The 7th Field-Map Educational International User Conference
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The 1st Re-census by Field-Map at Žofín ForestGEO Plot

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Contents

Using Field-Map

Where?

Czech natural forests

Main research goal?

Observing life cycle of each stem (position, unique identifier) through repeated measurement

Three Field-Map set

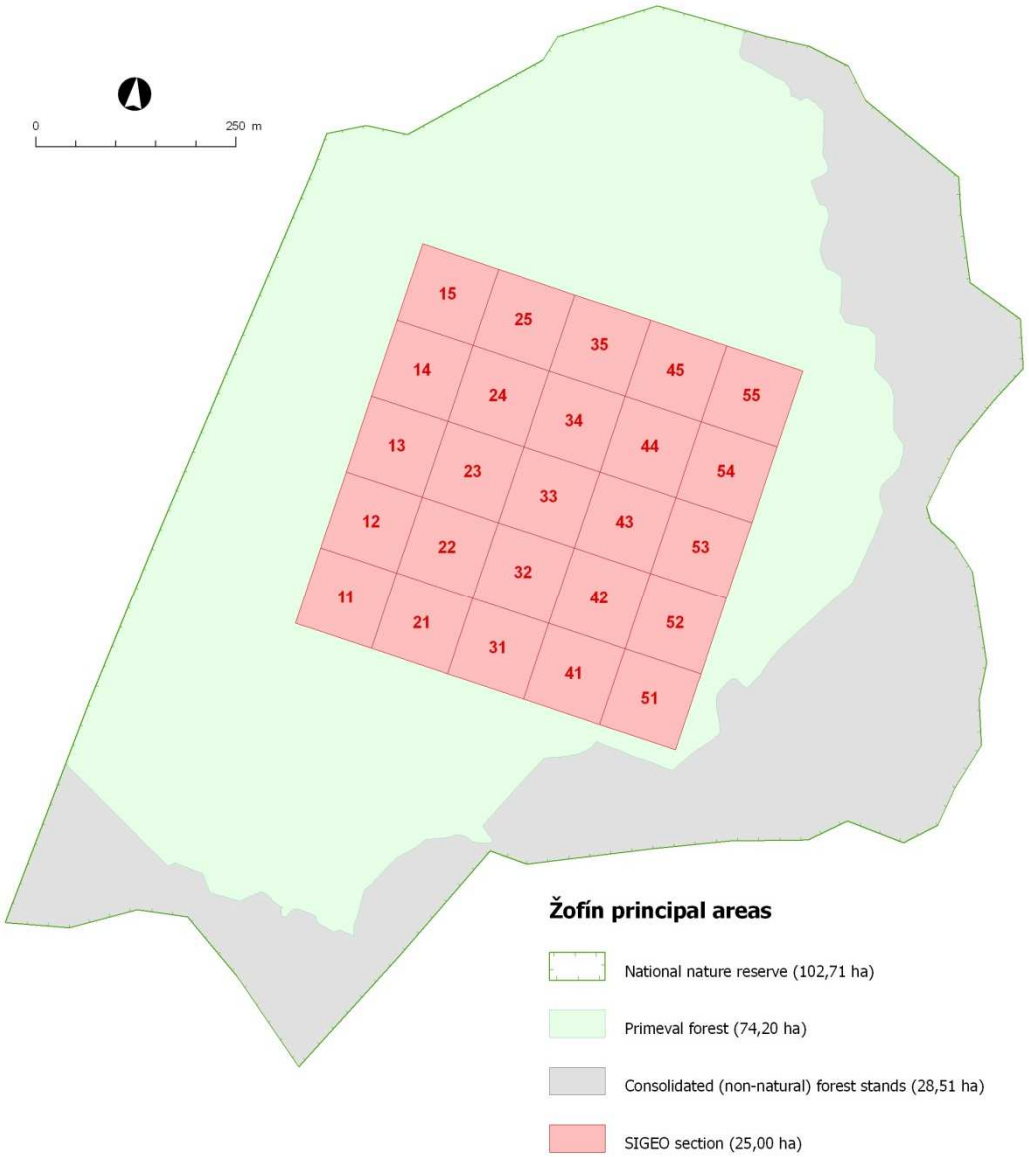
Using Field-Map since 2001

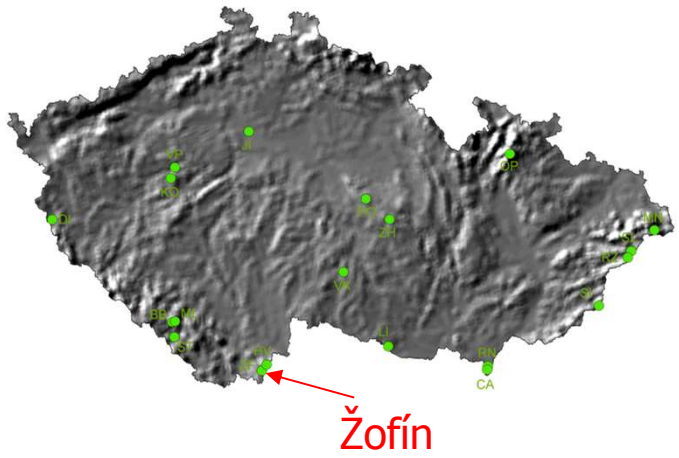
Whole-area measurement: 25 sites, 390 ha (in CZ)

Statistical inventory: 12 sites, 750 ha (in CZ)

http://www.naturalforests.cz

Žofín Plot





Žofín primeval forest

Area: 74.20 ha

Height range: 730 – 837 m a.s.l.

Spontaneous development: since 1838

Dominating species: beech, spruce, fir

Žofín under whole-area measurements

- 1975: Eduard Průša – the 1st whole-area measurement
  …theodolite -> analogue map 1 : 1000

- 1997: Tomáš Vrška and team – the 2nd whole-area measurement
  …editing the analogue map in field, digitizing results in office -> digital database (tree data model)

- 2008: Tomáš Vrška and team – the 3rd whole-area measurement
  new survey using Field-Map and digital database (1996) -> accurate digital database (stem data model)

- 2012: Tomáš Vrška and team – detailed measurement inside ForestGEO section (25 ha) using Field-Map (piece data model)

- 2017: Tomáš Vrška and team – the 1st re-census at ForestGEO plot, Field-Map used again

ForestGEO (ex-SIGEO)

Smithsonian Institute Global Earth Observatory

http://forestgeo.si.edu/

Research on tropical forest dynamics continues, but joins new initiatives to study carbon fluxes, temperate forests, and the impacts of climate change on biodiversity and forest function.

67 plots, 27 countries, 6 mil trees, 12 000 species

Basic ForestGEO rules

25ha (square) section; 1ha (square division)

Live stems with D.B.H. of 1 cm and more
- Position
- Identification (tagging)
- Basic dendrometry attributes

Dead stems with D.B.H. of 10 cm and more

Repeated measurement after 5 years

2008 – with Field-map

- Whole-area (74 ha) measurement of live and dead stems

- Reference point network (364, 44.25 m) surveyed (via current geodesy)

2012 – Inicial census

Step 1: Check increment and vitality of thicker (>10cm) stems
Step 2: Survey thinner stems (1-10cm) with all dendrometry

New features of measurement:

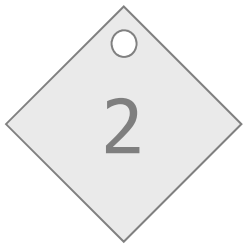
- Extend D.B.H. range with interval of 1 – 10 cm
- Increase precision of positions
  - Tripod
  - Decrease reflector height on mainpole (60 cm)
  - Decrease equipment height (kneeling) somet.
  - Vernier caliper (up to 15 cm)
- Tagging

Tagging

Single-stem tree

Aluminium tag

„SubplotID-TreeID“ branded



Multi-stem tree

Aluminium tag

(2nd, 3rd…) „StemID“ branded

Field-Map project

CONCEPTION

Each subplot represents one separate Field-Map project

25 projects, same structure

MAIN LAYERS

Standing stems 2017 [Tree]

Initially copy of Standing stems 2012

Lying stems 2017 [Deadwood]

Initially copy of Lying stems 2012

MAIN ATTRIBUTES

SPECIES

DBH

HEIGHT

POM

TREE_STATUS

TAG_STATUS

TREE_ID

STEM_ID

PIECE_ID

Re-census steps

- Remeasurements
  - Identify stem
  - Check DBH, Height, statuses…
  - Remove tag (died stem)
- New recruits survey
  - Insert new record
  - New attribute values
  - Instal tag
  - Paint point of measurement

Re-classifying Attribute **POM** (Point of Origin)

LookUp list

- 100 standing live stem unbroken
- 200 standing live stem broken
- 300 standing dead stem unbroken
- 400 standing dead stem broken
- 500 dead above, live below (D.A.L.B.)
- 600 stump
- 700 windtrow pit
- 800 ex-stump pit
- 900 base of lying stem (B.L.S.)

Recording dynamics (1): Attribute **Stem_status**

LookUp list

- 100 No change (stem lives on)
- 200 Recruit (new stem registered)
- 300 Died (stem died, registered again)
- 400 Decomposed or cutted out (stem dissapeared)
- 500 Missed last time (mistake)
- 600 Extra stem last time (mistake)

Recording dynamics (2): Attribute **Tag_status**

LookUp list

- 100 Tag remains
- 200 New tag installed
- 300 Tag taken down (stem death)
- 400 Tag not found
- 500 Tag not installed last time (mistake)
- 600 Tag installed late (mistake)

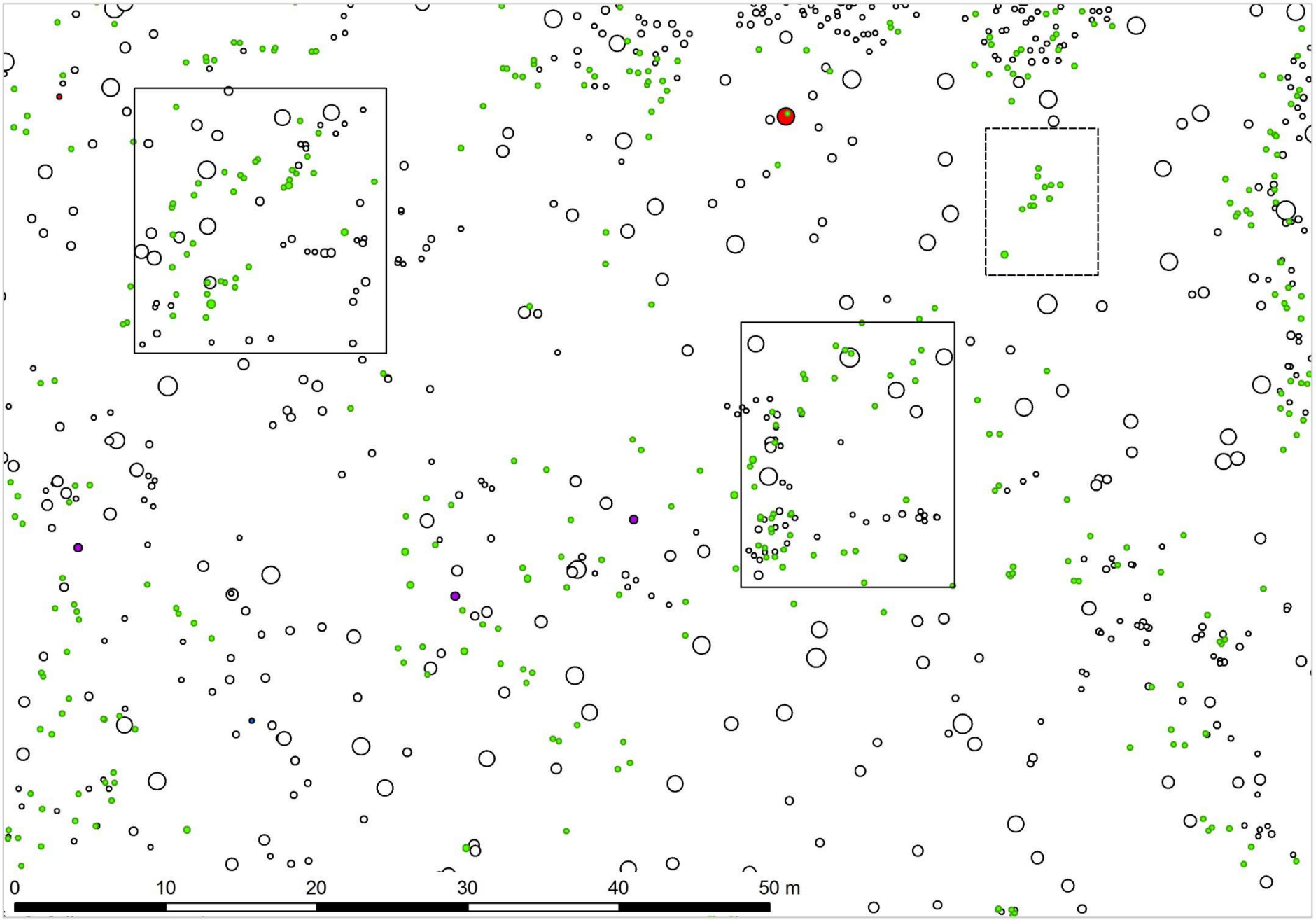
Re-census survey methods

- Distance & angles from devices

  Laser rangefinder and electronic compass

- Pen mapping

  Both inside and outside dense tree clusters


0
10
20
30
40
50 m

Results

78,800 stems measured

61,800 live on

15,300 new recruits

1,000 died

300 decomposed

400 mistakes

Intensity of Labour and Capital

740 man-days

May, 15th to September, 8th

36,500 $

Conclusions

Field-Map allows to repeat whole-area census

- ACCURATE network of reference points – the necessary base for another steps
- DENSE ARRAY of stems helps faster mapping
- Apropriate ATTRIBUTE ARRANGEMENT could cover changes between censuses
- SCRIPTS improve measurement comfort and prevent errors

Thank you for your attention!

This contribution has been resulted thanks to project

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Spatiotemporal differences in competition between tropical and temperate forest: diversity matters