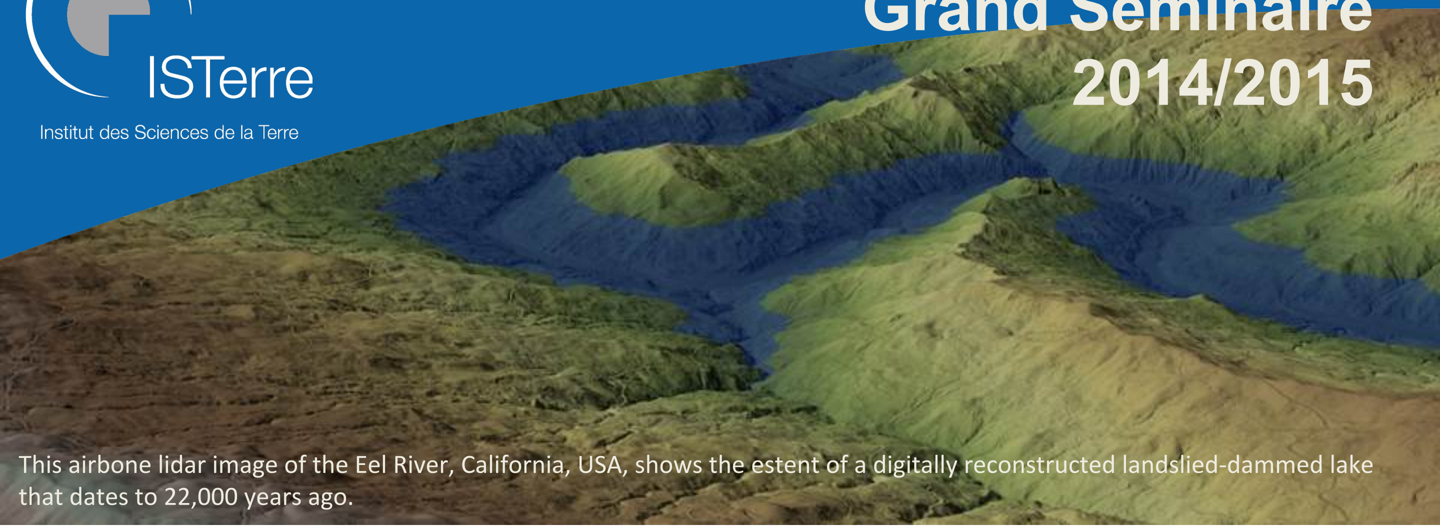
ISTerre
Institut des Sciences de la Terre

# Grand Séminaire 2014/2015


This airbone lidar image of the Eel River, California, USA, shows the estent of a digitally reconstructed landslied-dammed lake that dates to 22,000 years ago.

# The evolution of mountainous landscapes: Modern and paleo perspectives on how uplift, climate, and biota modulate erosion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*Unraveling how tectonics and climate shape landscapes and regulate sedimentary process in the Late Cenozoic is much debated. While glaciated landscapes have been well-studied and simulated, unglaciated terrain is much more extensive, yet we lack data and theory to decode how these settings were affected by the onset of Pleistocene climate change. Here we combine a model for periglacial weathering with paleoclimate reconstructions and a paleoerosion sedimentary archive to demonstrate that frost-driven bedrock weathering was pervasive in unglaciated settings during the Last Glacial Maximum (LGM), increasing erosion relative to modern rates. By using downscaled general circulation model simulations to predict the extent and intensity of frost processes, we quantify the influence of ocean, elevation, and ice sheet proximity on seasonal temperature patterns and thus climate-driven sediment fluxes. By contrast, in settings prone to frequent landslides, climate appears to alter erosion rates by regulating precipitation patterns that induce pore pressures that contribute to slope instability. Here, we summarize a suite of studies (including photogrammetry and satellite interferometry) for landslide-dominated catchments that collectively illustrate how climate-driven landsliding shapes mountains through glacial-interglacial intervals. Thus, in unglaciated settings, we observe diverse pathways for climate to imprint landscapes and the geologic record.*


**Jeudi 6 novembre 2014 à 11h**

**Salle de conférences d'ISTerre**

OSUG-C, 1381 rue de la piscine, Campus Universitaire
Arrêt Tram B/C Bibliothèques universitaires

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