

CLAD Science Committee Meeting Notes
Fall NADP Meeting – Lake Tahoe, CA
October 19, 2010

Welcome and CLAD Business: - *Richard Pouyat* welcomed the 45 participants in the room and on the phone and reviewed web meeting logistics, led a round of introductions, circulated a sign-in sheet to update the mailing list, and reviewed that agenda.

Project Updates* (CLAD and others)

1. *Steve McNulty (USFS)* – Climate Change Impacts on CL Estimates for Soil Acidification
 - Simple Mass Balance Equation for forest soils (working on an update). What are the implications of using a steady state model for non-steady state conditions? CL under one condition might not be the same CL under other conditions (Ex: climate change, insects, elevated nitrogen deposition).
 - Biggest changes occurred in New England, areas that have some of the highest levels of exceedances.
 - In the future will look at changes in runoff and how that impacts the model, as well as changes in forest management (as impacted by climate change), harvest rates, and disturbance.
 - Data have not yet been entered into TACCIMO (Template for Assessing Climate Change Impacts and Management Options) software, but will be added as a geographic layer in the future and region 9 will be fully incorporated by January.

2. *Eric Miller (ERG) and Paul Miller (NESCAUM)* – Update on Multi-Agency Funded North Eastern CL Project
 - Integrated assessment of terrestrial and aquatic CLs in the Northeast that also adds NY State to the original analysis undertaken for the New England Governors and Eastern Canadian Premiers organization.
 - Evaluated exceedance of the CL with respect to deposition “present” (2002) and a “future” scenario (2018).
 - The project consists of two primary components: 1) an aquatic CL layer, which can also be mapped by flow network, enabling a view of where CL are exceeded from the headwaters to the downstream waters; 2) a terrestrial CL layer, to determine where aquatic and terrestrial CLs are both exceeded, the aquatic CL layer may be overlaid on the terrestrial CL map.
 - Web seminar training session planned for October 28, 2010: comprehensive review of methods, data layers, models, how to access the data, use of regional assessment results at local scales. Contact pmiller@nescaum.org to register. (CLAD chair’s note: this training session was postponed until a later date TBD)

*Due to technical difficulties, project updates and the general discussion were intermixed and did not necessarily occur in this exact order

3. *Lee Tarnay and Martin Hutten (NPS)* –Yosemite Lichen CL Project

- Evaluating N concentrations in the lichen thallus, N deposition, and then ultimately the lichen diversity in Yosemite National Park. Have seen high N concentrations in the lichens, but high concentrations could be due to seasonality and so resampling during different seasons will occur. Effects of easting and elevation have been seen, but precipitation data still needs to be incorporated.
- Need to expand and look further North and South to incorporate more variability.
- It is not yet known if lichens reflect recent deposition. It appears that macronutrients, including nitrogen, are fairly mobile in lichen and changes in concentrations over a couple months can be seen. Other elements like lead and metals are less mobile and may take years to gradually decrease after they have been removed from deposition.

4. *Harald Sverdrup (UNECE)* – Using FORSAFE-VEG to assess feasibility of modeling N CL for Biodiversity in the Rocky Mountains

- The FORSAFE-VEG model gives reasonable outputs for a synthetic site based on a combination of real data from real sites and estimates CL based on biodiversity limits. It can be applied regionally. Nitrogen, climate change, and deposition inputs collectively drive change in plant biodiversity and land management. Currently includes 132 different functional groups such as lichens, mosses, sedges, grasses, herbs, forbs, and trees. While applied in an alpine setting, model can be used in other areas and includes 30-40 low elevation plants.
- Atmospheric ozone will be included in the future, but has not yet been fully parameterized.
- Model was fairly stable at first, and then after 60-100 years exhibited significant changes. This is due to long delays in the chemical, carbon, and nitrogen pools. The vegetation changes come decades before the leaching starts and thus is an early diagnostic parameter to indicate changes.
- Output is in Mondrian units which can be used to compare changes across units and design an optimization process.

General Discussion

1. *Linda Geiser (USFS)* – CL Information Needs and Repository

- Three key questions related to CL data: (1) What data are available? And for what areas? (2) If data is available, who could be the potential manager for the data? (3) Where could that data be posted? Or linked to a web location?
- Linda to develop a 1 page proposal of the outline of the issue and to develop a spreadsheet to be circulated, where people can fill in known data sources and locations. Jason has already started some of this data identification and will share that information. These questions tie directly into the FOCUS project and the two efforts should be coordinated.

2. *Linda Pardo (USFS)* – Update on CCE Modeling and Mapping Task Force meeting

- Attended the CCE Modeling Meeting in Paris in the spring of 2010. The most relevant topic to CLAD was the discussion of the workshop on using the Very Simple Dynamic (VSD) model which is something that CLAD should look to more. Simple way to calculate terrestrial CLs that is useful in areas where there is less information available.
 - Also attended the Empirical CL for Nitrogen Revision workshop in the Netherlands. The main focus was on updates to the 2003 document for empirical CL of nitrogen. The CCE discussed revisions to empirical CLs for N in the European context since lower CLs for N are reported in the US context. US steady state modeling is moving forward under the CLAD/FOCUS project lead by Tom Moore and advances are being made on the empirical CL of nitrogen in the US.
 - Advances in dynamic modeling of nitrogen and the inclusion of biodiversity in the model are beginning in the US and already happening in Europe.
3. *Rich Pouyat (USFS)* – Update on upcoming FS Riverside workshop on ICP and FHP monitoring plots (to be held week of 2 May, 2011)
- USFS has been working to give capacity to the experimental forests (21 sites) so that CL could be calculated in a similar way that they are in EU.
 - A workshop will be held in April to train sites/operators on how to install and operate the equipment for ICP level 2 plots. This will also include a gap analysis to see where different kinds of data are being collected, how to better coordinate the collection of that data, and how it could possibly be tied into the call for data for CLAD.
 - Representatives from other agencies will be invited to participate in the workshop, particularly the gap analysis discussion.

Focal Center Utility Study (FOCUS) update

1. *Tom Moore (CIRA) and Richard Haeuber (EPA)* – Outline process for UNECE Call for CL Data Overview: FOCUS is an exercise in gathering data using the “call for data” recently issued by UNECE as an organizing framework. This provides an opportunity to gather U.S. data and begin to systematically move to a broader representation of the data. Because the U.S. has not committed to submit to CL data to the UNECE under the Convention on Long Range Transport of Air Pollution, this is NOT a formal submission of data. Instead, the call for data is being used as a pilot project to “focus” the US CL community on how to gather, integrate, and map widespread and disparate CL data and projects. A general update on the current progress, next steps, how to become involved in the process, and overall timeline were given.

- The general timeline is to have the data compiled by March of 2011. Still need to lay out the steps leading up to that date as well as planning a series of workshops/conference calls and data processing/transfers to meet the CCE milestone. After the initial data delivery, the goal is to work on a series of publications and policy and planning implementation that will take place between late 2011 and early 2013.
- Advisory group: Charlie Driscoll, Jason Lynch, Linda Pardo, Jean Paul Hettelingh, Mark Fenn, Jack Cosby

- Main focus of the project is to:
 - Submit modeled CL for acidification, eutrophication (and the data to compute them), and empirical nitrogen
 - Area of ecosystem within each EMEP grid cell
 - General discussion over the use of the EMEP grid cell:
 - EMEP grid does not cover North America and so a similar grid needs to be defined for use.
 - The use of CMAQ to define a grid was suggested, but it was pointed out that the downside of CMAQ is that it is a large grid that causes loss of critical areas when averages are calculated.
 - Suggested that a suite of statistics should be used to determine the best way of defining a grid and its associated values, possibly using fine scale variability to describe small scale differences within a grid.
 - (added during discussion) Compare CLs with deposition and create a deposition map for the entire US
- Other general comments:
 - This is a process that will identify data needs, evaluate the data gaps, and determine how to fill those gaps in the future.
 - It is important to emphasize that this is an exercise in the experience of laying out the process. There are a number of advances in the modeling of CMAQ that will not be available by March 2011, but there might be some datasets at the 12km scale that can be supplied as a place holder until further data is available.
 - Should consider including the nitrogen impacts on estuaries in future efforts, as that may be a way to attract funding
 - Need to talk to Canadian contacts about the Canadian experience with the process since they have been involved in the process previously.
 - Need further discussion of what data should be published under the UN process if there are still questions about observations and models, especially given the short amount of time.

CLAD Business

1. *Richard Haeuber* (EPA) and *Rich Pouyat* (USFS) volunteered to be co-chairs for 2011.
2. *Linda Geiser* (USFS) volunteered to be secretary for 2011.
3. Note: this was the first official meeting of CLAD as a full standing scientific committee.