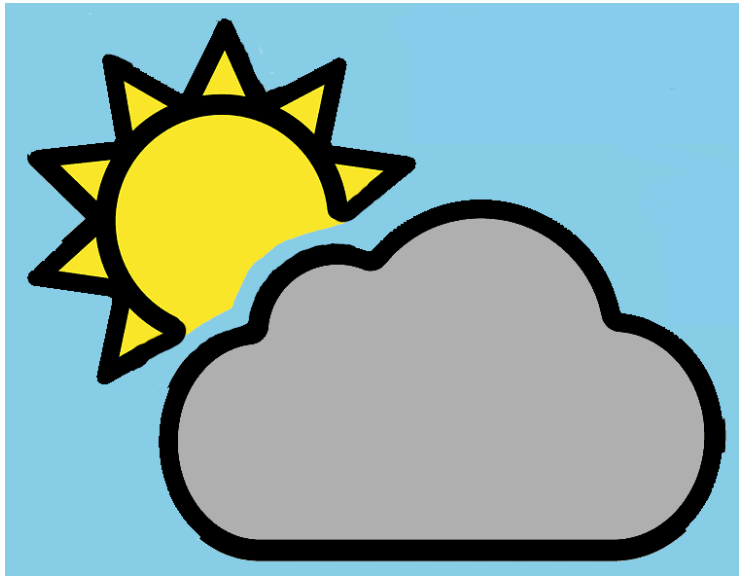
Mike Krejci

Weather by the Numbers

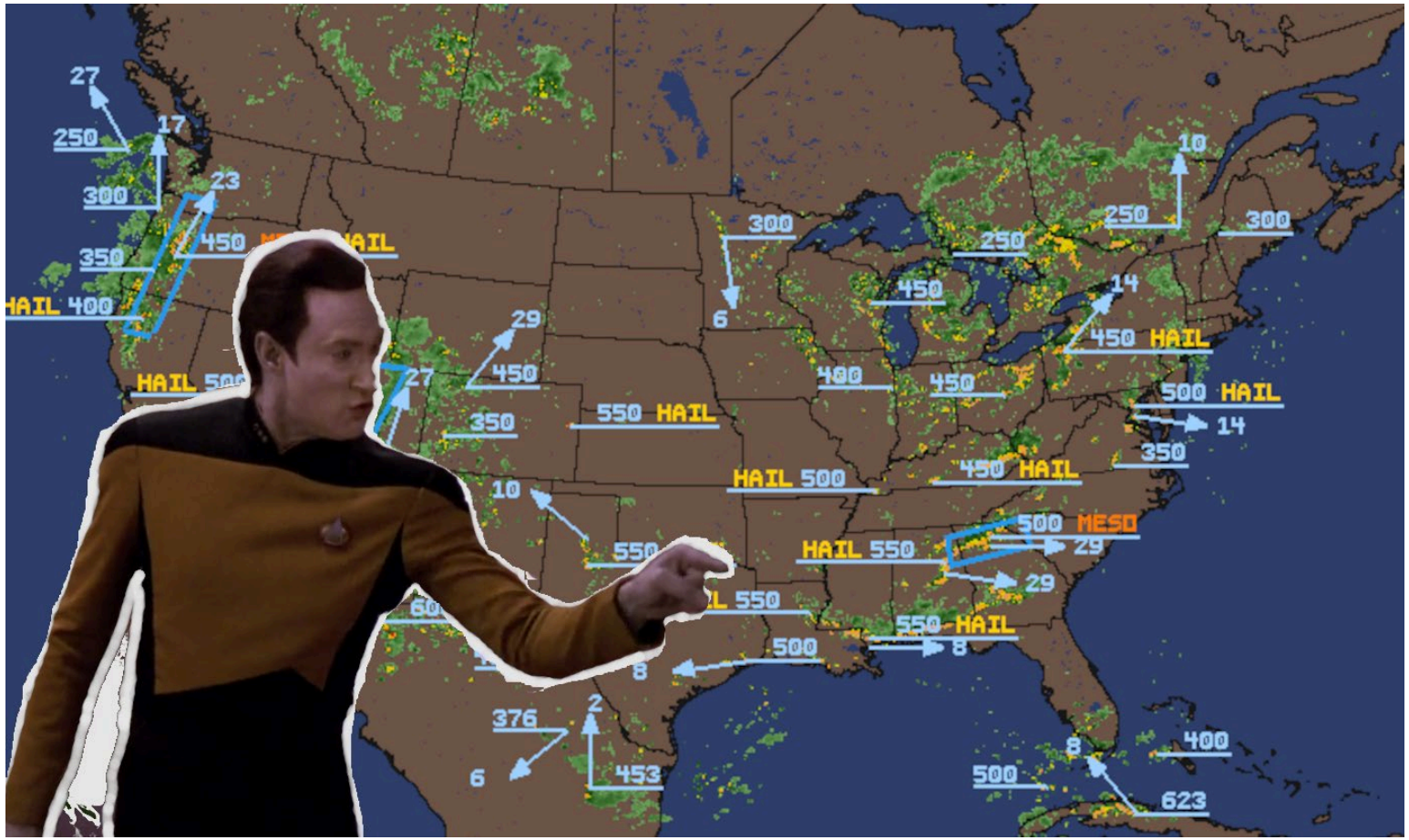
A look into weather data storage and use.

https://www.weathersigma.com



https://www.weather-reporter.com

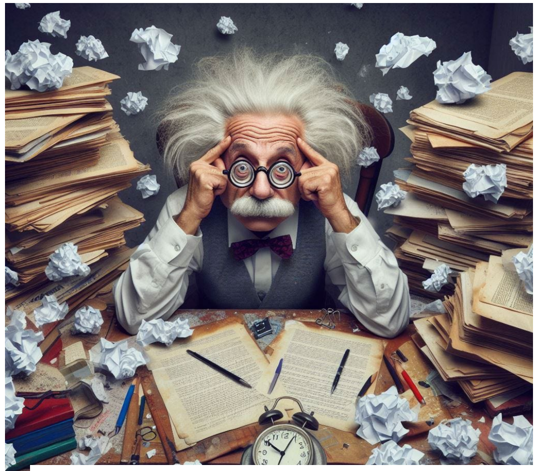
Weather Data



Where does it come from?

How is it used?

Historical Data



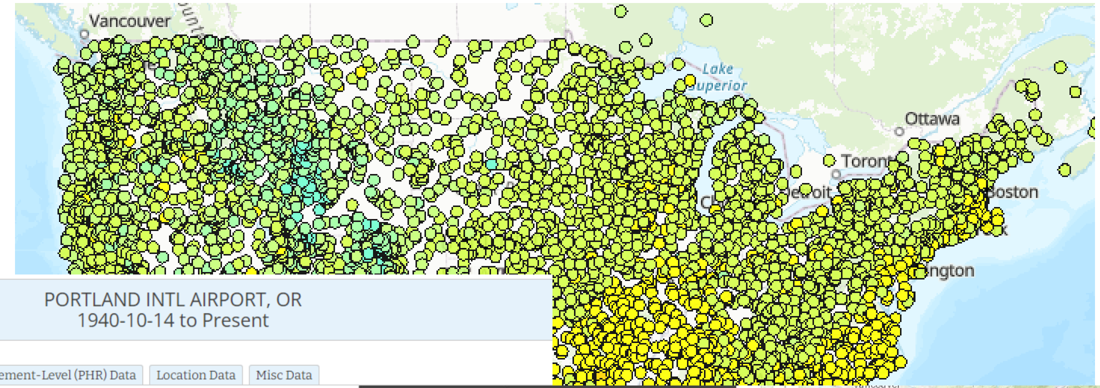
```
000
CXUS56 KPQR 211201
CF6PDX
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                              STATION:    PORTLAND OR
                              MONTH:      AUGUST
                              YEAR:       2024
                              LATITUDE:    45 35 N
                              LONGITUDE:  122 36 W

 TEMPERATURE IN F:          :PCPN:    SNOW:  WIND          :SUNSHINE:
================================================================
1   2   3   4   5  6A  6B    7    8    9   10  11  12  13    14  1
                                       12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S
================================================================

 1  99  66  83  11   0  18 0.00  0.0    0  5.3 12 280   M    M
 2  91  69  80   8   0  15 0.00  0.0    0  5.0 13 280   M    M
 3  86  63  75   3   0  10 0.00  0.0    0  4.6 13 290   M    M
 4  93  60  77   5   0  12 0.00  0.0    0  5.6 13 290   M    M
 5  87  60  74   2   0   9 0.00  0.0    0  6.6 13 350   M    M
 6  79  58  69  -3   0   4 0.00  0.0    0  6.7 14 320   M    M
 7  88  59  74   2   0   9 0.00  0.0    0  7.8 15 310   M    M
 8  96  65  81   9   0  16 0.00  0.0    0  4.9 13 320   M    M
 9  85  65  75   4   0  10 0.00  0.0    M  3.5 12 300   M    M
10  88  62  75   4   0  10 0.00  0.0    M  5.4 12 310   M    M
11  83  62  73   2   0   8 0.00  0.0    M  7.7 16 310   M    M
12  73  60  67  -4   0   2 0.00  0.0    M  4.1 15 320   M    M
13  73  63  68  -3   0   3 0.00  0.0    M  3.8 12 230   M    M
14  80  63  72   1   0   7 0.00  0.0    0  4.5 12 320   M    M
15  79  64  72   1   0   7 0.00  0.0    0  4.2 10 330   M    M
16  81  59  70  -1   0   5
17  84  60  72   1   0   7
18  80  61  71   1   0   6
19  80  58  69  -1   0   4
20  80  60  70   0   0   5
================================
SM 1685 1237           0 167
================================
AV 84.3 61.9

================================
NOTES:
# LAST OF SEVERAL OCCURRENC

COLUMN 17 PEAK WIND IN M.P.

PRELIMINARY LOCAL CLIMATOLO

[TEMPERATURE DATA]          [PR

AVERAGE MONTHLY:  73.1      TOT
DPTR FM NORMAL:    1.8      DPT
HIGHEST:     99 ON  1       GRT
```

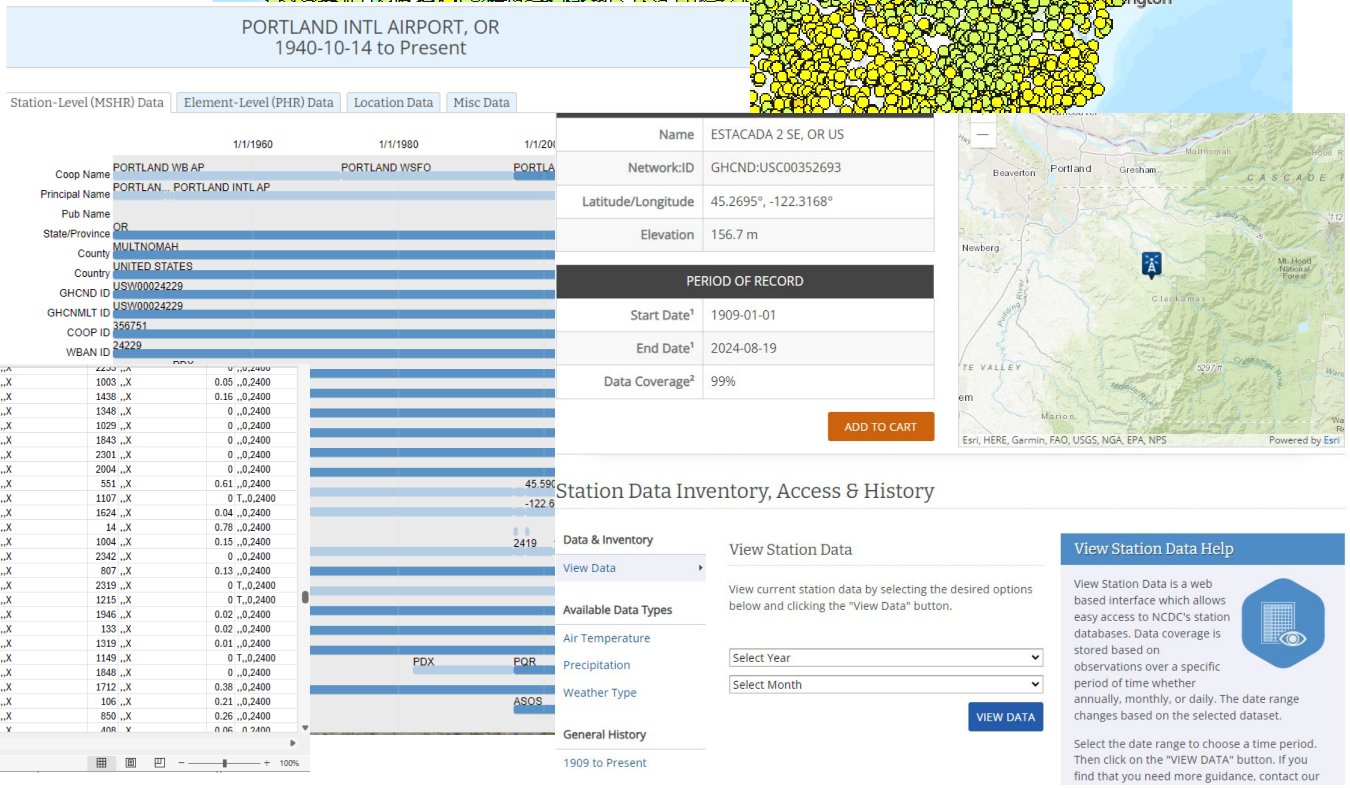
```
000
CDUS46 KPQR 211141
CLIPDX

CLIMATE REPORT
NATIONAL WEATHER SERVICE PORTLAND OREGON
441 AM PDT WED AUG 21 2024

...................................

...THE PORTLAND OR CLIMATE SUMMARY FOR AUGUST 20 2024...

CLIMATE NORMAL PERIOD 1991 TO 2020
CLIMATE RECORD PERIOD 1940 TO 2024

WEATHER ITEM   OBSERVED TIME   RECORD YEAR NORMAL DEPARTURE LAST
                VALUE   (LST)  VALUE       VALUE  FROM      YEAR
                                                  NORMAL
..................................................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         80    353 PM 100    2016  82     -2        88
  MINIMUM         60    549 AM  46    1947  59      1        60
                                      1959
  AVERAGE         70                        70      0        74

PRECIPITATION (IN)
  YESTERDAY        0.00          0.55 1997   0.02  -0.02      0.00
  MONTH TO DATE    0.30                      0.29   0.01      0.01
  SINCE OCT 1     38.86                     35.15   3.71     33.51
  SINCE JAN 1     22.37                     20.51   1.86     17.40

SNOWFALL (IN)
  YESTERDAY        0.0           0.0  2022
  MONTH TO DATE    0.0
  SINCE JUL 1      0.0

DEGREE DAYS
 HEATING
  YESTERDAY        0                          0      0         0
  MONTH TO DATE    0                          0      0         0
  SINCE JUN 1     45                         90    -45        45
  SINCE JUL 1      0                         10    -10         0

 COOLING
  YESTERDAY        5                          6     -1         9
  MONTH TO DATE  167                        129     38       246
  SINCE JUN 1    552                        356    196       611
  SINCE JAN 1    575                        379    196       710
..................................................................

WIND (MPH)
  HIGHEST WIND SPEED     16   HIGHEST WIND DIRECTION      NW (320)
  HIGHEST GUST SPEED     22   HIGHEST GUST DIRECTION      NW (320)
```

20241	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/11/1991	100 ,,X	100 ,,X	8.95 ,,X	950 ,,X	1003 ,,X	0.05 ,,0,2400
20242	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/12/1991	80 ,,X	80 ,,X	14.54 ,,X	150 ,,X	1438 ,,X	0.16 ,,0,2400
20243	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/13/1991	70 ,,X	90 ,,X	5.14 ,,X	1450 ,,X	1348 ,,X	0 ,,0,2400
20244	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/14/1991	50 ,,X	50 ,,X	3.13 ,,X	950 ,,X	1029 ,,X	0 ,,0,2400
20245	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/15/1991	70 ,,X	90 ,,X	2.91 ,,X	50 ,,X	1843 ,,X	0 ,,0,2400
20246	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/16/1991	60 ,,X	80 ,,X	4.92 ,,X	2350 ,,X	2301 ,,X	0 ,,0,2400
20247	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/17/1991	90 ,,X	100 ,,X	12.75 ,,X	1950 ,,X	2004 ,,X	0 ,,0,2400
20248	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/18/1991	100 ,,X	100 ,,X	8.72 ,,X	250 ,,X	551 ,,X	0.61 ,,0,2400
20249	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/19/1991	70 ,,X	80 ,,X	5.59 ,,X	1153 ,,X	1107 ,,X	0 T,,0,2400
20250	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/20/1991	80 ,,X	90 ,,X	10.29 ,,X	1850 ,,X	1624 ,,X	0.04 ,,0,2400
20251	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/21/1991	100 ,,X	100 ,,X	8.05 ,,X	50 ,,X	14 ,,X	0.78 ,,0,2400
20252	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/22/1991	100 ,,X	100 ,,X	4.92 ,,X	1353 ,,X	1004 ,,X	0.15 ,,0,2400
20253	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/23/1991	100 ,,X	100 ,,X	9.4 ,,X	2350 ,,X	2342 ,,X	0 ,,0,2400
20254	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/24/1991	100 ,,X	100 ,,X	8.28 ,,X	23 ,,X	807 ,,X	0.13 ,,0,2400
20255	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/25/1991	100 ,,X	100 ,,X	12.75 ,,X	2350 ,,X	2319 ,,X	0 T,,0,2400
20256	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/26/1991	100 ,,X	100 ,,X	9.17 ,,X	1650 ,,X	1215 ,,X	0 T,,0,2400
20257	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/27/1991	100 ,,X	100 ,,X	10.07 ,,X	1950 ,,X	1946 ,,X	0.02 ,,0,2400
20258	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/28/1991	100 ,,X	100 ,,X	6.71 ,,X	2350 ,,X	133 ,,X	0.02 ,,0,2400
20259	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/29/1991	100 ,,X	100 ,,X	6.93 ,,X	1550 ,,X	1319 ,,X	0.01 ,,0,2400
20260	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/30/1991	100 ,,X	80 ,,X	8.05 ,,X	1150 ,,X	1149 ,,X	0 T,,0,2400
20261	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	12/31/1991	50 ,,X	60 ,,X	6.49 ,,X	1850 ,,X	1848 ,,X	0 ,,0,2400
20262	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	1/1/1992	100 ,,X	100 ,,X	10.07 ,,X	2250 ,,X	1712 ,,X	0.38 ,,0,2400
20263	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	1/2/1992	90 ,,X	70 ,,X	6.71 ,,X	50 ,,X	106 ,,X	0.21 ,,0,2400
20264	USW00024229	PORTLAND INTERNATIONAL AIRPORT, OR US	45.5958	-122.6093	5.8	1/3/1992	100 ,,X	100 ,,X	13.42 ,,X	1750 ,,X	850 ,,X	0.26 ,,0,2400

OR-PDX-USW00024229

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION





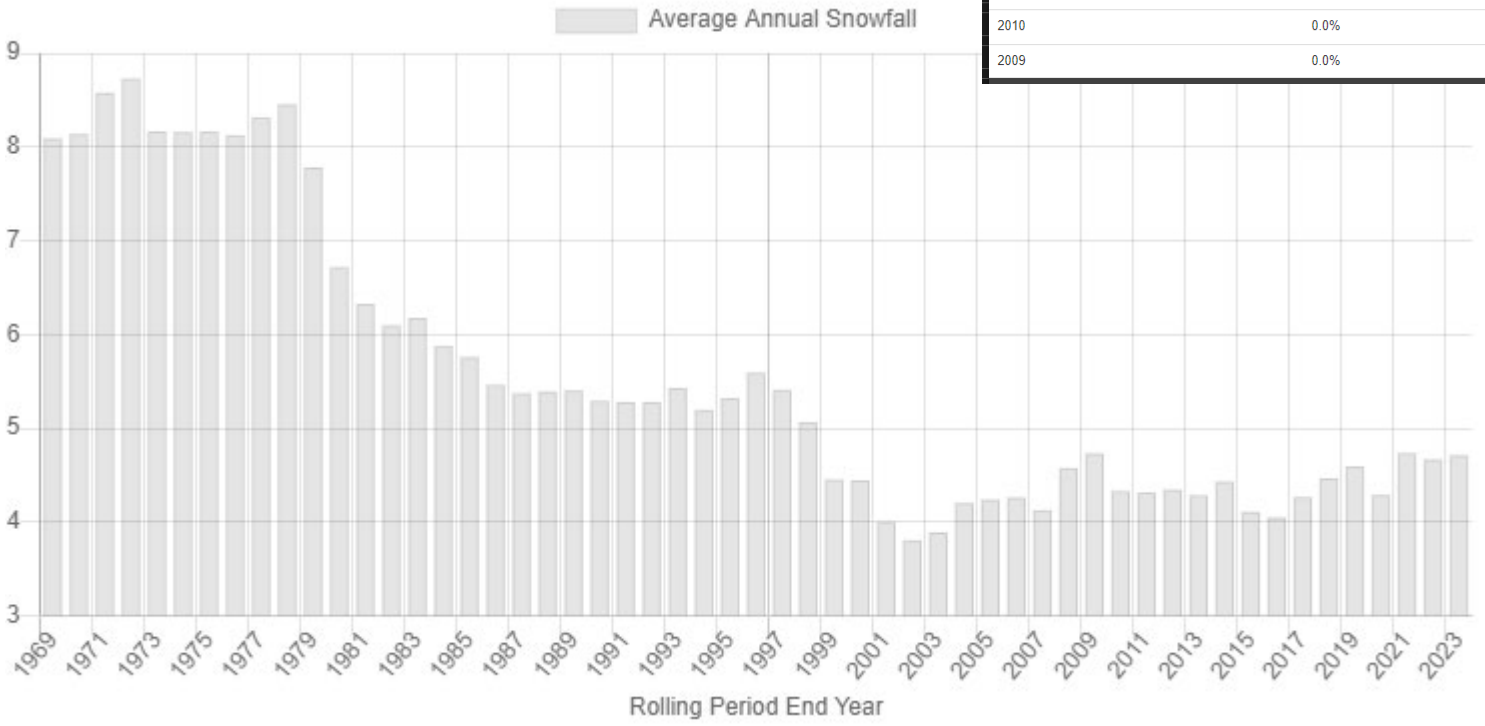
Data Accuracy / Uses

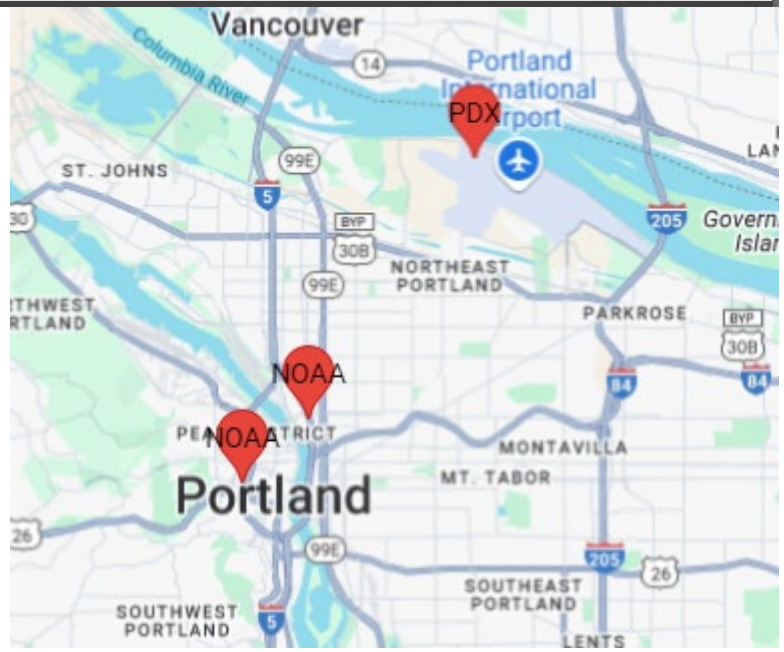
Data Sources and Completeness for Salem, OR (McNary Field Airport) [SLE]

The NCDC data is used in 44,828 days of data. The earliest date used from this data set is Dec 1, 1892. The latest date used from this data set is Feb 29, 2016.

The data for this station is 98.8% complete, 99.6% of the daily records are available, of which 99.1% of that data is complete.

Year	Missing Days %	Missing Highs %	Missing Lows %	Missing Precip %	Missing Snowfall %
2024	0.0%	0.0%	0.0%	0.0%	98.4%
2023	0.0%	0.0%	0.0%	0.0%	100.0%
2022	0.0%	0.0%	0.0%	0.0%	100.0%
2021	0.0%	0.0%	0.0%	0.0%	100.0%
2020	0.0%	0.0%	0.0%	0.0%	100.0%
2019	0.0%	0.0%	0.0%	0.0%	99.2%
2018	0.0%	0.0%	0.0%	0.0%	58.4%
2017	0.0%	0.0%	0.0%	0.0%	40.5%
2016	0.0%	0.0%	0.0%	0.0%	28.1%
2015	0.0%	0.0%	0.0%	0.0%	100.0%
2014	0.0%	0.0%	0.0%	0.0%	100.0%
2013	0.0%	0.0%	0.0%	0.0%	91.5%
2012	0.0%	0.0%	0.0%	0.0%	100.0%
2011	0.0%	0.0%	0.0%	0.0%	100.0%
2010	0.0%	0.0%	0.0%	0.0%	100.0%
2009	0.0%	0.0%	0.0%	0.0%	100.0%





Processing Historical Data

To view a report simply check the one you want to see and click on Generate Report. Some reports may also require other data which will display when you select the report.

Select Report to View:

- Last 8 Weeks Report
- On This Day Report
- Single Year Report
- Growing Degree Days
- Daily Records
- Monthly Records
- Daily Records History
- Monthly Records History
- All-time Records History
- 30 Year Weekly Averages
- 30 Year Daily Averages
- 30 Year Monthly Averages
- Annual Summaries Report
- Annual Frequencies Report
- Monthly Summaries Report
- Monthly Frequencies Report
- Monthly Departures Report
- Moving Averages Report
- Compare Past Years Report
- Consecutive Days Report

Generate Report

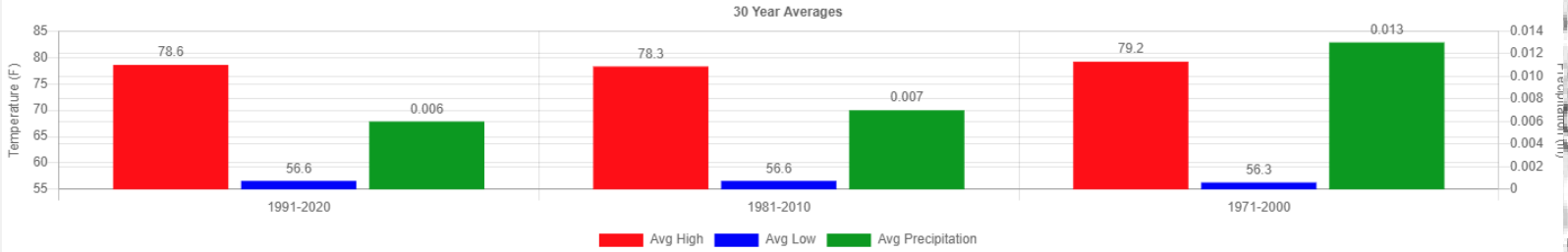
Image Shares

This station has **30,927** daily observations. Dated from **January 1, 1940** until **September 2, 2024**.

The data for this station is **100.0%** complete, 100.0% of the daily records are available, of which 100.0% of that data is complete.

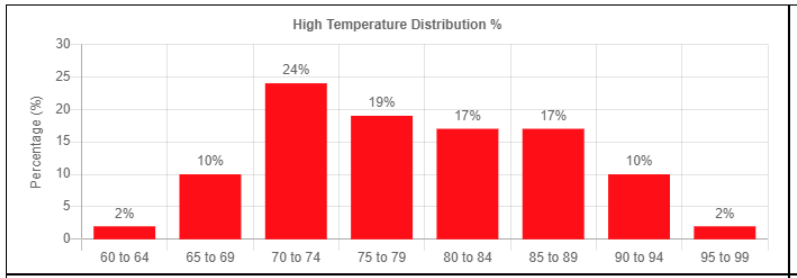
Sources & Detailed Completeness

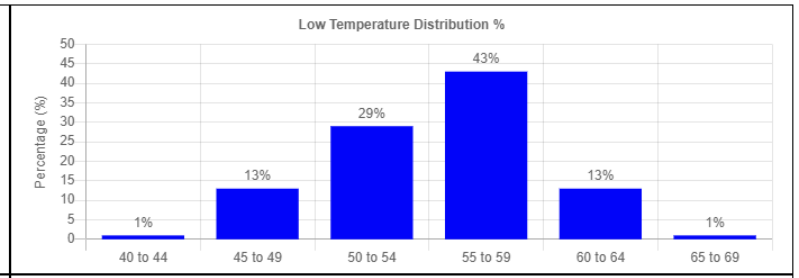
Today (September 4) in Weather History for Portland, Oregon



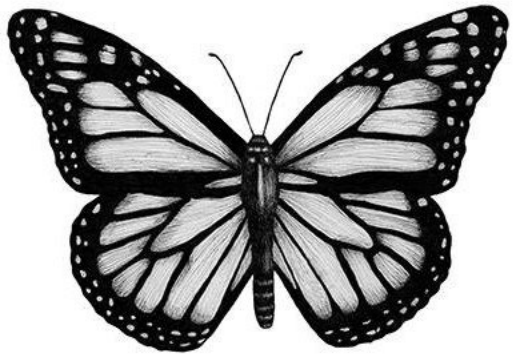
Records For This Day:

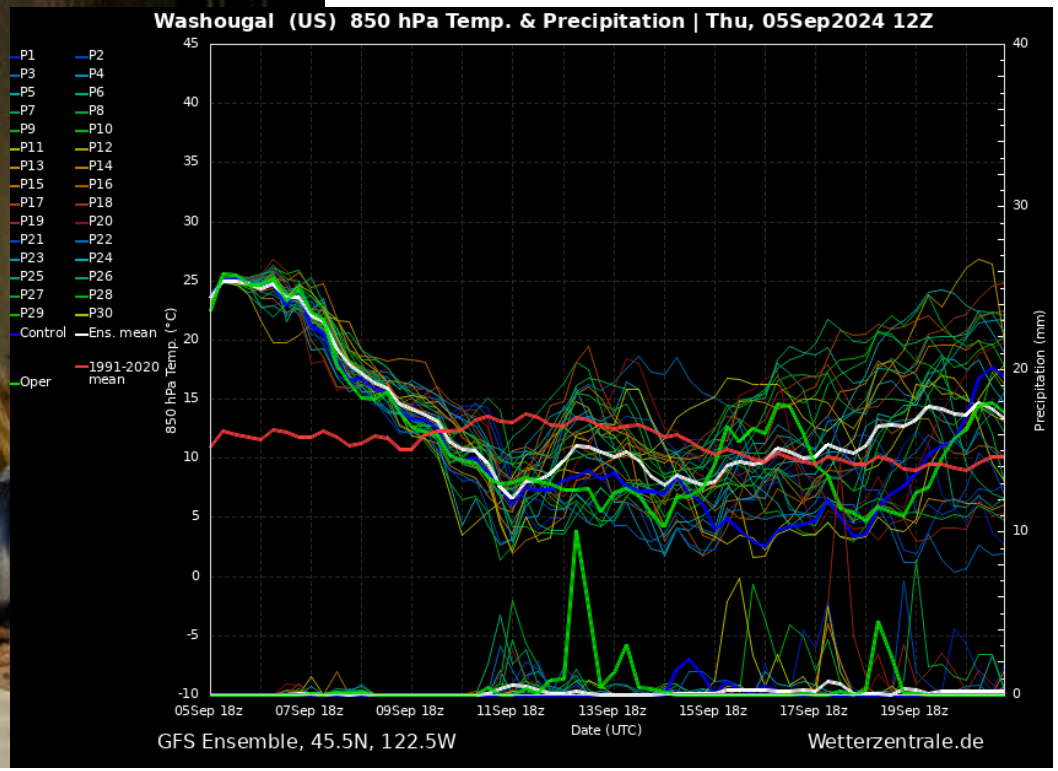
Max High: 98° recorded in 1955
Min High: 62° recorded in 1978, 1959
Max Low: 65° recorded in 2019
Min Low: 43° recorded in 1956
Max Precip: 1.00" recorded in 1959



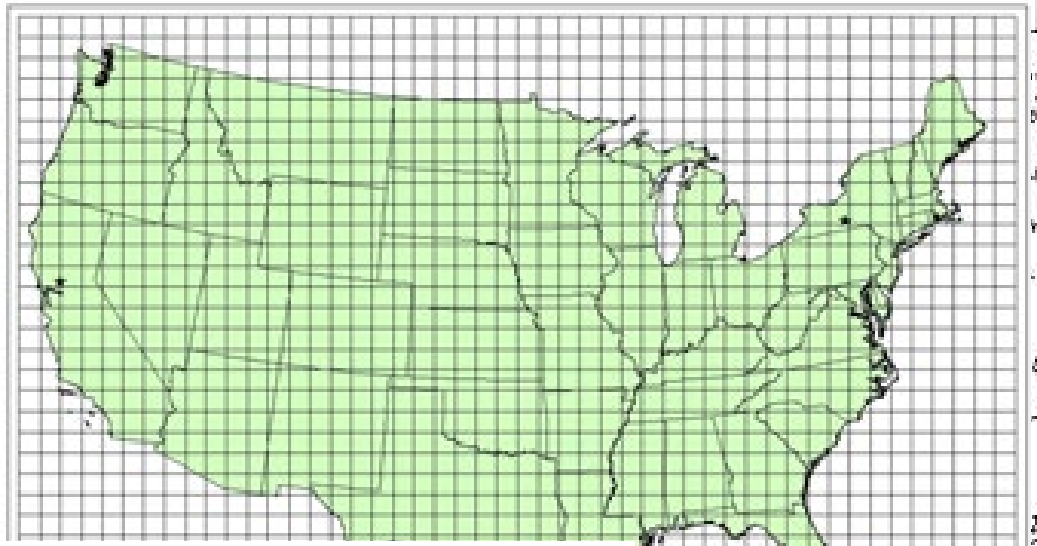


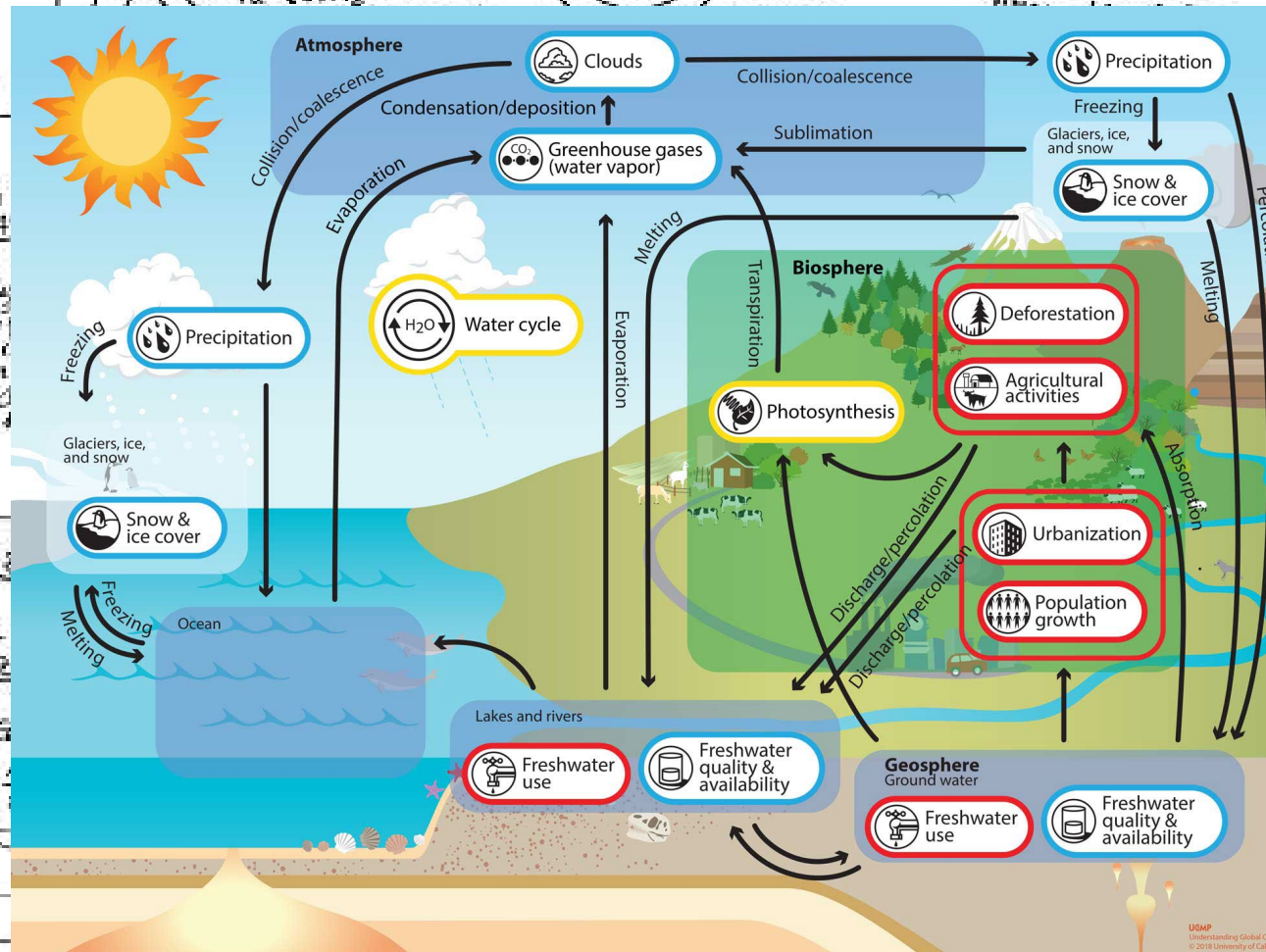
Weather Models





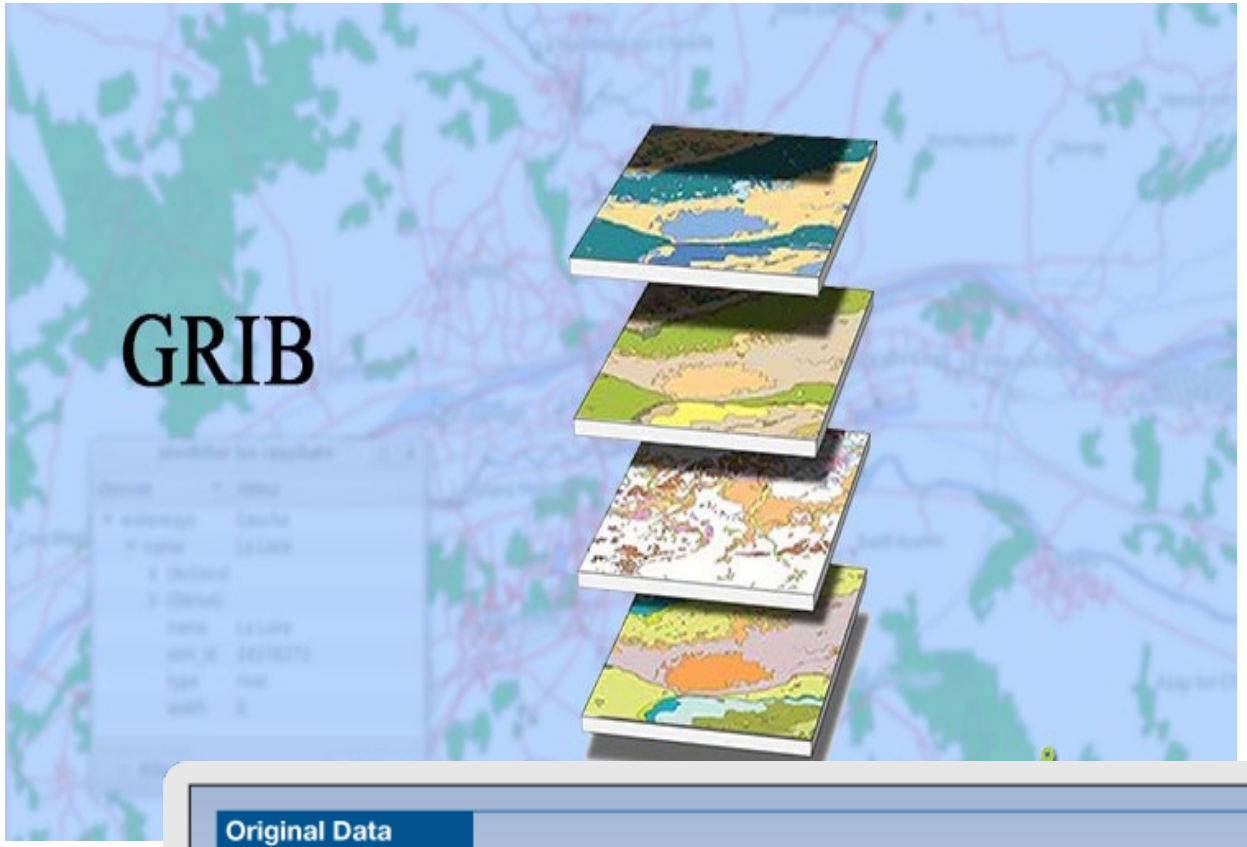
Model Mathemagics

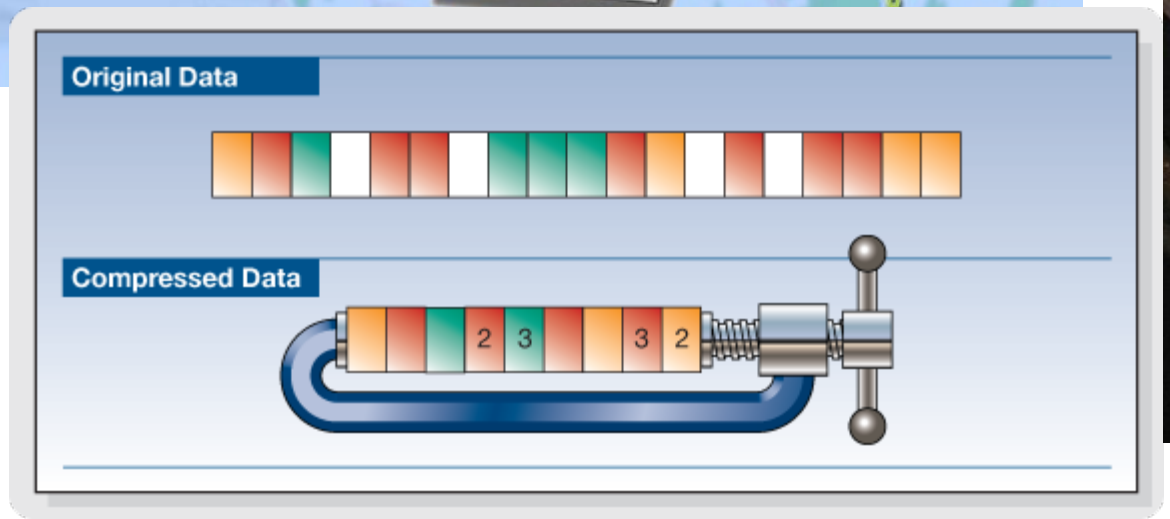




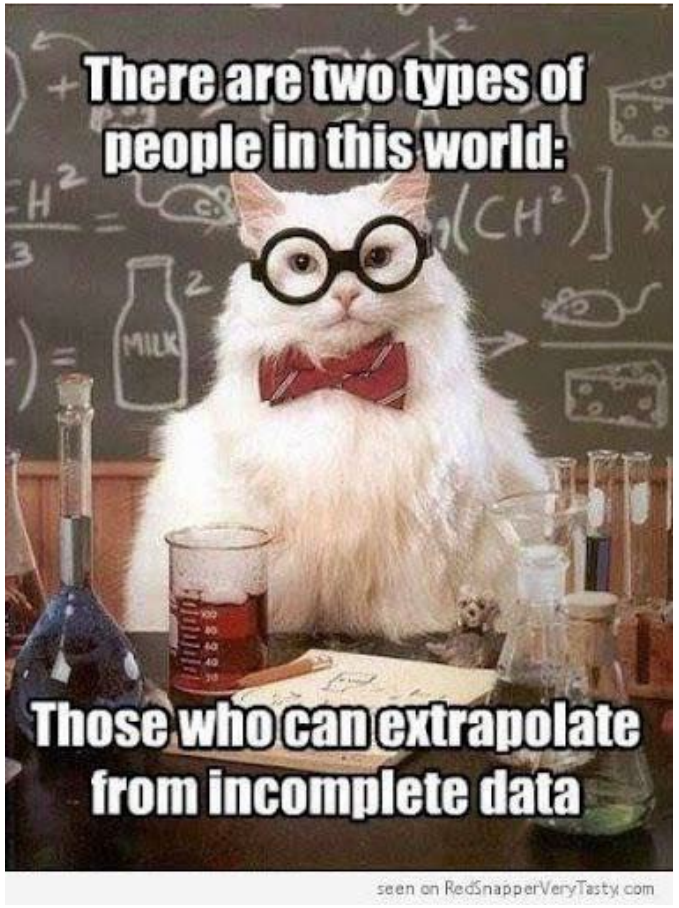
GRIB Files

Glowing Radioactive Iridescent Babies

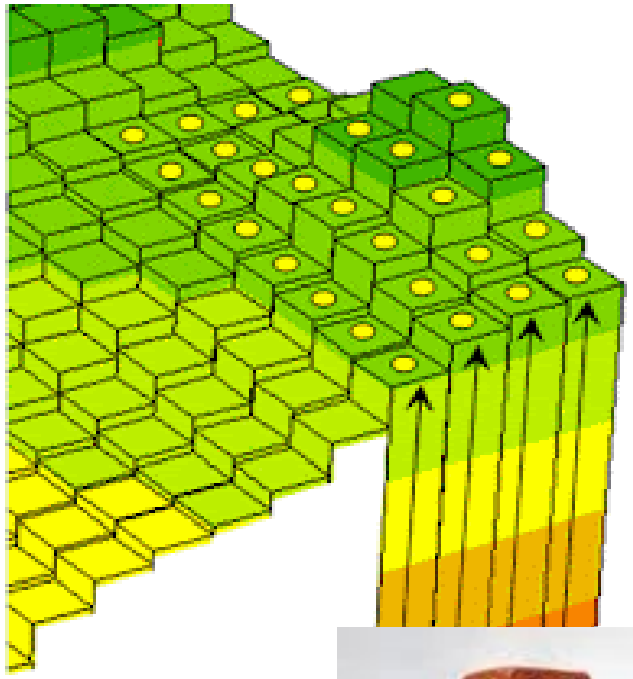




Map ‘Drawing’



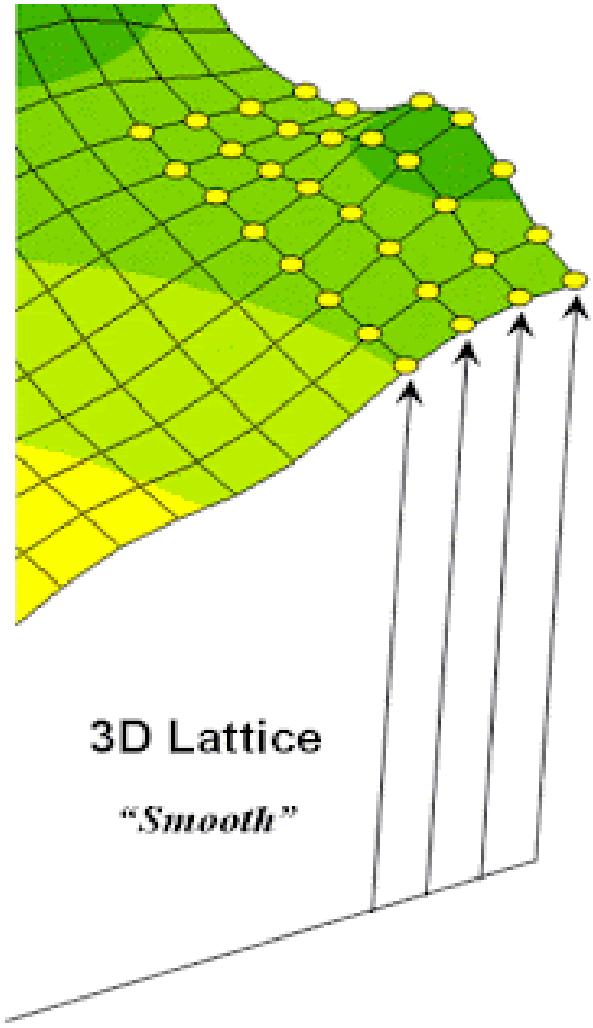
*…**3D Grid** display pushes each cell up to the level of the stored value*



3D Grid

“Blocky”

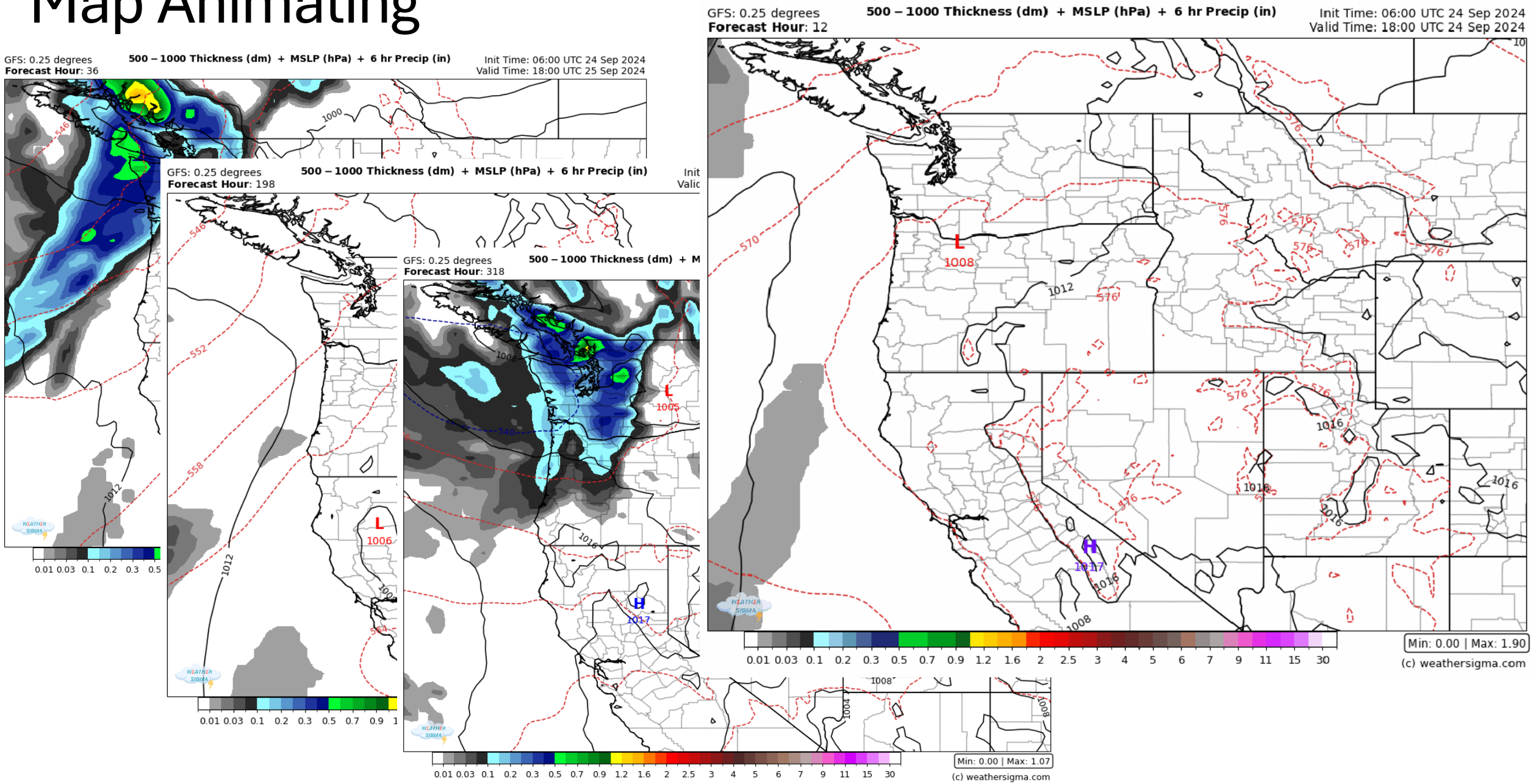
*…**3D Lattice** display pushes the nodes of the wireframe up to the value*



3D Lattice

“Smooth”

Map Animating



Thank You