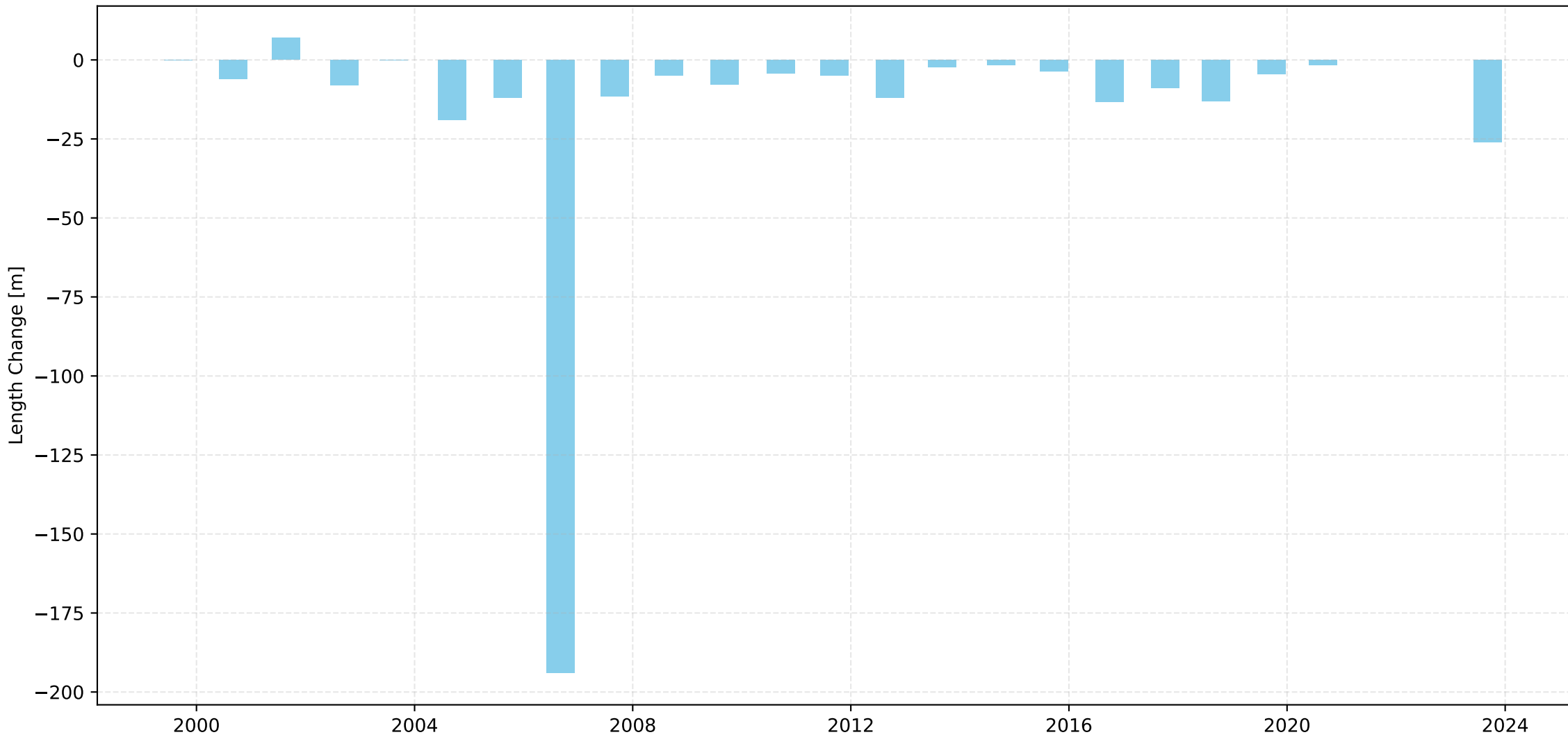
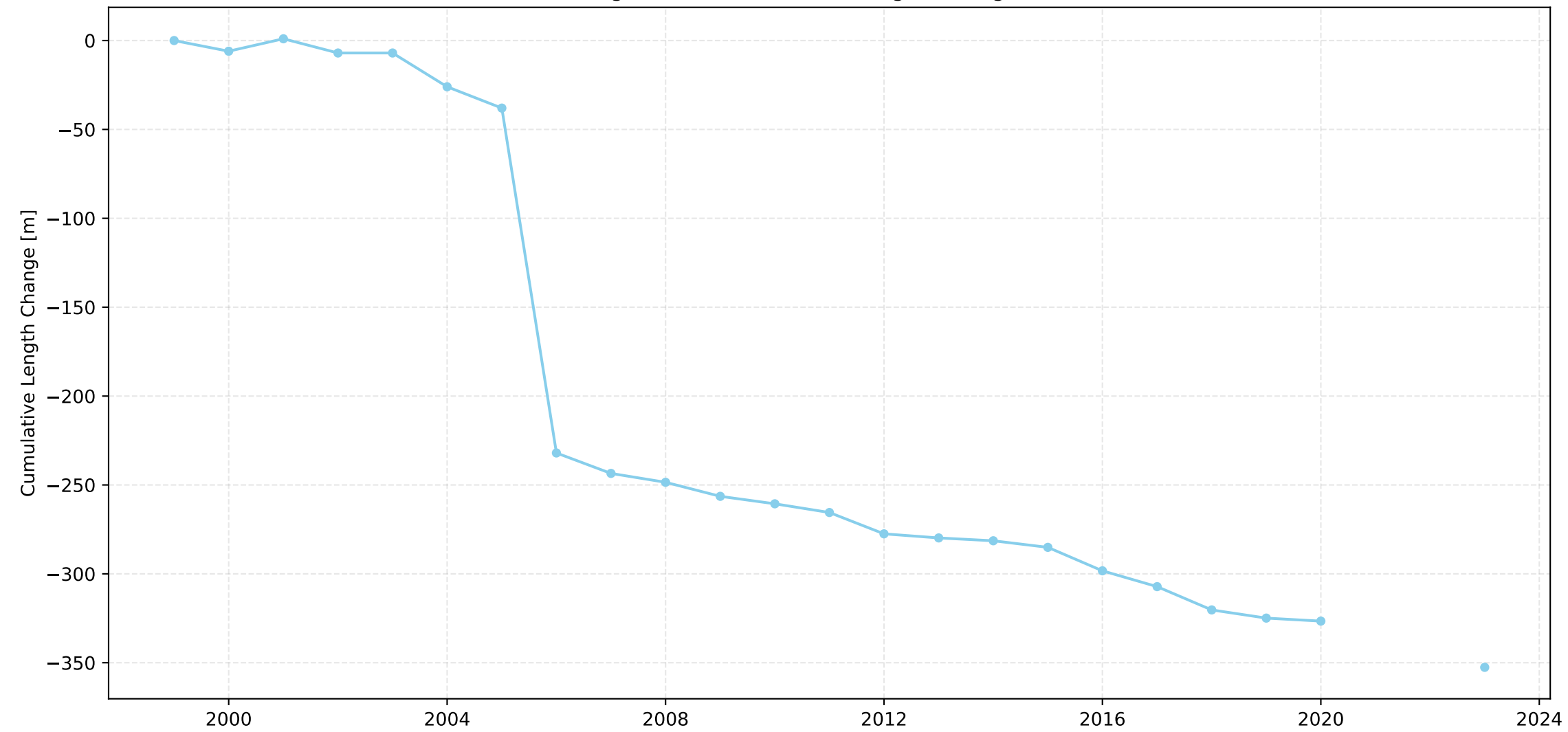


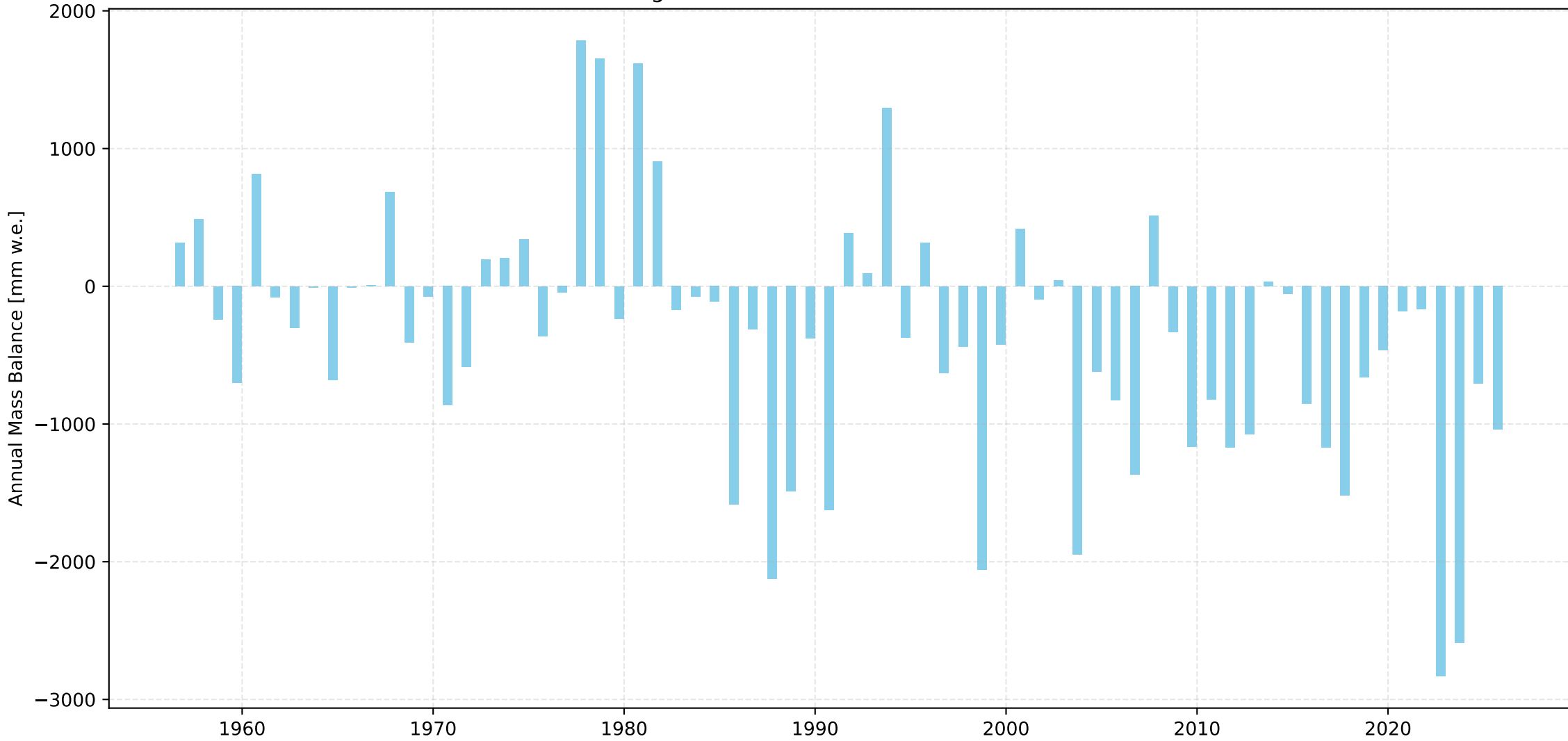
Hohlaubgletscher Length Change Over Time



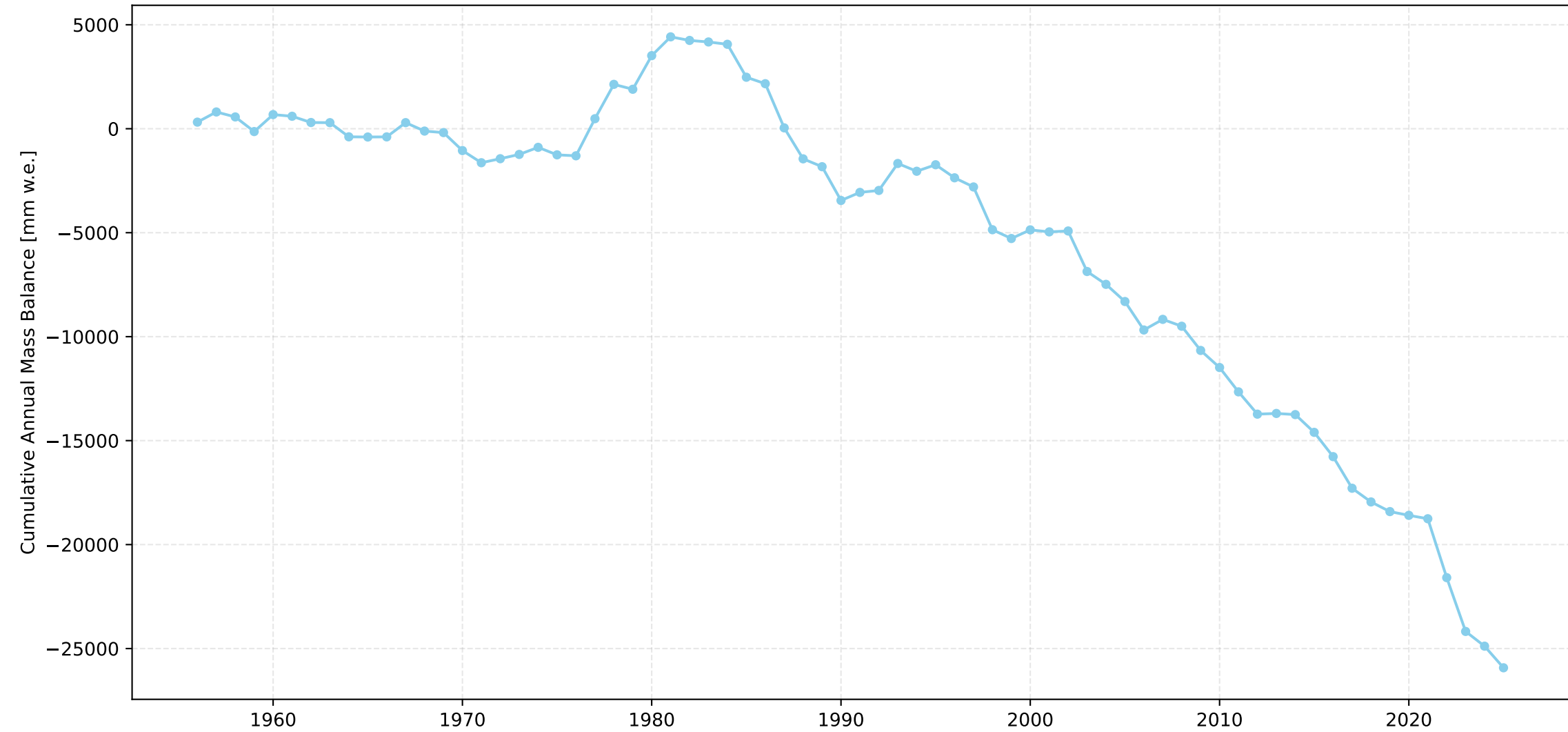
Hohlaubgletscher Cumulative Length Change Over Time



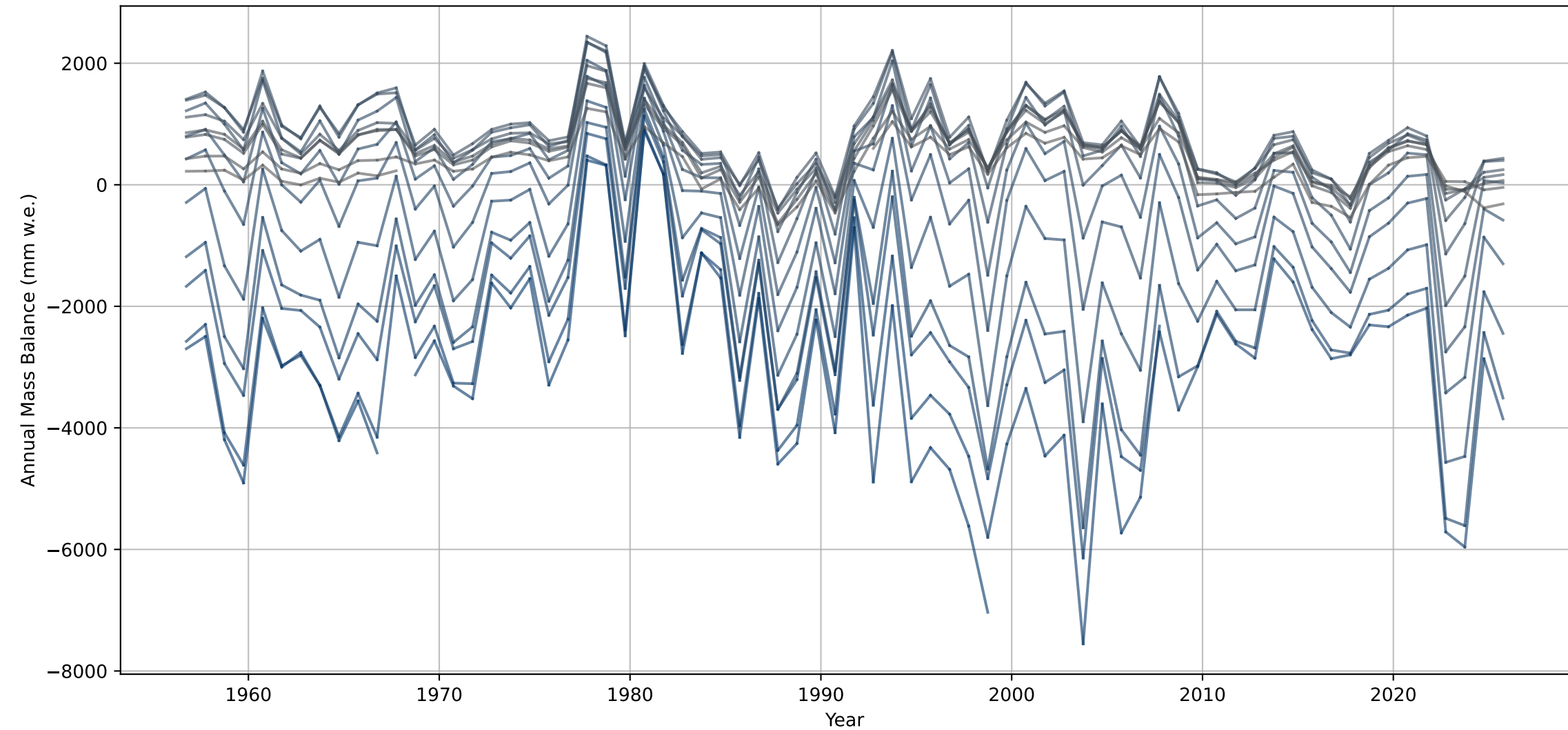
Hohlaubgletscher Annual Mass Balance Over Time



Hohlaubgletscher Cumulative Annual Mass Balance Over Time



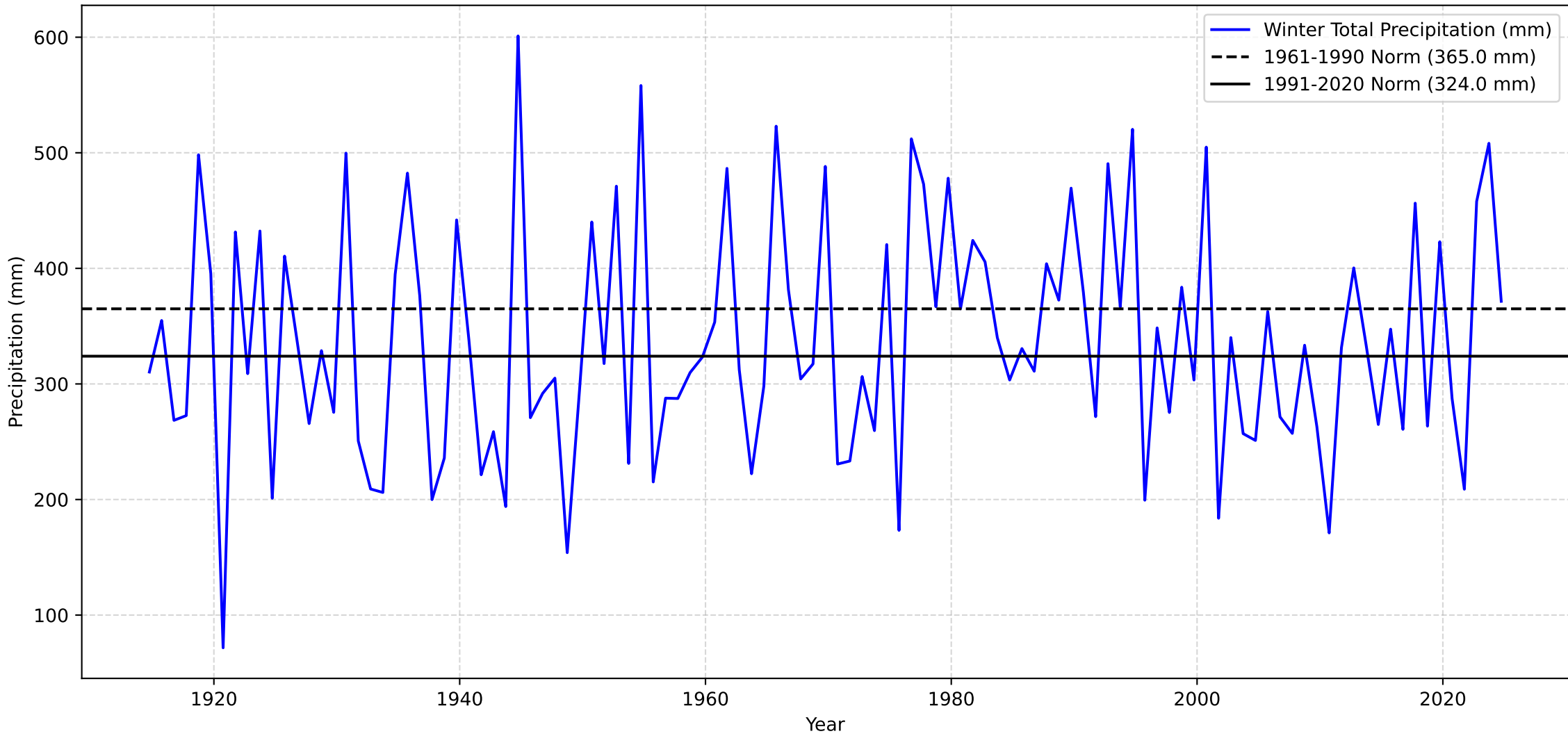
Annual Mass Balance for each Elevation Bin over Time - Hohlaubgletscher



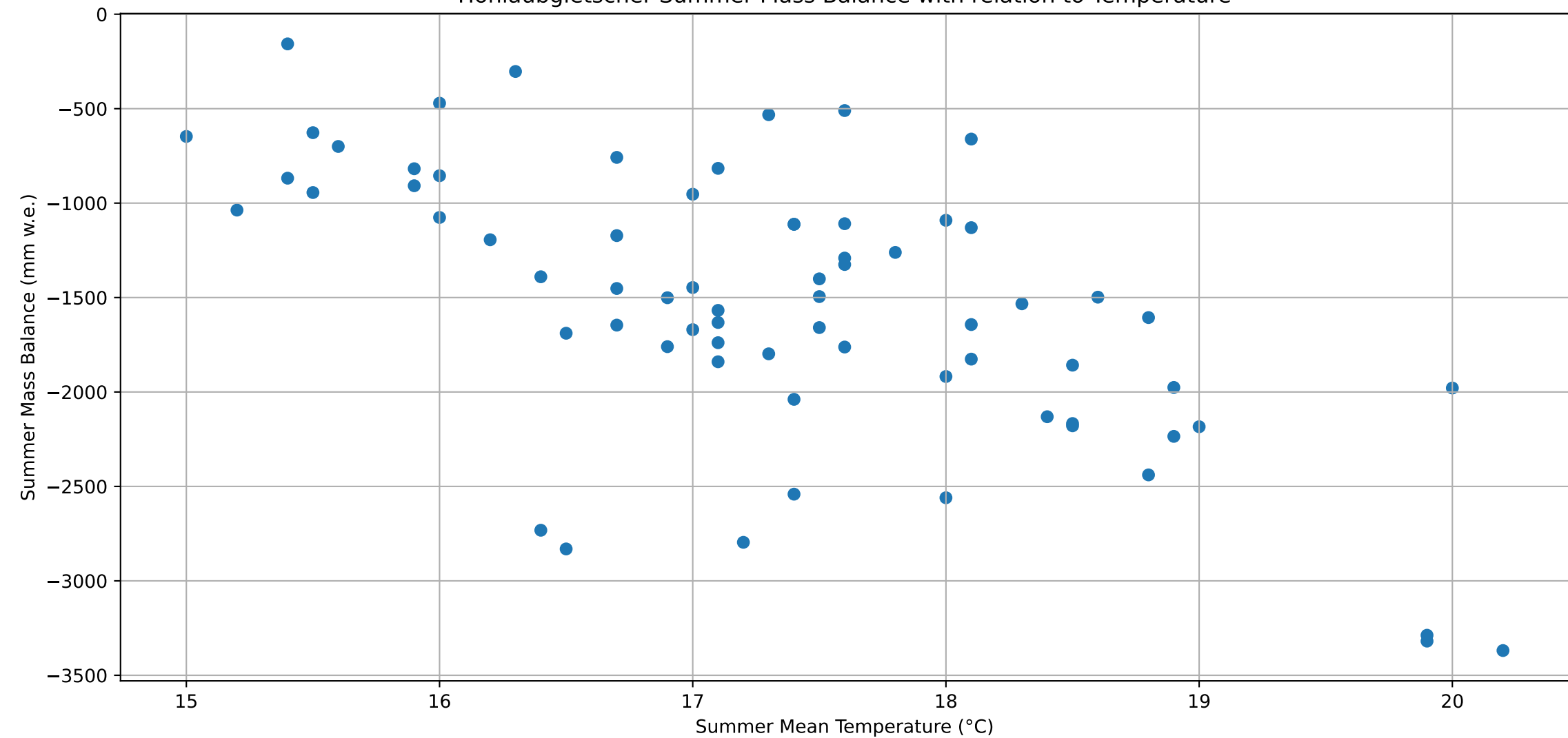
Sion Summer Mean Temperature



Sion Winter Total Precipitation

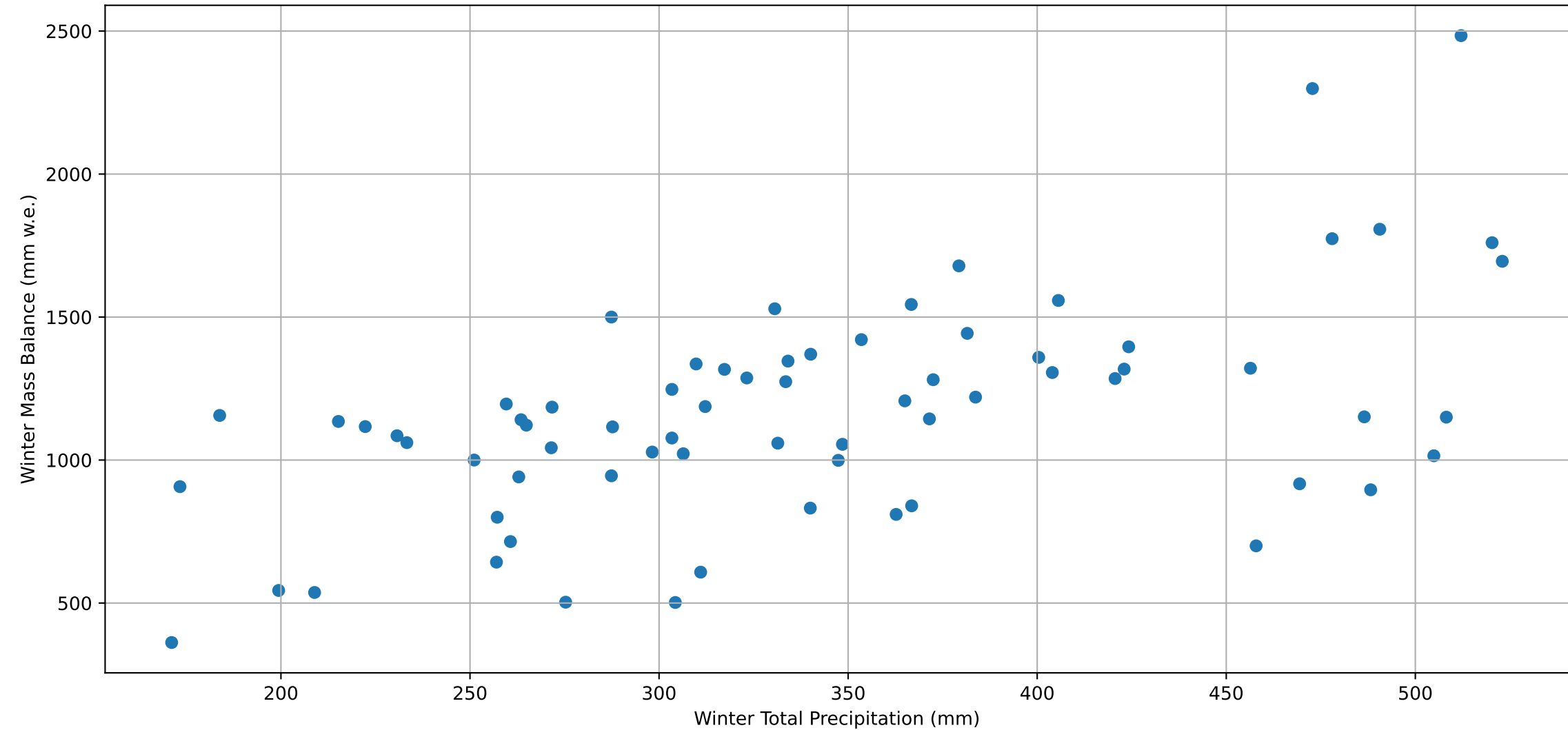


Hohlaubgletscher Summer Mass Balance with relation to Temperature





Hohlaubgletscher Winter Mass Balance with relation to Precipitation



Regression: Monthly 1961-1990

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MONTHLY DEVIATIONS for Hohlaubgletscher using 1961-1990 climate norms
=====

Correlation Analysis with Significance Testing:
Skipping constant column: const
Table with 5 columns: Variable, Correlation Coefficient, P-value, Significant (p < 0.05), and an unlabeled column. Rows include months from July to January.

Number of observations: 70

Regression Summary:

OLS Regression Results
Table with 4 columns: Dep. Variable, Model, Method, Date, Time, No. Observations, Df Residuals, Df Model, Covariance Type, R-squared, Adj. R-squared, F-statistic, Prob (F-statistic), Log-Likelihood, AIC, BIC.

Table with 7 columns: coef, std err, t, P>|t|, [0.025, 0.975]. Rows include const, may\_td, june\_td, july\_td, august\_td, september\_td, october\_pd, november\_pd, december\_pd, january\_pd, february\_pd, march\_pd, april\_pd.

Table with 4 columns: Omnibus, Prob(Omnibus), Skew, Kurtosis, Durbin-Watson, Jarque-Bera (JB), Prob(JB), Cond. No.

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

Regression: Optimal 1961-1990

=====
OPTIMAL SEASONAL DEVIATIONS for Hohlaubgletscher using 1961-1990 climate norms
=====

Correlation Analysis with Significance Testing:
Skipping constant column: const
Variable Correlation Coefficient P-value Significant (p < 0.05)
0 opt\_season\_td -0.602347 3.457786e-08 True
1 opt\_season\_pd 0.272364 2.254596e-02 True

Number of observations: 70

Regression Summary:

OLS Regression Results						
=====						
Dep. Variable:	annual mass balance (mm w.e.)			R-squared:	0.407	
Model:	OLS			Adj. R-squared:	0.390	
Method:	Least Squares			F-statistic:	23.04	
Date:	Fri, 19 Dec 2025			Prob (F-statistic):	2.43e-08	
Time:	16:02:42			Log-Likelihood:	-557.04	
No. Observations:	70			AIC:	1120.	
Df Residuals:	67			BIC:	1127.	
Df Model:	2					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	47.5984	105.330	0.452	0.653	-162.641	257.838
opt_season_td	-410.3203	66.837	-6.139	0.000	-543.727	-276.913
opt_season_pd	2.3534	1.047	2.247	0.028	0.263	4.444
=====						
Omnibus:	8.352		Durbin-Watson:		1.542	
Prob(Omnibus):	0.015		Jarque-Bera (JB):		8.071	
Skew:	-0.661		Prob(JB):		0.0177	
Kurtosis:	4.009		Cond. No.		111.	
=====						

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

Regression: Seasonal 1961-1990

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SUMMER/WINTER SEASONAL DEVIATIONS for Hohlaubgletscher using 1961-1990 climate norms
=====

Correlation Analysis with Significance Testing:
Skipping constant column: const
Variable Correlation Coefficient P-value Significant (p < 0.05)
0 summer\_td -0.630517 4.928413e-09 True
1 winter\_pd 0.227639 5.806108e-02 False

Number of observations: 70

Regression Summary:

OLS Regression Results						
=====						
Dep. Variable:	annual mass balance (mm w.e.)			R-squared:	0.434	
Model:	OLS			Adj. R-squared:	0.417	
Method:	Least Squares			F-statistic:	25.65	
Date:	Fri, 19 Dec 2025			Prob (F-statistic):	5.35e-09	
Time:	16:02:42			Log-Likelihood:	-555.45	
No. Observations:	70			AIC:	1117.	
Df Residuals:	67			BIC:	1124.	
Df Model:	2					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	87.4437	104.438	0.837	0.405	-121.015	295.902
summer_td	-474.8311	70.647	-6.721	0.000	-615.844	-333.818
winter_pd	1.8549	0.897	2.067	0.043	0.064	3.646
=====						
Omnibus:	6.635		Durbin-Watson:		1.541	
Prob(Omnibus):	0.036		Jarque-Bera (JB):		5.868	
Skew:	-0.605		Prob(JB):		0.0532	
Kurtosis:	3.740		Cond. No.		132.	
=====						

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

# Regression: Monthly 1991-2020

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MONTHLY DEVIATIONS for Hohlaubgletscher using 1991-2020 climate norms

=====

## Correlation Analysis with Significance Testing:

Skipping constant column: const

	Variable	Correlation Coefficient	P-value	Significant (p < 0.05)
2	july_td	-0.551877	7.340182e-07	True
3	august_td	-0.467402	4.515425e-05	True
1	june_td	-0.444657	1.150260e-04	True
4	september_td	-0.414801	3.566138e-04	True
0	may_td	-0.388732	8.821633e-04	True
5	october_pd	0.192638	1.101076e-01	False
9	february_pd	0.154829	2.006150e-01	False
11	april_pd	-0.141633	2.421798e-01	False
6	november_pd	0.101388	4.036308e-01	False
7	december_pd	0.082763	4.957804e-01	False
10	march_pd	0.064021	5.985187e-01	False
8	january_pd	0.014279	9.066076e-01	False

Number of observations: 70

## Regression Summary:

### OLS Regression Results

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.518
Model:	OLS	Adj. R-squared:	0.417
Method:	Least Squares	F-statistic:	5.105
Date:	Fri, 19 Dec 2025	Prob (F-statistic):	1.05e-05
Time:	16:02:42	Log-Likelihood:	-549.81
No. Observations:	70	AIC:	1126.
Df Residuals:	57	BIC:	1155.
Df Model:	12		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	-761.0987	100.998	-7.536	0.000	-963.343	-558.854
may_td	-51.7296	66.025	-0.783	0.437	-183.942	80.483
june_td	-16.4373	62.241	-0.264	0.793	-141.073	108.198
july_td	-161.9487	66.779	-2.425	0.018	-295.671	-28.226
august_td	-132.5787	78.796	-1.683	0.098	-290.364	25.207
september_td	-121.8690	62.697	-1.944	0.057	-247.418	3.680
october_pd	7.0823	3.071	2.306	0.025	0.932	13.232
november_pd	2.8305	2.282	1.240	0.220	-1.739	7.400
december_pd	4.4549	1.907	2.336	0.023	0.636	8.274
january_pd	0.6375	2.321	0.275	0.785	-4.010	5.285
february_pd	1.2869	1.802	0.714	0.478	-2.322	4.896
march_pd	-0.7323	2.653	-0.276	0.784	-6.045	4.581
april_pd	-4.2385	4.053	-1.046	0.300	-12.354	3.877

Omnibus:	3.799	Durbin-Watson:	1.573
Prob(Omnibus):	0.150	Jarque-Bera (JB):	3.408
Skew:	-0.540	Prob(JB):	0.182
Kurtosis:	3.006	Cond. No.	65.8

## Notes:

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

Regression: Optimal 1991-2020

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OPTIMAL SEASONAL DEVIATIONS for Hohlaubgletscher using 1991-2020 climate norms

=====

Correlation Analysis with Significance Testing:  
Skipping constant column: const

	Variable	Correlation	Coefficient	P-value	Significant (p < 0.05)
0	opt_season_td	-0.605611	2.786038e-08		True
1	opt_season_pd	0.272364	2.254596e-02		True

Number of observations: 70

Regression Summary:

OLS Regression Results

=====

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.409
Model:	OLS	Adj. R-squared:	0.392
Method:	Least Squares	F-statistic:	23.21
Date:	Fri, 19 Dec 2025	Prob (F-statistic):	2.19e-08
Time:	16:02:42	Log-Likelihood:	-556.93
No. Observations:	70	AIC:	1120.
Df Residuals:	67	BIC:	1127.
Df Model:	2		
Covariance Type:	nonrobust		

=====

	coef	std err	t	P> t	[0.025	0.975]
const	-749.6822	101.557	-7.382	0.000	-952.390	-546.974
opt_season_td	-414.5566	67.243	-6.165	0.000	-548.774	-280.339
opt_season_pd	2.2984	1.047	2.196	0.032	0.209	4.387

=====

Omnibus:	7.664	Durbin-Watson:	1.534
Prob(Omnibus):	0.022	Jarque-Bera (JB):	7.203
Skew:	-0.628	Prob(JB):	0.0273
Kurtosis:	3.944	Cond. No.	107.

=====

Notes:

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

Regression: Seasonal 1991-2020

=====
SUMMER/WINTER SEASONAL DEVIATIONS for Hohlaubgletscher using 1991-2020 climate norms
=====

Correlation Analysis with Significance Testing:
Skipping constant column: const
Variable Correlation Coefficient P-value Significant (p < 0.05)
0 summer\_td -0.628791 5.584849e-09 True
1 winter\_pd 0.227639 5.806108e-02 False

Number of observations: 70

Regression Summary:

OLS Regression Results						
=====						
Dep. Variable:	annual mass balance (mm w.e.)			R-squared:	0.431	
Model:	OLS			Adj. R-squared:	0.414	
Method:	Least Squares			F-statistic:	25.33	
Date:	Fri, 19 Dec 2025			Prob (F-statistic):	6.41e-09	
Time:	16:02:42			Log-Likelihood:	-555.64	
No. Observations:	70			AIC:	1117.	
Df Residuals:	67			BIC:	1124.	
Df Model:	2					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	-763.8050	99.610	-7.668	0.000	-962.627	-564.983
summer_td	-472.5222	70.779	-6.676	0.000	-613.797	-331.247
winter_pd	1.8323	0.900	2.036	0.046	0.036	3.629
=====						
Omnibus:	6.431		Durbin-Watson:		1.533	
Prob(Omnibus):	0.040		Jarque-Bera (JB):		5.631	
Skew:	-0.599		Prob(JB):		0.0599	
Kurtosis:	3.704		Cond. No.		124.	
=====						

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