Environmental Statistics Short Course

June 11-13, 2001
Colorado State University
Fort Collins, Colorado

Contact Jim Loftis
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Following in the footsteps of our week-long short course on the Design of Water Quality Monitoring Networks, this new course is designed to provide additional content and experience with statistical methods appropriate for environmental monitoring, including water, air, and soil. Applications will include biological monitoring as well as chemical and physical variables. This course is especially appropriate for those

- who have already attended the network design course, or
- who wish to attend two courses in a row, or
- who are most interested in the statistical aspects of monitoring.

Notable Features of the Course

- The course will include lots of example problems and exercises.
- Computer labs will give students a chance to try the latest in software that works best for environmental statistics.
- The enrollment is limited to 18 students to provide one computer per student and individual attention from instructors.
- Course notes will be provided for each lecture.
- The teaching style will be very informal, and we will have FUN!

Topics and Tentative Schedule

Monday, June 11

Welcome and Orientation — Sanders
Introduction, Overview of the Design and Analysis Process

Sampling Environmental Populations — Loftis

Environmental Sampling Design — Iyer/Loftis
- Simple random sampling
- Stratified random sampling
- Systematic sampling

Computer Lab
- Overview of available software
- The EPA Sample Size Calculator

Tuesday, June 12

Quantiles, Proportions and Means, Standards Compliance — Loftis

The Lognormal Distribution — Iyer

Dealing with Nondetects — Loftis

Outlier Detection and Control Charts — Loftis

Comparing Populations — Loftis/Iyer
- Parametric methods including ANOVA
- Nonparametric methods

Computer Lab
- Using Spreadsheets and WQStat for statistical analysis

Wednesday, June 13

Comparing Populations, continued — Loftis/Iyer

Trend Analysis — Loftis
- Parametric methods including regression
- Nonparametric methods
- Accounting for flow effects, serial correlation

Multivariate Methods, a brief introduction — Iyer
- Principal components
- Factor analysis

Computer Lab
- Using WQStat Plus, Minitab, and other packages

Text

Statistical Methods for Environmental Montitoring by R. O. Gilbert. Van Nostrand Reinhold, 1987.

Additional material will be included in notes provided during the course.

Course Fee

The course fee is $565, not including the text. The text may be purchased through most major bookstores and web sources for approximately $110 or less. All participants will receive a copy of our WQStat software (somewhat outdated) and will be able to purchase a copy of the new WQStat Plus for Windows from Intelligent Decision Technologies at $225, 50% off the retail price.

Instructors

Jim Loftis, Professor of Civil Engineering, Colorado State University

Hari Iyer, Professor of Statistics, Colorado State University

Tom Sanders, Associate Professor of Civil Engineering and Program Coordinator of Environmental Engineering, Colorado State University

Jim and Hari have co-taught environmental statistics at Colorado State University for the past six years, receiving glowing reviews from students with a minimal background in statistics. Both Jim and Hari effectively communicate statistical concepts to non-statisticians.

Tom and Jim have taught statistical concepts in the Design of Water Quality Monitoring Networks short course for over twenty years, still going strong based on word-of-mouth advertising.

Lodging

Many options for lodging exist within walking distance of the campus. These include bed-and-breakfast establishments such as the Edwards House Historic Bed and Breakfast, 970-493-9191 (www.edwardshouse.com) and Elizabeth Street Guest House (970-493-2337),
reasonably priced motels such as the Best Western University Inn (960-484-1984) , and the very nice University Park Holiday Inn (970-482-2626).