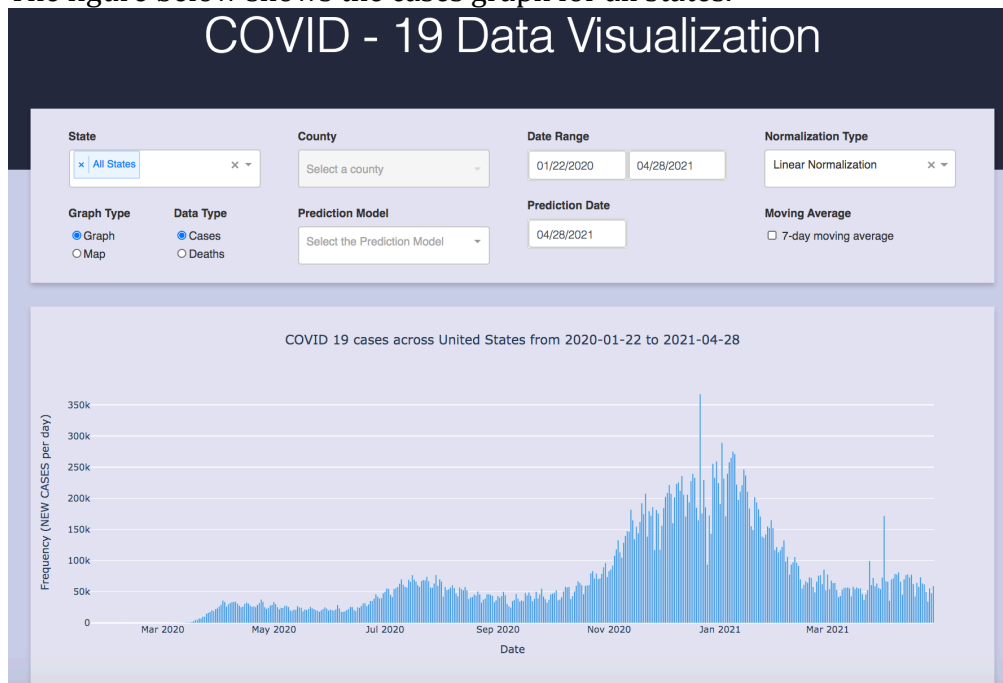


The main portion of stage IV that I worked on was creating functions to plot the linear and best non-linear models and predictions on the dashboard graph. This allowed for visualizations of the trends for new COVID-19 cases and deaths for the entire USA, each state, and each county within each state. It also allowed for selecting a date on the dashboard, and then plotting the prediction line for any location up until that date. This was only one of the functionalities of the dashboard. Members of my group worked on other aspects of the dashboard and we worked on some together.

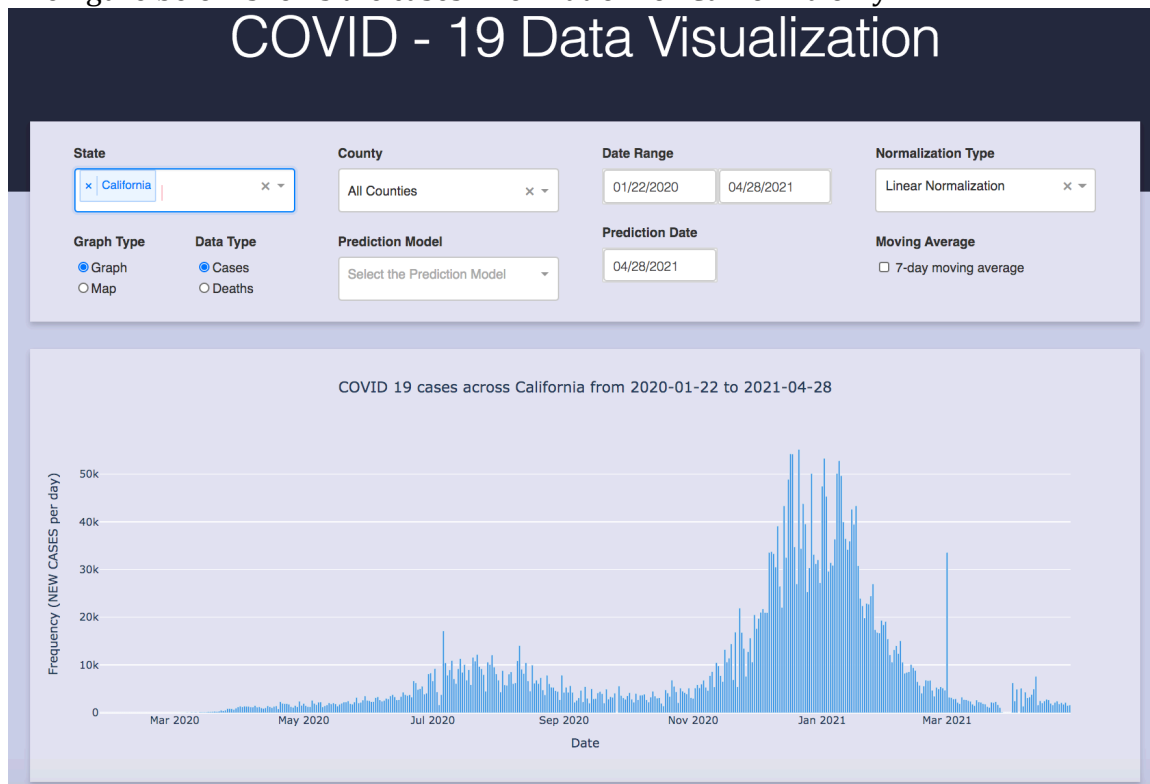
The dashboard was designed in a way that it starts off showing the cases for the entire USA. Here it is possible to change the graph to showing the deaths, select a date range to view either deaths or cases on, view linear or log normalization, look at linear or non-linear prediction models up until any date you choose, and view the 7-day moving average. It is also possible to choose a specific state in which to view all of these features. Along with the state you can choose from the counties within that state and view this information at a county level. Going back a little, when you choose the state, you can choose multiple states to view and compare their information. This automatically prevents the county selection from occurring, but keeps all other features.

On the dashboard, it is also possible to select the map view rather than the graph view. Doing so takes you to a map of the USA, which shows a county level heat map of either the normalized cases or the normalized deaths. Hovering over each county allows you to see the county name, the state the county is located in, the number of cases and normalized cases for the county, and the population of the county. The map allows you to clearly see highly affected areas within the county and within each state.

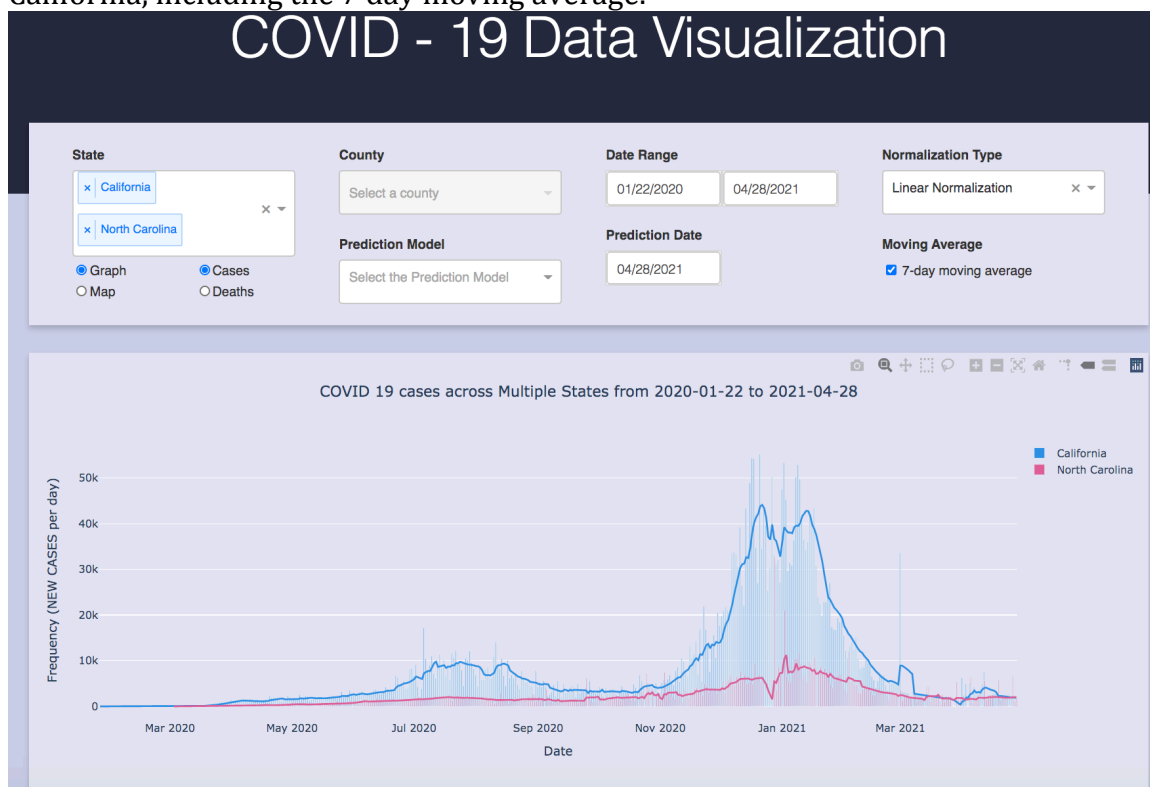
The figure below shows the cases graph for all states.



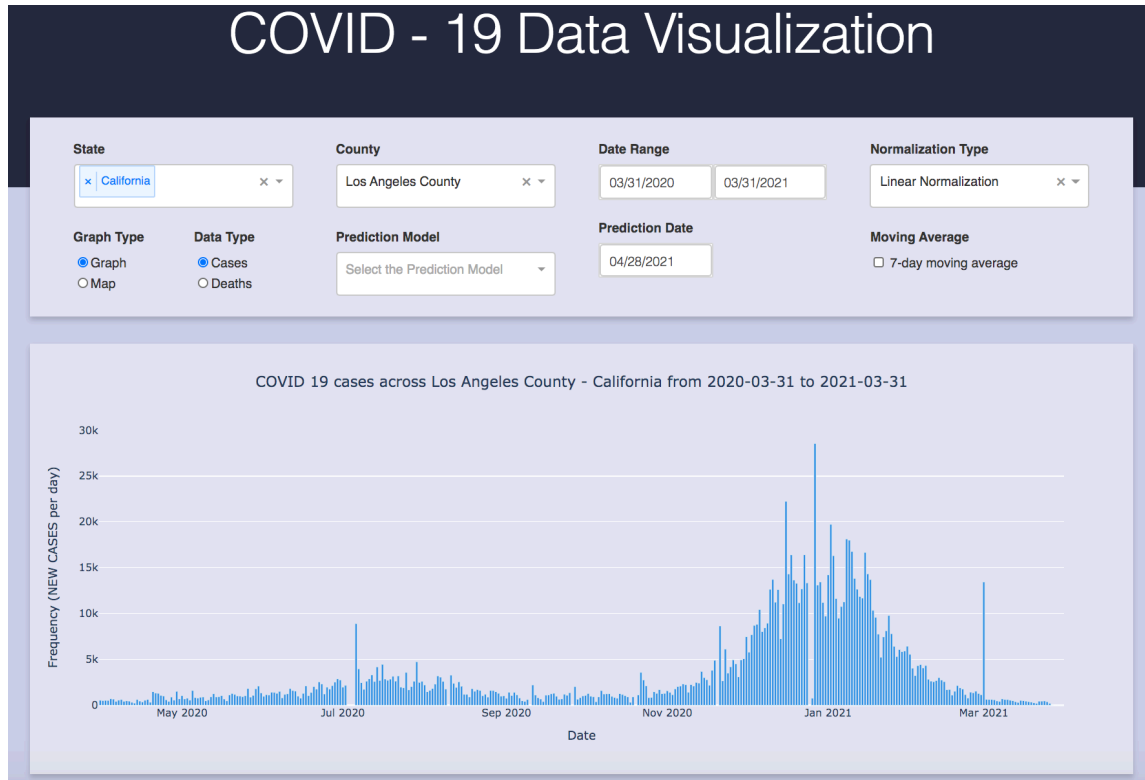
The figure below shows the cases information for California only.



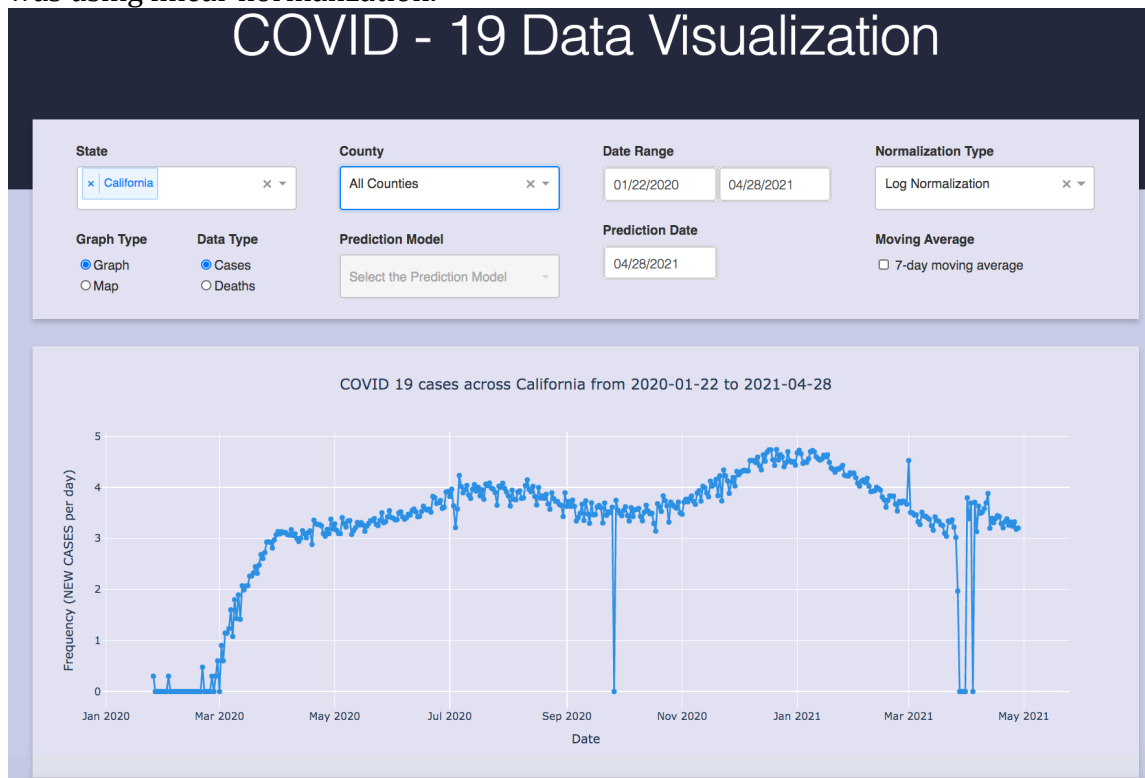
The figure below shows the comparison of cases data between North Carolina and California, including the 7 day moving average.



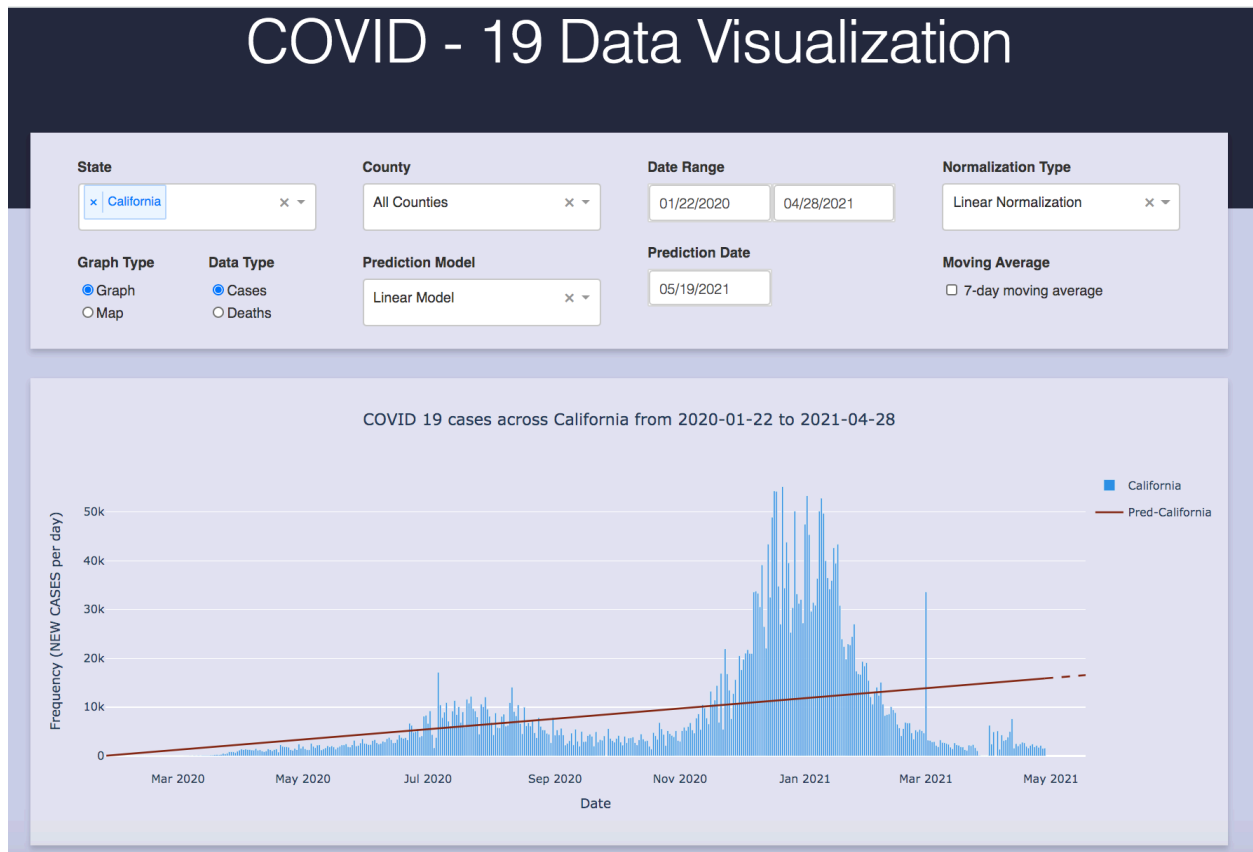
The figure below shows the cases information for Los Angeles County in California from March 31st 2020 to March 31st 2021.



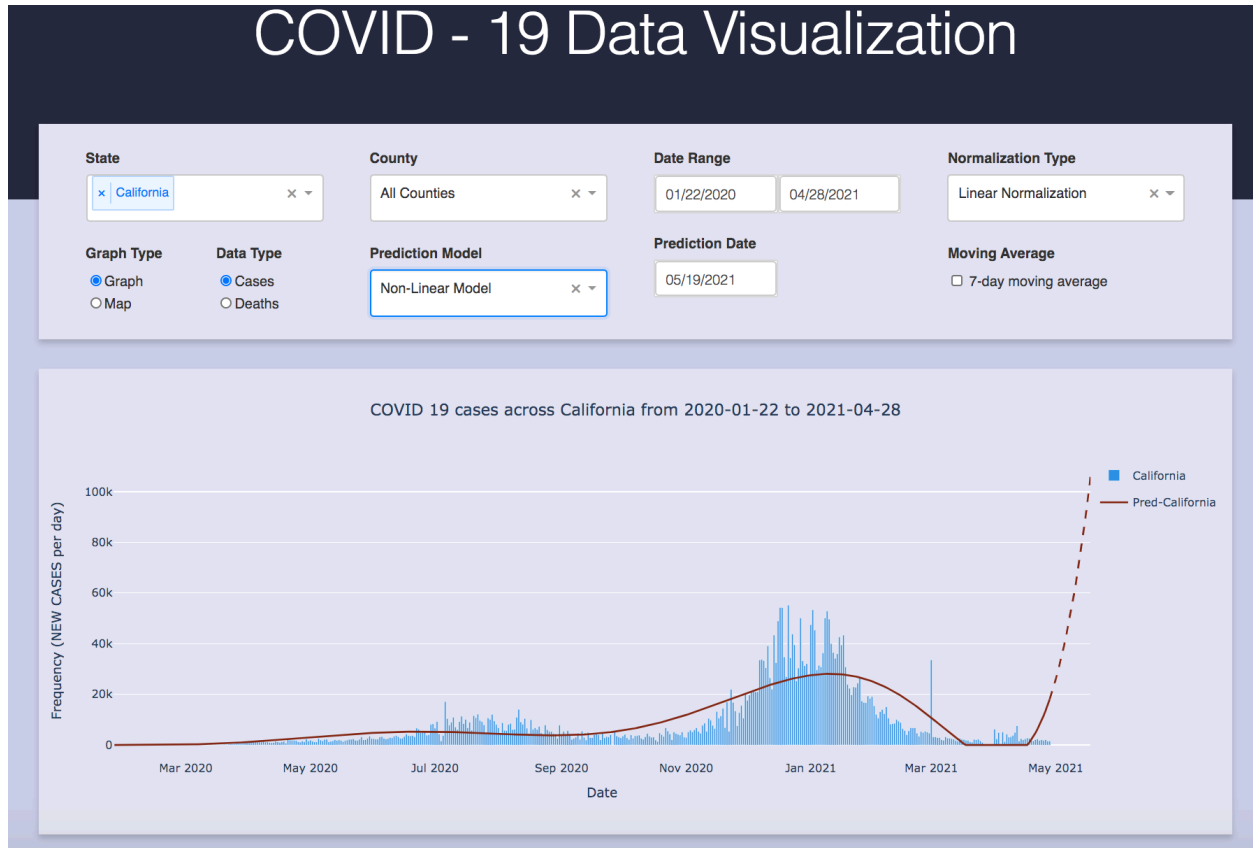
The figure below shows the log normalization for California cases. Everything previously was using linear normalization.



The figure below shows the linear prediction model for California cases until May 19th, 2021.

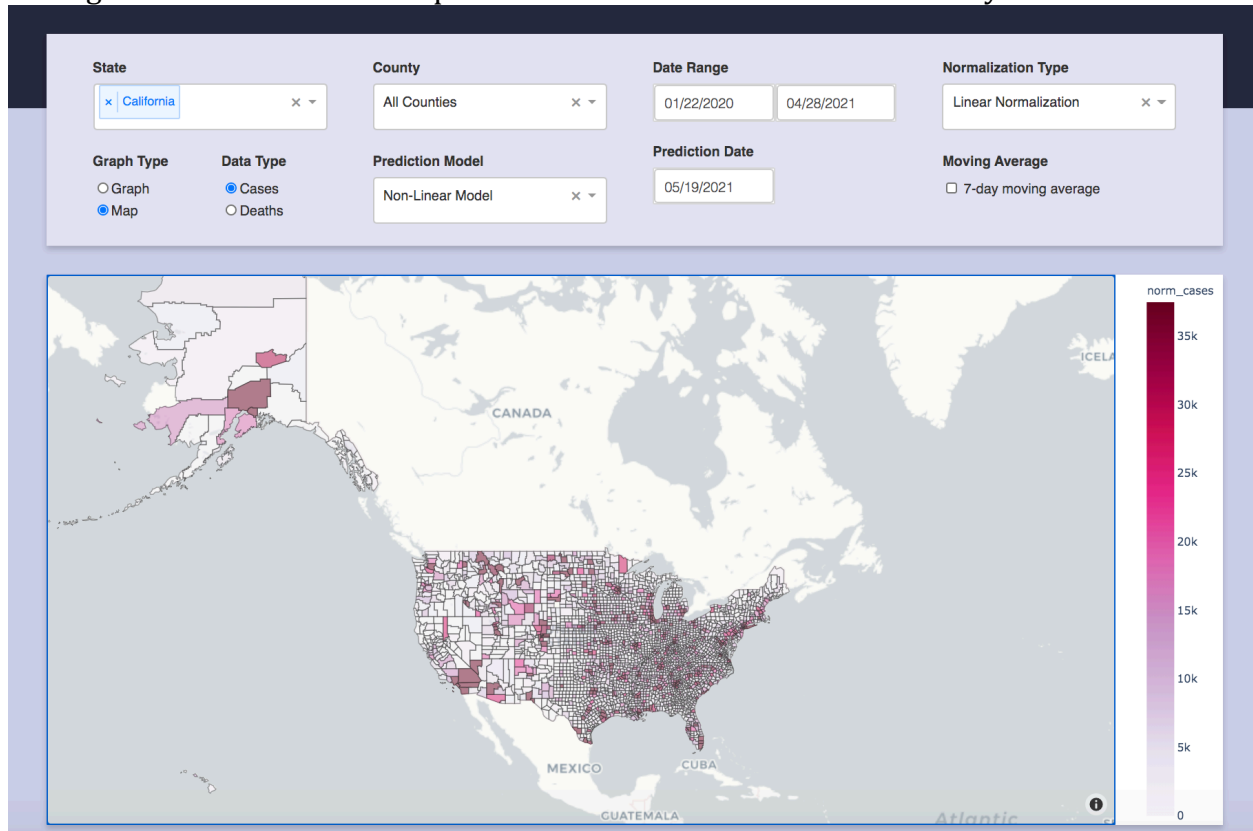


The figure below shows the non-linear prediction model for California cases until May 19th 2021.



All of the figures above show options that can be chosen for COVID cases, but these options are available for deaths as well.

The figure below shows the map for the COVID cases in the entire county.



The figure below shows the map of deaths for the entire country.

