

TOOLIK FIELD STATION

OCT 1, 2018 - SEPT 30, 2019 REPORT

2020 METEOROLOGICAL STATION UPDATE

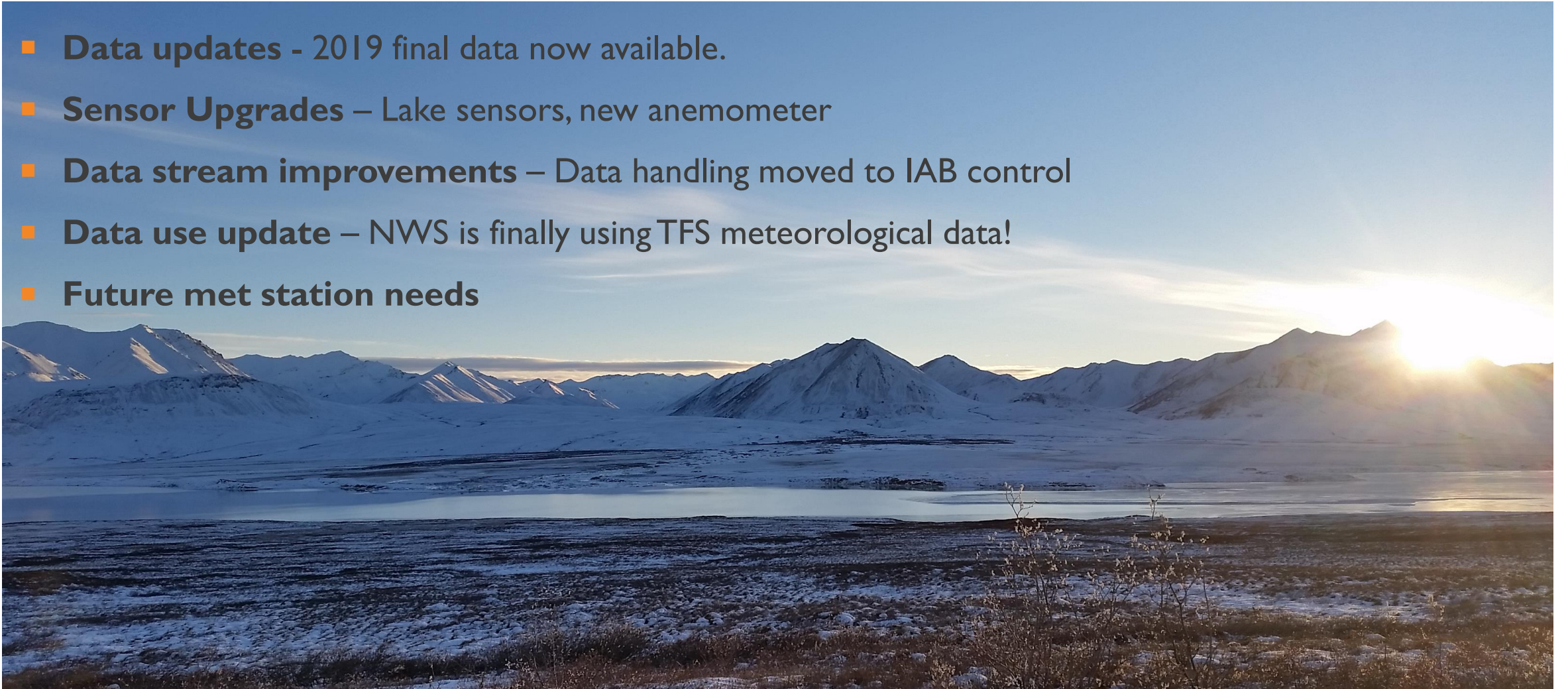


COLIN EDGAR



METEOROLOGICAL STATION UPDATE

- **Data updates** - 2019 final data now available.
- **Sensor Upgrades** – Lake sensors, new anemometer
- **Data stream improvements** – Data handling moved to IAB control
- **Data use update** – NWS is finally using TFS meteorological data!
- **Future met station needs**



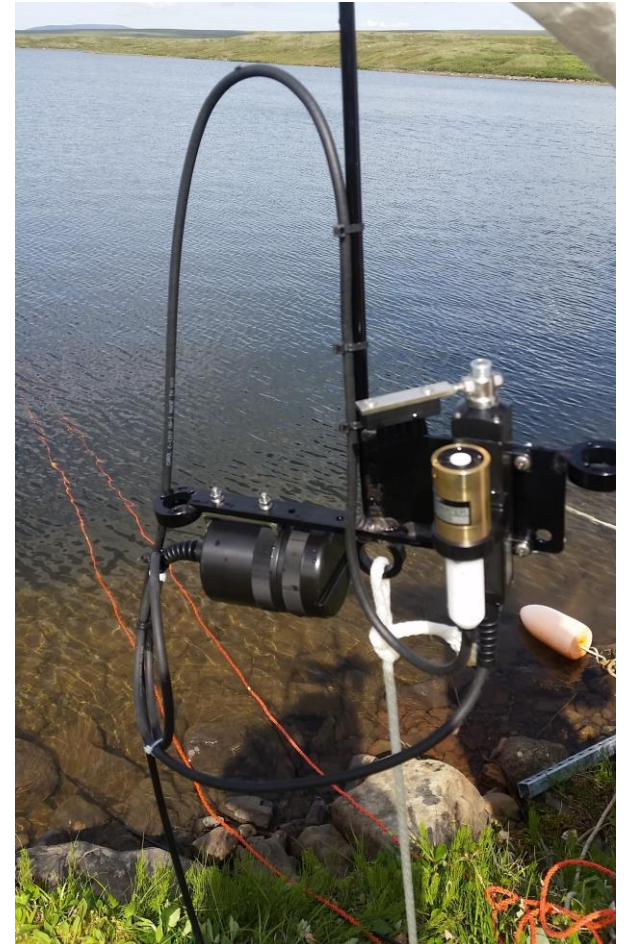
METEOROLOGICAL STATION UPDATE

- **TFS Meteorological Data updates**
 - 2019 final error checked data now available.
 - In Sept was checked data was posted on EDC webpage
 - In 2020 I will make error checked data available in April and October
 - I shared checked/compiled data with nearly two dozen users throughout the year.

METEOROLOGICAL STATION UPDATE



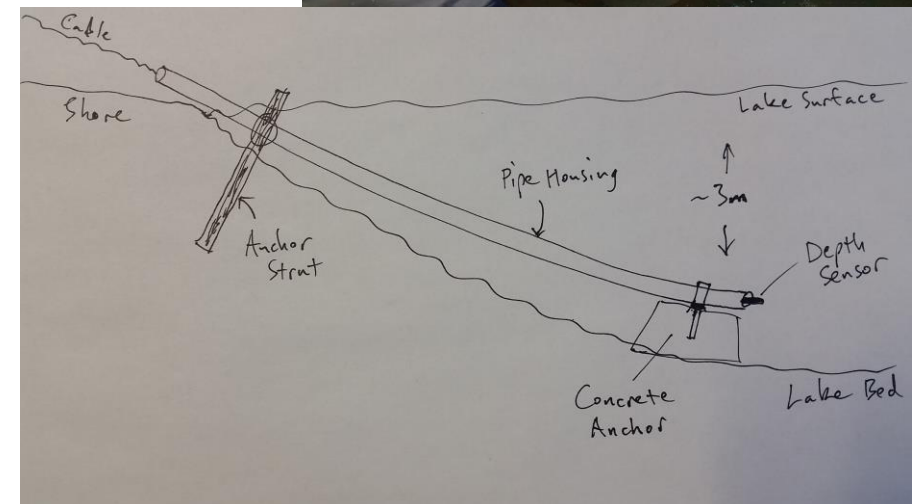
- **Sensor Upgrades**
 - New Underwater PAR sensor system deployed
 - Automatic cleaning device and seasonal retrieval system
 - Fixed depth of 1.5m below surface.



METEOROLOGICAL STATION UPDATE

■ Sensor Upgrades

- Re-installed Lake Depth and Temperature sensors
- Mounted in a protective casing with a permanent anchor point at ~3m depth to avoid ice
- Will allow future removal of sensors for service or replacement while ensuring a fixed measurement point.



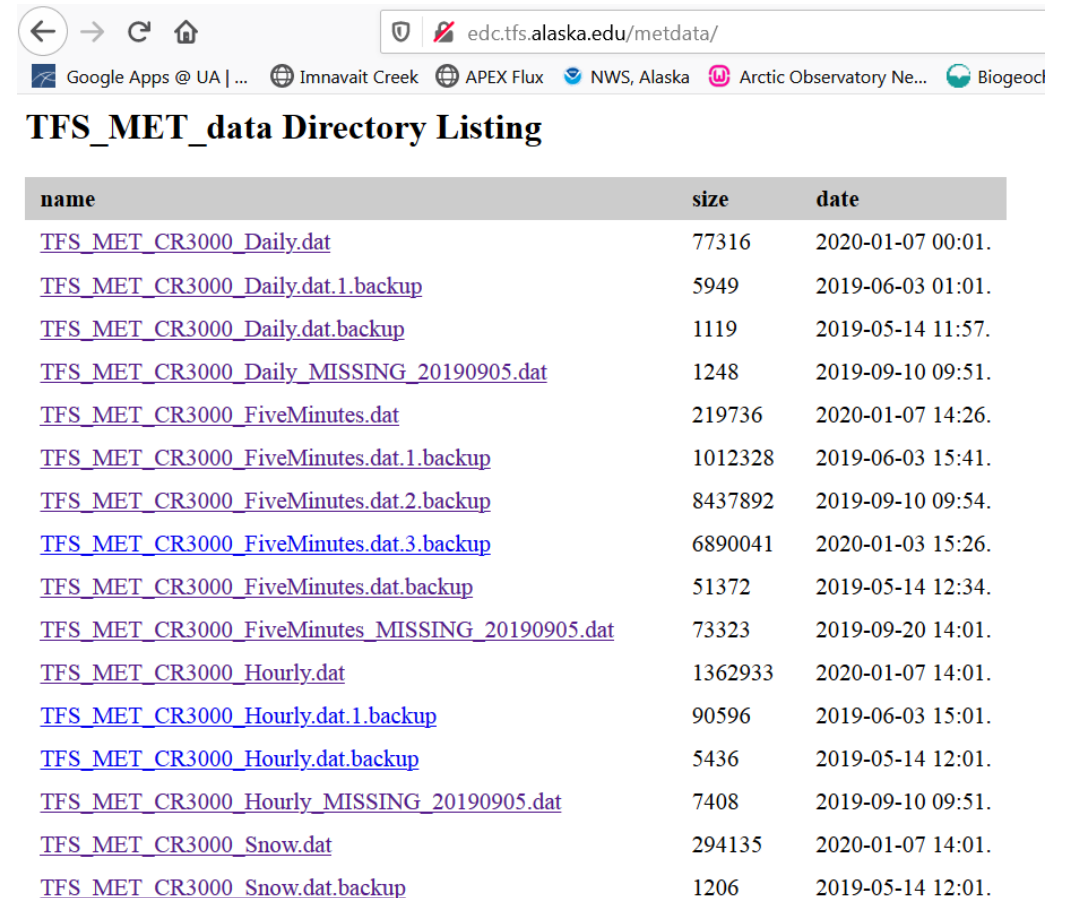
METEOROLOGICAL STATION UPDATE

- **Sensor Upgrades**
 - New 2D heated sonic anemometer installed
 - Hopefully will reduce winter data loss from rime icing of propeller-type anemometers



METEOROLOGICAL STATION UPDATE

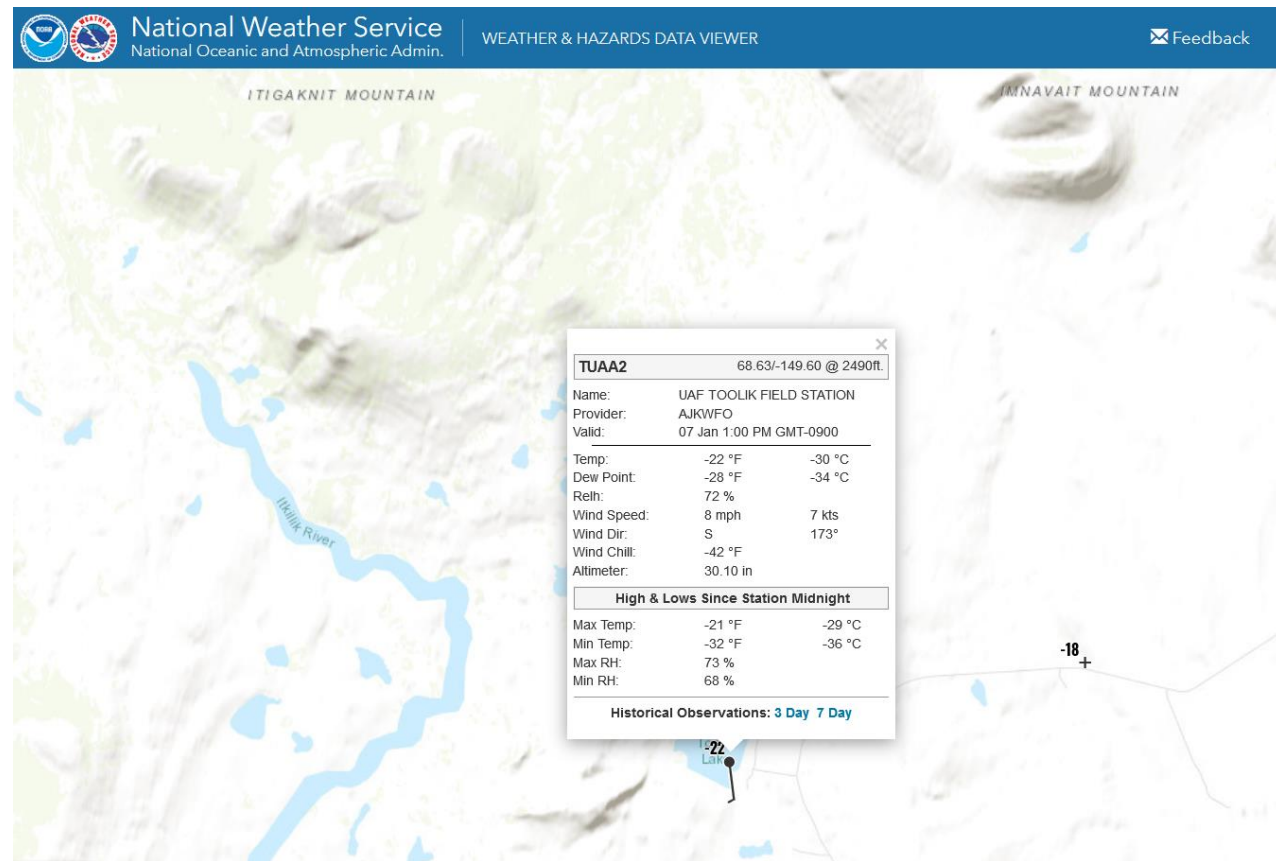
- **Datastream upgrades**
 - Met station data now collected by IAB server
 - Data automatically archived and monitored
 - Repaired secondary radio connection with datalogger and TFS network
 - EDC now has direct control of all communications and data archival



name	size	date
TFS_MET_CR3000_Daily.dat	77316	2020-01-07 00:01.
TFS_MET_CR3000_Daily.dat.1.backup	5949	2019-06-03 01:01.
TFS_MET_CR3000_Daily.dat.backup	1119	2019-05-14 11:57.
TFS_MET_CR3000_Daily_MISSING_20190905.dat	1248	2019-09-10 09:51.
TFS_MET_CR3000_FiveMinutes.dat	219736	2020-01-07 14:26.
TFS_MET_CR3000_FiveMinutes.dat.1.backup	1012328	2019-06-03 15:41.
TFS_MET_CR3000_FiveMinutes.dat.2.backup	8437892	2019-09-10 09:54.
TFS_MET_CR3000_FiveMinutes.dat.3.backup	6890041	2020-01-03 15:26.
TFS_MET_CR3000_FiveMinutes.dat.backup	51372	2019-05-14 12:34.
TFS_MET_CR3000_FiveMinutes_MISSING_20190905.dat	73323	2019-09-20 14:01.
TFS_MET_CR3000_Hourly.dat	1362933	2020-01-07 14:01.
TFS_MET_CR3000_Hourly.dat.1.backup	90596	2019-06-03 15:01.
TFS_MET_CR3000_Hourly.dat.backup	5436	2019-05-14 12:01.
TFS_MET_CR3000_Hourly_MISSING_20190905.dat	7408	2019-09-10 09:51.
TFS_MET_CR3000_Snow.dat	294135	2020-01-07 14:01.
TFS_MET_CR3000_Snow.dat.backup	1206	2019-05-14 12:01.

METEOROLOGICAL STATION UPDATE

- Live Toolik weather data now feeds to the National Weather Service and MesoWest



METEOROLOGICAL STATION UPDATE

MESO WEST Region: Alaska GCA Product: Surface Weather Maps Go

NWS XML Permalink 7 Days Int. Units Cloud Column Decoder FAQ/Data Issues

STATION INFO
 ID: TUA2
 NAME: UAF TOOLIK FIELD STATION
 LATITUDE: 68.62830
 LONGITUDE: -149.59580
 ELEVATION: 2490 ft
 MNET: AJKWFO
 LAND COVER: Avail for CONUS stns only
 DATA COURTESY OF:



[Change to Weather Map](#)
[Change to Graphical Display](#)
[Change to Metric Units](#)
[Change to Local Time](#)

Weather Conditions for TUA2

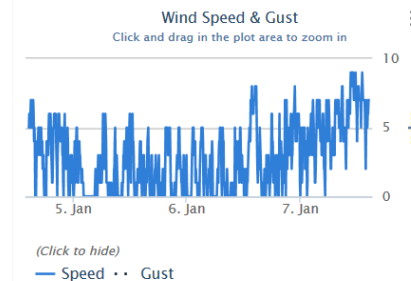
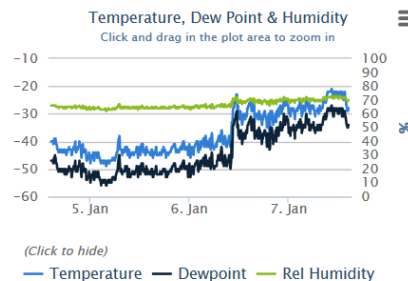
Current Time: 01/07/2020 14:32 AKS

Most Recent Weather Conditions at: 01/07/2020 14:00 AKS

Graphical Links	14:00	Max Since 0:00 (AKS)	Min Since 0:00 (AKS)	24 Hour Maximum	24 Hour Minimum
Temperature	-27.4° F	-21.1 at 10:20	-31.8 at 1:30	-21.1 at 10:20	-36.4 at 19:25
Dew Point	-33.9° F	-27.1 at 10:20	-38.6 at 1:30	-27.1 at 10:20	-43.4 at 19:25
Wet bulb temperature	-27.7° F	-21.5 at 10:20	-32.1 at 1:30	-21.5 at 10:20	-36.6 at 19:25
Relative Humidity	70%	73 at 12:20	68 at 3:10	73 at 12:20	66 at 19:25
Wind Speed	6.8 mph	9.3 at 11:00	0.0 at 0:00	9.3 at 11:00	0.0 at 0:00
Wind Direction	SSE	-	-	-	-
Pressure	27.48 in	27.48 at 14:00	27.46 at 0:00	27.48 at 14:00	27.44 at 16:00
Altimeter	30.10 in	30.10 at 14:00	30.07 at 0:00	30.10 at 14:00	30.05 at 16:00
Solar Radiation	4.0 W/m*m	5.0 at 13:40	0.0 at 11:40	5.0 at 13:40	0.0 at 11:40
Net Radiation	-38.6 W/m*m	-28.8 at 1:30	-48.5 at 10:40	-21.5 at 17:40	-48.5 at 10:40
Outgoing Shortwave Radiation	0.0 W/m*m	1.0 at 13:25	0.0 at 14:00	1.0 at 13:25	0.0 at 14:00
Battery voltage	13.44 volt	13.45 at 11:00	13.44 at 14:00	13.45 at 11:00	13.44 at 14:00

*Note: Observations above in yellow indicate that they are older than the last row of observations below.

Weather Conditions For:
 UAF TOOLIK FIELD STATION, AK, [TUA2](#) (AJKWFO)
 Elev: 2490 ft.; Lat/Lon: 68.62830/-149.59580
 Current Time: Jan 7 2:36 pm AKST
[Get Yearly Precip Total \(non QA/QC'd data\)](#)
[Get Water Year Precip Total \(non QA/QC'd data\)](#)



Date (AKST)	Temp (F)	Dew Point (F)	Relative Humidity (%)	Wind Chill (F)	Wind Direction	Wind Speed (MPH)	Station Pressure (inches)	Sea Level Pressure (mb)	Altimeter Setting (inches)	Solar Radiation (W/m ²)	Solar Pct of psbl	1 Hour Precip (inches)	Snow Depth (inches)	Snowfall 3 Hour (inches)	Snowfall 6 Hour (inches)	Snowfall 24 Hour (inches)
07 Jan 2:30 pm	-28	-34	70		S	7				1	--					
07 Jan 2:25 pm	-28	-34	70		S	7				2	--					
07 Jan 2:20 pm	-29	-35	70		SSE	6				2	--					
07 Jan 2:15 pm	-29	-35	69		SSE	6				3	--					

METEOROLOGICAL STATION UPDATE

- **Soil temperature – fix probes that likely have drifted spatially**
 - Buying newly available commercially manufactured thermistor probes
 - Pros: only use one datalogger port, durable/warrantied, less technician time
 - Cons: high price ~\$4000 for two probes
 - Collaborate with Permafrost Lab at nearby borehole to add surface soil probes
 - Pros: Can couple data with borehole, use their expertise
 - Cons: not exact same location, site longevity
 - Reinstall existing sensors.
 - Pros: cheap, use exact same sensor
 - Cons: time-consuming, will suffer same issue in a few years

CS231-L

SDI-12 Temperature Profiler

Soil Temperature Sensors / CS231-L



METEOROLOGICAL STATION UPDATE

- **Improve/replace year-round precipitation gage**
- Issue - wind causes small winter precip errors due to vibration. In our dry climate this could be significant on seasonal or yearly scale.
 - Partial solution – added ‘did it snow today’ element to Naturalist Journal, manually remove errant data
 - Purchase new gage with optical gate
 - Pros – probably will solve issue, used by NOAA
 - Cons – cost ~\$4000
 - Engineer a system myself using laser sensor
 - Pros – cheap
 - Cons – time sink, no guarantee of success, cold weather performance may be poor.

THANK YOU!



QUESTIONS?

