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The role of upstream-migrating knick points in turbidity current channels

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High-resolution bathymetric images of turbidity current channels reveal the existence of a wide range of bedforms within these systems. Knick points are the dominant kilometre-scale bedform in most sandy systems. These knick points are thought to initiate and maintain submarine channels, and they would therefore play a key role the transport of sediment and nutrients to the deep sea. In contrast to their important role very little is known about knick points. What drives the formation of a knick point? Are they remnant headwalls of landslide, or are they related to supercritical turbidity currents? Are they a purely erosional feature? Do they have any preservation potential in the rock record?

Here we present data collected from knick points in an active turbidity current channel on a fjord floor in British Colombia, Canada. These data show how trains of knick points migrate several hundred metres upstream every year. We use repeat surveys to show how knick points are a combined erosional-depositional feature. Furthermore, we have deployed several instruments over the knick points to study how the knick points interact with the passing turbidity currents. Finally, we use repeat surveys and cores to explore the potential architecture and facies association associated to knick points.