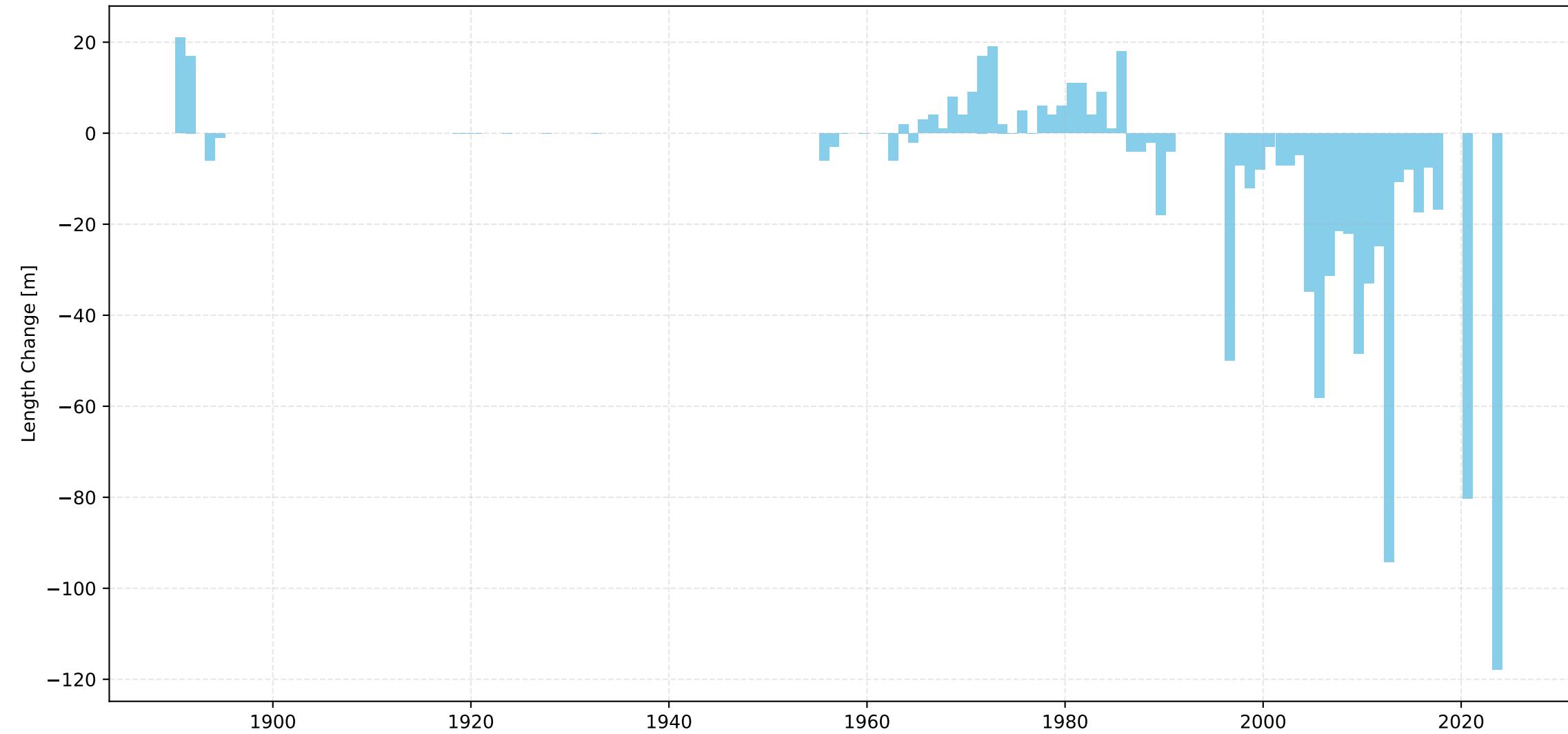
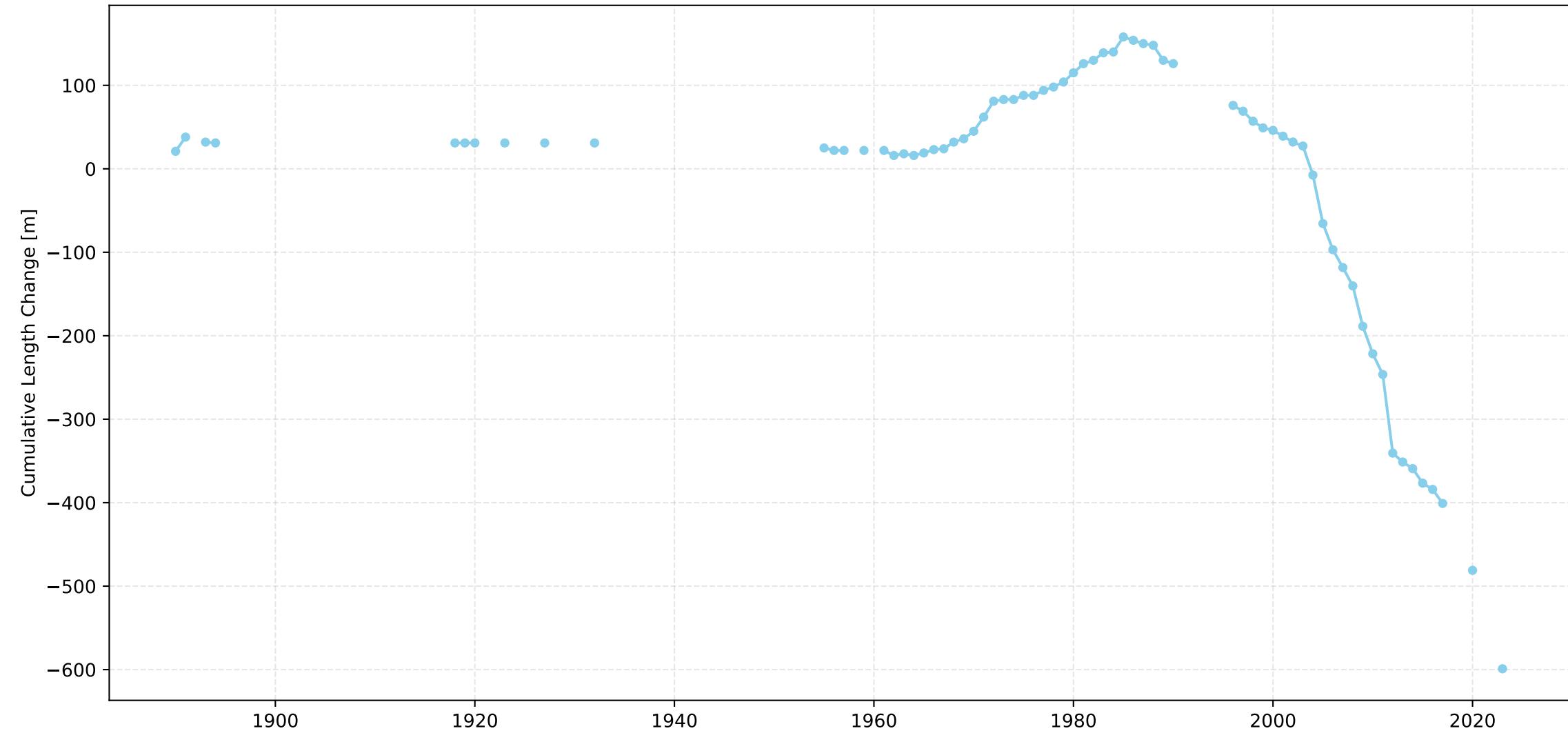


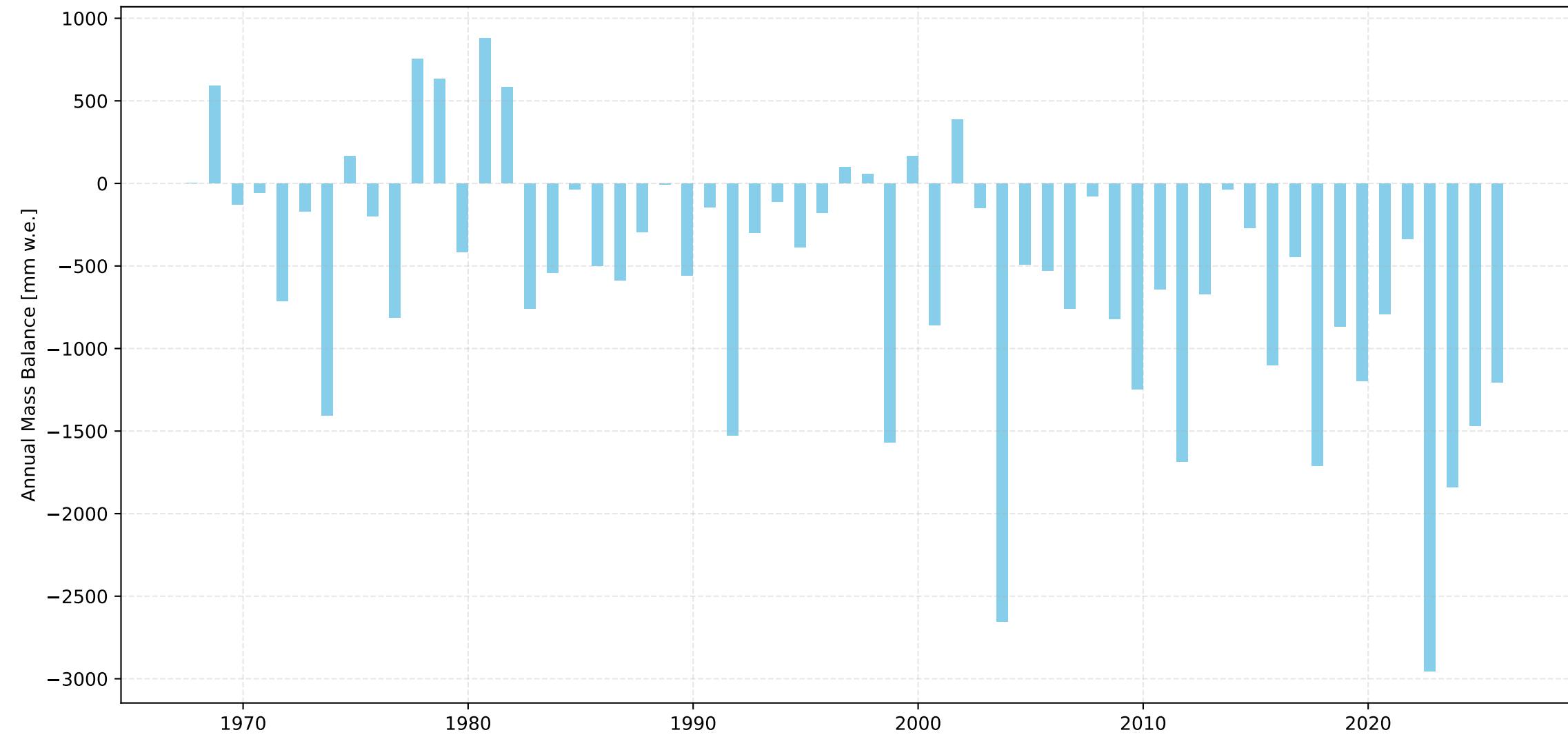
Glacier du Giétra Length Change Over Time



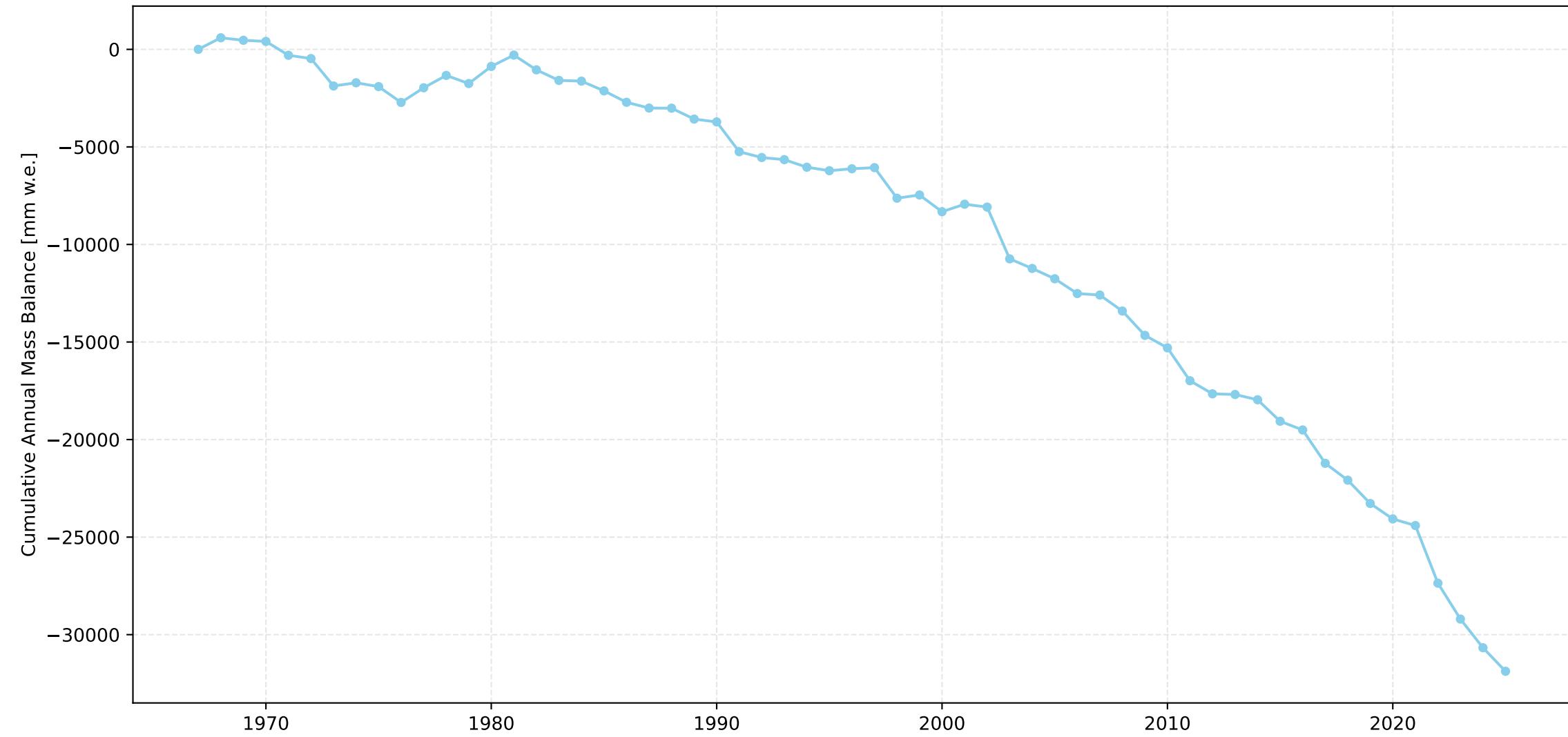
Glacier du Giéstro Cumulative Length Change Over Time



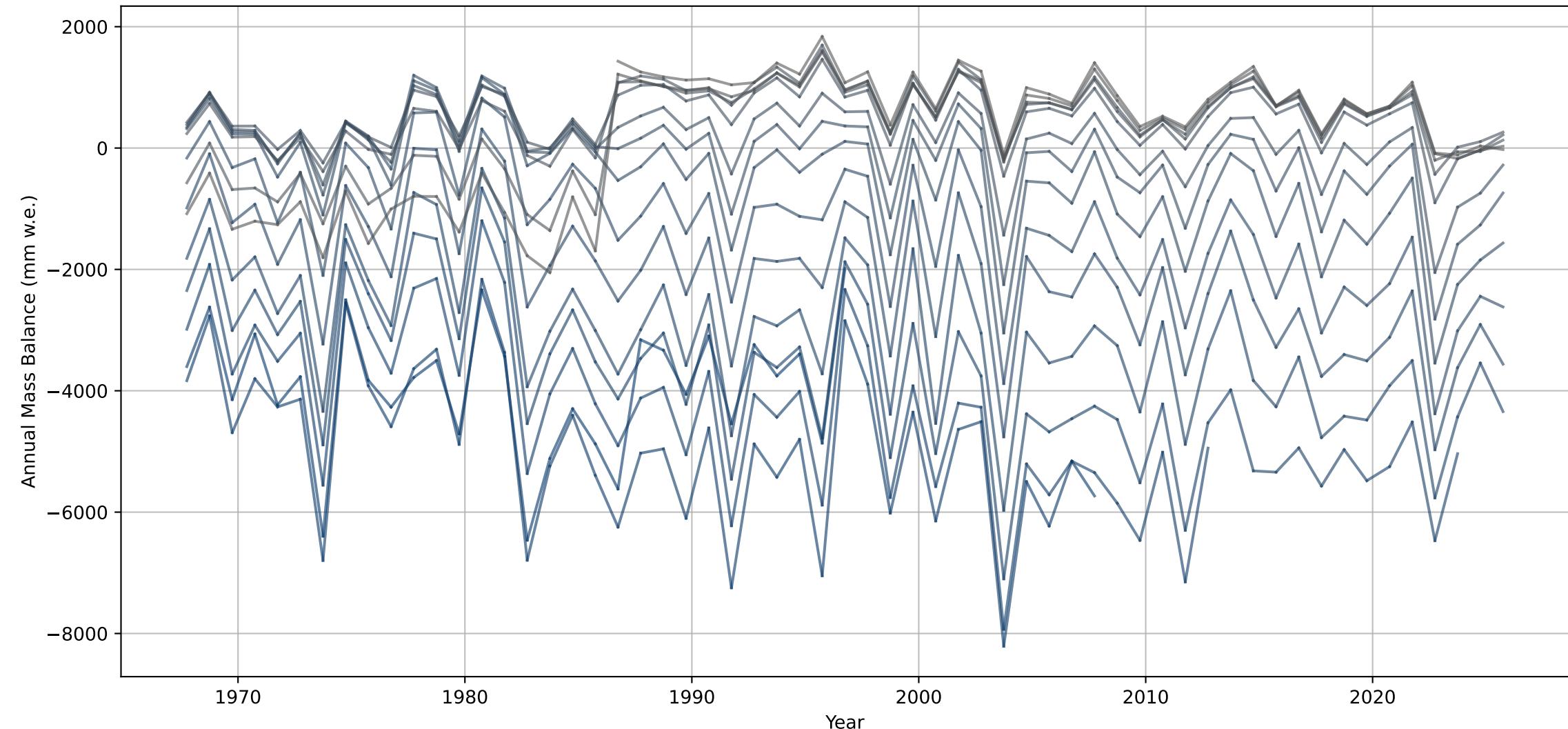
Glacier du Giétre Annual Mass Balance Over Time



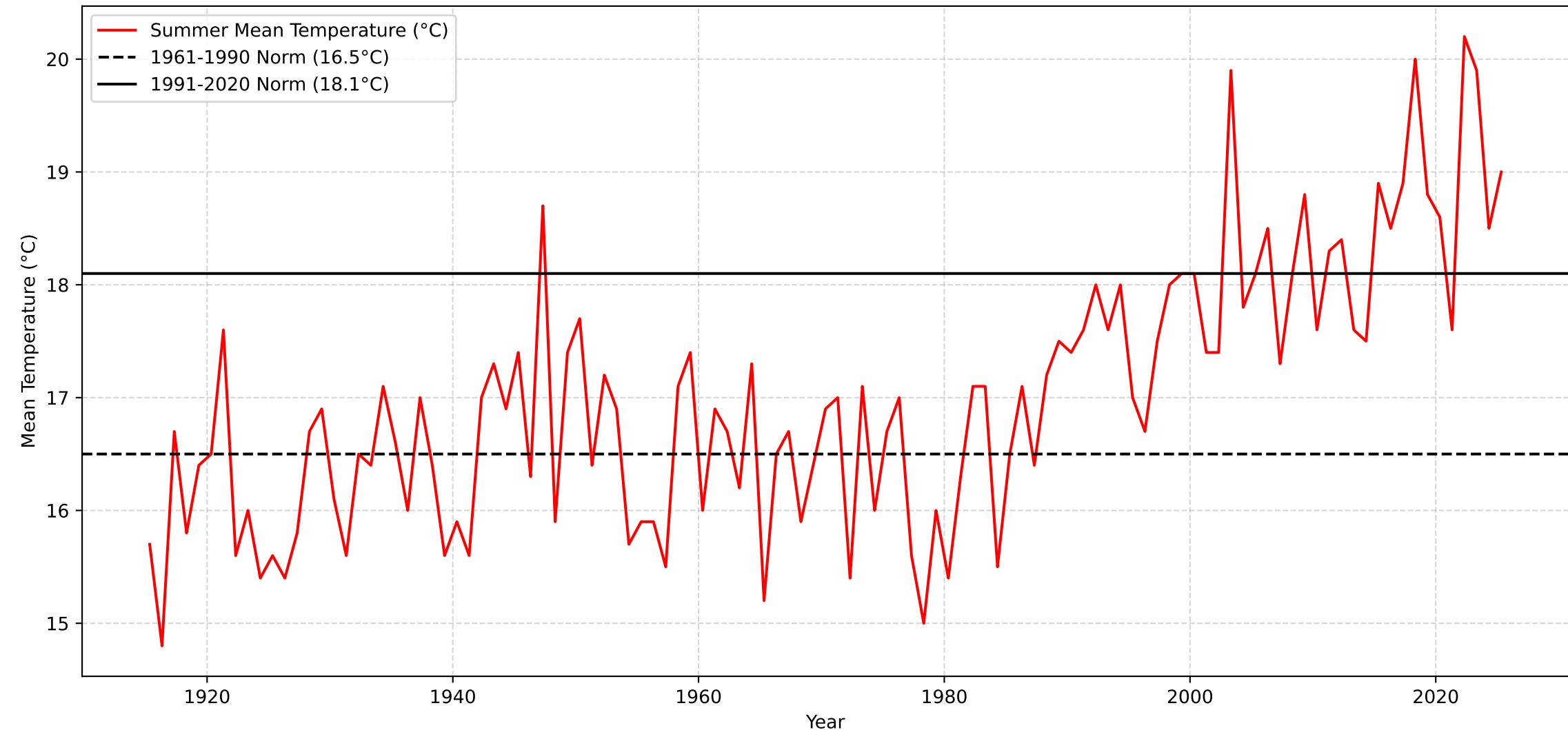
Glacier du Giétre Cumulative Annual Mass Balance Over Time



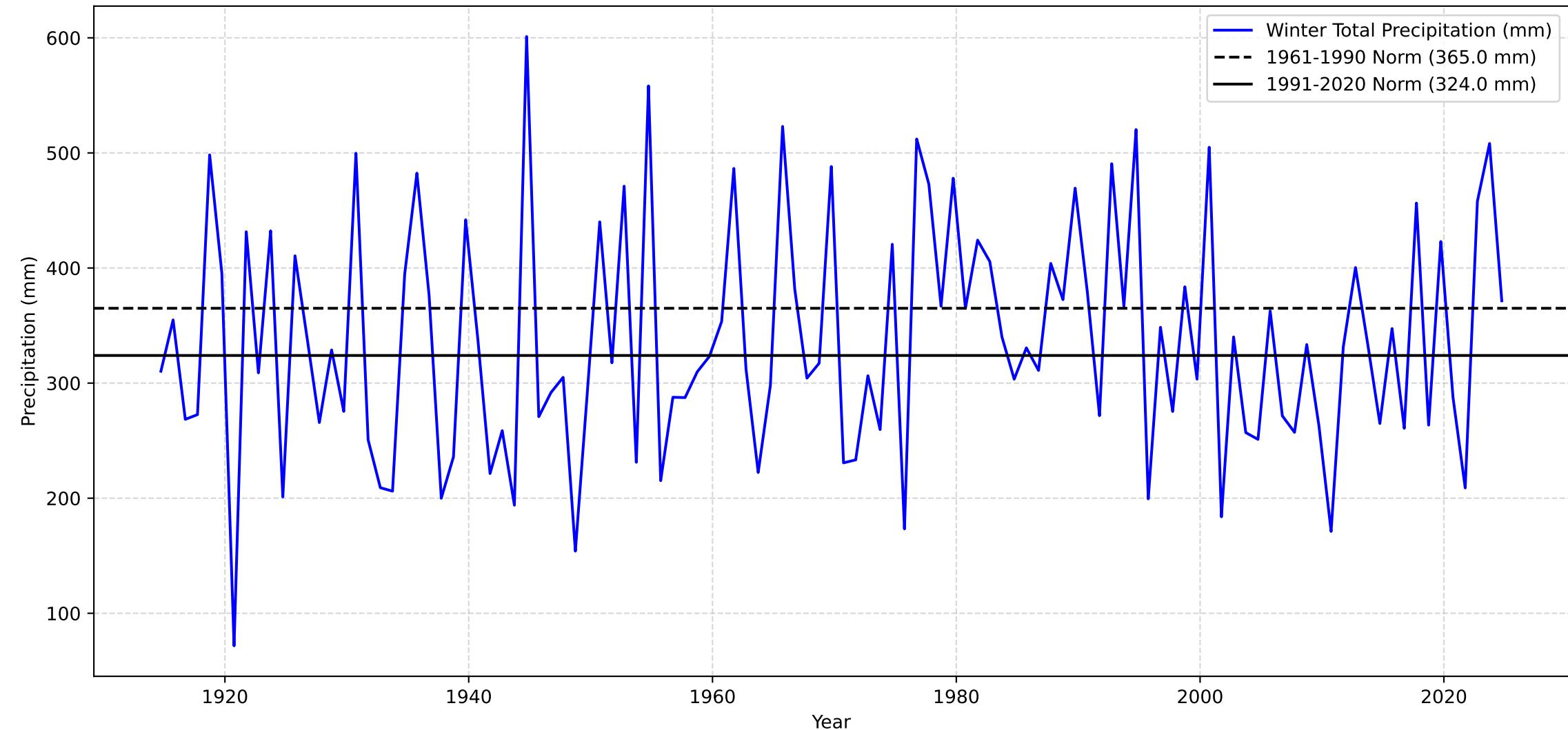
Annual Mass Balance for each Elevation Bin over Time - Glacier du Giéstro



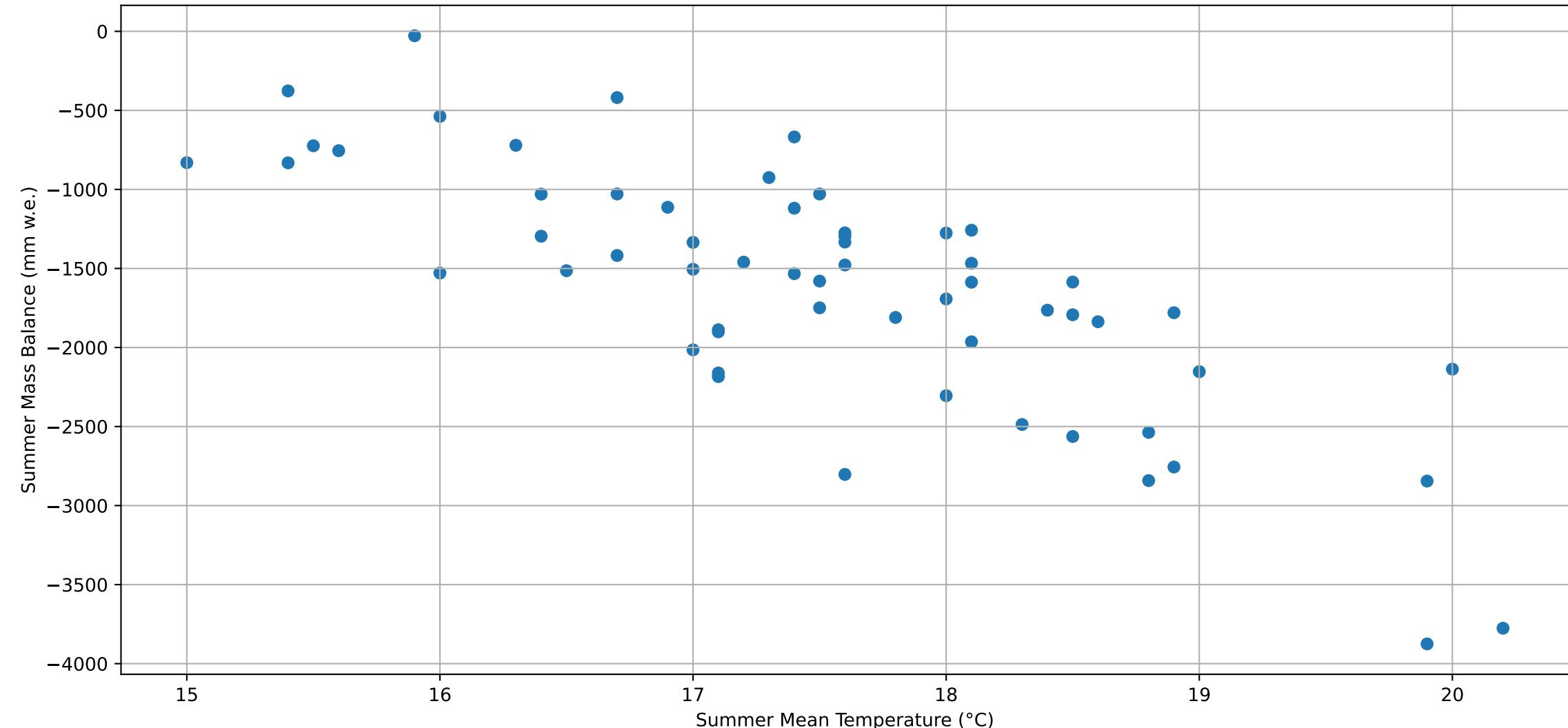
Sion Summer Mean Temperature



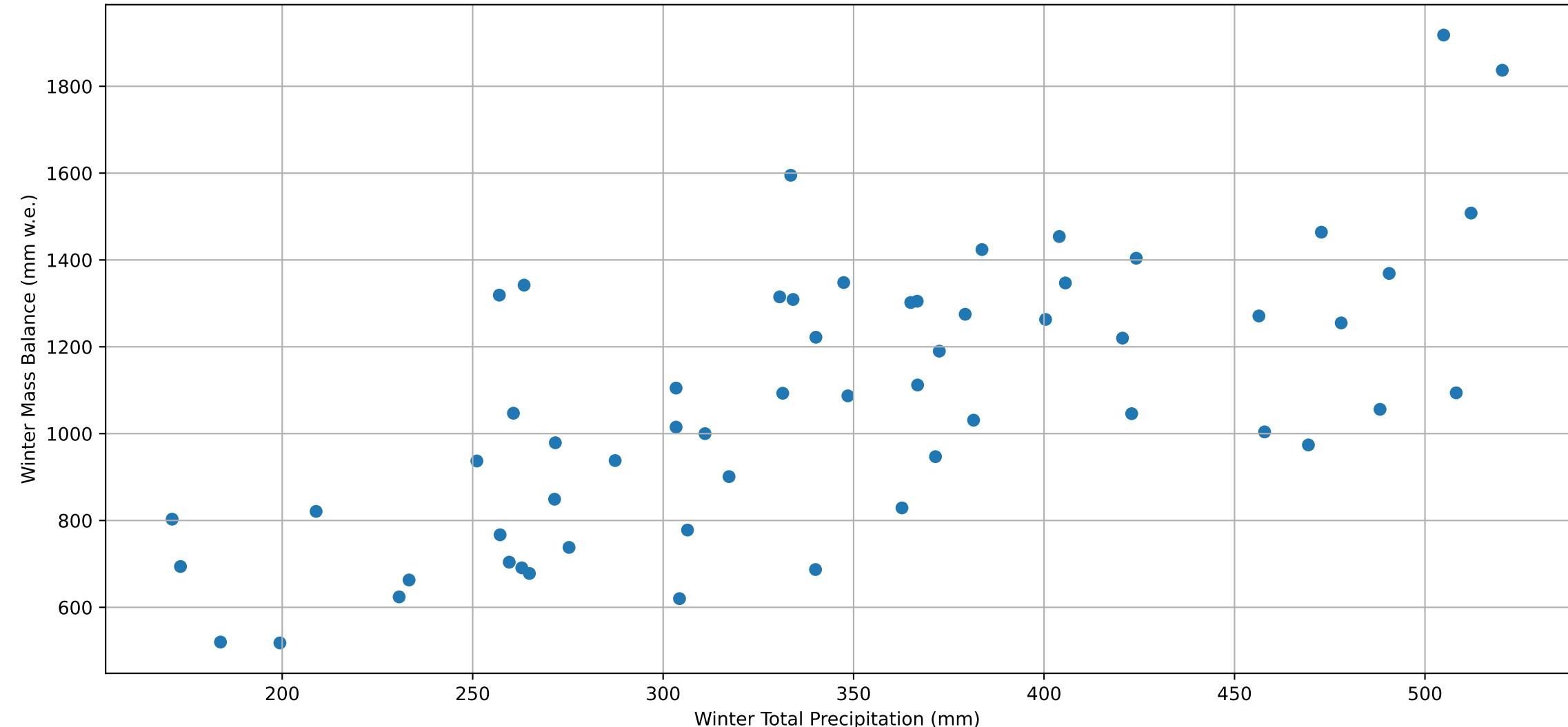
Sion Winter Total Precipitation



Glacier du Giéstro Summer Mass Balance with relation to Temperature



Glacier du Giétro 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 Glacier du Giéstro (1961-1990 norms)
=====

Number of observations: 59

Regression Summary:

OLS Regression Results

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Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.703
Model:	OLS	Adj. R-squared:	0.625
Method:	Least Squares	F-statistic:	9.065
Date:	Fri, 05 Dec 2025	Prob (F-statistic):	1.40e-08
Time:	00:05:39	Log-Likelihood:	-438.92
No. Observations:	59	AIC:	903.8
Df Residuals:	46	BIC:	930.9
Df Model:	12		
Covariance Type:	nonrobust		

=====

	coef	std err	t	P> t	[0.025	0.975]
const	2.7952	83.806	0.033	0.974	-165.897	171.488
may_td	-38.2728	50.064	-0.764	0.448	-139.046	62.500
june_td	-89.3936	45.822	-1.951	0.057	-181.629	2.842
july_td	-145.8930	49.850	-2.927	0.005	-246.235	-45.551
august_td	-120.0130	61.355	-1.956	0.057	-243.515	3.489
september_td	-75.7921	47.156	-1.607	0.115	-170.713	19.129
october_pd	2.3180	2.186	1.060	0.295	-2.083	6.719
november_pd	-1.5704	1.698	-0.925	0.360	-4.988	1.847
december_pd	1.3308	1.522	0.874	0.386	-1.733	4.395
january_pd	3.3608	1.667	2.017	0.050	0.006	6.715
february_pd	2.8796	1.417	2.032	0.048	0.027	5.732
march_pd	1.7271	1.961	0.881	0.383	-2.219	5.674
april_pd	3.1540	2.942	1.072	0.289	-2.768	9.076

=====

Omnibus:	1.577	Durbin-Watson:	2.085
Prob(Omnibus):	0.454	Jarque-Bera (JB):	1.584
Skew:	-0.345	Prob(JB):	0.453
Kurtosis:	2.589	Cond. No.	70.8

=====

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

Coefficient Interpretation:

Intercept (normal mass balance): 2.80 (p=0.9735)

may_td: -38.27 (p=0.4485)

june_td: -89.39 (p=0.0572)

july_td: -145.89 (p=0.0053)

august_td: -120.01 (p=0.0565)

september_td: -75.79 (p=0.1148)

october_pd: 2.32 (p=0.2946)

november_pd: -1.57 (p=0.3598)

december_pd: 1.33 (p=0.3865)

january_pd: 3.36 (p=0.0496)

february_pd: 2.88 (p=0.6192)

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 Glacier du Giéstro (1961-1990 norms)
=====

Number of observations: 59

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.613
Model: OLS Adj. R-squared: 0.599
Method: Least Squares F-statistic: 44.31
Date: Fri, 05 Dec 2025 Prob (F-statistic): 2.91e-12
Time: 00:05:39 Log-Likelihood: -446.73
No. Observations: 59 AIC: 899.5
Df Residuals: 56 BIC: 905.7
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-18.0295	84.349	-0.214	0.832	-187.001	150.942
opt_season_td	-446.5694	50.418	-8.857	0.000	-547.570	-345.569
opt_season_pd	1.4813	0.792	1.869	0.067	-0.106	3.069

=====

Omnibus: 1.903 Durbin-Watson: 2.018
Prob(Omnibus): 0.386 Jarque-Bera (JB): 1.697
Skew: -0.409 Prob(JB): 0.428
Kurtosis: 2.857 Cond. No. 119.
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -18.03 (p=0.8315)
opt_season_td: -446.57 (p=0.0000)
opt_season_pd: 1.48 (p=0.0668)

Variance Inflation Factors (VIF):

	Variable	VIF
0	const	1.803517
1	opt_season_td	1.021486
2	opt_season_pd	1.021486

R-squared: 0.6128

Adjusted R-squared: 0.5989

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 Glacier du Giétra (1961-1990 norms)
=====

Number of observations: 59

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.639
Model: OLS Adj. R-squared: 0.626
Method: Least Squares F-statistic: 49.53
Date: Fri, 05 Dec 2025 Prob (F-statistic): 4.12e-13
Time: 00:05:39 Log-Likelihood: -444.67
No. Observations: 59 AIC: 895.3
Df Residuals: 56 BIC: 901.6
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-0.5130	81.722	-0.006	0.995	-164.221	163.195
summer_td	-482.4056	52.396	-9.207	0.000	-587.367	-377.444
winter_pd	1.8067	0.663	2.725	0.009	0.479	3.135

=====

Omnibus: 2.416 Durbin-Watson: 2.076
Prob(Omnibus): 0.299 Jarque-Bera (JB): 2.319
Skew: -0.422 Prob(JB): 0.314
Kurtosis: 2.521 Cond. No. 140.
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -0.51 (p=0.9950)
summer_td: -482.41 (p=0.0000)
winter_pd: 1.81 (p=0.0086)

Variance Inflation Factors (VIF):

Variable	VIF
0 const	1.815207
1 summer_td	1.012704
2 winter_pd	1.012704

R-squared: 0.6388

Adjusted R-squared: 0.6259

Regression: Monthly 1991-2020

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MONTHLY DEVIATIONS ANALYSIS USING 1991-2020 CLIMATE NORMS
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MONTHLY DEVIATIONS for Glacier du Giéstro (1991-2020 norms)
=====

Number of observations: 59

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.703
Model: OLS Adj. R-squared: 0.625
Method: Least Squares F-statistic: 9.065
Date: Fri, 05 Dec 2025 Prob (F-statistic): 1.40e-08
Time: 00:05:39 Log-Likelihood: -438.92
No. Observations: 59 AIC: 903.8
Df Residuals: 46 BIC: 930.9
Df Model: 12
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-848.2916	69.883	-12.139	0.000	-988.959	-707.625
may_td	-38.2728	50.064	-0.764	0.448	-139.046	62.500
june_td	-89.3936	45.822	-1.951	0.057	-181.629	2.842
july_td	-145.8930	49.850	-2.927	0.005	-246.235	-45.551
august_td	-120.0130	61.355	-1.956	0.057	-243.515	3.489
september_td	-75.7921	47.156	-1.607	0.115	-170.713	19.129
october_pd	2.3180	2.186	1.060	0.295	-2.083	6.719
november_pd	-1.5704	1.698	-0.925	0.360	-4.988	1.847
december_pd	1.3308	1.522	0.874	0.386	-1.733	4.395
january_pd	3.3608	1.667	2.017	0.050	0.006	6.715
february_pd	2.8796	1.417	2.032	0.048	0.027	5.732
march_pd	1.7271	1.961	0.881	0.383	-2.219	5.674
april_pd	3.1540	2.942	1.072	0.289	-2.768	9.076

=====

Omnibus: 1.577 Durbin-Watson: 2.085
Prob(Omnibus): 0.454 Jarque-Bera (JB): 1.584
Skew: -0.345 Prob(JB): 0.453
Kurtosis: 2.589 Cond. No. 59.6
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -848.29 (p=0.0000)

may_td: -38.27 (p=0.4485)

june_td: -89.39 (p=0.0572)

july_td: -145.89 (p=0.0053)

august_td: -120.01 (p=0.0565)

september_td: -75.79 (p=0.1148)

october_pd: 2.32 (p=0.2946)

november_pd: -1.57 (p=0.3598)

december_pd: 1.33 (p=0.3865)

january_pd: 3.36 (p=0.0496)

february_pd: 2.88 (p=0.6192)

Regression: Optimal 1991-2020

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

=====
OPTIMAL SEASONAL DEVIATIONS for Glacier du Giéstro (1991-2020 norms)
=====

Number of observations: 59

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.613
Model: OLS Adj. R-squared: 0.599
Method: Least Squares F-statistic: 44.31
Date: Fri, 05 Dec 2025 Prob (F-statistic): 2.91e-12
Time: 00:05:39 Log-Likelihood: -446.73
No. Observations: 59 AIC: 899.5
Df Residuals: 56 BIC: 905.7
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-851.3509	70.979	-11.994	0.000	-993.538	-709.163
opt_season_td	-446.5694	50.418	-8.857	0.000	-547.570	-345.569
opt_season_pd	1.4813	0.792	1.869	0.067	-0.106	3.069

=====

Omnibus: 1.903 Durbin-Watson: 2.018
Prob(Omnibus): 0.386 Jarque-Bera (JB): 1.697
Skew: -0.409 Prob(JB): 0.428
Kurtosis: 2.857 Cond. No. 98.8
=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -851.35 (p=0.0000)
opt_season_td: -446.57 (p=0.0000)
opt_season_pd: 1.48 (p=0.0668)

Variance Inflation Factors (VIF):

	Variable	VIF
0	const	1.277080
1	opt_season_td	1.021486
2	opt_season_pd	1.021486

R-squared: 0.6128

Adjusted R-squared: 0.5989

Regression: Seasonal 1991-2020

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

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SUMMER/WINTER SEASONAL DEVIATIONS for Glacier du Giétra (1991-2020 norms)
=====

Number of observations: 59

Regression Summary:

OLS Regression Results

=====
Dep. Variable: annual mass balance (mm w.e.) R-squared: 0.639
Model: OLS Adj. R-squared: 0.626
Method: Least Squares F-statistic: 49.53
Date: Fri, 05 Dec 2025 Prob (F-statistic): 4.12e-13
Time: 00:05:39 Log-Likelihood: -444.67
No. Observations: 59 AIC: 895.3
Df Residuals: 56 BIC: 901.6
Df Model: 2
Covariance Type: nonrobust
=====

	coef	std err	t	P> t	[0.025	0.975]
const	-866.2990	68.944	-12.565	0.000	-1004.410	-728.188
summer_td	-482.4056	52.396	-9.207	0.000	-587.367	-377.444
winter_pd	1.8067	0.663	2.725	0.009	0.479	3.135

=====

Omnibus:	2.416	Durbin-Watson:	2.076
Prob(Omnibus):	0.299	Jarque-Bera (JB):	2.319
Skew:	-0.422	Prob(JB):	0.314
Kurtosis:	2.521	Cond. No.	116.

=====

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

Coefficient Interpretation:

Intercept (normal mass balance): -866.30 (p=0.0000)
summer_td: -482.41 (p=0.0000)
winter_pd: 1.81 (p=0.0086)

Variance Inflation Factors (VIF):

Variable	VIF
0 const	1.291950
1 summer_td	1.012704
2 winter_pd	1.012704

R-squared: 0.6388

Adjusted R-squared: 0.6259