# RECONNAISSANCE MAP OF SURFICIAL DEPOSITS IN THE CONNECTICUT PART OF THE THOMPSON QUADRANGLE, CONNECTICUT-RHODE ISLAND

By

Elizabeth Haley London
and
Robert L. Melvin

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

## EXPLANATION

### INTRODUCTION

This map is a compilation of information gathered in conjunction with mapping programs conducted by U.S. Geological Survey (USGS) in the 1960's and 1970's. P. M. Hanshaw mapped the Rhode Island part of the quadrangle in 1960-1961 and described some surficial deposits in Connecticut. R. L. Melvin surveyed the Connecticut part of the quadrangle in 1962-1963 and made detailed notes about surficial deposits for a water-resources inventory of the Quinebaug River basin over the quadrangle (Randall and others, 1966). D. Goulding conducted additional field work in 1970-1975. E. H. London mapped the Connecticut part of the quadrangle in 1979 and delineated the geologic units shown on this map. The observations made by previous investigators are compiled on this map along with published bedrock outcrop data (Dixon, 1974) and published subsurface data (Thomas and others, 1966). Thus, this map is a record of the surficial geologic information gathered to date by USGS personnel and associates for the Connecticut part of the Thompson quadrangle. It should serve as a data base for further geologic and hydrogeologic investigations.

### DESCRIPTION OF MAP UNITS

#### POST-GLACIAL DEPOSITS

**al** — Alluvium - Layers of gravel, sand, fine-sized particles, and organic matter deposited by modern streams in channels and on flood plains. The alluvium shown on this map was delineated from aerial photographs

**sw** — Swamp deposits - Variable amounts of organic matter and sediment, usually fine-grained, that fill kettle holes, bedrock depressions, meltwater channels, and alluvial backwaters. The swamps shown on this map were identified on aerial photographs; many swamps may be wetlands with very thin deposits

**st** — Stream-terrace deposits - Beds of sand and gravel or sand produced by entrenchment and local reworking of stratified-drift deposits by post-glacial streams

#### GLACIAL MELTWATER DEPOSITS

Stratified drift - A sorted and stratified mixture of sediments deposited by glacial meltwater in fluvial and lacustrine depositional settings. Stratified deposits are divided into map units on the basis of grain size observed in exposures and reported from wells and test borings. Superposed units are shown where deep pits or subsurface information indicate the

existence of extensive, roughly uniform strata. Texture and gross stratigraphy furthermore are inferred in places from topographic setting and morphology of the deposits, which suggest (a) the likelihood of fluvial versus lacustrine sedimentation and (b) proximity to the ice margin at the time of deposition. The actual textures and thicknesses of stratified drift deposits are indicated where known by point data and boring data plotted on the map

g — Gravel deposits - Pebble gravel to boulder gravel with interstitial sand. Beds of sand compose less than 50 percent of the deposit. The gravel unit is shown on the map only where it has been observed in the field

sg — Sand and gravel deposits - Interbedded layers of sand and mixed sand and gravel. These deposits contain from 25 to 75 percent gravel-size particles

s — Sand deposits - Sand, which may contain as much as 50 percent fine-grained sediment. Gravel may be present, but it composes less than 25 percent of the deposit

f — Fine-grained deposits - Very fine sand, silt, and clay. These deposits may contain as much as 50 percent sand that is coarser than very fine sand

u — Undifferentiated stratified deposits; no reliable textural data available

sg/s, sg/f, sg/f — Superposed deposits - Areas where one kind of deposit overlies another. The surface deposit is at least 6 feet thick in most places. Superposed units are mapped only where an areally extensive and uniform stratigraphy is indicated by deep excavations and(or) subsurface logs

GLACIAL-ICE DEPOSITS

Till - A generally unsorted and unstratified mixture of rock particles deposited by glacier ice. The color, lithology, and texture of till reflect those of the local bedrock, from which it was chiefly derived. The Thompson quadrangle is underlain by gray and green-gray gneisses, some of which weather to yellow, orange, and pink hues of gray (Dixon, 1974). The till is yellowish gray to light olive-gray, and the matrix is predominantly sand

Two kinds of till are present in the map area, upper till and lower till (Pessl, 1966). Upper till was deposited during the last glaciation; it is the most common kind of till in the

map area. Upper till is unoxidized, crudely stratified in places, loose, and sandy. Most commonly it forms a thin mantle (less than 15 feet thick) over bedrock and conforms to the bedrock topography. Upper till is labelled "t" in the map. A variety of upper till that includes flowtill and stratified drift and that forms mounds and ridges is interpreted as ablation till. Deposits of ablation till are outlined by short dashed lines on the map and labelled "at." Lower till is believed to be an older till deposited during an earlier glaciation (Pessl, 1966). It is oxidized, compact, and moderately fissile. Relative to upper till, it is darker, finer grained, and more uniform in texture. Lower till has been observed in one excavation at East Putnam (see diamond symbol on the map); however, it is believed to constitute the bulk of thick till deposits in the quadrangle (Schafer and Hartshorn, 1965). Thick till deposits commonly form smooth, molded landforms, such as drumlins, that mask the bedrock topography. The location and extent of thick till deposits have been mapped from aerial photographs. Thick till deposits are delineated on the map by long dashed lines and are labelled "tt." Actual thicknesses of till are indicated by well logs, which are plotted on the map

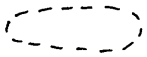
t — Till - A generally unsorted, unstratified, and slightly to moderately compact mixture of rock particles

at — Ablation till - Loose, sandy till deposits that include flowtill and stratified drift, and that form mounds and ridges

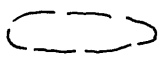
tt — Thick till - Compact, fine-grained till that forms smooth, molded landforms. Thick till deposits are from 15 to more than 100 feet thick

Bedrock outcrops; solid color represents continuous outcrop; ruled pattern represents numerous closely spaced outcrops. Most outcrop data from Dixon (1974)

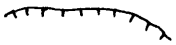
Contact



Ablation till



Thick till



Terrace scarp, produced by the trenching and meandering of streams

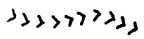

Observation of delta foreset beds; number is estimated elevation of topset/foreset contact in feet above mean sea level


Glacial striations on bedrock (one locality); observation at tip of arrow; number is degrees east of south

Long axis of drumlin; dot at crest of drumlin

Meltwater channel cut into till

Lower-till locality



Ice-channel filling or esker


Pit or excavation; extent of cut shown by hachures. Letter symbol indicates texture; number is thickness of unit, in feet. Superposed symbols represent superposition of materials in exposure. Pit symbols: active pit ( ) inactive pit ( )

notations:
- b - boulders and sand
- c - cobbles and sand
- p - pebbles and sand
- s - sand
- f - fine-grained sediment
- t - till

bc, cp, etc.: combined letter notations are used where two or more clast sizes are abundant. The order of symbols corresponds to the prevalence of clast size; the size listed first is the most abundant

Log of well or test hole, selected and annotated from logs published by Thomas and others (1966). Letter and number designations taken from Thomas and others (1966):

Th - Thompson township

Pu - Putnam township
Ki - Killingly township
sample notations:

80 t/rk - 80 feet of till over bedrock
96.6 t/e - 96.6 feet of till; end of boring
15 sg/14 f/ r - 15 feet of sand and gravel over
14 feet of fine-grained sediment; refusal

## GEOLOGIC INTERPRETATION OF MAJOR STRATIFIED-DRIFT DEPOSITS IN THE FIVEMILE RIVER LOWLAND

The following interpretation is based on (1) estimated elevations of delta topset/foreset contacts (see delta symbols on map); (2) down-gradient changes in grain size; (3) morphology, location, and gradient of deposits in plan; and (4) an established rate of post-glacial crustal upwarp of 4.3 feet per mile (Stone and Randall, 1975).

$Qfr_1$ - Comprises several ice-contact, fluvial-lacustrine morphologic sequences (Koteff, 1974) graded to a proglacial lake in the lower Fivemile River valley. The alignment of deposits along the east side of the valley (see fig. 1) suggests that the stagnant ice margin impinged against the east wall during north-northwest retreat. Individual ice-margin positions are outlined by the collapsed west flanks of terraces along the east side of the valley; gradations in texture (from coarse-grained to fine-grained) serve to further differentiate individual morphologic sequences. Numerous exposures of deltaic bedding and additional deposits with deltaic morphology and stratigraphy (see well data) indicate a lacustrine setting for many deposits of unit $Qfr_1$. The elevations of three observed topset-foreset contacts fall on a plane that rises northward at a rate of approximately 4.3 feet per mile, suggesting that they were built sequentially into an expanding proglacial lake with a constant lake level. The existence of a plug of till and ice in the gorge east of Pineville is implied by the damming and duration of this lake in the lower Fivemile River lowland.

$Qfr_2$ - Probably one ice-contact fluvial-lacustrine morphologic sequence (Koteff, 1974) graded to a lake in the Fivemile River lowland north of Quaddick Reservoir with a water plane approximately 15 feet higher than the lake in $Qfr_1$. The separation of this deposit from those to the south (see fig. 1) is based on: (1) the uniform reconstructed gradient of these deposits and the corresponding uniform surface textural gradation; and (2) the topset-foreset elevation of one delta at the southern end of this deposit. The 15-foot increase in water plane elevation can be attributed to rapid retreat of the ice margin from $Qfr_1$ with subsequent ponding of meltwater behind a mass of detached stagnant ice at Quaddick Reservoir. Unit $Qfr_2$ was deposited on and around ice blocks as indicated by the extensive collapse of the deposit. The ice-contact head of this deposit is located 1.3 miles north in the Oxford quadrangle (P. J. Barosh, written commun., 1980).

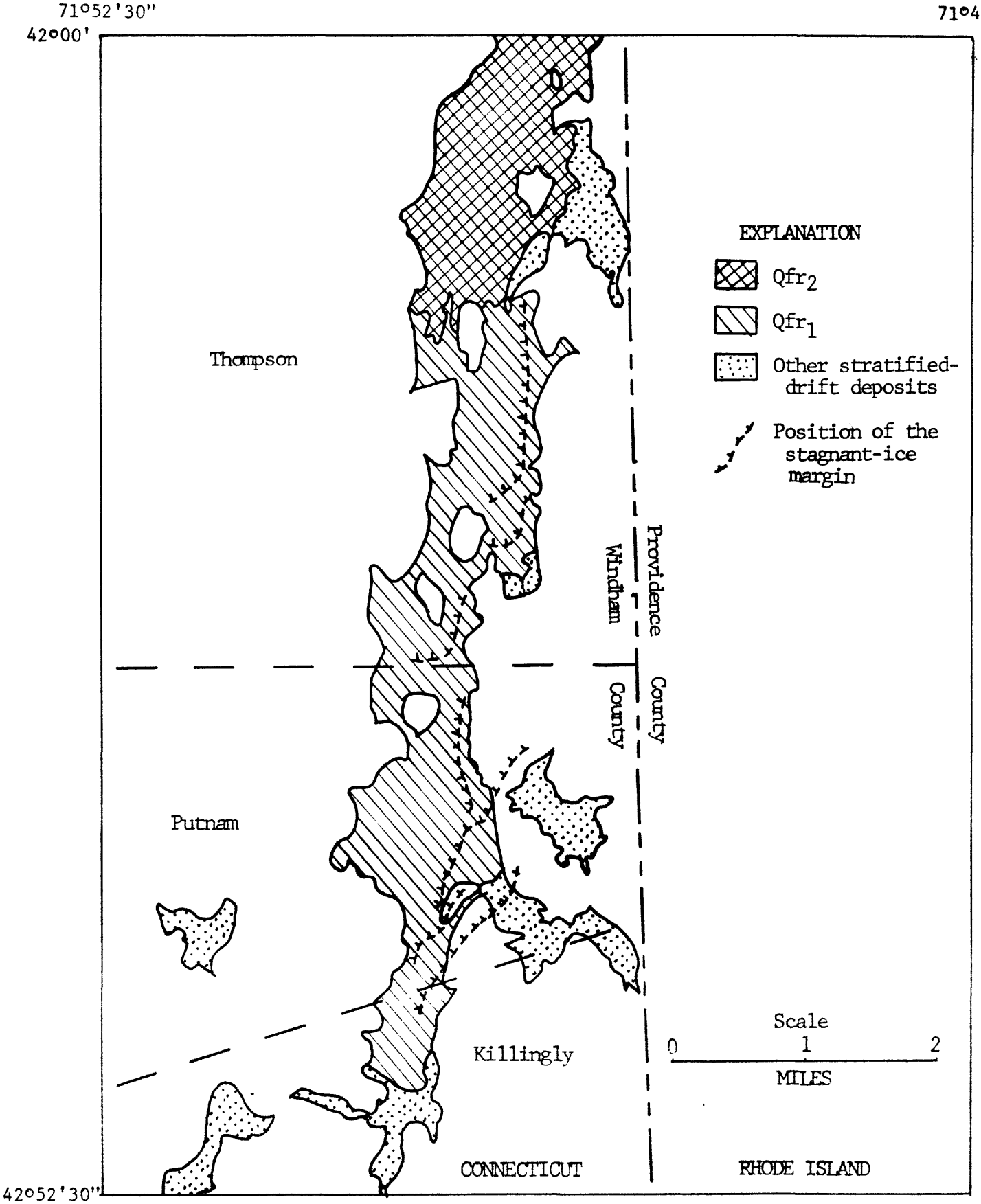



Figure 1.--Location of major stratified-drift units in the Fivemile River lowland. (See map explanation for description of surficial units.)

Other stratified drift deposits are ice contact in origin and are highly collapsed. The deposits south and east of the Fivemile River lowland are generally slightly older than deposits in the lowland at the same latitude.

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