Title: Self-organized patterns in soils and rock breakdown in high mountains: products of ice growth in porous media

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Abstract: Diverse patterns in soils in cold regions have long attracted scientific attention as they form some of the most striking designs in nature. They form spontaneously where the ground surface is subjected to recurrent variations in temperature and freeze-thaw cycles. These features are excellent research targets because they manifest interactions between process and form under particularly instructive conditions (signal is large, little noise). Moreover, they are accessible and active, and hence can be readily monitored instrumentally. In this talk I'll examine how repeated cycles of ice growth and decay create these intriguing self-organized patterns. I will also suggest that freezing in rocks may have much larger scale effects: it may moderate the growth of tectonically active mountain ranges by providing an efficient means of breaking down bedrock and producing debris that can be evacuated readily by rivers.