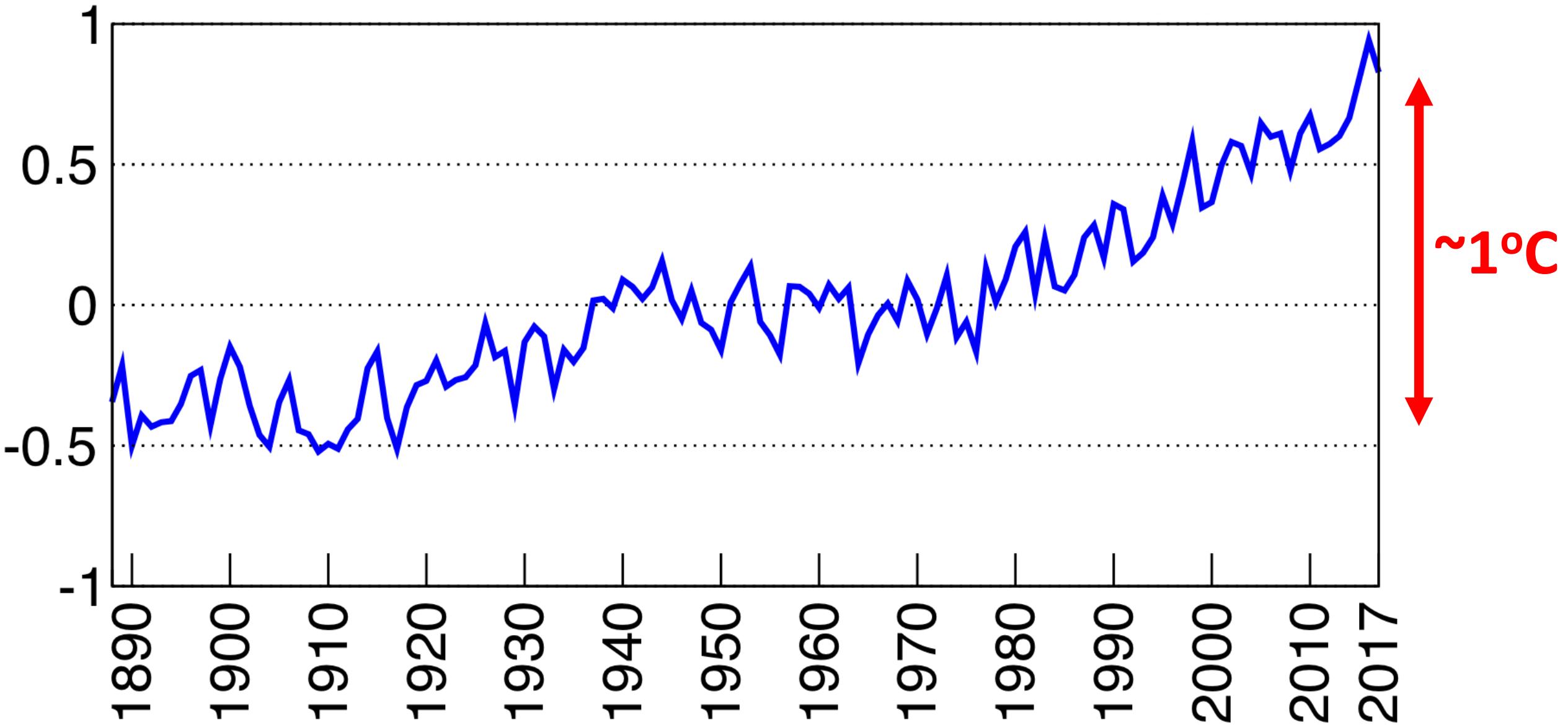


# Osmotrene klimatske promene i scenarija promene klime u Srbiji, mogući uticaji i mogućnosti adaptacije

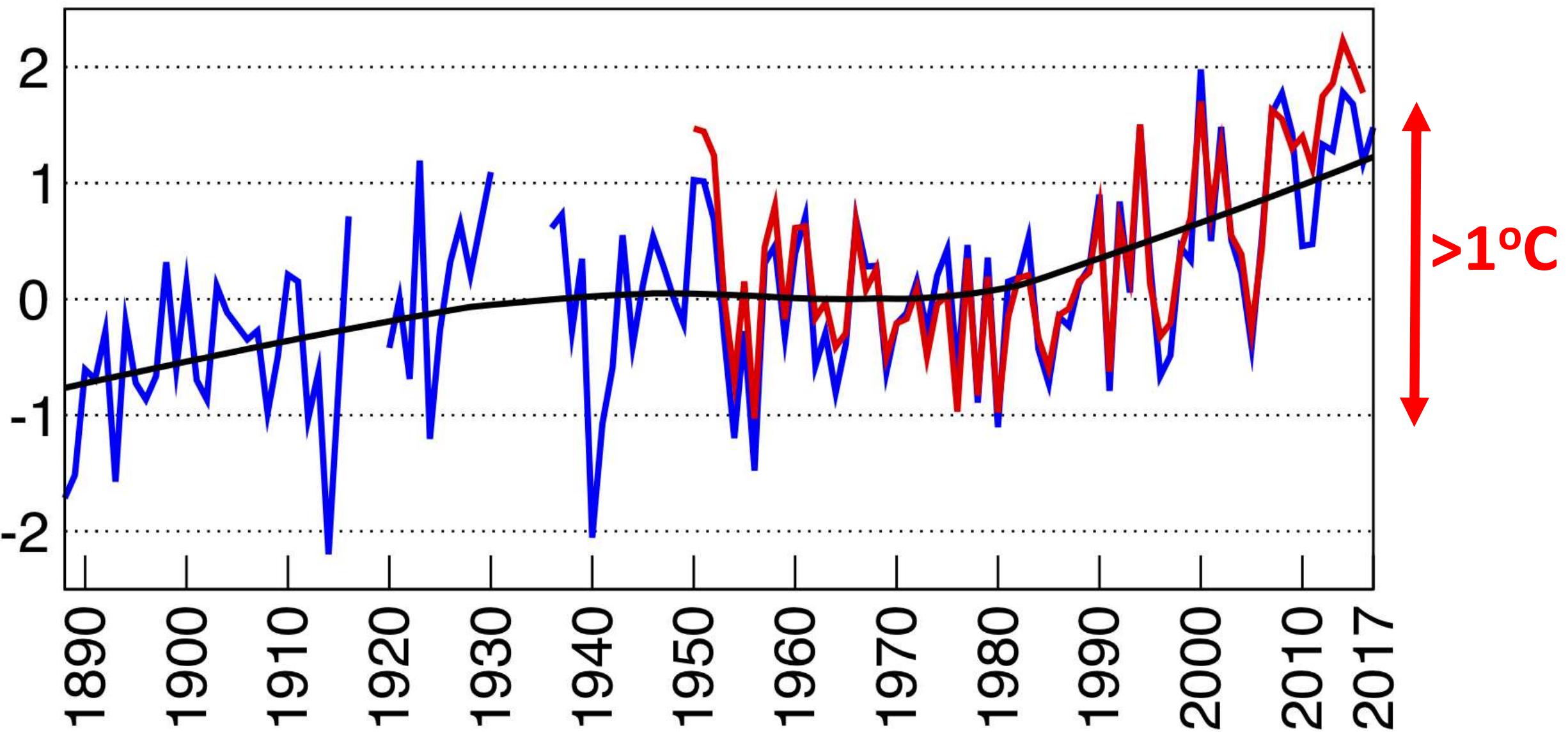
Vladimir Đurđević

# Promena globalne srednje godišnje temperature

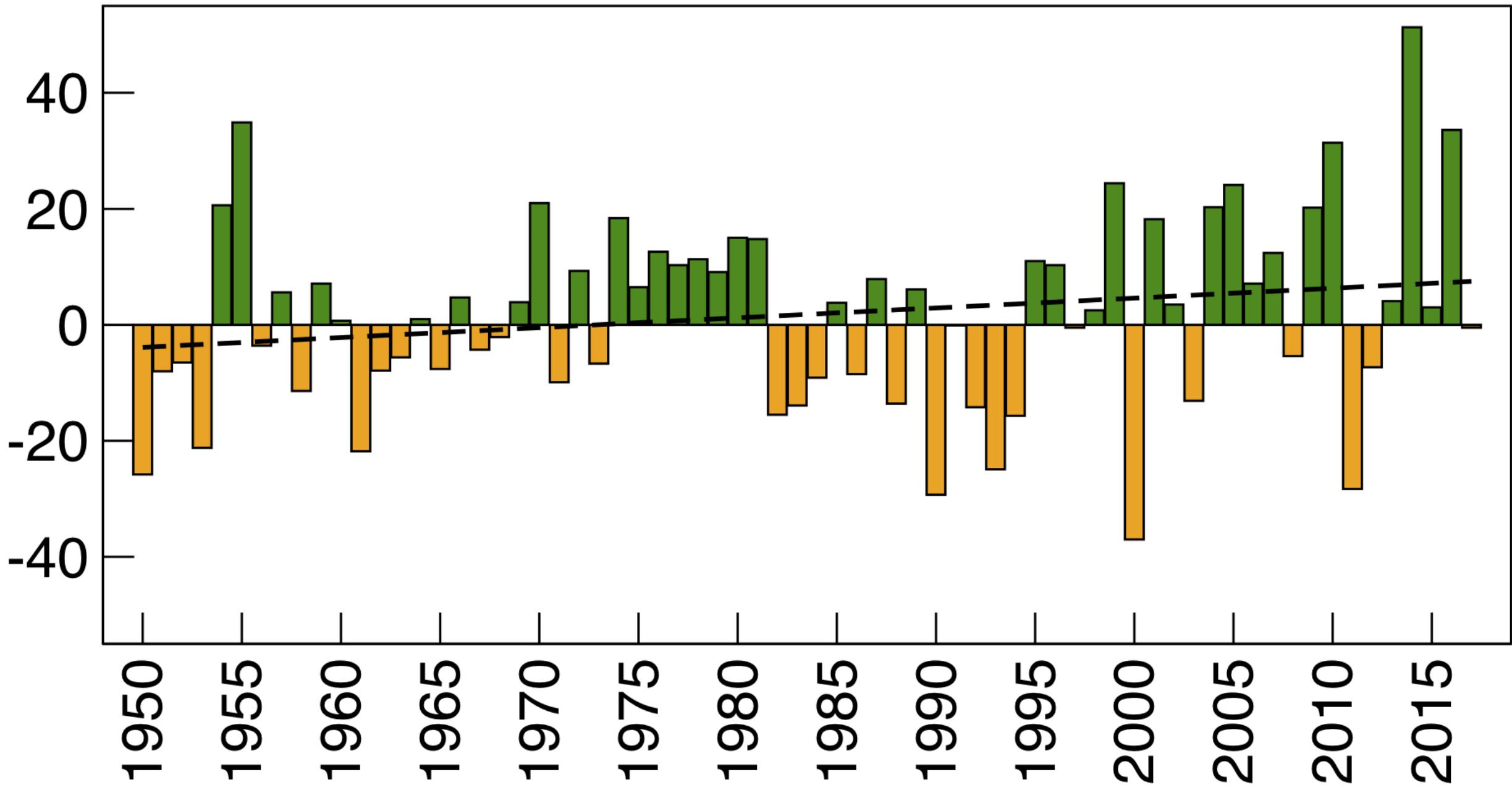


# Promena srednje godišnje temperature

— Beograd  
— Srbija  
— fit



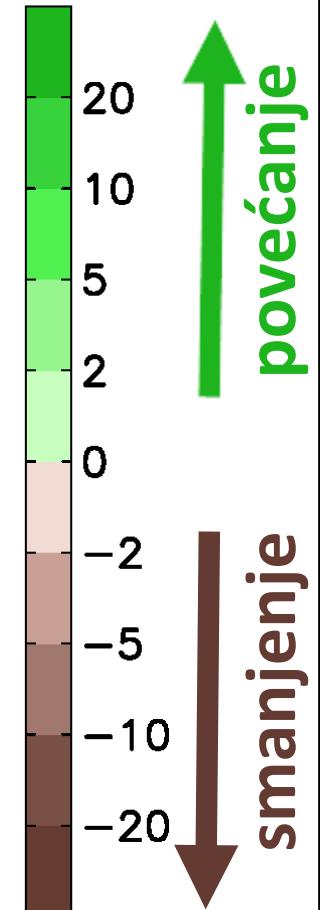
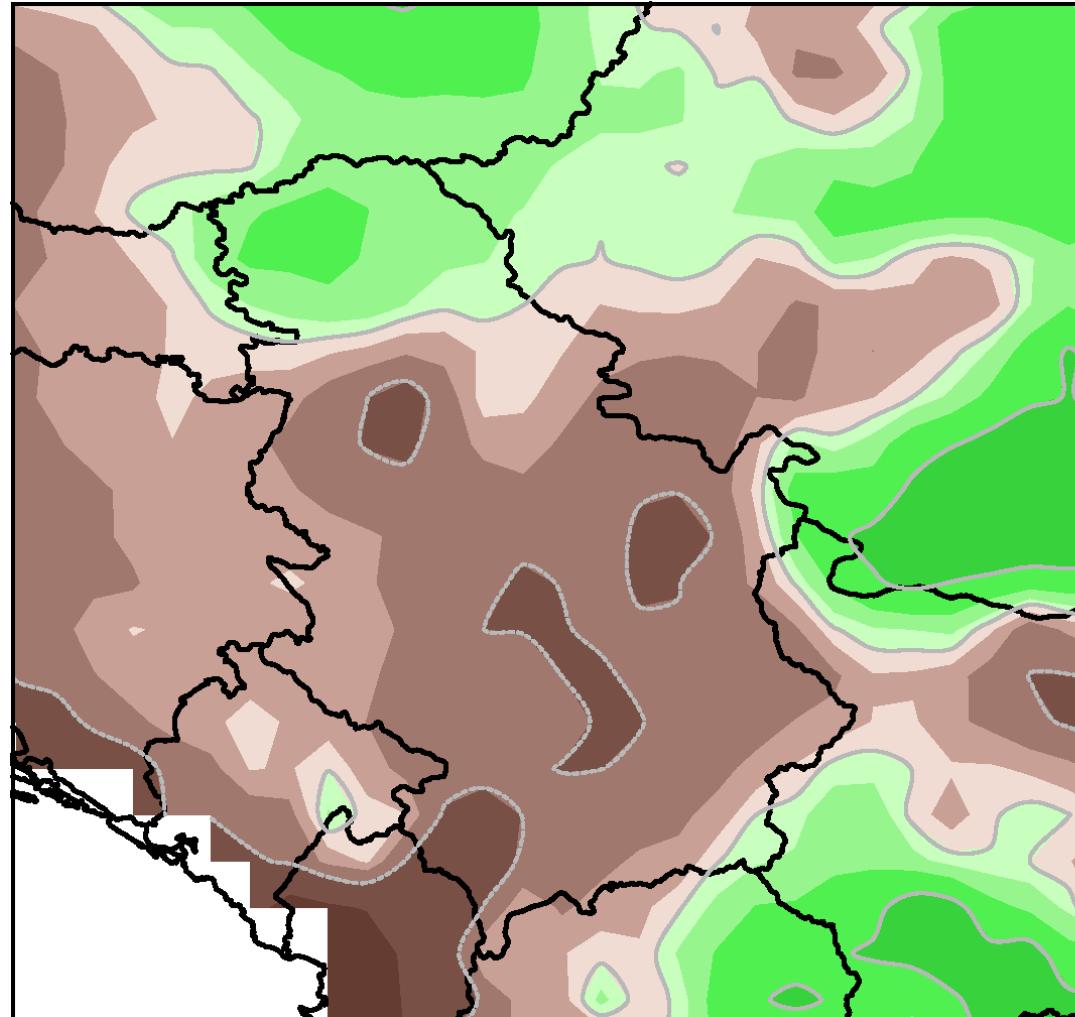
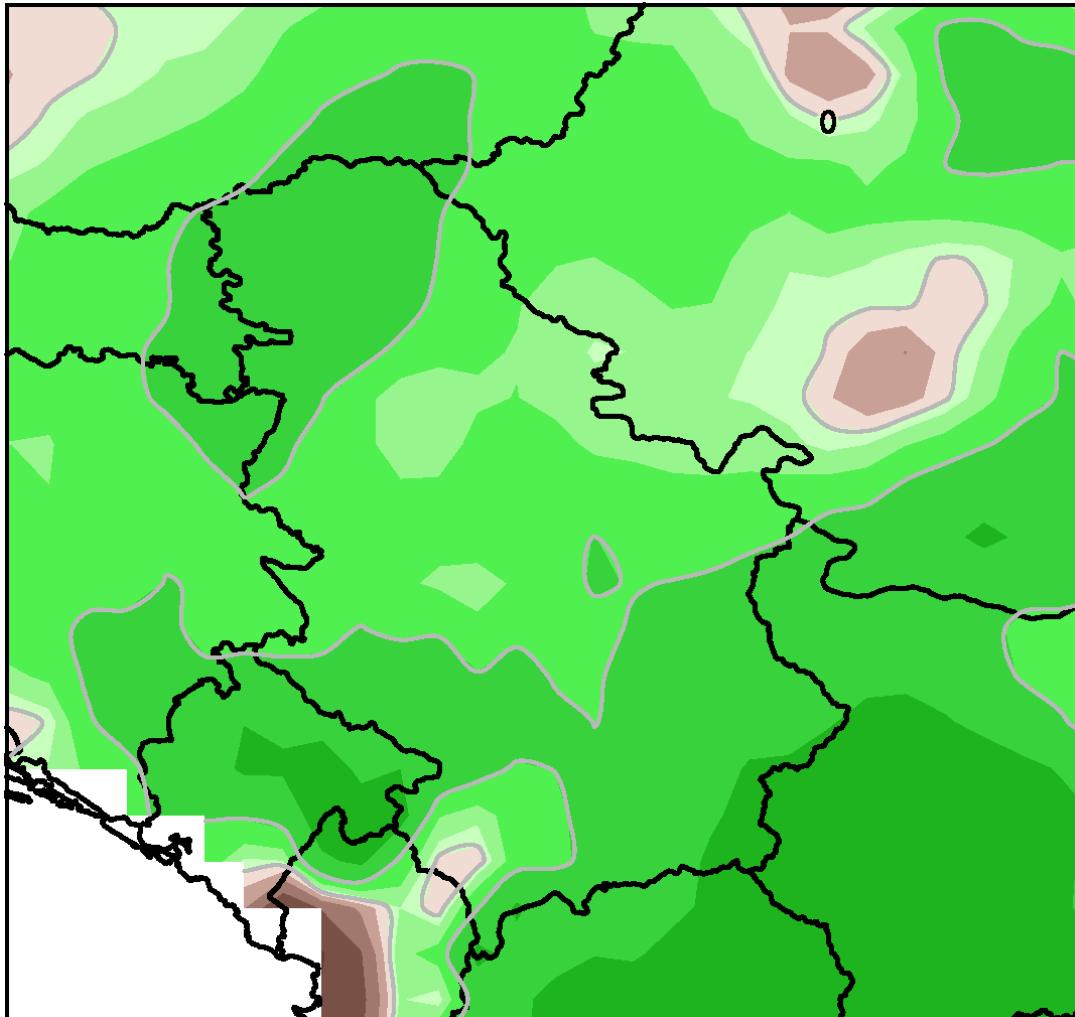
# Godišnje padavine za celu Srbiju [odstupanje u %]



# Promena padavina (%) [2001-2017 u odnosu na 1961-1990]

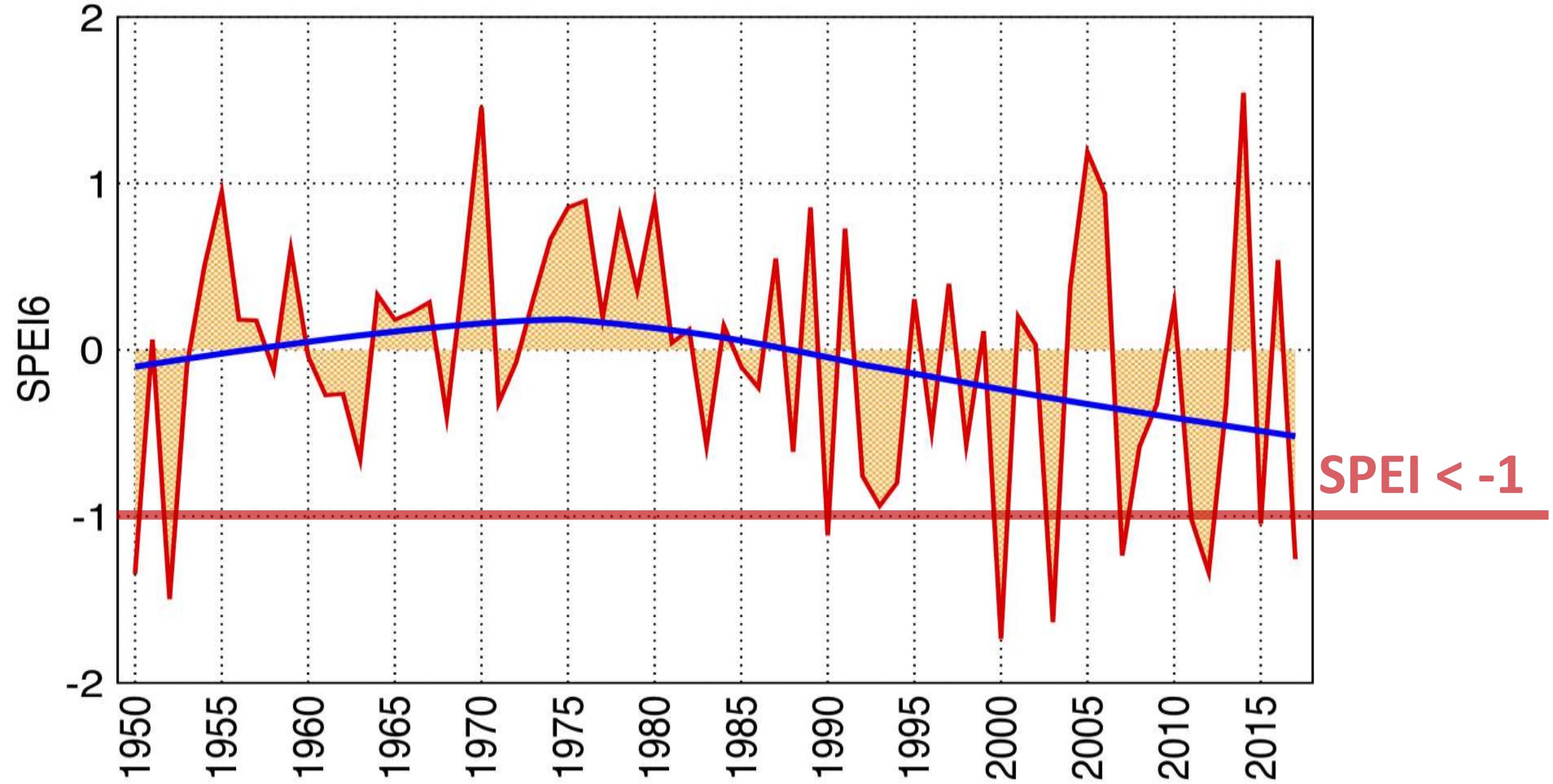
Godišnje

Letnje (JJA)

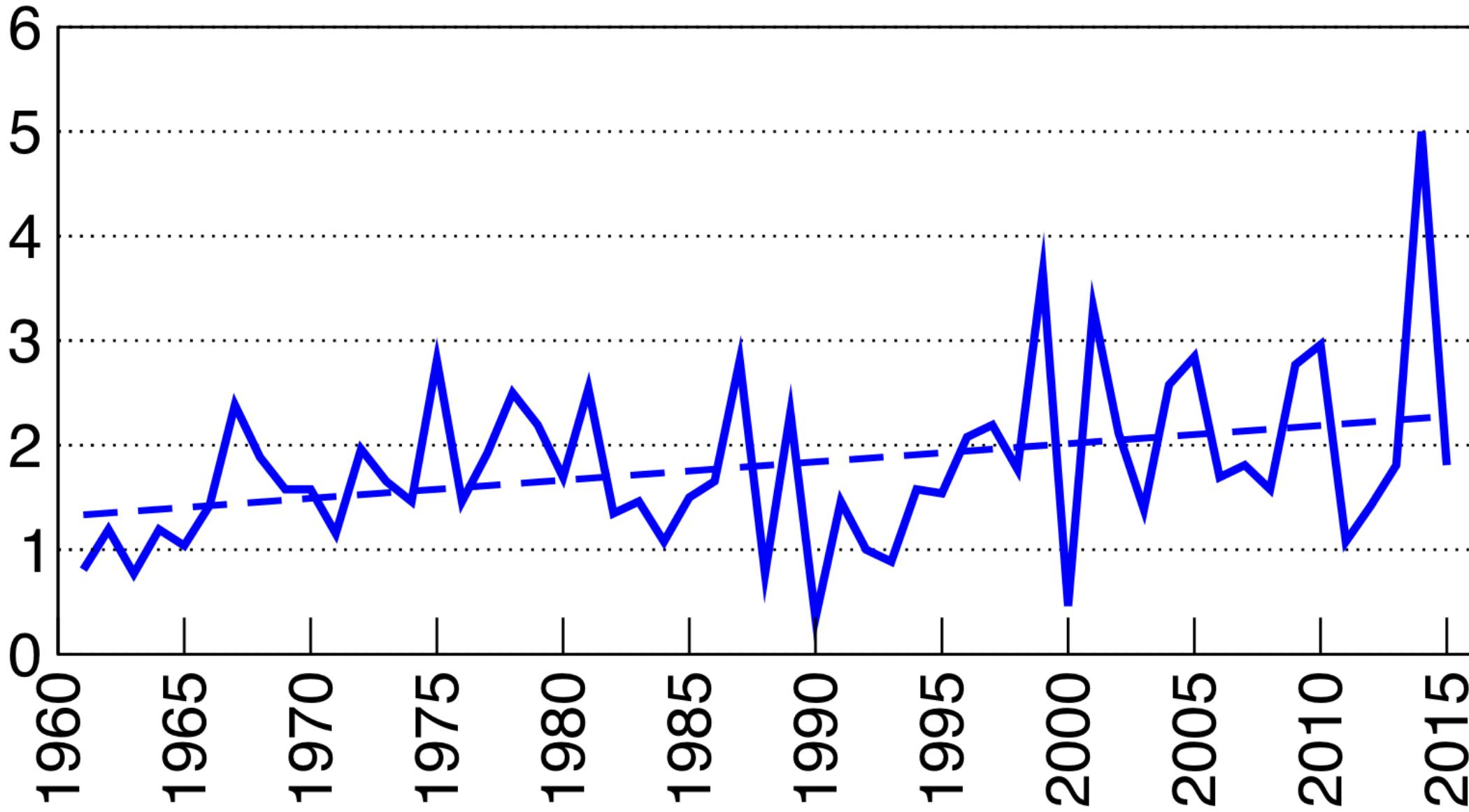


# SPEI Indeks suše

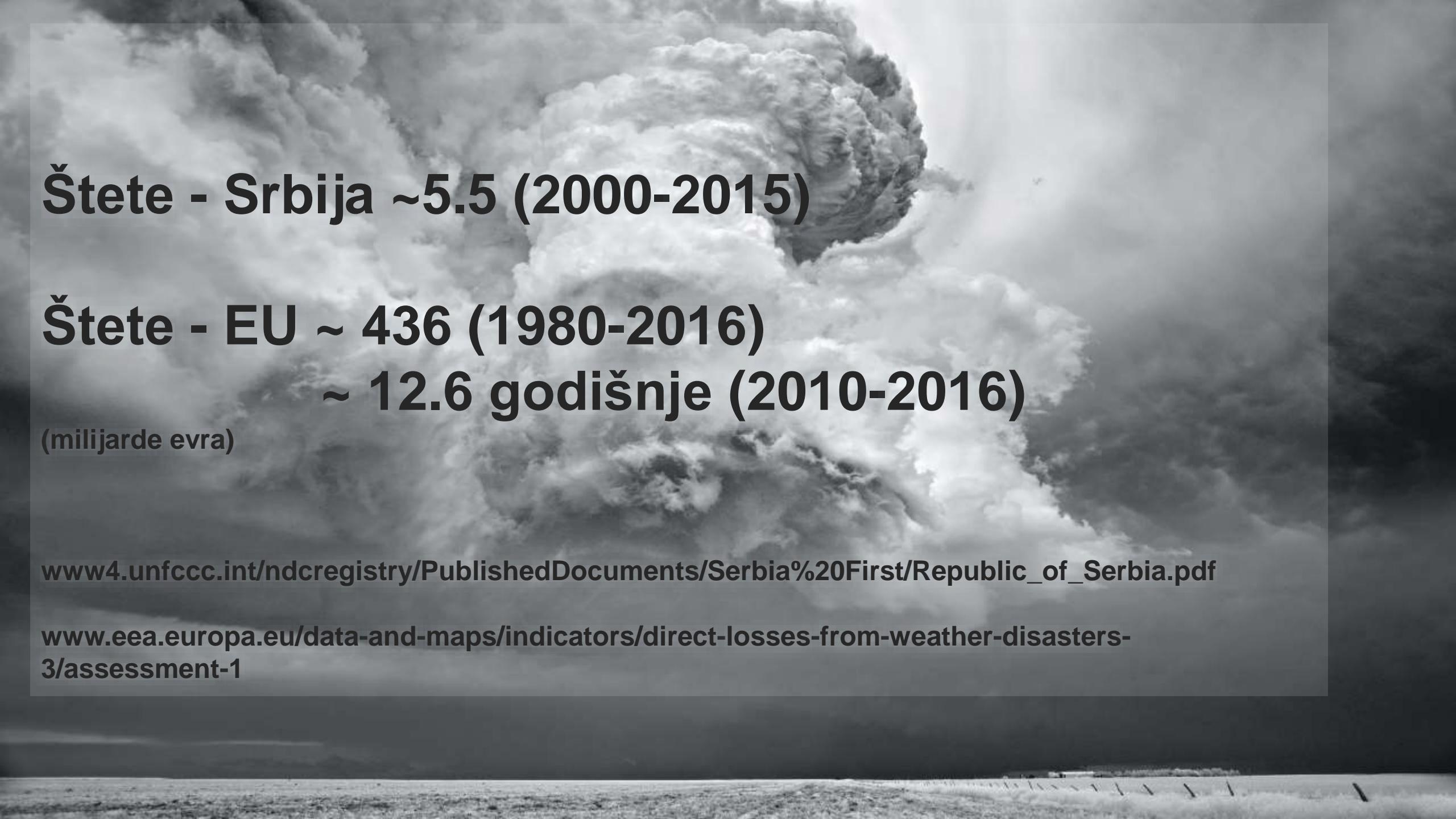
SPEI6 (Avgust)  
fit



# Broj dana sa padavinama većim od 30 mm



(podaci: RHMZS)



**Štete - Srbija ~5.5 (2000-2015)**

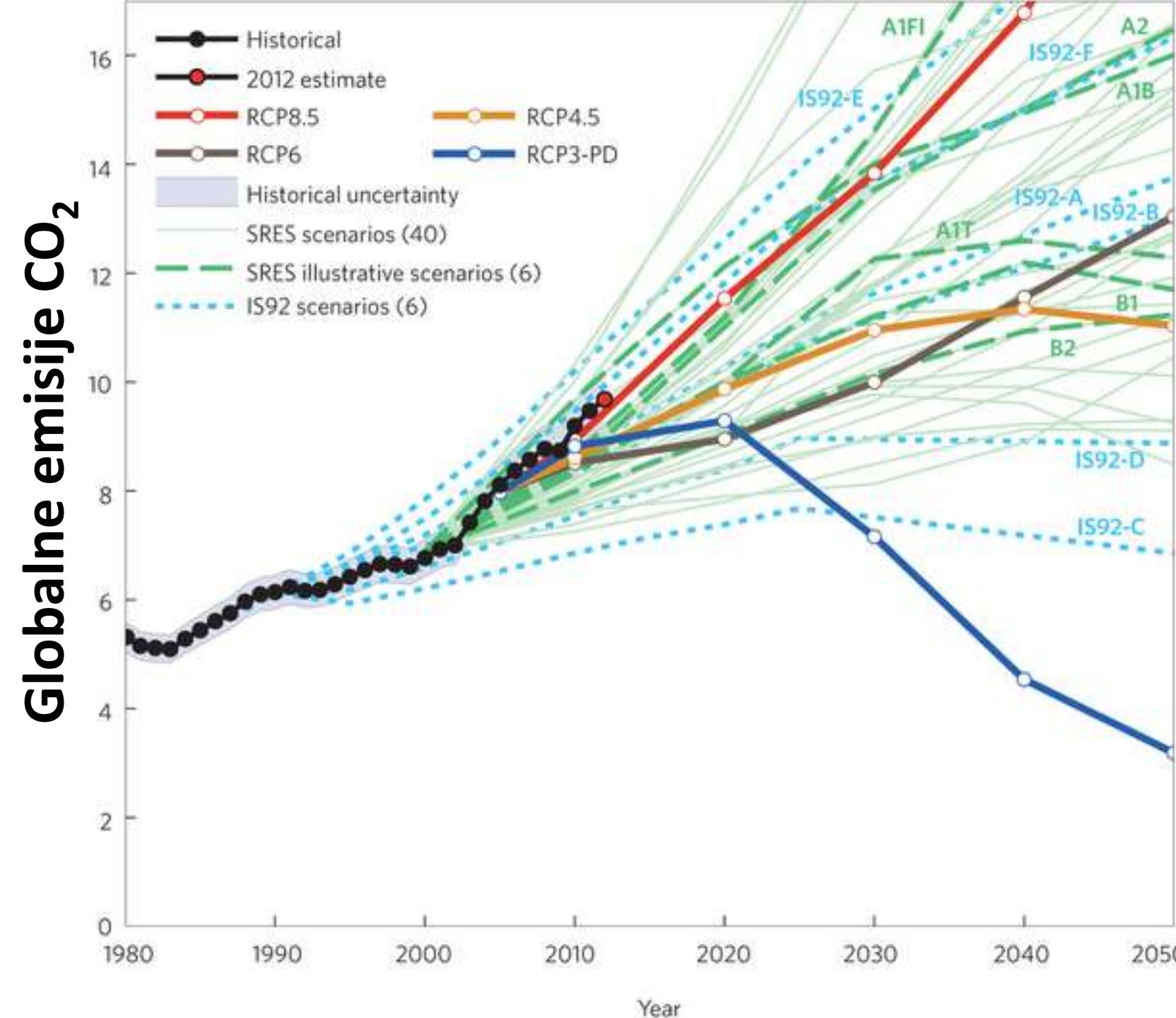
**Štete - EU ~ 436 (1980-2016)**  
**~ 12.6 godišnje (2010-2016)**

(milijarde evra)

[www4.unfccc.int/ndcregistry/PublishedDocuments/Serbia%20First/Republic\\_of\\_Serbia.pdf](http://www4.unfccc.int/ndcregistry/PublishedDocuments/Serbia%20First/Republic_of_Serbia.pdf)

[www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment-1](http://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment-1)

# Projekcije za budućnost

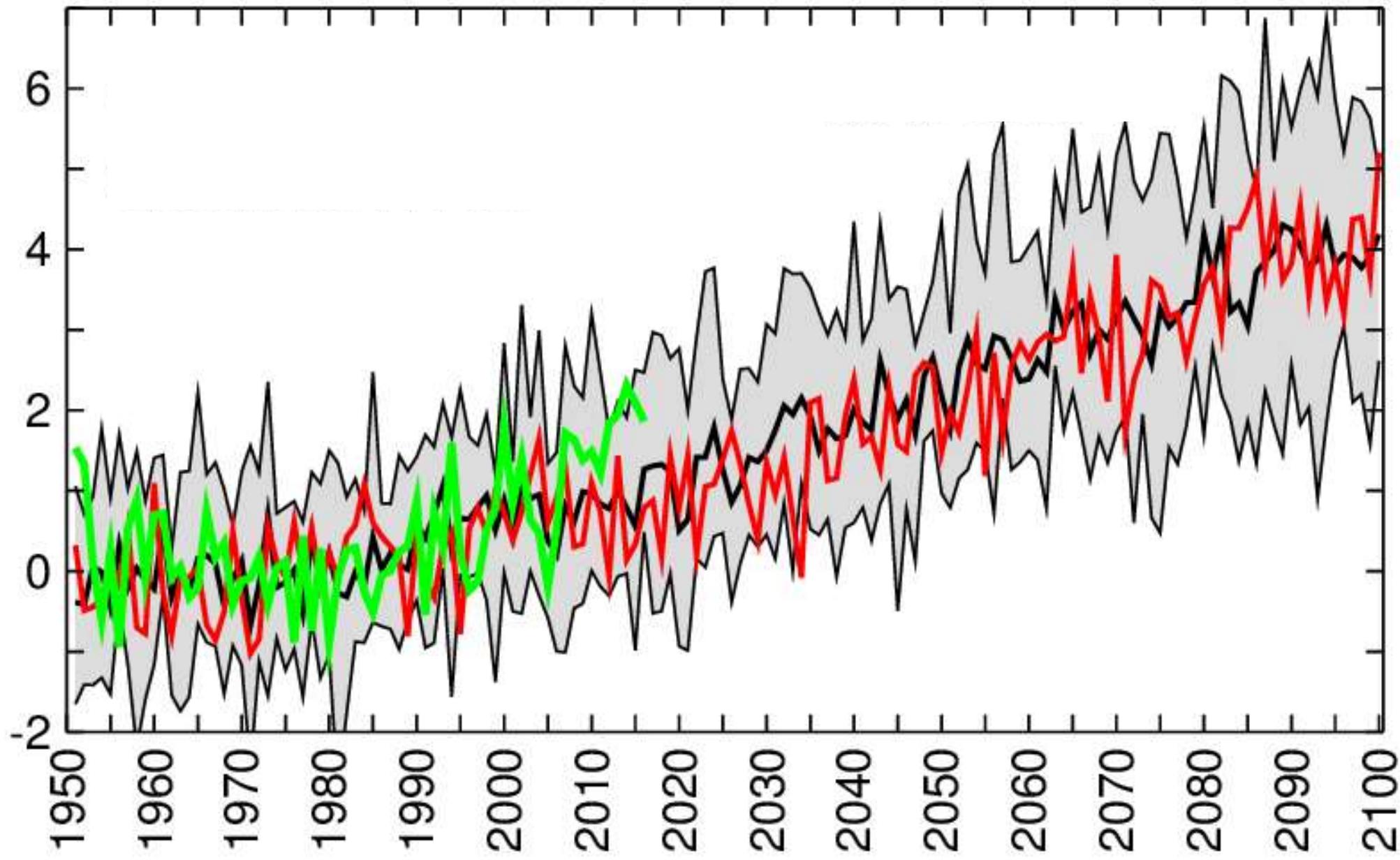


**Scenarija emisija:**

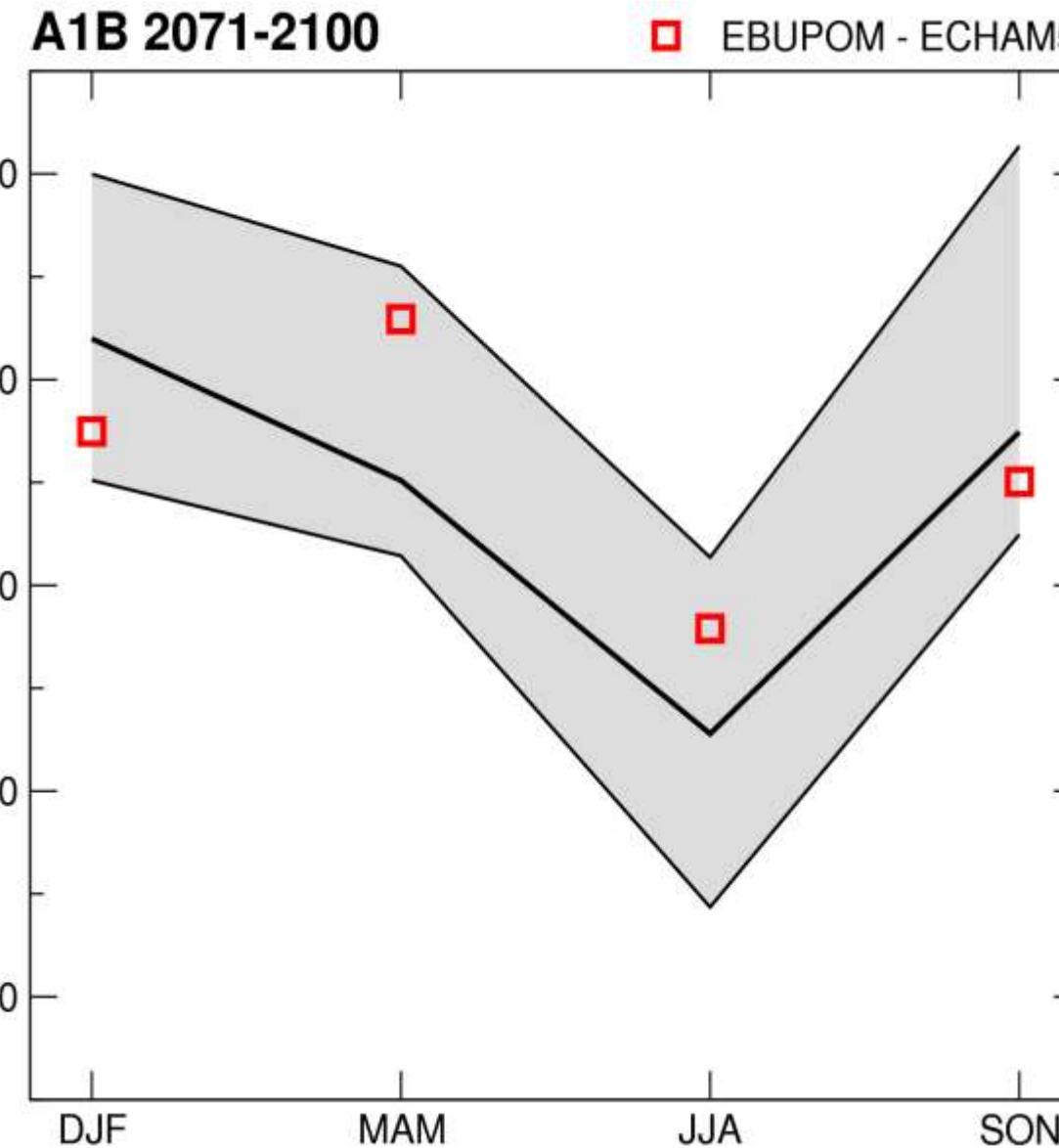
- “nepovoljan” scenario
- “Pariski sporazum”

KLIMATSKI MODELI

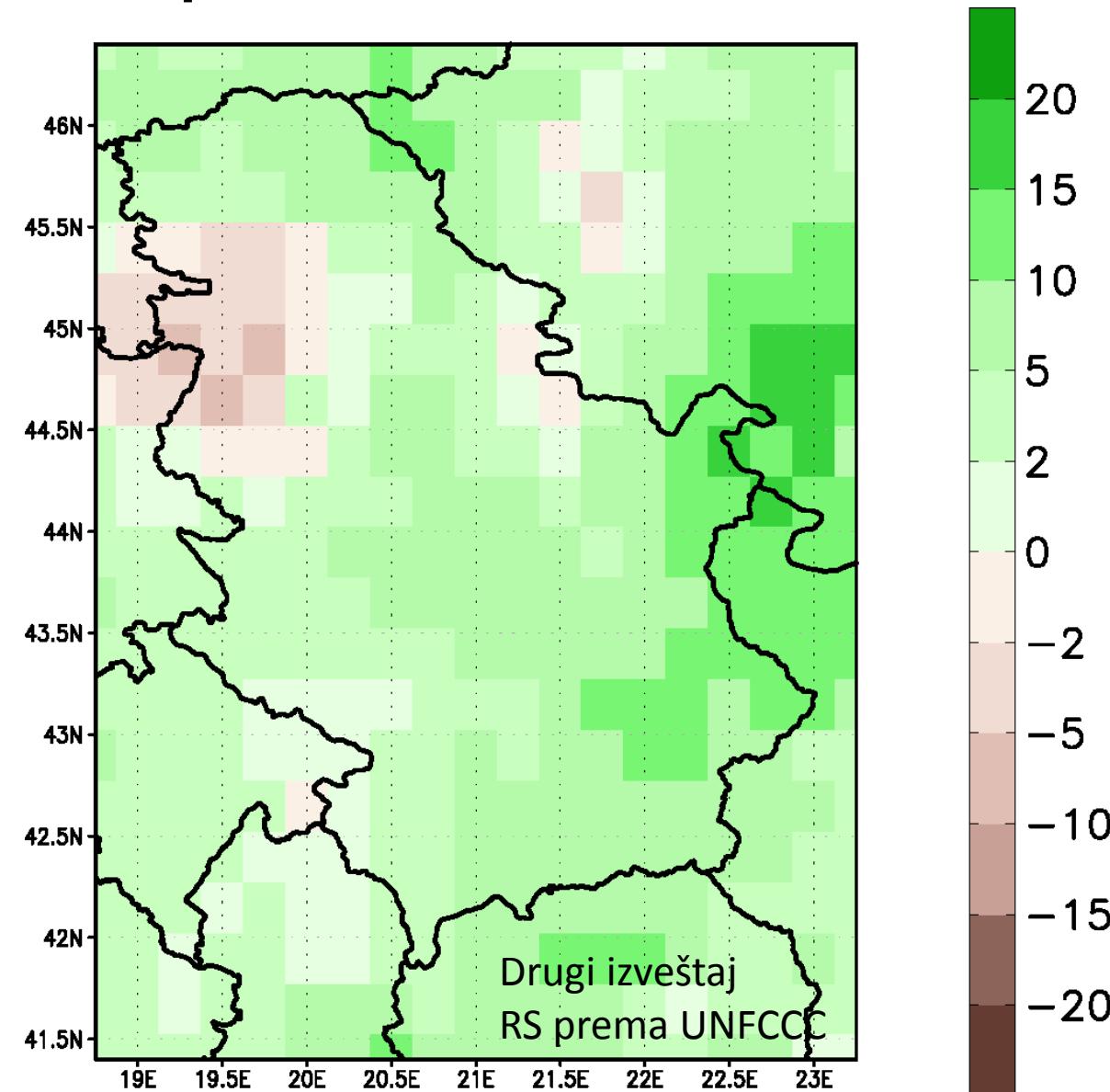
— EBU-POM MODEL  
— OSMATRANJA



## Odstupanje sezonskih padavina (%) za period 2071-2100.



## Anomalija akumuliranih padavina (%) u danima sa >20mm za period 2071-2100



# Uticaj klimatskih promena

(Prvi i Drugi izveštaj)

Visoke  
temperature

Suša

Ekstremne  
padavine

**Poljoprivreda**

**Vodni resursi**

**Šumarstvo**

**Zdravlje**

**Biodiverzitet**

Mnaji kvanititet i kvalitet prinosa (kuk. >50%), nove bolesti i štetočine ...

Gubitak resursa, nepovoljne promene u h. ciklucu, poplave, snabdevanje ...

Gubitak klim. uslova za pojedine vrste (bukva), požari, bolesti/štetočine ...

Dugotrajni toploni talasi, pojava vektorskih bolesti, indirektni uticaji ...

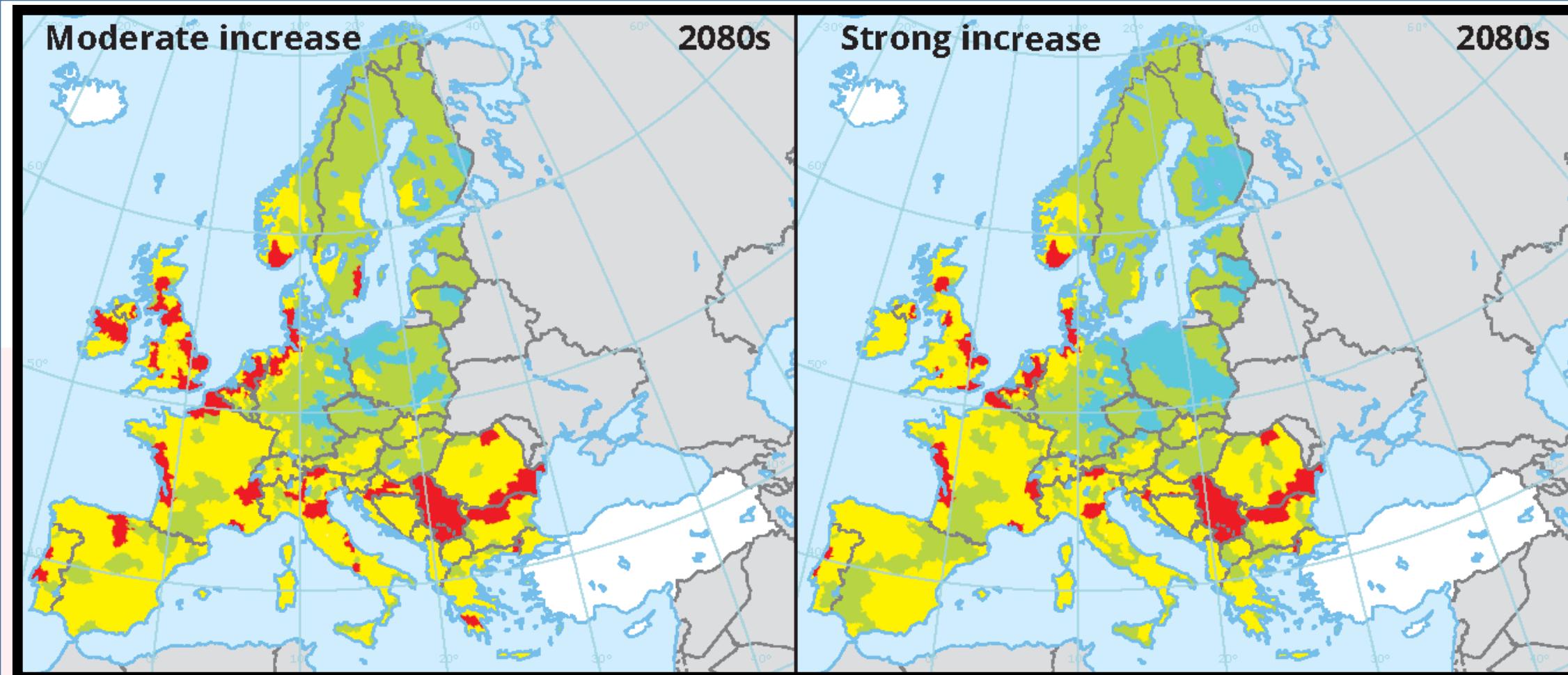
Gubitak staništa i vrsta, pojava invazivnih vrsta, ...

Moderate increase

2080s

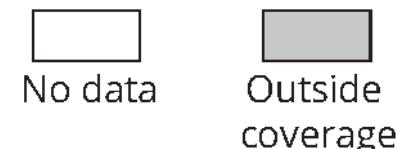
Strong increase

2080s



#### Projected increase in exposure to multiple climate-related hazards

Number of hazards with moderate/strong/extreme increase



Dugotrajni toploni talasi, pojava vektorskih bolesti, indirektni uticaji ...

Gubitak staništa i vrsta, pojava invazivnih vrsta, ...

**Hazardi: toplotni talasi, hladni talasi, suše, požari, poplave, priobalno plavljenje i olujni vetrovi**

<https://www.eea.europa.eu/data-and-maps/figures/projected-multi-hazard-exposure-for>

# Adaptacija – predložene mere

				Strategic areas		Adaptation measures		Challenges		
				Strategic area	Adaptation measures	Challenges and obstacles	Strategic area	Adaptation measures	Challenges and obstacles	
Reducing risks										
Policy				Strategic area	Adaptation measures	Challenges and obstacles	Strategic area	Adaptation measures	Challenges and obstacles	
Monitoring and research				Risk reduction	Detailed forest mapping Detailed vulnerability assessment to climate change Introduce fire protection systems Increase production of timber under very dry conditions Establish climate change impact assessments Adopt a sector plan for climate change Adapt a sector plan for climate change Improve inner-sector planning Improve planning of integral water resource management Improve regulations and directives Include climate change impacts in the sector strategy Adopt an adaptation plan within the sector Improve the climate monitoring system Improve hydrological observation network Improve early warning systems for climate and hydrological events Establish a data base on extreme meteorological and hydrological events and disasters Improve research in area of numerical modeling of hydrological processes (precipitation/snow-runoff) for different time scales Intensify multidisciplinary research on climate change Intensify research on climate change impacts on water resources	Inadequate funds Inadequate technical capacity Lack of awareness	Develop a biodiversity indicator system Detailed vulnerability assessment to climate change Increase protected areas Ensure one sector plan for climate change Increase production of timber under very dry conditions Establish climate change impact assessments Adopt a sector plan for climate change Adapt a sector plan for climate change Improve inner-sector planning Improve planning of integral water resource management Improve regulations and directives in forest management Include climate change impact problems in forest sector strategy and Action Plan Adopt an adaptation plan within the sector, including its financial needs	Inadequate funds Inadequate technical capacity Lack of awareness	Develop a biodiversity indicator system Detailed vulnerability assessment to climate change Increase protected areas Ensure one sector plan for climate change Increase production of timber under very dry conditions Establish climate change impact assessments Adopt a sector plan for climate change Adapt a sector plan for climate change Improve inner-sector planning Improve planning of integral water resource management Improve regulations and directives in forest management Include climate change impact problems in forest sector strategy and Action Plan Adopt an adaptation plan within the sector, including its financial needs	Inadequate funds Inadequate technical capacity Lack of awareness
Capacity building and public awareness				Policy	Improve integral monitoring of the effects of air, water and soil pollution and climate change on forest ecosystems Intensify multidisciplinary research of climate change impacts on forests Develop and apply strategy evaluation methods and adaptation measures, including measures for strengthening the resilience of forests to climate change	Inadequate funds Inadequate technical capacity Lack of awareness	Climate change in sector strategy and planning An adaptation plan within the sector Action plan for especially endangered forest ecosystems Plan for increasing protected areas	Inadequate funds Inadequate technical capacity Lack of awareness	Climate change in sector strategy and planning An adaptation plan within the sector Action plan for especially endangered forest ecosystems Plan for increasing protected areas	
Monitoring and Research				Monitoring and research	Include climate change impacts in sector strategies and Action Plans Create an adaptation plan within the sector Improve trans-sector planning and integral management of water resources in catchment areas of importance to agriculture Introduce new insurance mechanisms	Inadequate funds Inadequate technical capacity Lack of awareness	Monitoring of relevant parameters within catchments Established and continuous monitoring in data base Monitoring of endangered species and their habitats	Inadequate funds Inadequate technical capacity Lack of awareness	Monitoring of relevant parameters within catchments Established and continuous monitoring in data base Monitoring of endangered species and their habitats	
Capacity building and public awareness				Monitoring and research	Improve climate monitoring systems Establish climate base containing information on extreme weather occurrences and disasters connected with climate change, including information on damage in the agriculture and other sectors Improve climate monitoring and early warning systems of droughts and other extreme climate episodes of importance to agriculture Research and development of new seeds and hybrids Develop and apply methods and models for integral assessment of climate change impacts on agriculture and economic parameters of adaptation options Develop and apply agro-climate indicators in agro-climatic and agro-ecological zoning	Inadequate funds Inadequate technical capacity Lack of awareness	Improving scientific and research capacity Improving private and public sector capacity Improving capacity of personnel in protected natural areas	Inadequate funds Inadequate technical capacity Lack of awareness	Improving scientific and research capacity Improving private and public sector capacity Improving capacity of personnel in protected natural areas	
Monitoring and Research				Capacity building and public awareness	Strengthening the role of local communities in sustainable forest management Raise awareness of the scientific community and forest owners Raise the public awareness level and improve information on climate change impacts and possible adaptation measures	Inadequate funds Inadequate technical capacity Lack of awareness	The informing of professionals and the public on climate change impacts and possible adaptation options	Inadequate funds Inadequate technical capacity Lack of awareness	The informing of professionals and the public on climate change impacts and possible adaptation options	
Capacity building and public awareness				Capacity building and public awareness	Additional research and monitoring of vulnerability and adaptation (LT) Continued inventory of private forests	Inadequate funds Inadequate technical capacity Lack of awareness	Measures and measures of adaptation to climate change Biodiversity	Inadequate funds Inadequate technical capacity Lack of awareness	Measures and measures of adaptation to climate change Biodiversity	
Capacity building and public awareness					Capacity building of public enterprises of appropriate legal, organizational and professional nature	Inadequate funds Inadequate technical capacity Lack of awareness	Measures and measures of adaptation to climate change Biodiversity	Inadequate funds Inadequate technical capacity Lack of awareness	Measures and measures of adaptation to climate change Biodiversity	

Table 4.6. Strategic areas and measures of adaptation to climate change

## Strategic areas and measures of adaptation to climate changes in agriculture

Forests and adaptability of forests to climate change		Measures		Adaptation measures		Policy		Risk reduction		Specific resources - Lowland species (Pedunculate oak, Turkey oak, etc.) as the most endangered species	
	Area	Measure	Segment	Measure	Segment	Policy	Measure	Segment	Measure	Policy	Measure
forests and adaptability of forests to climate change	Small catchments	<ul style="list-style-type: none"> <li>Crop cultivation in an area influenced by climate change implies crop genotypes with adaptability to abiotic and biotic factors or adaptive genotypes to future requirements.</li> <li>A detailed analysis based on meteorological and biological characteristics is required to prevent disease outbreaks and epiphytotic invasions.</li> </ul>	<ul style="list-style-type: none"> <li>Increased efficiency of water supply systems (WSS, M) including:           <ul style="list-style-type: none"> <li>Optimisation of forests</li> <li>Water saving technologies</li> <li>Application of forest available water for irrigation and compensation with irrigation systems (SPS/OS/ETC) with respect to water availability (W, M).</li> <li>Reduction in specific water use by intensity and irrigation, especially for non-industrial and irrigation systems (W, M).</li> <li>Transferring water from more abundant regions to water deficit areas (W, M).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Provide legislative framework for implementation of adaptation measures in particular (M).</li> <li>Introduce institutional policies, enabling successful interaction between industry and research to support the necessary research and industry involvement, monitoring and evaluation (M).</li> <li>Provide subsidies for adaptation and mitigation measures.</li> <li>Implement adapted irrigation measures for specific needs protection of quality of water resources through fertilizing (M).</li> <li>Support training and education of farmers (M).</li> <li>sustainable use of agricultural land</li> <li>organic production</li> <li>preservation of vegetation and land</li> <li>agro-ecological measures, good crop varieties and other environmental protection</li> </ul>	<ul style="list-style-type: none"> <li>Promote water resource use agreement, increase groundwater level in dry periods, if possible (M).</li> <li>Adapt drilling and drilling operations to altered environmental conditions (M).</li> <li>Promote a "leave no trace" approach in respect of the use of irrigation systems (M).</li> <li>Promote raising of soil science (soil organic matter and soil health) (M).</li> </ul>						
forests and adaptability of forests to climate change	Middle	<ul style="list-style-type: none"> <li>Changing sowing dates earlier planning time, selection of tolerant varieties in order to reduce overall stress in the future. It will be necessary more water for irrigation in large areas than before.</li> <li>replacement of current varieties to those that open later and are more temperature-tolerant.</li> <li>Planting and post-disease processes can be reduced by using crop rotation.</li> <li>Post-and disease monitoring and forecasting can strengthen effectiveness measures and reduce risk of crop failure.</li> </ul>	<ul style="list-style-type: none"> <li>Introduction of irrigation systems for all environments (e.g. agriculture, industrial and urban areas (U, C)) - many of them are not yet fully developed.</li> <li>Use existing irrigation systems for a greater number of potential irrigation areas (U, C).</li> <li>Increase in groundwater levels (M, M).</li> <li>Construction of green areas along the river banks (L).</li> </ul>								
forests and adaptability of forests to climate change	Sugar beet	<ul style="list-style-type: none"> <li>Irrigation</li> <li>Soil cover</li> <li>Delayed harvesting of sugar beet, which prolongs production until favorable conditions for field storage occurs</li> <li>Selective of tolerant hybrid plants and identifying the region and conditions for cultivation.</li> </ul>	<ul style="list-style-type: none"> <li>Development of flood protection plans for irrigation areas and large rainwater storage tanks (M).</li> <li>Introduction of the existing irrigation system (Irrigation system) and construction of new ones using the latest technology (M).</li> <li>Implementation of protective forest irrigation and pass communication, very important to protect against fires (M).</li> <li>Regular maintenance and repair of flood protection infrastructure and drainage systems.</li> <li>The maximum storage capacity of reservoirs must be controlled to reduce risks and minimize the flood-prone areas (U, L).</li> <li>Interaction of building and the natural development in flood-prone areas (M).</li> <li>Internal power plants (P, U).</li> <li>Integrated approach and harmonized activities of institutions and organizations at all stages of regional and national levels (A, STRE).</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring adaptive capacity building, use effectiveness measures, changes of insurance policy, using farmers' groups involved in implementation of adaptation measures - importance of financial instruments, awareness raising of risk and stakeholders involved in implementation of adaptation measures - advocacy services.</li> <li>Research: Development of indicators to measure the impact of procedures for re-evaluation of insurance companies, calculating the cost of insurance premiums, the impact of insurance companies on the environment, the impact of insurance companies on different sectors and sectors. Use data to predict adverse effects and mitigate their effects.</li> </ul>							
forests and adaptability of forests to climate change	Grapes and fruits	<ul style="list-style-type: none"> <li>Adaptation measures that take into account the expected changing climate for setting new cultivars and vineyards are listed below:</li> <li>Soil fertilization</li> <li>Irrigation</li> <li>Setting up anti-frost nets</li> <li>Wind control</li> <li>Constant pruning</li> <li>Removing fallen leaves</li> </ul>	<ul style="list-style-type: none"> <li>Increasing in water storage capacity by (W, M).</li> <li>Transferring water from water-abundant regions to water-deficit areas (W, M).</li> </ul>	<ul style="list-style-type: none"> <li>Water Management Strategy (WMS, L), Irrigation (I), Water Basin Management Plans (WBM, I).</li> <li>Other planning documents according to the Law on Water, e.g. Water Pollution Prevention Plan, Flood Protection Plan (W, M, M).</li> </ul>	<ul style="list-style-type: none"> <li>Training and education of farmers related to production management options.</li> <li>Support and advice for short marketing options for farmers.</li> <li>Advisory services available for all farming/farm systems.</li> <li>Provision of education opportunities for young general farmers.</li> <li>Integrating of small farms in medium and large areas (M).</li> <li>Introducing balanced intercropping and intercropping practices (M).</li> </ul>	<ul style="list-style-type: none"> <li>Promotion of water use efficiency and "leave no trace" approach (M).</li> <li>Promotion of mixed farms (M).</li> </ul>					
forests and adaptability of forests to climate change											<ul style="list-style-type: none"> <li>Establishing the better understanding of the process of afforestation, among which include methods (M).</li> <li>Increasing the forest area and cultural protection and urban forest area (M).</li> <li>Building capacity of public organizations and the forestry sector through its regulation of appropriate legal, organizational and financial framework (M).</li> <li>Transfer of knowledge from the existing European models (e.g. Germany, Austria and Serbia).</li> <li>Proactive treatment of severe forest fires in the process of forest management (reducing them and helping with organization of their activities).</li> </ul>

# Adaptacija

Strategic areas and measures of adaptation to climate change	
Monitoring and research	<ul style="list-style-type: none"> <li>- Improve research in area of numerical modelling of forest processes (precipitation/snow-ton) for different timber species and climate change scenarios</li> <li>- Improve capacity of forest management to adapt to climate change impacts</li> <li>- Improve location of forest resources</li> <li>- Strengthen research institutions</li> <li>- Raise the public awareness level and improve information on climate change impacts and possible adaptation measures, in go</li> </ul>
Capacity building and public awareness	<ul style="list-style-type: none"> <li>- Capacity building in institutions responsible for forest management</li> <li>- Educate rangers</li> <li>- Strengthen the role of local communities in sustainable forest management</li> <li>- Raise awareness of the scientific community and forest users</li> <li>- Raise the public awareness level and improve information on climate change impacts and possible adaptation measures</li> </ul>
Table 4.6. Strategic areas and measures of adaptation to climate change	Table 4.6. Strategic areas and measures of adaptation to climate change

Table 4.6. Strategic areas and measures of adaptation to climate change

Measure	Strategic segments	Adaptation measures	Policy	Risk reduction
Introducing resilience in areas influenced by climate change; implies direct adaptation to climate change and adaptation types with adaptability to static and static factors or adaptive types to future requirements.		<ul style="list-style-type: none"> <li>Increased efficiency of irrigation systems (SME, MT) including:           <ul style="list-style-type: none"> <li>Optimisation of factors</li> <li>Introduction of drought resistant varieties</li> </ul> </li> </ul>		
Reduced risk assessment based on meteorological and biological observations; implementation of climate-resilient crop varieties required to prevent disease outbreaks and aphidophytic invasions.		<ul style="list-style-type: none"> <li>Application of frost avoidance irrigation techniques and cooperation with agricultural associations (federal associations, SPDR/BBG) with respect to water availability (B, MT)</li> <li>Method for specific water use by velocity and temperature specific for non-agricultural and irrigation purposes (N, MT)</li> <li>Transferring water from water-abundant regions to water-deficient areas (BAM, MT)</li> </ul>		
Improving growing status (soil and planning limits), selection of tolerant varieties and early harvesting in order to reduce overall stress in the future. It will be necessary to irrigate in larger areas than before.	Water reduction	<ul style="list-style-type: none"> <li>Implementation - management plans for all sectors (crop, tree, forest, industry and household sectors) (B, MT) ensuring that available water resources are applied for efficient sectoral protection regarding water from agriculture (B, MT)</li> <li>Increase in reservoir capacity (B, MT)</li> <li>Characterisation of groundwater usage along the river basins (B, MT)</li> </ul>		
Managing pest and disease pressures can be reduced by sound crop rotation and disease monitoring and forecasting can strengthen effective control measures and reduce risk of crop failure.	Production against the environmental base	<ul style="list-style-type: none"> <li>Development of Pest protection plans for environmental trees and large tree-based threats, like this etc. (B, MT)</li> <li>Introduction of the existing environmental taxes and contribution of green areas may be increased (B, MT)</li> <li>Introduction of protective forest regulation and green communities, especially important in coastal areas (B, MT)</li> <li>Regular maintenance and control of flood protection infrastructure and drainage systems (B, MT)</li> <li>The increase in water storage capacity within river basins by constructing large-scale dams and reservoirs in flood-prone areas (FEM, MT)</li> <li>Introduction of breeding selection and genetic resources development to flood-prone areas (B, MT)</li> <li>Introduction of irrigation systems, especially linear irrigation systems, large reservoirs, series of linear thermal power plants etc. (B, MT)</li> <li>Integrated approach and harmonised activities of researchers and organisations in charge of flood prevention research levels (B, STMT)</li> </ul>		
Measures that take into account the expected changing climate and new risks and vineyards are listed below:	Management	<ul style="list-style-type: none"> <li>Increase in water storage capacity (FEM, GL)</li> <li>Transferring water from water-abundant regions to water-deficient areas (BAM, MT)</li> </ul>		
Agro-forestry	Parks and Forest Management	<ul style="list-style-type: none"> <li>Waste Management Strategy (BAM, LST); Integration (LST)</li> <li>Forest Waste Management Plan (BAM, LST)</li> <li>Other starting documents according to the Law in Wales (e.g. Water Pollution Plan, Forest Protection Plan, BPP, MT)</li> </ul>		
Agro-forestry	Policy and Legal Framework		<ul style="list-style-type: none"> <li>Plastic legislation, framework for the implementation of ad-hoc measures in agriculture (B)</li> <li>Introducing institutional policies, enabling successful collaboration and research through the right combination of statutory and advisory services, establish networking and also (MT)</li> <li>Provide subsidies for adaptation sector mitigation measures</li> <li>Implement adapted irrigation measures for specific area protection of quality of water sources through fertilising (MT)</li> <li>Support training and education of farmers (ST)</li> <li>sustainable use of agricultural land</li> <li>organic production</li> <li>preservation of agricultural land</li> <li>agro-ecological measures, good crop varieties and other environmental protection</li> </ul>	
Agro-forestry	Monitoring and Research		<ul style="list-style-type: none"> <li>Monitoring - adaptation capacity building, cost effectiveness measures, changes of insurance policy, testing farmer's a person involved in implementation of adaptation, assess appearance of harmful organisms, witness rating of potential risks involved in implementation of adaptation measures, advisory services</li> <li>Research: Development of knowledge to ensure an array of procedures for the implementation of mitigation, measure effectiveness of adaptation, measure effectiveness of prediction of different scales and adaptive measures to predict adverse effects and mitigate their effects</li> </ul>	
Agro-forestry	Capacity building and youth awareness		<ul style="list-style-type: none"> <li>Training and education of farmers related to protection management options</li> <li>Support and advice for dairy marketing systems for farmers</li> <li>Advisory services available for all farmers farming systems</li> <li>Provision of education opportunities for young generations</li> <li>Merging of small farms in medium and large areas, build applicable</li> <li>Widening balance between crop and field biodiversity, products increase of GMs varieties on both local and global scale</li> </ul>	
Agro-forestry	Policy			<ul style="list-style-type: none"> <li>Reduction of risks and avoid disturbances through building adaptive capacity of forests           <ul style="list-style-type: none"> <li>Building fire protection for forest areas or the species regions (MT)</li> <li>Early treatment of pests (ST)</li> <li>Management of thinning of dead plant material (MT)</li> <li>Promotion of dead wood diversity (MT)</li> <li>Establishment of buffer zones around forest (MT)</li> </ul> </li> <li>Choice of suitable tree species, preservation, population and genetics, which show higher tolerance to altered climate conditions or are specifically adapted to current climate conditions in the future (ST)</li> <li>Introducing the concept of adaptive management of forests and forest resources in order to adapt to climate change</li> <li>Introducing climate adaptation policies and promotion of "tree-for-area" based management approach (ST)</li> <li>More intense introduction of degraded lands by afforestation, after erosion and related activities</li> <li>Preservation of ancient and rare kinds of forests</li> </ul>
Agro-forestry	Risk reduction			<p>Specific measures - Lowland species (Pedunculate oak, Turkey oak, etc.) as most endangered species</p> <ul style="list-style-type: none"> <li>Improve water resource management, increase groundwater level in dry periods, if possible (MT)</li> <li>Adapt thinning and felling operations to avoid environmental damage (MT)</li> <li>Promote a "clear to native" regeneration to prevent the use of regenerant species (MT)</li> <li>Finance training of local business capital (young) with soft loans and subsidies (L)</li> </ul> <p>Specific measures - Mountainous forests (European beech, Silver fir, Norway spruce, etc.) as potentially highly endangered based on future climate projections</p> <ul style="list-style-type: none"> <li>Promotion of selective felling management and "use-to-maintain" approach (ST)</li> <li>Promotion of mixed forests (ST)</li> </ul>

# Adaptacija

# Implementacija?

# Rana implementacija omogućava evaluaciju (i ispravljanje “grešaka”) kao i izbegavanje nefunkcionalne adaptacije (+ izbegavanje brzopletih rešenja + izbegvanje greenwashing-a)

# Adaptacija na klimatske promene

u sinergiji (možda?) sa:

Ciljevima održivog razvoja

Smanjenje rizika od elementarnih nepogoda

Dugoročne sektorske strategije

Velika infrastrukturna ulaganja ...

Osmotrena klima i/ili trenutni trendovi

# Adaptacija na klimatske promene

u sinergiji (možda?) sa:

Ciljevima održivog razvoja

Smanjenje rizika od elementarnih nepogoda

Dugorčne sekotorske strategije

Velika infrastrukturna ulaganja ...

Osmotrena + trend + projekcije buduće klime

# Adaptacija

# Prioritet?

# Troškovi/dobit; Troškovi/efikasnost; Višekriterijumska analiza; Ekspertska procena

# Ciljanje vremenskog horizonta

# Planovi za treći izveštaj

Revizija projekcija buduće klime (scenarija iz RCP familije, sa horizontalnim razlaganjem od 11km, CORDEX/Copernicus baza podataka).

Revizija uticaja i ranjivosti sektora (u zavisnosti od dostupnosti podataka; fokus na sub-nacionalnom nivou).

Prioriteti u implementaciji.

Sinergija sa drugim planovima/strategijama.

Među-sektorske analize.



# Osmotrene klimatske promene i scenarija promene klime u Srbiji, mogući uticaji i mogućnosti adaptacije

H V A L A