



# Stream of Consciousness

Newsletter of the Alliance for Aquatic Resource Monitoring

Spring/Summer 2004

## Contents:

ACID RAIN PROJECT	Page 1
PEC INTERNSHIP	Page 1
NEW DIRECTIONS	Page 2
SCCA UPDATE	Page 3
WILSON COLLEGE	Page 6
CONNODOGUINET	Page 7
CURRENT EVENTS	Page 8
DAM REMOVAL 2	Page 9
GOLF COURSES	Page 10
DCNR INTERNSHIP	Page 12
ARCHIVAL REVIVAL	Page 13
STORM WATER	Page 14
NEW T-SHIRTS	Page 16
STAFF PAGE	Page 17

## The End of an Era: ALLARM Closes the Doors on Its Acid Deposition Project

By Becki Walker

ALLARM has not always been The Alliance for Aquatic Resource Monitoring. When Candie Wilderman first founded our organization in 1986, it was christened The Alliance for Acid Rain Monitoring. ALLARM not only had a different name, but also different goals, a different method of research, and a different logo.



In the beginning, ALLARM was dedicated to monitoring the effects of acid deposition on Pennsylvania's waters. Pennsylvania was a state that desperately needed a monitoring program – the Keystone State has the dubious honor of

'Acid Rain Project' continues on page 11

## A View of the Capitol: Lessons in Environmental Policy from Harrisburg

By Colleen Haney

Every Wednesday and Friday morning I spend a few minutes walking across the Walnut Street Bridge, which crosses over the Susquehanna, connecting City Island to Harrisburg. From the bridge I can just make out the dome of the State Capitol building peaking out from behind the various office buildings that make up Harrisburg. Once across the footbridge I make my way to 130 Locust Street and head up the stairs to Suite 200. This is the location of the Central Pennsylvania Office of the Pennsylvania Environmental Council (PEC) and the location of my spring semester internship.

PEC is a statewide non-profit organization that was founded in 1970. PEC's goal is to enhance the quality of life for all Pennsylvania residents by enhancing Pennsylvania's natural and built environments through the integration of advocacy, education, and the implementation of local and

'PEC Internship' continues on page 4

# New Directions for SMART

## by Audrey Fisher

This semester the Students Monitoring Aquatic Resources Together (SMART) coordinators developed questions and interviewed teachers and leaders in other watershed organizations to determine how to more effectively reach students and fully integrate the learning process within the greater community. Through dialogue with other educators, it was possible to form a more detailed picture of what needs to be improved, and to gain a better sense of how to approach these key issues in an effort to move SMART forward.

### Raising Awareness

Alerting communities and schools about SMART requires creativity and innovation. One suggestion for improving public relations is through more stream clean-ups such as the Mully Grub event and other activities that increase awareness throughout the community. Press releases, features in local media, and town meetings organized by legislators are also suggested means for reaching the public. The Pennsylvania Alliance for Environmental Education (PAEE) holds yearly conferences attended by educators and also publishes a newsletter to be used by groups such as ALLARM as a way to circulate information. The highly successful educational branch of the Chesapeake Bay Foundation (CBF) is accredited by a state agency and uses state-wide standards in the development of the programs they offer. We have not yet fully developed a repertoire of activities according to grade level and standard requirements; however the process is underway to review the standards and match each component with relevant educational materials and activities.

### Making Connections

A major focus of this evaluation is to determine the best way to approach schools about the SMART program in order to bring valuable watershed education into classrooms. When reaching out to local youth, several of the individuals interviewed suggest that a personal contact with teachers is the best first step. After identifying interest among teachers, administrators can then be approached with more specific ideas of what SMART can bring to their schools. On the other hand, some educators believe the principal, if informed first,

could alert teachers and administrators jointly about the SMART program.

### Scheduling

Time is a limiting factor for everyone. This is especially true for teachers who are faced with the responsibility of covering the required subjects in 180 days. SMART coordinators must be prepared to work around teachers' busy schedules, and plans should be submitted early in the semester so that scheduling can accommodate field trips that may involve additional transportation, substitute teachers, and extra supplies.

### Adequate Communication

As several teachers indicated, this is a vital part of any collaboration. Goals and expectations from all parties should be clearly conveyed. SMART instructors need to have an understanding about the abilities and educational backgrounds of each group of students they meet so that programs can be designed specifically to meet these needs. This could be achieved by sitting in on a class prior to instruction, meeting with the teacher, and speaking to the students themselves about their interests.

### New Education Legislation

In an effort to improve education, new requirements are constantly being placed upon schools to increase student performance. We must be aware of these new initiatives, as they may impede efforts by groups such as SMART who want to contribute to already busy classrooms. PSSA testing requirements are a major obstruction to the inclusion of field work in the curriculum. The No Child Left Behind Act is currently a challenge for teachers to rewrite curriculums and cut programs that do not directly affect scores on the reading and math assessments given in grades three, eight, and eleven. Although it does not directly affect math and reading scores, independent thinking and real world problem solving should not be excluded from the curriculum. By stressing the ability of SMART presentations to enrich young minds and contribute to educational goals, teachers and administrators may be accommodating to SMART despite already stretched

schedules. Teachers needing to attain the new state standards in environmental education would be welcoming of groups that can aid them in that pursuit. In the current atmosphere of pressure to re-write and reschedule classroom activities, it is necessary that state-standard related goals, methods, and time requirements be clearly defined by SMART.

### Instruction Methods

Methods will be re-evaluated in the context of the new standards. Interviewed teachers agree that hands-on, multimedia activities are the most effective way to engage students and ensure that the experience is fun and inspirational. SMART will continue to take advantage of the popular Powerpoint technology and successful field trips. In addition to this, we will develop innovative ways to build a fundamental environmental understanding while also engaging students in the protection of their local watersheds.

SMART is changing directions on the expedition to educate local youth about the appreciation and protection of watersheds. We are now in the process of addressing several issues such as how to develop programs specific to classroom needs, how to effectively reach elementary school teachers, and how to convey to teachers the value of the programs SMART has to offer. We will develop new ways of establishing school-community partnerships and new methods for assessment that target specific components of the state-wide standards on environmental education. Before moving forward, we must stop and examine where we have been and what lies ahead. To this end, SMART coordinators will work together this year to determine the new road to take.



Claire Foster does a demonstration for Cumberland Valley students and their teacher, former ALLARM staffer, Jess Spencer

# SCCA Partner Update

by Claire Foster



Danny Blum works with SCCA members at an ALLARM sponsored "Data to Information" Workshop on March 8, 2004

The great transformation from data to information has begun! The Shermans Creek Conservation Association (SCCA) is well on their way to completing the data interpretation for the culmination of a three-year, comprehensive monitoring program. In February and March, ALLARM held two consecutive data-to-information workshops. In the first workshop, volunteers learned how to interpret data using a virtual watershed with virtual data. Using summary charts and graphs, they identified potential problem sites and discussed possible causes of the problems.

In the second workshop, SCCA volunteers took the skills they learned in the first workshop and applied them to real data from their own watershed. After a brief review of the different water quality parameters they measured, members split into small groups to uncover the story of Shermans Creek in the data. The parameters analyzed were pH, alkalinity, dissolved oxygen, temperature, nitrates, macroinvertebrates, and bacteria.

This is very exciting, because SCCA is only the second of ALLARM's partner groups to go through the entire process from study design to data interpretation. In the past, the watershed groups were not involved in the data analysis process. They would monitor their sites and submit their data to ALLARM for interpretation and conclusions. With volunteers participating in the

'SCCA Update' continues on the next page

entire process, we are able to find out more from the data using the local expertise of monitors regarding the watershed and their own sites.

Volunteers identified several problem areas throughout the watershed by going through the analysis. Three sites in the headwaters of Shermans Creek were identified as acid rain impacted streams with no buffering capacity. Two of these sites have not yet been identified by DEP as impaired reaches. Several sites seem to be impacted by agriculture, as indicated by nitrate levels and/or macroinvertebrate populations.

From here, SCCA will revamp their water-monitoring program according to what they found out from the data analysis. They plan to centralize their program on areas that need more technical monitoring, and further investigate sites that were identified within the watershed as problem areas.

When asked what advice she would give to groups that are in the process of making a study design or just beginning their monitoring program, Linda Sieber, president of SCCA, recommended talking to people who have lived in the watershed all of their lives to hear their input about issues in the watershed. She also warned against becoming discouraged when some volunteers stop monitoring, because this is natural and new volunteers will come! Another suggestion she had was to fly over your watershed in a small plane to get a good aerial view of land uses and possible problem areas.



SCCA member, Vince Humay, presents his groups findings at March 8th's "Data to Information" Workshop

regional action projects. The Central Pennsylvania Office of PEC is particularly involved in many of the environmental policy discussions and decision-making that takes place in Harrisburg.

During my internship I have been involved in several different projects. Some of these projects have involved firsthand policy research and the compilation of information to be distributed to interested parties. In addition to these projects, I have had the opportunity to sit in on various meetings. For instance I was able to participate in a "Better Stormwater Management" workshop held in Juniata County, which was put on by PEC and Cahill Associates.

One of the most memorable meetings I attended through this internship was a press conference held in the Capitol building on February 4, 2004. At this conference I was able to see Governor Rendell and Interior Secretary, Gale Norton, speak about the Bush Administration's proposal to modify and reauthorize the Abandoned Mine Land fund (AML).

Abandoned coal mines are of national concern because they are safety threat and because of the various environmental damages that result from them. Abandoned mines leak acidic and metal-contaminated water, which can pollute waterways and destroy fish and wildlife habitat. The AML fund is one of the major sources of federal funding for the reclamation of abandoned mine lands. The AML fund is authorized under the Federal Surface Mining Control and Reclamation Act of 1977 (SMCRA) and collected by the Office of Surface Mining (OSM). AML funds come from a tonnage fee on current coal production (\$0.35/ton surface mined coal, \$0.15/ton underground mined coal, and \$0.10/ton lignite coal). The money from the AML fund is then distributed to coal-mining states for the support of abandoned mines reclamation programs. Pennsylvania, on average, receives \$25 million per year from the AML fund.

The authority of the OSM to collect the fee to support the AML fund expires on September 30, 2004. Besides this time limitation, there are also limitations to the effectiveness of the allocation of this fund. Under this Act, 71% of the grant funding for abandoned mine cleanup is distributed to states based on their current coal production rates, rather than their historic production rates. Thus, the fund is not properly

structured to reclaim coal mines that were abandoned before 1977. This is a problem because many states that produced coal during the coal boom in the first part of the twentieth century, like Pennsylvania, do not currently have high coal production rates. Yet, these states still face the environmental and safety problems that result from the abandoned mine lands; however they are not receiving the majority of the available funding.



The State Capitol Building: Harrisburg, Pennsylvania

Pennsylvania has a particular interest in the reauthorization and modification of the AML fund. Pennsylvania has a very high historic rate of coal production and is home to nearly 200,000 acres of abandoned mine lands. At the press conference Secretary Norton commented that of the over 3.5 million Americans living less than one mile from a high-priority abandoned coal mine site, almost half (about 1.5 million people) live in Pennsylvania. In addition to the immediate safety risk that the abandoned mine lands pose to the community, these lands are also responsible for immense environmental damage within the commonwealth. The Pennsylvania Department of Environmental Protection estimates that at least 2,100 miles of Pennsylvania streams are impaired by polluted drainage from coal mines (abandoned mine drainage).

To address the AML fund issue, Pennsylvania Senator, Arlen Specter, recently introduced proposal S. 2049 in the US Senate. This legislation would amend SMCRA by reauthorizing the collection of reclamation fees and revising the abandoned mine reclamation

program. Under these amendments resources from the AML fund would be allocated to states based on historic coal production. If this proposed legislation is passed Pennsylvania would expect to receive over \$35 million per year over the next 15 years to put towards the cleanup of abandoned mine lands and impacted waterways. Pennsylvania Senator, Rick Santorum signed on as a co-sponsor to S. 2049 and Pennsylvania Congressman, John E. Peterson (5<sup>th</sup> District), introduced the same proposal in the House of Representatives as H.R. 3778.

Bringing this all back to my biweekly trek across the Walnut Street footbridge, I've found that lately I look at the State Capitol building in a different light. Among other things, interning with PEC has given me valuable exposure to the policy making process. I realize that now I am so much more aware of the environmental policy deliberations that are taking place in Harrisburg and in the Capitol building itself. My internship experience has undoubtedly contributed vastly to my Dickinson College education in the field of environmental studies. I am positive that the skills acquired during my time with PEC will be put to use as I pursue a career in the environmental field post-graduation in May 2005.

For more information on the AML fund visit The Office of Surface Mining website [www.osmre.gov](http://www.osmre.gov) or contact the Pennsylvania Environmental Council Central Office at 717-230-8044.

# Wilson College Sustainability Conference

## March 26-27, 2004

By Laura Walters

The two-day Richard Alsina Fulton Conference on Sustainability and the Environment brought together an amazing bunch of people to share success stories, ideas, and plans for incorporating sustainability into education and everyday life. But what is actually meant by the term sustainability? The term was coined in 1987 in the Brundtland Commission Report, "Our Common Future." It was defined as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." It has expanded slightly over time and today is applied not only to development but the entire future of the environment.

A common theme linking many of the talks was the need for stronger connections with nature and other humans in order to further the sustainability movement. I think this is a major problem in today's fast-paced society; people don't dedicate enough time to fostering these connections.



Lois Gibbs

<http://www.heinzawards.net/>

The highlight of the conference was the keynote speaker, Lois Gibbs. She described the connections she has made with hundreds of people dealing with chemical contamination, especially those she personally dealt with at Love Canal, near Niagara Falls. She recalled how her family was not told anything about the thousands of barrels of chemicals buried under the local school. She went on to explain how the chemicals at Love Canal had affected her family. This began her battle, advocating for the rights of her family and her neighbors to a clean and safe environment. The opportunity to actually hear Lois

Gibbs tell her own story made me fully appreciate everything that she has fought for. It is just not the same to learn about it in a class, no matter how passionate the teacher is. There is no comparison to a personal account from a mother who lived through such an event.

She also inspired the audience by telling of her continued efforts to help other individuals and groups affected by similar problems. Her organization, The Center for Health, Environment and Justice is currently working on two campaigns: "Be Safe" and "Child Proofing Our Communities." The "Be Safe" campaign is an effort across the nation to build support for the precautionary principle for various environmental issues. The precautionary principle refers to adopting policies, based on hard scientific data, which work to prevent major problems in the future. This could range from adopting strict policies to combat climate change or not allowing our food to be genetically modified because we are still unsure of possible environmental or human effects. The Child Proofing campaign is focused on children's exposure to chemicals in their schools. Gibbs also spoke about how we have to take back corporate charters because companies are actually given government permits to pollute which can affect our health. She made the point that "We are still making decisions about how much harm is acceptable, rather than how much harm we can avoid."

Candie Wilderman, founder and science director of ALLARM, spoke about educating for sustainability and pointed to various techniques to successfully integrate principals of sustainability into college curriculums. Candie explained the need to form an emotional bond with nature because we will not fight to save something that we do not love. I think this is an extremely important point and relates back to the missing connection between people and nature. She also presented ALLARM as an example of a group teaching and fostering sustainable practices in various watershed groups.

There were many other amazing talks and presentations, I only wish there had been more

students involved to be inspired and excited about moving toward a more sustainable future. However, the conference was still a great success. It was also announced that Wilson has funding to host another conference in 2006, so mark your calendar now!

## Middle Conodoguinet Creek River Conservation Plan Unveiled

By Micah Weintraub

Representatives from the Conodoguinet Creek Watershed Association (CCWA) convened a public meeting along with complimentary pancake breakfast to present their newly completed Middle Conodoguinet Creek River Conservation Plan to the community. The meeting took place on the morning of Saturday, February 7<sup>th</sup> at Oak Flat Elementary School in Newville. Two Dickinson College students, Danny Blum ('04) and myself attended the meeting as representatives of ALLARM.

The meeting started with a background and overview of the River Conservation Plan, funded by the PA Department of Conservation and Natural Resources (DCNR). The plan is the culmination of a five-year study of the middle reaches of the Conodoguinet Creek. The goal of the plan was to develop recommendations encouraging environmentally conscious land use planning. The report should be a valuable resource to county and municipal bodies for creating and reviewing land-use practices in the region.

The River Conservation Plan identifies resources that need additional protection and land use issues that contribute to environmental degradation in the Conodoguinet Creek watershed. Some of the major recommendations include: controlling agricultural storm water runoff through the use of best management practices, developing and enforcing storm water management plans for controlling commercial and residential runoff, encouraging municipalities to work jointly on planning and zoning issues, and limiting development in riparian corridors.

At the conclusion of the presentation, the meeting's participants broke into groups to discuss the issues and recommendations presented in the River Conservation Plan. The community members were encouraged to provide their opinions of the report so that their input could be incorporated into the final plan. They were asked if they disagreed with any of the recommendations, if there were any overriding ideas missing, and if they know of any specific land areas of concern that the CCWA should focus on.



A view of the Conodoguinet Creek. This picture was borrowed from the Conodoguinet Creek Water Association Website

The community members were eager to give their two cents. They developed a variety of suggestions for improving and implementing the River Conservation Plan. One proposal was to work more closely with Mennonite farmers to encourage better management practices. Another suggestion was to provide native plantings to residents who live along the creek. Almost everyone agreed that the most effective way to get the community involved in the River Conservation Plan was through face-to-face communication. Mailings and websites were seen as less effective means for engaging local residents and businesses.

The meeting concluded around lunchtime and left all of its participants a little better informed. Community members left with knowledge about the importance of the Conodoguinet Creek, threats to its health, and the CCWA's potential solutions as proposed in the Middle Conodoguinet Creek River Conservation Plan. The CCWA left the meeting with some new areas of focus and methods for community outreach and engagement, and of course, Danny and I left with full minds and full bellies.

## **Current Events:**

# **A Look at Water Resource Issues Making Headlines**

**By Danny L. Blum**

### **Ecotourism: As Good as it Sounds?**

Ecotourism, long hailed as the sustainable alternative to conventional modes of tourism, may not be everything it's cracked up to be. Although not widely applied, the International Ecotourism Society defines ecotourism as "responsible travel to natural areas which conserves the environment and sustains the well-being of the local people." Once a niche activity, ecotourism is growing rapidly. According to the World Tourism Organization, ecotourism now accounts for seven percent of all travel worldwide. The industry is especially growing in the Asia-Pacific region, where interest is outpacing the establishment of credible ecotourism operations.

Biologists around the world are raising concerns that ecotourism may not be as sustainable as it should be. There is increasing evidence that tourists, well intentioned or not, are adversely affecting wildlife around the world. The New Scientist points out that these effects go beyond the physical impacts of increased tourism volume to include physiological changes in animals such as heart rate, stress level, and social behavior. In the Globe and Mail, Prof. Schaefer of the University of Manitoba noted that whale-watching on the St. Lawrence river has led to greater instances of whales beaching themselves due to trauma caused by increased boat activity.

The industry also faces the problem of increased human-animal contact that takes away from the wilderness of an area and may pose serious safety issues for tourists. The latter threat was brought to light in April 2001 when a boy was killed by two dingoes on Australia's Fraser Island. While the dingoes are the main attraction, the accident prompted authorities to kill 31 more in an effort to establish greater controls. Ultimately, ecotourism can be beneficial as long as comprehensive management practices are in place.

[www.ecotourism.org](http://www.ecotourism.org)  
[www.world-tourism.org](http://www.world-tourism.org)  
[www.newscientist.com](http://www.newscientist.com)  
[www.globe and mail.com](http://www.globeandmail.com)

### **A River Blasts Through It**

On February 23, an entire city in Virginia paused for the demolition of Embrey Dam at river mile 109 on the Rappahannock River. The destruction of the dam at Fredericksburg, Virginia, means the Rappahannock is now the longest free-flowing river in the Chesapeake Bay watershed. The Rappahannock's 184 miles of unimpeded flow originate at Chester Gap in the Shenandoah Mountains. It is the first time the river has been barrier-free in 150 years and it is expected the removal will lead to the reestablishment of shad and herring.

Twenty-two feet high and approximately 1,000 feet across, Embrey Dam was built in 1909 as a hydroelectric power generator and remained in use until the late 1960s. In its 94-year history the dam became a significant part of Fredericksburg's culture and hundreds of locals turned out to view its demolition. Scheduled for demolition just moments after noon, the first explosion triggered only ten percent of the 600 pounds of explosives positioned at the dam. It was not until 90 minutes later, after divers with the Army Corps of Engineers re-laid the triggers, that the crowd got the explosion it was looking for. While the initial explosion had cracked the dam, the second blast sent smoke and water high into the air.

Although the demolition was the most visible and public event in the dam's removal, the effort to have it removed has been long in the making and full removal is not expected to be complete until 2006. Liability concerns lead the city of Fredericksburg to support the dam removal. A broad coalition of environmental and outdoor groups along with federal and state agencies also made the removal possible. U.S. Senator John Warner (R-Virginia) secured full federal funding for the \$10 million project.

[www.fws.gov](http://www.fws.gov)  
[www.washingtonpost.com](http://www.washingtonpost.com)  
[www.fredericksburg.com](http://www.fredericksburg.com)



# Dam Removal Project: Part 2

By Rob Berns

Last year, ALLARM collaborated with the Pennsylvania Organization for Watersheds and Rivers (POWR) and American Rivers on a project aimed at expanding upon knowledge of the ecological impacts of removing dams, the aptly named Dam Removal Project. This initial project focused on a citizen monitoring program for pre- and post-dam removal, in order to quantify the results of the removal on the ecological health of the stream. In the spirit of keeping a good thing going, the Dam Removal Project has been brought back for a second year, with more involved parties, including watershed partners and other environmentally-focused groups.

Among the participants in this new phase of the Dam Removal Project are American Rivers, Alliance for the Chesapeake Bay, various watershed groups, ALLARM and POWR. The project, entitled "Integrating Watershed Groups into Dam Removal Efforts in Pennsylvania", is funded by a grant from the National Fish and Wildlife Foundation, which was awarded to POWR and further distributed to many organizations, including ALLARM. The new phase of the Dam Removal Project involves expansion of the pre- and post-removal monitoring training to focus on teaching citizen volunteers how to evaluate the dam sites after removal for additional activities to restore the area to conditions that existed before the dam. This project is to center on streams within the Chesapeake Bay watershed region in south-central Pennsylvania. Specifically, the new activities for monitors will have the following focuses: 1) developing post-removal streambank and instream restoration measures; 2) training three different watershed groups in assessment methodologies; and 3) creating and publishing a guidebook that deals with how to replicate this project in other Chesapeake Bay communities. In addition, this project serves the goals of integrating community-based organizations into dam removal projects and improving fish passage, water quality, and aquatic ecosystem assessments.

ALLARM's role in this phase of the Dam Removal Project reflects the general concept of empowering citizens to monitor the health of their streams. ALLARM will facilitate the development of study design and restoration assessments, and will provide training to the citizen volunteers involved in the project. In particular,



Dam Removal Project in Wisconsin; retrieved from <http://limnology.wisc.edu/personnel/stanley/DamRemoval.html>

ALLARM will supply several forms of support to aid the monitors with the implementation of the project, including facilitating meetings, training volunteers in the protocols for water monitoring, and providing guidance on the options for restoration. American Rivers will provide up to \$5000 to each group to assist with the implementation of the plan. This program is being implemented in the following areas: Detters Mill on the Conewago Creek in York County, Hoffman Dam on the Yellow Breeches in Cumberland and York Counties, and the Siloam Dam on the Conococheague in Franklin County. Each group will assess the dam site to determine appropriate restoration needs and develop solutions. After developing their plan, they will assess the area to measure the effects of the removal and then fine-tune the restoration initiatives before presenting the final plan to the public.

Dam removal is a significant event for citizens who monitor streams in their area, as would be any event like construction, runoff from industrial or agricultural sources, or other such actions that may impact a body of water. Citizen involvement in the restoration of streams after dam removal provides an important outlet to allow interested parties to have a say in what happens to the health of their local streams. Working together with ALLARM and other involved groups, citizens can yet again be empowered to have a voice in the health of their streams, and to make sure that appropriate dam removal actions are taken and performed correctly.

# Golf Courses

By Andrew Schwerin

In examining how land use affects our watershed health, much attention has been directed toward golf courses and their impact. Exploring the most basic level of interaction between the game of golf and its surrounding environ: the ecological impact is a jumping point to exploring deeper issues of power, privilege, information ownership, and citizen empowerment.

In the early 1990s, New York attorney general Robert Abrams tried to find out about the use of pesticides on golf courses on Long Island. His report "Toxic Fairways" concluded that groundskeepers were using too many pesticides too often and should altogether cease using the pesticides containing known or probable carcinogens. Neal Lewis, executive director of a Long Island environmental group called Neighborhood Network, extrapolated Abrams' numbers and concluded that across the nation golf courses use 65 million pounds of dry bulk pesticides and 2.9 million pounds of liquid pesticides a year. Lewis wants golf courses to embrace "organic golf" without pesticides.

This usage of chemicals is not without health affects. In 1994, a study by researchers at the Department of Preventative Medicine and Health at the University of Iowa was presented to the Golf Course Superintendents Association of America. The study found that golf course superintendents contracted non-Hodgkin's lymphoma, brain cancer and prostate cancer at more than twice the national average, and large-intestinal cancer at almost that rate. However, the failure to take into account other factors like heredity and smoking in the study prevented any definitive cause-effect relationship.

Also worth considering is the amount of water that courses use. In Rhode Island, the average private course applied 21 million gallons of water per summer, more water than any of the public courses. Furthermore, private courses usually serve fewer members (Rottenberg). By comparison, average public courses pumped 8.5 million gallons. Rebekah Rottenberg, author of "Green Golf Courses: A Study of Maintenance Practices in Rhode Island" attributes these differences of water use to the combined factors of number of irrigated acres, course maintenance, and height of cut.

For greenskeepers, determining the height of cut relied on several factors, one of which was "golfers' expectations." Golfers playing on public courses were not as demanding of pristine greens, and the end result was a wiser use of resources. Greenskeepers are businesspeople; successful business relies on a sensitivity to client demands. One of the simplest steps toward creating golf courses with less of an environmental impact is for golfers to ask for them.

An overly simple account of golf courses and their surrounding socio systems is a model of social competition where two groups (golf courses and communities) are competing for common resources: clean air and water, which are essential to everyone's health but are potentially sacrificed in the golf courses' attempt for economic well being. Within this two-group model of golf courses in socio and ecosystems, there is no room for consumer influence on golf operations. However, the fact that golfers' expectations carry weight in course design and maintenance is promising for redesigning courses and management practices.

The other side of the story of golf deals with the physical placement of the course within a larger ecological framework. Just like accounts of social positioning, this story of golf courses and their ecosystems is also often described using language of competition. The basic retelling is as follows: in attempting to please their members with perfect greens, golf course greenskeepers use more than their fair share of water and biocides, activities which threaten the health of the surrounding land. However, this model of ecological (resource) competition is challenged by examples like the golf course at Fort Eustis on the James River (Chesapeake Bay watershed). According to an article by the US Army about the construction of eco-friendly golf courses, this golf course has been built around the existing woodlands in addition to no-mow zones that occupy 50 acres of the 450 acre course, discouraging geese and encouraging a regrowth of frog, snake and turtle populations.

Where this reform of the course's siting holds the most promise is that it was not entirely due to outsiders' push. Instead, the impetus for design came as a response to simple economics: budget and manpower constraints forced the design to be reworked to complement the natural ecosystems already in place, thus, a design was used that required a smaller grounds crew and less water and biocides. This paradigm change works under

a model where the aesthetics, functionality, economics and ecological compatibility of a golf course are not necessarily in competition with one another.

These complications to the story of golf give us, as citizen monitors, several options to consider when we're evaluating the impact golf courses contribute and the potential for reform:

- What first steps can be taken, as in the case of the course at Fort Eustis, to lighten the environmental load of the course on the parent ecosystem without severely impacting the finances of the course? Are there ways to make the course a seamless extension of the parent ecosystem?
- Are there ways for golfers to negotiate with greenskeepers to define acceptable levels of ecological impact and playing quality? Can golfers be a part of the strategy to mediate between the two parameters?

'Acid Rain Project' continued from page 1

being the third largest producer of chemicals that result in acid rain. In addition, Pennsylvania is downwind from Ohio, the largest producer of sulfur dioxide and nitrogen oxide (the two main causes of acid deposition). Pennsylvania's water quality is not only of importance to those living in the commonwealth – the Chesapeake Bay receives over 50% of its water from Pennsylvania streams and rivers.

Candie Wilderman founded ALLARM in an attempt to discover just how badly our waters were being impacted by acid deposition. However, ALLARM was not going to send scientists out to the field to collect data – ALLARM was going to train volunteers to do it. These volunteer monitors were commissioned to monitor a site of their choice once a week for at least a year. The monitors' samples were then sent to the ALLARM lab for quality control analysis. The volunteers would be part of a research model known as the "community workers" model – professional scientists defined the problem, designed the study, and interpreted the data. The monitors were responsible for collecting the samples and, to a certain extent, analyzing them.

Skepticism abounded. Would volunteer monitors be able to collect samples? Would their data be useful in any way? Most importantly, would anyone even want to pay \$20 for a monitoring kit and the privilege to spend a couple of hours per week wading around in a stream for an entire year?



ALLARM Founder, Candie Wilderman and Monitors

The skeptics have been silenced by our acid deposition project's overwhelming success. Our volunteer monitors have collected enough samples to make our pH and alkalinity database the largest in the state of Pennsylvania. We now have information on more than 700 sites in 500 bodies of water in 96% of Pennsylvania counties. Monitors have helped us make the discovery that almost 50% of streams in the highest resistance category still undergo periods of increased sensitivity to acid rain. Our data have also been used as sources for several scientific papers.

In 1996, ALLARM decided to broaden its focus, due to demand from monitoring groups. With this came our current name and logo, and a new mission – to train monitoring organizations to define problems in their watersheds, design their own studies, collect their own data, analyze it, and then turn that data into useful information. The information would then, hopefully, be turned into social action in local communities. ALLARM was now a service provider engaged in community based participatory research. Our new focus was committed to bringing about social change through empowering citizens of a civil society.

Because ALLARM has baseline data for so many sites for extended periods of time (some as long as 16 years), taking weekly measurements of pH and alkalinity are

'Acid Rain Project' continues on the next page

'Acid Rain Project' continued from the previous page

no longer our primary objective. We decided that, in order to best fulfill ALLARM's new mission as a service provider, we should devote most of our time and energy to working with watershed organizations and discontinue the acid rain project (except for a few selected sites that will be part of a Clean Air Act Amendments study undertaken by Claire Foster). I was assigned the task of writing a letter to the monitors to inform them of this decision and connect them with a local monitoring organization.

Though the acid deposition project is officially over, it is important to remember the humble beginnings from which the current ALLARM emerged. Our volunteer monitors have not only helped us amass a huge database, they have shown that common citizens are not only willing, but able to "do" science. There are people out there who will selflessly commit hours of time to a cause they believe in, for no compensation except the knowledge of the fact that they have made their corner of the world a bit cleaner. It is doubtful ALLARM would have become as successful as we are without the unflinching dedication of these individuals.



ALLARM Director , Lauren Imgrund

# Plants: Friends or Foes? An Inside Look at DCNR

By Meghan Klasic

This semester I am completing an internship through the Department of Conservation and Natural Resources (DCNR). I am currently interning in the Bureau of Forestry. Before I discuss what exactly I am working on I will provide some background information about DCNR's role as "overseer" of Pennsylvania's natural environment.

DCNR was first established on July 1, 1995 and is charged with preserving state parks, managing state forest land, providing information on the state's natural resources, and securing community conservation partnerships. DCNR also works to analyze and study the geologic heritage of Pennsylvania through surveying and mapping, by awarding millions of dollars in grants each year, by designing and managing construction projects, and through maintaining, managing, enhancing, and restoring PA's wild flora, fauna, and ecosystems. With such a broad area of interest, DCNR is able to complete all of these tasks along with holding up their own infrastructure with the help of nearly 1,300 salaried and 1,400 seasonal employees. For more information regarding DCNR, refer to their main website at <http://www.dcnr.state.pa.us/>.

As stated previously, I am currently interning with the Bureau of Forestry. The Bureau of Forestry works with private forest landowners to develop management plans, provides information on recreational activities and safety precautions, and educates the public about forest fire prevention, suppression, and how people can get involved in "fire crews". The Bureau of Forestry has also set up a sub-branch dedicated to education, information, and management plans for publicly owned state forests. Finally, the Bureau of Forestry works to distribute methods on how to protect forest health from pest management to dealing with invasive species (this is the branch in which I am presently working).

By definition, an "invasive plant" is a species that has become a weed pest, a plant which grows aggressively, spreads, and displaces other plants. Invasive infestations can be very costly both in monetary and

environmental value. The majority of invasive plant species appeared from other continents. These species are referred to as “alien plants”.

There are a number of reasons why invasive species should not be used in landscaping; the number one reason is because they are degrading our native environments. Invasive species are second only to habitat loss as a factor in the decline of native plants. Examples of invasive plants are Kudzu Vine, Purple Loosestrife, Garlic Mustard, Multiflora Rose, Japanese Knotweed, and Oriental Bittersweet. The problem occurs when there are threatened, endangered, or rare species which are only present in small numbers and are therefore extremely vulnerable. Invasive species can also very easily escape the area in which they were originally planted.

In the Bureau of Forestry, I am reading a variety of literature on invasive species, how they spread, their inherent dangers, and how to control them. I have been doing research both online and in the physical library located in the Rachel Carson Building -- the DCNR headquarters in Harrisburg. At the Bureau of Forestry's current website there is a link to information about invasive species; however, there are no pictures available, and the information is not presented in a user-friendly format. After reading a good deal about the backgrounds of these invasive species, I will work to design information pages on each plant that will include a picture, a description, the most prevalent geographic area of concern, different methods which have been used in preventing the spread and/or growth of the plant, as well as other sources or links on the designated plant. The goal of this project is that private forest land owners will be able to look up plants that seem to be “taking over”, learn how to manage them, and eventually get rid of them altogether. The website should be up and running by the end of March or beginning of April.

As you hopefully have learned through this article, there are many projects to be completed through the Bureau of Forestry and they are always looking for more help. If you do happen to have information that you think might be of use to my project regarding invasive species, please feel free to contact me at [klasicm@dickinson.edu](mailto:klasicm@dickinson.edu). For more information regarding invasive plant species or the Bureau of Forestry in general, visit the bureau homepage at <http://www.dcnr.state.pa.us/forestry/index.aspx>.

# Archival Revival: Preserving our Past to Protect our Future

By Adam Wickline

In the fall semester of 2003, Danny Blum began the ambitious goal of gathering various parts of our past and preserving them in the Dickinson College Archives. Though this was a loaded task involving many hours of sorting, sifting, collecting, copying, and archiving, Danny was tired of seeing the ALLARM records in disarray. He contacted Jim Gerencser, the college archivist, and discussed what could be done to make sure that the story of ALLARM can endure. They decided that our documents would be organized and kept in the controlled environment of the archives, so that they would last beyond their original life of being kept in the corner of our office.

But wait. Why is all this necessary? Why should we keep these decaying newspapers and long-forgotten articles of a time past? Would they not just occupy precious space? There is method to this madness. It is similar to the method used in the environmental field. It is the idea of thinking and planning for the future. The same way that we must consider future generations in environmental planning, we must also do so with our history. When in the future a person needs to know more about our past, he or she will have all the sources needed for the story of ALLARM.

There is another reason we need to save our history in as many documents as we can. There is an old proverb that says “Truth is the daughter of Time.” This can be understood in different ways, but I see it to mean that truth is the manipulation of actual events by the effects of time (the inevitable decay of our memory through time) and limitless human fallibility and bias. Historical “truth” can be used as an instrument to whatever end someone wants, if the story is not well kept. Sir Herbert Butterfield, a historian at Cambridge University, had this to say about history in the last lines of his famous dissertation [The Whig Interpretation of History](#).

'Archival Revival' continues on the next page

'Archival Revival' continued from the previous page

She [History] cheats us with optical illusions, sleight-of-hand, equivocal phraseology. If we must confuse counsel by personifying history at all, it is best to treat her as an old reprobate, whose tricks and juggleries are things to be guarded against. In other words, the truth of history is no simple matter, all packed and parceled ready for handling in the marketplace. And the understanding of the past is not so easy as it is sometimes made to appear. (p. 132)

We at ALLARM are now taking part in this preparation of our story. By making many documents viewable, we can hopefully minimize this impact on the truth of ALLARM. In this ascertaining of documentation, we ask that you, the watershed groups and individual monitors, look in your files for anything that you wish to preserve pertaining to your interaction with ALLARM. Your donation of these items to the Dickinson College archives would be a valuable addition to the story of ALLARM, and would assist in the preservation of our truth against the ravishes of time.



ALLARM's *Archival Revival* project leaders, Adam and Danny, make the inaugural deposit of ALLARM material to Jim Gerencser, director of Archives and Special Collections at Dickinson College, in the basement of Waidner-Spahr Library.

# Pennsylvania Storm Water Regulations

By Micah Weintraub

Both federal and state governments have established guidelines for regulating storm water runoff from industrial facilities, municipalities, and construction sites. The United States Environmental Protection Agency defines storm water as “storm water runoff, snow melt runoff, and surface runoff.” These standards are important for the preservation of watersheds because unmanaged storm water runoff can adversely affect the health of aquatic ecosystems by carrying harmful pollutants. On construction sites, the major environmental concerns are erosion and sedimentation. In 1990, the EPA established Phase I Storm Water Regulations for industry. Storm water from industrial activity is defined as discharges from any point source used for collecting and conveying storm water, which is directly related to manufacturing, processing, or material storage areas at an industrial plant. Under Phase I, industrial facilities can qualify for “no-exposure” exemption from storm water regulation if their industrial materials are not exposed to the elements.

Many municipalities have separate storm sewers that are not combined with sewage or directed to a publicly owned treatment works. Municipal storm water sewers are required by permit to control pollutants to the maximum extent practicable using Best Management Practices (BMPs) or numerical discharge limits. Also, there are requirements for preventing non-storm water discharges from entering into the sewer system.

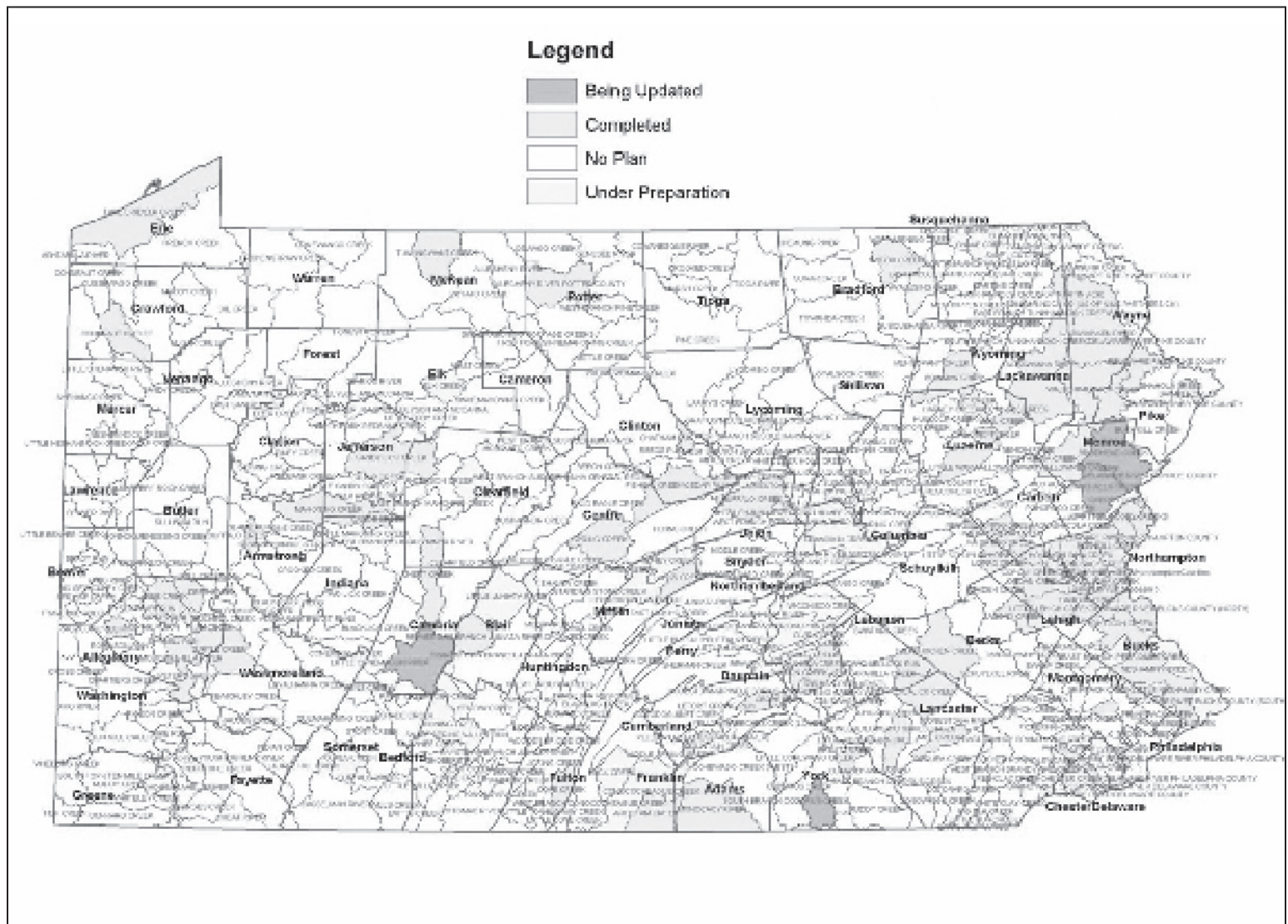
In 1999, the EPA enacted Phase II Storm Water Regulations, adding requirements for small municipalities and discharges from construction sites. Further, industries are now required to provide proof if attempting to qualify for “no-exposure” exemption.

Pennsylvania’s regulatory framework builds on the existing EPA storm water regulations. Large construction sites are required to have National Pollutant Discharge Elimination System (NPDES) permits for their storm water discharges. Small construction sites require NPDES permits if they disturb between one and five

acres resulting in a point discharge to a U.S. waterway. All projects must demonstrate that they employ BMPs and an Erosion and Sedimentation Plan to protect and maintain water quality. Specific numerical effluent limits and sampling are not required as a part of this BMP driven program.

In accordance with Pennsylvania's Storm Water Management Act of 1978, each county is required to develop a storm water management plan for the watersheds with its boundaries. Since 1985, the DEP has given grants for up to 75% of the cost of preparing and implementing these plans. Figure 1 Shows which counties and watersheds have adopted plans so far. For example, Cumberland County does not have a countywide storm water management plan, but plans have been developed for three of the county's watersheds, the Upper Yellow Breeches, Hogestown Run, and Trindle Spring Run.

The opinion of Tom Englerth, a surveyor who has worked extensively with storm water management, is that Phase II regulations might do very little to actually improve water quality in Pennsylvania's rivers and streams for a variety of reasons. First, the primary pollutant of concern from construction sites is soil, but E&S plans have used BMP's to control erosion for years. Requiring NPDES permits at small construction sites entails little more than the addition of annoying red tape. Second, after construction is completed, the NPDES requirement vanishes. Third, there are no effluent standards associated with Pennsylvania's Phase II storm water regulations, meaning that there is no guarantee that existing water quality will be maintained. Lastly, and perhaps most importantly, Phase II regulations ignore agricultural storm water runoff, which can be much more damaging because it can carry toxic and organic materials in addition to a tremendous sediment load.



'Current Events' continued from page 8

## Supreme Decision on Potomac

The Supreme Court recently made a landmark ruling in a case involving water rights on the Potomac River. In a 7-2 decision, the Court ruled in favor of Virginia over Maryland concerning Fairfax County Water Authority's right to withdraw water from the midsection of the Potomac. The decision was based mainly on the 1785 Compact between the two states, but stretched all the way back to a grant from King Charles I in 1632. Back then, the territory of Maryland and the river were known as the Potowmack (named for the local Indian chief). The river was appropriated to Lord Baltimore by the King of England and the river has remained in Maryland's control ever since. However, the 1785 Compact between Virginia and Maryland recognized the riparian properties of both states and the privileges that come with those, in this case the right to freely draw water from the river. The Supreme Court found that Maryland's authority over the river pertains only to ensuring that it remains navigable and does not include approving permits by Virginia water authorities to construct intake pipes. The case has been pending since 1996 when the Fairfax County Water Authority, which serves 1.2 million residents in Northern Virginia, applied to Maryland authorities to build a mid-river intake and was rejected. The state of Virginia then filed suit against Maryland and because of the Supreme Court's original jurisdiction involving disputes between states, the case went straight to the nation's highest court. Prior to the ruling, a special master appointed by the Court had been investigating the dispute and relevant historical documents. He eventually recommended a finding in Virginia's favor. Citing the 1785 Compact and noting that no state should be empowered to control another state's access to basic water supplies, the Court agreed. Ruling with the majority was Chief Justice Rehnquist and Justices O'Connor, Scalia, Thomas, Ginsburg, and Breyer. Opposing the ruling were Justices Steven and Kennedy.

[www.supremecourt.gov](http://www.supremecourt.gov)

[www.fcwa.org](http://www.fcwa.org)

[www.potomacriver.org](http://www.potomacriver.org)

[www.greenwire.com](http://www.greenwire.com)

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## A Salute to ALLARM's Graduates



Andrew, ALLARM Chemist



Claire, Data Analysis Expert



Laura, Trouble Maker with  
Danny, The Idea Man



ALLARM Seniors 2004

## Spring 2004 ALLARM Staff

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