Program Review Report
For
MS in Statistics
2005-06

Contents

Preamble

This report summarizes the strengths, weaknesses, needs and significant changes in the MS program in Statistics. In addition, we summarize our outcomes assessment process and results.

Strengths

The MS program in Statistics typically enrolls four to six students per year (Appendix 5), has reasonable enrollment in graduate courses (Appendix 8; because students from other programs enroll), graduates one to five students per year (Appendix 7), and is part of a program with good student credit hour production (Appendix 6). We view the following as program strengths:

1. Our graduates find jobs, many with the State of Alaska, or successfully go on to complete their PhD at well respected statistics programs (see Appendix 1).

2. The program has continuing RA support from UAF's Planning, Analysis, and Institutional Research and from Scott Rupp in Forest Science. As a result of this support we typically have three students on RAs and two on TAs. This arrangement helps keep the cost of our program low and students well supported. RA positions typically fund students during the summer session.

3. Student projects must be written in a scientific journal format. This recently implemented requirement has resulted in one student publishing a paper and another submitted. Both papers were coauthored with faculty members. It is very uncommon for MS students in statistics to publish papers so we view our recent success as a good indication of project quality.

4. The MS program requires four core courses and a selection of electives. Many of the elective courses commonly have a majority of non statistics graduate students enrolled. This is the case, for example, in categorical statistics, spatial statistics, time series, and experimental design. Thus, the statistics graduate program is relatively inexpensive in terms of required courses only utilized by our majors. Furthermore, other programs, notably fisheries and petroleum engineering, have some of their students take statistics graduate core courses. Thus, enrollments are generally good in all our graduate courses (see Appendix 8).

Weaknesses

The primary weakness in the MS program during the past five years has been insufficient elective courses for our students. This has occurred because of two reasons

1. During the past five years we have had one retirement and two faculty members left to take positions elsewhere. With only four statistics positions this is very high turn over. As a result we have had open positions during several search years. We have an additional faculty member joining the department in January 2006 and currently have a search on going to fill the fourth position. When all the positions are full we should be able to offer a good collection of electives again.

2. The following changes in teaching by other units impacted elective course options for students in the Statistics MS program:

> a. Faculty in Economics used to teach a section of STAT 200 but no longer do so. Their covering of a section of STAT 200 freed statistics faculty to offer an additional elective course.

> b. Many of our students are interested in becoming Biometricians. Therefore, they commonly take graduate Wildlife courses. With the departure of faculty members Terry Bowyer and Eric Rexstad from Biology and Wildlife, two courses that our students have taken as electives in the past, WLF 695 , Animal Abundance Estimation, and WLF 621, Vertebrate Population Dynamics, have not been offered recently. WLF 621 has been proposed for deletion. WLF 695 may be taught by a new hire but it may be another year before that occurs according to recent correspondence with Biology and Wildlife (Mark Lindberg). WLF 625, Analysis of Vertebrate Population Survival and Movement, will continue to be taught alternate years and our students are likely to continue to take this course as an elective.

Needs

We need to recruit and retain well qualified statistics faculty.

An organized sustained student recruiting effort is needed. Students hear of the statistics MS program by word of mouth or find it on the web. This program has the capacity for additional students. Thus, we should grow this program. There are two limiting factors for growth in student numbers; 1) space for graduate students and 2) research or teaching assistantships. We have had great success in finding RA funding for previous students, sometimes we did not have enough students to fill every RA request, so we are reasonably confident to continue to do so. However, the department's requests for additional space have been unanswered (see Appendix 4).

A good collection of elective courses should be offered regularly so that students do not have to go hunting for courses to fill a full time course load. One clear need is a course in Bayesian statistics. We should be able to do this when the four statistics faculty positions are full.

Recent Significant Changes

The 2003 outcomes assessment report (Appendix 3) made the following three recommendations:
1) Meet with incoming graduate students early in their first semester and arrange for them to make up for their deficiencies as quickly as possible. We have been implementing this recommendation.
2) Insist that projects be approved by the statistics faculty before they are given to employers. We have informed all new students of this requirement and added this to our web page.
3) Advise students that they should have their projects done by the end of their fourth semester and use the graduate seminar to properly pace the student's research. Students have been advised to complete their projects during four semesters but have not complied, e.g., one finished her project this summer. Each student has given a mid-project talk and a final project talk. Not all students have given the project proposal talk and we should improve consistency in our requirement here.

MS statistics students typically complete a project rather than a thesis. The 2005 outcomes assessment process, which includes a review of student projects, indicated significant variation in the quality of written projects. In addition, we wanted students to become familiar with research writing in a more organized fashion. As a result of these concerns we began requiring that student projects be written in topic specific journal format effective fall 2005.

To better balance course loads among semesters we changed the offering frequency of STAT 611, Time Series, from alternate fall to alternate spring; effective fall 2004.

Because only Biology and Wildlife faculty members had taught, STAT 680, Data Analysis in Biology, which was cross listed with BIO 680 and WLF 680, we dropped STAT 680 after discussion with the Biology and Wildlife faculty; effective fall 2004.

Because of relatively low local demand and the retirement of the faculty member that developed the course, we changed the frequency of offering for STAT 661, Sampling Theory, from alternate spring to as demand warrants; effective spring 2003. We did not eliminate this course because UAF Fisheries faculty members located in Juneau offer this course.

The prerequisites for STAT 653, Statistical Theory III, were changed from STAT 651 & 652 to STAT 651 or 401 and MATH 200-202 and MATH 314; effective spring 2004. Experience teaching these courses prompted us to ensure proper mathematics preparation. In addition, because of the sequence of course offerings, these changes allow students entering the program at different times to enroll in the same course.

The frequency of offering for STAT 651, Statistical Theory, was changed from alternate fall to each fall; effective fall 2003. This changed allowed students entering the program in "off" years to begin the program and take subsequent courses.

The frequency of offering for STAT 621, Distribution-free Statistics, was changed from as demand warrants to alternate spring because of continuing demand for this course; effective fall 1999.

The frequency of offering for STAT 611, Time Series, was changed from as demand warrants to alternate fall because of continuing demand for this course; effective fall 1999.

The frequency of offering for STAT 605, Spatial Statistics, was changed from as demand warrants to alternate spring because of continuing demand for this course; effective fall 1999.

The frequency of offering for STAT 654, Statistical Consulting Seminar, was changed from spring to alternate spring because of less demand than anticipated and it the revised schedule meets the needs of our MS students; effective fall 1999.

Outcomes Assessment Summary

Appendix 3 provides the 2005 outcomes assessment summary and Appendix 4 provides the 2003 outcomes assessment summary. These appendices indicate the information collected, conclusions drawn from that information and curricular changes made in response to the conclusions. We are generally doing a good job of implementing and using the outcomes assessment process as intended in this program.

Appendix 1 – List of MS Statistics Graduates by Year

<u>1998</u>
- Bob Sutherland works as a Biometrician for the Alaska Department of Fish and Game in Anchorage, AK
- Brian Taras, works as a Biometrician for the Alaska Department of Fish and Game in Fairbanks, AK
- Pam McNeley, unknown
- Alex Prichard is employed as a Biometrician at Alaska Biological Research in Fairbanks, AK
- Gordon Bower worked at the Geophysical Institute, UAF and then took a job in Juneau.

<u>1999</u>
- Arny Blanchard is employed as marine ecologist and environmental statistician at the Institute of Marine Science (IMS) at UAF. He is a principal investigator on a long-term research program, and is pursuing a PhD at IMS.
- Peter Dillingham was employed in AIDS research with Hutchison AIDS Research Institute in Seattle, WA and is now pursuing a PhD program in New Zealand.
- Julie Smith (McIntyre) completed Ph.D. at North Carolina State University, did a postdoc at Carnegie-Mellon and has accepted a faculty position at UAF beginning January 2006.
- Franz Muter, earned PhD in Fisheries at UAF and now holds a research position with the University of Washington.

<u>2000</u>
- Gwen Gruenig works for Institutional Research at the University of Alaska Statewide Office in Fairbanks, AK.

<u>2001</u>
- Kelley Cadman works for Institutional Research at Central Washington University and occasionally teaches a course for the math department there.
- Xinxian Zhang works as a Biometrician for the Alaska Department of Fish and Game in Juneau, AK.

<u>2002</u>
- Helen Nute worked as a Statistical Epidemiologist for Alaska Health and Social Services, Anchorage, AK then moved to Oregon; current employment unknown.

2003

- Randy Mullen is employed as a Biometrician for the Alaska Department of Fish and Game in Juneau, AK.
- Colleen Ianuzzi works for Institutional Research at the University of Alaska Statewide Office in Fairbanks, AK.
- Anton Antonovich is employed as a Biometrician for the Alaska Department of Fish and Game, Anchorage, AK
- Xiang Fang worked for the Water and Environmental Research Center Institute of Northern Engineering and UAF's Institutional Research for two years then in 2005 went to University of Nebraska for a Ph.D in Statistics
- Sherri Dressel completed a PhD in Fisheries at UAF and now works as a Biometrican with ADF&G in Juneau.

2004

- Mark Olson works as a research associate UAF's Forestry Research
- Yongmei Qin, works for Institutional Research
- Joe Liddle teaches for UAS in Sitka

2005

- Chen Xi, Biometrician ADF&G Fairbanks
- Randy Phillips, unknown

Enrolled now in the STAT MS are
Jiao Shou
Yingte Zhang
Yu Chen
Alan Shay
Steve Houston
Xian Yu (begins in January 2006)

Appendix 2 – MS Statistics Outcomes Assessment Plan (Revised, Nov. 2003):

Mission: We shall provide a thorough graduate education in statistical theory and methods.

Goal: To assure that our students have the skills to successfully compete for and excel in jobs in applied statistics. Our students will be highly qualified, in particular, as biometricians for government agencies. The students will also be well prepared for additional education in statistics.

Intended Outcomes/ Objectives	Assessment Criteria	Implementation (What, when, who)
Students will master a wide variety of statistical tests, statistical procedures, sampling methodologies and will be able to design experiments	ENTRY LEVEL ASSESSMENT: Introductory course in statistics required as condition of admission.	ENTRY LEVEL: Assessed at time of admission to the program.
	EXIT LEVEL ASSESSMENT: 1) Applied part of the comprehensive exam. 2) Report by the student's advisor on the student's research activities.	EXIT LEVEL: Examined by all members of the statistics faculty. Information on research activities will be added to the MS Statistics assessment file.
	ASSESSMENT OF ALUMNI: Follow the careers of Statistics Program graduates.	ALUMNI: Data compiled by statistics program coordinator. Information will be added to MS Statistics assessment file.
Students will understand and be able to use statistical theory	ENTRY LEVEL ASSESSMENT: Calculus (three semesters) and Linear Algebra are required.	ENTRY LEVEL: Ascertained at time of admission.
	EXIT LEVEL ASSESSMENT:	EXIT LEVEL: Written assessed by the

	Written and oral part of the comprehensive exam.	statistics faculty, oral assessed by graduate committee.
	ASSESSMENT OF ALUMNI: Follow the careers and further education of the graduates. Survey the graduates to see if their training was satisfactory.	ALUMNI: Contacts to be maintained by the statistics program coordinator.
Students will have consulting skills.	EXIT LEVEL ASSESSMENT: Student's achievement in the statistical consulting seminar	EXIT LEVEL: Exceptional research and consulting by graduate MS Statistics students will be added to the program assessment file.
	ASSESSMENT OF ALUMNI: Follow the careers of graduates.	ALUMNI: Contacts to be maintained by the statistics program coordinator. Information will be summarized in the MS Statistics assessment file.
Students will have computing skills, especially in SAS and one other statistical software package, e.g., R.	EXIT LEVEL ASSESSMENT: 1) Evaluation of student's programming skills in applied and core statistics courses. 2) Applied statistics portion of the comprehensive exam. 3) Report by student's advisor on student's exceptional research and consulting outside of class.	EXIT LEVEL: Statistics faculty, on an annual basis.
	ASSESSMENT OF ALUMNI:	ALUMNI: Contacts to be

	Follow the careers of graduates. Survey graduates to see if curriculum was satisfactory.	continually maintained by the statistics program coordinator.
Students will have skills in an area outside of statistics- an applied science, social science or mathematics.	EXIT LEVEL ASSESSMENT: 1) Applied portion of comprehensive exam.	EXIT LEVEL: Assessed by the faculty member who wrote the applied portion of the exam.
Students will display effective written communication skills.	EXIT LEVEL ASSESSMENT: 1) Statistics projects. 2) Applied portion of comprehensive exam.	EXIT LEVEL: Assessed by the statistics faculty at time of graduation.

MEMORANDUM

To: Susan Henrichs
            Dean of the Graduate School and Vice Provost for Instructional Affairs

From: Dana Thomas (Department Chair)
            Ron Barry (Program Coordinator)
            Department of Mathematics and Statistics

DATE: November 24, 2005

SUBJECT: Progress Report on the MS Program in Statistics

Attached is our assessment plan on MS Program in Statistics. Also attached are the 2004-2005-assessment report on the MS Program in Statistics and a feedback email from a recent graduate of the MS Program in Statistics. The assessment report summarizes comments from other graduates contacted by phone and/or email.

Here is a list of the items in our assessment plan and the status of implementation. Overall, we are doing a fair job. The plan is in need of further revision, to be explicit with the informal and episodic nature of the alumni and employee assessment (It is usually conducted when we have contact with alumni or employers for other reasons. This does occur with regularity, however.)

Assessment Criteria	Implementation
Entry Level Assessment: 1) Introductory courses in statistics required as condition of admission. 2) Calculus (three semesters) and Linear Algebra are required.	1) YES 2) YES. All of our applicants have the bulk of these courses on admission, and we have been proactive in meeting with students to get the deficiencies out of the way as soon as possible.
Assessment of Alumni: Follow the careers and further education of Statistics program graduates. Survey the graduates to see if their training was satisfactory.	YES - We have also interviewed employers occasionally (we should make this periodic).
Exit Level Assessment: 1) Evaluation of student's	1) YES 2) YES

programming skills in applied and core statistics courses	3) YES
2) Applied statistics portion of the comprehensive exam	4) YES
	5) NO, except for grades.
3) Report by the student's advisor on student's research and consulting outside of class.	6) YES
	7) NO
4) Student Project review	
5) Student's achievement in the statistical consulting seminar	
6) Written and oral part of the comprehensive exam.	
7) Report by the student's advisor	

ASSESSMENT OF THE MASTERS PROGRAM IN STATISTICS
Fall 2005

EXIT INTERVIEW:

We gave the <u>College of Science, Engineering and Mathematics Exit Interview for Graduating Masters and Ph.D. Students</u> to the three students who had completed their degree program in the Spring of 2003. The results are in the Table 1 (appendix). The graduate student's opinion of the program was mixed. In general students strongly agreed or agreed with each of the positive statements "I would recommend the statistics MS degree program to others", "The quality of instruction by statistics faculty is excellent", "The core MS statistics course provided a solid foundation", "I had access to modern computing equipment and statistics software", Statistics faculty members were accessible and involved in my education", "I learned a lot in completing the MS project", "Statistics elective courses were at an appropriately challenging level", and "Degree requirements were well communicated". The exceptions were one neutral response to "I would recommend the statistics MS degree program to others", one neutral response to "Statistics elective courses were at an appropriately challenging level", and two neutral responses (along with one strongly agree) to "Sufficient elective courses were offered". We found it a bit alarming that a student would be neutral in recommending the program, as in the past all students either agreed or strongly agreed to recommend the program to others. Reading student comments, and considering the results of the survey, it is clear that students wish that we would expand the elective course offerings. Specifically, there seems to be a desire for a class in Bayesian Statistics, which we would like to offer when we get a full contingent of faculty. There was also a request for more research assistantship opportunities, which is a bit puzzling, as most of the students in the program were supported by research assistantships. Finally, one student requested more information on researching in journals, planning presentations and writing reports. Actions taking include planning to add information on journal research, citation, presentation planning and report writing to the consulting seminar. As for the lack of electives, this may actually get worse in the short term, as we lost two faculty members in the last two years, and it also appears that an elective (Analysis of Vertebrate Populations) offered by the Dept. of Biology and Wildlife that has been popular with our graduate students may not be offered in the future.

POST-GRADUATE INTERVIEW:

Within the last six months we have had discussion with two of four 1998 graduates, two of three 1999 graduates, one of two 2001 graduates, four of five of our year 2003 graduates, two of three 2004 graduates and one year 2005 graduate (I have not talked with the year 2000 graduate in the last six months about the program). I specifically asked what improvements could be made in the program, and whether the program prepared them well for their jobs. All of the graduates I talked to were happy with the program, though there were suggestions that topics such as Bayesian Analysis, model selection and data management be added to the curriculum. Most agreed that the research assistantship positions with other units on campus or State agencies were

valuable. Our students have generally been successful in obtaining jobs in statistics, with seven of nine 2003, 2004 and 2005 graduates in statistical positions (I do not know that employment status of the other two graduates). Our program was originally instigated to help supply biostatisticians for the State and Federal government in Alaska, and it has continued to fill that role, with four of the nine recent graduates taking positions as biometricians with the Alaska Department of Fish and Game. In fact, about a third of all of the students to ever graduate from the MS program in Statistics have biometrician positions in the Alaska Department of Fish and Game. One of our graduates has completed a PhD in Statistics. This student thought that the MS program was a good preparation for doctoral study.

EMPLOYER INTERVIEW:
We have regular conversations with managers with hiring authority in the Alaska Department of Fish and Game. They stated that they are happy with the program as designed and with the graduates of the program.

FACULTY EVALUATION OF EXAMS AND PROJECTS:
The Program Coordinator of the Statistics Program evaluated the comprehensive exams of graduates in the 2003-2004 (5 exams) and 2004-2005 (exams) school years.
1. As recommended in the previous assessment, we have been very active in encouraging our students to get their deficiencies out of the way as soon as possible. We have also used our experiences to improve courses and the timing of courses. Along with the high quality of students now entering the program, these factors may lead to improvement in the quality of the students' comprehensive exams. As part of assessment we read the comprehensive exams and take home exams of all students since 2003. While we have always required good performance on the written part of the comprehensive exams, the overall quality of the exam answers has obviously increased from 2003 through 2005. In general, the mathematical ability of the students has clearly increased. The take-home portion of the comprehensive exam (which is customized for each student) has shown a curious trend- in 2003 most of the take-home exams involved theoretical topics and were written by the Statistics faculty. Recent take-home exams are closer to how we originally envisioned them, as analyses of an applied statistical problem. These students' work on these take-homes has been excellent. They are well-written and display good statistical analysis skills.

2. Project reports are now written in the form of paper in proper form, suitable for submission to a journal. One Masters Project has been published in a peer-reviewed statistics journal. Material from a Masters Project in progress has been submitted for review at another statistics journal. The quality of the Masters Projects has been uniformly high.

TIME TO COMPLETION:
Recently, all students have completed their program within two years. Occasionally students have used part of the summer to finish, but even these students have been

virtually finished at the beginning of their last summer. Time to completion has been good.

ADDITIONAL ASSESSMENT:

We have not yet convened an advisory board for the M.S. Statistics program. We suggest that the advisory board be dropped from the assessment. Formalizing the employer interview should suffice to give us the same information, as university Institutional Research programs and the Alaska Department of Fish and Game have been the major employers of our former students, and will probably continue employ many of our graduates. Input from managers in these two areas along with the general program recommendations of the American Statistical Association should suffice to give us an external view of the MS Program in Statistics.

E-mail from Amy Blanchard giving feedback on MS program in Statistics; November 22, 2005.

Dana,

I read the assessments of the statistical programs at UAF and have a few comments I'd like to add.

As far as I'm concerned, the stats classes have turned out to be the most useful classes I completed at UAF. Most classes are about accumulating knowledge but the stats classes provide tools for exploring, analysis and elucidating patterns which is what my work is all about. My only regret is that I couldn't see the usefulness of statistics earlier on so I could have pursued a PhD in statistics! I think the core stats classes are exactly what's needed and the program as a whole provides the training necessary to fill the role required of statisticians. I can't say enough good about the program nor about the skills I gained. Completing the MS in Statistics was the best choice I made for my career and I encourage students at all levels to take advantage of the great courses taught by the statistics faculty.

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MEMORANDUM

To:	Susan Henrichs Dean of the Graduate School and Vice Provost for Instructional Affairs
From:	Dana Thomas (Department Chair) Ron Barry (Program Coordinator) Shunpu Zhang Devin Johnson Department of Mathematical Sciences
DATE:	October 03, 2003
SUBJECT:	Progress Report on the MS Program in Statistics

Attached is our assessment plan on MS Program in Statistics. Also attached are the 2002-2003-assessment report on the MS Program in Statistics and a feedback email from a recent graduate of the MS Program in Statistics. The assessment report summarizes comments from other graduates contacted by phone and/or email.

Here is a list of the items in our assessment plan and the status of implementation. Overall, we are doing a fair job. Since we are not implementing all the items in our assessment plan, we are going to revise the plan in the future.

Assessment Criteria	Implementation
Entry Level Assessment: 1) Introductory courses in statistics required as condition of admission. 2) Calculus (three semesters) and Linear Algebra are required.	1) YES 2) YES
Assessment of Alumni: Follow the careers and further education of Statistics program graduates. Survey the graduates to see if their training was satisfactory.	YES - We have also interviewed employers occasionally (we should make this periodic).
Exit Level Assessment: 1) Evaluation of student's programming skills in applied and core statistics courses 2) Applied statistics portion of the comprehensive exam 3) Report by the student's advisor on	1) YES 2) YES 3) NO 4) YES 5) NO, except for grades. 6) YES 7) NO

student's research and consulting outside of class. 4) Student Project review 5) Student's achievement in the statistical consulting seminar 6) Written and oral part of the comprehensive exam. 7) Report by the student's advisor	

ASSESSMENT OF THE MASTERS PROGRAM IN STATISTICS
Summer 2003

EXIT INTERVIEW:
We gave the <u>College of Science, Engineering and Mathematics Exit Interview for Graduating Masters and Ph.D. Students</u> to five students who had completed their degree program in the Spring of 2003. The results are in the Table 1 (appendix). The graduate student's opinion of the program was quite high, with all students either agreeing or strongly agreeing with "I would enthusiastically recommend my degree program to another student", " I learned a lot at UAF", "I feel prepared for the next step in my professional life", "The quality of instruction in my department is high" (all strongly agreed), "I was pleased with the curriculum within my major" (all strongly agreed), "I had access to modern equipment in my program of study", "Faculty in my department were accessible", "Faculty in my department were closely involved in my education", "Faculty in my department provided me with intellectual stimulation", "I had a high quality research experience at UAF", and "My research project was adequately funded".

One student was not sure they would recommend UAF to a student, though they strongly recommended the program. The same student did not agree that the general quality of instruction in UAF outside statistics was high. The same student did not feel that the other students provided him/her with intellectual stimulation, and felt that the amount of assigned work in the TA was not appropriate. This student was, however, happy with the curriculum, classes and faculty in the Statistics program.

POST-GRADUATE INTERVIEW:
As many as possible of working alumni of the program were contacted and asked whether they were satisfied with the program, what changes they would make and where they were working. Of the 16 alumni of the program (as of Summer 2003), all but one were contacted. All of the contacted alumni have jobs with some involvement with statistics or data analysis. Five of the alumni are biometricians in the Alaska Dept. of Fish and Game. Three run laboratories or research programs, with statistical consulting duties. Two are consulting (bio statistics). One is doing postdoctoral work in Statistics. One alumnus works as a statistician in the Alaska Dept. of Health and Social Services, one works for UA Planning, Analysis and Institutional Research, one is teaching statistics and one works as a fisheries researcher.

The alumni were generally very happy with the program, and did not have any major recommendations for changes in the curriculum. Some of the alumni felt that the mathematics deficiencies of graduate students should be addressed earlier in the program (we have implemented this change) and also recommended the integration of more consulting work into the program. Several of them thought that the combination of written, take-home and oral exam was unnecessarily grueling.

EMPLOYER INTERVIEW:
An official in the Alaska Dept. of Fish and Game with hiring authority and with regular contact with our graduates was interviewed. He was satisfied with the graduates of the program and was not able to make any recommendation for new curriculum.

FACULTY EVALUATION OF EXAMS AND PROJECTS:

The faculty of the Statistics Program, Dept. of Mathematical Sciences, met in September 2003 to discuss the quality of graduate projects and comprehensive exams written to that point.

1. Exams were variable in quality, with the lowest scores going to graduate students who did not rapidly ameliorate their mathematics deficiencies. Several students, for example, did not have Calculus II, Calculus III or Linear Algebra when entering the program. Two of the students who had quickly taken care of their deficiencies later said that getting these requirements out of the way quickly helped them understand the material in the statistics graduate core courses. RECOMMENDATION: Meet with incoming graduate students early in their first semester and arrange for them to make up for their deficiencies as quickly as possible. We have been implementing this recommendation.

2. Graduate students who used their employment as a base for their projects occasionally turned in copies of their projects to their employer in a rough state, for instance with some statistical errors and with grammar and spelling errors. The statistics faculty were not given the opportunity to completely read and correct these project write-ups. This is a facet of the bigger problem of insufficient supervision by statistics faculty of students who do their research as part of their job. RECOMMENDATION: Insist that projects be approved by the statistics faculty before they are given to employers. Use the graduate seminar to keep abreast of student research (see recommendation below).

3. Occasionally graduate students ask to be able to finish their projects during the summer. This can cause problems if faculty members are unavailable during the summer. RECOMMENDATION: First, advise all students that they should have their projects done by the end of their fourth semester. Second, use the graduate seminar to properly pace the student's research. This can be accomplished by requiring each student to give a proposal talk describing their future project, and a mid-project talk telling what they have accomplished, what remains and what they have learned. These will allow the students to get practice giving talks, keep the faculty up-to-date on the student's projects, and assure that the projects are getting done at the right pace. We will start implementing these recommendations in the 2003-2004 academic year.

TIME TO COMPLETION:

Thirteen graduate students finished in two years and three students required more than two years. One of the late finishers completed the program in three years, which was needed to complete the data collection end of her research. The other late finishers did not take mathematics deficiencies promptly, and thus required extra time to complete the program. The students are generally finishing within two years.

ADDITIONAL ASSESSMENT:

We will need to convene the advisory board for the M.S. Statistics program. This consists of statisticians and employers of statisticians in Alaska. The advisory board can review our curriculum and make recommendations.

APPENDIX:

1=strongly agree   2= agree 3=neutral 4=disagree 5=strongly agree

I would recommend my degree program	1	2	2	1	1
I would recommend UAF	2	2	2	3	2
I learned alot at UAF	2	1	1	1	1
I enjoyed myself	2	2	3	1	1
I feel prepared for the next step in prof life	2	1	1	2	1
The quality of instruction in dept is high	1	1	1	1	1
The quality of instruction at UAF is high	2	2	1	4	2
I was pleased with the major curriculum	1	1	1	1	1
I had access to modern equipment	1	2	1	2	2
Faculty in dept were accessible	2	1	1	1	1
Faculty were closely involved in my education	1	1	1	2	1
Faculty provided me with intellectual stimulation	1	1	1	2	1
Fellow students provided intellectual stimulation	1	1	1	3	1
I had a high quality research experience	1	1	1	1	2
My research project was adequately funded	2	2	1	1	2
I was well informed of my duties	2	NA	NA	1	1
The amount of assigned work was appropriate	1	NA	NA	4	1

19
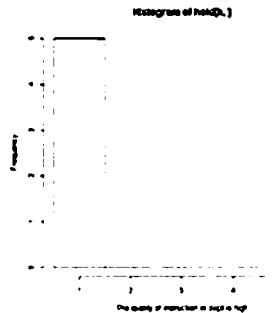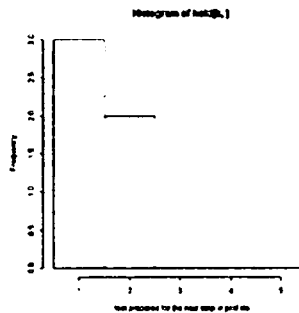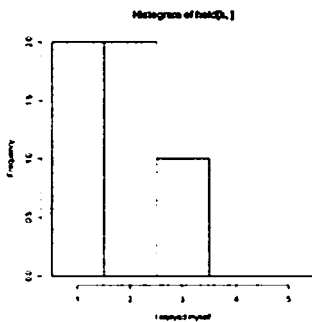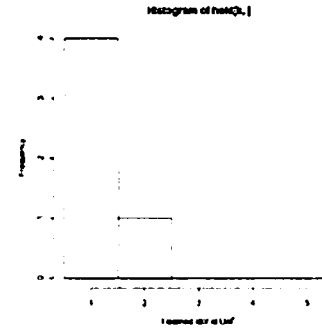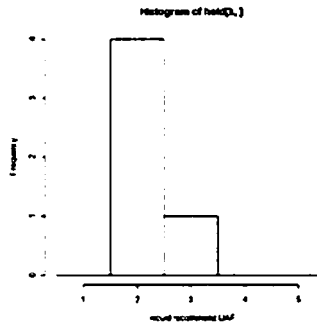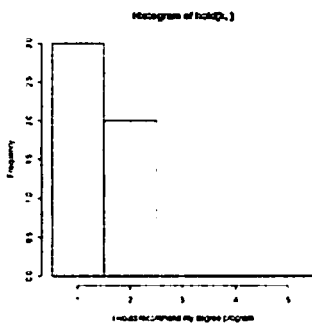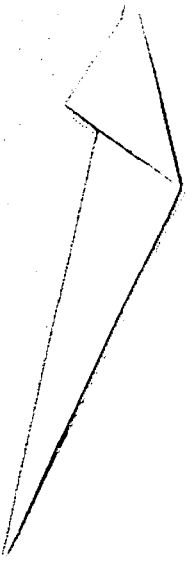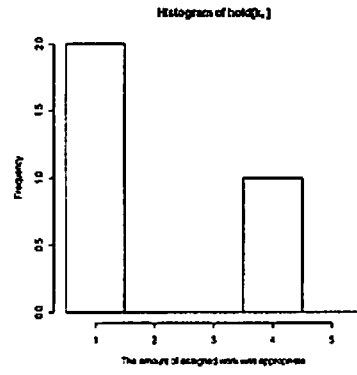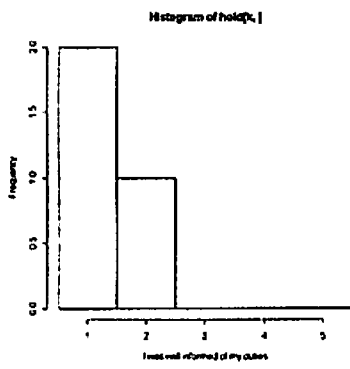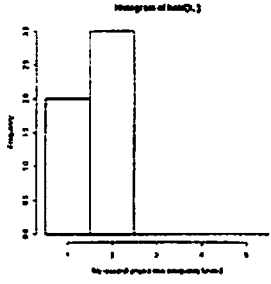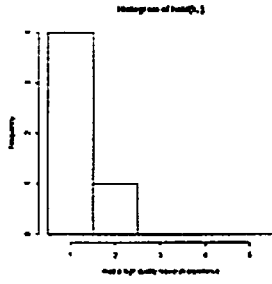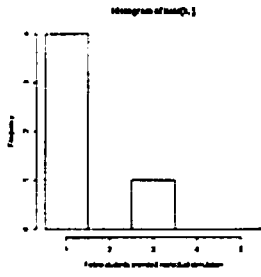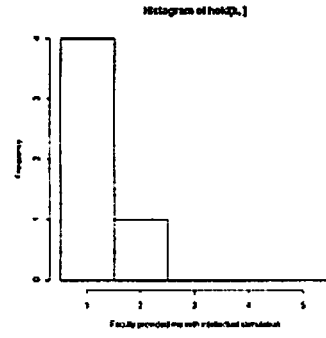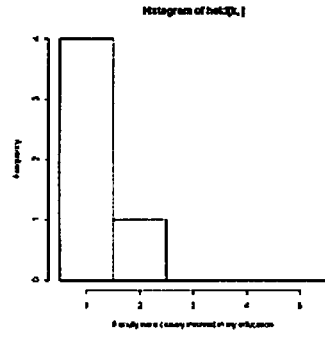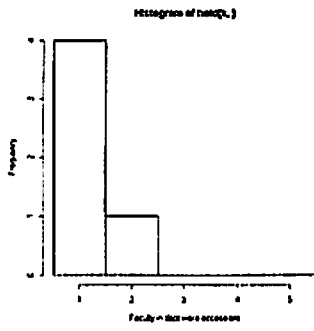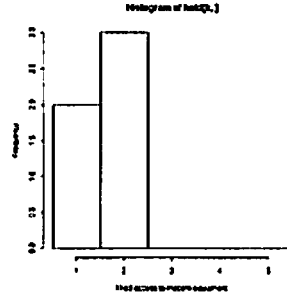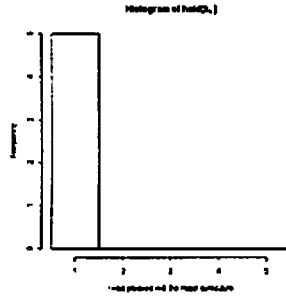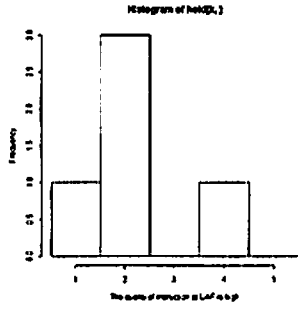
E-mail from Julie McIntyre (Smith) giving feedback on MS program in Statistics; March 5, 2003.

Julie:

Thanks for the note. You were a great candidate for the position here so I am sorry to see you take another job. However, I think a position at Carnegie Mellon will be great for your career and look forward to your application here when we have another opening. I certainly wish you the best for your position there.

Thank you also for the information on the two other books. I am familiar with and have Bickel and Doksum. The other text I have not heard of but will investigate.

I have thought for some time that we could strengthen our masters program with additional linear models material so you have just helped confirm my suspicions. Would a course from McCallaugh and Nelder be about the right level? What did you use for the course there?

Dana Thomas

Julie Pilar Mcintyre wrote:

Dana:

I wrote to Ron yesterday and let him know that I have decided to accept another job. But I also wanted to drop you a note and thank you for
considering me for the position there. I really think that the department at UAF (and the stats program in particular) does a great job.

It was really nice to talk with you all and catch up a bit. You asked me if I could suggest alternative math-stat textbooks for the graduate
courses. I asked around a bit and had 2 recommended to me, one was Bickel and Docksum and the other was Degroot and Schervish. I'm not familiar with either, but I think they use Bickel and Docksum in the Univ. of Minnesota Biostat program.

You also asked me to let you know if I had any more thoughts about the statistics master's program. I would say that the only area where I felt weak coming into the Ph.D. program here was in linear model theory. But still, I wouldn't argue for changing your course much, as much of that stuff isn't practically useful. I ended up retaking the course here which wasn't a big deal.

Anyway, sorry to ramble on. I hope you are doing well and that everything works out with the faculty search.
    -- Julie

Appendix 5 – Headcount of Majors By Year

UAF Program Review 2005-06
College of Natural Science and Mathematics
Headcount of Majors

Department	Major	Degree	Fall 2000	Spring 2001	Fiscal Year 2001	Fall 2001	Spring 2002	Fiscal Year 2002	Fall 2002	Spring 2003	Fiscal Year 2003	Fall 2003	Spring 2004	Fiscal Year 2004	Fall 2004	Spring 2005	Fiscal Year 2005
CNSM Mathematical Sciences	Mathematics	BA	5	6	6	7	7	9	4	5	6	9	3	9	6		7
		BS	25	24	36	26	35	36	39	38	45	33	34	41	37	30	42
		MS	4	6	6	6	7	8	6	3	8	2		4	6	5	6
		PHD	1		1				1	2	2	4	5	5	6		6
	Statistics	BS	2	2	2	1		1	1		1	1		1	1		1
		MS				4	6	7	9	9	10	4	5	8	4	5	5
	Premajor - Mathematics	BI													2	2	3
	Premajor - Statistics	BI										1		1	1		1
CNSM Mathematical Sciences Total			37	38	49	44	55	61	60	58	72	53	52	69	58	51	69

Appendix 6 – Student Credit Hours By Year

UAF Program Review 2005-06 College of Natural Science and Mathematics *Student Credit Hours without audited hours*				Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring
Department CNSM Mathematical Sciences	Subject	Subject_Description	Level	2000	2001	2001	2001	2002	2002	2002	2003	2003	2003	2004	2004	2004	2005
	MATH	Mathematics	LD	2,585	2,581	545	2,725	2,602	420	2,784	2,808	533	2,888	2,593	557	2,766	2,47
			UD	425	356	78	405	318	125	473	443	117	485	463	05	626	539
			GR	56	63		67	89	9	59	53	8	103	54		74	125
	STAT	Statistics	LD	312	363		300	338	51	312	372	51	372	389		312	389
			UD	155	208		125	283		216	237		136	290		172	248
			GR	66	66	5	60	85		66	89	8	57	82		62	67
	Total CNSM Mathematic Sciences			3,599	3,789	726	3,682	3,688	700	3,910	4,000	735	4,169	3,959		4,012	3,90

Appendix 7 – Degrees Awarded By Year

UAF Program Review 2005-06
College of Natural Science and Mathematics
Degrees Awarded

Department	Degree	Major_Description	1999	2000	2001	2002	2003	2004	2005
CNSM Mathematical Sciences	BA	Mathematics			1		1	1	2
	BS	Mathematics	5	8	8	3	9	10	8
		Statistics	1	1	1	1	1	1	
	MS	Mathematics	1				4	1	2
		Statistics				1	3	5	1
CNSM Mathematical Sciences Total			7	9	10	5	18	18	13

Statistics Course Enrollment (sections; J = Juneau) by semester 2000-2005

STAT	Fall 2000	Spring 2001	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005
200	104(2)	122(2)	101(2)	114(2)	104(2)	124(2)	125(2)	123(2)	104(2)	123(2)	106(2)
300		42		46		41		47		44	31
401	16	19	17	19	34	27	19	36	31	28	27
402	29		20		28		20		16		15
461				12				7			
480			canceled	10							
602	11				9				11		
605				13					11		
611		6				13				12	
621				2				4			
631			12				11				8
651	6		7		6		6		7		6
652		7				7				6	
653				9					8		
654		5				7		1		1	
661		2									10(J)