



## Hot Air from EEOP – *A Newsletter*

Environmental Education Outreach Program (EEOP)  
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Web version @  
<http://www.nau.edu/eeop/newsletter>

### **The Newsletter**

This newsletter is a service of the Institute for Tribal Environmental Professionals (ITEP) Environmental Education Outreach Program (EEOP). We've created this newsletter specifically for K-16 students, educators, and tribal professionals that are interested in learning more about environmental issues with a focus on air quality. The newsletter will also contain information about EEOP programs and activities.

### **Summer Scholars 07**

The EEOP Summer Scholars has provided a valuable educational experience for Native American students in middle school and high school since 1999. In late May we received notification that the Arizona Science Foundation awarded a grant for Summer Scholars. Since the money was late, we were only able to plan and complete one week of Summer Scholars this year. Although Summer Scholars 2007 was limited, we already have the funding for next year.

The Summer Scholars program provides Native American students a one-week, on-campus pre-college experience with emphasis in mathematics, science, and technology and how they can be applied to local environmental issues. One goal of Summer Scholars is to make students aware of opportunities that exist after high school. Students are encouraged to consider mathematics, science, and technology careers that require post-secondary education.

The topic for Summer Scholars 2007 was "Sustainability". Students worked in four teams throughout the week: Energy Team, Water Team, Building Team, and Transportation Team. A major focus throughout the week was to reduce air pollution, including the production of carbon dioxide. Each team developed recommendations for their school district on how to save money and reduce the environmental impact of their school operations.

The Energy Team identified various ways that energy could be conserved. They also recommended that the school invest in solar and wind power. The Water Team learned that conserving water is an important way to conserve energy. They also learned that Northern Arizona has been in a drought for many years, making water an increasingly important, yet threatened resource. The Building Team identified a list of considerations that should be incorporated into the new Middle School proposed for their district. Passive solar heating and natural daylight are important ways to reduce the carbon footprint of a building. The transportation team recommended that the school switch to bio-diesel for their buses and to stop idling when picking up students. In addition to reducing the carbon footprint, the Transportation Team students believe that these changes may also improve the health of bus riding students.

The EEOP staff will continue working with the students and teachers that attended Summer Scholars 2007 to see if any changes can be made in the school operations to reduce the carbon footprint of the school. For example, with the permission of the school administration, the students could do an energy audit and water audit on their school building, looking for ways to start saving energy and water. The EEOP staff will be recruiting schools to participate in the Summer Scholars 2008 program. If your school is interested, contact one of the EEOP staff for more details.

### **Air Quality – Bio-diesel Emissions**

The Summer Scholars students identified the use of bio-diesel as one way to improve air quality and reduce the impacts of bus transportation on global warming. One of the compelling observations about bio-diesel is that it has reduced emissions of particulate matter (PM), Carbon-monoxide (CO), and Hydrocarbons (HC). Additionally, bio-diesel has no sulfur oxide emissions. On the negative side there is a slight rise in nitrogen oxides.

Bio-diesel is a clean burning alternative fuel, produced from domestic, renewable resources. Bio-diesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a bio-diesel blend. It can be used in compression-ignition (diesel) engines with little or no modifications. Bio-diesel is simple to use, biodegradable, nontoxic, and essentially free of sulfur and aromatics.

No single energy solution has all the answers, but perhaps bio-diesel could be part of an energy solution. The Summer Scholars students investigated bio-diesel and are interested in considering bio-diesel for their school as one way of reducing air pollution, while also reducing the carbon footprint of their school district.

### **Neah Bay High School Joins GLOBE program**

During the month of August, one teacher and seven high school students worked with the EEOP staff to install a GLOBE atmospheric monitoring station at Neah Bay High school. The teacher and students also participated in a three day workshop on how to actively participate in the Global Learning and Observation to Benefit the Environment (GLOBE) program.

The GLOBE program is an international, hands-on, primary and secondary school-based science and education program. The vision of the GLOBE program is to promote and support students, teachers, and scientists to collaborate on inquiry-based investigations of the environment and the Earth system working with NASA and NSF Earth System Science Projects in study and research about the dynamics of Earth's environment.

During the GLOBE workshop at Neah Bay High School the students practiced science inquiry to explore how variations in the atmosphere such as temperature, pressure, and relative humidity manifest themselves in the local weather patterns. They looked at what atmospheric conditions will form various clouds, how and why the wind blows, and when precipitation is likely to fall. They also explored the concepts and issues surrounding global climate change and how it may affect their local community in the future. They spoke with elders in their community about changes in the local climate, both perceived and documented, that have taken place within the last century.

Some of the most enjoyable and long lasting experiences during the workshop came in the form of team building. Through simple team building and communication activities these seven

students have bonded together to developed the core of the school atmospheric monitoring team. Each student is currently completing an EEOP internship involving the GLOBE program.

If your school is interested in creating a GLOBE environmental monitoring program at your school, contact one of the EEOP staff.

### **Indoor Air Quality (IAQ) Building Assessments**

The EEOP staff has done several workshops preparing students and their mentors to conduct Indoor Air Quality (IAQ) Building Assessments in their community. One workshop was held at Southwestern Indian Polytechnic Institute (SIPI) in Albuquerque, New Mexico, another workshop was held for the Makah Nation in Neah Bay, Washington, and the final workshop was held at Northern Arizona University (NAU), Flagstaff, Arizona.

The workshop sessions prepared students, educators, and tribal environmental professionals to understand the impact of poor Indoor Air Quality (IAQ) on human health. The training covered issues such as radon, carbon monoxide poisoning, and asthma triggers. Following the workshop, students have been working with a Tribal Environmental Professional or educator in their local community to complete a 20 hour internship.

Several NAU college students also participated in the workshops. These NAU college students are available to assist educators and students with Indoor Air Quality (IAQ) Building Assessments in tribal communities near Flagstaff. They will introduce the US EPA Indoor Air Quality Tools for Schools program to educators, then work with educators and students to conduct an Indoor Air Quality (IAQ) Building Assessment of their school building. The NAU college students will bring the EEOP IAQ kit, which contains various instruments to facilitate making Indoor Air Quality (IAQ) measurements.

The data and observations collected during the Building Assessment will be provided to the school administration for their information and action. This is an educational program, not a regulatory program. Only the school staff receives the assessment reports. If your school is interested in doing an Indoor Air Quality (IAQ) Building Assessment, contact one of the EEOP staff.

### **New Grant – Engineering Outreach Program (EOP)**

The EEOP staff will be continuing the Engineering Outreach Program with funding from the Arizona Science Foundation. The purpose of the Engineering Outreach Program is to increase awareness of engineering as a potential career and help students understand how they can prepare for an exciting career in engineering.

Engineering is the combination and application of science, mathematics, and technology to create new products or to solve problems. Engineering has been called the "invisible profession" because most people have no clue what engineers do. This is unfortunate, because everything in our society is linked to engineering. Many people confuse engineering and science; however, engineering is not science. Engineers generally don't "do" science. Science is about discovering the natural world and how it works. Engineering is creating the artificial. Theodore Von Karman, an aerospace engineer, put it nicely when he said, "**Scientists discover the world that exists; engineers create the world that never was.**"

The EEOP staff is available to work with teachers and students to develop an understanding of engineering and to encourage students to consider engineering as a career option. If you are

interested in a classroom presentation or other information about engineering, contact one of the EEOP staff.

### **New Grant – Continued Funding for Wildlife Education**

The EEOP staff will be continuing the Wildlife In Native Schools (WINS) program with funding from the US Forest Service. The focus of this year will be “More Children in the Woods”. With the assistance of staff from the US Forest Service Rocky Mountain Research Station, the EEOP staff will be working with teachers and students from the region to increase awareness of our national forests and careers that involve management of forest ecosystems.

During forest visits to the Fort Valley Research Forest (near NAU campus) students will be introduced to forest management, ecology, wildlife and environmental issues through hands on activities. Topic areas will focus on forest management, biodiversity, land stewardship, wildlife management, basic ecological principles, related career opportunities, and the effects of good or poor air, water, and soil quality on ecosystems. In addition to learning activities, scientists will work with the students to learn about forest management. Guest speakers will be invited from various groups such as the Rocky Mountain Research Station (RMRS), NAU faculty, tribal elders, and Arizona Game and Fish department officials. The guest speakers will also serve as role models for students that may be interested in pursuing an environmental career.

These forest visits will serve a dual purpose; they will not only educate the students about environmental issues, but they will also provide models for teachers in how to use hands-on, environmental activities within their own classrooms. These visits will also demonstrate the benefit of inquiry based education.

Middle schools and high schools from Northern Arizona will be invited to participate in this program. Transportation scholarships are available to the schools outside the Flagstaff city limits through the US Forest Service funding. Schools interested in participating in this program should contact the EEOP staff for more details.

### **Future Issues**

We are also interested in publishing articles from you. We are interested in articles sharing stories from students, teachers, or tribal professionals influenced by ITEP or EEOP activities.

### **Credits and Contacts**

The US Environmental Protection Agency (USEPA) Office of Air and Radiation provides part of the funding to make this newsletter possible. The newsletter is disseminated on various list serves, however, if you would like to join the newsletter list serve, contact [mansel.nelson@nau.edu](mailto:mansel.nelson@nau.edu).

Our staff looks forward to providing new services and developing new programs, as well as continuing existing programs. We especially look forward to hearing from you. So please visit our website at <http://www.nau.edu/ceop> or contact us via telephone or email.

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