Chesapeake Bay Program
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Discussion on Remote Sensing for Riparian Forest Buffer Detection

Forestry Workgroup Meeting

Alex Gunnerson, CBPO Contractor and Eric Hughes, EPA

Agenda

1. Background
2. RFB BMP Verification Protocols
3. Current Remote Sensing Use for Forestry BMPs
4. Potential for Remote Sensing
5. Available BMP data for Training

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Background

CBPO recognizes the BMP reporting and verification burden on jurisdictions

- If there is a way to reduce the burden, CBPO would like to assist
- One potential method: expanding the use of remote sensing where it is practical, scientifically sound, and partnership approved

Why Riparian Forest Buffers?

- Wide adoption
- Numerous benefits beyond water quality
- Upstream efficiency credit, in addition to land use conversion
  - Potential for extending efficiency credit beyond initial contract period

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Verification Protocols for Riparian Forest Buffer BMPs

As We Understand Them

Forestry BMP Verification Guidance (rev 2017)

Riparian Forest Buffers

- Verify planting establishment (0.5-4 years post planting)

Forestry BMP Verification Guidance (rev 2017)

Riparian Forest Buffers

- Verify planting establishment
- Spot check plantings for mortality, maintenance, invasives, and channelization (5-10% of practices per year)

Forestry BMP Verification Guidance (rev 2017)

Riparian Forest Buffers

- Verify planting establishment
- Spot check plantings
- Verify at end of contract life (10 or 15 years)if the buffer should be reenrolled in a contract, if the buffer will be maintained voluntarily, or if the buffer has been terminated

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Current use of Remote Sensing for Forestry BMPs

1m LULC

- 1m LULC produced by CIC and CBPO at four-year time steps captures the land use conversion credit for RFBs and other forestry BMPs
  - NAIP imagery as base, with extensive use of ancillary datasets

Jurisdictional use of Imagery and LiDAR

- Presentation from MD DNR and MD Forest Service in December 2020 on use of NAIP imagery and LULC for evaluating tree canopy coverage for RFBs
- In the 2023 QAPPs, DE indicated the usage of remote sensing to evaluate RFBs
  - PA QAPP mentioned a pilot study in 2016 and MD mentioned using GIS

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Potential Applications of Remote Sensing for RFB BMPs

End of Contract Life Monitoring for RFBs

- Potential workflow:
  - Use NAIP (1m) as base data, available every 2 years
  - Interpolate for years without NAIP using Sentinel-2 and Sentinel-1 data (10m)
  - Compare with 1m LULC product when available every four years
- Goal: establish presence/absence product for RFBs at end of 15-year contract to inform renewal

End of Contract Life Monitoring for RFBs

- Potential benefits:
  - Decision support resource for jurisdiction to decide if a field visit is required
  - Reduced time spent reviewing imagery
  - Additional dataset, which if used in conjunction with 1m LULC, could potentially improve accuracy of change over time in riparian zones

Key Questions

- Is presence/absence of tree canopy in the buffer sufficient verification to allow for reenrollment or be kept for credit at the end of a 15-year contract?
  - If not, what other information typically gathered from a site visit would be needed?
- Temporal frequency: needed on an annual basis?
- **Would this make a difference in reducing the reporting burden on jurisdictions? Would this save much time?**

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BMP Data Availability

BMP Data

What BMP data is available to share with CBPO for evaluating RS methods?

- Non-cost share BMP data in NEIEN (points)
- Delineated RFB polygons?
- Volunteer plantings?

What limitations or conditions would come along with using this data?

Ag RFB BMP reported through NEIEN in MD planted in 2008. Purple lines indicate 90m riparian buffer zone. Background: 2021 NAIP imagery

Thank you!

Alex Gunnerson: agunnerson@chesapeakebay.net
Eric Hughes: hughes.eric@epa.gov