Marc Mangel, Merit Increase 2010-11, Personal Statement

I will briefly review my contributions to teaching, research, and service assuming that readers have the BioBib for back up. The relevant review period is 24 Aug 2006-13 Sept 2010.

Teaching

I separate formal instruction and individualized instruction of research supervision.

Formal Courses

Since I had sabbatical in 2006-07, and various substantial administrative duties subsequent to that (Chair of AMS 2007-2009, Vice Chair of the Senate 2009-10, Director of CSTAR during the entire period), I taught only 4 formal courses during the review period.

In 2007-08, I had been scheduled to teach AMS 3 (pre-calculus) but the precipitous departure of Jorge Cortes left us without an instructor for AMS 214, so I taught that. In 2008-09 I taught AMS 215 (Stochastic Models in Biology), a new course in our program, and AMS 290 (Advanced Topics in Mathematical Biology), and in 2010-11 AMS/ECON 11A (Mathematical Methods for Economists I). In essence, each of these was a new preparation, although I had taught some version of each course at some prior point in my career.

One of the themes in my courses is to empower students. Norm Matloff, a faculty member at UCD, decided that my approach was sufficiently powerful to begin his book with a quotation from the syllabus of one of my courses (http://heather.cs.ucdavis.edu/~matloff/132/PLN/ProbStatBook.pdf, Chapter 1 on 'Time Waste Vs. Empowerment'). He also quotes Woody Allen and Richard Feynman at the start of this chapter.

AMS 290 was a graduate seminar on policy relevant science. It let to publication J32 with the students.

Research Supervision

I believe that in a research university such as UCSC we change the world one student at a time and that the research supervisor provides intellectual, financial, and emotional support for the student. My PhD students must find their own problems, so that in essence I work for them.

During the review period, I supervised/co-supervised the completion of seven PhD theses in three different PhD programs and one MSc thesis (pg 35 of the BioBib). All of the PhD students are employed in positions that use their skills. I currently supervise three PhD students in two different graduate programs at UCSC and co-supervise one at the University of Haifa and I served on two PhD and one MS committee of students who completed their degrees during the review period (pg 37). I currently serve on three PhD committees (other than my own students). I currently supervise two post-doctoral
scholars (Will Satterthwaite and Ole Shelton) and during the review period also supervised Kate Cresswell, David Swank, Stephanie Carlson (NSF Bioinformatics Post-doc jointly with Thanasis Kottas), and Cynthia Kern (pg 41-42). Three of the graduate students supervised were women, and two were Hispanic. Three of the post-doctoral colleagues supervised were women.

During the review period, I supervised 4 undergraduate research students, one of them from UCM, participating in the UCLEADS program for minority students (pg 43).

Research

The goal of my research is to use mathematical methods to solve problems in biology. To do this, the fundamental law of evolution by natural selection is operationalized through mathematical models. The methods that I use are stochastic optimization, dynamical systems, and Bayesian statistics. The major themes of my work are quantitative methods for fisheries management and the evolutionary biology of aging and longevity, including understanding stem cell dynamics.

Publications (pg 6ff of the BioB)

During the review period, I published 36 journal articles (of which 33 were peer-reviewed), one book chapter, and 4 book reviews. The article can be grouped as follows: Evolutionary biology of age and longevity (J1, J3*, J5, J8*, J11, J17); Quantitative methods in ecology (J2, J4, J7*, J9, J13, J15*, J16, J20, J21, J23, J24, J25, J28, J31*, J36, BC1); Policy relevant science (J6, J22, J30, J32, J33, J34); Southern ocean krill and response to climate change (J10*, J12, J18, J27, J29, J35); Steelhead trout and water management in California (J14, J19*, J26). Articles that are marked by * are ones that I suggest reviewers who are unable to read all of the papers look at. In all of my book reviews, I try to follow the example Peter Medawar who used every book review—no matter how short—to make a strong intellectual point. I encourage reviewers to look at BR1 especially.

I do not put my name on a paper unless I have done substantial work, which is more than providing comments on drafts. Thus, my BioBib (pg 52ff) contains a list of publications by my group on which I have had substantial input but considered that my effort did not warrant inclusion as author.

Grants

During the review period, I received increments on my CSTAR Training grant (bringing it to more than $1.2M over the last decade), Lenfest Ocean Program Grant (bringing it to a total of about $800K) and CalFed Science Program Grant (bringing it to a total of $1.2M). In addition, I received 4 new grants: two from the Fisheries Service, one from NSF, and one from the North Pacific Research Board (details on pg 3 of the BioBib).

A major component of my grants is to support students and post-docs, both my own and those of colleagues. In addition to my own students, during the review period I supported Chris Simon on my CalFed Science Program grant and starting in summer 2010 Maria Deyoreo through CSTAR related work; they are PhD students working of Hongyun Wang and Thanasis Kottas, respectively.
I also mentor students in their application for their own grants. During the review period, my student Kate Richerson (EEB) received both NSF and NMFS/Sea Grant graduate fellowships and Valerie Brown (SAM) a NMFS/Sea Grant graduate fellowship. There were 6 NMFS/SG Fellowships given in the nation and my group received 2 of them.

**Recognition**

During the review period, I was elected Fellow of the American Institute of Fishery Research Biologists and Foreign Fellow of the Royal Society of Edinburgh (the National Academy of Scotland). The official description of the RSE is “The Royal Society of Edinburgh (RSE) is Scotland’s National Academy. It is an independent body with a multidisciplinary fellowship of men and women of international standing which makes it uniquely placed to offer informed, independent comment on matters of national interest”.

I was the inaugural speaker in the Lamberson Ecology Trust Lectures at Humboldt State University, and gave endowed lectures at the University of Wisconsin, the University of Oxford, and CSIRO in Hobart, Tasmania (pg. 2). I gave numerous plenary or invited lectures (pg 24ff) and department seminars (pg 28). Regarding the latter, I point to the one given at the University of Washington in May 2010. I was the third speaker in a series in which students select the speakers. The speaker in 2009 was Simon Levin and in 2008 was Jane Lubchenko. Both are members of the NAS (and Jane is currently Director of NOAA). I also take note of the talk given in Jerusalem in July 2010; this was an 80th birthday celebration for Prof Dan Cohen, one of the great geniuses of evolutionary biology. Danny specifically requested that Simon Levin and I be invited to the meeting.

Other kinds of recognition came during the review period as well. For example, in 2007 Dr. S. Elworthy (then at Princeton University Press) did a review of the 30 most influential books in ecology and my book *The Ecological Detective. Confronting Models with Data* was in the list. Although the *ED* is now somewhat dated, it was the first book to introduce modern statistical methods (including likelihood and Bayesian ones) to ecologists.

In August 2010, my group was given the award for the best paper published in the *Transactions of the American Fisheries Society* in 2009, for J19. In 2009, *TAFS* had four issues and published a total of 95 papers.

**Contributions to Diversity**

These are explained in the section on teaching.

**Service**

*University Service*

My major service during the review period: I chaired the Department of Applied Mathematics (2007-2009), served as Vice Chair of the Academic Senate (2009-10) and since 1 July 2010, I have served as the Director of the Program in Technology and Information Management. I chaired the subcommittee of the Senate Executive Committee that prepared an analysis and recommendation concerning updating the Narrative Evaluation System and presented the analysis and recommendation at the
Senate meeting in April 2010. I also chaired the campus-wide ad hoc committee on Public Health in 2007-08 and was elected to the Academic Senate Committee on Committees in 2008 (serving 2008-09). Other service is found on pages 22-23 of the BioBib.

Professional and Public Service

I organized an international meeting, sponsored by the Lenfest Ocean Program, on “Identifying and Resolving Key Uncertainties in Management Models for Krill Fisheries”. I continue to serve on three editorial boards (pg 33) and have rejoined the Board of Directors of FishWise, a non-profit dedicated to training point of sale persons in grocery stores in sustainable fisheries started by my MSc student Teresa Ish. With a new focus in SoE on entrepreneurship, my experience in guiding Teresa in the formation of FishWise and return to the Board of Directors is timely and relevant.

In 2010-11, I will conclude seven years of service on the Special Committee on Seals (SCOS, the last three as Chair), which advises the British government on seal conservation in the UK through a process in which we answer questions posed by the Department of Environment, Food and Rural Affairs (UK), The Scottish Parliament, and Marine Scotland (The Scottish Government). During this time, we have guided the development and implementation of a Bayesian model for grey seal population dynamics to the point that now a single model, which will be used for management considerations, receives nearly 100% of posterior probability.

I have served on the Scientific Advisory Board of the UCI Center for Complex Biological Systems since 2008, on the Steering Committee for the University of Florida IGERT in Spatial Ecology since 2009, and on the Scientific Advisory Board of the Florida State University Coastal and Marine Laboratory since 2008.

I chaired three external reviews: the Fisheries Centre at the University of British Columbua, the US Antarctic Marine Living Resources (US AMLR) program, and the Department of Applied Mathematics at the Naval Postgraduate School. I also participated in the external review of the Sea Mammal Research Unit at the University of St. Andrews.