MARINE SCIENCE TRAINING PROGRAM
FOR ALASKA NATIVE STUDENTS

1. Final Report 1990
   USN/ONR N00014-90-J-3068

   USN/ONR N00014-91-J-1266

KUSKOKWIM CAMPUS
COLLEGE OF RURAL ALASKA
UNIVERSITY OF ALASKA FAIRBANKS

by

Dennis Schall
John Kelley
Vera Alexander

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KUC 91-1
August 1991
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August 1991
ANNUAL PROGRESS REPORT

To: Department of the U.S. Navy
Office of the Chief of Naval Research
Code 1125 AR
800 North Quincy Street, CODE 1512A: SAM
Arlington, Virginia 22217-5000

From: John J. Kelley
Associate Professor and Director PICO
School of Fisheries and Ocean Sciences
University of Alaska Fairbanks
Fairbanks, Alaska 99775

Dennis G. Schall
Kuskokwim Campus
University of Alaska Fairbanks
P.O. Box 368
Bethel, Alaska 99559

Re: Annual Report to Office of Naval Research
on continuing grant contract N00014-91-J-1266 and
Final Technical Report on contract N00014-J-3068

Title: A Marine Sciences Training Program for
Alaska Native Students

Principal Investigators:
Vera Alexander
Professor and Dean
School of Fisheries and Ocean Sciences
SSN 099-26-1788

John J. Kelley
Associate Professor
School of Fisheries and Ocean Sciences
and Director, PICO
SSN 160-26-5059

Dennis G. Schall
Assistant Professor
SSN 505-56-3013
Kuskokwim Campus

Statement A per telecon Dr. Thomas Cuntin
ONR/Code 1125
Arlington, VA 22217-5000

NW 2/24/92
HISTORY OF THE TRANSFER OF THE GRANT TO THE UNIVERSITY OF ALASKA FAIRBANKS KUSKOKWIM CAMPUS STUDENTS

This grant is a continuation of an internship for Alaska Native college students at the University of Alaska Fairbanks to encourage and nurture them in the field of marine sciences. Prior practice had been to provide limited part time laboratory experience and/or summer work experience at one of our marine laboratories - Seward Marine Center or Kasitsna Bay. In 1989 we decided that a more intensive internship with direct faculty involvement would be more effective. During the 1989-90 grant year ($12,750) we were able to support the Ph.D. program of Mr. Richard Glenn on sea ice research (Appendix 1). Mr. Glenn reported directly to Dr. Lewis Shapiro and Dr. W. Weeks of the Geophysical Institute, UAF.

Mr. Glenn's participation in the program continued into the new grant year (7 November 1990, start - October 1991; $60,000). In addition to the continuation of his research at Barrow he was approached by the North Slope Borough Barrow Gas Fields office to assist in the interpretation of the geological and geophysical records for developing under the East Barrow Gas Field or the Walakpa gas prospect.

The Walakpa prospect was chosen as the best candidate for development and recently proved to be the correct choice. Although Mr. Glenn plans to continue his research, he has requested a leave-of-absence from his Ph.D. program during the development state of the Walakpa gas field for which his services are greatly needed. In keeping with the philosophy of our mentorship program, Dr. Shapiro plans to keep at least a minimal research effort going with Mr. Glenn until he can resume full time studies.

Another student partially supported under this mentorship program was Rebecca Reynolds who worked on a comparative biochemistry project (Appendix 2). Her mentor was Dr. Lawrence Duffy. Two publications resulted from this internship (Appendix 2). Ms. Reynolds subsequently decided to embark on a Ph.D program at Stanford University. Dr. Duffy is working with another student, a Yupik Native from the Bethel area, who he wishes to support under this grant during the fall 1991 through 1992; i.e. into the third year of this grant.

Dr. James Sedinger, UAF Associate Professor of Biology, is the mentor for another Alaska Native student Terri Fitka. Terri is from Marshall, a village on the Yukon River. Terri has a cooperative position with the United States Fish and Wildlife Service and UAF. She is a Biology major and is involved in a study of distribution, population dynamics and use of estuarine habitats by black brant, a marine goose of the Pacific Coast. Terri will be returning to UAF in the fall 1991 for her Sophomore year (Appendix 3).

MINORITY SCIENCE IMPROVEMENT PROGRAM (MSIP)

Drs. Kelley and Alexander were informed during the first phase of this program (1989-90; $12,750) that the University of Alaska Fairbanks no longer qualified for minority status under the Department of Education-managed Minority Science Improvement Program (MSIP). Considerable time was expended in maintaining continuity with our students while finding a suitable and qualified institution to transfer the grant while maintaining the management goals.

Through the assistance of the College of Rural Alaska (Dr. Ralph Gabrielli, Associate Dean) we were eventually able to transfer the grant to the Kuskokwim Campus of the University of Alaska Fairbanks. Transfer was contingent upon receipt
of a letter of affirmation of accreditation from the U.S. Department of Education, MSIP Program (Appendix 4). This was obtained November 29, 1989.

A new proposal from the Kuskokwim Campus was submitted to the Office of Naval Research (ONR) in October 1990. Primary investigators were Drs. Vera Alexander and John Kelley, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks (UAF), and Dr. Dennis Schall, Kuskokwim Campus, UAF. A grant from ONR was awarded dated November 7, 1990, to the Kuskokwim Campus with the cognizant principal investigator being D. Schall. Dr. Schall received notice of the award in February 1991 and acknowledged receipt of the grant documents on February 8, 1991.

AMERICAN INDIAN SCIENCE AND ENGINEERING SOCIETY (AISES)

The University of Alaska Fairbanks supports a chapter of the American Indian Science and Engineering Society (AISES). AISES is a highly respected nationwide organization for Native College students interested in science, math, and engineering. We strongly support the objectives of AISES particularly the peer reinforcement of the students desire to stay in school and succeed. We contributed $1000 to support the travel of AISES participants to the National Conference. AISES has been a source of students for our program.

SUPPORT PROGRAMS

The University of Alaska Fairbanks provides several support services and programs specifically designed for Alaska Native students. These programs are designed to recruit, retain, and encourage success for Alaska Native students in higher education.

The Rural Student Services (RSS) at UAF provides orientation activities for prospective Native students from the state's rural high schools. In addition RSS provides the Alaska Native students with assistance in admission to the University, financial aid, housing, and University life. However, their main function is academic advising, personal counseling, peer counseling and referrals to other campus support services.

The Student Support Services Project (SSSP) at UAF provides a wide range of academic and personal support for Alaska Native students. They provide diagnostic math and reading evaluation and a wide range of developmental courses to help insure success in core college courses. In addition SSSP, a federally funded program, provides individual tutoring and group tutoring.

A third program at UAF is the Rural Alaska Honor Institute (RAHI) which takes Alaska Native students that are junior in high school and provides them a six week taste of college life during the summer. The selected Alaska Native students take core curriculum courses in mathematics, writing, a major research paper, Native studies, college orientation, a team research project and swimming. Elective specialty courses are available in the major disciplines (Appendix 5).

These programs enhance and support our philosophy of mentorship for Alaska Native students in marine sciences and goals of this grant.
A MARINE SCIENCES TRAINING PROGRAM FOR ALASKA NATIVE STUDENTS

INTRODUCTION

The University of Alaska proposed to develop and offer a training program in oceanography and related areas for Alaska Native students. Alaska has a very extensive coastline (more than 7500 miles), and is surrounded by a number of distinct oceanic and continental self areas from the Gulf of Alaska through the Bering, Chukchi, and Beaufort Seas. A large proportion of the Alaska Native population lives in coastal villages, and these coastal villages have a strong subsistence and cultural affinity with the sea. While the residents have not had opportunity for formal training related to the marine environment, they have a wealth of pragmatic knowledge. This program has introduced them to areas of science that relate directly to their interests, and can be the vehicle to attract Alaska Native residents into scientific fields.

The University of Alaska Fairbanks' marine sciences instructional program is primarily a graduate program leading to the M.S. or Ph.D. degrees. This program includes training and experience in the disciplines of physics, biology, and chemistry and geology applied to oceanographic topics. There is a very strong tradition in research through the Institute of Marine Science and its companion research institutes, the Geophysical Institute and the Institute of Arctic Biology, as well as the College of Natural Sciences, the College of Rural Alaska, and the School of Engineering. The capability of offering a strong research experience coupled with the instructional program at the University can afford a rich educational and research training opportunity for Native Alaska students.

The University of Alaska Fairbanks is recognized as a leader in meeting the post-secondary educational needs of Alaska Natives. The campus has long recognized the need to provide undergraduate, lower division student with a science experience steeped in instruction research directly related to the subsistence environment in which they live. It is strongly believed that providing lower division students with an opportunity to explore the effects of science upon their daily lives will attract student to careers into oceanic and related sciences and further studies in programs on the University of Alaska Fairbanks campus in Fairbanks. Very few Native students enter scientific fields, and there has only been one Native Ph.D. recipient (in geophysics) at the University of Alaska to date. This program currently supports another Alaska Native Ph.D. student conducting his thesis work on Arctic Ocean life. The Institute of Marine Science produces a major portion of the doctorates at the University of Alaska, and the Kuskokwim Campus will improve the chances for participation of Rural Alaska Native students in a program rich in research experience.

In addition to identifying and recruiting Alaska Native students, we conducted, through this training program, nurturing activities which, through past experience, we have found often makes the difference between success and failure. Although we will continue to provide direct contact in our laboratories between the scientist and student, we will conduct additional supportive activities through other programs as UAF, e.g., the National Science Foundation Polar Ice Coring Office (PICO) programs.
OBJECTIVES

Our goals are to increase the number of Native students who pursue degrees in science, math, or engineering through their association with our research projects in the marine sciences. The marine sciences incorporate all of the primary disciplines (physics, biology, chemistry, geology, and mathematics) in the marine sciences. Role modeling and nurturing of the student interests through project association are important to advancing the student's career.

The University of Alaska Fairbanks operates branch campuses at Bethel, Nome, and Kotzebue, and cooperates with the Higher Education Center at Barrow. These campuses and centers have served as the sites for some of the proposed activities. The Fairbanks campus has used the ocean-going and remote sensing capabilities.

Students at the graduate level will of necessity have much closer contact with their faculty and peer group, nevertheless they will still have a strong identity with other Native students. It is our intention to enlist the aid of our Native students to serve as role models for science oriented students just entering college or at the high school level.

We consider the nurturing activities vital to the success of this program, recognizing the stress inherent in trying to adjust to the urban academic environment. We feel that our program is enhanced by the association between the School of Fisheries and Ocean Science (SFOS) and the Kuskokwim Campus. One of the primary goals of the Kuskokwim Campus is to provide village Native Alaskans with both the social and academic skills needed prior to transition onto the urban campus. Collaboration with other UAF programs will further assist and nurture the student to ease the transition from the rural community. Through UAF native oriented programs on the Fairbanks campus students will be able to have access to the preparatory courses if required, support and social activities through Rural Student Services (RSS).

Our involvement will also include another ingredient: maintenance of contact with the student's community and a formal interface with Alaska Native corporations and governments. We have also participated in a symposium on arctic science for Alaskan Eskimos.

As part of this mentorship program we are proposing to provide the students with a summer training program which will be in close collaboration with the Institute of Marine Sciences and School of Fisheries and Ocean Sciences. This program will be carried out at the SFOS/IMS Kasitsna Bay Laboratory during 1992 if approved by ONR. In addition to formal instruction in the areas of science they will have the opportunity to interact with graduate students, collaborate with each other, and work one-on-one with faculty members. Part of the hands-on experience will include use of UAF's ocean going vessels, remote sensing equipment, and other laboratory facilities at Seward and/or Kasitsma laboratories.

Another objective achieved the past two years has been to involve area high school students in these collaborative sponsored research projects. The local school districts and their science teachers are our main source of students for these programs. One village student spent her second year in a two-week jointly sponsored research field station on the delta. It is this type of foundation that will identify, engage, nurture, and eventually bring Native students into our University programs.
THIS CONTRACT PERIOD

Although this last year efforts can be considered prenatal at best, they do have the full endorsement of the Association of Village Council Presidents (AVCP), the State of Alaska Department of Fish and Game, and the United States Fish and Wildlife Service all of which have supported the campus in its program development. Of interest to the above agencies is the desire to improve upon the concept of cooperative management of the region's marine and terrestrial resources. Cooperative management of the natural resources demands an informed public. Even those involved students who return to their villages without pursuing further education can provide a greater understanding of science by sharing what they have learned with other residents of their towns. This entire effort will be enhanced when the scientists who address the region's people in the future are Native Alaskans.

In pursuit of this goal we propose during this school year that we will select and provide support for two qualified high school students to join Dr. Kelley's spring break cruise to the glacier fiords on the R/V Alpha Helix or to a marine station.

In addition this contract has contributed $1000.00 for student travel to attend the American Indian Science and Engineering Society (AISES). We worked closely with AISES which is a clearing house for science, math, and engineering students as well as U.A.F.'s Rural Student Services (RSS). There are currently 27 members of AISES.

We initiated an experimental 1 week mini-course in marine science (physical oceanography, marine geology, and marine chemistry) at the Institute of Marine Sciences and School of Fisheries and Ocean Sciences Kasitna Bay Laboratories. This was for science teachers (Instructor: Dr. J. Kelley) and provided for interaction between students and teachers, and undergraduates in the marine sciences. We propose an expanded version of this in our future direction for the summer of 1992.

EVALUATION

We desire to follow up on the effectiveness of this program especially to discover ways in how we make modifications and improvements in the program.

We do have a high degree of collegiality among the mentors and students on a continuing basis. However, we wish to follow our students career's, if we can, once they leave the program. Appendix 6 presents a draft questionnaire that we plan to use to assess effectiveness of the program.

Further, in order to track our students, we use an intake form to register our students with a faculty or staff mentor (Appendix 7).

FUTURE DIRECTION

We will continue to actively contribute funds for Alaska Native student members of AISES to participate in the national conference.

We will provide funds for up to five students to participate in a summer practicum in Oceanography at the University of Alaska Kasitna Bay laboratory during the summer of 1992. This summer training would involve a period of formal instruction followed by hands-on experience with research, including work on board an oceanographic vessel. The five students will be provided with a stipend and travel to the laboratory. Travel and two months salary will be provided for instructors, one
of them to be Dr. Schall or a designee and one from the School of Fisheries and Ocean Sciences or designee. Additional funds are required for this project.

Students Progress: Evaluation of students progress will be made by the supervisors of the project(s). Records of student participation will be archived. These students will be tracked on an annual basis by follow-up contact to access their educational and career progress (See also Appendix 8 & 9). During the project year, at the University we plan to follow student progress through an annual report (Appendix 10).

Briefly stated our project field practicum is considered essential to introduce all students to the application of physical, chemical, geological, and ecological principles to oceanographic processes and problems. The IMS/SFOS laboratory at Kasitsna Bay and Seward offers an excellent opportunity for marine laboratory studies, instruction and convenient access to the sea.

We plan to invite graduate students from the University as well as science teachers to participate. A pilot program during the summer 1991 proved to be highly successful, and we plan to suggest expansion of this idea.

1. PROJECTED STUDENT PARTICIPATION

* Professor Duffy requested one student to work in the field of marine biochemistry

* Professor Kelley requested a student to work on a project related to marine engineering

* Professor Sedinger and Schall requested two students (P. Kuzerak and Terri Fitka) to work in the field of marine biology

* Professors Shapiro and Weeks requested continuation of support for a student (R. Glenn) to work on a sea ice project for his Ph. D.

* Dr. Ken Coyle requested an additional student (T. Rogers) to work on an invertebrate marine biology project and to participate in NOAA undersea vehicle cruises to Chukchi and Bering Sea.

* During the Spring break at UAF we wish to offer an opportunity for two Native high school students who have a recognized proficiency in the sciences as determined by their teachers to participate in a cruise to a tide water glacier fiord aboard the R/V Alpha Helix. Dr. Kelley has traditionally made one or two berth available for outreach to the high school community.

2. AMERICAN INDIAN SCIENCE AND ENGINEERING SOCIETY (AISES)

We plan to increase our involvement with the American Indian Science and Engineering Society (AISES) which is an excellent clearing house and peer group organization of Native college students with majors in science, math, and engineering. This year (calendar 1991-92) we intend to contribute $2000 toward participation of the students at the AISES national meeting.
3. SYMPOSIUM ON ARCTIC SCIENCE EDUCATION FOR ALASKA ESKIMOS: YUPIIT KANGINGNAURUTAIT

Dr. Lawrence Duffy participated in the "Arctic Science Education for Alaska Eskimos Symposium." This symposium was held at Kuskokwim College in Bethel, Alaska, on 8-10 August 1991. Dr. Duffy participated in discussions about encouraging Yup'iks to enter science careers and to use the knowledge and experience of local village elders. On Saturday, 10 August, Dr. Duffy made a presentation about the research and education program at Kasitsna Bay (supported by NSF and ONR). It should be noted that the meeting was attended mainly by wildlife field biologists and Dr. Duffy was the only representative for marine science and laboratory science.

Several participants told of their educational experience and strongly recommended:

a. Financial Aid – Village students have less access to currency than more traditional middle class students.

b. Mentorship Programs – These programs fit better with the traditional training experienced by the hunting/gathering lifestyle of Alaskan Eskimos.

c. More University scientists to visit rural Alaska and talk with students about science careers.

4. EQUIPMENT

We have had to barrow equipment from several sources (e.g., Seward Marine Station) to take to outlying field station to provide training for our students. There is an urgent need to acquire a small portable CTD (e.g., SEABIRD) and lightweight sampling equipment (e.g., grabs water sampling bottles). We estimate that the cost for acquisition to be approximately:

1. CTD with software, lightweight computer and printer $15,000
2. Grabs 2,000
3. Bottles 3,000
4. Nets 2,500
5. General at-sea support equipment & supplies 2,500
6. Biochemical analytical equipment - chromatography 10,000

$35,000

This will require no-cost modification to our present grant. This may or may not be approved and must be discussed with our ONR project manager.

5. PRACTICUM IN ARCTIC OCEANOGRAPHY

During the summer 1992 we would like to take up to five students to Barrow for one week to obtain practical experience in working on ice covered seas. We have made preliminary discussions with members of the North Slope Borough (Dept.
of Wildlife Conservation and the Arctic Sivunmun Lisagvik College (Barrow) and they are not only agreeable to this project, but willing to help with lodging and some logistic support on a not-to-interfere lease.

We plan to coordinate this project as an extension of the field course at Kasitsna Bay.

6. SUMMARY OF COSTS PROJECTED FOR FUTURE ACTION OR GRANT MODIFICATION

Estimated Cost:

<table>
<thead>
<tr>
<th>6.1 Equipment</th>
<th>35,000 (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2 Summer Practicum at Kasitsna Bay</td>
<td></td>
</tr>
<tr>
<td>* Faculty Salaries (2)</td>
<td>12,000</td>
</tr>
<tr>
<td>* Faculty Travel to Kasitsna Bay</td>
<td>2,000</td>
</tr>
<tr>
<td>* Students Travel (5)</td>
<td>3,000</td>
</tr>
<tr>
<td>* Student Stipend</td>
<td>-0- (2)</td>
</tr>
<tr>
<td>* Food Costs</td>
<td>3,000 (3)</td>
</tr>
<tr>
<td>* Laboratory Day Charges</td>
<td>$7,500 @ $250/day for one month</td>
</tr>
<tr>
<td>Total</td>
<td>$27,500</td>
</tr>
</tbody>
</table>

| 6.3 Summer field experience at Barrow - one week | |
| * Faculty Salaries (2) | -0- (4) |
| * Faculty Travel (2) | $1,200 |
| * Faculty Lodging/Per Diem @ 5 nights | 1,200 |
| * Students Travel (5) | 3,000 |
| * Students Lodging/Food | 2,500 |
| * Shipping (equipment) | 500 |
| * Local Rental of Boats | $2,000 |
| Total | $10,500 |

| 6.4 Spring Break Training on R/V Alpha Helix | |
| * Transportation for students (2) | $2,000 |
| * Per Diem | 200 |
| Total | $2,200 |

(1) Can be reprogrammed in calendar 1990/91 grant if approved
(2) No cost - Students are already on stipend
(3) Faculty/students must provide/cook food
(4) Salaries accounted for in section 6.2
APPENDIX 1

MEMORANDUM

L. Shapiro and R. Glenn

to J. Kelley
MEMORANDUM

To: J. Kelley

From: L. Shapiro - Mentor
R. Glenn - Student

Date: October 1, 1990

Subject: Report on Richard Glenn's activities and request for additional funding for the current year.

Project Title: Measurement and Simulation of the Profile Properties of Undeformed First-Year Sea Ice; Supported by the National Science Foundation.

Principal Investigator: W.W. Weeks
Co-Principal Investigator: L. H. Shapiro
Student Trainee: Richard Glenn; PhD student in Geophysics

Project Description:

The mechanical properties of first year sea ice are known to be highly variable in both space and time, and the variations are large enough that they must be incorporated into any treatment of the properties of sea ice sheets. The purpose of this project is to test and extend a model which predicts the composite properties of ice sheets from the meteorological parameters that determined the growth history of the ice. The project combines field and laboratory work to monitor the thickness and composition of first year ice sheets which begin to form at different times of the year (and thus have different histories) near Barrow, Alaska. Structural and mechanical parameters are then measured on samples collected from ice with different histories and the results are used to test and modify the theoretical model.

Student Activities:

Richard was at Barrow for the entire ice year (September, 1989 to July, 1990). He did the sampling and participated in all of the laboratory work and data analysis. In addition, he made general observations of processes involved in the initial formation, growth, deformation and decay of the ice sheet.

Richard did the following with the funds from JK:

1. Lectured for two weeks on Geology and Sea ice to a Barro H.S. science class and took the students on a field trip.

2. Spoke on opportunities and Arctic science during "career day" at Barrow H.S.

3. Lectured to elementary school 5th grade classes once.

4. Worked with H.S. vice-Principal and a Special Asst. to the Mayor of the North Slope Borough to organize a conference on science education in the Arctic called "developing strategies for increasing science awareness in the Arctic." Conference was funded by the NSB school district, UAF, plus contributions from other local organizations. There were about 200 attendees including representatives from UAF, State of Alaska, NSF, and other educational organizations from as far away as New York state. Richard gave an invited presentation at the conference and chaired a panel.
5. Gave several informal field trips and tours of the research project to local citizens and students.

6. Was on the radio twice on interview programs regarding science education.

How was money used? -- the funds provided part of Richards assistantship while at Barrow.

Future plans

The field phase of the project to continue for one additional year, and Richard's degree program will probably be completed about a year later. Richard will remain in Fairbanks taking courses for the current (Fall, '90) semester, and then return to Barrow for the Spring to do additional field work. In addition to his own studies while in Fairbanks, Richard serves as a volunteer tutor for Rural Student Services. On his return to Barrow he will renew his involvement with the school system and other activities there. In addition, if time and other commitments permit, he will visit schools in other North Slope villages to lecture, etc.

Funding Request:

$5K for salary plus additional funds for travel to other North Slope villages to make presentations to students.
APPENDIX 2

COMPARATIVE BIOCHEMISTRY OF
AMYLOID AND AMYLOID PRECURSOR PROTEIN

Lawrence K. Duffy, Mentor
Rebecca Reynolds, Student
Comparative Biochemistry of Amyloid and Amyloid Precursor Protein

Lawrence K. Duffy, Associate Professor of Chemistry and Biochemistry - Mentor
Rebecca Reynolds - Student

We are currently studying the formation of brain amyloid by developing peptide models and observing their physical properties. The amyloid model we chose is one that appears to be associated with aging. In this case, the amyloid precursor protein is a membrane protein whose processing leads to small amyloidogenic peptides which tend to form fibrils. At present, we have a very shallow understanding of why some peptides form beta-sheets and aggregate into amorphous forms while others form fibrils. We are now synthesizing peptide analogues and characterizing them. The effect of different amino acid substitutions on the structure of amyloid as mimicked by these analogues is monitored by fluorescence spectroscopy and X-ray diffraction. Binding and toxicity assays of the peptide analogues are also being performed and we are isolating amyloid peptides from aging salmon brains.

The student will synthesize peptides, characterize and initiate CD spectroscopy studies of the amyloid peptides. The student will also study the effect of metals and other proteins on the peptide's conformation. CD spectroscopy will help us gather a different type of data and enable us to study the effects of pH, salts and temperature. These studies are on the cutting edge of protein biochemistry and the results will be used in understanding protein structure and behavior in general and the relevant forces in protein folding and stabilization. Also the effect on amino acid substitutions on the ability of these peptides to form beta-sheets in aqueous solutions will be monitored using the spectropolarimeter. Preliminary CD studies by others have indicated a possible conformational transition based on peptide length. These studies need to be confirmed and expanded.

Rebecca Reynolds worked closely with technical staff and Dr. Duffy in learning the use of the HPLC and amino acid analyzer. This intensive research experience led her to a career decision to enter an M.D./Ph.D. program at Stanford University. Her work resulted in two publications related to her learning the use of HPLC and amino acid analyzer related protein analyses.

Publications:


APPENDIX 3

REPORT ON OFFICE OF NAVAL RESEARCH GRANT TO INVOLVE ALASKA NATIVE STUDENTS IN MARINE RESEARCH PROJECTS

James S. Sedinger
Report on Office of Naval Research Grant to Involve Alaska Native Students in Marine Research Projects

James S. Sedinger

I had one student involved in my field research on the Bering Sea coast of the Yukon-Kuskokwim Delta. The student, Terri Fitka, is from Marshall, a village on the Yukon River. The student was originally interviewed in Fairbanks and offered a student position through the University of Alaska. She was subsequently offered a cooperative education position with the United States Fish and Wildlife Service. Because the latter position comes with a high probability of receiving a permanent position I encouraged Terri to accept it, which she did. I arranged for Terri to be assigned to the Yukon-Delta National Wildlife Refuge and she was able to work with us in the field from late June through late July. She was absent from the field site for several days during early August owing to a death in her family.

Terri is a Biology major. She assisted us with a study of distribution, population dynamics and use of estuarine habitats by black brant, a marine goose of the Pacific Coast. Her duties included monitoring habitat use, noting the presence of marked individuals and applying individually recognizable tags to brant. Terri will be returning to UAF in fall 1991 for her Sophomore year.
APPENDIX 4

CURRENT MSIP ACCREDITATION LIST
November 13, 1989

Dr. Gerald V. Shnatt
Dean
College of Fair. Alaska
University of Alaska Fairbanks
PO Box 7560
Fairbanks, AK 99775-0560

Dear Dr. Shnatt:

We have received a letter dated November 13, 1989 from Robert E. Bowlin, Associate Director, Commission on Colleges, Northwest Association of Schools and Colleges attesting to the full and satisfactory accreditation status of the Chukchi, Kuskokwim and Northwest campuses of the University of Alaska Fairbanks.

We are therefore pleased to advise you that as the result of the receipt of this affirmation of accreditation, the Chukchi, Kuskokwim and Northwest campuses of the University of Alaska Fairbanks are eligible to apply for and receive MSIP awards, provided, of course, that the accreditation status remains satisfactory and the institutional underrepresented minority student enrollment continues to exceed 50 percent of the total student body.

Thank you for your interest in MSIP.

Sincerely,

John R. Bonas
Program Officer
 Minority Science Improvement Program

cc: Dr. Angelia Velez-Rodriguez
MINORITY SCIENCE IMPROVEMENT PROGRAM (MSIP)

LISTING OF MINORITY COLLEGES AND UNIVERSITIES

MAY, 1990

For information, contact:
Dr. Argelia Velez-Rodriguez, or
Dr. John E. Bonas
Minority Science Improvement Program
U.S. Department of Education
Division of Higher Education Incentive Programs
400 Maryland Ave., S.W.
Washington, D.C. 20202-5251
Telephone (202) 708-9407

4662
PREFACE

The accompanying Listing of Minority Colleges and Universities is a compilation of American accredited colleges and universities that are defined as "minority" according to criteria set forth in the Fiscal Year 1990 Announcement and guidelines for the Minority Science Improvement Program (MSIP). (See the Higher Education Act as amended, Title X, Part B, Subpart 1; 34 CFR Parts 637 and 735, 1981.)

The Listing is derived from ED directories and publications that contain information on all U.S. colleges and institutions. However, much of the data in this Listing has been updated and, in some cases, corrected.

The Listing is updated periodically by MSIP staff as more accurate information becomes available. Therefore, it is used internally as a guide to minority institutions and not as an authoritative directory. It is not an official ED directory of minority institutions. Users are cautioned to use the Listing with these limitations in mind.

DEFINITIONS

* Accredited means currently certified by a Federally recognized accrediting agency or making progress toward achieving accreditation.

* Minority means American Indian, Alaskan Native, Black (not of Hispanic origin), Hispanic (including persons of Mexican, Puerto Rican, Cuban, and Central or South American origin), Pacific Islander or other ethnic group underrepresented in science and engineering. It is generally understood that these minority persons are United States citizens.

* Minority institution means an accredited college or university whose enrollment of a single minority group or a combination of minority groups as defined here exceeds fifty percent of the total enrollment.

* Ethn means: AI = American Indian/Alaskan Native
  CO = Combination of minorities
  HB = Historically Black (recognized by ED as established prior to 1964)
  HM = Hispanic/Mexican
  PB = Predominantly Black
  PI = Pacific Islanders/Asian
  PR = Puerto Rican

A. Velez-Rodriguez
J.E. Bonas
May, 1990
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<th>STATE INSTITUTION</th>
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<td>PUB</td>
<td>501 LINCOLN STREET</td>
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<td>98335</td>
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<td>PUB</td>
<td>600 WASHINGTON RD.</td>
<td>FAIRBANKS</td>
<td>95701</td>
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<td>658 ELECTRICAL RD.</td>
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<td>650 BOX 285</td>
<td>MONTGOMERY</td>
<td>36195</td>
<td>(205)393-4205</td>
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<td>ALABAMA STATE UNIVERSITY</td>
<td>PUB</td>
<td>914 STANTON STREET</td>
<td>MOBILE</td>
<td>36617</td>
<td>(205)479-3274</td>
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<td>CONCORD COLEGE</td>
<td>PUB</td>
<td>1004 GREEN STREET</td>
<td>SELMA</td>
<td>36701</td>
<td>(205)872-3053</td>
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<td>HOMESTEAD COLLEGE</td>
<td>PUB</td>
<td>3400 MARTIN L. KING, JR.</td>
<td>TUSCALOOSA</td>
<td>35401</td>
<td>(205)752-7880</td>
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<td>PUB</td>
<td>3060 WILSON RD., S.W.</td>
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<td>35221</td>
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<td>PUB</td>
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<td>GREENVILLE</td>
<td>36037</td>
<td>(910)382-4606</td>
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<td>NILES COLLEGE</td>
<td>PUB</td>
<td>800 BOX 8300</td>
<td>BIRMINGHAM</td>
<td>35208</td>
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<td>PUB</td>
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<td>PUB</td>
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<td>LITTLE ROCK COLLEGE</td>
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<td>1600 1ST ST.</td>
<td>LITTLE ROCK</td>
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<td>SHORTER COLLEGE</td>
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<td>604 LOCUST ST.</td>
<td>LITTLE ROCK</td>
<td>72202</td>
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<tr>
<td>UNIVERSITY OF ARKANSAS, PINE BLUFF</td>
<td>PUB</td>
<td>2500 1ST ST.</td>
<td>PINE BLUFF</td>
<td>71001</td>
<td>(501)351-6500</td>
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<tr>
<td>AMERICAN SAMOA COMMUNITY COLLEGE</td>
<td>PUB</td>
<td>2030 W. 2600</td>
<td>PAGO PAGO</td>
<td>96799</td>
<td>(681)688-9156</td>
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<tr>
<td>AMERICAN INDIAN BIBLE COLLEGE</td>
<td>PUB</td>
<td>10028 N. 15TH AVE.</td>
<td>PHOENIX</td>
<td>85021</td>
<td>(602)844-4385</td>
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<td>MISAU COMMUNITY COLLEGE</td>
<td>PUB</td>
<td>1125 S. 15TH AVE.</td>
<td>TUSAIE</td>
<td>86550</td>
<td>(602)310-3237</td>
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<td>SOUTH MOUNTAIN COMMUNITY COLLEGE</td>
<td>PUB</td>
<td>7050 S. 24TH ST.</td>
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<td>85040</td>
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<td>LA STATE UNIV., DOMINGUEZ</td>
<td>PUB</td>
<td>1000 N. 15TH AVE.</td>
<td>CARSON</td>
<td>90747</td>
<td>(213)518-3310</td>
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<tr>
<td>LA STATE UNIV., LOS ANGELES</td>
<td>PUB</td>
<td>1501 W. 15TH AVE.</td>
<td>CARSON</td>
<td>90747</td>
<td>(213)518-3310</td>
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<tr>
<td>BISHOP HS TECHNICAL INSTITUTE</td>
<td>PUB</td>
<td>1151 S. 15TH AVE.</td>
<td>ROSEMEAD</td>
<td>91770</td>
<td>(213)293-0411</td>
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<tr>
<td>EAST LOS ANGELES COLLEGE</td>
<td>PUB</td>
<td>1300 BROADWAY AVE.</td>
<td>MONTEREY PARK</td>
<td>91754</td>
<td>(213)265-8650</td>
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<td>IMPERIAL VALLEY COLLEGE</td>
<td>PUB</td>
<td>2000 W. 15TH AVE.</td>
<td>IMPERIAL</td>
<td>92251</td>
<td>(619)352-8320</td>
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<td>LOS ANGELES MISSION COLLEGE</td>
<td>PUB</td>
<td>201 S. 15TH AVE.</td>
<td>SAN FERNANDO</td>
<td>90404</td>
<td>(213)346-8271</td>
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<td>LOS ANGELES SOUTHWEST COLLEGE</td>
<td>PUB</td>
<td>400 W. 15TH AVE.</td>
<td>LOS ANGELES</td>
<td>90047</td>
<td>(213)777-2225</td>
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<tr>
<td>LOS ANGELES TRADE-TECH COLLEGE</td>
<td>PUB</td>
<td>400 W. 15TH AVE.</td>
<td>LOS ANGELES</td>
<td>90015</td>
<td>(213)749-8800</td>
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<tr>
<td>SERRIT COLLEGE</td>
<td>PUB</td>
<td>2500 CAMPUS DRIVE</td>
<td>OAKLAND</td>
<td>94619</td>
<td>(415)351-4911</td>
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<tr>
<td>NATIONAL HISPANIC UNIVERSITY</td>
<td>PUB</td>
<td>255 S. 14TH AVE.</td>
<td>OAKLAND</td>
<td>94606</td>
<td>(415)351-0511</td>
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</table>
APPENDIX 5

BROCHURES, ETC.
The University of Alaska Fairbanks is the home of about 5000 students each semester including over 400 Native students. The University Housing program offers students a choice of living situations to meet the diverse needs of both single students and students with families. Residence hall students are served meals in a large dining room, cafeteria style. An extensive support staff guides activities, provides counseling and works hard to make your UAF experience meaningful.

For More Information Contact:

Budie Headnixson, Administrative Assistant
Rural Student Services
University of Alaska Fairbanks
W1 Chaa-dal Hall South
Fairbanks, Alaska 99775-1490

Timeline for Applications and Attendance - UAF

SEPTEMBER
- Apply for admission
- Apply for housing
- Submit transcript
- Submit護in the Clear
- Financial Aid application and 1040

OCTOBER
- Housing application
- Conditional Acceptance
- Apply for Work Study

FEBRUARY
- Apply for Boarding
- Choose your room

MAY
- Graduation

JUNE
- Summer job to earn $ to pay for tuition

JULY
- Financial Aid approved

AUGUST
- Income Financial Aid
- Come to UAF Early Orientation

SEPTEMBER
- Study At UAF!!!
Help With Going to College

Rural Student Services provides assistance to new students by helping with the necessary forms and paperwork needed to attend the University.

RSS assists students with information and trouble shooting problems with:
- Admission to the University
- Financial Aid
- Housing
- University Life

Rural Student Services also invites high school groups to visit our campus and participate in the following orientation activities:
- College expectations
- Campus tour
- Q&A session

"In the village, one learns one version of how and what makes the world. Higher education changes how you see your world, and learn about a new one. It (higher ed) also allows one to learn more about himself and how the world outside the village functions."

Grant Kashatok

"In May 1990 I received my bachelor's degree. For years I have dreamed of this day. It's a real tribute to my parents. My parents have always walked in two worlds. Education has been a strong value as has our culture. They're both important."

Agnes Sweetsir
Galena, AK.

Support Services

Students experience many academic and social changes as they go through college. Rural Student Services will assist you in making the transition to University life. RSS advisors provide personal counseling as well as making referrals to other campus support services.

Peer Counseling

Provided by RSS student counselors to help fellow students with questions and problems.

Rural Student Services (RSS) originally began as a program called Student Orientation Services in 1969. Rural Student Services has become an integral part of UAF student services, particularly on behalf of Native college students. As increasing numbers of Native students graduate from village high schools, the pressure for UAF to meet its mission of opening higher education opportunities for
How do you qualify:

You must:

1. be a full-time undergraduate student and a citizen of the U.S.

2. belong to one of these groups
   a. first generation college status (i.e., neither parent has a 4 year baccalaureate degree)
   b. physically handicapped (verification is required)
   c. financially disadvantaged (income not exceeding 150% of poverty level)

Joining the program

is a simple process. If you meet the eligibility requirements, please stop by 1508 Grunblad Building to fill out an application and schedule an intake interview, or call (907) 474-6887 for more information.

The Student Support Services Project is funded by the United States Department of Education and strives to improve both student retention and student success rate.
appropriate way to achieve your goals and make the most of your opportunities at college.

SSSP is a program to help students at UAF improve their skills and ensure a successful college experience.

The project is unique and specially designed to meet the needs of Alaska Native students. The courses are developed and taught by instructors with extensive cross-cultural experience. Many of the tutors are former SSSP members.

The project networks closely with other Alaska Native programs and related educational activities which promote success for Alaska Native students in college-level studies.

Courses
- Advocate and Personal Support
- Handicapped Student Services

Testing
This provided to aid in advising course placement and to determine your individual needs so we can help you in the best possible way.

Advocacy and Personal Support
Is provided to help you cope with challenges and better understand your ongoing needs and how to respond to them. Initial interviewing, assessment, selection, and placement within the program is done to make sure your needs are being addressed. Individualized progress monitoring, referral to other campus or community resources and educational assistance focusing on cross-cultural needs are provided to help you adjust to complicated college life.

Handicapped Student Services
Include trained tutors, note-taker coordination, testing accommodations, referrals, and advocacy.
What do RAHI graduates say?

"You get to meet a lot of new friends and learn so much in such a short period of time. You really do have a chance to challenge yourself, and if you're looking for a challenge, RAHI is the definite place for you."

"RAHI is a college prep program that gives you a taste of college and an inventory of things you need to learn before college."

"Exciting, fun, gives you motivation!"

RAHI means wonderful new friends from all over Alaska and even from other countries of the circumpolar north.

"You'll meet a lot of new friends and probably won't forget them. You'll learn how to swim, like I did. You'll get prepared for college and what college life is like."

"It is the best!"

"You can deal with the feeling being away from home. You get a taste of college work and lifestyle."

"It was a great learning experience."

RAHI was founded at the request of Alaskan Native leadership who support and participate in the program. AFN president Julie Kuka congratulates Douglas Kwanak at the 1990 RAHI graduation.

Any other questions?

For more information call or write Jim Kowalsky, director, or Denise Wattrus (“Wateeze”), RAHI secretary:

Rural Alaska Honors Institute
So7 Gruening Building
University of Alaska Fairbanks
Fairbanks, AK 99775
PHONE: 907-474-6886
FAX: 907-474-5624
UACN VAX ID: FYRAHI

RAHI math students work on problem solving and develop an appreciation for the richness of math.

The University of Alaska Fairbanks is an affirmative action/equal opportunities employer and educational institution.

Challenge Yourself!
your life, your family's lives, or in the lives of Alaska's Native people?

If any answers are "yes," CHALLENGE YOURSELF! Think about RAHI!

RAHI? What is it?

It's the Rural Alaska Honors Institute and we call it "RAHI."

It's for Alaska's best and brightest Alaska Native students who have spent all or most of their lives living and attending school in rural Alaskan communities. Students should have at least an overall 3.0 GPA and be juniors ready to become seniors to qualify. RAHI 1991 will also accept a limited number of graduates seniors. At RAHI they'll get their first taste of college life.

RAHI students build a future of mutual trust and support that will last a lifetime.

RAHI is challenging, but it's also a lot of fun. You'll meet and make wonderful new friends that may last a lifetime. There are opportunities for outdoor recreational field trips, dances, and eating Native foods. Students receive individual help by a supportive staff in everything from personal counseling to mathematics homework.

Who you meet and what you learn at RAHI will be valuable throughout your personal and academic career and beyond. Students feel strongly about their RAHI experience. Many say it will stay with them forever. Probably the toughest day is the last day when students say goodbye to their new friends.

How much does RAHI cost?

Each Alaska student selected will receive a full scholarship to attend RAHI covering all travel, room, board, tuition, supplies, and student fees.

How do students apply?

Applications are available from your school counselor or principal, village or regional Native corporation, Native village council or RAHI. Complete and send us your application, ask your school to send the necessary recommendation, transcripts and standardized test scores, and ask a community resident to send their recommendation all by March 1, 1991.

Spaces are limited and acceptance to RAHI is competitive, so apply early. We'll let you know in early April whether or not you are accepted by the special RAHI Admissions Committee.

RAHI, for students who will be between their junior and senior years in high school during the summer of 1991, will be held from June 10 to July 26, 1991. For graduated seniors the dates of the special RAHI session are June 10 to July 26, 1991.

What happens after RAHI?

You'll return home to finish high school (or you'll enroll at the University of Alaska Fairbanks) with an evaluation of your college readiness, recommendations for your senior year course work, and a plan for applying to college. RAHI will stay in contact with you to help with your college plans.

Students who graduate from RAHI have honors and enroll at the University of Alaska Fairbanks may be eligible for special financial awards. RAHI students may apply for early admission to the University of Alaska, allowing them a better selection of residence hall choices.

Later on, RAHI students enrolled in UAF academic degree programs may qualify for paid summer internships with co-sponsoring Native corporations.
APPENDIX 6

PROGRAM EVALUATION FORM
One of the goals of this program is to improve the recruitment and retention of promising science students in Alaska in the marine sciences. With this goal in mind, we hope that the participants will develop a collegial relationship with their cooperating faculty members. Such a relationship must provide mutual benefit to both the scientists and the participants. Please answer the following questions in light of this goal.

1. What advantages have you gained through your participation in this program?

2. Please suggest areas of this program which require improvement.

3. Do you anticipate continued interaction with the marine sciences faculty and staff in the future?

4. Do you plan to consider a career in the marine sciences or science teaching in the future?

5. Other comments:
APPENDIX 7

MARINE SCIENCE TRAINING PROGRAM
FOR ALASKA NATIVE STUDENTS
CHARGE AUTHORIZATION
TO WHOM IT MAY CONCERN:

Stipend charges during the period _______________ through _______________ are authorized for ____________________________________________________________________.
SS# _______________. Charges for the entire period are not to exceed $____________ without prior consent.

______________________________________________, as supervisor of this student, is further authorized to charge materials and supplies as necessary for the project. These charges are not to exceed $500 without prior consent.

Tuition waiver for the student is/is not available. If available, a proper request must be made to the UAF through the business office.

__________________________________________
Principal/Co-Principal Investigator
APPENDIX 8

INDIVIDUAL STUDENT COMMENT SHEET
* Your answers to the following questions will be used by the mentor to improve this program. Please be as thoughtful and constructive as possible in your comments.

* You are NOT required to answer any of these questions.

**I. What aspects of this program do you feel were especially good?**


**II. What changes could be made to improve the program?**


**III. Please use the back of this sheet for any additional comments or special questions. Thank you for your participation!**
APPENDIX 9

PARTICIPANT ALUMNI RECORD
PARTICIPANT ALUMNI RECORD

The purpose of this questionnaire is to follow the Marine Sciences Training Program participant's career.

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<th>(Middle)</th>
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NOTE: A student between the junior and senior year is classified as a senior.

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<th>(Middle)</th>
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<th>SEMINARS, PROJECTS, OR PUBLICATIONS PARTICIPATED IN BY STUDENT:</th>
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36
APPENDIX 10

MARINE SCIENCE TRAINING PROGRAM
FOR ALASKA NATIVE STUDENTS
ANNUAL STUDENT PROGRESS REPORT FORM
MARINE SCIENCE TRAINING PROGRAM
FOR ALASKA NATIVE STUDENTS

ANNUAL STUDENT PROGRESS REPORT

DATE: ____________________________
GRANT NO.: ____________________________
FUND NO.: ____________________________

STUDENT NAME: ____________________________
FACULTY ADVISOR: ____________________________
INSTITUTION: ____________________________

DESCRIPTION OF RESEARCH ACTIVITY:
Please attach any photographs/slides or reprints of your reports/papers resulting in whole or in part from the student’s participation in your research.

TITLE(S) OF REPORT(S) OR PAPER(S) RESULTING FROM THIS ACTIVITY: