Report on the Escalating Human and Economic Toll of Wildfire Smoke in the Western United States

Photo: 2018 Klamathon Fire – William E. Simpson II

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For years, I have tirelessly advocated for greater recognition of the devastating human and economic impacts of catastrophic wildfires and their toxic smoke in the western United States.

Despite facing resistance and dismissal from experts and officials, my warnings—rooted in personal tragedy and extensive research—have emphasized that modern wildfires, intensified by excessive fuel loads from collapsed herbivory (reduced natural grazers like wild horses and deer), produce "novel toxins" through extreme pyro-chemistry. These toxins go beyond standard pollutants like PM2.5 and carbon monoxide, silently contributing to premature deaths, long-term co-morbidities, and massive economic burdens.

The tragic loss of my wife, Laura Simpson, to an autoimmune reaction triggered by toxins in the 2018 Klamathon Fire smoke—despite over $1 million in medical care at St. Vincent's Neurological Center and Oregon Health & Science University—underscores the urgency of this issue. Her death, as noted by the Oregon Medical Examiner, was directly linked to these novel compounds. I have consistently argued that ecosystem imbalances, including the removal of natural grazers, exacerbate fire intensity and smoke toxicity, leading to preventable devastation.

Recent scientific advancements, particularly the December 2025 study published in Environmental Science & Technology by the American Chemical Society (ACS), vindicate these long-standing claims. This report

integrates my prior findings, the 2024 UCLA study on wildfire smoke mortality, and this new ACS research to provide updated estimates of annual premature deaths, long-term co-morbidities, and financial impacts across the western U.S. states (California, Oregon, Washington, Idaho, Nevada, Arizona, Utah, Colorado, New Mexico, Wyoming, and Montana). It calls for immediate policy action to address fuel management through natural solutions like rewilding American wild horses as part of the Wild Horse Fire Brigade initiative.

Background: My Warnings and Research on Wildfire Smoke Toxicity (2019–2025)

Since 2019, I have documented and publicized the dangers of "novel toxins" or hydrocarbons formed in super-hot wildfires, linking them to ecosystem mismanagement. These warnings predate major studies and highlight how fuel buildup from disrupted herbivory creates hotter fires, releasing overlooked compounds that trigger chronic health issues, including autoimmune disorders, respiratory diseases, and cardiovascular problems. Despite pushback, my work has consistently called for holistic forest management to reduce fire risks and smoke hazards. Key pre-2025 articles and posts demonstrating my foresight include:

- GrazeLIFE Blog (November 1, 2019): Highlighted "toxic wildfire smoke" resulting from fuel buildup in imbalanced ecosystems due to collapsed herbivory. https://grazelife.com/blog/wild-horse-fire-brigade-lessons-in-rebalancing-north-american-ecosystems-by-rewilding-equids/
- Sierra Nevada Ally (April 5, 2021): Detailed the "toxic smoke from the 38,000-acre Klamathon Fire" that claimed my wife's life, emphasizing toxins beyond standard pollutants. https://sierranevadaally.org/2021/04/05/wild-horse-wars/
- Pagosa Daily Post (April 4, 2023): Warned of "toxic wildfire smoke" from intensified fires linked to ecosystem imbalance. https://pagosadailypost.com/2023/04/04/opinion-wild-horses-vs-cattle-and-why-the-difference-matters/
- Siskiyou News (June 8, 2023): Called out "deadly toxic wildfire smoke" as an underrecognized killer driven by mismanagement. https://www.siskiyou.news/2023/06/08/apathy-greed-dogma-regarding-wildfires-toxic-smoke-is-killing-americans/
- Siskiyou News (June 30, 2023): Connected "toxic wildfire smoke" to predator-prey disruptions and imbalanced ecosystems. https://www.siskiyou.news/2023/06/30/salute-to-the-heritage-herd-of-wild-horses-of-the-cascade-siskiyou-mountains/
- Siskiyou News (June 27, 2023): Noted that prescribed burning releases "even more toxic smoke [and] carbon compounds," foreshadowing later findings on organic emissions. https://www.siskiyou.news/2023/06/27/prescribed-burning-a-bad-prescription-for-what-ails-our-wilderness-landscape/
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- Siskiyou News (June 10, 2024): Cited "novel toxins in the smoke" as the cause of my wife's death, per her death certificate. https://www.siskiyou.news/2024/06/10/indigenous-wisdom-and-eco-cultural-fire-how-effective-is-it-really/
- Pitchstone Waters (April 28, 2022): Discussed "toxic smoke" from wildfires linked to ecosystem imbalance. https://www.pitchstonewaters.com/understanding-wild-horse-fire-brigade/

- Pitchstone Waters (February 3, 2025): Referenced my wife being "killed by toxins in wildfire smoke." https://www.pitchstonewaters.com/la-fires-can-saving-american-wild-horses-help-reduce-the-loss-of-life-and-economic-losses-by-preventing-reducing-wildfires-toxic-smoke/
- Ginn and Topics (March 2, 2025): Explained my wife's death from an "autoimmune response triggered by toxins in the wildfire smoke." https://ginnandtopics.wordpress.com/2025/03/02/william-e-simpson-ii-talks-about-wild-horses-minimizing-wildfires-and-the-film-horse-of-nature-which-screens-at-amdocs-2025/
- Facebook Post (November 2, 2025, referencing 2019): Shared a press release on "Catastrophic Wildfire and Toxic Smoke Evolved From Ecological Imbalance." https://www.facebook.com/groups/690832265652316/posts/1075904137145125/
- Facebook Post (June 21, 2024): Discussed exposure to "toxic smoke," linking to my wife's death and collapsed herbivory. https://www.facebook.com/OfficialWHFB/posts/to-the-honorable-colorado-governor-jared-polisre-nepa-numberdoi-blm-co-g010-2024/505919242095985/

Additional references are listed in the appendix. These works collectively prove I was ahead of the curve, warning of novel toxins from high-fuel, high-temperature fires long before mainstream science caught up.

The 2025 ACS Study: Vindication Through New Evidence on Emissions

The groundbreaking study by Lyuyin Huang et al. (2025) in Environmental Science & Technology analyzes global wildland fire emissions from 1997–2023 and reveals that fires emit an average of 143 million tons of airborne organic compounds annually—21% higher than previous estimates. This upward revision accounts for previously overlooked intermediate-volatility organic compounds (IVOCs) and semi-volatile organic compounds (SVOCs), which readily form harmful fine particulate matter (PM2.5) in the atmosphere. These compounds are particularly dangerous, penetrating deep into the lungs and bloodstream, exacerbating health risks. As Huang noted, this inventory "provides a foundation for more detailed air-quality modeling, health-risk assessment, and climate-related policy analysis." The study fills a critical gap by adding 25.1 million tons per year of I/SVOCs, with grasslands contributing 66% of emissions and regions like Southern Hemisphere Africa as hotspots—but the implications are profound for fire-prone western U.S. areas where emissions overlap with population centers. This directly aligns with my pre-2025 assertions about "novel toxins" from pyro-chemistry in fuel-heavy fires, confirming that smoke pollution—and its health toll—is greater than previously modeled.

Updated Estimates: Human Lives, Long-Term Co-Morbidities, and Financial Impacts

Building on the 2024 UCLA study, which estimated 52,480–55,710 premature deaths in California from 2008–2018 due to wildfire-specific PM2.5 (annual average: ~4,800–5,100 deaths, with economic costs of $432–456 billion over 11 years, or ~$39–41 billion annually), we extrapolated to the western U.S. using population, fire activity, and smoke exposure data. Recent 2025 studies provide a national baseline of approximately 40,000 annual excess deaths from wildfire smoke across the U.S. (2011–2020 average). Given that western states bear the brunt of wildfire activity and smoke exposure (accounting for the majority of such deaths), we estimate a baseline of 25,000–30,000 annual premature deaths in the western U.S. Incorporating the ACS study's 21% upward revision in organic emissions (which contribute to PM2.5 formation), these figures increase by approximately 21%. Thus, the updated annual premature death toll in the western U.S. is estimated at 30,250–36,300. This represents excess mortality from cardiovascular, respiratory, and other conditions, often occurring months or years after exposure. Long-Term Co-Morbidities Beyond immediate deaths, wildfire smoke creates widespread long-term health issues. Exposure to these novel toxins and PM2.5 is linked to increased risks of chronic diseases, including:

- Autoimmune disorders: As in my wife's case, triggering reactions that lead to conditions like lupus or rheumatoid arthritis.

- Respiratory ailments: Exacerbating asthma, COPD, and lung cancer, with studies showing up to 3-year lagged effects.
- Cardiovascular problems: Higher rates of heart attacks, strokes, and hypertension.
- Other impacts: Mental health declines, reduced birth weights, and cognitive impairments.

Conservatively, for every premature death, smoke exposure may create 5–10 cases of long-term co-morbidities, affecting millions annually in the West and straining healthcare systems. With the 21% emissions increase, co-morbidity burdens could rise proportionally, leading to hundreds of thousands more chronic cases per year. Annual Financial Impacts Economic costs encompass healthcare, lost productivity, and premature mortality valuation. The UCLA study valued California's annual smoke-related costs at ~$40 billion. Extrapolating to the western U.S. (considering ~2x population but concentrated fire risks), baseline costs are estimated at $150–200 billion annually. Adjusting for the ACS 21% emissions increase, updated annual financial impacts rise to $181–242 billion. This includes:

- Health costs: Medical treatments and hospital admissions (~$30–50 billion).
- Lost earnings/productivity: Reduced work output from illness (~$100–125 billion nationally, prorated for West).
- Mortality valuation: ~$8–10 million per premature death, totaling significant portions (but adjusted downward for overlap with other costs).

These figures exclude broader wildfire damages (e.g., property loss), focusing on smoke-specific impacts. Projections indicate these could double by mid-century without intervention. Implications and Recommendations for the Western U.S. The western U.S., including Siskiyou County and the CA-OR border regions, faces disproportionate risks due to terrain, climate, and fuel accumulation. Recent events like the 2025 Los Angeles wildfires highlight how smoke travels, affecting distant populations. Climate change exacerbates this, contributing substantially to smoke-related deaths in western states (e.g., 26.8–38.3% in some analyses for 2006–2020). To mitigate:

- Restore Ecological Balance: Implement the Wild Horse Fire Brigade by rewilding American wild horses to naturally reduce grass and brush fuels, preventing hotter fires and novel toxin formation.
- Enhance Monitoring and Policy: Fund advanced air quality modeling and health surveillance, incorporating full-volatility emissions.
- Community Resilience: Invest in smoke filtration, early warning systems, and prescribed burns under controlled conditions.
- Legislative Action: Prioritize federal and state funding for herbivory restoration over costly, ineffective alternatives.

This report underscores that continued inaction is no longer defensible. Science has caught up to my warnings—now is the time for change to save lives and billions in costs. I urge you to engage and act.

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