

2003 Minority Students Pursuing Higher Degrees of Success in Ocean Sciences Program (MS PHD'S in Ocean Sciences Program): A Pilot Project

Formative Evaluation

Dr. Vivian Williamson, Evaluator

This evaluation of the *Minority Students Pursuing Higher Degrees of Success in Ocean Sciences Program (MS PHD'S in Ocean Sciences Program)* consists of an analysis of four data sets. Each data set is aligned to document progress in the achievement of the following program goals:

GOAL 1: The MS PHD'S in Ocean Sciences Program will successfully market, recruit, select, and engage underrepresented student and non-student participants with interest/ involvement in Ocean Sciences;

GOAL 2: The MS PHD'S in Ocean Sciences Program will provide meaningful engagement for participants as determined by quantitative analysis of user-feedback;

GOAL 3: The MS PHD'S in Ocean Sciences Program will provide meaningful engagement for participants as determined by qualitative analysis of user-feedback, and;

GOAL 4: The MS PHD'S in Ocean Sciences Program will develop a constituent base adequate to demonstrate evidence of interest, value, need and sustainability in its vision, mission, goals and activities.

The discussion of each program goal is segmented into three components:

- Presentation of data
- Interpretation of data
- Evaluation of data.

Data within GOAL 2 are logged as percentage of total response (student and non-student combined). Data in Appendix 1 and Appendix 2 document both actual number of responses and percentage within single participant categories. Appendix 1 portrays student response to survey questions and Appendix 2 portrays non-student response to the same set of questions.

Data are presented in quantitative and qualitative formats. These data, when combined, paint a more complete picture of participant response and program impact. When warranted, evaluator notes are inserted to identify of extenuating circumstances or exceptional conditions that contributed to the level of participant response.

A formative evaluation for each goal is placed at the end of data and the interpretation thereof. The summation is introduced with the restatement of the goal and concluded with evidence of compliance. A compilation of summaries for each goal is presented in the *MS PHD'S in Ocean Sciences Program Formative Evaluation Summary*.

GOAL 1: The MS PHD'S in Ocean Sciences Program will successfully market, recruit, select, and engage underrepresented student and non-student participants with interest/involvement in Ocean Sciences

DATA AND INTERPRETATION

The goal of the *MS PHD'S in Ocean Sciences Program* is explicit in its name. The program is intended to attract, engage and provide underrepresented students with mentoring experiences and exposure to practitioners within the multidiscipline academy of Ocean Sciences. Program announcement and application process was circulated in accordance to the plan outlined in the initial proposal. Student participants were selected through the specified applicant screening process. Twenty-one (21) students were selected to participate in onsite program activities. The remaining applicants received access to the *MS PHD'S* website and listserv and are currently held in a growing pool of eligible participants for future *MS PHD'S in Earth System Science Program* activities.

Academic backgrounds of student participants represented a broad spectrum. 2003 *MS PHD'S* student participants included, on the front end, two (2) high school students and on the back end, ten (10) graduate students and one (1) post-doctoral student. In addition, ten (10) undergraduate students and two (2) recent graduates/graduate school applicants comprised the first *MS PHD'S* class of twenty-one (21) students.

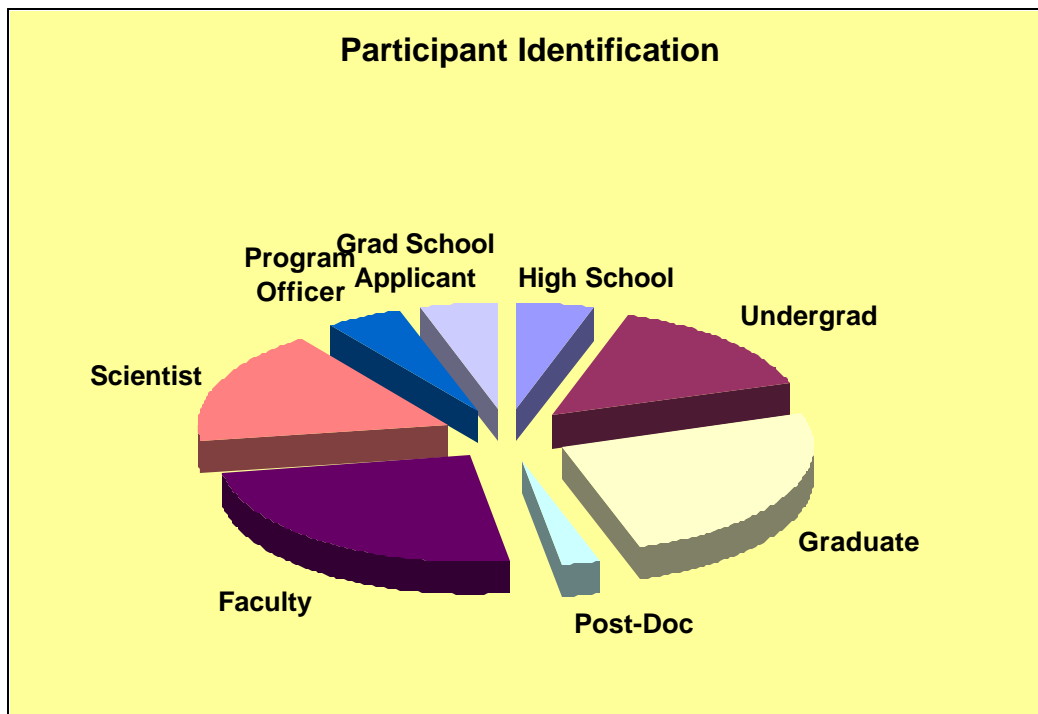


Table 1. Academic Status of *MS PHD'S* Student Participants

High School	2
Undergrad	6
Graduate	10
Post-Doc	1
Grad School Applicant	2

The success of the **MS PHD'S in Ocean Sciences Program** was highly determined by the degree through which Ocean Sciences practitioners, id. Est., faculty, scientists, agency and professional organization personnel, were recruited and meaningfully engaged in partnership with student participants. Mentors were selected whose discipline and research interest closely aligned with academic, professional and research interests of student participants.

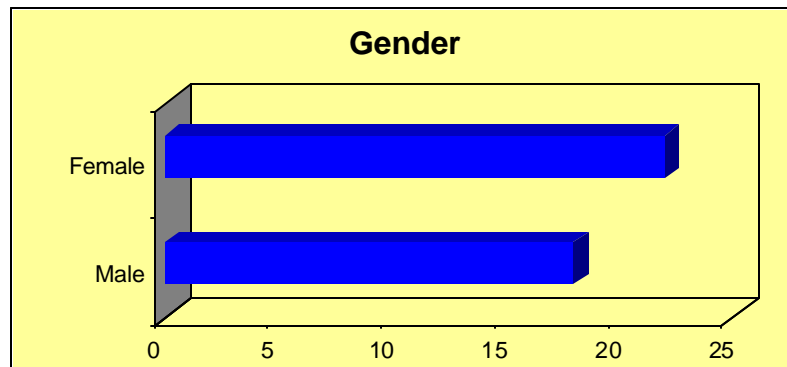
Because of the successful effort of the **MS PHD'S** Director, nineteen practitioners actively participated as program and/or JGOFS meeting mentors for the students. **MS PHD'S** mentors included ten (10) faculty, seven (7) scientists, and two (2) program officers.

Students were engaged with mentors on two levels: **MS PHD'S in Ocean Sciences Program** mentors and JGOFS Meeting mentors. The Program mentors served as consistent guides and support for their student mentees throughout onsite activities, tours and throughout the duration of the **MS PHD'S** project. JGOFS Meeting mentors provided guidance and support to facilitate their mentee's involvement and understanding of JGOFS Meeting presentations, poster sessions, and the mentor's personal research and involvement.

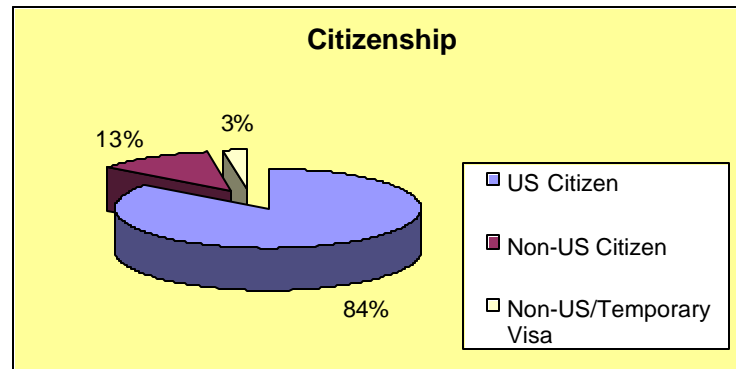
Table 2. Occupations of MS PHD'S Non-Student Participants

Faculty	11
Scientist	7
Program Officer	2

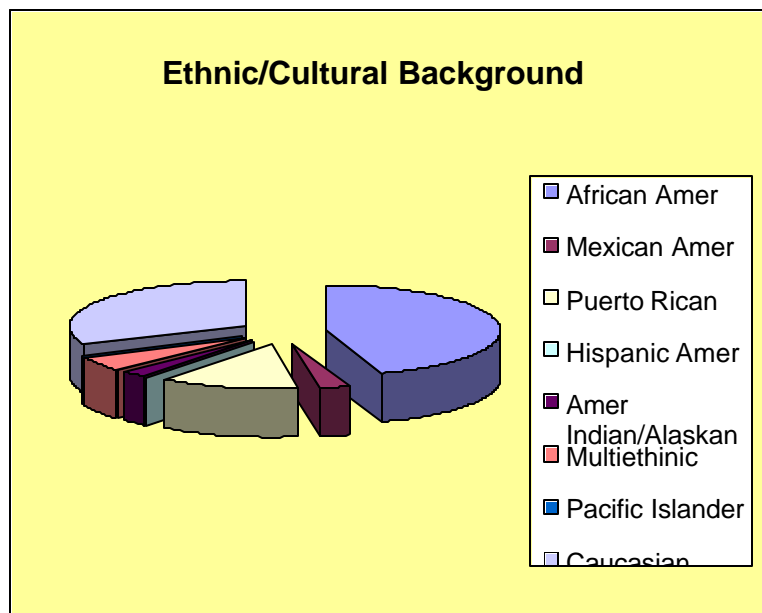
A total of forty-two (42) students and non-students participated in **MS PHD'S** onsite programming. Of that number, twenty-two were female and eighteen were male. In addition to addressing the need to expose underrepresented ethnic and cultural groups to Ocean Sciences, the **MS PHD'S in Ocean Sciences Program** was successful in attracting females to participate as mentees and/ mentors.



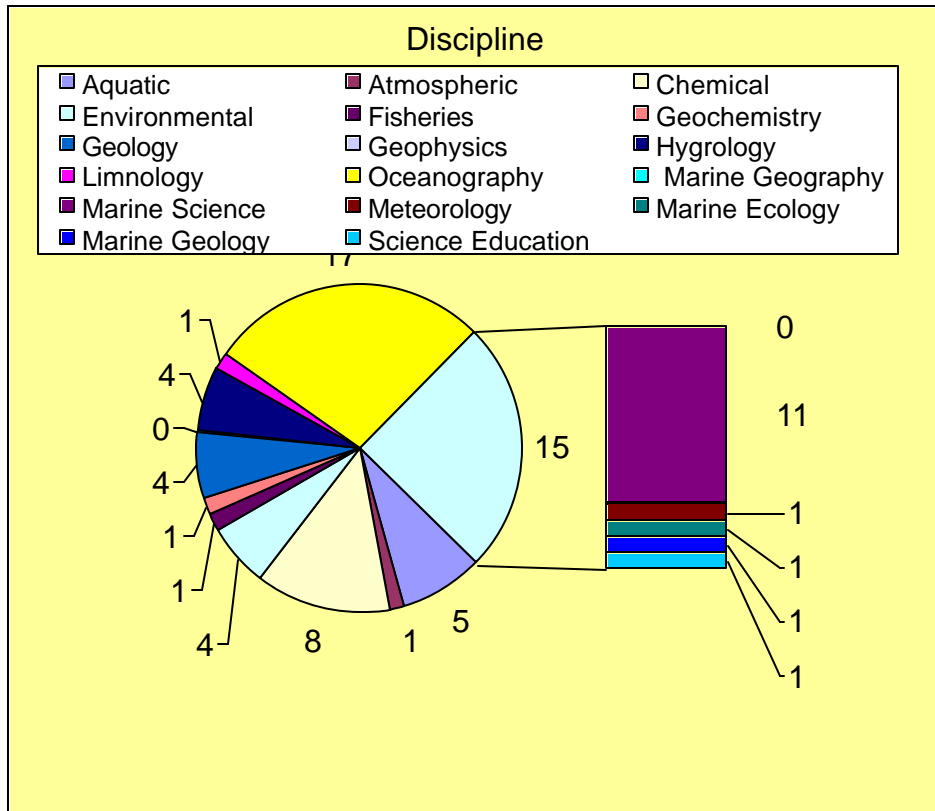
Seventeen students were from the continental United States and five (5) students were from Puerto Rico. Six non-United States citizens served as JGOFS Meeting mentors. Citizenship of international mentors includes Bangladesh, Canada, Cameroon, Germany, New Zealand, and Norway. The chart below depicts participation by citizenship of **MS PHD'S in Ocean Sciences Program** student and non-student participants.



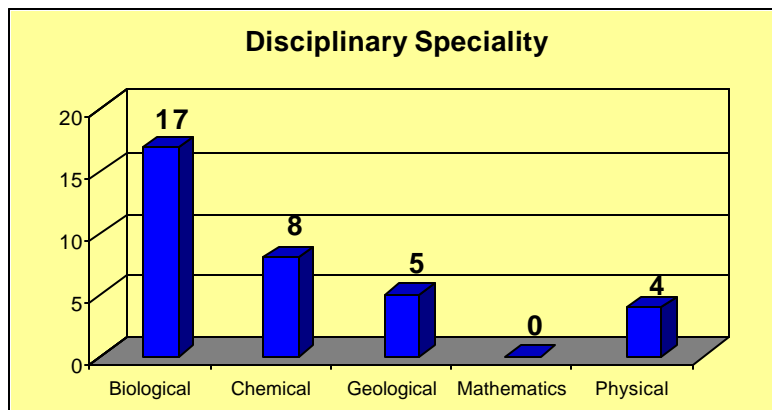
The **MS PHD'S in Ocean Sciences Program** was successful in identifying, recruiting, and involving underrepresented participants from six (6) ethnic and cultural backgrounds. Nineteen (19) participants self-identified as African American, one (1) Mexican American, five (5) Puerto Rican, one (1) American Indian, one (1) Native Hawaiian/Pacific Islander, and two (2) as Multiethnic/Multicultural. Of the remaining thirteen participants, one (1) person self-identified as Asian and twelve (12) self-identified as Caucasian/White.



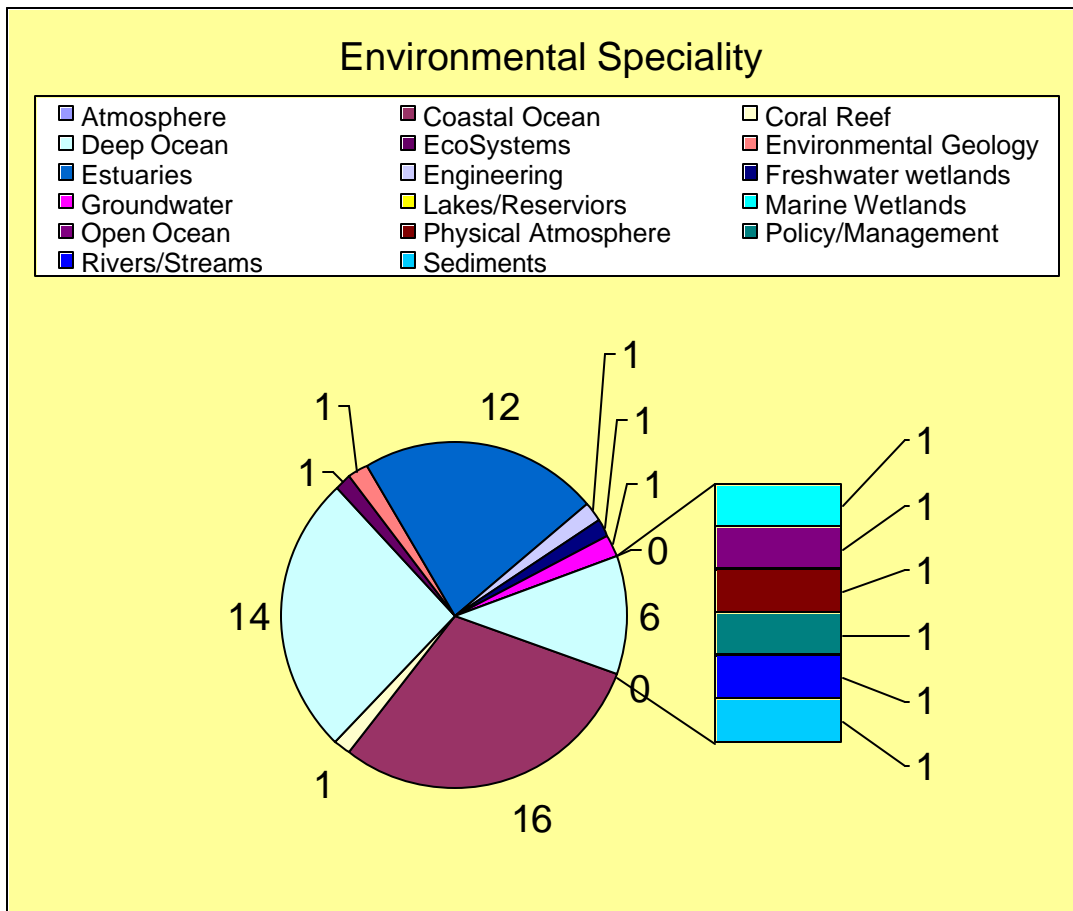
Equally important in the establishment of a participant base that was ethnically and culturally diverse, was the recruitment of participants whose interests spanned a wide range of disciplines within Ocean Sciences. **MS PHD'S in Ocean Sciences Program** participants indicated either involvement or interest in fourteen (14) disciplines. Of the disciplines the two most frequently identified as areas of focus were Oceanography (32%) and Marine Science (21%). Aquatic Science was selected by 9% of the participants and Environmental Science and Geology followed with an 8% selection rate. The remaining participants indicated interests in Atmospheric Science, Limnology, Meteorology, Marine Ecology, Geochemistry, Fisheries, Marine Geology and Science Education. Marine Ecology and Geophysics were the only two Ocean Sciences disciplines not represented by **MS PHD'S in Ocean Sciences Program** participants.



Overall, academic interest of **MS PHD'S in Ocean Sciences Program** participants fell into four (4) areas of disciplinary specialty: Biological, Chemical, Geological, and Physical. Fifty percent (50%) of **MS PHD'S in Ocean Sciences Program** participants were involved in Biological, 8% in Chemical, 5% in Geological and 4% in Physical Sciences.



Academic and research interest were further disaggregated to identify each participant's environmental specialty. Thirty-three percent (33%) selected Coastal Ocean as area of interest, 29% Deep Ocean, 24% Estuaries and 8% selected Open Ocean. Other environmental specialties represented included Freshwater/Wetlands, Groundwater, Lakes and Reservoirs, Marine Wetlands, Coral Reef, Physical Atmosphere, Environmental Geology, Policy Management, Engineering, and Ecosystems.



GOAL 1: The MS PHD'S in Ocean Sciences Program will successfully market, recruit, select, and engage underrepresented student and non-student participants with interest/involvement in Ocean Sciences. Data documented that each student participant self-identified as a member of an underrepresented ethnic/ cultural population as defined within program guidelines. Seventeen (17) students were from the continental US and five (5) were from Puerto Rico.

The MS PHD'S in Ocean Sciences Program marketed, recruited, selected and engaged twenty-two students participants and twenty (20) non-students as participants within its virtual community and on-site week-long experience. Among student participants were two (2) high school students, six (6) undergraduates, eleven (11) graduate students, one (1) post-doctoral researcher, and two (2) graduate school applicants.

In addition, the **MS PHD'S in Ocean Sciences Program** marketed, recruited, selected and engaged twenty non-student participants to serve as either **MS PHD'S in Ocean Sciences Program** mentors or JGOFS Meeting mentors. Non-student participants included eleven (11) university faculty, seven (7) research scientists, and two (2) program officers. Fourteen mentors are US citizens. The remaining six (6) are citizens of Bangladesh, Canada, Cameroon, Germany, New Zealand, and Norway, respectively.

The **MS PHD'S in Ocean Sciences Program** was successful in establishing a constituent group that was not only represented diversity in nationality, but also in gender and ethnicity. Among the forty-two participants were twenty-four (24) females and eighteen (18) male. Ethnic and cultural diversity are reflected in involvement of nineteen (19) African American, five (5) Puerto Rican, one (1) American Indian, two (2) Multiethnic/Multicultural, one (1) Native Hawaiian/Pacific Islander, and twelve (12) Caucasian/White participants.

Student and non-student participants evidenced interest/involvement in fourteen (14) disciplines within Ocean Sciences. Seventeen (17) were involved in Oceanography, eleven (11) in Marine Sciences, four (4) in Environmental Science, four (4) in Geology, four (4) in Hydrology. Other participants indicated interest among the following disciplines; Atmospheric Science, Limnology, Meteorology, Marine Ecology, Geochemistry, Fisheries, Marine Geology, and Science Education.

Biological was selected as disciplinary specialties by seventeen (17); Chemical by eight (8); Geological by five (5), and; Physical was selected by four (4) participants. When asked to identify Environmental Specialty, sixteen (16) participants selected Coastal Ocean, fourteen (14) Deep Ocean, twelve (12) Estuaries, and four (4) selected Open Ocean. The remaining participants selected one of the following areas of Environmental Specialty: Freshwater/Wetlands, Marine Wetlands, Coral Reef, Physical Atmosphere, Environmental Geology, Sediments, Engineering, Ecosystems, and Policy and Management.

Evaluative data support the fact that the *MS PHD'S in Ocean Sciences Program* successfully achieved GOAL 1. The *MS PHD'S in Ocean Sciences Program* successfully marketed, recruited, selected, and engaged underrepresented student and non-student participants with interest/involvement in Ocean Sciences.

GOAL 2: The MS PHD'S in Ocean Sciences Program will provide meaningful engagement for participants as determined by quantitative analysis of user-feedback

DATA AND INTERPRETATION

Student and non-student participants completed surveys to document their cognitive and affective assessment of the *MS PHD'S in Ocean Sciences Program* experience. Participants responded to the following eighteen questions. These questions were developed to align with each *MS PHD'S in Ocean Sciences Program* element: website, overall program format and process, community building activities, Brown-bag discussions, NASA field trips, Howard University tour, mentee/mentor partnerships, personal and professional goal clarification/advancement, and networking among peers, faculty and researchers.

Questions were structured as positive/affirmative of the *MS PHD'S in Ocean Sciences Program*. In order to ascertain a wide range of possible responses, the inquiry was formatted on a Likert Scale that ranged from 0 (Strongly Disagree), 1 (Disagree), 2 (Unsure), 3 (Agree), 4 (Strongly Agree), to 5 (Not Applicable). Directions for the completion of the survey are as follows:

Please rate the following aspects of the OVERALL *MS PHD'S in Ocean Sciences Program* and JGOFS Meeting experiences by checking the appropriate boxes.

Student and non-student participants completed the survey on-line within one month of the conclusion of onsite *MS PHD'S in Ocean Sciences Program* activities. Responses were disaggregated by participant category and entered in matrix-format to facilitate impact comparison. Following the prompt for each survey item is an italicized entry number. This entry indicates the number of *MS PHD'S in Ocean Sciences Program* participants who completed that survey item. Forty-two (42) *MS PHD'S in Ocean Sciences Program* participants completed surveys though each participant did not answer every survey question.

Calculations of percentages are based on total number of combined student and non-student responses for each survey item. Percentages are rounded up; therefore sums of responses to each item will not consistently equal 100%.

Appendix A: Disaggregated Data By Respondent Category: Student and Appendix B: Disaggregated Data By Respondent Category: Non-Student provide a listing of survey questions aligned with actual number of responses and percentage within each respondent category.

A brief comment follows each survey matrix to assist in providing context. An evaluative summary is presented at the end of the section.

aa. The website provides adequate details regarding the vision and goals of the MS PHD'S Initiative. (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	5%	22%	19%	0%
Non-student	0%	0%	3%	19%	27%	5%
Total	0%	0%	8%	41%	46%	5%

The *MS PHD'S in Ocean Sciences Program's* website was the port of entry for participants. In addition to program vision and goals, the site hosted application materials, mentor/mentee profile survey, mentor/mentee partnership checklist, online discussions, participant profiles, and links to professional, academic and culturally relevant sites. Though 8% (5% student and 3% non-student participants) registered an "unsure" response, when asked whether the **website provides adequate details regarding the vision and goals of the MS PHD'S in Earth System Science Initiative**, 87% either agreed or strongly agreed that the *MS PHD'S in Ocean Sciences Program's* website fulfilled its stated mission.

a. **I understand the vision and goals of the MS PHD'S in Ocean Sciences Program.** (38 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	0%	22%	24%	0%
Non-student	0%	0%	5%	24%	24%	3%
Total	0%	0%	5%	45%	47%	3%

A key indicator of the effectiveness of any program is the degree to which it clearly communicates its vision and goals to the participants. One-hundred percent (100%) of the student participants indicated that they either agreed or strongly agreed with the statement, **"I understand the vision and goals of the MS PHD'S in Ocean Sciences Program."** Of the non-students, 5% ranked this item with an "unsure" and 3% as "not applicable." Overall, 92% of the participants indicated an understanding of program vision and goals.

b. **There is a definite need for the MS PHD'S in Ocean Sciences Program.** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	0%	14%	32%	0%
Non-student	0%	0%	5%	22%	27%	0%
Total	0%	0%	5%	35%	59%	0%

Each student either indicated that they agreed or strongly agreed with the statement, **"There is a definite need for the MS PHD'S in Ocean Sciences Program."** A tally of non-student and student responses revealed that 94% either agreed or strongly agreed that there is definite need for the program. Five percent of the non-student participants rated this item as "unsure."

c. **The MS PHD'S experience assisted participants in developing a clearer understanding of strategies and activities required to achieve their academic and professional goals.** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	3%	22%	22%	0%
Non-student	0%	0%	3%	38%	11%	3%
Total	0%	0%	5%	59%	32%	3%

Three percent (3%) of student and non-student participants rated the item, “**The MS PHD'S experience assisted participants in developing a clearer understanding of strategies and activities required to achieve their academic and professional goals,**” as “unsure” and 3% of the non-student participants rated it as “not applicable.” However, 91% of the combined respondents rated it as either “agree” or “strongly agree.”

d. **Brown bag sessions provided participants with opportunities to learn from and network with federal and organization representatives.** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	3%	14%	30%	3%
Non-student	0%	0%	0%	22%	27%	3%
Total	0%	0%	3%	35%	57%	5%

Brown bag sessions were major components of the *MS PHD'S* experience. These sessions were structured to facilitate informal dialog with program officers, faculty, representatives of professional organizations, scientists, graduate school administrators, and federal agency representatives. Session topics and presenters were selected to align with the professional and academic interest of student participants.

Of the total response, 92% either agreed or strongly agreed with the statement, “**Brown bag sessions provided participants with opportunities to learn from and network with federal and organization representatives.**” Within the student category, 3% selected a response of “unsure,” and of the non-students, 3% selected the response of “not applicable.”

e. **The MS PHD'S experience provided an awareness and understanding of how NASA's research and innovations in aerospace technology affect and improve the quality of life for all citizens.** (38 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	5%	16%	21%	3%
Non-student	0%	0%	8%	18%	14%	16%
Total	0%	0%	13%	34%	34%	19%

Student participants and *MS PHD'S in Ocean Sciences Program* mentors toured two NASA facilities, Goddard Space Flight Center and Wallops Flight Facility. The survey item, “**The MS PHD'S experience provided an awareness and understanding of how NASA's research and innovations in aerospace technology affect and improve the quality of life for all citizens**” solicited reflection on the impact of information received during those tours.

Sixteen percent of non-student participants rated the item as “not applicable” and 8% rated it as “unsure” in large part because they did not go on the tours to the NASA facilities. Among student

response, 5% selected an “unsure” rating and 3% as “not applicable.” Overall, 68% of the respondents either agreed or strongly agreed with the statement.

f. **The MS PHD'S experience facilitated networking among peers (Undergraduate/ Master/Doctoral/Post-Doctoral).** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	3%	14%	27%	3%
Non-student	0%	0%	5%	14%	32%	3%
Total	0%	0%	8%	27%	59%	5%

Two survey items address the impact of “networking.” Projected outcomes of the program include reduction of student isolation from other underrepresented students through the provision of community building and networking opportunities.

When asked to respond to the statement, “**The MS PHD'S experience facilitated networking among peers (Undergraduate/ Master/Doctoral/Post-Doctoral),**” 3% of the students and 5% of the non-students registered an “unsure” rating. “Not applicable” was selected by 3% from each participant group. A combined total (86%) from both groups rated the item as “agree” or “strongly agree.”

g. **The MS PHD'S experience provided an awareness and understanding of opportunities for participation in NASA pre-employment scientific and technical programs.** (39 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	3%	21%	21%	0%
Non-student	0%	3%	5%	28%	5%	15%
Total	0%	3%	8%	49%	26%	15%

Survey item “*h*” and “Survey Item *f*” directly assess the impact of information obtained during tours of NASA’s Goddard Space Flight Center and Wallops Flight Facility. Both JGOF Meeting Mentors and MS PHD'S in Ocean Sciences Program Mentors completed the survey. Their joint ratings are logged in the non-student category on the matrix. JGOF Meeting Mentors did not accompany their students on the tour. This fact accounts for the range of non-student response from 3% “disagree” to 5% “unsure” to 15% “not applicable.” MS PHD'S in Ocean Sciences Program Mentors did accompany their mentees on the tour.

When asked to respond to the statement, “**The MS PHD'S experience provided awareness and understanding of opportunities for participation in NASA pre-employment scientific and technical programs,**” 79% of the responses were either “agree” or “strongly agree.” Three percent of student response fell in the “unsure” category.

h. **The MS PHD'S experience facilitated participant-to-faculty/researcher networking.** (38 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	0%	21%	21%	0%
Non-student	0%	0%	0%	32%	24%	3%
Total	0%	0%	0%	53%	45%	3%

Survey items “*g*” and “*i*” directly assess the impact of networking. The aforementioned item gauged the impact of peer networking. This item, “**The MS PHD'S experience facilitated participant-to-faculty/researcher networking,**” solicits reflections from student participants and non-student participants on faculty/researcher networking.

Though a rounded-up rating of 3% “not applicable” was registered among the non-student participants, 98% of all participants indicated that they either agreed or strongly agreed with the statement that the experience facilitated networking among and between these participant groups.

i. **The 2003 MS PHD'S experience was well organized and kept participants focused on achieving program goals.** (39 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	10%	10%	10%	13%	0%
Non-student	0%	0%	3%	28%	21%	5%
Total	0%	10%	13%	38%	33%	5%

Student response to the statement, “**The 2003 MS PHD'S experience was well organized and kept participants focused on achieving program goals,**” reflected a relatively even spread of 10% among three categories: “disagree,” “unsure,” and “agree.” Thirteen percent of student response was placed in the “strongly agree” category. Non-student participant response ranged from a 3% in the “unsure” category to 5% in the “not applicable” category. The majority of non-student responses fell within either the “agree” or “strongly agree” category.

Overall, 71% student and non-student participants either agreed or strongly agreed that the experience was aligned to support program goals. Participant reflections on the organization and structure of the *MS PHD'S* experience are specifically detailed within **GOAL 3: The MS PHD'S in Ocean Sciences Program will provide meaningful engagement for participants as determined by qualitative analyses of user-feedback** of the evaluation summary.

j. **The MS PHD'S experience increased the participants' awareness and understanding of opportunities to participate in NASA-related work, and/or develop NASA-related academic or research capabilities.** (38 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	5%	21%	18%	0%
Non-student	0%	0%	3%	37%	5%	11%
Total	0%	0%	8%	58%	24%	11%

Survey item *j*, **The MS PHD'S experience increased the participants' awareness and understanding of opportunities to participate in NASA-related work, and/or develop NASA-related academic or research capabilities**, assessed reflections gained from “Brown bag” discussions led by NASA personnel as well as lectures presented during tours of Wallops and Goddard facilities.

Five percent of student and 3% non-student responses were logged as “unsure.” Eleven percent of non-student participants viewed the item as “not applicable.” Eighty-two percent (82%) of total responses either agreed or strongly agreed with the statement that acknowledged that the *MS PHD'S* experience increased their awareness and understanding of NASA work opportunities, academic and/or research capabilities.

k. **The MS PHD'S agenda included information directly connected to participant research/professional/ academic interest.** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	3%	5%	19%	19%	0%
Non-student	0%	3%	11%	27%	11%	3%
Total	0%	5%	16%	46%	30%	3%

The **MS PHD'S** experience was constructed to align with research/academic interests of student participants. Topics for Brown bag discussions, networking opportunities, research presentations at Howard University, mentee/mentor assignments, behind the scene tour of the Smithsonian, JGOFS Meeting sessions were selected based on student profile information. Survey item *k* indicates participant response to the statement, “**The MS PHD'S agenda included information directly connected to participant research/professional/ academic interest.**”

Student responses reflected a 3% “disagree,” 5% “unsure.” Among non-student responses were 3% “disagree” and 11% “unsure” entries. Seventy-six percent (76%) of student and non-student responses affirmed the statement that the **MS PHD'S experience** provided direct connections to their research/academic/and or professional interests.

l. **Mentors and Mentees established specific commitments and follow-up activities.** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	3%	5%	16%	16%	5%
Non-student	0%	3%	3%	27%	19%	3%
Total	0%	5%	8%	43%	35%	8%

The **MS PHD'S in Ocean Sciences Program** is intended to facilitate and support mentee/mentor partnerships beyond the duration of the one-week onsite experience. The statement, “**Mentors and Mentees established specific commitments and follow-up activities,**” provided initial data on mentor/mentee commitments beyond the May, 2003 JGOFS Meeting.

Over three-fourths (78%) of the mentee/mentor partnerships indicated that they had established specific commitments and follow-up activities to sustain the relationship. A rounded-up percentage of 3% student and non-student participants indicated that they had not extended the mentee/mentor partnership with formalized plans. Five percent student and 3% non-student participant selected “not applicable” as their response to the statement.

m. **The MS PHD'S community-building activities help participants to feel comfortable and welcome.** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	8%	16%	19%	3%
Non-student	0%	3%	5%	22%	19%	5%
Total	0%	3%	14%	38%	38%	8%

Responses of JGOFS Meeting mentors and **MS PHD'S in Ocean Sciences Program** Mentors to survey item *m*, “**The MS PHD'S community-building activities help participants to feel comfortable and welcome,**” are combined within the “non-student” descriptor. Interaction of JGOFS Meeting mentors with their **MS PHD'S** mentees was restricted to JGOFS Meeting locations within the National Academy of Sciences. Therefore, JGOFS Meeting mentors did not participate in community building activities. **MS PHD'S in Ocean Sciences Program** Mentors participated in community-building activities that were conducted at the hotel, restaurant, and during tours.

Non-student responses ranged from 3% “disagree,” 5% “unsure,” to 5% “not applicable.” With the exception of 8% “unsure,” the remaining student responses fell within the “agree” and “strongly agree” categories. Overall, 76% of the responses either agreed or strongly agreed that **MS PHD'S** community-building activities helped them to feel comfortable and welcome.

n. **The MS PHD'S experience provided an awareness of programs/products that attract diverse students to NASA careers in science, technology, engineering, or mathematics.** (38 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	3%	16%	13%	13%	0%
Non-student	0%	0%	11%	24%	8%	13%
Total	0%	3%	26%	37%	21%	13%

Survey item *n*, “**The MS PHD'S experience provided an awareness of programs/products that attract diverse students to NASA careers in science, technology, engineering, or mathematics,**” yielded the second highest “unsure” response from student and non-student participants. This response can be attributed to the fact that the majority of participants were attracted to the program because of its emphasis on Ocean Sciences. Although Ocean Science related research was discussed during Brown bag discussions and demonstrated during a tour to a NASA facility, the vast majority of information on NASA careers related to atmospheric and flight research.

Three percent (3%) of student responses disagreed with the statement. Thirteen percent (13%) of non-student participants selected “not applicable” as response. Overall, 58% either agreed or strongly agreed that the **MS PHD'S** experience provided an awareness of programs/products that attract diverse students to NASA careers in science, technology, engineering, or mathematics.

o. **Some of my personal/academic/ professional goals were clarified and or reached through the MS PHD'S experience.** (40 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	5%	20%	13%	5%
Non-student	0%	13%	3%	0%	15%	28%
Total	0%	13%	8%	20%	28%	33%

The highest non-student “disagree” and “not applicable” responses were registered for survey item *o*, “**Some of my personal/academic/ professional goals were clarified and or reached through the MS PHD'S experience.**” This response is predictable considering that non-student participants have established career paths. Nevertheless, 15% of the non-student participants indicated that they strongly agreed with the statement that attributed personal/academic/professional goal clarification and attainment was reached through the **MS PHD'S** experience.

An analysis of student responses reflected 5% “unsure” and “not applicable” ratings. A total of seventeen (17) students completed this item on the survey. Of those responses, thirteen (13) either agreed or strongly agreed that some of my personal/academic/ professional goals were clarified and or reached through the **MS PHD'S** experience.

p. **The MS PHD'S experience increased interest in taking academic courses in NASA – related subjects.** (37 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	3%	24%	5%	5%	3%
Non-student	0%	0%	14%	24%	5%	16%
Total	0%	3%	38%	28%	11%	19%

Survey item *p*, “**The MS PHD'S experience increased interest in taking academic courses in NASA – related subjects,**” revealed the highest student and non-student rankings of “unsure.” Both student and non-student responses yielded the lowest selection of “strongly agree.” Interestingly, more non-student participants (24%) indicated increased interest in taking academic courses in NASA-related subjects than did students (5%).

q. **I would be interested in participating in future MS PHD'S in Ocean Sciences Program activities.** (36 entries)

Respondent	0- Strongly Disagree	1- Disagree	2- Unsure	3- Agree	4- Strongly Agree	5- Not Applicable
Student	0%	0%	5%	19%	17%	5%
Non-student	0%	0%	8%	22%	19%	3%
Total	0%	0%	14%	42%	36%	8%

Thirty-six of the 42 participants responded to survey item *q*, “**I would be interested in participating in future MS PHD'S in Ocean Sciences Program activities.**” Five percent student and 8% non-student responses were registered as “unsure.” “Non applicable” was reflected in 3% non-student and 5% student responses. Overall, 78% indicated interest in participating in future **MS PHD'S in Ocean Sciences Program** activities.

A second survey item was included to gauge participant interest in future **MS PHD'S in Ocean Sciences Program** activities. Item 11 asked, “Would you like to be contacted about future **MS PHD'S in Ocean Sciences Program** activities? To that question, 88% of the students and 95% of the non-student participants responded “yes.” Item 11 is included in the discussion of **GOAL 4: The MS PHD'S in Ocean Sciences Program will develop a constituent base adequate to demonstrate evidence of interest, value, need and sustainability.**

Student and non-student participants were asked to respond to eighteen (18) questions to gauge levels of their reflection on the **MS PHD'S** experience. Each survey item was constructed as an affirmative/positive statement. Participants were given a response range on a Likert Scale from left to right, 0 (disagree) to 4 (strongly agree) and a right extreme of 5 (not applicable).

Survey items addressed the following components of the **MS PHD'S in Ocean Sciences Program**. The survey item number is listed in parenthesis after the component topic.

- 1) **MS PHD'S** website (aa)
- 2) Program vision and goals (a)
- 3) Program utility (b)
- 4) Program content
- 5) Program organization and structure (i)
- 6) Program outcomes
 - a) Clarification and advancement of participant academic and professional goals (o)
 - b) Alignment of agenda with participant research/professional/academic interest (k)
 - c) Networking with federal/organizational representatives (d)
 - d) Networking among peers (f)
 - e) Networking with faculty/researchers (h)
 - f) Community building activities (m)
- 7) NASA information and opportunities
 - a) Aerospace technology impact on quality of life (c)
 - b) Research and innovations (e)
 - c) Pre-employment scientific and technical programs (g)
 - d) Academic and research opportunities (j)
 - e) Careers in science, technology, engineering or mathematics (n)
 - f) Interest in taking NASA- related subjects. (p)

8) Mentor/mentee commitment and follow-up activities (l)

9) Participant interest in future participation (q)

For the purpose of this formative evaluation, a threshold of 70% affirmation from both student and non-student participants, as evidenced by respondent choice of "agree" or "strongly agree," is interpreted as validation of the statement. Exceptions to this interpretation are detailed for individual items.

1) **MS PHD'S** website (aa)

Eighty-seven percent (87%) either agreed or strongly agreed that the **MS PHD'S** website provided adequate details regarding the vision and goals of the **MS PHD'S** initiative.

2) Program vision and goals (a)

Ninety-two percent (92%) either agreed or strongly agreed that they understand the vision and goals of the **MS PHD'S in Ocean Sciences Program**.

3) Program utility (b)

Ninety-four percent (94%) either agreed or strongly agreed that there is a definite need for the **MS PHD'S in Ocean Sciences Program**.

4) Program content (c)

Ninety-one percent (91%) either agreed or strongly agreed that the **MS PHD'S** experience assisted participants in developing a clearer understanding of strategies and activities required to achieve their academic and professional goals.

5) Program organization and structure (i)

Seventy-one percent (71%) either agreed or strongly agreed that the 2003 *MS PHD'S* experience was well organized and kept participants focused on achieving program goals.

6) Program outcomes

a. Clarification and advancement of participant academic and professional goals (o)

A combined total of student and non-student responses revealed that forty-eight percent (48%) either agreed or strongly agreed that some of their personal, academic, and or professional goals were clarified and/or reached through the *MS PHD'S* experience.

(Evaluator's Note: In looking at student response alone, disaggregated data documents that seventeen (17) students responded to this survey item. Of those responses, thirteen (13), 76% either agreed or strongly agreed with the statement. Two (2) students selected "unsure" and two selected, "not applicable." Although 15% of the mentors selected the "strongly agree" response, it was anticipated that the majority of the non-student participants would select either disagree (13%) or "not applicable" because of they have already established career paths.)

b. Alignment of agenda with participant research/professional/academic interest (k)

Seventy-six percent (76%) either agreed or strongly agreed that the **MS PHD'S** agenda included information directly connected to participant research/professional/academic interest.

c. Networking with federal/organizational representatives (d)

Ninety-two (92%) either agreed or strongly agreed that the Brown bag sessions provided participants with opportunities to learn from and network with federal and organization representatives.

d. Networking among peers (f)

Eighty-six percent (86%) either agreed or strongly agreed that the **MS PHD'S** experience facilitated networking among peers (Undergraduate/Master/Doctoral/Post-Doctoral).

e. Networking with faculty/researchers (h)

Ninety-eight percent (98%) either agreed or strongly agreed that the **MS PHD'S** experience facilitated participant-to-faculty/researcher networking.

f. Community building activities (m)

Seventy-six percent (76%) either agreed or strongly agreed that the **MS PHD'S** community-building activities helped participants to feel comfortable and welcome.

*(Evaluator's Note: Combined percentage includes responses from JGOFS Meeting Mentors. These mentors did not participate in community building activities. Their interaction with students was limited to the JGOFS meeting site. Community building activities were conducted at the hotel, restaurant, and during tours to NASA facilities. Non-student participant response reflected 3% "disagree," 5% "unsure," and 5% "not applicable." Seventeen students responded to this survey item. Thirteen (13), 76%, either agreed or strongly agreed that the *MS PHD'S* community-building activities helped participants to feel comfortable and welcome. Three students (3) responded as "unsure" and one (1) as "not applicable.")*

7) NASA information and opportunities

(Evaluator's Note: Information about NASA was presented to participants within two venues: Brown bag discussions and during tours to Wallops and Goddard facilities. Although JGOFS Meeting mentors and MS PHD'S in Ocean Sciences Program mentors attended Brown bag discussions, only the MS PHD'S in Ocean Sciences Program mentors went on the tours. Within the non-student category are responses from both JGOFS and MS PHD'S mentors. This factor accounts for the larger than average number of "unsure," "disagree," and "not applicable" responses to NASA related survey items. Therefore, additional data is inserted from Appendix 1: Disaggregated Data by Respondent Category: Student to document student response to the survey item.)

a) Impact of research and innovations in Aerospace technology on quality of life (e)

Sixty-eight percent (68%) of combined non-student and student responses either agreed or strongly agreed that the *MS PHD'S* experience provided an awareness and understanding of how NASA's research and innovations in aerospace technology affect and improve the quality of life for all citizens.

A look at student response alone reveals that 82% either agreed or strongly agreed that the *MS PHD'S* experience provided an awareness and understanding of how NASA's research and innovations in aerospace technology affect and improve the quality of life for all citizens. Two (2) students responded as "unsure" and one student as "not applicable."

b) Pre-employment scientific and technical programs (g)

Seventy-five percent (75%) of combined non-student and student responses either agreed or strongly agreed that the *MS PHD'S* experience provided an awareness and understanding of opportunities for participation in NASA pre-employment scientific and technical programs.

Student response indicates that 94% either agreed or strongly agreed that the *MS PHD'S* experience provided an awareness and understanding of opportunities for participation in NASA pre-employment scientific and technical programs.

c) Academic and research opportunities (j)

Eighty-two percent (82%) of combined non-student and student responses (and 88% student participants alone) either agreed or strongly agreed that the *MS PHD'S* experience increased the participants' awareness and understanding of opportunities to participate in NASA-related work, and/or develop NASA-related academic or research capabilities.

d) Careers in science, technology, engineering or mathematics (n)

Fifty-eight percent (58%) of combined non-student and student responses either agreed or strongly agreed that the *MS PHD'S* experience provided an awareness of programs/products that attract diverse student to NASA careers in science, technology, engineering, or mathematics. Twenty-six (26%) of combined responses reflected "unsure."

Thirty-five percent (35%) of student participants responded as "unsure", 58% as either "agree" or "strongly agree," and 6% as "disagree."

e) Interest in taking NASA- related subjects. (p)

Sixty-eight percent (68%) of combined non-student and student responses either agreed or strongly agreed that the *MS PHD'S* experience increased interest in taking academic courses in NASA-related subjects.

Twenty-four percent (24%) of student participants either agreed or strongly agreed with this statement whereas 53% selected "unsure" and 6% disagreed with the statement.

8) Mentor/mentee commitment and follow -up activities (l)

Seventy-eight percent (78%) of combined non-student and student responses either agreed or strongly agreed that mentors and mentees has established specific commitments and follow -up activities.

9) Participant interest in future participation (q)

Seventy-eight percent (78%) of combined non-student and student responses either agreed or strongly agreed with the statement, "I would be interested in participating in future ***MS PHD'S in Ocean Sciences Program*** activities.

Eight-six percent (86%) of students responses affirmed continued interest in future participation in ***MS PHD'S in Ocean Sciences Program*** activities.

For the purpose of this formative evaluation, a thresh hold of 70% affirmation from both student and non-student participants, as evidenced by respondent choice of "agree" or "strongly agree," is interpreted as validation of the statement. Exceptions to this interpretation are detailed for individual items.

The survey contained eighteen (18) items. Combined participant response rated fourteen (14) of the items above the threshold. These responses ranged from a high of 98% to a low of 71%. Of the four survey items that were rated lower than 70%, evaluator notes cited impacting conditions that influenced the ratings.

Overall, evaluative data support the fact that the *MS PHD'S in Ocean Sciences Program* successfully achieved GOAL 2. The *MS PHD'S in Ocean Sciences Program* provided meaningful engagement for participants as determined by quantitative analyses of user-feedback.

GOAL 3: The *MS PHD'S in Ocean Sciences Program* will provide meaningful engagement for participants as determined by user-feedback qualitative analysis

DATA AND INTERPRETATION

Program participants responded to three (3) open ended questions to further gauge the impact of the *MS PHD'S* experience. The questions were formatted to align with Action Research methodology. This method of inquiry produced evaluative, diagnostic and prescriptive data. The process, based on a constructivist approach, asked participants to reflect on the following questions:

1. What was the most beneficial aspect of the *MS PHD'S in Ocean Sciences Program* experience and JGOFS Meeting?
2. What was the least beneficial aspect of the *MS PHD'S in Ocean Sciences Program* experience and JGOFS Meeting?
3. How could the *MS PHD'S in Ocean Sciences Program* be improved?

Each question is accompanied by a set of responses. Responses are labeled with two identification tags: alpha and participant category. Alpha tags ("a" through "ii") allow the reader to identify a single respondent's comments on each of the three questions. Each respondent did not comment on all three items. In order to maintain sequence and parallel in response, the code "nc" is used to indicate that a respondent did enter a comment on a particular item.

Participant category tags are placed at the end of the comment to aid the reader in distinguishing non-student and student responses. The following tags are used to identify respondents:

- rs- Research Scientists
- pr- Post-doctoral Researcher
- po- Program Officer
- uf- University/College Faculty
- gp- Graduate Student Participant
- gsa- Graduate School Applicant
- up- Undergraduate Student Participant

The qualitative data requires little analysis. The explicit formatting of the questions permits the data to self-assess through reflection and recommendation. However, a brief formative evaluative summary is placed at the end of this section. Within the summary is a listing of dominant themes that were reflected within the comments.

1. What was the most beneficial aspect of the MS PHD'S in Ocean Sciences Program experience and JGOFS Meeting?

- a) Oral presentations by scientists –rs
- b) Some of the students were extremely enthusiastic and it was a pleasure to meet and interact with them-rs
- c) Science meetings and activities –rs
- d) I think the brown bag lunches were very useful.-rs
- e) Nc- rs
- f) Meeting motivated people.-pr
- g) Having an opportunity to interact with program participants and other fellowship program staff .-po
- h) An opportunity for participating students to be part of a well organized and structured program in a quality environment for exchange with quality messengers with a quality message relative to expanding and meeting one's aspirations, self actualization and expectation for a career in science.-po
- i) As a new mentor, my participation in 2003 MS PHD'S in Ocean Science was highly beneficial for me. There were a lot of things to learn from the discussion of expert mentors around the globe. The 2003 JGOFS was particularly beneficial for me as it provided me an excellent opportunity to interact with top experts of the world in matters related to coastal margins. It may be noted that Bangladesh has long coast line and a number of coastal problems.-uf
- j) Interacting with Erica Holloman. She is delightful. I felt I could help give her some information she did not already know.-uf
- k) I really enjoyed meeting the students and learning about their interests. I was delighted to see such enthusiasm for environmental sciences among the students.-uf
- l) ASSESSMENT! You actually collected relevant data DURING the meeting. WELL DONE! And most appreciated.-uf
- m) Direct interactions between students and mentors.-uf
- n) Direct mentor-mentee contact.-uf
- o) It was a pleasure to meet the students and do what I could to establish networks for them with senior scientists. -uf
- p) Insufficient opportunity to observe (no answer) .-uf
- q) The best part of the program was increasing the interaction between researchers and minority students. I saw numerous meetings occurring and I think that for many of the researchers this was their first real opportunity to interact with a minority student. The long lasting relationships that are built from these interactions will last a lifetime-uf
- r) I had to tell two mentors, not familiar with my field, what I was working on for my PhD. It was here that I realized that I had been working on projects at once and wasn't getting very far on any of them Because I had to think about my work in the MSPHD'S program, I could link all the projects into a cognitive dissertation topic.-gp
- s) I believe the receptiveness of the JGOFS mentors was exceptional. Their willingness to help the **MS PHD'S** students in a networking capacity was impressive.-gp
- t) I decided to pursue a PhD in paleoceanography.-gp
- u) The Smithsonian visit and also the visit to Goddard Flight Facility.-gp
- v) The most beneficial aspect of the program was the opportunity to meet and network with the top scientist in our fields. I was able to talk with a scientist who gave me excellent insight on my research.-gp
- w) It was good to meet so many enthusiastic graduate students in the field.-gp

- x) Brown bag discussion on funding opportunities for graduate students and meeting Dr. Deidre Gibson who provided me invaluable support.-gp
- y) Networking with other scientists.-gp
- z) The resources that we have there. Meeting the important scientist that gather there.-gp
- aa) The networking aspect is the best part. The friends I made are invaluable contacts.-gp
- bb) The in-depth information offered regarding "Choosing a Graduate School" and "Obtaining Funding for Graduate School." I also enjoyed the fact that I had 2 mentors, so I was able to gain a lot of knowledge from each of their perspectives.-gsa
- cc) Brown Bag discussions and Session III Ecosystem Structure and Dynamics.-gsa
- dd) For me the networking was definitely the most beneficial aspect of the program. I met a number of contacts that I will keep in contact with in the future that can help me in my endeavors.-up
- ee) Networking.-up
- ff) The most beneficial aspect of the 2003 MS PHD'S in Ocean Sciences Program was the networking opportunities and the brown bag sessions. It was very helpful to have mentors to talk with and for networking purposes, and the brown bag sessions had plenty of information to get me started on applying for graduate school and financial aid.-up
- gg) The ability to network with scientists and researchers in the fields I am interested in studying in. Also the ability to meet with mentors that help to clarify and structure current goals and ways to go about achieving them.-up
- hh) I felt that the brown-bag discussions were the most beneficial of all of the experiences at the conference. We were introduced to people and information that we normally wouldn't have gotten exposure to on our own. The connections that were made were very valuable. Also the private discussions and availability of the mentors was valuable. To be able to ask so many questions and get such honest answers with real life examples and information, that I know it helped me make some very informed decisions about my future endeavors.-up A lot of the JGOFS Meetings themselves were quite advanced and I believe that they lost the attention, interest, and understanding level of myself and many of the other participants. I understand that this is probably beyond the control of the MS PHD'S staff, but the conference content and level should be considered next time when choosing which one to send undergraduate students to.-up
- ii) Having the opportunity to interact with different people in different fields. I also enjoyed the location in which the program took place, the diversity of education levels participants had, and also Brown-Bag discussions were a great asset to the program.

2. What was least beneficial aspect of the MS PHD'S in Ocean Sciences Program experience and JGOFS Meeting?

- a) Extra-curricular activities of the conference – rs
- b) Some students seemed not as interested-but I expect it's hard to tell which students are truly there for the right reasons ahead of time-rs
- c) Brown bag lunches –rs
- d) My mentee's primary interests did not fit will with my interests and experience.-rs
- e) nc- rs
- f) N/A.-pr
- g) nc.-po
- h) None.-po
- i) There was nothing "least beneficial."-uf
- j) I felt the students were overscheduled. I understand that the organizers did not want them wasting their time, but they should have been able to opt out of some things if they got a better offer. There was frustratingly little time for Erica and me to interact except at coffee breaks and before the sessions began in the morning.-uf

- k) I really enjoyed all aspects of the program. It was very well organized and balanced from the mentor point of view. I was still able to attend the meeting and get from it what I needed while participating in *MS PHD'S* activities.-uf
- l) nc-uf
- m) At ASLO I had too many students (4) to seriously interact with all of them.-uf
- n) None.-uf
- o) nc.-uf
- p) Insufficient opportunity to observe (no answer) .-uf
- q) I thought all of the programs were beneficial. I wish that we had more meeting mentors who could interact with the students in their chosen scientific interests. However, I do not see this as a major point since the 'interaction' was the most important goal .-uf
- r) I did not need a Brown Bag talk on how to get into graduate school. I need one on how to get out of grad school.-gp
- s) The actual setup of the JGOFS meeting was not very beneficial, but that had nothing to do with the *MS PHD'S in Ocean Sciences Program* itself. The tight schedule was a little overwhelming at the beginning of the meeting, but that is to be expected in an important pilot program such as this one.-gp
- t) Touring Howard University and the brownbag discussion about how to be accepted into grad school.-gp
- u) Attending every one of the talks during the JGOFS meeting.-gp
- v) The least beneficial aspect of the program was the trip to Wallops. I thought that the trip was too time consuming. I thought that our trip to Goddard was more informative, better related to our fields, and overall, more interesting.
- w) It was really hard to meet with the mentees.-gp
- x) Brown bag discussions on subjects that I have already been through. E.g. how to apply to graduate school.-gp
- y) N/A.-gp
- z) We definitely need more time to share with scientist. The schedule was too tight. We were always on hurry, even the last day when we were in a hurry.-gp
- aa) nc.-gp
- bb) Honestly, I can't view any aspect of this program as being least beneficial. This program had a unique design and was intended to be rigorous and informative. It was a step above basic meeting programs.-gsa
- cc) The Friday field trip and the poster sessions.-gsa
- dd) The least beneficial aspect of the program was the amount of rest we had and the limited amount of time we had with our JGOFS mentors. Often our mentors wanted to introduce us to other people but couldn't because we ere rushing off to something else that was planned for us that we were not allowed to make the decision to skip if it was more beneficial for us to network.-up
- ee) Schedule.-up
- ff) For me, the least beneficial aspect of the 2003 *MS PHD'S in Ocean Sciences Program* was the JGOFS conference itself. Although the conference was educational and great for networking purposes, I felt I gained more from the brown bag sessions and from meeting with my mentors. I agree that the *MS PHD'S in Ocean Sciences Program* should coincide with a scientific conference, but this particular conference was not in my area of interest.-up
- gg) Some of the field trips attempted to pack to much in, while also applying directly to a few of the participants.-up
- hh) A lot of the JGOFS Meetings themselves were quite advanced and I believe that they lost the attention, interest, and understanding level of myself and many of the other participants. I understand that this is probably beyond the control of the *MS PHD'S* staff, but the conference content and level should be considered next time when choosing which one to send undergraduate students to.-up

ii) In my opinion, the least beneficial aspect of the program was the meetings we attended throughout the program. Some of the JGOFS meetings were interesting, yet others I found very complicated and rather hard to understand.-up

3. How could the MS PHD'S in Ocean Sciences Program be improved?

a) These should strongly involve non-American citizens. Non-Americans will also like to benefit from the programme-rs

b) Keep up the good work! -rs

c) There should be less sponsored activities so that the student participants can spend more time with their science mentors either at lunch or dinner- rs

d) The program should encourage more interaction before the meeting so both have a better feel for what to expect when they get there.-rs

e) I had a great difficulty in arranging times to meet with my mentee, as their programme was so full. I think it was too full for them to get the greatest benefit from the conference. The other very important activities in their specific programme and to get good value from their mentors. There needs to be time to spend quality time with the mentees, without pulling them from their programme or having to miss parts of the conference for both parties.

The program is very worthwhile and solving the time issue would increase the value considerable. If time was set aside each day when both parties are likely to be free it would help. Also, the possibility of meeting the mentee in an informal setting over dinner or something similar would provide good value for all concerned.-rs

f) Be more aware of students' scientific background – should relate to the conference's objectives.-pr

g) Structure the brown bag sessions in a similar way next way allowing another ½ hour if at all possible.

It is clear that this was an exceptional learning experience for participants. I hope that you are able to do it again next year.-po

h) Provide more time for large group and small group discussions. There were times during and following the brown bag sessions that I feel the students could have benefited from greater questions and answers time and a group discussion following.

My overall impression of the *MS PHD'S in Ocean Sciences Program* is that of high caliber. The JGOFS participation was done with respect and dignity. In other words, the participants were treated first class. I feel that the students left with a greater sense of what it takes to really prepare for eventual participation in the science enterprise. Simply put, the students left with a clear understanding of what they need to do to reach their short and term goals. If NASA and all the supporting agencies are to realize their role and goals in removing barriers to full inclusion, pluralism, and equity for All Americans they should continue to fund the *MS PHD'S in Ocean Sciences Program* for what it is doing and as a model for the right way to educate/train and mentor future scientist.-po

i) The activities are perfect. Coastal Environment related topic may be slightly increased.-uf

j) Most of it was excellent. Some of the mentors seemed a bit off the wall (e.g. Bernt Zwitzschel and Trevoer Platt). It is best to have mentors that understand the US system, preferable academics who know of others who might be good graduate advisors in the field of interest of the students.-uf.

k) My only suggestion would be to make more time for student questions during the brown bag sessions.-uf

l) Keep peer-mentoring as a key part of the initiative.-uf

m) At the JGOFS meeting I had a lot of interactions with the student I was mentoring but had a poor idea of the rest of her schedule and what I should or should not be involved in.-uf

n) Make a daily schedule of the mentees a little bit more relaxed, perhaps keep them at the scientific meeting for longer with less other activities. This would allow more systematic work on comprehending presentations and interacting with mentors.-uf

o) Give the mentees much more time with their mentors. I spent no more than 5 minutes a day talking with my mentee at the JGOFS meeting. That was wholly inadequate. It may be more important for the mentees to meet with their mentors and the mentor's colleagues, that to meet with agency folks or other students. Mentors can give a lot more push to a career than the other groups the mentees meet with.

I don't understand why so many questions above were about NASA. The mentees futures will depend on the broader array of agencies. NASA may support the *MS PHD'S in Ocean Sciences Program*, but that doesn't justify the NASA centric approach to the questions or to the program -uf

p) nc-uf

q) Having this interaction at an AGU or ASLO Conference would increase the diversity of the meeting mentors. I think some of the mentors were put off by the fact that many of the mentees were interested in topics that they did not specifically 'do'. In the future, I think it would be really good to state very explicitly that the role of the meeting mentors is to introduce them to science, what you do in a meeting, why their research is interesting, etc. This program needs to stay!-uf

r) Thanks for the experience. I haven't worked so diligently since boot camp.-gp

s) There should probably be time for mentor/mentee interaction in a more isolated (maybe social) setting. Just the mentors and their mentees alone outside of the main group and not a hurried, last minute type of gathering at the meeting site.-gp

t) More specific brownbag discussions/activities geared towards the group/academic interest of the group. For if the *MS PHD'S in Ocean Sciences Program* will be geared towards oceanography, then the activities and brownbag discussions should only pertain to that.

u) nc.-gp

v) I think that the time that we spent going to Wallops could have been used to explore DC or take a field trip. I realize that the program was NASA funded and that it was important for us to visit NASA facilities, but I don't think that we got a lot out of the experience.

I thought that the program was excellent and that the participants learned a lot about our potential futures.-gp

w) It would be better if the schedules of the students weren't so hectic. It was really hard for the mentees to contact their students since we had lectures all day and the lunch hour was filled with other stuff. It might have been useful to have the mentees attend the Sunday night reception and the Wednesday night lecture so that they could have met more people.

The program is great and is well organized. I think just giving the mentee and mentor more time to interact will make both of them feel as though their time has been well spent.-gp

x) Itemize the questionnaire so that it is easier to fill out and more importantly send it out ahead of meeting time.

I have participated in many internships, programs and activities and feel that this (by far) has been the most concentrated group of successful and motivated students I have been lucky enough to be associated with. Thank you Dr. Pyrtle for the opportunity-gp

y) Agenda was too tight. An enormous amount of activities to cover in such a short time. At the end of the day, you feel exhausted with a tremendous amount of information to assimilate.

Also, the program didn't provide the opportunity to network with people at the JGOFS conference that were not part of the *MS PHD'S* since at every lunch break, there was brown bag discussion session to attend. It would have been nice to have lunch with other scientists at the conference that were not part of the *MS PHD'S*.-gp

z) The program has to divide into two programs: graduate and undergraduate. The discussions were focused mostly on how to get into grad school but we needed information on how to succeed once we are enrolled in a PhD or Masters Program.-gp

aa) The conference was grueling. Although most students understood the demands of the JGOFS conference, we all felt that our energy was stretched a little too thin.-gp

bb) I suggest that the *MS PHD'S in Ocean Sciences Program* activities continually be designed to stimulate and inform the students.-gsa

cc) I think the participants need more down time. This is because we were bombarded with so much information.-gsa

dd) Allow a little more time for participants to rest, eat and digest their food before a discussion and not on a van, and allow a little more JGOFS mentor/mentee time.

Also, there were a number of participants, scientists included, that had good insight into DC travel, parking and eating plans. In the future the program should be more flexible with taking their suggestions into consideration. If something does get changed, they the participants should not be the ones to suffer. If we are late and have to cut lunch or dinner short, then the participants should be the first ones to eat and the staff eats last so that at least the participants can make it on time to the next session. Also, no one should be forced to rush when they eat and drivers should be allowed time to eat for the safety of everyone.-up

ee) Maybe some extra time.-up

ff) I would suggest having an icebreaker activity at the beginning of the program (conference) and keep the community activity toward the end. I really enjoyed the brown bag sessions and felt they were one of the most important parts of the program. I would suggest making these sessions longer so that more people can present their information (or have more time presenting) and a longer discussion can take place. Other than that I felt everything else was helpful and productive. Keep up the great program! -up

gg) Make the days less filled with activities but have them filled with a few directly related very beneficial activities.-up

hh) Leave more down time. The days were very packed. True, the information and activities were very useful and informative, but if your brain is tired it makes it hard to absorb and retain information. The brain can only take so much and everything done or introduced after that becomes pointless and is forgotten.

Can the JGOFS mentors or any type of science mentor be paired with the participant better? I.e. have more in common as far as fields of interest? -up

ii) Maybe give the participant's the choice of which presentation they would like to see and have other events going on while the rest of the group participates in other activities.

I really feel privileged to be one of the first *MS PHD'S*. I learned a lot about my future educational goals throughout the program. I also came in contact with many people looking for interns and scholarship nominees. I look forward to receiving information in the future from more programs *MS PHD'S* participates in. -up

FORMATIVE EVALUATIVE SUMMARY

The following issues appeared as recurrent concerns throughout the responses:

1. Interest in scheduling more time for mentors and mentees to meet together
2. Closer alignment of mentee research/academic interest with that of the assigned mentor
3. Interest in scheduling more "down time" for participants
4. Subdividing student participants according to academic interest and educational level to tailor presentations to better align with their needs
5. Scheduling "elective" sessions in order for participants to self-select sessions to attend.

Participant comments and recommendations focused on agenda structure, content and process. Diversity of interest is reflected on the number of program elements that were entered by some participants as "most beneficial," others entered the same element as "least beneficial." Attention to the five issues listed above will serve to enhance future ***MS PHD'S in Ocean Sciences Programs***.

Two underlying themes dominated the qualitative data:

- Appreciation of the opportunity to participate
- Advocacy for the continuation of the ***MS PHD'S in Ocean Sciences Program***.

Overall, evaluative data support the fact that the *MS PHD'S in Ocean Sciences Program* successfully achieved GOAL 3. The *MS PHD'S in Ocean Sciences Program* provided meaningful engagement for participants as determined by qualitative analysis of user-feedback .

GOAL 4: The *MS PHD'S in Ocean Sciences Program* will develop a constituent base adequate to demonstrate evidence of interest, value, need and sustainability

DATA AND INTERPRETATION

Student and non-student participants were asked to respond to three (3) questions in order to assess the degree to which the *MS PHD'S in Ocean Sciences Program* achieved GOAL 4: The *MS PHD'S in Ocean Sciences Program* will develop a constituent base adequate to demonstrate evidence of interest, value, need and sustainability. The questions asked are listed below:

- Would you recommend the *MS PHD'S in Ocean Sciences Program* to other students?
- Would you recommend the *MS PHD'S in Ocean Sciences Program* to other scientists?
- Would you like to be contacted about future *MS PHD'S in Ocean Sciences Program* activities?

Following the prompt for each survey item is an italicized entry number. This entry indicates the number of *MS PHD'S in Ocean Sciences Program* participants who completed that survey item. Forty-two (42) *MS PHD'S in Ocean Sciences Program* participants completed surveys though each participant did not answer every survey question.

A brief comment follows each survey matrix to assist in providing context. An evaluative summary is presented at the end of the section.

4. Would you recommend the *MS PHD'S in Ocean Sciences Program* to other students? (40 entries)

	Yes	No
Respondent		
Student	100%	0%
Non-student	100%	0%
Overall	100%	0%

Each student and non-student respondent indicated a willingness to recommend the *MS PHD'S in Ocean Sciences Program* to other students. This is the only survey item that received 100% rating by both student and non-student participants.

5. Would you recommend the *MS PHD'S in Ocean Sciences Program* to other scientists? (39 entries)

	Yes	No
Respondent		
Student	94%	6%
Non-student	100%	0%
Overall	97%	3%

Interestingly, when students were asked if they would recommend the program to other scientists, 94% answered "yes" and 6% (one student) answered "no." One hundred percent (100%) of the non-student respondents answered "yes" that they would recommend the program to other scientists.

6. Would you like to be contacted about future *MS PHD'S in Ocean Sciences Program* activities? (39 entries)

	Yes	No
Respondent		
Student	88%	12%
Non-student	95%	5%
Overall	92%	8%

When asked if they would like to be contacted about future *MS PHD'S in Ocean Sciences Program* activities, 88% of the students checked “yes,” and 12% (two students) checked “no.” Among non-student respondents, 95% checked yes and 5%, (one non-student participant) checked “no.” Of the thirty-nine participants who completed this survey item, three (3) indicated a disinterest in participating in future program activities.

FORMATIVE EVALUATIVE SUMMARY

For the purpose of this formative evaluation, a thresh hold of 70% affirmation from both student and non-student participants, as evidenced by respondent choice of “yes,” is interpreted as validation of the statement.

Forty (40) participants responded to the question, “**Would you recommend the *MS PHD'S in Ocean Sciences Program* to other students?**” Each student participant and each non-student participants checked “yes” as their response. This survey item yielded the first 100% response from both student and non-student participants that would recommend the *MS PHD'S in Ocean Sciences Program* to other students.

Thirty-nine (39) participants responded to the question, “**Would you recommend the *MS PHD'S in Ocean Sciences Program* to other scientists?**” Of student response, 94% selected “yes” and 100% of non-student participant respondents selected “yes.” Combined response of 97% serves as a strong indication that student and non-student participants would recommend the *MS PHD'S in Ocean Sciences Program* to other scientists.

Thirty-nine (39) participants responded to the question, “**Would you like to be contacted about future *MS PHD'S in Ocean Sciences Program* activities?**” Student response reflected a “yes” rating of 88%. Non-student participant response yielded a 95% “yes”. Combined response of 92% confirms continuing interest among constituents in future *MS PHD'S in Ocean Sciences Program* activities.

Evaluative data support the fact that the *MS PHD'S in Ocean Sciences Program* successfully achieved GOAL 4: The *MS PHD'S in Ocean Sciences Program* has developed a constituent base adequate to demonstrate evidence of interest, value, need and sustainability.

The formative evaluation of the *Minority Students Pursuing Higher Degrees in Ocean Sciences Program (MS PHD'S)* documented progress in the achievement of the following program goals:

GOAL 1: The *MS PHD'S in Ocean Sciences Program* will successfully market, recruit, select, and engage underrepresented student and non-student participants with interest/ involvement in Ocean Sciences;

GOAL 2: The *MS PHD'S in Ocean Sciences Program* will provide meaningful engagement for participants as determined by quantitative analysis of user-feedback;

GOAL 3: The *MS PHD'S in Ocean Sciences Program* will provide meaningful engagement for participants as determined by qualitative analysis of user-feedback, and;

GOAL 4: The *MS PHD'S in Ocean Sciences Program* will develop a constituent base adequate to demonstrate evidence of interest, value, need and sustainability in its vision, mission, goals and activities.

Qualitative and quantitative analysis of participant data provides strong evidence that the *MS PHD'S in Ocean Sciences* pilot program has accomplished each of the aforementioned program goals.

Appendix A

DISAGGREGATED DATA BY RESPONDENT CATEGORY: STUDENT

Please rate the following aspects of the **OVERALL MS PHD'S in Ocean Sciences Program** and **JGOFS Meeting** experiences by checking the appropriate boxes.

Statement	0- Strongly disagree	1- disagree	2- unsure	3- agree	4- strongly agree	5- not Applicable
The website provides adequate details regarding the vision and goals of the <i>MS PHD'S</i> Initiative.	0 0%	0 0%	2 12%	8 47%	7 41%	0 0%
I understand the vision and goals of the <i>MS PHD'S in Ocean Sciences Program</i> .	0 0%	0 0%	0 0%	8 47%	9 53%	0 0%
a. There is a definite need for the <i>MS PHD'S in Ocean Sciences Program</i> .	0 0%	0 0%	5 29%	12 71%	0 0%	0 0%
b. The <i>MS PHD'S</i> experience assisted participants in developing a clearer understanding of strategies and activities required to achieve their academic and professional goals.	0 0%	0 0%	1 6%	8 47%	8 47%	0 0%
c. Brown bag sessions provided participants with opportunities to learn from and network with federal and organization representatives.	0 0%	0 0%	0 0%	5 29%	11 65%	1 6%
d. The <i>MS PHD'S</i> experience provided an awareness and understanding of how NASA's research and innovations in aerospace technology affect and improve the quality of life for all citizens.	0 0%	0 0%	2 12%	6 35%	8 47%	1 6%
e. The <i>MS PHD'S</i> experience facilitated networking among peers (Undergraduate/Master/Doctoral/Post-Doctoral).	0 0%	0 0%	1 6%	5 29%	10 59%	1 6%
f. The <i>MS PHD'S</i> experience provided an awareness and understanding of opportunities for participate in NASA pre-employment scientific and technical programs.	0 0%	0 0%	1 6%	8 47%	8 47%	0 0%
g. The <i>MS PHD'S</i> experience facilitated participant-to-faculty/researcher networking.	0 0%	0 0%	0 0%	8 47%	8 47%	1 6%
h. The <i>MS PHD'S</i> experience was well organized and kept participants focused on achieving program goals.	0 0%	4 24%	4 24%	4 24%	5 29%	0 0%

i. The <i>MS PHD'S</i> experience provided an awareness and understanding of opportunities to participate in NASA-related work, and/or develop NASA-related academic or research capabilities.	0 0%	0 0%	2 12%	8 47%	7 41%	0 0%
j. The <i>MS PHD'S</i> agenda included information directly connected to participant research/professional/academic interest.	0 0%	1 6%	2 12%	7 41%	7 41%	0 0%
k. Mentors and Mentees established specific commitments and follow-up activities.	1 6%	2 12%	6 35%	6 35%	2 12%	0 0%
l. The <i>MS PHD'S</i> community-building activities help participants to feel comfortable and welcome.	0 0%	0 0%	3 18%	6 35%	7 41%	1 6%
m. The <i>MS PHD'S</i> experience provided an awareness of programs/products that attract diverse students to NASA careers in science, technology, engineering, or mathematics.	0 0%	1 6%	6 35%	5 29%	5 29%	0 0%
n. Some of my personal/academic/professional goals were clarified and or reached through the <i>MS PHD'S</i> experience.	0 0%	0 0%	2 12%	8 47%	5 29%	2 12%
o. The <i>MS PHD'S</i> experience increased interest in taking academic courses in NASA – related subjects.	0 0%	1 6%	9 53%	2 12%	2 12%	1 6%
p. I would be interested in participating in future <i>MS PHD'S</i> in <i>Ocean Sciences Program</i> activities.	0 0%	0 0%	2 12%	7 41%	6 35%	2 12%

Appendix B

DISAGGREGATED DATA BY RESPONDENT CATEGORY: NON- STUDENT PARTICIPANT

Please rate the following aspects of the **OVERALL MS PHD'S in Ocean Sciences Program** and **JGOFS Meeting** experiences by checking the appropriate boxes.

Statement	0- Strongly disagree	1- disagree	2- unsure	3- agree	4- strongl y agree	5- not applicable
aa. The website provides adequate details regarding the vision and goals of the <i>MS PHD'S</i> Initiative.	0 0%	0 0%	1 5%	7 35%	10 50%	2 10%
a. I understand the vision and goals of the <i>MS PHD'S in Ocean Sciences Program</i> .	0 0%	0 0%	2 10%	9 43%	9 43%	1 5%
b. There is a definite need for the <i>MS PHD'S in Ocean Sciences Program</i> .	0 0%	0 0%	2 10%	8 40%	10 50%	0 0%
c. The <i>MS PHD'S</i> experience assisted participants in developing a clearer understanding of strategies and activities required to achieve their academic and professional goals.	0 0%	0 0%	1 5%	14 70%	4 20%	1 5%
d. Brown bag sessions provided participants with opportunities to learn from and network with federal and organization representatives.	0 0%	0 0%	1 5%	8 40%	10 50%	1 5%
e. The <i>MS PHD'S</i> experience provided an awareness and understanding of how NASA's research and innovations in aerospace technology affect and improve the quality of life for all citizens.	0 0%	0 0%	3 15%	7 35%	5 25%	5 25%
f. The <i>MS PHD'S</i> experience facilitated networking among peers (Undergraduate/ Master/Doctoral/Post-Doctoral).	0 0%	0 0%	2 10%	5 25%	12 60%	1 5%

g. The <i>MS PHD'S</i> experience provided an awareness and understanding of opportunities for participate in NASA pre-employment scientific and technical programs.	0 0%	1 5%	2 9%	11 50%	2 9%	6 27%
h. The <i>MS PHD'S</i> experience facilitated participant-to-faculty/researcher networking.	0 0%	0 0%	0 0%	12 57%	9 43%	0 0%
i. The <i>MS PHD'S</i> experience was well organized and kept participants focused on achieving program goals.	0 0%	0 0%	1 5%	11 50%	8 36%	2 9%
j. The <i>MS PHD'S</i> experience provided an awareness and understanding of opportunities to participate in NASA-related work, and/or develop NASA-related academic or research capabilities.	0 0%	0 0%	1 5%	14 67%	2 10%	4 19%
k. The <i>MS PHD'S</i> agenda included information directly connected to participant research/professional/academic interest.	0 0%	1 5%	4 20%	10 50%	4 20%	1 5%
l. Mentors and Mentees established specific commitments and follow-up activities.	0 0%	1 5%	1 5%	9 50%	7 35%	1 5%
m. The <i>MS PHD'S</i> community-building activities help participants to feel comfortable and welcome.	0 0%	1 5%	2 10%	8 40%	7 35%	2 10%
n. The <i>MS PHD'S</i> experience provided an awareness of programs/products that attract diverse students to NASA careers in science, technology, engineering, or mathematics.	0 0%	0 0%	4 20%	8 40%	3 15%	5 25%
o. Some of my personal/academic/professional goals were clarified and or reached through the <i>MS PHD'S</i> experience.	0 0%	5 22%	1 4%	0 0%	6 26%	11 48%

<p>p. The <i>MS PHD'S</i> experience increased interest in taking academic courses in NASA – related subjects.</p>	<p>0 0%</p>	<p>0 0%</p>	<p>5 23%</p>	<p>9 41%</p>	<p>2 9%</p>	<p>6 27%</p>
<p>q. I would be interested in participating in future <i>MS PHD'S in Ocean Sciences Program</i> activities.</p>	<p>0 0%</p>	<p>0 0%</p>	<p>3 16%</p>	<p>8 42%</p>	<p>7 37%</p>	<p>1 5%</p>