



Изследване на поведението на топлинните и студентите био- климатични индекси за град София

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Съдържание

- Въведение;
- Методология:
 - Модели;
 - Данни;
 - Индекси – био-климатични и за качеството на въздуха.
- Резултати за честотата на повтаряемост на различните видове индекси;
- Заключение.

МЕТОДОЛОГИЯ

- ▶ Модели:
 - WRF;
 - SMOKE;
 - CMAQ.
- ▶ Данни
- ▶ Индекси:
 - Качеството на въздуха (AQI);

Banding	Value	Health Descriptor
Low	1-3	Effects are unlikely to be noticed even by individuals who know they are sensitive to air pollutants
Moderate	4-6	Mild effects, unlikely to require action, may be noticed amongst sensitive individuals.
High	7-9	Significant effects may be noticed by sensitive individuals and action to avoid or reduce these effects may be needed. Asthmatics will find that their "reliever" inhaler is likely to reverse the effects on the lung.
Very High	10	The effects on sensitive individuals described for "High" levels of pollution may worsen

МЕТОДОЛОГИЯ

Индекси:

- Био-климатични индекси (BCI) за:
 - o прегрев;
 - o измръзване.

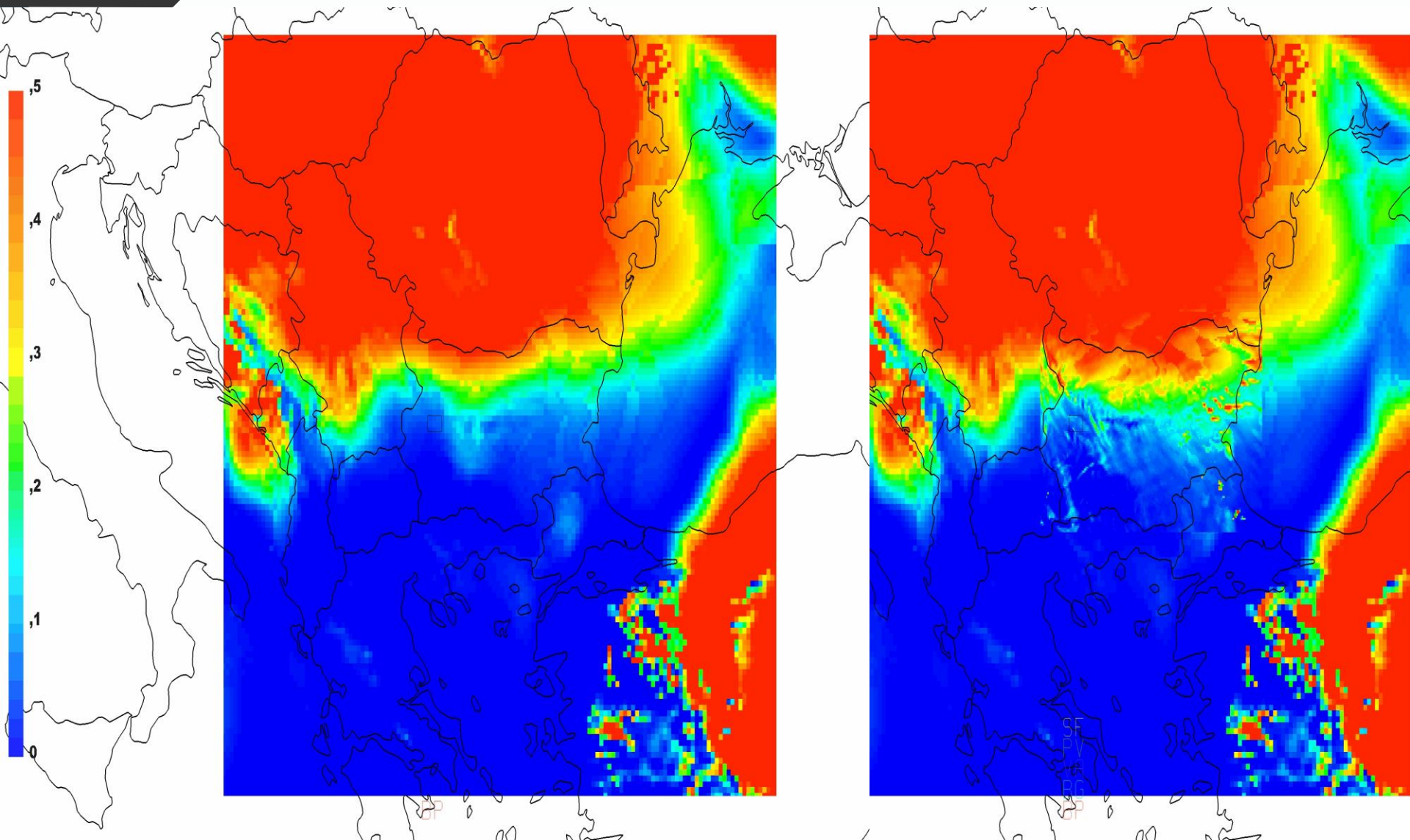
Heat Index Category	Numerical Interval	Health Precautions
Caution	26.7–32.2 °C	Fatigue is possible with prolonged exposure and activity. Continuing activity could result in heat cramps.
Extreme Caution	32.2–40.5 °C	Heat cramps and heat exhaustion are possible. Continuing activity could result in heat stroke.
Danger	40.5–54.4 °C	Heat cramps and heat exhaustion are likely; heat stroke is probable with continued activity
Extreme Danger	≥ 54.4 °C	Heat stroke is imminent

$$HI = -42.379 + 2.04901523 * T + 10.14333127 * RH - 0.22475541 * T * RH - 0.00683783 * T^2 - 0.05481717 * RH^2 + 0.00122874 * T^2 * RH + 0.00085282 * T * RH^2 - 0.00000199 * T^2 * RH^2$$

Wind Chill Category	Numerical Interval	Health Precautions
Light Risk	0––9 °C	Slight increase in discomfort.
Moderate Risk	–10––27 °C	Uncomfortable. Risk of hypothermia and frostbite if outside for long periods without adequate protection.
High Risk	–28––39 °C	High risk of frostnip or frostbite. Exposed skin can freeze in 10 to 30 min; Check face and extremities for numbness or whiteness; High risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.
Very High Risk	–40––47 °C	Very high risk of frostbite; Exposed skin can freeze in 5 to 10 min; Check face and extremities for numbness or whiteness; Very high risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.
Severe Risk	–48––54 °C	Severe risk of frostbite; Exposed skin can freeze in 2 to 5 min; Check face and extremities frequently for numbness or whiteness; Severe risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.
Extreme Risk	≤ –55 °C	DANGER! Exposed skin can freeze in less than 2 min; Outdoor conditions are hazardous.

$$WCI = 13.12 + 0.6215 * T_{\alpha} - 11.37 * V^{0.16} + 0.3965 * T_{\alpha} * V^{0.16}$$

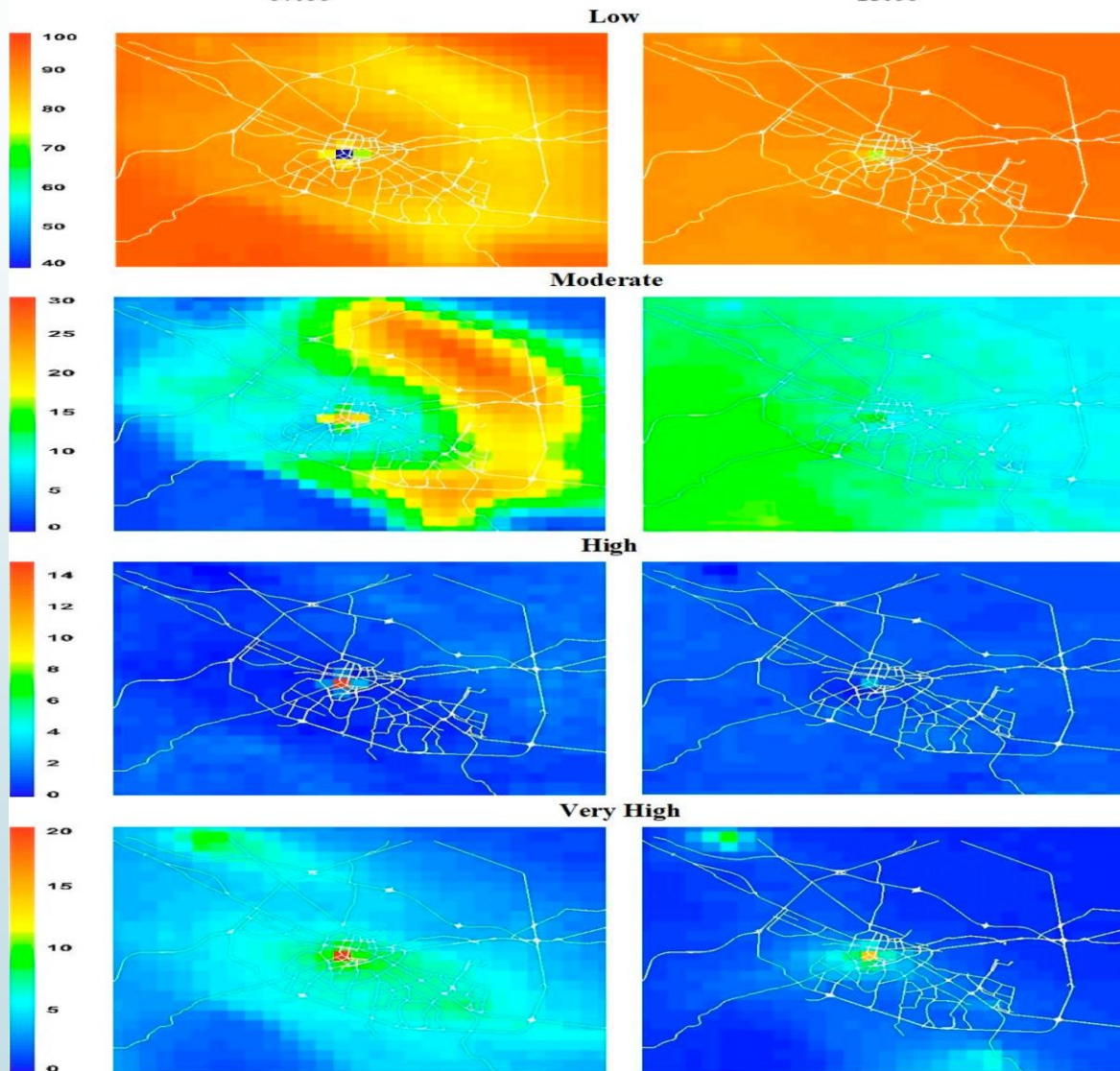
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Резултати: AQI

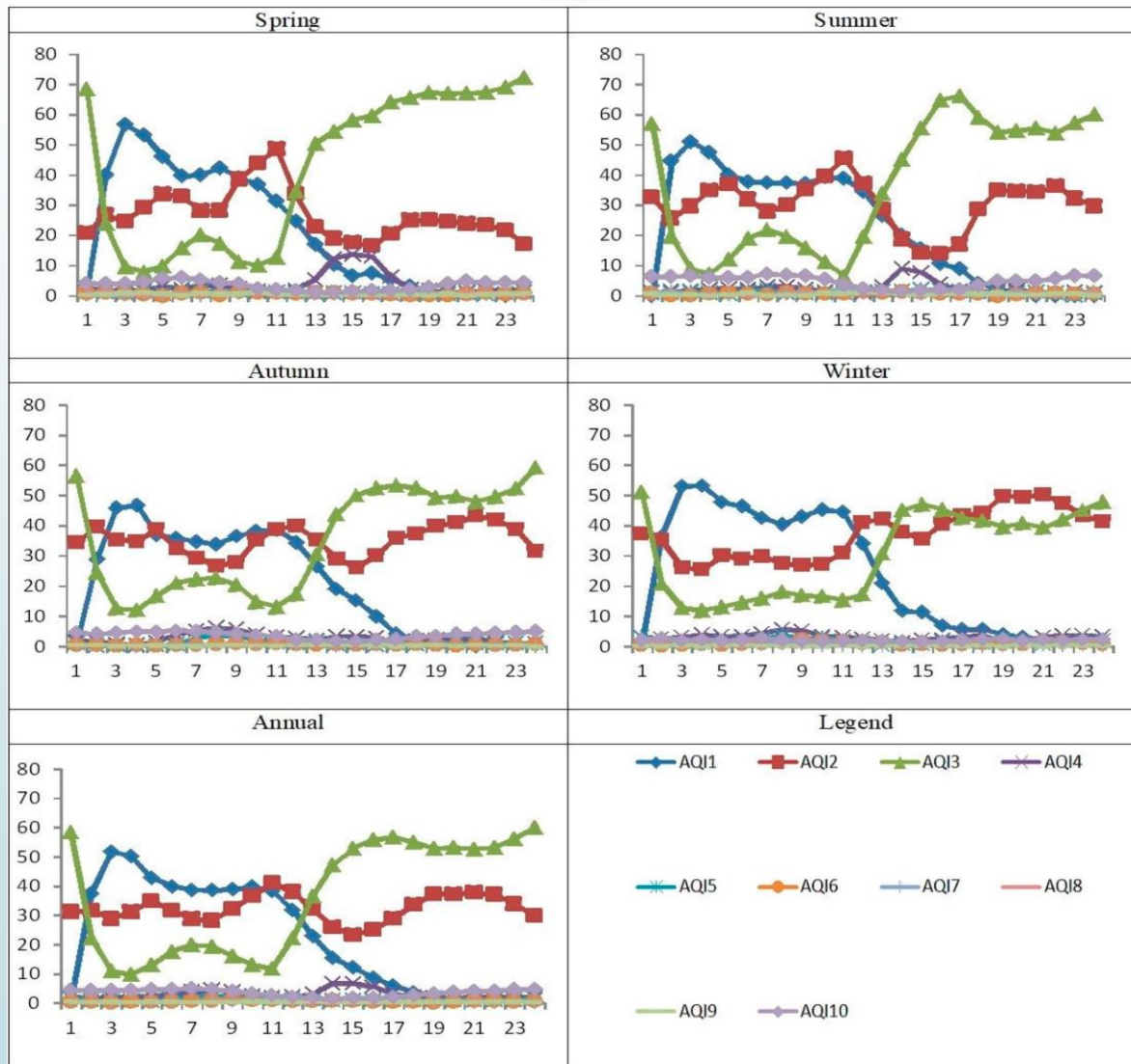
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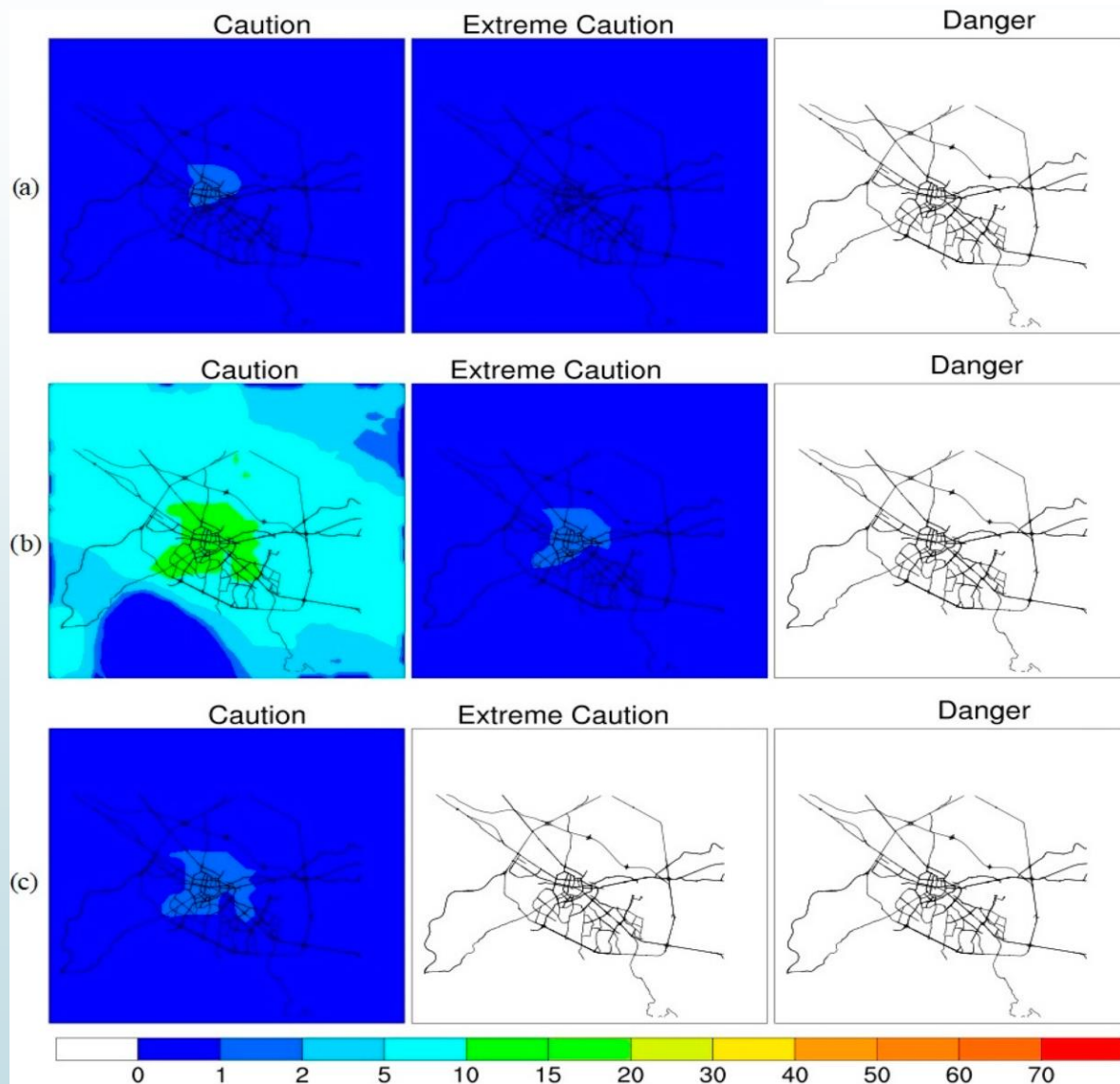


Резултати: AQI

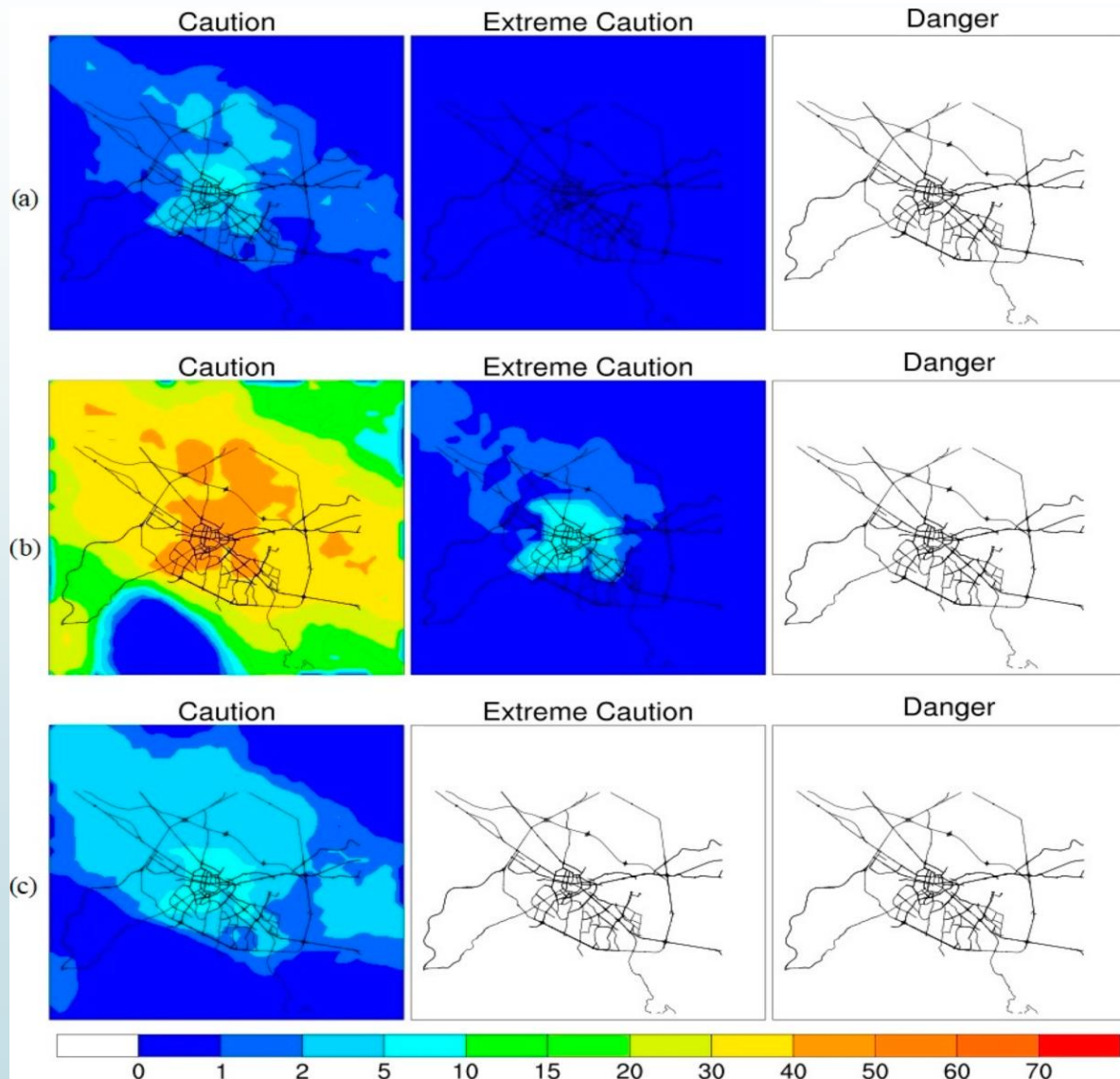
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Резултати: ВСІ - прегрев



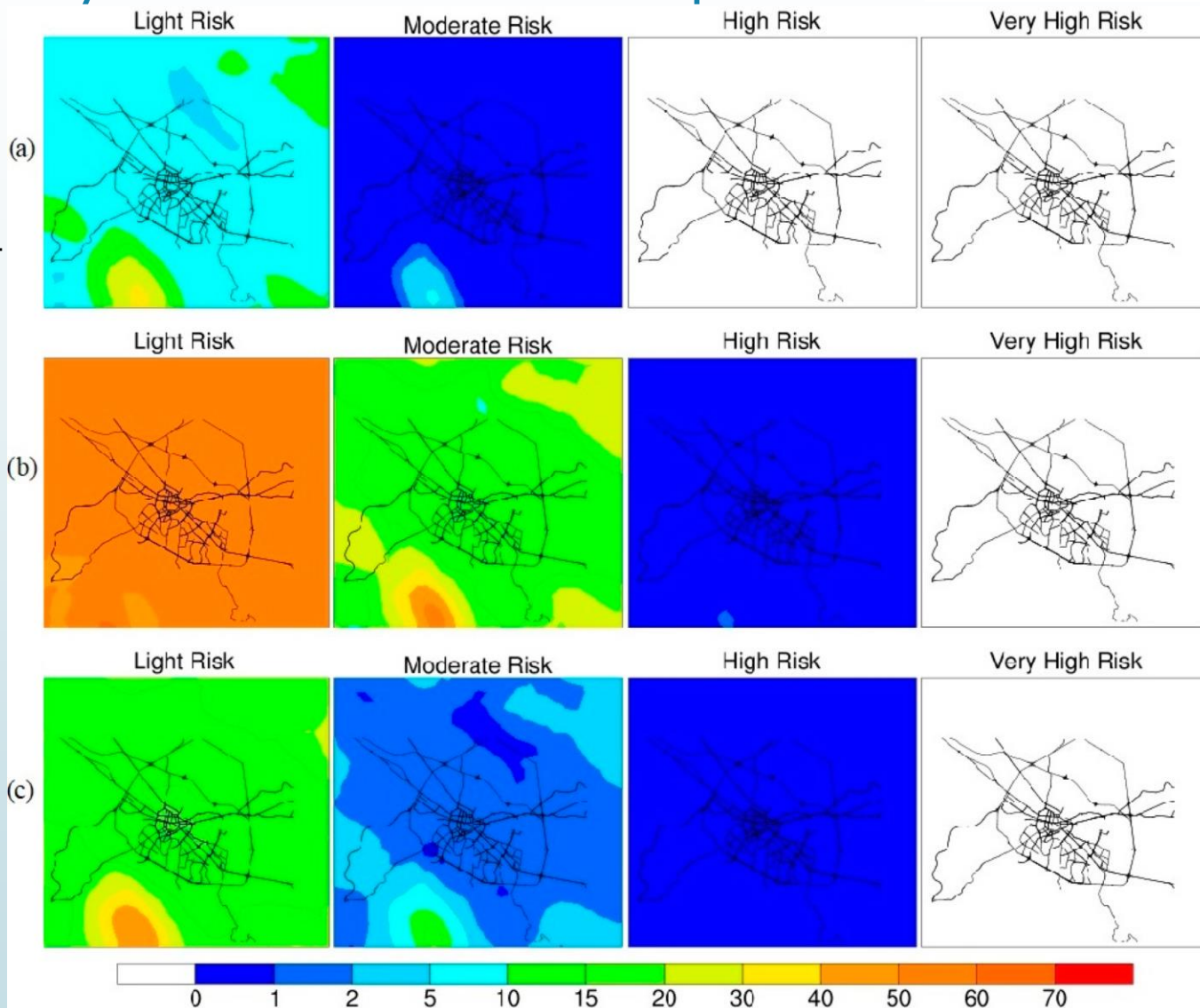
(a) Пролет,
(b) Лято,
(c) Есен



(a) Пролет,
 (b) Лято,
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 в 12:00UTC

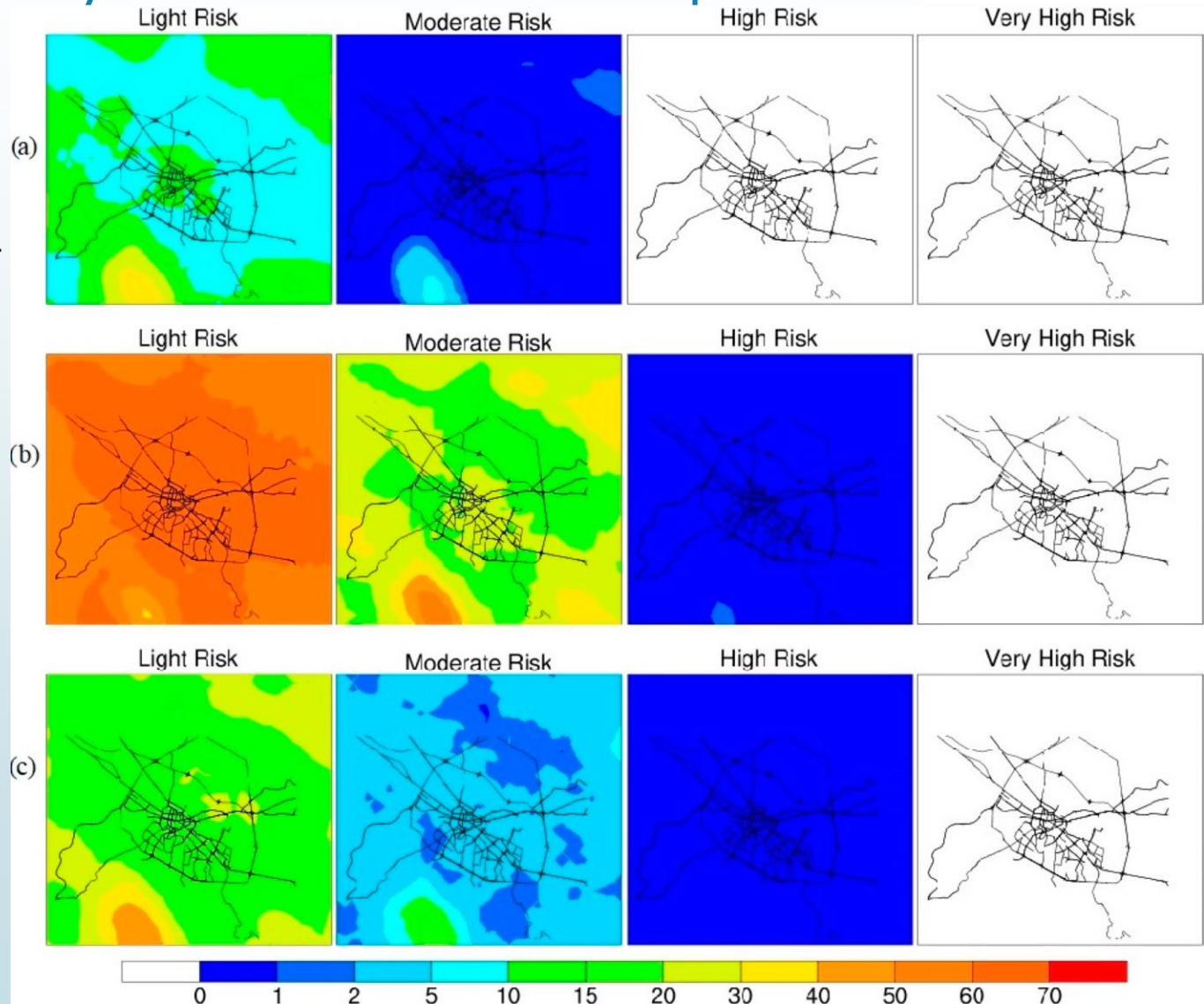
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(a) Есен,
(b) Зима,
(c) Пролет



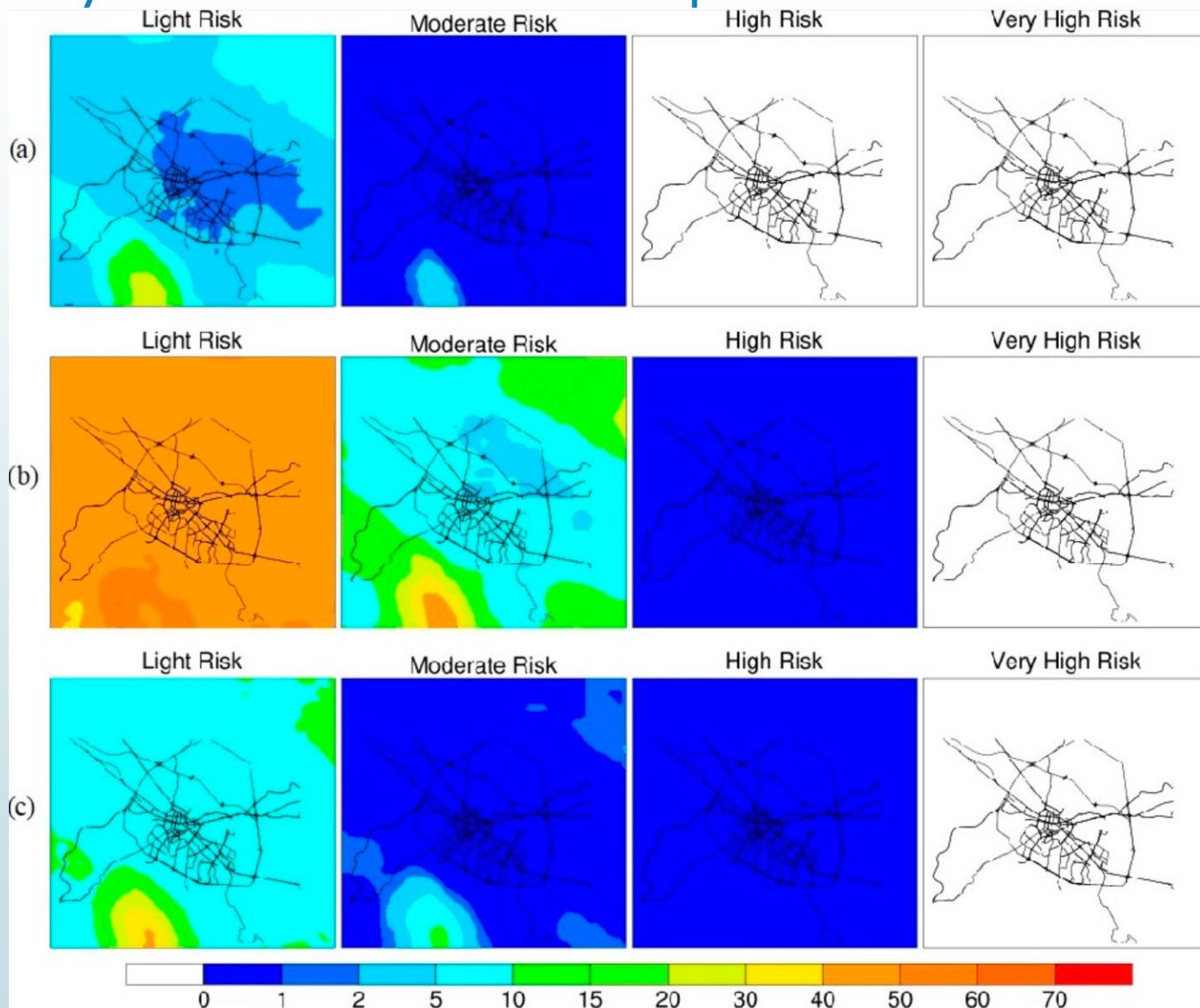
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Резултати: ВСІ - измръзване

(a) Есен,
(b) Зима,
(c) Пролет
в 15:00UTC



- ▶ Зоните с влошено качество на въздуха са основно околновръстния път и натоварените пътни трасета в града.
- ▶ Основно два фактора играят роля при биоклиматичните индекси. Първият е нормално изменение на температурата с надморската височина и вторият фактор е Градският остров на топлина добре откروим през пролетта и най-вече лятото.