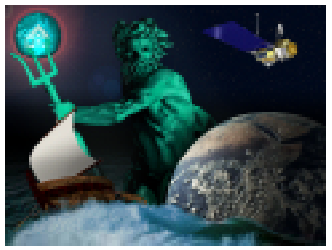
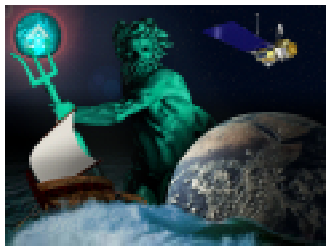
EDUCATION VIA CD-ROM



- Packed full of oceans and climate information, movies, ocean expeditions, interactive games and tutorials, teacher materials and classroom activities.
- Designed for middle school science students, it also can be used at many levels including the university undergraduate level.
- Produced by the TOPEX/Poseidon project at NASA's Jet Propulsion Laboratory.

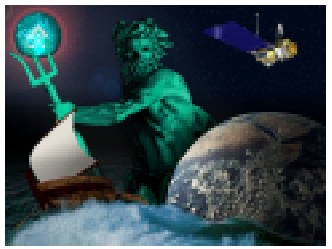
OVERVIEW



Three sections:

- 'Mission' - basics of orbits, measurement systems and satellites including the TOPEX/Poseidon, (includes animations, learning games).
- 'Guide' - teaching materials including classroom activities, background materials, images and animations.
- 'Expedition' - the 1997 El Niño, oceanographers and their work, and ocean science research cruise planning.

MAP FOR CD-ROM



- Map gives an overview of the content.
- Most boxes contain multiple elements.
- The 'Guide' section has it's own map.

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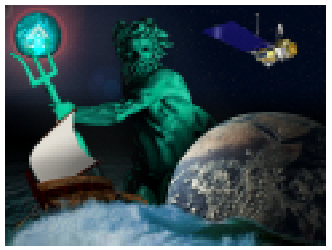
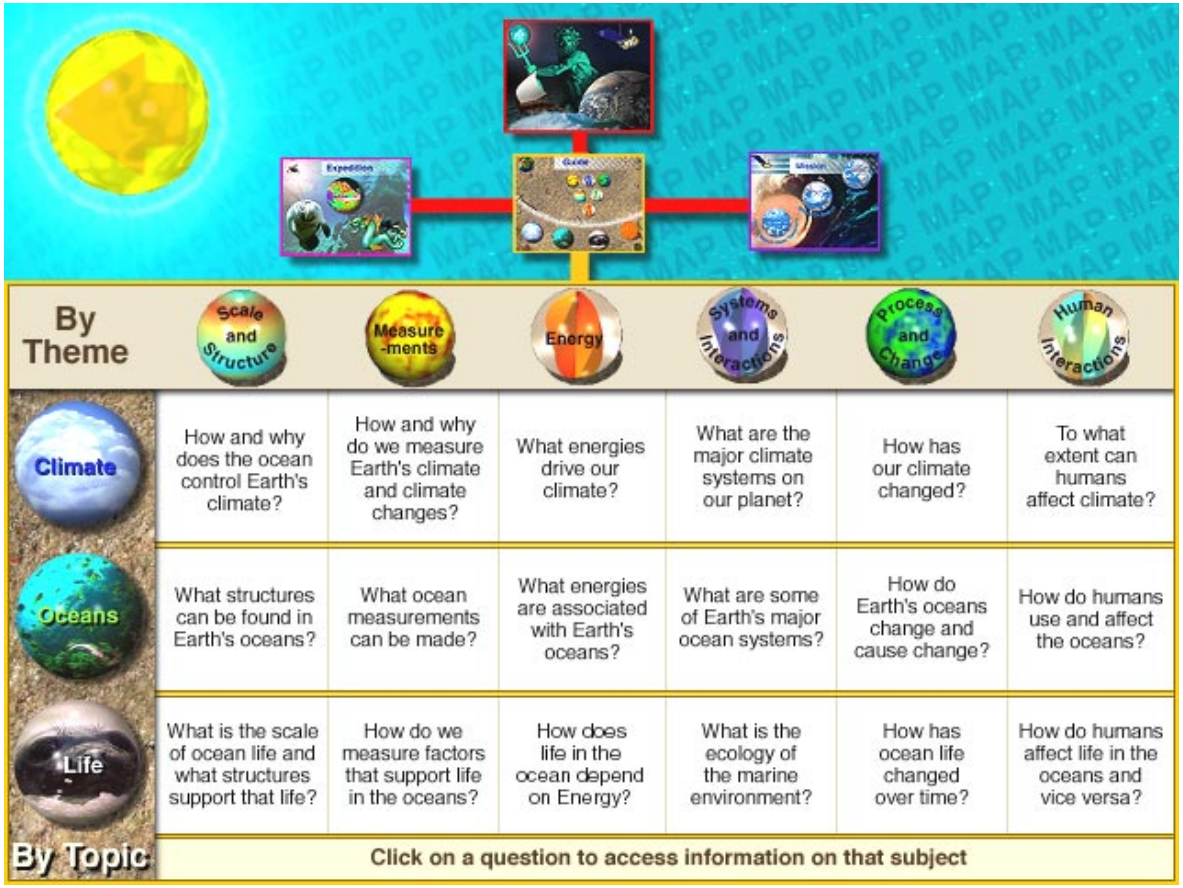
'GUIDE' MAP





The graphic for this section is shown below. Click to access the unit of your choice.

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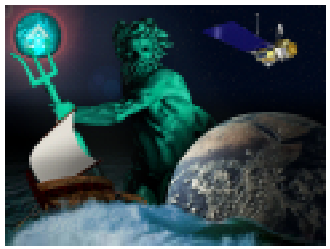
OCEANS TOPICS



For each topic, there are five themes, each of which contains teaching materials of direct use to educators and students.

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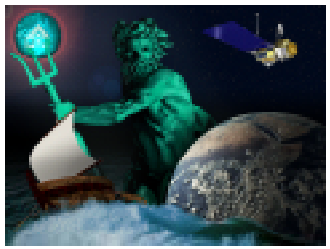
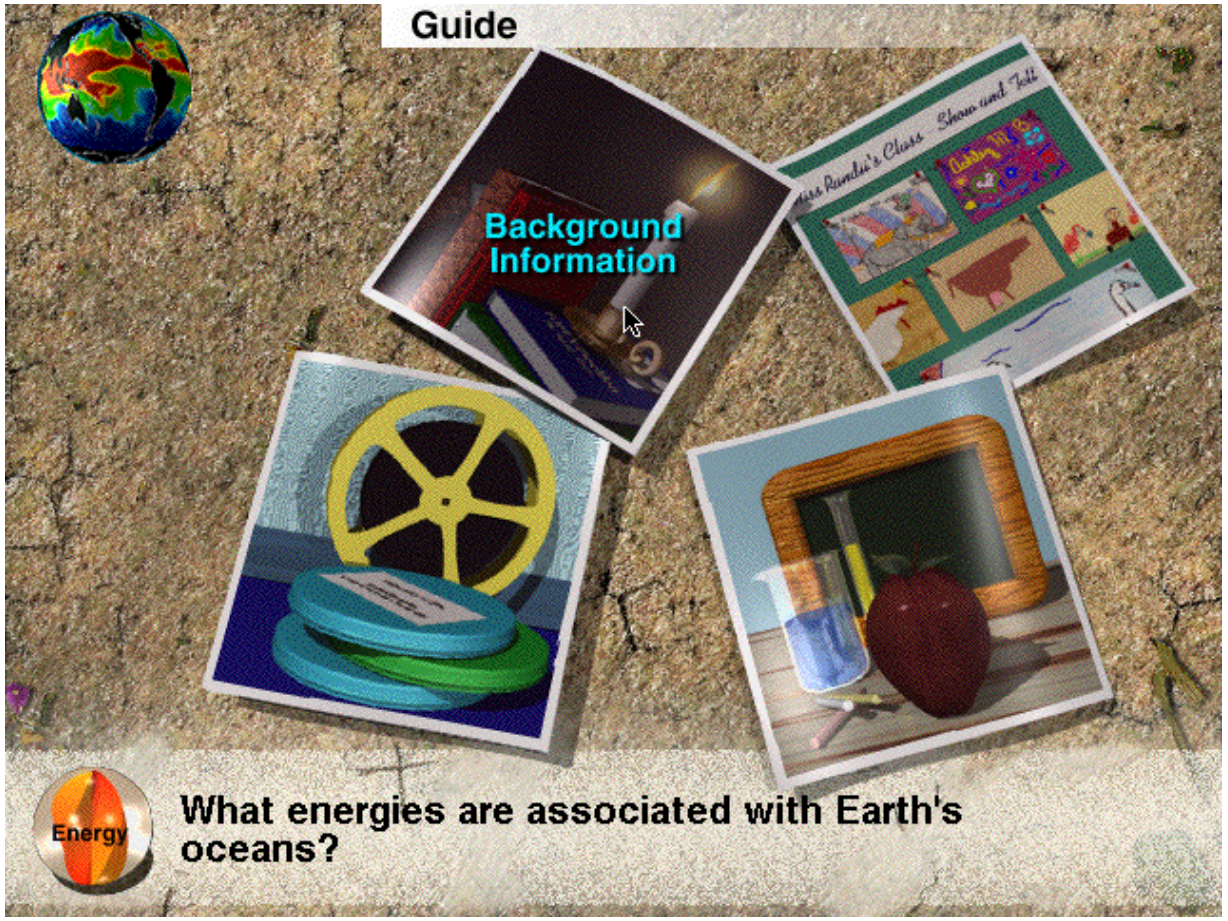
MATERIALS IN THE 18 SITES





- Within each of the 18 sites there are four types of materials:
  - Background information
  - Images
  - Classroom activities
  - Movies
- Classroom activities were developed by educational institutes and individual educators.

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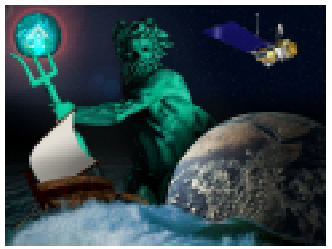
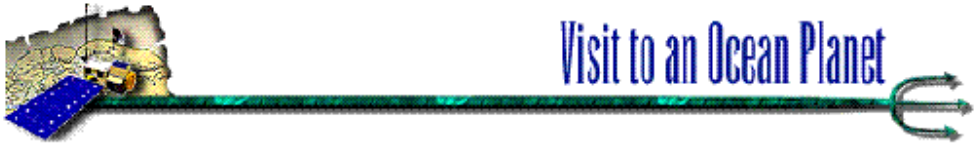
BACKGROUND MATERIALS AND CLASSROOM ACTIVITIES





WHAT ENERGIES DRIVE OUR CLIMATE?

The primary energy source driving Earth's climate is sunlight. Some of the sunlight that reaches Earth is reflected back to space, mostly by clouds, but much of it is absorbed by the land and ocean in the tropics. Heat is lost by radiation. Overall, the tropics absorb more heat than they lose, and the poles lose more heat than they absorb. The imbalance between poles and equator drives the planetary heat engine. That energy is redistributed within the climate system through various processes. One of the most important is *convection*, which drives the circulation of the atmosphere on both local and global scales. Solar energy is also distributed through ocean circulation and winds. The atmospheric and oceanic systems are intimately connected. The atmosphere drives ocean currents, and the heat supplied from the ocean is vital to the release of energy into the atmosphere. Atmospheric wind patterns govern oceanic flows, which in turn influence where and how much heat is released into the atmosphere. Furthermore, atmospheric cloud cover determines where and how much the ocean will be heated.

This theme (*Climate - Energy*) discusses the energy that drives climate and some of the ways that energy is redistributed throughout the atmospheric and oceanic systems.

Related Themes:

- Earth's hydrologic cycle and the properties of water are addressed in *Climate - Scale and Structure.*
- Climate changes are examined in *Climate - Process and Change.*
- How ocean circulation, upwelling, and downwelling affect climate is explained in *Climate - Systems and Interactions.*
- How satellites are used to study climate is presented in *Climate - Measurements.*
- Seasonal changes in sea level are included in *Oceans - Process and Change.*
- The Coriolis Effect is thoroughly covered in *Oceans - Energy.*
- Geostrophic ocean circulation is discussed in *Oceans - Systems and Interactions.*

Related Activities:

Background materials and classroom activities are on the CD-ROM as PDF files that can be readily printed. Images in the image section can also be printed.

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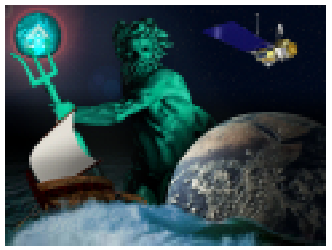
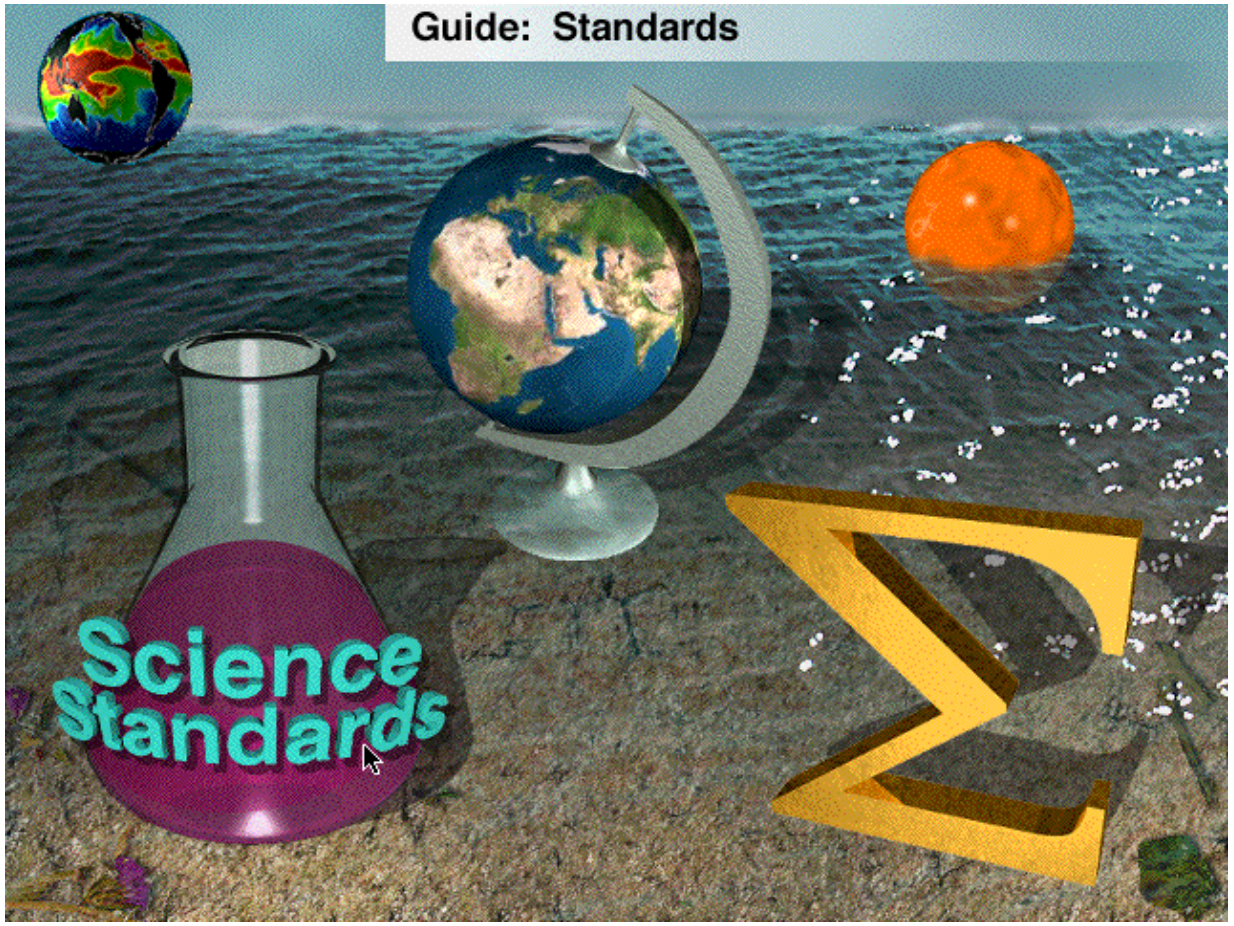
STANDARDS ALIGNMENT





- Materials in the Guide section are aligned with the National Education standards.
- Green 'page' symbols, in background and classroom activity files, link to text boxes that provide standards information.

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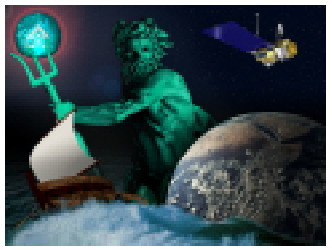
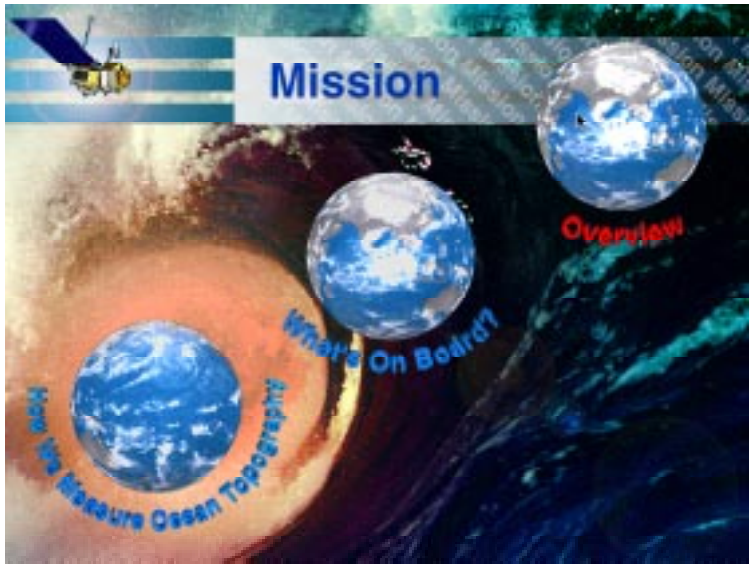
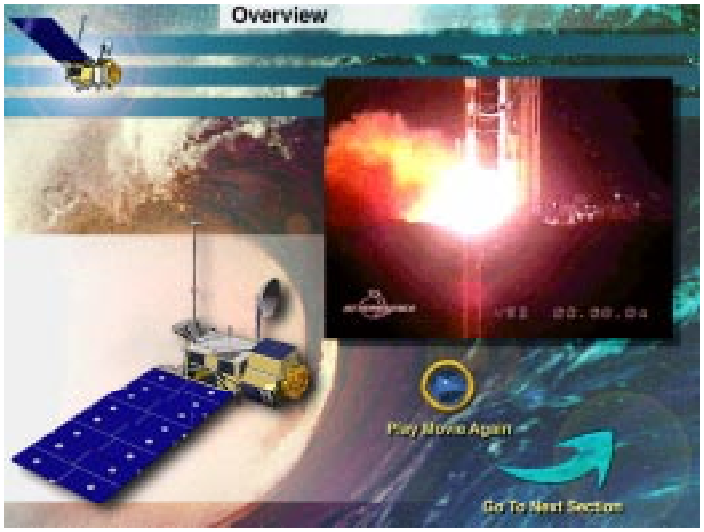
'MISSION'





How we Measure Ocean Topography contains a highly recommended instructional movie.

In 'What's On Board?' the spacecraft can be rotated on screen, pointers locate instruments.



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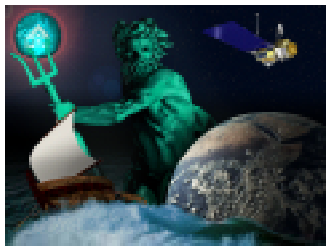
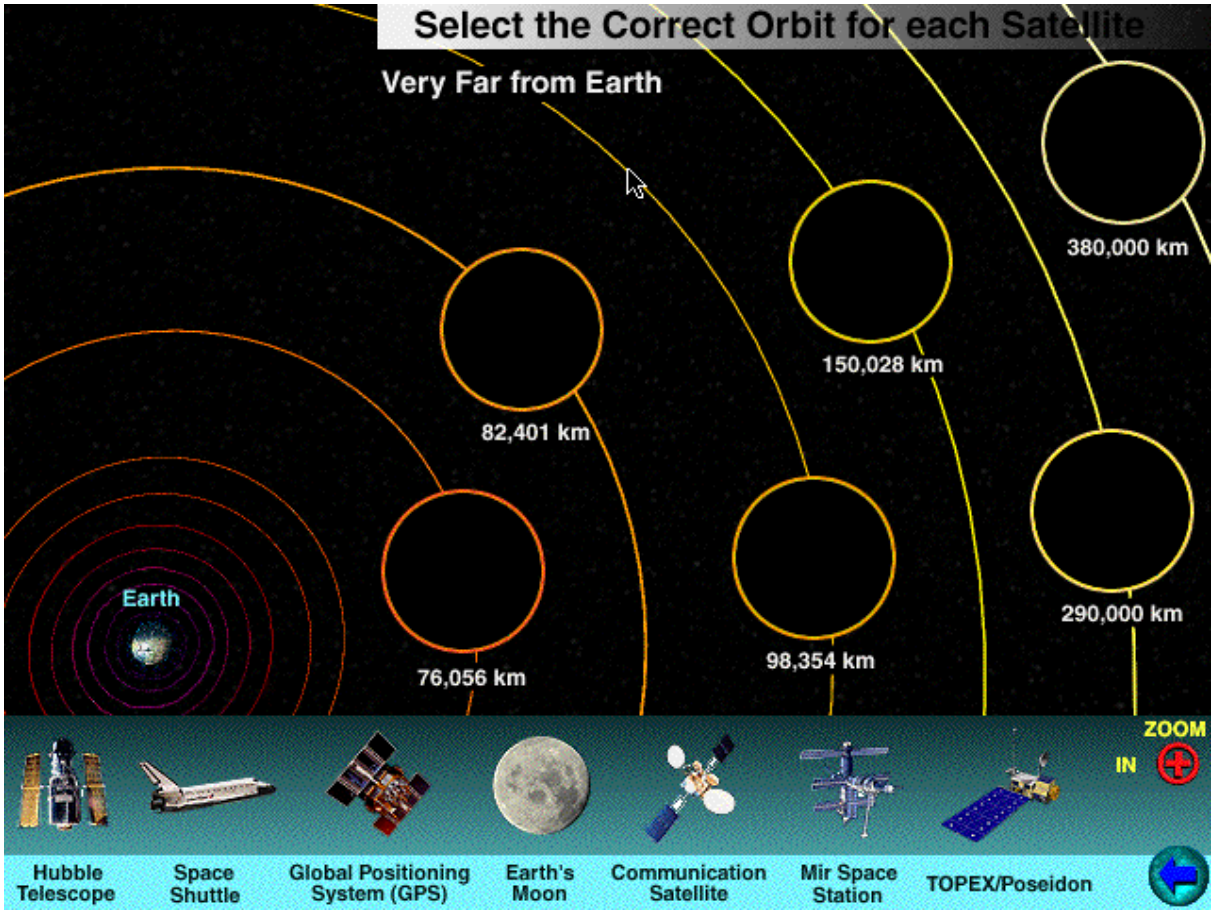
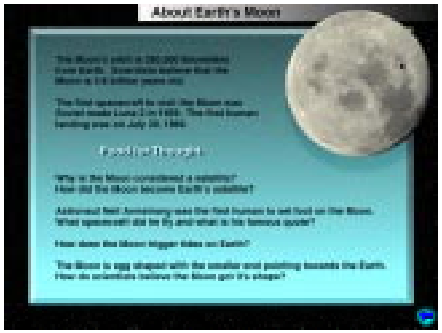
EDUCATIONAL ORBIT GAME





- Satellites are placed in orbits based on the satellite function.
- Great sound effects enhance this game and there are 'prizes'.



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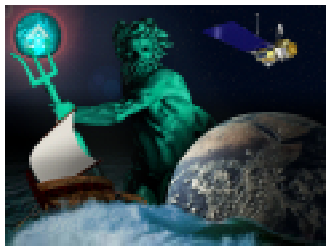
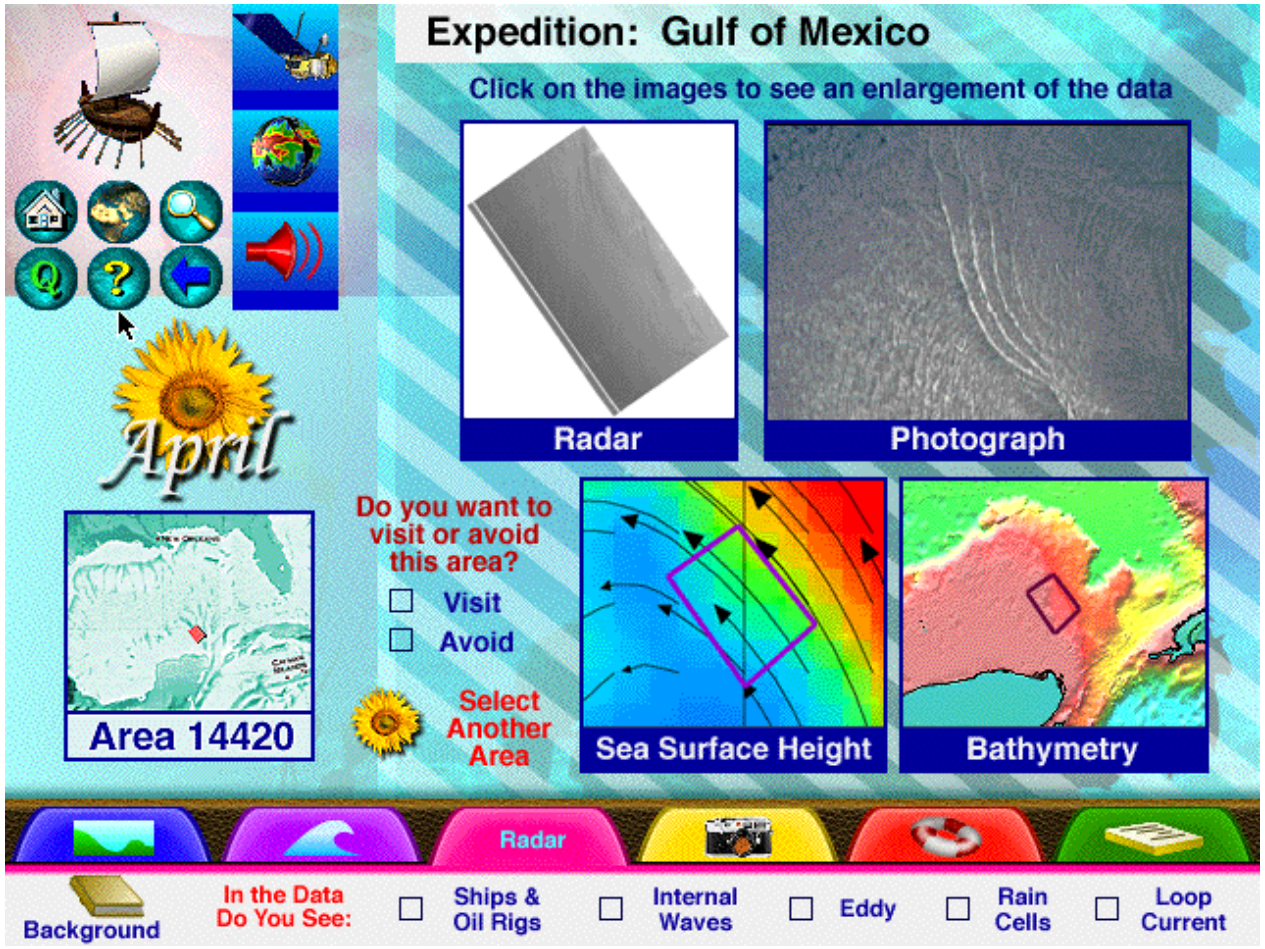
EXPEDITION - PLAN AN OCEANOGRAPHIC CRUISE





- Samples of real data are provided as are tools including sample images and background information.
- Students enter information into a electronic note book as an aid to making cruise decisions.

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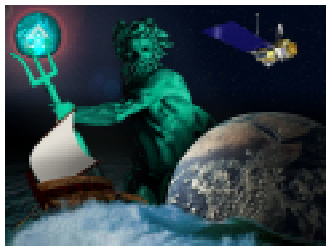
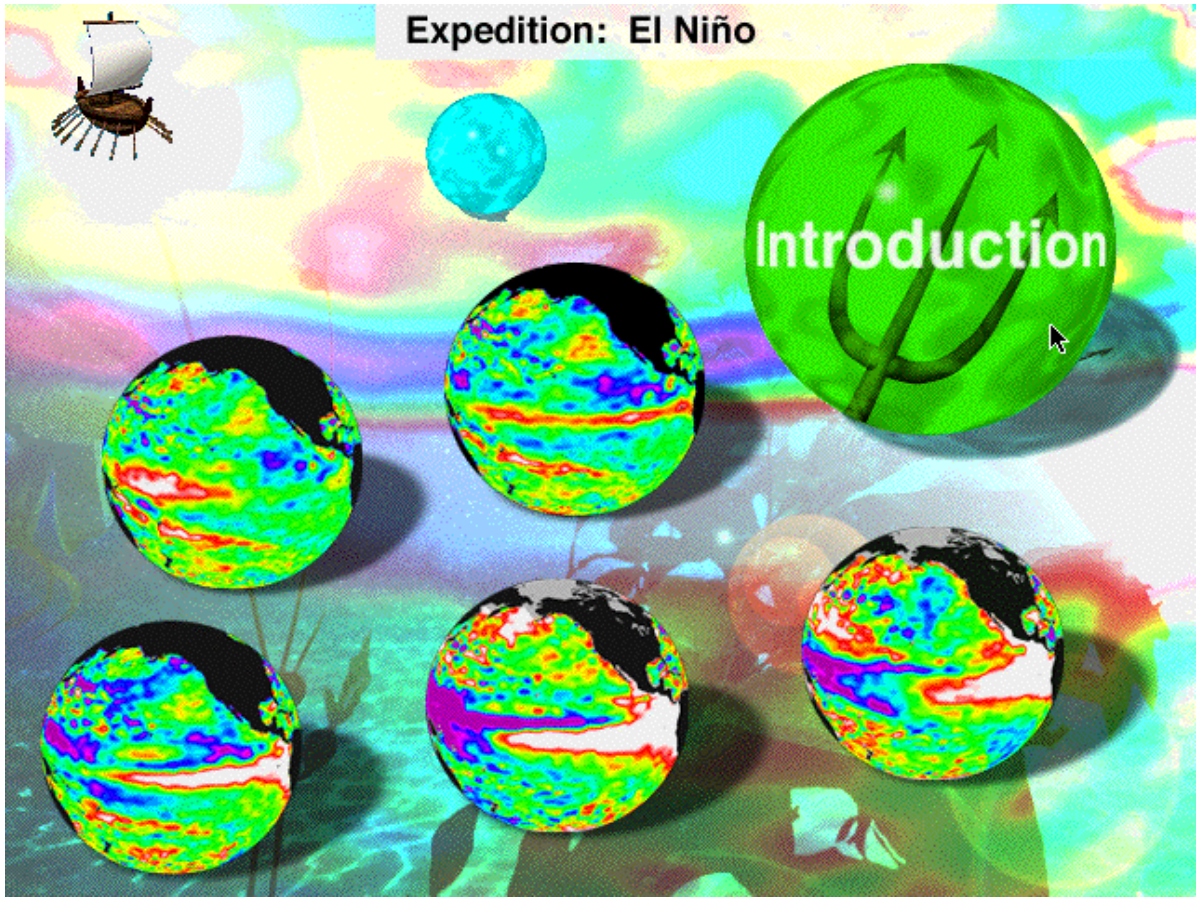
El NIÑO 1997





This section explores a variety of satellite and in-situ data sets, and the impact of El Niño on global weather and climate.

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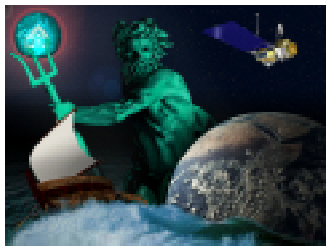
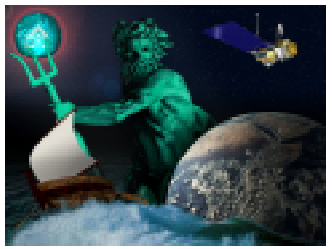
OCEANOGRAPHERS



Oceanographers and their current projects demonstrate the wide and fascinating field of oceanography.

HOW TO ORDER THE CD-ROM



- 'Visit To An Ocean Planet' can be ordered from: http://topex-www.jpl.nasa.gov/education/cdrom.html
- The CD-ROM is available free of charge to educators within the USA and many other countries.
- Check http://topex-www.jpl.nasa.gov/education/education.html for many other educational resources.
- If you wish to conduct your own workshop involving this product, any of our other products, or oceans information we would be happy to support you. Please contact the TOPEX/Poseidon project at the NASA Jet Propulsion Laboratory, topex@jpl.nasa.gov.

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