

Meeting Notes for Critical Loads Ad Hoc Subcommittee (CLAD)
NADP Spring Business Meeting
Burlington, Vermont
April 11 and 12, 2007

(See attachment 1 for the agenda and attachment 2 for a list for participants)

WEDNESDAY (APRIL 11, 2007)

1. CLAD Updates

- A. Nitrogen Critical Loads Workshop (Pardo) (attachment 3)**
Working on development of a Nitrogen indicators and thresholds workshop for November 2007. Focus will be on small group of invited scientists synthesizing general scientific understanding of terrestrial and aquatic effects of N in the US, and then estimating empirical CL.
- B. Great Smoky Mountains CL Project (Pardo)**
Wrapping up project developing CL for (S+N) and nutrient N effect on terrestrial systems at 4 sites in park (various elevations and ecosystem types). Revising final report now, and will write journal article.
[Discussion regarding sources of Al:BC = 0.1 as critical loads threshold criteria; Sverdrup states European literature is extensive for lab experiments showing understory species effects at this level]
- C. Critical Loads Model NE Comparison Project (Pardo)**
PnEt-BGC vs. VSD comparisons made at ~30 DDRP sites and ~30 Adirondack sites. Some MAGIC model comparisons made also.
Weathering rates are still an issue.
- D. Multi-Agency CL Pilot Projects (Blett)**
2 projects were selected for funding by the multi-agency group (NPS, EPA, USGS, FS). For the western US, Clow/Campbell will develop CL throughout the Rockies based on nitrogen effects to aquatic ecosystems. For the eastern US, Miller/Sullivan will develop/further refine CL for acidification of terrestrial and aquatic systems in the northeast US (likely including NY), with additional sites in Virginia and West Virginia. Updates will be held at future CLAD and NADP meetings on these projects.
- E. CLAD-UNECE Correspondence and relationship (Haeuber)**
A letter was recently sent from Haeuber (representing CLAD) responding to US/European outreach efforts made by Professor Alan Jenkins and Dr. Filip Moldan (Chairpersons of the Joint Expert Group on Dynamic Modeling under the UN-ECE Convention on Long Range Transboundary Air Pollution (CLRTAP). The letter explained CLAD and encouraged efforts to coordinate at various levels on CL between the US and UNECE groups.
- F. Multi-Agency Workshop Summary Article –status (Burns)**
Burns wrote an overview article on Critical Loads summarizing the multi-agency critical loads workshop held in May 2006 in Charlottesville, VA; as well as other past critical loads workshops held in Riverside, CA and

Denver, CO. The article has been submitted to the journal *Frontiers in Ecology*.

G. EPA NO_x/SO_x Secondary Standards Review- status (Tennant/Lewis)

The first step (going on now) is EPA's Integrated Science Assessment (led by Lewis) providing overview of peer-reviewed literature on ecosystem effects of NO_x and SO_x. Review of this draft document is slated for Oct/Nov 2007. Second step will be a Risk and Exposure Assessment. Third step will be a Regulatory Impact Assessment and Analysis. There will be some CASAC review of the report at various milestones.

H. NARSTO Multi-Pollutant Assessment (Scheffe/Burns) (attachment 4)

NARSTO was conceived as an interface between science and policy. It originally focused on ozone but has since embraced NAS recommendations to move towards a multi-pollutant approach. Current goal is to provide state of the science assessment for multiple pollutants within N. America in order to serve as a vehicle for accountability within EPA regarding effectiveness of regulatory programs.

I. US Forest Service Acidification CL Project – update (McNulty)

McNulty/Cohen have submitted paper to Environmental Pollution on Critical loads and exceedances for Forest soils across the US at 1km resolution. Used forest productivity as a key indicator. Used red oak as representative of hardwoods and red pine as representative of softwoods. May need to update as averages for more species. [Discussion: Sullivan is working on a validation of McNulty modeling effort][Discussion: McNulty took over chairmanship of the FAO North American Forestry Commission- Air Working Group recently and is talking with Candian and Mexican participants about expanding his modeling efforts throughout N.America.]

****Action Item: Have McNulty discuss link between CLAD and this group for fall 2007 Boulder CLAD meeting ?**

2. Ongoing Critical Loads Project Presentations

A. New England Governors-Eastern Canadian Premiers Forest Mapping Project (Miller) (attachment 7)

This project assessed forest sensitivity to acid deposition in New England. Objective was to estimate extent, location and severity of risk to forest resources posed by sulfur and nitrogen deposition (total). Critical limits were developed based on "sustainable nutrient supply" because of impacts of nutrient limitation to forest health. Steady State mass balance model was used. All New England states are now complete and Maine maps have been delivered. Results show that sulfur cap and trade resulted in 36% S deposition decrease and 13.6% improvement in CL. Results also indicate 30% of New England Forests are at risk for nutrient depletion and forest health effects related to CL exceedance.

B. Environmental Management Decision Support System (EMDS) CL Project (Sullivan/Lewis) (attachment 5)

EMDS could be applied to CL by using the system as a central repository for CL data; using it to assess data needs and missing data or uncertainty; develop consistency of CL assessments across time and space. EMDS produces a “strength of evidence metric” and encapsulates current state of knowledge about risk (probability of harm). A pilot project will be presented at the Sept 2007 NADP meeting showing proof of concept.

THURSDAY (APRIL 12, 2007)

3. Presentation: Development of a Biodiversity Approach to Critical Loads (Sverdrup) (attachment 6)

The tool is a model called “FORSAFE-Veg. Required inputs are soils, vegetation, deposition, site history. Could parameterize model for US with the help of plant ecologists. Model currently being run at Hubbard Brook, but parameterized with Swedish vegetation. Biodiversity in a CL context could include abundance of species, biodiversity of species; risk to threatened and endangered species. Proposal for the US is to: 1) Test model at a few sites, 2) conduct workshops for assigning N responses relevant to American plant groups (responses to light, N acidity, competition, etc), 3) Have a workgroup define biodiversity limits and target states for biodiversity of ecosystems.

4. General Discussion and New Business

A. NAPAP Assessment – Brainstorming Session (Burns)

NAPAP is on a 4 year cycle and meant as a “state of science” assessment. It should address “what further emissions reductions are needed to protect ecosystems.” [Discussion: How to use European literature vs US literature; Try to use other projects /literature lists from parallel ongoing efforts (like Secondary Stds review); Report will have to go through USGS and Inter-Agency review cycles; focus on decision oriented discussion in report “what is needed to protect” rather than process oriented “report card”; use examples of success stories (where CL exceedance has been reduced); include a section on policy relevance (case studies)]

B. NADP 2007 Technical Symposium Critical Loads Session – Planning Discussion (Blett/Haeuber)

Question: what are important/timely critical loads presentations that could be solicited for the fall meeting? Should we focus on Rocky Mtn critical loads development because of the venue? [Discussion: ROMO presentations OK, but need some room for others also; would be interested in Economic Valuation of Ecosystem Services (no speaker suggested); CL processes in Canada (Julian Ahearn?); presentations on integration of CL

science and policy?; European UNECE speaker to discuss how science has been used to develop policy in Europe.]

****Action: Bowersox suggested that session have theme.... Common element of interest seems to be something like: integration of science and policy in CL development.**

C. CL Science Meeting – Getting the Ball Rolling – Brainstorming session (Haeuber)

[Discussion: Group agreed that using an existing meeting structure to host a CL science meeting would be desirable. Options include: “Gordon Conference,” “Chapman Conference” AGU, ESA, ESRI (GIS), Air Pollution Workshop, and North American Forest Commission Working Group on Air].

****Action: Burns and Cosby will take the lead on developing a CL session at (1) either AGU or Air Pollution Workshop and (2) as a Gordon Conference. They will report on progress at the fall CLAD meeting in Boulder.**

D. Fostering CLAD International Relationships (Haeuber)

UNECE Critical Loads organizational structure is driven by both “working groups” (science) and policy/decision-making branches. In addition each country has a “national focal center” specifying indicators, chemical criteria, models used, etc. [Discussion: key slots in UNECE structure where US participants should focus and attend: “modeling and mapping” group and the “integrated assessment” group (Marcus Iman of Austria leads this)].

**** Action: Future CLAD meetings have report-out from all participants in UNECE groups. When CLAD is further developed consider formal representation in the integrated assessment group?**

E. CLAD Outreach and Communications (brainstorming session) (Haeuber/Blett)

****Action: CLAD presentations from this meeting (and future) will be posted to the CLAD web site.**

****Action: Tim Lewis will take the lead on development of the NADP CL Brochure, with assistance from Blett, Cosby, Pardo, Haeuber.**

F. CLAD Status within NADP

[Discussion: If CLAD is “long-term” then may want to become permanent committee under NADP, which would make CLAD chair a member of the Executive Committee. In long-term future CLAD may wish to serve as equivalent of UNECE modeling and mapping group.]