REMOTE SENSING

Read the General Rules in the manuals and on www.soinc.org as they apply to every event.

1. **DESCRIPTION**: Participants will use remote sensing imagery, science and mathematical process skills to complete tasks related to an understanding of the causes and consequences of global warming.

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

2. **EVENT PARAMETERS**: Each team may bring five 8.5" x 11" two-sided sheets of paper containing any information from any source. Each participant may bring any kind of (non-graphing) calculator, but no other resources.

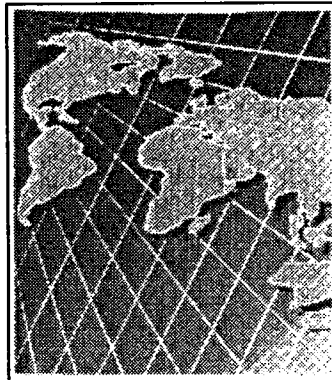3. **THE COMPETITION**: The event will be organized into a series of three tasks (a-c) including:

   a. **Causes of and contributors to Global Warming:** Students will analyze and interpret remote sensing images related to the causes of global warming.

   b. **Consequences of and evidence for Global Warming:** Students will analyze and interpret remote sensing images related to the consequences of global warming.

   c. **Data Analysis:** Given problems or a data set, students will use statistical analysis or other mathematical computations to analyze or express quantitative data related to global warming.

   d. Students should understand concepts and terms related to the causes and consequences of global warming including: radiative balance of the atmosphere, sources of greenhouse gasses, and changes in surface temperature, sea ice distribution, the volume of land ice, and plant growth.

   e. Students should be familiar with the principles of satellite imagery, including orbital missions and sensor systems related to climate change research (particularly radiometric measurements of temperatures, greenhouse gasses, land color and sea ice, plus altimetric measurements of land, ice and sea-level), principles of digital image processing and the electromagnetic spectrum.

   f. Students may be asked to interpret digital data presented numerically in a grid.

4. **SAMPLE ACTIVITIES:**

   a. Compare the area of glacial ice in a given location with recorded amounts in previous years.
   b. Evaluate area damaged by deforestation or forest fires.
   c. Compare potential effects of sea-level change through interpretations of coastal topographic maps.

5. **SCORING:** Teams with the highest number of correct answers will be the winners. Data Analysis task will be used as a tiebreaker.

RESOURCES: Science Olympiad Remote Sensing CD.

NATIONAL SCIENCE EDUCATION STANDARDS: Physical Science; Interactions of energy and matter; Science in Personal/Social Perspectives: Science and technology in global challenges.