MATH APPLICATION ACTIVITY:
Using Sound Waves to Study Climate Change

OBJECTIVES: Students will:
- Describe the characteristics of sound waves and their movement through different mediums;
- Analyze the relationship between the speed of sound in water and temperature;
- Illustrate the uses of acoustic monitoring in global change research;

MATERIALS:
- Student Sheets,
- calculator,
- paper/pencil, ruler,
- world atlas,
- graph paper;

PROCEDURE:
1. Read and discuss the background information on pages 1-2.
2. Students should try calculating the answers to the problems in ACTIVITY 1 using the information found in the reading selection.
3. Using the information in DATA TABLE 1, students should plot a line graph showing how the speed of sound in air varies with temperature. They should then answer the ANALYSIS questions for this section.
4. Direct students to DATA TABLE 2. Review the layout and the information included.
   - Instruct students to round the numbers in the Depth column (A) and record them in column B.
   - Instruct students to round the number Velocity column (C) to the nearest whole number and record them in column (D).
Instruct students to complete column E in the DATA TABLE using the following procedure:

1. Refer to the Temperature given for 44.60 m depth (5°C).
2. Use the following information and calculate the water temperature for each depth based on the sound velocities.
   
   NOTE: Water temperature increases 5°C for every 23 m/sec increase in the velocity of sound.

3. Record your computations in the column E.
4. Answer the ANALYSIS questions using information from the reading and your data.