North America Land Cover Characteristics Data Base Version 2.0

PLEASE NOTE: This is the Version 2.0 release of the North America land cover characteristics data base. The land cover information has been updated from Version 1.2. Please read section 5.0 for information about the revision process and what changes have been made to the data.

Table of Contents

1.0 Data Description

- The North America land cover data base is one portion of a global land cover characteristics data base that was developed on a continent-by-continent basis. All continents in the global data base share the same map projections (Interrupted Goode Homolosine and Lambert Azimuthal Equal Area), have 1-km nominal spatial resolution, and are based on 1-km AVHRR data spanning April 1992 through March 1993 (Loveland and others, 1999). Each continental data base has unique elements that are based on the salient geographic aspects of the specific continent. In addition, a core set of derived thematic maps produced through the aggregation of seasonal land cover regions are included in each continental data base. These are:

- Global Ecosystems (Olson, 1994a, 1994b)
- IGBP Land Cover Classification (Belward, 1996)
- U.S. Geological Survey Land Use/Land Cover System (Anderson and others, 1976)
- Simple Biosphere Model (Sellers and others, 1986)
- Simple Biosphere 2 Model (Sellers and others, 1996)
- Biosphere-Atmosphere Transfer Scheme (Dickinson and others, 1986)
- Vegetation Lifeforms (Running and others, 1994)

The legends for each of these derived data sets can be found in Section 3.2 - 3.8.

The North America land cover characteristics data are in a flat, headerless raster format. The pixel values correspond to class numbers defined in the appropriate land cover classification scheme legend. Data are distributed as compressed and uncompressed single-band images.

1.1 Downloading from the Web

From the North America Land Cover page, select either data in Interrupted Goode Homolosine projection or data in Lambert Azimuthal Equal Area projection. The selection will link to a page that contains links to all documentation files and the image files (both compressed and uncompressed). NOTE: World Wide Web browsers can vary in how the files will be downloaded. On PCs, some browsers will allow a user to interactively select the location where the file will be saved and to edit the file name. However, on certain browsers files may be automatically downloaded to a default storage location on the local system.

1. Select either button, compressed or uncompressed, for the file of interest.
2. A pop-up screen may appear, showing information on the download procedure. At this point, choose the directory in which to save the file.
3. For compressed files, the .gz extension must be added to the filename before downloading. However, if the browser will not accept adding an extension, continue with the download, and then rename the file with the .gz extension when the download is complete.
4. For uncompressed files, leave the .gz extension off. If a pop-up screen shows the filename with a .gz extension either edit the filename, or proceed with the download and rename the file without the extension after the procedure is complete.

2.0 Geometric Characteristics

The North America data base is available in two different map projections: the Interrupted Goode Homolosine and the Lambert Azimuthal Equal Area (see Steinwand, 1994 , and Steinwand and others, 1995, for a complete description of these projections).

2.1 Interrupted Goode Homolosine Projection Parameters

The data dimensions of the Interrupted Goode Homolosine projection for the North America land cover characteristics data set are 7,793 lines (rows) and 11,329 samples (columns) resulting in a data set size of approximately 88 megabytes for 8-bit (byte) images. The following is a summary of the map projection parameters used for this projection:

Projection Type: Interrupted Goode Homolosine

- Units of measure: meters

- Pixel Size: 1000 meters
- Radius of sphere: 6370997 m
- XY corner coordinates (center of pixel) in projection units (meters)
    - Lower left: (-17359000, 631000)
    - Upper left: (-17359000, 8423000)
    - Upper right: (-6031000, 8423000)
    - Lower right: (-6031000, 631000)

2.2 Lambert Azimuthal Equal Area Projection Parameters

The data dimensions of the Lambert Azimuthal Equal Area projection for the North America land cover characteristics data set are 8,996 lines (rows) and 9,223 samples (columns) resulting in a data set size of approximately 83 megabytes for 8-bit (byte) images. The following is a summary of the map projection parameters used for this projection:

Projection Type: Lambert Azimuthal Equal Area

- Units of Measure: meters
- Pixel Size: 1000 meters
- Radius of sphere: 6370997 m
- Longitude of origin: 100 00 00 W
- Latitude of origin: 50 00 00 N
- False easting: 0.0
- False northing: 0.0
- XY corner coordinates (center of pixel) in projection units (meters)
    - Lower left: (-4487000, -4515000)
    - Upper left: (-4487000, 4480000)
    - Upper right: (4735000, 4480000)
    - Lower right: (4735000, -4515000)

3.0 Derived Data Sets

3.1 North America Seasonal Land Cover Regions Legend

North America, v. 2.0

Value	Description
1	Spruce Forest
2	Needleleaf Forest (Sitka Spruce, Western Hemlock)
3	Needleleaf Boreal Forest (Black and White Spruce, Aspen, Birch)
4	Ponderosa, Lodgepole Pine Forest
5	Black Spruce Forest with Balsam Fir
6	Evergreen Needleleaf Forest (Lodgepole Pine and Douglas Fir)

7	Needleleaf Forest (Dougland Fir, Spruce, Western Red Cedar)
8	Open Evergreen Needleleaf Forest (Ponderosa Pine)
9	Needleleaf Forest (Hemlock, Spruce, Douglas Fir)
10	Evergreen Needleleaf Forest (Lodgepole Pine, Englemann Spruce, Ponderosa Pine)
11	Needleleaf Forest (Spruce, Jack Pine, Aspen, Birch, Tamarack)
12	Ponderosa/Lodgepole Pine Woodland
13	Spruce and Pine Forest
14	Evergreen Needleleaf Forest (Ponderosa Pine, Douglas Fir, Western Red Cedar)
15	Evergreen Needleleaf Forest (Douglas Fir, Lodgepole Pine, Larch, Western Red Cedar)
16	Mixed Boreal Forest (Aspen, Birch, Spruce, Pine)
17	Open Needleleaf Forest (Ponderosa Pine and Lodgepole Pine)
18	Needleleaf Forest (Western Red Cedar, Lodgepole Pine, Douglas Fir, Larch, Ponderosa Pine)
19	Needleleaf Forest (Lodgepole Pine, Ponderosa Pine, Englemann Spruce, Subalpine Fir)
20	Needleleaf Forest (Ponderosa Pine)
21	Needleleaf Forest (Ponderosa, Lodgepole and White Pine, Douglas Fir)
22	Ponderosa Pine Forest
23	Evergreen Needleleaf Forest (Spruce, Balsam Fir, Eastern White Pine, Eastern Hemlock)
24	Needleleaf Forest (Douglas Fir, Lodgepole Pine, Western White Pine)
25	Evergreen Needleleaf Forest (Chihuahua Pine, Apache Pine)
26	Evergreen Needleleaf Forest (Douglas Fir, Ponderosa, Jeffrey Pine)
27	Needleleaf Forest (Douglas Fir) with Mixed Hardwoods
28	Needleleaf Forest (Western Hemlock, Sitka Spruce, Douglas Fir)
29	Open Needleleaf Forest (Ponderosa Pine, Pinyon-Juniper)
30	Evergreen Needleleaf Forest (Pine Species)
31	Needleleaf Forest (Douglas Fir)
32	Evergreen Needleleaf Forest (Douglas Fir, Western Hemlock, Ponderosa Pine)
33	Evergreen Needleleaf Forest (Loblolly, Slash Pine) with Hardwoods (Gum, Cypress)
34	Evergreen Needleleaf Forest (Longleaf, Slash Pine)
35	Evergreen Needleleaf Forest (Douglas Fir, Ponderosa Pine, Redwoods)
36	Tropical Dry Forest
37	Montane Tropical Broadleaf Forest
38	Tropical Broadleaf Forest
39	Tropical Dry Forest
40	Tropical Broadleaf Forest

41	Degraded Tropical Forest
42	Degraded Tropical Forest
43	Semi-Deciduous Dry Forest
44	Semi-Deciduous Tropical Forest
45	Evergreen Broadleaf Tropical Forest
46	Deciduous Woodlands (Aspen)/Shrubland (Mountain Mahogany)
47	Deciduous Forest (Aspen) with Cropland
48	Deciduous Forest (Aspen)
49	Deciduous Tropical Dry Woodland
50	Deciduous Forest (Maple, Beech, Birch) with Cropland (Pasture, Hay)
51	Deciduous Forest (Oak)
52	Deciduous Forest (Maple, Beech, Birch, Oak, Hickory) with Pasture
53	Deciduous Forest (Oak, Hickory, Sweet Gum, Southern Pines) with Cropland and Pasture
54	Subalpine Forest (Englemann Spruce, Subalpine Fir, Douglas Fir)
55	Tall/Low Shrubs with Spruce Woodlands
56	Spruce Woodlands and Shrub Bogs
57	Subalpine Transitional Forest
58	Evergreen Needleleaf Forest (Balsam Fir, White Spruce, Black Spruce)
59	Mixed Forest (Aspen, Birch, Spruce)
60	Evergreen Needleleaf Forest and Woodland (Black and White Spruce)
61	White, Black Spruce Forest
62	Evergreen Needleleaf Forest (Balsam Fir, Black Spruce, White Spruce)
63	Spruce Woodlands with Low/Tall Shrubs
64	Open Mixed Forest (Aspen, Birch, White Spruce, Black Spruce)
65	Mixed Forest (Aspen, Birch, Balsam Poplar, Black and White Spruce)
66	Open Needleleaf Boreal Forest (Black and White Spruce, Tamarack, Aspen)
67	Mixed Forest (Black and White Spruce, Aspen, Birch)
68	Mixed Forest (Balsam Fir, Jack Pine, Black and White Spruce, Jack Pine, Aspen, Birch)
69	Needleleaf Forest (Red Pine, Jack Pine, Spruce, Aspen, Birch, Tamarack)
70	Mixed Forest (Aspen, Birch, Spruce, Balsam Fir)
71	Mixed Forest (Pine and Oak)
72	Mixed Forest (Pine and Oak)
73	Northern Mixed Forest (Maple, Beech, Birch, Pine)
74	Mixed Forest (Aspen, Maple, Oak, Jack Pine, Red Pine, Spruce)

75	Mixed Forest (Pine, Oak)
76	Caribbean Montane Mixed Forest
77	Mixed Forest (Oak, Pine Species)
78	Tall Shrubs (Willow, Birch, Alder)
79	Tall/Low Shrubs (Willow, Alder) and Wet Herbaceous
80	Tall/Low Shrubs, Tundra, Spruce
81	Tall Shrubs (Willow, Birch, Alder) and Wet Herbaceous Meadows
82	Artic Tall Shrubs (Willow, Birch, Alder)
83	Chaparral
84	Deciduous Shrubland (Oak) with Pinyon Juniper
85	Herbaceous Alpine Tundra with Low/Dwarf Shrubs
86	Herbaceous Alpine Tundra
87	Sparsely Vegetated Desert Shrubland
88	Herbaceous Arctic Tundra with Low/Dwarf Shrubs
89	Open Arctic Shrubland
90	Open Alpine Shrubland
91	Woody Arctic Tundra with Lichen
92	Woody Arctic Tundra, Tall, Low, and Dwarf Shrubland
93	Herbaceous Alpine Tundra with Low/Dwarf Shrubs
94	Desert Shrublands (Creosote, Saltbush, Sand Sage) - Sonoran
95	Tall/Low Shrubs, Tundra, Spruce
96	Black Spruce Woodlands, Bogs with Dwarf/Tall Shrubs
97	Woody Arctic Tundra (Dwarf and Low Shrubs)
98	Desert Shrubland (Creosote, Saltbush, Sand Sage, Mesquite) - Chihuahan
99	Desert Shrubland (Creosote, Saltbush, Mesquite, Sand Sage)
100	Shrubland/Grassland (Saltbush, Sand Sage, Rabbitbrush)
101	White Spruce and Black Spruce Fens
102	Shrubland/Grassland (Needlegrass, Big Sage, Rabbitbrush)
103	Black Spruce, Tamarack, Lichen Woodland
104	Open Spruce Forest with Tall Shrubs (Willow, Birch, Alder)
105	Desert Shrubland (Creosote, Saltbush, Mesquite, Sand Sage)
106	Desert Shrubland/Grassland (Creasote, Saltbush, Mesquite, Sand Sage)
107	Desert Shrubland (Creosote, Saltbush, Mesquite, Cactus) with Grasses
108	Juniper Woodland

109	Pinyon-Juniper Woodland
110	Open Deciduous Woodland (Oak, Populus) with Evergreen Needleleaf Species
111	Pinyon-Juniper Woodland
112	Pinyon-Juniper Woodland
113	Woody Savanna
114	Oak Woodlands
115	Grassland/Woodland (Oak) Mosaic with Cropland
116	Deciduous Dry Forest
117	Open Mixed Forest (Pine, Oak)
118	Grassland/Forest
119	Oak Savanna
120	Savanna
121	Wet Herbaceous Meadows
122	Grassland (Short Grass Prairie)
123	Grassland (Short- Mid Grass Prairie)
124	Grassland with Cropland (Small Grains)
125	Grassland with Shrubland
126	Grassland
127	Grassland with Shrubland
128	Grassland (Warm Season Grasses)
129	Grassland with Cropland (Small Grains, Pasture)
130	Grassland with Shrubland
131	Grassland/Shrubland with Crops, Fallow
132	Grassland with Cropland
133	Grassland with Woodland and Wetlands
134	Grassland with Cropland
135	Grassland (Tall Grass Prairie)
136	Grassland
137	Wetlands with Tall/Low Shrubs, Tundra, Spruce
138	Herbaceous Wetlands
139	Cropland (Small Grains and Pasture) with Grasslands
140	Cropland (Small Grains) with Grasslands
141	Cropland (Sugar Cane)
142	Cropland

143	Cropland (Small Grains, Pasture) with Grasslands
144	Irrigated Agriculture
145	Cropland (Truck Crops) with Deciduous Woodlands (Oak)
146	Cropland (Winter Wheat)
147	Cropland (Small Grains, Row Crops)
148	Irrigated Agriculture
149	Irrigated Agriculture
150	Irrigated Agriculture
151	Cropland (Corn, other Row Crops, Forage Crops) with Woodland
152	Irrigated Agriculture
153	Cropland (Small Grains, Hay, Pasture) with Wetlands
154	Cropland (Corn and Soybeans)
155	Irrigated Agriculture
156	Cropland (Corn and Soybeans)
157	Irrigated Agriculture
158	Cropland (Corn and Soybeans)
159	Irrigated Agriculture
160	Cropland (Cultivated Grassland)
161	Cropland (Mixed Row Crops) with Woodland
162	Cropland (Grass Seed, Small Grains) with Mixed Woodlands
163	Cropland (Winter Wheat)
164	Cropland (Cotton, Soybeans, Rice)
165	Cropland (Sugar Cane)
166	Irrigated Agriculture
167	Cropland with Savanna
168	Cropland (Cultivated Grasses) with Savanna
169	Irrigated Agriculture
170	Cropland (Corn, Soybeans, Cotton, Rice) with Pasture
171	Cropland
172	Cropland
173	Cropland with Woodland
174	Grassland, Cropland (Small Grains), Fallow Mosaic
175	Cropland, Woodland, Urban Mosaic
176	Cropland (Small Grains, Pasture)/Grassland Mosaic

177	Grassland/Cropland (Wheat, Corn) Mosaic
178	Cropland (Row Crops, Small Grains)/Grassland Mosaic
179	Cropland/Deciduous Forest (Aspen) Mosaic
180	Cropland (Small Grains, Row Crops)/Grassland
181	Deciduous Forest (Maple, Beech, Birch)/Cropland
182	Cropland (Corn, Sorghum, Small Grains)/Grassland Mosaic
183	Cropland (Corn, Soybeans, Alfalfa)/Woodlands Mosaic
184	Cropland/Grassland
185	Cropland (Corn, Cotton, Sorghum, Pasture)/Grassland Mosaic
186	Deciduous Forest (Maple, Elm)/Cropland (Corn, Soybeans, Pasture)
187	Cropland/Deciduous Dry Forest Mosaic
188	Cropland (Corn, Small Grains)/Deciduous Forest (Oak, Hickory) Mosaic
189	Cropland (Cultivated Grasses)/Deciduous Forest Mosaic
190	Cropland/Deciduous Forest Mosaic
191	Cropland/Woodland
192	Cropland (Corn, Soybeans, Pasture)/Woodland (Oak, Hickory) Mosaic
193	Cropland(Corn, Cotton, Soybeans)/Evergreen Needleleaf Forest (Slash Pine) Mosaic
194	Cropland (Pasture)/Grassland Mosaic
195	Ice and Snow
196	Barren
197	Barren Or Sparsely Vegetated
198	Sparsely Vegetated Arctic Tundra
199	Herbaceous Arctic Tundra
200	Herbaceous Arctic Tundra
201	Inland Water
202	Ocean

3.2 Global Ecosystems Legend

Value	Description
1	Urban
2	Low Sparse Grassland

3	Coniferous Forest
4	Deciduous Conifer Forest
5	Deciduous Broadleaf Forest
6	Evergreen Broadleaf Forests
7	Tall Grasses and Shrubs
8	Bare Desert
9	Upland Tundra
10	Irrigated Grassland
11	Semi Desert
12	Glacier Ice
13	Wooded Wet Swamp
14	Inland Water
15	Sea Water
16	Shrub Evergreen
17	Shrub Deciduous
18	Mixed Forest and Field
19	Evergreen Forest and Fields
20	Cool Rain Forest
21	Conifer Boreal Forest
22	Cool Conifer Forest
23	Cool Mixed Forest
24	Mixed Forest
25	Cool Broadleaf Forest
26	Deciduous Broadleaf Forest
27	Conifer Forest
28	Montane Tropical Forests
29	Seasonal Tropical Forest
30	Cool Crops and Towns
31	Crops and Town
32	Dry Tropical Woods
33	Tropical Rainforest
34	Tropical Degraded Forest
35	Corn and Beans Cropland
36	Rice Paddy and Field

37	Hot Irrigated Cropland
38	Cool Irrigated Cropland
39	Cold Irrigated Cropland
40	Cool Grasses and Shrubs
41	Hot and Mild Grasses and Shrubs
42	Cold Grassland
43	Savanna (Woods)
44	Mire, Bog, Fen
45	Marsh Wetland
46	Mediterranean Scrub
47	Dry Woody Scrub
48	Dry Evergreen Woods
49	Volcanic Rock
50	Sand Desert
51	Semi Desert Shrubs
52	Semi Desert Sage
53	Barren Tundra
54	Cool Southern Hemisphere Mixed Forests
55	Cool Fields and Woods
56	Forest and Field
57	Cool Forest and Field
58	Fields and Woody Savanna
59	Succulent and Thorn Scrub
60	Small Leaf Mixed Woods
61	Deciduous and Mixed Boreal Forest
62	Narrow Conifers
63	Wooded Tundra
64	Heath Scrub
65	Coastal Wetland, NW
66	Coastal Wetland, NE
67	Coastal Wetland, SE
68	Coastal Wetland, SW
69	Polar and Alpine Desert
70	Glacier Rock

71	Salt Playas
72	Mangrove
73	Water and Island Fringe
74	Land, Water, and Shore
75	Land and Water, Rivers
76	Crop and Water Mixtures
77	Southern Hemisphere Conifers
78	Southern Hemisphere Mixed Forest
79	Wet Sclerophylic Forest
80	Coastline Fringe
81	Beaches and Dunes
82	Sparse Dunes and Ridges
83	Bare Coastal Dunes
84	Residual Dunes and Beaches
85	Compound Coastlines
86	Rocky Cliffs and Slopes
87	Sandy Grassland and Shrubs
88	Bamboo
89	Moist Eucalyptus
90	Rain Green Tropical Forest
91	Woody Savanna
92	Broadleaf Crops
93	Grass Crops
94	Crops, Grass, Shrubs
95	Evergreen Tree Crop
96	Deciduous Tree Crop

3.3 IGBP Land Cover Legend

Value	Description
1	Evergreen Needleleaf Forest
2	Evergreen Broadleaf Forest
3	Deciduous Needleleaf Forest

4	Deciduous Broadleaf Forest
5	Mixed Forest
6	Closed Shrublands
7	Open Shrublands
8	Woody Savannas
9	Savannas
10	Grasslands
11	Permanent Wetlands
12	Croplands
13	Urban and Built-Up
14	Cropland/Natural Vegetation Mosaic
15	Snow and Ice
16	Barren or Sparsely Vegetated
17	Water Bodies

3.4 USGS Land Use/Land Cover System Legend (Modified Level 2)

Value	Code	Description
1	100	Urban and Built-Up Land
2	211	Dryland Cropland and Pasture
3	212	Irrigated Cropland and Pasture
4	213	Mixed Dryland/Irrigated Cropland and Pasture
5	280	Cropland/Grassland Mosaic
6	290	Cropland/Woodland Mosaic
7	311	Grassland
8	321	Shrubland
9	330	Mixed Shrubland/Grassland
10	332	Savanna
11	411	Deciduous Broadleaf Forest
12	412	Deciduous Needleleaf Forest
13	421	Evergreen Broadleaf Forest
14	422	Evergreen Needleleaf Forest
15	430	Mixed Forest

16	500	Water Bodies
17	620	Herbaceous Wetland
18	610	Wooded Wetland
19	770	Barren or Sparsely Vegetated
20	820	Herbaceous Tundra
21	810	Wooded Tundra
22	850	Mixed Tundra
23	830	Bare Ground Tundra
24	900	Snow or Ice

3.5 Simple Biosphere Model Legend

Value	Description
1	Evergreen Broadleaf Trees
2	Broadleaf Deciduous Trees
3	Deciduous and Evergreen Trees
4	Evergreen Needleleaf Trees
5	Deciduous Needleleaf Trees
6	Ground Cover with Trees and Shrubs
7	Groundcover Only
8	Broadleaf Shrubs with Perennial Ground Cover
9	Broadleaf Shrubs with Bare Soil
10	Groundcover with Dwarf Trees and Shrubs
11	Bare Soil
12	Agriculture or C3 Grassland
17	Persistent Wetland
18	Dry Coastal Complexes
19	Water
20	Ice Cap and Glacier

3.6 Simple Biosphere 2 Model Legend

Value	Description
1	Broadleaf Evergreen Trees
2	Broadleaf Deciduous Trees
3	Broadleaf and Needleleaf Trees
4	Needleleaf Evergreen Trees
5	Needleleaf Deciduous Trees
6	Short Vegetation/C4 Grassland
7	Shrubs with Bare Soil
8	Dwarf Trees and Shrubs
9	Agriculture or C3 Grassland
10	Water, Wetlands
11	Ice/Snow

3.7 Biosphere-Atmosphere Transfer Scheme Legend

Value	Description
1	Crops, Mixed Farming
2	Short Grass
3	Evergreen Needleleaf Trees
4	Deciduous Needleleaf Tree
5	Deciduous Broadleaf Trees
6	Evergreen Broadleaf Trees
7	Tall Grass
8	Desert
9	Tundra
10	Irrigated Crops
11	Semidesert
12	Ice Caps and Glaciers
13	Bogs and Marshes
14	Inland Water
15	Ocean
16	Evergreen Shrubs
17	Deciduous Shrubs

18	Mixed Forest
19	Forest/Field Mosaic
20	Water and Land Mixtures

3.8 Running Vegetation Lifeforms Legend

Value	Description
1	Evergreen Needleleaf Vegetation
2	Evergreen Broadleaf Vegetation
3	Deciduous Needleleaf Vegetation
4	Deciduous Broadleaf Vegetation
5	Annual Broadleaf Vegetation
6	Annual Grass Vegetation
7	Non-vegetated Land
8	Water Bodies

4.0 Information on Version 2.0

The first version of the global land cover database was completed and released to the public in November, 1997. We applied the feedback we received from the users of this database (Brown and others, 1999) and broad lessons learned from the validation exercise of the IGBP DISCover land cover data (Scepan, 1999; Muchoney and others, 1999) to the development of this revised version of the database. Version 2.0 of the North America land cover database contains updated land cover classes and revised labels. Users can identify the revised images and documentation by observing "2.0" or "2_0" in file names (for example, afigbp2_0g.img). Links to the previous version (1.2) of the land cover database are found on glcc_version1.php.

We have provided the specific changes to the North America land cover database in the following ascii text file, nalcdbtab2_0.txt . The file contains 42 fields (columns) and the data are of variable width with tabs as field delimiters. The first record (row) of the file corresponds to the field titles. The following records in the file are indexed by the second field to the North America Seasonal Land Cover Regions (Version 2.0). The field entitled "Update" contains information specific to the action taken in order to revise the particular Seasonal Land Cover Region (for example, the class was split, merged with another region, or relabeled).

5.0 References

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