

## Breakout Group #5

Recommendations of Stakeholders Updated by Boyer and Cowling October 27, 2008. These updated recommendations include the materials provided by breakout group participants in handwritten form.

The following individuals participated in Breakout Group #5's deliberations:

Roberta Parry Whiteall	Bob Summers	Jana Compton	Dave
John Hardin	Marcia Willhite	Hans Paerl	Cliff Snyder
Tom Wirth	Jason Lynch	Mike Kolian	Tom McNaught
Ed Dettman	Jennifer Phelan	Afton Liddell	

James Galloway and Thomas Theis were present for parts of the discussion.

The following points were made:

1. Considering the nitrogen budget: The way INC describes grain & meat as an Nr output, in the context of Nr pollution – **recall that they are what feeds you!**
2. Quantifying “reference” landscape conditions is a major research challenge; what is the background loss from natural systems? Recognizes the fact that setting criteria or standards cannot be uniform, as a function of the **heterogeneous nature of the landscape.**
3. For example, the ecoregion approach for setting standards is challenging -- because of the high degree of variability between watersheds over space & time, and air & water impacts. There is a huge value to considering **loads** as well as **concentrations** (for air & water) when considering **standards**. **There is a need for an individual watershed approach. There is a need to identify loadings to air and water and to partition sources of these loads.**
4. Seasonality is very important with regard to considering responses of the system, and environmental effects.
5. **Shifting from air concentrations to critical loads is essential to wise management air-quality impacts. But you can't get the most appropriate critical load value if you don't know what the ecological endpoint is. The management goals in terms of ecosystem end points need to be defined and possible management approaches adjusted to consider trade-offs among impacts when attempts to solve one pollution problem may cause increased difficulties with other pollution problems.**

6. Revision of the Clean Air Act may be necessary to allow EPA to use regionally and locally-specific critical loads as opposed to the present “national ambient air concentration” focus of EPA air quality regulations. This is necessary because of the very marked geographical and temporal variation in sensitivity of ecosystems.
7. A comprehensive Nr set of standards for both air/land/water is needed. The Clean Air Act & the Clean Water Acts are not well coordinated with regard to Nr pollution. We need to **consider how to integrate air & water**. We need to consider how to **implement** this on the ground. **Airsheds & Watersheds** are both important when considering landscape-scale budgets and plans for solutions. EPA needs to take a holistic look at the regulations guidance & technical support that they give the states in developing such plans (e.g SIP & TMDL planning processes). Certainly will require thinking about landscapes on a water region basis that crosses state and county boundaries. This will surely require **reorganization** in EPA, **rule changes** and technical support improvements.
8. EPA is now thinking about air quality standards. Measuring NO<sub>2</sub> in the air is insufficient. Oxidized **and reduced, and organic**, forms of Nr need to be quantified and considered as Nr pollutants.
9. Getting animal production and feed production co-located would be helpful toward Nr goals. Saves transportation **emissions**. **Enables more efficient use of the nutrients in the waste materials**.
10. More science is needed about how to optimize the use of organic or waste based fertilizer materials, in crop, forest, and rangelands.
11. EPA needs to work with USDA to develop optimum recommendations for environmental protection practices. For example, how to incentivize (e.g. under the farm bill) good environmental practices; encourage producers to look **at an integrated operation where you would have feedstock & livestock production close together**. Recommend required nutrient management plans for all farms, not just farms with CAFOs.
12. We need to understand the effectiveness of BMPs. For example, there's the USDA's Conservation Effects Assessment Project (CEAP)., led by the USDA's Natural Resource Conservation Service. That's a good start of a **framework & data collection that could be expanded to bring in other agency research, data collection, etc.**
13. In order to integrate things on a watershed or airshed basis, we need better MODELING and MONITORING Multiscale efforts. These efforts should be coordinated, **supported whole-heartedly, and supported Long-Term**. This should involve partnership among agencies, and related educational programs.

14. We need a cohesive database center for N where; a) total reactive nitrogen information can be accessed and analyzed; b) Metadata is very important; and c) Data intercomparability is assured.
15. Use Jim Galloway's 10/20/2008 summary slides to provide an improved framework for the Executive Summary for the INC report.
16. Be sure to include chemically reduced (NH<sub>x</sub>) and organic forms of Nr as well as N<sub>2</sub>O in the list of "pollutants of concern" in the recommendations of the INC Report.
17. Increase the power and effectiveness of the Interagency Conservation Effectiveness Program.
18. Develop a comprehensive nutrient accounting system for all crop- and animal-agricultural production sectors of the US economy.
19. Be sure that: a) nutrient runoff to streams and water bodies, b) Nr impacts on diversity, and c) the impacts of specific types of Nr (reduced, organic, and oxidized) on algal blooms and other adverse effects on aquatic ecosystems are covered in the INC recommendations.
20. Better base-line data on emissions/discharges and effects are essential to determine if management approaches are working well or need to be changed. This is the essence of the concept of "adaptive management."
21. More attention should be given in the INC report to what individual states are doing to decrease emissions and effects even under the present requirements of the national Clean Air and Clean Water acts.
22. EPA needs to develop and implement better data and modeling tools and technical guidance and training for both state and local air quality managers, and to educate both policy analysts policy makers, and the public at large about the need for better management of Nr impacts – including acidification, nutrient enrichment, visibility impacts, diversity changes, ozone effects on both public health and ecosystem productivity, and global climate impacts of N<sub>2</sub>O emissions.
23. Animal manures should no longer be regarded as "unpleasant waste products to be disposed of by least cost methods" but rather as "valuable natural resource to be used to increase the efficiency of nutrient management and food and fiber production systems" -- including both agriculture and forestry.