

**PROCENA RANJIVOSTI NA SUŠU
BAZIRANA NA KORIŠĆENJU MODELA ZA
SIMULACIJU PRINOSA USEVA,
KAO I PROCENA NA OSNOVU
KLIMATSKIH I GEOMORFOLOŠKIH
PODATAKA**

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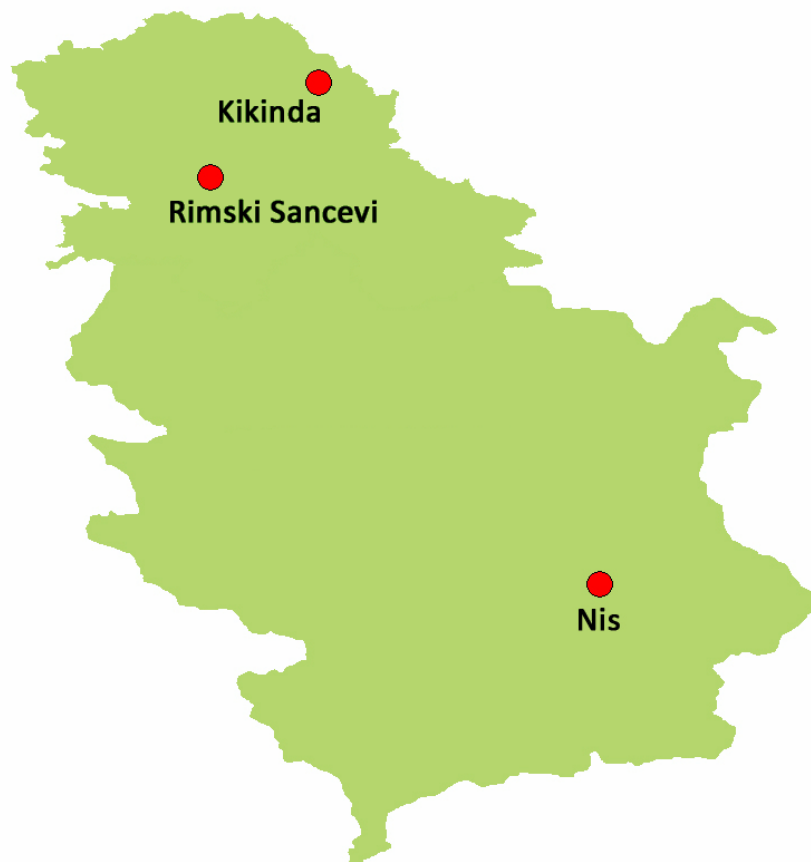
ZADATAK

WP:4, Activity:4.2.2

DROUGHT VULNERABILITY ESTIMATES BASED ON SIMULATIONS USING CROP-YIELD MODELS

- Izračunati pad prinosa kukuruza u uslovima bez navodnjavanja u višegodišnjem periodu (1971 – 2010)
- Odrediti broj godina u kojima proizvodnja kukuruza nije profitabilna
- Izračunati SPI2 za avgust mesec u analiziranom periodu
- Regesijom SPI2 za avgust i pada prinosa odrediti graničnu vrednost pri kojoj može nastati ekonomski rizik

KARAKTERISTIKE IZABRANIH LOKACIJA



KARAKTERISTIKE IZABRANIH LOKACIJA

- KIKINDA -

Klimatske karakteristike: kontinentalna klima, $T_{sr, god} = 11.19^{\circ}\text{C}$, $P_{sr, god} = 560\text{mm}$

Karakteristike zemljišta: Černozem beskarbonatni

Horizon	Depth (m)	Sand (%)	Silt (%)	Clay (%)	FC (%)	WP (%)	TAW (%)
A	0.6	45	30	25	27	11.7	15.3
AC	1.2	35	40	25	27	11.7	15.3
C	2.0	35	25	40	31.8	19.7	12.1

KARAKTERISTIKE IZABRANIH LOKACIJA

- NOVI SAD -

Klimatske karakteristike: kontinentalna klima, $T_{sr, god} = 11.28^{\circ}C$, $P_{sr, god} = 634mm$

Karakteristike zemljišta: Černozem karbonatni na lesnoj terasi

Horizon	Depth (m)	Sand (%)	Silt (%)	Clay (%)	FC (%)	WP (%)	TAW (%)
Ap	0.22	40.58	35.25	24.17	27	11.7	15.3
A	0.59	39.62	33.67	26.71	31.8	19.7	12.1
AC	0.94	39.60	38.09	22.31	27	11.7	15.3
C	1.65	38.53	40.55	20.65	27	11.7	15.3

KARAKTERISTIKE IZABRANIH LOKACIJA

- NIŠ -

Klimatske karakteristike: umereno kontinentalna klima,

$$T_{sr, god} = 11.73^{\circ}\text{C} , P_{sr, god} = 597 \text{ mm}$$

Karakteristike zemljišta: Smonica

Horizon	Depth (m)	Sand (%)	Silt (%)	Clay (%)	FC (%)	WP (%)	TAW (%)
A _{mo}	0.7	20	40	40	44	26	18
AC	1.2	30	25	45	45	31	14
C	1.8	25	25	50	45	31	14

KARAKTERISTIKE USEVA

- KUKURUZ -

- Hibrid kukuruza NS – 640

- FAO grupa zrenja 600

- Fenofaze rasta i razvića:

setva (20. apr)

nicanje (1. maj)

vegetativni porast (1. maj – 15 jul)

cvetanje i oplodnja (15. jul – 5. avg)

nalivanje zrna – sazrevanje (5. avg – 30. sep)

PAD PRINOSA KUKURUZA U USLOVIMA BEZ NAVODNJAVANJA

$$\left(1 - \frac{Y_a}{Y_m}\right) = k_y \left(1 - \frac{ET_a}{ET_m}\right)$$

$$k_y = 1,25$$

**Granična vrednost prinosa suvog zrna kukuruza
ispod koje proizvodnja nije profitabilna**

4,7 t/ha

Potencijalni prinos hibrida kukuruza NS-640

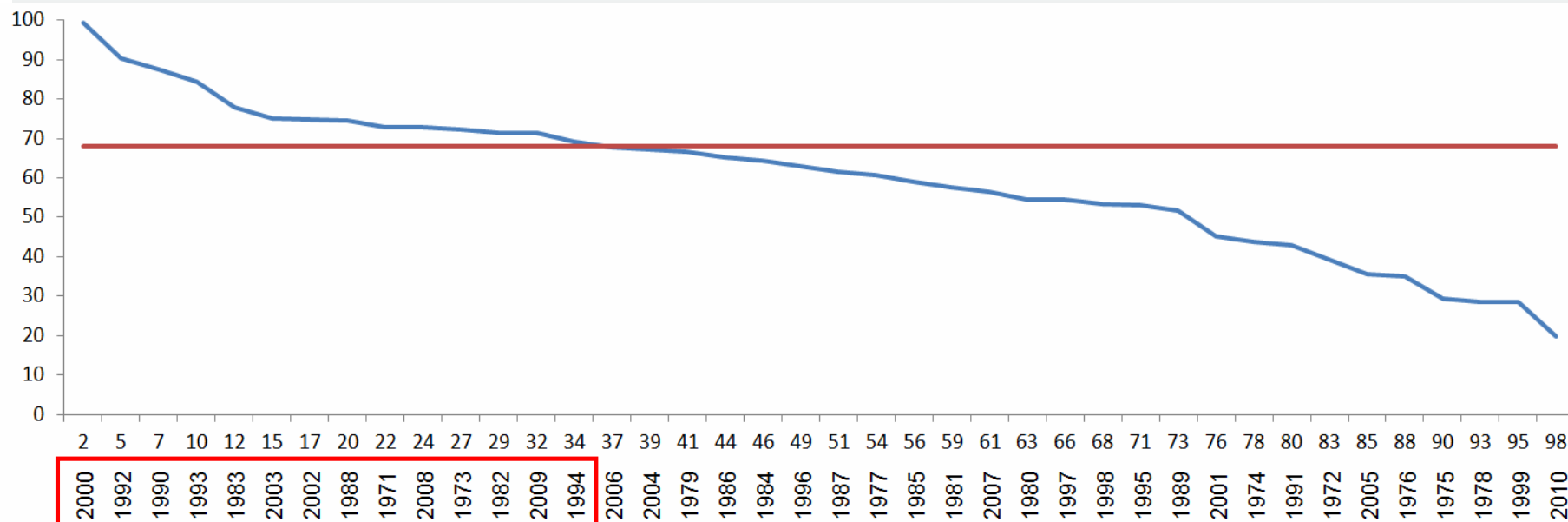
15 t/ha

Granica profitabilnosti

**pad prinosa od
68%**

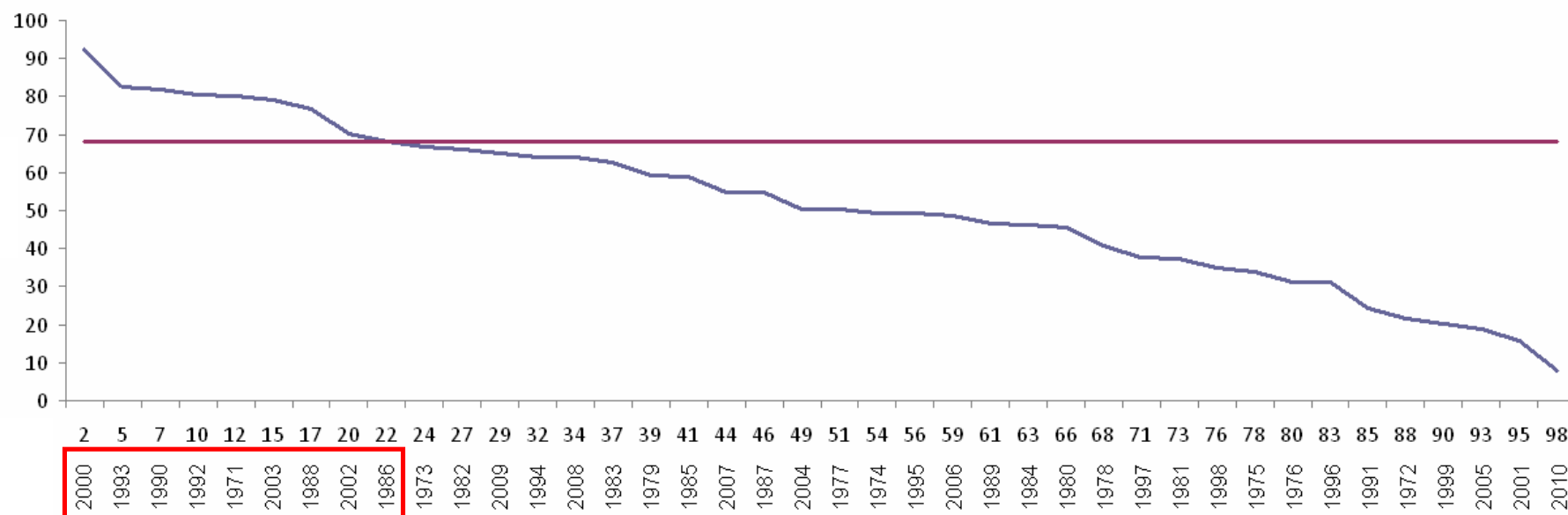
PAD PRINOSA KUKURUZA U USLOVIMA BEZ NAVODNJAVANJA

- KIKINDA -



broj godina u kojima proizvodnja kukuruza nije profitabilna = **14**
35% (14/40)

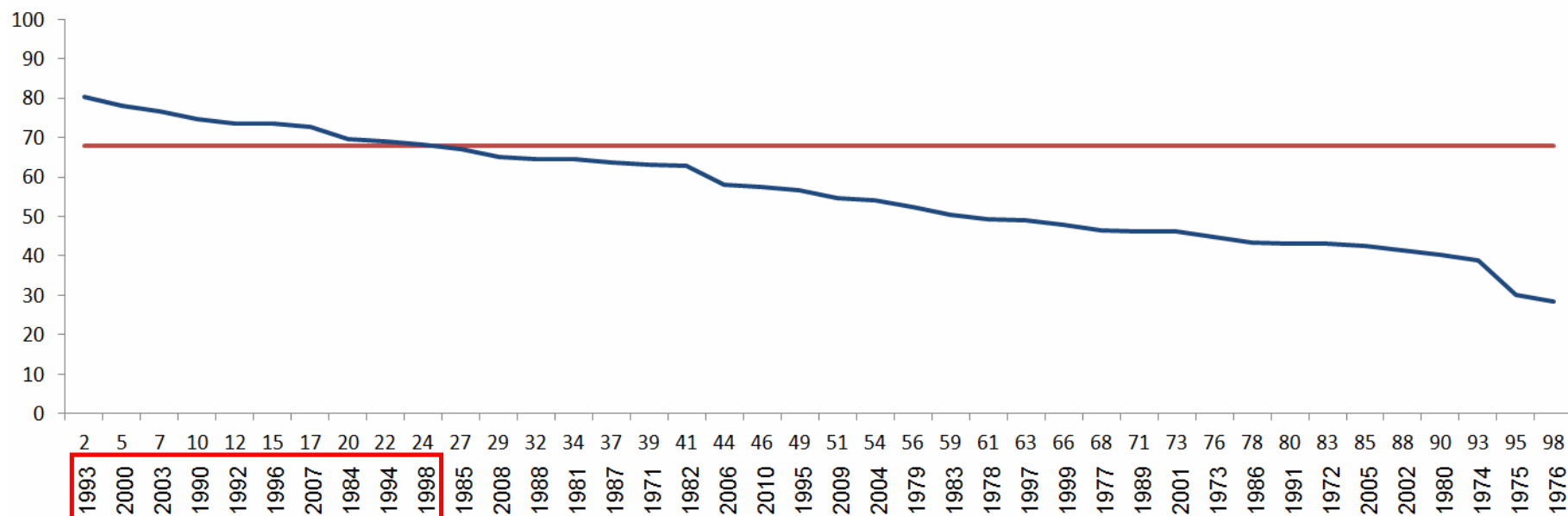
PAD PRINOSA KUKURUZA U USLOVIMA BEZ NAVODNJAVANJA - NOVI SAD -



broj godina u kojima proizvodnja kukuruza nije profitabilna = **9**
22,5% (9/40)

PAD PRINOSA KUKURUZA U USLOVIMA BEZ NAVODNJAVANJA

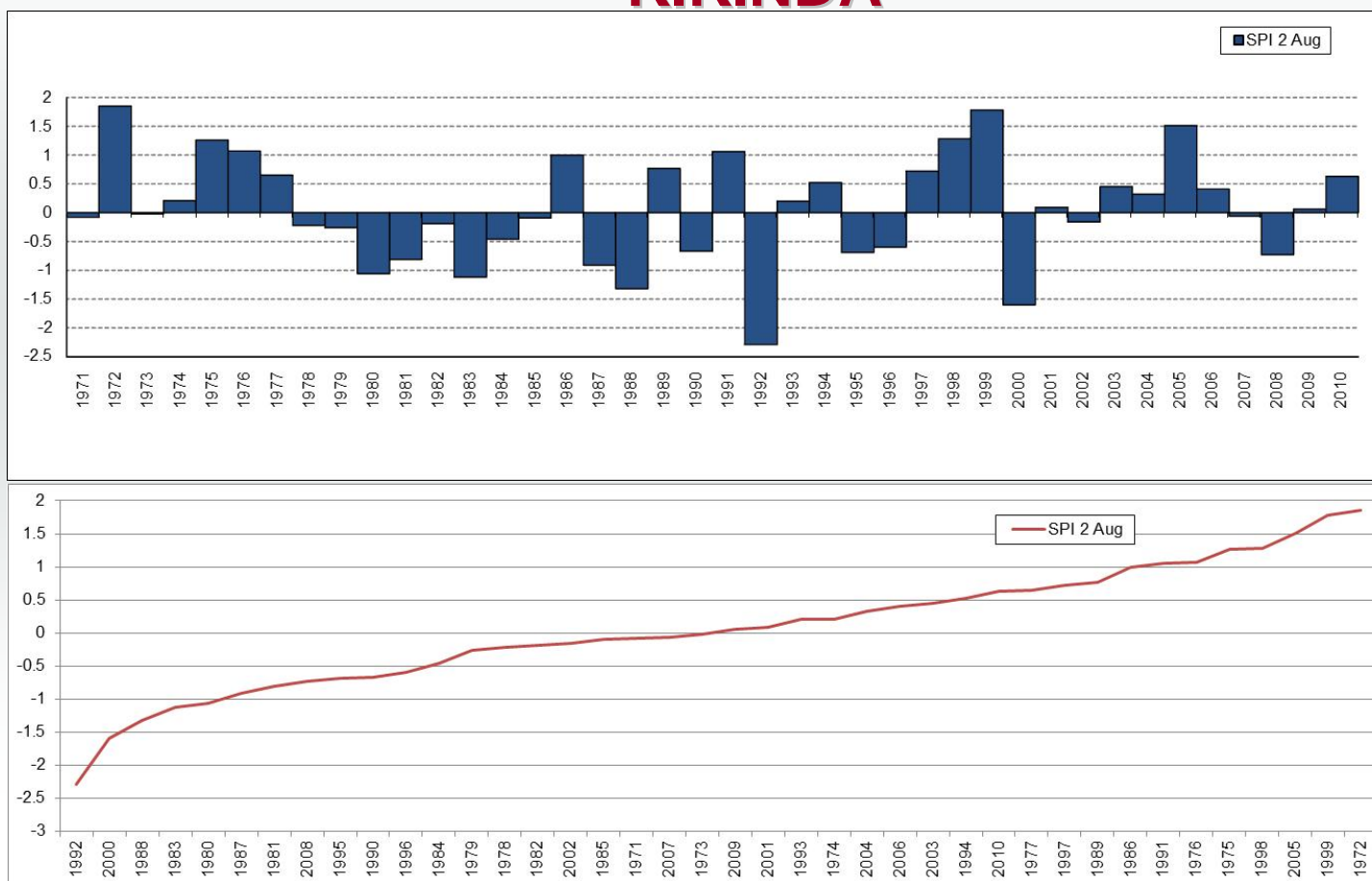
- NIŠ-



broj godina u kojima proizvodnja kukuruza nije profitabilna = **10**
25% (10/40)

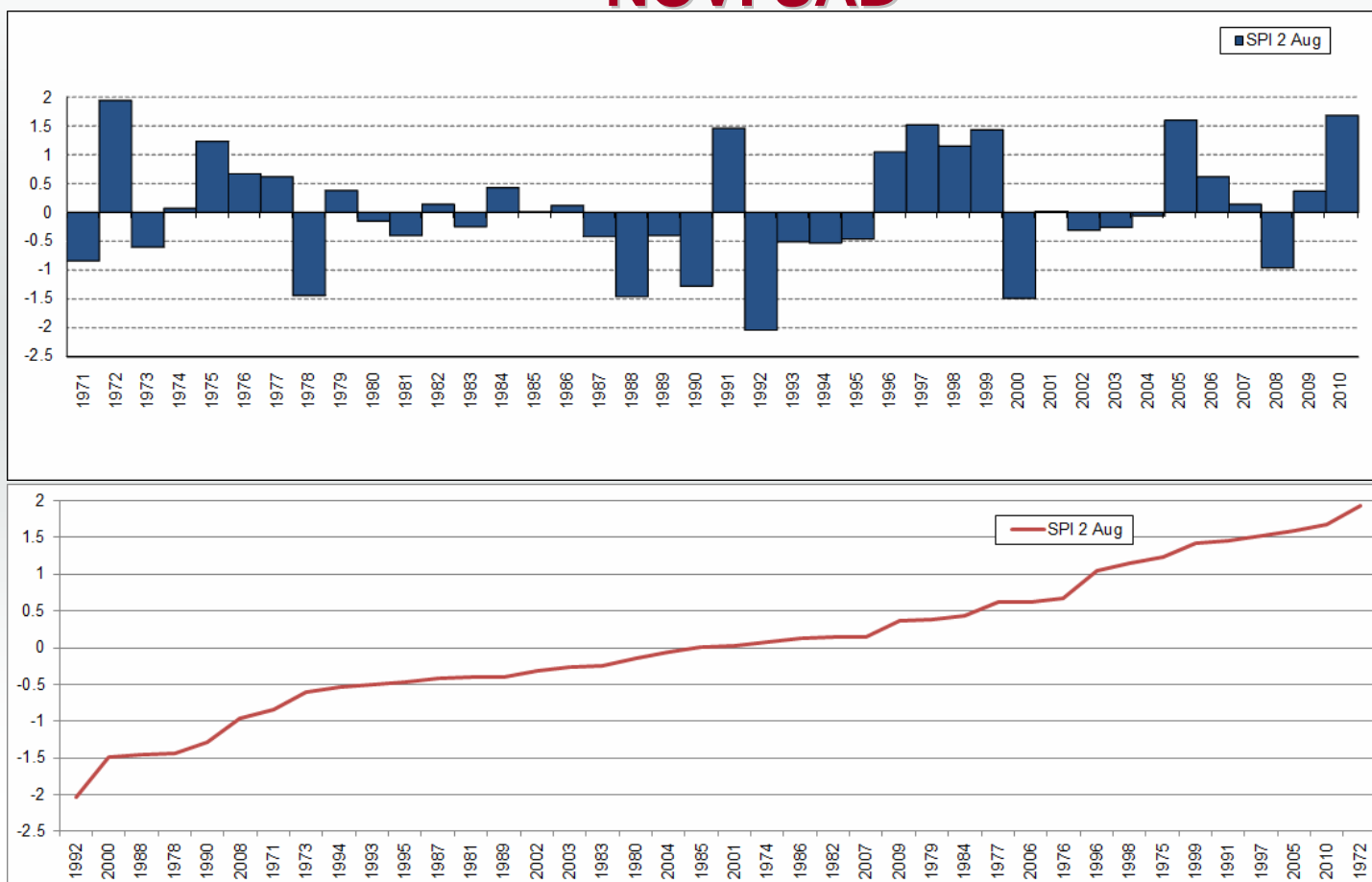
SPI2 ZA AVGUST MESEC

- KIKINDA -



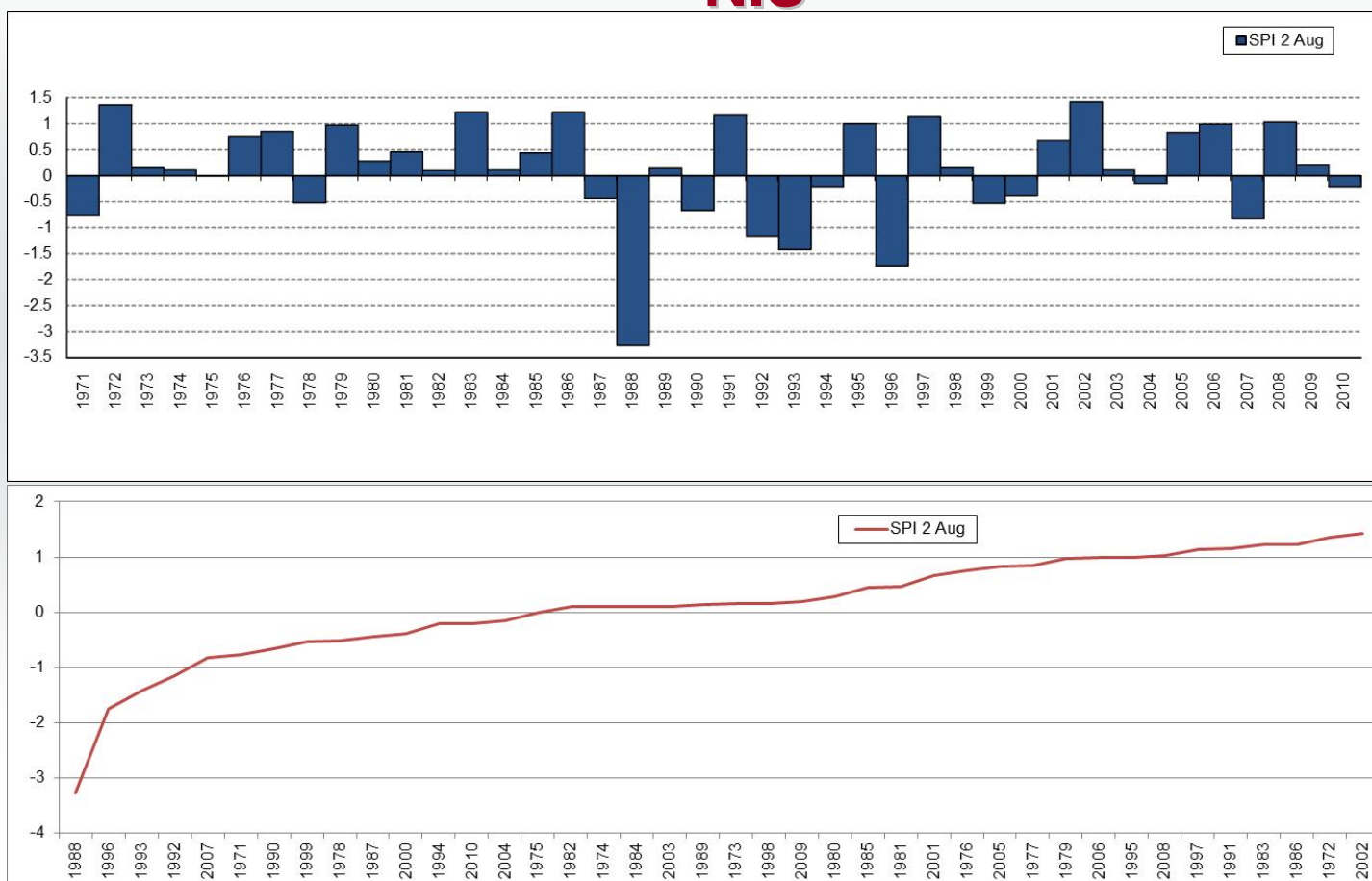
SPI2 ZA AVGUST MESEC

- NOVI SAD-

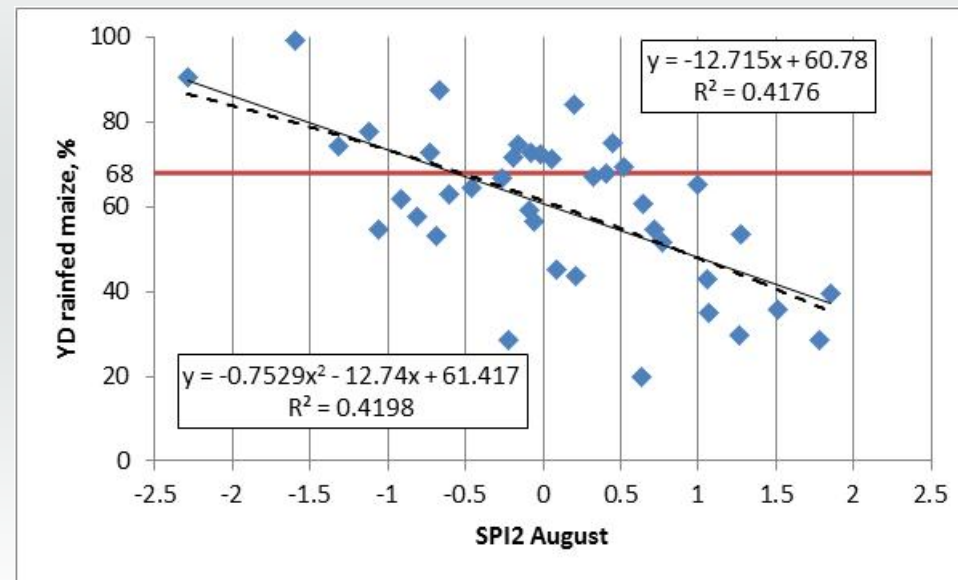


SPI2 ZA AVGUST MESEC

- NIŠ -

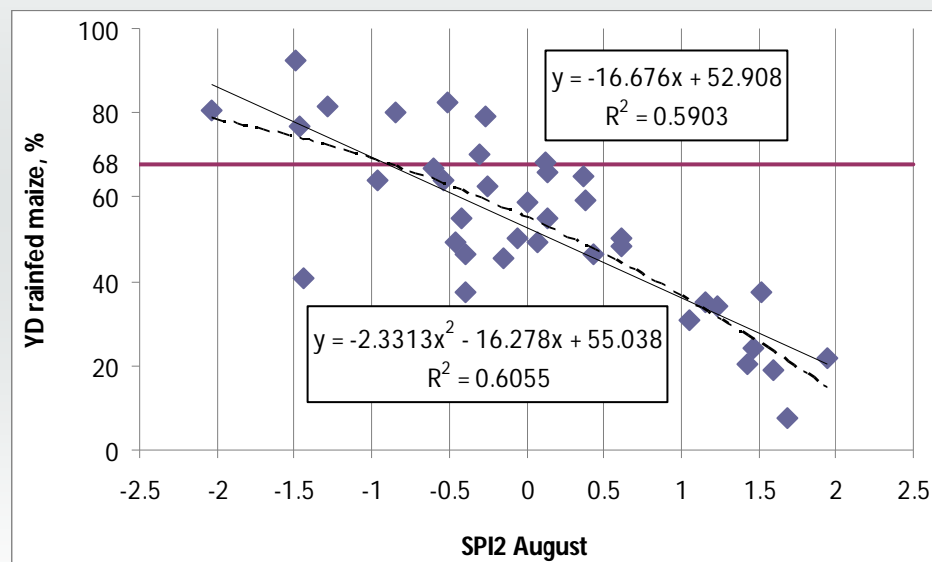


REGRESIJA SPI2 ZA AVGUST MESEC I PADA PRINOSA KUKURUZA - KIKINDA-



Granična vrednost profitabilne proizvodnje, **SPI2avgust = - 0.6**

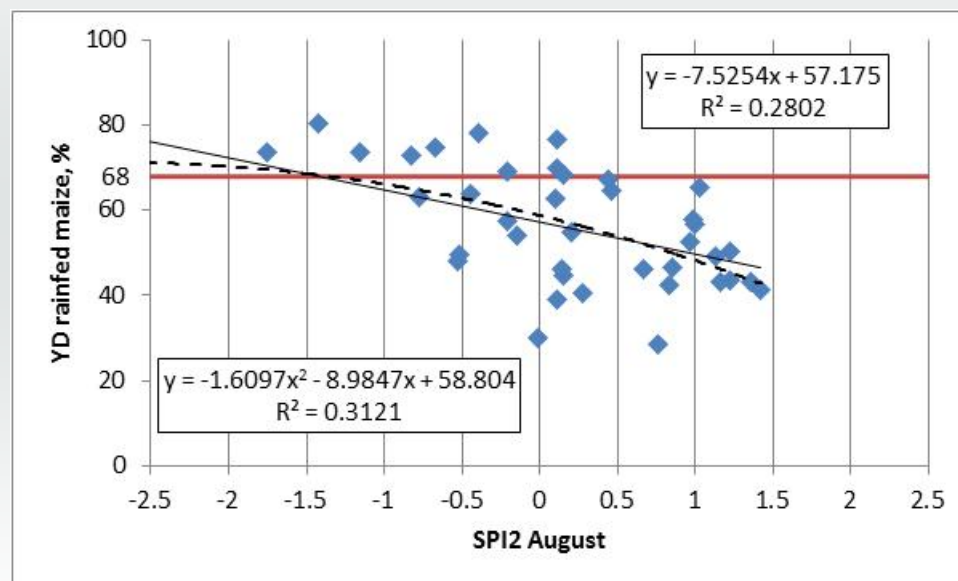
REGRESIJA SPI2 ZA AVGUST MESEC I PADA PRINOSA KUKURUZA - NOVI SAD-



Granična vrednost profitabilne proizvodnje, $SPI2_{avgust} = - 0.9$

REGRESIJA SPI2 ZA AVGUST MESEC I PADA PRINOSA KUKURUZA

- NIŠ-



Granična vrednost profitabilne proizvodnje, **SPI2avgust = - 1.4**

ZADATAK

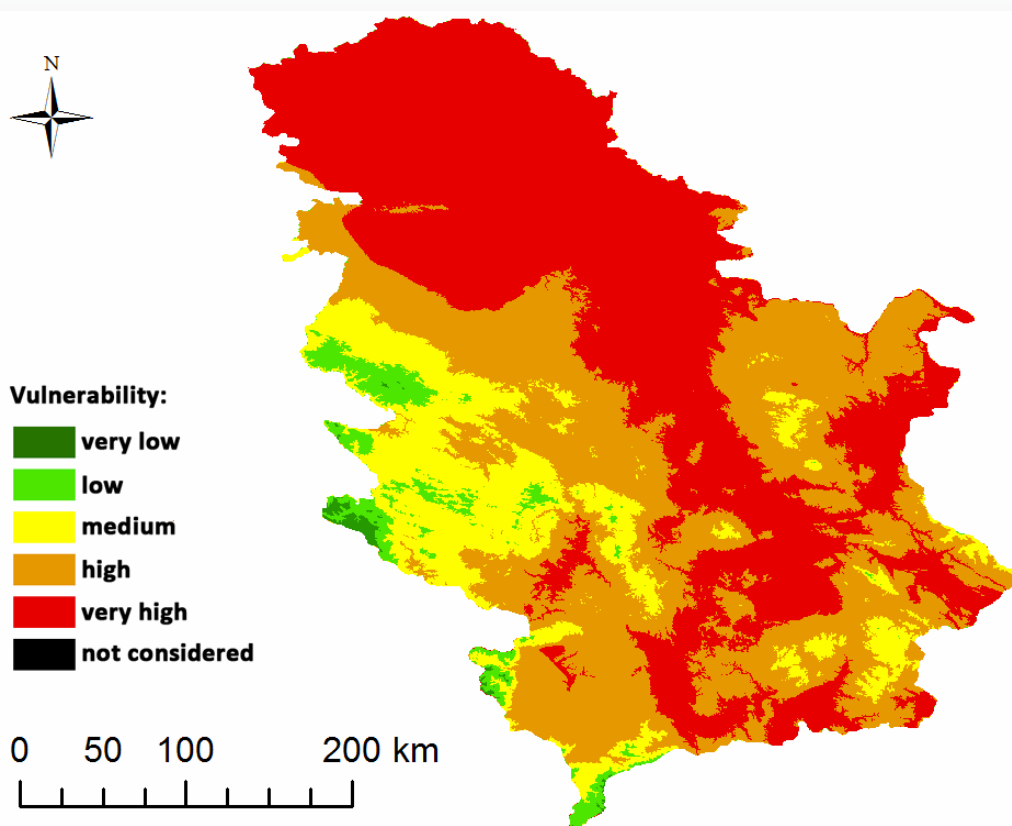
WP:4, Activity:4.2.1

DROUGHT VULNERABILITY ESTIMATES BASED ON CLIMATOLOGICAL AND GEOMORPHOLOGICAL

Proceniti ranjivost na sušu na osnovu:

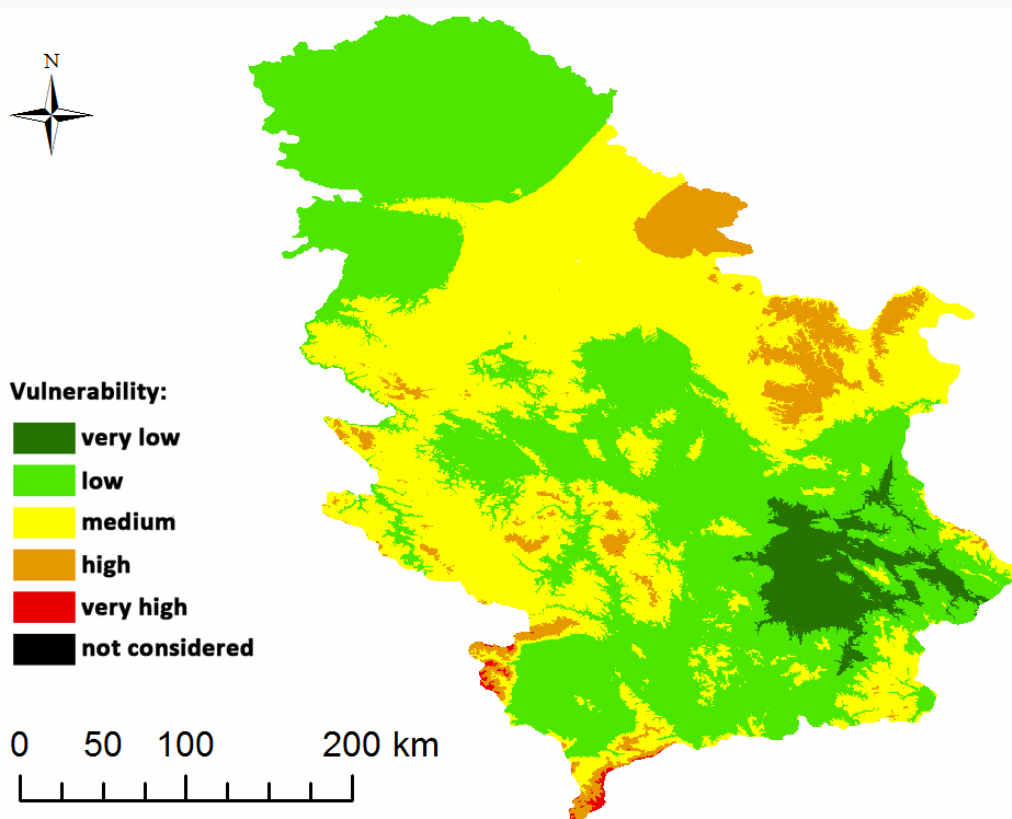
- PADAVINA (Srednja godišnja suma padavina i standardne devijacije)**
- TRAJANJA OSUNČANOSTI**
- NAGIBA TERENA**
- ZEMLJIŠNOG POKRIVAČA I NAČINA KORIŠĆENJA ZEMLJIŠTA**
- PEDOLOŠKOG TIPA ZEMLJIŠTA**

SREDNJA GODIŠNJA SUMA PADAVINA



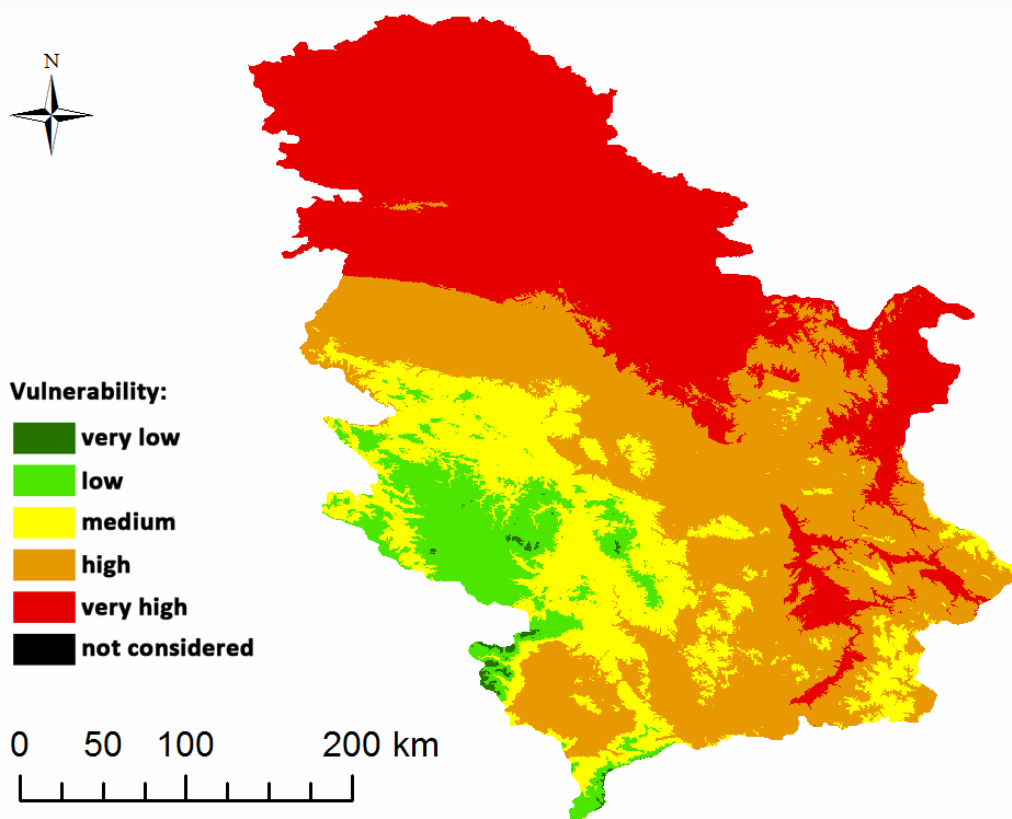
<i>Mean annual precipitation (mm)</i>	<i>Vulnerability class</i>	<i>Area (%)</i>
530 - 637	1.0	46.3
638 - 744	0.8	36.7
745 - 851	0.6	13.7
852 - 960	0.4	2.9
>961	0.2	0.4

STANDARDNA DEVIJACIJA PADAVINA



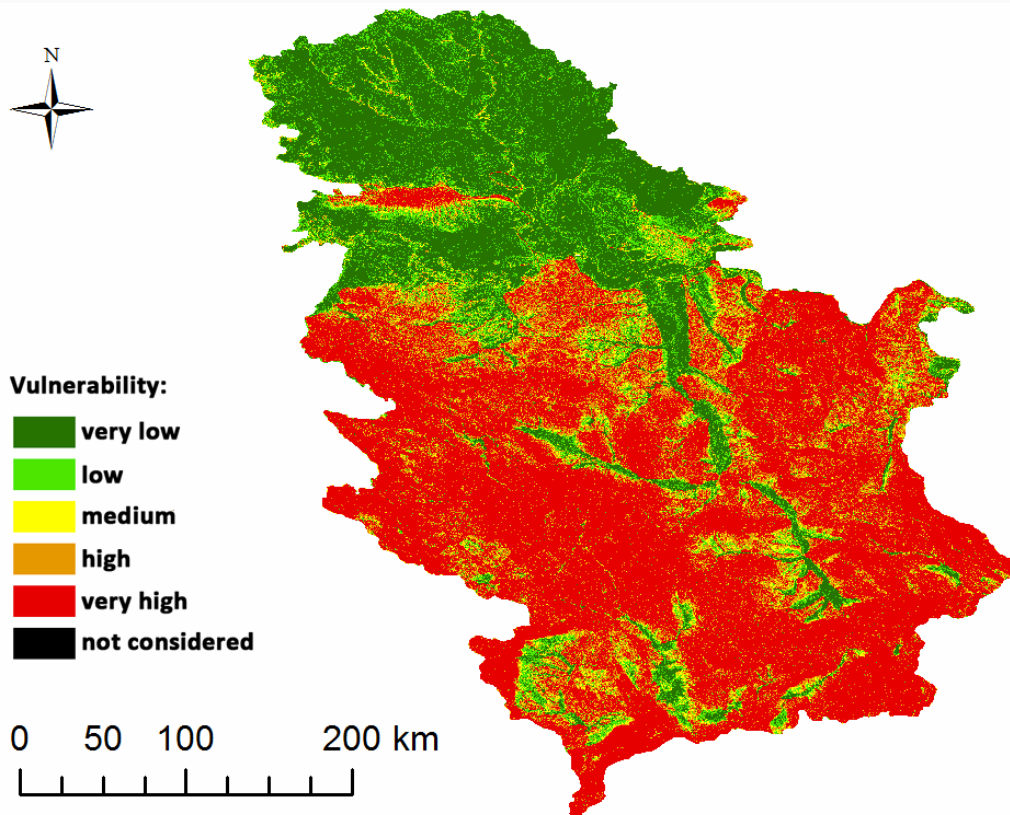
STDEV	Vulnerability class	Area (%)
95 - 109	0.2	4.8
109 - 123	0.4	50
123 - 137	0.6	38.8
137 - 151	0.8	6.2
> 151	1.0	0.2

TRAJANJE OSUNČANOSTI



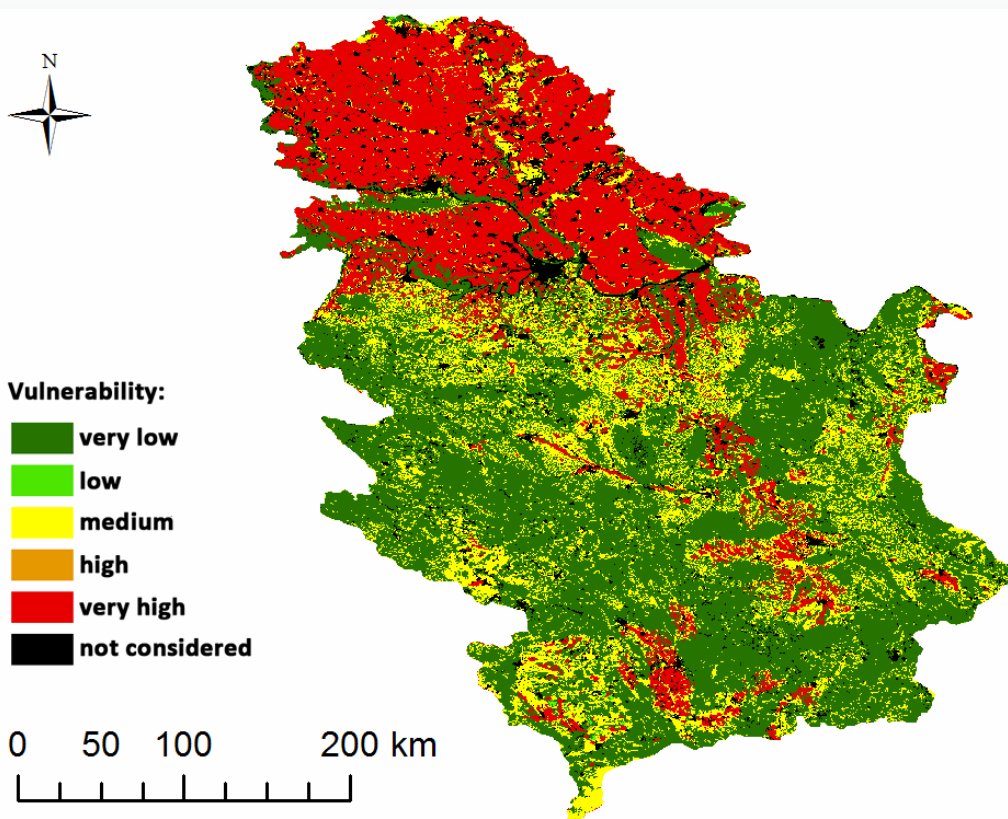
Sunshine duration (h)	Vulnerability class	Area (%)
1590 - 1635	0.2	0.3
1635 - 1680	0.4	7.6
1680 - 1725	0.6	17.1
1725 - 1770	0.8	35.8
> 1770	1.0	39.2

NAGIB TERENA



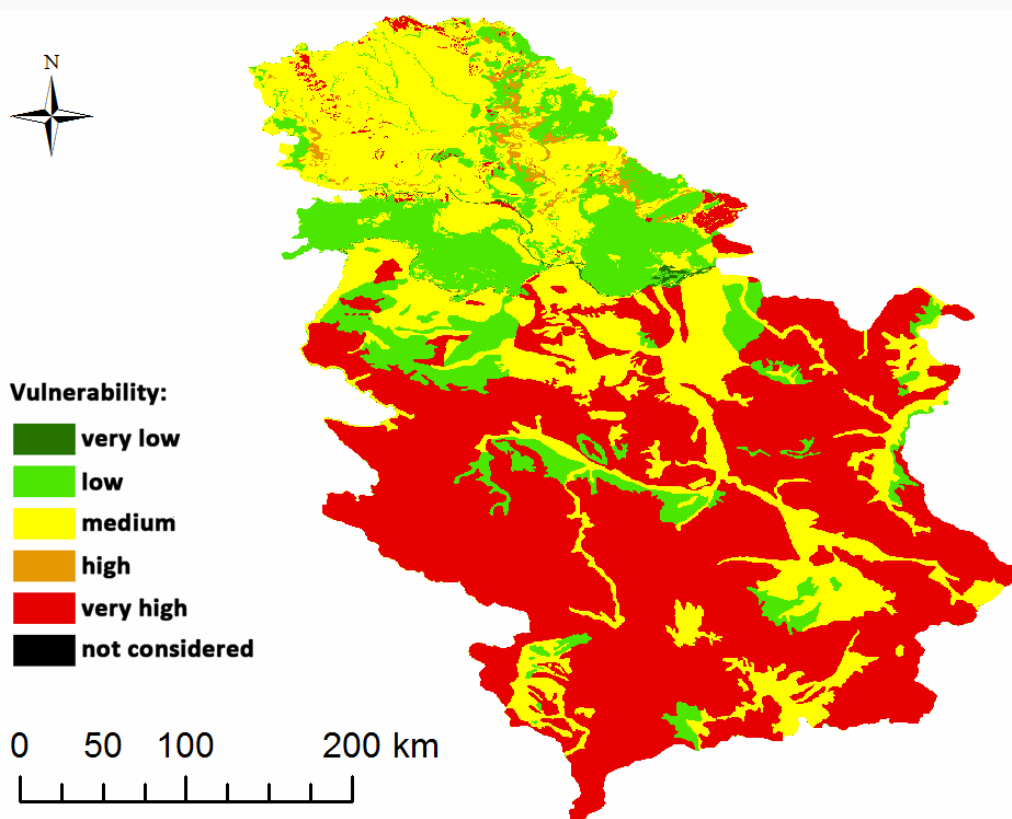
Angle (°)	Vulnerability class	Area (%)
0 - 5	0.2	24.4
5 - 12	0.4	9.3
12 - 20	0.6	5.4
20 - 35	0.8	11.1
35 - 90	1.0	49.8

ZEMLJIŠNI POKRIVAČ I NAČIN KORIŠĆENJA ZEMLJIŠTA



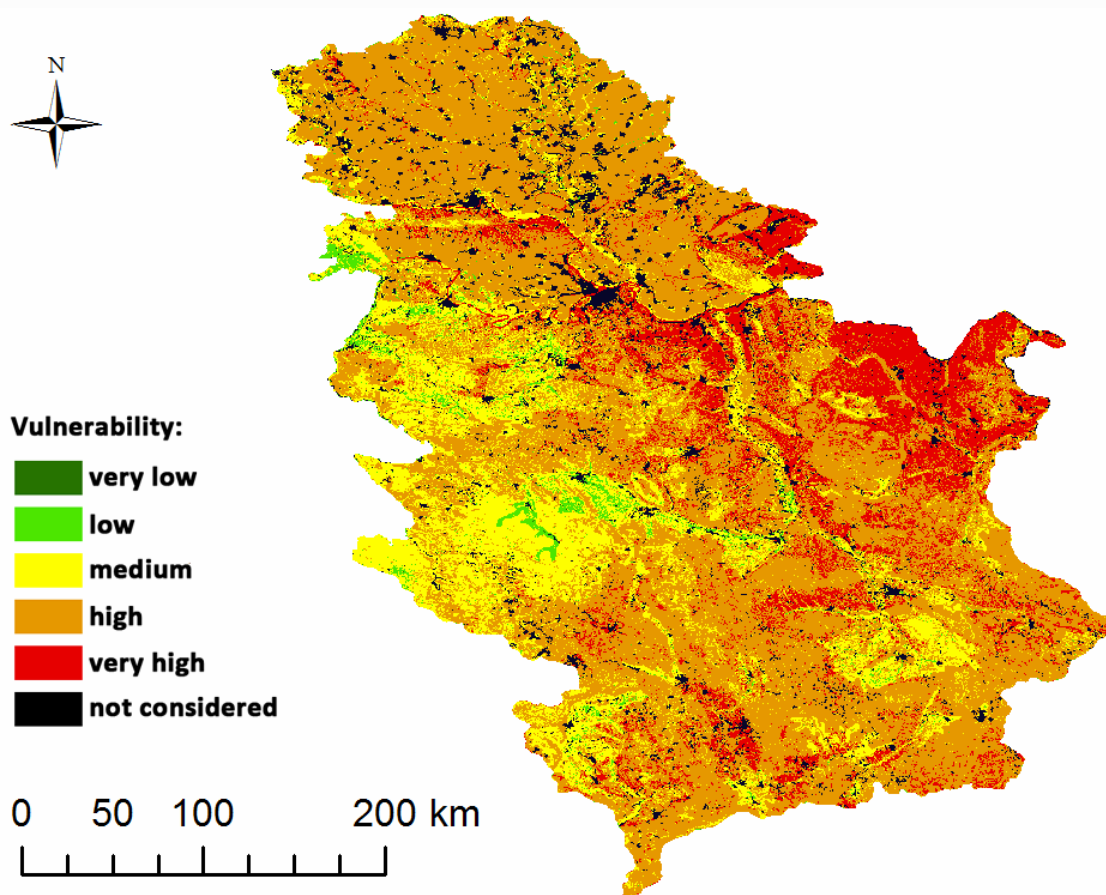
Description	Code	Vulnerability class	Area (%)
Land principally occupied by agriculture, Broad-leaved forest, Coniferous forest, Mixed forest	243,311,312,313	0.2	49.5
Vineyards	221	0.4	0.2
Heterogeneous agricultural areas, Natural grasslands, Moors and heathland, Sclerophyllous vegetation, Sparsely vegetated areas	242,321,322,323,333	0.6	19.5
Fruit trees and berry plantations	222	0.8	0.1
Non-irrigated arable land	211	1.0	24.1
Artificial surfaces, Wetlands, Water bodies	111, 112, 121, 122, 123, 124, 131, 132, 133, 141, 142, 334, 411, 511, 512	100	6.6

PEDOLOŠKI TIP ZEMLJIŠTA



<i>Soil type</i>	<i>Vulnerability class</i>	<i>Area (%)</i>
Histosol	0.2	0.06
Gleysols, Luvisols	0.4	15.8
Cambisols, Chernozems, Fluvisols	0.6	31.3
Phaeozems, Solonetz	0.8	1.0
Arenosols, Leptosols, Solonchaks, Vertisols	1.0	51.9

KARTA RANJIVOSTI NA SUŠU



<i>Vulnerability</i>	<i>Area (%)</i>
very low	0.02
low	1.8
medium	20.0
high	58.2
very high	13.4
not considered	6.6

HVALA NA PAŽNJI !