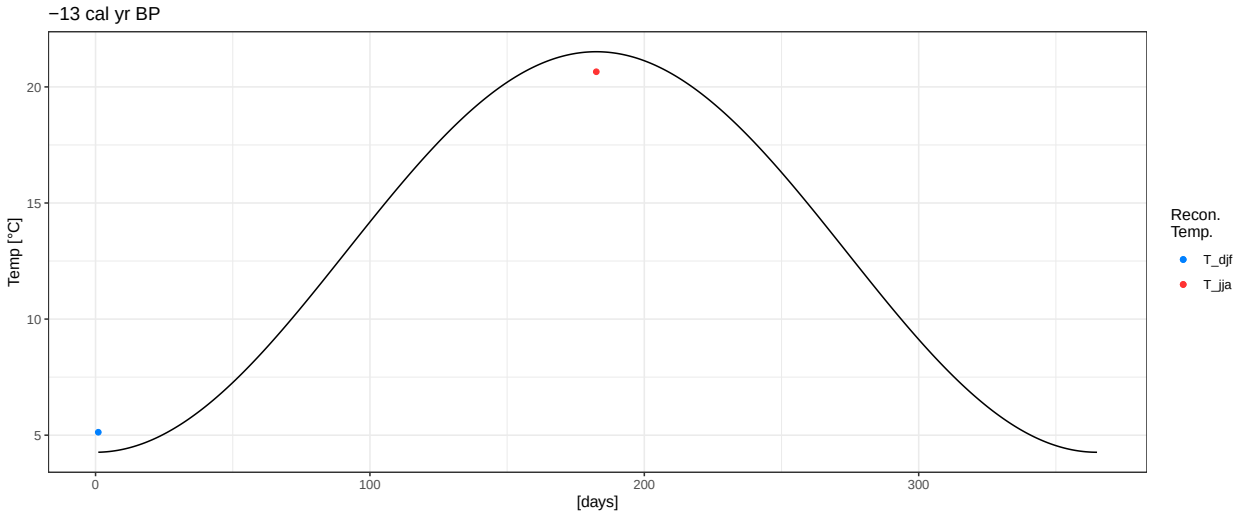
Padul Data: MI and Precip. corrections

New corrections

Calculate temperature anomalies

Using both T_{djf} and T_{jja} for each record, a sinusoidal curve was fitted using the `int_sin` function.

```
padul <- padul %>%
  dplyr::mutate(Tmean = (T_jja + T_djf) / 2,
                Tmax = Tmean + (T_jja - Tmean) / 0.9,
                Tmin = Tmean + (T_djf - Tmean) / 0.9)
```



Rows 5:9 were used as the baseline to calculate the temperature anomalies.

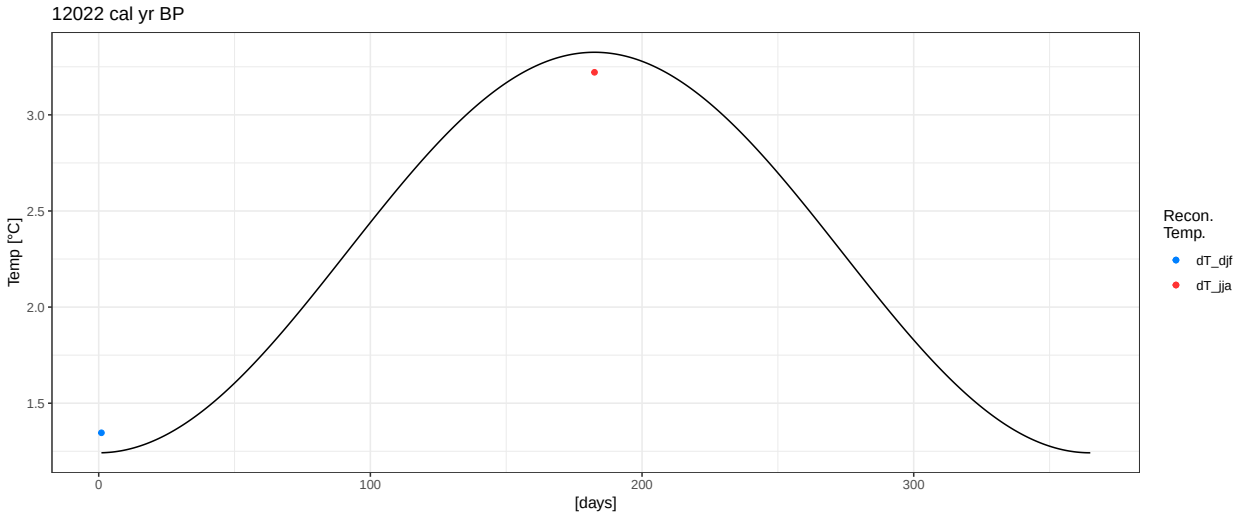
Age (cal yr BP)	MI	P_ann	T_djf	T_jja	Tmean	Tmax	Tmin
-38	0.5280490	553.3840	4.408130	19.99960	12.20387	20.86579	3.541937
-31	0.5228800	521.3800	3.954800	19.80480	11.87980	20.68536	3.074244
-25	0.5628840	576.7990	3.768040	19.22330	11.49567	20.08193	2.909414
-19	0.4382330	494.1200	5.015460	20.03580	12.52563	20.87026	4.180997
-13	0.4683820	539.3250	5.126590	20.65280	12.88969	21.51537	4.264023
	0.5040856	537.0016	4.454604	19.94326	12.19893	20.80374	3.594123

where

$$T_{\text{mean}} = (T_{\text{jja}} + T_{\text{djf}})/2$$
$$T_{\text{max}} = T_{\text{mean}} + (T_{\text{jja}} - T_{\text{mean}})/0.9$$
$$T_{\text{min}} = T_{\text{mean}} + (T_{\text{djf}} - T_{\text{mean}})/0.9$$

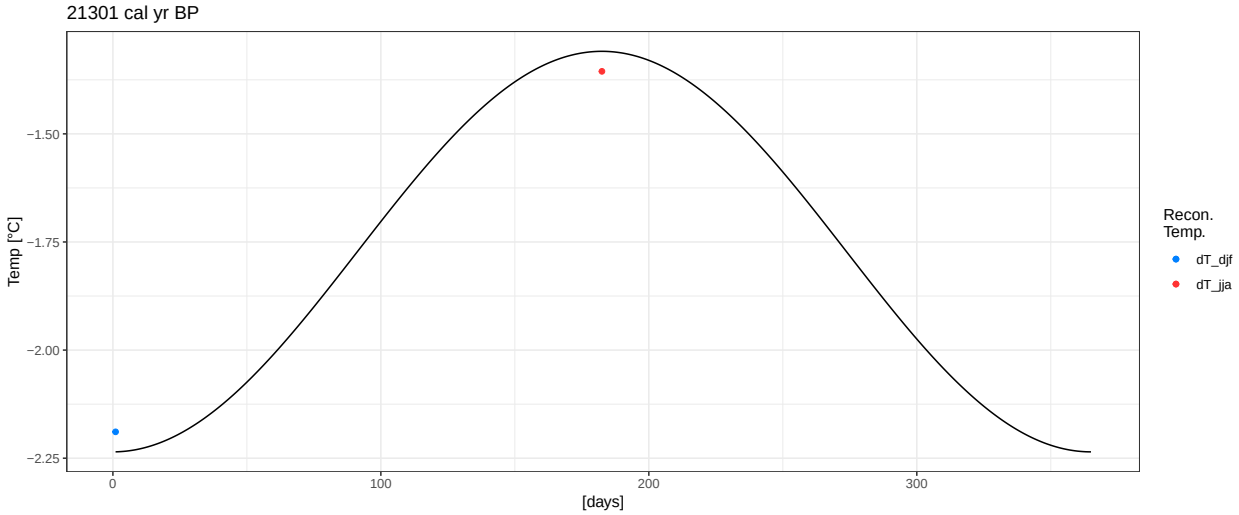
Padul: Anomaly for age = 12022 cal yr BP

Age (cal yr BP)	MI	P_ann	T_djf	T_jja	Tmean	Tmax	Tmin
	0.5040856	537.0016	4.454604	19.94326	12.198932	20.803741	3.594123
12022	0.4653760	479.2590	5.800750	23.16460	14.482675	24.129258	4.836092
			1.346146	3.22134	2.283743	3.325517	1.241969



Padul: Anomaly for age = 21301 cal yr BP

Age (cal yr BP)	MI	P_ann	T_djf	T_jja	Tmean	Tmax	Tmin
	0.5040856	537.0016	4.454604	19.94326	12.198932	20.803741	3.594123
21301	0.4304040	500.9450	2.265590	18.58780	10.426695	19.494589	1.358801
			-2.189014	-1.35546	-1.772237	-1.309151	-2.235323



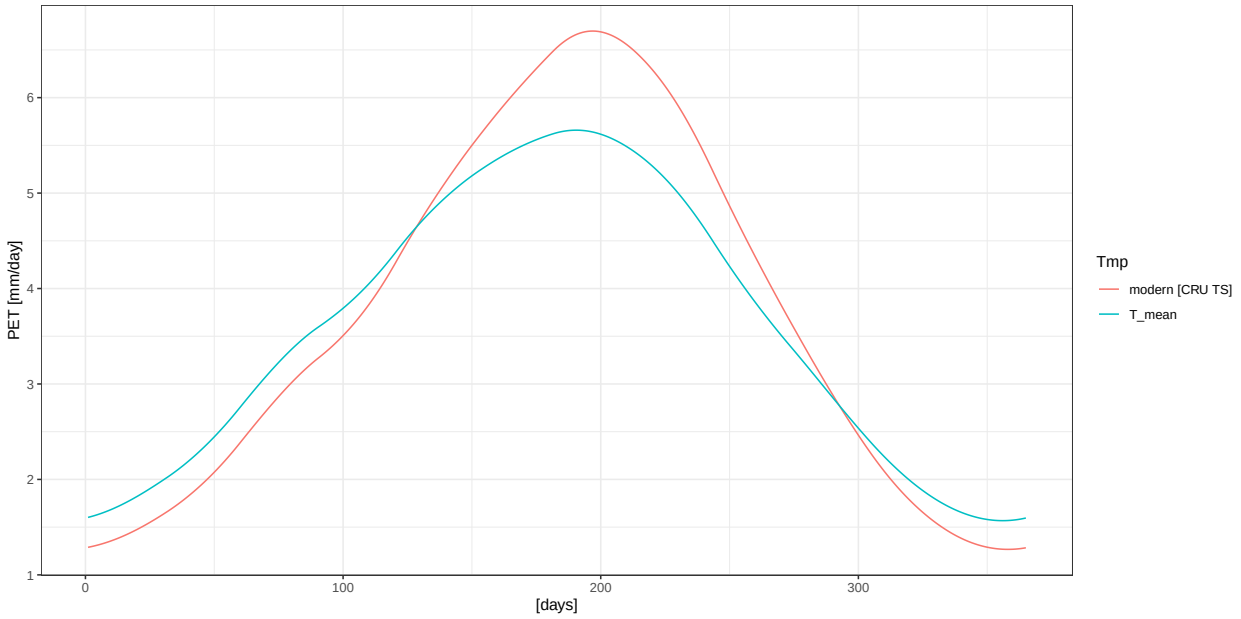
Calculate potential evapotranspiration (PET)

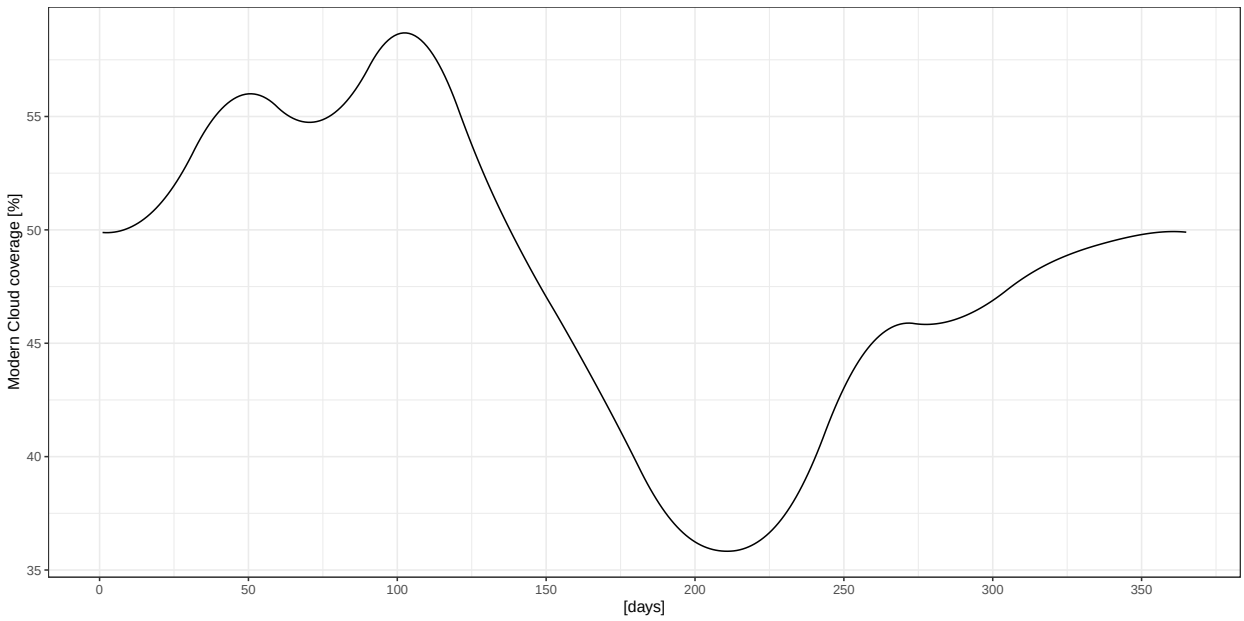
Padul location: 37.0108, -3.6039

Padul PET: Anomaly for age = 12022 cal yr BP

Params (`splash::calc_daily_evap`)

- Latitude: `37.0108`
- Elevation: 959
- Year: `1961`
- Sunshine fraction: [`CRU TS 4.04`]
- Temperature: $T_{\text{mean, i}}$ (14.482675) $+T_{\text{anomalies, i, day}}$





		[(T_djf + T_jja) / 2]		CRU TS 4.04	
day	sunshine fraction	Temp	PET	Temp	PET
1	0.5011582	15.72480	1.602247	7.977845	1.288733
2	0.5012256	15.72526	1.609329	7.972633	1.294312
3	0.5012185	15.72603	1.616948	7.968882	1.300383
4	0.5011370	15.72711	1.625099	7.966609	1.306945
5	0.5009810	15.72850	1.633779	7.965835	1.313994
100	0.4137719	16.92274	3.793212	13.546682	3.506774
101	0.4133551	16.94045	3.816267	13.643306	3.535225
102	0.4131502	16.95810	3.839862	13.743000	3.564514
103	0.4131574	16.97570	3.864009	13.845795	3.594663
104	0.4133770	16.99324	3.888722	13.951721	3.625692
105	0.4138090	17.01071	3.914009	14.060807	3.657622
200	0.6376062	17.76128	5.616716	27.702727	6.689089
201	0.6383766	17.75581	5.607496	27.743351	6.682886
202	0.6390596	17.75005	5.597420	27.777315	6.675047
203	0.6396579	17.74400	5.586504	27.804740	6.665604
204	0.6401744	17.73765	5.574764	27.825746	6.654593
205	0.6406121	17.73102	5.562219	27.840452	6.642046
300	0.5311425	16.31153	2.536467	15.072804	2.463255
301	0.5302380	16.29546	2.505293	14.890257	2.423060
302	0.5293001	16.27954	2.474369	14.708263	2.383330
303	0.5283288	16.26375	2.443708	14.526896	2.344081
304	0.5273243	16.24812	2.413327	14.346246	2.305331
305	0.5262870	16.23264	2.383237	14.166416	2.267097

Calculate corrected Precipitation

$$\text{corrected } P_{ann} = MI \times PET_{ann}$$

age_calBP	past_temp	past_co2	modern_co2	present_t	recon_mi	corrected_mi	corrected_P_ann
-13	12.88969	318.84	332.1725	12.88969	0.468382	0.4895393	456.9169
12022	14.48268	248.13	332.1725	14.48268	0.465376	0.6389500	548.4560
18402	11.03844	188.34	332.1725	11.03844	0.502894	0.8642041	505.4448