5th Field-Map International User Conference

October 1-3, 2014

The pit-mound microtopographies mapping by Field-Map in Michigan forests, USA

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Working with Field-Map

The Silva Tarouca Research Institute for Landscape and Ornamental Gardening, p.r.i.
Department of Forest Ecology

- Since 2001
- Czech natural forest (reserves)
- Repeated detailed research (stem) – 24 plots (360 ha)
- Monitoring (statistical inventory) – 12 plots (750 ha)

...more at www.pralesy.cz

- ❑ 3x Field-Map (1x FMIA)
- ❑ 3x Hammerhead + MapStar + Impulse
- ❑ Analogue calippers

Project

AMVIS - KONTAKT II - LH12039

Role of disturbance in soil formation and soil variability in temperate forests: synthesis through soil-formation-processes, spatial and time scales

American Science Information Center (s&t) amvis

2012 – 2015

Project resource:
VÚKOZ, p.r.i.

Partner:
Michigan State University

Project

Project regions

FM 2009 Haplic Cambisols – Western Carpathians (Razula, CZE)

FM 2008 Entic Podzols – Novohradské hory Mts. (Žofín, CZE)

FM 2013 Albic Podzols – Michigan (USA)

Project phases

Windthrow events dating (2012)

FM 2013 Windthrow effect on pedogenesis at the tree scale (2013)

Pedogenesis at the landscape scale (2014)

Windthrow impact at forest dynamics (2015)

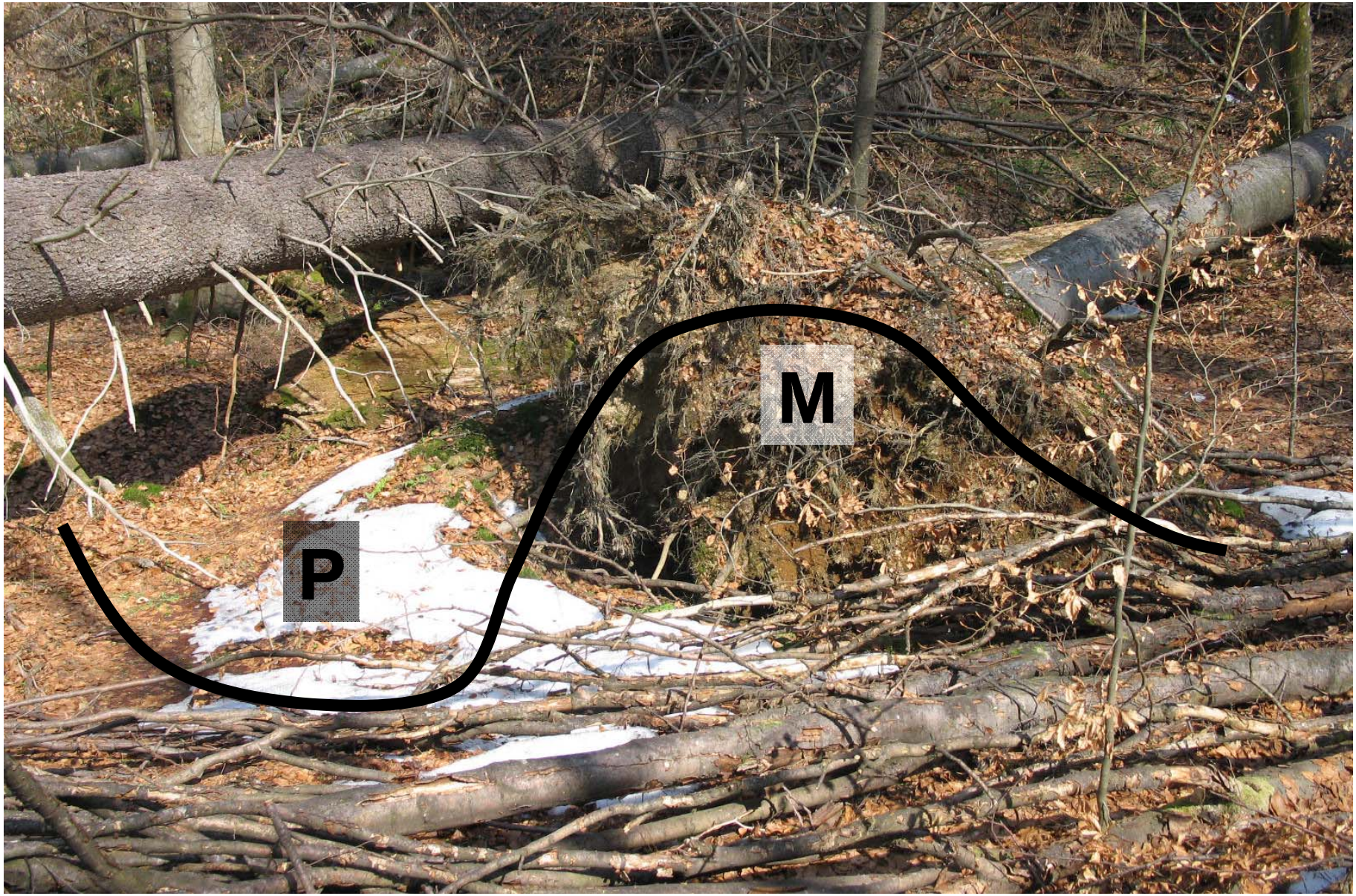
Why to map pit-mounds?

Understanding disturbance regime in forests

Solving aspects:

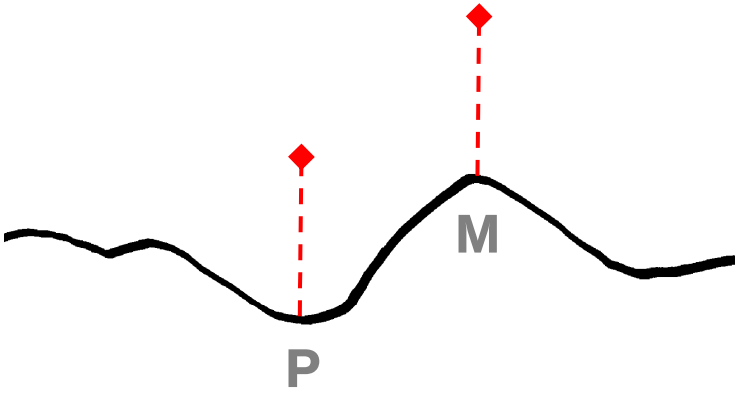
- disturbance dating
- soil variability
- tree spatial patterns

Pit-mound explanation (vertical)

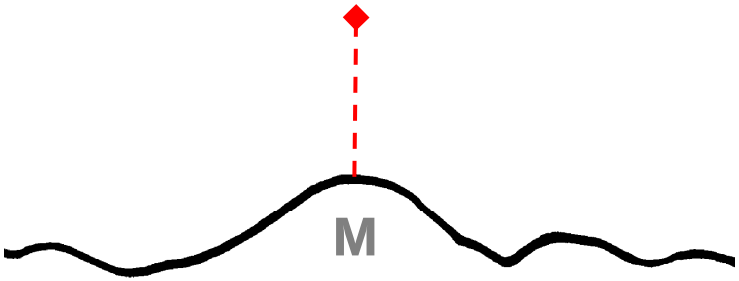


Pit-mound survey (Field-Map)

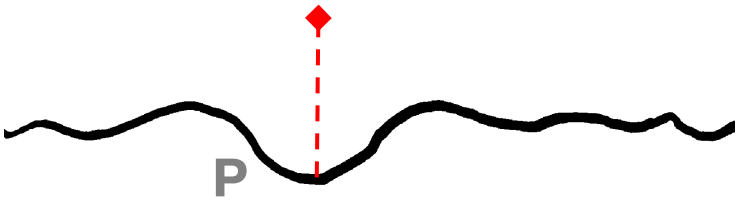
Pit-mound
complex



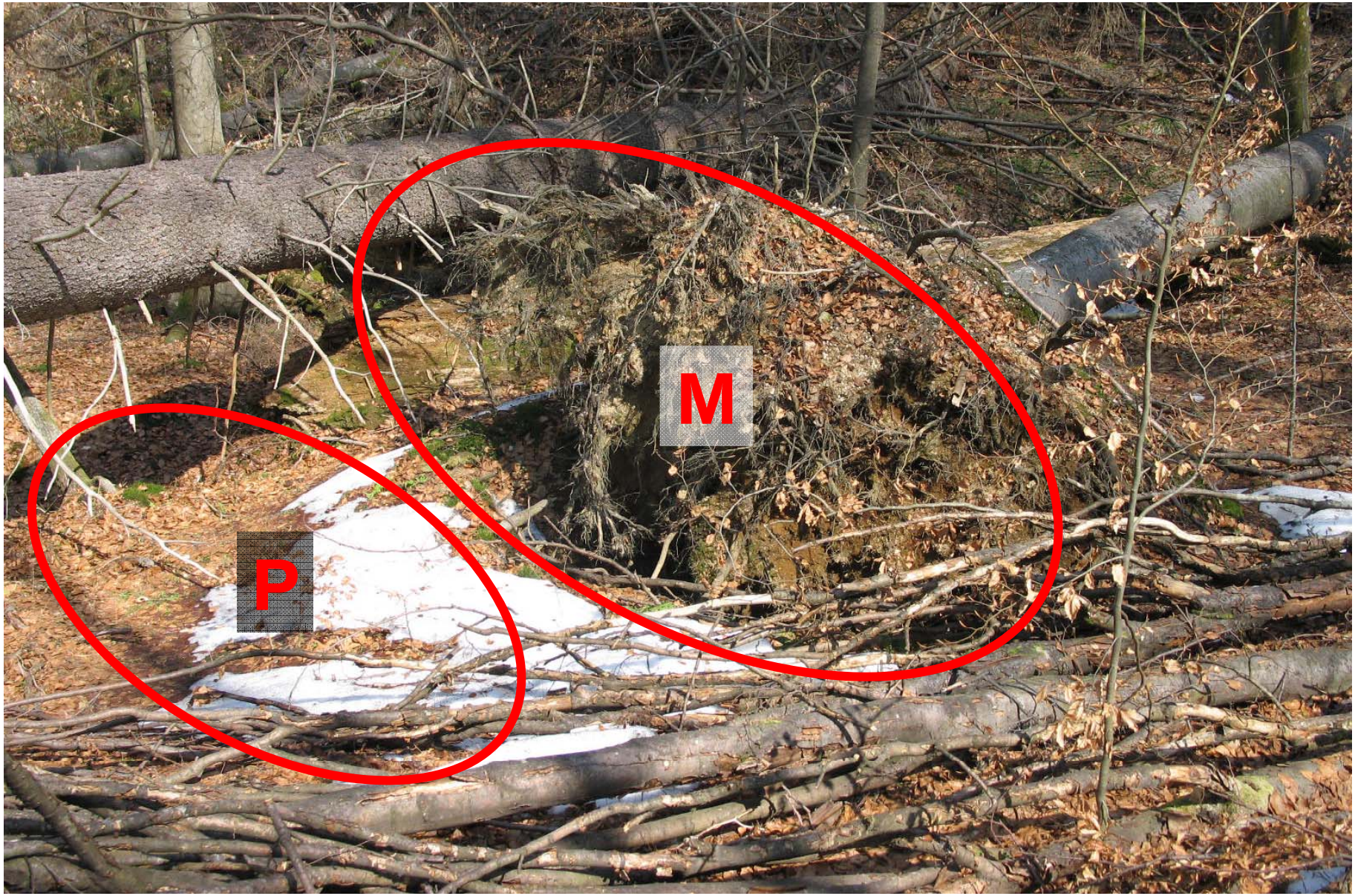
Mound
only



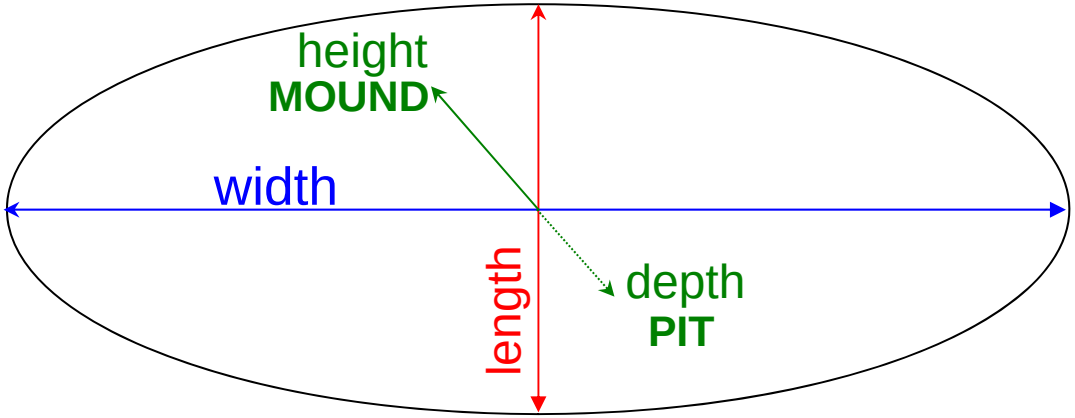
Pit
only

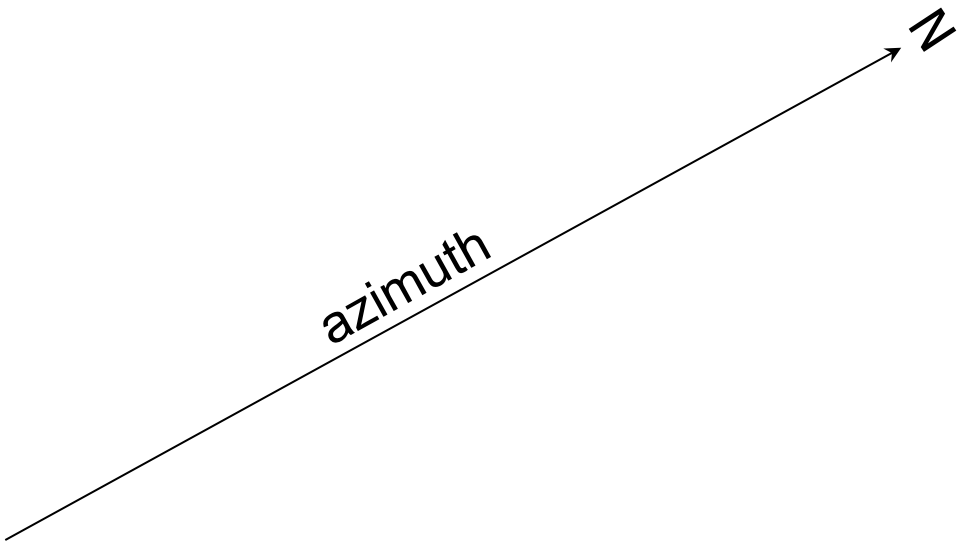


Pit-mound explanation (horizontal)



Pit-mound metrics (less Field-Map)





Default:

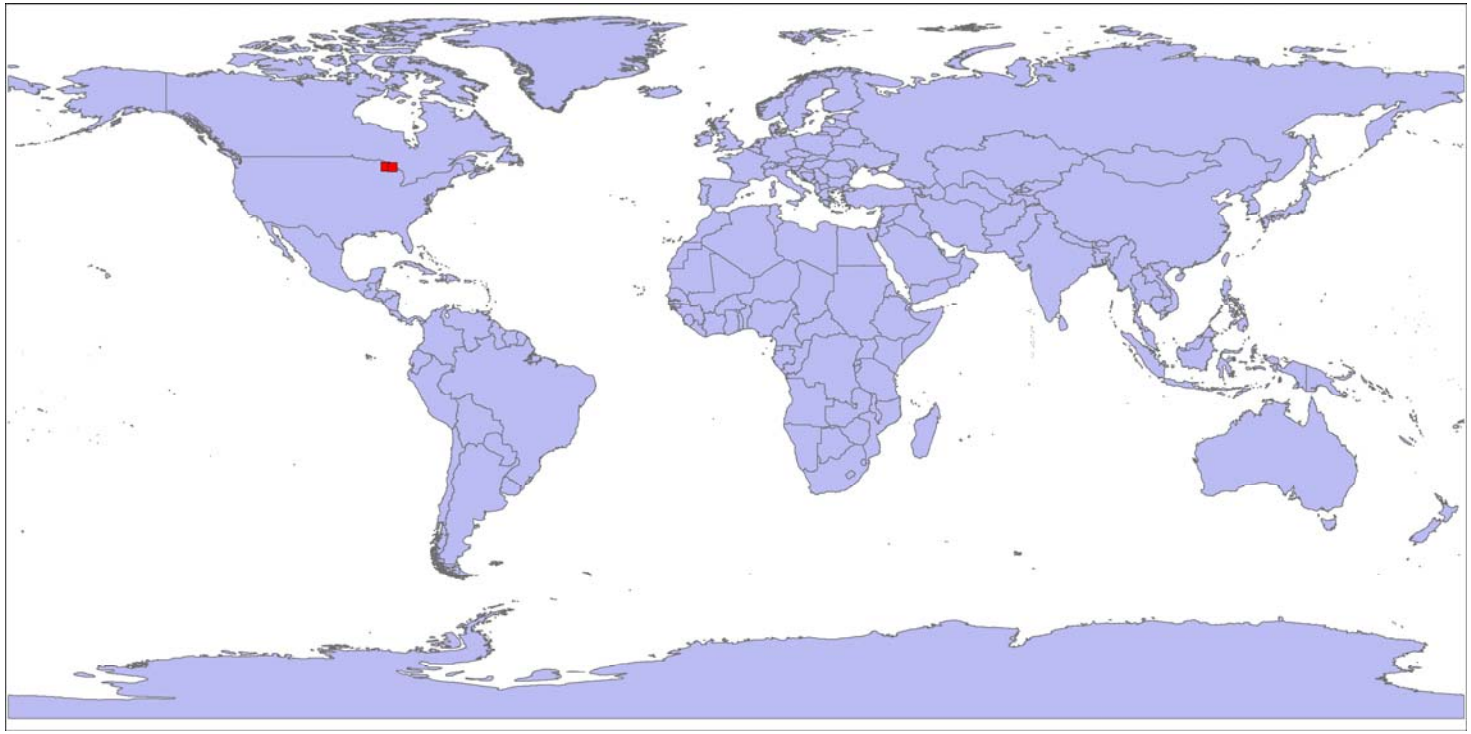
P – M connection

To be measured:

P or M alone

Along with the length

Sites (2013)



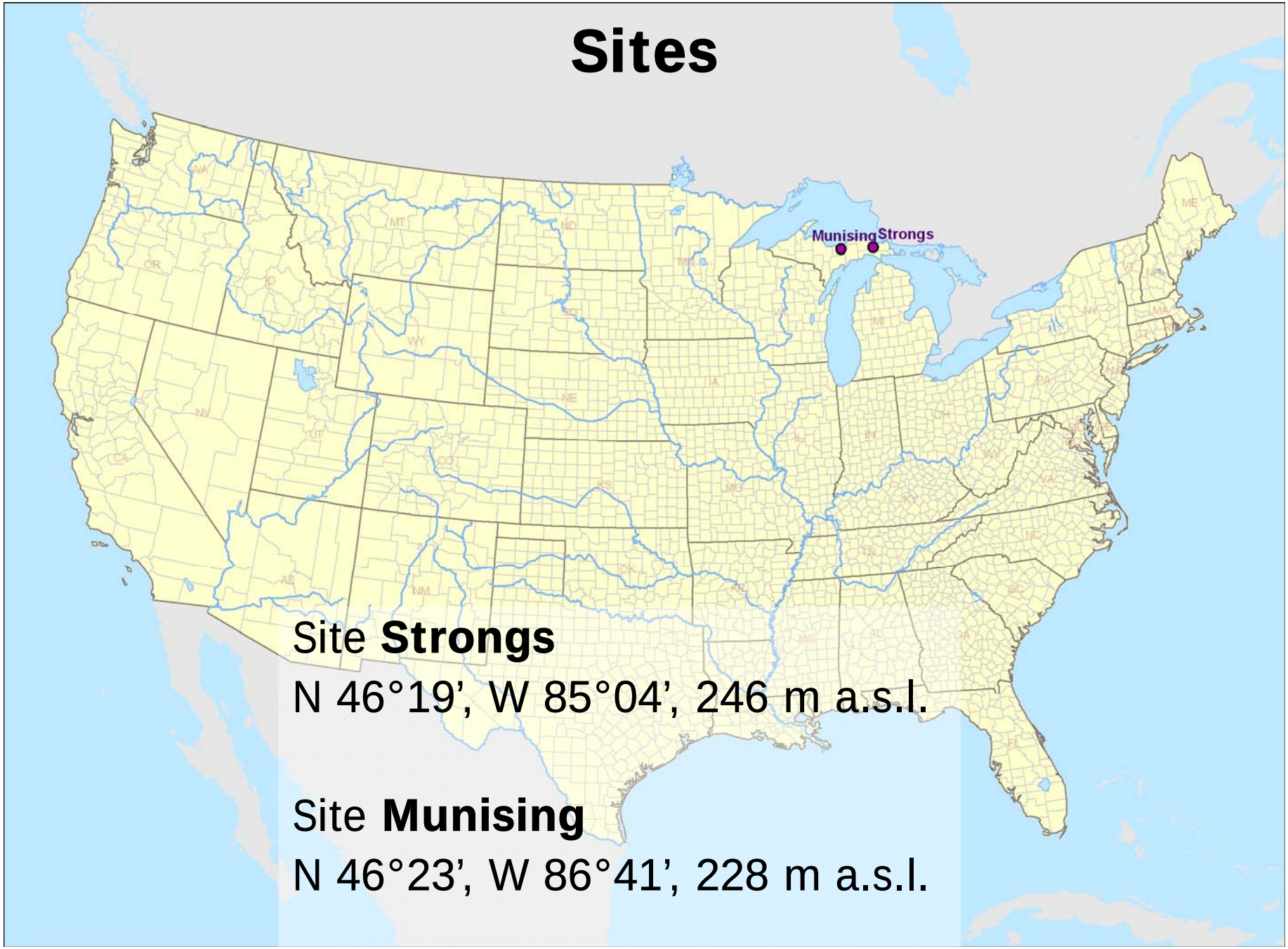
USA

Michigan

Upper Penninsula

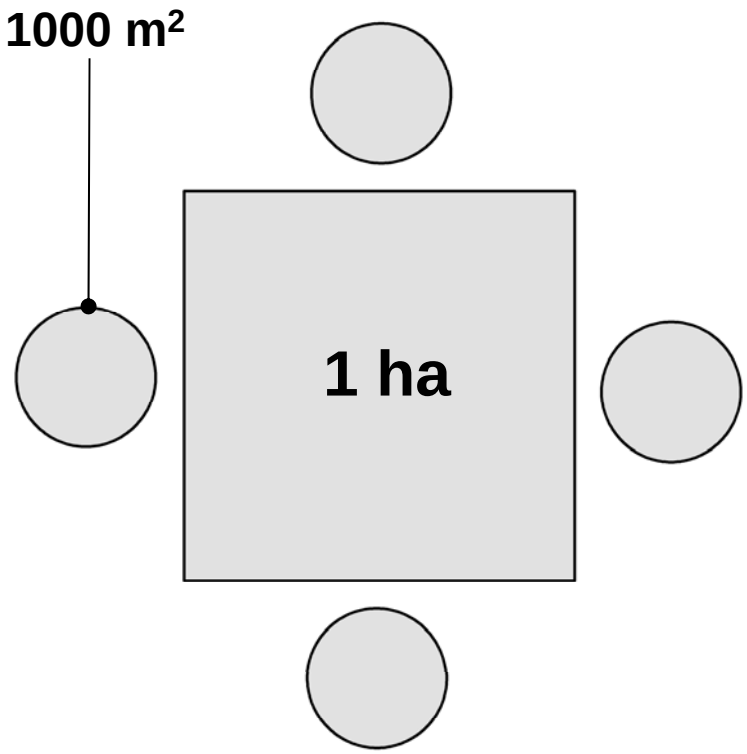
2 sites (120 km dist.)

The pit-mound microtopographies mapping by Field-Map in Michigan forests, USA



Plot arrangement

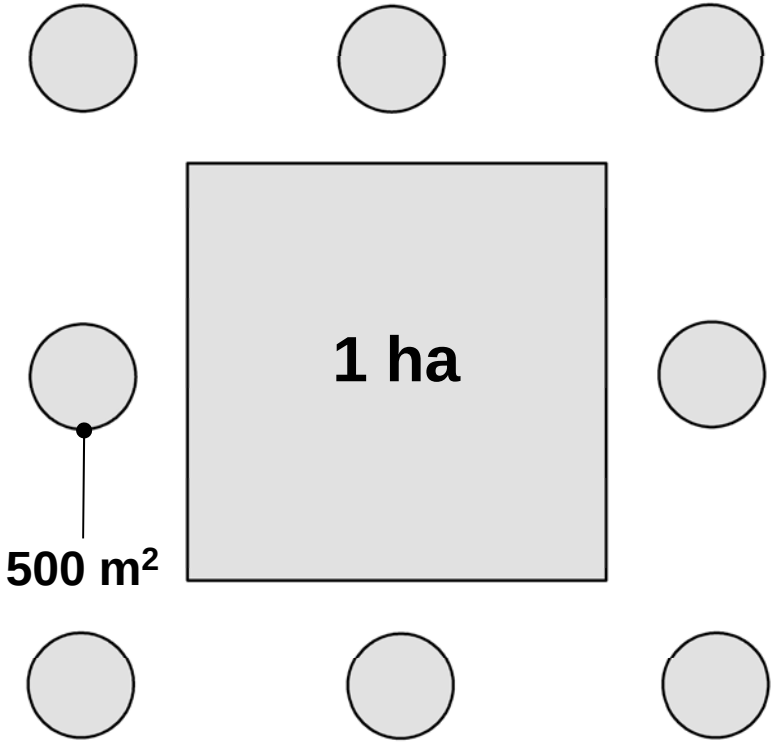
Strongs



1 x square plot (1 ha)

4 x circle plot (á 1000 m^3)

Munising

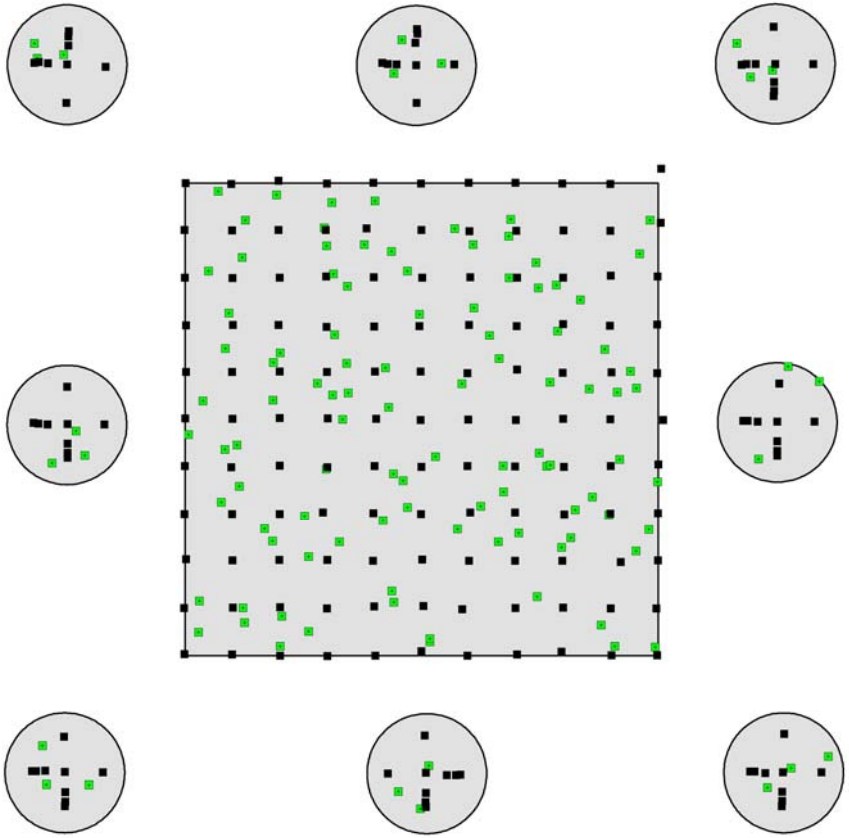


1 x square plot (1 ha)

8 x circle plot (á 500 m^3)

Soil profile network arrangement

Munising

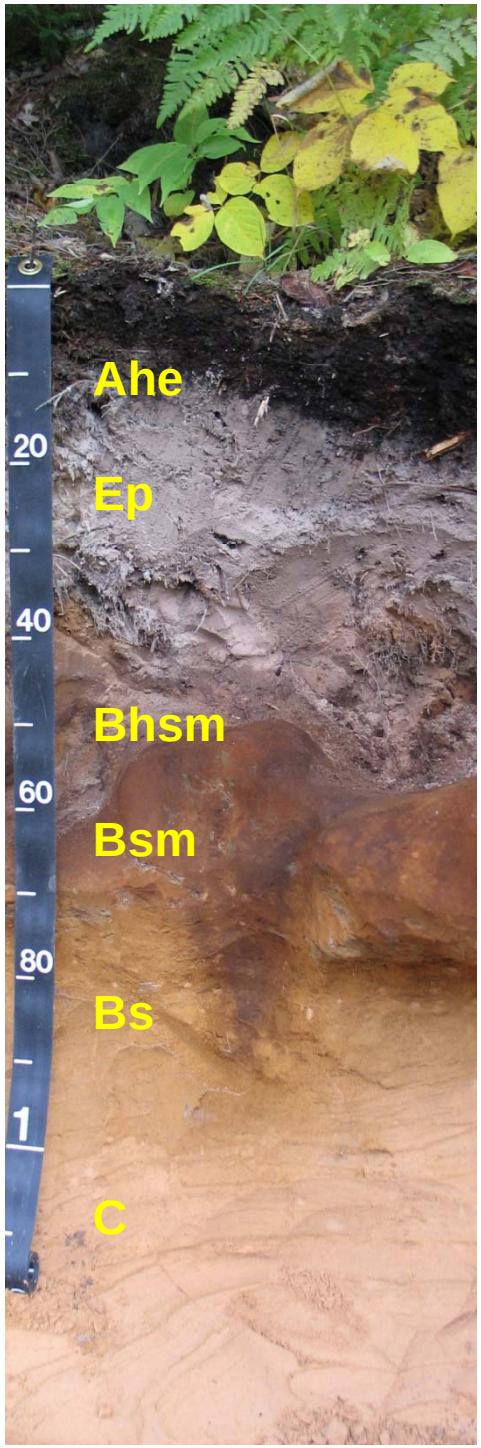


Regular network: 127 pts.

Random network: 109 pts.

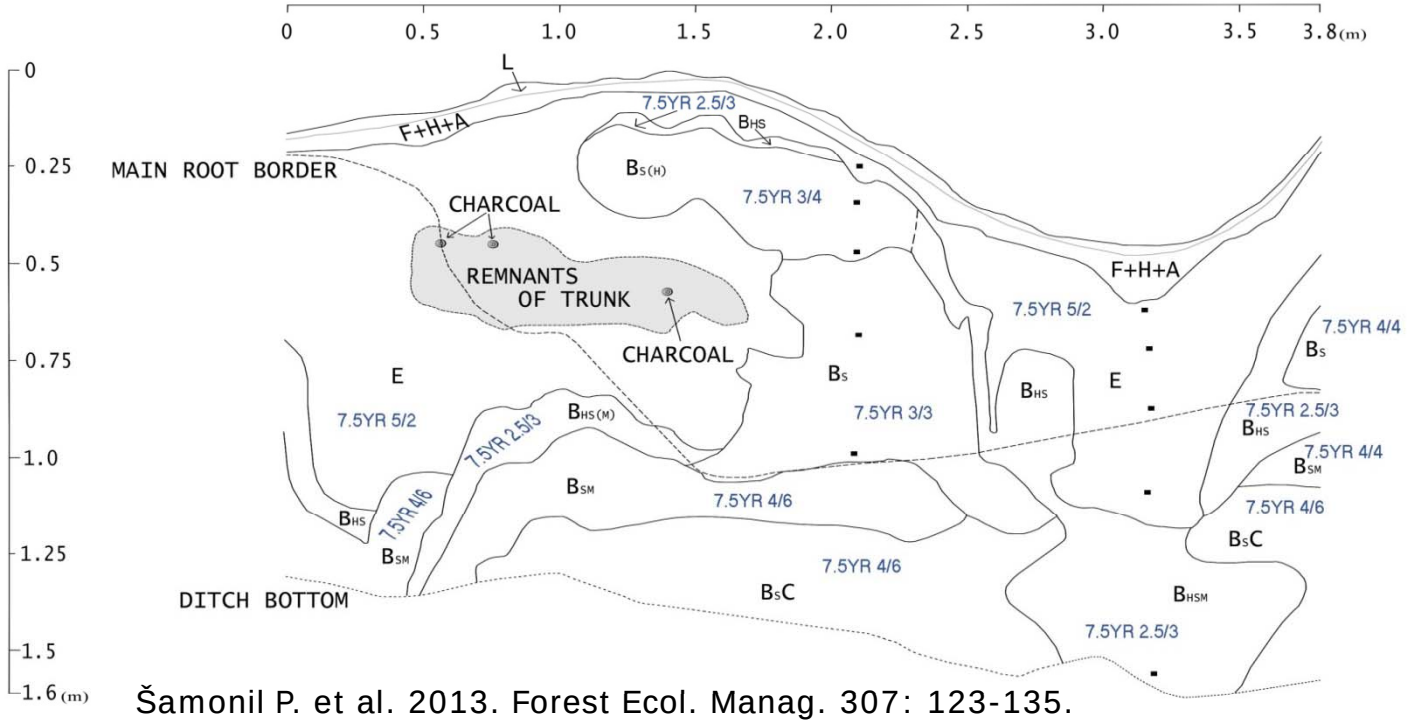
Measurements overview

Site Strongs	Topic	Site Munising
886 (P:376 + M:510)	**Pit-mounds pnts.**	900 (P:377 + M:523)
14	**Deep profiles pnts.**	4
-	**Shallow profiles ntw.**	317 (193 +124)
-	**Trees standing**	880
-	**Trees lying**	113
9	**Geomorph. plgns.**	23
1793	**DEM pnts.**	2937



Albic Podzols on outwash, (Michigan)

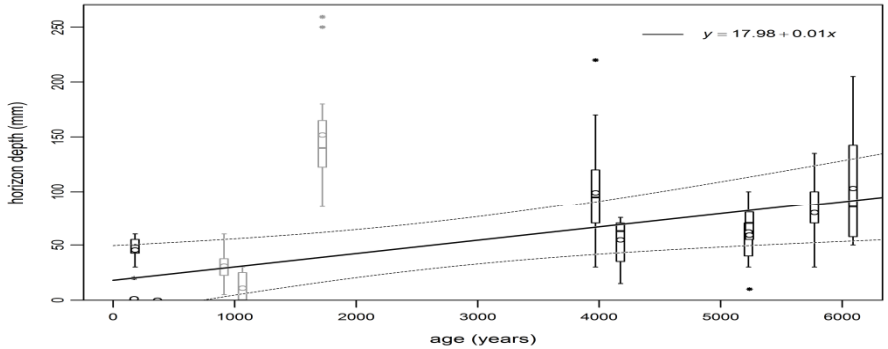
Longevity > 6000 years, different paths of pedogenesis



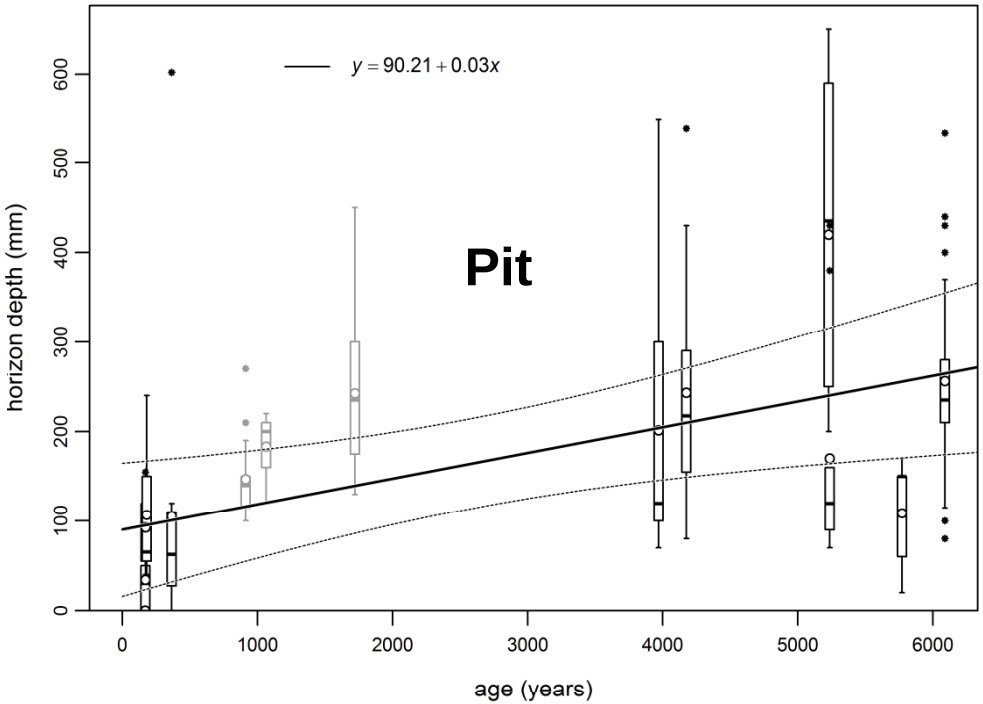
Šamonil P. et al. 2013. Forest Ecol. Manag. 307: 123-135.

Development of E-horizon

Mound



Pit



Pit-mound metric stats

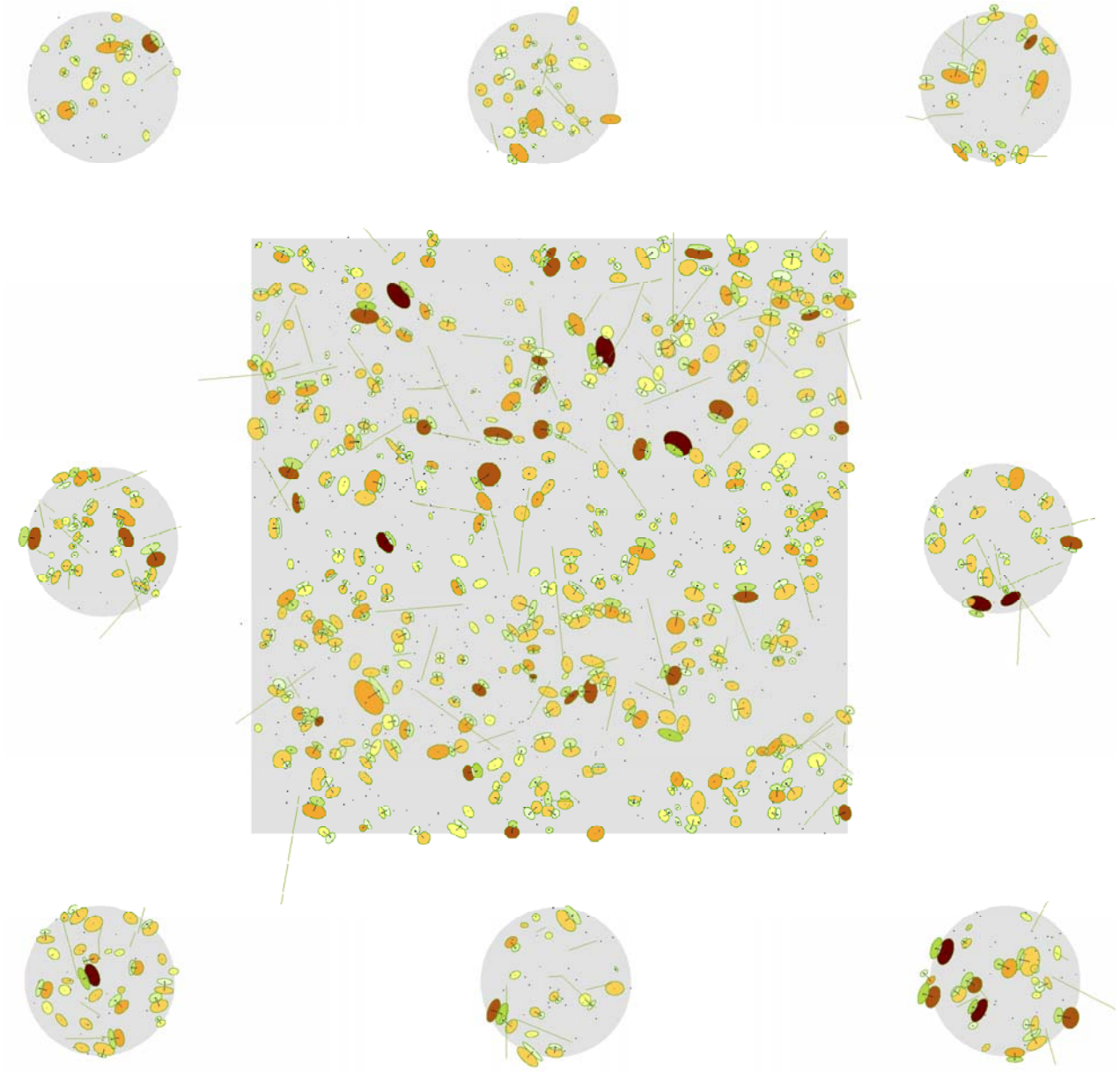
Width (0,3 – 6,4 m), avg. **2,3** m

Length (0,4 – 3,9 m), avg. **1,3** m

Height/Depth (0,15 – 0,55 m), avg. **0,22** m

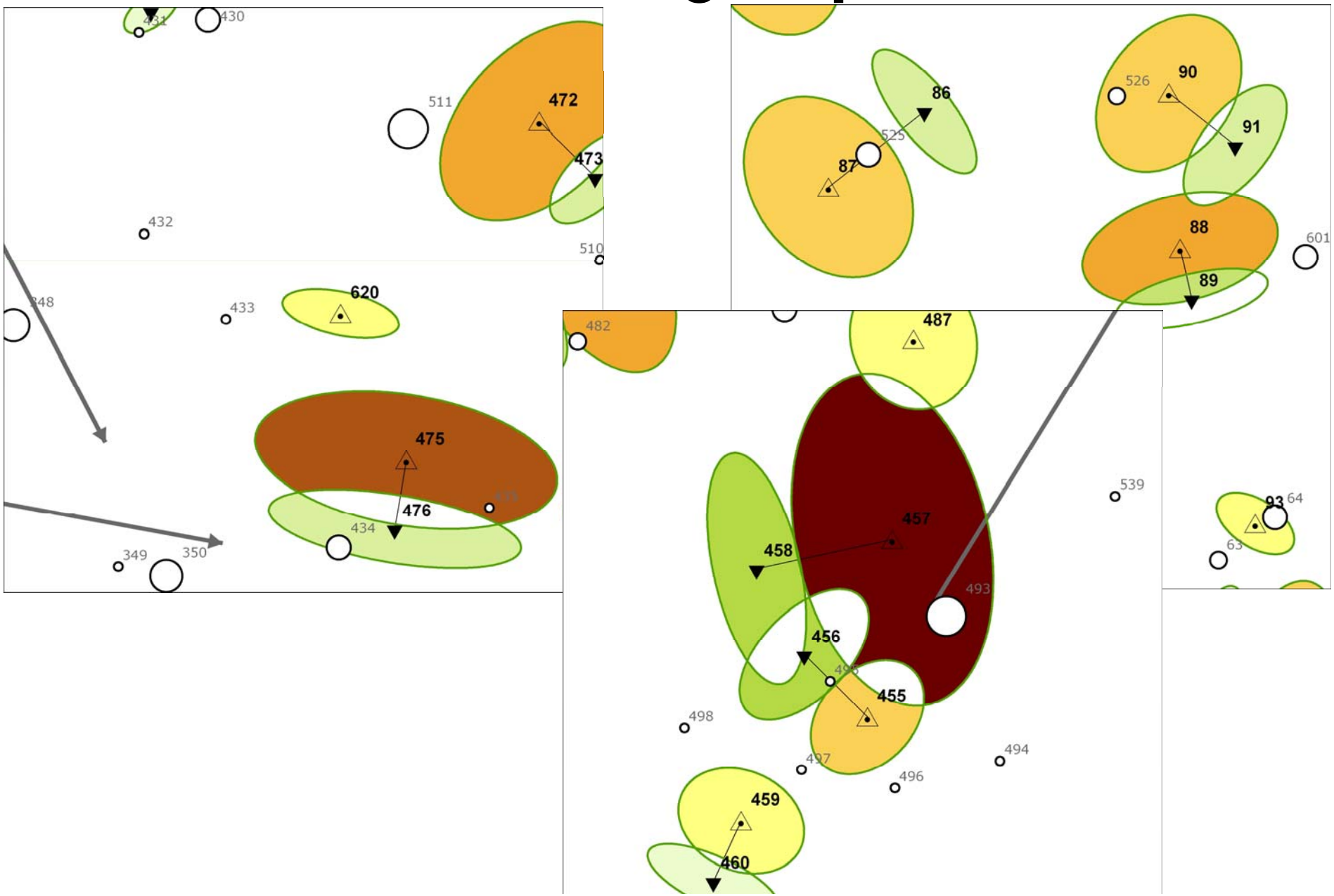
The pit-mound microtopographies mapping by Field-Map in Michigan forests, USA

Resulting maps



The pit-mound microtopographies mapping by Field-Map in Michigan forests, USA

Resulting maps



Conclusions

Field-Map helped us...

Set up plots and navigate within
- basic square plots
- accessory circle plots

Set up the soil profile networks and navigate within
- regullar network
- random network (refilling regular ntw.)

Survey geo-objects
- pit-mounds mictotopographies
- standing stems
- lying stems
- geomorphology areas
- soil profile points (real position survey)

Conclusions

Field-Map
handy and useful device in…

Setting up

Navigation

Mapping

This contribution has been resulted thanks to project

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