Lab 7.2 Agenda: Graphing Stacked Time Series Data

- **Attendance:** needed for today's work
- **Returns & Comments:** Lab 6, Appendix 2, & any outstanding items
- **Distribute:** multiple graph paper sheets

Graphing Stacked Time Series Data Lab (focus):

Complete your draft stacked time series graph. Use your screen's rationalized data (worth 1%; marked before you leave the lab)

Before leaving today

- **Instructor must mark your graph!** (as complete as possible; a draft is ok)
- **Sign-up** for your **15 minute instructor meeting next week** → schedule will be posted on the lab website (see side menu on cyclone)
- **View weather maps & satellite image integration** (example from last year – gives ideas that will help you prepare for your instructor meeting)

Due after today's lab: No submissions. Prepare for Instructor meeting (worth 2%)

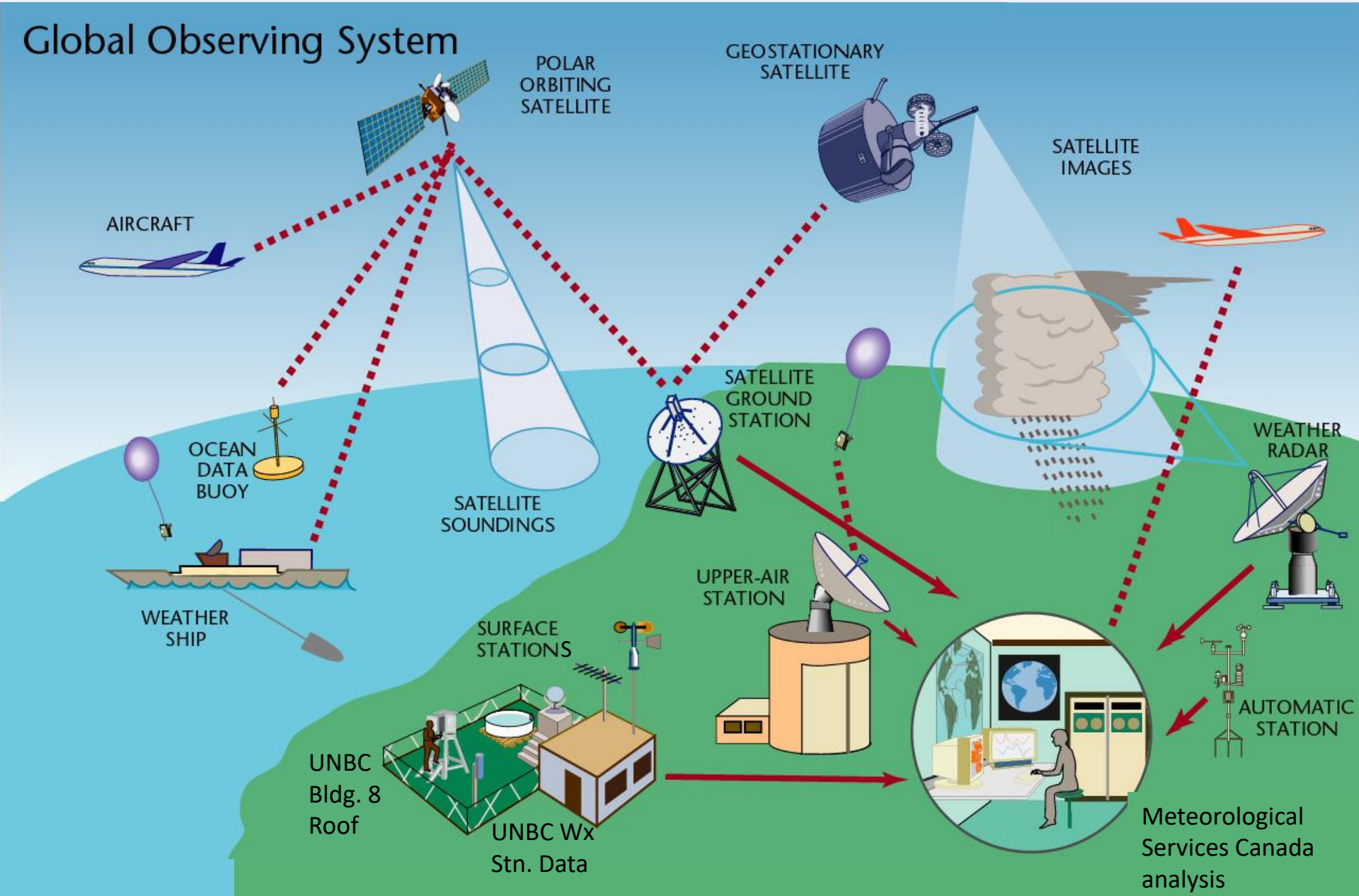
Be ready to: Present, discuss & explain your WxProj outline

- Discuss your 4-day weather story (to the best of your current ability)
- Provide supporting evidence for your ideas using your many data sources!
- Bring: UNBC Wx Stn graph, your draft graph, diary, selected digital weather maps /satellite

Lab 7.2:

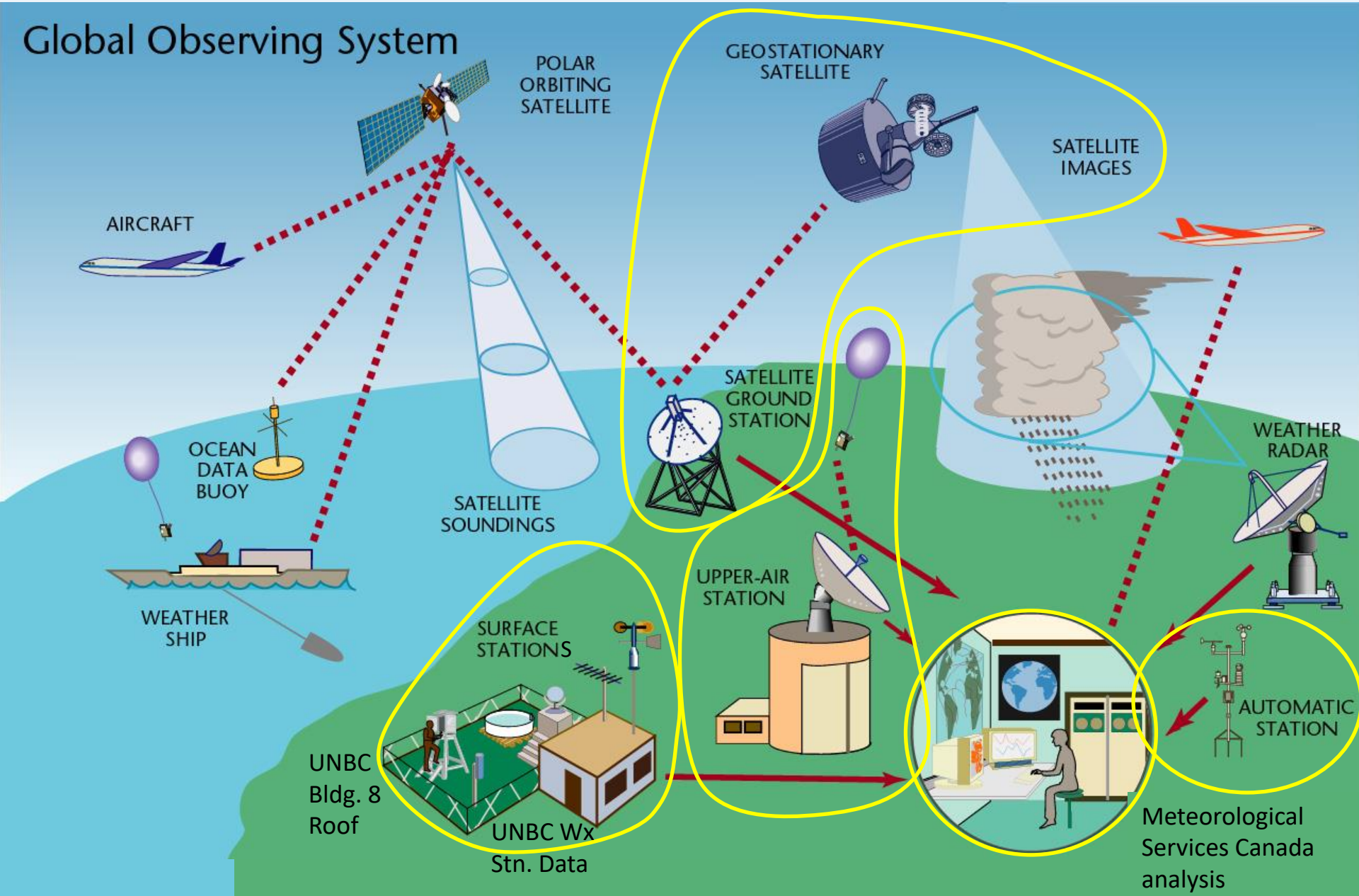
Integrating Data

use local & synoptic data to interpret the weather at UNBC for our 4 days…..



Integrating WxProj Data

our local & synoptic data sources



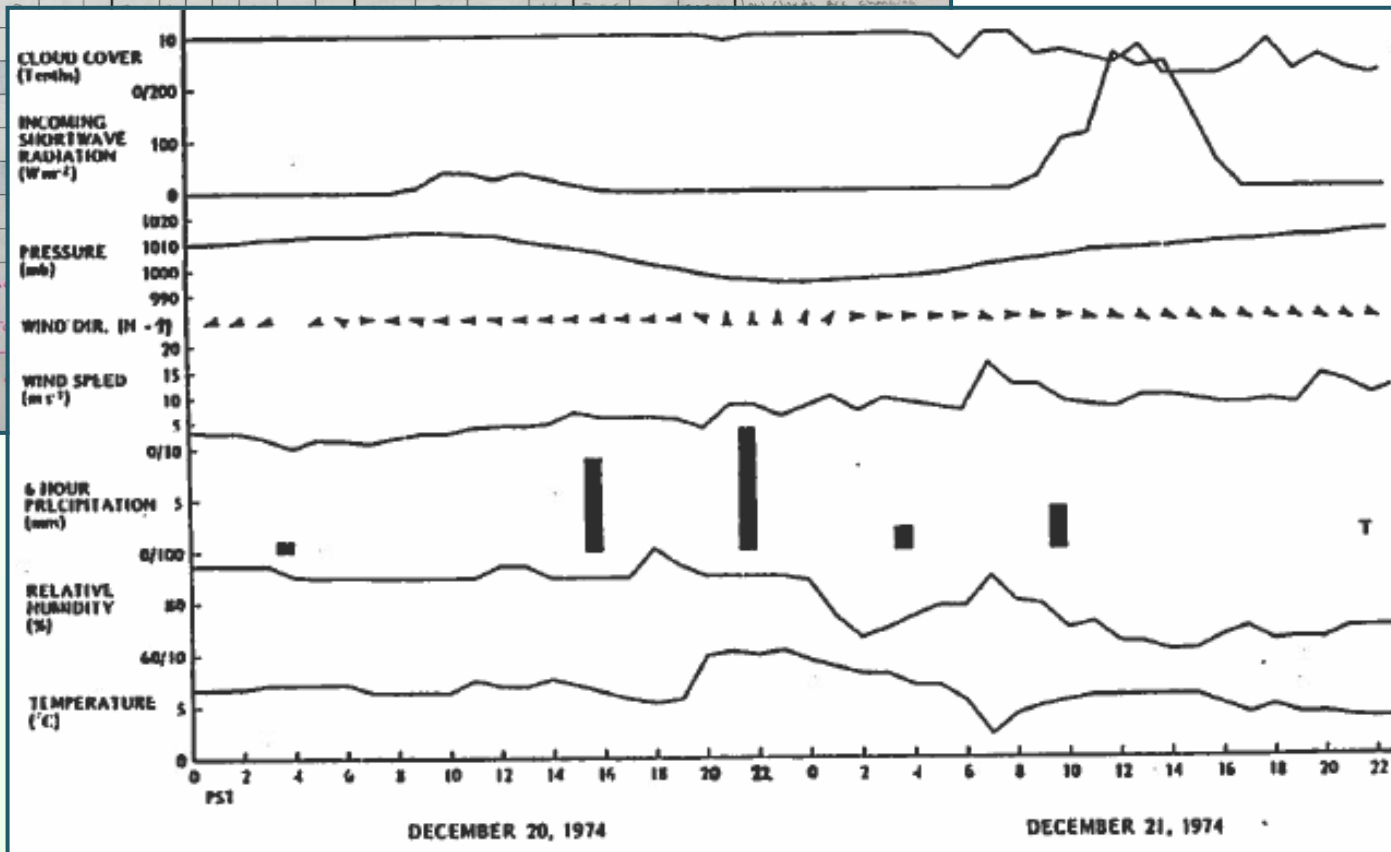
Today: Graphing your UNBC Bldg. 8 Roof Data ← 1st Step of your analysis

Screen B Instrument 3

TIME	TEMPERATURE			HUMIDITY (Note wick state & instrument type in the indicated columns)						PRECIPITATION (Note when precipitation is from melted rain gauge)				SKY Condition & CLOUD							WIND				PRESSURE			COMMENTS
														SKY	Amount (8ths)			Cloud type: Use 2-letter cloud abbreviations & double dashes for layers you cannot see.			Visual Observation		UNBC Weather Station					
	Max Temp. (°C)	Min Temp. (°C)	Present Air Temp. (°C)	Wet bulb Temp. (°C)	F = wick is frozen	Dry bulb Temp. (°C)	e (hPa)	RH (%) A = Assmann W = Wekseler B = Bacharach		Snow Depth (mm) Ruler measurement	Snow Water Equivalent SWE (mm)	Rain gauge (mm) T = Trace	M = from melted rain gauge	CLR FEW SCT BKN OVC OBSCD MISG	low	mid	high	low	mid	high	Direction Bearing (8-point compass)	Beaufort number	Direction Azimuth (degrees °) from north	Speed (m/s)	Barometer (mm Hg)	Barometer Temp. (°C)	Corrected Pressure (hPa)	
2	7:46	-2.0	-6.5	-7.0	-6.3	F	-6.2	3.6	98.4	A	--		0	--	BKN	6	1	--	ST	As	--	SW	1	240	2.0	700.8	20.0	932.0	Fog in lower town/not in sky view. First on the bench
2	12:30	-2.0	-8.0	-2.0	-3.7	F	-2.1	3.5	78.8	A	0	0	0	--	OVC	0	0	8	--	--	CS	E	2	101	0.4	700.8	21.0	931.8	Clouds changed
2	3:30	0.0	-3.0	-1.0	-1.5	F	1.4	6.9	75.5	A	--	0	--	--	SCT	--	2	2	--	As	Cl	SW	1	248	1.4	700.4	22.0	931.2	
3	8:05	-0.5	-13.0	-12.5	-10.4	F	-10.2	2.7	95.7	A	--	0	0	--	CLR	..	..	..	--	..	..	SW	0	229	0.4	703.4	21.0	935.3	Frost on bench, streaks clouds on the horizon
3	12:30	-8.0	-13.0	-8.0	-8.0	F	-7.9	3.2	96.4	A	0																	
3	3:50	-6.0	-8.0	-6.0	-7.6	F	-6.4	3.8	81.6	A	--																	
	8:04	-8.0	-15.0	-13.0	-10.9	F	-10.4	2.5	97.6	A	--																	
	12:21	-11.0	-13.0	-11.0	-9.5	F	-9.5	2.6	1000	A	. .																	
	3:45	-5.0	-11.0	-5.0	-5.8	F	-5.3	4.0	92.7	A	--																	
	7:35	-4.5	-13.5	-13.0	-11.4	F	-10.6	2.9	93.8	A	. .																	
	12:36	-6.0	-13.0	-6.0	-7.2	F	-5.1	4.6	73.6	A	0																	
	3:45	-2.0	-6.0	-2.0	-4.6	F	-2.2	5.4	74.1	A	0																	

some are t… check cal… you used

↑ But…
data must be rationalized first. Address any QC or calculation errors before plotting.



Graphing Stacked Time Series Data (1%)

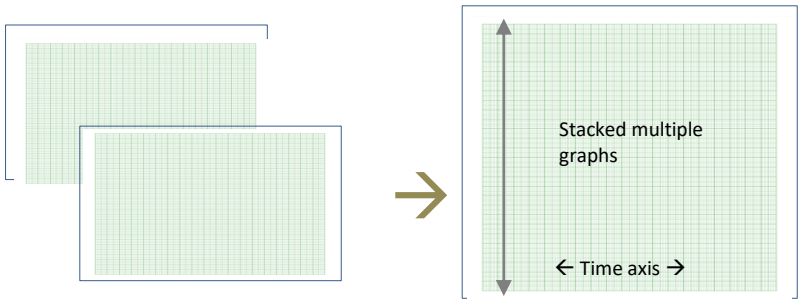
Complete your stacked time series graph using your screen's rationalized data (worth 1%; marked in lab)

If needed…
…all calculated dataset values must be corrected before plotting.

Before leaving today's lab: your instructor must mark your draft graph

Plot your screen's rationalized data - makes weather patterns clear

(shows connections & relationships between weather variables).



Best drawn by hand on a longer graph….

Join 2 or 3 graph sheets along their 11" (long-side of the page). Then rotate the pages to graph multiple stacked graphs on the longest side (so the time axis is on the 11" (inch) side & you have more height for multiple graphs).

- Hand-drawn graphs save time unless you already know software that plots time-series well – Excel won't do this
- ***Thoughtful, well designed, graphs that clearly and correctly express your ideas are better than slick graphs that communicate a limited, poor or incorrect message.***
- An accurate, clear but rough draft graph is sufficient for instructor meetings.

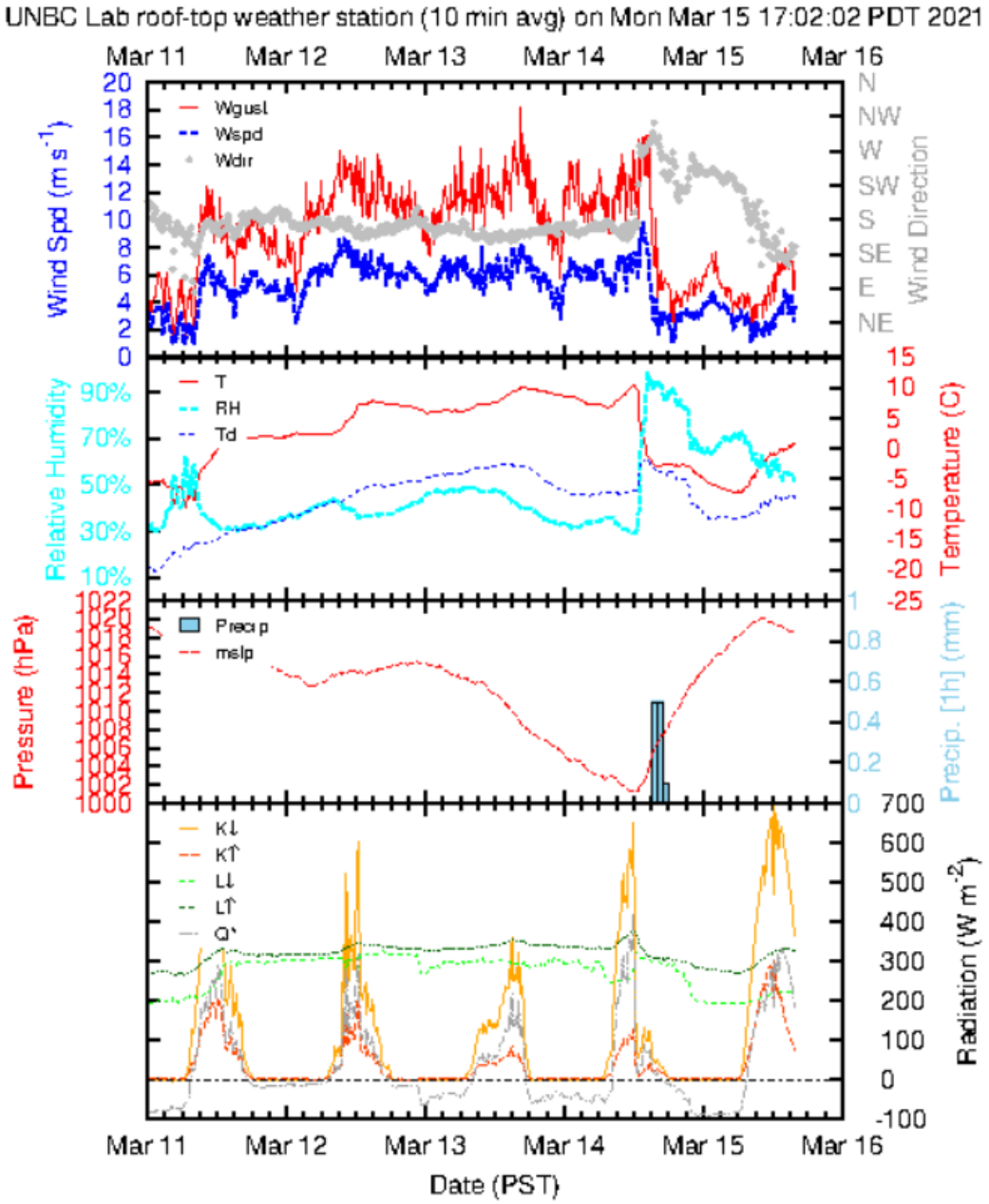
Stacked Time Series (STS) Examples

UNBC Wx Stn Graph

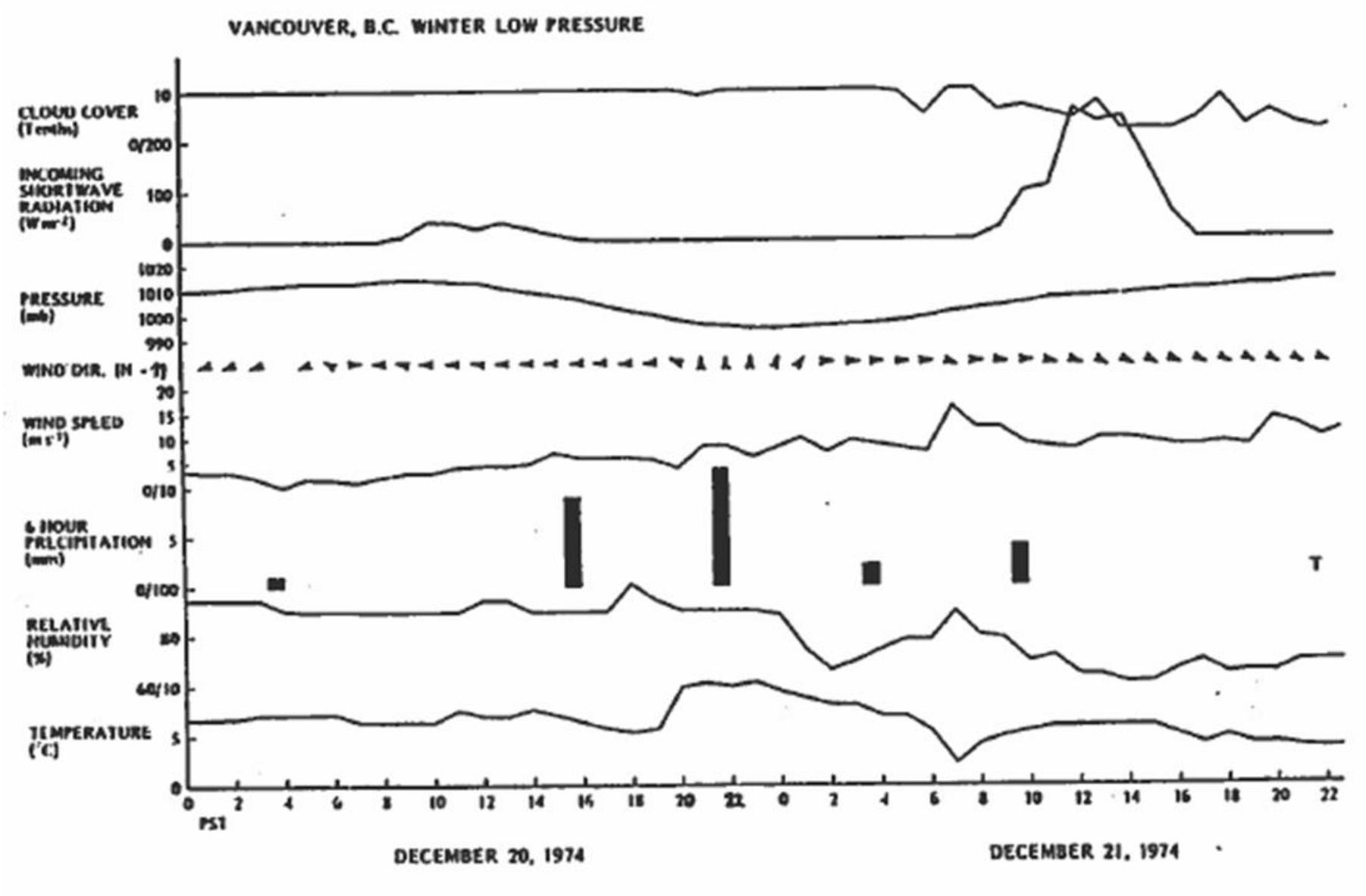
is a stacked time series example, but data differs & have this graph already….

Consider:

- how to correctly display
- what to display
- how to organize /stack graphs
- symbols
- colours
- represent intuitively
- possible misleading /confusing representation & how to avoid it



Lab 6 (Part B) is a good example but some data differs….



- Consider which variables to plot above or below each other to best see & communicate weather relationships & patterns

Ensure:

- time (x-axis) is represented equally (as during the day - observations are every ~4 hours; but overnight - observations are every ~16 hours)
- multiple stacked graphs clearly show /represent axes values (on the y-axis). *Consider if each variable must start at 0. Should properties showing 0 (i.e. nothing) be graphed? What do they mean?*
- symbols are clearly defined in a way or legend (*e.g. Does an up arrow (↑) mean the wind comes from the North? What does it show? Does the arrow symbol show the wind blowing from tip to tail? tail to tip?)*

  Your graph's symbol(s) must be clearly communicated by annotations or a legend if they can be confused by a reader.

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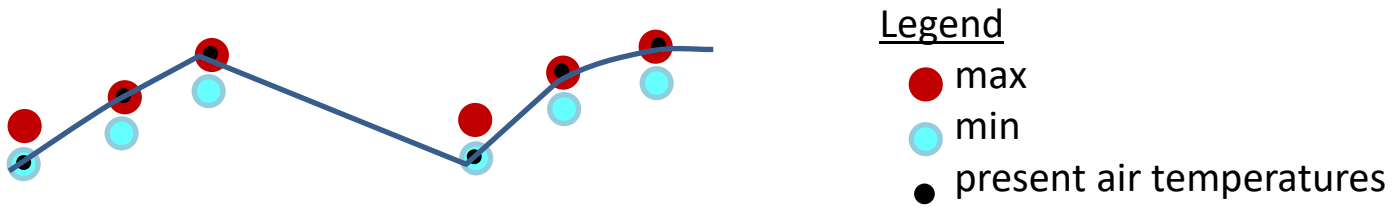
Connect graphed data points to show patterns or trends….how?

- **BUT** some data has NO TREND (consider precipitation, cloud? others?)
- Dashed ----- vs solid —— lines? How does their meaning differ? Is one better - when? How does it affect a reader's view of your plot?
- Example: Consider how to plot temperatures... You have max, min, and present air temperatures. Best seen as 3 points (•) on the same graph rather than 3 graphs. **What's the clearest /best way to relate these temperatures?**
  May depend on your purpose…



- Realize…. max & min temperatures & precipitation values represent events that occurred during the previous period.

Sign-up for your Instructor meeting time next week.

For example: Enter your name in the white cells. Note your time.

Instructor Interview Times. Ask if unclear or there are questions.

15 min. Wx Proj Report Meetings: Tuesday Siraj's 11:30 Lab

15 minutes meeting time; 5 min. grading between each meeting: Tues 13 students 11 expected(11:30 – 2:30 lab). **Instructors Meet @ 11:30 in 8-128.** **First meeting starts at**

Time	Name	Time	Name	Time	Name	Time	Name	Time	Name	Time	Name
11:30 to 11:40	Instructor set-up /meeting	11:30 to 11:40	Instructor set-up /meeting	11:30 to 11:40	Instructor set-up /meeting	11:30 to 11:40	Instructor set-up /meeting	11:30 to 11:40	Instructor set-up /meeting	11:30 to 11:40	x
11:45 to 12:00		11:45 to 12:00		11:45 to 12:00		11:45 to 12:00		11:45 to 12:00		11:45 to 12:00	x
12:05 to 12:20		12:05 to 12:20		12:05 to 12:20		12:05 to 12:20		12:05 to 12:20		12:05 to 12:20	x
12:25 to 12:40		12:25 to 12:40		12:25 to 12:40		12:25 to 12:40	x	12:25 to 12:40	x	12:25 to 12:40	x
12:45 to 13:00	Instructor Post meeting debrief & next session prep	12:45 to 13:00	Instructor Post meeting debrief & next session prep	12:45 to 13:00	Instructor Post meeting debrief & next session prep	12:45 to 13:00	Instructor Post meeting debrief & next session prep	12:45 to 13:00	Instructor Post meeting debrief & next session prep	12:45 to 13:00	x
13:05 to 13:20	x	13:05 to 13:20	x	13:05 to 13:20	x	13:05 to 13:20	x	13:05 to 13:20	x	13:05 to 13:20	x
13:25 to 13:40	x	13:25 to 13:40	x	13:25 to 13:40	x	13:25 to 13:40	x	13:25 to 13:40	x	13:25 to 13:40	x
13:45 to 14:00	x	13:45 to 14:00	x	13:45 to 14:00	x	13:45 to 14:00	x	13:45 to 14:00	x	13:45 to 14:00	x
14:05+	x	14:05+	x	14:05+	x	14:05+	x	14:05+	x	14:05+	x

See posted slides under Instructor mtg sched

Times are posted on the cyclone website, Labs menu once finalized