

GSM – Grand Solar Minimum. The real “Climate Change” existential threat is right around the corner. Do the Research!

OPS-43

Glaciers and Sea Level

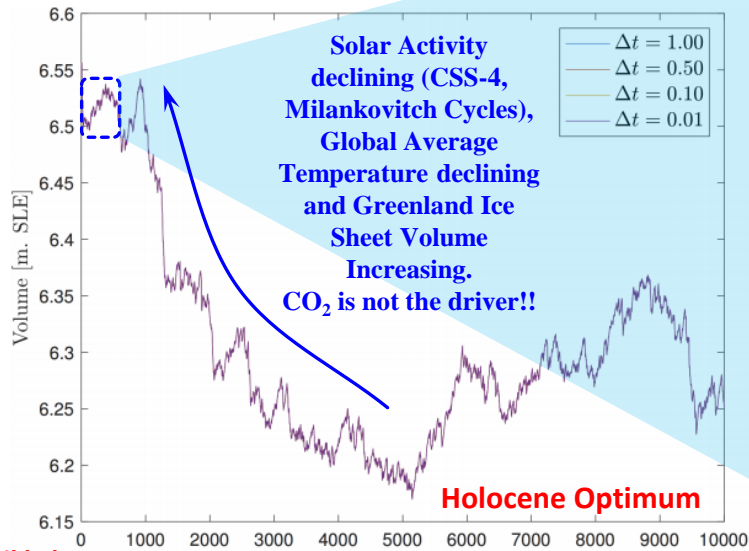
How can the glaciers be growing without CO₂ declining?

Remember, the MTR can be modelled with little or no CO₂ contribution. OPS-8 and my Open Letter Addendum (CMIP6 Beta Testing).

A couple of key points come out of comparing these two plots. The trends in both plots start long before human influence (i.e.: CO₂ emissions) became a significant factor. That begs the question, how do you differentiate the Man Made (?) trend (post-1950) from the Natural Trends (pre-1950)? The natural forcings have not suddenly stopped acting just because human emissions increased or the IPCC modellers declared it so.

Time step size Δt used for numerical integration

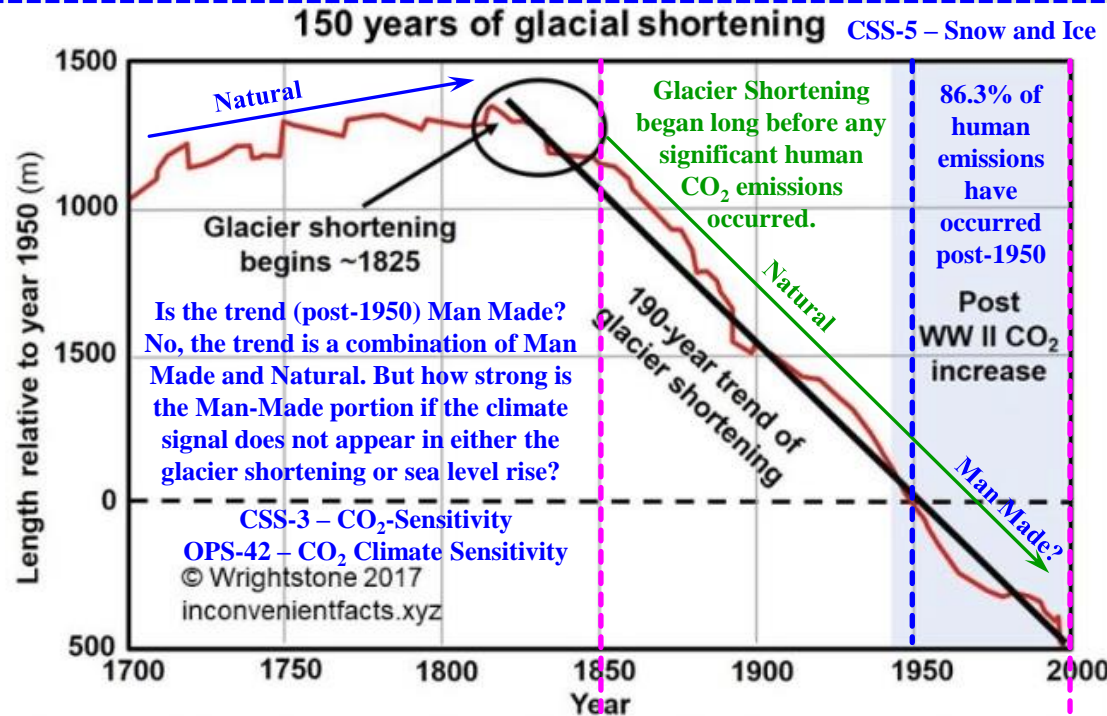
To determine an adequate time step size Δt to use for numerically integrating Eq. 1, we first generate a time series of fluctuating temperatures $\{T_i\}$ as described by Eq. (8) in the main article. With $\{T_i\}$ as input, and a similar initial condition as the simulations shown in Fig. 2 in the article, Eq. 1 is numerically integrated for varying Δt using the Euler scheme. Δt is varied in such a way that the temperature is the same for each whole year, regardless of the time step size. The results of varying Δt from 0.01 year to 1 year are shown in Fig. 1. As the resulting graphs of the ice sheet volume $V(t)$ practically coincide, we consider a time step size of one year to be sufficient.



Mikkelsen Paper Comments <https://tc.copernicus.org/articles/12/39/2018/tc-12-39-2018-supplement.pdf>

Figure 1. Varying the integration stepsize Δt from 1 year to 0.01 years for a simulation with $T=0$, such that the (random) fluctuating temperature T_i is the same for each whole year. A visual inspection confirms qualitatively that the graphs for varying Δt coincide and we do not further analyze the consequences of varying Δt .

The folly of looking at just the Modern Temperature Record (MTR, 1850 to the present) is readily apparent when comparing these two plots of ice changes on the planet. Note the data is from different sources but the concept is consistent. The chart to the right shows dramatic ice decline. When taken in a larger context (the chart to the left), the changes are no longer significant.



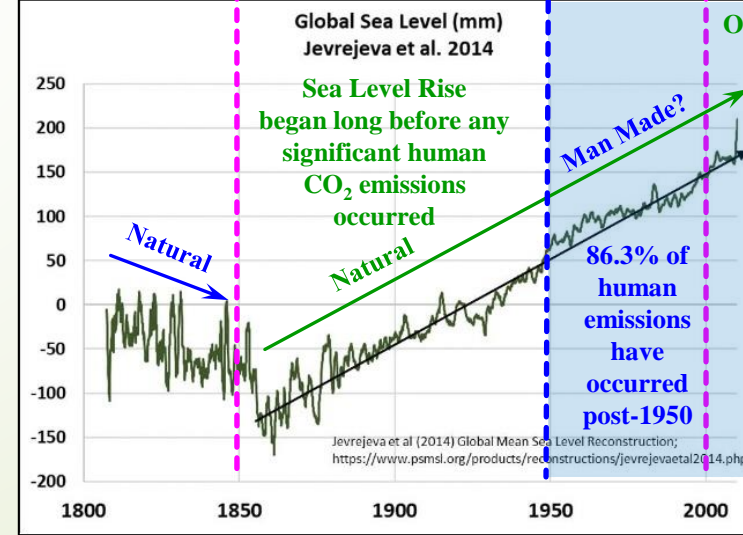
Oerlemans J (2005) Extracting a Climate Signal from 169 Glacier Records. *Science* 29 Apr 2005: Vol. 308, Issue 5722, pp. 675–677 DOI: 10.1126/science.1107046

Glaciers Sea Level

The same logic can also be applied to global temperatures. Refer to my CSS Holocene Logic posts for more detail (CSS-1 – Holocene Logic, CSS-2 – Holocene Logic – CO₂ Influence, CSS-4 – Solar Forcing – Milankovitch Cycles, OPS-26 – Holocene Logic, OPS-27 – Holocene T-CO₂ Logic – Simplified and OPS-36 – Holocene – Simplified – 2). Atmospheric CO₂ concentrations (pre-MTR) were virtually flat, yet there were significant temperature fluctuations, significant ice volume fluctuations and significant sea level fluctuations. Through much of the Holocene, forests grew and humans inhabited areas where glaciers are currently receding. The Vikings inhabited Greenland during the Medieval Warm Period (MWP) and probably could have through most of the Holocene (especially through the Holocene Climate Optimum), if they had been around. Overall, the temperatures, ice volumes and sea level all move in unison. Historically, those movements have been based on Natural processes (primarily solar (through direct and indirect factors)). That has not changed.

So, what happens as we move further into the GSM? Temperatures will continue dropping, glaciers will continue growing and sea levels will start dropping in the real world. They will move in the opposite direction in the CAGW virtual reality.

The other problem for the Catastrophic Anthropogenic Global Warming (CAGW) alarmist NARRATIVE is the historical data pre-MTR. Sea Level was dropping as Glaciers were growing. Their expensive, unvalidated, non-consensus computer projections do not allow that to happen in their virtual reality. The natural forcings are set to virtually zero (OPS-22 – Computer Models – Very Simple). That problem gets magnified enormously when the analysis is extended out to include the entire Holocene.



Jevrejeva et al (2014) Global Mean Sea Level Reconstruction; <https://www.psmsl.org/products/reconstructions/jevrejevaetal2014.php>

OPS-23 – Sea Levels Open Letter



330 mm Estwing Rock Pick H/T to David Middleton for Estwing use

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