Using Group-based Cloud Computational Models as a Way to Help Students Investigate Complex Yellowstone Trophic Interactions

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Abstract

Group-based Cloud Computing (GbCC) is an agent-based modeling problem. This poster describes the implementation of a "Wolves-Elk-Aspen" simulation and four day curriculum that was developed to allow students to explore the impact of extirpation of wolves in Yellowstone National Park.

1. Introduction

School-based learning occurs in group settings; however, instruction typically engages only the individual by following the initiation - response - feedback (IRF) sequence (Wells, 1993). For classrooms to engage in generative teaching and learning, instructors must design situations for groups of students to construct relations between stored knowledge, experience, and new information (Wittrock, 1991). Using the taxonomy of generative design provided by Stroup, Ares, and Hurford (2004) scientific modeling allows learners to engage in generative learning with the help of educational technologies (Petrosino, Stroup, Harron, & Sherard, 2017).

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2. Agent-based Models and Simulations

Group-based Cloud Computing (GbCC) is an agent-based modeling program, powered by NetLogo Web (Wilensky, 1999), designed to allow learners to work collaboratively as they participate in, author, and share models. Next Generation Science Standards require students to learn about food webs, species interactions, and the negative impact of human actions; however, the standards fail to capture the emergent and complex nature of these topics. To address this, the GbCC "Wolves-Elk-Aspen" simulation was developed to allow students to explore the emergent impact of extirpation of wolves in Yellowstone National Park while engaging in participatory scientific modeling practices (Wilensky & Stroup, 1999). The figures below share some of the lessons, concept maps, and models we have developed related to a curriculum that utilizes GbCC.





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