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Acid rainfall level high in Centre County area

By BRIAN MAGEE
 Collegian Staff Writer

In the past several years, the term "acid rain" has gone from being scientific jargon to one of today's most hotly debated environmental issues.

Industry, sportsmen, farmers, researchers and government officials have varying opinions of what — if anything — should be done about it. And it looks as if those searching for some agreement as to what exactly should be done are in for a long wait.

James Lynch, leader of a project that monitors acidity rainfall for the Pennsylvania Department of Environmental Resources, said while all of state receives acid rain, most acidic precipitation falls on the region stretching from the southwest corner of the state to the central portion, which includes State College.

The sources of acid precipitation, many experts believe, are the pollutants sulfur dioxide — from the burning of coal and other fuels in utility plants and smelters — and nitrogen oxides from automobile exhaust.

Through a series of complex chemical reactions these pollutants combine with atmospheric moisture to form acids.

Lynch said rain received in this part of the state is more acidic than any other part of the United States, with a pH around 4.6.

The lower the pH, the more acidic the rain. A pH of 7 is neutral. A pH of 5.6 is considered normal for rain.

Jim Holian, a graduate assistant in meteorology who monitors rainfall for that department, agreed that the pH of the region's rain is the lowest in the nation, but he pointed out that the effect of acid rain depends on the local geology.

The low pH rain doesn't affect the Centre Region's surface waters as much as other areas because the limestone and dolomite deposits in the valleys neutralize most of it, Holian said.

But the Poconos and New York's Adirondacks are not as fortunate. Their lakes and streams are acidic enough to kill many kinds of fish.

While central Pennsylvania lakes are buffered against large pH drops, streams have shown pH values between 5.0 and 5.5, with a few in the 4s, said Dean Arnold, leader of the Cooperative Fish and Wildlife Research Unit at the University.

"Our trout streams are in trouble," he said.

Different fish species have different pH limits in which they can survive, said Arnold, who has been involved in acid rain research since 1974.

"But even if the water is not acidic enough to kill the fish, it can affect their growth and reproduction.

"Tests done in laboratories may show a species resistant to a certain pH level, Arnold said, but when put into a stream of the same pH it may be unable to reproduce and the population dies out.

Recent research suggests that in acid rain environments, some trees grow more slowly and many plants

experience spotting and discoloration. This is especially damaging in crops such as lettuce, where the leaf is important, Arnold said. Also, the nutrient content of soybeans raised in acidic conditions was shown to decrease.

More tests are needed to determine the long-term effects on plants, he said.

Acid rain can also adversely affect drinking water by leaching harmful metal ions from the soil and pipes and carrying them into the water supply, Arnold said.

These metal ions, such as copper, lead and aluminum, become more soluble in acidic water, enabling them to travel with the water.

Rosa de Pena, University professor of meteorology, said 70 percent of the acid precipitation is a result of sulfur dioxide, while 30 percent comes from nitric oxides.

The pollutants can be carried hundreds of miles before falling to the earth. De Pena, Holian and others in the meteorology department are working on techniques that would determine where the acid rain falling in one area picked up its pollutants.

Holian said that sulfur dioxide, which has an atmospheric residence of three to five days, could come from as far as 700 miles away — all the way from St. Louis, for example.

Lynch said the major pollutant for this area is probably the Ohio River Valley, with some additional pollutants coming from local industries.

He added, however, that "there is little concrete data —

presently the evidence is circumstantial."

Dry deposition, the falling to earth of sulfur dioxide and nitrogen oxides as dry particles, was once thought to be insignificant but is now seen as a substantial contributor to the problem.

Dennis Thomson, University professor of meteorology, said dry deposition of pollutants can amount to anywhere from one-tenth to four times as much as acid rain.

Dry deposition may pose a more serious threat to plants, Thomson said.

When acid rain falls on a plant at the beginning of a storm, it is usually washed off by more neutral rain later in the storm. Dry deposition, however, can stick to a plant leaf for days, the longer exposure causing greater damage.

"But this is a matter of some controversy," he said, adding that more research is needed.

Some question exists to whether the pH of rainfall has been decreasing in the recent past. Lack of long-term data prevents researchers from determining trends.

De Pena said published data suggests a decrease in the pH of precipitation since the 1950s, but the data is not conclusive.

She said the acid rain problem is serious enough to warrant trying to reduce pollution levels, "but how to do that is another problem."

Until more research is done, Thomson said it will be difficult to give industries guidelines on decreasing pollution.

collegian notes

- The Penn State Thespians will meet at 1:30 Sunday afternoon in 307 HUB.
- The Krishna Yoga Society will hold a free vegetarian feast at 7 tonight and 5 Sunday afternoon at 103 E. Hamilton Ave.
- The student counselors are available for general information, personal counseling or referral advice. Stop by 133 Souder or call 862-2020 4 p.m. to midnight Monday through Friday or noon to 8 p.m. Saturday and Sunday.
- Chi Alpha Christian Fellowship will meet at 7:30 tonight in the Eisenhower Chapel lot.
- The canoe division of the Penn State Outing Club will have a pool session from noon to 2 Sunday afternoon in McCoy Natatorium. Beginners are welcome.
- The State College Area Music Guild will present a free concert at 2:30 Sunday afternoon in the First Presbyterian Church, Bellefonte.
- The Badminton Club will meet to discuss the upcoming match with Mansfield State at noon Sunday in 126 White Building.
- Any Golden Key member interested in helping with the College Bowl please leave your name and phone number at the HUB Desk.
- The School of Music will present organist Barbara Harkach-George in recital at 8:30 tonight in the recital hall of the Music Building.
- The Graduate Student Association will sponsor happy hours for graduates and guests from 4:30 to 6 tonight in 102 Kern.
- The Office of Student Activities will sponsor an eight-ball tournament at noon tomorrow in the HUB Billiard Room. Entry fee is \$2 and the first 32 entrants will receive a free T-shirt. The first place winner will be eligible to represent Penn State at the regional competition. Entries received after 4 this afternoon will not be seeded.
- The mountaineering division of the Penn State Outing Club will hold a fixed rope climbing and rappelling class at noon Sunday in 8 Intramural Building. Bring your sneakers.
- The Penn State Thespians will hold auditions and crew sign-up for their production of the children's show "Playground" from 7 to 10 Sunday night in Schwab Auditorium. Roles are available for five women and seven men.
- Yachad, Penn State Friends of Israel, will show a slide show on the physical landscape of Jerusalem at 4:30 Sunday afternoon at the HUB Desk.
- The State College Police Department reported Wednesday that Mid-State Bank, 245 E. College Ave., received forged checks totaling \$900 in November and December. An investigation is continuing, police said.
- Fred Burns, supervisor of presentation services, 1 Willard, told University police yesterday that an overhead projector was missing from 101 HUB during Fall Term. He also reported a slide projector missing from 105 Sackett since Dec. 16. The value of the missing items is estimated at \$660, police said.
- James Grace, 108 Ferguson, told University police Wednesday that his briefcase and its contents were missing from his office. The value of the missing items is estimated at \$110, police said.

—by Michael J. Vard

police log

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