



Innovative Technology continues to advance Chesapeake Bay restoration

New land use/land cover and change data provide powerful insights into how the watershed is transforming

Annapolis, MD – The Chesapeake Bay Program, in collaboration with the Chesapeake Conservancy, U.S. Geological Survey and the University of Vermont, is pleased to announce the release of the Very High-Resolution Land Use/Land Cover and Change Data. These data update the 2013-14 [High-Resolution Land Use Data Project](#), provide new land use and land cover data captured in 2017-18 and include a new data product that describes the changes in land use and land cover throughout the Chesapeake Bay watershed from 2013-14 to 2017-18.

In 2018, the U.S. Environmental Protection Agency entered into a six-year cooperative agreement with the Chesapeake Conservancy to produce land use, land cover and land change data for the watershed. This effort was intended to build upon the release of the initial one-meter data products in 2016 and 2017 that were the first and largest high-resolution land use/land cover datasets ever developed for the Chesapeake Bay watershed. When these products were released in 2016 and 2017, they provided more precise information showing small tracts of woods and individual trees in urban areas.

The new 2017-18 dataset includes a more detailed land use/land cover classification with enhanced technical and scientific information that was not previously available for the 2013-14 data products. Experts have now updated the 2013-14 datasets with this new information and are releasing a brand-new 2017-18 product. The new 2017-18 and revised 2013-14 datasets contain 54 land use/land cover classes that are grouped into a general 18 class schema. This new release includes 38 more land use/land cover classes than the original 2013-14 data product.

These data cover 99,000 square miles—an area comprising 206 counties that intersect or are adjacent to the Chesapeake Bay watershed. They will inform [Chesapeake Bay Total Maximum Daily Load](#) planning efforts that will help watershed jurisdictions make progress toward meeting their pollutant reduction goals. In addition, the 1-meter data support the goals and outcomes of the [Chesapeake Bay Watershed Agreement](#) by helping [partners](#) of the Chesapeake Bay Program improve their ability to measure and focus environmental, community and economic benefits, such as determining improvements in air quality, reducing flooding risks, energy savings, carbon sequestration, advancements in environmental justice and enhancements in stormwater management.

To complement these updated and new datasets, change data are being offered for the very first time. This is the first such product to map change at this large scale. The change data will inform powerful insights about how our watershed is transforming. It will help guide actions and decisions to make progress toward meeting land management goals, including monitoring changes in tree canopy, determining how much carbon is stored in forests, and mapping wildlife habitat, ecologically sensitive lands and areas where environmental restoration can provide the most benefit. Additionally, these data can track how lands transition into being

developed or used for agricultural production, as well as other changes that impact water quality and the environment as a whole.

The Very High-Resolution Land Use/Land Cover change data are currently limited to a 4–5-year span, as these novel data have only been developed for two time periods at this point (2013-14 and 2017-18) for each county in the Chesapeake Bay watershed. Because one-by-one meter data has not been produced using imagery prior to 2013, [moderate 30-by-30 meter resolution data](#), produced by the U.S. Geological Survey, are used to assess land use/land cover prior to that time. These data will continue to be important in understanding long-term trends in human activities across the Chesapeake Bay watershed.

This is the largest amount of open data at this scale that has ever been made available and it's free for anyone to use. The 2017-18 land cover and land use data, as well as the change data can be accessed at <https://www.chesapeakeconservancy.org/conservation-innovation-center/high-resolution-data/lulc-data-project-2022/>. A webinar explaining how to access and use the data is available will be held on Tuesday, May 24 from 1:00 p.m.-2:30 p.m. Please visit [this link](#) to register for the webinar. The next iteration of land use/land cover and change data is expected in 2024, representing the 2021-22 timeframe.

Facts

Land cover describes the natural and human-made features that exist on the land surface, such as impervious surfaces, tree canopy, and water. Land cover data are produced directly from either satellite or aerial imagery combined with information on features from LiDAR imagery and planimetric data on roads and building footprints. Land use illustrates how people make use of the land with classes such as cropland, turf grass, solar fields and extractive (such as active mining operations). Translating land cover into land use requires nuanced consideration and use of a variety of ancillary data including tax parcels, active and abandoned mines, landfills, golf courses, utility transmission lines, and timber harvest permit areas. The availability and usability of ancillary data varies across the watershed.

Issues

Accurate Very High-Resolution Land Use/Land Cover data are expensive to produce, requiring expert staff, computers and software. This makes it difficult for organizations and local government agencies to generate their own. Moreover, accurate mapping of land use/land cover change at very high-resolution is extremely rare, requiring a focused effort to compare images representing two different dates rather than attempting to differentiate two independently developed land use/land cover datasets. Without accurate and precise land use/land cover data, it is challenging to set realistic, rigorous pollutant reduction targets. Up until 2017, the Chesapeake Bay Program has relied on 30-meter land cover data produced by the U.S. Geological Survey and the National Oceanic and Atmospheric Administration. While such data can describe generalized landscape trends, data at that resolution cannot accurately depict tree canopy in densely developed areas, low-density residential development, narrow roads or small buildings.

Importance

One-meter resolution land use/land cover and change data will be useful not only to the restoration efforts of the Chesapeake Bay Program, but also to state and local governments, nonprofits, businesses and academic institutions throughout the watershed. It provides partner organizations with the power to practice precision restoration and conservation, which is loosely described as getting the right restoration and conservation practices, in the right places at the right times. Effective and impactful decisions about where to target restoration and conservation efforts, made based on the foundational land use/land cover data, will save government and nonprofit redundancies and resources.

Quotes

“These new data will help anyone who wants to do their part in protecting every corner of the watershed. There’s tremendous benefit in having data like this that can show the good and bad treatment of land so that we can make better decisions going forward.

- Adam Ortiz, Chair, Chesapeake Bay Program Principals’ Staff Committee and Regional Administrator, Environmental Protection Agency, Mid-Atlantic Region

“For the first time, high-resolution change data is available for the Chesapeake as open data. This allows us to better understand what’s happening on the landscape and to do change detection and trend analysis. The significance of this cannot be understated. For those of us working to restore the Chesapeake, this is practically the James Webb Space Telescope moment.”

- Joel Dunn, President and CEO, Chesapeake Conservancy

“The one-meter land use and land cover data are foundational, authoritative, and transformative to the Bay restoration effort. They are foundational because they inform most outcomes in the 2014 Agreement and will serve as the basis for developing the next generation of watershed and land change models. They are authoritative due to their anticipated high accuracy (i.e., 95% user’s accuracy for impervious cover and tree canopy) and transparency: any person viewing the data can recognize and evaluate features and areas of interest based on their local knowledge. The data are transformative because they will ultimately change the way restoration and conservation actions are implemented, enabling a complete inventory of restoration and conservation opportunities and the targeting of actions.”

- Peter Claggett, Coordinator, Chesapeake Bay Program Land Use Workgroup and Research Geographer, U.S. Geological Survey