Connecting K-12 science reform to higher education STEM.
(A workshop with paper.)

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This paper and workshop discussion will examine how resources originally developed for improving K-12 science have been used successfully for that purpose AND how these tools have the potential for supporting reform in higher education STEM. The author will highlight stories and examples from several projects (K-20) at Colorado College over the past 10 years.

In the 1990s several seminal documents emerged from such groups as the National Academies (of science, medicine and engineering) and the American Association for the Advancement of Science (AAAS) designed primarily to inform and improve K-12 science teaching and learning. Among the reports and books were the AAAS's *Benchmarks* (1993) and *Atlas of Science Literacy* (now in two volumes, 2000, 2007) and the National Academies *National Science Education Standards* (1996), *Inquiry and the National Science Education Standards* (2001), and the often cited *How People Learn (1999)*.

In this paper and the workshop session the focus will be the AAAS *Atlas.* Both volumes help K-20 teachers determine developmentally appropriateness of concepts ("Big Ideas") as well as see how a teaching sequence of concepts might be modified based on the published 'road maps.' These road maps are broadly constructed (e.g., "Flow of Energy Through Ecosystems", "Structure of Matter: atoms and molecules," etc.) and always cut across disciplinary boudaries. Teachers not only see a sensible sequence, they realize how "Big Ideas" from different domains of science are interwoven and interdependent.

In reviewing one map, a chemistry faculty member noted that the conceptual flow map for Structure of Matter is the same sequence he uses in his introductory general chemistry. He discovered this by teaching for 20+ years and now verifies that the road map is a successful pathway with his college students. Yet the portion of the map he analyzed was for grades 6-12. How might maps in the Atlases be used as curriculum planning tools in higher education? This workshop (with paper) will explore answers to this question.