WHY FOCUS ON CLIMATE CHANGE?

Climate change is a significant challenge today. Educators have the potential to inspire decisions, actions, and change. The information in these modules has been crafted to enhance your understanding of the key scientific elements of climate change, and provide resources for you to bring into the classroom to help students understand not only the urgent need for change, but also the opportunity to be part of the transformation toward sustainability.

The purpose of this module is to draw attention to the urgency of the climate change challenge.

The two videos below provide an overview of the issues of climate change.

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Try watching this video on www.youtube.com, or enable JavaScript if it is disabled in your browser.
CLIMATE TRENDS

Scientists have been measuring and recording global temperatures for well over a century. The graphic below from the Intergovernmental Panel on Climate Change (IPCC) shows the observed globally averaged combined land and ocean surface temperature anomaly from 1850 to 2012 from three data sets. [An anomaly is the deviation from what is standard or expected.]

Figure SPM.1: Observed globally averaged combined land and ocean surface temperature anomaly 1850-2012

This graph uses the average temperature of land and ocean (in Celsius) observed during 1961 to 1990 as the standard - represented by 0.0 on the left side of the graph.
Important elements to consider:
- The chart is based upon observed data, not predictions.
- The standard was calculated during a period of thirty years (highlighted by a red horizontal line added to the graph) and after warming trends were already observed.
- For reference, note that a 0.6 increase or decrease on the Celsius scale is equivalent to a 1.08 increase or decrease on the Fahrenheit scale.

The video below is another way to understand the information provided in the graphic above.

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The increase in atmospheric carbon dioxide (CO₂) levels described in the video above are illustrated in the chart below. The top chart shows the parts per million (ppm) of atmospheric CO₂ from 1958 through 2012. In 2015, we exceeded 400 ppm of atmospheric CO₂ as a monthly average.
As you can see in the IPCC figure above, in conjunction with the increase in atmospheric carbon dioxide, CO₂ absorption levels in the oceans have increased. Approximately one fourth of our total carbon dioxide emissions are absorbed by the oceans. Increased levels of CO₂ in seawater lowers pH values of the water resulting in what is known as ocean acidification. This acidification is problematic because acidic ocean water results in fewer carbonate ions available for use by marine organisms (e.g. oysters, clams, corals, plankton) that build skeletons and shells out of calcium carbonate. The changing chemistry of the oceans puts marine ecosystems at risk. (National Oceanic and Atmospheric Administration)

The video below provides a summary of the key issues related to climate change and describes how we can change our future by investing in, and implementing, solutions now.
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In-Class Activity

The Department of Geosciences at Georgia State University has published a set of labs that may be helpful. Of particular interest is Lab 8 Recent Climate Variability & Change (Part 1)
http://sites.gsu.edu/geog1112/lab8-1/

Why Focus On Climate Change - 1 - PowerPoint Presentation


NASA website on climate science http://climate.nasa.gov/

A University of British Columbia online course http://www.youtube.com/user/climateliteracy

Of particular interest related to this section is Module 2.5 Climate Change in the Recent Past http://www.youtube.com/watch?v=W5wgReG5Vc

Pacific Institute for Climate Solutions Examples of Global Warming (7:08 minutes) http://www.youtube.com/watch?v=MeBnenUq0Dk

