Exceptional Events Rule

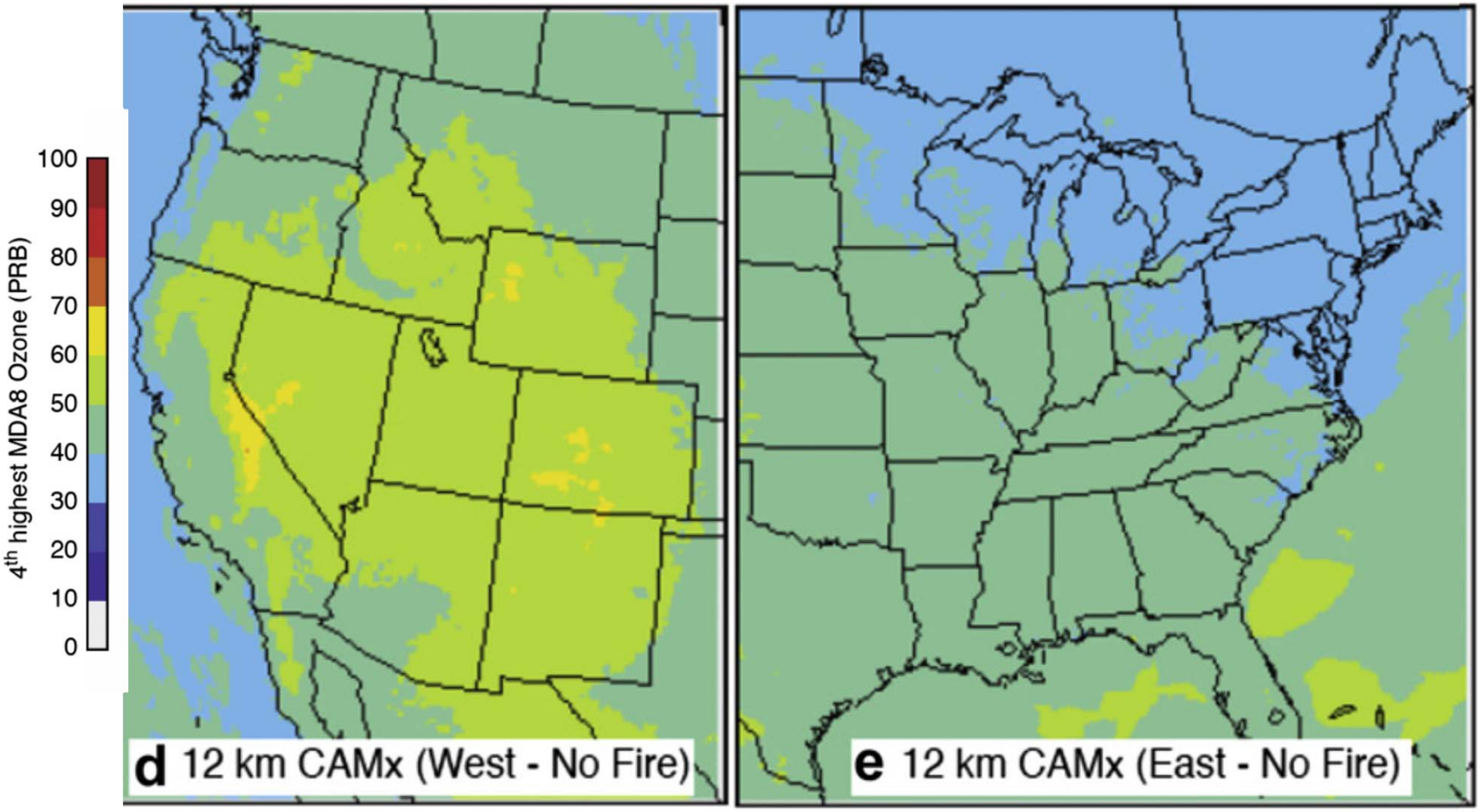
Addressing Total Background Ozone

Background Ozone

- Background ozone comes from natural sources and international transport.
- Natural Sources:
  - Wildfires
  - Lightning
  - Biogenic emissions from natural processes in soil, plants and animals
  - Stratospheric Intrusion
- International Transport:
  - Transport of emissions of ozone precursors mainly from Asia
  - Transport of ozone, which can have atmospheric lifetime of weeks
- Background ozone can be a significant fraction of total ozone, not controllable by US regulations, and may keep large areas in the West from meeting the 70 ppb Ozone NAAQS.
- EPA has historically only approved 1 stratospheric intrusion, 1 wildfire, and 1 associated fire for exclusion as exceptional events for ozone.

4th Highest 8-hour Maximum Daily Average Background Ozone with CAMx for 2006

Background as high as 50-70 ppb in the West!

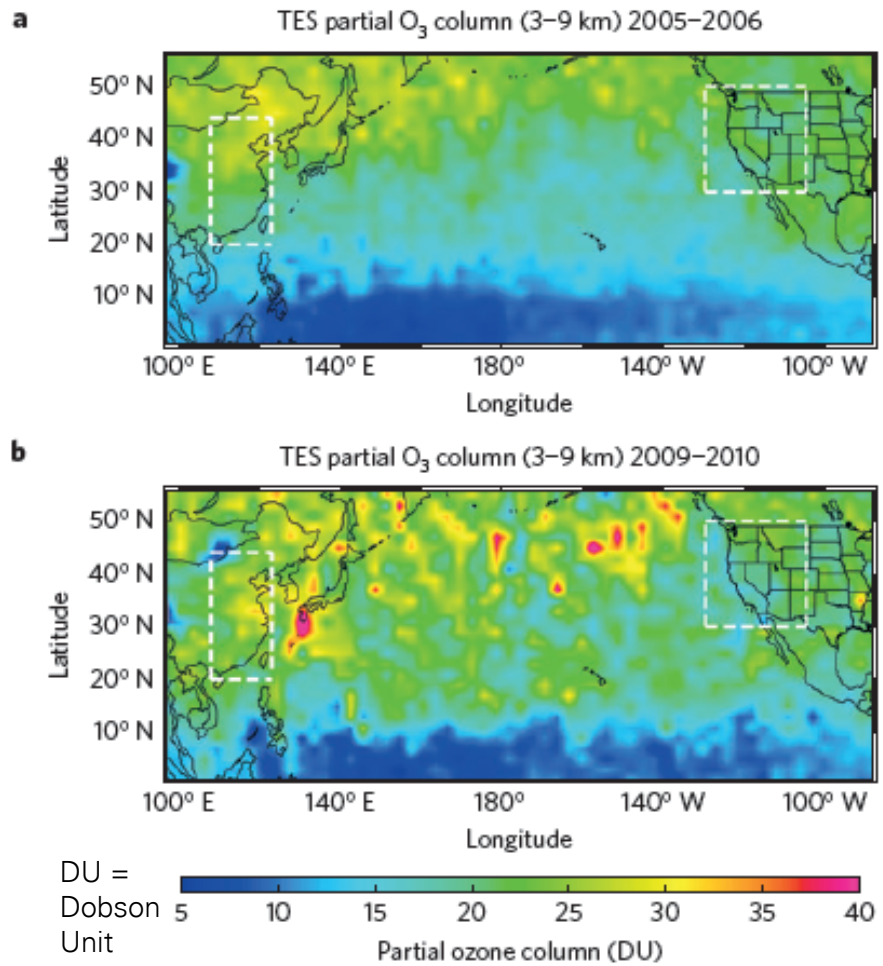


(Emery et al., 2012)

Aura Satellite Measurement of Increase In Asian Emissions

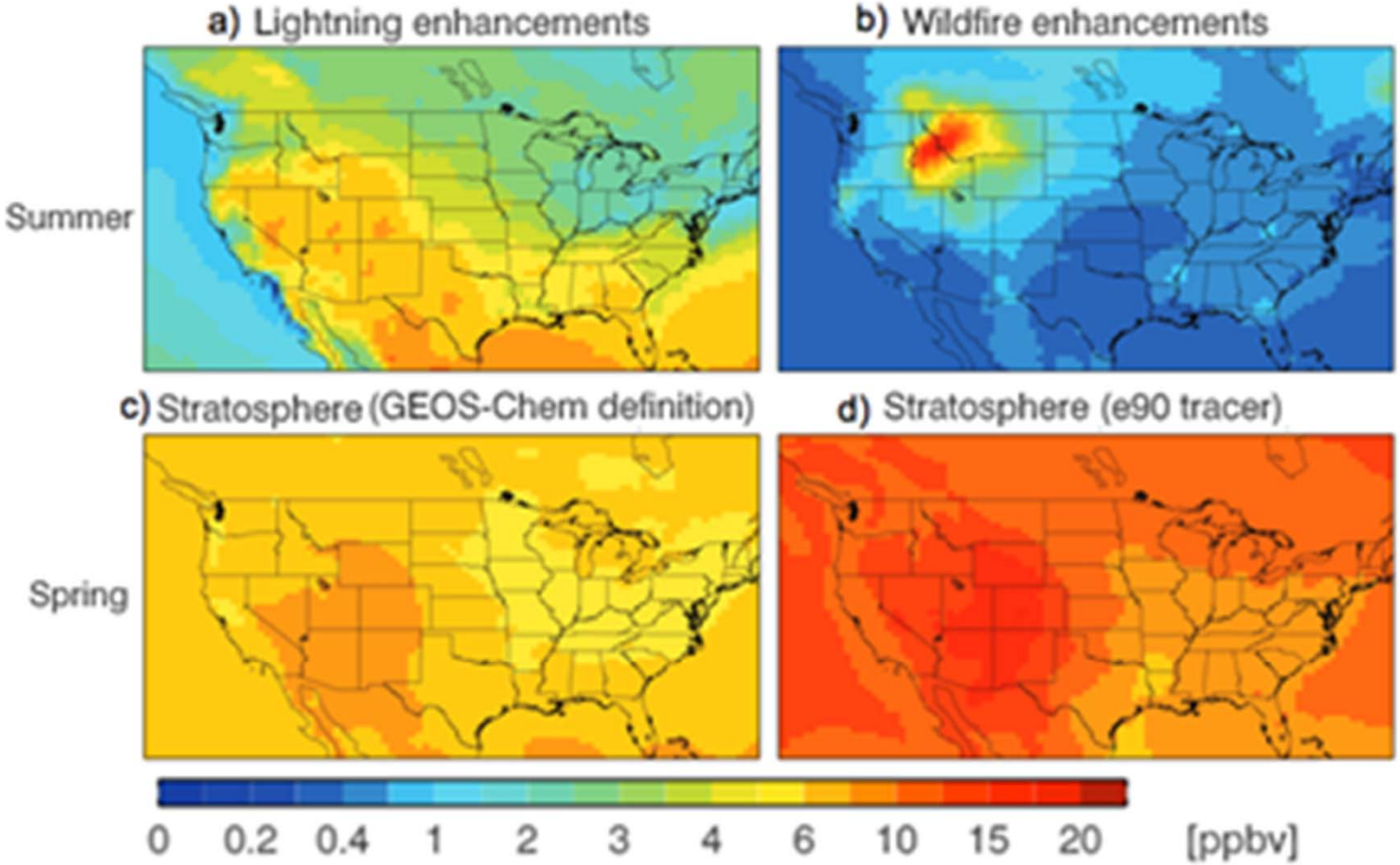
Verstraeten et al. (2015) review of Aura satellite measurements using the Tropospheric Emissions Spectrometer (TES) for ozone and the Ozone Monitoring Instrument (OMI) for NO_2 found:

- **Ozone** concentrations over China have **increased 7%** between 2005 and 2010 because
  - **Chinese emissions have increased 21%**
  - **Increased Stratosphere-troposphere transport**
- Transport from China of ozone and its precursors has **offset 43% of the 0.42 DU reduction** in free tropospheric ozone over the western US that was expected between 2005-2010 due to regulations.



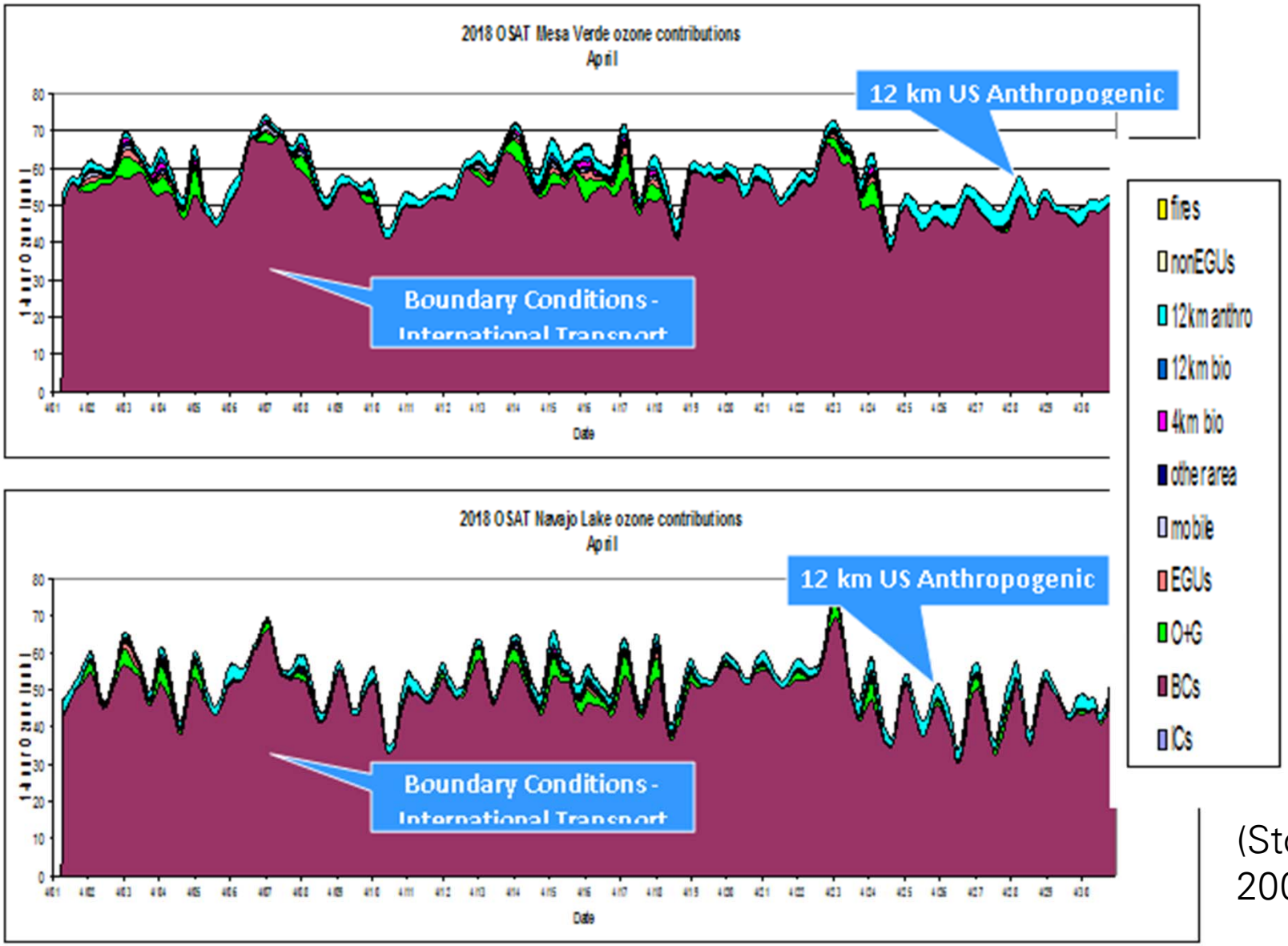
(Verstraeten et al., 2015)

Background Source Impacts



(Zhang et al., 2014)

Combined Background Ozone Exceed 70 ppb



(Stoeckenius, 2009 and 2010)

Impacts of Background Ozone To BP

- Operations in the Intermountain West
  - Wamsutter, WY
  - San Juan, CO and NM
- Ozone levels approaching 70 ppb
- Nonattainment results in applying the stricter Control Technique Guidelines applying to existing oil and gas production sites
- Retrofitting existing sites with controls extremely costly
- Could render existing wells uneconomic to operate although background ozone is the primary cause.
- Stricter permitting requirements to new sites limiting development
- Will not result reductions in ozone due to background ozone

Addressing Background Ozone

- Addressing exceedances due to background during implementation is difficult due to limited tools
- Exceptional Events Rule
  - Precludes exclusion of background ozone from biogenic sources , lightning and international transport.
  - Process is burdensome, time consuming, and expensive for the states.
  - Limited time for states to submit demonstrations
  - Only 3 approved
- Section 179B – International Transport
  - Area still designated nonattainment and not provided any relief
  - Only keeps are from being “bumped up” to higher nonattainment classification
  - Only 1 approved
- Section 182 (h) – Rural Transport
  - Area still designated nonattainment and not provided any relief
  - Process is burdensome, time consuming, and expensive for the states
  - Western counties are large and often located next to a metropolitan statistical area, preventing its use
  - Only 3 approved

Clean Air Act Requirements for Exceptional Events

- 319(b)(1) **(A) In general**
  - The term "exceptional event" means an event that—
    - (i) affects air quality;
    - (ii) is **not reasonably controllable or preventable**;
    - (iii) is an event caused by **human activity that is unlikely to recur** at a particular location or **a natural** event; and
    - (iv) is determined by the Administrator through the process established in the regulations promulgated under paragraph (2) to be an exceptional event.
- **319 (b)(2)(B) Requirements**
  - Regulations promulgated under this section shall, at a minimum, provide that—
    - (i) the occurrence of an exceptional event must be demonstrated by reliable, accurate data that is promptly produced and provided by Federal, State, or local government agencies;
    - (ii) a **clear causal relationship must exist between the measured exceedances** of a national ambient air quality standard **and the exceptional event t**o demonstrate that the exceptional event **caused a specific air pollution concentration at a particular air quality monitoring location**;
    - (iii) there is a public process for determining whether an event is exceptional; and
    - (iv) there are criteria and procedures for the Governor of a State to petition the Administrator to exclude air quality monitoring data that is directly due to exceptional events from use in determinations by the Administrator with respect to exceedances or violations of the national ambient air quality standards.

Strengths and Weakness of the EER Proposal

- Removal of the clauses that were not in the Clean Air Act
  - "There would have been no exceedance or violation but for the event." (40 CFR 50.14(c)(3)(iv)(D)
  - "Is associated with a measured concentration in excess of normal historical fluctuations including background." (40 CFR 50.14(c)(3)(iv)(C))
- Removal of the requirement to demonstrate "Affected air quality (40 CFR 50.1(j))"
- None the less, the revisions stop short from including all sources of background in Exceptional Events demonstrations
  - International transport
  - Biogenic Sources
  - Lightning
- Incomplete approach requires quantification of individual sources of background ozone which is impossible to achieve and does not allow for a holistic approach.

Further Strengthen of the EER Proposal to Address Total Background Ozone

- Use the commonly understood definition of "**event**" to apply **regardless of duration** (short term and long term)
- **Allow all sources of background ozone to be excluded** (not just wildfires and stratospheric intrusion)
- **Include international transport** as it is not controllable by states and it includes natural sources. It should be treated as a "natural" source that does not have to demonstrate it is unlikely to recur at a specific location
- **Include lightning** as it is clearly a "natural, non-recurring event that is not reasonably controllable or preventable.
- **Include biogenic sources of ozone** as they are clearly natural sources.
- **Allow exceedance due high total background ozone to be an exceptional event**, not just contribution from each source as separate events.
  - Clear causal relationship between total background ozone and exceedance
  - Where modeling or monitoring show total background as the "principal" contributor to exceedance, a clear causal relationship should be presumed.
  - Current policy is not technically feasible, but these changes are feasible

Alternative – Appendix U of the Ozone NAAQS

- If it is concluded that the EER does not allow for a holistic approach to address background, then revisions to Appendix U of the Ozone NAAQS is another tool that is available.
- Appendix U provides guidelines for interpreting data on ozone levels for purposes of whether the NAAQS is violated.
- Appendix U could be revised to provide that exceedances of the Ozone NAAQS caused “principally” by background will not be taken into account in determining whether an area is in nonattainment.
- EER revisions are strongly preferred due to the upcoming October 1, 2016 state designation deadlines for Ozone.