

Integrated Nitrogen Committee

June 20 - 22, 2007

**EPA Science Advisory Board
1025 F Street Northwest, Washington DC**

Agenda Overview

Monday June 20

- Overview of the Committee's Activities, Plans for this Meeting, and Future Plans
- Reports of the Phase I Working Groups
- Phase I outline; Phase I writing assignments; Phase II and III: revisit

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Thursday, June 21

Invited Presentations

Dr. Raymond Knighton, National Program Leader - Air Quality, USDA

Dr. Mark Walbridge, National Program Leader - Soil and Water Resource Management, USDA

Ms. Roberta Parry, OW, EPA

Dr. Richard Haueber, OAR, EPA

Mr. Gary Lear, OAR, EPA

Dr. Rohit Mathur, ORD U.S. EPA

Dr. Richard Linthurst, ORD, EPA

Dr. Jonathan Garber, ORD, EPA

Discussion

presentations; risk assessment; structure of Phase II & III

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Friday, June 22

- Draft Report Outline and Preliminary Writing assignments
- Phase 1
 - Writing Sessions
 - Leads Brief Committee on main consensus points
 - Committee Discussion
- Phase II
 - Identification of Information to be Gathered
 - Development of Agendas for Future Meetings
 - Working Group Sessions
 - Preliminary Report to Committee

Integrated Nitrogen Committee

Goal

- 1) The committee will learn about EPA's various programs for reactive nitrogen, so as to
- 2) Develop scientific and technical recommendations regarding the enhancement of integrated research and management strategies for reactive nitrogen, which will
- 3) Provide EPA the information to better integrate reactive nitrogen research and risk management strategies across environmental media and programs.

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Objectives

- 1) Identify and analyze, from a scientific perspective, the problems nitrogen presents in the environment and the links among them;
- 2) Evaluate the contribution an integrated nitrogen management strategy could make to environmental protection;
- 3) Identify additional risk management options for EPA's consideration; and
- 4) Recommend to EPA concerning improvements in nitrogen research to support risk reduction.

Current Phases of INC

Phase I relates to sources, transport, fate, effects, impacts and metrics relating to reactive nitrogen in the environment and make appropriate related writing assignments for its report. Three working groups were formed, organized around the N Cascade.

Phase II addresses the relationship of nitrogen to ecosystem scale through case studies. In this phase, the Committee will reorganize itself into groups that address regional or archetypical systems, selecting three regions across the regions, perhaps agriculture intensive, urban intensive, and coastal. These working groups would do the preparation for the third meeting.

Phase III addresses N issues in the future. In this phase, the Committee would address future trends by projecting ahead and considering what trends are we on, keeping in mind that discontinuities occur. At this time it is not clear whether the Committee will undertake this as a whole or divide into working groups, possibly organized by expertise that could develop future trends scenarios.

Phase One

This phase relates to sources, transport, fate, effects, impacts and metrics relating to reactive nitrogen in the environment and make appropriate related writing assignments for its report. Three working groups were formed, organized around the N Cascade.

Producers

Environmental Systems

Impacts and Metrics

As part of Phase One, we agreed that the working groups would address the following.

1. How would each WG expand the conceptual model to take into account the important issues the specific sub-systems?
2. What information do you need for your group? Whom would you like to hear from at the next meeting? What questions should they address?
3. Where do you think data existed to give current trends on indicators? (The trend period is from 1970 onward.)

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Producers Working Group:

Members are Aneja (*lead), Boyer, Cassman (**vice lead), Doering, Herz, Kohn, Lighty, Shaw.

The WG task is to quantify, with error estimates, reactive nitrogen creation within United States. Within EPA what is the state of knowledge on Nr creation, temporally and spatially? Where are the knowledge gaps? Where other agencies are involved, what is the level of interaction between EPA and those agencies?

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Environmental Systems Working Group:

Members are Boyer, Dickerson**, Hey, Mitsch, Mosier*.

The WG task is to address how reactive nitrogen moves through the overall environmental system, what the losses are from one subsystem (e.g., atmosphere) and the inputs to other subsystems (e.g., forests) and where the choke points (including denitrification) would be where nitrogen inputs and outputs can be managed.

The Working Group has agreed to focus on: the relationship of emissions to deposition, choke points, transfer and recycle rates.

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Impacts and Metrics Working Group:

Members are Cowling, Doering, Moomaw**, Paerl, Stacey, Theis*.

The WG task is to address to what degree the data exist on how a change in N concentration/flux contributes to an impact. In addition, the Group will assess the impacts that are primarily N-driven vs. those that N contributes to. Lastly, it will address what metrics should be used to assess the magnitude of the impact.

Some specific questions they will address are:

1. What are the impacts of reactive N ecosystem and human health?
2. What EPA programs are addressing these impacts in terms of there extend or in terms of understanding the underlying processed?
3. What metrics does EPA use to determine the extent of the impacts?
4. What are other metrics that could be used?

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For the Next Year

In the remaining time for this committee (~1 year), we need to do the following

1. Examine N issues by scale and for the future
2. Evaluate the contribution an integrated nitrogen management strategy could make to environmental protection;
3. Identify additional risk management options for EPA's consideration.
4. Recommend to EPA concerning improvements in nitrogen research to support risk reduction.
5. Develop scientific and technical recommendations regarding the enhancement of integrated research and management strategies for reactive nitrogen.
6. Provide EPA the information to better integrate reactive nitrogen research and risk management strategies across environmental media and programs.

For the Next Year--Path Forward

In the remaining time for this committee (~1 year), we need to do the following

1. Examine N issues by scale and for the future **(current WGs)**
2. Evaluate the contribution an integrated nitrogen management strategy could make to environmental protection; **(new WG-1)**
3. Identify additional risk management options for EPA's consideration. **(new WG-1)**
4. Recommend to EPA concerning improvements in nitrogen research to support risk reduction. **(new WG-1)**
5. Develop scientific and technical recommendations regarding the enhancement of integrated research and management strategies for reactive nitrogen. **(entire committee)**
6. Provide EPA the information to better integrate reactive nitrogen research and risk management strategies across environmental media and programs. **(entire committee)**

Integrated Nitrogen Committee

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◆ Identification and Discussion of Critical Science Issues (in Support of Risk Reduction).

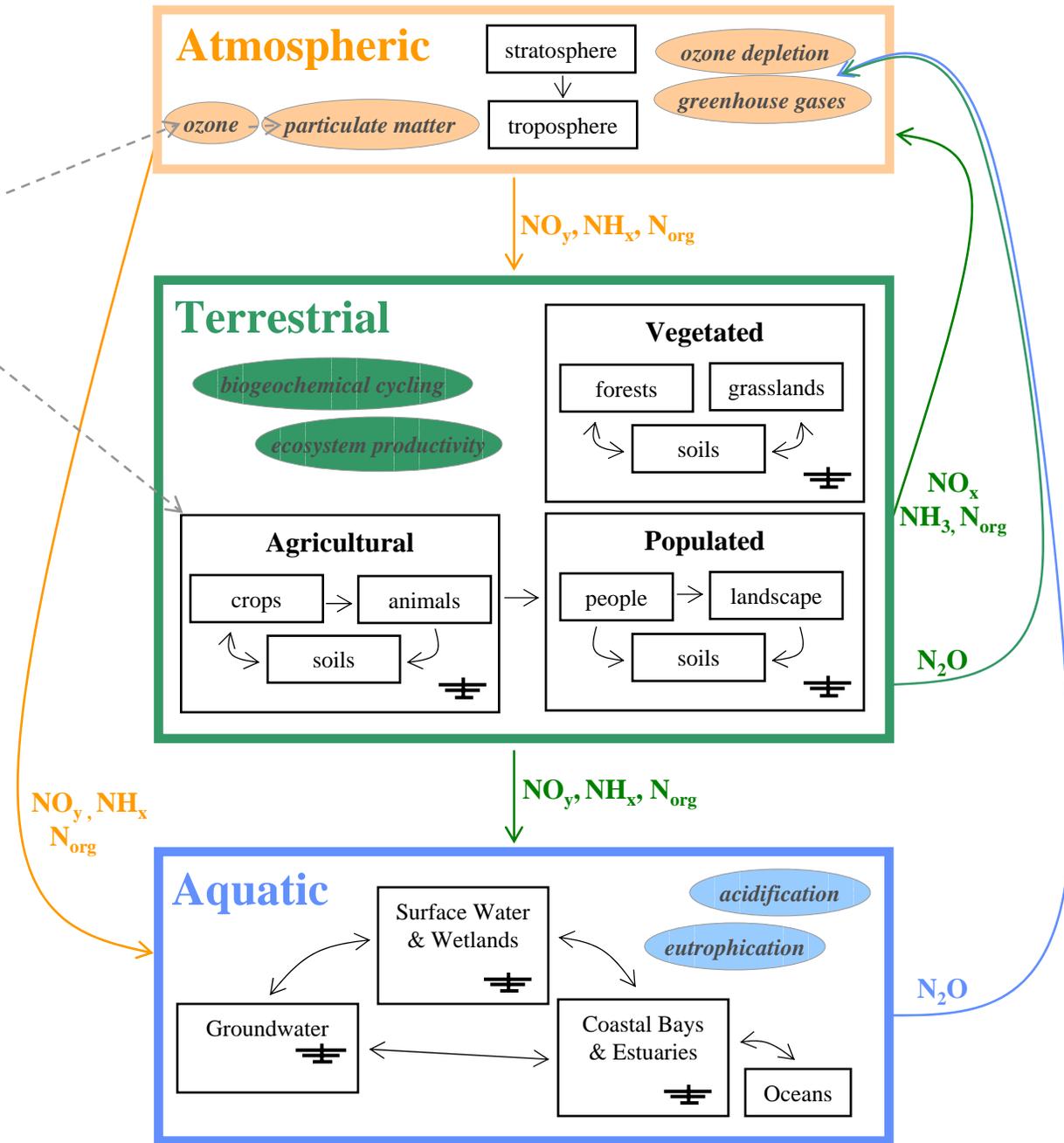
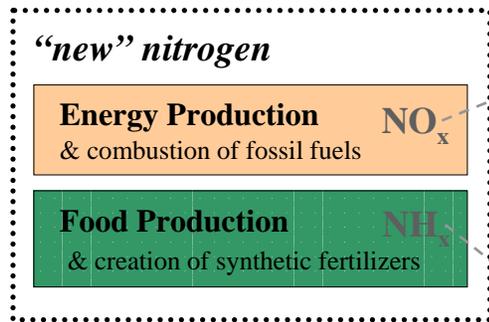
◆ Each person state for their area:

- a significant N-related risk.
- whether the scientific foundation supporting that risk is good enough to recommend action to manage the risk.
- whether we know how to manage the risk.
- whether there are policy instruments in place to manage the risk.
- what risk-specific complexities exist to confound management (e.g., multi-agency jurisdiction or no jurisdiction).

◆ The results of this exercise will be used to determine the information needed at future meetings.



The Nitrogen Cascade



≡ denitrification potential

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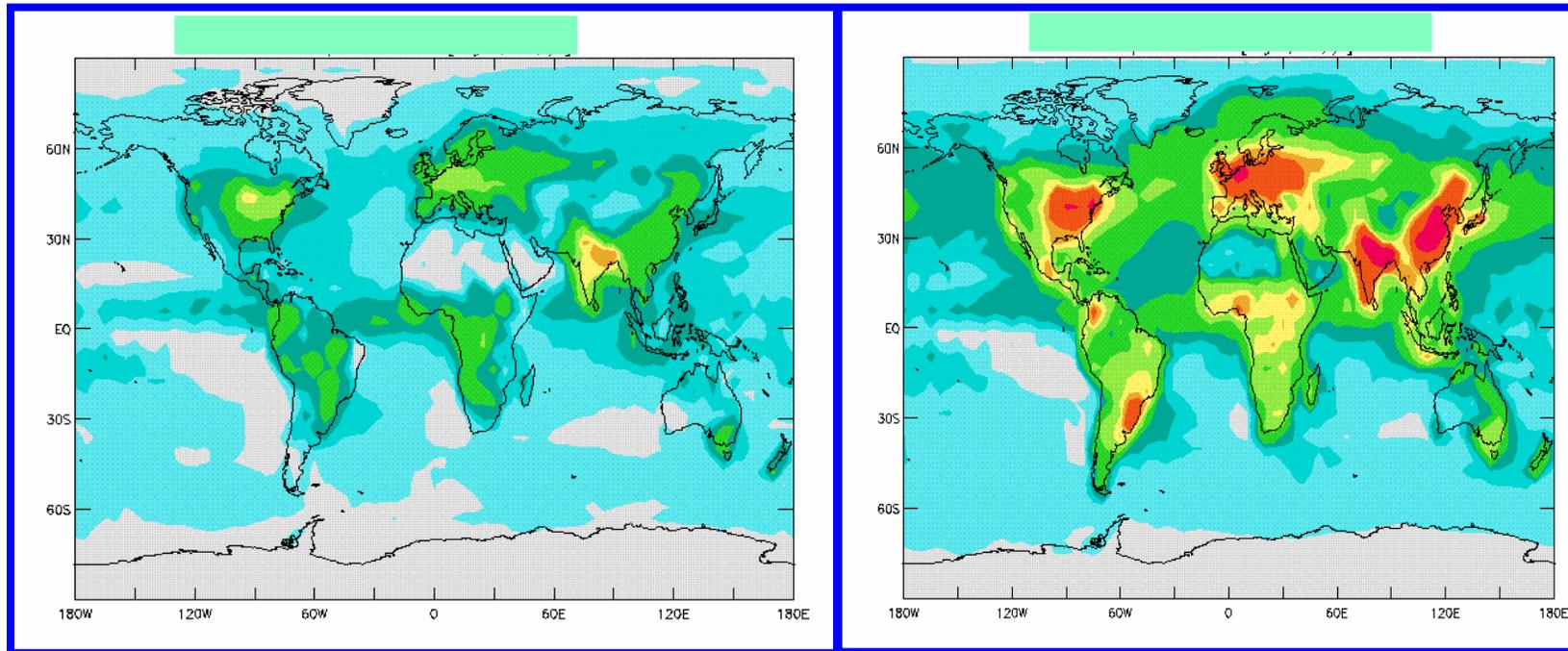
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Nitrogen Deposition

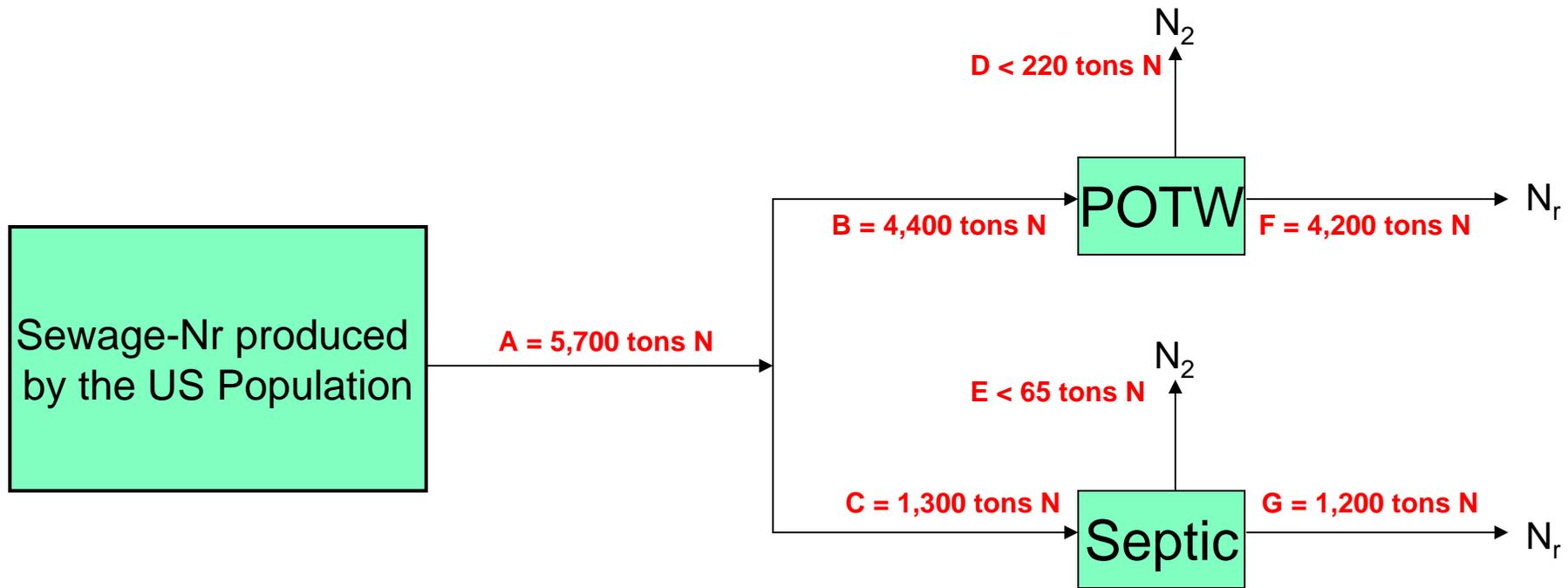
Past and Present

mg N/m²/yr



1860

1993



Definitions

A= Nr in sewage

B= Nr in sewage that goes to a POTW

C= Nr in sewage that goes to septic systems

D= Nr in POTW that is converted to N_2 .

E= Nr in septic systems that is converted to N_2 .

F= Nr in POTW that is discharged to environment

G= Nr in septic systems that is discharged to environment.