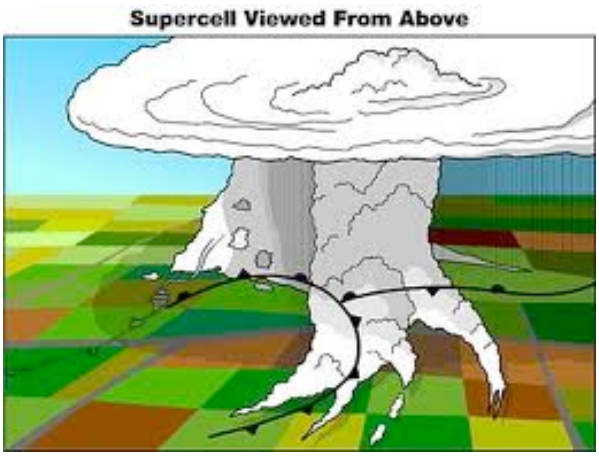
METEOROLOGY: SEVERE STORMS

1. **DESCRIPTION**: This event emphasizes the use of process skills within designated meteorological topics. Skills to be addressed and evaluated may include generating inferences, making predictions, problem solving, observing, formulating and evaluating hypotheses, and analyzing and interpreting data.

   A TEAM OF UP TO: 2 **APPROXIMATE TIME**: 50 Minutes

2. **EVENT PARAMETERS**: Each team may bring one non-programmable calculator and one single 8½ x 11 sheet of paper with notes (front and back, hand written or computer generated).

3. **THE COMPETITION: Questions will be from the following topics**:
   a. Air masses, fronts, cyclones, and anticyclones, weather maps, weather stations, global circulation patterns, semi-permanent highs and lows, and scales of atmospheric motion.
   b. Thunderstorms, supercell thunderstorms; life cycles, characteristics, structure and hazards
   c. Squall lines, mesoscale convective complexes, dry line thunderstorms
   d. Straight line winds, downdrafts, downbursts, gust fronts, microbursts, derechos
   e. Electrification of clouds, lightning strokes, sprites and jets, lightning direction finders
   f. Tornados: life cycles, characteristics, structure, and hazards, Fujita & E-Fujita Scales
   g. Doppler radar interpretation of thunderstorms and tornados (bow front, TVS etc.)
   h. Identify and interpret cloud types associated with severe storms
   i. Mid-latitude cyclones: life cycles, characteristics, structure, and hazards; surface weather maps
   j. Hurricanes: life cycles, characteristics, structure, hazards, origin/distribution, Saffir-Simpson Scale
   k. Hurricane satellite imagery and Doppler imagery, notable hurricanes (Katrina, Andrew etc.)
   l. Weather hazards (hail, flooding, winds, storm surges, etc.), NOAA warnings and watches



4. **REPRESENTATIVE ACTIVITIES:** Participants may be asked to:
   a. Interpret surface weather stations, isobars, fronts, radar data, Doppler radar imagery, or satellite imagery relating to associated severe storms
   b. Demonstrate knowledge of the life cycle of different severe storms and be able to associate those conditions with radar and frontal data
   c. Relate specific hazardous conditions of severe storms and interpret their significance (i.e., Hurricanes and storm surges)
   d. Using Doppler radar and satellite images to interpret the three-dimensional structure of storms

5. **SCORING**: Points will be awarded for the quality and accuracy of responses, the quality of supporting reasoning, and the proper use of scientific technique. Highest score wins. A minimum of five pre-identified questions will be used as tiebreakers.

Recommended Resources: All reference and training resources including the **Audubon Weather (Meteorology) Guide and Bio/Earth CD** are available on the Official Science Olympiad Store and Website at http://www.soinc.org.