Volume 2, Issue 1

Fall 2015

CWSU NASHUA

The Tail Wind

The Changing of the Seasons…

By the time you read this, the annual brilliant New England fall foliage show will be a distant memory. And the thoughts of many turn toward winter and the upcoming holidays…

Here at the Nashua CWSU, the changing of the seasons means a lot of different things. We adjust our day-to-day situational awareness focus from mesoscale weather systems (i.e. thunderstorms) to larger scale weather systems. Jet stream-induced turbulence, low level wind shear, icing, IFR ceilings, wintery weather...these all become regular parts of our weather briefing vocabulary this time of year...not that we ever let our guard down for any weather phenomena...after all, this is New England!

And just because thunderstorms aren't always on our mind doesn't mean that we forget about them. Low-topped thunderstorms (tops of FL200-300) can and do still cause significant impacts to aircraft operations, especially terminal and approach control ops.

So what does the upcoming winter season have in store for us? Will El Nino keep us warmer and wetter than normal? Will we see less snow (and possibly more rain and/or ice)?

See what the NOAA Winter Outlook may have in store for us later in this newsletter.

New CWSU Web Pages!

It took longer than we had hoped, but we finally have our new webpages published. A huge thanks goes out to forecaster Mike Abair who figured out how to get this all done, and make things look good. We'll be adding some new briefing pages in the near future to the site.

Our page URL has also changed…

http://www.weather.gov/zbw

All of our Tactical Decision Aides and other briefing resources are still available, and hopefully will be a little easier to find.

Any comments regarding our pages—just drop us an email at

W-ZBW.webmaster@noaa.gov

Inside this issue:

Winter DSS at CWSU Nashua	2
Winter 2015-16 Outlook	3
KBOS	3
Turbulence	3
CWSU ZBW on Social Media	4
Trivia	4

Special points of interest:

- *Check out page 2 for more insight on how CWSU Nashua works.*
- *Satellite trivia on page 4...*
- *Got an idea for a future edition? Just email us...*

Winter Aviation Decision Support Services at CWSU Nashua

Scott Reynolds
MIC, CWSU Nashua

Warning—MANY acronyms contained in this article. :)

Decision Support Services (or "DSS") — Center Weather Service Units have been providing DSS to our FAA customers since our inception in 1978. But what exactly is DSS as provided by a CWSU, and how does it differ from FAA facility to facility, or even within the same FAA facility (such as an ARTCC)?

BOSTON CENTER

Let's start with our support to the Boston ARTCC. We provide weather support to a number of different entities, just within the walls of Boston Center. The Center is divided into 5 Operations Areas. The Traffic Management Unit (or "TMU") works with the Areas to keep a smooth and efficient flow of traffic within the Center's airspace. TMU also coordinates with the Air Traffic Control System Command Center ("ATCSSC" or the "Command Center"), as well as other nearby Centers and facilities in terms of "the bigger picture" traffic flow.

So what do we brief everyone on? For the TMU, we focus first on Boston Logan International Airport (KBOS) operations. This includes detailed forecast information on winds, ceiling height, visibility, and precipitation (timing, intensity, type, etc.). See the KBOS article below for some more details on just how the weather impacts operations at Boston.

After KBOS, we also need to look at the New York Metro airports (KJFK/ Kennedy, KEWR/Newark, and KLGA/ LaGuardia), as well as any of the other big airports in the eastern U.S. that could slow traffic throughout the country. Some days that means Chicago, other days it's Washington DC. The level of detail is not as great as for KBOS, but impacts to the New York Metros in particular can have quite an impact on Boston Center operations.

Then, we look at specific weather impacts within Boston Center airspace itself. That information also gets relayed to the Areas. This could include precipitation type and timing for the "secondary" airports in our airspace, such as Bradley (KBDL), Manchester (KMHT), Providence (KPVD), and sometimes even Syracuse (KSYR), Albany (KALB), Burlington (KBTV), or Portland (KPWM). If another bigger airport is closed or is severely delayed, aircraft may need an alternate airport to fly into.

Jet stream-level turbulence (sometimes referred to as "clear air turbulence"), low level turbulence and/or low level wind shear, icing, and even winter-time thunderstorms can also impact local operations. We're constantly monitoring for all of this.

In addition to TMU and the Areas, we also brief Technical Operations personnel and Center management on local weather that could impact the Center's operations, whether it be for parking lot plowing, or for personnel being able to arrive safely to work or not.

> ***On a quiet day, the total number of briefings that we might provide could be as low as around 10 or so...on a busy day, we could do 50 or more!***

On a "normal" day, we provide weather briefings to TMU at least 3 or 4 times per day, at least once per day to the Technical Operations staff, and 3 scheduled briefings to Air Traffic personnel. We also provide updated briefings to all of these people and others as conditions warrant throughout the day. On a quiet day, the total number of briefings that we might provide could be as low as around 10 or so...on a busy day, we could do 50 or more! But that's just our "in house" briefings. What about other facilities?

OTHER FAA PARTNERS

We also provide briefing support to the Boston Terminal Radar Approach Control (or "TRACON"). Boston TRACON's briefings are very similar to those provided to the Center's TMU regarding KBOS. In addition to the KBOS-specific briefings, we also brief the TRACON on turbulence and icing concerns in their airspace below 12,000 feet, which is roughly the vertical extent of their airspace. Boston TRACON is the "connector" between Boston Tower (BOS) and Boston Center airspace.

While we don't brief BOS often, they're just as important, as much of what impacts the TRACON also impacts the Tower. Logan Airport is one of the most weather sensitive airports in the U.S.

BOS is much more concerned about ceiling heights, precipitation (type, timing), and especially wind. We share support duties for BOS with the NWS Weather Forecast Office in Taunton MA (BOX).

FORECAST COLLABORATION

Both the CWSU and BOX provide briefings as needed to BOS personnel. So, it's very important that we are on the same page regarding forecasts. The CWSU and BOX routinely collaborate on both new forecasts, and potential updates to existing forecasts.

BOX is responsible for the KBOS Terminal Aerodrome Forecasts (TAF), or the specific airport forecast for BOS. The CWSU (in collaboration with BOX) can provide additional details to the BOS forecast that the TAF is simply not designed to provide.

During weather events that have more widespread impacts, we may also collaborate with other NWS offices regarding forecasts, especially if those airports may be needed as alternate airports for flights to divert to.

And if this wasn't enough, we also collaborate on forecasts during "busier" days with the NWS meteorologists at the Command Center. The Command Center Unit briefs FAA planners and are looking as the U.S. airspace as a whole.

Not too busy, are we?

Winter 2015-2016 Outlook

Brian Seeley and Weir Lundstedt
Forecasters, CWSU ZBW

Forecasters at NOAA's Climate Prediction Center have issued their U.S. Winter Outlook, which covers the months of December 2015 through February 2016. The forecast for the Northeast generally calls for above normal average temperatures and near to above normal average precipitation.

An ongoing strong El Nino off the west coast of South America, expected to rival the intensity of the one that occurred in 1997, should be the main influence on weather and climate patterns this winter, by significantly impacting the position of the jet stream across the Pacific Ocean. However, other factors such as the changing phases of the North Atlantic Oscillation, the Arctic Oscillation and the Madden-Julian Oscillation, as well as an ongoing area of warmer than normal ocean temperatures off the Pacific Northwest U.S. coast and off the Atlantic seaboard, are also likely to factor into the final Winter outcome.

For the local weather across Southern New Hampshire, previous strong El Nino winters have typically gotten off to a quick, chilly, and active start, with significant snowfalls in December and January, followed by an overall waning of the cold and snow for February and March.

Our own ZBW long-range forecasting guru, is expecting winter to feature above average temperatures and precipitation, but with below normal snowfall. After three consecutive above normal snowfall seasons here in Nashua, for the first time since records began, a milder and less snowy season would be welcome news for many. Only time will tell what Old Man Winter and Mother Nature have in store for us.

KBOS—Weather Sensitive Airport?

Just the smallest shift in wind direction can force the BOS tower controllers into changing runway(s). A change in runways means that incoming flights would be landing on a different runway, likely coming from a different direction. While that sounds simple, getting all of the traffic "lined" up to safely land on the new runway setup could take some time, which in turn may mean delays in arrivals and departures, which could have a "snowball" effect across other parts of the country.

If a runway change has to happen during busy arrival and departure times, those delays cost the airlines (and the flying public) time and money.

But, it's not just wind shifts that cause problems with airports. Certain changes in ceiling height or visibility can reduce (or increase) the arrival rate at KBOS. Timing of precipitation and changes in precipitation type also can have a huge impact on operations. Wet runways can force use of a lower arrival rate, which can lead to delays. Certain precipitation types (heavy snow, sleet, freezing rain, just to mention a few), can potentially "shut the airport down" if it goes on long enough.

"If a runway change needs to occur during busy arrival or departure times, those delays cost the airlines (and the flying public) time and money."

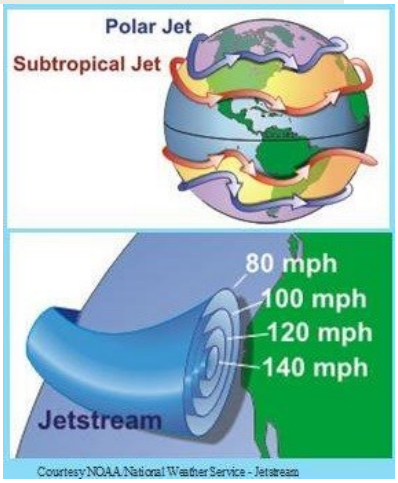
'Tis the season … for Turbulence…

Ever wondered why your smooth flight gets bumpy (or worse) all-of-the-sudden? It's probably caused by Clear Air Turbulence (or *CAT*). While you can't see turbulence itself, there are signs that forecasters look for to better forecast it.

Late fall and through the winter and into early spring are the more typical times for CAT to occur. One prime reason for this is because jet streams tend to be much stronger during the "cool" months than during the warmer months. Wind shear is the primary culprit. Wind shear can be due to changes in wind speed and/or wind direction.

CAT associated with the jet stream is usually confined to relatively thin, transient layers of the atmosphere.

CWSU meteorologists are often asked where "smoother" rides are, so the aircraft requesting a change in altitude can lessen the turbulence (or avoid it altogether). We use a number of forecast tools to determine where the turbulence is maximized and where the rides should smooth out.



About Us

CWSU NASHUA

FAA—ARTCC/CWSU
35 Northeastern Blvd.
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Providing Aviation Impact-Based Decision Support Services since 1978...

We're on the Web...
http://www.weather.gov/zbw

We're on Social Media ...

CWSU Nashua has joined the world of social media. Please find us on both Facebook and on Twitter.

We're just getting started on this. We will try to post a few items every week on both media. Sometimes directly related to ongoing weather… sometimes an educational piece...sometimes some weather trivia.

If you have a question or comment, just leave a message for us. We'll try to respond when we can. (If we're busy with ongoing weather, please note that responses will be slow.)

US National Weather Service
Boston Center Weather Service Unit

@NWSCWSUZBW

CWSU Nashua ...

CWSU Nashua has been providing Aviation Impact-Based Decision Support Services to the Boston Air Route Traffic Control Center ("Boston Center") since 1978.

Meteorologist-in-Charge and Tail Wind Editor—Scott Reynolds

Next issue scheduled for early Spring 2016

Trivia ...

The pictures below are 2 different satellite image channels, from the same time. Question—what time of year is this from? Answer coming in the next edition...