

## **Report: Tri State Working Group 2<sup>nd</sup> Quarterly Meeting**

June 15, 2017

**Participants:** Edil Sepulveda (CMS Applications); Vanessa Escobar (CMS Applications); Sabrina Delgado (CMS Applications); Chalita Forgotson (CMS Applications); George Hurtt (University of Maryland); Katelyn Dolan (University of Maryland); Wenli Huang (University of Maryland); Stu Sheppard (University of Maryland); Elliott Campbell (MD DNR); Rachel Marks (MD DNR); Rob Feldt (MD Forest Service); Naomi Bates (DE Geological Survey); Donald Strebel (Versar, Inc.); Michelle Canick (The Nature Conservancy); Will Price (Pinchot Institute)

### **Summary**

The 2<sup>nd</sup> Quarterly Meeting of the Tri State Working Group provided an opportunity for the CMS Leadership to inform the Tri State stakeholders about the status of the CMS Initiative, which has been included as one of the NASA programs to be eliminated on the new budget for FY2018. This year's CMS Science Team Meeting, as well as the CMS Applications Workshop, will still take place in November in Norman, OK. The CMS Applications team is collecting information to educate and inform how CMS provides relevance, not only to climate change, but also to technical advances, empowering jobs and decision processes. This group is key for this feedback and effort because we have many active users of CMS data products.

Regarding science progress and updates, the University of Maryland (UMD) team has the canopy height data available, but will release it as a package with the biomass products through the ORNL DAAC (Oak Ridge National Laboratory Distributed Active Archive Center). The UMD team is finalizing the empirical biomass versions for Pennsylvania and Delaware. For more information regarding the project and products available, please visit the Ecometrica website, which is a web-based reporting platform where you can both view and produce reports of different GIS layers. There is a plan to expand the Tri-State working group to other states to apply this approach of land-based carbon monitoring and planning, and eventually scale it up to the national level.

Regarding stakeholder updates, several agencies in different states have been advertising and providing CMS data for interested stakeholders. Some of the uses and potential applications of the CMS data products in the Tri state area include: monitoring endangered fox squirrel habitats; identifying linear features, such as transmission lines, pipelines, and streams; monitoring methane emissions for wetlands (using data products from other CMS projects); and carbon reconnaissance in the Delaware River Basin.

Elliott Campbell and Rachel Marks from the Center for Economic and Social Science at Maryland DNR provided some updates on the Maryland's Greenhouse Gas Reduction Act (GGRA), the results of George Hurtt's presentation to the Maryland Commission on Climate Change Mitigation Working Group, how they are using CMS data products for their ecosystem service evaluation work, and a preliminary plan of other uses and applications of CMS data products for the agency.

Finally, stakeholders indicated interest in soil carbon sequestration data products, and monitoring emissions from wetlands, while the UMD team is interested in further discussing how to use CMS products (i.e. 1m canopy cover) to help inform compliance with the MD Forest Conservation Act.

## I. Introduction / Announcements

- Vanessa Escobar (CMS Applications Team Lead)
  - The CMS is on the President's proposed budget cuts list.
  - CMS Applications is collecting information to educate and inform how CMS provides relevance, not only to climate change, but also to technical advances, empowering jobs and decision processes. This group is key for this feedback and effort because we have many active users of CMS data products.
  - We would like to collect statements and information from you and put that into our lessons learned document.
- George Hurtt (CMS Science Team Lead)
  - NASA will suspend making decisions on new awards, but continue funding existing awards. This is the current NASA posture, while waiting for final decision from Congress.
  - We are still planning the CMS Science Team Meeting in November 2017 in Norman, OK.
  - We are also increasing the positive messaging of products and science results from CMS. We have several Hyperwall presentations (NASA high-resolution talks) that are available and a few others in the making. We are also creating a set of success stories, which exhibit a major scientific advance coupled to a major stakeholder need. These success stories were coauthored by stakeholders and CMS scientists. They will be presented in NASA social media.

## II. Science progress, updates and plans from NASA CMS (George Hurtt, Katelyn Dolan)

- The tri-state project (Hurtt-03 CMS Project) aims to increase accuracy of high spatial resolution land-based carbon monitoring and planning and scale it up to the national level, and link it to the upcoming NASA Global Ecosystem Dynamics Investigation (GEDI) mission [<https://science.nasa.gov/missions/gedi>].
- All of the **canopy cover data** for Delaware is available through the state GIS repository. Other available CMS products can be found at the ORNL DAAC: [https://daac.ornl.gov/cgi-bin/dataset\\_lister.pl?p=33](https://daac.ornl.gov/cgi-bin/dataset_lister.pl?p=33).
- The University of Maryland (UMD) team has the **canopy height data** available, but will release it as a package with the biomass products through the ORNL DAAC (Oak Ridge National Laboratory Distributed Active Archive Center). The UMD team is finalizing the empirical biomass versions for Pennsylvania and Delaware.

- The **Ecometrica** website is a web-based reporting platform where you can both view and produce reports of different GIS layers. To access, please email Katelyn Dolan ([kdolan@umd.edu](mailto:kdolan@umd.edu)) or Stuart Sheppard ([sheppard@umd.edu](mailto:sheppard@umd.edu)). Available prototypes are:
  - Maryland - <https://maryland-statecms.umd.ourecosystem.com>
  - Tri-State - <https://cmstristate.umd.ourecosystem.com> (Products still under review).
- The UMD team is interested in knowing how the Ecometrica website might be useful for stakeholders. Any feedback or suggestion is welcome.
- There is a plan to expand the Tri-State working group to other states to apply this approach of land-based carbon monitoring and planning.

#### **IV. Stakeholder updates, data needs, existing and planned activities**

- Maryland Forest Service (Rob Feldt)
  - There are requests for canopy data and tree height data, available on MD iMAP, from different stakeholders. MD Forest Service has a list of the stakeholders who have asked for the data products.
- Delaware Geological Survey (Naomi Bates)
  - Delaware Geological Survey is using CMS data for looking at endangered fox squirrel habitats in the state.
  - The agency has been advertising CMS data for interested Delaware stakeholders.
- Pennsylvania DCNR Bureau of Forestry
  - No updates.
- The Nature Conservancy (Michelle Canick)
  - No updates.
- Versar, Inc. (Donald Strebel)
  - Versar is trying to use the CMS canopy cover and biomass product to look into linear features, such as transmission lines, pipelines, and streams. However, biomass product at 30m does not provide adequate resolution. Meanwhile, the canopy cover at 1m really defines the outlines of these linear features really well.
  - Versar needs high resolution (state level) methane emissions data products for wetlands. The Daniel Jacob's CMS product (Methane Flux for North America 0.5 degree x 0.667 degree V1, archived at GES DISC ) does not provide adequate spatial resolution at state level.
- Pinchot Institute (Will Price)
  - Pinchot Institute is interested in enroll in carbon reconnaissance in the Delaware River Basin, to prioritize parcels to The Nature Conservancy's Working Woodland program, or prioritize for management assistance.

## V. Quarterly Presentation: “Integrating NASA CMS Products into Maryland’s Greenhouse Gas Accounting” (by Elliott Campbell and Rachel Marks)

- Elliott Campbell and Rachel Marks from the Center for Economic and Social Science at Maryland DNR provided some updates on the Maryland’s Greenhouse Gas Reduction Act (GGRA), the results of George Hurtt’s presentation to the Maryland Commission on Climate Change Mitigation Working Group, how they are using CMS data products for their ecosystem service evaluation work, and a preliminary plan of other uses and applications of CMS data products for the agency.
- Originally, the GGRA 2020 requirement was 25% GHG emissions reductions by 2020. 13% of the CO<sub>2</sub> emissions reductions would come from the Forestry sector (4.55 MMtCO<sub>2</sub>e). The new GGRA of 2016 requires a 40% reduction by 2030. The plan formulation begins now, and will be finalized by January 2019.
- On May 11, 2017, George Hurtt presented to the Mitigation Working Group, which consists of state officials, industry representatives, advocacy groups and academics. The presentation was well received, members agreed that a spatial approach would improve upon existing methods. There was an informal commitment made to use NASA CMS data products in GGRA targets.
- Uses and Applications: MD DNR is currently using the CMS forest cover layer in their ecosystem service valuation work. There is a need within the state for more information on soil carbon sequestration, particularly from agriculture. MD DNR has done an analysis on carbon sequestration from wetlands in Maryland, and would like to have corroborating spatial data.
- MD DNR presented their forest carbon sequestration map in forests for the state of Maryland, which was made with the CMS Lidar-based forest canopy coverage data layer in addition to the Forest Service iTree sequestration rate. They also presented a map of the net carbon sequestration in forests and wetlands for the state of Maryland.
- The potential applications of the NASA CMS products include the following:
  - Refining current projections of estimated carbon sequestration resulting from GGRA;
  - Set reasonable targets to meet by 2030;
  - Target locations with the highest sequestration potential for reforestation;
  - Identify locations where forest may be currently under-performing, to target areas where modification of forest management may improve sequestration.
- Concerns: Some of the concerns identified include the potential conflict between growing forests and growing crops. Representatives from agriculture are concerned about potential loss of agriculture lands. Another concern is that it appears MD DNR has been overestimating carbon sequestration yearly rates from forest management (cumulative totals reported as annual).

- Next Steps: Next step is to have a technical meeting with MD DE, MD DNR & CMS researchers to discuss how best to incorporate CMS information into their model of carbon emissions and reductions for the state.
- More information on the Climate Commission Website:  
<http://www.mde.state.md.us/programs/Marylander/Pages/mccc.aspx>

## VI. Discussion and Next Steps

- Some stakeholders, including Donald Strebel from Versar, Inc., have expressed their interest in soil carbon sequestration data products. There is a new 2016 CMS project developing a nationwide soil carbon map: Izaurrealde-02 CMS Project: Cropland Carbon Monitoring System (CCMS): A satellite-based system to estimate carbon fluxes on U.S. Croplands ([https://carbon.nasa.gov/cgi-bin/inv\\_pgp.pl?pgid=3480](https://carbon.nasa.gov/cgi-bin/inv_pgp.pl?pgid=3480))
- In addition, Rachel Marks from MD DNR is interested in monitoring emissions from wetlands. There is also a CMS project (Windham-Myers-01) working on linking satellite and soil data to validate coastal wetland blue carbon inventories. For more information see Windham-Myers-01 CMS Project ([https://carbon.nasa.gov/cgi-bin/inv\\_pgp.pl?pgid=3143](https://carbon.nasa.gov/cgi-bin/inv_pgp.pl?pgid=3143)).
- George Hurtt indicated that there is the potential for having graduate students from UMD working in internships linked to MD DNR, and other state agencies interested in hosting graduate students.
- There is interest from UMD team to use CMS products (i.e. 1m canopy cover) to help inform compliance with the MD Forest Conservation Act. Rob Feldt indicated that this could be possible, but that they would need the products updated on a regular basis (around every 5 years). Don Strebel added that they would need the routine inventory of forest areas that are subject to been cut or those that have been reforested under the Act.

## Action Items & Other Announcements

- **Action Item**: Follow up conversation between George Hurtt, Rob Feldt, Don Strebel, and others to see how CMS products can provide a benchmark map by which changes in forest carbon can be assessed.
- **Action Item**: CMS applications team to collect information from MD Forest Service regarding organizations requesting canopy cover data.
- **New Tri-State Working Group Webpage**: Will be hosted on the CMS website. It is currently not live, but will become available in the upcoming days.

- The webpage includes the following information: WG goals; links to metadata and data products to download; information about last year's workshop including workshop summary report, agenda, presentations, and recording of the event; a table with the WG participants and contact information; past and upcoming quarterly meetings with the meeting minutes; other upcoming events of interest for the WG; and contact information. The page is under construction so any feedback or suggestion is welcome.
- If anyone from the Working Group doesn't want their name and/or contact information to be included on this webpage please send an email to the CMS Applications Team (via Edil Sepulveda).
- A survey regarding the uses and applications of Lidar derived CMS products will be sent to the stakeholders in Delaware and Pennsylvania in the coming weeks.
- The next Quarterly Meeting will be scheduled for September 2017. A doodle poll will be sent in the coming months.