

PREDICTING THE OCCURRENCE OF PERMAFROST IN THE ALASKA DISCONTINUOUS ZONE WITH SATELLITE DATA

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SYNOPSIS

A predictive permafrost model developed for the Caribou-Poker Creeks Research Watershed was extended to a portion of the surrounding Yukon-Tanana Upland and evaluated by comparison with borehole data from the trans Alaska pipeline. The logistic regression model incorporated a Thematic Mapper satellite-derived vegetation classification and a thermal band used as a surrogate for potential incoming solar radiation. The satellite-derived environmental variables predicted the spatial distribution of three permafrost mapping categories (frozen, discontinuously frozen, and unfrozen) with 75 percent accuracy.

~~solar irradiance index provided the strongest relationship with permafrost and were, thus subsequently selected for the CPRW model. A complete description of this research can be found in Morrissey, et al. (1986). To further test this technique, the logistic coefficient developed at the initial test site were extended to classify permafrost in the surrounding Yukon-Tanana Upland Province. The permafrost classification for the extended region was evaluated with Alyeska Pipeline Service Company (APSC) inhouse data that were originally acquired for the design of the trans Alaska pipeline. These data consist primarily of geotechnical borehole logs for sites along the pipeline route segments which generally parallels the Elliot Highway between Fairbanks and Livengood, Alaska.~~