Water Grand Challenges: Education & Outreach

Defining Environmental Literacy

Background – In the United States, the relationship between social behavior and environmental health is often not entirely understood by the general public. Environmental literacy is at times thought to be the same as environmental awareness. In actuality, it is a more complex concept that involves understanding the dynamics of the natural world, and the connection between human actions and environmental changes.[1] This can be taken for granted, resulting in ecological health taking a backseat to industrial progress. Such oversight is detrimental to the health of all entities in an ecosystem, including humans.

An illustrative example is the connection between forest dynamics and logging. If too large an area is harvested, not only are re-growth slower and the potential for nutrient leaching increased, but the biodiversity of the forested area is also jeopardized. Through understanding the effect of ecosystem fragmentation on wildlife and the role of tree root systems in maintaining water quality, harvesters can better plan environmentally sound logging practices.

The [Advisory Committee for Environmental Research and Education](#) (AC-ERE) formed through the National Science Foundation in 2000 developed a 10-year agenda to address environmental research challenges between human and environmental systems. In 2003, AC-ERE released a report on the state of environmental literacy in the U.S., stating that the public will need to understand environmental matters in order to assess risk and "understand how individual decisions affect the environment and local and global scales."[1]

Sustainable resource management operates under the idea that everything we as humans need for survival exists within our natural environment.[2] As the basis of sustainability and to ensure natural resource availability for future generations, environmental and human systems must be understood as interconnected from the very beginning.[3] Effective environmental literacy promotes environmental stewardship through hands-on training and applied knowledge (figure 1).[3]

Environmental awareness – This first step toward environmental literacy occurs when an

Environmental Awareness   **Personal Conduct and Knowledge**   **True Environmental Literacy**

individual has general knowledge of environmental issues and a deeper understanding of the causes and implications of environmental phenomena.[3] Awareness has been shown to contribute to public support for environmental policy and management.

Personal Conduct and Knowledge – The next step involves combining environmental awareness with individual action. Examples of this informed action are reducing one's carbon footprint through recycling, composting, and reducing individual run-off pollution.

True Environmental Literacy – Obtaining true environmental literacy requires a "depth of understanding" of environmental topics stemming from underlying environmental principals.[3] Environmental literacy implies that individuals have the appropriate skills to investigate the subject, comprehension of how to apply knowledge and skills to a problem, and the ability to fully explain the connection between environmental conditions and societal behavior.

Environmental Literacy in Texas – Although it is not a formal educational requirement in state schools, Texas informal educators have created TEKS-aligned K-12 environmental education curricula for science, technology, engineering, and mathematics (STEM) courses. Non-government organizations (NGOs), former educators, scientists, informal outdoor educators, and policy specialists joined forces to create a framework for natural resource education and environmental literacy and to implement environmental education into curriculum at the ground level.[4]

Formally introduced in 2013, Texas Natural Resource/Environmental Literacy Plan, is a non-partisan effort created through the Texas Association for Environmental Educators and the Texas Partnership for Children in Nature (TCIN). The roots of this effort stem from the No Child Left Inside Act (H.R. 2054), which was first introduced in Congress in 2009 and then re-introduced in 2011 into the Senate as S. 1981. Despite the legislative delay, educators nationwide continue to use informal environmental resources to supplement formal lesson plans in school. Many recognize the value of environmental education and experiential learning. These efforts have been shown to inspire students to pursue careers in science and produce a more effective approach to interdisciplinary instruction.[1]

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[1] NSF Advisory Committee for Environmental Research and Education. 2003. "Complex Environmental Systems Synthesis for Earth, Life, and Society in the 21st Century." National Science Foundation. January 8, 2003. http://www.nsf.gov/geo/ere/ereweb/acere_synthesis_rpt.cfm (accessed May 23, 2013).

[2] Environmental Protection Agency. What is Sustainability? http://www.epa.gov/sustainability

[3] Cole, K. Environmental literacy in America. 2005. Washington, D.C.: The National Environmental Education & Training Foundation.

[4] Texas Partnership for Children in Nature. "Texas natural resource/environmental literacy plan." Texas Association of Environmental Educators. 2013. http://taee.org/tnrelp_online.pdf (accessed May 22, 2013).