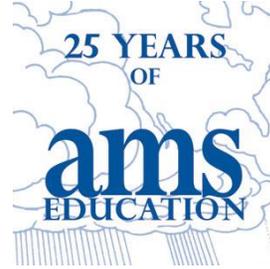


Climate at a Glance: From Local to National Scale



NOAA National Centers for
Environmental Information



American Meteorological Society
Education Program

Activity Sources: American Meteorological Society (AMS), in cooperation with NOAA's National Centers for Environmental Information (NCEI). Adapted with permission.

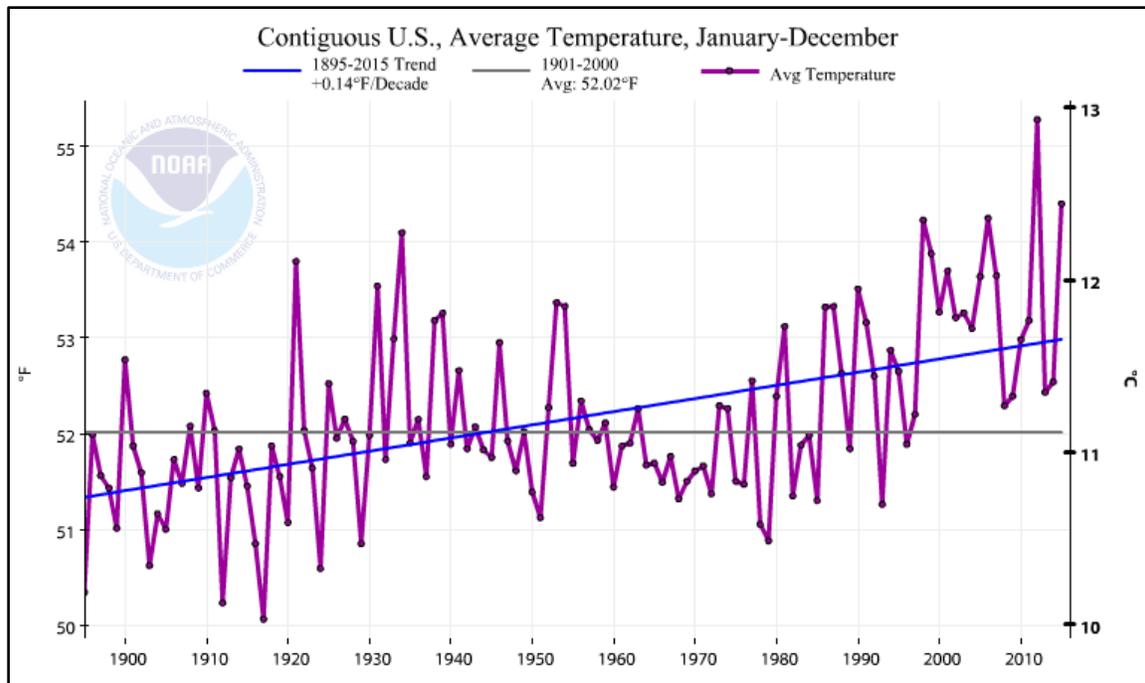
Introduction: Climate, traditionally defined as the average of weather and the extremes at a particular location over a period of time, has expanded in meaning to describe the state of the climate system as a whole. The state of Earth's climate system, composed of the atmosphere, hydrosphere, cryosphere, lithosphere, and biosphere, results from internal and external influences, mutual interactions, and feedbacks. Climate is fundamentally the journey of the Sun's energy received on Earth as it is deflected, stored, transformed, put to work, and eventually emitted back to space.

Climate, climate variability, and climate change studies require knowledge of the state of Earth's climate system—past and current. The U.S. National Oceanic and Atmospheric Administration's National Centers for Environmental Information (NOAA NCEI) has made U.S. climatological data easily available via its website **Climate at a Glance** (CAG). CAG is designed for near real-time analysis of monthly temperature and precipitation data at hundreds of locations across the U.S., and it is intended for the study of climate variability and climate change.

Materials: Computer with Internet access.

Procedure:

1. Go online to **Climate at a Glance** (CAG) at <https://www.ncdc.noaa.gov/cag/>.
2. In the **Times Series** template that appears (already set for "Average Temperature"), go to the Time Scale drop-down box and click on "Annual." Under the Options heading to the right, check the Display Trend box. Then, scroll down and click on the "**Plot**" button. Is the large graph that appears (scrolling down if necessary) the same as the graph shown below? If not, try again.



The graph displays the average annual temperatures of the 48 contiguous states of the U.S. from 1895 to 2015. The black horizontal line marks the 1901–2000 average annual temperature, which was 52.02 °F. The sloping blue line shows the overall trend in temperature change over the 1895–2015 time period. The temperature increase over the 120 years of record was about 1.7 F degrees.

3. Temperature trend (i.e., change in temperature per decade) is given in the graph to the left under the title. Over the **[(1895–2015)(1901–2000)]** time period the trend was +0.14 F degree per decade.
4. To find average annual temperature information at a location near you, return to the CAG Time Series template. Key in “Annual,” and in the State/Region drop-down box, select your state. Then, in the Climate Division/City drop-down box, select the location nearest you. Click on “**Plot**.” In the graph that appears, compare your temperature data with those plotted for the contiguous U.S. average annual temperature graph. Try other locations. Do they report identical or different climate conditions?
5. Explore CAG. Return to the CAG Time Series template. In the Parameter drop-down box, select “Precipitation”. Select “Annual” in the Time Scale box. In the State/Region box, select “Contiguous U.S.” Be sure that under the Options heading to the right, the Display Trend box is checked. Then, click on the “**Plot**” button. What does the trend line reveal about annual precipitation across the U.S.? Call up various locations around the country, looking for similarities and differences.

Summary: Now that you have been introduced to CAG, it is time to investigate different climate parameters at the different locations (station, climate division, state, climate region, contiguous U.S.) on different time scales (monthly, seasonal, annual, decadal, entire period of record), while also learning about climate differences around the country due to variations in recorded climatic conditions.

Electronic copy of this activity is available at <https://ametsoc.org/amsedu/cag.pdf>

Grade Level: 6, 7, 8, 9, 10, 11, 12. Tags: activity, climate, atmosphere. Categories: Atmosphere: Climate and Weather, Human Dimension: Environmental Impacts, Human Dimension: Technology, Hydrosphere: Climate and Weather, Skill Building: Methodology and Analyses.