Land Use Workgroup Workplan for #1 Priority

Full Title of Priority: Improve spatial, temporal, and categorical representation of urban, agricultural, federal, and natural land uses and, to the extent possible, assign separate loading rates. Where local data unavailable, develop more accurate distribution of loads

High Priority, 21 votes

Notes: The above priority also includes backcasting land use over the calibration period for the watershed model and forecasting land use to 2017. These are minimal requirements for developing a land use dataset suitable for the 2017 Watershed Model. The LUWG will also explore the development of a 2025 land use dataset if jurisdictions or the WQGIT desire a 2025 land use to inform their Phase III WIPs or offset strategies.

Supporting Partners: Forestry, Agriculture and Urban Stormwater Workgroups (lead for recommending land uses and loading rates); Watershed Technical Workgroup; BMP Panels; WQGIT to resolve any cross-workgroup issues.

Necessary Datasets, Analyses, or Decisions: Recommendations on what new land uses should be added in or removed. Loading rates associated with different land uses – LUWG might need to convene panels in conjunction with sector Workgroups to develop loading rates.

Start Date: November 2012

Completion Date: April 2015

Interim Deliverables, Including Lead and Deadlines:

- November 2, 2012: Land Use Workgroup convenes meeting with supporting partners to develop work plan (Lead: Land Use Workgroup)
- December 3, 2012: Work plan due to WQGIT (Lead: Land Use Workgroup)
- December 10, 2012: Work plan discussed and approved by WQGIT (Lead: WQGIT)

Level of Effort for Lead and Supporting Partners, Including (as relevant) CBPO Modeling Team:
For the CBPO modeling team, improving the spatial, temporal and categorical representation of land uses would be a high level or effort. Developing 2025 projections for use in Phase III WIPs would be a moderate level of effort. Applying differential loading rates would be a moderate level of effort.

Potential Conflicts with Other Priorities: consult with entity's members (eg, Workgroup membership), supporting partners, and, if involves refinements to CBP modeling tools, CBPO modeling team to see if completing this priority interferes with completing other priorities and/or would lead to some outcomes that contradict other priorities, such as more detailed vs. coarser regional factors. Where a conflict exists, defer to higher priority if mutually agreed upon solution can't be found, or flag for WQGIT.

Requiring Input from Full WQGIT: Will need to resolve any cross-workgroup issues.

Other Notes: Combines multiple priorities: land use categories, forecasts and backcasts, completing WIPs in 2025 land use, and loading rates for different land uses. Relates to Guiding Principle 2: Enhance decision support and assessment tools to enable successful engagement

of local partners. WQGIT believes that land use is one of the most important data inputs in terms of gaining credibility with local governments.

Workplan Elements

1. Spatial and Temporal resolution
    a. Inventory local LULC across the Bay watershed, 1980 – present. Jan - March 2013
        i. Identify gaps in local LULC in urban, suburban, and exurban counties.
        ii. Develop and evaluate options for filling gaps with LULC data derive from remotely sensed imagery in combination with other data sources.
            1. Identify land uses and areas of the watershed for which accurate information is most critical for informing CBP management decisions.
    b. Explore issues and develop protocol for using local LULC. Jan – Dec 2013
        i. How does resampling and developing land cover coefficients for land use classes impact the comparison of local data with P532 data?
        ii. How does the incorporation of local LULC impact the equity in load allocations? (work with Modeling Workgroup)
        iii. Develop protocol for accepting local land use data.
    c. Explore methods for developing probabilistic estimates of land use/land cover using data fusion and accounting for uncertainty. June – Dec 2013
        i. Example: Rather than classifying an area as "commercial", it could be classified as 50% likely to be commercial, 35% likely to be residential, and 15% likely to be pasture. Multiplying the probability by the size of the area will yield unique acreages for each land use.
        ii. Suggest a STAC workshop on this topic (present at Dec or March meeting).
    d. Explore backcasting and forecasting options (1984 – 2017) given available data (June 2013 – June 2014).
        i. Implement options (Dec 2013 – Dec 2014)
    e. Explore forecasting options for 2025 (waiting for WQGIT and jurisdiction decision)
        i. Implement options (Dec 2013 – Dec 2014)
2. Categorical resolution
    a. Compile suggested changes to LULC classes (e.g., commercial, low-density residential, wetlands, riparian forest buffers, high-functioning forests). Jan - March 2013
    b. Develop categorical crosswalk between local and CBP LULC. (March – July 2013)
        i. How does reclassifying local data impact comparison with P532 LULC?
    c. Participate in coordinated effort with the Watershed Technical and Sector workgroups to explore the feasibility of assigning unique loading rates to potential new LULC classes – which will inform the final set of LULC classes to be used in the Phase 6 suite of models. (March 2013– March 2014)
        i. Integrate work on categorizing new land uses with interim deadlines from the LULC loading rate effort to meet final deadlines for submittal of Phase 6 LULC.
        ii. Convene expert panels if needed to explore and recommend new loading rates.
3. Develop and implement methods and evaluate available data and feasibility of mapping new LULC classes using available data. (March 2013 – December 2014)
    Data examples: NASS Cropland Data Layer, Longitudinal Employer-Household Dynamics database, Housing density by Census Block, Soils, Slope, Aspect, Common Land Units, Distance to streams, etc.
4. Develop protocol for reconciling local LULC with Census of Agriculture (April – July 2013)
    a. Compare extent of cropland and pasture/hay extent from Census with local LULC

   b. Use USDA Farm Service Agency's Common Land Unit polygons to spatially identify areas misclassified as agriculture in local LULC.
   c. Discuss options for correcting classification errors.
5. Develop impervious surface and tree canopy coefficients for relevant LULC classes (March 2013 – July 2014)
   a. Collect high-resolution impervious surface and tree canopy data where available
   b. Summarize impervious surface and tree canopy percentages per LULC class
   c. Evaluate the accuracy of impervious surface and tree canopy coefficients applied to the CBP LULC through a comparison with original high-resolution land cover data.
6. Evaluate the land use generalizations, assumptions, and scenarios (March 2013 – July 2014)
   a. Identify and assemble a ground-truth dataset composed of county and/or municipal land use data representing a gradient of rural to urban conditions.
   b. Compare the P532 and updated versions of the Chesapeake Bay Land Use Dataset to the ground-truth datasets.
   c. Characterize the accuracy of the CB Land Use Datasets in terms of omission and commission errors across the rural to urban gradient.
   d. Based on these observations, explore means for further improving the representation of land uses throughout the CB watershed.
7. Review results of applying new data and methods to CBPO models and compare with local models if available (Leads: Ag, Forestry, Urban Stormwater, Watershed Technical Workgroups, CBPO Modeling Team) (April – December 2014)
   a. Incorporate new LULC into CBLCM, Scenario Builder, and/or Watershed Model (Lead: CBPO Modeling Team)
   b. Review impact of new LULC data on CBLCM, Scenario Builder, and/or Watershed Model outputs (Leads: CBPO Modeling Team and Land Use Workgroup)
   c. Make changes to LULC data based on Workgroup review (Lead: CBPO Modeling Team and Land Use Workgroup)
8. Finalize land use dataset and submit for WQGIT approval (Lead: WQGIT) (January - April 2015)
   a. Make any changes to LULC based on WQGIT review (Lead: Land Use Workgroup)
   b. Bring to WQGIT for final review, approval.

Land Use Workgroup Timeline for Major Tasks

	2013												2014												2015			
Major Tasks	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Inventory local LULC																												
Explore Issues and develop protocol for using local LULC																												
Explore probabilistic LULC estimate																												
Explore backcasting and forecasting options (1984 - 2017)																												
Explore backcasting and forecasting options for 2025																												
Implement backcasting and forecasting methods																												
Compile suggested changes to LULC classes																												
Develop categorical crosswalk between local LULC and P532 LULC																												
Coordinate the development of loading rates for new LULC classes																												
Develop methods to map new LULC classes																												
Reconcile local LULC with Census of Agriculture																												
Develop impervious surface and tree canopy coefficients																												
Evaluate land use generalizations, assumptions, and scenarios																												
Review impact of applying new LULC in CBPO models																												
Finalize land use dataset and submit for WQGIT approval																												