Analysis of vegetation on avalanche slopes in the central part of the Giant Mts.

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With Míla Kociánová

Avalanches

slab avalanche

dry snow avalanche

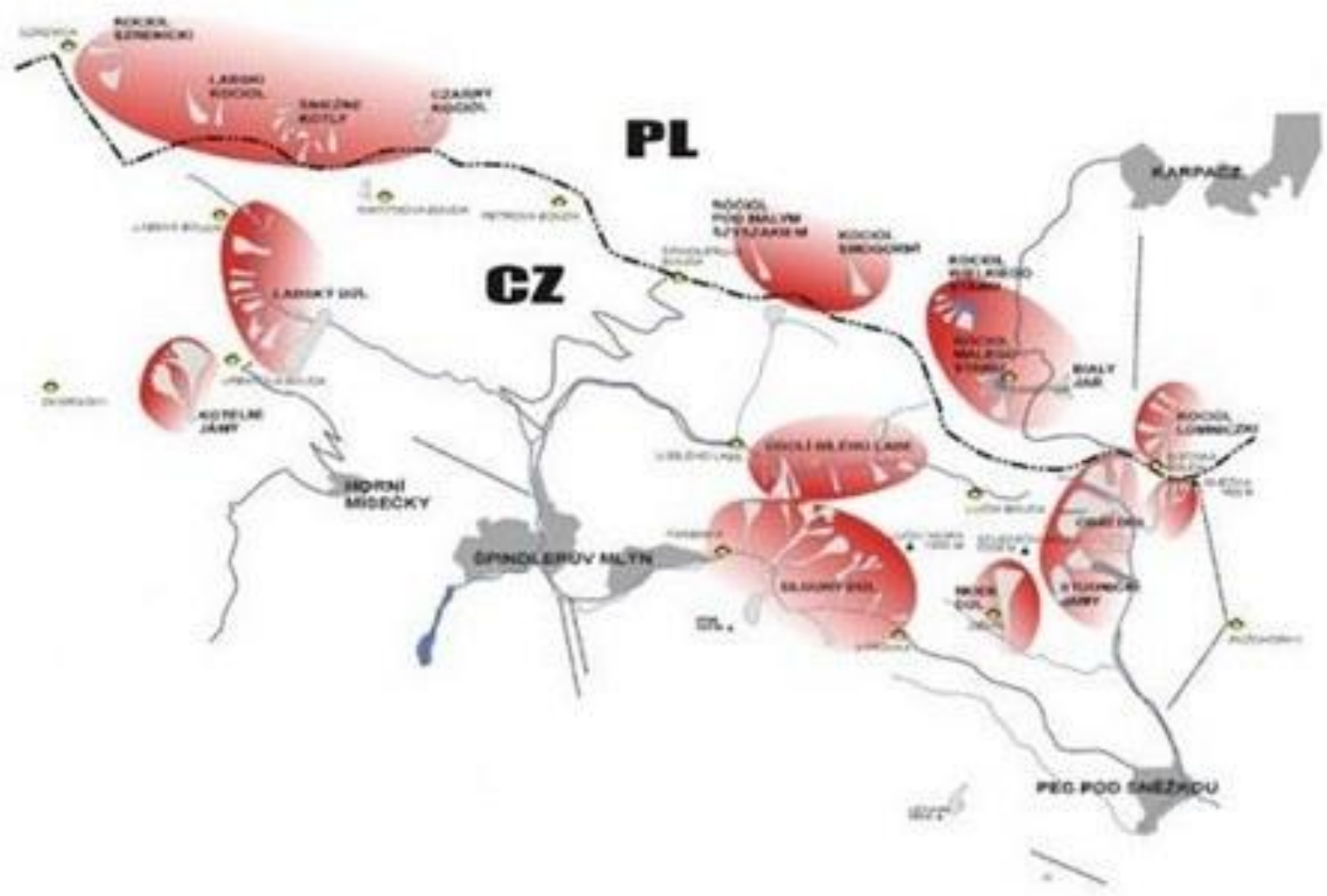
Avalanches create new sites for plant species establishment.

Velká Studniční jáma ,
12.3.2002. Photo V. Spusta

Studniční stěna, Úpská jáma. Photo M. Tůma

Photo M. Kociánová , 13.3. 2002

Avalanches slopes in KRNAP



Our localities

1. Pramenný důl – Červinkova mulda
2. Labský důl
3. Úpská rokle – Obří důl


905,8
1283,8
Červenkův kr.
kleč
Červenkova
mohyla
Volenský
žlab
Výrovka
kleč
Zadní
Planina
1422,7


Labská bd.
Labská rokle
1317,1
Martinův důl
Navorská jama
Labské meandry
Schustlerova zahr.
Krakonošova klenotnice
1029,0
1174,6
Labské kaskady
Hančův pom.
Harrachova jáma
Mohyla Hanče a Vrbaty
Zlaté návrší
1410,9
Buchárova cesta
Malý Labský dp.
Dvorský p.
smrk
Stříbrná
830,9
Labe


Schr. Pod Śnieżka
Śnież
býv. Obří bd.
1602,3
Úpská jáma
Sněž
Krakonošova
zahrádka
Rudnik
Rudné rokle
Čertův hřeben
Čertova rokle

1) Dendrochronological part

Study of trees affected by avalanches, dating significant avalanche events.

2) Herbaceous part

Study of successional stages and vegetation dynamics of avalanche tracks.

DENDROCHRONOLOGY

Veronika Langová

Aims of study

- Study species Picea abies
- Dendrochronological methods (tree ring analysis) in combination with available climatic data

- To evaluate age structure and changes in radial growth of trees
- To create control growth curve for individuals not disturbed by avalanche
- To find out the effects of avalanche fall on trees along the whole avalanche track
- To find out a differency in wood structure of individuals regularly disturbed by avalanche

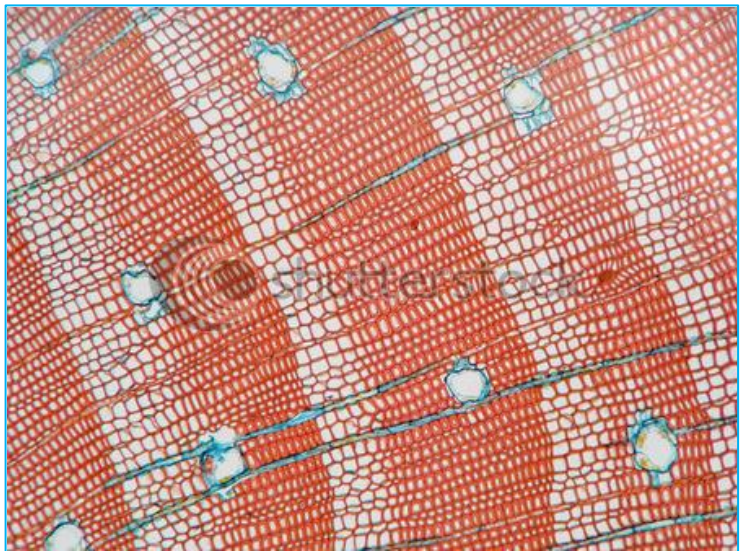
Methods

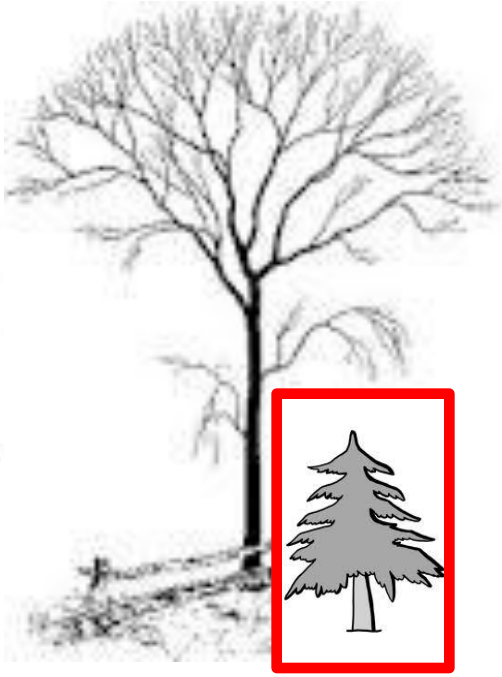
- Collecting tree core samples of *Picea abies*
- Measurements of tree hight and DBH
- Analysis of samples by standard dendrochronological methods

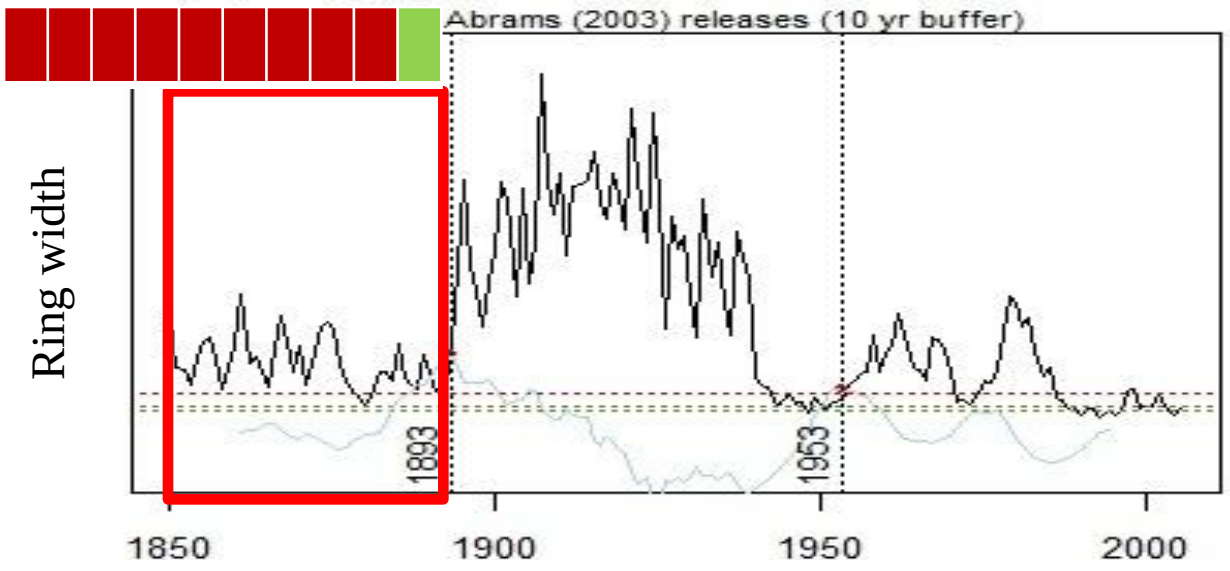
Sample collecting

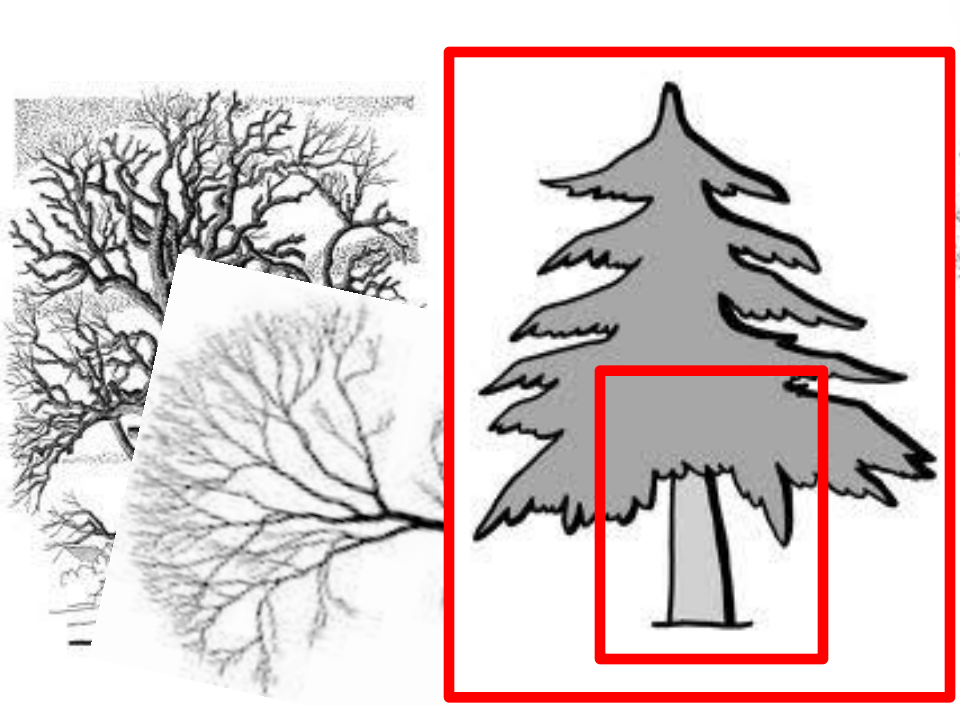
http://lape.prf.jcu.cz/specializace/dendrochronologie/

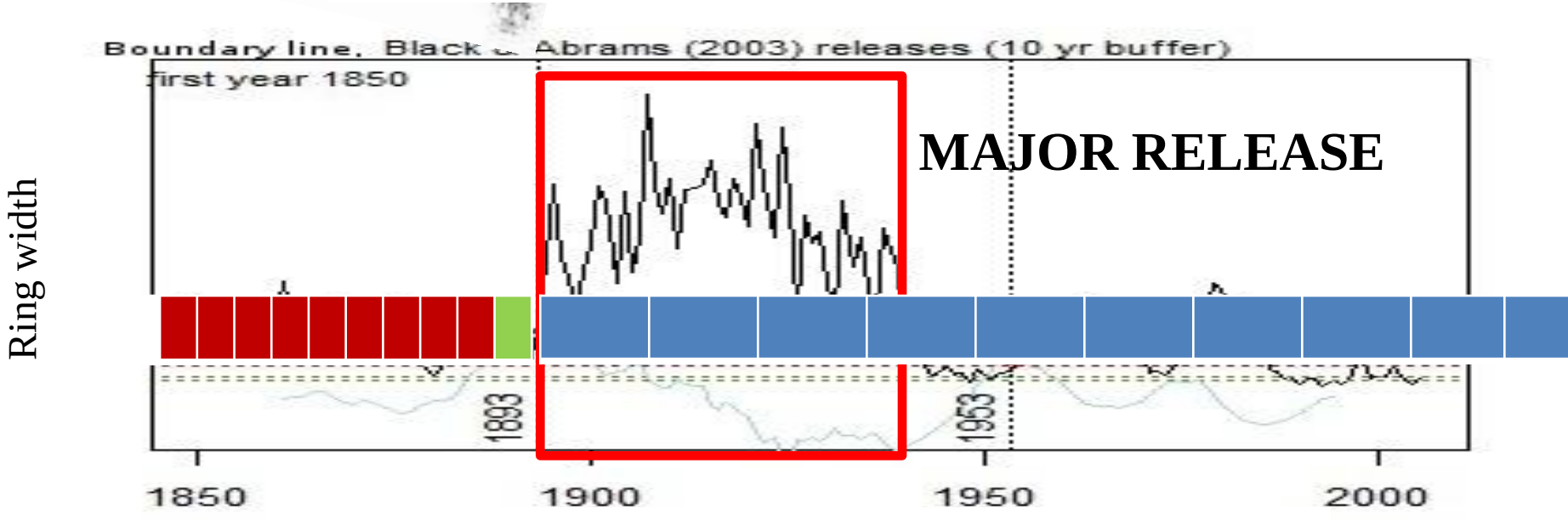
Changes in a tree ring growth

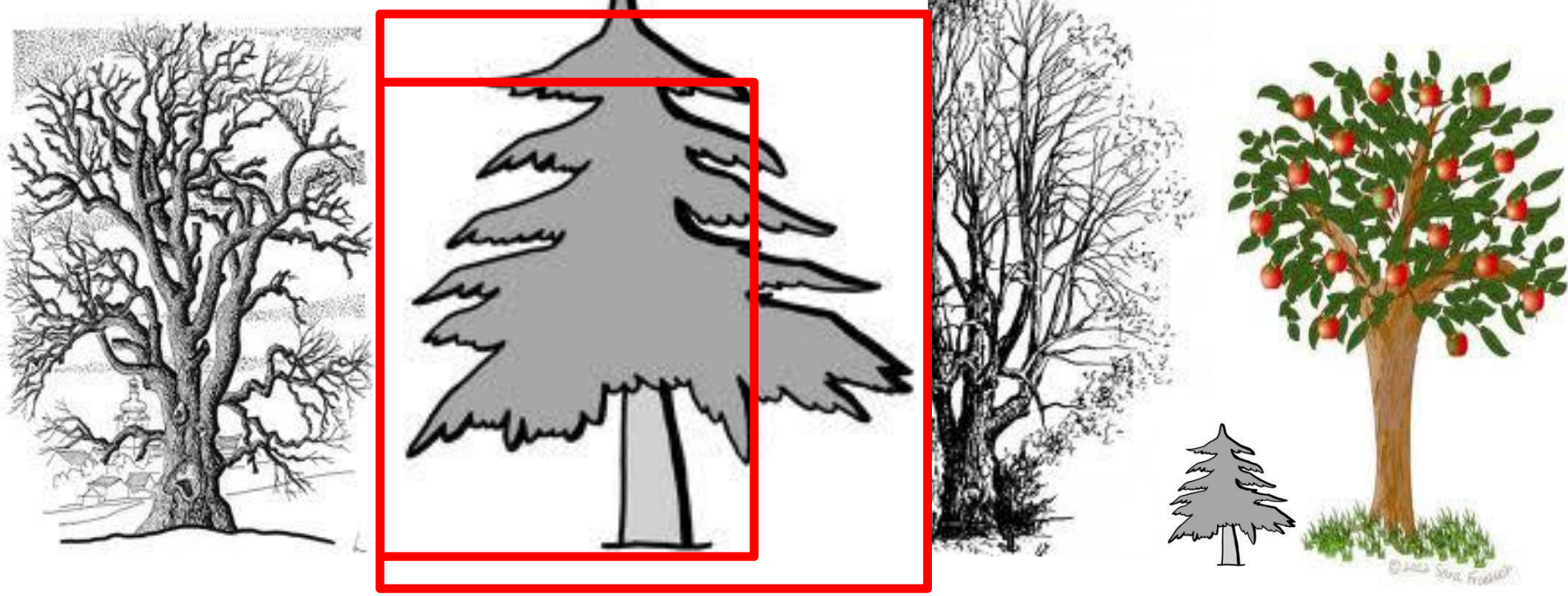


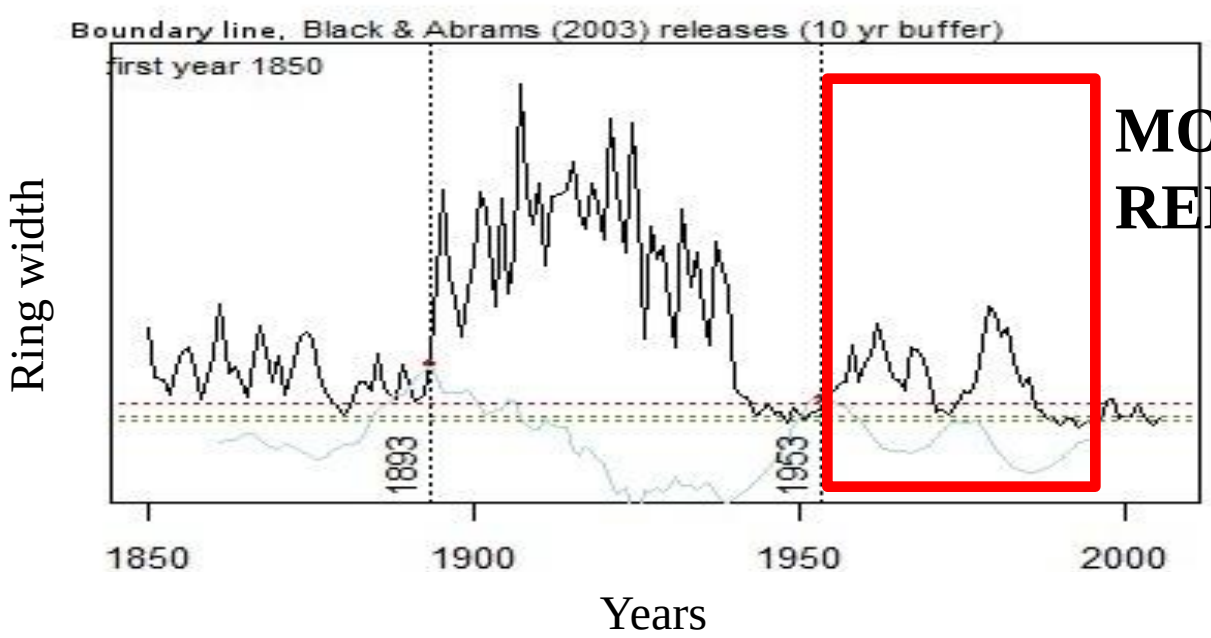



Abrams (2003) releases (10 yr buffer)
Ring width
1893
1953
1850
1900
1950
2000
Years




Boundary line, Black & Abrams (2003) releases (10 yr buffer)
first year 1850
MAJOR RELEASE
Ring width
1893
1953
1850
1900
1950
2000
Years



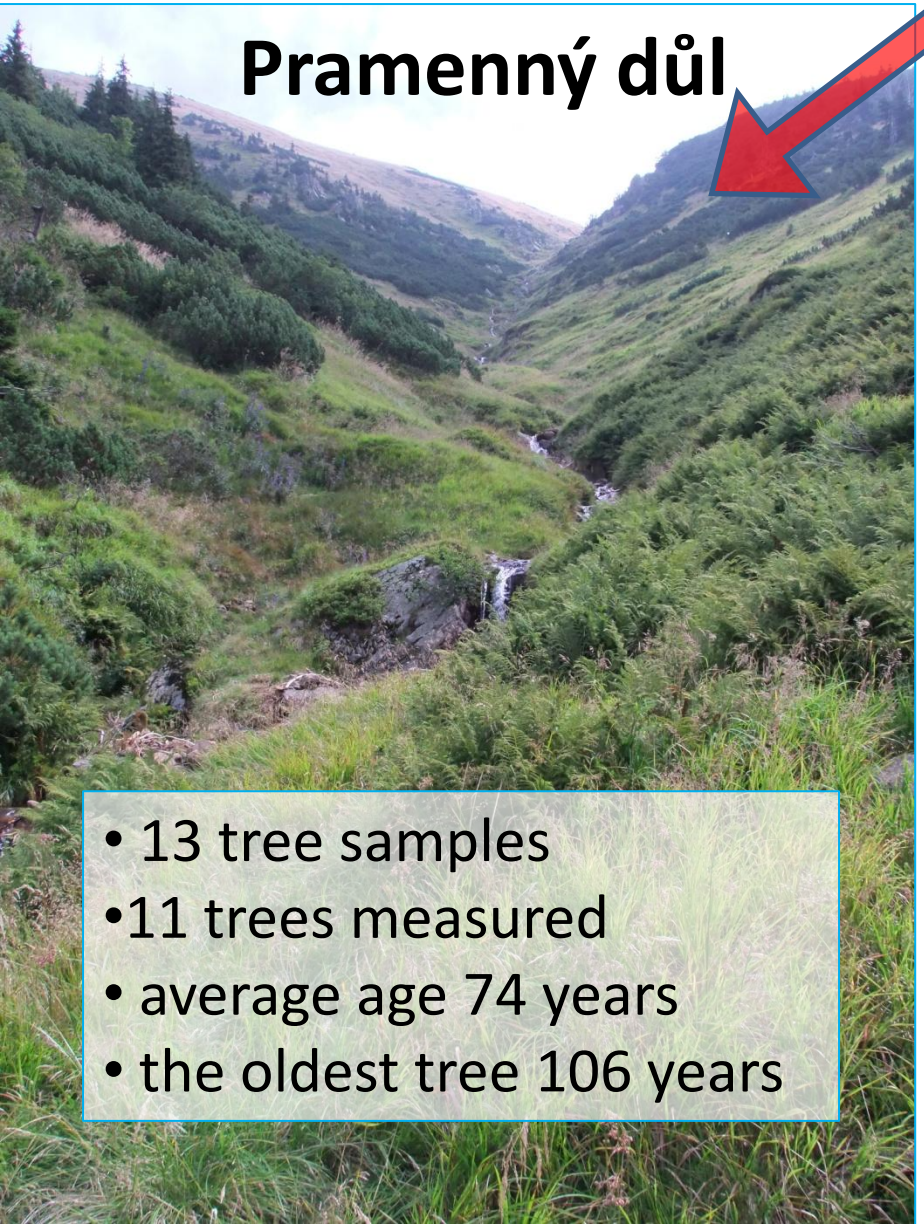


MODERATE RELEASE

Localities

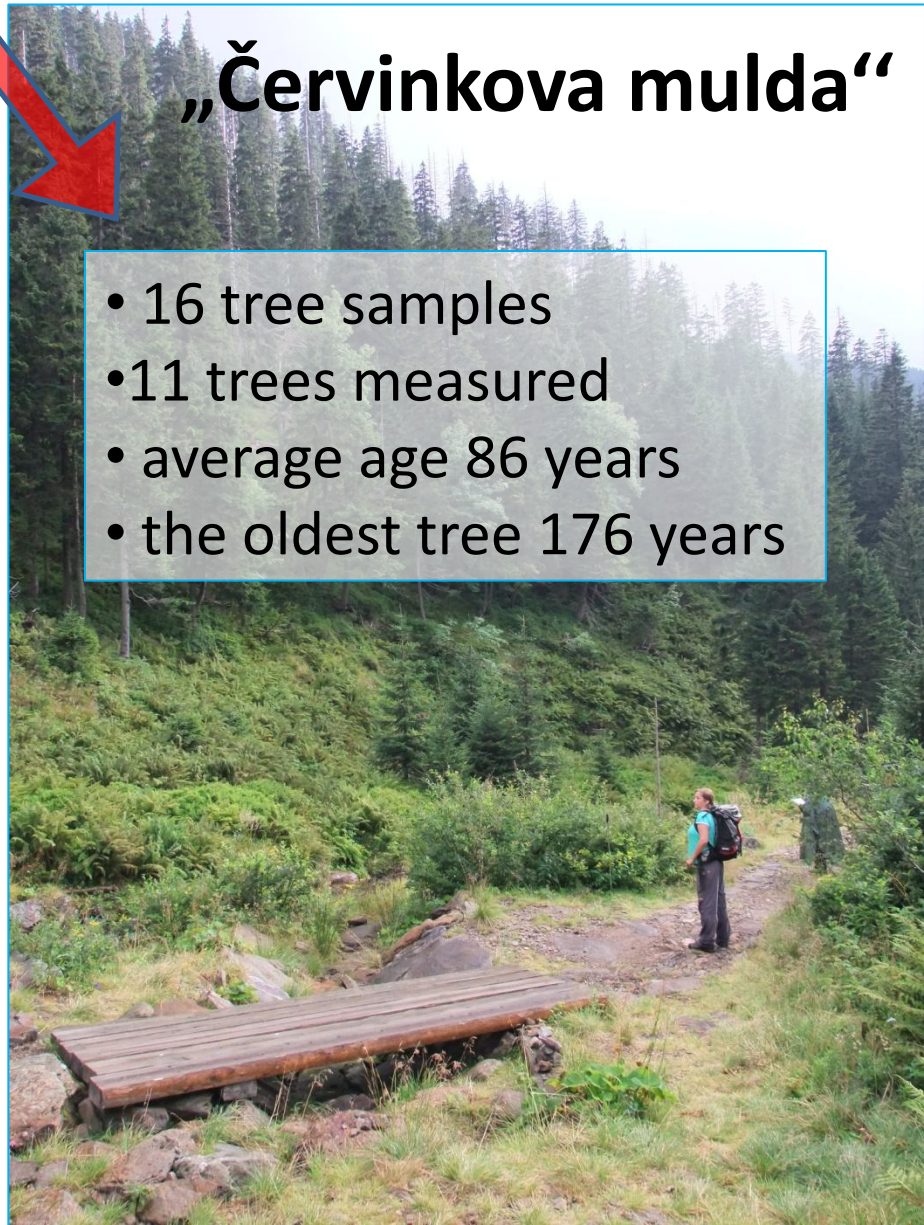
Dlouhý důl

Pramenný důl

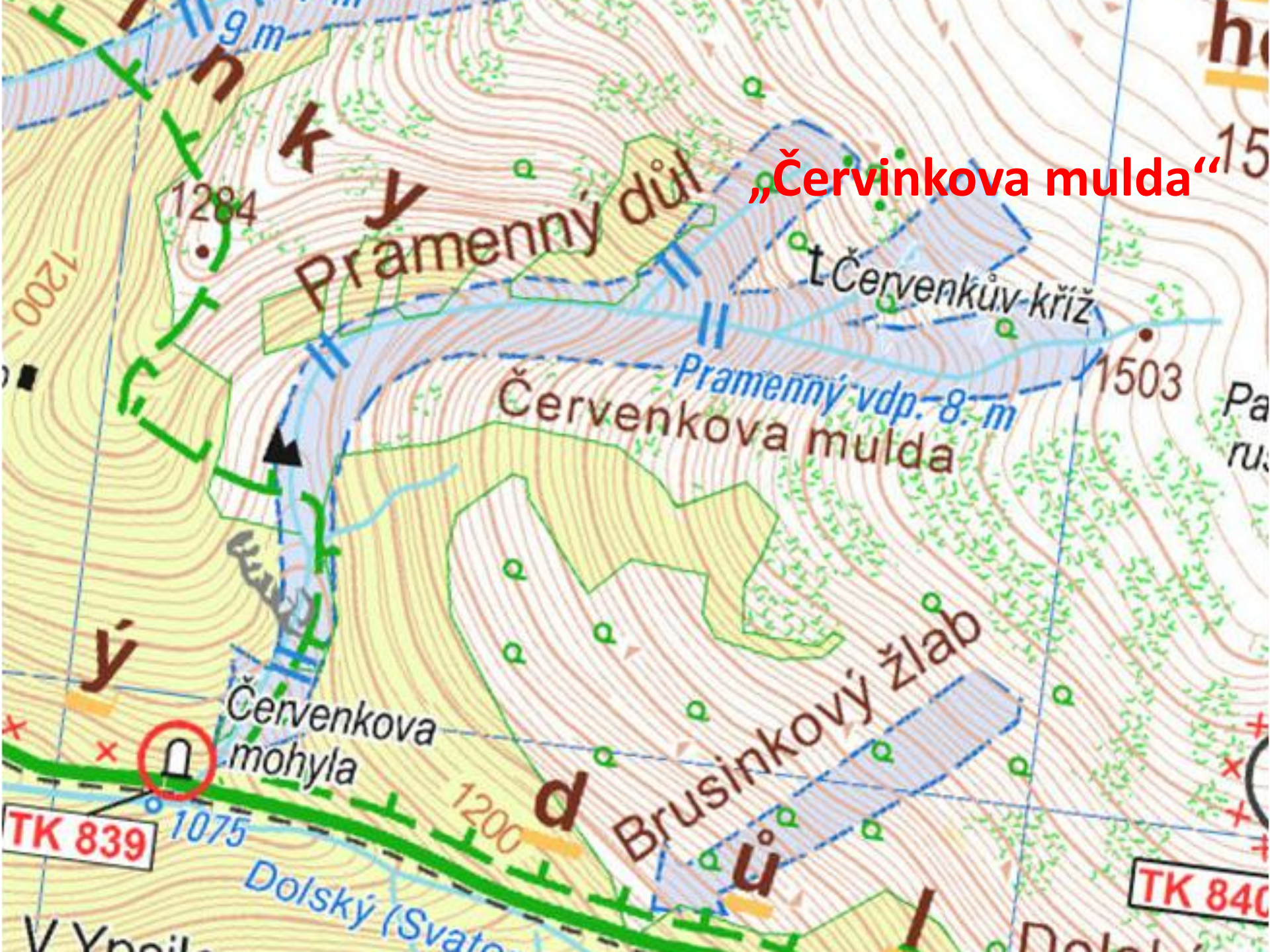


- 13 tree samples
- 11 trees measured
- average age 74 years
- the oldest tree 106 years

„Červinkova mulda“



- 16 tree samples
- 11 trees measured
- average age 86 years
- the oldest tree 176 years

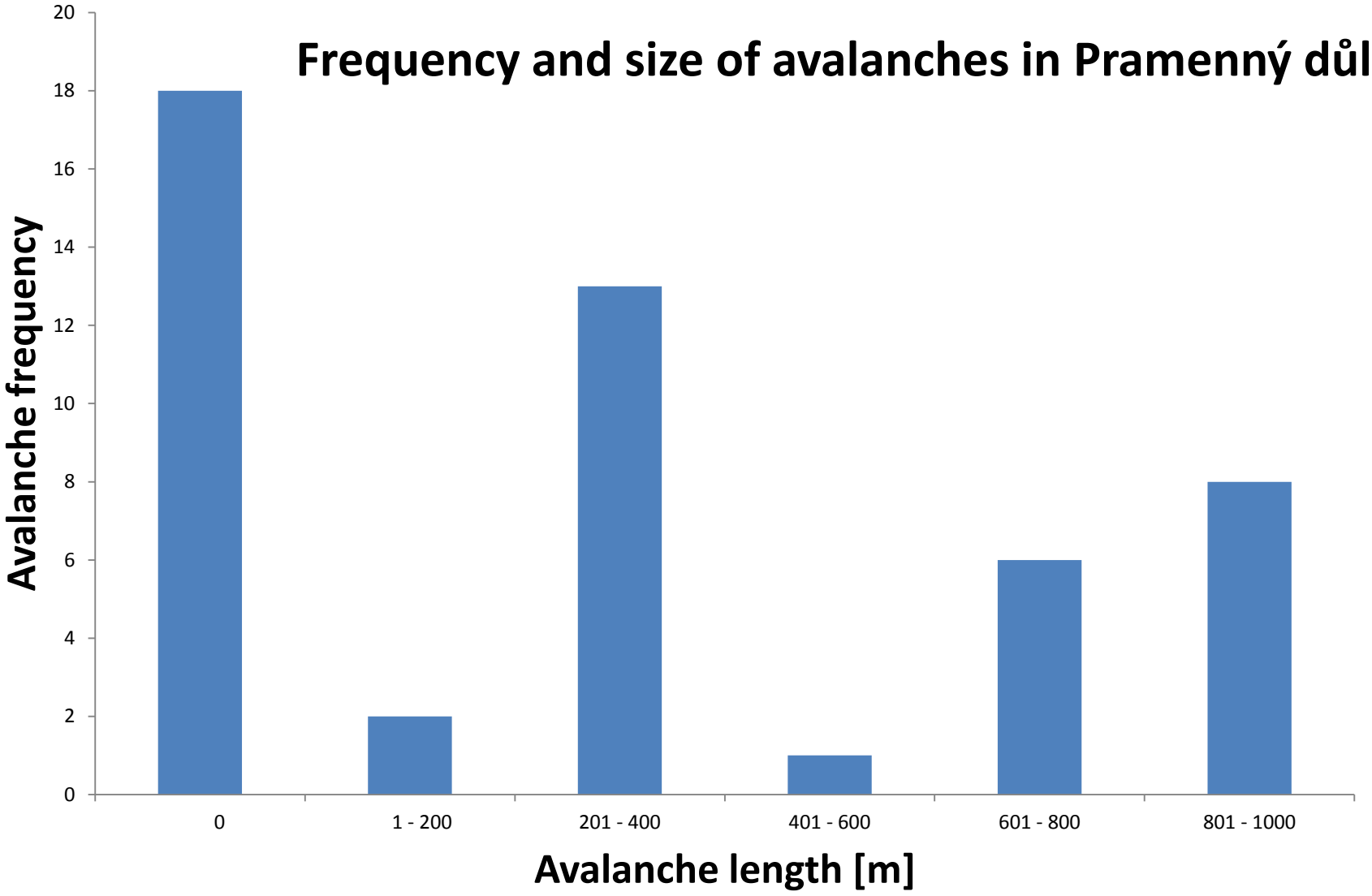

„Červinkova mulda“
Pramenný důl
Červenkův kříž
1503
Pramenný vdp. 8. m
Červenkova mulda
1284
Červenkova mohyla
1075
1200
TK 839
Brusinkový žlab
Dolský (Svato
TK 840

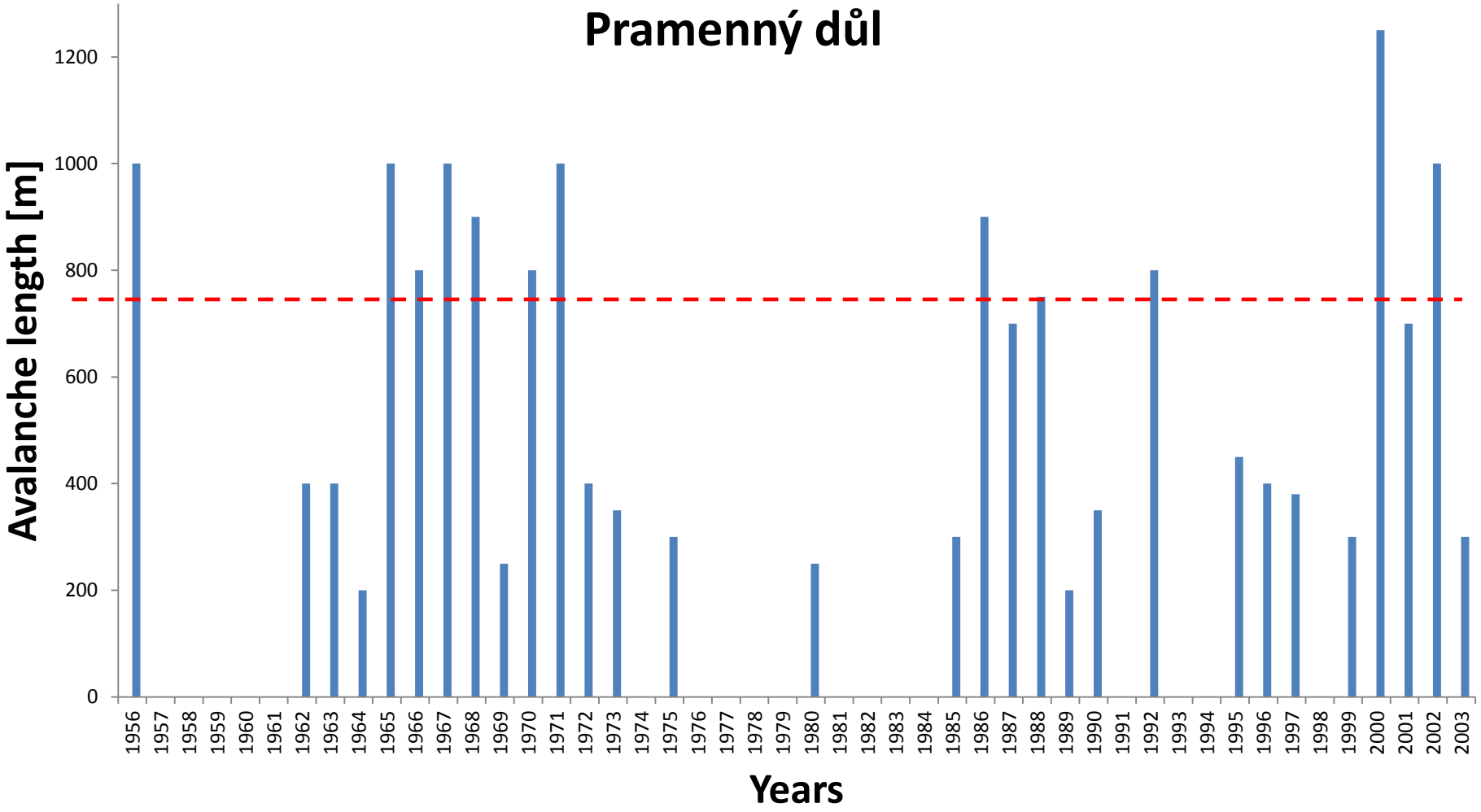
Results

Picea abies samples

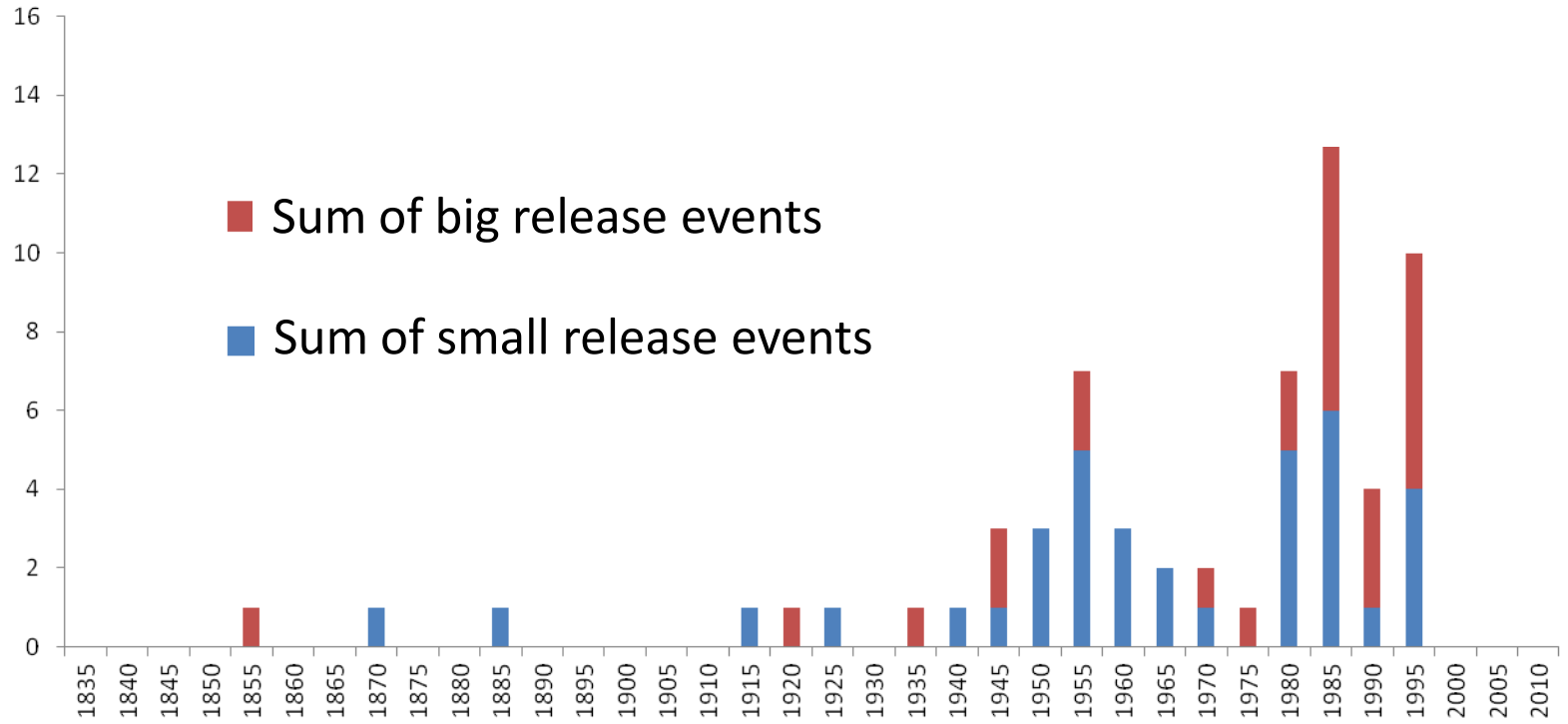
- Samples from 5 avalanche tracks
- Total number of analysed tree rings: 8 713

Wow wow wow!!!


Frequency and size of avalanches in Pramenný důl
Avalanche frequency
20
18
16
14
12
10
8
6
4
2
0
0
1 - 200
201 - 400
401 - 600
601 - 800
801 - 1000
Avalanche length [m]

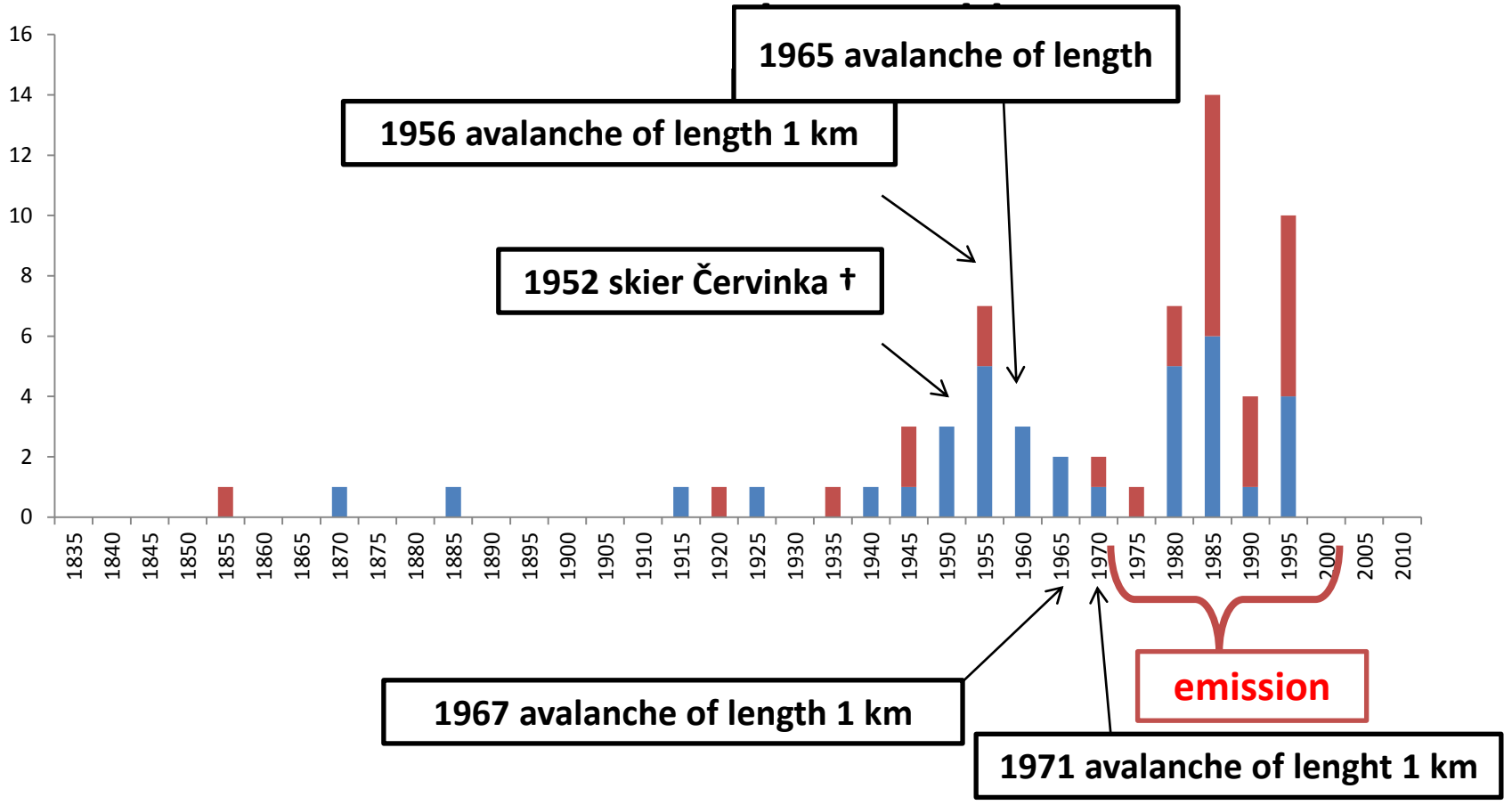

Pramenný důl
Avalanche length [m]
0
200
400
600
800
1000
1200
1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003
Years

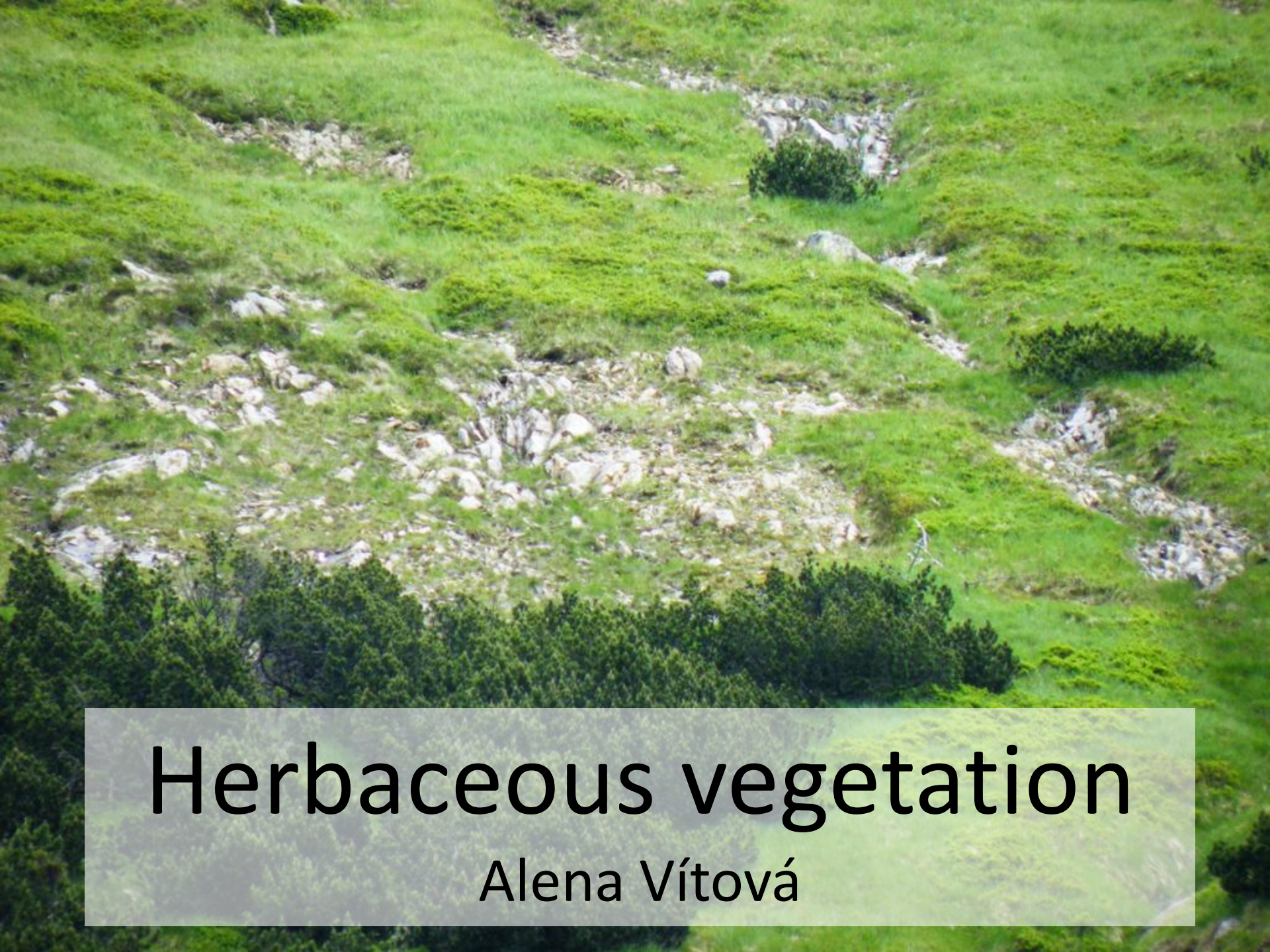
Number of „release“ in 5-year intervals in Dlouhý důl, avalanche track in Pramenný důl



No. of measured trees – 22
Average age – 86 years
The oldest tree – 176 years

No. of release events in 5-year intervals in Dlouhý důl, avalanche track Pramenný důl





Herbaceous vegetation

Alena Vítová

In years 2011 - 2013

- establisment of permanent plots 1 x 1 m
- monitoring of vegetation dynamics

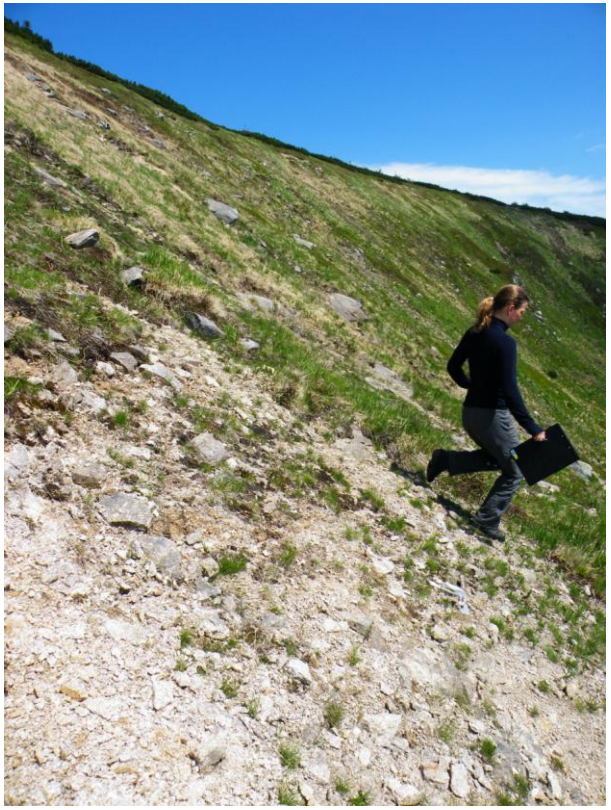
Foto J. Kopáčová, 12.10.2006

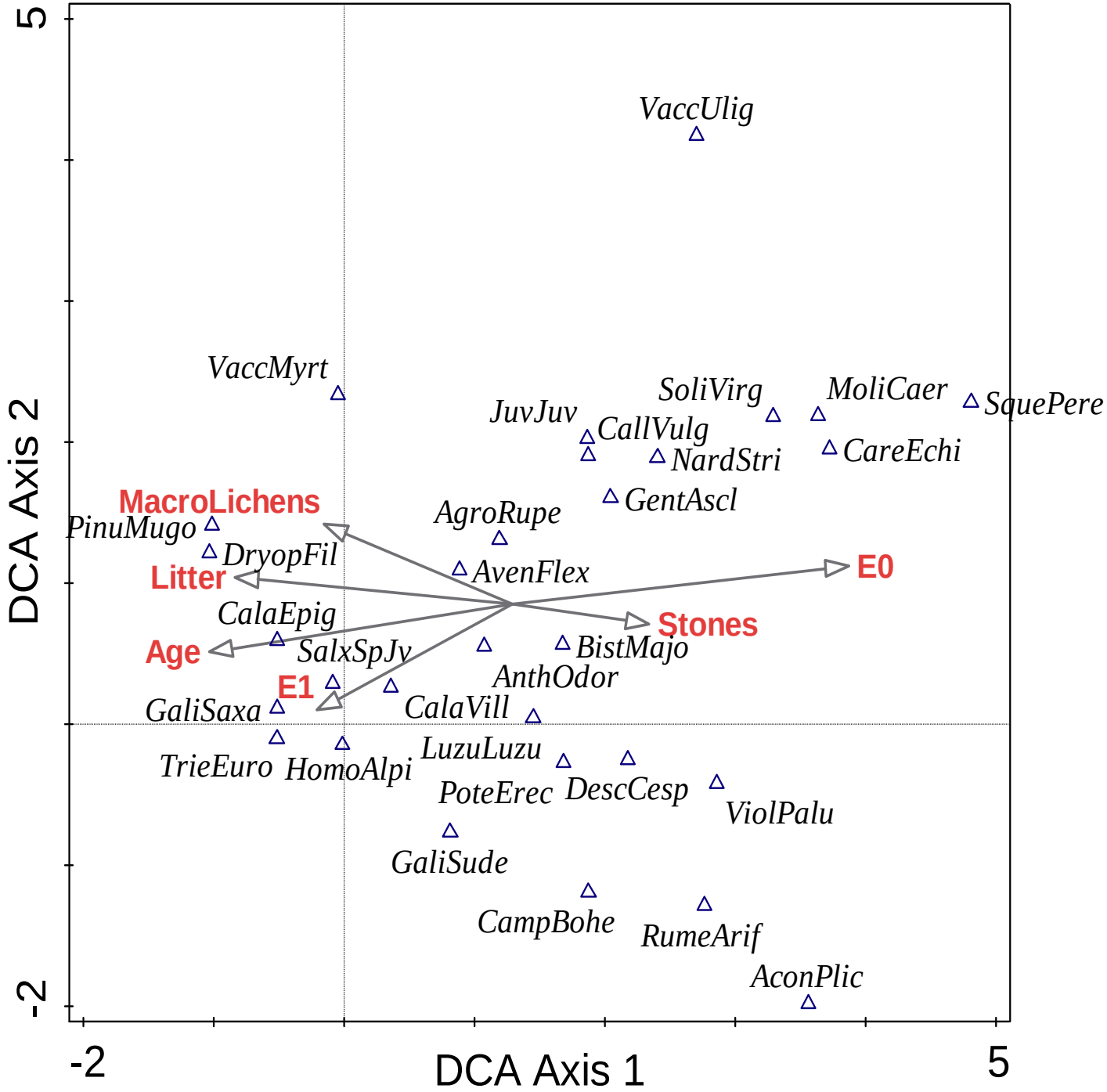
Pramenný důl

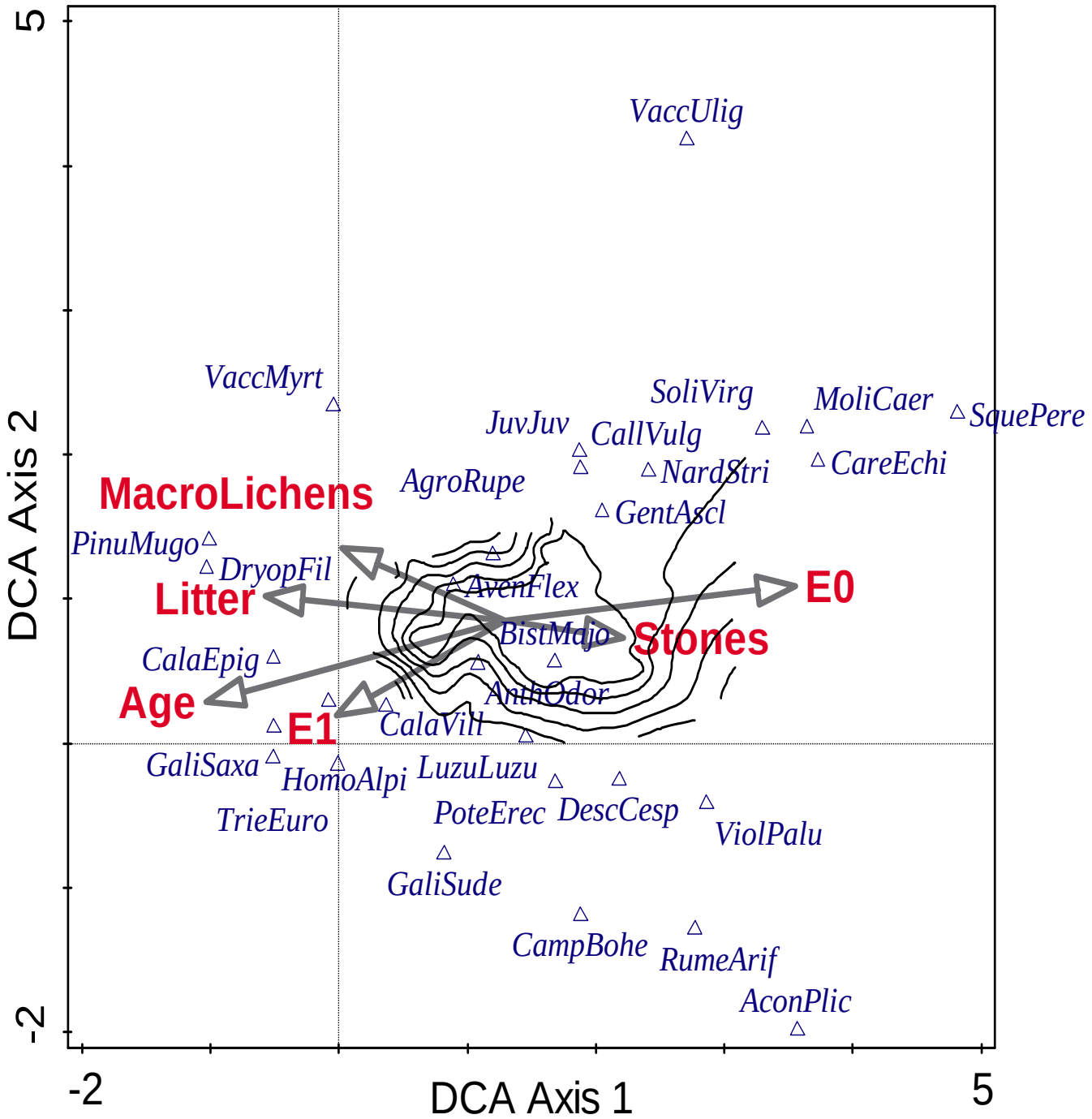
- based on Míla Kociánová research
- 1992 – full-depth avalanche (with vegetation segregation)
- the last avalanche 1997 (slab avalanche)

Úpská rokle

- based on Míla Kociánová research
- the most avalanches in KRNAP (in 1961/2 – 1997/8 59 falls)
- 1993 – mixed type of avalanche (without snow cover)
- avalanche falls in 1998, 2002 and 2010




5
-2
DCA Axis 2
-2
DCA Axis 1
5
VaccUlig
VaccMyrt
SoliVirg
MoliCaer
SquePere
JuvJuv
CallVulg
NardStri
CareEchi
GentAscl
MacroLichens
AgroRupe
PinuMugo
DryopFil
AvenFlex
Litter
E0
CalaEpig
Stones
Age
SalxSpJv
BistMajo
AnthOdor
E1
GaliSaxa
CalaVill
LuzuLuzu
TrieEuro
HomoAlpi
PoteErec
DescCesp
ViolPalu
GaliSude
CampBohe
RumeArif
AconPlic


5
-2
DCA Axis 2
-2
DCA Axis 1
5
VaccUlig
VaccMyrt
SoliVirg
MoliCaer
SquePere
JuvJuv
CallVulg
CareEchi
NardStri
AgroRupe
MacroLichens
GentAscl
PinuMugo
DryopFil
AvenFlex
Litter
E0
BistMajo
Stones
CalaEpig
Age
AnthOdor
E1
CalaVill
GaliSaxa
HomoAlpi
LuzuLuzu
TrieEuro
PoteErec
DescCesp
ViolPalu
GaliSude
CampBohe
RumeArif
AconPlic

Thanks for your attention!