Earth System Data Explorer: Creating an Animation & Line Plot of Your City

1. Go to Earth System Data Explorer on My NASA Data.
2. On the top left hand corner, select Data Set. Select Atmosphere > All Data > Atmospheric Chemistry > Monthly Tropospheric Concentration of CO2.
3. In a separate search window, type in **Google Maps**. It is now time to find the latitude and longitude of your city. Type in your city in the search engine bar. Once the map has zoomed in on your location, click on the center of the map to show the latitude and longitude values at the bottom of the screen. The first number is the latitude coordinate and the second number is the longitude coordinate. **Please note: A negative symbol in front of the latitude number indicates a southern latitude. A negative symbol in front of the longitude number indicates a western longitude.**

Ex. Suffolk, VA 36.710568°N, -76.639197°W
4. Now that you know the latitude and longitude coordinates of your city, you can use this information to create a box around your city in Earth System Data Explorer. In ESDE, go to the coordinate area below the mini map. Recall from the example that Suffolk, VA has a latitude and longitude value of 36.710568 °N, -76.639197 °W. To create a box in ESDE around your city’s coordinates, simply subtract and add 5 degrees from each coordinate value to create a range. For example, the latitude coordinate of Suffolk, VA is 36.710568 °N, so 41°N will be used as the northernmost boundary and 31°N will be used as the southernmost boundary. Type the northernmost boundary and southernmost boundary in the coordinates area below the mini map.

5. Next, input your longitude value by subtracting and adding 5 degrees to each coordinate value. In the example, Suffolk, VA has a longitude coordinate of -76.639197 °W. This means the longitude boundaries will be -81°W and -71°W. Please note: When you add a negative coordinate in ESDE, the system will automatically remove the negative sign and use the associated direction instead.
6. Now that all boundary values have been added, click on Update Chart above the mini map. By clicking the box next to Update Chart, it will update automatically each time you change a feature. You should now have a box that displays Monthly Tropospheric Concentration of CO2 around your city.

7. The next step is to create an animation of your city’s CO2 levels over time. Go to the top of the screen and select the Animate button. From there, you will go to a window displaying several different options. Click Ok at the bottom and ESDE will take you to a new window called Animation.
8. To get the full picture of changing CO2 levels over time in your city, keep the time range that is shown. At the frame selection, plot every 6 frames to display data every six months. Lastly, click *Submit*. Now the ESDE is going to be loading the information until it renders the entire time period selected. This may take several minutes. Once the rendering stops, the animation will begin moving. You now have an animation displaying rising CO2 levels of your city.

9. To create a line plot of rising CO2 levels in your city, go back to ESDE. Under the coordinate area, locate **Line Plots**. Select *Time* and the system should automatically update and change your map to a line plot.
10. The annotations window about the graph gives you a description of the line plot and indicates the units used for measurement.

For further information on how to input coordinates or create animations and line plots, please visit the following NASA tutorials:

- Using Latitude and Longitude Coordinates in the ESDE
- Creating Animations with the MND Earth System Data Explorer
- Using Data Analysis Tools with Earth System Data Explorer