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A Systematic Review: Global Wildfire Events & GHG

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PECO Statement

"What global greenhouse gases emissions are released from wildfires as compared to emissions from anthropogenic greenhouse gas producing activities?"

Objectives

The available evidence on the role of wildfires in emitting greenhouse gas emissions into the atmosphere has not been formally and comprehensively reviewed. Therefore, the objective of this systematic review was to examine the following PECO question "Globally within the atmosphere, how are greenhouse gas emissions linked to wildfires estimated as compared to emissions from anthropogenic greenhouse gas producing activities?" We evaluated the current literature regarding this subject area and examined patterns in study design, emission techniques utilized, and status of greenhouse gas emissions estimates to inform the role that wildfire events play in emitting GHG gases.

Methods

A literature review of studies published between 1990 – 2020 that attempted to quantify greenhouse gas emissions from various global wildfire events was conducted. Of the 3,372 studies identified for this review, only 11 articles that met the inclusion criteria were ultimately selected and included in this review (Figure 1). The studies included represented research conducted in a variety of countries including Argentina, the United States, Canada, China, Russia, and South Korea.

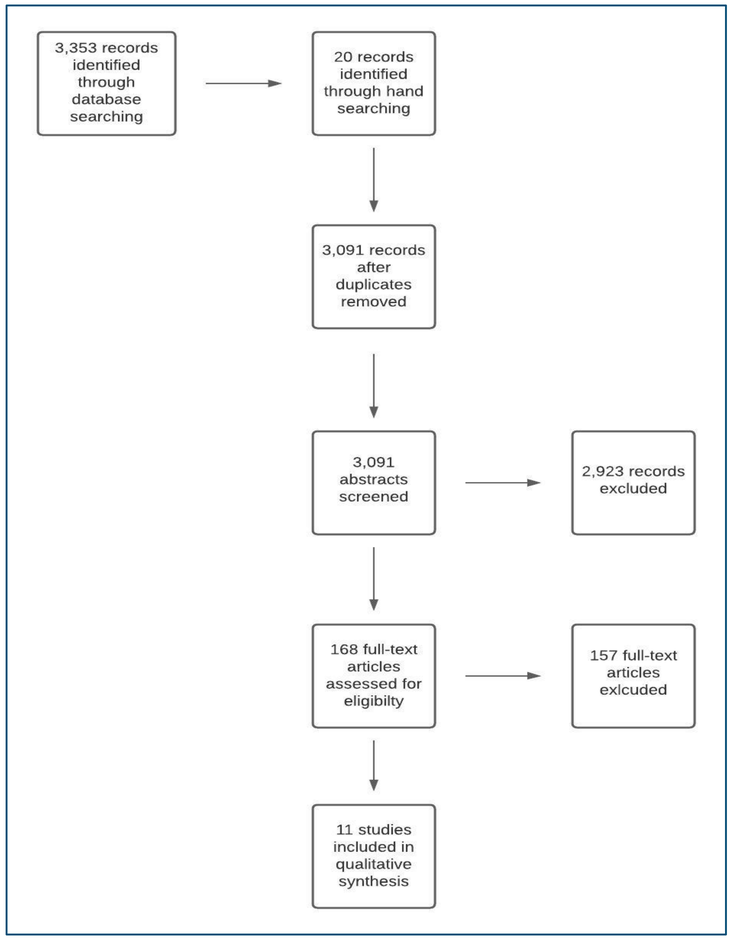

Figure 1

NOAA, 2020

Results

Based on our analysis and interpretation of the emission estimates provided, as well as the methods utilized in each of the studies, we have concluded that strength of evidence is low. We were unable to assess a significant association between the exposure and outcome of interest due to a variety of factors including variations in study design and emissions estimation techniques. Therefore, although GHG emissions estimates were reported, it was difficult to conduct a comparison and lingering knowledge gaps must be addressed.

Conclusion

Therefore, while this review of the existing literature on greenhouse gas emissions from wildfire events was unable to find any significant associations, further research is warranted. As the problem of climate change continues to grow, it is imperative that further funding and research on GHG emissions from wildfire events continues in order to accurately quantify the amounts of these harmful gases that are entering our atmosphere.

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