Pan-Arctic September 2014 Sea Ice Outlook
July report (based on June 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 : 4.7 million km^2 (with 319 k km^2 standard deviation on the prediction)
Arctic Ice AREA : 3.0 million km^2

*** Short explanation of outlook method :

The basic concept behind my method pertains to estimating albedo-based Arctic amplification during the melting season.

Specifically, I focus on a few variables that I think will significantly affect the amount of energy inserted into the Northern Hemisphere during sping and early summer :

- Land snow cover in March, April, May and June, using monthly average data from Rutgers' snow lab :
http://climate.rutgers.edu/snowcover/table_area.php?ui_set=1&ui_sort=0

- Melting ponds and polynia ('dark' areas in the immediate vacinity of ice), for which I assume that (Extent minus Area) is a reasonable variable.
For example, if in a certain pixel of satellite observations melting ponds and polynia represent 10 % of the size of the pixel, the picel will be recorded as 90 % 'area' (ice concentration) and 100 % 'extent' (ice cover), and thus "extent minus area" will be the 10 % of low-albedo we are looking for as a variable representing low-albedo.
For both 'extent' and 'area', I'm using NSIDC numbers :
ftp://sidads.colorado.edu/DATASETS/NOAA/G02135/Jun/N_06_area.txt for June area and extent, and
ftp://sidads.colorado.edu/DATASETS/NOAA/G02135/Sep/N_09_area.txt for Sept area and extent.

Next, to find out to which extent these variables affect ice melt during the melting season, I set up a regression equation for ice melt :

june_area - september_extent = alpha + beta * (Melt_Formula) ;

I used the data (Area_June, Extent_September) for the period 1995 - 2013, and then used linear regression to find the best fitting 'Formula', which is a linear combination of the variables mentioned above (snow cover in March, April, May and June, and ice extent and area in June).

The 'Formula' that obtained the best correlation was this one :

Melt_Formula = june_snow - 0.2*may_snow + 0.3*april_snow + 0.3*march_snow - 2.0*(june_extent - june_area)

For the period 1995 - 2013, linear regression then obtained a best 'fit' with alpha = 7.873729 and beta = -0.239193, and obtains a prediction for Sept 2014 ice extent of 4.71 million km^2.

*** Projection uncertainty/propability estimate :

Using simple regression of the data on the method described above, I obtain a prediction for September sea ice EXTENT of just 319 k km^2 standard deviation.

*** Executive Summary :

My projection method to estimate September sea ice extent is based on an estimate of how much heat the Northern Hemisphere absorbs during spring and early summer. I found that Northern Hemisphere land snow cover (in March, April, May and June) as well as a estimate of June 'melting ponds and polynia' (June-extent - June-area) shows particularly strong correlation with Sept sea ice extent, as shown in this graph :

http://i1272.photobucket.com/albums/y396/RobDekker/June-14_zps7336859b.jpg?t=1404334698

which specifically shows a very low standard deviation on the prediction of just 319 k km^2.

With my submission I hope to raise some awareness of the importance of loss of land snow cover in spring on Arctic sea ice melt in summer, a correlation which I think has been underrepresented in models and media articles alike.