



From the Plains of Abraham to Dodo Canyon: Remarkable dolomite karst in permafrost in the Mackenzie Mountains, Northwest Territories, Canada

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Along a west-to-east transect across the Canyon Ranges at Lat. 66N in the Mackenzie Mountains (Northwest Territories, Canada) there is a remarkable variety of karst landforms. The host rocks are Upper Proterozoic - Devonian in age, consisting of two thick-to-massive platformal dolomite formations with salt and redbeds below and a dolomite-gypsum megabreccia above. Only the most easterly sector of the transect experienced any glacierisation (Laurentide Continental Icesheet), conditions in the mountainous interior being too arid. Modern ecoclimatic conditions range from polar desert at >1500 m above sea level in the west to taiga-boreal ecozone transitional at approximately 300 m asl in the east. Technically there is 'continuous permafrost' >50 m deep along the transect but groundwater recharge is common wherever the geohydrologic conditions are favourable. Despite the cold and aridity, and the low solubility generally associated with dolomite in comparison with limestone, etc. karst groundwater circulation and landform development are widespread along the transect, including extensive solutional pavements, steephead valleys and cirques (reculées), dolines, dry canyons, a large structural polje, fresh and salt springs, and a fantastical 'dissolution drape' topography on the breccia. It is proposed to protect a representative corridor along the transect under the aegis of the new UNESCO "International Geopark" programme.