

Hello Fellow Winter Flyers,

Here is the summary from the Winter Wx Class held in our hangar on Nov 7.

For those of you who missed the session, we focused on the basics of weather and the NOAA's weather prediction tools that are based upon Model Output Statistics. Yes, Statistics are the great lie, and you have to be careful using these tools because they are predictions based upon probabilities rather than a 100% depiction of what is going to happen. With that said - the models are improving with every run and in fact, have improved 350% in the past 20 years. So even though weather is tremendously dynamic, with hundreds of variables that change with geography and altitude - slowly but surely, the predictions are getting more accurate.

We can lower the risk of our winter flying by remembering a few rules of thumb:

- don't overestimate the weather model tools. By this I mean, don't look at lines of precipitation, wind, low clouds or the like with too much precision. Just because it looks like the rain or snow will fall north of LaGrande on the model, doesn't mean you won't encounter rain or snow to the south of LaGrande over the Blue Mountains. You should expect that if there is rain or snow predicted near LaGrande, you will likely encounter weather anywhere around LaGrande. This kind of planning helps keep you safe and ready to resort to your Plan B.

- be more willing to cancel your plans in the winter. Start your planning with the assumption that the weather is not going to cooperate with you. This puts you in the right frame of mind to not go when the weather starts looking threatening. Avoid the trap of getting your mind set on making this trip on a particular day and telling everyone you will fly in at a particular time. This commits you mentally to make this trip regardless of the risk.

- tight canyons with water, and lot's of trees are not your friend in the winter. These canyons have a greater tendency to hold moisture and quickly form fog, low clouds and showers. I'm thinking particularly of the Lochsa River drainage from Grangeville to Missoula as one such canyon. It is notorious for clouds in layers from ground level up to 6 or 7000 feet in the winter. A much better choice is a wide, arid canyon drainage further east. Imagine flying low, in and out of clouds in a tight canyon as a way to avoid planning a bad winter trip. Go for wide open spaces where you can see weather clearly and have several alternatives where you can put the plane on the ground and wait out a passing shower. And if the model is predicting a storm in your path - don't go at all.

- be very cautious evaluating weather for a trip when you're not familiar with the terrain. Don't assume that weather near Bryce Canyon, Utah, for instance, is similar to anything near Boise. Bryce Canyon is high altitude with interesting terrain, (best seen under clear blue skies). Weather there is very different than say - McCall. So don't extend your local weather knowledge to places you don't know.

- finally, be especially careful with incoming Low Pressure systems from our Southwest. These Lows carry much more moisture than ones coming from Canada or the Gulf of Alaska. They will more often than not, result in significant precipitation events when they reach Idaho, which in the winter translates to snow and ice.

Speaking of ice - if you haven't checked it out already, watch the AOPA account of a guy who iced up in his 182. It's a good video about a pilot that was a bit too casual about his winter flight planning -

[http://flash.aopa.org/asf/pilotstories/iceambush/index.cfm?WT.mc\\_id=121116epilot&WT.mc\\_sect=tts&cmp=ePlt:Phto](http://flash.aopa.org/asf/pilotstories/iceambush/index.cfm?WT.mc_id=121116epilot&WT.mc_sect=tts&cmp=ePlt:Phto)

So here is how to begin your flight planning.

First, start with the GFS, 850mb temp, mslp, precip by going to -

[http://mag.ncep.noaa.gov/NCOMAGWEB/appcontroller?model=GFS&area=NAMER&pname=850\\_temp\\_mslp\\_precip&rname=SFC-LAYER+PARMS&areaDesc=North+America+-+US+Canada+and+northern+Mexico&cycle=11%2F20%2F2012+18UTC&storm=&prevPage=Param&page=Param&cat=MODEL+GUIDANCE&imageSize=M&currKey=model&prevArea=NAMER&page=Param](http://mag.ncep.noaa.gov/NCOMAGWEB/appcontroller?model=GFS&area=NAMER&pname=850_temp_mslp_precip&rname=SFC-LAYER+PARMS&areaDesc=North+America+-+US+Canada+and+northern+Mexico&cycle=11%2F20%2F2012+18UTC&storm=&prevPage=Param&page=Param&cat=MODEL+GUIDANCE&imageSize=M&currKey=model&prevArea=NAMER&page=Param)

850mb pressure altitude translates to about 5000 ft in the atmosphere - about the height we fly - so a good place to start.

Choose the most recent run of the model (these runs take hours to compute, so the 18z run may not be completely available until 3 or 4 pm locally), and click on "Loop All". This will download 16 days of model output. The first 8 days will be in 3 hour increments and the next 8 days will be in 12 hour increments. The accuracy of the model is also much better for the first 8 days vs the next 8. The scale for precip is located on the left side of the graphics page. This shows you precip over North America for a period of 6 hours BEFORE the time stamp at the top of the output page. So when you're looking at this output and trying to judge precip over a potential area of flight, be sure to remember it's for a cumulative period of 6 hours before the timestamp. So if you're looking at an area covered by green with a timestamp of 18z, it means it will probably rain or snow to some extent (measured by the shade of green), from 12z until 18z (or 5am - 11am MST).

Now let's talk about the "blue line". The blue line in the graphics output is where the freezing point lies in the 5000ft airmass. There can be more than one "blue line". Typically the one furthest south is the 0 deg C line, and as you go north the lines designate -10, -20, etc. Remember, this is freezing at 5000ft, so if you're higher, it's likely colder than 0 deg C, if you're lower, (Treasure Valley), it's likely warmer. Standard lapse rate is 3.5 degrees F warmer for every 1000ft, (or colder if you're going up). Lapse rates are seldom standard and many times in the winter, it can actually be colder near the ground than it is in the upper atmosphere (aka - an inversion) - so use this only as a rule of thumb. More importantly, if there is precip around and to the north of the

"blue line", it's likely to fall as snow. Also note how the blue line gets pushed along by low pressure - meaning, warm air ahead of the low, followed by cold air trailing, leaving low cloud debris and icy weather behind.

Mostly, the 850mb plot is about what the weather is doing to the 5000ft layer of the atmosphere, but it's hard to see the cause on these plots. You should download the "500 vort\_ht" model to see what's causing the weather.

[http://mag.ncep.noaa.gov/NCOMAGWEB/appcontroller?prevPage=Model&MainPage=index&image=&page=Param&cycle=11%2F24%2F2012+18UTC&rname=UPPER+AIR+PARMS&pname=500\\_vort\\_ht&pdesc=&model=GFS&area=NAMER&cat=MODEL+GUIDANCE&fcast=&areaDesc=North+America+-+US+Canada+and+northern+Mexico&prevArea=NAMER&currKey=model&returnToModel=&imageSize=M](http://mag.ncep.noaa.gov/NCOMAGWEB/appcontroller?prevPage=Model&MainPage=index&image=&page=Param&cycle=11%2F24%2F2012+18UTC&rname=UPPER+AIR+PARMS&pname=500_vort_ht&pdesc=&model=GFS&area=NAMER&cat=MODEL+GUIDANCE&fcast=&areaDesc=North+America+-+US+Canada+and+northern+Mexico&prevArea=NAMER&currKey=model&returnToModel=&imageSize=M)

500mb is approximately 18,000ft - this is where most of the weather gets steered around the atmosphere. So while the 850mb model shows you WHAT the weather is likely to be at 5000ft, the 500mb output shows you WHY it's happening. When you see a well-defined low on the 500mb charts, you can expect some serious weather down below. Lows that come directly down from Canada will bring abundant cold weather with them, but not necessarily much snow - it's too dry over BC and Alberta. Our lows typically come from the Gulf of Alaska and have adequate moisture to create a good snow storm. Lows that come up from California on the other hand, are generally warmer and bring rain. Study these charts in conjunction with the 850mb to get an idea of what's in store and how serious it might be.

Next, look at the "700mb rh\_ht"

[http://mag.ncep.noaa.gov/NCOMAGWEB/appcontroller?prevPage=Model&MainPage=index&image=&page=Param&cycle=11%2F24%2F2012+18UTC&rname=UPPER+AIR+PARMS&pname=700\\_rh\\_ht&pdesc=&model=GFS&area=NAMER&cat=MODEL+GUIDANCE&fcast=&areaDesc=North+America+-+US+Canada+and+northern+Mexico&prevArea=NAMER&currKey=model&returnToModel=&imageSize=M](http://mag.ncep.noaa.gov/NCOMAGWEB/appcontroller?prevPage=Model&MainPage=index&image=&page=Param&cycle=11%2F24%2F2012+18UTC&rname=UPPER+AIR+PARMS&pname=700_rh_ht&pdesc=&model=GFS&area=NAMER&cat=MODEL+GUIDANCE&fcast=&areaDesc=North+America+-+US+Canada+and+northern+Mexico&prevArea=NAMER&currKey=model&returnToModel=&imageSize=M)

This shows you relative humidity at the 10,000ft level. If you see solid dark green, expect heavy cloud cover at that height. Also, while you're on these charts, check the wind arrows. This will give you an idea of what winds will be like at our ridge top level in Idaho. I don't know about you, but I don't like winds above 20kts over these ridge tops. Makes for a rough ride, but also one filled with surprises - like downdrafts and occasionally rotor clouds.

Finally, we include some close-in tools for the day before your launch. Check cloud cover and precip with the LAMP tools.

<http://www.nws.noaa.gov/mdl/forecast/graphics/MAV/> Choose your parameters on the left, such as "Ceiling height-sky cover" and then choose "ceiling height(cat)" and look at the map of low clouds - or no clouds. Don't try to use this tool with too much resolution - meaning, just because the line of low clouds looks like it's north of LaGrande, doesn't

mean LaGrande won't also have low clouds. Make a plan for low clouds if this shows there might be some in the vicinity.

You can get a more accurate shot of the same data by using the MOS tool for specific sites - <http://www.usairnet.com/cgi-bin/launch/code.cgi?Submit=Go&state=ID> Use the drop down box to find a city nearby your destination or route of flight and check out the details of the prediction. Remember - these are still probabilities of weather - not declarations of how it will be.

Read what the experts are saying about the model output in the Area Forecast Discussion - <http://www.wrh.noaa.gov/zoa/cwa.php> Click on the area of interest on the map, for instance Boise. It can be hard to understand sometimes, but the more you study it, the more you learn and over time it actually starts to make sense. The people that write these summaries actually live in the area they are forecasting, so they use their accumulated wisdom as well as the model output to come up with even more likely predictions. I find they are very close to the outcome and I don't second guess their prognostications.

If you have the benefit of flying in the daylight, I encourage you to check out webcams. They seem to be everywhere anymore. Here is a new site for many BC webcams - <http://www.idahoaviation.com/webcams.php>. Idaho Department of Transportation (as do most states) have web cams along highways that can be useful - <http://lb.511.idaho.gov/idlb/cameras/routeselect.jsf>

May you have blue skies and safe flights!

Bill