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# ***Interactive comment on “Role of rainwater induced subsurface flow in water-level dynamics and thermoerosion of shallow thermokarst ponds on the Northeastern Qinghai–Tibet Plateau” by X. Pan et al.***

## **Anonymous Referee #2**

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The article ‘Role of Rainwater Induced Subsurface Flow in Water-Level Dynamics and Thermoerosion of Shallow Thermokarst Ponds on the Northeastern Qinghai-Tibet Plateau’ addresses the hydrology of two ponds of the Qinghai-Tibet Plateau.

The paper presents interesting ideas which could potentially contribute to understanding hydrological and thermal processes related to aquatic ecosystems in permafrost setting. However, the paper is very poorly written and, in my opinion, doesn’t meet the minimal requirements for a publication in The Cryosphere. In many instances, it is not possible to clearly understand the concepts proposed because they are not properly

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explained in the text.

### 1) Originality.

This paper contains interesting ideas regarding the lateral fluxes of water that may contribute to pond hydrology and permafrost degradation (potentially by thermo-erosion) on the QTP which is characterized by very low snow precipitation. Other interesting concepts presented in the paper are the interactions between the thaw front propagation in the active layer, water table and groundwater flow around ponds.

### 2) Scientific quality.

This paper lacks scientific rigour. The methodology is not always clearly explained. In fact some parts are sound while other sections really lack details to evaluate the strength of the results produced.

The concepts of thermokarst and thermo-erosion are not always used in a proper way or in the proper context. The authors also discuss about conductive heat transfers while it should be convective heat transfer (in relation with thermo-erosion). The evidences of thermo-erosion are anecdotal and have not been demonstrated clearly.

It is not clear if the water level data measured using U20 sensors have been corrected for atmospheric pressure. If not, then the results in figures may contain significant noise. The authors assume that there is no infiltration of water into the mudstone below the pond. However, the 'waterproof' character of the mudstone hasn't been demonstrated clearly. Fissures in the rock could contribute to infiltration of water from the talik and thus to pond water level. This could severely impacts the conclusions of this study. There is not enough rationale or background information given in the evapo-transpiration-evaporation equations. it is not specified where those equations are coming from (not enough referenced).

Basically, I consider that this paper is not well-articulated, that the evidence presented are vague, the discussion is often anecdotal (no clear scientific proof) and therefore

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the conclusions are weakly supported.

### 3) Significance

Because the text lacks clarity, it is difficult to evaluate the significance of the findings of this study. Many statements do not represent, in my opinion, a scientific proof. I was not convinced, by the way the results are presented, of the strong significance of the scientific concepts regarding pond hydrology and heat transfers.

### 4) Presentation quality

The scientific results are not presented in a clear, concise, and well-structured way. The quality of the English is very poor, the text contains many errors of syntax/spelling. The sentences are very long and often contain more than one idea/topic. It is often difficult to understand what the authors are trying to explain. The graphical quality of the figures is not always good and explicit (e.g. fig. 3) and the figure caption is not detailed enough to interpret/understand the figures.

For the reasons stated above, I do not recommend publication of this paper.

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Interactive comment on The Cryosphere Discuss., 8, 6117, 2014.

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