

Bringing Forest Floor & Humus Form Classification to Life Using Multimedia & Mobile-Based Learning

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Better Education on Soil Classification is Needed!

Soil description and classification are important skills for most natural resource professionals. Those who work in regions with extensive forest ecosystems, such as British Columbia, need to have an understanding of forest floor description, humus form classification, and the processes involved in forest floor development.



Expertise is possessed by relatively few. There is a risk of knowledge deficit for future generations (Photo credit: Maja Krzic)

Challenges of Forest Humus Form Classification:

- Requires extensive field practice for learning and retention
- Incorporates visual, tactile and memory recall learning
- Relatively few learning resources are available; those that do exist are static and often require interpretation or guidance from an expert

Project Objectives

To improve post-secondary education of forest humus form classification by developing:

- The **Forest Floor Tool** - an online, multimedia supported educational resource
- The **Forest Humus Forms Quest** - a mobile, game-based educational quest
- A learning unit that integrates these two tools in Introductory Soil Science courses at UBC & SFU, Canada.

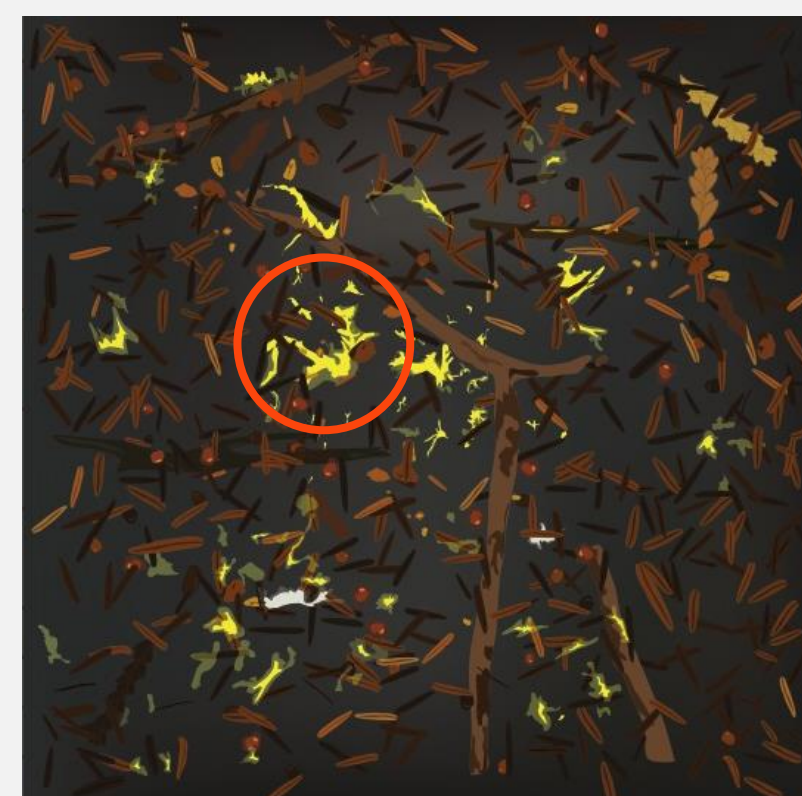
All these are scheduled to be piloted in early 2015.

Technology-Enhanced Learning In and Out of the Classroom

The **Forest Floor Tool** is a **multimedia website** providing students the information to complete a humus form description and classification, while gaining an understanding of the important ecological functions of the forest floor.



Videos feature interviews with an expert, explaining organic horizons, humus forms, ecological importance and how to sample and describe the forest floor (Photo credit: Julie Wilson).



Graphic elements are used to highlight important properties of organic horizons, supplementing the text, videos, photographs and tutorial featured on the website. Fungal hyphae are highlighted here. (Graphic design: Claire Roan, Photo credit: Darrell Hoffman).

Implementation and Evaluation

- With the aid of the **Forest Floor Tool**, students will be asked to complete a basic description of a humus form sample and a follow-up assignment requiring them to delve deeper into the subject matter.
- Students will be **surveyed** and **interviewed** to determine their level of satisfaction with the tool, the effectiveness of individual elements and receive suggestions for further improvements.

Forest Humus Forms Quest at UBC Farm, Vancouver

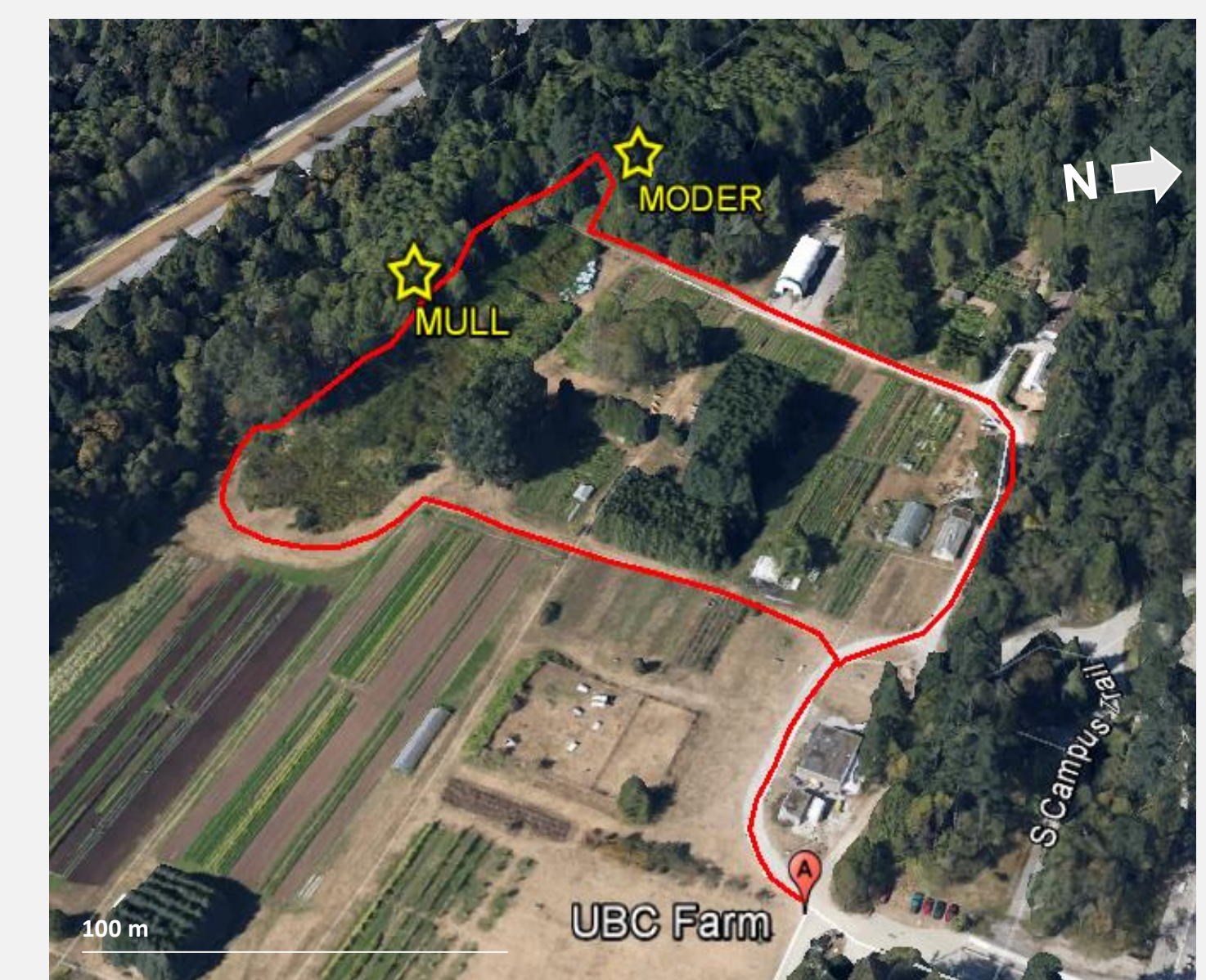
The **Forest Humus Forms Quest** is an **interactive game**, similar to a scavenger hunt, where users navigate an area and answer questions or decipher clues about particular points of interest.

The **Forest Humus Forms Quest** is a field-based, group activity that supports the **Forest Floor Tool** and learning unit.



- Based on the **Questogo™** platform, a FREE mobile app (developed by 14Oranges Software Inc.).
- It utilizes a smartphone's GPS to identify when the user has reached a desired location and then is prompted to answer a question.

- Students work in small teams to complete the Quest by following directions and answering questions.
- They walk to different forest stands on the UBC Farm and observe the forest floor.
- Points are awarded for correct answers and are posted to a connected scoreboard in real-time.



Aerial overview of the Forest Humus Forms Quest flow path (Source: Google Earth).

Why Use Mobile-Based Learning?

- Competitive games stimulate student motivation and performance.
- Quests can be effective self-study tools, and a useful means to engage in course content.