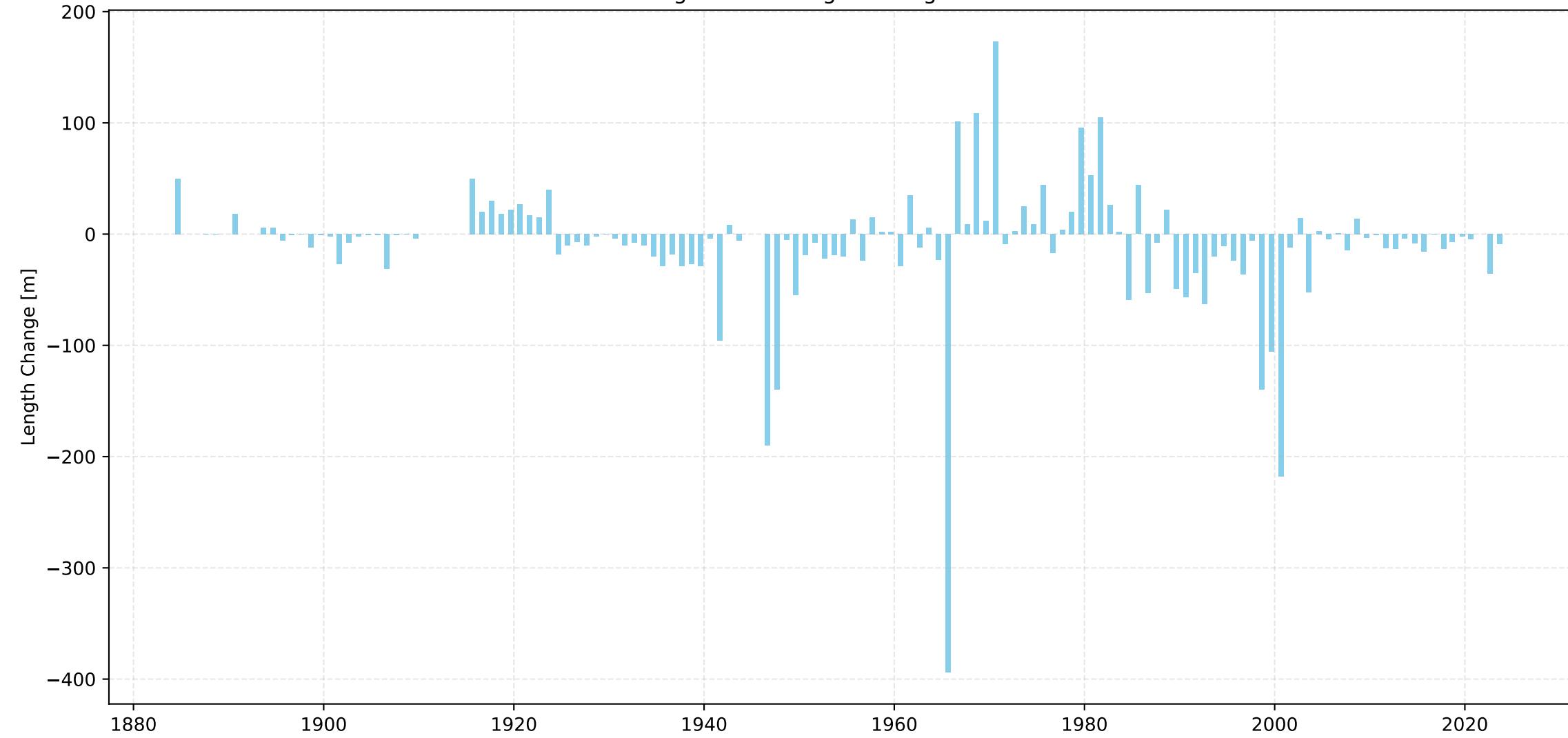
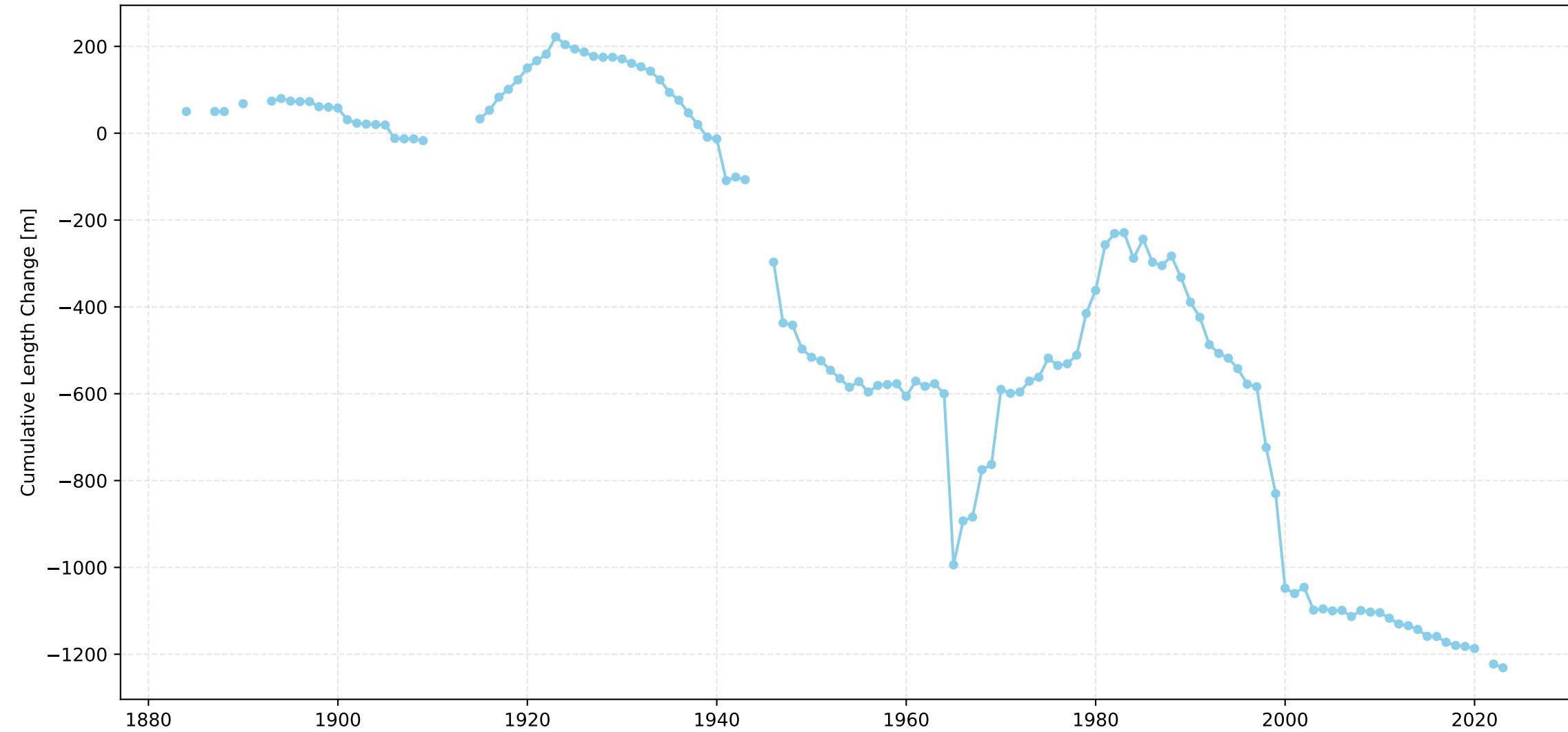


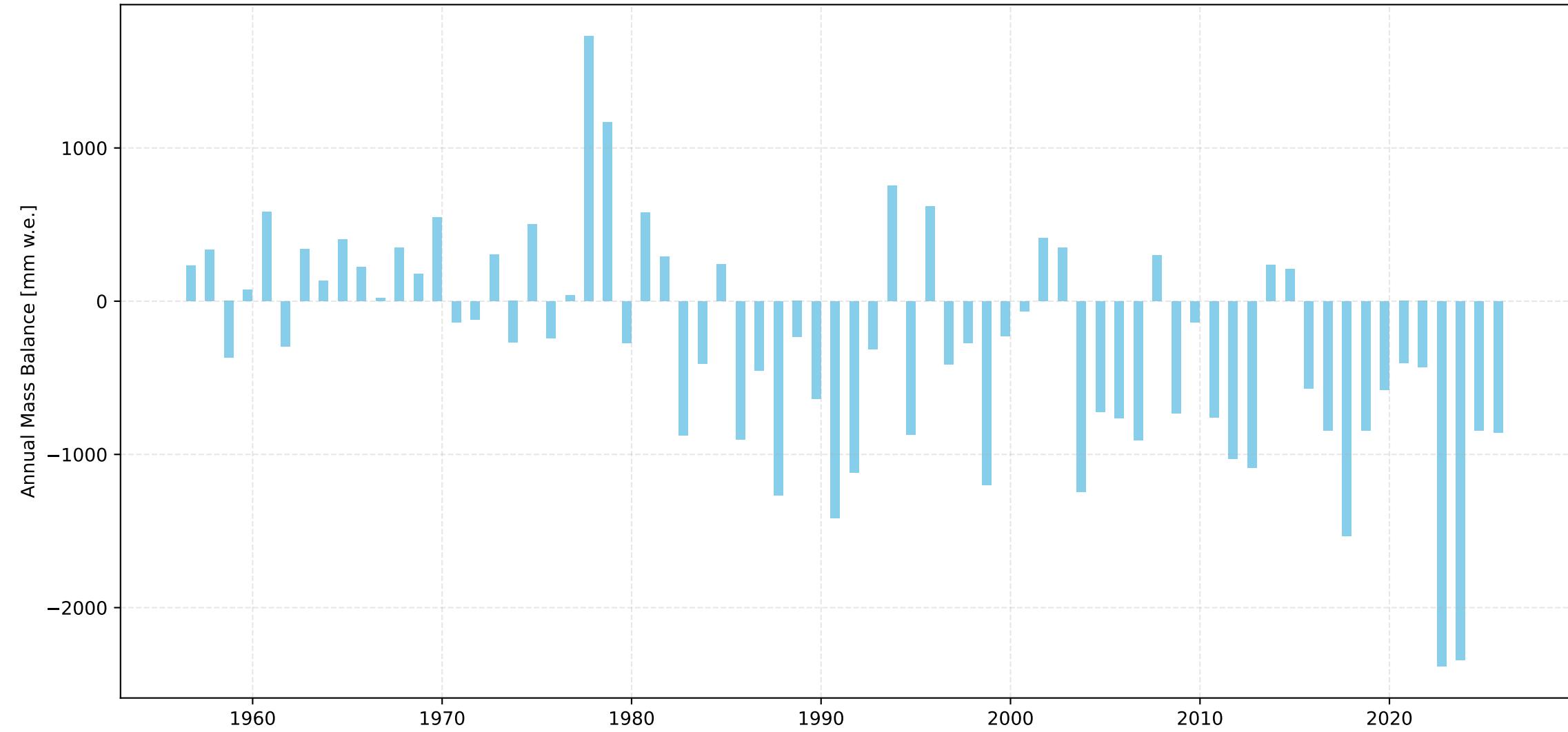
Allalingletscher Length Change Over Time



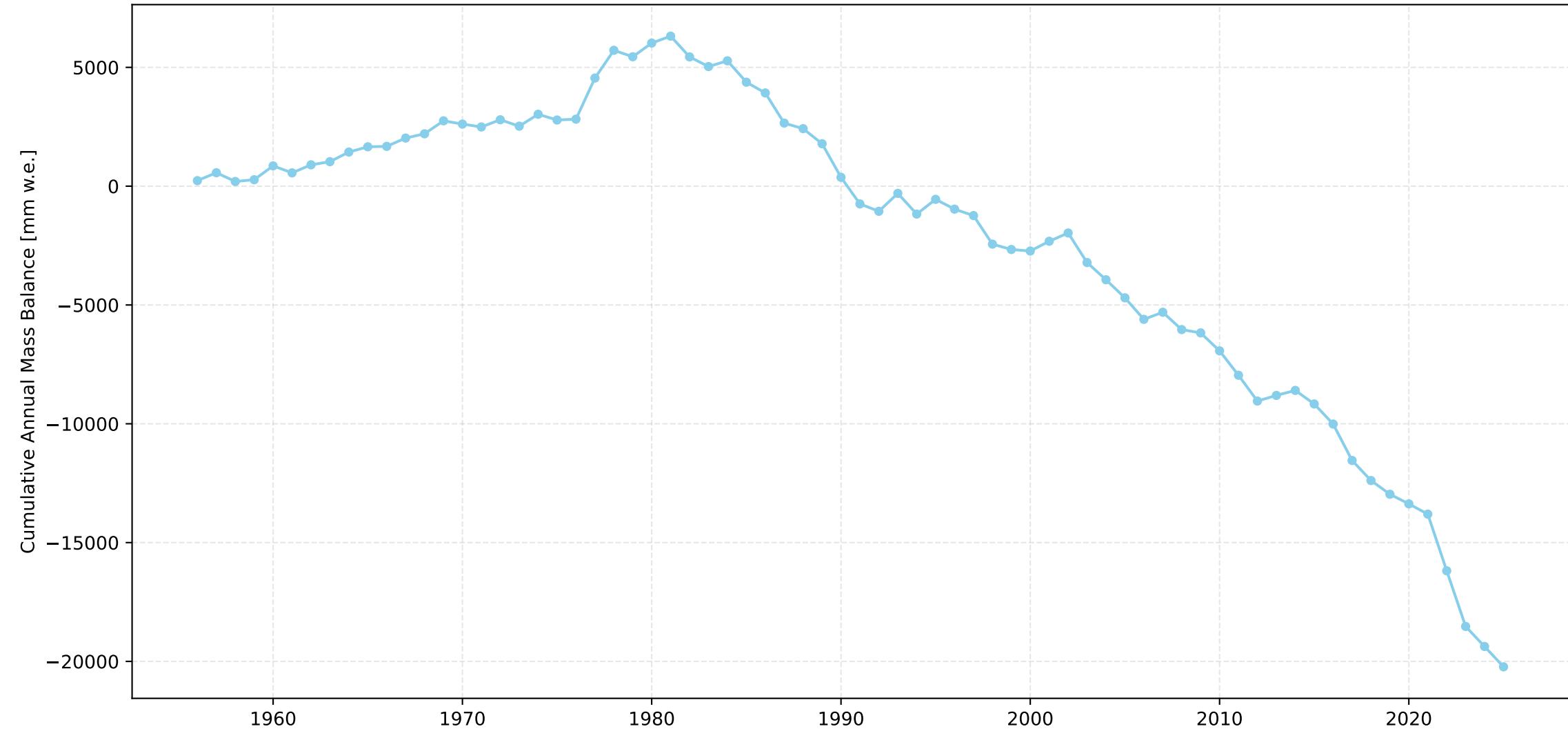
Allalingletscher Cumulative Length Change Over Time



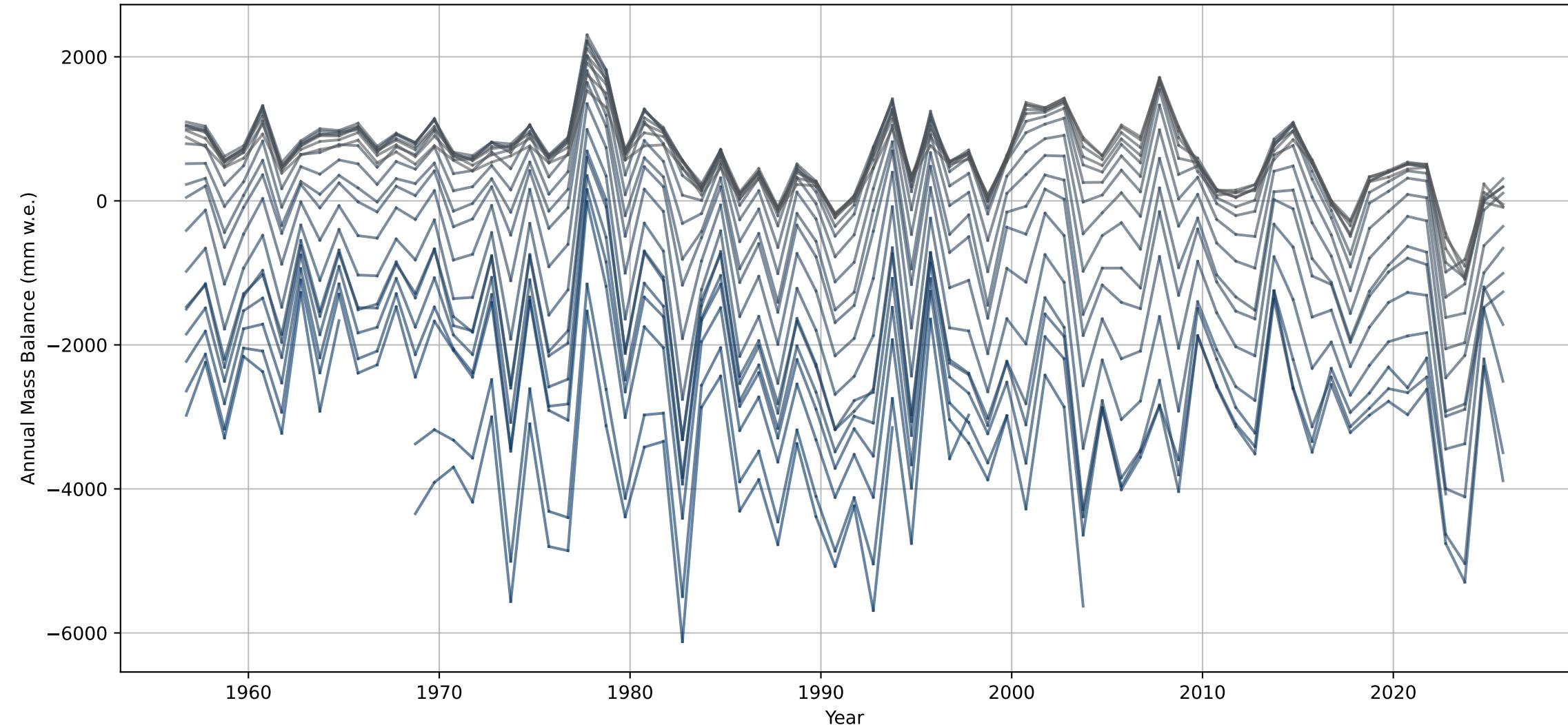
Allalingletscher Annual Mass Balance Over Time



Allalingletscher Cumulative Annual Mass Balance Over Time



Annual Mass Balance for each Elevation Bin over Time - Allalingletscher



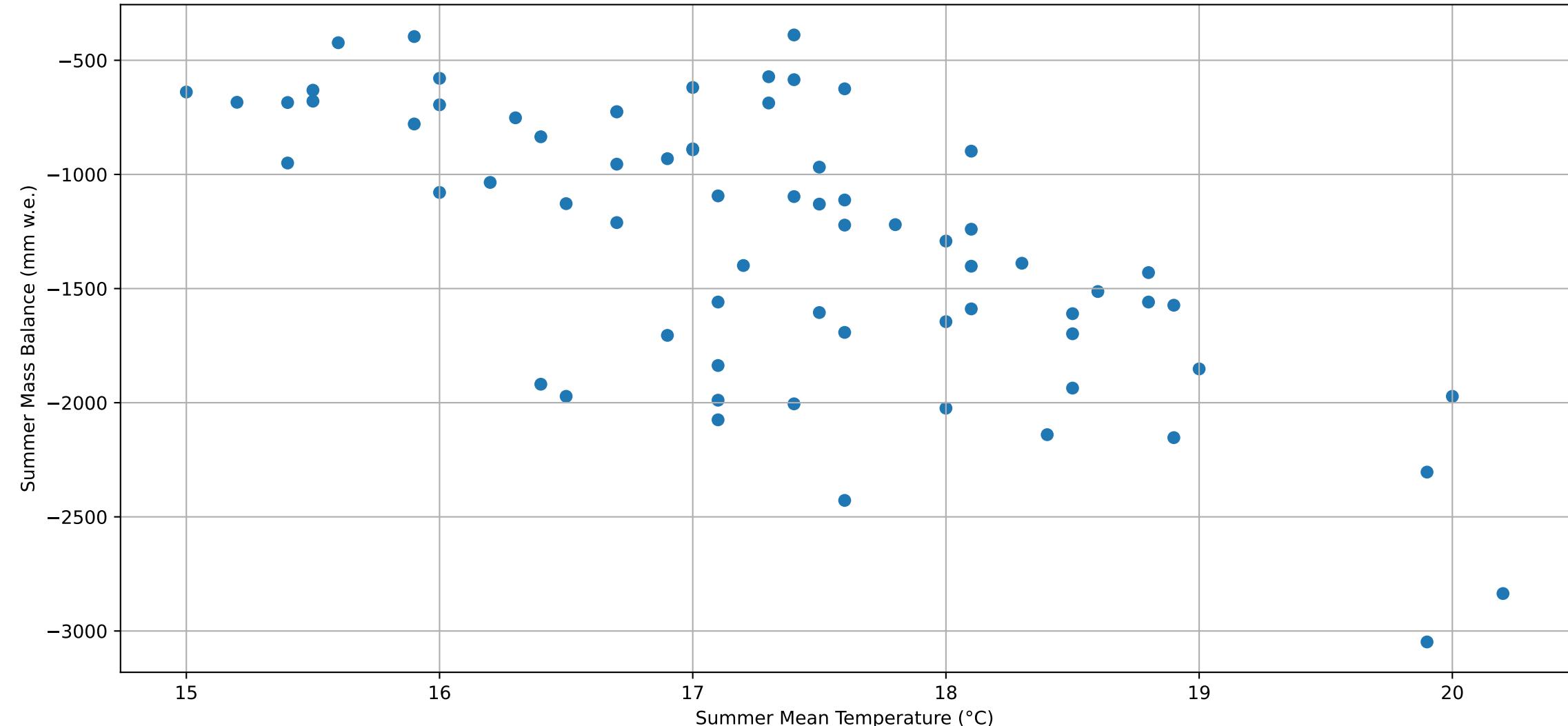
Sion Summer Mean Temperature



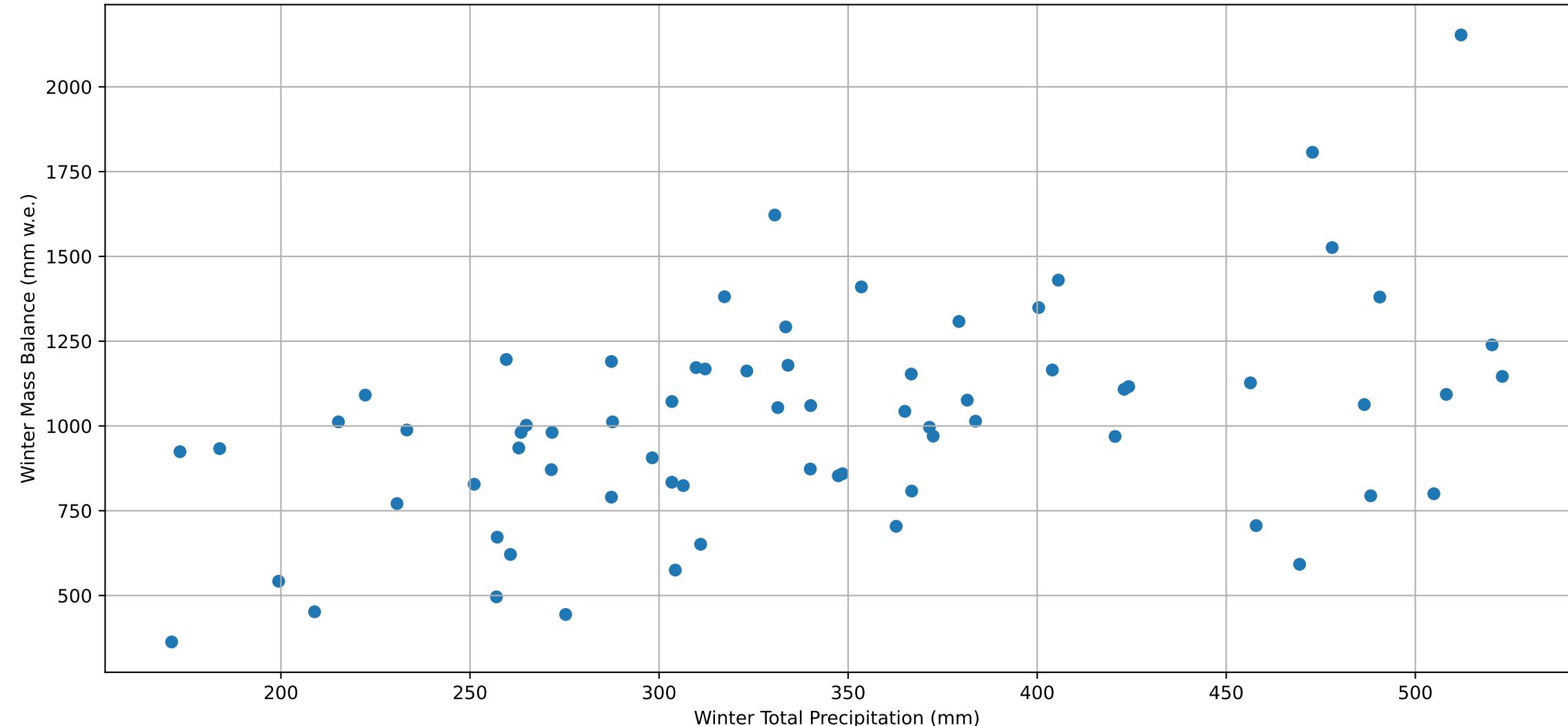
Sion Winter Total Precipitation



Allalingletscher Summer Mass Balance with relation to Temperature



Allalingletscher Winter Mass Balance with relation to Precipitation



Regression: Monthly 1961-1990

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MONTHLY DEVIATIONS for Allalingletscher using 1961-1990 climate norms
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Correlation Analysis with Significance Testing:

Skipping constant column: const

	Variable	Correlation Coefficient	P-value	Significant (p < 0.05)
3	august_td	-0.575838	1.834509e-07	True
2	july_td	-0.569002	2.755457e-07	True
4	september_td	-0.524591	3.138374e-06	True
1	june_td	-0.507660	7.269171e-06	True
0	may_td	-0.383095	1.062868e-03	True
9	february_pd	0.191023	1.131806e-01	False
6	november_pd	0.139067	2.509042e-01	False
10	march_pd	0.078152	5.201751e-01	False
7	december_pd	-0.056406	6.427920e-01	False
5	october_pd	0.049693	6.828859e-01	False
11	april_pd	-0.033442	7.834401e-01	False
8	january_pd	0.026701	8.263267e-01	False

Number of observations: 70

Regression Summary:

OLS Regression Results

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.577
Model:	OLS	Adj. R-squared:	0.488
Method:	Least Squares	F-statistic:	6.472
Date:	Wed, 17 Dec 2025	Prob (F-statistic):	4.26e-07
Time:	20:25:23	Log-Likelihood:	-530.10
No. Observations:	70	AIC:	1086.
Df Residuals:	57	BIC:	1115.
Df Model:	12		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	115.7522	81.059	1.428	0.159	-46.565	278.069
may_td	-35.6575	49.823	-0.716	0.477	-135.427	64.112
june_td	-43.8331	46.968	-0.933	0.355	-137.885	50.218
july_td	-107.0402	50.392	-2.124	0.038	-207.949	-6.132
august_td	-116.1017	59.460	-1.953	0.056	-235.168	2.965
september_td	-150.8187	47.312	-3.188	0.002	-245.560	-56.078
october_pd	1.3714	2.318	0.592	0.556	-3.269	6.012
november_pd	2.9680	1.722	1.723	0.090	-0.480	6.416
december_pd	1.1423	1.439	0.794	0.431	-1.740	4.024
january_pd	1.9309	1.751	1.102	0.275	-1.576	5.438
february_pd	0.8317	1.360	0.611	0.543	-1.892	3.555
march_pd	0.5088	2.002	0.254	0.800	-3.500	4.518
april_pd	2.4437	3.058	0.799	0.428	-3.680	8.568

Omnibus:	1.054	Durbin-Watson:	1.687
Prob(Omnibus):	0.590	Jarque-Bera (JB):	1.056
Skew:	-0.164	Prob(JB):	0.590
Kurtosis:	2.496	Cond. No.	68.7

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

Regression: Optimal 1961-1990

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OPTIMAL SEASONAL DEVIATIONS for Allalingletscher 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	-0.663145	3.977237e-10	True
1	opt_season_pd	0.186076	1.230024e-01	False

Number of observations: 70

Regression Summary:

OLS Regression Results

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.454
Model:	OLS	Adj. R-squared:	0.437
Method:	Least Squares	F-statistic:	27.83
Date:	Wed, 17 Dec 2025	Prob (F-statistic):	1.59e-09
Time:	20:25:23	Log-Likelihood:	-539.03
No. Observations:	70	AIC:	1084.
Df Residuals:	67	BIC:	1091.
Df Model:	2		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	73.5746	81.436	0.903	0.370	-88.972	236.122
opt_season_td	-370.5059	51.675	-7.170	0.000	-473.650	-267.362
opt_season_pd	1.0606	0.810	1.310	0.195	-0.556	2.677

Omnibus:	2.669	Durbin-Watson:	1.541
Prob(Omnibus):	0.263	Jarque-Bera (JB):	1.882
Skew:	-0.338	Prob(JB):	0.390
Kurtosis:	3.433	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 Allalingletscher using 1961-1990 climate norms
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Correlation Analysis with Significance Testing:

Skipping constant column: const

Variable	Correlation Coefficient	P-value	Significant (p < 0.05)
0 summer_td	-0.712312	4.685311e-12	True
1 winter_pd	0.183920	1.274798e-01	False

Number of observations: 70

Regression Summary:

OLS Regression Results

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.527
Model:	OLS	Adj. R-squared:	0.513
Method:	Least Squares	F-statistic:	37.38
Date:	Wed, 17 Dec 2025	Prob (F-statistic):	1.25e-11
Time:	20:25:23	Log-Likelihood:	-533.96
No. Observations:	70	AIC:	1074.
Df Residuals:	67	BIC:	1081.
Df Model:	2		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	116.6081	76.826	1.518	0.134	-36.737	269.953
summer_td	-434.6813	51.969	-8.364	0.000	-538.412	-330.950
winter_pd	1.1106	0.660	1.682	0.097	-0.207	2.428

Omnibus:	2.272	Durbin-Watson:	1.565
Prob(Omnibus):	0.321	Jarque-Bera (JB):	1.650
Skew:	-0.360	Prob(JB):	0.438
Kurtosis:	3.219	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 Allalingletscher using 1991-2020 climate norms
=====

Correlation Analysis with Significance Testing:

Skipping constant column: const

	Variable	Correlation Coefficient	P-value	Significant (p < 0.05)
3	august_td	-0.575838	1.834509e-07	True
2	july_td	-0.569002	2.755457e-07	True
4	september_td	-0.524591	3.138374e-06	True
1	june_td	-0.507660	7.269171e-06	True
0	may_td	-0.383095	1.062868e-03	True
9	february_pd	0.191023	1.131806e-01	False
6	november_pd	0.139067	2.509042e-01	False
10	march_pd	0.078152	5.201751e-01	False
7	december_pd	-0.056406	6.427920e-01	False
5	october_pd	0.049693	6.828859e-01	False
11	april_pd	-0.033442	7.834401e-01	False
8	january_pd	0.026701	8.263267e-01	False

Number of observations: 70

Regression Summary:

OLS Regression Results

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.577
Model:	OLS	Adj. R-squared:	0.488
Method:	Least Squares	F-statistic:	6.472
Date:	Wed, 17 Dec 2025	Prob (F-statistic):	4.26e-07
Time:	20:25:23	Log-Likelihood:	-530.10
No. Observations:	70	AIC:	1086.
Df Residuals:	57	BIC:	1115.
Df Model:	12		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	-645.4679	76.214	-8.469	0.000	-798.084	-492.852
may_td	-35.6575	49.823	-0.716	0.477	-135.427	64.112
june_td	-43.8331	46.968	-0.933	0.355	-137.885	50.218
july_td	-107.0402	50.392	-2.124	0.038	-207.949	-6.132
august_td	-116.1017	59.460	-1.953	0.056	-235.168	2.965
september_td	-150.8187	47.312	-3.188	0.002	-245.560	-56.078
october_pd	1.3714	2.318	0.592	0.556	-3.269	6.012
november_pd	2.9680	1.722	1.723	0.090	-0.480	6.416
december_pd	1.1423	1.439	0.794	0.431	-1.740	4.024
january_pd	1.9309	1.751	1.102	0.275	-1.576	5.438
february_pd	0.8317	1.360	0.611	0.543	-1.892	3.555
march_pd	0.5088	2.002	0.254	0.800	-3.500	4.518
april_pd	2.4437	3.058	0.799	0.428	-3.680	8.568

Omnibus:	1.054	Durbin-Watson:	1.687
Prob(Omnibus):	0.590	Jarque-Bera (JB):	1.056
Skew:	-0.164	Prob(JB):	0.590
Kurtosis:	2.496	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 Allalingletscher 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	-0.665403	3.303086e-10	True
1	opt_season_pd	0.186076	1.230024e-01	False

Number of observations: 70

Regression Summary:

OLS Regression Results

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.455
Model:	OLS	Adj. R-squared:	0.439
Method:	Least Squares	F-statistic:	28.02
Date:	Wed, 17 Dec 2025	Prob (F-statistic):	1.44e-09
Time:	20:25:23	Log-Likelihood:	-538.92
No. Observations:	70	AIC:	1084.
Df Residuals:	67	BIC:	1091.
Df Model:	2		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	-616.3370	78.515	-7.850	0.000	-773.054	-459.620
opt_season_td	-374.0837	51.987	-7.196	0.000	-477.850	-270.318
opt_season_pd	1.0113	0.809	1.250	0.216	-0.604	2.626

Omnibus:	2.208	Durbin-Watson:	1.529
Prob(Omnibus):	0.332	Jarque-Bera (JB):	1.476
Skew:	-0.299	Prob(JB):	0.478
Kurtosis:	3.386	Cond. No.	107.

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

Regression: Seasonal 1991-2020

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SUMMER/WINTER SEASONAL DEVIATIONS for Allalingletscher using 1991-2020 climate norms
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Correlation Analysis with Significance Testing:

Skipping constant column: const

Variable	Correlation Coefficient	P-value	Significant (p < 0.05)
0 summer_td	-0.711854	4.903874e-12	True
1 winter_pd	0.183920	1.274798e-01	False

Number of observations: 70

Regression Summary:

OLS Regression Results

Dep. Variable:	annual mass balance (mm w.e.)	R-squared:	0.526
Model:	OLS	Adj. R-squared:	0.512
Method:	Least Squares	F-statistic:	37.16
Date:	Wed, 17 Dec 2025	Prob (F-statistic):	1.38e-11
Time:	20:25:23	Log-Likelihood:	-534.07
No. Observations:	70	AIC:	1074.
Df Residuals:	67	BIC:	1081.
Df Model:	2		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	-639.4128	73.187	-8.737	0.000	-785.495	-493.330
summer_td	-433.6850	52.004	-8.339	0.000	-537.485	-329.885
winter_pd	1.0890	0.661	1.647	0.104	-0.231	2.409

Omnibus:	2.028	Durbin-Watson:	1.553
Prob(Omnibus):	0.363	Jarque-Bera (JB):	1.428
Skew:	-0.333	Prob(JB):	0.490
Kurtosis:	3.217	Cond. No.	124.

Notes:

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