Joy Higgins, Massachusetts

Marine Protected Areas Workshop 2009

Target Group: 11th & 12th graders

Time: Several periods of class time

Advanced Preparation: Signing out a computer lab/the library; double checking site connections, Excel spreadsheet program

Background: This project is designed to be the final project of a semester course in Marine Biology. Information taught all semester will be incorporated into the project. Students will plan a mission to a MPA or a National Marine Sanctuary. They will be responsible for a research topic, how data will be collected, and the site they will focus on. Students will be expected to gather fish count data from reliable web sources and compare harvested numbers versus catch/release numbers. They will be expected to use their skills with GIS to create several maps of their area along with their skills in using Excel to create graphs comparing their fish counts.

Content Standards:

1. Recognize, interpret, and be able to create models of the earth's physical features in various mapping representations.
2. Analyze changes in population size and diversity that result from the following: natural causes, changes in climate, human activity, and introduction of invasive species.
3. Describe how relationships among organisms add to the complexity of biological communities.

SIS1: Make observations, raise questions, and formulate hypothesis.

SIS2: Design and conduct scientific investigation.

SIS3: Analyze and interpret results of scientific investigation.

SIS4: Communicate and apply the results of scientific investigation.

Lesson Plan Objectives: (1) To gain an understanding of what is involved in conducting a scientific investigation at sea.

(2) To design a research project that includes a hypothesis, background information, materials needed, and methods of conducting the investigation.

Materials: Access to the internet GIS/ArcView software
Project Description Sheet Excel program

Procedures:

1. Prior to students working in their groups, engage students in a conversation about why exploration is important. Lead students into a discussion about what they would want to explore if they were a lead investigator. How would their study contribute to our understanding of the sea.
2. Explain to the students that they will be working in small groups or alone to develop a scientific investigation to a MPA or NMS.
3. Examples of a project description will be reviewed along with current and/or completed investigations at some MPAs/NMS to give student further ideas.
4. Students will spend time researching their topic and completing a rough draft. The rough draft will be peer edited before the final draft is submitted.
5. Students will also be responsible for completing an information poster on their research topic.

Assessment: Informal assessment during research days/group discussion, formal assessment of project description and poster

Relevant Vocabulary:
MPA- Marine Protected Area
NMS- National Marine Sanctuaries
GIS- Geographic Information System
SIS: Scientific Inquiry Skill Standards

Cross-Curriculum Ideas:
Law classes- researching protection laws/acts
Math classes- doing statistical analysis of fish counts
History classes- timelines on how MPAs or NMS came to be
Art classes- murals of MPAs or NMS, the habitats/organisms, etc