

Introduction

Reconstructing paleoglaciology of the Tibetan Plateau is critical to understanding linkages between regional climate changes and global climate changes, and topographic evolution. Though it has been studied for one century, controversies remain and the picture of the glaciation pattern in the Tibetan Plateau needs to be sharpened.

Controversies

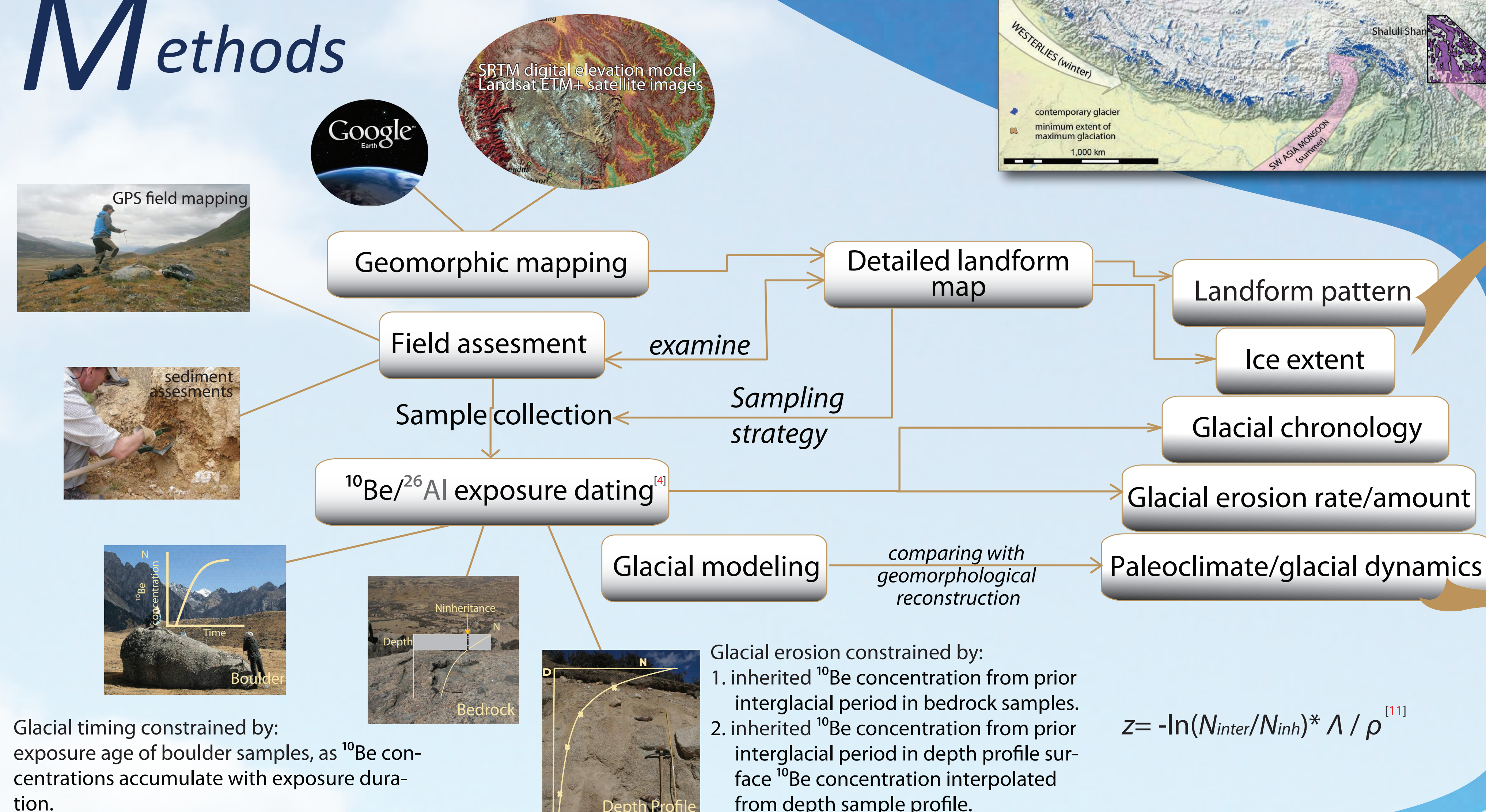
- Glacial timing and extent are inconsistent across the plateau; seems asynchronous with Northern Hemispheric ice sheet changes;
- Glaciations across the plateau responded differently to climate change.

Objectives and ways to solve the problems

- Glacier extent, pattern of glaciations < -- detailed landform mapping
- Timing of past glaciers, glacial erosion < -- dating methods
- Paleoclimate, glacial dynamics < -- Glacial modeling

Here we focus on the glacial history of the Shaluli Shan of the southeastern Tibetan Plateau that receives much of its precipitation from monsoon flow. The work presented here provides important insights into the paleoglaciology pattern and paleoclimate pattern.

Methods



References

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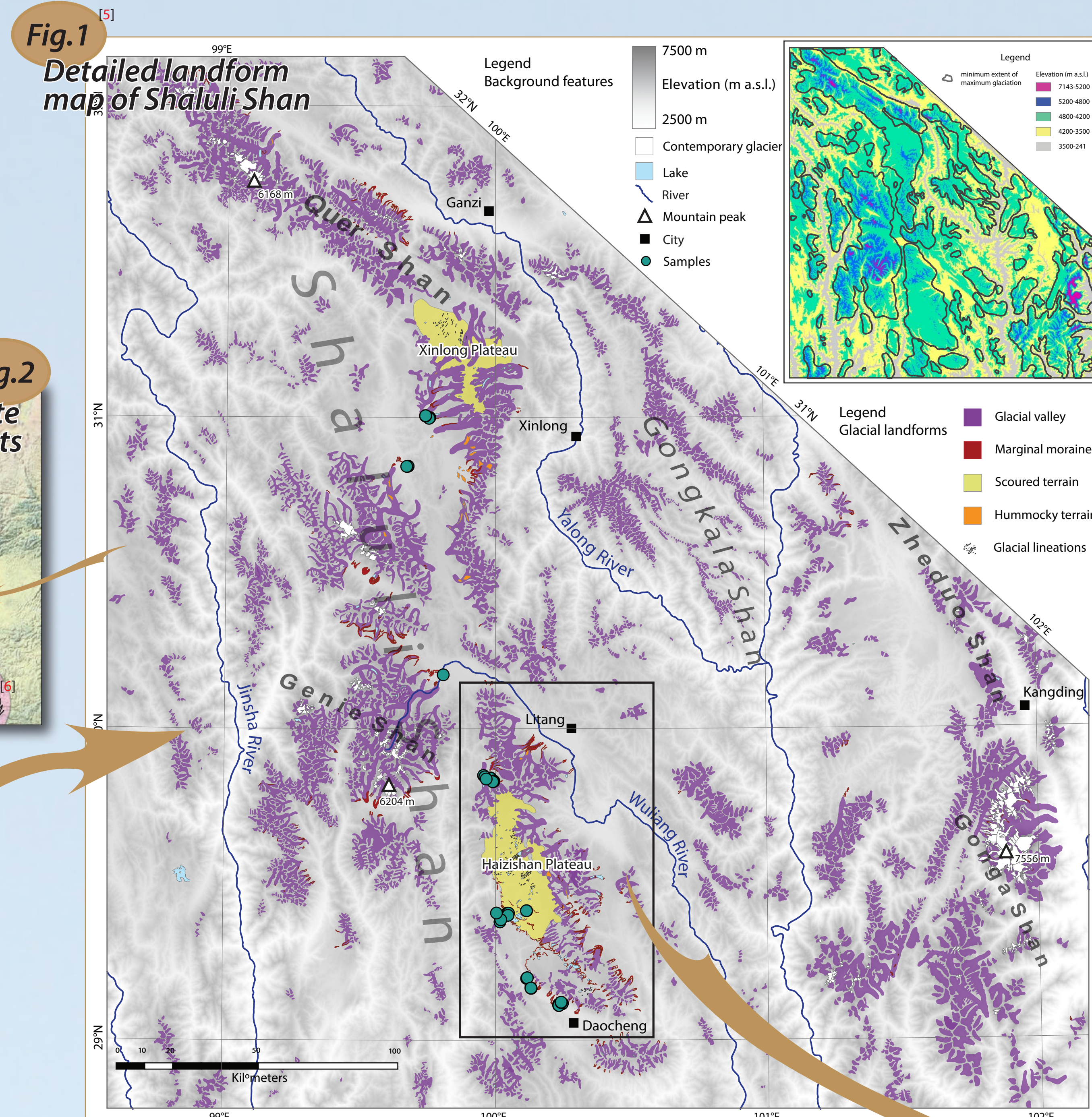
Acknowledgements

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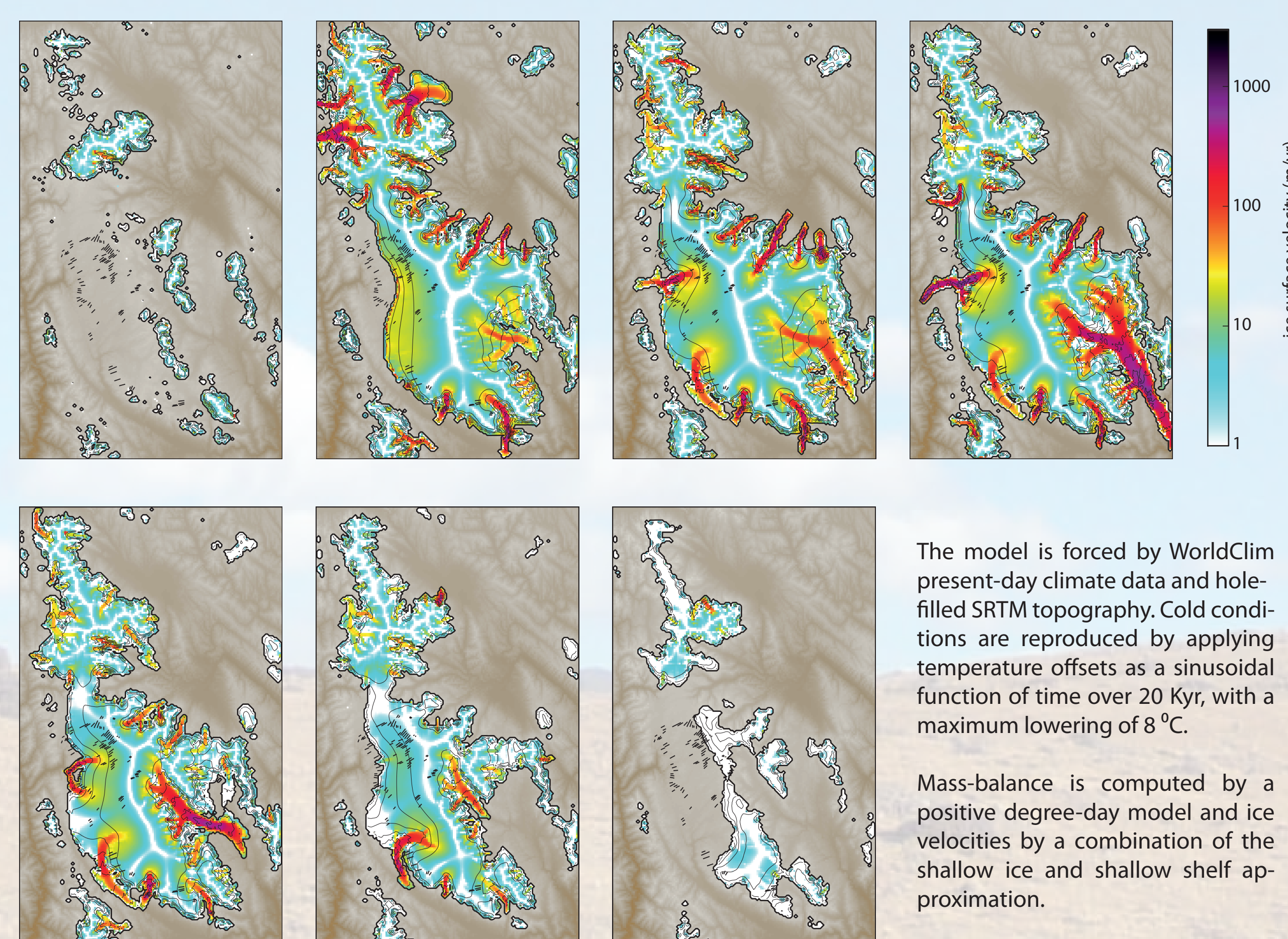
Results & Discussion

1. Glaciation patterns of Shaluli Shan area

- Alpine glaciation centered to high mountain range (Fig. 1)
- Ice cap glaciation on low-relief plateaus (Figs. 1&4)
- Significant influence from southwestern Asia Monsoon (Fig. 2)



4. Modeled Haizishan ice cap

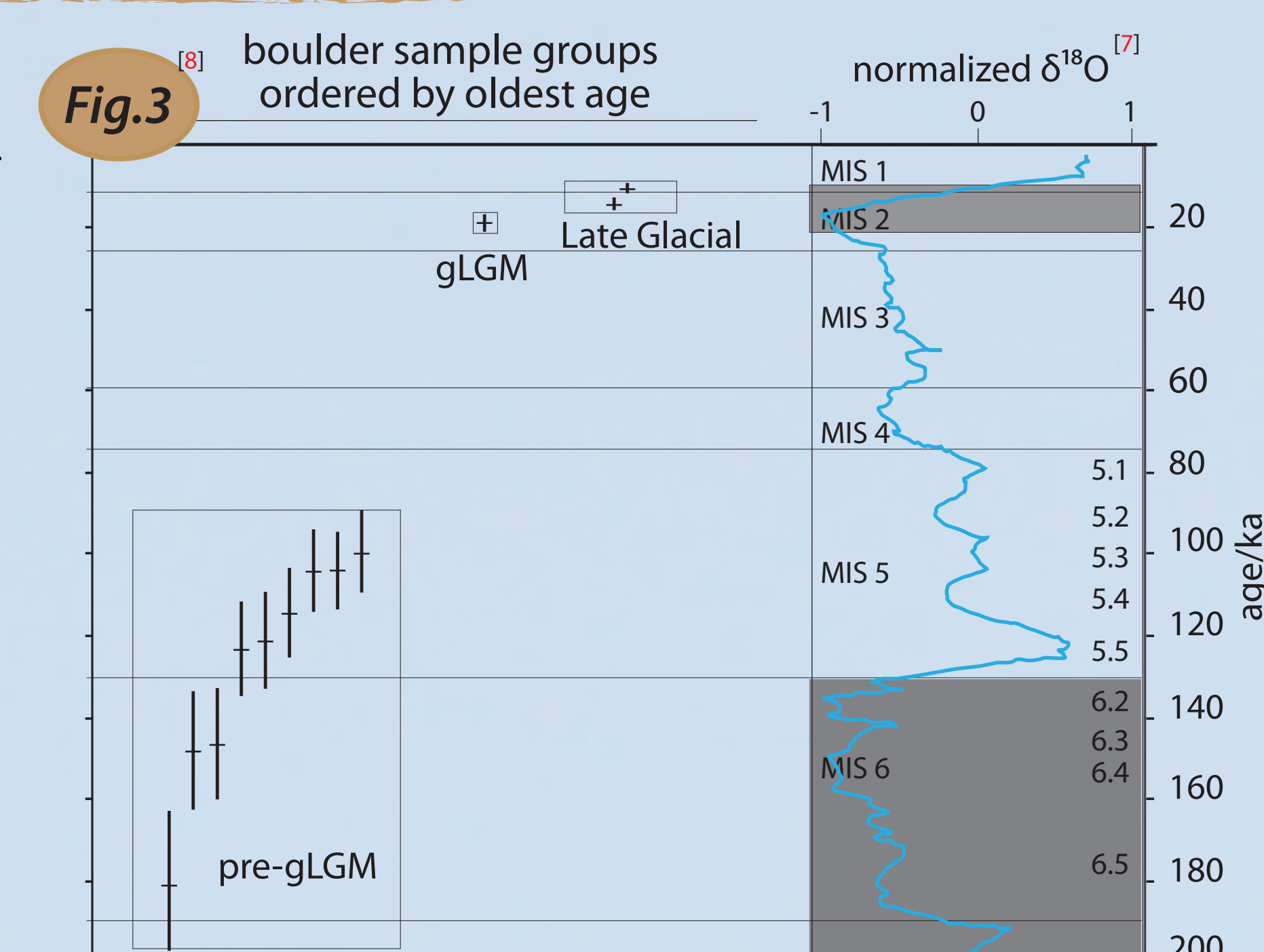


2. Glacial Chronology of Shaluli Shan area

* Minimum landform ages correlated to MIS 2, 6 (Fig. 3)

* Three glacial events identified: Late Glacial (13.0±1.2 ka - 17.1±1.6), LGM (21.6±2.0 ka), MIS 6 and older (102.3±10.0 - 183.6±17.0 ka)

* Ages in MIS 3/4 are missing, indicating absences of or restricted MIS 3/4 glacial stadials in the Shaluli Shan



3. Erosion Pattern of Haizishan ice cap

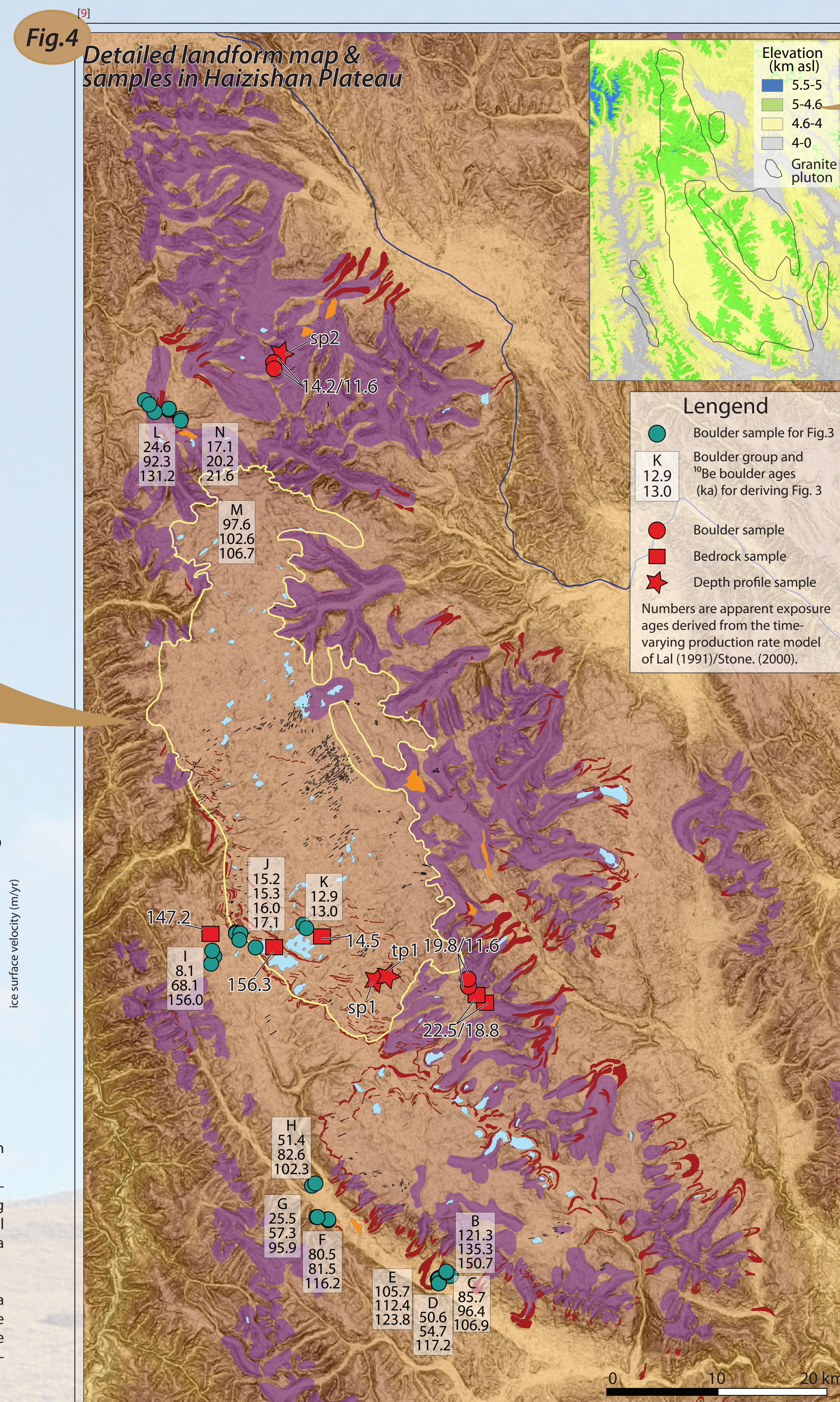


Fig.5 Zonation of landforms of Haizishan ice cap

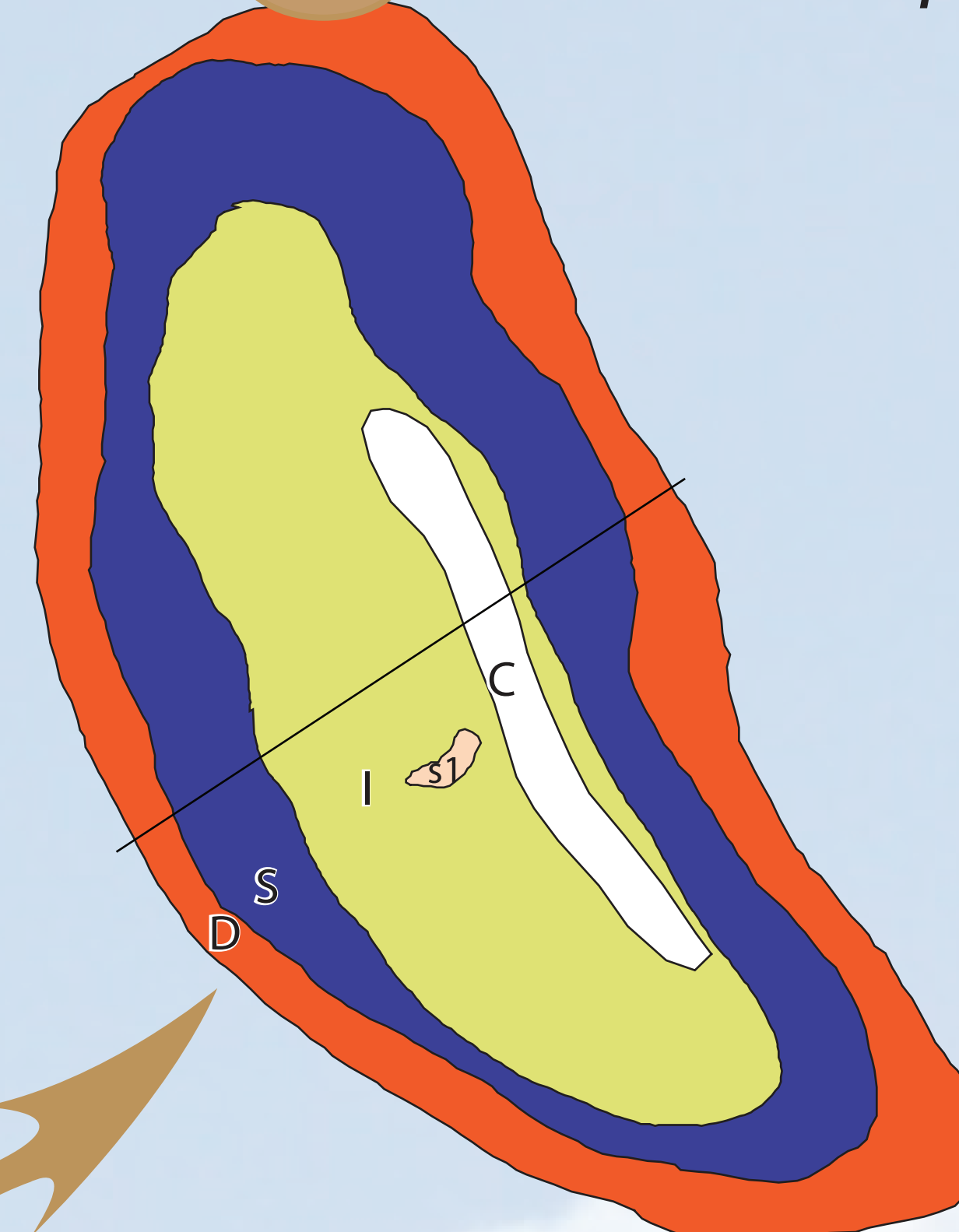
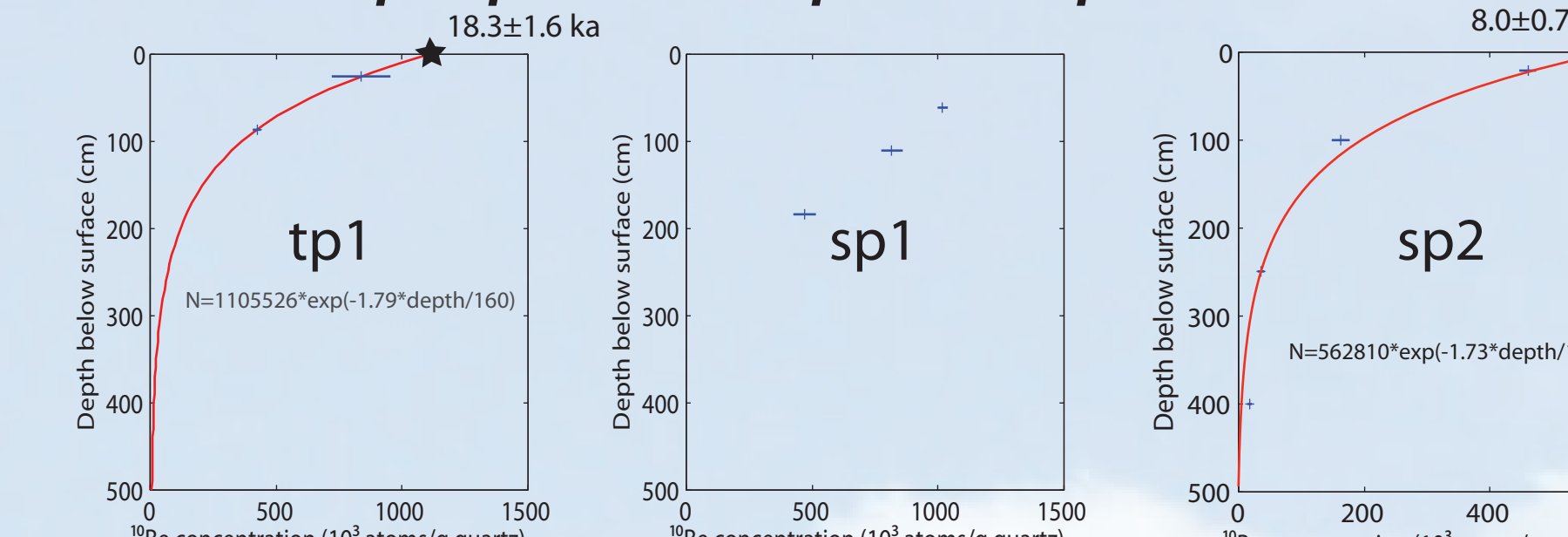


Fig.6 Depth profile samples interpolation



* Zonation of landforms of Haizishan paleo ice cap similar to landform pattern formed by northern hemisphere ice sheet (Figs. 4&5).

* Central relict zone and preserved saprolite profile indicate cold based ice cover or ice dome or ice-divide.

* High inherited nuclide concentration in saprolite depth profile samples (sp1) show limited glacial erosion during the last glaciation (Figs. 4&6).

* 1.4 -1.7 m bedrock has been eroded away by outlet glacier at the head of the glacial valley.

Conclusions

- Timing of glacial deposits: Late glacial, gLGM, MIS 6 and older, tentatively correlated with northern Hemisphere ice sheet glaciations contrasting more interior regions of the Tibetan Plateau
- Complex basal thermal condition of paleo Haizishan ice cap indicated by landform zonation and bedrock surface exposure ages
- Simulated Haizishan ice cap shows migration of ice divide, concordant with the glacial lineation pattern
- Future work will focus on glacial modeling in order to constrain paleoclimate