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***UNIVERSITY OF WASHINGTON STATISTICS DEPARTMENT TEN-YEAR REVIEW  
REPORT OF THE REVIEW COMMITTEE***

***June 2019***

*Members of the Committee*

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**EXECUTIVE SUMMARY**

- Statistics is a key discipline crucial to a wide range of research and educational activities at UW. It is pillar for data science methodology.
- UW Statistics is easily a top-10 department nationally. It was ahead of its time in championing interdisciplinary research.
- The Statistics Department has suffered potentially crippling faculty losses and retirements due to both bad luck and internal discord.
- The Department needs to function better as a team.
- Now is the critical, and perhaps final, opportunity to preserve and nurture this top-10 department and its contribution to world-leading research and data-science literacy at UW.
- It appears necessary to undertake an external search for the next departmental chair. Success in the chair search is not assured.
- In spite of the need to retain hiring flexibility for the future chair, faculty count is so low relative to current teaching demands that two recruitments need to be made in the next academic year, one potentially above the rank of assistant professor.
- The Department should follow up on the findings of the recent CERSE climate study.

## **THE REVIEW PROCESS**

A 10-year review Site Visit of the University of Washington Statistics Department took place May 6-7, 2019. The site visitors were Drs. Dale Durran (Professor and Chair, UW Atmospheric Sciences, and Review Committee Chair), Bin YU (Professor of Statistics, U of California at Berkeley), and Ross Prentice (Fred Hutchinson Cancer Research Center, and UW Professor of Biostatistics). A family health issue prevented Dr. Susan Murphy (Harvard) from participating as scheduled. Statistics Department self-study materials were available in advance to reviewers. The review committee met over dinner on May 5 and 6 to discuss these materials, and to consider additional materials or meetings beyond those listed in the draft site visit agenda that might facilitate the review.

Following an introductory meeting with Graduate School representatives, the Committee met, over the two day period, with Professor and Statistics Department Chair Thomas Richardson; professors Meila, Perlman, Raftery, Steutzle, Wakefield, and Wellner (via audio link); associate professors (Dobra, Harchaoui, and McCormick); assistant professors (Chen, Han, Leudtke); lecturers and acting assistant professors; administrative staff; computing staff; educational program leads; graduate students; undergraduate students; as well as leaders and representatives from other UW Units that interact with, and rely on, the Statistics Department. There were also scheduled individual meetings with Professors Melina and Wakefield and with Divisional Dean Suzanne Hawley. Short individual meetings were held with several other senior Department faculty members at the invitation of the Review Committee. At the end of the two day period an exit discussion was held. The first part of this discussion included Dr. Richardson, Department Administrator Vickie Graybeal, and Arts and Sciences College Council Chair Dan Pollack. After these persons left the meeting room, discussion continued with Dean Hawley and representative of the Graduate School and with UW Administration more generally. The Committee thanks each of the persons who engaged in these discussions. The Committee especially appreciated the candor and openness by many interviewees, which allowed the formulation of some observations and recommendations, in spite of a site visit of only two days. The remainder of this report lists and elaborates the resulting major observations and recommendations.

## **DETAILED FINDINGS AND RECOMMENDATIONS**

*Statistics is a key discipline crucial to a wide range of research and educational activities at UW.*

Statistics is the science of extracting useful information from data and properly formulating experimental design. It originated, in part, with census data collection and analysis, and has evolved into a modern discipline that is one of the three main pillars of data science, along with computer science and domain-specific disciplines. It has a scientific root as exemplified by its modern founding father R. A. Fisher, who is also a founding father of statistical genetics. It has a

tradition of interdisciplinary research through collaboration with scientists and domain experts, while learning the domain knowledge and building it into the statistical model employed. In the last two decades, while keeping its tradition of interdisciplinary research and experimental design, statistics has embraced machine learning as a frontier area at the interface of statistics and computer science and hired many CS-trained machine learning young people into its departments across the country.

In addition to its Ph.D, MS and undergraduate major, the Statistics Department is deeply involved with other UW programs. Many of its faculty have joint appointments with other departments, including Biostatistics, Computer Science and Sociology. In recent years, statistics has been an important partner and a co-leader in building up the data science education programs at UW. Statistics partners with other departments to offer the Applied and Computational Mathematical Sciences (ACMS) major and the Professional Data Science MS degree. It provides substantial service teaching. It offers free consulting services to researchers across campus.

*UW Statistics is easily a top-10 department nationally. It was ahead of its time in championing interdisciplinary research.*

A great research university needs internationally acclaimed departments. Modern universities need to encourage interdisciplinary research opportunities. UW Statistics fills both of these roles, but its top-10 reputation is at serious risk. Its faculty includes many joint appointments with other UW departments such as CS and biostatistics. Historically, the statistics department has provided service courses across campus to train students at all levels with data analysis, study design, and quantitative reasoning skills. For decades, its faculty members have engaged in collaborative research with members of other academic units, both within the College of Arts and Sciences, and elsewhere on campus.

*The Statistics Department has suffered potentially crippling faculty losses and retirements due to both bad luck and internal discord.*

Examples of faculty who have left or are leaving UW for other universities include Mathias Drton, Mark Handcock, Peter Hoff and Vladimir Minin. Examples of faculty who have shifted fractions of their appointments out of Statistics to other departments include Emily Fox and Sham Kakade. While some of these changes arose from factors clearly beyond the control of the department, other losses could potentially have been avoided if the climate and resources within the department were better.

*The Department's faculty needs to function better as a team.*

Junior faculty, campus-wide collaborators, and students are disappointed in the lack of senior leadership willing to step into the chair role. Even to this day, hard feelings remain among some

senior faculty about the establishment of the Center for Statistics in the Social Sciences (CSSS), which occurred 20 years ago. Many of the faculty have joint appointments in other departments. Although such appointments can be an excellent way to foster interdisciplinary collaborations, they do force people to split their activities among those departments and can reduce an individual's sense of commitment to at least one of the departments. Substantial teaching and service duties are borne by the diminished number of faculty whose appointments are 100% in Statistics.

*Now is the critical, and perhaps final, opportunity to preserve and nurture this top-10 department and its contribution to world leading research and data science literacy at UW.*

Outside the UW, the reputation of the Statistics Department remains very high. Yet within the Department the situation has become critical. This is evidenced by the unwillingness of any of the senior faculty to serve as the next chair and by a feeling that the faculty is spread far too thin.

Despite of the large number of service courses and its (joint) heavy lifting with CS on data science activities, the number of tenure-track faculty in the Statistics Department has been decreasing from an already lean 15.25 FTE in 2016 to a projected 9.25 FTE in 2020. The department is clearly at the brink of crossing a critical sustainability threshold. The Committee strongly recommends that immediate steps be taken to pursue new tenure-track hires. The current "Statistics Hiring Plan: 2019-2024" can serve as a good starting point for a plan of action. The Committee was pleased that very strong support for the re-invigoration of the Department was expressed by the Dean during our review.

*It appears necessary to undertake an external search for the next departmental chair. Success in the chair search is not assured.*

Challenges that could make this a difficult search include the following. The sense of collective ownership and camaraderie among faculty needs to be significantly enhanced before the department will look attractive to an outsider. There is currently substantial competition nationally for individuals capable of serving as an outstanding statistics chair. The UW position will not look attractive unless the College and the University are willing to put significant resources into the new chair's hand, components of which should include an endowed chair and the opportunity to fill several new faculty positions. Because of these challenges, the interim chair should be prepared to serve for two years if necessary.

*In spite of the need to retain hiring flexibility for the future chair, faculty count is so low relative to current teaching demands that two recruitments need to be made in the next academic year, one potentially above the rank of assistant professor.*

This will also create some positive momentum for the concurrent search for the new chair. The committee supports the current hiring plan of 7 hires in 5 years and further growth of 25% to

50% beyond the first five years. The next chair search should be configured to allow a cluster hire and with an endowed professorship for the chair.

*The Department should follow up on the findings of the recent CERSE climate study*

A climate study of the UW Statistics Department was recently conducted by the University of Washington Center for Evaluation & Research for STEM Equity (CERSE). It is our understanding that leaders of graduate students in the department have played a key role in making the study happen. It is very commendable that they have been proactive in building an inclusive community.

The climate-study report finds that 1/3 of the women experience sexism, that faculty women and students alike face higher standards, that international and domestic students are not well integrated, and that caregivers and parents do not have enough support. It suggests that much work is needed to build an inclusive community.

The report provides many good recommendations, but they need to be prioritized to have an effect, especially given the low number of faculty and the demand of data science activities on campus. It is recommended that the department engage the whole community to select a few of the most important recommendations to follow up with detailed plans for implementation. Given the low faculty numbers and proactive activities of the graduate students, it is recommended that graduate students be invited as equal partners in prioritizing the recommendations and devising their implementation plans. Without having a full understanding of the issues, the committee sees inclusion training and transparent communication as important priorities.

*Potential to expand the undergraduate major*

The Department has invested substantially in its undergraduate teaching program in the past decade, especially in course offerings for Statistics majors. There are close to 100 applicants per year for the Statistics Major, of whom 30-40 are typically admitted. There are also about 5-10 graduates per year with a Statistics Minor. Also, the Department actively contributes to the Applied and Computational Mathematical Sciences Major, which graduates 50-60 undergraduates per year, and includes a Statistics and Data Sciences option. Additionally, the Department offers four introductory statistics service courses each quarter for students in other academic units, including a Basic Statistics course with over 500 students per year. The undergraduate teaching seems to be in good shape under capable leadership, and morale among students seemed excellent. Developments for statistics majors includes a three-quarter sequence that provides a systematic introduction to mathematical statistics, an area of strength for the Department, as well as the development of a Data Science track and new courses in machine learning and special topics. This aspect of the Department's activities is limited only by the availability of faculty to offer leadership and pertinent courses, and it could be considerably expanded if more faculty were hired.

*Instructor and acting assistant professor career paths and mentoring*

While the instructors (and acting assistant professor) who met with the Committee seemed to be enthusiastic and capable contributors, they also seemed unsure about their own career path and advancement opportunities. The Committee judges that it is quite important to recognize and reward the contributions of these key contributors in an ongoing basis, including taking advantage of the appointment ladder available to faculty in the instructor stream at UW.

#### *Student support*

The committee noted a few areas in which the Department could better support its students. The funding package to the PhD admits needs to be increased to be on par with competitors and offset Seattle's expensive cost of living. The yearly cost of the fee-based Master of Science in Statistics program should be communicated to students in a timely manner. In particular, the tuition and fees for the upcoming year should be communicated to students who are considering accepting offers from the program in advance of the acceptance deadline. The department should make more funds available for student-organized social activities; of all our recommendations, this should be the easiest to satisfy.

#### *Future interim report and full review*

Given the extensive challenges faced by the Department, the committee recommends it submit a three-year interim report. Foci of that document would include reports on the external chair search, the additional faculty searches, and on the overall progress in revitalizing the department. It would also be appropriate to report on progress made addressing the other issues noted in this report.

We recommend the next full Department review be at the nominal 10-year interval.