

# Protocols



## **[Selecting and Documenting Your Atmosphere Study Site](#)**

Instructions on how to select the best site for making atmospheric observations, setting up and documenting your atmosphere study site.

## **[Instrument Construction: Instrument Shelter](#)**

Instructions for building an atmosphere instrument shelter.

## **[Instrument Construction: Snowboard](#)**

Instructions for making a snowboard for measuring solid precipitation.

## **[Instrument Construction: Surface Ozone](#)**

Instructions for making an ozone measurement station and wind direction instrument.

## **[Cloud Protocols](#)**

Students estimate the amount of cloud and contrail cover, observe which types of clouds are visible, and count the number of each type of contrail.

## **[Aerosols Protocol](#)**

Students use a red/green sun photometer to measure the amount of sunlight reaching the ground when clouds do not cover the sun.

## **[Water Vapor Protocol](#)**

Students use a near-infrared sun photometer to measure the amount of sunlight reaching the ground at wavelengths that are correlated to water vapor.

## **[Relative Humidity Protocol](#)**

Students measure the relative humidity using either a digital hygrometer or a sling psychrometer.

### **Precipitation Protocols**

Students measure daily rainfall using a rain gauge, daily snowfall using a snow board, total snow accumulation on the ground, the equivalent depth of rain for both new snow and snow pack, and use techniques from the *Hydrology Investigation* to measure pH of rain and melted snow.

### **Digital Multi-Day Max/Min/Current Air and Soil Temperature**

Students use a digital multi-day maximum/minimum thermometer mounted in their instrument shelter to measure the maximum and minimum air and soil temperatures for up to six previous 24-hour periods.

### **Maximum, Minimum, and Current Temperature Protocol**

Students use a maximum/minimum thermometer mounted in their instrument shelter to measure current temperature and the maximum and minimum temperatures for the previous 24 hours. Students also may collect current temperature only.

### **Surface Temperature Protocol**

Students use an infrared thermometer (IRT) to measure the temperature of Earth's surface.

### **Ozone Protocol**

Students expose a chemically sensitive strip to the air for an hour and determine the amount of ozone present using an ozone strip reader.

### **Barometric Pressure Protocol**

Students use an aneroid barometer to measure barometric pressure in support of the *Aerosols* and *Water Vapor Protocols*.

### **Automated Weather Station Protocols**

Students use an automated weather station ([Davis](#), [RainWise](#), or [WeatherHawk](#)) to measure barometric pressure, relative humidity, rain rate and amount, air temperature, and wind speed and direction every 15 minutes.

### **HOBO® Data Logger Protocol**

Students use a data logger and temperature sensors to measure air temperature and soil temperature at 5, 10, and 50 centimeter depths every 15 minutes for extended time periods.

### **AWS Earth Networks® Schools Protocol**

Students define their school's AWS Earth Networks® station as a GLOBE Atmosphere Study Site and arrange for GLOBE to retrieve a copy of the data from their station to include in the GLOBE data archive.