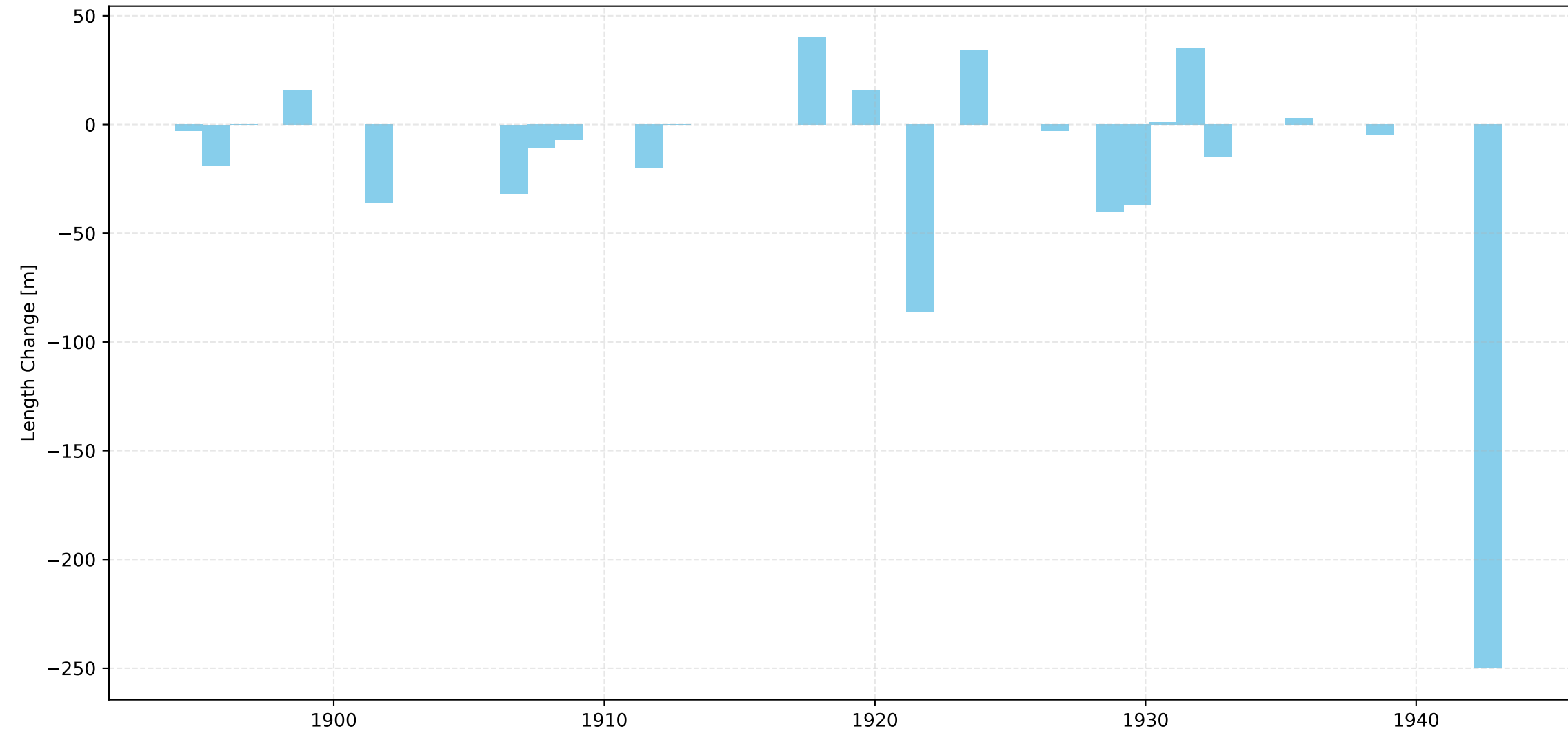
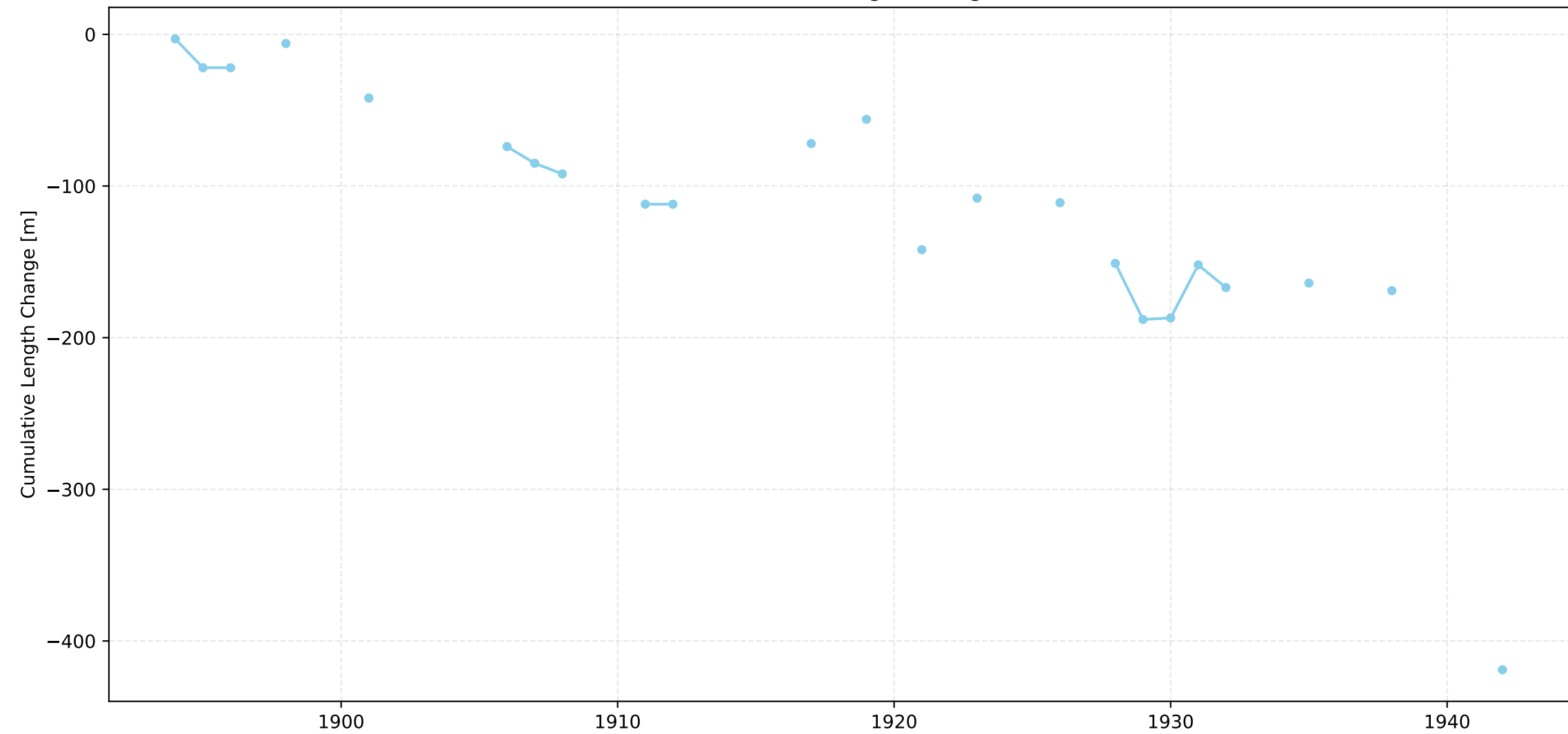


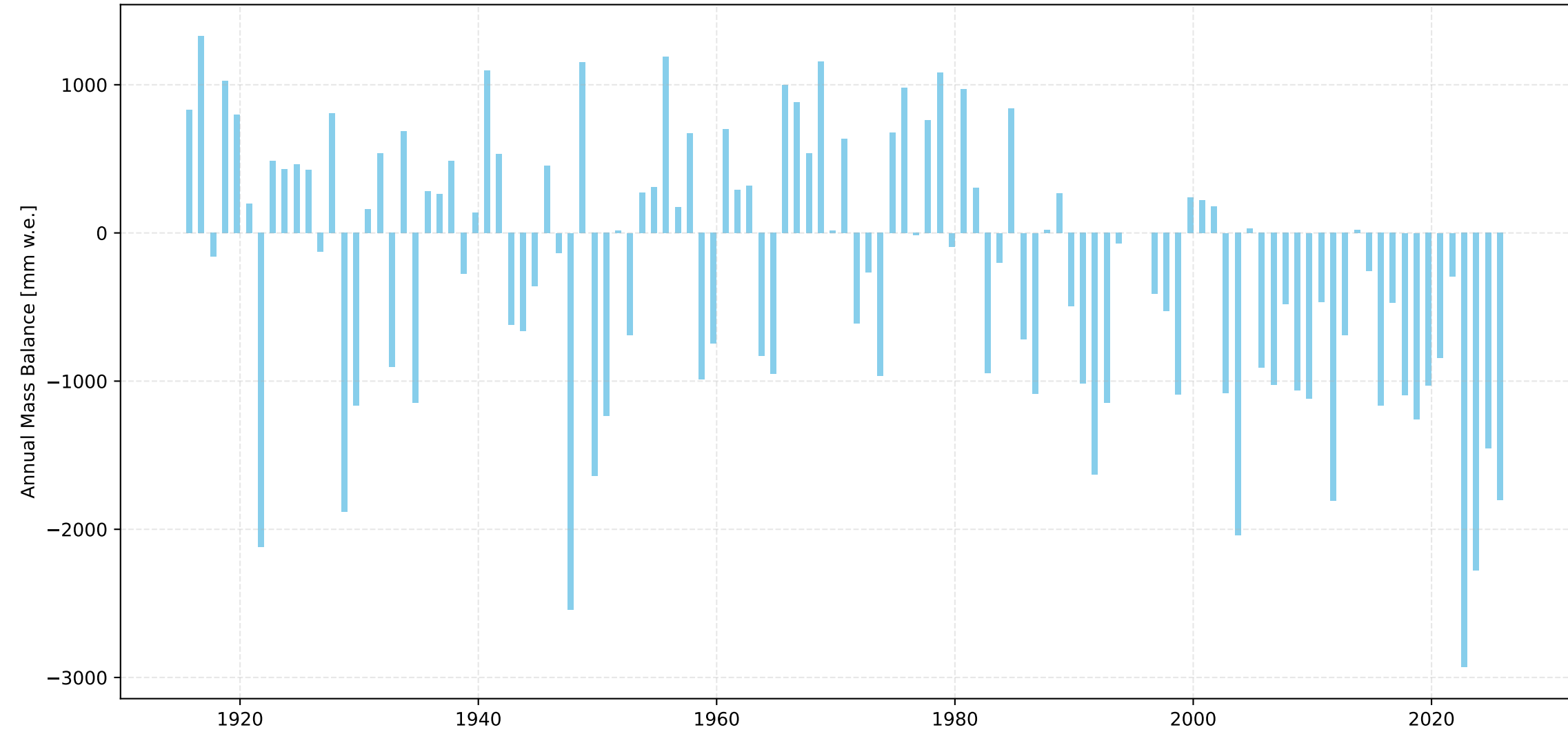
Claridenfirn Length Change Over Time



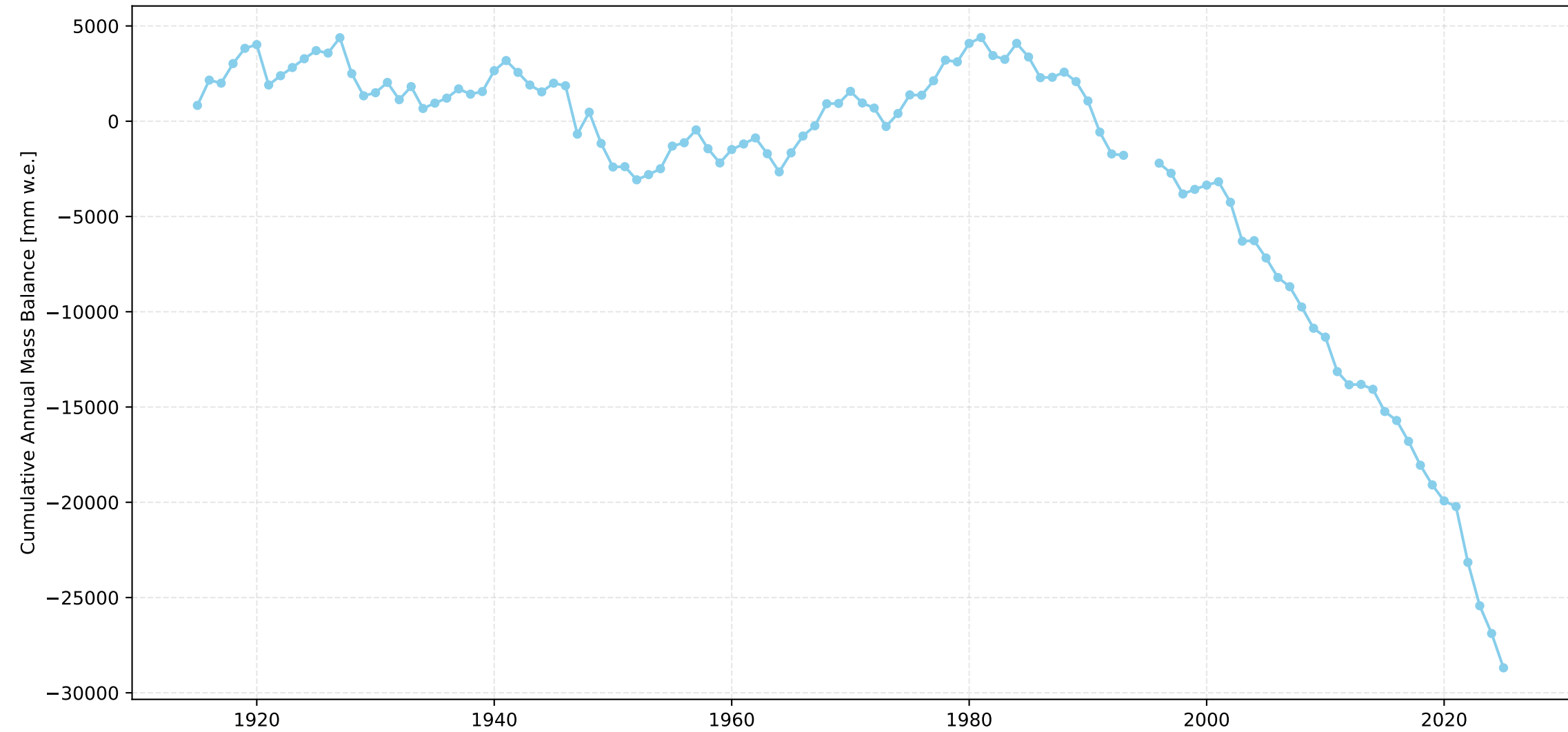
Claridenfirn Cumulative Length Change Over Time



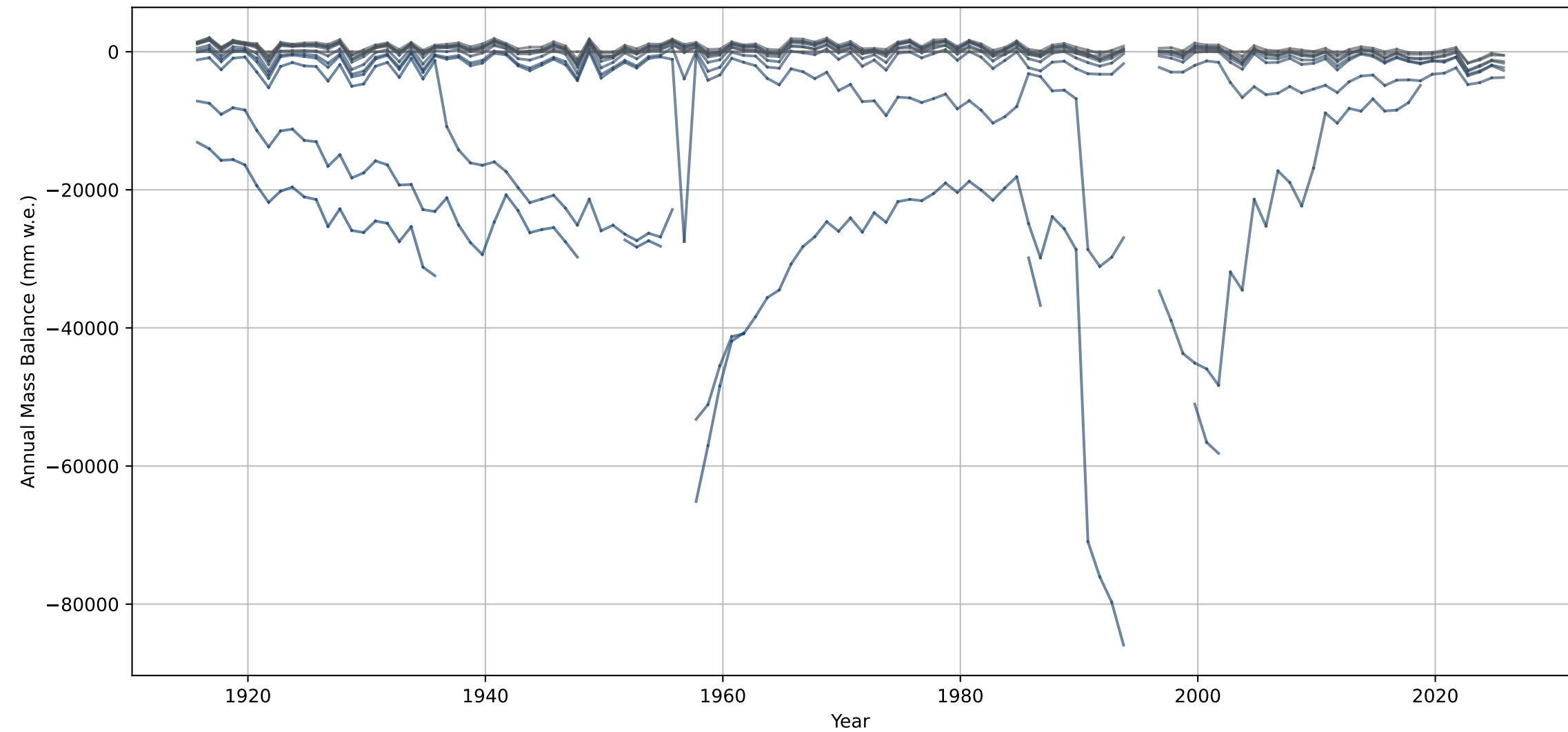
Claridenfirn Annual Mass Balance Over Time



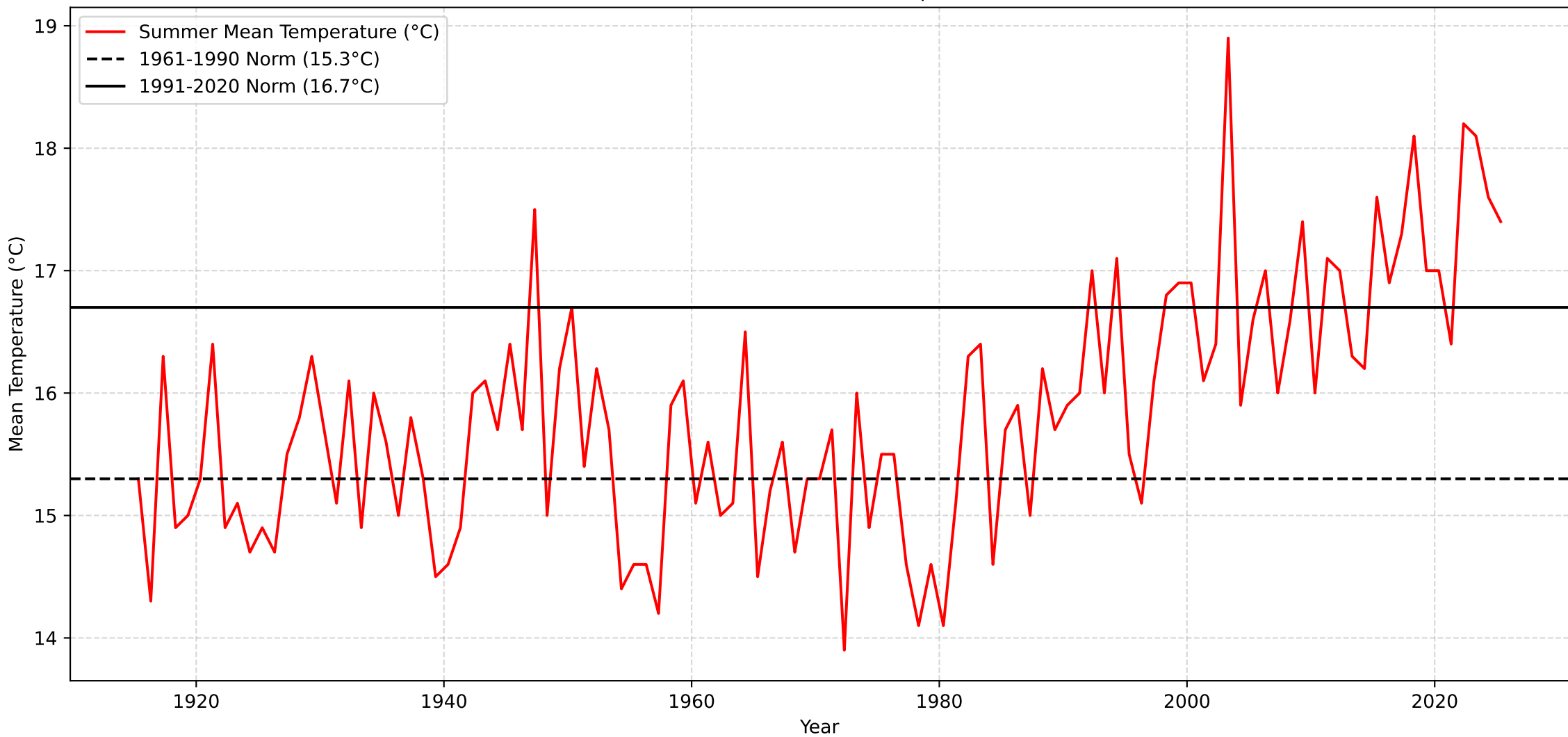
Claridenfirn Cumulative Annual Mass Balance Over Time



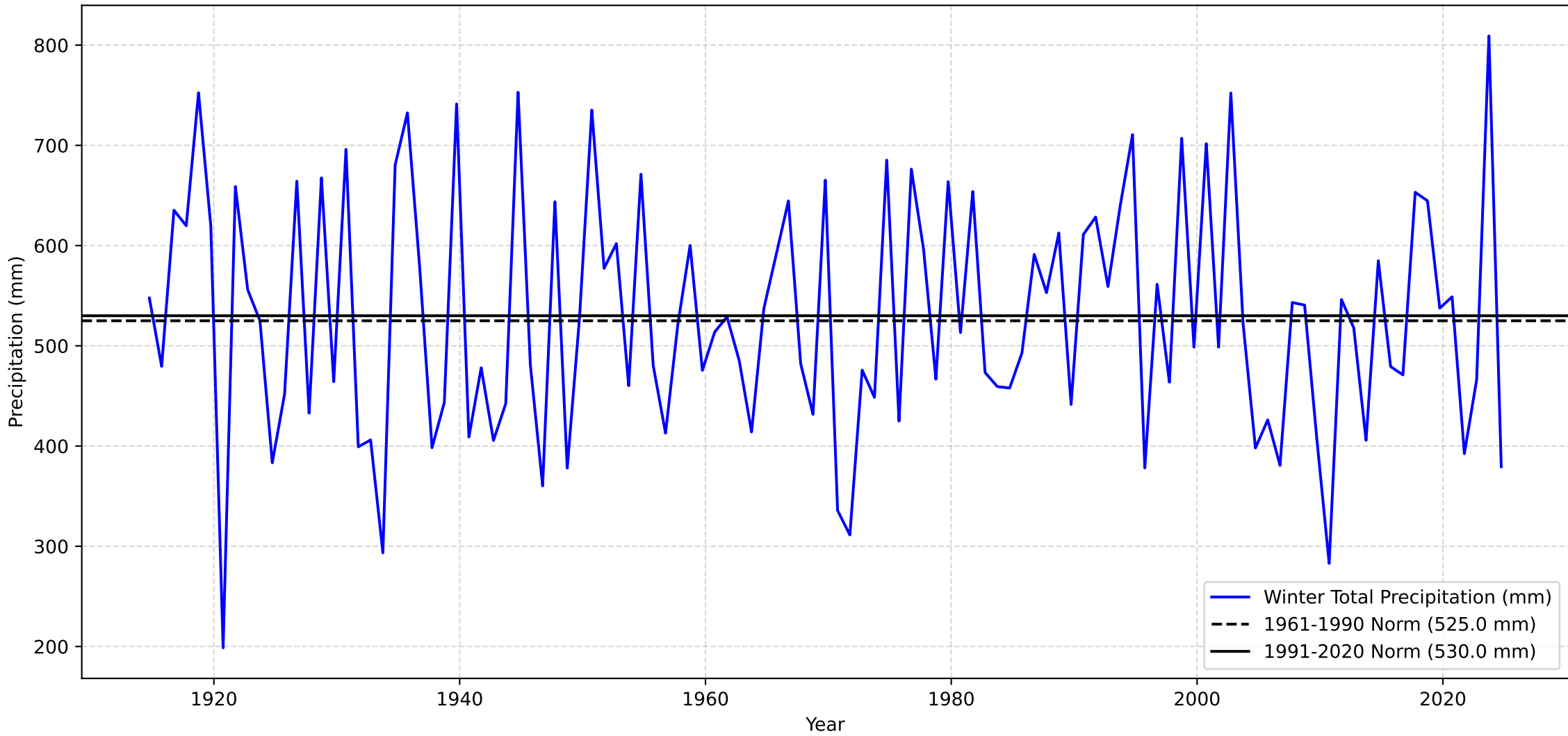
Annual Mass Balance for each Elevation Bin over Time - Claridenfirn



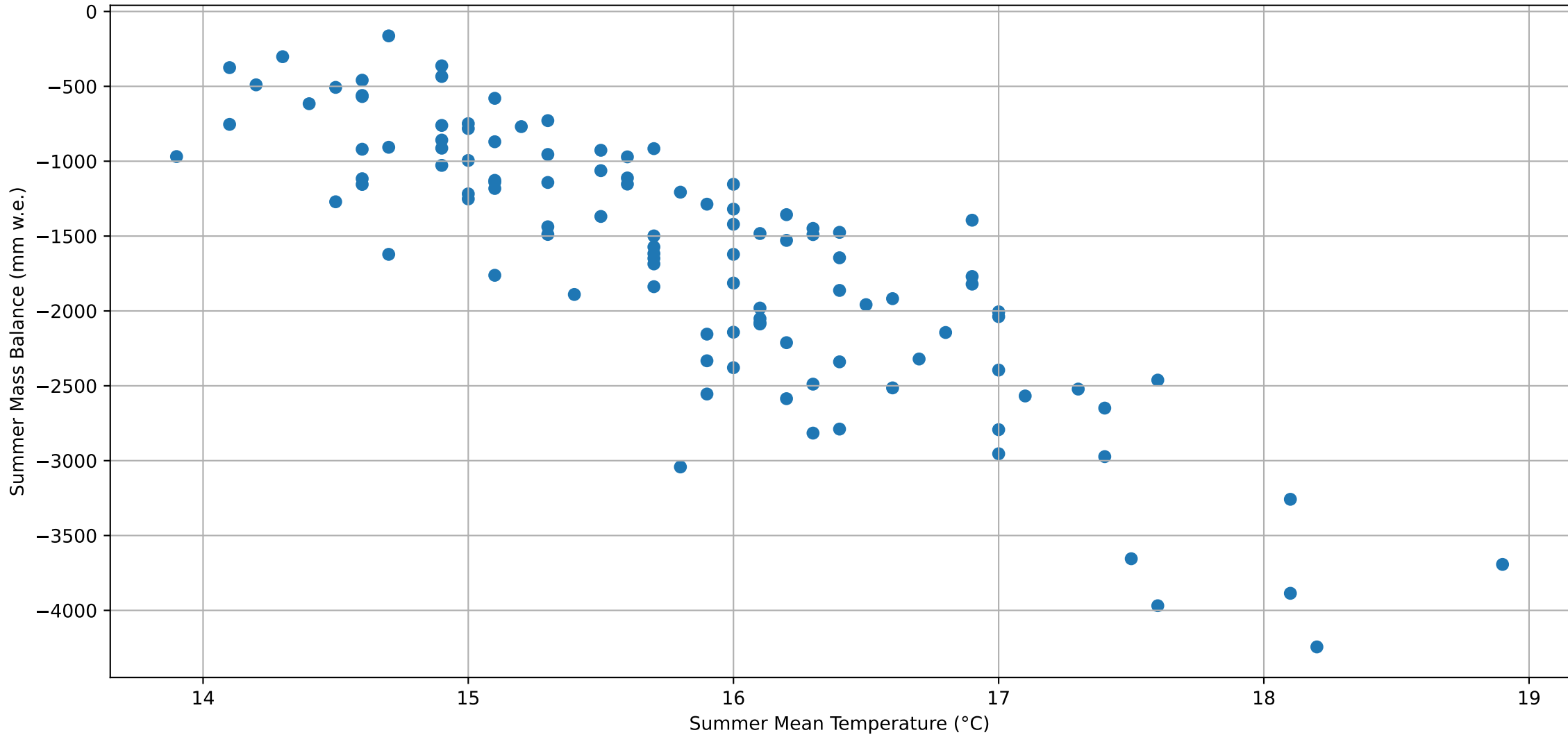
Altdorf Summer Mean Temperature



Aldorf Winter Total Precipitation



Claridenfirn Summer Mass Balance with relation to Temperature





Regression: Monthly 1961-1990

MONTHLY DEVIATIONS ANALYSIS USING 1961-1990 CLIMATE NORMS

MONTHLY DEVIATIONS for Claridenfirn (1961-1990 norms)

Number of observations: 109

Regression Summary:

OLS Regression Results			
Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.768
Model:	OLS	Adj. R-squared:	0.739
Method:	Least Squares	F-statistic:	26.54
Date:	Sun, 07 Dec 2025	Prob (F-statistic):	2.55e-25
Time:	23:22:26	Log-Likelihood:	-818.07
No. Observations:	109	AIC:	1662.
Df Residuals:	96	BIC:	1697.
Df Model:	12		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	59.2099	53.628	1.104	0.272	-47.241	165.661
may_td	-78.5856	30.615	-2.567	0.012	-139.356	-17.815
june_td	-98.5647	30.860	-3.194	0.002	-159.821	-37.309
july_td	-192.9518	34.689	-5.562	0.000	-261.808	-124.095
august_td	-189.5345	36.611	-5.177	0.000	-262.207	-116.862
september_td	-137.7202	34.027	-4.047	0.000	-205.263	-70.178
october_pd	3.7112	0.949	3.911	0.000	1.827	5.595
november_pd	2.0676	0.824	2.509	0.014	0.432	3.703
december_pd	2.2300	0.913	2.443	0.016	0.418	4.042
january_pd	3.4498	1.133	3.046	0.003	1.202	5.698
february_pd	4.5414	1.066	4.258	0.000	2.424	6.658
march_pd	2.7083	1.152	2.350	0.021	0.421	4.996
april_pd	-0.5163	1.286	-0.402	0.689	-3.069	2.036

Omnibus:	1.448	Durbin-Watson:	1.667
Prob(Omnibus):	0.485	Jarque-Bera (JB):	1.207
Skew:	-0.039	Prob(JB):	0.547
Kurtosis:	2.491	Cond. No.	72.2

Notes:  
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Coefficient Interpretation:  
Intercept (normal mass balance): 59.21 (p=0.2723)  
may\_td: -78.59 (p=0.0118)  
june\_td: -98.56 (p=0.0019)  
july\_td: -192.95 (p=0.0000)  
august\_td: -189.53 (p=0.0000)  
september\_td: -137.72 (p=0.0001)  
october\_pd: 3.71 (p=0.0002)  
november\_pd: 2.07 (p=0.0138)  
december\_pd: 2.23 (p=0.0164)  
january\_pd: 3.45 (p=0.0030)

Regression: Optimal 1961-1990

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OPTIMAL SEASONAL DEVIATIONS ANALYSIS USING 1961-1990 CLIMATE NORMS

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OPTIMAL SEASONAL DEVIATIONS for Claridenfirn (1961-1990 norms)

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Number of observations: 109

Regression Summary:

OLS Regression Results			
Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.640
Model:	OLS	Adj. R-squared:	0.633
Method:	Least Squares	F-statistic:	94.27
Date:	Sun, 07 Dec 2025	Prob (F-statistic):	3.00e-24
Time:	23:22:26	Log-Likelihood:	-842.09
No. Observations:	109	AIC:	1690.
Df Residuals:	106	BIC:	1698.
Df Model:	2		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	83.3856	60.955	1.368	0.174	-37.464	204.236
opt_season_td	-604.5066	48.447	-12.478	0.000	-700.557	-508.456
opt_season_pd	2.8935	0.512	5.649	0.000	1.878	3.909

Omnibus:	1.729	Durbin-Watson:	1.776
Prob(Omnibus):	0.421	Jarque-Bera (JB):	1.287
Skew:	-0.250	Prob(JB):	0.526
Kurtosis:	3.180	Cond. No.	133.

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Coefficient Interpretation:

Intercept (normal mass balance): 83.39 (p=0.1742)

opt\_season\_td: -604.51 (p=0.0000)

opt\_season\_pd: 2.89 (p=0.0000)

Variance Inflation Factors (VIF):

	Variable	VIF
0	const	1.310518
1	opt_season_td	1.000043
2	opt_season_pd	1.000043

R-squared: 0.6401

Adjusted R-squared: 0.6333

Regression: Seasonal 1961-1990

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SUMMER/WINTER SEASONAL DEVIATIONS ANALYSIS USING 1961-1990 CLIMATE NORMS
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SUMMER/WINTER SEASONAL DEVIATIONS for Claridenfirn (1961-1990 norms)
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Number of observations: 109

Regression Summary:

OLS Regression Results
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.717
Model: OLS Adj. R-squared: 0.712
Method: Least Squares F-statistic: 134.6
Date: Sun, 07 Dec 2025 Prob (F-statistic): 8.03e-30
Time: 23:22:26 Log-Likelihood: -828.90
No. Observations: 109 AIC: 1664.
Df Residuals: 106 BIC: 1672.
Df Model: 2
Covariance Type: nonrobust

Table with 7 columns: , coef, std err, t, P>|t|, [0.025, 0.975]. Rows include const, summer\_td, and winter\_pd.

Omnibus: 3.151 Durbin-Watson: 1.635
Prob(Omnibus): 0.207 Jarque-Bera (JB): 2.632
Skew: -0.367 Prob(JB): 0.268
Kurtosis: 3.201 Cond. No. 155.

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Coefficient Interpretation:
Intercept (normal mass balance): 113.67 (p=0.0362)
summer\_td: -708.50 (p=0.0000)
winter\_pd: 2.67 (p=0.0000)

Variance Inflation Factors (VIF):
Variable VIF
0 const 1.289085
1 summer\_td 1.000019
2 winter\_pd 1.000019

R-squared: 0.7175
Adjusted R-squared: 0.7122

Regression: Monthly 1991-2020

MONTHLY DEVIATIONS ANALYSIS USING 1991-2020 CLIMATE NORMS

MONTHLY DEVIATIONS for Claridenfirn (1991-2020 norms)

Number of observations: 109

Regression Summary:

OLS Regression Results						
Dep. Variable:	annual mass balance (mm w.e.)			R-squared:	0.768	
Model:	OLS			Adj. R-squared:	0.739	
Method:	Least Squares			F-statistic:	26.54	
Date:	Sun, 07 Dec 2025			Prob (F-statistic):	2.55e-25	
Time:	23:22:26			Log-Likelihood:	-818.07	
No. Observations:	109			AIC:	1662.	
Df Residuals:	96			BIC:	1697.	
Df Model:	12					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
const	-885.9051	61.387	-14.432	0.000	-1007.757	-764.054
may_td	-78.5856	30.615	-2.567	0.012	-139.356	-17.815
june_td	-98.5647	30.860	-3.194	0.002	-159.821	-37.309
july_td	-192.9518	34.689	-5.562	0.000	-261.808	-124.095
august_td	-189.5345	36.611	-5.177	0.000	-262.207	-116.862
september_td	-137.7202	34.027	-4.047	0.000	-205.263	-70.178
october_pd	3.7112	0.949	3.911	0.000	1.827	5.595
november_pd	2.0676	0.824	2.509	0.014	0.432	3.703
december_pd	2.2300	0.913	2.443	0.016	0.418	4.042
january_pd	3.4498	1.133	3.046	0.003	1.202	5.698
february_pd	4.5414	1.066	4.258	0.000	2.424	6.658
march_pd	2.7083	1.152	2.350	0.021	0.421	4.996
april_pd	-0.5163	1.286	-0.402	0.689	-3.069	2.036
Omnibus:	1.448	Durbin-Watson:	1.667			
Prob(Omnibus):	0.485	Jarque-Bera (JB):	1.207			
Skew:	-0.039	Prob(JB):	0.547			
Kurtosis:	2.491	Cond. No.	83.1			

Notes:  
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Coefficient Interpretation:  
Intercept (normal mass balance): -885.91 (p=0.0000)  
may\_td: -78.59 (p=0.0118)  
june\_td: -98.56 (p=0.0019)  
july\_td: -192.95 (p=0.0000)  
august\_td: -189.53 (p=0.0000)  
september\_td: -137.72 (p=0.0001)  
october\_pd: 3.71 (p=0.0002)  
november\_pd: 2.07 (p=0.0138)  
december\_pd: 2.23 (p=0.0164)  
january\_pd: 3.45 (p=0.0030)

Regression: Optimal 1991-2020

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OPTIMAL SEASONAL DEVIATIONS ANALYSIS USING 1991-2020 CLIMATE NORMS
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OPTIMAL SEASONAL DEVIATIONS for Claridenfirn (1991-2020 norms)
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Number of observations: 109

Regression Summary:

OLS Regression Results
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.642
Model: OLS Adj. R-squared: 0.635
Method: Least Squares F-statistic: 94.89
Date: Sun, 07 Dec 2025 Prob (F-statistic): 2.40e-24
Time: 23:22:26 Log-Likelihood: -841.86
No. Observations: 109 AIC: 1690.
Df Residuals: 106 BIC: 1698.
Df Model: 2
Covariance Type: nonrobust

Table with 7 columns: , coef, std err, t, P>|t|, [0.025, 0.975]. Rows include const, opt\_season\_td, and opt\_season\_pd.

Omnibus: 2.136 Durbin-Watson: 1.779
Prob(Omnibus): 0.344 Jarque-Bera (JB): 1.580
Skew: -0.252 Prob(JB): 0.454
Kurtosis: 3.307 Cond. No. 156.

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Coefficient Interpretation:
Intercept (normal mass balance): -844.33 (p=0.0000)
opt\_season\_td: -610.08 (p=0.0000)
opt\_season\_pd: 2.87 (p=0.0000)

Variance Inflation Factors (VIF):
Variable VIF
0 const 1.777901
1 opt\_season\_td 1.000114
2 opt\_season\_pd 1.000114

R-squared: 0.6416
Adjusted R-squared: 0.6349

Regression: Seasonal 1991-2020

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SUMMER/WINTER SEASONAL DEVIATIONS ANALYSIS USING 1991-2020 CLIMATE NORMS
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SUMMER/WINTER SEASONAL DEVIATIONS for Claridenfirn (1991-2020 norms)
=====

Number of observations: 109

Regression Summary:

OLS Regression Results
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.717
Model: OLS Adj. R-squared: 0.712
Method: Least Squares F-statistic: 134.6
Date: Sun, 07 Dec 2025 Prob (F-statistic): 8.03e-30
Time: 23:22:26 Log-Likelihood: -828.90
No. Observations: 109 AIC: 1664.
Df Residuals: 106 BIC: 1672.
Df Model: 2
Covariance Type: nonrobust

Table with 7 columns: , coef, std err, t, P>|t|, [0.025, 0.975]. Rows include const, summer\_td, and winter\_pd.

Omnibus: 3.151 Durbin-Watson: 1.635
Prob(Omnibus): 0.207 Jarque-Bera (JB): 2.632
Skew: -0.367 Prob(JB): 0.268
Kurtosis: 3.201 Cond. No. 181.

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Coefficient Interpretation:
Intercept (normal mass balance): -864.89 (p=0.0000)
summer\_td: -708.50 (p=0.0000)
winter\_pd: 2.67 (p=0.0000)

Variance Inflation Factors (VIF):
Variable VIF
0 const 1.748573
1 summer\_td 1.000019
2 winter\_pd 1.000019

R-squared: 0.7175
Adjusted R-squared: 0.7122