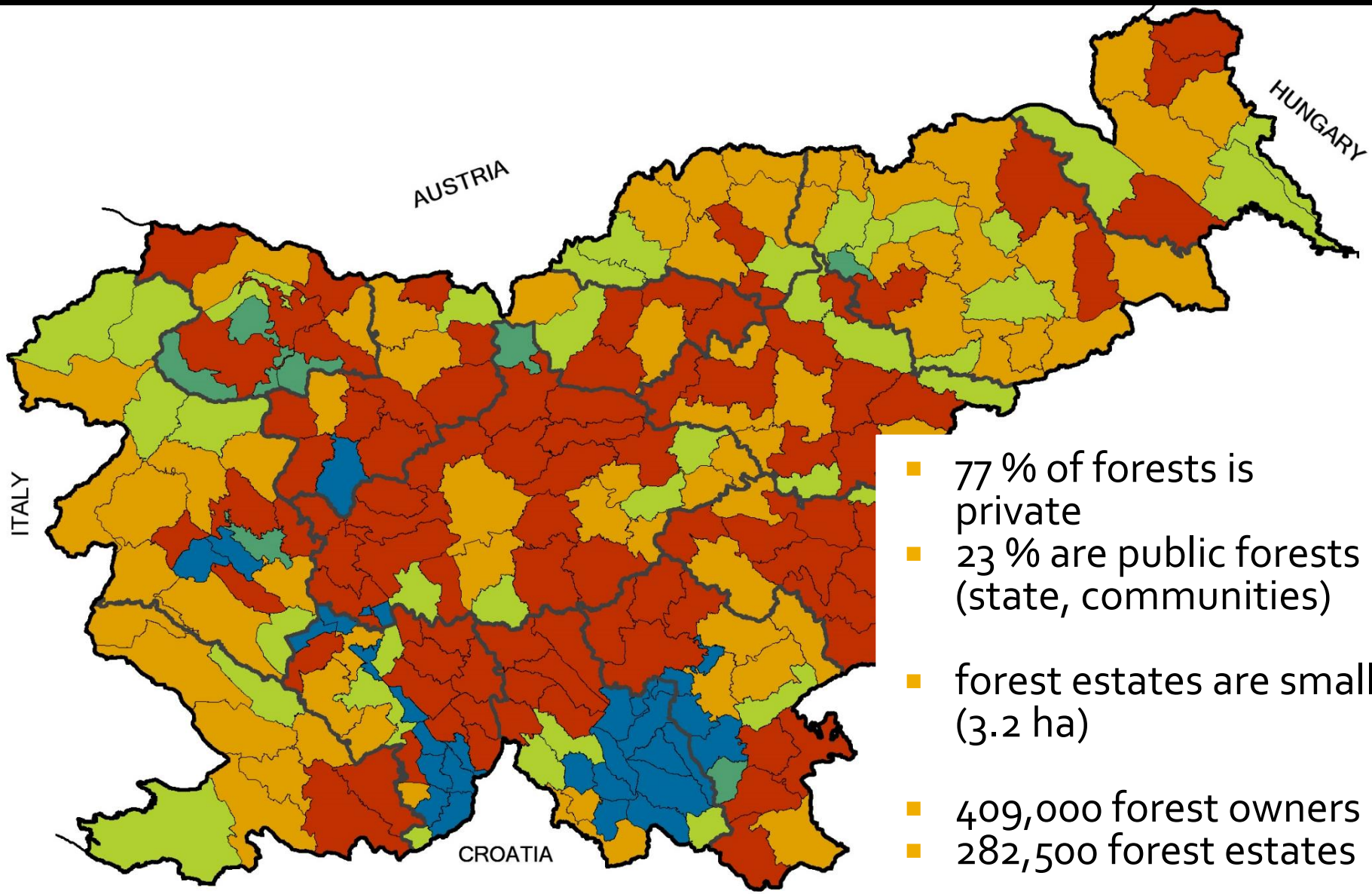


Diverse forest structure and tree species composition

- uneven-aged, with multi-layered stand structure
- mean growing stock is 304m^3 ha^{-1}
- mean annual increment is 7.4 m^3 ha^{-1}
- high amount of large diameter trees (dbh > 50 cm)
- 71 tree species; European beech (33%), Norway spruce (30%) and Silver fir (8%) predominate



Forests are mainly privately owned



- 77 % of forests is private
- 23 % are public forests (state, communities)
- forest estates are small (3.2 ha)
- 409,000 forest owners
- 282,500 forest estates

Fundamental principles of forest management

- Sustainability

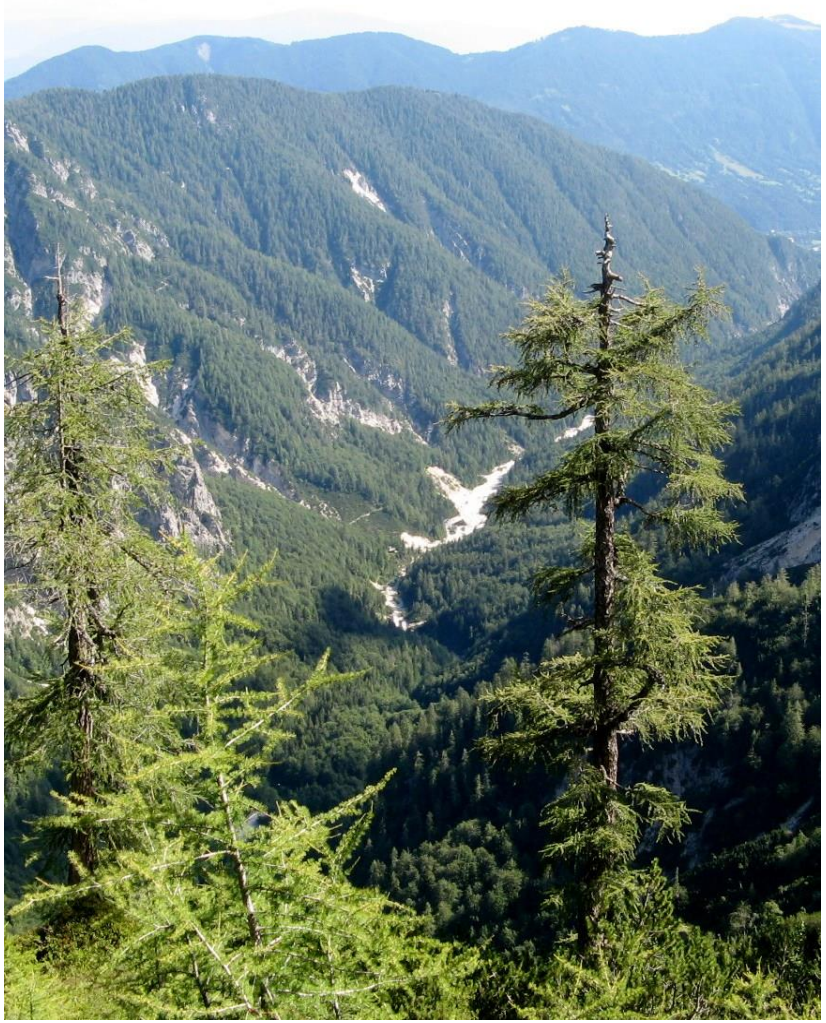
sustained preservation of forests, sustained use of their goods and services

- Multifunctionality

balanced significance of ecological, production, and social roles of forests

- Close to nature FM

FM that promote conservation of natural forest structure by mimicking natural processes



Multi objective forest management

Forests provide many goods and services

Forest management should ensure sustainable preservation of all forest functions → *multi-purpose, multifunctional, multi-resource, multiple-use, multi-objective forest management*






Legal bases of forest management

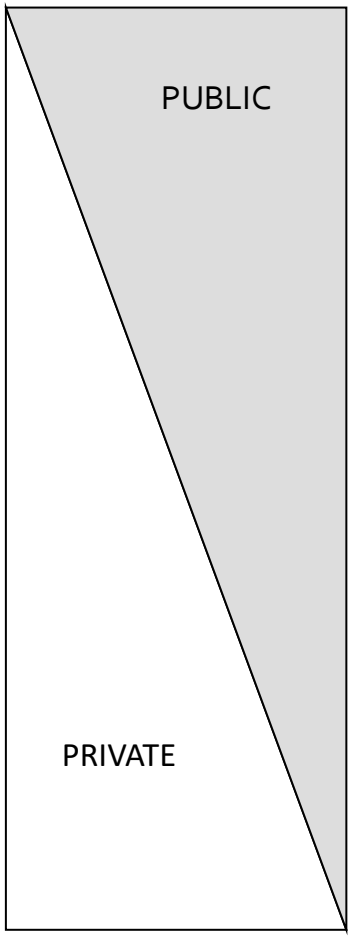
Forest management and forest use are directed by:

- Ministry of Agriculture, Forestry and Food as the supreme state institution
- Slovenia Forest Service as a public forestry service.

Main national documents:

- The Act on Forests: regulates protection, silviculture, exploitation and use of forests on the basis of forest management plans;
- The Forest Development Programme: defines the national policy on close-to-nature forest management, guidelines for the preservation and development of forests and conditions for their exploitation or multipurpose use.

Forest management planning is hierarchically organized



REGIONAL FOREST PLANS
(14 RU; 100.000 ha)

- strategic level
- forest and game management
- solving large scale problems
- forest function, multipurpose FM
- management ↔policy
- first RFP: 1970; renewed every 10 y.

FOREST MANAGEMENT PLANS
(232 FMU; 5.000 ha)

- tactical level
- inventory, monitoring
- management goals
- strategies for silviculture, functions, technology…
- concrete measures
- renewed every 10 years

SILVICULTURAL PLANS, PROJECTS
(compartment, 5-100 ha)

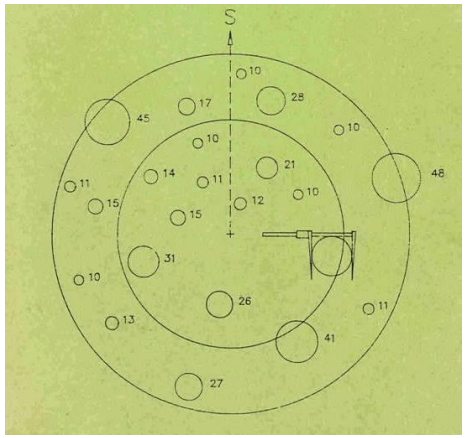
- operational level
- concrete measures
- detailed prescriptions for forest operations
- renewed after execution of measures

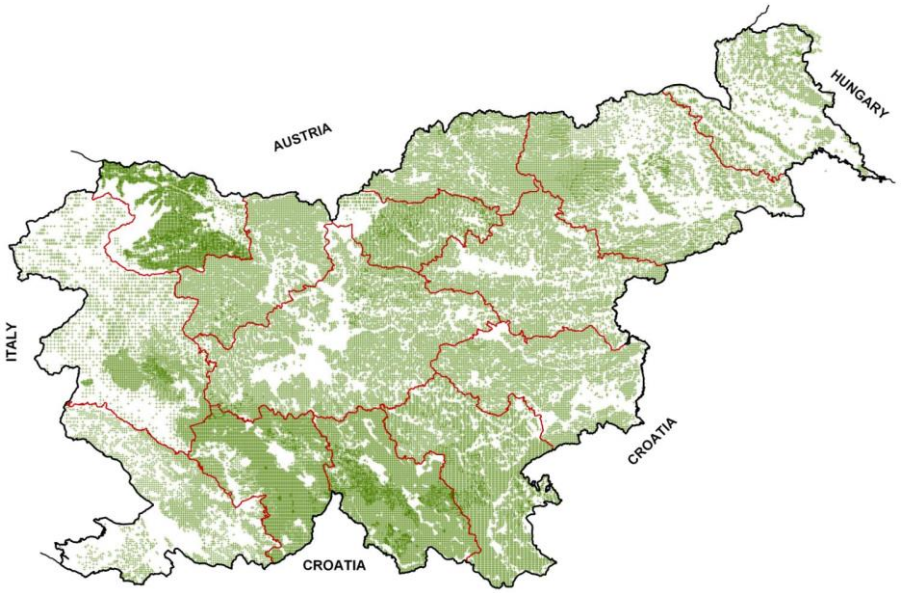
Forest inventory

- Integral part of forest planning at FMU level
- 10 year circle; each year 1/10 of forests is re-measured
- combination of tree measurements at permanent sampling plots (PSP) and field descriptions of all forest stands
- evaluation of forest functions

Permanent sampling plots inventory

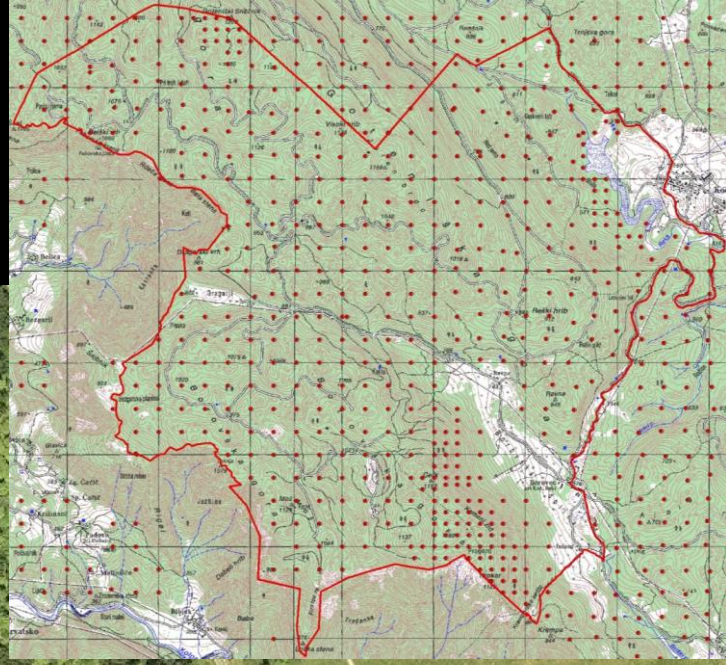
- 1972 FMR Bled
- 1998 all forests in Slovenia
- third re-measurement is going on (6th at FMR Bled)
- more than 100.000 plots covering all Slovenian forest
- different systematic grid

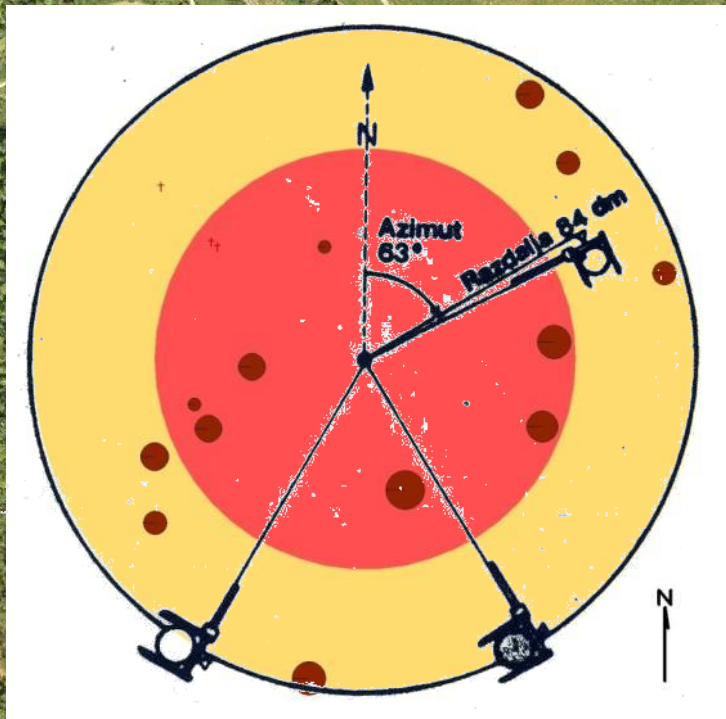




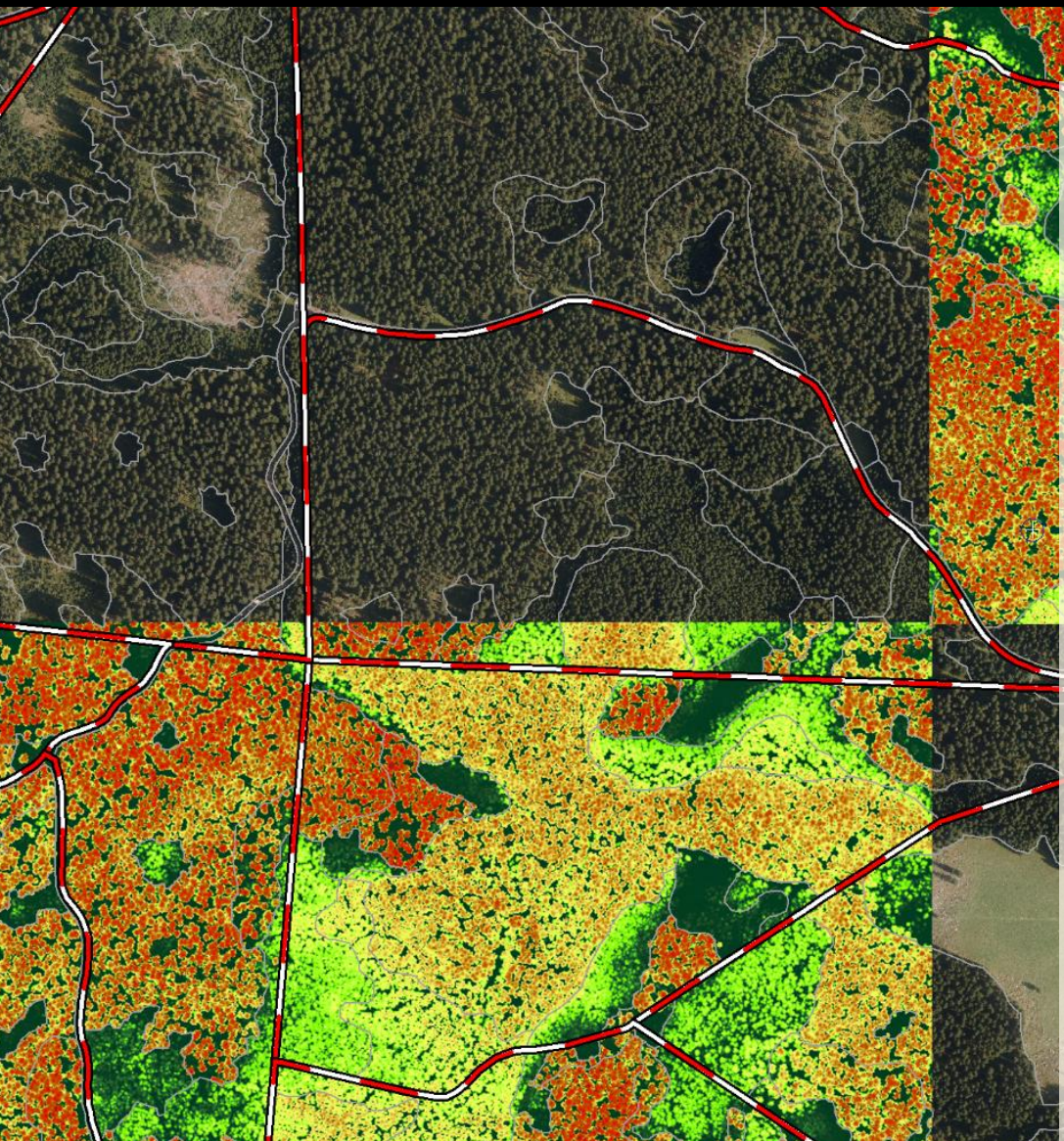
Permanent sampling plot

- geo-referenced
- two concentric circles (200 and 500 m²):
  - smaller circle → trees with dbh ≥10 cm
  - larger circle → trees with dbh ≥30 cm
- plot level data
- tree level data





Forest stand assesment and delineation

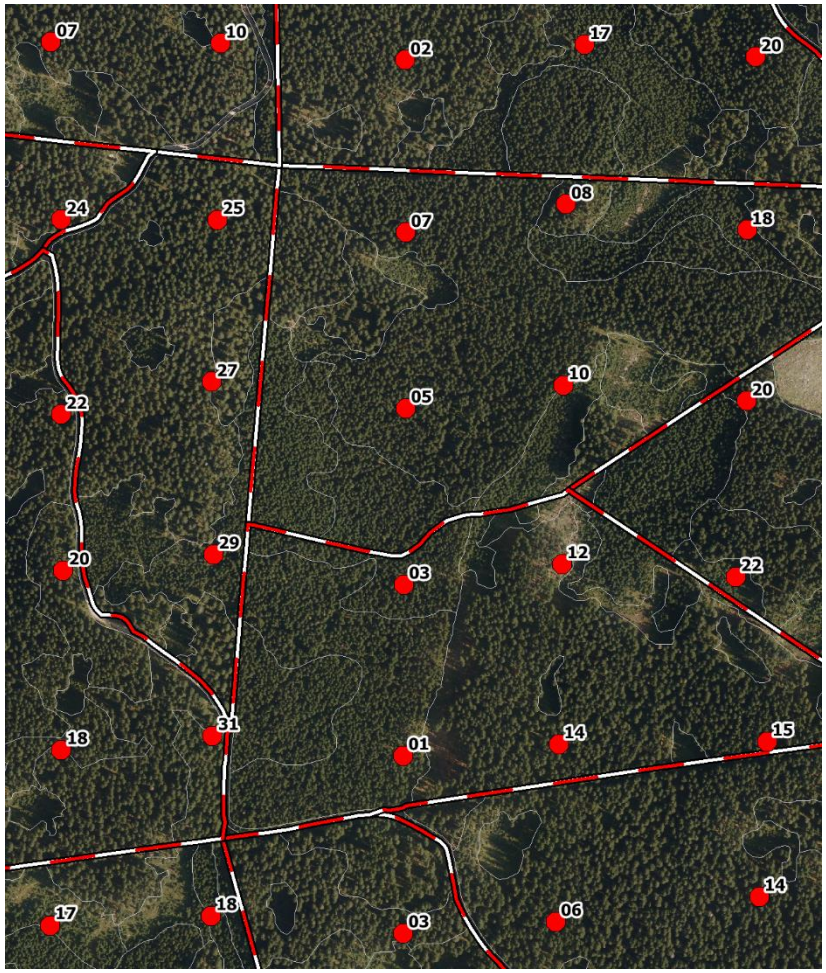


- First stand map from 2009
- Process:
  - stand delineation
  - stand description

- Interactive stand map
  - Stand type / development phase
  - Tree species composition
  - Stand density

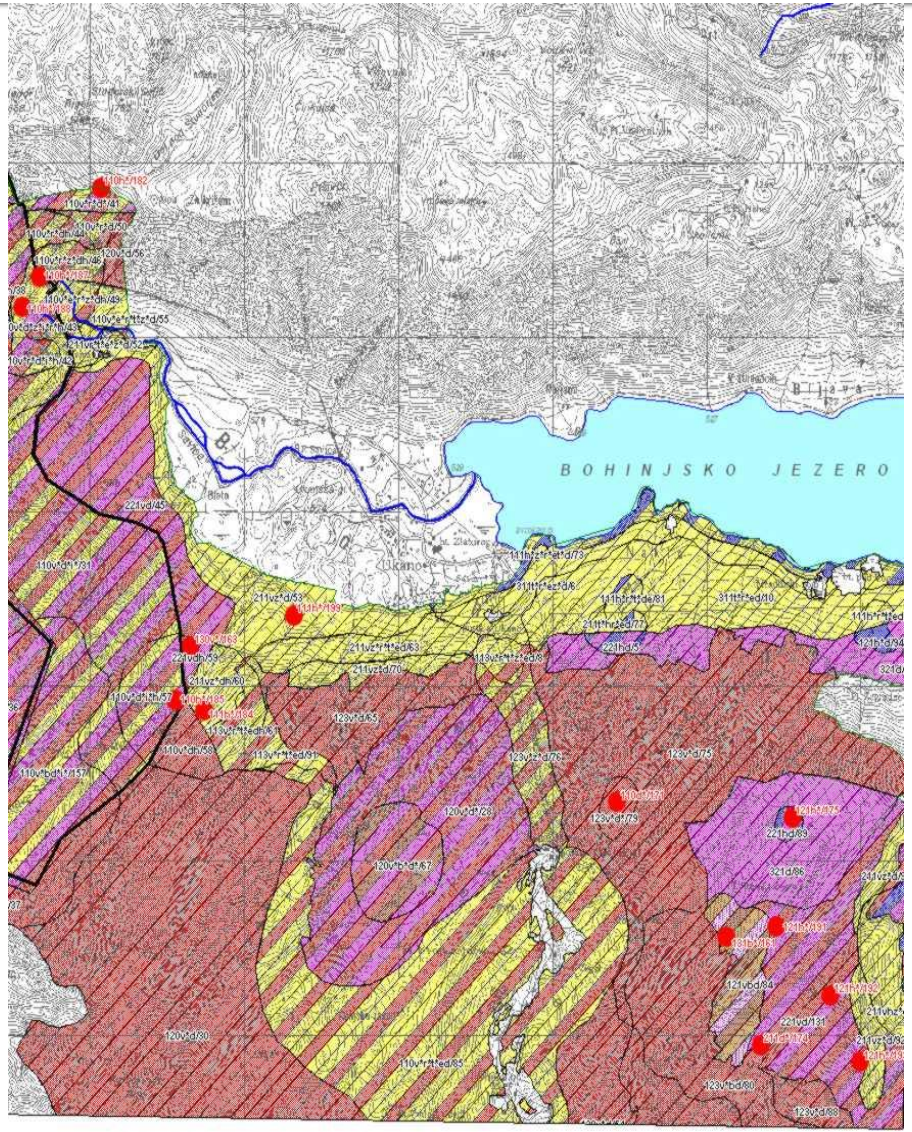
Forest (sub)compartment database

- PSP inventory and stand assessment are done independently
- Harmonization at FMU level (GS, increment, tree species composition)
- Basis for plan preparation

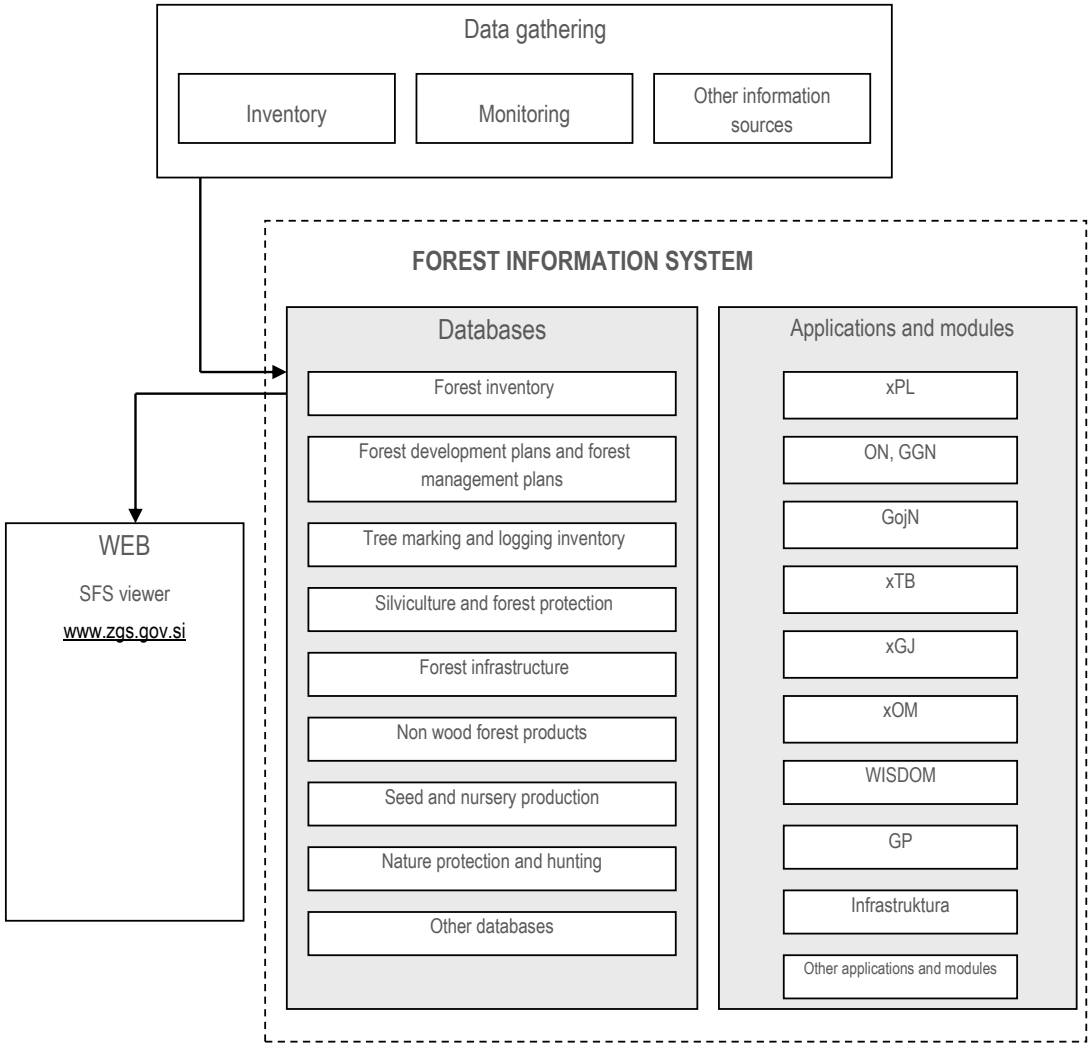


Evaluation of forest function

- Different demands, different natural potential
- Inventory of different functions of forests
- Different methods:
  - GIS assessment (e.g. protective function, water)
  - survey (e.g. needs of forest owners, other forest products)
- Forest function map

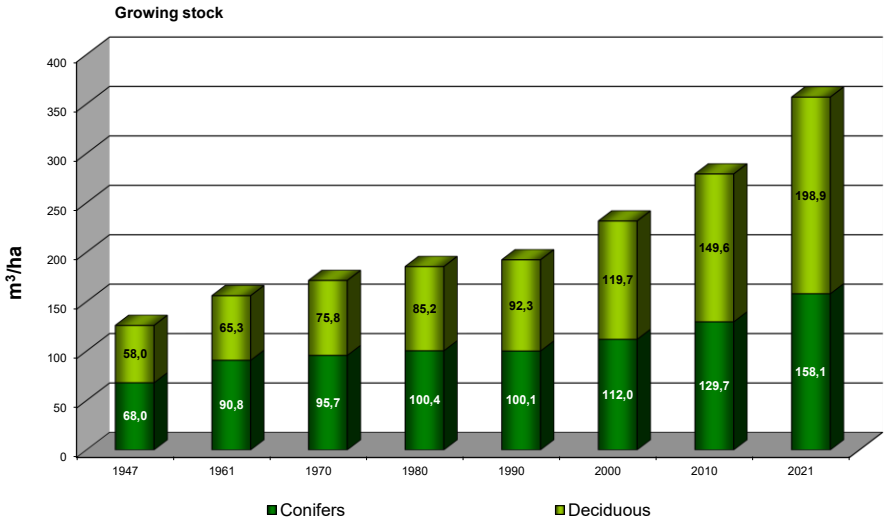


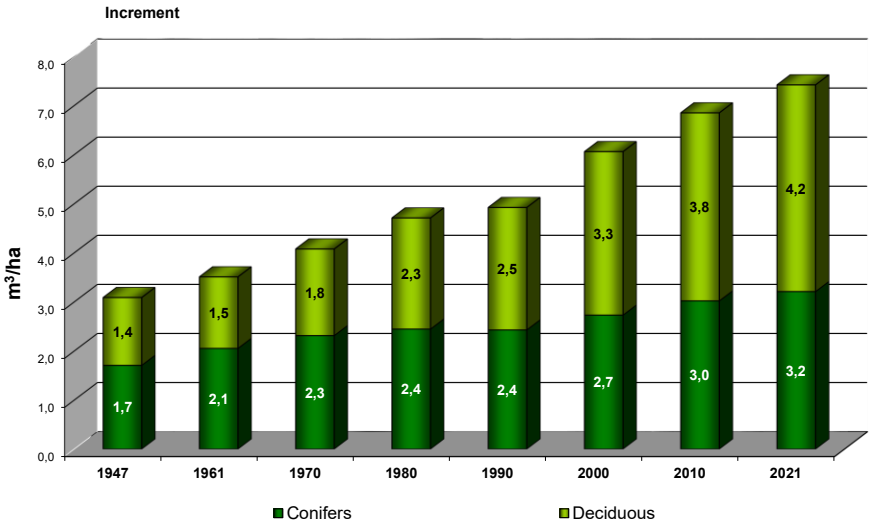
Forest information system



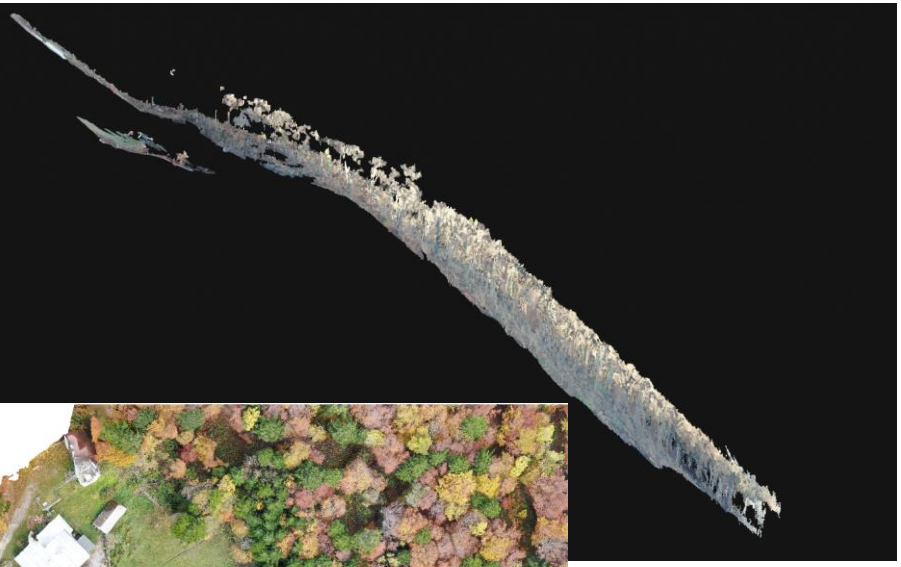
Structure and composition of forest stands changed significantly in last 70 years

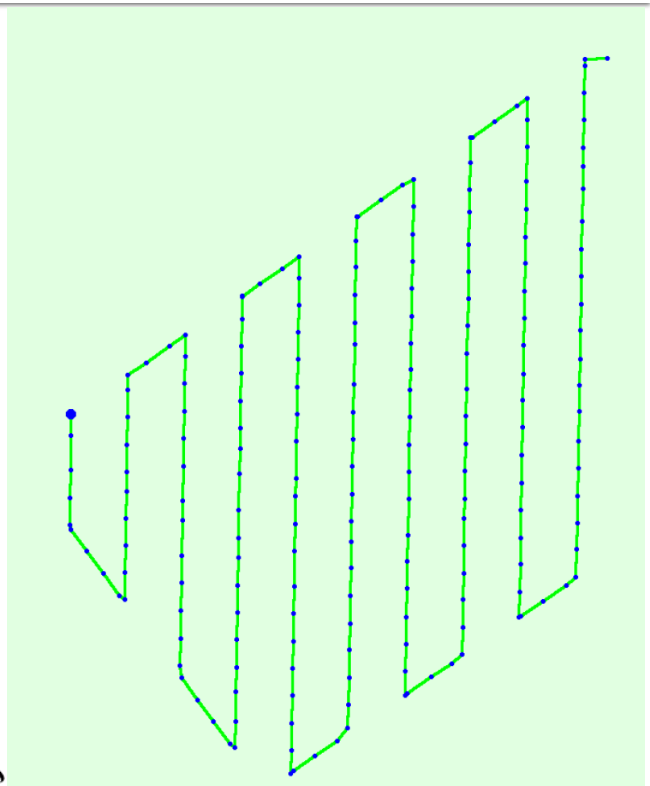
- Forest area has been increased by 31 %
- Constant increase of growing stock (by 230 % in last 74 years).
- Constant increase of increment (by 240 % in last 74 years).
- A shift of tree species composition towards the potential vegetation.

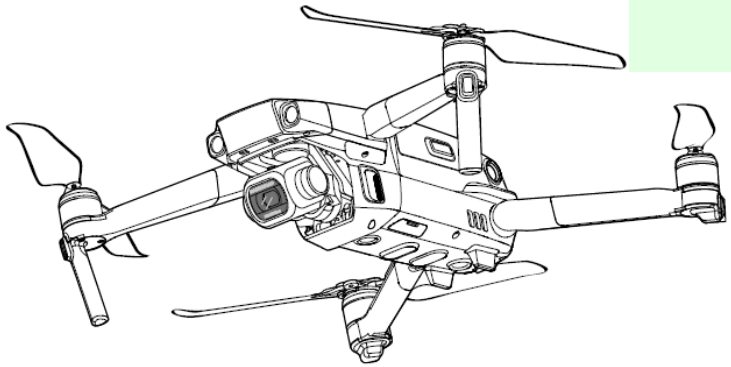




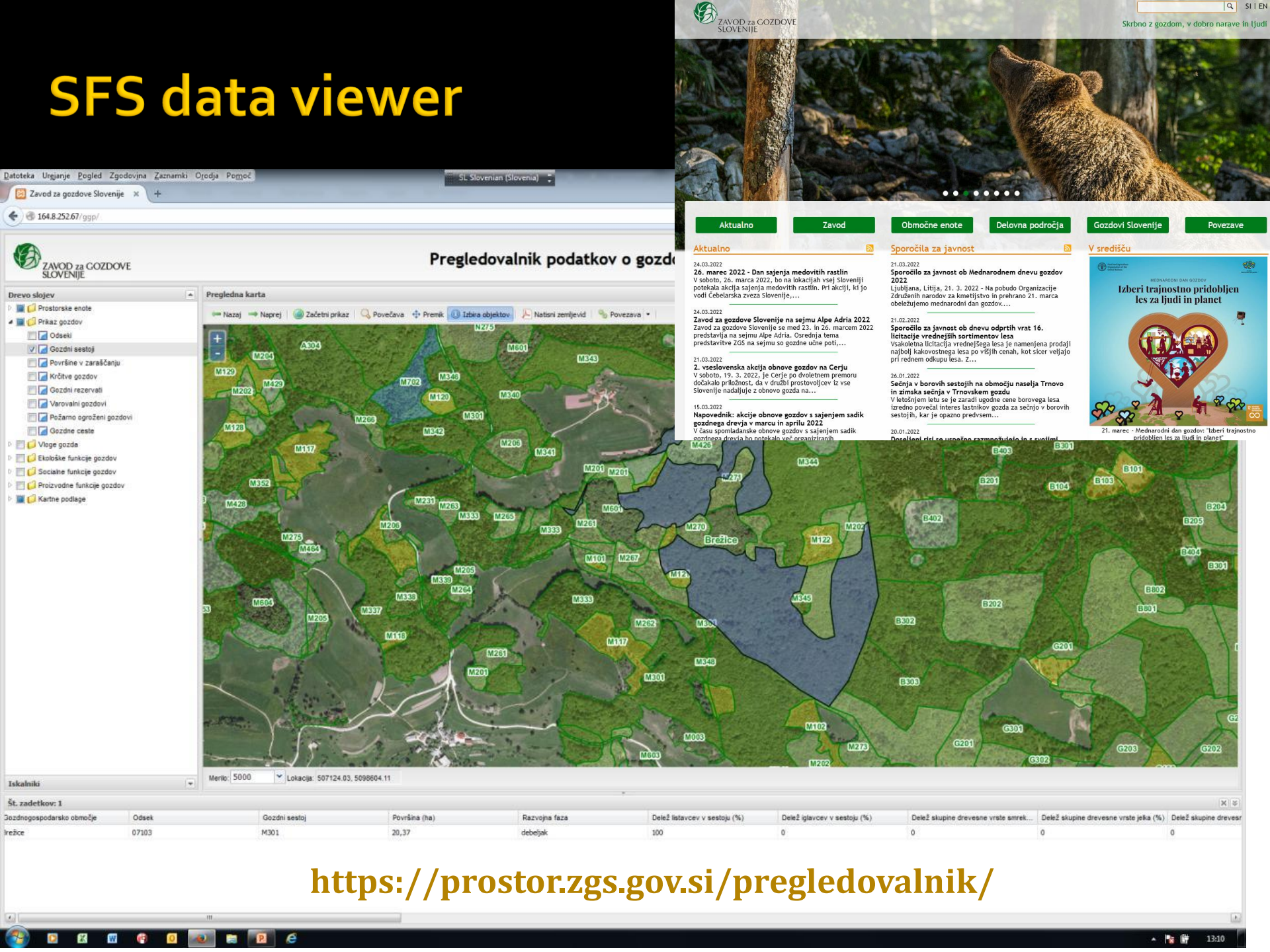
New aproaches







SFS data viewer

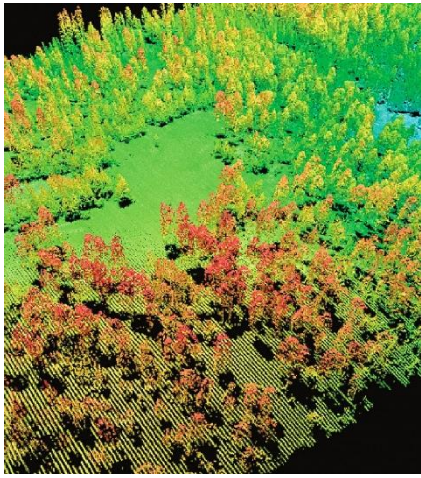


https://prostor.zgs.gov.si/pregledovalnik/

Today and future challenges

- Development of participatory planning
- Special cases of forest plans
- Integrating uncertainties into FMP
- Assessment of main stand parameters from remote sensing – LiDAR (e.g. GS, species composition, health status)
- Increased use of data (e.g. modelling, international reporting, science)

  - Social conditions (e.g. new demands, Natura 2000 sites capture 50 % of all forests)
  - Timber market (e.g. problem of large diameter timber)
  - Environmental conditions (e.g. climate change)
  - Preparing scenarios: an important part of forest planning and management



Thank you for your attention