Advances in Agricultural Statistics

This project fostered research to identify and develop statistical methodology that is applicable to agricultural research and provided a forum for sharing information with and educating both statisticians and subject-matter scientists in the agricultural, environmental, and natural sciences.
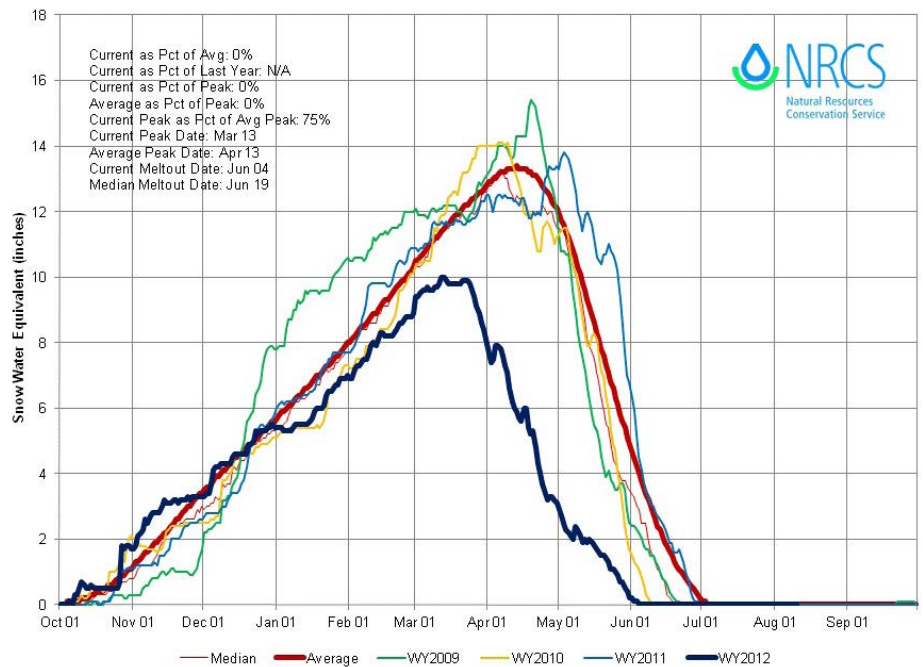
Who cares and why?

Statisticians who work as consultants and researchers in Agriculture Experimental Station environments enable land grant institutions to perform their agricultural research missions more effectively and efficiently; however, most stations have only one or two professional statisticians who cannot offer expertise in every area of statistics. With the increased availability of high speed computers, many new computation-intensive statistical methods and software have become available. This means that it is more challenging, but also more critical, for academic, government, and industry statisticians to work together to stay abreast of the latest statistical advances so that they can develop enhanced or new methodologies. This multi-state committee brings together statisticians who work in related areas at many stations. The resulting exchange of knowledge helps statisticians provide more effective and timely assistance to researchers in their respective states and institutions, determine the best solutions to common statistical problems, and guide future statistical research and software creation.

What has the project done so far?

This coordinating committee has served as a resource for its members and a sounding board for new ideas in applied statistical research. Several members of NCCC-170 are members of subject matter societies, such as the American Society of Agronomy, and have been instrumental in developing new subgroups devoted to specific topics. The group has also provided a forum for members interested in statistics from a teaching point of view. NCCC-170 members have presented many well-attended workshops (Mixed Model Analysis of Variance, Spatial Statistics) at national and regional meetings of several major subject matter societies and have diligently updated these workshops to reflect new approaches and software.

Arkansas River Basin Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Aug 10, 2012

Current as Pct of Avg: 0%
Current as Pct of Last Year: N/A
Current as Pct of Peak: 0%
Average as Pct of Peak: 0%
Current Peak as Pct of Avg Peak: 75%
Current Peak Date: Mar 13
Average Peak Date: Apr 13
Current Meltout Date: Jun 04
Median Meltout Date: Jun 19

It is increasingly important for statisticians to work together to standardize methods and models so that data can be compared among different places or so that trends, like snowpack amount (Map courtesy of NRCS) can be tracked over time. Using statistical analysis and interpretation, scientists can determine the significance of the year-by-year changes in snowpack level.

Impact Statements

Educated large numbers of researchers in a wide variety of disciplines on the application of the latest developments in mixed model analysis of variance and spatial statistics.

Enabled its members to provide more effective statistical advice and assistance to scientists at their home institutions by improving and broadening their expertise in several areas of statistics critical to agricultural research.

Developed new and enhanced statistical methods and best practices that take advantage of the latest research and software, helping statisticians better support scientists with higher quality data.

Provided its members with supporting material for educating the next generation of scientists in the use of the latest statistical methods.

What research is needed?

Scientists need to continue research on the application of statistics to agricultural problems, especially in emerging technologies such as various "omics" (e.g., genomics, proteomics) and precision agriculture which heavily depends on detailed observations about variations within fields. Further research is also needed on software that is able to correctly implement statistical analyses based on the newly developed methodology.
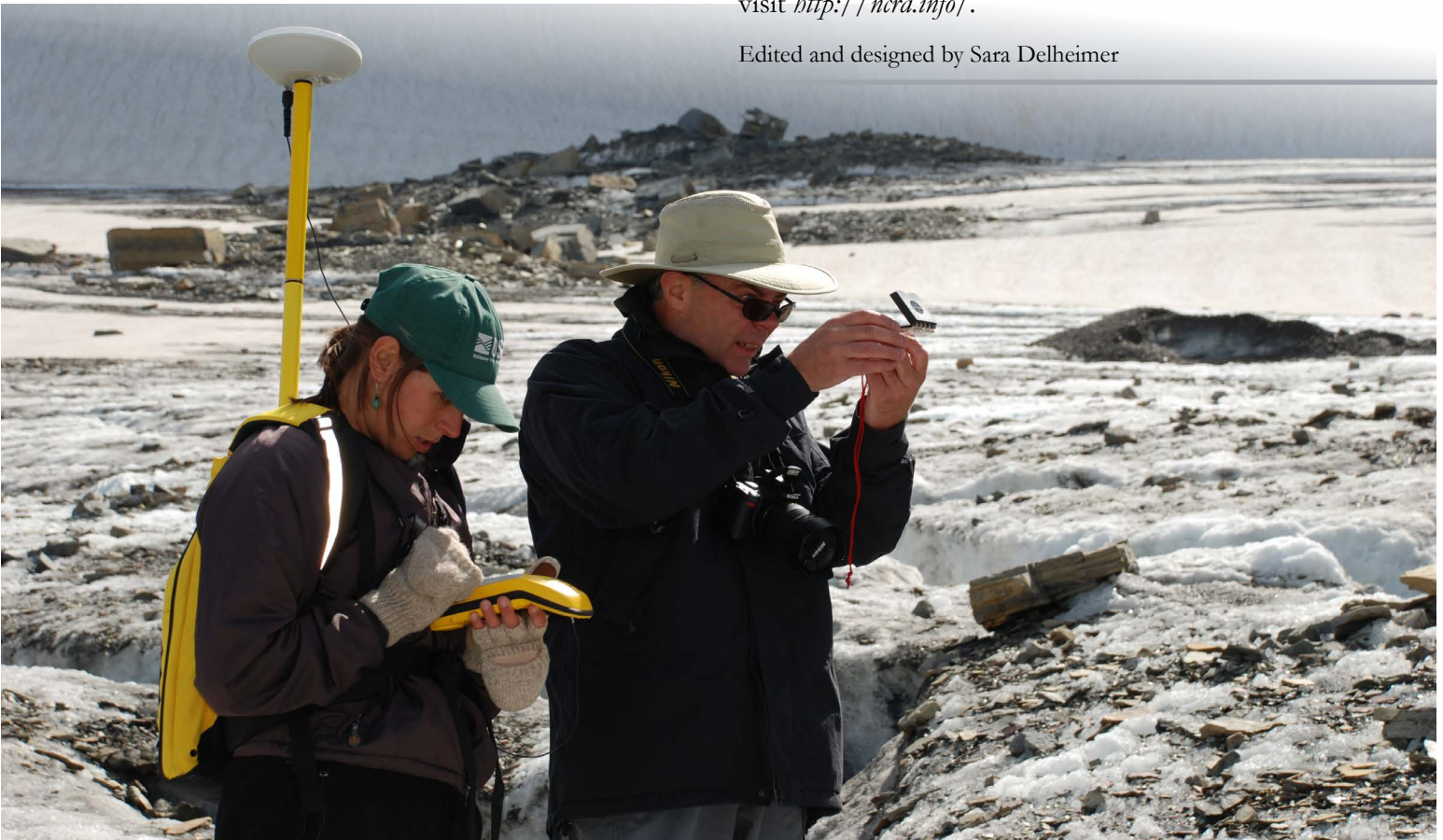
Want to know more?

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The data recorded by Global Positioning System (GPS) units can be analyzed and interpreted by statisticians in order to determine trends, such as changes in snowfall over time or the impacts of climate change. Keeping abreast of available technologies and developing appropriate statistical methods and models is necessary for statisticians to be able to help researchers understand their data and the significance of their observations. Photo courtesy of USGS.