

Cave Owner's Newsletter

A Publication of the Virginia Cave Board, Department of Conservation and Recreation

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Who Are These Cavers ?

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Here They Come!

They are getting closer, walking back across the field to their cars on this pleasant weekend. Clad in mud-smearred coveralls that were relatively clean when they arrived many hours earlier, they now seem tired, yet surprisingly animated, their arms moving and using unusual body language as they appear to be gesturing dimensions, directions, or ungainly and contorted maneuvers. They spend some time changing into clean, dry clothes prior to leaving for home and the real world of jobs and families.

Earlier in the day, they stopped by your house to check in and confirm that they are welcome to visit your cave. Perhaps they now bid you farewell as well, as they are about to head home, and tell you of the adventures and discoveries that they have just experienced beneath your property. They thank you for your hospitality. They sure seem like an odd lot, these cavers. You may wonder, what possesses some folks to give up weekends and leave the light of day in order to crawl, squeeze, climb, or walk in a world without natural light and that is typically dank, muddy, and replete with natural obstacles that tax the strength of body and will of mind? Who are these cavers? Why do they do this? Clearly they seem organized, competent, and very knowledgeable and reverent of the realms that they explore.

Cavers Come From All Walks of Life

What do cavers do in their 'normal' lives? The answer is "just about anything." As exploring and studying caves is a hobby or outdoor activity for most of the participants, it represents leisure time and hence, time away from the work-a-day world. Cavers

earn their livings in ways that reflect the cross section of American jobs. Many are graduates of higher education, engaged in various professions, such as business, engineering, manufacturing, teaching, medicine, law, and so forth. Many others come from virtually all other components of the work force. Regardless of their daily jobs, cavers share one passion, a strong curiosity of the natural world. This is so strong that the drive to explore is often all consuming as they venture underground. So, perhaps there is a high probability that a particular caver is employed in a field that encourages and rewards curiosity.

Most cavers start their underground journeys relatively early in life, perhaps more often in their twenties than other years. Granted, some begin caving in childhood with parents that are cavers or as part of youth-group activities, such as scouting, summer camp, 4-H, church activities, community outdoor programs and the like. Others may take their first cave trip as they befriend cavers in later years. But most are exposed soon after they are out on their own, in the workforce, college, or military. This is typically a time of wanderlust, of taking on new challenges, of participating in various social activities. As we will see, caving is, among other things, an encompassing and compelling social circle, bonding people who hail from diverse family backgrounds and even more varied educational, vocational, and social backgrounds. The common thread is simply a love of the underground.

So Why Do These Folks Go Underground?

The reasons why people go caving and become dedicated to this endeavor are somewhat complex.

Several authors have tried to explain the underlying drives responsible; however, it is definitely a personal thing for each individual. Based on nearly forty years of caving, I feel that I can describe some reasons that I find prevail among my subterranean colleagues.

When asked why he climbed mountains, George Mallory, the legendary Himalayan mountaineer of the 1920s, gave his classic, yet profound, answer, "Because they are there!" Okay, cavers may go caving because the caves are there. But there is much more. First of all, the cave explorer wants to know "What is there?" In the case of an unclimbed mountain, the climber often can see beforehand what is there. But caves can not be seen until one enters them and, therefore, the first explorers have little idea of what to expect. The caver does not know in advance what adventures may lie ahead and what wonderful discoveries may be made. Just how extensive or deep is the cave? Are there beautiful formations? The biologist may wonder what new animals may be discovered. And the list goes on. Discoveries are made as one goes... around the next bend in the passage, down the next pit to a lower level, through the next tight squeezeway, and so on. At each juncture the caver is irresistibly beckoned and this, in itself, provides a rush, a reason to venture underground. The mud, fast running streams, tight crawlways, long rope climbs, and many hours in the cool damp would indeed be obstacles for most people; but for the caver, they are the essence of the quest. The rewards are sweeter if the gains are made with the proverbial pain.

The true passion lies in the exploration of the unknown. Aside from the ocean depths and space (both of which are inaccessible to most people), the last truly unexplored places for human curiosity are underground. It is impossible to tell how many caves remain to be found and explored. If the yearly tally of new discoveries is any indication, it will be a long time before we run out of possibilities. All that is necessary, apart from occasional luck and serendipity, is perseverance in an area that is conducive to cave development, such as areas of karst (most importantly, areas with soluble rock, e.g. limestone).

Although major factors in caving are those of exploration and discovery, cavers are also motivated by the recreational aspects of venturing underground, in a way that others may be attracted to hiking and backbacking. But there is another important aspect that can not be ignored. Most cavers are not content with the aforementioned reasons alone. They also enjoy creative activities, both while underground and during times that they are above ground.

What Cavers Do While Topside

Crawling around in the dark recesses of the Earth is only part of the total caving experience. Many cavers spend quite a bit of their leisure time participating in an immense variety of activities related to caves.

One popular activity is reading about caves and studying to become familiar with cave areas in order to find new caves and understand those already found. Scientists may take materials or data gathered from caves to laboratories for analysis. Cave surveyors will process their meticulously collected data through computers and spend hours creating detailed maps of their favorite caves. Some cavers enjoy writing, whether it is an account for their local grotto newsletter, a national caving publication, a guidebook on caves of an area, or a scientific journal. There are photographs to be processed or drawings or artwork to produce. Most cavers are not content with merely visiting or exploring caves and they will extend their interests to various creative endeavors.

Because cavers are generally a gregarious lot, many find it enjoyable to organize and plan caving events, such as grotto meetings, regional get-togethers, national conventions, or scientific symposia. There is also a great deal of interest among some cavers to be active on the political scene by becoming an officer of a grotto or serving on a greater geographic scale such as on a regional or national level. There are an ever-growing number of accomplished cavers that later become leaders in their subdisciplines and facilitate dissemination of their experiences as well as those of their colleagues.

It is important to realize that nearly all activities of cavers are purely voluntary, and without financial gain. Even on a national level, the officers of the NSS and chairs of all committees and internal organizations are all unpaid volunteers. What sustains this phenomenal effort is a love of caves and caving and the camaraderie that cavers enjoy.

How Are Cavers Organized?

Nearly all cavers, especially those that have taken up the interest on a regular and consistent basis, are members of the National Speleological Society (NSS), headquartered in Huntsville, Alabama. There are over 12,300 active members in the Society. Virginia alone has over 820 members, the largest contingent among all of the states. (This is no surprise as Virginia and West Virginia together have nearly 9000 known caves, a number that is currently growing at a rate of 100 to 200 per year.) The NSS

holds its Annual Convention at sites throughout the United States. About 800-1700 members attend this meeting, that includes technical sessions in all aspects of cave science and caving techniques, competitions (in photography, cartography, arts, music, and rope climbing, to name a few), social events, and business meetings. Since 1960, Virginia has hosted the NSS Convention in 1963 (Mountain Lake, Giles County), 1971 (Blacksburg), and 1995 (Blacksburg). Additionally, conventions have been held next door, in West Virginia, in 1973, 1976, 1983, and 2001.

There are nearly two hundred local chapters (known as "grottos") of the NSS in the United States. Of these, sixteen are in Virginia and another twenty are found in neighboring Maryland, West Virginia, Delaware, and North Carolina. Members of these grottos go caving primarily in the western counties of Virginia and the eastern counties of West Virginia that, as a contiguous area, comprises one of the most significant cave regions in North America. Most grottos meet once a month at a regular site, such as a meeting hall, library, museum, school or college, or in some cases, at a member's home.

The NSS is subdivided into twelve regions. Virginia is part of the Virginia Area Region (VAR) that includes Virginia, West Virginia, Maryland, Delaware, and parts of Tennessee and North Carolina. Although cavers are not specifically members of regions, they participate in regional events, which typically include spring and fall outings and business meetings and occasional region-sponsored activities, such as work weekends and conservation projects (e.g. surveying trips and clean-ups of selected caves and sinkholes).

There are seventeen sections within the NSS to which cavers belong. Among them are sections specializing in geology and geography, biology, paleontology (fossils found in caves), history, arts and letters, human sciences, vertical caving (for those interested in descending and ascending techniques and equipment used in negotiating pits and drops), survey and cartography, diving (exploration of water-filled cave passages), digging (finding new caves or extensions of known passages), rescue, medical aspects, photography, videography, and stamp collecting. As one can see, these represent many different aspects of cave study and enjoyment and reflect a myriad of interests expected from the diversity of the caver population.

There are a number of other specialized organizations in which cavers may hold membership. These include the American Cave Conservation Association (promoting the conservation and

protection of caves and karst), the Karst Waters Institute (geoscientists that study the technical aspects of caves and karst, with an emphasis on groundwater), the Cave Research Foundation (a national organization of cave scientists, explorers, and cartographers that primarily investigate caves and karst within the U.S. National Parks, including Mammoth Cave in Kentucky, Carlsbad Caverns and the Guadalupe Mountains in New Mexico, Sequoia and Kings Canyon in the Sierra Mountains of California, and along National Scenic Rivers in Missouri and Arkansas), and Bat Conservation International (the largest membership organization dedicated to education about bats and to the protection of these animals around the Earth). Some cavers also belong to various international speleological organizations.

Information about the National Speleological Society, its regions, and grottos is readily available at the NSS website (www.caves.org). Contact information for the Society and its groups is available there as well. Internet contact information for other cave-related organizations is listed at the end of this article.

The Out-of-Towners

Most of the cavers that visit your cave will likely be from some distance away, such as the metropolitan areas of the state, including northern Virginia, Richmond, and the Tidewater cities. These localities are well outside the limestone belt that harbors the caves, yet most cavers live in these urban areas owing to employment or personal desires. For them, nearby caving means a fairly long drive to the Appalachian (Valley and Ridge) region of the state.

If you own a cave that is fairly sizeable, well known, or has some particular appeal that makes it a popular destination, you are likely to see non-Virginia license plates on caver vehicles on weekends. In fact, cavers from grottos throughout the eastern United States regularly visit caves of this region, so you may notice plates representing states from Maine to Florida and from Michigan to Texas. Most often these will be from the greater Virginia region, including West Virginia, North Carolina, Maryland, or Delaware. However, cars from Tennessee, Pennsylvania, New York, and the New England states are not unusual. Although the northeastern states have a large number of caves among them, they are typically not as spacious or as lengthy as those in the Virginias. Nor are the northeastern caves as well decorated with formations. Virginia caves offer a wide range of challenges and interesting scenery that entice cavers to make a full-day's drive to spend a weekend in the Appalachian cave country. Many of

the out-of-state cavers are involved in projects such as exploration, mapping, photography, scientific study, or environmental clean-ups and, as such, their visits may not be merely recreational.

Compiling Information - A Huge Data Bank

Perhaps the most significant accomplishment of cavers as a group, in keeping with discovering, exploring, mapping, studying, and documenting, is to preserve their findings for others to use. The level of detailed documentation of known caves over the last 60 years or so is phenomenal. Most significant caves in the United States have been surveyed at least in part and the resulting detailed maps are commonly published. Moreover, cavers routinely write descriptions of these caves and make note of their experiences after their trips. Most often this information is published in a grotto newsletter (nearly all grottos publish a newsletter). Cave publications, including grotto newsletters, cave-report monographs, and county or statewide surveys, are archived, but not only by cavers. The largest collection of this material is housed by the NSS in its library in Huntsville, Alabama. In addition, the NSS maintains a large national cave file that is organized according to cave. For Virginia, the most complete files are housed by the Virginia Speleological Survey (VSS), an official survey of the NSS. The Virginia files are among the most organized state files. The data base consists of both published and unpublished written material, maps, and a computer data base that can be searched with many keywords. It should be emphasized that this material is privately held and is not accessible to the public at large (out of concern for conservation, safety, and landowner wishes). However, serious researchers may inquire of the VSS for information (see web site at end of this article).

Publications Produced By Cavers

Cavers publish their findings and experiences in many forms. Most writings, as mentioned above, appear in periodic newsletters of grottos and consist of cave descriptions, trip reports, and maps based on their surveys. Photographs are often included. Cave scientists publish results of their research in the appropriate technical journals of their disciplines. There are quite a number of scientific journals throughout the world that are specific to caves and karst. The major journal in North America is the *Journal of Cave and Karst Studies*, published by the NSS. A great deal of information is contained in proceedings volumes of meetings and symposia dealing with caves and karst (there are about 5 to 6 of these held in the United States per year). Much of

the scientific findings are thereby made available to speleologists worldwide. Major articles of general interest may appear in the monthly *NSS News*.

More ambitious publications include books on caves and caving. These monographs include scientific treatises, accounts of exploration and discovery, compilations of caves of a particular area or region (such as a mountain, county, drainage basin, state, or country). With exception of the books dealing purely with adventure and natural science, most monographs are published internally within the speleological community, in order to protect caves from damage and to ensure that visits to caves are made safely, by properly trained cavers.

Caving Ethics

Underlying the whole spectrum of the caving world is a reverence for the natural environment of caves and its importance in the greater scheme of things. Cavers have developed a keen appreciation of the wondrous underground world and feel a oneness with it. As a result, the typical caver is fiercely protective of caves and their contents and the privilege of visiting and studying them. Safety in exploring caves is a primary concern of cavers. Without proper training and experience on the part of a caver, some caves may pose dangers that may result in injuries or death. Cavers are keenly aware of these dangers and know that proper training and the use of specialized equipment will alleviate these dangers. A caver is also highly aware and respectful of the privilege of being allowed to enter caves as extended by the landowner.

Who Are "Spelunkers?"

Most of us are familiar with the word "spelunker" and many people among the non-caving public refer to cavers as spelunkers. "So you're a spelunker!?" a person might ask upon discovering that someone frequents caves. This is often exclaimed with noticeable pride because that funny-sounding word somehow seems so appropriate for someone that plunges into the underground. "You spelunk?"

The words *spelunking* and *spelunker* were coined in the late 1930s by Roger Johnson, a caver in Massachusetts who helped found the New England Spelunkers Grotto, that merged with the District of Columbia Speleological Society (now the DC Grotto) in 1941 to form the NSS. The *spelunk-* and *speleo-* words are all derived from the Greek, *spelunca*, meaning cave.

Unfortunately, the term "spelunker" has fallen out of favor with many cavers (this author excluded because of the historical context of the word). Nowadays, a spelunker is viewed as a person who dabbles in going into caves, often without the proper training that is found within the NSS and its chapters; a "Sunday caver" as it were. The implication is that one who enters a cave without adequate training and education about caves may inadvertently or intentionally damage a cave, or worse have an accident that would not have happened if proper caving techniques had previously been learned. Organized cavers have a slogan, "Cavers rescue spelunkers."

Safety and Rescue

The foregoing brings up another important aspect of the caving community. There has been a great deal of effort over the years of organized caving to make this activity as safe as possible. Training is all-important. With the proper techniques and equipment, caving is very safe. In fact, there is a saying that a caver is much more likely to get injured on the highway going to or from a cave than while in the act of caving. And statistics bear this out. So, a cave owner may be at ease with cavers belonging to the NSS and its internal organizations, as they generally are well trained, having gained years of experience from those with whom they venture underground. Many cavers attend practices and workshops to learn the technical aspects of ropework, descending and ascending. A large number of cavers also volunteer their time to become trained in search and rescue techniques. This is important, should a person experience difficulty in a cave or become involved in an incident requiring help and evacuation.

Conservation and Preservation

One point that virtually all cavers agree on is the need for the protection of caves. Caves are delicate and fragile environments that, once altered or destroyed, are basically gone forever. What first comes to mind with respect to features that are easily damaged are the vast variety of formations, including stalactites, stalagmites, helictites, flowstone, gypsum flowers, etc. But these are only a part of the cave environment. Walls, floors, and ceilings of passages and rooms are part of the scenery and should not be harmed in any way, such as by writing or drawing on them. The water in underground streams is not only part of the scenery, it is an ecosystem and its quality is very easily degraded by careless pollution of surface- or groundwater. Moreover, caves are the

habitat of a surprisingly diverse suite of organisms, ranging in size and complexity from microscopic species (proterozoa and the like) to larger invertebrates (e.g. amphipods, crayfish, insects, spiders) and vertebrates (e.g. salamanders, bats).

Cavers are protective of caves and their contents. There is considerable peer pressure within the caving community to appreciate and conserve the fragile and delicate nature of caves and the groundwater that flows through them.

Cavers as Social Animals

As mentioned previously, cavers are a gregarious lot. Most meetings within the NSS structure have a strong social component on national, regional, and grotto levels. Most events of these groups provide considerable opportunities for discussion on various discoveries and projects, business meetings, and of course conviviality. These gatherings usually include well-attended field trips to caves and related areas.

Cavers and Cave Owners - Mutual Benefits

Most cavers will take great care in establishing and maintaining working relationships with landowners. They are eager to share their discoveries and knowledge with the persons they view as the ultimate stewards of the underground. Cavers that belong to the established speleological organizations discussed in this article respect the wishes of cave owners in managing their caves, including the terms of access. The willingness of most cave owners to allow cavers access to their caves is not taken lightly. In fact, in the Virginia Area Region (VAR), since 1992 over 30 owners of caves in Virginia and West Virginia have received the VAR Landowner Recognition Award.

Cave owners are always welcome to request information or help regarding their caves. Cavers and their organizations can be contacted through the various web sites listed below.

In Summary

It is hoped that this brief overview has shed some light on who cavers are and why they are so dedicated to the exploration, study, and protection of caves. The Virginia Cave Board is eager for you, as stewards of this valuable resource, to learn more about caves. We welcome the opportunity to assist you in any way that we can.

Web Sites for Further Information:

National Speleological Society (NSS)
www.caves.org

American Cave Conservation Association (ACCA)
www.cavern.org

Virginia Speleological Survey (VSS)
www.virginiacaves.org

Virginia Cave Board (VCB)
www.dcr.state.va.us/dnh/cavehome/

National Caves Association (NCA)
cavern.com

Cave Research Foundation (CRF)
www.cave-research.org

Cave Conservancy of the Virginias (CCV)
Members.aol.com/caveconser/

Karst Waters Institute (KWI)
www.karstwaters.org

National Cave Rescue Commission (NCRC)
www.caves.org/io/ncrc

Bat Conservation International (BCI)
www.batcon.org

Groundwater Hydrology in Virginia's Karstlands

by Joseph Fagan and Wil Orndorff

Virginia Karst Program, Division of Natural Heritage
Virginia Department of Conservation and Recreation

Over many thousands of years, rainwater has percolated downward through the soils of western Virginia, becoming mildly acidic and slowly dissolving the underlying limestone bedrock. The resulting landforms are called *karst*, and in addition to caves, are characterized by subsurface drainage, sinking or losing streams, sinkholes, and springs. It is a dominant landscape in the Valley and Ridge Physiographic Province along the western margin of the state. Twenty-eight of Virginia's ninety-five counties contain areas with karst terrane.

When water falls onto any given spot, it usually flows toward a small stream or river and then into a bay or ocean. A *watershed* is a land area that acts to capture all the flow into a particular body of water. In areas of karst, water enters the subsurface through sinking streams, sinkholes, and by infiltration through the soil and small cracks in the bedrock, where it flows through networks of subterranean conduits. (The circulation of water underground is termed *groundwater hydrology*.) In karst areas, boundaries of drainage basins are not always apparent through inspection of the surface topography, because cave systems allow water to move beneath surface drainage divides. Groundwater may flow for several miles underground through a karst *aquifer* (water-bearing rock). Limestone springs commonly derive their flow from waters that enter the groundwater system and quickly travel relatively long distances. Defining watershed

boundaries for springs and underground streams in karst regions often requires hydrologists to use tracing techniques with fluorescent dyes.

Potentially, the most serious karst-related hazard is groundwater contamination. Once introduced into a karst aquifer, pollutants can spread rapidly, flowing several miles in as little time as a few hours. Contamination of groundwater can lead to catastrophic problems. Hazardous materials can be released into karst aquifers as a result of chemical spills associated with highway, pipeline, aviation, and rail accidents. Contamination can also originate from incidents related to manufacturing or construction, failure of sanitation facilities, or even illegal dumping. Public and domestic supplies of drinking water can be quickly fouled by inadvertent actions or accidents.

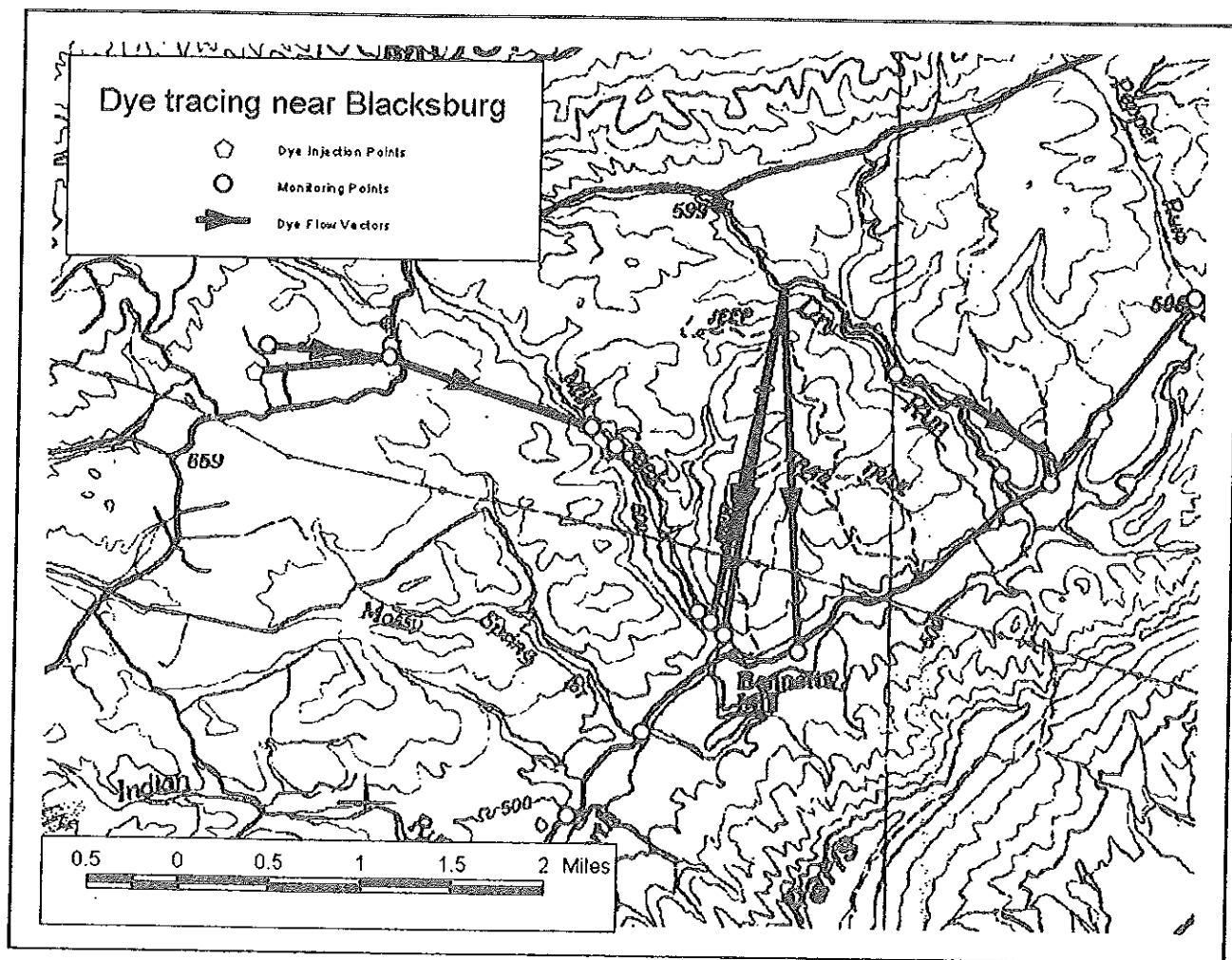
As stated above, underground flow paths in karst areas are not readily apparent by observing only surface streams. It is difficult to design effective watershed plans without knowing the specific origin of spring water. Having accurate information about underground flow paths in karst areas is necessary in order to identify sources of contamination when spills do occur. The routes followed by underground streams are usually unknown until hydrologic studies with tracer dyes are performed. The tracer dyes used by the DCR Karst Program are approved by the National Sanitation Foundation for use in groundwater tracing studies and pose no danger to

people or to the environment. Small amounts of these non-toxic fluorescent dyes are introduced into streams and later recovered from springs or other streams on specially prepared activated charcoal samplers. The charcoal samplers are periodically retrieved and replaced and analyzed in the laboratory to test for the presence of the tracer dyes, which can be detected in concentrations as low as one half part per trillion in water.

The DCR Karst Program is working on a project to define watershed boundaries and to determine recharge areas (where water enters the ground) for several karst aquifers in Virginia. Given sufficient resources, it would be possible to perform an extensive groundwater dye-tracing program throughout Virginia's karst areas. Such a study would provide a more comprehensive knowledge of specific underground flow paths in Virginia's karst-

lands. At this time, the Karst Program's dye-tracing efforts are focused on finding groundwater recharge areas for underground streams associated with some of the larger and more biologically important cave systems in the state.

The map depicted below displays results of a recent study performed near Blacksburg, Virginia, by the DCR Karst Program, and illustrates the complex nature of karst aquifers. During the course of this investigation, traces using three different fluorescent dyes helped define the hydrologic relationship among two sinking streams, four different cave streams, and numerous springs. Dye from one sinking stream and a separate cave stream traversed an underground flow path that passed through three caves before emerging within two days from a spring located two miles distant from the site where the stream went underground.



Dye traces near Blacksburg, Virginia, performed by the DCR Karst Program. This map shows six traces (indicated by straight lines with arrows) that connect points of dye injection on the surface or in caves, with monitoring points on streams and at springs where the dyes passing through the aquifer discharged at the surface.

The DCR Karst Program is currently assembling a computer-based Karst Hydrology Atlas of Virginia that will contain detailed information about current and past karst groundwater dye-tracing investigations performed in Virginia. The atlas will provide information for environmental managers, reviewers, and scientists to help them to do a better job in planning for sustainable growth while protecting valuable cave and karst resources and groundwater quality.

If you are reading this issue of the Virginia Cave Owners Newsletter, it is likely that you live in or own property in a karst area. If you own or know of a cave or spring and would like to know where the water comes from, please contact the Virginia Department of Conservation and Recreation Karst Program at (540) 831-4056. If we know, we'll tell you. If not, hopefully we can work together to find out.

Members of the Virginia Cave Board

For additional information, please contact the **Virginia Department of Conservation and Recreation, Division of Natural Heritage**, 217 Governor Street, 3rd Floor, Richmond, VA 23219 or one of the following members of the Virginia Cave Board:

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Note:

The Virginia Cave Board consists of eleven appointed members. As this issue of the newsletter was going to press, one vacancy remains to be filled on the Board.

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