CENSARA: REGIONAL HAZE GLIDEPATH EVALUATION

Preliminary Results

Cassie Archuleta

Air Resource SPECIALISTS

Uarporn Nopmongcol and Ralph Morris

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CENSARA RHR GLIDEPATH EVALUATION

- Project task: Provide recommendation(s) regarding how to address anthropogenic/non-anthropogenic emission sources outside a state's control to help develop a more accurate regional haze program glide path
- Factors evaluated include:
  - Definitions of controllable vs. uncontrollable sources
  - Attribution methods
- Use of the above definitions and methods to evaluate RHR glidepath treatment recommendations, including:
  - Modifications to treatment of "Natural Conditions"
  - Characterization of large episodic natural events (e.g., wildfires and dust storms)
  - Calculation of 20% most impaired/least impaired days

DEFINITIONS OF CONTROLLABLE VS. UNCONTROLLABLE SOURCES

Using WAQS 2008 PSAT modeled categories:

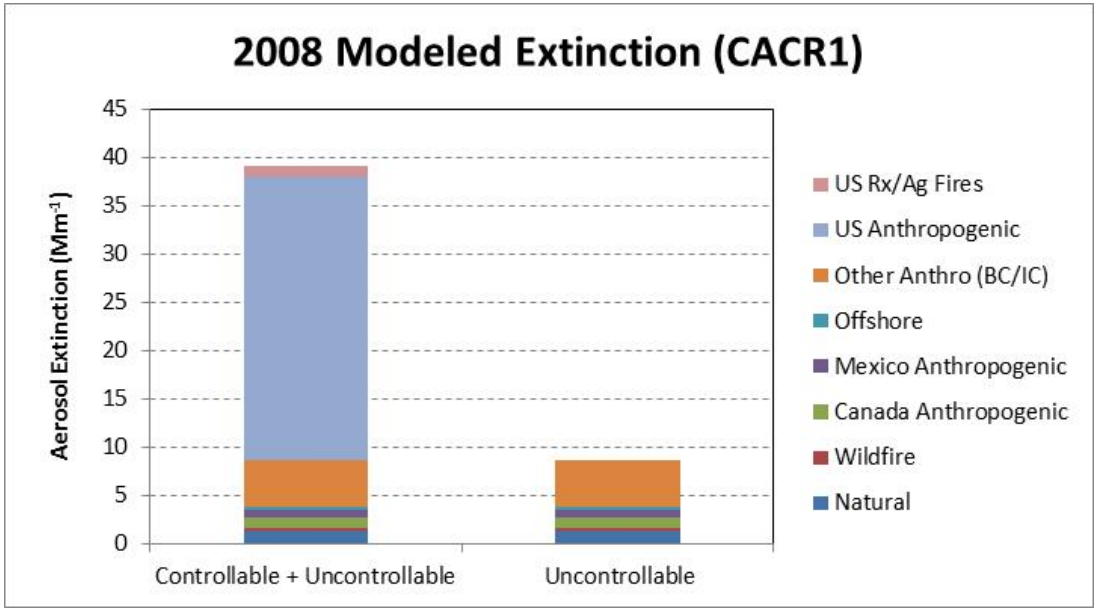
Uncontrollable

- US+Non-US Natural
- US+Non-US Wildfire
- US Prescribed Fires
- Canada
- Mexico
- Offshore
- Non-US Prescribed Fires
- Non-US Agricultural Fires
- Boundary Conditions (BC)
- Initial Conditions (IC)

Controllable:

- US Anthropogenic
- US Agricultural Fires

Example results from 2008 PSAT



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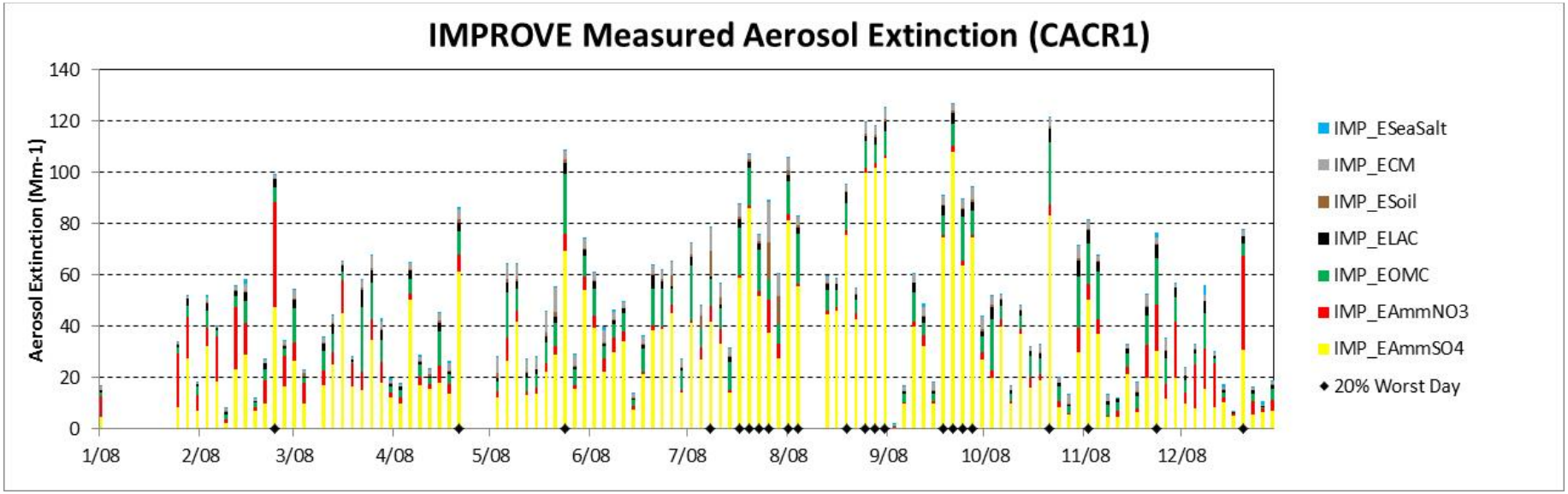
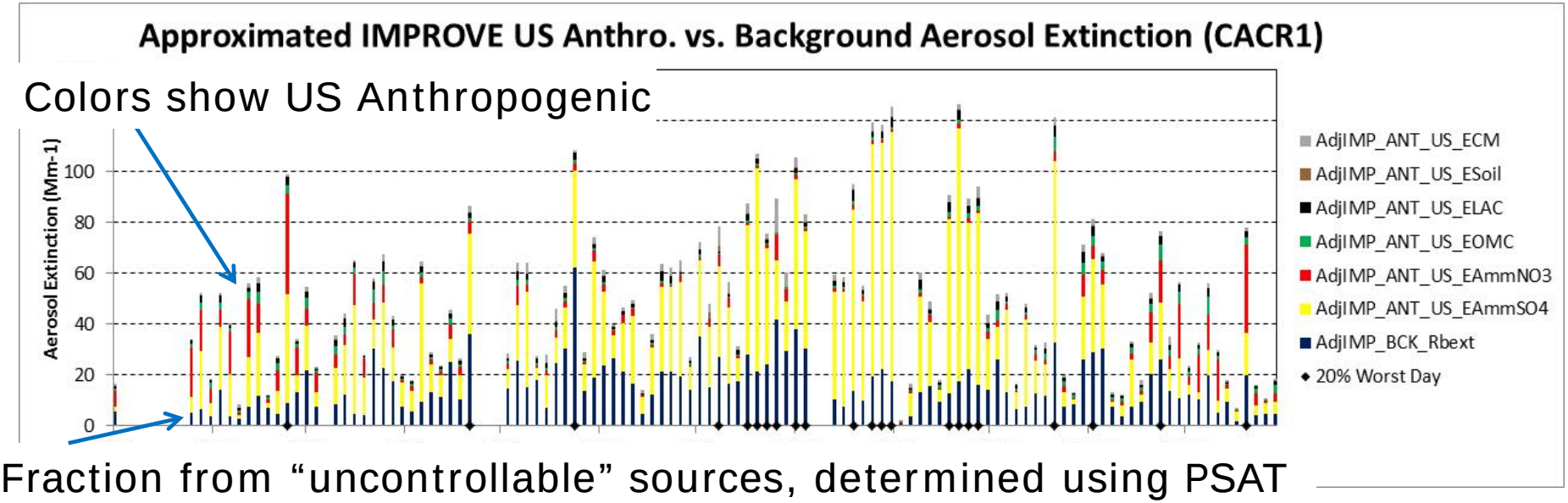
PROPOSED TREATMENT OF CONTROLLABLE VS. UNCONTROLLABLE CONTRIBUTIONS

- Proposed methodology:
  - Use 2008 PSAT visibility attribution data to scale the source contributions to match the IMPROVE measurements by species
    - Controllable: %Controllable (from 2008 PSAT) * measured (from IMPROVE)
    - Uncontrollable: %Uncontrollable (from 2008 PSAT) * measured (from IMPROVE)
  - Use PSAT weighted “uncontrollable” as a more attainable 2064 “background” goal , rather than default natural conditions

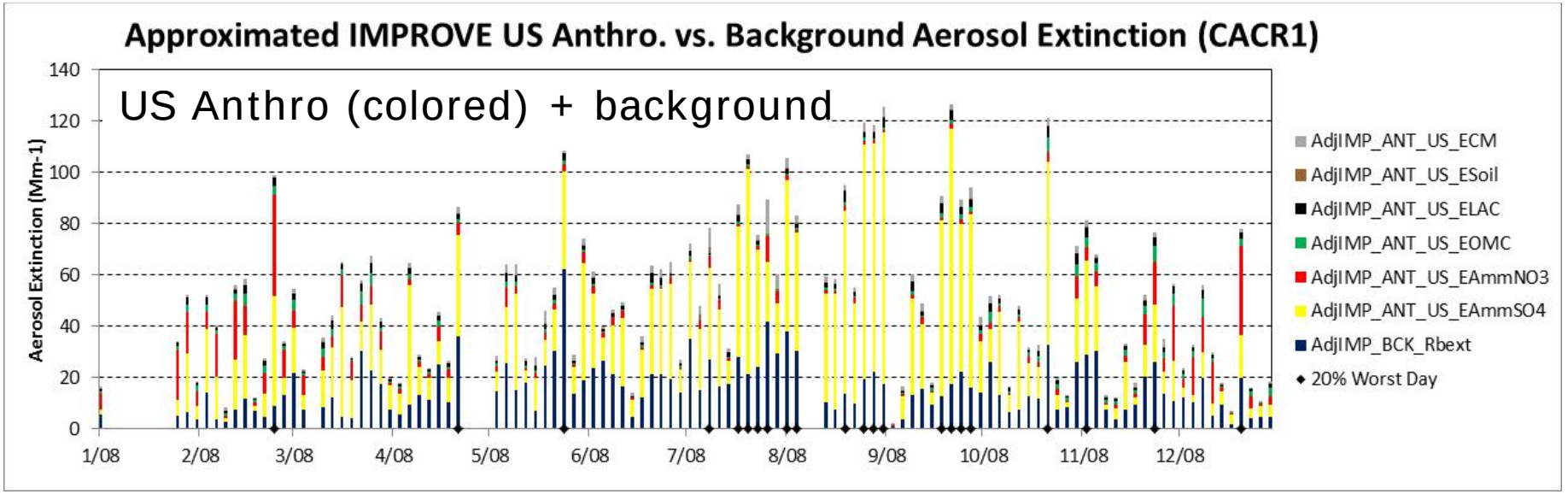
CONTROLLABLE VS. UNCONTROLLABLE CONTRIBUTIONS TO AEROSOL EXTINCTION

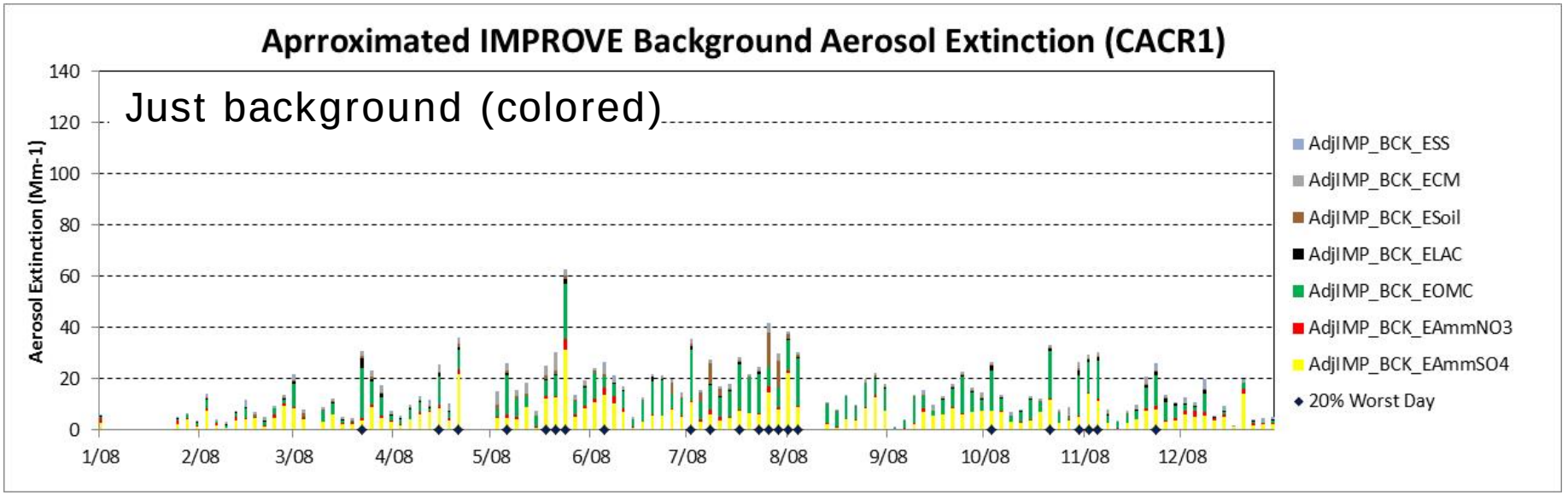




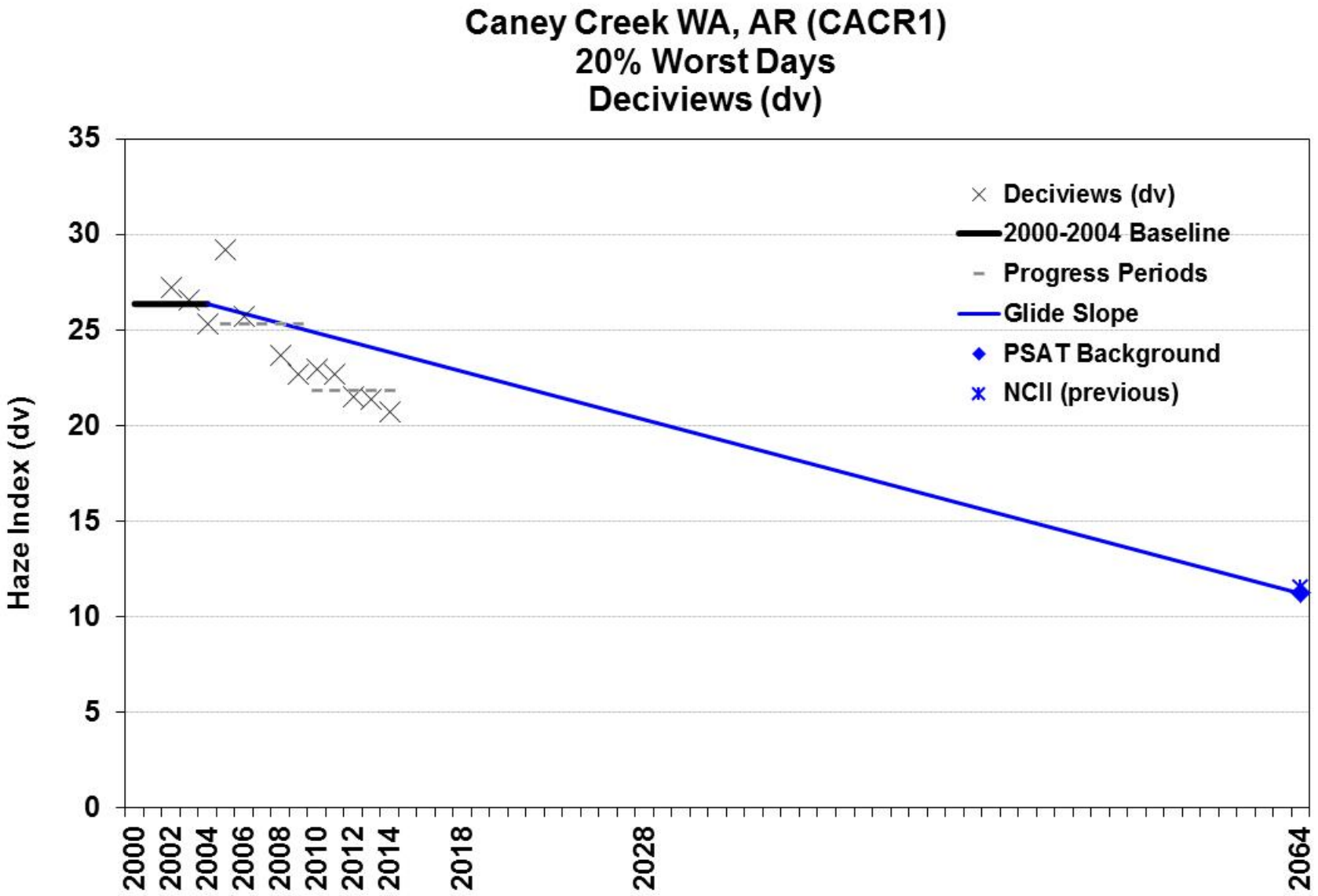
Fraction from “uncontrollable” sources, determined using PSAT

CONTROLLABLE VS. UNCONTROLLABLE CONTRIBUTIONS TO AEROSOL EXTINCTION





Glideslope – Example Plots (CACR1)



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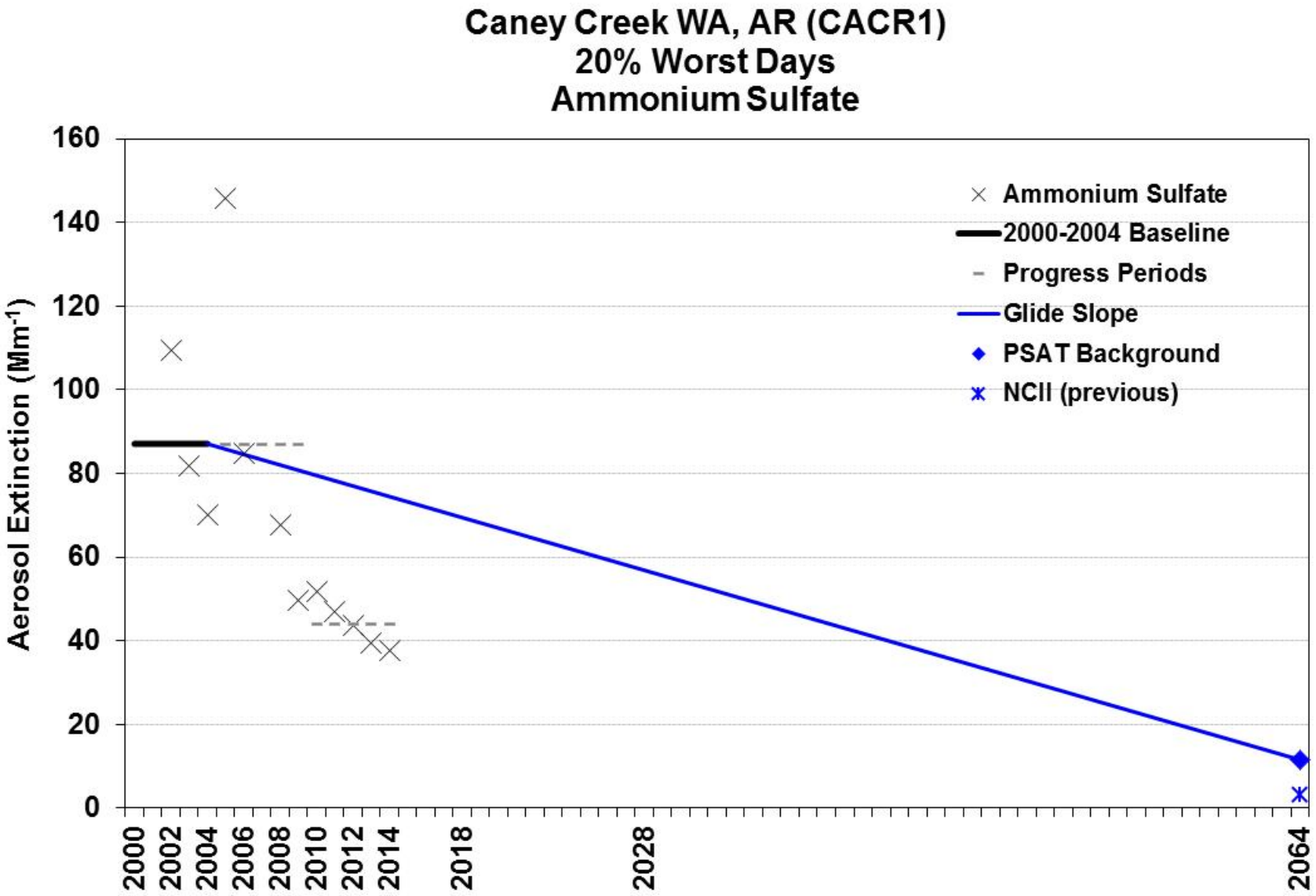

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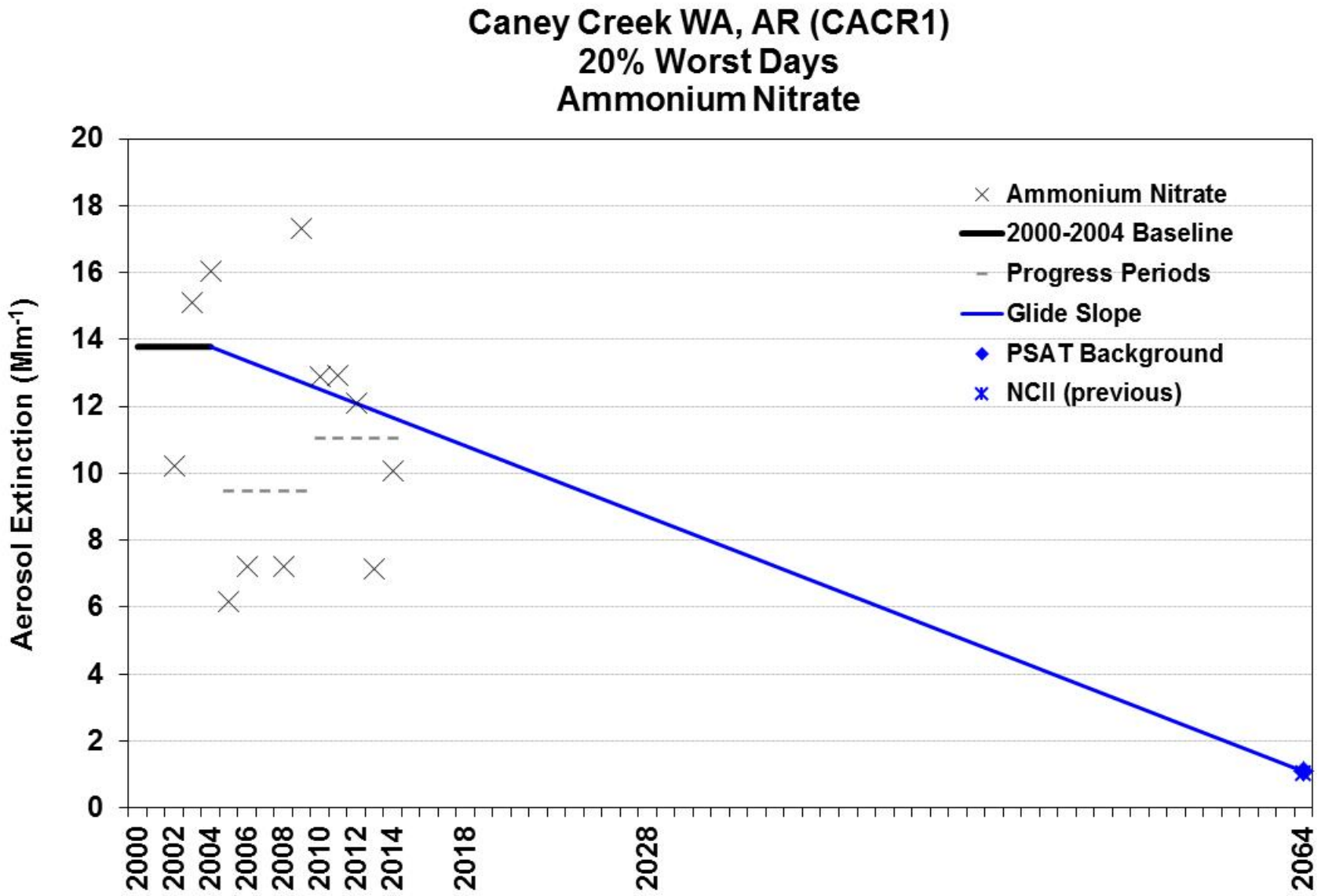

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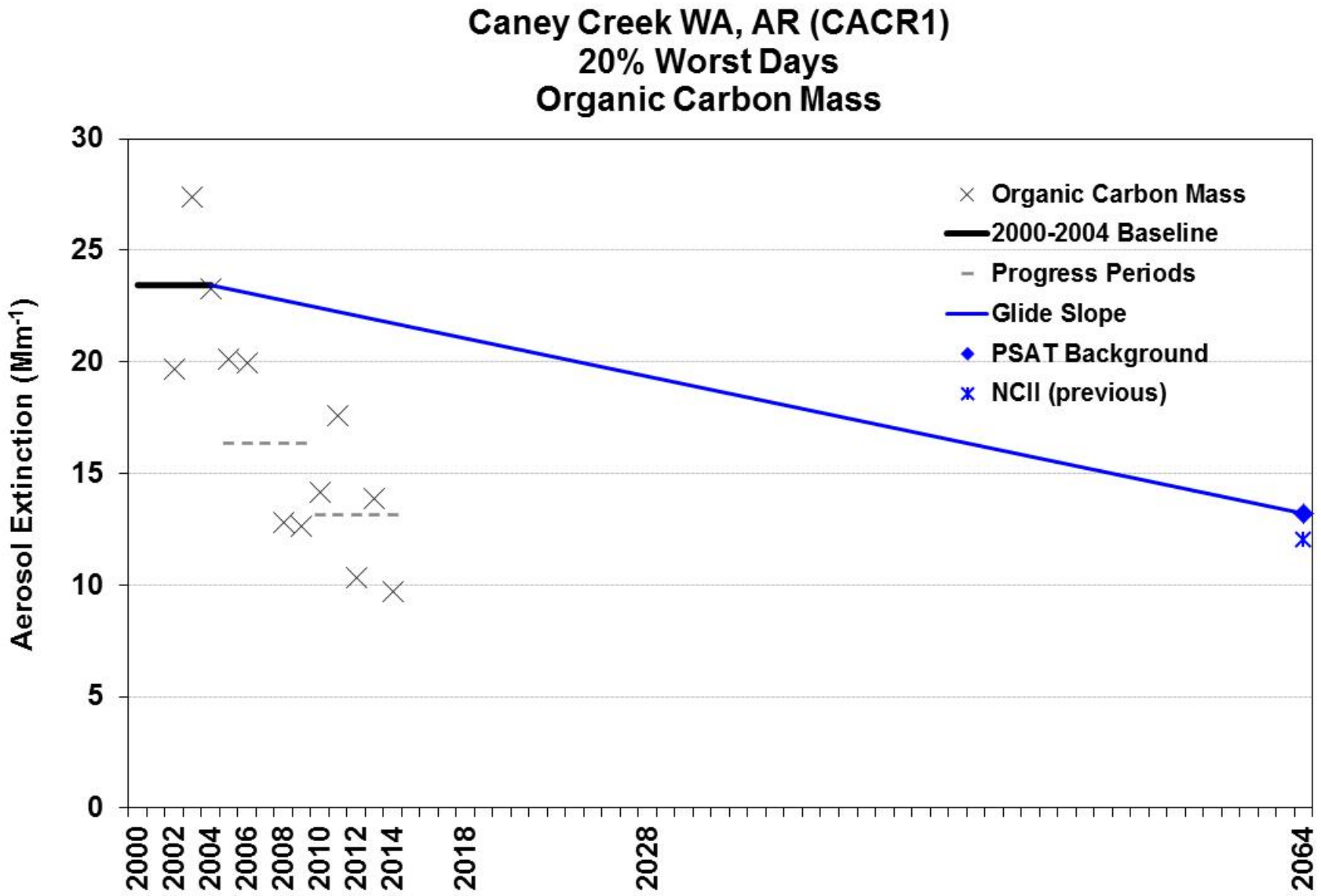

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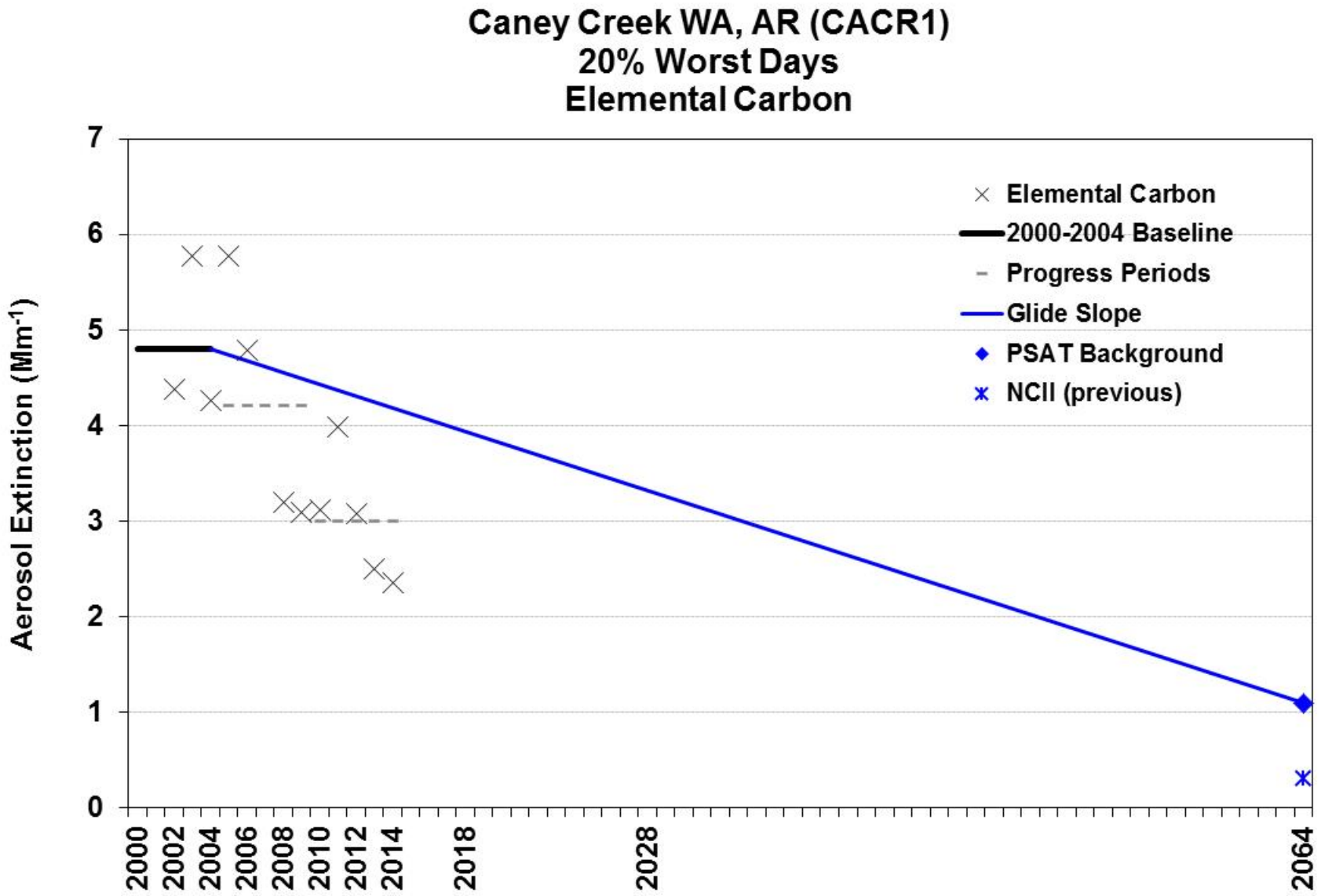


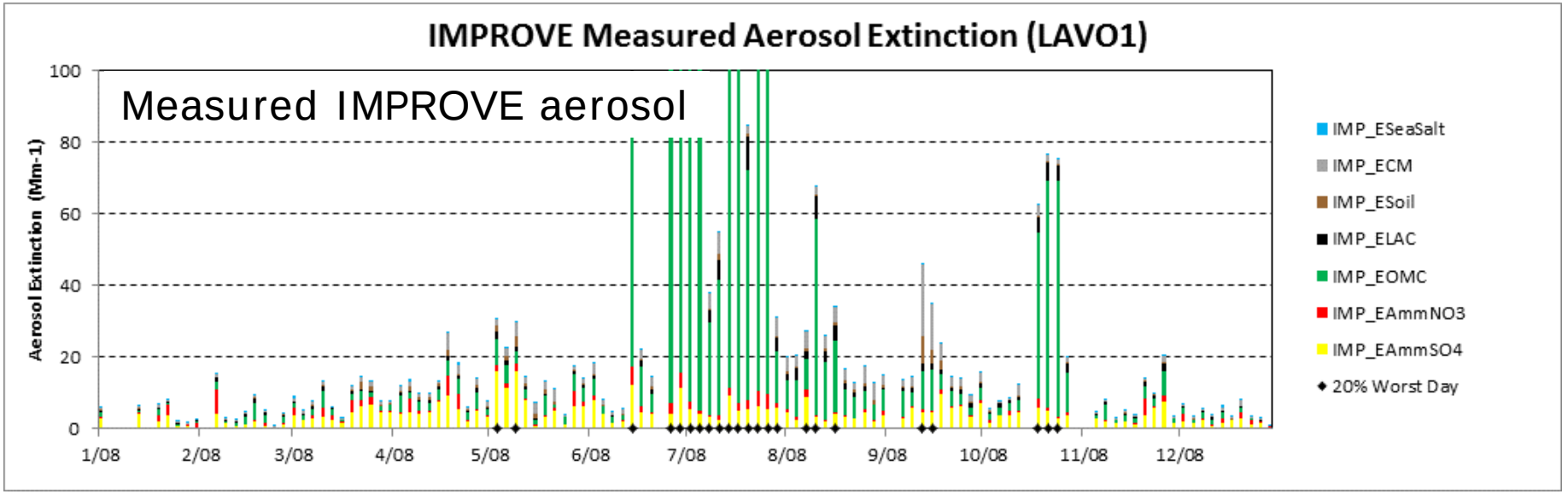
CONTROLLABLE VS. UNCONTROLLABLE CONTRIBUTIONS TO AEROSOL EXTINCTION

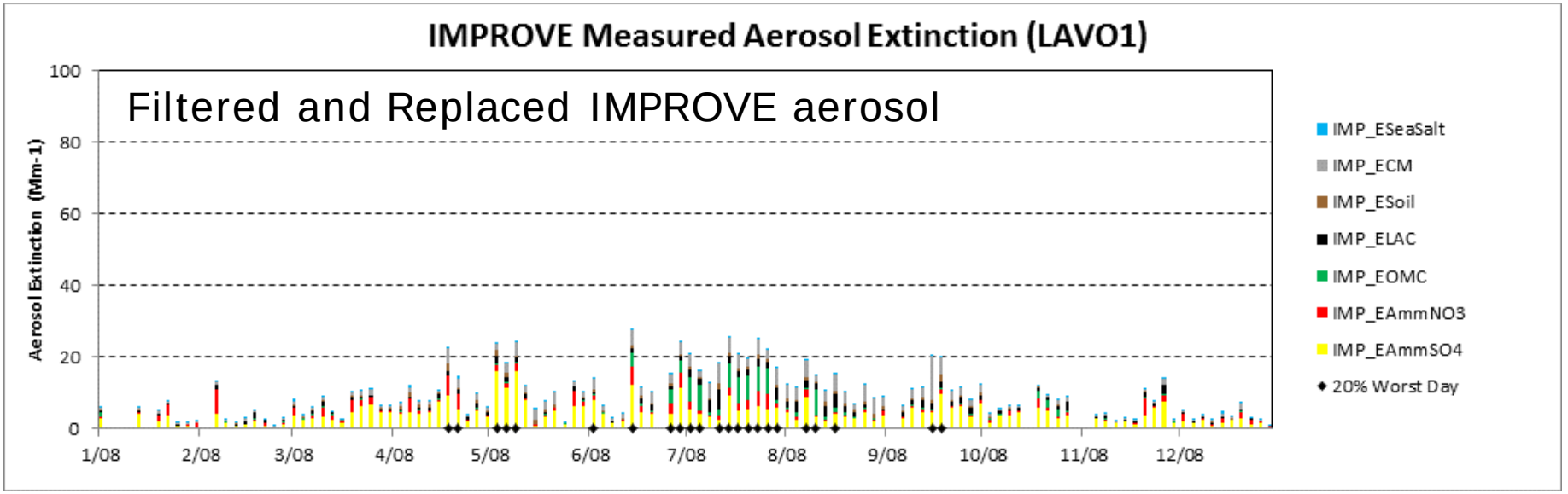
- Recommendation
  - Use “Uncontrollable” part of PSAT attribution as 2064 goal
  - Alternate – model future year projection without “controllable” emissions
- Advantages:
  - Can use same modeling platform for current, interim and goal conditions
    - Allows for consistent assumptions for all points along glidepath (e.g., meteorological conditions, emissions profiles, etc.)
  - Daily distribution for “uncontrollable” 2064 goal allows for determination of 20% best and 20% worst days
- Dis-Advantages:
  - Models have inherent uncertainty (partially addressed by scaling model results to IMPROVE results)
  - “Uncontrollable” attribution as modeled in 2008 (or alternate base year) is assumed as estimate for 2064
  - Any large natural episode events (e.g. wildfires and dust storms) in 2008 (or alternate base year) would be represented in future goal (see proposed treatment on next slide)

TREATMENT OF LARGE, EPISODIC, NATURAL EVENTS

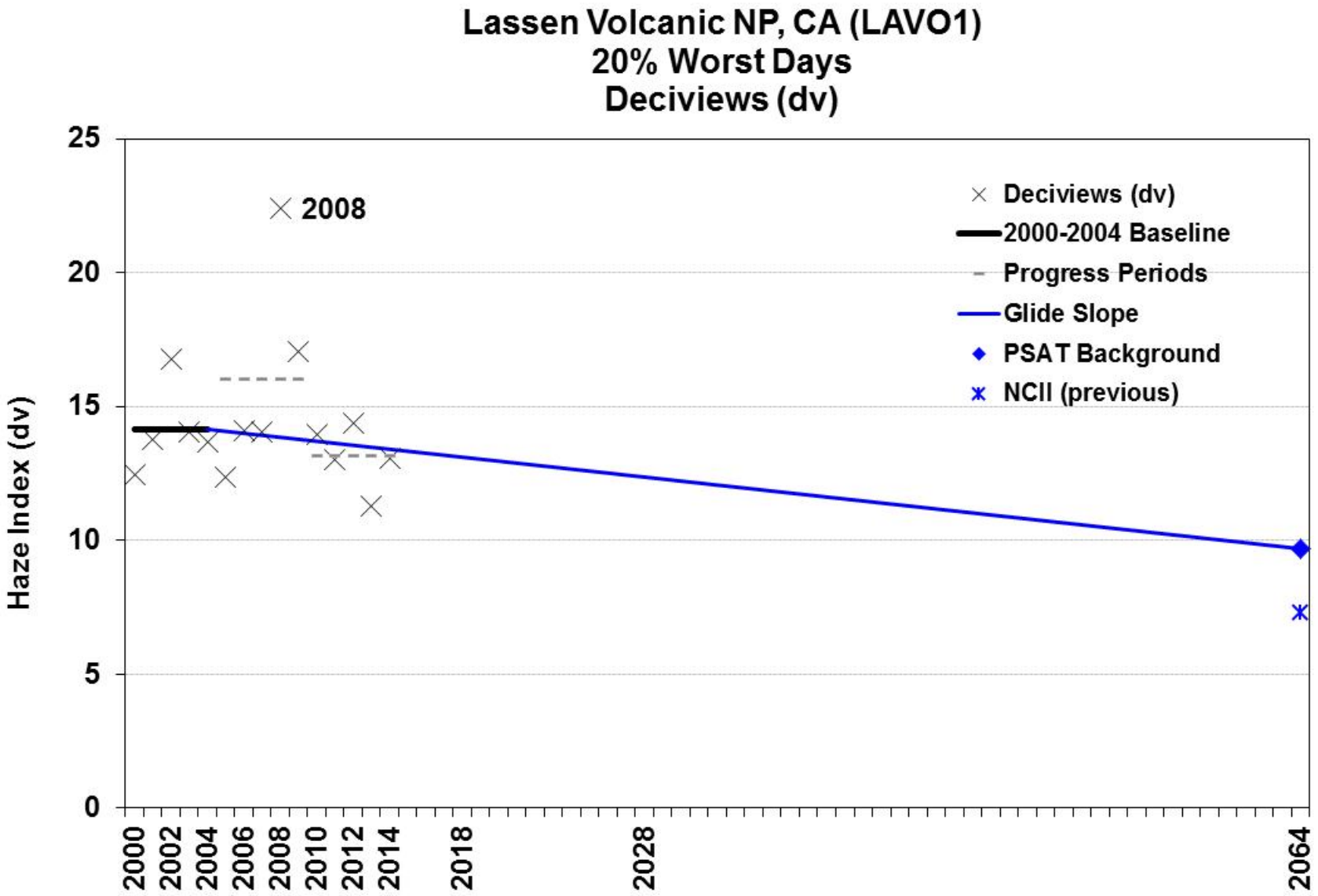
- For “Background” conditions:
  - Identify large episodic natural events in measured data
    - Jim Boylan method: Filter OC+EC (TC) and CM for values > 5*Median to isolate “large” events (e.g. wildfires and dust storms)
    - **Recommend comparisons to supporting information such as non-soil K, satellite images or other evidence of probable fire/dust impacts
  - Replace large episodic natural events with median values
    - Jim Boylan’s method uses annual median from entire history of site
    - **Recommend using current IMPROVE precedent to determine substituted value
      - IMPROVE uses the seasonal median from previous 5 years to fill in missing data
  - Determine “Background” conditions as described previously (using attribution results to determine controllable vs. uncontrollable)
- For “Baseline” and “Current” conditions:
  - Can use same methodology – identify events, and substitute medians
  - Recalculate best and worst day distributions

EXAMPLE – FILTER AND REPLACE LARGE EPISODIC NATURAL EVENTS





Glideslope – Example Plots (LAVO1)



*Episodic events substituted for 2064 “background” only (not baseline or current conditions)

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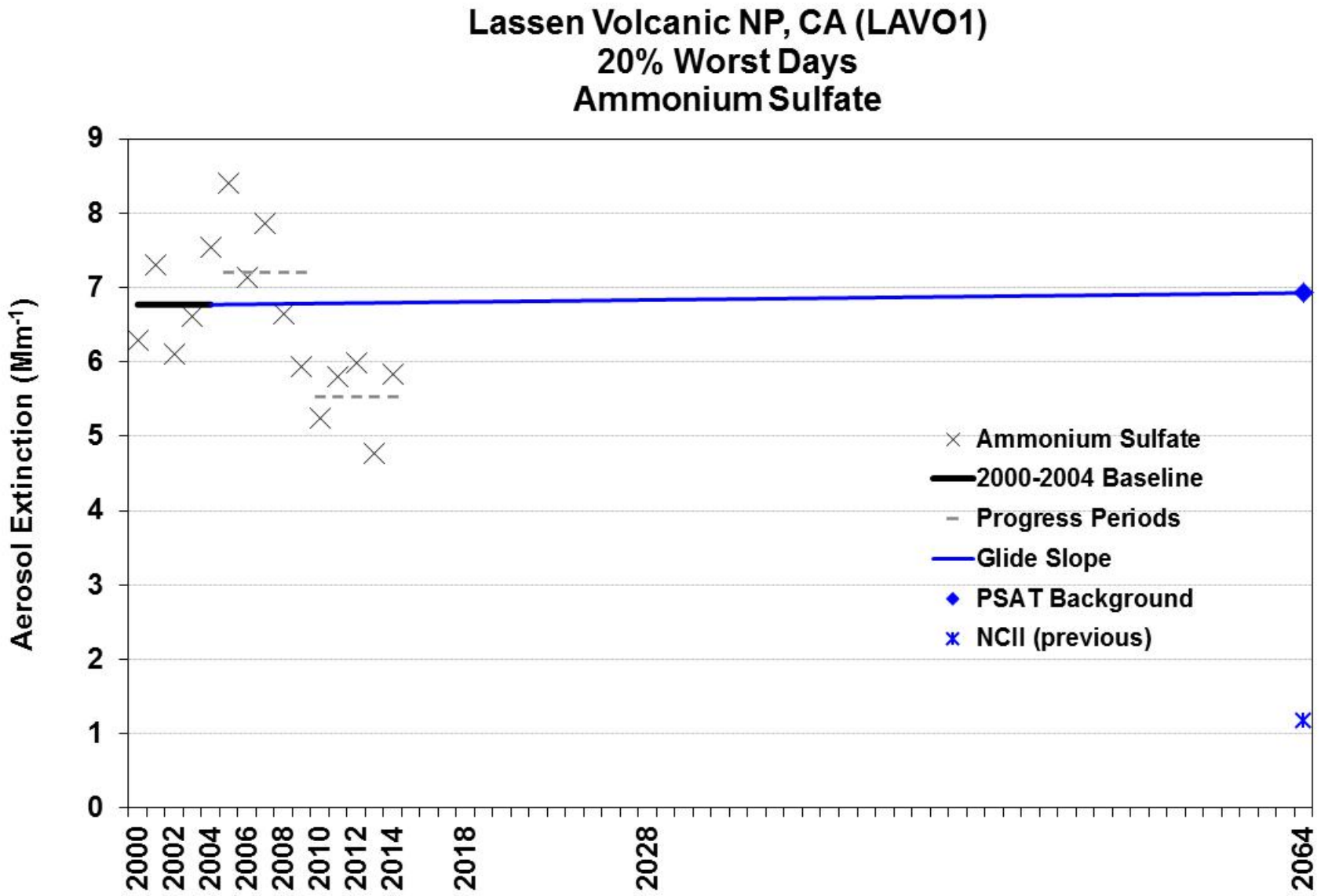

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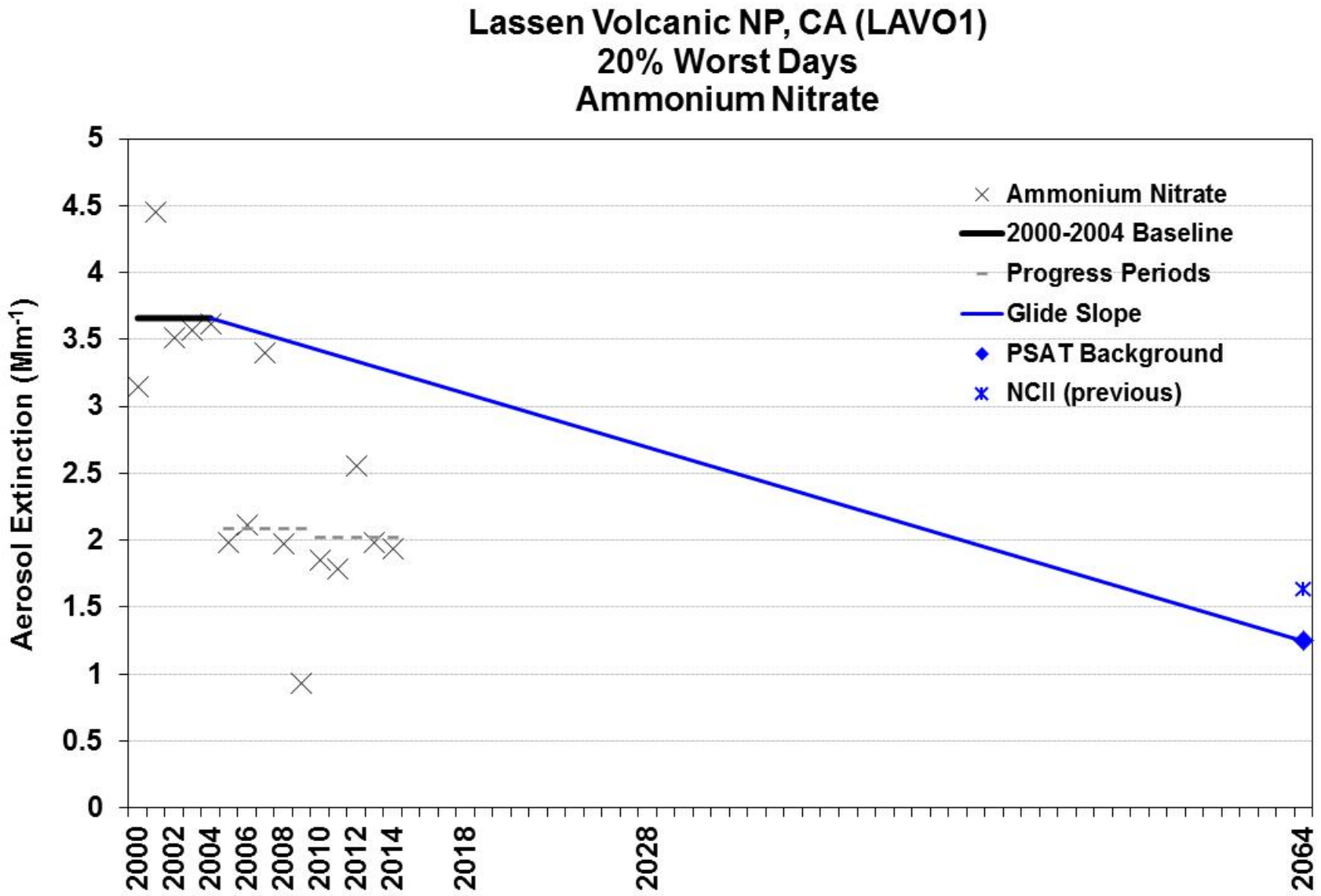

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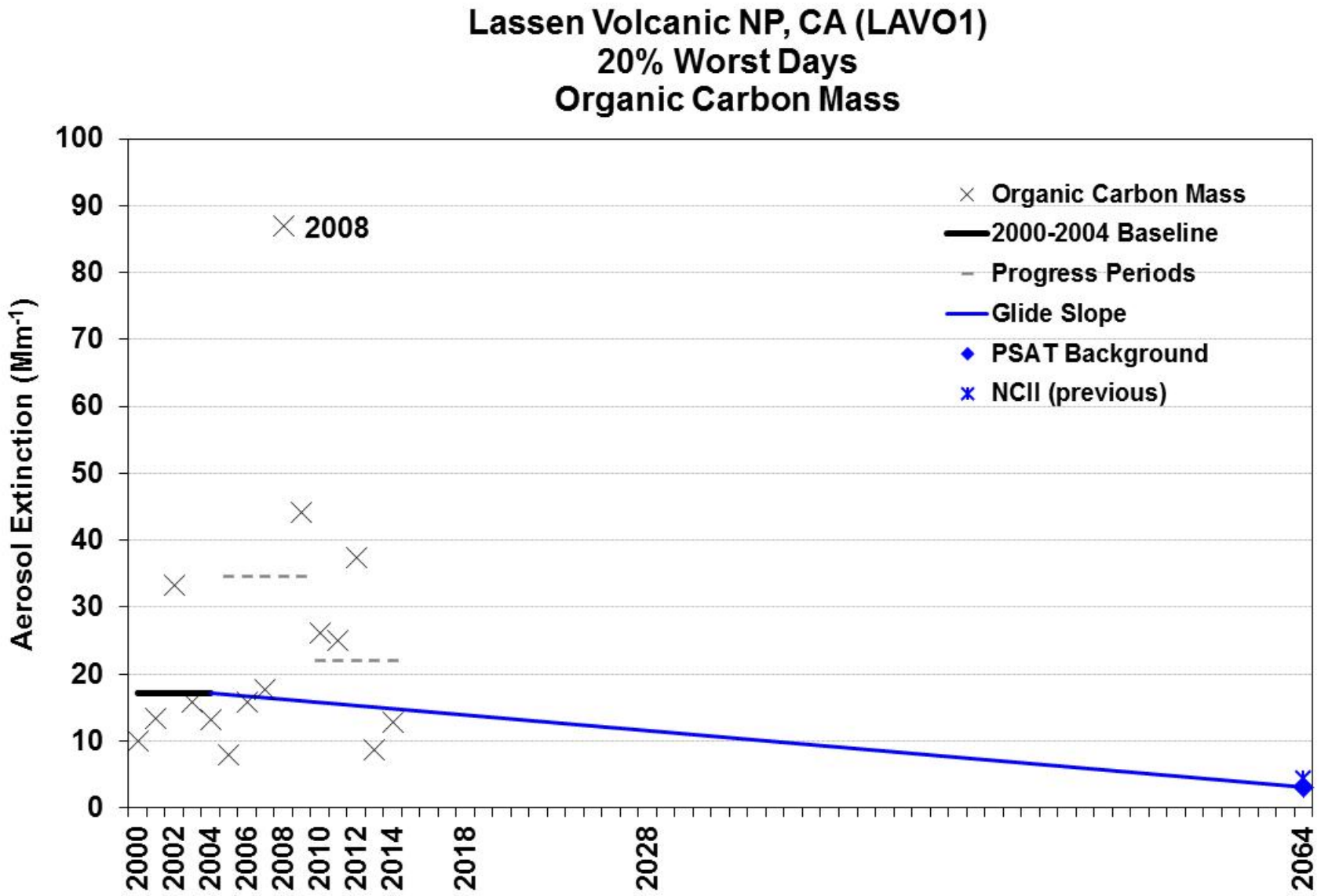

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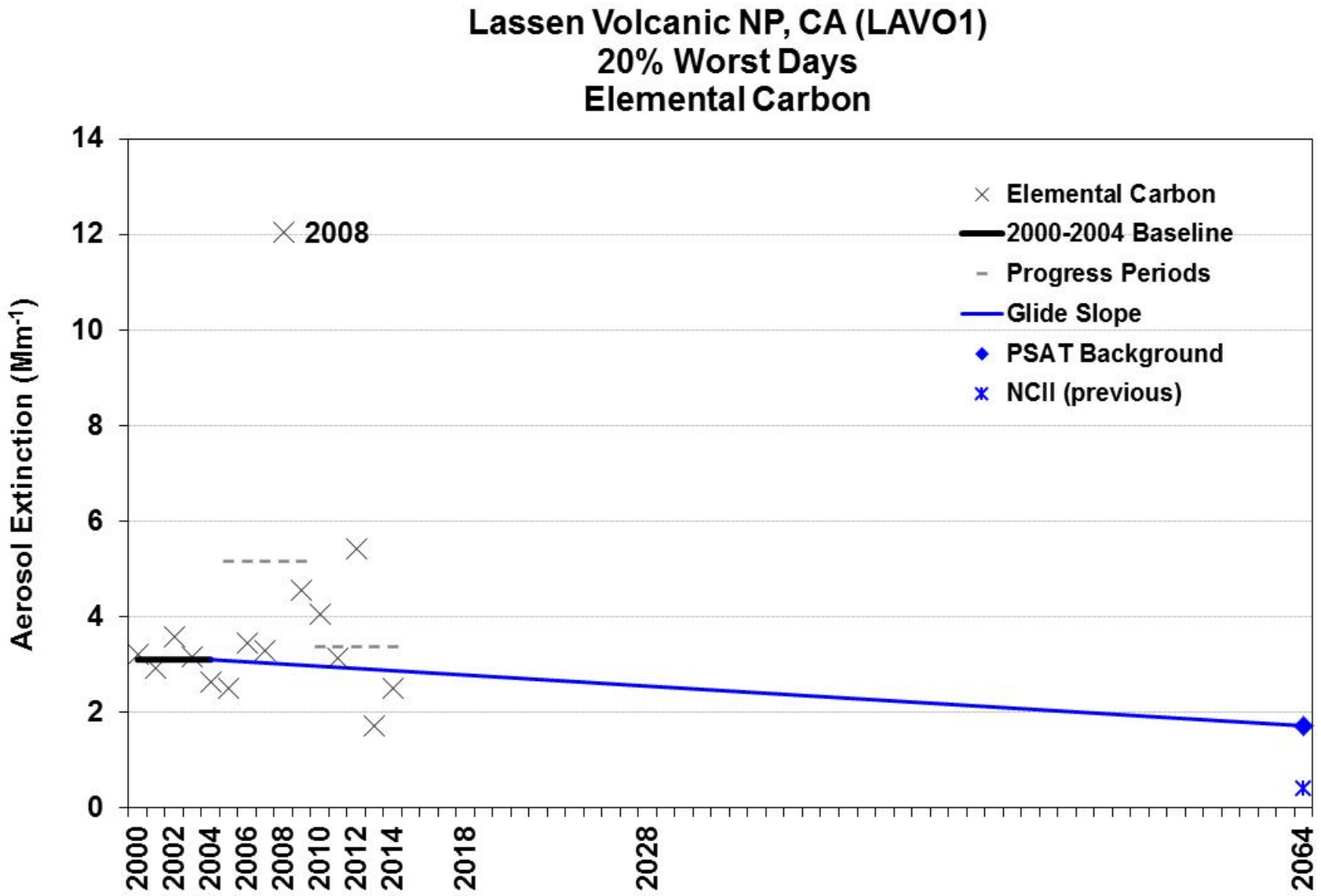

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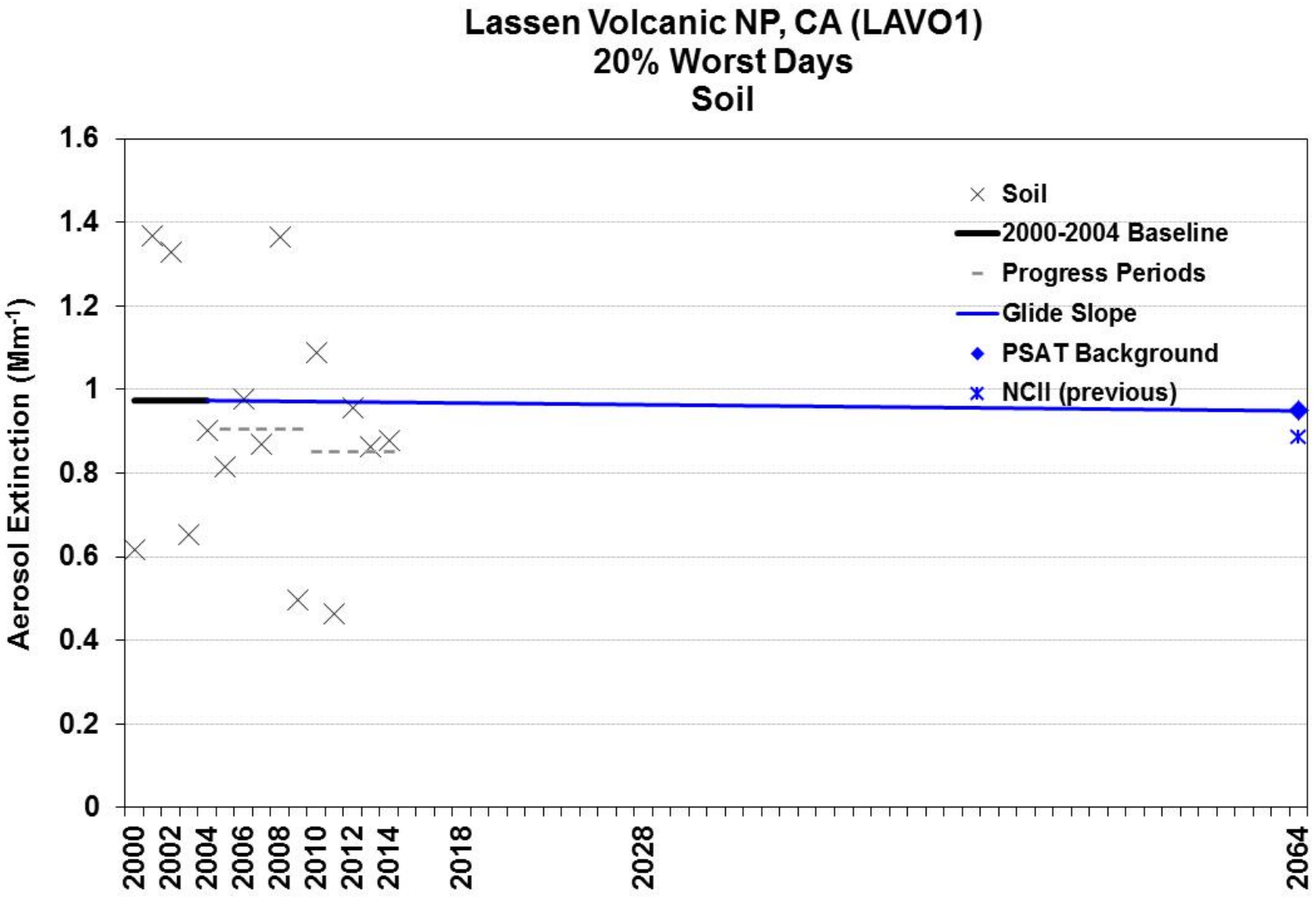

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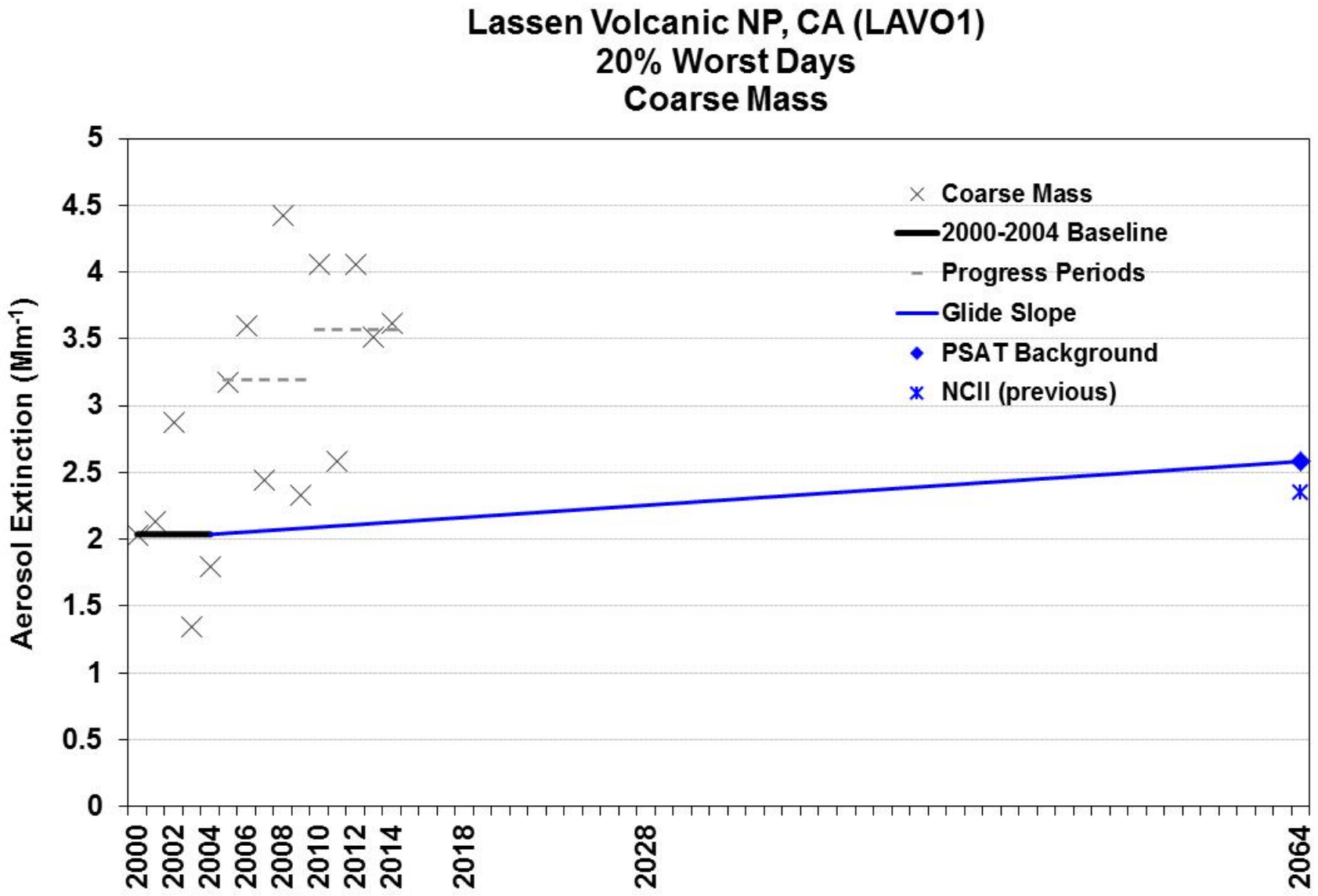

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