

# SnowEx23 CRREL Ground Penetrating Radar Raw, Version 1 Technical Reference

## 1 DATA DESCRIPTION

This data set contains the raw results of 1 GHz ground-penetrating radar surveys conducted at the Upper Kuparuk/Toolik (UKT) site in northern Alaska, USA as part of the NASA SnowEx 2023 field campaign.

### 1.1 File Information

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#### 1.1.1 Format

The data are as 68 .nc files, each representing a single GPR track collected on a single day.

#### 1.1.2 Naming Convention

The data files are named according to the following convention, and as described in Table 1.

SNEX23\_CRREL\_GPR\_Raw\_UKT\_TWT-[nn]\_[configuration]\_[YYYYMMDD]\_v01.0.[nc]

Table 1. Final naming convention

Variable	Description
SNEX23	SnowEx2023 field campaign
CRREL	Cold Regions Research and Engineering Laboratory
GPR_Raw	Raw Ground-Penetrating Radar survey data
UKT	Site code: Upper Kuparuk Toolik
TWT	Two-way travel time collected over snow
[nn]	Two-digit GPR line number; can be used to correlate each file to a snow pit or SWESARR track (see Appendix A)
[configuration]	Geometric configuration of GPR track (Trench, Spiral, Transect)
[YYYYMMDD]	Date acquisition date (4-digit year, 2-digit month, and 2-digit day)
v01.0	Data set version

### 1.1.3 GPR Track Identification

The following table correlates GPR tracks with snow pit and SWESARR flight line locations. The information provided in the Date, Identifier, and Sampling Configuration fields can be matched with the data set files names.

<b>Date (MMDDYY)</b>	<b>Identifier</b>	<b>Sampling Configuration</b>	<b>Related Snow Pits</b>	<b>Additional Description</b>
030823	Line 1	Trench	N667	
030823	Line 2	Spiral	A664	
030823	Line 3	Transect	A664, N667	Data collected on transit from A664 to N667
030823	Line 4	Transect	N667, N657	Data collected on transit from A664 to N667
030823	Line 5	Spiral	N657	
030823	Line 6	Transect	N657, N659	Data collected on transit from A664 to N667
030823	Line 7	Transect	N659	Data collected on transit from N659 to Toolik Field Station
030923	Line 1	Trench	A784	
030923	Line 2	Spiral	A784	
030923	Line 3	Transect	A784, N787	Data collected on transit from A784 to N787
030923	Line 4	Trench	N787	
030923	Line 5	Spiral	N787	
030923	Line 6	Transect	N787, N789	Data collected on transit from N787 to N789
030923	Line 7	Trench	N789	
030923	Line 8	Spiral	N789	
030923	Line 9	Transect	N789, N790	Data collected on transit from N789 to N790 to Toolik Field Station
031023	Line 1	Trench	A766	

Date (MMDDYY)	Identifier	Sampling Configuration	Related Snow Pits	Additional Description
031023	Line 2	Spiral	A766	
031023	Line 3	Transect	A766, N762	Data collected on transit from A766 to N762
031023	Line 4	Trench	N762	
031023	Line 5	Spiral	N762	
031023	Line 6	Transect	N762, A760	Data collected on transit from N762 to A760
031023	Line 7	Trench	A7760	
031023	Line 8	Spiral	A760	
031023	Line 9	Transect	A760	Data collected on transit from A760 to Toolik Field Station
031123	Line 1	Trench	N730	
031123	Line 2	Spiral	N730	
031123	Line 3	Transect	N730, A739	Data collected on transit from N730 to Snotel to A739
031123	Line 4	Trench	A739	
031123	Line 5	Spiral	A739	
031123	Line 6	Transect	A739, N746	Data collected on transit from A739 to N746
031123	Line 7	Spiral	N746	
031123	Line 8	Trench	N746	
031123	Line 9	Transect	N746	Data collected on transit from N746 to Toolik Field Station
031223	Line 1	Trench	A665	
031223	Line 2	Spiral	A665	
031223	Line 3	Transect	A665, A652	Data collected on transit from A665 to A652
031223	Line 4	Trench	A652	
031223	Line 5	Spiral	A652	

Date (MMDDYY)	Identifier	Sampling Configuration	Related Snow Pits	Additional Description
031223	Line 6	Transect	A652, I775	Data collected on transit from A652 to I775
031223	Line 7	Spiral	I775	
031223	Line 8	Transect	I775, I668	Data collected on transit from I775 to I668
031223	Line 9	Trench	I668	
031223	Line 10	Spiral	I668	
031323	Line 1	Transect	-	Data collected between UKE1 to UKE10 (UKE SWESARR Line W to E)
031323	Line 2	Transect	-	Data collected between UKE10 to UKE9 (E to W)
031323	Line 3	Transect	-	Data collected between UKE9 to UKE8
031323	Line 4	Transect	-	Data collected between UKE8 to UKE7
031323	Line 5	Transect	-	Data collected between UK7 to UKE9.5
031323	Line 6	Transect	-	Data collected between UKE9.5 to UKE7
031323	Line 7	Transect	-	Data collected between UKE7 to UKE1
031323	Line 8	Transect	-	Data collected between UKE1 to Toolik Field Station
031423	Line 1	Transect	I679	Data collected on transit from Toolik Field Station to 1679
031423	Line 2	Trench	I679	Antenna Height to Snow (36 cm, 43) lh (73,89) Snow depth (37, 46) (i.e., SW Corner, NW Corner)
031423	Line 3	Spiral	I679	
031423	Line 4	Trench	I679	Data collected on ice surface
031423	Line 5	Trench	I679	Data collected on ice trench
031423	Line 6	Transect	I679, I775	Data collected on transit from 1679 to I775
031423	Line 7	Transect	I775, I784	Data collected on transit from I775 to I784
031423	Line 8	Transect, Spiral	I668, D764	Data collected on transit from I668 to D764, then in spiral around D763

Date (MMDDYY)	Identifier	Sampling Configuration	Related Snow Pits	Additional Description
031423	Line 9	Transect	D764, I784	Data collected on transit from D764 to I784
031423	Line 10	Spiral	I784	
031423	Line 11	Transect	I784	Data collected on transit from I784 to Toolik Field Station
031523	Line 1	Transect	D698	Data collected on transit from USK Line to D698
031523	Line 2	Transect	D698	Data collected on transit from D698 to Grid
031523	Line 3	Trench	D698	
031523	Line 4	Transect	D698	D689 on UKS

## 2 RELATED DATA SETS

[SnowEx at NSIDC | Data Sets](#)

[SnowEx23 CRREL Ground Penetrating Radar, Version 1](#)