

Influence of COVID-19 on Night-Time Lights in Czechia

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night-time light data: VIIRS Day/Night Band, NOAA, NASA, 2023

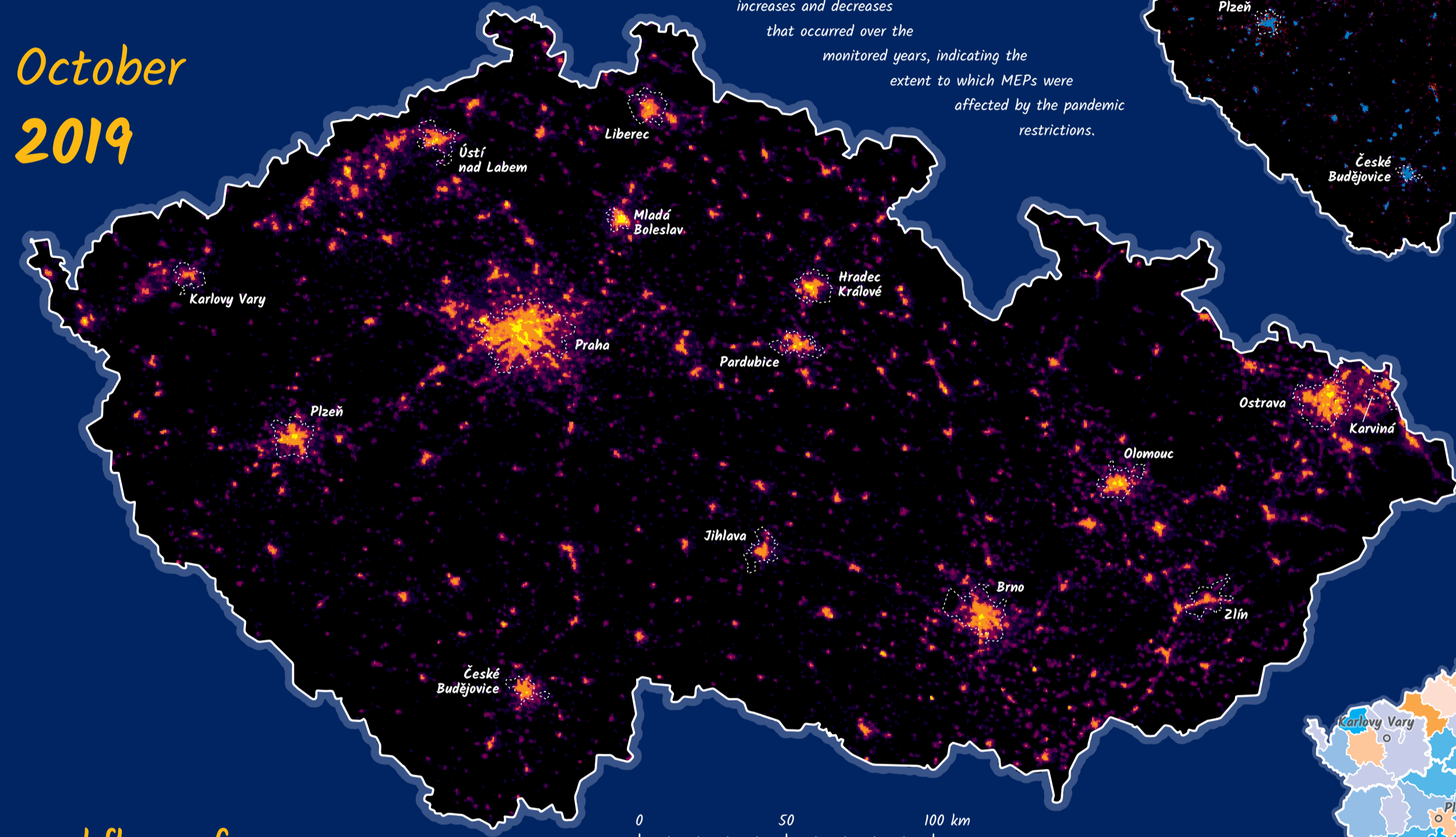
topography: ©ArcČR, ARCDATA PRAHA, ZÚ, ČSÚ, 2014

map projection: UTM Zone 33N

Night-Time Light (NTL) satellite imagery is a powerful tool used worldwide in spatial analysis and research. Using Day/Night Band of Visible Infrared Imaging Radiometer Suite (VIIRS/DNB) data, we focused on the changes in NTL intensity before and during the COVID-19 restrictions which, at the peak of the pandemic, strongly affected the possibilities of movement and social and economic life around the world. At the resolution level of the original data (460 m grid), we prepared three maps showing NTL intensity in October 2019 before the pandemic, and change maps for October 2020 at the time of strong restrictions and for October 2021 just before another peak in the number of infections. The next three maps show the index of change that occurred between all pairs of monitored periods examined in the administrative districts of municipalities with extended power (MEP). These were combined and the result was a typology defining 6 types of MEPs based on the binary classification of the

increases and decreases that occurred over the monitored years, indicating the extent to which MEPs were affected by the pandemic restrictions.

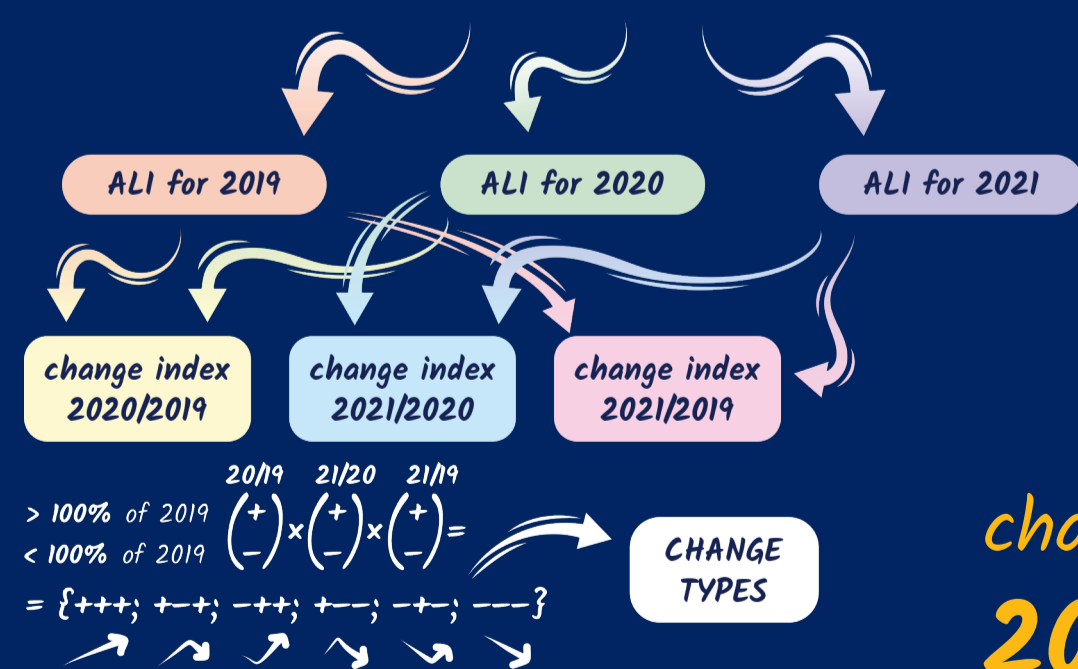
October 2019



workflow of data processing

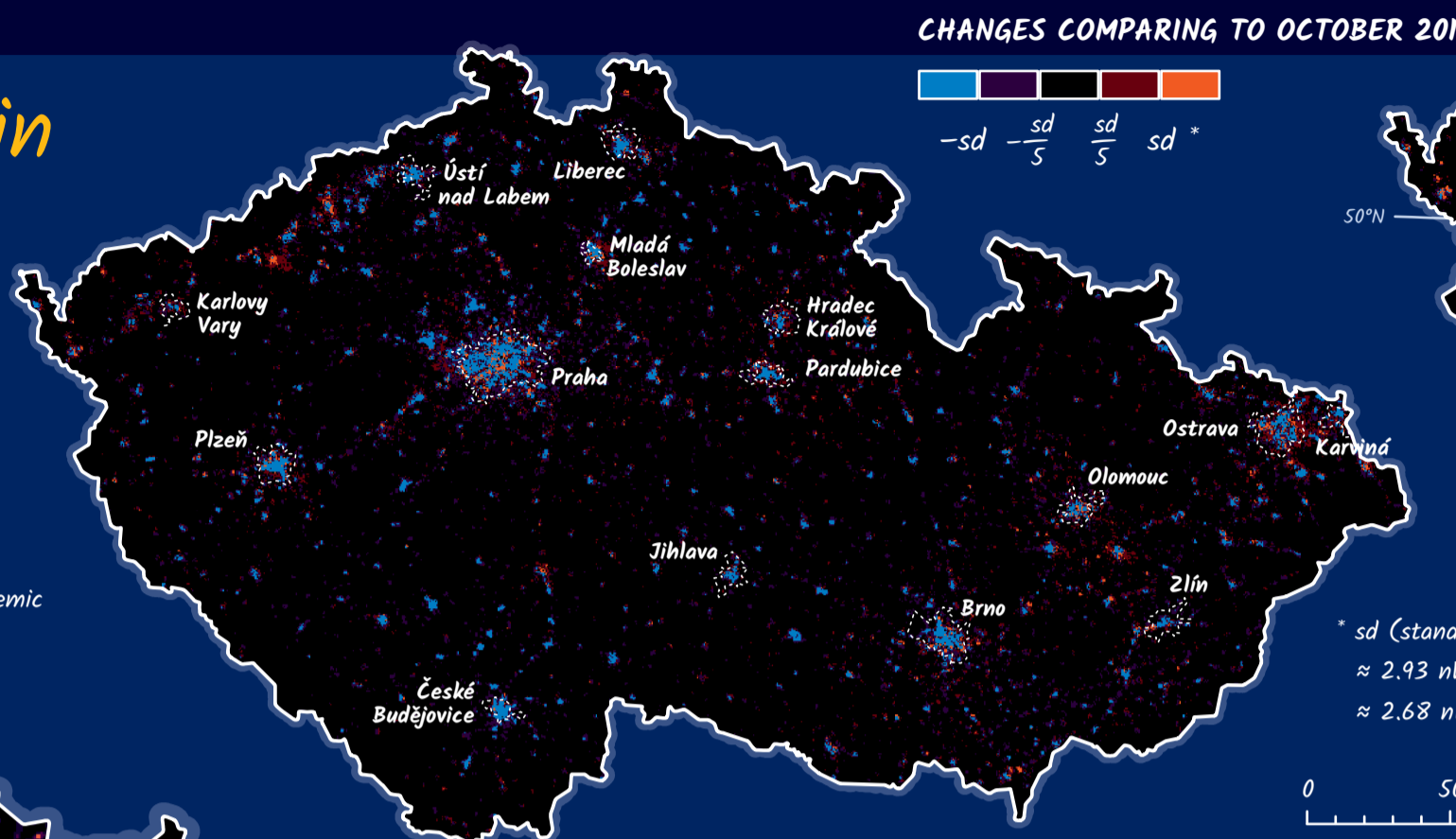
imagery data 2019 imagery data 2020 imagery data 2021

mosaicing + filling missing pixels & extreme outliers + ALI calculation

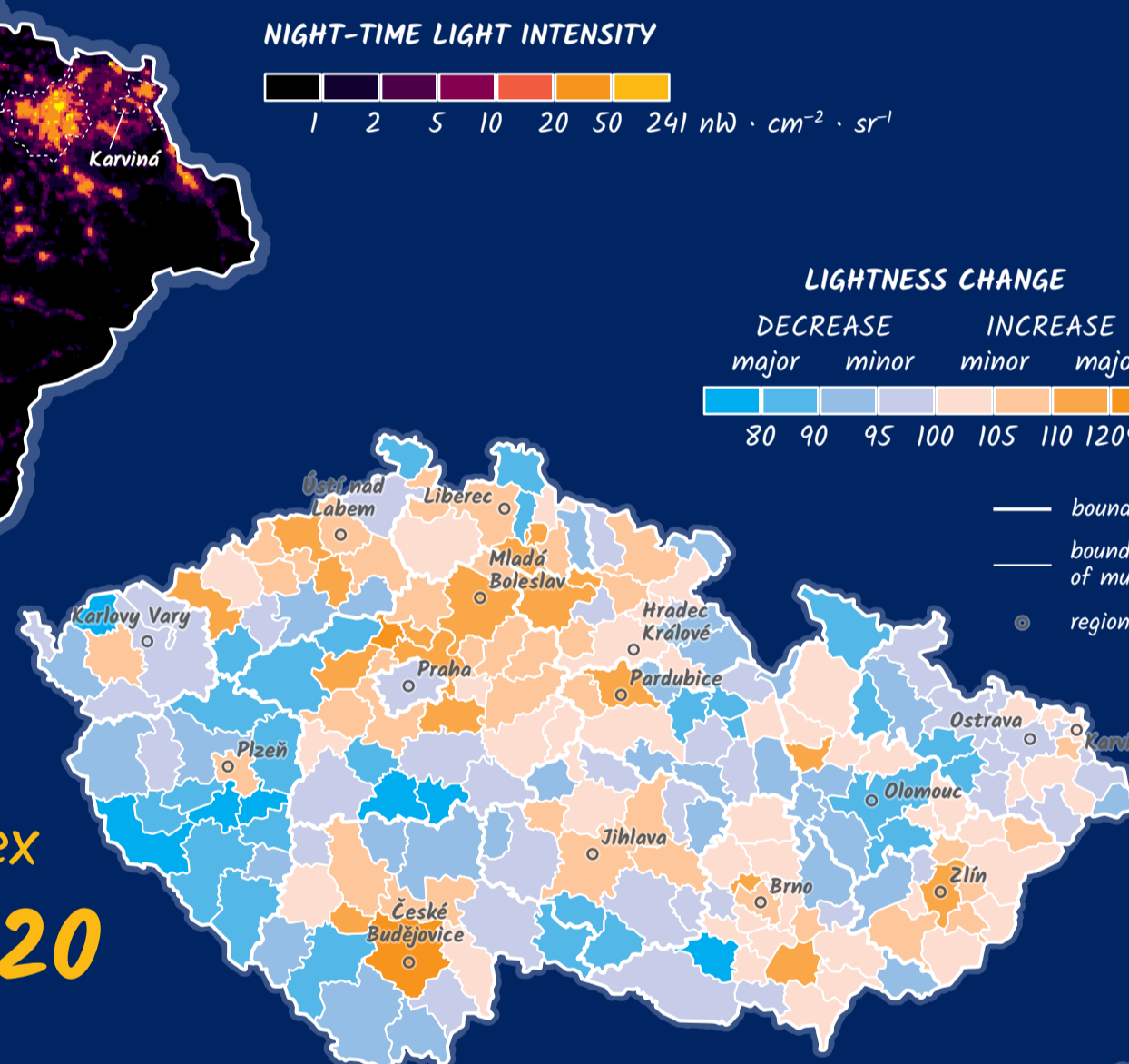


The data was processed and the map layout was designed using ArcGIS Pro software powered by Esri.

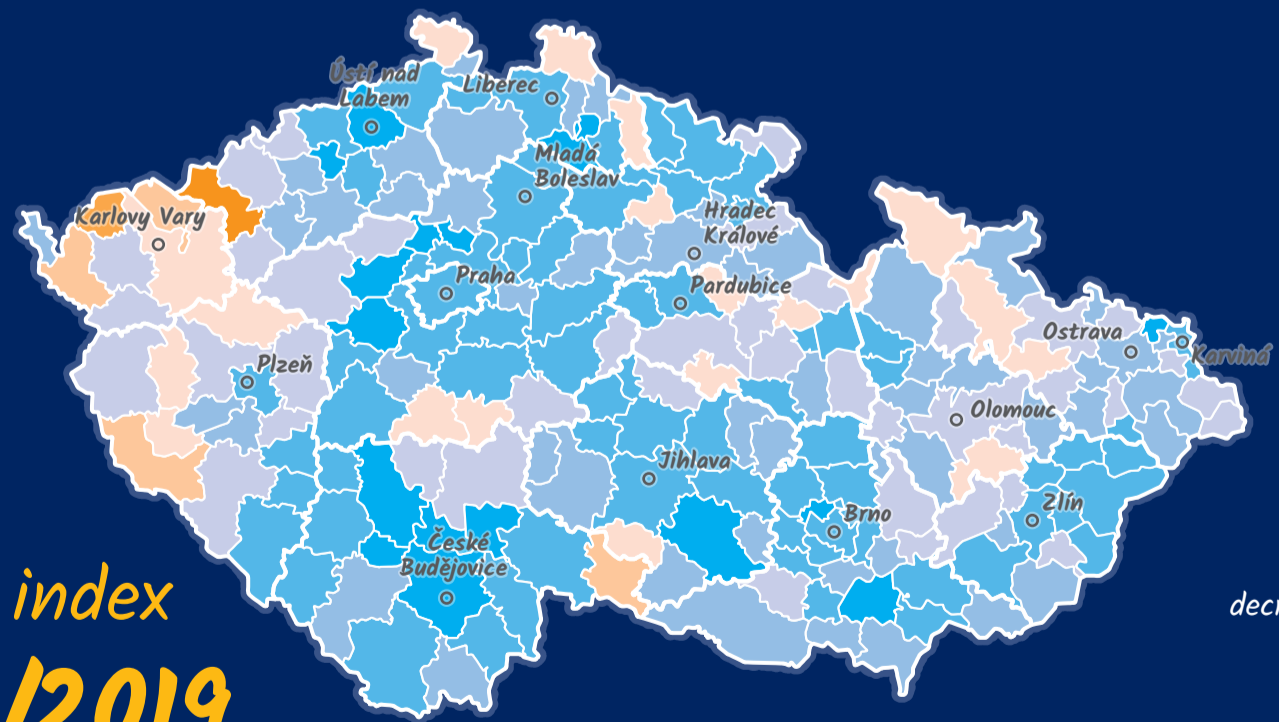
change in October 2020



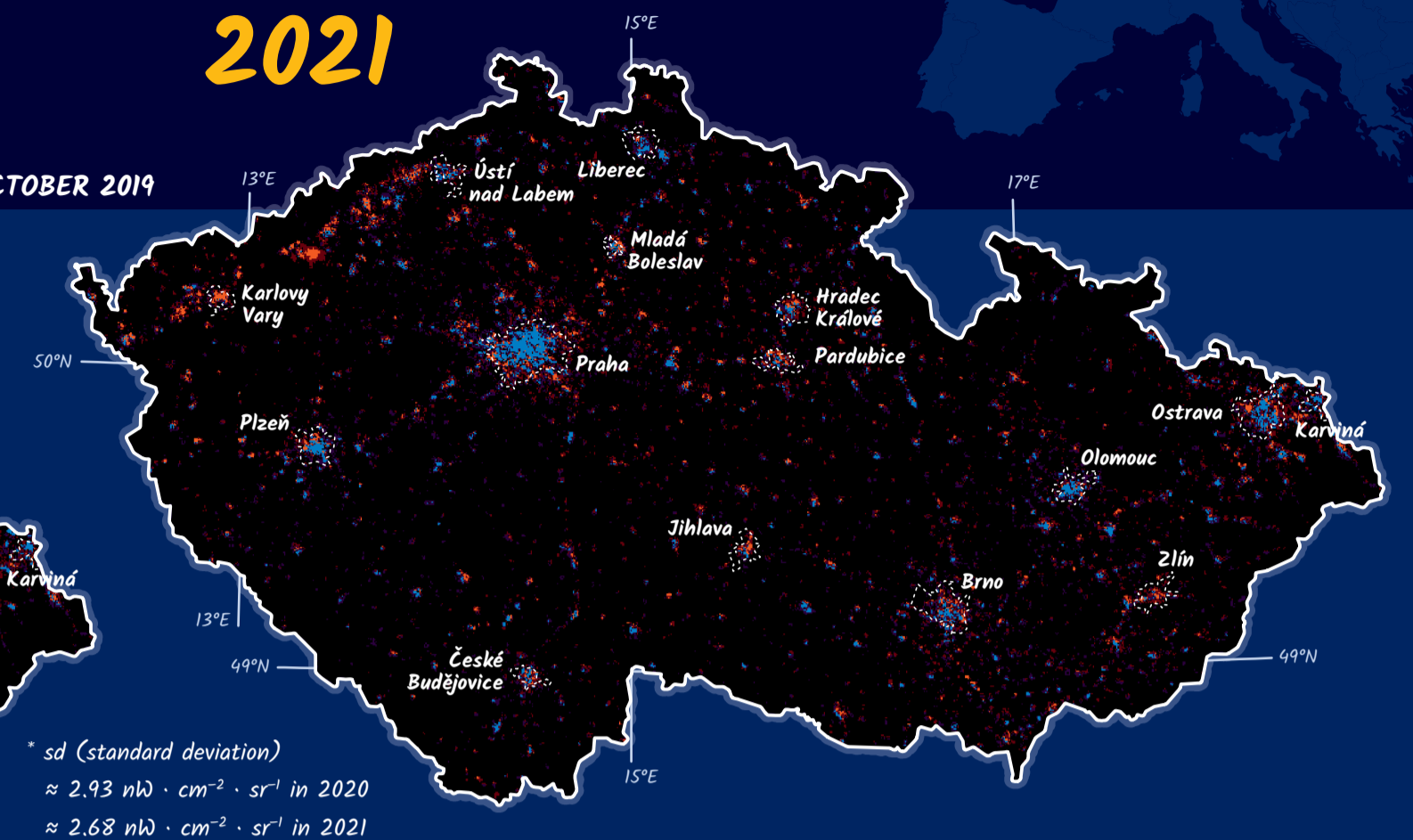
change index 2021/2020



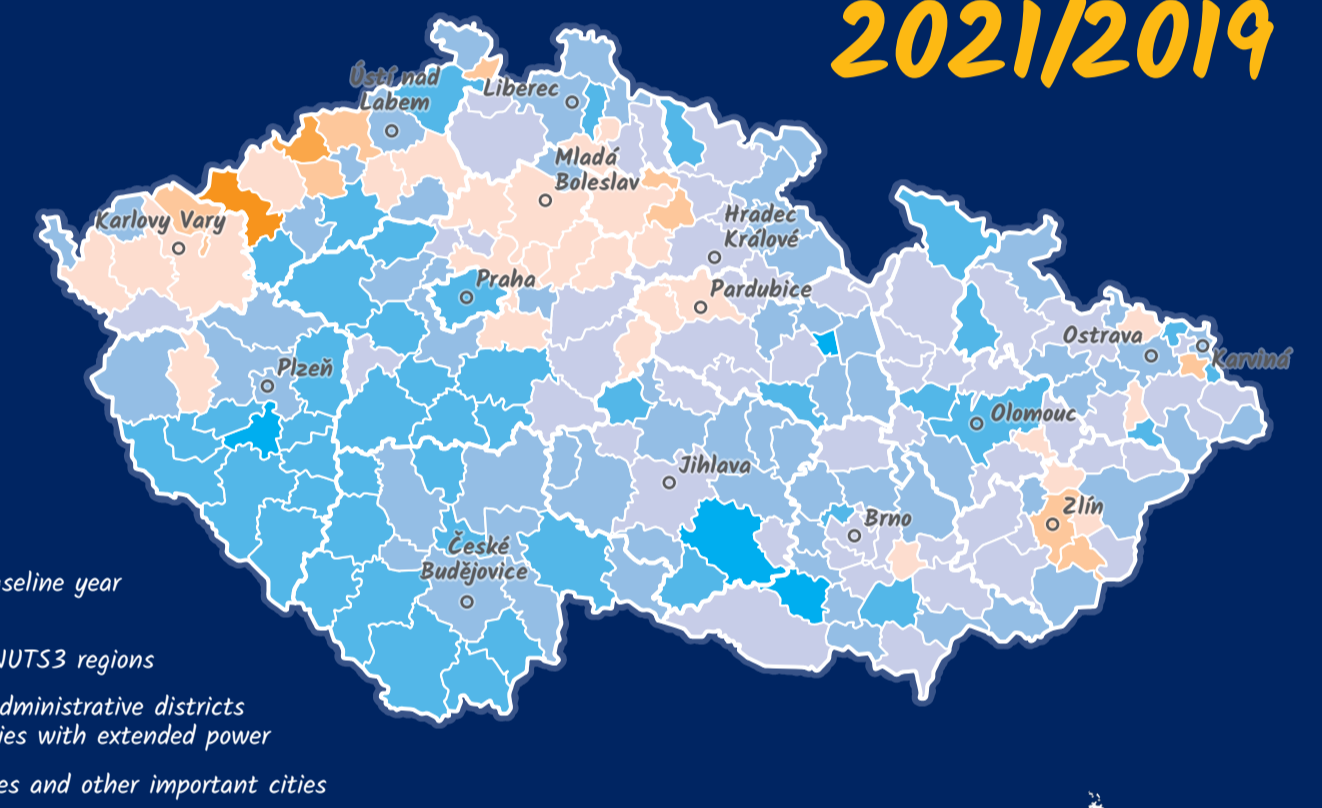
change index 2020/2019



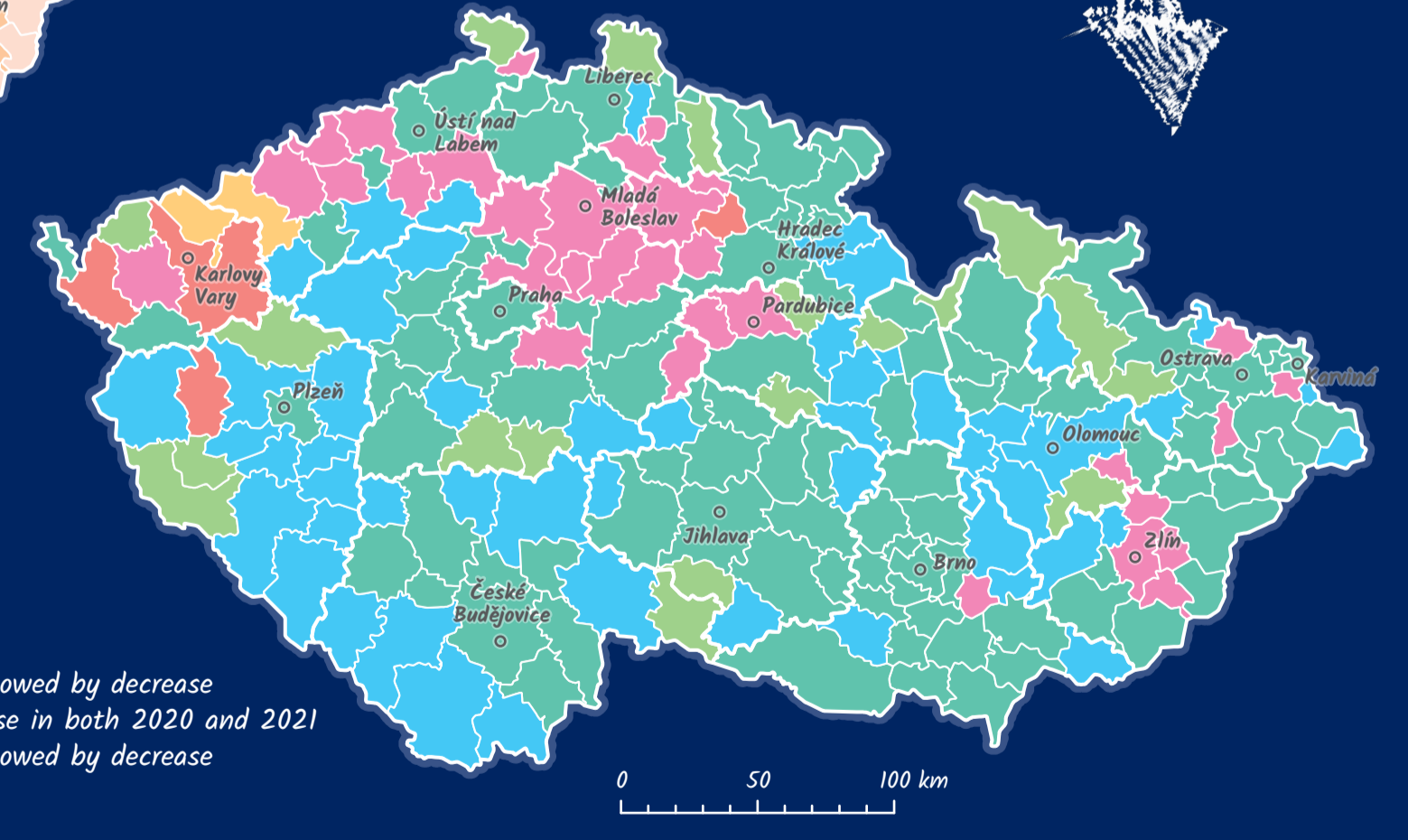
change in October 2021



overall change index 2021/2019



CHANGE TYPES



Legend for Change Types:

- overall increase
- decrease followed by increase
- increase followed by decrease
- decrease in both 2020 and 2021
- increase in both 2020 and 2021
- decrease followed by increase
- increase followed by decrease
- overall decrease

The research was published in the article: Daniel Pavlačka, Pavel Vyvlečka, Radek Barvíř, Oldřich Rypl & Jaroslav Burian (2023) Influence of COVID-19 on night-time lights in Czechia, Journal of Maps, 19:1, 2235381, DOI: 10.1080/17445647.2023.2235381.

