

NRE 5555 - Watershed Systems Stewardship

This course was first developed in a 2008 grant-funded collaborative effort by the Graduate School to promote interdisciplinary graduate education. I coordinated the Northern Virginia leaders in the College of Natural Resources and in the Science Education Department of the School of Education (College of Liberal Arts and Human Sciences) and welcomed the participation of other leaders in Environmental Engineering, Urban Planning, and Landscape Architecture. I designed the course with regional NGO support introduce course participants to summer explorations of Northern Virginia watersheds and their features and charactersitics, challenges, advocacy groups, and relevant resources.

In 2010, these courses were redesigned for Fall Semester evening courses, which restricted the field exploration that characterized the earlier course. This new course flipped the role of the instructor and students, and followed a project-based learning approach to give students the skills necessary for understanding a watershed of their choice and developing an advocacy plan and tools. Optional field explorations were offered on Saturdays.

In 2014, the course was redesigned for online delivery with students participating from throughout the world, and course learning objectives and assessments were re-aligned according to research-based best-practices in project-based inquiry. John Larmer and John Mergendoller of the Buck Institute of Education revised the five goals to eight essentials (Larmer and Mergendollar, 2011), including:

- 1. Significant content** - focused on important knowledge and concepts;
- 2. A need to know** - engaging and relevant themes;
- 3. A driving question** - clear, compelling language with a sense of purpose and challenge;
- 4. Student voice and choice** - as much student choice as the curriculum allows;
- 5. 21st century skills** - collaboration, presentation, media, problem-solving and reflection skills;
- 6. Inquiry and innovation** - opportunities to raise and explore new questions;
- 7. Feedback and revision** - rubrics, mentors and direct feedback; and
- 8. Publicly presented products** - a real audience for utility and rigor.

(continued)

Objective	Relevant Course Activities	Proposed Enhancements	Notes/Comments
1. Shift from natural resources to sustainable development	Mapping, Delineation and GIS; Web Soil Survey;	Emphasis on regulation, mitigation, and land swaps; Water treatment	Wetlands rights;
2. Emphasis on the global context of sustainable development challenges	Foundations of Ecology and Systems-Thinking; Student choice of study areas;	International comparisons of laws and initiatives;	
3. Relevant leadership strategies and skills for sustainability professionals	Nonprofit leadership; DiSC profiles	Volunteer Management; Membership organizations; Policy leadership;	
4. Applying science, facts and theory to problem-solving	Foundations of Ecology and Systems-Thinking; Threat Assessment;	Data aggregation; Multi-faceted analysis;	
5. Content and skills relevant to business, government and NGO's	Nonprofit Leadership; NGO and Agency profiles	More comprehensive Agency profiling	Local, State, Federal and International opportunity
6. Role(s) of businesses and market sector in addressing sustainability challenges	Threat Assessment;	Corporate Responsibility; Toxic Release Inventory;	Data analysis opportunity;

Biodiversity Stewardship

My Biodiversity course was designed and first delivered in 2014 according to research-based best-practices in project-based inquiry.