



ISRIC - WAGENINGEN
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SOIL ASSOCIATIONS

- ROLLING SOILS OF THE PIEDMONT**
- 1. Glenside - Manor - Chester Association: Well-drained, moderately permeable, medium-textured soils formed over micaceous crystalline rocks.
 - 2. Neshaminy - Aldino - Watchung Association: Well-drained, moderately well-drained, and poorly drained, moderately slowly to slowly permeable, medium-textured soils formed over dark-colored gabbroic rocks.
- GENTLY SLOPING SOILS ALONG THE FALL LINE**
- 3. Neshaminy - Talleyville - Urban land Association: Well-drained, moderately slowly permeable, medium-textured soils, relatively undisturbed to severely disturbed, formed over dark-colored gabbroic rocks.
 - 4. Elsinboro - Delanco - Urban land Association: Well-drained and moderately well-drained, moderately permeable and moderately slowly permeable, medium-textured soils, relatively undisturbed to severely disturbed; formed in old alluvium on stream terraces.
 - 5. Urban land Association: Areas used for streets, sidewalks, buildings and other areas where cutting and filling have been extensive.
 - 6. Aldino - Keyport - Mattapeke - Urban land Association: Moderately well drained, slowly permeable, medium-textured soils, relatively undisturbed to severely disturbed.
- NEARLY LEVEL SOILS OF THE COASTAL PLAIN**
Dominantly well-drained
- 7. Matapeke - Sassafras - Urban land Association: Well-drained, moderately permeable, medium-textured and moderately coarse-textured soils, relatively undisturbed to severely disturbed.
 - 8. Sassafras - Fallsington - Matapeke Association: Well-drained and poorly drained, moderately permeable, moderately coarse-textured and medium-textured soils.
 - 9. Matapeke - Sassafras Association: Well-drained, moderately permeable, medium-textured and moderately coarse-textured soils.
 - 10. Sassafras - Fallsington Association: Well-drained and poorly drained, moderately permeable, moderately coarse-textured and medium-textured soils.
 - 11. Evesboro - Rumford - Fallsington Association: Excessively drained, well-drained and poorly drained, rapidly permeable, coarse-textured to moderately coarse-textured soils; underlain by sand.
- Dominantly moderately well-drained to poorly drained
- 12. Fallsington - Sassafras - Woodstown Association: Poorly drained, well-drained and moderately well drained, moderately permeable, moderately coarse-textured to medium-textured soils.
 - 13. Keyport - Elkton Association: Moderately well-drained and poorly drained, slowly permeable, clayey soils.
 - 14. Othello - Matapeke - Mattapeke Association: Poorly drained to well drained, moderately slowly permeable, medium-textured soils with sandy substrata.
 - 15. Elkton - Matawan - Keyport Association: Poorly drained and moderately well-drained, slowly permeable, clayey to moderately coarse-textured soils.
- Dominantly very poorly drained
- 16. Pocomoke - Fallsington - Evesboro Association: Very poorly drained and poorly drained, moderately permeable, moderately coarse-textured soils, and excessively drained, rapidly permeable, coarse-textured soils; underlain by sand.
 - 17. Fallsington - Pocomoke - Woodstown Association: Poorly drained, very poorly drained and moderately well-drained, moderately permeable, moderately coarse-textured soils underlain by sand.
 - 18. Pocomoke - Fallsington - Sassafras Association: Very poorly drained, poorly drained and well-drained, moderately permeable, moderately coarse-textured soils underlain by sand.
- Wetlands**
- 19. Tidal marsh-Coastal beach Association: Mineral and organic soil materials that are regularly subject to tidal flooding by salt water; and loose, salty beach and dune sands.
 - 20. Muck - Pocomoke - Swamp Association: Very poorly drained, dark-colored, mixed organic and mineral soil materials in fresh-water swamps.
 - 21. Tidal fresh-water marsh Association: Muck or peat over sand, regularly covered by fresh-water tides.

ESTIMATED SOIL LIMITATIONS FOR SELECTED USES

SOIL ASSOCIATION (No. OF STATES)	SOIL SERIES	PERCENT OF SOIL ASSOCIATION	DWELLINGS (THREE STORIES OR LESS)		SEPTIC TANK ABSORPTION FIELDS	LOCAL ROADS AND STREETS	RECREATION CAMP AND PICNIC AREAS	INTENSIVE CROPPING
			WITHOUT BASEMENTS	WITH BASEMENTS				
1 (3%)	GLENSIDE MAJOR MINOR SOILS	43 28 15	SLIGHT TO MOD 1 SLIGHT TO MOD 1 SEVERE 3,4	SLIGHT TO MOD 1 SLIGHT TO MOD 1 SEVERE 3,4	SLIGHT TO MOD 1 SLIGHT TO MOD 1 SEVERE 3,4	MOD. TO SEV. 1,6,13 MOD. TO SEV. 1,6,13 SEVERE 3,4	SLIGHT TO MOD 1 SLIGHT TO MOD 1 SEVERE 3,4	SLIGHT TO MOD 2 SLIGHT TO MOD 2 SEVERE 3,4
2 (1%)	NESHAMINY MAJOR MINOR SOILS	38 29 15	SLIGHT TO MOD 1,2,4 SLIGHT TO MOD 1 SEVERE 3,4	SLIGHT TO MOD 1,2,4 SLIGHT TO MOD 1 SEVERE 3,4	SEVERE 12 SEVERE 12,15 SEVERE 3,4,11	MOD. A SEV. 13,6,1 SEVERE 3,4,11,12 MOD. A SEV. 13,6,1	SLIGHT TO MOD 1 SLIGHT TO MOD 1 SEVERE 3,4	SLIGHT TO MOD 2,14 SLIGHT TO MOD 2 SEVERE 3,4,11,12,14
3 (1%)	NESHAMINY TALLEYVILLE MAJOR MINOR SOILS	65 35	SLIGHT NOT RATED	SLIGHT NOT RATED	SEVERE 12 NOT RATED	MOD. A SEV. 13,6 NOT RATED	SEVERE 12 NOT RATED	SLIGHT NOT RATED
4 (1%)	ELINSBORO DELANCO MAJOR MINOR SOILS	42 20 10	SLIGHT NOT RATED SEVERE 3,4	SLIGHT NOT RATED SEVERE 3,4	SLIGHT NOT RATED SEVERE 3,4,12	MODERATE 6,13 SEVERE 3,4,13 SEVERE 3,4,12	SLIGHT NOT RATED SEVERE 3,6	SLIGHT NOT RATED SEVERE 3,6
5 (1%)	URBAN LAND	100	NOT RATED	NOT RATED	NOT RATED	NOT RATED	NOT RATED	NOT RATED
6 (1%)	ALDINO KEYPORT MAJOR MINOR SOILS	30 24 18	SLIGHT SLIGHT SEVERE 3	MODERATE 3,15 SEVERE 3,7 SEVERE 3	SEVERE 11,3,15 SEVERE 3,6,7,11 SEVERE 3	SEVERE 3,5,13,15 SEVERE 3,6,7,11 SEVERE 3,6,13	MODERATE 3,11 SEVERE 3,12 NOT RATED	SLIGHT SLIGHT SEVERE 3,12
7 (1%)	MATAPEAKE MAJOR MINOR SOILS	67 17 15	SLIGHT SLIGHT SEVERE 3	SLIGHT SLIGHT SEVERE 3	SLIGHT TO MOD 12 SEVERE 3 SEVERE 3	SLIGHT NOT RATED NOT RATED	SLIGHT NOT RATED NOT RATED	SLIGHT NOT RATED NOT RATED
8 (9%)	SASSAFRAS FALLSINGTON MAJOR MINOR SOILS	25 25 25	SLIGHT SEVERE 3 SLIGHT OR SEV 3	SLIGHT SEVERE 3 MOD. OR SEV 3	SLIGHT SEVERE 3 MOD. OR SEV 3,11,7	SLIGHT SEVERE 3,5 SEVERE 3,5,7,13	SLIGHT SEVERE 3 MOD. OR SEV 3,11	SLIGHT SEVERE 3 SLIGHT OR MOD 3,11
9 (6%)	MATAPEAKE FALLSINGTON MAJOR MINOR SOILS	68 17 15	SLIGHT SLIGHT SEVERE 3,4	SLIGHT SLIGHT MOD. OR SEV 3,4	SLIGHT TO MOD 12 SEVERE 3 MOD. OR SEV 3,4	SLIGHT SEVERE 3 MOD. OR SEV 3,4,5,13	SLIGHT SEVERE 3 MOD. OR SEV 3,4	SLIGHT TO MOD 2 SEVERE 3,4
10 (18%)	SASSAFRAS FALLSINGTON MAJOR MINOR SOILS	40 25 25	SLIGHT SEVERE 3 SLIGHT OR SEV 3	SLIGHT SEVERE 3 SLIGHT TO SEV 3	SLIGHT SEVERE 3 SLIGHT TO SEV 3,10	SLIGHT SEVERE 3 SEVERE TO SEV 5,13	SLIGHT SEVERE 3 SEVERE TO SEV 3	SLIGHT SEVERE 3 SLIGHT TO MOD 3,9
11 (20%)	EVESBORO RUMFORD FALLSINGTON MAJOR MINOR SOILS	55 20 10	SLIGHT SEVERE 3 SLIGHT OR SEV 3	SLIGHT SEVERE 3 MOD. A SEV 3	SLIGHT SEVERE 3 MOD. A SEV 3	SLIGHT SEVERE 3,5 MOD. A SEV 3	MODERATE 6,9 SEVERE 3 SEVERE 3	SEVERE 6,7 MODERATE 6,9 MODERATE A SEV 3,4,9
12 (16%)	FALLSINGTON SASSAFRAS MAJOR MINOR SOILS	35 25 25	SEVERE 3 SEVERE 3 SEVERE 3,4	SEVERE 3 SEVERE 3 SEVERE 3,4	SEVERE 3 SEVERE 3 SEVERE 3,4	SEVERE 3,5 SEVERE 3,5 SEVERE 3,4,5	SEVERE 3 SEVERE 3 SEVERE 3,4	MODERATE 3 SEVERE 3 SEVERE 3,4
13 (1%)	KEYPORT ELKTON MAJOR MINOR SOILS	43 25 15	SLIGHT SLIGHT SEVERE 3,7	MODERATE 3 SEVERE 3 SEVERE 3,7	SEVERE 11,3 SEVERE 3,7,11 SEVERE 3	SEVERE 3,5,7,13 SEVERE 3,7,11 SEVERE 3,5,7,13	MODERATE 3,11 SEVERE 3,7,11 SEVERE 3	SLIGHT MODERATE 3,7,11 MODERATE 3
14 (2%)	OTHELLO MATAPEAKE MAJOR MINOR SOILS	40 35 15	SEVERE 3 SLIGHT SEVERE 3,4	SEVERE 3 SLIGHT SEVERE 3,4	SEVERE 3 SLIGHT TO MOD 12 SEVERE 3,4	SEVERE 3,5,13 SEVERE 3,12 SEVERE 3,5,13	SEVERE 3,12 MODERATE 3,12 SEVERE 3,4	MODERATE 3,12 MODERATE 3,12 SEVERE 3,4
15 (1%)	ELKTON MATAPAN MAJOR MINOR SOILS	40 25 10	SEVERE 3,7 SEVERE 3 SEVERE 3	SEVERE 3,7 SEVERE 3 SEVERE 3	SEVERE 3,7,11 SEVERE 3,11 SEVERE 3	SEVERE 3,5,7,13 SEVERE 3,11 SEVERE 3,5,7,13	SEVERE 3,11 SEVERE 3,11 SEVERE 3,11	SEVERE 3,7,11 SLIGHT SEVERE 6,9
16 (7%)	POCOMOKE FALLSINGTON MAJOR MINOR SOILS	52 25 10	SEVERE 3,4 SEVERE 3 SEVERE 3,4	SEVERE 3,4 SEVERE 3 SEVERE 3,4	SEVERE 3,4 SEVERE 3 SEVERE 3,4	SEVERE 3,4,5 SEVERE 3,5 SEVERE 3,4,5	SEVERE 3,4 SEVERE 3 SEVERE 3,4	MODERATE 3,4 MODERATE 3 SEVERE 3,4
17 (5%)	FALLSINGTON POCOMOKE MAJOR MINOR SOILS	28 25 15	SEVERE 3 SEVERE 3,4 SEVERE 3	SEVERE 3 SEVERE 3,4 SEVERE 3	SEVERE 3 SEVERE 3,4 SLIGHT TO SEV 3,11	SEVERE 3,5 SEVERE 3,4,5 SEVERE TO SEV 5,13	SEVERE 3 SEVERE 3,4 MOD. OR SEV 3,11	MODERATE 3 SEVERE 3,4 SLIGHT TO SEV 3,11
18 (4%)	TOTAL MARSH COASTAL BEACH	95	VERY SEV 3,4,13 SEVERE 3,4,8,9,13	VERY SEV 3,4,13 SEVERE 3,4,8,9,13	VERY SEV 3,4,13 SEVERE 3,4,8,10	VERY SEV 3,4,13 SEVERE 3,4,8,9,13	VERY SEV 3,4,13 SEVERE 3,4,8,9,13	VERY SEV 3,4,13 SEVERE 3,4,8,9
19 (9%)	MUCK POCOMOKE MAJOR MINOR SOILS	90 20 10	VERY SEV 3,4,13 SEVERE 3,4 SEVERE 3,4	VERY SEV 3,4,13 SEVERE 3,4 SEVERE 3,4	VERY SEV 3,4,13 SEVERE 3,4 SEVERE 3,4	VERY SEV 3,4,13 SEVERE 3,4,13 SEVERE 3,4,8	VERY SEV 3,4,13 SEVERE 3,4 SEVERE 3,4	VERY SEV 3,4 MODERATE 3,4 SEVERE 3,4,8
20 (1%)	TIDAL FRESH-WATER MARSH MAJOR MINOR SOILS	90 10	VERY SEV 3,4,13 VERY SEV 3,4,13	VERY SEV 3,4,13 VERY SEV 3,4,13	VERY SEV 3,4,13 VERY SEV 3,4,13	VERY SEV 3,4,13 VERY SEV 3,4,13	VERY SEV 3,4,13 VERY SEV 3,4,13	VERY SEV 3,4 VERY SEV 3,4

GENERAL SOIL MAP
THE GENERAL SOIL MAP OF DELAWARE SHOWS 21 MAIN PATTERNS OF SOILS CALLED SOIL ASSOCIATIONS. EACH SOIL ASSOCIATION CONTAINS TWO MAJOR SOILS AND SEVERAL MINOR SOILS, AND IS MADE UP OF THESE MAJOR SOILS. THE SOILS IN ONE ASSOCIATION MAY BE IN ANYWHERE, BUT IN A DIFFERENT PATTERN.

KEY TO PRINCIPAL SOIL LIMITATIONS

1. EXCESSIVE SLOPE
2. SLIPS AND EROSION HAZARD
3. CRACKING OR FLOODING HAZARD
4. FLOODING OR FLOODING HAZARD
5. HIGH POTENTIAL FROST ACTION
6. MODERATE POTENTIAL FROST ACTION
7. CLAYEY, PLASTIC MATERIAL
8. VERY SANDY
9. SLOTTING
10. GROUNDWATER POLLUTION HAZARD
11. SLOW PERMEABILITY
12. MODERATE TO MODERATELY SLOW PERMEABILITY
13. INADEQUATE CLASSIFICATION OF MATERIAL
14. MODERATE TO MODERATELY SLOW PERMEABILITY
15. GENERALLY SAND, MASSIVE BEDROCK AT DEPTH OF A TO 6 FEET

BRIEF EXPLANATIONS OF COLUMNS IN THE TABLE

SOIL ASSOCIATION
THE NUMBER IN THIS COLUMN CORRESPONDS WITH THE NUMBERED SOIL ASSOCIATION (GENERAL SOIL MAP) ON THE GENERAL SOIL MAP OF DELAWARE. EACH SOIL ASSOCIATION IS MADE UP OF MAJOR SOILS.

SOIL SERIES AND PERCENT OF SOIL ASSOCIATION
THESE FIGURES SHOW THE APPROPRIATE FIGURES OF EACH SOIL SERIES IN EACH SOIL ASSOCIATION, AND THE TOTAL PERCENT OF ALL THE MAJOR SOILS.

SOIL INTERPRETATIONS
THE ACCOMPANYING INTERPRETIVE TABLE, ENTITLED "SOIL INTERPRETATIONS FOR SELECTED USES", PROVIDES SOIL INTERPRETATIONS FOR 6 SEVERAL USES FOR EACH OF THE SOIL ASSOCIATIONS SHOWN ON THE GENERAL SOIL MAP OF DELAWARE. THESE ARE APPROXIMATE PERCENT OF EACH ASSOCIATION OCCURRED IN EACH OF THE MAJOR SOILS AND THE TOTAL PERCENT OF ALL THE MAJOR SOILS IS SHOWN FOR EACH OF THE SOIL ASSOCIATIONS.

SOIL LIMITATIONS
THIS COLUMN SHOWS THE APPROPRIATE FIGURES FOR EACH OF THE SOILS IN EACH ASSOCIATION, AND THE TOTAL PERCENT OF ALL THE MAJOR SOILS.

RECREATION - CAMP AND PICNIC AREAS
THESE FIGURES SHOW THE APPROPRIATE FIGURES FOR TOURS AND SMALL CAMP FACILITIES AND THE APPROPRIATE ACTIVITIES OF OUTDOOR LIVING AND FOR FAMILIES IN RECREATION AREAS.

INTENSIVE CROPPING
THE RATES ARE BASED ON LOW TO MEDIUM USE OF THE SOILS FOR NEW CROPS OR OTHER INTENSIVE KINDS OF FARMING REQUIRING FREQUENT USE OF FERTILIZER AND PESTICIDES.

SOIL LIMITATION CLASSES
SOILS RATED AS SLIGHT HAVE FIVE OR NO LIMITATIONS FOR THE USES SPECIFIED. SOILS RATED MODERATE HAVE LIMITATIONS WHICH REDUCE TO SOME DEGREE THEIR SUITABILITY WHEN USED FOR THE PURPOSES BEING CONSIDERED. THE RATES ARE BASED ON CONSERVATIVE MEASURES. SOILS RATED SEVERE HAVE UNDESIRABLE SOIL PROPERTIES OR FEATURES WHICH MAKE THEM UNDESIRABLE FOR THE PURPOSES BEING CONSIDERED. IT DOES NOT MEAN THAT SOILS RATED SEVERE CANNOT BE USED FOR A SPECIFIED USE. IT DOES MEAN THAT SPECIAL SPECIAL MEASURES, INCLUDING OR INCLUDING SPECIAL MEASURES ARE NECESSARY TO OVERCOME THE LIMITATIONS. COSTS ARE USUALLY GREATER THAN ON SOILS RATED SLIGHT OR MODERATE AND MANY TIMES COSTS ARE PROHIBITIVE. SOILS RATED VERY SEVERE HAVE EXTREME LIMITATIONS ON THEIR USE AND USUALLY ARE ECONOMICALLY FEASIBLE TO CORRECT OR, IF THEY ARE TO BE CORRECTED, MAJOR AND COSTLY RECLAMATION IS INVOLVED.

PRESENT LAND USE, NEARNESS TO ROADS, RAILROADS, STREAMS, LAKES OR OTHER OBSTACLES, FEATURES AND NOT CONSIDERED IN THE RATING. LIMITATION CLASSIFICATION IS BASED ON SOIL PROPERTIES AND FEATURES. FOR EXAMPLE, THERE ARE LARGE AREAS OF POCOMOKE AND FALLSINGTON SOILS IN WOODS. ALTHOUGH THE THESE ARE NOT BEING RATED FOR A NEW INTENSIVE USE, THIS IS NOT CONSIDERED TO BE A SOIL LIMITATION AND, THERE, IS NOT CONSIDERED IN RATING THE SOILS.

LOCAL ROADS AND STREETS
THE RATES ARE FOR SHALLOW, SUB-SURFACE TANK ABSORPTION FIELDS AND DO NOT INCLUDE OTHER ALTERNATIVE SYSTEMS, SUCH AS DEEP "VERY WELLS".

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