IUFRO 2019 Abstract submission

A1E

Comparison of erosion potential between manual and cable-assisted mechanized felling on steep slopes – A case study in southern Oregon, USA

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ABSTRACT

Cable-assisted logging systems are a relatively new technology being used on steep slopes in the Pacific Northwest, USA. We will present preliminary results from a study comparing traditional manual timber harvesting practices with a cable-assisted, mechanized timber cutting system. Approximately 2 hectares of the 18 hectare harvest unit were manually using a chain saw, and the remaining area was harvested mechanically by a cable-assisted feller-buncher. Timber in both areas was then extracted using the same cable logging system. After cable logging, in late fall 2018, we installed erosion fences in (a) skyline corridors in cable-assisted machine felling areas, (b) skyline corridors in manual felling areas, and (c) cable-assisted machine tracks. Our objectives are to quantify differences in soil erosion and sediment transport between harvest types. We installed 4 pairs of soil moisture probe clusters (10, 20, 30, 40, and 50 cm depth) along machine tracks and minimally disturbed ground in the cable-assisted timber harvesting area to quantify soil water content. We will present preliminary results of overwintering and partial summer erosion, sediment delivery, and soil moisture impacts from the two forest harvesting treatments. To facilitate interpretation of the erosion data, we are also collecting data on post-yarding ground based LIDAR, precipitation intensity and total, and pre- and post-treatment bulk density, soil strength (penetrometer), soil water content, and saturated hydraulic conductivity. This study is expected to provide insights into the relative impacts of steep slope cable-assisted harvesting operations on runoff and erosion compared to the traditional manual timber felling and cable-logging.

SESSION DETAILS

A1e: Rising issues in mountain forests and mountain forest management

R17 - PG

15:30 - 17:30

Tuesday, 1st October, 2019

The characteristic features of mountain forests such as rough topography and steep environmental gradients provide unique habitats hosting high species diversity and diverse ecosystem services. Mountain forests are also crucial sources of wood. Social demand for forest products and services from local mountain people as well as from society outside mountain areas is increasing and puts intense pressure on mountain forest ecosystems. Global warming is changing mountain climates and disturbance regimes in mountain forests. This session will cover social and environmental issues in mountain regions including natural hazards such as avalanches and erosion, risk mitigation, harvesting systems, forest utilization and ecological characteristics. The session aims to identify threats and pressures on mountain forests and mountain people, how mountain forest ecosystems respond to these threats, and forest management approaches to deal with such pressures. We seek empirical as well as modelling studies.

IN THIS SESSION

15:30 - 15:45
Global analysis of the share of steep slope in forest land

15:45 - 16:00
Forest operations in mountainous areas: a challenging question

16:00 - 16:15
Comparison of erosion potential between manual and cable-assisted mechanized felling on steep slopes – A case study in southern Oregon, USA

16:15 - 16:30
Utilization potential of unused broadleaved tree stands harvested with simple rigging cable systems on mountainous area

16:30 - 16:45
The Challenge of Sustaining the Integrity of Forest Soils in Mountain Regions

16:45 - 17:00
Tree mortality and recruitment in a high mountain coniferous stand on Mt. Jiri, Korea

17:00 - 17:15
The Legacy of Pre-Columbian Fire on the Pine-oak Forests of Upland Guatemala

17:15 - 17:30
Assessing ecosystem services from mountain forests