Southeast Alaska
Cloudburst Chronicle

National Weather Service
Juneau, Alaska

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Ask the Experts!
Send in your weather questions to:
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In This Issue:

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Southeast Alaska Thunderstorms

By Craig Schwartz

"Have you ever seen thundersnow?"

While thunderstorms are frequently observed over interior Alaska during the late spring and summer, they are quite rare over the Panhandle. When they do form, they are capable of hail, lightning, and heavy rain, and even snow, all of which can disrupt travel and outdoor activities. In addition, forecasting thunderstorms in southeast Alaska is tricky due to the wide geographic diversity of the region.

The table below lists the total and annual average number of thunderstorm-days over the past 21 years at Annette, Juneau, and Yakutat. A thunderstorm-day is simply a calendar day when lightning was reported at the observation station. These data were acquired by sifting through climate reports prepared by the National Climatic Data Center in Asheville, North Carolina. Representing southern regions of the Panhandle, Annette Island received just over one thunderstorm-day per year over the past 21 years. Yakutat, however, reported nearly four thunderstorm-days per year during the same time period. On average, Juneau has been impacted by approximately one thunderstorm every year between 1986-2006.

Southeast Alaska Thunderstorm Climatology: 1986-2006

Location	Total Number of Thunderstorm - Days	Average Number of Thunderstorm - Days Per Year
Annette	26	1.24
Juneau	16	0.76
Yakutat	83	3.95

Remember, these numbers represent *averages*, and that certain years may feature a greater or fewer number of thunderstorms. In fact, four of Juneau's sixteen thunderstorms over the past 21 years were reported between June and August of 2004!

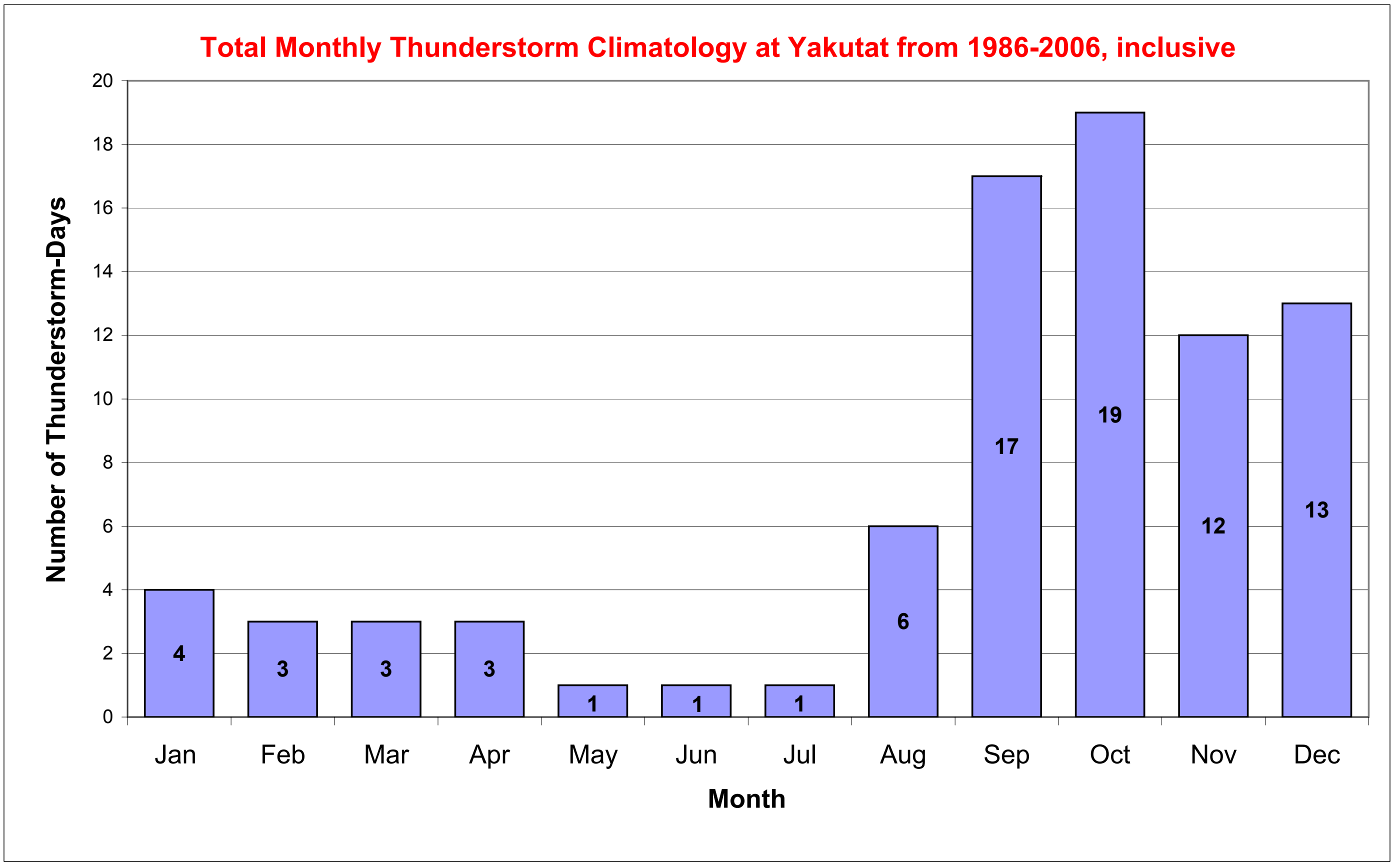


Figure 1.

During the fall and winter months, the statistical likelihood of thunderstorms in Juneau and the rest of the central and southern Panhandle decreases. However, as Figure 1 indicates for northern areas such as Yakutat, their prime thunderstorm season begins in September.

Much is known about thunderstorm formation over the continental United States and interior Alaska, but, partly due to their rarity, some mystery remains about their development in southeast Alaska. To consider one theory, we have to discuss atmospheric stability. Television personalities use the words "stable" and "unstable" with great regularity, but what do they really mean? And, what do they have to do with thunderstorms?

When conditions are stable, an object returns to its starting point when displaced. Take a ball and gently toss it in the air. After reaching its peak, gravity forces it back down to your hand; the ball ends in the same position it began. Likewise, air in a vertically stable atmosphere will return to its original position when displaced upward.

On the other hand, something unstable accelerates away from its initial position. Release a helium balloon, and you'll see an example of instability. In a similar manner, when the atmosphere is unstable, which generally occurs when cold air overlays warm, moist air at the surface, air given a tiny push upward can continue to rise like the helium balloon, seemingly in defiance of gravity. This phenomenon is called free convection; free, because the air rises on its own once initially displaced. If the air can rise high enough, it condenses, forming clouds and eventually rain (or snow). Lightning occurs if a sufficiently large electric field is generated within the clouds due to charge differences between liquid water and ice.

However, air across southeast Alaska is usually stable at the surface. How then, does the air rise to form thunderstorms, especially during the fall and winter when powerful cyclones parade across the Gulf of Alaska? These storms are very dynamic, and, although the surface air is stable and resists ascent, the atmosphere can literally force the air to rise. When the air is being forced to rise, thunderstorms will not occur. Rather, a steady, soaking rain is more likely. But sometimes the forcing lifts the air so high and atmospheric temperatures are configured in such a way that air becomes unstable high above the ground. At that point, the air can rise on its own, and thunderstorms are possible! Aptly, this process is known as forced convection, because the air needs an external force to make it rise since it is initially stable and resists rising on its own. Figure 2 illustrates the differences between the two mechanisms.

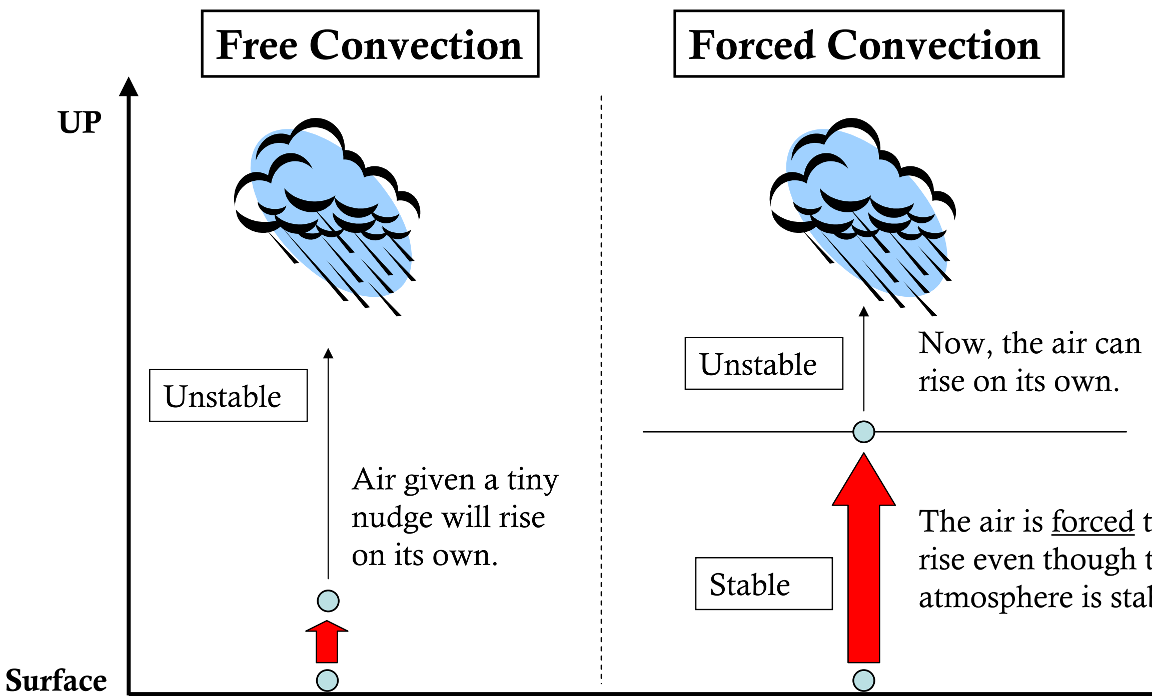


Figure 2. Free and forced convective processes. The vertical axis represents height above Earth's surface.

Although the chances of hearing thunder and seeing lightning are low (as always) during fall and winter season, don't be completely surprised if you hear a stray rumble. Revel in observing such a rare event! Please report any occurrences of lightning and thunder to the National Weather Service.

FORECASTER SPOTLIGHT

Who Forecasted That?

By Brian Bezenek

The Forecaster Spotlight is an opportunity to find out who the forecasters are in Juneau. I have been writing the spotlight articles over the last few issues. Well, I figured that it was about time I finally introduce myself!

I grew up in Breckenridge, a small Minnesota town along the Minnesota – North Dakota border, about 50 miles south of Fargo.

To an extent, I have been interested in weather since being a kid. I remember seeing several cold air funnel clouds one summer day as a kid and that piqued my interest. Shortly thereafter I told my sisters one year that it would hail and blizzard on their respective birthdays, months ahead of time. What a nice brother. (By pure luck, I turned out to be right in both cases.) By the time I entered high school, I knew what I wanted to do, so it made taking the classes I needed to prepare for a career in meteorology fairly easy.

I attended the University of North Dakota and graduated in 1990 with a Bachelors of Science degree in Meteorology.

When first applying for jobs with the National Weather Service, I checked the box on the application stating that I would go anywhere. The first job listing that arrived and I applied for was for Nome, Alaska. I spent just under two years there, before transferring to Juneau. I worked in Juneau for a year, before moving to The Center Weather Service Unit at the Anchorage Air Traffic Control Center for 18 months and then returned to Juneau, where I've been since 1995.

So far, my whole 16 year career has been in Alaska. I am quite content to stay a forecaster in Alaska, although I do miss my midwest roots. I enjoy weather forecasting for the challenge of trying to interpret the model guidance and observations that we receive, and then seeing how it plays out. It is a combination, I feel, of pure science and an art of how you take what you are given and try to paint a picture that everyone can relate to and understand in the forecasts we issue.

Away from work, my interests are quite varied and slowly evolving as well. I enjoy reading, golfing, hiking the area trails, chess, and war gaming.

Tune in next time to see who ends up in the spotlight.

American Meteorological Society

2008/2009
Scholarships and Fellowships

"Everyone talks about the weather, but no one does anything about it." Mark Twain

The American Meteorological Society (AMS) administers an array of graduate fellowships and undergraduate scholarships with the support of its members, corporations, and government agencies nationwide. The fellowships and scholarships help further the education of outstanding graduate and undergraduate students pursuing a career in the atmospheric and related oceanic or hydrologic sciences. These AMS scholarships may not change the weather, but they may help you in your endeavor to study the physical sciences (Atmospheric Science, Oceanography, etc):

Deadline for all is 8 February 2008 unless otherwise noted.

- AMS/Industry Minority Scholarships
- AMS Freshman Undergraduate Scholarships
- AMS Undergraduate Scholarships
- AMS Industry/Government Graduate Fellowships
- AMS Graduate Fellowship in the History of Science

Applications and additional information are on the National American Meteorological Society web site at : http://www.ametsoc.org/amsstudentinfo/scholfeldocs/index.html

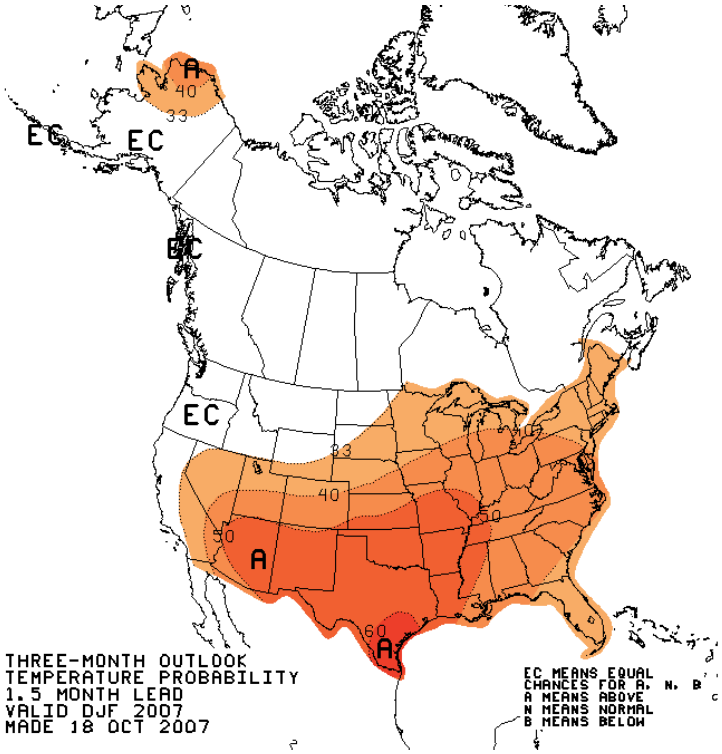
Entrance Island

If you haven't already had a chance to read it, the Spring 2007 edition of the National Cooperative Observer shows the Sheep Mountain, Alaska Cooperative Observer Zack Steer with his dog sled team. Zack placed 3rd out of 80 mushers who started the 2007 Iditarod! You can find this issue and others at http://www.weather.gov/om/coop/.

WFO Juneau Winter Weather Outlook for the 2007-2008 Winter Season (December-February):

By Rick Fritsch

The National Climate Prediction Center (CPC) seasonal outlook for the 3-month period of December through February is predicting "Equal Chances" of SE Alaska having average, below average, or near average temperatures and precipitation. "Equal Chances" means that CPC could not detect any signals or patterns (oscillations, teleconnections, ENSO, etc.) that were strong enough to justify deviating from "climatology" as the official forecast.



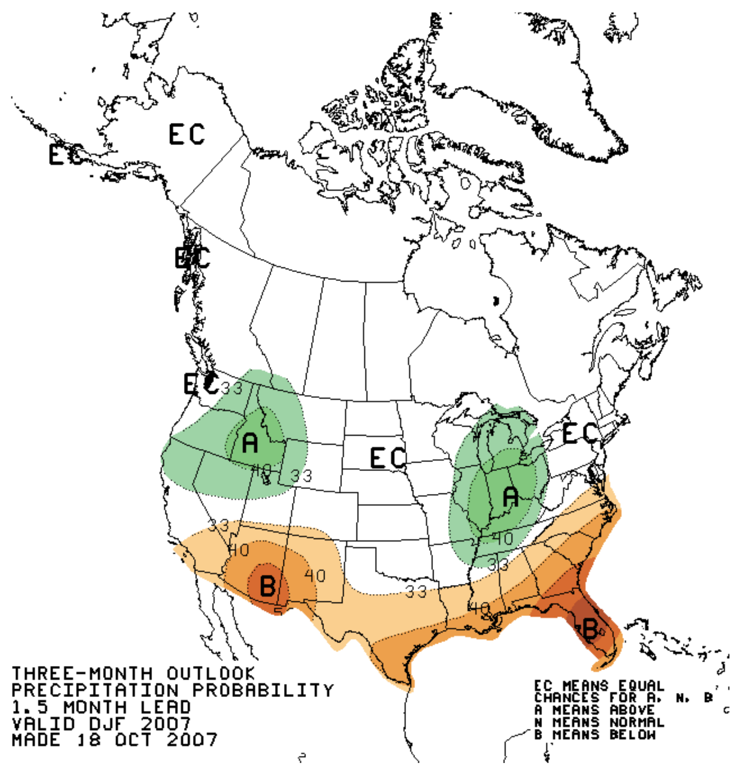
The current La Niña is forecast to increase to moderate strength. La Niña winters tend to be cooler than normal in Southeast Alaska.

Local studies, including one performed during the summer of 2006, indicate that cooler than normal winters in Southeast Alaska tend to be drier than normal. Specific reasons for this have not yet been identified and may include multiple influences – La Niña being only one of many.

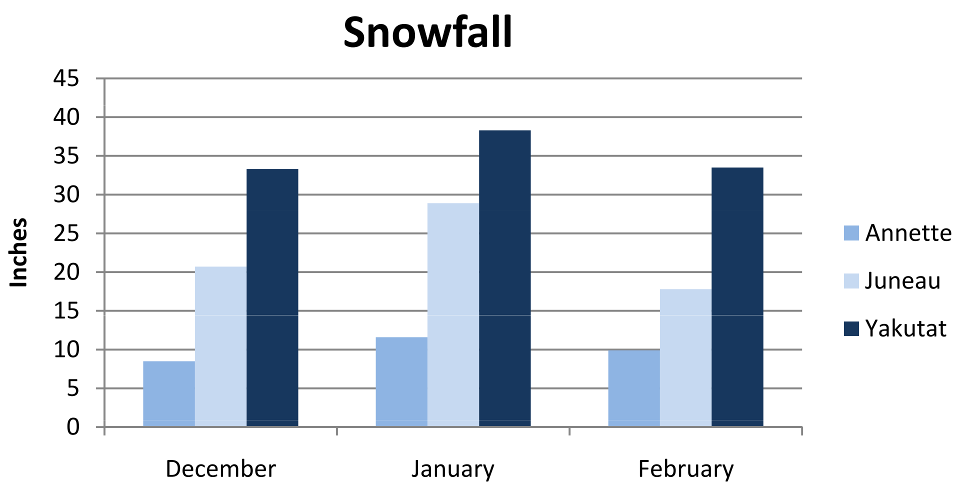
The traditional La Niña Winter (cooler and drier than normal) relationship does not always happen as expected. During some recent La Niña Winters within the past 30 years there have been months when the average temperature in Juneau was as much as 10°F warmer than normal instead of cooler than normal.

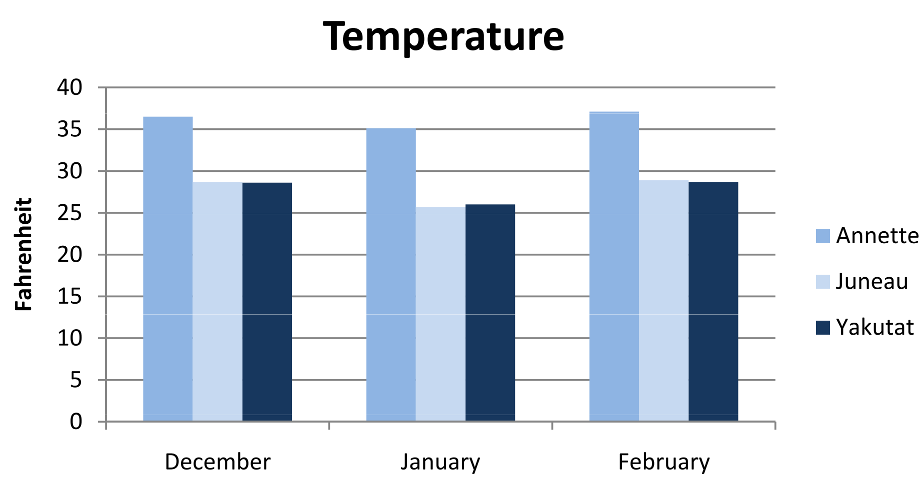
The annual snowfall record for Juneau is highly variable from year to year – so much so that you cannot rely upon just El Niño or La Niña as an accurate predictor of seasonal snowfall.

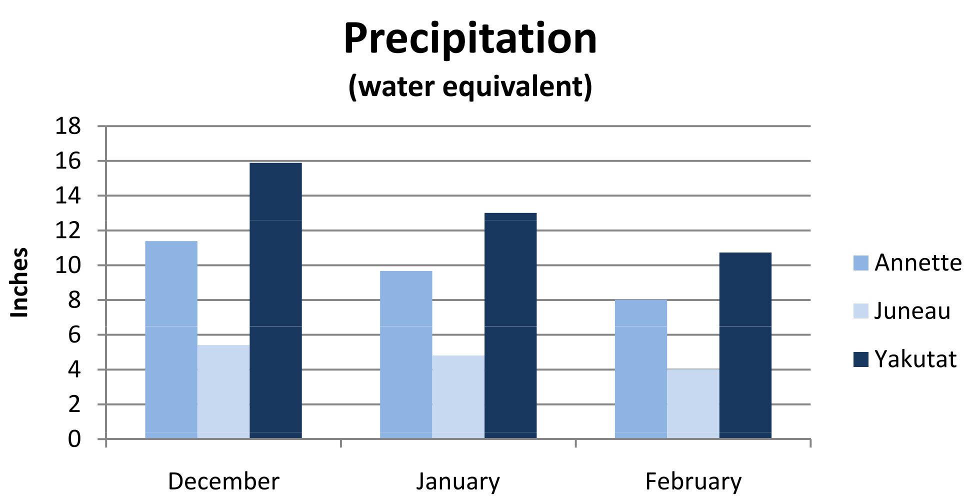
What we expect in Southeast Alaska for the winter season (December-February):
Cooler than normal temperatures
Less than normal precipitation



Winter Season Normals (December - February)







Changes On the Air

The National Weather Service Forecast Office in Juneau reorganized the content of its NOAA Weather Radio (NWR) broadcasts to better meet the needs of our listeners, minimize redundant information, and reduce the overall length of the broadcast. For example, marine weather forecasts for the inner channels aired over NWR will now describe the first three days of the forecast instead of five days. The way hourly weather observations from around Southeast Alaska are described was also changed. No longer will we repeat “degrees” after every temperature and “knots” after every wind speed. Other wording adjustments to weather warnings reduced redundant verbiage. The changes have resulted in 20-25% reduction in cycle time on some transmitters – that almost five minutes shorter! Forecasts and observations are always available in their entirety online at http://weather.gov/juneau. The National Weather Service is acutely aware of the importance of the NWR broadcast to listeners in Southeast Alaska. We strive to provide the right balance of information to satisfy the diverse interests of all our listeners.

Summary of the North Pacific Environmental Satellite Workshop for Coastal and Marine Applications

The following article is an abridged version of a paper written by Todd D. Sikora (Millersville University, Millersville, Pennsylvania), Carl F. Dierking (National Weather Service, Weather Forecast Office, Juneau, Alaska), and Nathaniel S. Winstead (Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland).

Coastal and marine weather observations come from a variety of sources: lighthouses, buoys, ships, radars, and satellites. Figure 1 shows the distribution of surface-based data platforms around Alaska. Note the large gaps between the weather observations. In contrast, Figure 2 shows satellite derived wind speed. The speeds are shown only over the water and are based on the roughness of the water. Weather forecasters and others interested in ocean wind data favor the satellite data for its greater coverage and amazing detail.

The National Weather Service Forecast Office in Juneau hosted the first annual North Pacific Environmental Satellite Workshop for Coastal and Marine Applications May 29-30, 2007. The workshop was held at the University of Alaska Southeast (UAS). Thirty-seven people from the US, Canada, and France representing government agencies, universities, and private industry took part in presentations and panel discussions. While the primary presentations focused on the application of Synthetic Aperture Radar (SAR) satellite data, the workshop also touched on the broader topic of infusing scientific research into daily weather forecasting operations. Panel discussions with satellite data experts focused on accommodating future enhancements of remote sensing (e.g., satellite) programs by learning the planned uses of this type of data from those who are actively using remotely sensed environmental information today.

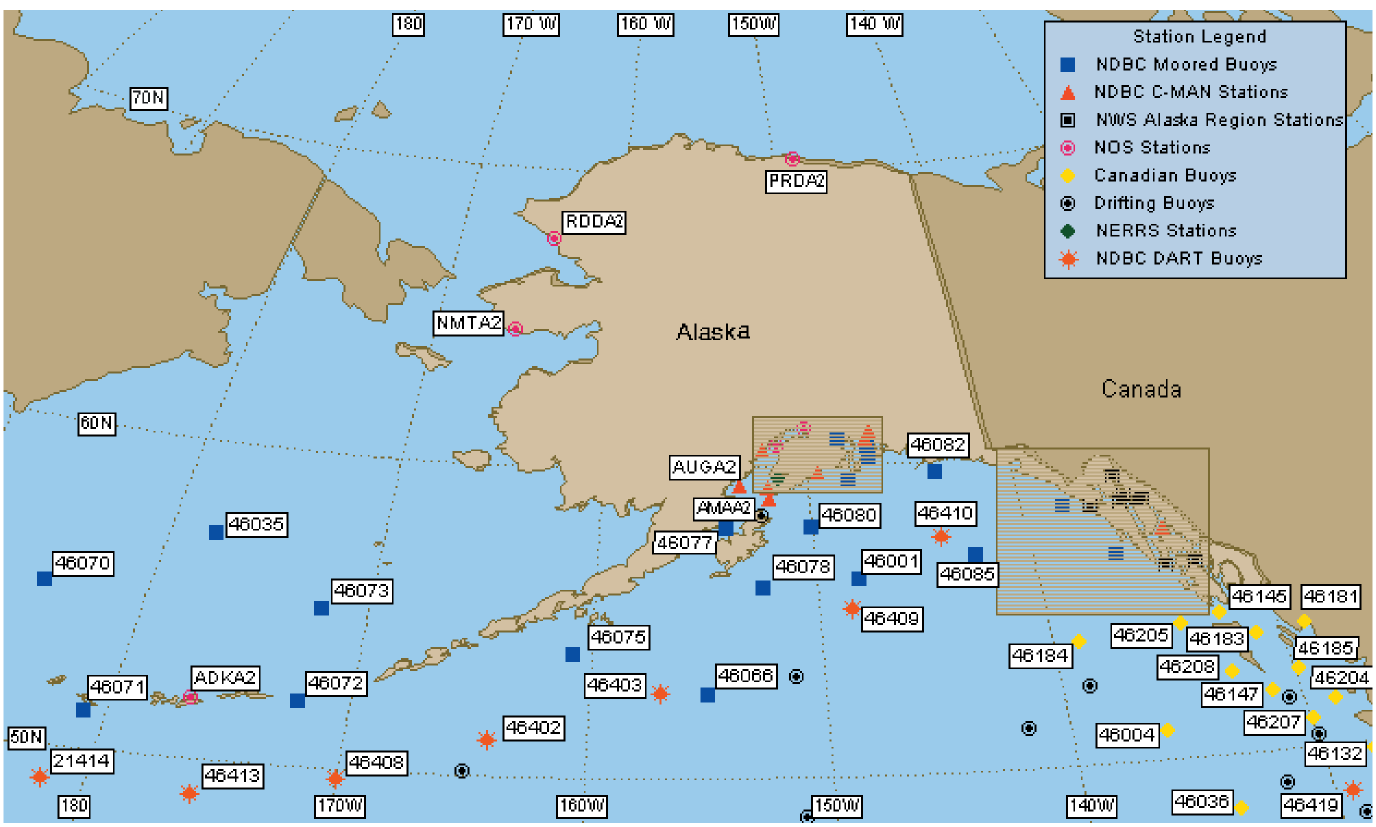


Figure 1. NDBC map of marine observation platforms within the Alaska region.

In order to address the environmental satellite user needs of the coastal and marine communities of the North Pacific Ocean, the workshop was conceived as part of a training project between NWS Weather Forecast Office (WFO) Juneau and Millersville University of Pennsylvania (MU). Additional workshop sponsors were National

Environmental Satellite Data and Information Service (NESDIS), Johns Hopkins University Applied Physics Laboratory (JHUAPL), NWS Alaska Region Headquarters, and University of Alaska Southeast. Participants represented a variety of disciplines including meteorology, hydrology, fisheries, hazards response, and law enforcement.

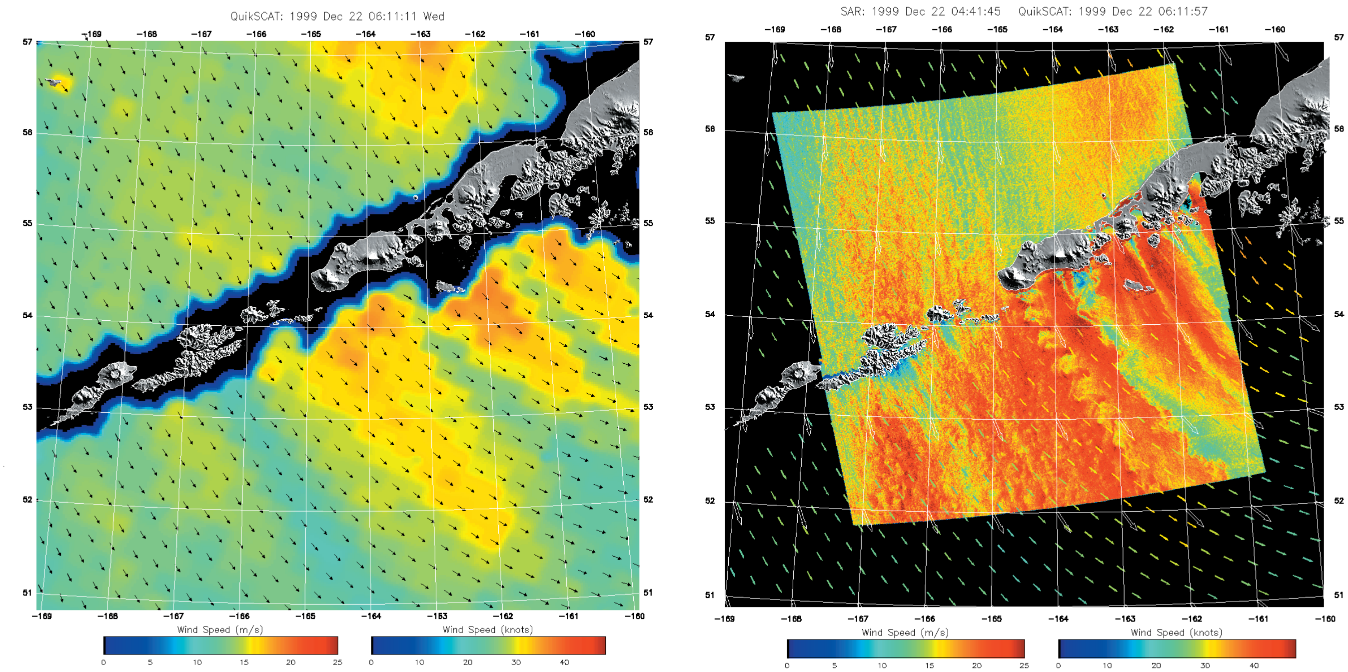


Figure 2. Comparison of QuikSCAT wind vectors (left) and SAR-derived wind speed (right) for the Alaska Peninsula at the same valid time. QuikSCAT wind vectors are overlaid on the SAR-derived wind speed image. Images are provided courtesy of Frank Monaldo, JHUAPL.

There were two primary goals of the workshop: 1) to provide a forum for presentation and discussion of research and development regarding the application of environmental satellite data to a variety of coastal and marine issues in the North Pacific Ocean; 2) to solicit feedback from satellite data users regarding current and desired environmental satellite products. On each workshop day, a number of 15-30 minute talks preceded a 90 minute panel discussion. The workshop agenda can be viewed at http://pajk.arh.noaa.gov/training/sat/workshop.html. Abstracts for each talk can be found by following the hyperlinks from the agenda.

After 18 presentations and two panel discussions on satellite products and how they are delivered (i.e. frequency and formats), a list of recommendations was generated with actions for participants to follow up on after the workshop. A recurring theme throughout the workshop, especially the second day, was the importance of SAR data in research and operations conducted by the participants. For example, due to its unequaled high resolution, SAR-derived wind speed imagery is being used in offices with marine forecast responsibilities from the Aleutians to the Pacific Northwest.

The workshop attendees were pleasantly surprised to learn of the many ways SAR satellite data was being applied. As a result, new collaborative partnership ideas came to light, most notably transferring science and technology from research and development to operations more quickly and creating new marine service possibilities for both the public and private sectors.

Participants were hopeful a follow up Second Annual North Pacific Environmental Satellite Workshop for Coastal and Marine Applications will be held in 2008.

New Weather Stations Added in Southeast Alaska

By Tom Ainsworth

The National Weather Service Forecast Office in Juneau recently installed two new weather stations in Southeast Alaska and upgraded an older existing station with new sensors. The new stations are Lincoln Rock in northern Clarence Strait and Bartlett Cove at the entrance to Glacier Bay. The existing weather station at Cape Decision Lighthouse, on the ocean coast at the south end of Kuiu Island, was overhauled with new sensors and a new tower.

Lincoln Rock

Installing the Lincoln Rock site, about 55 miles (90 km) north of Ketchikan, was the culmination of several years of effort to expand weather observations in Clarence Strait. The US Coast Guard granted permission to add weather sensors to the tower structure at this aid to navigation site in May this year and installation was completed in early September. The station measures wind speed and direction, air pressure, and pressure tendency (rising or falling). The sensors are located between 30 and 50 feet above the water surface. The true value of this new site is the wind information it provides mariners and weather forecasters. It is the first true "marine" weather station in Clarence Strait automatically reporting from mid channel.

The new sensors at Cape Decision measure air temperature and the dew point temperature in addition to wind speed and direction, and air pressure. A new "tilt down" tower replaced the aging and dangerously corroded tower. The upper and lower halves of the tower are separated with a hinge. This allows technicians to safely tilt the upper section to their level for installation and servicing, and eliminates the need to climb up the tower to sensors attached 60 to 80 feet above the water surface.

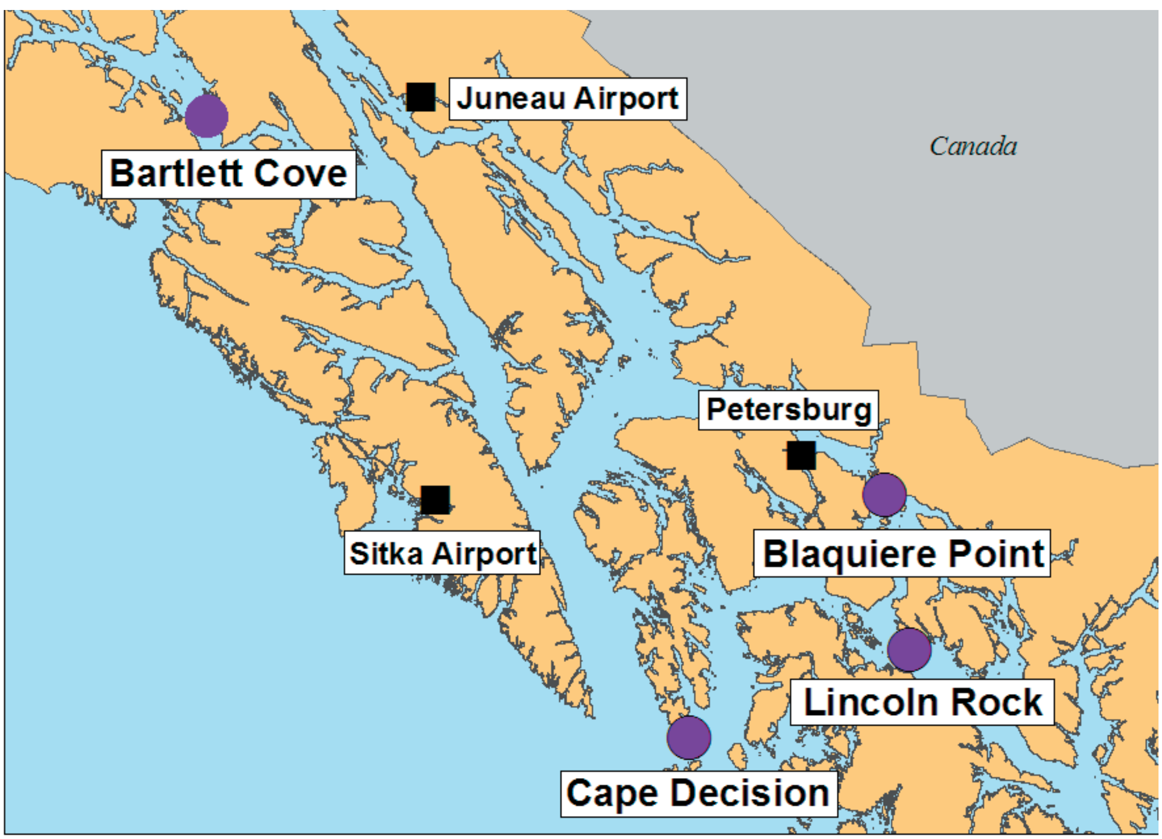
The Bartlett Cove weather station was made possible by the successful collaboration between the National Park Service, Department of Defense Cold Regions Research and Engineering Labs (CRREL), and the National Weather Service. Each agency contributed some portion of the equipment, communications, or installation that resulted in the first automated real time observation so close to Glacier Bay National Park. It is located on the elevated pier in front of Park Headquarters. Like Lincoln Rock, this new station provides the first automated real time observation from a marine forecast zone (Glacier Bay), although, technically, it is not situated inside the Park boundary.

The Lincoln Rock and Cape Decision equipment was tested by hazardous weather soon after they were installed. A very intense Pacific storm caused a sustained wind (i.e., wind speed averaged over two minutes) of over 60 mph and a peak wind (i.e., instantaneous (one-second) speed) of over 90 mph at both locations on September 21, 2007.

Observations from the new sites are available on local NOAA Weather Radio broadcasts and the Internet at http://www.weather.gov/juneau/obs.php and http://www.ndbc.noaa.gov/maps/SoutheastAlaska_inset.shtml.

Cape Decision

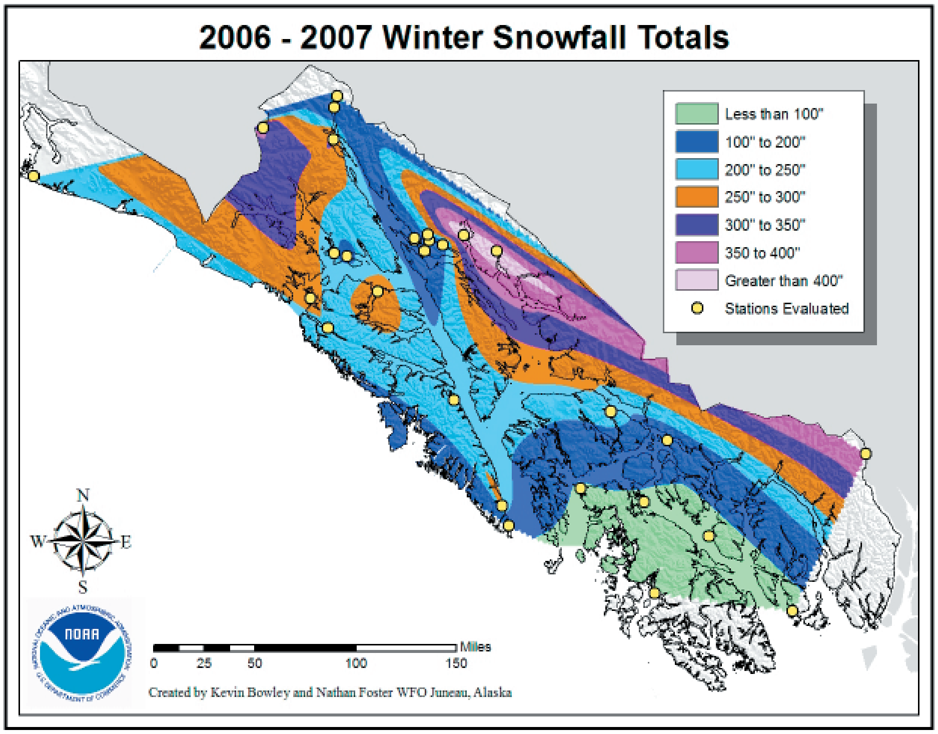
Note: Alaska Department of Transportation and Public Facilities is now making available on their Road Weather Information System (RWIS) web page weather observations from near the new Inter Island Ferry terminal 33 miles south of Petersburg along the Mitkof Highway. The weather station is at Blaquiere (BLAK' er ee) Point, near the very end of the Mitkof Highway, and the Internet page also includes images from a web camera located near the ferry terminal. Check out all the DOT weather stations and web cams at: http://www.dot.state.ak.us/iways/roadweather/forms/AreaSelectForm.html and click on "Southeast Alaska".



Weather Stations Added in Southeast Alaska

Last Season's Winter, One for the Record Books

By Kevin Bowley



As the region prepares for yet another winter, it is fitting to look back on the 2006-2007 snow season, which was the snowiest winter in history for much of Southeast Alaska. The observation site at Juneau International Airport received 197.8" of snow, enough to break the record previously set in the 1964-1965 season. Other locations that broke all-time records included long-standing observation sites in Elfin Cove, Annex Creek, Petersburg, Hyder, Auke Bay (Juneau), and Gustavus. Many other observation sites also saw new records set, setting a high standard for coming years in terms of snow. November of 2006 and March of 2007 were particularly potent months, with many areas seeing monthly snowfall totals that approached or broke records. This article will take a month-by-month look back on the past winter, and we'll let you decide if you want to see another one like it this year.

November of 2006 started the winter off with a bang. After a relatively docile October, the first major storm of the season dumped 20+" of snow over many locations, and an amazing 55.5" in Elfin Cove. This storm, which hit from the 13th to the 16th, also brought wind gusts up to 70 mph along Lynn Canal. A second large storm rolled in at the end of the month, with Juneau bearing most of the brunt. The airport reported 19.1" of snow on the 29th, though downtown Juneau only reported 8.0" of snow. Overall, the month brought up to five times the average amount of snow to several locations, and almost every area saw above average snowfall. To see more information on the November snowfall, please refer to the Spring 2007 edition of the Cloudburst Chronicle, where Nathan Foster provided a summary complete with GIS maps showing snowfall and temperature anomalies throughout the panhandle.

As November rolled into December, the winter weather returned to a much more normal pattern for most of the panhandle, but there was an exception along the interior mountains, particularly near Haines and Skagway. Haines Customs Station measured 159.5" of snow for the month, a new record. Other locations, including Hyder, Annex Creek Power Plant, and Snettisham Power Plant, all recorded over 80" of snow, and both the Skagway Power Plant and Skagway Customs Station set new records with over 40" of snow on the month. There were very few major storms during the month, although much of the heavy snow that added to the above records was from a series of late month storms that rolled through between the 20th and 30th of December.

With the New Year came another month of above average snowfall, especially near the interior mountains. Haines and Hyder both set new monthly records (although it must be noted that if you combine the climate history of Hyder and Stewart, B.C., it is not a new record). Haines received 81.6" while Hyder reported a whopping 123" of snow. Annex Creek also cracked the 100" mark, although it wasn't a new record. One weather system on January 5th left between 6" and 14" of snow on the ground over much of the panhandle. Hyder and Annex Creek received over 14" of snow, and Yakutat received 8.5"

February was by far the quietest month of the season, providing a proverbial calm before the storm that was March. Almost half of the observation sites saw below-average snowfall, and no major storms managed to belt the region during the month. No monthly records toppled during this month.

March quickly made up for February's lack of snowfall, and roared in much like a lion. From March 1st to the 3rd, the region saw one of its most potent storms in recent memory, one that lead to the issuances of blizzard warnings for several zones, including the Juneau Borough. Storm totals of snowfall had a very wide range, with much of Juneau receiving around 15" of snow. Hoonah saw the highest snowfall, with over 54" reported. This storm affected the region for several days, with heavy snow falling in Haines until the 5th. The dry, powdery snow that fell was quickly whipped up by strong winds associated with the storm system. These winds, clocked in the 40-60 mph range, led to dangerous blowing and drifting snow and whiteout conditions that prompted the blizzard warnings.

Photo by Jim Green

Drifting snow at the Haines library on March 6, 2007.

The remainder of March had few major storms, but there was nearly constant snowfall. Hyder and Haines saw snowfall on all but six days of the month, while Petersburg had snowfall on all but five days. The Juneau Weather Forecasting Office in the Mendenhall Valley reported snow on a remarkable 29 of 31 days during the month, a testament to the persistent weather pattern affecting the region during the month. After one last storm on the 28th, the winter weather completely shut off. Very little snow was reported throughout Southeast after this date, but the damage was already done. Ten new monthly snowfall records were set. Five locations received more than 100", with Snettisham Power Plant coming out on top with 152". Every single reporting station had above average snowfall, with many areas having more than four times their average snowfall.

Overall, the 2006-2007 winter season was one that will remain locked in the memories of the residents of Southeast Alaska for years to come. Over a dozen new seasonal snowfall records were set, with fourteen locations seeing more than 200" of snowfall, primarily along the coastal and interior mountains. The winter provided a challenge for the forecasters here at the Juneau Forecasting Office, with the first blizzard warnings posted in several years. The storms also provided a challenge to the public, with difficult working and living conditions prevalent everywhere. In the end, it was the kind of winter that you can tell your children or grandchildren about, and you will be able to say that you survived one of the snowiest winters in Southeast Alaska history.

Snow Loads

By Joel Curtis

Each year during our snow season, the National Weather Service receives many inquiries asking for snow load information after significant storm or long term accumulations. Here is a brief review on how snow loads can be easily calculated from a couple of measurements. The essential measurement that is required for these estimates is the water equivalent (WE). In some instances, you will also need to know your roof angle.

If you don't have a weather office nearby to provide you with the water equivalent of snowfall, you can calculate it yourself. You will need a long cylindrical container deep enough for the snow depth. A capped piece of PVC would work well. Invert the cylinder and take a core sample of the snow all the way to the ground. Tip it right side up and allow the snow to melt indoors. The inches of water remaining in the cylinder represent the water equivalent of the snow that was on the ground.

The density of water by definition is 1000 kg (kilograms) per cubic meter at 4 degrees Celsius, however, most snow load information is requested in the English measurement system of pounds per square foot.

$$\frac{1000.0}{\text{cubic meter}} = \frac{2204.6 \text{ lbs.}}{35.3 \text{ cubic feet}} = 62.4 \text{ lbs./cubic foot of water}$$

Refined even further, 62.4 pounds of water on a square foot, 1 foot deep, or 5.2 pounds per inch. The Snow Load Information table below conveniently gives the snow load for each increment of one inch of water equivalent. There are several cautions in using this table. You should measure the snow on your roof, if possible, because of the great variations in snow depth that may occur over even a small geographic area. Another assumption is that the snow metamorphosis (transformation with age) is also uniform and will yield similar water equivalents across the geographic area and various heated roofs. It is important to note that this is a rough estimate of the snow load and should be used with caution.

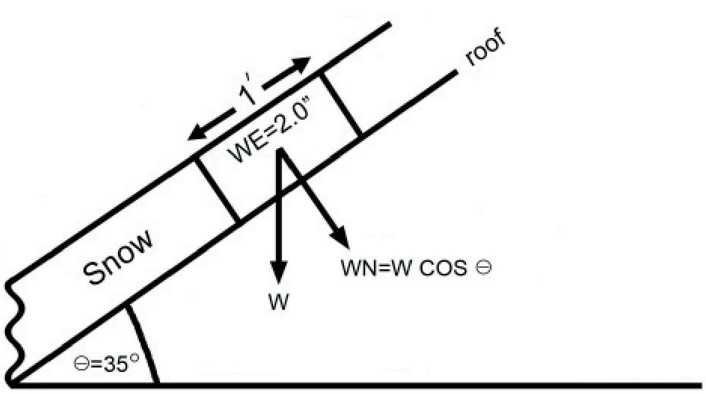


Figure 1

You may also need to adjust your snow load calculations based on the pitch of your roof. Figure 1 illustrates the loads normal and tangent to the roof's surface.

Example: Consider a pitched roof that is 35 degrees up from the horizon. A water equivalent of 2.0 inches is observed at a nearby weather office. This yields a load, W, against a flat roof of 10.4 pounds per square foot. But only a portion of that load is directed directly into a pitched roof. That portion is found by multiplying the load on a flat roof by the Cosine of the roof pitch.

So, the load (force per unit area) normal or directly against the roof, WN, is computed by:

(10.4 lbs/sq. ft.) (COS 35 degrees) = 8.5 lbs/sq. ft.

The force in the direction along the plane of the roof is cumulative for the roof-wise column of snow. Snow will remain on the pitched roof only as long as there is a balancing force of friction in the tangential (up-roof) direction.

Another item to consider is the snow load on the wings of light aircraft. A guideline is that light aircraft wings are stressed downward for a "minus 2 Gs" - twice the aircraft's static weight. Most owners realize that when it snows, they had better relieve the snow weight off the wings. Consider that the average light aircraft has 150 square feet of wing area and a total aircraft weight of 2000 lbs. This would yield 26.67 lbs. per sq. foot or a water equivalent of 5.1 inches as a very rough guideline for wing damage due to snow accumulation.

These guidelines should help provide you with an idea of the weight of the snow on your roof. Now get out there and enjoy the winter weather!

SNOW LOAD INFORMATION

WATER = 62.4 lbs/cu.ft.

Inches	WE=lbs/sq.ft.
1.0	5.2
2.0	10.4
3.0	15.6
4.0	20.8
5.0	26.0
6.0	31.2
7.0	36.4
8.0	41.6
9.0	46.8
10.0	52.0
11.0	57.2
12.0	62.4
13.0	67.6
14.0	72.8
15.0	78.0
16.0	83.2
17.0	88.4
18.0	93.6
19.0	98.8
20.0	104.0

Inches	WE=lbs/sq.ft.
21.0	109.2
22.0	114.4
23.0	119.6
24.0	124.8
25.0	130.0
26.0	135.2
27.0	140.4
28.0	145.6
29.0	150.8
30.0	156.0
31.0	161.2
32.0	166.4
33.0	171.6
34.0	176.8
35.0	182.0
36.0	187.2
37.0	192.4
38.0	197.6
39.0	202.8
40.0	208.0

Warning & Advisory Trivia

1. *A High Wind Warning is issued in SE Alaska when which one of these elements is observed or is imminent?* a) wind gusts to 50 mph b) sustained winds of 40 mph c) sustained or frequent gusts 60 mph or above d) sustained or frequent gusts 70 mph or above
2. *In Southeast Alaska, a Heavy Snow Warning is issued when 6 inches of snow falls in 12 hours or 12 inches in 24 hours. One zone is 12 inches in 24 hours only because less than a foot is considered a dusting in their area? Which zone is it?* a) Juneau Borough and Northern Admiralty Island b) Haines Borough and Lynn Canal c) Southern Inner Channels including Ketchikan d) Misty Fjords including Hyder
3. *Wind Chill advisories are issued with 15 mph sustained winds and it "feels like" (wind chill temperature) what temperature for 3 hours or more?* a) -30º F b) -50º F c) 0º F d) -15º F
4. *In the marine waters, gale warnings are issued for sustained winds between...* a) 34 to 47 knots b) 25 to 35 mph c) 20 to 40 knots d) any winds higher than 30 mph
5. *A winter weather event having more than one predominant hazard (i.e. heavy snow and sleet, heavy snow and blowing snow, etc) is called a...* a) Blizzard Warning b) Winter Storm Warning c) Snow Advisory d) Heavy Snow Warning
6. *True or False.* An advisory means conditions are posing a threat to life and property?
7. *A Flood Warning is issued when...* a) 2 inches or more of rain or snow melt occurs in 1 hour b) A river rises rapidly above flood stage c) A river rises slowly above flood stage d) Flooding is possible in the next 36 hours
8. *What is a Red Flag Warning issued for?* a) high winds in marine areas b) hurricanes c) tornadoes d) dry windy weather and increased threat of wildfire.

WEATHER WATCHERS
SOUTHEAST ALASKA SPOTTER NETWORK

Most Active Spotter

Torrential rains, thunder and lightning, high winds, and high temperatures kept our spotters calling in significant weather between April 1 and November 30, 2007.

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 ***Don "Griz" Nicholson of Blashke Island*** is our Most Valuable Spotter! He conveyed numerous, timely reports. For his efforts, Don will receive an *Alaska Cloud & Weather field guide*. Congratulations and thanks for the great reports! Other notable spotters were Bob Pegues of Tenakee Springs and Trina Ives of Petersburg.

Trivia Answers: ***1.*** *A High Wind Warning is issued when sustained or frequent gusts 60 mph or above is observed or is imminent.* ***2.*** *This zone is Misty Fjords including Hyder.* ***3.*** *Wind Chill advisories are issued with 15 mph sustained winds and it "feels like" (wind chill temperature) temperature -30º F for 3 hours or more.* ***4.*** *In the marine waters, gale warnings are issued for winds between 34 to 47 knots.* ***5.*** *A winter weather event having more than one predominant hazard (i.e. heavy snow and sleet, heavy snow and blowing snow, etc) is called a Winter Storm Warning.* ***6.*** *Advisory conditions only cause "significant inconvenience".* ***7.*** *A Flood Warning is issued when a river rises slowly above flood stage.* ***8.*** *A Red Flag Warning issued for fires. In Southeast, these are usually issued when humidities reach less than 15% or are less than 30% with 25 mph winds. They must also accompany "burnable" vegetation.*

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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