

Modeling the mortality effect of weekly temperature anomalies on country level mortality

Jonas Schöley

 @jschoeley

 0000-0002-3340-8518

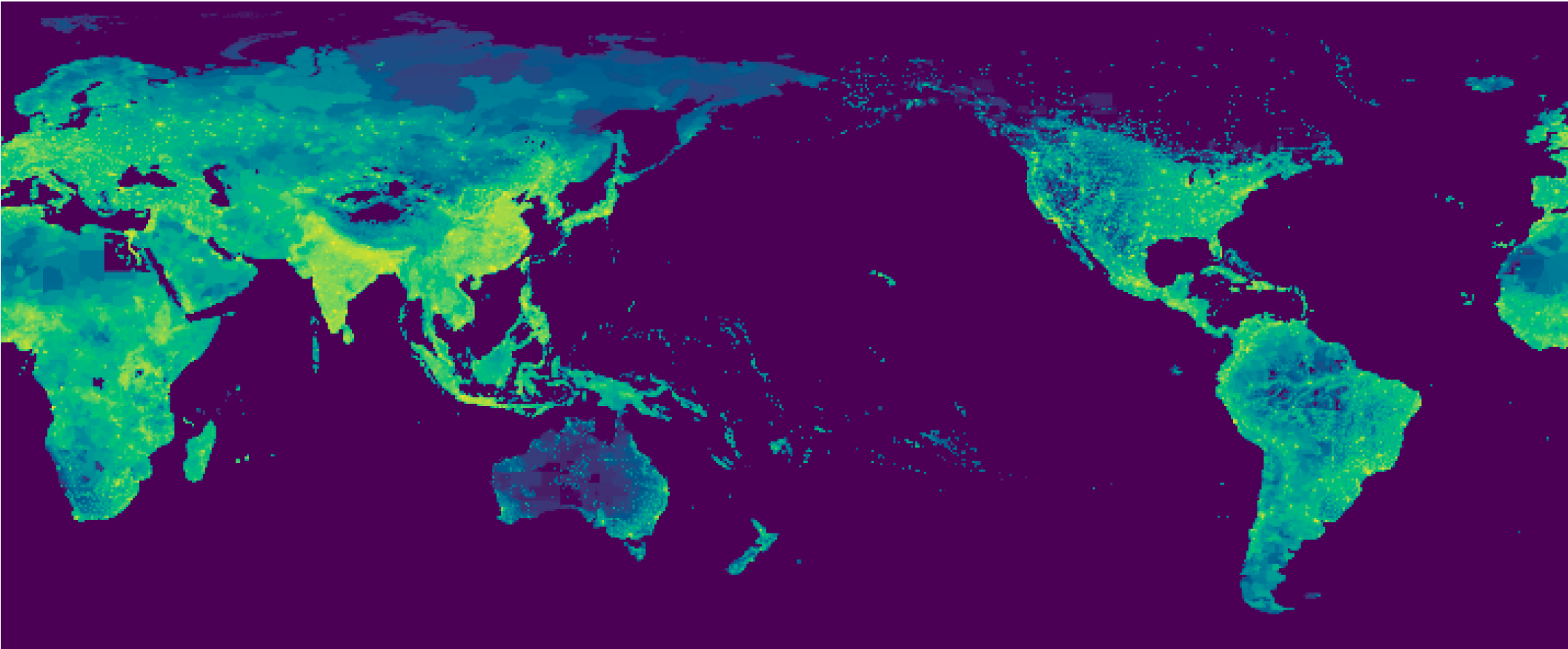
 schoeley@demogr.mpg.de



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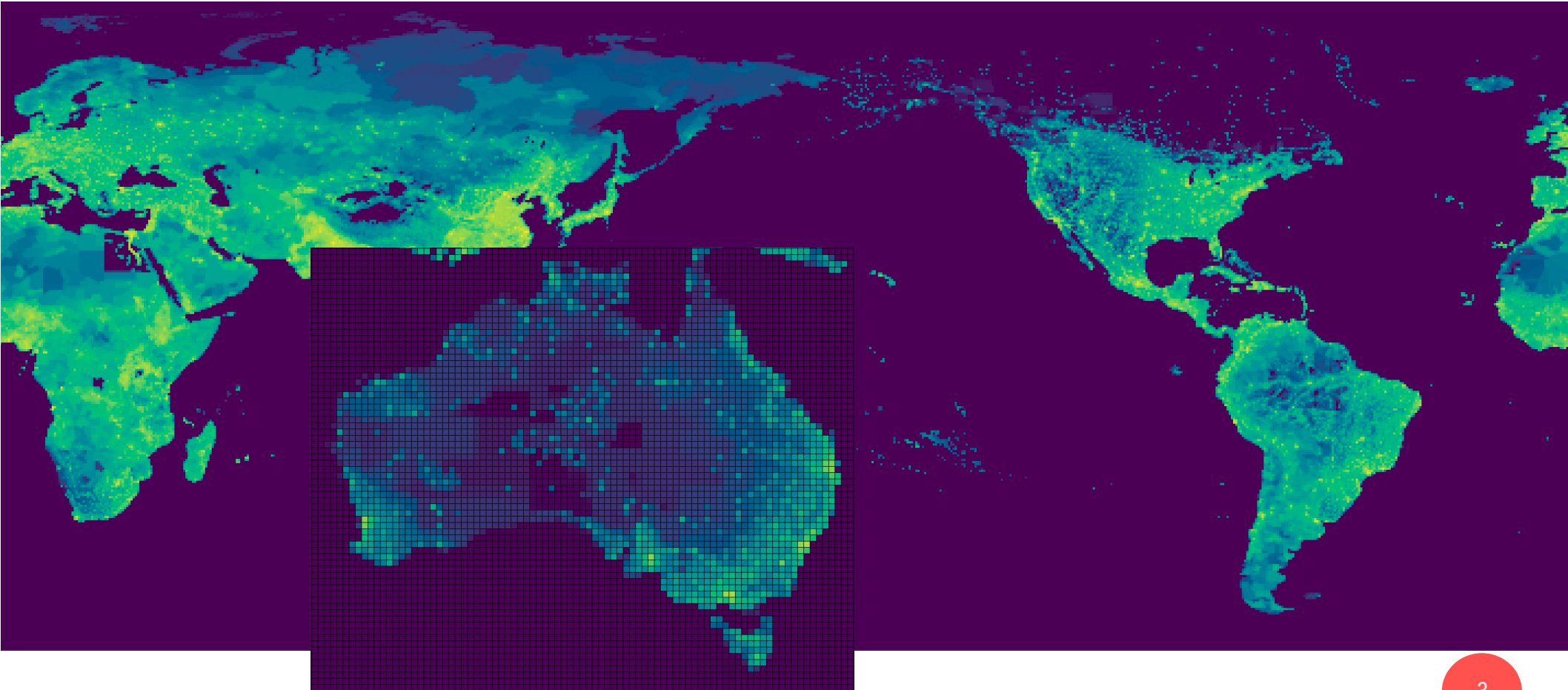
Global gridded population counts

CIESIN (2018). Gridded Population of the World, Version 4. [10.7927/H4JW8BX5](https://doi.org/10.7927/H4JW8BX5)



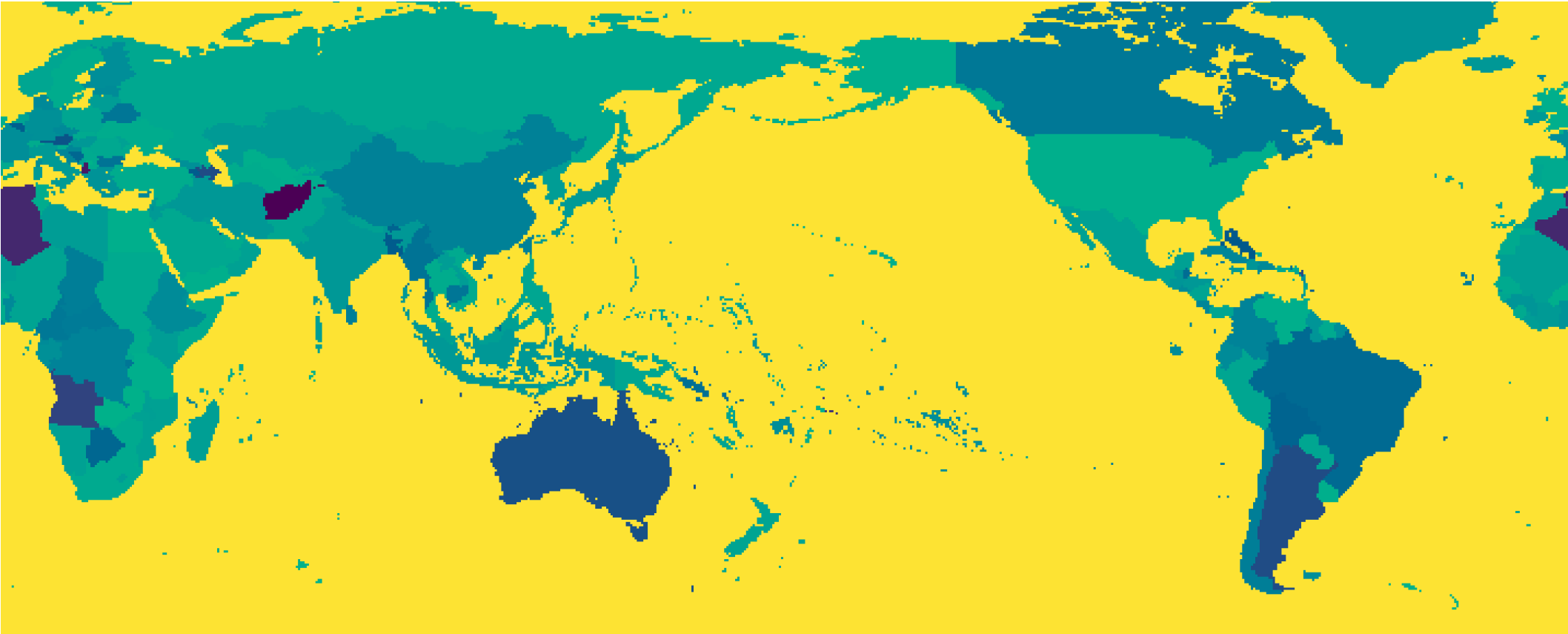
Global gridded population counts

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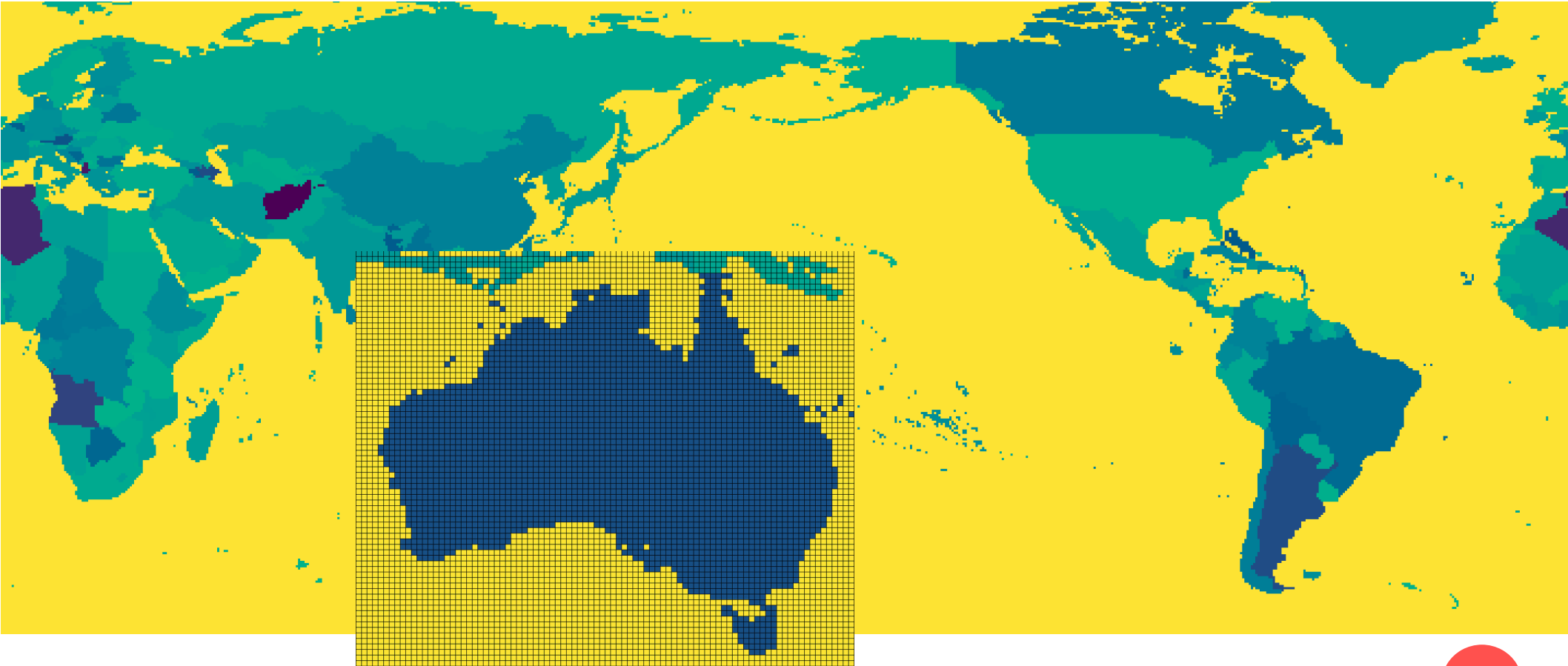
Global gridded territories

CIESIN (2018). Gridded Population of the World, Version 4. [10.7927/H4JW8BX5](https://doi.org/10.7927/H4JW8BX5)

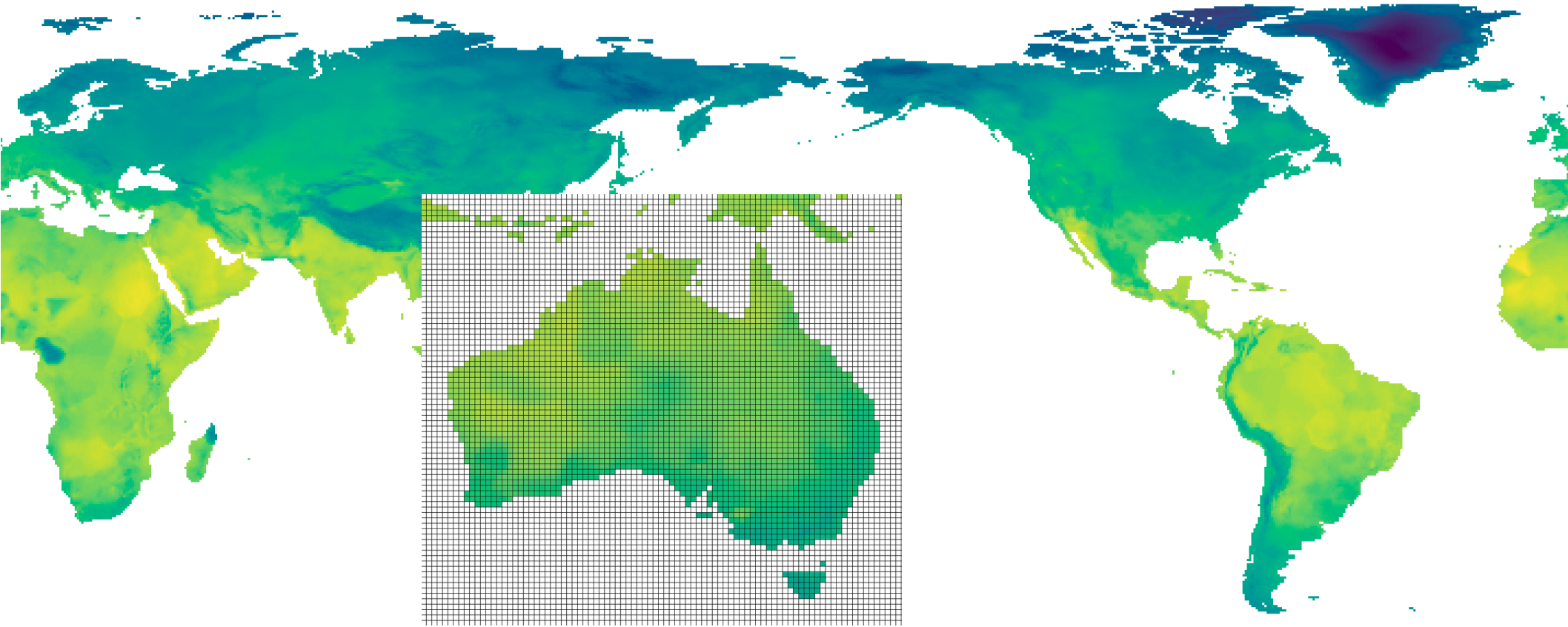


Global gridded territories

CIESIN (2018). Gridded Population of the World, Version 4. [10.7927/H4JW8BX5](https://doi.org/10.7927/H4JW8BX5)

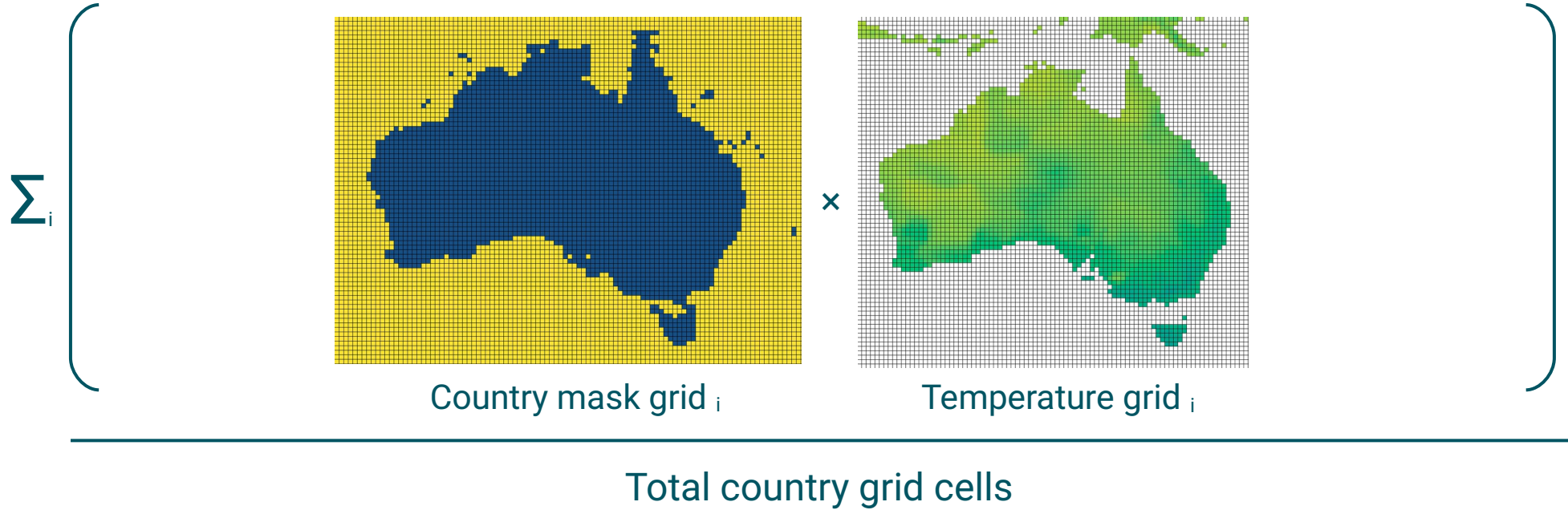


Global gridded temperature



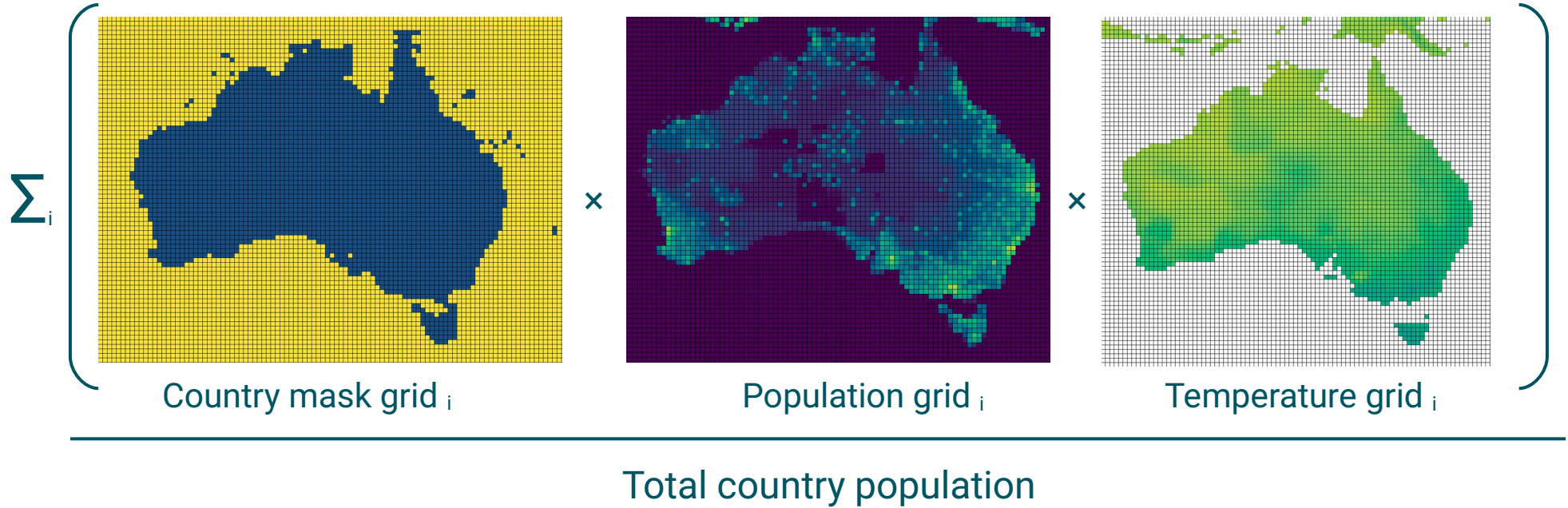
NOAA (2023). CPC Global Temperature. [Link.](#)

National land average weekly temperature



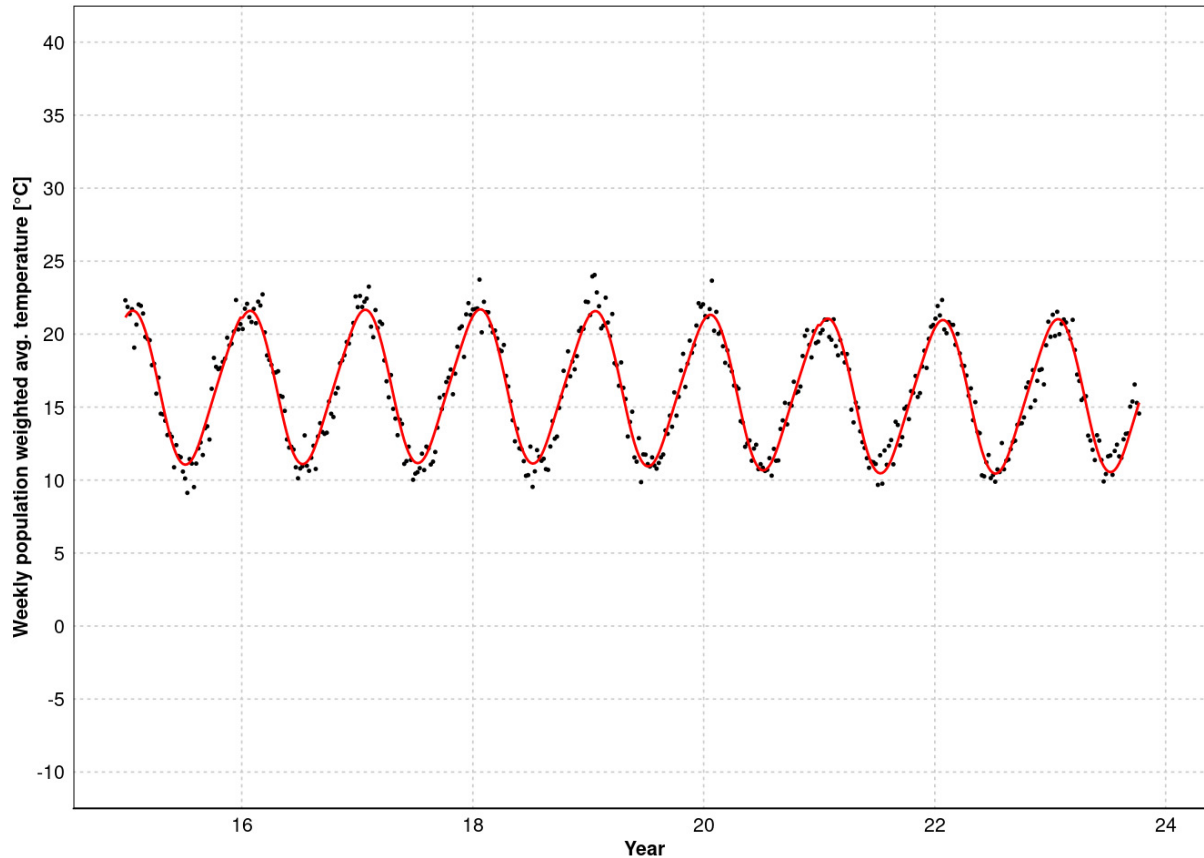
= 20.5°C

National population weighted average weekly temperature



= 14.5°C

Expected population weighted average weekly temperature



Australia

Expected temperature

$$T_i \sim \text{Normal}(\mu_i, \sigma)$$

$$\mu_i = b_0 + s([\text{weeks since 2015}]_i) +$$

TP spline

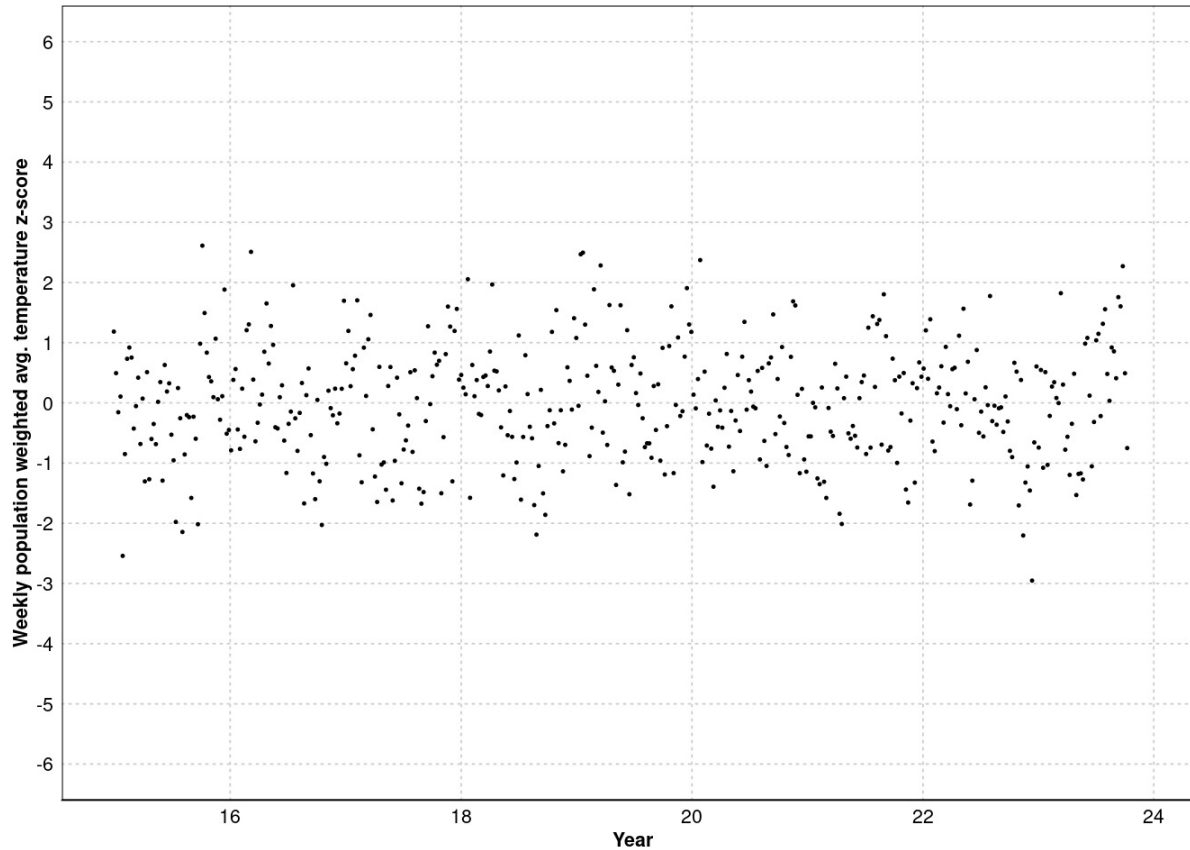
$$s([\text{week of year}]_i)$$

Cyclical P-spline

Temperature anomaly

$$z_i = (T_i - \mu_i) / \sigma$$

Population weighted weekly temperature anomalies



Australia

Expected temperature

$$T_i \sim \text{Normal}(\mu_i, \sigma)$$

$$\mu_i = b_0 + s([\text{weeks since 2015}]_i) +$$

TP spline

$$s([\text{week of year}]_i)$$

Cyclical P-spline

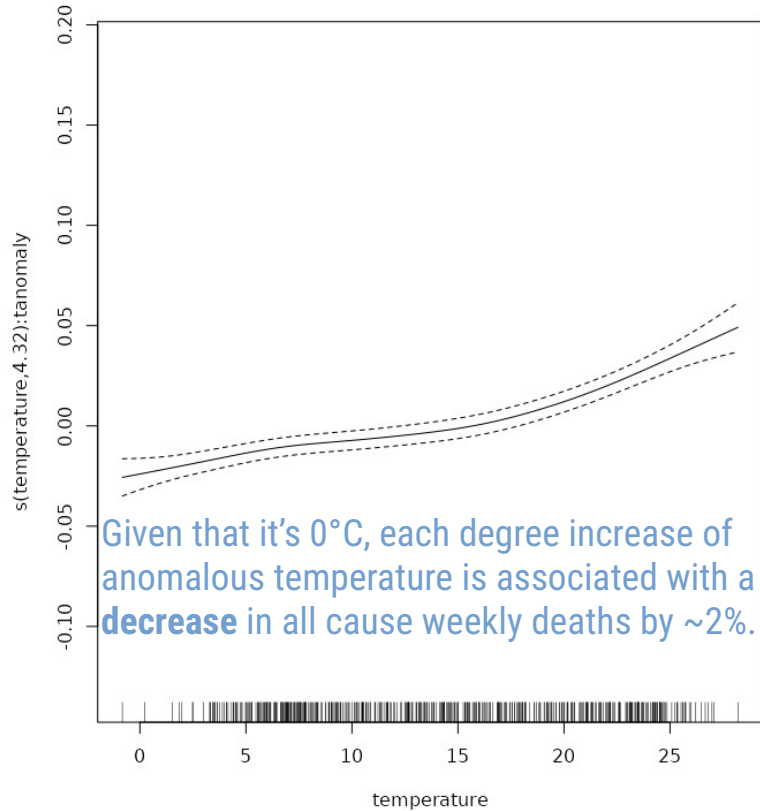
Temperature anomaly

$$z_i = (T_i - \mu_i) / \sigma$$

Modeling the mortality effect of temperature anomalies

Varying coefficients

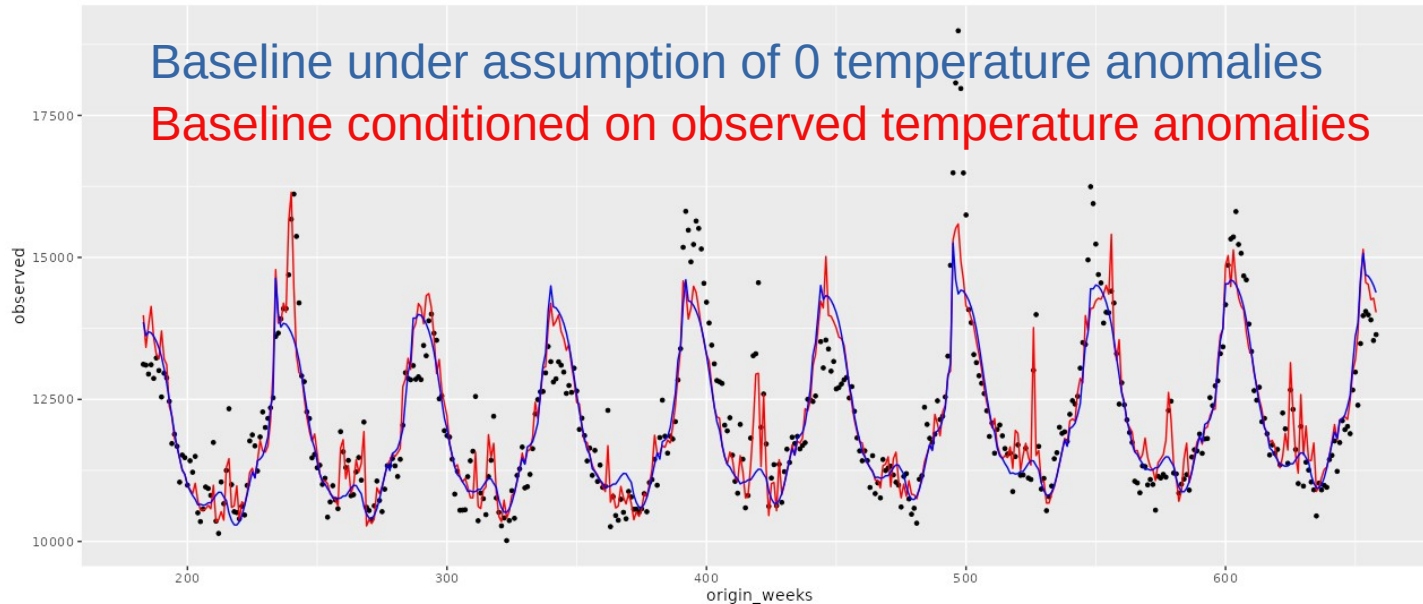
Italy – Negative Binominal model with varying coefficients of temperature anomaly ($^{\circ}\text{C}$) over temperature



Modeling the mortality effect of temperature anomalies

Varying coefficients

Italy – Negative Binominal model with varying coefficients of temperature anomaly ($^{\circ}\text{C}$) over temperature



Reproducible analysis

github.com/jschoeley

Jonas Schöley

 @jschoeley

 0000-0002-3340-8518

 schoeley@demogr.mpg.de



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