

**Annual Report for Period:**09/2004 - 08/2005**Submitted on:** 12/21/2004**Principal Investigator:** Walker, Sharon H.**Award ID:** 0215341**Organization:** U of Southern Mississippi**Title:**

Regional Center for Ocean Sciences Educational Excellence [COSEE]--Gulf of Mexico

### Project Participants

#### Senior Personnel

**Name:** Walker, Sharon**Worked for more than 160 Hours:** Yes**Contribution to Project:**

Dr. Sharon Walker is the PI of this effort and manages all aspects of this collaborative, to include monitoring the efforts being provided by the five subcontracts to the following Senior Personnel/Co-PIs and their respective university affiliations: Dr. Rick Tinnin-UT-MES; Dr. John Dindo-DISL; Dr. Michael Spranger-UF; and Dr. Jessica Kastler-LUMCON; Dr. Dan Brook-MSU; Dr. Brook is a Senior non-Co-PI and also represents a member of this proposed effort's Senior Personnel. Annually, in Mississippi, Dr. Walker has/will implement the two-day Informal Workshop for 70 participants and the five-day 'face to face' and 10-day online portions of the 15-day Professional Development Institute for middle school teachers (grades 5-9) and scientists. She will also supervise the COSEE scientist and educator in Mississippi. Dr. Walker will coordinate the 'Teachers-To-Sea' component with Dr. Mary Alyce Lach of St. Norbert College, Dr. Shelia Brown of USM, and Ms. Brenda Smith and Mr. Mark Jarrett of NAVMETOCCOM and NAVOCEANO, respectively. The Co-PIs and Ms. Smith will coordinate the minority recruitment. Dr. Walker and Ms. Smith will provide oversight management of these undergraduates, as well as securing their individual Mentors. Drs. Walker and Brown will also work with the MS Gulf Coast Community College in recruiting the two, minority undergraduate students from the Jackson County and Jefferson Davis Campuses of the MGCCC. Dr. Walker, the four Co-PIs, Dr. Dan Brook, and Dr. Shelia Brown will all work with the Evaluation Team, the Public Broadcasting Stations (PBS), the Sea Scholars Program, and the Instructional Technology (IT) Coordinators throughout the Gulf of Mexico.

**Name:** Dindo, John**Worked for more than 160 Hours:** Yes**Contribution to Project:****Name:** Kastler, Jessica**Worked for more than 160 Hours:** Yes**Contribution to Project:**

#### Post-doc

#### Graduate Student

#### Undergraduate Student

**Name:** Magee, Kinyatta**Worked for more than 160 Hours:** No**Contribution to Project:**

Underserved undergraduate student, Kinyatta Magee, worked with the COSEE Scientist and Educator in MS for ten weeks during the summer. She was recruited from the MS-Gulf Coast Community College, Jefferson Davis Campus. Ms. Magee's responsibilities involved both ocean and coastal sciences research and education. She received three hours undergraduate credit in coastal sciences.

**Name:** Colston, Tameka**Worked for more than 160 Hours:** No**Contribution to Project:**

Underserved undergraduate students worked with the COSEE Scientist and Educator in MS for ten weeks each summer. These

undergraduate students were recruited from the existing populations of students at the MS-Gulf Coast Community College, Jackson County and Jefferson Davis Campuses. The students' responsibilities involved both ocean and coastal sciences research and education.

**Name:** Chapman, Charmain

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Underserved undergraduate students worked with the COSEE Scientist and Educator in MS for ten weeks each summer. These undergraduate students were recruited from the existing populations of students at the MS-Gulf Coast Community College, Jackson County and Jefferson Davis Campuses. The students' responsibilities involved both ocean and coastal sciences research and education.

## Technician, Programmer

### Other Participant

**Name:** Brook, Robert

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

Dr. Brook implemented the videoconferencing component of the Central COSEE-Gulf of Mexico effort in Year 2 and will continue this effort for Year 3. Dr. Brook's responsibilities involved the design, implementation, and application of high-speed data and video network systems. The content of these videoconferences included the thematic areas of coastal processes, marine technology, and habitats and organisms. Dr. Brook is from Mississippi State University in Starkville.

**Name:** Brown, Shelia

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

Dr. Brown is our COSEE Scientist and she began work on this project January 2, 2003. Her duties included 'bridging the gap' between this COSEE's three thematic areas, i.e., coastal processes, habitats and organisms, and marine technology. Dr. Brown focused on NSF research efforts (and research of other agencies) being conducted in the central Gulf of Mexico to leverage those research findings for the proposed audiences of informal educators, formal educators, scientists, and the general public. Dr. Brown coordinated the recruitment of scientists and teachers for the summer institute as well as Sea Scholars. She served as an instructor for both efforts.

**Name:** Baggett, Barbara

**Worked for more than 160 Hours:** Yes

**Contribution to Project:**

Ms. Baggett began work on this project January 2, 2003. Her responsibilities involved working with the COSEE Scientist and 'fellow' COSEE Educators, i.e., one each in AL and LA. These COSEE Educators, in cooperation with the COSEE Scientist, worked cooperatively to demonstrate the relevance of the oceans--based on scientific research and subsequent interpretation of those data--to the general public, informal educators, and formal educators, thereby creating a more ocean literate citizenry within the broader Gulf of Mexico region. Ms. Baggett assisted in coordinating the summer institute and served as an instructor.

**Name:** Bosarge, Johnette

**Worked for more than 160 Hours:** No

**Contribution to Project:**

Ms. Johnette Bosarge helped maintain the Regional Gulf of Mexico-Central COSEE participants' databases and assisted in dissemination of recruitment materials with this effort's Co-PIs, Senior Non-Co-PI, the Scientist and Educators in MS, AL, and LA and within the broader Gulf of Mexico region. This is a part-time position.

## Research Experience for Undergraduates

### Organizational Partners

U.S. Government Agency

The Naval Meteorology and Oceanography Command (NAVMETOCOM) and the Naval Oceanographic Office (NAVOCEANO) provided personnel and oceanographic survey ships for two Sea Scholars/Teacher-To-Sea Voyages. These Voyages involved 27 teachers from the states of CA, FL, LA, MS, MN, OK, TN, TX, and WA. The Office of Naval Research (ONR) and the National Oceanographic Partnership Program (NOPP) provided fiscal support to add the states of Texas and Florida to enable this Regional COSEE-Central Gulf of Mexico effort to be expanded to all five states. Six undergraduate internships could have been provided by NAVMETOCOM and NAVOCEANO (three undergraduate students per semester) to work 20 hours per week at The University of Southern Mississippi COSEE or at those U.S. Navy Offices at Stennis Space Center. Selected part-time personnel salaries were also being provided by ONR/NOPP.

The National Oceanic and Atmospheric Administration (NOAA)-Oceanic and Atmospheric Research (OAR)-National Sea Grant College Program provided fiscal funds for Personnel and/or Consultant Salaries, i.e., Year 2 Video conference Implementation, the Internal and External Evaluation Process, and Materials and Supplies. Select NOAA scientists and/or educators were used to supplement the numbers of guest speakers and/or results from research data. Through these partnerships, the original, Regional COSEE-Central Gulf of Mexico submission is now 'fully' funded!

### **Consortium NonAcad and Acad Orgs**

The National Marine Educators Association; the National Science Teachers Association; the FL, AL, MS, LA, and TX State Science Teachers Associations; the Marine Technology Society; the Sea Grant Network; the Consortium for Oceanographic Research and Education (CORE); the American Association for Limnology and Oceanography; and the American Geophysical Union assisted this project in recruitment of program participants, in the dissemination of the results through their newsletters and websites, or through professional presentations at these conferences.

### **Other Collaborators or Contacts**

The State Departments of Education in each of the five, Gulf of Mexico states and the LA Public Broadcasting Station were involved in the recruitment of participants and the dissemination of project results. The Mississippi Gulf Coast Community College, Jefferson Davis and Jackson County Campuses participated in the recruitment of underserved, undergraduate students, as well as the University of New Orleans.

Other collaborators included two, External Evaluators (Drs. Tina Bishop and Peter Tuddenham) from the College of Exploration in Potomac Falls, VA. One Internal Evaluator (Dr. Susan Culipher-Ross) was employed part-time from USM-College of Science and Technology.

There were two Co-PIs who received supplemental (non-NSF) funding from the Office of Naval Research (ONR) and the Office of Atmospheric Research (OAR)-Sea Grant. They are Dr. Mike Spranger from the University of FL, FL Sea Grant College Program, and the FL Museum of Natural History in Gainesville, FL and Dr. Richard Tinnin from the University of Texas and the Marine Science Institute at Port Aransas.

### **Activities and Findings**

**Research and Education Activities:** (See PDF version submitted by PI at the end of the report)

#### **Findings:**

Please see attached file.

#### **Training and Development:**

All of the Co-PIs, Senior Personnel, Educators, Internal and External Evaluators, and Consultants were not only involved in each state's 15-day, 'ace to Face' (five days) and 10-day online components and the Nonformal Educators Workshops...but, in the recruitment process for the Sea Scholar Voyages and all aspects of the varied, summative evaluations (pre- and posttests for cognitive achievement) and Likert-scale evaluations for attitudinal achievement, as well. The Co-PIs, Senior Personnel(Brook and Brown), and Evaluators have also made over 20 presentations in 2003 and 15 presentations in 2004. Further, this group, in combination with the COSEE:CGOM Educators and Consultants (IT, PBS, and Sea Scholar Coordinators) also met as a COSEE:CGOM Management Team for the first time December 11-12, 2002, followed by meetings at the National Science Teachers Association in March 2003 and 2004, at the National Marine Educators Association in July 2003 and 2004, and then again September 4-5, 2003. The Management Team also has a meeting January 4-7, 2005.

The majority of the Co-PIs attended the First COSEE PI Mtg. in Washington, D.C. in March 2003 to interact with the other seven COSEE and discuss goals, objectives, implementation strategies, evaluation and assessment plans, and potential benefits....as well as 'setting a common course' for all COSEE. Lastly, the interaction with the individual state scientists in the Gulf of Mexico and the eleven scientists in 2003 and six in 2004 through the COSEE:CGOM Online Institutes, combined with the Naval Oceanographers on the T-AG-60 series of Oceanographic Survey Ships provided each member of the COSEE:CGOM Management Team with enhanced science education research skills and experience.

### **Outreach Activities:**

The five outreach facilities, the J.L. Scott Marine Education Center and Aquarium in MS; the Dauphin Island Sea Lab's Estuarium on Dauphin Island; the Marine Science Institute in Port Aransas; the Museum of Natural History on the UF's Gainesville Campus; and the LA Universities Marine Sciences Consortium in Chauvin each have an annual visitation of 80,000 or a collective annual visitation of 400,000. This number does not include the festivals in which each of these outreach facilities is involved which encompasses an additional 500,000 members of the general public impacted by the Co-PIs, Senior Personnel (Brown and Brook), and the Educators. These COSEE:CGOM Management Team efforts certainly enhance the awareness and understanding of the citizenry of the Gulf of Mexico relative to ocean sciences and coastal processes.

As previously mentioned, the web site for this endeavor is <[www.cosee-central-gom.org](http://www.cosee-central-gom.org)> and the 'Oceanography and Coastal Processes Resource Guide' URL, <<http://www.coast-nopp.org/toc>> both augment technological applications. Further, the 10-day Online COSEE:CGOM Institute for scientists and middle school teachers tends to 'drive' the technology for the teacher participants. Lastly, as one of the seven regional COSEE, this Central Gulf of Mexico investigation is also linked to the COSEE-Central Coordinating Office's URL, <[www.COREocean.org](http://www.COREocean.org)> now <[www.cosee.net](http://www.cosee.net)>.

### **Journal Publications**

#### **Books or Other One-time Publications**

Shelia Brown

Jennifer Buchanan

Kimberly Harvey

Kay Baggett, ""Selected Plants of Grand Bay National Estuarine Research Reserve and Grand Bay National Wildlife Refuge"", (2004). Book, Published

Bibliography: Brown, Shelia, Jennifer Buchanan, Kimberly Harvey, and Kay Baggett. 2004. "Selected Plants of Grand Bay National Estuarine Research Reserve and Grand Bay National Wildlife Refuge

### **Web/Internet Site**

#### **URL(s):**

[www.cosee-central-gom.org](http://www.cosee-central-gom.org)

#### **Description:**

The website is utilized for recruitment of summer institute, informal workshops, and Sea Scholar participants. It also serves as the site for the online component of the summer institute course.

### **Other Specific Products**

## Contributions

### **Contributions within Discipline:**

Agenda and activities were developed by each Gulf of Mexico state to complement the three thematic topics: oceanography and coastal processes, habitats and organisms, and marine technologies for the Summer Institutes, during which research scientists and educators shared experiences, knowledge, and observations about both science and education and the interconnectedness between the two groups. In fostering a paradigm shift between scientists and teachers and developing a partnership between the two groups, the COSEE:CGOM has succeeded in linking those individuals for more than just the five 'Face to Face' days of the Summer Institute.

Even though TX and LA did not yet have their respective COSEE:CGOM educators during the 2003 summer, MS, AL, and FL did have their educators who developed and implemented sample, staff development programs so the participating teachers would better understand this grant commitment for their own presentations when returning to their respective schools and/or school districts. Drs. Tinnin (TX) and Kastler (LA) developed and implemented their own professional development programs. During the 2004 summer all Centers (AL, FL, LA, MS, and TX) had educators develop and implement example, staff development programs for participating teachers.

Several educational brochures based on sound science have been or are being written for general distribution at the five informal educational affiliations. These brochures 'bridge the gap' between data and the relevance of those data to the general public. When research data are disseminated to the general public in an understandable way, non-scientists perceive scientific research as more practical and beneficial.

The MS, AL, and FL educators have prepared and presented PowerPoint sessions on Medicines from the Sea to the Association of Louisiana Pharmacists, Aquatic Nuisance Species to Mississippi teachers, and Deep Water Corals to Mississippi, Louisiana, and Alabama teachers. All of these topics are subjects under current research investigations.

Further, the MS, AL, and FL educators have assisted school districts in aligning subject matter with state standards. In Mississippi core objectives within the state frameworks were aligned with the activity program, The Wonder of Wetlands. Other examples in Mississippi including the design and implementation of teacher workshops on Nuisance Species, Wetlands, Deep Sea Corals, and Applications of Technology in Ocean Sciences.

Numerous PowerPoint presentations have been developed by the COSEE:CGOM educators to include implementing complementary activities on a wide variety of ocean sciences content areas. The MS and AL educators prepared and presented activities on Marine Polymers and Medicines From the Sea to both formal and informal educators at the Southern Association of Marine Educators (SAME) Fall Conference, November 22, 2003. A second SAME Fall Conference, November 19-21, 2004 provided 55 nonformal and formal educational activities and presentations on coastal restoration.

Through the efforts of the COSEE:CGOM educators, participating teachers are more empowered to 'bridge the gap' with their middle school students. And, the COSEE:CGOM educators are also working with the general public in each state's Informal Center to enhance guests' awareness and understanding of ocean sciences and coastal processes.

### **Contributions to Other Disciplines:**

The COSEE:CGOM educators will continue to lead Elderhostel programs designed to acquaint participants with local communities and issues in the five-day curriculum, e.g., in MS, the Elderhostel programmatic theme is Chains of Life. Further, these COSEE:CGOM educators also make presentations to local civic groups about the natural history of their respective state's coasts and their indigenous flora and fauna. These COSEE:CGOM educators also participate in many coastal festivals, allowing the COSEE:CGOM to serve as a catalyst for not only the 400,000 visitors of these outreach facilities but for the thousands of guests attending these coastal festivals as well. In 2003 the COSEE:CGOM Scientist, Dr. Shelia Brown, and the MS-COSEE Educator, Ms. Kay Baggett, received modest NOAA-Ocean Exploration funding to implement two Hydrothermal Vent Workshops in the Gulf of Mexico involving approximately 40 precollege teachers. The COSEE:CGOM Scientist, Dr. Shelia Brown, also received modest funding from the Mississippi-Department of Marine Resources-Tideland Trust Fund and NOAA-Grand Bay National Estuarine Research Reserve (NERR) to develop a Plant Guide for the Grand Bay NERR. The PI and Co-PIs are all leveraging the NOAA-OAR Sea Grant, NSF, and NOPP-ONR COSEE:CGOM support enhancing their respective Informal Centers' public outreach and precollege students' programs.

### **Contributions to Human Resource Development:**

All of the COSEE:CGOM educators are involved in 4-H programs, scouting events, science fairs, ocean bowls, and career events for precollege students. The informal presentations made by the COSEE:CGOM educators assist in demonstrating the interconnectedness of all species, thereby resulting in a more science literate populace.

### **Contributions to Resources for Research and Education:**

Presentations have been made for the following professional organizations: National Science Teachers Association, National Marine Educators Association, Southern Association of Marine Educators, Marine Technology Society, Florida Marine Science Educators Association, Texas Marine Educators Association, Texas Science Teachers Association, Florida Science Teachers Association, Louisiana Science Teachers Association, Mississippi Science Teachers Association, the American Geophysical Union, the American Meteorological Association, Sea Grant

Programs in the Gulf of Mexico, and numerous precollege public and private schools. Publications and presentations are listed below:

2003

- ò Brown, Shelia. 2003. Sea Scholars, National Marine Educators Association, July 21, Wilmington, NC.
- ò Brown, Shelia, Cindy Moon, and Christine Wilson. 2003. Plankton and Other COSEE Staff Development Activities, Mississippi Science Teachers Association Annual Conference, October 27, Jackson, MS.
- ò Kastler, Jessica, C. Chavin, J. Cain, L. Pulling, J. Simpson, V. Stewart, C. Banks-Jones, K. Barbay, T. Miguez, C. Bihm, and S. Bordelon. Center for Ocean Science Education Excellence (COSEE) at LUMCON (I), Louisiana Science Teachers Association Annual Conference, December 5, Chauvin, LA.
- ò Kastler, Jessica, C. Chavin, J. Cain, L. Pulling, J. Simpson, V. Stewart, C. Banks-Jones, K. Barbay, T. Miguez, C. Bihm, and S. Bordelon. Center for Ocean Science Education Excellence (COSEE) at LUMCON (I), Louisiana Science Teachers Association Annual Conference, December 5, Chauvin, LA.
- ò Spranger, Mike. 2003. COSEE, Florida Marine Science Educator Association Annual Meeting, May 2, Marathon, FL.
- ò Spranger, Mike. 2003. COSEE: Partnerships at Work, Southeast Atlantic Ocean Observation System Project Biannual Meeting, May 28, Jacksonville, FL.
- ò Spranger, Mike. 2003. COSEE: Goals, Objectives, Expectations, Formal Educator's COSEE Institute, June 23, Cedar Key, FL.
- ò Spranger, Mike. 2003. COSEE, Annual Florida Sea Grant Faculty Meeting, October 7, Gainesville, FL.
- ò Spranger, Mike. 2003. Bridging the Gap: Changing the Science/Education Paradigm, NonFormal COSEE Education Workshop, December 10, Gainesville, FL.
- ò Walker, Sharon H. 2003. Central Gulf of Mexico Center for Ocean Sciences Education Excellence, Mississippi Academy of Sciences, February 14, Hattiesburg, MS.
- ò Walker, Sharon H., John Dindo, Jessica Kastler, Michael Spranger, Richard Tinnin, Shelia Brown, and Dan Brook. 2003. COSEE:CGOM, National Marine Educators Association Share-A-Thon at the National Science Teachers Association National Conference, March 27, Philadelphia, PA.
- ò Walker, Sharon H., John Dindo, Jessica Kastler, Michael Spranger, Richard Tinnin, Shelia Brown, and Dan Brook. 2003. COSEE:CGOM, COSEE PI Meeting, March 3-4, Washington DC. Invited special presentation (oral), national meeting, published abstract.
- ò Walker, Sharon H. and Michael Spranger. 2003. COSEE:CGOM Update, Sea Grant Week, April 24-28, Galveston, TX.
- ò Walker, Sharon H., John Dindo, Jessica Kastler, Michael Spranger, Richard Tinnin, Shelia Brown, and Dan Brook. 2003. COSEE:CGOM, The Oceanography Society-Oceanology International Americas Ocean Conference, June, New Orleans, LA. Poster presentation, international meeting, published abstract.
- ò Walker, Sharon H., John Dindo, Jessica Kastler, Michael Spranger, Richard Tinnin, Shelia Brown, and Dan Brook. 2003. Central Gulf of Mexico (CGOM):Center for Ocean Sciences Education Excellence (COSEE), July, Wilmington, NC. Oral presentation, national meeting (with international attendance), published abstract.
- ò Walker, Sharon H., John Dindo, Jessica Kastler, Michael Spranger, Richard Tinnin, Shelia Brown, and Dan Brook. 2003. Center for Ocean Sciences Education Excellence:Central Gulf of Mexico (COSEE:CGOM)- The First Year, Marine Technology Society, September 22-26, San Diego, CA. Oral presentation, international conference, published paper (proceedings).

2004

- ò Brown, Shelia A. and Sharon H. Walker. 2004. Sea Scholars and Mississippi's COSEE:CGOM, National Marine Educators Association Annual Conference, July 19. St. Petersburg, FL.
- ò Kastler, Jessica A., Sharon Walker, John Dindo, Mike Spranger, Rick Tinnin. 2004. Summer Opportunity for Teachers at LUMCON: Center for Ocean Sciences Education Excellence - COSEE:CGOM. Environmental Education Symposium, February. Baton Rouge, LA.
- ò Kastler, Jessica A., Sharon Walker, John Dindo, Mike Spranger, Rick Tinnin. 2004. Summer Opportunity for Scientists with the Central Gulf of Mexico Center for Ocean Science Education Excellence (COSEE). Louisiana Academy of Sciences, McNeese State University, March, Lake Charles, LA.
- ò Tinnin, Rick 2004. Center for Ocean Sciences Education Excellence:Central Gulf of Mexico. Texas Council for Elementary Science Conference. University of Texas Marine Science Institute. January 16-18. Port Aransas, TX.
- ò Tinnin, Rick 2004. Center for Ocean Sciences Education Excellence:Central Gulf of Mexico. Informal Science Educators Association of Texas Conference, March 3-6. University of Texas Marine Science Institute, Port Aransas, TX.
- ò Tinnin, Rick. 2004. Center for Ocean Sciences Education Excellence:Central Gulf of Mexico. Texas Marine Educators Association Workshop, April 16-18. University of Texas Marine Science Institute, Port Aransas, TX.
- ò Tinnin, Rick. 2004. Center for Ocean Sciences Education Excellence:Central Gulf of Mexico. NSF-GK-12 Symposium, June 7. University of Texas Marine Science Institute, Port Aransas, TX.
- ò Tinnin, Rick. 2004. Center for Ocean Sciences Education Excellence:Central Gulf of Mexico. Science Teachers Association of Corpus Christi, November 4-6. Corpus Christi, TX.
- ò Walker, Sharon H., Shelia A. Brown, and Kay Baggett. 2004. Center for Ocean Science Education Excellence: Central Gulf of Mexico Presents Its Spring 2004 Informal Educators' Workshop. Mississippi's COSEE:CGOM Nonformal Workshop. March 4-5. Biloxi, MS.

- ò Walker, Sharon H., Shelia Brown, John Dindo, Mike Spranger, Jessica Kastler, Rick Tinnin - COSEE:Central Gulf of Mexico. 2004. Chitin/Chitosan: Refuse Revisited or One Person's Trash is Another's Treasure. National Science Teachers' Association Annual Conference. April 1. Atlanta, GA.
- ò Walker, Sharon H. 2004. COSEE:CGOM Poster Presentation. COSEE Strategic Planning Workshop. Consortium for Oceanographic Research and Education (CORE). April 13-15. Washington, DC.
- ò Walker, Sharon H., Michael Spranger, John Dindo, Richard Tinnin, Jessica Kastler, Shelia Brown, R. Dan Brook, Susan Culipher-Ross, Tina Bishop, and Peter Tuddenham. 2004. The First Year, Lessons Learned - Comparison of Years 1 and 2: COSEE:CGOM Formal and Informal Education, National Marine Educators Association Annual Conference, July 19. St. Petersburg, FL.
- ò Walker, Sharon H. 2004. The COSEE Network's Involvement in Aquariums and Public Outreach Panel DiscussioníK Aquarium Exhibity and COSEE:CGOM Public Awareness of Ocean Sciences, American Zoo and Aquarium (AZA) Association Annual Conference, September 20. New Orleans, LA.
- ò Walker, Sharon H. and Shelia A. Brown. 2004. Mississippi's Centers for Ocean Sciences Education Excellence (COSEE:CGOM), Sea Scholars, and Oceans Alive! 2004. Mississippi Science Teachers Association Annual Conference. October 25-26. Jackson, MS.
- ò Walker, Sharon H., Shelia Brown, Susan Culipher Ross, Michael Spranger, John Dindo, Rick Tinnin, Jessica Kastler, Dan Brook, Tina Bishop, and Peter Tuddenham. 2004. A Successful Collaborative: Scientists and Middle School Teachers! American Geophysical Union Annual Fall Meeting. December 14. San Francisco, CA.
- ò Walker, Sharon H. 2005. Lessons Learned.... Center for Ocean Sciences Education Excellence:Central Gulf of Mexico, American Meteorological Association Annual Meeting, January 10. San Diego, CA. (to be presented)

### **Contributions Beyond Science and Engineering:**

- ò Drs. Spranger and Walker were invited to attend the Gulf and Caribbean Fisheries Institute (GCFI) Annual Conference in Tortola, BVI in November 2003 to discuss potential education strategies for this professional society.
- ò Dr. Walker has served on the Science Advisory Panel for the U.S. Commission on Ocean Policy, 2002-2003.
- ò Dr. Walker has worked with an Ad Hoc Educational Committee (of 14) for the National Oceanographic Partnership Program to develop individual ocean sciences education strategies during 2002 and 2003.
- ò Dr. Walker has also served as the Marine Technology Society's Educational Chair since 1993.
- ò Dr. Brown is a Board member for the Coastal Training Program for Grand Bay National Research Reserve (NOAA and MS Dept. of Marine Resources).

### **Special Requirements**

#### **Special reporting requirements:**

Unobligated funds are anticipated to be spent on salaries and other expenses by February 14, 2003. The Year 2 commitment will be needed by February 15, 2003.

**Change in Objectives or Scope:** None

**Unobligated funds:** \$ 0.00

**Animal, Human Subjects, Biohazards:** None

### **Categories for which nothing is reported:**

Any Journal

Any Product

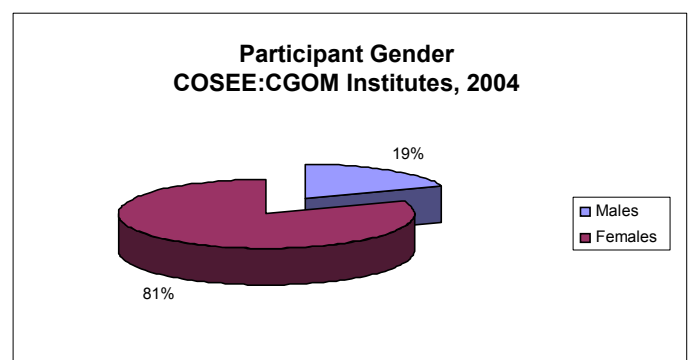
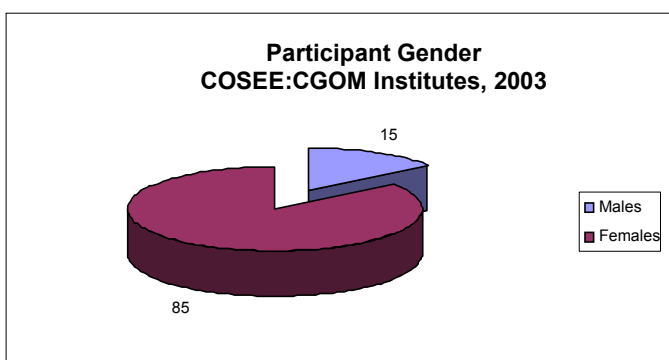
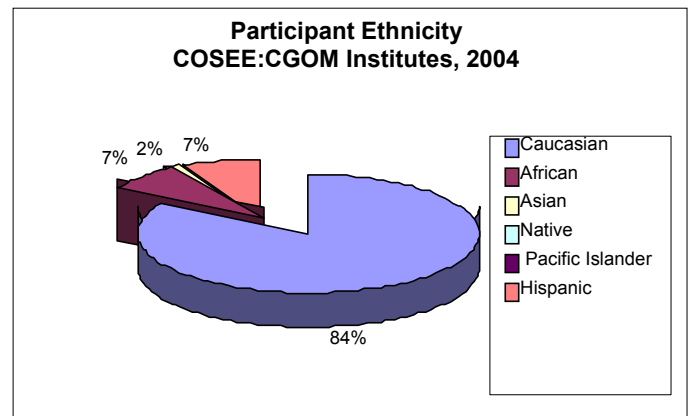
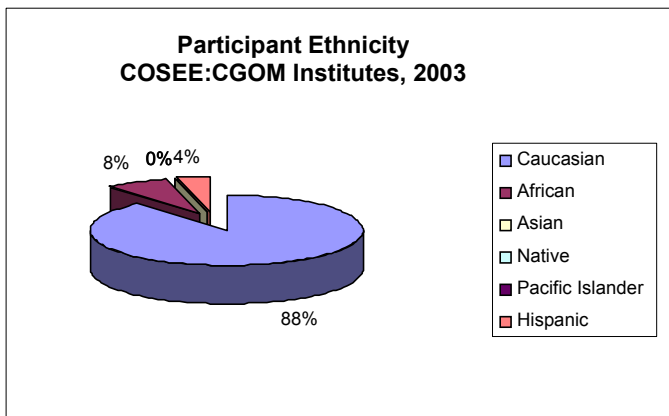
For implementation of the project, there were five, Summer Institutes in June-July 2003 and 2004 in the states of AL, FL, LA, MS, and TX. These Institutes provided professional development opportunities for middle school teachers. The Institutes involved teacher/scientist teams in a fifteen day course. The course involved five days of 'hands-on' inquiry-based, field activities and ten days of online virtual conferences for three semester hour credits. The three interdiscipline themes of instruction were oceanography and coastal processes, habitats and organisms, and marine technologies. The number of participating teachers and scientists – by state were as listed:

**SUMMER TEACHERS AND SCIENTISTS' INSTITUTES 2003 AND 2004\***

ALABAMA	13 TEACHERS <b>12 TEACHERS</b>	7 SCIENTISTS <b>8 SCIENTISTS</b>
FLORIDA	10 TEACHERS <b>11 TEACHERS</b>	3 SCIENTISTS <b>8 SCIENTISTS</b>
LOUISIANA	12 TEACHERS <b>14 TEACHERS</b>	7 SCIENTISTS <b>10 SCIENTISTS</b>
MISSISSIPPI	11 TEACHERS <b>10 TEACHERS</b>	11 SCIENTISTS <b>13 SCIENTISTS</b>
TEXAS	9 TEACHERS <b>7 TEACHERS</b>	4 SCIENTISTS <b>3 SCIENTISTS</b>
TOTALS	109 (55/54)	74 (38/42)

\* 2004 has been “**bolded.**”

Demographic data for 2003 and 2004 are as delineated below:





**Summer Teacher Institutes**

Each state of the COSEE:CGOM implemented a Professional Development Summer Institute for middle school teachers and scientists. In Year 1, a total of 55 teachers and 38 scientists were involved during June in these Institutes. In Year 2 (2004), there were 54 teachers and 42 scientists involved in the Institutes (one Institute per Gulf of Mexico state). Each Institute issued pre- and posttests to the teachers to evaluate cognitive achievement for the “Face-to-Face” component. Teachers from all states were given 25 questions (1-25) that were the same and 25 questions (26-50) that were developed and suited for each respective state. Paired, two tailed, t-tests were utilized for data analyses. In 2003 the data indicated the results for the first 25 questions that were common to all states were statistically significant at the 0.01 level for FL and MS and significant at the 0.05 level for AL, LA and TX. For questions 1-50, the data indicated the results were statistically significant at the 0.01 level for all states but MS. In MS, the entire 50 questions were significant at the 0.05 level.

**PRETEST & POSTTEST EVALUATIONS  
“FACE TO FACE” 2003 INSTITUTES**

	FIRST 25 QUESTIONS		ENTIRE 50 QUESTIONS		SIGNIFICANCE LEVEL		
	MEAN PRE	MEAN POST	MEAN PRE	MEAN POST			
AL	16.0	17.4	28.5	34.9	First 25	0.05	p=0.0109243
					Entire 50	0.01	p=0.000000100184
FL	16.2	19.5	33.3	40.8	First 25	0.01	p=0.003906
					Entire 50	0.01	p=0.000191
LA	15.5	23.9	28.7	46.8	First 25	0.05	p=0.000003793
					Entire 50	0.01	p=0.000005084
MS	17.0	20.1	34.0	38.5	First 25	0.01	p=0.007
					Entire 50	0.05	p=0.0384
TX	18.9	20.7	32.0	39.4	First 25	0.05	p=0.004741
					Entire 50	0.01	p=0.00107

In 2004, the data indicated results for the first 25 questions were not significant for AL and MS; these first 25 questions were significant at the 0.01 level for FL and LA and at the 0.05 level for TX. For questions 1-50, the data indicated results were statistically significant at the 0.01 level for MS, LA, FL, and TX and at the 0.05 level for AL. These analyses are outlined below.

**PRETEST & POSTTEST EVALUATIONS  
“FACE TO FACE” 2004 INSTITUTES**

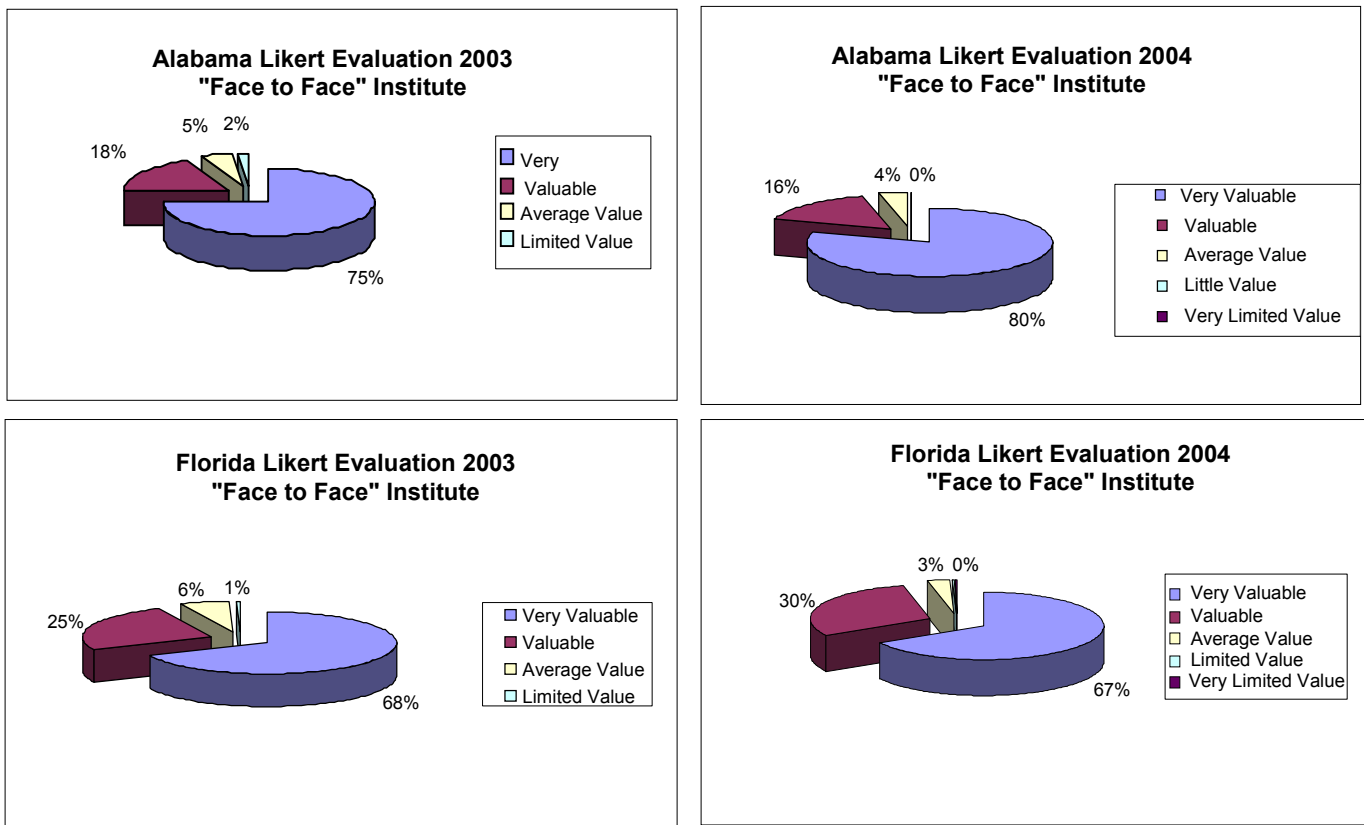
	FIRST 25 QUESTIONS		ENTIRE 50 QUESTIONS		SIGNIFICANCE LEVEL		
	MEAN PRE	MEAN POST	MEAN PRE	MEAN POST			
AL	18.0	19.5	33.9	36.9	First 25	NS	p=0.204188
					Entire 50	0.05	p=0.012575
FL	16.4	20.5	29.8	39.4	First 25	0.01	p=0.007476
					Entire 50	0.01	p=0.002103

LA	15.4	19.4	27.7	36.5	First 25	0.01	p=0.000886
					Entire 50	0.01	p=0.0000125
MS	16.2	18.0	30.4	36.9	First 25	NS	p=0.116646
					Entire 50	0.01	p=0.0050561
TX	18.7	23.7	31.3	45.9	First 25	0.05	p=0.010467
					Entire 50	0.01	p=0.00107

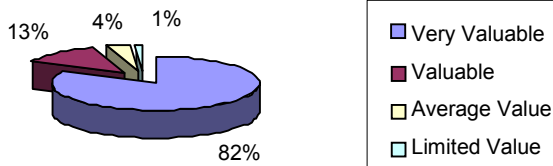
In the 2003 Summer “Face to Face” Institutes, Likert-scale evaluations were administered to teachers of all states (and the scientists of AL and MS) to determine attitudinal achievement and perceived value of activities, field trips, and speakers of the Summer Institutes. The 2003 data indicated that 98% of the AL and MS teachers and 99% of the FL and LA teachers rated the activities of Average to Very Valuable. Seventy-five percent of AL, 68% FL, 82% of LA and 68% of MS activities were rated Very Valuable. The scientists for AL and MS rated the activities as 100% and 99% Average to Very Valuable respectively with 73% of the AL and 40% of the MS activities as being Very Valuable.

In the 2004 Summer “Face to Face” Institutes, Likert-scale evaluations were also administered and quantified using content analyses to determine attitudinal achievement and perceived value of activities, field trips, and speakers of the Summer Institutes. These 2004 data revealed all COSEE:CGOM participants perceived between 95-100% Very Valuable/Valuable and between three and four percent of the scientists and teachers believed select activities were of Average Value and two percent of the LA teachers and scientists believed the activities to be of Limited Value.

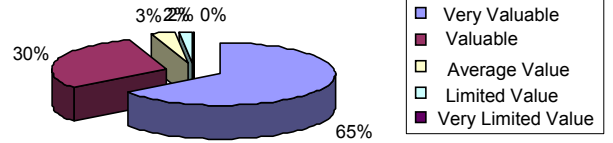
The 2003 and 2004 “Face to Face” Likert-scale evaluations by state for teachers are outlined below:



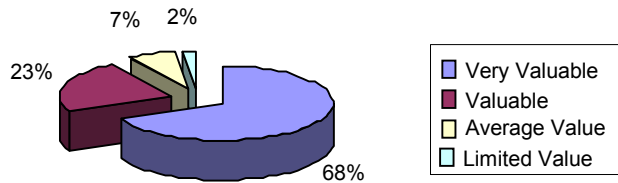
**Louisiana Likert Evaluation 2003  
"Face to Face" Institute**



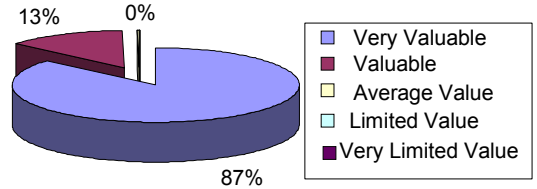
**Louisiana Likert Evaluation 2004  
"Face to Face" Institute**



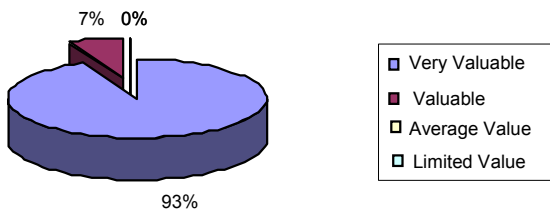
**Mississippi Likert Evaluation 2003  
"Face to Face" Institute**



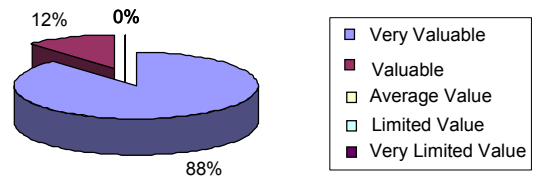
**Mississippi Likert Evaluation 2004  
"Face to Face" Institute**



**Texas Likert Evaluation 2003  
"Face to Face" Institute**



**Texas Likert Evaluation 2004  
"Face to Face" Institute**



**2003 AND 2004\* TEACHER LIKERT SCALE EVALUATION  
STATE COMPARISONS**

STATE	VERY VALUABLE	VALUABLE	AVERAGE VALUE	LIMITED VALUE
ALABAMA	75%—80%	18%—16%	5%—4%	2%—0%
FLORIDA	68%—67%	25%—30%	6%—3%	1%—0%
LOUISIANA	83%—65%	13%—30%	4%—3%	1%—2%
MISSISSIPPI	69%—87%	23%—13%	7%—0%	2%—0%

TEXAS	93%— <b>88%</b>	7%— <b>12%</b>	0%— <b>0%</b>	0%— <b>0%</b>
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- 2004 data have been “**bolded.**”

In 2003 scientists for Alabama and Mississippi rated the activities as 100% and 99% Average to Very Valuable, respectively with 73% of the Alabama and 40% of the Mississippi activities as being Very Valuable. A scientists’ profile was conducted by all five states in 2003 to evaluate the knowledge level of participating scientists on national education standards, science framework, middle school science content, and philosophy of inquiry-based learning. Results of the 2003 “Face to Face” Scientists’ Profiles and Likert-scale evaluations by scientists of the AL and MS Workshops are given below:

### **2003 SCIENTISTS’ PROFILE COMPOSITE FACE-TO-FACE (1-NO KNOWLEDGE TO 5 EXPERT KNOWLEDGE)**

KNOWLEDGE LEVEL	1	2	3	4	5
KNOWLEDGE OF “NATIONAL EDUCATION STANDARDS”	37%	34%	23%	6%	--
KNOWLEDGE OF SCIENCE FRAMEWORK	43%	26%	23%	9%	--
KNOWLEDGE OF MIDDLE SCHOOL SCIENCE CONTENT	24%	32%	35%	9%	--
KNOWLEDGE OF THE PHILOSOPHY OF INQUIRY-BASED LEARNING	11%	29%	26%	26%	9%

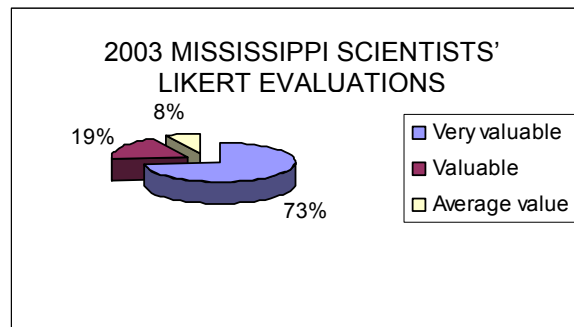
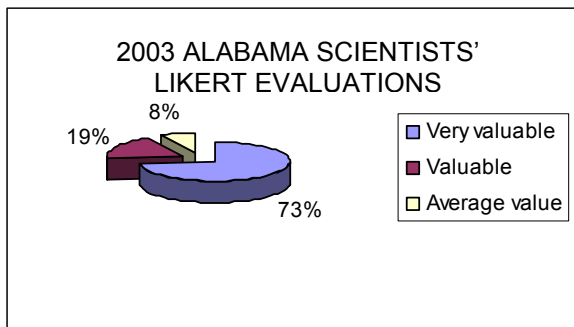
These data reveal that the scientist respondents do not relate to a comfortable knowledge of teachers’ pedagogical expertise related to *State and/or National Science Education Standards* or the knowledge of learning by middle school students. These data further reveal the scientists “better understand” inquiry-based learning when compared to their perceived knowledge of *State and National Standards*. These findings might suggest there is a “mirror image” between scientists’ content knowledge and in general, teachers’ need to have enhanced scientific content knowledge and teachers’ knowledge of education theory/learning need of precollege students and scientists lack of expertise in this pedagogical arena. Therefore, the COSEE:CGOM Management Team Members are of the opinion, these Summer Institutes will result in an experiential scientific and pedagogical exchange between the scientists and middle school teachers which will result in augmented professional respect between the two professions.

The findings below, by each Gulf of Mexico state, revealed scientists’ perceived knowledge levels of 1) *State and National Science Education Standards*, 2) middle school marine content, and 3) inquiry-based learning. Based on these findings, 50% of the Texas and 63% of the Florida scientists believed they possess an average knowledge or less of the *Standards*. In Mississippi, Alabama, and Louisiana, 86-89% of the scientists, believed they have an average or less knowledge of the *Standards*. For the scientists’ knowledge level for middle school science content, these data—in general—documented that the majority of scientists believe they have an average or less than average understanding of the scientific levels needed by these 6<sup>th</sup> through 8<sup>th</sup> grade students. And, the data for the scientists’ perception of their knowledge of the philosophy of inquiry-based learning, revealed 100% of the Texas respondents perceived they had knowledge of this criterion while 44% of the Alabama scientists believed they had expert knowledge or knowledge of the philosophy of

inquiry-based learning. Eighty-nine to 100% of the scientists in Mississippi, Florida, and Louisiana were of the opinion that they had only an average to no knowledge of the philosophy of inquiry-based learning.

## 2003 SCIENTIST PROFILE (1-NO KNOWLEDGE TO 5 EXPERT KNOWLEDGE)

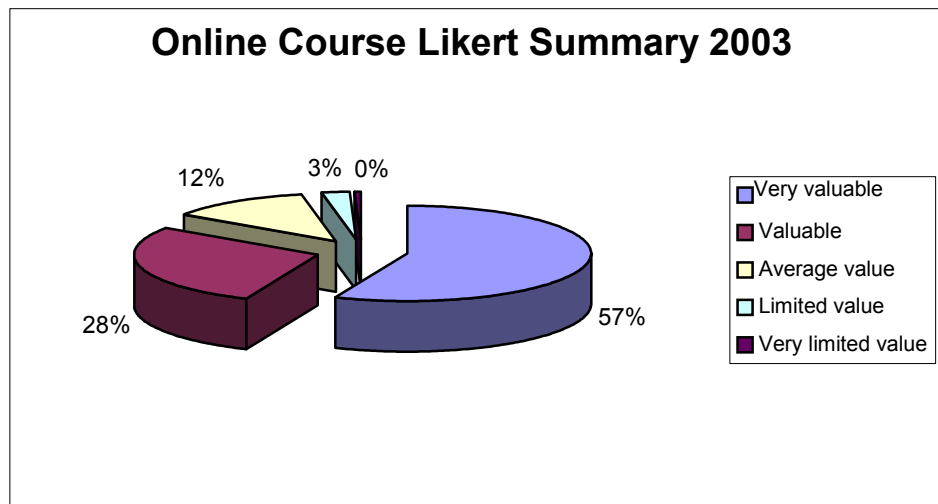
KNOWLEDGE LEVEL	1	2	3	4	5
<b>KNOWLEDGE OF "NATIONAL EDUCATION STANDARDS"</b>					
ALABAMA	29%	43%	14%	14%	
FLORIDA	25%	13%	63%	--	
LOUISIANA	44%	44%	--	11%	
MISSISSIPPI	56%	33%	11%	--	
TEXAS	--	50%	50%	--	
<b>KNOWLEDGE OF SCIENCE FRAMEWORK</b>					
ALABAMA	29%	43%	14%	14%	
FLORIDA	25%	13%	50%	13%	
LOUISIANA	67%	11%	11%	11%	
MISSISSIPPI	56%	22%	22%	--	
TEXAS	--	100%	--	--	
<b>KNOWLEDGE OF MIDDLE SCHOOL SCIENCE CONTENT</b>					
ALABAMA	29%	43%	29%	--	
FLORIDA	13%	13%	50%	25%	
LOUISIANA	22%	44%	22%	11%	
MISSISSIPPI	33%	22%	33%	11%	
TEXAS	--	50%	50%	--	
<b>KNOWLEDGE OF THE PHILOSOPHY OF INQUIRY-BASED LEARNING</b>					
ALABAMA	14%	29%	14%	29%	14%
FLORIDA	25%	50%	25%	--	--
LOUISIANA	--	56%	44%	--	--
MISSISSIPPI	33%	11%	45%	11%	
TEXAS	--	--	--	100%	--



In 2003, pre-and posttest instruments for the Online Institutes were analyzed using paired, two-tail t-tests. The results were significant at the 0.05 level for AL, LA, and TX, and not significant in MS and LA. In 2004, the pre- and posttest analyses for each of the Gulf of Mexico states were significant at the 0.01 level for the Online Institutes.

**PRETEST & POSTTEST  
EVALUATIONS FOR ONLINE COURSE 2003 & 2004\***

	MEAN PRETEST	MEAN POSTTEST	SIGNIFICANCE LEVEL	
AL	32.1 *12.9	37.6 18.3	0.05 0.01	p=0.012471 p=0.00194
FL	34.2 *13.2	42.6 18.5	0.05 0.01	p=0.028375 p=0.00812
LA	39.0 *12.5	40.8 18.4	NS 0.01	p=0.655375 p=4.47 E-07
MS	38.2 *10.5	36.9 16.2	NS 0.01	p=0.394365 0.00341
TX	18.9 *15.2	20.7 19.0	0.05 0.01	p=0.04741 p=00838



During the 2003 and 2004 Summer Institutes in each Gulf of Mexico state, the Lessons Plans developed during the Online component have been aligned with respective state and/or national science standards.

Drs. Tina Bishop and Peter Tuddenham are external evaluators for the COSEE:CGOM. Drs. Bishop and Tuddenham contacted all Online Keynote Scientist Instructors and provided the following documentation to the COSEE:CGOM PIs. The following report summarizes results from a survey of Scientist Instructors who provided Online instruction to the teacher participants in the COSEE-Gulf of Mexico Institute in summer 2003. An email survey was sent in September 2003 to the eleven Scientist Instructors for the Online Institute. The survey consisted of seven open-ended questions. Four Scientists responded to the survey, with one respondent expressing the caveat of only marginal involvement.

The first question addressed expectations about the Instructor's participation in the Online Institute and whether these expectations were met. One respondent did not know what to expect and one person had no expectations prior to the Online component. The other respondents said they had expected that their presentations would be followed by interactive discussion among the participants and questions and answers from the participants. They believed that the presentation of material would generate dialogue about the content but this did not happen. One Instructor said this left a sense of dissatisfaction with instructional efforts. The development of an educational community that could have occurred did not happen. One person's expectation was to give a lecture and be available for questions but not to give study guides and develop activities. One person expressed that a stipend would be nice, given the amount of work in a short time period. In discussing the amount of time they spent online with the teachers, they all reiterated that they spent little time online with teachers. Neither did they interact much with the other instructors.

A question was posed about the ease or difficulty of developing the Keynote Scientist Instructors' materials for online presentation. In general the Instructors stated that it was not difficult to develop materials. For one presenter, the process was simple but time-consuming, as the web made it slightly more complicated. One person said it took a good deal of time to reformat.

They voiced several concerns and suggestions:

- There may be limitations for teachers downloading with dial-up modems;
- "Guidelines" need to be developed for Instructors about what will work in this instructional medium;
- Instructors need a good way to get feedback about whether the participants got the content information "with or without misconceptions." The homework being sent to individual COSEE educators precluded appropriate feedback for the instructor; and
- There wasn't enough time to put together a quality presentation online.

When asked about difficulties encountered, three Instructors stated they had no difficulties. One person would have liked more advance information about the logistics of participation. Technical difficulties included: 1) the website was not friendly to non-Microsoft browsers and 2) not all MS Explorers have Flash Player installed. However on the positive side, one person said that "the page does look nice with the proper computer setup."

Benefits derived from their participation included:

- A good chance "to look at my program from a different perspective."
- "New experience in working in distance learning area."
- "An opportunity for transferring the information in our many years of science to understandable and usable information for educators and the public" (same as with any education and outreach group).

On the downside, one person derived no personal or professional benefits and emphasized the desire for closer interaction with participants.

Survey respondents were asked to provide impressions of how the experience enhanced scientist-educator connections. By and large the Scientist Instructors responded that expected interactions among themselves and educators did not occur. Cross-state connections among scientists and educators on the topic areas did not happen. Reasons may have been technology issues or short-time frame. One person expressed the view that the Online format was very limiting for interactions and found the "Face to Face" more conducive. However one person said that the Institute was a good way to inform the educators about respective scientific research programs, to help build more knowledgeable students and public. Respondents acknowledged benefits for the educators and encouraged future Online programs.

The following thoughts and suggestions were provided by the Instructors:

- Make the website viewable by any web browser for both text and multimedia files. The website should be compliant with common html standards or other cross platform formats;

- Rethink how to get Scientist Instructors involved; more clearly define and market reasons why Scientists would want to be involved;
- Seek ways to require communication between educators and instructors e.g. short questions by instructors to the educators;
- Provide basic ocean science concepts to teacher participants ahead of time;
- Increase the “Face to Face” time; and
- Coordinate the development of pre- and posttest questions by instructors.

From the suggestions made in 2003, the following improvements were implemented for the 2004 Online Institute:

- The web master reformatted website presentations to comply with common html standards and other cross platform formats;
- Online Instructors were limited to six;
- Teacher participants were provided CDs of all presentations prior to the implementation of the Online component;
- The six Online Scientist Instructors each provided pre- and posttest questions specific to their respective presentation.

The review of the 2004 Online component by Drs. Tina Bishop and Peter Tuddenham led to the conclusion that the Online Institute has been successful in helping COSEE:CGOM reach its goal of strengthening ocean and coastal sciences education through the interpretation of research results for teachers. The Online portion of the Summer Institute reinforced the excellent “Face to Face” sessions held at the partner locations earlier in the summer.

The Online Institute was designed in a traditional expert-student model with the scientists imparting information to the teachers as students. A suggestion for expanding the Institute would be to have the teachers present information to the scientists about their own teaching. This would encourage learning to go both ways. This “side-by-side” learning of teachers and scientists would further bridge the gap between the science and education communities.

Technical issues were still barriers to ease of viewing of presentations and building relationships between teachers and scientists. The presentations were secured on web pages with one login and password combination and the message board was in another web location requiring a different login and password. It would be helpful to see the process combined under one login and in one web location.

This Online portion offers the opportunity for teachers from different states to interact. It also gives teachers a chance to dialogue directly with scientists who are doing cutting edge research and exploring timely issues in the Gulf of Mexico. Therefore to maximize these opportunities, the COSEE:CGOM Team should explore ways to make the interaction among scientist presenters and teacher participants a more salient feature of the Online program. Additional preparation and training for the scientist presenters related to Online presentation and facilitation would be helpful to stimulate Online dialogue. Re-structuring the Online format so that content discussion and technical support issues could be in separate areas might promote a better environment for dialogue among scientists and teacher participants.

### **Sea Scholars**

The Sea Scholars voyages provided by the U.S. Navy’s Meteorology and Oceanography Command (NAVMETOCCOM) and the Naval Oceanographic Office (NAVOCEANO) have been implemented “up to” three times per year (spring, summer, and fall) for a potential total of 42 teacher participants per year. Goals of the Sea Scholars Voyages were: 1) to develop public perception of the U.S. Navy as a steward of the oceans; 2) provide K-12 teachers a view of the U.S. Navy of which too few people are aware; 3) remove the myth that the U.S. Navy is not concerned about the environment; and 4) increase and improve the content knowledge, attitudes, and instructional strategies of the Sea Scholars relative to coastal processes and ocean sciences. These goals were accomplished as teachers worked side by side with Navy and civilian scientists while studying the topics of chemical, biological, geological, and physical oceanography to include bathymetry, acoustics, plankton, bioluminescence, meteorology, geodesy and mapping, conductivity, temperature, depth, geologic cores, and naval application of these data. These once in a lifetime experiences partner with the U.S. Navy aboard its 329-



ft., T-AG 60 Oceanographic Survey Ships and their U.S. Navy and Civilian Surveyors. Both 2003 voyages were in the Gulf of Mexico and Dry Tortugas area aboard the *USNS MARY SEARS*. As indicated below, the 2003 Sea Scholars component of this study involved the implementation of two different voyages, i.e. June 7-14 with 11 participants and July 2-11 involving 16 participants. In the first 2003 voyage, the participants represented the states of LA, MS, TX, and TN. In the second 2003 voyage, the 16 participants represented eight states, i.e., CA, FL, MN, MS, OK, TN, TX, and WA. In 2004, the U.S. Navy was only able to provide the Sea Scholars opportunity for one voyage, October 15-25 involving 14 participants from eight states, i.e., AL, FL, OH, CO, MS, TX, CT, and NJ. This voyage began in Honolulu, HI and concluded in Portland, OR aboard the *USNS SUMNER*.

**SEA SCHOLARS PARTICIPATION  
SUMMER 2003 (LEGS 1 & 2) AND FALL 2004**

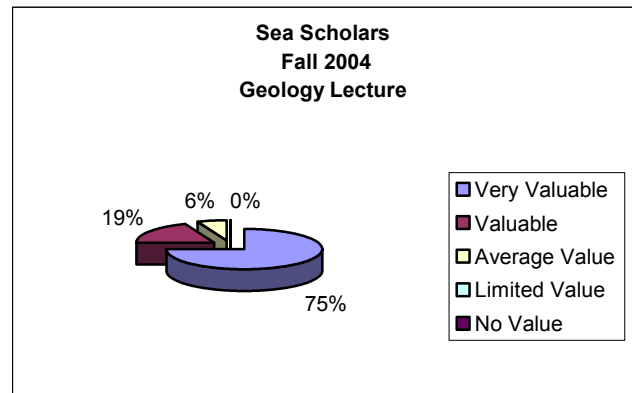
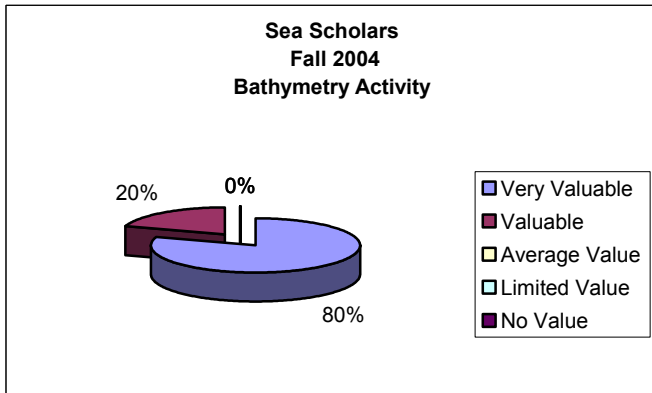
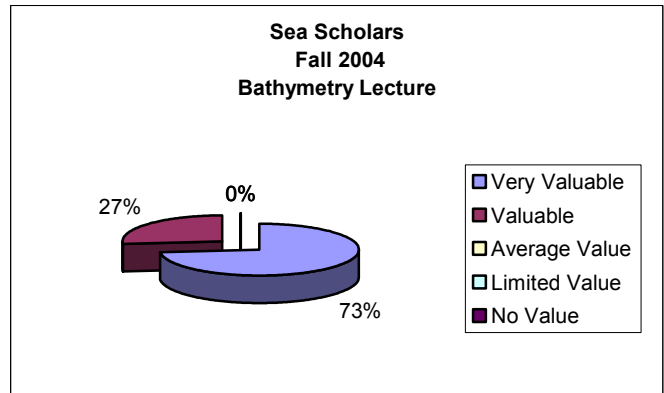
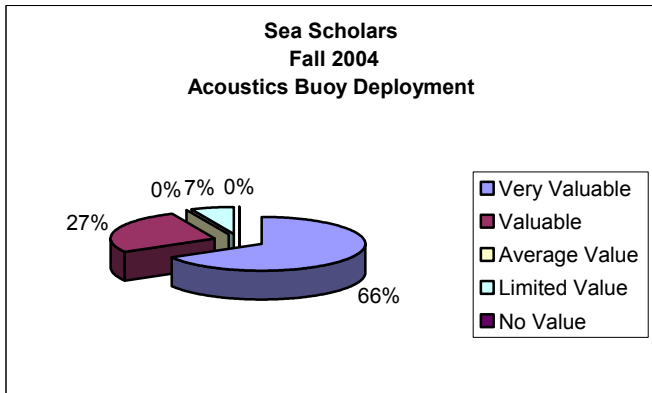
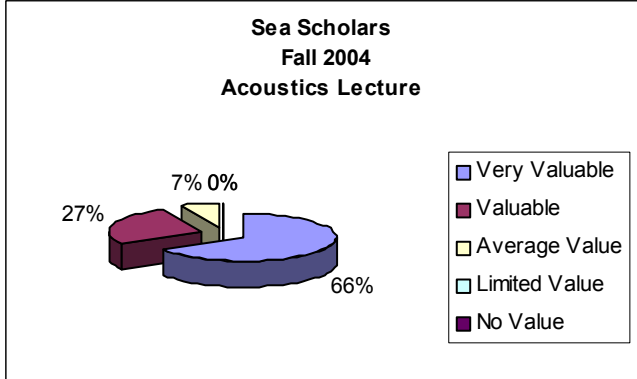
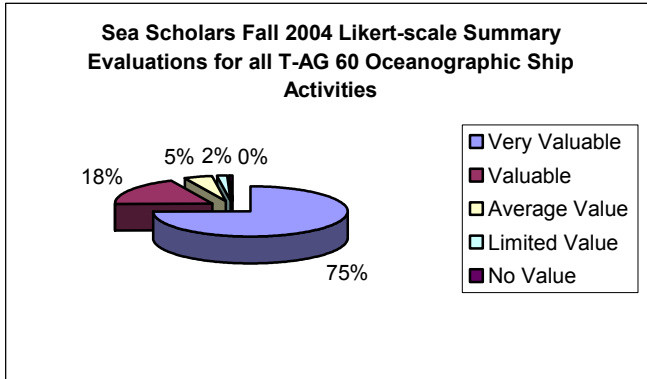
JUNE 7-14,2003	11 PARTICIPANTS 1 LA            7 MS 2 TN            1 TX		
JULY 2-11, 2003	16 PARTICIPANTS CA            2 FL            1MN 7 MS            2 OK            1 TN 1 TX            1 WA		
OCTOBER 15-25, 2004	14 PARTICIPANTS 4 AL            1 CO            1 CT 1 FL            1 MS            2 NJ 1 OH            3 TX		

For all voyages paired, two-tailed t-tests were used to statistically analyze pre-and posttest data. For both voyages in 2003 and the one voyage in 2004, the mean scores for both pre-and posttests were significant at the 0.01 level. Likert-scale analyses for the Sea Scholars component of the COSEE:CGOM effort were not implemented in 2003, but Likert-scale evaluations were developed, administered, analyzed and interpreted during 2004. The Likert-scale data were quantified using content analyses. As indicated below, the 2004 Likert-scale summary data for Sea Scholars revealed for 93% of the 14 participants perceived all activities as Very Valuable/Valuable, while five percent perceived all activities of Average Value and two percent of the teachers believed the activities to be of Limited Value. The following 24 graphs delineate the perceived teachers' value of each activity while aboard the T-AG 60 Oceanographic Survey Ship.

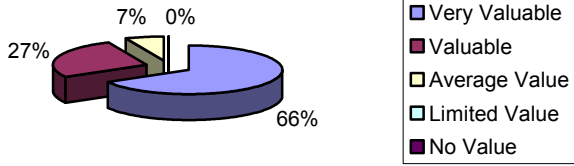
**PRETEST & POSTTEST  
EVALUATIONS FOR SEA SCHOLARS  
(LEGS 1 & 2 SUMMER 2003 AND FALL 2004)**

	MEAN PRETEST	MEAN POSTTEST	SIGNIFICANCE LEVEL	
SUMMER 2003 (LEG1)	23.1	28.7	0.01	p=0.0000399
SUMMER 2003 (LEG 2)	21.2	28.5	0.01	p=0.0000000387
FALL 2004	19.9	26.5	0.01	p= 0.0000218

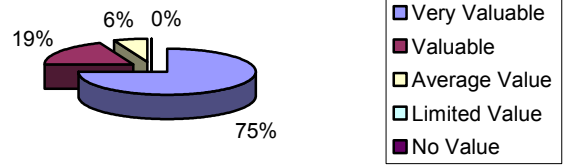
It is of interest to note the teacher participants perceived the State and National Standards Discussions and Professional Development Lecture to be of Limited or No Value when compared to all scientific and/or ship activities. It is also interesting that these data revealed several areas only perceived to be Very Valuable and Valuable ratings.



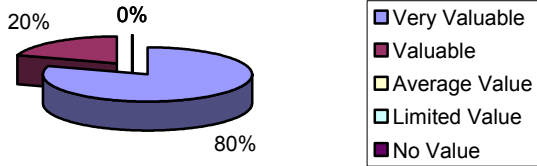
**Sea Scholars  
Fall 2004  
Core Sampling and Analysis**



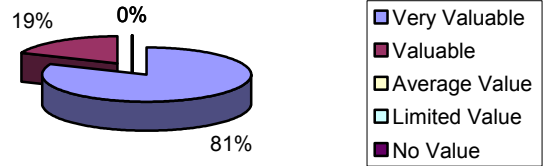
**Sea Scholars  
Fall 2004  
Dredge Sampling and Analysis**



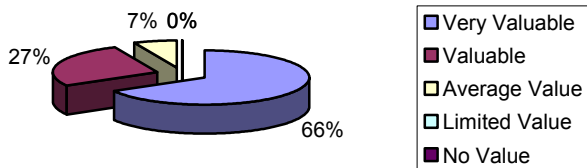
**Sea Scholars  
Fall 2004  
Meteorology Lecture**



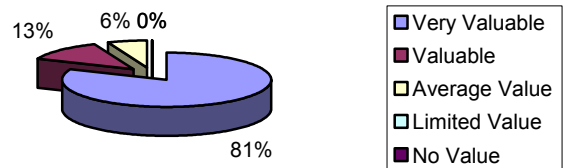
**Sea Scholars  
Fall 2004  
Weather Balloon Deployment**



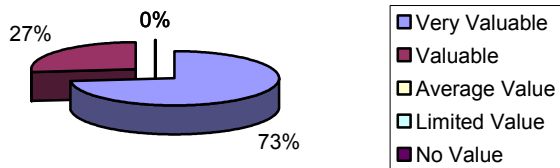
**Sea Scholars  
Fall 2004  
Physical Oceanography Lecture**



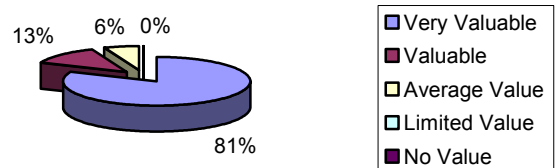
**Sea Scholars  
Fall 2004  
CTD Deployment and Analysis**



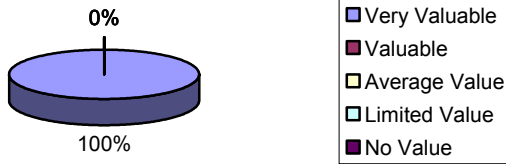
**Sea Scholars  
Fall 2004  
Biological Oceanography Lecture**



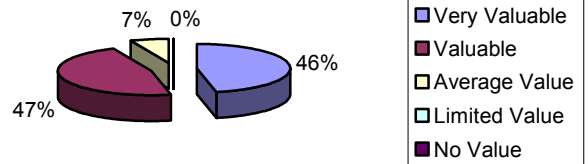
**Sea Scholars  
Fall 2004  
Plankton Activities**



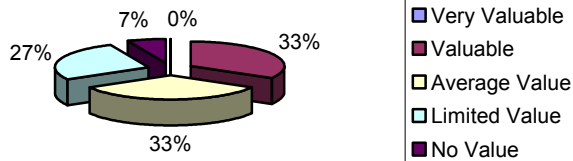
**Sea Scholars  
Fall 2004  
Bioluminescence**



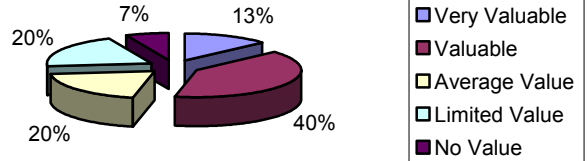
**Sea Scholars  
Fall 2004  
Shark Dissection and Fish Biology**



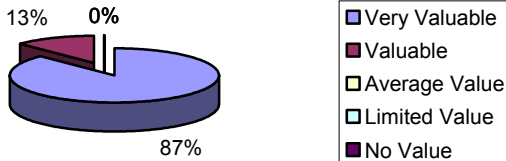
**Sea Scholars  
Fall 2004  
State and National Standards**



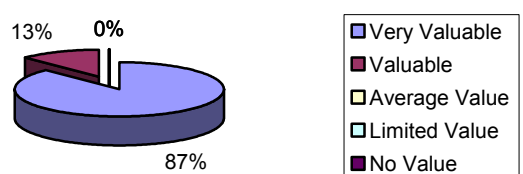
**Sea Scholars  
Fall 2004  
Professional Development Lecture**



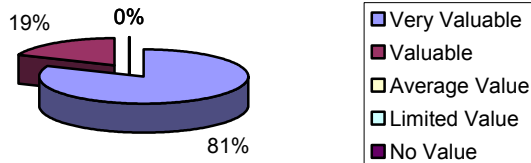
**Sea Scholars  
Fall 2004  
Teacher Share-a-Thon**



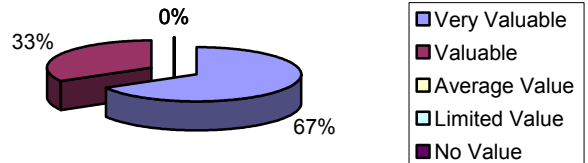
**Sea Scholars  
Fall 2004  
Professional Development Activities  
Developed Onboard**

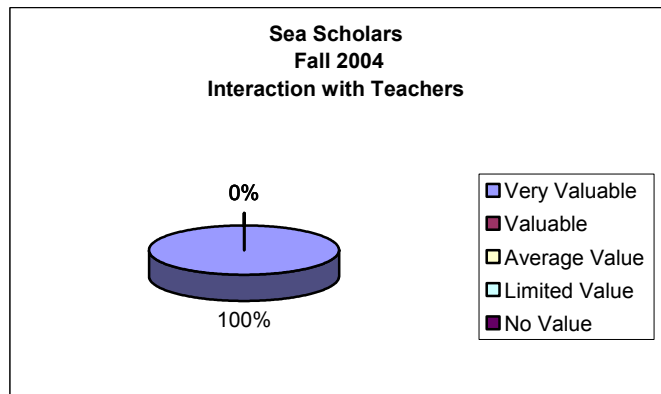
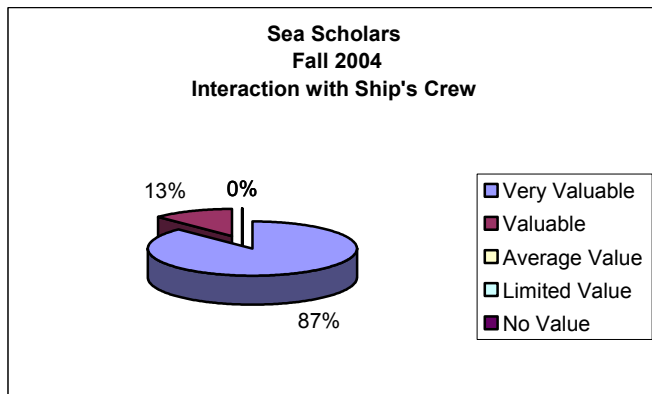
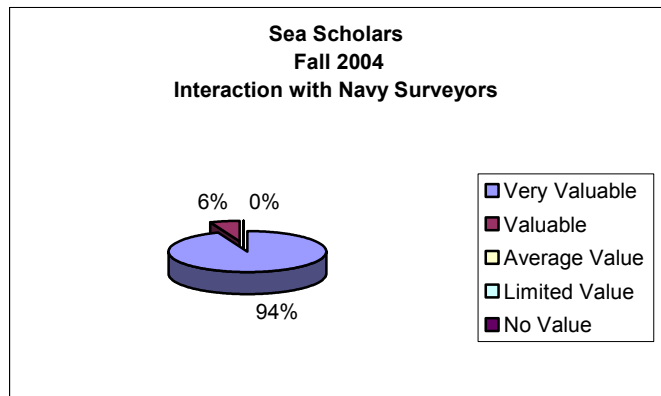
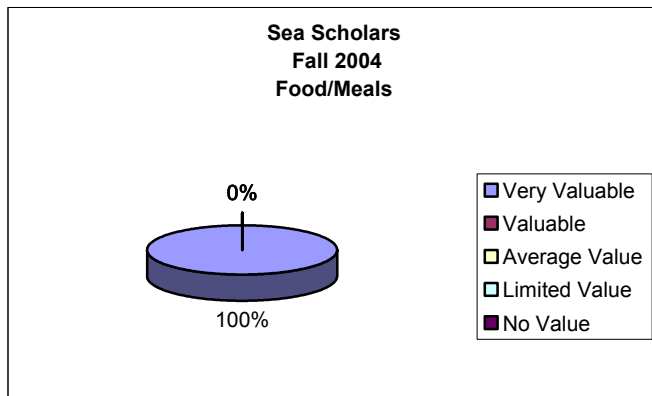


**Sea Scholars  
Fall 2004  
Ship Tour**



**Sea Scholars  
Fall 2004  
Sleeping Accommodations**





**Underserved Internships:**

Three Internships for underserved students from the Jefferson Davis Campus of the Mississippi Gulf Coast Community College were awarded through the National Sea Grant College Program/Mississippi-Alabama Sea Grant College. Ms. Kinyatta Magee, worked ten hours per week for ten weeks during the summer of 2003 with the COSEE Scientist and Educator at the Scott Aquarium. In the summer of 2004, Charmain Chapman and Tameka Colston were the student Interns that worked at the J.L. Scott Marine Education Center and Aquarium with the COSEE Scientist and Educator. All of these minority, women are currently undergraduate students at either USM Hattiesburg or USM Gulf Park Campuses.

One intern responded to Dr. Tina Bishop’s survey. The intern identified herself as a sophomore at Mississippi Gulf Coast Community College – Jefferson Davis campus, majoring in Biotechnology Applied Science. She accepted the internship at the Marine Education Center for ten weeks during the summer or 2004, working with Dr. Shelia Brown, Dr. Sharon Walker, and Kay Baggett. During her internship, she learned to set up a butterfly habitat, helped create keys for local ferns and carnivorous plants, and catalogued the local native plant species. Ms. Chapman said that the Internship helped increase her knowledge of biodiversity, and brought about an understanding of its importance in the ecosystem. Her work also made her more aware of the impact that humans had on the environment around them. Ms. Chapman also learned the value of research as one embarks on a new project. She mentioned other valuable experiences during her Internship included talking with a diverse group of teachers and working in the field instead of a lab. Ms. Chapman would like to continue her education, to include a Ph.D after her undergraduate degree is completed.

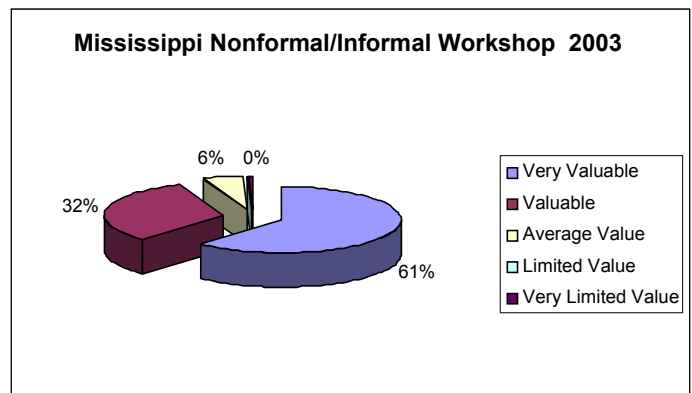
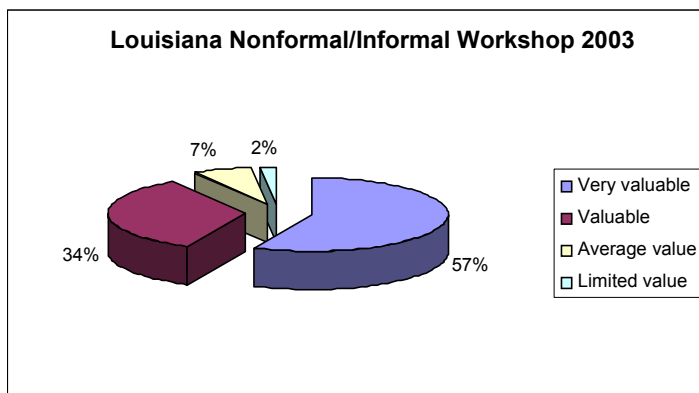
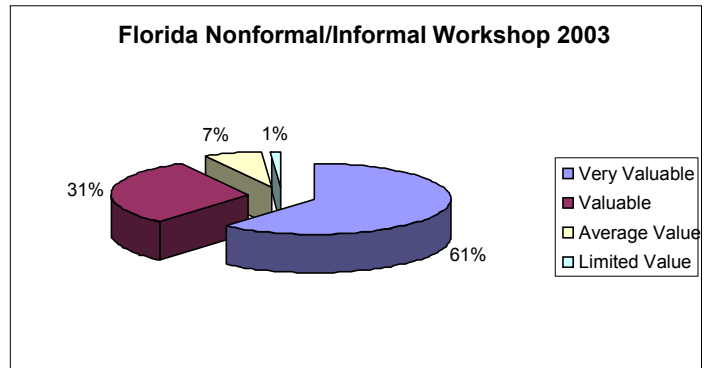
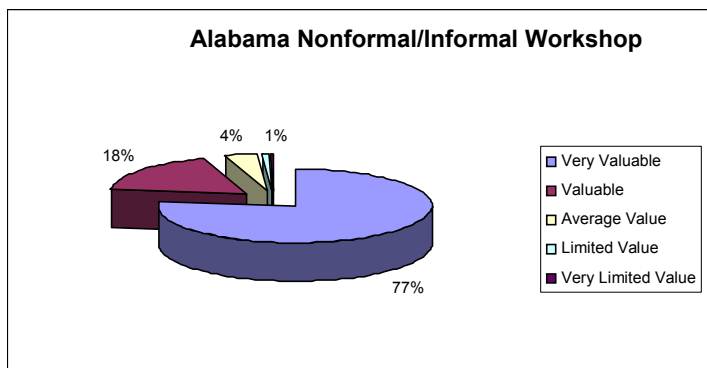
**Website:**

Dr. Dan Brook and his post-doctoral student, Dr. Brian McCann, of Mississippi State University developed and are maintaining the COSEE:GCOM website, <[www.cosee-central-gom.org](http://www.cosee-central-gom.org)>. This website contains information and/or applications for the “Face to Face” and Online components of the Summer Institutes, Sea Scholars, the Minority Internships, and the Nonformal/Informal Workshops. The 2003 and 2004 science education research findings are also contained on this website, as well as digital images from the “Face to Face” Institutes and Sea Scholars components.

### Nonformal/Informal Workshops:

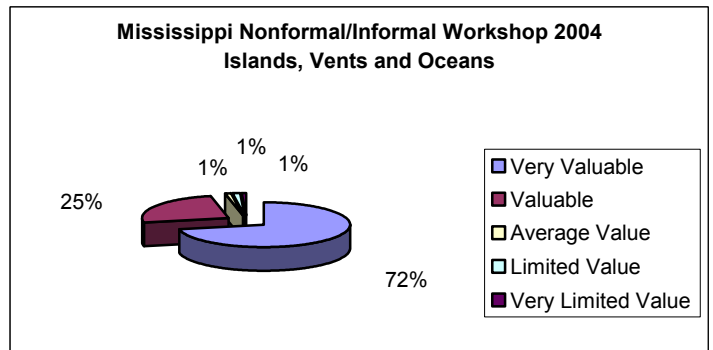
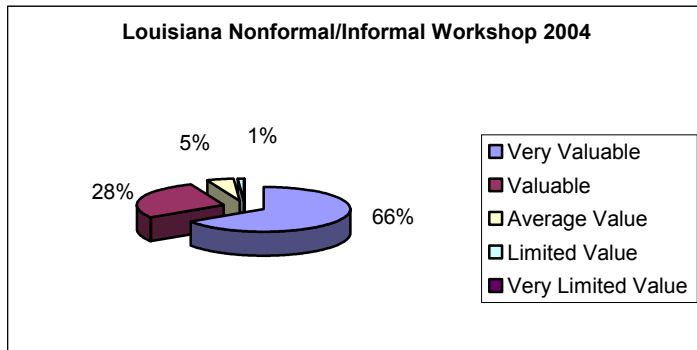
The Year 1 Nonformal/Informal, two-day Workshops were implemented in November 13-15, 2003 (LA) involving 35 participants focusing on Global Climate Change and Hurricanes. In MS and AL, the two-day Nonformal/Informal Workshop focused on Aquaculture, Aquatic Nuisance/Invasive Species, Biotechnology, and Hurricanes. The MS Workshop involved 53 participants during March 2-3, 2004. The AL Workshop was held February 28-29, 2003 with 47 attendees. Florida implemented their two-day Nonformal/Informal Workshop, “Bridging the Gap: The Changing Paradigm in Science/Educations” with 72 participants in December 2003. The Conference themes encompassed Sharks-Biology, Management, and Conservation; Marine Biotechnology; Aquatic/Marine Invasive Species; Ocean Observation Systems; Marine Aquaculture; and “Bridging the Gap – Changing Paradigm” Discussions.

The Likert-scale data for each of the Workshops by state revealed the following perceived values: AL – 85% Very Valuable/Valuable; MS – 93% Very Valuable/Valuable; LA – 91% Very Valuable/Valuable; and FL – 92% Very Valuable/Valuable. For the Average Value rating, the perceived values were: AL – four percent; MS – six percent; LA – seven percent; and FL – seven percent. For Limited Value perceptions, the percentage varied from less than one to two percent in MS, LA, and FL; AL participants were of the opinion 10% of the content and activities were of Limited Value. These data are graphically represented below:



- In Year 2 (November and December 2004 through January and February 2005) the following Nonformal Workshops were/are scheduled:
  - Louisiana – November 19-20, 2004 (implemented);
  - Mississippi – December 2-3, 2004 (implemented);
  - Alabama – January 20-22, 2005;
  - Florida – First week of February, 2005; and

- Texas – January 11-12, 2005.



The LA Nonformal Workshop November 19-21, 2004 presented topics associated with coastal restoration to the 49 participants. The MS Nonformal Workshop December 2-3, 2004 exposed the 42 participants to topics of island and marsh restoration, biology of sulfate reduction at hydrothermal vents and cold seeps, and an ocean overview. The Likert-Scale dates for the second year Workshops for LA and MS revealed the following perceived values: LA – 94% Very Valuable/Valuable; MS-97% Very Valuable/Valuable. For the Average Value rating, the perceived values were LA-5%; MS – 1%. For Limited Value perception, the percentage was the same for both LA and MS-one percent. MS participants rated one percent of the activities as Very Limited Value.

#### **Program Evaluation:**

The program evaluation model was developed and implemented by Dr. Susan Ross as internal evaluator and Drs. Tina Bishop and Peter Tuddenham as external evaluators. Additional activities performed by COSEE: CGOM personnel included:

- \* Evaluation of data and subsequent interpretations,
- \* Presentations at various meetings,
- \* Co-PI Meetings/Expanded COSEE-CGOM meetings
  - \* July (NMEA) 2003
  - \* September 4-5, 2003
  - \* December 11-13, 2002,
  - \* Conference Calls every two months in 2003 and 2004, and
  - \* COSEE Management Team Meeting, January 4-7, 2005