Southeast Alaska

Cloudburst Chronicle

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Weather Extremes

What's the highest temperature ever recorded on Earth? See page 7 for cool information on weather extremes!

In This Issue:

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Earth Day in Haines

By Paul Swift, Haines COOP Observer

As part of a week long Haines Earth Day symposium held April 22 - 27, I was asked to provide a brief explanation of my duties recording weather conditions in the Haines area. Topics included were methods of observation, past extremes and trends, comparisons of record snowfall during the 2006-07 winter vs. 2007-08 winter, and information regarding sources for researching current and/or past weather conditions.

The presentation was in a round table format where I answered questions as the talk progressed. I used data from the Juneau Forecast Office, observations I had made as the Haines COOP Weather Observer since 1998, and records I have kept as an amateur "weather keeper" for the past 22 years. Visual aids included photos of standard NOAA equipment and of an unofficial snow measure gauge at 2400' on a local mountain, plus Williwaw Publishing Company's "Alaska's Climates" fact sheet. Jim Green, Williwaw's owner, contributed copies of his 2008 Alaska Weather Calendar for distribution.

The one-hour timeslot was easily taken up by the presentation and discussion. The photos and other visual aids were well received. It appears that the public is very interested in weather observation data during this time of heightened awareness regarding climate change.

NWS COOP Observer Paul Swift (center holding map) at the Haines Earth Day Symposium.

Forecasting Fire Weather

The NOAA National Weather Service's Incident Meteorologists include a group of scientists specially trained to go to wildfires and other incidents and provide weather briefings and forecasts to incident responders and command staff. The forecasts they provide ensure the safety of operations, allowing responders to take into account of the most changeable aspects of any incident—the weather.

Firefighters at an wildland-urban interface. Fires burning close to people are becoming an increasing concern as people build more homes in and near forested land.

We've seen it on the news—dry conditions and a wayward spark are the start of engulfing flames, wildfires that threaten homes and sweep across the landscape. And oftentimes, we hear how shifting winds or other weather phenomena are impacting decisions and the ability of firefighters to control a blaze. The weather is one of the most changeable aspects of any incident, and in factoring the weather, incident responders have turned to NOAA's National Weather Service for over 90 years.

Today, there are about 70 Incident Meteorologists (IMETs) within NOAA who travel to incidents, bringing their expertise as well as the backing of the entire National Weather Service. This group's beginnings date back to the early 1900s and the group has grown ever since.

The History of the IMET Program

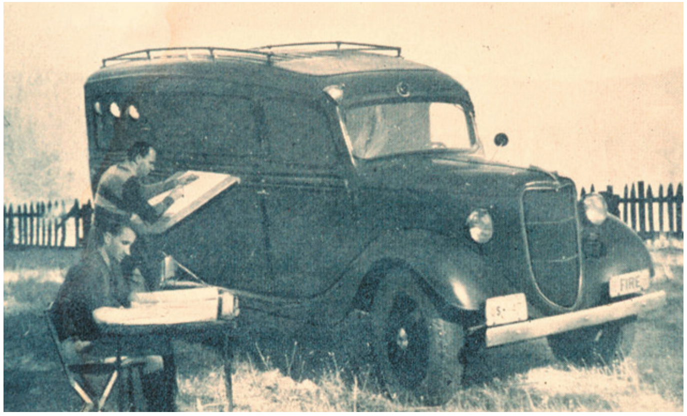
The catastrophic fires of 1910 that raged across Idaho, Montana, and Washington, were a turning point in how the nation dealt with wildland fires. Prior to 1910, there was no real concerted effort to manage or control the nation's forests or fight forest fires. The death and devastation left behind by the 1910 wildfires made people take notice, and the U.S. Forest Service was soon tasked with managing the nation's forests and fighting forest fires. Forest Service employees soon realized that the weather was a major factor in how and when fires could be fought, and so they turned to the experts at the U.S. Weather Bureau, the predecessor to the National Weather Service.

IMETs preparing to travel to a fire camp, circa 1920.

"Mobile" Fire Weather Units

The Weather Bureau started doing forecasts specifically for the fire weather community in 1914. In 1916, the first "mobile" weather unit was deployed to a fire. This mobile unit consisted of a forecaster and a team of horses carrying his weather equipment to the field to support firefighters. It soon became apparent that having a forecaster at the incident was a big plus for both planning and safety.

In the 1930s, the first mobile fire weather vans were created. Automobiles had proven reliable and could carry more equipment farther and with less upkeep than a team of horses. Fire weather "vehicles" were used all the way into the 1970s, with upgrades of vehicles and radios as they became available.



IMETs preparing a Fire Weather Forecast for a wildfire incident, circa 1930.

The Boise Interagency Fire Center

In 1965, the Forest Service and the Bureau of Land Management developed the Boise Interagency Fire Center (BIFC) to better coordinate firefighting efforts in the Great Basin area of the U.S. Shortly thereafter, the Weather Service joined the group and created a "Staff Meteorologist" position to support decision making at the BIFC and to streamline the IMET program nationwide.

In 1993, the BIFC changed its name to the National Interagency Fire Center (NIFC), to better reflect the national scope of its mission.

The Air Transportable Meteorological Unit

In the 1980s, the Weather Service realized that there were better ways to support the IMET program. While fire weather vans had worked in the past, there were problems with this system. Only a handful of vans were available, meaning that only a few IMETs were available for dispatch. Weather support on an incident was critical, and while the demand for IMETs was increasing, the supply of IMETs and weather vans was staying the same. Also, incidents were taking place in increasingly remote areas of the country. Not only did the Weather Service need more IMETs, it also needed to be able to get these IMETs and their equipment to remote areas quickly.

The first step in addressing these issues was to scale down the size of the equipment, so it could be more easily transported. Thus, the first Air Transportable Meteorological Unit (ATMU) was born. The ATMU consisted of custom designed cargo boxes carrying satellite communications and weather observing equipment. The IMET and ATMU could be flown directly into incident areas.

The Advanced Technology Meteorological Unit

In the early 1990s, technology had advanced enough that the first laptop computers were used in the field, bringing ATMU equipment down to a more manageable size. Also, equipment for satellite communications had "shrunken" to a size that was easier to transport. This marked the creation of the new Advanced Technology Meteorological Unit. For the first time, IMETs were able to travel literally anywhere that a vehicle or helicopter could take them and, equally important, all the equipment needed to run a small "weather office" could come along for the ride.

The IMET Program Today

Today, the main incidents IMETs cover are wildfires, though IMETs have responded to other types of incidents such as oil and chemical spills and terrorism response drills. IMETs were on the scene when the *M/V New*

Shown above is the main tool used by IMETs, the Advanced Technology Meteorological Unit (ATMU)

Clarissa tanker spilled oil off the coast of Oregon, helped in recovering debris from the Space Shuttle Columbia in Texas, and provided forecasts for emergency responders in the event of a terrorist attack at the 2004 Democratic and Republican National Conventions. Most recently, the IMET program has assisted with forecast and warning support for the Federal Emergency Management Agency after the Greensburg, Kansas EF5 tornado in May 2007.

Tools of the Trade

Today, IMETs have the ability to set up "mini-Weather Forecast Offices" at any site across the nation. In 2007, satellite communications were upgraded to use a two-way system that consists of a small, portable satellite dish, about the size of a laptop, with a receiver and a transmitter. This allows IMETs to download weather data from the Internet nearly anywhere in the world. The new All-hazards Meteorological Response System (AMRS) now weighs in at around 50 pounds, a far cry from the old days of horses or vans.

IMET Chuck Redman from the NOAA National Weather Service forecast office in Boise, Idaho, setting up the FireRAWS equipment near a wildfire.

Laptops used by IMETs have also been upgraded. IMETs in the field now use a software package that mimics the software used in Weather Forecast Offices. IMETs use a single program to look at forecast models, satellite data, radar data, sounder data, lightning data, and surface and upper air observation data. This allows IMETs to work with data in real time, thus shaving precious minutes off any weather alerts that may affect an incident.

The ATMU was also changed in 2002. The new ATMU—now called the "Atmospheric Theodolite Meteorological Unit"—fits in one case and consists of the theodolite and Pilot Balloon equipment used by IMETs to launch and measure weather balloons on site. These balloons allow IMETs to take upper air observations at an incident, in order to determine what the winds at the location might do later in the day.

A special unit within the Bureau of Land Management dispatches, sites, and maintains the Remote Automated Weather System (RAWS). RAWS provides IMETs with crucial information, including temperature, humidity, and wind speed and direction. However, unlike earlier systems, RAWS has better computing capabilities; can take readings on fuel moisture and precipitation; and can radio its observations to a satellite, after which the observations can be downloaded and added to the RAWS network, and made available in the forecaster's ATMU.

Training

IMETs are National Weather Service meteorologists who have completed specialized, intensive training. Before being selected as an IMET trainee, each meteorologist must have completed training on synoptic and meso-scale forecasting, radar and satellite interpretation, NOAA policy, and other topics needed to become qualified as a "journeyman forecaster."

IMET certification requires the completion of several more fire-weather specific courses and at least two on-site training dispatches. Trainees learn about everything from the Incident Command System to how a fire reacts to certain weather, fuel, and topographic

NOAA forecaster Troy Lindquist of the NOAA National Weather Service forecast office in Grand Junction, Colorado, uses a theodolite to align the angle a weather balloon takes after being launched.

conditions. Trainees must also learn about micro- and meso-scale (very small scale) forecasting for fire weather. Trainees must also prove that they can perform all the duties required of them during an incident. This "proof" comes during trainee dispatches to wildfires, under the tutelage of a certified IMET.

Once a trainee has completed all of these tasks, they are then certified as an IMET. By the time a trainee becomes certified, he or she will have completed, at a minimum, over 225 hours of fire weather and behavior training as well as on-the-job training.

In order to remain certified, all IMETs must take 25 hours of refresher training each year or go to an incident every 18 months.

Future Directions

The IMET program has a long history of excellence in incident response. The IMETs are uniquely qualified and knowledgeable to respond to any incident, anywhere in the U.S. In the coming years, the program will continue to evolve. The use of high resolution data, embedded within larger National Weather Service forecast systems, will allow IMETs to provide responders with greater detail about the weather and allow for better forecasting of where a hazard will move next. Improving technology will also allow IMETs to deliver information to responders more quickly.

After the September 11th terrorist attacks, the world changed in many ways, including increased emphasis on response to terrorism and other hazards. IMETs have always responded to incidents other than wildfires.

A weather briefing at fire camp.

However, as we move ahead, the role of IMETs in all-hazards response will only increase.

Information from: http://celebrating200years.noaa.gov/magazine/imet/

WFO Juneau currently has one fully trained IMET, Joel Curtis, our Warning Coordination Meteorologist.

FORECASTER SPOTLIGHT
Who Forecasted That?
By Brian Bezenek

The Forecaster Spotlight is an opportunity to find out who the forecasters are in Juneau. There has been a lot of turnover in the staff at the Juneau office over the last year or so and, as a result, there are many new faces here. This time around, I managed to track down one of the newer members of the Juneau Forecast Office, Pete Boyd. Pete arrived in March, just in time to see the spring season emerge from winter. ***Welcome to Juneau, Pete!***

Pete with his Suzuki V-Storm.

Brian - Where are you from?
Pete - I am from Albany, New York.

Brian - Have you always been interested in weather?
Pete - Yes, but only considered it as a career within the past few years.

Brian - Where did you receive your meteorological training?
Pete - The State University of New York, Albany.

Brian - Where else have you worked?
Pete - I was on the Meteorology Team at the U.S. Army Proving Ground in Yuma, Arizona. Before that, I held many non-weather related jobs.

Brian - What do you like best about being a forecaster?
Pete - Since the weather is always changing, the job is (usually) not the same day to day. I also like those opportunities to do some fieldwork and get outside.

Brian - How long have you been forecasting the weather?
Pete - About 2 years.

Brian - Why did you choose to accept a job in Alaska?
Pete - After 3 years in the Arizona desert, I had enough of the heat. Alaska also offered many outdoor activities.

Brian - Outside of the job, do you have any hobbies or activities to fill in your time.
Pete - I enjoy cycling, mountain climbing, snowboarding, and photography.

I'd like to thank Pete for taking time from his busy schedule to answer my questions. Tune in next time to see who ends up in the spotlight!

Extreme Weather Records

By Phillip Moser

Compilation of weather and climate extremes

Element	Characteristic	World		
Temperature	Maximum	57.8ºC (136ºF)	13-Sep-1922	El Azizia, Libya
	Minimum	-89.4ºC (-129ºF)	21-Jul-1983	Vostok, Antarctica
	Maximum mean	34.4ºC (94ºF)	Oct 1960 - Nov 1966	Dallol, Ethiopia
	Minimum mean	-50.56ºC (-59.5ºF)	1957-1964	Amundsen-Scott Station, Antarctica
Snow	Maximum 24-hour	1.925 m (75.8 in.)	(14-15)-Apr-1921	Silver Lake, Colorado
	Maximum seasonal (July-June)	28.956 m (1140 in.)	1998-1999	Mt. Baker Ski Area, Washington
Rain	Maximum 24-hour	1.825 m (72.0 in.)	18-Jan-1966	Foc-Foc, La Reunion Island (Tropical Cyclone Hyacinthe)
	Least annual	0.6 mm (.024 in.)	59 years	Arica, Chile
	Maximum annual	26.47 m (1042 in.)	Aug 1860 - Jul 1861	Cherrapunji, India
	Longest dry period	59 years		Arica, Chile

Element	Characteristic	U.S.		
Temperature	Maximum	56.67ºC (134ºF)	10-Jul-1913	Greenland Ranch, California
	Minimum	-62.22ºC (-80ºF)	23-Jan-1971	Prospect Creek, Alaska
	Maximum mean	25.44ºC (77.8ºF)	1872-2007	Key West, Florida
	Minimum mean	-15.33ºC (4.4ºF)	1974	Bartar Island, Alaska
Snow	Maximum 24-hour	1.925 m (75.8 in.)	(14-15)-Apr-1921	Silver Lake, Colorado
	Maximum seasonal (July-June)	28.956 m (1140 in.)	1998-1999	Mt. Baker Ski Area, Washington
	Maximum depth	11.455 m (451 in.)	11-Mar-1911	Tamarack, California
Rain	Maximum 24-hour	1.092 m (43 in.)	(25-26)-Jul-1979	Alvin, Texas
	Least annual	46.74 mm (1.84 in.)	1929	Death Valley, California
	Maximum annual	17.903 m (704.83 in.)	1982	Kukui, Hawaii
	Longest dry period	767 days	(3-Oct-1912)-(8-Nov-1914)	Bagdad, California

Element	Characteristic	Southeast Alaska		
Temperature	Maximum	36.67ºC (98ºF)	31-Jul-1976	Haines
	Minimum	-4.44ºC (-24ºF)	2-Feb-1947 and 30-Dec-1964	Skagway
	Maximum mean	9.33ºC (48.8ºF)	1958	Beaver Falls
	Minimum mean	1.33ºC (34.4ºF)	1966	Craig
Snow	Maximum 24-hour	1.232m (48.5 in.)	1-Dec-1988	Canyon Island
	Maximum seasonal (July-June)	10.241m (403.2 in.)	1975	Yakutat
	Maximum depth	3.962m (156 in.)	22-Mar-1951	Annex Creek
Rain	Maximum 24-hour	0.497 m (19.56 in.)	21-Sep-1981	Port Alexander
	Least annual	0.387m (15.23 in.)	1905	Skagway
	Maximum annual	7.423m (292.24 in.)	1987	Little Port Walter
	Longest dry period	55 days	24-Dec-1908	Skagway

Cooperative Observer Data

How it's Used and the Importance of its Accuracy

By Nikki Becker

Precipitation measuring stick

In Alaska, the Cooperative Observer Program (COOP) has been active since September 1904 providing daily meteorological temperature and precipitation measurements. Currently, there are 287 active COOP stations in Alaska, with 35 of those located in Southeast Alaska[1]. The COOP network has evolved from taking observations used mainly for agricultural purposes to multiple climate-related applications. COOP data are used to measure and study climate change and variability; verify National Weather Service forecast and warnings; assist with water management decisions, road and dam safety regulations, building codes, energy consumption models, litigation, flood hazard assessment, and weather forecast model initialization, just to name a few[2]. It is important that the data collected by Cooperative Observers be accurate because it plays a vital role in our understanding of floods, droughts, heat and cold waves, all of which affect our daily lives.

Precipitation data (rain and melted snow) is collected manually on a daily basis by the majority of COOP observers ("COOPs") throughout Alaska using an 8-inch diameter rain gauge installed by the National Weather Service. A labeled measuring stick (left) is used to measure the amount of liquid precipitation fallen according to *The National Weather Service Observing Handbook Number 2: Cooperative Station Observations (July 1989)*. The measuring stick is labeled every 0.10 inches with a large tick mark, an unlabeled medium tick mark every 0.05 inches, and an unlabeled small tick mark every 0.01 inches. The daily precipitation observations are used to generate weather simulation models for a variety of applications[3].

A study conducted by Oregon State University used a computer model to interpolate daily weather parameters over large geographic areas where no data existed. The model used COOP precipitation data from the continental U.S. in the 1990s and the maps that were created were called Parameter-elevation Regressions on Independent Slopes Model or PRISM. The precipitation mapping effort produced spatial patterns that were highly discontinuous in space (even over flat inland terrain, i.e. Oklahoma). A follow-up investigation concluded COOP data suffered from observer bias, which is the tendency for an observer to favor or avoid some precipitation values compared to others. Observer bias showed a tendency of underreporting daily amounts less than 0.05 inches and a strong tendency for COOPs to report precipitation amounts divisible by 5 or 10 when recorded in inches. Stations with observer bias can and probably have had a negative impact on all the applications of data described earlier[4].

Observer bias creates serious problems for many applications of COOP data used in the United States. Therefore, it is important to discuss what might be causing these issues so that corrective actions can be taken. The PRISM group at Oregon State University came to various conclusions why underreporting and 5/10 bias may be happening: the markings on the measuring stick could lead to the tendency of observers to round to the nearest 5 or 10; the tendency to apportion the precipitation total into two different periods when observations are not preformed at the

8" rain gauge at Haines Customs

assigned time; many observers may not see the need to take precipitation measurements if they perceive that inconsequential precipitation had fallen in the last twenty-four hours; or the observer is unaware of any precipitation that has fallen and does not check the gauge to confirm.

There are simple corrective actions one can take to reduce observer bias: 1. Ensure observers are using the proper equipment and understands COOP precipitation measurement procedures. For example, a ten year comparison of precipitation measured using a 4-inch plastic gauge instead of a standard 8-inch gauge found that the 4-inch gauge consistently collected more precipitation and the greater percentage of differences was during very light events[5]. 2. Ensure observers are checking the rain gauge daily at the assigned time, regardless if precipitation has fallen or not. Having knowledge about observer bias can help prevent reporting data incorrectly in the future.

The data COOPs collect daily is important in many real-world applications. The problems discovered in the Lower 48 PRISM study may be occurring at Alaska COOPs without observers even realizing it. COOPs unsure if they are recording the data accurately can always ask for refresher training during the annual visit by NWS personnel or may call the servicing NWS at anytime.

[1]Pete Rahe, Cooperative Program Specialist, NOAA's National Weather Service, Alaska Region Headquarters, Personal interview, 2 May 2008.

[2]Cooperative Observer Program (COOP) (US Department of Commerce, NOAA's National Weather Service Jan. 2000).

[3]Daly, Christopher, Wayne P. Gibson, George H. Taylor, Mathew K. Doggett, and Joseph I. Smith, "Observer Bias in Daily Precipitation Measurements at United States Cooperative Network Stations," BAMS, June 2007, 899-912.

[4]Daly 900-901.

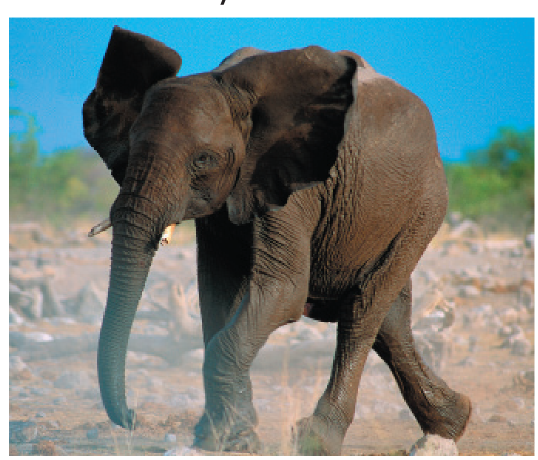
[5]Daly 909-911.

Your spotter reports are essential for verification of our forecasts.

Recently, a spotter in Kansas reported not one, but two tornados which verified the tornado watch that was issued earlier in the day.

On a funnier note, a few minutes after the tornadoes were reported, another spotter called in to report that circus elephants were running loose because they were spooked by a thunderstorm.

Always changing, inclement weather can occur without warning. Your reports can help save lives by letting us know when bad weather is occurring. Call in your weather report, no matter how trivial you may think it is.



WIND DIRECTION: TRUE vs. MAGNETIC

By Joel Curtis

Wind direction is an essential component of both observed weather reports and weather prediction. It is used to make decisions by air traffic controllers, fire fighters, boaters, and ferry captains. But there are two types of direction references: Magnetic and true.

Here's an opportunity to test your knowledge on how the difference between your compass reading and True North affects your interpretation of wind direction. Answers are given below.

1) Magnetic "Variation" and "Declination" are terms used to describe the difference between true direction and magnetic direction. What is the variation (or declination) at Juneau? _________ degrees _________ (East or West).

2) Standing in an area without magnetic interference (i.e., no large iron objects nearby), and using a perfect compass (no correction to the instrument), what is the direction of "True North" on your compass in Juneau ? _______________ degrees .

3) Yes or No: Ships and airplanes navigate using a magnetic (MAG) orientation. ___________

4) Yes or No: Navigational charts, both aeronautical and nautical, are oriented using True direction. ______

5) Yes or No: Weather observations received by the National Weather Service (NWS) have wind directions reported in "True". __________________

6) Federal Aviation Administration Tower wind directions (airports) are given in ATIS broadcasts or radio communications to pilots with ________________ (true or mag) orientation.

7) All wind direction forecasts issued by the NWS are given in ____________ (true or mag) orientation.

8) Yes or No: True or Magnetic orientation is not important because it can't make a difference a wind forecast. _______________

Answers:

1) According to nautical and aeronautical charts, magnetic declination or variation in Alaska is East at all locations and ranges from 2 degrees East at Shemya to 22 degrees East at Juneau.

Here are some values for stations across Southeast Alaska from NOAA tables rounded to tenths of degrees by postal zip-code location:

Yakutat	22.0 E	Skagway	22.6 E	Juneau	22.2 E
Ketchikan	21.1 E	Sitka	21.6 E	Petersburg	21.7 E
Wrangell	21.5 E	Craig	21.1 E	Hoonah	22.0 E

These values vary slightly each year as the earth's magnetic field changes. Most nautical charts indicate the yearly change for those of us who do not buy the charts for each update.

2) The way to figure out how the declination or variation is to be applied is to remember, “East is Least, West is Best”. This mnemonic saying applies to the algebraic sign of application to Magnetic North. In other words, to find True North, face North on your compass, subtract the East variation in degrees, (the nautical term is “backing”, or counting back against increasing direction) and this gives the “Magnetic Heading” of True North. Here’s an example:

I would face Magnetic North on my compass in Juneau where the variation is 22 degrees east. I count back 22 degrees, and therefore True North would be heading 338 degrees on my compass. Everyone in Alaska will have True North less than the 360 degree reading on his or her compass. Check it out: go outside on a clear night with a reasonably good compass. Face due True North on your compass and you will see the North Star, Polaris, somewhere like a quarter turn on your left. (Incidentally, Polaris varies from a bearing of 001 to 359 depending on time of day.)

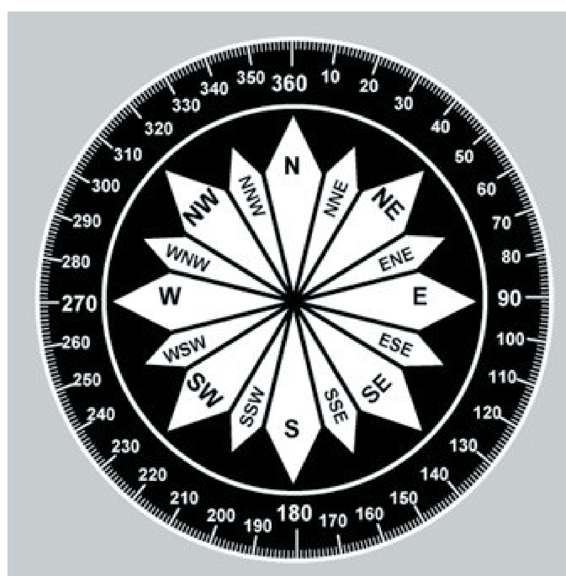
3) Generally, yes, unless the ship or plane, for some weird reason, has a gyro compass that they can slew to True North, ships and planes steer on a magnetic orientation. Another unusual exception is when a craft navigates near the pole, the longitude lines converge so rapidly that these vessels must have a directional gyro that they can change to “artificial North”. This is known as grid navigation, and is an awful lot of trouble if you are the navigator. Everybody, basically, uses magnetic orientation because compasses are easy to use.

4) YES - With the extremely rare exceptions. Even charts with navigational grids will have a True North orientation for some given longitude. Polar stereographic projections that are used for many of NWS map displays will either have a central longitude (like 150W) or show the pole in the center.

5) YES - Most of the time. Aircraft weather observations, buoys, and upper air balloons report to the NWS using True wind directions. Most land stations with private or other agency wind equipment are set up oriented to True North. Raw buoy data, if you can find it, is in MAG.

6) Magnetic! Pilots need to have it that way because they are flying according to their compass.

7) True North orientation.



8) NO - It matters! NWS wind direction forecasts are given in reference to an eight-point compass (i.e., N, NE, E, SE, etc.). Consider Juneau’s 22-degree variation. That’s almost exactly one-half a compass point. Which way does it get rounded?

On the Gulf Coast off Yakutat, the beach is oriented almost 270-090 degrees, MAG. If forecasted wind directions are parallel to the coast, the effects are much different from onshore or offshore wind. For example, the fetch distance for generating wind waves may be considerable longer or shorter depending on whether True or MAG wind directions are used.

Many users of NWS forecasts go about their day-to-day operations using a compass. It is important for forecasters and forecast users alike to understand and apply a good understanding of wind direction.

Southeast Alaska 2007-2008 Winter in Review

By Rick Fritsch

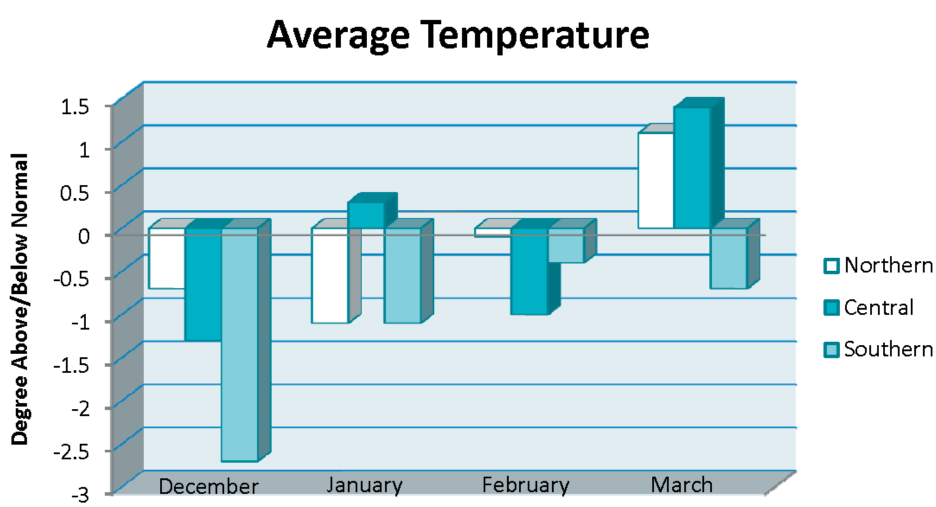
For those of you who may remember, the winter season prediction for Southeast Alaska called for slightly cooler than normal temperatures, less than normal precipitation, and near normal snowfall. This prediction was because we were, at the time, experiencing a La Niña that was expected to increase in strength. Let's see how that prediction held up.

December got off to a cold start with a cold spell that affected the entire Panhandle. Central Panhandle locations got the worst of the cold with daily highs and lows running 25°F to 28°F below normal during the first week of the month. This was also a dry week with only around 2 ½ inches of snow in northern locations temperatures warmed the second week of December. All locations saw nighttime lows somewhat above normal with central locations as much as 11°F above typical December nighttime values. The warmth did not translate into significantly warmer daytime highs for northern and southern locations, but the central Panhandle experienced daytime highs anywhere from 4°F to 6°F above normal during the second week and the first part of the third week of the month. Another brief cold snap affected central and northern locations December 18-20 with highs and lows anywhere from 10°F to 15°F below normal. For the month of December, the southern Panhandle had the greatest monthly average temperature departure: almost three degrees below normal.

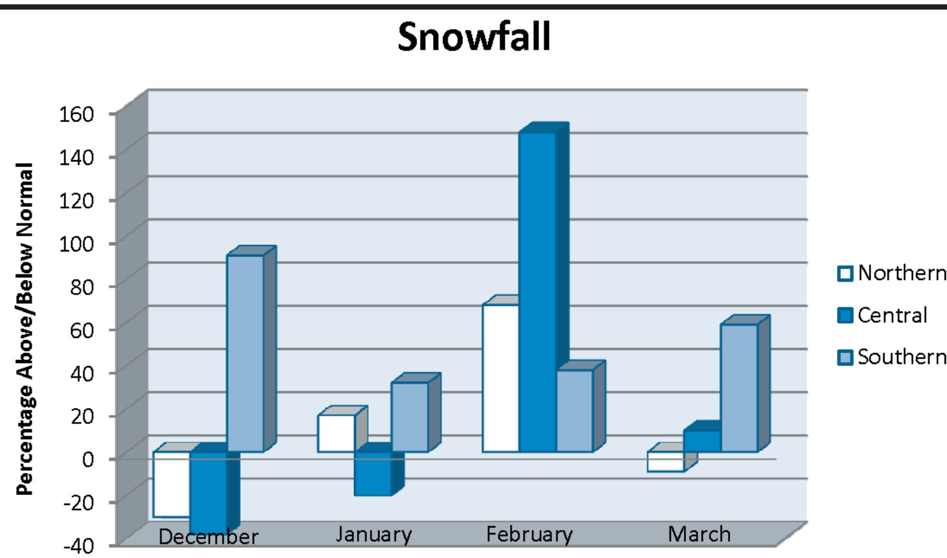
Regular precipitation resumed by the beginning of the second week but did not rebound to normal December amounts. All locations posted a precipitation deficit for December, with the greatest in northern locations and the least in southern locations. Although southern locations recorded a total precipitation deficit for the month, the below normal average temperature for the month translated into 91% greater than normal monthly snowfall.

The first three weeks of January saw fairly normal temperatures in northern and southern locations with a few large excursions above normal in overnight lows while central Panhandle locations were generally above normal for daily highs and lows. Beginning with the 4th week of January, northern and southern locations experienced a significant decrease in daily high and low temperatures with central Panhandle locations following suit towards the end of the month. Total precipitation and snowfall worked out as expected for northern and southern locations, with an overall precipitation deficit and normal to slightly above normal snowfall which was more dramatic in northern locations. Central locations, however, saw a slight precipitation surplus and snowfall deficit owing to the warmer than normal conditions experienced for most of the month.

The cold snap continued into February and temperatures did not return to normal levels until the middle of the second week. This was most pronounced in the northern half of the Panhandle, which experienced the coldest air as the Arctic Front spread south across the region. By the second week of the month, temperatures had risen to normal or above normal values and stayed there for the remainder of the month. Nighttime lows were decidedly above normal for the northern half of the Panhandle. In spite of monthly average nighttime lows being above normal for the northern half, the daytime highs and nighttime lows during the first week were cold enough to keep the monthly average temperatures for north, central, and southern Panhandle locations near to slightly below

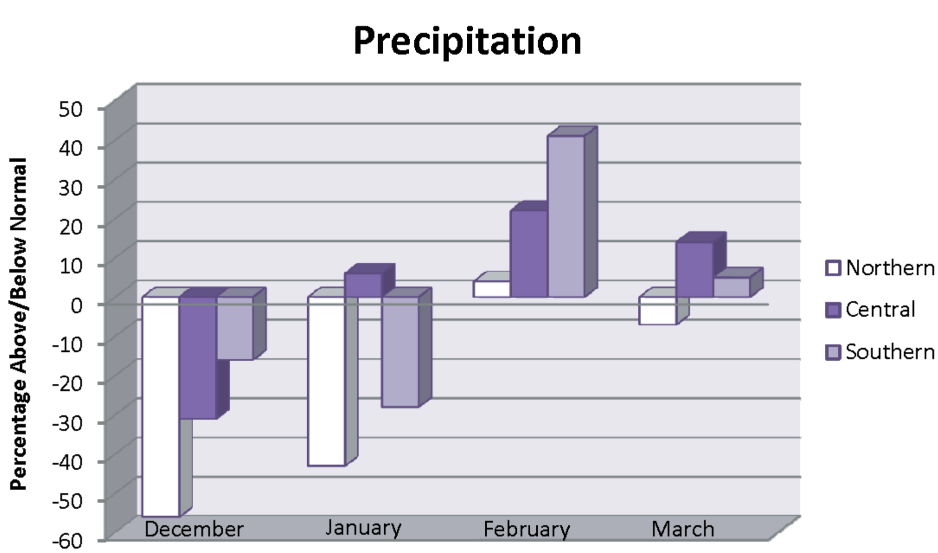


normal. In terms of precipitation, rain and snow were unevenly distributed both throughout the month and across the Panhandle. Common to the entire Panhandle, was above normal precipitation and snowfall totals for February.



Generally, March began warmer than normal across the Panhandle and remained for the first 11 days of the month. This period was reflected primarily in warmer than normal nighttime lows in northern locations and warmer than normal daytime highs in central and southern locations. The middle of the month was near normal in terms of temperatures with daytime highs right around normal for central locations while both northern and southern locations were slightly below normal. The last part of the month saw daytime highs and nighttime lows trending below normal in most locations with nighttime lows deviating the farthest below normal. The exception to this generality were daytime highs over the central Panhandle which trended slightly above normal and coincided with partly cloudy skies and light winds under a broad area of high pressure. In summary, the northern Panhandle monthly average temperature came out around a degree above normal due to nighttime lows averaging well above normal for the month – as much as 3°F in some locations. Central Panhandle locations saw both daily highs and lows running above normal and this was reflected in daily average temps around 1.4°F above normal. Southern locations saw daily highs, lows, and averages all below normal (0.5°F to 1.0°F) for the month.

In terms of precipitation, rain and snow were very unevenly distributed during the first three weeks for northern and central locations with the last week of the month dry. Precipitation was distributed much more evenly throughout the month over southern locations with the exception of heavy rain on the 2nd, heavy snow on the 16th, and 4 dry days at the end of the month. Apart from the heavy snow around the middle of the month, very little fell and, without this mid-month snow, southern locations would have been below normal for March snowfall instead of above normal.



Now that winter and spring are behind us, what does the summer hold in store? The moderate to strong La Niña that was in place last winter has begun to diminish and the Climate Prediction Center (CPC) expects that ENSO neutral conditions may exist by the end of July. This is not expected to have a significant impact on Southeast Alaska summer weather for two primary reasons. First, El Niño and La Niña typically only exert an influence over Panhandle weather during the winter months. Secondly, there is typically a 2 to 3 month lag between the return to ENSO neutral sea surface temperatures in the tropical Pacific Ocean and the corresponding response by the atmosphere in the form of more "normal" (ENSO neutral) weather.

The CPC is calling for 33 to 40% probability of greater than normal precipitation for northern Panhandle locations for June, July, and August, which would bring some welcomed relief to a precipitation deficit that has seen below normal monthly values for all but 3 of the last 17 months. In terms of temperatures this summer, the CPC is forecasting a 33 to 40% probability of cooler than normal temperatures for the entire Panhandle. In other words, the summer temperature forecast means that we have up to a 40% chance of cooler than normal temperatures, and they could be 1°F below normal or 10°F below normal. Likewise, we have a 33% chance of near normal temperatures and a 27% chance of warmer than normal temperatures. Notice, that if you add up all the probabilities, they total 100% - that's how probability forecasts work.

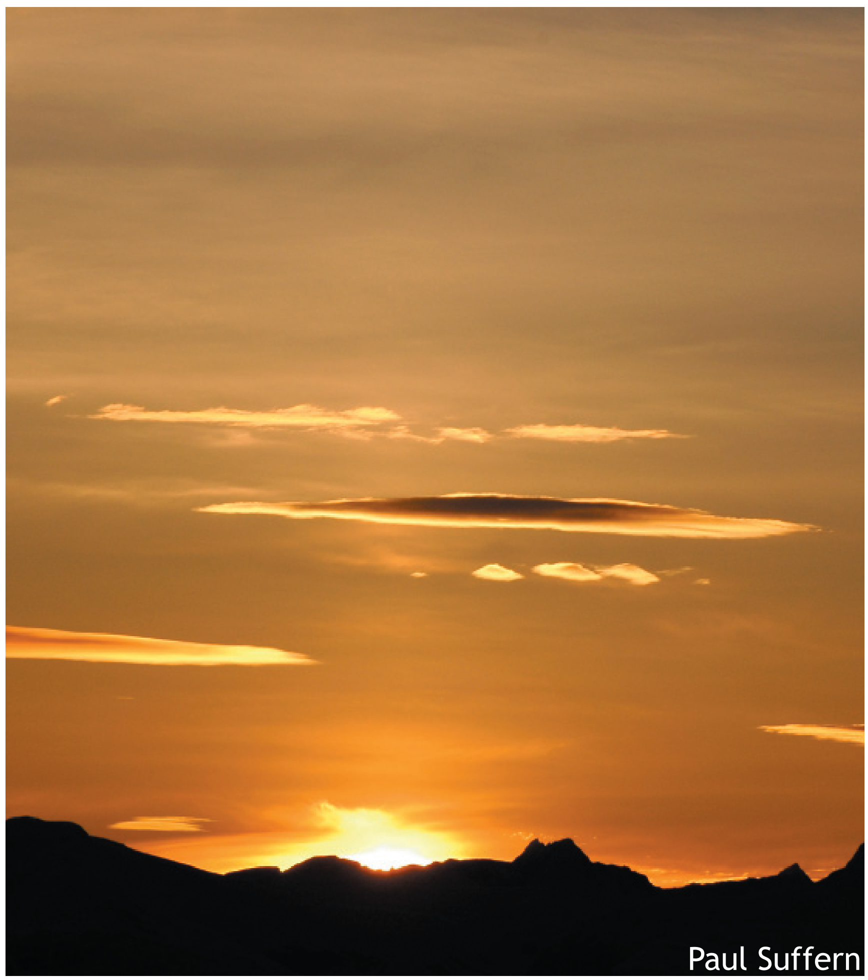
So, keep track of your daily and monthly average temperatures this summer and see how they compare to the CPC's seasonal forecast.

Extreme Temperatures from around Southeast January 1 - May 31

WFO Juneau reported a -21°F on February 8, the lowest temperature recorded since its record began in January 1999.

The high temperature goes to Klawock on May 24 with 80°F beating the old record for this date of 65°F by 15 degrees!

May 24 - 27 brought some warm weather, breaking daily temperature records starting on the 24th with Blashke Island reporting 78°F (4 degrees above the previous daily record of 74°F in 2004). Haines reported 78°F on the 25th, which was 14 degrees higher than the previous daily record of 64°F in 2005. On the 26th, Skagway Customs reported a high of 77°F (breaking the old record of 70°F set in 2006) while WSO Annette reported 77°F on the same day (breaking the old record of 73°F set in 2005). Thorne Bay and Hollis reported 79°F on the 26th. To finish our stretch of nice weather, Hyder and Thorne Bay Water reported 79°F on the 27th.



Lenticular clouds over the Chilkat Mountains.

Climate is what you expect, weather is what you get.

Trivia

1. **The National Weather Service (NWS) belongs to which department of the government?**
   a) Defense b) Interior c) Commerce d) Homeland Security

2. **Which President signed a joint resolution of Congress authorizing the Secretary of War to establish a national weather service?**
   a) Ulysses S. Grant b) Teddy Roosevelt c) Franklin D. Roosevelt d) Millard Fillmore

3. **The U.S. Weather Bureau was renamed the National Weather Service in what year?**
   a) 1920 b) 1949 c) 1967 d) 1979

4. **The current budget of the NWS is:**
   a) $2.5 billion b) $903.5 million c) $402.5 million d) $112 million

5. **How many NWS Forecast offices are there around the country?**
   a) 216 B) 122 c) 89 d) 13

6. **True or False - The NWS provides forecasts and warnings for outer space?**

7. **How many people work at WFO Juneau?**
   a) 14 b) 22 c) 32 d) 45

8. **True or False - Before 1950 there was ban on the use of the word tornado in NWS weather forecasts?**

WEATHER WATCHERS
SOUTHEAST ALASKA SPOTTER NETWORK

Most Active Spotter

December 1, 2007 to May 31, 2008

Our spotters called in a variety of weather - wind devils, blowing spray, water spouts, freezing spray, ice pellets, high winds, avalanches, heavy snow, freezing anemometers, gelling fuel oil, heavy rain, and hail.

Our spotters make a tremendous contribution to the forecast process by providing meteorologists with critical "ground truth" information about severe weather. It was a very difficult decision to make, but ***Trina Ives of Petersburg*** is our Most Valuable Spotter! She conveyed numerous, timely reports. Thanks for the great reports! Other notable spotters were Paul Swift of Haines and Bob Pegues of Tenakee Springs.

Trivia Answers: ***1.*** Department of Commerce (DOC). The Weather Bureau, as it was called at it's inception, was established in 1870 and placed with the Department of War, where it remained until 1891 when it was transferred to Department of Agriculture. ***2.*** Ulysses S. Grant ***3.*** 1967 ***4.*** The budget for NWS in fiscal year 2008 (October 2007 - September 2008) is $903.5 million. ***5.*** 122 ***6.*** True - The Space Weather Prediction Center is part of the National Centers for Environmental Prediction (NCEP) ***7.*** 22 ***8.*** True - It was feared that predicting tornadoes would cause panic - http://www.spc.noaa.gov/faq/tornado/#Forecasting

This quarterly educational newsletter is designed for Southeast Alaska's volunteer weather spotters, schools, emergency manager, and the news media. All of our customers and partners in Southeast Alaska are welcome to subscribe to it.

NOAA's National Weather Service Forecast Office in Juneau, Alaska is responsible for weather forecasts and warnings from Cape Suckling to the Dixon Entrance.

This publication, as well as all of our forecasts and warnings, are available on our web site: http://pajk.arh.noaa.gov.

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