

THE IMPACT OF GREENHOUSE GASES ON SEA ICE AND SNOW COVER FROM 1980 – 2015

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Abstract: Climate change has been persistently associated with global warming and acknowledged as the rationale for the decrease in sea ice and snow cover. This change is considered to be caused by an increase in the emissions of greenhouse gases, besides high levels of temperatures that affect such emissions. The gases can be emitted through anthropogenic activities or natural processes. We hypothesized that increased levels of carbon dioxide (CO₂) and methane (CH₄) are associated with a rise in climatic changes and the reduction of sea ice and snow cover in the Northern and Southern Hemispheres. In this study, two greenhouse gases, CO₂ and CH₄, were observed over a 35 year span, using NOAA and NASA sources. The emissions of those greenhouse gases were observed with global temperature changes, along with sea ice and snow cover data from the Northern Hemisphere, Southern Hemisphere, and the Globe. Data were analyzed using SAS 9.4 and the results revealed an increase in the levels of greenhouse gas emissions from 1980 – 2015. Results also indicated a strong relationship between temperature and CO₂; and temperature and CH₄, besides seasonal variation. However, there were no correlations found between global temperatures and sea ice melt. Further analysis is required to better understand such relationships using additional variables along with testing non-linear models.

Keywords: Global warming, greenhouse gases, regression, seasonal variation

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