Rizikové a extrémní meteorologické jevy – popis, podstata a dopady - opakování

Upraveno za podpory projektu FRVŠ 755/2013/B4/d:
„Multimediální podklady pro cvičení předmětu Agroklimatologie“

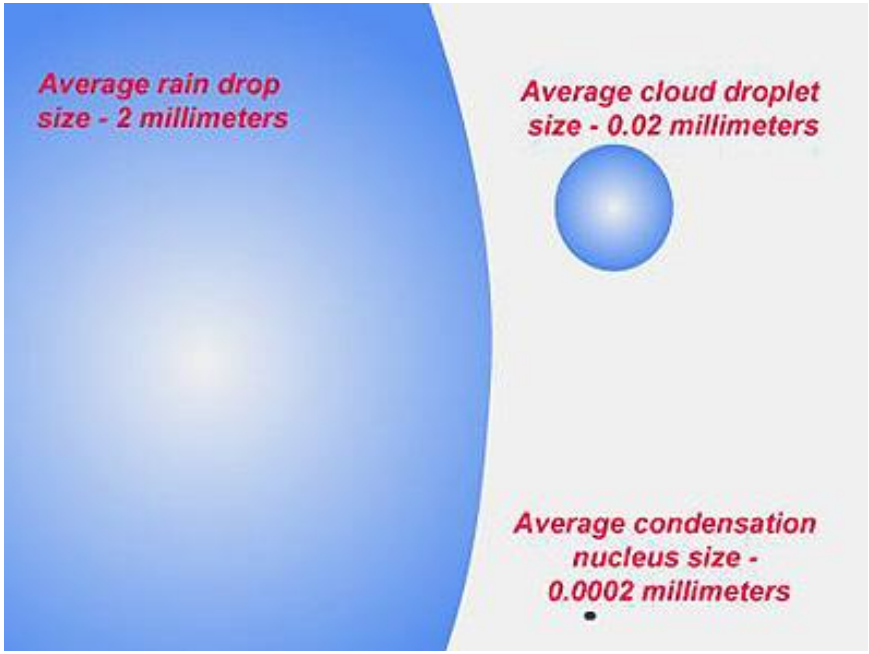
Přehled studovaných jevů

- horké vlny
- bouřka a projevy atmosférické elektřiny
- krupobití
- povodně
- sucho
- extrémní rychlosti větru
- tornáda

Vznik srážek:

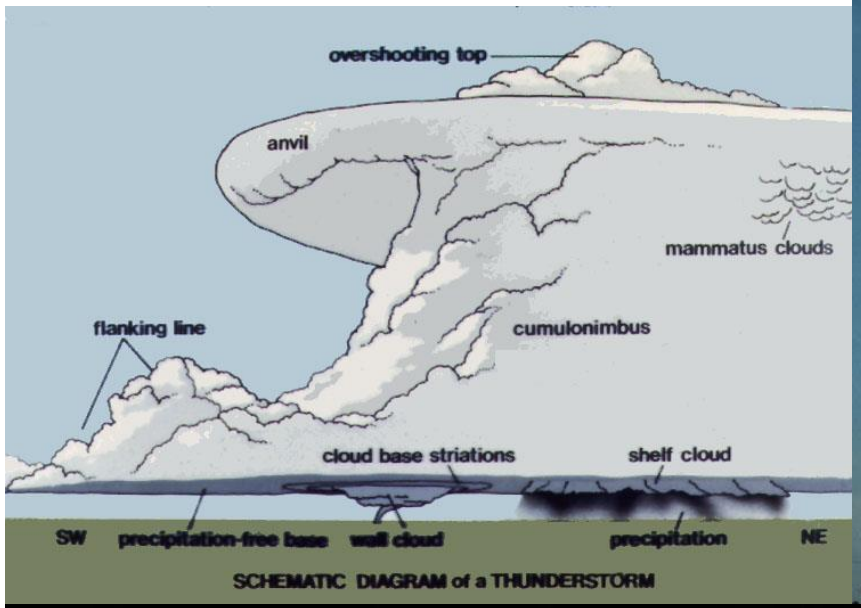
-difuze

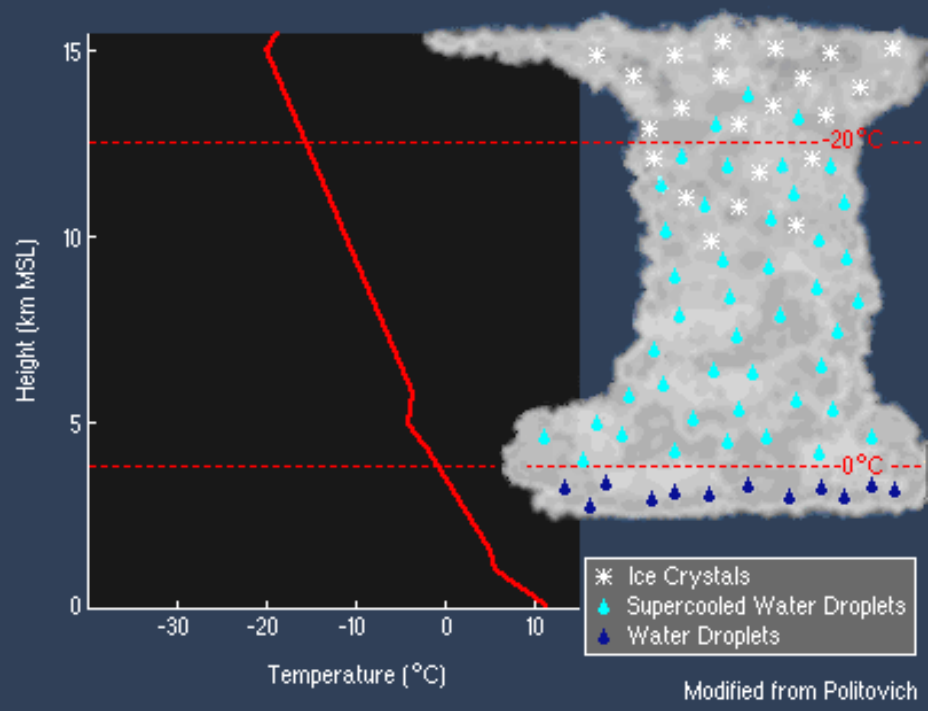
-koagulace

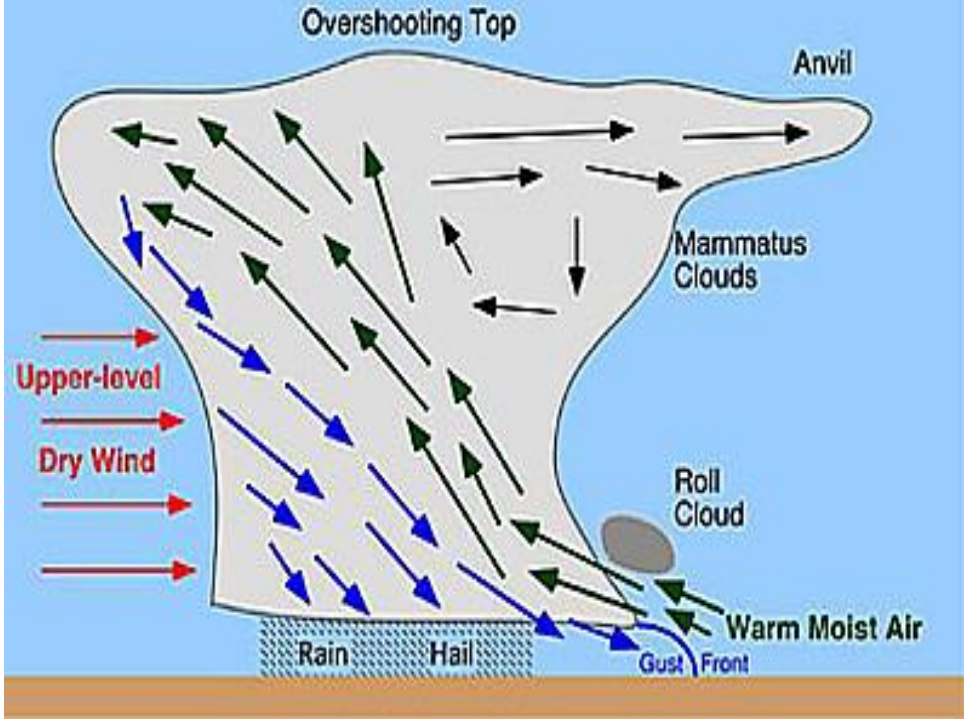


Cumulonimbus - formování

Cumulonimbus - popis

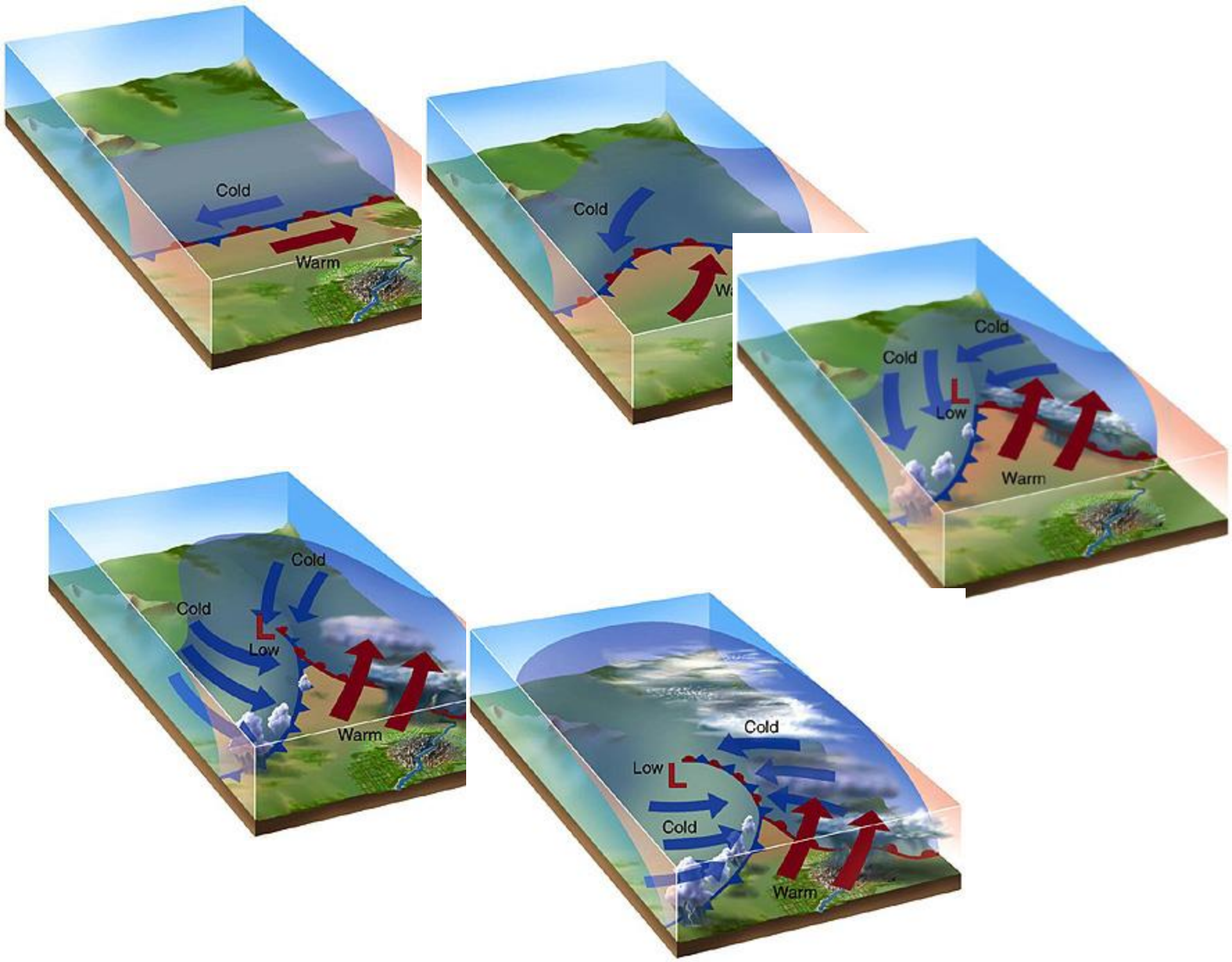



15
10
5
0
Height (km MSL)
-30
-20
-10
0
10
Temperature (°C)
-20°C
0°C
Ice Crystals
Supercooled Water Droplets
Water Droplets
Modified from Politovich

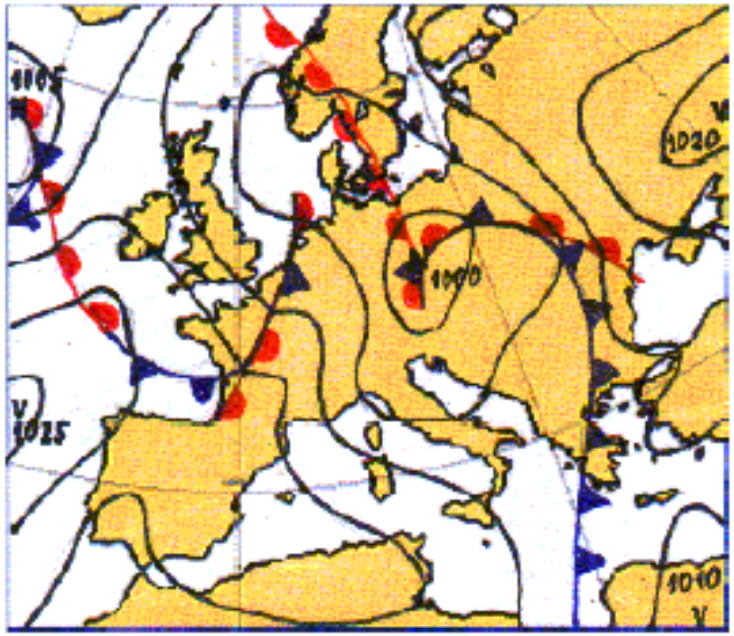

Overshooting Top
Anvil
Mammatus Clouds
Upper-level
Dry Wind
Roll Cloud
Warm Moist Air
Rain
Hail
Gust Front

Povodňové stavy - příčiny

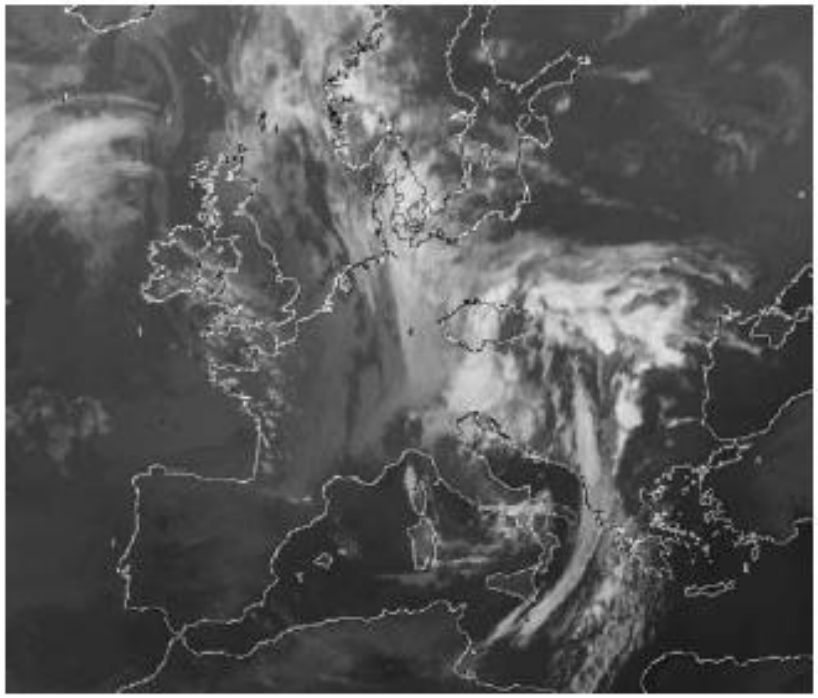
1. Intenzivní srážky (1997, 2002)
2. Tání sněhu (jarní povodně)
3. Přehrazení toků


Cold
Warm
Cold
Cold
Cold
L
Low
Warm
Cold
Cold
L
Low
Warm
Cold
Low
L
Cold
Warm

Tlaková níže a přechod cyklóny, 2002

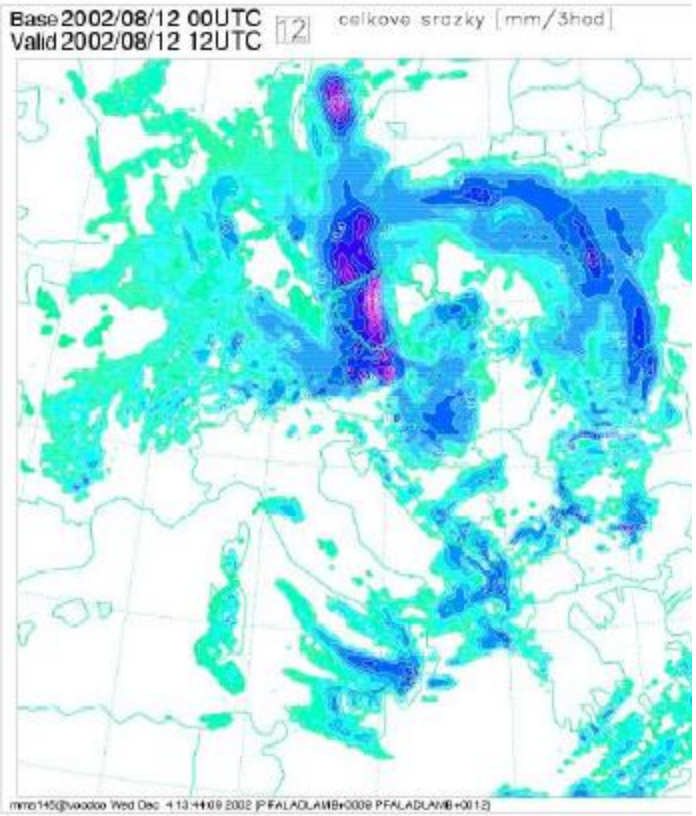


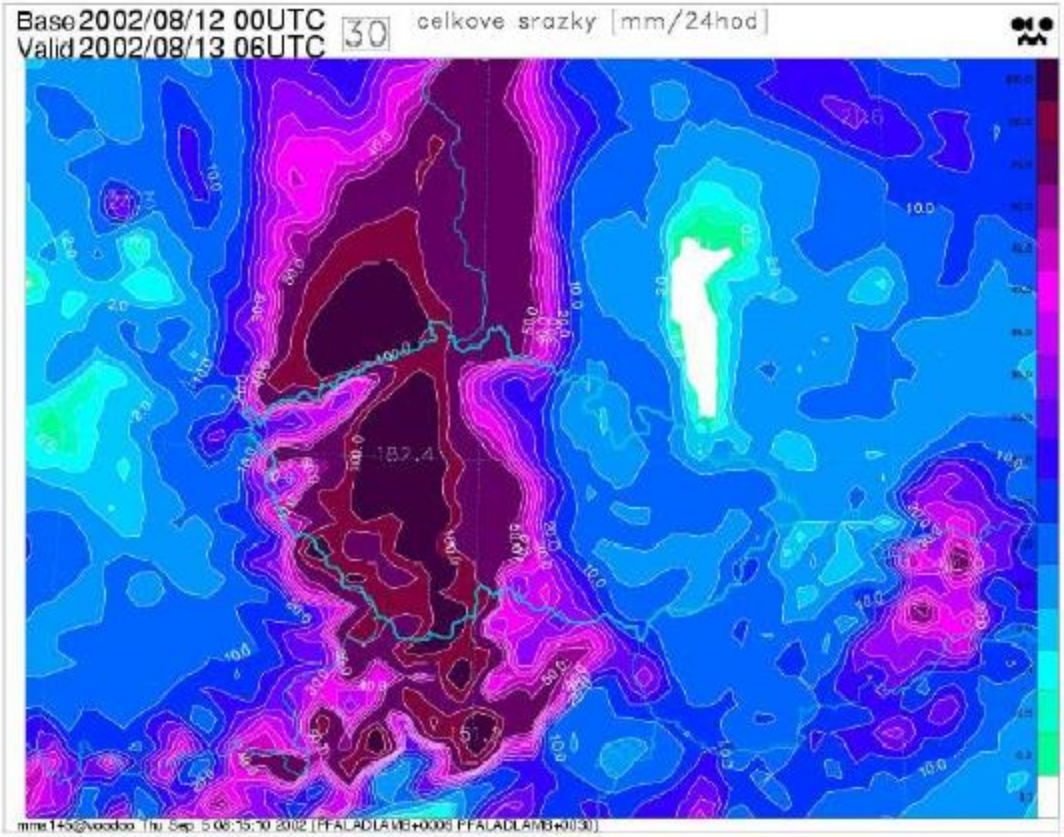
Obr. 1.34 Přízemní mapa z 12. srpna 00:00 UTC.



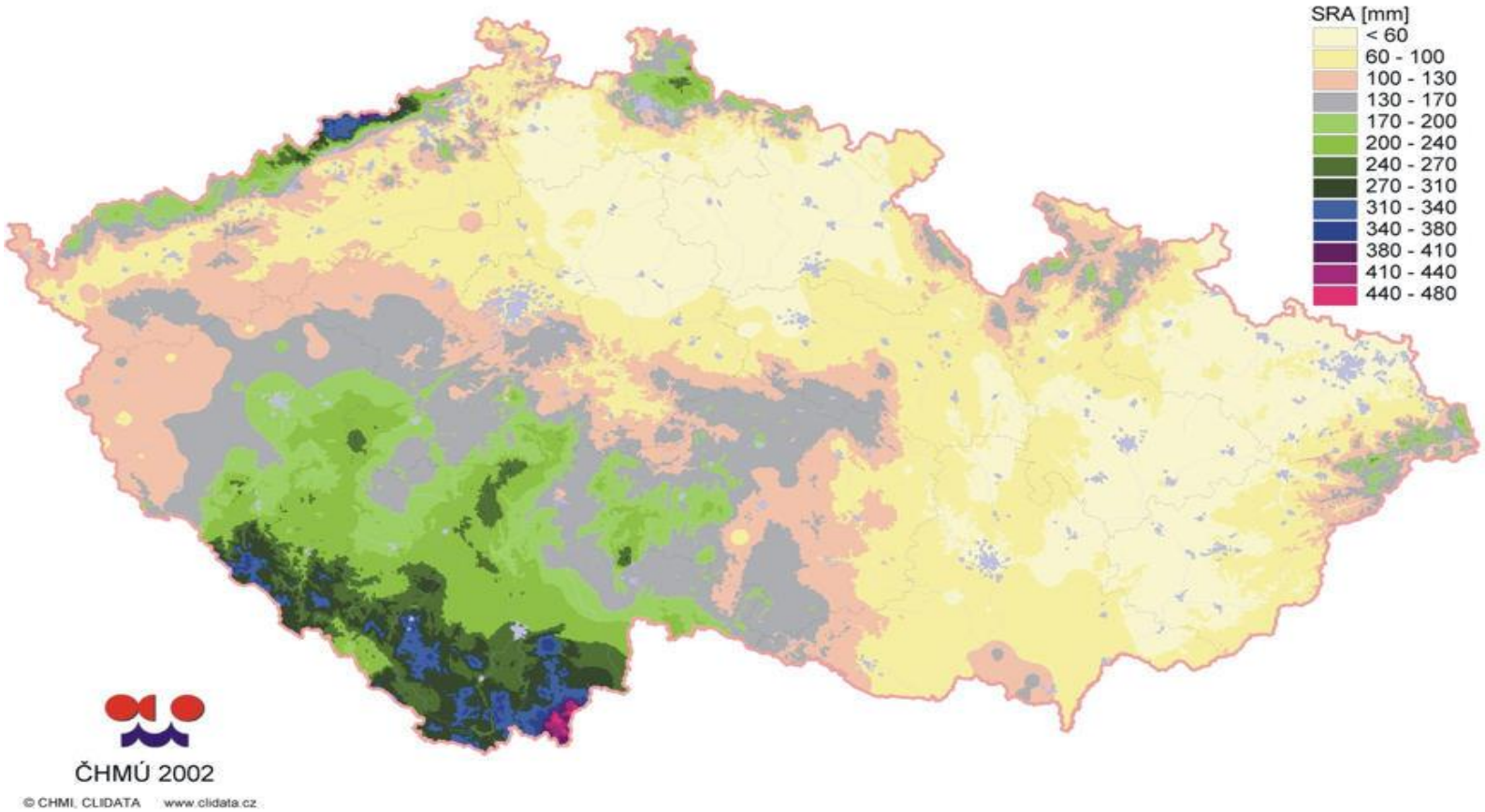
Obr. 1.33 Infračervený snímek geostacionární družice Meteosat z 12. srpna 00:00 UTC.

Predikce modelu ALADIN, 2002

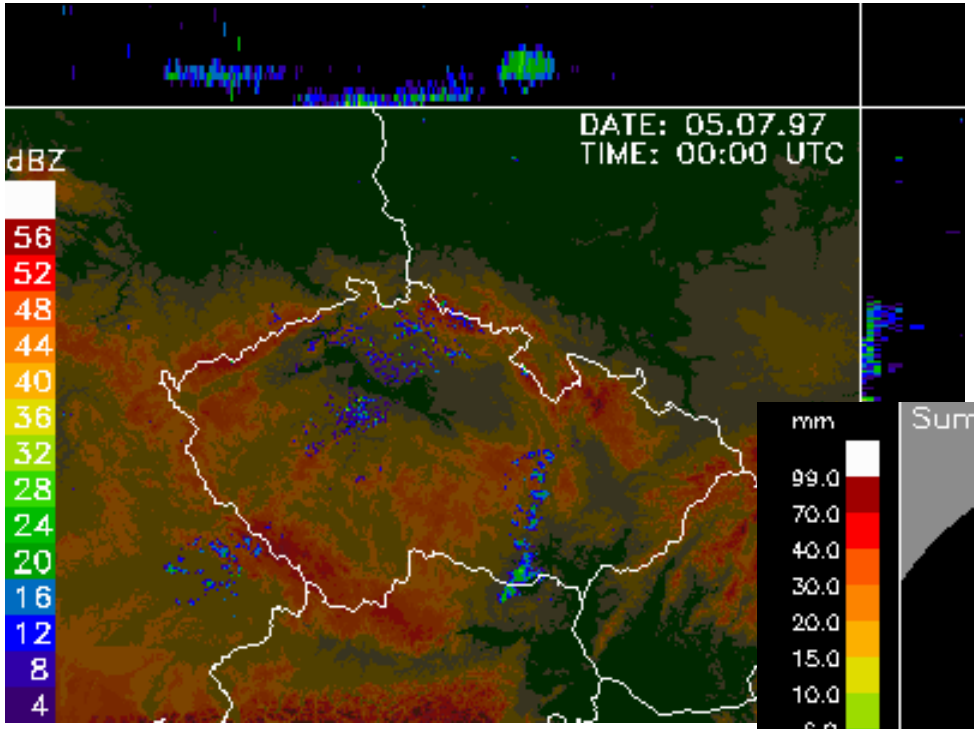


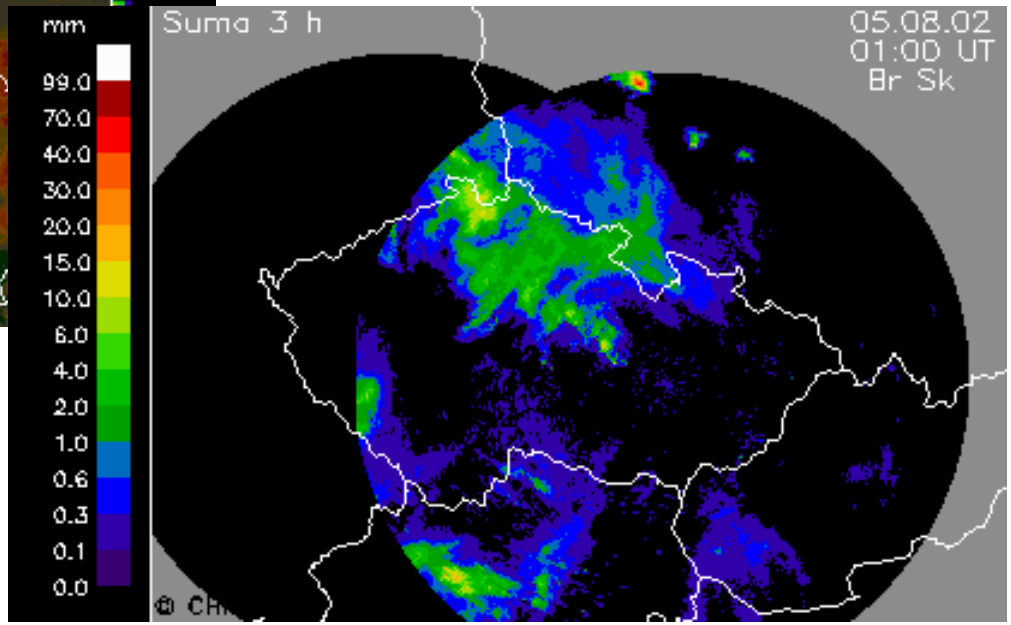


Povodně 2002 (úhrn srážek 6.-15.8.2002)

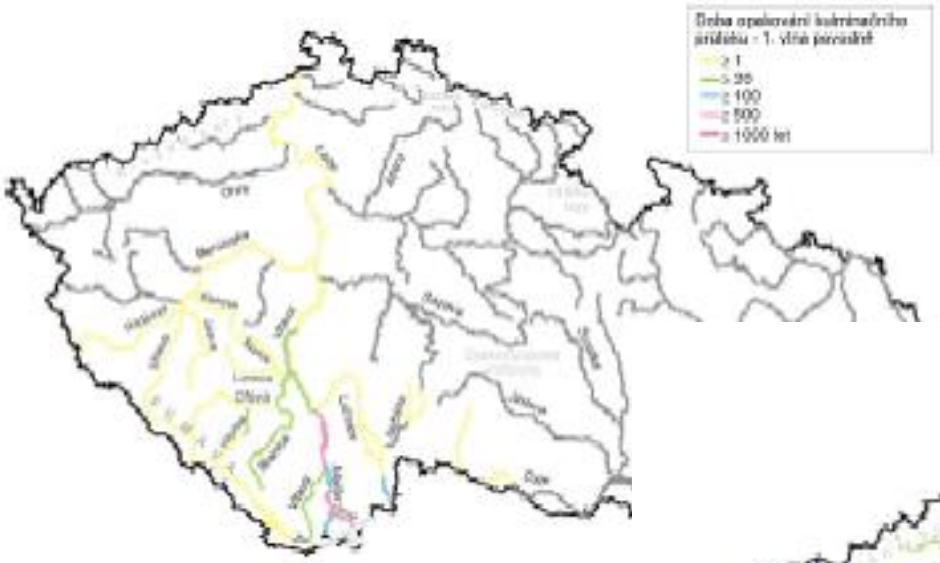


Povodně 1997 a 2002 – animace

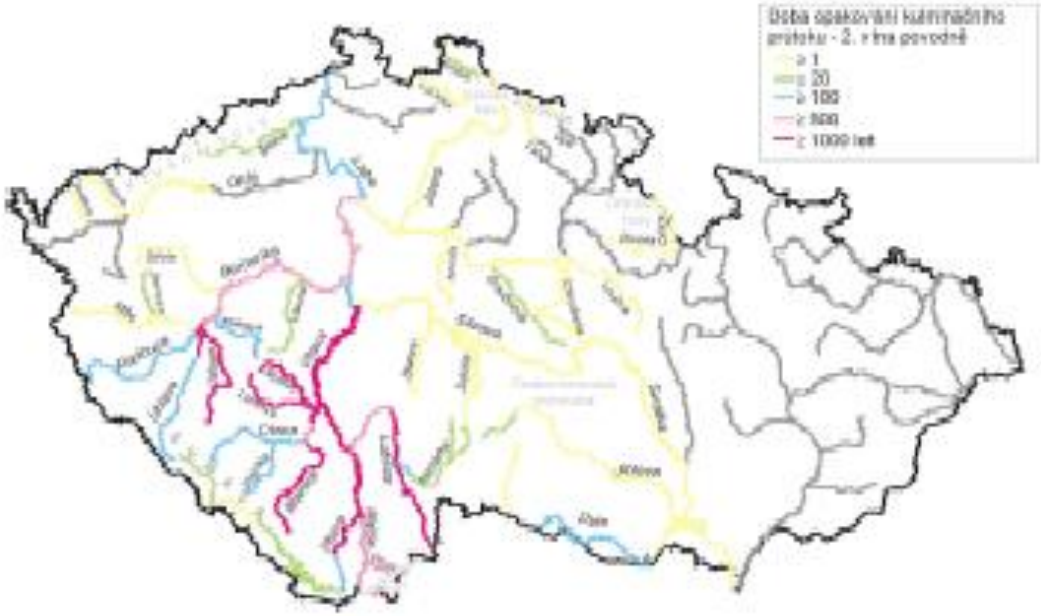




Povodně 2002 – n letost vod v jednotlivých povodích

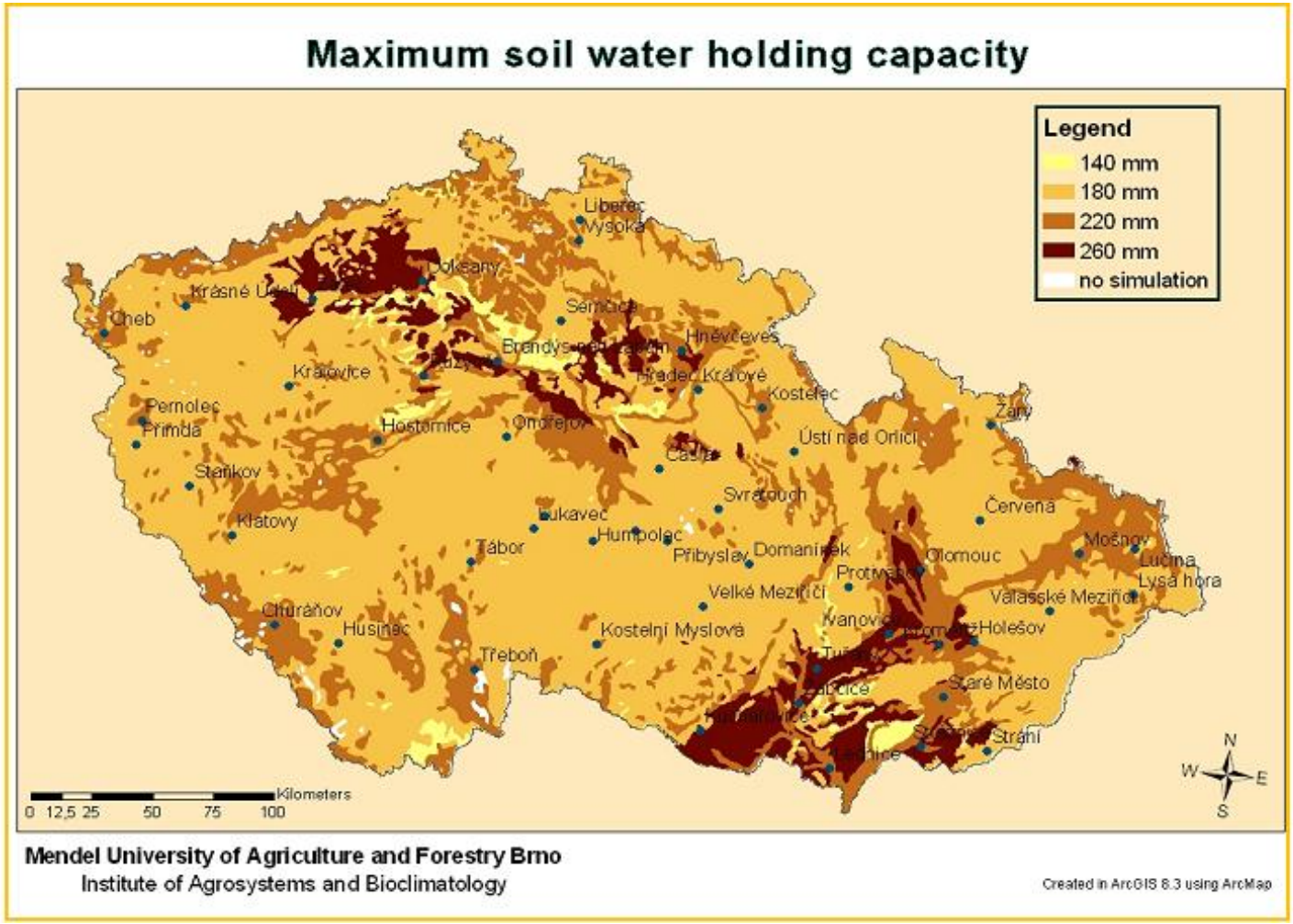


Obr. 1.3 Zaznamenané extremity kulminačního průtoku v řídkých datech během 1. vlny povodně.



Obr. 1.4 Zaznamenané extremity kulminačního průtoku v řídkých datech během 2. vlny povodně.

Retenční schopnost půd



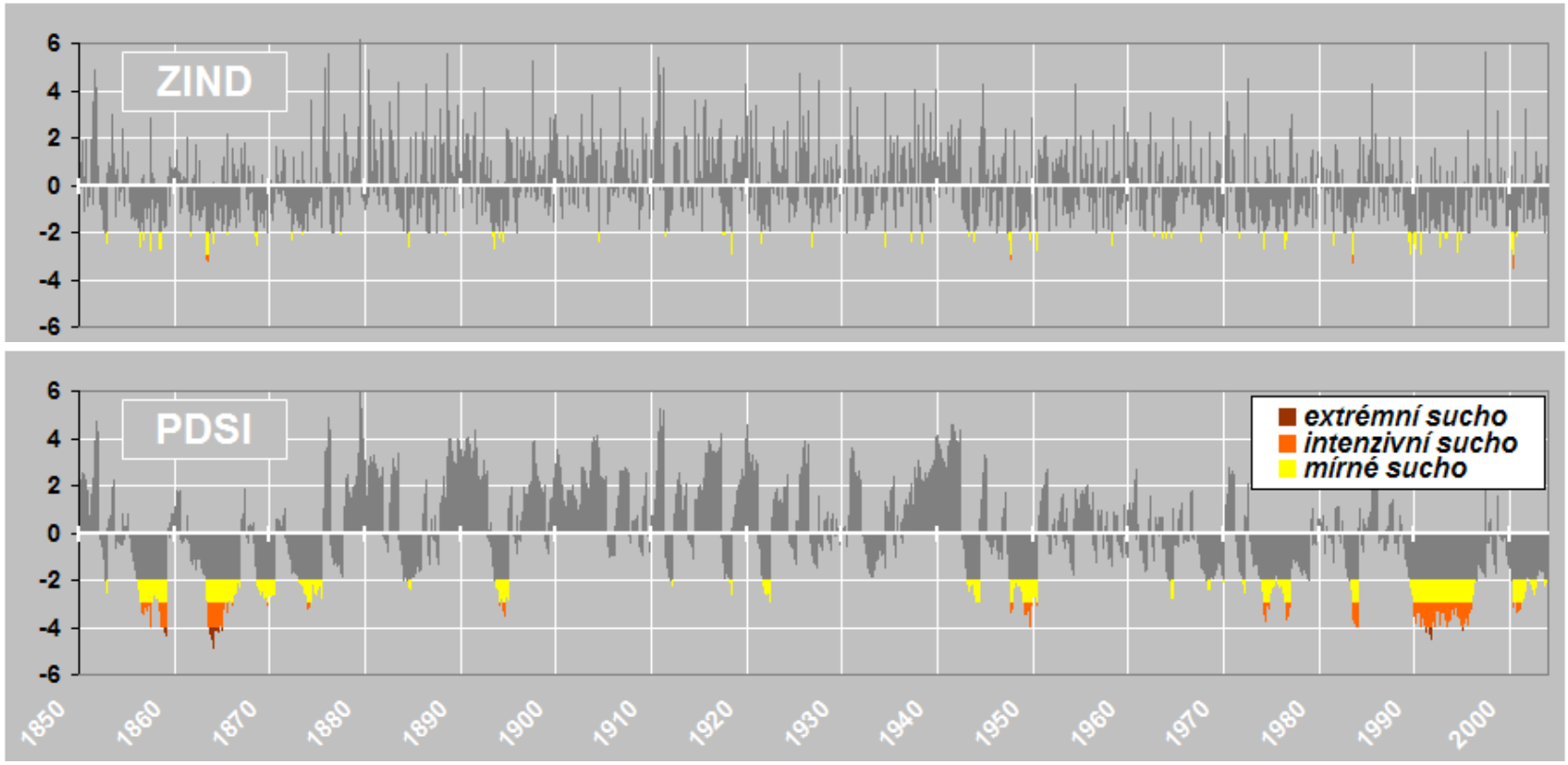
Sucho

1. meteorologické
2. hydrologické
3. zemědělské
4. socioekonomické

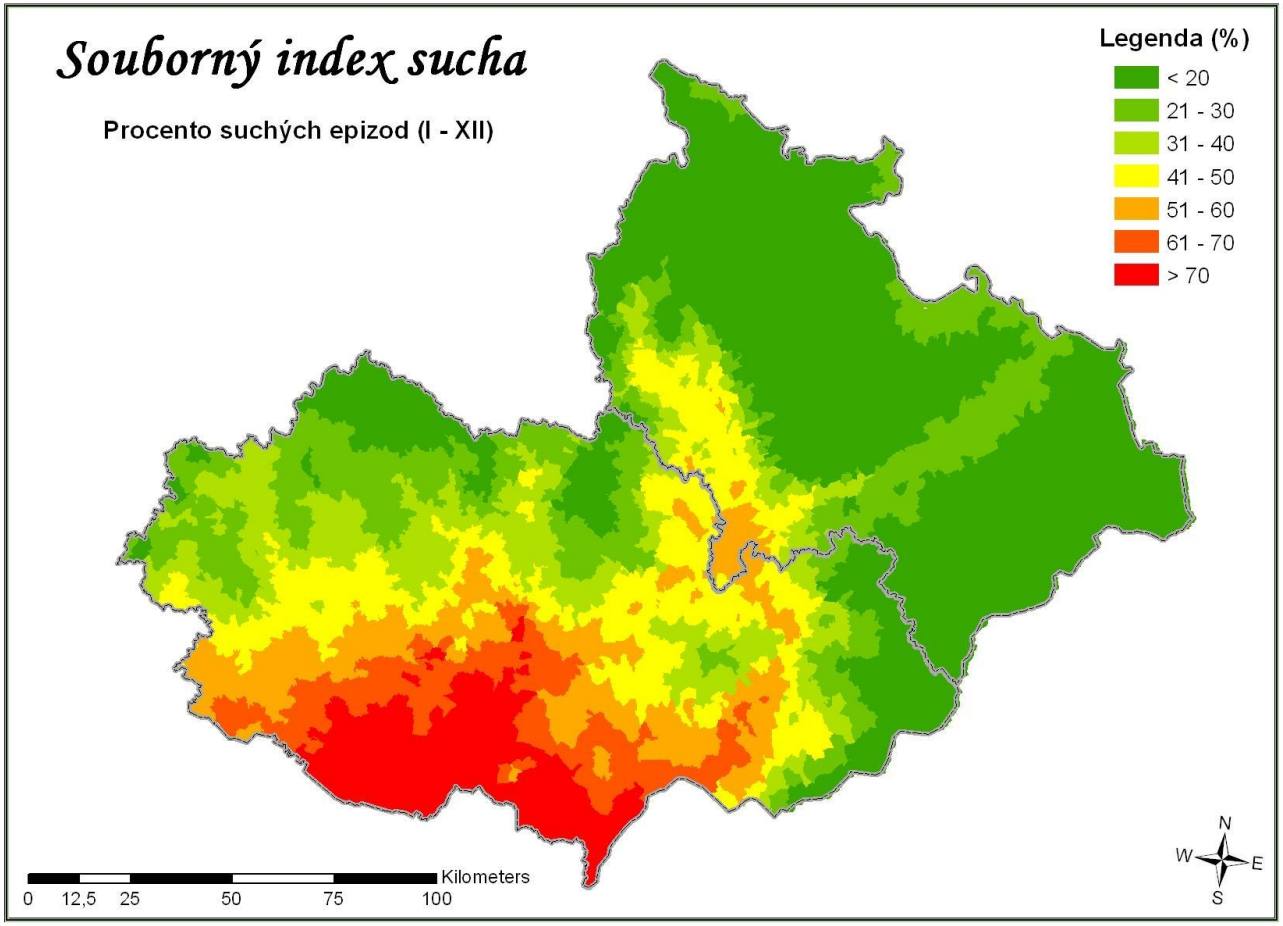
stomataregulace	velmi rychle	snížit transpiraci
snížení osmotické výměny	rychle	udržet růst
snížení růstu listů	pomalu	snížit transpiraci
zvýšení růstu kořenů	pomalu	zlepšit zásobování vodou

Dlouhodobá variabilita klimatu

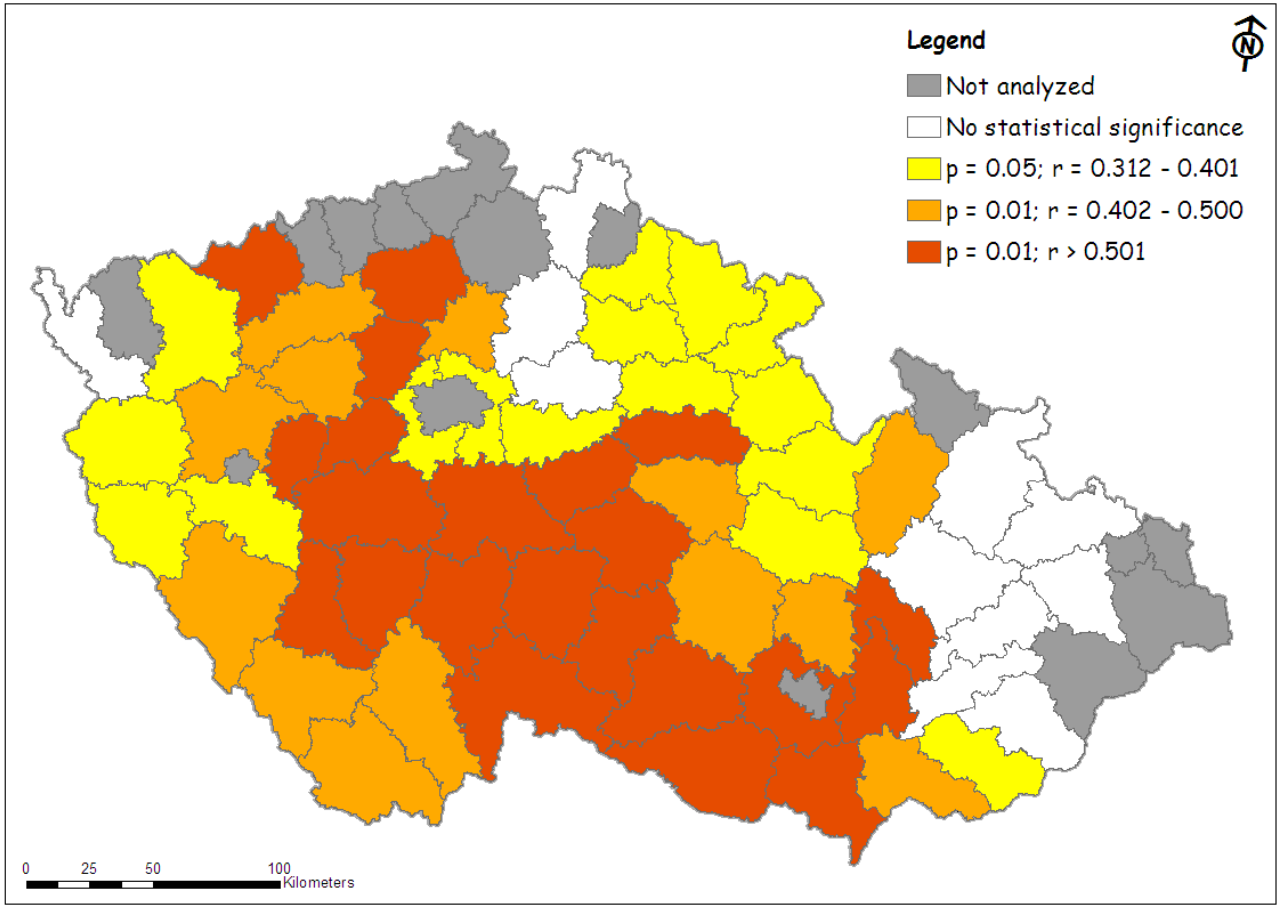
Dlouhodobá variabilita klimatu



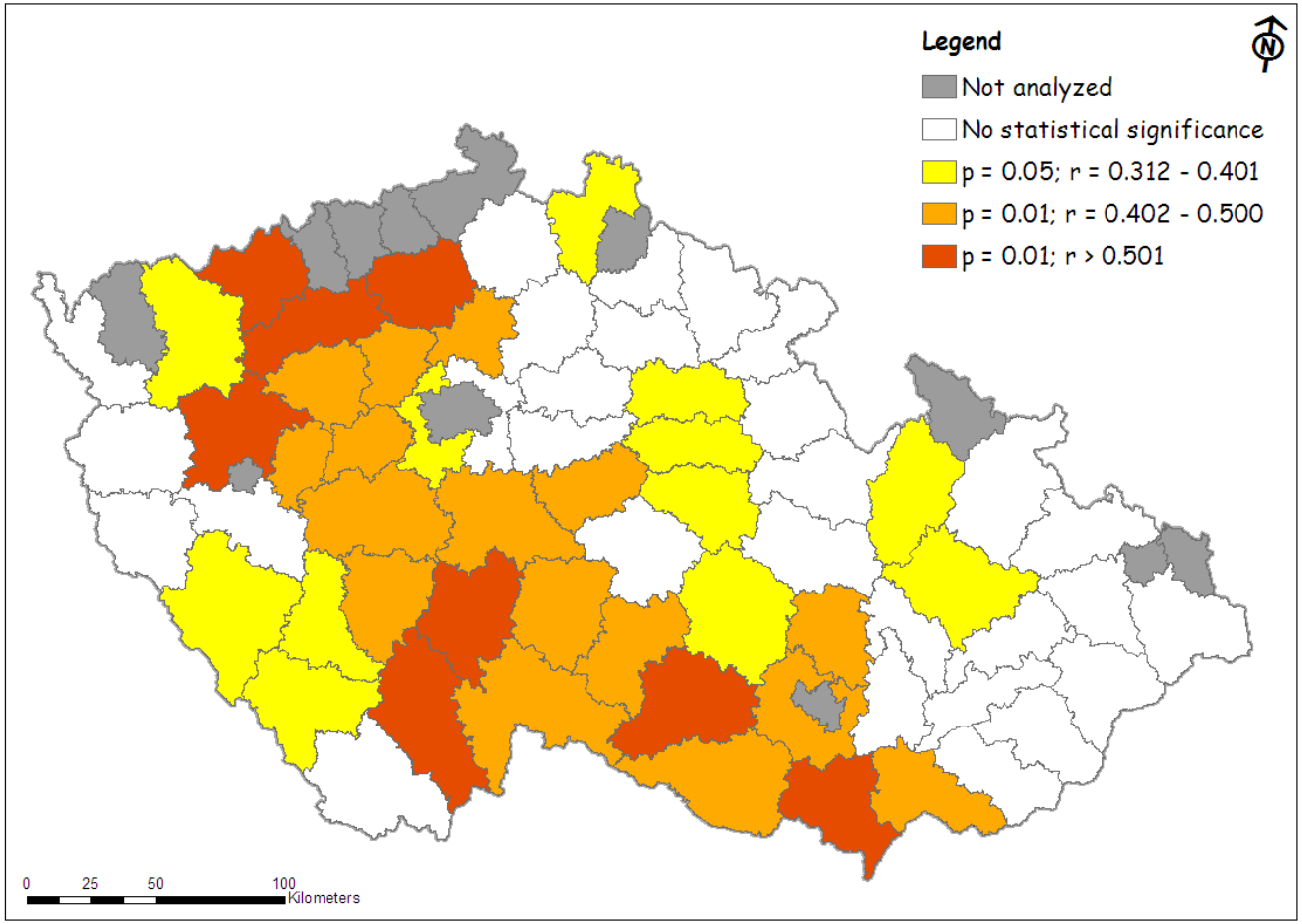
Klimatologie sucha – na území Moravy a Slezska



Ječmen jarní

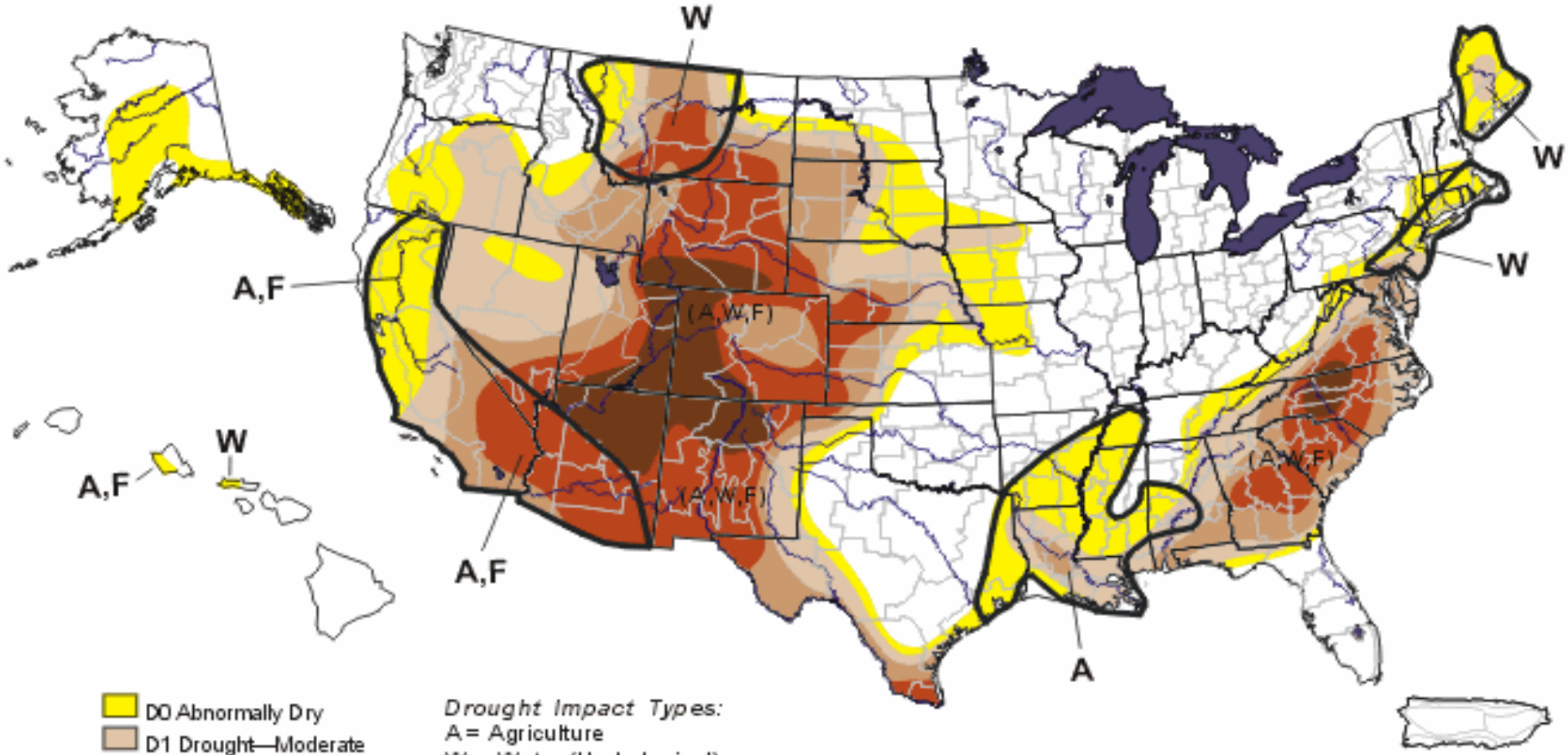


Pšenice ozimá



U.S. Drought Monitor

July 9, 2002
Valid 8 a.m. EDT



D0 Abnormally Dry
D1 Drought—Moderate
D2 Drought—Severe
D3 Drought—Extreme
D4 Drought—Exceptional

Drought Impact Types:
A = Agriculture
W = Water (Hydrological)
F = Fire danger (Wildfires)
Delineates dominant impacts
(No type = All 3 impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

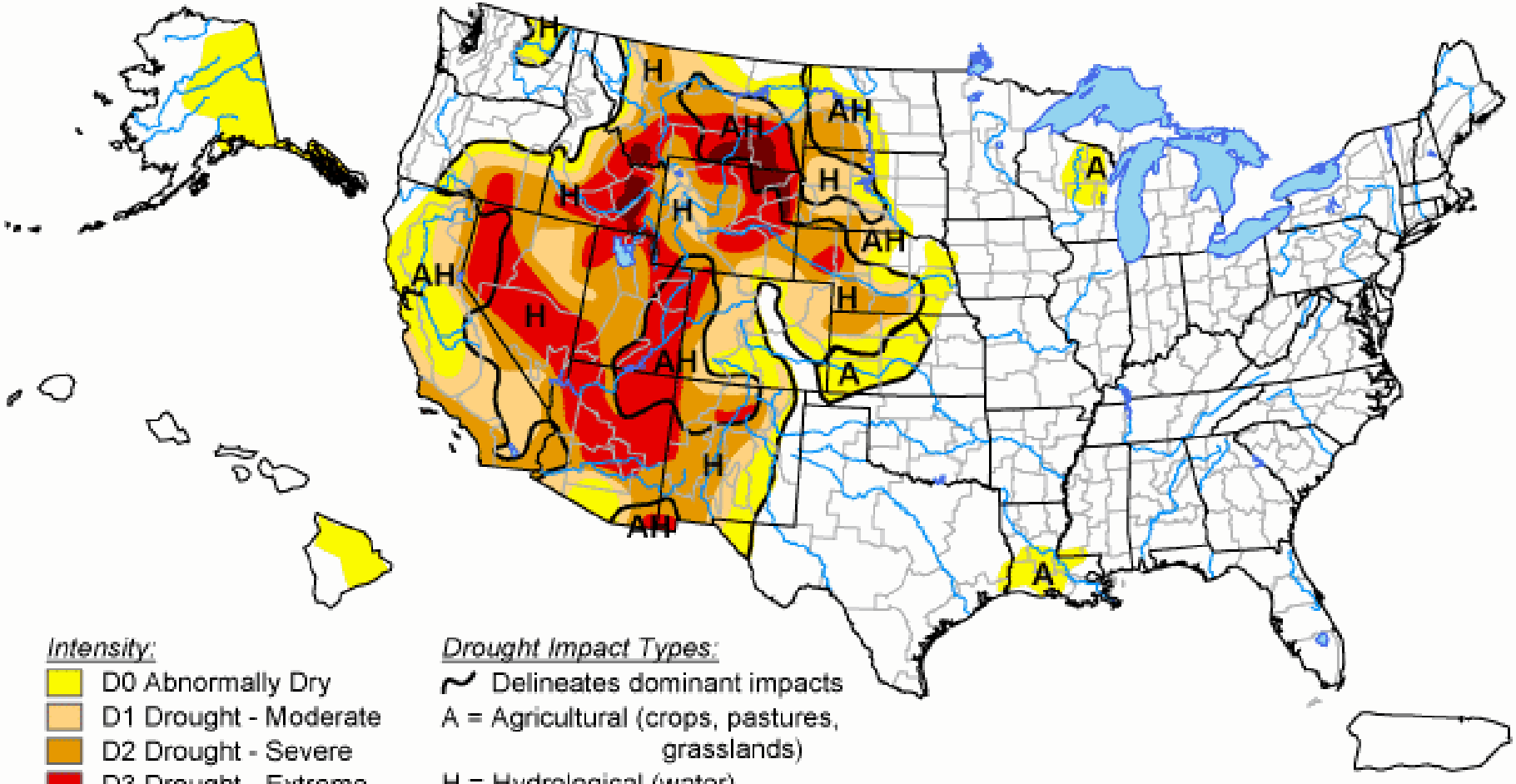
http://drought.unl.edu/dm

Released Thursday, July 11, 2002

Author: *Mark Svoboda, NDMC*

U.S. Drought Monitor

September 14, 2004
Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)
- (No type = Both impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

USDA National Drought Mitigation Center

Released Thursday, September 16, 2004

Author: Douglas Le Comte, CPC/NOAA

North American Drought Monitor

September 2004

Released: Wednesday, November 10, 2004

http://www.ncdc.noaa.gov/nadm.html

Analysts:
Canada - Ted O'Brien
Dwayne Chobanik
Mexico - Miguel Cortez
U.S.A. - Michael J. Hayes
David Miskus*
Brad Rippey*

(* Responsible for collecting analysts input & assembling the NA-DM map)

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

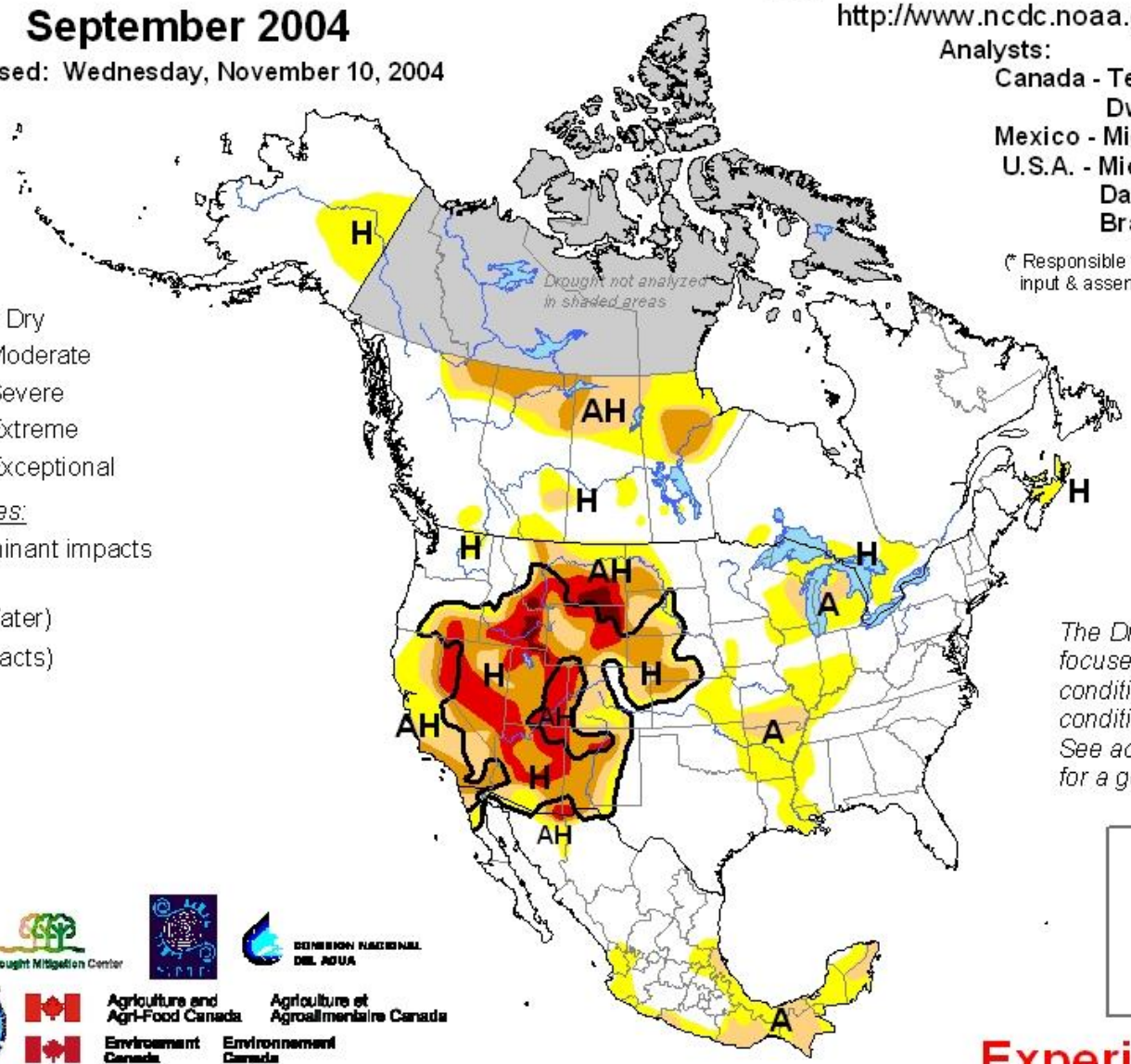
Drought Impact Types:

Delineates dominant impacts

A = Agriculture

H = Hydrological (Water)

(No type = Both impacts)



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text for a general summary.

USDA

National Drought Mitigation Center

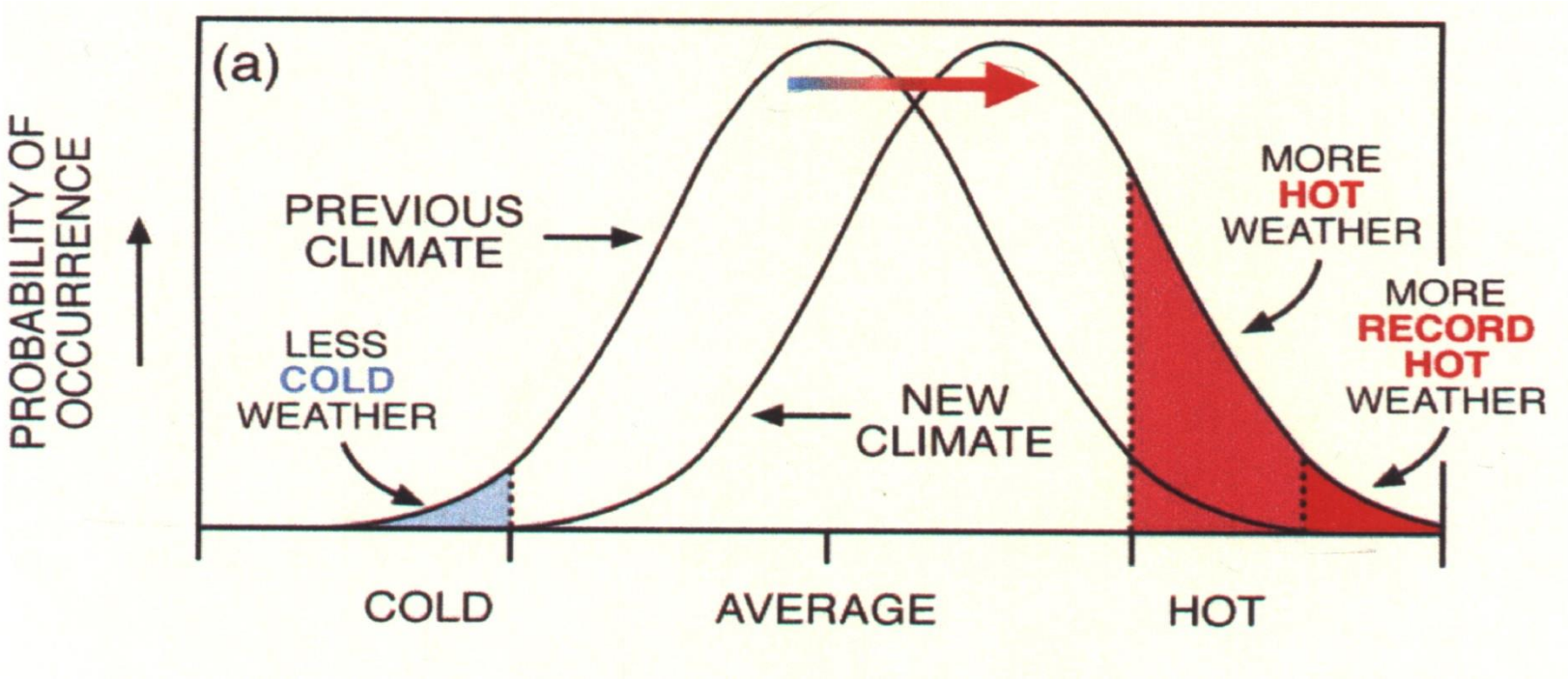
CONAGUA COMISION NACIONAL DEL AGUA

Agriculture and Agri-Food Canada / Agriculture et Agroalimentaire Canada

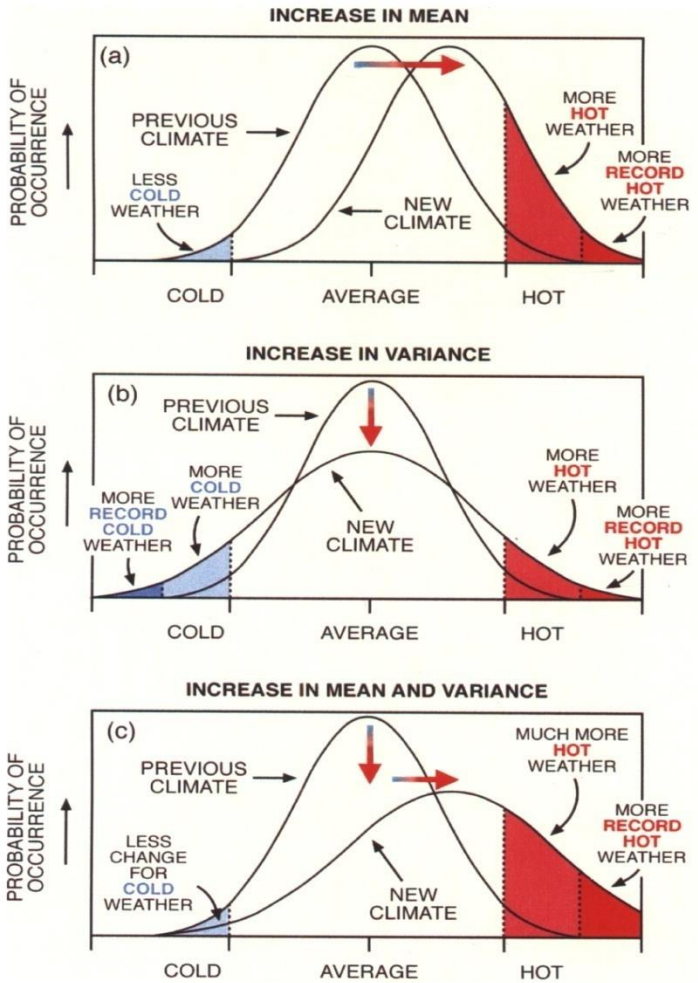
Environment Canada / Environnement Canada

Experimental

Vliv změny klimatu na četnost a intenzitu extrémních jevů??



Vliv změny klimatu na četnost a intenzitu extrémních jevů??

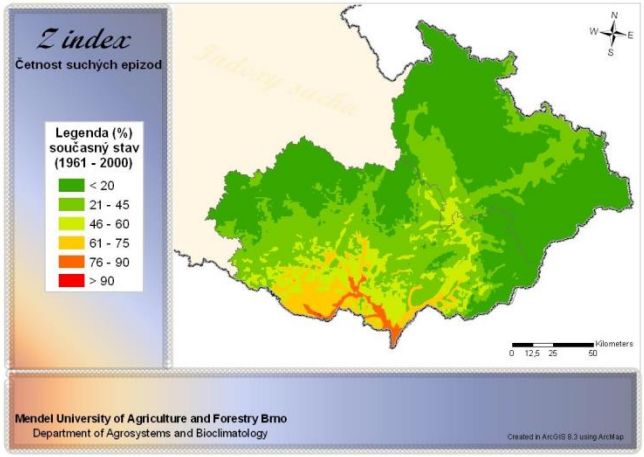


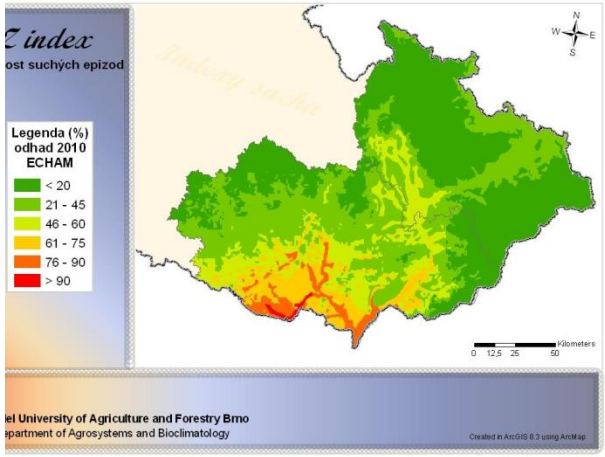
nárůst průměrných hodnot

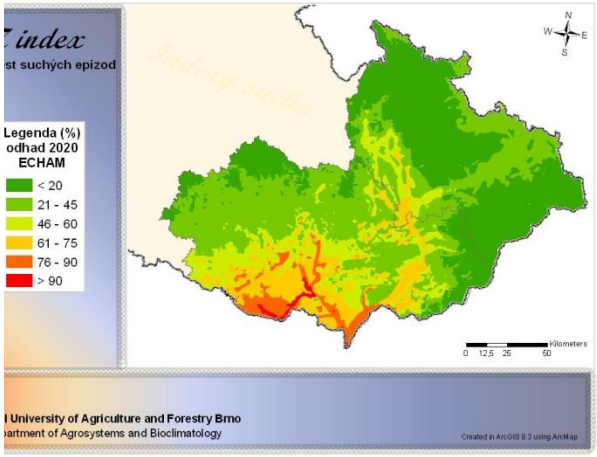
zvýšení variability

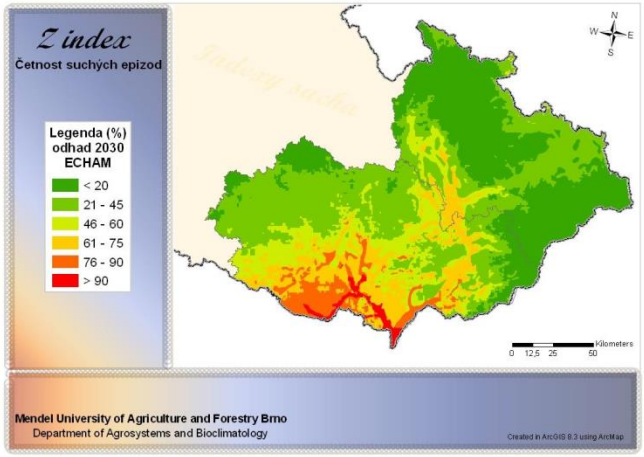
nárůst průměrných hodnot a zvýšení variability

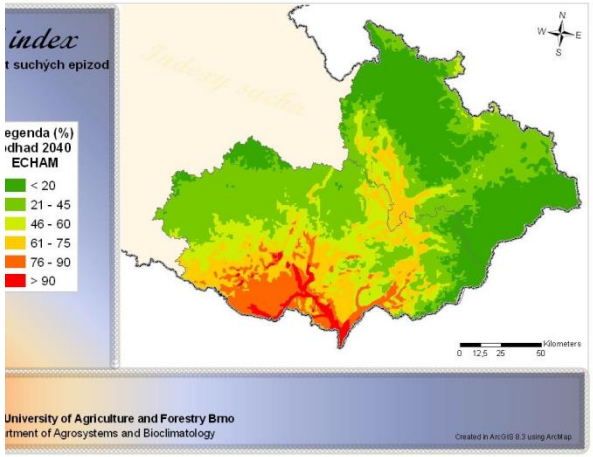
Sucho na Moravě a ve Slezsku

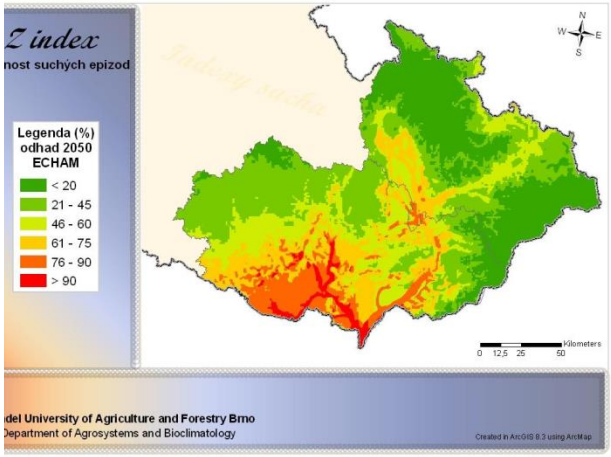


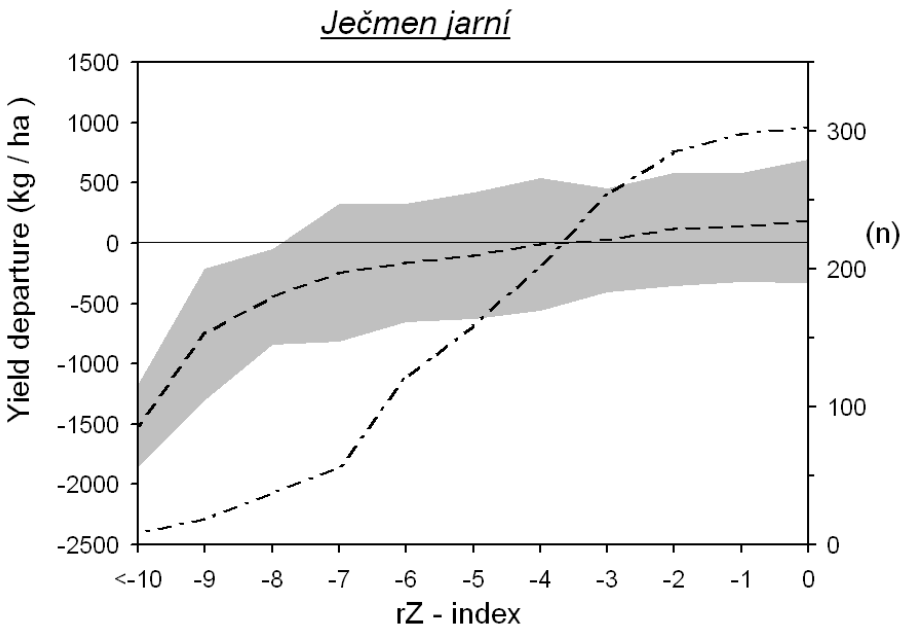


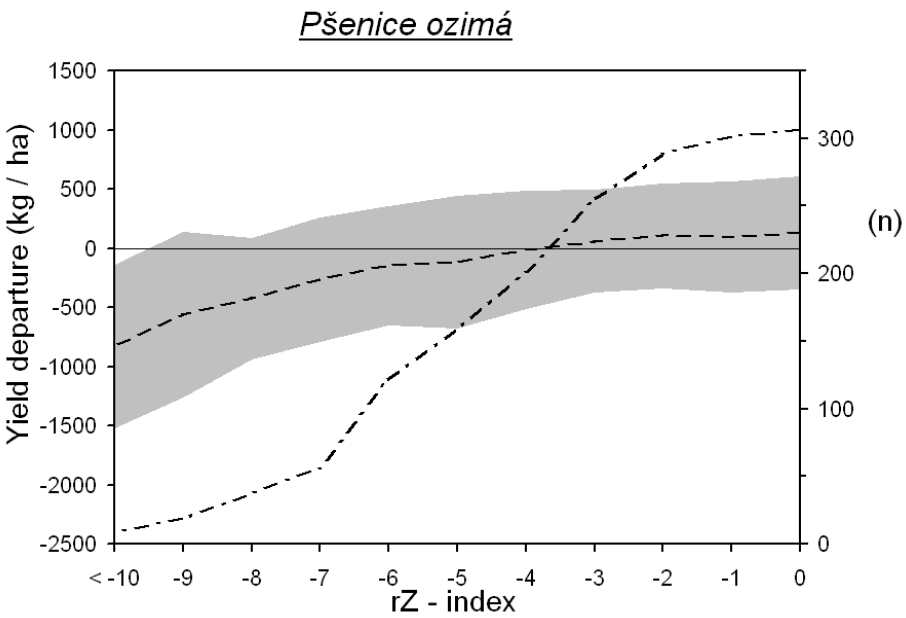








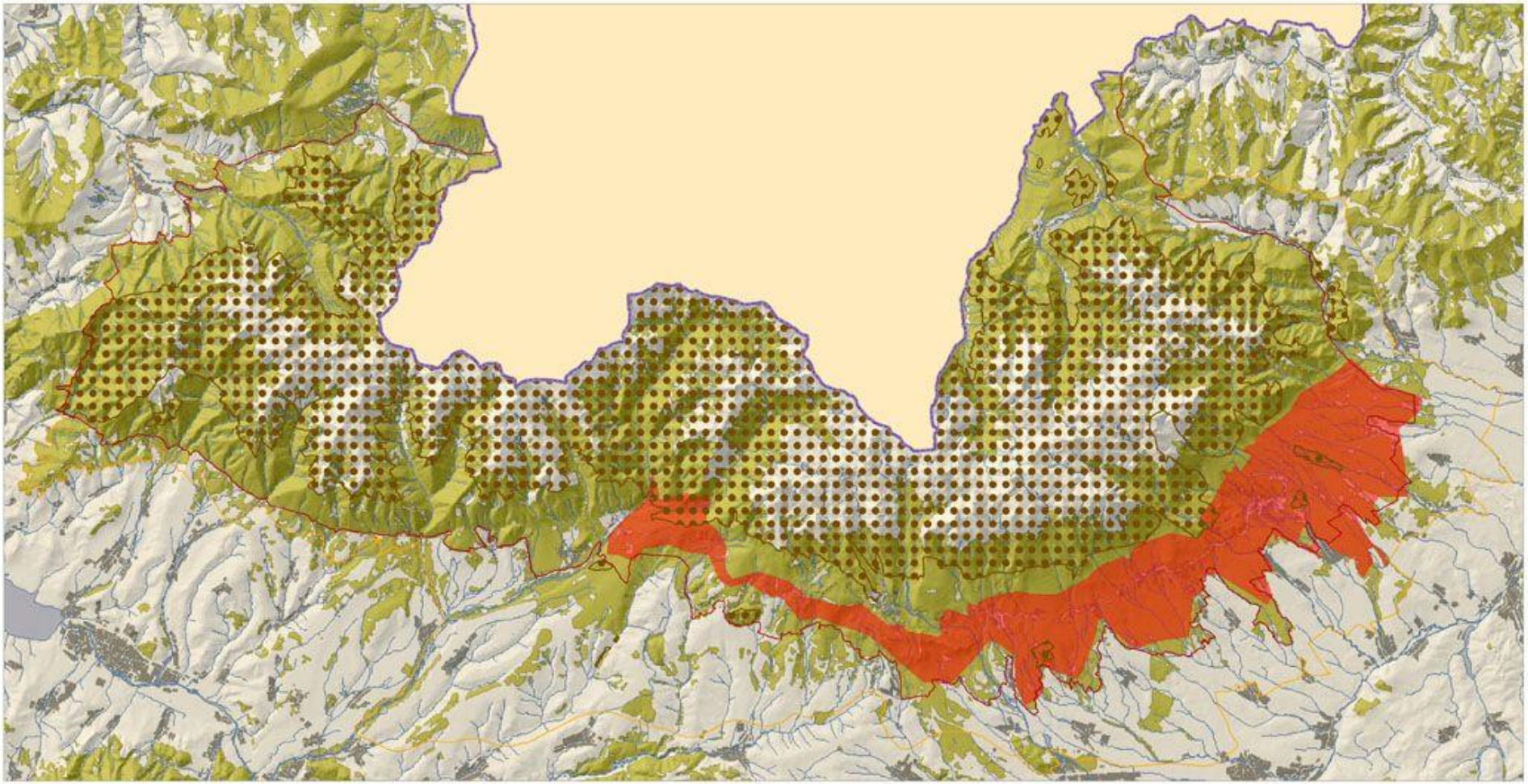

Ječmen jarní
Yield departure (kg / ha)
1500
1000
500
0
-500
-1000
-1500
-2000
-2500
300
200
100
0
(n)
<-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
rZ - index


Pšenice ozimá
Yield departure (kg / ha)
1500
1000
500
0
-500
-1000
-1500
-2000
-2500
300
200
100
0
(n)
< -10
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
rZ - index

Extrémní rychlost větru

Kalamita ve VYSOKÝCH TATRÁCH (2004)

- Skalnaté pleso rychlost větru 194 km/h
- Maximální rychlost 230 km/h (odhad)
- 12 000 ha
- 2 – 3 km x 30 km
- 25% plochy TANAPu
- Škody 7,8 miliardy Sk
- 3000000 m3 dřeva (90% roční těžby)



0 5 10 20 30 km

TATRANSKÝ NÁRODNÝ PARK

Legenda

- Územie NP
- Ochranné pásmo NP
- Navrhovaná A-zóna
- Lesné porasty postihnuté vetrovou smršťou

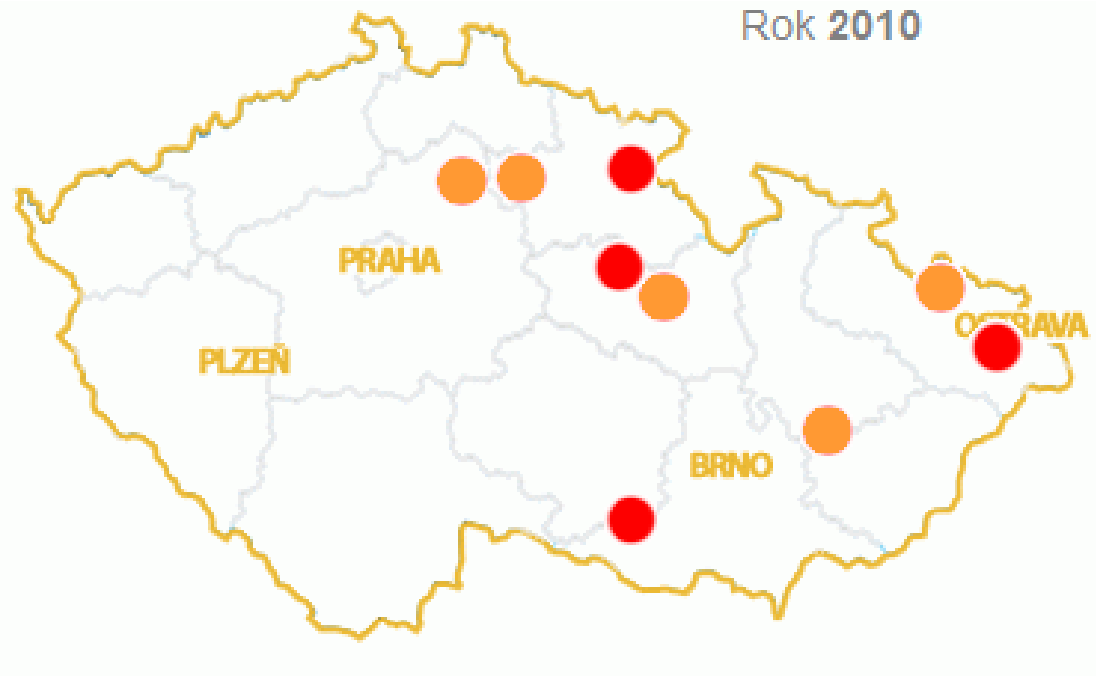
N

SVM50 © Ústav geodézie, kartografie a katastra SR, 2000, č.040/010205-AG
Tematické spracovanie © Štátna ochrana prírody SR, Správa TANAP-u, 2004

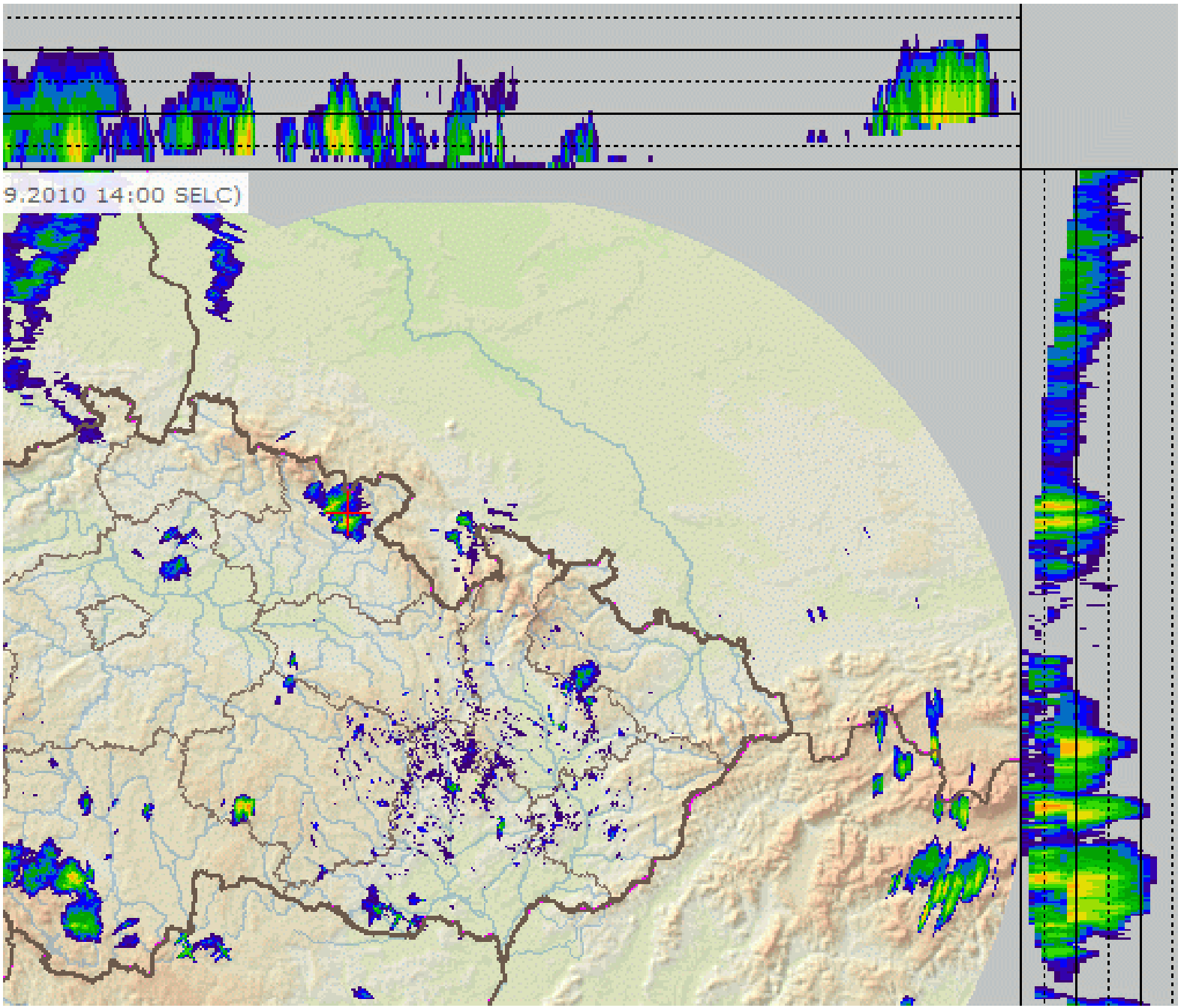
Pravda

Tornáda

- Silně rotující vítr
- Dotkne se povrchu země
- Působí škody
- 50-100 m/s
- Středozápad USA
- i u nás


Rok 2010
PRAHA
PLZEŇ
BRNO
OSTRAVA

Trutnovsko
u obce Libňatov
Autor: Václav Šimek
www.tornada.cz


9.2010 14:00 SELC)

Děkuji za pozornost!!

Upraveno za podpory projektu FRVŠ 755/2013/B4/d:
„Multimediální podklady pro cvičení předmětu Agroklimatologie“