Southeast Alaska Cloudburst Chronicle

National Weather Service
Juneau, AK

April 2001
Quarterly Publication

Spring in Southeast Alaska...

The Dry Season?

By Michael Richmond

We all know Southeast Alaska is a wet place with abundant rainfall year-round. Fortunately, Mother Nature has favored us with a few months that are normally drier than the rest, at a time when the days are lengthening, temperatures warming, and plants and animals coming back to life.

How much drier is spring in Southeast Alaska? A glance at Figure 1 (page 2) of average monthly precipitation for four sites in the region gives an overview. In general, the three driest months of April, May, and June receive only one-third to one-half the amount of precipitation of the two wettest months, September and October. The next question is, why?

Southeast Alaska lies between the latitudes of 55 and 60 degrees north, on the Pacific Ocean. At these latitudes, the jet stream, which forms and directs storm systems between the poles and the tropics, is active year-round. The jet stream is strongest during the winter, when the temperature contrast between the Arctic and the tropics is greatest. That temperature contrast begins to weaken in spring. Thus, storms that form and are directed by the jet stream are usually weaker and fewer in number.

This leads us to another question: Why does it usually become wetter through the course of the summer and into early fall in Southeast Alaska, when the jet stream is at its weakest? The answer to this is fairly simple. With warmer

(See DRY SEASON - page 2)

EARTHQUAKE!

Do you know what to do?

By Aimee Devaris

Seattle's recent seismic experience serves as a reminder to us all that we should always be prepared for disaster. The following information is provided for your use in developing a disaster plan for your home and office.

<u>What to do BEFORE an earthquake...</u>

Go on a "Hazard Hunt" in your home and office. Most injuries are caused by things falling or breaking as people scramble to take cover. Anything that can move, break, fall, or cause a fire when your building starts to shake is a potential hazard. Inspect your home and workplace at least once a year and fix potential hazards.

- ✓ Bolt bookcases, china cabinets, and other tall furniture to wall studs.
- ✓ Place heavy objects on lower shelves.
- ✓ Hang heavy items, such as pictures and mirrors, away from beds and couches.
- ✓ Strap the water heater to the studs in the nearest wall using plumbers' tape.
- ✓ Install flexible pipe fittings to avoid gas or water leaks.
- ✓ Use closed hooks for hanging lamps and plants, and brace overhead light fixtures.
- ✓ Store breakables in low, closed cabinets.
- ✓ Repair cracks in ceilings and foundations.
- ✓ Store weed killer, pesticides and flammable products away from heat sources.
- ✓ Replace magnetic cabinet latches with latches that will hold shut during an earthquake.

(See EARTHQUAKE - page 11)

(DRY SEASON - Continued from page 1)

temperatures in summer, the atmosphere is able to hold more moisture. And even though storms may be weaker, and fewer, more moisture can be delivered. As the oceans warm, too, during the summer, more moisture is exchanged to the atmosphere, which can be rained out. These processes combine in late summer and early fall with a strengthening jet stream, due to an increasing temperature contrast between the Arctic and the tropics, to form our fall storm season. At this time storms become more frequent, and this, combined with abundant atmospheric moisture, leads to our soggy late summer/early fall.

Knowing that spring is the "dry season" for Southeast Alaska, does that mean it is usually sunnier too? Unfortunately, not necessarily. In Juneau and the rest of Southeast Alaska, the sunniest period on average is January through mid-March, when cold high pressure systems in the Interior produce an offshore flow over the region, clearing us out. Any degree of onshore low-level flow in Southeast Alaska, which means anything from southeast through west, will usually bring in clouds from the Pacific. Our long stretches of cool cloudy weather, with just small amounts of drizzle or light rain, often occur with a high pressure ridge over the region. ☼

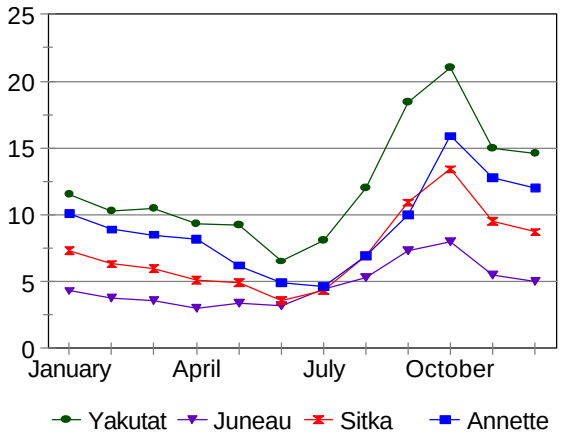


Figure 1 - Average Monthly Precipitation

Spring Sizzles!

By Laura Furgione

The week of June 18–22 is Lightning Safety Awareness Week. Lightning is merely a discharge of electricity. A simplified discharge of this electricity takes place when you shuffle your feet across the floor and then touch a door handle. The main difference is the amount current and the distance lightning can travel. A single lightning stroke may involve a current as great as 100,000 amperes and travel distances up to 10 miles. (A 100-watt light bulb only draws about 1 ampere of current.)

Lightning will most often strike the highest object in the immediate area. On a body of water, that highest object will likely be your boat. To minimize lightning strike damage, make sure you and your boat do not become a lightning target. Lightning protection systems are available, but they do not prevent lightning strikes. The purpose of lightning protection systems is to reduce the damage to your boat and the possibility of fatal injuries.

To understand better how lightning could affect you and your boat, let's look at a few examples. Lightning strikes the ungrounded radio antenna on your boat. The antenna carries the electrical charge to the radio. Your hand is on the radio while your feet are on a wet surface in contact with the metal hull of the boat. Instantly, you are the best conductor of the lightning. Or, lightning strikes the mask of your sailboat. The current follows from the mast or rope to your hands, through your body to the wet surface, and then through the hull to the water. Lightning could also directly strike you or your graphite fishing rod.

If lightning is in the area, preferably stay off or get off the water. One of the best safety tips to remember is: If you can hear thunder, you are close enough to be struck by lightning.☼

Seafarers' Spotlight

By Aimee Devaris

In addition to our spring feature on fog, we also want our marine customers to know that National Safe Boating Week is May 19–25. You will find a plethora of marine safety information on the web at www.uscgboating.org and www.safeboatingcouncil.org. Also, please see the National Safe Boating Council's article on choosing the right life jacket (page 8).

MARINE ADVISORIES AND WARNINGS

Small Craft Advisory	24 - 33 kt... And/or Seas ≥8 ft
Gale Warning	34 - 47 kt
Storm Warning	48 - 63 kt
Hurricane Force Winds*	64 kt or more

*A Hurricane Force Wind Warning does not imply the presence of a hurricane; it refers to wind speed.

Special Marine Warning: Issued when a potentially hazardous event, usually of short duration (~ 2 hrs) is imminent and not covered by existing forecasts.

FOG

In Southeast Alaska, we typically see 20 to 35 days a year during which fog is a dominant weather feature. Our fog "climatology" is consistent with other coastal areas along the North Pacific, but it is not as intrusive as in areas along the Washington, Oregon, and northern California coasts where 60 to 80 days a year are foggy.

Simply stated, fog is a cloud that is based at the ground. Cloud droplet sizes in fog are quite small, and a cubic meter of fog typically contains only about 0.1 gram of liquid water dispersed over 1 to 10 million droplets. These tiny cloud droplets reduce visibility, making fog hazardous to transportation whether by sea, by land, or by air.

Fog can occur through a number of different processes, so fog types are designated by the process that leads to their formation. *Upslope fog* develops when moist air is cooled by being lifted over mountain slopes. This type of fog is commonly seen along the terrain in Southeast Alaska following rain showers and often forms in tendrils. *Radiation fog* forms when outgoing long-wave radiation cools the air to its dew point temperature. It is most common during sunrise when nighttime cooling and relative humidity are at their maximums. *Advection fog* is produced when warm air flows over a cold surface and cools from below until saturation is reached. This is common along the Pacific coast during the summertime; cold water upwelling near the coast combined with seasonally warm air masses can lead to persistent episodes of advection fog – sometimes called *sea fog*. *Steam fog* develops in quite the opposite way when a cold air mass moves over a warm body of water. Evaporating water mixes with the adjacent air and raises its dew point to saturation. This is the type of fog we create with our own breath during cold winter days! *Precipitation-induced fog* forms just as suggested by its name; falling precipitation adds moisture to the air and cools the air as well, and fog develops when the dew point is reached.

Knowing the type of fog you are dealing with, i.e. what is causing it, can give you a clue as to how persistent it may be. The shortest duration fog types are generally the radiation and steam varieties. Precipitation-induced fog generally dissipates when the precipitation stops. On the other hand, upslope and advection fogs, if they are extensive, may persist until there is a significant change in the wind direction or speed.

There is one thing that is certain, if you live in Southeast Alaska, you will undoubtedly witness all of these fog types at one time or another! ☼

Is It Safe to Plant my Begonias?

Mother Nature vs. Climate Statistics

by Carl Dierking

The cool, short summers of Southeast Alaska can be a challenge for warm season activities like gardening and construction. The last freeze in the spring is a good indicator for the start of the warm season, but how can you be certain the last one has occurred? A statistical analysis of historical temperature records can provide the kind of information that we need to make informed decisions about this event based on probability and risk.

Table A shows standard statistical measures of the last freeze for selected locations. One method is to use the average date or "mean" as a reference, but by itself this could be misleading. For one thing, approximately half of the years studied will have occurrences later than the average. This wouldn't be very helpful if you were planning freeze-sensitive activities, like moving tender plants outside. "Early" and "late" dates give you an idea of the possible extremes, but in most cases planning by extremes is too conservative to be useful. The standard deviation gives the number of days on either side of the mean that had a significant number of freezes.

Station	Mean	Median	Early	Late	Std Dev	Years
Yakutat	5/26	5/25	5/05	6/21	10.8	52
Skagway	5/16	5/15	4/23	6/28	13.4	17
Petersburg	5/16	5/15	4/20	6/16	14.7	40
Sitka Mag Obs	5/14	5/15	3/29	6/10	14.0	76
Juneau Airport	5/12	5/12	4/18	6/13	12.4	57
Haines Dock	4/28	4/28	4/05	6/04	13.6	23
Juneau Dtwn	4/28	4/30	3/29	5/26	12.4	64
Ketchikan	4/22	4/22	3/18	5/24	15.2	38
Sitka Airport	4/20	4/19	3/15	5/15	12.3	48
Annette Is.	4/16	4/16	3/19	5/15	13.9	52

Table A. Standard Statistical Measures

With any statistical study, when the amount of data is relatively small, the sample may not represent the distribution of possibilities. Extreme events can cause the mean to be biased in one direction or another. For this reason, it is good to compare the median with the average. When close to the mean, the distribution of the data is less likely to be biased.

Now, to quantify the likelihood of an event on a particular day, we can try to "fit" the data to a normal probability curve. This step assumes that, given enough years of data, the frequency of the last freeze dates would be distributed in a "bell-shaped" pattern with the greatest number of events concentrated around the mean. Once the normal curve has been approximated we can determine probability for any given day. Graph B (page 9) shows "fitted" normal probability curves for three sites.

From these curves we can estimate the dates at which the freeze probabilities drop below certain thresholds. This provides a way to select a date based on an acceptable level of risk. For example, if you were planning a freeze- sensitive outdoor activity in downtown Juneau and could accept a 20% risk, you would plan the activity for May 6th. Table C below summarizes some of the dates for lower-end probabilities at Southeast Alaska stations.

Station	40%	30%	20%	10%	5%
Yakutat	5/26	5/19	6/01	6/06	6/10
Skagway	5/16	5/19	5/24	5/30	6/03
Petersburg	5/16	5/21	5/25	5/31	6/06
Sitka Mag Obs	5/13	5/17	5/21	5/29	6/01
Juneau Airport	5/12	5/15	5/19	5/25	5/29
Haines Dock	4/28	5/01	5/06	5/12	5/16
Juneau Dtwn	4/28	5/01	5/06	5/11	5/16
Ketchikan	4/22	4/26	5/01	5/07	5/13
Sitka Airport	4/20	4/23	4/27	5/02	5/06
Annette Is.	4/16	4/20	4/24	4/30	5/05

Table C. Freeze Probability Threshold Dates

(See FREEZE - page 9)

...on the Web...
Radar Imagery

by Brian Bezenek

Radar is just one of the many tools weather forecasters use to forecast the weather, and now you can see nearly what we see at our office. Data from the Doppler radar sites is now available on a link from our homepage (http://www.alaska.net/~jnufo). Just click RADAR!

Four products are currently available for viewing at this site: base reflectivity, composite reflectivity, one-hour rainfall, and storm-total rainfall. You can also loop one hour's worth of images (6 to 12 images) to see how the weather features are moving.

So what am I looking at? When a radar is operating it transmits a beam of energy out as it 'scans' the area out to a range of 124 miles. The reflectivity image is a graphic display of returned energy to the radar site. The more energy that is returned, the larger the reflectivity value. These are normally displayed with the larger values in the warmer colors (yellow, orange, red).

The base reflectivity product is only from the lowest elevation scan used by the radar. On the other hand, the composite reflectivity product uses all of the elevation scans. Then, for each data point, the highest value is plotted.

Rainfall estimates are created from the lowest two elevation scans using the reflectivity values. These products are useful in determining where the heaviest precipitation is occurring and helps forecasters assess flood potential in remote locations.

Why do images disappear east of Sitka? The images appear to fade out as they move onshore Southeast Alaska, because the lower scans of the radar beam are blocked by the terrain and the higher scans eventually shoot over the cloud tops.

On the web, you can access a mosaic of all of the Lower 48 radar sites, all seven Alaskan radars, and the Pacific Island sites. For your reference the seven sites in Alaska and their Ids are: Biorka Island (ACG), Middleton Island (AIH), Kenai (AHG), Pedro Dome [Fairbanks] (APD), King Salmon (AKC), Bethel (ABC), and Nome (AEC). ☼

Weather Watchers
Southeast's Spotter Network

By Aimee Devaris

Freezing rain, 60 mph winds, heavy snow, thunderstorms, and even a waterspout! These phenomena were reported by our storm spotters over the past winter.

Our spotters make a tremendous contribution to the forecast process by providing meteorologists with critical "ground truth" information about severe weather. In this way, these important volunteers help the National Weather Service achieve its mission: To protect lives and property.

The Southeast Alaska Spotter Network includes individuals from Juneau, Sitka, Yakutat, Port Alexander, Tenakee Springs, and False Island (in Peril Strait). This is a great start, but we would love to expand the network into other communities, like Skagway and Ketchikan... and every place in between!

Becoming a spotter is easy! You can browse through the training information on the web, we can mail you a packet, or you can attend a short 2-hour spotter course. Courses may be scheduled in any community where there is enough interest to satisfy a minimal level of attendance (usually at least 10 people).

If you are interested in becoming a spotter, please give us a call at 790-6803. You will also find more information on the web at www.alaska.net/~jnufo/spotter/spot.htm.☼

MOST ACTIVE SPOTTER

We appreciate your time and dedication and recognize our most active spotters with special prizes and awards. This quarter, our most active spotter was Martha Reeves with 15 reports. Martha was also our most active spotter last quarter with 10 reports!

Congratulations, Martha! You will receive an "Alaska Cloud and Weather Field Guide" for your efforts!

Coop Corner

By Angel Corona

Why is the Cooperative Observer Program needed? To protect life and property, the National Weather Service issues severe weather watches and warnings. Therefore, the collection of timely and accurate weather data is vital. The NWS also maintains a database of climatic weather information, used to prepare medium- and long-range forecasts.

The Cooperative Observer Program is the backbone of the nation's climatological database. Cooperative observers also act as severe storm spotters, sending in reports of hazardous weather.

What do coops do? Being an NWS cooperative observer can be a demanding job. To provide accurate and complete weather data, the NWS needs observations seven days a week, 365 days a year. This does not mean that someone has to always be "monitoring"the weather. Instruments are provided to monitor temperature and precipitation. However, someone should be available to record the daily maximum and minimum temperature, the daily precipitation total, and other data. This is usually done around 7:00 a.m.

What equipment is used? Depending on how much service is expected, equipment can vary from an 8-inch, non-recording plastic or metal rain gage, to a full coop station with an electronic thermometer and recording precipitation gage.

The NWS will deliver, set up, and maintain the equipment. Typically, the coop station consists of a set of max/min thermometers and a rain gage.

What happens to the information collected by the observers? The observers transmit the data to the local NWS office via the web or telephone. Forecasters use the information in forecast and warning decisions. The data is also available to the public and media.

What kind of training is needed? Training consists of on-site, hands-on instruction with the observer and their backup and is usually provided on the day of the equipment installation. Coops are supported by the local NWS with assistance and maintenance and are visited annually. ☼

The Great White North?

By Bob Tschantz

This was Alaska's warmest winter since records began in 1918. The northern and central parts of the state saw temperatures average 7 degrees or more above normal, while the southern coastal areas had temperatures of 5 to 7 degrees above normal. The Aleutians, Kodiak Island, and the southern Panhandle had winter temperatures 2 to 5 degrees above normal.

For Southeast Alaska, this winter was warmer than average, but not record-breaking. In Juneau, the average temperature during December through February was 32.1 degrees. This was the 7th warmest winter on record in Juneau. In Haines, the average temperature was 29.5 degrees, the 5th warmest on record. In Sitka, the average temperature was 38.1 degrees, the 8th warmest on record.

With the warm weather in the area, the Juneau airport has received only 29.1 inches of snow so far this winter, the second lowest total ever through March 15th. This lack of snow caused the Eaglecrest ski area to open on February 1st, the latest opening date in its history.

A New Voice for NOAA Weather Radio

Good news! ...for those of you who aren't too fond of the computer-synthesized voice used for the weather radio broadcasts. An effort is underway to implement a new, easier-to-understand voice that sounds more like a real person.

Hear voice samples and express your opinion!
www.nws.noaa.gov/nwr/voicesamples.htm
Your feedback is very important!

Spring Outlook Calls for Flood Potential, Continued Drought

The Climate Prediction Center, a division of the National Weather Service, has released the nation's Spring Outlook (April – June 2001). Both flooding and drought conditions headline the list of anticipated weather-related threats the nation is expected to face this spring.

Winter snow storms in the Northeast and Midwest have set the stage for potential flooding while drought conditions in the Northwest and water shortages in the Southeast will linger despite spring rains, NOAA scientists say.

"A major concern is the impact of continued dry conditions on salmon stocks and hydroelectric energy production in the Northwest," said Scott Gudes, NOAA's acting administrator. "Current conditions are so extreme that portions of the Columbia River Basin may register river flow volume at its lowest since 1977."

Retired Air Force Brig. Gen. Jack Kelly, director of NOAA's National Weather Service, said, "The spring outlook presents forecasters with two concerns – drought and floods. Heavy snows in the Northeast and Midwest now make some of those states vulnerable to floods if the snowpack melts too quickly. The water shortage in the Southeast is expected to remain. The Northwest will see above normal precipitation, but the spring rainfall will be too little, too late to replenish water resources there."

For Spring 2001, the nation can expect:

In the South, frequent rains since November in parts of Texas, Oklahoma, Arkansas, Alabama, Louisiana, and Mississippi have eliminated drought conditions. If these areas get additional significant rain, flooding is likely because streams are already running high.

In the Western Great Lakes region (Wisconsin, eastern Minnesota, and Upper Michigan) and in the Northeast, there is a potential for a wet spring. In the Northeast, snow from March's Nor'easter has heightened flooding concerns along the Connecticut and Merrimack river basins in New England, where at least 10-12 inches of water is stored in the snowpack – twice the normal amount. Above normal snow-melt flooding is possible across the region.

Near normal average temperature conditions are expected in the Mid-Atlantic region and central United States (including Ohio, Tennessee, and mid- and southern-Mississippi Valleys), and most of the Plains states.

The Midwest is expected to have a normal spring. However, the weather service is closely watching the snow-melt in many areas including Minnesota and the Dakotas for potential flooding. The region received above average snowfall this winter creating a likelihood for spring flooding.

In the Southeast, including Florida, the weather service is forecasting a warm and dry spring. Severe droughts have sparked wildfires in Florida, however mid- to late-March rains and season rains, which typically return about June, could provide some relief.

In the Southwest, expect above normal temperatures but normal precipitation.

Though above normal precipitation is forecast for parts of the Northwest, it will not be enough to offset the impact of already low precipitation levels and thin snow pack.

Near normal precipitation conditions are expected over Alaska, Hawaii, and Puerto Rico, leaving most of Hawaii and southern Puerto Rico in persistent dryness. This spring, above normal temperatures are expected for northern Alaska while the southern extremes should be cool.

Relevant web sites:
www.drought.noaa.gov, www.noaa.gov/nwsrfc.html and www.cpc.ncep.noaa.gov ☼

If You Don't Like to Wear a Life Jacket,

Raise Your Hand!

Finding the right life jacket for you!

Life jackets are personal flotation devices (PFDs) and come in a variety of shapes, colors, sizes, and materials. Some are made to be more rugged and last longer while others are made to protect you from cold water. No matter which life jacket you choose, be sure to get the one that is right for you. Select a PFD based on your planned activities, and the water conditions you expect to encounter. Remember, spending a little time now, can save your life later. United States Coast Guard (USCG) approval means that the PFD has passed rigorous testing. So, always look for the USCG approval number on any life jacket you buy. Be sure to read the manufacturer's label and the "Think Safe" pamphlet that is attached to the device. Valuable information is contained within these resources. ☼

Winter Arrives... Late!

By Zaaron Allen

February 2001 marked a return to more typical winter conditions across Southeast Alaska, at least in comparison to the previous four months. Actually, the first few days of the month resembled winter up to that point... damp and mild. A change in the pattern finally occurred from the 7th through the 12th, as modified Arctic air filtered into the northern two-thirds of the Panhandle.

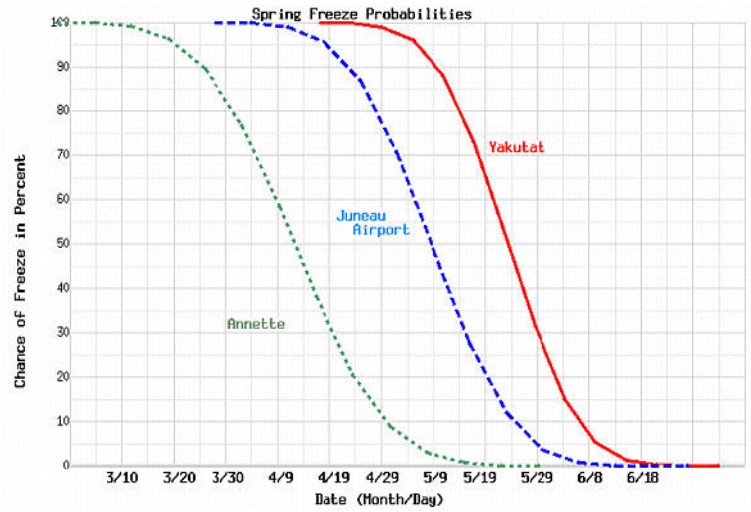
Then a storm system moved in from the west on the 13th. With the cooler air in place, the largest snowfall this winter occurred over the central Panhandle, with the Juneau area receiving eight to fourteen inches of snow. Areas to the north received between three and six inches of snow, with the extreme southern Panhandle receiving between one and two inches of rain. Following the heavy snow event, high pressure dominated the region for the next seven to ten days.

The month ended with another heavy precipitation event. Yakutat received over five inches of liquid precipitation, with seven inches of snow on the 25th. Several other locations received over half of their total monthly precipitation during this period.

Then on February 26th, Yakutat experienced minor flooding of secondary roads, with significant ponding on primary roadways. In addition, standing water was reported in the school gymnasium.

Elsewhere across the region, smaller streams experienced some significant within-bank rises, however no known flooding occurred. Stream flow in the major watershed regions of Southeast Alaska remained near normal seasonal levels. ☼

(FREEZE - -Continued from page 4)



Graph B. Normal Probability Curves

We are still missing some key information. Since, some springs arrive early and some late, we must compare one year to others. To do this, we need to compare freeze dates to something that would reflect these annual differences. In the transition from winter to summer, the daily average temperature experiences the greatest change during the spring months as it warms to its summer maximum. We can relate the last freeze of the season to this transition by evaluating it in terms of the number of days before, or after, an average temperature threshold was first reached.

For most Southeast Alaska stations, when the average temperature first reaches 50 degrees the chance of another freeze is fairly small. Table D shows a statistical summary of the dif-ference between these two dates. The numbers are positive when freezes occur after the first 50 degree average. Some inland locations, however, have a wider range between the daily high and low. These are the sites where the average number of days to the last freeze is positive by more than a week. At these stations, the 50 degree threshold is probably too low and a threshold of 55 degrees may be more useful (See Table E).

Station	Mean (days)	Median	Std D	Frz Prob After 50°	Days to 20%	Days to 10%	Days to 5%
Yakutat	4.7	1.0	14.8	49%	12	19	24
Skagway	16.6	18.5	14.3	83%	26	32	37
Petersburg	11.7	9.0	15.7	65%	20	27	32
Sitka Mag Obs	-13.9	-14	20.1	16%	-3	7	12
Juneau Airport	-2.8	9.8	9.8	28%	3	7	10
Haines Dock	-3.3	13.2	13.2	32%	4	11	15
Juneau Dtwn	-3.4	12.9	12.9	30%	4	10	14
Ketchikan	1.5	20.6	20.6	40%	12	22	29
Sitka Airport	-10.4	-9.5	-9.5	14%	-3	2	7
Annette Is.	-5.0	20.0	20.0	30%	7	15	22

Table D. Days to Last Freeze From First 50 Degree Average Temperature

Station	Mean (days)	Median	Std D	Frz Prob After 55°	Days to 20%	Days to 10%	Days to 5%
Skagway	0.3	-1	12.8	42%	8	14	18
Petersburg	-11.3	-9	18.7	18%	-2	7	14

Table E. Days to Last Freeze From First 55 Degree Average Temperature

So, how can all these numbers be put to use? This is best illustrated by an example. Suppose you were in Yakutat and wanted to determine a date that had no more than a 20% chance of a freeze. From Table C you find that normally the chance of a freeze drops to 20% on June 1st. As spring progresses, if the average temperature should reach 50 degrees by May 10th, you can see from Table D that a 20% chance of a freeze is only 12 days away, or May 22nd.

Now you can worry about more important things, like... marigolds or petunias? ☼

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Saving Lives Through Education

The Southeast Alaska Avalanche Center

In 1995, after assisting with the search for and body recovery of a friend swept away by an avalanche, Bill Glude vowed to start teaching awareness courses that would save lives. Now, in 2001, the Southeast Alaska Avalanche Center (SAAC), under Glude's direction, provides snow avalanche safety education and information for a region broadly defined as extending from Yakutat some 900 kilometers to Ketchikan, and over-lapping from Atlin to Kluane in adjacent Canada.

While many avalanche centers still focus mostly on back-country skiers, SAAC's courses have been unusually successful in serving the needs of snow boarders, younger people, alpine out-of-bounds skiers, and Alaskan-style heli-skiers and heli-guides. The typical back-country course makeup is over 50% snow boarders under 18, with the remainder split between a wide range of ages and snow riding tool choices.

SAAC devotes a considerable amount of time to providing a broad range of educational services. They answer many media inquiries and do numerous interviews every season. And they function as a source of avalanche expertise for the general public, for specific projects, and for whatever services are needed during avalanche emergencies. For example, Glude traveled to Southcentral Alaska last winter during the big avalanche cycle. He helped various agencies and operations with explosive avalanche-reduction, safeguarding work crews, forecasting, and assessing dangers to homes and communities.

If you would like more information about becoming a member of the Southeast Alaska Avalanche Center or would like to take a snow avalanche safety course, please visit the SAAC web site at www.avalanche.org/~seaac. ☼

Space Weather

By Aimee Devaris

And now for your three day forecast...

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Solar activity is expected to be low to
moderate.  The geomagnetic field is expected to
be unsettled to active.  Effects from a high
speed coronal hole stream are expected early in
the three day period.  Higher levels of
activity are also possible as a result of the
recent CME occurrences.
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Many of us probably do not realize that space weather forecasts for the earth are compiled daily, just as we generate predictions for precipitation, wind and temperature. It's fairly obvious why we like to know how local weather patterns will impact our travel or recreational plans, but why in the world do we need a forecast for space weather?

Actually, solar activity has a number of effects that are of interest to us. Radiation from energetic particles can be hazardous for astronauts and for electronics on satellites. Geomagnetic field disturbances can damage power systems, disrupt communications, degrade high-tech navigation systems, or create the spectacular aurora borealis and australis (Northern and Southern lights).

NOAA's Space Environment Center (SEC), located in Boulder, provides warnings of these events and continues the solar monitoring that began 400 years ago with Galileo's invention of the telescope.

Want to learn more? Visit the SEC web site at www.sec.noaa.gov. ☼

Cloudburst Chronicle

Editor: Aimee Devaris
Contributers: Zaaron Allen, Brian Bezenek, Angel Corona, Carl Dierking, Laura Furgione, Michael Richmond, and Bob Tschantz

Your comments or suggestions are welcome!
Call 790-6803 or Email: Aimee.Devaris @noaa.gov or Laura.Furgione@noaa.gov

(EARTHQUAKE - Continued from page 1)

- ✓ Block wheeled objects so they cannot roll.
- ✓ Bolt house to foundation and repair any cracks.
- ✓ Remove dead or diseased tree limbs that could fall on the house.
- ✓ Rearrange furnishings so that if they did tip they would not block an evacuation route or access to emergency supplies.

When an earthquake, winter storm, flood, or other disaster strikes, you may not have access to food, water, and electricity for days, or even weeks. Store these supplies now.

- ✓ Have at least one gallon of water per person, per day.
- ✓ Water should be stored in thoroughly washed plastic, glass, fiberglass, or enamel-lined metal containers.
- ✓ Treat the water with a preservative, such as chlorine bleach to prevent the growth of microorganisms. Use liquid bleach that contains 5.25% sodium hypochlorite and no soap.
- ✓ Seal your water containers tightly, label them and store them in a dark cool place.

<u>What to do DURING an earthquake...</u>

If you are indoors when the shaking starts:

- ♦ Take cover under a table or desk and hold on.
- ♦ Sit against an inside wall, and cover your head and neck.

If you are outdoors when the shaking starts:

- ♦ Try to find an open area away from power lines and buildings.
- ♦ Crouch down and cover your head.

If you are in a vehicle:

- ♦ Stop in an open area away from bridges and buildings.
- ♦ Stay in your vehicle.

If you are in bed:

- ♦ Stay in bed.
- ♦ Cover your head with pillows or bedding.

If you are in a coastal area:

- ♦ Move to higher ground. (More on tsunamis in our summer issue)

In all circumstances, try to stay away from anything that could break or fall such as windows, chimneys or tall furniture.

<u>What to do AFTER an earthquake:</u>

- ✓ Check yourself for injuries. You will be better able to care for others if you have received first aid for your own injuries.
- ✓ Protect yourself from further injury by putting on sturdy clothes, shoes, and gloves.
- ✓ Try to help injured or trapped people.
- ✓ Look for and extinguish small fires, and eliminate fire hazards.
- ✓ Clean up spilled medicines, bleaches, gasoline, and other flammable liquids.
- ✓ Inspect your home for damage, and get everyone out if it is unsafe.
- ✓ Open closet and cabinet doors cautiously.
- ✓ Listen to a portable, battery-operated radio (or television) for updated emergency information.
- ✓ Expect aftershocks.
- ✓ Watch out for fallen power lines, and stay out of damaged areas.
- ✓ Leave the gas on at the main valve unless you smell gas or think it's leaking.
- ✓ Use battery-powered lanterns or flashlights to inspect your home. Avoid using light sources that have an open flame.
- ✓ Use the telephone system only to report life-threatening emergencies.

If you need to purify your water:

- ♦ Boil the water for 10 minutes.
- ♦ Add two drops of liquid chlorine bleach (bleach that contains 5.25% sodium hypochlorite and no soap) per quart of water; four drops if the water is cloudy.
- ♦ Add water purification tablets according to the package directions.

For more information: www.fema.gov ☼