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The Cryosphere Discussions

Interactive comment on "Analysis of ice phenology of lakes on the Tibetan Plateau from MODIS data" *by* J. Kropáček et al.

J. Kropáček et al.

jan.kropacek@tu-dresden.de

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We would like to thank to the referees for highly inspiring comments and suggestions. We are convinced that the modifications helped to bring the text to a qualitatively higher level.

Sincerely, Jan Kropáček and co-authors

1) statistical significance of the results added Statistical significance has been listed for trends in DI and DCI for all lakes (Appendices A, B and C). The statistical significance of differences of means of DI and DCI amongst the groups has been carried checked by Anova. Further the significance of differences in mean trends in DI and DCI amongst the groups were assessed by ANOVA.

2) +/- 8 days issue In order to alleviate for this problem, each ice phenology date was obtained as an interpolation between the first neighboring points above and below the thresholds on the open water curve. The accuracy of the approach has been assessed by comparison of the water curve with higher resolution satellite images of Nam Co which resulted in mean error as low as 1.2 days.

3) z-scores The z-scores for all ice phenology variables were calculated using the proposed approach. The variation in the groups nevertheless stayed high. We found the use of z-scores impractical since it is a dimensionless quantity and therefore the overview of the ice phenology becomes less understandable for the reader. We prefer to stay with the original variables instead.

4) clustering of the lakes instead of a simple geographic grouping The lakes were re-grouped using clustering as suggested instead of a simple geographical division into four groups. This resulted in 3 groups that are more or less geographically compact. A higher number of clusters (4, 5) resulting from k-means was experimented with. This did not lead to a decrease of variation of ice phenology parameters. A thorough description of the new grouping has been added to the text.

5) actual climate dataset used Reanalyzed data for the period 2000-2010 were used instead of WorldClim data for the characterization of the present climatic conditions. Based on this data set climatic conditions on the TP were briefly described in the first part of the Introduction section (2.). A figure showing temperature and wind fields over the TP has been added (now Fig. 1) together with a graph showing mean wind velocity and temperature for each lake group during the year (Fig. 3). The data processing of this new dataset has been described in the section 3.4.

6) influence of wind speed Information about wind speed has been added to the Introduction including figures showing mean annual, DJF and JJA wind speed (Fig. 1). Additionally a graph showing mean wind velocity and temperature for each lake group during the year was added (Fig. 3). Since the wind affects the freeze-up process prob-

ably mainly as a disturbance of new ice during strong wind events we did not include the mean wind speed into the clustering process.

7) influence of salinity on the ice regime Information about salinity has been added to the second part of the section 2. According to the work of Zheng and Liu (2009) the mean salinity of five lake zones on the TP is in the range 135 - 352 g/l which is rather high. This convinces us that the ice regime of many lakes is impacted by salinity. A comprehensive data set describing salinity of Tibetan lakes is unfortunately not available.

8) freezing and thawing indices Both thawing and freezing index were used for parametrization of the climate factor. Surprisingly, after the regrouping of the lakes, there are only very little differences in dependency of ice phenology on the mean temperature, freezing and thawing indices.

9) page 1757, line 18 The value of correlation coefficient has been changed according to the actual results.

Interactive comment on The Cryosphere Discuss., 6, 1739, 2012.