



## Weather and Climate



## Wrangell – St. Elias Fall 2013 Weather Summary

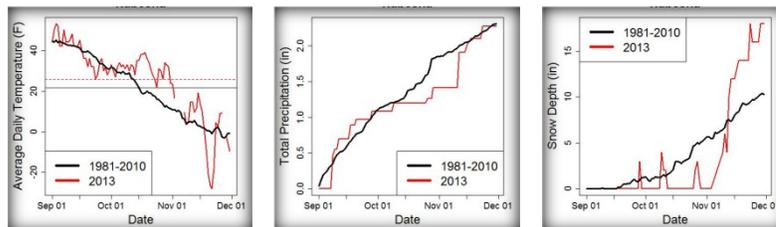
### What is Normal?

“Normals” are used to place recent climate conditions into historical context. It takes 30 years of continuous weather data at one location to calculate what makes temperatures or precipitation amounts “normal”. The latest normal period is 1981-2010.

There are three weather stations in & around the park that have records dating back long enough to calculate normals - Nabesna, Gulkana, and Yakutat. These sites provide valuable long-term records for the park and are good index sites to use for climate comparisons

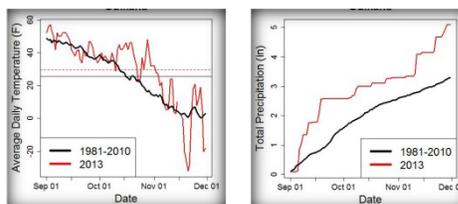
In Nabesna, fall 2013 started out a bit cooler than normal with an average monthly temperature of 39.1° F, which was -1.0° F below the normal value. The precipitation total was 1.08 inches, which is 94% of normal. October was a warm month statewide and Nabesna was no exception — the average temperature was 9.0° F warmer than normal at 31.6° F, the warmest on record for this location. The precipitation total was below normal for the month at 0.33 inches, and only 3.8 inches of snow fell during October. All of the snow melted by the end of the month due to the warm temperatures. The first persistent snow fell sometime during the first week of November. There were more than 5 days of missing values for November so monthly values were not calculated. By the end of the month there was 18 inches of snow on the ground.

**Nabesna Temperature, Precipitation and Snow Depth (red) compared to Normal (black)**



It was a warm autumn for Gulkana. The average temperature for September was 45.0° F, 1.7° F warmer than normal. September was wet with 2.58 inches of rain, which is 163% of normal. An impressive 0.76 inches of rain fell on September 7. It was the warmest October on record for Gulkana; the average monthly temperature of 37.6° F was an impressive 11.0° F warmer than normal! Precipitation for the month was just below normal. The temperatures in November were just at normal at 5.8° F for the month. There was an 82 degree F temperature spread between the warmest day (Nov 1) at 40° F and the coldest day (Nov 21) at -42° F. Nearby, at the Upper Tsaina River snow site, the first persistent snow was recorded on November 11, ~ 3 weeks later than normal. At Tsaina, there was 37 inches of snow on the ground on November 30<sup>th</sup>.

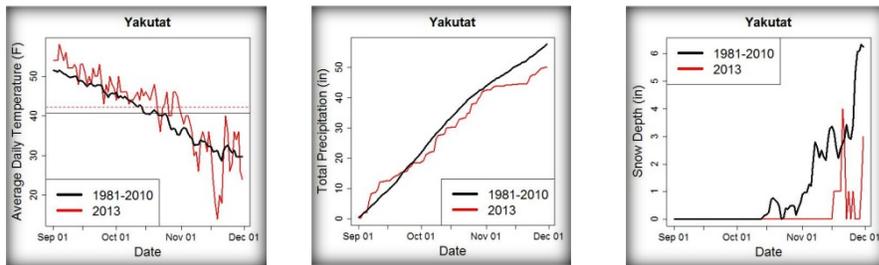
**Gulkana Temperature and Precipitation (red) compared to Normal (black).**



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And along the southern coast....in Yakutat, the average monthly temperature in September was 51.2° F, 2.8° F above the 1981-2010 normal. The Gulf Coast was one of the few areas in the state with positive deviations for the month. Precipitation total was 18.53 inches, which is 88% of normal. A storm event rolled through on September 6<sup>th</sup> that brought 48 mph winds and 3.87 inches of rain. The temperatures in October remained warm; the average temperature was 44.3° F, +3.4° F warmer than normal. No snow fell during the month of October, which is unusual. Temperatures in November cooled and the snow started to fall. Average monthly temperatures were 31.0° F, which is 1.3° F below normal. Precipitation was light at 7.68 inches, 53% of normal and total snowfall was 9.2 inches, 51% of normal. According to the weather observers in Yakutat, "the month of November was especially nice".

**Yakutat Temperature, Precipitation, and Snow Depth (red) compared to Normal (black).**



### Nabesna Weather Records:

Climate Normal Period 1981 – 2010

Climate Record Period 1967 – 2013

#### Temperature

Nabesna Fall - 2013	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
September	39.1	40.1	-1.0	64 / Sep 3	21 / Sep 23, 24
October	31.6	22.6	+9.0	50 / Oct 18	13 / Oct 24
November	**2.3	3.9	---	**28 / Nov 1	**-33 / Nov 20

\*\* 5 missing days of temperature data. Fall Season Departure from Normal: not calculated

#### Precipitation

Fall 2013	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 – hr. total in. / Date	Total Monthly Snow	Snow Depth at end of month in.
September	1.08	1.15	-0.07	0.46 / Sep 8	2.6	0
October	0.33	0.56	-0.23	0.15 / Oct 29	3.8	0
November	**0.86	0.55	---	0.50 / Nov 11	**8.0	18

\*\* There were missing values for precipitation and snowfall in November; these values are low. Snow depth was recorded, but daily snowfall totals were missing for > 5 days.

Fall Season Departure from Normal: not calculated

# Wrangell – St. Elias Fall 2013 Weather Summary

## Gulkana Weather Records:

Climate Normal Period 1981 – 2010

Climate Record Period 1949 – 2013

### Temperature

Gulkana Fall	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
September	45.0	43.3	+1.7	64 / Sep 3	21 / Sep 29
October	37.6	26.6	+11	55 / Oct 28	8 / Oct 24
November	5.8	5.8	0	40 / Nov 1	-42 / Nov 20, 21

Fall Season Temperature Departure from Normal: +4.2°F

### Precipitation

Gulkana Fall	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 –hr. total in. / Date	# Days with $\geq 0.01$ in. water
September	2.58	1.58	+1.00	0.76 / Sep 7	12
October	0.71	1.01	-0.30	0.22 / Sep 8	10
November	1.80	0.72	+1.08	0.67 / Nov 11	10

Fall Season Departure from Normal: + 0.59 inches

## Yakutat Weather Records:

Climate Normal Period 1981 – 2010

Climate Record Period 1949 – 2013

### Temperature

Yakutat Fall	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
September	51.2	48.4	+2.8	62 / Sep 4	34 / Sep 25
October	44.3	40.9	+3.4	56 / Oct 1	27 / Oct 22
November	31.0	32.3	-1.3	46 / Nov 23	6 / Nov 18

Fall Season Temperature Departure from Normal: +1.6°F

### Precipitation

Yakutat Fall	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 –hr. total in. / Date	# Days with $\geq 0.01$ in. rain or snow
September	18.53	21.11	-2.58	3.87 / Sep 6	25
October	23.87	21.98	+1.89	4.06 / Oct 8	29
November	7.68	14.45	-6.77	1.89 / Nov 22	21

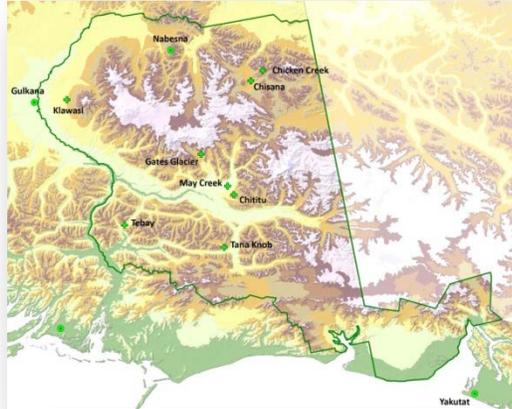
Fall Season Departure from Normal: -2.49 inches

### Snow

Yakutat Fall	Total Monthly Snow in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 –hr. snow total in. / Date	Snowfall since Jul 1 in.
September	0	0	0	0	0
October	0	2.5	-2.5	0	0
November	9.2	18.2	-9.0	3.1 / Nov 29	9.2

# Wrangell – St. Elias Fall 2013 Weather Summary

As part of the climate monitoring vital sign, additional NPS climate stations were installed in the park to complement the long-term records at Nabesna, Gulkana, and Yakutat. These additional sites provide critical data on a park-wide scale that help characterize the climate gradients and patterns affecting resources in Wrangell-St. Elias National Park and Preserve.



Wrangell – St. Elias Remote Automated Weather Station (RAWS) summary – Fall 2013:

Site	Elev. Ft.	Average Temp °F			Fall Avg. Temp °F	Extremes °F		Snow On Date	Peak Wind mph	High T – Low T °F *
		Sep	Oct	Nov		High	Low			
Chicken Creek	5240	35.9	30.8	9.2	25.3	61	-22	Dec 11	33	83
Chisana	3318	38.6	29.2	0.0	22.6	70	-41	Nov 8	29	111
Gates Glacier	4060	38.4	33.1	14.2	28.6	50	-19	Oct 7	29	69
May Creek	1600	42.9	35.8	10.4	29.7	65	-38	Nov 9	25	103
Klawasi	3450	41.7	36.7	10.2	29.5	61	-27	**	78	88
Tebay	2000	42.9	36.3	15.3	31.5	57	-23	Nov 21	13	80

\* Difference between the high and low temperature for the season \*\* snow not measured.

Interesting notes from RAWS stations:

- Although we have only 9 years of data for Tebay and Chicken Creek... October 2013 was the warmest October on record at these sites.
- The date of the first persistent snow was later than normal this year at all locations due to the warm October temperatures.
- The southeast wind often howls at the Klawasi station. The peak wind speeds reached 67 mph in September, 78 mph in October, and 59 mph in November. It was only calm 7.4% of the time at this site this fall.

Tana Knob and Chittu sites are currently not transmitting real-time data and therefore are not summarized.

## Connecting Further

- Access near real-time data from [Western Regional Climate Center](#) and [MesoWest](#)
- Check out the Jul-Aug-Sep weather outlook from the [NOAA Climate Prediction Center](#)

### For more information contact:

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Please Note: The summarized data are preliminary and have not undergone final quality control. Therefore, these data are subject to revision.