



STREAM OF CONSCIOUSNESS

A NEWSLETTER OF THE ALLIANCE FOR ACID RAIN MONITORING (ALLARM)

Edited by Colleen Thompson

December 1991

"Never doubt that a small group of thoughtful, committed citizens can change the world.
Indeed, it's the only thing that ever has."

--Margaret Mead

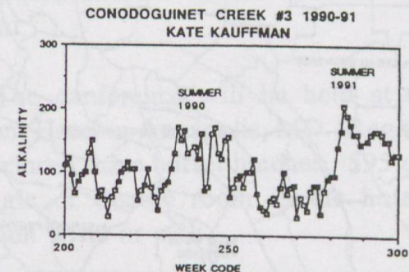
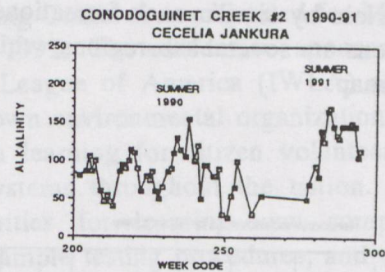
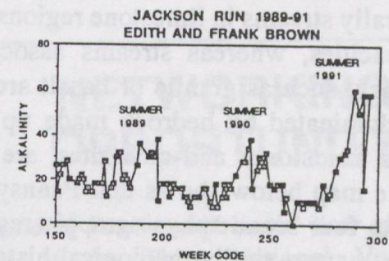
DROUGHT AND ITS EFFECT ON STREAM HEALTH

If you live in one of the counties in Pennsylvania affected by this summer's drought, no doubt you've noticed the level of water in your stream dropping. Several volunteers made note of this on their data forms. Some particularly observant monitors even pointed out variations in pH and alkalinity that seemed to correlate with the drought and sporadic rainfall events. This prompted us to take a closer look at the effects that the drought has had on the streams of Pennsylvania.

We hypothesized that with little rainfall alkalinity levels would be elevated in the affected streams, because the flows would be generated from groundwater sources. As this water must travel through the underlying bedrock, it dissolves ions which contribute to its alkalinity. Also, without rain, there is little acidic input to the streams.

We chose three sites monitored by ALLARM volunteers during the summer of 1991 and during at least one previous summer to test our hypothesis: two sites along Conodoquinnet Creek in Cumberland County and one site along Jackson Run in Perry County. Notice how alkalinity rises in the summertime in all cases, but rises more during the dry summer of 1991.

However, not all sites are showing this pattern; in particular, sites that are primarily fed by surface runoff will not necessarily show increasing alkalinities during the drought. Pollutants build up in the atmosphere during periods of drought; when rain eventually falls, it "washes clean" the atmosphere and is extremely acidic.



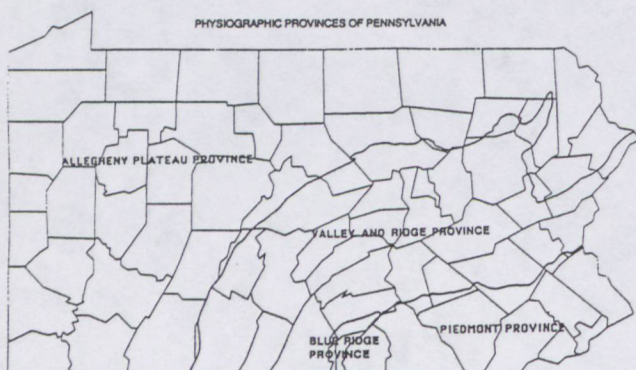
The maps on page 7 show an average rainfall pH in central Pennsylvania of 3.9 during extreme drought conditions in July 1991. In response, streams may show wider fluctuations of alkalinity and pH, coinciding with rainfall events. Can you see any of these patterns in your own data? ♦

IT'S ALL IN THE ROCKS!

By Candie Wilderman

Data from 91 streams that were monitored by ALLARM volunteers in 1989 have shown that the single most important factor in determining stream response to acid deposition is the composition of the underlying bedrock and soils in the watershed. After a rainfall, water either runs off the surface of the ground and into the stream or it percolates through the soil into underground aquifers, where it slowly makes its way to streams as it travels through the bedrock. On its journey to a stream, the rainwater will dissolve available ions, some of which may increase its ability to neutralize acid or to "buffer" the system. These are the ions that we measure when we measure alkalinity. It is important to note that this "acid neutralizing capacity" is derived from the soils and rocks and is finite and irreplaceable.

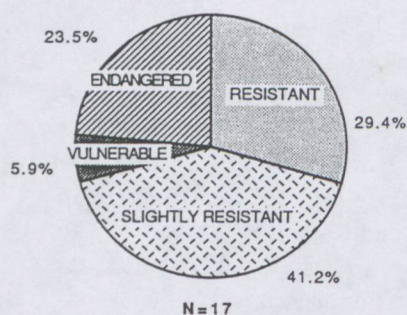
Generally streams in limestone regions have high buffering capacities, whereas streams associated with igneous bedrock, such as granite or basalt are sensitive. Those areas dominated by bedrock made up mostly of silica, such as sandstones and quartzites, are extremely sensitive. The map below shows that Pennsylvania can be divided into four broad "physiographic regions," that is, regions that have a similar geological history and are therefore underlain by similar rock formations. Within these four regions are several sub-regions, which are not shown on the map.



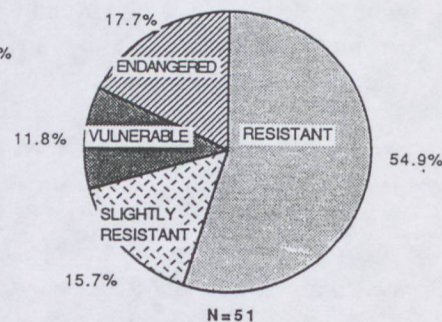
Studies on 91 streams monitored by ALLARM volunteers in 1989 show that there were significant differences in the number of endangered and vulnerable streams in the four geologic provinces, with Blue Ridge having the highest percentage, followed by Allegheny

Plateau, Valley and Ridge, and Piedmont (see the pie diagrams below). Other studies confirm what we have found. For example, the EPA has singled out the Southern Blue Ridge as having the highest proportion of streams sensitive to acidification; they also note that the upland, forested sites of the Allegheny Plateau and Valley and Ridge Province are characterized by low acid neutralizing capacities. Although location within a physiographic province may give us some predictive model for a stream's sensitivity, local watershed characteristics do vary from stream to stream and the only way to assess a stream's sensitivity is to do long-term, weekly or biweekly monitoring of alkalinity and pH. ♦

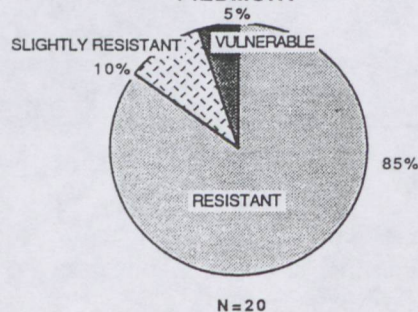
ALLEGHENY PLATEAU



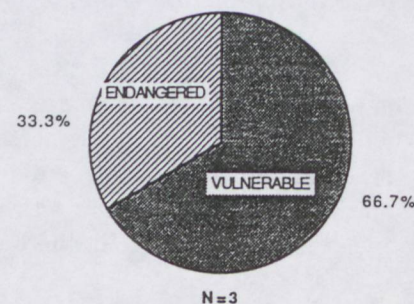
VALLEY AND RIDGE



PIEDMONT



BLUE RIDGE



ENERGY BILL REJECTED

by Christy White

The Johnston-Wallop energy bill which was recently rejected by Senate was also strongly opposed by environmental groups; it would have opened drilling along a 1.5 million acre coastal plain of the Arctic National Wildlife Refuge in Alaska, one of the country's last unspoiled wilderness regions. The refuge needs to be protected because it offers shelter to one of the world's largest migratory herds of caribou, which give birth exactly in the area where the drillers had hoped to drill. In addition, polar bears and rare species of sea mammals live in that area.

The bill, which was turned aside on the first of November, would have encouraged increased domestic drilling while also dropping some of the regulations that hinder the nuclear energy industry in building new reactors. Proponents of drilling argued that the reserve could have potentially provided the country with more than a half million barrels of oil a day.

Environmental activists worked on a letter writing campaign to defeat the bill, citing the potential danger of increased sulfur and nitrogen oxide emissions which contribute to acid rain. Other opponents of the bill included small and medium sized utility companies; they claim that deregulation would put them at a financial disadvantage to larger companies.

Now that the Arctic drilling provision has been eliminated it seems that the Senate may reconsider the energy bill in the near future. The American Petroleum Institute called the Senate vote "a serious setback" and that Arctic oil drilling is "the key to increased domestic oil production." Ronni Liberman, a spokeswoman for the Sierra Club was pleased with the Senate action yet continues to oppose the energy legislation because it "encourages increased use of nuclear power, does nothing to promote solar and wind energy, and does too little to insure greater automobile fuel efficiency."♦

ACTIVISTS' CORNER

**RIGHT TO KNOW, RIGHT TO USE,
RIGHT TO FACTS--IT'S OUR RIGHT!**

ATTENTION ACTIVISTS AND CONCERNED CITIZENS! Since the "Community Right to Know" Act was passed in 1986, great strides have been taken in acquiring information regarding hazardous wastes, toxic producers, and waste receivers in communities throughout the Commonwealth. Many roads have yet to be travelled. We at Dickinson College want to be a directory of information and assistance to those wishing to track the confusing, twisting trail of toxics and their sources in their communities. With access to the environmental databases of RACHEL, RTK NET, and TOXNET we can and want to help you! Professor Michael Heiman and Dana Intern Julianne Bowman are your Dickinson contacts-- Julianne will be doing most of the on-line data searches. She can be reached at (717) 240-3886. Michael is best at networking with other sources of information, such as personal contacts, organizations, and reference texts. He can also assist in devising strategies beneficial to your particular situation. He can be reached at (717) 245-1338. Both Michael and Julianne are eager to access these databases. If you can utilize their services, or have any questions concerning SARA, Right to Know, or the databases accessible to them, don't hesitate to call--it's your RIGHT TO KNOW!♦

NETWORKING OPPORTUNITY

Building Partnerships in the Year of Clean Water is the theme of the Third National Volunteer Water Monitoring Conference scheduled for March 29 through April 2, 1992. The conference, sponsored by the Izaak Walton League of America (IWLA) along with other well known environmental organizations, will focus on hands-on learning for citizen volunteers who monitor water systems throughout the nation. There will be opportunities for learning new computer programs, proper sample testing procedures, and other techniques necessary for success in the citizens' environmental movement.

The conference will be held at the Annapolis Waterfront Hotel in Annapolis, MD. Registration is \$35, which includes three buffet lunches. \$95 covers the cost of a single or double room in the hotel. For more information write or call:

IWLA
1401 Wilson Blvd., Level B
Arlington, VA 22209
(703)528-1818

ALLARM staff members will be attending--will you join us?♦

DID YOU KNOW ...

✓ that 1991 will be recorded as Pennsylvania's seventh driest year to date?

✓ that the average household produces 160 pounds of household hazardous waste per year which are routinely thrown away in the trash, poured down the drain, or dumped in the backyard?

✓ that one tree shading your home can save fuel by cutting as much carbon dioxide as 15 forest trees?

✓ that according to the US EPA approximately 17,000 water bodies around the country remain heavily polluted by the annual influx of billions of pounds of pollutants, many of them toxic?

✓ that only 10% of the 160 million tons of municipal solid waste produced in the US is being recycled, 80% is buried in landfills, and the other 10% is incinerated?

✓ that last year in Poland, angry residents of Plonsk broke through fences with tractors and destroyed a toxic waste incinerator run by the military to burn Austrian hazardous waste?

✓ that current global climate change predictions call for temperature increases of 2 to 9 degrees F during the next century, a rate and magnitude greater than the last 10,000 years?

✓ that the White House estimates that the cost of implementing the Clean Air Act will be \$25 billion by 2005?

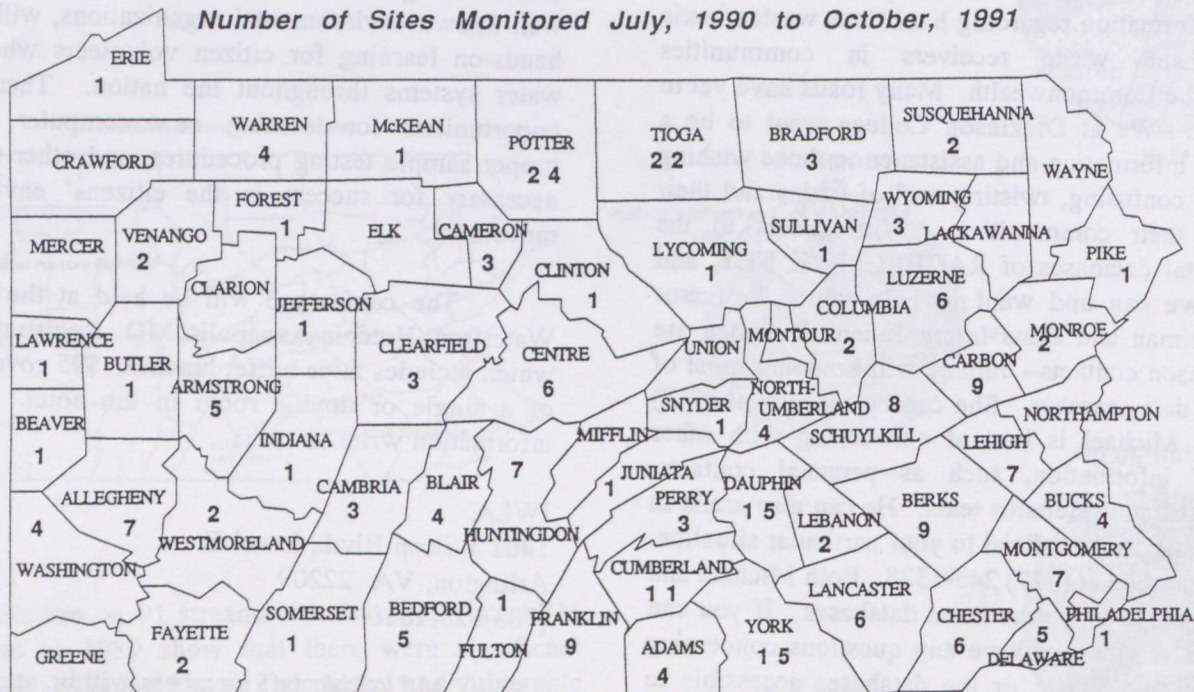
✓ that in the 1700's England protected its salmon and trout streams through citizen monitors known as "Riverkeepers"? These riverkeepers preserved the flow of water, prevented poaching, and encouraged the breeding of flies to feed the fish.

✓ that you can receive copies of current environmental legislation in Pennsylvania's General Assembly by telephoning 717/787-6732 for the Senate and 787-5320 for the House?

✓ that dying sugar maples produce a greater amount of sap which is sweeter than normal in reaction to stress caused by acid rain? ♦

By John Meckley

Number of Sites Monitored July, 1990 to October, 1991



ALLARM NEWS & NOTES

ALLARM and Founder Receive EPA Award

by Matthew Kloiber

ALLARM and its founder, Dr. Candie Wilderman, were both recent recipients of an Environmental Protection Agency (EPA) award. The award was given "For Excellence in Environmental Education." ALLARM and Dr. Wilderman were praised for "encouraging citizens actions instrumental in identifying and monitoring environmental problems."

The award was presented by EPA representative Bonnie Smith at an October 12 ceremony at Pine Grove Furnace State Park. Ms. Smith noted at the ceremony that ALLARM was the only non-profit organization within EPA region III to receive the prestigious award.

Approximately thirty people, including ALLARM monitors, board members, staff members and family members of Professor Wilderman attended the presentation. All those present also enjoyed the barbecued food and homemade treats served at a picnic held prior to the ceremony. Several individuals also took part in an intense volley ball game.

As part of the ceremony, everyone present was asked to share some words about what ALLARM has meant to them. Several individuals mentioned that ALLARM is important to them because through their work monitoring streams with ALLARM, they have been able to help make a difference in trying to solve one of the environmental problems that we face, acid rain. ALLARM provides a way in which they can influence the government concerning acid rain issues by documenting its effects throughout the state.

Professor Wilderman shared similar thoughts. Holding the award in her hand she said that this award really belonged to all the members of ALLARM.

The staff of ALLARM would therefore like to take the chance to congratulate Professor Wilderman and all the ALLARM volunteers for your excellent work. ♦

CAPHE Grant Awarded

By Jennifer Litton

Last spring, after months of working hard to devise a grant proposal and waiting for a response, ALLARM received our first big grant from the Consortium for the Advancement of Private Higher Education (CAPHE). The proposal falls under the category of "Programs that place colleges' human and other resources in service to the community". We received \$16,661 from CAPHE and \$16,661 matching funds from Dickinson. These funds will be used to: 1) increase the size of our student staff; 2) increase the depth of water analysis by asking volunteers to collect more samples for more sophisticated analysis in our lab; 3) increase the sophistication and frequency of student-conducted regional volunteer training; 4) include water quality monitoring at critical watersheds, and 5) continue integrating ALLARM activities into Dickinson's curriculum. These activities will be conducted over a period of three years. We are proud to announce, therefore, that ALLARM will be continuing to grow for some time. ♦

Available to Members

John Meckely is assembling packets of information specific to the needs of our volunteers. If you would like more in-depth information concerning ALLARM, acid deposition, or additional parameters which may be tested in your stream, this is for you. Contact John at the ALLARM office.

As you can imagine, Carmen Irizarry is swamped with data forms! Because of the need for maximum efficiency, she has devised personalized data forms. These new forms will have your name, county, and stream name already printed on them. It will eliminate some common problems, such as two members working on the same site sending in forms using both names interchangeably, which can lead to confusion when filing information. If you run out of your old forms, let Carmen know, and she'll whisk some new ones to you!

(continued on page 6)

ANNUAL BOARD MEETING SUCCESSFUL

Once every fiscal year the ALLARM Board of Directors meets to discuss past successes, remedy "rough spots," and plan for the future. On October 12 this year's meeting was held at Dickinson College.

The meeting was fruitful; new tactics for volunteer recruitment were discussed, the CAPHE Grant was celebrated, as was Candie Wilderman's receiving of the Federal EPA's Award for Excellence in Environmental Education.

The highlight of the meeting was the election of new Board members. Those elected for three year terms are as follows:

John Childe (pending consent)
Lorna Joiner (pending consent)
Dick Robertson (pending consent)
Cecilia Jankura
Christine Reuss
Jeff Swingholm (pending consent)

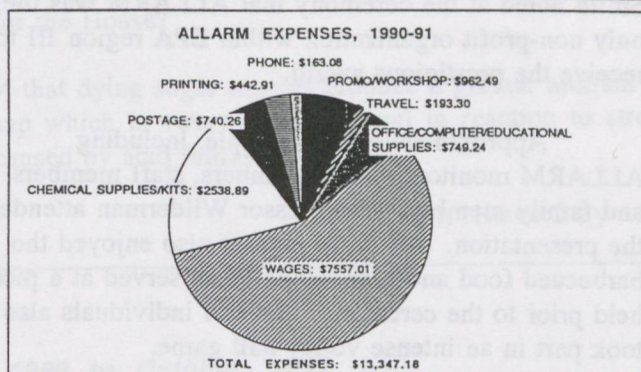
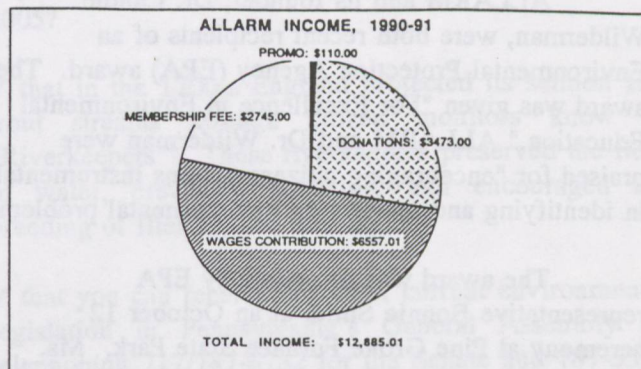
Those being offered honorary membership and open terms on the Board are as follows:

Rep. John Broujos
Maurice Goddard
Walt Lyon
Fred Johnson
Bob Schott

Everyone was delighted to elect Christine Reuss, former student coordinator and friend of ALLARM, as President of the Board. Cecilia Jankura was elected to the office of Vice President. Cecilia has been very active in ALLARM; she has given valuable insight into the office management, and is also currently testing for many parameters other than acidity and alkalinity in the Conodoquinet Creek, Cumberland County. Marcus Sheffer, who also extensively tests the Conodoquinet, was elected to be the Treasurer. He is also the Chairperson of the Newsletter Committee. Pending her consent, Lorna Joiner will be the Secretary. Recently she has kept us well informed of her travels, sending us beautiful pictures to add to our new photo album, which is presently being assembled by Christy White, and reminding us of the environment beyond Pennsylvania. ♦

FINANCIAL REPORT

During the past fiscal year, which includes July 1, 1990 through June 30, 1991 our income covered our operational expenses. ALLARM's largest expense was student wages, followed by chemical supplies and HACH kits. For a complete breakdown of both income and expenses, please refer to the graphs below. ♦



Available to Members

(continued from page 6)

Note: If you are monitoring at more than one site, please keep them separate! It is important that data from only one stream site is listed on a form!

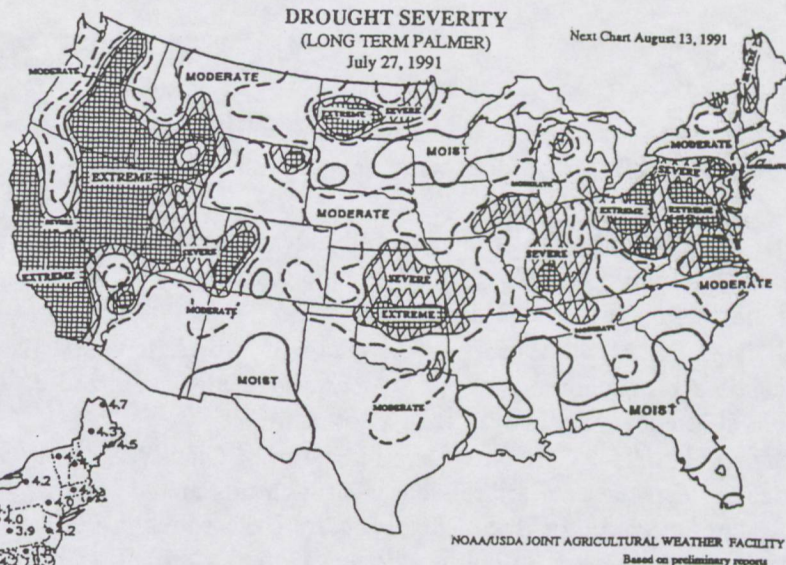
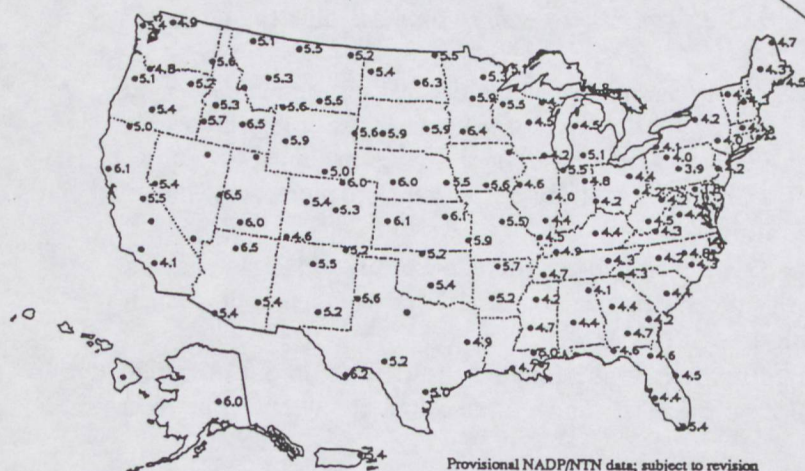
If you are an educator, organization leader, or hold another position which allows you to influence others in a lecture or discussion setting, and you would like to talk about ALLARM, Matt Kloiber's newly revised slide show will be available for your use. It can be altered slightly to suit your specific needs and audience. It is an easy to follow overview of the chemistry and cause of acid deposition, and a description of ALLARM and its role in establishing a database useful in showing the effects of acid precipitation on Pennsylvania's streams. If you are interested in borrowing the slide show, please contact Matt at the ALLARM office. ♦

Drought

(continued from front page)

**DROUGHT SEVERITY
(LONG TERM PALMER)
July 27, 1991**

Next Chart August 13, 1991

NOAA/USDA JOINT AGRICULTURAL WEATHER FACILITY
Based on preliminary reports**pH of Precipitation for June 24-July 21, 1991**

Provisional NADP/NTN data; subject to revision

ALLARM REQUEST FORM**ALLARM T-SHIRTS** - A fun and comfortable way to spread the word.

ALLARM t-shirts are white with kelly green logo (see below), 100% cotton. Choose from small, medium, large, and extra large. Fill out the form below and return it to the ALLARM office with \$10.00 per shirt. ♦

☐ Please send me _____ t-shirts. T-shirt sizes _____ S, _____ M, _____ L, _____ XL

DONATIONS

☐ I would like to make a donation to ALLARM in the amount listed below.

_____ \$50, _____ \$30, _____ \$20, _____ \$10, _____ other (\$ _____)

MONITORING MANUAL

☐ Please send me the ALLARM monitoring manual.



NAME _____

ADDRESS _____

PHONE NUMBER () _____

MEET THE STAFF

The ALLARM staff this year is a perfect mix between experienced old timers and fresh new faces. Here's a summary, a kind of who-does-what behind the scenes to keep things running smoothly!

Jennifer Litton - Jen is this year's Student Coordinator, which basically means that she is in charge! Jen's duties are many--some of the bigger jobs include graphing volunteer data, keeping the finances for the fiscal year straight, and managing the ALLARM office.

Carmen Irizarry - Carmen is our data entry specialist! She also sends out HACH kits and chemicals to volunteers. Recently she developed a system which produces personalized data forms for every volunteer; this should increase office efficiency and save Carmen a lot of time!

Christy White - Christy, who is in charge of Quality Control, insures that volunteer test results match her own, indicating that the data are reliable. Through this method she is able to detect if a volunteer is doing the testing procedure correctly, or if the chemicals are fresh enough to be accurate indicators of stream health. She also helps Jen graph data, and assists in editing the newsletter. Currently, Christy is revising our current brochure, which needs to be updated to reflect ALLARM's growth since its original writing.

John Meckley - John has been busy working on ALLARM's membership and sponsor drive. He also has put together information packets which he can customize to fit the specific needs of interested volunteers or interest groups who request further information on acid deposition or ALLARM.

Matt Kloiber - Matt is our networking specialist. Currently, he is in the final stages of revising our outdated slide show. It should prove to be very informative, and, like John's packets, can be altered to suit any audience (please see "Available to Members").

Colleen Thompson - Colleen is the editor of our newsletter, "Stream of Consciousness," this year. She is also responsible for locating volunteer monitoring sites on a central map.

Kate Kauffman - Kate, in addition to doing extensive monitoring of the Conodoquinet Creek in Cumberland County, is working hard to raise matching funds for our CAPHE grant. She offers endless insight to our staff meetings, and keeps us full with fresh veggies from her garden and homemade sticky buns (Contact ALLARM office for recipe)!

Dr. Candie Wilderman - Candie, the founder of ALLARM, leads us in our endeavors. She is a fountain of information and ideas, always pointing us in the right direction. Her responsibilities are endless, and her service irreplaceable. She recently received an award "for excellence in environmental education".

It's going to be a very productive year for ALLARM, a year of expansion, improved organization, and high expectations. Special thanks to you, our volunteers, who make ALLARM work! ♦

Stream of Consciousness

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ALLIANCE FOR ACID RAIN MONITORING

Dickinson College
Environmental Studies Department
Carlisle, PA 17013
(717) 245-1565

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