Incorporation of Marine Research and Resource Issues into Public Education

Moss Landing Marine Laboratories and San José State University Foundation
Professional Development for Teachers

B-WET funded

Partners

Monterey Bay National Marine Sanctuary
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Elkhorn Slough National Estuarine Research Reserve
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Staff @ MLML

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Evaluator: Traci Conlin

Guest Speaker: Gage Dayton

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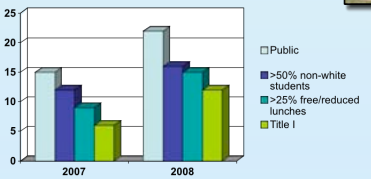
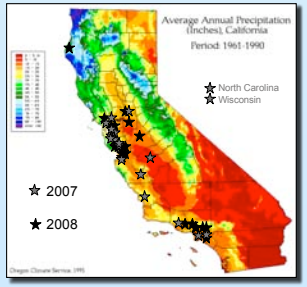
Target Audience

20 Middle and high school science teachers/year

2,500 students - 5 classes of 25 students per year (USDE est.)

Schools and Locations





Goal and Objectives

- Teachers will demonstrate increased understanding of how marine research provides data for developing effective marine resource management techniques, especially as they relate to the Monterey Bay watersheds.
- Program Objectives
  - To provide teachers direct experience with inquiry-based activities
  - To enhance teachers understanding of local environmental issues
  - To train teachers to skillfully use marine research tools
  - To establish a forum of peer support

  In addition, the students of participant teachers will:
  - Use hypothesis-driven problem solving as listed in the California science standards for Investigation and Experimentation
  - Apply science and math skills to collecting and analyzing data
  - Understand how research allows for effective management and policy
  - Experience "meaningful" activities that nurture a connection with and foster an understanding of Monterey Bay watersheds

Project Overview

- Summer workshop
- Curriculum
  - field, lab, and computer activities
  - using real and current data
  - addressing current issues
  - targeting CA science standards
- Academic year support
  - To local classrooms
    - Scientists
    - Teacher helpers
    - Stuff
  - To the field
    - Local experts

Products

- Workshop: "Field and Lab Explorations in Marine Science"
- Logo
- Website
  - teach.mlml.calstate.edu
- Curriculum
  - Distributed to workshop participants on CD

Partner Curriculum

- Watershed Overview
  - ESNERR, MERITO (MBNMS)
- Habitat Monitoring
  - LiMPETS (MBNMS)-Sandcrab activity
  - Salinas River State Beach
- Scientific Database use
  - SIMoN (MBNMS)
- Virtual Sea Urchin
  - Hopkins Marine Station

MLML Curriculum

- Marine Science overview
- Based on MLML Research:
  - Invasive Species
    - Japanese mud snail transects at Kirby Park, Elkhorn Slough
  - Habitat Restoration and Water Quality
    - Nitrate levels in Moro Cojo Slough
  - Shark/Ray Monitoring and Conservation
    - Prickly Shark behavior at Monterey Bay Aquarium

Evaluation Plan

- The evaluation plan for this project will be three fold:
  - Front-end
    - used to determine audience needs, skills, and knowledge
  - Formative
    - used to improve the project
  - Summative
    - used to guide judgments about the project's impact and merit

Evaluation Results

- All goals were met, teachers reported:
- Gaining new lesson plans & hands-on activities
- Incorporating hands-on field and lab activities into their curriculum
- An enhanced understanding of how research data are collected and used in resource management and protection of the marine environment
- Satisfaction with the forum of peer support established during the workshop

Changes Made

- Provide teachers with access or low cost alternatives to equipment/technology needed to teach workshop content
- Provide more time for math and graphing activities
- Implement student surveys