Emily H. Griffith  
Personal Statement

**Consulting.** My statistical consulting work is a natural extension of my interest in areas of application of statistical methods and theory. There are two major themes that run through all of the consulting work that I do. First, I provide high-quality statistical consulting to researchers across campus. Second, I study and develop the scholarship of consulting, including thinking about how best to teach consulting and mentor student consultants as well as leading the committee that developed the structure of our Statistical Consulting Core at North Carolina State University (NCSU). As part of this, I use my knowledge of the researchers on campus and my knowledge of the faculty in my own department to promote multidisciplinary collaboration and encourage multidisciplinary research.

**Consulting Theme 1.** I provide high-quality statistical consulting to researchers across NCSU and beyond. The breadth of my statistical consulting expertise is shown in the variety of fields in which I have provided services recognized by co-authorship of peer-reviewed manuscripts. I have been the statistical expert on papers published in *Nanotoxicology* [10], *The Journal of Orthopaedic Surgery and Research* [17], *The Journal of Veterinary Medical Education* [44], and *Foodborne Pathogens and Disease* [6]. In veterinary medicine applications, my primary area of statistical consulting, I have been the statistician on papers ranging from immunology [12] and diagnostic accuracy [31] to orthopedics and surgery [50]. Due to my breadth of consulting experiences and my reputation for explaining statistical concepts to non-statistical audiences, I was invited to give a seminar on statistical principles to the Environmental Protection Agency’s Community of Practice in June 2016.

The quality of my statistical consulting work is shown through repeated collaborative work with the same researchers. I have published eleven papers with Duncan Lascelles, a professor of small animal surgery and pain management ([12], [13], [14], [20], [23],[24], [35], [36], [46], [49], [51]), eight papers with Natasha Olby, a professor of neurology and neurosurgery ([16], [19], [23-- joint with Lascelles], [25], [27], [37], [38], [48]), and six with Marije Risselada, an assistant professor of small animal soft tissue and oncologic surgery ([18], [28], [30], [32], [40], [41]). My work with Duncan Lascelles and his lab grew from providing statistical advice to being a co-investigator on two funded grants: one funded by the Winn Feline Foundation and another by the Duke NCSU Translational Research Grant program. My work with Natasha Olby has led to my inclusion as a collaborator and the statistical expert on a recently submitted, multi-center, NIH grant to study ALS in dogs. In addition, work that I have done with graduate students in entomology led to my inclusion as the statistical expert on a pending grant application to NASA, and my committee work with a student in Architecture and Design led to my inclusion as the statistical expert on a pending grant application to a Robert Wood Johnson Foundation program. Due to my consulting experiences, I serve as the statistical expert for the Science of Security Lablet at NCSU and have been included as part of their renewal proposal. The increase in trust and responsibility that my consulting clients show indicates that the services I provide are exceptional.

**Consulting Theme 2.** In addition to providing statistical consulting, I am becoming nationally recognized for my work in teaching consulting, mentoring new consultants, and providing consulting services. I will present an invited poster, “Teaching a Large, Project-Based Statistical Consulting Class,” at the Joint Statistical Meetings this summer. I am also an invited participant in my second panel discussion on
consulting in academia at this summer’s Joint Statistical Meetings. The first such panel was at the International Conference on Advances in Interdisciplinary Statistics and Combinatorics in Greensboro, North Carolina, in 2014.

I have mentored twelve students on their consulting projects for our department’s statistical consulting course, even in semesters when I am not the class instructor. As the class instructor, I have overseen 113 students working on more than 50 projects. I have also been the faculty advisor for STATCOM, a student group providing pro-bono statistical consulting to the community, since the fall of 2015.

This mentoring work led me to present a poster and speed abstract at the Women in Statistics and Data Science conference in October 2016. My attendance was funded by the Faculty Diversity Professional Development Award, and I spoke about maintaining confidence while finding a balance between being an expert in statistics and being a novice in the subject-matter area in which you are consulting. Ideas from that talk grew into a University Diversity Mini Grant application that was funded in Marcy 2017.

Another unique aspect of my work is the opportunity that I have to promote multidisciplinary collaboration and encourage multidisciplinary research. I have regularly been able to connect researchers in my own department with researchers in other departments. These connections have resulted in a funded grant, two publications, one of which was co-authored by a doctoral student in the statistics department, and a thesis project for another doctoral student in statistics.

**Teaching.** My approach to teaching involves two main ideas: that knowledge makes life interesting, and that statistical concepts are best made accessible through other fields that people understand and enjoy. I apply these ideas in every class that I teach, using engaging examples to get the students to learn data sense and to understand the ‘why’ of statistics in addition to the ‘what’ and ‘how.’

**Courses Taught.** At the graduate level, I have taught statistical consulting online and in person as well as a service course for students in the biological sciences. Teaching consulting online is increasingly common, but best practices are still being developed. As the classes I teach are already large relative to other online classes, my work in this area fills an important void in our knowledge of best practices. At the undergraduate level, I have taught sampling and design of experiments. In my undergraduate classes in particular, I use in-class activities to help the students fully understand the concepts. In the sampling class, I had students compete in a relay race by estimating the total amount of time it would take their team to complete the race based on a small sample. The group that was statistically significantly fastest won the race. This exercise emphasized the large variances typically obtained when estimating totals as opposed to means, the importance of stratification, and it allowed the students to draw inferences from their data. In the design of experiments class, students worked in groups to evaluate the effect of different settings on catapults. This activity covered random effects and the motivation behind split-plot designs in a memorable way.

In graduate service courses, I relate the material back to the students’ own fields and research interests, helping them learn to think about why a particular analytical technique may be appropriate for their research. In the graduate consulting course, I use examples from my own consulting work to inform class discussions about communication and application.
Course Development. When the Department of Statistics at NCSU decided to move to a three-credit, graded consulting course from a one-credit, pass/fail consulting course for our masters-level students, I proposed and developed the larger course, called Statistical Practice. Students work in pairs on consulting projects with researchers across campus and in the community, and each team is responsible for three oral presentations during the semester. In addition to practicing oral and written communication, topics covered include power analysis and sample size calculations, the peer-review process, and writing methods sections for applied papers. I also arrange to have at least three Career Days in class, where alumni of our program come speak to our students about the type of jobs that they have and the reasons they enjoy their work. This helps our students have a better understanding of the job market and the types of work available for masters-level statisticians, in particular.

Research. My primary research focus involves mentoring undergraduate statistics majors on research projects. Through my consulting work, I have developed a long-term relationship with the Office of Assessment at NCSU. I have mentored six undergraduate students as they have completed analyses of blinded data about our own students. These projects benefit the university by answering questions about retention and graduation, and they also benefit our students by allowing them to build models from large datasets that directly impact them. As I have built this program, we have increased the number of students involved and the expectations for them. This past semester, two of my students presented posters at the Undergraduate Research Symposium and one of them will present her poster at the Joint Statistical Meetings as well.

Service. I serve the statistical community at the departmental, state, and national level. At NCSU, I started by chairing the Beach Trip Committee, and have gained increased service responsibilities since then. I have served on the Qualifying Exam Committee, the Seminar Committee, and a search committee for a teaching assistant professor. I am currently the Junior Faculty Representative and a member of the department’s Advisory Committee.

Outside of the university, I served as a judge at DataFest in 2014, and have been a reviewer for several journals. I have also been a member of the American Statistical Association’s Committee on Award of Outstanding Statistical Practice (2015-2017) and was recently elected to be Vice-President 2 of the North Carolina Chapter of the American Statistical Association.

Summary. My position was initially 70% consulting, 20% teaching, 5% research, and 5% service. In the fall of 2016, my responsibilities shifted to 45% consulting and 45% teaching, while maintaining the same levels of research and service. In both consulting and teaching, I have consistently performed at a high level and have begun to receive community and national recognition for my work. I have additionally contributed in research, mentoring undergraduates, department service, and professional service.