Supplementary Material

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1. **Supplementary Data**

**Land cover class definitions (USGS, 2020)**

Developed – Areas of intensive use with much of the land covered with structures (e.g., high density residential, commercial, industrial, or transportation), or less intensive uses where the land cover matrix includes vegetation, bare ground, and structures (e.g., low density residential, recreational facilities, cemeteries, or transportation/utility corridors), including any land functionally related to the developed or built-up activity.

Cropland – Land in either a vegetated or unvegetated state used in production of food, fiber, and fuels. This includes cultivated and uncultivated croplands, hay lands, orchards, vineyards, and confined livestock operations. Forest plantations are considered as forests or woodlands (Tree Cover class) regardless of the use of the wood products.

Grass/Shrub – Land predominantly covered with shrubs and perennial or annual natural and domesticated grasses (e.g., pasture), forbs, or other forms of herbaceous vegetation. The grass and shrub cover must comprise at least 10% of the area, and tree cover is less than 10% of the area.

Tree Cover – Tree-covered land where the tree cover density is greater than 10%. Cleared or harvested trees (i.e., clearcuts) will be mapped according to current cover (e.g., Barren, Grass/Shrub).

Water – Areas covered with water, such as streams, canals, lakes, reservoirs, bays, or oceans.

Wetland – Lands where water saturation is the determining factor in soil characteristics, vegetation types, and animal communities. Wetlands are comprised of mosaics of water, bare soil, and herbaceous or wooded vegetated cover.

Ice/Snow – Land where accumulated snow and ice does not completely melt during the summer period (i.e., perennial ice/snow).

Barren – Land comprised of natural occurrences of soils, sand, or rocks where less than 10% of the area is vegetated.

1. **Supplementary Figures**

Pre-packaged and pre-processed Landsat data from the USGS called the U.S. Landsat ARD (referred to as “ARD”) which provide data for the following supplementary figures include data from the Landsat archive which covers the years 1982-present (Dwyer et al., 2018). Reprojected (Universal Transverse Mercator (UTM) into the ARD Albers Equal Area Conic) scene-based Level-2 Landsat data that uses the exact same source scenes that made up the ARD data (referred to as “REP”) are also displayed.

**Chart, line chart

Description automatically generatedSupplementary Figure 1**. Annual Atlanta tile Tree Cover composition comparison (A) and annual composition (B) for the ARD-based data (ARD) and scene-based (i.e., reprojected) data (REP) during 1985-2023.

**Chart

Description automatically generatedSupplementary Figure 2**. Annual Atlanta tile Developed composition comparison (A) and annual composition (B) for the ARD-based data (ARD) and scene-based (i.e., reprojected) data (REP) during 1985-2023.

**Chart

Description automatically generatedSupplementary Figure 3**. Annual Atlanta tile Cropland composition comparison (A) and annual composition (B) for the ARD-based data (ARD) and scene-based (i.e., reprojected) data (REP) during 1985-2023.

**Chart

Description automatically generatedSupplementary Figure 4**. Annual Atlanta tile Grass/Shrub composition comparison (A) and annual composition (B) for the ARD-based data (ARD) and scene-based (i.e., reprojected) data (REP) during 1985-2023.

**Chart

Description automatically generatedSupplementary Figure 5**. Annual Atlanta tile Water composition comparison (A) and annual composition (B) for the ARD-based data (ARD) and scene-based (i.e. reprojected) data (REP) during 1985-2023. Drought periods are highlighted with vertical shading.

**Chart

Description automatically generatedSupplementary Figure 6**. Annual Atlanta tile Wetland composition comparison (A) and annual composition (B) for the ARD-based data (ARD) and scene-based (i.e. reprojected) data (REP) during 1985-2023.

**Chart

Description automatically generatedSupplementary Figure 7**. Annual Atlanta tile Barren composition comparison (A) and annual composition (B) for the ARD-based data (ARD) and scene-based (i.e. reprojected) data (REP) during 1985-2023.

**References**

Dwyer, J.L., Roy, D.P., Sauer, B., Jenkerson, C.B., Zhang, H., and Lymburner, L. (2018). Analysis ready data—Enabling analysis of the Landsat archive: Rem. Sens., 10, 9, 1363. doi: <https://doi.org/10.3390/rs10091363>

U.S. Geological Survey (USGS) (2020). Land Change Monitoring, Assessment, and Projection (LCMAP) Data Format Control Book (DFCB): U.S. Geological Survey, LSDS 1424. Accessed online: <https://www.usgs.gov/media/files/lcmap-dfcb>

**Data Availability for Supplementary Figures**

Details and sources of Collection 2 Landsat data archive (Level-1, Level-2, and Level-3 data products) can be found at https://www.usgs.gov/landsat-missions/landsat-data-access. A variety of sources provide access to the Landsat data archives including the USGS EarthExplorer (https://earthexplorer.usgs.gov), commercial cloud access (https://www.usgs.gov/landsat-missions/landsat-commercial-cloud-data-access), GloVis (https://glovis.usgs.gov), Landsat Look (https://landsatlook.usgs.gov), the USGS Earth Observation and Science (EROS) Center Science Processing Architecture (ESPA) On-Demand interface (https://espa.cr.usgs.gov), and NASA AppEEARS portal (https://appeears.earthdatacloud.nasa.gov). The Albers scenes that go into ARD tiling are published via Amazon Web Services (AWS) S3, and the USGS Landsat data can be accessed using the USGS SpatioTemporal Asset Catalog (STAC) at <https://www.usgs.gov/landsat-missions/spatiotemporal-asset-catalog-stac>.

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