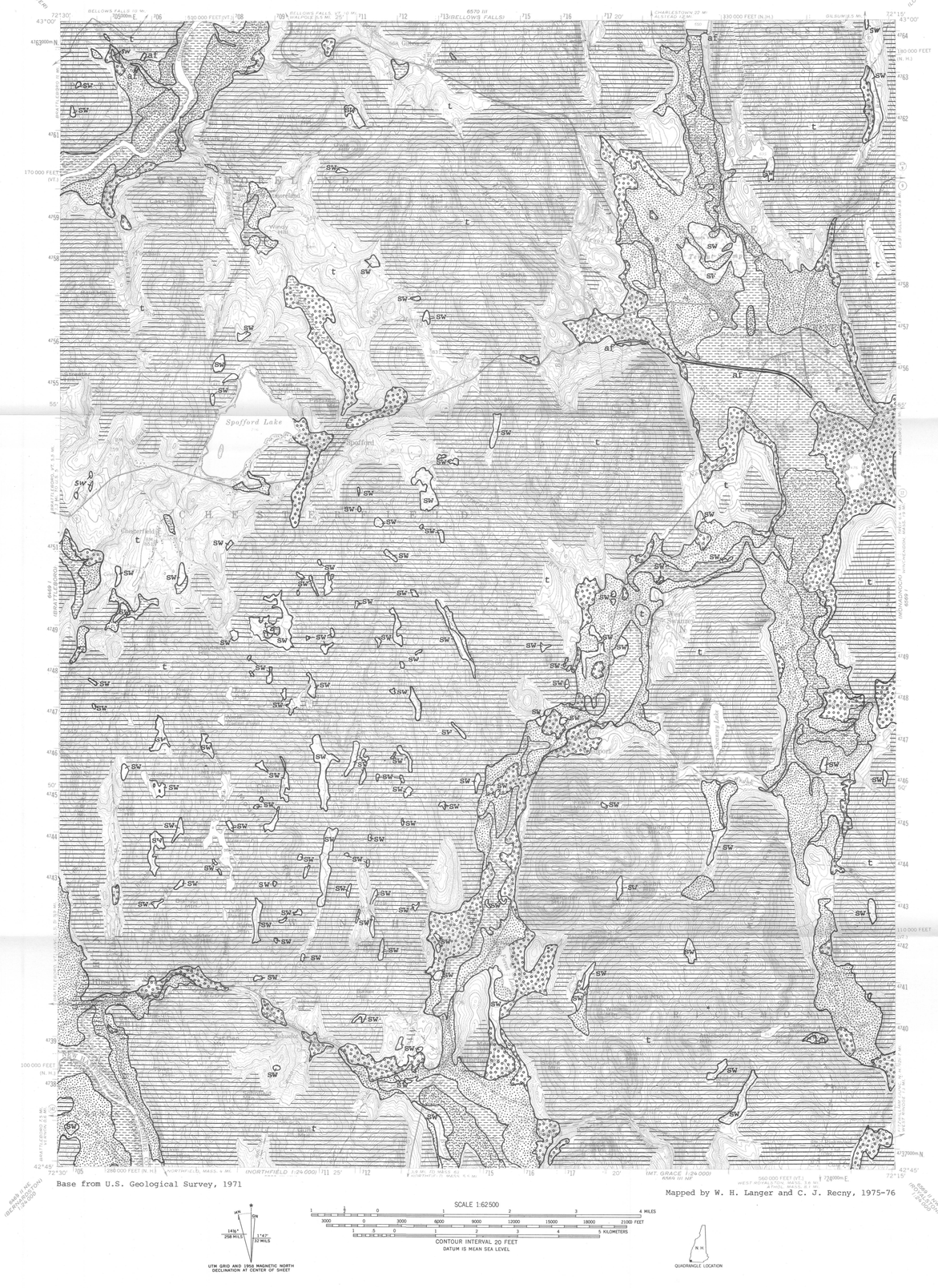
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1012
LANGER AND RECNY—UNCONSOLIDATED MATERIALS,
KEENE QUAD., N. H. -VT.



This map describes the distribution and type of unconsolidated materials in the Keene quadrangle. It is intended to serve as an aid in reconnaissance evaluation, areal planning, and areal identification of potential economic deposits.

THIS MAP SHOULD NOT BE USED AS A SUBSTITUTE FOR ONSITE INVESTIGATION

The map shows the distribution of particle sizes of the first materials of a significant thickness (generally greater than 3 ft (1 m) thick) occurring beneath the soil layer. The soil layer, commonly 1 or 2 ft (about 0.5 m) thick, is not mapped. Till (hardpan) forms the mapped surface over large areas. In most parts of the quadrangle, it is believed to underlie the other unconsolidated materials. Stratified deposits are composed of gravel, sand, silt, clay, and organic matter. They occur in layers and overlie till and (or) bedrock in most of the mapped area. Stratified deposits at the surface are often underlain by stratified materials of different texture. Bedrock (ledge) underlies the entire map area at various depths beneath the unconsolidated materials and is shown where it is at or near the land surface (generally within 10 ft (3 m)). Figure 1 shows the vertical relationships often encountered in unconsolidated materials in New England.

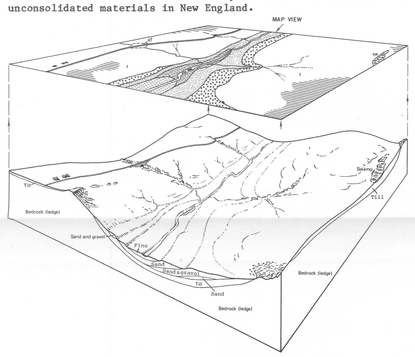


Figure 1.--Block diagram of hypothetical area in New England showing some common examples of unconsolidated materials overlying bedrock. Map view shows unconsolidated materials projected from land surface.

Most unconsolidated materials are mixtures of the three particle-size classes defined in table 1 below. Coarse particles include granules, pebbles, cobbles, and boulders. Medium particles include all sand sizes except very fine sand. Fine particles include very fine sand, silt, and clay-sized particles.

Table 1. - Particle-size classification. Modified from Wentworth (1922).

Diameter of particles	10 256	2.5 64	.16 4	.08 2	.04 1	.02 .5	.01 .25	.005 .125	.0025 .062	.00015 .004	inches millimeters
Boulders	Cobbles	Pebbles	Granules	SAND							
				Very Coarse	Coarse	Medium	Fine	Very Fine	Silt	Clay	
COARSE				MEDIUM				FINE			

Figure 2 shows the distribution of three particle-size groups (fine, medium, and coarse particles) for stratified deposits and till. Particle-size distribution at any point on the diagram is determined by following three lines that parallel the triangle sides from that point to the margins of the diagram, and by reading the matching figures or interpolating between them at the margins. For example, the particle-size distribution at point A is 25 percent fine, 50 percent medium, and 25 percent coarse particles. Point B consists of a mixture of 0 percent fine, 80 percent medium, and 20 percent coarse particles. In all cases, the total of all particle sizes adds up to 100 percent.

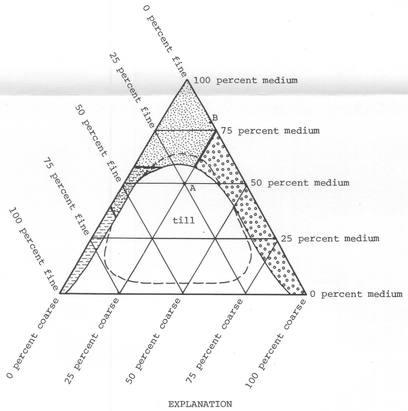


Figure 2. Distribution of three particle-size groups for stratified deposits and till.

Stratified deposits (shown on fig. 2 by patterns) are mixtures of one or two predominant particle sizes; usually they contain only small amounts of a third particle-size. Till (enclosed by dashed line) consists of a mixture of all three particle sizes. In one area of the diagram, stratified deposits and till have the same particle size distribution. The difference between these two deposits is that stratified deposits are layered, whereas till would have no well-developed layering.

Materials mapping involves a visual estimate of particle-size distribution by a field geologist. Percentages of particle sizes may, therefore, differ somewhat in places from the limits defined in the map units below. Many units may also contain small lenses of material that differ in particle size from the main deposit.

DESCRIPTION OF MAP UNITS

Some descriptions of units are accompanied by generalized vertical sections (modified from Stone, 1976). Particle sizes and horizontal distances are not to scale; vertical scales are indicated. Symbols are defined below sections.

STRATIFIED DEPOSITS

Sand and gravel deposits

Particle sizes range from 100 percent coarse particles to 25 percent coarse particles and 75 percent medium particles. Minor amounts of fine particles may be present (see fig. 2). Particle sizes may range from coarse to medium both laterally and vertically in a deposit. Material may occur as:

~5 ft (1.5m) — Thin (generally less than 2 ft (.6 m) thick) beds of well to poorly sorted sand and gravel, and well to poorly sorted gravel.

~5 ft (1.5m) — Material which ranges laterally from sand through sand and gravel to gravel deposits, and may be well to poorly sorted.

~5 ft (1.5m) — Layers of poorly sorted mixed sand and gravel.

~5 ft (1.5m) — Poorly sorted gravel deposits.

~15 ft (4.6m) — Thick (generally greater than 5 ft (1.5 m) thick) layers of well-sorted, fine to medium sand interbedded with thick layers of poorly sorted sand and gravel. Either sand or gravel may occur at the surface.

Open circles, coarse particles;
dots, medium particles

Sand deposits

Particle sizes range from 25 percent coarse and 75 percent medium particles through 100 percent medium particles to 60 percent medium and 40 percent fine particles (see fig. 2).

~5 ft (1.5m) — Material commonly occurs as well to poorly sorted layers of differing thickness.

Open circles, coarse particles;
dots, medium particles;
dashes, fine particles

Mixed sand and fine deposits

Particle sizes range from 60 percent medium and 40 percent fine particles to 40 percent medium and 60 percent fine particles (see fig. 2).

~5 ft (1.5m) — Material commonly occurs as a massive, homogeneous mixture of medium and fine particles.

Dots, medium particles;
dashes, fine particles

Fine deposits

Particle sizes range from 100 percent fine particles to 60 percent fine and 40 percent medium particles. Deposits locally contain scattered coarse particles (see fig. 2). Material may occur as:

~2 ft (0.6m) — Thin, alternating layers of well-sorted very fine sand and (or) silt and (or) clay.

~10 ft (3.0m) — Massive beds of very fine sand and (or) silt and (or) clay.

~5 ft (1.5m) — Well to poorly sorted very fine sand and silt containing organic material.

Dots, very fine sand-sized particles;
dashes, silt-sized particles
solid black layers, clay-sized particles;
irregular black blebs, organic material

TILL (HARDPAN) DEPOSITS

t

Ranges from a nonsorted to poorly sorted, noncompact mixture of silt, sand, pebbles, cobbles, and boulders which contains minor amounts of clay, to a nonsorted, compact mixture of silt and clay with some pebbles and cobbles. Till is present at depth beneath most unconsolidated materials in the map area

SWAMP DEPOSITS

sw

Generally dark, decomposed or partially decomposed organic material intermixed with varying amounts of sand, silt, and clay. Locally, contains scattered coarse particles. Swamp deposits are commonly underlain by the surrounding material

BEDROCK (LEDGE) OUTCROP AND SHALLOW BEDROCK

Bedrock (ledge) exposed at the ground surface or generally within 10 ft (3 m) of the ground surface

ARTIFICIAL FILL

af

Shown only for major highways and Surry Mountain Dam. Additionally, in urban centers and other areas of dense development, fill of variable thickness and extent may overlie the natural materials shown on the map

REFERENCES

Stone, J.R., 1976, Map showing unconsolidated materials, Windsor Locks quadrangle, Connecticut: U.S. Geol. Survey Misc. Field Studies Map MF-450 E.

Wentworth, C.K., 1922, A scale of grade and class terms for clastic sediments: Jour. Geology, v. 30, p. 337-392.

MAP SHOWING UNCONSOLIDATED MATERIALS, KEENE QUADRANGLE, NEW HAMPSHIRE-VERMONT

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