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Protégées recruited for summer 2007**Returning Protégées**

- Miriam Garcia, University of Texas at El Paso
- Lennox Thompson, Coppin State University, Baltimore MD (an historically black college)

New Protégées

- Emannelle Bonilla Feliciano, University of Puerto Rico
- Katherine Fornash, Yale University
- Cynthia Boshell Hyland, Humboldt State University
- Ezer Patlan, University of Texas at El Paso

SOARS & RESESS protégés 2007. Kneeling (L to R): *Ian Colon Pagan, Karen Diaz., Luna Rodriguez, Alex Gonzalez, Alisha Fernandez, Ezer Patlan.* Front Row (L to): **Katherine Fornash, Anastasia Yanchilina, Theresa Aguilar, Shanna-Shaye Forbes, Nicole Ngo, Cecille Villanueva, Lumari Pardo, Cynthia Hyland, Zi Zi Searles.** Back Row (L to R): *Douglas Gavin, Marcus Walter, Armand Silva, Lennox Thompson, Michael Hernandez, Christopher Williams, Mack Jones, Emanuelle Feliciano Bonilla, Marcus R Waldman.* Not pictured: *Kimberly Trent and Miriam Garcia.* **RESESS interns' names in bold**

Recruited Mentors**2006:***Science Mentors*

- Dr. Eric Calais, Purdue University with the help of Dr. David Phillips, UNAVCO
- Dr. Penina Axelrad, U. Colorado, Aerospace Eng.
- Dr. Roger Bilham and Walkter Szeliga, U. Colorado, geophysics

Writing and Communication Mentors

- Dr. Fran Boler, UNAVCO
- Blaise Stephanus, UNAVCO

3

- David Aragon, Director of Minorities in Engineering Program, University of Colorado

Community Mentors

- Kim Cabbagetalk, UNAVCO
- Dr. Fran Coloma, National Center for Snow and Ice
- No mentor was required for Stephen Hernandez as he was returning to the program.

UNAVCO paid for a Year 0 intern in this program before funding was acquired.

Peer Mentors for new protégées who are SOARS protégées and selected by the SOARS staff.

- Keith Goodman for Lennox Thompson
- Stephen Hernandez for Miriam Garcia

2007*Science Mentors*

- Dr Harley Benz, National Earthquake Hazard Center, USGS, Golden
- Dr. Dena Smith, U. Colorado, Museum of Natural History
- Dr. Tim Orr, Hawaii Volcano Observatory, USGS, Hawaii
- Dr. Peter Cervelli, Alaska Volcano Observatory, USGS, Alaska with the help of Dr. Charles Meerten, UNAVCO, Boulder

Writing and Communication Mentors

- Dr. Fran Boler, UNAVCO
- Dr. Freddie Blume, UNAVCO
- Dr. Will Prescott
- Shelley Olds, UNAVCO

Community Mentors

- Marianne Okal, UNAVCO
- Joe Pettit, UNAVCO
- Matt Beldyk, UNAVCO

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In 2007, the SOARS/RESESS group formed peer groups as there were more new protégées than returning people to do the one-on-one mentoring.

Recruitment Techniques

For summer 2006

RESESS is developing a multi-pronged approach to recruiting for the RESESS program. Based on recruitment for a UNAVCO intern for this program prior to RESESS funding starting in September 2005, we added more components resulting in:

Eriksson attended the following national conferences of organizations promoting students from underrepresented group to science and engineering.

– Association for Indians in Science and Engineering (AISES), Charlotte, NC: Eriksson attended sessions and distributed fliers to key individuals and to colleges and organizations with similar goals

– Society for the Advancement of Chicanos and Native Americans in Science (SACNAS): RESESS materials were available in the IRIS and EarthScope booths, UNAVCO organized a multi-organizational tour (UNAVCO, USGS, NCAR) one day field trip for geoscience students attending the national SACNAS meeting in Denver, fall 2005. 55 students from Puerto Rico and across the US visited UNAVCO

– National Association of Black Geologist and Geophysicist: Eriksson gave an invited keynote speech and distributed fliers on RESESS

4

SACNAS students tour UNAVCO headquarters fall of 2005 and learn about GPS.

For Summer 2007

In the fall of 2006, Eriksson continued the association with NABGG and SACNAS as described above. She spent more time on personal interactions with people who have potential interns such as faculty at the University of Puerto Rico and Humboldt State University, Dine College, Arizona State University. Eriksson made a two-day visit to the University of Texas at El Paso with the Director of SOARS to visit faculty and administrators in the Department of Geoscience and in the administration of the College of Science. We hosted an information session for students in geoscience and Eriksson gave a departmental seminar on EarthScope and UNAVCO science and technology as well as RESESS. This resulted in one more, highly qualified applicant for the program.

Advertising

Without project funds, UNAVCO paid for development of a RESESS logo to aid in recruitment and identification of this program. This logo has been used on the RESESS website and on UNAVCO publications describing the program.

UNAVCO developed a one-page information sheet distributed at various national meetings.

http://unavco.org/pubs_reports/brochures/2005-onepagars/resess.pdf. Over 250 have been handed out in 2005-2006.

In 2006, the one-page information sheet was revised and made into two different brochures – one which appeals to faculty who might have potential students for the program and one which is more youngperson friendly directed to the student. Over 1000 of these were handed out at various schools, meetings, and through the mail during the 2006-2007 academic year.

5

In spring of 2006 UNAVCO staff members Jennifer Yu and Susan Eriksson developed the RESESS website at www.resess.unavco.org. The application form was available in a pdf on this site.

In 2007, the webpage included stories of the 2006 summer interns, and the application process was put on-line. All applicants used this to apply for 2007. We continue to rely heavily on the SOARS program for the extensive website in support of the summer program. RESESS protégées use this and their information is available on www.soars.ucar.edu.

RESESS pays SOARS to help with promotion and for the publications that show the protégés work. Last year SOARS:

- Included a small RESESS logo on its advertising poster.
- Included an article on RESESS in one SOARS newsletter.

- Acknowledged RESESS on the final colloquium abstract volume and provided several copies to RESESS.
- Distributed RESESS one-pagers during recruitment visits to various schools.

6

There is also information about RESESS on the SOARS website at <http://www.soars.ucar.edu/protegeRESESSinfo.php>.

RESESS advertised in the following journals and/or websites:

- SACNAS, Geological Society of America, American Geophysical Union, AISES, NABGG, HBCU – central career center
- UNAVCO website
- DLESE

E-mail distribution lists:

- Geo-ed listserv – DLESE
- UNAVCO community
- EarthScope community
- IRIS community

Personal contacts:

- Eriksson's professional contacts
- UNAVCO staff sent to professional contacts
- Information sent from USGS Golden to other regional offices

Other Long-term Recruiting Plan

Even though the funding is significantly reduced from what was requested, RESESS left the community college component in as the community college audience is a significant target for RESESS-type activities. The work plan for this component is given below. Dr. Baer has worked on this during the fall term, 2005. However, significant progress has not been made, and the RESESS Project Director will rethink this component in the fall of 2006, considering changing personnel for this activity.

2007 Update on the Community College Component. Because Eric Baer did not fulfill most of his work for this project, Baer agreed to discontinue this component. He did fulfill the field trip aspect in the late spring of 2007. Baer worked with Tim Melbourne of Central Washington University (UCW) to take students from Highline Community College to visit the 4 year geoscience department at UCW with an accompanying field trip.

8 students attended the field trip from Highline

Community College to the Department of Geosciences at Central Washington University.

These included 6 women, 2 men, with one selfidentified

Latina. Dr. Tim Melbourne gave a tour

of the PANGA geodetic network at UCW.

7

Work Plan for Community College Component - 2006

Rationale for Work: The main goal of RESESS is to increase the number of individuals from underrepresented populations who complete Masters' and PhD degrees in solid earth geoscience. Two of the three RESESS objectives involve community colleges. Eric Baer, Department of Geology, Highline Community College, Des Moines, WA will lead the project tasks related to community colleges.

Recruiting: A disproportionate number of students from underrepresented groups go to two-year colleges (54% Hispanic, 52% American Indian, and 46% African Americans compared to 44% of all U.S. undergraduates). Highline Community College in the Seattle, Washington area has a total student population of 17,227 (63% female and 37% male) and a total of 45% non-white student population (18% Asian/Pacific Islander, 13% African American, 8% Hispanic, 1% Native American or Native Alaskan and 5% Other (self reported data)). Eric Baer will both recruit students from Highline Community College for RESESS and help RESESS build a national network of community colleges who can send students to RESESS.

Project Management: Eric Baer is participating in the Program Management Team because of his experience in teaching a diverse group of students, particularly in increasing quantitative skills, in a 4-

person geology department in a community college with a large population of students from underrepresented populations and with strong ties to UNAVCO's research community.

Baer will provide leadership in bridging community college students to a 4 year institutions, disseminating lessons learned through the regional project, and interacting with community colleges nationally. Baer will also present papers, with protégés were appropriate, at professional meetings (e.g. AGU, GSA, DLESE, EarthScope, IRIS, UNAVCO).

Bridging: RESESS has a component that includes bridging from community college to degree-granting institution. Demographics at community colleges reflect the changing demographics of our nation. Highline CC will establish a bridging program from the Puget Sound Community colleges to Central Washington University Department of Geological Sciences through field trips and visits to the four-year institution. In addition, Baer will also conduct research on the current state of community college students who go finish degrees at 4-year institutions and do not go on to graduate school.

Funding for Baer: We have budgeted one month summer salary for Eric Baer, Highline Community College annually (years 1-3) to support his participation and leadership in building regional and national groups of community colleges from which RESESS can recruit. Funding for Baer also supports his research and dissemination regarding the project.

RESESS will contract with Highline Community College (invoice) for one course release for Eric Baer for each fall semester (years 1-3) to plan a joint field trip with University of Central Washington and to build a pool of students from other community colleges in the Puget Sounds area. Baer will work with UNAVCO scientists Tim Melbourne and Megan Miller in the bridging program to UCW.

2. Collaborating with SOARS

Part of the condition of this award was for RESESS to recruit protégées and mentors and to use the SOARS infrastructure in running the program. SOARS and RESESS have worked together toward this end with funds moving from RESESS to SOARS to cover expenses for the leadership and writing components, protégée apartments, and a few miscellaneous administrative costs. RESESS through UNAVCO has handled all of the travel, stipends, recruitment, and other functions such as providing computers, email, etc. SOARS and RESESS staff met prior to the 2006 summer session and have communicated via email and phone during the summer. RESESS and SOARS have shared

8

some events such as opening and closing receptions as well as the final research colloquium. RESESS hosted a picnic for all protégées at UNAVCO about three weeks into the summer program. Hence, SOARS protégées have the opportunity to see the work that UNAVCO supports.

This has been a large time commitment from both SOARS and UNAVCO which has not been funded through this current award.

2007 Update: Both SOARS and RESESS staffs made considerable effort in year 2 to improve communication and planning. The Directors of SOARS and RESESS met regularly and the two program staffs met approximately every two weeks in the months prior to and during the summer period that the interns were in Boulder. This reduced the frustration of having two new programs working together and helped RESESS and SOARS implement many of the changes resulting from the formative evaluation. There were still issues in including more geoscience faculty in SOARS-organized programs. The lead time and importance of this to RESESS was better articulated throughout the summer and we have plans in place to improve this aspect more for 2008. For example, instead of having the students start from scratch in June to plan seminars, they gave input at the final All-Hands review in August, 2007 for implementation in 2008. This will allow RESESS staff to recruit scientists for certain programs in a timely way and provide more time for coordination between the two programs. There is also a period of educating NCAR and UCAR staffs not directly associated with SOARS as to the relationship of RESESS to SOARS and UCAR/NCAR.

3. Evaluation

During 2005 year, Eriksson identified a local external evaluator as reduction of funding made it more

feasible to work locally than bring someone from Georgia to Colorado to conduct interviews. External evaluation will be done by Dr. Liane Pedersen-Gallegos, Ph.D., Director, Ethnography & Evaluation Research Center to Advance Research and Teaching in the Social Sciences (CARTSS), University of Colorado, Boulder, Colorado. Dr. Pedersen-Gallegos conducted an extensive, NSF-funded evaluation of the SOARS program <http://www.soars.ucar.edu/documents/SOARS%20Evaluation%20Report.pdf> and RESESS can benefit from her knowledge of SOARS and not replicating certain aspects of our evaluation.

Eriksson and Pedersen-Gallegos worked closely with AIR evaluator Roger Levine in 3 conference calls in January-February 2006 to ensure that the RESESS evaluation is aligned with the goals of the OEDG project and that the data needed by AIR can be obtained within the qualitative evaluation of RESESS. Pedersen-Gallegos has integrated the two different evaluation plans. The final plan for her work is listed below. For 2006, protégée interviews have been conducted, mentors will be interviewed in September 2006, and demographic data on applicants, selected protégées, and mentors is collected internally.

UNAVCO

Research Experiences in Solid Earth Science for Students (RESESS) Project Evaluation Plan

Scope of Work

This is an evaluation of the RESESS program, which is a program patterned after, and affiliated with the SOARS program, for which E&ER also conducted an evaluation. The RESESS project has a geoscience focus, based in east Boulder County, and runs alongside, overlapping with, the SOARS program.

The evaluation will include in-depth, ethnographic interviews with key program participants, and in cooperation with a national evaluation effort from the AIR program, administration of their survey to protégé participants. Interviews with protégés will be conducted during the summer sessions when they are in the Boulder area, and interviews with their respective mentors will be conducted shortly after the conclusion of each summer session. Reports, oral and written, will be delivered to Susan Eriksson, PI of the RESESS program, at times listed below, in accordance with funders' requirements. Reports in years 9

2006 and 2007 will be formative evaluation progress reports designed to optimize the program, and the final report in 2008 will be summative in nature, to include any findings that may be helpful to future projects.

Program Goals

The RESESS program goals are consistent with those of SOARS:

- To enhance protégé interest in the discipline.
- To facilitate enrollment of students from under-represented groups as protégés.
- To encourage and support protégés entry into graduate school, preferably in the geosciences.
- To promote protégés' socialization into the science community, including the enhancement of research and writing skills.

To promote systems change by:

- Teaching the UNAVCO community the value of the RESESS program and of mentoring undergraduate and graduate students in general.
- Teaching the community beyond UNAVCO (ie GSA and AGU) the value of the RESESS program and of mentoring undergraduate and graduate students in general.

Each year's scope of work is outlined below:

Year One

3 protégés

- In-depth interviews with three protégés.
- Administration of the AIR survey.
- In-depth interviews with the protégés' mentors (estimated at twelve, some of whom are graduate students, from SOARS and UNAVCO community).
- One focus group interview with administrators/managers, not fully-coded (quick coded, for protocol development, to inform report-writing)
- One focus group interview with Steering Committee (two members from UNAVCO on

SOARS committee and two from SOARS on UNAVCO's committee), not fully-coded (quick coded, for protocol dev, to inform report writing)

Year one = 15 interviews fully-coded, 2 quick-coded focus group with admin.

Personnel: Liane (1 month \$6,653), transcriber (15 tapes x 7 hours x \$10/hour = \$1,050)

Year Two

– In-depth interviews with six protégés; three who are new, three returning.

– Observe Steering Committee meeting (not fully coded)

– Interview mentors in focus groups at an event/meeting where they would be anyway

4 groups: research, writing, community, and peer mentors

Year two = 7 interviews, 3 new protégés, 4 focus groups

Personnel: Liane (3 weeks 4,990), transcriber (7 tapes x 7 hours x \$10/hour = \$490)

Year Three

– In-depth interviews with six protégés, two from each of first two years, plus two new ones.

– 15 interviews: 6 protégés, 4 mentor focus groups (research, writing, community, peer), 3

admin: steering committee, admin, staff, 2 individual mentors who can't make the focus group interviews.

E&ER Personnel: Liane, transcribers. Other direct costs: tapes, ink cartridges, paper.

CU Human Research Committee approval has been secured.

Deliverables and Budget - Three years: June, 2006 – December 2008

Year one: \$8,000 Evaluation to be conducted end of summer 2006

10

Year two: \$5,000 Evaluation to be conducted end of summer 2007

Year three: \$8,000 Evaluation to be conducted end of summer 2008

Year One: June-Sep 2006 \$8,000

Liane 25% FTE for 4 months ~\$6,653

Transcriber for 105 hours work @ \$10 hour = \$1,050

Formative Evaluation Report due Dec 1, 2006

Year Two: June – Sep 2007 \$5,000

Liane 25% FTE for 3 months ~\$4,990

Transcriber for 7 hours @ \$10/hour = \$490

Formative Evaluation Report due Dec 1, 2007

Year Three: June – Sep 2008 \$8,000

Liane 25% FTE for 4 months ~\$6,653

Transcriber for 105 hours work @ \$10/hour = \$1,050

Verbal report to RESESS Principal Investigator, Susan Eriksson Sep 15, 2008

Summative Evaluation Report due Dec 1, 2008

Included here is the written report of year one which was delivered to the RESESS PI in December, 2006.

RESESS Evaluation Progress Report

December 2006

This is a progress report, based on interviews from one summer's participants (2006, the second year of the RESESS program). The purpose of this report is to inform RESESS administrators and staff of participants' feedback in order to facilitate potential mid-stream adjustments in the ongoing program.

Thirteen minimally-structured, in-depth interviews were conducted with the following participants: all three protégés, and ten mentors (three of the four research mentors, all three writing and communication mentors, both community mentors and both peer mentors.) We were unsuccessful in reaching one of the research mentors for an interview, but will continue attempts to include this mentor in the ongoing evaluation.

Protégés' Feedback

Protégés were specifically asked about, but reported no, problems feeling included with SOARS protégés. At the same time, they had a sense of belonging to the RESESS group, as such. The RESESS group appears sufficiently small (with three protégés) at the present to prohibit a dynamic of an "out group" between the SOARS and RESESS protégés. In addition, the RESESS protégés reported belonging to small, especially close friendship groups with SOARS protégés. This natural formation of

cliques, as noted in the SOARS evaluation (2005), was not seen as problematic by the RESESS protégés, and their identities as RESESS students were further normalized by the acceptance of the two groups of protégés.

There was some degree of culture shock, especially for one of the protégés. However, this could be seen as a “growing pain,” one that this protégé would gladly assume again. This is not unlike the culture shock described by SOARS protégés. A couple of the protégés said that they would have liked to know ahead of time more about expectations of protégés, i.e. writing and presentations.

Protégés’ suggestion: One RESESS protégé suggested, and the other two agreed, that they would appreciate more focus on the earth sciences, in parallel to that of the SOARS program. There were two ways in which this was visualized: SOARS has speakers and related special events for their protégés that relate specifically to atmospheric science. The RESESS protégés would like to have scientists specializing in earth sciences serve as speakers. Similarly, the RESESS protégés expressed anticipation of having more RESESS protégés in the future with which to discuss earth sciences and their particular

11

summer projects. They did not have a sense of currently benefiting as much as the SOARS protégés from peer discussions of their summer projects, as there are only three RESESS protégés, and differences between the groups’ work made it difficult for students in one group to fully appreciate the science employed by the other group. While the SOARS protégés do benefit from discussing their projects with one another, it is possible that the RESESS protégés over-rated the extent to which SOARS protégés understand one another’s projects.

Surprise: RESESS protégés expressed no resistance toward the writing program. This is a surprise because the SOARS protégés expressed dislike of the writing seminars in a prior evaluation. However, a norm of resistance to the writing workshops had developed among the SOARS protégés, that was addressed following the 2005 SOARS evaluation. It is possible that this issue has been adequately addressed since the time of the SOARS evaluation.

Mentors’ Feedback

Some of the mentors expressed concerns about one of the protégés in particular. This protégé appeared to them to be especially timid and, as one pointed out, academically unprepared for the level of work required. The other mentors expressed concern about this protégé’s self-reliance, especially in terms of the practical, day-to-day living, that is expected of protégés. As time elapsed and the interviews continued, the self-reliance concerns appeared to be largely resolved. However, one mentor’s questions about this protégé’s academic readiness for RESESS work persisted.

The mentoring experience was seen as rewarding to nearly all of the mentors. One unexpected benefit cited by some of them was increased involvement with colleagues who also volunteered as mentors. They were also surprised, and pleased, to receive recognition from RESESS for their contributions as mentors.

The mentors had less of a sense of affiliation with SOARS than did the protégés, but had positive feedback about the interactions they did have with SOARS staff and administrators. At the same time, they also had little sense of affiliation with UNAVCO, which raised some questions about the role of UNAVCO in RESESS. For example, one mentor suggested that UNAVCO should play a more visible role, particularly in recruiting mentors from within. The visibility of support from top UCAR administrators for the SOARS program was in contrast to the invisibility of higher level support from UNAVCO administrators. It was suggested that RESESS, particularly as a new program, would benefit from more visible promotion from UNAVCO executives.

Mentors who participated in training that SOARS provided for first-time mentors said that they found value in these sessions. Of particular note, mentors provided positive feedback about weekly emails sent from SOARS staff in which expectations for each week were spelled out. At the same time, mentors described difficulty absorbing the large amount of information SOARS sent to them (some of which was not read because of time constraints) and attending mentor trainings, even though these were seen as of potential value.

The amount of time needed for mentoring turned out to be more than some mentors expected, but not too much, at least not too much for the occasional involvement. These mentors said that they can not make the time commitment every year, but nearly all expressed an interest in doing it again. In general,

mentors liked the fact that they were personally asked to be mentors and most, if not all, hoped to be invited to be mentors again. Several also expressed an interest in getting feedback from their respective protégés about how they performed as mentors.

Research mentors

As mentioned above, there was some concern about the level of academic preparation of protégés. At the same time, mentors supported the RESESS goal of providing protégés who had few or no previous opportunities to gain specific skills. This feedback is not different than SOARS research mentors' concerns, but merit attention here, as they highlight the value of informing and reminding mentors of the RESESS program's goals in this regard. Both SOARS and RESESS administrators have discussed with the evaluator their intentions of providing meaningful opportunities for promising students who would not otherwise have these benefits. In choosing students for these programs, a judgment must be made

12

about which applicants would benefit most from these opportunities, considering that some applicants would either succeed in their science careers without it or fail in spite of it. Difficult selection decisions are informed by this, as well as other, criteria. Close communication between research mentors at the conclusion of the summer projects and RESESS personnel who make selections among protégé applicants will promote a common understanding, and help to meet program goals.

There were challenges related to constructing and then tailoring research projects, that are not unlike those described by SOARS research mentors. There are inherent difficulties involved with knowing where to establish the level of challenge for protégés, and then monitoring success/struggle of the protégés. We pursued an idea with RESESS mentors, that originally came up in interviews with SOARS research mentors, about lessons learned by more experienced research mentors about how to design projects that could be easily modified over the course of the summer, given the individual protégé's abilities. We found that RESESS and SOARS research mentors alike have expressed interest in exchanging ideas about project planning with each other and, in particular, learning from more experienced research mentors. A panel discussion featuring experienced research mentors prior to the summer session would be helpful.

One of the protégé's projects involved coordination with an off-site mentor, followed by field work late in the program calendar. While the particular challenges this posed appear to have been met, they did cause a notable level of stress and challenge among the mentors involved. In cases such as this one, that entail greater than the usual level of challenges, particular attention to coordination among the group is especially important. For instance, the ambiguity of "pre-writing" expectations inherent in all of the protégés projects are enhanced in such cases, and are thus more stressful.

Writing and communication mentors

As with the SOARS mentor teams, there is an ongoing need for communication between writing and research mentors. In particular, there is a certain level of role overlap between writing and research mentors that merits attention. Questions naturally arise about when and how much the research mentors should give feedback on the writing and when the writing mentors should take the lead in providing this direction. Meetings of the mentors early in the project to clarify how particular teams prefer to work this out would minimize this stress for mentors and protégés alike.

There was some variation in closeness of collaboration between writing mentors and their protégés. Some of this was influenced by the ease of relationship between particular people, and some by the level of involvement in the writing that was assumed by the research mentors. As with research teams generally, it is natural that certain individuals find they have particularly compatible working styles and tend to collaborate more than others. It is a strength of the program that these relationships are permitted to evolve without undue rigidity in role expectations. At the same time, when a natural partnership develops between the protégé and either the research mentor or the writing mentor, and those pairs collaborate more on the writing, it is helpful that the benefits of this partnering be communicated to the team as a strength and not reflect on any other team members as deficient in some way. These natural collaborations need to be normalized so that others do not feel they contribute, or are otherwise consulted, too little.

Materials provided through the protégés' writing seminar were seen as useful to the writing mentors, but did not lend themselves directly to working sessions with protégés. It was helpful to make the materials available the writing mentors.

Community mentors

The community mentors, as did the other mentors, indicated they enjoyed their involvement in RESESS. Their feedback was positive overall, with only a couple of concerns, addressed below.

As with the SOARS program, questions arose among RESESS community mentors about the expectations involved with their role. The SOARS staff concluded that benefits of role flexibility outweighed discomforts of role ambiguity for community mentors. However, it is helpful to regularly revisit the question, as it does pose some difficulty for community mentors. The emergent issue this summer was uncertainty about how much money community members “ought” to spend on entertaining their

13

protégés. Noticeable differences in amounts that the community mentors (including SOARS and RESESS mentors) were able to spend raised the question among those with more modest means. In one case the duties of being a mentor was of some concern to the mentor’s supervisor. There was concern expressed about potential time demands that could interfere with the mentor’s work. While no specific problems arose, the issue was, in itself, of some concern to the mentor.

Overview

Feedback from all interviewees was generally positive. The RESESS program was seen as an important endeavor and off to a very promising start. All three of the protégés expressed interest in and the intent to apply again for next year’s program.

Suggestions made included ideas about how much to grow and issues of continuing the alliance with SOARS. In general, the protégés and mentors, alike, favored keeping RESESS small enough to maintain its affiliation with SOARS. Some expressed surprise that RESESS would consider growing beyond their partnership with SOARS. The protégés expressed more enthusiasm than did the mentors about increasing the number of RESESS protégés, and hence the size of the program. As addressed above, the protégés liked the idea of having a group of their own, focused on earth sciences. In this and other ways they would like to increase their “RESESS identity.” At the same time, they valued and wished to retain their affiliation and identity with the SOARS protégés. On occasion, there was an element of wistful thinking expressed in the interviews about having the same type and level of attention to earth science as there currently is at SOARS for atmospheric science. Still, they appreciate the relatedness of earth science to atmospheric science and SOARS overall. They did not want to branch out, independently of SOARS, too early.

Other Observations

Affiliations that mentors have with colleagues and other groups, including those on the University of Colorado campus, proved helpful to them as mentors, as well as to their protégés. For instance, mentors made introductions between protégés and their colleagues, and exposed the protégés to programs of interest.

Most commonly, interviewees believed that RESESS should remain affiliated with SOARS—no real benefit seen in a separate program. In fact, RESESS was seen as all the stronger for its alignment with SOARS. The only point at which a separate program was seen as best was if RESESS grew to have “enough” protégés to warrant a separate program. How many constitute “enough” was difficult to establish with interviewees, but several interviewees indicated that when RESESS has 15 protégés, it would be sufficiently large to be independent. They also assumed that the time it would take to grow this much would also allow for the development of UNAVCO support staff. Splitting too soon was not recommended, as there are many benefits to protégés (and to mentors, it would seem) to maintaining the relationship with SOARS. These include: the community of protégés, the protégés’ culture, the living arrangements in which the protégés have a good-sized group of peers as neighbors, the experienced SOARS staff who have learned to anticipate protégés’ needs, and the level of organization in general (seminars, trainings, tightly scheduled rhythm of an intense program in a brief ten weeks).

The protégés, in particular, were aware of the challenges of anonymity in the evaluation, and this may have contributed to lack of criticism of the program.

14

4. Education of the Community

SOARS and RESESS collaborated on a presentation for fall, 2005 AGU.

AGU 2005 Abstract

ED31B-1214

Providing Opportunities for Interdisciplinary Research through Partnering two Undergraduate Research Programs: RESESS and SOARS *

Pandya, R E, pandya@ucar.edu

, UCAR SOARS Program, UCAR, P.O. Box 3000, Boulder, CO 80307 United States and

Eriksson, S C, eriksson@unavco.org, UNAVCO, 6350 Nautilus Drive, Boulder, CO 80301 United States

Undergraduate research provides a unique opportunity to explore scientifically novel questions, particularly those at the intersection of disciplines. This opportunity should be balanced with the need to provide the strong discipline-based training that undergraduate students require to continue their academic careers. This need for balance is especially acute for students from groups who are historically under-represented in geosciences; their status as minorities and women makes them especially vulnerable to the devaluing of their research if it isn't along traditional lines.

Combining undergraduate research with a strong, diverse learning community is one way to balance the opportunity of interdisciplinary research with the need for depth of understanding in a field. In this model, students individually pursue focused research in partnership with a particular scientist as they work collaboratively across disciplines to prepare scientific papers, presentations, and posters to share the results of their research. Over time, programmatic success can even help insulate students from the risks of interdisciplinary work. Research Experience for Students in Solid Earth Science (RESESS) and Significant Opportunities in Atmospheric Science (SOARS) implement this approach. SOARS is a program with a 10-year history in the atmospheric science; RESESS is a new program focused on Solid Earth Sciences. The two currently collaborate by merging their learning communities while maintaining distinct research focuses. While still in the pilot phase of partnering, initial discussions by the student participants indicate a growing awareness of potential for cross-disciplinary collaboration. In fact, two projects, both by graduate students who have participated for multiple summers, straddle the disciplines of geology and meteorology. One project characterized dust storms in the Southwest US using remote sensing, and a second project studied wind-driven migration of sand dunes on the Navajo Nation. Based on the RESESS/SOARS partnership in 2005 and plans for a three-year collaboration, we describe the ongoing process of navigating the partnership and developing a cohesive learning community. We also provide evidence of the growing acceptance of interdisciplinary research within the SOARS and RESESS students and the scientists who work with them.

DE: 0805 Elementary and secondary education

DE: 0850 Geoscience education research

DE: 0855 Diversity

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15

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Alliances for Undergraduate Research in the Geosciences Through Collaborative Recruitment

Pandya, R , Eriksson, S., Haacker-Santos, R ; Calhoun, A

Undergraduate research is a key strategy for encouraging students to pursue graduate school and careers in science and engineering. In the geosciences, where participation by members of underrepresented groups is among the lowest of any science field, these programs must continue and strengthen their efforts to engage students from historically underrepresented groups. A significant limitation on our ability to engage students from historically underrepresented groups comes from the expense, in terms of time and resources, of promoting these career options to talented undergraduates considering a host of STEM careers. Another hurdle is our ability to match students with research projects tailored to their interests. Further complicating this is the challenge of matching students who have culturally motivated geographic constraints—for example, Native students who seek to serve their local community—to relevant opportunities. As a result, we believe that a number of highly qualified students never fully consider careers in the geosciences. To address these obstacles, we propose an alliance of undergraduate research programs in the geosciences. In this model, all members of the alliance would share recruiting, and students would submit a single application forwarded to all alliance members. The Alliance could offer applicants multiple research opportunities, from across the alliance, tailored to fit the applicant's needs and interests. This strategy has proven very effective in other fields; for example, the

Leadership Alliance allows 32 member institutions to offer internships and fellowships through one central application process. SOARS and RESESS, programs in atmospheric science and geophysics, respectively, have done this co-recruiting for two years. There are many benefits to this type of alliance. First, it would allow programs to leverage and coordinate their recruiting investments. From our experience with SOARS and RESESS, much of the effort in recruiting involves education about careers in the geosciences. By collaborating to build awareness of the geosciences, all partnering institutions and programs would have access to a larger applicant pool, thus enabling them to select the most qualified applicants for their programs. Second, applicants could be more easily matched with programs fitting their stated research interests. Third, fewer highly qualified applicants would be overlooked and discouraged from approaching a career in geosciences. By focusing alliance activities on attracting students from underrepresented groups who have not considered geoscience careers, we could increase the number of students from underrepresented groups who pursue careers in geoscience fields. Our presentation will describe the initial SOARS/RESESS collaboration, next steps to build the alliance, and invite additional participation in the alliance.

Eriksson was lead on a session at the UNAVCO Science Workshop in March, 2006 which focused on broadening participation in our science. RESESS was discussed.

The UNAVCO polar community submitted two proposals in 2005. RESESS interns were included in both proposals, both with a bit of prodding and encouragement by UNAVCO E&O and by the President. The first is funded and will fund one intern in year 2 and 3 of the engineering project and a second project was funded in mid-2007. We have included this information here as RESESS is becoming known within the geoscience community and we are gaining support for this project, even though it is in its beginning stages.