

June Report: Outlook Based on May Data
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1. *A sea ice projection for the September monthly mean arctic sea ice extent (million square kilometers), 4.6*
- 2-*The type of estimate: heuristic, and statistical*
- 3-*The physical rationale for the estimate.*

There is opinion among Russian scientists that anomaly low sea ice extent (SIE) in September 2007 was occurred primarily due to rare circulation atmospheric regime held on in summer

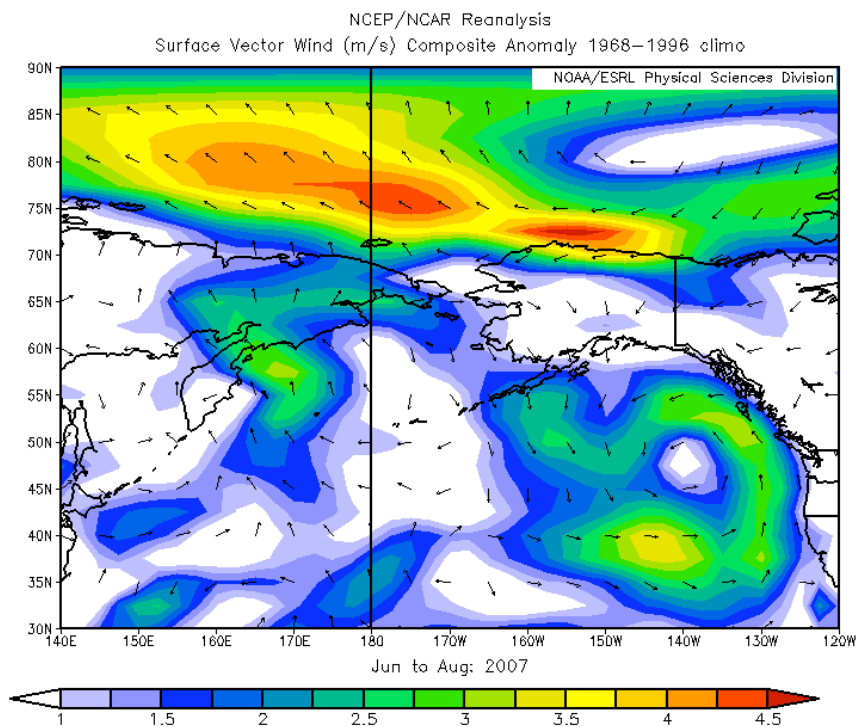


Figure 1. Surface vector wind field for summer 2007

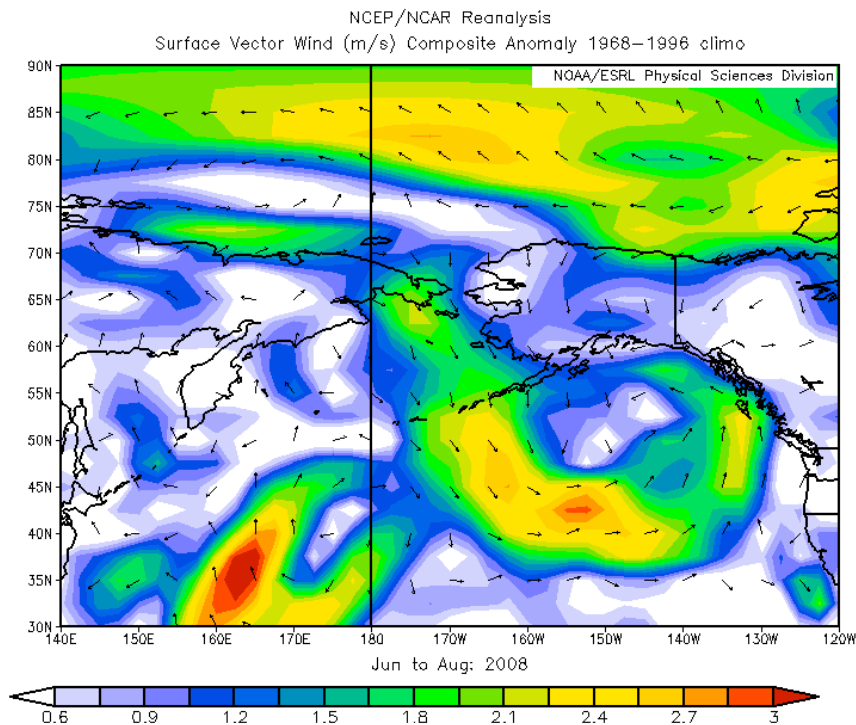


Figure 2. Surface vector wind field for summer 2008

(see fig.1). There is an opinion that extremely low Arctic sea ice extent (ASIE) magnitude was observed in 2007 due to strong eastward wind, which destroyed thin ice cover in Pacific (especially in Alaska and Canadian) sector of Arctic melted by warm air masses inflow from low latitudes. The wind field last (2008) year (fig.2) has been distinguished by strong north wind occurred in Siberia. As a result September ASIE in 2008 was partly recovered with account to 2007.

Wind field anomalies are generated partly by SST occurred in previous months. Our main attention should be drawn to North Pacific (NP) area. Spring field of SST (fig.3) reveals negative anomaly in eastern part of NP and significant temperature contrast between the east and west parts. That led to generation of atmospheric high in eastern part of NP and rapid transport of warm air from south. The SST field in 2009 (fig.4) demonstrates quite opposite SST anomaly. That suggests a different regime of air circulation in summer months 2009. Thus the ASIE in Pacific sector is expected to be close to last year value.

The ASIE in Atlantic sector is regulated mainly by temperature of Atlantic inflow waters. Most important indicator is a temperature of Atlantic waters at 300 m core depth. Unfortunately, the SST is only available indicator to be used. Thus there is some uncertainty, based only on the SST fields. Nonetheless, the SST field is a valuable source of data to predict ASIE in western Arctic (I mean Nordic, Barents, and Kara seas). The difference between January-April SST fields 2009 and 2007 (fig.5) shows that this year Atlantic water inflow is much cooler than those in 2007. So, we expect that the ASIE value in this area will be higher 2007 magnitude.

April ASIE value is more close to those of 2008 and higher than those of 2007. Thus, we can expect that September ASIE value of 2009 will be close to those of 2008: **4.6**.

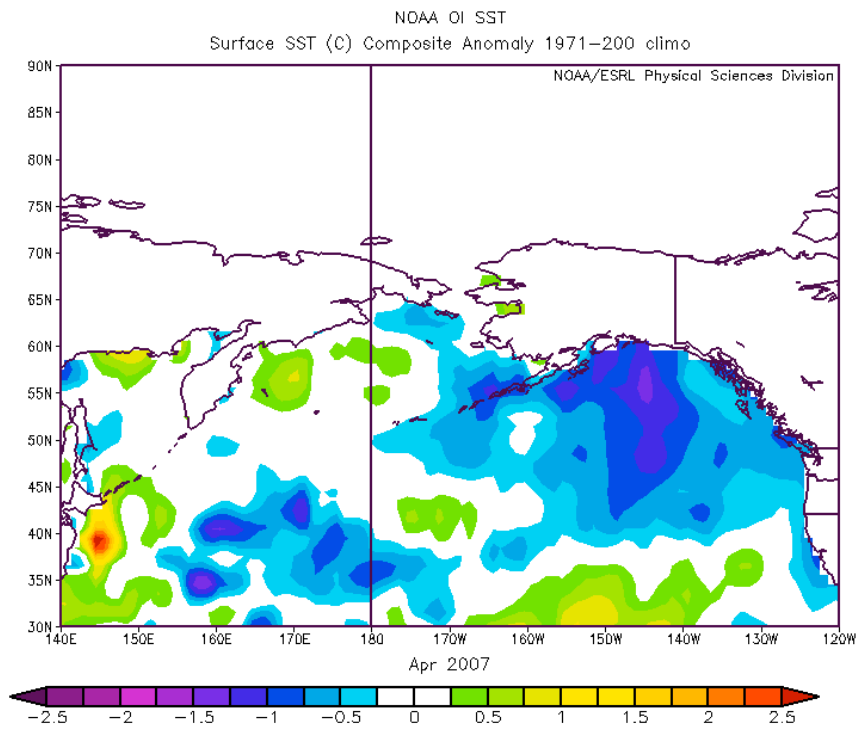


Figure 3. SST field anomaly in NP for April 2007

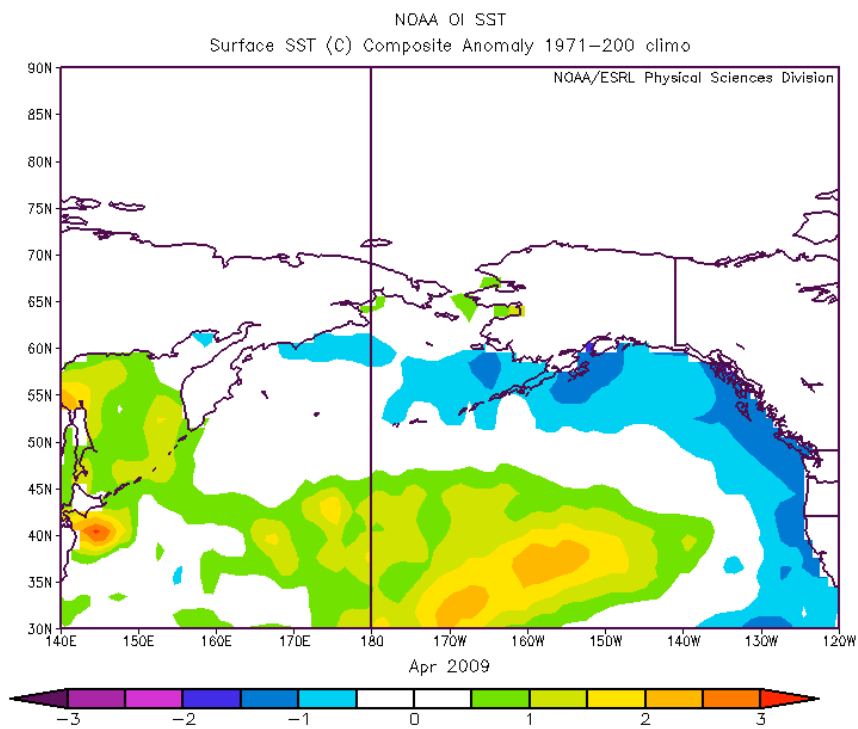


Figure 4. SST field anomaly in NP for April 2009

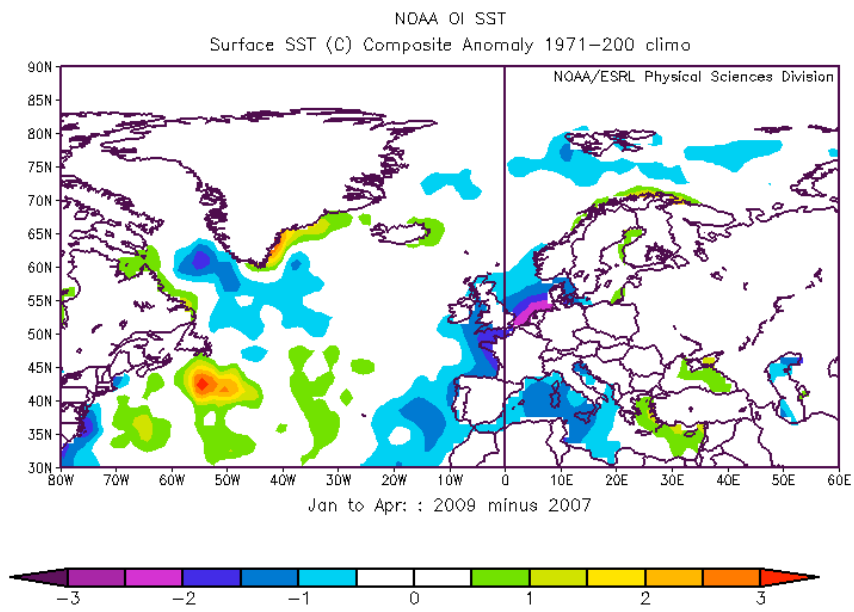


Figure 5. The difference between January-April SST fields 2009 and 2007.