Submittee: Laura Cowen
Date Submitted: 2011-12-02 11:02
Title: Pacific Northwest Statistics Seminar
Event Type: Conference-Workshop

Location:
University of Victoria

Dates:
October 14, 2011

Topic:
Circular Distributions and Fisheries Models On Friday October 14, 2011, we are holding the Pacific Northwest Seminar in honour of Dr. Bill Reed who retired from the University of Victoria on July 1, 2011. The seminars will focus on two areas that Bill has worked in: assessing goodness-of-fit and applied statistics. Michael Stephens will offer a theoretical discussion of assessing the fit of circular distributions and emerging issues in this field. Jon Schnute will discuss applied fisheries models and will look at what further research is required in this area.

Methodology:
2 seminars, poster session with student poster competition, dinner banquet

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Organizers:
Cowen, Laura, Mathematics and Statistics, University of Victoria Dean, Charmaine, Statistics and Actuarial Science, Simon Fraser University

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Speakers:
Dr. Jon Schnute, Adjunct Professor, UBC Fisheries Centre Title: Mathematics and Ecology: Heavenly Marriage, Shotgun Wedding, or Impending Divorce? Abstract: Mathematics and ecology have a natural affinity through the concept of quantity. For example, the question "How many fish are alive in the sea right now?" has a quantitative answer that depends on precise definitions of "fish", "alive", "the sea", and "right now". If an ecologist tries to answer this question, she will probably solicit the help of a mathematician or statistician who knows something about sampling theory (a heavenly marriage). If she applies for funding and the proposal doesn't include a mathematical component, she probably won't get any money unless that component is added (a shotgun wedding). I can now reveal that, based on my definitions, the answer to this question is 12,288,052,987,972 fish. When she discovers that I've played a sneaky mathematical trick to give an utterly false sense of precision and accuracy, she will probably fire me (an impending divorce).
In this talk, I'll trace the role of mathematics as a descriptor of the real world, quickly citing the work of famous scientists, including: Nicolaus Copernicus, Tycho Brahe, Galileo Galilei, Johannes Kepler, Rene Descartes, Isaac Newton, Leonhard Euler, Carl Friedrich Gauss, Florence Nightingale, Bernhard Riemann, Ludwig Boltzmann, Albert Einstein, Richard Feynman, and Steven Weinberg.

From there, I'll move to somewhat more familiar territory among the mathematical and ecological communities at the University of Victoria with a discussion of work by Carlo Cercignani, Marvin Shinbrot, Reinhard Illner, Buzz Holling, Carl Walters, Colin Clark, and the celebrated Bill Reed. What has this generation of ecologically oriented mathematicians accomplished? What natural limits apply to mathematical descriptions of ecology? In what directions should students and future scientists focus their research? You might want to attend this lecture, if only to watch me self-destruct as I attempt to cover so much territory in a single lecture. // Dr. Michael Stephens, Professor Emeritus, Department of Statistics and Actuarial Science, Simon Fraser University Title: a) Rayleigh's Test: A discrete look at the drunken man, and b) Testing Benford's Law Abstract: An interesting correspondence between Karl Pearson and Lord Rayleigh took place in 1905 in the pages of Nature. Suppose a man takes successive steps with random orientation. Pearson wanted to know how far he would be from the starting point 0 after N steps. Suppose this distance is R. Lord Rayleigh gave a large-N solution, and the next year Kluyver gave a full mathematical solution. Pearson's question has become known as the problem of the drunken man. The size of R, for large N, is often used to test if directions are uniform around a circle. This is called Rayleigh's test. The distribution of R has importance in studying directional data, and the von Mises distribution. Sometimes, in applied statistics, directions are grouped into cells of angular width, say, 10 or 20 degrees, and all the directions in the cell are regarded as placed at the midpoint. New results will be given on the distribution of R for such data. An interesting conjecture arises. The second problem concerns testing fit for Benford's Law, which gives a discrete distribution for the nine possible first significant digits of sets of numbers. Work with Mary Lesperance and Bill Reed to test if data follows Benford's Law will be described.

Links:
