SOUTHEAST IDAHO

SPOTTER NEWS

NATIONAL WEATHER SERVICE POCATELLO/IDAHO FALLS SUMMER 2004

Editors' Notes

Hello Everyone…This edition of the spotter newsletter really concentrates on Hydrology. Sherrie Hebert, our Hydrologist here at the Pocatello Weather Forecast Office put together superb information along with an experiment for you and your family to do.

Our weather spotter of the quarter has been chosen and you can read about his dedication to weather reporting and recording on page 2.

Remember… our toll free number if you observe any severe weather is: 1-800-877-1937.

If you would like to visit or schedule a tour, please write or call anytime. Thanks.

Ken Simosko
C/o Spotter News
1945 Beechcraft Ave.
Pocatello, ID 83204
208-233-0834
e-mail:
Ken.Simosko@noaa.gov

Sunny Days Ahead!

Weather Spotter Of the Quarter

Our Weather Spotter Of The Quarter is Mr. Evan Tibbott from Rigby/Jefferson County

See Page 2 for a complete story.

On The Weather Menu Inside…

Biography of Evan Tibbott, Weather Spotter Of The Quarter

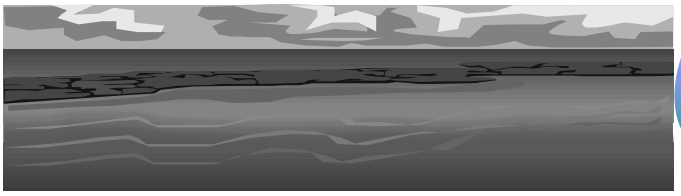
Mr. Evan Tibbott began his interest in weather while in high school in Philadelphia, Pennsylvania when he began keeping his own observations of temperature and precipitation and reading books on weather and climate. Evan and his father built a homemade anemometer from basic erector set materials for a project in high school. During this time, as a member of the Franklin Institute in Philadelphia, Evan placed No. 1 in a twelve-week weather course offered there, which was taught by the late David Ludlum, Meteorologist.

During high school, Evan also took part in weather instruction and weather station orientation at Camp Dix, New Jersey, under the guidance of an Air Force captain with whom he had become acquainted through his interest in weather. A summer job at State College, Pennsylvania drawing synoptic weather maps for a Navy forecasting project in 1952 led to Evan's enlistment in the Air Force and subsequent assignment to weather school at Chanute Air Force Base at Rantoul, Illinois. From weather school, he received an assignment to Sondrestrom Air Base in Greenland, a very isolated outpost where he operated a weather station from October 1953 until November 1954. Despite a continuing interest in staying in the far north, regulations required that he return to stateside duty.

From Greenland, Evan was assigned to Malmstrom Air Force Base at Great Falls, Montana, which as Evan said, "looked like great ski country". Here began a lifelong interest and dedication to cross-country skiing. During his two years at Great Falls, Evan decided his future was in the West. Following an Honorable Discharge in March of 1957, Evan returned to Montana to work at Plains Ranger Station on the Lolo Forest, as an Assistant Fireman. Part of his duties were keeping fire-weather observations to determine fuel-moisture content of the forest vegetation, temperature, relative humidity, and precipitation, which was then transmitted to Region 1 Headquarters of the Forest Service at Missoula. Subsequent work on the forest fire lookouts on the Lewis and Clark Forest in Montana, and on the Powell District of the Clearwater Forest in northern Idaho involved general weather observations, and recording information regarding lightning activity for the study of forest fire behavior.

An avid outdoorsman and skier, Evan was a founder of the Idaho Falls Nordic Ski Patrol in the early 1970's, after finally settling in southeastern Idaho in 1967. He also works as a Docent at the new Museum of Idaho in Idaho Falls, in conjunction with his interest in early American history and the Lewis and Clark expedition. He also serves as an assistant Scoutmaster in Idaho Falls.

Evan has been a vital part of the National Weather Service Spotter Program for several years. Anytime severe weather passes by in Rigby, Evan calls us immediately with his reports and this allows us to verify our warnings quickly and accurately. Without weather spotters like Mr. Tibbott, it would be more difficult to do this. For his assistance in providing real-time, accurate weather information for Jefferson County – which enhances the mission of the National Weather Service – "The Preservation Of Life And Property", Mr. Evan Tibbott has earned the Weather Spotter Of The Quarter Award. Great job Evan! We will be seeing you soon to present your awards and a free lunch for you and your wife.



Currents....

With All The Rain This Summer, the Drought Must Be Over, Right?

It would seem so. However, Eastern Idaho has actually been experiencing a normal summer with respect to precipitation. Let's first take a look at some numbers.

Pocatello Regional Airport
Precipitation Totals by Month
Total Annual precipitation: 12.58 inches

Rank	Month	Amount (inches)		Rank	Month	Amount (inches)
1	May	1.51		7	Feb	1.01
2	Mar	1.38		8	Oct	0.97
3	Apr	1.18		9	Jun	0.91
4	Jan	1.14		10	Sep	0.89
5	Nov	1.13		11	Jul	0.70
6	Dec	1.10		12	Aug	0.66

Using Pocatello as the reference point for Eastern Idaho, the average annual precipitation at the Pocatello Regional Airport is 12.58 inches, of which 32% comes in the spring months of March, April and May.

The monthly precipitation rankings are in the table to the left.

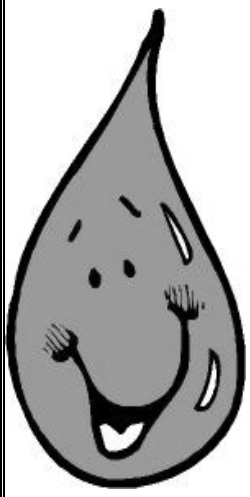
Looking back on June and July of this year – were the rain amounts in the normal range? June seemed a lot wetter to most of Eastern Idaho residents, however it appears we still didn't quite hit our average, as June's precip was only 83.5% with 0.76 inches. However, look at July – do you remember the great thunderstorms that moved through? They literally poured buckets of rain over much of far Eastern Idaho with the Pocatello Airport receiving 1.02 inches, 145.7% of normal.

The eastern foothills of Pocatello received 1.90 inches in less than 45 minutes during the July 18 storms - nearly 3.00 inches per hour! That's a lot of rain to pour on one area at one time. What usually happens when large amounts of rain fall over a short period? Yes, flash flooding.

Because of the July 18 storms, an estimated $542,000 in damage occurred. The damage ranged from minor driveway and street flooding to basement windows shattering under the pressure of the water and mud rushing into them. One home, in particular, had a newly finished basement filled to the ceiling with mud and water.

Well, this must have put a dent in the drought, right? If you consider a puddle in an ocean a recovery, then yes – but if you're like most…

Rains from severe thunderstorms like these come fast and furious with rapid runoff. Some will make it to the reservoirs, some will eventually seep into the ground, but much will evaporate as it rests in puddles. The rains we have had thus far this summer have helped the reservoirs somewhat by alleviating some of the irrigation demands; however, levels are still startlingly low. We are doing better than last year as current reservoir levels in Eastern Idaho are averaging 122.2% of last year's levels, yet they are only 45.7% of normal, which is only 32.6% of their capacity. Note how the average is higher than the capacity.



Since the drought began in 1999, the Pocatello Airport has run a precipitation deficit of 21.00 inches. Considering our average annual precip is 12.58 inches, that's no drop in the bucket. So, sorry to dash anyone's hopes, but we're "not out of the water yet" – I guess you could say we'd like to be in the water…

Meanwhile, continue to do your part by conserving water where you can. Here are some water-saving tips to help.

- Xeriscape landscaping – there are many beautiful drought tolerant plants to choose from.
- Water your lawns in the evening and at most every other day.
- Cut your shower time – you can sing and shake your bootie while you dry off!
- Use water and energy-efficient appliances.
- Irrigate wisely and maintain irrigation equipment.

If you would like to learn how your home is doing with water conservation, you may try the "Baths Versus Showers" activity that begins on the following page.

Have a great fall and see you next time!
Sherrie Hebert
Service Hydrologist

Baths Versus Showers

Here is a fun and simple activity for both kids and adults that can help determine how much water is used in your home when taking a bath versus that used when taking a shower.

What You Will Need:

- Adhesive Tape – good quality that will stick when wet
- Empty 2-Liter Plastic Container (such as an empty soda bottle)
- Tub and Shower Combination
- "Water Usage Chart" (provided at the end of the activity)

Preparation:

1. Start by calibrating the tub. Using the empty 2-liter container, pour exactly 20 liters of water into the tub.
2. Mark the water level with a piece of the adhesive tape.
3. Pour in 20 more liters and mark the 40-liter water level with tape. Repeat until the tub is nearly full. This will take about 7 to 10 rounds.
4. Once calibration is complete, drain the water in the tub to a comfortable depth. Record the depth of the water on the "Water Usage Chart".
5. On the next day, take a shower with the tub plugged. Make sure you take an "average" shower for the best results.
6. Record the depth of the water in the tub on the "Water Usage Chart".
7. Repeat the shower procedure for several days, or get other family members to collect data for you.
8. If you wish, you may determine the amount of energy required for your baths by determining the "Btu's" (British Thermal Units) used. Directions are provided after the liters-to-gallons conversion below.

Converting Liters to Gallons

Conversion: 1.0 liter = 0.264 US gallons

Equation: $X \text{ liters} * \frac{0.264 \text{ gallons}}{1 \text{ liter}} = \text{gallons used}$

where "X" is the number of liters used

Example: If your shower used 50.0 liters…

$50.0 \text{ liters} * \frac{0.264 \text{ gallons}}{1 \text{ liter}} = 13.2 \text{ gallons of water used}$

Determining the Energy Used

First, you must determine the number of pounds of water used.
Conversion: 1 gallon = 8.35 pounds

Equation: X gallons * $\frac{8.35 \text{ pounds}}{1 \text{ gallon}}$ = gallons used
where "X" is the number of gallons used

Example: Continuing with the example above, using 13.2 gallons…

13.2 gallons * $\frac{8.35 \text{ pounds}}{1 \text{ gallon}}$ = 110.2 pounds of water used

Now that we have water used in pounds, we can convert the water into Btu's of heat used. The general definition of a Btu *is the quantity of heat required to raise the temperature of 1 pound of water 1°F under a constant pressure of 1 atmosphere.* This is about the amount of energy released when the tip of a kitchen match burns.

Let's assume that we take showers at 100°F and we are heating the water from 60°F to 100°F:

100°F – 60°F = 40°F

So, 40 Btu's are required to heat 1 pound of water in this experiment.
Multiply each entry in the "Pounds" column by 40 to determine the energy used.

Since your power bill reports in kilowatt-hours, you may want to convert to kilowatt-hours from the Btu's.

Conversion: 1 kilowatt hour = 3412.14 Btu

Equation: X Btu's * $\frac{1 \text{ kilowatt-hour}}{3412.14 \text{ Btu}}$ = kilowatt hours used
where "X" is the number of Btu's used

Example: Continuing with the example above, heating 110.2 pounds of water to 100°F takes 40 Btu's per pound totaling 4408 Btu's …

4408 Btu's * $\frac{1 \text{ kilowatt hour}}{3412.14 \text{ Btu}}$ = 1.29 kilowatt hours used

What can you conclude about the amount of water and energy you use in bathing/showering? Odds are you will discover you use much less water and therefore energy when taking a shower rather than a bath.

Now that's conserving water!!

Let us know how your results came out! If you would like to share them, please send Sherrie an e-mail at: Sherrie.Hebert@noaa.gov

If we receive enough data, we will summarize it in the fall newsletter. Have fun!

Water Usage Chart

Date	Bath (liters)	Bath (gallons)	Bath (pounds)	Shower (liters)	Shower (gallons)	Shower (pounds)	Energy (Btu's)	Energy (KW hrs)

Weather Quiz: Time to test your ***Weather*** knowledge.…(Answers on back)

1. Which is hotter…100 degrees Fahrenheit or 100 degrees Celsius? _____.

2. Draw a line from each instrument and match it up to what it measures.

Instrument	Measures
Anemometer	Air Pressure
Sling Psychrometer	Atmospheric Moisture/ Relative Humidity
Barometer	Wind Speed

3. The lowest temperature of the day usually occurs at _____.
   a Midnight
   b. 3AM
   c. Around Sunrise

4. The windiest weather on earth and the coldest temperature ever recorded is/was in_____.
   a. North America
   b. Antarctica
   c. South America

5. The largest hailstone on record weighed 2 pounds and was _____ inches in circumference.
   a. 7.5
   b. 12.5
   c. 17.5

6. The peak temperature of a lightning stroke is on the order of _____ degrees Fahrenheit.
   a. 10,000
   b. 50,000
   c. 100,000

7. On a sunny day, which of the following will record a hotter temperature than the rest?
   a. New Snow
   b. Trees in a Forest
   c. Black Pavement

8. Relative Humidity tends to be lowest during the _____ and highest right around _____.
   a. Late Afternoon/Sunrise
   b. Morning/Sunset
   c. Night/Noon-time

9. When watching the weather forecast on television, meteorologists show lines of equal pressure and lines connecting equal temperature on their maps. In meteorological terms, these are known as _____ and _____.
   a. Isotherms and Contours
   b. Isotherms and Isobars
   c. Isobars and Isotherms

10. _____ is a better measure of how much water vapor is actually in the air than the _____ .
   a. Dew Point Temperature, Relative Humidity
   b. Relative Humidity, Dew Point Temperature

Answers to the Weather Quiz:

1. **100 Celsius is hotter.** For every change of one degree Celsius, there is roughly a 2 degree Fahrenheit change. A quick and dirty way to approximate a Fahrenheit to Celsius temperature conversion is to subtract 32 from your Fahrenheit temperature, then divide by 2 and add 1. For example, if someone wants to know what 68F is in Celsius…applying the above rule we would get 68-32=36. Then divide by 2, which is 18, and add 1 to get 19C. This is an approximate answer…as the real answer is 20C. The real formulas go like this: From Fahrenheit to Celsius: 5/9 (F-32) and From Celsius to Fahrenheit 9/5 times Celsius + 32. **So in our problem above, 100 Celsius is what in Fahrenheit? 9/5 times 100 and then add 32. It follows…180 + 32 = 212F. 100 Celsius or 212F is the boiling point of water!**

---

2. **An Anemometer measures Wind Speed; A Sling Psychrometer measures Atmospheric Moisture; and a Barometer measures Air Pressure.**

---

3. ***C. Around Sunrise.*** On a clear night with light winds and very little cloud cover…expect the low temperature to be reached near or just slightly after sunrise. The earth cools all night as longwave radiation or outgoing energy escapes into space. This is maximized until the sun begins to send shortwave radiation or incoming energy back in during the day and this process begins as soon as the sun rises. Usually within 20 minutes after the sun rises, the incoming or shortwave energy from the sun becomes greater than the longwave energy going out. The point in time when the longwave out = the shortwave in…any further drop in temperature will be terminated…thus your low temperature will be achieved at this point.

---

4. B. **Antarctica**. Winds reach up to 200 miles per hour very frequently especially near Commonwealth Bay. Vostok, Antarctica…a Russian research station… recorded the coldest temperature on earth at -127 Fahrenheit.

---

5. C. The largest hailstone was 17.5 inches and fell in Coffeyville, Kansas on September 3, 1970.

---

6. B. **50,000 Degrees Fahrenheit**. Compare this to the temperature of the sun's surface which is 11,000 F.

---

7. C. **Dark Pavement**. Black absorbs the sun's energy while white reflects it. The percentage of energy reflected or not absorbed is known as Albedo. A perfect mirror has an albedo of 100% while a perfectly black surface has an albedo of 0%. The color white, like snow, has a high albedo, ranging anywhere between 80 and 95% depending on how clean it is. A forest has an albedo ranging between 5 to 15% which means it reflects 5 to 15% of the incoming light from the sun but this is highly dependent on how dense the forest or trees are. Black pavement has a very low albedo, approximately 15%.

---

8. A. **Late Afternoon/Sunrise**. The Relative Humidity is dependent upon how close the air temperature is to the dewpoint. The dewpoint is a true measure of how much moisture is in the air. In the morning, the temperature and dewpoint are usually within 5 degrees of each other which yields a RH between 90 and 100%. During the afternoon, the rise or change in temperature is greater than the change in moisture and thus the temperature and dewpoint are farthest apart, which usually occurs late in the afternoon.

---

9. **C. Isobars and Isotherms.** In meteorology, isobars connect lines of equal pressure on a constant height surface…with the height being zero since every pressure is reduced to sea level, while contours connect lines of equal height on a constant pressure surface, like the 500mb map. Isotherms connect points of equal temperature, both on constant pressure and height surfaces.

---

10 **A. Dew Point Temperature, Relative Humidity.** Reason for this is that the Dew Point Temperature is not affected by air temperature and is a direct measurement of how much water vapor is in the air; while the *Relative Humidity changes with changes in air temperature, even if the amount of water vapor in the air is constant. See question 8 for more explanation.*

Next Spotter Newsletter…November 2004!

Weather Forecast Office
National Weather Service
1945 Beechcraft Ave.
Pocatello, Idaho 83204

208-233-0137 Recorded Forecast
208-233-0834 Report Weather Changes
http://www.wrh.noaa.gov/pocatello/