Southeast Alaska

Cloudburst Chronicle

National Weather Service
Juneau, Alaska

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In this issue:

From the Editor: We apologize for the delay in getting this latest edition of the Cloudburst to you. In an attempt to make our newsletter more timely, Ursula Jones will be taking over as Chief Editor. Thanks for your patience!

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Know Before You Go!

By Tom Ainsworth

After the cold, wet, dark months of winter in Southeast Alaska, the much drier spring season infects me with a severe case of Spring Fever. I seek out my hiking trail maps, move the winter coats to the back of the closet and pull my pairs of shorts to the top of the drawers again. After deciding a time and location to immerse myself in the sounds and colors of Southeast Alaska's outdoors, I grab my water bottle and take off! After not too long on the trail, especially if the kids are along, I am encouraged to dig out a snack. Rats! I forgot to bring one. Proceeding down the path, I sense my pace slowing. Rounding the bend and crossing the stream at the base of a rushing waterfall, the sun slips behind the clouds. The plunging waterfall imparts a breeze that cools my bare, short sleeved arms. Emerging from the canopy of towering spruces and hemlocks a few drops of "liquid sunshine" blot my dusty day pack. Rats! I have no rain gear with me. Over the next 30 minutes, the rain pelts the broad, green leaves lining the trail making them sway. My bare arms are now wet. The beaten path is becoming slippery in spots. Then, like the roar of a stadium crowd, the wind bullies its way through the trees. The firs swagger sideways and throw up their boughs for balance. My instincts tell me this is a gust front being pushed ahead of a heavy rain shower. This is one forecast I wish I got wrong. A few large rain drops hit me in the chest and then millions more pour down. It's a wash out. A muddy rock overhang affords minimal shelter, and I take it. I'm wet, cold, stranded, and hungry. And it's all my fault. I wasn't prepared for the weather.

This particular hiking story is fictitious. But being caught unprepared for the weather happens to all of us now and then. Sometimes it's a mere inconvenience, like when we are caught running from the car to the store in the rain without a coat. Sometimes it's uncomfortable, like when we are waiting at the bus stop without boots and the slushy snow is accumulating over and into our shoes. Other times, being unaware and unprepared can be dangerous.

"The National Weather Service is committed to making weather information available to all citizens and visitors anywhere in the country."

The bay waters were flat calm when you pushed off in your kayak this morning. But the wind picked up considerably only an hour later making the water steep and choppy. Cold, whipping spray is making your hands numb and making the paddle back to shore an uphill battle. You arrive on the beach exhausted and cold. But at least you arrived. Others have not been as lucky.

Outdoor activities increase substantially during the summer months as people are

While underway, you can convey weather information on your location and receive forecast information from our Weather Service Offices in Annette and Yakutat.

Use **VHF Channel 16** to reach our Weather Service Offices:

- Yakutat's call sign is **WXM 83**
- Annette's call sign is **WWF 78**

Use **HF/USB at 4125 Khz** to reach our Weather Service Offices:

- Yakutat's call sign is **KDG91**
- Annette's call sign is **KGD58**

continued from cover...

lured out by the long hours of daylight and warm temperatures. As you prepare to venture out into the elements this summer, whether it is to a picnic across town or a boat trip across the sound, make a habit of including weather information in your preparations. The NWS Forecast Office in Juneau routinely collects weather information from various locations in southeast Alaska and makes predictions for weather conditions as far as seven days into the future. All this information is available to the public. There are many convenient ways to obtain weather information. The two most direct sources of weather information are 1) the continuous National Weather Service VHF broadcasts, and 2) the internet pages maintained by the Juneau Forecast Office **(http://pajk.arh.noaa.gov).**

NOAA Weather Radio (NWR), or WX1, cycles observations, forecasts, and other information about ongoing and predicted weather in Southeast Alaska. There are nine NWR transmitters between Yakutat and Ketchikan operating 24 hours per day. Seven frequencies between 162.400 and 162.550 MHz have been set aside for this purpose. In the event of unusual or severe weather, the programming may be interrupted by live broadcasts. The Coast Guard "rebroadcasts" the NWR programming over 11 VHF-FM high level transmitter sites in the panhandle (and 28 high sites total along coastal Alaska). Marine weather forecasts use certain terminology to alert Mariners when a heightened awareness of weather conditions is warranted:

Small Craft Advisory: sustained winds, or frequent gusts, over 20 knots, and/or waves frequently eight feet high or greater.

Gale Warning: sustained winds 34 to 47 knots. Gale force winds generate steep, short period waves that pose a hazard to most small boats.

Storm Warning: Sustained winds 48 to 63 knots.

Hurricane Force Wind Warning: Sustained winds 64 knots or more not associated with a tropical storm. After some typhoons (western Pacific hurricanes) lose their tropical characteristics (i.e., closed circulation with an "eye"), they reform as north Pacific storms and move through the Gulf of Alaska with hurricane force winds.

Special Marine Warnings: Gusty winds of 35 knots or more lasting less than two hours. These are usually associated with heavy rain showers or thunderstorms which cause rapid deterioration in sea state and visibility.

Know these terms and listen for them in NWS weather information.

If you stay on land to hike, camp, or bicycle, for example, don't be fooled into thinking that you are closer to safety. Rain and wind, even for a short period of time, can be cold! If you expect to be staying outside overnight, it is especially important to know what weather to expect so you can be prepared to survive. The likelihood of precipitation is expressed in NWS forecasts as a probability over the zone, or geographical area, the forecast applies to. The Juneau Forecast Office issues predictions for 13 zones across the panhandle. In addition to the probability (expressed as a percent chance of precipitation), recognize the different terminology used to describe the characteristics of precipitation:

Rain: steady precipitation, usually for several hours at a time, from thick stratiform clouds.

Rainbows are formed by the interaction of sunlight and rain. The observer must be between the shower and the sun. The sun must also be between the horizon and 42 degrees above the horizon to get the proper refraction for rainbow formation.

Showers: intermittent and brief periods of rain from tall cumulus clouds. Showery weather often is a mix of clouds and sun and blustery winds - rainbow making conditions.

Know these terms and listen for them in NWS weather information. An old weather adage says, "Slow to begin - slow to end (i.e., rain), quick to start - quick to end (i.e., showers)." Thunderstorms and lightning are rare phenomenon in Southeast Alaska (and temperate high latitude maritime climates world wide), but they do occur. When they do occur, it will be in a showery weather pattern. Don't discount the life threatening hazard of lightning during our summer showers.

If you plan to be outside when the forecast calls for a chance of rain, it is important you take along what you need to stay warm. The key to staying warm is staying dry. Use these preventative steps to avoid coldness:

- Avoid contact with moisture - take along a water repellant jacket with a hood and water repellant shoes or boots.
- Wick away natural moisture from sweat - carry a small towel or handkerchief.
- Isolate yourself from the wind by wearing appropriate clothing and considering alternate routes.
- In colder temperatures, form a layer of insulating air between your clothing and your skin by dressing in layers.

The National Weather Service is committed to making weather information available to all citizens and visitors anywhere in the country. If your summer plans will take you out of Southeast Alaska, you can always find weather information for where you are at and where you are going. Information is available in text messages, color images, and tabular and graphical presentations. Just click on the "Organization" link (**http://www.wrh.noaa.gov/wrhq/nwspage.html**) on the Juneau internet page. When you visit this site you will find a map of the United States and the locations of all NWS Forecast Offices. If it is easier for you to obtain weather information using the phone, you may call the Juneau office (790-6800) or the Alaska Weather Line (1-800-472-0391).

I encourage you to routinely take a moment everyday to obtain weather information and use it in planning your day around town, around the state, or around the country. Each year staggering amounts of money and volunteer hours are spent to help stranded and injured people back to safety. A large percentage of cases could have been avoided if people took the time to find and use weather information before they committed to their outdoor activity. In fact, they may not have ventured out at all if they had known the weather was predicted to take a turn for the worst. Let the National Weather Service help you plan and prepare to be safe. Let's work together to keep stories of wet, cold, stranded, and hungry outdoor enthusiasts fictitious.

Local web sites that can provide great information for staying safe while out and about in Southeast Alaska:

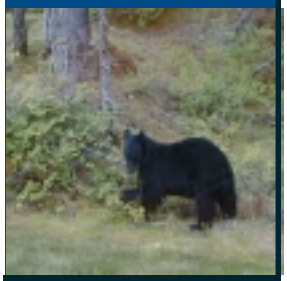
The FAA in Alaska has information on flying safety in Alaska and lots of great web cams in remote spots:
www.alaska.faa.gov

The USCG District 17 site has links to great information on boating safety:
www.uscg.mil/d17

The US Forest Service has great information on staying safe in the backcountry of Southeast Alaska:
www.fs.fed.us/r10/tongass

The National Park Service also has great outdoor safety info at their Glacier Bay National Park web site:
www.nps.gov/glba

In Juneau, organizations such as Trail Mix and the Nordic Ski Club have great updates on trail conditions and other excellent outdoor safety information:
www.juneautrails.org
home.gci.net/~jnordski



Aurora Borealis - The Northern Lights

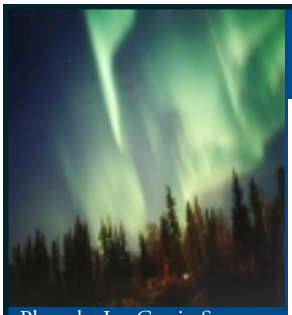


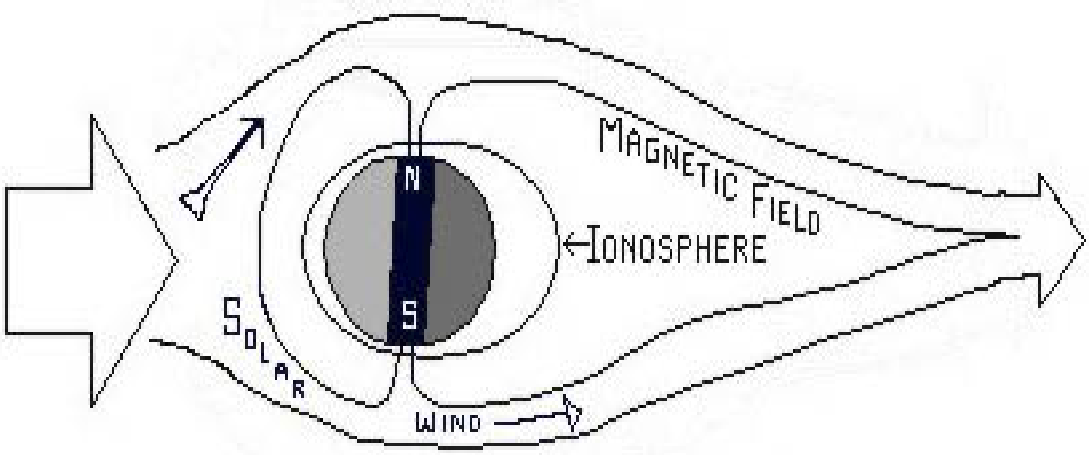
Photo by Jan Curtis, State Climatologist for Wyoming

By Linnae Neyman

Last fall was a time where we witnessed better than average auroras in Southeast Alaska. This was due to a brief increase in solar storm activity. The weather also helped our viewing experience as skies were clearer than normal. This was fortunate, since fall is our wettest time of year.

What causes an aurora?

Auroras result when high speed electrons and protons from the solar wind are guided by the earth's magnetic field into the very high near vacuum upper atmosphere. This happens near the poles because that is where the lines of magnetic force dip back toward the giant earth-sized bar magnet poles.



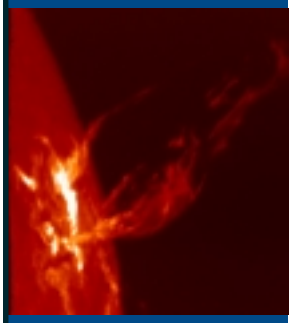
The solar wind interacts with the Earth's magnetic field and the ionosphere to form the aurora near the poles.

In the high thin atmosphere, the charged particles interact with the sparse and widely spaced gas atoms, producing a variety of colors. When a gas atom is struck by a charged particle, it may jump to a higher energy state, or become energized. Or the atom may become ionized by having an electron ripped away in the collision. In either case, the gas atom is pushed out of its normal energy state. When the atom returns to its normal energy state as equilibrium demands, it gives off energy in the wavelengths of visible light. When a lot of charged particles are streaming into the upper atmosphere which is what happens near the poles, an aurora results.

To have an aurora, a planet must have a magnetic field. The charged particles are guided and concentrated by the magnetic lines of force of the Earth's magnetic field. They coalesce in the curtains, streaks and clouds that are a signature of the aurora, where the Earth's magnetic field intersects the ionosphere. There are also auroras that have been seen by telescope on Jupiter and Saturn as they also have magnetic fields.

What causes different colors?

Different colors are produced depending on the energy of the solar wind charged particles striking the gas atoms, the type of atoms and the altitude where the atoms are struck by the charged particles. The aurora colors chart (opposite) shows the approximate colors produced at different elevations in the atmosphere by the various gas atoms and molecules. Below 60 miles high, the atmosphere is too dense for the solar particles to penetrate.



A solar flare occurs when a large amount of plasma from the sun's surface is ejected outwards. When the plasma returns to the suns surface, it collides with denser material found in the chromosphere. This collision releases large amounts of energy in the form of x-rays and other wavelengths which travel toward the earth at the speed of light.

An example of the red colors that can be seen during intense aurora events.

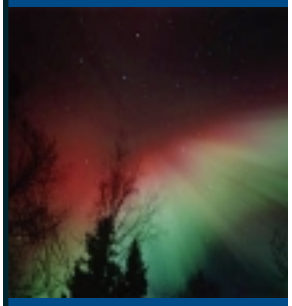


Photo by Jan Curtis, State Climatologist for Wyoming

The Colors of the Aurora

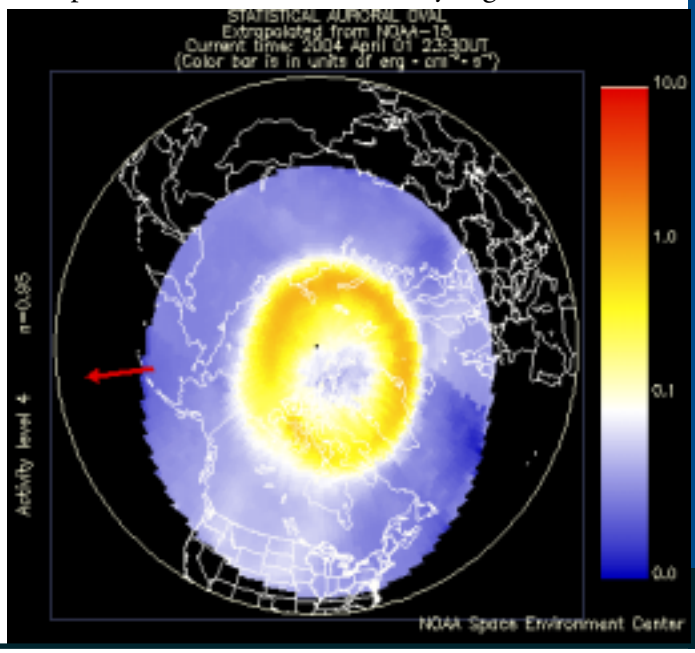
When is the best time to see an aurora?

It helps if it's dark out, but you can see them when its dusk. Scientists at the University of Alaska at Fairbanks say that midnight to 2 a.m. is the best viewing time. The strength and coverage of the aurora is dependent on the strength and character of the solar wind. There are two ways the sun produces a gustier or more intense solar wind. Sun spots, solar storms in the top layer of the sun, vary by number and intensity. Every 11 years there is a relative high point in the number and intensity of sun spots. This is called solar maximum. This is a time when more solar storms produce more flares that intensify the solar wind and auroral activity. The last solar max was in 2000. A strong solar flare will send a strong solar gust to earth in approximately 40 hours and the gust will be past earth in one day. This is a short lived active aurora usually lasting one night.

The other kind of solar activity that increases the aurora, is brought on by coronal holes. These are is most common in the few years after solar max, or from 2001 to 2004 this time around. Coronal holes last longer than flares, up to a year, and the hole will be on the side of the sun facing earth for 7 to 10 days at a time. The coronal hole will rotate back around to the side of the sun facing Earth every 27 days. The solar wind particles from a coronal hole will take 3 to 4 days to reach Earth and will produce an active aurora every night for a week or more.

Using data from a satellite between the earth and sun, scientists at the Geophysical Institute at the University of Alaska at Fairbanks produce a forecast for location and intensity of the aurora each day. Forecasts can be found at www.gi.alaska.edu/cgi-bin/predict.cgi

The NOAA Space Environment Center web site can be found at www.sec.noaa.gov



NOAA's Space Environment Center (SEC) provides real-time monitoring and forecasting of solar and geophysical events, conducts research in solar-terrestrial physics, and develops techniques for forecasting solar and geophysical disturbances. SEC's Space Weather Operations Center is jointly operated by NOAA and the U.S. Air Force and is the national and world warning center for disturbances that can affect people and equipment working in the space environment.

Instruments on board the NOAA Polar-orbiting Operational Environmental Satellite (POES) continually monitor the power flux carried by the protons and electrons that produce aurora in the atmosphere. SEC has developed a technique that uses the power flux observations obtained during a single pass of the satellite over a polar region to estimate the total power deposited in an entire polar region by these auroral particles. The power input estimate is converted to an Auroral Activity Index that ranges from 1 to 10 and is depicted by graphics (left) on their web site. Generally a POES Auroral Activity Index of 6 is needed for aurora viewing in Southeast Alaska.

A few words about forecast accuracy:

Don't let anyone fool you, weather forecasting still remains an inexact science. Naturally we do our best to be as accurate as possible with any of our forecasts. We do have several verification programs that can reveal how our forecasts matched the various automated observing sensors located throughout Southeast Alaska. Also, reports from our weather spotters and cooperative observers help us get the "ground truth" we need to learn from our mistakes. But what about these new graphical forecasts? How are they verified?

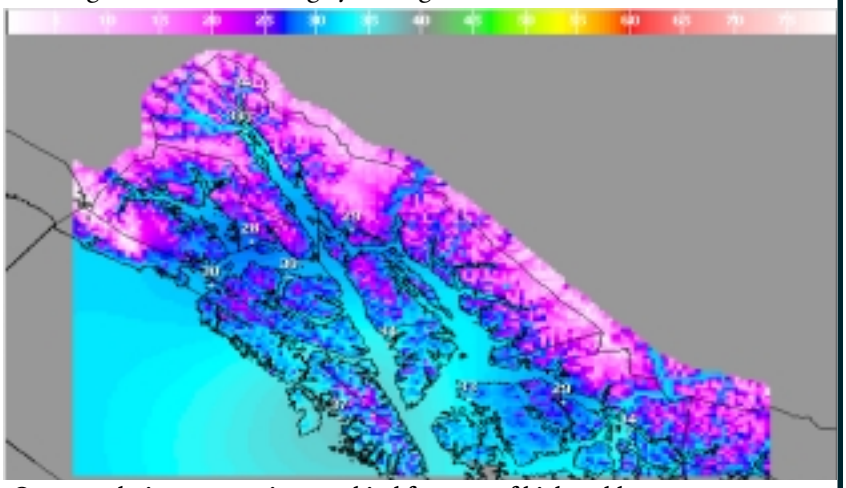
Well, since we don't have automated observations, let alone people in every location in the Panhandle, these graphical forecasts are obviously much harder to verify. Eventually more weather sensors, satellite, and radar data will help this cause, but for now you must realize that these graphic forecasts likely will not be pinpoint accurate. They are, however, the best forecast information we have for now and should get you in the ballpark of what conditions to expect. Our graphical forecasts will only improve with time and, as always, we encourage your feedback.

See the forecast, Be the forecast!

By Brian Bezenek

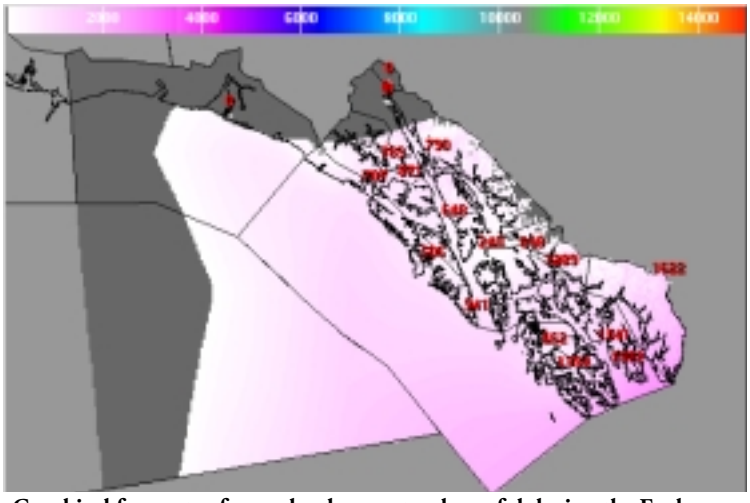
The graphical forecast era is finally here. Last November, the Weather Forecast Office (WFO) in Juneau transferred over to using state of the art graphical software to create the text forecasts that you have been used to seeing for years. In mid January, both the other Alaskan WFO's (Anchorage and Fairbanks) joined us in generating their forecast products via this new graphical software.

If you have visited our web site, http://pajk.arh.noaa.gov you may have already seen the graphical images that we are routinely creating. If not, I encourage you to go and take a look! Once at our site, simply click on "Graphical Forecasts" on the left tool bar. These images represent what we believe will happen across all of the varied terrain of Southeast Alaska. They should provide you with additional forecast information that you cannot receive from our simple text forecasts (which tend to focus on our population centers).



On our web site you can view graphical forecasts of high and low temperatures. This image is zoomed in on the Northern Panhandle. Graphical Forecasts like these could help you plan a camping or hunting trip in our backcountry.

The ways our new graphical forecasts can be utilized is endless. Perhaps you are leaving on a hunting trip to one of the Panhandle's many smaller islands in a few days. You need a better idea of what weather to expect on that island so that you can pack accordingly. Simply review the graphical forecasts on our web site and within minutes you have a much better idea of what to bring! How about if you are planning a hiking and camping trip into the backcountry of Southeast Alaska's mountains. How cold will it get at night? If I'm hiking in the mountains, is there a chance it might snow? If I decide to set up camp on that mountain peak with the great views, how much windier will it be up there? These new graphical forecasts should prepare you much better for the elements and help ensure your trip into the wilderness is a safe one.



Graphical forecasts of snow level are not only useful during the Eagle Crest ski season, they can also let you know when we might get a late Spring or early Fall snow. This could be critical if you are going hiking.

There is also work being done to mosaic the graphical forecasts around the state, into a single image. In the future these images for Alaska will be available to the public at www.nws. noaa.gov/forecasts/graphical There are already graphics on this site for the rest of the country.

We welcome comments, suggestions, and questions regarding our current set of operations. Feel free hit me up anytime! The best way to reach me is by email at brian.bezenek@noaa.gov

Cloudburst Classroom

by Kimberly Vaughan

IT'S COOL TO BE A FLAKE

Snow, we love to play in it and hate to shovel it. We welcome it in the Fall and wish it good-bye in the Spring (usually). So after we praise it and curse it, what do we really know about it? Snow is a mineral that comes in many different shapes, sizes and colors. That cleared up everything, right?! Not even close, you say! After you've plowed through this article you will be able to wow your friends with what a dendrite is, how snow becomes blue and is there really such a thing as thunder snow, along with a lot more.

The first thing that snow needs to form is for the temperature of the water vapor in the air to drop below the freezing point. The second is some hygroscopic nuclei. You're now saying hygro-what-a-side! Hygroscopic nuclei is nothing more than a fancy way of saying dust and other dry particles. The water vapor needs something to hold onto and then the crystallization can begin. Snow flakes start out as a hexagon, due to the geometry of the bonding of water molecules. As these flakes move around they collect more water vapor that crystallize and the flake grows and may even join with other flakes. Once enough crystallization has occurred an ice cloud is formed, but it's still not snow. The flakes must grow to the point in which the atmosphere can not hold them and they start falling to the ground, and now we can call it snow. There are six types of snowflakes:

✱**Star:** The most common snowflake. They are formed at temperatures near 5 F. These are very fragile and usually break and may even join with other stars before reaching the ground.

✱**Needles:** These form in air temperatures between 23 F to 14 F. They are dense, producing a heavy snow load.

✱**Dendrites:** They are star crystals that form in 3 dimension as they grow. They need extreme cold to form, -4 F to -13 F.

✱**Column:** These can form at a wide range of air temperature from 5 F to -13 F. They also like it to be a bit dryer. Like their Needle cousins, they are heavier than the star.

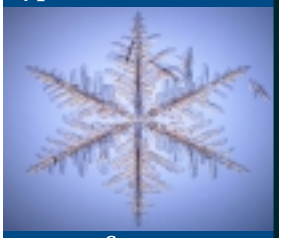
✱**Plate:** When there is a lack of significant moisture the spokelike arms of the star are unable to form, giving us plates, instead. Temperatures range from 14 F to -4 F.

✱**Column capped with plates:** This dynamic duo usually forms at the dryer and upper levels of the clouds. As they fall, they pass through different moisture and temperature layers gathering star flakes on its way down.

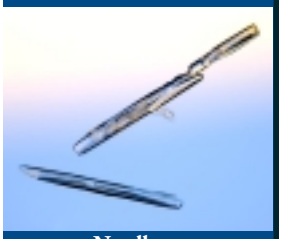
The amount of moisture in the air is the main factor to the amount of snowfall and the size of flakes. Simplistically put: more moisture equals more snow and/or larger flakes. There are Scientist whose studies are solely on flakes and it would be impossible to give every formation possibility in this publication. With so many factors, its no wonder that no two snowflakes are the same or are they? The answer to this timeless question is no. Snowflakes may look the same to the naked eye, but their real individuality can always be seen using a microscope at the molecular level.

Snow has different shapes and sized, why not different colors? Snow most often is white, due to it reflecting most of the sunlight and the equal absorption of what little wave-lengths it does absorb. Blue is a color we most often see in glaciers. This occurs as the light is reflected in the layers of snow or ice and the blue wavelength is the only one with enough energy to be reflected back for us to see. The more air trapped in the layers the less blue will be visible. Another process that causes one special glacier to be blue, occurs in mid April and only in Hyder (to my knowledge). The Caroline Glacier is formed after snow has fallen on a roof and is overcome by gravity and then with lots of love and attention the remnants of a blue stew is added. Snow can be brown to black in color, but this is only caused be dirt and grime. The last color snow can be, or at least the last color we will be discussing is red. The occurrence of

Types of Snow Flakes:



Stars



Needles

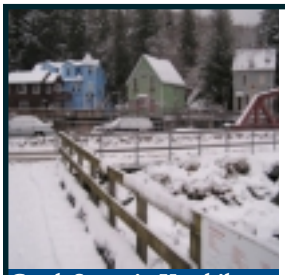
Dendrites

Columns

Plates

Column capped with plates

photos from Rasmussen & Libbrecht collection, Caltech U



Creek Street in Ketchikan after a rare snowfall this past winter.

Reflections on this past winter in Southeast Alaska:

Late last summer and through the fall we projected near normal temperatures and snowfall in Southeast Alaska for the upcoming winter. After a relatively cold and snowy November it was looking as if our outlook might have been a bit too conservative! Then we experienced a rather dry and warm February. That balanced things out and resulted in the majority of the Panhandle experiencing near normal temperatures for the winter season. Skiers frequenting Eagle Crest certainly had an enjoyable season.

The table to the right lists snowfall totals for this past winter and how they compared to the historical winter record. The notable exceptions were along the outer coast and in the Southern Inner Channels where above normal temperatures resulted in below normal snowfall this past winter.

Notes: There was no snowfall data for several communities this past winter. In Sitka our observers at the Fire Department were unable to track things due to their move. In Wrangell and Kake we continue to look for volunteer (cooperative) weather observers to report data to the Juneau Forecast Office.

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this color in snow may be the easiest to explain. The red color is caused by the snow containing algae.

There are a lot of myths and rules of thumbs relating to snow. I hope the following will help separate some fact from fiction:

Q. *Can it snow and thunder at the same time?* Yes, it's called Thunder snow. These are rare events and most often occur near coastal areas.

Q. *Can it be too cold to snow?* No, but you do need moisture.

Q. *Snow to water to snow ratio is always 10:1?* False, snow varies in water content. The water content of 10 inches of fresh snow can range from one tenth of an inch to four inches.

Q. *Can it snow when the surface temperature is above freezing?* Yes, as long as the layer (portion of air between the freezing level and the ground) is shallow enough to not allow the snow to melt before reaching the earth.

It's hard to believe that something so small could be so complicated. Snow has different shapes, sizes and colors. The temperature and moisture level controls the formation of the flakes and it all starts with a speck of dust.

Blizzard Wizard

- Biggest snow flake on record was *8 by 12 inches* (about the size of a sheet of paper). This huge snowflake fell in Bratsk, Siberia in 1971.

The records for the greatest snowfalls in North America and Alaska are as follows:

- Season Records - Mount Baker, WA during the winter of 1998-99 with 1,140 inches. Alaska's record goes to Thompson Pass with a collection of 974.5 inches during the winter of 1952-53.
- Single Storm Records - Mount Shasta Ski Bowl, CA with 189 inches from Feb 13 - 19, 1959. Alaska's record occurred at Thompson Pass from Dec 26 - 31, 1955 with 175 inches.
- Monthly Records - Tamarack, CA had 390 inches fall during January 1911. Alaska's record occurred at Thompson Pass with 297.9 inches during Feb 1953.
- Daily Records - Silver Lake, CO collected 76 inches from April 14 - 15, 1921. Alaska's record is once again held by Thompson Pass on Dec 29, 1955 with 62 inches. Guess we all know the snowiest spot in Alaska...at least for where measurements are taken!

Winter 2003-04 Snowfall Totals (Nov - Mar)

Southeast AK Location:	Snowfall this winter	Historical Winter Average	% of Average
Yakutat	142"	190"	75%
Skagway	52"	38"	137%
Haines	183"	166"	110%
Haines Customs (Canadian Border)	238"	236"	101%
Juneau (airport)	92"	96"	96%
Annex Creek	218"	231"	94%
Canyon Island	196"	168"	117%
Gustavus	81"	71"	114%
Hoonah	74"	70"	106%
Pelican	85"	77"	110%
Port Alexander	17"	56"	30%
Point Baker	11"	N/A	N/A
Petersburg	67"	64"	105%
Hollis	21"	46"	46%
Blashke Island	17"	N/A	N/A
Ketchikan	26"	37"	70%
Annette Island	27"	44"	61%
Hyder	180"	171"	105%

The Latest On Southeast Alaska Automated Weather Stations

By Chris Maier

The complex terrain and land/sea interface of the Panhandle results in a myriad of local weather effects. The more automated weather sensors that are deployed, the more of those local weather effects are captured. Not only do these sensors help our forecasters do a better job, but they also allow everyone to monitor the current weather conditions. They provide data 24/7 and can be set up in remote locations that can give worst case weather information. The bottomline is that these weather sensors can help save lives.

Curious if the forecasted southerly gale is about to hit our Outer coast? Check the Cape Fairweather and Cape Edgecumbe buoy data. What's it doing in Lynn Canal? Check out the weather data on Eldred Rock and in Skagway. Icy Strait? Try the Sisters Island weather station. Get the point? As more and more of these sensors become available, we are all able to track the weather much better.

Funding, of course, is always the main issue when it comes to deploying weather sensors in new locations. Unfortunately the National Weather Service (NWS) owns very few of the automated sensors that are in place in Alaska. Usually another agency, such as the FAA or AK DOT, owns the actual sensor. Our Electronic Technicians (ETs) then work with those agencies on the installation and maintenance of the equipment. In a few rare instances a private entity will want to buy a sensor and ask the NWS to install and maintain it. We can enter a "cooperative agreement" in those cases, as long as the equipment being purchased is similar to the type that our Technicians usually work with. They simply can't be learning and buying parts for every automated observing station that is out there.

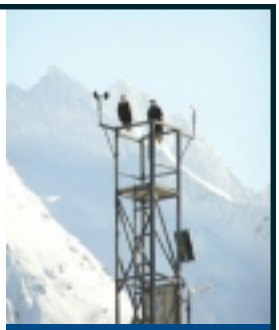
Another issue is the outages our weather sensors experience from time to time. When a weather buoy goes down for example, the USCG buoy tenders schedule a maintenance trip mission, but must wait for a window of good weather (minimal wind and seas). Similarly, our Electronics Technicians must plan a maintenance trip to remote stations such as Eldred Rock or Sisters Island that is based on when a helicopter can be flown into and out of the site. Once on site, the problems can range from batteries losing their solar charge, to Eagles perching on and damaging the anemometer, to varments chewing a cable, to someone actually taking pot shots at the equipment. Incredible when you think of how precious few observation sites we already have in Southeast Alaska!

Problems this past winter with the Eldred Rock, Point Bishop, and Sisters Island weather sensors were recently repaired. The USCG was planning on fixing the Cape Edgecumbe buoy winds this Spring. Lastly, our office received funding for one new weather sensor for the Ketchikan area. Caamano Point and Guard Island were being investigated as potential sites for this equipment.

Our Electronic Technicians work hard on the old automated weather station on Eldred Rock. When stations like this go down, a period of good helicopter flying weather is needed to get to the site for repairs.

Our automated weather stations (like Cape Spencer) use a combination of solar and battery power.

This new weather station on southeast Mitkof Island will capture the strong outflow winds of the Stikine River delta (seen in the background). Currently the data is only accessible by calling the station. We are working on getting the data so that it will be available on our web site, NOAA Weather Radio broadcasts, and the Alaska Weather Line.



Unforunately, eagles and other large birds can damage our wind sensors.

All of the automated weather sensors at the various airports in Southeast Alaska are owned by the FAA. The NWS does maintain most of them, however. Shown above is the sensor at the Haines Airport.

The wind sensor on Sisters Island was recently repaired. The wind direction and speed should now be accurate.

PORCUPINE DAY: WHAT DOES IT MEAN IF JUNEAU JIMMY SEES HIS SHADOW?

By: Chris Maier

I've often heard friends of mine talk about how "we'll pay for such nice spring weather by having a wet summer." Knowing these friends have lived here in Southeast much longer than myself, I've always thought there must be some truth to it. Until now, I've never tested that perception.

I looked back at the climatological record for the Juneau Airport (dating back to 1943), to compare years where we had above and below normal precipitation in April and May, with years where we had above and below precipitation and temperatures from June through August. Here is what history reveals:

When we have a wet spring: we actually have a 62% chance of having a wet summer, and only a 38% chance of having a drier than average summer. Wet springs are also typically followed by cool summers (71%), as opposed to warmer than average summers only 29% of the time.

When we have a drier than average spring: there is actually a slightly better chance (45%) for having a dry summer. Our chance of being wetter than average of course falls to 55%. We are also more likely (45% of the time) to have a warmer than average summer after a dry spring.

Curious. At least for Juneau, after a dry spring, history shows we actually have a better chance to experience a warmer and drier than average summer (and viceversa). This past April 2nd, Juneau Jimmy did not see his shadow indicating a nice Spring was on its way. Through mid May, it of course has been drier than normal. We'll have to hire that Porcupine!

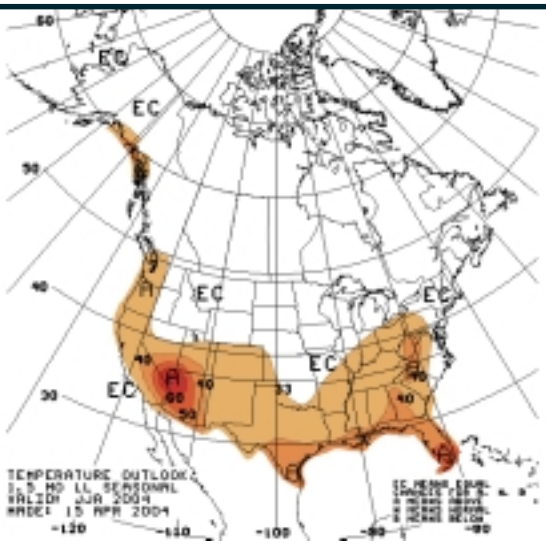
Southeast Alaska Climate Outlook

By Chris Maier

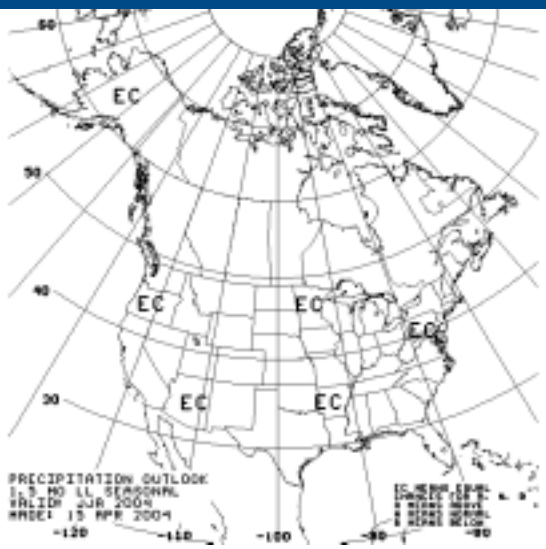
A climate research associate of mine estimates that at most, ENSO (El Nino and the Southern Oscillation) events explain only 20% of the annual variability in climate we experience across the North Pacific. In other words, 80% of what causes the yearly fluctuations in our climate here in Southeast Alaska is unknown. That 20% is so important however, because it represents the vast majority of climate variability we can actually predict. Until research allows us to gain insight into that unknown 80%, the ENSO cycle will continue to be the main predictor we use for our seasonal climate outlooks.

The NOAA Climate Prediction Center's latest outlooks for this summer in Southeast Alaska show above normal temperatures should be expected. The trend actually shows a better chance for June to be warmer than normal, than August. As far as their precipitation outlook, there is an equal chance for above normal, below normal, and near normal precipitation. At first glance that prediction does not seem to give us much insight. However, just the fact we have a 33% chance of being drier than normal this summer says something! Perhaps we will be due for another decent summer after our wetter than normal early Spring (Feb - Apr) weather.

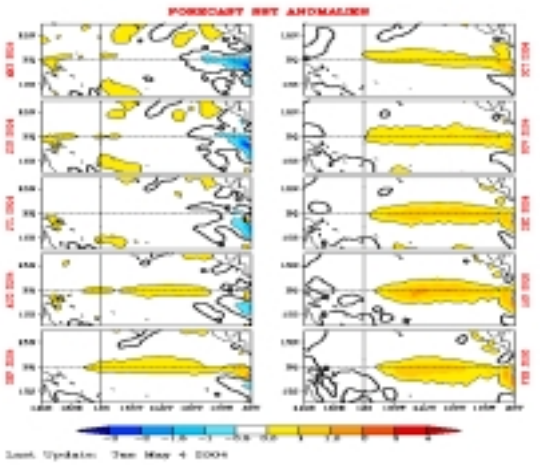
One reason there is so much uncertainty for the upcoming summer is that ENSO neutral conditions (near normal sea surface temperatures) are forecast to continue in the equatorial Pacific. With neither an El Nino (warmer than normal sea surface temps), nor La Nina (colder than normal) at play, there is simply no strong climate signal to hang one's hat on. Longer range climate model predictions reveal a different story. A weak El Nino is projected to develop for the 2004-05 winter. El Nino winters *usually* result in warmer than normal winters and below normal snowfall in Southeast Alaska. This would go against recent trends (over the past couple of winters) where we are starting to see signs for the development of a cycle of colder and snowier than normal winters. We obviously still have a long way to go before next winter, so we'll keep you posted!



NOAA's Climate Prediction Center is currently calling for warmer than normal temperatures this summer (June - August) in Southeast Alaska.



NOAA's Climate Prediction Center projects we have a 33% chance of experiencing a drier than normal summer (June - August) in Southeast Alaska.



Longer range climate prediction models are projecting that an El Nino will develop for next winter. This could reverse the recent developing trend of cooler and snowier winters in

Southeast Alaska Weather Trivia

We recently experienced a relatively long dry spell the first half of May. That made us wonder what were the longest periods without rainfall on record for the various communities around the Panhandle. Test your 'fair weather' knowledge of Southeast, and see if you can match these record dry spells with the correct location:

_____ Juneau	**A.** 23 days in July of 1971
_____ Haines	**B.** 17 days in July of 1981
_____ Yakutat	**C.** 25 days in June and July of 1959
_____ Sitka	**D.** 30 days in August of 1979
_____ Petersburg	**E.** 11 days in July of 1982
_____ Skagway	**F.** 16 days in June of 1991
_____ Ketchikan	**G.** 18 days in July of 1920
_____ Klawock	**H.** 31 days in July of 1920

WEATHER WATCHERS

Southeast Alaska's Spotter Network

Our Most Valuable Spotters!

In no particular order, the following Weather Spotters provided timely and accurate reports, that helped us gain insight on the local impact of severe weather, since our last newsletter publication: **Paul Swift of Haines, Betty Holgate of Mud Bay, Bob Pegues of Tenakee Springs, Chris and John Spute of Gustavus, Martha Reeves and Randy Host of Juneau, Trina Ives of Petersburg, Kim Baxter of Craig, John Markle of Saxman, and Caroline Stewart of Hyder.** Your exemplary contributions and dedication to our Weather Watchers program is literally helping save lives and property from severe weather! Thanks! You will all be receiving new rain/snow gauges and Alaska Cloud and Weather Field Guides.

Spotter News:

Over the past eight months we have given weather spotter training presentations in Gustavus, Petersburg, Wrangell and Yakutat. We would like to welcome our new weather spotters aboard! Everyone in the program will be receiving a packet with updated reference materials this summer. If you would like to have us give weather spotter training in your community, call Chris at 790-6803!

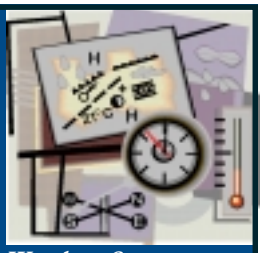
SOUTHEAST ALASKA WEATHER WATCHER PHOTOS!

This image was submitted by **Betty Holgate** from Mud Bay on the Chilkat Peninsula. It was taken around sunset in March of 2003 after a major winter storm. The clouds captured in this breathtaking photograph are known as *Altocumulus Lenticularis*. Lenticular clouds are formed when strong winds aloft, blow across mountain ridges and impart a wave action that results in their UFO like appearance. They are a warning sign of strong to extreme turbulence aloft. Thanks for sharing your talent and amazing shot, Betty!

This photograph was submitted by our outstanding weather spotter in Tenakee Springs, **Bob Pegues**. "It was taken during the "Thanksgiving Day Storm," not the famous one in 1984, but one that occurred back in 1968! It shows how bad the seas were rolling inside the breakwater at the Tenakee Small Boat Harbor. The Tenakee seaplane float, about a mile to the west, was ripped off its moorings, and took out a section of the town's dock approach. The tide was not as high as the '84 storm, but the winds were similar," Bob shared. Thanks for the vivid history lesson!

Please share a Southeast Alaska weather photo with us! Images can be e:mailed to chris.maier@noaa.gov (image file size must be less than 5MB), or mailed into us. We will return your photo after it is scanned in for our newsletter. Thanks in advance for any contributions you make!

Trivia Answers: *Juneau = F, Haines = D, Yakutat = C, Sitka = G, Petersburg = B, Skagway = H, Ketchikan = A, Klawock = E.*



Weather Spotters volunteer their time and energy to report when weather is impacting their community. This information helps us issue better forecasts and warnings, which ultimately helps save lives and property here in Southeast Alaska. When you volunteer to become a weather spotter, you are only expected to call or e-mail information when it is convenient to you. Please do not feel bad if you are unable to convey reports from time to time. We totally understand and are very appreciative for the service you do provide!

Weather Spotters should report:

- Thunderstorms
- Waterspouts
- Hail
- Winds of 40 mph or more
- Weather related damage
- Rainfall of a 1/2" or more in an hour
- Freezing rain or drizzle
- Heavy Snowfall...rates of an inch or more an hour
- 4" or more of snow in 12 hours
- Roads closed or impassible due to high water
- Coastal Flooding
- Land or mud slides
- Rivers or streams near bankfull
- Any unusual weather event!