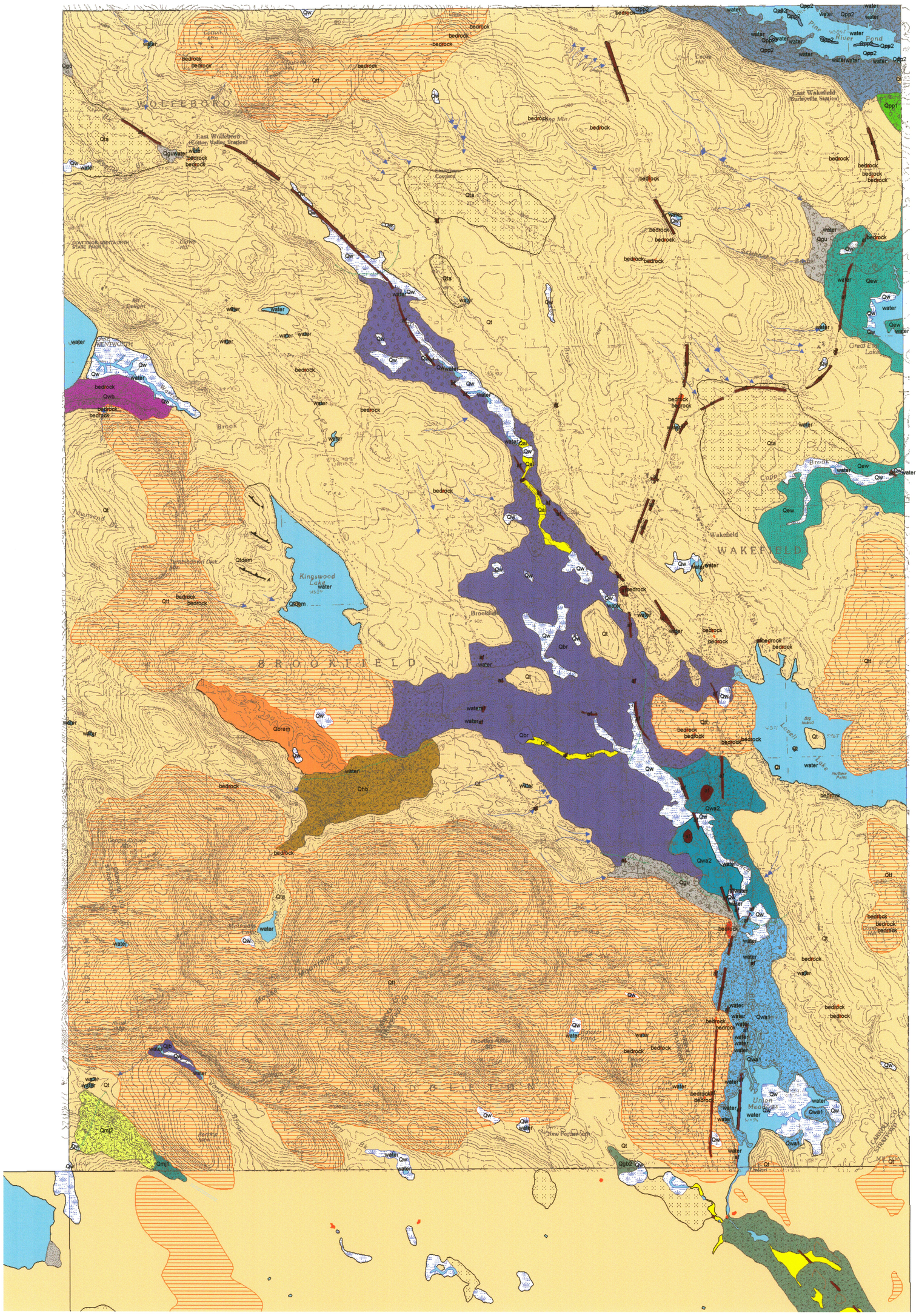
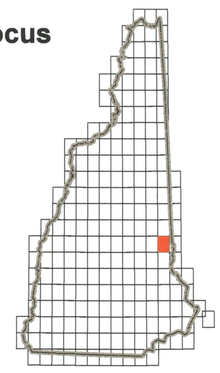
Surficial Geologic Map of the Sanbornville Quadrangle



Legend

- af
- aft
- Qal
- Qta
- bedrock
- Qbr
- Qbrem
- Qew
- Qgb2
- Qgu
- Qhb
- Qjb
- Qmj1
- Qmj2
- Qpp1
- Qpp2
- Qt
- Qtdem
- Qtt
- Qw
- Qwa1
- Qwa2
- water
- Qwb
- Gravel
- Mixed sand and gravel
- Sand, minor silt
- y
- -9999
- Ice margin
- Meltwater channel
- Moraine

Locus



Adjoining Quadrangles and Authors

TUFTONBORO	OSSIPEE	WEST NEWFIELD
WOLFEBORO	SANBORNVILLE KOTEFF	GREAT EAST LAKE EGGI/BROOKS
ALTON GOLDSMITH	FARMINGTON GOLDSMITH	MILTON EGGI/TINKHAM

SURFICIAL GEOLOGIC MAP OF THE SANBORNVILLE QUADRANGLE, CARROL AND STRAFFORD COUNTIES, NEW HAMPSHIRE

BY CARL KOTEFF

OPEN-FILE MAP PUBLISHED 2005

REVISED DIGITAL MAP PUBLISHED 2006

DESCRIPTION OF MAP UNITS

A layer of windblown fine-to medium-grained sand and silt less than 3 ft. (1 m) thick is present over much of the surface of the map area but is not shown. The lower part of this layer is generally mixed with underlying surficial deposits.

Qal Alluvium (Holocene)—Sand, silt, and minor gravel in flood plains along present-day rivers and streams. As much as 25 ft. (8 m) thick and generally underlain by adjacent deposits. Extent of alluvium indicates most areas flooded in the past which may be subject to future flooding

Qw Swamp deposits and wetlands (Holocene)—Muck, peat, silt, and sand underlying poorly drained areas. Generally 5 to 10 ft (1.5-3 m) thick but may be as much as 30 ft (9.1 m) thick

GLACIAL LAKE AND GLACIAL STREAM DEPOSITS (Pleistocene)

Glacial lake and glacial stream deposits were laid down during deglaciation of the Sanbornville quadrangle chiefly at or near the margin of the continental ice sheet as it retreated from the region. Material for these sediments was derived mostly from within the ice sheet, with a minor amount derived from melt water erosion of the area adjacent in front of the stagnant-ice margin. These deposits are subdivided into morph sequences (Koteff and Pessl, 1981) on the basis of their position, altitude, and textural composition, and their location represents a particular chronologic position of the stagnant-ice margin during general ice retreat. Most of the units were deposited as deltas into ponded water bodies whose levels were controlled by spillways beyond the map area.

The glacial stream or fluvial portion of the deltas is represented by topset beds which overlie foreset beds that were deposited below the lake level. Most of the uncorrelated deposits (Qgu) appear to have been deposited into smaller ponded water bodies that were controlled by separate base-levels in or beyond the ice margin

Qpp2
Qpp1 Pine River Pond area deposits (Pleistocene)—Gravel, sand, with minor silt; at least 125 ft thick. Very coarse gravel in the upper parts of the unit, becoming finer-grained with depth. Unit Qpp1 is the oldest. Unit Qpp2 deposited on and around large ice blocks that occupied the area of Pine River Pond

Qew East Wakefield area deposits (Pleistocene)—Mostly sand with scattered gravels. Thickness not well known, but as much as 20 ft. Much of this unit may be lake bottom deposits, although the extent and outlet for this ponded body is not well known

Qwb Warren Brook area deposits (Pleistocene)—Sand and gravel as much as 30 ft thick. Deposited in a pond between ice and the valley wall as a kame terrace

Qbr Brookfield area deposits (Pleistocene)—Sand, gravel, with minor silt as much as 40 ft thick. Deposited into ponded water controlled by an outlet to the southeast of the Sanbornville quadrangle. Most of the deposits in the upper part of Pike Brook are fluvial and contain mostly gravel. The unit probably is made up of more than one morphosequence

Qtdem Tumbledown Dick end moraine deposits (Pleistocene)—Chiefly sand, gravel, silt, with minor amounts of till. Unit represents several small and local readvances that indicate a period of instability during general ice-marginal retreat from the area. These deposits, along with possibly those of unit brem, are the earliest known in southeastern New Hampshire, and represent an uncommon event during deglaciation of this region

Qhb Hanson Brook area deposits (Pleistocene)—Sand, gravel, with minor silt; as much as 100 ft thick. Deposited as a kame entirely within an ice cavity into ponded water whose drainage is not well known

Qbrem Brookfield morainal deposits (Pleistocene)—Chiefly till deposited either as ice-shoved material or as a lateral moraine between the ice margin and the valley wall. As much as 80 ft thick

Qwa2
Qwa1 Wakefield area deposits (Pleistocene)—Sand, gravel, with minor silt; unit Qwa1 is the oldest. Deposited into ponded water that was controlled by a spillway to the south of the Sanbornville quadrangle. As much as 60 ft thick

Qbt Brookfield-Wakefield deposits (Pleistocene)—Medium to coarse gravel; as much as 30 ft thick. (See accompanying photograph). Deposited between the valley wall and the ice, although the unit may have originated as a subglacial esker

Qmj2
Qmj1 Mt. Jesse area deposits (Pleistocene)—Sand, gravel, with minor silt and scattered very large boulders; as much as 100 ft thick. Unit Qmj1 is oldest. Deposited in ponded water

Qnp
Qgb2 New Portsmouth area deposits (Pleistocene)—Gravel, sand, with minor silt; as much as 25 ft thick. These deposits are extended from unit gb2, mapped by R.G. Goldsmith in the adjoining Farmington quadrangle to the south

Qgu Uncorrelated sand and gravel deposits

Qt
Qtt
Qta Till (Pleistocene)—Nonsorted to poorly sorted mixture of clay, silt, sand, pebbles, cobbles, and boulders; dominant grain size is silt to small pebbles; locally contains small irregular masses of sand and gravel. Deposited directly by the ice sheet. Nearly all of the surface till was deposited during the last glaciation (Wisconsinan) that overran the area. Based on exposures in adjacent quadrangles, drumlins generally are underlain by older Illinoian till, which is siltier and generally contains smaller and fewer boulders than the Wisconsinan till. Thickness of the surface till (Wisconsinan) generally less than 15 ft; thickness in the drumlins is as much as 125 ft, and may exceed 180 ft in places. Ablation till, unit Qta, has a matrix of very little silt and clay, and appears to have been derived by meltwater erosion of nearby till deposits

af Artificial fill—Earth-fill material that was derived from surficial deposits and/or bedrock in made land. Many small bodies not shown on the map

Bedrock exposures—Ruled pattern (Qtt) indicates areas of abundant exposures and areas where surficial cover is thin (generally less than 10 ft thick)

EXPLANATION OF MAP UNITS

Contact

Retreatal position of the stagnant-ice margin—Approximate position of ice during deposition of designated morphosequence

Meltwater channel—Erosional features developed mostly in till. In places, acted as the debris-laden melt water feeder for nearby morphosequences

Glacial grooves and striations—Indicates direction of ice movement. Observation is at tip of arrow. Number is in degrees east or south

Long axis of drumlin—Generally parallel to inferred direction of ice movement.

Crest of morainal ridge

MATERIALS OBSERVATIONS

Texture of stratified deposits—Indicated to depth of at least 5 ft (1.5 m).

Gravel

Mixed sand and gravel

Sand with minor silt

Gravel or sand pit—Letter symbols indicate predominant texture of exposed materials: s, sand; p, pebble; c, cobble; b, boulder, in decreasing order of abundance: g, gravel; for example, pcg means pebble-cobble gravel, that contains interlayer of sand. (SYMBOL) Abandoned gravel or sand pit.

Note: Well data are provided with this map as a separate overlay, which is also available in digitized format from the N.H. Department of Environmental Services, N.H. Geological Survey, Concord, New Hampshire.

REFERENCES

Koteff, Carl, and Pessl, Fred, Jr., 1981, Systematic ice retreat in New England: U.S. Geological Survey Professional Paper 1179, 20 p

Mapped in cooperation of the National Geologic Map Program; STATEMAP program