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ON THE COVER — This is a view of the Survey building as the flood waters were rising. The intensity of the current which came on extremely suddenly, prevented rescue of any items until the waters receded.

PENNSYLVANIA GEOLOGY is published bimonthly by the Topographic and Geologic Survey, Dept. of Environmental Resources, Harrisburg, Pennsylvania, 17120.

AUGUST 1972
The Pennsylvania Geological Survey has been subjected to destruction unparalleled in its 136-year history.

On June 21 it began to rain. In the next 4 days the tropical storm Agnes dumped 16 inches of water on central Pennsylvania. The Susquehanna River reached a crest of 16.5 ft. above flood stage at Harrisburg, Pennsylvania, on June 24. This spelled disaster for the Survey, which, occupying the entire ground floor and basement at its custom-designed new quarters, saw the water reach 12 ft. at its site, well above the ground-floor ceilings.

When we finally waded in, we were dumbfounded by the havoc. Nothing was left intact. A black, pitch-like layer of industrial oil on top of 2 to 3 inches of silty muck covered everything. Furniture was in a jumbled tangle as desks, chairs and wooden cabinets had floated and flipped, dumping all top contents. The acoustical-tile ceiling had dissolved into oatmeal-like mush. In the exposed spidery network of the suspended ceiling hung entangled furniture, manuscripts, notebooks and records. Plywood walls lay in contorted shapes, and plasterboard partitions had simply sagged to the floor. The outer offices, with their large glass windows, left little to salvage, as the weight of the water had burst through and flushed all belongings out; some desks were found 2 miles downstream, and other items now line the floor of Chesapeake Bay. Our map room, lined with proud new wooden map cases, looked as if a giant had built a mountain of jumbled blocks; it was a total loss. As the water soaked through file cases (including air photos for 700 quadrangles) the contents expanded and burst the fronts of each drawer. Office bookcase exhibited weird patterns of deformation as water-soaked books had swelled up and pushed through the sides of the cases. The wreckage of the chemistry lab with the pools of intermixed reagents would have done credit to a fictional fiend. The wreckage of the X-ray and microscope labs would bring tears to the eyes of any scientist.

Continued on page 2
In terms of totality of loss, our library of nearly 40,000 volumes suffered the worst. It was in an interior room and we could not get to it for several days. Having moved just a few weeks before, our books were still packed in a big pile of cartons. When we did get in to them we found that expansion had burst every box and we faced a massive mound of 40,000 volumes covered with dissolved glue, mud, and industrial oil. By that time most of the books were well on their way of returning to pulp.

We are now in temporary quarters striving to pull ourselves together. The staff has worked fiendishly to salvage what we could. We got great help from some of our geologist friends who worked with us side by side in the muck. Particularly we must acknowledge help from the staffs at Dickinson, Lehigh and Penn State. A few of the instruments we have salvaged—at least well enough to be sent off for factory rebuilding. Our top-priority manuscripts we fished out of the muck and rushed to Bill Heintz (of Williams & Heintz Map Corp.) who generously offered to wash and dry them. Most equipment and furniture we shall have to replace. Our records retrieved from the muck, were rushed to industrial freezers and later processed in the hay-drying ovens at Hershey Farms; they are now crisp.

As to our library—the core of our research capability—we must issue an appeal. Many items are just not on the market, so we would greatly appreciate it if anyone with surplus geological books or periodicals would forward a list of them to the Pennsylvania Geological Survey. We will check off only the ones we need and make arrangements for shipment.

The Pennsylvania Survey will rise again, but we need the help and patience of our friends and patrons.

Arthur G. Dobrow

AN EXPLANATION

For the past few years the August issue of the Pennsylvania Geology Bulletin has carried our annual NEWSLETTER in which we list all the ongoing geological projects in Pennsylvania. We had planned the same this year and the annual questionnaire had been distributed, received, and compiled. Came the flood! All the returned questionnaires were completely lost. So we are going to skip the NEWSLETTER issue this year, but we’ll have it again for you next year. Sorry, but we trust you appreciate the problem.
Near the peak of the flood our main building and the outer warehouse showed little left of our ground floor quarters.

At peak flood level, nothing shows of the Survey’s quarters on the ground floor. The water depth was 12 feet at the Survey buildings.
The oil saturated Survey building became a graveyard of devastated furniture and equipment. Acquired with difficulty over the years, in one fell swoop it ended up as landfill material.

One end of the map room looked like this after the flood. On the cases are the remains of a stock of new topographic maps received before the flood. Over 200,000 maps were ruined.
Our new map cases loaded with topographic maps were tossed about by the flood and left in a jumbled heap.

One end of the library showing the havoc among the photo files. Water level higher than the ceiling dissolved the tiles, leaving exposed the struts of the suspended ceiling.
The stock of surplus library books got hit hard. There were no surplus books left after the flood. Oil, silt, and mud ruined the entire library.
Student assistant Kim Bodoia finds access to the map files somewhat restricted.

The furniture was a total loss, but our manuscripts in progress and our administrative records, we were determined to save. Here Arthur Socolow, Bert VanOlden, and Don Hoskins pass boxes of the mud-covered, oil-soaked materials out the demolished windows, to be sent to freezers to prevent decay.
These oil soaked shambles were once the State Geologist's neat, white-walled office.

Here Assistant State Geologist Donald Hoskins takes a breather to survey some of the few items which were saved. Arthur Socolow washes the library card files — at least we have a record of what we lost.
A sad sight faced us when we got into the geology library. Our books, which had still been in cartons from our recent move, had turned to an oil and glue covered mass of pulp. A total loss of nearly 40,000 volumes.

Through a window demolished by swirling waters, Environmental Division Chief Alan Geyer points to the oil saturated remains of his office.
A collection of map tubes fared poorly in the oil and muck.

Geologists Bill Sevon and Don Hoskins compare notes on salvage operations as Art Socolow, with phones out of commission, had to use walkie-talkie to get messages out.
The boats were a help in salvage work before the water completely receded. The oil line shows total submergence of our ground floor quarters.

Survey office building after the battle! It looked like it and felt like it.
Twelve feet high waters carried a file cabinet into the ceiling struts and left it hanging there.

Geologists Bill McGlade and John Way helped to clean up some of the electronic lab equipment in the hopes of salvaging these valuable items.
Our electric typewriters did not fare well. Only three out of 24 were repairable. Unlike ball point pens, they don’t do well under water.

Geologist Dave MacLachlan retrieves some of his records even as the flood waters still abound.
As salvage progressed, it was a tough job keeping the piles of junk material separate from the piles of "to be saved" items.

This photo was not a setup. The chair actually floated up there and was left stranded on the cabinets.
There was even an artistic side to the flood disaster. These are swirling oil stains left on our building columns.

One had to look in all possible and impossible places for salvage. Here a manuscript in Editor Wilshusen's office was actually left stranded on a light fixture close to the ceiling.
Bert VanOlden, Arthur Socolow, and Barbara Conrad are washing down some library records prior to rushing them off to a freezer for preservation. The entire staff worked diligently to salvage critical items.

The stock of our educational geology booklets in the outside warehouse had to be shoveled out and became part of the new landfill of the area.
Chief of the Field Division, Sam Root, uses his back lawn to lay out and dry his project maps.

Survey Librarian Sandra Blust, in the uniform of the day, stands at the oil soaked front of the Survey quarters to help retrieve some important documents.
Buck O'Neill was drying out some of his mineral deposits maps after the holocaust.

This was not our Monday wash line. It was our Monday manuscript line — hanging out to dry in our parking lot.
Outside our ruined, oil coated building, staff geologist Rick Wells strung a clothesline to dry his field project maps and sections.

Our X-ray equipment was pulled out and cleaned in the hopes of salvaging some of its components.
Our geologists take a breather during salvage work. Left to right: Troutman, Bodoia, Bragonier, Berg, Glover, and Hoskins.

Free parking overnight in our parking lot did not pay off for this car.
THE FLOOD AND THE SURVEY

The flood caused by hurricane Agnes in June of this year resulted in crest waters of 32.57 feet at Harrisburg. This meant that the entire facilities of the Pennsylvania Geological Survey at 100 N. Cameron St. in the Paxton Creek lowland were inundated completely to the ceilings. Damage by flooding was extensive and in many forms not anticipated. Everything was wet, obviously. Almost everything exposed was coated with mud. But some of the places where mud was deposited were almost unbelievable: between the pages of books packed on shelves; inside multi-lens microscope objectives and oculars; inside Brunton compasses; on papers in files in closed drawers, etc. Although some things were damaged by movement during the flood, much damage occurred as the flood waters dropped and sedimentation of moved materials occurred. Unquestionably the most shocking and visual damage came from the large amounts of oil which literally coated everything in the front of the Geological Surveys ground floor headquarters. Oil found its way into all parts of the building. Other types of damage, many of which are illustrated by the pictures in this booklet include: wooden items, such as desks and tables, floated and dumped everything on their top, such as lamps, books and even a Programma 101 computer; chemicals were spilled; windows were broken. The Assistant Director’s desk was floated out his office window and carried several blocks downstream from the building. Some field notebooks containing data representing many months and even years of work were washed away and never found. Even more startling were tightly packed books which swelled with water and bent metal bookcases outward at both ends. Air photographs swelled and wedged open the fronts of locked file drawers; acoustical ceiling tile floated, disintegrated and made a sticky mess wherever they were deposited; numerous maps and papers were buried in the mud and debris and never recovered; wooden desk drawers swelled and could be opened only with axes and crow bars; expensive electronic and other electrical equipment was virtually made worthless. These are the destructive effects of hurricane Agnes which were witnessed. As is well known, this flood was a major catastrophe, particularly to those who work and live in the Susquehanna River basin.

Flooding in the Susquehanna River basin was severe. Those areas reserved by nature to accommodate excess water, the flood-plains, were inundated in many places to depths never experienced since these regions were settled in the 17th century (Figure 1). Some places, like Wilkes-Barre, were almost destroyed. At Harrisburg, the Paxton Creek lowland became again a channel of the Susquehanna River and Harrisburg Island existed again temporarily (Figure 2). We say that areas again became flooded because such events (disasters), though freaks of nature in a man’s short life span, are in reality a part of the predictable and clearly evident history, past and future, of the Susquehanna River basin.
Figure 1. Flood crest and flood stage heights (in feet) at selected recording stations in the Susquehanna River Basin. Data is preliminary information, supplied by Geological Survey-Water Resources Division, Harrisburg, Pa.

The Geologic Reasons For Flooding

During the last several million years, the landscape of Pennsylvania has been slowly evolving through the processes of erosion and glaciation. Much of this area is part of the Susquehanna River drainage basin and the landscape is intimately related to that river and its many tributaries. Much of the northern part of the drainage basin bears the marked imprint of glaciation but the southern part has changed only subtly during the last million years. Since the 17th century the extensive human settlement in the basin has mainly effected only the surface characteristics of the drainage basin, generally in terms of land use. The effects of the 1972 hurricane Agnes upon the influences and changes, both geological and man-made, in the Susquehanna River basin and its impact upon the Pennsylvania Geological Survey are the subject of this bulletin.

One of the subtle changes wrought in the landscape by the slow process of landscape evolution through river erosion has occurred at Harrisburg, Pennsylvania. Within the last million years the Susquehanna River bed was 20 to 30 feet
higher than at present. After flowing through the confinement of the Susquehanna Water Gap in Blue Mountain north of Harrisburg, the river previously occupied a much wider channel than now and surrounded an island area where the city of Harrisburg now sits. The situation then was almost identical to the situation experienced at Harrisburg during the recent flood (Figure 2) except that then, because the river bed was higher, the broader channel and island existed during normal flow conditions as well as during flood conditions. Gradually the river eroded its bed. Greater erosion occurred in the western channel than in the eastern channel and eventually the Susquehanna River abandoned the eastern channel and what was Harrisburg Island joined the east bank by a lowland area now occupied by a small stream, Paxton Creek.

The Paxton Creek lowland was flooded periodically by the Susquehanna River, but this tendency apparently decreased as the river to the west continued to erode and lower its base level.

As extensive human settlement of Pennsylvania progressed, the surface of the land throughout the Susquehanna River drainage basin was changed to meet the needs of man: agriculture, home sites, transportation systems, etc. Most of these changes resulted in deforestation, lowered rainfall retention, increased runoff and consequent increased flood potential in such areas as the Paxton Creek lowland. The man-influenced environment was thus prepared and had proved itself no longer a natural baffle to floods in 1936 when the Susquehanna River flooded the Paxton Creek lowland.

Throughout man's development of the Susquehanna River Basin, he has, for one reason or the other (economic, convenience, esthetics or willful disregard of nature), extensively developed land subject to the occasional ravages of the river and its tributaries. Many communities, such as Wilkes-Barre and Sunbury, have been built almost entirely on floodplains. The Paxton Creek lowland at Harrisburg is now occupied by housing, industries, office buildings and retail stores.

The Flood

On April 17, 1972, after 53 years of residence in various places on the old Harrisburg Island, the Bureau of Topographic and Geologic Survey completed a move to new quarters on the ground floor of 100 N. Cameron Street, an office building in the Paxton Creek lowland. The west side of the building was immediately adjacent to the present channel of Paxton Creek.

April, May and early June were wet months in the Susquehanna River drainage basin and ground water tables were already high. The situation was within normal limits on a long term basis and in keeping with long term cyclic rainfall fluctuations (drought years and wet years). Moderate to heavy rainfall in the upper Susquehanna River basin prior to June 21 caused some flooding in New York State and increased drainage into the Susquehanna River. And then came Agnes.
Figure 2 Map Showing Area of Harrisburg Flooded in June, 1972
Hurricane Agnes arrived in Pennsylvania on June 21st where she moved slowly. The result was the large amounts of rainfall shown in Figure 3. Because of the low water absorption capacity of the Susquehanna River drainage basin created by long term influence of land use and short term effects of high water tables, copious runoff developed and large quantities of water ran into stream channels.

Flooding represents the natural accommodation in the stream valley of great quantities of water which exceeds the capacity of the normal stream channel. Such accommodation (flooding) is normal and repetitive. The excess water in its downstream rush simply spreads out onto the flood plain and may eventually fill the entire stream valley. The increased amount of water results not only in a rise of water level, but also an increase in flow rate and carrying capacity. As the flow rate increases, a stream which during normal flow may be able to transport only silt and clay size material (mud) may reach such high velocities that rocks the size of bowling balls and even snowmobiles can be swept along. In addition, the increased stream volume and velocity cause the stream to carry a greatly increased amount of eroded materials such as sand, boulders, trees, and a great variety of other items which are not moved by a stream in normal flow conditions.

This load of debris causes varieties of damage to other objects, particularly stationary objects such as buildings, which happen to be in the path of the rapidly flowing currents. The moving debris combined with the increased velocity and carrying capacity causes the stream to severely damage by erosion not only its own banks, but also road beds, house foundations and agricultural lands.

Floods crest eventually and the water level begins to recede. As the water level drops, there is a decrease in velocity and carrying capacity of the currents and a resulting deposition of the materials being transported. It is during this phase of flooding that gravel deposits are formed on grass lawns and mud layers are formed on all surfaces. All of these aspects of flooding (water level rise, erosion, impact and deposition) are generally destructive to the works of man. Every flooded community within the Susquehanna River basin returned to find what devastation this flood had wrought. We at the Pennsylvania Geological Survey found that, physically, we had been almost destroyed.

Salvage

Salvage operations at the Survey commenced even before the flood waters were completely out of the building. Initially, salvage was hindered by the shock of the extent of damage, which was beyond expectation, and by the problem of
Figure 3. Total "Agnes" Rainfall - June 20 thru 25, 1972 (inches)
From P.M. on 20th or A.M. on 21st
Thru P.M. on 25th or A.M. on 26th
(Date from Dr. J.J. Rahn, NOAA State Climatologist
for Pennsylvania, University Park, Pa.)
what to do first. Entrances to rooms were blocked by jumbled furniture. No light existed to explore interior windowless rooms. There was constant danger of cuts from broken glass and possible tetanus or hepatitis infections. Other problems included: how to evaluate what to attempt to save; where to take flood-damaged but salvagable materials; what to do with non-salvagable materials.

Salvage at the Survey proceeded rapidly with maximum effort by all of the Survey staff, including geology-student summer assistants, as well as numerous friends of the Survey. Because of the superb efforts of all, most of the important Survey manuscripts and research materials were saved. The bulk of equipment, furniture, and the physical things which comprise the Geological Survey were seriously damaged or destroyed.

Individuals assumed responsibility for salvage of materials in their offices and everyone worked where help was needed. The Editorial Division received high priority and about 40 manuscripts in various stages of preparation for publication and representing literally hundreds of man-years of work were rushed to Williams and Heintz in Washington, D. C., for immediate washing and drying in a massive successful attempt at saving them.

Some of the materials from the files were taken to commercial food lockers to be frozen; weeks later they were thawed and dried individually on the floor or strung from lines in temporary quarters to which the Survey was almost immediately relocated within 3 days after salvage started. Some of the frozen files and books were stacked in hay and dried in the hay drier at Hershey Farms in Hershey, Pennsylvania. Survey people had washing and drying operations at their homes for several weeks. Many pieces of intricate scientific equipment were shipped or carried by car to parent companies for cleaning, overhaul and repair. Metal furniture and other items were steam cleaned at the new Survey quarters and gradually put back into operation. Much was left behind, too badly damaged to be saved.

The Loss

In terms of tangibles, the main loss was the Survey's library of nearly 40,000 volumes and the map library containing 250,000 maps. The volumes were awaiting new shelving at the time of the flood and became a chaotic mess in the cardboard boxes in which they were stored on the floor. The bulk of the library contents were subsequently removed by a front end loader and piled at the street curb, not a pleasant sight. This rubble contained the published work spanning not only the 138 years of nearly continuous activity by this agency, but also housed geological data from every state in the union and from a large number of foreign countries which publish geological information. Its scientific importance to the Commonwealth’s community of geologists and the citizens they service is immeasurable. It is gone.
Water damage and subsequent corrosion ruined some equipment such as altimeters, typewriters, calculators and cameras, while some pieces such as the delineascope (3½" x 4" glass slide projector), which is now almost obsolete, came through virtually unscarred. Almost everything made of wood, desks, drafting tables, book cases, microscope cases and other equipment containers, was a total loss. The nature and extent of damage to our x-ray machine is still unknown.

Evaluation of intangible losses is more difficult. The loss of time and progress on research projects can only be evaluated in terms of delay of completion and delay in the start of the next project. The value of lost data may be unknown for years—until the data is needed and found missing. The loss of the library will make itself felt everytime required data or background information is unavailable.

The Present and Future

The Pennsylvania Geological Survey is now relocated on the second floor of the former Evangelical Press Building at the corner of Third and Reily Streets in Harrisburg. Drying and cleaning of equipment and files will continue for some time, but operation of the Survey is slowly returning to an approximation of normality. Much equipment needs replacement and a library must be rebuilt. As individuals complete salvage of their personal and research materials they are returning to project work and attempting to pick up where they left off on June 21, 1972. The Editorial Division is already back in limited operation and some field geologists have returned to project problems.

As often happens when people share an experience such as a flood, an 'espirit de corp' has developed in the Survey which will certainly assist the rebuilding of the organization. It is certain that as momentum is gained the Pennsylvania Geological Survey will rise to meet the geological challenges of Pennsylvania and perhaps be better and wiser because of its experience.

The Lesson

The recent floods in the Susquehanna River basin and their effects on thousands of people can only emphasize how little attention man is paying to the reality of natural events. Flooding is a natural and repetitive event which is intimately related to geologic, topographic, meteorologic and land use factors of any area. Continued disregard for these factors means continued loss and misery for those effected.

Flood hazard areas can be utilized in many ways which receive minimal effect from flooding. Such uses are parks, parking lots, athletic fields and other non-structure uses. Future utilization of areas recently flooded should be directed towards such use.
Because of its important lesson, the physical effects of the Agnes-related flood on erosion and redeposition should receive high-priority attention because of the opportunity to evaluate stream processes at a scale which occurs infrequently in one individual's life span but frequently in the longer span of geologic time. The geologists' ability to interpret and predict future events, such as floods, depends largely upon how well he evaluates the recent data and the preserved past record of similar events. Perhaps his greatest responsibility is to bring home to other people that natural events such as floods will recur and that man must learn to relocate and readjust his life and his works to those events.

William D. Sevon

MOUNTAINS OF SOLID WASTE

The Pennsylvania Department of Environmental Resources reports that as of the end of August, 15,826,000 cubic yards of solid waste had been generated by the flood or resulting from flood damage. Placed in more readily understood terms, the amount of solid waste generated by the flood and subsequent recovery operations would fill nearly 200,000 railroad gondola cars, enough to stretch from Philadelphia to Los Angeles. Department records indicate that at the peak of the clean-up in the Wilkes-Barre Kingston areas, 78,000 tons of solid waste were being removed daily to sanitary landfills. To put this in perspective, it should be noted that Philadelphia, with its population of approximately 2.5 million persons, produces about 5,000 tons of solid waste a day. Thus the peak load in the Luzerne County area cited was more than 15 times as heavy as that produced in the State's largest city under normal circumstances. At one point debris was piled 10 feet high on either side of the street leading an observer to say he was driving through a "canyon of waste".

At the height of operations in the Wilkes-Barre area there were about 16 landfill sites operating during daylight hours. Most were strip mine sites, while there were also some sand and gravel pits. The fortunate thing was that the landfill sites were located close to the cities, making it possible to move in 1,000 to 2,000 truckloads a day at the larger sites. General Motors Acceptance Corp. took over a site for the crushing of some 4,000 new and used General Motors cars which had been caught on dealers lots and in showrooms in the floods. Some $3 million worth of liquor which had been stored in a warehouse affected by the flood was taken to a landfill and destroyed. Millions of dollars worth of food, drink, and pharmaceuticals were embargoed to prevent use and disposed of at sanitary landfills. Responsibility for properly disposing of the thousands of tons of waste rested with the Division of Solid Waste Management of the Department of Environmental Resources.
AGNES’ LACUSTRINE LEGACY

Tropical storm Agnes left behind a legacy of death and destruction unequaled in the history of Pennsylvania. Besides washing away cars, bridges, houses, and people, the storm and ensuing flood also caused changes in the topography and surficial geology of the state. Streams changed their courses, landslides revealed new bed rock exposures, new springs appeared, and several new lakes formed from Agnes’ waters.

Two of these new lakes, one in Washingtonville Quadrangle, Montour County, and the other in White Deer Valley in Lycoming County (Montoursville South Quadrangle), were investigated by the Pennsylvania Survey. These lakes occupy natural depressions on gently dipping limestones of the Silurian Tonoloway and Keyser Formations, and have no surface outlets. They formed from surface runoff and new ground-water springs, and continued to rise for a few days after the rain stopped. Drainage from these lakes is through underground seepage beneath topographic divides, through an unseen network of fractures and solution channels in the limestone bedrock.

"Lake Agnes", as the new lake in Limestone Township, Montour County came to be called, covered L. R. 47020 and extended some 2,000 feet north of the road, with a maximum depth of 35 to 40 feet. This lake soon became popular with boaters and sight-seers, as water-skiers skimmed over the corn and wheat fields. One farmer, who owned part of the land under Lake Agnes, claimed that if he had been able to charge people a dollar a head to visit the lake, he would have made more money than he could by farming. Thirty days after the storm, this lake had dropped four feet, draining at a rate of 1 ½ inches per day.

The second lake investigated was in White Deer Valley, and inundated the community of Maple Hill in Brady Township, Lycoming County. This lake is called "Sinks Lake", from a swampy depression by that name which now lies at the bottom of the lake. It covered two state roads (L.R. 41008 and 41009) to a depth of 6½ or 7 feet, and was over 1½ miles long and 40 feet deep at its maximum. Sinks Lake was also popular with swimmers and boaters, but not so popular with the residents of White Deer Valley, who found the only road out of the east end of the valley blocked by the high water. Sinks Lake was larger than Lake Agnes, and slower to drain, dropping only 15 inches by July 22nd.

Call it the fickleness of Mother Nature, or simply the meteorological vicissitudes of the summer of ‘72, but the unusually wet weather of June was followed by six weeks of virtually no rainfall. By August 22nd Lake Agnes was no more, Sinks Lake had dropped below the lowest road level, and the flow of traffic was again restored in White Deer Valley. Water levels in limestone terrain are quick to reflect changes in precipitation, and if we had had normal rainfall during July and August, the road junction at Maple Hill would still be under water.
We would do well to remember that although storms like Agnes seem to be single, catastrophic events, they are a normal part of the long-term history of the area. Even though this may have been a "hundred-year flood", which occurs on an average of once each century, the water has been this high in the past and will rise again. Meaningful averages of relatively rare occurrences such as this are difficult to calculate, and such figures become totally irrelevant when the water is cresting over the dikes and the rain is falling for the fifth or sixth straight day. Rather than consider the Great Flood of '72 a thing of the past, over and done with, it might be wiser to plan for the next Great Flood by raising some of our roads, intersections, and other critical facilities above the flood plains.

Richard B. Wells

Sinks Lake

Lake Agnes
The Bureau of Publications, which stores the stocks of Pennsylvania Geological Survey publications, was flooded during the recent Susquehanna River rampage. Large losses were incurred to all Survey publications and some stocks were almost entirely destroyed. Many of these publications will be reprinted as soon as time and money permit. Such reprinting will be announced in this magazine.

All stocks of Pennsylvania Field Geologists Conference guidebooks were destroyed by the flood. These guidebooks will also be reprinted as soon as time and money permit.

**NEW SURVEY PUBLICATIONS**

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<td>M63</td>
<td>Properties and Uses of Pennsylvania Shales and Clays, Southeastern Pennsylvania</td>
<td>$4.95</td>
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<td></td>
<td>by Karl V. Hoover, Timothy E. Saylor, Davis M. Lapham, Miles E. Tyrell. (329 p., 17 figs., 8 tables)</td>
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<td>IC72</td>
<td>Coal Reserves of Pennsylvania: Total, Recoverable, and Strippable (January 1, 1970),</td>
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<td>by William E. Edmunds. (40 p., 6 figs., 7 tables, 4 appendices)</td>
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<td>W20 (2nd Ed.)</td>
<td>The Ground-Water Observation-Well Program in Pennsylvania</td>
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<td>by Charles W. Poth. (18 p., 8 figs., 1 table)</td>
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**STRATIGRAPHIC FRAMEWORK OF GREATER PITTSBURGH AREA—PART 2, ON OPEN FILE**

The Bureau of Topographic and Geologic Survey in cooperation with the U. S. Geological Survey began an environmental study of the Pittsburgh area by preparing a stratigraphic framework of the surface and near surface rocks. This information on the nature and distribution of the rocks is needed for succeeding phases of the total environmental study and these data in the form of cross sections are a valuable guide to anyone engaged in excavation, construction, mining and drilling in the area.

Part 1 consisting of four cross sections through Allegheny, Washington, Beaver, and southern Butler Counties, a short text, and several figures was placed on open file in October 1971.

Part 2 has now been completed and is on open file at three locations: Bureau of Topographic and Geologic Survey, 401 Pittsburgh State Office Building, 300 Liberty Avenue, Pittsburgh; U. S. Geological Survey, 102 East Mall (Second Floor), Carnegie; and the Bureau of Topographic and Geologic Survey, 3rd and Reily Streets, Harrisburg.

This report includes four cross sections through Westmoreland, Armstrong, northern Butler, and western Indiana Countries, 20 pages of text, several figures, and one table.

All interested persons are encouraged to examine this report at the offices cited. Copies of the report may be made available at the expense of the individual.
PENNSYLVANIA GEOLOGICAL SURVEY STAFF
Arthur A. Socolow, State Geologist
Donald M. Hoskins, Assistant State Geologist

ADMINISTRATIVE DIVISION
Mary Jane Adams, Typist
Shirley J. Barner, Stenographer
Sandra Blust, Librarian
Joanne Bowman, Typist
John G. Kuchinski, Draftsman
Christine Miles, Asst. Editor
Virginia Milewski, Draftsman
Marjorie Steel, Stenographer
Albert Van Olden, Draftsman
Terry M. Wilson, Stenographer
John P. Wilshusen, Editor

ENVIRONMENTAL GEOLOGY DIVISION
Alan R. Geyer, Division Chief
Barbara Conrad, Clerk
Jesse Craft, Geologist (Pittsburgh Office)
William G. McGlade, Geologist
Donna M. Snyder, Stenographer
Grace Tyson, Clerk
Vacant, Geologist
Vacant, Geologist

FIELD GEOLOGY DIVISION
Samuel I. Root, Division Chief
Thomas M. Berg, Geologist
William A. Bragonier, Geologist
William E. Edmunds, Geologist
Rodger T. Faill, Geologist
J. Douglas Glaeser, Geologist
Albert D. Glover, Geologist
David B. MacLachlan, Geologist
William D. Sevon, Geologist
John H. Way, Jr., Geologist
Richard B. Wells, Geologist

MINERAL RESOURCES DIVISION
Davis M. Lapham, Division Chief
John H. Barnes, Geologist
John C. Benson, Typist
Leslie T. Chubb, Laboratory Technician
Bernard J. O'Neill, Geologist
Robert C. Smith, Geologist

OIL AND GAS DIVISION
(Pittsburgh State Office Bldg.)
William S. Lytle, Division Chief
Louis Heyman, Geologist
Cheryl Cozart, Stenographer
Elizabeth A. Eberst, Typist
Walter R. Wagner, Geologist

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AUGUST 1972
GROUND-WATER LEVELS