

# The Dynamics of Laurentian Great Lakes Surface Energy Budgets

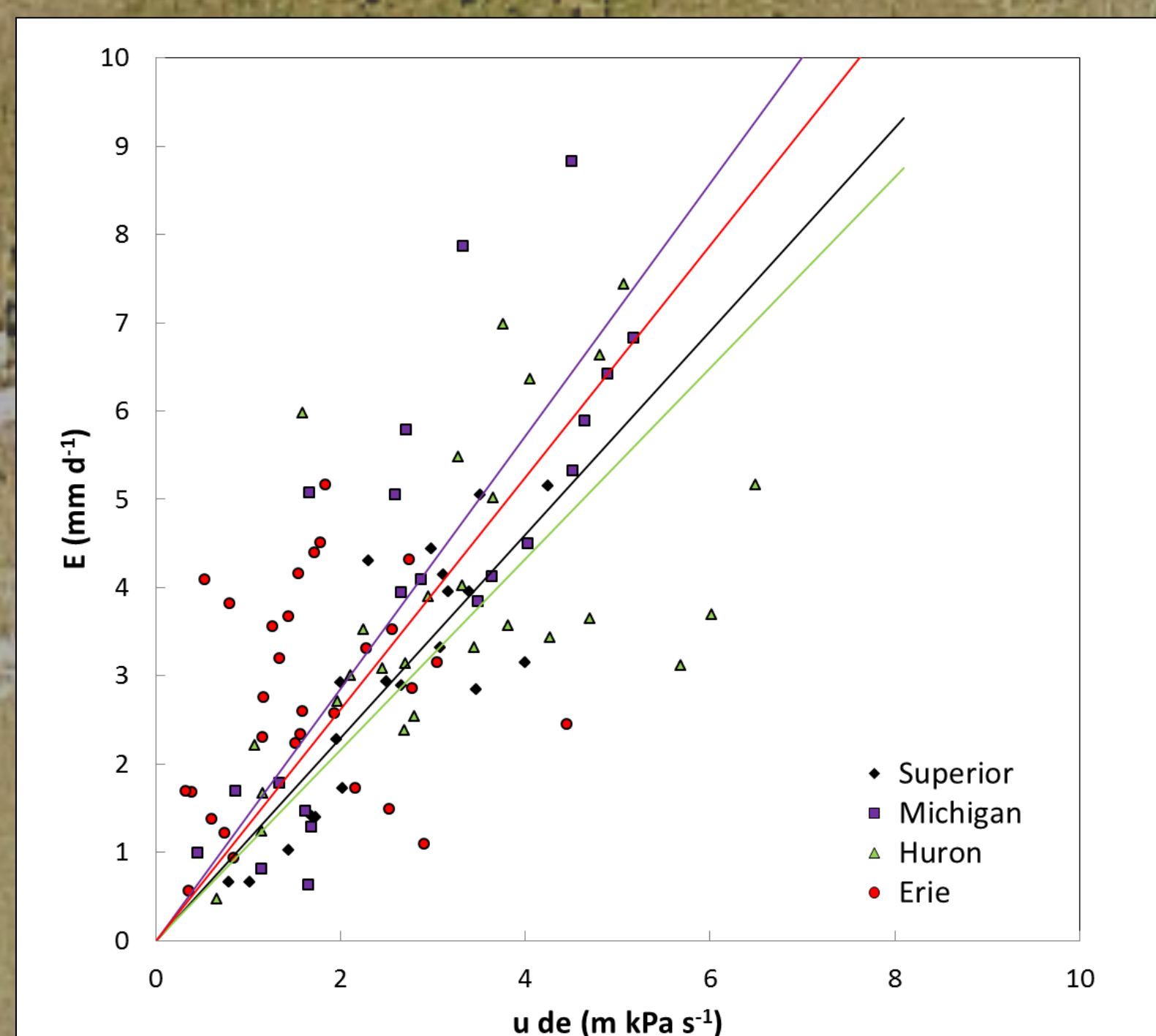
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## INTRODUCTION

- The Laurentian Great Lakes constitute the largest freshwater surface in the world and are a valuable North American natural and socio-economic resource.
- In response to calls for improved monitoring and research of the energy budgets of the lakes, there has been an ensemble of in situ measurements deployed through an on-going bi-national collaboration known as the Great Lakes Evaporation Network (GLEN)
- The objective of GLEN is reduced uncertainty in Great Lakes seasonal and 6-month forecasts, and climate change projections of lake energy budgets, water fluxes and levels
- This poster reports on recent successes in three major areas.

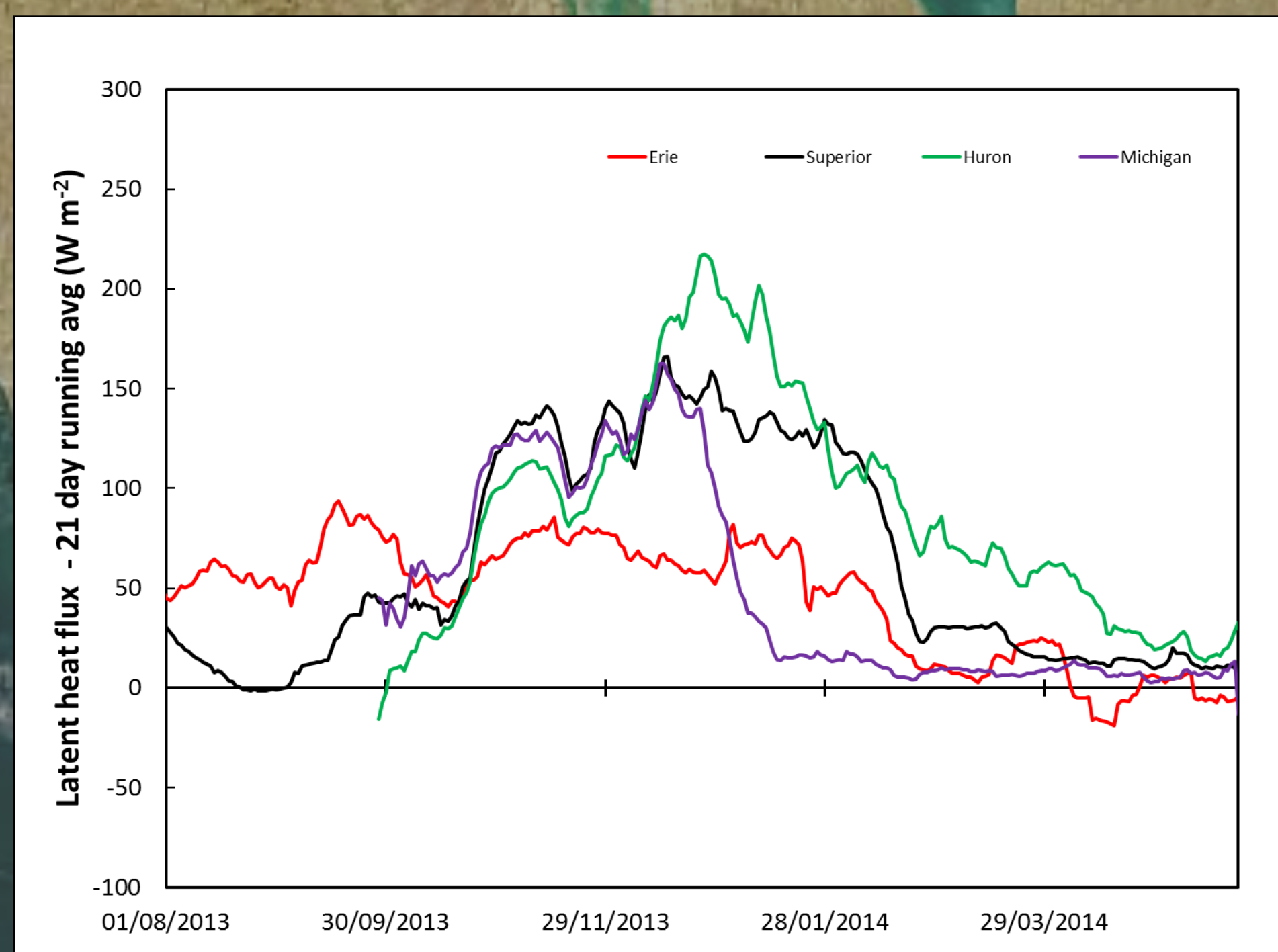


### Understanding the controls on evaporation variability



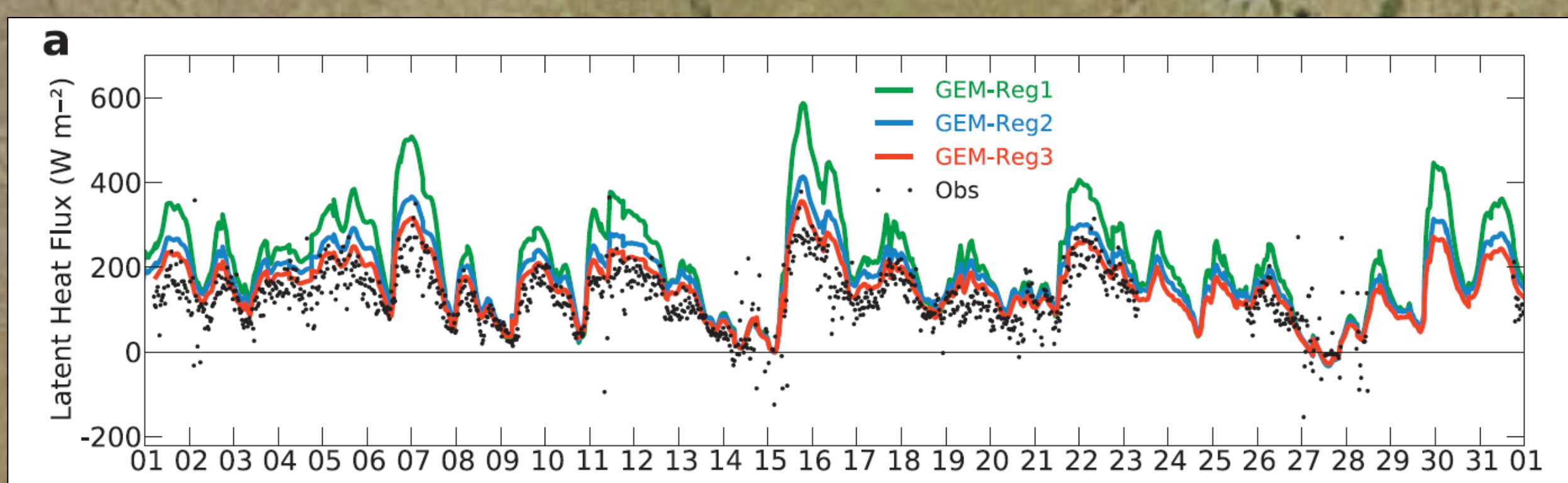
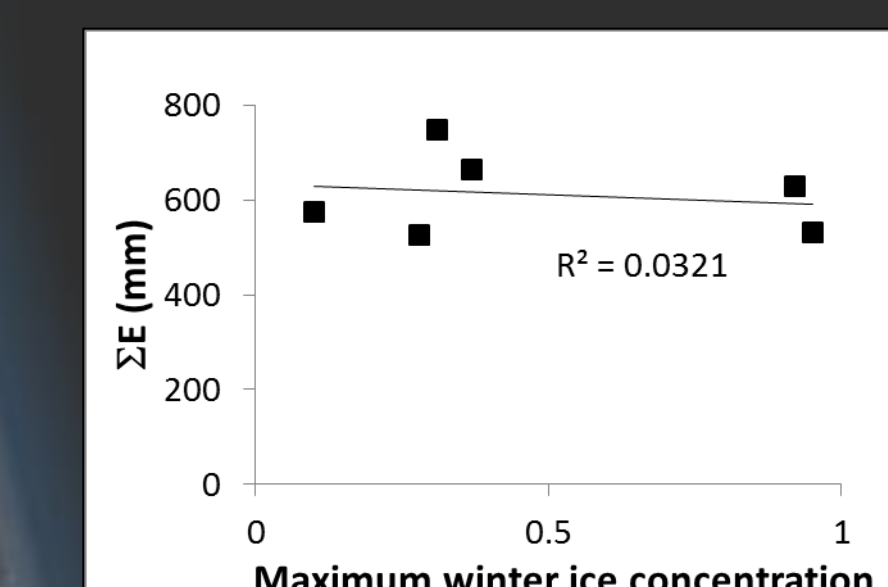
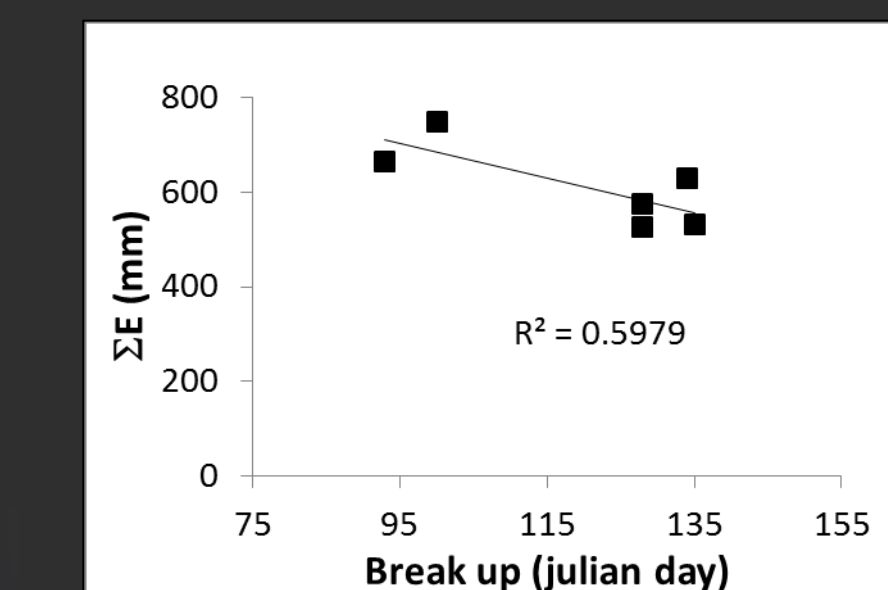
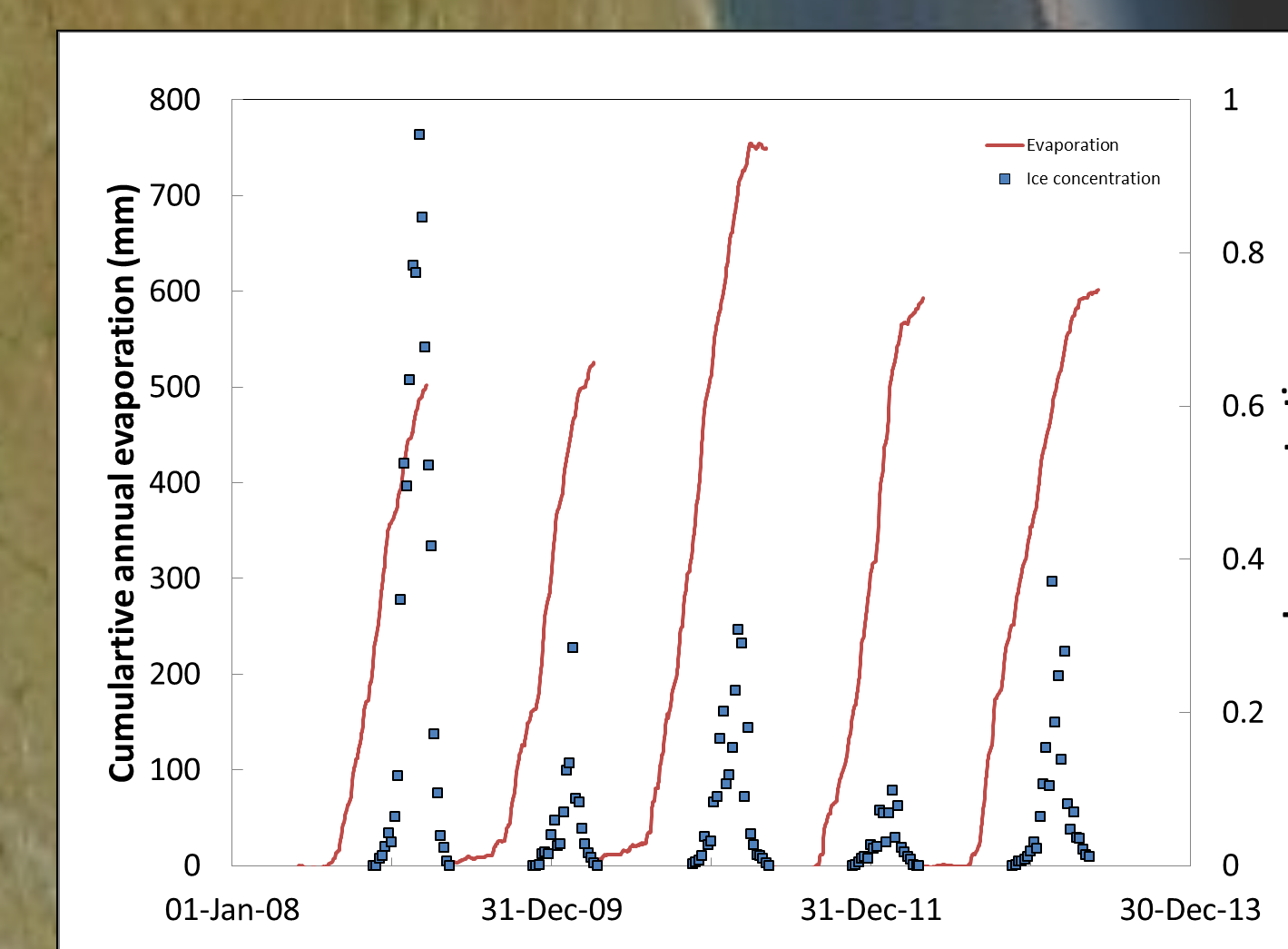
Daily mass transfer relationships among the lakes in November 2013.

### Estimating latent heat flux over each lake

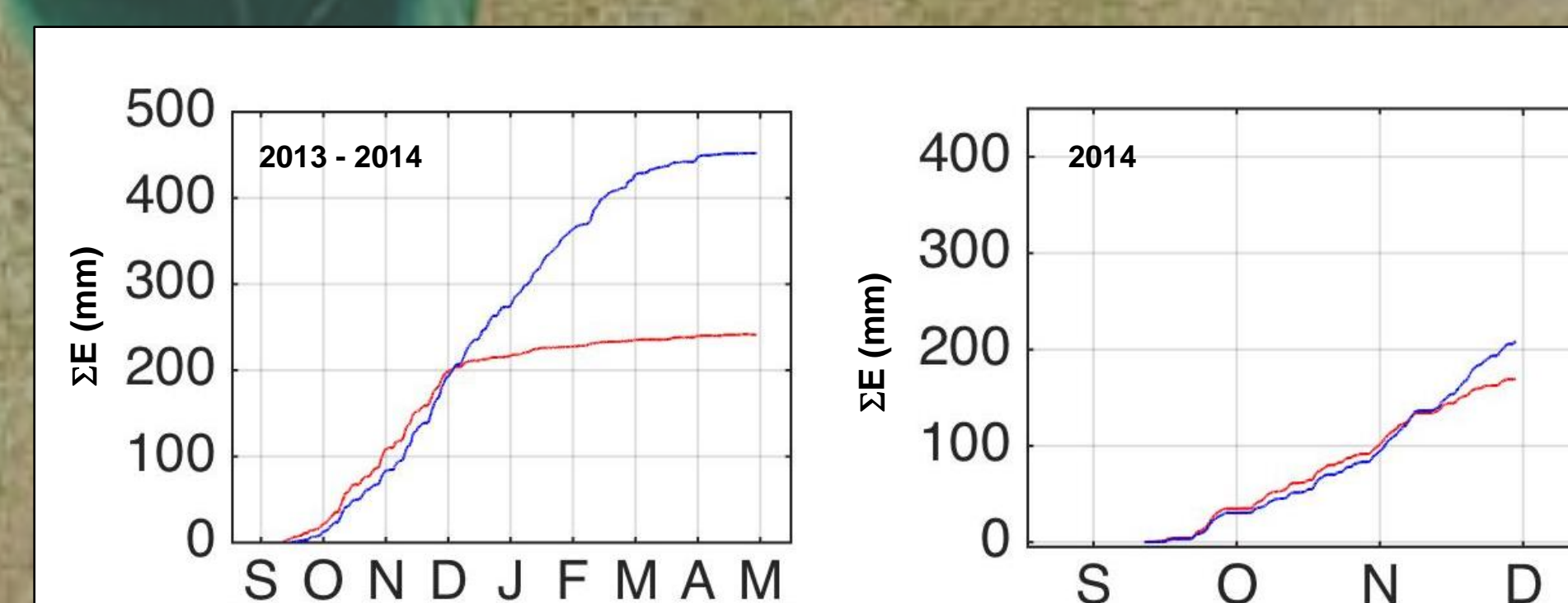


Latent heat flux from four lakes showing similarities and differences due to passage of synoptic events and onset of ice cover.

### Ice, water temperature and evaporation interaction

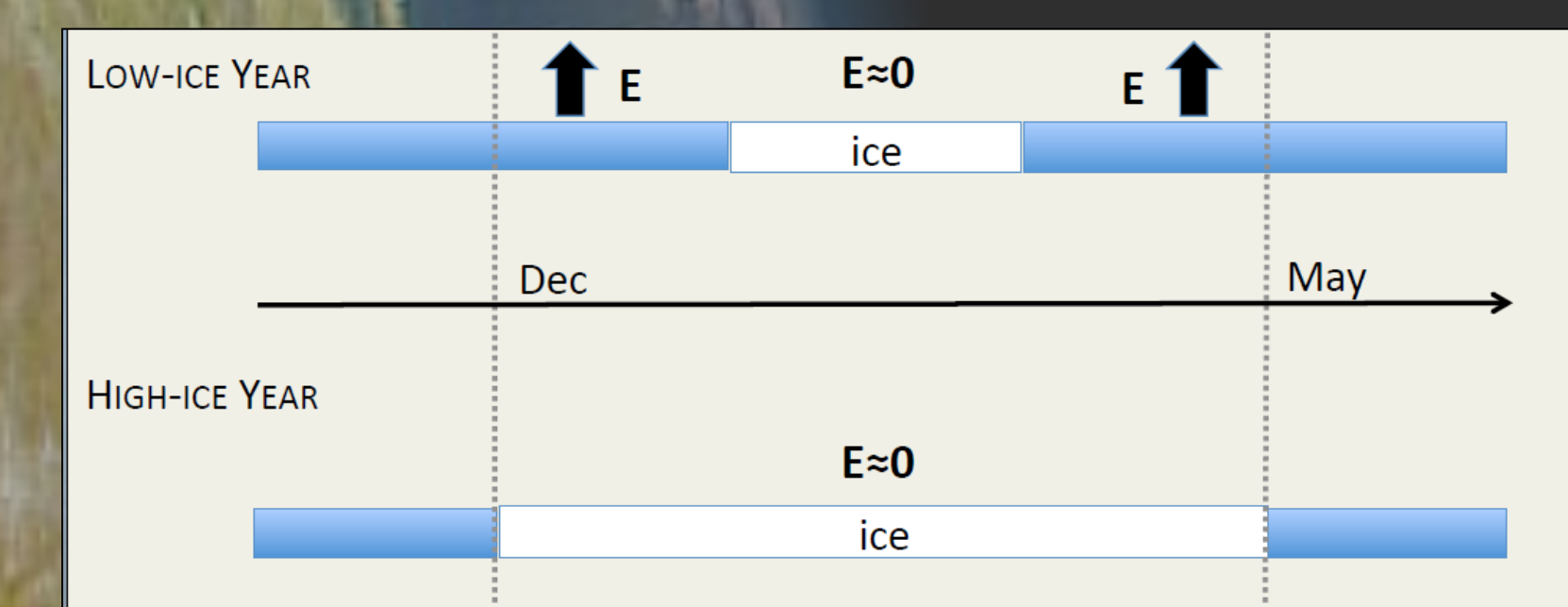


Improvements to simulated latent heat flux, Dec. 2008 with Environment Canada's regional deterministic prediction system (RDPS) (from Deacu et al., 2012)

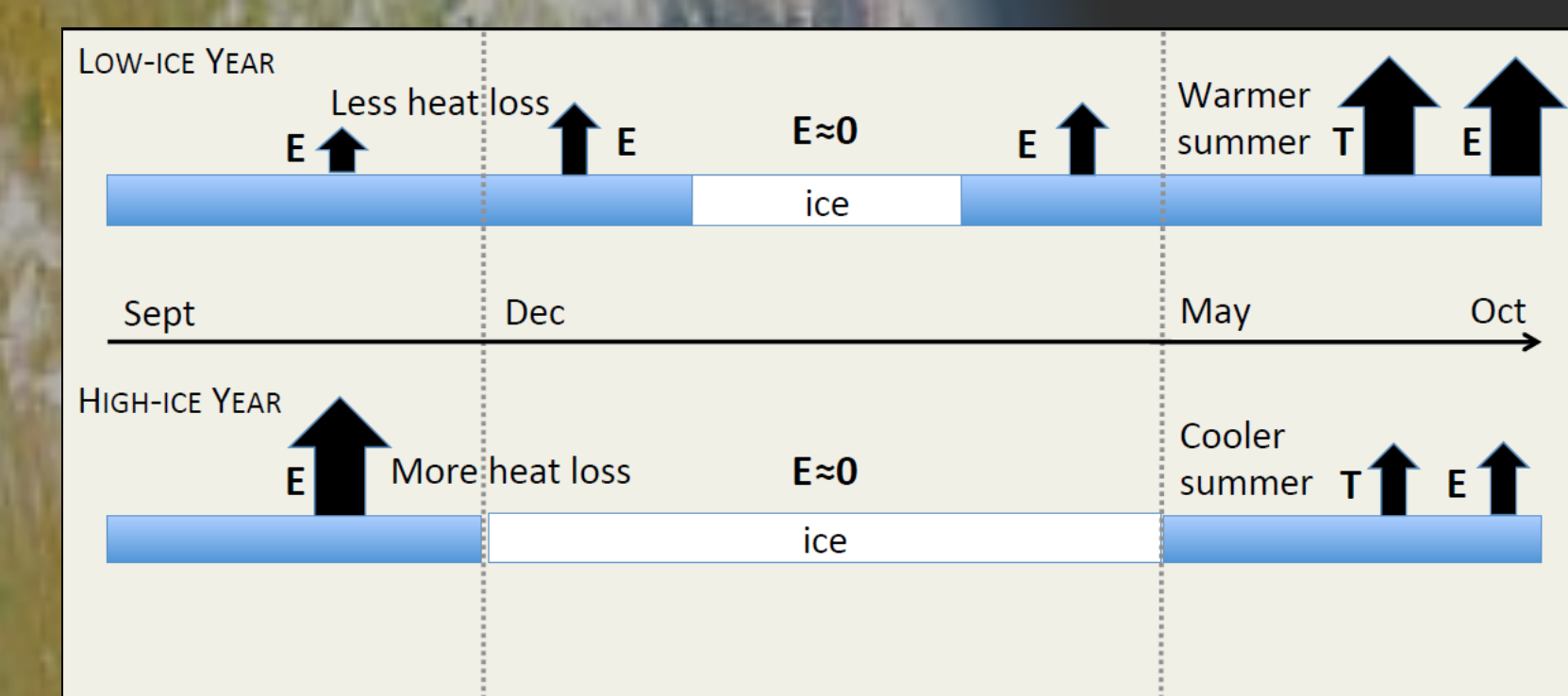


Cumulative evaporation from White Shoal (red) and Spectacle Reef (blue) illustrating local effects of ice cover.

Old Paradigm



New Paradigm



Development of a new paradigm of the relationship between ice cover, and seasonal evaporation