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**Reexamining Pleistocene tunnel valleys on  
the Scotian Shelf and their implications  
for slope sediment delivery**

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Tunnel valleys are a special kind of erosional channel characterized by anastomosing, steep-sided channel systems formed by subglacial, confined meltwater flow. On the Scotian Shelf, partially infilled tunnel valleys are recognized on the sea floor in bathymetric data, but previous workers have also found buried examples. An earlier project by the authors used 2D industry seismic data near Sable Island to better constrain the geometry of tunnel valleys in the area. Our interpretation showed V to U-shaped buried channels north and west of Sable Island averaging 2–5 km wide and 150–400 m deep with a north-south orientation that extensively branch, reconnect, and meander. The buried channels are similar to channels exposed on the sea floor further north. Immediately to the south and west of Sable Island, the channels become narrower (1–1.5 km) and more widely spaced. Contrary to previous interpretations, the orientations remain roughly N-S and there is a gap of 20–30 km between the ends of the detectable tunnel valleys and the shelf edge south of Sable Island. An exception is at the shelf edge at the head of Logan Canyon, but these channels are also disconnected from those further north. The reason for this gap is not clear; however, it could be due to the limited resolution of industry seismic data in the shallow part of the section. Alternatively, if the channels genuinely end just south of Sable Island, then the gap between them and the shelf edge implies

that they were either present but not preserved (i.e. removed by subsequent erosion), or that along this stretch of shelf edge (between The Gully and Logan Canyon) the subglacial meltwater channels did not empty directly at the shelf edge. This situation would have implications for models of sediment delivery to the Scotian Slope during the Pleistocene. Thus, we plan to use single channel and 3-D industry seismic tied with borehole data to investigate the tunnel valleys between Sable Island and the shelf edge. The data will allow us to test relative ages, modes of formation, and the character of the valleys as they become smaller in size.