FDL-A Fact Sheet

For Late Summer 2019

ANNUALIZED MOVEMENT RATE
(as of August 2019)

31.6 ft/yr

DISTANCES TO INFRASTRUCTURE
(as of August 2019)

Old Dalton: 56.7 ft

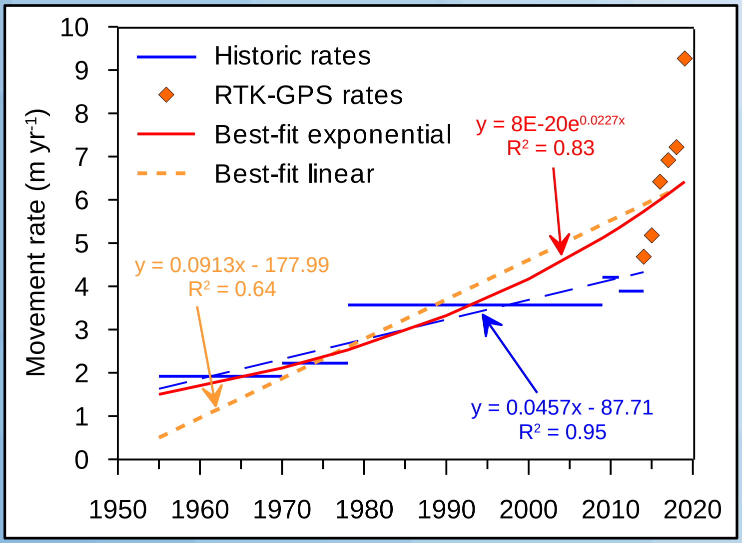
New Dalton: 419.1 ft

TAPS: 798.1 ft

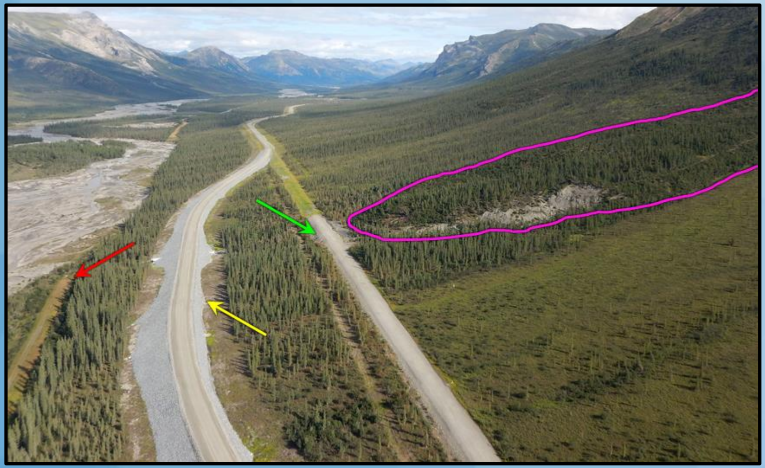
ESTIMATED DATES OF IMPACT
(as of August 2019)

Old Dalton: May 2021 (< 2 years)

New Dalton: 2032 (~13 years)



FDL-A's increasing rate of movement. Historic rates increase linearly. Adding recent DGPS-measured rates illustrates an exponential increase in movement.



Oblique view of FDL-A (outlined in pink), the old (green arrow) and new Dalton Highway (yellow arrow) alignments, and the location of the buried Trans Alaska Pipeline System (red arrow), as seen in August 2019.

In 2018, the Alaska Department of Transportation and Public Facilities completed the realignment of the Dalton highway in front of FDL-A, effectively "buying" 20 years of time before FDL-A impacts the new alignment location. Based on our 2019 measurements – only one year later – *the cushion of time has been reduced to only 13 years.*

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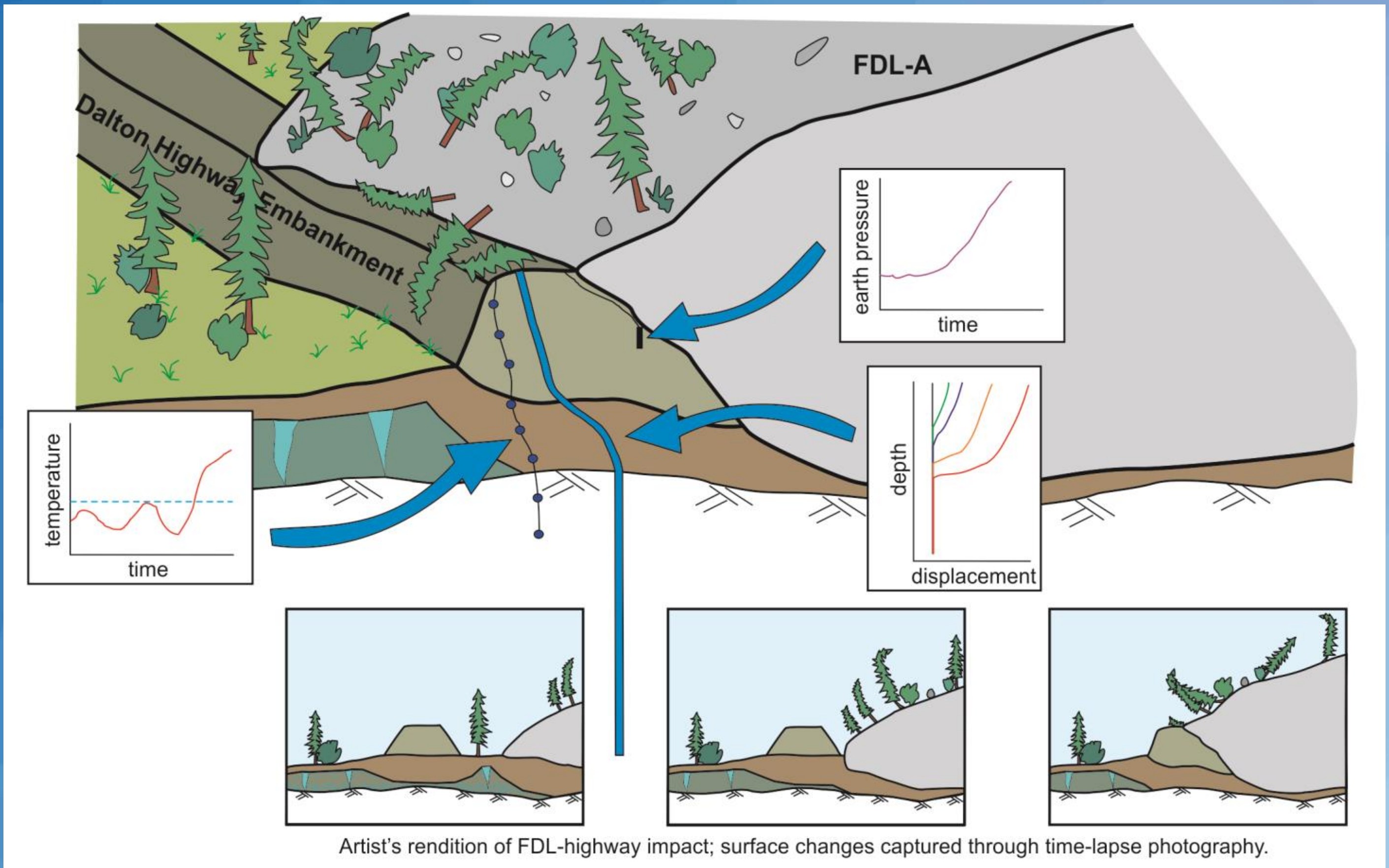
How can we stop or slow down FDL-A? The answer to this question will inform future mitigation plans for this and other frozen debris lobes, as well as other mass movement events in permafrost environments.

Three proposed steps for future research:

1) ***Instrument the old Dalton Highway embankment.***

The collision of FDL-A with the Dalton Highway embankment represents a ***unique opportunity*** to observe a landslide impacting a roadway in a safe and controlled way and on a predictable schedule. Instrumenting the embankment will provide data on how much earth pressure a landslide applies to an engineered structure, and how the landslide deforms the embankment and changes the underlying permafrost.



Schematic illustrating data acquired through proposed instrumentation plan.

2) ***Conduct thermal modeling of ACE-FDL-A interaction.***

Research indicates that FDL movement is dependent on temperature and water pressure. Reducing the basal temperature of FDL-A through an innovative ACE application may reduce FDL-A's downslope advance.

3) ***Find the water within FDL-A through a geophysical survey.***

One mitigation strategy with nearly all landslides is to control the internal water pressure. Determining zones of high water pressure within FDL-A will identify potential areas where draining the landslide is feasible.