

# Studying the COVID-19 Impact on the Antarctic Glacier Melting Rate

**Mason Chen**

Stanford OHS, Academy Hall Floor 2 8853 415 Broadway  
Redwood City, CA 94063, USA  
[mason05@ohs.stanford.edu](mailto:mason05@ohs.stanford.edu)

## Abstract

This paper will study the Time Series Antarctic Glacier Mass from April 2002 to March 2021. The objective of this paper is to forecast the Antarctic Glacier Mass level for 2021 to 2041. The Science studied is the Geoscience of the Glacier; the Technology applied is the GRACE-FO satellites to collect the Glacier Ice Sheet Mass data; Engineering focuses on the COVID-19 impact on the Glacier melting rate; and mathematical/statistical tools like Time Series ARIMA models are applied. Although the Glacier melting rate sped up recently before 2020, the COVID-19 situation might have slowed down the rate of glacier melting in 2020 in both Antarctic and Greenland. During 2020 COVID-19 period, Antarctic Glacier Mass seasonal pattern became a smoother single-peak cyclic pattern which is different from the double-peak cyclic pattern in 2002 to 2019. Authors conducted both non-seasonal and seasonal ARIMA models and concluded that only the Seasonal ARIMA Forecasting modeling algorithm can detect more reliable insights of the relatively small pattern change during 2020 period. The COVID-19 factor might have made certain impact on the Antarctic Glacier Melting rate. The Glacier Melting rate may have been slowed down by 20% in the 2020-2021 period.

## Biographies

**Mason Chen** is currently a student at Stanford OHS and serves as the student ambassador and webmaster for STEAMS. Having started STEAMS since its inception in 2014, he has held various roles such as President of the Student Chapter from 2017 to 2019. Through STEAMS, he has published more than 20 conference proceeding papers as first, second, or third author. As first author, he has won numerous awards including the Best Conference Proceeding Paper Award in the 2018 JMP Discovery Summit as well as finishing 1st Place three times for the STEM presentation competition at IEOM conferences. He has also certified the IBM SPSS Statistics Level I, II, Modeler Level I, and IASSC Yellow Belt, Green Belt, and Black Belt.