

## Data Story #3 : Data Comparison

**Background:** Sea ice is a topic frequently discussed in conjunction with climate change. In places like Maine many people even have personal histories over which they have observed a local change in sea ice concentration. The Climate Reanalyzer is a great tool to explore many climate variables so I thought I would look at how it could be used to explore changes in sea ice concentration.

**Question:** Does the amount of sea ice in the Arctic increase and decrease at the same times as sea ice in the Antarctic over the time of 1979 to 2014 and do these variations have a relationship with temperature?

### Evidence:

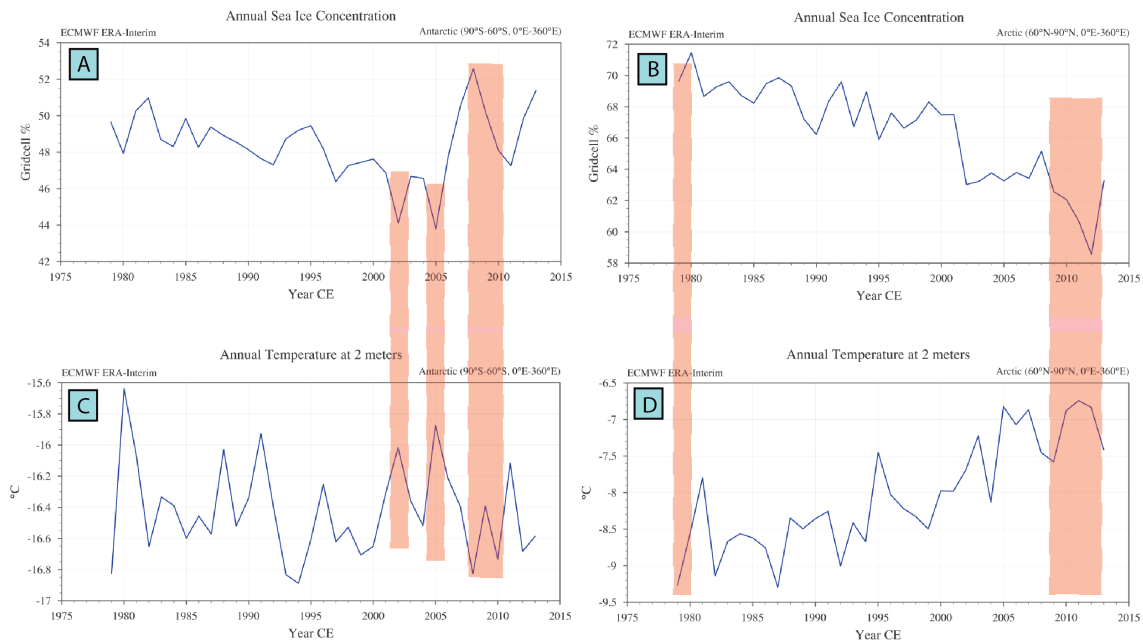


Figure 1.0 Time series generated using the Climate Reanalyzer then annotated. A.) Sea ice concentration in the Antarctic from 1979-2014 shown in terms of grid cell %. B.) Sea ice concentration in the Arctic from 1979-2014 shown in terms of grid cell %. C.) Annual temperature at 2 meters in the Antarctic from 1979 to 2014. D.) Annual temperature at 2 meters in the Arctic from 1979 to 2014. Red blocks highlight a few of location where the covariation of sea ice concentration with temperature stand out.

**Data from:** The above plots were made using the Climate Reanalyzer ([cci-reanalyzer.org](http://cci-reanalyzer.org)) using the European Reanalysis Interim (ERA-Interim) data set, which spans from 1979-2014.

**Claim:** Sea ice concentrations in the Arctic do not always follow the same trend. However, sea ice in both the Arctic and Antarctic vary with temperature.

**Reasoning:** Sea ice concentrations in the Arctic and Antarctic follow a similar trend of decrease between 1979 and approx. 2005. Then the trends diverge. While the % of gridcells covered in sea ice are different in the Arctic and Antarctic they are both steadily decreasing on average from 1979 to 2005 as shown in the time series graphs A and B. Then around 2005 sea ice starts to follow an increasing trend in the Antarctic, while it

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continues to follow a decreasing trend in the Arctic. Sea ice concentration in both the Arctic and the Antarctic have a negative correlation with temperature, as highlighted by the red boxes.

**Further Question:** How much does average temperature vary in the Antarctic vs. the Arctic? What is the difference between the factors governing sea ice formation in the Arctic and Antarctic?

**NGSS Standards:**

ESS3D: Global Climate Change

ESS3C: Human Impacts on Earth Systems

ESS2D: Weather and Climate