

Introduction to Arctic Weather

This lesson provides a structured way for students to become familiar with Polar WRF images on the BPRC website, the graphics, and the terminology and symbols used. Individual or group investigations can be developed once this familiarity is gained.

Students may elect to investigate temperature or pressure, or both, depending on their areas of interest. Some students may be particularly interested by the [animated pressure maps](#) on the BPRC website. The animation is only available for the current day, but it can be used to illustrate general features of air circulation in the Arctic region and may serve as an interest "hook" if a particularly high- or low-pressure area is active in the region at the time.

Learning Objectives

Using images from the Byrd Polar Research Center's Polar Frontier Project, students will:

- 1) Become familiar with the geographic region shown in the maps (Worksheet 1).
 - a) Label the countries on the map.
 - b) Label the oceans and seas, and the major surface currents in each.
 - c) Label the large lakes on each continent.
 - d) Sketch the major rivers that empty into the Arctic Ocean.
 - e) Label the parallels (latitude lines).
 - f) Label the North Pole.
- 2) Become familiar with Coordinated Universal Time (UTC).
 - a) What is UTC? See: <http://www.timeanddate.com/worldclock/city.html?n=1440>
 - b) How do you adjust UTC for your location?
- 3) Locate National Weather Service Forecast Office websites for three locations of interest in a part of the U.S. shown on the Polar WRF maps.
 - a) Name 3 locations, states, or regions that you would like to monitor.
 - b) List the URLs that provide weather data for those locations.
- 4) Become familiar with the temperature ranges shown in the color key.
 - a) What temperature range is represented by the white area on the map?
 - b) What temperature range is represented by pink?
 - c) What are the warmest and coldest temperatures shown for a selected map?
- 5) Become familiar with air pressure systems and *isobars* (lines of equal air pressure).
 - a) What units are being used on the maps? _____
See: <http://www.theweatherprediction.com/habyhints2/410/>
 - b) Determine the "lowest low" and the "highest high" on a map of air pressure.
 - c) What is the difference in pressure between isobars on slp maps? _____
 - d) Explain why isobars cannot cross each other.
- 6) Investigate actual and forecast weather conditions for a specific U.S. location in the area shown on the Polar WRF graphics and within a specific set of dates, comparing the accuracy of the Polar WRF model to the reports issued by the National Weather Service Forecast Office for that location

More maps are available from: <http://polarmet.osu.edu/PFP/images/>