Looking Toward The Skies

by Stephen Mayne

One of our favourite pastimes in Canada is talking about the weather. It seems that everyone has an opinion about it, knows what tomorrow will bring and can recite any number of weather folklore tales. But do any of us really understand just what weather is?

Many of you will say yes as we folks here in Canada are a knowledgeable bunch when it comes to the weather. Yet, so much is happening in the atmosphere all the time that it is impossible to know what is coming weather-wise without a solid basic understanding of how weather is made.

To begin with, let us summarize just what the word weather really means. Weather is our atmosphere in action, the physical part of the air around us that can make us feel cold one minute and hot the next, can create a gust of wind seemingly out of nowhere and stop just as fast. It is a hurricane, a tornado, a monsoon or a hot sunny day with no breeze.

Weather, the very word itself, can conjure up many images in our minds: a warm pleasant day at the beach, a hike through the forest taking in all that fall has to offer, skiing your favourite resort or spending a day out on a boat fishing. But tell me this; can you describe what the sky looks like during any moment when you are enjoying the weather?

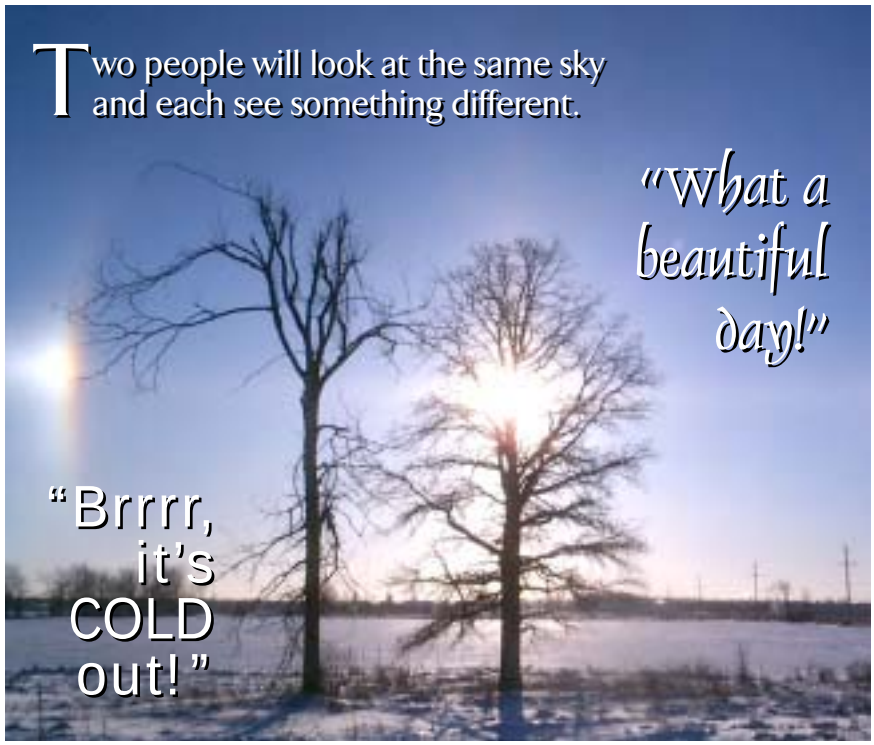


Photo courtesy of Stephen Mayne

People will frequently describe a nice summer day as sunny and warm with a bit of humidity if asked what the day was like, but we sometimes miss out on one of nature's most beautiful canvases: the sky. Throughout the centuries, authors and poets alike have described the sky in a multitude of ways, and two people will look at the same sky and each see something different.

CHALLENGE ONE:

☞ Without looking outside, write down what you think it's like.

Every day we spend at least two hours outside either on our way to school or work and on our way back home. During that time we may people-watch, count the trees that go by, play a guessing game or just stare off into space taking a bit of a brain break.

In other words, few of us actually take the time to observe the sky in detail.

CHALLENGE TWO:

☞ Describe some of the things you see on your way to and from school or work.

All of your observations are beneficial but to a person, almost every one of you will have missed one critical item when you tried to describe what it looked like outside. Before telling you what that one thing is, try this last challenge.

CHALLENGE THREE:

☞ Again, without looking, describe exactly what the sky looks like right now, and write it down.

☞ Now, go outside and look at what the sky looks like.

☞ Then write down what you observed in the sky.

All of these observations are very useful for the outdoors person whether out on a brief hike, a day in the bush or away camping. But again, what have you missed? Did you notice if it is cloudy out, what kind of clouds you saw and which way they were travelling? Did you notice which way the wind was blowing and roughly how fast? Probably not.

Here are a few rules of thumb to follow when outdoors to help you learn about the environment around you and the weather as it pertains to your time outdoors. If you can learn these skills, you will be better prepared for the unpredictable or for unplanned change. Then once you are finished, go back outside and observe once again, following challenges one to three, and see how much of a difference you have in your observations. You can find an observations form on the lanarkweather.org web site for you to use.

Winds and sky conditions such as clear or cloudy skies are your friends. When it comes to weather changes these two observations can tell you everything you need to know. Knowing your types of clouds and the heights at which they are generally formed is one of many clues that can help you. The wind is another indicator of things to come and helps you identify some of the many things going on in the skies above you including the presence of high and low-pressure systems.

A low-pressure system is one in which the air around us is lighter. This is due to the fact that the air is rising, a condition we call convection, which causes what meteorologists call an unstable air mass. This is also one of the first building blocks of a thunderstorm if the action continues.

A high-pressure system is the absolute opposite where the air is dropping, pressing down upon us. During this condition, skies are usually clear and if it is summer, the air can become very humid and sticky, and pollution can increase. But if it is the winter, you can be assured of very cold conditions and crystal clear skies.

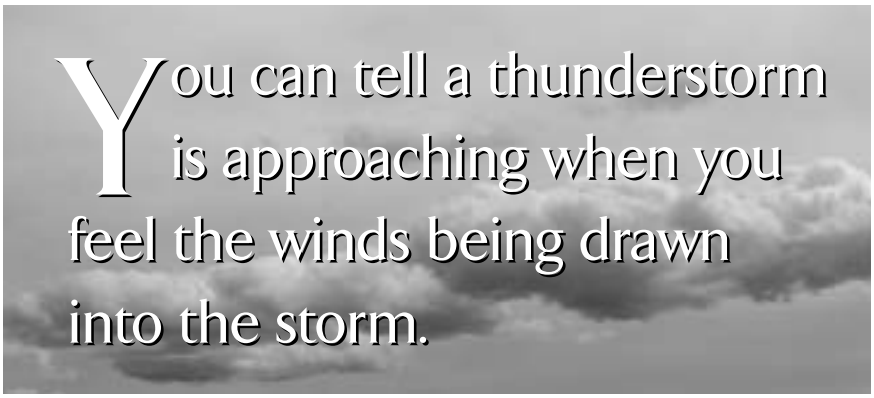
In all cases, wind travels from the high-pressure system to the low-pressure system and the faster the winds, the greater the difference between the high and the low. Here is an example for you to follow which is almost always correct. As in everything to do with the weather, nothing

When it comes to weather changes these two observations can tell you everything you need to know. Clouds and the wind are good indicators of things to come.

Photo: Sean Munro

is absolute but these rules of thumb are generally good indicators. To gauge wind speed we will use the Beaufort Scale, a scale developed using observations of what the winds are able to move.

Let's say you are at Haliburton Scout Reserve with no batteries in your radio, and your cell phone just can't seem to be able to reach out and touch someone. Now let's say that you need to know what the weather is going to be: you look up and see a clear sky except for some really small, wispy and non-threatening looking clouds way up there to your southwest.



Then you notice that the winds are blowing roughly from the south and that those small, wispy and non-threatening looking clouds are moving at a good pace to the northeast; say a 3 on the Beaufort Scale. That is a good indication that a storm is moving up from the southwest – and the higher the winds are from that direction, the stronger the storm is.

On the other hand, if it has been raining but you are seeing a few breaks or cracks in the cloud cover and the winds have picked up from the west, you can figure that the worst is over and the skies should clear in the next few hours.

Again, these are only rules of thumb and are not always perfect but for the most part, you can learn to understand what is happening and be able to determine what to expect.

Lastly, we will discuss thunderstorms. These are the bad boys of the atmosphere and can do much damage but fortunately they are usually short lived.

A thunderstorm is a low-pressure system with much convection (rising air that travels up a central column, called the updraft, feeding the storm its moisture and heat). In its wake we are usually left with cooler conditions and a light breeze. A thunderstorm will build, usually in the south to southwest and draw in heat and moisture from the land ahead of itself. You can tell a thunderstorm is approaching when you feel the winds being drawn into the storm.

It has many parts and goes through an evolution that is much the same in each storm. Also, there are two types of these storm systems: a worst first and a worst last storm. A worst first is a storm that hits with all its fury right at the start. This type of storm is usually very short-lived and passes in less than an hour.

In a worst last storm, you get a sequence of events that begins with hearing the thunder off in the distance (you can start to hear the thunder when the storm is 20km away). Then comes a light rain followed by lightning – sometimes lots of it, and with it or just afterward comes the rain curtain. This is a wall of rain that represents the leading edge of the core of the storm where the main updraft lives.

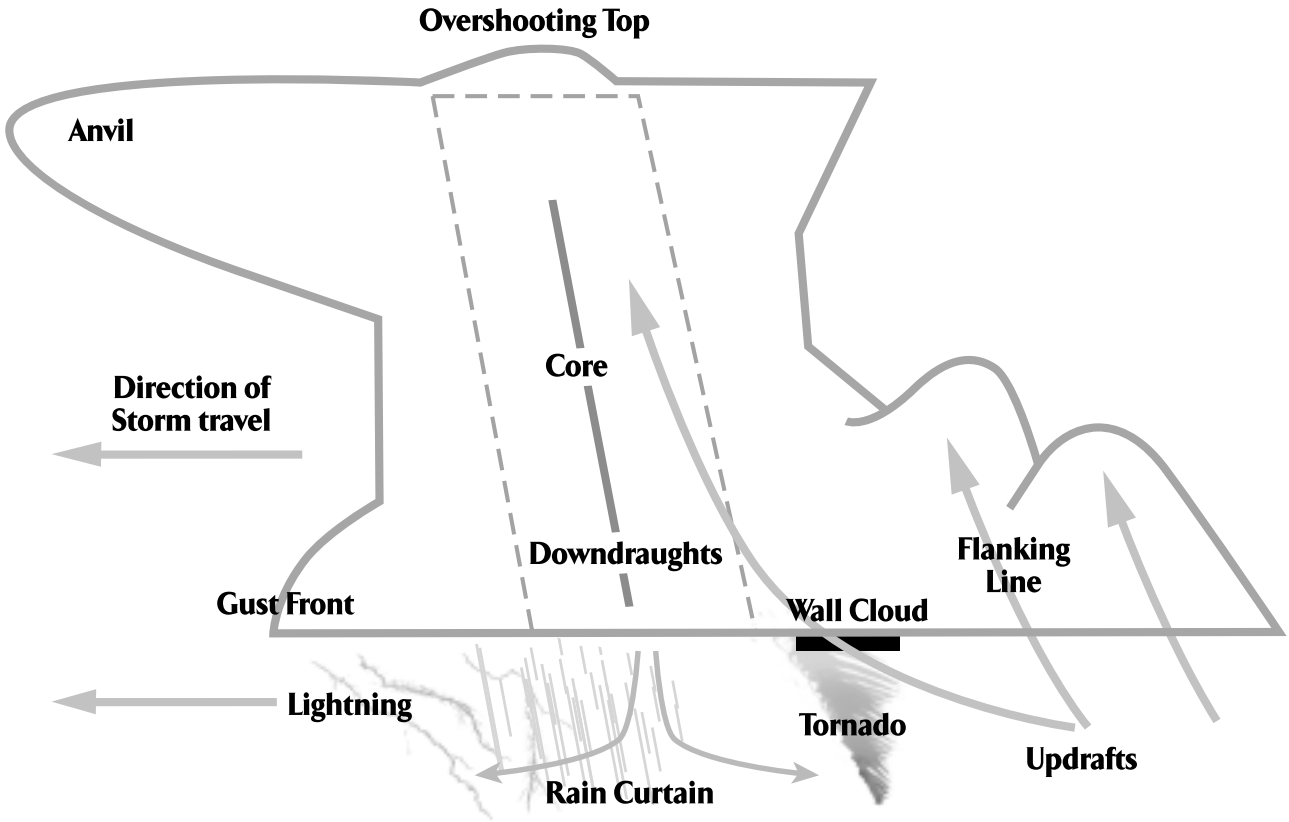
Once it has passed you may get some hail if the storm is severe and the updraft is close by, but you may notice little or no winds here since the main updraft in the core is drawing all the air upward. Now, if the storm is severe enough, a tornado or funnel cloud can form, almost always behind the updraft in a region called the flanking line and usually about one kilometre behind the core. Once that threat has passed, there is usually nothing left except some pretty and colourful sky. At the very back you can sometimes see a cloud formation called mammatus that looks like a bunch of pouches hanging off the back of the anvil of the storm. This is caused by the warm air that was drawn up into the storm falling back to earth as cold air.

Again, these are not all the conditions that can occur, but it does represent some of the most common. And remember, all weather conditions have their own dangers, even the nice weather, so make it your job to learn all the safety rules which are on the web site as well. If you wish to find out more about the weather, please visit www.lanarkweather.org/*TheLeader*.

BEAUFORT SCALE

Code	Speed MPH	Speed KPH	Description	Effects on Land
0	Below 1	Below 1	Calm	Smoke rises vertically
1	2 - 3	1 - 5	Light air	Smoke drifts slowly
2	4 - 7	6 - 11	Light Breeze	Leaves rustle, vanes begin to move
3	8 - 12	12 - 19	Gentle Breeze	Leaves and twigs move
4	13 - 18	20 - 29	Moderate Breeze	Small branches move; dust blown about
5	19 - 24	30 - 38	Fresh Breeze	Small trees sway
6	25 - 31	39 - 51	Strong Breeze	Large branches sway; utility wires whistle
7	32 - 38	51 - 61	Near Gale	Trees sway; difficult to walk against wind
8	39 - 46	62 - 74	Gale	Twigs snap off trees
9	47 - 54	75 - 86	Strong Gale	Branches break; minor structural damage
10	55 - 63	87 - 101	Whole Gale	Trees uprooted; significant structural damage
11	64 - 74	102 - 120	Storm	Widespread damage
12	Above 75	Above 120	Hurricane	Widespread destruction

Schematic Diagram of a Supercell



Here you will find references to everything discussed here and much, much more. Also, I will be setting up a page on my site to display photos and drawings from anyone in Scouting who wishes to submit them to me. All I ask is that you supply me with your name, email address, group and section so that I can give you the credit for the images.

If you would like me to visit your group or section (I am in Southeastern Ontario) you can arrange a time with me by writing to Scouter_Steve@lanarkweather.org or if you have a question, feel free to write.

– Stephen Mayne is a Group Commissioner for 1st Beckwith in the Valley Highlands area of Voyageur Council and has been both a Cub and Beaver Leader. He is a Storm Chaser, actively chasing severe weather in eastern Ontario and made his first trip to Tornado Alley in the U.S. last spring (May 2004). Much of his photographic work is displayed on Lanarkweather.org along with forecasts, storm warnings and more. Stephen would like to acknowledge his sponsors: The Weather Network, Storm Internet Services, Prodecal of Perth, Riada Software, HTML Validator/A1 Internet Solutions, Nature Lover's Bookshop. He is also a member of the following organizations:

CANWARN: a network of registered and trained weather spotters for Environment Canada
Severe Weather Watcher (Environment Canada)
CERV: **C**ommunity **E**mergency **R**esponse **V**olunteer trained in assisting during civil emergencies by Emergency Management Ontario
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Southern Ontario Storm Chasers