

2014 PAN-ARCTIC OUTLOOK

June Report based on May Data

*** Contributor :

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*** Type of Outlook :

Statistical model, using mainly NH snow cover as input variable.

*** September 2014 monthly average projection :

Arctic Ice EXTENT : 4.6 million km²

Arctic Ice AREA : 3.0 million km²

*** Short explanation of outlook method :

I've been concerned by the steep decline of Arctic sea ice over the past decades, and wondered how exactly the Arctic amplification of GHG induced global warming contributes to that decline.

For that, I reasoned that Arctic amplification during the Arctic melting season may come from a decrease in NH albedo, and thus, that we should see this amplification reflected in land snow cover in spring and early summer.

For my method, I'm assuming that most ice that melts between May and September is FYI, and I'm assuming that the effective thickness of that ice did not change much over the past two decades.

With these assumptions, the only form of Arctic amplification can come from the amount of heat absorbed by the Northern Hemisphere during the melting season, which should depend on Northern Hemisphere snow cover decline, and forming of melting ponds and polynia on melting sea ice.

In support of that theory, using linear regression data available in spring, NSIDC September Arctic sea ice extent correlates best against Rutgers' lab NH snow cover data (R=0.88 using April and May NH snow data).

This correlation makes physical sense, since land snow cover strongly affects albedo during spring and summer, and thus the amount of heat the Northern Hemisphere absorbs during the melting season.

And the correlation is so good that it triggered me to file this submission.

*** Projection uncertainty/propability estimate :

Using simple regression of Rutgers Snow Lab April and May data for NH snow cover over the 1995-2012 sea ice extent and area data from NSIDC, I obtain a prediction for September sea ice EXTENT of just 445 k km² standard deviation. For the sea ice AREA prediction, the correlation is even better, with standard deviation of 371 k km².

*** Executive Summary :

Arctic sea ice decline has global implications for Northern Hemisphere weather patterns and Arctic eco systems and wild life alike, and thus it is concerning that our global climate models so far appear to underestimate the observed rate of decline based on albedo amplification of sea ice alone.

My projection method for the decline in Arctic sea ice is based on another variable affecting how much heat the Northern Hemisphere absorbs. One that shows particularly strong correlation with Sept sea ice extent, and which I think has been underestimated in models and media articles alike : Northern Hemisphere snow cover in spring.