Producing High-resolution Land Cover and Land Use Data for the years 2025 and 2029
FACT SHEET

In February 2018, the U.S. Environmental Protection Agency's Chesapeake Bay Program Office issued a Request for Proposals to provide "geospatial analysis support for the CBP partnership in support of the targeted implementation of actions in support of reaching 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. This is critical because it allows 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 first of which involves the production of comparable land cover and land use data for the years 2017 and 2021, an accuracy assessment, and corrections to the existing 2013 land use data so that is directly comparable with the data produced for 2017 and 2021. 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 the 12-class land cover data while the CC leads the development of the 55-class land use data. 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 production of "land cover" 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 such as impervious cover, tree canopy, herbaceous, and barren classes. In contrast, "land use" represents how the land is used (e.g., turf grass, cropland, timber harvest, etc.). 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 high-res land cover data. For example, "forest" land use is defined as patches of trees larger than 1 acre with a minimum width of 72m and further than 10-20 meters from structures.

These 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 models. They are authoritative due to their accuracy and transparency; any person viewing the data can recognize features and areas of interest and compare them to their local knowledge. They are transformative because they will ultimately change the way restoration and conservation actions are implemented, enabling both to be targeted 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 and forest management activities.

The 2013-2017-2021 datasets only cover an eight-year period which constrains our ability to interpret trends and patterns and relate them to drivers of change and impacts which is the purpose of the Land Use Methods and Metrics Outcome. This data series needs to be continued through 2029 to fully leverage their transformative potential. The addition of land cover and land use data for the years 2025 and 2029 will enable the CBP Partners to examine longer-term trends and compare them with changes in management actions, stream flow,

stream temperature, water quality, and species diversity. The total cost of extending the land data series through 2029 is expected to be $4 million.

Funding the production of new land cover and land use datasets for the years 2025 and 2029 could be accomplished with two separate Cooperative Agreements. The current six-year Agreement with the Chesapeake Conservancy expires in June 2024. To ensure the timely production of data for the year 2025, a new RFP will need to be issued by summer 2025 to establish a new Cooperative Agreement by winter 2025 (assuming the project will again rely on available imagery produced by the National Aerial Imagery Program). A separate Cooperative Agreement could be issued in 2029 to produce that dataset by the summer of 2031. The above timeline and estimated $4 million cost are contingent on the free availability of NAIP and LiDAR imagery to the CBP Partners. If it is decided that the paid acquisition of imagery is needed, Cooperative Agreements should be in place the year prior to each target year (e.g., 2024 and 2028) to provide time for scheduling flights or tasking satellites. While two separate Cooperative Agreements may be fiscally practical, it is imperative that the data are comparable across all years, 2013 – 2029, and therefore it may be advantageous to have a single Agreement cover the production of data for both 2025 and 2029.

If the USEPA agrees to continue funding this effort, then they will need to budget for $1 million per year for the years 2026-2027 and 2030-2031. While it would be wonderful for counties to collectively fund this effort (because they would be paying 75% less than purchasing similar data individually), this is unlikely to happen given the logistics of coordinating such a purchase. If the USEPA does not foresee continuing its investment in high-resolution land cover and land use data, the Management Board should develop a strategy to do so by December 2023.