

LAND USE LAND COVER CLASSIFICATION SYSTEM (2007)

NJDEP MODIFIED ANDERSON SYSTEM

Derived from: A Land Use and Land Cover Classification System for Use with Remote Sensor Data, U. S. Geological Survey Professional Paper 964, 1976; edited by NJDEP, OIRM, BGIA, 1998, 2000, 2001, 2002, 2005, 2007, 2010. (Classes used in NJDEP mapping programs shown in **bold**)

1000 URBAN OR BUILT-UP LAND

The Level 1 Urban or Built-up Land category is characterized by intensive land use where the landscape has been altered by human activities. Although structures are usually present, this category is not restricted to traditional urban areas. Urban or Built-up Land Level II categories include Residential; Commercial and Service; Industrial; Transportation, Communication and Utilities; Industrial and Commercial Complexes; Mixed Urban or Built-up; Other Urban or Built-up and Recreational. Included with each of the above land uses are associated lands, buildings, parking lots, access roads, and other appurtenances, unless these are specifically excluded.

Urban or Built-up Land takes precedence over other categories when the criteria for more than one category are met. For example, recreational areas that have enough tree cover to meet Forest category criteria are placed in the Recreational category.

1100 RESIDENTIAL

The residential category includes single-family residences, multiple-unit dwellings and mobile homes. Also included is the mixed residential group, which is comprised of two or more of the above groups. Residential areas are easily identified on aerial photographs by the shapes and patterns of individual houses, housing developments and multiple dwelling (apartment or condominium) complexes. They can also be identified by their proximity to urban centers or roadways.

Residential areas which are integral parts of other land uses and located on the site of that land use are included in that land use category. For example, residential units may be found on military bases or on college campuses in the form of barracks, apartments or dormitories. These residences would be mapped as their associated land use.

Residential area categories are based on density in terms of dwelling units per acre (DUPA). In order to determine density at Level III mapping scale, an acre grid is placed over residential areas on the photoquad base map and the number of residential structures or portions of a structure is counted. An average number of dwelling units per acre is determined and the area is mapped accordingly. Multiple unit structures, such as 2 or 3-family homes, may be included within single-unit residential areas since they are not extensive enough to be mapped individually. Also, commercial areas too small to be mapped separately may be found within residential areas.

1110 Residential (High Density or Multiple dwelling)

This category contains either high-density single units or multiple dwelling units on 1/8 to 1/5-acre lots. These areas are found in the densely populated urban zones and generally are characterized by impervious surface coverage of ~65%.

1111 Single Unit, High Density

This category contains single unit residential areas of more than 5 dwellings per acre. These are generally found in densely populated urban areas.

1112 Multiple Dwelling, Low Rise (3 stories or less)

This category contains residential areas of 2 and 3 family homes, row houses and garden apartments of up to 3 stories. These are generally found in the urban or urban fringe areas of cities.

1113 Multiple Dwelling, High Rise (4 stories or more)

This category includes residential areas comprised of condominiums, apartment complexes and towers of 4 stories or more, generally found in or near urban areas. Multiple dwelling residences can be identified on aerial photography by their size, height, construction pattern and the location of driveways and parking lots.

1120 Residential (Single Unit, Medium Density)

This category is comprised of residential urban/suburban neighborhoods greater than 1/8 acre and up to and including 1/2 acre lots. These areas generally contain impervious surface areas of ~30-35%

1130 Residential (Single Unit, Low Density)

This category contains single unit residential neighborhoods with areas greater than 1/2 acre up to and including 1-acre lots. These areas generally contain impervious surface areas of ~20-25%

1140 Residential (Rural, Single Unit)

This category contains single unit residential neighborhoods with areas between 1 acre and up to and including 2-acre lots. These areas generally contain impervious surface areas of ~15-20% or less. This type is found in sparsely populated regions surrounded by or adjacent to forested or agricultural lands. Also included are estates or modern sub-divisions with large lot sizes providing a density less than or equal to 1 dwelling unit per acre. Impervious surface areas in the more rural settings can be as low as 5%.

1150 Mixed Residential

The mixed residential category is used for an area where various residential uses occur and the individual uses cannot be separated at mapping scale (1 acre). Where more than 1/3 intermixture of other residential use or uses occurs in a specific area, it is classified as mixed residential. Where the inter-mixtures of other residential land use or uses total less than 1/3 of the specified area, the dominant land use category is applied. Impervious surface coverage in

these areas can vary significantly.

1200 COMMERCIAL & SERVICES

Areas that contain structures predominantly used for the sale of products and services are classified as Commercial and Services.

The main building, secondary structures and supporting areas such as parking lots, driveways and landscaped areas are also placed under this category, (unless the landscaped areas are greater than 1 acre in size in which case they are put into a separate category). Sometimes non-commercial uses such as residential or industrial intermix with commercial uses making it difficult to identify the predominant land use. These categories are not separated out; but, if they exceed 1/3 of the total commercial area, the Mixed Urban category (16) is used. Often, specific uses of some commercial and services buildings cannot be easily identified from photography alone. Some supplemental information is required. These areas generally have a high percentage of impervious surface coverage. Any of the specific uses listed below may be included in the 1200 category, with the exception of Military Installations which are delineated separately under the code 1211.

1201 Central Business District (CBD)

These are the "downtown" banking and commercial centers of cities or towns where land use is largely undifferentiated. Retail stores, banks, office buildings, post offices, libraries, firehouses and courthouses are examples of structures that may comprise a CBD. Some public land uses such as schools and cemeteries are separated out into other categories if they are of a mappable size.

CBDs can exist in any size city or town. Metropolitan CBDs can be easily identified by their large number of high-rise buildings surrounded by parking lots. They are usually easily accessed by interstate bypass routes. Medium-size CBDs contain 3 and 4 story buildings fronted by parking spaces. They are away from the main traffic intersections of cities and often expand outward from railroad lines. Small towns CBDs contain 2 or 3 story buildings that line the streets and are in close proximity to residential structures. They usually parallel main traffic arteries.

1202 Commercial Strip Development

This is the commercial activity developed along major highway and access roads to cities and towns in a more or less single strip. Motel accommodations, car dealers, fast food services, gas stations and other similar goods and services establishments are examples that may comprise a Commercial strip. Location of these building along a main vehicular transportation route is the key criterion. Frequently, especially in suburban areas, residential and industrial land uses intermix with Commercial Strip Development. When these uses exceed 1/3 of the total contiguous length of the Commercial Strip, the Mixed Urban category is used.

1203 Isolated Commercial Establishments for Goods and/or Services

This category pertains to commercial establishments providing goods and services for direct consumer use. Isolated single commercial buildings or isolated cluster of commercial buildings that are not part of a Commercial Strip Development or a well-defined CBD are included in this category.

These buildings are distinguished from Isolated Commercial Office Buildings (1204) because they provide goods and services for direct consumer use while 1204 does not. Some examples are fast

food services, dry cleaners, gas stations and banks. Professional buildings that house medical offices, real estate brokers, law firms and travel agents are included in this category as well.

1204 Isolated Commercial Office Buildings

This category pertains to scattered commercial development, specifically commercial office buildings (not providing goods and services for direct consumer use). Isolated single commercial buildings or isolated clusters of commercial buildings that are not part of a Commercial Strip Development or well-defined CBD are included in this category. These buildings are distinguished from the Isolated Establishments for Goods and Services because they do not provide products and services directly to the consumer. Buildings can house administrative and support staffs for large corporations or staffs for several smaller businesses. These buildings can range in size from 2 to 3 stories to high-rise structures.

When several Commercial Office Buildings exist together and share common driveways, parking lots and lawns they are placed in the industrial and Commercial Park category (151).

1205 Shopping Centers

A Shopping Center is a group of retail stores and other commercial establishments planned, developed, owned and managed as a unit, with off-street parking provided on the property. Shopping centers range in size from those of just a few thousand square feet to plazas covering acres. Key identification features are large and often interconnecting buildings surrounded by well-paved parking lots located near interchanges and highways. Retention ponds located on the property, if of a mappable size are included in the Artificial Lake category (531).

1206 Resorts, Hotels, Motels & Related facilities

These facilities usually associated with leisure time activities contain over-night accommodations, dining facilities, services and recreational activities. They range in size from converted farmhouses to luxury resort hotels. Features that help define them such as tennis courts, pools, golf courses, ski slopes and well kept lawns and gardens are all included in the category. (These features are included with the resort since they are private and not accessible to non-paying guests). Hotels within urban areas are generally not mapped separately because they are difficult to distinguish from other commercial buildings.

1207 Educational Institutions

This category includes all levels of public and private schools, colleges, universities and training centers. All buildings, campus open space, dormitories and parking areas are included. Not included are recreational facilities such as ball fields, tennis courts, stadiums and swimming pools. These recreational facilities are included in Recreation (18) if they are of a mappable size. Universities can often be identified by a maze of walkways linking various buildings. Elementary and secondary schools are usually 1 or 2 story buildings surrounded by recreational fields and located in residential areas away from high traffic volumes. Any educational activity associated with religious institutions involving parish schools, seminaries, orphanages and novitiates, if of a mappable size, are included in this category.

1208 Health Institutions

Any facility providing direct health care to the public such as hospitals, mental health institutions, sanitariums, special care centers, major clinics and nursing homes are included in this category.

Some identifiable features may include circular drives, covered main entrances, multi-story buildings with wings, large parking lots and spacious grounds.

1209 Correctional Institutions

Prisons and rehabilitation centers make up this category. They can be identified by high walls and controlled access points. Topographic maps should be consulted to make sure minimum security prisons are not over-looked. Land uses, such as farmland or quarries associated with prisons are mapped separately according to their appropriate land cover/land use category.

1210 Government Centers

This category includes any state, regional, county or municipal office buildings. They can range in size from 1 or 2 story buildings to high-rise complexes. Any government office located in the CBD (1201) or along a Commercial Strip (1202) is included in those categories unless it is of a mappable size.

1211 Military Installations

Military bases and camps, armories, ordinance depots, missile sites, National Guard and Reserve armories are included in this category. Boundaries of major military installations are identified by fence lines and roads along their perimeter. Military facilities have a wide variety of conditions including training camps, missile sites, etc. Auxiliary land uses, particularly residential, commercial and other supporting uses located on a military base should be included in this category.

1212 Other Institutional

This category includes any other institutions not included in the other categories. Some examples are churches, synagogues, convents, special research facilities, medical research facilities not open to the public, and social clubs associated with established organizations.

1213 Mixed Commercial & Services

This category is used when a mix of various commercial uses and services exist and no one category predominates. When more than 1/3 of one commercial use is mixed with another use this Mixed category is used. Where the intermixture total less than 1/3 then the dominant use is mapped.

1214 Former Military; Indeterminate Use

Included in this category are portions of former military installations, that have been de-commissioned and sold. New development of these areas has not yet begun, so particular use can be determined from the photography. Many of the undeveloped portions of these former military sites may remain as preserved undeveloped open space. Developed areas may be re-developed for other uses. However, in all cases, the new intended use is not discernible from the latest available photography, or other ancillary data.

1300 INDUSTRIAL

This category encompasses a great variety of structure types and land uses. Light and heavy industry are comprised of land uses where manufacturing, assembly or processing of products takes place. Power generation is included here because of its similarity to heavy industry. These

areas generally have a high percentage of impervious surface coverage.

1310 Light Industrial

Light industry deals with design, assembly, finishing, packaging, and storing of products or materials that have usually been processed at least once. These activities are characterized as "clean", since they produce a relatively small amount of smoke and other effluents, noise, and dust.

Light industries include facilities for administration, research, assembly, storage, warehousing, and shipping. Examples are electronics firms, trucking companies, small textile mills, and auto assembly plants. Characteristic features may include the nature of the buildings, parking and shipping arrangements, the presence of outdoor storage facilities, trailer trucks, loading docks, rail lines, power sources and smokestacks.

1320 Heavy Industrial

Heavy industry involves the processing of raw materials such as iron ore, timber, petroleum or coal, or the fabrication and assemblage of parts that are bulky and heavy

Examples of heavy industry are steel, pulp, and lumber mills, oil refineries and tank farms, chemical plants, and grain mills. Recognizable features include blast furnaces, kilns, chemical processing towers, large chimneys or stacks, fuel tanks, boiler house, transformer yards, silos, bins and piles and ponds of water. Also included in this category are surface structures associated with mining operations: loading devices, trucks, access roads processing facilities, stock piles, and storage sheds.

1330 Power Generation

There are three main types of power generators: thermal, nuclear and hydroelectric. Features common to all three types are the presence of transmission lines and transformer yards, and often, proximity to water.

Both thermal and nuclear plants usually have cooling towers for used water. Thermal plants often have associated coal piles and conveyor belts leading to the main plants. Nuclear plants have a characteristic nuclear reactor building. Hydroelectric plants are usually at the dams of large reservoirs or impounded streams, or at an elevation break on a watercourse. Typical features include a dam and trailraces.

1400 TRANSPORTATION, COMMUNICATION & UTILITIES

The transportation, communication, and utilities land uses are often associated with the other Urban or Built-up categories, but are often found in other categories. However, they often do not meet minimum mappable size and are considered an integral part of the land use in which they occur. The presence of major transportation routes, utilities such as sewage treatment plants and power lines, power substations, and communication facilities greatly influence both the present and potential uses of an area. These areas generally have a high percentage of impervious surface coverage .

1410 Major Roadway (2002)

Major roadways include limited access highways that typically contain at least two lanes in each direction, separated by a concrete barrier or median strip. There are usually no cross streets or traffic lights, and access is limited to ramps. Included in this category are service (rest) areas, right-of-ways, interchanges, maintained hillsides, other service and terminal facilities and portions of local roads. Examples are interstates, U.S. highways and freeways.

Limited access highways are characterized by "diamond" and "clover-leaf" patterns of ramps, crossroads intersecting via underpasses or overpasses, and the lack of adjacent residential, commercial or industrial development with direct connections to the highway. Limited access highways right-of-way are often bounded by fences or drainage paths.

1411 Mixed Transportation Corridor Overlap Areas (2007)

Mixed transportation corridor overlap areas are intersection areas between different transportation categories. Typical features would be located where railroad tracks cross roadways, or where major roadways cross other mapped non-major road features.

1419 Bridge Over Water (2002 - WATER)

Bridges over water are characterized by having significance in the delineation of watercourses flowing below. Any bridge or portion of roadway constructed over a mappable open water body has been identified and characterized as water. Although the bridge surface is impervious, the structure does not impact or alter the impervious nature of the water flowing below.

1420 Railroad Facilities (2007)

Railway facilities include railroads and spurs as well as stations, parking lots, roundhouses, power generators, and repair and switching yards. Spurs that connect industrial or extractive pick-up points with main rail lines are included in the appropriate industrial or extractive category.

1430 Bus and Truck Terminals

Bus and truck terminals are characterized by long buildings with truck trailers or buses adjacent to them. There are large paved areas surrounding the garages, which are used for maneuvering and parking. Terminals are often located in close proximity to major transportation routes.

1440 Airport Facilities (2002)

Airport facilities are characterized by the presence of long, linear runway surfaces and adjacent areas cleared of vegetation and other obstructions.

Typical moderate to large-sized airports contain parallel primary runways, smaller parallel taxi strips, intervening land, aircraft parking aprons, hangars, terminals, service buildings, navigation aids, fuel storage areas, parking lots, and limited buffer zones. This category also include heliports and land associated with seaplane bases. It does not include other built-up land of small airports.

1450 Port Facilities

Seaports are isolated areas of high utilization with no well-defined intervening connections. Included

in this category are docks, piers, shipyards, drydocks, locks, waterway control structures, buildings, parking lots and adjacent water utilized by ships in the loading or unloading of cargo or passengers.

1460 Power Facilities

Power facilities include power substations associated with transmission line right-of-ways where the right-of-way is clearly visible on aerial photography and not used for any other purpose. On aerial photography, power substations appear as geometric configuration with associated transformers and transmission lines extending outward. Those associated with an industrial, commercial, or extractive land uses are included in this category.

Right-of-ways in urban and agricultural land are sometimes difficult to see because there is usually no demarcation from the surrounding land. Additionally, the surrounding activity also occurs in the right-of-way most of the time and would be mapped as the Level III category it is traversing.

When there is a clear demarcation of the right-of-way, it would be mapped separately when traversing a wetland, a forest, or an urban environment, but would be mapped as a 1461, 1462, or 1463 Level III category.

For example, transmission line right-of-ways are clearly discernible where they traverse forest: there are no trees, and vegetation growth is controlled through periodic mowing or herbicides. These areas are allowed to regenerate for 5 to 10 years and do support a variety of wildlife during this period. This differs greatly from areas obviously maintained on a much more frequent basis.

1461 Wetland Rights-of-Way (WETLAND)

Included in this category are rights-of-way that exist in former wetland areas, and which still exhibit evidence of soil saturation on the photography. Because of alterations associated with creating the rights-of-way and the periodic clearing, these areas may not support the typical natural wetland vegetation found in adjacent unaltered natural areas. They may, however, support shrubby forms of the surrounding vegetation. They do, however, exist in areas shown on the Natural Resources Conservation Service soil surveys to have hydric soils, and exhibit the darker tonal signatures associated with saturated soils on the photography. Colors of these areas will vary generally from blue-gray to black on winter CIR film and dark gray to black on panchromatic film. Textures will generally be smooth to slightly rough depending on whether the dominant vegetation is low herbaceous species or taller shrubs.

1462 Upland Rights-of-Way, Developed (2002)

Included in this category are Rights-of-Way in uplands that exist in developed areas. These areas looked well maintained, usually in mowed grass, but are not part of adjacent land use. It should include areas adjacent to urban or agricultural areas but not visibly used in connection with any agricultural or urban land use. They may contain access roads and have a clear separation from surrounding land use. Because of alterations associated with maintaining these portions of the rights-of-way, these areas may not support typical natural vegetation. Textures will generally be smooth due to the lack of low herbaceous species or taller shrubs.

1463 Upland Rights-of-Way, Undeveloped (2002)

Included in this category are Rights-of-Way in uplands that usually exist in undeveloped non-urban areas. They typically support shrubby forms of the surrounding vegetation, which may be periodically cut or mowed back. Because of alterations associated with creating the rights-

of-way, these areas may support the natural vegetation found in adjacent unaltered natural areas. It should also include areas adjacent to agricultural areas but not visibly used in connection with any agricultural or urban land use. Textures will generally be smooth to slightly rough depending on whether the dominant vegetation is low herbaceous species or taller shrubs.

1470 Water Treatment Facilities

Water treatment facilities consist of buildings with adjacent circular or rectangular tanks. They are usually restricted to moderately sized towns and cities, rather than rural areas. Water treatment facilities and sewage treatment facilities are often similar in appearance on aerial photography. However, many water treatment facilities are upstream from the community served, whereas the sewage treatment facilities are often downstream.

1480 Sewage Treatment Facilities

Sewage treatment plants are often adjacent to streams or rivers. Identifiable features include an array of rectangular or circular tanks for initial processing, settling and aeration, and associated low buildings. Like water treatment facilities, they are usually restricted to moderately sized towns and cities rather than rural areas, where individual septic systems are prevalent. Also included in this category are pumping stations, sewage mains, and tertiary treatment fields.

1490 Other Transportation, Communication and Utilities

This category consists of related facilities not included in any of the previous Level III categories. Included are radio, radar, and television antennas, microwave stations, water towers, and lighthouses. Towers include the land enclosed by guide wires. Fence-lines, trimmed or mowed grounds, and access roads are associated with many of these facilities.

1499 Stormwater Basin (2002)

This category consists of stormwater management basins or areas identified as serving the function of a surface water collection site. They are typically associated with new commercial and residential areas. They may contain water and show varying degrees of management or vegetation.

1500 INDUSTRIAL & COMMERCIAL COMPLEXES

The Industrial and Commercial Complexes category includes those industrial and commercial land uses that typically occur together or in close proximity. These areas are commonly referred to as "Industrial or Commercial Parks." The major types of business establishments located in these planned industrial and commercial parks are light manufacturing, administration offices, research and development facilities, and computer systems companies. Also found here are facilities for warehousing, wholesaling, retailing and distributing.

Industrial and Commercial Complexes are usually located in suburban or rural areas. The key identifying feature is the planned layout of buildings exhibiting the same or very similar construction. Other identifying features include well kept lawns and landscaped areas, ample parking areas and common roadways connecting buildings that also provide access to major highways. The lack of smokestacks, storage tanks, raw materials or finished products, and waste signifies that no heavy industries are present. These areas generally have a high percentage of

impervious surface coverage (~85%) and some may be up to 100%.

1510 Industrial and Commercial Parks

See category 15 for description. Clusters of commercial office buildings that happen to exist side by side but do not share common roadways and landscaped areas are included in the Isolated Commercial Office building category (1204).

1600 MIXED URBAN OR BUILT-UP

This category includes those urban or built-up areas for which uses cannot be separated into individual categories at the mapping scale employed. Areas are identified under the mixed urban category when more than one-third intermixture of another use or uses is evident.

Uses considered in mixed urban include primarily residential, commercial/service, industrial and transportation/communication/utility. Not included in the category are areas considered part of a definable commercial strip as described under 1202. In addition, open land that could be classified for any agricultural use would not be included in the mixed urban category.

Level 3 divisions of the Mixed Urban category involve separating the mixed areas based on the predominant use in the intermixture, if one is evident.

1610 - Predominantly Residential - (>50%, but <66% of the use can be identified as Residential).

1620 - Predominantly Commercial/Service - (>50%, but <66% of the use can be identified as Commercial/Service).

1630 - Predominantly Industrial - (>50%, but <66% of the use can be identified as Industrial).

1640 - Predominantly Transportation/Communication/Utilities - (>50%, but <66% of the use can be identified as Transportation/Communication/Utilities).

1650 - Heterogeneous Mixture - (No single use in the intermixture comprises more than 50%).

1700 OTHER URBAN OR BUILT-UP

Included are undeveloped, open lands within, adjacent to or associated with urban areas. Some structures may be visible, as in the case of abandoned residential or commercial sites that have not yet been redeveloped. The land cover in these areas may be brush-covered or grassy. Large, managed, maintained lawns common to some residential areas, and those open areas of commercial/service complexes, educational installations, etc., are also included. Undeveloped, but maintained lawns in urban parks are also part of this category, if a specific recreational use is not evident. In addition, areas that have been partially developed or redeveloped but remain unfinished are included. Cemeteries were included in this category in 1986 & 1995, but were separated out for 2002.

1710 Cemetery (2002)

These areas represent large tracts of primarily open land within urban areas. Large cemeteries can be identified by layout of driveways, lots, mausoleums and marking stones. Cemeteries associated with small towns, individual churches or family estates may not be

easily identifiable. Supplemental information is often needed to identify these smaller cemeteries.

1711 Cemetery on Wetland (2002 - WETLANDS)

These areas represent large tracts of primarily open land within urban or rural areas on land identified as wetland. Large cemeteries can be identified by layout of driveways, lots, mausoleums and marking stones. Cemeteries associated with small towns, individual churches or family estates may not be easily identifiable. Supplemental information is often needed to identify these smaller cemeteries.

1720 Undeveloped Land Within Urban Areas

Within this category are those areas generally considered vacant lots. These areas may never have been developed, or may represent formerly built-up that have been entirely or partially cleared, but not redeveloped. Included would be abandoned manufacturing or commercial sites that could be redeveloped. Areas within this category are generally brush or grass-covered and may or may not be maintained. Buildings may be present, interspersed with brush areas and concrete or black top.

1730 Inactive Land With Street Patterns

This category represents areas for which development or redevelopment was started, but which has been abandoned after some street construction has been completed. No active development is visible. These areas typically would support residential developments if completed, but some industrial or commercial development may be found here. These areas generally have low vegetative cover, possibly with sporadic trees and may or may not be maintained.

1740 Open Areas

Included in this category are miscellaneous open areas within urban settings that do not fall into any of the other categories. Many areas identified as 174 have planned and maintained feature, such as a central lawn area within a suburban development or a commercial and/or corporate complex, that provides "open space." Some areas that are not maintained may be included here.

1741 Phragmites Dominate Urban Area (2002)

This category contains urban areas where the common reed, Phragmites australis dominates. The photographic signatures for these areas are rough and puffy and range in color from tan to silvery pale white.

1750 Managed Wetland in Maintained Lawn Greenspace

Included in this category are former natural wetland areas that now are part of an altered managed landscape, but which still exhibit signs of soil saturation on the imagery. These areas do not support typical wetland vegetation, but are vegetated primarily by grasses and other planted vegetation that may be routinely mowed. Examples of this category would be maintained open lawns and storm water swales in residential, commercial or industrial areas. None of the wetlands included in this category are routinely inundated, although the swales may be on occasion. These altered wetlands exist on areas shown on the US Soil Conservation Service soil surveys to have hydric soils.

1800 RECREATIONAL LAND

Under this category are included those areas which have been specifically developed for recreational activities, if these areas are open to the general public. Any facilities that are part of a resort complex and open only to patrons of the hotel or motel are not mapped under category 18, but under Commercial and Services category. Facilities mapped as recreational land may charge user fees to the public, such as public golf courses; or, they may be free to the public, such as ball fields on public school grounds. Level III divisions of this category involve identifying the predominant recreational uses of the areas.

1801 Golf Courses

All par 3 courses and above are included, both public and private, unless associated with a resort hotel/motel. Courses can be identified by greens, fairways, sand traps, water hazards, club houses, and parking areas. Additional facilities often associated with golf courses, such as tennis courts, pools, parking, etc. are not identified separately but included in the 1801 category. Ponds, wetlands and other water bodies are, however, identified separately under the appropriate category if they meet minimum polygon size.

1802 Picnic and Camping Parks

This category includes areas that are set aside for picnicking and camping specifically and associated activities (hiking, etc.). Commercial and private tent and trailer campgrounds are included, unless they are part of a resort complex. Any open areas associated with either picnicking or camping areas that exceed one acre are mapped out under category 1809. Supplemental information may be needed to identify picnic or camping areas in forested regions.

1803 Marina and Boat Launches

Public and private facilities consisting of docks, storage, storage buildings, boat ramps, jetties, piers, and parking areas are included in this category. Boats may or may not be visible because of photo scale. Small, primarily state-owned launching sites will generally not be visible on the small scale air photos.

1804 Athletic Fields (Schools): Community Recreation Areas

Included in this category are a variety of recreational facilities which are not part of established parks, such as baseball fields, tennis courts, basketball courts, and playgrounds. These may be associated with schools. Industrial and commercial firms, or a community housing development.

1805 Parks

City, town, county and state parks that are maintained by a government agency are included in this category. What is actually mapped in this category is park headquarters, parking lots and accessory buildings. Open areas, swimming pools and beaches, golf courses, picnic and camping facilities, etc. are mapped separately under their appropriate category.

1806 Swimming Pools

Included are public and commercial facilities such as swim clubs and city-operated pools. Pools associated with country clubs, motels, resorts and private residences are not mapped. Support

buildings and parking areas are mapped in this category, as are any tennis courts, etc. which may be associated with the pool.

1807 Swimming Beaches

These areas are specifically man-made beaches adjacent to lakes or ponds, which have been developed for recreational activities. Parking areas are included, but the water is identified under the appropriate water category.

1808 Formal Lawns, Arboretums and Landscaped Areas

Included are landscaped areas that are associated with facilities open to the public such as gardens. Similar areas associated with private estates are not included within this category. Public facilities are identifiable by general layout, associated roadways, parking areas, and support buildings, all of which are mapped as part of 1808.

1809 Open Areas in Parks

This category includes any open area within a city, town, county, or state park that meets minimum mapping polygon size and which is not developed for any specific recreation activity.

1810 Stadium, Theaters, Cultural Centers, and Zoos (2002)

Included in this category is any entertainment facility that is developed for public use. Stadiums, outdoor concert halls, racetracks (horse and car), drive-in theaters, amusement parks, and zoos are the primary facilities involved. Such facilities are primarily commercial, although some public recreation areas may be found. Not included are similar facilities on private property, such as horse tracks within private farms, that are open to the public. Parking areas, driveways, and support buildings are mapped in this category.

1811 Other Recreational

Included are rifle, skeet, and archery ranges, ski and winter sport areas, fairgrounds, etc., that do not fall into any of the above categories. These areas often have conspicuous signatures, such as ski runs, but form a small part of the land area of New Jersey.

1850 Managed Wetland in Built-up Maintained Recreation Area (WETLANDS)

Included in this category are former natural wetland areas that now are part of an altered managed recreational area, but which still exhibit signs of soil saturation on the imagery. These areas do not support typical wetland vegetation, but are vegetated primarily by grasses and other planted vegetation that may be routinely mowed. Examples of this category would be saturated portions of golf courses, and fields used for baseball and other sports in designated recreation areas. None of the wetlands included in this category are routinely inundated, although portions may be on occasion. These altered wetlands exist on areas shown on the US Soil Conservation Service soil surveys to have hydric soils.

2000 AGRICULTURAL LAND

This Level I category includes all lands used primarily for the production of food and fiber and some of the structures associated with this production. These areas are easily distinguished from the other categories and represent a significant land use in New Jersey. The Level II categories of Agricultural Land are; Cropland and Pastureland; Orchards; Vineyards; Nurseries and Horticultural Areas; Confined Feeding Operations; and Other environmental concern because of the non-point source pollution associated with confined feeding operations.

2100 CROPLAND AND PASTURELAND

This Level II category contains agricultural lands managed for the production of both row and field crops and for the grazing of cattle, sheep and horses. Also included in this category are croplands left fallow or planted with soil improvement grasses and legumes. Cropland and pastureland can easily be distinguished from other land uses with large-scale imagery.

2110 Harvested Cropland

This category contains agricultural areas that are managed for the production of harvested row or field crops. These include row crops, such as corn, soybeans, cabbage, and potatoes; or field crops predominately used as forage, such as hay or alfalfa. Row crops are easily identified on imagery because of the striations and the regular patterns. However, there are problems distinguishing between field crops, such as hay or winter wheat, from pastureland.

Pastureland can be distinguished because of its close association with farm structures such as barns or feeding stations. Also, pastureland usually has a slightly more mottled or uneven tone than the photographic signature of field crops.

2120 Pastureland

This category contains agricultural areas that are managed as pasture areas for livestock grazing. These areas may be either permanent pastures or tillable cropland that is used as pasture at the time of photography. The identification problems using imagery alone are discussed in Section 2110. Identification of pastureland, field cropland, and inactive cropland may require field verification or other supplemental information. Pasture may be covered by some brush but are included in 2120 if the predominant use is for pasture.

2130 Inactive Cropland

This category contains agricultural areas that have no physical indication of present agricultural use. These areas include both abandoned cropland and fields left fallow or planted in soil-improving grasses and legumes. An indication of inactive cropland is the presence of any woody stems in the field. The area is placed in the Brushland category if the woody stems cover is abundant and the field appears to be abandoned rather than left fallow for soil improvement. An area is placed in Brushland as either Old Field (4410) or Brush/Shrubland (4430,4440) depending on the percentage of brush cover.

2140 Agricultural Wetlands (WETLANDS)

Included in this category are lands under cultivation that are modified former wetland areas, and which still exhibit evidence of soil saturation on the photography. These lands will exhibit

the textural signature characteristics described for the other agricultural categories, but will have darker color and tonal signatures. Colors will range from blue-gray to black on winter CIR film and dark gray to black on panchromatic film. In addition, these agricultural wetlands also exist in areas shown on soil surveys of the Natural Resources Conservation Service to have hydric soils. In the 2002 update all Cranberry farmland have been combined into this code, regardless of the presence of water.

2150 Former Agricultural Wetlands - Becoming Shrubby, not Built-up (WETLANDS)

This category was added to identify areas coded as 2140 in the baseline data set, but which do not appear to be under active cultivation in subsequent years. These areas have not undergone any other alterations, such as filling, grading or development, and may again be returned to the 2140 category if the farmland is again placed under cultivation. However, these wetlands may continue to develop into a scrub/shrub wetland area if active cultivation is not resumed. As areas in a state of flux, they have been given a separate code.

2200 ORCHARDS, VINEYARDS, NURSERIES AND HORTICULTURAL AREAS

This Level II category contains agricultural areas, which are intensively managed for production of fruits, trees, ornamental plants, and vegetable seedlings. Wholesale greenhouses where plants are grown are also included in this category as are orchards, nurseries, cranberry farms and blueberry farms vineyards, sod and seed farms, and commercial greenhouses. Areas delineated include actively cultivated lands as well as land associated with the operations as, uncultivated lands, dirt roads, dikes, etc.

2210 Orchards

This category contains agricultural areas that are intensively managed as commercial orchards. Established orchards are easily recognized on the imagery by the regular grid patterns of the planted trees. Newly planted orchards are more difficult to identify, but the signature can be distinguished from adjacent cropland.

2220 Vineyards

This category contains agricultural areas of intensively managed vineyards. These areas can be recognized by a "cross-hatched" pattern caused by the vines trained on wires and the poles used for support in the form of perpendicular lines.

2230 Nurseries

This category is comprised of areas that are intensively managed for commercial or private nurseries. Nurseries can be recognized as narrow fields with very regular and definite rows. The colors are usually darker in tones than other cropland. Different shades and tones are present in adjacent fields due to the different stages of seedlings or saplings planted. These shades and tones in the narrow fields present a different signature from other agricultural areas. Christmas tree farms are included in this category.

2240 Floriculture

This category contains areas occupied by wholesale producers of flowers, nursery stock, produce, and vegetable seedlings. These areas consist of large greenhouse operations and the associated

land and buildings. Retail greenhouse should be included in a Commercial and Services category. Retail greenhouses can be distinguished from wholesale greenhouse operations by their size, amount of associated land, available customer parking and general location. Hobby greenhouse associated with private homes will not be mapped.

2250 Sod and Seed Farms

This category contains commercial sod and seed farms. These areas can be identified on the color infrared (CIR) imagery by an even-tone deep red signature. This signature is similar to a well-maintained golf course, but is a deeper shade of red (Note: red on CIR represents green in true color). These operations are usually substantial in size, occupying more than 50 acres. When harvesting procedures are in progress, the signature may exhibit some strips of bare ground. These sod farms are often located near potential markets.

2260 Cranberry Farms

This category is comprised of intensively managed cranberry farms primarily located in southern New Jersey. These areas appear as very dense rows of brush occurring in rectangular or circular fields. These areas have irrigation systems present and are traversed by an extensive network of roads or lanes.

2270 Inactive

This one category is used to represent lands occupied by abandoned or inactive orchards, vineyards, nurseries, and cranberry and blueberry farms. For orchards, vineyards, and nurseries, the inactive signature appears similar to the active signature, except the patterns will be less regular. Natural vegetation growing in the abandoned areas will cause irregular patterns and differing textures in the signature. In some cases, the trees may be removed and earlier photography or supplemental information may be necessary to place the area in this category. Inactive cranberry and blueberry farms may be difficult to distinguish from the Wetlands Brushland/Bog areas.

2280 Blueberry Farms

This category is comprised of intensively managed blueberry farms primarily located in southern New Jersey. These areas appear as very dense rows of brush generally occurring in rectangular fields. Between the rows a bright sand signature is characteristic.

2300 CONFINED FEEDING OPERATIONS

This Level II category contains specialized livestock and poultry production enterprises and other specialty farms. These operations have high populations in relatively small areas, resulting in a concentration of waste material. Since this concentrated animal waste is a critical environmental concern, these areas warranted a specific Level II category. Normal structures [barns] associated with a farmstead are not mapped in this category.

2310 Cattle and Swine Feedlots

This category contains mainly beef cattle feedlots and hog farms. Structures and attached corrals will be mapped in this category, but any substantial acreage of associated pasture will be mapped as Pastureland.

2320 Poultry Farms

This category is comprised of chicken, turkey, and duck production enterprises. These farms may be for either egg or meat production.

2330 Specialty Farms

This category contains specialized farms, such as game farms [pheasant or quail], fish hatcheries, goat farms, pigeon-raising areas, and rabbit production farms.

2400 OTHER AGRICULTURE

This category contains other miscellaneous agricultural areas, including experimental fields, horse farms and isolated dikes and access roads.

2410 Experimental Agriculture Fields

This category contains experimental crop areas associated with agriculture research stations, universities, or industries. These areas are for research purposes and contain many different crops in one field.

2420 Isolated Structures for Crop or Equipment Storage

This category contains storage buildings which are not adjacent to the farmsteads. These areas include isolated grain silos, crop storage sheds, and sheds for storage of farm machinery.

2430 Horse Farm

This category contains specialized farms for raising and training horses. This includes horse barns, corrals, and training racetracks. The oval training racetracks are easily recognized on aerial photography. Extensive acreage of pasture associated with a horse farm is mapped as Pastureland (2120).

2440 Agricultural Dikes/Roadways

Included are non-cultivated portions of special agricultural areas such as dikes or roadways found in blueberry or cranberry farms. These features may be the only portions of these farm categories that are not inundated during certain portions of the growing season, and provide access to the wetter cultivated portions of these farms.

3000 RANGELAND

Rangeland is not found in New Jersey, Consequently, it is omitted from the classification system. However, in order to remain numerically consistent with the USGS Classification Codes, Rangeland's numerical designation (#3) has also been omitted.

4000 FORESTLAND

This Level I category contains any lands covered by woody vegetation other than wetlands. These areas are capable of producing timber and other wood products, and of supporting many kinds of outdoor

recreation. Forestland is an important category environmentally, because it affects air quality, water quality, wildlife habitat, climate, and many other aspects of the ecology of an area. The Level II categories under Forestland are Deciduous; Coniferous; Mixed Deciduous-Coniferous; and Brushland.

4100 DECIDUOUS

This Level II category includes forested lands that contain deciduous tree species. The average height of the stand is at least 20 feet. Areas with woody vegetation less than 20 feet high should be placed in the Brushland category. A forest stand must have at least 75% canopy coverage from deciduous tree species to be placed in this category.

Deciduous trees are those species which lose their leaves at the end of the growing season. These trees remain leafless throughout the winter and sprout new leaves the following spring.

4110 Deciduous, 10-50% Crown Closure

This category contains deciduous forest stands that have crown closure greater than 10%, but less than 50%. Crown closure is the percentage of a forest area occupied by the vertical projections of tree crowns. Crown closure percentages provide a reasonable estimate of stand density.

An ocular estimate of percent crown closure is made while viewing the area stereoscopically. The ocular judgement is a reliable estimate since the category levels for closure are relatively broad: 10-50% and > 50%. This procedure will also be followed to determine percent crown closure in the other categories.

4120 Deciduous > 50% Crown Closure

This category contains deciduous stands with crown closures greater than 50%. The majority of the deciduous forests in New Jersey will be in this category.

4200 CONIFEROUS

This Level II category includes forested lands which contain coniferous tree species. The stand must be 20 feet high and must be stocked by at least 75% conifers to be labeled as a coniferous stand.

Coniferous species are those trees commonly known as evergreens. They do not lose their leaves (needles) at the end of the growing season but retain them through the year. Conifers can easily be distinguished from deciduous trees on wintertime color infrared photography because of their high infrared reflectance due to their leaf retention.

4210 Coniferous, 10-50% Crown Closure

This category contains natural coniferous stands with crown closure > 10%, but less than 50%.

4220 Coniferous, > 50% Crown Closure

This category contains natural coniferous stands with crown closure > 50%.

4230 Plantation

This category contains conifer stands that have been artificially planted. These include stands planted for timber harvesting or aesthetics. Crown closure estimates will not be determined for plantations. Plantations appear as uniform blocks (usually rectangular) of conifers.

Other planted stands of conifers, such as Christmas tree farms, will not be included in this category but in the nursery category under Agriculture.

4300 MIXED DECIDUOUS/CONIFEROUS

This Level II category consists of forested areas where there is a mixture of coniferous and deciduous trees. If less than 75% of the forest is dominated by either type then the stand is placed in the mixed category. Only forest stands greater than 20 feet in height will be placed in this category.

4310 Mixed with Coniferous Prevalent (> 50% Coniferous)

This category contains stands of mixed coniferous and deciduous trees. The percentage of coniferous trees is higher than the deciduous (>50% of the stand) but the coniferous species do not dominate the stand (<75%).

4311 Mixed with Coniferous Prevalent (10%-50% Crown Closure)

This category contains stands of mixed coniferous and deciduous trees with the coniferous species > 50% and with crown closures between 10% and 50%.

4312 Mixed with Coniferous Prevalent (> 50% Crown Closure)

This category contains stands of mixed coniferous and deciduous trees with the coniferous species > 50% and with crown closures > 50%.

4320 Mixed with Deciduous Prevalent (> 50% Deciduous)

This category contains stands of mixed deciduous and coniferous trees. The percentage of deciduous trees is higher than the coniferous (> 50%), but the deciduous species do not dominate the stand (< 75%).

4321 Mixed with Deciduous Prevalent (10%-50% Crown Closure)

This category contains stands of mixed deciduous and coniferous trees with the deciduous species > 50% and crown closures between 10% and 50%.

4322 Mixed with Deciduous Prevalent (> 50% Crown Closure)

This category contains stands of mixed deciduous and coniferous trees with the deciduous species > 50% and crown closures > 50%.

4400 BRUSHLAND/SHRUBLAND (Height<20 feet)

This Level II category contains forestlands, which are predominately between 0 and 20 feet in height. Vegetative communities in these areas may range from early successional species which are only a few years old, to climax or sub-climax communities which are many years old. Also included in this category are old fields that are covered primarily by grasses and some shrubs. Brushland areas represent critical habitat for many species of wildlife in New Jersey.

4410 Old Field (<25% Brush Covered)

This category includes open areas that have less than 25% brush cover. The predominant cover types are grasses, herbaceous species, tree seedlings and/or saplings. Old fields are distinguished from inactive farmland (2130) by the amount of brush cover. If a field contains few woody stems (<5%), it should be placed in the inactive farmland category. An area should be placed in the Old Field category if the amount of brush cover requires extensive brush removal before plowing. In some cases, it may not be established that the previous use was agricultural.

4411 Phragmites Dominate Old Field (2002)

This category contains open fields where the common reed, Phragmites australis dominates. The photographic signatures for these areas are rough and puffy and range in color from tan to silvery pale white.

4420 Deciduous Brush/Shrubland (>25% Brush Covered with Deciduous Species Predominant > 75%)

This category contains natural forested areas with deciduous species less than 20 feet in height. An area must have greater than 25% brush cover to be placed in this category. This category also contains inactive agricultural areas that have been grown over with brush.

There are photographic signature differences between brushland and the pole or saw-timber stage trees (Categories 4100, 4200, 4300). Besides the obvious height difference visible on stereo viewing, larger trees display much larger crown diameters than brushland areas.

4430 Coniferous Brush/Shrubland (>25% Brush Covered with Coniferous Species Predominant > 75%).

This category contains natural forested areas with coniferous species less than 20 feet high. This category is for natural areas; therefore, Christmas tree farms should be placed in the Nursery category (223).

4440 Mixed Deciduous/Coniferous Brush/Shrubland (>25% Brush Covered with a Mixture of Deciduous Coniferous Species; <75% of One Type)

This category contains natural forested areas less than 20 feet in height with a mixture of coniferous and deciduous trees.

4500 SEVERE BURNED UPLAND VEGETATION

Included in this category are naturally vegetated upland areas which have been altered by intense burning. These burned areas have not re-vegetated sufficiently on the photography, or at the time of any field inspection undertaken to support a mapping effort, to make a determination of the type of vegetation that will re-appear in the burned area. The pre-burn cover type may be any of those listed above in the 4000 series. Where sufficient re-vegetation has occurred to determine a post-burn cover type, the burned area is given the appropriate land cover code. However, where the re-vegetation has been insufficient, the 4500 code has been applied. Note that many different upland forest types may be included in this category.

5000 WATER

All areas within the landmass of New Jersey periodically water covered are included in this category. All water bodies should be delineated as they exist at the time of data acquisition, except areas in an obvious state of flood. Level I includes four (4) Level II categories; Streams and Canals; Natural Lakes; Artificial Lakes; and Bays and Estuaries. Not included in this category are water treatment and sewage treatment facilities.

5100 STREAMS & CANALS

This category includes river, creeks, canals and other linear water bodies that have a minimum width of 80 feet. For watercourses interrupted by control structures, the impoundments are placed in other appropriate water categories (see below), and the impoundment structures are included in the Urban or Built-up category. Remote sensing of these features is not difficult. Colors on infrared photography range from light blue to black, and on the black & white photography the tones range from medium gray to black. The signature can be smooth or rippled depending on the conditions at the time of the photography. The greatest difficulty occurs when overhanging vegetation or shadows obscure the extent of the watercourse.

5110 Streams

This category includes streams that are no less than 80 feet wide. These features are easily recognized on aerial photography because of their meandering pattern and variable width due to natural fluvial processes. Short distances of WC constriction which fall under the minimum width standard may be included for the sake of continuity. The photographic characteristics of streams are much too numerous and obvious to list. Specific comments on signature and problems are discussed under category 5100.

5120 Canals

This feature may be no less than 80 feet wide and like streams is easily recognized on aerial photography. Canals are consistent in width, do not meander, are sometimes bordered by a towpath and often utilize a lock system. Along the length of the canal are found clusters of buildings that formerly serviced the canal track when it was a transportation entity. In New Jersey these clusters along with the canal and the towpath often comprise either historic sites or parkland and should be included under those categories when such information is available.

5190 Exposed Flats (2007)

Exposed flats are unvegetated areas in riverine systems that were formerly classed as water, but because of meandering of the stream course, are now exposed. They are felt to be semi-

permanent changes in the stream configuration and not the result of temporary water level reductions. Because these areas may again be under water at some time in the future, they remain in the WATER category

5200 NATURAL LAKES

Water bodies larger than three acres that are non-flowing and naturally enclosed, including regulated natural lakes but excluding reservoirs, are placed in this category. Islands less than three (3) acres are included in the water area. To identify this feature accurately, it is important to remember natural lakes are the results of ground water seepage and surface run-off of precipitation, whereas reservoirs are the result of man-made impoundments and are maintained primarily by linear watercourses. Remote sensing of this feature, once again is simple. The signatures and attendant problems are discussed under category 5100.

5210 Small Lakes

These features have an areal range of one (1) to two (2) acres. Confer with category 5200.

5220 Medium Lakes

These features have an areal range of two (2) to ten (10) acres. Confer with category 5200.

5230 Large Lakes

These features will be greater than ten (10) acres in area. Confer with category 5200.

5300 ARTIFICIAL LAKES & RESERVOIRS

Artificial impoundments of water larger than three (3) acres used for irrigation, flood control, municipal water supplies, recreation, landscaping and hydro-electric power or the result of an active extractive operation are included in this category. Dams, bulkheads, spillways and other water control structures should be evident and are critical for accurately identifying these features. Also important to remember is that artificial lakes and reservoirs are charged primarily through linear WCs. Photo identification should key on the non-linear shapes of these features, the water control structures, and the signatures discussed in category 5100. All water reservoirs supporting cranberry operations will be included, however, water within dikes will be included in the agriculture codes for the 2002 update.

5310 Artificial Lakes

Water bodies one acre or larger are included in this category. Since the primary use for these artificial lakes is recreation, some recreational characteristics such as beaches, refreshment stands, parking lots, boat slips, etc. should be present. Frequently, residential development approaches the lake shoreline. Aerial interpretation is discussed under category 5300.

5320 Multiple Use Reservoirs

Water bodies of one acre or larger are included in this category. The two most common combinations are flood control/recreation and hydro-electric/recreation. As in category 5310, the recreational and water control characteristics should be present and obvious. In addition, if the water body is used for flood control, the water level should be well below the maximum capacity, and, if the water body is used for hydroelectric purposes, the generating station should be present. Confer with

category 53 for more specific identification information.

5330 Restrictive Use Reservoirs

Once again the minimum size of this feature is one acre. Most restricted use reservoirs are municipal water supplies. Thus, they are located in more remote, less trafficked areas of the state. They are characterized by limited road access and dense surrounding vegetation. No recreational characteristics should be present. Confer with category 5300 for more specific identification information.

5400 BAYS, ESTUARIES & OTHER TIDAL WATERS

This category is comprised of salt-water inlets and arms of the sea that extend inland and fall within the landmass of New Jersey. All U.S.G.S. conventions delineating the open sea and bay/estuary interface shall be followed.

5410 Tidal Rivers, Inland Bays and Other Tidal waters

Included in this category are the tidal portions of watercourses, enclosed tidal bays, and other tidal water bodies such as tidal pools, ponds and natural lagoons. The tidal watercourses may include everything from smaller entirely tidal features commonly draining tidal marsh systems, to the tidal portions of intermediate and large features such as the Mullica River, the Raritan River, and even the Delaware River. Enclosed tidal bays are those open water tidal features existing commonly behind barrier island systems. These bays generally have a restricted opening to larger tidal features such as Delaware Bay or the Atlantic Ocean. While these features are regularly flushed, portions of these enclosed bays may have complex flushing patterns due to the relatively small outlets. These small bays provide important finfish, shellfish and waterfowl habitat, as well as important recreational potential. Tidal pools and ponds generally will be found in the interior portions of regularly flowed tidal marshes, but these waterbodies themselves may not be flooded on every tidal cycle.

5411 Open Tidal Bays

Included in this category are large tidal waterbodies such as Delaware and Raritan Bays, which have large unrestricted openings directly to the Atlantic Ocean.

5420 Dredged Lagoon, Artificial

Artificial dredged lagoons are networks of rectangular dredged areas, containing water, usually associated with residential development or mobile home development. Dredged lagoons are generally in sites of former wetlands and have characteristically bulkheaded shorelines. They usually feed into a central dredged waterway that gives access to open tidal water.

5430 Atlantic Ocean

This category includes only open water off areas of the Atlantic Ocean. (It was added to identify open ocean offshore waters from those of tidal bays and rivers for water quality analyses).

6000 WETLANDS

The wetlands are those areas that are inundated or saturated by surface or ground waters at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions. Included in this category are naturally vegetated swamps, marshes, bogs and savannas which are normally associated with topographically low elevations but may be located at any elevation where water perches over an aquiclude. Wetlands that have been modified for recreation, agriculture, or industry will not be included here but described under the specific use category.

The wetlands of New Jersey are located around the numerous interior stream systems, and along our coastal rivers and bays. New Jersey, by its numerous different physiographic regions, supports various wetland habitats dependent upon physiographic and geological variables. The Level II classification separates wetlands into two categories based on the location relative to a tidal water system.

6100 COASTAL WETLANDS

These areas are associated with the tidal portions of the Delaware River system and the tidal portions of the watercourses draining into the Atlantic Ocean. This cover type is predominantly vegetated by herbaceous plants adapted to the varied environmental conditions imposed by the tidal environment: water level fluctuations, salinity and sediment deposition. Also included are those non-tidal areas closely associated with adjacent coastal wetlands such as salt marsh transition zones and coastal vegetated dunes.

6110 Saline Marshes

These are open graminoid dominated regions associated with waters with salinities >1 part per thousand (0/00). Saline marshes are generally dominated by two growth forms of Spartina alterniflora in regions with the highest salinities. Marshes flowed by water less than 10 0/00 are generally brackish and co-dominated by Spartina cynosuroides, S. alterniflora, Phragmites australis, Typha angustifolia, and Scirpus pungens.

Marshes exhibiting these characteristics are restricted to the Delaware Bay and associated tributaries downstream of Salem and all estuarine tributaries that empty into the Atlantic Ocean. The photographic signatures for these areas are smooth and low, and range in color from red to pinks on summer infrared photographs.

The following Level III classifications of saline marshes have been added for 2002 to further delineate the coastal marshes of previous delineation. The separation is primarily by visible texture and species composition.

6111 Saline Marshes (Low marsh vegetation) (2002)

This category contains herbaceous vegetation dominated by Spartina alterniflora where the height is <1 foot and is primarily flooded throughout. The photographic signature for these areas range in color from blues to red.

6112 Saline Marshes (High marsh vegetation) (2002)

This category contains herbaceous vegetation dominated by Spartina patens where the height is 1 foot to 3 feet. The photographic signature for these areas range in color from red to pink or pale white.

6120 Freshwater Tidal Marshes

These marshes are co-dominated by annual and perennial herbaceous vegetation on substrates associated with tidal waters with salinities less than 1 0/00. Freshwater marsh species are characterized by Nuphar lutea, Peltandra virginica, Pontederia cordata, Zizania aquatica, Polygonum punctatum, Bidens laevis, and Typha latifolia. Marshes exhibiting this cover are found on the tidal Delaware River and tributaries downstream of Trenton to Salem and upstream of the saline marshes on the Atlantic drainage watercourses. Non-tidal marshes are listed under interior wetlands. The photographic signatures for these areas are both smooth-and rough-textured with little elevation. The colors range from dark grey to pink on summer infrared photographs.

6130 Vegetated Dune Communities

These are areas near the coast that are between saline marsh and open beach. The dominant vegetation can be Ammophila breviligulata, Prunus maritimus, Rhus radicans, Juniperus virginicus, and Acer rubrum. The areas have open to partly closed canopied signatures that are rough in texture and exhibit a red to red brown color on summer infrared photographs.

6141 Phragmite Dominate Coastal Wetlands (2002)

This category contains saline marsh areas where the common reed, Phragmites australis dominates. The photographic signatures for these areas are rough and puffy and range in color from tan to silvery pale white. Freshwater wetlands will have a cowardin code present in the attributes while saline marshes will have no cowardin code.

6200 INTERIOR WETLANDS

These are generally found in non-tidal lowlands associated with primary, secondary and tertiary watercourses, and isolated wetlands. Included under this heading are all forested wetland (regardless of tidal influences) dominated by deciduous and coniferous trees, and non-tidal herbaceous marshes and savannas.

6210 Deciduous Wooded Wetlands

These wetlands are closed canopy swamps dominated by deciduous trees normally associated with watercourses, edges of marshes, and isolated wetlands. The important canopy species includes Acer rubrum, Nyssa sylvatica, Fraxinus pennsylvanica, Salix nigra, Quercus bicolor, Q. phellos, Q. falcata, Liquidambar styraciflua, and Platanus occidentalis. These species combine to form a series of mixed hardwood lowland habitats throughout the entire state. These species have photographic signatures that exhibit height, rough texture, and are dark blue-gray to dark gray or black on winter infrared, and gray to dark gray on panchromatic film.

6220 Coniferous Wooded Wetlands

These wetlands are closed canopy, dominated by coniferous tree species associated with watercourses, seeps, and low topographic land. The northern areas will support Tsuga canadensis, Larix laricina, and Picea mariana as monotypic stands or mixed communities. The southern portion of the State has Pinus rigida and P. taeda in monotypic communities or co-dominate with Acer rubrum. Other species such as Nyssa sylvatica and Chamaecyparis thyoides may also be present. These species have photographic signatures that are varied in texture and are red to dark red on winter infrared film and dark gray to black on winter

panchromatic film.

6221 Atlantic White-cedar Wetlands

These wetlands are predominantly closed canopy, seasonally flooded wetlands of southern New Jersey dominated by Atlantic White-cedar, Chamaecyparis thyoides. Some other trees such as Acer rubrum and Nyssa sylvatica, and shrubs such as Vaccinium corymbosum may also be present. The dense cedar cover, however, generally precludes a heavy herbaceous layer.

6230 Brush-Dominate and Bog Wetlands

These wetlands are dominated by woody species that are less than 20 feet tall. These areas may be an early successional stage to wetland dominated by canopy species or a shrub dominate community associated with marshes, isolated wetlands or bogs. The brush category will include communities composed of young saplings such as Acer rubrum, Acer negundo, Liquidambar styraciflua, and areas dominated by shrub species such as Cornus amomum, C. stolonifera, C. racemosa, Spirea alba, S. tomentosa, Viburnum dentatum, and Alnus serrulata. Bogs are Ericaceae dominated and highly acidic, normally associated with glacial areas in the north and pingoes or river ox bows in the south. Some bogs may also contain herbaceous vegetation that is unique to these habitats yet classified by this system as 6240, non-tidal marsh. The photographic signature for those cover types vary. The brush-dominated areas will have a similar signature as 6210 with more space and smaller stature. The bog areas will be round to oval, low topographically and normally separated from major watercourses. The color seen on winter infrared photographs will be dark blue-gray to black and dark gray to black on the panchromatic films.

6231 Deciduous Brush and Bog Wetlands

This brush category will include communities composed primarily of young samplings of deciduous tree species such as Acer rubrum, A. negundo, Liquidambar styraciflua, Alnus serrulata, Cornus stolonifera, and C. amomum; and woody shrubs such as Vaccinium corymbosum, V. macrocarpon, Spirea alba, Viburnum dentatum, Rosa palustris, Myrica pennsylvania, M. gale, Clethra alnifolia, Cephalanthus occidentalis and Rhododendron viscosum, among others.

6232 Coniferous Brush and Bog Wetlands

This brush category will include communities composed primarily of young samplings of coniferous tree species such as Pinus rigida, Larix laricina, Tusga canadensis, and Picea mariana, and shrubs such as Chamaedaphne calyculata, and Kalmia angustifolia.

6233 Mixed Brush and Bog Wetlands with Deciduous Dominant

Included in this category are brush and bog wetlands with a mixture of deciduous and coniferous species, with the deciduous species > 50% but < 75%. Species will be similar to those described under 6231 and 6232.

6234 Mixed Brush and Bog Wetlands with Coniferous Dominant

Included in this category are brush and bog wetlands with a mixture of deciduous and coniferous species, with the coniferous species > 50% but < 75%. Species will be similar to

those described under 6231 and 6232.

6240 Non-Tidal Marshes

These are wetlands dominated by various herbaceous species that are not connected or associated with tidal waters. Lake edges, open flood plains and abandoned wetland agricultural fields are locations for this cover type. Leersia oryzoides, Phalaris arundinacea, Nuphar lutea, Polygonum arifolium, P. sagittatum, Typha latifolia and Phragmites are species that may dominate this cover type. Bog herbaceous vegetation will be covered by this section includes numerous Cyperaceae genera, Juncus sp. and the carnivorous genera of Drosera and Sarracenia. This cover type will have a similar photographic signature as 6120, varied texture, and light blue-gray or tan color on winter infrared and light gray on the panchromatic photograph.

6241 Phragmite Dominate Interior Wetlands (2002)

This category contains fresh marsh areas where the common reed, Phragmites australis dominates. The photographic signatures for these areas are rough and puffy and range in color from tan to silvery pale white. Freshwater wetlands will have a cowardin code present in the attributes while saline marshes will have no cowardin code.

6250 Mixed Wooded Wetlands

Included in this category are wetlands inhabited by mixtures of deciduous and coniferous species. Species of each type will be similar to those identified under 6210 and 6220. The dominant type of vegetation will generally be greater than 50% but less than 75%.

6251 Mixed Wooded Wetland with Deciduous Prevalent

This category contains mixed wooded wetlands with the deciduous tree species > 50 % but < 75%.

6252 Mixed Wooded Wetlands with Coniferous Prevalent

This category contains mixed wooded wetlands with the coniferous tree species > 50% but < 75%.

6290 Unvegetated Flats (2007)

Unvegated flats are former vegetated area located adjacent to a stream or river, in which the vegetation has been scoured away, so that at the time of the photography, there is no vegetation visible. These areas may have been previously classed as wetlands or as upland areas. However, since all the vegetation in these areas was removed primarily because of scouring of scouring by ice in the adjacent stream or river, all of these areas are now included in the WETLAND category since any re-vegetaion will most probably now be by wetland species.

6500 SEVERE BURNED WETLANDS

Included in this category are naturally vegetated wetland areas which have been altered by intense burning at the time of the land cover analysis. These burned areas have not re-vegetated sufficiently on the photography, or at the time of any field inspection undertaken to support a

mapping effort, to make a determination of the type of vegetation that will re-appear in the burned area. The pre-burn cover type may be any of those listed above in the 6200 series. Where sufficient re-vegetation has occurred to determine a post-burn cover type, the burned area is given the appropriate land cover code. However, where the re-vegetation has been insufficient, the 6500 code has been applied. Note that many different wetland types may be included in this category.

7000 BARREN LAND

Barren lands are characterized by thin soil, sand or rocks and a lack of vegetative cover in a non-urban setting. Vegetation, if present, is widely spaced. Barren land such as beaches and rock faces are found in nature but also result as a product of man's activities. Extraction mining operations, landfills and other disposal sites compose the majority of man-altered barren lands.

7100 BEACHES

Beaches are predominantly composed of sand and may occur at the land-water interface of oceans, bays and estuaries. Beaches are generally elongated non-vegetated buffering systems subject to the action of waves and tides.

7110 Open Beach

The open beach potentially includes the sandy area from mean low water (MLW) of the foreshore to the berm crest and the backshore. The open beach is characterized by sparse vegetative cover. Other substrate types may be intermixed with sand, including pebbles, stones, silts and shells.

7120 Unvegetated Dune Communities

Unvegetated dune communities are comprised of areas with sparse vegetative cover, with sand substrate and with notable changes in elevations. These areas have a wind-driven origin and vary in size and shape. Dunes are found in coastal areas near large sources of sand. Vegetated dune areas are included in the Wetland categories.

7130 Other Sandy Areas

This category includes natural areas that have been sandy for long periods of time and perturbed areas which have been sandy and for which no known land use is evident.

7200 BARE EXPOSED ROCK, ROCK SLIDES, ETC.

Areas lacking vegetation and composed of rock or rock faces are included in this category. Exposed rock from highway construction is not included in this category.

7210 Rock Faces, Rock Slides, Cliffs

This category includes rock faces on mountains, rock slides and cliffs which are sparsely vegetated. These exposed types have a large vertical component.

7220 Exposed Rock

Areas consisting of exposed bedrock or other accumulation of rocks lacking vegetative cover are

included. These areas have a small vertical component compared to rock faces, etc.

7300 EXTRACTIVE MINING

Extractive operations include a wide variety of mining activities, both surface and subsurface. Included are stone quarries, gravel, sand and clay pits, and limestone quarries to mention a few. Extractive industries are characterized by disturbed ground usually with depth, extractive machinery, buildings and roads for and with heavy equipment. Open mining areas frequently contain water. Extractive mining areas may be large as stone quarries or small as borrow pits.

7310 Stone Quarries

Stone quarries are characterized by right-angled rock cleavage, flat terraces, and straight vertical walls. Drill stands, air compressors and similar extractive machinery and buildings may be visible.

7320 Sand and Gravel Pits (Borrow Pits)

Sand and gravel pits have curved borders and sloping walls. They often lack the vertical relief of quarries and do not generally have exposed rock associated with them. Steam shovels, bulldozers, and mechanical loaders are associated with these tow types of extraction. Sand pits may have water and consequently, dredging equipment associated with them. Sand and gravel pits show wide variability in size.

7330 Other Mining

Other types of mining are characterized by disturbed ground with depth, slag heaps, shafts, buildings, and active transportation (trucks, roads for heavy machinery, railways).

7340 Abandoned Mining Sites

Abandoned operations are often partially vegetated and may be accompanied by machinery, roads and buildings in disrepair. When vegetation dominates the site, the parcel is characterized by cover type. In contrast, active operations show evidence of operational equipment and buildings, roads for heavy machinery, etc. Current mining activity is not always distinguishable, and inactive, unclaimed and active strip, mines, quarries barrens pits and gravel pits are included in this category, until other cover or use is established.

7400 ALTERED LANDS

Altered lands are areas outside of an urban setting that have been changed due to man's activities other than for mining.

7410 Solid Waste Disposal Areas

Junkyards, open dumps, landfills and incinerators compose the majority of solid waste disposal sites. Junkyards are collection of old automobiles, machinery or other vehicles. Larger junkyards are fenced and have regular stacking and placing of debris, with well-defined access roads. Older abandoned yards may be vegetated and difficult to detect.

Open dumps and sanitary landfills are usually located in abandoned pits, low-lying areas or other

areas of low economic importance. They are characterized by steep banks, white fringes of exposed debris, rough texture and lack of vegetation. Larger dumps/landfills are fenced and generally have one heavily used access road.

7420 Dredge Material Disposal Sites

Dredge material disposal sites are barren areas separated from other land forms by dikes. Inside the rectangular dike systems are fine grained sands and silts either deposited in piles but more likely forming a slurry with varying amounts of water within the dike system. Old dredge material site may appear as landfills with steep sides and rough texture but without exposed debris or signs of active management.

7430 Disturbed Wetlands

Included in this category are former natural wetlands that have been altered by some form of clearing, leveling, grading, filling and/or excavating, but which still exhibit obvious signs of soil saturation on the imagery. Because of the alterations, these areas do not generally support typical wetland vegetation, and may in fact be unvegetated. They do, however, exist in areas shown on the US Soil Conservation Service soil surveys to have hydric soils, and exhibit the darker tonal signatures associated with saturated soils on the photography. Colors of these areas will vary from gray to blue-gray to black on winter CIR film and gray to black on panchromatic film. These areas may be in transition to a use or associated with a transitional development.

7500 TRANSITIONAL AREAS

This category encompasses lands on which site preparation for a variety of development types has begun. However, the future land use has not been realized. Included are residential, commercial and industrial areas under construction. Also, areas that are under construction for unknown use and abandoned structures are included. These areas are usually sparsely vegetated.

Transitional Areas

7510 Single Unit Residential Under Construction

7520 Multiple Unit Residential Under Construction

7530 Commercial/Service Under Construction

7540 Industrial Under Construction

7550 Transportation/Communication/Utilities Under Construction

7560 Industrial/Commercial Parks Under Construction

7570 Unknown Use Under Construction

7580 Abandoned Structures (Non-Urban)

7600 UNDIFFERENTIATED BARREN LAND

Undifferentiated barren lands encompass cleared lands that have no apparent site preparation or

any indication of past activities. Such areas vary in shape and size but generally possess little vegetation, exposing the soil or surface material only. Ancillary information also gives no indication of former uses.

8000 MANAGED WETLANDS

This category was added to provide an Anderson classification code for several types of disturbed wetland areas that did not easily fit into the existing classification categories. Included would be various landscaped or maintained areas that exhibit signs of soil saturation on the imagery, and which are in zones of hydric soils, but which do not support typical wetlands vegetation because of various alterations. Examples of managed wetlands would be storm water swales, saturated portions of golf fairways and other recreational fields, and open lawn areas in business parks, etc. These areas have often been graded, are vegetated typically by various cultivated grasses and often undergo periodic mowing and other maintenance typical of managed lawn areas. (This code is a legacy code that appears only in the 1986 data set. It has been replaced by codes 1750 and 1850 in the updated data set)

05/015/2010