

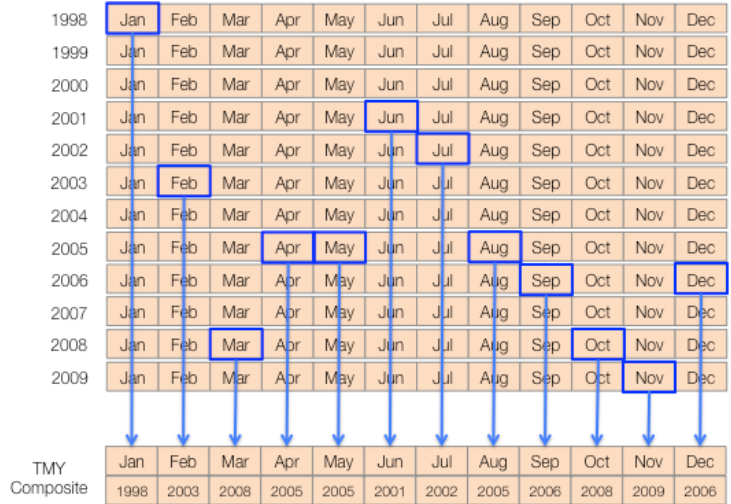
Typical Meteorological Year – a Primer

What is a Typical Meteorological Year

“TMY” weather files are designed to represent a “Typical Year” of weather at a particular location. This is done by looking at a multiple-year history and selecting the most typical data for each month.

How TMY Files are Constructed

Weather stations collect hourly weather data over multiple years (up to 30 years, depending on the source). Certain years may experience extraordinary weather conditions like El Nino. To counter this effect, TMY files select the most representative year for each month, based on sunlight and temperature. The weather file is then constructed of the most representative months throughout those years. For example, you may have January from 1998 and February from 2003 because those specific data were most representative of the “typical” January and February for that location.



What TMY Files Look Like

TMY files represent a full year of hourly data, so there are 8760 rows (365 days x 24 hours). The timestamp (column B of the HelioScope CSV output) will show the specific day/year of each reading – and because of how TMY files are constructed, the year will often jump from one month to the next (as can be seen in rows 745-746 below):

735	734	1/31/98 13:00	613	933	90	10.91	1.19	0
736	735	1/31/98 14:00	479	932	49	10.85	1.19	0
737	736	1/31/98 15:00	311	845	42	10.79	1.52	0
738	737	1/31/98 16:00	97	282	56	10.73	1.52	0
739	738	1/31/98 17:00	2	35	1	10.49	1.52	0
740	739	1/31/98 18:00	0	0	0	10.26	3.05	0
741	740	1/31/98 19:00	0	0	0	10.02	3.05	0
742	741	1/31/98 20:00	0	0	0	9.71	3.05	0
743	742	1/31/98 21:00	0	0	0	11.21	4.02	0
744	743	1/31/98 22:00	0	0	0	12.22	4.5	0
745	744	1/31/98 23:00	0	0	0	13.22	4.97	0
746	745	2/1/03 0:00	0	0	0	14.22	5.44	0
747	746	2/1/03 1:00	0	0	0	15.22	5.91	0
748	747	2/1/03 2:00	0	0	0	16.23	6.39	0
749	748	2/1/03 3:00	0	0	0	16.73	6.36	0
750	749	2/1/03 4:00	0	0	0	16.35	6.36	0
751	750	2/1/03 5:00	0	0	0	15.98	6.36	0
752	751	2/1/03 6:00	1	39	0	15.62	8.57	0
753	752	2/1/03 7:00	105	470	45	15.25	8.57	0
754	753	2/1/03 8:00	260	541	95	16.52	8.57	0
755	754	2/1/03 9:00	343	334	192	17.79	6.47	0
756	755	2/1/03 10:00	462	465	204	19.05	6.47	0
757	756	2/1/03 11:00	514	452	238	20.5	6.47	0
758	757	2/1/03 12:00	576	646	179	21.95	7.9	0
759	758	2/1/03 13:00	496	589	164	23.4	7.9	0
760	759	2/1/03 14:00	391	566	128	22.95	7.9	0
761	760	2/1/03 15:00	231	421	96	22.5	12.76	0

Further Reading

For a more in-depth understanding of the TMY3 methodology, see NREL’s TMY3 Handbook:

<http://www.nrel.gov/docs/fy08osti/43156.pdf>

For a high-level discussion of weather calculations, see HelioScope Modeling 101: <http://www.folsomlabs.com/modeling/>

For a detailed documentation of the weather and irradiance calculations in HelioScope, see the Mathematical Formulation:

<https://helioscope.folsomlabs.com/documentation/mathematical-formulation>