

1. Names of Scientist(s) making the Outlook.  
**This outlook was produced by Leif Toudal Pedersen, Rasmus Tonboe and Gorm Dybkjær, Danish Meteorological Institute (DMI)**

2. Estimate of sea ice extent for the month of September 2008  
**4.46 million square kilometers**

3. Principal method (numerical model, statistical model, comparison to 2007 weather and satellite data, etc.) Keep this short as it will go into a table.

**Statistical model, multiple linear regression**

4. A short several sentence summary of your primary physical reasoning behind the estimate provided in #2. We are primarily interested in how you may be using data from July.

**The multiple linear regression estimates September ice extent from**

- a) **Number of freezing degree days the previous winter (proxy for thickness of FY ice)**
- b) **End of April multi-year ice extent (the last reliable measure of MY-ice extent from scatterometer data)**
- c) **July total ice extent.**

**Item c) is updated every month to provide information about the recent developments.**

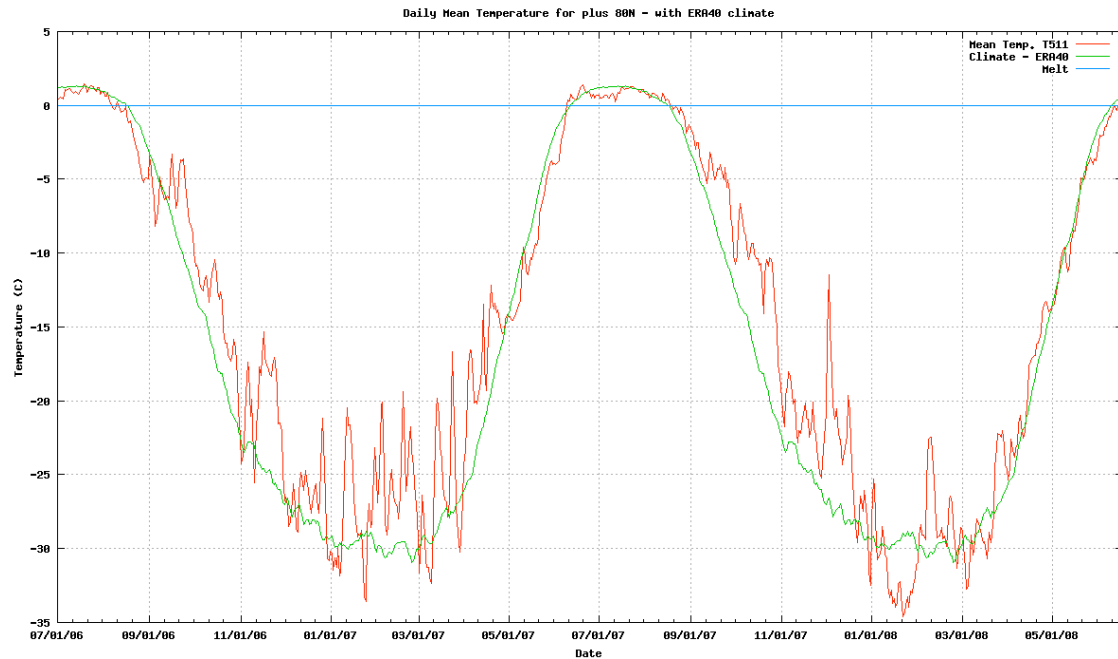
5. Any expanded information with figures which backs up #4.

**Description of input parameters.**

From ECMWF reanalysis (ERA40) (1999-2002) and operational (T511) (after 2002) model grids we estimated

- Freezing degree days between Oct. 1. and May 31

The temperature compared to ERA40 climatology is shown in figure 1.



**Figure 1** The average 2m air temperature (T2m) north of 80N for the last two years in red and ERA40 climatology in green. Note that during the 2006-07 winter T2m was above the climatological mean almost all the time. The fall of 2007 also had T2m above the climatological mean whereas the spring of 2008 has been close to ‘normal’.

Multiyear ice extent is mapped for the area inside the Arctic Ocean using QuikScat SeaWinds scatterometer data (CERSAT/IFREMER) in a Bayesian classification. The classification is done on the daily grids between Oct. 1. and Apr. 30 and the multiyear ice area is observed to decrease during winter approximately at the same rate as the Fram Strait export. We use the April average multiyear ice area for each year in the prediction. Data are available since 2000. The thick multiyear ice melts at a much slower rate than the thinner first-year ice. The multiyear ice is the ‘memory’ from last year.

The total ice extent in July is from NSIDC.

**Method:**

Our estimate of the September ice extent is calculated using a multiple linear regression with the source data mentioned above as independent variables. Various parameter combinations were tried out, and the presented estimate is based on the following parameters:

- Freezing degree days during winter,
- April MY area,
- Total Northern Hemisphere ice extent in July.

The estimate based on June total ice extent was 3.41 and the estimate from May was 3.66 million square kilometers. The 2008 September had the potential to become a new absolute minimum, but the recent estimate is more conservative based on the fact that the July total extent was larger than feared.

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