Producing Very-High Resolution Land Use / Land Cover Data through the year 2030
FACT SHEET – March 2022

Background

In February 2018, the U.S. Environmental Protection Agency's Chesapeake Bay Program Office issued a Request for Proposals to provide geospatial data and analysis to support the goals and outcomes of the *2014 Chesapeake Bay Watershed Agreement.* In the summer of 2018, a six-year, $7.5 million Cooperative Agreement was awarded to the Chesapeake Conservancy (CC). Funding for this RFP was provided at the sole discretion of USEPA and subject to the availability of funds on an annual basis. It's important to note that this is a Cooperative Agreement and not a contract or grant. Cooperative Agreements allow the CBP Partners to actively participate in the development of products and enables adjustments to the scope to address evolving technology and partnership needs.

The successful proposal consists of four objectives, the primary of which involves the production of comparable 1-meter resolution land use/cover data for the years 2017 and 2021, an accuracy assessment, and corrections to the existing 2013 land use/cover data. The estimated total cost of this first objective is $4 million, distributed over six years. The CC subcontracted with the University of Vermont's Spatial Analysis Laboratory to produce a 12-class land cover dataset while the CC and USGS lead the development of a 50+ class land use dataset. Land cover and land use data are being developed for all 206 counties intersecting the Bay watershed which equates to a 100,000 square-mile area (note that the watershed is 64,000 square miles). The decision to include full-county coverage was made to ensure that the data would be useful for county-level decisions as called for in the Land Use Methods and Metrics Outcome in the 2014 Agreement.

The Value of Long-term Monitoring of Land use and Land Cover Change

The production of "land cover" data involves the direct classification of aerial imagery based on the spectral properties of the imagery and height information derived from LiDAR. Land cover represents the surface characteristics of the land with classes such as impervious cover, tree canopy, herbaceous, and barren. In contrast, "land use" represents how humans use the land with classes such as turf grass, cropland, and timber harvest. Land use data are critical for understanding the impact of human activities on the Chesapeake Bay. Producing land use from land cover data requires a variety of ancillary datasets (e.g., tax parcels, abandoned mine lands, solar panel arrays, landfills, and quarries) combined with spatial rules that leverage the contextual information inherent in the very-high resolution land cover data.

The very-high resolution 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. These 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 targeting actions at a fine scale to locations where they will be most effective. Moreover, establishing accurate trends in impervious cover, forests, and tree canopy will enable the CBP Partners to improve the efficiency and effectiveness of stormwater controls, forest management, and climate resilience activities.

If the production of very-high resolution land use/cover data is not continued, the value of the current $4 million investment will be partially forsaken. The CBP Partners will have no context for understanding whether the trends observed over the 8-year period are representative or anomalous. National, 30-meter resolution land use/cover data will once again be the standard

for informing models and decisions, but we know now that these data greatly underestimate the amount of impervious cover in the watershed and that they are not sensitive to detecting low-density residential development which occurs throughout the watershed and has been responsible for much of the loss of forests and farmland to development over recent decades. Moreover, the local governments and non-governmental organizations that have begun to rely on the data for updating county comprehensive plans, mapping stormwater management areas, assessing community tree canopy stream restoration, and other purposes may quickly lose confidence in the data, especially in areas experiencing recent changes in land use.

In summary, the production of very-high resolution land use/cover data needs to be continued through 2030 to fully leverage their transformative potential. The addition of land cover and land use data every 4-5 years will enable the CBP Partners to interpret landscape change more accurately and to compare long-term trends in land use and management actions with observed changes in stream flow, stream temperature, water quality, and species diversity. The total cost of extending the very-high resolution land data series through 2030 is expected to be between $4 and $5 million. This estimated cost is contingent on the free availability of USDA's National Aerial Imagery Program data and LiDAR imagery to the CBP Partners.