

LET'S CLEAR THE AIR ABOUT AIR (POLLUTION, THAT IS)TM

A synopsis of successful air monitoring programs utilizing the Eco Badge[®].

Ozone Monitoring Project

<http://earth.simmons.edu/ozone/ozone.html>

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The Ozone Monitoring Project, which began in 1993, is designed to have students and teachers monitor low level atmospheric ozone levels and share data via the Internet. Ozone levels are tested using Eco-Badges (Vistanomics, Inc.) which are ozone sensitive filter papers (called Test CardsTM). Ozone levels are monitored 2 times during the academic year, once in the fall and once in the spring near students' schools, either in the classroom or in the school yard. Students and teachers share data via the Internet on the ozone project web site. Shared data includes ozone levels in parts per billion, basic weather data and other optional descriptive information.

The Ozone Monitoring Project is applicable to K-12 students in all disciplines and teachers and students with all levels of technological ability. Participants vary from all age groups, disciplines and geographic locations. Participation can vary from entry level, exploratory level or research level. Students can just collect and share ozone data, they can collect data, share data and analyze data or they can do all the before mentioned as well as collaborate with other schools and conduct ozone research projects. In depth research projects, yearly and long term studies are encouraged.

The success of the project has been largely due to the interest generated by the general public around air quality. The ease

of use of the Eco-Badges as well as the applicable nature to all disciplines and grade levels has also contributed to the success of the project. Each year we get more and more participants, from more and more geographic areas. An example of the variety of ways this project and Eco-Badges can be used with different age group students was in the Concord School District in 1993. An eighth grade girl was participating in the Ozone Monitoring Project in her earth science class studying air quality within a meteorology unit while at the same time her second grade brother was participating in the project learning about air and energy conservation. Their parents were thrilled when at home, at night around the dinner table, the discussion centered on the Ozone Monitoring Project that they were both involved with at school in very different, yet similar ways. As a family they had common ground for discussion and family involvement in such an important, local and global issue.

"Air Quality And You"

by Claudia Fowler

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As a former high school environmental science teacher, I often teach workshops that focus on environmental topics. In the early spring of 1999, I was approached by the Louisiana Resource Center for Educators (LRCE) and asked to submit a proposal for a summer environmental workshop, which would be offered to teachers in the Greater Baton Rouge area. Five of the parishes (counties) in the Greater Baton Rouge area are in "serious non-attainment" for ozone, i.e. they

have not met the standards as set forth in the EPA Criteria Air Pollutants and Standards index. Because of this, I felt that a workshop on air quality, with a specific emphasis on ozone, was an appropriate topic; consequently, I submitted a proposal to them for a two-day workshop that would focus primarily on ozone. It was accepted.

Baton Rouge is in a highly industrialized, petro-chemical corridor of the state and the issue of air quality can be quite "volatile" at times. In order to have a well-balanced forum for the teachers, I structured my two-day workshop as follows:

Introduction to the chemistry of ozone, with special emphasis on ground level ozone. This was followed by a panel of four experts that made a 25 minute presentation each. Questions from the teachers were taken at any time.

Panel was composed of:

a) Local pulmonary doctor – to present the medical issues and questions relative to ozone;

b) Local legislator – gave perspective on legislation that was passed during this session that increased the cost of motor vehicle inspection in the 5 parish area;

c) Air quality expert from the LA. Department of Environmental Quality (LDEQ) – gave the regulatory aspects of the Clean Air Act and in particular ozone issues

d) Chair of the Mayor's Clean Air Coalition – gave an overall perspective and history of ozone non-attainment within the state and in particular the Greater Baton Rouge Area.

We also heard the industry perspective when we took a tour of one of the largest oil refineries in the U.S. Our speaker addressed what guidelines they were

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“Air Quality And You” (cont.)

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mandated to follow by the Clean Air Act and what specifics they had in place to meet these guide lines.

Time was also spent on the internet, familiarizing teachers with various websites and resources such as those found at the LDEQ air quality website and the U.S. EPA.

One of the key materials that I included in the grant proposal was funding for an Eco Badge kit for each participating teacher. It is very difficult to find activities in the area of air quality that are substantive. The Eco Badge kit offers teachers an opportunity to provide this type of experience. The experiments can provide students the opportunity to collect real data that they can use as a basis for further investigation and dialogue.

The teachers, as did my own students, found the kits quite easy to use. I actually cut the double test strips in half and let the teachers place one in various locations within several blocks of the Center. Just like my students, it was hard to keep them engaged as they were so eager to see the test results! Some of the results were not explainable but we had a great, great dialogue on what were some of the possible causes for discrepancies! Just what you are looking for in a good discussion! The teachers also planned ways in which they could set up communications between their various schools during the “ozone season” and compare data taken at specific times! I also have plans to suggest that, during the next year’s ozone season, some of the schools use their badges and report back to the LDEQ with their findings in hopes of helping to identify some of the sources that remain a mystery, even to the “experts.”

The AIR Quality of Curitiba: Evaluating & Educating

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*Monitoring the Level of Ozone and
Particulates in the Troposphere*

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The “ProAR” Project, as it is called, is basically a pioneer research project that has ambitious intentions, it promotes Environmental Education through a process of evaluation/monitoring the Air quality, i.e., the research centralizes a sequence of activities devoted to the community awareness of the importance of the Air quality, which is a new study theme in the Parana State.

It is a pioneer project not only in terms of its theme, but also because it dares to open the doors of the University in order to promote an interinstitutional and interdisciplinary process of teaching-learning cooperation with some members of the community.

The “ProAR” research kit includes a wooden pedestal (support) with three devices:

- (1) The ozone monitor “Eco Badge®” (imported from Vistanomics, Inc. USA);
- (2) a particulates collector (alternative device made of two plastic posts and a paper filter); and
- (3) a rain water collector (transparent plastic bottle with a funnel).

The research was carried out during 30 days, for eight hours daily.

The main signs of the “ProAR” success are in the teachers and children responses: Most of the E.E. teachers involved produced more than expected in terms of interdisciplinary extra-class activities motivating their students to learn through environmental research, e.g. one took the students to the school surroundings to

count the passing cars for one hour/week and correlated the results with some topics of Mathematics, Geography and Statistics. Another teacher suggested to the students to register the amount of trees in the school neighborhood and taught them about the forest relationship with the Air quality. Others associated Health to Water and Air qualities in their studies.

It is hoped that the program, which has been in place since August '97, will become a paradigm for schools throughout Brazil.

Vicozone

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The Victorian Ozone Project has been operating for six years with students from Primary and Secondary Schools. Over 1000 students across Australia have been involved during this period. All their results for the past four years have been published on our web site,

<http://www.netspace.net.au/~vicozone/>

Students monitor one hour and eight hour tropospheric ozone levels that is ozone pollution levels using Ecobadges from Vistanomics. If the school is located near one of the Victorian Environmental Protection Authority’s (EPA) monitoring stations then the student’s one hour Ecobadge readings can be compared to that of the EPA. The EPA’s readings are posted on their web site.

One school monitored ozone levels in their photocopy room because of the their concern that the ozone levels were too high. After a short period the Ecobadges gave a clear indication that the ozone levels of were much too high and fans were installed in the room.

Students are clearly motivated by the project since they have a deep concern about the environment and eagerly wear the badges around the school. The students have enthusiastically joined the project and they have shared their experiences at student environmental conferences, at Department of Education exhibitions and via live satellite broadcasts.

