Arctic Sea Ice in summer 2008 – July outlook

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For the July outlook we run the coupled ocean-ice model NAOSIM with NCEP forcing until the 7th August 2008. The ensemble experiment starts from these initial conditions. For details of the ensemble technique see the June outlook.

Results

Minimum Ice Extent 2008

The summer minimum sea ice extent for all 20 realizations is shown in Figure 1, ordered by the magnitude of ice extent. Note, the extraordinary value of the 2007 forcing. The ensemble mean value for the 20 summers is 4.53 million km^2 which is somewhat higher than the mean value of the June outlook (4.43 million km^2). The standard deviation of the ensemble is 0.15 million km^2 – considerably smaller than the standard deviation of the June outlook (0.21 million km^2). Assuming a Gaussian distribution we can draw the following probabilistic statements:

The probability that in 2008 the minmum ice extent will fall below the minimum from September 2007 is less than 1%, the probability to fall below the minimum of 2005 (second lowest value in the last 20 years) is practically 100%.
With a probability of 80% the minimum ice extent in 2008 will be in the range between 4,34 and 4.72 million km^2.

The ensemble runs have been started from initial conditions which are not constrained by observations (no data assimilation) but calculated from a forward run. Due to model or forcing deficits the initial state on August 7th underestimates considerably the ice concentration in the Eurasian basin (not shown) as compared to observation. Though we account for a systematic underestimation of the model by a constant correction, we cannot exclude that the July outlook still tends to underestimate the ice extent for September.

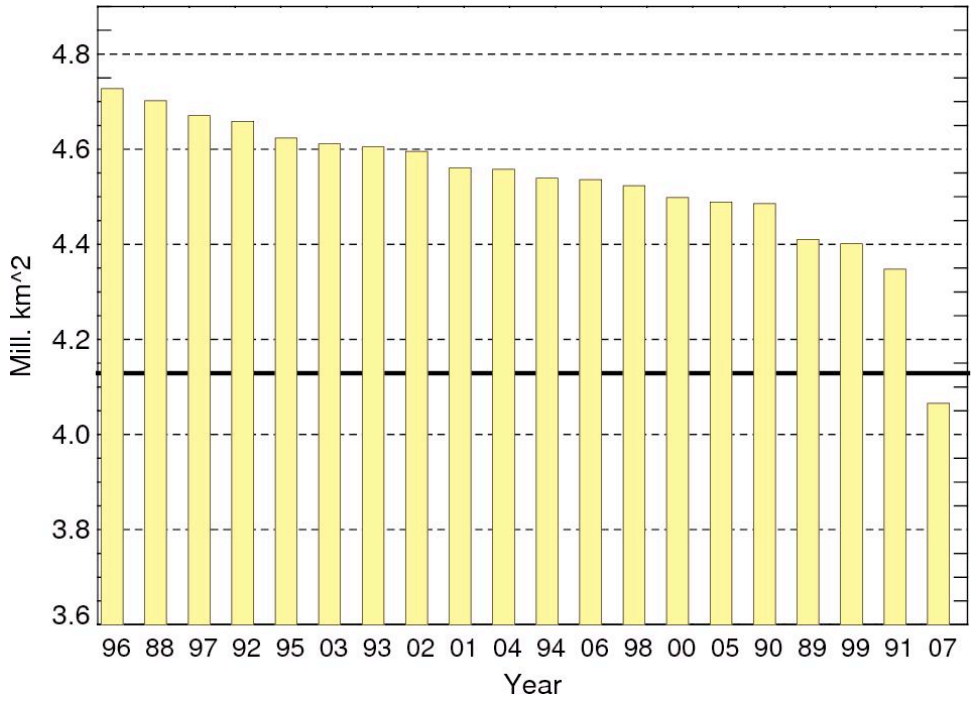

Figure 1: Simulated minimum sea-ice extent in 2008 [Mill. km^2] when forced with atmospheric data from each year between 1988 and 2007 from the initial state of August 7, 2008. Model derived ice extents have been adjusted with a constant offset to account for discrepancies with satellite-derived ice extents. The thick black horizontal line displays the minimum ice extent observed in 2007.