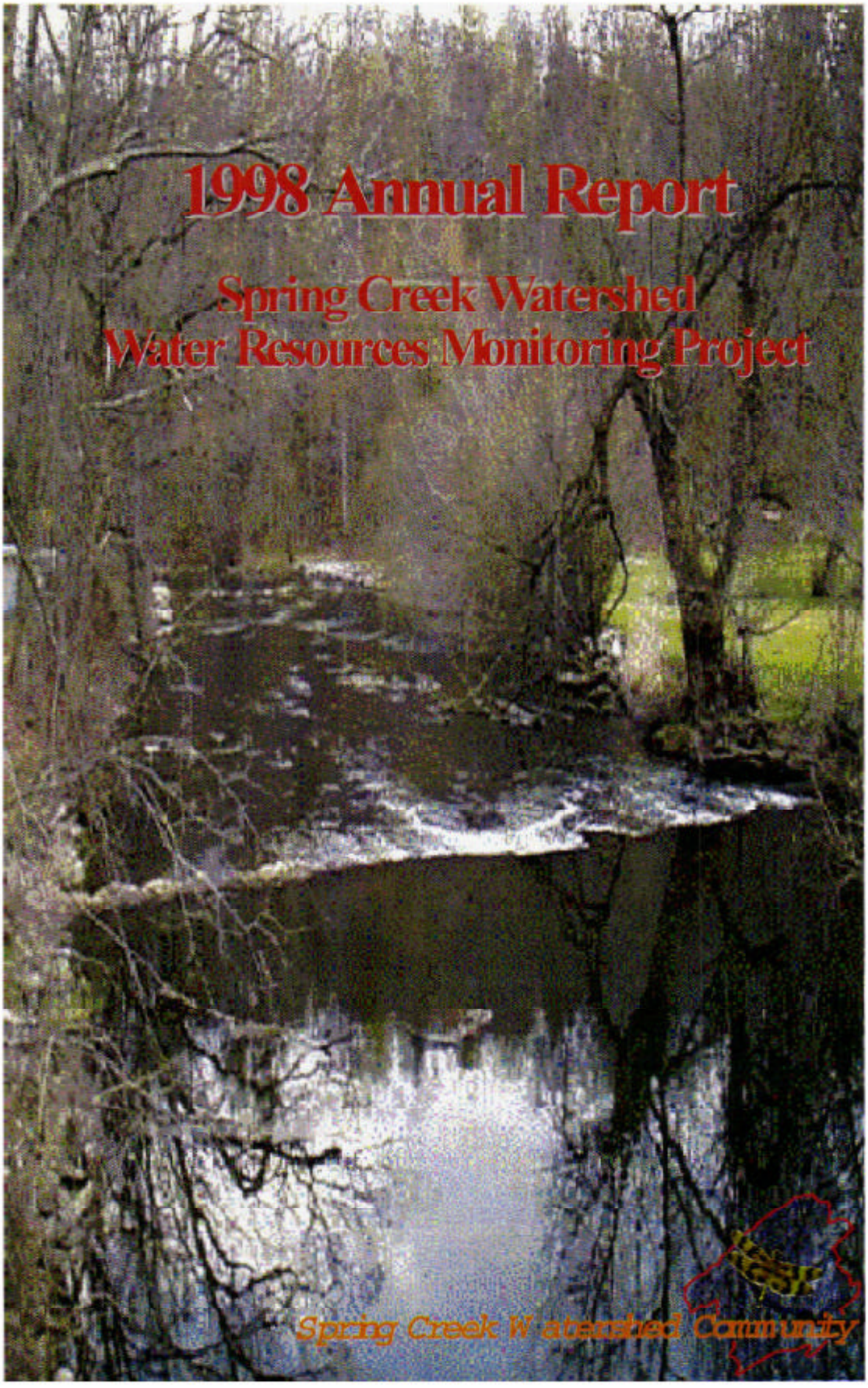

1998 Annual Report
Spring Creek Watershed
Water Resources Monitoring Project
Spring Creek Watershed Community

WATER RESOURCES MONITORING PROJECT UPDATE
Spring Creek Watershed Community
April 1999

EXECUTIVE SUMMARY

Since January 1998, the Water Resources Monitoring Committee of the Spring Creek Watershed Community has been working to establish a monitoring network of 12 sites throughout the Spring Creek watershed "to provide a reasonably accurate description of the quantity and quality of surface waters that will (1) allow for relatively rapid detection of changes in quality and (2) be sufficiently sensitive to permit identification of causes for these changes." To date, ten monitoring sites have been established along: Spring Creek (four sites), upper Buffalo Run, lower Logan Branch, Slab Cabin Run (two sites), lower Thompson Run, and lower Cedar Run to collect continuous water level and temperature data. Permission is currently being sought from the landowner to place a stilling well and to use an existing stilling well for the two remaining sites on lower Buffalo Run and upper Logan Branch.

A pilot sampling effort was conducted on April 6 at four selected monitoring sites within the watershed. Samples were collected under the guidance and assistance of the PA Department of Environmental Protection. Monthly water quality sampling is scheduled to continue at all twelve sites in May for 11 quality parameters designed to determine agricultural and urban non-point source influences on water quality.

The Water Resources Monitoring Committee has nearly completed an historical and current literature search resulting in the compilation of approximately 100 historical and current studies into a searchable bibliographic database. The Committee is also in the process of establishing a widely-usable Microsoft Access database for the water quantity and quality data that will be produced.

Specific tasks to be completed during 1999 include: establishing a written sampling and analysis protocol; creating rating curves to relate water level to stream discharge; raising funds for years 2000 and 2001 of the project; and preparing and distributing an annual report which will include the first year of water quality data. The Committee is also developing a detailed written monitoring network plan that will assure that the quality of the data will be adequately controlled according to DEP standards, efficient collection of data, and consistency among collection methodology from sampling period to period.

INTRODUCTION

The purpose of this report is to inform supporters and stakeholders of the Water Resources Monitoring Project of the Spring Creek Watershed Community as to the progress, activities, and accomplishments that have occurred over the last year. This annual report is provided as one of the outlined work tasks of the overall project. Given the developmental stage of the monitoring effort, this first report focuses on general project information rather than data. Future reports will have a heavier emphasis on data as monitoring activities continue in 1999.

BACKGROUND

The monitoring project was conceived in January 1998 as part of a strategic planning effort by the Spring Creek Watershed Community, a broad-based stakeholders project of the ClearWater Conservancy. The Watershed Community's mission is "to promote actions that protect and enhance the quality of life, the environment, and the economy throughout the watershed while maintaining and improving the high quality of Spring Creek and its tributaries." This monitoring project directly addresses the second of the Community's five stated strategic goals:

1. Maximize involvement and participation in Spring Creek Watershed Community actions.
2. Measure watershed quality and set goals for improvement
3. Develop a vision for the future and implement it
4. Increase public awareness of watershed issues through education and communication
5. Increase inter-governmental and inter-organizational cooperation

PROJECT CONCEPTION, MANAGEMENT, AND DESIGN

The Water Resources Monitoring Project was designed and is managed by an action group of the Spring Creek Watershed Community, now known as the Water Resources Monitoring Committee. The objective of the monitoring project is "to provide a reasonably accurate description of the quantity and quality of surface waters that will (1) allow for relatively rapid detection of changes in quality and (2) be sufficiently sensitive to permit identification of causes for these changes."

The monitoring project is intended to create a database of professionally accepted data for meeting the stated project objective using limited financial resources and maximizing volunteer labor. Monitoring stations are strategically located to collect data from sub-basins with differing or changing land use characteristics. Water levels and temperature data are being collected continuously with automated equipment, stored in computer dataloggers, and downloaded monthly for incorporation into the database. Grab samples will be collected monthly and sent to a PA Department of Environmental Protection (DEP) certified laboratory for analyses of essential quality parameters indicative of land use impacts to surface water:

- Nitrate
- Orthophosphate
- Chlorides
- Zinc
- Copper
- Lead
- pH
- Total Suspended Solids
- Turbidity
- Total Organic Carbon
- Total Petroleum Hydrocarbons

These data will be used to establish baseline conditions in the Spring Creek watershed and to link changes in condition to specific sub-basins. Once created, the raw data will be available for public review and use. An annual report of our activities and findings will be provided to project supporters automatically and to watershed stakeholders who request it.

ACCOMPLISHMENTS TO DATE

Since the inception of the project in January 1998, numerous milestones have been accomplished towards meeting the project objectives. These include:

Determination of current monitoring activities- Based on the objectives of the project, determinations were made as to what should and shouldn't be sampled to cost effectively characterize changes to water quality that would likely to result from agricultural and urban influences. Also, it was determined that a monthly sampling scheme at normal flows was sufficient to create a baseline data base.

Preparation of a basin-wide monitoring network plan- Locations of the monitoring sites were selected to best characterize the Spring Creek basin and sub-basins, again with cost efficiency in mind. Therefore, twelve sites were selected (Attachment I).

Estimation of project resource needs- A detailed budget for the project was produced which outlined approximately $30,000 in startup costs for equipment purchases and installation and $30,000 for annual operating costs (labor and analyses).

Fund raising for startup and operating capital- Approximately $54,360 was raised in 1998 in order to establish the monitoring system and to perform water quality and quantity sampling and analyses for 1999. The remaining 1999 financial needs will be met by in-kind contributions from various sources. Additionally, $19,360 and $15,360 have been pledged toward the maintenance (labor and analyses) of the project for year 2000 and 2001.

New instrumentation of 6 and partial instrumentation of 4 monitoring stations- A comparison of different equipment types was performed and models were selected and purchased to measure water level and temperature on a continual basis. Three new stilling wells were placed and outfitted with instruments including a water level recorder (WaterLog submersible logger, pressure transducer by H_2OFX), a staff gage to manually record water level, and a temperature monitor (RL100 temperature monitor by Ryan Instruments). Photographs of the instruments are contained in Attachment II. Three existing stilling wells were completely outfitted with

instruments, and four existing monitoring stations having water level recorders already, were outfitted with staff gages (where appropriate) and temperature monitors.

Literature search initiated- A recent graduate from Penn State was hired, under the direction of the vice-chair of the Committee, to research and compile historical and current studies, both published and unpublished, related to the Spring Creek watershed's surface and groundwater resources. Studies that are hyrdrological, biological, and chemical in nature were specifically sought. Over 100 resources have been found and recorded in a searchable bibliographic database. Examples of searchable words and resource entries are included as Attachment III.

Planning and preparation for water quality monitoring in Spring 1999- A written methodology and data management protocol was established for downloading the data from the water level recorders. Methods for fixing and filtering samples were also investigated and were tested during the April 6 pilot sampling period. Five laboratories were contacted for analytical services resulting in the selection of DEP. The DEP laboratory was able to provide free analytical services, limiting our expenses to the costs of collecting and preparing the samples for analysis. This selection saves the project thousands of dollars a year, and further enhances the credibility of the data to DEP. *Note: Data provided by a community monitoring effort cannot be used for enforcement actions against regulated entities, regardless of the laboratory performing the testing.*

PROJECT WORKS IN PROGRESS

Water level and temperature data is currently being recorded at ten of the monitoring sites. Permission is currently being sought from the landowner to use an existing stilling well at the lower Buffalo Run site and to place a new stilling well at the upper Logan Branch site. If permission is not received quickly, alternate sites will be chosen in the same vicinity. Equipment for the sites has already been purchased and will be placed as soon as possible. This work will be completed no later than the end of April 1999.

A pilot water quality sampling effort was conducted April 6 for four of the twelve monitoring stations. An additional two sites were visited, but samples were not collected. DEP assisted with the sampling to help establish the methodology in which samples are collected, filtered, preserved, and transported that meet standard DEP procedures. Modifications to the sampling procedures will be made, as necessary, if any recommendations are made by the DEP laboratory. A finalized systematic approach to sample collection and handling will be written for future sampling efforts.

The literature search continues and is scheduled to be completed at the end of April 1999.

Database options are being explored by the Monitoring Committee. Microsoft Access will be used as the general purpose database because of its widespread availability. Other software is being investigated in order to provide limited statistical analysis and graphical representation of data trends in the most effective and efficient manner. The Water Resources Monitoring Committee is currently working with a staff member and graduate student from Entomology at Penn State to determine if their technology would be suitable for the purposes of the project.

1999 PROPOSED TASKS
Specific tasks which will be completed in 1999 include:

- Continue monthly sampling and laboratory analyses of surface water from the 12 monitoring stations
- Place a stilling well along Logan Branch and install instruments. Place instruments in/at the existing stilling well along Buffalo Run once permission has been granted from the owner.
- Establish a written sampling and analysis protocol (after the first test sampling period with DEP in April 1999)
- Design and develop an Access (Microsoft) database for data management
- Complete the historical and current literature search, and assemble and maintain a library of readily available information at the ClearWater Conservancy office.
- Create "rating curves" for each monitoring station that relate water level to stream discharge for the purpose of calculating loading rates of chemical parameters
- Raise additional local funds from business and industry, as part of the ClearWater Conservancy's 1999 fund-raising campaign, to support remaining needs for 2000 and 2001 of the project.
- Prepare and distribute an annual report of project activities and findings

ACKNOWLEDGEMENTS

The Spring Creek Watershed Community and the ClearWater Conservancy would like to express its gratitude to the many entities that have made this project of the Spring Creek Watershed Community possible:

Financial Supporters:
Benner Township
Bellefonte Borough
Centre County Community Foundation
Centre Region Council of Governments (College, Ferguson, Halfmoon, Harris, Patton Townships and State College Borough)
Corning Foundation
Heinz Endowments
Milesburg Borough
Pennsylvania State University, Office of the Physical Plant
Spring Township
State College Borough Water Authority
Trout Unlimited
University Area Joint Authority

In-kind Contributors:
Cooperative Fish and Wildlife Research Unit, Penn State University
Corning Asahi Video Products
Pennsylvania Department of Environmental Protection

We hope that our sponsors will consider providing support for future years of this project and other projects designed to "protect and enhance the quality life, the environment, and the economy throughout the watershed while maintaining and improving the high quality of Spring Creek and its tributaries."

ATTACHMENTS

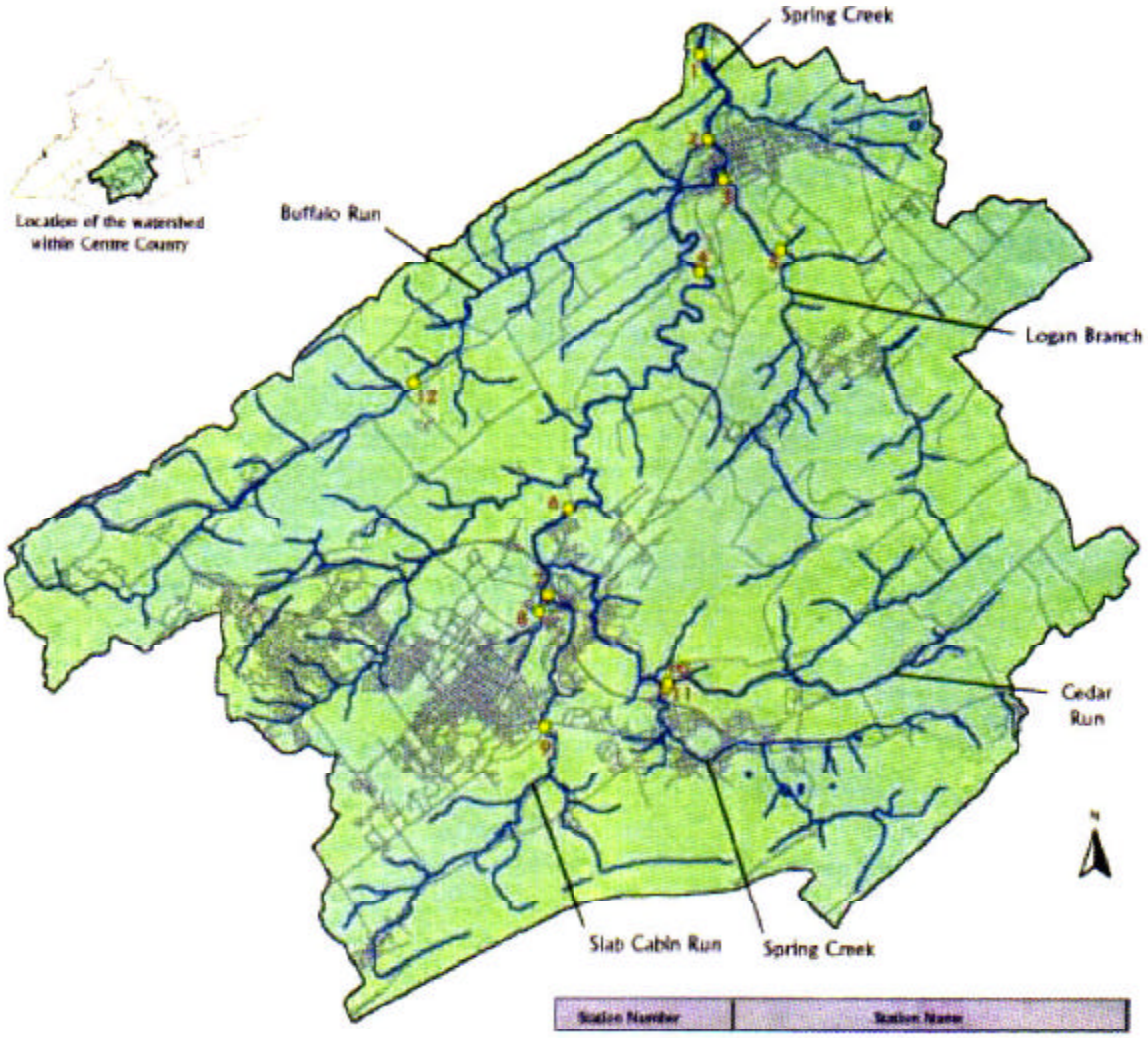
Attachment I.	Project Map "Spring Creek Watershed Water Resources Monitoring Network"
Attachment II.	Equipment and Site Location Photographs
Attachment III.	Keywords for the Spring Creek Watershed Bibliographical Database and Examples of Resource Entries
Attachment IV.	Project Team
Attachment V.	Centre Daily Times News Article

ATTACHMENT I

PROJECT MAP

"Spring Creek Watershed Water Resources Monitoring Network"

Spring Creek Watershed
Water Resources Monitoring Network



Station Number	Station Name
1	Spring Creek - USGS Milesburg
2	Lower Buffalo Run
3	Lower Logan Branch
4	Spring Creek - USGS Axemann
5	Upper Logan Branch
6	Spring Creek - USGS Houserville
7	Lower Slab Cabin Run
8	Lower Thompson Run
9	Slab Cabin Run
10	Lower Cedar Run
11	Upper Spring Creek
12	Upper Buffalo Run

Sampling Station
Streams
Roads
Spring Creek Watershed Boundary

0 1 2 3 4 Miles

ATTACHMENT II

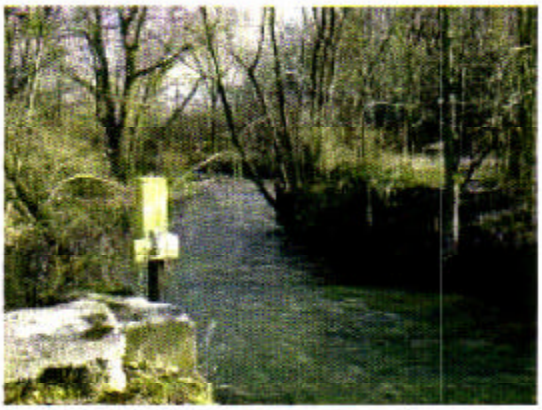
EQUIPMENT AND SITE LOCATION PHOTOGRAPHS

Station #9 -- Slab Cabin Run

RL100 Temperature Monitor

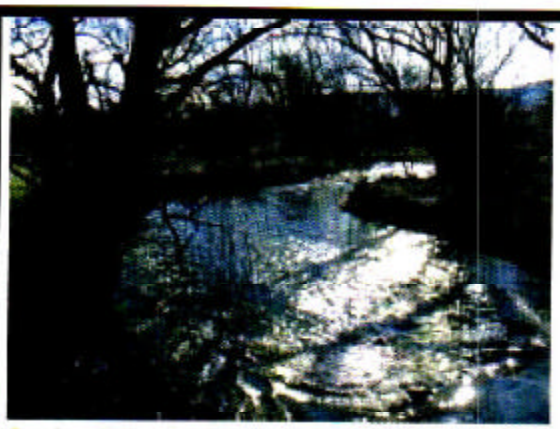
Station #10 -- Lower Cedar Run

Station #10 -- Lower Cedar Run



Station #3 -- Lower Logan Branch

Station #3 --Lower Logan Branch



Station #6 -- Spring Creek USGS Houserville

Station #6 -- Spring Creek USGS Houserville

Station #6 -- Spring Creek USGS Houserville

ATTACHMENT III

KEYWORDS FOR BIBLIOGRAPHIC DATABASE

EXAMPLES OF RESOURCE ENTRIES

Keywords

agricultural runoff
alkalinity
alkyl benzyl sulfate
ammonia
arsenic
Axemann Spring
Benner Spring
Big Spring
biological condition
biological nitrogen removal
biological oxygen demand
black crappie
brook trout
brown trout
Buffalo Run
cadmium
calcium
Cedar Run
Centre Region Sewage Facilities Plan
Cerro Metal Products Co.
chloride
chloroform
chromium
chronic toxicity
ClearWater Conservancy
coliform bacteria
conductivity
copper
cyanide
dissolved oxygen
dissolved solids
Domtar Chemicals Inc.
economic value
effluent
environmental impact statement
Escherichia coli
eutrophication
evapotranspiration
farm 12
fecal coliform
fish community
fish tissue samples
Fisherman's Paradise
fluorine
groundwater
groundwater level
groundwater recharge
groundwater runoff
hardness
herbicides
hydrogeology
iron
kepone
kjeldahl
lead
lindane
livestock grazing damage
Logan Branch
Lower Spring Creek
macroinvertebrate community
macrophytes
magnesium
management plan
manganese
map
mercury
metals
Millbrook Marsh
nickel
nitrate
nitrite
nitrogen
non-point source
nutrients
orthophosphorus
PCBs
periphyton
pH
phosphate
phosphorus
plant communities
pollution
polychlorinated biphenyls
precipitation
primary productivity
proposal
rainbow trout
redd distribution
riparian grazing
riparian restoration
Roaring Run
Ruetgers-Nease Chemical Co.
sediment loads
sediment sample analysis
sedimentation
silver
Slab Cabin Run
slimy sculpin
solar irradiance
Spring Creek
Spring Creek Watershed Community
State College Water Authority
stream corridor
stream flow
sulfate
suspended solids
Susquehanna River Basin Commission
temperature
thallium
Thompson Run
Thompson Spring
Thorton Spring
TOC
toluene
total coliform
total dissolved solids
total phosphorus
total solids
total suspended solids
trichloroethane
trout
turbidity
University Area Joint Authority
Upper Spring Creek
Waddle Run
Warner Mining Co.
wastewater
water budget
water chemical analysis
water level
water quality
water use
watershed
wetland
white sucker
Windy Hill Farms
xylene
zinc

Example of Journal Entry

Record Number:
Author, Analytic: Carline, R. F.//Beard. T. D. Jr
Article Title: Response of wild brown trout to elimination of stocking and to no-harvest regulations
Medium Designator:
Connective Phrase:
Journal Title: North American Journal of Fisheries Management
Translated Title:
Date of Publication: 1991
Volume Identification: 11
Issue Identification:
Page(s): 253-266
Language:
Connective Phrase:
Availability:
Storage Location/URL: Pennsylvania State University
Pattee Library
Paterno 3rd Floor
ISSN:
Notes: To describe the changes in the brown trout population and sport fishery that occurred after stocking had been suspended, due to pesticide residues discovered in resident fishes, and no-harvest regulations had been in effect for 7 years. Trout populations were sampled during the last week of July and the first 3 weeks of August in 1980 and 1988.
Abstract:
Call Number:
Keywords: Spring Creek/ trout/ brown trout

Example of Report Entry

Record Number:
Author, Analytic: Hughey, R. E.
Author Role, Analytic: Aquatic Biologist
Author Affiliation: Department of Environmental Resources
Section Title:
Medium Designator: unpublished memo
Connective Phrase:
Author, Monographic:
Author Role:
Report Title: Fish Kill Investigation Spring Creek, Centre County, Pennsylvania
Edition:
Author, Subsidiary:
Author Role:
Place of Publication:
Publisher Name:
Date of Publication: October 11, 1988
Report Identification:
Extent of Work: 10 p.
Packaging Method:
Series Title:
Series Volume ID:
Series Issue ID:
Connective Phrase:
Availability:
Location/URL: Pennsylvania Department of Environmental Protection
208 West 3rd Street, Suite 101
Williamsport, PA 17701-6448
CODEN:
Notes: During the week of September 19, 1988 a fish kill occurred in Spring Creek Centre County. The kill was traced to the vicinity of University Area Joint Authority's outfall. High Chlorine discharge was of concern. Collections were made on September 27 and October 3, 1988. Macroinvertebrates and fish were sampled at 5 sites.
Abstract:
Call Number:
Keywords: Spring Creek/ macroinvertebrate community/ fish community/ biological condition

Example of Conference Proceedings Entry

Record Number:
Author, Analytic: Carline, R. F.//Spotts, D. E.
Author Role:
Author Affiliation, Ana.:
Paper/Section Title: Early responses of stream communities to riparian restoration in agricultural watersheds, eastern USA
Medium Designator: Conference Proceedings
Connective Phrase:
Editor/Compiler: Haigh, M. J.//Krecek, J.//Rajwar, G. S.//Kilmartin. M. P.
Editor/Compiler Role:
Proceedings Title: Headwaters: Water Resources and Soil Conservation, Proceedings of Headwater '98, The Fourth International Conference on Headwater Control
Date of Meeting: April 1998
Place of Meeting: Merano, Italy
Place of Publication:
Publisher Name: Rotterdam. Brookfield, VT : A.A. Balkema, 1998
Date of Publication: 1998
Date of Copyright:
Volume Identification:
Location in Work:
Extent of Work:
Packaging Method:
Series Editor:
Series Editor Role:
Series Title:
Series Volume ID:
Location/URL: Pennsylvania State University
Engineering Library
325 Hammond Building
ISBN: 9054107804
Notes: A variety of physiochemical and biological variables were measured in streams before and after riparian restoration activities.
Abstract:
Call Number:
Keywords: Slab Cabin Run/ Spring Creek/ Cedar Run/ riparian restoration/ livestock grazing damage/ macroinvertebrate community/ turbidity

ATTACHMENT IV
PROJECT TEAM

The project manager for the Water Resources Monitoring Project is Roxanne Shiels, the Watershed Coordinator for the Spring Creek Watershed Community and the ClearWater Conservancy. The project manager is responsible for performing the sampling and maintaining the sites, creating and maintaining the data base, and providing the annual report and data, upon request, to interested stakeholders and contributors.

The Water Resources Monitoring Committee is comprised of industry, academic, regulatory, and consulting professionals from the local community who volunteer their time and expertise to provide technical oversight and to perform work tasks, as necessary, for the project. Committee members include:

- David Smith (Chair), Plant Superintendent, University Area Joint (Sewer) Authority
- Robert Carline, Ph.D. (Vice-chair), Adjunct Professor and Leader of Pennsylvania Cooperative Fish and Wildlife Research Unit, Penn State University
- Andrew Cole, Ph.D., Research Associate, Penn State Cooperative Wetlands Center
- Jim DeWolfe, Environmental Engineer, Sear Brown*
- Scott Harrison, Agricultural/Environmental Scientist and Chemist, Centre Analytical Laboratories
- Bert Lavan, Senior Process Engineer, Corning Asahi Video Products
- Gene Proch, Environmental Affairs Manager, Corning Asahi Video Products
- John Sengle, Water Quality Specialist, PaDEP
- Rick Wardrop, Hydrogeologist and Industrial Contaminant Specialist, USFilter
- Jason Wert, Environmental Engineer, Herbert, Rowland, and Grubic*

* New members as of February 1999

ATTACHMENT V

CENTRE DAILY TIMES
NEWS ARTICLE (3/18/99)

CENTRE DAILY TIMES

Thursday, [illegible] · [illegible] Central Pennsylvania and online at www.centredaily.com

CREATING A STANDARD FOR LOCAL STREAM

[illegible]

Roxanne Shiels of the Spring Creek Watershed Community and David A. Smith of the University Area Joint Authority check and record data about Slab Cabin Run on a laptop [illegible]. The [illegible] in the foreground records the water [illegible] every 30 minutes and stores the information at the site along South Atherton Street in State College.

Volunteers set watermark for Spring Creek studies

By [illegible]
Centre Daily Times

Spring Creek is [illegible] a watershed [illegible].

The Water Resources Monitoring Committee is [illegible] a project that could help to ensure the health of the Spring Creek watershed for years to come, despite development [illegible] that include a major [illegible] and commercial growth.

"This project is going to be providing baseline data for development … like the [illegible]," said Roxanne Shiels, [illegible] coordinator for the Spring Creek Watershed Community and project manager for the [illegible] project. "That's why this project is so crucial."

> **INSIDE:** What's involved in the water monitoring process [illegible]

"You'd probably have a hard time finding a committee that has more technical expertise than this one," said David A. Smith, committee chairman and plant superintendent at the University Area Joint Authority. The committee has taken pains to ensure that the data is collected under Pennsylvania Department of Environmental Protection guidelines.

The 11-member volunteer committee made up of technical and environmental experts has spent more than a year developing a project that will measure the quantity, quality and temperature of Spring Creek and its tributaries well into the future.

> **INFORMATION**
>
> - For more information, to help out or make a donation, call the ClearWater Conservancy at 237-0400.

See SPRING CREEK, page 4A

Volunteers set Spring Creek standards

SPRING CREEK, continued from 1A

With a major research institution like Penn State nearby, Spring Creek and the watershed are well-studied, Smith said. The database established by the group will be accompanied by a bibliography that lists some of the previous studies and where to find them.

But among those studies, none has offered the comprehensive, long-term information that this one will, Shiels said.

The monitoring sites are located throughout the 175-square-mile Spring Creek watershed that covers all or parts of 14 municipalities surrounding State College.

Each monitoring station performs two functions. A quantity test measures water depth every half hour. A temperature reading also is taken every half hour.

Starting in April, Shiels will take a sample once a month at each station to measure 11 different chemicals including nitrates and phosphates — commonly found in fertilizers — zinc, copper and lead. Shiels said the committee chose parameters that would help to identify agricultural and development impacts.

Ten stations are currently in place and are collecting information — two in Slab Cabin Run, one in Thompson Run, one in Cedar Run, four in Spring Creek, one in Buffalo Run and one in the Logan Branch. Shiels hopes two other stations — a second station along both Buffalo Run and the Logan Branch — will be in place soon.

The committee will establish a Microsoft Access database of information downloaded from the monitoring sites and the water quality information.

"Our purpose in this is to make the data available to anyone interested in having it," Smith said. "This project is really community-based."

Twelve municipalities, businesses, agencies and other organizations donated the $30,000 necessary to purchase equipment for the 12 monitoring stations and the $30,000 to fund the project's first year.

Each of the monitoring stations costs about $2,200 to set up.

Smith said the project will cost about $30,000 a year to maintain.

Shiels said some of the current supporters have indicated they may donate money for another two years. Shiels also is applying for a grants through the ClearWater Conservancy and hoping for private donations to fund the continuation of the monitoring.

Over time, the data can be used to help a company figure out how to limit its effect on the stream, or to start a stream-side tree-planting effort to lower stream temperatures, Shiels said.

Smith said all the support from the more than 20 organizations either serving on the committee or who have donated money "seems to accentuate the fact that the community is all for the preservation of Spring Creek."

Valerie Gilicrn can be reached at 231-4616 and agilcrn@centredaily.com

AT A GLANCE

From CDT staff reports

◆ Contributors to the Water Resources Monitoring Project that will establish baseline quality and quantity data about Spring Creek and its tributaries:

Corning Foundation
University Area Joint Authority
Trout Unlimited
Heinz Endowments
State College Borough Water Authority
Penn State Office of Physical Plant
Centre County Community Foundation
Centre Region Council of Governments municipalities (College, Ferguson, Halfmoon, Harris and Patton townships and State College borough)
Benner Township
Bellefonte Borough
Millesburg Borough
Spring Township

◆ Water Resources Monitoring Committee members:

Roxanne Shiels, project manager, watershed coordinator for the Spring Creek Watershed Community

Dave Smith, committee chair, plant superintendent, University Area Joint Authority

Robert Carline, committee vice-chair, leader of the Pennsylvania Cooperative Fish and Wildlife Research Unit, Penn State professor

Andrew Cole, research associate, Penn State Cooperative Wetlands Center

James DeWolfe, environmental engineer, The Star-Brown Group

Scott Harrison, business development/agrochemicals, Centre Analytical Laboratories, Inc.

Albert Lewis, senior process engineer, Corning Asahi Video Products

Gene Prech, regulatory affairs and facilities manager, Corning Asahi Video Products

John Seagle, water quality specialist, Pennsylvania Department of Environmental Protection

Rick Wardrop, hydrogeologist and industrial contamination specialist, Nittany Geoscience/Chester Engineers

Jason Wert, environmental engineer, Herbert, Rowland and Grubick, Inc.