Monitoring of Bark Beetle Damages in Slovenia - intro

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Affected species:

mostly coniferous: spruce (*Picea abies*) attacked by eight-toothed bark beetle (*Ips typographus* L.) and fir (*Abies alba*).

Causes and key factors:

1. anthropogenic – historical planting of coniferous outside of their natural habitat

2. natural - climatic factors: extreme weather events + higher temperatures + precipitation distribution

3. Series of connected events: planning – big damages - consequence
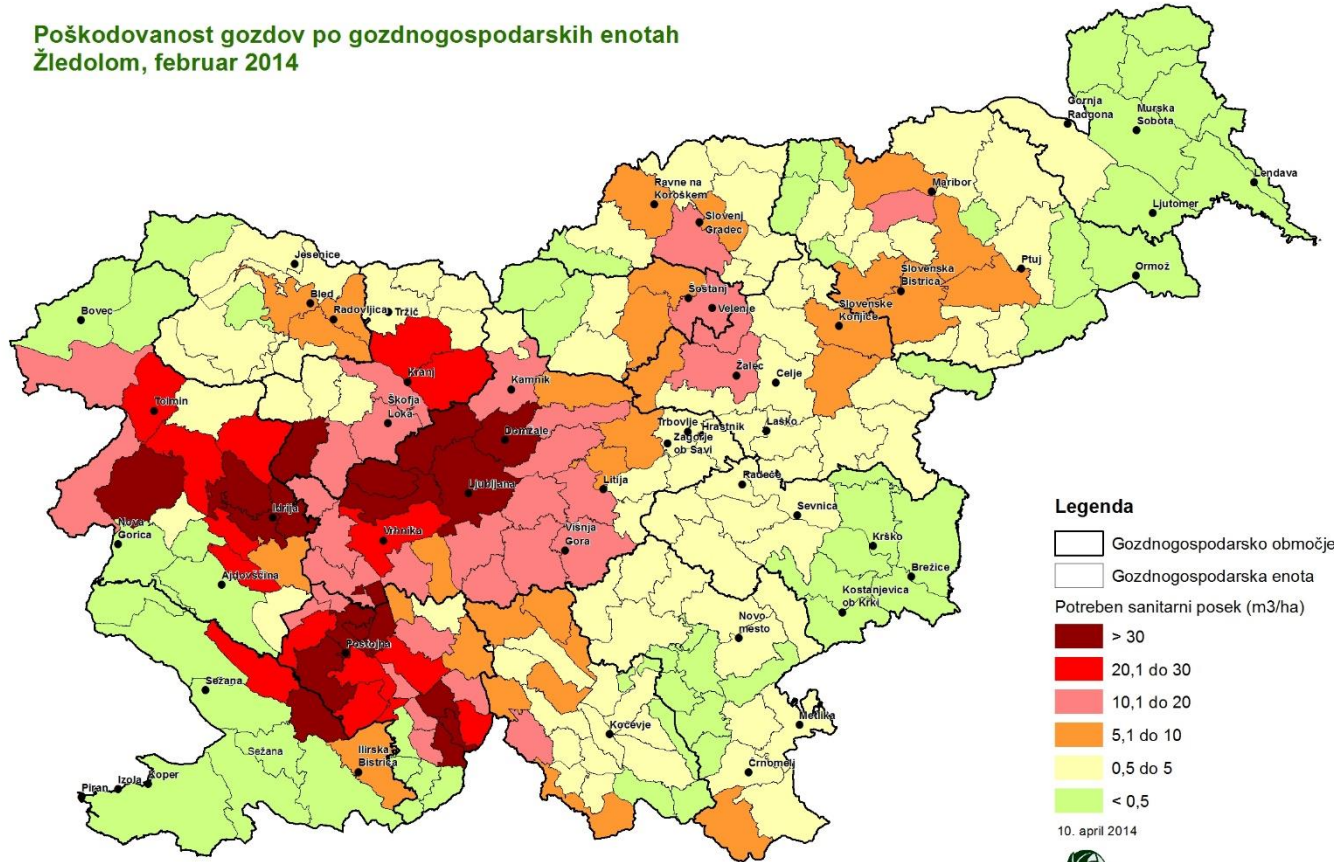
Timeframe:

Sever sleet (ice rain) damages in 2014 + windthrow -> bark beetle damages

Poškodovanost gozdov po gozdnogospodarskih enotah Žledolom, februar 2014

Legenda

Gozdnogospodarsko območje
Gozdnogospodarska enota

Potreben sanitarni posek (m3/ha)
> 30
20,1 do 30
10,1 do 20
5,1 do 10
0,5 do 5
< 0,5

10. april 2014
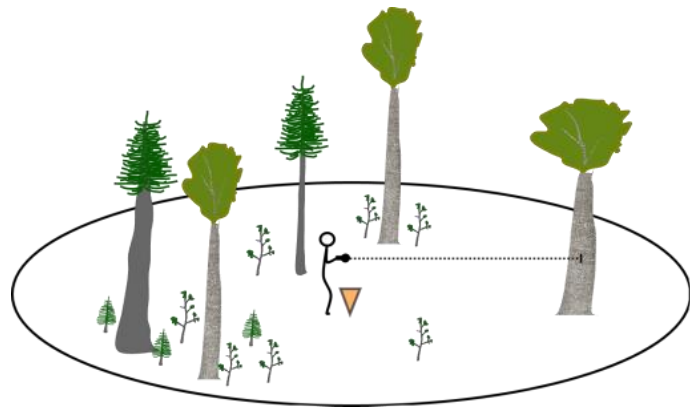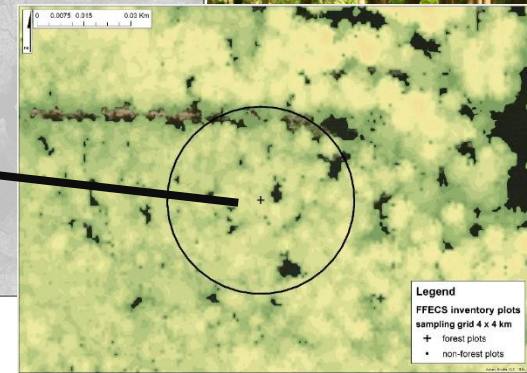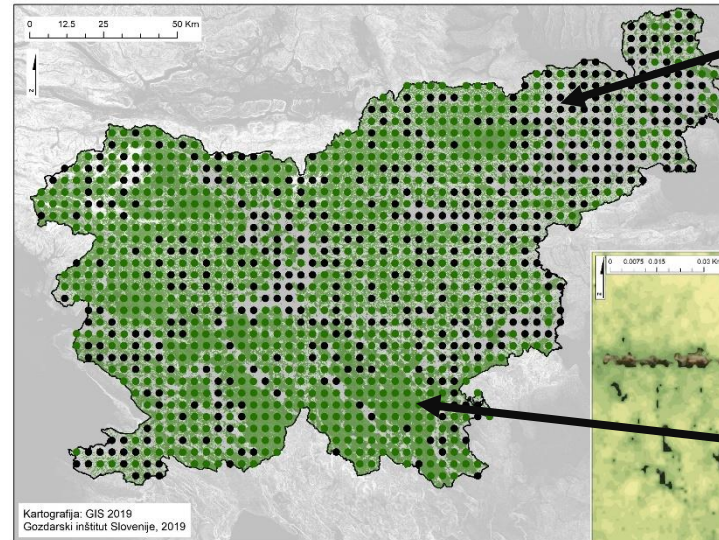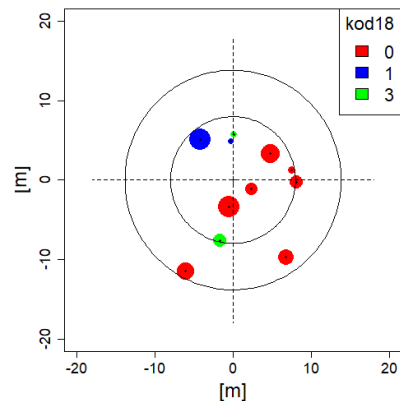
ZAVOD za GOZDOVE SLOVENIJE

CURRENT DETECTION and MONITORING:

Field assessment -> ground truth data

1. Public Forest Service -> district foresters
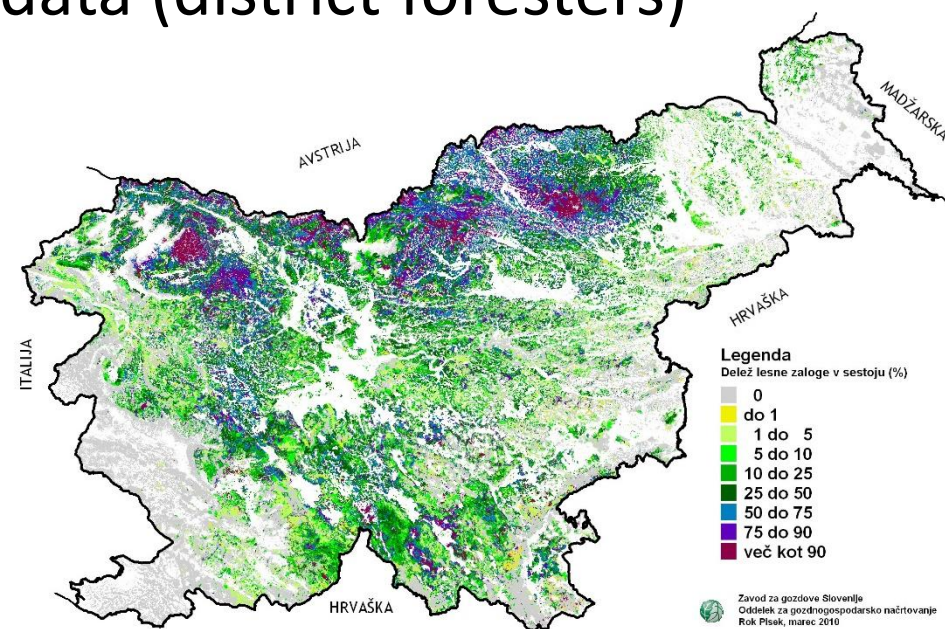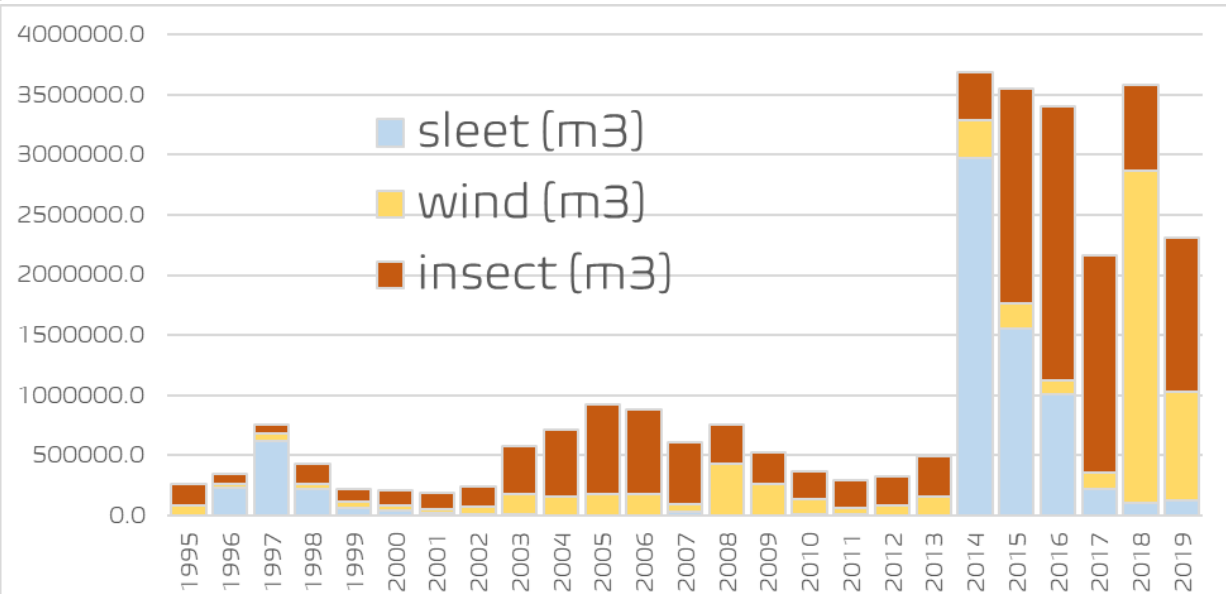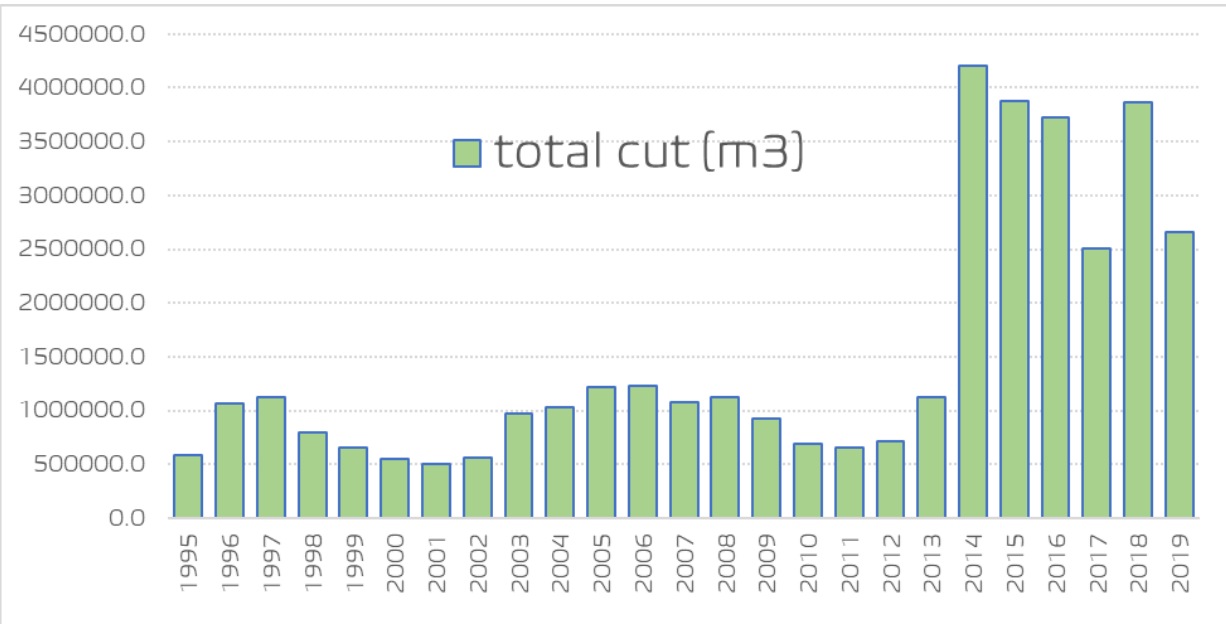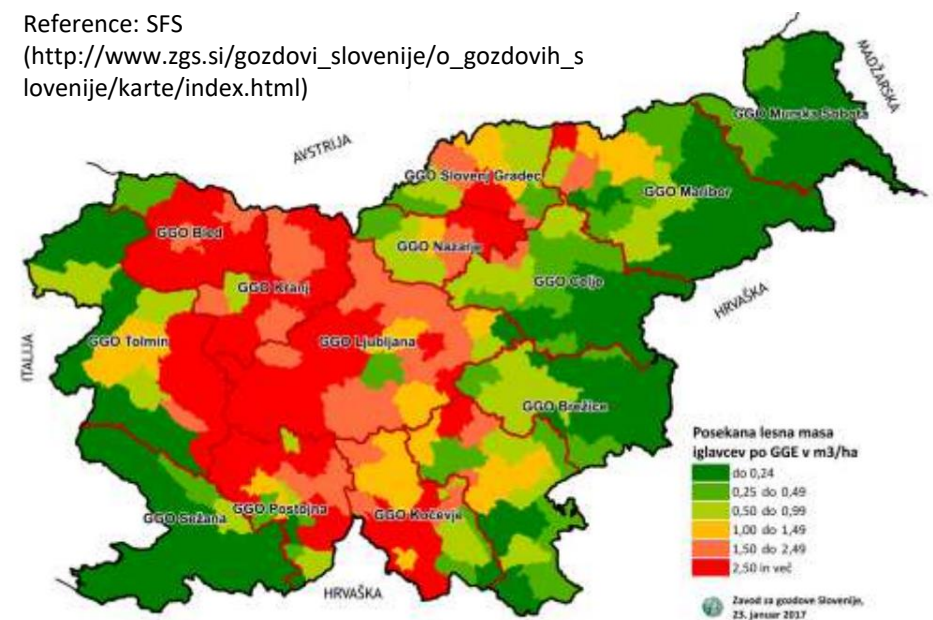2. National Forest Inventory -> plot inventory

DETECTION and MONITORING: SFS Timber data (district foresters)

Data source: Timber - podatkovna zbirka o poseku gozdnega drevja. Zavod za gozdove Slovenije, 1995-2019
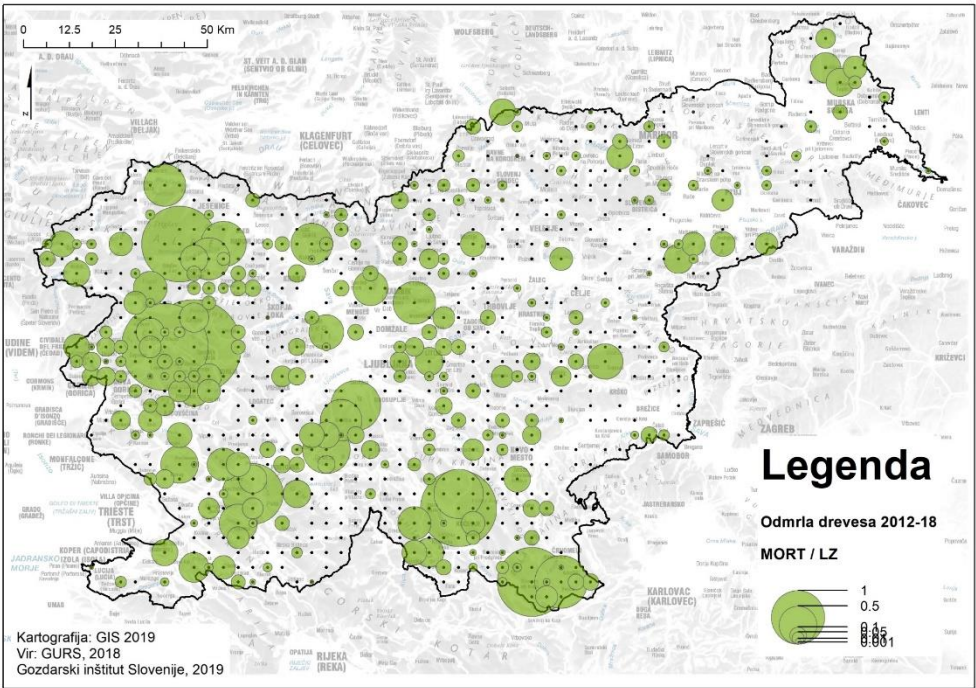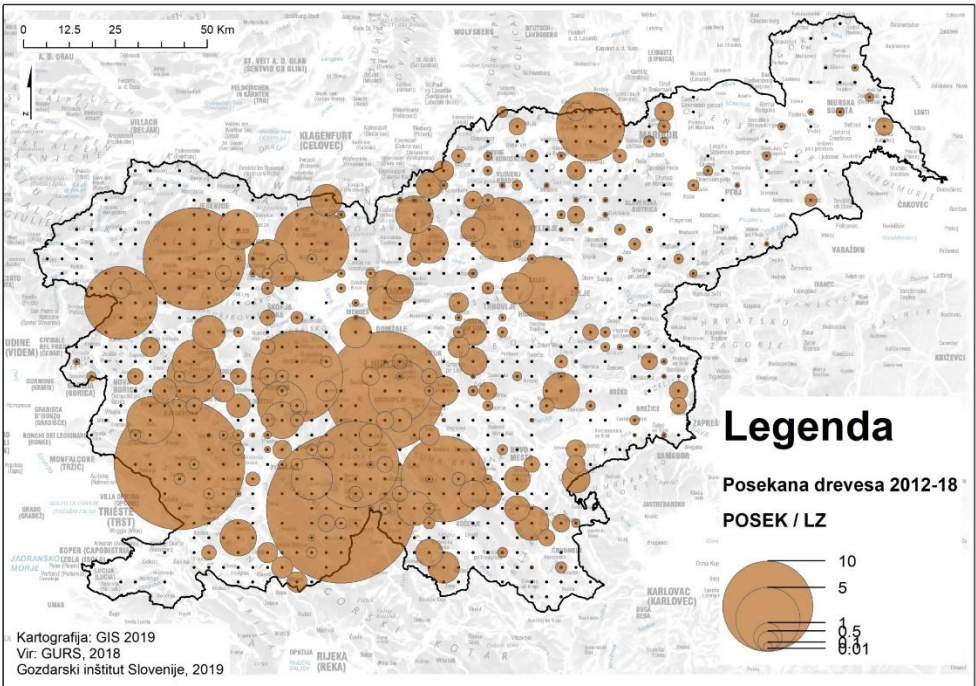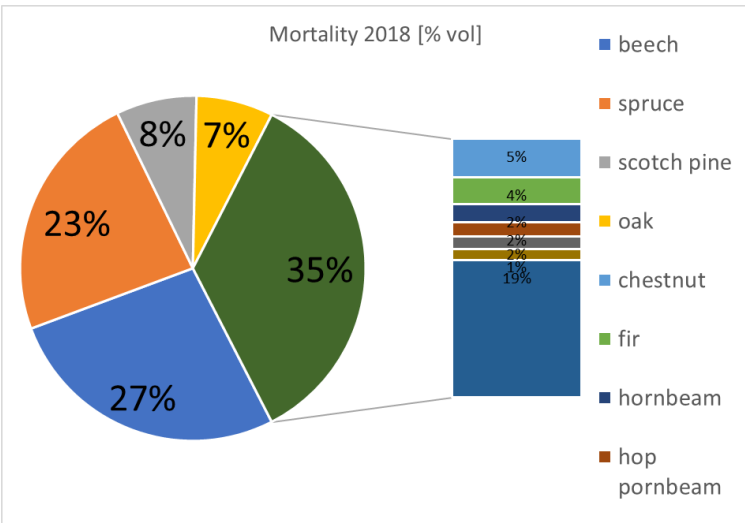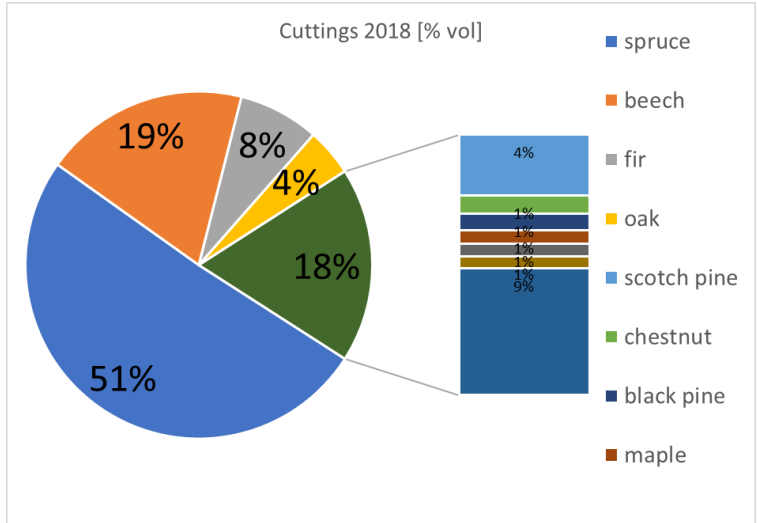

Reference: SFS
(http://www.zgs.si/gozdovi_slovenije/o_gozdovih_s
lovenije/karte/index.html)

Reference: SFS report on Slovenian forests 2016

DETECTION and MONITORING: National Forest Inventory 2012-2018 (SFI and SFS)

Logging reason	% of total
Sanitary	50.2
Other	49.8

GS [m³/ha] — 2007, 2012, 2018
beech, spruce, fir, oaks, scots pine, maple, hornbeam, chestnut, black pine, hop-hornbeam, other

Cuttings 2018 [% vol]
- spruce 51%
- beech 19%
- fir 8%
- oak 4%
- scotch pine 4%
- chestnut
- black pine
- maple
(4%, 1%, 1%, 1%, 1%, 1%, 9%)

Mortality 2018 [% vol]
- beech 27%
- spruce 23%
- scotch pine 8%
- oak 7%
- chestnut 35%
- fir
- hornbeam
- hop pornbeam
(5%, 4%, 2%, 2%, 2%, 1%, 19%)

Legenda
Posekana drevesa 2012-18
POSEK / LZ
10, 5, 1, 0.5, 0.01

Kartografija: GIS 2019
Vir: GURS, 2018
Gozdarski inštitut Slovenije, 2019

Legenda
Odmrla drevesa 2012-18
MORT / LZ
1, 0.5, 0.15, 0.001

Kartografija: GIS 2019
Vir: GURS, 2018
Gozdarski inštitut Slovenije, 2019

Comments on current monitoring

- Damage assessment (sanitary felling) -> ground truth data
  - Only detected/reported felling included
  - Objective methodology

- Problems with early warnings?
  - Importance of small hot spots
  - Inaccessible areas (Alps)
  - -> protective forests

Ongoing research and further information

- Use of UAV and satellite date for early warnings
- Predictions of bark beetle outbreaks
- Problems with spatial and temporal resolution of satellite data + cloud problems

SCERIN -> LISTEN TO (DAY2: January 22, 2021):

1. Maarten de Groot and Nikica Ogris = *Predictive modeling of the first bark-beetle outbreaks and links to remote sensing*

2. Andrej Kobler and Nikica Ogris = *Scaling bark beetle damage from the country- to regional- and local levels*

Thank you!

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