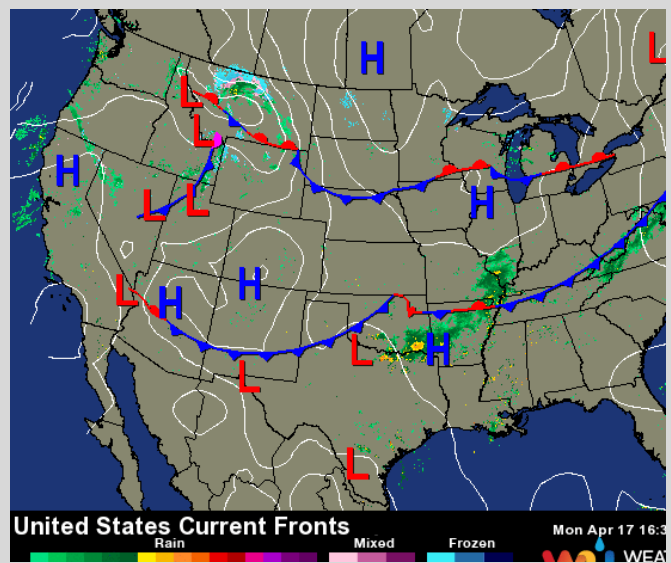
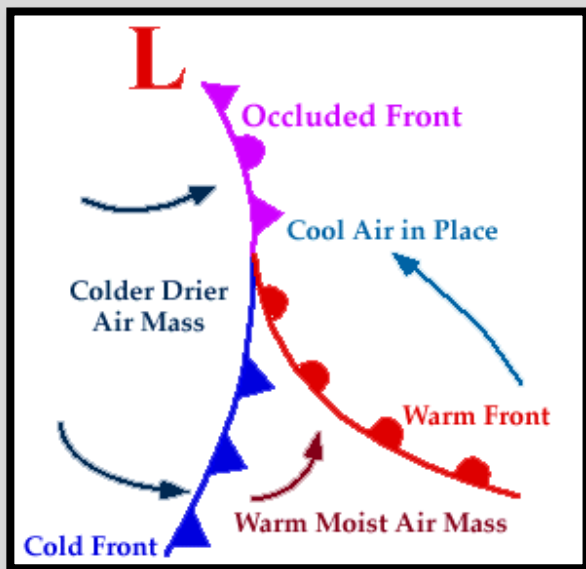


Racing Pigeon fronts and inversions

Ove Fuglsang Jensen ©



Racing Pigeons and fronts

During the many years of pigeon racing here in Europe, it came to the knowledge that the meteorological fronts had an effect on the races. It was specially the coldfront which made the problems, **when the pigeons had to go through the front.** In Germany the responsible for releasing the pigeons knows this fact about the fronts, and so do they in Holland. In Denmark we have known this problem of coldfront and pigeon racing for 40-50 years. However I do not know how much the fanciers in USA know of pigeon racing and coldfront/inversion - maybe you know a lot?

I have noticed that the temperatures in the States are in Fahrenheit. In Europe we only have Celsius, but I have found a scale with both Fahrenheit/Celsius, and when I write the temperature it will be with C/F for both scales. The wind we in Europe measure in meter per second or in kilometer. I have noticed that the wind in the States are measured in miles and I know that one mile is 1,6 km which makes 60 miles to 100 km/hour.

In the article there will shortly be mentioned the fronts and inversion, and thereafter a description of the problems the pigeons have with fronts and inversions in races.

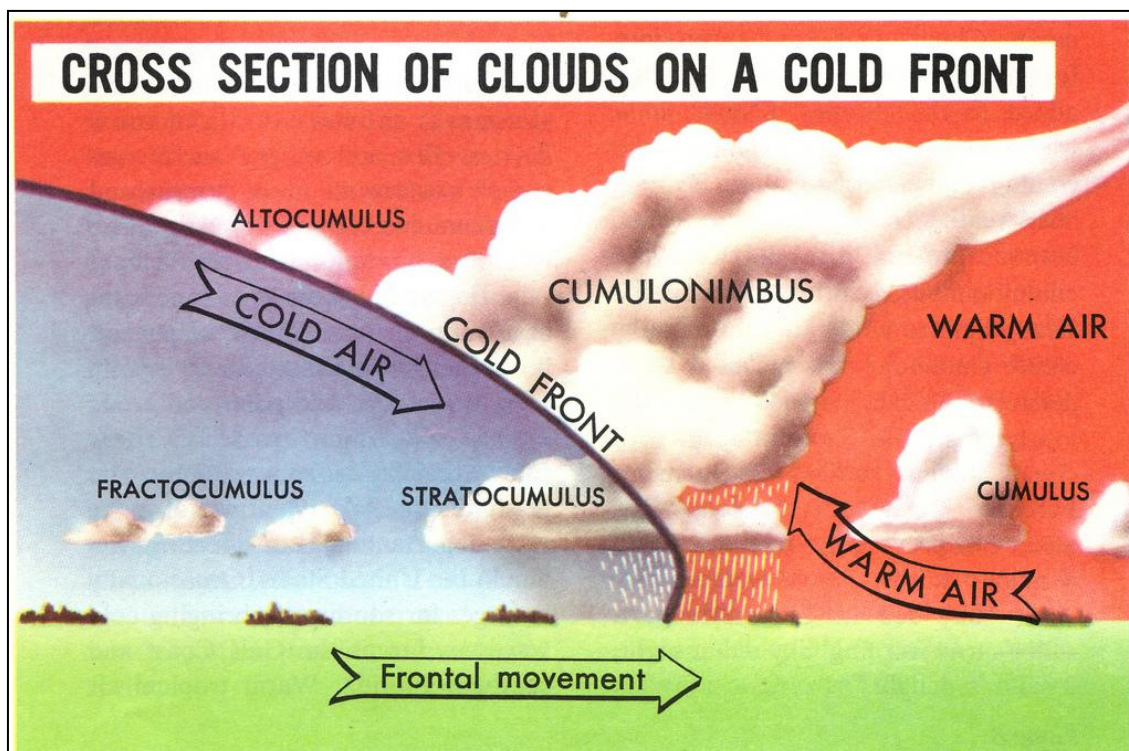


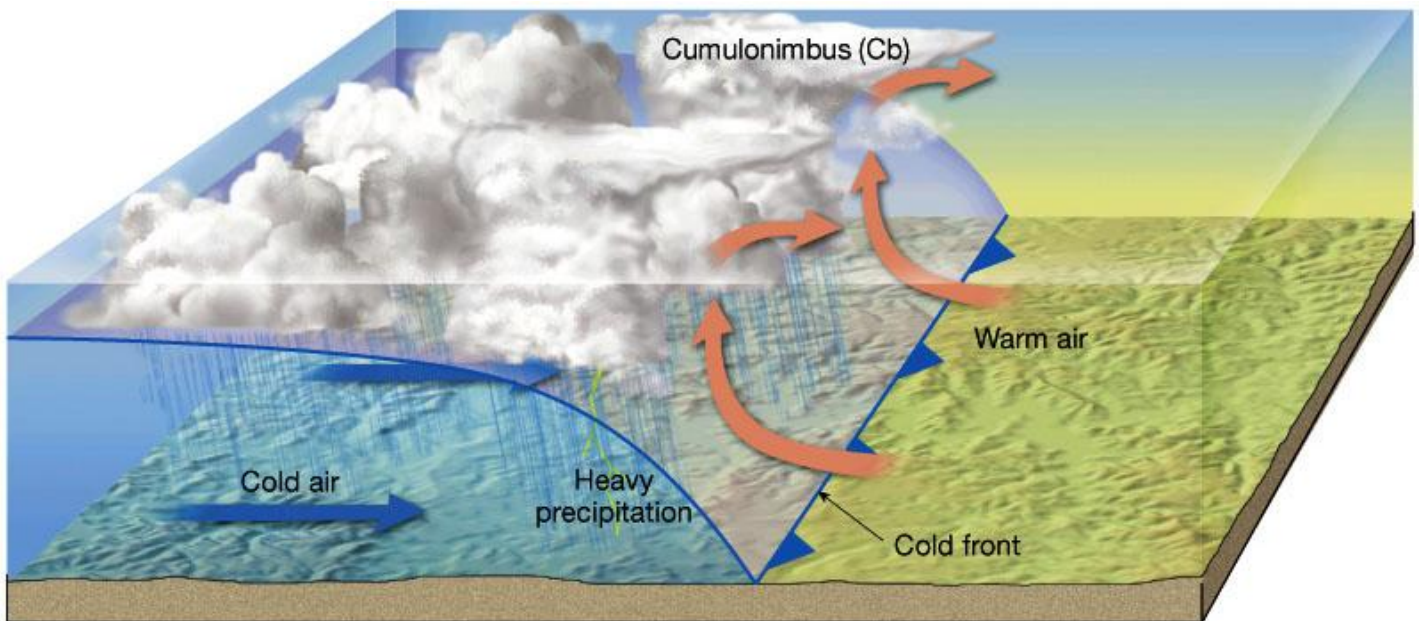
4 different types of fronts

The four major types of fronts depends of the direction of air mass's travel and its characteristics. When two different air masses collide, the warmer air rises above the colder denser air. In the northern hemisphere, most fronts travel from west to east carrying clouds and rain. As a front passes through an area, it results in changes in wind speed and direction, atmosphere pressure and moisture.

Cold front

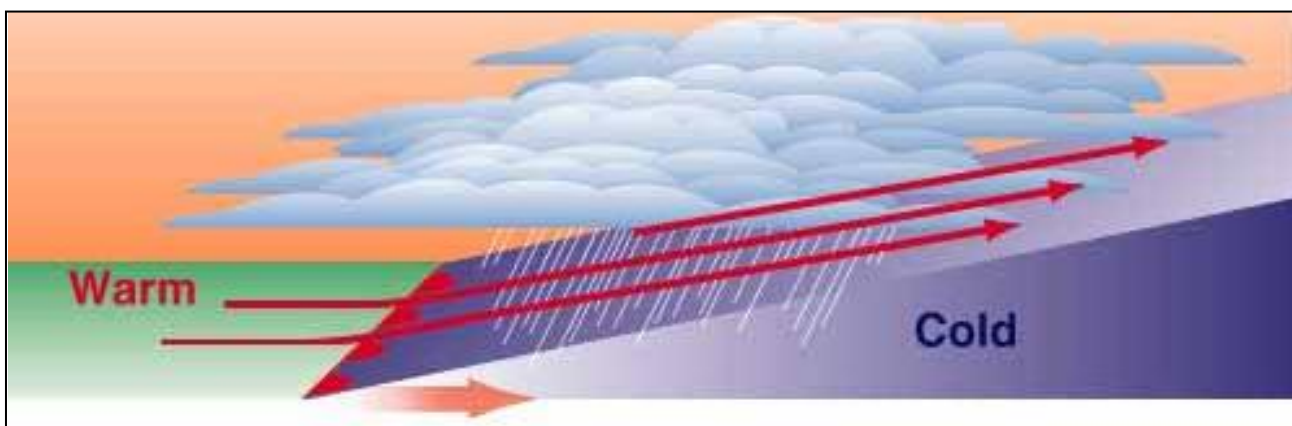
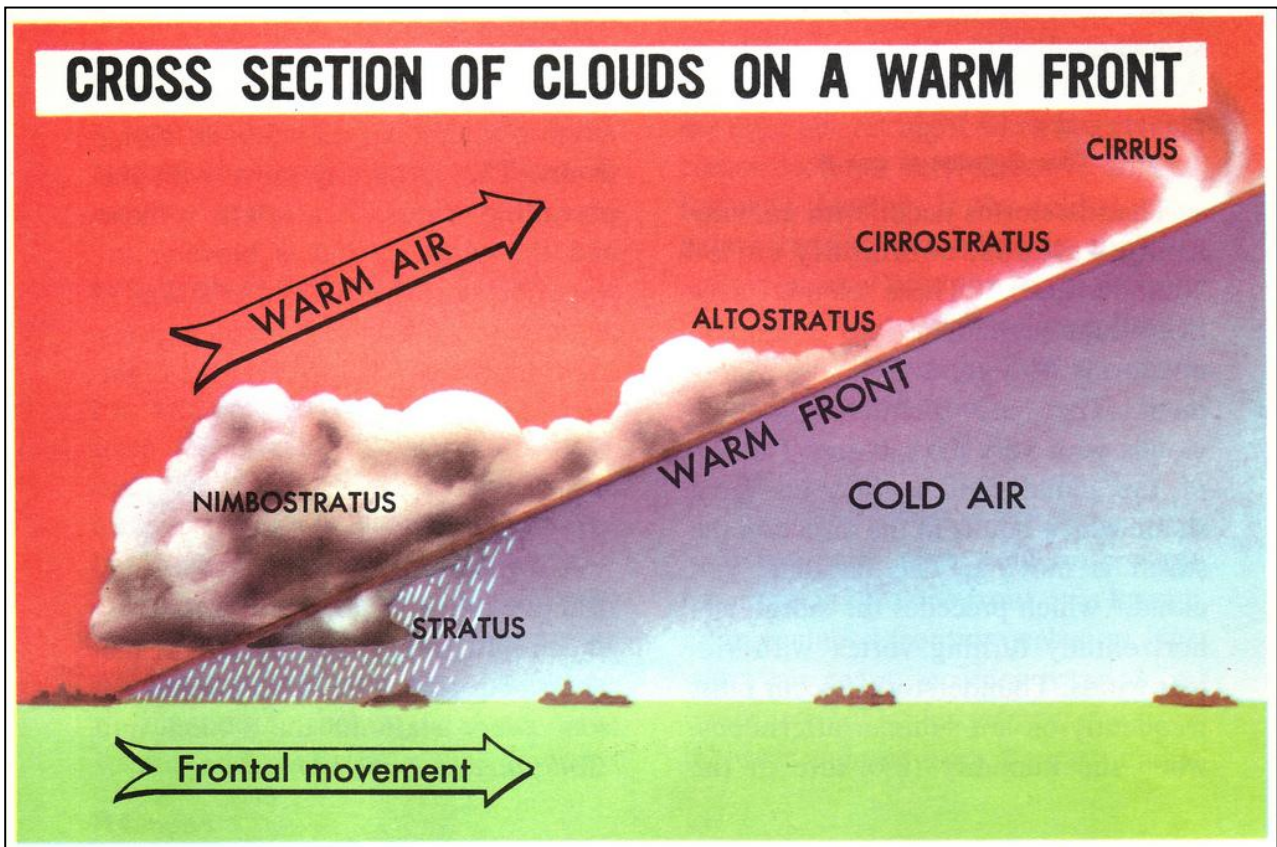
When cold air replaces warm air, a cold fronts results. As warm air rises and cools, the water vapor condenses with cloud formation. The rain resulting from cold fronts is short lived and heavy, generally affecting a distance out about 50 miles as the front moves on. Cold fronts blow over areas faster than other types of fronts, producing some of the most violent thunderstorms that move with the front while maintaining their intensity. They are often associated with a line of strong thunderstorms, a squall line parallel to the front and moving ahead leaving weather behind with clear blue skies.

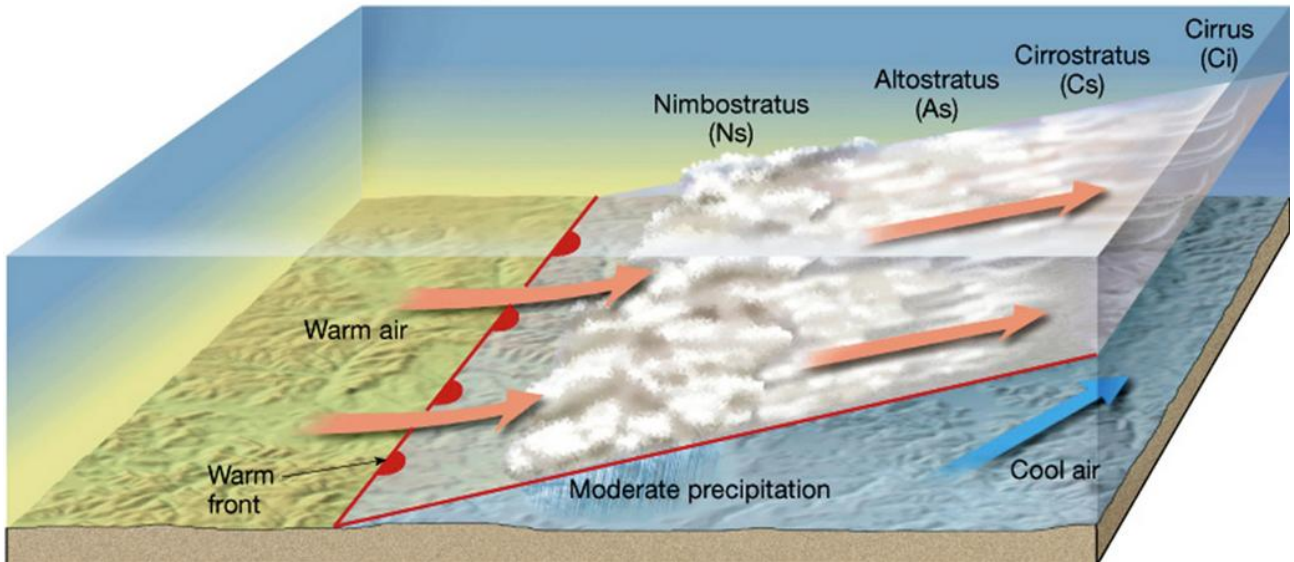




Warm front

Warm fronts move more slowly and are less violent than cold fronts. They are associated with warm air moving over cold air and are more likely to produce large regions of light to moderate rain, drizzle or snow. Cirrus clouds and alto cumulus, along with fog, often precede warm fronts as they move through an area. The milder weather that follows will be warmer in temperature.





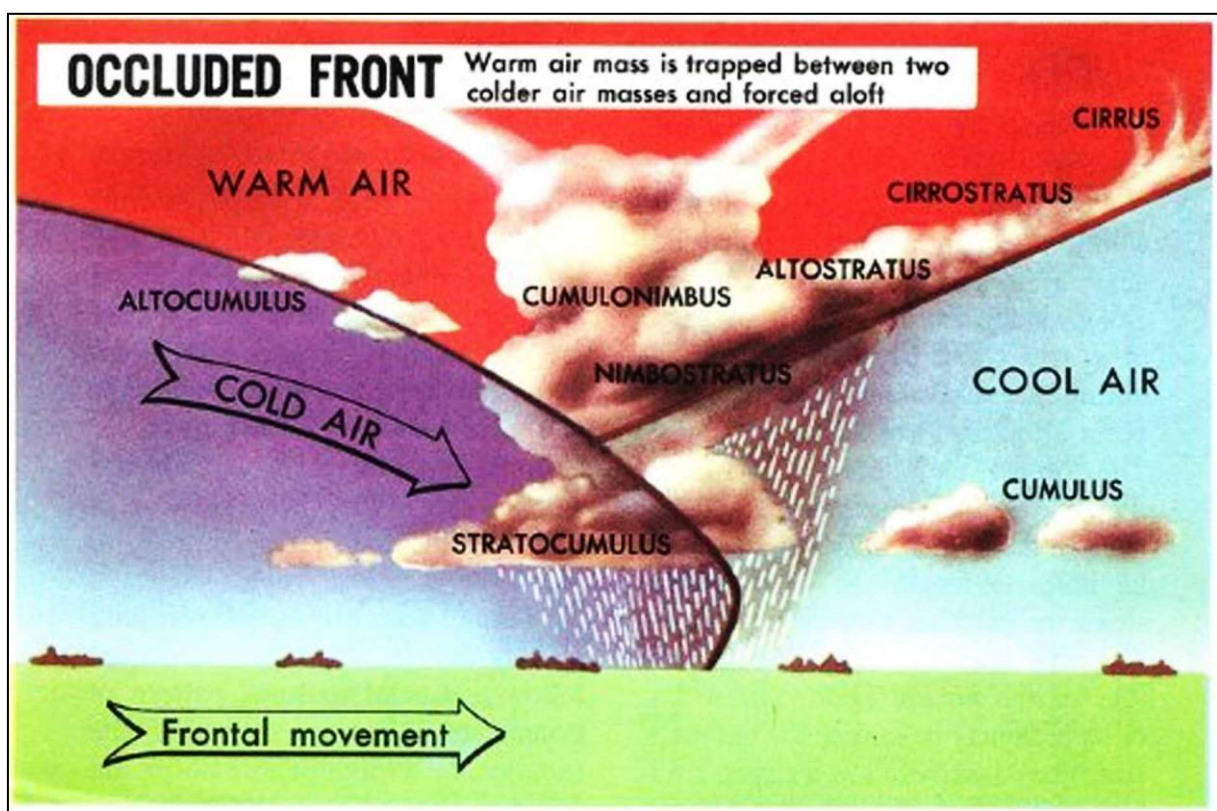
YouTube video of cold/warm front:

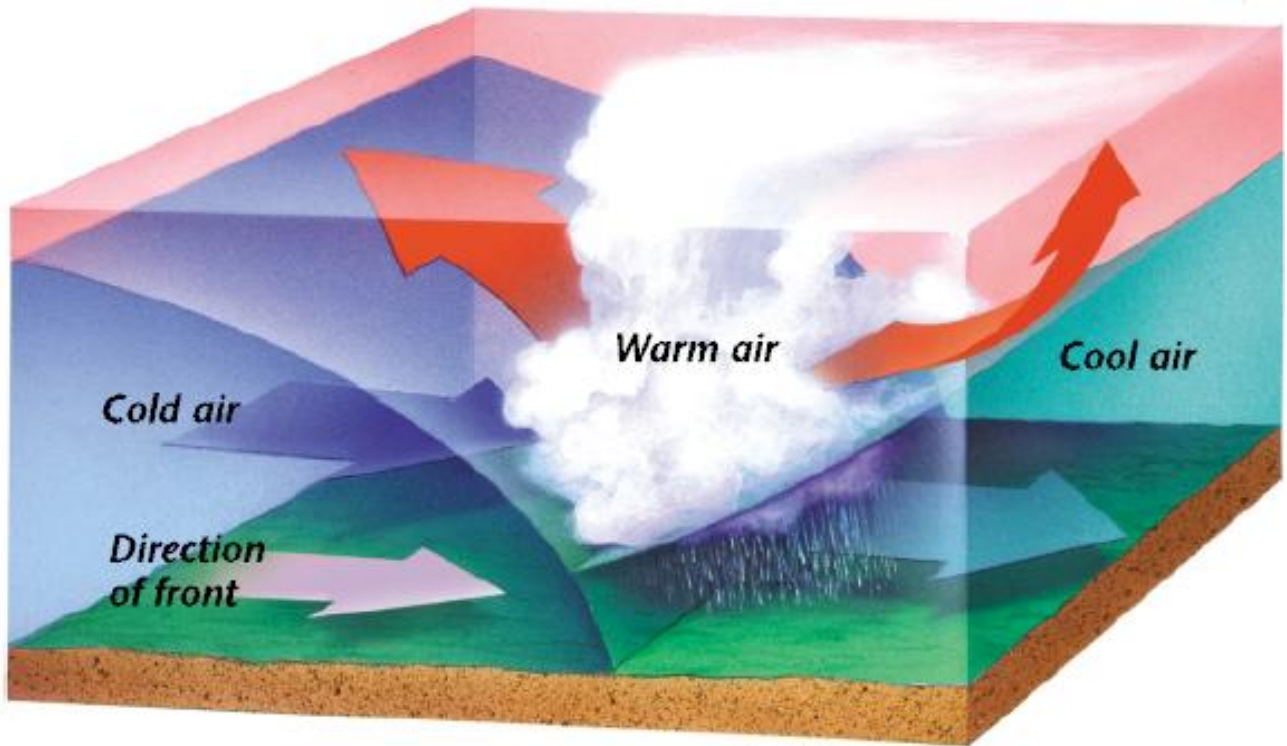
<https://www.youtube.com/watch?v=huKYKykjc0>

Occluded front

The condition of occluded fronts arise whenever cold, warm and cool air combine. There are two types of occluded fronts: Cold and warm. The cold occlude front forms when a cold front overtakes a warm front. The warm front rises over the colder, which slowly creeps along the ground surface. The weather characterizes a warm front when the occlusion begins but gradually changes into a cold front with low temperatures and heavy rain.

The warm occluded front occurs when a cold front approaches a warm front layered over an extremely cold front as it remains near ground level. The resulting weather pattern is similar to that of a passing warm front.





YouTube video of occluded front:

<https://www.youtube.com/watch?v=4gc7puH279s>

<https://www.youtube.com/watch?v=Bb3-fwpI6no>

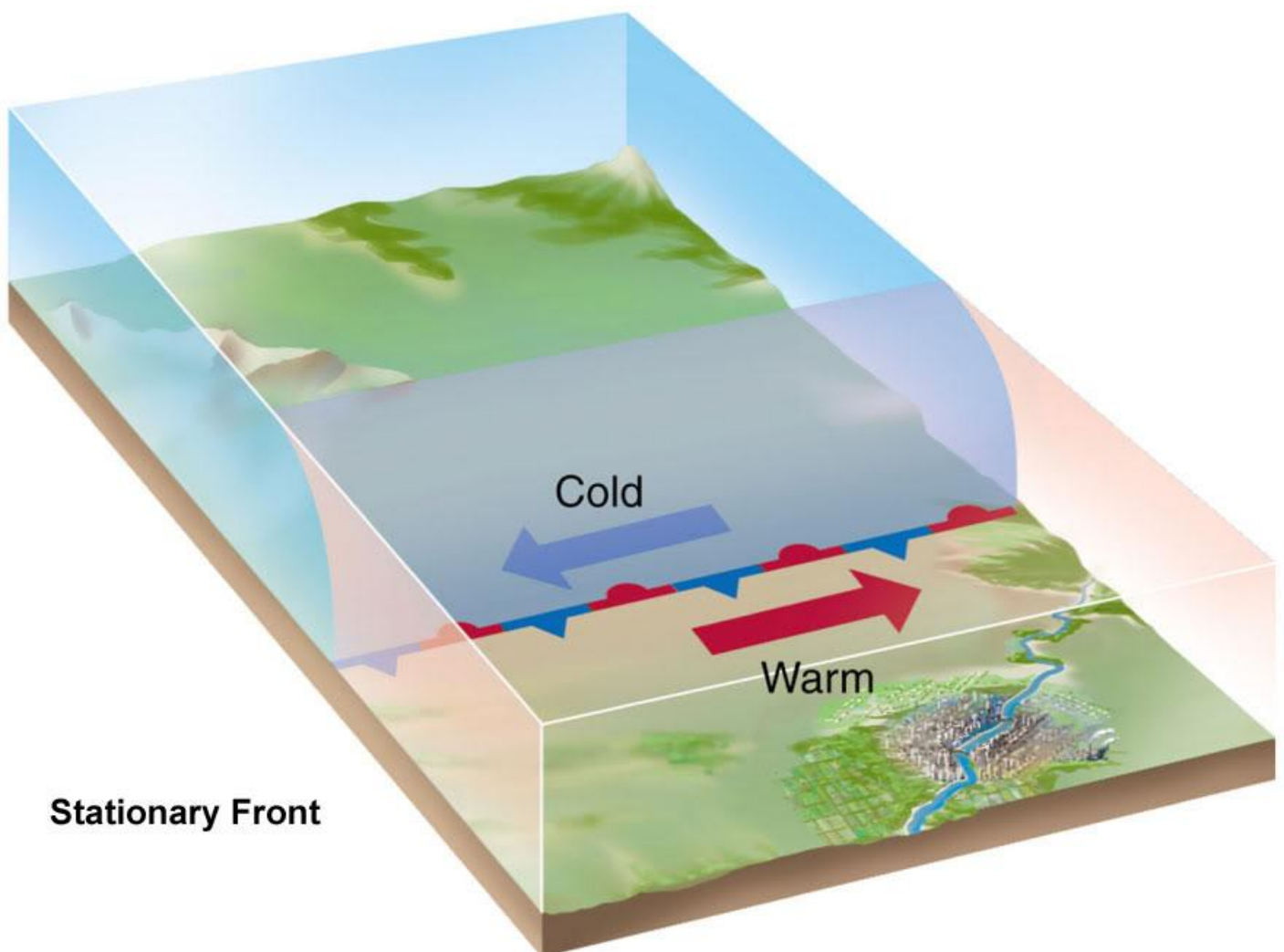
<https://www.youtube.com/watch?v=c5rTQRLEJVU>



Stationary front

When warm and cold air masses meet and form a stationary boundary or front, there is no further movement from either one. This characteristic is similar to warm fronts but stationary fronts are less active and eventually fade away.

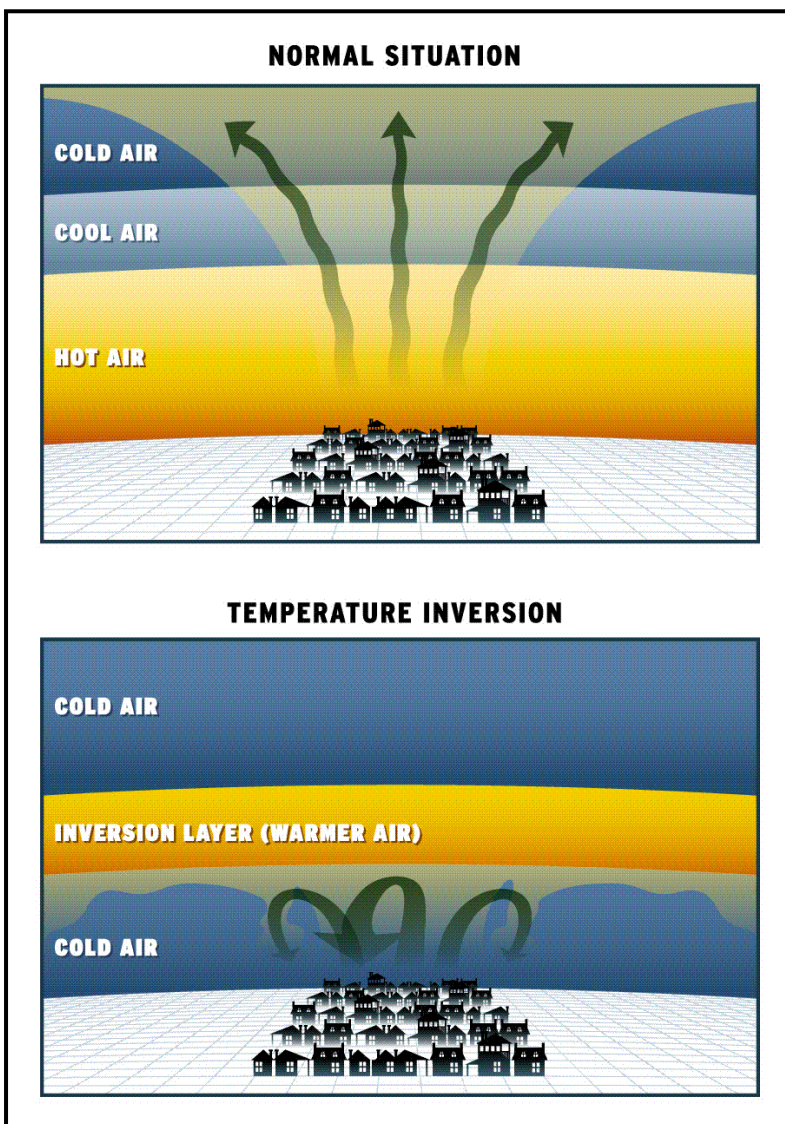
A dry line is a frontal boundary separating hot dry western air from warm moist air in the east. **They often occur during the spring in the plain states of the western USA**, and move east during the day. If the atmospheric instability in the warm air is strong enough, dry lines can spawn severe storms with tremendous winds, large hail and tornadoes.



Inversions

A temperature inversion is a thin layer of the atmosphere where the normal decrease in temperature with height switches to the temperature increasing with height. An inversion acts like a lid, keeping normal **convective overturning** of the atmosphere from penetrating through the inversion.

This can cause several weather-related effects. One is the trapping of pollutants below the inversion, allowing it to build up. If the sky is very hazy, or if sunsets are very red, there is likely an inversion somewhere in the lower atmosphere. This happens more frequently in high pressure zones, where the gradual sinking of air in **the high pressure dome** typically causes an inversion to form at the base of a sinking layer of air.



Under normal circumstances, an inversion will be active in the early morning after a night with a clear blue sky. The inversion is invisible, but near the horizon a little blurred or dizzy, it can be a good sign. If an inversion is in an open flat area and not locked down between some mountains, the inversion will be "burned" away by the sun.





An inversion are invisibel, but the smoke from a fire can show where the unversion layer are. On picture below notice hazy layer near ground.



You Tube video of inversion:

<https://www.youtube.com/watch?v=L7i7N-je-aM>

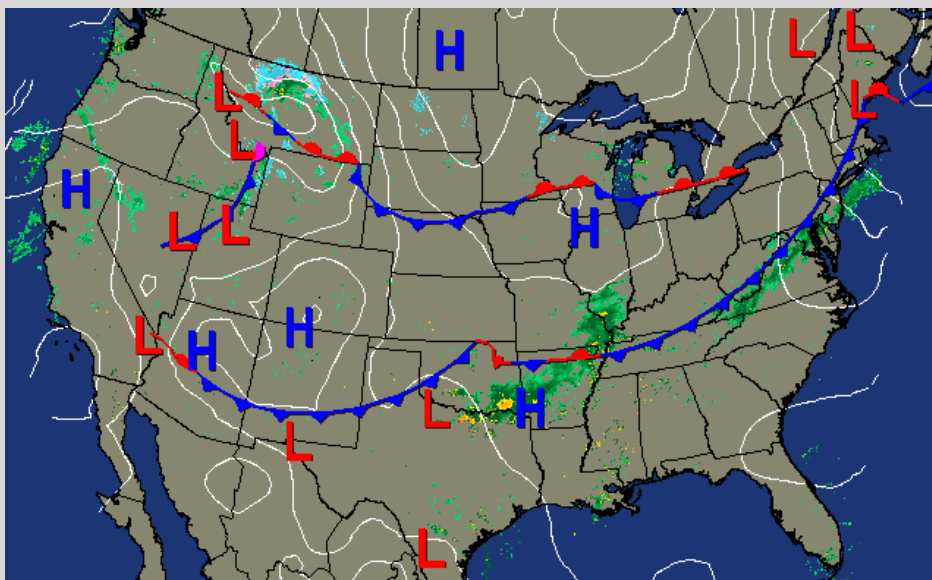
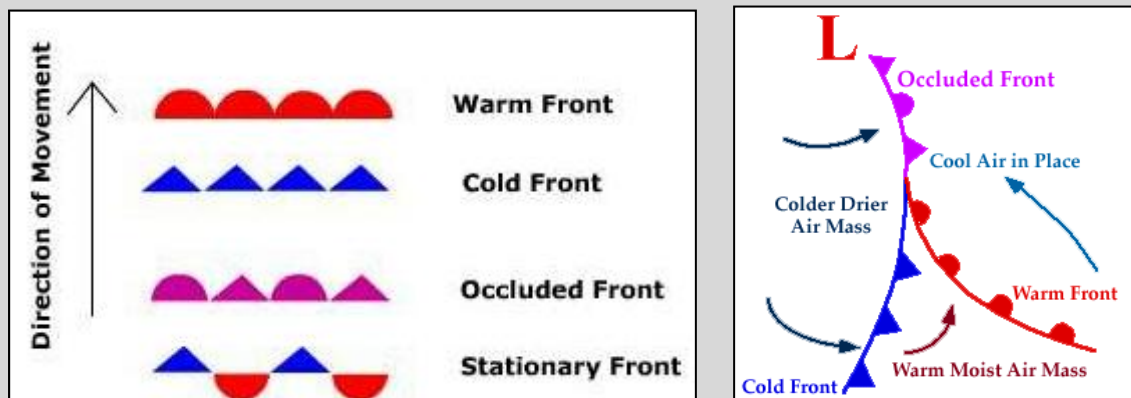
https://www.youtube.com/watch?v=T_U3TXHBt-0

Racing Pigeons -fronts and inversions

When we sent our pigeons to a race, they will always be exposed to physiological elements in the weather. It can be high temperatures, wind or rain. The pigeons can tackle these common obstacles, but in special occasions the pigeons shall go through a front or are released in an inversion. This can make problems for the pigeons, and that is why we shall have a closer look on fronts and inversions.

The biggest problem lies in cold fronts and occluded fronts. A warm front is easy to see on the weather radar, but the cold fronts and occluded fronts are more complicated and compounded. In Europe we do not have stationary fronts, but I will make a comment on this.

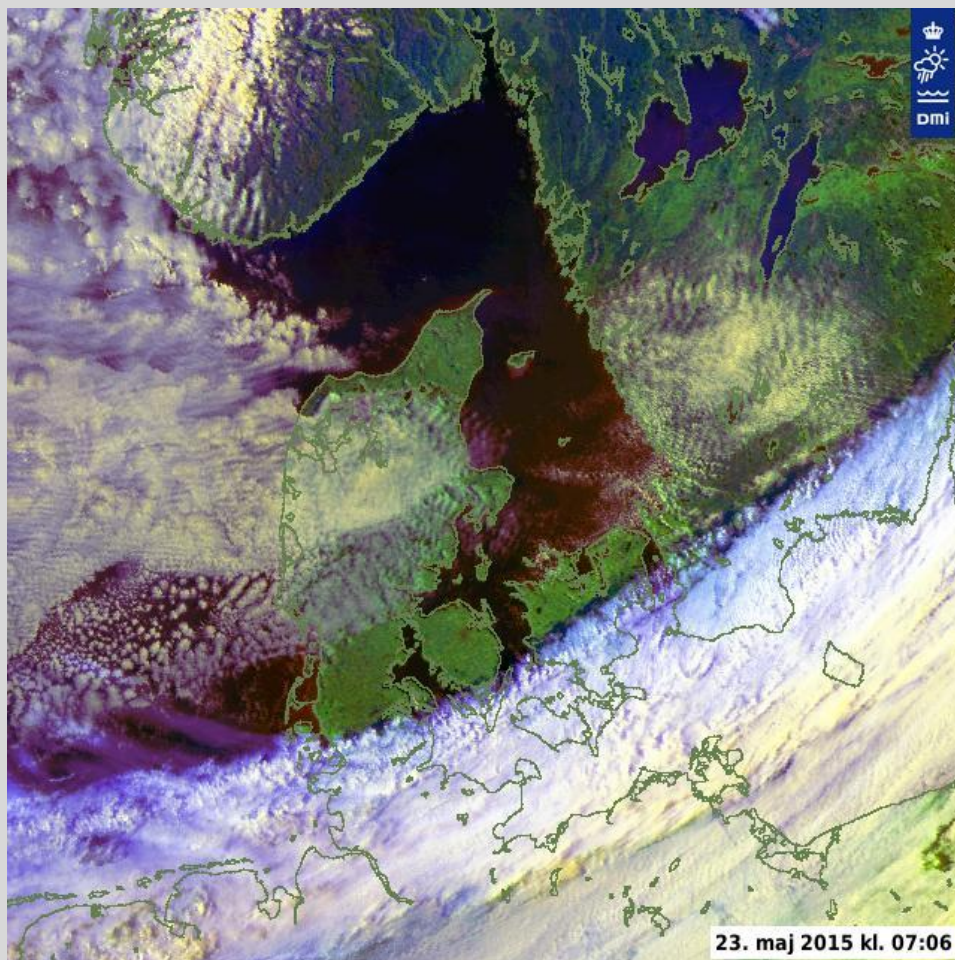
Symbols for fronts



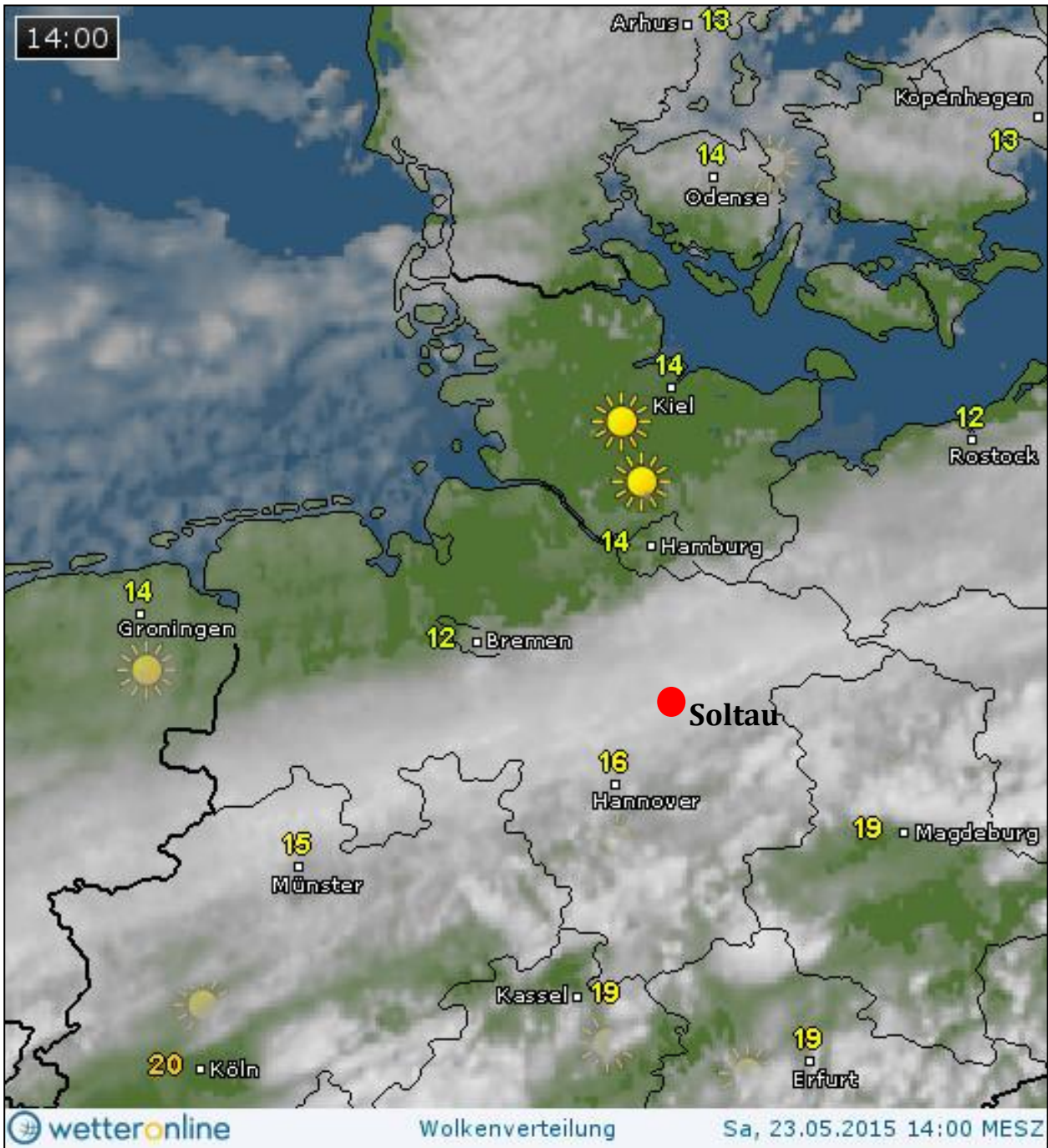
Cold front

The description of a cold front is cold air pressing on warmer air, but it is important to know, that there are more than one sort of cold front. If the difference between the temperature in the cold side and warm side are great - let say over 10C/50F, the cold front is what we call a strong one. These powerful cold fronts are always with rain and thunder. The difference in temperatures can be much less, and this is a mild cold front. **In other words there are cold front of different strength and with or without rain.**

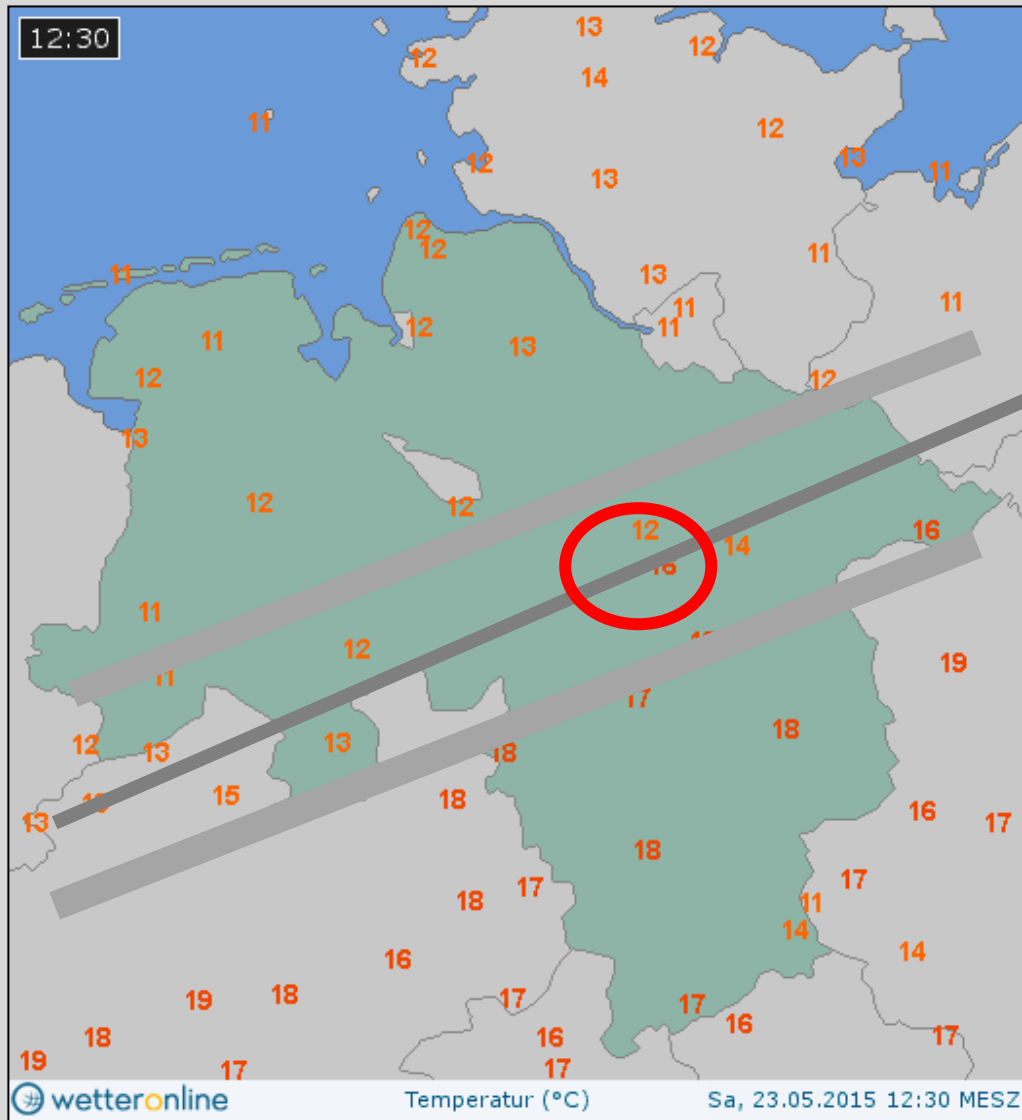
Instead of a long explanation, it is better to show an example of a release of pigeons that went utterly wrong. Out from this we will discuss the effect of a coldfront on our pigeons.



Here we see a cold front coming from northeast. After the cold front has passed the weather is clear with sun. In northeast the temperature is 10C/50F, and in southeast it is 18C/58F.

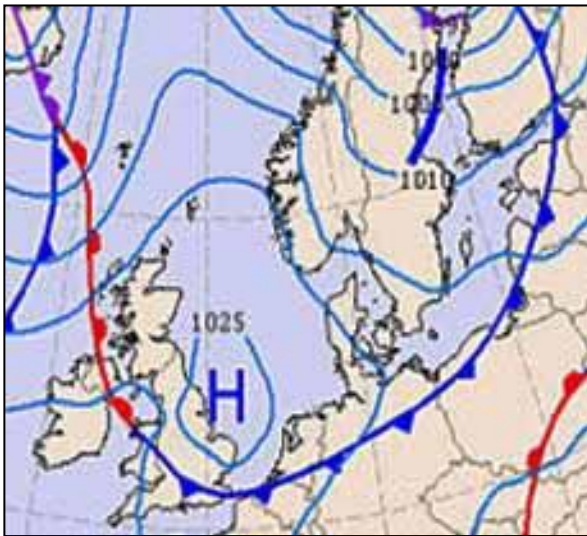
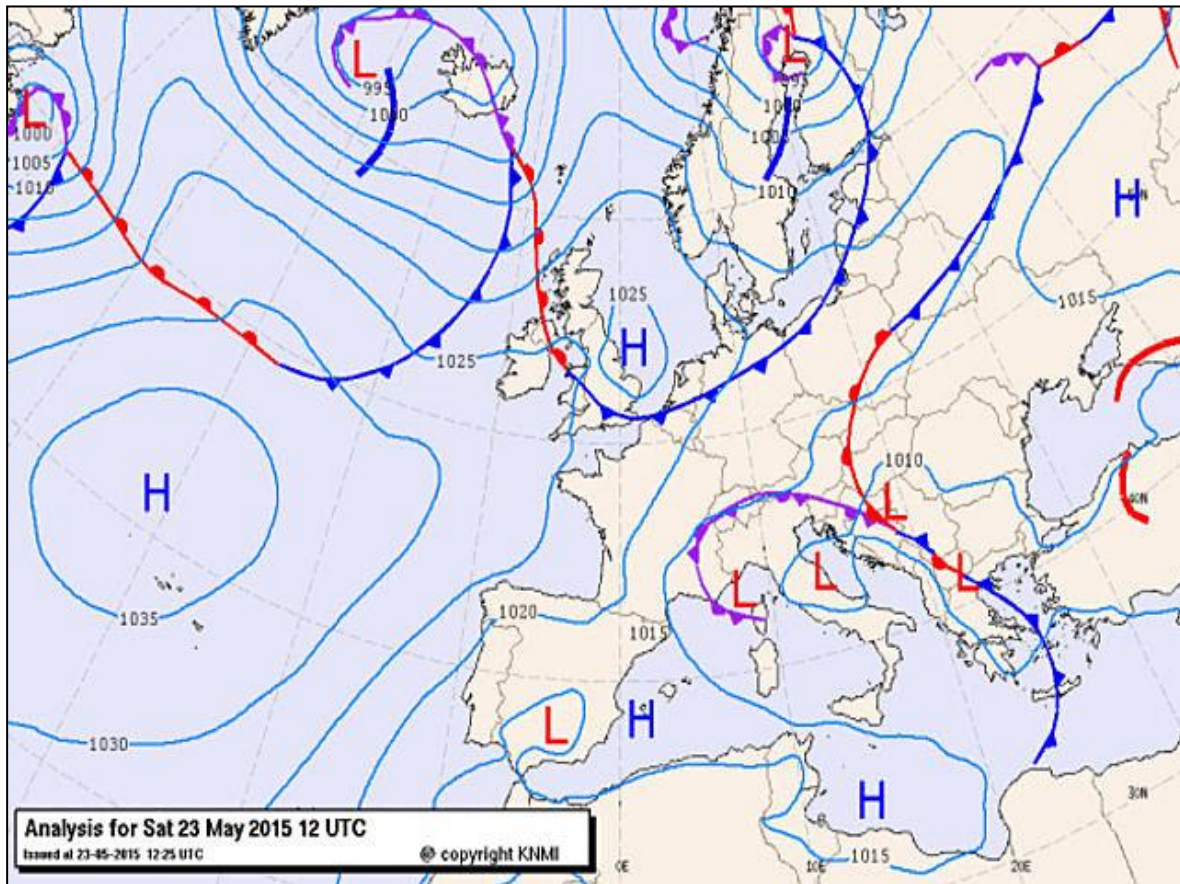


The cold front has moved south and are 14.00 placed exactly over the point of release. Notice that there are no clouds with rain, only dense covering of clouds. The pigeons were released in Soltau 13.30 and 14.00, and as seen in the middle of the cold front. Pigeons in Hamburg and further north had no problem in race.



Map with temperatures in celcius. Front in grey lines. Notice temperatures north of front are 12C/52F, and south of front is 18C/58F. Notice also that in Soltau - the red ring - there are two temperatures close in 12C and 16C. This front can be called a medium cold front without rain.





On some weather websites one can see the position of the fronts some hours in forward, and some shows the positions the day after.

On the frontmap on top it is a forecast from the day before, and if we look on the detail from the map, you can see that the cold front is placed accurately where the front was placed the next day! This can be very useful if one knows the position of the fronts the day before a race.

USA forecast fronts:

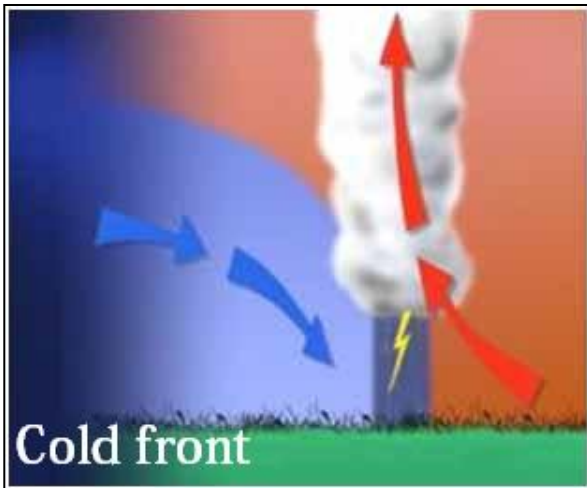
<https://weather.com/maps/forecast/surface-weather-map>

<http://www.intellicast.com/National/Surface/Current.aspx>

Pigeons reaction to a Cold front

The above described situation were the meteorological conditions for thousands of pigeons in a race. But how did the pigeons return home from the race - very bad indeed! Some of the Sections only had 10% of the pigeons home on the day. It was a true disaster - and why ?

Inside a cold front



In meteorological terms it is called a front, because it is "a war between the cold and warm temperatures" In the picture you see a cross section of a cold front, and here it is evidently that the warm wind is forced upwards and the cold wind is going downwards. In the center of the front there is a lot of turbulence, and sometimes a thunderstorm. Depending of the strength of the cold front, these vertical winds can be very fast - up to 100km/60 miles per hour! It can be dangerous for a small

aeroplaine to go through these inferno of winds.

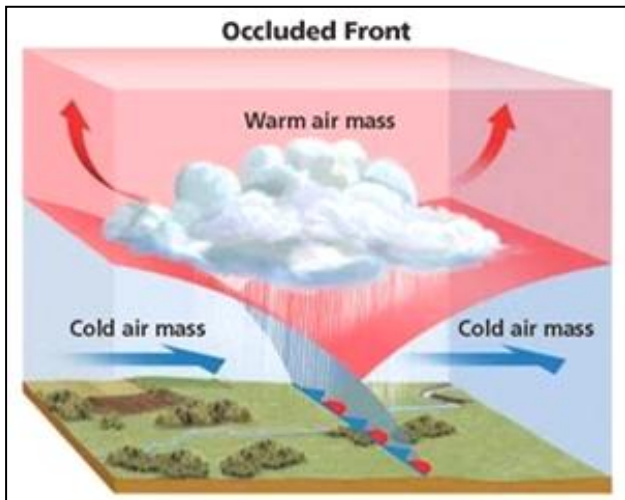
There is not one sort of cold front as it depends of how big the different there are on the temperatures. There can be a strong powerful cold front, or it can be mild or in between, but there are always turbulent winds.

The pigeons reaction

Shall a flock of pigeons go through a cold front they will of course feel the very violent physiological impact from the center of the front, and some pigeons will go through the front, but the elderly pigeons will bend off and follow the front looking for a hole to go through . No doubt that most of the pigeons will be confused and do not know what to do - the confusion can be destructive. for the flock of pigeons. In the example above there are no rain in the front, but the effect on the flock of pigeons are destructive and will spread the pigeons.

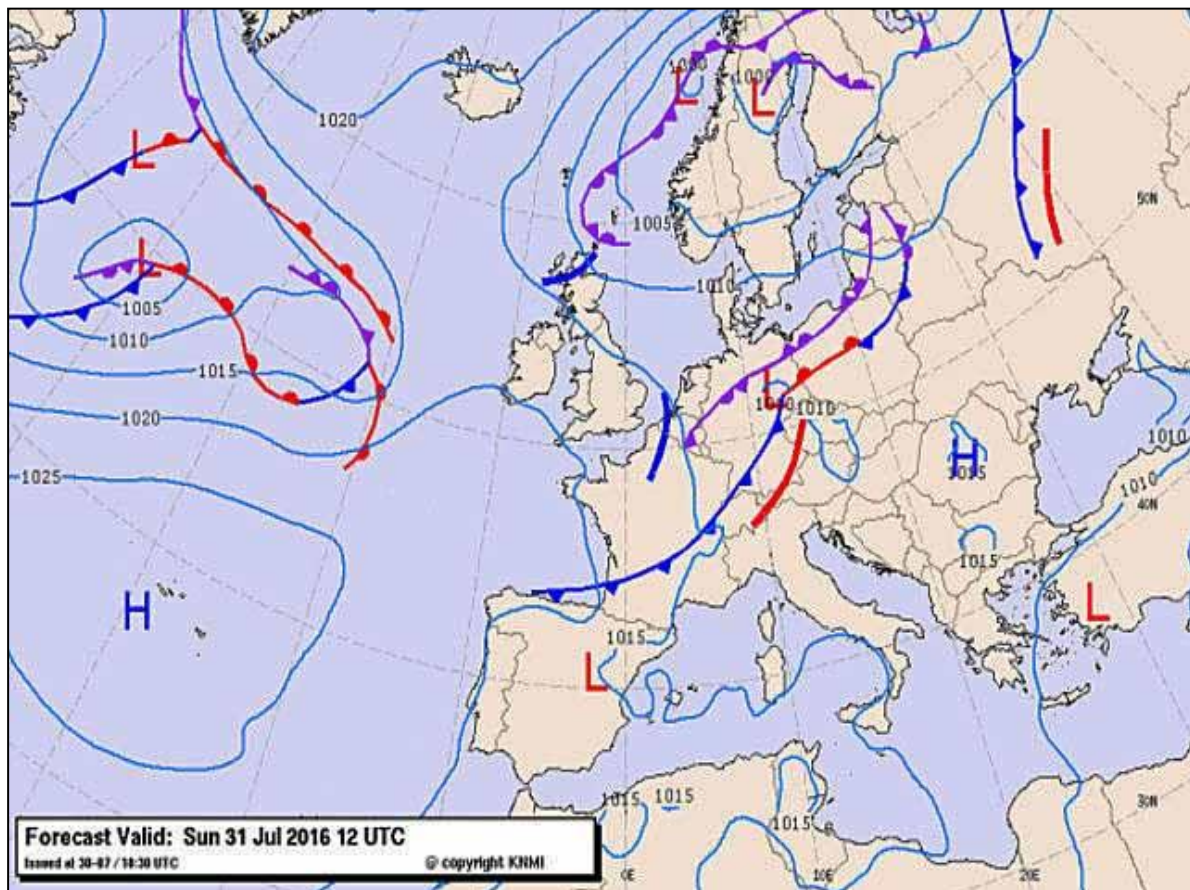


Occluded front



As described above the occluded front are a col/warm front melted together in one front. The interesting here is, that there are only cold/cool air near the ground and warm air above. Notice the fact that in bottom there are two kinds of cold air: One cool air with moist and the other side cold air with less moist. A occluded front always give a little rain.

Below there is an example on an occluded front in a pigeon race.

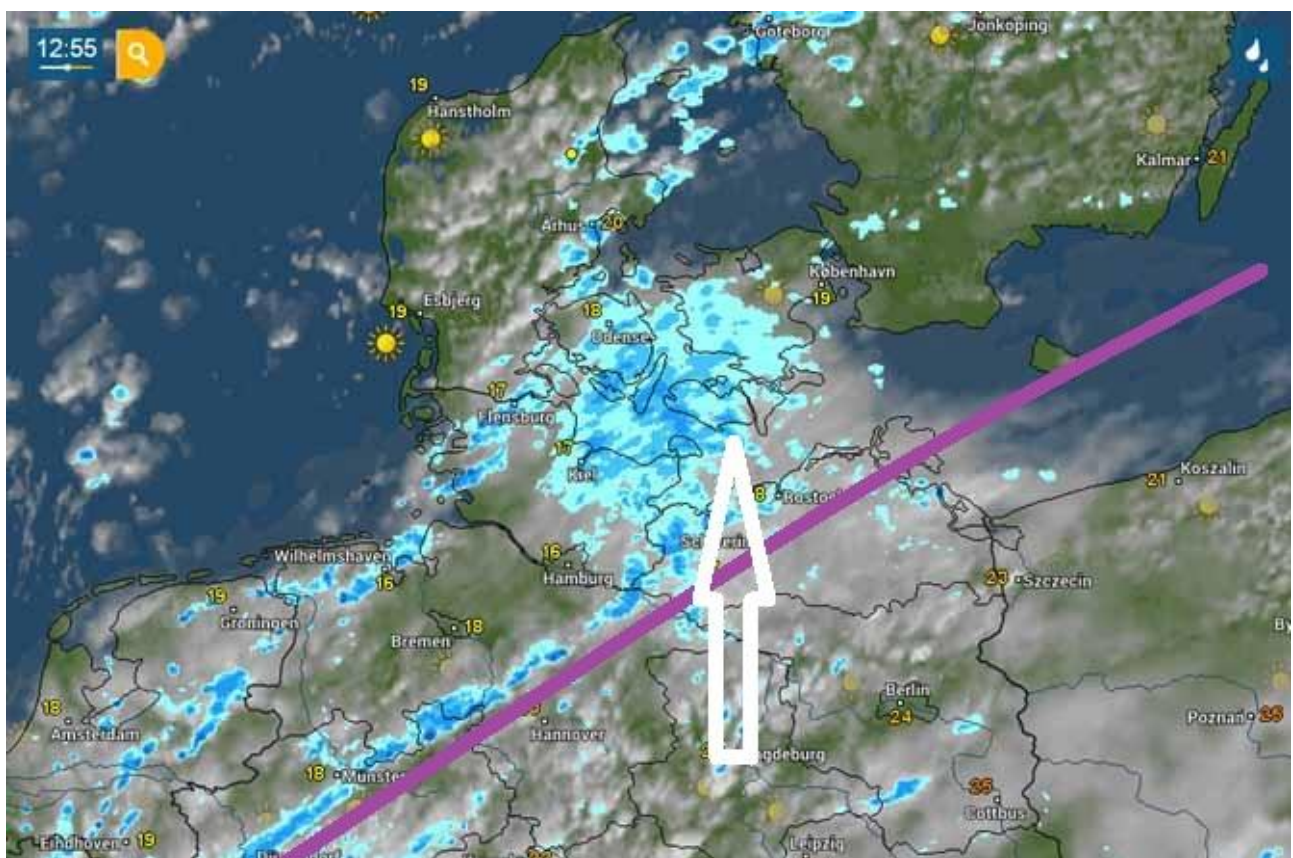


Forecast of weather fronts. It is the occluded front south of Denmark which was the problem, and unfortunately it was rather stationary.



On the left you can see a detail from the big front map. These front forecast are from the German website WetterOnline, but other meteorological Institutes have the same here in Europe - also the Danish.

Below you see a picture from a weather radar including clouds. I have inserted a violet line besides the occluded front, and it is easy to see the line of rainshowers where the front are positioned. The white arrow are the route of the pigeons from Magdeburg to Denmark. The pigeons will normally pass 11.30 to 12.30.



The pigeons reaction

The result of this occluded front was the same as a cold front - maybe worser. The two races were completely spoiled and many pigeons return delayed and some never returned. The results of these races must make it clear that an occluded front are a serious matter.

Inversions

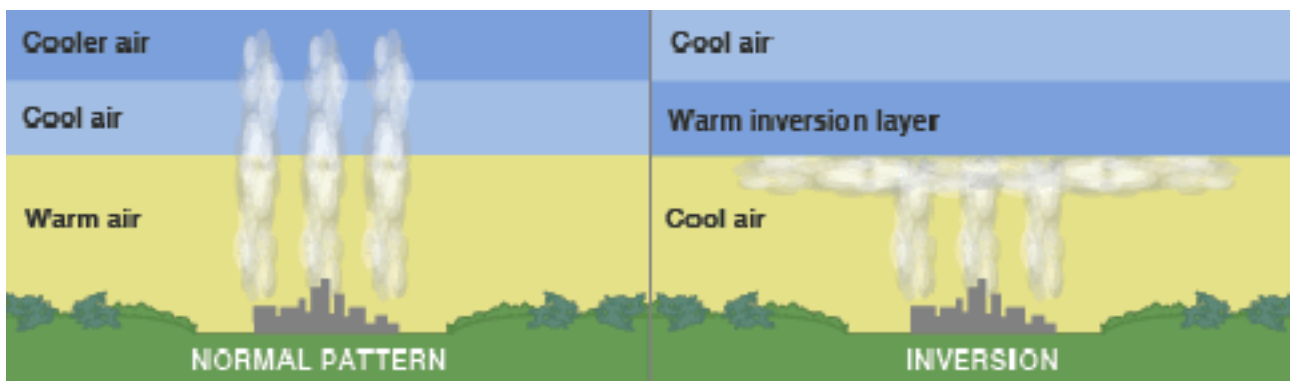
The different kind of fronts are a meteorological phenomena where the airmasses are moving in the landscape, but an inversion are quite the opposite. Inside an inversion there are absolutely no wind.

The pigeons reactin

The pigeions reaction on the cool - warm - cool "air pockets" can bring a lot of confusion into the flock of pigeons. At the beginnig they will circle on the realese site, but some of the pigeions - proberly a small party, will go free and have a bearing. The rest of the pigeions will cicle some more - even ½ hour or more. On the return of the pigeons you will see the flock of pigeons are spread out over a span of time. **What is anoying the pigeions inside the inversion?**

There has never been given an answer to this question - but let us try! If you are inside an inversion and moved upwards, the separation between the layers are very sharp - very abruptly. A qualified guess would be that it works physiologic on the pigeons but it can also harm the ability of navigating. Never the less the inversion have an effect on the flock of pigeons, but two things are here important for a pigeon: To have an easy temper - not too wild, and secondly have a good sense of navigation.

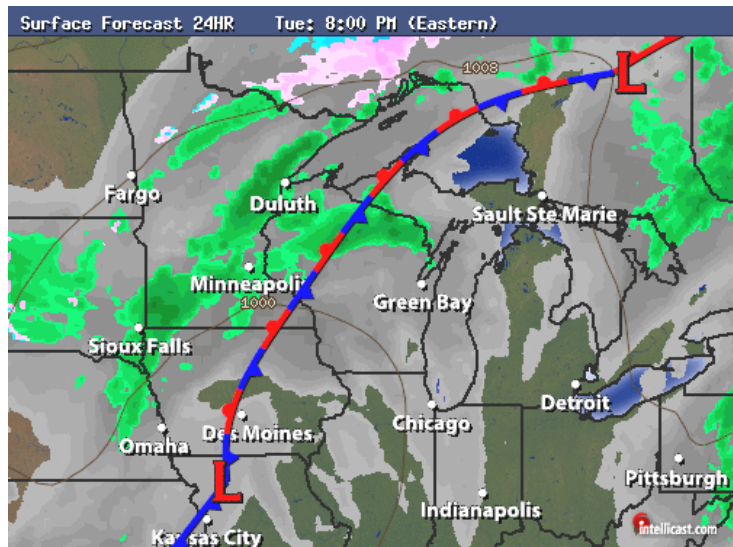
An inversion in a open area near the ground, will be "burned away" by the sun in an hour or two, depeding of the situation.



Stationary front

In Europe we do not have these fronts, but they are common in spring in the States on the open plain. The winds are very strong in each side of the stationary line, and there are possibility for heavy storms.

Are pigeons forced to pass a stationary front with wind in different directions, it can make some problems for the pigeons.



Visibility and humidity

To release pigeons in a tossing or a race you need a fairly visibility. In the early morning there can be hazy more or less, and this is because the sun has not heated the lower airmasses. The humidity near the ground will therefore be high, and by measuring the humidity you can see how the visibility are. High humidity = low visibility - low humidity = good visivility.

| Humidity | Visibility | Release |
|----------|-------------|---------|
| 95-100% | 2km/1,5mile | Bad |
| 90-95% | 5km/3miles | Fairly |
| 80-90% | 10km/6miles | Good |

In websites for weather it is not always the visibility is on, but usually the humidity are measured.

Are there webcamera near release site you can see visibility directly.

A race goes wrong?

In most cases a race with the pigeons goes as planned, but in some cases the pigeons returns very scattered and the fanciers ask each other: What was wrong here? In this situation you have to make a small research on the problem. Use your computer and look for the answer in the 4 main points:

1. The Sun - 2. Fronts - 3. Weather radar and weather data - 4. Inversions

To examine any problems from the sun, takes only 1- 2 minutes. The fronts are just as easy, but to examine the other weather data is more complicated, The radar goes backwards and is easy, but you also need temperatures, humidity, visibility, wind and the hight of the clouds. If you make an effort, you can find some facts which do not seem satisfactory.

In Europe we have WetterOnline.de and here there is both status and backwards not only for the day, but weeks, months and years the data are hidden in the computer program. In the States it seems you have some pritty advanced weather websites and you can presumably do the same as here in Europe.

It is my hope that this article has shown some of the challenges our pigeions have to meet in the races. Maybe some of you already knows a lot or some of the mentioned problems. With the hope of good seasons in the furure.

Ove Fuglsang Jensen, Denmark

