

**Compilation of Comments from Members of the CASAC Secondary NAAQS Review Panel
for Oxides of Nitrogen and Sulfur on the Panel's Draft ISA Report**

The following comments from Panel members are grouped according to each section of the Panel's Draft ISA report.

General Comments

Edith Allen – I have read the draft letter to the EPA Administrator and the NO_x/SO_x Second Draft ISA Review Report with emphasis on those sections I reviewed earlier (Chapt 1.1, 1.4, 1.5 and associated appendices) during our September 5-6, 2018, meeting. I believe both documents reflect our discussions and recommendations for the most part.

Praveen Amar - I have reviewed the CASAC's proposed Letter to The EPA Administrator Wheeler as well as the detailed CASAC comments. I think both the four-page letter and the detailed comments are well written and represent CASAC's deliberations at the September 5-6, 2018 meeting as well as the work of various CASAC sub groups CASAC's after the September 5-6 meeting.

I suggest some comments below to clarify our input to both the Letter and the detailed comments.

Laurie Chestnut - I've read through the letter and the consensus report. They look very good to me and have captured all the key points, I think. I don't have any changes to recommend. I would like to delete line 3 on page A-19 of my individual comments. These are no longer preliminary comments.

Frank Gilliam - I have read through the draft, and I must that it looks very good. It seems to contain all the input we provided last September.

Daven Henze - I have reviewed the summary, in particular the chapters to which I contributed comments, and have no further comments on the draft report.

Erik Nelson - I have no comments to add.

Panel Roster

Edith Allen - p. ii Edith Allen, Professor Emeritus of Plant Ecology (text says Professor, I am now Professor Emeritus)

Letter to the Administrator

p. 2, line 1. (Praveen Amar). I commend various references to reduced reactive nitrogen (ammonia) throughout the letter as well as detailed comments. However, I suggest that on line 1 (page 2 of the letter), for emphasis, we replace “the importance of ammonia (reduced nitrogen)” with “*the importance of ammonia (reactive reduced nitrogen), including its emissions as well as its ecological impacts*”. I suggest this change to be clear that we are concerned with both the emissions and impacts of reduced nitrogen.

p.2, line 2. (Mark Fenn). The sentence beginning on line 2 of the second page of the letter is confusing and needs to be edited for clarity.

p. 2, line 27. (Praveen Amar). On page 2 of the letter (line 27), I am not sure this is the right place to refer to the publication by Horn et al. (2018) on tree mortality. I have no expertise in the field, but since the publication is so recent (2018), I think this reference to Horn's work should be in the detailed comments and not in the letter itself.

p. 3, line 17. (Praveen Amar). On page 3 of the letter (Line 17), I think we need to emphasize our recommendation by replacing "Chapter 1.10 could be improved" with "Chapter 1.10 SHOULD be improved" or "Chapter 1.10 CAN be improved." I suggest this change because our write up on this in the detailed comments section is quite clear about the role of crustal material as a source of cations in PM.

p. 3, lines 26-27 (Praveen Amar). On Page 3 of the letter (comments on Chapter 1.11, Lines 26-27): Are we saying that by "pre-industrial conditions, we mean the time period from about 1760 to sometime between 1820 to 1840, and by "the latter half of the 19th century, we mean 1880s or 1890s, etc., a period after the industrial revolution, and about 150 years ago. Thus, is the intent here is to change the "ecological baseline" to include the impact of industrial revolution? I am not sure this is the correct baseline even though we seem to endorse it by noting "EPA consider a definition more attuned to interdependence between humans and ecosystems."

On Page 3 (Chapter 1.12, Lines 33-35): I think we are simply confusing the issue by describing "climate" and "climate change" at the same time. I think we have always meant (in our previous comments on draft ISAs), the impact of climate change ("long term climate change") on various ecosystem responses. I think we need to drop the words "climate" to avoid confusion

p. 3, line 37 (Praveen Amar). On Page 3 (Line 37): I think the reference to the treatment of uncertainty as "interesting" is not correct. I think what we seem to be saying is that the treatment of "uncertainty" is "not complete" or "not clear" or "not rigorous".

Consensus Responses to Charge Questions

p. 2. (Edith Allen). There is no mention of reduced N in this Review of the Executive Summary. However, reduced N is included in the draft letter to the EPA Administrator (line 43, "The CASAC suggests that several topics receive more emphasis in the Executive Summary. These topics include: the importance of ammonia (reduced nitrogen)...")

p. 2, line 37 (Edith Allen). The Review of the Executive Summary concludes with (p. 2, l. 37) "Effects for all other causal associations identified in this ISA are currently occurring in some areas as a result of past and continuing S and/or N deposition." At this point it would be useful to add that "Reduced N may account for 19-63% of total observed inorganic N deposition" and this may have an effect on ecosystems and their services.

p. 4, line 35 (Praveen Amar). On Page 4 (Line 35): To be clear, we should state “The levels of NO₂ and SO₂ have declined below EXISTING (or CURRENT) regulatory secondary standard levels”. This change is necessary to be clear that our CASAC Panel is charged to review the current secondary standards for their adequacy for protection of various ecosystems.

p. 6, line 3 (Praveen Amar). On Page 6 (Line 3): I suggest an editorial change by replacing “previous CASAC recommendations” to “CASAC’s previous recommendations”.

p. 11, line 7 (Praveen Amar). On Page 11 (Line 7): The sentence “this particular topic is one that has not received a lot of research until...” needs to be modified by saying “this particular topic has not received a lot of ATTENTION...”

p. 13, lines 3-4 (Praveen Amar). On Page 13 (Lines 3-4): Regarding the use of the word “interesting” in the context of how the concept of uncertainty is addressed in the second draft ISA: Please see my earlier comments on the letter. I think we need to say that the treatment of uncertainty in ISA is “not complete” or “not rigorous” etc. The word “interesting” is not appropriate/correct in this context.

Individual Comments from Panel Members

Page A-21, lines 15-16. (Mark Fenn). On page A-21, lines 15-16, here is an appropriate reference to cite:

Houlton, B.Z., Morford, S.L. and Dahlgren, R.A. 2018. Convergent evidence for widespread rock nitrogen sources in earth's surface environment. *Science* 360, 58-62.

Page A-21, lines 34-36. (Mark Fenn). ---On page A-21, lines 34-36: Here is the reference originally alluded to:

Albright, M.B.N., Johansen, R., Lopez, D., Gallegos-Graves, L.V., Steven, B., Kuske, C. R., and Dunbar, J. 2018. Short-term transcriptional response of microbial communities to nitrogen fertilization in a pine forest soil. *Applied and Environmental Microbiology*. 84: e00598-18. 18 pp.

In this study by Albright et al 2018, they state: “We found little support for the conventional view that high N supply represses the expression of genes involved in decomposition.”