Glacial conditioning of stream geomorphology in low-relief versus mountain landscapes

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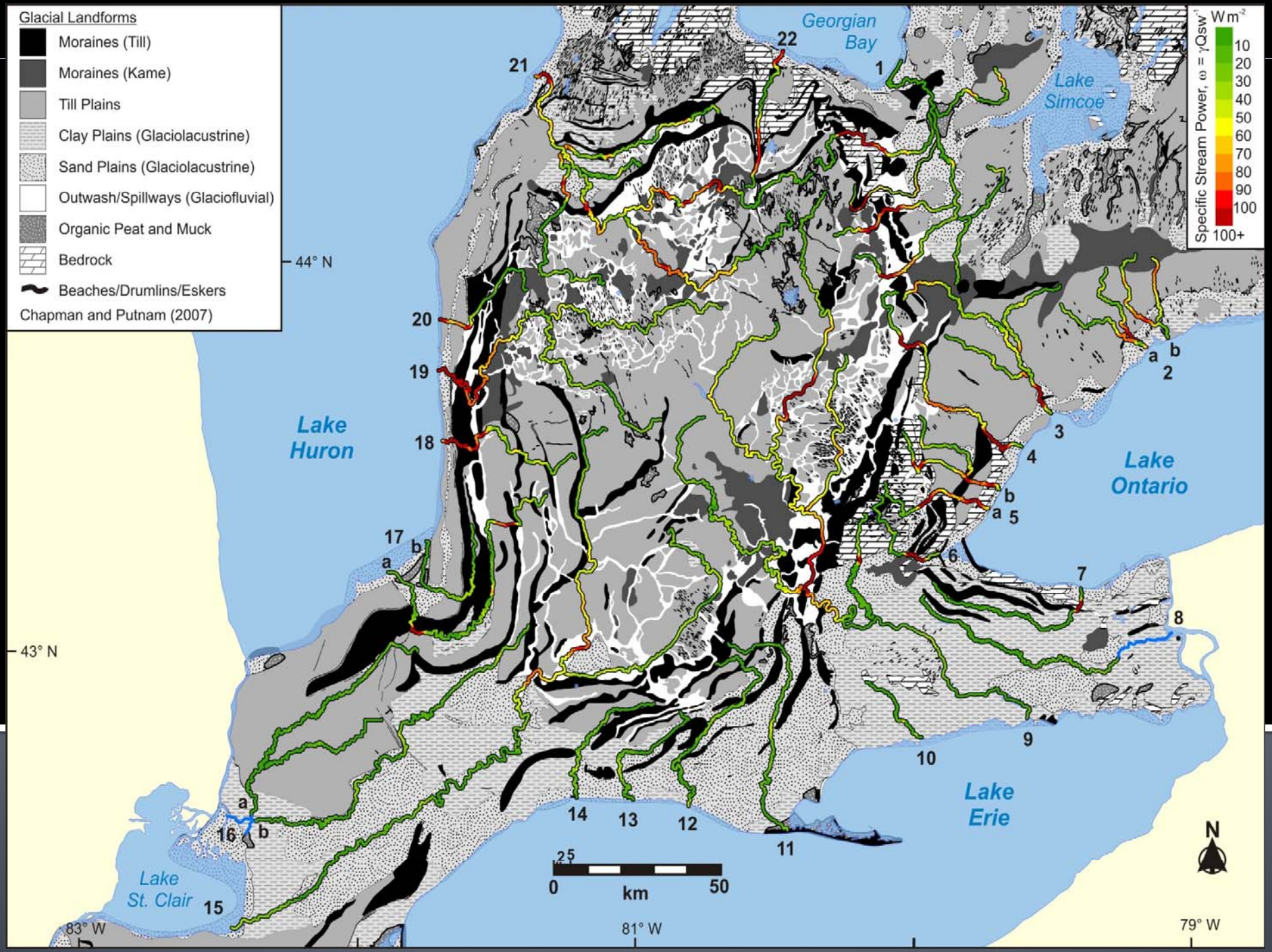
Glacial conditioning of stream geomorphology in low-relief versus mountain landscapes

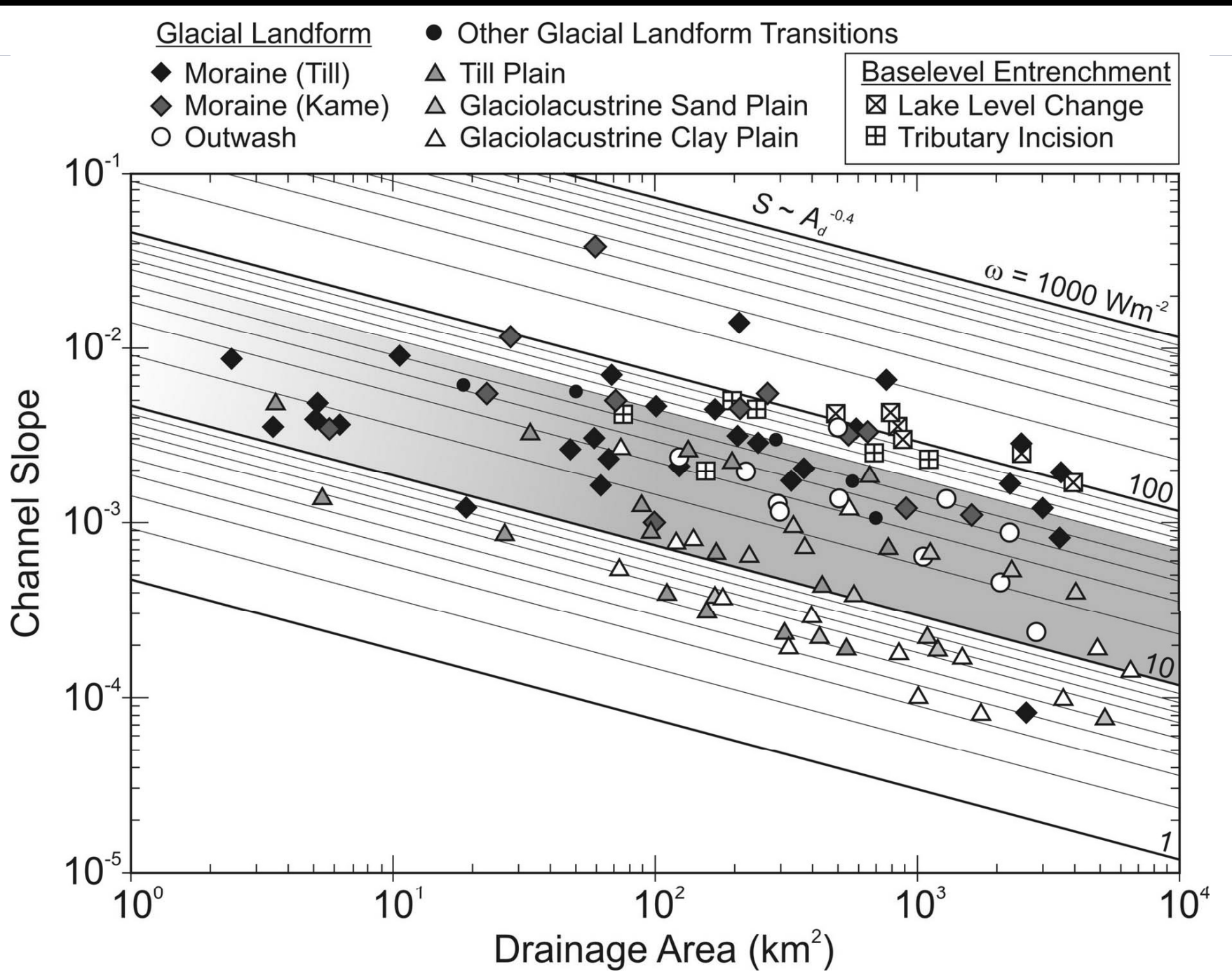
1. *Stream Power*
2. *Alluvial Floodplains*
3. *Fluvial Landscape Model*

1 Stream Power in Southern Ontario



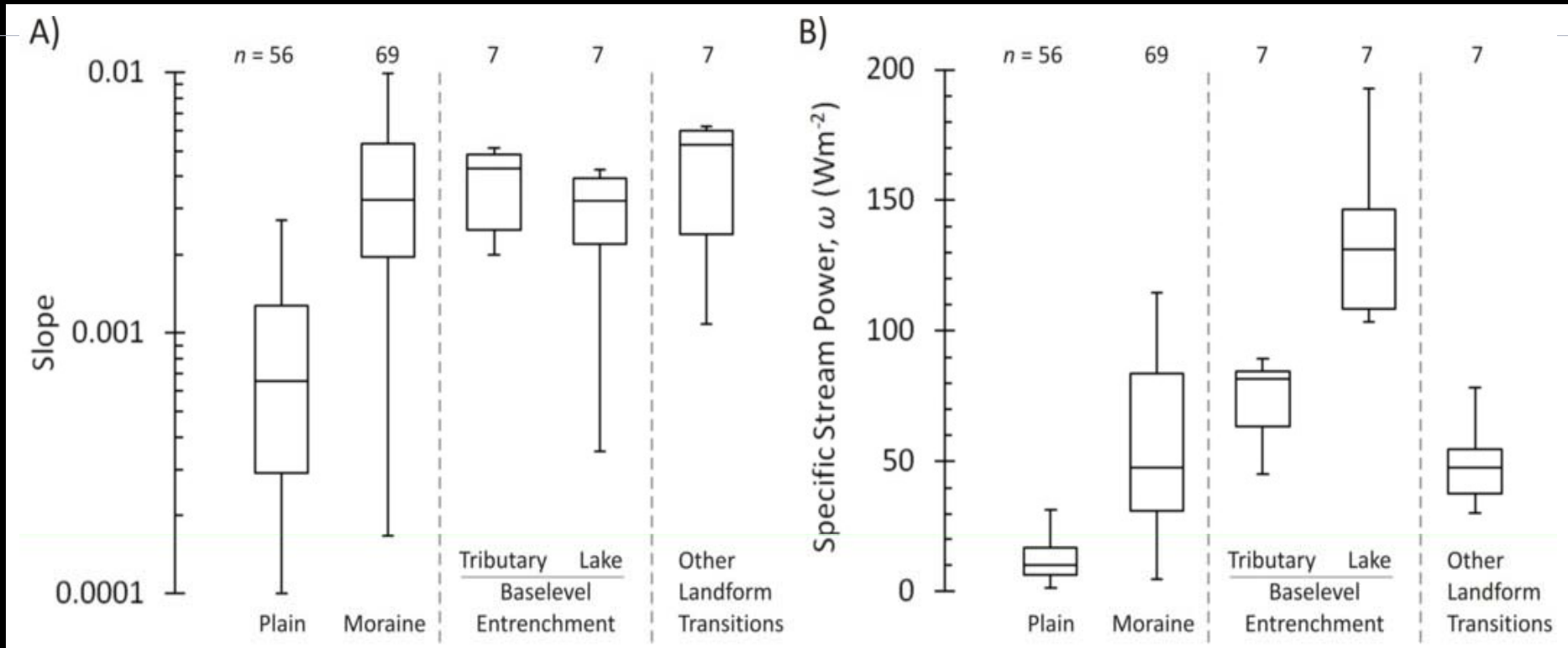
Phillips, R.T.J. and Desloges, J.R. (2014[a]). *Geomorphology*.

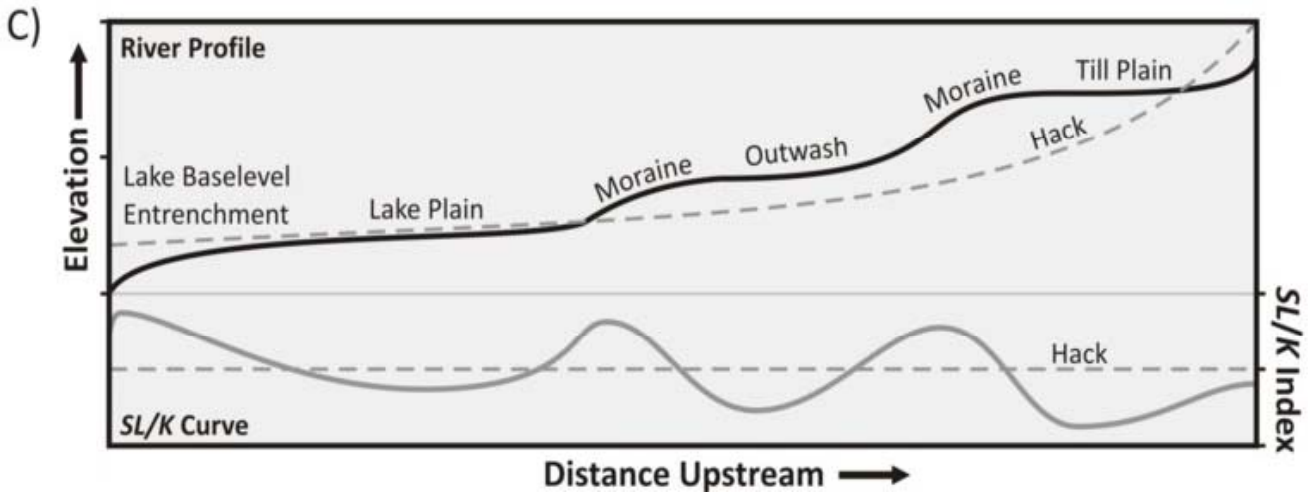
1 Slope-Area Plot with Glacial Landforms



Phillips, R.T.J. and Desloges, J.R. (2014[a]). *Geomorphology*.

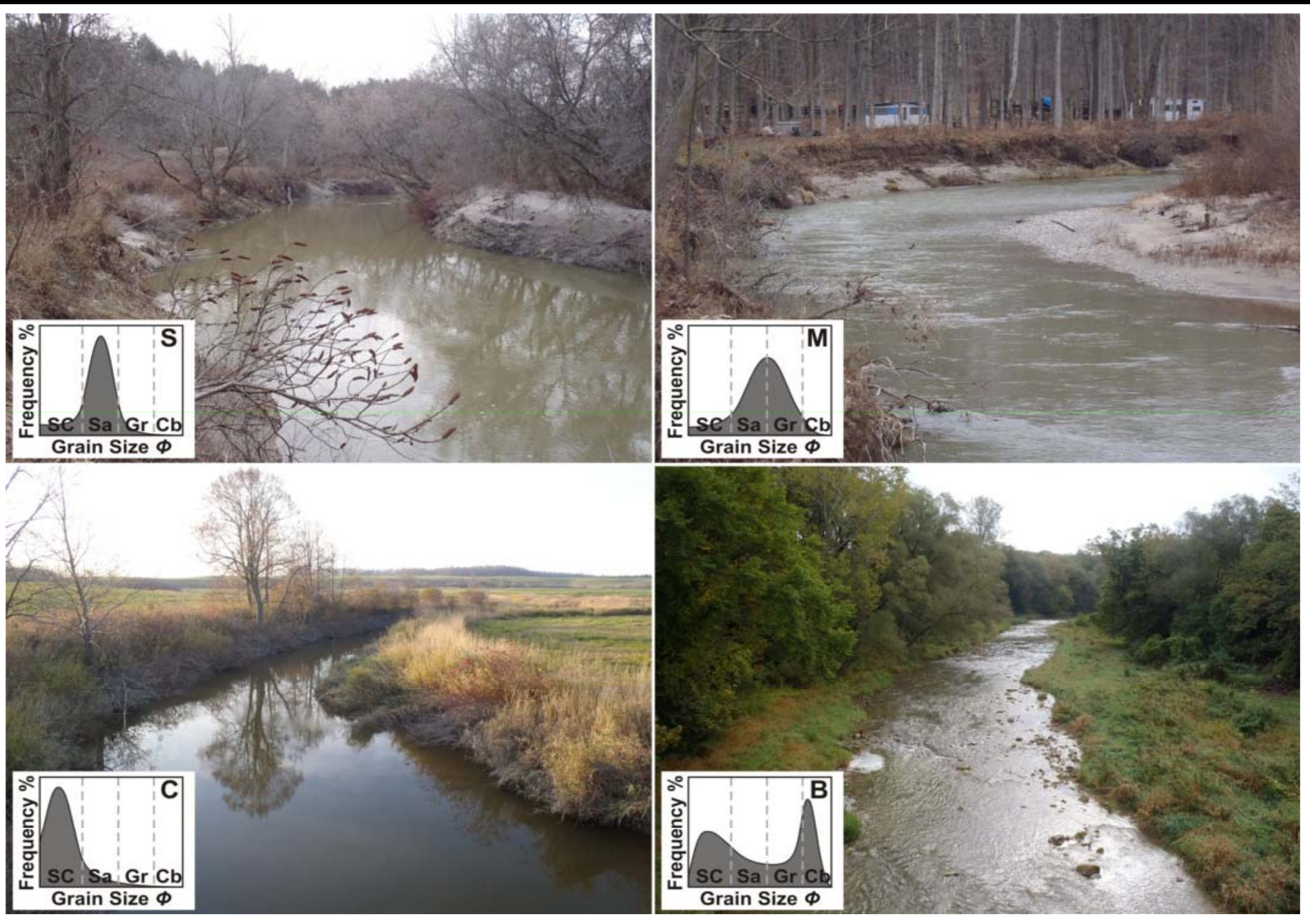
Box-Plots (Moraines versus Plains)





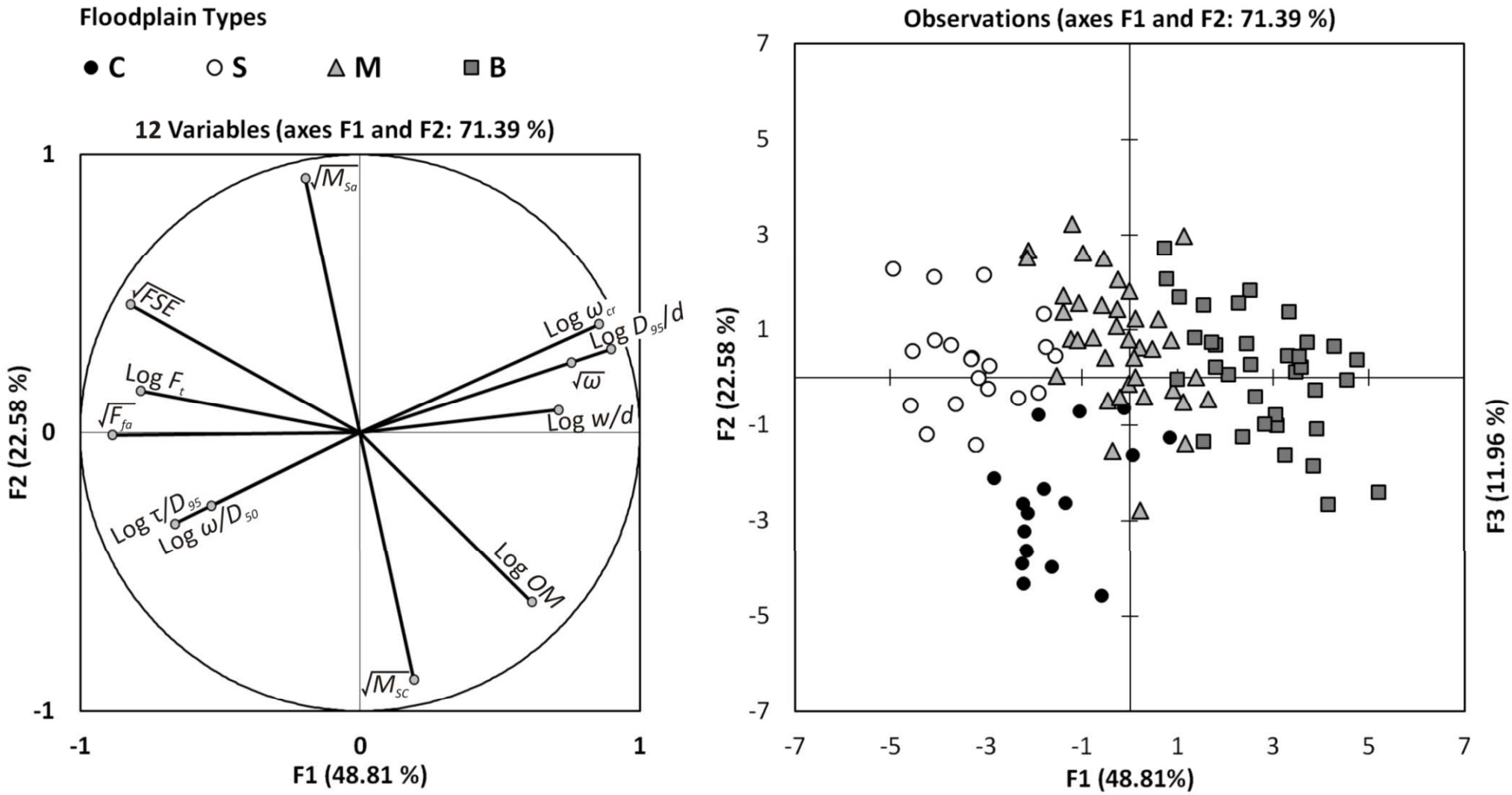
2 Floodplain Classifications – K-Means Clustering

w/d F_t F_{fa} *FSE* *OM* M_{SC} M_{Sa} Φ_{50} D_{95}/d



Phillips, R.T.J. and Desloges, J.R. (2014[b]). *Earth Surface Processes and Landforms*.

Principal Component Analysis



12 Variable PCA

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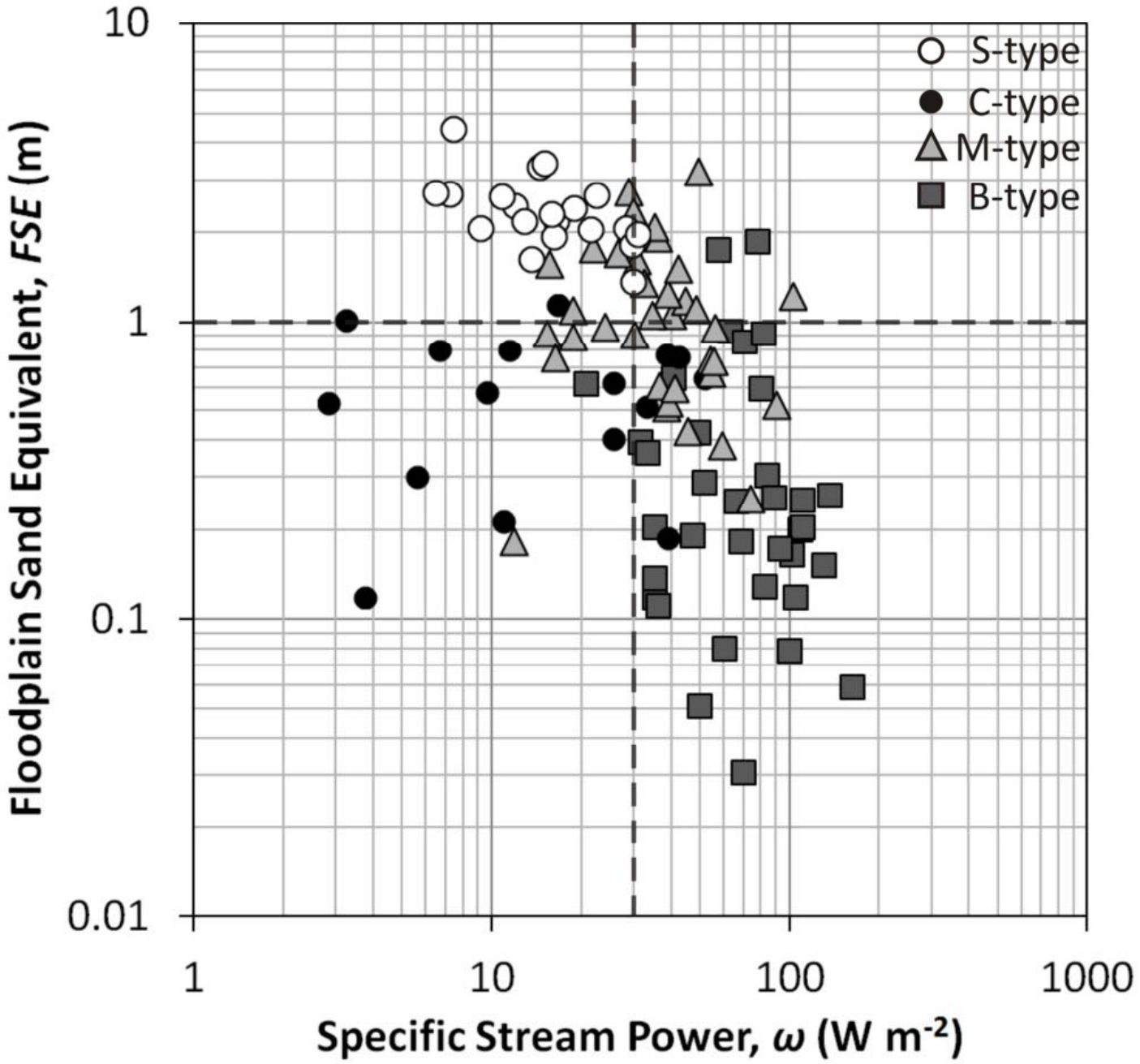
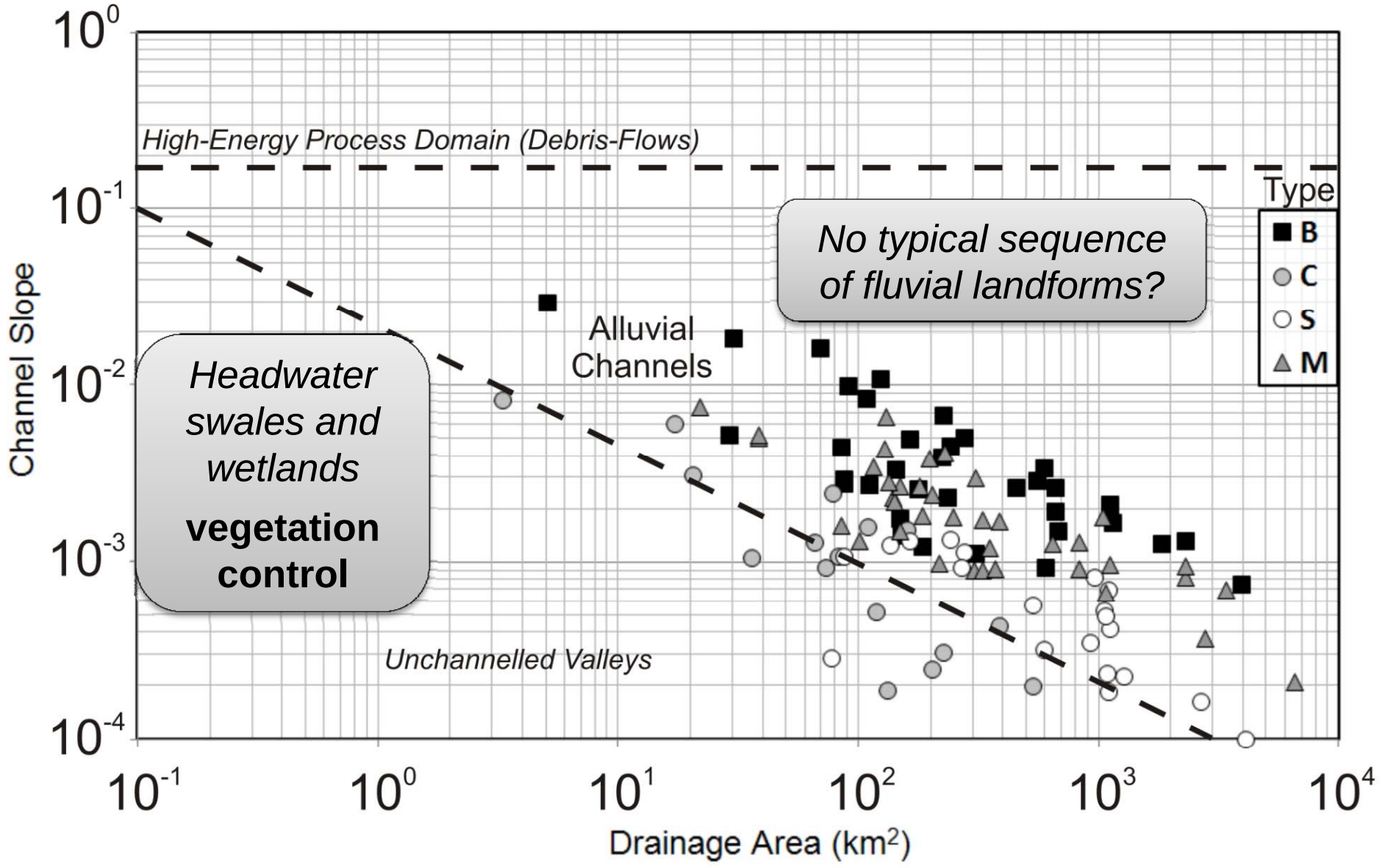
Stream Power – Floodplain Sand Equivalent



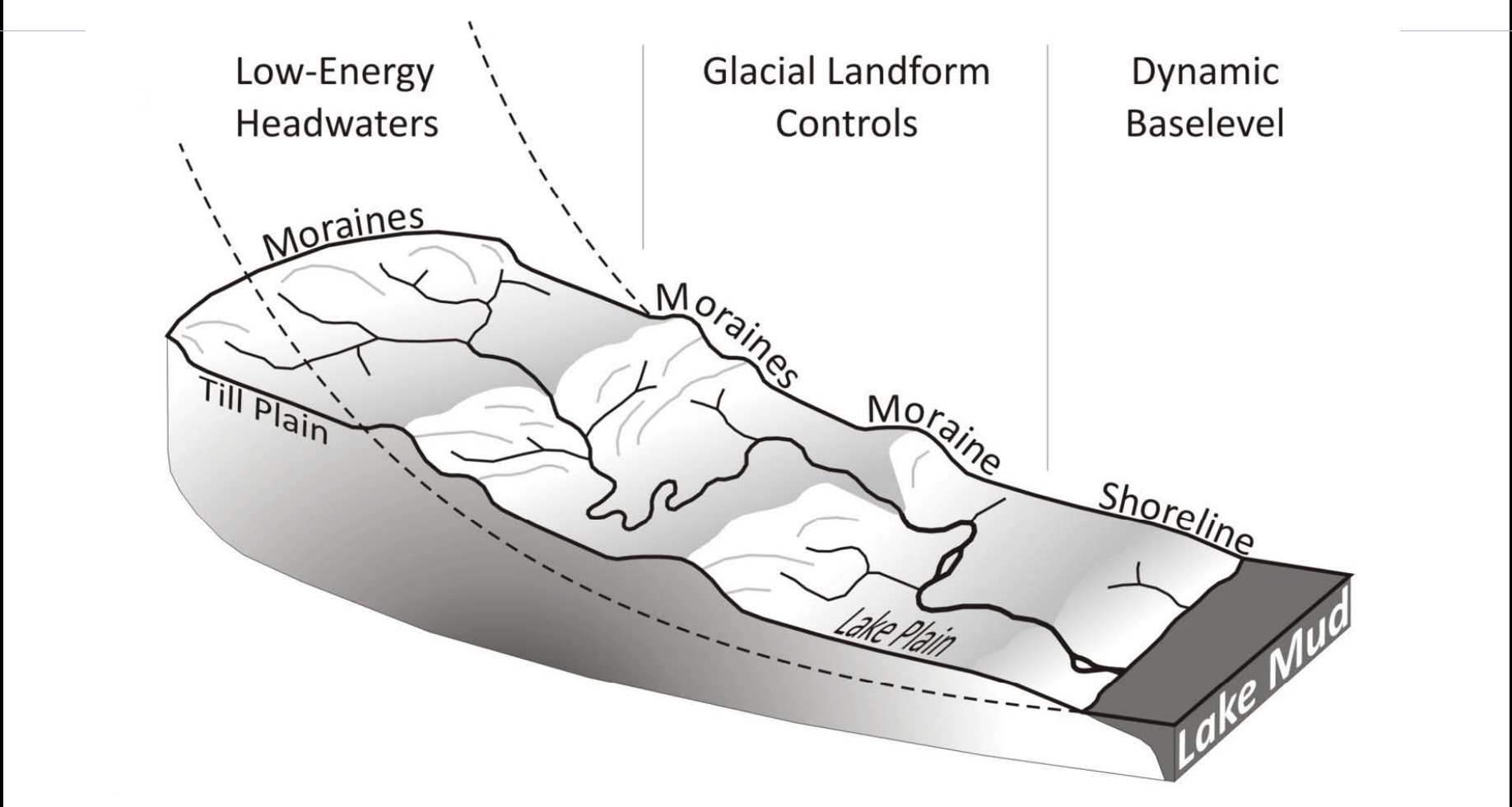
Phillips, R.T.J. and Desloges, J.R. (2014[b]). *Earth Surface Processes and Landforms*.

3 Slope-Area Plot with Floodplain Classifications



Dashed lines and process domains for unglaciated mountainous catchments from Montgomery and Foufoula-Georgiou (1993)

Fluvial Landscape Model

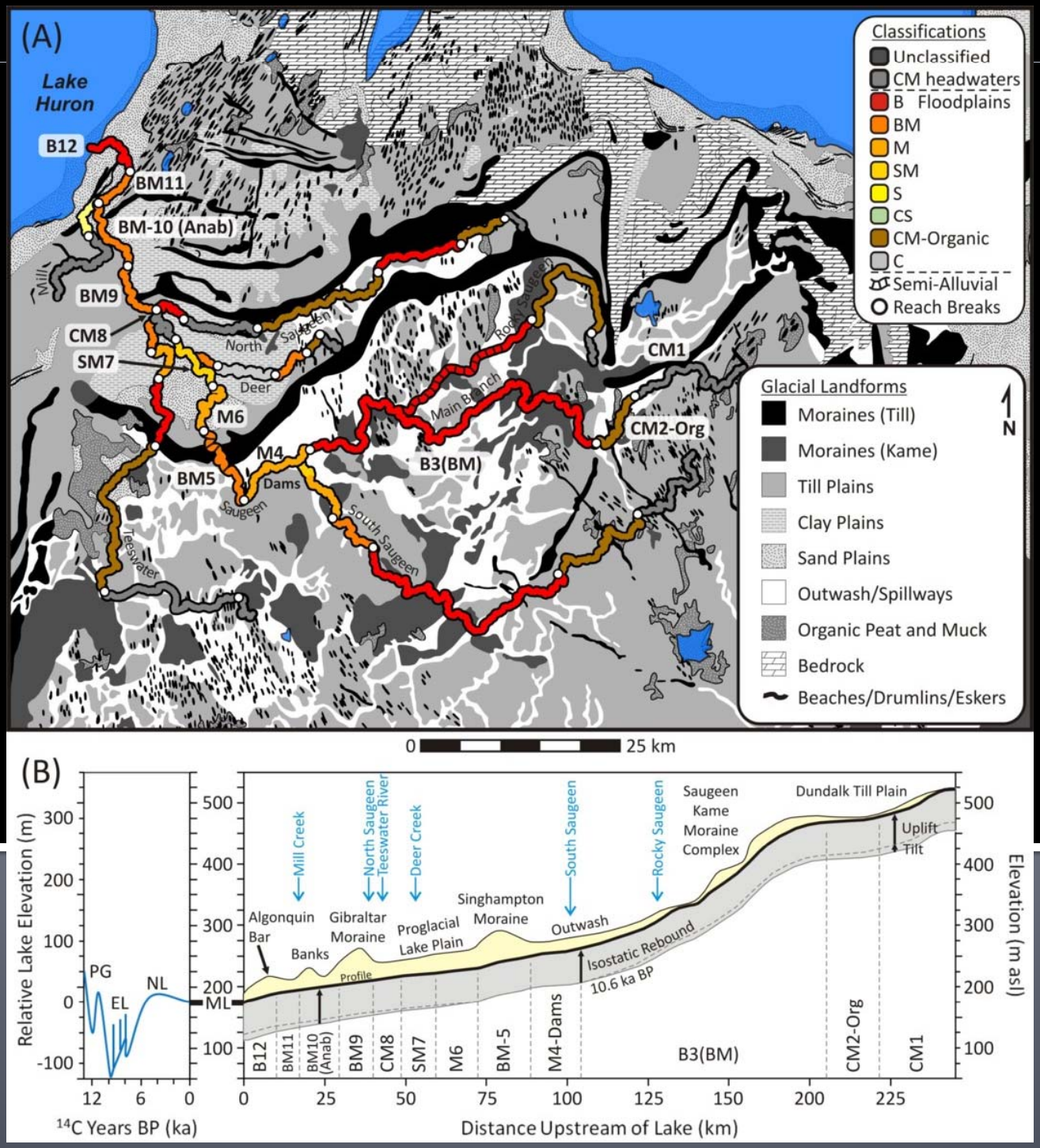


Moraines, Outwash	**B** (or M*)
Till Plains	**C** (or CM)
Sand Plains	**S**
Clay Plains	**C**

Channel / Floodplain Types

***M-Types**
fluvial sediment transport of gravel from upstream sources

3 Example: Saugeen River Reach Classifications



for Applied Environmental Geoscience

Stream Restoration

Endangered Species Habitat Assessment

Thank You!

Phillips, R.T.J. and Desloges, J.R. 2014[a]. Glacially conditioned specific stream powers in low-relief river catchments of the southern Laurentian Great Lakes. *Geomorphology*, **206**: 271–287.

Phillips, R.T.J. and Desloges, J.R. 2014[b]. Alluvial floodplain classification by multivariate clustering and discriminant analysis for low-relief glacially conditioned river catchments. *Earth Surface Processes and Landforms*.