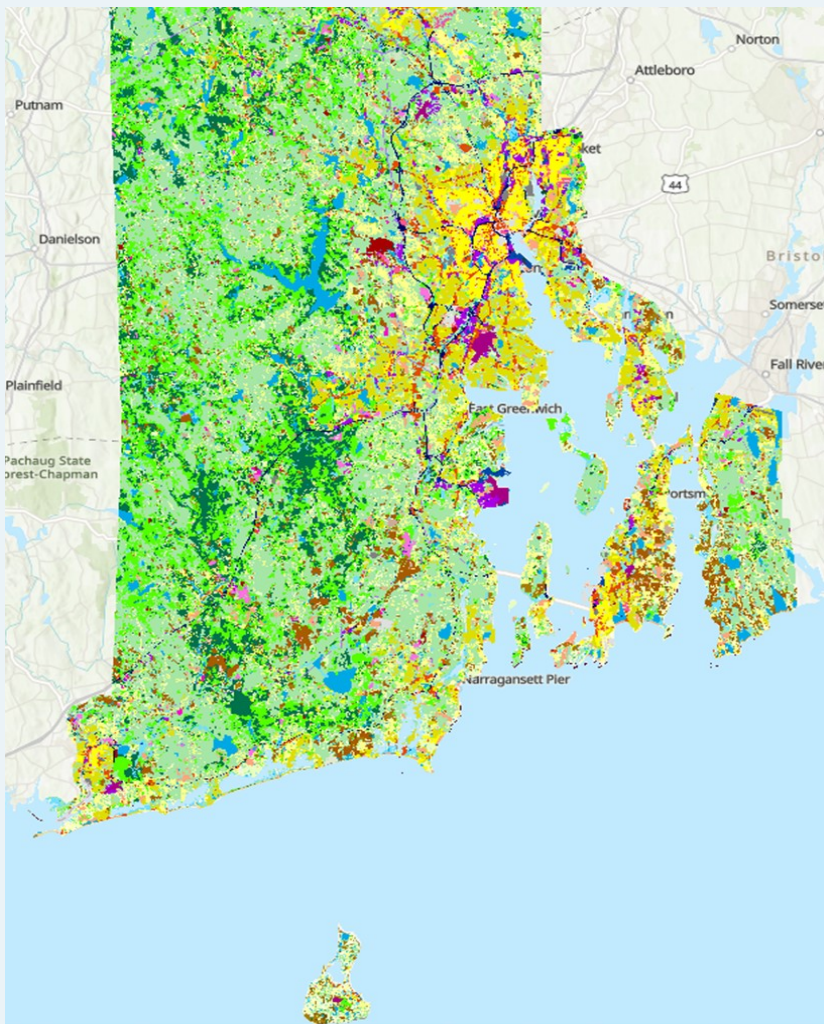




New 2020 Land Use Land Cover Data Available

In 2019, Nancy Hess and Paul Gonsalves of the Division of Statewide Planning began working with the United States Geological Survey (USGS), Charles LaBash, University of RI Environmental Data Center and Paul Jordan, Department of Environmental Management on a project to update the mapped land use and land cover (LULC) characteristics for the State. Partnering with USGS, NV5 Geospatial was contracted to perform the project using an approach consisting of a hybrid of semi-automated workflows coupled with manual change detection and interpretation techniques conducted by qualified photogrammetric analysts. A full description of the project is on the back of this page. Funding for the 2020 Land Use and Land Cover, Impervious Surface, and Digital Aerial Orthoimagery update projects was made possible from the Federal Highway Administration and Rhode Island State appropriations through the RI Division of Statewide Planning and the RI Office of the Attorney General as part of the settlement in Rhode Island v. Volkswagen AG, et al., C.A. No.: PC-2018-0026. The new data and the supporting information along with other historical LULC data are available through the Rhode Island Geographic Information System (RIGIS) Open Data website maintained by the University of Rhode Island's Environmental Data Center for free download at: <https://www.rigis.org>



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The project involved three stages. The 1st stage was the collection of high-resolution true-color and near-infrared aerial orthoimagery in the Spring of 2020. It consisted of flying an area of approximately 1,403 sq. miles and acquiring 0.5-foot resolution, 16-bit depth, 4-spectral band images in GeoTiff format based upon the RI State Plane Coordinate System, NAD 1983 (1986), NAVD88(18) survey feet and a prior tiling scheme. The imagery was acquired from a fixed-wing aircraft at an altitude of 9,512 ft, AGL. The mission yielded 3,153 image tiles with each pixel representing a ground resolution of six inches. Photos were leaf-off, free of clouds, cloud shadow, smoke, haze, snow, and excessive flooding to the greatest extent possible with little or no reflectance from water. Images were captured in four flights on April 29th and May 2, 2020, in 47 flight lines.

The 2nd stage involved the identification of changes in impervious surfaces between 2011 and 2020 using the new spring 2020 orthoimagery. NV5 Geospatial updated the Impervious Data layer through semi-automated methods. Only real changes between the 2011 and 2020 imagery was mapped. Errors present in the previous 2011 data set were not corrected (unless they were directly associated with a real LULC change) as this would skew the change analysis. The minimum mapping unit for this data layer was 800 square feet. The changed area was then inspected by a photo interpreter to ensure greater than 95% accuracy. After the changed area was inspected, it was then used to update the 2011 impervious data raster layer.

The 3rd stage involved the identification of changes between 2011 and 2020 in LULC using the new impervious surface data layer and the new aerial orthoimagery. Rhode Island's modified Anderson Level III Land Classification Codes were used to classify the LULC cover data consistent with five prior LULC datasets. To complete the 2020 LULC vector layer project a team of NV5 Geospatial GIS Technicians worked to photo-interpret and digitize LULC change from 2011 to 2020. A minimum mapping unit of 1/2 acre was used, except in water bodies which were retained in the data for areas less than 1/2 acre. Changes made to the new impervious raster layer were used as an ancillary layer to assist photointerpretation of LULC change. All data were checked for gaps, overlaps, and slivers and anything below the minimum mapping unit were reviewed and merged or reclassified if necessary. Altogether, ~1,128 sq. miles of imagery were reviewed and classified for change. This area represents the entire State of Rhode Island and includes ½ mile coverage into Massachusetts and Connecticut.

Throughout the project, number of technical review meetings were held virtually between all involved as photointerpretation of LULC cover can be ambiguous within class descriptions and because of visual similarities. Clarification had to be made on numerous items recurring across the State to bring consistency to the classified data. The most discussed classes were residential, institutional, and commercial. The medium density residential class showed the most change, gaining about almost a 1,000 acres of new LULC. The skills of the NV5 Geospatial photo interpreting team and the local knowledge and skills of the Rhode Island Team helped to make accurate classification calls. Additionally, there were two new Anderson Level III land use classes added to the 2020 LULC update; 148 Ground-mounted Solar Energy Systems, and 149 Wind Energy Systems. These uses did not exist in the previous LULC layers.

Data Available*

Land Use and Land Cover (2020) –Land use/land cover for the entire state and adjacent nearby areas of Connecticut and Massachusetts available for download in vector GIS formats (shapefile, file geodatabase) and as a consumable web feature service.

2020 Statewide Orthoimagery in GeoTiff format. Available as consumable web image services <https://www.rigis.org/pages/ri-202004-rgbi-6in>.

Impervious Surfaces (2020) – A 2020 statewide Impervious Surface raster data set in an ESRI raster format.

Metadata - Documentation for all project data explaining on how the 2020 land use/land cover and impervious surface layers were created along with supporting ancillary data, data projections, and the LULC codes/descriptions used to classify polygon features.

*** Caveats*** Users of the new data should keep in mind that the 2020 LULC does not contain all wetlands in the State that were identified in previous LULC data sets or other RIGIS wetlands data sets. Hydrological conditions in the Spring of 2020 also involved the creation of differing edges for water bodies in some areas of the State. Areas classified as forested wetlands in earlier LULC data sets are shown as forest types in the 2020 LULC. Also, in a few areas outside of the State ½ mile boundary buffer, 2011 to 2020 LU/LC changes were not mapped due to lack of 2011 orthoimagery coverage necessary to perform the change detection with the 2020 orthoimages. Finally, since a hybrid approach was used to develop the 2020 LULC, direct comparisons resulting from any statistical analysis between previous LULC or RIGIS wetlands data should be interpreted with caution and appropriate disclosures.