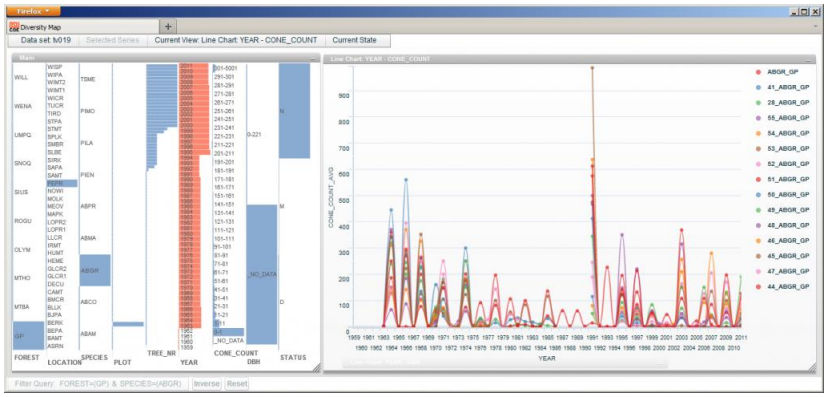
LTER ASM 2012 Working Group:

Interactive Visual Analysis Promotes Exploration of Long-Term Ecological Data



The visual analysis interface for the cone production data set opened in a browser window.

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Date: Monday Sep 10, 2012 16:00 – 18:00pm

Location: Ruesch Auditorium - Hobbs

Abstract

Long-term ecological data are crucial in helping ecologists understand ecosystem function and environmental change. Nevertheless, this kind of data is often difficult to analyze because they are usually large, multivariate, and spatiotemporal. Although existing analysis tools such as statistical methods provide rigorous tests of pre-conceived hypotheses, they have limited capacity to provide a holistic overview of the data and to enable ecologists to explore data iteratively. Interactive visual analysis of data, when combined with the existing tools, is especially appealing for long-term ecological data because it offers the potential to allow ecologists to explore data directly, formulate and refine hypotheses quickly, and discuss their findings with others, prior to further statistical analysis. This working group focuses on *information visualization (InfoVis)* (display of abstract data, which do not have natural mappings to 2D or 3D space, such as counts of insects, cone production, or vegetation cover) rather than *scientific visualization (SciVis)* (rendering volumes or surfaces realistically, such as rendering of multiple layers of trees in a forest from LiDAR data). This working group will explore how interactive visual analysis of ecological data may help ecologists formulate hypotheses and structure analyses of long-term ecological data. We will demonstrate our web-based interactive visual analysis tool of several long-term data sets such as of moths [Miller], cone production [Franklin], and vegetation cover [Halpern, Pabst]. During the session, we will invite participants to experiment with the visualizations and give feedback regarding improvements to the tool. More information on the proposed working group can be found at: http://web.engr.oregonstate.edu/~pham/asm2012-visual-analysis/ or http://goo.gl/9IDiJ

Agenda

Introduction (10 mins)

Presentation and Discussion on Long-term Ecological Data and the Proposed Visualization Tool (30 mins; see ecovis_workgroup_slides.pdf)

Demos and Hands-on Exercises (60 mins)

Note: Participants used their laptops during the hands-on exercises

Discussion and Feedback (including filling out a short survey -- see ecovis_workgroup_survey.pdf) (20 mins)

Participants

In summary, the list of participants includes one faculty, four site managers/information managers, five post-docs, and five graduate students. Please refer to ecovis_workgroup_participants.xlsx for a full list of participants.

Summary and Next Steps

The meeting was an information exchange session. We learned three things from the working group: (1) how ecologists approach long-term ecological data, (2) how interactive visualization may help with the process (see ecovis_workgroup_slides.pdf for more details), and (3) the pros and cons of our proposed visualization tool. In particular, the participants liked the tool for its ease of use, holistic view of large data, and interactivity. Nevertheless, the participants wished the tool supported more chart types (e.g. dual-scale time-series line chart) and data import features so they can upload and visualize their own data.

Our next steps are to continue to improve the tool following the feedback and most importantly, make the tool publicly available for LTER community. We will keep the participants posted on the progress of the project.