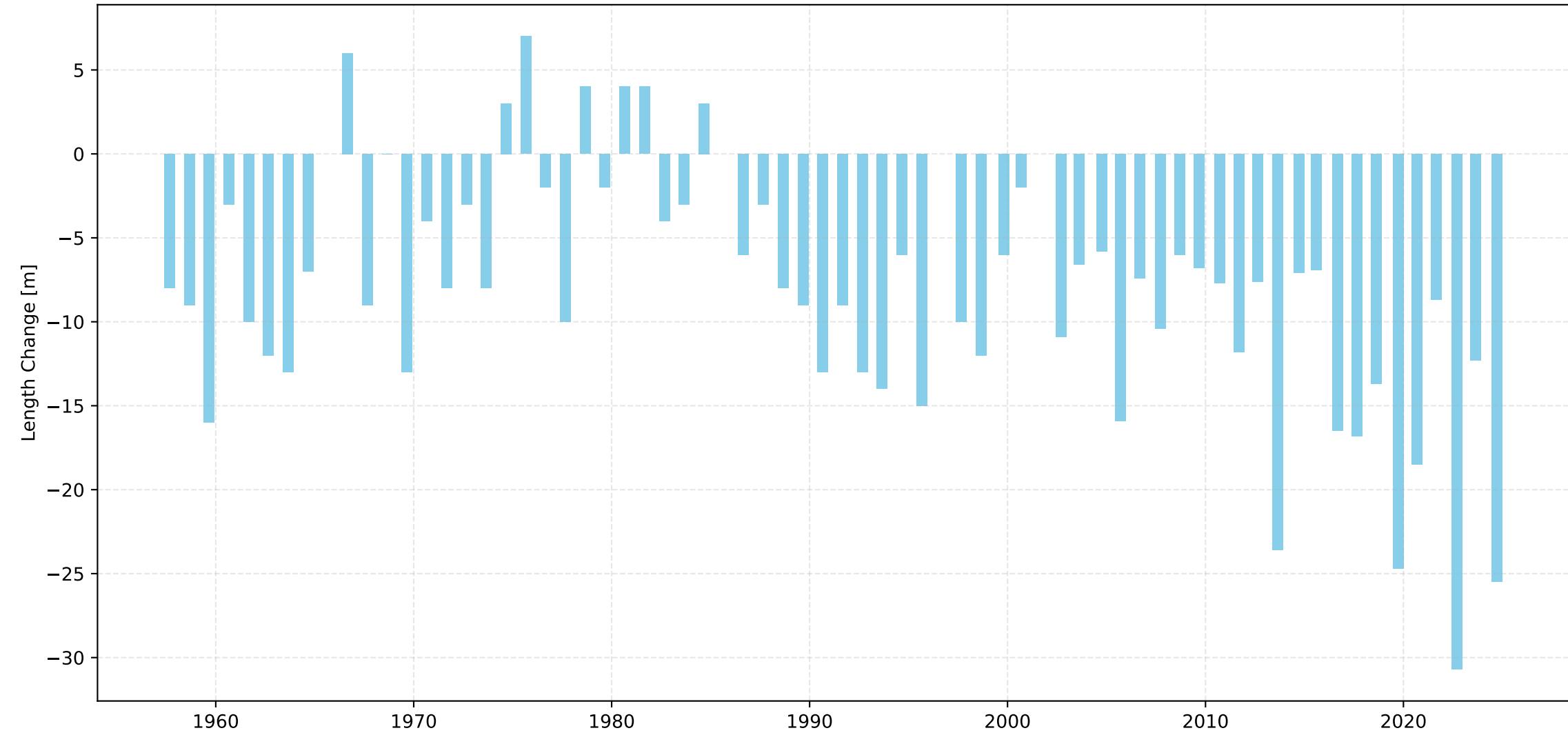
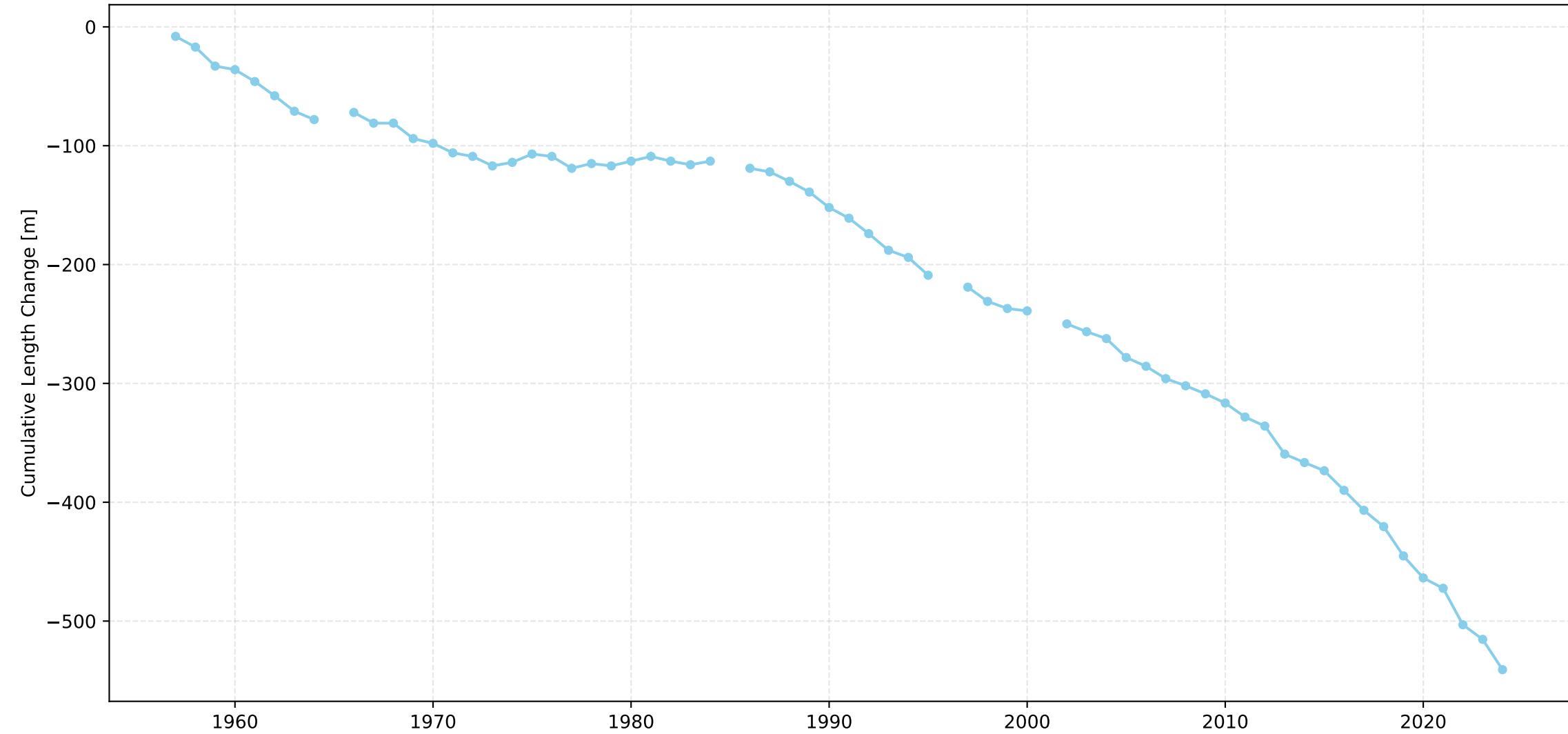


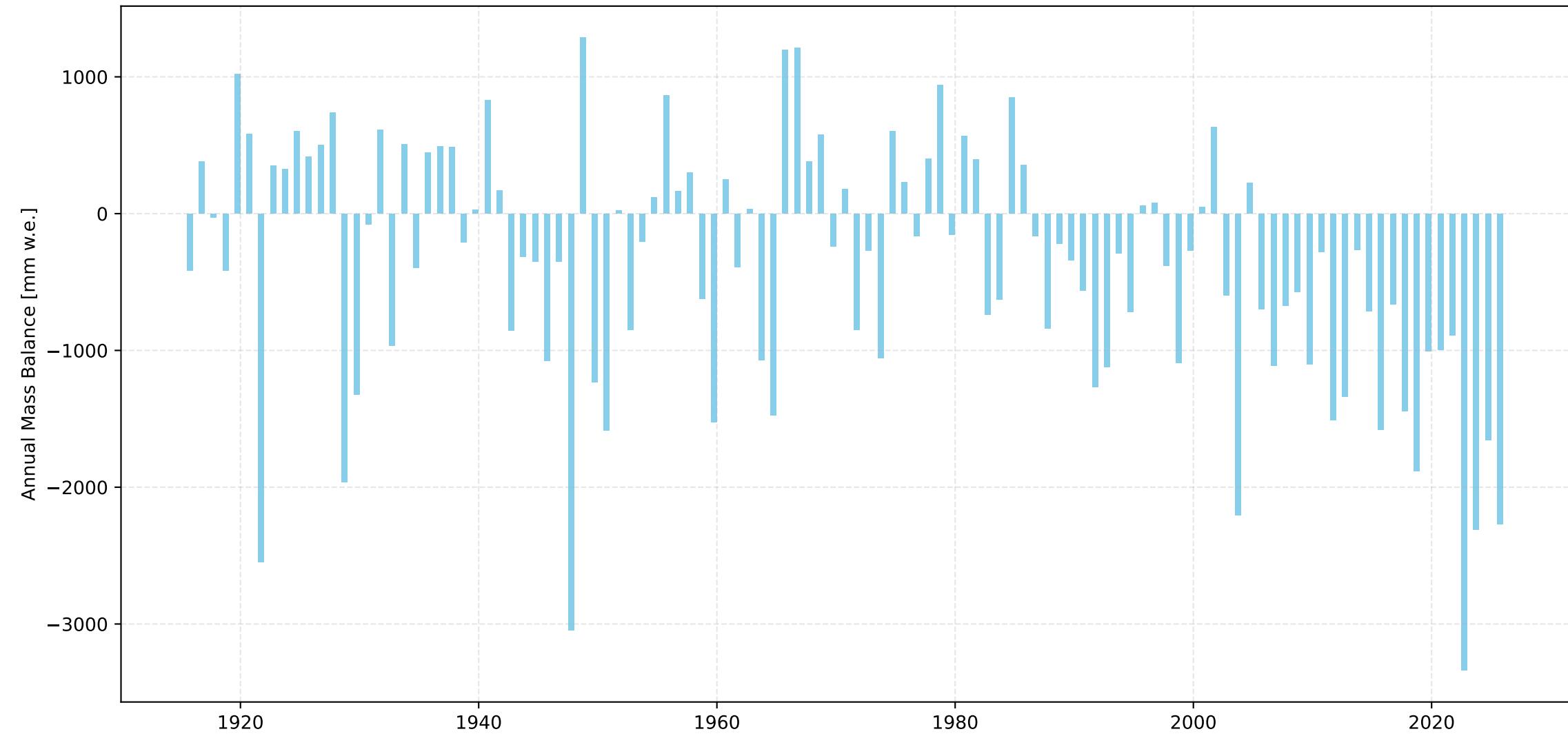
Silvrettagletscher Length Change Over Time



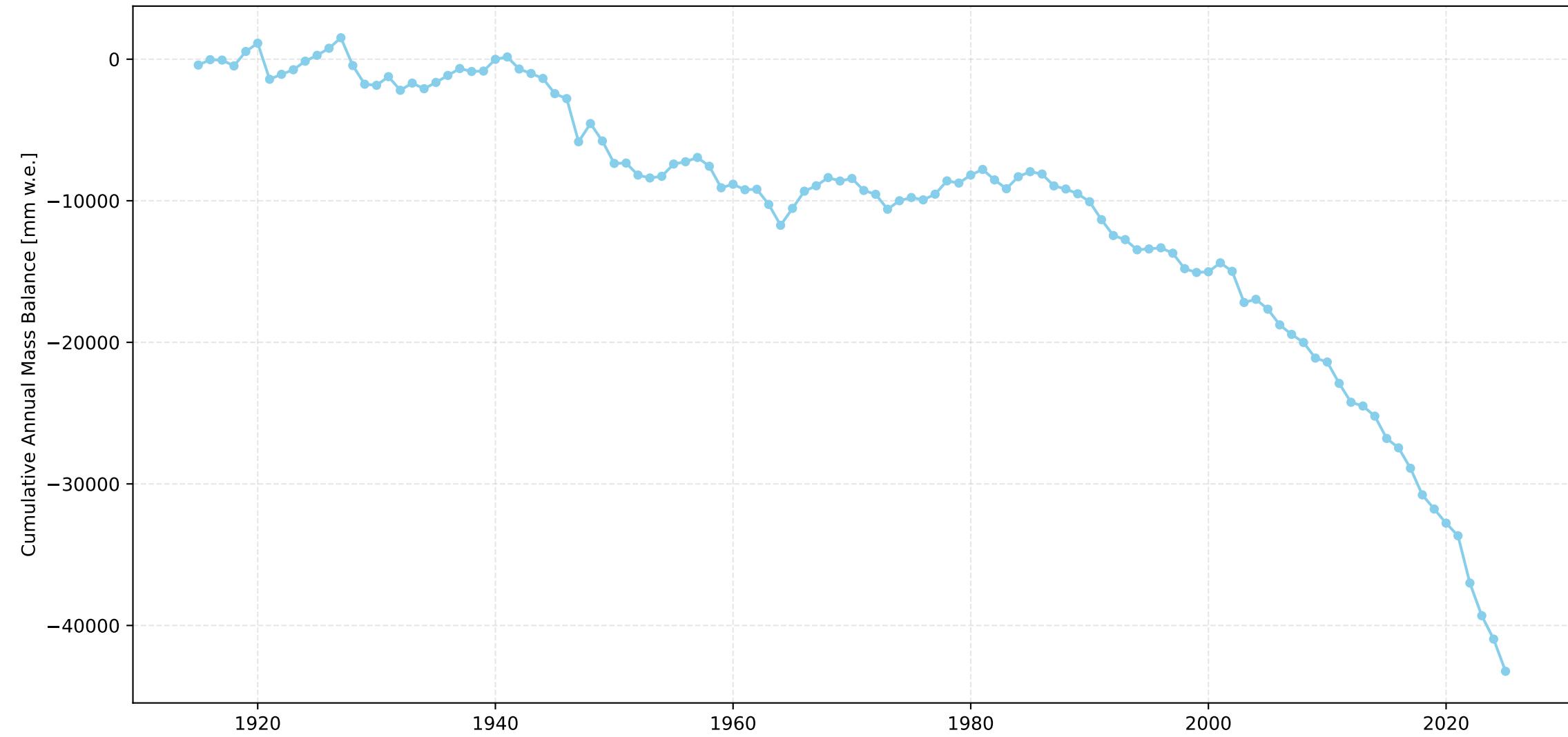
Silvrettagletscher Cumulative Length Change Over Time



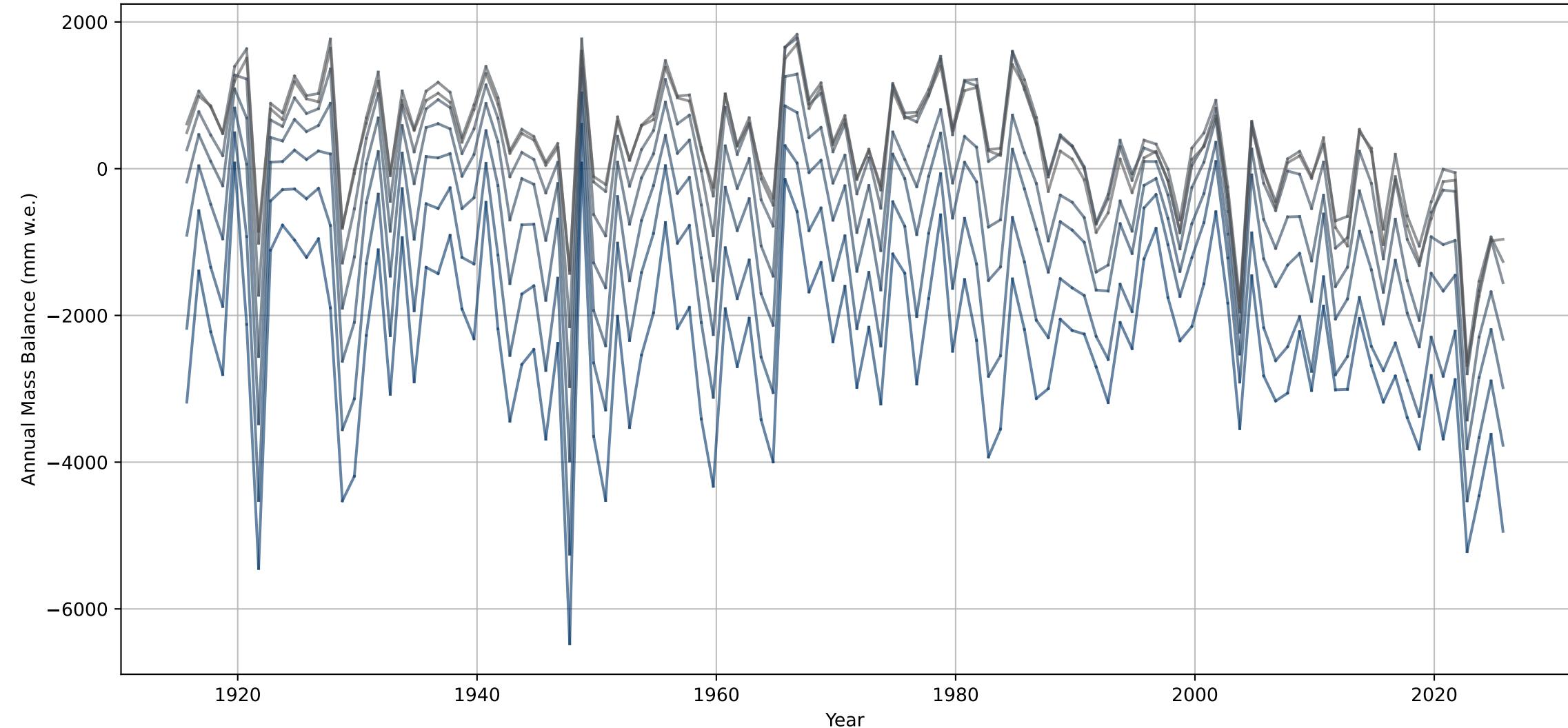
Silvrettagletscher Annual Mass Balance Over Time



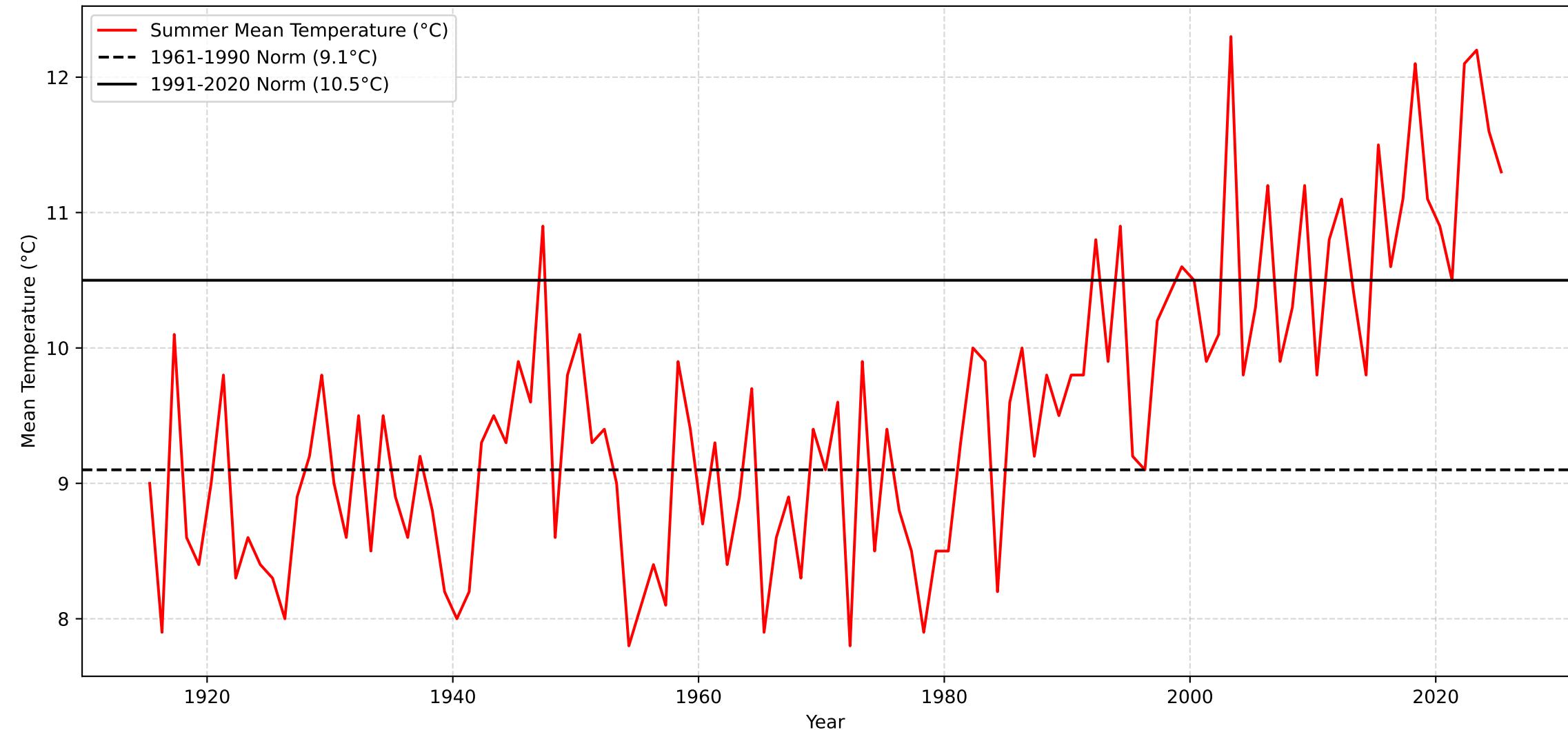
Silvrettagletscher Cumulative Annual Mass Balance Over Time



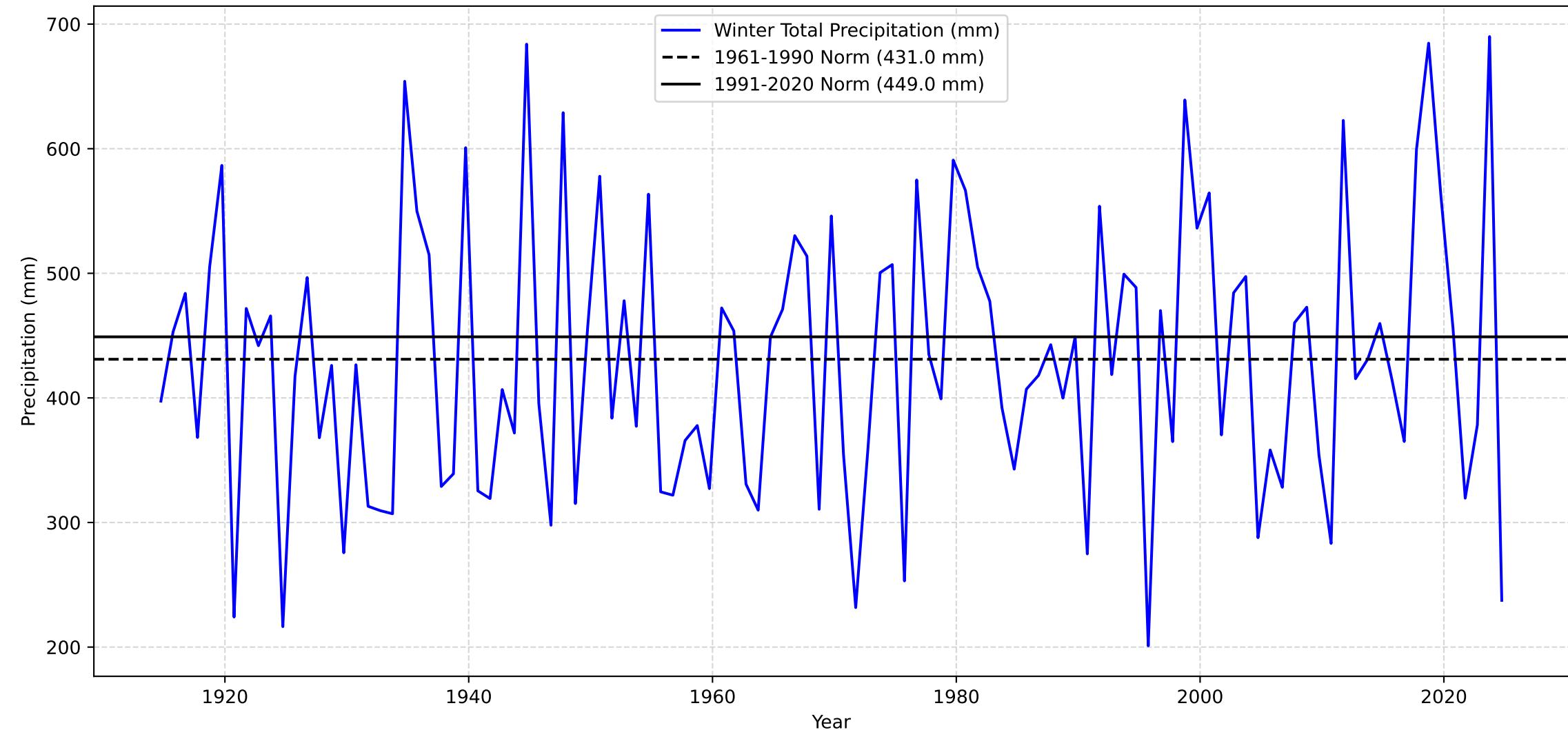
Annual Mass Balance for each Elevation Bin over Time - Silvrettagletscher



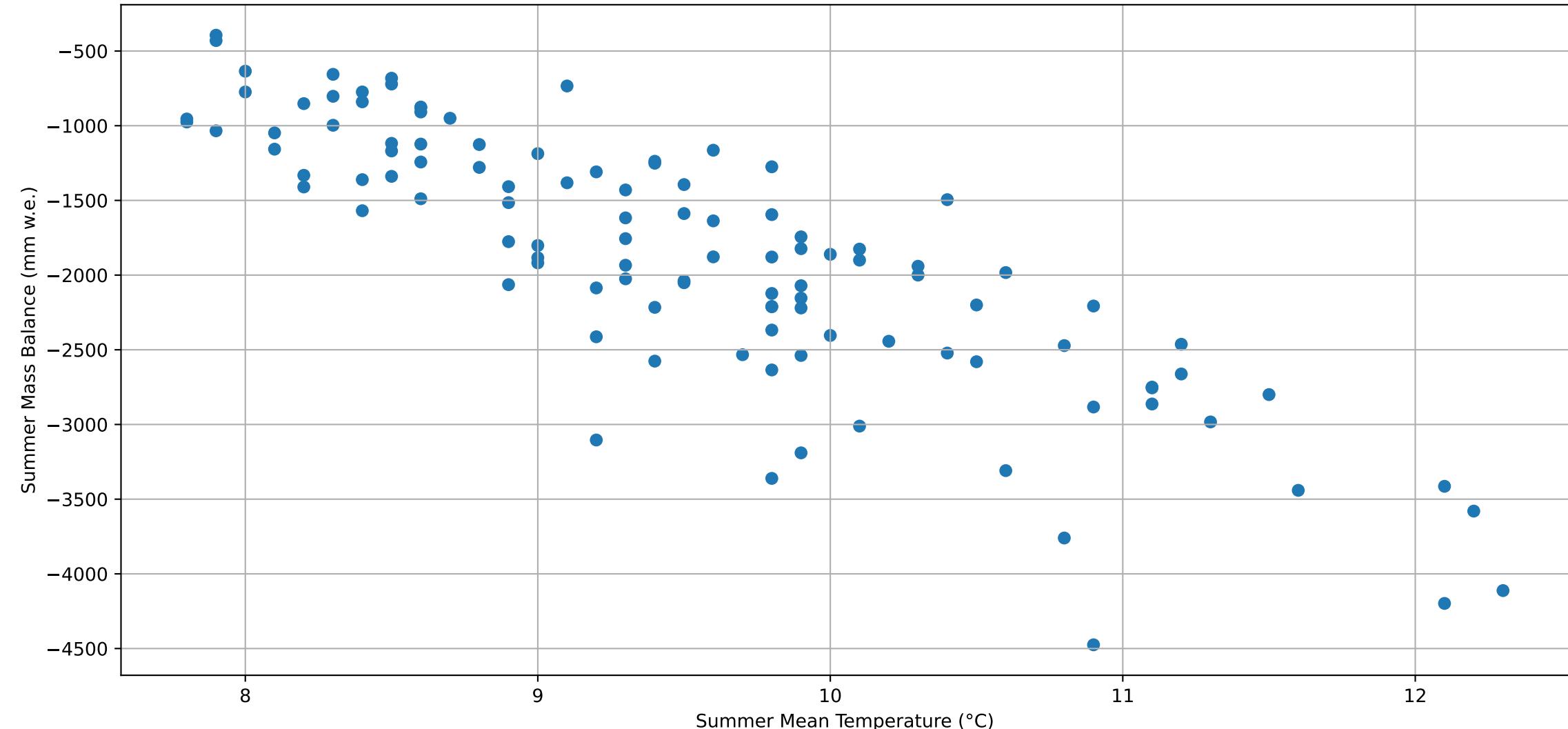
Davos Summer Mean Temperature



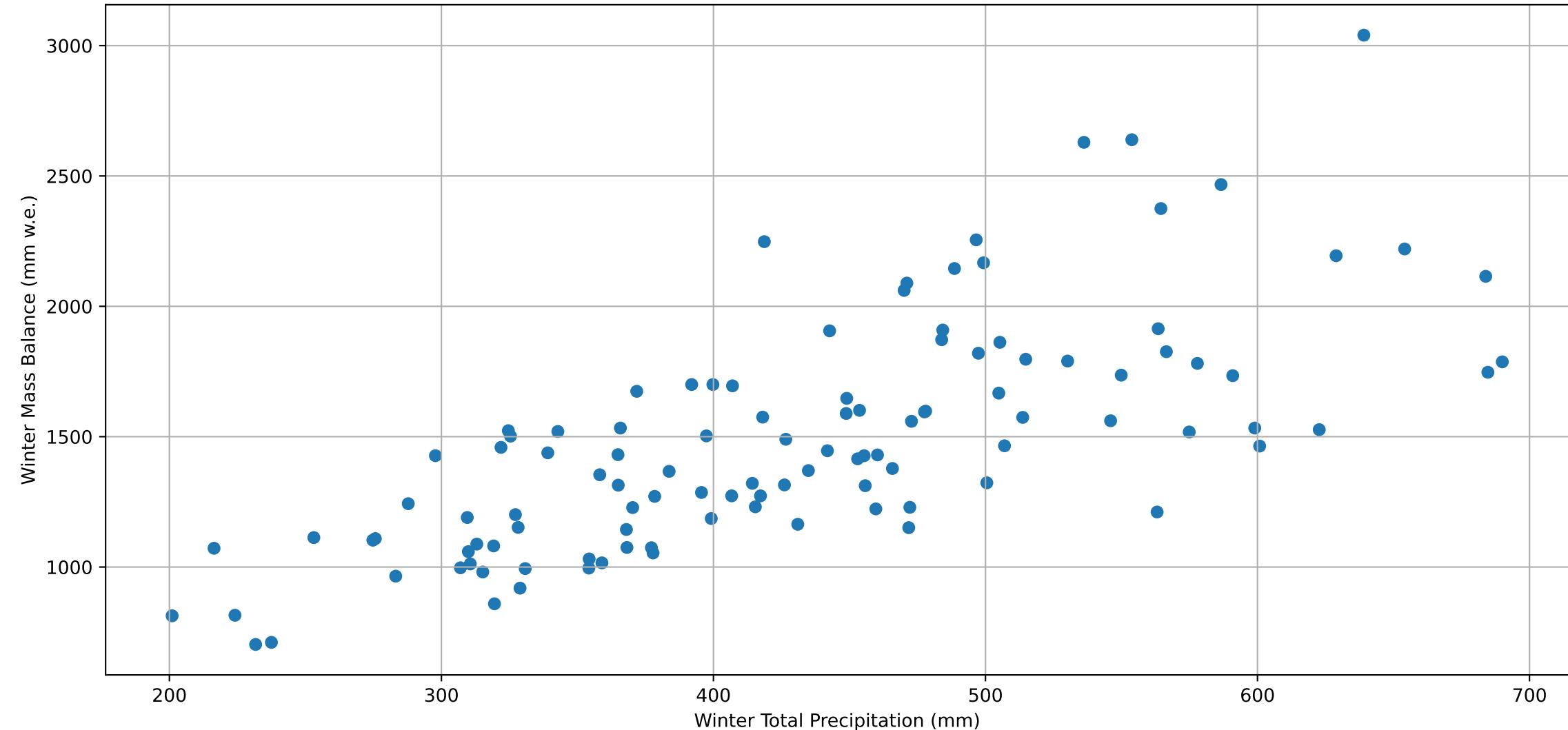
Davos Winter Total Precipitation



Silvrettagletscher Summer Mass Balance with relation to Temperature



Silvrettagletscher Winter Mass Balance with relation to Precipitation



Regression: Monthly 1961-1990

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MONTHLY DEVIATIONS ANALYSIS USING 1961-1990 CLIMATE NORMS

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MONTHLY DEVIATIONS for Silvrettagletscher (1961-1990 norms)

=====

Number of observations: 111

Regression Summary:

OLS Regression Results

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Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.730
Model:	OLS	Adj. R-squared:	0.697
Method:	Least Squares	F-statistic:	22.11
Date:	Fri, 05 Dec 2025	Prob (F-statistic):	8.96e-23
Time:	00:05:16	Log-Likelihood:	-841.07
No. Observations:	111	AIC:	1708.
Df Residuals:	98	BIC:	1743.
Df Model:	12		
Covariance Type:	nonrobust		

=====

	coef	std err	t	P> t	[0.025	0.975]
const	-97.6019	55.476	-1.759	0.082	-207.692	12.488
may_td	-82.7007	32.167	-2.571	0.012	-146.535	-18.867
june_td	-129.4217	30.488	-4.245	0.000	-189.924	-68.919
july_td	-186.8879	34.816	-5.368	0.000	-255.979	-117.797
august_td	-138.3572	36.665	-3.774	0.000	-211.118	-65.596
september_td	-144.9407	32.587	-4.448	0.000	-209.608	-80.273
october_pd	3.2888	1.205	2.729	0.008	0.897	5.680
november_pd	1.9937	1.141	1.747	0.084	-0.271	4.258
december_pd	3.3502	1.027	3.262	0.002	1.312	5.388
january_pd	2.1727	0.953	2.279	0.025	0.281	4.065
february_pd	2.8034	0.989	2.834	0.006	0.840	4.766
march_pd	3.0489	1.374	2.219	0.029	0.322	5.776
april_pd	3.1920	2.086	1.530	0.129	-0.948	7.332

=====

Omnibus:	9.671	Durbin-Watson:	1.744
Prob(Omnibus):	0.008	Jarque-Bera (JB):	9.749
Skew:	-0.621	Prob(JB):	0.00764
Kurtosis:	3.752	Cond. No.	65.3

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

Coefficient Interpretation:

Intercept (normal mass balance): -97.60 (p=0.0816)

may_td: -82.70 (p=0.0116)

june_td: -129.42 (p=0.0000)

july_td: -186.89 (p=0.0000)

august_td: -138.36 (p=0.0003)

september_td: -144.94 (p=0.0000)

october_pd: 3.29 (p=0.0075)

november_pd: 1.99 (p=0.0837)

december_pd: 3.35 (p=0.0015)

january_pd: 2.17 (p=0.0248)

february_pd: 2.80 (p=0.0056)

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 Silvrettagletscher (1961-1990 norms)
=====

Number of observations: 111

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.627
Model: OLS Adj. R-squared: 0.620
Method: Least Squares F-statistic: 90.75
Date: Fri, 05 Dec 2025 Prob (F-statistic): 7.51e-24
Time: 00:05:16 Log-Likelihood: -859.06
No. Observations: 111 AIC: 1724.
Df Residuals: 108 BIC: 1732.
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-77.3737	59.240	-1.306	0.194	-194.798	40.051
opt_season_td	-587.8772	45.620	-12.886	0.000	-678.304	-497.450
opt_season_pd	2.6514	0.533	4.975	0.000	1.595	3.708

=====

Omnibus: 5.726 Durbin-Watson: 1.809
Prob(Omnibus): 0.057 Jarque-Bera (JB): 5.201
Skew: -0.442 Prob(JB): 0.0742
Kurtosis: 3.587 Cond. No. 122.
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -77.37 (p=0.1943)
opt_season_td: -587.88 (p=0.0000)
opt_season_pd: 2.65 (p=0.0000)

Variance Inflation Factors (VIF):

	Variable	VIF
0	const	1.227043
1	opt_season_td	1.006793
2	opt_season_pd	1.006793

R-squared: 0.6269

Adjusted R-squared: 0.6200

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 Silvrettagletscher (1961-1990 norms)
=====

Number of observations: 111

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.714
Model: OLS Adj. R-squared: 0.709
Method: Least Squares F-statistic: 134.9
Date: Fri, 05 Dec 2025 Prob (F-statistic): 4.34e-30
Time: 00:05:16 Log-Likelihood: -844.30
No. Observations: 111 AIC: 1695.
Df Residuals: 108 BIC: 1703.
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-72.5907	51.014	-1.423	0.158	-173.709	28.528
summer_td	-690.0372	44.285	-15.582	0.000	-777.818	-602.256
winter_pd	2.8235	0.425	6.638	0.000	1.980	3.667

=====

Omnibus: 10.787 Durbin-Watson: 1.798
Prob(Omnibus): 0.005 Jarque-Bera (JB): 11.208
Skew: -0.659 Prob(JB): 0.00368
Kurtosis: 3.828 Cond. No. 134.
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -72.59 (p=0.1576)
summer_td: -690.04 (p=0.0000)
winter_pd: 2.82 (p=0.0000)

Variance Inflation Factors (VIF):

Variable	VIF
0 const	1.187213
1 summer_td	1.008990
2 winter_pd	1.008990

R-squared: 0.7141

Adjusted R-squared: 0.7088

Regression: Monthly 1991-2020

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MONTHLY DEVIATIONS ANALYSIS USING 1991-2020 CLIMATE NORMS

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MONTHLY DEVIATIONS for Silvrettagletscher (1991-2020 norms)

=====

Number of observations: 111

Regression Summary:

OLS Regression Results

=====

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.730
Model:	OLS	Adj. R-squared:	0.697
Method:	Least Squares	F-statistic:	22.11
Date:	Fri, 05 Dec 2025	Prob (F-statistic):	8.96e-23
Time:	00:05:16	Log-Likelihood:	-841.07
No. Observations:	111	AIC:	1708.
Df Residuals:	98	BIC:	1743.
Df Model:	12		
Covariance Type:	nonrobust		

=====

	coef	std err	t	P> t	[0.025	0.975]
const	-1012.9579	67.730	-14.956	0.000	-1147.366	-878.550
may_td	-82.7007	32.167	-2.571	0.012	-146.535	-18.867
june_td	-129.4217	30.488	-4.245	0.000	-189.924	-68.919
july_td	-186.8879	34.816	-5.368	0.000	-255.979	-117.797
august_td	-138.3572	36.665	-3.774	0.000	-211.118	-65.596
september_td	-144.9407	32.587	-4.448	0.000	-209.608	-80.273
october_pd	3.2888	1.205	2.729	0.008	0.897	5.680
november_pd	1.9937	1.141	1.747	0.084	-0.271	4.258
december_pd	3.3502	1.027	3.262	0.002	1.312	5.388
january_pd	2.1727	0.953	2.279	0.025	0.281	4.065
february_pd	2.8034	0.989	2.834	0.006	0.840	4.766
march_pd	3.0489	1.374	2.219	0.029	0.322	5.776
april_pd	3.1920	2.086	1.530	0.129	-0.948	7.332

=====

Omnibus:	9.671	Durbin-Watson:	1.744
Prob(Omnibus):	0.008	Jarque-Bera (JB):	9.749
Skew:	-0.621	Prob(JB):	0.00764
Kurtosis:	3.752	Cond. No.	80.0

=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -1012.96 (p=0.0000)

may_td: -82.70 (p=0.0116)

june_td: -129.42 (p=0.0000)

july_td: -186.89 (p=0.0000)

august_td: -138.36 (p=0.0003)

september_td: -144.94 (p=0.0000)

october_pd: 3.29 (p=0.0075)

november_pd: 1.99 (p=0.0837)

december_pd: 3.35 (p=0.0015)

january_pd: 2.17 (p=0.0248)

february_pd: 2.80 (p=0.0056)

Regression: Optimal 1991-2020

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OPTIMAL SEASONAL DEVIATIONS ANALYSIS USING 1991-2020 CLIMATE NORMS
=====

=====
OPTIMAL SEASONAL DEVIATIONS for Silvrettagletscher (1991-2020 norms)
=====

Number of observations: 111

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.627
Model: OLS Adj. R-squared: 0.620
Method: Least Squares F-statistic: 90.75
Date: Fri, 05 Dec 2025 Prob (F-statistic): 7.51e-24
Time: 00:05:16 Log-Likelihood: -859.06
No. Observations: 111 AIC: 1724.
Df Residuals: 108 BIC: 1732.
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-1016.9993	74.517	-13.648	0.000	-1164.705	-869.294
opt_season_td	-587.8772	45.620	-12.886	0.000	-678.304	-497.450
opt_season_pd	2.6514	0.533	4.975	0.000	1.595	3.708

=====

Omnibus: 5.726 Durbin-Watson: 1.809
Prob(Omnibus): 0.057 Jarque-Bera (JB): 5.201
Skew: -0.442 Prob(JB): 0.0742
Kurtosis: 3.587 Cond. No. 156.
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -1017.00 (p=0.0000)
opt_season_td: -587.88 (p=0.0000)
opt_season_pd: 2.65 (p=0.0000)

Variance Inflation Factors (VIF):

	Variable	VIF
0	const	1.941487
1	opt_season_td	1.006793
2	opt_season_pd	1.006793

R-squared: 0.6269

Adjusted R-squared: 0.6200

Regression: Seasonal 1991-2020

=====
SUMMER/WINTER SEASONAL DEVIATIONS ANALYSIS USING 1991-2020 CLIMATE NORMS
=====

=====
SUMMER/WINTER SEASONAL DEVIATIONS for Silvrettagletscher (1991-2020 norms)
=====

Number of observations: 111

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.714
Model: OLS Adj. R-squared: 0.709
Method: Least Squares F-statistic: 134.9
Date: Fri, 05 Dec 2025 Prob (F-statistic): 4.34e-30
Time: 00:05:16 Log-Likelihood: -844.30
No. Observations: 111 AIC: 1695.
Df Residuals: 108 BIC: 1703.
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-1017.5852	64.008	-15.898	0.000	-1144.460	-890.710
summer_td	-690.0372	44.285	-15.582	0.000	-777.818	-602.256
winter_pd	2.8235	0.425	6.638	0.000	1.980	3.667

=====

Omnibus: 10.787 Durbin-Watson: 1.798
Prob(Omnibus): 0.005 Jarque-Bera (JB): 11.208
Skew: -0.659 Prob(JB): 0.00368
Kurtosis: 3.828 Cond. No. 173.
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -1017.59 (p=0.0000)
summer_td: -690.04 (p=0.0000)
winter_pd: 2.82 (p=0.0000)

Variance Inflation Factors (VIF):

Variable	VIF
0 const	1.869045
1 summer_td	1.008990
2 winter_pd	1.008990

R-squared: 0.7141

Adjusted R-squared: 0.7088