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The Nitty Gritty of South Carolina Soil Orders

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Abstract

Detailed information on soil orders of South Carolina is available but not in a digestible format for various state stakeholders. The goal of this first semester Creative Inquiry is to develop stakeholder-appropriate tools regarding general soil characteristics of South Carolina. A poster, extension bulletin, and interactive Web map depicting and explaining the soil orders of South Carolina are the first tools produced. The poster are targeted for K-12 teachers as teaching aids and will accompany lesson plans for meeting school standards. The extension bulletin and Web map will be available for the public to use in exploring SC soil orders. By the end of the second semester, students will complete and present lesson plans to 7th grade science classes, and will identify at what classification level soil attributes will be used to integrate into the interactive Web map.

Introduction

Across the nation, enrollment in university soil science programs has been decreasing over the past decade. The goal of this Creative Inquiry is to develop resources that convey information about SC soil orders in easy to understand formats for different audiences in hopes to enhance understanding and spark interest in soil science.

Objectives

1. Develop a poster depicting the soil orders of SC for general use.
2. Develop an extension bulletin explaining SC soil orders.
3. Develop a lesson plan and lecture 7th grade students on soil characteristics as required by state teaching standards.
4. Identify other stakeholders and their needs in regards to how soils can help make sound-based decisions.
5. Develop a Web based interactive map showing soil orders and other state features (as determined from completing Obj. 5).

Materials and Methods

Soil Orders of South Carolina Poster

ArcGIS software (ESRI, Redlands, CA) was used to create a map of South Carolina that depicts the seven most prevalent soil orders found in the state. Data from the Natural Resources Conservation Service (NRCS) website and information from Brady and Weil (2007) textbook was used to generate the maps and for soil descriptions. Each order is distinguished by a color and includes a description of the characteristics of each order. This description includes the percentage of land the order covers in the state, were they are commonly found, color, texture, and their productivity. Each description is accompanied by a map that shows each order individually and a picture of a soil profile that serves as an example. A legend, compass, and scale bar were included on the overall map for reference.

Materials and Methods Cont.

Extension Bulletin

An extension bulletin is being developed using the same resources as for the poster. This extension bulletin is more inclusive, providing explanation for the identification, characterization, and management of each order. The bulletin includes a soil profile diagram of the horizons for each soil order.

Lesson Plans and Lectures

Two lesson plans are being developed to address the 7th grade Teaching Standard 7.E.5 with intention of meeting the Performance Indicator 7.E.5.2.

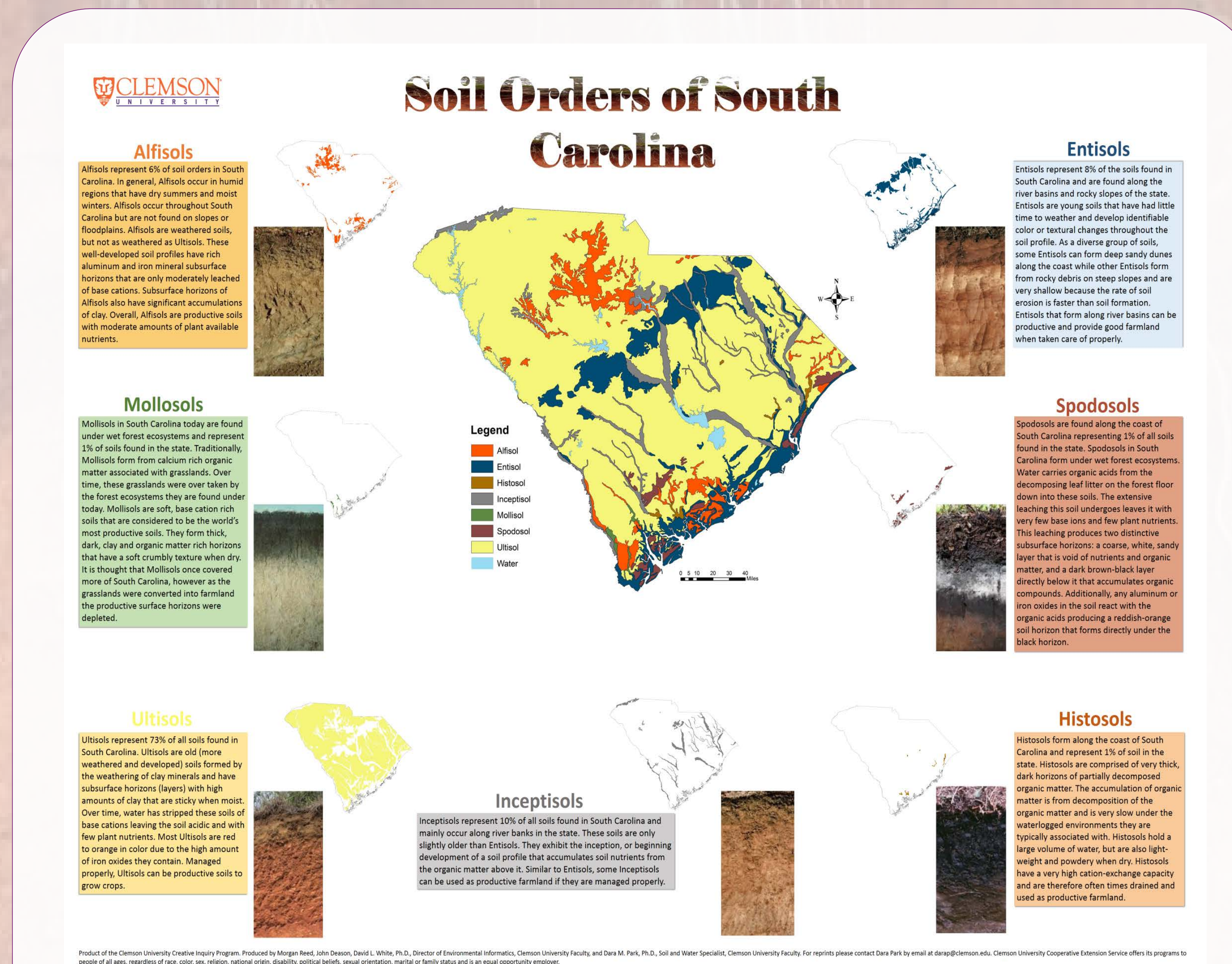
Interactive Web-Based Map

An interactive map is currently being developed to assist stakeholders explore characteristics of SC soils, their common uses, and management options. Identifying the appropriate soil classification level to display the data is currently being determined.

Results and Discussion

Soil Orders of South Carolina Poster

The poster (Fig. 1) consists of one large map containing all seven orders, plus a separate category for surface water bodies, was created in addition to seven smaller maps that depicted each soil order individually. Each soil order was assigned as color to define the order boundaries. The information provided is intentionally limited because the poster is meant to be an eye catching resource for teachers and students to generate interest and explore the concept of soil quality and their significance to the ecosystems the soil orders are found in.



Soil Orders of South Carolina Poster to be used as a teaching tool.

Figure 1

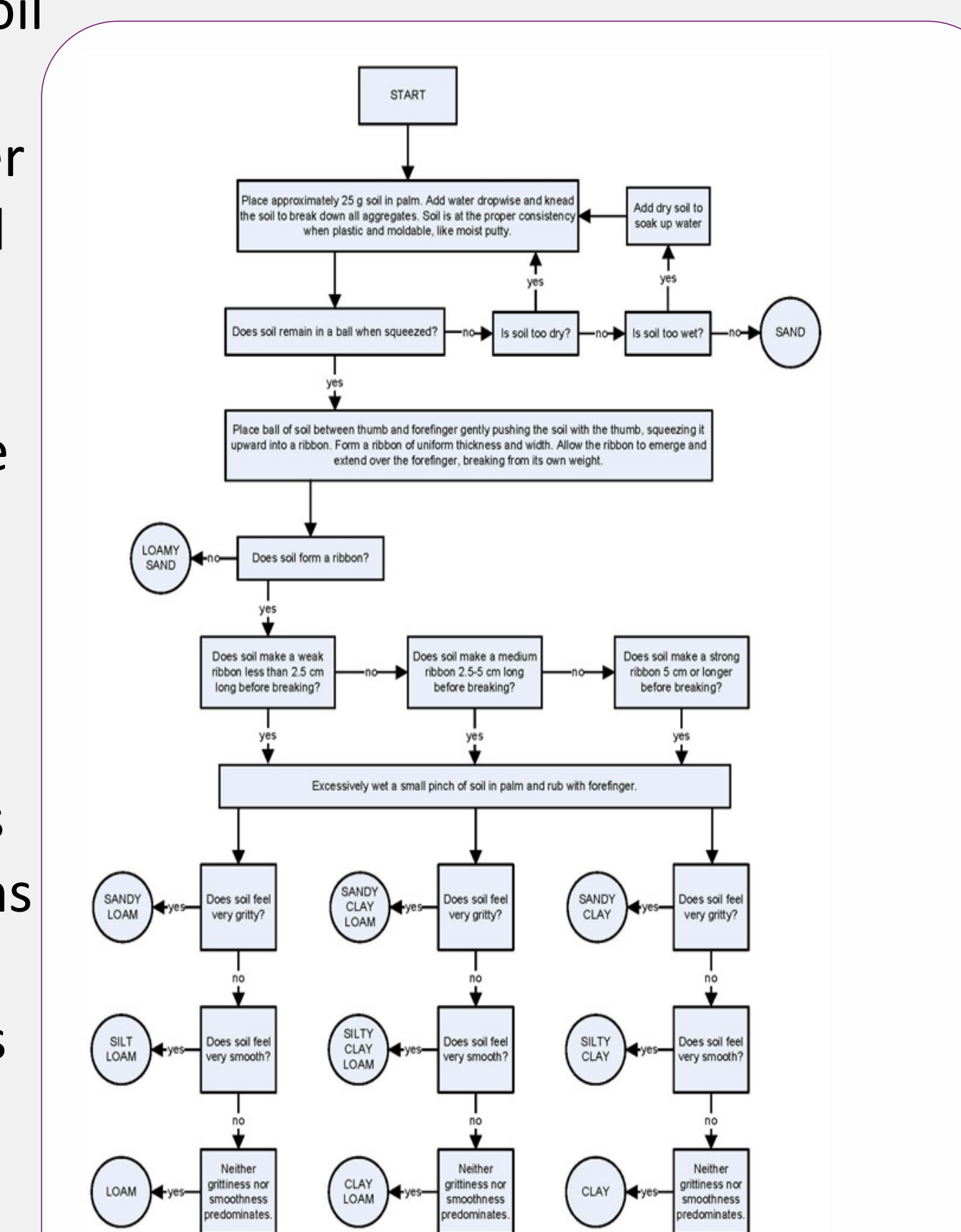
Results and Discussion Cont.

Extension Bulletin

The extension bulletin will be more technical in describing each of the seven soil orders found in South Carolina. This resource is to be used by various stakeholders. For example, while it may assist in high school and college students understand the soil orders in SC, it is also meant for stakeholders such as farmers and pine plantation managers to discover soil properties they may have on their land.

Lesson Plans and Lectures

Lectures will focus on soil texture, color, mineral separates, pH, and other characteristics of SC soil orders. Students will be engaged by actively determining soil texture using the "Texture By Feel" Method (Fig. 2), determine color using a Mussel Color Chart, and an informative soils version of bingo. Lessons will be completed and delivered to 7th graders in Fall 2014.



Flow chart to determine soil texture by the feel method.

Figure 2

Interactive Web-Based Map

The current USDA-NRCS Web Soil Survey is slow (and sometimes unresponsive) and not user friendly for the general public. The interactive map will be a much simplified version tailored to SC stakeholder needs. The map is currently being developed to assist stakeholders explore characteristics of SC soils, their common uses, and management options. Stakeholders identified are farmers, pine plantation managers, engineers, and well drillers.

Conclusion

Improving awareness of one of South Carolina's most precious natural resources, soils, will assist in attracting students to the soil sciences. South Carolina requires that students be taught minimal basic information about soils. We are creating attractive, fun tools (posters and lessons) to help students learn about the soils that they live on and how they influence their daily lives. In addition, developing stakeholder resources that are easy to understand, is essential to improving awareness of the importance of soil and its correct use and management.