



CENTERS FOR OCEAN SCIENCES
EDUCATION EXCELLENCE

**Ocean Sciences Education Retreat
October 20, 2010**

Centers for Ocean Sciences Education Excellence

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- **Overview National COSEE Network**
- **Example of a successful COSEE Center**
- **Overview of COSEE Partnerships**
- **How COSEE is addressing its goals for broadening participation in ocean sciences**



Image courtesy of COSEE-Ocean



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The National COSEE Network

- **Fifteen collaborative Centers linking higher education and research institutions to formal and informal ocean sciences education**
- **Centers are “anchored” by at least one research institution, one formal education entity and one informal science education provider**
- **Centers may have a regional focus or a national thematic mission and must contribute to National COSEE Network activities**



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COSEE Objectives

- To provide opportunities for ocean scientists to engage in broader impact activities
- To develop catalytic partnerships between ocean science researchers and educators
- To foster communication & coordination among ocean science education programs nationwide
- To promote ocean education as an interdisciplinary tool for improving science education
- Increase the participation of students from under-represented groups in the ocean sciences



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COSEE History

- 2000 - Workshop in Long Beach, MS with 73 multiple sector participants to evaluate community needs
- 2001 - Priority Recommendations sent to NSF
 - Special Issue of *Current*, the Jour. of Marine Educ.
 - First NSF request for proposals
- 2002 - 7 Centers & Central Coordinating Office funded
- 2005 - 3 new Centers funded
- 2007 - 3 new Centers funded
- 2010 - 3 new Centers funded



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COSEE 2008-2009

Management Changes

New Central Coordinating Office

New Executive Director

New National Evaluation Team

New web site, www.cosee.net

Renewed National Advisory Committee



Image courtesy of COSEE-New England



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COSEE has grown into the nation's most comprehensive ocean science and education network with over 220 current institutional partners:

62 Universities and Research Institutions

5 Community Colleges

22 School Districts

75 Informal Science

Education Institutions

49 Local, State, and

Federal Agencies



Image courtesy of COSEE-Great Lakes



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COSEE Funding Sources 2002-2010

- **National Science Foundation**
 - Ocean Sciences, EHR
- **National Oceanic and Atmospheric Administration**
 - NOAA Ocean Exploration & Research, Sea Grant,
National Ocean Service, Office of Education
- **United States Navy, Office of Naval Research**
- **Private Industry**



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Engaging Scientists and Educators Summer Scientist-Teacher Institutes



**Hands-on
and
Online**





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Engaging Scientists and Educators

Multi-Day Workshops

Annually in two states

Theme-based:

Climate Change
Oceans and Human
Health
Marine Technology
Coastal Processes
Hurricane Science
Habitats and Organisms



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COSEE Impacts 2002-2010

- Engaged more than **700 ocean scientists** in education and outreach activities in 2009
- Engaged more than **10,000 teachers** in professional development activities with ocean scientists
- Advanced ocean awareness and literacy among the general public, directly reaching **tens of thousands** of people
- Developed and implemented new undergraduate and graduate courses on communicating ocean sciences at **22 universities**
- Reached underserved and underrepresented audiences through targeted recruitment, partnerships with school districts, and translation of materials for non-English speakers
- Created K-12 curricular materials, with teams of educators and scientists, integrating ocean sciences into science curricula



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COSEE Partnerships

Goal of creating partnerships to extend COSEE's reach was incorporated into COSEE's new strategic business plan (March 2009)



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COSEE Partnerships

Smithsonian Institution National Museum of Natural History Sant Ocean Hall

➤ **Goal: Working together, build on complementary strengths to leverage collective resources such that significant enhancements to ocean science learning and literacy would occur throughout the nation.**



Image Courtesy Chip Clark



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COSEE Partnerships

Society for the Advancement of Chicanos and Native Americans in Science

➤ **Goal:** Develop a presence for ocean sciences through symposia, work force workshops, and direct interactions with high school, undergraduate, and graduate students



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COSEE Partnerships

Institute for Broadening Participation

➤ **Goal:** To exchange resources and capitalize on the Institute's access to underrepresented populations and intellectual capital in developing programs to effectively reach these audiences



Image courtesy Alaska SeaLife Center



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COSEE Broadening Participation in Ocean Sciences

Diversity Working Group formed in 2008

Purpose: To be a broker to relevant scholarly expertise. Synthesizing the relevant research literature on best practices related to diversity in science education.

Conducted Network-wide survey to determine Centers' most promising efforts to broaden participation - completed in 2010.



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COSEE Broadening Participation in Ocean Sciences

Key Survey Results

- 77% of Centers focus on diversifying their Center teams and advisory boards, incorporating individuals with strong credentials and research backgrounds in this area

- 54% of Centers are making a major effort toward building partnerships for serving diverse audiences



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**COSEE Broadening Participation in Ocean Sciences
Research and Resource Development**

COSEE-Ocean Learning Communities (UW)

Learning Sciences Research emphasizes how youth learn about the environment in diverse communities; assisting institutions to reframe programming to better connect with world views, histories, and interests of these youth and their communities; curriculum design and program partnership with campus GK-12 program and Sound Citizen project

COSEE Alaska (UA)

Preparing/promoting publication of articles on education by Native American authors



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**COSEE Broadening Participation in Ocean Sciences
Research and Resource Development**

COSEE Ocean Systems (UMaine)

Produces Ocean Climate Interactive tools created for all audiences regardless of location, racial, gender or cultural background; available for free, computer access and literacy needed for use.

COSEE-California (UC Berkley and SIO)

Customization of undergraduate courses to incorporate relevant local/community culture and native/traditional knowledge; disseminating courses to Hampton University



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**COSEE Broadening Participation in Ocean Sciences
Program Development**

COSEE-Great Lakes (Cornell)

Inland Seas program draws on two or more Native American groups for learning on Lake St. Clair.

COSEE Alaska (UA)

SEANET designed to bring scientists, educators and communities together to discuss research and traditional knowledge; Ocean Science Fair projects in coastal Alaska Native Communities judged on ocean science quality and cultural relevance by scientists and Native elders.



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**COSEE Broadening Participation in Ocean Sciences
Program Development**

COSEE-Southeast (SC SeaGrant)

Conducted regional, 3-day, multi-cultural workshop on specific needs and strategies, resulting in an online set of proceedings; initiated a 4-year Diversity Advisory Task Force to present best strategies; developed a survey to determine the regional workforce diversity in state, federal agencies and universities with ocean sciences efforts.



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**COSEE Broadening Participation in Ocean Sciences
School District Programming**

COSEE Central Gulf of Mexico (USM)

Districts throughout the Gulf Coast region

COSEE West (USC, UCLA)

Los Angeles Unified School District

COSEE New England (UMass)

**Boston Public School District and other districts with low
academic performance.**

COSEE California (SIO)

San Diego Unified School District



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COSEE Broadening Participation in Ocean Sciences

**Partnerships with ISE institutions/national organizations that
serve underrepresented student populations**

COSEE CCO (URI)

SACNAS and ASLO MCP

COSEE NOW (Rutgers, WHOI)

Liberty Science Center

COSEE Great Lakes (Cornell)

Niagra Aquarium

COSEE West (USC, UCLA)

EXPO Community Center



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COSEE Broadening Participation in Ocean Sciences

The challenge in the next decade is for COSEE to provide a unifying framework that connects its variety of programs into a systemic force. This will require the support of federal and state agencies, universities and colleges, and private/public industry.

The National COSEE Network must also provide a systemic approach within its own Network, sharing successful projects, communicating most effective practices, and building stronger partnerships.

