

## ***Interactive comment on “Synoptic climatology and recent climate trends at Lake El’gygytgyn” by M. Nolan et al.***

**Anonymous Referee #3**

Received and published: 10 July 2012

### GENERAL COMMENTS

This manuscript describe results of a study to character the regional synoptic climatology influencing the Lake E area. It relies on a statistical spatial analysis method that has been applied in other recent studies. The reported result that most of the warming in the Lake E area is coming during spring and autumn is particularly noteworthy. There are a number of other well-supported conclusions that come from this study. The authors make clear the earlier work that supports the use of SOM for achieving stated objectives. They present a synthesis of their results and structure the paper in a logical orderly flow.

At initial glance the manuscript appears highly technical and overly complex. Clearly one can not easily jump right into the middle of text and figures unless already well

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familiar with the SOM methodology. But beyond this and similar limitations, the authors do well in building through each set of results from the initial 35 SOM maps to the final attribution section. Results described in the text are supported by the graphics. As with many journal articles, the appeal of the technical details will be limited for many readers of CP. Graphics are not easily understood without reading through portions of the text. But I see no obvious need for a major alterations to the manuscript structure.

However, the manuscript can be improved.

Where appropriate some mention of how results from the present study related to other recent work (eg. Serreze, Zhang, Walsh, Finnis) may be helpful to the reader. For example, what do other studies suggest about the seasonality in recent warming? The mechanisms speculated by the authors to be occurring have been discussed in other related studies. Specific comments follow.

### SPECIFIC COMMENTS

Maps in the present paper should include the location of Lake E.

page 1491, lines 15-20: more detail needed on when freeze and thaw seasons start/end. Is it the first occurrence of a temperature above or below 0C? Or three day average temperatures? What happens if temperatures fluctuate around 0C for a few weeks?

page 1492, line 28: There is only one low pressure north of the Lake. The text says "low pressure centers north of the lake..." Make consistent.

Patterns 5 and 30 have same number of NDD (fig 5). What does this say given the same frequency but different standard deviation in occurrence? Is the fact that they have same NDD totals meaningful?

Page 1494, line 7: It is not clear in the figure that early summer (DOY 150) got a bit cooler as suggested. Be more specific or describe another way?

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A check should be made to see that defining negative degree days over calendar year is not causing a bias with respect to NDD calculated over the cold season.

#### TECHNICAL COMMENTS

Page 1496, line 26: What is DDJ? Should this be DJF?

no labels on colorbar in figure 2A.

Consistency needed in use of NCEP, NCEP/NCAR, NNR

text around figures should be larger or bolder. For example in figure 3a the text "Temperature Anomaly" is clearer than other axis numeric labels. All text should be same boldness and generally larger.

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Interactive comment on Clim. Past Discuss., 8, 1485, 2012.