

Supplementary Materials

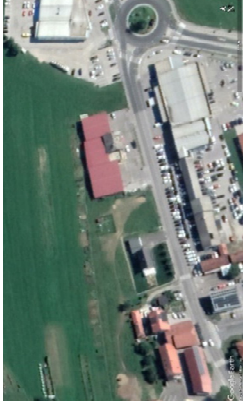


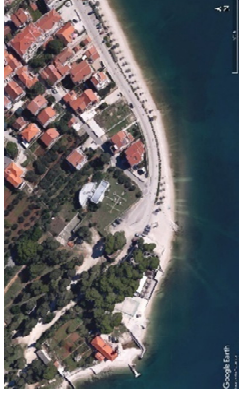
Table S1. The main geographical features of the research area.




Type of geographical characteristic	Research area geographical information
Spatial distribution by countries	Slovenia, Croatia, Bosnia and Herzegovina, Serbia, and Montenegro
Latitude	41.51°N–46.52°N
Longitude	13.23°E–23.00°E
Total geographical area (km ²)	230.387
Population number (in million)	16.731.211
Capital cities in the research area	Ljubljana, Zagreb, Sarajevo, Belgrade, Podgorica
Landscape—mountainous (the Alps and the Dinarides)	North, central, and west Slovenia, west and south Croatia, central and west Bosnia and Herzegovina, northeast Montenegro, west and southwest Serbia
Landscape—plain (Pannonian Plain)	Northeast Slovenia, east Croatia, north Bosnia& Herzegovina, north Serbia
Landscape—coastal (Adriatic coast)	Southwest Slovenia, west Croatia, southwest Bosnia and Herzegovina, southwest Montenegro
Climate—in higher landscape	Alpine or mountainous climate
Climate—in lower landscape	Moderate continental climate
Climate – coastline	Mediterranean climate





Aerial photo of 1 km ²				
LCZ type (Stewart and Oke, 2012)	LCZB/LCZ2	LCZ8/LCZB	LCZB	LCZD
Climate type (Kottek et al. 2006)	Cfa — continental	Cfa — continental	Cfa — continental	Cfa — continental
MD % (PET)	0.0%	1.6%	0.1%	0.3%
Alt.	132	121	202	84





Long.	Alt.	MD % (PET)	Climate type (Kottek et al. 2006)	LCZ type (Stewart and Oke, 2012)	Aerial photo of 1 km ²	No	Country	Station name	Abb.	Lat.	Long.
21°55'	432	0.0%	Cfa — continental	LCZ8		1	Serbia	Belgrade	BG	44°48'	20°28'
14°86'	467	0.1%	Cfb — continental	LCZD/LCZ6		2	Serbia	Loznica	LO	44°33'	19°14'
16°45'	256	0.3%	Cfb — continental	LCZ6/LCZD		3	Serbia	Niš	NI	43°20'	21°54'
14°30'	298	0.0%	Cfb — continental	LCZ2/LCZ3		4	Serbia	Novi Sad	NS	45°19'	19°49'

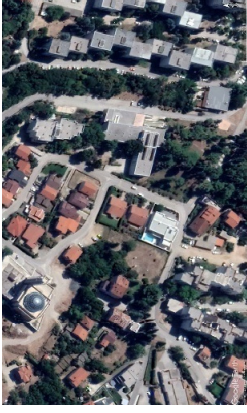



Lat.	Long.	Alt.	MD % (PET)	Climate type (Kottek et al. 2006)	LCZ type (Stewart and Oke, 2012)	Aerial photo of 1 km ²	No	Country	Station name	Abb.	Lat.
46°39'	16°11'	182	0.5%	Cfb— continental	LCZD		5	Serbia	Vranje	VR	42°33'
45°57'	13°39'	108	0.3%	Cfb— continental	LCZB		6	Slovenia	Kočevje	KO	45°64'
45°48'	15°10'	214	0.2%	Cfb— continental	LCZB/LCZ6		7	Slovenia	Lendava	LE	46°56'
45°29'	13°36'	7	0.0%	Csc— Mediterranean	LCZD/LCZE		8	Slovenia	Ljubljana	LJ	46°03'

Abb.	Lat.	Long.	Alt.	MD % (PET)	Climate type (Kottek et al. 2006)	LCZ type (Stewart and Oke, 2012)	Aerial photo of 1 km ²	No	Country	Station name	Abb.
PO	45°49'	14°15'	461	0.0%	Cfb — continental	LCZD/LCZ6		9	Slovenia	Murska Sobota	MS
ZA	44°48'	14°58'	1594	0.0%	Dfb — boreal	LCZA/LCZD		10	Slovenia	Nova Go- rica	NG
ZG	45°48'	15°58'	157	1.5%	Cfb — continental	LCZ3		11	Slovenia	Novo Mesto	NM
ZD	44°07'	15°12'	5	0.0%	Csa — Mediter- ranean	LCZ6/LCZB/ LCZG		12	Slovenia	Portorož	PR

Station name	Abb.	Lat.	Long.	Alt.	MD % (PET)	Climate type (Kottek et al. 2006)	LCZ type (Stewart and Oke, 2012)	Aerial photo of 1 km ²	No	Country	Station name
Varaždin	VŽ	46°16'	16°21'	167	0.0%	Cfb—continental	LCZD		13	Slovenia	Postojna
Split	ST	43°30'	16°25'	122	0.0%	Csa—Mediterranean	LCZB		14	Croatia	Zavižan
Rijeka	RI	45°20'	14°26'	120	0.0%	Csc—Mediterranean	LCZB/LCZ9		15	Croatia	Zagreb
Pula	PU	44°53'	13°55'	63	1.4%	Csc—Mediterranean	LCZD/LCZE		16	Croatia	Zadar

Station name	Abb.	Lat.	Long.	Alt.	MD % (PET)	Climate type (Kottek et al. 2006)	LCZ type (Stewart and Oke, 2012)	Aerial photo of 1 km ²	No	Country
Osijek	OS	45°30'	18°33'	89	0.0%	Cfa—continental	LCZD		17	Croatia
Dubrovnik	DU	42°38'	18°05'	52	0.0%	Csa—Mediterranean	LCZB/LCZ9/LCZ8		18	Croatia
Nikšić	NK	42°46'	18°57'	635	2.3%	Cfb—continental	LCZB/LCZ8		19	Croatia
Pljevlja	PV	43°35'	19°35'	784	0.6%	Cfb—continental	LCZA/LCZ8		20	Croatia

Station name	Abb.	Lat.	Long.	Alt.	MD % (PET)	Climate type (Kottek et al. 2006)	LCZ type (Stewart and Oke, 2012)	Aerial photo of 1 km ²	No	Country
Podgorica	PG	42°43'	19°27'	49	2.5%	Csa — Mediterranean	LCZ6/LCZ E		21	Croatia
Banja Luka	BL	44°47'	17°12'	151	0.0%	Cfb — continental	LCZ6		22	Croatia
Bijeljina	BN	44°45'	19°12'	90	0.0%	Cfa — continental	LCZ6		23	Montenegro
Doboj	DO	44°44'	18°05'	143	1.4%	Cfa — continental	LCZ5/LCZ D		24	Montenegro

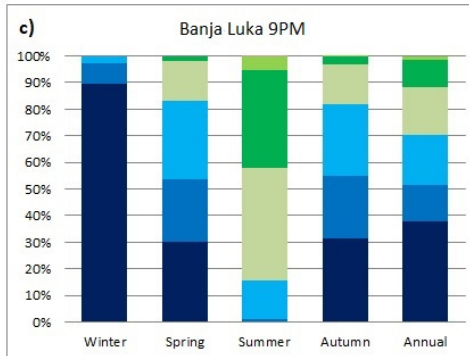
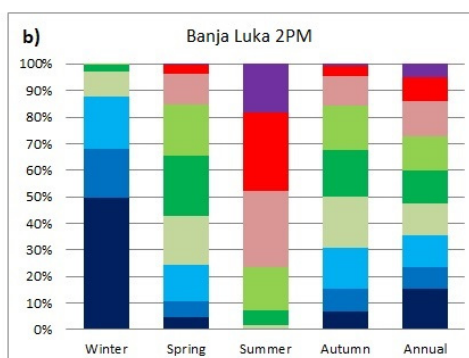
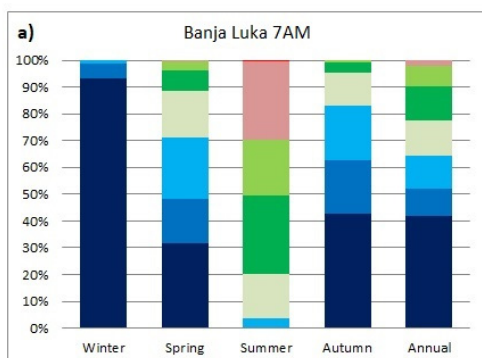
Station name	Abb.	Lat.	Long.	Alt.	MD % (PET)	Climate type (Kottek et al. 2006)	LCZ type (Stewart and Oke, 2012)	Aerial photo of 1 km ²	No	country
Mostar	MO	43°21'	17°48'	70	0.0%	Csb— Mediterranean	LCZ5/LCZ6		25	Montenegro
Sarajevo	SA	43°52'	18°26'	630	0.0%	Cfb— continental	LCZ3		26	Bosnia and Herzegovina
Trebinje	TB	42°42'	18°20'	299	0.6%	Csb— Mediterranean	LCZ6		27	Bosnia and Herzegovina
Tuzla	TZ	44°33'	18°42'	305	1.3%	Cfb— continental	LCZB/LCZE		28	Bosnia and Herzegovina

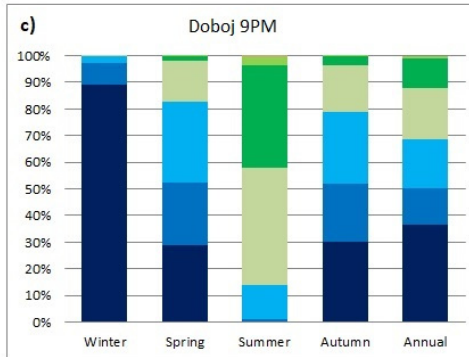
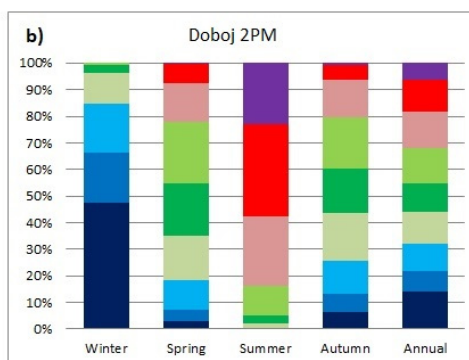
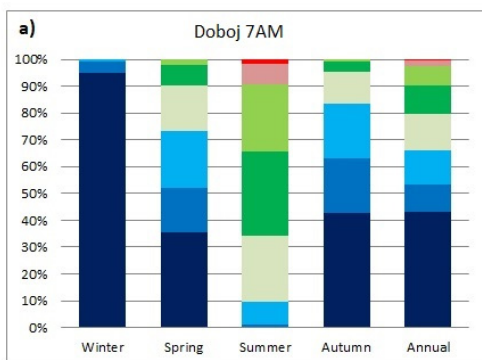
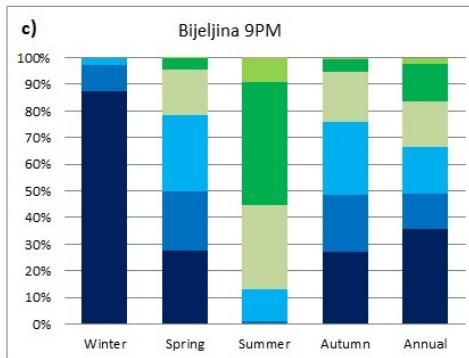
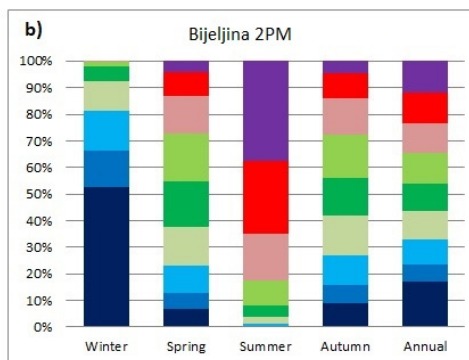
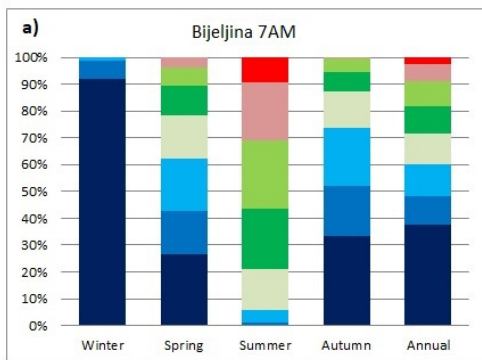
Country	Bosnia and Herzegovina	Bosnia and Herzegovina	Bosnia and Herzegovina	Bosnia and Herzegovina
No	29	30	31	32

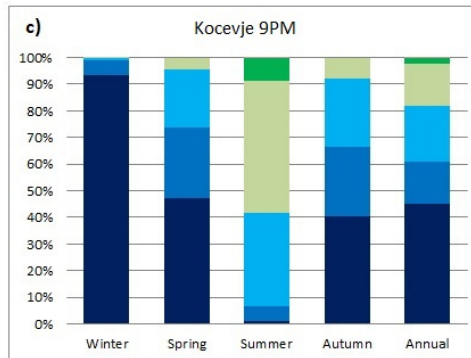
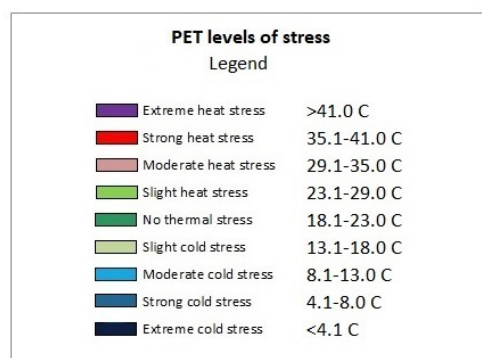
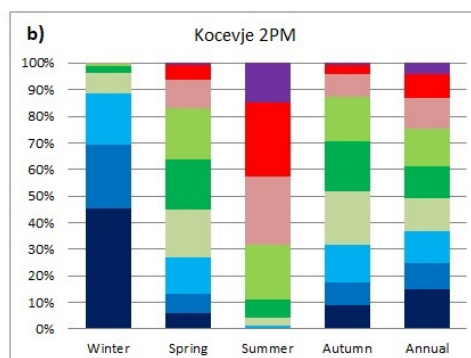
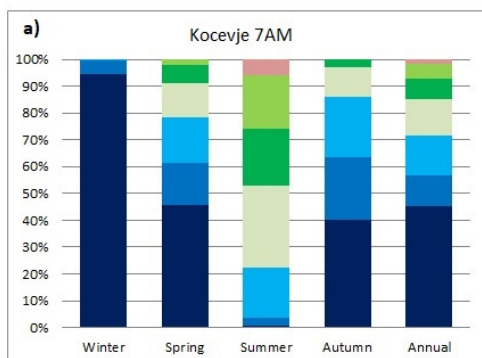
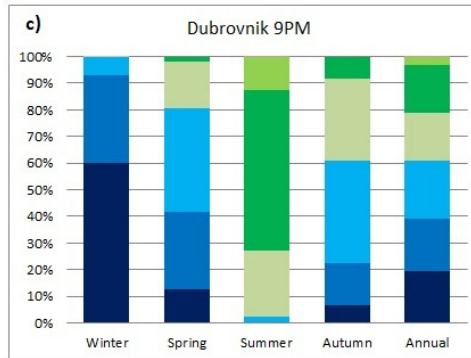
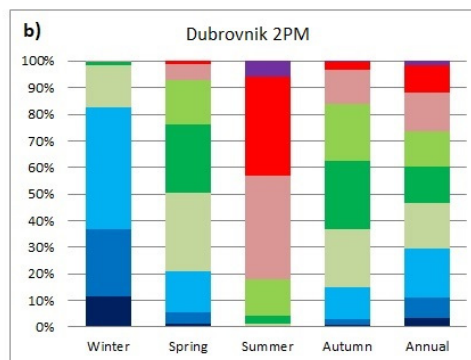
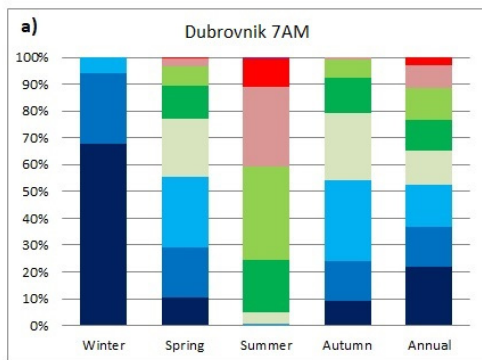
Figure S1. Spatial characteristics of each meteorological station surrounding. Note: Aerial photo background is based on the Google Earth Pro.

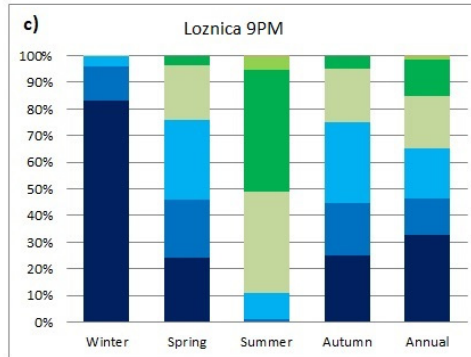
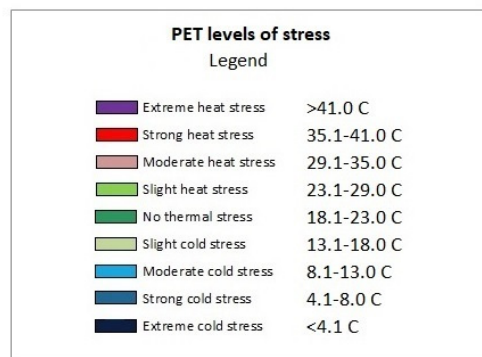
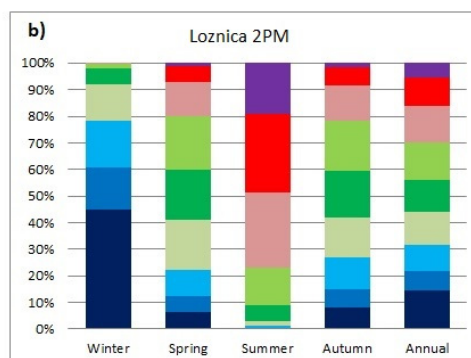
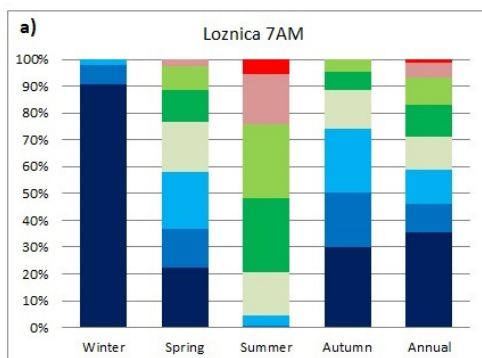
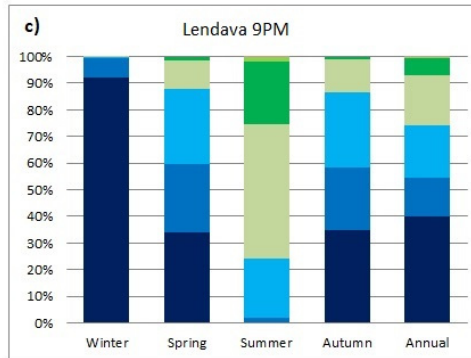
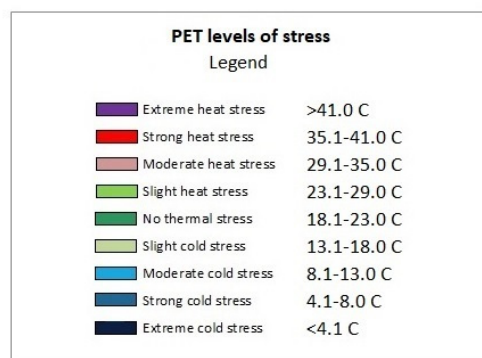
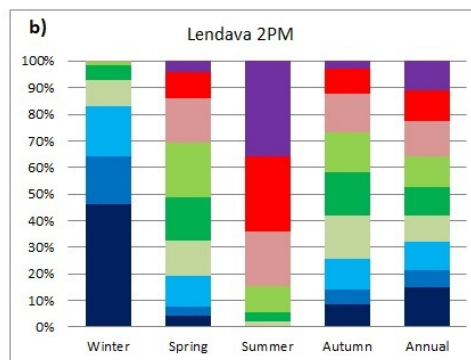
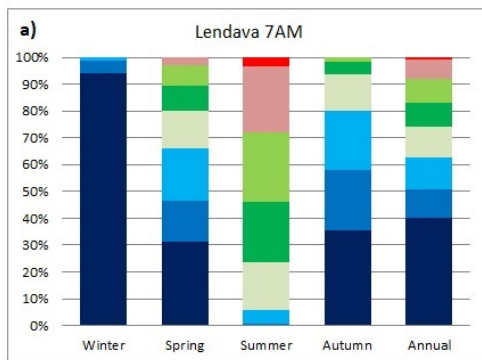
Table S2. Physiological Equivalent Temperature (PET) range for different levels of thermo-physiological stress (Matzarakis and Mayer, 1996).

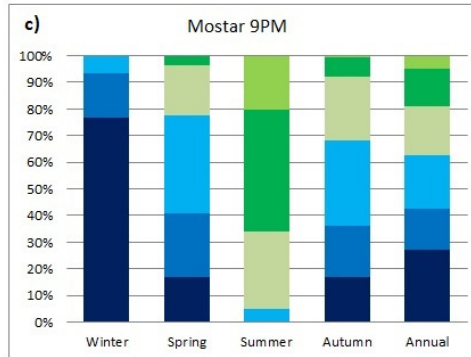
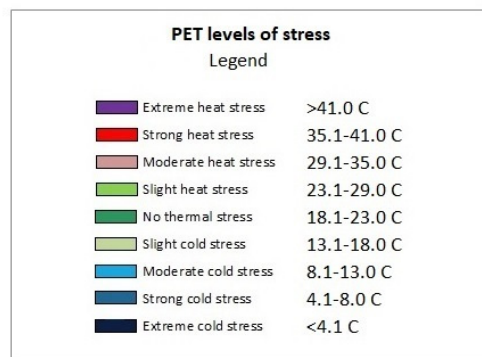
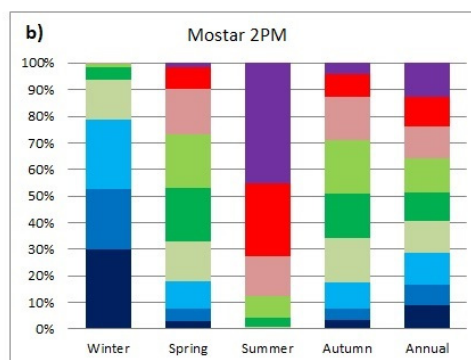
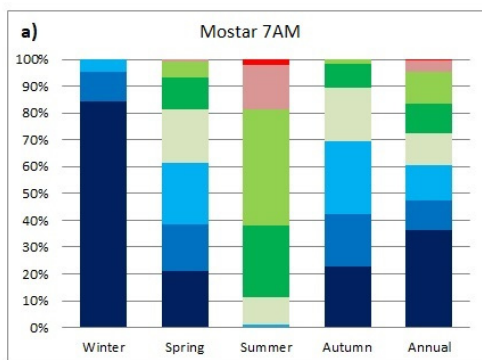
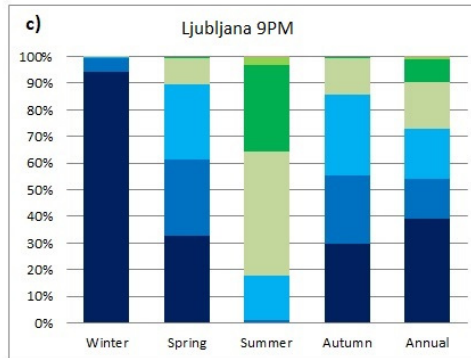
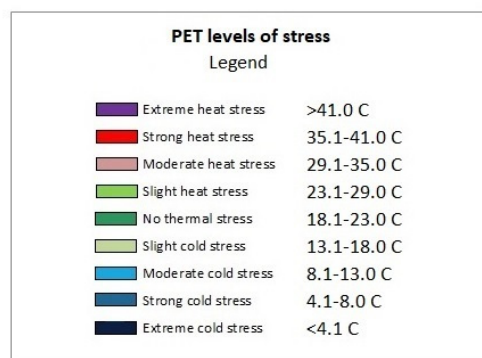
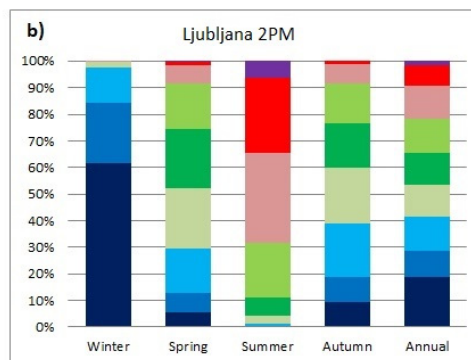
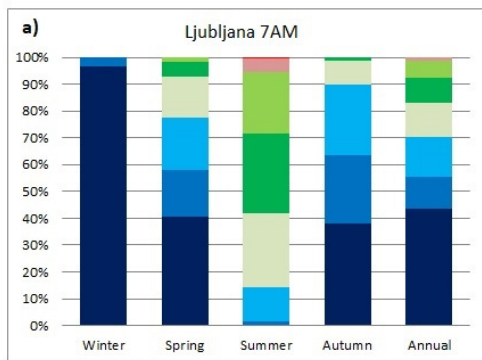
PET range (°C)	Level of thermal stress
> 41.0	extreme heat stress
35.1– 41.0	strong heat stress
29.1– 35.0	moderate heat stress
23.1– 29.0	slight heat stress
18.1– 23.0	no thermal stress
13.1– 18.0	slight cold stress
8.1– 13.0	moderate cold stress
4.1– 8.0	strong cold stress
< 4.1	extreme cold stress

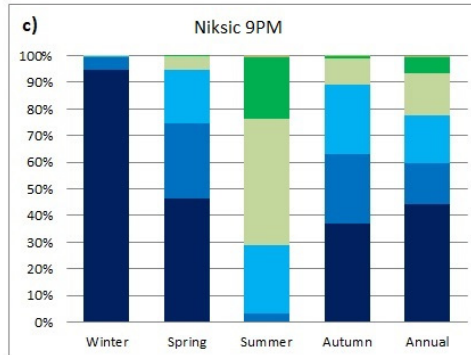
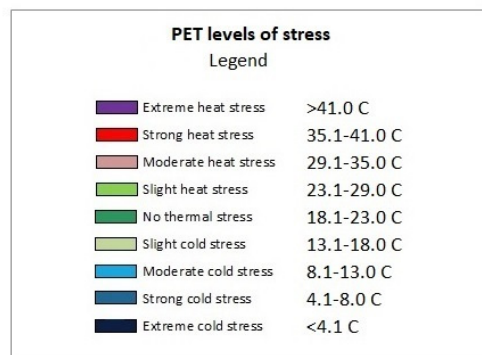
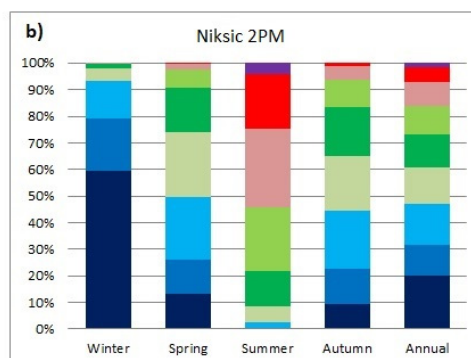
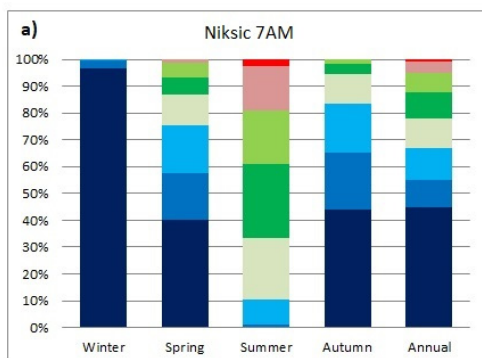
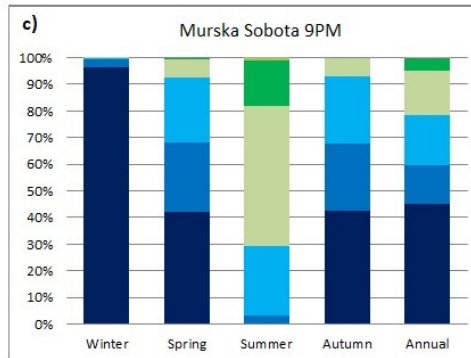
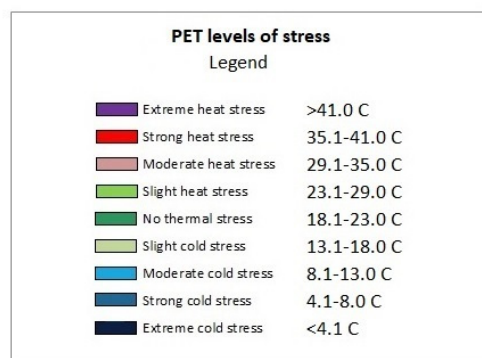
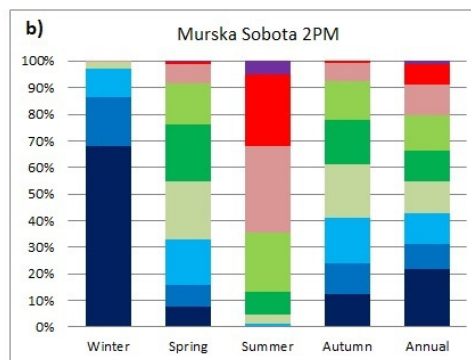
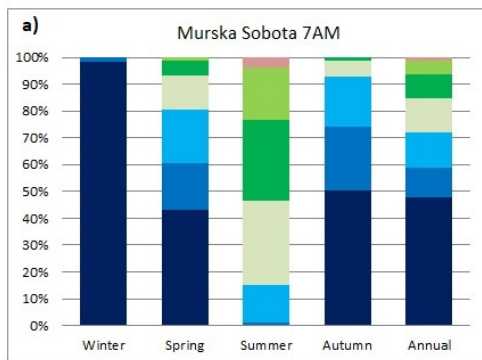


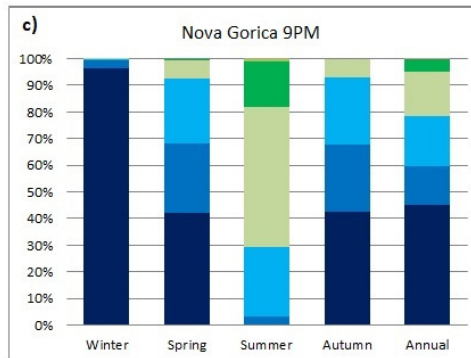
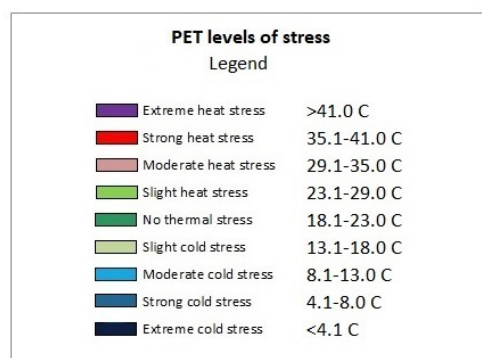
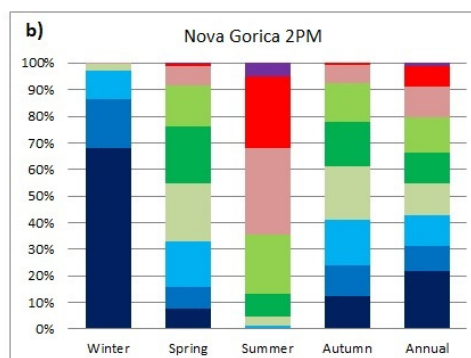
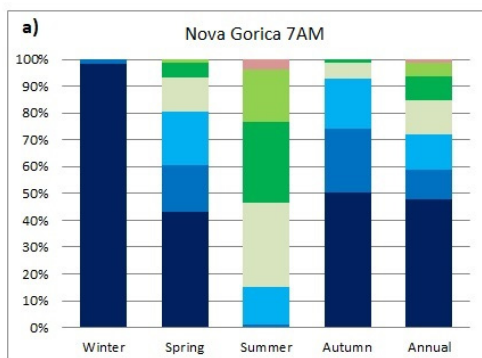
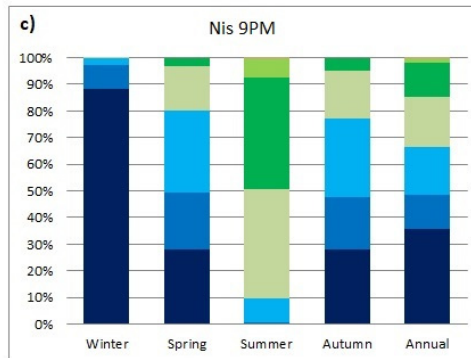
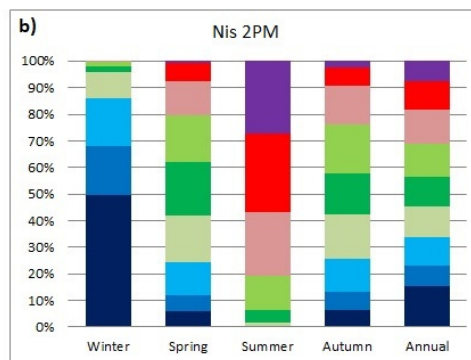
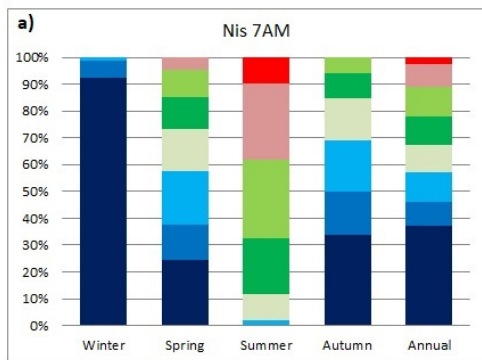


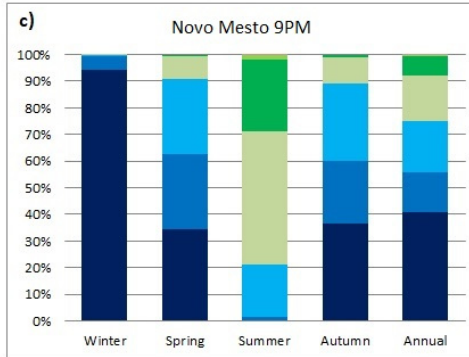
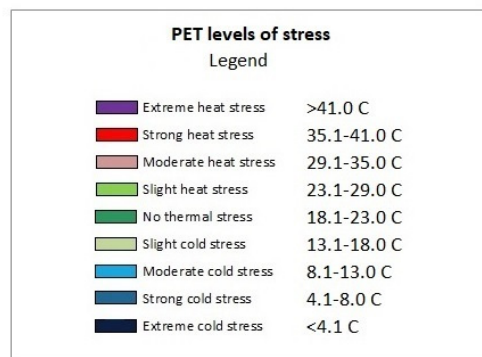
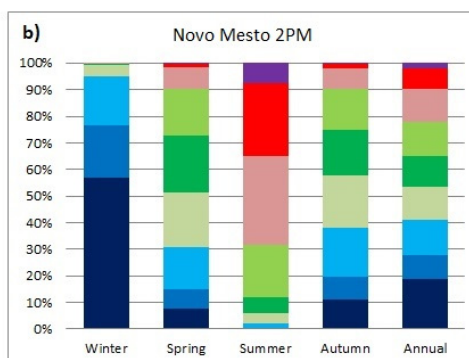
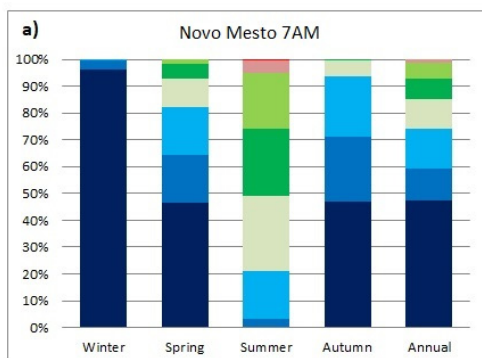
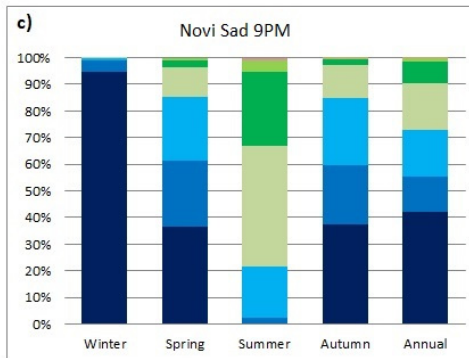
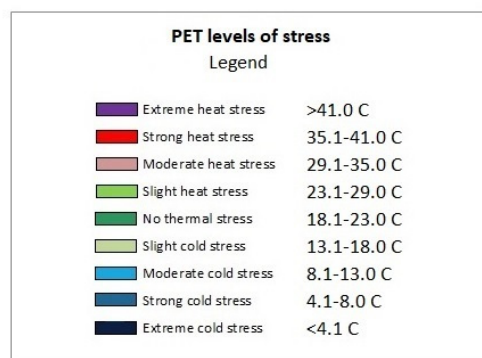
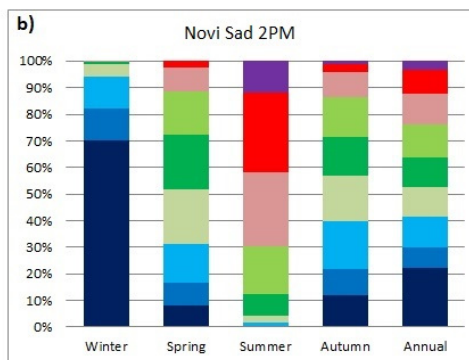
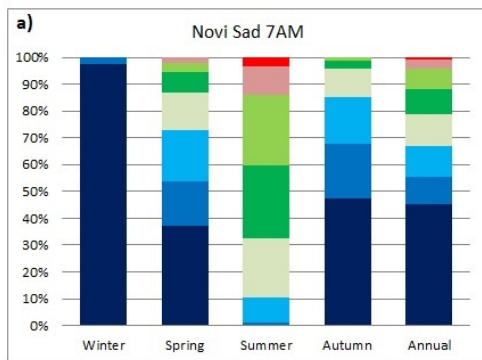


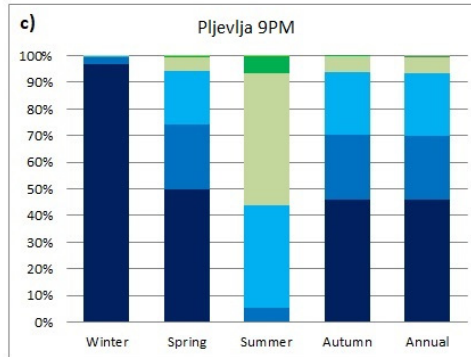
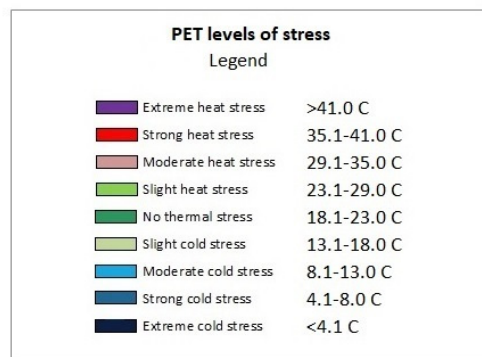
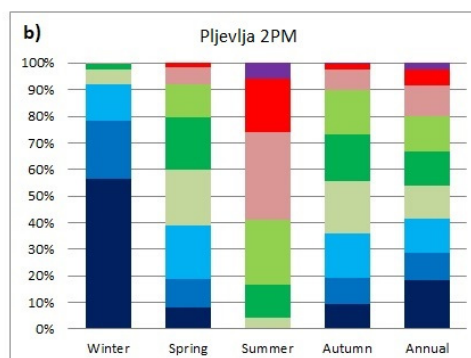
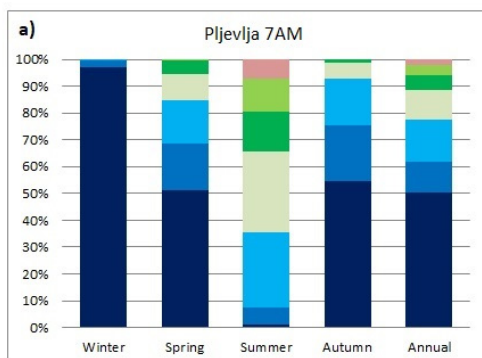
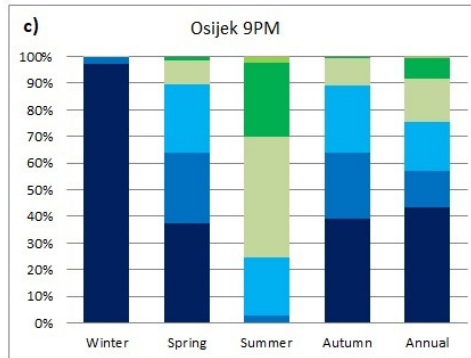
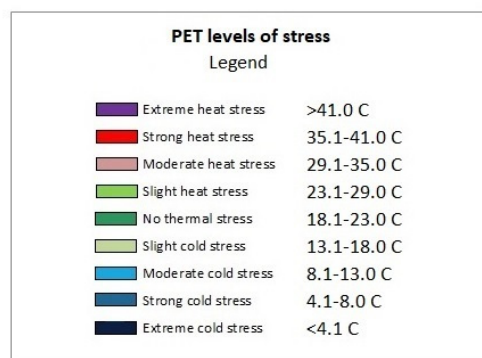
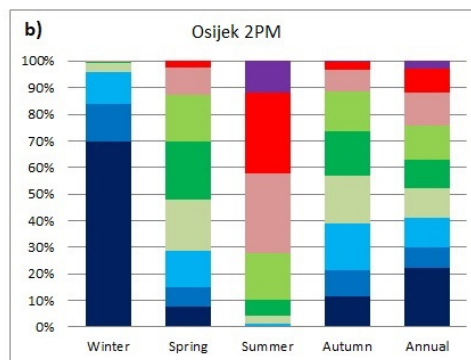
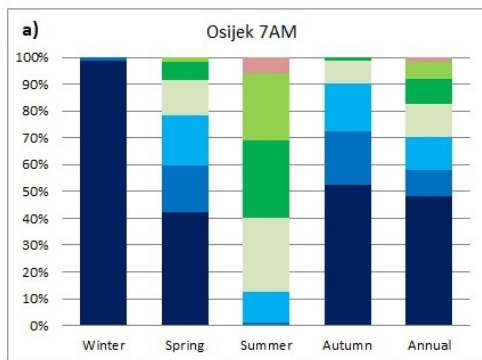


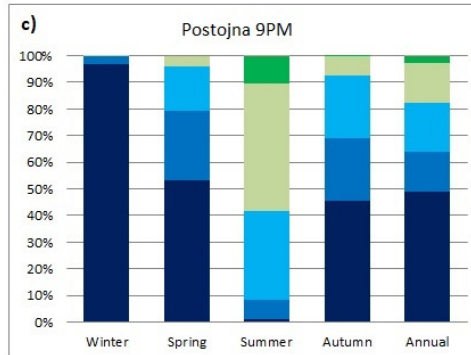
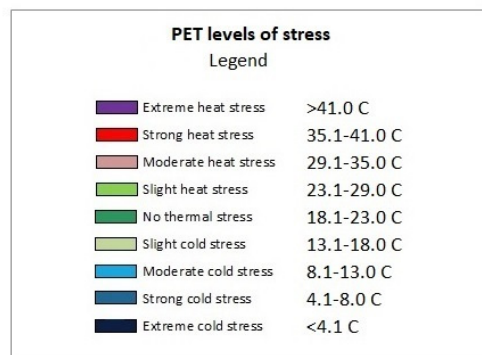
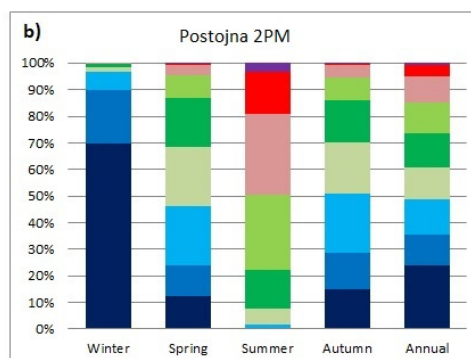
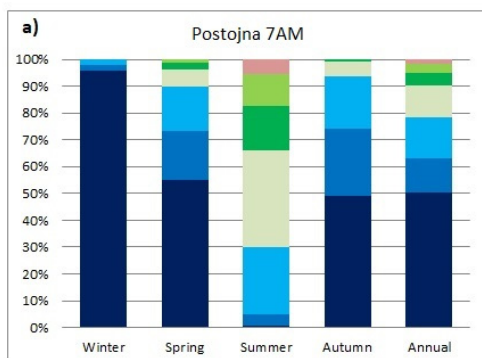
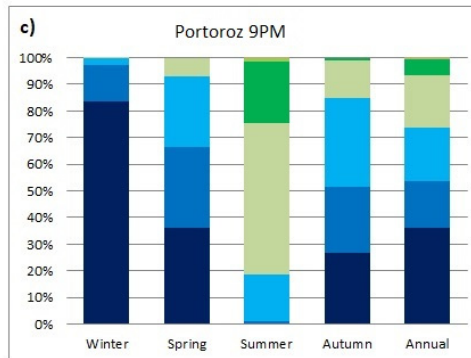
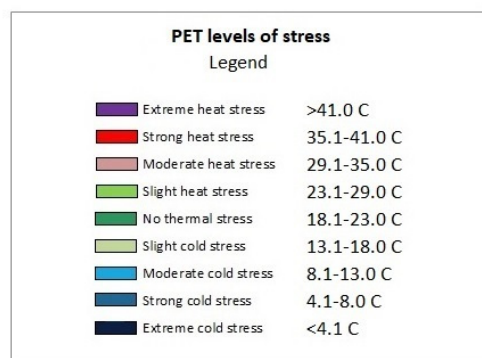
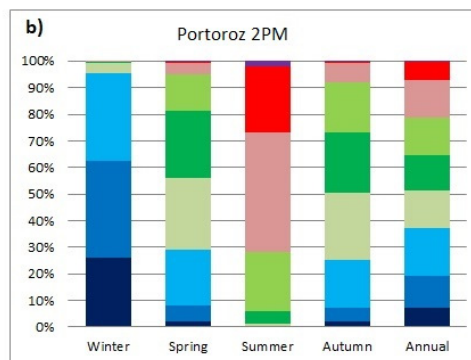
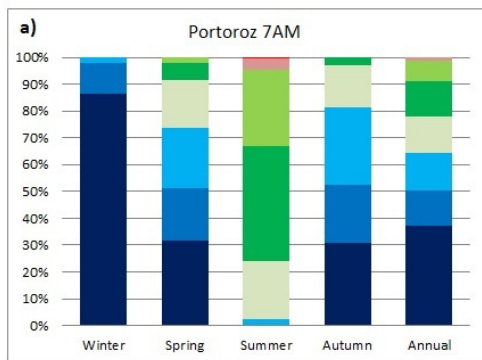


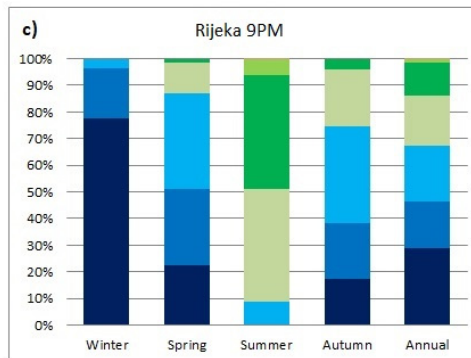
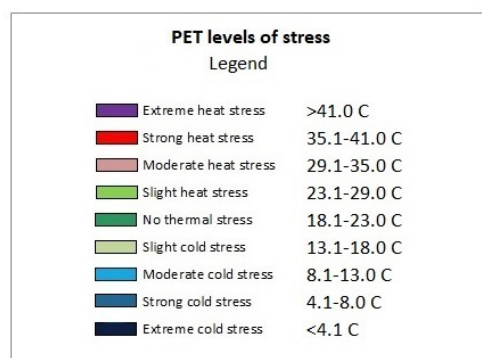
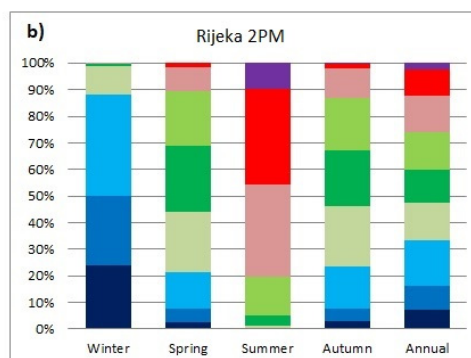
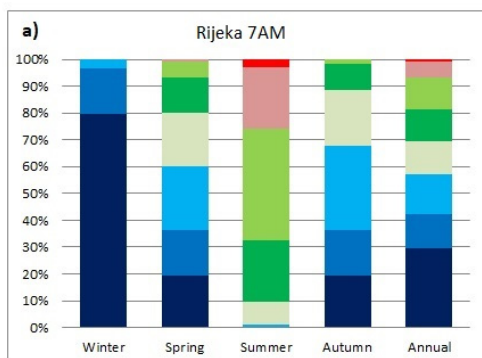
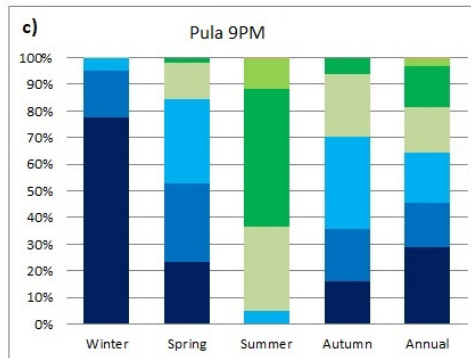
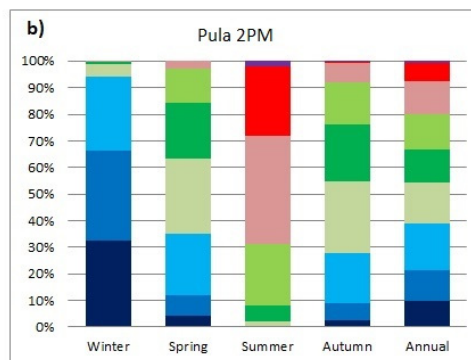
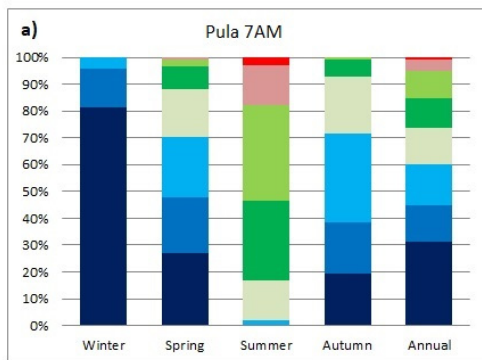


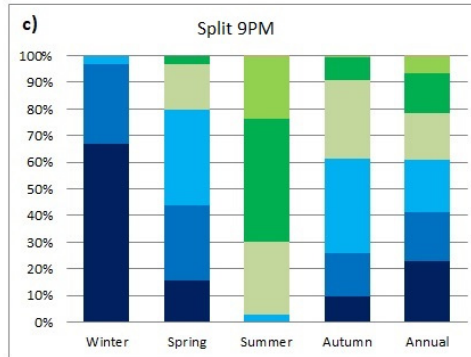
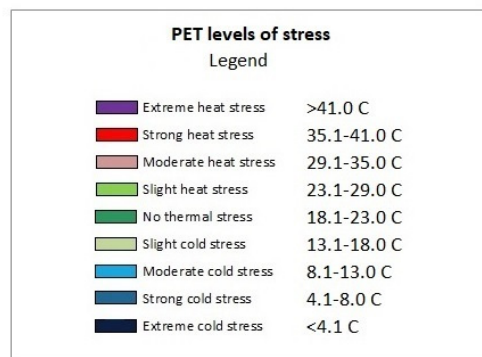
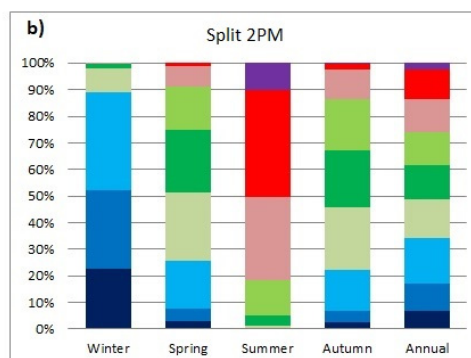
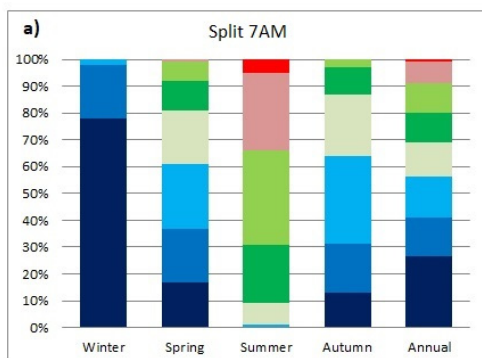
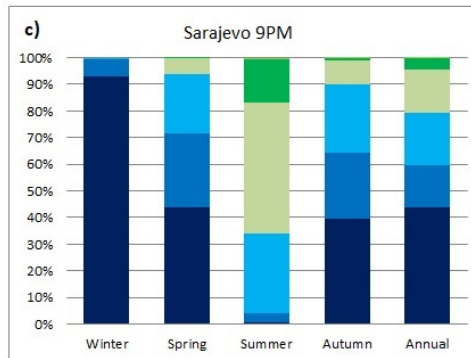
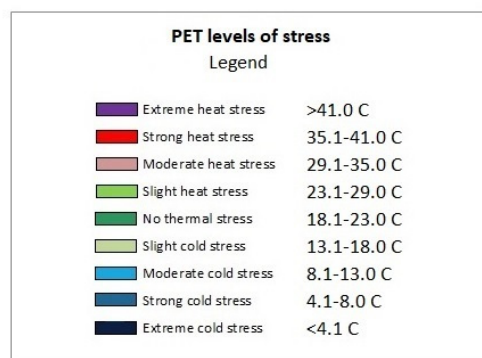
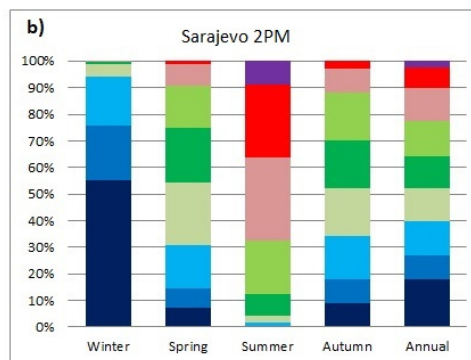
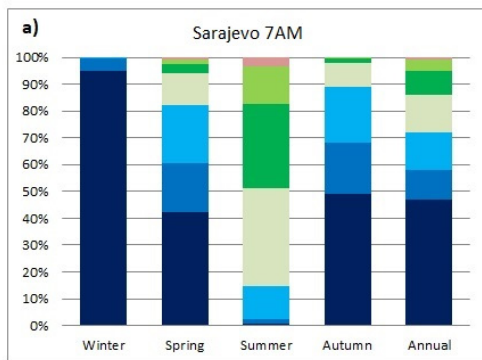


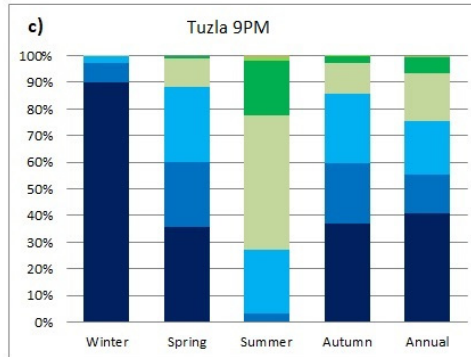
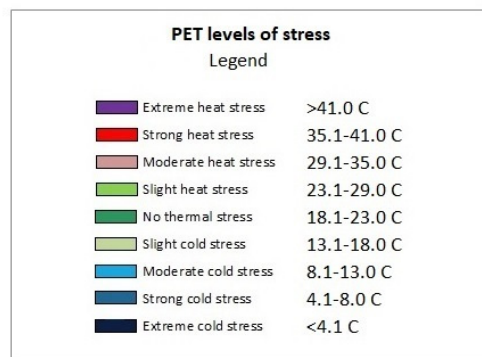
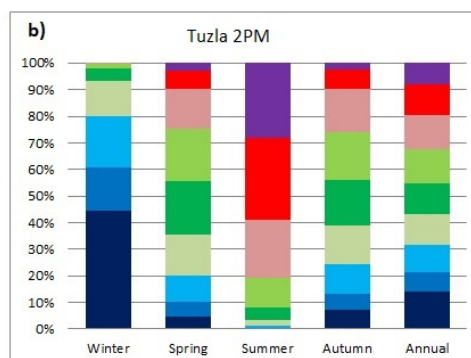
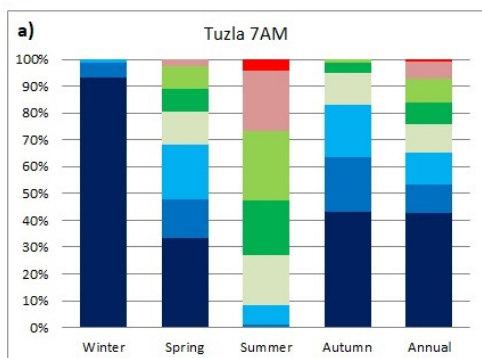
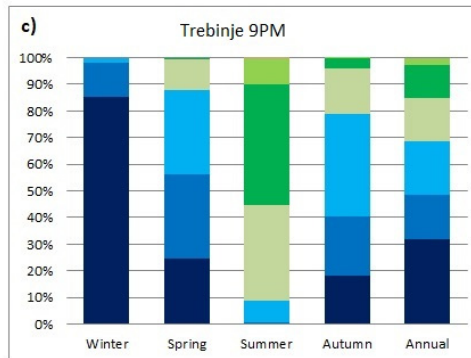
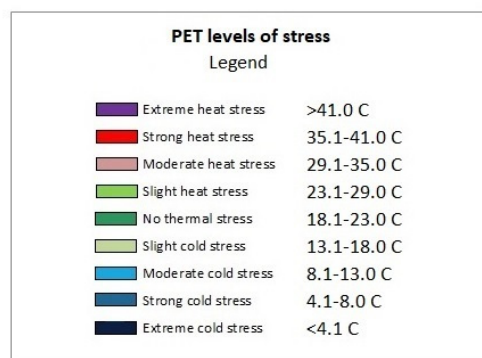
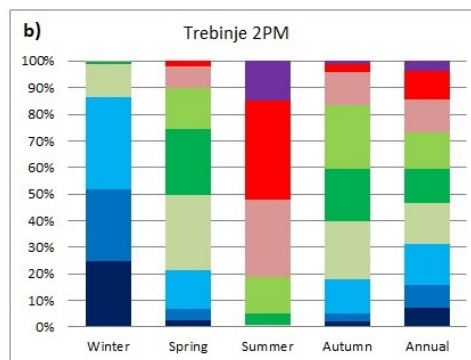
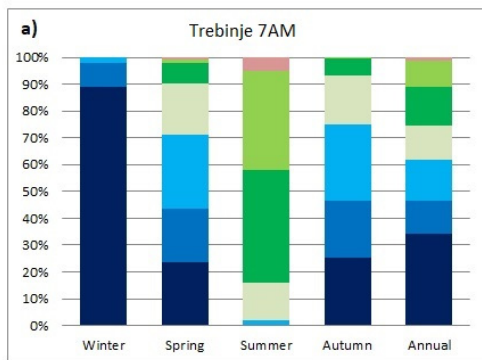


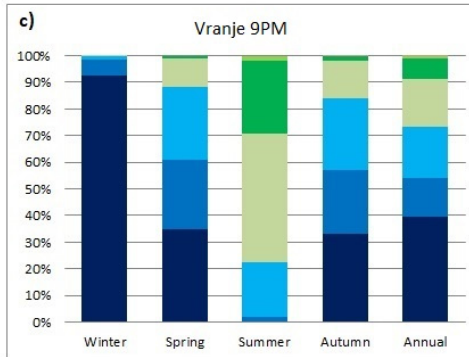
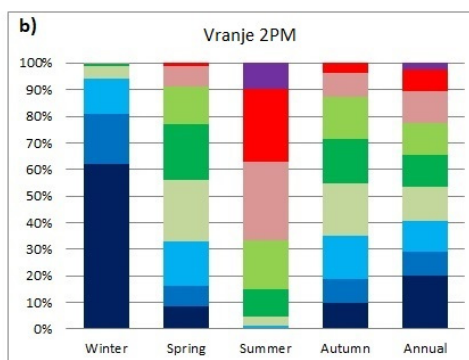
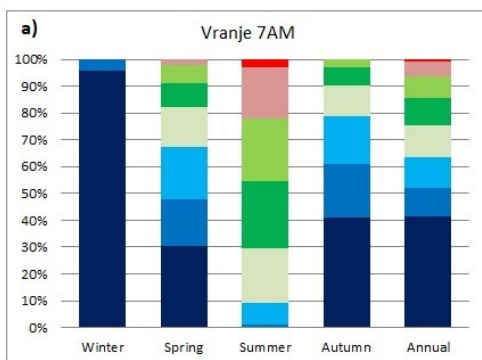
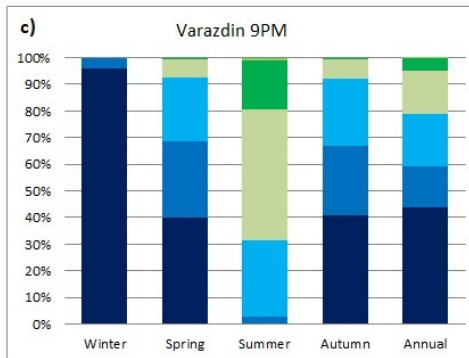
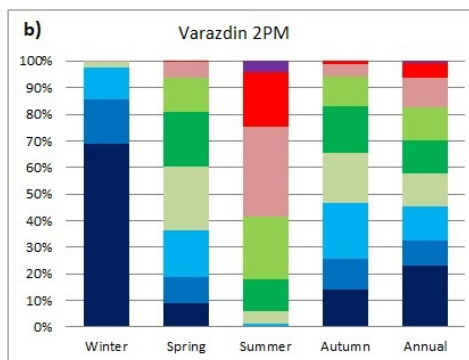
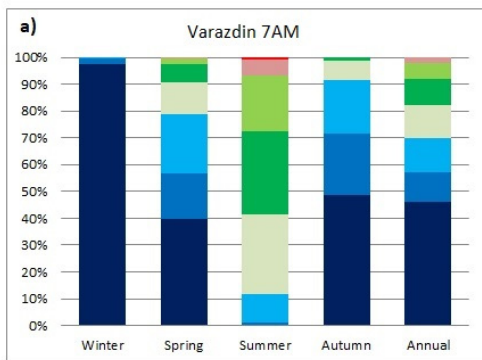












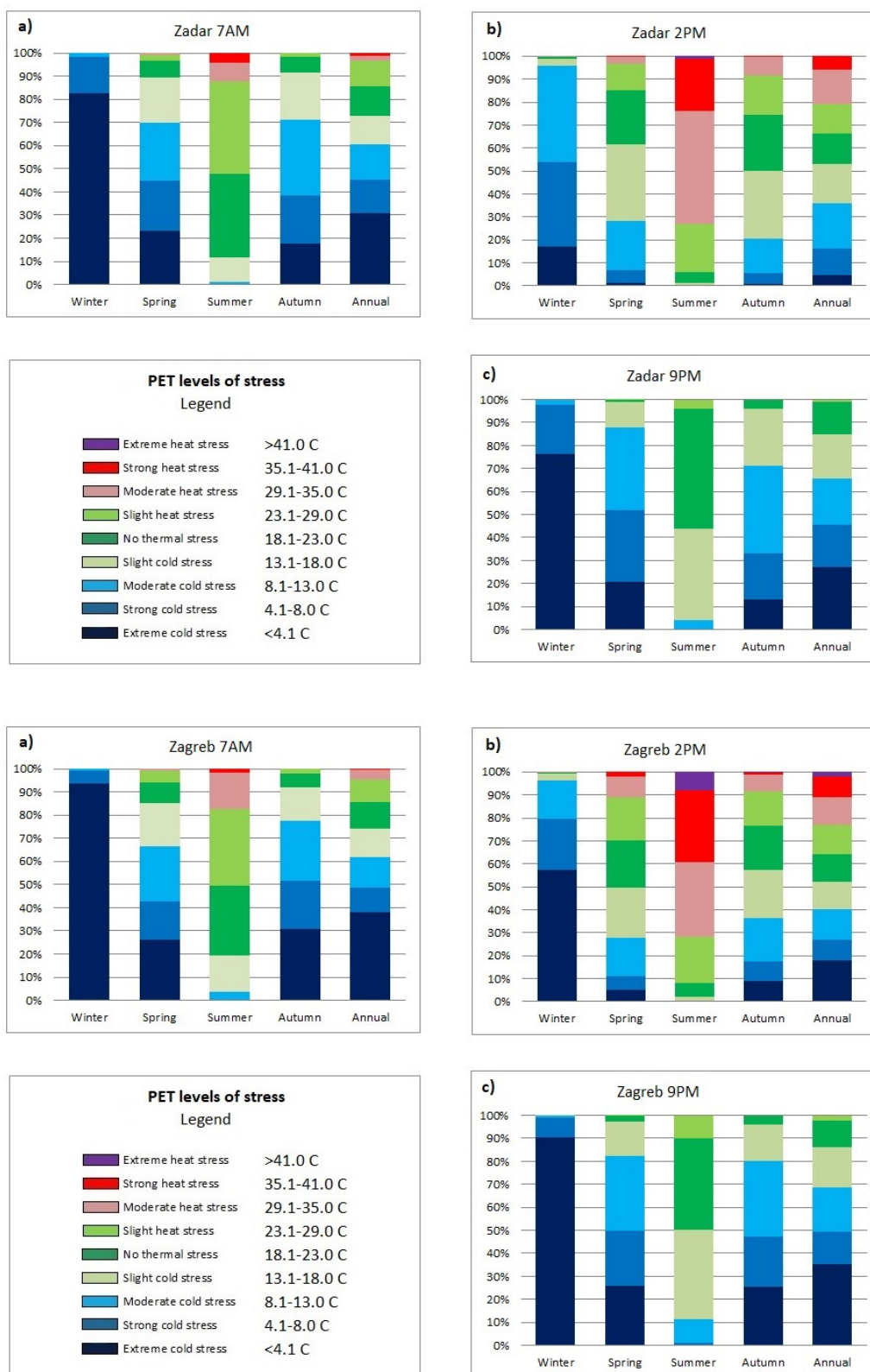
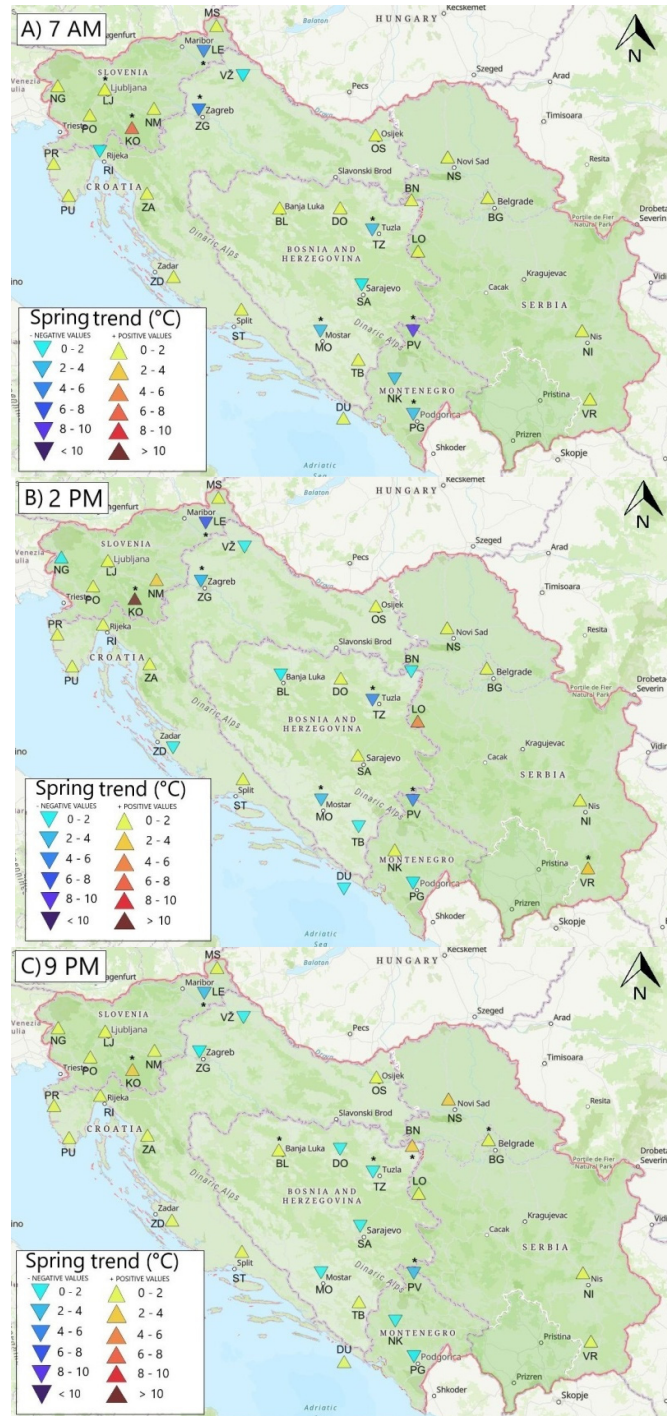


Figure S2. Frequency analysis (in %) of different PET stress levels at a) 7 am, b) 2 pm and c) 9 pm. Note: Measurement stations are arranged in alphabetical order. Belgrade, Podgorica and Zavižan measurement sites are presented and explained in more detail in the main text.

B



C



D

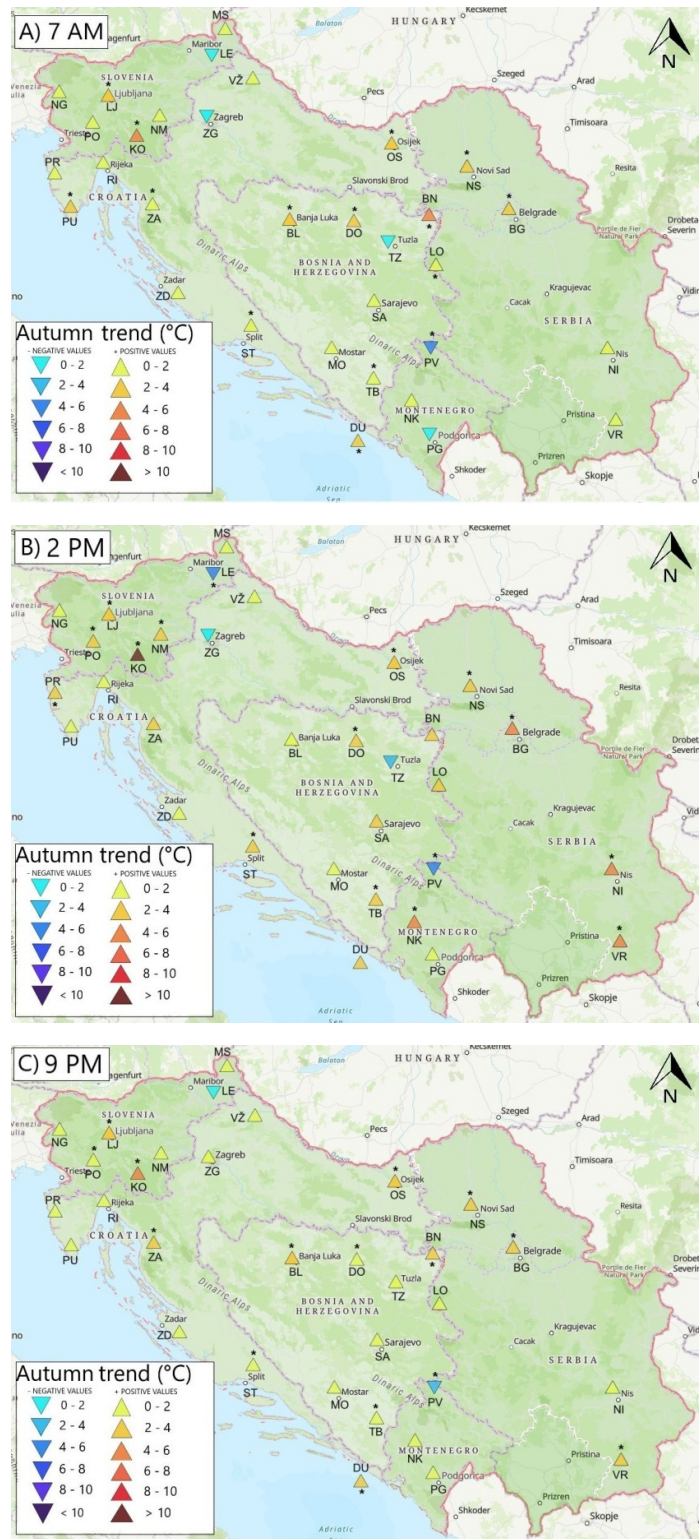


Figure S3. Seasonal (winter (A), spring (B), summer (C), autumn(D)) trends of averaged PET values across the research area for the period 2001–2020. Background map source: Esri, HERE, Garmin, FAO, NOAA, USGS. Note: The trends are expressed in °C per 20-year period. Statistically significant trends (95% of confidence level) are marked with an asterisk (*). The letter marks a), b) and c) represent PET trends from measurement terms at 7 am, 2 pm, and 9 pm.