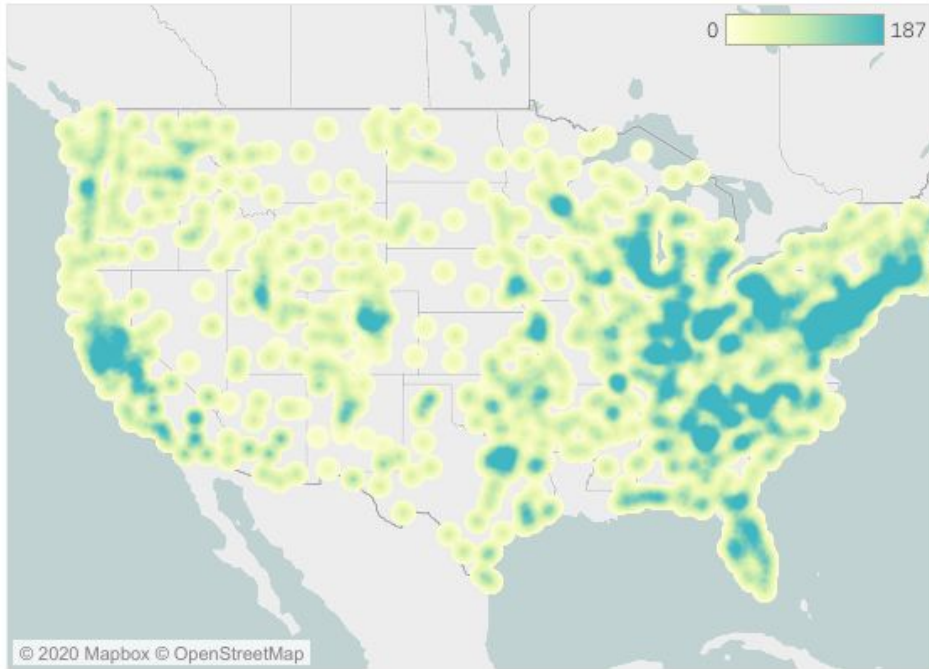


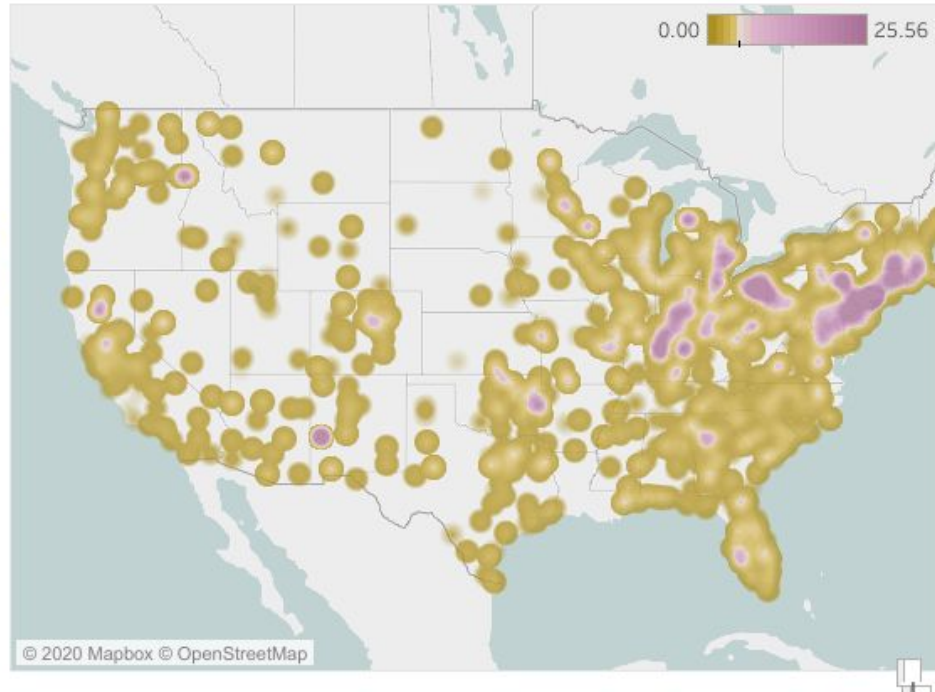
Pollution, Mortality Rate,  
Unemployment and Mobility:  
Bringing them all together

## Impact of Air Quality on Mortality Rate

90th Percentile AQI



Mortality Rate

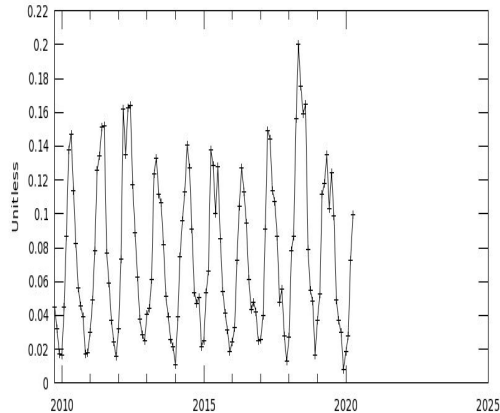


90th Percentile AQI: 90 percent of daily AQI values during the year were less than or equal to the 90th percentile value. This parameter is a measure of prolonged exposure to atmospheric pollutants of inhabitants of a particular region. Most regions with higher 90th percentile AQI in 2019 show higher mortality rate.

# Impact of lockdown on Air Quality

- ❖ Lockdown due to **COVID-19** has drastic **effects** on social and economic fronts, However, a rare positive has been the significant global decrease in air pollution levels.
- ❖ This map compares the Aerosol optical depth measured this year to the previous year.

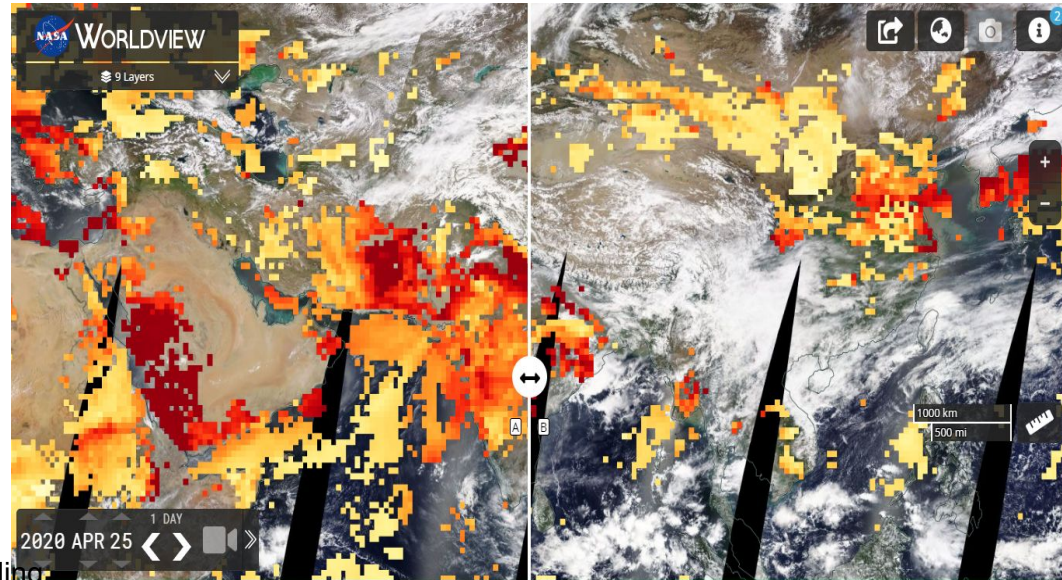
Time Series, Area-Averaged of Dust Extinction AOT 550 nm monthly 0.5 x 0.625 deg (MERPA-2 Model M2TMNXAER v5.12.4) over 2009-Oct - 2020-Apr, Region 67.5E, 7.0313N, 96.3281E, 37.9688N



- The user-selected region was defined by 67.5E, 7.0313N, 96.3281E, 37.9688N. The data grid also limits the analyzable region to the following bounding points: 67.5E, 7.5N, 96.25E, 37.5N. This analyzable region indicates the spatial limits of the sub-sampled granules that went into making this visualization result.

Source : NASA Earthdata

As seen there is temporary dip in PM emission from their pre-crisis levels, encouraging some to hope that our global society may indeed be able to reduce greenhouse gas emissions substantially over the long term to mitigate impending climate change and speed up the economic recovery after global crisis.

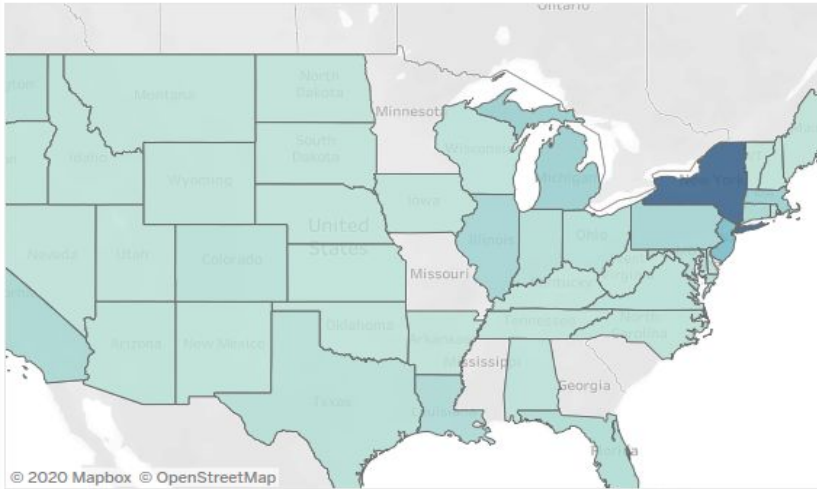


Source : NASA Worldview

Link : [Comparison Map](#)

# Impact of Covid-19 on Unemployment and mobility rate

Covid19 deaths in US



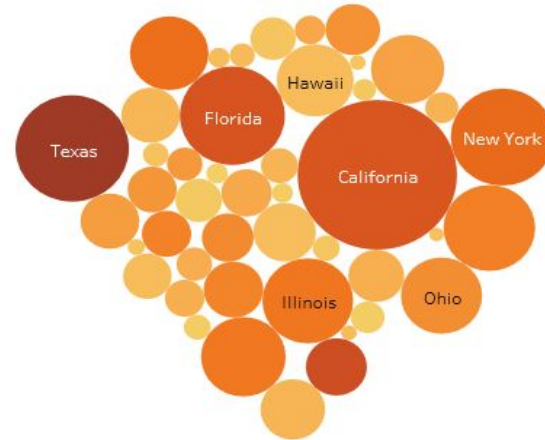
Deaths



Net Mobility



Unemployment and Mobility



Month of Date

- ☒ (All)
- ☒ Null
- ☒ February
- ☒ March
- ☒ April
- ☒ May

States

- ☒ (All)
- ☒ Null
- ☒ Alabama
- ☒ Alaska
- ☒ Arizona
- ☐ Arkansas

Link: [Comparison map](#)

This comparison shows the impact of covid19 on Unemployment and the reduction in mobility rate of the employees affected by the factors increasing covid19 deaths in the most affected urban regions of US.

## Conclusions

- Long-term average exposure to fine particulate matter ( $PM_{2.5}$ ) is associated with an increased risk of COVID-19 deaths. Hence, we see higher mortality rate in regions/countries with higher 90th Percentile AQI for the year 2019.
- In states like New York, California, Texas and Florida, we see a higher drop in mobility. These are also the states with higher unemployment rates. The connection between drop in mobility and unemployment rate is due to the high impact on the transportation and logistics industry during the lockdown.
- A significant global decrease in air pollution levels has been among the rare positives observed during the lockdown. Now that we have the unachievable, we look forward to a return-to-normalcy model that strikes a balance between Air Quality and urban life.
- As a next step, we intend to perform a detailed analysis using forecasting and simulation techniques to find time taken to restore the previous status in urban mobility and suggest a pragmatic balance between restoring urban life and keeping AQI at least 1-2% lower than the previous 5 year average.