Dear Herb:

For information purposes, I enclose a copy of a document on "Strategic Planning" from the Department of Statistics. This document provides a summary and represents an 'interim' report on the Department's activities with regard to the subject of strategic planning. Some of these activities were sparked as a response to the departmental review which took place during 1998-99. Overall, these activities have had a very positive effect on the department. We have many goals to accomplish and progress may not always seem to happen as quickly as we might wish, as is often the case with many important projects. But we feel that we have established a better mechanism to examine issues and move forward with new ideas in the areas of directions of the discipline and new faculty hiring priorities, curriculum modernizations, and communications and enhancement of our department image both on and outside the campus.

We hope that you might find the document to be informative, and we hope that with your support and cooperation and that of the administration in other allied schools and colleges (e.g., CALS and Medical School), we will be able to realize the goals that are roughly outlined in the document as well as further goals still to be developed.

Sincerely,

Gregory C. Reinsel
Professor and Chair
email: reinsel@stat.wisc.edu

cc: Dean Phillip L. Certain, L&S
encl.: Strategic Planning Document
Strategic Planning Document for Statistics - Spring 2000

1. Introduction

The Department of Statistics has made a major effort during the current academic year to initiate a process of strategic planning. A Steering Committee composed of Murray Clayton, Dave DeMets, Michael Newton, Rick Nordheim, Greg Reinsel (Dept. Chair), Jun Shao (Dept. Associate Chair), Grace Wahba, and Bob Wardrop guided the process. Rick Nordheim was the "leader" of this Steering Committee.

This Committee began meeting during the summer of 1999 and has met regularly throughout the academic year (except during the recent hiring season when hiring activities consumed a great deal of time.) Information was solicited by email from the entire faculty on several occasions. Ad hoc subcommittees (with members both from the Steering Committee and the general faculty) were created as- necessary. Numerous small group discussions have taken place. From 5 to 8 hours of regular faculty meetings were devoted to discussions of strategic issues. These discussions have led to the establishment of a forum (these faculty meetings) at which the faculty is comfortable discussing issues of importance.

Early in the process, the Committee, based on input from the faculty, developed a fairly exhaustive list of topics that might be considered. A copy of this document, with topics grouped into 8 categories, is presented in Appendix A to this document. Our goals for the current year were to attempt to reach a consensus regarding the first category, 'Direction of the Discipline', and then to develop a plan relating to 'Goals for Faculty Composition and Hiring'. Beyond this we hoped to make a major start in addressing issues related to 'Academic Programs and Curriculum' and also to 'Communications'.

We believe that we have largely met our goals. Presented in this document are our Department thoughts on 'Direction of the Discipline' and our proposals for 'Goals for Faculty Composition and Hiring'. Beyond this, we present our plans to date regarding 'Academic Programs and Curriculum'; these have focused on our MS and PhD Programs. We hope to complete this aspect next year. Also, we present some initial plans in the area of 'Communications'. Again, we anticipate further efforts in this area.

2. Direction of the Discipline

The area of major growth in our discipline is statistical computation. The tremendous growth in computer power over the past 10 years has allowed the development of methods of model building and statistical inference based on intensive computation. For example, there has been a major increase in methods making use of sample reuse (e.g. bootstrapping) as well as the development of techniques like Markov Chain Monte Carlo. Nonlinear estimation, nonparametric and semiparametric modeling and inference, spatial statistics, and genomic statistics are other examples of areas that have been almost "revolutionized" by the new power in computing. To retain and enhance our position as a department on the cutting edge, we need to increase our strength in this area.

Statistics will grow to meet new needs from the world of science and technology. Our Department will need to be prepared to provide statistical expertise (research and instruction) in several (perhaps many) of these areas. Currently we have strength in the biological sciences generally. We need to build on these strengths and consider developing new ones. Based on anticipated needs (as well as past ties) we believe that the development of more ties with engineering would be particularly fruitful.

We recognize that our discipline maintains a strong core of shared ideas relating to statistical inference and its probabilistic underpinnings. It is quite clear that regardless of the directions of our discipline, we will need to retain a strong core of faculty who can continue to perform fundamental research and to instruct in these areas. Some (probably most) of these individuals will have interests in statistical computing or other areas of application; however, it will be necessary to ensure that we never lose our theoretical base.
The current training of PhD statisticians is sufficiently broad so that any given individual can make some changes in his/her area of interest. Thus, an overarching goal in hiring should be to find individuals with broad backgrounds with demonstrated strengths in solving problems. Such problems can span a range from theoretical to applied; a broad training will allow an individual to modify his/her major areas of work as their interests change.

3. Goals for Faculty Composition and Hiring

Currently, (including this season’s hiring), the following indicates the distribution of our faculty.

<table>
<thead>
<tr>
<th>Full-time</th>
<th>Biostat</th>
<th>Biometry (CALS)</th>
<th>Other</th>
</tr>
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<tbody>
<tr>
<td>Harris</td>
<td>DeMets</td>
<td>Nordheim</td>
<td>Miller</td>
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<td>Johnson</td>
<td>Chappell</td>
<td>Yandell</td>
<td>Kurtz</td>
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<td>Wahba</td>
<td>Newton</td>
<td>Clayton</td>
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<td>Wardrop</td>
<td>Kecorok</td>
<td>Zhu</td>
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<td>Reinsel</td>
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<tr>
<td>Bates</td>
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<td>Loh</td>
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<td>Lin</td>
<td>Zhang</td>
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<table>
<thead>
<tr>
<th>FTEs</th>
<th>Biostat</th>
<th>Biometry (CALS)</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 FTE</td>
<td>2.25 FTE</td>
<td>1.75 FTE</td>
<td>0.75 FTE</td>
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</tbody>
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At the current time, we have 15.75 FTE.
(There are also three faculty members in Biostatistics who have a 0 FTE appointment in Statistics. Keeping them and any new faculty in this area closely associated with our Department is a high priority.)

It appears reasonable to assume that in 5 years we will have from 0 to 2 “Full-time” retirements and from 0 to 1 “Other” retirements. (The “0” and the “1” are not firm upper bounds.) Given below is a hiring target for 5 years from now.

<table>
<thead>
<tr>
<th>Target for 5 Years from Now</th>
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<tbody>
<tr>
<td>Full-time</td>
</tr>
<tr>
<td>9-11 current</td>
</tr>
<tr>
<td>2-5 new hires</td>
</tr>
<tr>
<td>13-14 FTE</td>
</tr>
</tbody>
</table>

This results in an FTE target of 18.5 – or more.

Comments:

• Allocation of FTE’s between full-time and joint positions — The given “targets” in FTE’s should be viewed as a starting point for discussion only. It may very well be that to better fulfill the mission of the Department, some different allocation may be found preferable.
• Goals for full-time hires — All or virtually all such hires will be expected to have substantial strengths in computational statistics. It would be good to have (perhaps) 2 hires with particular strengths in the theory that underlies statistical computing, (perhaps) 1 hire with strengths in dependent data structures, (perhaps) 1 hire in an area like semiparametrics or modern empirical processes, and (perhaps) 1 hire in generalized linear models. With any given hiring opportunity, we should have a modest range of useful areas in mind.

• Goals for Biostat hiring — Perhaps this area could expand with an additional hire in an area related to basic science. Such an individual would likely have strong computing skills.

• Goals for Biometry hires — The next future hire should bring expertise in an area like genomics. Such an individual would likely have strong computing skills. (We also anticipate substantial interactions between Biostatistics and Biometry.)

• Goals for “Other” hires — Here there are several issues to consider. First, we need to decide if we wish to develop any joint appointments in new areas. If the answer to that question is yes, then we need to consider the “type” of such appointments. One option might be to consider single joint appointments in several areas such as Sociology, Demography, Engineering, or Psychology. These would be intended as “bridge-building”. Another alternative would be to devote (say) 3 positions (perhaps 1.5 FTE) to a single area (perhaps Engineering). This would allow for a broader and more permanent relationship to be built. In the bridge-building scenario, it would seem that joint appointments would work best if they involved individuals who are already on campus or new hires with tenure. We may also wish to consider if we want to continue and/or extend our joint relationship with Mathematics or if we wish to begin a joint relationship with Computer Science.

• Teaching needs — There is a steady increase in the demand for service teaching from a wide range of disciplines. Some of these come in areas where we already have some joint appointments whereas others come from elsewhere. For a number of our courses and potential new ones, it is helpful to tailor a class to the needs of students from a certain area. For instance, it is clear that an audience of students from the social sciences will respond to different motivations and examples than (say) those in engineering. As the size of the audience warrants, we very much hope to expand the number of “tailored” courses.

• Cluster hiring activities — In attempting to achieve our hiring goals over the next several years, we generally plan to actively participate in cluster hiring proposals. This will be especially the case for hires in the statistical genomics and computing areas. We currently are working on a cluster hiring proposal for Fall 2000 that would include (at least) one hire in the area of statistical genomics, which would most likely involve a joint appointment between Statistics and CALS or the Medical School.

4. Academic Programs and Curricula

We have spent a considerable amount of time this year discussing changes in our academic programs and curriculum. We have devoted most of our efforts to our graduate programs. Our faculty have come to broad agreement on a number of issues but time was insufficient this year to result in formal action on an overall proposal. When we make such changes, we feel we need to do so all at once; a piecemeal approach seems a likely recipe for problems.

In the M.S. Program, we intend to raise the total number of credits for the degree. We expect to formally require a full year of mathematical statistics (600-610). Our main applied/linear models sequence 848-850 will be updated with attention devoted to use of the statistical computing packages S-Plus and SAS in analyzing data. For the Ph.D. Program we intend to modify the way that we expect our students to learn probability so that we can serve the needs of students entering with various backgrounds. Thus, we intend to prescribe a relatively specific coverage of probabilistic topics for our Ph.D. sequence on mathematical statistics (709-710) and work with the Math Department to prepare suitable courses for students whose background does not include the level of measure theory and probability required to take 709-710. The Ph.D. “category” requirements we currently require will be revamped. Beyond this, certain of our courses need to be modernized.
We also have given some thought to developing a broader package of options for undergraduate students. In particular, we are exploring possibilities of joint programs with the Math Department and with the new Biology Major.

5. Communications

Lack of time precluded making as much progress on this issue as we had hoped. We very much recognize the need for improved communication of our programs, activities, and accomplishments both on and off campus. One possibility is to provide a more structured Department Web page. Another is to prepare some sort of "annual report" of Department activities. Due to the amount of time we spent on direction and curricular issues, we have considerable work to complete in this area.

6. Conclusion

We are pleased with the results of this year's planning efforts. We have made real progress in developing a sense of direction for our Department. Also, we have discussed a number of curricular issues and believe that we are well over half done in putting together revised M.S. and Ph.D. Programs. Completion of this will be our highest priority for next year. The process of planning has been beneficial for the Department. We have had a number of excellent faculty discussions that led to serious dialog (particularly) on issues related to departmental direction and curriculum. These will definitely be continued next year and beyond.
Appendix A

Topics that Might Be Considered in Strategic Planning:

1. Direction of the Discipline
   - What is the common core of statistical enterprise (what separates us from other disciplines)?
   - What are new and expanding areas of activity within statistics?
   - What role does computation play in statistics? How will that role change? What role is statistics playing in the sciences? In other disciplines? How will that change?

2. Goals for Faculty Composition and Hiring
   - Identify ideal balance between “theory” and “application”; full-time and joint positions
   - Aggressively recruit senior women faculty
   - Identify goals regarding breadth of involvement with joint positions or other forms of ties with other programs: possibly, Engineering, Demography, Psychology, Probability, Computer Sciences
   - Identify background expectations of all faculty (theory, breadth, understanding of science)
   - Identify need for hires at a senior level
   - Develop 5-10 year hiring plan
   - Learn from models at other institutions

3. Academic Programs and Curriculum
   - Role of faculty in teaching (balance between individual desires and Department needs related to individual competence)
   - Determine what teaching capabilities must be maintained to reflect “common core of statistical enterprise” identified above?
   - Modify curriculum so that certain core techniques of current research and practice (eg bootstrapping) are required for all students.
   - PhD program
     - reevaluate and update PhD Exam Syllabus
     - Reevaluate and update requirements for PhD program
     - Modernize 709-710
   - PhD minor
     - reevaluate and update PhD minor
   - MS program
     - reevaluate and update (expand) requirements for MS program
   - Undergraduate program
     - reevaluate and update undergraduate program
     - Evaluate goals regarding expansion of undergraduate program
     - Consider joint program with Math
     - Investigate certificate program
   - General
     - Add, delete, and modify courses; Modernize course titles, descriptions, and syllabi for continuing courses

4. Faculty Rewards, Appreciation, Encouragement etc.
• Develop an agreed-upon reward structure and make it clearer (e.g., teaching vs. research; basic vs collaborative applied work)
• Specify expectations in terms of narrow focus vs. breadth
• For joint positions, clear enumeration of needs and expectations of all parties
• Improve mentoring system for assistant professors
• Improve within-Department awareness of each other’s contributions
• Encourage development of faculty (including grant submission)

5. Graduate Student Issues

• Reevaluate TA workloads and assignments; can split appointments be eliminated?
• Continue to improve recruitment of strong domestic students
• Encourage the recruitment of graduate students with background strengths in science.

6. Communications

• Enhance communications between us and other state departments, and between us and other units on campus
• Prepare a Departmental annual report: focus on a reader-friendly vocabulary and target a broad audience both inside and outside of UW
• Improve information delivery about our curriculum

7. Financial Issues

• Encourage contributions from industry
• Develop funding/infrastructure support for computing
• Increase funding support for colloquia
• Increase funding support for student travel to meetings
• Involve faculty in policy decisions about using “discretionary” moneys

8. Administrative Matters

• Reconsider committee structure, departmental organization
• Consider hiring a permanent lecturer to help with instruction and also with administration
• Develop system for responding to opportunities for growth (e.g., new positions)
• Build in a mechanism for updating strategic planning periodically
• Evaluate current space needs