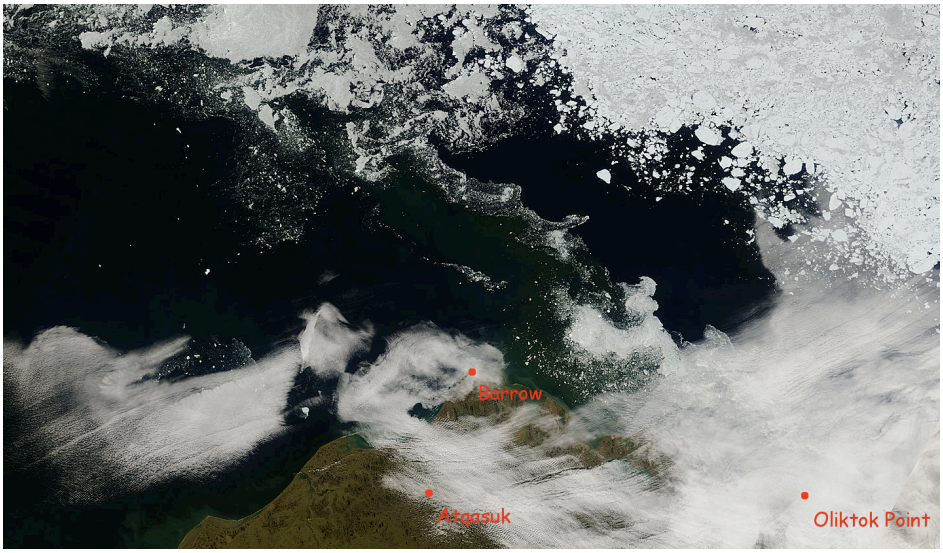
Don’t ignore Arctic Clouds.



MODIS Satellite Visible Image July 23, 2007

You have explained the surface albedo feedback and ignored clouds when doing so. Was ignoring clouds ok?

Lucky you! Reliable observations show summer clouds do not change when sea ice is lost (see picture and figure to the left). Your ignoring worked, sort of…

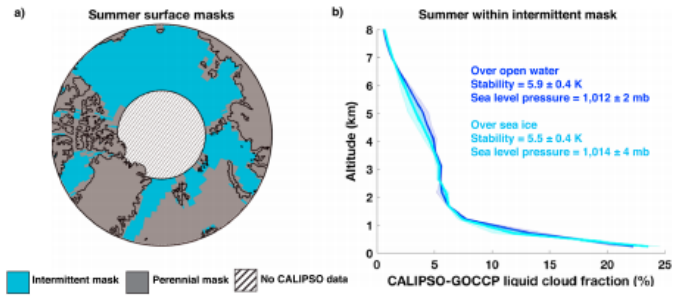


Figure 2. Observed summer liquid cloud response to recent Arctic sea ice variability: (a) the intermittent and perennial masks and (b) liquid cloud profiles over open water and over sea ice within the intermittent mask. The perennial mask includes pixels that are always sea ice-covered, always open water, or always land in every year from 2008 to 2015. The intermittent mask includes all other pixels or pixels where sea ice concentration varies from year to year. Instantaneous cloud profiles are only used within the intermittent mask and if they occur over sea ice concentrations less than 15% (“over open water”) or greater than 80% (“over sea ice”). The climatological means over open water and over sea ice are the thick dark blue and light blue lines, respectively. The purple and light blue shaded regions are the 95% confidence intervals around the mean cloud profile over open water and over sea ice, respectively. During summer, over open water within the intermittent mask, the mean near-surface static stability is 5.9 K and the mean sea level pressure is 1,012 mb. Over sea ice within the intermittent mask the mean summertime near-surface static stability is 5.5 K and the mean sea level pressure is 1,014 mb.

Figure 2 from Morrison, Kay et al. 2018, https://doi.org/10.1002/2017JD027248

Clouds Still Matter. Even if summer clouds don’t respond to sea ice loss, they still reduce the efficacy of amplifying positive feedbacks (It’s all connected via the ocean!).

And Seasonality also matters. Let’s discuss!

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