

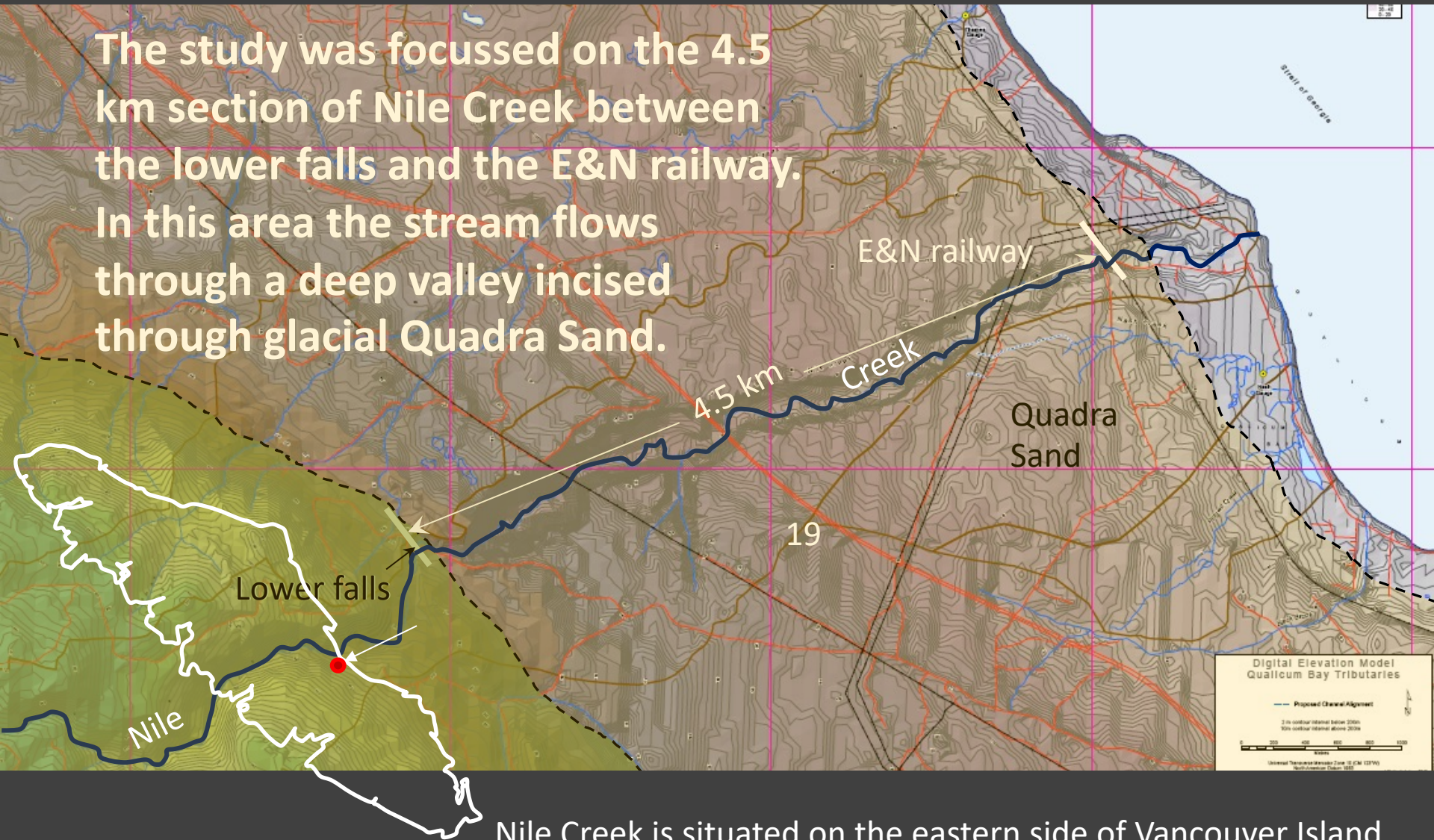
# Contribution of groundwater to the flow of Nile Creek, Vancouver Island



This video has no soundtrack

# Lower part of Nile Creek

The study was focussed on the 4.5 km section of Nile Creek between the lower falls and the E&N railway. In this area the stream flows through a deep valley incised through glacial Quadra Sand.



Nile Creek is situated on the eastern side of Vancouver Island



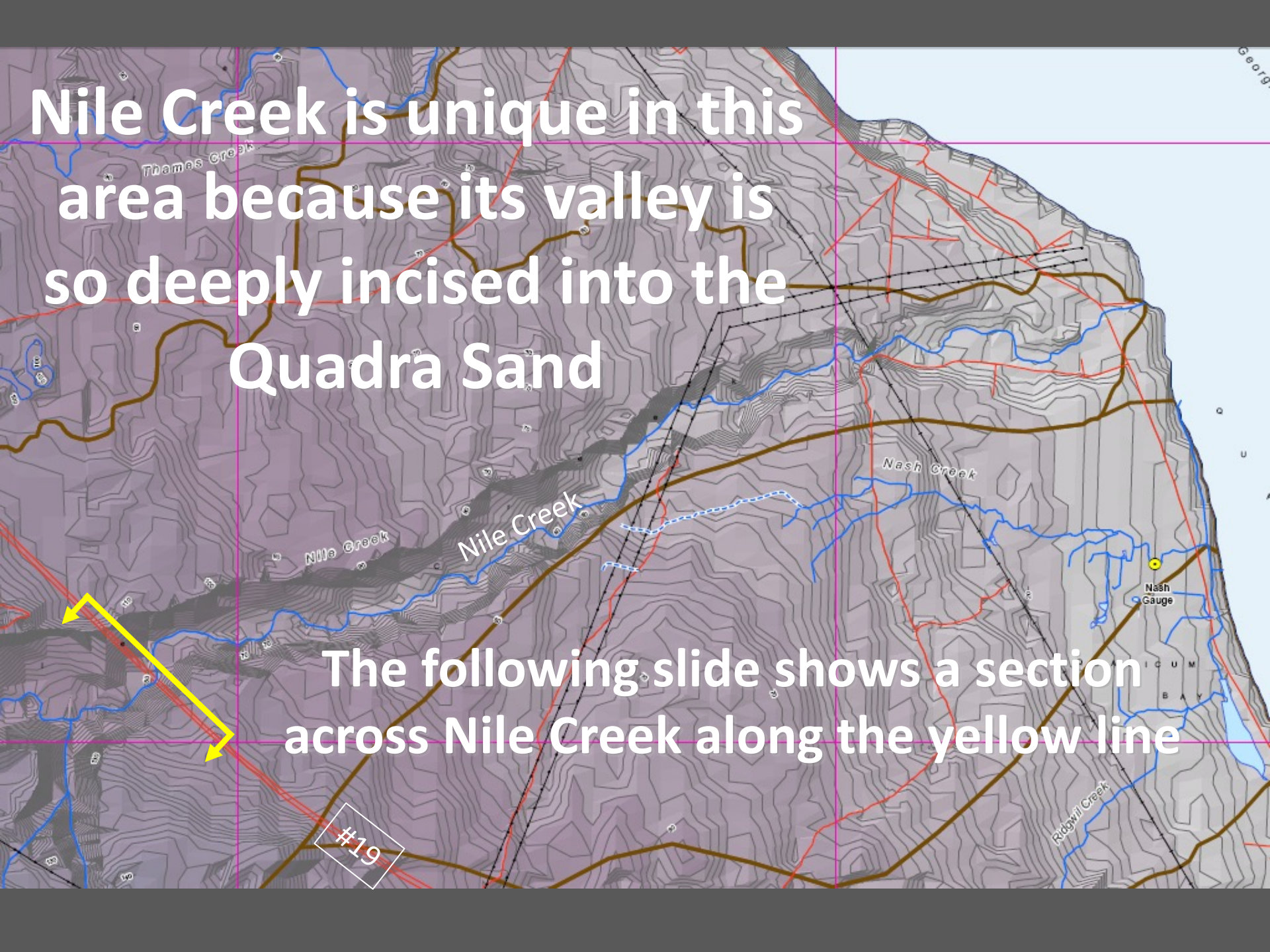
Pleistocene glaciofluvial Quadra Sand  
in Nile Creek valley

The Quadra Sand is relatively permeable





**It is underlain by much less permeable glacial till  
(Dashwood Drift) in the Nile Creek area**

A topographic map showing Nile Creek and surrounding terrain. The map features contour lines, a grid, and labels for various geographical features. A yellow arrow points from the bottom left towards the Nile Creek valley. A white box with the number '#19' is located in the bottom left corner. The text 'Nile Creek' is written in white over the map. Other labels include 'Thomas Creek', 'Nash Creek', 'Nash Gauge', and 'Ridgwell Creek'. The map is overlaid with a grid of red and blue lines.

Nile Creek is unique in this area because its valley is so deeply incised into the Quadra Sand

The following slide shows a section across Nile Creek along the yellow line

#19

# Nile Creek at Highway 19 – looking up stream

110 m  
100  
90  
80  
70  
60  
50

N →

Quadra Sand

water table

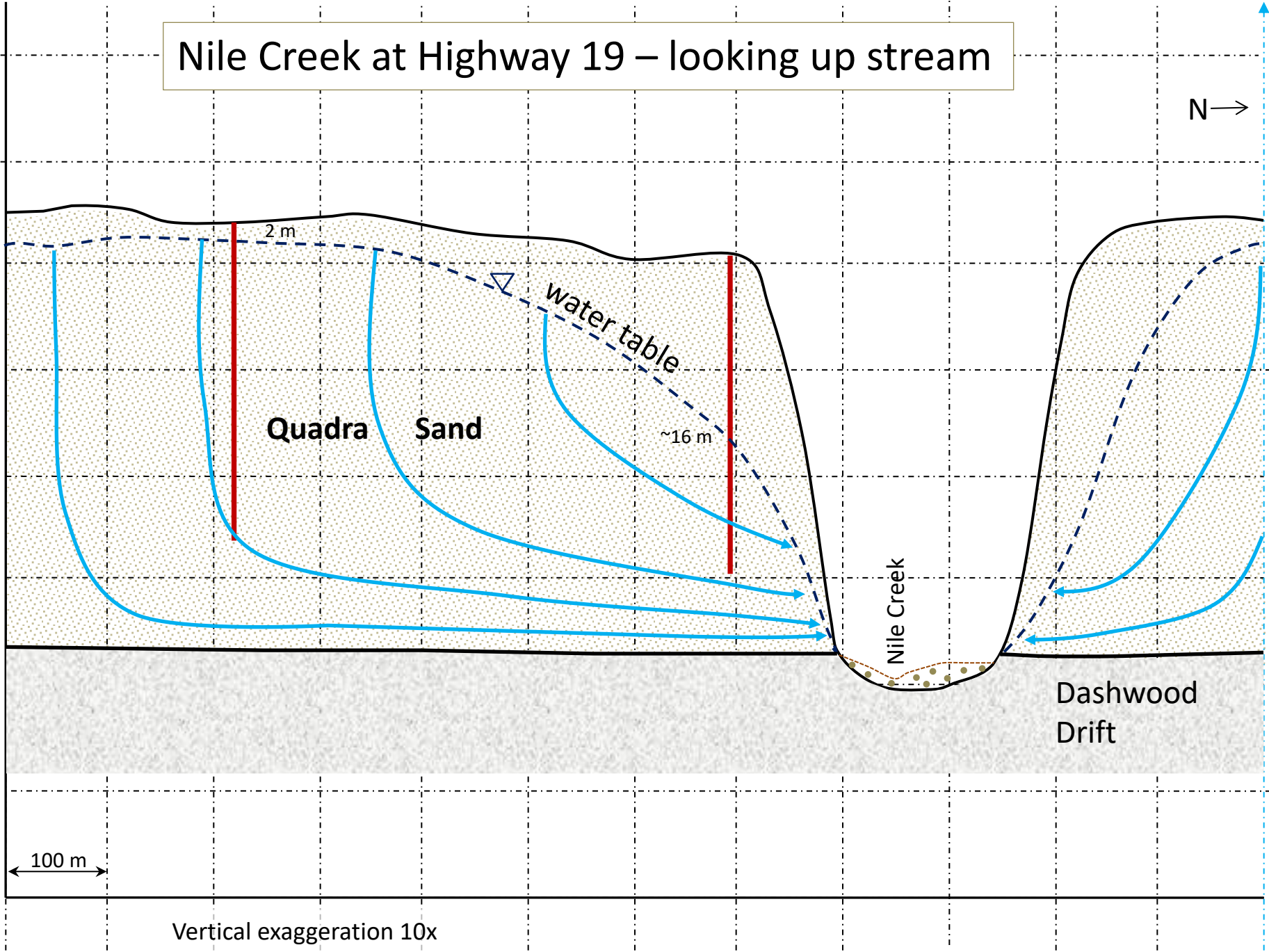
~16 m

Nile Creek

Dashwood Drift

100 m

Vertical exaggeration 10x



**Water temperature and conductivity were measured at multiple locations along Nile Creek and in springs along the side of the valley at periods of high flow (February) and low flow (September)**

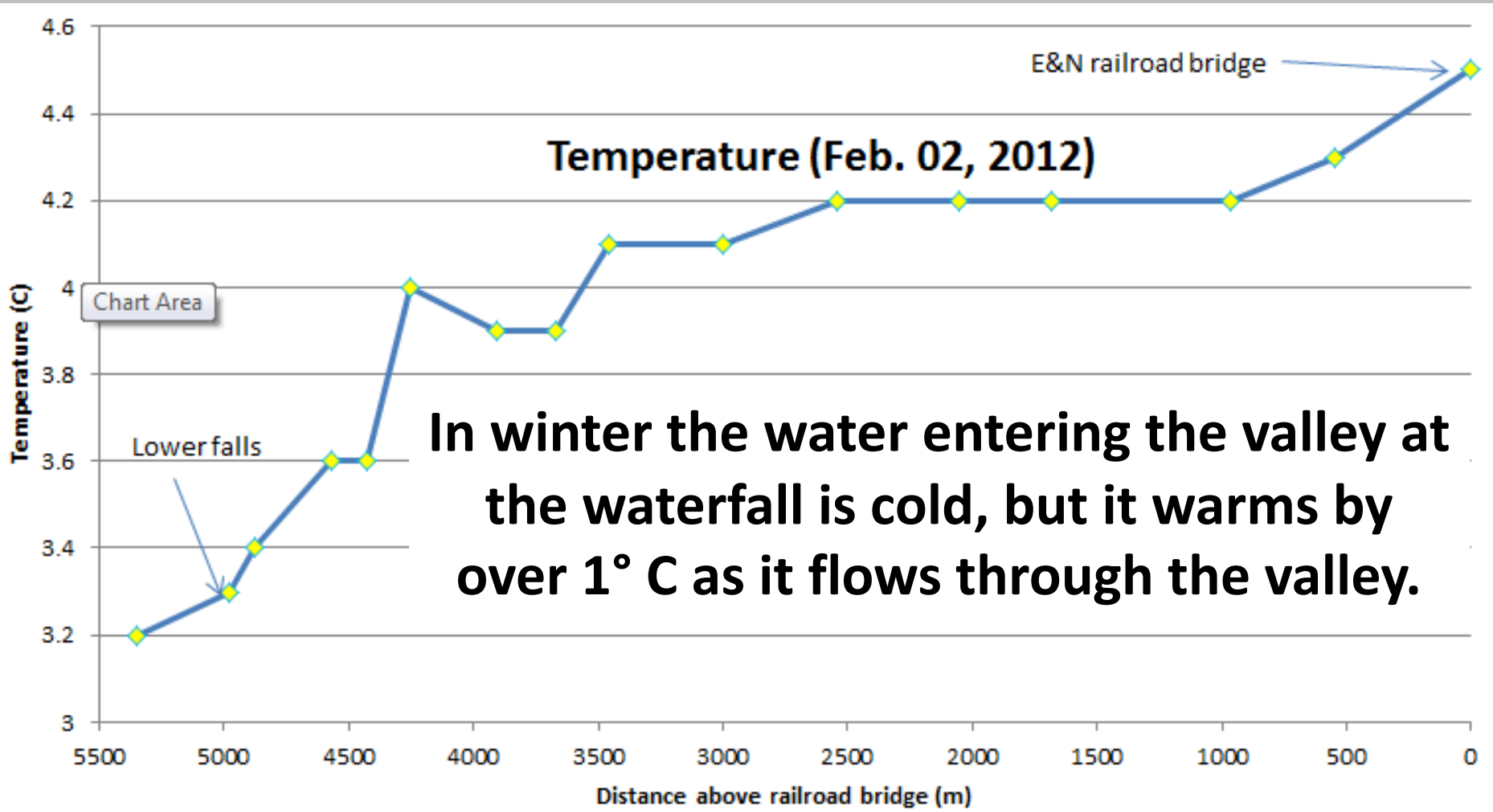




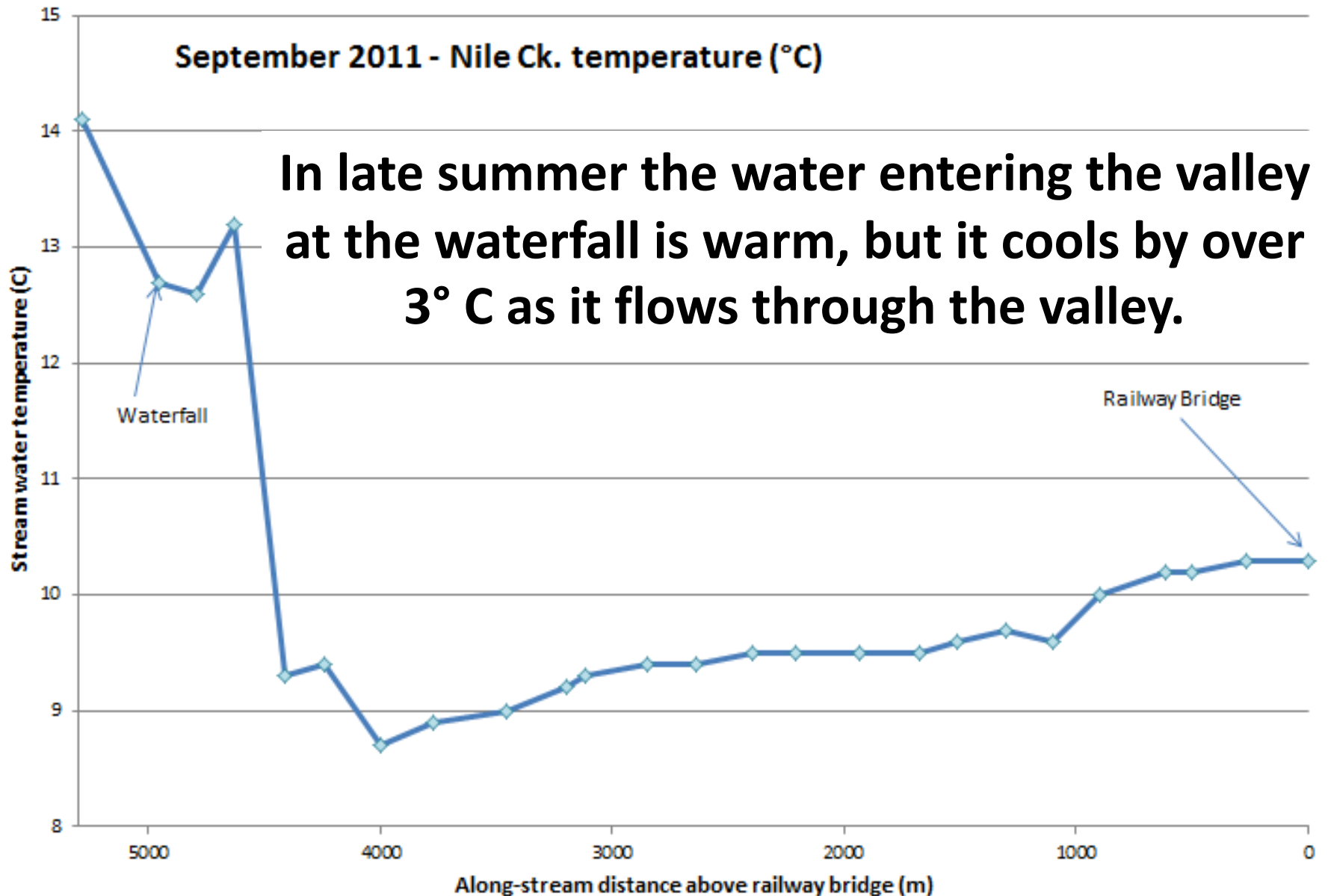
**The average temperature of groundwater from the springs in the Nile Creek valley is 8.1° C. The average conductivity of the spring water is 72  $\mu\text{S}/\text{cm}$ .**

**The water of Nile Creek above the falls ranges from about 3° C in winter to about 13° C in summer. The conductivity ranges from 24  $\mu\text{S}/\text{cm}$  in winter to 60  $\mu\text{S}/\text{cm}$  in summer.**

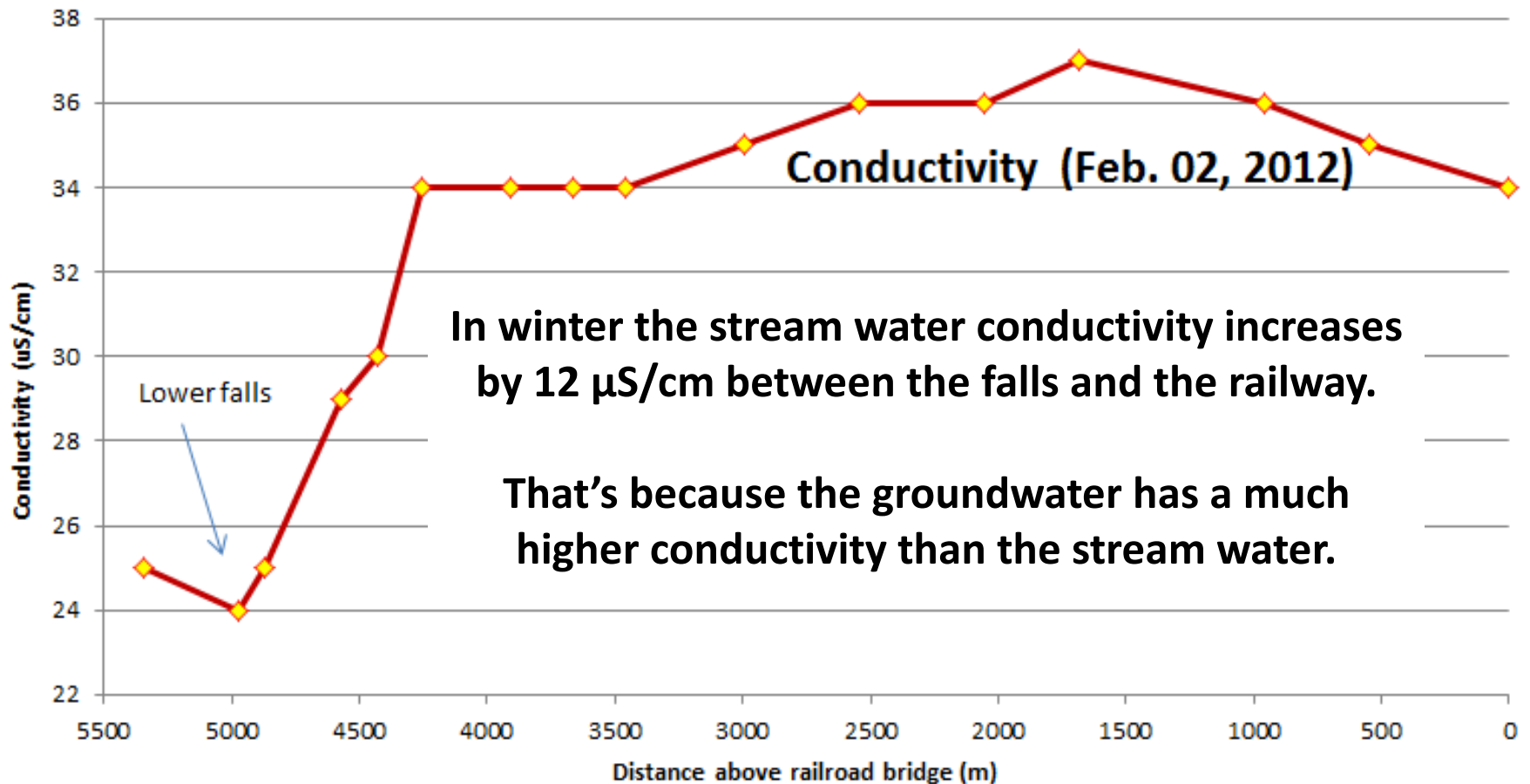
# February temperature profile



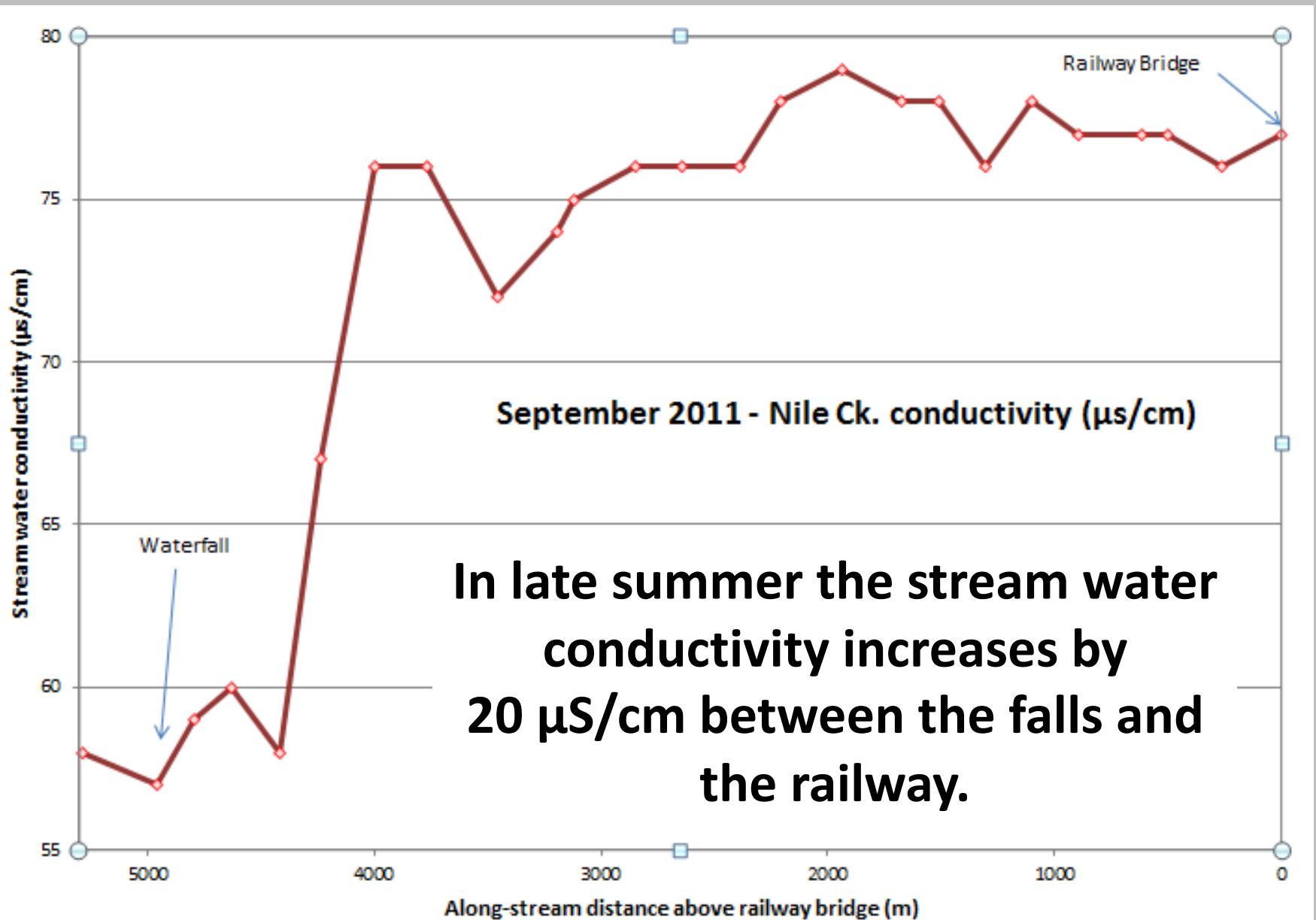
# September temperature profile



# February conductivity profile



# September conductivity profile



**These results imply that there is a significant input of Quadra-Sand-derived groundwater into Nile Creek in both summer and winter.**

**In winter 20 to 40% of the stream flow appears to be directly from groundwater. In summer 60 to 90% of the stream flow appears to be from groundwater.**

**Groundwater adds to the flow of Nile Creek and cools the stream significantly in the summer. That makes Nile Creek an ideal habitat for Pink salmon.**



**In order to protect Nile Creek as an ecosystem we also need to protect and limit the use of the Quadra Sand aquifer.**



**This work was supported by  
Trout Unlimited Canada,  
the Nile Creek Enhancement Society  
and by  
Vancouver Island University**



# Text summary for Nile Creek video

The video provides an introduction to Nile Creek, a stream on the eastern side of Vancouver Island that occupies a deep channel within the glaciofluvial Quadra Sand Formation.

There is evidence that groundwater represents an important contribution to the flow of the lower part of Nile Creek, and so a study was undertaken to assess that role. Water temperature and conductivity were measured at multiple locations along the creek at different times of the year, including late winter, when rain is abundant and the flow is high, and late summer when the flow is low following several months of minimal precipitation.

The results show that there is a significant groundwater contribution to the flow of Nile Creek. In winter, 20 to 40% of the stream flow appears to be directly derived from groundwater. In summer, 60 to 90% of the stream flow appears to be from groundwater.

Groundwater adds to the flow and cools the stream significantly in the summer, and that makes Nile Creek an ideal habitat for Pink salmon. In order to protect the Nile Creek ecosystem we also need to protect the Quadra Sand aquifer that surrounds it.