Infrastructure, Curation, and Metadata

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NSF Workshop on Cyberinfrastructure for Polar Sciences
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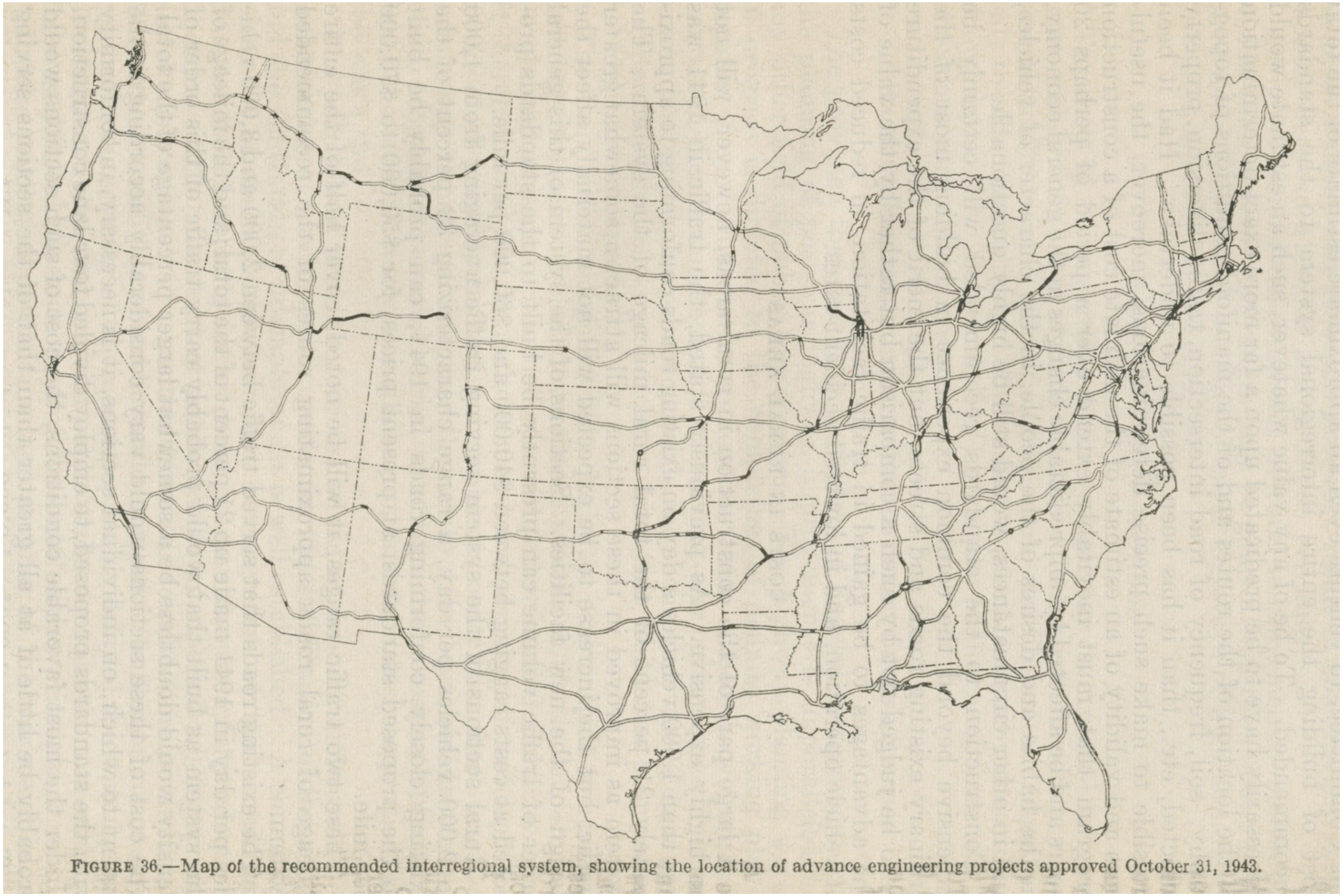


FIGURE 36.—Map of the recommended interregional system, showing the location of advance engineering projects approved October 31, 1943.

From *Interregional Highways: Message from the President of the United States Transmitting a Report of the National Interregional Highway Committee, Outlining and Recommending a National System of Interregional Highways*, 12 Jan. 1944.

http://www.shockblast.net/aerial-photographs/urban-sprawl-by-christoph-gielen-arizona/

Infrastructure is

Relationships, interactions, and connections
between humans, technologies, and institutions

Interchange

Ranch Exit

Understanding Infrastructure: Dynamics, Tensions, and Design

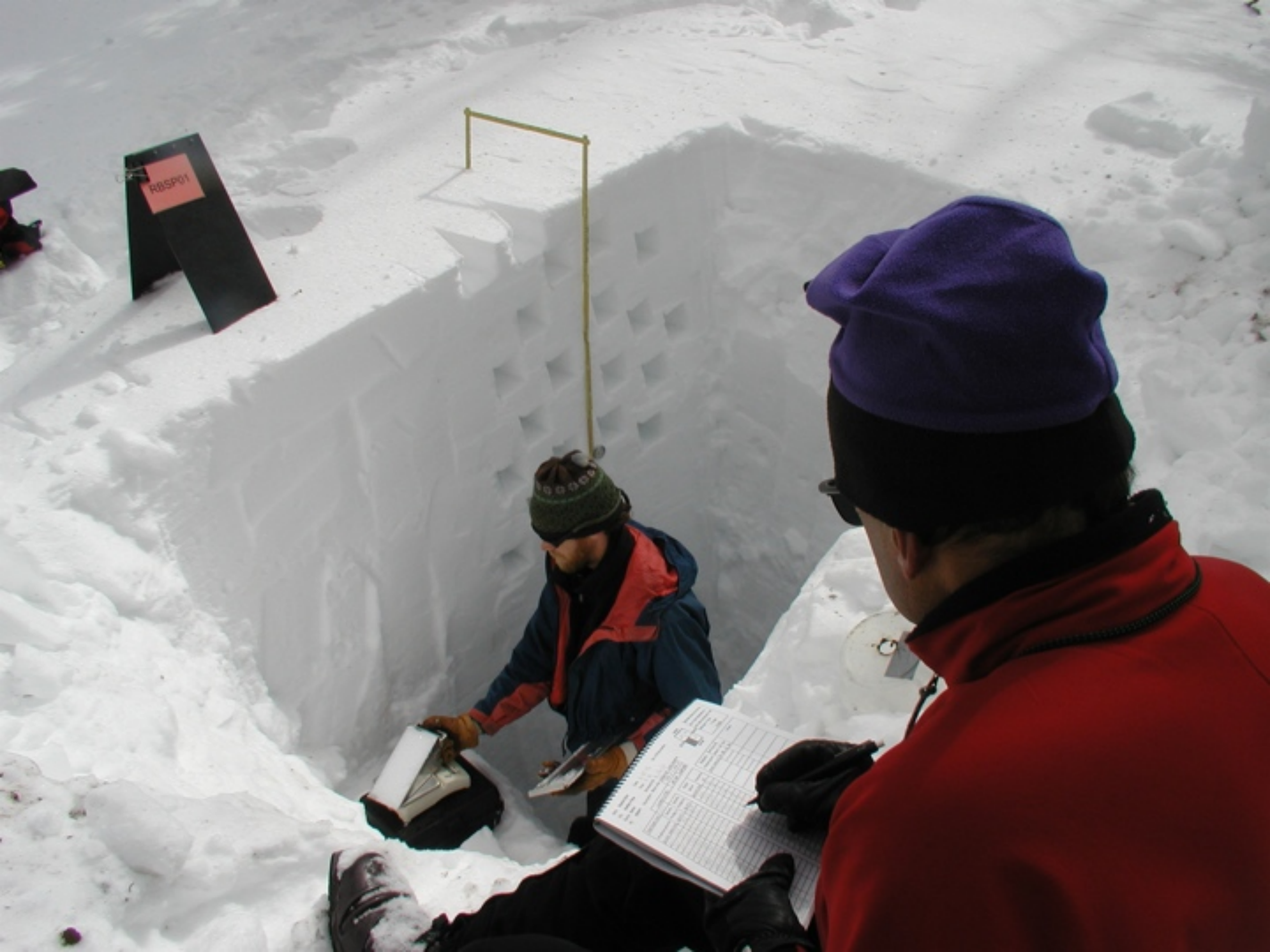
2007

Paul Edwards, Steven Jackson, Geoffrey Bowker,
and Cory Knobel

http://hdl.handle.net/2027.42/49353


JACK'S TIRE SERVICE
GOODYEAR
Budget
ONE WAY
Car and Truck Rental
homestore.com


Budget
ONE WAY
homestore.com


RBSP01


The Nordic Lodge
Pool Area


Elkhorn
Bar & Cafe
LIGHT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data
wrangler
Budget
ONE WAY
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Example of Snow Pit Data

We start with this:

MSA: **Rabbit Ears** Date: 2-25-03 ISA UTM Boundaries:

ISA: **Buffalo Pass** Time: 10:54

Sector: **Bravo** Surveyed By: HYMSTRA/MULLER/ELDER

Pit: **RBSP5** Description: Black pole, orange top - N end of large clearing

4,488,891 | B | C | 357,076 | 358,076 | A | D | 4,487,891

	UTM - E	UTM - N
Location (UTM):	~~357,414~~ 7451	~~4,488,859~~ 8873

20 M ACCURACY ON GPS

Total Depth (cm): 270

Ht above ground top (cm) - bottom (cm)	Density Profile A kg m-3	Density Profile B kg m-3	Height above ground (cm)	Temperature °C
270 - 260	71	64	270	-3
260 - 250	76	75	260	-8
250 - 240	86	88	250	-10
240 - 230	93	109	240	-10
230 - 220	110	112	230	-10
220 - 210	117	118	220	-10
210 - 200	142	138	210	-10
200 - 190	154	154	200	-9
190 - 180	178	183	190	-8
180 - 170	214	224	180	-8
170 - 160	263	249	170	-7
160 - 150	273	275	160	-7
150 - 140	297	291	150	-6
140 - 130	291	296	140	-6
130 - 120	320	320	130	-5
120 - 110	327	310	120	-4
110 - 100	338	320	100	-4
100 - 90	364	356	90	-3
90 - 80	369	376	80	-3
80 - 70	380	363	70	-3
70 - 60	340	347	60	-2
60 - 50	333	344		

Grain Size: Measure short and long axis of 3 grains representative of a small, medium and large grain in layer

Grain Type: N = New, R = Rounds, F = Facets, M = Mixed

Stratigraphy Ht above ground top (cm) - bottom (cm)	Axis type	Grain Size (mm) nearest 0.1 mm Sm	Med	Lg	Grain Type	Comments
270-223	short	.1	.2	.2	N	NEW SNOW
	long	.1	.3	.5		
223-170	short	.1	.2	.2	R	THIS WEEKS SNOW
	long	.1	.3	.4		
170-142	short	.1	.2	.3	F	PREVIOUS SNOWS MELT CRUST @ 142
	long	.2	.2	.4		
142-80	short	.2	.3	.5	R	TRENDING TOWARD FACETS
	long	.2	.5	.8		
80-35	short	.4	.7	.10	M	95% ROUNDED 5% FACETS
	long	.6	.8	1.0		
35-0	short	.4	.6	1.2	M	85% ROUNDS 15% FACETED
	long	.4	1.0	2.0		

DIRECTIONS:

Surface Wetness	D
Surface Roughness	Y
Soil Sample A	18
Soil Sample B	18
Canopy	N

Wetness: Dry (D), Moist (M), Wet (W), Very Wet (VW)

Roughness: Photo Taken? Yes (Y) or No (N)

Soil Samples: Depth of Core (cm)

2 samples, label as **RBSP5A** and **RBSP5B**

Canopy: Point underneath canopy? No (N), Yes/Coniferous (YC), Yes/Coniferous with snow (YCS), or Yes/Deciduous (YD)

Comments: PIT BETWEEN 2 ROWS OF TALL TREES.

Example of Snow Pit Data

And create this:

Summary Table

PIT	IOP	SECTOR	DATE	TIME	UTME	UTMN	SWET	SRUF	...	CNHT	DEPTH	SWE	DNS_LYRS	DNS_AVG	...
										cm	cm	mm		kg/m^3	
rbsp01	iop1	alpha	20020224	1115	357156	4487926	d	y		-999	214	637	22	298	
rbsp02	iop1	alpha	20020224	930	357211	4488306	d	y		-999	200	587	20	293	
rbsp03	iop1	bravo	20020224	928	357197	4488466	d	y		-999	180	514	18	286	
rbsp04	iop1	bravo	20020224	1330	357188	4488887	d	y		-999	225	667	23	298	
rbsp05	iop1	bravo	20020224	1528	357414	4488859	d	y		-999	212	679	22	320	

Stratigraphy Table

PIT_NAME	IOP#	TOP	BOT	SM-SHT	MD-SHT	LG-SHT	SM-LNG	MD-LNG	LG-LNG	GRN-TYPE	COMMENT
		cm	cm	mm	mm	mm	mm	mm	mm		
rbsp01	iop1	214	205	0.2	0.5	0.7	0.4	0.6	0.8	n	QC(000)
rbsp01	iop1	205	163	0.4	1	1	0.5	1	1.5	m	QC(000)
rbsp01	iop1	163	119	0.2	0.5	0.7	0.4	0.6	1.3	m	QC(000) Ice lens @119 cm.
rbsp01	iop1	119	19	0.3	0.3	0.5	0.3	0.7	1.2	m	QC(000)
rbsp01	iop1	19	0	0.4	0.5	2	0.5	0.8	2	f	QC(000)

Density Table

PIT_NAME	IOP#	TYPE	TOP	BOT	DENSITY-A	DENSITY-B	DENSITY-AVG	QC
			cm	cm	kg/m^3	kg/m^3	kg/m^3	
rbsp01	iop1	C	214	204	104	101	102.5	QC(000)
rbsp01	iop1	C	204	194	147	140	143.5	QC(000)
rbsp01	iop1	C	194	184	142	143	142.5	QC(000)
rbsp01	iop1	C	184	174	161	158	159.5	QC(000)

Temperature Table

PIT_NAME	IOP#	HEIGHT	TEMPERATURE	QC
		cm	deg-C	
rbsp01	iop1	214	-2	QC(000)
rbsp01	iop1	204	-6	QC(000)
rbsp01	iop1	194	-6	QC(000)
rbsp01	iop1	184	-7	QC(000)

Curation is

continual and conscious improvement of data.

Curation matters

- Embedding “data wranglers” in the field significantly improved data quality and completeness. (~20% of the data sheets had issues corrected in the field that would not have been correctable later).
- Reveals and documents tacit knowledge. Can even uncover science questions.
- Integrated much more than the field data with common grids and formats
    - “Standard” formats often do not exist and need to be created by the community. Sometimes you need multiple formats.
- A mediated relationship between user and collector.
- Need to include curators in data collection even if they are not in the field.
- Get to know your local curator.

Metadata are

Everything necessary to make data independently understandable by a designated community.

Infrastructure is comprised of relationships.

Curators create and enhance relationships.

Metadata is often the information shared (often tacitly) in those relationships.

A standard sensor format?

- Temporally varying sensors (e.g. a borehole)
- Spatially varying sensors (e.g. a transect)
- Temporally and spatially varying sensors (e.g. a drifting buoy)

Thank You

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NOAA