# Systems modeling feedback homework

1. Download and open the Arctic_Sept_Seaiceextent.xls file, which contains satellite observations of sea ice extent in the Northern Hemisphere from 1979-2015. Create a plot of year (x-axis) vs. sea ice extent (y-axis), and place it here. Make sure to include a title, x- and y-axis labels, and units.

2. Do the satellite observations appear to have a trend with time? If so, how would you describe it?

3. Comparing the sea ice extent data with the output from the Bathtub feedback models, what type of feedback (positive/reinforcing or negative/balancing) do you suspect is present in the Arctic? Why?

4. In fact, the Arctic has what is known as the ice-albedo feedback. Albedo refers to the amount of sunlight a surface can reflect. Sea ice is white (high albedo) and reflects most of the Sun's energy, while ocean water is dark (low albedo) and absorbs much of the Sun's energy. Given this information and your answer to #3, complete a system diagram (i.e., add arrows and +/- relationships) to the following: