Handout #1 An Introduction to Using Cal-Adapt

Watch this 6 minute instructional video by Dr. Mark Stemen for an orientation to Cal-Adapt.

1. Start with temperature. Go to **cal-adapt.org** and click on Annual Averages. You will land on the Maximum Temperature page.

2. First, you need to change the location. The location box is to the left of the graph. Click "change location".

3. Next, on 'Select boundary', click "Incorporated and Census Designated Places". Then in the search by address or place name bar, type in the name of your region and hit return.

4. Then click on the polygon (squiggly outline) for your region (the line should turn dark). Then click Update Chart.

5. Now you are on the average maximum page for your selected region. To get the average maximum temperature for 2050, you need to move the slide bars in the box "Modeled Projected Annual Mean for."

6. Right now it is for 2070-2099. To get and average for 2050, you need a ten-year range. So, you want to move the slide bars to 2045 and 2055. The new number is the average maximum temperature for 2050. You can show how much the climate has already changed in 2015 by moving the slide bars to 2010 and 2020.

7. Repeat the same process above to forecast minimum temperature average and average precipitation.

What is the difference between RCP scenarios?

The main driver of human-caused climate change is our emissions of carbon dioxide and other greenhouse gases into the atmosphere. Greenhouse gases are so called because they trap heat in the atmosphere, causing it to warm over time. Atmospheric warming in turn leads to other changes throughout the earth system. How much the climate changes in the future depends in large part on the amount of greenhouse gases we emit now and going forward. However, since our emissions of greenhouse gases depend on a variety of different social, political, and economic factors, we cannot be certain how they will change. But we can formulate educated guesses about how

greenhouse gas emissions might change, and use those scenarios to create future climate projections.

Each tool in Cal-Adapt shows outcomes for two different greenhouse gas scenarios: a high-emissions scenario in which greenhouse gas emissions continue to rise over the 21st century, and a low-emissions scenario in which greenhouse gas emissions level off around the middle of the 21st century and by the end of the century are lower than 1990 levels.

The two scenarios forecasted by the Cal-Adapt software are labeled as 'Representative Concentration Pathways' (RCP) 4.5 and 8.5. Under the RCP 4.5 scenario, emissions peak around mid-century at around 50% higher than 2000 levels and then decline rapidly over 30 years before stabilizing at half of 2000 levels. Under the RCP 8.5 scenario, CO_2 concentration continues on trend to about 520 ppm in 2070 and continues to increase but more slowly throughout the 21st century. Both futures are considered possible depending on how much action we take to mitigate (reduce) greenhouse gas emissions.

Addressing climate change will be costly, and the costs often keep us from acting. By comparing the two scenarios, we can more easily measure the cost of inaction, and thus build public support for action on climate change by supporting mitigation measures that will reduce greenhouse gas emissions in the future.

Comparing the two scenarios also reveals a key feature of climate change. You should notice that the two scenarios do not really diverge until 2035 because greenhouse gasses take about fifteen years from release to have a noticeable warming effect. So, that means we also need to begin adapting to a changing climate regardless.