

Appendix E – Pre-Draft SIP revision State/FLM Communications

E.1 – Communications Log

| Date | Method | Entities Involved | Topic/Problem | Outcome | Notes/Links | Added By: |
|----------------------|----------------------------|-------------------------------|---|---|---|-------------------|
| 6/12/2019 | Phone (email setup) | NDDEQ/MTDEQ | informal coordination call for RH2 planning | ND/MT are taking similar approaches | 20190612_MT-ND Regional Haze Call.pdf | David - 10/2/19 |
| 9/20/2019 | Email | NDDEQ/NPS (Don S.) | North Dakota's Regional Haze progress and information | 9/23 email | 20190920_FW_ North Dakota's Regional Haze progress and information.pdf | David 12/4/19 |
| 9/20/2019 | email | NDDEQ/EPAR8 | ND RH progress and information | NDDEQ responded via email | North Dakota's Regional Haze progress and information.pdf | David - 12/2/19 |
| 9/20/2019 | email | NDDEQ/NPS (Don S.) | North Dakota's Regional Haze progress and information (follow-up) | N/A | 20190920_RE North Dakota's Regional Haze progress and information.pdf | David 12/4/19 |
| 9/23/2019 | Phone (email setup) | NDDEQ/SDDENR | informal call on RH2 4F work | SD 4F RH plan in line with ND strategy | 20190923_SD-ND Regional Haze Call (4F).pdf | David - 10/2/19 |
| 11/21/2019 | email | NDDEQ/MPCA | MPCA email request on 4F info | NDDEQ responded via email | 20191121_RE_ North Dakota 4-Factor Analysis(MPCA).pdf | David - 11/21/19 |
| 6/2/2020 | Skype Meeting | NDDEQ/MTDEQ | Coordination call for RH2 planning | See Notes/Link | 20200602_MT_ND State-to-State coordination call.pdf | David - 10/6/2020 |
| 9/30/2020 | MS Teams Meeting | NDDEQ/EPAR8 | ND RH progress and information | Shared PowerPoint | 20201106 & 20201216_ North Dakota Regional Haze Round 2-EPApresentation.pdf | David - 10/6/2020 |
| 10/5/2020 | MS Teams Meeting | NDDEQ/MTDEQ | RH SIP emissions inventory section discussion | Discussion on emission inventories in RH SIP | 20201005_RH SIP emissions inventory section discussion.pdf | David - 10/6/2020 |
| 10/6/2020 | MS Teams Meeting | NDDEQ/SDDENR | ND/SD RH progress and information | Shared PowerPoint | 20201106 & 20201216_ North Dakota Regional Haze Round 2-EPApresentation.pdf | David - 10/6/2020 |
| 11/6/2020 | MS Teams Meeting | NDDEQ/NPS (David P.) | ND RH progress and information | Shared PowerPoint | 20201106 & 20201216_ North Dakota Regional Haze Round 2-EPApresentation.pdf | David - 11/6/2020 |
| 11/23/2020 | MS Teams Meeting | NDDEQ/USFS | ND RH progress and information | Shared PowerPoint | " (USFS attendees: Trent Wickman, Jill Webster) | David - 1/12/2021 |
| 12/15/2020 | MS Teams Meeting | NDDEQ/NPS | ND RH progress and information | Shared PowerPoint | " (NPS attendees: Kirsten King, Melanie Peters, Don Shepard, David Pohlman, Debra Miller, Andrea Stacy) | David - 1/12/2021 |
| 3/22/2021 | MS Teams Meeting | NDDEQ/MPCA (Hassan Bouchareb) | ND and MN SIP revision progress and input | Discussed plans, estimated timelines, and need for information exchange | Informal Discussion, no specific links | David - 4/5/2021 |
| ~Oct. 2020 - Current | Recurring MS Teams Meeting | NDDEQ/MTDEQ | ND and MT recurring discussions | Utilization of WRAP information and products for SIP revision | Informal Discussion, no specific links | David - 5/12/2021 |
| 6/9/2021 | email | NDDEQ/MTDEQ | North Dakota's Regional Haze Determination on Impact of Facilities On North Dakota's Class I Area | Requested feedback on North Dakota RH SIP RPGs (no actions requested to date) | 20210609_ND-to-MT-inputrequest.pdf | David - 6/15/2021 |
| 6/9/2021 | email | NDDEQ/SDDENR | North Dakota's Regional Haze Determination on Impact of Facilities On North Dakota's Class I Area | Requested feedback on North Dakota RH SIP RPGs (no actions requested to date) | 20210609_ND-to-SD-inputrequest.pdf | David - 6/15/2021 |
| 6/9/2021 | email | NDDEQ/MPCA | North Dakota's Regional Haze Determination on Impact of Facilities On North Dakota's Class I Area | Requested feedback on North Dakota RH SIP RPGs (no actions requested to date) | 20210609_ND-to-MN-inputrequest.pdf | David - 6/15/2021 |
| 7/8/2021 | MS Teams Meeting | NDDEQ/EPAR8 | ND RH progress update | Shared PowerPoint | 20210708_RE_ North Dakota and EPA R8 Regional Haze Discussion.pdf | David - 8/23/2021 |
| 12/18/2018 | email | NDDEQ/EPAR8/FourFactorSources | Interest Rate | 5.25% rate, bank prime rate at the time. Passed info. to sources | 181226_Regional Haze Economic Analyses (interest).pdf | David - 2/16/2022 |

E.2 – Communications

Stroh, David E.

Subject: MT-ND Regional Haze Call
Location: 406-444-4647, access code: 6646861

Start: Wed 6/12/2019 11:00 AM
End: Wed 6/12/2019 12:00 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Harbage, Rebecca

CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe.

Hi all,

This is an informal coordination call between Montana and North Dakota to discuss regional haze topics that are of interest to both states. Specifically, we will talk about SIP work to-date as well as possible coordination on upstream O&G and international impacts.

I don't foresee us needing web access for the call, just the phone number and access code below.

→ [Join Skype Meeting](#)

Trouble Joining? [Try Skype Web App](#)

Join by phone

406-444-4647, access code: 6646861 (Helena Capitol Campus Region)

[Find a local number](#)

Conference ID: 6646861 (same as access code above)

[Forgot your dial-in PIN?](#) | [Help](#)

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Rebecca Harbage

Air Quality Planner | 406-444-1472

P.O. Box 200901, Helena, MT 59620-0901



From: Stroh, David E. [<mailto:deStroh@nd.gov>]
Sent: Monday, June 03, 2019 9:10 AM
To: Harbage, Rebecca <RHarbage@mt.gov>
Cc: Bachman, Tom A. <tbachman@nd.gov>; Seligman, Angela N. <aseligman@nd.gov>; Semerad, Jim L. <jsemerad@nd.gov>
Subject: RE: Upcoming Regional Haze Webinar - Request

Rebecca,

North Dakota is interested in having a kick-off discussion with Montana per your email below. You are right, upstream O&G and international impacts are both very pertinent to ND and MT. A coordinated approach to address O&G from our states and others (CO/WY) would be ideal.

As a follow-up to our discussion, the morning June 12th works for us to have a kick-off meeting to discuss these topics plus anything else pertinent to RH.

If you would confirm with the MT RH staff this morning will work and respond with a proposed time – we will speak Wednesday, June 12th. Let me know if you want to discuss anything in advance of that date.

David Stroh
Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

From: Harbage, Rebecca <RHarbage@mt.gov>
Sent: Wednesday, May 29, 2019 5:46 PM
To: Stroh, David E. <deStroh@nd.gov>
Cc: Semerad, Jim L. <jsemerad@nd.gov>; Bachman, Tom A. <tbachman@nd.gov>
Subject: RE: Upcoming Regional Haze Webinar - Request

| |
|--|
| <p>CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe.</p> |
|--|

Thanks for the info, David.

As a follow-up, I have had “schedule call with North Dakota” on my to-do list for a while now. Would you all be interested in chatting with the Montana regional haze team at some point in the near future? We have had informal calls with both Idaho and Wyoming to check-in on progress and near-border Class I areas.

Specifically related to your email below, we’re interested in trying to coordinate with neighboring states on an approach for upstream oil and gas. We heard pretty strong feedback from the USFWS on our progress report that they expect something this round. From our conversations with Wyoming, I believe they’re also interested in some sort of coordinated approach. In addition – I know ND shares our concerns with international impacts from sources in Canada located very near the border and I would be interested in starting a conversation on that topic as well, although we don’t have a solid path forward developed yet (apart from waiting to see EPA’s modeling results).

If you're interested in getting a call on the calendar, let me know what works for you. If you're busy with Round 1 conversations right now and prefer to hold off, that works too.

Thanks again,
Rebecca

--

Rebecca Harbage

Air Quality Planner | 406-444-1472
Montana Department of Environmental Quality
P.O. Box 200901, Helena, MT 59620-0901

From: Stroh, David E. [<mailto:deStroh@nd.gov>]

Sent: Wednesday, May 29, 2019 1:06 PM

To: Harbage, Rebecca <RHarbage@mt.gov>

Cc: Semerad, Jim L. <jsemerad@nd.gov>; Bachman, Tom A. <tbachman@nd.gov>; Tom Moore <tmoore@westar.org>; Jay Baker <jbaker@utah.gov>; amber.potts@wyo.gov

Subject: RE: Upcoming Regional Haze Webinar - Request

CAUTION: This email message may contain an unsafe attachment.

We scan email attachments for malicious software to protect your computer and the State's network. If we determine that an attachment is unsafe, then we block it and you will only see an attachment called 'Unsupported File Types Alert.txt'. If we cannot scan an attachment, then we provide this warning that the attachment may be unsafe and advise you to verify the sender before opening the attachment. If you don't see a file attached to this message, it doesn't mean that we blocked it, some email signatures contain image files that we cannot scan.
Please contact your agency IT staff for more information.

Hello Rebecca,

Below is an email response on where North Dakota is at regarding the topics listed in your email (copied, as follows, with response in red text):

- Are you using Q/d as a screening tool? If so, what threshold are you using to determine which sources require further analysis? Did you include PM10 in your calculation of Q?
 - Yes, North Dakota used a Q/d of ~10 as the threshold for reaching out to sources. 10 sources were selected, 6 coal EGUs and 4 other facilities. The initial 4F request letters were sent in May 2018. (attached "Basin RH2 Letter.pdf" as example)
 - I checked North Dakota's selections vs the WRAP Q/d tool and it was in direct alignment with the sources selected.
 - PM10 was not included. ~80% of North Dakota's impairment is from sulfates and nitrates – so we had the sources focus on NOx and/or SOx (depending on the units which emit at their facilities).
- How many sources are "screened in" based on your selected threshold?
 - 10. No current plans to reach out to more.
- Are you focusing on any particular industrial sectors in this round of planning?
 - Not targeting anyone specifically, targeting those which are believed to impact Class I visibility.
 - North Dakota is hopeful to follow EPA/other states on addressing RH from the O&G upstream sector (wellsites).

Sources selected:

- 6 Coal EGUs (similar to Round 1).
- 1 coal gasification facility
- 1 NG compression facility (located near TRNP north unit "Class I" area)

- 2 gas processing plants
- Have you contacted the screened sources to discuss the four-factor analysis?
 - Yes, started communications with letter in May 2018. Many phone conversations since then.
- How did you (or will you) determine which emitting units at a source require the full four-factor analysis?
 - Start with the emissions profile for the facility,
 - narrow down to the units of concern,
 - determine current “level of control” and whether or not additional controls need to be evaluated.
- Have you consulted informally with EPA, FLMS, or neighboring states/locals/tribes on your screening or analysis?
 - Not for Round 2. North Dakota is working with EPA (and just engaged FLMS) on a Round 1 revised SIP for a ND Coal EGU we are hoping to resolve in advance of Round 2 deadlines.

Feel free to share this information during the June 20th webinar.

Let me know if you have any questions/comments or want to discuss these in greater detail, thanks.

David Stroh

Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

From: Harbage, Rebecca <RHarbage@mt.gov>

Sent: Tuesday, May 28, 2019 5:16 PM

To: molly.birnbaum@alaska.gov; emerta@cabq.gov; Templeton.Ryan@azdeq.gov; christine.suarez-murias@arb.ca.gov; curtis.taipale@state.co.us; michael.madsen@doh.hawaii.gov; Pascale.Warren@deq.idaho.gov; bharprin@ndep.nv.gov; Mark.Jones@state.nm.us; Stroh, David E. <deStroh@nd.gov>; Orman.Michael@deq.state.or.us; rick.boddicker@state.sd.us; jhuy461@ecy.wa.gov

Cc: Amber Potts <amber.potts@wyo.gov>; Jay Baker <jbaker@utah.gov>; Tom Moore <tmoore@westar.org>

Subject: Upcoming Regional Haze Webinar - Request

CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe.

Hi State/Local Leads –

The Coordination & Glide Path Subcommittee and the Regional Haze Planning Work Group co-chairs are working to plan our next milestone webinar. We plan to hold the webinar on Thursday, June 20 at 12:00-2:00pm Mountain Time (save-the-date email coming soon). Topics will include updates on fire emissions from the Fire & Smoke Work Group, an update from the Oil & Gas Work Group on their operator survey effort, and a discussion of point source emissions projection methodology for future year emission scenarios.

Following the last webinar in March, we’ve heard that folks found the brief status updates from states (we heard from CO, WA, AZ, and MT) very helpful and so I’m seeking volunteers for a similar “open mic”-type agenda item for this upcoming webinar.

Would you or someone else from your state be willing to give a five-minute update on your efforts to-date to establish a Q/d threshold, how many sources you're working with, whether there are any particular industries you are focused on in this round, and generally how things are going? I know many states shared updates on the Control Measures Subcommittee call last week and I think that would be great info to share with the webinar participants as well. If you're willing to share an update on the webinar, would you please respond by Friday 5/31 to let me know?

Specifically, some topics of interest include:

- Are you using Q/d as a screening tool? If so, what threshold are you using to determine which sources require further analysis? Did you include PM10 in your calculation of Q?
- How many sources are "screened in" based on your selected threshold?
- Are you focusing on any particular industrial sectors in this round of planning?
- Have you contacted the screened sources to discuss the four-factor analysis?
- How did you (or will you) determine which emitting units at a source require the full four-factor analysis?
- Have you consulted informally with EPA, FLMS, or neighboring states/locals/tribes on your screening or analysis?

Thanks in advance!
Rebecca

--
Rebecca Harbage
Air Quality Planner | 406-444-1472
P.O. Box 200901, Helena, MT 59620-0901



Stroh, David E.

From: Shepherd, Don <don_shepherd@nps.gov>
Sent: Tuesday, July 23, 2019 2:34 PM
To: Stroh, David E.
Subject: Re: [EXTERNAL] RE: ND facilities for potential RP analyses

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David--thanks!

On Tue, Jul 23, 2019 at 12:34 PM Stroh, David E. <deStroh@nd.gov> wrote:

Don,

The Department has made this information available through our website at the following location:

<https://deq.nd.gov/AQ/planning/RegHaze.aspx>

At the bottom of the webpage under North Dakota's Progress, you can access the Regional Haze Files. Specifically, you will find:

Round 1

- communications regarding updated Great River Energy Coal Creek Station BART analysis (outstanding from the 1st round – 1st bullet)
- 5 year progress report post round 1 (2nd bullet)
- Other final documents from the 1st round of regional haze program (bullets 3 through 6)

Round 2

- four-factor requests, four-factor reports received, NDDEQ responses on four-factors (to date), and revised four-factor reports received
 - this was requested in your email

Let me know if you have any questions as you review the information.

David

From: Shepherd, Don

Sent: Monday, July 22, 2019 3:19 PM

To: Stroh, David E. <deStroh@nd.gov>

Cc: Patricia Brewer <Patricia_F_Brewer@nps.gov>; Melanie Ransmeier <melanie_peters@nps.gov>; Dave Pohlman <david_pohlman@nps.gov>; d King <kirsten_king@nps.gov>; Andrea Stacy <andrea_stacy@nps.gov>; Bachman, Tom A. <tbachman@nd.gov>; Seligman, Angela N. <aseligman@nd.gov>; Semerad, Jim L. <jsemerad@nd.gov>; Thorton, Rhannon T. <rThorton@nd.gov>

Subject: Re: [EXTERNAL] RE: ND facilities for potential RP analyses

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David, thanks for sharing this information. Would it also be feasible for you to share the industry response to your May 2018 request?

On Mon, Jul 15, 2019 at 9:22 AM Stroh, David E. <deStroh@nd.gov> wrote:

Hi Don,

Thank you for the email regarding source selection for four-factor analysis. The criteria/approach you used is consistent with what North Dakota did in May 2018. This is also consistent with the guidance and tool produced by WRAP for states to use for selection of sources potentially impacting visibility in Class I Areas. Here is a link to WRAP website containing tool and info on Q/d analysis: <http://views.cira.colostate.edu/tssv2/Emissions/QDAnalysis.aspx>

As you indicate in the email, the guidance recommends states address 80% of the visibility impairment in Class I areas. Through the four-factor analysis, North Dakota is addressing approximately 80% of the visibility impairment (nitrates and sulfates) as determined by the IMPROVE monitoring network in North Dakota (<http://vista.cira.colostate.edu/Improve/agrv-summaries/>). North Dakota sent four-factor request letters to the ten highest Q/d facilities in North Dakota, which addresses ~94% of the 2012-2016 emissions from stationary sources. Q/d for the sources selected in North Dakota ranged from 7 to 164. See attached "4 Factors Source Analysis Q over D" for a list of the sources North Dakota has selected for four-factor analysis. The list is consistent with the recommendations provided in your email attachment (North Dakota also included Northern Border Compression Station No. 4 for analysis).

Additionally for your information, I have attached the four-factor request letters sent by North Dakota in May 2018. North Dakota has received responses from all the facilities and is in the process of reviewing the analysis for completeness and accuracy. Please let me know if you have any additional questions, comments, or would like to discuss.

David Stroh

Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

From: Shepherd, Don

Sent: Friday, July 12, 2019 2:36 PM

To: Stroh, David E. <deStroh@nd.gov>

Cc: Patricia Brewer <Patricia_F_Brewer@nps.gov>; Melanie Ransmeier <melanie_peters@nps.gov>; Dave Pohlman <david_pohlman@nps.gov>; d King <kirsten_king@nps.gov>; Andrea Stacy <andrea_stacy@nps.gov>

Subject: ND facilities for potential RP analyses

CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe.

Hello David,

I am sending the attached list of ND facilities for potential 4-factor RP analyses. Please accept this information as part of our discussion on how to address this task.

EPA's draft RP guidance recommends that states capture enough facilities for 4-factor RP analysis to account for 80% of the impact at each Class I area. I have used Q/d as a surrogate for impact (as allowed by EPA guidance). My calculation of "Q" includes only SO₂ + NO_x because I have discovered that PM is typically already very well controlled or, in the case of surface mines (e.g., copper, coal), their very large emissions can have a great impact on facility selection with essentially no way to further reduce PM emissions. (EPA's draft guidance advises not reviewing facilities that have little potential for additional control.) Also, Clean Air Markets Data (CAMD--now AMP) does not include PM. For "d," we calculated the distance to all facilities in the 2014 National Emissions Inventory (NEI) out to about 1000 km.

Our basic approach follows:

1. Extract from the 2014 NEI all facilities within about 1000 km of the NPS Class I area most-impacted by ND facilities.
 - Theodore Roosevelt NP (THRO)
2. Calculate Q/d.
3. Delete airports and rail yards because states have little regulatory authority.
4. Substitute more recent data for EGUs available from CAMD/AMP. Use projected/expected changes in EGU emissions for this planning period.
5. Rank the remaining facilities by Q/d and select those facilities contributing to 80% of impact (total Q/d) at each NPS Class I area.
6. Combine the sets of selected facilities for each NPS Class I area to produce combined lists based upon the highest impact at the NPS Class I areas.

Please feel free to comment or ask questions.

thanks,

--

Don Shepherd

National Park Service

Air Resources Division

12795 W. Alameda Pkwy.

Lakewood, CO 80228

Phone: 303-969-2075

Fax: 303-969-2822

E-Mail: don_shepherd@nps.gov

"the man who really counts in the world is the doer, not the mere critic" TR 1891

--

Don Shepherd

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"the man who really counts in the world is the doer, not the mere critic" TR 1891

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"the man who really counts in the world is the doer, not the mere critic" TR 1891

| Year | Inventory | EIS ID | County | Facility Name | NAICS Code Description | Latitude | Longitude | State | NOX | SO2 | Q | to NPS Class I Area | Q/d | NPS Class I Area |
|------|-----------|---------|---------------|-----------------------------|--|----------|-----------|-------|-------|--------|--------|---------------------------|-------|---------------------|
| 2018 | CAMD | 8086611 | Mercer County | Coyote | Fossil Fuel Electric Power Generation | 47.222 | -101.814 | ND | 7,975 | 14,913 | 22,888 | 116 | 197.6 | THRO |
| 2018 | CAMD | 8086511 | Mercer County | Antelope Valley | Fossil Fuel Electric Power Generation | 47.371 | -101.834 | ND | 3,589 | 12,037 | 15,626 | 109 | 143.5 | THRO |
| 2018 | CAMD | 8011011 | McLean County | Coal Creek | Fossil Fuel Electric Power Generation | 47.376 | -101.157 | ND | 6,995 | 6,858 | 13,853 | 159 | 87.2 | THRO |
| 2018 | CAMD | 8087911 | Oliver County | Milton R Young | Fossil Fuel Electric Power Generation | 47.066 | -101.214 | ND | 9,275 | 2,776 | 12,051 | 161 | 75.1 | THRO |
| 2014 | NEI | 8086711 | Mercer | Great Plains Synfuels Plant | Natural Gas Distribution | 47.361 | -101.838 | ND | 3,235 | 3,818 | 7,053 | 109 | 64.6 | THRO |
| 2018 | CAMD | 8086311 | Mercer County | Leland Olds | Fossil Fuel Electric Power Generation | 47.282 | -101.319 | ND | 4,664 | 1,704 | 6,368 | 149 | 42.7 | THRO |
| 2014 | NEI | 8013911 | Williams | Tioga Gas Plant | Natural Gas Liquid Extraction | 48.400 | -102.914 | ND | 946 | 569 | 1,515 | 91 | 16.6 | THRO |
| 2014 | NEI | 8023811 | Billings | Little Knife Gas Plant | Crude Petroleum and Natural Gas Extraction | 47.298 | -103.098 | ND | 24 | 526 | 550 | 35 | 15.8 | THRO |
| 2018 | CAMD | 8087011 | Morton County | R M Heskett | Fossil Fuel Electric Power Generation | 46.867 | -100.884 | ND | 955 | 1,228 | 2,183 | 185 | 11.8 | THRO |

Stroh, David E.

From: Stroh, David E.
Sent: Friday, September 20, 2019 1:19 PM
To: 'Shepherd, Don'; Dave Pohlman
Cc: Bachman, Tom A.; Semerad, Jim L.; Thorton, Rhannon T.; Seligman, Angela N.
Subject: FW: North Dakota's Regional Haze progress and information
Attachments: Regional haze Q over D Analysis

Don and David,

I wanted to keep you informed of North Dakota's regional haze progress regarding Round 2 planning and Round 1 resolution efforts. See the email sent to EPA region 8 planning group yesterday (below) for more information and links to the information we have made available on our website.

Additionally, I extended an offer (**highlighted** in the email below) to EPA R8 for Great River Energy (GRE) – Coal Creek Station to present an overview of the recently submitted revised NOx BART analysis. EPA R8 is interested in this and we are in the process of coordinating a time for this to happen. Tentatively leaning toward an afternoon later next week (9/25-9/27).

I realize this is short notice, but if it something you would be in interested in attending - please let me know and I can keep you appraised of the date/time. If it wouldn't happen to work for you next week, we could look at doing something independent in the upcoming weeks.

Let me know if you have any questions or comments.

Regards,
David

David Stroh
Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

From: Stroh, David E.
Sent: Thursday, September 19, 2019 4:17 PM
To: Worstell, Aaron <Worstell.Aaron@epa.gov>
Cc: Dobrahner, Jaslyn <Dobrahner.Jaslyn@epa.gov>; Jackson, Scott <Jackson.Scott@epa.gov>; Semerad, Jim L. <jsemerad@nd.gov>; Bachman, Tom A. <tbachman@nd.gov>; Seligman, Angela N. <aseligman@nd.gov>; Thorton, Rhannon T. <rThorton@nd.gov>
Subject: North Dakota's Regional Haze progress and information

Aaron,

As a follow-up to our call this morning. Here is the link to North Dakota's regional haze files for Round 1 resolution and Round 2 planning: <https://deq.nd.gov/AQ/planning/RegHaze.aspx>

Toward the bottom of the page, you'll find a "North Dakota's Progress" section. Within that section, "Regional Haze Round 1 Files" and "Regional Haze Round 2 Files" are contained. The first bullet under the "Round 1 Files" contains the GRE-CCS revised NOx BART analysis (received late last week) and correspondence associated with the development of that package. Under the "Round 2 Files", we have uploaded the: four-factor request letters, the four factor reports received to date, and formal communications between the facility and DEQ regarding our comments on the initial analysis received.

One other item I was going to mention/ask in our call. Prior to NDDEQ receiving the revised GRE NOx BART Analysis, GRE presented a PowerPoint overview of information contained in the report. I found this overview helpful as I have begun to thoroughly review the report. GRE offered to repeat this presentation/overview to you (and/or other EPA R8 staff). If this is something you think would be helpful, let me know and we can coordinate a time for this to happen.

Lastly, I have attached a NDDEQ internal Q/d email from May 2018 which outlines our original rationale for the sources selected for four factor analysis. The attachment also includes spreadsheets summarizing the Q/d information. *Side note to Q/d info* – here is a link to the NPS files sent to WESTAR-WRAP states regarding state sources for consideration of four factor analysis: https://www.wrapair2.org/RHP_Control.aspx. As you can see the NPS suggestions are in line with the sources already selected by NDDEQ.

I'd be happy to discuss any of this information after you get a chance to review.

Regards,
David Stroh
Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

Stroh, David E.

From: Bachman, Tom A.
Sent: Wednesday, May 09, 2018 9:09 AM
To: O'Clair, Terry L.; Semerad, Jim L.; Stroh, David E.; Kautzman, Rheanna M.; Mills, Ryan D.; White, Rob J.
Subject: Regional haze Q over D Analysis
Attachments: 4 Factrors Source Analyssis Q over D.xlsx; Voyageurs Q ove D Analysis.xlsx

Hi all:

Attached is a spreadsheet that contains a Q/D (tons/km) analysis for Regional Haze Round 2. The analysis was done the same way we did it in Round 1(i.e. total SO₂ plus NO_x emissions for Title 5 sources divided by the distance to the nearest Class I area). As suspected, coal-fired EGUs dominate the Q/D analysis. Based on the average of 2012-2016 emissions, the coal-fired EGUs account for 86% of the emissions and 78% of the Q/D (EPA guidance suggests we address at least 80% of the impact from in-state sources). The Stanton Station is included in this analysis; but, as we all know, it is now shutdown. Please note the emissions do not include other minor point sources we track and area sources. Using the 2014 NEI, the coal-fired EGUs would only account for 39% of the total SO₂ and NO_x emissions. Of these other SO₂ and NO_x emissions in the 2014 NEI, only a small portion are controllable by us.

In the 2012-2016 emissions Q/D analysis, there is a very distinctive break point after the Northern Border No.4 station (Q/D of 8.7 versus 4.5 for the Grasslands Gas Plant). If you include DGC, the Tioga Gas Plant, the Little Knife Gas Plant, and Northern Border No.4 in the four factors analysis, you get 94% of the emissions and 93% of the Q/D. If you go down through the top ten sources in the Q/D analysis, you get 95% of the emissions and 96% of the Q/D. Some of the sources in the top ten, such as Hawkeye Compressor Station and Little Missouri Gas Plant, are very well controlled (recent PTCs); so, there is not much to gain from these sources. It is my understanding that the Fort Buford Compressor Station is now shut down. That leaves the Grasslands Gas Plant, Mandan Refinery and the Lignite Gas Plant. Perhaps these sources should be reviewed more closely to see if we can get some reductions from a four factors analysis.

The 2017 emissions are not quite complete yet; however, I was able to get emissions for the coal-fired EGUs and the top ten sources from the 2012-2016 Q/D analysis. The break point after Northern Border No.4 is still there. Once all of the 2017 emissions are available, I will complete the analysis for 2013-2017. I believe the 20117 emissions will not change our decision for which sources we want a four factors analysis.

I also conducted a Q/D analysis solely based on Voyageurs National Park for the coal-fired EGU's (see attached spreadsheet). Interesting that ACS has bigger Q/D than some power plants at Voyageurs. Perhaps this will be an issue with Minnesota.

We probably should have a meeting to decide what additional sources we want a four factors analysis. One other point to consider is the EPA guidance that indicates we must address more than 80% of the impact sources if we do not meet the glide path (we did not meet the glide path in Round 1).

If you have any questions, please see me.

Tom Bachman, P.E.
ND Dept. of Health
(701) 328-5188

Stroh, David E.

From: Worstell, Aaron <Worstell.Aaron@epa.gov>
Sent: Friday, September 20, 2019 9:59 AM
To: Stroh, David E.
Cc: Dobrahner, Jaslyn; Jackson, Scott; Semerad, Jim L.; Bachman, Tom A.; Seligman, Angela N.; Thorton, Rhannon T.
Subject: RE: North Dakota's Regional Haze progress and information

Follow Up Flag: Follow up
Flag Status: Completed

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Hi David-

Thank you for the link to the RH files, as well as the round 2 Q/D materials.

Yes, it would be helpful for GRE to walk EPA through the Coal Creek Station NOx BART presentation. I'm available in the afternoon all days next week.

Thanks.

From: Stroh, David E. <deStroh@nd.gov>
Sent: Thursday, September 19, 2019 3:17 PM
To: Worstell, Aaron <Worstell.Aaron@epa.gov>
Cc: Dobrahner, Jaslyn <Dobrahner.Jaslyn@epa.gov>; Jackson, Scott <Jackson.Scott@epa.gov>; Semerad, Jim L. <jsemerad@nd.gov>; Bachman, Tom A. <tbachman@nd.gov>; Seligman, Angela N. <aseligman@nd.gov>; Thorton, Rhannon T. <rThorton@nd.gov>
Subject: North Dakota's Regional Haze progress and information

Aaron,

As a follow-up to our call this morning. Here is the link to North Dakota's regional haze files for Round 1 resolution and Round 2 planning: <https://deq.nd.gov/AQ/planning/RegHaze.aspx>

Toward the bottom of the page, you'll find a "North Dakota's Progress" section. Within that section, "Regional Haze Round 1 Files" and "Regional Haze Round 2 Files" are contained. The first bullet under the "Round 1 Files" contains the GRE-CCS revised NOx BART analysis (received late last week) and correspondence associated with the development of that package. Under the "Round 2 Files", we have uploaded the: four-factor request letters, the four factor reports received to date, and formal communications between the facility and DEQ regarding our comments on the initial analysis received.

One other item I was going to mention/ask in our call. Prior to NDDEQ receiving the revised GRE NOx BART Analysis, GRE presented a PowerPoint overview of information contained in the report. I found this overview helpful as I have begun to thoroughly review the report. GRE offered to repeat this presentation/overview to you (and/or other EPA R8 staff). If this is something you think would be helpful, let me know and we can coordinate a time for this to happen.

Lastly, I have attached a NDDEQ internal Q/d email from May 2018 which outlines our original rational for the sources selected for four factor analysis. The attachment also includes spreadsheets summarizing the Q/d information. *Side note to Q/d info* – here is a link to the NPS files sent to WESTAR-WRAP states regarding state sources for consideration of four factor analysis: https://www.wrapair2.org/RHP_Control.aspx. As you can see the NPS suggestions are in line with the sources already selected by NDDEQ.

I'd be happy to discuss any of this information after you get a chance to review.

Regards,
David Stroh
Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

Stroh, David E.

From: Shepherd, Don <don_shepherd@nps.gov>
Sent: Monday, September 23, 2019 12:10 PM
To: Stroh, David E.
Cc: Bachman, Tom A.
Subject: Re: [EXTERNAL] FW: North Dakota's Regional Haze progress and information
Attachments: BCS Permit 01092019.pdf; BuckinghamCompressorStationPermitApp (1).pdf

Follow Up Flag: Follow up
Flag Status: Flagged

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David (and Tom),

Thanks for the update/heads-up. Yes, i would be interested sitting in on a presentation by GRE regarding CCS, and i would appreciate it if you would let me know when that might happen.

Regarding selection of facilities for four-factor analyses for the next phase of Regional Haze/Reasonable Progress work, i was very pleased to see how closely our lists matched. I have recently begun thinking about how we can address the impact of new source growth on Class I areas like Theodore Roosevelt National Park. For example, i saw that NDDEQ recently concluded a public review process for expansion of Targa Midstream's Little Missouri River Gas Plant a few kilometers from the Park. It is my understanding that this permit application did not trigger PSD or any BACT requirements. However, the resulting Q/d, if this facility is constructed as proposed, would easily exceed the thresholds NDDEQ used to trigger a four-factor RP analysis. Furthermore, we are aware of a similar project in VA with lower NOx emissions. The information contained in the attachments indicates that Dominion Energy's Buckingham County (VA) Compressor Station includes a Solar Centaur 50 compressor turbine (similar to the three CTs proposed by Targa) that is equipped with SoLoNOx and SCR to meet a NOx limit = 3.75 ppm (compared to 15 ppm at LMGP). Likewise, our comments on Meridian's Davis Refinery noted examples of similar emission units with lower permit limits. It is likely that there are several more similar situations where new source growth may need to be accounted for as we formulate strategies to make reasonable progress during this planning period. I would appreciate any additional thoughts you and Tom might have on this.

On Fri, Sep 20, 2019 at 12:20 PM Stroh, David E. <deStroh@nd.gov> wrote:

Don and David,

I wanted to keep you informed of North Dakota's regional haze progress regarding Round 2 planning and Round 1 resolution efforts. See the email sent to EPA region 8 planning group yesterday (below) for more information and links to the information we have made available on our website.

Additionally, I extended an offer (**highlighted** in the email below) to EPA R8 for Great River Energy (GRE) – Coal Creek Station to present an overview of the recently submitted revised NOx BART analysis. EPA R8 is interested in this and we

are in the process of coordinating a time for this to happen. Tentatively leaning toward an afternoon later next week (9/25-9/27).

I realize this is short notice, but if it something you would be in interested in attending - please let me know and I can keep you appraised of the date/time. If it wouldn't happen to work for you next week, we could look at doing something independent in the upcoming weeks.

Let me know if you have any questions or comments.

Regards,

David

David Stroh

Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

From: Stroh, David E.

Sent: Thursday, September 19, 2019 4:17 PM

To: Worstell, Aaron <Worstell.Aaron@epa.gov>

Cc: Dobrahner, Jaslyn <Dobrahner.Jaslyn@epa.gov>; Jackson, Scott <Jackson.Scott@epa.gov>; Semerad, Jim L. <jsemerad@nd.gov>; Bachman, Tom A. <tbachman@nd.gov>; Seligman, Angela N. <aseligman@nd.gov>; Thorton, Rhannon T. <rThorton@nd.gov>

Subject: North Dakota's Regional Haze progress and information

Aaron,

As a follow-up to our call this morning. Here is the link to North Dakota's regional haze files for Round 1 resolution and Round 2 planning: <https://deg.nd.gov/AQ/planning/RegHaze.aspx>

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One other item I was going to mention/ask in our call. Prior to NDDEQ receiving the revised GRE NOx BART Analysis, GRE presented a PowerPoint overview of information contained in the report. I found this overview helpful as I have begun to thoroughly review the report. GRE offered to repeat this presentation/overview to you (and/or other EPA R8 staff). If this is something you think would be helpful, let me know and we can coordinate a time for this to happen.

Lastly, I have attached a NDDEQ internal Q/d email from May 2018 which outlines our original rational for the sources selected for four factor analysis. The attachment also includes spreadsheets summarizing the Q/d information.

Side note to Q/d info – here is a link to the NPS files sent to WESTAR-WRAP states regarding state sources for consideration of four factor analysis: https://www.wrapair2.org/RHP_Control.aspx. As you can see the NPS suggestions are in line with the sources already selected by NDDEQ.

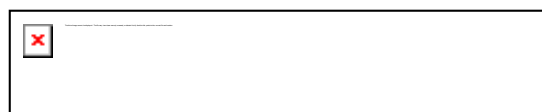
I'd be happy to discuss any of this information after you get a chance to review.

Regards,

David Stroh

Environmental Engineer

701-328-5188 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

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Don Shepherd
National Park Service
Air Resources Division
12795 W. Alameda Pkwy.
Lakewood, CO 80228
Phone: 303-969-2075
Fax: 303-969-2822

E-Mail: don_shepherd@nps.gov

"the man who really counts in the world is the doer, not the mere critic" TR 1891

Stroh, David E.

From: Tom Moore <tmoore@westar.org>
Sent: Monday, September 23, 2019 10:25 AM
To: Boddicker, Rick; Stroh, David E.
Subject: RE: brief call to coordinate on 4factor analysis

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Great, sorry for missing the mark on getting an appt. out earlier.

*Tom Moore, WRAP Air Quality Program Manager
Western States Air Resources Council (WESTAR) / e: tmoore@westar.org / o: 970.491.8837
Western Regional Air Partnership / www.wrapair2.org*

From: Boddicker, Rick <Rick.Boddicker@state.sd.us>
Sent: Monday, September 23, 2019 9:23 AM
To: Tom Moore <tmoore@westar.org>; destroh@nd.gov
Subject: RE: brief call to coordinate on 4factor analysis

It'll work for us. I have Kyrik with as well

From: Tom Moore <tmoore@westar.org>
Sent: Monday, September 23, 2019 10:21 AM
To: Boddicker, Rick <Rick.Boddicker@state.sd.us>; destroh@nd.gov
Subject: RE: [EXT] brief call to coordinate on 4factor analysis

Hi, Rick and David – so sorry, I forgot to send an appt. Would 930 MDT / 1030 CDT work? Will send an appt. now. Thanks.

*Tom Moore, WRAP Air Quality Program Manager
Western States Air Resources Council (WESTAR) / e: tmoore@westar.org / o: 970.491.8837
Western Regional Air Partnership / www.wrapair2.org*

From: Boddicker, Rick <Rick.Boddicker@state.sd.us>
Sent: Thursday, September 19, 2019 12:09 PM
To: Tom Moore <tmoore@westar.org>; destroh@nd.gov
Subject: RE: brief call to coordinate on 4factor analysis

Monday morning should work for us as well.

Thanks.

From: Tom Moore <tmoore@westar.org>
Sent: Thursday, September 19, 2019 12:22 PM
To: Boddicker, Rick <Rick.Boddicker@state.sd.us>; destroh@nd.gov
Subject: [EXT] brief call to coordinate on 4factor analysis

Hi, Rick and David – I didn't know if you guys have met, so I wanted to suggest a brief call to coordinate on SD's 4factor work with the "consistent WESTAR-WRAP states' effort" that David is leading.

Rick – we have some materials that David (or I could help) can walk through, and we'd like to learn more about the 2 sources you all are looking at.

Would you guys have some time on Monday the 23rd, say 900 AM MDT / 1000 AM CDT? I can send us an appt.

Thanks.

Tom Moore, WRAP Air Quality Program Manager
Western States Air Resources Council (WESTAR) / e: tmoore@westar.org / o: 970.491.8837
Western Regional Air Partnership / www.wrapair2.org

Stroh, David E.

From: Stroh, David E.
Sent: Thursday, November 21, 2019 11:30 AM
To: Bouchareb, Hassan (MPCA)
Subject: RE: North Dakota 4-Factor Analysis

Hi Hassan,

Here is the link to North Dakota's regional haze files for Round 1 resolution and Round 2 planning: <https://deq.nd.gov/AQ/planning/RegHaze.aspx>

Toward the bottom of the page, you'll find a "North Dakota's Progress" section. Within that section, "Regional Haze Round 1 Files" and "Regional Haze Round 2 Files" are contained.

The first bullet under the "Round 1 Files" contains the GRE-CCS revised NOx BART analysis (received in Sept. 2019) and correspondence associated with the development of that package.

Under the "Round 2 Files" – specific to what you requested, we have uploaded the: four-factor request letters, the four factor reports received to date, and formal communications between the facility and DEQ regarding our comments on the initial analysis received.

The NDDEQ is in the process of reviewing these reports and determining what is considered reasonable for round 2.

Let me know if you have any questions or comments, thanks!
David

David Stroh
Environmental Engineer

701-328-5229 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

From: Bouchareb, Hassan (MPCA) <hassan.bouchareb@state.mn.us>
Sent: Thursday, November 21, 2019 9:11 AM
To: Stroh, David E. <deStroh@nd.gov>
Subject: North Dakota 4-Factor Analysis

| |
|--|
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Good morning David,

If you remember, we both spoke at the Class of '85 State Meeting on Regional Haze. In your presentation, I think you had mentioned that you had already received some 4-factor analyses from some coal-fired EGUs? Are those analyses posted or available

somewhere? I'm looking for what's available to try and gauge what levels of control utilities are looking at and what seems reasonable. If you can share those analyses I would appreciate it.

Feel free to contact me if you have any questions or if there is anything I can help you with as well.

Thank you!

Hassan M. Bouchareb | Engineer
Minnesota Pollution Control Agency (MPCA)
Environmental Analysis & Outcomes Division
520 Lafayette Road | St. Paul, MN | 55155
Office: (651) 757-2653 | Fax: (651) 296-8324
Pronouns: he/him/his
Hassan.Bouchareb@state.mn.us | www.pca.state.mn.us



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Stroh, David E.

Subject: MT/ND State-to-State coordination call
Location: Skype Meeting

Start: Tue 6/2/2020 2:00 PM
End: Tue 6/2/2020 3:00 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Payne, Rhonda

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MATERIALS ADDED:

- 1) Agenda and background regulatory information
- 2) WEP-AOI Slides for discussion

Talk to you tomorrow!

Hi David,

MT would like to take this time to begin conversations with ND on a coordinated emissions management strategy to address potential interstate emissions impacts in our respective CIAs.

I am working on a packet of information for our discussion that I'll attach to this meeting request by the end of the week.

Our rough agenda is:

- Montana's schedule for submitting a draft SIP for FLM review by July 10.
- Consider guidance listed in Step 2: Determination of affected Class I areas in other states
- Current URPs for Medicine Lake, Lostwood, Teddy Roosevelt
- Current WEP/AOI results for Medicine Lake, Lostwood, Teddy Roosevelt

If there is anything else you'd like to add, please let me know!

Talk to you on Tuesday, June 2nd at 1:00pm MST.

Thanks,

Rhonda

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406-444-4647, access code: 136127 (Helena Capitol Campus Region)

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Agenda:

- Montana's schedule for submitting a draft SIP for FLM review by July 10.
- Consider guidance listed in Step 2: Determination of affected Class I areas in other states (see excerpt below)
- Current URPs for Medicine Lake, Lostwood, Teddy Roosevelt
- Current WEP/AOI results for Medicine Lake, Lostwood, Teddy Roosevelt

Excerpt from EPA's Guidance for RH SIP Development in the 2nd Planning Period (Pg. 8)

2. Step 2: Determination of affected Class I areas in other states

Section 51.308(f)(2) of the Regional Haze Rule requires each state to develop an LTS that includes the control measures necessary to make reasonable progress at each Class I area outside the state "that may be affected by emissions from the state."¹ This section addresses how a state determines which Class I areas in other states may be affected by its own emissions, so it knows which out-of-state Class I areas need to be considered in the development of its LTS. This linkage to specific Class I areas affects LTS development because baseline visibility impacts from individual sources and visibility benefits from possible emission control measures are specific to a Class I area. Also, section 51.308(f)(3) of the Regional Haze Rule provides that if a state contains sources whose emissions are reasonably anticipated to contribute to visibility impairment in a Class I area in another state for which the RPG is above the URP glidepath, the state must provide a "robust demonstration" that there are no additional emission reduction measures that would be reasonable to include in its own LTS.^{19 2}

As an initial matter, a state has the flexibility to use any reasonable method for quantifying the impacts of its own emissions on out-of-state Class I areas, and it may use any reasonable assessment for this determination. Additionally, since determinations of affected Class I areas were previously made for the first regional haze implementation period, states may consider retaining the same linkages and assumptions from those SIPs, but if states do so then they should consider whether the assumptions about source-receptor relationships have changed since those assessments.

States that are reassessing their linkages for the second implementation period may make this determination based on the state's recent emissions or anticipated emissions in 2028, which is the end of the second implementation period. Because visibility impairment is defined such that only anthropogenic emissions are considered to contribute to visibility impairment, all types of anthropogenic sources are to be included in this determination. States may also make this determination based on total statewide emissions.

¹ Section 51.308(f)(2) of the Regional Haze Rule also requires each state to develop an LTS that includes the control measures necessary to make reasonable progress at each of its own Class I areas. The qualification regarding "may be affected" applies only to out-of-state Class I areas; the state preparing a SIP revision must develop an LTS that includes measures necessary to make reasonable progress at each of its own Class I areas regardless of the impact from its own sources' emissions on those areas.

² See Section II.B.7.c of this document for additional information regarding the requirement for a robust demonstration.

A variety of technical, quantitative approaches exist to assess which out-of-state Class I areas may be affected by aggregate emissions from a given state. The most common approach in the first implementation period was to use a photochemical transport model to track the contribution due to emissions from whole states to specific Class I areas. This approach may also be used in the second implementation period, or a state may use another reasonable approach (e.g., back trajectory-based approaches).

A state with a Class I area may advise another state that it considers its Class I area to be affected by emissions from the other state. However, each state is responsible for its determination of what Class I areas may be affected by its emissions, regardless of impacts that a neighboring state might or might not have identified.³ This is also a suitable subject for interstate consultation. The Regional Haze Rule requires that states describe actions taken to resolve any disagreements and document interstate consultations.⁴

Excerpt from RHR – 40 CFR (f)(2)(ii):

(ii) The State must consult with those States that have emissions that are reasonably anticipated to contribute to visibility impairment in the mandatory Class I Federal area to develop coordinated emission management strategies containing the emission reductions necessary to make reasonable progress.

(A) The State must demonstrate that it has included in its implementation plan all measures agreed to during state-to-state consultations or a regional planning process, or measures that will provide equivalent visibility improvement.

(B) The State must consider the emission reduction measures identified by other States for their sources as being necessary to make reasonable progress in the mandatory Class I Federal area.

(C) In any situation in which a State cannot agree with another State on the emission reduction measures necessary to make reasonable progress in a mandatory Class I Federal area, the State must describe the actions taken to resolve the disagreement. In reviewing the State's implementation plan, the Administrator will take this information into account in determining whether the plan provides for reasonable progress at each mandatory Class I Federal area that is located in the State or that may be affected by emissions from the State. All substantive interstate consultations must be documented.” 40 CFR 51.308(f)(3)(ii)(B) Reasonable progress goals “If a State contains sources which are reasonably anticipated to contribute to visibility impairment in a mandatory Class I Federal area in another State for which a demonstration by the other State is required under (f)(3)(ii)(A), the State must demonstrate that there are no additional emission reduction measures for anthropogenic sources or groups of sources in the State that may reasonably be anticipated to contribute to visibility impairment in the Class I area that would be reasonable to include in its own long-term strategy. The State must provide a robust demonstration, including documenting the criteria used to determine which sources or groups or sources were evaluated and how the four factors required by paragraph (f)(2)(i) were taken into consideration in selecting the measures for inclusion in its longterm strategy.”

³ If the state preparing a SIP revision has no Class I areas of its own and it has demonstrated that there are no out of-state Class I areas that may be affected by its sources' emissions, we encourage the state to discuss this conclusion with their EPA Regional office.

⁴ 40 CFR 51.308(f)(2)(ii)(C).

Excerpt from MT Proposed FIP

TABLE 149—MT SOURCES EXTINCTION CONTRIBUTION 2000–2004, 20% WORST DAYS

| Class I area | Pollutant Species | Extinction (Mm^{-1}) | Species contribution to particle extinction (%) | MT sources contribution to species extinction (%) ¹ |
|-----------------------|-------------------|--------------------------|---|--|
| Lostwood NWR | Sulfate | 21.4 | 34 | 2 |
| | Nitrate | 22.94 | 36 | 9 |
| | OC | 11.05 | 18 | 17 |
| | EC | 2.84 | 5 | 12 |
| | PM _{2.5} | 0.62 | 1 | 7 |
| | PM ₁₀ | 3.93 | 6 | 11 |
| | Sea Salt | 0.26 | 0 | ---- |
| Theodore Roosevelt NP | Sulfate | 17.53 | 35 | 3 |
| | Nitrate | 13.74 | 27 | 15 |
| | OC | 10.82 | 21 | 49 |
| | EC | 2.75 | 5 | 33 |
| | PM _{2.5} | 0.9 | 2 | 22 |
| | PM ₁₀ | 4.82 | 10 | 25 |
| | Sea Salt | 0.07 | 0 | ---- |

¹Contribution of sulfate and nitrate based on PSAT; OC, EC, PM_{2.5}, PM₁₀, and Sea Salt contribution based on WEP.

5. Consultation and Emissions Reduction for Other States' Class I Areas

40 CFR 51.308(d)(3)(i) requires that EPA consult with another state if Montana's emissions are reasonably anticipated to contribute to visibility impairment at that state's Class I area(s), and that EPA consult with other states if those other states' emissions are reasonably anticipated to contribute to visibility impairment at Montana's Class I areas. EPA worked with other states and tribes through the WRAP process. EPA also accepts and incorporates the WRAP-developed visibility modeling into the Regional Haze FIP for Montana. This proposal contains the necessary measures to meet Montana's share of the reasonable progress goals for the other state's Class I areas. Table 149 above shows Montana's contribution to Class I areas in neighboring states. None of the neighboring states with Class I areas have indicated to EPA that specific reductions are necessary for this FIP. Therefore, EPA proposes that this FIP meets Montana's share of the reasonable progress goals for the other state's Class I areas.

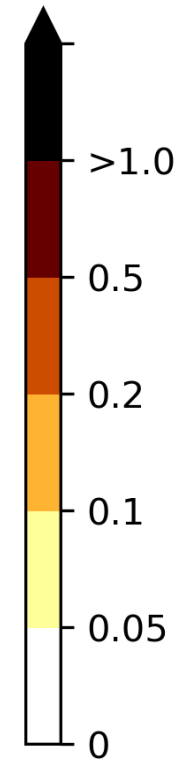
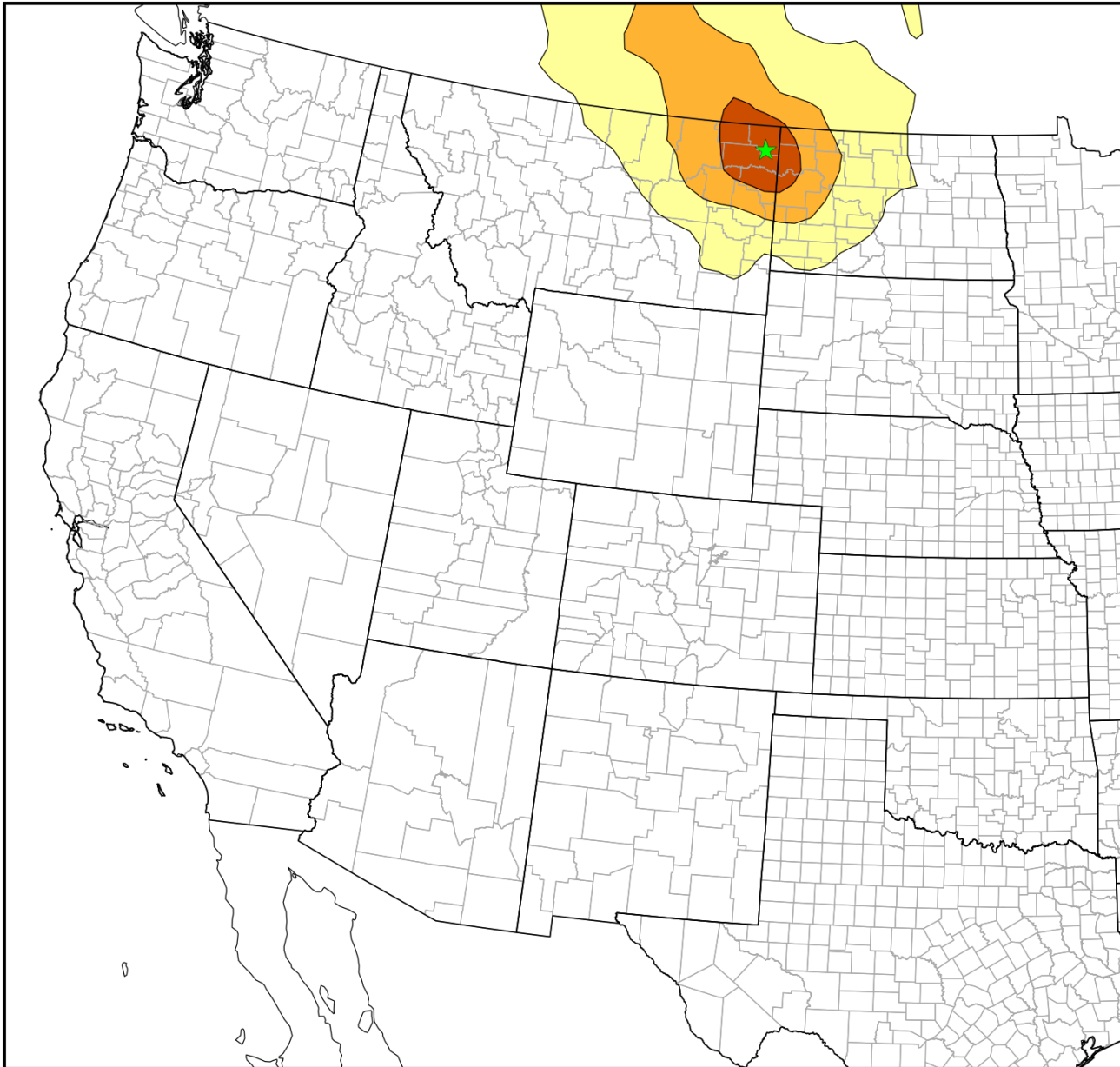
WEP-AOI slides

MELA1, THRO1, LOST1

6/1/2020

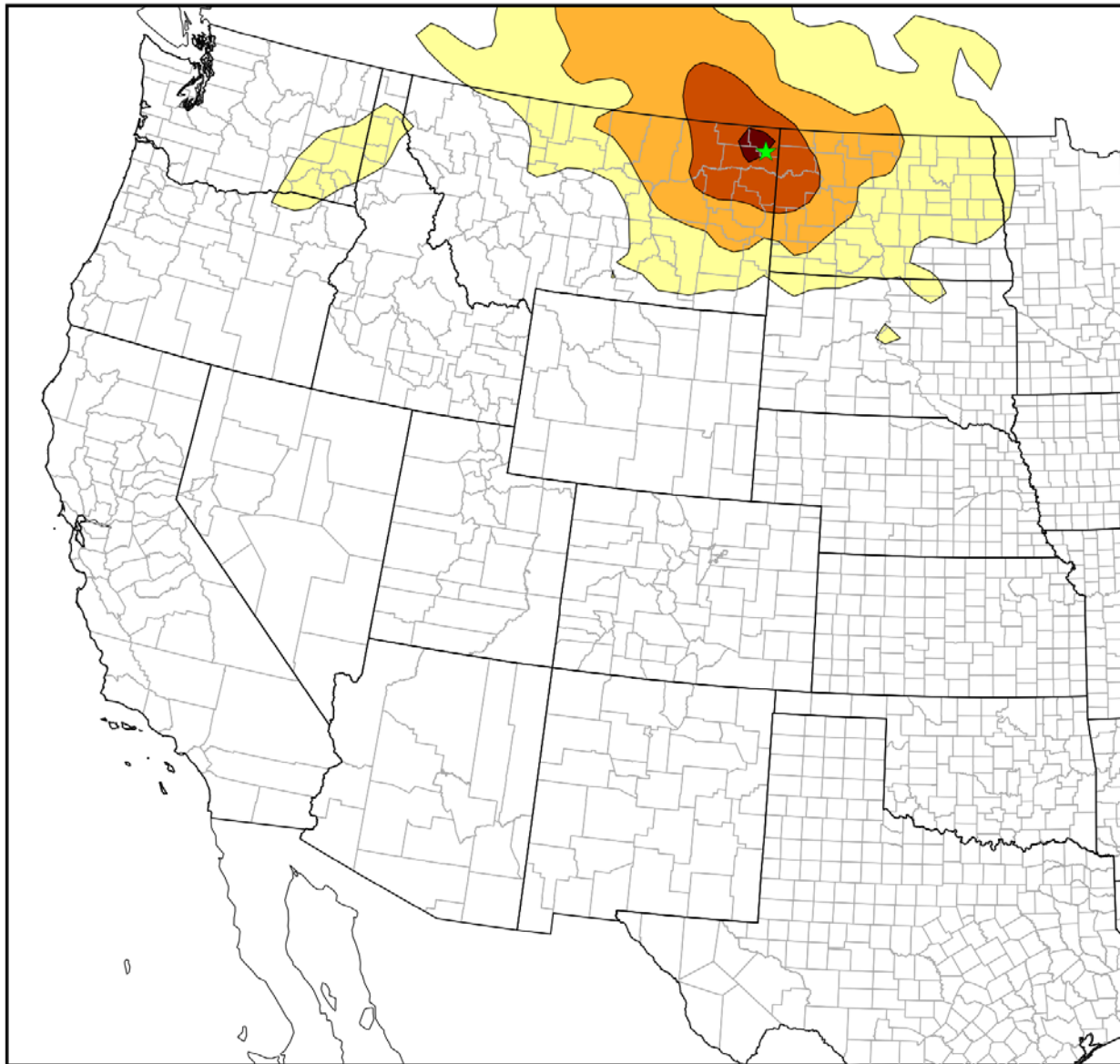
MELA1

MELA1 - 20% Most Impaired Days All Residence Times (%)



Area of
Influence

MELA1 - 20% Most Impaired Days
All Amm_NO3 Extinction Weighted Residence Times (%)

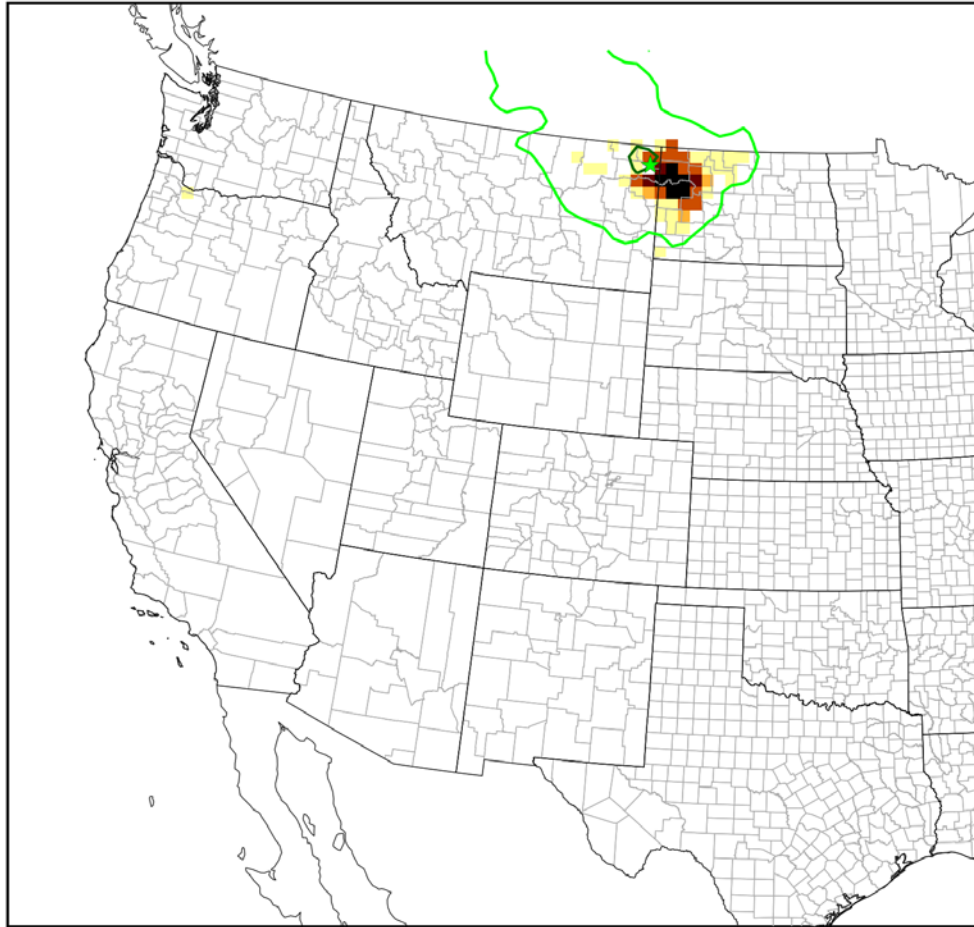


NOx

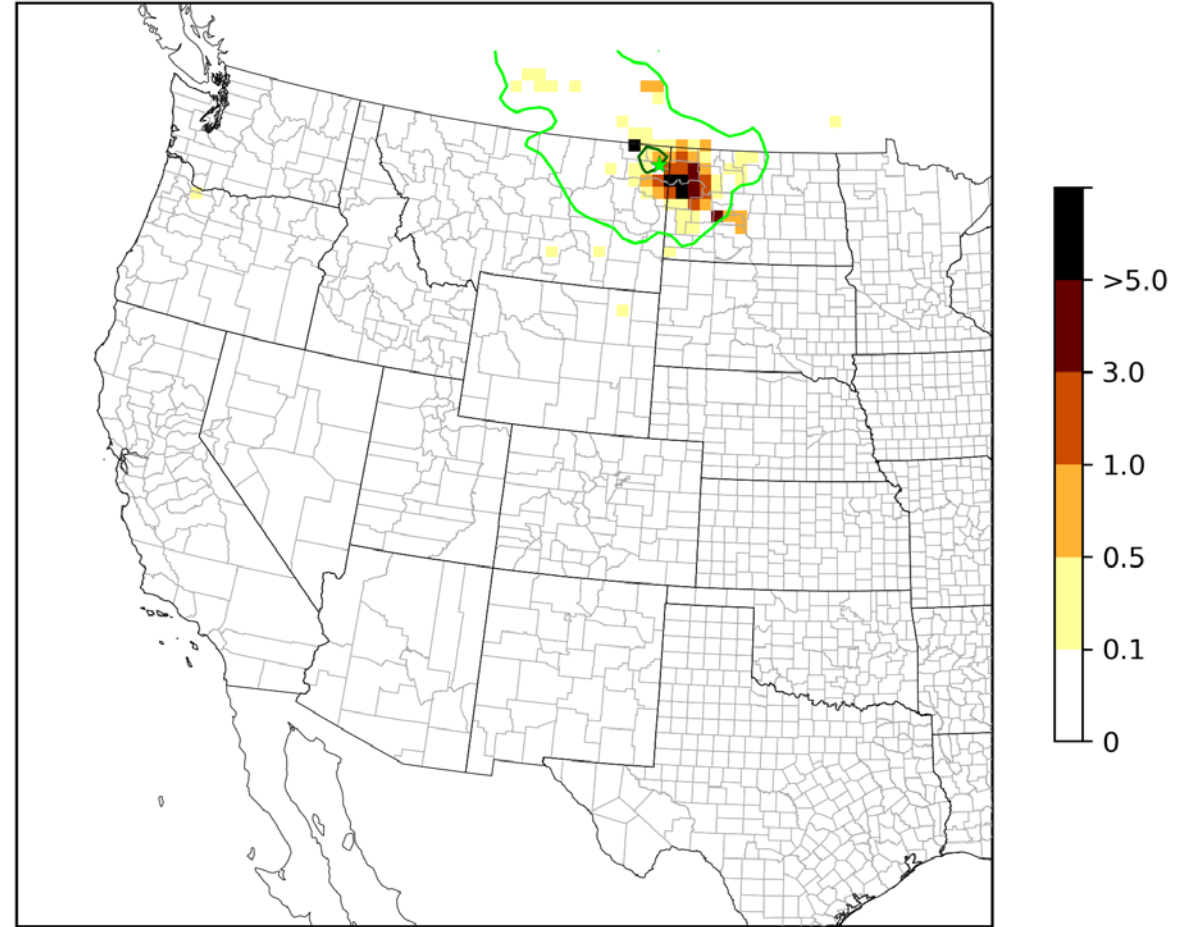
Extinction
Weighted
Residence
Times

NOx

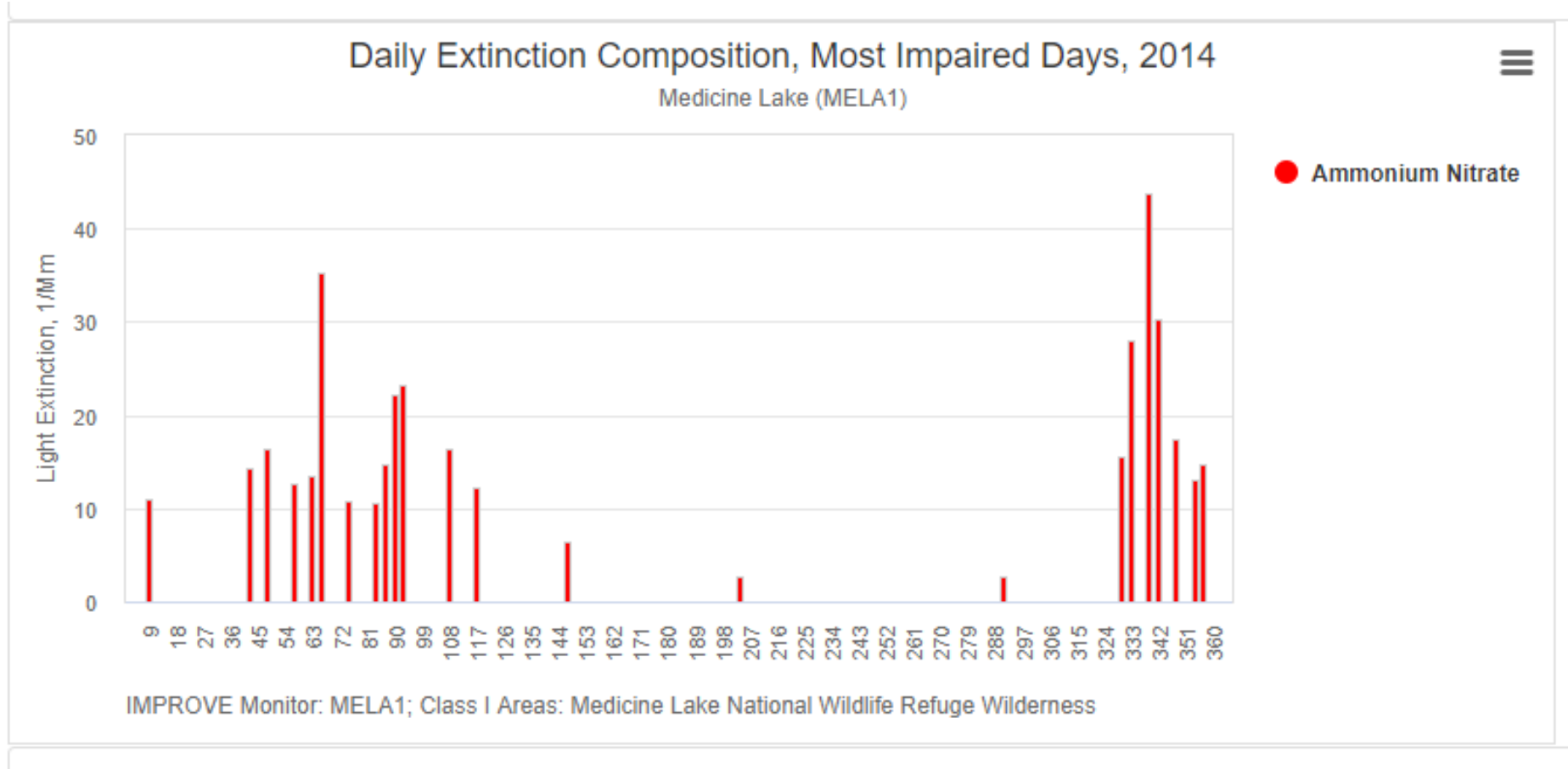
MELA1 - 20% Most Impaired Days All - EWRT
AREA NOx Emission Weighted Distance (%)



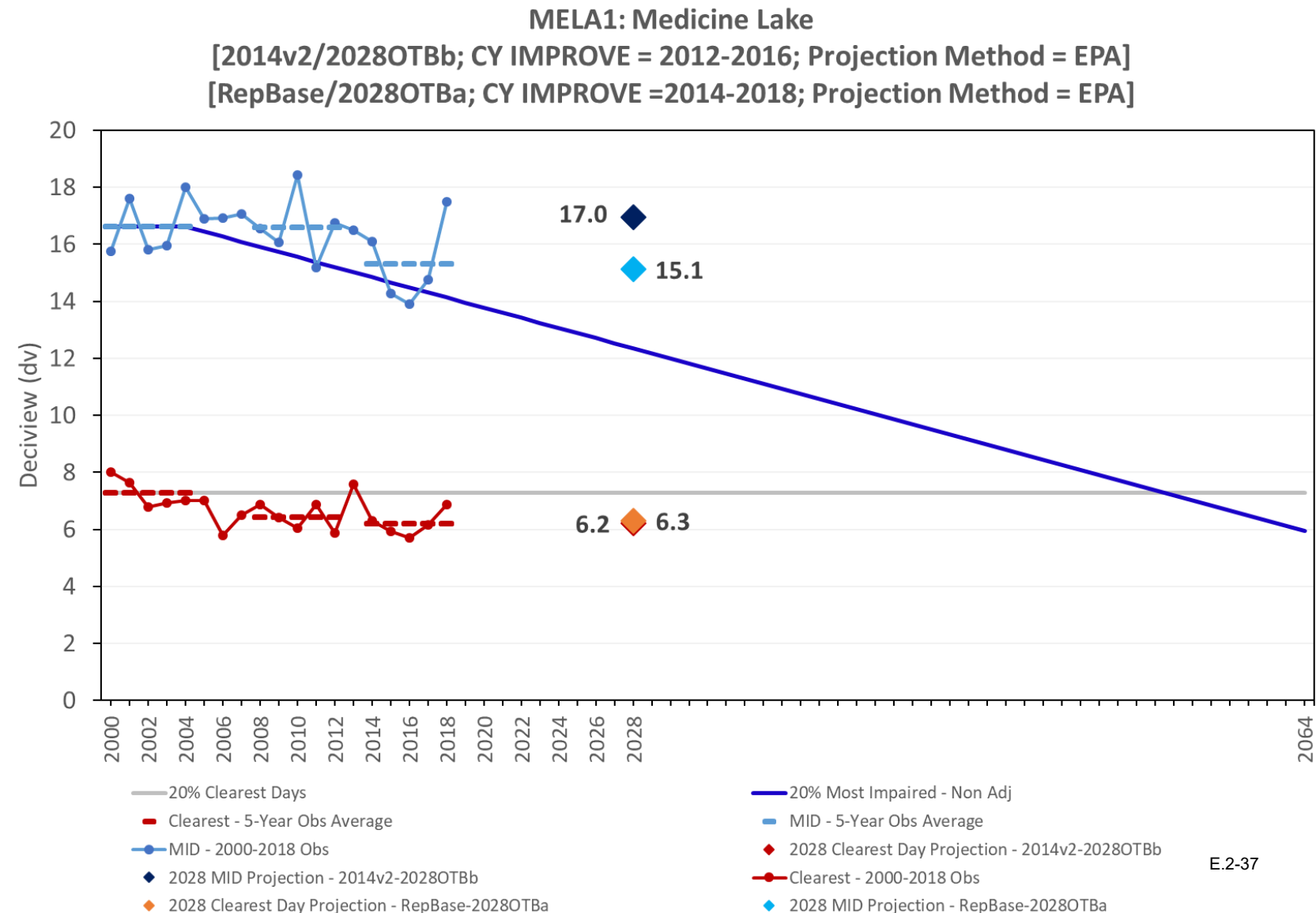
MELA1 - 20% Most Impaired Days All - EWRT
TOTAL_ANTRHO NOx Emission Weighted Distance (%)



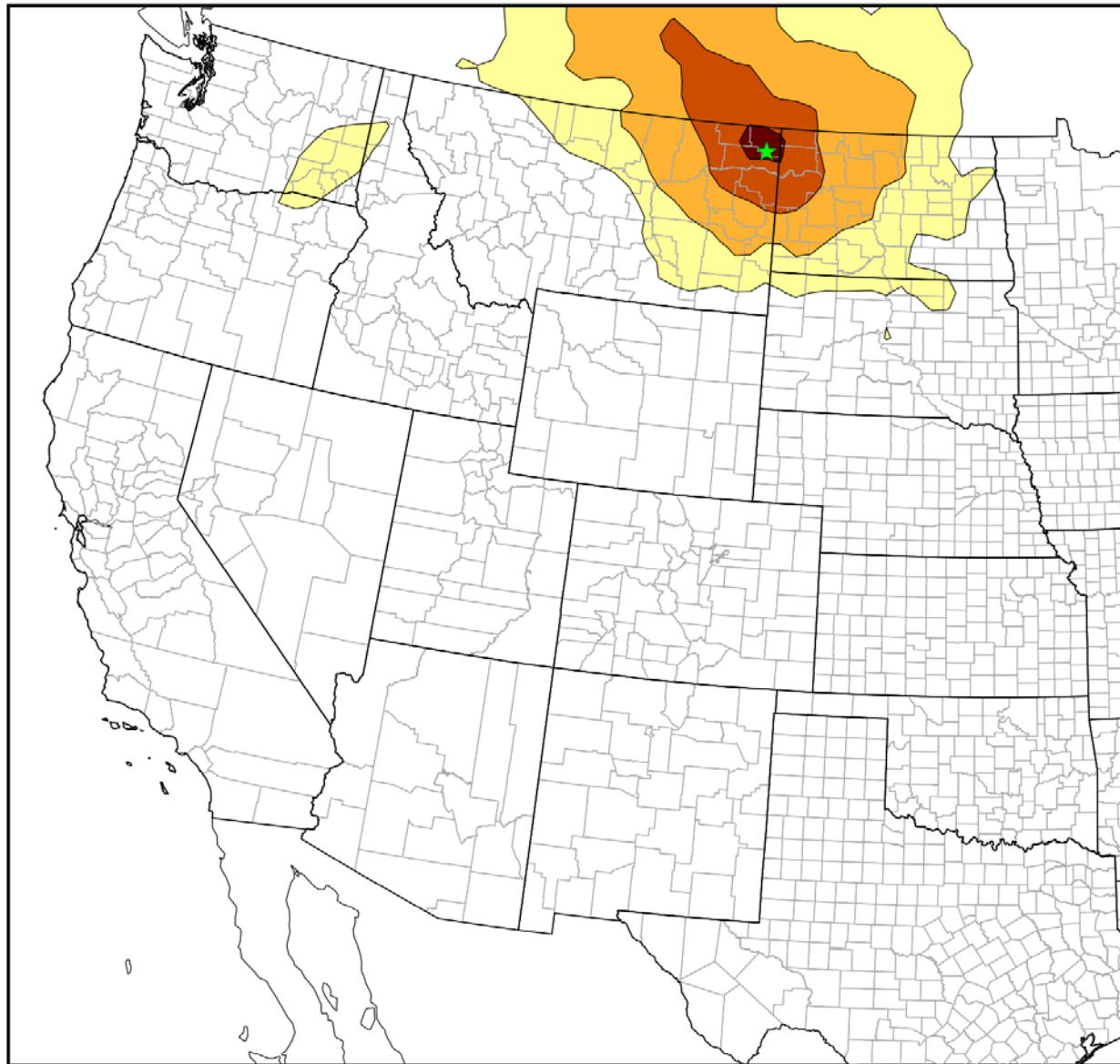
MIDs in 2014



MELA URP & 2028 Projections



MELA1 - 20% Most Impaired Days
All Amm_SO4 Extinction Weighted Residence Times (%)

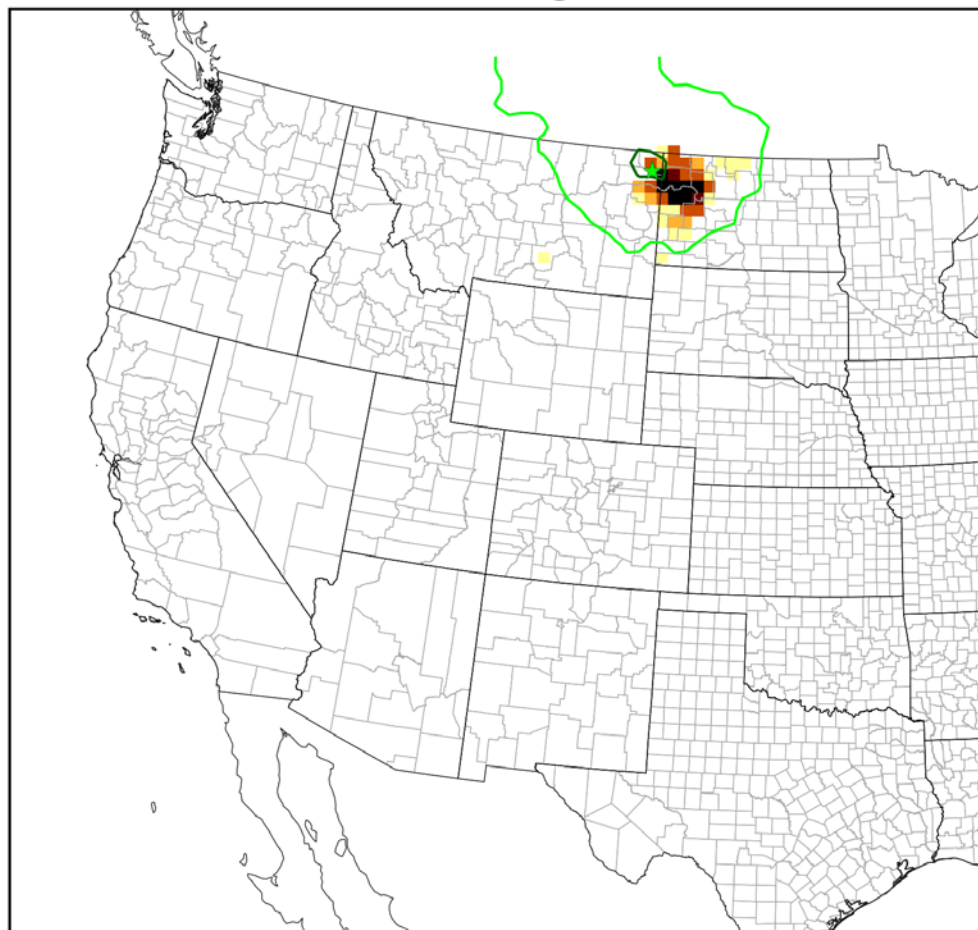


SOx

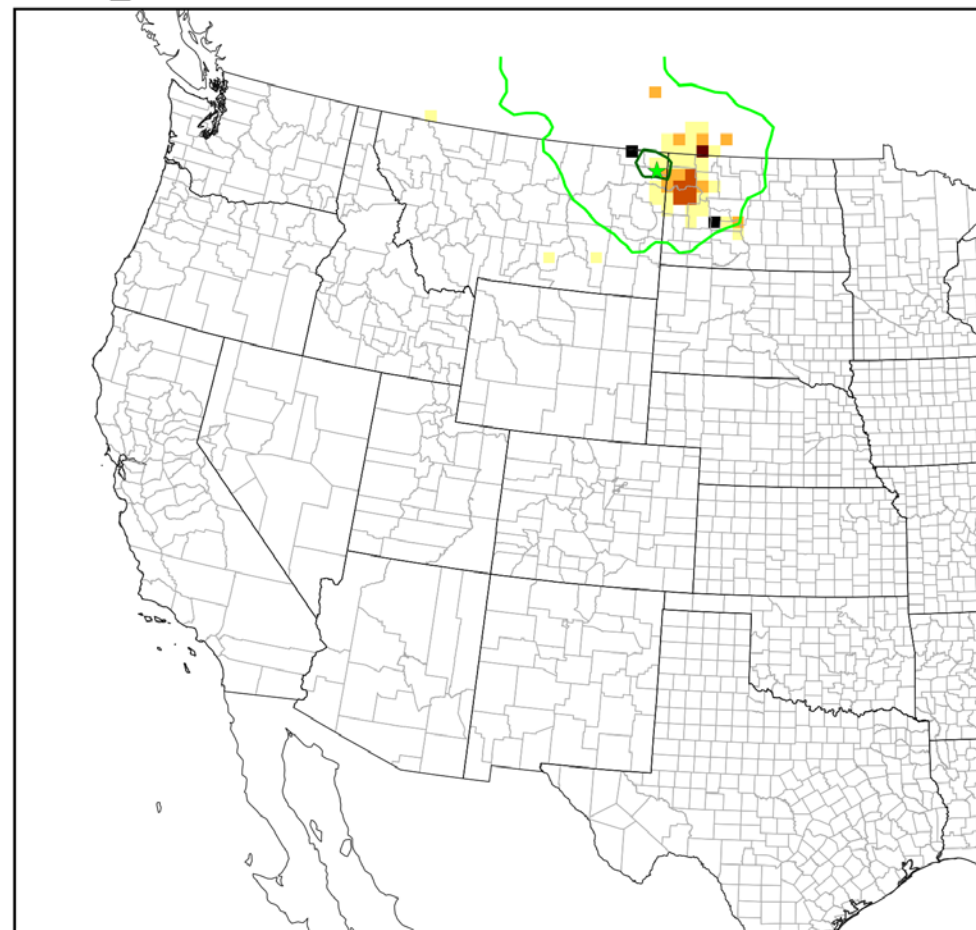
Extinction
Weighted
Residence
Times

SOx

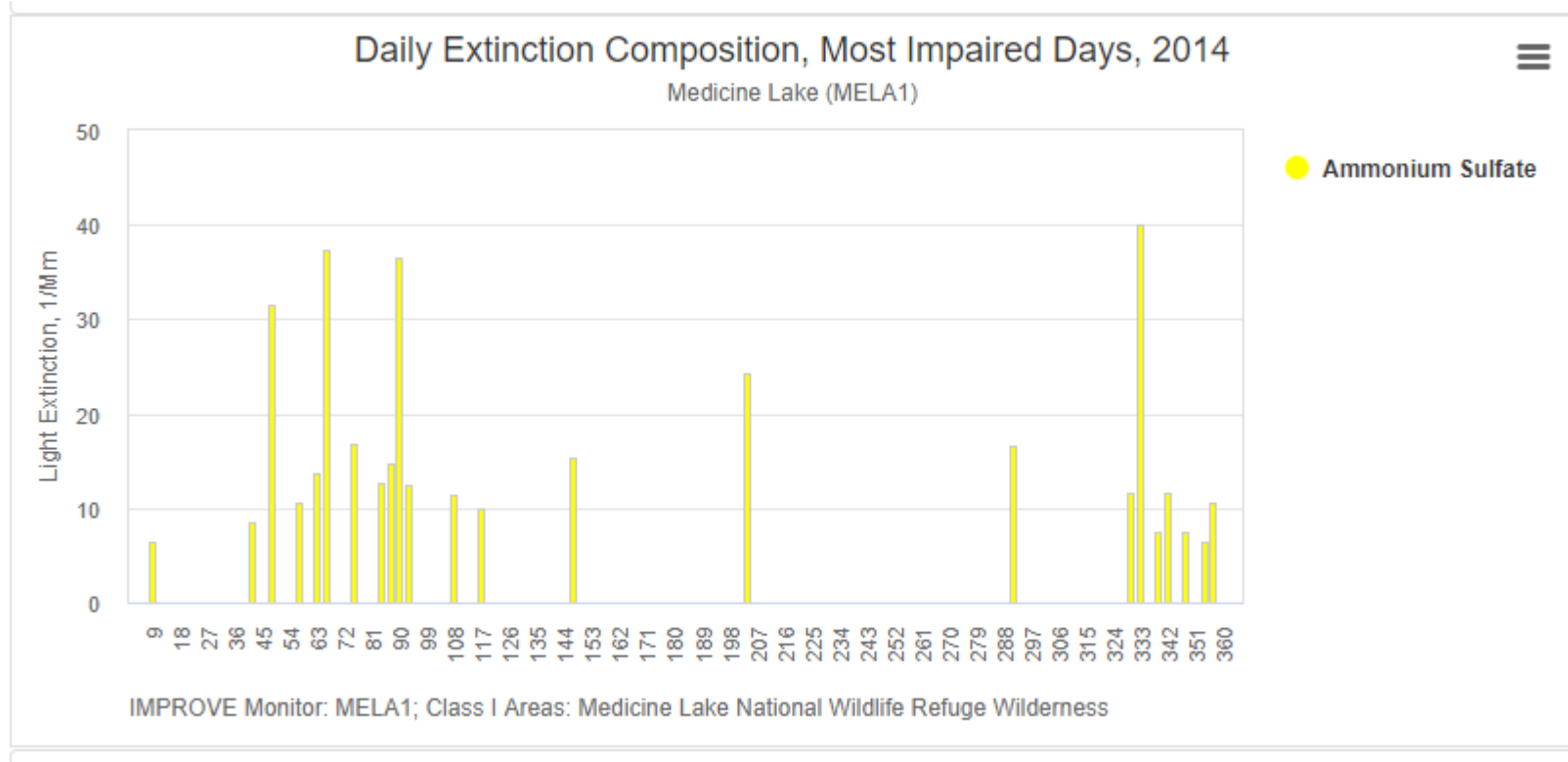
MELA1 - 20% Most Impaired Days All - EWRT
AREA SOx Emission Weighted Distance (%)



MELA1 - 20% Most Impaired Days All - EWRT
TOTAL_ANTRHO SOx Emission Weighted Distance (%)

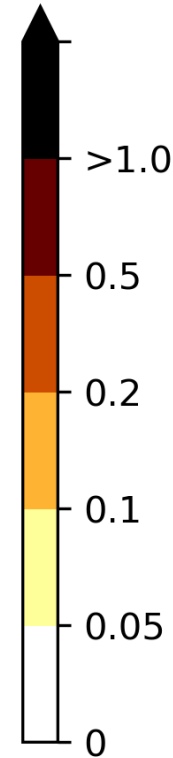
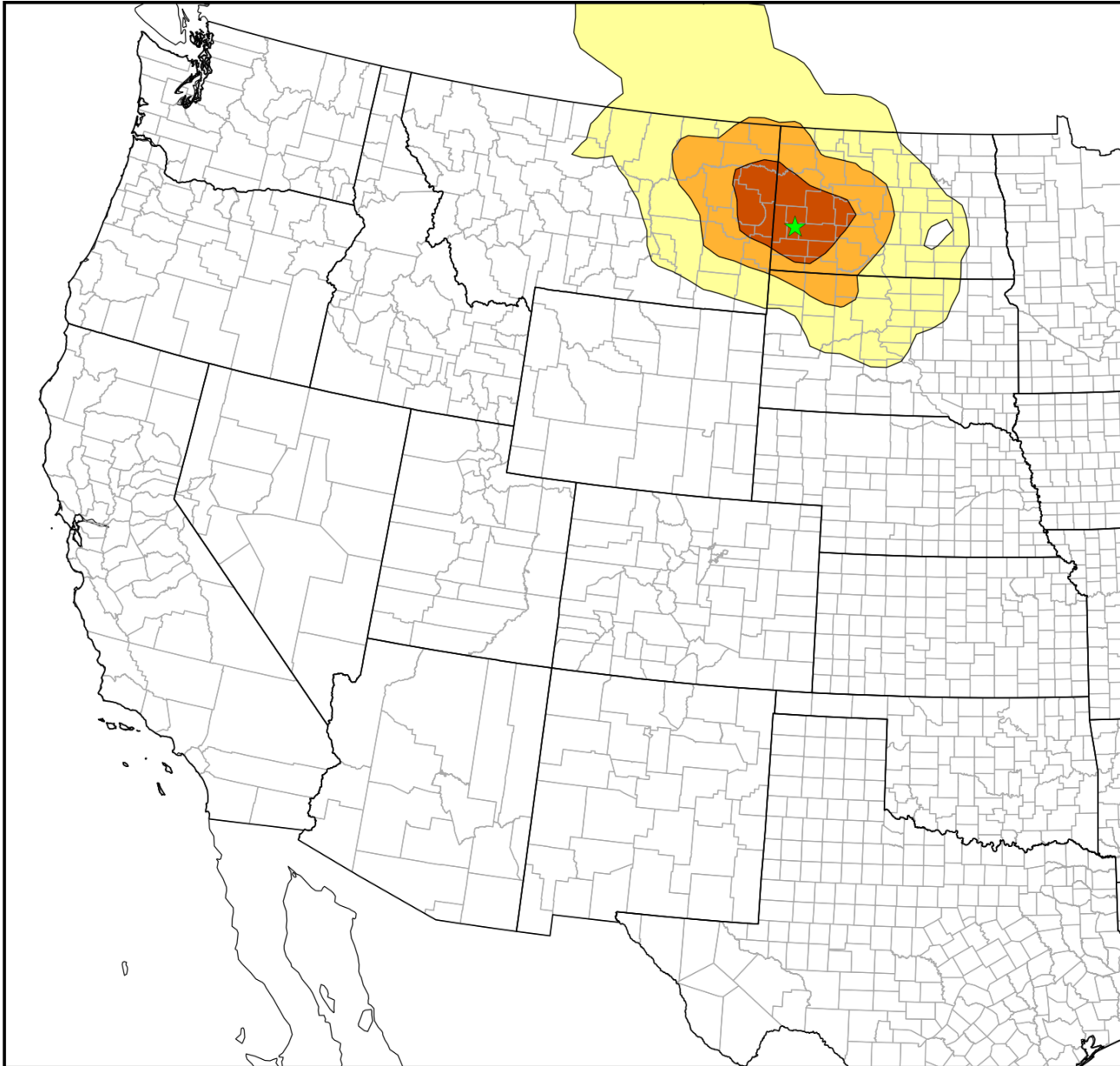


MIDs in 2014



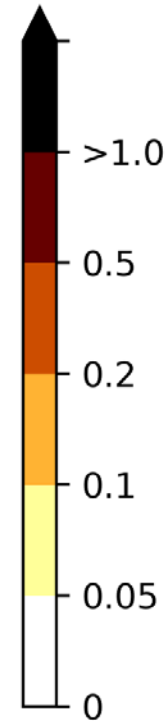
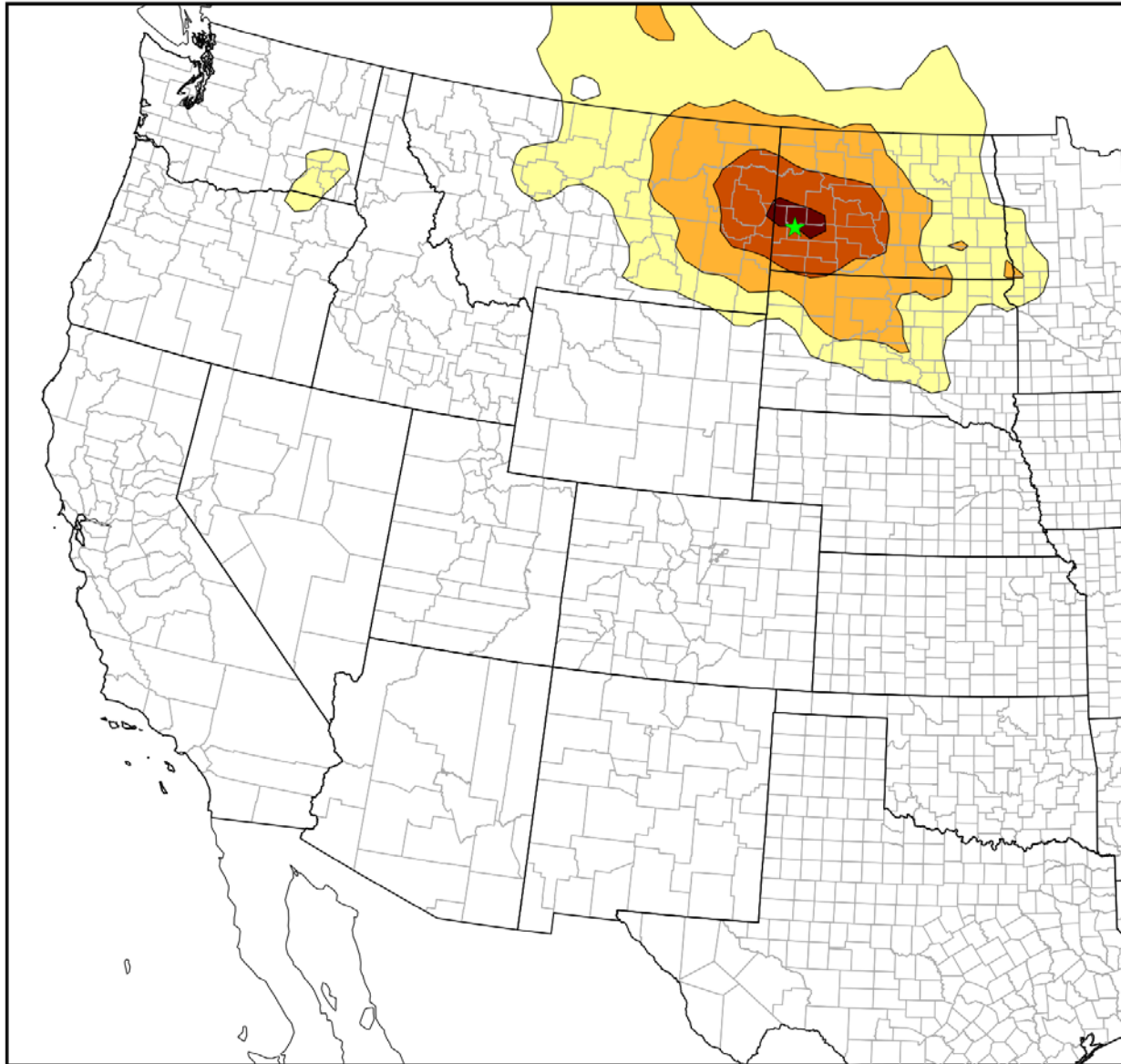
THRO1

THRO1 - 20% Most Impaired Days All Residence Times (%)



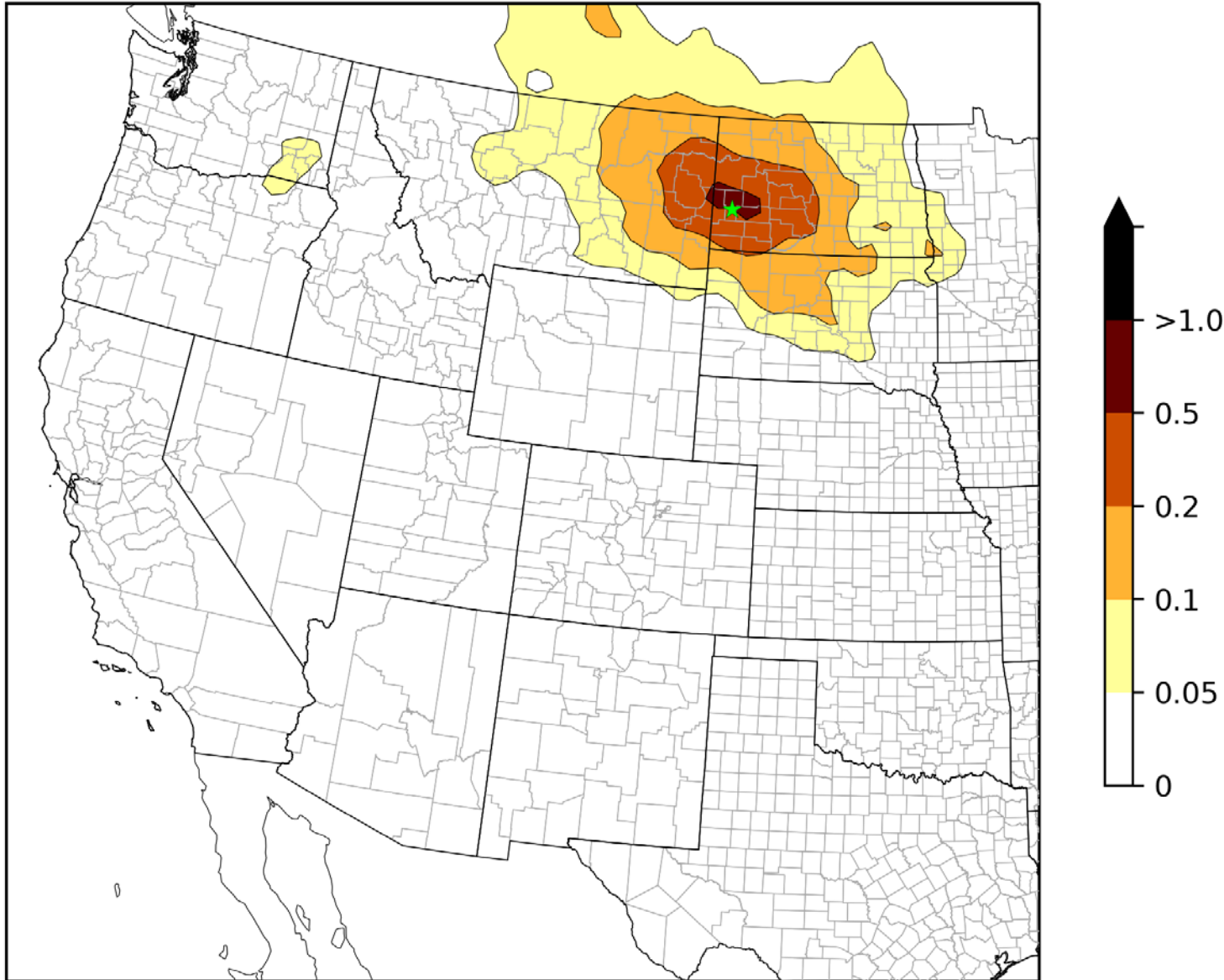
Area of
Influence

THRO1 - 20% Most Impaired Days
All Amm_NO3 Extinction Weighted Residence Times (%)



Area of
Influence

THRO1 - 20% Most Impaired Days
All Amm_NO3 Extinction Weighted Residence Times (%)

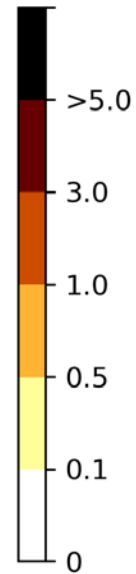
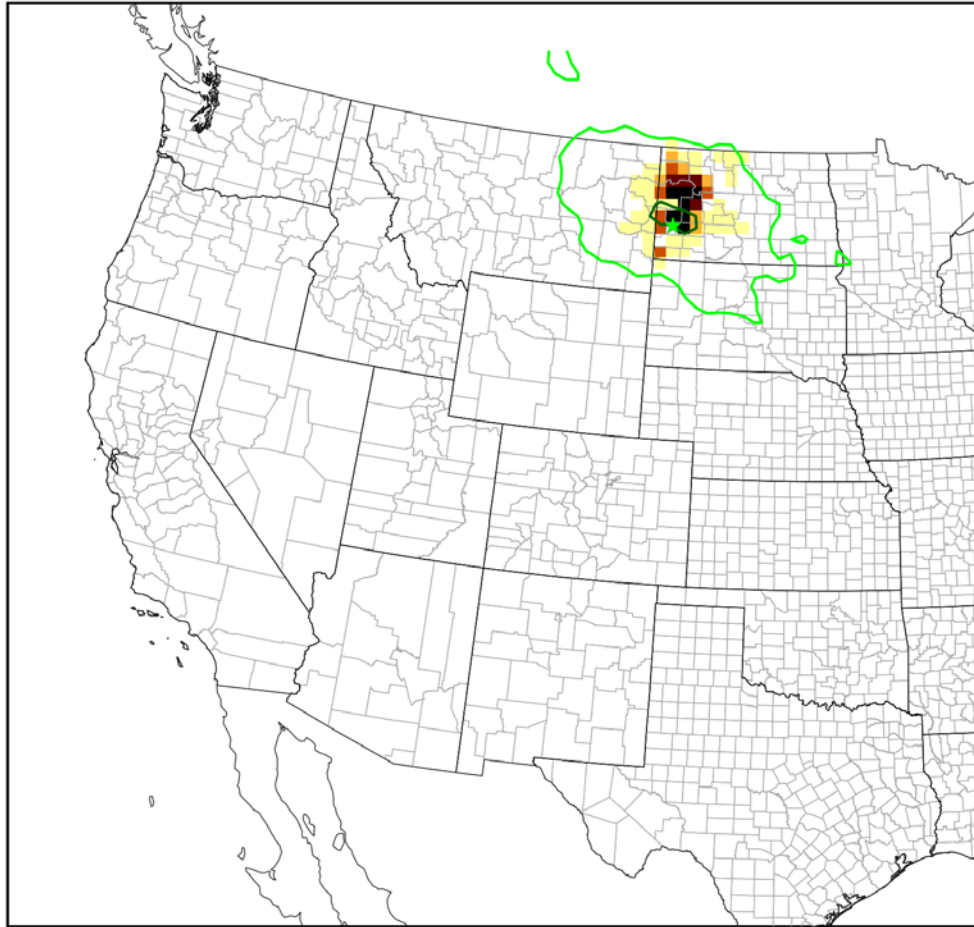


NOx

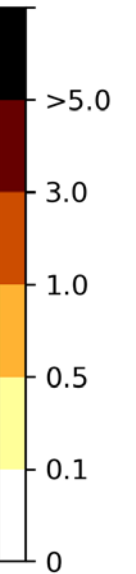
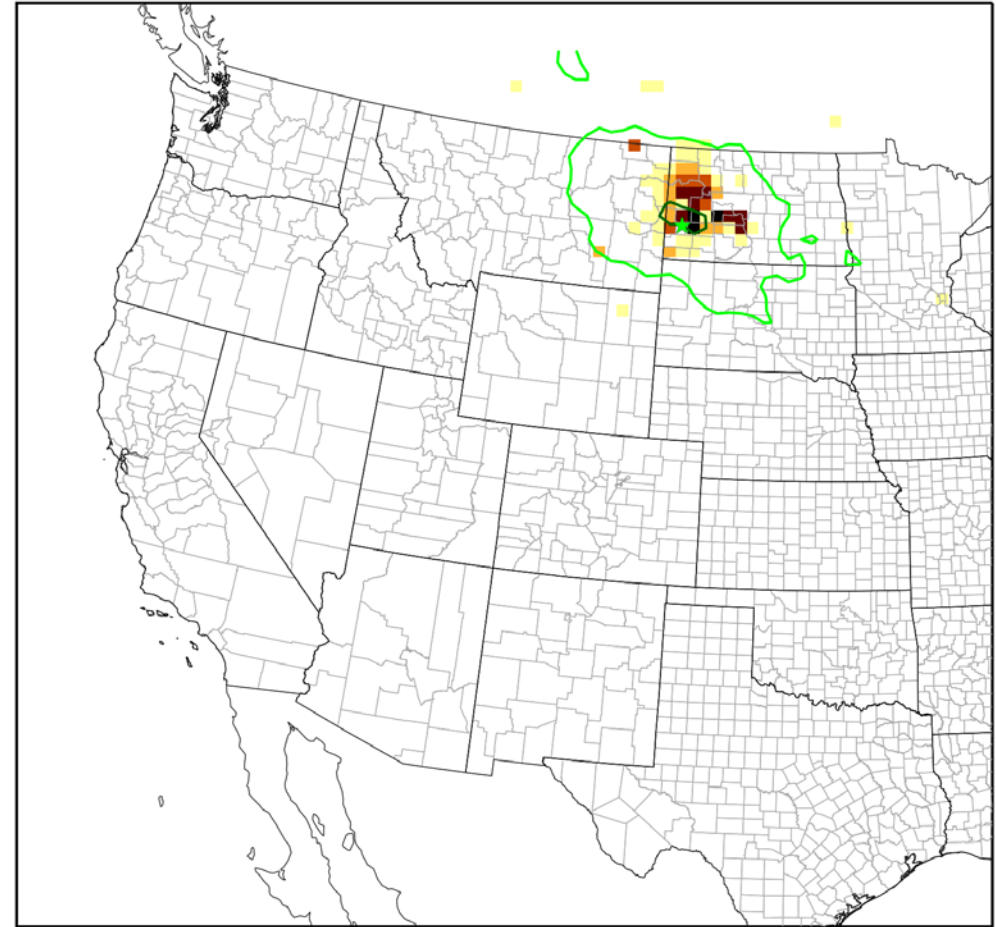
Extinction
Weighted
Residence
Times

NOx

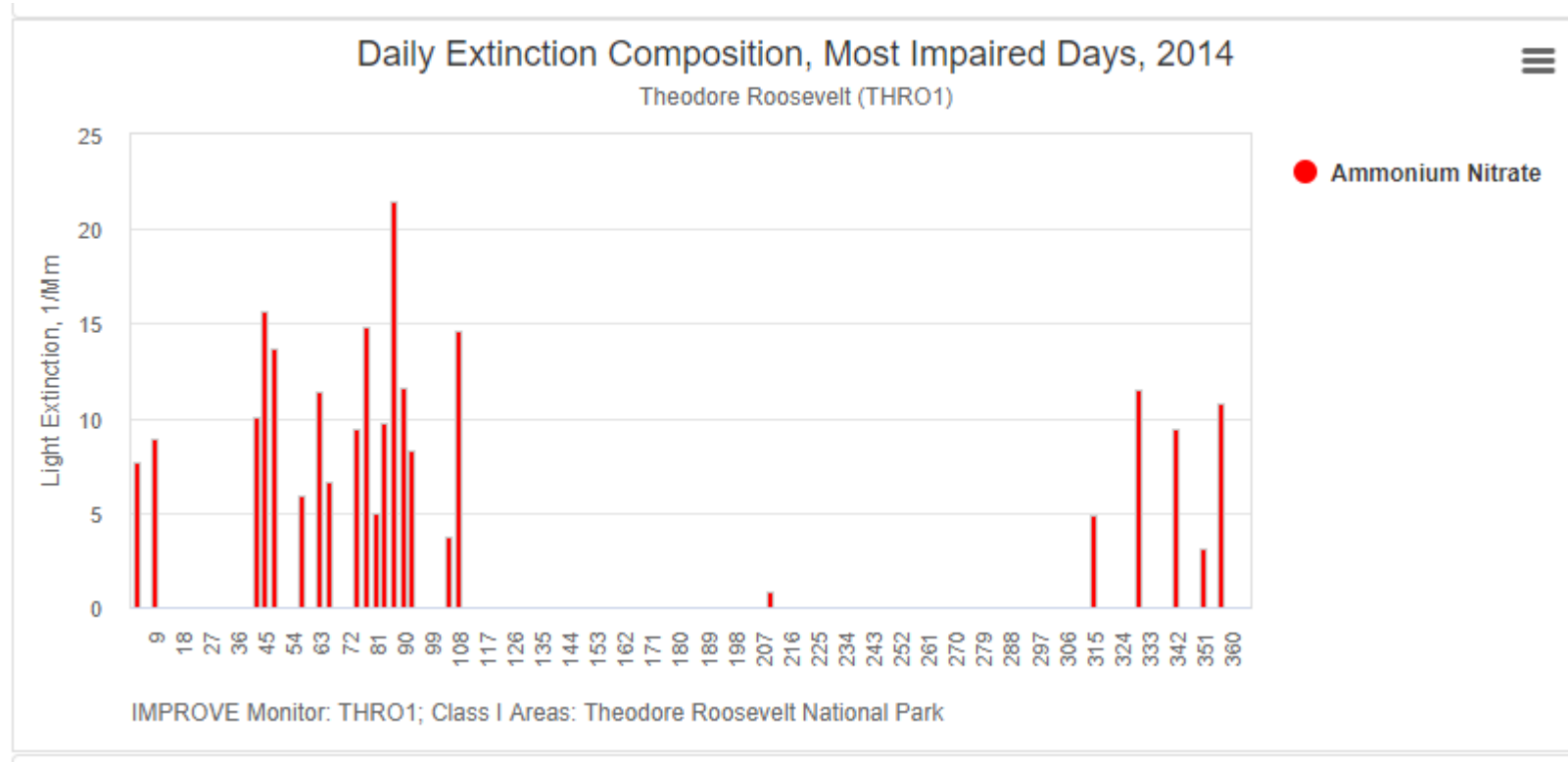
THRO1 - 20% Most Impaired Days All - EWRT
AREA NOx Emission Weighted Distance (%)



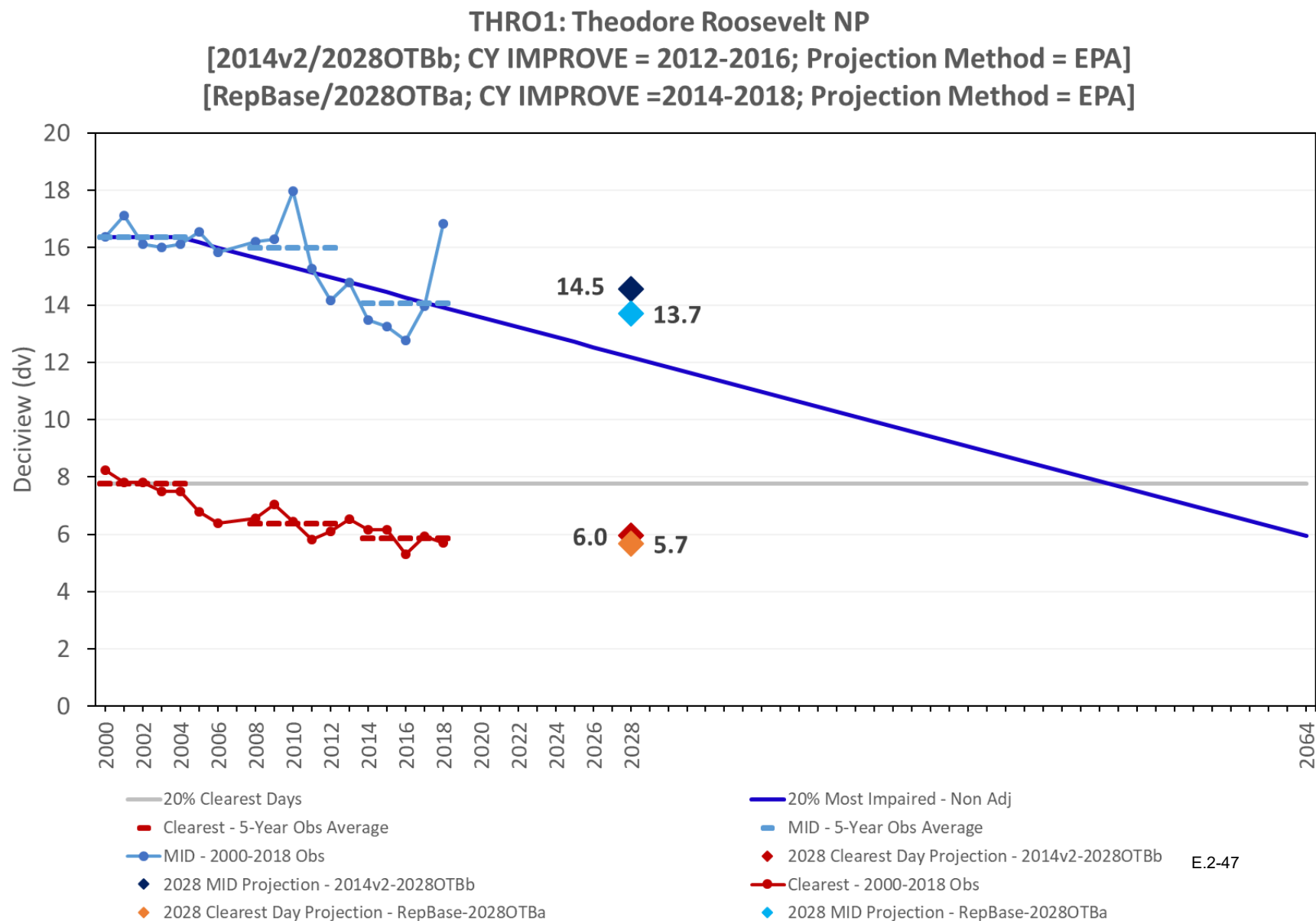
THRO1 - 20% Most Impaired Days All - EWRT
TOTAL_ANTRHO NOx Emission Weighted Distance (%)



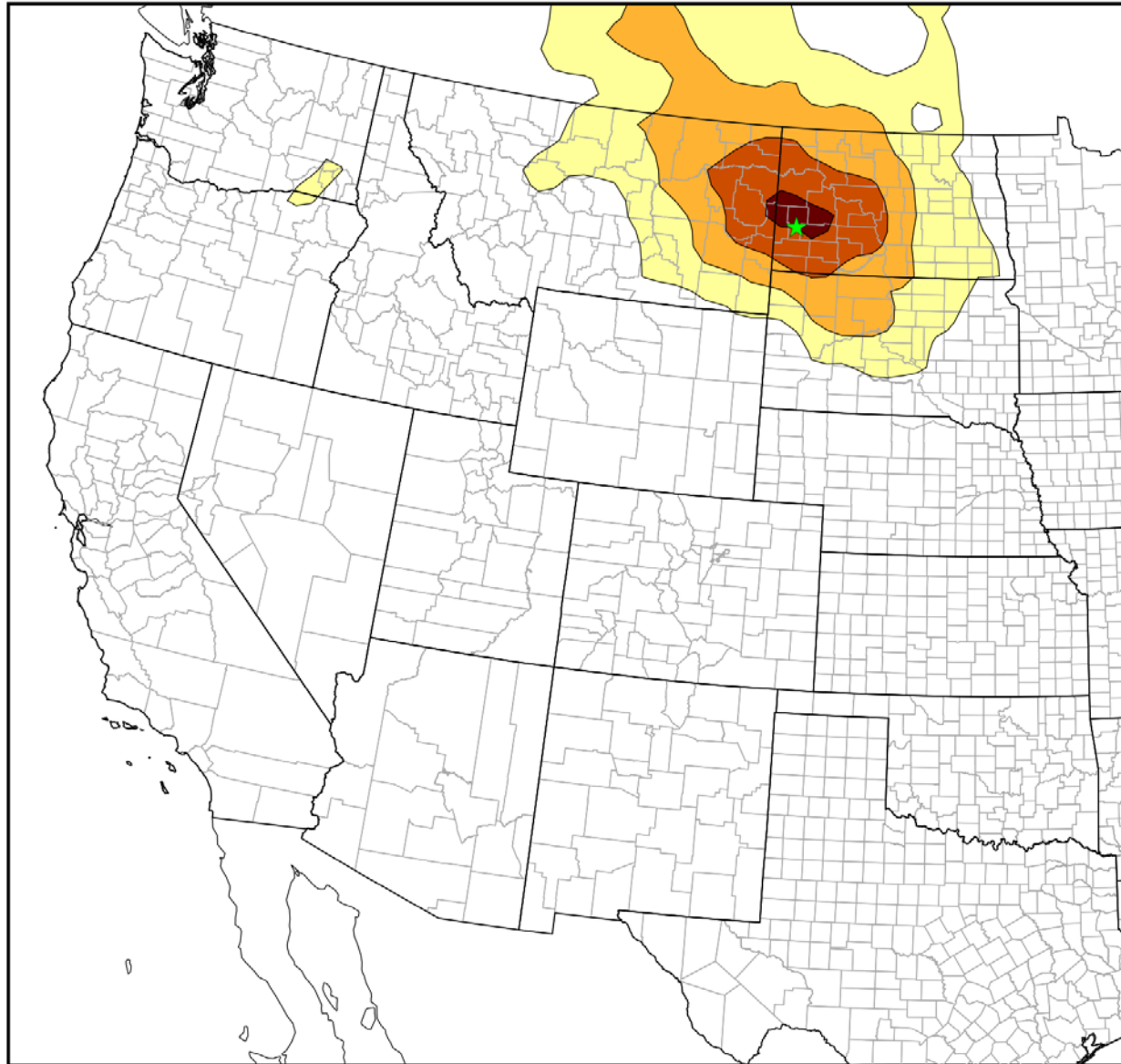
MIDs in 2014



THRO1 URP and 2028 Projections

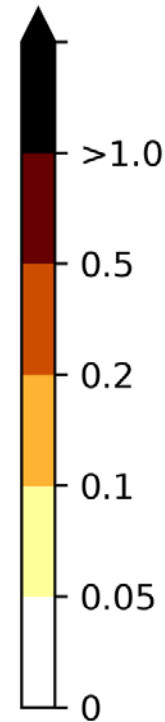


THRO1 - 20% Most Impaired Days
All Amm_SO4 Extinction Weighted Residence Times (%)



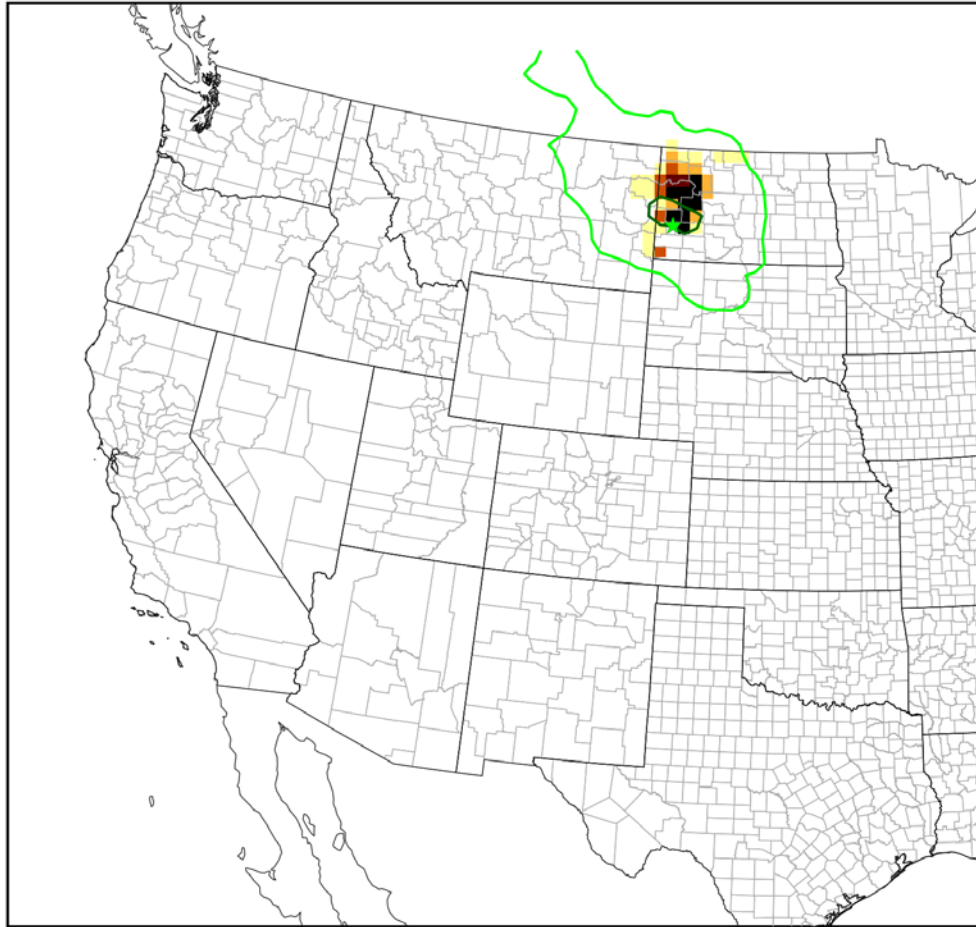
SOx

Extinction
Weighted
Residence
Times

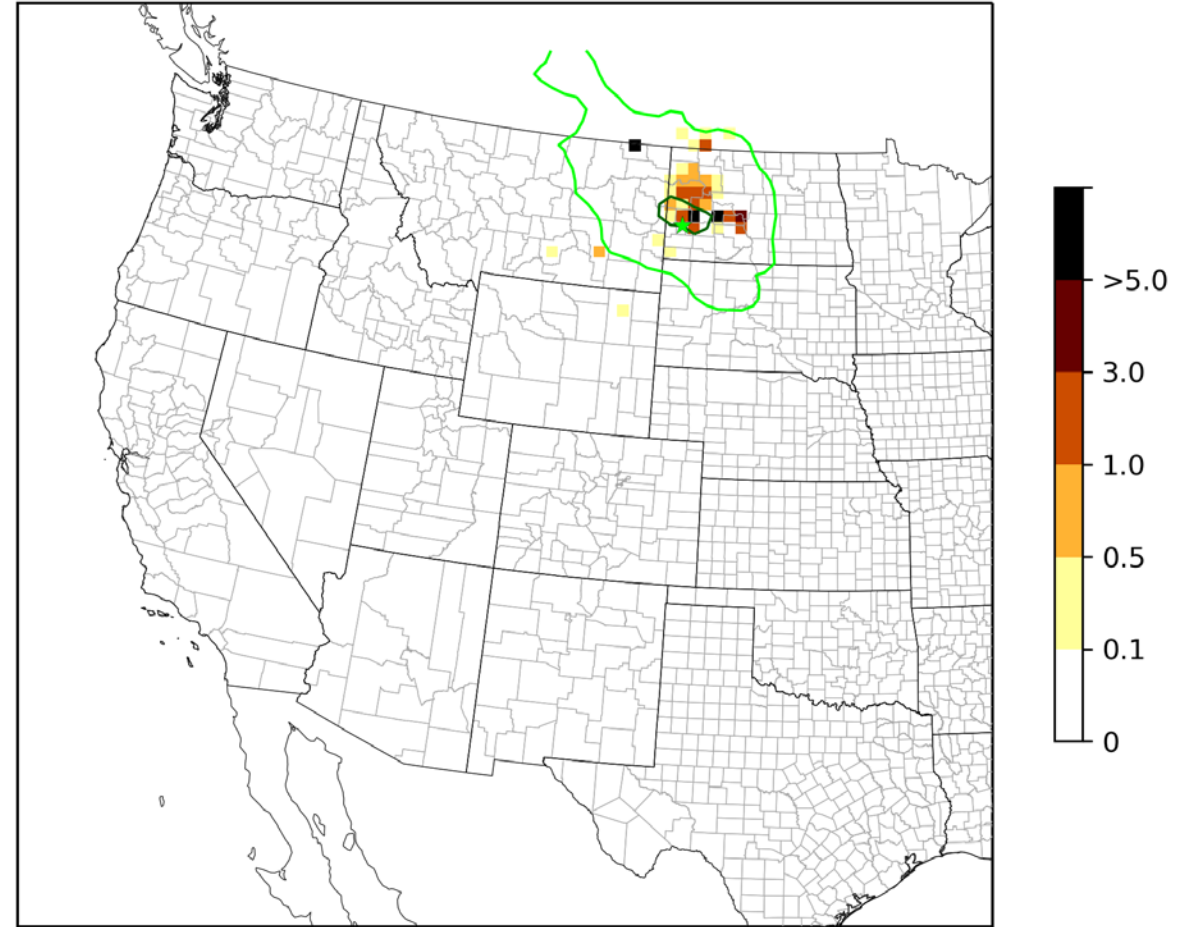


SOx

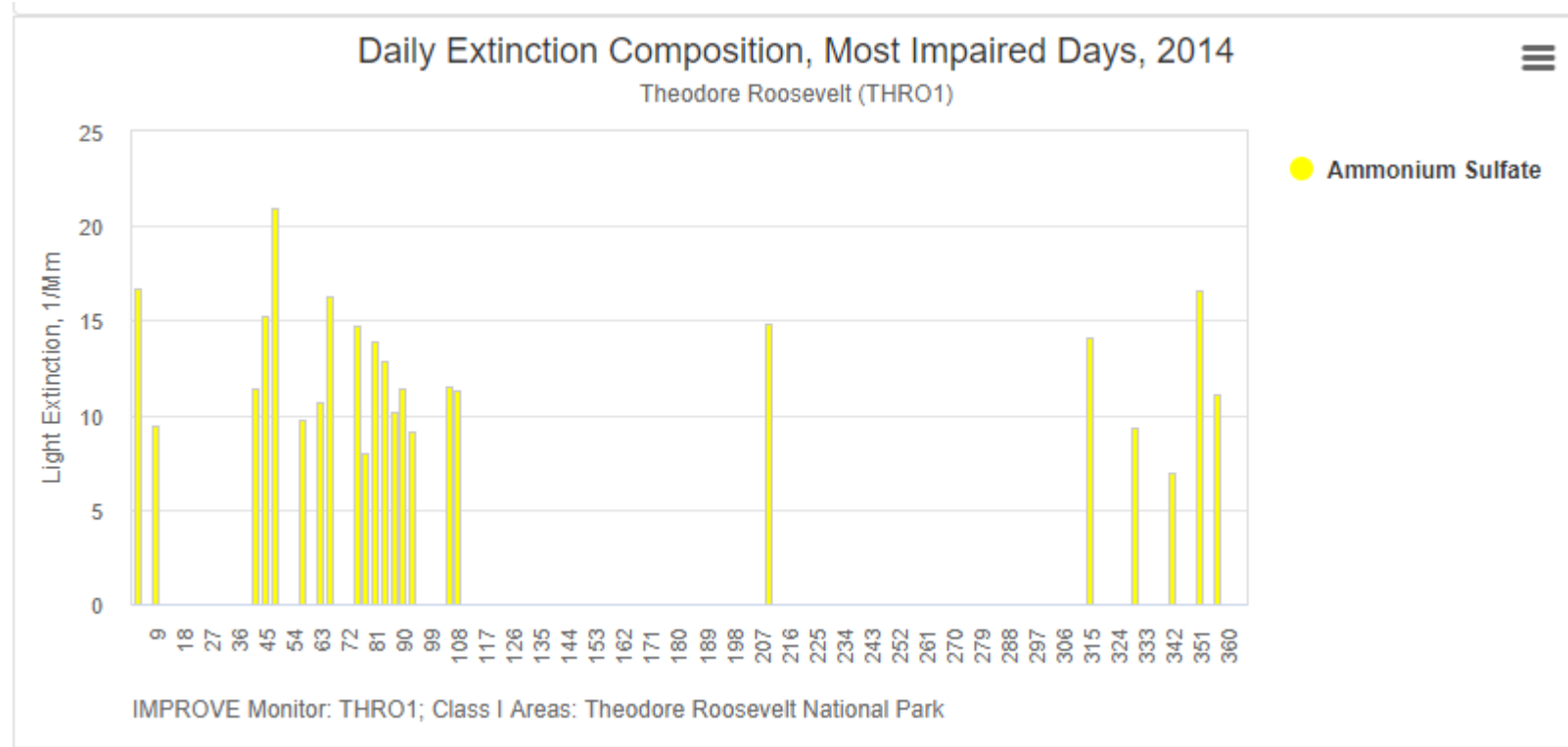
THRO1 - 20% Most Impaired Days All - EWRT
AREA SOx Emission Weighted Distance (%)



THRO1 - 20% Most Impaired Days All - EWRT
TOTAL_ANTRHO SOx Emission Weighted Distance (%)

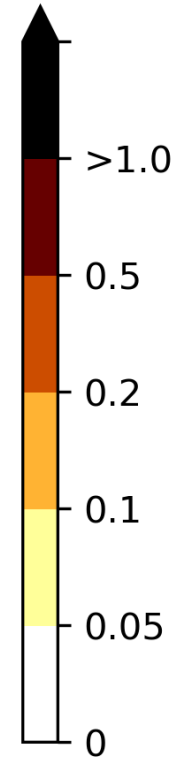
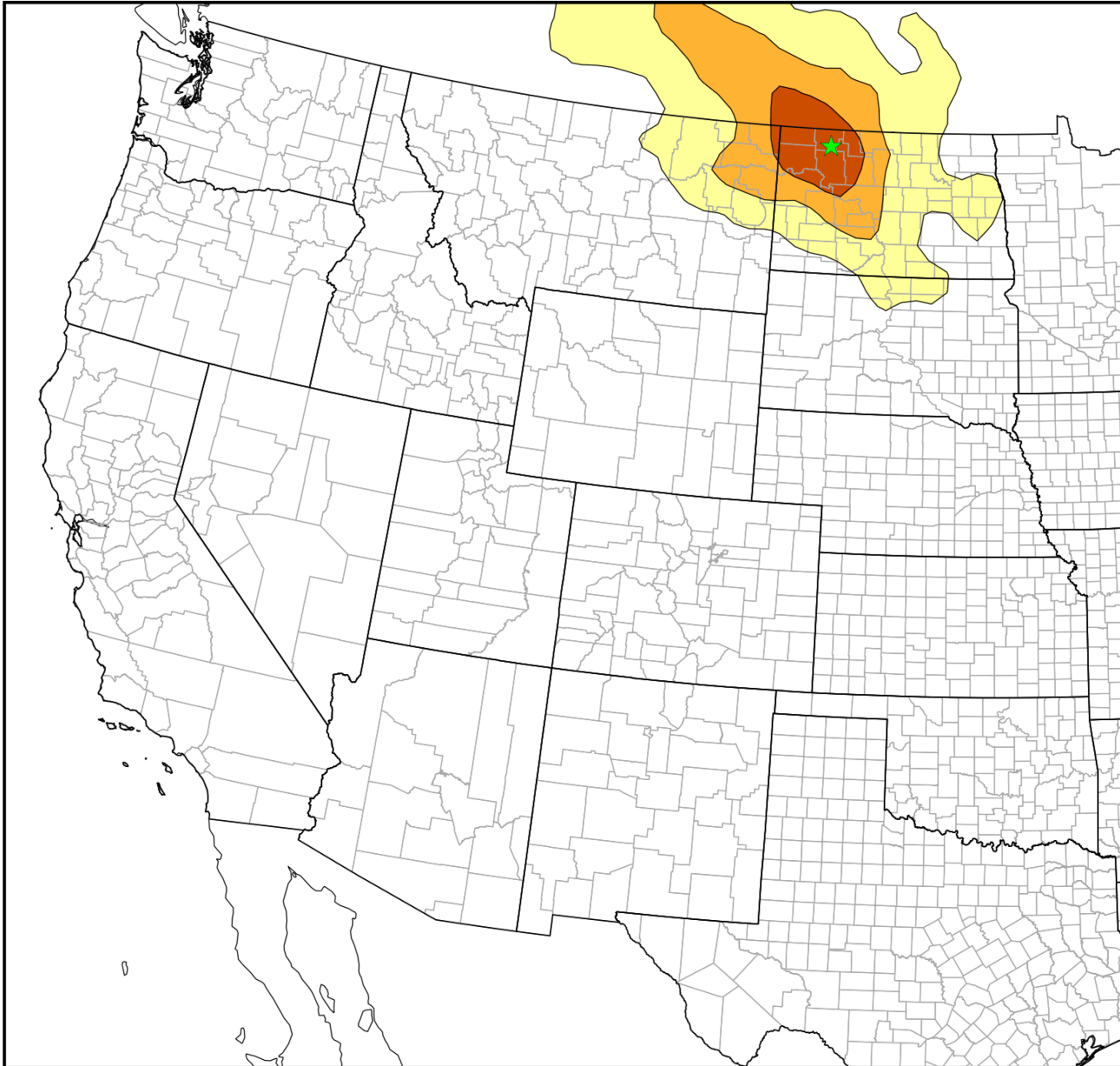


MIDs in 2014



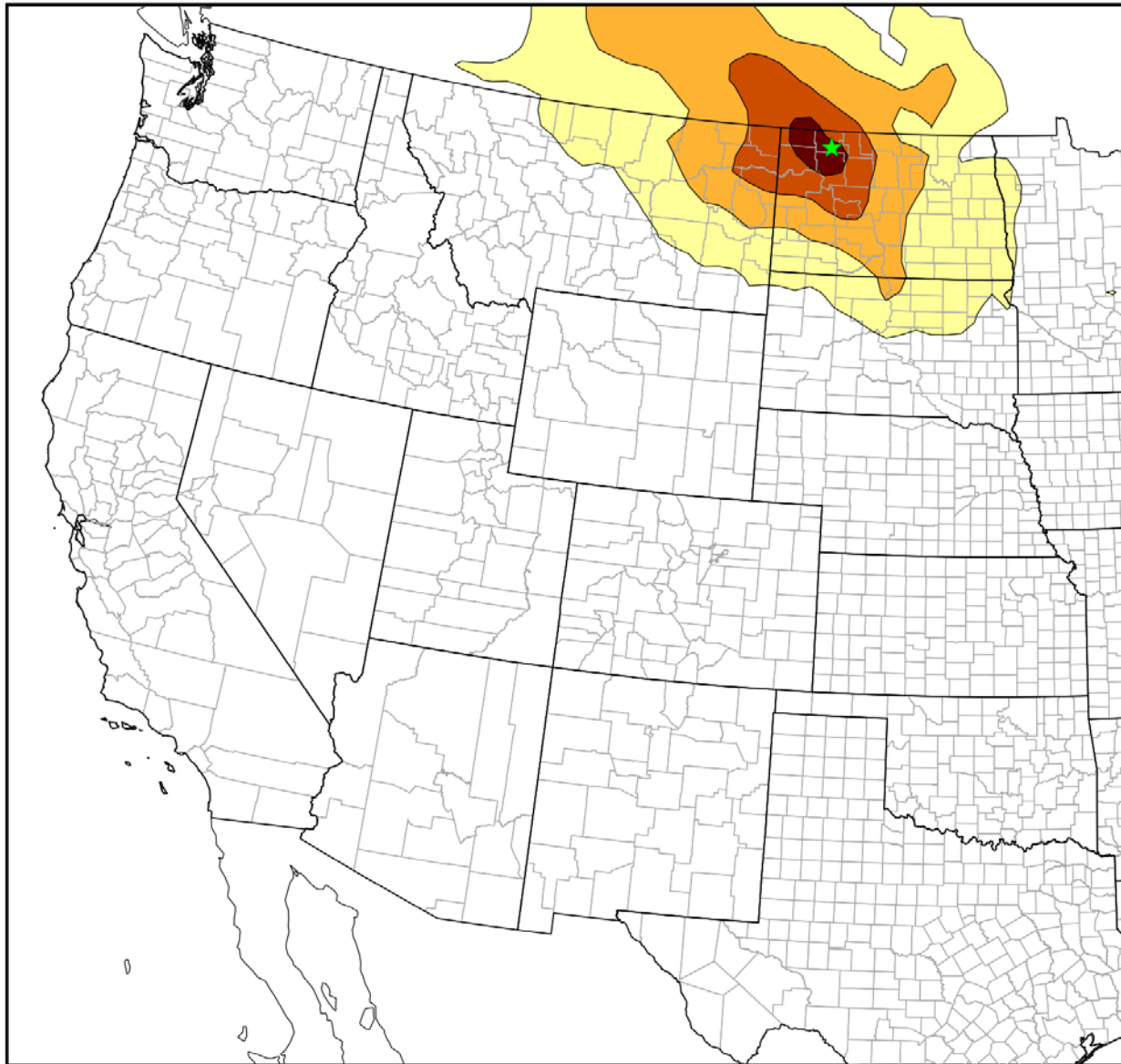
LOST1

LOST1 - 20% Most Impaired Days All Residence Times (%)



Area of
Influence

LOST1 - 20% Most Impaired Days
All Amm_NO3 Extinction Weighted Residence Times (%)

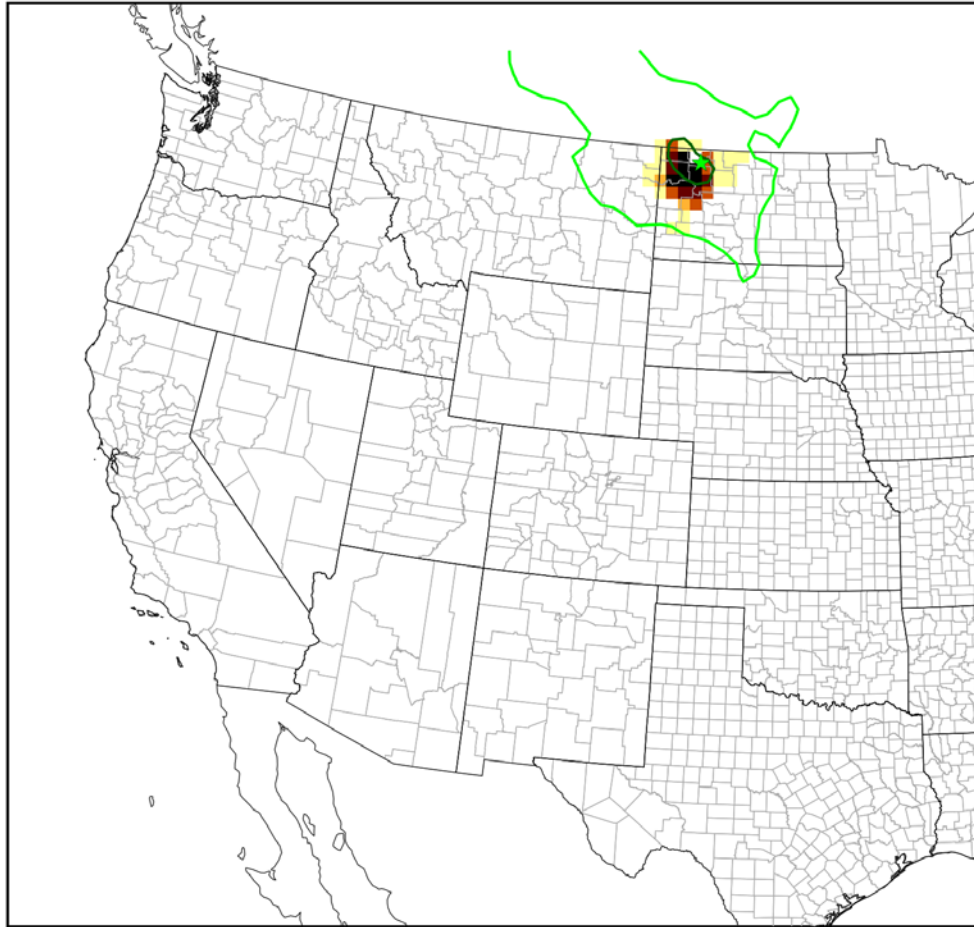


NOx

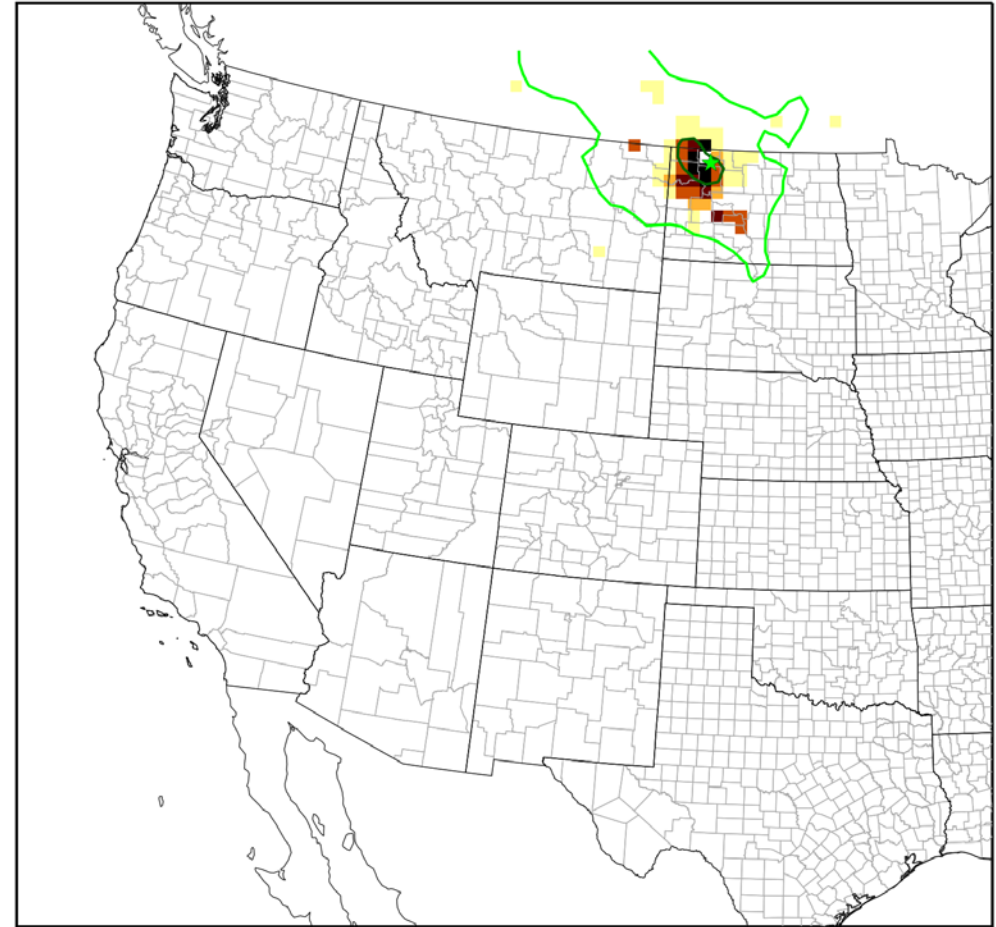
Extinction
Weighted
Residence
Times

NOx

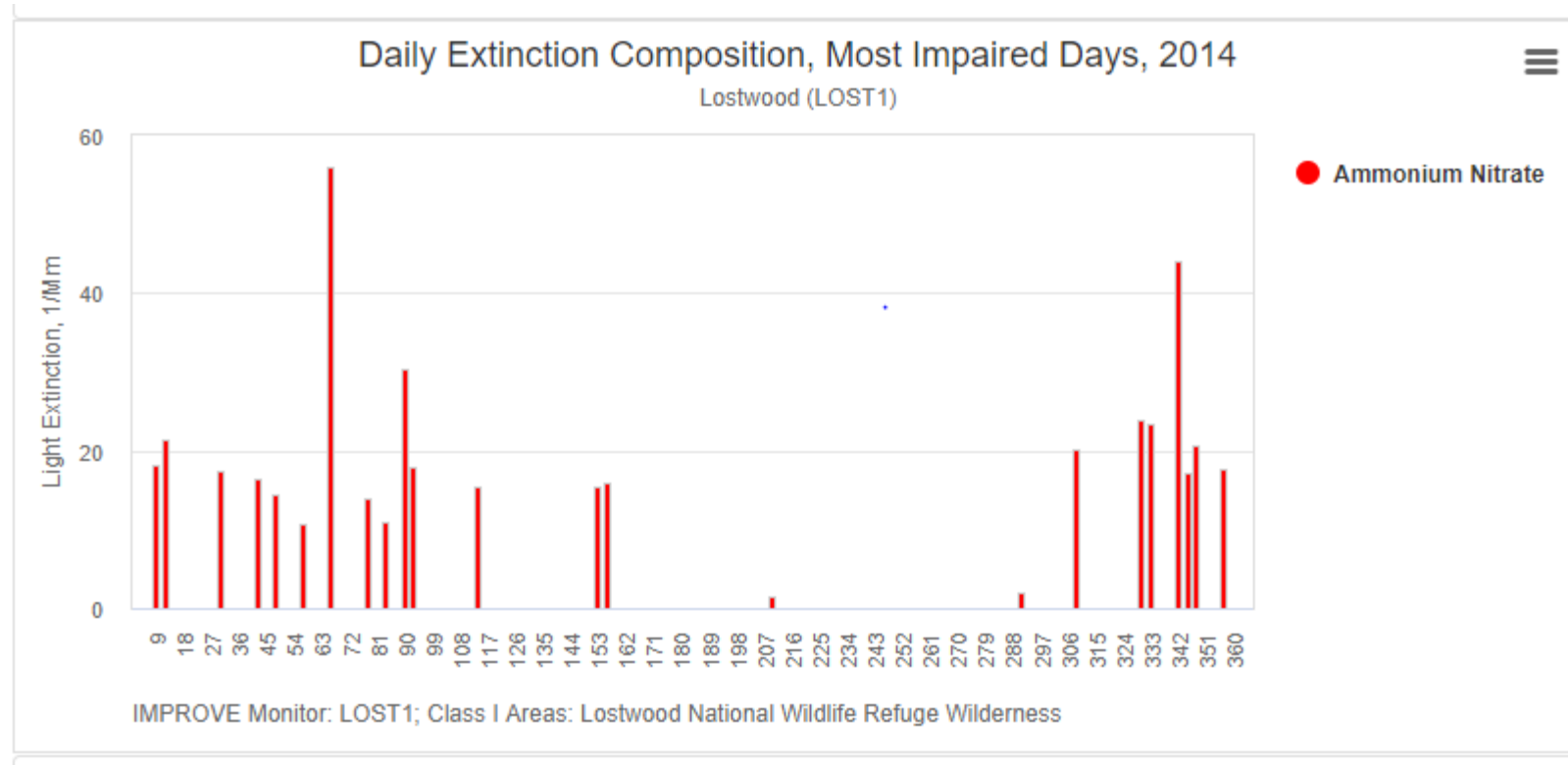
LOST1 - 20% Most Impaired Days All - EWRT
AREA NOx Emission Weighted Distance (%)



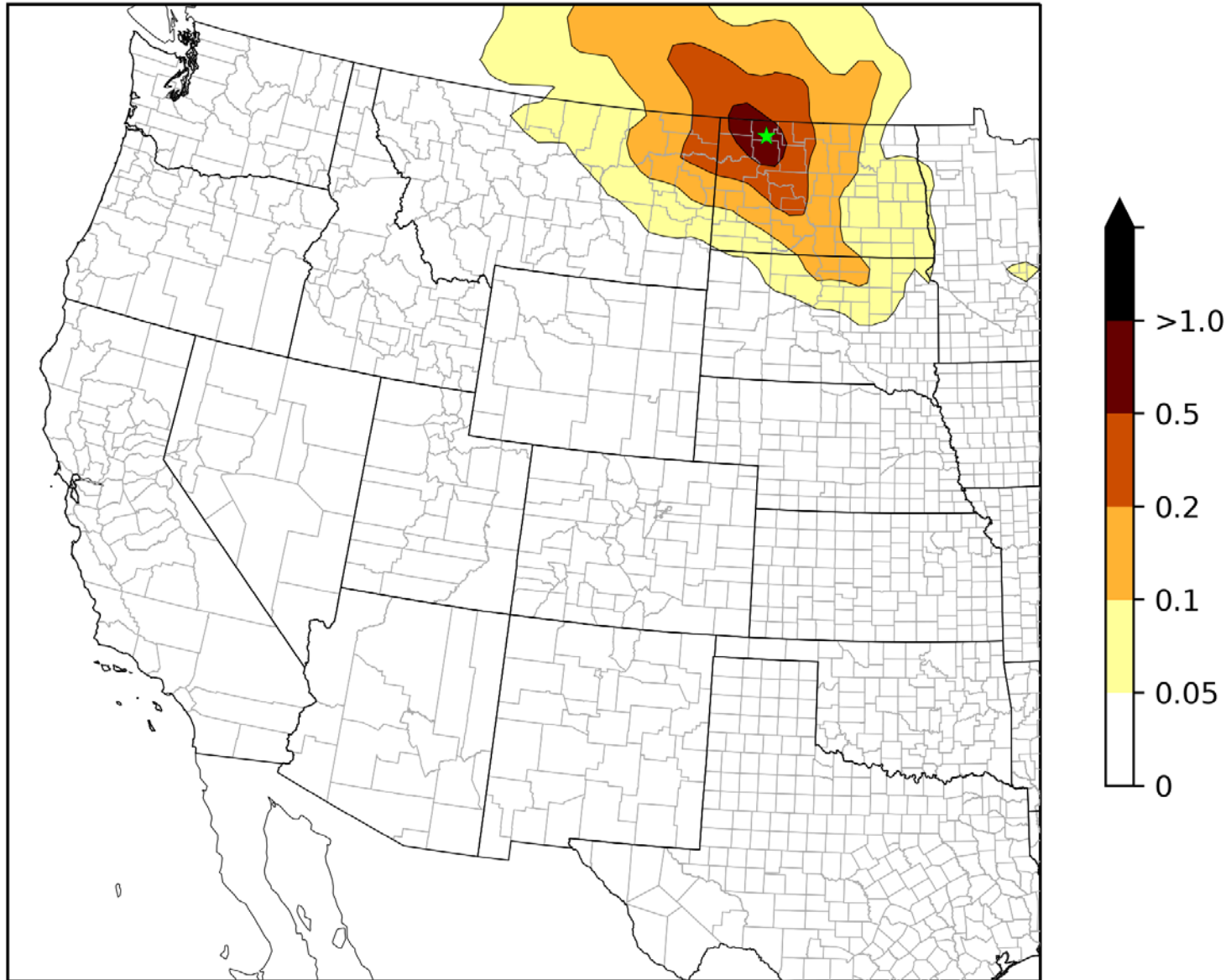
LOST1 - 20% Most Impaired Days All - EWRT
TOTAL_ANTRHO NOx Emission Weighted Distance (%)



MIDs in 2014



LOST1 - 20% Most Impaired Days
All Amm_SO4 Extinction Weighted Residence Times (%)

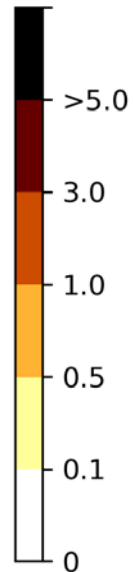
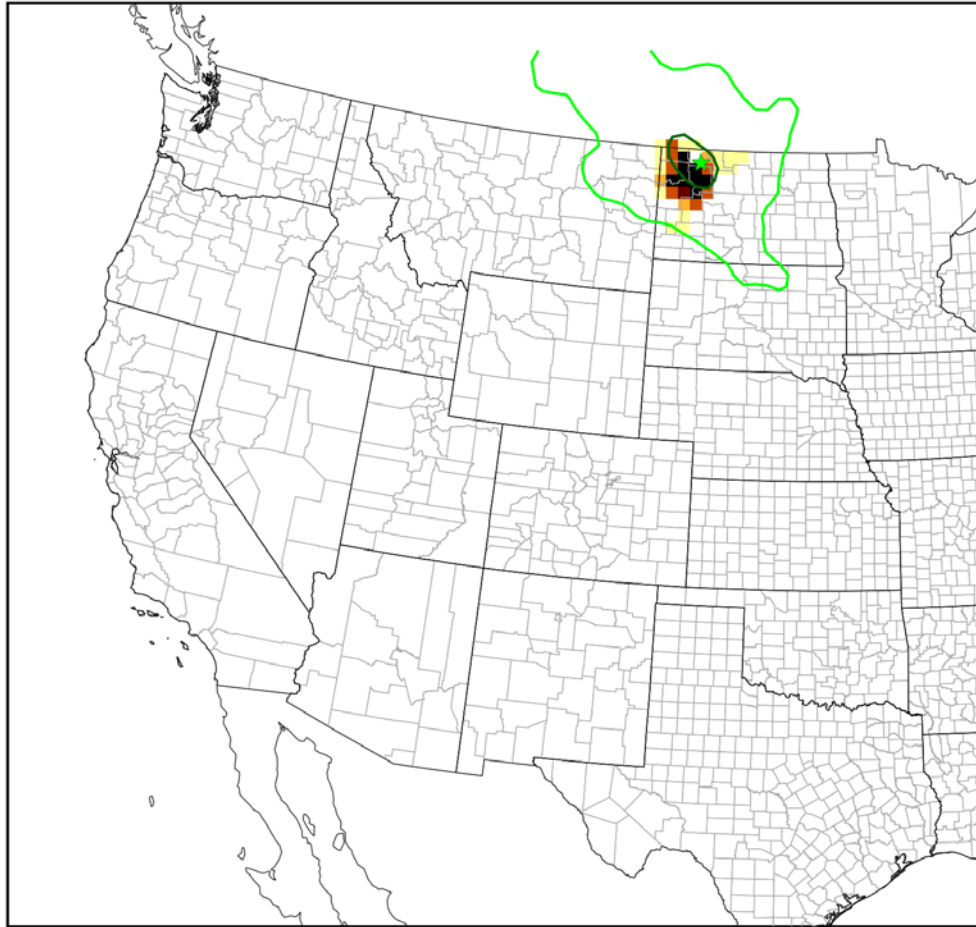


SOx

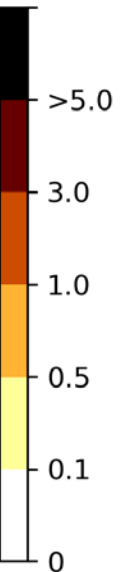
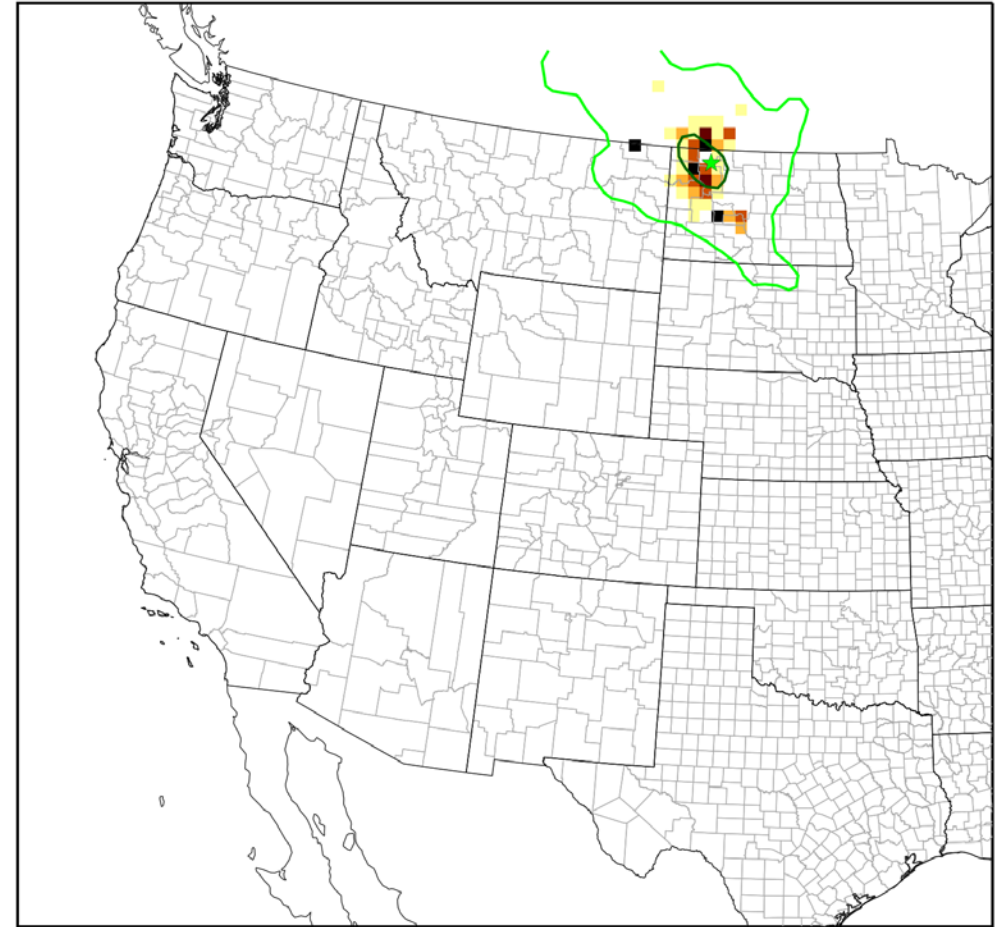
Extinction
Weighted
Residence
Times

SOx

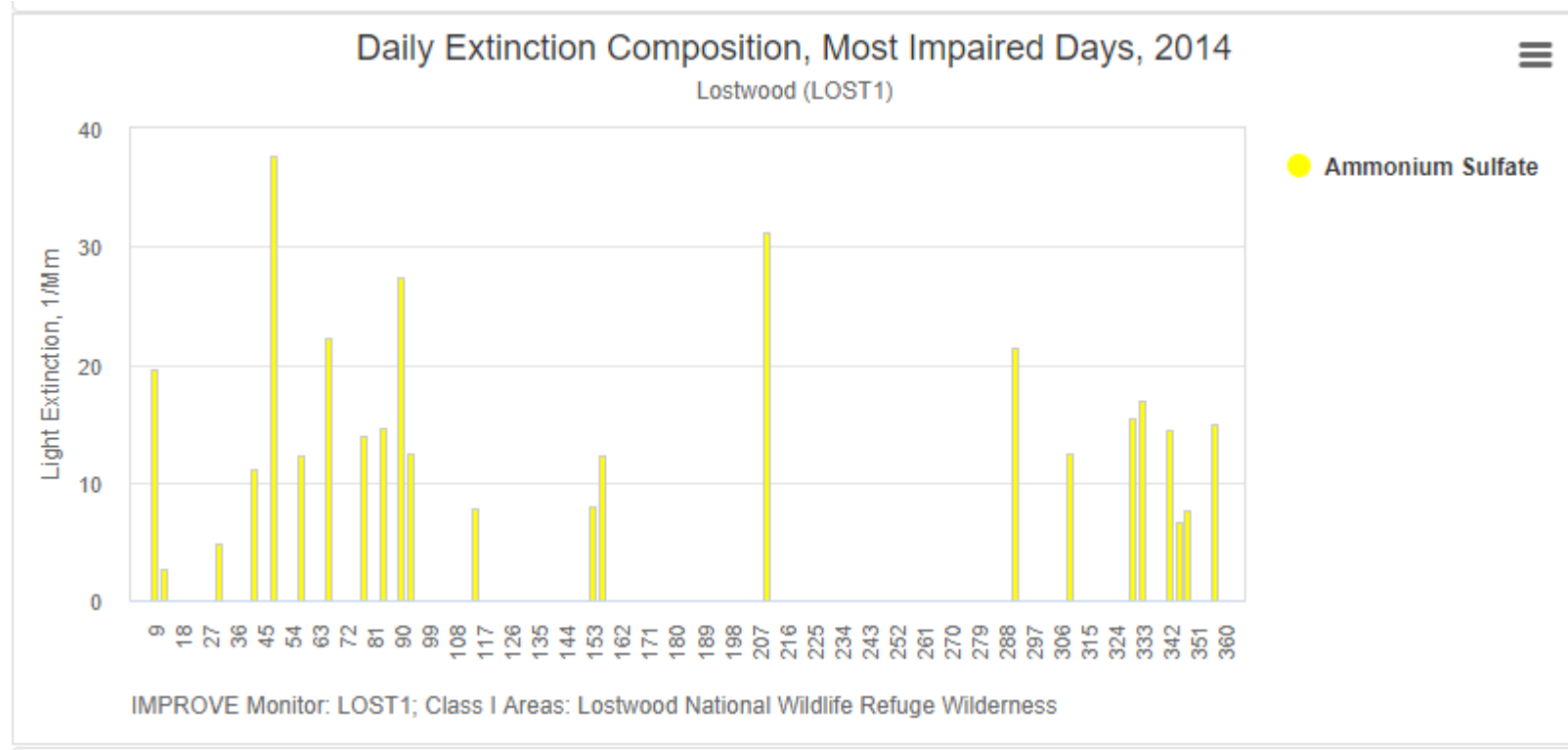
LOST1 - 20% Most Impaired Days All - EWRT
AREA SOx Emission Weighted Distance (%)



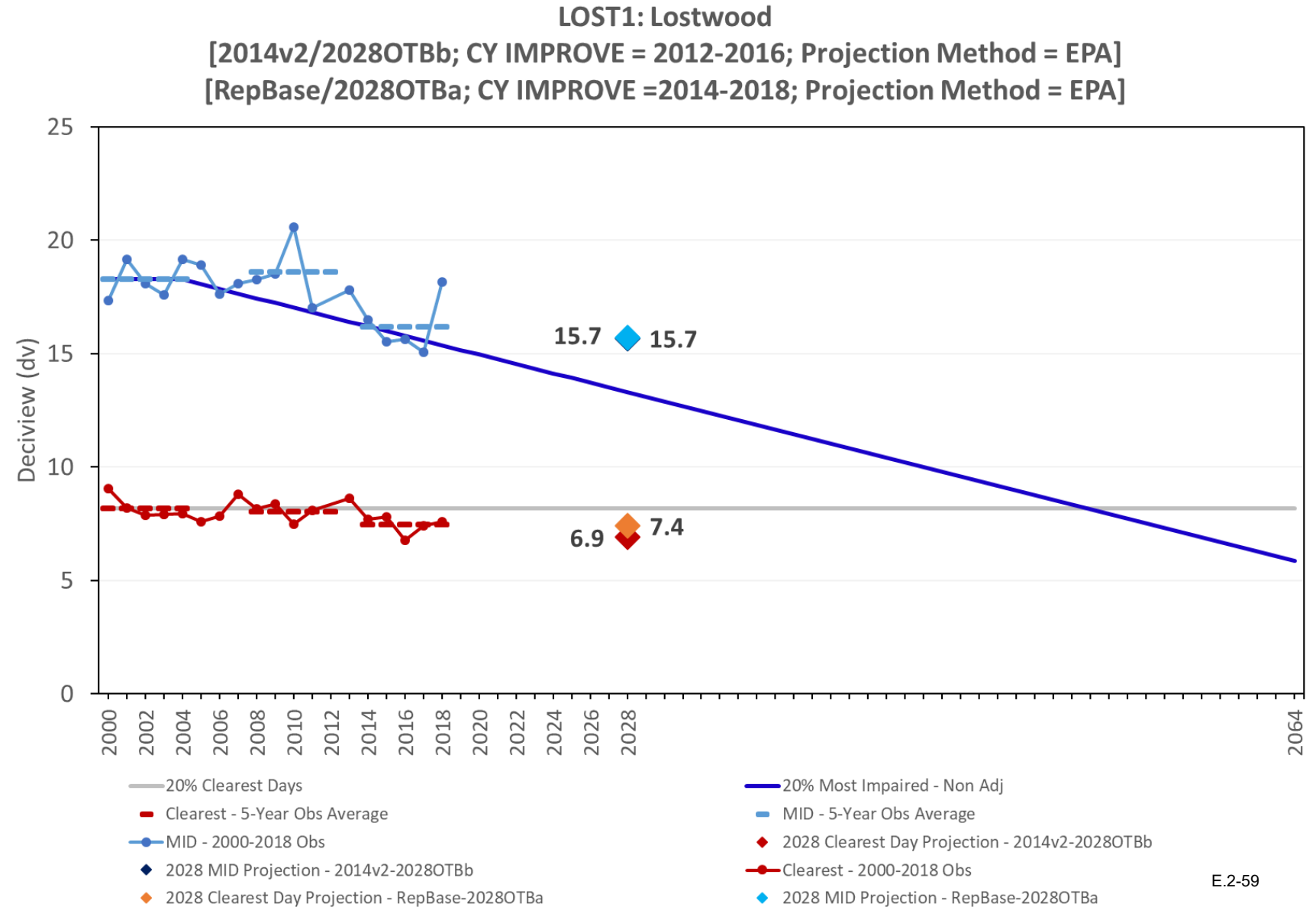
LOST1 - 20% Most Impaired Days All - EWRT
TOTAL_ANTRHO SOx Emission Weighted Distance (%)



MIDs in 2014



LOST1 URP and 2028 Projections



Stroh, David E.

Subject: RH SIP emissions inventory section discussion
Location: Microsoft Teams Meeting

Start: Mon 10/5/2020 2:30 PM
End: Mon 10/5/2020 3:30 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Payne, Rhonda

CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe.

UPDATE – Change to today? Hopefully this works!

I'd like to brainstorm with you about what the best way to organize the emissions inventory information into sections in the RH SIP.

The requirements for EIs are in this table:

RHR Requirements for an Emissions Inventory

| RHR Rule Citation | RHR Description |
|---|---|
| Section 51.308(f)(2)(iii) | Identify the emissions information on which the state's strategies are based and explain how this information meets the RHR's requirements regarding the year(s) represented in the information to the NEI. |
| Section 51.308(f)(6)(v) | Requires states to submit a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in a Class I area. The inventory must include emissions for the most recent year for which data are available, and estimates for future projected emissions. |
| Paragraph 51.308(g)(4) of the Regional Haze Rule requires periodic progress reports to contain the following element: | An analysis tracking the change over the period since the period addressed in the most recent plan required under paragraph (f) of this section in emissions of pollutants contributing to visibility impairment from all sources and activities within the State. |
| Paragraph 51.308(g)(5) requires periodic progress reports to contain the following element: | An assessment of any significant changes in anthropogenic emissions within or outside the State that have occurred since the period addressed in the most recent plan required under paragraph (f) of this section including whether or not these changes in |

| RHR Rule Citation | RHR Description |
|-------------------|---|
| | anthropogenic emissions were anticipated in that most recent plan and whether they have limited or impeded progress in reducing pollutant emissions and improving visibility. |

There may be more requirements that I haven't listed.

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Conference ID: 423 916 903#

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Stroh, David E.

From: Stroh, David E.
Sent: Friday, November 6, 2020 11:02 AM
To: Dave Pohlman
Subject: North Dakota Regional Haze Round 2 Planning
Attachments: North Dakota Regional Haze Round 2-presentation.pdf

David,

Thanks again for the discussion regarding North Dakota regional haze round 2 planning. I have attached the slide deck we covered. Feel free to pass this along to the appropriate personnel. As discussed, I will be keeping in touch later this month to schedule additional meetings.

In the meantime, should you or others have questions/comments regarding the slide deck, let me know and I can provide more information.

David

David Stroh
Environmental Engineer

701-328-5229 • destroh@nd.gov



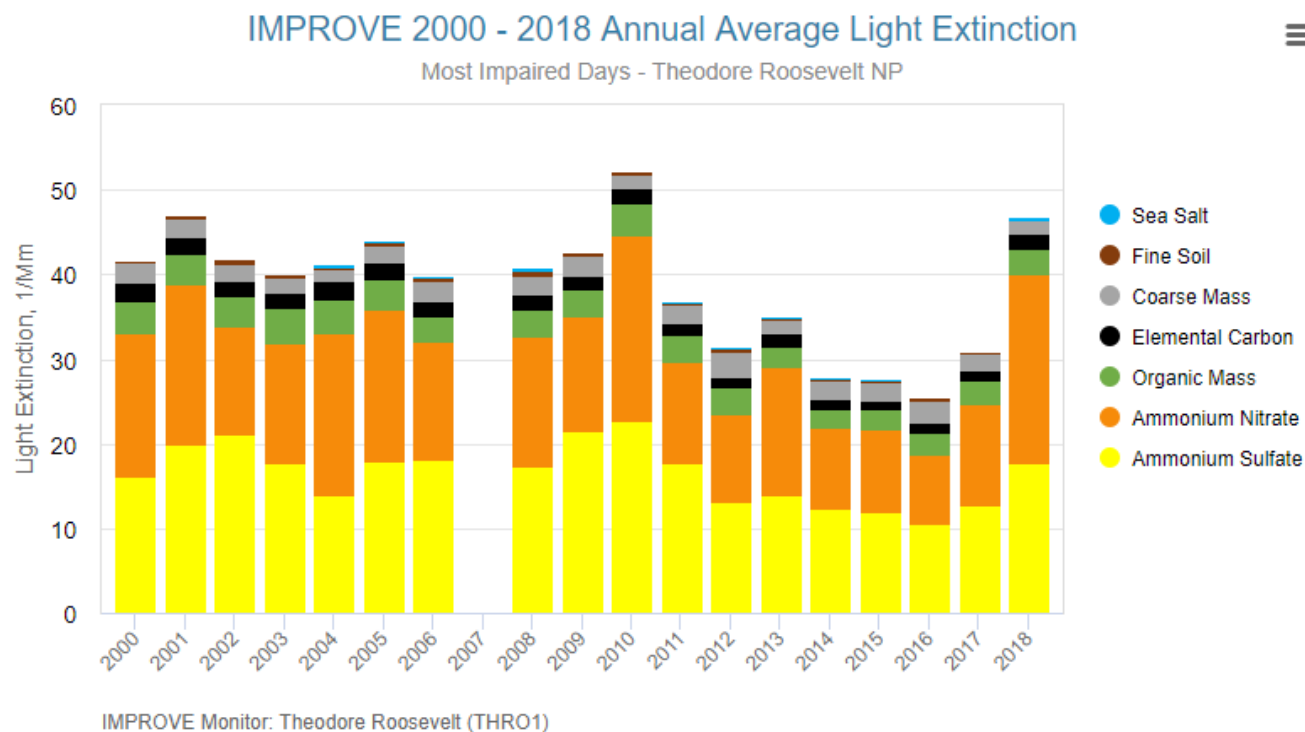
918 E. Divide Ave. • Bismarck, ND 58501

North Dakota Regional Haze Round 2

- Impairment Species
- Facilities and Four Factor Analysis
 - Cost of Compliance
- Impairment and Modeled Visibility
 - Glidepath and International Emissions
- Other Factors
 - Generation Trends
 - Economics

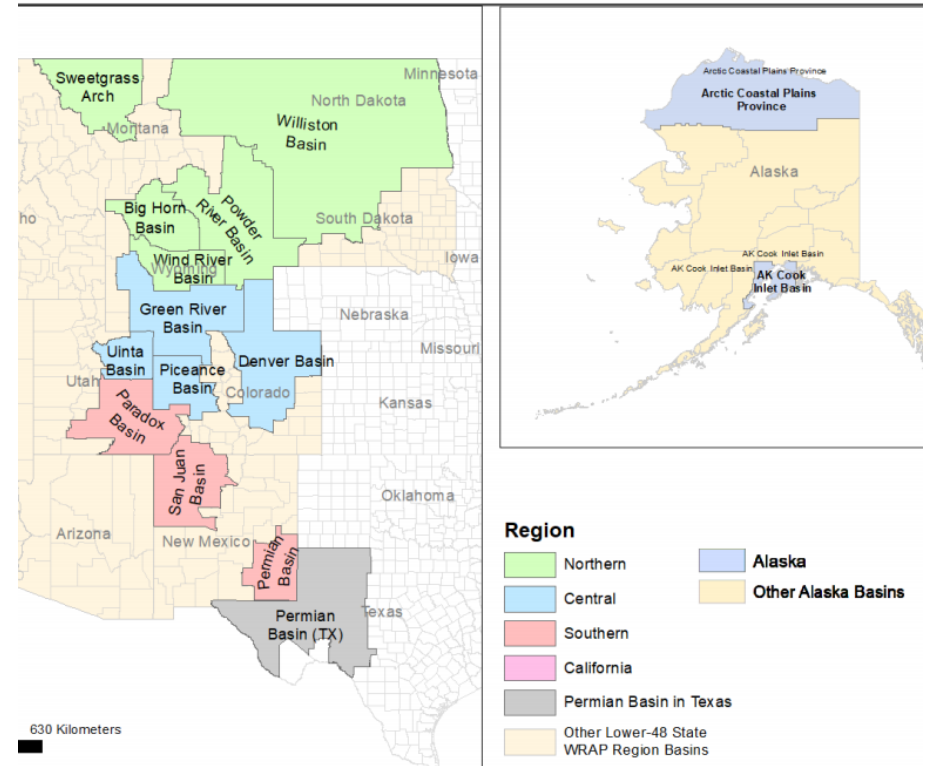
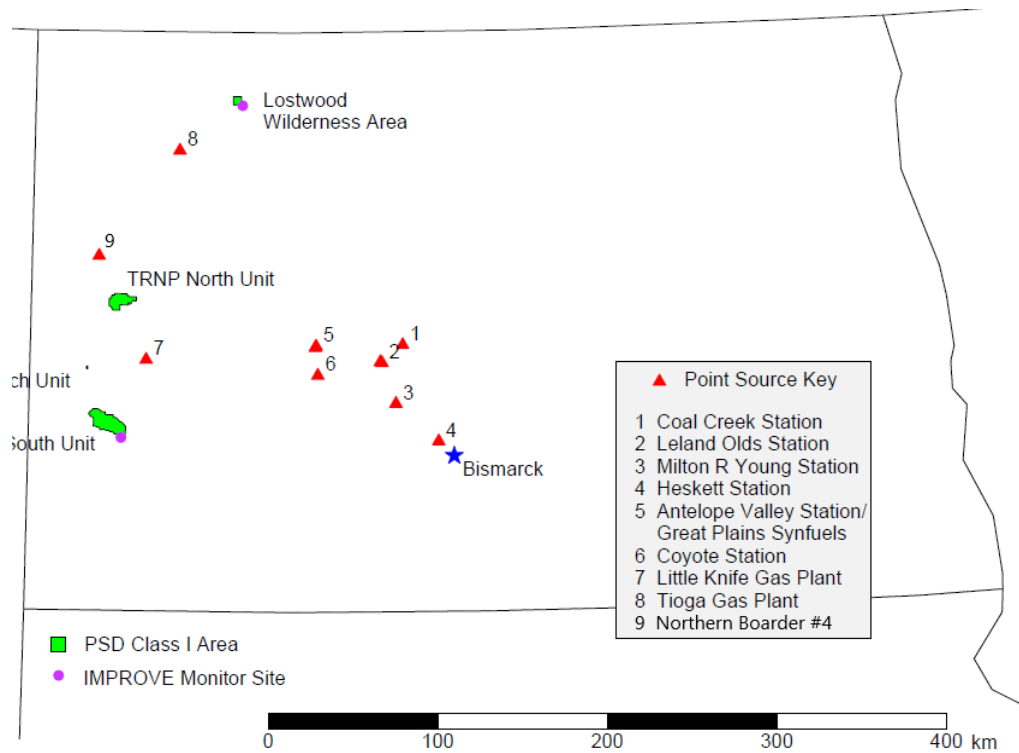
Most Impaired Species for ND

- Nitrates and Sulfates
 - NO_x and SO₂
- Graphic is for THRO, LOST looks nearly identical



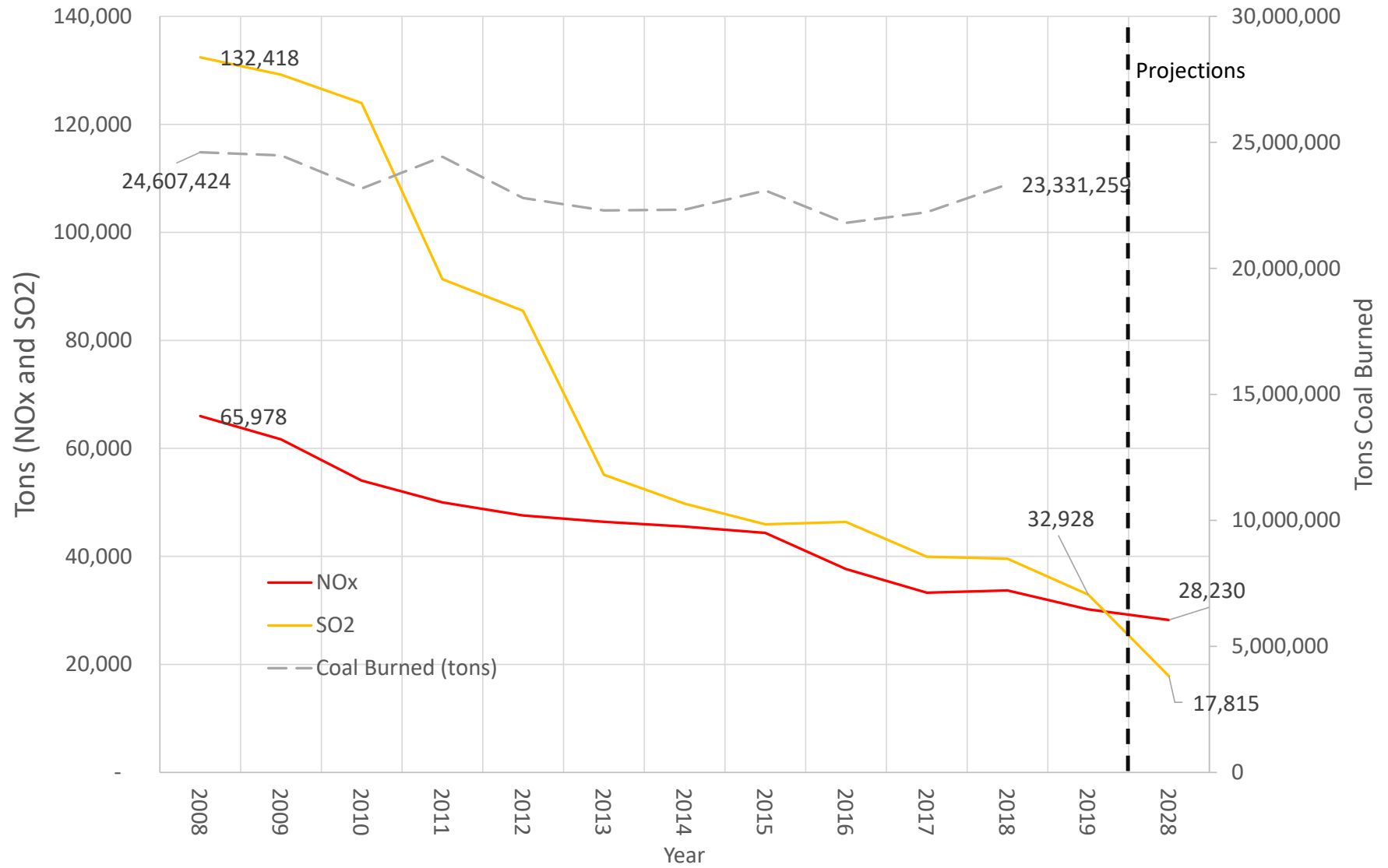
<https://views.cira.colostate.edu/tssv2/>

Sources Reviewed



https://www.wrapair2.org/pdf/WRAP_OGWG_2028_OTB_DraftReport_11Oct2019a.pdf

Coal EGU Totals



Coyote Station SO₂ (RP source)

| | Emission Rate | Reduction from | Projected Actual from ER & CF |
|------------------------|---------------|----------------|----------------------------------|
| Control Technology | (lb/MMBtu) | Baseline | |
| DFGD/FF (Baseline) | 0.85 | | 12,963 |
| DSI + Existing FGD | 0.58 | 31.8% | 8,845 |
| FGD Improvements | 0.50 | 41.2% | 7,625 |
| DSI + FGD Improvements | 0.33 | 61.2% | 5,033 |
| Absorber Replacement | 0.09 | 89.4% | 1,373 |
| WFGD | 0.06 | 92.9% | 915 |

| Control Technology | Annual Emission Reduction (tpy) | Installed Capital Cost (\$) | Annual O&M Cost (\$) | Annualized Total Cost (\$) | Cost of Compliance (\$/ton) | Incremental Cost (\$/ton) |
|-------------------------|------------------------------------|--------------------------------|-------------------------|-------------------------------|--------------------------------|------------------------------|
| DSI + Existing FGD | 4,118 | 23,765,000 | 10,423,000 | 12,371,000 | 3,004 | |
| FGD Stoich Improvements | 5,338 | 526,000 | 2,042,000 | 2,085,000 | 391 | (8,431) |
| DSI + FGD Improvements | 7,930 | 24,292,000 | 12,465,000 | 14,456,000 | 1,823 | 4,772 |
| Absorber Replacement | 11,590 | 110,120,000 | 12,097,000 | 21,122,000 | 1,822 | 1,821 |
| WFGD | 12,048 | 324,742,000 | 22,481,000 | 49,094,000 | 4,075 | 61,139 |

Modeled for Potential Additional Controls

Coyote Station NO_x (RP source)

| Unit | Control Technology | Emission Rate (lb/MMBtu) | Reduction from Baseline | Projected Actual from ER & CF |
|------|---------------------------|--------------------------|-------------------------|-------------------------------|
| | SOFA (Baseline) | 0.46 | | 7,015 |
| 1 | SOFA Optimization | 0.42 | 8.7% | 6,405 |
| 1 | SNCR + Optimization | 0.28 | 39.1% | 4,270 |
| 1 | SNCR + RRI + Optimization | 0.20 | 56.5% | 3,050 |

| Control Technology | Annual Emission Reduction (tpy) | Installed Capital Cost (\$) | Annual O&M Cost (\$) | Annualized Total Cost (\$) | Cost of Compliance (\$/ton) | Incremental Cost (\$/ton) |
|-------------------------|---------------------------------|-----------------------------|----------------------|----------------------------|-----------------------------|---------------------------|
| Combustion Optimization | 610 | | | | | |
| SNCR + CO | 2,745 | 19,840,000 | 3,128,000 | 4,753,933 | 1,732 | |
| SNCR + RRI + CO | 3,965 | 56,864,000 | 8,030,000 | 12,690,135 | 3,200 | 6,505 |

Modeled for Potential Additional Controls

AVS SO₂ (RP source)

| Unit | Control Technology | Emission Rate (lb/MMBtu) | Reduction from Baseline | Reduction from Uncontrolled | Projected Actual from ER & CF |
|------|-----------------------|--------------------------|-------------------------|-----------------------------|-------------------------------|
| 1,2 | DFGD/FF (Baseline) | 0.36 | | 87.6% | 6,274 |
| 1,2 | Station Work Practice | 0.35 | 2.8% | 87.9% | 6,100 |
| 1,2 | Ca:S Stoichiometry | 0.2 | 44.4% | 93.1% | 3,486 |
| 1,2 | DFGD (CDS/FF) | 0.09 | 75.0% | 96.9% | 1,568 |
| 1,2 | WFGD | 0.07 | 80.6% | 97.6% | 1,220 |

| Control Technology | Annual Emission Reduction (tpy) | Installed Capital Cost (\$) | Annual O&M Cost (\$) | Annualized Total Cost (\$) | Cost of Compliance (\$/ton) | Incremental Cost (\$/ton) |
|-------------------------|---------------------------------|-----------------------------|----------------------|----------------------------|-----------------------------|---------------------------|
| Reduction in Allowable* | 14,639 | | | | | |
| DFGD/FF | Baseline | | | | | |
| Station Work Practice | 174 | 0 | 135,000 | 135,000 | 775 | |
| Ca:S Stoichiometry | 2,788 | 9,698,000 | 1,144,000 | 1,938,773 | 695 | 690 |
| DFGD (CDS/FF) | 4,705 | 230,447,000 | 16,718,000 | 35,603,658 | 7,566 | 17,561 |
| WFGD | 5,054 | 272,384,000 | 16,945,000 | 39,267,491 | 7,770 | 10,512 |

Modeled for Potential Additional Controls

AVS NO_x (RP source)

| Unit | Control Technology | Emission Rate (lb/MMBtu) | Reduction from Baseline | Projected Actual from ER & CF |
|------|----------------------------|--------------------------|-------------------------|-------------------------------|
| 1,2 | SOFA/LNCFS (Limit) | 0.17 | | 2,963 |
| 1,2 | SOFA/LNCFS (Operational) | 0.11 | | 1,896 |
| 1,2 | SOFA/LNCFS (Baseline) | 0.11 | | 1,917 |
| 1,2 | SNCR | 0.09 | 18.2% | 1,568 |
| 1,2 | SCR-tail end configuration | 0.05 | 54.5% | 871 |

| Control Technology | Annual Emission Reduction (tpy) | Installed Capital Cost (\$) | Annual O&M Cost (\$) | Annualized Total Cost (\$) | Cost of Compliance (\$/ton) | Incremental Cost (\$/ton) |
|----------------------------|---------------------------------|-----------------------------|----------------------|----------------------------|-----------------------------|---------------------------|
| Reduction in Allowable* | 1,046 | | | | | |
| SOFA/LNCFS | | | | | | |
| SNCR | 349 | 16,356,000 | 1,945,000 | 3,285,412 | 9,426 | |
| SCR-tail end configuration | 1,046 | 221,396,000 | 18,201,000 | 36,344,908 | 34,758 | 47,424 |

*Plan to lower limit more in line with current operations

No Potential Additional Controls Modeled

Coal Creek Station (BART Source)

Current rates, two identical units:

- SO₂ rate: ~0.14 lb/MMBtu (WFGD)
- NO_x rate: ~0.13 lb/MMBtu (LNC3+)

Round 1: No approved NO_x BART

Round 2: Review indicates no reasonable additional controls (lower limits)

Facility future still uncertain (potential buyer)

Leland Olds Station (BART Source)

- Unit 1 – current rates
 - SO₂ rate: 0.088 lb/MMBtu (WFGD)
 - NO_x rate: 0.16 lb/MMBtu (SNCR)
- Unit 2 – current rates
 - SO₂ rate: 0.084 lb/MMBtu (WFGD)
 - NO_x rate: 0.29 lb/MMBtu (SNCR) (cyclone unit)

Four factor review indicates no reasonable additional controls

MR Young (BART Source)

- Unit 1 – current rates
 - SO₂ rate: 0.074 lb/MMBtu (WFGD)
 - NO_x rate: 0.33 lb/MMBtu (SNCR) (cyclone unit)
- Unit 2 – current rates
 - SO₂ rate: 0.126 lb/MMBtu (WFGD)
 - NO_x rate: 0.33 lb/MMBtu (SNCR) (cyclone unit)

Four factor review indicates no reasonable additional controls

Emissions Profile SO₂

| Facility | 2014 Base Case | Representative Case | 2028 OTB/OTW | 2028 PAC1 | 2028 PAC2 | FGD Improvement, both units |
|-----------------------|----------------|---------------------|---------------|-----------|-----------|-----------------------------|
| Coyote Station | 12,777 | 12,994 | 12,994 | 1,373 | 7,625 | |
| Basin AVS 1 | 5,809 | 6,279 | 6,279 | 3,405 | 6,279 | FGD Improvement, both units |
| Basin AVS 2 | 6,975 | 6,319 | 6,319 | 3,405 | 6,319 | |
| Basin LOS 1 | 412 | 636 | 636 | 636 | 636 | |
| Basin LOS 2 | 1,025 | 1,258 | 1,258 | 1,258 | 1,258 | |
| GRE CCS 1 | 7,885 | 3,458 | 2,740 | 2,384 | 2,384 | |
| GRE CCS 2 | 7,940 | 3,400 | 2,743 | 2,387 | 2,387 | FGD Improvement, both units |
| MR Young 1 | 361 | 766 | 766 | 766 | 766 | |
| MR Young 2 | 1,710 | 2,165 | 2,165 | 2,165 | 2,165 | |
| MDU Heskett 1 | 1,030 | 753 | 0 | 0 | 0 | |
| MDU Heskett 2 | 2,339 | 1,214 | 0 | 0 | 0 | |
| Stanton | 2,591 | 0 | 0 | 0 | 0 | |
| Total EGU : | 50,852 | 39,242 | 35,900 | 17,778 | 29,818 | |
| Hess TGP | 569 | 740 | 740 | 740 | 740 | |
| DGC | 3,818 | 3,904 | 3,904 | 3,904 | 3,904 | |
| Petro-Hunt LKGP | 526 | 307 | 307 | 307 | 307 | |
| NB CS4 | 2 | N/A | N/A | N/A | N/A | |
| Total non-EGU: | 4,914 | 4,950 | 4,950 | 4,950 | 4,950 | |
| Total: | 55,766 | 44,192 | 40,850 | 22,728 | 34,768 | |

Emissions Profile NO_x

| Facility | 2014 Base Case | Representative Case | 2028 OTB/OTW | 2028 PAC1 | 2028 PAC2 |
|-----------------------|----------------|---------------------|---------------|---------------|---------------|
| Coyote Station | 11,374 | 7,363 | 7,363 | 4,270 | 7,363 |
| Basin AVS 1 | 3,196 | 1,697 | 1,697 | 1,697 | 1,697 |
| Basin AVS 2 | 6,052 | 1,708 | 1,708 | 1,708 | 1,708 |
| Basin LOS 1 | 1,373 | 1,059 | 1,059 | 1,059 | 1,059 |
| Basin LOS 2 | 5,202 | 4,192 | 4,192 | 4,192 | 4,192 |
| GRE CCS 1 | 4,697 | 3,987 | 3,010 | 2,980 | 2,980 |
| GRE CCS 2 | 3,287 | 3,010 | 3,010 | 2,983 | 2,983 |
| MR Young 1 | 3,205 | 3,435 | 3,435 | 3,435 | 3,435 |
| MR Young 2 | 5,004 | 5,735 | 5,735 | 5,735 | 5,735 |
| MDU Heskett 1 | 351 | 209 | 0 | 0 | 0 |
| MDU Heskett 2 | 995 | 978 | 0 | 0 | 0 |
| Stanton | 1,662 | 0 | 0 | 0 | 0 |
| Total EGU : | 46,399 | 33,374 | 31,210 | 28,059 | 31,152 |
| Hess TGP | 946 | 880 | 880 | 880 | 880 |
| DGC | 3,235 | 2,490 | 2,490 | 2,490 | 2,490 |
| Petro-Hunt LKGP | 24 | 21 | 21 | 21 | 21 |
| NB CS4 | 97 | 110 | 124 | 124 | 124 |
| Total non-EGU: | 4,301 | 3,501 | 3,515 | 3,515 | 3,515 |
| Total: | 50,700 | 36,875 | 34,725 | 31,574 | 34,667 |

SNCR Reduction

Modeled Reductions

| Reductions | 2028OTB/OTW - PAC1 | Notes |
|-----------------|--------------------|--|
| SO ₂ | 18,122 | CS: Absorber Replacement AVS: Scrubber Improvements |
| NO _x | 3,151 | CS: SNCR (cyclone boiler) |
| Total | 21,273 | * |

*Modeled by WRAP to determine the impact to visibility on the most impaired days

Glidepath and Adjustment

EGU and Non-EGU Point Sources

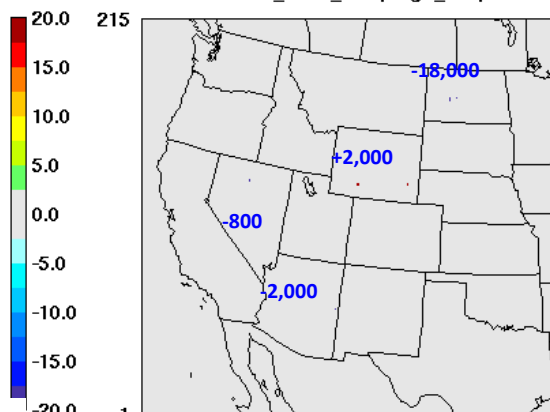
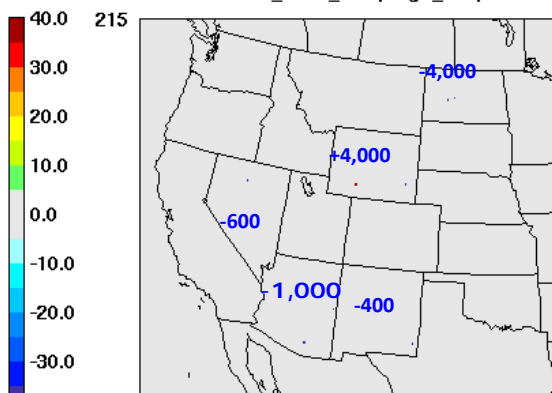
Delta_NOX

Changes (TPY)

Delta_SO2g

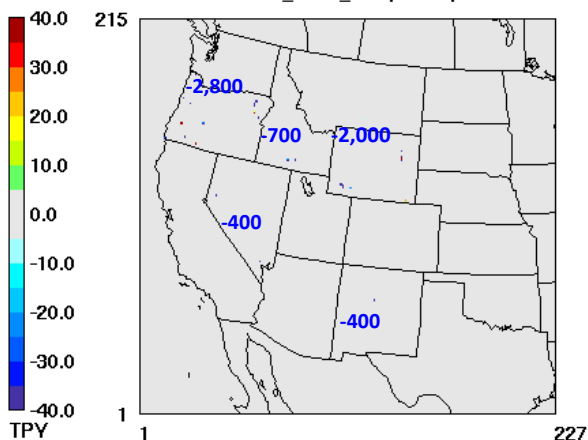
2028PAC1-2028OTB
Annual_Total_Diff:ptegu_wrap

2028PAC1-2028OTB
Annual_Total_Diff:ptegu_wrap



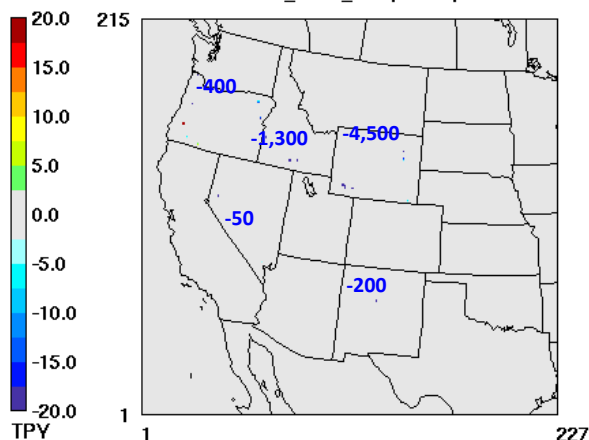
Delta_NOX

2028PAC1-2028OTB
Annual_Total_Diff:ptnonipm



Delta_SO2g

2028PAC1-2028OTB
Annual_Total_Diff:ptnonipm

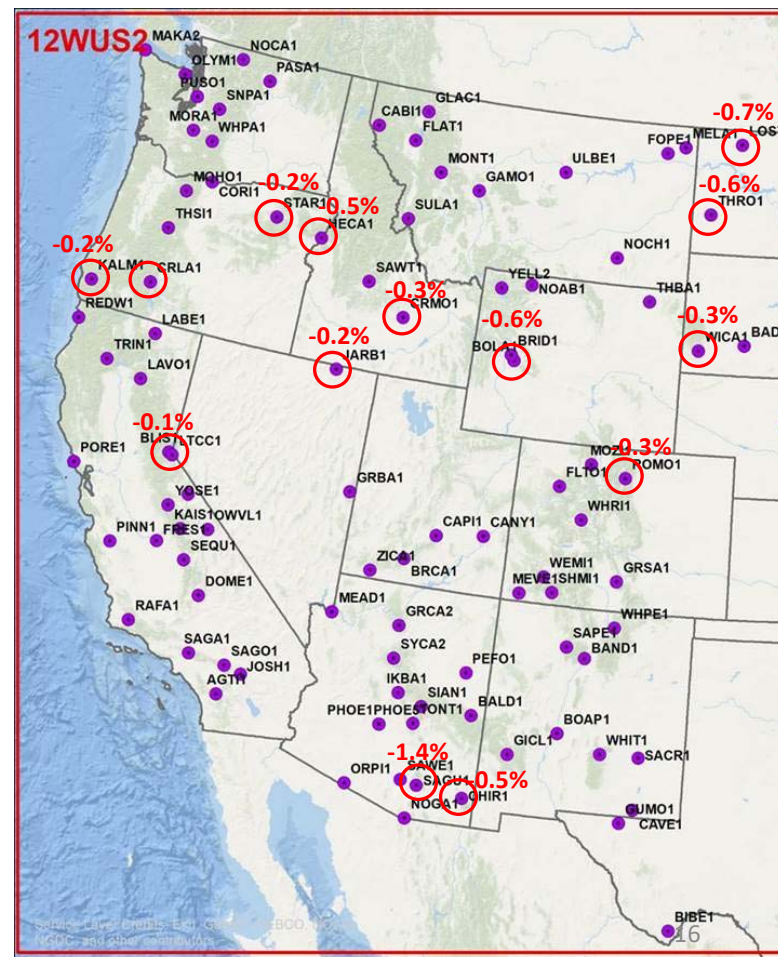


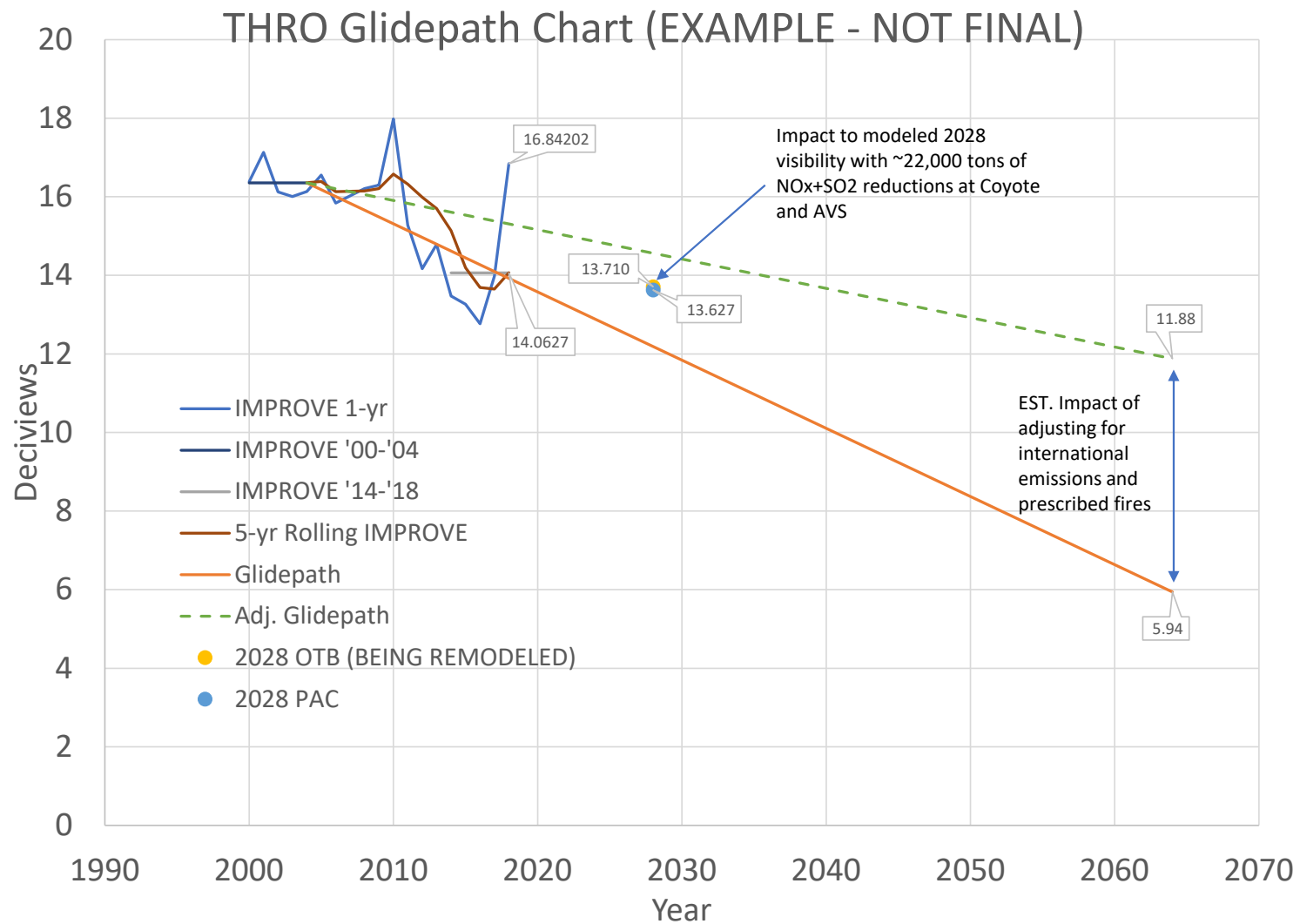
April 1, 2004 0:00:00
Min=-1438.7 at (112,124), Max=669.5 at (144,139)

April 1, 2004 0:00:00
Min=-3441.6 at (112,124), Max=70.1 at (24,158)

Percent Change in 2028 Visibility

(lower deciview value, better projected visibility in 2028)





Generated from data available at: <https://views.cira.colostate.edu/tssv2/>

EPA 2019 Modeling

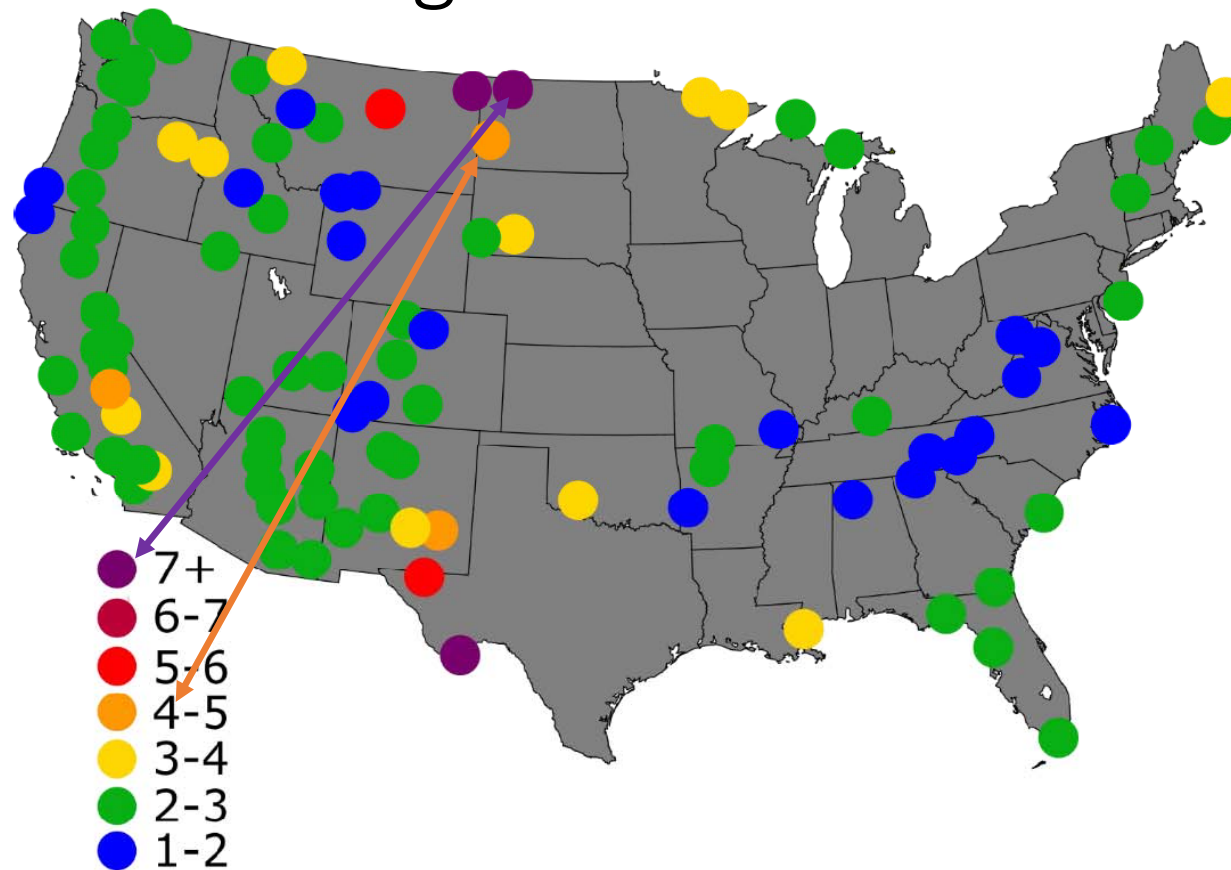


Figure 5-2 Adjustment to 2064 endpoint from international anthropogenic impacts on the 20% most impaired days (in deciviews)

https://www.epa.gov/sites/production/files/2019-10/documents/updated_2028_regional_haze_modeling-tsd-2019_0.pdf (page 66)

EPA 2019 Modeling

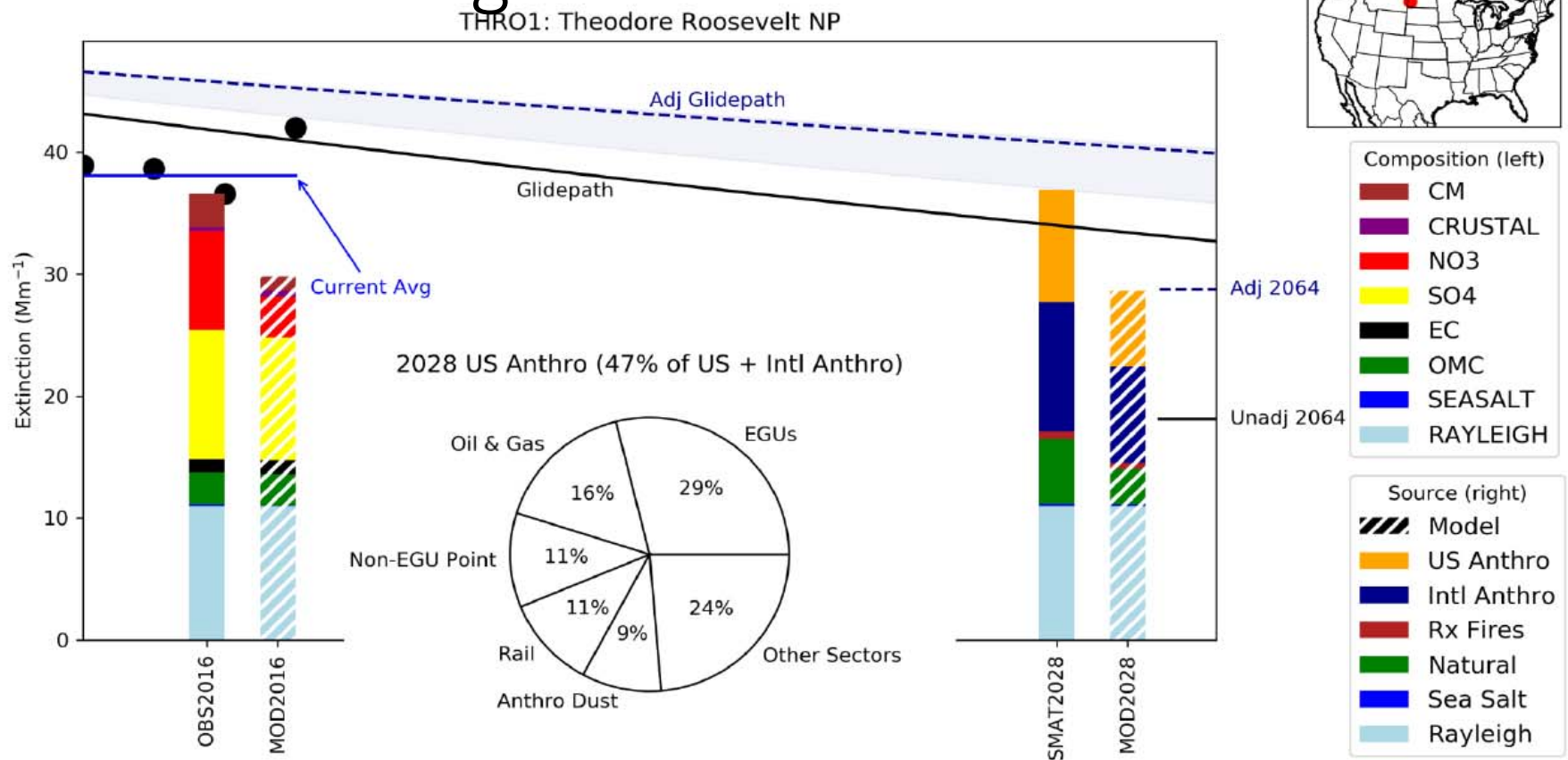


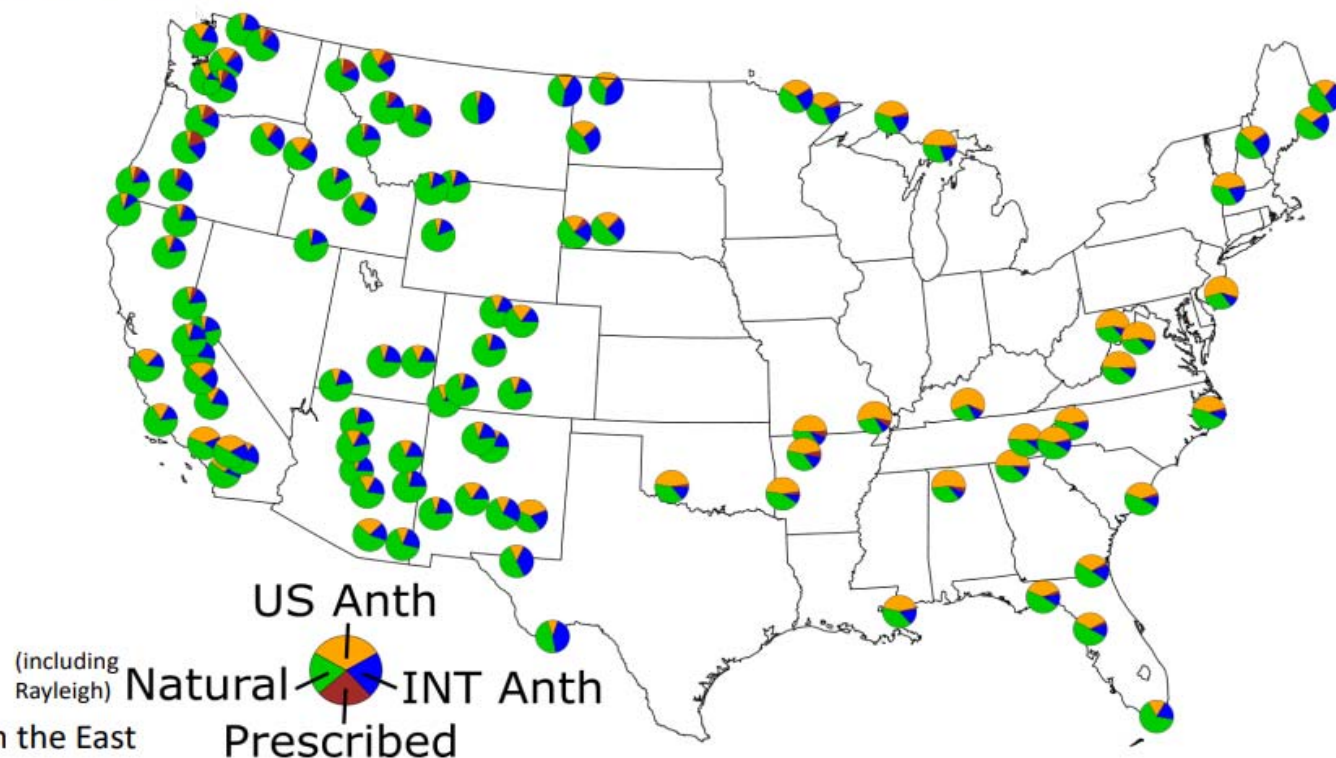
Figure 89: 2014-2017 IMPROVE observations, 2016 CAMx model predictions, 2028 modeled projection, and 2028 sector contributions at THRO1. Used for Class I areas: Theodore Roosevelt NP.

https://www.epa.gov/sites/production/files/2019-10/documents/updated_2028_regional_haze_modeling-tsd-2019_0.pdf (page B-92)

International Impacts

2028 Total Visibility Impairment Components (20% most impaired days)

| 2028 Visibility Impairment | Range (Mm-1) |
|--------------------------------------|--------------|
| US anthropogenic | 0.98–45.68 |
| International anthropogenic | 2.88–19.33 |
| Prescribed Fires | 0.03-5.15 |
| Modeled natural (including Rayleigh) | 11.72-29.83 |



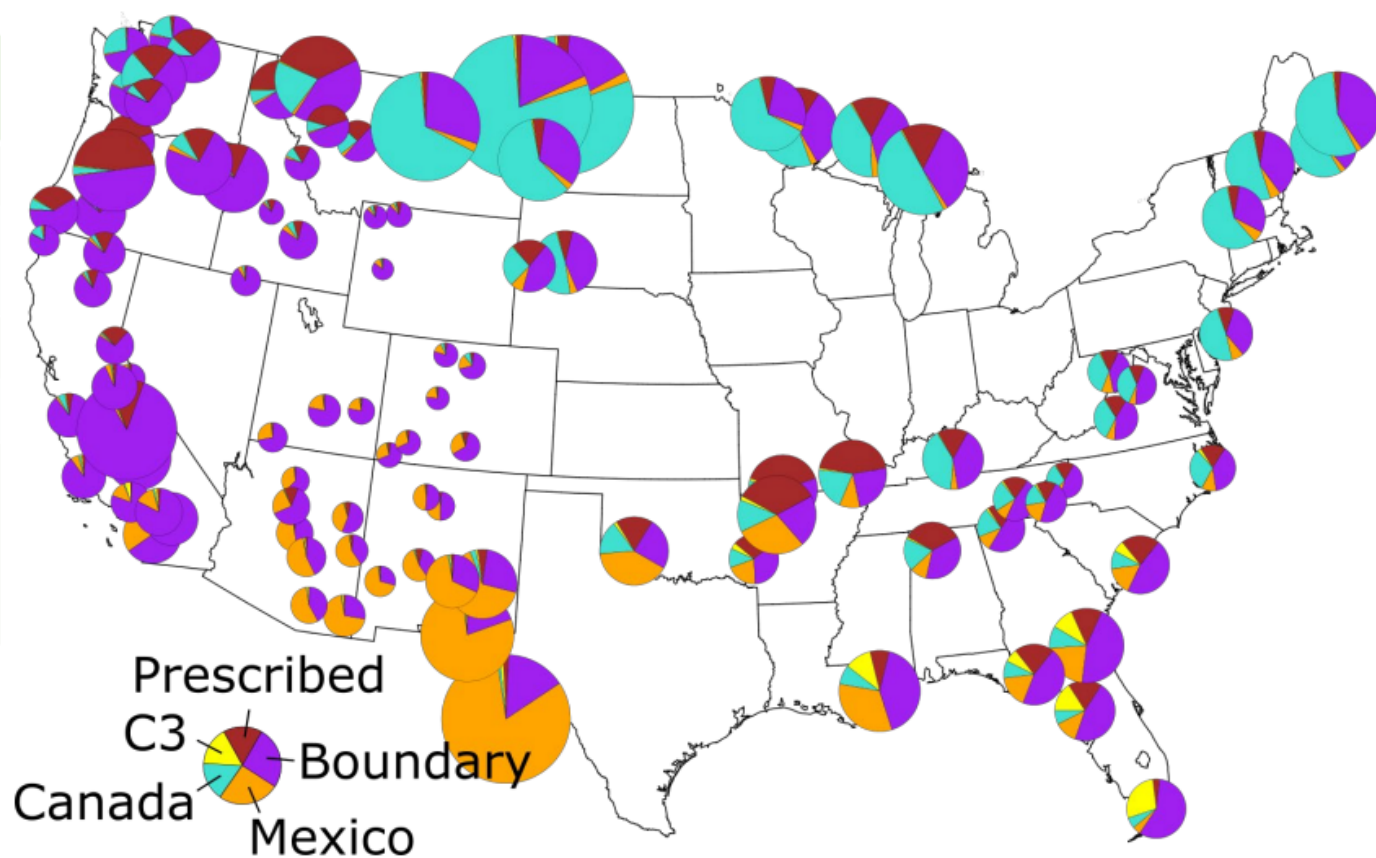
- Percentage of US anthropogenic higher in the East
- Percentage of natural higher in the West
- International anthropogenic contribution largest near border areas
- Prescribed fire contribution highest in the Northwest

https://www.epa.gov/sites/production/files/2019-10/documents/epa_rh_modeling_summary_101519-final_0.pdf (Slide 22)

21

International Anthropogenic and Prescribed Fire Contributions (20% most impaired days)

| Glidepath Adjustment components | Range (Mm-1) |
|--|--------------|
| Prescribed fires | 0.03-5.15 |
| C3 commercial marine outside the US ECA region | 0-2.28 |
| Canada anthropogenic | 0.01-15.49 |
| Mexico anthropogenic | 0.02-14.39 |
| International anthropogenic from outside the 36km domain (boundary conditions) | 1.19-11.73 |

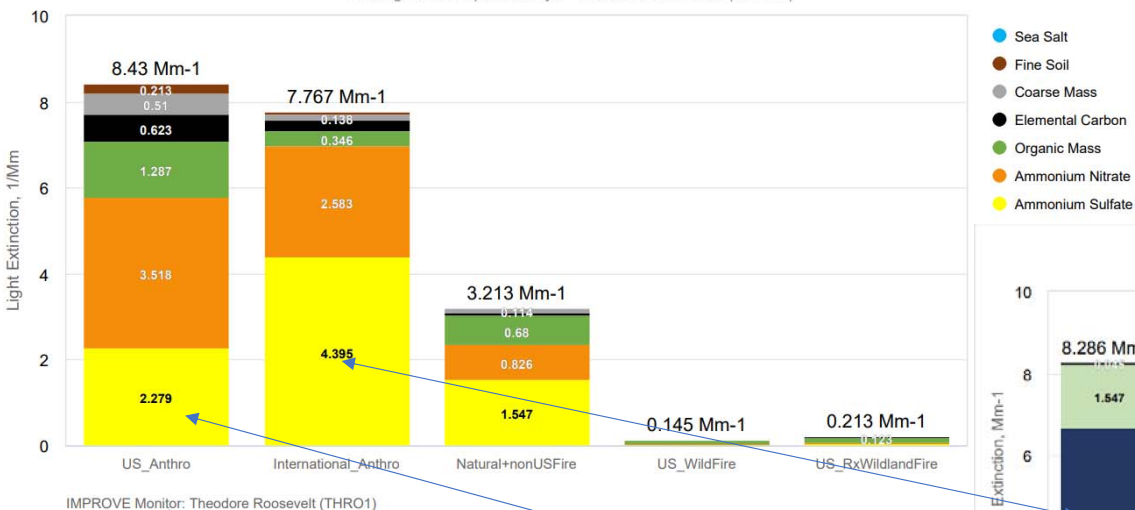


https://www.epa.gov/sites/production/files/2019-10/documents/epa_rh_modeling_summary_101519-final_0.pdf (Slide 22)

22

MID - International Contributions

RepBase Source Contributions - Extinction
Average Most Impaired Days - Theodore Roosevelt (THRO1)



IMPROVE Monitor: Theodore Roosevelt (THRO1)

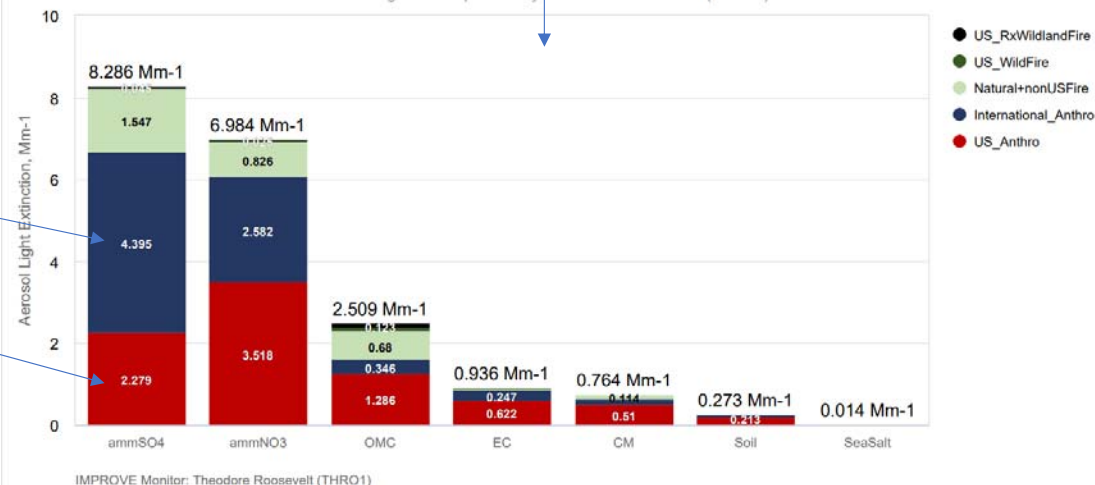
Impairment by
Category

Same numbers on both graphs,
displayed different to show:

- 1) species causing most impairment
- 2) significance of international

Impairment by
species

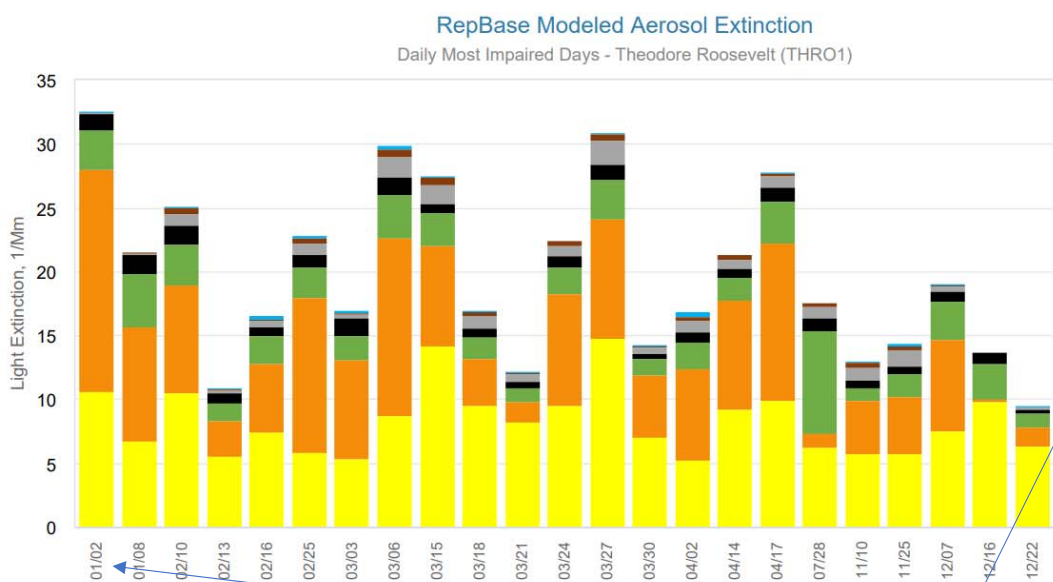
RepBase Source Contributions - Extinction
Average Most Impaired Days - Theodore Roosevelt (THRO1)



IMPROVE Monitor: Theodore Roosevelt (THRO1)

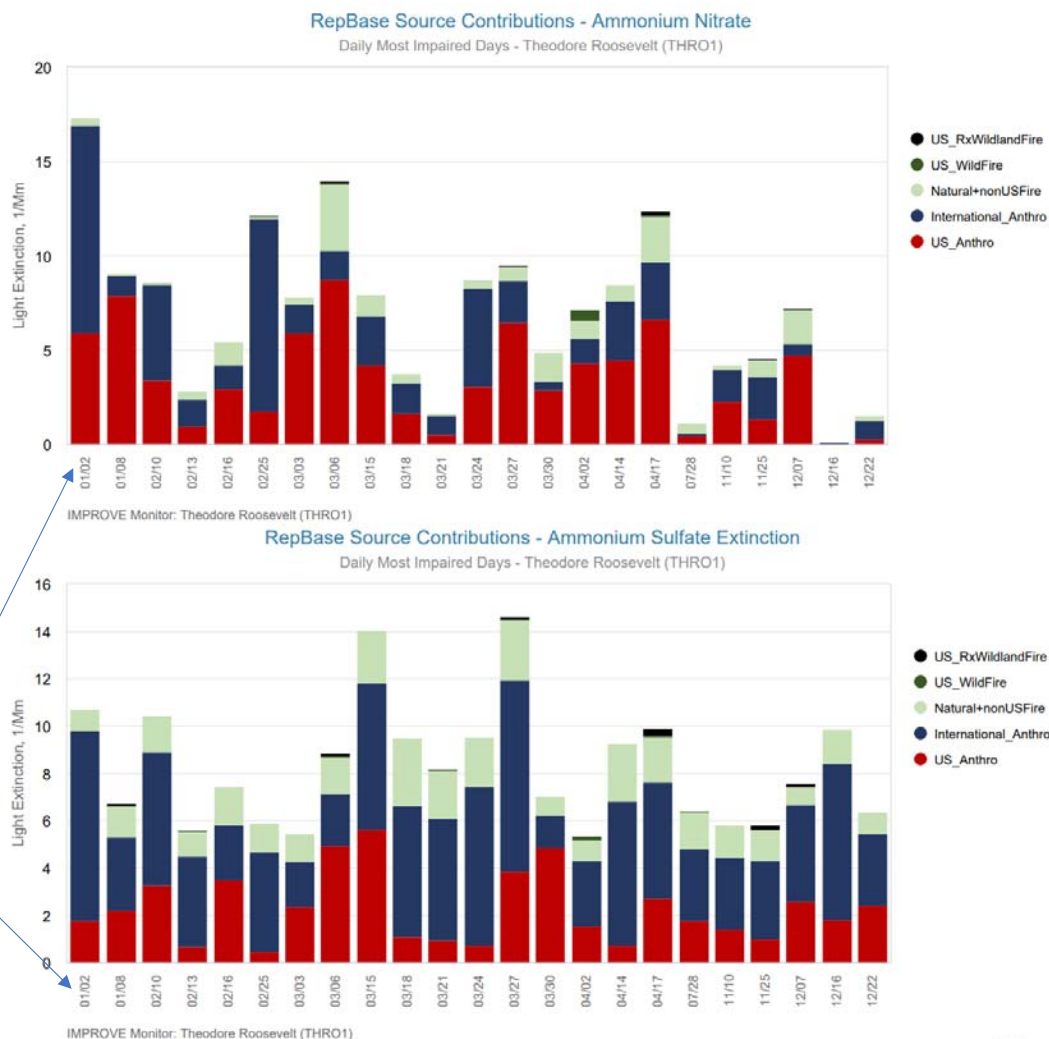
<https://views.cira.colostate.edu/tssv2/>

MID – US vs Int.



Nitrate: 17.3
Sulfate: 10.7

| Anthropogenic | Nitrates | Sulfates |
|---------------|----------|----------|
| US | 5.91 | 1.75 |
| International | 11.00 | 8.04 |

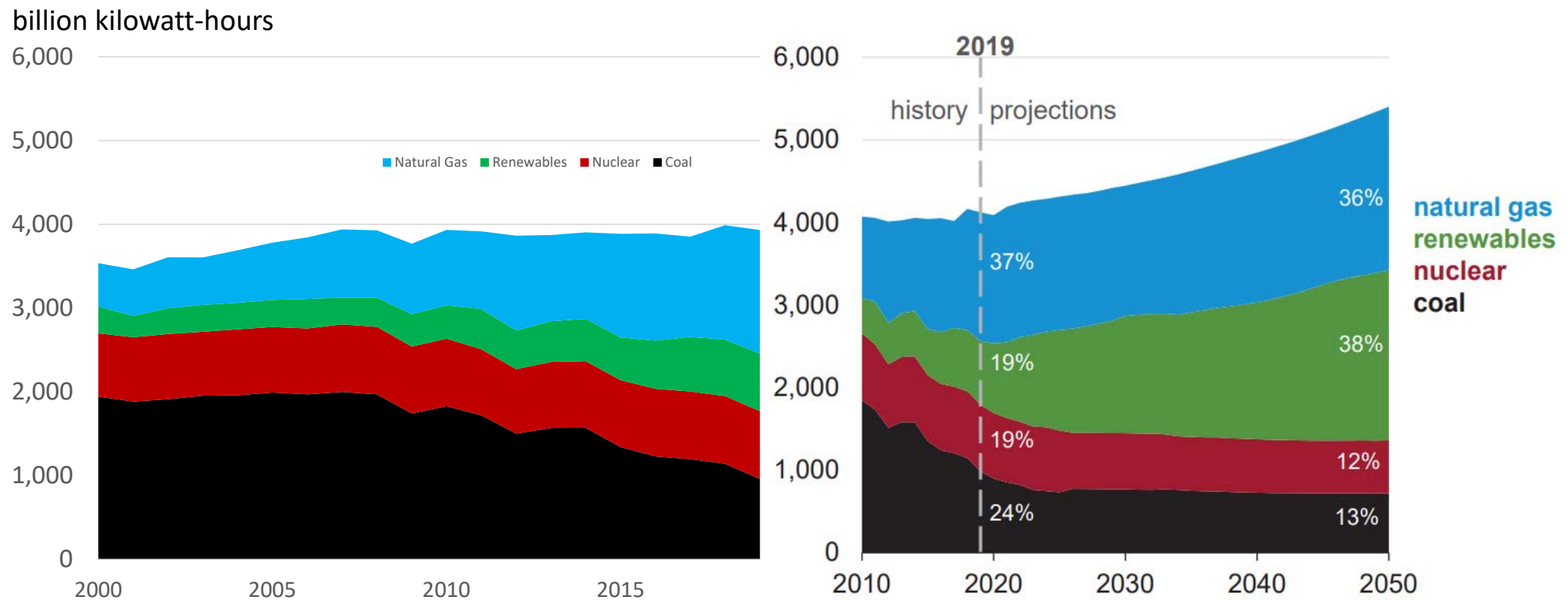


<https://views.cira.colostate.edu/tssv2/>

Other Factors

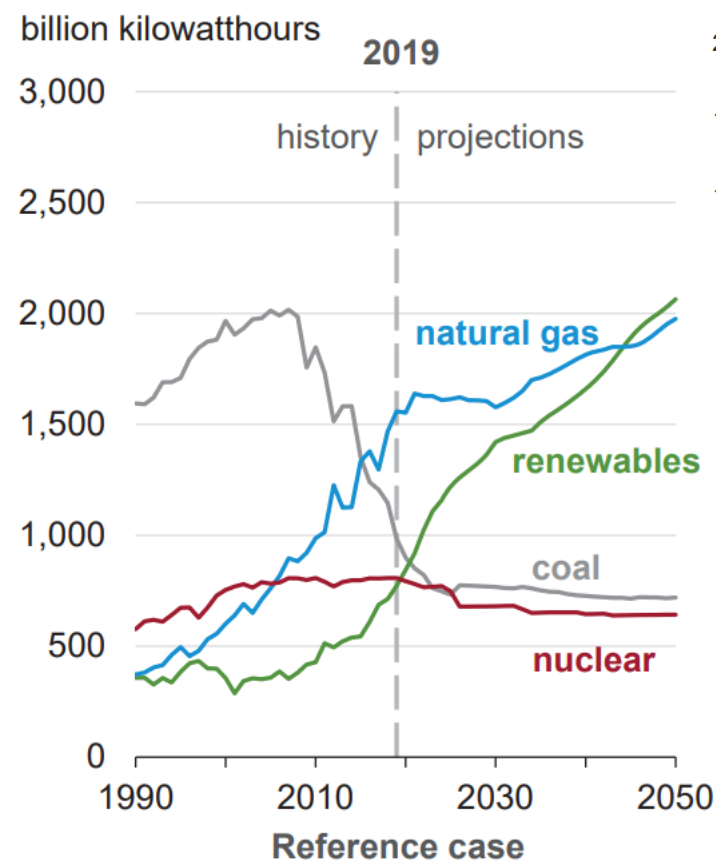
Generation Trends and Economics

US Electrical Power Generation

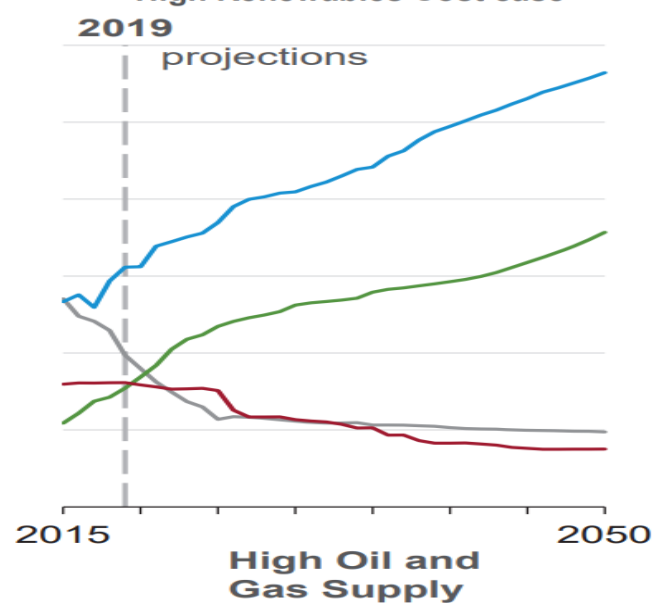
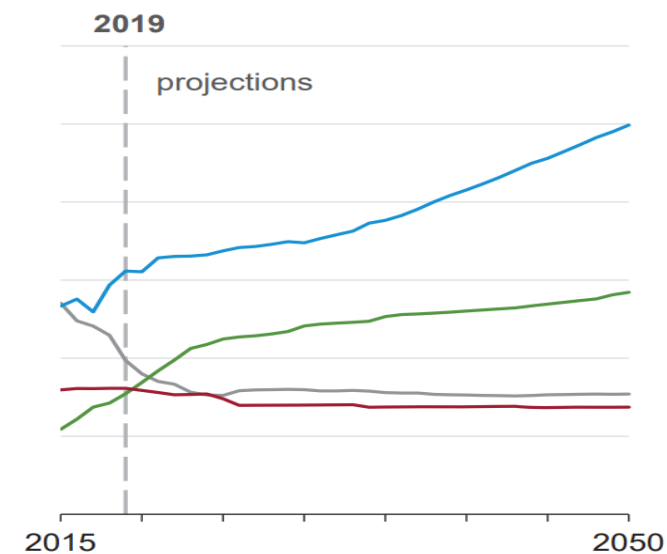
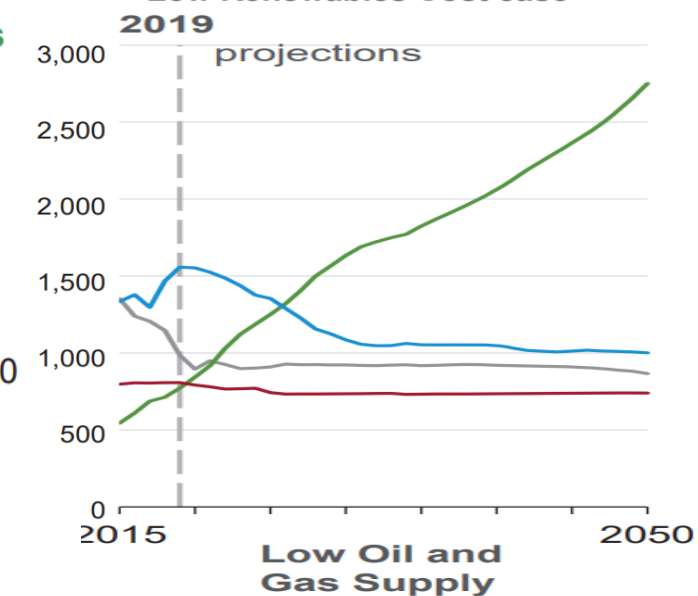
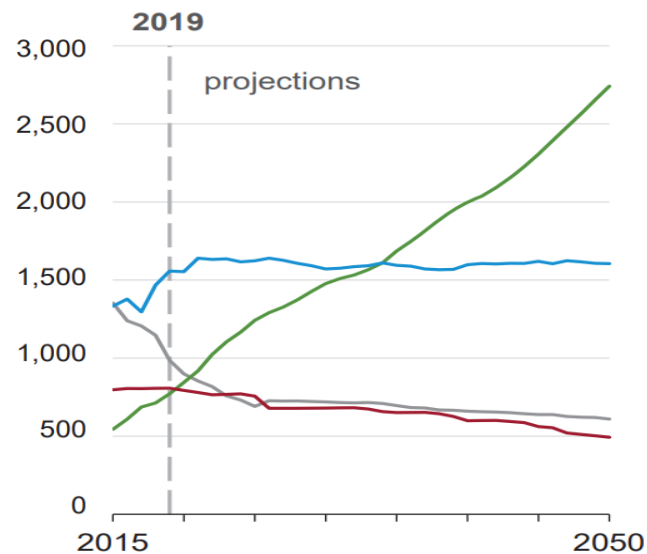


<https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf> (page 128)

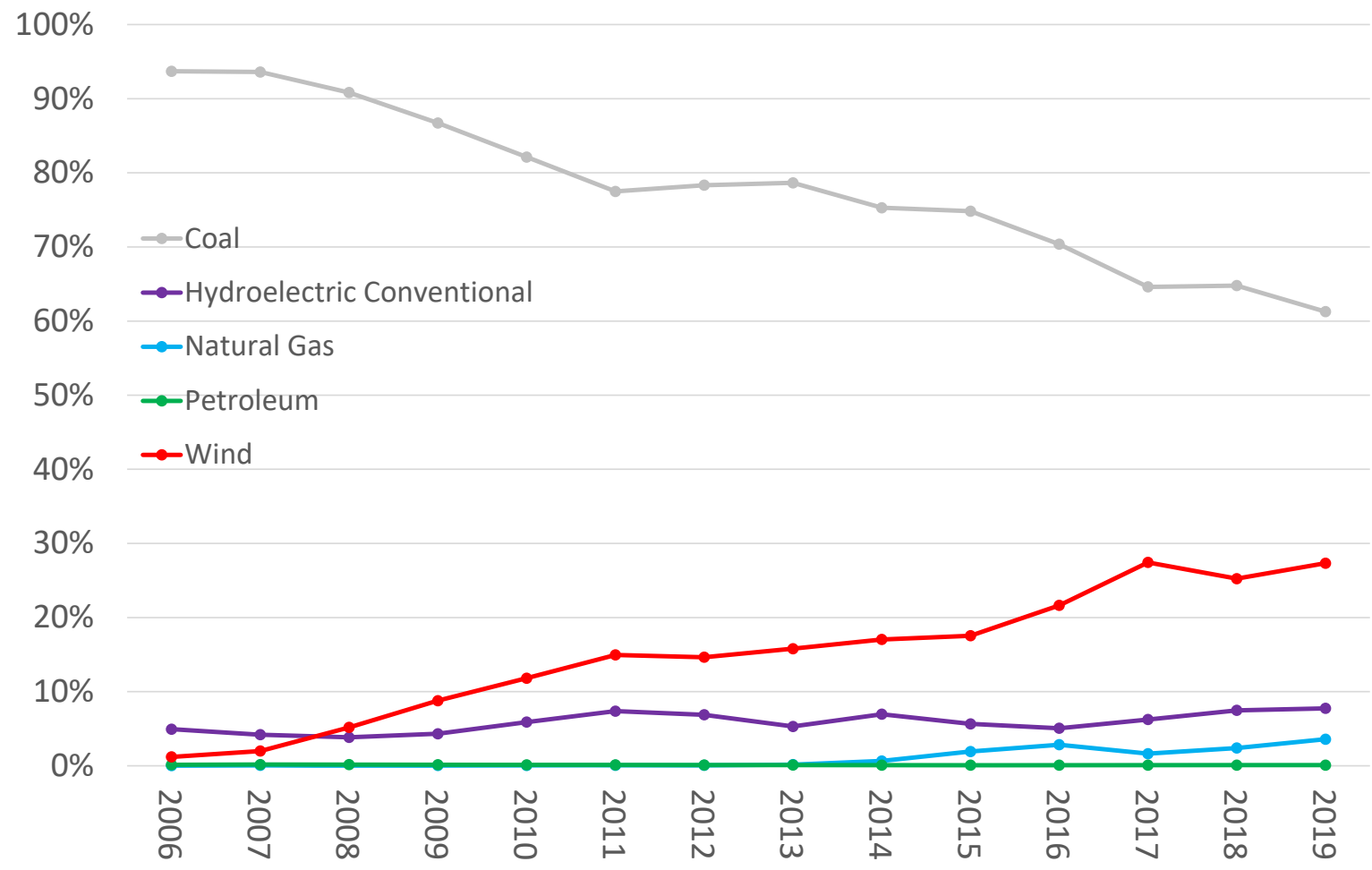
US Generation



<https://www.eia.gov/outlooks/aeo/pdf/AEO2020%20Full%20Report.pdf>



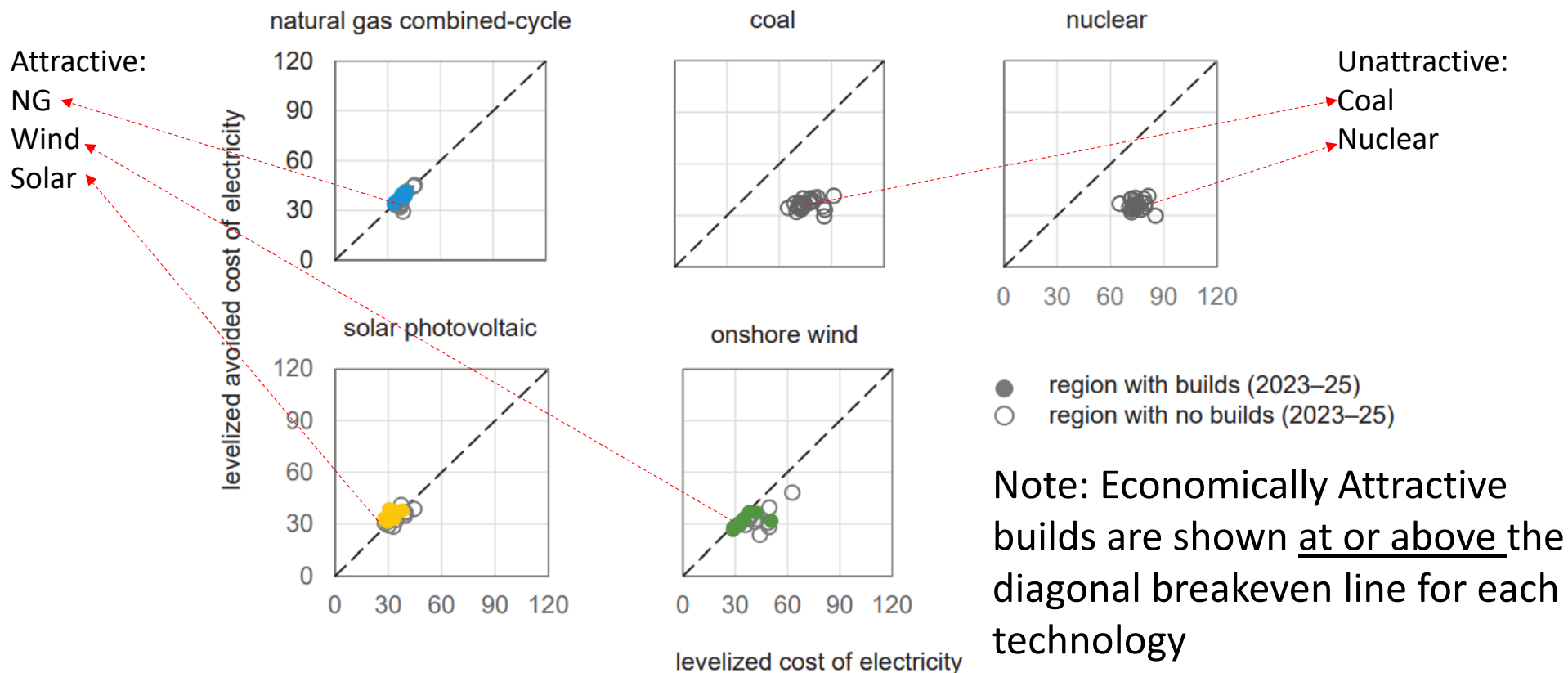
North Dakota Generation Trends



<https://www.eia.gov/electricity/data/state/>

Costs of Electricity – New Construction

2019 dollars per megawatthour



<https://www.eia.gov/outlooks/aeo/pdf/AEO2020%20Full%20Report.pdf>

29

Oil and Gas

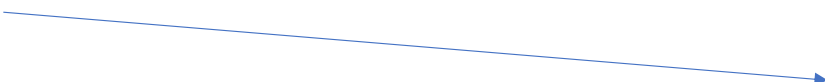
North Dakota Oil and Gas

- Statewide gas capture goal of 91% currently being met

- June – 89%
- July – 91%

July Breakdown*

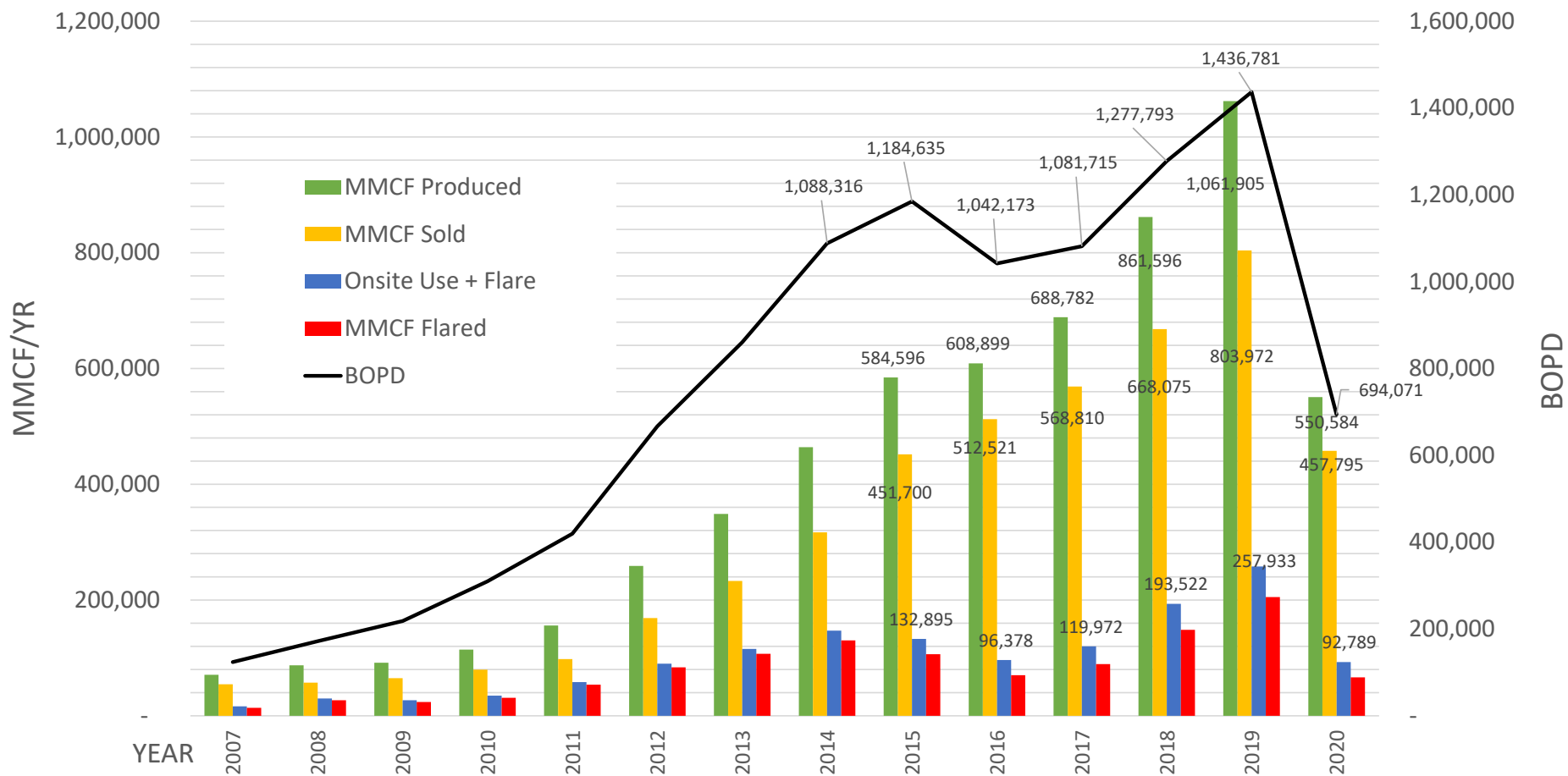
Gas Capture Details:



| | |
|-----------------------|-----|
| Statewide..... | 91% |
| Statewide Bakken..... | 92% |
| Non-FBIR Bakken..... | 93% |
| FBIR Bakken..... | 88% |

- NSPS OOOO/OOOOa adopted
- Decline in activity due to COVID and OPEC
 - Expected to last until late 2022, at least

*<https://www.dmr.nd.gov/oilgas/directorscut/directorscut-2020-09-15.pdf>



<https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp>

Stroh, David E.

From: Wickman, Trent R -FS <trent.wickman@usda.gov>
Sent: Tuesday, November 24, 2020 9:27 AM
To: Stroh, David E.; Webster, Jill - FS
Cc: Seligman, Angela N.; Thorton, Rhannon T.; Semerad, Jim L.; Bachman, Tom A.
Subject: RE: Regional Haze discussion follow-up

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Thank you – will do

From: Stroh, David E. <deStroh@nd.gov>
Sent: Monday, November 23, 2020 4:39 PM
To: Wickman, Trent R -FS <trent.wickman@usda.gov>; Webster, Jill - FS <jill.webster@usda.gov>
Cc: Seligman, Angela N. <aseligman@nd.gov>; Thorton, Rhannon T. <rThorton@nd.gov>; Semerad, Jim L. <jsemerad@nd.gov>; Bachman, Tom A. <tbachman@nd.gov>
Subject: Regional Haze discussion follow-up

Trent and Jill,

Thank again for the discussion today and I apologize again for it taking ~2hrs versus the 1hr which was schedule for, but it was a great conversation!

Don't hesitate to reach out if you have any follow-up questions or comments. We look forward to working more with you as North Dakota's Round 2 Regional Haze SIP progresses.

Regards,
David

David Stroh
Environmental Engineer

701-328-5229 • destroh@nd.gov



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Stroh, David E.

From: Shepherd, Don <Don_Shepherd@nps.gov>
Sent: Wednesday, December 16, 2020 11:38 AM
To: Stroh, David E.
Cc: Peters, Melanie; King, Kirsten L; Stacy, Andrea; Miller, Debra C
Subject: Re: [EXTERNAL] North Dakota - Four Factor Analysis Update

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Good morning, David,

Thanks for sending me the info on your updated web page--it is very helpful.

Again, thanks for the excellent presentation yesterday.

From: Stroh, David E. <deStroh@nd.gov>
Sent: Wednesday, December 16, 2020 10:10 AM
To: Shepherd, Don <Don_Shepherd@nps.gov>
Subject: [EXTERNAL] North Dakota - Four Factor Analysis Update

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Hi Don,

As a follow-up to our discussion yesterday, I have made an update to the NDDEQ Regional Haze webpage. <https://www.deq.nd.gov/AQ/planning/RegHaze.aspx>

The update is specific to the North Dakota Progress section, Regional Haze Round 2 Files. Located toward the bottom of the webpage.

The data which used to be 2 separate Google drive folders has been consolidated into one document, Appendix B – Four Factor Information.

Direct link: https://www.deq.nd.gov/publications/AQ/Planning/RegionalHaze2/Appendix_B.pdf

Appendix B contains all the significant communications between NDDEQ and the sources regarding the four factor analysis. This Appendix is broken into 10 sections, B.1 – B.10. Each of these sections represents a facility which provided information per our request. These sections have been ‘bookmarked’ to ease navigation from report to report.

Of note per the discussion yesterday. Appendix B.1 contains the information received from Coyote Station. In 2020, the Department received 2 additional submittals from Coyote. One contains revisions to ‘SNCR and RRI costs’, and the other included revisions to the ‘SO2 controls analysis’.

Let me know if you have any questions or trouble accessing this information. Thank again for the discussion yesterday.
Regards,
David

David Stroh

Environmental Engineer

701-328-5229 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

Stroh, David E.

Subject: Regional Haze Consultation
Location: Microsoft Teams Meeting

Start: Mon 3/22/2021 10:00 AM
End: Mon 3/22/2021 11:00 AM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Stroh, David E.
Required Attendees Bouchareb, Hassan (MPCA)

Sounds great, Hassan.

Here is the invite for next Monday. Looking forward to the discussion.

Regards,
David

Microsoft Teams meeting

Join on your computer or mobile app

[Click here to join the meeting](#)

Join with a video conferencing device

teams@join.nd.gov

Video Conference ID: 118 591 122 8

[Alternate VTC dialing instructions](#)

Or call in (audio only)

[+1 701-328-0950,,148072804#](#) United States, Fargo

Phone Conference ID: 148 072 804#

[Find a local number](#) | [Reset PIN](#)



Enjoy your meeting

[Learn More](#) | [Help](#) | [Meeting options](#)

From: Bouchareb, Hassan (MPCA) <hassan.bouchareb@state.mn.us>
Sent: Wednesday, March 17, 2021 4:06 PM
To: Stroh, David E. <deStroh@nd.gov>
Subject: RE: Regional Haze Consultation

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That works for me, thanks David!

Hassan M. Bouchareb | Engineer
Minnesota Pollution Control Agency (MPCA)
Office: (651) 757-2653 | Fax: (651) 296-8324
Pronouns: he/him/his
Hassan.Bouchareb@state.mn.us | www.pca.state.mn.us

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From: Stroh, David E. <deStroh@nd.gov>
Sent: Wednesday, March 17, 2021 11:36 AM
To: Bouchareb, Hassan (MPCA) <hassan.bouchareb@state.mn.us>
Subject: RE: Regional Haze Consultation

Hi Hassan,

I also have good availability next Monday, can make most times work.

How does Monday, March 22nd @ 10:00am work?

If it works, I can send a Microsoft Teams meeting invite and we can get it on the calendar.

Regards,
David

David Stroh
Environmental Engineer

701-328-5229 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

From: Bouchareb, Hassan (MPCA) <hassan.bouchareb@state.mn.us>
Sent: Wednesday, March 17, 2021 10:52 AM

To: Stroh, David E. <deStroh@nd.gov>

Subject: RE: Regional Haze Consultation

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Hi David,

I'd be happy to talk through regional haze topics with you. I'm generally available anytime this coming Monday if that works for you? If not, feel free to suggest some days/times.

Thanks!

Hassan M. Bouchareb | Engineer

Minnesota Pollution Control Agency (MPCA)

Office: (651) 757-2653 | Fax: (651) 296-8324

Pronouns: he/him/his

Hassan.Bouchareb@state.mn.us | www.pca.state.mn.us

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From: Stroh, David E. <deStroh@nd.gov>

Sent: Thursday, March 4, 2021 2:49 PM

To: Bouchareb, Hassan (MPCA) <hassan.bouchareb@state.mn.us>

Subject: Regional Haze Consultation

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Hi Hassan,

As a follow-up to my voicemail, I would like to gauge your interest in beginning state-to-state consultation. A couple items that come to mind are SIP submittal timelines and expectations, progress to date, and any input required from North Dakota to Minnesota or vice-versa for planning purposes.

Feel free to give me a call when you have time or respond via email and we can coordinate a time for discussion.

Hope you are doing well.

Regards,

David

David Stroh

Environmental Engineer

701-328-5229 • destroh@nd.gov

Stroh, David E.

From: Payne, Rhonda <repayne@mt.gov>
Sent: Wednesday, June 9, 2021 12:41 PM
To: Stroh, David E.; Henrikson, Craig
Cc: McGuire, Brandon; Thorton, Rhannon T.
Subject: RE: North Dakota's Regional Haze Determination on Impact of Facilities On North Dakota's Class I Areas

***** **CAUTION:** This email originated from an outside source. Do not click links or open attachments unless you know they are safe. *****

Great, thank you, David. Also, thank you for sharing the modeling delays information.

Have a great weekend,

Rhonda

From: Stroh, David E. <deStroh@nd.gov>
Sent: Wednesday, June 9, 2021 7:48 AM
To: Payne, Rhonda <repayne@mt.gov>; Henrikson, Craig <CHenrikson@mt.gov>
Cc: McGuire, Brandon <BMcGuire@mt.gov>; Thorton, Rhannon T. <rThorton@nd.gov>
Subject: [EXTERNAL] North Dakota's Regional Haze Determination on Impact of Facilities On North Dakota's Class I Areas

Sending this email to correct the subject line.

I liked the subject line provided my Craig in Montana's request – so I copied it. Only I forgot to change it to ND. My apologies for any confusion.

David

From: Stroh, David E.
Sent: Tuesday, June 8, 2021 3:02 PM
To: repayne@mt.gov; Henrikson, Craig <CHenrikson@mt.gov>
Cc: BMcGuire@mt.gov; Thorton, Rhannon T. <rThorton@nd.gov>
Subject: Montana's Regional Haze Determination on Impact of Facilities On Montana's Class I Areas

Hi Craig and Rhonda,

Under various sections of the Regional Haze regulation, states with Class I areas are required to develop reasonable progress goals (RPG) for visibility improvement at their Class I areas. When developing each Class I area RPG, states are required to consult with other states which may reasonably be anticipated to cause or contribute to visibility impairment in a Class I area. This email provides some general information and requests feedback from Montana.

Outside sources contributing to impairment in North Dakota Class I areas

Visibility in North Dakota's Class I areas is not significantly impaired by Montana sources on the most impaired days and Montana sources are not impeding North Dakota's ability to make reasonable progress during this planning period.

Therefore, North Dakota is not requesting the adoption of any controls or emission reduction measures from Montana during the second-planning period for the Regional Haze regulation.

North Dakota sources contributing to impairment in Montana Class I areas

North Dakota has reviewed the impacts our sectors have on visibility impairment in the Class I areas closest to North Dakota. This review indicated North Dakota sector contributions do not appear to be significantly impacting visibility in these Montana Class I areas (e.g. Medicine Lake “MELA1”) on the most impaired days. We believe this determination is supported by the Source Apportionment Charts provided by WRAP, specifically the “WRAP State Source Group Contributions - U.S. Anthro” (Tool 9 on the TSSv2, <https://views.cira.colostate.edu/tssv2/Express/ModelingTools.aspx> [\[views.cira.colostate.edu\]](https://views.cira.colostate.edu)). Should Montana disagree with this position, please notify North Dakota accordingly. Notification can be provided at any time, before or during the required public comment period.

This email provides an early opportunity for Montana to inform North Dakota of any expectations Montana has regarding North Dakota’s Regional Haze SIP for round 2 of the planning process.

Thank you in advance for your participation in this consultation process.

Please contact me at 701-328-5229 or destroh@nd.gov should you require additional information on this matter.

Regards,

David

David Stroh

Environmental Engineer

701-328-5229 • destroh@nd.gov



[\[gcc01.safelinks.protection.outlook.com\]](https://gcc01.safelinks.protection.outlook.com)

918 E. Divide Ave. • Bismarck, ND 58501

Stroh, David E.

From: Stroh, David E.
Sent: Wednesday, June 9, 2021 8:56 AM
To: rick.boddicker@state.sd.us; Anthony.Lueck@state.sd.us
Cc: Thorton, Rhannon T.
Subject: North Dakota's Regional Haze Determination on Impact of Facilities on North Dakota's Class I Area

Hi Rick and Anthony,

Under various sections of the Regional Haze regulation, states with Class I areas are required to develop reasonable progress goals (RPG) for visibility improvement at their Class I areas. When developing each Class I area RPG, states are required to consult with other states which may reasonably be anticipated to cause or contribute to visibility impairment in a Class I area. This email provides some general information and requests feedback from South Dakota.

Outside sources contributing to impairment in North Dakota Class I areas

Visibility in North Dakota's Class I areas is not significantly impaired by South Dakota sources on the most impaired days and South Dakota sources are not impeding North Dakota's ability to make reasonable progress during this planning period. Therefore, North Dakota is not requesting the adoption of any controls or emission reduction measures from South Dakota during the second-planning period for the Regional Haze regulation.

North Dakota sources contributing to impairment in South Dakota Class I areas

North Dakota has reviewed the impacts our sectors have on visibility impairment in the Class I areas closest to North Dakota. This review indicated North Dakota sector contributions do not appear to be significantly impacting visibility in these South Dakota Class I areas (e.g. Badlands NP "BADL1") on the most impaired days. We believe our determination is supported by the Source Apportionment Charts provided by WRAP, specifically the "WRAP State Source Group Contributions - U.S. Anthro" (Tool 9 on the TSSv2, <https://views.cira.colostate.edu/tssv2/Express/ModelingTools.aspx>). Should South Dakota disagree with this position, please notify North Dakota accordingly. Notification can be provided at any time, before or during the required public comment period. This email provides an early opportunity for South Dakota to inform North Dakota of any expectations South Dakota has regarding North Dakota's Regional Haze SIP for round 2 of the planning process.

Thank you in advance for your participation in this consultation process.

Please contact me at 701-328-5229 or destroh@nd.gov should you require additional information on this matter.

Regards,
David

David Stroh

Environmental Engineer

701-328-5229 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

Stroh, David E.

From: Bouchareb, Hassan (MPCA) <hassan.bouchareb@state.mn.us>
Sent: Tuesday, June 15, 2021 1:41 PM
To: Stroh, David E.
Subject: RE: North Dakota's Regional Haze Determination on Impact of Facilities On North Dakota's Class I Area

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Hi David,

Thanks for the voicemail and follow up email. No immediate updates yet, but I'm discussing with others here at MPCA and I'll get back to you when I have more information from those discussions.

Thanks!

Hassan M. Bouchareb | Engineer
Minnesota Pollution Control Agency (MPCA)
Office: (651) 757-2653 | Fax: (651) 296-8324
Pronouns: he/him/his
Hassan.Bouchareb@state.mn.us | www.pca.state.mn.us

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From: Stroh, David E. <deStroh@nd.gov>
Sent: Wednesday, June 9, 2021 8:49 AM
To: Bouchareb, Hassan (MPCA) <hassan.bouchareb@state.mn.us>
Subject: North Dakota's Regional Haze Determination on Impact of Facilities On North Dakota's Class I Area

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Hi Hassan,

Following up on my voicemail. Under various sections of the Regional Haze regulation, states with Class I areas are required to develop reasonable progress goals (RPG) for visibility improvement at their Class I areas. When developing each Class I area RPG, states are required to consult with other states which may reasonably be anticipated to cause or contribute to visibility impairment in a Class I area. This email provides some general information and requests feedback from Minnesota.

Outside sources contributing to impairment in North Dakota Class I areas

Visibility in North Dakota's Class I areas is not significantly impaired by Minnesota sources on the most impaired days and Minnesota sources are not impeding North Dakota's ability to make reasonable progress during this planning period. Therefore, North Dakota is not requesting the adoption of any controls or emission reduction measures from Minnesota during the second-planning period for the Regional Haze regulation.

North Dakota sources contributing to impairment in Minnesota Class I areas

North Dakota has reviewed the impacts our sectors have on visibility impairment in the Class I areas closest to North Dakota. This review indicated North Dakota sector contributions do not appear to be significantly impacting visibility in these Minnesota Class I areas (e.g. Voyageurs NP “VOYA2”) on the most impaired days. We believe our determination is supported by the Source Apportionment Charts provided by WRAP, specifically the “WRAP State Source Group Contributions - U.S. Anthro” (Tool 9 on the TSSv2, <https://views.cira.colostate.edu/tssv2/Express/ModelingTools.aspx>). Should Minnesota disagree with this position, please notify North Dakota accordingly. Notification can be provided at any time, before or during the required public comment period. This email provides an early opportunity for Minnesota to inform North Dakota of any expectations Minnesota has regarding North Dakota’s Regional Haze SIP for round 2 of the planning process.

Thank you in advance for your participation in this consultation process.

Please contact me at 701-328-5229 or destroh@nd.gov should you require additional information on this matter.

Regards,
David

David Stroh
Environmental Engineer

701-328-5229 • destroh@nd.gov



918 E. Divide Ave. • Bismarck, ND 58501

Stroh, David E.

From: Stroh, David E.
Sent: Thursday, July 8, 2021 9:20 AM
To: Jackson, Scott; Worstell, Aaron; Dobrahner, Jaslyn; Thorton, Rhannon T.; Semerad, Jim L.
Subject: RE: North Dakota and EPA R8 Regional Haze Discussion
Attachments: July 2021_North Dakota Regional Haze Round 2.pptx

All,

I have attached the PP we will be covering today. I plan to screenshare, walkthrough the PP, and we can have an open discussion on the material.

Scott – thanks for the heads up

David

From: Jackson, Scott <Jackson.Scott@epa.gov>
Sent: Thursday, July 8, 2021 9:06 AM
To: Stroh, David E. <deStroh@nd.gov>; Worstell, Aaron <Worstell.Aaron@epa.gov>; Dobrahner, Jaslyn <Dobrahner.Jaslyn@epa.gov>; Thorton, Rhannon T. <rThorton@nd.gov>; Semerad, Jim L. <jsemerad@nd.gov>
Subject: RE: North Dakota and EPA R8 Regional Haze Discussion

***** **CAUTION:** This email originated from an outside source. Do not click links or open attachments unless you know they are safe. *****

Hi all,

I have a doctor's appt. during this time so I'm unable to make it. I will follow up with Jaslyn and Aaron to see how it went.

Scott

Scott Jackson
Air Quality Planning Branch Chief
U.S. EPA Region 8
(303) 312-6107

-----Original Appointment-----

From: Stroh, David E. <deStroh@nd.gov>
Sent: Wednesday, June 9, 2021 10:31 AM
To: Stroh, David E.; Worstell, Aaron; Dobrahner, Jaslyn; Jackson, Scott; Thorton, Rhannon T.; Semerad, Jim L.
Subject: North Dakota and EPA R8 Regional Haze Discussion
When: Thursday, July 8, 2021 10:00 AM-11:00 AM (UTC-07:00) Mountain Time (US & Canada).
Where: Microsoft Teams Meeting

Hi all,

Aaron and I spoke this morning regarding North Dakota, regional haze, and the upcoming work/SIP submittal (thanks for the good discussion, Aaron). We felt convening as a group to discuss North Dakota's current draft plan was a good idea. As your schedule allows, please join in the discussion set for July 8th. Feel free to pass along this invite to other EPA staff as you see fit.

I am planning to pull together some slides together for our discussion and will share the in advance of this call.

In the meantime, let me know if you have any questions or comments.

Regards,

David

Microsoft Teams meeting

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Join with a video conferencing device

teams@join.nd.gov

Video Conference ID: 118 768 209 8

[Alternate VTC dialing instructions](#)

Or call in (audio only)

[+1 701-328-0950,,881680625#](#) United States, Fargo

Phone Conference ID: 881 680 625#

[Find a local number](#) | [Reset PIN](#)



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North Dakota Regional Haze Round 2 SIP Update

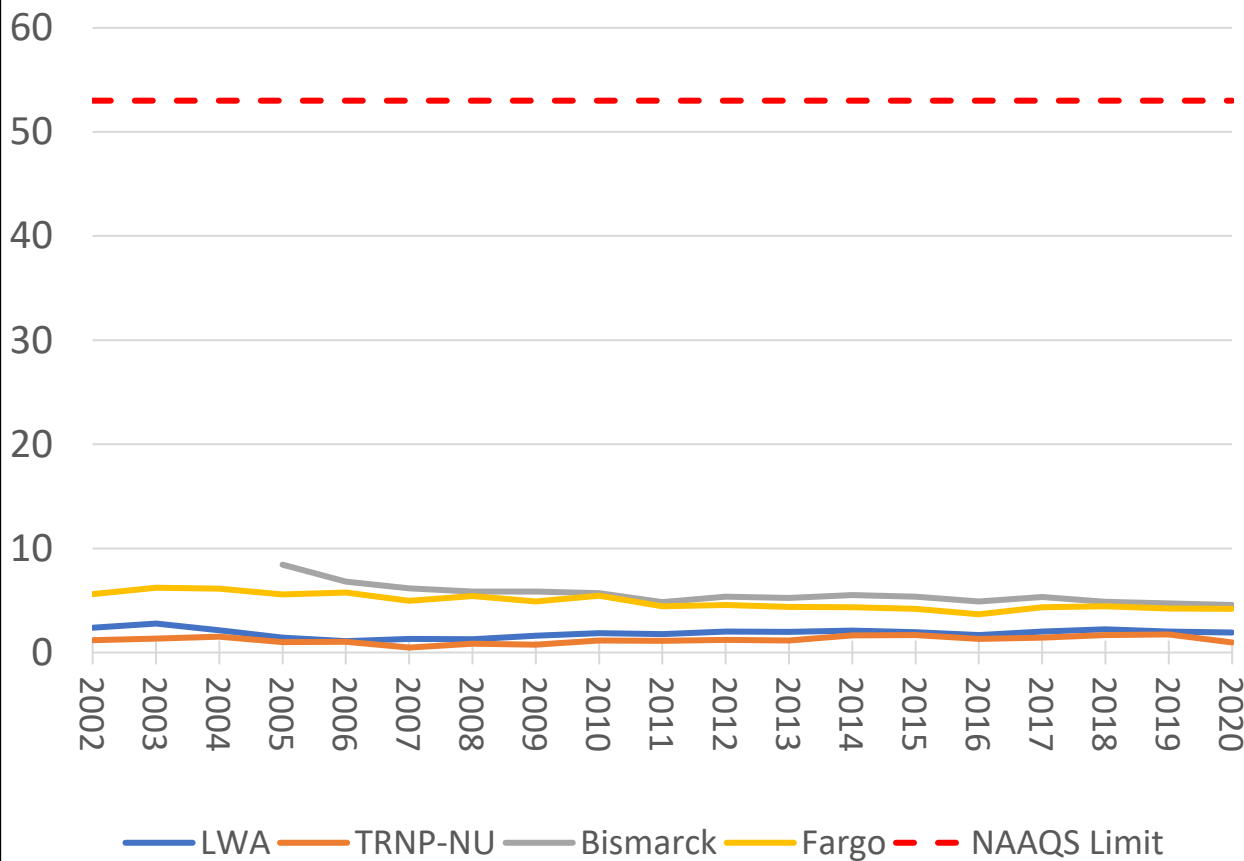


Draft Regional Haze Round 2 SIP Layout

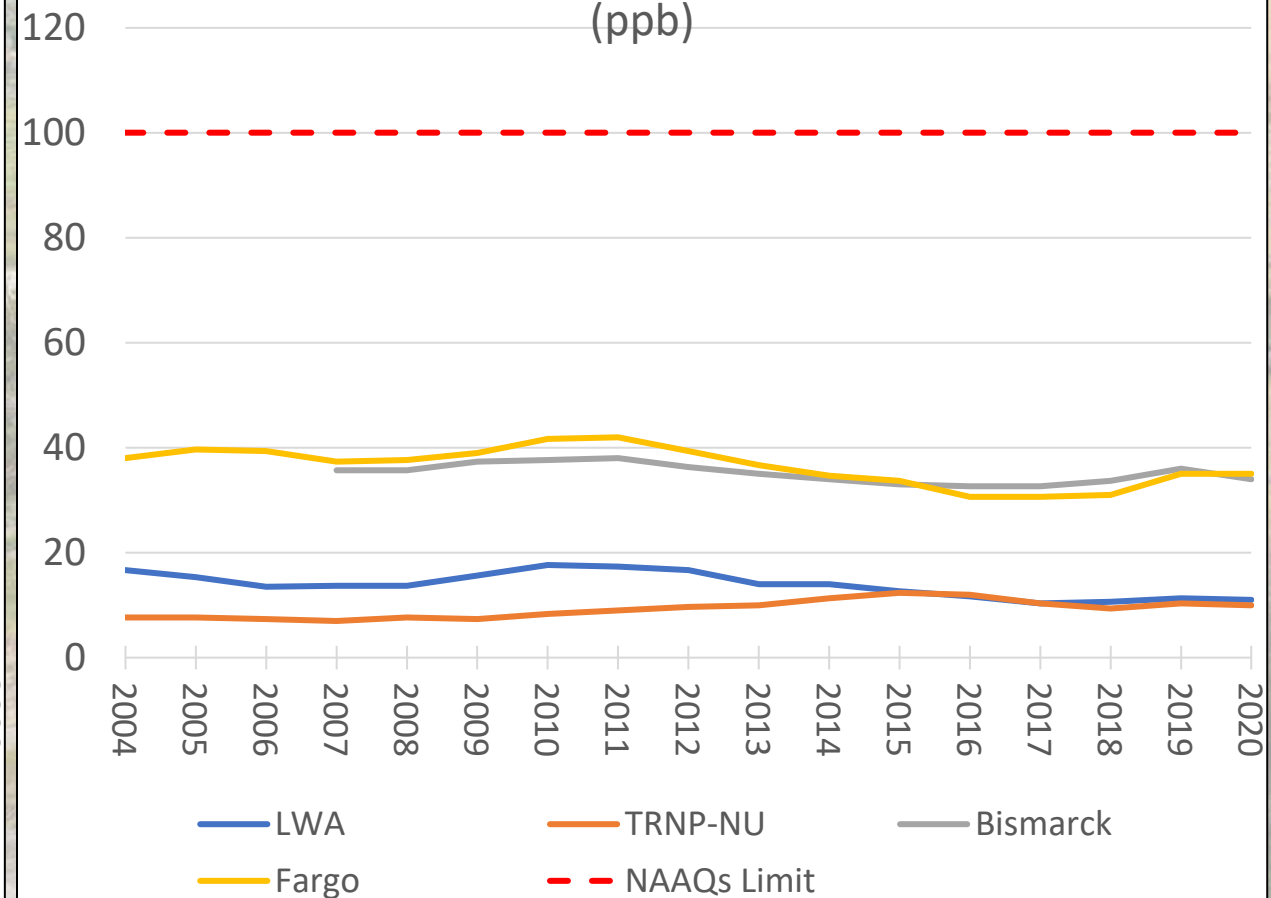
- 1) Background and Overview of RHR
 - 2) SIP Development Process
 - 3) Air Quality and Visibility Analysis
 - 4) Emissions Inventories
 - 5) Long-Term Strategy (LTS)
 - 6) Modeling of LTS for Reasonable Progress Goals (RPGs)
 - 7) Overview of WRAP Modeling
 - 8) BART Requirements for Coal Creek Station NO_x Limits
 - 9) Five-year Progress Report
- Supporting Appendices

ND Air Quality

NO₂ Annual Ambient Concentration (ppb)

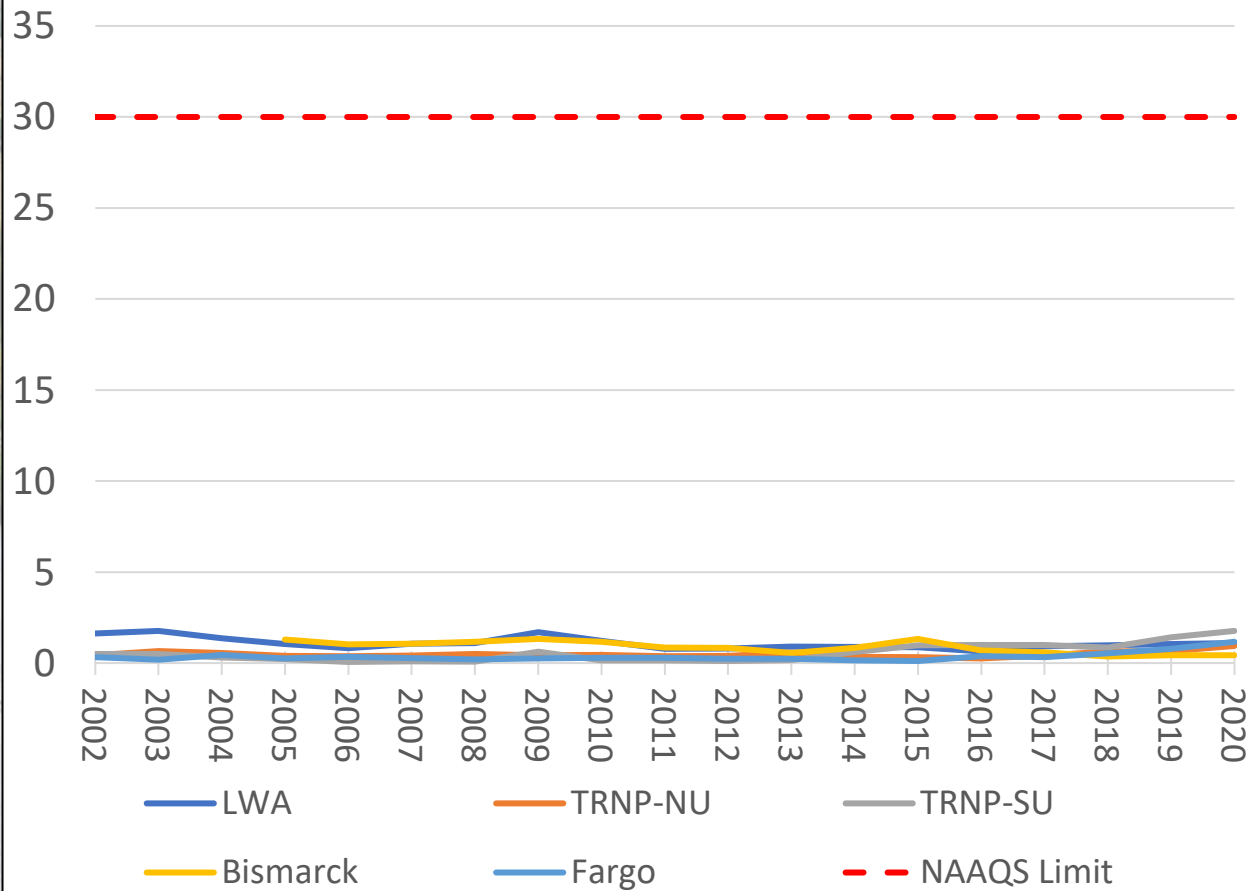


NO₂ 98th Percentile of 3-Year Rolling Average (ppb)

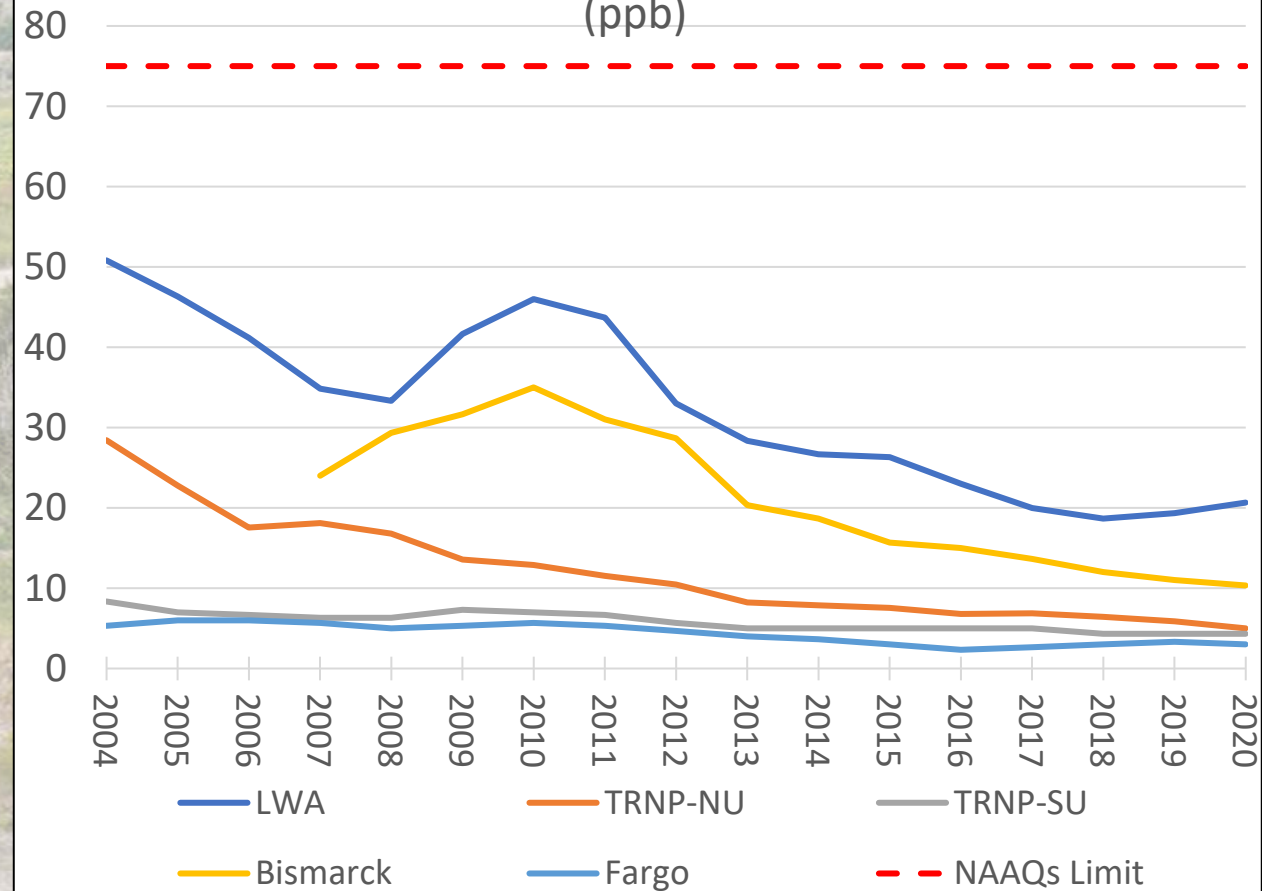


ND Air Quality

SO₂ Annual Ambient Concentration (ppb)

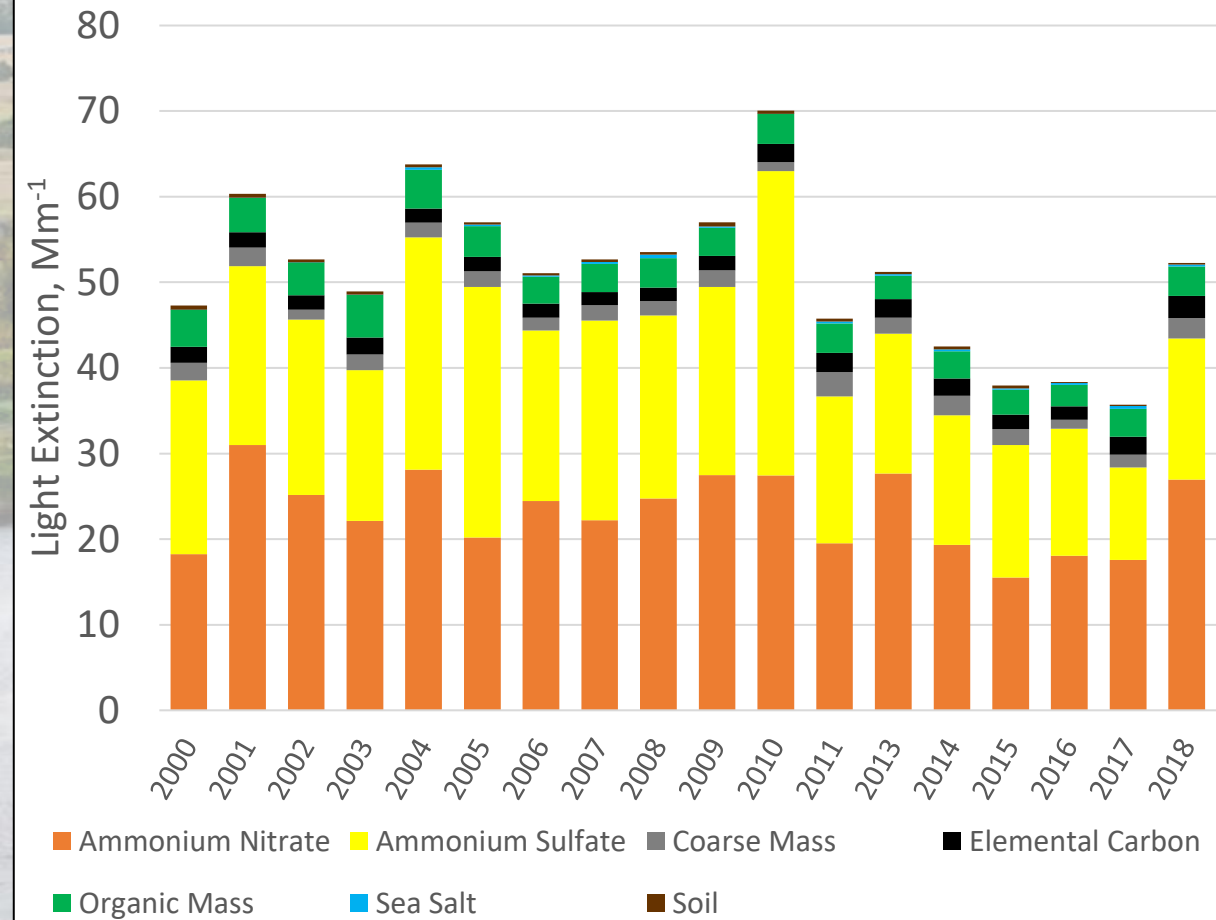


SO₂ 99th Percentile of 3-Year Rolling Average (ppb)

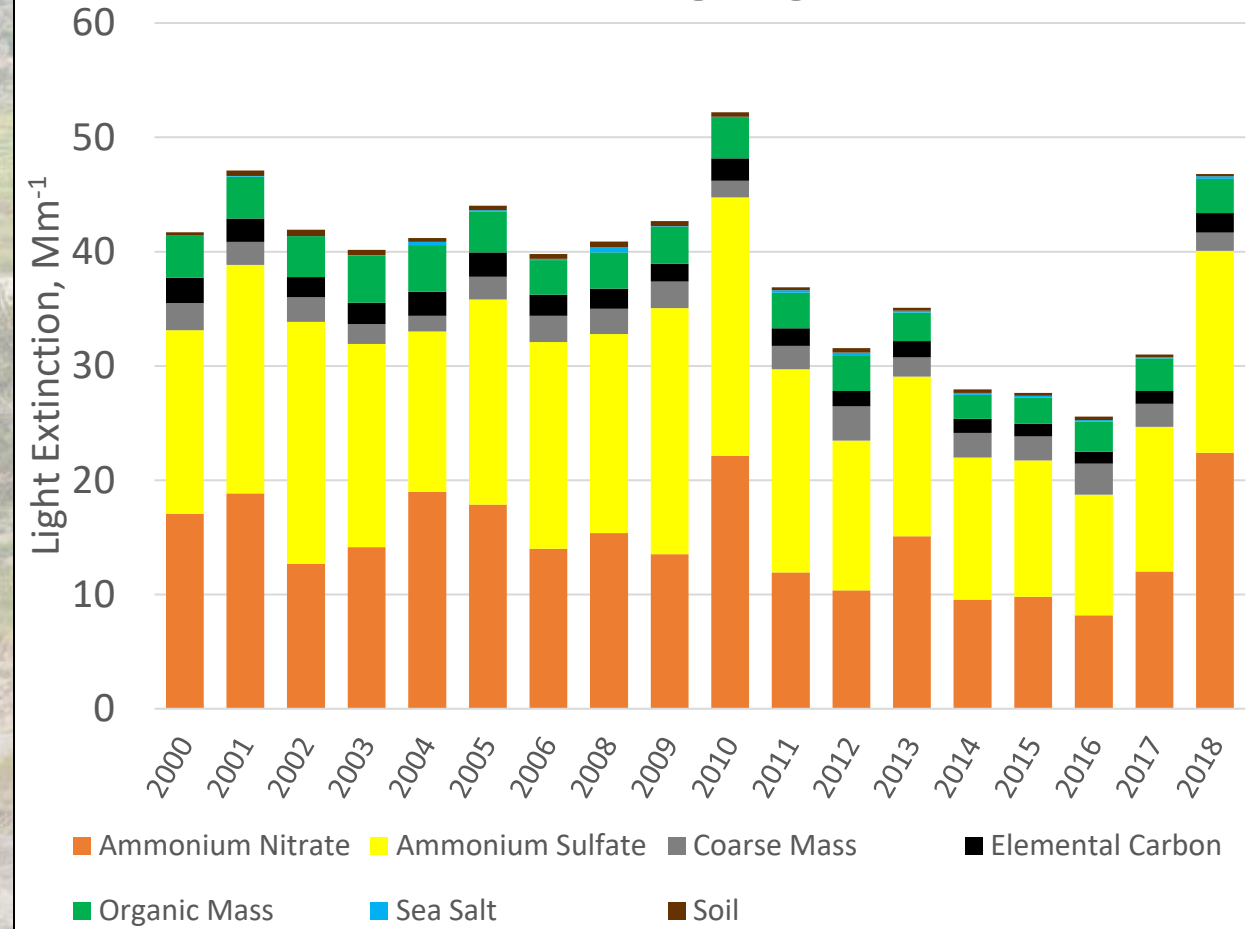


CIA Visibility - Most Impaired Days

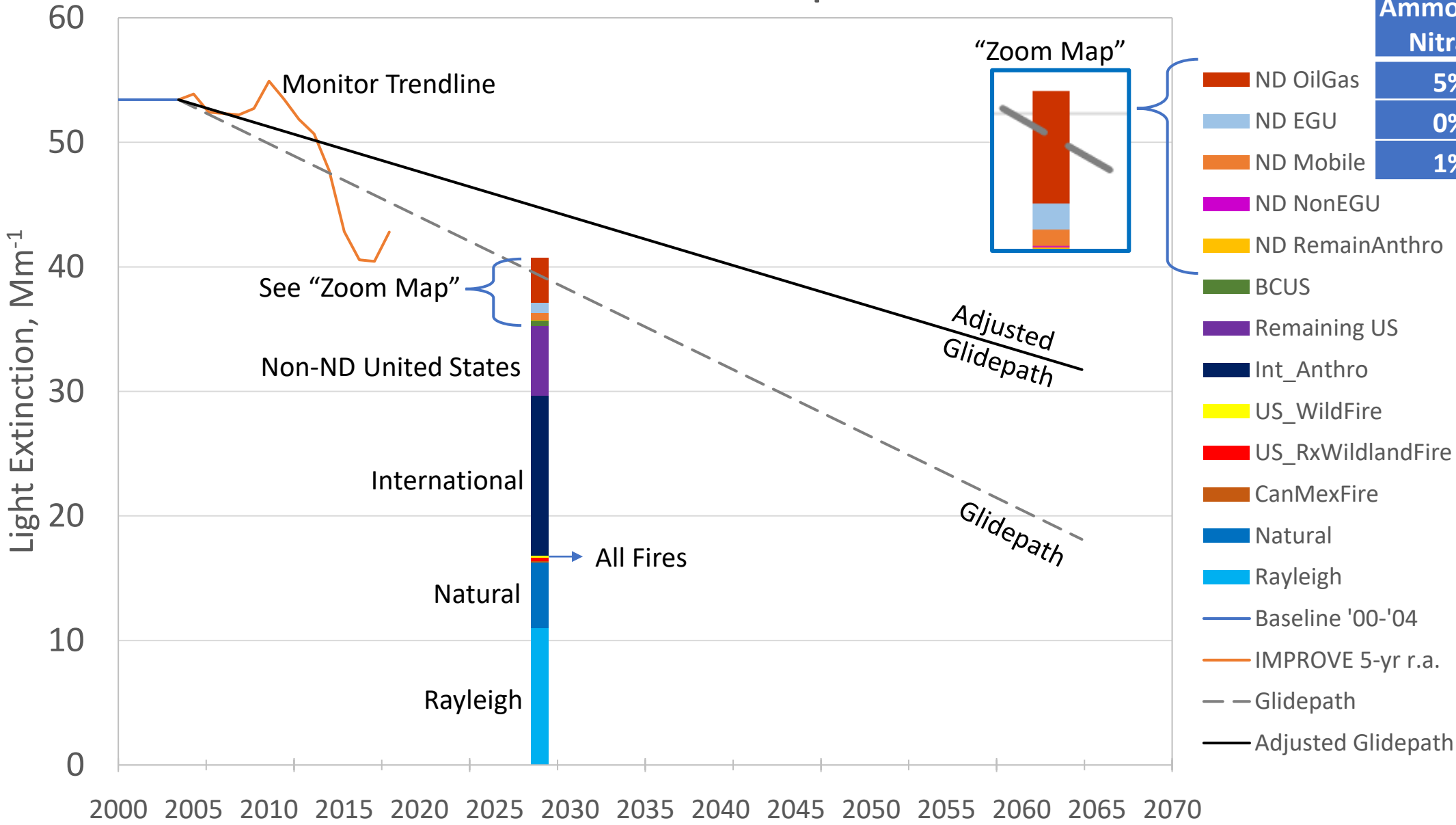
LWA Annual Average Light Extinction



TRNP Annual Average Light Extinction

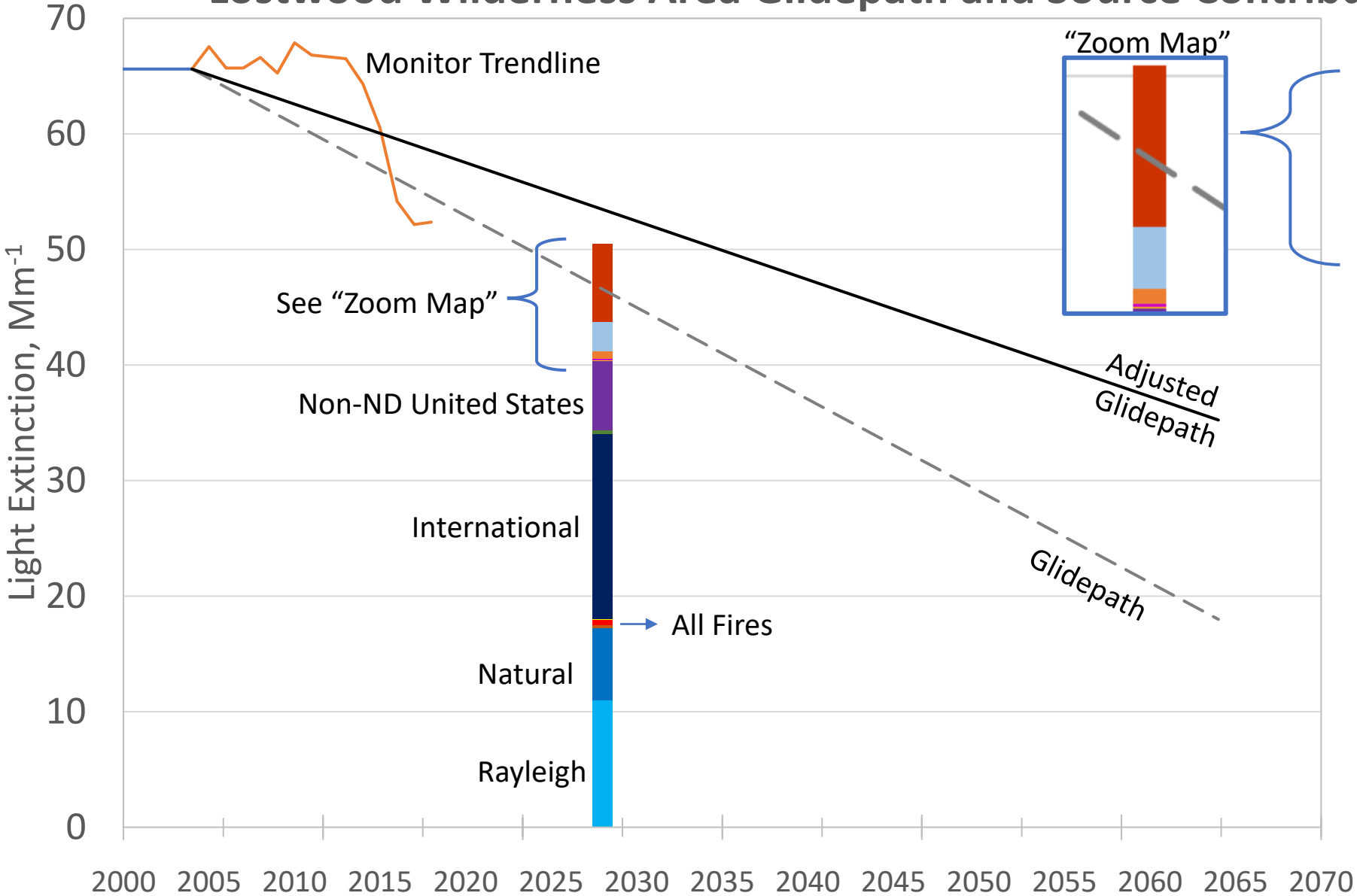


Theodore Roosevelt National Park Glidepath and Source Contribution



| Ammonium Nitrate | Ammonium Sulfate |
|------------------|------------------|
| 5% | 4% |
| 0% | 2% |
| 1% | 0% |

Lostwood Wilderness Area Glidepath and Source Contribution



| Ammonium Nitrate | Ammonium Sulfate |
|------------------|------------------|
| 8% | 6% |
| 1% | 4% |
| 1% | 0% |

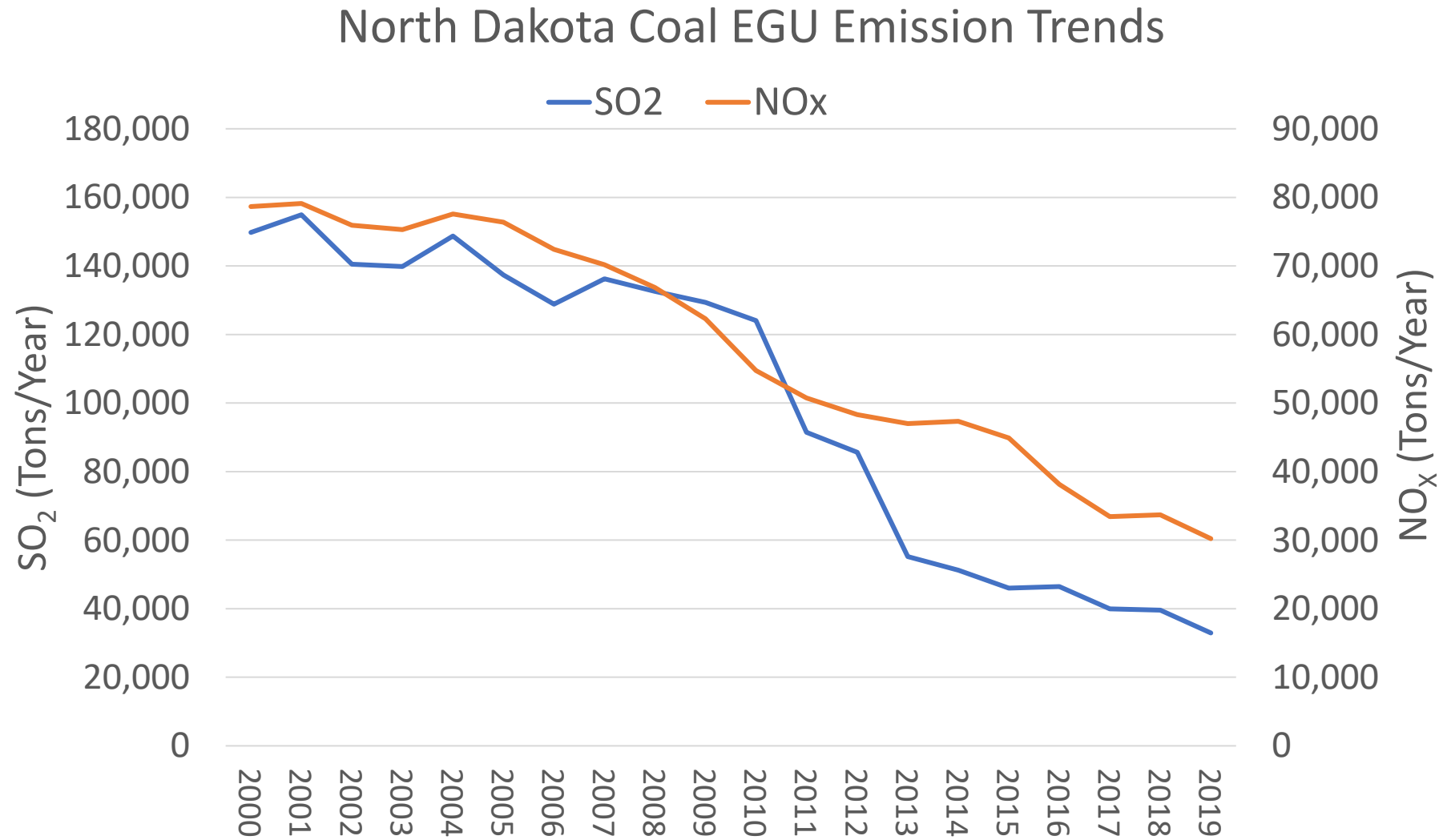
Emissions Inventories for North Dakota

Representative Baseline Emissions Inventory (tons/year)

2028 Emissions Projections (tons/year)

| Sector | SO ₂ | NO _x | VOC | NH ₃ | PM ₁₀ | PM _{2.5} | Sector | SO ₂ | NO _x | VOC | NH ₃ | PM ₁₀ | PM _{2.5} |
|-------------------------------------|-----------------|-----------------|----------------|-----------------|------------------|-------------------|-------------------------------------|-----------------|-----------------|----------------|-----------------|------------------|-------------------|
| Fugitive Dust (area-source) | 0 | 0 | 0 | 0 | 186,929 | 32,975 | Fugitive Dust (area-source) | 0 | 0 | 0 | 0 | 186,929 | 32,975 |
| Agricultural Operations | 0 | 0 | 1,249 | 36,130 | 0 | 0 | Agricultural Operations | 0 | 0 | 1,249 | 36,130 | 0 | 0 |
| Agricultural Fire | 403 | 1,188 | 1,655 | 6,399 | 5,253 | 3,459 | Agricultural Fire | 403 | 1,188 | 1,655 | 6,399 | 5,253 | 3,459 |
| Biogenic | 0 | 44,573 | 179,876 | 0 | 0 | 0 | Biogenic | 0 | 44,573 | 179,876 | 0 | 0 | 0 |
| Commercial Marine Vehicle | 0 | 0 | 0 | 0 | 0 | 0 | Commercial Marine Vehicle | 0 | 0 | 0 | 0 | 0 | 0 |
| Lightning NOx | 0 | 34,491 | 0 | 0 | 0 | 0 | Lightning NOx | 0 | 34,491 | 0 | 0 | 0 | 0 |
| Remaining Nonpoint | 171 | 1,194 | 17,144 | 133 | 878 | 778 | Remaining Nonpoint | 171 | 1,194 | 17,144 | 133 | 878 | 778 |
| Non-road Mobile | 40 | 28,060 | 7,208 | 37 | 2,278 | 2,201 | Non-road Mobile | 32 | 12,200 | 4,762 | 38 | 852 | 819 |
| Non-US Fire | 0 | 0 | 0 | 0 | 0 | 0 | Non-US Fire | 0 | 0 | 0 | 0 | 0 | 0 |
| Oil & Gas Nonpoint | 9,391 | 62,190 | 400,646 | 0 | 1,116 | 1,116 | Oil & Gas Nonpoint | 15,203 | 57,269 | 416,111 | 0 | 562 | 562 |
| Sea Salt and DMS | 0 | 0 | 0 | 0 | 0 | 0 | Sea Salt and DMS | 0 | 0 | 0 | 0 | 0 | 0 |
| Onroad Mobile | 91 | 33,305 | 10,753 | 343 | 1,884 | 1,320 | Onroad Mobile | 53 | 8,051 | 3,831 | 259 | 808 | 308 |
| Electricity Generating Point | 39,323 | 33,712 | 633 | 172 | 3,575 | 2,553 | Electricity Generating Point | 35,962 | 31,539 | 625 | 172 | 3,338 | 2,317 |
| Industrial Point | 2,856 | 4,517 | 2,885 | 112 | 2,044 | 1,554 | Industrial Point | 2,856 | 4,517 | 2,885 | 112 | 2,016 | 1,531 |
| Oil & Gas Point | 5,814 | 5,179 | 2,927 | 972 | 1,034 | 929 | Oil & Gas Point | 5,814 | 5,179 | 2,857 | 972 | 1,034 | 929 |
| Rail | 9 | 14,758 | 749 | 8 | 468 | 430 | Rail | 7 | 8,244 | 348 | 7 | 216 | 209 |
| Residential Wood | 31 | 126 | 1,404 | 60 | 1,329 | 1,327 | Residential Wood | 31 | 126 | 1,404 | 60 | 1,329 | 1,327 |
| Prescribed Fire | 214 | 593 | 6,605 | 279 | 2,542 | 2,369 | Prescribed Fire | 214 | 593 | 6,605 | 279 | 2,542 | 2,369 |
| Windblown Dust | 0 | 0 | 0 | 0 | 3 | 1 | Windblown Dust | 0 | 0 | 0 | 0 | 3 | 1 |
| Wildfire | 60 | 221 | 1,518 | 55 | 564 | 541 | Wildfire | 60 | 221 | 1,518 | 55 | 564 | 541 |
| Total | 58,403 | 264,107 | 635,252 | 44,700 | 209,897 | 51,553 | Total | 60,806 | 209,385 | 640,870 | 44,616 | 206,324 | 48,125 |

ND First Round EGU Reductions



ND EGU Emissions and Reductions

NO_x Emissions (tons)

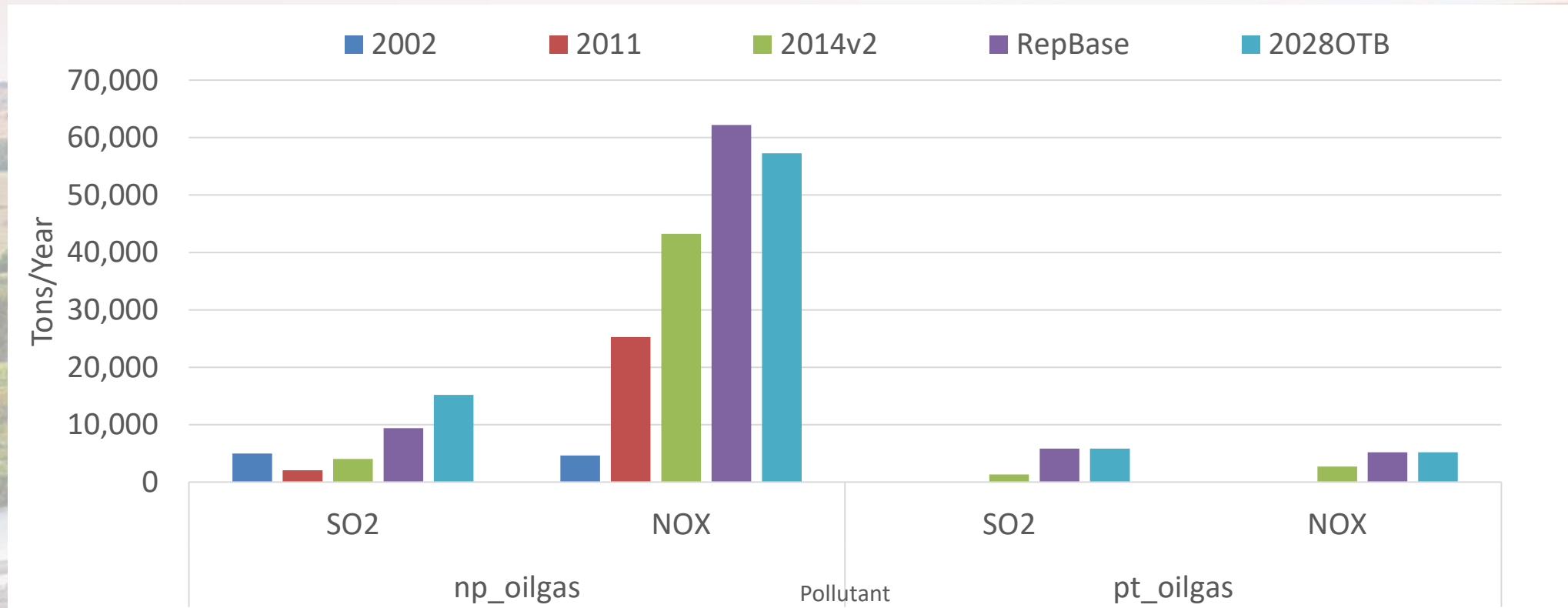
| Facility | Unit | 2002 | RepBase | 2028 OTB | Reduction* |
|--------------------|------|--------|---------|----------|------------|
| Coyote | 1 | 13,173 | 7,363 | 7,363 | 44% |
| Antelope Valley | 1 | 5,840 | 1,697 | 1,697 | 71% |
| Antelope Valley | 2 | 5,953 | 1,708 | 1,708 | 71% |
| Leland Olds | 1 | 2,581 | 1,059 | 1,059 | 59% |
| Leland Olds | 2 | 11,184 | 4,192 | 4,192 | 63% |
| Coal Creek | 1 | 4,863 | 3,987 | 3,010 | 38% |
| Coal Creek | 2 | 5,492 | 3,010 | 3,010 | 45% |
| Milton R. Young | 1 | 8,510 | 3,435 | 3,435 | 60% |
| Milton R. Young | 2 | 14,335 | 5,735 | 5,735 | 60% |
| RM Heskett Station | 1 | 180 | 209 | | |
| RM Heskett Station | 2 | 918 | 978 | | |
| Stanton Station | 1 | 2,209 | | | |
| Stanton Station | 10 | 890 | | | |
| Total | | 76,127 | 33,373 | 31,209 | 59% |

SO₂ Emissions (tons)

| Facility | Unit | 2002 | RepBase | 2028 OTB | Reduction* |
|--------------------|------|---------|---------|----------|------------|
| Coyote | 1 | 14,069 | 12,994 | 12,994 | 8% |
| Antelope Valley | 1 | 6,580 | 6,279 | 6,279 | 5% |
| Antelope Valley | 2 | 7,283 | 6,319 | 6,319 | 13% |
| Leland Olds | 1 | 16,655 | 636 | 636 | 96% |
| Leland Olds | 2 | 30,744 | 1,258 | 1,258 | 96% |
| Coal Creek | 1 | 11,910 | 3,458 | 2,740 | 77% |
| Coal Creek | 2 | 12,518 | 3,400 | 2,743 | 78% |
| Milton R. Young | 1 | 19,858 | 766 | 766 | 96% |
| Milton R. Young | 2 | 8,707 | 2,165 | 2,165 | 75% |
| RM Heskett Station | 1 | 622 | 753 | | |
| RM Heskett Station | 2 | 2,189 | 1,214 | | |
| Stanton Station | 1 | 8,900 | | | |
| Stanton Station | 10 | 1,122 | | | |
| Total | | 141,156 | 39,242 | 35,900 | 75% |

*Reduction from 2002 to 2028 Projections

ND Oil and Gas Emissions



| Sector | Pollutant | 2002 | 2011 | 2014v2 | RepBase | 2028OTB |
|-----------|-----------------|-------|---------|---------|---------|---------|
| np_oilgas | SO ₂ | 4,958 | 2,073 | 4,043 | 9,391 | 15,203 |
| | NO _x | 4,631 | 25,277 | 43,237 | 62,190 | 57,269 |
| | VOC | 7,740 | 252,920 | 664,297 | 400,646 | 416,111 |
| pt_oilgas | SO ₂ | - | - | 1,314 | 5,814 | 5,814 |
| | NO _x | - | - | 2,702 | 5,179 | 5,179 |
| | VOC | - | - | 2,025 | 2,927 | 2,857 |

Long-Term Strategy (LTS)

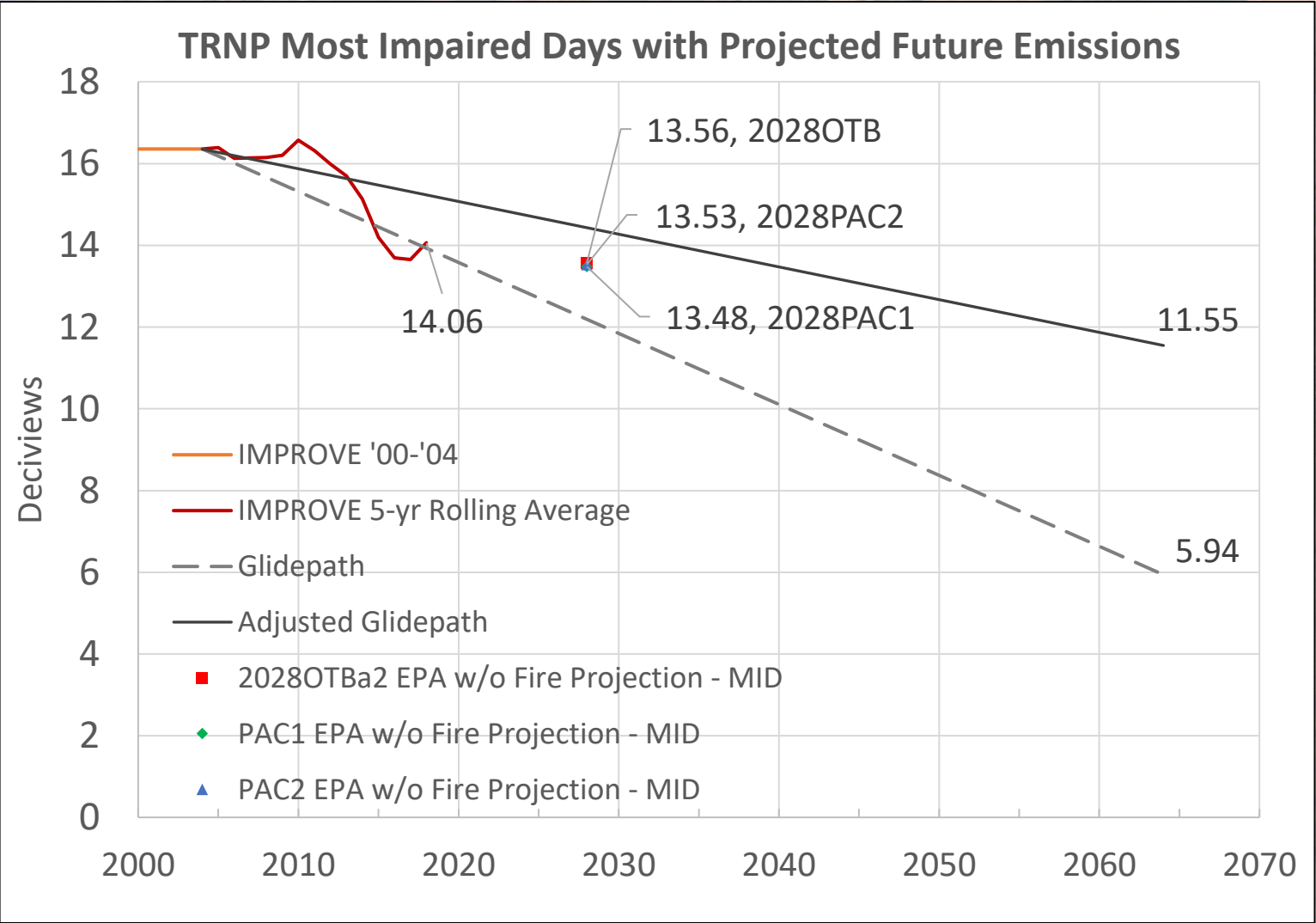
- Selected Sources using Q/d
 - NO_x + SO₂
- Confirmed source/sector selection with WEP/AOI tools
- Selected potential additional controls for modeling evaluation
 - Coyote Station and Antelope Valley Station
- Reviewed visibility impact to determine if potential LTS option(s) should be included in the Reasonable Progress Goals (RPGs)

Facility Modeled Emissions Reductions

| Potential Additional Controls 1 | Control Technology | Pollutant | Annual Emission Reduction (tpy) | Installed Capital Cost (\$) | Annual O&M Cost (\$) | Annualized Total Cost (\$) | Cost of Compliance (\$/ton) |
|---------------------------------|----------------------------------|---------------------------|---------------------------------|-----------------------------|----------------------|----------------------------|-----------------------------|
| Coyote | Absorber Replacement | SO ₂ | 11,621 | 110,120,000 | 12,097,000 | 21,122,000 | 1,818 |
| | SNCR + Comb. Opt. | NO _x | 3,093 | 19,840,000 | 3,128,000 | 4,753,933 | 1,537 |
| AVS 1 | Ca:S Stoichiometry | SO ₂ | 2,874 | 9,698,000 | 1,144,000 | 1,938,773 | 675 |
| AVS 2 | Ca:S Stoichiometry | SO ₂ | 2,914 | 9,698,000 | 1,144,000 | 1,938,773 | 665 |
| CCS 1 | LNC3+ | NO _x | 1,034 | N/A | N/A | N/A | N/A |
| CCS 1 & 2 | Scrubber Modification | SO₂ | 712 | N/A | N/A | N/A | N/A |

| Potential Additional Controls 2 | Control Technology | Pollutant | Annual Emission Reduction (tpy) | Installed Capital Cost (\$) | Annual O&M Cost (\$) | Annualized Total Cost (\$) | Cost of Compliance (\$/ton) |
|---------------------------------|----------------------------------|---------------------------|---------------------------------|-----------------------------|----------------------|----------------------------|-----------------------------|
| Coyote | FGD Stoich Improvements | SO ₂ | 5,369 | 526,000 | 2,042,000 | 2,085,000 | 388 |
| CCS 1 | LNC3+ | NO _x | 1,034 | N/A | N/A | N/A | N/A |
| CCS 1 & 2 | Scrubber Modification | SO₂ | 712 | N/A | N/A | N/A | N/A |

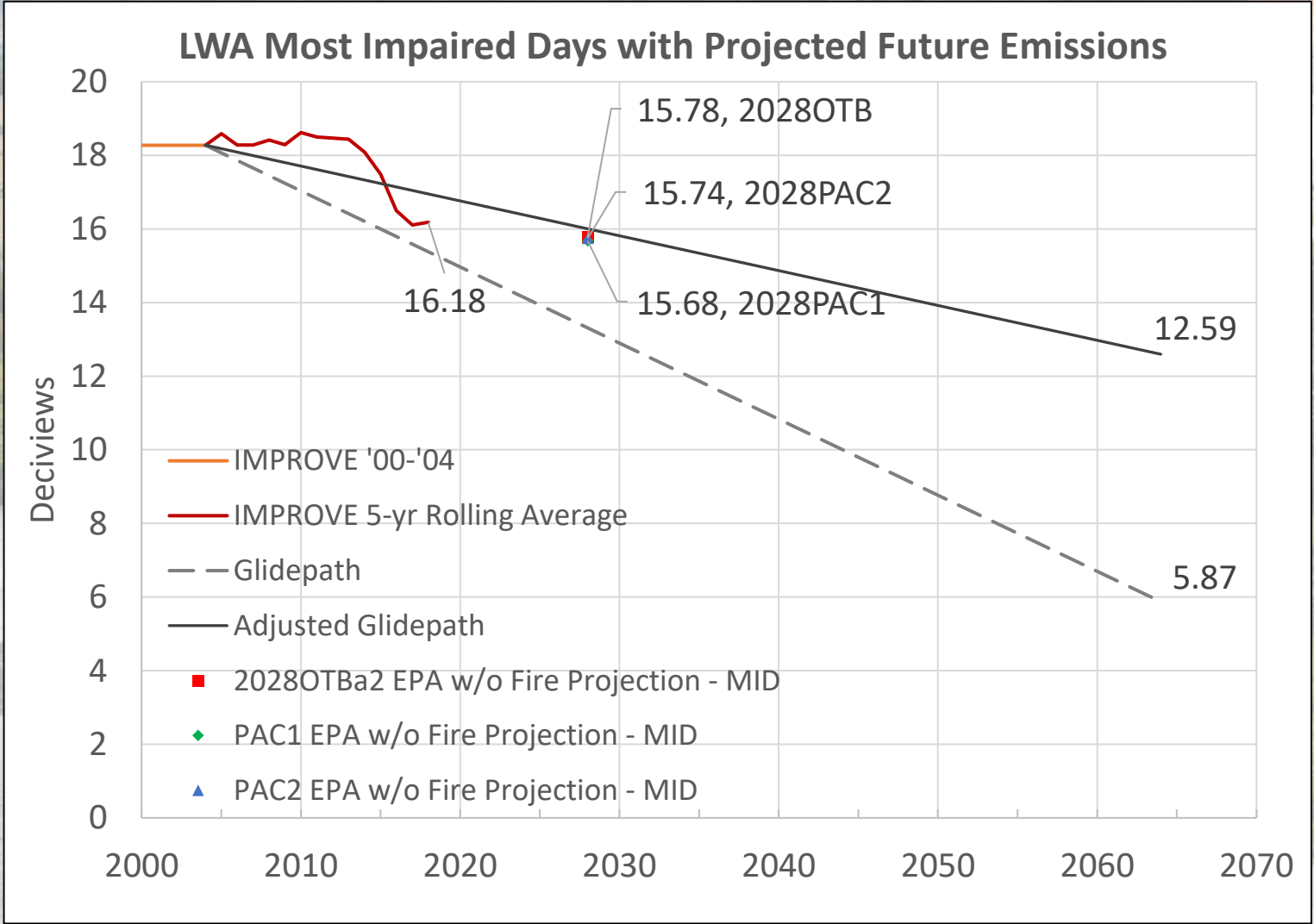
TRNP Reasonable Progress Goal



| Scenario | SO ₂ | NO _x |
|----------|-----------------|-----------------|
| 2028OTB | 35,900 | 32,186 |
| 2028PAC1 | 17,779 | 28,059 |
| 2028PAC2 | 29,819 | 31,152 |

| EGU Reductions | SO ₂ | NO _x | Total |
|----------------|-----------------|-----------------|--------|
| PAC 1 | 18,121 | 4,127 | 22,248 |
| PAC2 | 6,081 | 1,034 | 7,115 |

LWA Reasonable Progress Goal



| Scenario | SO ₂ | NO _x |
|----------|-----------------|-----------------|
| 2028OTB | 35,900 | 32,186 |
| 2028PAC1 | 17,779 | 28,059 |
| 2028PAC2 | 29,819 | 31,152 |

| EGU Reductions | SO ₂ | NO _x | Total |
|----------------|-----------------|-----------------|--------|
| PAC 1 | 18,121 | 4,127 | 22,248 |
| PAC2 | 6,081 | 1,034 | 7,115 |

Modeling Support

- Regional Technical Operations Workgroup
 - Chairs: Mike Barna (NPS), Gail Tonnesen (EPA R8), Kevin Briggs (CO APCD)
 - <https://www.wrapair2.org/rtowg.aspx>
- Model Data Tools available to public at TSSv2.
 - CAMx: <https://views.cira.colostate.edu/tssv2/Express/ModelingTools.aspx>
 - WEP/AOI: <https://views.cira.colostate.edu/tssv2/WEP-AOI/>

BART for Coal Creek Station

- Great River Energy is selling CCS to Rainbow Energy Center
- Round 1 NOx BART
 - Low NOx burners in conjunction with DryFinishing™ and expanded overfire air registers (LNC3+)
 - U1 and U2 have LNC3+ installed (2020 and 2010, respectively)
 - Proposed limit of 0.15 lb/MMBtu (30-day r.a.)

Five-year Progress Report

- Original submitted in January 2015
- Update included with RH SIP revision
 - Requirements of 40 CFR 51.308(g)
- 40 CFR 51.308(h) “*adequacy of existing implementation plan*”
 - For Progress reports, statement to be included with this SIP revision.

Timeline and Next Steps

- Finish internal review
- 60-day formal FLM consultation period
 - Summarize/Incorporate comments
- 30-day public comment period
 - Hold public hearing
 - Respond to comments
- Route to Governor's Office for signature
- Submit

North Dakota Current Actions

- Upstream Oil and Gas
- Hess TGP
- Project Tundra
- Dakota Gasification Company
- Heskett Station Coal Closure (NG switch)

Stroh, David E.

From: Bachman, Tom A.
Sent: Wednesday, December 26, 2018 9:58 AM
To: kthomas@minnkota.com; mthoma@otpc.com; Roth, Mary Jo GRE-MG; Cris Miller; dwhitley@bepc.com; abbiekrebsbach@mdu.com; skohler@petrohunt.com
Cc: O'Clair, Terry L.; Semerad, Jim L.; Stroh, David E.; Seligman, Angela N.
Subject: Regional Haze Economic Analyses
Attachments: EPA Guidance 12-18.pdf

Regional Haze Contacts:

Following is an email we received from EPA regarding the proper interest rate to use in the Regional Haze four-factors economic analysis. Based on EPA's guidance, the Department believes the interest rate should not exceed 5.25%.

Also, attached is guidance that EPA provided for determining the "most impaired" days and adjusting the glidepath for international sources.

If you have any questions, please feel free to contact David Stroh, Angela Seligman or me.

Tom Bachman
Senior Environmental Engineer

701.328-5188. • tbachman@nd.gov • Division of Air Quality



health.nd.gov • 918 E. Divide Ave. • Bismarck, ND 58501-1947 • [Provide Feedback](#)



From: Worstell, Aaron <Worstell.Aaron@epa.gov>
Sent: Tuesday, December 18, 2018 11:55 AM
To: Bachman, Tom A. <tbachman@nd.gov>; Dobrahner, Jaslyn <Dobrahner.Jaslyn@epa.gov>
Cc: Sorrels, Larry <Sorrels.Larry@epa.gov>
Subject: RE: Regional Haze Economic Analyses

| |
|---|
| CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe. |
|---|

Hi Tom-

The interest rate recommended by EPA can vary by firm or industry, but the bank prime rate is a default rate that can be used for annualization of capital costs. The most recent bank prime rate (currently ~5.25%) can be found on the Federal Reserve website here:

<https://www.federalreserve.gov/releases/h15/>

Also, consult the somewhat recently revised Cost Estimation chapter of EPA's Control Cost Manual. See discussion of the bank prime rate in Section 2.5.2, Interest Rates:

https://www.epa.gov/sites/production/files/2017-12/documents/epaccmcostestimationmethodchapter_7thedition_2017.pdf

I hope that is helpful.

Happy Holidays!

Aaron

From: Bachman, Tom A. <tbachman@nd.gov>

Sent: Tuesday, December 18, 2018 9:48 AM

To: Worstell, Aaron <Worstell.Aaron@epa.gov>; Dobrahner, Jaslyn <Dobrahner.Jaslyn@epa.gov>

Subject: Regional Haze Economic Analyses

Aaron/Jaslyn:

Now that our sources are working on four-factor analyses (and GRE is contemplating a revised BART analysis for Coal Creek Station), a question regarding the analysis has come up. That is – what is the appropriate interest rate to be used in the economic analysis to determine annualized costs? In the past we have generally used 7%; however some analyses used a lower value. Given current low interest rates, is 7% still valid?

Any information you can provide will be appreciated!

Tom Bachman, P.E.
ND Dept. of Health
(701) 328-5188