



Quarterly Weather & Climate Summary Wrangell-St. Elias National Park & Preserve Summer 2015

Wrangell-St. Elias Summer Temperatures

In Gulkana, June temperatures were below normal for the start of the month and then warmed up mid-month with temperatures climbing above normal between June 14 and 25. Overall, June 2015 was 2.4°F warmer than normal. July started out with some cool overnight temperatures (33°F on July 2), but warmed toward the end of the first week. The high temperature of 86°F on the 6th was a record for that day and the warmest day of the summer. The average monthly temperature for July was 1.3°F warmer than normal. August temperatures were above normal for the first week and then cooled off for the remainder of the month. The monthly average was 52.2°F, 1.3°F cooler than normal. Overall the summer of 2015 with an average temperature of 59.4°F was the 15th warmest summer on record (1949-present) (Figure 1, Table 1).

In Yakutat, the monthly mean temperature for June was 53.6°F compared to a normal of 50.8°F. Temperatures soared in mid-June and Yakutat broke two high temperature records on June 14 and 15 with temperatures of 80°F and 82°F, respectively. It was the 4th warmest June on record. The average monthly temperature for July remained above normal at 56.0°F, this was 1.7°F above normal and the 7th warmest July on record. The average temperature of 62°F on July 20th was 7.2°F warmer than average and a record for that day. Temperatures continued on the warm side for August with a monthly average temperature of 55.0°F, which is 1.2°F warmer than normal. Summer of 2015 was the 5th warmest summer on record for Yakutat. The average temperature for June, July, and August was 1.9°F warmer than normal at 54.9°F (Figure 1, Table 2).

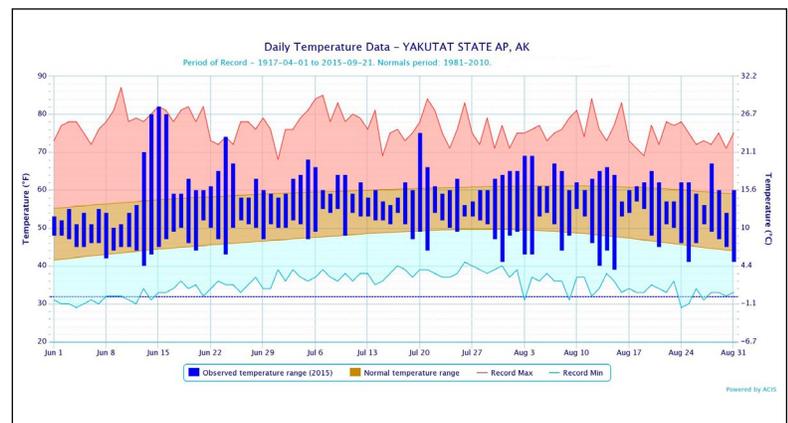
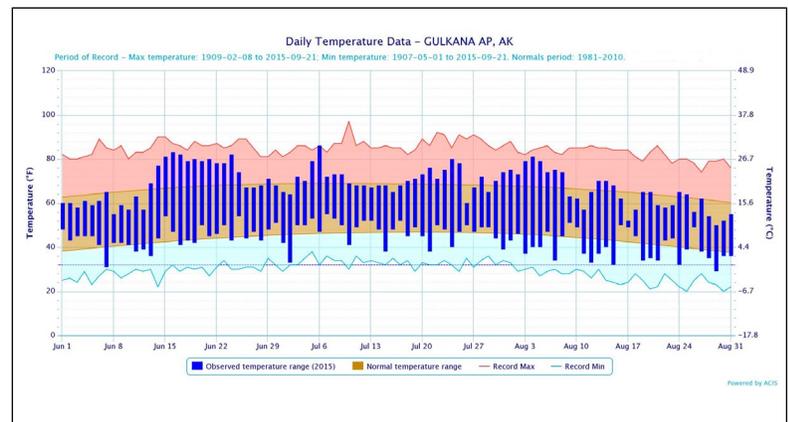


Figure 1. Summer 2015 daily temperatures at Gulkana (top) and Yakutat (bottom) showing **record maximum** (red), **record minimum** (blue), **normal** (brown) and **2015 observed** daily range (blue).

Summer Precipitation

In Gulkana, June was dry with a rainfall total of 0.72 inches, which is 51% of normal. Over half of the total monthly precipitation fell on June 12 with a total of 0.41 inches for the day. July precipitation was also below normal with a total of 1.46 inches of rainfall; normal is 1.81 inches. Things changed in August, the total precipitation for the month was well above normal at 3.82 inches, which is 212% of normal. Most of the August rain fell on only three days. 1.10 inches fell on August 10th, 0.92 inches fell on the 17th, and 1.00 inches fell on the 18th. All of these were new daily records. It was the third wettest August on record and the wettest since 1971. 6.00 inches of rain fell in summer 2015, compared to a normal seasonal total of 5.01 inches (Figure 2, Table 1).

June and July are statistically the two driest months of the year in Yakutat; for 2015 (so far) May has been the driest month. Rainfall totals for the beginning of the summer were above normal. 8.65 inches of rain fell in June, which is 2.26 inches more than normal. In July, 11.81 inches fell, which is 150% of normal. August generally signals the beginning of the wet season for Yakutat. The rainfall total for the month was 13.91 inches, just below the normal 14.07 inches that is expected. A storm moved through the region on the 17th and dumped an impressive 5.82 inches of rain over a 48-hr period. 4.39 inches of that fell on August 17th a new record for that day. Summer precipitation totaled 34.37 inches; the 1981-2010 normal is 28.34 inches (Figure 2; Table 2).

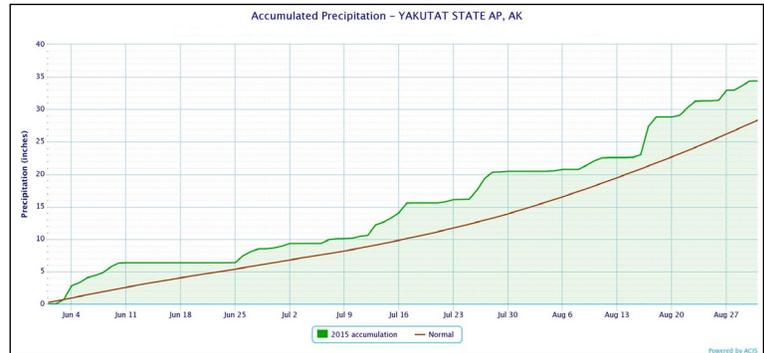
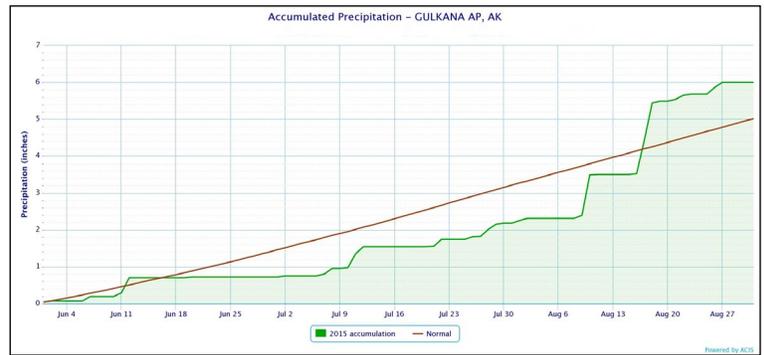


Figure 2 Summer 2015 accumulated precipitation at Gulkana (top), and Yakutat (bottom) compared to normal (brown line).

Climate Monitoring in Wrangell-St. Elias

The NPS climate stations in Wrangell-St. Elias are approaching the 10-year mark for climate monitoring (Figure 3). The NPS stations complement long-term records available from the National Weather Service stations in Gulkana and Yakutat. The NPS stations are providing critical data at higher elevations which helps characterize climate gradients and patterns affecting resources in Wrangell-St. Elias National Preserve.

Table 3 summarizes the summer weather data for NPS sites.

In 2013 phenology cameras were added to some of the climate stations. These cameras capture images four times per day; the images are downloaded once a year. The images are used to help quantify the snow season, green-up period, and other basic phenologic information.

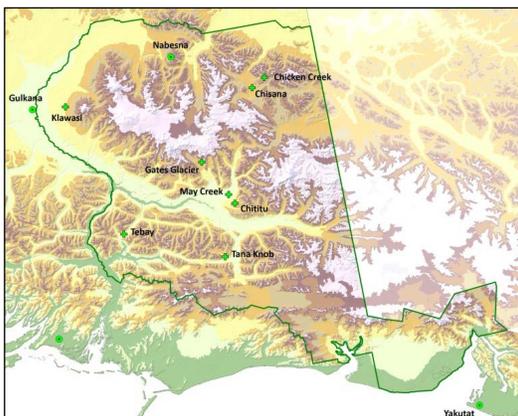


Figure 3. Map of NPS stations in Wrangell-St. Elias

Interesting Notes from the CAKN Stations (see Table 3)

- Every site recorded minimum temperatures below freezing during summer of 2015.
- The Chititu site is about 3000 feet higher than nearby May Creek, and summer temperatures average about 10° F cooler at Chititu.
- Most sites had more precipitation in August compared to June or July. However, monthly rainfall totals at some sites north of the Wrangell Mountain Range (Chisana and Chicken Creek) were wettest in July. Gates Glacier was the wettest site with a total of 11.56 inches of rain for the summer.

Table 1. Gulkana Summer 2015 Temperature and Precipitation compared to the 1981-2010 normal.

Summer 2015	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
June	56.8	54.4	+2.4	83 / Jun 16	31 Jun 7
July	58.9	57.6	+1.3	86 / Jul 6	33 / Jul 2
August	52.2	53.5	-1.3	81 / Aug 4	29 / Aug 29

Summer Season Temperature Departure from Normal: +0.8°F

Summer 2015	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24-hr. total in. / Date	# Days with >=0.01 in. water
June	0.72	1.40	-0.68	0.41 / Jun 12	6
July	1.46	1.81	-0.35	0.38 / Jul 11	13
August	3.82	1.80	+2.02	1.10 / Aug 10	14

Summer Season Precipitation Departure from Normal: +0.99 inches (120% of normal)

Table 2. Yakutat Summer 2015 Temperature and Precipitation compared to the 1981-2010 normal.

Summer 2015	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
June	53.6	50.8	+2.8	82 / Jun 15	40 / Jun 13
July	56.0	54.3	+1.7	75 / Jul 20	41 / Jul 31
August	55.0	53.8	+1.2	69 / Aug 3, 4	39 / Aug 15

Summer Season Departure from Normal: +1.9°F

Summer 2015	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24-hr. total in. / Date	# Days with >=0.01 in. water
June	8.65	6.39	+2.26	2.10 / Jun 4	16
July	11.81	7.88	+3.93	1.84 / Jul 27	23
August	13.91	14.07	-0.16	4.39 / Aug 17	19

Summer Season Departure from Normal: +6.03 inches (121% of normal)

Table 3. Summary of weather statistics from WRST climate stations. All data are preliminary and subject to review.

Site	Elev.	Average Temp °F			Extreme High	Extreme Low	Rainfall (inches)			Peak Wind Speed (JJA)
	Ft.	June	July	Aug.	°F	°F	June	July	Aug.	mph
Chicken Creek	5420	45.0	46.7	42.2	69	21	2.29	4.68	2.16	29
Chisana	3318	52.4	54.3	47.6	83	23	1.18	1.94	1.75	22
Chititu	4616	46.1	47.3	43.9	72	24	1.25	1.95	2.79	53
Gates Glacier	4060	47.9	48.2	45.5	67	31	1.38	3.21	6.97	22
Klawasi	3045	53.2	54.9	49.8	79	22	2.39	2.01	4.84	57
May Creek	1600	57.2	58.4	52.1	88	27	0.80	1.30	2.90	28
Tana Knob	3739	49.5	50.3	47.8	70	31	0.05	0.94	2.86	32
Tebay	2000	51.1	54.0	50.8	79	29	0.45	1.49	3.77	11

Long-term Summer Temperature Trends

At Gulkana, the average summer temperature for 2015 was 56.0°F, which is 0.8°F warmer than the 1981-2010 normal (the latest climate normal period) and 1.1°F degrees warmer than the long-term average (1949-2015).

We calculate the average summer temperature by simply taking the average of June, July, and August monthly temperatures. Average summer temperatures show great variability with a range between 51.6°F in 1949 and 59.4°F in 2004.

For Gulkana, the overall increasing trend of 0.13°F per decade for summer temperatures is not statistically significant based on a simple linear regression ($p=0.18$). Figure 4 shows the high variability of summer seasonal temperatures from 1949 through 2015.

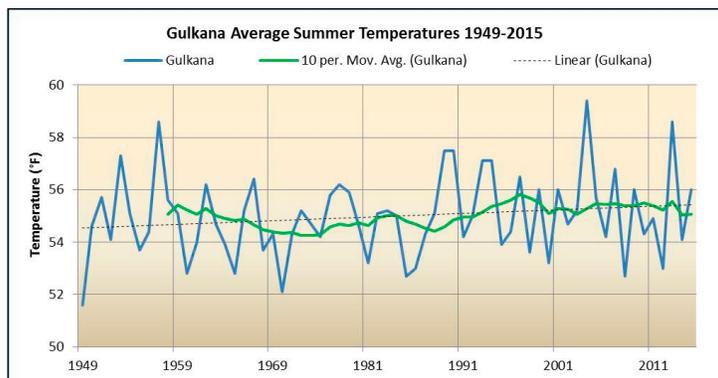


Figure 4. Average summer (June, July, August) temperatures in Gulkana since 1949. The green line shows the 10-year moving average. The dotted line shows a simple linear regression trend.

At Yakutat, the average summer temperature for 2015 was 54.9°F, which is 1.9°F warmer than the 1981-2010 normal (the latest climate normal period) and 2.3°F degrees warmer than the long-term average (1949-2015). Average summer temperatures range between 47.9°F in 1965 and 55.4°F in 2004.

For Yakutat, the overall increasing trend of 0.33°F per decade for summer temperatures is statistically significant based on a simple linear regression ($p<0.01$). The 10-year moving average shows the coolest period in the mid-1970s. On average, the summer period over the past decade has been about 1.0°F warmer than the long-term mean (Figure 5).

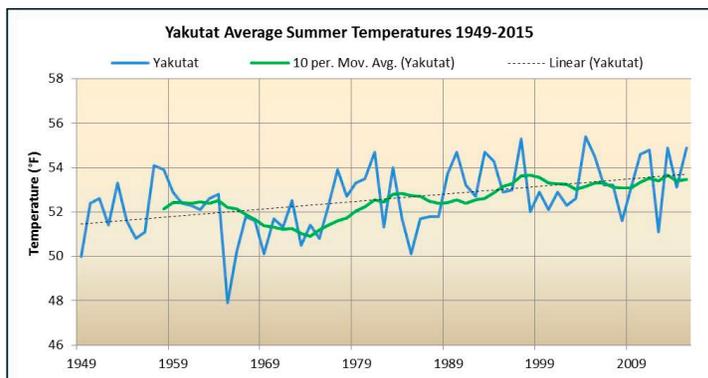


Figure 5. Average summer (June, July, August) temperatures in Yakutat since 1949. The green line shows the 10-year moving average. The dotted line shows a significant ($p<0.01$) positive linear regression trend.



Connecting Further

- Previous weather summaries & other climate monitoring documents on the [Central Alaska Network web portal](#)
- Access near real-time data from [Western Regional Climate Center](#) and [MesoWest](#)
- Statewide summary of weather highlights in the latest [Alaska Climate Dispatch](#) from the Alaska Center for Climate Assessment and Policy

- [Maps](#) of projected temperature and precipitation changes for Wrangell-St. Elias National Park and Preserve

More Information

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