From the Mountains to the Ocean Chesapeake Bay Academy

Dates: August 6-10, Monday-Friday

Academy Theme: Hydro-ecological connections between the northern Shenandoah Valley and Chesapeake Bay

Academy Description: The focus of this five-day residential Bay Academy is to explore the Shenandoah River headwaters region and connect these headwaters with the Chesapeake Bay estuary watershed. Join us as we investigate this watershed sub-system to gain a deep understanding of watershed science, karst topography, field research skills, awareness of new technologies that can be used for MWEEs, and new skills for teaching a student-centered MWEE. Each day, we will learn from environmental scientists and education experts and will engage in investigative activities that model the process of science. We will take field excursions to two sites along the Shenandoah River where we will conduct a comparative analysis of site and water quality. We also will travel to karst sites to explore the groundwater hydrology of karst areas. The Academy will culminate with you sharing the outdoor-based watershed investigation lesson plans you create using knowledge and skills learned during the Academy. All participants will receive a comprehensive resource notebook, Project WET curricular materials, and take home models and tools that you construct during the Academy. Participants opting for graduate credit through VCU will develop a 4-lesson MWEE unit and will share a synopsis of their students' learning for at least one of these lessons. *From the Mountains to the Ocean Bay Academy* is based at the State Arboretum of Virginia (Blandy Experimental Farm), a University of Virginia field ecology research station in northwestern Virginia. You will stay in our historic Quarters building, once part of an antebellum estate. We look forward to learning with you!

Graduate Credit: Graduate credit (3 credits) will be available

For more information about the State Arboretum of Virginia go to: http://blandy.virginia.edu/



Tentative Daily Schedule for From the Mountains to the Ocean Bay Academy

Each day of the Academy will be structured to incorporate preparation (learning new science content and MWEE investigation skills), action (MWEE investigations outdoors and/or using on-line resources), and reflection (data analysis & synthesis, personal & group learning assessment, and application of new knowledge & skills to develop MWEE lesson ideas for teachers' individual classrooms).

DAY	SCIENCE THEME/*SOL(2010)*	TOPIC	INVESTIGATION	SKILLS
1	**Hydrosphere: Water cycle & watersheds** ***SOL:*** *6.1, LS.1, ES.1, ES.2, BIO.1 & 6.7, LS.6, LS.9, PS.1, BIO.8, CH.1, PH.1*	1. Introductions & Course overview 2. Personal & Group MWEE teaching assessment 3. Watershed Science: interdisciplinary connections	Field investigation: problem, question, hypothesis, & methods design	Practice w/ new field technologies
2	**Hydrosphere/Biosphere interface** ***SOL:*** *6.7, LS.7, LS.11, ES.6, BIO.9* **Hydrosphere: Water chemistry & aquatic ecology** ***SOL:*** *6.7, LS.9, LS.11, ES.1, ES.2, ES.8, BIO. 2, BIO.8*	1. Forest hydrology & the importance of riverine buffers 2. Aquatic ecosystem chemistry 3. Indicator species	Shenandoah River Site 1: Site analysis, water chemistry, & macroinvertebrate survey	1. Water chemistry: understanding the parameters 2. Using aquatic macroinverts as indicator species 3. How to conduct a site analysis
3	**Hydrosphere: Regional watershed &** **Hydrosphere/Atmosphere interface** ***SOL:*** *6.7, LS.6, LS.9, LS.11, ES.8, BIO.2, BIO.8*	Shenandoah River Watershed Hydrology Importance of outdoor-based watershed investigations for students	Shenandoah River Site 2: Site analysis, water chemistry, macroinvertebrate survey	1. Data analysis 2. Hypothesis evaluation 3. Creating a safe, outdoor-based watershed field trip for your students
4	**Biosphere: Terrestrial/Estuarine ecology** ***SOL:*** *6.7, LS.6, LS.9, LS.11, ES.8, ES.10, BIO.2, BIO.8*	Hydro-ecological connectivity between the Shenandoah River watershed and the Chesapeake Bay	Watershed boundaries, water flow, & water quality analysis investigations	1. Using Fieldscope 2. Using on-line water quality & weather data
5	**Lithosphere: Karst topography & groundwater systems** ***SOL:*** *6.7, LS.11, ES.10* **Stewardship: Land-use policy** ***SOL****: 6.5, 6.7, 6.9, LS.11, ES.6, ES.10, BIO.8*	**1**. Karst topography & groundwater hydrology **2**.Land use impacts on C.B. watershed **3**.Group presentations of lessons developed **4**.Personal & group MWEE learning assessment	Shenandoah Valley karst and spring sites	1. Using a karst hydrology model 2. Using hydro-geology models to investigate run-off & recharge