

## **2012 PAN-ARCTIC OUTLOOK**

June Report based on May Data

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1. **Extent Projection 4.3 +/- 95% confidence interval of 1.12 M Km<sup>2</sup> based on past performance of this technique.**
2. **Methods/Techniques - Statistical**
3. **Rationale**

Towards the end of May Extent and Area tend to show little variation. They also show little skill for predicting the minimum. The methods I have presented last year worked on extent and area showing how the season is progressing and gain more skill as the season progresses.

The second method of predicting falls from current position using area, extent or cumulative energy that could be captured by ocean that was formerly ice does not show any skill at this length of time before the minimum.

The first adjusted Gompertz fit method at this time of the season barely shows any skill over Hamilton's Gompertz fit method. This method attempts to predict the residual from a Gompertz fit of NSIDC average September Extent by linear regression using the residual from a Gompertz fit of Cryosphere Today area at 31 May.

4. **Executive Summary**

I attempt to predict the residual from a Gompertz fit of NSIDC average September Extent by linear regression using the residual from a Gompertz fit of Cryosphere Today areas at 31 May.

5. **Estimate of Forecast Skill (if available)**

The standard error arising in the linear regression is .44 M Km<sup>2</sup>.

However standard errors of a method tend to underestimate the errors likely in practice. So I have used only information up to 31 May of the year being predicted to predict each of the last 10 years. As shown in the table this gives a RMSE for this method of 0.56 M Km<sup>2</sup> which has been doubled to give a 95% confidence interval of 1.12 M Km<sup>2</sup>. This is hardly any smaller than the RMSE of 0.57 M Km<sup>2</sup> for Hamilton's Gompertz fit method. Consequently, it is not clear whether there is any skill at this lead time compared to just using a Gompertz fit.

**Estimate at 31 May of year concerned**

Year	Actual	Gompertz Fit	Gompertz & Area Fit	Gomptz Fit Err	Gomptz & Area Fit Err	Gomptz Fit Err^2	Gomptz & Area Fit Err^2
2002	5.96	6.44	6.44	-0.48	-0.48	0.23	0.23
2003	6.15	6.17	6.11	-0.02	0.04	0.00	0.00
2004	6.05	6.06	6.06	-0.01	-0.01	0.00	0.00
2005	5.57	5.95	5.89	-0.38	-0.32	0.14	0.10
2006	5.92	5.65	5.42	0.27	0.50	0.07	0.25
2007	4.30	5.62	5.59	-1.32	-1.29	1.75	1.67
2008	4.73	4.74	4.54	-0.01	0.19	0.00	0.04
2009	5.39	4.40	4.61	0.99	0.78	0.97	0.60
2010	4.90	4.58	4.48	0.32	0.42	0.10	0.18
2011	4.61	4.46	4.41	0.15	0.20	0.02	0.04
2012		4.28	4.29				

MSE 0.33      0.31  
 RMSE 0.57     0.56