**Supplementary Table**

**Table S1: Summary of Sources Referenced for the Direct Implications of SAI**

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| --- | --- | --- | --- | --- |
| **Direct Impact of SAI** | **Number of Sources on Direct Impacts** | **Number of Sources Including Background Information** | **General Summary of Effects** | **Consistency of Sources** |
| *Atmospheric Disruption* |  |  |  |  |
| Tropospheric Air Pollution | 2 | 19 | - Decrease in Tropospheric Ozone  -Increases in surface PM | Relatively large body of literatures, with consistent effects |
| Stratospheric Ozone & UV Radiation | 9 | 16 | - Decreases in stratospheric ozone in high latitudes  -Increased UV radiation at the planet’s surface  -Similar impacts to those expected from unmitigated climate change | Conflicting evidence throughout the literature, dependent on injection scenario |
| Biogeochemical Cycling | 10 | 21 | -Decreased atmospheric carbon  -Increased carbon ocean uptake due to ocean cooling  -Regional changes in vegetative carbon storage  -Increased land carbon uptake | Consistent literature as most effects are due to decreases in global temperature |
| *Hydrological System* |  |  |  |  |
| Monsoons & Tropical Storms | 25 | 35 | - Overall decrease in mean precipitation  -Regional fluctuations in mean precipitation  -Counteract increase in precipitation that will be experienced under unmitigated climate change  -Suppression of monsoon precipitation  -Reduce drought likelihood  -Reduce flooding risk | Overall consistent agreement and relatively large amount of literature suggesting a decline in global mean precipitation, but varying effects region to region with conflicting evidence |
| Ice Melt, Runoff, & Sea Level Rise | 8 | 16 | -Reduced land ice melt  -Decreased risk of sea level rise  -Reduced sea ice melt | General consensus in literature since effects are due to decreased temperature rise, but dependent on injection scenario |
| Ocean Circulation and Biogeochemistry | 6 | 16 | -Changes in overturning circulation  -Reduction in ocean acidification through temperature reduction  -Changes in Ocean NPP | Contradictory evidence within the literature body especially related to NPP changes |
| Wet Deposition & Toxicity | 5 | 14 | -No significant increase in sulfur deposition  -Increased lifetime of surface air pollution | Limited evidence so far on this topic |
| *Surface Disturbances* |  |  |  |  |
| Soil | 4 | 12 | -Limited changes in soil moisture, possible increases depending on changes in precipitation  -Increased soil carbon storage | Limited literature but general consensus on effects due to decrease in global mean precipitation |
| Permafrost | 3 | 5 | -Prevent melting of permafrost layer | Limited literature but general consensus on effects due to decrease in global temperature rise |
|  |  |  |  |  |
| Ecosystem Disruptions |  |  |  |  |
| Vegetation | 4 | 8 | -Increases in terrestrial gross primary productivity | Some conflicting evidence due to carbon cycling and majority of literature is focused on agricultural productivity. |
| Biodiversity | 2 | 9 | -Current biodiversity effects are linked to potential implications of termination shock, but not implementation of SAI | Limited evidence and studies mostly focus on termination shock |
| Zoonotic Infection | 4 | 7 | -Decreases in global temperature would limit Malaria ranges | Limited evidence so far on this topic |
| *Global Food System* |  |  |  |  |
| Agriculture | 9 | 14 | -Increase in Chinese rice yields  -Increase in crop growth due to reduce surface ozone | Conflicting evidence on agriculture yields in specific countries, difficult to estimate general global impacts |
| Ocean Food Systems | 3 | 9 | -No changes to aragonite saturation  -Possible impacts to coral reefs | Limited evidence so far on this topic |