Questions on UMBS Weather dataset specifics (for use in data cleaning procedures):

1. The data provided to me begins on 1/1/80, however the file names indicate the data should begin in 1978. Is there somewhere I can find the missing data?

Yes. When I have a chance, I will combine all of the daily weather observations data into one file. 1/1/80 is a good place to start, though. Summer of 1979 was the beginning of consistent year round data collection.

2. The files containing data from 2016 and earlier contain 4 different columns that relate to precipitation. What is the meaning and unit for each of the 4 columns highlighted in the sample shown below?

Date	Max Temp	Min Temp	Observed Temp	Rain Melted, snow, etc	Snow, ice pellets, hail	Snow ice pellets, hail, ice on ground	RAIN GAUGE
1/20/16	23	13	17	0.04	1.25	21	0.06
1/19/16	22	-6	13	0	0.25	22	0.01
1/18/16	17	4	7	0.19	3	25	0.26
1/17/16	17	12	13	0.25	15.5	28	0.21
1/16/16	23	15	15	0.52	1.5	15.5	0.66
1/15/16	29	13	26	0.02	0.25	15.5	0.03
1/14/16	26	11	14	0.15	11	19	0.22
1/13/16	16	10	12	0.44	0.25	8	0.21
1/12/16	21	9	12	0.08	2	9	0.06

"Rain, melted snow…" is precipitation (from the previous 24 hours) measured to the nearest 1/100 inch in a Belfort Rainfall Transmitter 5915 rain gauge. "Snow, ice pellets…" is recent (over the past 24 hours) snow measured with a ruler. Historically, it was measured to the nearest ¼ inch, but this past winter, I started measuring to the nearest 1/10 inch, which is the National Weather Service Standard. "Snow, ice pellets…on the ground" is accumulated snow depth. This should be to the nearest inch. The last "Rain gauge" column is rainfall measured in a ETI NOAH IV rain gauge to the nearest 1/100 inch. That rain gauge was installed in the past decade, I think (you'll be able to see in the data), and I now use that rain gauge exclusively for precipitation data. Here's a quirk: I think that data recorded in that "RAIN GAUGE" column go from 0:00 to 24:00, whereas the Belfort data go from 08:00 to 08:00. I can probably check to confirm that.

3. The files containing data from after 2016 contain 4 different columns that relate to precipitation. What is the meaning and for each of the 4 columns highlighted in the sample shown below? What is the unit for the first two highlighted?

Date	24 Hr Temp Max	24 Hr Temp Min	Temp Current	24 Hr Precip (Belfort)	24 Hr Precip (ETI)	24 Hr Snow (in)	Official Snow on Ground (in)
2/1/2019	7	-18	-10	0.01	0	0.25	20
2/2/2019	26	-12	26	0	0	0	19.5
2/3/2019	32	22	32	0.02	0.04	0	19
2/4/2019	39	31	33	0.06	0.35	0	17.5
2/5/2019	42	13	14	0.35	0.05	T	16
2/6/2019	20	11	18	0.27	0.24	0.75	
2/7/2019	20	15	19	0	0.6	0	
2/8/2019	33	9	9	0.58	0.06	1.5	
2/9/2019	13	8	11	0	0	0	
2/10/2019	19	1	5	0	0.05	0	

These are the same columns as described above in # 2, but reorganized and renamed a bit. Inches is the unit for those columns.

4. All data files occasionally contain a value "T" in the columns for "Rain, melted snow, etc", "snow, ice pellets, hail", and "snow, ice pellets, hail, ice on ground". What does this mean?

Date	Max Temp	Min Temp	Observed Temp	Rain Melted, snow, etc	Snow, ice pellets, hail	Snow ice pellets, hail, ice on ground
4/2/90	34	34	34	0.5	T	T
4/1/90	46	33	36	0.1		0
3/31/90	45	30	32	0		0
3/30/90	35	31	33	0.09	1	2
3/29/90	49	27	31	0		2
3/28/90	38	14	27	0		4
3/27/90	34	10	14	0		4
3/26/90	24	18	18	T	T	5
3/25/90	40	18	31	0		5

"T" is for trace precipitation.

5. Data from November 19 forward contains terms in the "Notes" column that say "wind 3" or "wind = 2" or other similar integers. Why is this recorded in the "Notes" column and should I transfer it to the "Wind (knots)" column?

Date	Wind Speed (knots)	Wind Speed (mph)	Other Observations/Notes
11/8/2019			Wind 2. Patchy light snow.
11/9/2019			Wind 3. Check iButton temps.
11/10/2019			Wind 4. From north. Sleet overnight.
11/11/2019			Wind 2. NE
11/12/2019			Wind 0.
11/13/2019			Wind 2-3. E.
11/14/2019			Wind 1. Light snow.

This is wind speed approximated to the Beaufort Wind Scale. I'd keep it in the notes. These recordings are in lieu of actual quantitative wind measurements. We have more reliable wind measurements from other sources. We used to have a tower in camp with an anemometer to measure wind speed that ran into the 1990s, maybe? You'll see in the data. I would recommend excluding any wind data in the data set from after that anemometer was decommissioned.

For my own reference and information, I've usually (but irregularly) either included a Beaufort estimate or a wind speed measurement from the buoy (which is deployed during the growing season), but I would suggest not including those as anything other than notes. I would recommend gathering wind data from the flux towers and the buoy.

That said, I'd like to set up another anemometer in camp.