Sea Ice Outlook, August 2011

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Summary

This statistical method uses previous years' daily extent change rates from July 27 through September 30 to calculate projected daily extents starting from June 30. The September daily extents are averaged to calculate the monthly extent. Rates from recent years are more likely to occur because of the change in ice cover. Thus, the official project is based on the rates for 2002-2010, yielding a **September 2011 average of 4.52 million square kilometers, which is 0.2 million square kilometers lower than the July projection**; the range however is still quite large with **a standard deviation of 370,000 square kilometers**. Using all years (1979-2010) yields a slightly higher estimate of 4.68 million square kilometers (about 400,000 square kilometers below the July projection), but a similar range of 360,000 square kilometers. One out of the 32 scenarios (using rates from 2008) would yield a new record minimum September extent. This suggests the **chance for a record low this year is ~3%**, though this may underestimate the probability because recent years have tended to follow faster decline rates. On the other hand, declines did slow the last few days of data used in this projection. Thus, **a new record low September extent this year is unlikely, but not out of the realm of possibility**. However, projections from all 32 years would result in an extent in the lowest 5 this year. Thus, unless the decline rate is slower than any of the previous 32 years, **this year will be among the five lowest** of the satellite record. It is also **very likely that this year will have an extent below 5 million square kilometers**. All recent years (since 2002), and 25 of the 32 total years, result in a sub-5 million square kilometers

Details

The method is the same as is described in the July Outlook, but projecting from July 27 instead of July 1.

Range/Category (million sq km)	*All Years (1979-2010) 32 total years*	*Recent Years (2002-2010) 9 total years*
Average [St. Dev.]	4.69 [0.36]	4.52 [0.37]
Maximum [Year]	5.29 [2001]	4.95 [2006]
> 5.5 (# occurrences)	0	0
5.0 – 5.5	7	0
4.5 – 5.0	14	5
4.0 – 4.5	3	3
< 4.0	0	1
Record Low (< 4.30)	1	1
Lowest 5 (< 5.57)	32	9
Minimum [Year]	3.83 [2008]	3.83 [2008]

Table 1. Average, maximum, minimum and ranges of potential extents based on extent rates from all 32 years (middle column) and the most recent 9 years (right column). Based on projections from July 27.

Range/Category (million sq km)	*All Years (1979-2010) 32 total years*	*Recent Years (2002-2010) 9 total years*
Average [St. Dev.]	5.09 [0.52]	4.72 [0.56]
Maximum [Year]	6.06 [2001]	5.60 [2006]
> 5.5 (# occurrences)	7	1
5.0 – 5.5	14	2
4.5 – 5.0	9	4
4.0 – 4.5	0	0
< 4.0	2	2
Record Low (< 4.30)	2	2
Lowest 5 (< 5.57)	27	8
Minimum [Year]	3.88 [2007]	3.88 [2007]

Table 1 for July. Average, maximum, minimum and ranges of potential extents based on extent rates from all 32 years (middle column) and the most recent 9 years (right column). Based on projections from July 1

An image of the trajectories of sea ice extent for the remainder of the melt season (through September 30) is provided in Figure 1. For clarity trajectories are only provided from the past 5 years. However, it is clear that no trajectory approaches the average climatological values, even for years not shown. The maximum projected September average (using 2001 rates) is over a million square kilometers below the 1979-2000 average of 7.04 million square kilometers and nearly 1.5 million square kilometers below the 1979-2010 average of 6.58 million square kilometers.

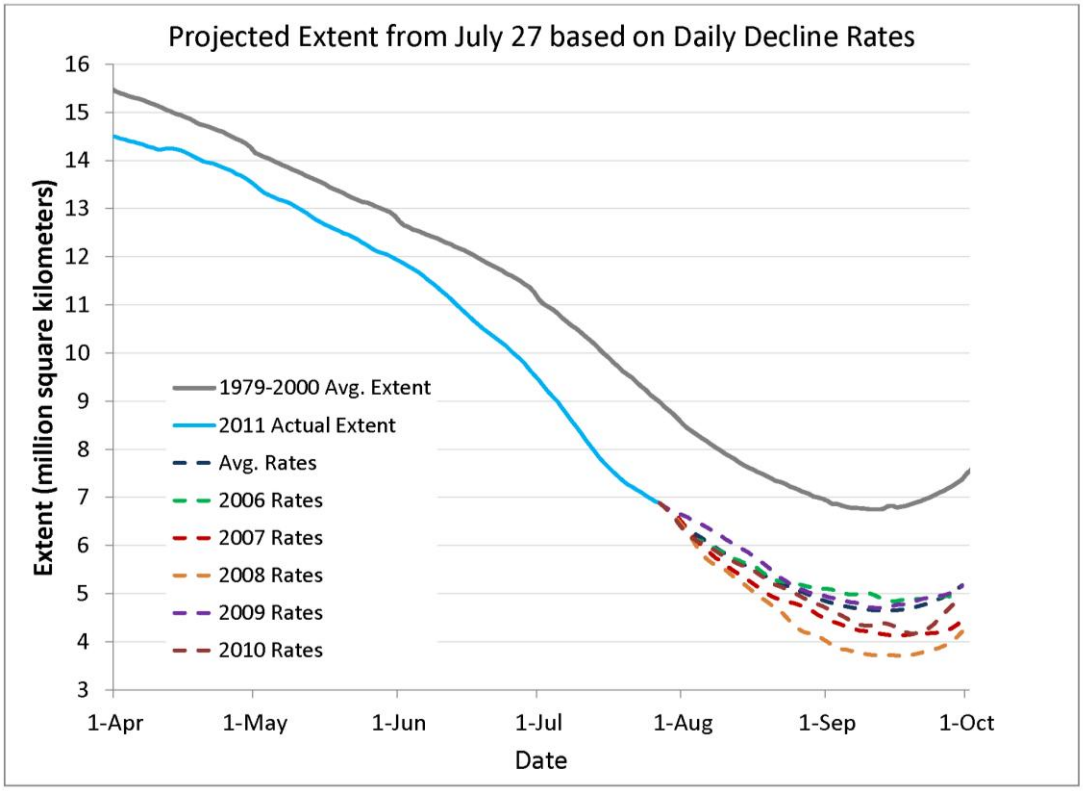

Figure 1. Timeseries of daily total sea ice extent with projections using extent change rates from the previous five years (2006 – 2010).