UNDERHILL

Physiography
Geology
Natural Resources
Scenery

Elizabeth Weichel Moore

THE GEOLOGY

The Geographic Setting *

One factor that makes Underhill unique is its geographic setting. The town is situated in the Green Mountain Range, the "rock rib" of Vermont, and the town boundary includes the undeveloped western slope of Mount Mansfield, at an elevation of 4,393 feet above sea level, the highest mountain in the state.

The Physical Geography **

The physical geography distinguishes Underhill from other towns in the county and neighboring communities. The layout of parallel north-south trending mountains and valleys has severely limited the development of roads, particularly those suitable for modern automobile traffic. In the days of travel by horse and wagon when people stayed home during winter snows and mud season and there were no school buses, there were some seasonal connecting roads across the mountains which not only linked different parts of Underhill, but provided access to the neighboring towns of Westford, Bolton and Stowe, as well. Not only is there now no direct highway between Underhill and Stowe or Bolton or Westford, but the eastern part of town paralleling Mount Mansfield and known as Underhill Center is connected to the western part of town by a single east-west road. The two parts of Underhill are almost like separate towns. In the western part of town, VT 15 does provide a transportation artery both for through traffic and for the Underhill roads which feed into it, but the feeder roads are defined by parallel hills which separate them from each other and there is limited interconnection.
Historically, Underhill never grew around a single town center as its civic focus. From the beginning of settlement the population ranged out through the isolated valleys along the rivers and streams.

In contrast, the neighboring town of Jericho has a broad area of shallow, rolling topography and neighboring Westford is largely a dissected upland. These towns and the Chittenden County towns in the flat-lying Champlain Valley developed interconnecting road networks which provided community cohesion. Though neighboring Bolton, Cambridge and Stowe share with Underhill a geographic setting in the Green Mountains, Cambridge includes the agriculturally rich and unifying floodplain of the Lamoille River. Bolton and Richmond share the Winooski River floodplain; Stowe has the Waterbury River floodplain. None of the other Green Mountain towns in Chittenden County have quite the limiting physiography of Underhill.

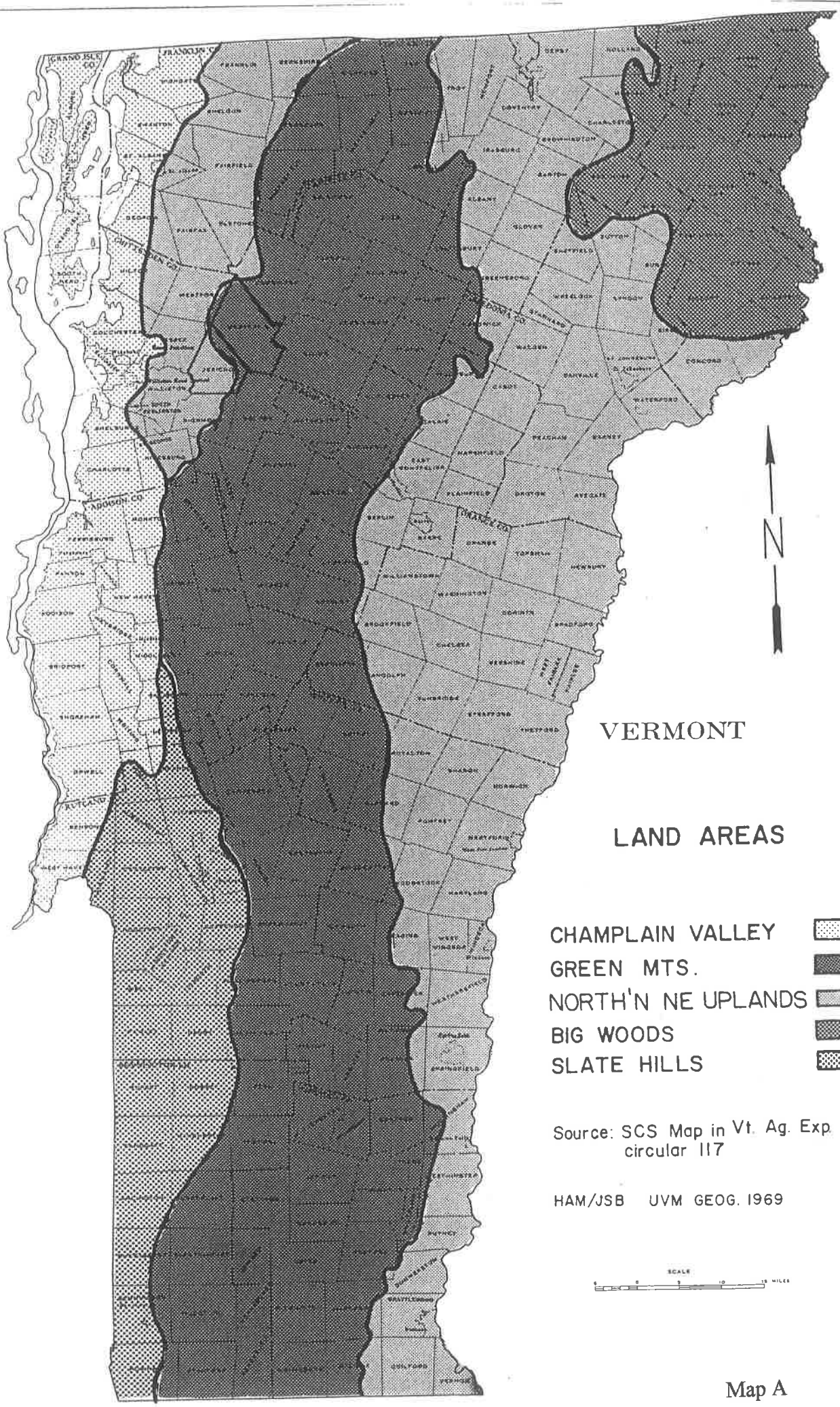
The parallel mountain and valley system of Underhill Center can be spectacularly viewed from neighboring Cambridge on the hill by the Bassett Farm on Bryce Road. Looking south, Pleasant Valley is bounded by Mount Mansfield and Macomber Mountain; the valley view sweeps down to the profile of Camels Hump in the distance. The Irish Settlement valley is bounded by Macomber Mountain and Flynn Hill. It is easy to see why these valleys are wind tunnels, subject to serious snow drifting in the winter. (Gales have been clocked as high as 80 mph). The parallel hills and stream valleys that characterize all of Underhill are natural "greenbelts" and wildlife corridors.

Formation of the Green Mountains

The underlying bedrock in Underhill is also a limiting factor in the development of the town. In order to understand the nature of the problem, it is necessary to realize how the rock was formed and how the Green Mountains were created. The contours of the Green Mountains have been determined by the nature of the folds and fractures which developed as the mountains were

*Map A

**Map B

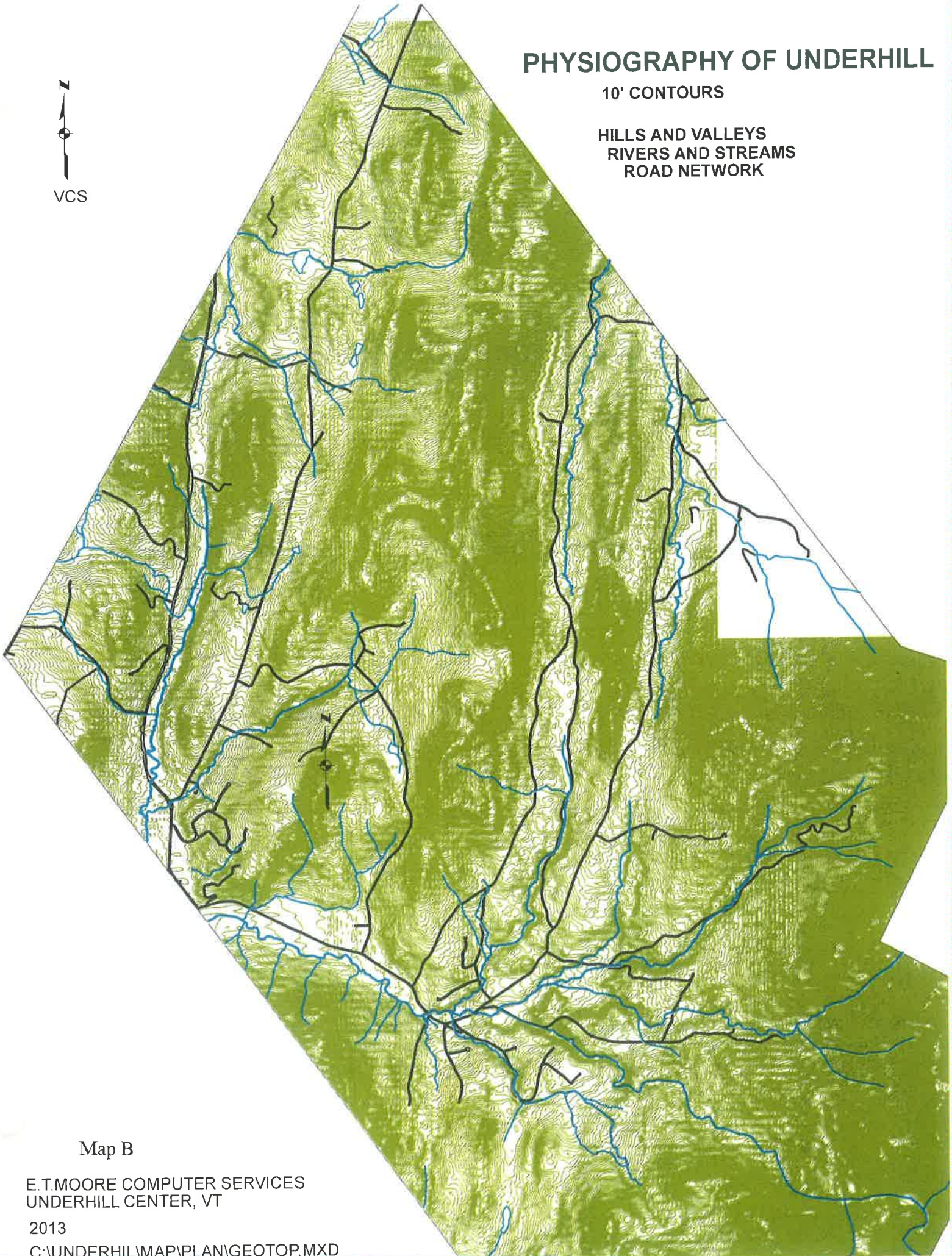

VERMONT
LAND AREAS
CHAMPLAIN VALLEY
GREEN MTS.
NORTH'N NE UPLANDS
BIG WOODS
SLATE HILLS
N
Source: SCS Map in Vt. Ag. Exp. St. circular 117
HAM/JSB UVM GEOG. 1969
SCALE

Map A

PHYSIOGRAPHY OF UNDERHILL

10' CONTOURS

HILLS AND VALLEYS
RIVERS AND STREAMS
ROAD NETWORK



Map B

E.T.MOORE COMPUTER SERVICES
UNDERHILL CENTER, VT

2013

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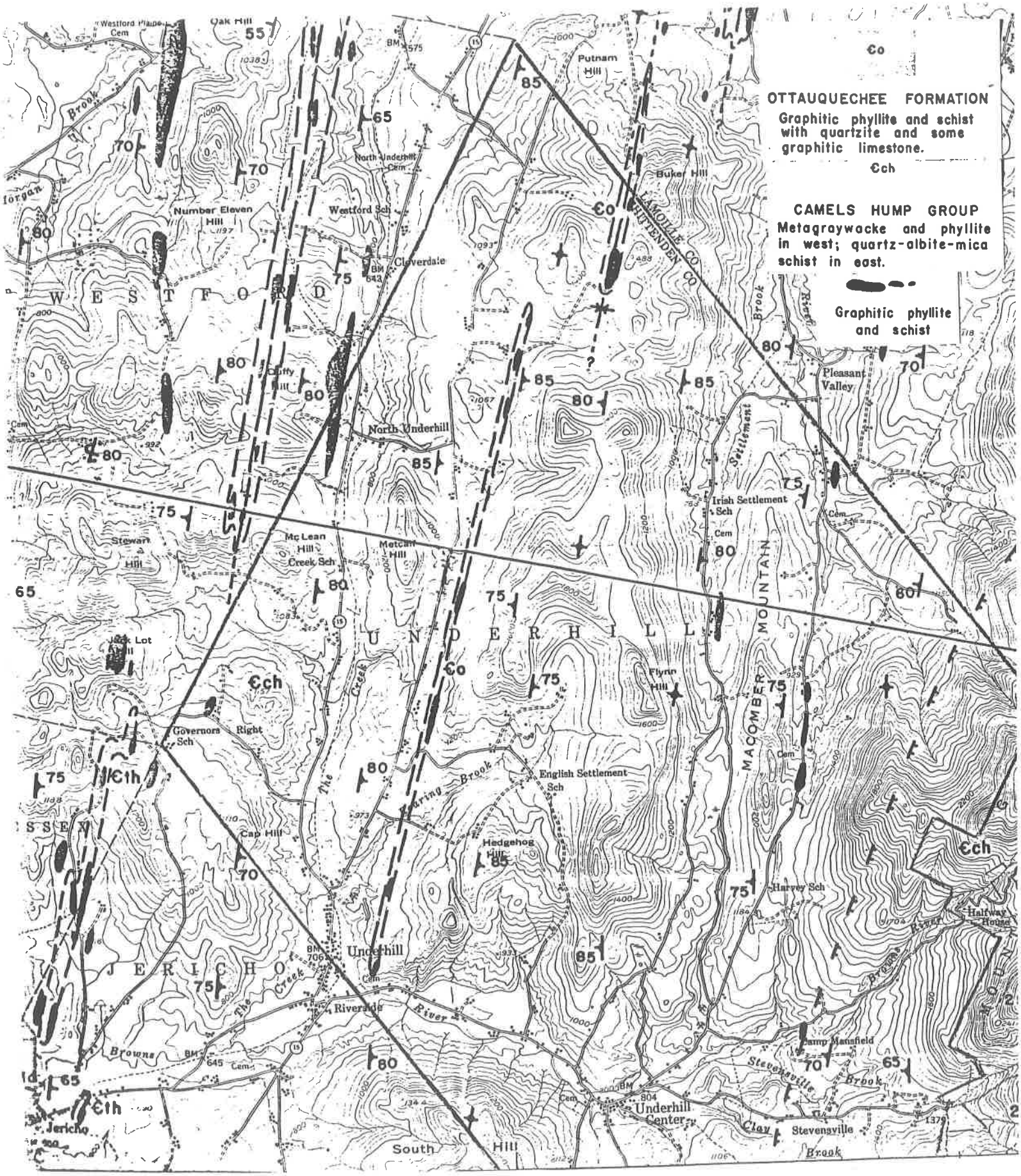
GEOLOGIC MAP OF VERMONT
Charles G. Doll, State Geologist
1961
(metamorphic schist shown as light brown)

Map C



TOPOGRAPHY BY U. S. GEOLOGICAL SURVEY 1948

GEOLOGY BY ROBERT A. CHRISTMA

SCALE 1:62500

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

Map D

APPROXIMATE MEAN DECLINATION, 1948

BEDROCK GEOLOGY, MOUNT MANSFIELD QUADRANGLE, VERMONT

being formed in ancient geologic times. The mountains are old on the geologic time table, having been created in the Cambrian - Ordovician period of the Paleozoic era. Even millions of years before the Green Mountains were formed there were earlier mountains which were eroded by ancient rivers which carried fine-grained sediments of mud and silt and deposited them in a shallow sea somewhere in the area of what is now eastern Vermont. These sediments accumulated to a thickness of many hundreds of feet and over the millennia consolidated into hard, rather nondescript sedimentary rocks called greywacke, siltstone and shale. Then sometime on the order of 350 million years ago tremendous forces in the earth southeast of the ancient sea began to thrust up the massive layers of sedimentary rocks, crumpling and folding them to form the Green Mountain range.

Unlike volcanic mountains, which can sometimes even be created while men are watching (as in recent times in Mexico and Iceland), folded mountains are formed over long periods of time. The tremendous heat and pressure associated with the mountain-building forces which created the Green Mountains caused the sedimentary rocks of which they were being formed to become plastic. The chemical elements in the particles of mud and clay of the sedimentary rocks became rearranged and re-crystallized as new minerals, mostly platy types, such as mica and chlorite, with some associated quartz and feldspar. The great pressures forced the mineral platelets parallel to each other, giving the newly formed rocks a layered appearance and an easy direction of splitting. The rocks are called schist, from a word which means splitting. (Generically they are metamorphic rocks, a term coined from the words "meta", meaning change, and "morph" or form.) Unlike sedimentary rocks or igneous rocks such as granite, which are formed by cooling from a molten state, metamorphic rocks are dense and non-porous. They are also characterized by the presence of many fine cracks and larger fractures. *

The mineral content and appearance of the metamorphic schist which forms the Green Mountains varies somewhat along the length of the range and various names have been given to the rock in different places. In Underhill, the schist is aptly called the Underhill Formation. It forms the cliffs at Smuggler's Notch and the bare rock faces along the crests of the mountains. Huge fractures in the schist have formed the cliffs which created the contour of Mt Mansfield, known as " The Sleeping Giant". (The forehead, nose and chin of the giant are more distinct when viewed from the aspect in Stowe than on the Underhill side.) Other fractures in the rock formation are subject to weathering, especially frost action, which periodically causes massive sections to break off and create terrifying rock slides. (As recently as 1983 such a slide closed the road through Smuggler's Notch. A jogger observed the crash and was miraculously spared.) The Underhill Formation is a shiny, blue-green platy rock, sometimes sprinkled with dark red garnets. It weathers into flat stones which are valued for use as steps, walks and patios. Unexposed to the weather the schist is dense and hard, as anyone who has had to blast through it will attest, but when it is subject to weathering, water can infiltrate the cleavage in the platy minerals and the tiny cracks in the rock, leading eventually to crumbling of the material into particles.

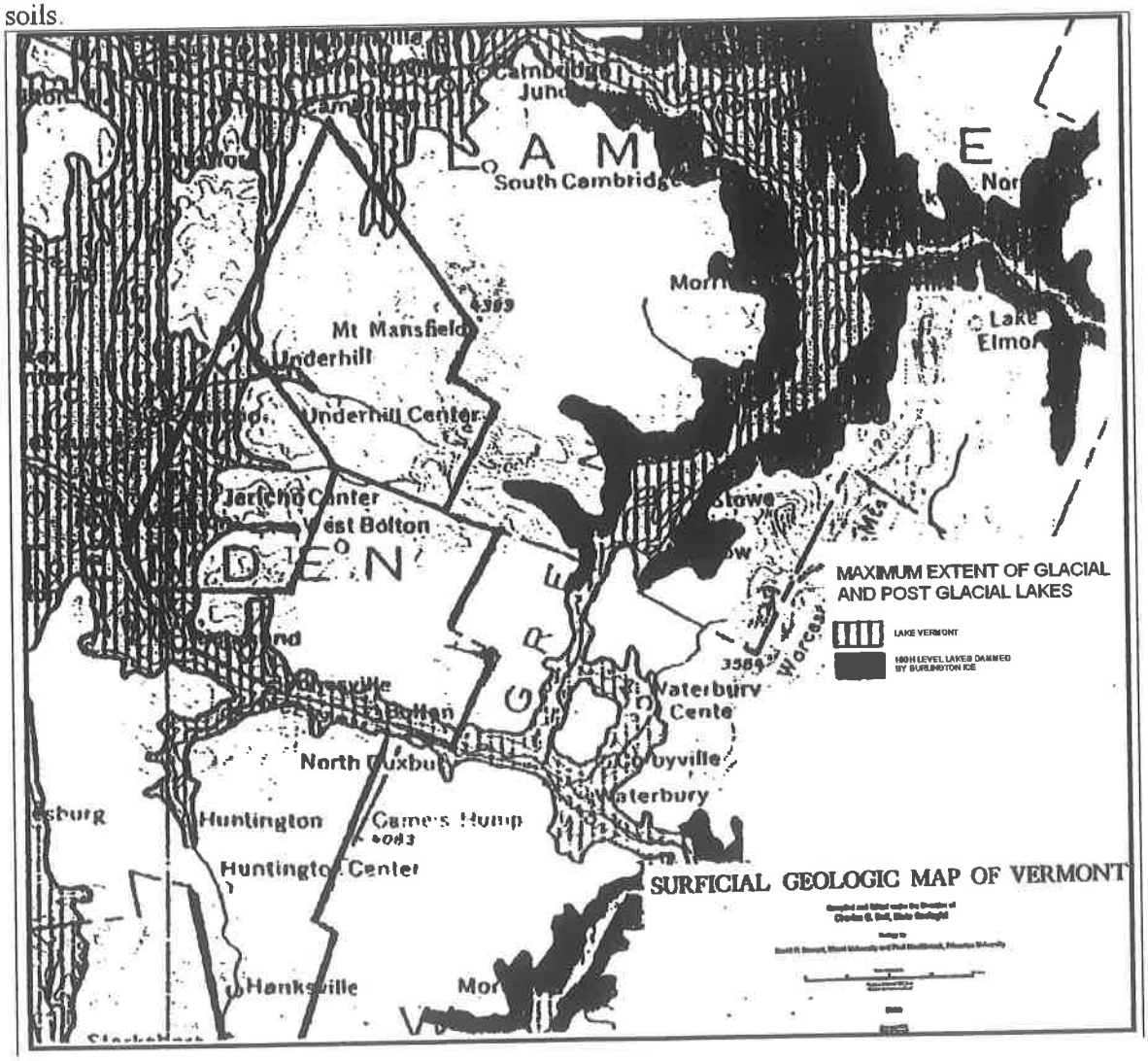
On Metcalf and Hedgehog Hill and toward VT 15 in Underhill the rocks show some traces of their original sedimentary layering and texture. Narrow lenses or "inliers" of other formations which are found in larger amounts north of Underhill, in particular, a dark, platy metamorphic rock called phyllite, can be observed along Poker Hill Road and Pleasant Valley Road. **

Surficial geology

The physical geography of Underhill, created by the mountain formation and subsequent erosion was also influential in the development of the surficial geology, or soil cover. The most

*Map C
**Map D

important geologic event in Vermont since the creation of the Green Mountains, among the oldest mountains in the world, was the Pleistocene ice age. The thick mantle of ice, miles high, covered all of the northern part of the continent. As it moved over the landscape it smoothed off mountaintops, scoured the valleys and carried an assortment of rock debris at its base that it compacted as it traveled. The last of the ice age was barely 10,000 years ago, a blink-of-an-eye on the geologic time scale. When the ice melted, it created in the area of northern Vermont an enormous lake, called by geologists, Lake Vermont. (At one stage the lake was connected to the ocean, as the presence of marine fossils indicates.) Sediments became stratified as they settled in the large lake. When the water receded to the level of the present Lake Champlain and the land finally dried out, the fertile Champlain Valley was created. The great river systems and the smaller tributary streams also flooded to high levels and produced rich, stratified agricultural soils.



A map showing the maximum extent of the glacial and postglacial flooding in the area of Chittenden County is shown in the figure above. The map was enlarged from the accessory map on the 1970 Surficial Geologic Map of Vermont. The location of Underhill has been sketched on the map and, for comparison, Jericho is also shown. While most of the towns to the west of Underhill, including Jericho, received the bounty of prime agricultural soils, Underhill with its higher elevations, stood above the flood. Only small areas in the floodplains of the Browns River,

the Creek, Seymour River and Settlement Brook developed fertile agricultural soils.
On the elevations which were above the flood the glacier melted back and left in situ the rock debris which it had gathered as it moved along from the north. This material, called glacial till by geologists and fragipan by soils scientists, is known by the laymen who have had to work it as hardpan. It consists of highly compacted, finely pulverized rock material and includes pebbles, stones and boulders of all sizes. Most of the material is from "away", someplace to the north. (On Stevensville Road in Underhill, across from the former Underhill Ski Bowl, there are elephant-size boulders of pillow basalt, an unusual rock whose parent formation can be found near Lake Memphramagog on the Canadian border. Such free-standing boulders are called glacial erratics.) *

** The Surficial Geologic Map of Vermont shows that most of the state is covered by glacial till. It is certainly the dominating surficial cover in Underhill. Heroic efforts were made by early settlers to clear the rocks from the till, (hence the ubiquitous stone walls), and to cultivate the inhospitable soils. Such farms were not viable and over the years have been abandoned. Fortunately, several of the older farms which are located in the small areas of Underhill which do have prime agricultural soils are still being farmed. (Sugarbush Farm along the Seymour River straddles the Cambridge border and is administered by the American Farmland Trust.) Impermeable glacial till does not lend itself to modern residential development that, unlike earlier times, requires ample running water and elaborate septic disposal systems. On land covered by glacial till the state health regulations require artificial (and expensive) mound or alternative systems for sewage disposal.

Glacial till is an also an unfortunate road base. Except for the River Road, all of the town roads in Underhill are under laid by such material. The impermeability of the till, along with the presence of many underground springs, creates expensive road maintenance problems. Frost heaves in the Underhill section of the paved Pleasant Valley Road are hazardous. (By contrast, when the road reaches Cambridge the underlying stratified soils of the Seymour River floodplain provide an adequate base and the road immediately smoothes out.) The mud season frustrations of the dirt roads are legendary. Replacement or overlayment of the till by an adequate thickness of gravel is costly and the town has to approach mitigation of the problems incrementally.

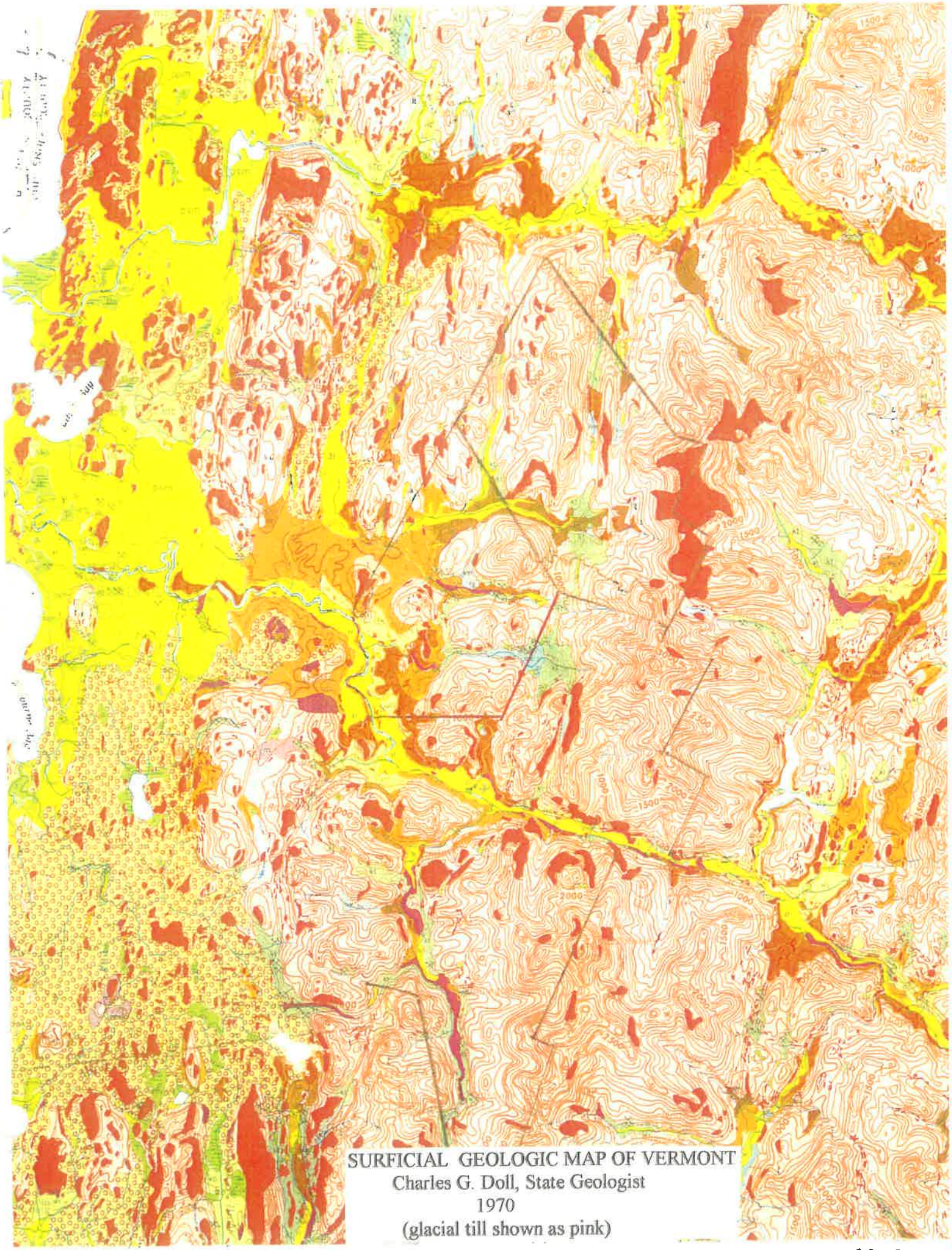
The vulnerable ground water aquifers ***

The metamorphic schist which forms the bedrock of Underhill is an important groundwater recharge aquifer, holding water in the cracks and providing storage which can be tapped for wells. The aquifer is extremely vulnerable to pollution because of the many interconnecting cracks in the rocks. Unlike porous materials, such as sand and gravels, in which bacterial pollution can be filtered over relatively short distances, polluted water can travel for miles through the cracks in the schist, contaminating wells far from the source of the problem. The Soil and Water Conservation Zoning District in Underhill was created to protect this vulnerable ground water environment.

An entirely different kind of ground water aquifer was formed in the area around the village of Underhill Center as the residual glacial ice was retreating from Mount Mansfield. The Browns River originates high on Mt Mansfield. Its tributaries, Stevensville Brook, Clay Brook, Harvey Brook and Mill Brook (called Steinhour Brook in the Vermont Atlas) also form on the mountain and fan down to join the Browns River in the valley of Underhill Center. As the glacial ice melted back, the mountain streams flooded and sediments were relatively stratified along the banks in piles of sand and gravel called "kame terraces". This fan shaped area of softly contoured hills characterizes the lower slopes of Mount Mansfield. The very porous sands and gravels constitute an important ground water aquifer environment and is protected in the Underhill

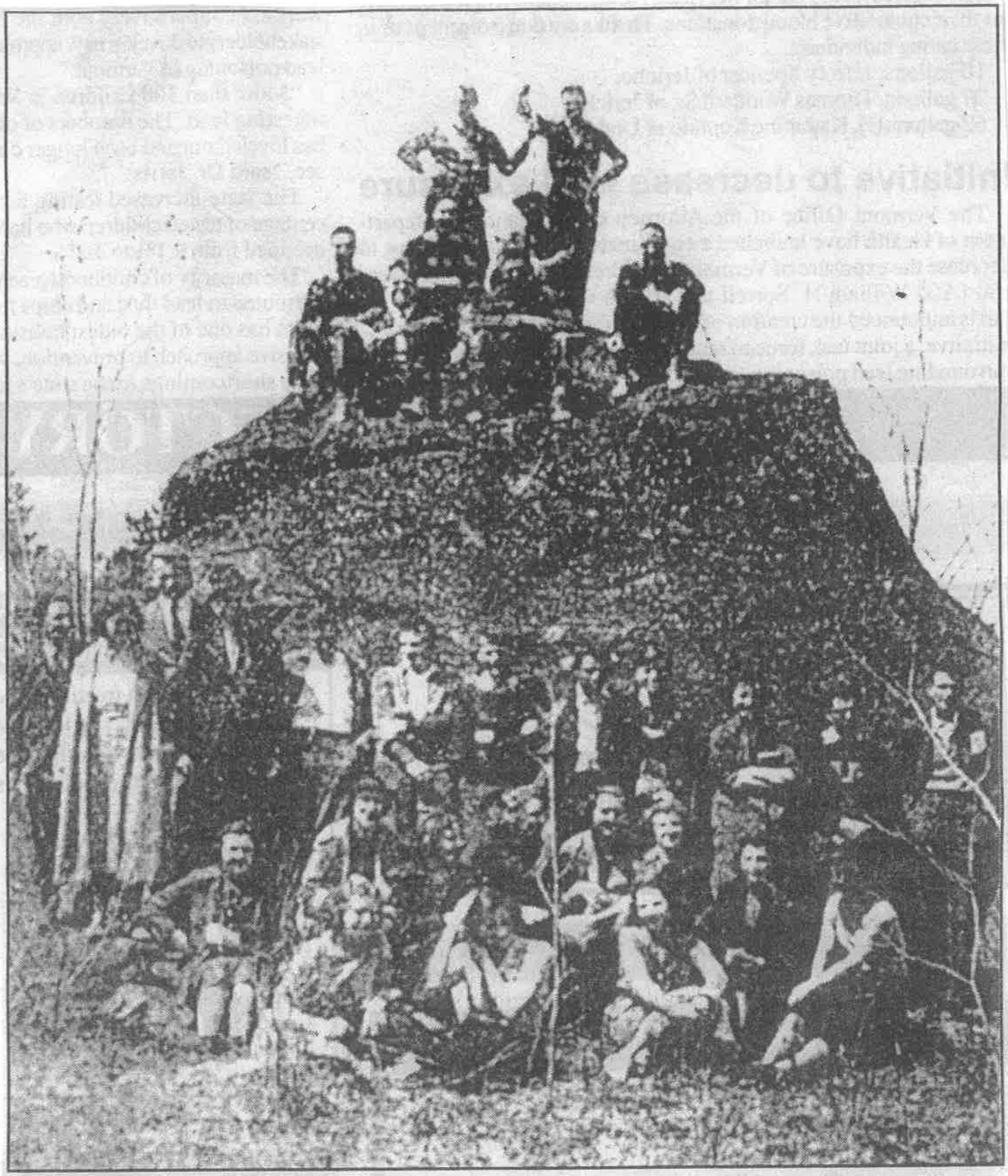
* ***Pleistocene Legacy*** Photos 1-8

**Map E ***Figure 1



SURFICIAL GEOLOGIC MAP OF VERMONT
Charles G. Doll, State Geologist
1970
(glacial till shown as pink)

Map F



UVM Geology students, c.1946, atop a 'glacial erratic' – a boulder of pillow basalt transported by the Pleistocene glacier from the Canadian border to Stevensville hill in Underhill Center.

Photo 1

Photo 2

Glacial ERRATIC

(In Bogue woods on south side of Stevensville Rd, Underhill Center-- across from former Ski Bowl lift.)

Gigantic boulder of volcanic pillow basalt - - note polygonal structure.

Photo 3

Photo 4

Glacial ERRATIC

(In hillside on edge of Stevensville Rd, Underhill Center --south side across from Nugent)

Large boulder of volcanic pillow basalt - - note polygonal structure .

Photo 5

Photo 6

Glacial KAME
(In meadow across from Underhill Central School)
Note gentle even slope.

KAME:

Low lying hill of stratified sand and gravel with gentle contours.
Created by ice melt forming short streams formed in cracks in the ice.

Photo 7

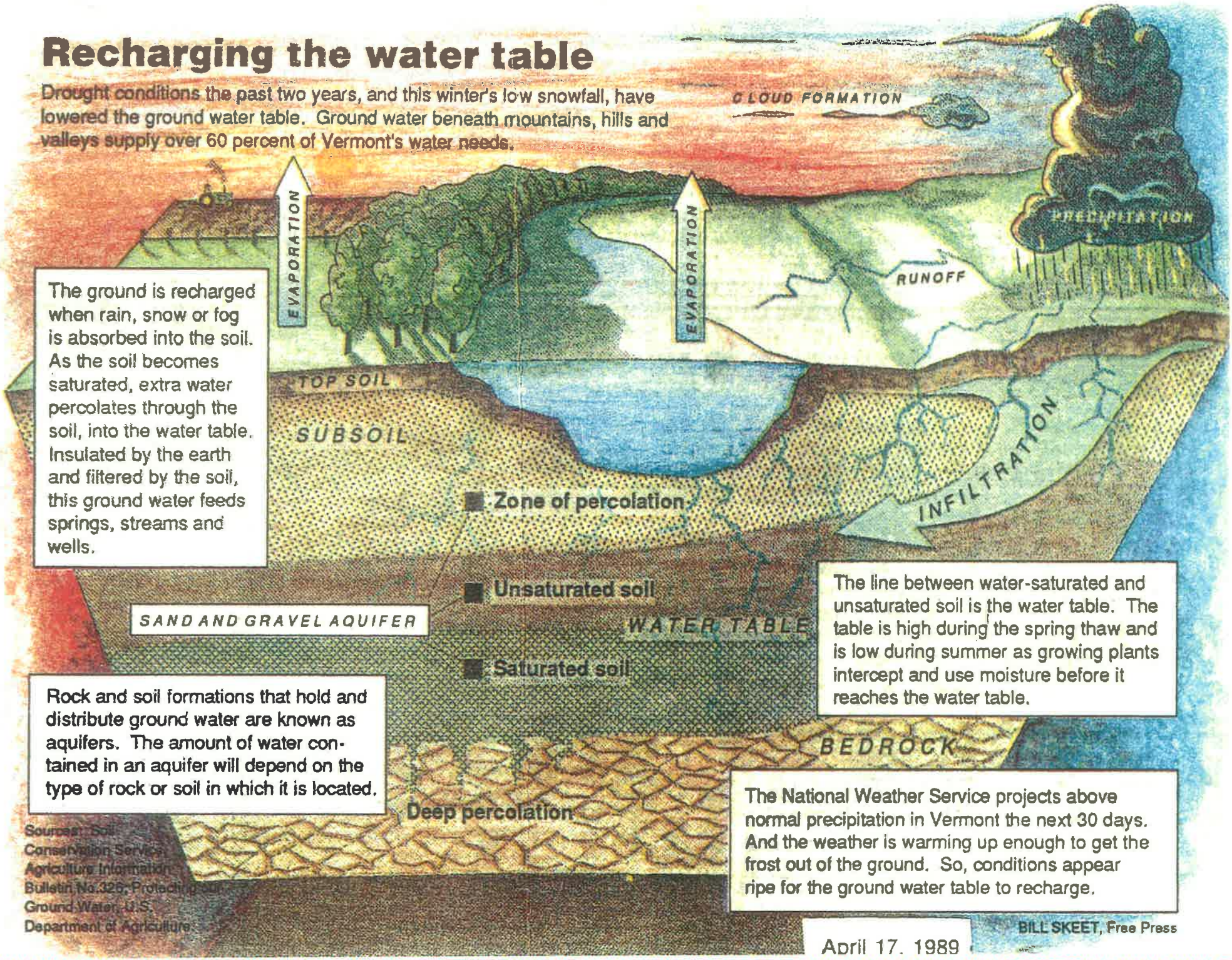
Photo 8

Glacial KETTLE
(Meadow on Browns Trace-- opposite Nashville Rd, Jericho)
Note gently sloping contours of bowl.

KETTLE :
A large block of ice becomes detached from the glacier and covered by outwash materials which delay the melting of the block. Eventually the ice melts, the covering materials collapse and a depression results.

Recharging the water table

Drought conditions the past two years, and this winter's low snowfall, have lowered the ground water table. Ground water beneath mountains, hills and valleys supply over 60 percent of Vermont's water needs.



The ground is recharged when rain, snow or fog is absorbed into the soil. As the soil becomes saturated, extra water percolates through the soil, into the water table. Insulated by the earth and filtered by the soil, this ground water feeds springs, streams and wells.

The line between water-saturated and unsaturated soil is the water table. The table is high during the spring thaw and is low during summer as growing plants intercept and use moisture before it reaches the water table.

Rock and soil formations that hold and distribute ground water are known as aquifers. The amount of water contained in an aquifer will depend on the type of rock or soil in which it is located.

The National Weather Service projects above normal precipitation in Vermont the next 30 days. And the weather is warming up enough to get the frost out of the ground. So, conditions appear ripe for the ground water table to recharge.

Sources: Soil Conservation Service Agriculture Information Bulletin No.326, Protecting your Ground Water, U.S. Department of Agriculture

BILL SKEET, Free Press

April 17, 1989

Zoning by-laws as the Water Conservation District. Although the gravel environment has better purifying characteristics than the bedrock, it is so porous that the Soil Conservation Service now describes the soils as "flashy" and recommends care in the installation of septic systems.

The Scenery

Nebraska Notch, south of Mount Mansfield, was carved by the erosive action of an ancient stream between Mount Dewey and Mount Clark. When the Town of Mansfield existed, encompassing the upper elevations on both sides of the mountain, a road was cut through the gap in the mountains to provide access between the two parts of the town. When the unmanageable arrangement was dissolved, the unused road became a trail, much used today by hikers and skiers. Trees grow almost to the summit of the mountains, which are green much of the year. They are "comfortable mountains" which can be enjoyed by hikers; no elaborate mountaineering equipment is required. The "Long Trail" traverses the Green Mountains and continues southward along the greater Appalachian chain of which they are a part.

In difficult times one often hears the remark, "You can't eat the scenery." Yet, despite the hardships encountered in the early days in Underhill, the settlers must have appreciated the scenic beauty around them, for many of the oldest farmsteads were sited to capture the most spectacular panoramic views. Underhill abounds not only in scenic vistas, but in isolated ravines and gorges where the brooks have sculptured the easily eroded schists and only the gurgling of the water is heard. On the eastern side of town nearly every road provides its own special view of Mount Mansfield. On the western side of town the view sweeps across Lake Champlain to the Adirondacks in the distance. An understanding of the special combination of geologic factors that have created the scenic features in Underhill can enhance appreciation for the uniqueness of the legacy we enjoy.

THE LANDSCAPE *

The geologic history, natural history and social history of Underhill are interrelated. The parallel hills and valleys were developed during the folding of the mountains, carved by the rivers and sculpted by the glacier. This physiography, along with the marked variations in elevation and the heritage of glacial deposits, have determined the plant life, wildlife and mineral resources of the town.

Rivers, Streams and Wetlands **

The major stream in Underhill is the Browns River, a tributary of the Lamoille River. It begins on Mount Mansfield and is joined in the valley of Underhill Center by Stevensville Brook and Clay Brook, which also begin their journey high on the mountain. The three streams form a fan-shaped watershed. Harvey Brook, Cranes Brook and Mill Brook, which drain the lower hillsides, also join the Browns River in the village of Underhill Center, creating special problems in the population center, due to a high ground water level and vulnerability to flooding. It then flows parallel to South Hill and is joined in Jericho by the Creek, a slow flowing stream paralleling VT 15 which drains the slopes of Metcalfe and McLean hills on the western side of Underhill. The Browns River swings north through Essex and Westford and drains into the Lamoille River at Fairfax. Thus, the water that collects on Mount Mansfield eventually flows into Lake Champlain.

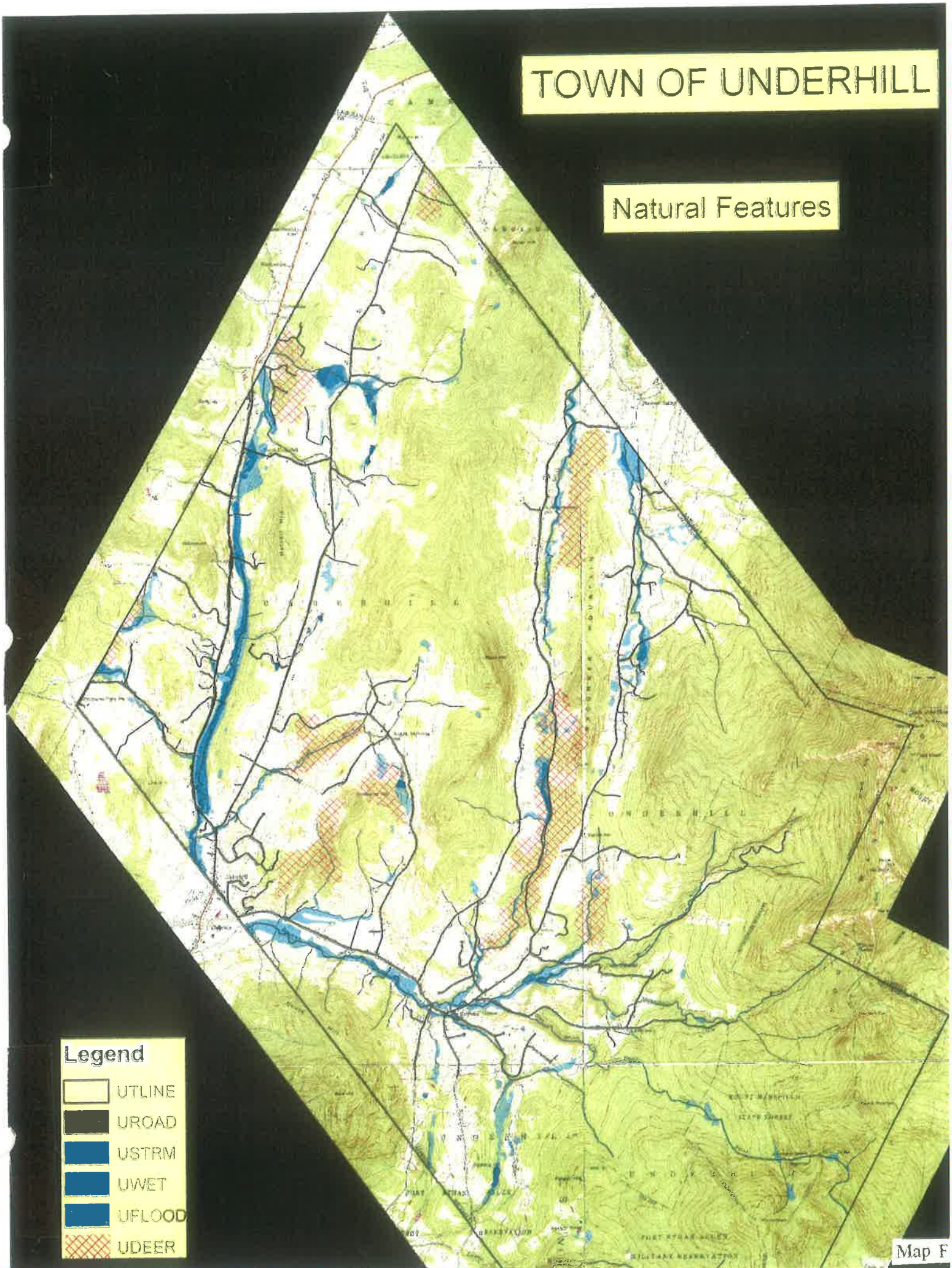
At one time there was a small settlement called Stevensville on Mount Mansfield which grew up at falls in the Stevensville Brook where there was a cheesebox factory. Traces of the factory foundation remain, but few of the houses are standing and the handsome schoolhouse was

*Map F

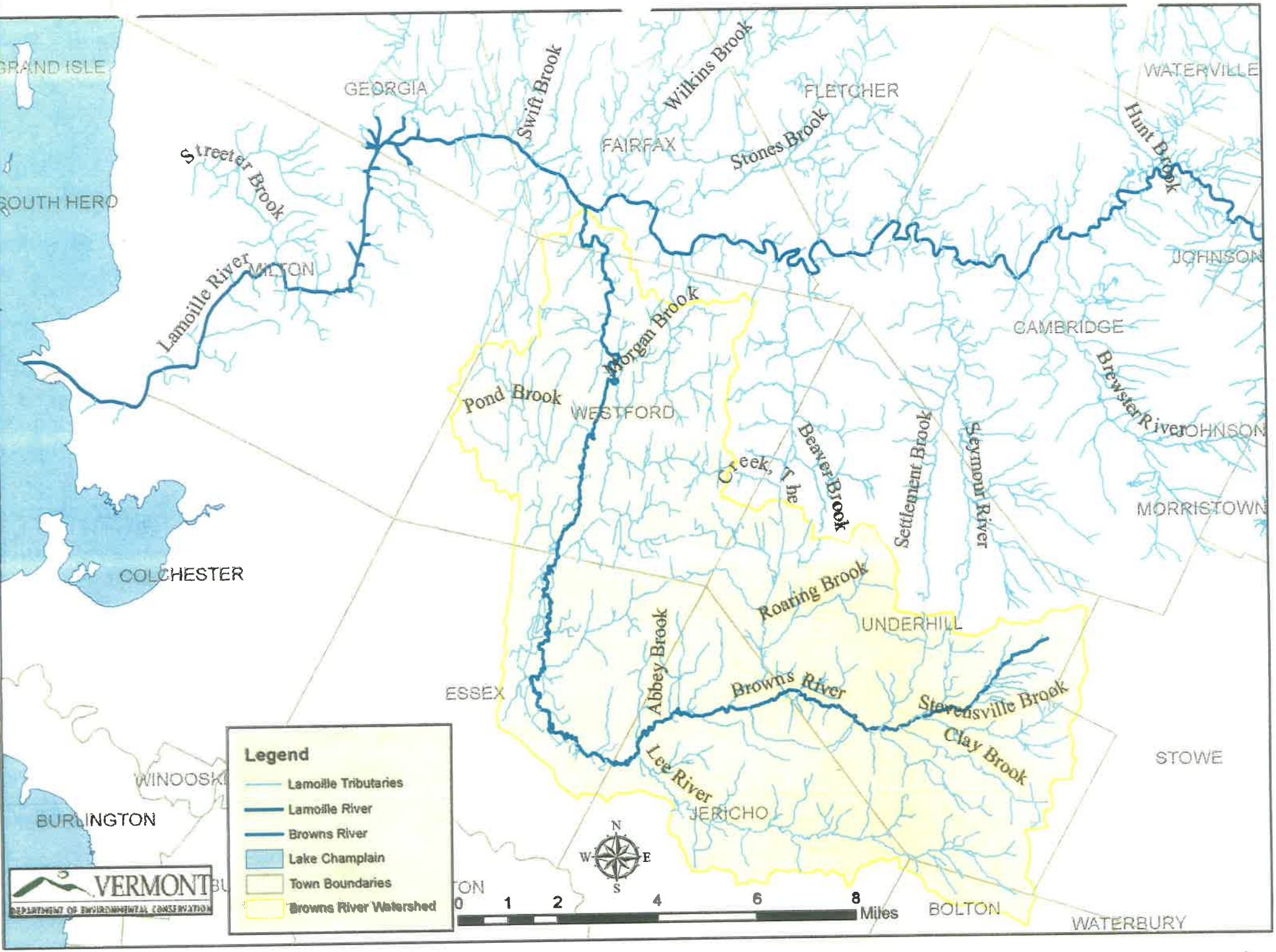
**Map G

TOWN OF UNDERHILL

Natural Features



Map F


GRAND ISLE
SOUTH HERO
GEORGIA
Swift Brook
Wilkins Brook
FLETCHER
WATERVILLE
Streeter Brook
FAIRFAX
Stones Brook
Hunt Brook
Lamoille River
MILTON
JOHNSON
Morgan Brook
CAMBRIDGE
Brewster River
Pond Brook
WESTFORD
Beaver Brook
Creek, The
Settlement Brook
Seymour River
JOHNSON
MORRISTOWN
COLCHESTER
Roaring Brook
UNDERHILL
Abbey Brook
ESSEX
Browns River
Stevensville Brook
Clay Brook
Lee River
STOWE
WINOOSKI
BURLINGTON
JERICHO
BOLTON
WATERBURY
Legend
Lamoille Tributaries
Lamoille River
Browns River
Lake Champlain
Town Boundaries
Browns River Watershed
N
W
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Miles
VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Map G

destroyed by an arsonist. Higher up, Stevensville Brook supported a seasonal sawmill; Browns River, Crane Brook and Mill Brook also had sawmills. Clay Brook is aptly named, for it has formed a steep ravine through a deep stratification of clay. The banks are unstable and slippery and often give way, carrying huge trees that fall across the brook.

The Seymour River, which flows directly into the Lamoille River in Cambridge, created the rich agricultural Pleasant Valley, mostly in Cambridge, partly in Underhill. In North Underhill the Beaver Brook drains Metcalfe Hill and flows across Westford into the Lamoille River. When viewed from the air, a dominating feature of the landscape is the broad wetland of the Creek, which flows south along VT 15 through Underhill. It joins the Browns River in Jericho and is an important floodway for the Browns River watershed. The Browns River meanders through a broad floodplain along the River Road, often changing its course during spring floods. The small farming area along the River Road is the major heritage of the post glacial flooding in Underhill, the only concentrated area of prime agricultural soils in town, a heritage which should be preserved.

Wetlands are areas that are inundated by surface or ground water with a frequency sufficient to support significant vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth and reproduction.
Wetlands are now recognized as serving important functions:

- They protect waterways and water quality by providing water storage for floodwater and storm runoff, thus reducing the severity of flooding;
- They protect surface and ground water resources through chemical reactions, nutrient uptake and sediment filtration;
- They control erosion with a protective cover of vegetation.
- They provide habitat for wildlife, including rare animals, migratory waterfowl and songbirds.
- They provide economic benefits by providing cover or feeding, spawning and nursery habitat for deer, bear and many species of game birds and fish.

There are many kinds of wetlands in Underhill, including the rare habitat at the crest of Mount Mansfield. Protection of wetlands and their functions, including National Wetlands Inventory mapped wetlands, is a major thrust of town regulations. (See map F)

The Woodlands

The virgin forests on Mount Mansfield and its foothills were cleared to fuel shipping on Lake Champlain; the logs were cut at the sawmills that dotted almost every mountain stream. When the trees were gone the stumped land was sold to hardy immigrants who established farms on the hillsides and amazingly far up on Mount Mansfield. Wildlife that depended upon forest cover became scarce. Beavers especially declined in numbers due to trapping and loss of habitat. Most of the small hillside farms failed to prosper and in the early 1900's many were bought for vacation homes. Caught up in the conservation ethic, the seasonal residents planted stands of trees, mostly pines and spruces. The State of Vermont participated by donating seedlings. Photographs of Mount Mansfield taken in the late forties show small trees beginning to green up the slopes that had been cleared. Unfortunately, monocultural planting is vulnerable and during the 1950's stand after stand of white pines in the northeast were lost to the blight of blister rust, carried on currant and gooseberry bushes. Underhill lost many white pines. The mature white pine stands seen today actually date from more recent plantings in the fifties after the blight had passed. In addition, many of the non-indigenous red pines were plagued by "ring rot".

The natural reforestation was more successful. Today Mount Mansfield and the Town of

Underhill, in spite of residential development, look much more like the territory that greeted the early settlers. When viewed from the air, there is a stark contrast between the appearance of Mount Mansfield on the Stowe and Underhill sides. The Underhill slope is undeveloped and no building is allowed above 1500 feet.

The variation in elevation (from about 500' to 4200') results in a wide range of climate zones and plant communities. The classic Northern Hardwood Forest predominates: maples, beech, birch, hemlock and white pine. At about 2500' on Mount Mansfield and on the tops of higher foothills transitional forest, which includes yellow birch and painted trillium, can be found. At higher elevations is the spruce fir forest community, which has figured in the acid rain research conducted by the University of Vermont. The forests of Underhill are again being logged, this time under the oversight of careful forest management. At upper elevations, The Mount Mansfield State Forest is logged under management of the State Department of Forests and Parks. Some private lands in Underhill are logged commercially; many are under forest management in one of the Town or State current use programs. In addition, there are many stands of sugar maples, planted and managed over the years in conjunction with farming operations, which still provide income for maple syrup producers.

In addition to the many smaller privately owned plots, Underhill has three publicly owned forests:

Underhill State Park
Part of the 34,000-acre Vermont State Forest system, the park is open from mid-May through Columbus Day and provides access to the recreational facilities of the forest.

UVM's Mount Mansfield Natural Area
This area has the largest alpine tundra in Vermont as well as sub-alpine areas and alpine bogs. It contains some of the rarest and fragile plants in Vermont.

UVM's Proctor Research Center
Maple research at UVM began in the 1890s and has centered on the sugar maple tree. The sugar bush at Proctor has about 1800 taps as well as thousands of young trees. It is used as a classroom for scientists, students and maple sugar producers.

Wildlife Habitats

Reforestation has influenced the return of wildlife to Underhill and protection of the habitats is a significant aspect of town regulations. Beavers are again common. The moose population has increased and the shy black bear den along the higher ridges, on Flynn Hill in particular. Fishers were introduced in the early 70s to control a burgeoning porcupine population, which especially enjoyed the glue used in exterior plywood and were becoming a menace. The fishers have thrived and porcupines are rarely seen. Otters and even bobcats have been observed, in addition to the more common white tailed deer, fox, raccoon, coyotes, weasel (ermine) and mink. There have been rare sightings of the elusive catamount, although the Fish and Wildlife Dept does not believe that there are any mating pairs in Vermont.

The system of parallel hills in Underhill constitutes natural greenbelts. Large sections of land reach from Cambridge to Jericho, providing unhindered movement of animals along the ridgeline travel corridors. Steep, inaccessible ravines and gorges in the easily weathered bedrock are also important wildlife sanctuaries. Map F shows critical deeryards identified by the Vermont Fish and Wildlife Department. These are largely stands of conifers that provide winter habitat, often found on south facing or protected hillsides. Deer are sensitive to disturbance by dogs and vehicles and the deeryards require a buffer zone.

Floodplains

A Flood Hazard Area is an area that is statistically likely to be inundated by a flood every 100 years. A floodway is the channel of a river and the adjacent land area that must be reserved to discharge the 100 year flood without accumulatively increasing the water elevation more than one foot. Vegetation in the floodway helps protect the riverbanks from erosion during floods, slows the movement of water, filters sediment and debris and provides important wildlife habitat throughout the year. Maps showing the Flood Hazard Areas as determined by the Federal Emergency Management Agency (FEMA) are on file at town hall. Building is severely restricted in these areas and Flood Hazard insurance is required for all buildings.

Fragile areas

The remnants of tundra and associated flora found at the summit of Mount Mansfield are a heritage of the Pleistocene glacier. Robert Hagerman has described this special and fragile habitat in his book, "Mansfield, The Story of Vermont's Loftiest Mountain". There are at least 40 species of plant life in the area, some very rare. The tundra is extremely vulnerable and if disturbed or compacted will never recover; the special plant life will be destroyed. Unfortunately, some has already been ruined by hikers and by motorized vehicles. Elsewhere on the summit are several small peat bogs where some of the rarest plants in the state are found. One bog is 40 inches deep and is so acid that organic matter that has fallen in does not decompose. It provides a fossil record of everything that has grown there since the bog was formed about 3000 years ago. Several of these areas have been designated critical sites by the Vermont Natural Heritage program.

Photo 9

Courtesy, Prof. H. Vogelmann

Diaspora lapponica, one of the rarest Alpine- Arctic species
(Mt Mansfield tundra at the 'chin'.)

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