# Article information:

Present‐day climate forcing and response from black carbon in snow - Flanner - 2007 - Journal of Geophysical Research: Atmospheres - Wiley Online Library
<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2006JD008003>

# Article summary:

1. Black carbon (BC) in snow reduces snow reflectance, altering snowmelt timing and affecting climate through snow-albedo feedback.

2. The Snow, Ice, and Aerosol Radiative (SNICAR) model was used to estimate global annual mean BC/snow surface radiative forcing from all sources, with biomass burning BC emissions being the largest source of uncertainty.

3. The efficacy of BC/snow forcing is more than three times greater than forcing by CO2, with a global temperature response that is threefold greater than expected from equal forcing by CO2.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article "Present-day climate forcing and response from black carbon in snow" by Flanner (2007) provides a detailed analysis of the impact of black carbon (BC) on snow reflectance and its subsequent effect on climate. The study uses a Snow, Ice, and Aerosol Radiative (SNICAR) model coupled with a general circulation model to estimate the radiative forcing and climate response from BC in snow.

The article presents several potential biases that could affect the estimates of BC/snow radiative forcing. These include uncertainty in BC emissions, snow aging, aerosol scavenging by snow meltwater, BC optical properties, and snow cover fraction. The study acknowledges that BC emissions are the largest source of uncertainty followed by snow aging. However, it does not provide a detailed discussion of how these uncertainties were addressed or quantified.

The article also makes several unsupported claims regarding the efficacy of BC/snow forcing compared to CO2 forcing. It suggests that the efficacy of BC/snow forcing is more than three times greater than CO2 forcing without providing sufficient evidence to support this claim. Additionally, the study does not explore counterarguments or alternative explanations for its findings.

Furthermore, while the article notes some potential risks associated with changes in snow albedo caused by BC, it does not provide a comprehensive assessment of these risks or discuss potential mitigation strategies.

Overall, while the study provides valuable insights into the impact of BC on snow reflectance and climate, it would benefit from a more thorough discussion of potential biases and limitations as well as a more balanced presentation of evidence and alternative perspectives.

# Topics for further research:

* Mitigation strategies for black carbon in snow
* Uncertainty quantification in black carbon emissions and snow aging
* Counterarguments to the efficacy of black carbon/snow forcing compared to CO2 forcing
* Comprehensive assessment of risks associated with changes in snow albedo caused by black carbon
* Alternative explanations for the impact of black carbon on snow reflectance and climate
* Comparison of the impact of black carbon on snow reflectance and climate to other anthropogenic factors.

# Report location:

<https://www.fullpicture.app/item/ed9af0e0f56bafc3033ed62c3efa8035>