Erik Erhardt

Service Statement

Assistant Professor of Statistics
Department of Mathematics and Statistics
University of New Mexico

Service to the Program, Department, College, and University

My UNM service supports the ongoing and emerging needs of the Statistics students, the Department of Mathematics & Statistics, and the University. After much faculty turnover in statistics since 2007 (especially in 2010), as a group we have primarily focussed on meeting the basic needs of our students (eduction, mentorship, research, leadership opportunities) and the needs of others across the university. I have also worked on a *vision* of where I'd like the statistics group to be in 5 or 10 years, which may include

1. an additional graduate concentration in Applied Data Analytics,
2. the hiring of 2–3 more statisticians in a variety of areas,
3. an active learning track for Introduction to Statistics (Stat 145, I designed a set of materials for this purpose in Summer/Fall 2015),
4. an expanded Statistical Consulting Clinic with capacity to meet the needs of the entire university (possibly hiring a full-time MS-level statistician to run the clinic with faculty oversight), and
5. an increase in national recognition by bringing national conferences to UNM, for example in 2017 as president of WNAR/IBS (nominated Oct 2015) or on the program committee.

Below are a list of my service contributions with an outlook for where I'd like to put my energy for positive change in the next few years.

Statistics Program

Statistics graduate program

- For six consecutive semesters I wrote the **Statistics Qualifying takehome exam** and evaluated the results of the student work. The standard exam includes two problems: one requiring multiple regression and one requiring experimental design analysis methods.
  Future: Revise takehome exam structure to be a more open-ended problem, such as: "Here's an interesting dataset. Determine three interesting questions (one with a numerical response, one with a categorical response, and the last up to you), provide a description of one or two methods that can help answer each question, and provide your answer (assessing model assumptions, etc.)." It may also be interesting to include a section where they have to assess/review the work of someone else.
- I am **advising** my second MS Stat student and advising a post-doctoral fellow, both in statistical brain imaging.
  Future: I intend to advise a PhD student or two in either statistical models for foodwebs or statistical brain imaging.
- I also serve on at least one **thesis or dissertation committees** for graduate students in statistics each year, and a few outside statistics.
  Future: I'll continue to do this.
- I created a Statistics Education Practicum (SEP) for graduate and undergraduate students in statistics who want a practical experience teaching in a "flipped" active-learning classroom for a semester.
  Future: I'll continue to do this.
- In Feb 2014 I helped revise the **Statistics Graduate Handbook**.
  Future: As the vision of the program develops, I intend to help revise the handbook to provide that vision and the path for students to succeed.

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- I've organized statistics student talks within the department.
- In a year-long **statistical consulting mentorship**, I brought in a two-part $75,000 contract with Sandia National Labs and formed and mentored three research teams of graduate students to develop statistical models to solve real-world problems.
  <u>Future:</u> I'll continue to develop the relationships that make these opportunities possible.

<u>Future:</u> I'm excited to help design an additional MS statistics concentration in **applied data analytics**, a highly in-demand skill set for our data-rich world. I expect this to be a money maker for the department. Students would earn a terminal MS degree strictly through course work and income could be used to offer more TAs for our other students (and as graders for the data analytics concentration). Therefore, there would not be an additional burden on faculty to advise students. While some universities have developed undergraduate data science programs, I think students are underprepared with only a BS for competently addressing real problems.

Statistics undergraduate program

- I am working on the design of an **active learning** track for **Introduction to Statistics** (Stat 145, I designed a set of materials in Summer/Fall 2015), and piloting much of the material in my Advanced Data Analysis 1 (Stat 427/527) course. These materials meet the ASA guidelines for statistics education
  <u>Future:</u> I intend to pilot these materials in one or two sections of Stat 145 within the next two years.

Department of Mathematics & Statistics

- As Director of the UNM **Statistical Consulting Clinic** (SCC) I selected and mentored talented graduate students to enhance the quality of research carried out at the University of New Mexico. One semester I negotiated to have 3 consultants, 2 dedicated to the Math & Stat dept, and 1 dedicated to the Robert Wood Johnson Foundation (RWJF) Center for Health Policy. Because two-thirds of SCC hours are spent on grant-funded research and those grants are using our resources for free, I started working with Johannes van Reenen in the OVPR to include the SCC in more university grant proposals to fund more student consultants and increase our impact. I've given a talk to our stat grad students on "Statistical consulting and collaboration, how to get started", and intend to give the talk every couple years.
  <u>Future:</u> I will continue to work towards an expanded Statistical Consulting Clinic with capacity to meet the needs of the entire university. I want to have grant-funded research that relies on the currently free service of the clinic to include statistical consulting as a line item in their budgets. I also want to continue to offer free service to any student for projects or non-funded thesis and dissertation work. Ultimately, I would like to see the SCC have 3–5 PhD student consultant positions for training with a full-time MS-level statistician managing the clinic with faculty oversight.
- I enjoy **committee work** because it gives me an opportunity to collaborate with and learn from others in the department whom I may not otherwise have the chance to work with. I've served on the Executive Committee (2015–16), Graduate Committee (2011–13), Undergraduate Committee (2015–16), Hiring Committee (2011–14, 15–16), and Institutional Review Board (IRB) Committee (2013–16).
  <u>Future:</u> While committee work itself can be tedius and time consuming, the rewards of recognizing deserving students through awards or learning from my peers keep my interest.
- I've organized **seminar** series (2012) or invited speakers to complement material I'm teaching in class (2013, 2014).
  <u>Future:</u> I'll continue to do this.

College of Arts & Sciences

- I was the **faculty mentor** to three graduate students (2 Bio, 1 CS) who co-designed and taught a course called Probability for Scientists (Biol 409/509, Stat 479). This project was a Program in Interdiciplinary Biological and Biomedical Sciences (PIBBS) Collaborative Interdisciplinary Teaching (CIT) course. I helped the students develop a syllabus, define the content and scope of the course, learn teaching methodologies, and do actual instruction.
  <u>Future:</u> While I enjoy this type of opportunity, I feel it is an undervalued/underrewarded service item (probably worth about 1/4 teaching of a course). With some recognition from the Biology Department I would be willing to do this again. I have also taught two sections on Brain imaging for the PIBBS programs for their TIBBS and SIBBS courses.
- With a strong interest in education, I'm excited to be the department representative for the **STEM Gateway Redesign Council**, a group committed to improving the way that we teach science, technology, engineering and

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math (STEM) courses in order to empower more Hispanic and low-income students to achieve their STEM career goals.

Future: STEM Gateway has helped redesign Math 121 (College Algebra) and Math 153 (Trigonometry/Precalculus). I'm hoping to bring some resources to the redesign of Stat 145 (Intro to Stats) to provide active-learning sections of the 2200-student per year course (the largest course in the department).

University of New Mexico

- I've given a dozen **colloquia** in the last few years around campus on statistical issues (CV: "Colloquium and seminar talks locally") to inform researchers outside statistics about important statistical methods or issues in their fields.
  Future: I'll continue to strengthen the bridge between our department and others.
- I regularly serve on **committees** for students from other departments.
  Future: I'll continue to do this.
- For fun, I am the faculty sponsor for two student clubs: The **Juggling Club** and The **Folk Music and Dance Society (FolkMADS) UNM Student Chapter**, an extension of the community group of which I'm the current president.
  Future: I'll continue to provide leadership opportunities to students in fun activities.

Service to the Profession

I contribute to the ongoing and emerging needs of two professional organizations for statisticians.

Local

Albuquerque Chapter of the ASA

- I've held **every office** of the Albuquerque Chapter of the American Statistical Association (ACASA). I'm now in a mentorship role for the current student officers. I started and continue to be the chair of the Mu Sigma Rho subcommittee, which gives awards for the national honorary society for statistics. In these capacities I help organize meetings and community service, such as judging state-wide and international science fairs for "best use of statistics".
  Future: I'll continue to provide leadership and direction for local discipline-specific community building.

National

WNAR

- WNAR is the Western North American Region of The International Biometric Society, an international professional and academic society promoting the development and application of statistical and mathematical theory and methods in the biosciences. I have served on the **regional advisory board** (2012-15), organized sessions, receptions, a dance, and redesigned the website.
  Future: I was nominated (Oct 2015) to run for **President**, which I intend to do. Whether elected or not, I'm serving on the conference committee and will be bringing the 2017 conferences to NM, possibly to UNM.
- I have refereed for many journals, mostly focussed in my research areas of brain imaging and ecology.
  Future: I intend to serve as an associate editor for a statistics journal with a biology/ecology focus in the next five years.

Service to Society

In the greater Albuquerque community:
- I've been **interviewed for TV** on topics where probability or statistics are core ideas.
- I performed an analysis and was interviewed by KOB-TV4 (Albuquerque, NM) regarding "NM Law Enforcement Academy Police cadet test scores under investigation".
- I've been a judge for science fairs from middle schools, high schools, and at the university.
- I also consult for legal, medical, and other issues involving statistics in New Mexico.
  Future: I'll continue to be a local face of statistics, using my powers for good.

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