58. NORTHEASTERN HIGHLANDS								62. N	ORTH CENTRAL	LAPPAI	LACHIANS								
Level IV Ecoregions Physiography Geology Geology Softer Softer Natural Vegetation Land Cover and Land Use Level Area (square frea (square frea (square Sufficial and Bedrock Order (Great Group) Common Soil Series Frest Free Mean annual Mean Temperature Mean ann								Level IV Ecoregions	Area quare	Elevation / Local Relief	Geology Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series	Temperature / Precipitation Moisture Mean annual	Climate Frost Free Mean Temperature Mean annual January min/max;	Natural Vegetation	Land Cover and Land Use		
58a. Taconic Mountains	 Low mountains and high hills, gently rounded to steep slopes; narrow valleys. Moderate to high gradient bedrock, boulder, and cobble-bottomed streams. Wild rainbow trout inhabit many streams. 	(feet) 1000–2100 / 600–800	Pleistocene loamy till, discontinuous loamy till, some sandy loamy till, valley bottom deposits of alluvium. Ordovician graphitic phyllite, schist, slate, quartzite, and some minor limestone; Cambrian metagraywacke and gneiss-cobble conglomerate.	Inceptisols (Dystrudepts)	Nassau, Bernardston, Taconic, Macomber	Regimes(inches)Mesic, some Frigid / Udic34–56	(days) July min/max (°F) 90–135 10/28; 54/79	Northern hardwoods at middle and upper elevations; more mesic sites have sugar maple, beech, yellow birch, and basswood, with some eastern white pine and hemlock. Some southern-influenced forests with oaks and hickories on lower, drier slopes (more prevalent farther south), including red oak, white oak, and chestnut oak, along with shagbark, bitternut, and pignut hickory. Some montane spruce-fir at highest elevations in the north.	Deciduous forest, mixed deciduous and evergreen forest, some minor pasture and cropland in narrow valleys. Forestry, recreation, hunting.	62b. Low Poconos/ Mongaup Hills	niles) 433 Dissected plateau with areas of hummocky topography. Moderate to high gradient streams with boulder and cobble substrates. Larger streams deeply incised. Many kettle lakes and	(feet) 500–1675 / 1 50–800 4	Pleistocene glacial till, kame deposits, and fluvial sand and gravel. Middle and Upper Devonian shale, sandstone, and conglomerate.	Inceptisols (Fragiudepts, Dystrudepts)	Wurtsboro, Wellsboro, Oquaga, Lackawanna, Arnot	Regimes (inches) Mesic / 32–50 Udic, some Aquic	(days) July min/max (°F) 130–165 11/31; 56/79	Northern hardwoods of sugar maple, American beech, and birch; Appalachian oak forest of red, white, black, and chestnut oak and hickory species. Oaks grow on slopes and south-facing aspects. Hemlock grows in moist areas and on north slopes. River birch, sycamore, and green ash occur in riparian areas. Common understory shrubs in the uplands include witch hazel, rosebay rhododendron, mountain laurel, partridgeberry, and hillside blueberry.	Deciduous forest, mixed deciduous and evergreen forest. Tourism, recreation, rural residential, and wildife habitat.
58b. Western New England Marble Valleys	Few to no lakes. Some springs and caves. Steep-sided valleys with floodplains, terraces, and rolling to hilly terrain. Low to moderate gradient streams with bedrock, boulder, cobble, and sandy substrates. Numerous springs, seeps, and	500–1000 / Mostly 200–500, some hills to 900	Pleistocene ground moraine, sandy loamy till; ice-contact gravel, sand, and silt; lake silt and clay; Holocene alluvium. Ordovician and Cambrian dolomite marble, calcite marble, dolostone, limestone, quartzite, phyllite, and	Inceptisols (Eutrudepts, Dystrudepts)	Stockbridge, Farmington, Nassau, Hollis, Chatfield, Copake	Mesic / 36–48 Udic	135–170 11/33; 58/84	Southern summits support pitch pine-scrub oak rather than spruce-fir. Species-rich transition hardwoods forests with sugar maple, white ash, basswood, bitternut hickory, hophornbeam, and alternate-leaved dogwood. Calcareous rock outcrops with eastern red cedar, purple clematis, and roundleaf shadbush. On well-drained calcareous slopes, sugar maple, chinkapin oak, white ash, shagbark hickory, and hackberry. In lowlands, calcareous red maple-tamarack swamps with red maple, tamarack, black ash, northern white cedar, willows,	Pasture and cropland, mixed and deciduous forest, urban, suburban, and rural residential development, rock quarries.	62d. Unglaciated High Allegheny Plateau	 wetlands. Stream water cool enough in uplands for wild and hatchery trout. 758 Deeply dissected plateau, narrow valleys, and steep valley sideslopes. Entrenched, high gradient streams with gravel and cobble substrates. Few to no 	1350–2350 / 500–1000	Unglaciated. Colluvium, alluvium, and exposed bedrock. Pleistocene glacial outwash, fluvial sand and gravel fill major drainage channels. Kame deposits and minor inclusions of glacial till near drainageways.	Ultisols (Hapludults, Fragiudults)	Rayne, Kinzua, Carrollton, Cookport, Ernest, Buchanan, Portville, Onoville, Shongo, Mandy, Gilpin	Mesic, 30–60 Frigid / Udic, some Aquic	90–150 11/30; 54/78	Forest cover historically high in hemlock and beech with American chestnut also represented. Today, oaks, pitch pine, white pine, mountain laurel, and hickory grow on drier slopes; hemlock, beech, sugar maple, and birch grow in areas with more moisture. Red maple and black cherry are more adaptable to frequent disturbance and they now	Deciduous forest and some mixed deciduous and evergreeen forest. Public land in national and state forests. Timber production; minor
58e. Berkshire Transition	 wetlands. A few lakes and reservoirs. Hills, low mountains, and narrow valleys. Some steep slopes. Moderate gradient bedrock, boulder, and cobblebottomed streams. Some natural lakes and ponds, and a few larger reservoirs. 	400–1700 / 600–1000	schist. Pleistocene sandy loamy till, some ice-contact sand and gravel. Devonian schist, micaceous quartzite, quartz schist, calcareous granofels, quartzose marble, granite, and gneiss; Ordovician to Cambrian schist, gneiss,	d Inceptisols (Dystrudepts, Eutrudepts)	Hollis, Charlton, Chatfield, Stockbridge	Mesic / 45–51 Udic, some Aquic	150–165 14/34; 59/81	and hemlock. On floodplains, silver maple, cottonwood, American elm, and sycamore. Mix of northern, transition, and central hardwoods-conifer forests. Northern hardwoods- hemlock-white pine forest on dry to mesic mostly north-facing slopes and ravines. Red oak-sugar maple transition forest on mesic mid-slopes with northern red oak, sugar maple, beech, black birch, and some white pine and hemlock. Oak-hemlock-white pine forest with white oak, chestnut oak, northern red oak, and black birch. Some ridgetop pitch pine-scrub	Deciduous forest, some mixed and evergreen forest, hay/pasture, some urban land. Forestry, rural residential, tourism, recreation. Some public state forest and state park lands.		natural lakes, but a few impoundments. Streams with a diversity of darters, minnows, and redhorse suckers.		Upper Devonian shale, siltstone, and sandstone. Minor inclusions of Lower Pennsylvanian conglomerate.					dominate forests in the region.	areas of dairy and forage crop agriculture. Small urban centers in the Allegheny River valley.
59: Clasiated	551 Hills and low mountains, steen narrow	450 1664 /	amphibolite, and marble; Precambrian gneiss and schist.	Incenticals (Dystrudents)	Hollis Chatfield Charlton	Maria / 41.55	130, 180, 10/35:	oak woodland. On stream slopes and terraces, red maple, silver maple, American elm, basswood, sugar maple, shagbark hickory, and black cherry.	Deciduous forest, some everyteen forest	64. N	ORTHERN PIED Physiography		Geology		Soils		Climate	Natural Vegetation	Land Cover and Land Use
581. Glaciated Reading Prong/Hudson Highlands	valleys. High lake density, some with blue- spotted sunfish and, historically, banded sunfish. Drinking water storage reservoirs. Moderate gradient boulder and cobble- bottom, cool water streams support trout.	430–10047 300–1000	Proterozoic hornblende granite and granitic gneiss, biotite-quartz-feldspar gneisses, quartzite, amphibolite; some sandstone and conglomerate.	;	Paxton	Udic, some Aquic	130–180 64/86	(red, white, and chestnut oak) and hickories (shagbark and pignut hickory). Hemlock and northern hardwoods on north slopes and red maple, green ash, swamp white oak, and tupelo in wooded swamps. Mountain laurel, flowering dogwood, black huckleberry, and blueberry grow in the understory. Shadbush, chokecherry, black cherry, and scrub oak grow in exposed rocky bald areas.	on north slopes. Wildlife habitat, tourism, and recreation. Some rural residential development. Public land in state parks, the largest being Harriman State Park, and privately-owned conservation land.	64b. Trap Rock and	Area quare niles) Rocky, steep-sided ridges, hills, and paliandes of the Hudson Piver Project	Elevation / Local Relief (feet) 50–675 / 7 100,500 k	Surficial and Bedrock Thin to discontinuous Pleistocene glacial till; exposed	Order (Great Group) Inceptisols (Dystrudepts)	Common Soil Series Holyoke, Wethersfield	Temperature / Moisture Regimes Precipitation Mean annual (inches) Mesic / Lidia 40–55	Frost Free Mean annual (days) Mean Temperature January min/max; July min/max (°F) 135–195 23/38; 65/85	Ridgetops and upper slopes support mixed oak forests of red, white, and black oak with	Deciduous forest, some mixed forest,
58j. Upper Montane/ Alpine Zone	Constraints of the second state of the second	2800–5344 / 1500–2500	Pleistocene surficial deposits mostly absent; some thin and discontinuous deposits of sandy loamy till separated by extensive bedrock outcrops. In the Adirondack high peaks, Proterozoic metanorthosite and anorthositic gneiss. Occasional inclusions of metasedimentary rocks.	Spodosols (Humicryods, Haplocryods, Haplohumods, Haplorthods, Endoaquods), Histosols (Cryofolists)	Ricker, Rawsonville, Surplus, Sisk, Saddleback, Skylight, Ampersand, Wallface, Esther	Cryic, some Frigid / Udic, some Aquic	40–80 –3/24; 44/60	Between 2800 and 3500 feet, dominant forest species include red spruce, balsam fir, and yellow birches, with mountain ash, mountain holly, and creeping snowberry. Above 3500 feet to timberline, subalpine forests of balsam fir and mountain paper birch. Near timberline above about 4500 feet, alpine krummholz and heath communities with stunted balsam fir, black spruce, and birch, Labrador tea, sheep laurel, and black crowberry. Alpine meadow areas above 4500 feet with low mat-forming shrubs, sedges, rushes, grasses, mosses, and lichens,	Evergreen forest, some mixed deciduous and evergreen forest, shrubland and grassland, bare rock. Recreation, wildlife habitat, some forestry. Public land in Adirondack Park.	Conglomerate Uplands 64e. Glaciated Triassic	 generally too narrow, uplifted, and rocky for significant water resources. 153 Flat to irregular plains, moist domessions low kills and ridges Low. 	50-480 / H	Upper Triassic diabase (intrusive lava or traprock). Pleistocene glacial till of gravel, sand, silt, and clay;	Inceptisols (Dystrudepts),	Wethersfield, Watchaug,	Mesic / 40–50	170–190 15/35; 60/84	hemlocks and mixed hardwoods forest. Only forest on drive prices and basswood.	Wildlife habitat, urban open space, and recreation. Public land in High Tor, Hook Mountain, Rockland, and Tallman Mountain State Parks. Mostly urban land in New York; some agriculture, recidual truck forming
58x. Taconic Foothills ¹	240 Rolling hills with convex tops and steep side-slopes. Narrow valleys. Moderate gradient bedrock, boulder, and cobble- bottomed trout streams. Some natural lakes and ponds	500–1400 / 50–500	Pleistocene coarse loamy till, discontinuous in areas. Glacial outwash channels, sand and gravel deposits between hills. Ordovician slate and graywacke; Cambrian quartzite, slate nhvllite schist and graywacke	Inceptisols (Dystrudepts)	Nassau, Bernardston, Hoosic, Pittstown	Mesic / 30–50 Udic, some Aquic	120–180 13/33; 57/80	including diapensia, Bigelow's sedge, highland rush, Lapland rosebay, and alpine bilberry. Chestnut oak, red oak, and formerly American chestnut on steep slopes. Hemlock on northern slopes. On lower slopes and more infertile soils, Appalachian oak-hickory forest with white oak, black oak, pignut hickory, and historically, American chestnut. Abandoned farm fields colonized by red maple, eastern white pine, and sugar maple. North of Columbia County, northern hardwood forest begins to replace Appalachian oak-hickory forest	Deciduous forest, some mixed deciduous and evergreen forest, pastureland, minor cropland for small grains and dairy forage crops. Small towns and rural residential areas	Lowlands	depressions, low hills and ridges. Low gradient streams with silt, sand, gravel, and bedrock substrates. Lowland streams once contained unique coastal plain species such as mud sunfish and ironcolor shiner.	25-50 s k U a s	stratified drift in valleys; outwash and till plains, deltas, kame deposits, and moraines. Upper Triassic sandstones, siltstones, mudstones, arkose, and conglomerates. Lower Ordovician serpentinite.	Histosols (Haplosaprists)	Carlisle	Aquic	60/84	hemlock-northern hardwoods forest. Oak forest on drier sites with red, white, and black oaks, hickories, and historically, American chestnut. Moist valleys, ravines, and northern slopes contain sugar maple, beech, birch, and hemlock. On Staten Island, remnant serpentine barrens-grassland-savanna communities. Red maple-sweetgum swamps with swamp cottonwood, swamp white oak, pin oak, and black gum.	agriculture, residual truck farming and nursery crops, scattered woodlots. Public land in Great Kills Park.
58y. Catskill High Peaks	817 Stepped ridges and high peaks surrounded by radiating ranges and ridgelines. Few to no lakes. Cold to cool water high gradient streams with bedrock, boulder, cobble, and gravel	1000–4180 / 1100–2000	Pleistocene glacial till shallow, discontinuous, or absent. Exposed bedrock common. Upper Devonian shale, sandstone, and conglomerate.	Inceptisols (Dystrudepts, Fragiudepts)	Vly, Oquaga, Lackawanna, Lewbeach, Mongaup, Halcott, Arnot, Elka, Willowemoc	Frigid, Mesic 47–60 on lower slopes / Udic, some Aquic	90–125 9/27; 51/72	Above 3000 feet, red spruce, balsam fir, and yellow birch. Witch hobble common in the understory. Shrub cover on rocky summits includes huckleberry, lowbush blueberry, and mountain laurel with pitch pine and scrub oak. On north slopes and in cool moist areas, northern hardwoods occur, with bigtooth and quaking aspen, paper birch, and black ash. A mix of northern and central hardwoods occurs below 3000 feet, including American beech,	Deciduous forest, mixed forest, and evergreen forest. Bare rock. Little to no land clearing for agriculture. Rural residential, tourism, recreation, public water supply, wildlife habitat. Public land in Cethelil Berkend Forest Breastrue	64g. Hackensack Meadowlands	10 Low-lying wetland and marsh. Freshwater ponds and brackish lagoons, tidal creeks.	0–10, bedrock F outcrops and s landfills to U 100 / 0–10	Pleistocene proglacial lake bed with sandy and silty substrates. Upper Triassic sandstone, siltstone, and mudstone.	Histosols (Sulfihemists), Inceptisols (Dystrudepts), Entisols (Udorthents)	Pawcatuck, Ipswich, Wethersfield, Greenbelt, Kleinekill	Mesic / 42–48 Udic, Aquic	180–220 26/38; 68/85	Historically, Atlantic white cedar swamps, floodplain forests of pin oak, red maple, and swamp white oak. Presently, cattail, phragmites, and saltmarsh cordgrass cover various marshlands. Other vegetation includes seashore saltgrass, blackgrass, sea lavender, saltwort and seaside goldenrod.	Salt, brackish, and freshwater marsh. Industrial and commercial development, landfills, wildlife habitat, and fishery.
58z. Adirondack High	453 High glaciated mountains, with steep-sided narrow valleys. High gradient bedrock,	1500–2800 / 800–1800	Pleistocene glacial till, exposed bedrock, lacustrine sand and gravel, fluvial sand and gravel.	Spodosols (Haplorthods, Haplohumods)	Mundal, Mundalite, Rawsonville, Hogback,	Cryic, some 40–60 Frigid /	60–120 3/24; 53/76	Between 1500 and 2500 feet, northern hardwood forest composed of sugar maple, beech, and yellow birch, mixed with red spruce, hemlock, and white pine. Between 2500 and	Deciduous forest, mixed forest, and evergreen forest. Bare rock. Little to no	67 P	IDCE AND VALL	FV							
TURS	boulder, and cobble-bottomed streams. A few mid-elevation lakes. Majority of lake fish species are nonnative. Brook trout naturally reproducing in 12% of ponds, stocked in others. Threatened round whitefish and summer sucker in a few ponds.		Proterozoic metanorthosite and anorthositic gneiss; inclusions of charnocktite, mangerite, and syenitic gneiss.		Ampersand, Knob Lock	Udic, some Aquic		2800 feet, red spruce, balsam fir, and yellow birches increase in transition to high elevation spruce-fir forest. Understory plants include mountain ash, mountain holly, and creeping snowberry.	land clearing for agriculture. Tourism, recreation, wildlife habitat. Public land in Adirondack Park.	Level IV Ecoregions	Physiography Area quare	Elevation / Local Relief	Geology Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series	Temperature / Moisture Precipitation Moisture Mean annual	Climate Frost Free Mean Temperature January min/max;	Natural Vegetation	Land Cover and Land Use
58aa. Acid Sensitive 3 Adirondacks 3	275 Low to moderate-relief mountains and knobby hills interlaced by numerous rivers and streams. High density of lakes and wetlands. Lakes and streams with low pH and low acid neutralizing capacity are common. About 38% of smaller ponds are fishless. Brook trout	1300–3900 / 100–1900	Pleistocene glacial till, exposed bedrock, kame deposits, lacustrine sand and gravel, fluvial sand and gravel. Proterozoic metasedimentary rocks, biotite, amphibolite; charnockitic, granitic, mangeritic, and quartz syenitic gneisses.	Spodosols (Haplorthods, Haplohumods)	Becket, Tunbridge, Skerry, Mundalite, Rawsonville, Hogback	Frigid / 45–60 Udie, Aquie	60–120 2/25; 53/75	Red, white, and black spruce and balsam fir grow in saturated or shallow soils. Red maple, yellow birch, black cherry, and an understory of sheep laurel and blueberries may be associated with the conifers. Black spruce and tamarack occur in bogs and swamps with shrubs such as sheep laurel and labrador tea. Deeper soils support northern hardwoods such as sugar maple, beech, and yellow birch.	Deciduous forest, mixed forest, and evergreen forest. Little to no land clearing for agriculture. Logging, wildife habitat, tourism, recreation. Public land in Adirondack Park.	67j. Northern Glaciated Limestone Valleys	72 Broad, flat to gently rolling valleys with a smoothed surface. Some karst areas; free interchange between surface stream flow and ground water. Streams have gentle gradients, extensive meanders, oxbows, and fine-textured substrates. Some wetlands: lakes uncommon	n 480–620 / F 20–120 s n C	Pleistocene loamy, calcareous glacial till; lakebed sediments and ground moraine. Cambrian limestone and dolostone; Proterozoic calcitic and dolomitic marble.	Inceptisols (Eutrudepts), Histosols (Haplosaprists)	Pittsfield, Stockbridge, Georgia, Palms, Carlisle	Mesic / 35–50 Udic, some Aquic	(days) July min/max (°F)	Forest vegetation limited to scattered woodlots of sugar maple and central Appalachian hardwoods. Upland forests are typically mixed-hardwood, dominated by sugar maple with white, black, and red oak, white ash, tulip tree, black birch, yellow birch, red maple, basswood, beech, and hickories. Understory trees include hop hornbeam and ironwood, and shrubs include maple-leaved viburnum, black haw, spicebush, and beaked hazel. Calcareous wetland types include swamps, fens, and sinkholes. Red maple, yellow birch, ash, basswood, tulin tree, and black gum grow in forested wetlands.	Deciduous forest, some mixed deciduous and evergreen forest, wooded, shrubby, and herbaceous wetlands. Pasture and cropland, urban, suburban, and rural residential development.
58ab. Northern and Western Adirondack Foothills2	 390 Ridges, foothills, and mountains of low to moderate relief. Deranged stream drainage and a network of intersecting glacial outwash channels. High water table with many wetlands and scattered larger lakes. Lake trout found in a few 	750–2000, isolated mountains to 2800 and 3300 / 75–600	Pleistocene glacial till, kame deposits, fluvial outwash sand and gravel, lacustrine sand and gravel. Proterozoic amphibolite, charnockitic, mangeritic, and quartz syenitic gneisses; biotite and hornblende granitic gneiss; calcitic and dolomitic marble in the northwest portion.	c Spodosols (Haplorthods)	Potsdam, Tunbridge, Becket, Monadnock, Skerry, Adams, Colton	Frigid, some 35–55 Mesic / Udic, some Aquic	90–145 2/25; 54/77	Second growth northern hardwoods such as sugar maple, beech, black cherry, and yellow birch. Significant amounts of white pine in western foothills and in northern outwash areas. Aspen and birch prominent in the northern foothills. Red, white, and black spruce and balsam fir grow in saturated or shallow soils. Black spruce and tamarack occur in bogs and swamps with understory shrubs such as sheep laurel and labrador tea. Historically, spruce dominated in this region, but it has not returned after logging.	Deciduous forest, evergreen forest, and some mixed deciduous and evergreen forest. Logging, wildlife habitat, tourism, recreation, some minor cleared land for forage crops. Public land in Adirondack Park.	67k. Northern Glaciated Shale and Slate Valleys	558 Broad, irregular, rolling to hilly valley. Meandering, low-gradient streams with steep banks and bedrock, boulder, gravel, sand, and clay substrates. Warmwater fishery in the Wallkill River of smallmouth bass, pickerel, and yellow perch.	300-778 / F 50-300 C	Pleistocene glacial till, kames, lacustrine sand, silt, and clay, fluvial sand and gravel. Ordovician shale, argillite, siltstone, and greywacke.	Inceptisols (Dystrudepts, Fragiudepts, Endoaquepts), Alfisols (Endoaqualfs)	Nassau, Mardin, Canandaigua, Niagara, Hoosic	Mesic / 30–50 Udic, some Aquic	130–190 17/35; 64/85	Mixed oak-sugar maple-northern hardwoods forest. Chestnut, black, and red oak, hickories, and tulip tree grow in shallow soil. Upland forests are typically mixed-hardwood, dominated by sugar maple with white, black, and red oak, white ash, tulip tree, black birch, yellow birch, red maple, basswood, beech, and hickories; understory trees include hop hornbeam and ironwood, and shrubs include maple-leaved viburnum, black haw, spicebush and beaked hazel. Red maple, yellow birch, ash, basswood, tulip tree, and black gum grow in forested wetlands.	 Deciduous forest, some mixed deciduous and evergreen forest, pasture and cropland, urban, suburban, and rural residential land. Farming for dairy and truck crops. Some wildlife habitat.
58ac. Eastern ¹ Adirondack Foothills	 medium-sized lakes. Moderate gradient, tannic, sandy and cobble-bottomed streams, with some impounded reaches. Ridges, foothills, and rounded low mountains with steep-sided narrow valleys in the south and the broader Ausable and Saranac valleys in the north. Moderate lake density. Some big 	350–2650 / 200–2300	Pleistocene glacial till, exposed bedrock, kame deposits, lacustrine sand and gravel, and fluvial outwash sand and gravel. Proterozoic hornblende and pyroxene granitic gneiss, anorthorsite. Cambrian sandstone in the north:	Spodosols (Haplorthods), Inceptisols (Dystrudepts)	Bice, Tunbridge, Lyman, Becket, Skerry, Pyrities, Kalurah, Charlton, Hollis	Frigid, Mesic 30–45 on lower slopes / Udic, some Aquic	90–145 4/28; 56/80	Northern hardwoods forest with some elements of Appalachian oak forest on slopes above the Hudson Valley and Champlain Lowlands. White pine is a prominent species, along with red maple, white ash, and northern red oak. Other Appalachian species found near 1000 feet include butternut, witch hazel, and eastern redcedar.	Deciduous forest, mixed forest, and evergreen forest. Some farmland in river valleys in the north cultivated for forage crops and pasture. Tourism, recreation, wildlife habitat. Public land in	671. Northern Glaciated Limestone Valleys and Terraces	93 Limestone valley with fluvial terraces, interspersed ridges, and some karst terrain. Low gradient streams with gravel and cobble substrates.	260–500 / F 10–60 a	Pleistocene glacial till, lacustrine silt and clay, fluvial sand and gravel. Devonian limestone, siltstone, and shale.	Inceptisols (Dystrudepts, Eutrudepts, Fragiudepts)	Arnot, Lordstown, Chenango, Bath, Mardin, Nassau, Stockbridge, Farmington	Mesic / 30–45 Udic, some Aquic	130–180 17/35; 63/84	Forest vegetation in woodlots of sugar maple and central Appalachian hardwoods. Upland forests are typically mixed-hardwood, dominated by sugar maple with white, black, and red oak, white ash, tulip tree, black birch, yellow birch, red maple, basswood, beech, and hickories; understory trees include hop hornbeam and ironwood, and shrubs include maple-leaved viburnum, black haw, spicebush, and beaked hazel.	Deciduous forest, pasture, and cropland, urban, suburban, and rural residential land. Farming for dairy and truck crops. Some wildlife habitat.
58ad. Central 1 Adirondacks	 lakes, like Lake George, stocked with non-native landlocked salmon. Many streams have naturally reproducing brown and rainbow trout. Low to moderate-relief mountains and hills. Moderate gradient cobble- bottomed streams. Lakes and streams 	1450–3360 / 45–1050	Proterozoic calcitic and dolomitic marble, charnockitic, granitic, and quartz syenitic gneisses, and metagabbro in the south. Pleistocene glacial till, exposed bedrock, kame deposits, lacustrine sand and gravel, and fluvial outwash sand and gravel.	Spodosols (Haplorthods, Haplohumods)	Hermon, Becket, Monadnock, Tunbridge, Skerry, Mundalite,	Frigid / 34–60 Udic, Aquic	90–150 3/24; 52/75	Northern hardwoods such as sugar maple, beech, and yellow birch, mixed with red spruce, hemlock, and white pine. Red and black spruce and balsam fir grow on shallow or saturated soils. Red and white pine are abundant on lake shores. White pine and spruce,	Adirondack Park. Deciduous forest, mixed forest, and evergreen forest. Little to no cleared land for agriculture. Wildlife habitat, tourism,	67m. Northern Glaciated Ridges	131 Folded and faulted parallel ridges, exposed cliffs. High gradient streams have acidification risk.	500–2289 / T 80–1700 U g	Thin to discontinuous Pleistocene glacial till. Upper Silurian sandstone, shale, conglomerate, and quartzite.	Inceptisols (Dystrudepts, Fragiudepts)	Oquaga, Lordstown, Arnot, Wurtsboro, Nassau, Wellsboro, Morris	Mesic / 35–50 Udic, some Aquic	130–185 17/32; 63/81	Pitch pine, chestnut oak, and scarlet oak on shallow, droughty soils. Mostly pitch pine on exposed ridges, may be dwarfed. Pitch pine-scrub oak forest in more protected areas with red maple, chestnut, scarlet, and white oak. Hemlock, tulip tree, and white oak in moist depressions; hemlock and northern hardwoods in shaded ravines. On rocky ridges and talus slopes, dense blueberry shrubland. Mountain laurel understory common in woodland.	Deciduous forest, mixed forest, exposed bedrock, and cliffs. Recreation, tourism, and wildlife habitat. Public land at Minnewaska State Park, private conservation land.
	have moderate to high acid neutralizing capacity. Concentration of large lakes in the north.		Proterozoic anorthosite, calcitic and dolomitic marble, charnockitic, granitic, mangeritic, and quartz syenitic gneisses.		Rawsonville			once abundant in the headwaters of the Hudson River, have been replaced by successiona hardwoods after logging.	I recreation, and logging. Public land in Adirondack Park.	83. E	ASTERN GREAT	LAKES	S LOWLANDS						
58ae. Tug Hill Plateau	 Gently sloping, relatively flat-topped plateau. High density of streams and bogs. Radial stream drainage pattern; cool to coldwater streams with moderate to high acid neutralizing capacity. Numerous beaver ponds and reservoirs. 	980–2000 / 50–300	Dense Pleistocene glacial till, kame deposits, fluvial outwash sand and gravel, lacustrine sand, and peat deposits. Upper Ordovician sandstone; inclusions of siltstone and shale.	Spodosols (Fragiorthods, Fragiaquods)	Worth, Empeyville, Westbury	Frigid, Mesic on lower slopes / Udic, Aquic	90–130 7/25; 56/76	Historically, red spruce was mixed with a hemlock-northern hardwoods forest of sugar maple, beech, birch, and hemlock. Today, after extensive logging, sugar maple dominates in a beech-maple mesic forest, along with other successional hardwoods, such as black cherry, white ash, and red maple. In state reforestation areas, forest plantations contain native white and red pine, with non-native Austrian pine, jack pine, Scotch pine, Norway spruce, white spruce, and European larch. Local conditions determine the occurrence of various types of	Deciduous forest, evergreen forest. Little agricultural clearing or cultivation. Wildlife habitat, recreation, wind-farming, and logging. Public land in state forests and wildlife management areas.	Level IV Ecoregions	Area quare niles) 449 Elat lake plain interspersed with	Elevation / Local Relief (feet) 246–900 /	Geology Surficial and Bedrock Pleistocene glacial till in scattered moraines and	Order (Great Group)	Soils Common Soil Series Collamer, Niagara, Hudson	Temperature / Moisture Regimes Precipitation Mean annual (inches) Mesic / 26–45	Climate Frost Free Mean Temperature Mean annual January min/max; July min/max (°F) 130–185	Natural Vegetation	Cropland and urban centers
58af. Tug Hill Transition	 Diverse fish assemblages, including pearl dace and blacknose shiner. East to west sloping plateau, or cuesta, with eastern escarpment. Moderate to high gradient cool water, boulder, cobble, and gravel-bottomed streams. Few natural lakes. Waterfalls and gorges (or "gulfs") occur in shale perimeter 	485–1904 / 50–750	Deep Pleistocene glacial till, kame deposits, lacustrine sand, fluvial outwash sand and gravel. Middle and Upper Ordovician siltstone, shale, and sandstone.	Spodosols (Fragiorthods), Inceptisols (Fragiaquepts, Fragiudepts)	Worth, Empeyville, Camroden, Pinckney	Frigid, Mesic 35–48 on lower slopes / Udic, Aquic	100–140 8/28; 55/80	swamps and bogs: spruce-fir, hemlock-hardwood, and red maple-hardwood swamps, black spruce-tamarack bogs, alder shrub swamps, and sedge meadows along streams. Historically, northern hardwoods forest of sugar maple, beech, birch, and hemlock. Today, woodlots and abandoned farms contain successional hardwoods, such as sugar maple, black cherry, white ash, and red maple.	Deciduous forest, evergreen forest, agricultural and rural residential land. Dairy farming and cultivation for associated forage crops.	Lake Plain	moraines or drumlins, bounded inland by Pleistocene beach ridges. Many small streams originating on beach ridges drain the narrow plain. Migratory species from Great Lakes into inland streams: sauger, black and silver redhorse, Atlantic salmon and steelhead (rainbow trout).	y 1	drumlins; lacustrine sand, silt, and clay; gravelly beach ridges. Devonian shale, siltstone, sandstone, and limestone. Upper Ordovician shale and siltstone.	Inceptisols (Eutrudepts), Entisols (Udorthents)	Canandaigua, Rhinebeck, Howard, Phelps, Cosad, Alton	Udic, Aquic	62/82	with some chestnut and oak on gravelly soils. Today, these forest types are confined to woodlots. Elm, ash, and tulip tree may be present in the beech-maple forest, as is a diverse herbaceous layer, with spring-blooming ephemeral wildflowers. Silver and red maples, elm, and green, white, and black ash occur in wetland depressions. Beaches and dunes support sea rocket, beach grass, and bluestem grasses. Stabilized dunes may support red maple, yellow birch, eastern cottonwood, and sand dune willow.	Deciduous forest, wooded wetlands, grasslands, and beaches. Dairy farming and cultivation of specialty crops, including grapes, orchard crops, small fruits, and vegetables.
58ag. Rensselaer Plateau	 Streams historically contained redside dace and blacknose shiner. Elevated plateau with a rolling surface clearly defined by perimeter escarpment and deep valleys to the east. High density of wetlands and ponds. Moderate to high 	1000–1800 / 20–50, 400 at escarpment	Pleistocene rocky glacial till; stagnant ice moraines; sand, clay, and silt. Cambrian quartzite greywacke with minor shale and conglomerate.	Inceptisols (Eutrudepts, Dystrudepts, Endoaquepts)	Buckland, Glover, Brayton	Frigid / 36–46 Udic, Aquic	90–135 <u>13/29;</u> 58/78	Northern hardwoods forest mixed with red spruce and balsam fir. Spruce flats of red, white, and black spruce, and groves of balsam fir. Numerous hemlock-hardwood, red maple-hardwood, and spruce-fir swamps, black spruce-tamarack bogs, wet sedge meadows, and sphagnum bogs occur. Dry escarpments and south-facing slopes support Appalachian oak-	Mostly forest, deciduous forest, some evergreen forest, barren rock outcrops. Minor clearing for hay or pasture; short growing season and stony soil limits	83b. Champlain Lowlands	879 Glaciated area of relatively low relief containing flat to gently rolling plains with some prominent hills. Low gradient streams and rivers with mostly sandy and silty substrates. Fish species include Atlantic salmon, muskellunge, and eastern sand darters	95-720, isolated mountains to 1644 / 5-700	Pleistocene lake silt and clay, Pleistocene marine silt and clay, marine delta sand and gravel, quaternary glacial till. Ordovician limestone, dolomite, shale, slate, phyllite, and marble; Cambrian quartzite, limestone, dolostone, and sandstone.	Inceptisols (Dystrudepts), Alfisols (Hapludalfs, Endoaqualfs), Spodosols (Haplorthods)	Vergennes, Kingsbury, Hollis, Charlton, Tunbridge, Monadnock, Becket	Mesic, 30–34 some Frigid north / Udic, Aquic	145–165 8/30; 60/81	Remnant valley clayplain forests of red maple, beech, hemlock, swamp white oak, bur oak, white oak, ash, and shagbark hickory. Small areas of pine-oak-heath sandplain forest with black oak, red oak, white pine, pitch pine, and red maple. Silver maple and green ash floodplain forests. On hills, northern hardwood forests of beech, yellow birch, sugar maple, and hemlock. Some limestone bluff cedar-pine forest with northern white cedar, red pine, white pine, hophornbeam, and hemlock. Dry oak forests of red oak, white oak, white pine, and heath shrubs. Tack pine dominates sandstone payement barrens	Mixed deciduous and evergreen forest, deciduous forest, hay and pasture land, cropland, and urban and residential land. Farming for hay, silage corn, dairy, livestock, nursery and greenhouse products, some vegetables small fruits and orchards
	cobble substrate and numerous waterfalls at plateau escarpments.							nickory and chestnut oak forests.	tourism, recreation, and some mining for quartz sandstone (greywacke).	83c. Ontario 5 Lowlands	5895 Diverse physiography with drumlin fields, moraines, kames, glacial lake	246–1100 45–300	Pleistocene glacial till, kame deposits, lacustrine silt and clay, fluvial outwash sand and gravel, peat, and	Alfisols (Hapludalfs), Inceptisols (Eutrudepts)	Hilton, Ontario, Ovid, Collamer, Canandaigua,	Mesic / 30–45 Udic, Aquic	130–200 16/31; 61/80	Historically, beech and sugar maple grew on moist, fine-textured soils with smaller amounts of white oak on coarse-textured, drier sites. Basswood, elm, and white ash also occurred.	Deciduous forest, grassland, limestone (alvar) barrens, crop and pasture land,
59. N Level IV Ecoregions	ORTHEASTERN Physiography	COAST	FAL ZONE Geology		Soils		Climate	Natural Vegetation	Land Cover and Land Use		plains, sand dunes, kettle topography, and large wetland complexes. Low gradient streams converted to canals, which provide infestation routes for alien zebra mussel. Atlantic salmon once found in tributaries of eastern		muck. Devonian shale and limestone; Silurian sandstone, shale, limestone, and dolostone. Ordovician limestone and dolostone.		Niagara, Palmyra, Phelps, Lansing, Conesus, Honeoye, Lima, Kendaia, Manlius, Farmington			today, these forest types are confined to woodlots. Elm, black ash, and silver maple are still found in poorly drained hardwood swamps. East of Lake Ontario, areas of shallow soil over limestone pavement barrens (also called alvar grasslands) occur, dominated by grasses, sedges, prairie herbs, and shrubs. Trees, such as eastern red cedar, northern white cedar, bur oak, and paper birch root in crevices in the limestone rock. Other habitats found on the easter Ontario shore include lakeshore dunes and rich herbaceous or shrub fens fed by limey seeps.	shrubby and herbaceous wetlands, beaches, rural residential and urban centers. Farming for dairy, livestock, forage crops, fruit, vegetables, and n other specialty crops.
59c. Southern New 5 England Coastal	Irregular plains with some low hills. Numerous glacial drumlins. Ponds,	Elevation / Local Relief (feet) 40–800 / 100–300	Surficial and Bedrock Pleistocene sandy till; ice-contact gravel, sand, and silt; sandy loamy till.	t; Inceptisols (Dystrudepts, Endoaquepts)	Common Soil Series Woodbridge, Paxton, Ridgebury, Hollis, Chatfield,	Temperature / Moisture Regimes Precipitation Mean annual (inches) Mesic / Udic, some 46–52	IFrost Free Mean annual (days)Mean Temperature January min/max; July min/max (°F)150–18015/35; 61/82	Appalachian oak-pine forests with various combinations of red, white, scarlet, black, or chestnut oaks, white pine, red maple, hickories, and other central or transition hardwoods.	Deciduous forest, woody wetlands; urban, suburban, and rural residential land. Hay,	83d. St. Lawrence 1 Lowlands	 Lake Ontario. Relatively flat to gently rolling lake plain interspersed with occasional low ridges. Large wetland complexes. Atlantic salmon historically in many tributaries; dams blocked 	177–600 / 45–100	Glacial lake or marine plain sand, silt, and clay; Pleistocene glacial till, minor kame deposits, minor exposed bedrock, peat and muck. Proterozoic biotite or hornblende granitic gneiss, leucogranitic and plagioclase gneiss, biotite quartz,	Alfisols (Epiaqualfs), Inceptisols (Eutrudepts, Endoaquepts), Spodosols (Haplorthods, Endoaquods)	Hogansburg, Muskellunge, Insula, Adjidaumo, Naumburg, Croghan	Frigid / 30–42 Udic, Aquic	120–140 5/25; 58/80	Remaining forests on clay soils include sugar maple, beech, hemlock, shagbark hickory, and bur and white oak. Sandy soils support black and red oak, white pine, pitch pine, and red maple. Red maple, swamp white oak, and white ash grow in wetland soils.	Crop and pasture land, deciduous forest, some mixed deciduous and evergreen forest, urban centers. Farming for dairy, livestock, forage crops, and potatoes.
Plains and Hills	small lakes, reservoirs, and wetlands are abundant. Extensive reservoir system for New York City and local uses. Low to moderate gradient streams with silt, sand, gravel, cobble, and bedrock substrates. A number of		biotite-quartz-plagioclase gneiss and dolomitic marble; Ordovician schist and amphibolite.	;	Charlton	Aquic		on shallow dry rocky solis on upper stopes, chestnut oak, northern red oak, black oak, and some pitch pine. Oak-hickory forests with northern red oak, white oak, pignut hickory, shagbark hickory, or mockernut hickory. On midslopes, oak-hemlock-white pine forests that also include some black birch, black cherry, and red maple. A few areas of moist forests with sugar maple, northern red oak, American beech, and white ash. Swamps with red maple, green ash, hemlock or Atlantic white cedar. On small river floodplains, pin oak-green ash	cropland. Some public state forest and state park lands.	83e. Upper St. Lawrence Valley	 their migration. Lake sturgeon and muskellunge present in some streams. Parallel low ridges in the west, terraces, rolling toeslopes of the Adirondack foothills in the east. Few lakes. Low to moderate stream drainage density 	, 480–1479 / 95–500	calcitic and dolomitic marble; Ordovician dolostone and sandstone; Cambrian sandstone. Pleistocene glacial till, glacial lake beach ridges and deltas, lacustrine sand, minor kame deposits, peat, and muck. Proterozoic biotite quartz plagioclase gneiss	Inceptisols (Epiaquepts, Eutrudepts), Alfisols (Endoaqualfs), Spodosols (Haplorthods)	Malone, Kalurah, Hailesboro, Pyrities, Coveytown, Trout River	Frigid / 34–50 Udic, Aquic	90–145 6/26; 57/79	Second growth northern hardwoods such as sugar maple, beech, black cherry, and yellow birch. Aspen, birch, and balsam poplar are common. Red, white, and black spruce and balsan fir grow in saturated or shallow soils.	Deciduous forest, some mixed forest and evergreen forest, small- to moderate-sized farms, rural residential and small towns. Farming
59g. Long Island5Sound CoastalLowland	517 Flat to irregular plains, coastal beaches, bays, and tidal flats. Low gradient streams with silt, sand, and gravel substrates.	0–250 / 20–50	Pleistocene sandy till; sandy loamy till; moraine gravel, sand, and silt; outwash gravel, sand, and silt; saline or estuarine marsh deposits. Cambrian biotite-hornblende-quartz-plagioclase gneiss, amphibolite, schist; coastal plain clay, sand, and gravel.	 I, Entisols (Quartzipsamments), Inceptisols (Dystrudepts) 5, I. 	, Plymouth, Montauk, Haven, Chatfield, Riverhead, Charlton	Mesic / 44–48 Udic, some Aquic	170–220 20/38; 63/82	On uplands, coastal oak-hickory or oak-tulip tree forests with various combinations of red, white, scarlet, black, or chestnut oaks, white pine, red maple, hickories, and other central hardwoods. Black oak increased after disappearance of American chestnut. Coastal forests may have dense shrub layer and vines. Some moist forests with northern red oak, white oak, American beech, tulip tree, and flowering dogwood. In wetter areas, red maple, sweet gum,	Deciduous forest, evergreen shrublands, woody wetlands, emergent herbaceous wetlands, salt marsh, beaches, some pasture and minor amounts of cropland. Urban, dense suburban, and some rural	83f. Mohawk Valley ²	 Cooler water temperatures and frequent waterfalls block lowland fish species from upper valley streams. Irregular valley with rolling hills, low mountains, river terraces, and a narrow 	t 400–1812 / 1 200–800	leucogranitic gneiss, amphibolite, calcitic and dolomitic marble; Ordovician shale, limestone, and dolostone; Cambrian sandstone and dolostone. Pleistocene glacial till, fluvial outwash sand and gravel, kame deposits, lacustrine sand, silt, and clay, and some	Entisols (Udipsamments), Alfisols (Hapludalfs),	Oakville, Windsor, Hudson, Nassau	Mesic / 29–50 Udic, some	120–180 11/28; 58/81	Sugar maple and beech dominate forests on moist, fine-textured soils. Hemlock may be present in low numbers. Common shrubs include witch-hazel and hobblebush. Hemlock-	Agricultural land, woodlots, and urban centers, barge canal. Farming for dairy
59i. Hudson Valley 2	126 Irregular valley, plains broken by hills	165–700 /	Pleistocene glacial till, exposed bedrock, lacustrine	Inceptisols (Dystrudepts),	Charlton, Chatfield, Hollis,	Mesic / 26-45	120–185 15/34;	and pin oak. On coastal burrs, pitch pine, eastern redcedar, post oak, and nickories with some northern bayberry and seaside goldenrod. On well-drained moraines, shrubs of northern bayberry, beach plum, poison ivy, beach rose, winged sumac. On low dunes, American beach grass, beach pea, seaside goldenrod. On low marshes and creek borders, smooth cordgrass. In high marshes, saltmeadow cordgrass, spikegrass. In the south, an extension of Appalachian oak-hickory forest with black and white oak	Pasture and cropland, deciduous forest,		streams with cobble, gravel, and sand substrates. Many fishes introduced from the Great Lakes and alien zebra mussels established.	n S	Ordovician shale, siltstone, sandstone, greywacke, limestone, and dolostone; Cambrian limestone, dolostone, and chert.	Inceptisols (Dystrudepts)		Aquit		northern hardwoods forest on north slopes and in ravines. In river floodplains, silver maple dominant with green ash, elm, ostrich fern, and a diverse herbaceous layer. Northern white cedar on exposed rocky balds.	and livestock, pasture, hay, and forage crops such as corn for silage, grain, and soybeans. Specialty crops include market vegetables and strawberries.
	and terraces; flatter glacial lake plain in the north. Narrow floodplain along the Hudson River. Estuarine species include shortnose sturgeon, American eel, and American shad. Upper Hudson River connected to Lake Champlain basin	25–350	sand, silt, and clay, fluvial outwash sand and gravel, sand dunes. Devonian limestone, chert, and dolostone. Ordovician shales, greywacke, and siltstones. Cambrian shale and slate.	Entisols (Udipsamments), Alfisols (Hapludalfs)	Oakville, Nassau, Hudson, Vergennes, Windsor	Udic, some Aquic	60/84	and pignut, mockernut, and shagbark hickories. To the north, northern hardwoods forest predominates. Pitch pine-scrub oak barrens can still be found in sandy areas on the glacial lake plain, particularly at Albany Pine Bush and Wilton Preserves. Freshwater tidal marshes and mudflats occur along the river as far north as Troy, New York.	mixed deciduous and evergreen forest, major urban, suburban, and rural residential land. Farming for dairy, livestock, grains, hay, soybeans, corn, fruit, and nursery stock.	84. A Level IV Ecoregions	TLANTIC COAS Physiography	TAL PI	NE BARRENS Geology		Soils		Climate	Natural Vegetation	Land Cover and Land Use
	through the Champlain Canal.										Area square niles)	Elevation / Local Relief (feet)	Surficial and Bedrock	Order (Great Group)	Common Soil Series	Temperature / Moisture Regimes Precipitation Mean annual (inches)	Frost Free Mean Temperature January min/max; July min/max (°F)	e	
60. N Level IV Ecoregions	ORTHERN ALLE Physiography	GHEN Elevation / Local Relief (feet)	Y PLATEAU Geology Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series	Temperature / Precipitation Moisture Mean annual Regimes (inches)	Climate Frost Free Mean annual (days) Mean Temperature January min/max; July min/max (°F)	Natural Vegetation	Land Cover and Land Use	84a. Cape Cod/Long Island	 Level to rolling plains, some steeper slopes near moraines, and kettle topography with small lakes and ponds. Low gradient streams and rivers; most have been modified by urbanization. Carmens River has brook trout and once contained anadromous brook trout. Most other inland 	s 0-115 / 11 10-50 a d	Pleistocene outwash sand and gravel, kames, moraines, and loose sandy till, outwash sand and gravel, Holocene dunes. Precambrian bedrock of granite, gneiss, and schist is covered by 200-400 feet or more of gravel, sand, silt, and clay.	Entisols (Quartzipsamments), Inceptisols (Dystrudepts)	Carver, Plymouth, Haven, Riverhead	Mesic / 35–56 Udic 35–56	180–220 26/38; 68/85	Fragmented sandplain and dune woodlands with pitch pine, black, red, white, and scrub oak, black huckleberry, blueberry, and bearberry. Sandplain grassland with little bluestem, Pennsylvania sedge, poverty grass, bearberry, scrub oak, stiff aster, and bayberry. Sandplain heathlands with scrub oak, black huckleberry, bearberry, and lowbush blueberry. Sand dune grasslands with beach grass, beach-pea, seaside goldenrod, and beach heather. Some swamps and bogs with Atlantic white cedar, pitch pine, red maple, highbush blueberry, and leatherlead Salt marshes with saltmeadow and smooth cordgrass, spike-grass, and saltmarsh rush.	Mixed, deciduous, and some evergreen forest, urban and suburban development, pine barrens, shrublands, wetlands, grasslands, and cropland. Tourism, recreation, vegetable farming. Pine barrens in private conservation lands.
60a. Glaciated Low Allegheny Plateau	934 Dissected plateau with glacially- smoothed rolling hills and narrow to wide valleys. Streams subject to flooding and scouring. Low gradient headwater streams may have diverse aquatic vegetation and support swallowtail and bridle shiners. Few	900–2515 190–1000	Pleistocene glacial till, some exposed bedrock, some kame deposits, glacial lacustrine sand, fluvial outwash sand and gravel. Devonian shale, siltstone, sandstone, and conglomerate.	Inceptisols (Dystrudepts, Fragiudepts) e.	Mardin, Bath, Volusia, Lordstown, Solon, Valois, Chenango, Lackawanna, Wellsboro, Willdin, Lewbath, Napoli, Almond, Yorkshire	Mesic, some Frigid / Udic, Aquic	110–150 14/31; 57/80	Appalachian oak forest on drier slopes and northern hardwoods on north slopes and moist locations. Historically, American chestnut, beech, sugar maple, white and black oak, white pine, and hemlock were common. Today, successional hardwoods dominate with more red maple and black cherry and less hemlock than in the past. Groundwater-fed depressions support hemlock-hardwood swamps with hemlock, red maple, yellow birch, black gum, highbush blueberry, great rhododendron, and cinnamon fern.	Deciduous forest, mixed deciduous and evergreen forest, wooded wetlands, and cleared land for agriculture. Dairy and livestock farming with cultivation of forage crops; rural residential and urban centers.	84c. Barrier Islands/ Coastal Marshes	 waters dominated by largemouth bass. 203 Flat to gently sloping plains, coastal bays and inlets, islands, bluffs, dunes, beaches, tidal flats, and marshes. Marine fishes predominate. 	0-50 / 1	Pleistocene outwash sand and gravel, Holocene dunes, beach strand. Coastal deposits, clay, sand, and gravel.	Inceptisols (Dystrudepts), Entisols (Quartzipsamments), Histosols (Sulfihemists)	Riverhead, Haven, Plymouth, Carver, Bridgehampton, Pawcatuck, Ipswich	Mesic / 35–56 Udic, some Aquic	180–220 26/38; 68/85	Coastal forests of scarlet oak, black oak, post oak, beech, black gum, red maple, pitch pine, and American holly. Coastal forests may have dense shrub layer and vines including sassafras, greenbrier, poison ivy, Virginia creeper, beach plum, lowbush blueberry or grape. Beach strand with sea-rocket, dune grass, beach pea, and seabeach orache. Salt marshes with saltmeadow and smooth cordgrass, spike-grass, and saltmarsh rush.	Urban land, deciduous and mixed forest, beaches, wetlands, salt marshes, and grassland. Tourism, recreation, some commercial and sport fishing. Public land in Fire Island National Seashore, Gateway National Recreation Area, and several state parks.
60b. Delaware- Neversink	 natural lakes; Otsego Lake has lake trout and longnose sucker. Dissected plateau expressed as rolling flat-topped ridges of moderate relief and slope. Streams are adversely 	1000–1700, isolated ridge to 2231 /	Pleistocene glacial till, minor exposed bedrock, minor kame deposits and fluvial outwash sand and gravel. Devonian shale, sandstone, and conglomerate.	Inceptisols (Fragiudepts, Fragiaquepts, Dystrudepts)	Wellsboro, Wurtsboro, Volusia, Arnot, Oquaga, Lordstown	Mesic / 32–46 Udic, some Aquic	110–165 11/31; 56/79	Northern hardwoods forest of sugar maple, beech, and birch on north slopes and in moist areas. Appalachian oak forest on south-facing slopes and at lower elevations. Species include several species of oak (red, chestnut, scarlet, and white), black gum, tulip tree, four species	Deciduous forest, mixed deciduous and evergreen forest, pasture and cropland, rural residential. Higher ratio of	SOURCES:			Fisher D.W. Isachsen Y.W. and Rickard L.V. 197(70 Geologic Map of New Yo	prk 5 Kudish M	2000 The Catskill forest -	a history [.] Fleischmanns. N	lew York Purple	on C.B. 1988 Total alkalinity of
Highlands 60c. Catskills 14	 affected by acidic runoff. The Delaware River supports American shad, American eel, and a few bridle shiners and bluespotted sunfish. Dissected plateau in the west with rolling flat-topped ridges and steep 	130–700 400–2400, isolated peaks	Pleistocene glacial till, exposed bedrock, minor kame denosits fluvial outwash sand and gravel	Inceptisols (Fragiudepts,	Willowemoc, Lewbath, Lewbeach Halcott	Frigid, 35–60 Mesic lower	90–120 11/32; 54/80	of hickory, flowering dogwood, and redbud. Historically, American chestnut was common. Hemlock grows with northern hardwoods forest on north slopes, in ravines, and in moist sites. Central hardwoods or Appalachian oak forest at lower elevations or on south- and west- facing slopes. Species include several species of oak (red. chestnut, scarlet, and white)	woodland to farmland than in Ecoregion 60a. Rural residential and urban centers. Deciduous forest, some mixed and every even forest. Some pasture and hav	American Bird Conservancy, 2000, Adirondack Mountains, Corne www.blm.gov/wildlife/plan/pl Atwood, J.L., Rimmer, C.C., McFar Distribution of Bicknell's thru	Partners in Flight Bird Conservation Plan f ell Laboratory of Ornithology, Ithaca, New _26_10.pdf. cland, K.P., Tsai, S.H., and Nagy, L.R., 1990 ish in New England and New York: Wilsor	for the York, 96, on Bulletin,	 Glitzenstein, J.S., Canham, C.D., McDonnell, M.J., a environment and land-use history on upland for Valley, New York: Bulletin of the Torrey Botan 	and Streng, D.R., 1990, Effectorests of the Cary Arboretum, nical Club, v. 117, no. 2, p. 10	ew York, Mounta Lake Champ ects of Isle, Ve a, Hudson Lake Champ .06–122.	plain Basin Program, 2004, fermont, www.lcbp.org/Atla plain Basin Program, 2007, Sarias No. 4: Grand Isla Vie	Lake Champlain Basin At s/index.htm. Wetlands in the Lake Chai	mplain Basin, Fact mplain Basin, Fact off(wetlands2007 pdf) off(wetlands2007 pdf)	s of the Inland Basin, www.priweb.
Transition	slopes; plateau escarpment in the east; mid-elevation ranges and ridgelines in the north. High to moderate gradient cool water streams with bedrock, boulder, and cobble substrates. Occasional natural lakes and ponds. Streams and impoundments renowned for brown trout fishery.	to 3345 / 350–900	Devonian shale, sandstone, and conglomerate.	2 jouracep(5)	Mongaup, Vly, Arnot, Lordstown, Wellsboro, Valois, Mardin, Volusia	slopes / Udic, some Aquic		black gum, tulip tree, four species of hickory, flowering dogwood, and redbud. Historically, American chestnut was common. Dense laurel brakes (groves of mountain laurel) form beneath oak canopies. Hemlock-northern hardwood forest grows on north slopes, in ravines, and in moist sites.	land. Limited farming for dairy and livestock. Recreation, wildlife habitat, rural residential development.	 v. 108, no. 4, p. 650–661. Bailey, R.G., 1995, Description of the Miscellaneous Publication Not Service, 108 p. + map. Bailey, R.G., Avers, P.E., King, T., a subregions of the United State compiled and edited by McNa 	he ecoregions of the United States (2nd ed. . 1391, U.S. Department of Agriculture–Fo and McNab, W.H., editors, 1994, Ecoregion is (supplementary table of map unit descrip b, W.H., and Bailey, R.G.): Washington, D.	L.): orest ns and ptions D.C., U.S.	 Greller, A.M., 1972, Observations on the forests of n from colonial times to the present: Bulletin of t 4, p. 202–206. Greller, A.M., 1972, A classification of mature forest Bulletin of the Torrey Botanical Club, v. 104, n Greller, A.M., Calhoon, R.E., and Mansky, J.M., 1978 	northern Queens County, Lor the Torrey Botanical Club, v. sts on Long Island, New York no. 4, p. 376–382. 78, Grace Forest - a mixed me	ng Island, 2. 99, no. C: C: C: C: C: C: C: C: C: C: C: C: C:	D., McFarland, K.P., Rimme cal model of Bicknell's thru n Bulletin, v. 117, p. 1–11. Wyllie, W.D., and Lawford nal Park: Ottawa, Ontario, P A., and Greller, A.M., 1973,	er, C.C., Faccio, S.D., and sh distribution in the north d, R.G., 1979, Climate of t Parks Canada. , The distribution of tree sp	Shife wetanids2007.pdf.Rensselaer Plateau Alliance, www.rensselaerplateaAtwood, J.L., 2005, A eastern United States:Rensselaer Plateau Alliance, www.rensselaerplateaRohm, C.M., Omernik, J.M., and Kiilsgaard, C.W., phosphorus in lakes of the northeastern United Management, v. 11, no. 1, p. 1-14 + map.Seischab, F.K., 1990, Presettlement forests of the P western New York: Bulletin of the Torrey Bor	u.org/Home.html. 1995, Regional patterns of total d States: Lake and Reservoir helps and Gorham Purchase in tanical Club, v. 117, no. 1, p. 27–38.
60d. Finger Lakes Uplands and Gorges2	732 Northern edge of dissected Allegheny Plateau, rolling, glacially-smoothed hills and north-flowing drainageways. Large glacially carved lake beds, hanging valleys, and waterfall-eroded gorges. Streams tributary to the Finger Lakes	382–2196 / 200–600	Pleistocene glacial till, some exposed bedrock, kame deposits, glacial lacustrine sand, silt, and clay, fluvial outwash sand and gravel. Devonian shale, siltstone, and limestone.	Inceptisols (Dystrudepts, Fragiudepts), Alfisols (Hapludalfs)	Bath, Mardin, Lansing, Ontario, Honeoye, Lima, Hudson, Collamer, Schoharie, Valois, Erie, Langford, Manlius, Darien	Mesic / 30–45 Udic, some Aquic	130–190 58/81	Appalachian oak forest on drier slopes, including several oak species, oak/hickory, and, historically, oak/chestnut. Black, white, red, and chestnut oak mix with pitch pine and white pine on open ridges. Beech, sugar maple, hemlock, basswood, and tulip tree grow in soils with higher moisture content. Hemlock, basswood, bitternut hickory, and tulip tree in ravines with hemlock often dominating on ravine slopes. Black ash, silver maple, and elm occur in swamps on river floodplains and in the glacial troughs at the ends of the Finger Lakes.	In the south, a farm and woodlot mosaic, becoming more intensive in farming, residential, and urban development to the north. Deciduous forest, mixed deciduous and evergreen forest, wooded wetlands. Dairy farming, cultivation of forage groups, gradered for the	Department of Agriculture–Fo Baker, J.P., Gherini, S.A., Christense Newton, R.M., Reckhow, K.H - interpretive report: Ray Broo 274 p. Bierhorst, J., 1995, The Ashokan Ca	nest Service, map scale 1:7,500,000. en, S.W., Driscoll, C.T., Gallagher, J., Mun ., and Schofield, C.L., 1990, Adirondack la ok, New York, Adirondack Lakes Survey Co atskills - a natural history: Fleischmanns, N	nson, R.K., G akes survey Corporation, G New York,	Grier, N.M., 1925, The geology of Long Island with Harbor region and its flora: American Midland Griffith, G.E., Omernik, J.M., Bryce, S.A., Royte, J., D., Metzler, K.J., and Hellyer, G., 2009, Ecoreg with map, descriptive text, summary tables, and	a especial reference to the Col d Naturalist, v. 9, no. 11, p. 53 ., Hoar, W.D., Homer, J., Kein egions of New England (color nd photographs): Reston, Virg	of Cunold Spring31-563.irstead,or posterginia,souther	ningnam Park, Queens Couv. v. 100, no. 5, p. 313–318. ., 1974, The vegetation of the egion: American Midland N 1987, Pre-European settlem eastern New York: American	unty, New York: Bulletin o he ravines of the southern I Naturalist, v. 91, no. 2, p. 3 nent forest composition in n Midland Naturalist, v. 11	 I une Torrey Botanical Finger Lakes, New Tarr, R.S., and Turner, E.T., 1902, The physical geo University of Michigan, 397 p. U.S. Department of Agriculture–Natural Resources soils data. 	tion of Fire Island, New York: Bulletin 298–306. ography of New York State: Ann Arbor, Conservation Service, STATSGO
60e. Glaciated Alleghenv Hills	 Hay have hilgratory non-native rainbow trout, but historically had native Atlantic salmon. Two of the smaller Finger Lakes have ninespine stickleback. High elevation section of glaciated Allegheny Plateau; plateau remnants, rolling bills law are stated. 	1400–2548 / 200–900	Pleistocene glacial till, some exposed bedrock, minor kame deposits, fluvial outwash sand and gravel. Devonian shale giltetene and such t	Inceptisols (Fragiudepts, Dystrudepts)	Lewbath, Lewbeach, Willowemoc, Vly, Mongaup, Bath Mardin Order	Frigid, 35–60 Mesic lower	90–120 11/30; 54/78	Northern hardwoods predominate. Beech, sugar maple, hemlock, basswood, and tulip tree grow in soils with higher moisture content. Appalachian oak forest occurs on drier slopes, including red, white, and electronic characteristic including red.	Deciduous forest, some mixed deciduous and evergreen forest. Some agriculture for dairy livesteels and for	Purple Mountain Press, 116 p. Central Pine Barrens Joint Planning comprehensive land use plan, York, Central Pine Barrens Joi Clark, J.S., 1986, Coastal forest tree	and Policy Commission, 1995, Central Pir Volume 2: Existing conditions: Great River int Planning and Policy Commission. populations in a changing environment, so gical Monographs v 55, pp. 4, p. 250, 277	ine Barrens I er, New Joutheastern 7.	 U.S. Geological Survey, map scale 1:1,325,000 Heimburger, C.C., 1933, Forest-type studies in the A Cornell University Agricultural Experiment Sta Hunt, D.M., Edinger G.J., Schmid, J., Evans, D.J., N Young, S.M., 2002, Lake Erie gorges biodivers analysis: Albany, New York, New York, Status P 	Adirondack region: Ithaca, Ne tation Memo 165, 122 p. Novak, P.G., Olivero, A.M., a rsity inventory and landscape Department of Environment of	w York, and integrity McIntosh, R McIntosh, R Monog McIntosh, R	R.P., 1962, The forest cover ted by land survey records: R.P., 1972, Forests of the Ca graphs, v. 42, no. 2, p. 143– R.P., and Hurley, R.T., 1964.	of the Catskill Mountain re American Midland Natura tskill Mountains, New Yor 161. , The spruce-fir forests of t	 begion, New York, as list, v. 68, p. 409–423. k: Ecological be Catskill Mountains: U.S. Department of Agriculture–Natural Resources Conservation Service), various county soil su U.S. Department of Agriculture–Natural Resources resource regions and major land resource area and the Pacific Basin: Washington, D.C., U.S. 	Conservation Service (formerly Soil rveys of New York. Conservation Service, 2006, Land as of the United States, the Caribbean, . Government Printing Office,
60f. Cattaraugus Hills 7	 roning mins, row mountains, and steep valley slopes. Occasional shallow lakes or ponds. Streams are of moderate gradient; some contain tonguetied minnow. Dissected plateau; broad rolling hills and plateau toeslopes. Incised stream 	900–1800, isolated high	Pleistocene glacial till; large gravel and sand kame deposits, glacial lacustrine silt and clay fluvial outwash	Inceptisols (Fragiudepts, h Dystrudepts)	Mardin, Volusia, Valois, Chenango, Erie Manlius	Mesic / 32–48	110–150 12/28; 57/77	Northern hardwoods forest, consisting of sugar maple, beech, white pine, white, red, and chestnut oak, with eastern hemlock. Understory shrubs include mountain laurel and	Deciduous forest, mixed deciduous and evergreen forest, basture and cropland	Cline M.C LMC -	J.E., Jr., Nowacki, G.J., Carpenter, C., and I gions - sections and subsections of the conto C., U.S. Department of Agriculture-Forest -76, map scale 1:3,500,000.	McNab, terminous J t Service,	Johnson, E.A., and Smith, D., editors, 2006, Legacy: Co Biodiversity: Albany, New York, American Muset State Biodiversity Research Institute, New York S Conservation. New York Natural Heritage Program	gram, 99 p. + appendices and onserving New York State's cum of Natural History, New Yo State Department of Environme am, and The Nature Conservant	d maps. Ecolog McMartin, B Cork Countr nental McNab, W.H ney, 100 p. States	gy, v. 45, no. 2, p. 314–326. 3., 1994, The great forest of ry Books. H., and Avers, P.E., compile – section descriptions: Was	f the Adirondacks: Utica, N ers, 1994, Ecological subre chington, D.C., U.S. Depar	Agriculture Handbook 296, 669 p. + map.New York, Northgions of the United tment of Agriculture-U.S. Department of Agriculture-Soil Conservation and major land resource areas of the United S Government Printing Office, Agriculture Handbook 296, 669 p. + map.U.S. Department of Agriculture-Soil Conservation and major land resource areas of the United S Government Printing Office, Agriculture HandbookU.S. Fish and Wildlife Service, 1997, Significant hall	Service, 1981, Land resource regions States: Washington, D.C., U.S. dbook 296, 156 p. + map. bitats and habitat complexes of the New
	channels. Low gradient streams with silty and gravelly substrates empty into Lake Erie. Rainbow trout migrate upstream from Lake Erie. Eastern sand darter once collected in Cattaraugus Creek.	point 1935 / 200–500	sand and gravel. Devonian shale, siltstone, and sandstone.	,		Aquic	5111	mapleleaf viburnum. On fine-textured soils, cucumber magnolia, red maple, white ash, and black birch may co-dominate. The shale cliff and talus community, consisting of red cedar, mountain maple, white ash, and slippery elm, occurs on the steep slopes of streams incised in the soft shales. Wetlands appear as fens, which are not as acidic as bogs. Fen vegetation includes red maple, speckled alder, green ash, and tamarack.	Emergent herbaceous wetlands. Dairy and livestock farming with some cultivation for forage crops; rural residential and urban centers; natural gas fields.	Cornel, M.G., and Marshall, R.L., 19 Cornell University, New York 61 p. Cogbill, C.V., and White, P.S., 1991 forest and treeline along the App	, The latitude-elevation relationship for spr palachian Mountain chain: Vegetatio, v. 94, p.	, new York, lletin 119, J pruce-fir . 153–175.	 Kahl, J.S., Stoddard, J.L., Haeuber, R., Paulsen, S.G. Webb, J.R., Dewalle, D.R., Sharp, W., Driscoll, Murdoch, P.S., Roy, K., Webster, K.E., and Urc waters responded to the 1990 Clean Air Act An and Technology. December 2004 n 4854-490 	G., Birnbaum, R., Deviney, F., I, C.T., Herlihy, A.T., Kellogg rquhart, N.S., 2004, Have U.S mendments?: Environmental 0A.	A., J. J. Forest J. J. J	Service Administrative Pub Strayer, D.L., Scheuerell, M Idson River basin - a history 5, v. 19, no. 4, p. 814–823.	blication WO-WSA-5, 267 A.D., and Carlton, J.T., 199 y of invasions and introduc	 p. b. York Bight watershed: Charlestown, Rhode Isl b. Whitney, G.G., 1990, The history and status of the Allegheny Plateau: Journal of Ecology, v. 78, b. Whittaker, R.H., and Woodwell, G.M., 1969, Structure pine forest at Brookhaven. New York: Journal of Structure Plateau 	hand, U.S. Fish and Wildlife Service. hemlock-hardwood forests of the no. 2, p. 443–458. e, production, and diversity of the oak- f Ecology, v. 57, no. 1, p. 155–174
61. ERIE DRIFT PLAIN										Conard, H.S., 1935, The plant assoc plant sociology: American Mic Dickinson, N.R., 1983, Physiograph	nations of central Long Island - a study in c dland Naturalist, v. 16, p. 433–516. hic zones of southern and western New York	descriptive	Keys, J., Jr., Carpenter, C., Hooks, S., Koenig, F., Mo M.L., 1995, Ecological units of the eastern Uni Atlanta, U.S. Department of Agriculture-Forest	IcNab, W.H., Russell, W.E., S hited States - first approximation st Service, Technical Publicat	Smith, Circula tion: National Oce tion R8-	and Scheueren, M.D., 1998 ar No. 57: Albany, New Yor eanic and Atmospheric Adr perature precipitation and	rk, New York State Museu ninistration, 2002, Monthl heating and cooling data	m, 51 p. y station normals e days, 1971–2000 Will C.R. Sturment, P.D. Oction D.F. (2007) Will C.R. Sturment, P.D. Oction D.F. (2007) Will C.R. Sturment, P.D. Oction D.F. (2007) Will C.R. Sturment, P.D. Oction D.F. (2007)	Pttawa, Canada, Environment Canada,
Level IV Ecoregions Physiography Geology Solids Climate Natural Vegetation Land Cover and Land Use Area Elevation / Surficial and Bedrock Order (Great Group) Common Soil Series Temperature / Precipitation Frost Free Mean Temperature									New York, New York State De Resources Center, 11 p. Edinger, G.J., Evans, D.J., Gebauer,	S., Howard, T.G., Hunt, D.M., and Olivero	, Wildlife ro, A.M.,	TP 21, map scale 1:3,500,000. Kiviat, E., 1991, The northern Shawangunks - an ecc York, Mohonk Preserve, Inc., 107 p.	cological survey: New Paltz, N	New New Vork N	tography of the United State all Climatic Data Center.	es No. 81- New York: Ash	Guides, http://www.	e Journal, v. 29, no. 1, p. 1–25. ard, C.W., 1996, Level III and Level IV ge Mountains the Ridge and Valley	
61c. Low Lime Drift 1 Plain	quare guare 090 Rolling landscape of ridges, moraines, and hummocky terrain. Meandering streams and floodaleine guart floodaleine	Local Relief (feet) 1000–2000 / 250–400	Pleistocene glacial till; stratified drift of sand, silt, and clay; moraines, kettles, kame deposits, lacustrine silt and clay and flurial and and	Inceptisols (Fragiaquepts, Dystrudepts, Endoaquepts,	Volusia, Chadakoin, Schuyler, Fremont,	Moisture Regimes recipitatio Mean annua (inches) Mesic / Udic, Aquic 32–48	Image: Second	Beech-maple forest in moist locations. Northern hardwoods with some hemlock on better drained sites. Understory in upland forest dominated by witch hazel, mapleleaf viburnum, and forms. Pingring forests of success and an investory in upland forest of success and an investory in upland fores	Deciduous forest, pasture and cropland, and rural residential land. Dairy forming and accessition in the interval	editors, 2002, Ecological comin New York, New York State of York Natural Heritage Program Evans, D.J., and VanLuven, D.E., 20 - summary of findings: Albany	munities of New York State, Second edition Department of Environmental Conservation. 007, Biodiversity in New York's state park 7, New York, New York Natural Heritage Provided the Provided Heritage Provided Her	on: Albany, on, New H c system Program. H	 Kuchler, A.W., 1964, Potential natural vegetation of t York, American Geographical Society, Special I 1:3,168,000. Kudish, M., 1992, Adirondack upland flora - an ecological statement of the second stateme	the conterminous United Stat Publication no. 36, 116 p., m logical perspective: Saranac	tes: New TOFK N acris.n nap scale New York St Assess , New Omernik I	ynhp.org/guide. tate Department of Environ sment, LP-203 8/82, 110 p. M., 1987. Ecoregions of the	imental Conservation, 198	Coregions of rennsylvania and the Blue Ridg and the Central Appalachians of Virginia, We Oregon, U.S. Environmental Protection Agenres: Annals of the	st Virginia, and Maryland: Corvallis, cy, EPA/600/R-96/077, 49 p.
	substrates. Occasional kettle ponds. Several biologically diverse streams		Upper Devonian shale, siltstone, and sandstone.	(Fragiaqualfs)	Erie, Chenango			silver maple, black willow, American elm, and green and white ash occur in wetland areas.	forage crops, timber and maple syrup production, rural residential centers,	http://www.nysparks.com/new	vs/public/.		York, The Chauncey Press, 320 p.	,	Associ	iation of American Geograp	ohers, v. 77, no. 1, p. 118–1	25.	FOR SALE BY U.S. GEOLOGICAL SUR

wildlife habitat, and recreation.

58. N	NORTHEASTERN	HIGHLANDS							62. N	ORTH CENTRA	LAPPA	LACHIANS						
Level IV Ecoregions	Physiography	Elevation / Surficial and Bedrock	Order (Great Group)	Soils	Temperature / Precipitat	Climate	nerature Natural Vegetation	Land Cover and Land Use	Level IV Ecoregions	Physiography	Elevation /	Geology Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series	Femperature / Precipitatio	Climate	Natural Vegetation	Land Cover and Land Use
((s	(square miles)	Local Relief (feet)		,	Moisture Mean ann Regimes (inches)	ual Mean annual January m (days) July min/n	nin/max; max (°F)			quare iles)	Local Relief (feet)				Moisture RegimesMean annua (inches)	I Mean annual (days) January min/m July min/max (ax; F)	
58a. Taconic Mountains	151 Low mountains and high hills, gently rounded to steep slopes; narrow valleys. Moderate to high gradient bedrock, boulder, and cobble-bottomed streams. Wild rainbow trout inhabit many streams. Few to no lakes. Some springs and caves.	1000–2100 / 600–800 Pleistocene loamy till, discontinuous loar sandy loamy till, valley bottom deposits of Ordovician graphitic phyllite, schist, slate and some minor limestone; Cambrian me and gneiss-cobble conglomerate.	ny till, some Inceptisols (Dystrudepts) of alluvium. e, quartzite, tagraywacke) Nassau, Bernardston, Taconic, Macomber	Mesic, some Frigid / Udic	90–135 10/2 54/7	 28; Northern hardwoods at middle and upper elevations; more mesic sites have sugar maple, 79 beech, yellow birch, and basswood, with some eastern white pine and hemlock. Some southern-influenced forests with oaks and hickories on lower, drier slopes (more prevalent farther south), including red oak, white oak, and chestnut oak, along with shagbark, bitternut, and pignut hickory. Some montane spruce-fir at highest elevations in the north. Southern summits support pitch pine-scrub oak rather than spruce-fir. 	Deciduous forest, mixed deciduous and evergreen forest, some minor pasture and cropland in narrow valleys. Forestry, recreation, hunting.	62b. Low Poconos/ Mongaup Hills	433 Dissected plateau with areas of hummocky topography. Moderate to high gradient streams with boulder and cobble substrates. Larger streams deeply incised. Many kettle lakes and wetlands. Stream water cool enough in unands for wild out hot how there the topographic stream of the stream water to be the stream to the stream st	500-16757 50-800	Pleistocene glacial fill, kame deposits, and fluvial sand and gravel. Middle and Upper Devonian shale, sandstone, and conglomerate.	Inceptisols (Fragiudepts, Dystrudepts)	Wurtsboro, Wellsboro, Oquaga, Lackawanna, Arnot	Mesic / 32–50 Udic, some Aquic	130–165 11/31; 56/79	Northern hardwoods of sugar maple, American beech, and birch; Appalachian oak for red, white, black, and chestnut oak and hickory species. Oaks grow on slopes and sou facing aspects. Hemlock grows in moist areas and on north slopes. River birch, sycan and green ash occur in riparian areas. Common understory shrubs in the uplands inclu- witch hazel, rosebay rhododendron, mountain laurel, partridgeberry, and hillside blue	est of Deciduous forest, mixed deciduous and evergreen forest. Tourism, recreation, rural residential, and wildife habitat.
58b. Western New England Marble Valleys	158 Steep-sided valleys with floodplains, terraces, and rolling to hilly terrain. Low to moderate gradient streams with bedrock, boulder, cobble, and sandy substrates. Numerous springs, seeps, and wetlands. A few lakes and reservoirs.	500–1000 / MostlyPleistocene ground moraine, sandy loamy ice-contact gravel, sand, and silt; lake silt Holocene alluvium.200–500, some hills to 900Ordovician and Cambrian dolomite marb marble, dolostone, limestone, quartzite, p schist.	v till;Inceptisols (Eutrudepts, Dystrudepts)e, calcite hyllite, andInceptisols (Eutrudepts, Dystrudepts)	Stockbridge, Farmington, Nassau, Hollis, Chatfield, Copake	Mesic / 36–48 Udic 36–48	135–170 11/3 58/8	 Species-rich transition hardwoods forests with sugar maple, white ash, basswood, bitternut hickory, hophornbeam, and alternate-leaved dogwood. Calcareous rock outcrops with eastern red cedar, purple clematis, and roundleaf shadbush. On well-drained calcareous slopes, sugar maple, chinkapin oak, white ash, shagbark hickory, and hackberry. In lowlands, calcareous red maple-tamarack swamps with red maple, tamarack, black ash, northern white cedar, willows, and hemlock. On floodplains, silver maple, cottonwood, American elm, and sycamore. 	Pasture and cropland, mixed and deciduous forest, urban, suburban, and rural residential development, rock quarries.	62d. Unglaciated High Allegheny Plateau	 uplands for wild and hatchery trout. Deeply dissected plateau, narrow valleys, and steep valley sideslopes. Entrenched, high gradient streams with gravel and cobble substrates. Few to no natural lakes, but a few impoundments. 	1350–2350 / 500–1000	Unglaciated. Colluvium, alluvium, and exposed bedrock. Pleistocene glacial outwash, fluvial sand and gravel fill major drainage channels. Kame deposits and minor inclusions of glacial till near drainageways. Upper Devonian shale, siltstone, and sandstone. Minor	Ultisols (Hapludults, Fragiudults)	Rayne, Kinzua, Carrollton, Cookport, Ernest, Buchanan, Portville, Onoville, Shongo, Mandy, Gilpin	Mesic, 30–60 Frigid / Udic, some Aquic	90–150 11/30; 54/78	Forest cover historically high in hemlock and beech with American chestnut also represented. Today, oaks, pitch pine, white pine, mountain laurel, and hickory grow drier slopes; hemlock, beech, sugar maple, and birch grow in areas with more moist. Red maple and black cherry are more adaptable to frequent disturbance and they nor dominate forests in the region.	n Deciduous forest and some mixed deciduous and evergreeen forest. Public land in national and state forests. Timber production; minor areas of dairy and forage crop
58e. Berkshire Transition	 46 Hills, low mountains, and narrow valleys. Some steep slopes. Moderate gradient bedrock, boulder, and cobble-bottomed streams. Some natural lakes and ponds, and a few larger reservoirs. 	400–1700 / 600–1000 Pleistocene sandy loamy till, some ice-co gravel. Devonian schist, micaceous quartzite, qu calcareous granofels, quartzose marble, g and gneiss; Ordovician to Cambrian schis	ntact sand and Inceptisols (Dystrudepts, Eutrudepts) artz schist, ranite, st, gneiss,	, Hollis, Charlton, Chatfield, Stockbridge	Mesic / 45–51 Udic, some Aquic	150–165 14/3 59/8	 Mix of northern, transition, and central hardwoods-conifer forests. Northern hardwoods-hemlock-white pine forest on dry to mesic mostly north-facing slopes and ravines. Red oak-sugar maple transition forest on mesic mid-slopes with northern red oak, sugar maple, beech, black birch, and some white pine and hemlock. Oak-hemlock-white pine forest with white oak, chestnut oak, northern red oak, and black birch. Some ridgetop pitch pine-scrub 	Deciduous forest, some mixed and evergreen forest, hay/pasture, some urban land. Forestry, rural residential, tourism, recreation. Some public state forest and state park lands.	6.4 N	Streams with a diversity of darters, minnows, and redhorse suckers.	ΜΟΝΤ	inclusions of Lower Pennsylvanian conglomerate.						agriculture. Small urban centers in the Allegheny River valley.
58i. Glaciated Reading Prong/Hudson	551 Hills and low mountains, steep narrow valleys. High lake density, some with blue- spotted sunfish and, historically, banded sunfish Drinking water storage reservoirs	 amphibolite, and marble; Precambrian grischist. 450–1664 / Pleistocene gravelly and sandy glacial till Proterozoic hornblende granite and grani biotite-quartz-feldspar gneisses, quartzite some sandstone and conglomerate. 	L. Inceptisols (Dystrudepts) i, amphibolite;) Hollis, Chatfield, Charlton, Paxton	Mesic / 41–55 Udic, some Aquic	130–180 19/3 64/8	 oak woodland. On stream slopes and terraces, red maple, silver maple, American elm, basswood, sugar maple, shagbark hickory, and black cherry. Transition hardwood forest of sugar maple, American beech, black birch, tulip tree, oaks (red, white, and chestnut oak) and hickories (shagbark and pignut hickory). Hemlock and northern hardwoods on north slopes and red maple, green ash, swamp white oak, and tupelo in wooded swamps. Mountain laurel, flowering dogwood, black buckleberry, and 	Deciduous forest, some evergreen forest on north slopes. Wildlife habitat, tourism, and recreation. Some rural residential development. Public land in state parks	Level IV Ecoregions	Physiography Trea quare duare	Elevation / Local Relief	Geology Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series T	Temperature / Precipitatio Moisture Regimes (inches)	Climate	Natural Vegetation	Land Cover and Land Use
58j. Upper Montane/ Alpine Zone	205 Glaciated rocky peaks and ridges. High mountains with steep slopes. High gradient headwater streams with	2800–5344 / Pleistocene surficial deposits mostly abse 1500–2500 thin and discontinuous deposits of sandy separated by extensive bedrock outcrops.	nt; some loamy till Haplocryods, Haplohum Haplorthods, Endoaquod	, Ricker, Rawsonville, ods, Surplus, Sisk, Saddleback, ls), Skylight, Ampersand,	Cryic, some 52–86 Frigid / Udic, some	40–80 –3/2 44/6	 24; Between 2800 and 3500 feet, dominant forest species include red spruce, balsam fir, and yellow birches, with mountain ash, mountain holly, and creeping snowberry. Above 3500 feet to timberline, subalpine forests of balsam fir and mountain paper birch. Near timberline 	the largest being Harriman State Park, and privately-owned conservation land. Evergreen forest, some mixed deciduous and evergreen forest, shrubland and grassland, bare rock. Recreation, wildlife	64b. Trap Rock and Conglomerate Uplands	 18 Rocky, steep-sided ridges, hills, and palisades of the Hudson River. Region generally too narrow, uplifted, and rocky for significant water resources. 	50–675 / 100–500	Thin to discontinuous Pleistocene glacial till; exposed bedrock. Upper Triassic diabase (intrusive lava or traprock).	Inceptisols (Dystrudepts)	Holyoke, Wethersfield	Mesic / 40–55 Udic	135–195 23/38; 65/85	Ridgetops and upper slopes support mixed oak forests of red, white, and black oak v sugar maple, black birch, white ash, and tulip tree. Understory plants include maple- viburnum, poison ivy, catbriar, and wild grape. In ravines and on north-facing slopes hemlocks and mixed hardwoods occur. On dry slopes, chestnut oak, red oak, red ced hickory, and grassland openings with bluestem grasses and Indian grass. Talus slope	th eaved barren rock outcrops and cliffs. Wildlife habitat, urban open space, and recreation. Public land in High Tor, Hook Mountain, Rockland, and
58x. Taconic Foothills	1240 Rolling hills with convex tops and steep side-slopes. Narrow valleys. Moderate	500–1400 / Pleistocene coarse loamy till, discontinue Glacial outwash channels, sand and grave	bus in areas. el deposits) Nassau, Bernardston, Hoosic, Pittstown	Mesic / 30–50 Udic, some	120–180 13/3 57/8	 above about 4500 feet, alphe kruthmioiz and heart communes with stuffed balsam in, black spruce, and birch, Labrador tea, sheep laurel, and black crowberry. Alpine meadow areas above 4500 feet with low mat-forming shrubs, sedges, rushes, grasses, mosses, and lichens, including diapensia, Bigelow's sedge, highland rush, Lapland rosebay, and alpine bilberry. Chestnut oak, red oak, and formerly American chestnut on steep slopes. Hemlock on northern slopes. On lower slopes and more infertile soils, Appalachian oak-hickory forest 	Deciduous forest, some mixed deciduous and evergreen forest, pastureland, minor	64e. Glaciated Triassic Lowlands	 Flat to irregular plains, moist depressions, low hills and ridges. Low gradient streams with silt, sand, gravel, and bedrock substrates. Lowland streams once contained unique coastal 	50-480 / 25-50	Pleistocene glacial till of gravel, sand, silt, and clay; stratified drift in valleys; outwash and till plains, deltas, kame deposits, and moraines. Upper Triassic sandstones, siltstones, mudstones, arkose and conglomerates. Lower Ordovician	Inceptisols (Dystrudepts), Histosols (Haplosaprists)	Wethersfield, Watchaug, Carlisle	Mesic / 40–50 Udic, some Aquic	170–190 15/35; 60/84	 habitats support hemlock, paper birch, black birch, white pine, and basswood. Remaining fragmented woodlands transitional between Appalachian oak forest and hemlock-northern hardwoods forest. Oak forest on drier sites with red, white, and bl oaks, hickories, and historically, American chestnut. Moist valleys, ravines, and nor slopes contain sugar maple, beech, birch, and hemlock. On Staten Island, remnant serpentine barrens-grassland-savanna communities. Red maple-sweetgum swamps y 	Tallman Mountain State Parks. Mostly urban land in New York; some agriculture, residual truck farming and nursery crops, scattered woodlots. Public land in Great Kills Park.
58y. Catskill High Peaks	 gradient bedrock, boulder, and cobble- bottomed trout streams. Some natural lakes and ponds. 817 Stepped ridges and high peaks surrounded by radiating ranges and ridgelines. Few to no lakes. Cold to 	between hills. Ordovician slate and graywacke; Cambri- slate, phyllite, schist, and graywacke. 1000–4180 / Pleistocene glacial till shallow, discontinu absent. Exposed bedrock common. Upper Devogian shale, sandstope, and co	an quartzite, lous, or Fragiudepts)	, Vly, Oquaga, Lackawanna, Lewbeach, Mongaup, Halcott Arnot Elka	Aquic Frigid, Mesic on lower slopes /	90–125 9/2 ⁻ 51/7	 with white oak, black oak, pignut hickory, and historically, American chestnut. Abandoned farm fields colonized by red maple, eastern white pine, and sugar maple. North of Columbia County, northern hardwood forest begins to replace Appalachian oak-hickory forest. 7; Above 3000 feet, red spruce, balsam fir, and yellow birch. Witch hobble common in the understory. Shrub cover on rocky summits includes huckleberry, lowbush blueberry, and mountain laurel with nitch nine and scrub oak. On north slones and in cool moist areas. 	cropland for small grains and dairy forage crops. Small towns and rural residential areas. Deciduous forest, mixed forest, and evergreen forest. Bare rock. Little to no land clearing for agriculture. Bural	64g. Hackensack Meadowlands	 plain species such as mud sunfish and ironcolor shiner. 10 Low-lying wetland and marsh. Freshwater ponds and brackish lagoons tidal creeks. 	s, 0–10, bedrock autorops and landfills to	serpentinite. Pleistocene proglacial lake bed with sandy and silty substrates. Upper Triassic sandstone, siltstone, and mudstone.	Histosols (Sulfihemists), Inceptisols (Dystrudepts), Entisols (Udorthents)	Pawcatuck, Ipswich, Wethersfield, Greenbelt, Kleinekill	Mesic / 42–48 Udic, Aquic	180–220 26/38; 68/85	 swamp cottonwood, swamp white oak, pin oak, and black gum. Historically, Atlantic white cedar swamps, floodplain forests of pin oak, red maple, a swamp white oak. Presently, cattail, phragmites, and saltmarsh cordgrass cover vario marshlands. Other vegetation includes seashore saltgrass, blackgrass, sea lavender, statistical s	nd Salt, brackish, and freshwater marsh. Industrial and commercial ltwort, development, landfills, wildlife
58z. Adirondack High Peaks	 453 High glaciated mountains, with steep-sided narrow valleys. High gradient bedrock, 	1500–2800 / 800–1800Pleistocene glacial till, exposed bedrock, sand and gravel, fluvial sand and gravel.	lacustrine Spodosols (Haplorthods, Haplohumods)	Willowemoc Mundal, Mundalite, Rawsonville, Hogback,	Udic, some Aquic Cryic, some Frigid /	60–120 3/24 53/7	 northern hardwoods occur, with bigtooth and quaking aspen, paper birch, and black ash. A mix of northern and central hardwoods occurs below 3000 feet, including American beech, sugar maple, red maple, hemlock, white pine, basswood, American elm, and sycamore. 4; Between 1500 and 2500 feet, northern hardwood forest composed of sugar maple, beech, and yellow birch, mixed with red spruce, hemlock, and white pine. Between 2500 and 2000 feet pine. 	residential, tourism, recreation, public water supply, wildlife habitat. Public land in Catskill Park and Forest Preserve. Deciduous forest, mixed forest, and evergreen forest. Bare rock. Little to no	67 R	IDCE AND VAL	0-10							naonat, and insidery.
I Caks	boulder, and cobble-bottomed streams. A few mid-elevation lakes. Majority of lake fish species are nonnative. Brook trout naturally reproducing in 12% of ponds, stocked in others. Threatened round whitefish and summer sucker in a few ponds.	Proterozoic metanorthosite and anorthosi inclusions of charnocktite, mangerite, and gneiss.	tic gneiss; 1 syenitic	Ampersand, Knob Lock	Udic, some Aquic		2800 feet, red spruce, balsam fir, and yellow birches increase in transition to high elevation spruce-fir forest. Understory plants include mountain ash, mountain holly, and creeping snowberry.	land clearing for agriculture. Tourism, recreation, wildlife habitat. Public land in Adirondack Park.	Level IV Ecoregions	Physiography I D G E A N D V A L I Physiography I are Juare	Elevation / Local Relief	Geology Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series T	Temperature / Precipitation Moisture Mean annua Regimes (inches)	Climate	Ime Natural Vegetation	Land Cover and Land Use
58aa. Acid Sensitive Adirondacks	3275 Low to moderate-relief mountains and knobby hills interlaced by numerous rivers and streams. High density of lakes and wetlands. Lakes and streams with low pH and low acid neutralizing capacity are common. About 38% of smaller ponds are fishless. Brook trout are more tolerant of acidic stress than sensitive minnows.	1300–3900 / 100–1900Pleistocene glacial till, exposed bedrock, deposits, lacustrine sand and gravel, fluvi gravel. Proterozoic metasedimentary rocks, bioti amphibolite; charnockitic, granitic, mang quartz syenitic gneisses.	kame Spodosols (Haplorthods, al sand and Haplohumods) te, eritic, and	Becket, Tunbridge, Skerry, Mundalite, Rawsonville, Hogback	Frigid / 45–60 Udic, Aquic	60–120 2/2: 53/7	5; 75 Red, white, and black spruce and balsam fir grow in saturated or shallow soils. Red maple, 75 yellow birch, black cherry, and an understory of sheep laurel and blueberries may be associated with the conifers. Black spruce and tamarack occur in bogs and swamps with shrubs such as sheep laurel and labrador tea. Deeper soils support northern hardwoods such as sugar maple, beech, and yellow birch.	Deciduous forest, mixed forest, and evergreen forest. Little to no land clearing for agriculture. Logging, wildife habitat, tourism, recreation. Public land in Adirondack Park.	67j. Northern Glaciated Limestone Valleys	 Broad, flat to gently rolling valleys with a smoothed surface. Some karst areas; free interchange between surface stream flow and ground water. Streams have gentle gradients, extensive meanders, oxbows, and fine-textured substrates. Some wetlands; lakes uncommon. Broad, irragular, rolling to hilly valley. 	h 480–620 / 20–120 n	Pleistocene loamy, calcareous glacial till; lakebed sediments and ground moraine. Cambrian limestone and dolostone; Proterozoic calcitic and dolomitic marble.	Inceptisols (Eutrudepts), Histosols (Haplosaprists)	Pittsfield, Stockbridge, Georgia, Palms, Carlisle	Mesic / 35–50 Udic, some Aquic	140–180 18/35; 60/84	F) Forest vegetation limited to scattered woodlots of sugar maple and central Appalach hardwoods. Upland forests are typically mixed-hardwood, dominated by sugar mapl with white, black, and red oak, white ash, tulip tree, black birch, yellow birch, red m basswood, beech, and hickories. Understory trees include hop hornbeam and ironwo and shrubs include maple-leaved viburnum, black haw, spicebush, and beaked hazel Calcareous wetland types include swamps, fens, and sinkholes. Red maple, yellow b ash, basswood, tulip tree, and black gum grow in forested wetlands. Mixed oak sugar maple porthern bardwoods forest. Chastaut black and red oak his	In Deciduous forest, some mixed deciduous and evergreen forest, ple, wooded, shrubby, and herbaceous d, wetlands. Pasture and cropland, urban, suburban, and rural residential development.
58ab. Northern and Western Adirondack Foothills	2390 Ridges, foothills, and mountains of low to moderate relief. Deranged stream drainage and a network of intersecting glacial outwash channels. High water table with many wetlands and scattered larger lakes. Lake trout found in a few medium-sized lakes. Moderate gradient, tannic, sandy and cobble-bottomed	750–2000, isolated mountains to 2800 and 3300 / 75–600Pleistocene glacial till, kame deposits, flu sand and gravel, lacustrine sand and grav Proterozoic amphibolite, charnockitic, ma quartz syenitic gneisses; biotite and horni gneiss; calcitic and dolomitic marble in the portion.	vial outwash el. angeritic, and blende granitic ne northwest) Potsdam, Tunbridge, Becket, Monadnock, Skerry, Adams, Colton	Frigid, some 35–55 Mesic / Udic, some Aquic	90–145 2/2: 54/7	5; Second growth northern hardwoods such as sugar maple, beech, black cherry, and yellow birch. Significant amounts of white pine in western foothills and in northern outwash areas. Aspen and birch prominent in the northern foothills. Red, white, and black spruce and balsam fir grow in saturated or shallow soils. Black spruce and tamarack occur in bogs and swamps with understory shrubs such as sheep laurel and labrador tea. Historically, spruce dominated in this region, but it has not returned after logging.	Deciduous forest, evergreen forest, and some mixed deciduous and evergreen forest. Logging, wildlife habitat, tourism, recreation, some minor cleared land for forage crops. Public land in Adirondack Park.	671 Northern	 Meandering, low-gradient streams with steep banks and bedrock, boulder, gravel, sand, and clay substrates. Warmwater fishery in the Wallkill River of smallmouth bass, pickerel, and yellow perch. Limestone valley with fluvial terraces. 	d 260-500 /	Pleistocene glacial till, lacustrine silt and clay, fluvial sand	Fragiudepts, Endoaquepts), Alfisols (Endoaqualfs)	Arnot, Lordstown,	Mesic / 30–45	130–130 64/85 130–180 17/35:	and tulip tree grow in shallow soil. Upland forests are typically mixed-hardwood, dominated by sugar maple with white, black, and red oak, white ash, tulip tree, black yellow birch, red maple, basswood, beech, and hickories; understory trees include he hornbeam and ironwood, and shrubs include maple-leaved viburnum, black haw, spi and beaked hazel. Red maple, yellow birch, ash, basswood, tulip tree, and black gun in forested wetlands.	birch, bi
58ac. Eastern Adirondack Foothills	streams, with some impounded reaches. 1768 Ridges, foothills, and rounded low mountains with steep-sided narrow valleys in the south and the broader Ausable and Saranac valleys in the north. Moderate lake density. Some big lakes, like Lake George, stocked with	350–2650 / Pleistocene glacial till, exposed bedrock, 200–2300 deposits, lacustrine sand and gravel, and outwash sand and gravel. Proterozoic hornblende and pyroxene gra anorthorsite, Cambrian sandstone in the r Proterozoic calcitic and dolomitic marble	kame fluvial nitic gneiss, orth; , charnockitic,), Bice, Tunbridge, Lyman,) Becket, Skerry, Pyrities, Kalurah, Charlton, Hollis	Frigid, Mesic on lower slopes / Udic, some Aquic	90–145 4/28	 Northern hardwoods forest with some elements of Appalachian oak forest on slopes above the Hudson Valley and Champlain Lowlands. White pine is a prominent species, along with red maple, white ash, and northern red oak. Other Appalachian species found near 1000 feet include butternut, witch hazel, and eastern redcedar. 	Deciduous forest, mixed forest, and evergreen forest. Some farmland in river valleys in the north cultivated for forage crops and pasture. Tourism, recreation, wildlife habitat. Public land in Adirondack Park.	Glaciated Limestone Valleys and Terraces 67m. Northern	 interspersed ridges, and some karst terrain. Low gradient streams with gravel and cobble substrates. Folded and faulted parallel ridges, 	10-60 500-2289 /	and gravel. Devonian limestone, siltstone, and shale. Thin to discontinuous Pleistocene glacial till.	Eutrudepts, Fragiudepts)	Chenango, Bath, Mardin, Nassau, Stockbridge, Farmington	Mesic / 35–50	130–185 17/32;	forests are typically mixed-hardwood, dominated by sugar maple with white, black, red oak, white ash, tulip tree, black birch, yellow birch, red maple, basswood, beech, hickories; understory trees include hop hornbeam and ironwood, and shrubs include leaved viburnum, black haw, spicebush, and beaked hazel.	and and naple- con Deciduous forest, mixed forest,
58ad. Central Adirondacks	 1437 Low to moderate-relief mountains and hills. Moderate gradient cobble- bottomed streams. Lakes and streams 	1450–3360 / Pleistocene glacial till, exposed bedrock, deposits, lacustrine sand and gravel, and outwash sand and gravel.	kame Spodosols (Haplorthods, fluvial Haplohumods)	, Hermon, Becket, Monadnock, Tunbridge, Skerry, Mundalite,	Frigid / 34–60 Udic, Aquic	90–150 3/22 52/7	 4; Northern hardwoods such as sugar maple, beech, and yellow birch, mixed with red 75 spruce, hemlock, and white pine. Red and black spruce and balsam fir grow on shallow or saturated soils. Red and white pine are abundant on lake shores. White pine and spruce, 	Deciduous forest, mixed forest, and evergreen forest. Little to no cleared land for agriculture. Wildlife habitat, tourism,	Glaciated Ridges	exposed cliffs. High gradient streams have acidification risk.	80-1700	Upper Silurian sandstone, shale, conglomerate, and quartzite.	Fragiudepts)	Arnot, Wurtsboro, Nassau, Wellsboro, Morris	Aquic	63/81	exposed ridges, may be dwarfed. Pitch pine-scrub oak forest in more protected areas red maple, chestnut, scarlet, and white oak. Hemlock, tulip tree, and white oak in no depressions; hemlock and northern hardwoods in shaded ravines. On rocky ridges ar slopes, dense blueberry shrubland. Mountain laurel understory common in woodland	st Recreation, tourism, and wildlife habitat. Public land at Minnewaska State Park, private conservation land.
58ae. Tug Hill Plateau	 have moderate to high acid neutralizing capacity. Concentration of large lakes in the north. Gently sloping, relatively flat-topped plateau. High density of streams and bogs. Radial stream drainage pattern; 	Proterozoic anorthosite, calcitic and dolo charnockitic, granitic, mangeritic, and qu gneisses. 980–2000 / 50–300 bense Pleistocene glacial till, kame depo outwash sand and gravel, lacustrine sand, deposits.	sits, fluvial spodosols (Fragiorthods, Fragiaquods)	, Worth, Empeyville, Westbury	Frigid, Mesic 40–55 on lower slopes /	90–130 7/2: 56/7	 once abundant in the headwaters of the Hudson River, have been replaced by successional hardwoods after logging. 5; Historically, red spruce was mixed with a hemlock-northern hardwoods forest of sugar maple, beech, birch, and hemlock. Today, after extensive logging, sugar maple dominates in a beech-maple mesic forest, along with other successional hardwoods, such as black cherry, 	Deciduous forest, evergreen forest. Little agricultural clearing or cultivation. Wildlife habitat, recreation, wind-farming, and	83. E Level IV Ecoregions	ASTERN GREAT Physiography Area	LAKE Elevation /	S LOWLANDS Geology Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series	Temperature / Precipitatio	Climate on Frost Free Mean Tempera	Natural Vegetation	Land Cover and Land Use
58af. Tug Hill	 cool to coldwater streams with moderate to high acid neutralizing capacity. Numerous beaver ponds and reservoirs. Diverse fish assemblages, including pearl dace and blacknose shiner. 657 East to west sloping plateau, or cuesta, with eastern escarpment. Moderate 	485–1904 / Deep Pleistocene glacial till, kame depos 50–750 sand, fluvial outwash sand and gravel.	its, lacustrine Spodosols (Fragiorthods) Inceptisols (Fragiaquepts), Worth, Empeyville, s, Camroden, Pinckney	Udic, Aquic Frigid, Mesic 35–48 on lower	100–140 8/28 55/8	 white ash, and red maple. In state reforestation areas, forest plantations contain native white and red pine, with non-native Austrian pine, jack pine, Scotch pine, Norway spruce, white spruce, and European larch. Local conditions determine the occurrence of various types of swamps and bogs: spruce-fir, hemlock-hardwood, and red maple-hardwood swamps, black spruce-tamarack bogs, alder shrub swamps, and sedge meadows along streams. 8; Historically, northern hardwoods forest of sugar maple, beech, birch, and hemlock. Today, woodlots and abandoned farms contain successional hardwoods, such as sugar maple, black 	logging. Public land in state forests and wildlife management areas. Deciduous forest, evergreen forest, agricultural and rural residential land.	83a. Erie/Ontario Lake Plain	 Flat lake plain interspersed with moraines or drumlins, bounded inland by Pleistocene beach ridges. Many small streams originating on beach ridges drain the narrow plain. Migrator 	Local Relief (feet) 246–900 / 20–200	Pleistocene glacial till in scattered moraines and drumlins; lacustrine sand, silt, and clay; gravelly beach ridges. Devonian shale, siltstone, sandstone, and limestone. Upper Ordovician shale and siltstone.	Alfisols (Hapludalfs), Inceptisols (Eutrudepts), Entisols (Udorthents)	Collamer, Niagara, Hudson, Canandaigua, Rhinebeck, Howard, Phelps, Cosad, Alton	Moisture Regimes Mean annua (inches) Mesic / Udic, Aquic 26–45	al Mean annual (days) January min/n July min/max 130–185 19/32; 62/82	ax; (°F) Historically, before agricultural clearing, natural vegetation was largely beech-maple if with some chestnut and oak on gravelly soils. Today, these forest types are confined to woodlots. Elm, ash, and tulip tree may be present in the beech-maple forest, as is a divident herbaceous layer, with spring-blooming ephemeral wildflowers. Silver and red maples and green, white, and black ash occur in wetland depressions. Beaches and dunes support.	orest, erse elm, ort sea Cropland and urban centers. Deciduous forest, wooded wetlands, grasslands, and beaches. Dairy farming and cultivation of specialty crops, including grapes, orchard crops,
58ag. Rensselaer	 to high gradient cool water, boulder, cobble, and gravel-bottomed streams. Few natural lakes. Waterfalls and gorges (or "gulfs") occur in shale perimeter. Streams historically contained redside dace and blacknose shiner. 162 Elevated plateau with a rolling surface 	Middle and Upper Ordovician siltstone, s sandstone. 1000–1800 / Pleistocene rocky glacial till; stagnant ice 20, 50, 400 st	hale, and Fragiudepts)	Buckland, Glover, Brayton	slopes / Udic, Aquic Frigid / 36–46	90–135 13/2	 29; Northern hardwoods forest mixed with red spruce and balsam fir. Spruce flats of red, white, 	Dairy farming and cultivation for associated forage crops. Mostly forest, deciduous forest, some	83b. Champlain Lowlands	 species from Great Lakes into infand streams: sauger, black and silver redhorse, Atlantic salmon and steelhead (rainbow trout). Glaciated area of relatively low relief containing flat to gently rolling plains with some prominent hills. Low gradient streams and rivers with mostly 	d 95-720, isolated mountains to 1644 /	Pleistocene lake silt and clay, Pleistocene marine silt and clay, marine delta sand and gravel, quaternary glacial till. Ordovician limestone, dolomite, shale, slate, phyllite	Inceptisols (Dystrudepts), Alfisols (Hapludalfs, Endoaqualfs), Spodosols (Haplorthods)	Vergennes, Kingsbury, Hollis, Charlton, Tunbridge, Monadnock, Becket	Mesic, 30–34 some Frigid north / LIdic, Aquic	145–165 8/30; 60/81	Remnant valley clayplain forests of red maple, beech, hemlock, swamp white oak, bu oak, white oak, ash, and shagbark hickory. Small areas of pine-oak-heath sandplain fo with black oak, red oak, white pine, pitch pine, and red maple. Silver maple and green floodplain forests. On hills, northern hardwood forests of beech, vellow birch, sugar	Mixed deciduous and evergreen forest, deciduous forest, hay and pasture land, cropland, and urban and residential land Farming for hay
Plateau	and deep valleys to the east. High density of wetlands and ponds. Moderate to high gradient cool water streams with boulder/ cobble substrate and numerous waterfalls at plateau escarpments.	escarpment Cambrian quartzite greywacke with mino conglomerate.	or shale and		oule, Aquie	567	hardwood, and spruce-fir swamps, black spruce-tamarack bogs, wet sedge meadows, and sphagnum bogs occur. Dry escarpments and south-facing slopes support Appalachian oak- hickory and chestnut oak forests.	Minor clearing for hay or pasture; short growing season and stony soil limits farming. Rural residential development, tourism, recreation, and some mining for quartz sandstone (greywacke).	83c. Ontario	 sandy and silty substrates. Fish species include Atlantic salmon, muskellunge, and eastern sand darters. Boverse physiography with drumlin fields, moraines, kames, glacial lake plaine send darter location but to compare the sender of the sender sende	5-700 246–1100 45–300	and marble; Cambrian quartzite, limestone, dolostone, and sandstone. Pleistocene glacial till, kame deposits, lacustrine silt and clay, fluvial outwash sand and gravel, peat, and	Alfisols (Hapludalfs), Inceptisols (Eutrudepts)	Hilton, Ontario, Ovid, Collamer, Canandaigua,	Mesic / 30–45 Udic, Aquic	130–200 16/31; 61/80	 and hemlock. Some limestone bluff cedar-pine forest with northern white cedar, red p white pine, hophornbeam, and hemlock. Dry oak forests of red oak, white oak, white and heath shrubs. Jack pine dominates sandstone pavement barrens. Historically, beech and sugar maple grew on moist, fine-textured soils with smaller an of white oak on coarse-textured, drier sites. Basswood, elm, and white ash also occurr Today these forest formed to upondiate. Film block ash also occurr 	 silage corn, dairy, livestock, nursery and greenhouse products, some vegetables, small fruits, and orchards. Deciduous forest, grassland, limestone (alvar) barrens, crop and pasture land, ehreihuw end herbecome untlende.
5 0 N										and large wetland complexes. Low gradient streams converted to canals,		Devonian shale and limestone; Silurian sandstone, shale, limestone, and dolostone. Ordovician limestone		Lima, Kendaia, Manlius,			still found in poorly drained hardwood swamps. East of Lake Ontario, areas of shallow over limestone pavement barrens (also called alvar grasslands) occur, dominated by g	soil beaches, rural residential and urban centers. Farming for dairy, livestock,
Level IV Ecoregions Physiography Geology Soils Climate										which provide infestation routes for alien zebra mussel. Atlantic salmon once found in tributaries of eastern		and dolostone.		Farmington			sedges, prairie herbs, and shrubs. Trees, such as eastern red cedar, northern white ced oak, and paper birch root in crevices in the limestone rock. Other habitats found on the Ontario shore include lakeshore dunes and rich herbaceous or shrub fens fed by limey	r, bur forage crops, fruit, vegetables, and other specialty crops.
(s n	Area square miles)	Elevation / Surficial and Bedrock Local Relief (feet)	Order (Great Group	Common Soil Series	Temperature / Moisture Regimes Precipitat	ion Frost Free Mean Tem ual Mean annual January m (days) July min/r	nperature nin/max; max (°F)		83d. St. Lawrence	591 Relatively flat to gently rolling lake plain interspersed with occasional	177–600 / 45–100	Glacial lake or marine plain sand, silt, and clay; Pleistocene glacial till, minor kame deposits, minor	Alfisols (Epiaqualfs), Inceptisols (Eutrudepts,	Hogansburg, Muskellunge, Insula, Adjidaumo,	Frigid / 30–42 Udic, Aquic	120–140 5/25; 58/80	Remaining forests on clay soils include sugar maple, beech, hemlock, shagbark hicko bur and white oak. Sandy soils support black and red oak, white pine, pitch pine, and	y, and Crop and pasture land, deciduous forest, some mixed deciduous and
59c. Southern New England Coastal Plains and Hills	530 Irregular plains with some low hills. Numerous glacial drumlins. Ponds, small lakes, reservoirs, and wetlands are abundant. Extensive reservoir system for New York City and local uses. Low to moderate gradient	40-800 / 100-300Pleistocene sandy till; ice-contact gravel, sandy loamy till. Southeastern NY: Proterozoic gneiss; Car biotite-quartz-plagioclase gneiss and dolo Ordovician schist and amphibolite.	sand, and silt; nbrian pmitic marble; Inceptisols (Dystrudepts) Endoaquepts)	, Woodbridge, Paxton, Ridgebury, Hollis, Chatfield, Charlton	Mesic / 46–52 Udic, some Aquic	150–180 15/3 61/8	 Appalachian oak-pine forests with various combinations of red, white, scarlet, black, or chestnut oaks, white pine, red maple, hickories, and other central or transition hardwoods. On shallow dry rocky soils on upper slopes, chestnut oak, northern red oak, black oak, and some pitch pine. Oak-hickory forests with northern red oak, white oak, pignut hickory, shagbark hickory, or mockernut hickory. On midslopes, oak-hemlock-white pine forests that also include some black birch, black cherry, and red maple. A few areas of moist forests with 	Deciduous forest, woody wetlands; urban, suburban, and rural residential land. Hay, pasture, and some minor amounts of cropland. Some public state forest and state park lands.	1 B 3 B 3 E C C C C C C C C C C	 low ridges. Large wetland complexes. Atlantic salmon historically in many tributaries; dams blocked their migration. Lake sturgeon and muskellunge present in some streams. Parallel low ridges in the west, terraces 	s, 480–1479 /	exposed bedrock, peat and muck. Proterozoic biotite or hornblende granitic gneiss, leucogranitic and plagioclase gneiss, biotite quartz, calcitic and dolomitic marble; Ordovician dolostone and sandstone; Cambrian sandstone. Pleistocene glacial till, glacial lake beach ridges and	Endoaquepts), Spodosols (Haplorthods, Endoaquods) Inceptisols (Epiaquepts,	Naumburg, Croghan Malone, Kalurah, Hailesboro,	Frigid / 34–50	90–145 6/26;	maple. Red maple, swamp white oak, and white ash grow in wetland soils. Second growth northern hardwoods such as sugar maple, beech, black cherry, and yel	evergreen forest, urban centers. Farming for dairy, livestock, forage crops, and potatoes.
59g. Long Island Sound Coastal	 streams with silt, sand, gravel, cobble, and bedrock substrates. A number of streams support wild brown trout. 517 Flat to irregular plains, coastal beaches, bays, and tidal flats. Low gradient streams with silt, sand, and gravel 	0–250 / Pleistocene sandy till; sandy loamy till; n 20–50 sand, and silt; outwash gravel, sand, and estuarine marsh deposits.	noraine gravel, silt; saline or Entisols (Quartzipsammo Inceptisols (Dystrudepts	ents), Plymouth, Montauk, Haven,) Chatfield, Riverhead, Charlton	Mesic / 44–48 Udic, some Aquic	170–220 20/3 63/8	 sugar maple, northern red oak, American beech, and white ash. Swamps with red maple, green ash, hemlock or Atlantic white cedar. On small river floodplains, pin oak-green ash forest with some swamp white oak, American sycamore, red maple, and American elm. On uplands, coastal oak-hickory or oak-tulip tree forests with various combinations of red, white, scarlet, black, or chestnut oaks, white pine, red maple, hickories, and other central hardwoods. Black oak increased after disappearance of American chestnut. Coastal forests 	Deciduous forest, evergreen shrublands, woody wetlands, emergent herbaceous wetlands, salt marsh, beaches, some	Lawrence Valley	rolling toeslopes of the Adirondack foothills in the east. Few lakes. Low to moderate stream drainage density. Cooler water temperatures and frequen waterfalls block lowland fish species from upper valley streams.	95–500 it	deltas, lacustrine sand, minor kame deposits, peat, and muck. Proterozoic biotite quartz plagioclase gneiss, leucogranitic gneiss, amphibolite, calcitic and dolomitic marble; Ordovician shale, limestone, and dolostone; Cambrian sandstone and dolostone.	Eutrudepts), Alfisols (Endoaqualfs), Spodosols (Haplorthods)	Pyrities, Coveytown, Trout River	Udic, Aquic	57/79	birch. Aspen, birch, and balsam poplar are common. Red, white, and black spruce and fir grow in saturated or shallow soils.	balsam forest and evergreen forest, small- to moderate-sized farms, rural residential, and small towns. Farming for dairy, livestock, forage crops, and potatoes.
Lowland	substrates.	Cambrian biotite-hornblende-quartz-plag amphibolite, schist; coastal plain clay, sa	ioclase gneiss, nd, and gravel.				may have dense shrub layer and vines. Some moist forests with northern red oak, white oak, American beech, tulip tree, and flowering dogwood. In wetter areas, red maple, sweet gum, and pin oak. On coastal bluffs, pitch pine, eastern redcedar, post oak, and hickories with some northern bayberry and seaside goldenrod. On well-drained moraines, shrubs of northern bayberry, beach plum, poison ivy, beach rose, winged sumac. On low dunes, American beach grass, beach pea, seaside goldenrod. On low marshes and creek borders, smooth cordgrass. In high marshes, saltmeadow cordgrass, spikegrass.	pasture and minor amounts of cropland. Urban, dense suburban, and some rural residential land, coastal resorts and tourism, some commercial fishing.	83f. Mohawk Valley 2	1263 Irregular valley with rolling hills, low mountains, river terraces, and a narrow incised river valley. Moderate gradient streams with cobble, gravel, and sand substrates. Many fishes introduced from the Great Lakes and alien zebra mussel established.	400–1812 / 200–800 m ls	Pleistocene glacial till, fluvial outwash sand and gravel, kame deposits, lacustrine sand, silt, and clay, and some exposed bedrock. Ordovician shale, siltstone, sandstone, greywacke, limestone, and dolostone; Cambrian limestone, dolostone, and chert.	Entisols (Udipsamments), Alfisols (Hapludalfs), Inceptisols (Dystrudepts)	Oakville, Windsor, Hudson, Nassau	Mesic / 29–50 Udic, some Aquic	120–180 58/81	Sugar maple and beech dominate forests on moist, fine-textured soils. Hemlock may present in low numbers. Common shrubs include witch-hazel and hobblebush. Hem northern hardwoods forest on north slopes and in ravines. In river floodplains, silver dominant with green ash, elm, ostrich fern, and a diverse herbaceous layer. Northern cedar on exposed rocky balds.	be Agricultural land, woodlots, and urban centers, barge canal. Farming for dairy and livestock, pasture, hay, and forage crops such as corn for silage, grain, and soybeans. Specialty crops include market vegetables and strawberries.
59i. Hudson Valley ²	2126 Irregular valley, plains broken by hills and terraces; flatter glacial lake plain in the north. Narrow floodplain along the Hudson River. Estuarine species include shortnose sturgeon, American eel, and	165–700 / 25–350Pleistocene glacial till, exposed bedrock, sand, silt, and clay, fluvial outwash sand sand dunes. Devonian limestone, chert, and dolostone shales, greywacke, and siltstones. Cambr	lacustrine and gravel, Entisols (Udipsamments Alfisols (Hapludalfs) an shale and), Charlton, Chatfield, Hollis, Oakville, Nassau, Hudson, Vergennes, Windsor	Mesic / 26–45 Udic, some Aquic	120–185 15/3 60/8	34; In the south, an extension of Appalachian oak-hickory forest with black and white oak and pignut, mockernut, and shagbark hickories. To the north, northern hardwoods forest predominates. Pitch pine-scrub oak barrens can still be found in sandy areas on the glacial lake plain, particularly at Albany Pine Bush and Wilton Preserves. Freshwater tidal marshes and mudflats occur along the river as far north as Troy, New York.	Pasture and cropland, deciduous forest, mixed deciduous and evergreen forest, major urban, suburban, and rural residential land. Farming for dairy, livestock, grains, hay, soybeans, corn,	84. A	TLANTIC COAS	TAL PI	NE BARRENS		1				
	American shad. Upper Hudson River connected to Lake Champlain basin through the Champlain Canal.	slate.						fruit, and nursery stock.	Level IV Ecoregions	Physiography	Flovation /	Geology	Order (Creat Crean)	Soils	Tomporatura / Procinitatio	Climate	Natural Vegetation	Land Cover and Land Use
										illes)	Local Relief (feet)				Moisture Regimes Mean annua (inches)	Il Mean annual January min/m (days) July min/max	ax; °F)	
60. N Level IV Ecoregions	NORTHERN ALLE Physiography	GHENY PLATEAU Geology		Soils		Climate	Natural Vegetation	Land Cover and Land Use	84a. Cape Cod/Long Island	near moraines, and kettle topography with small lakes and ponds. Low gradient streams and rivers; most have been	10–50	and loose sandy till, outwash sand and gravel, kames, moralnes, and loose sandy till, outwash sand and gravel, Holocene dunes. Precambrian bedrock of granite, gneiss, and schist is accurated by 200, 400 fact or more of gravel, and solit	Inceptisols (Dystrudepts)	Riverhead	Udic 35–56	180-220 26/38, 68/85	oak, black huckleberry, blueberry, and bearberry. Sandplain grassland with little blues Pennsylvania sedge, poverty grass, bearberry, scrub oak, stiff aster, and bayberry. Sand heathlands with scrub oak, black huckleberry, bearberry, and lowbush blueberry. Sand rescaled a with beach grass beach grass consider goldeney, and heather Same	m, evergreen forest, urban and suburban development, pine barrens, shrublands, wetlands, grasslands,
60a. Glaciated Low 7 Allegheny Plateau 7	Area square miles) Dissected plateau with glacially- smoothed rolling hills and narrow to wide valleys. Streams subject to	Elevation / Local Relief (feet) Surficial and Bedrock 900–2515 Pleistocene glacial till, some exposed bed kame deposits, glacial lacustrine sand, flu sand and gravel.	Order (Great Group Irock, some Inceptisols (Dystrudepts) Ivial outwash Fragiudepts)	 Common Soil Series Mardin, Bath, Volusia, Lordstown, Solon, Valois, Chenango, Lackawanna 	Temperature / Moisture Regimes Precipitat Mean ann (inches) Mesic, some Frigid / Udic, Aquic 32–48	ion ual (days) Frost Free Mean annual (days) Mean Tem January m July min/r 110–150 14/3 57/8	apperature nin/max; max (°F) Appalachian oak forest on drier slopes and northern hardwoods on north slopes and moist locations. Historically, American chestnut, beech, sugar maple, white and black oak, white nine, and hemlock were common. Today, successional hardwoods dominate with more red	Deciduous forest, mixed deciduous and evergreen forest, wooded wetlands, and cleared land for agriculture. Dairy and	84c. Barrier Islands/ Coastal Marshes	 River has brook trout and once contained anadromous brook trout. Most other inlam waters dominated by largemouth bass. Flat to gently sloping plains, coastal bays and inlets, islands, bluffs, dunes, 	ud 0–50 / 0–10	Pleistocene outwash sand and gravel, Holocene dunes, beach strand.	Inceptisols (Dystrudepts), Entisols (Quartzipsamments),	Riverhead, Haven, Plymouth, Carver, Bridgehampton,	Mesic / 35–56 Udic, some	180–220 26/38; 68/85	Coastal forests of scarlet oak, black oak, post oak, beech, black gum, red maple, pitch pine, and American holly. Coastal forests may have dense shrub layer and vines include	ng beaches, wetlands, salt marshes, and
	flooding and scouring. Low gradient headwater streams may have diverse aquatic vegetation and support swallowtail and bridle shiners. Few natural lakes; Otsego Lake has lake trout and longnose sucker.	Devonian shale, siltstone, sandstone, and	drack minor Incenticals (Eraciudants	Wellsboro, Willdin, Lewbath, Napoli, Almond, Yorkshire		110 165 11/2	maple and black cherry and less hemlock than in the past. Groundwater-fed depressions support hemlock-hardwood swamps with hemlock, red maple, yellow birch, black gum, highbush blueberry, great rhododendron, and cinnamon fern.	livestock farming with cultivation of forage crops; rural residential and urban centers.		Marine fishes predominate.		Coastal deposits, clay, sand, and gravel.		rawcatuck, ipswich	Aquit		Beach strand with sea-rocket, dune grass, beach pea, and seabeach orache. Salt marsh saltmeadow and smooth cordgrass, spike-grass, and saltmarsh rush.	s with commercial and sport fishing. Public land in Fire Island National Seashore, Gateway National Recreation Area, and several state parks.
Neversink Highlands	flat-topped ridges of moderate relief and slope. Streams are adversely affected by acidic runoff. The Delaware River supports American shad, American eel, and a few bridle shiners and bluespotted sunfish.	isolated ridge to 2231 / 130–700	ind gravel. Fragiaquepts, Dystrudep	volusia, Arnot, Oquaga, Lordstown	Udic, some Aquic	56/7	79 areas. Appalachian oak forest of sugar maple, beech, and birdin of norm stopes and in moist 79 areas. Appalachian oak forest on south-facing slopes and at lower elevations. Species include several species of oak (red, chestnut, scarlet, and white), black gum, tulip tree, four species of hickory, flowering dogwood, and redbud. Historically, American chestnut was common. Hemlock grows with northern hardwoods forest on north slopes, in ravines, and in moist sites.	evergreen forest, mixed deciduous and evergreen forest, pasture and cropland, rural residential. Higher ratio of woodland to farmland than in Ecoregion 60a. Rural residential and urban centers.	SOURCES: American Bird Conservancy, 2000, Adirondack Mountains, Corne www.blm.gov/wildlife/plan/pl	Partners in Flight Bird Conservation Plan Il Laboratory of Ornithology, Ithaca, New _26_10.pdf.	for the v York,	Fisher, D.W., Isachsen, Y.W., and Rickard, L.V., 19 map sheets, Albany, New York, New York St map scale 1:250,000.Glitzenstein, J.S., Canham, C.D., McDonnell, M.J	970, Geologic Map of New Ya ate Museum, University of N ., and Streng, D.R., 1990, Eff	ork, 5 Kudish, M., 2 ew York, Mountai Lake Champla ects of Isle, Ver	000, The Catskill fores in Press, 218 p. ain Basin Program, 200 mont, www.lcbp.org/A	t - a history: Fleischmanr)4, Lake Champlain Basir tlas/index.htm.	As, New York, Purple Atlas, Version 3: Grand Omernik, J.M., Griffith, G.E., Irish, J.T., and surface waters - a national map: Corval Research Laboratory, U.S. Environmer 1:7,500,000.	Johnson, C.B., 1988, Total alkalinity of is, Oregon, Corvallis Environmental al Protection Agency, map scale
60c. Catskills ¹ Transition	1404 Dissected plateau in the west with rolling, flat-topped ridges and steep slopes; plateau escarpment in the east; mid-elevation ranges and ridgelines in the north. High to moderate gradient cool water streams with bedrock, boulder, and cobble substrates. Occasional natural lakes and ponds. Streams and impoundments renowned for brown trout fishery.	400–2400, isolated peaks to 3345 / 350–900 Pleistocene glacial till, exposed bedrock, deposits, fluvial outwash sand and gravel Devonian shale, sandstone, and conglome	minor kame Inceptisols (Fragiudepts, Dystrudepts)	, Willowemoc, Lewbath, Lewbeach, Halcott, Mongaup,Vly, Arnot, Lordstown, Wellsboro, Valois, Mardin, Volusia	Frigid, 35–60 Mesic lower slopes / Udic, some Aquic	90–120 11/3 54/8	 32; Central hardwoods or Appalachian oak forest at lower elevations or on south- and west-facing slopes. Species include several species of oak (red, chestnut, scarlet, and white), black gum, tulip tree, four species of hickory, flowering dogwood, and redbud. Historically, American chestnut was common. Dense laurel brakes (groves of mountain laurel) form beneath oak canopies. Hemlock-northern hardwood forest grows on north slopes, in ravines, and in moist sites. 	Deciduous forest, some mixed and evergreen forest. Some pasture and hay land. Limited farming for dairy and livestock. Recreation, wildlife habitat, rural residential development.	 Atwood, J.L., Rimmer, C.C., McFar Distribution of Bicknell's thru v. 108, no. 4, p. 650–661. Bailey, R.G., 1995, Description of t Miscellaneous Publication No Service, 108 p. + map. Bailey, R.G., Avers, P.E., King, T., a subregions of the United State compiled and edited by McNa Department of Agriculture–For 	 Iand, K.P., Isai, S.H., and Nagy, L.K., 199 Ish in New England and New York: Wilso ne ecoregions of the United States (2nd ed. 1391, U.S. Department of Agriculture–F nd McNab, W.H., editors, 1994, Ecoregio s (supplementary table of map unit descripted, W.H., and Bailey, R.G.): Washington, E 	96, on Bulletin, d.): Forest ons and ptions D.C., U.S.	 environment and land-use history on upland Valley, New York: Bulletin of the Torrey Bot Greller, A.M., 1972, Observations on the forests of from colonial times to the present: Bulletin of 4, p. 202–206. Greller, A.M., 1972, A classification of mature for Bulletin of the Torrey Botanical Club, v. 104 Greller, A.M., Calhoon, R.E., and Mansky, J.M., 19 stand on Long Island, New York: Botanical Club 	forests of the Cary Arboretun anical Club, v. 117, no. 2, p. 2 f northern Queens County, Lo f the Torrey Botanical Club, v ests on Long Island, New Yor , no. 4, p. 376–382. 078, Grace Forest - a mixed m fazette, v. 139, no. 4, p. 482–4	n, Hudson 106–122. Lake Champla Sheet Se Sheet Se Lambert, J.D. practical Wilson I k: Lapczak, S., V National esophytic Lefkowitz, A. 89. of Cunn	ain Basin Program, 200 eries No. 4: Grand Isle, , McFarland, K.P., Rim l model of Bicknell's th Bulletin, v. 117, p. 1–1 Wyllie, W.D., and Lawf l Park: Ottawa, Ontaric , and Greller, A.M., 19 ingham Park, Oueens (7, Wetlands in the Lake (Vermont, www.lcbp.org/ umer, C.C., Faccio, S.D., and the stribution in the normal. Ford, R.G., 1979, Climate parks Canada. 73, The distribution of tractional stribution st	 Champlain Basin, Fact factsht/wetlands2007.pdf. and Atwood, J.L., 2005, A ortheastern United States: of the St. Lawrence Islands e species on the uplands in of the Torrey Botanical Paleontological Research Institute. Glacial F org/ed/finger_lakes/nystate_geo3.html. Rensselaer Plateau Alliance, www.rensselaer Rohm, C.M., Omernik, J.M., and Kiilsgaard, phosphorus in lakes of the northeastern Management, v. 11, no. 1, p. 1-14 + ma Seischab, F.K., 1990, Presettlement forests o western New York: Bulletin of the Torrey 	atures of the Inland Basin, www.priweb. plateau.org/Home.html. C.W., 1995, Regional patterns of total United States: Lake and Reservoir b. The Phelps and Gorham Purchase in by Botanical Club, v. 117, no. 1, p. 27–38. Vegetation of Fire Island, New York: Bulletin
60d. Finger Lakes 2 Uplands and Gorges	2732 Northern edge of dissected Allegheny Plateau, rolling, glacially-smoothed hills and north-flowing drainageways. Large glacially carved lake beds, hanging valleys, and waterfall-eroded gorges. Streams tributary to the Finger Lakes may have migratory non-native rainbow trout, but historically had native Atlantic salmon. Two of the smaller Finger Lakes have ninespine stickleback.	382–2196 / 200–600Pleistocene glacial till, some exposed bec deposits, glacial lacustrine sand, silt, and outwash sand and gravel. Devonian shale, siltstone, and limestone.	Inceptisols (Dystrudepts, clay, fluvial Fragiudepts), Alfisols (Hapludalfs)	, Bath, Mardin, Lansing, Ontario, Honeoye, Lima, Hudson, Collamer, Schoharie, Valois, Erie, Langford, Manlius, Darien	Mesic / 30–45 Udic, some Aquic	130–190 58/8	32; Appalachian oak forest on drier slopes, including several oak species, oak/hickory, and, historically, oak/chestnut. Black, white, red, and chestnut oak mix with pitch pine and white pine on open ridges. Beech, sugar maple, hemlock, basswood, and tulip tree grow in soils with higher moisture content. Hemlock, basswood, bitternut hickory, and tulip tree in ravines with hemlock often dominating on ravine slopes. Black ash, silver maple, and elm occur in swamps on river floodplains and in the glacial troughs at the ends of the Finger Lakes.	In the south, a farm and woodlot mosaic, becoming more intensive in farming, residential, and urban development to the north. Deciduous forest, mixed deciduous and evergreen forest, wooded wetlands. Dairy farming, cultivation of forage crops, orchard fruit, wine grapes, truck crops, and nursery stock. Tourism, recreation, and wildlife habitat.	 Baker, J.P., Gherini, S.A., Christens Newton, R.M., Reckhow, K.H - interpretive report: Ray Broc 274 p. Bierhorst, J., 1995, The Ashokan Ca Purple Mountain Press, 116 p. Central Pine Barrens Joint Planning comprehensive land use plan, 	en, S.W., Driscoll, C.T., Gallagher, J., Mu ., and Schofield, C.L., 1990, Adirondack I k, New York, Adirondack Lakes Survey C tskills - a natural history: Fleischmanns, N and Policy Commission, 1995, Central Pi Volume 2: Existing conditions: Great Rive	inson, R.K., lakes survey Corporation, New York, ine Barrens er, New	 Grier, N.M., 1925, The geology of Long Island wi Harbor region and its flora: American Midlar Griffith, G.E., Omernik, J.M., Bryce, S.A., Royte, D., Metzler, K.J., and Hellyer, G., 2009, Eco with map, descriptive text, summary tables, a U.S. Geological Survey, map scale 1:1,325,0 Heimburger, C.C., 1933, Forest-type studies in the Cornell University Agricultural Experiment 	th especial reference to the Co nd Naturalist, v. 9, no. 11, p. 5 J., Hoar, W.D., Homer, J., Ke regions of New England (colo and photographs): Reston, Vin 00. Adirondack region: Ithaca, N Station Memo 165, 122 p.	bld Spring 31–563. irstead, pr poster ginia, lew York, Club, v. Lewin, D.C., York reg southeas McIntosh, R.F.	100, no. 5, p. 313–318 1974, The vegetation o gion: American Midlan 987, Pre-European settl stern New York: Ameri P., 1962, The forest cov d by land survey record P. 1972, Forests of the	f the ravines of the south d Naturalist, v. 91, no. 2, lement forest composition can Midland Naturalist, v er of the Catskill Mountains ds: American Midland Na	 a for the Torrey Botanical Club, v. 113, no of the Torrey Botanical Club, v. 114, no of the Torrey Botanical C	3, p. 298–306. al geography of New York State: Ann Arbor, purces Conservation Service, STATSGO purces Conservation Service (formerly Soil oil surveys of New York.
60e. Glaciated Allegheny Hills	641 High elevation section of glaciated Allegheny Plateau; plateau remnants, rolling hills, low mountains, and steep valley slopes. Occasional shallow lakes or ponds. Streams are of moderate gradient; some contain tonguetied minnow	1400–2548 / 200–900Pleistocene glacial till, some exposed beck kame deposits, fluvial outwash sand and Devonian shale, siltstone, and sandstone.	Irock, minor Inceptisols (Fragiudepts, gravel. Dystrudepts)	, Lewbath, Lewbeach, Willowemoc, Vly, Mongaup, Bath, Mardin, Ontusia, Napoli	Frigid, 35–60 Mesic lower slopes / Udic, some Aquic	90–120 11/3 54/7	 30; 78 Northern hardwoods predominate. Beech, sugar maple, hemlock, basswood, and tulip tree grow in soils with higher moisture content. Appalachian oak forest occurs on drier slopes, including red, white, and chestnut oaks, shagbark and pignut hickory, and historically, American chestnut. Understory shrubs include witch hazel, maple-leaf viburnum, shadbush, chokecherry, and flowering dogwood. 	Deciduous forest, some mixed deciduous and evergreen forest. Some agriculture for dairy, livestock, and forage crops. Rural residential development, timber production, and oil fields.	York, Central Pine Barrens Jor Clark, J.S., 1986, Coastal forest tree Long Island, New York: Ecolo Cleland, D.T., Freeouf, J.A., Keys, J. W.H., 2007, Ecological subreg	nt Planning and Policy Commission. populations in a changing environment, s gical Monographs, v. 56, no. 3, p. 259–27 I.E., Jr., Nowacki, G.J., Carpenter, C., and tions - sections and subsections of the con	southeastern 77. I McNab, iterminous	Hunt, D.M., Edinger G.J., Schmid, J., Evans, D.J., Young, S.M., 2002, Lake Erie gorges biodive analysis: Albany, New York, New York State Conservation, New York Natural Heritage Pr Johnson, E.A., and Smith, D., editors, 2006, Legacy:	Novak, P.G., Olivero, A.M., ersity inventory and landscape Department of Environments ogram, 99 p. + appendices an Conserving New York State's	and Monogra e integrity al McIntosh, R.F McIntosh, R.F McIntosh, R.F Ecology McMartin, B., York Country	aphs, v. 42, no. 2, p. 14 P., and Hurley, R.T., 19 v, v. 45, no. 2, p. 314–32 , 1994, The great forest Books.	64, The spruce-fir forests 26. t of the Adirondacks: Utic	In the Catskill Mountains:U.S. Department of Agriculture–Natural Res resource regions and major land resour and the Pacific Basin: Washington, D.C Agriculture Handbook 296, 669 p. + ma, New York, NorthU.S. Department of Agriculture–Soil Conser and major land resource areas of the U Conserver and major land resource areas of the U	e areas of the United States, the Caribbean, , U.S. Government Printing Office, p. ation Service, 1981, Land resource regions ited States: Washington, D.C., U.S.
60f. Cattaraugus Hills	774 Dissected plateau; broad rolling hills and plateau toeslopes. Incised stream channels. Low gradient streams with silty and gravelly substrates empty into Lake Erie. Rainbow trout migrate upstream from Lake Erie. Eastern sand darter once collected in Catternuous Const.	900–1800, isolated high point 1935 / 200–500Pleistocene glacial till; large gravel and s deposits, glacial lacustrine silt and clay, f sand and gravel. Devonian shale, siltstone, and sandstone.	and kame Inceptisols (Fragiudepts, luvial outwash Dystrudepts)	, Mardin, Volusia, Valois, Chenango, Erie, Manlius	Mesic / 32–48 Udic, some Aquic	110–150 12/2 57/7	 28; Northern hardwoods forest, consisting of sugar maple, beech, white pine, white, red, and chestnut oak, with eastern hemlock. Understory shrubs include mountain laurel and mapleleaf viburnum. On fine-textured soils, cucumber magnolia, red maple, white ash, and black birch may co-dominate. The shale cliff and talus community, consisting of red cedar, mountain maple, white ash, and slippery elm, occurs on the steep slopes of streams incised in the soft shales. Wetlands appear as fens, which are not as acidic as bogs. Fen vegetation 	Deciduous forest, mixed deciduous and evergreen forest, pasture and cropland. Emergent herbaceous wetlands. Dairy and livestock farming with some cultivation for forage crops; rural residential and urban centers; natural gas fields	Cline, M.G., and Marshall, R.L., 19 Cornell University, New York 61 p. Cogbill, C.V., and White, P.S., 1991	 ., 0.5. Department of Agriculture-Forest-76, map scale 1:3,500,000. 77, Soils of New York landscapes: Ithaca State Extension Service, Information Bu , The latitude-elevation relationship for spalachian Mountain chain: Vagatatic x 04. 	a, New York, alletin 119, pruce-fir 5, 153–175	 BIOUIVERSITY: Albany, New York, American Mu State Biodiversity Research Institute, New York Conservation, New York Natural Heritage Prog Kahl, J.S., Stoddard, J.L., Haeuber, R., Paulsen, S. Webb, J.R., Dewalle, D.R., Sharp, W., Drisco Murdoch, P.S., Roy, K., Webster, K.E., and U waters responded to the 1990 Clean Air Act. 	Scall of Natural History, New Y State Department of Environn ram, and The Nature Conserva G., Birnbaum, R., Deviney, F oll, C.T., Herlihy, A.T., Kellog Jrquhart, N.S., 2004, Have U. Amendments?: Environmenta	nental McNab, W.H. ncy, 100 p. States – .A., Forest S gg, J.H., Mills, E.L., St S. surface the Huds I Science Coasts.	, and Avers, P.E., comp section descriptions: V ervice Administrative 1 trayer, D.L., Scheuerell son River basin - a hist v. 19, no. 4, p. 814–822	bilers, 1994, Ecological su Vashington, D.C., U.S. De Publication WO-WSA-5, I, M.D., and Carlton, J.T., ory of invasions and intro 3.	 Bregions of the United partment of Agriculture-267 p. 1996, Exotic species in ductions: Estuaries and Government Printing Office, Agriculture U.S. Fish and Wildlife Service, 1997, Signific York Bight watershed: Charlestown, Rh Whitney, G.G., 1990, The history and status Allegheny Plateau: Journal of Ecology, Whittaker, R.H., and Woodwell. G.M., 1969 States 	e manupook 296, 156 p. + map. nt habitats and habitat complexes of the New de Island, U.S. Fish and Wildlife Service. If the hemlock-hardwood forests of the v. 78, no. 2, p. 443–458. ucture, production, and diversity of the oak-
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61. ERIE DRIFT PLAIN Level IV Ecoregions Physiography Colory Net 1V + t'										ic zones of southern and western New Yo partment of Environmental Conservation	ork: Delmar, , Wildlife	Atlanta, U.S. Department of Agriculture-For TP 21, map scale 1:3,500,000.	est Service, Technical Publica	tion R8- National Ocea of tempe Climato	anic and Atmospheric A erature, precipitation, a graphy of the United S	Administration, 2002, Mo nd heating and cooling do tates No. 81- New York:	Inthly station normalsEcological Land Classification Series NInthly station normalsWill, G.B., Stumvoll, R.D., Gotie, R.F., and SInthly station normalsNorth Carolina,Inthly station normalsNorth Carolina,	mith, E.S., 1982, The ecological zones of Game Journal, v. 29, no. 1, p. 1–25.
	Area (square	Elevation / Surficial and Bedrock	Order (Great Group	Solls o) Common Soil Series	Temperature / Precipita Moisture Mean area	tion Frost Free Mean Ten Mean annual Japaner	nperature min/max;	Lang Cover and Land Use	Edinger, G.J., Evans, D.J., Gebauer, editors, 2002, Ecological com	S., Howard, T.G., Hunt, D.M., and Oliver nunities of New York State, Second edition	ro, A.M., on: Albany,	Kiviat, E., 1991, The northern Shawangunks - an e York, Mohonk Preserve, Inc., 107 p.	cological survey: New Paltz,	New National New York National	I Climatic Data Center. tural Heritage Program	, 2009, Online Conservat	ion Guides. http://www. woods, A.J., Omernik, J.M., Brown, D.D., K ecoregions of Pennsylvania and the Bh	ilsgaard, C.W., 1996, Level III and Level IV e Ridge Mountains, the Ridge and Valley, a West Virginia and Member 1 Country
61c. Low Lime Drift	miles) 1090 Rolling landscape of ridges, moraines, and	(feet) 1000–2000 / Pleistocene glacial till; stratified drift of a	sand, silt, and Inceptisols (Fragiaquept	s, Volusia, Chadakoin,	Regimes Mesic / 32–48	(days) July min/ 3 120–160 14/	/max (°F) /31; Beech-maple forest in moist locations. Northern hardwoods with some hemlock on better	Deciduous forest, pasture and cropland,	New York, New York State of York Natural Heritage Program Evans D.L. and VanLuven D.E. 20	Department of Environmental Conservati n. 2007 Biodiversity in New York's state park	ion, New	Kucnier, A.W., 1964, Potential natural vegetation o York, American Geographical Society, Specia 1:3,168,000.	1 the conterminous United Sta al Publication no. 36, 116 p., r	nes: New acris.nyi nap scale New York Sta Assessm	te Department of Envir nent, LP-203 8/82, 110	ronmental Conservation, p.	1981, Forest Resource Oregon, U.S. Environmental Protection	A, WEST VIRGHIA, and Waryland: Corvallis, Agency, EPA/600/R-96/077, 49 p.

and clay, and fluvial sand and gravel. Upper Devonian shale, siltstone, and sandstone. Plain Eutrudepts), Alfisols Chautauqua, Busti, Venango, and floodplain swamps with fine-textured substrates. Occasional kettle ponds. Several biologically diverse streams supporting threatened darters and mussels. (Fragiaqualfs) Erie, Chenango

Summary Table: Characteristics of the Ecoregions of New York