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Integrating sustainability into: Socio-Environmental Synthesis and Sustainability Research (approved, course number pending)

Socio-environmental synthesis is a research approach that seeks to produce actionable knowledge on environmental problems through the integration of large, often heterogeneous datasets from both the social and natural sciences. Many of today's urgent environmental problems are also social problems, linked with human agencies and socio-political decision-making. Understanding whether socio-environmental systems are sustainable or not is a key part of producing actionable science – science that is in a readily useable form for policy makers who, ultimately, drive much of environmental decision-making. In this course, considerable time will be invested in understanding sustainability as a temporal measurement of the suitability of decision-making for promoting a healthy and stable natural environment.

One of the ways sustainability will be incorporated into this course will come through using a *case-study* approach to teaching socio-environmental synthesis. One of the case studies that will be presented will be on soil erosion in Latin America, one of the most pressing environmental problems of recent centuries in the region. During presentation of this case study, students will be introduced to the following three sustainability learning objectives or “big ideas”:

- Environmental Justice: achieving the basic human right for all to enjoy a healthy environment and, more specifically, the distributional patterns of environmental costs, benefits, and risks among human communities.
- Systems Thinking: this is a basic, core concept of both socio-environmental synthesis *and* sustainability studies in that it promotes awareness of the interconnectedness of human and natural systems and of the multiple feedbacks involved in human-environment relations.
- Food Security: this is a core principle not only for sustainability, but also in the soil sciences, the topic of the current case study. Soil health is directly related to food security and whether or not our current use of the soil can continue in perpetuity.

These three learning objectives overlap both with sustainability as a concept and as a practice, especially as they relate to soil erosion in Latin America. Assessment of these learning objectives will be made during: 1) discussion period after presentation of case study; 2) short quiz at end of first third of the course; and 3) the requirement to incorporate the concept of sustainability (along with core concepts) into students' final projects (see syllabus).