

2012 the “Survey on Human- Environment Interaction” was launched using SurveyMonkey. The survey aimed to explore how humans view their relationship to the natural world as well as how demographics influence beliefs about environmental issues. In September, with 383 respondents, the survey was closed for analysis. Over 90% of respondents agreed that there is a direct link between human health and environmental health and that environmental degradation is disturbing; therefore, this consensus may serve as a useful backdrop to environmental education. Age, education level, and political affiliation were found to play an important role in how humans view environmental issues; therefore, these characteristics may be useful in the creation of educational programs.

CURRICULUM MATERIALS AS A XOMPANION TO A LARGE MUSEUM EXIBITION ON HUMAN HEALTH AND WELLNESS. David B. Hagan, Science Museum of Virginia, 2500 W. Broad Street, Richmond, VA 23220. The Science Museum of Virginia has a statewide mission for informal science education. It has spent 14 months in research, planning and design for an 8,000 square foot interactive exhibit gallery focused on the human body and mind. It also produced a five-minute education curriculum video on the human body, its systems, chemistry, and physiology. Research on the function and visitor learning was conducted on the interactive exhibits using formative evaluation. Student groups (elementary through high school) were observed engaging with a selected set from each of the three main categories of exhibits, (Body, Mind and Play). The results of these evaluation cycles were used to implement modifications to the interactive exhibit units. In the Body section the exhibits included: an isometric bench press, a test of strength in pushing a fixed bar in a standing position; a test of balance on a 12-foot tightrope six inches above the floor; a test of reaction time in response to visual stimuli; a test of the visitor’s ability to assume a yoga position and hold it for ten seconds; a test of the visitor’s flexibility as measured by their ability to fit into a small space; and three exhibits focused on concepts related to nutrition, diet and food preparation in the Kitchen Theater. Visitor experiences in the Mind section include psychology-related engagements: a self-reported measure of happiness; two different short-term memory tests; a challenge of the visitor’s capability to cooperate in a group to succeed at a timed challenge; a demonstration of eye-tracking sensors showing where the visitor’s gaze was focused on an image; and a Sleep Theater experience that takes the visitor on a narrated journey through a typical night’s sleep showing the sleep cycles and levels of sleep. The Play section of the exhibit includes: playing percussion instruments, attempting to match and hold a given note as a test of perfect pitch; and an interactive overview of pastimes, hobbies and sports. The exhibit has been tested and is in the process of installation.

Environmental Science

PLANTS AS INDICATORS OF DISTURBANCE AT THE ABRAMS CREEK WETLANDS, A PROTECTED CALCAREOUS ECOSYSTEM IN WINCHESTER AND FREDERICK COUNTY, VIRGINIA. J. T. Walker, V. Thomas, W. S. Bousquet, D. F. Cooper, B. Ridgeway, S. Dieudonné, S. Kochman, J. Miller & G. Ayers. Environmental Studies Program, Shenandoah University, Winchester, Virginia 22601.

A 1998 study by Shenandoah University (SU) supplemented investigations by the Virginia Natural Heritage Program in documenting the ecological significance of the Abrams Creek Wetlands. In the spring and fall of 2012 SU researchers resurveyed four communities from the 1998 study. Using the relevé (Braun-Blanquet) method, community plots were described by their vegetation and physical characteristics. For each community, researchers compared the changes in relative cover by species from 1998 to 2012. Indicator plant species were selected by three criteria: large (≥ 3 s.d.) change in relative cover, rarity in Virginia, and low coefficient of conservatism. Factors potentially responsible for changes in vegetation were then identified. While the analysis is preliminary, it provides opportunities to better understand wetland ecology, improve wetland management, and protect local and regional biological diversity.

STORMWATER MITIGATION CHOICES BY THE GENERAL PUBLIC. Shane H. Abinette¹ & Eugene G. Maurakis² & ³, ¹Biology Dept., Virginia Commonwealth University, ²Science Museum of Virginia, & ³Biology Dept., University of Richmond. Objectives were to educate and survey visitors in the Rainkeepers exhibition at the Science Museum of Virginia regarding proper stormwater mitigation practices. Survey data were gathered from visitors' voting responses in interactive panels that asked 11 questions regarding the user's habits on littering, car washing, oil recycling and other topics from December 2012 –April 2013. Results showed a high visitor willingness to use pervious concrete and rain barrels but a lack of actual use of these materials. High levels of participation in litter and pet waste pick up, and reduced use of lawn pesticide were also found. A high willingness was also detected for recycling motor oil and converting lawns to native vegetation. For all questions, a majority of respondents claimed they already did or were willing to practice good stormwater management techniques. Funded by a National Fish and Wildlife Foundation grant.

LAND-USE PROBLEMS FOR LOCAL AIR QUALITY AND BIOLOGICAL CONSERVATION, A SIMPLE SOLUTION PROPOSED. Richard S. Groover, Department of Environmental Science and Policy, George Mason University, Fairfax VA 22030-4444. Local air quality and biological conservation is connected to land-use decisions and resulting changes. The citizens and the governmental officials often may not understand the importance of air quality or biodiversity conservation, and ecosystem connectivity with respect to their land-use decisions, but they need to become aware of such. Individuals or developers who wish to maximize their use of land and resources often have less concern for conservation. This presentation explores the current situation local habitat destruction and how these losses impact air quality, local biota in Virginia, how local governments are structured, local government decision-making processes, and what conservation supporting tools exist for them to use. Two win/win strategies for achieving better success with local air quality and biological conservation can improve local land-use decisions. One of the strategies is the development of an innovative proffer and mitigation approach to increase trees and improve carbon sequestration on land proposed for development. It includes an in-perpetuity protection of set-a-side forest areas. The second strategy involves an in-perpetuity protection of wildlife travel corridors, within the associated land being

rezoned. Both strategies would be utilized during the zoning change phase for property to be developed.

Posters

A COMPARATIVE ANALYSIS OF THE HEALTH OF THE NI RIVER AND MASSAPONAX CREEK IN SPOTSYLVANIA COUNTY. Dr. M. L. Bass, E. E. Stewart, A. T. Elliott & H. E. Richters, University of Mary Washington. The main focus of this research project was to determine the health of both the Ni River and Massaponax Creek in Spotsylvania County, VA. The two streams provide a good demonstration of the effects of urban development. There are four sample sites located on Massaponax Creek and three sites on the Ni River. At each site, macrobenthic samples were taken as bio-indicators of pollution. These samples were corroborated by water chemistry analyses, including conductivity, dissolved oxygen levels, fecal coliform, alkalinity, calcium hardness, phosphate and nitrate concentrations and total dissolved solids. All samples were taken within each season. An examination of the macrobenthic results indicate that throughout the summer, the %EPT of the Ni River was approximately 90% at most sites. The low was of 82.8% at the McEwan Farm site. At Massaponax Creek, the summer's %EPT ranged from 97.3% at the Wetland to a low of 62.7% at Route 208. These ranges are caused by variations in water chemistry. During autumn and winter, the %EPT's steadily fell, as the organisms completed their aquatic life cycles. It can also be noted that one particular site on Massaponax was afflicted by a high CFU count, as well as high spikes in alkalinity, phosphate and hardness in the winter. It has been determined that the Ni River is healthier than Massaponax Creek. This is represented by the higher EPT percentages and diversity of macrobenthic individuals within the Ni River. However, Massaponax Creek has maintained good health despite increased development within its watershed.

Medical Sciences

THIOREDOXIN-INTERACTING PROTEIN MEDIATES HCYS-INDUCED NLRP3 INFLAMMASOME ACTIVATION IN MOUSE PODOCYTES. Justine M. Abais, Krishna Boini, Min Xia, & Pin-Lan Li, Department of Pharmacology & Toxicology, Virginia Commonwealth University, Richmond VA 23298. Our recent studies have demonstrated that NADPH oxidase-derived reactive oxygen species (ROS) activates NLRP3 inflammasomes causing homocysteine (Hcys)-induced podocyte and glomerular injury, however the precise mechanism regarding how ROS activates the inflammasome is still unknown. The current study explored whether thioredoxin-interacting protein (TXNIP) mediates Hcys-induced NLRP3 inflammasome activation in podocytes. TXNIP, the regulatory inhibitor of the antioxidant thioredoxin (TRX), is thought to dissociate from TRX in response to elevated levels of oxidative stress to bind to inflammasome protein NLRP3 and activate the inflammasome complex. Genetic or pharmacologic inhibition of TXNIP by small interfering RNA or verapamil prevented Hcys-induced NLRP3 inflammasome formation and activation both *in vitro* and *in vivo* by reducing colocalization of NLRP3 with ASC or caspase-1, blocking Hcys-induced coimmunoprecipitation of TXNIP with NLRP3, and diminishing