(Photo: *Bangor Daily News*)

National Weather Service Weather Forecast Office

WINTER SIMULATION GUIDE

for the

Weather Event Simulator-2 (WES-2) Bridge Simulation Capability

Version 1.0

Designed by the National Weather Service
WARNING DECISION TRAINING DIVISION (WDTD)
Office of the Chief Learning Officer (OCLO)

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**** WDTD wrote this document to be used by both training officers (facilitators) and NWS operational staff (students) ****

Introduction:

This is the second WES-2 Bridge Simulation release to the National Weather Service (NWS) and the first pertaining to winter weather. This simulation covers a mixed wintry precipitation-type event that lasted nearly 12 hours. The event has been trimmed-down to 90 minutes, with the WES-2 Bridge "skip" function available to the user. A series of quiz questions will accompany the simulation via a tailored WES Scripting Language-2 (WESSL-2) script. Upon completion of the simulation on the WES-2 machine, the student will take the online Commerce Learning Center (CLC) Learning Management System (LMS) quiz to receive credit.

Purpose:

The training simulation and accompanying quiz questions provide short-fused seasonal-readiness for NWS forecasters and enhance learning by exposing them to a multi-faceted event with mixed winter precipitation-types. The role of the student is to interrogate available radar and observational data in simulated real-time to determine the types of precipitation affecting their area of responsibility. They will provide decision-support services to users and partners in this simulated event.

Learning Objective:

At the conclusion of this simulation, the student (NWS operational staff member) will be able to:

1). Identify the appropriate reasoning for selecting a WSR-88D Radar Volume Coverage Pattern (VCP).

Performance Objectives:

At the conclusion of this simulation, the student (NWS operational staff member) will be able to:

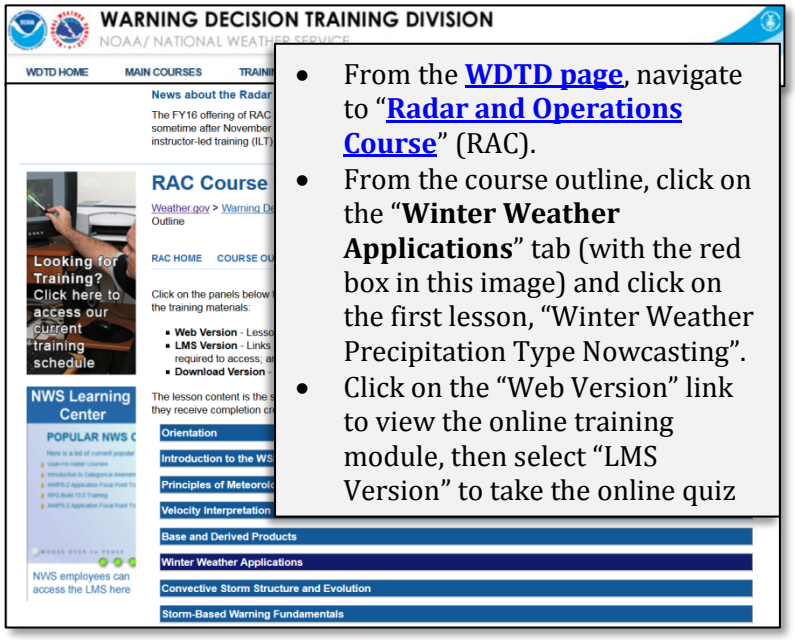
1). Determine the precipitation-type for designated point locations at specified times using Dual-Polarization base data.
2). Determine the likely precipitation type at the surface using information about precipitation type in the beam and other environmental data
3). Provide weather-related decision-support services based on the requests and information received from the user or partner using the available radar, model guidance, and observations when prompted during the simulation.

Simulation Prerequisites:

This simulation provides the student the ability to demonstrate his/her knowledge in two areas: 1) evaluating precipitation type via radar, 2) effective responses to user queries in a DSS winter weather environment, and 3) VCP training.

For 1), Students (NWS operational staff) completed required training on Dual-Polarization products, facilitated by WDTD. This training occurred before the deployment and installation of Dual-Polarization on WSR-88D radars during the time span from 2010 – 2012.

For the purpose of seasonal-readiness and review prior to beginning this simulation, WDTD strongly recommends that students first complete this module on winter weather precipitation-type nowcasting. This is a 20-minute module, for which students can receive credit when taken through the CLC LMS. The learning objectives found in this module closely follow the objectives of this training simulation.



- From the **WDTD page**, navigate to "**Radar and Operations Course**" (RAC).
- From the course outline, click on the "**Winter Weather Applications**" tab (with the red box in this image) and click on the first lesson, "Winter Weather Precipitation Type Nowcasting".
- Click on the "Web Version" link to view the online training module, then select "LMS Version" to take the online quiz

For 2), the last objective requires knowledge of providing effective decision support to partners. WDTD recommends students have taken AWOC Core within the last two years (since 2013). If not, please be familiar with the lesson on

- **Communicating Risks in High Impact Events** (http://www.wdtb.noaa.gov/courses/awoc/ICCore5/Lesson5/presentation.html). This lesson is also available in the CLC LMS for credit.

Other useful resources to include:

- the VCP training course lessons (http://www.wdtb.noaa.gov/modules/vcpTraining/index.html) especially the
- VCP decision aid tool (http://www.wdtb.noaa.gov/modules/vcpTraining/tool/decision-tool.html),
- and the VCP characteristics tables at (http://www.wdtb.noaa.gov/courses/dloc/topic3/lesson1/Section6/Section6-6.html).

Case Overview:

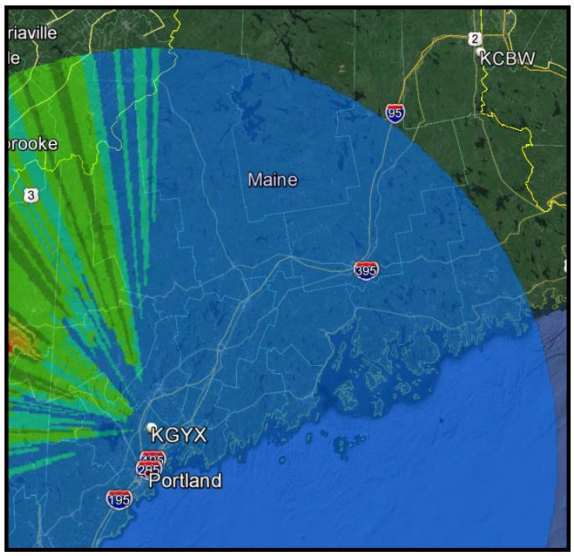
This simulation covers an event that occurred in northern New England from the late night hours of Dec. 9th into midday Dec. 10th, 2012. A bulk of the wintry precipitation impacted the Caribou, ME WFO (CAR), which is the area of concentration for this simulation. Graphical Forecast Editor (GFE) is not available in this simulation, so the forecast watch/warning/advisory aspect is not covered in this training.

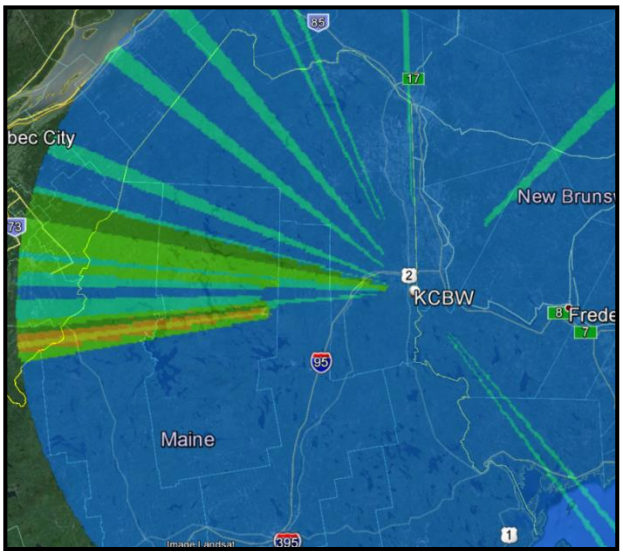
Light precipitation echoes begin to appear after 0400 UTC, but precipitation does not infiltrate the area until almost 0900 UTC, a few hours later. Surface temperatures across the area during this time are well below freezing over the northern-half of the County Warning Area (CWA), where it is mainly in the teens and low 20s. However, the southern-half of the CWA is much closer to freezing, with temperatures gradually climbing toward and eventually above freezing during the morning hours.

Low-level atmospheric profiles from available model soundings (NAM and RAP) will be important for analysis and interrogation, along with available radar data from "home" radar KCBW and neighboring radar KGYX (NWS Gray/Portland, ME). Usage of KCBW will be largely preferred, based on the sampling angle compared with area of responsibility; however, KGYX will be available.

Radar Beam Blockage/Distance Considerations:

Radar beam blockage is not expected to be a significant factor when interrogating radar data from either of the available WSR-88Ds (KCBW, KGYX). The images below show the beam blockage maps overlays for each radar, with blue equating to no blockage and colors from green and up the color scale to warmer colors equating to increasing percentages of signal blockage. The lower-right image shows Caribou's radar, KCBW.



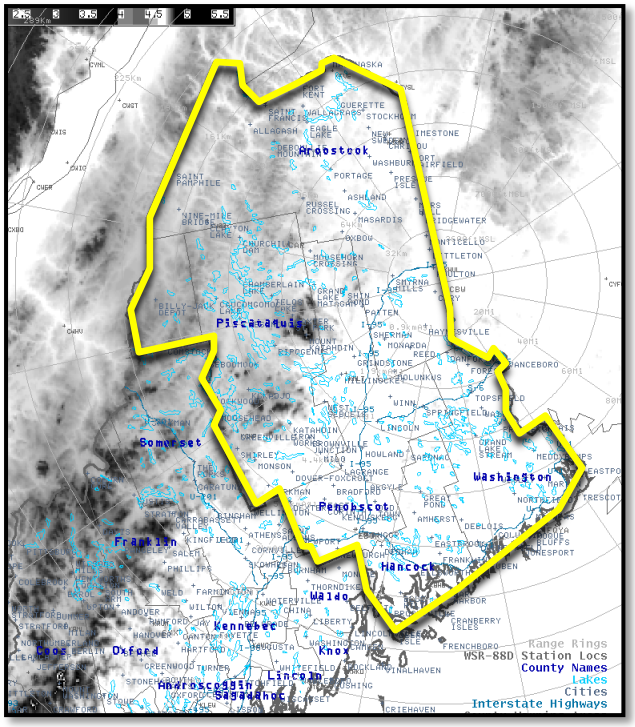


This radar only has a few smaller-scale features to contend with to the north and west, with relatively little signal degradation under most atmospheric conditions. There is a small collection of mountains (approximately 4,000 to 5,000 feet) south-southwest of the radar. The mountains barely degrade the lowest level signal. At worst, the degradation is 20-30 percent, and only occurs in a small stripe (where you see the yellow and orange stripe). At that distance, the beam is only skimming the top of the peaks. Much of the rest of the signal will be clear enough for good low-level data interrogation. KGYX is only useful for the extreme southwestern portion of NWS CAR's CWA because it is not degraded for that area.

While beam blockage may not be an issue, the sampling height is an important consideration for even the lowest tilts. Once you sample areas about 60 to 70 nautical miles away from the radar, you will be sampling areas 7,000 – 8,000ft up and rising. This is why it will be important to not rely solely on the radar data and to utilize surface observations and any received reports.

Besides the obvious features like the northern extent of the Appalachians covering roughly the northern half of the CWA and the Atlantic Ocean hugging the southern coast, think about this area in terms of the effects of a potential wintry mix or frozen precipitation-type scenario. The plush green color on the right indicates that much of the area – and surrounding areas – is covered in trees. There is one main interstate, I-95, which essentially divides the area with the higher terrain to the west and north from the rolling hills east and south all the way to the coast. The two nearby radars, both WSR-88Ds, are KGYX (NWS Gray Maine's radar, located just north of Portland, Maine) and KCBW (NWS Caribou's radar, denoted by the white circle). KCBW is nearly 60 miles south of the WFO, and is just over a mile away from the US – Canada border.

Geography and Topography of the NWS Caribou, ME CWA:



Student Responsibilities during Simulation:

1). Radar Operator. Since the student will not be issuing or updating forecasts, including any winter-related hazardous weather headlines, they are to analyze current and recent-past radar data during the "Live" sections of the simulation. You are also the "simulation operator" for this case. Since this is a long-fused event, you will only be performing simulated radar and observational analysis for brief periods of this event. There are seven "Live" data/analysis periods where you will be analyzing data and answering questions, stitched together by the capability of WES-2 Bridge to "skip" to a completely different time in the event with the push of a button.

Refer to the table below as your guide for the exact time periods of "Live" data/analysis. You will start off at the "Start Time", and when you reach the "End Time", you will "skip" to the next period.

Winter Simulation Timeline

Simulation Period	Start Time (UTC)	End Time (UTC)
1	10:00	10:10
2	11:20	11:30
3	12:30	12:45
4	13:30	13:45
5	14:30	14:45
6	15:45	16:00
7	17:00	17:10
Total Simulation Time: 90 minutes (1.5 hours)		

Simulation Navigation Procedures:

Follow these procedures to navigate through the simulation.

Skipping to the Next Time Period. The simulation will start at 10:00 UTC, December 12, 2012. Let the clock run for 10 minutes (according to the table on the previous page). Once the clock reaches 10:10 UTC, click on the "**SKIP**" button. **You can PAUSE the simulation while answering the quiz questions, if you need more time. Just click the "PAUSE" button. Once you are ready to resume, click the "PLAY" button to continue.**

This calendar window (left image) will appear and usually defaults to the start time of the simulation. Use the table on the previous page to see what the "Start Time" is for the next simulation period. Click on the proper date and set the time (if it isn't already correct) and click "OK".

Repeat this process for each simulation period. Go through the 10 or 15-minute simulation periods, "SKIP" to the next simulation period by setting the proper time in this calendar window.

When you click "OK", the data will automatically "SKIP" to the valid time for you. You do not have to reload any of the panels/data you had from the previous simulation period. For example, if you have a 4-panel of Dual-Pol products from KCBW loaded in one of your panes in CAVE, the data will automatically update to the time you input in the "SKIP" calendar window.

Answering Embedded WESSL-2 script Questions. A WESSL-2 script will guide the student from one period to the next. During these periods, data will appear live in simulated real-time. Students will have the opportunity to look at data from the recent past, based on the number of frames they invoke and the data they choose to display. Use the available time wisely but you can "catch-up" from one period to the next and piece together the trends of the event moving forward through the simulation. Altogether, there are 90 minutes of total "Live" simulation time.

This is a precipitation-type transition event, so the use of base WSR-88D Dual-Polarization products is highly recommended throughout the event and in all seven "Live" data/analysis periods. Radar data analysis should be combined with available surface, satellite, and model soundings to build a more complete picture of the atmosphere over and near the CWA.

A series of quiz questions throughout the simulation will appear via the WESSL-2 script, prompting the student to answer at the time it occurs. Screen captures of these questions are included at the end of this document, which students can print and use to write down their answers. For offices with internet PCs near the workstation hosting WES-2 Bridge (and this simulation), students can log in to the Commerce Learning Center's (CLC) Learning Management System (LMS) and take the quiz simultaneously. Printing out the questions and writing out answers is geared mainly toward offices that do not have this set-up. Further instructions are included as an introduction to the questions section on page 11.

2). "NOWCasts" Short-Term Forecasts. Since the student will not be issuing or updating forecasts, including any winter-related hazardous weather headlines, only one product can be issued, the Short-Term Forecast (NOW). This product should be issued at the student's discretion, based on their analysis of the conditions at any point within the "Live" sections of the simulation. During these periods where data will appear in simulated real-time, the student will have the option to open WarnGen and practice generating a NOW product. These products will not be graded and will not carried-over into any training completion consideration. This is an opportunity to practice and refine real-time product creation capabilities.

The "Short-Term Forecast" is `PWMNOWCAR` or `NOWCAR; CAR` = Caribou, ME.

For reference on "NOW-cast" writing, follow the Eastern Region Supplement 02-2007 (http://www.nws.noaa.gov/directives/sym/pd01005017e022007curr.pdf), which is applicable to the NWS Directives 10-517 Multi-Purpose Weather Products Specification (http://www.nws.noaa.gov/directives/sym/pd01005017curr.pdf).

From 10-517: "WFOs may issue Short Term Forecasts to discuss the evolution of convective and stratiform precipitation, winter weather, sea breezes, marine weather, fog, winds, and temperatures within their geographic area of responsibility. The NOW will not duplicate or contradict information contained in the SPS or other watch, warning, or advisory text products…"

Example NOW:

```
NOW...
MODERATE TO HEAVY SNOW...MIXED WITH SLEET AT TIMES...WILL CONTINUE
OVER PORTIONS OF THE INTERSTATE 93 CORRIDOR OF CENTRAL NEW HAMPSHIRE
THROUGH 10 PM. VISIBILITIES WILL BE REDUCED TO LESS THAN 1 MILE UNDER
THE HEAVIEST ACTIVITY. SNOW IS EXPECTED TO TRANSITION TO ALL SLEET
AROUND 10 PM.
```

3). Provide Decision-Support Services. The simulation will test the student's ability to provide informal decision-support to various partners within their CWA, according to the needs of the partner and the information that they provide to the student. Although the student will not be issuing or updating forecast or hazardous weather headline products, the analysis of radar, observations, and available forecast model data will play a role in the answer(s) they provide the inquisitive partner.

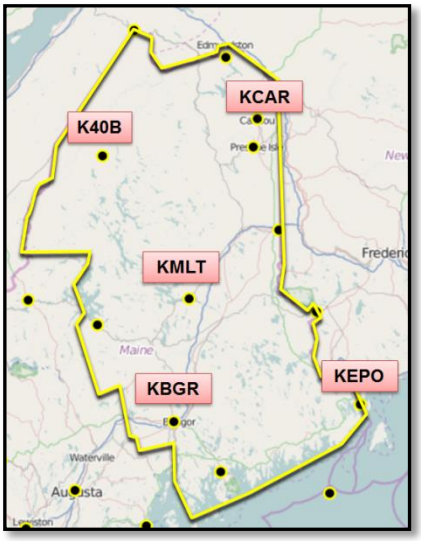
There are no briefings (formal or informal), only short, targeted answers to questions received through randomly placed phone calls during the event, via the WESSL-2 script. These questions are a portion of the overall quiz, which will be graded (when taken through the CLC LMS) for credit.

4). Available Data. In order to focus specifically on the objectives in this simulation, the data in this case has been edited to the following:

- Radar data: KCBW, KGYX (WSR-88D Radars).
- Point data: METARs.
- Model data: NAM12, RAP13.

In-Simulation Activities:

Quiz questions will appear via the WESSL-2 script during the simulation, a number of them are based on interrogation of Dual-Polarization base products for specific point locations at specified times. These point locations are the five points within the NWS Caribou CWA, shown on the map on the right and in the table below.



Site	Lat.	Lon.	0.5° Beam Elev. (AGL)
K40B	46.6171	-69.5229	~8,300'
KCAR	46.8683	-68.0129	~4,600'
KMLT	45.6479	-68.6856	~4,000'
KBGR	44.8075	-68.8281	~10,000'
KEPO	44.9109	-67.0126	~8,600'

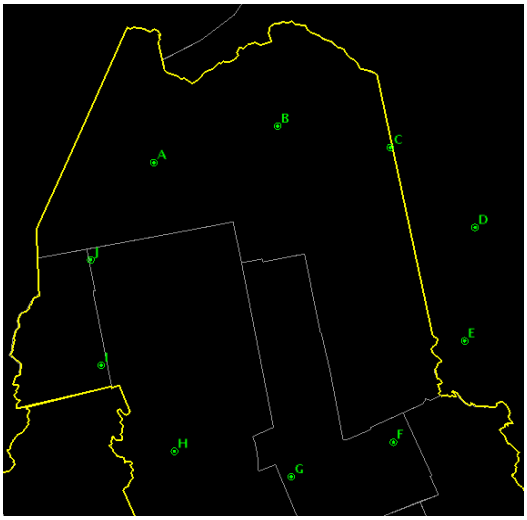
When answering questions about the data over these sites, keep in mind the elevation of the beam you are sampling – which will be 0.5° for each site. Three of the five sites have lowest tilt elevations above 7,000 ft, which may be overshooting much of the falling precipitation and especially a lower-level transition zone (radar-derived "bright band") from ice crystals/snow to a mix of sleet and snow and then into liquid/rain in some locations. Remember to also account for the geography of these locations. Is a point near a large body of water? Is a point nestled in between mountain ranges? What is the elevation of the point? All of these considerations, and others, will not only affect your radar data interrogation, but should be incorporated into analysis of observations and model data (i.e. model soundings). When interrogating the radar data, you certainly can use higher tilts to supplement your analysis, but the quiz questions will only cover the data that appears over these five points at the lowest tilt (0.5°).

**** Students should use the "DualPol-Flipchart.pdf" (*included on the DVD*) as a reference guide for precipitation-type analysis with the base Dual-Polarization Products. ****

Since a number of the quiz questions are based on analysis for these points, follow the instructions in the next section on how to set the points before the start of the simulation. This will allow for quicker and easier interrogation of the data over the points at various times during the simulation.

How to Set Your Points:

- In AWIPS 2 Common AWIPS Visualization Environment (CAVE), click on “Tools”, then “Points”. A number of points should display as in the image on the right.



- You only need five points for the quiz questions, so keep Points A through E, the rest you can either drag off to the side, or delete –right-click on the point and hold, so the menu appears, then click on “Delete Point”. You can always add new points later.

- To customize these points to be in the proper location to just answer the quiz questions, follow these steps for each of the five points.

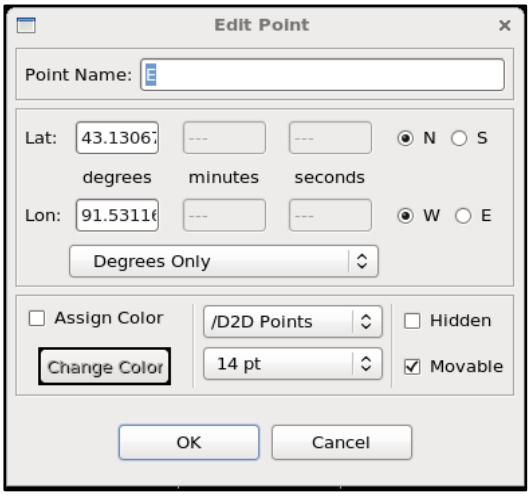
  1). Right-click and hold on a point, then click “Edit Point”.

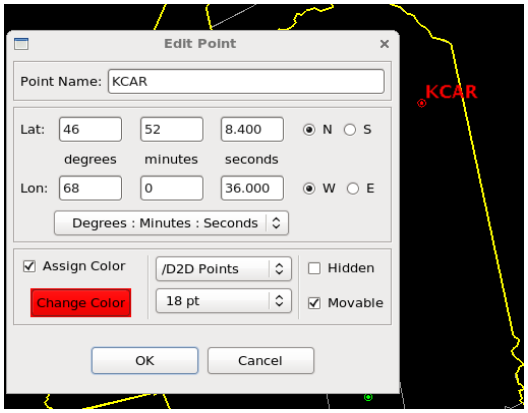
  2). A window will appear (right-hand image). Rename the point to the location identifier from the following table (i.e. KCAR, KBGR, etc.).

  3). Below the Lat: & Lon: fields, select “Degrees Only” from the pull-down menu, since this is not the default.

  4). Input the associated Lat & Lon values for that point.

  5). Customize the point, if you wish, as in the example to the right. To change the color, click on the “Assign Color” option, then on the “Change Color” button below. Change the font size in the lower half of the window, then click “OK” to save the changes.





SIMULATION QUESTIONS HANDOUT (Print, if needed)

Training Facilitators: Print this handout (color or no color) and distribute to students.

Students: There are 12 quiz questions associated with this training, 11 are graded (automatically when you take the quiz through the CLC). Answer the questions on this handout while going through the simulation. Questions will appear via the WESSL-2 script, which you can answer as well, but write down your answers on this sheet as well.

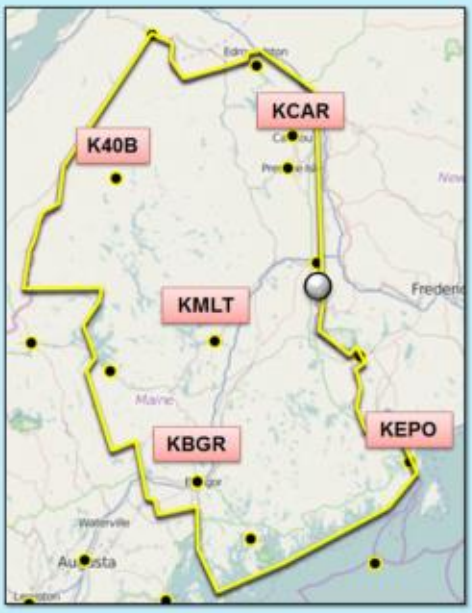
Once finished with the simulation, log onto the CLC LMS and search for "WES-2 Bridge Winter Simulation" and take the test online through this LMS to receive credit. The questions/answers from the WESSL-2 are the same as the questions/answers on the LMS.

**** The answers you see in the following screen captures are randomized and will be different each time you see the question. ****

1). Match the elevation heights (NOT GRADED...but you must answer to continue)

Match up the sites (from the image on the right) to the approximate sampling heights (ft. AGL) for the 0.5 degree tilt from WSR-88D Radar KCBW, denoted by the white circle on the eastern edge of NWS Caribou's CWA.

KMLT	~4,600'
KBGR	~8,600'
K40B	~8,300'
KEPO	~4,000'
KCAR	~10,000'



2). Dual-Pol Analysis

The 1000 UTC (0941 UTC) observation from KBGR reports light snow (-SN). Using **only** the available Dual-Pol base products at 1006 UTC, choose the following statement that best confirms the KBGR observation. Note: you can use all available radar tilts and recent radar trends (before 1006 UTC), but the determination is based off of the 1006 UTC product time. Use the Dual-Pol Flipchart for reference.

- ○ Disagree with the KBGR observation, based on timing. At 0941 UTC, there may have been snow but now, at 1006 UTC, it appears that more of a mix is approaching from the south and could now be mixed with sleet.
- ○ A wave of echoes (Z > 15 dBZ) has been moving across this area for the past 15-20 minutes, which higher CC values (>0.99), slightly positive values of ZDR, and slightly positive values of KDP.
- ○ Cannot make that determination from radar data (Dual-Pol products) because KBGR is on the fringe of the echoes at 1006 UTC. This data is too noisy and inconsistent.
- ○ Cannot make that determination from radar data (Dual-Pol products) alone because the lowest tilt is only at ~10,000'. No available radar data below that.
- ○ None of the above. None of these response reflects your analysis of Dual-Pol data to explain why KBGR is reporting snow at this time.

3). IDSS Question 1. Time: 1129 UTC

The Superintendent of Schools for Houlton, ME calls and starts off by saying, "we decided not to call off school today, since nothing was happening but now it's starting to snow. I'm wondering if we need to have an early dismissal this afternoon. How long is this going to last and how much are we going to get?" Which of the following potential responses best addresses their concern and questions?

- ☐ "You didn't cancel school or go on a two-hour delay?! We've had this in the forecast for days now. It's going to last all day and in fact, it'll probably turn to sleet and ice this afternoon. Luckily, you'll probably get a break by the time school ends today, so you might as well just wait it out."
- ☐ None of the above properly address their concern or questions.
- ☐ "An upper-level trough will continue to move across the region today, with a weak shortwave sliding over the area. The main surface low pressure system remains off to the west, with some weak isentropic lift responsible for the current precipitation over the area. A low-level jet maximum will approach the area from the south, likely bringing a warm-nose into the southern portions of the area this afternoon, with a transitional precipitation-type phase possible. Model guidance is coming into better agreement on the timing of this event, but we are waiting for the 12Z runs to come in before we solidify forecast amounts."
- ☐ "We're expecting 2 to 4 inches of snow from this morning's activity and into the early afternoon. However, we are also expecting that to start transitioning to more of a mix of sleet and possibly some rain before this wave passes this afternoon. Around that time, the precip should begin to taper off with the potential for some light ice accumulation expected from sleet. Surface temps should be near or just above freezing by the middle of the afternoon."
- ☐ "You guys will probably get about 2 to 4 inches of snow but that should be it."

4). IDSS Question 2. Time: 1242 UTC

The morning meteorologist from WLBZ 2 in Bangor sends a chat in your office NWSChat room. "Hey CAR! Just went outside to do a snow measurement and we only have about a quarter of an inch on grassy surfaces. It's still snowing here in temperature is about 28 degrees but now we're starting to get some light sleet mixed in. I know you guys were saying 1-2 inches of snow here but I don't even think we'll get half an inch. You might want to think about trimming that back. I don't see hardly anything on radar south and west of here." Which of the following responses would be the best for this situation?

- ☐ No response. They didn't give me anything I need to respond to, just a report and some feedback. Just record the report and ignore the rest.
- ☐ No response. They're are always critical of our office and don't really deserve a response.
- ☐ Respond by going into a lengthy discussion about how the models were consistent that the 2-inch snow line was centered just to the north of Bangor, talk about the additional QPF that is expected and that there are no plans to update the forecast until the 12Z model runs are available.
- ☐ Respond by thanking them for the report, ask them if they have received any other snowfall reports from their viewers, remind them that the radar may be overshooting some of the precipitation, and that you are expecting more frozen precipitation in the coming hours, before the transition takes place.

5). Precipitation-type Analysis: 1336 UTC (KCBW)

The table below represents the Dual-Pol base products (and base reflectivity) sampling for the five designated sites. Using these values (keeping in mind the sampling heights for the 0.5 deg tilt and available observations, place the correct precipitation-type (and intensity) with the correct site.

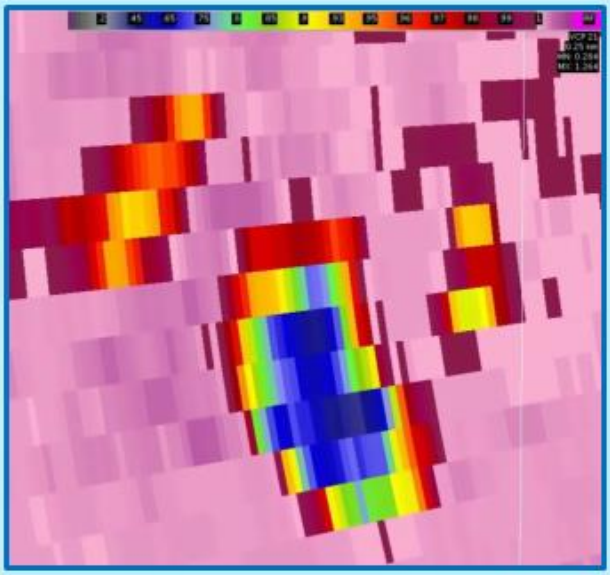
Site	CC	ZDR	KDP	Z
K40B	1.008	0.25	0.15	19.0
KCAR	1.018	0/25	0.20	16.5
KMLT	0.998	0.44	-0.05	20.5
KBGR	0.995	0.94	-0.10	18.0
KEPO	0.988	1.31	-0.15	17.5

KMLT	moderate snow
KEPO	snow flurries
K40B	light freezing rain/mix
KCAR	snow flurries
KBGR	light sleet/rain mix

6). Precipitation-type Analysis:

This area of very low CC values does appear somewhere on the KCBW scope, at some time during the event, with data that is available to you. Choose the best option to explain what this region of lower CC values represents.wsldwcmic20!

- ○ Smoke from wildfire
- ○ TDS (Tornado Debris Signature)
- ○ Other type of artifact. There is actual precipitation there, the radar just isn't sampling it properly.
- ○ Beam blockage (from mountains/terrain)
- ○ Side-lobe effect
- ○ A flock of migrating birds, bats, or insects



7). Model Sounding Analysis

Using the NAM12 sounding for KMLT (set a point to the specified Lat/Lon), choose the correct option at which the temperature profile of the sounding climbs above 0° C for this site.

- ○ Between 14 & 15 UTC
- ○ Between 15 & 16 UTC
- ○ Between 16 & 17 UTC
- ○ The T profile does not go above for this site during this event.
- ○ Between 12 & 13 UTC
- ○ Between 13 & 14 UTC
- ○ Between 17 & 18 UTC

8). Model Sounding Analysis

This is the NAM sounding for KMLT, valid at 15 UTC. Click on the T/Td profile (click somewhere on the line) at the approximate location of the 0.5 degree tilt (the elevation of the beam) from KCBW at this location, then click "Submit". Sample the area on plan view or use the site information table.

9). IDSS Question 3. Time: 1442 UTC

The Penobscot Co. Emergency Manager calls and says that they are getting heavy sleet in Howland and are getting reports of multiple vehicle accidents from Lincoln to Howland. They want to know how much more snow and ice will accumulate in this area and when will it end. Which of the following responses would be the best for this situation?

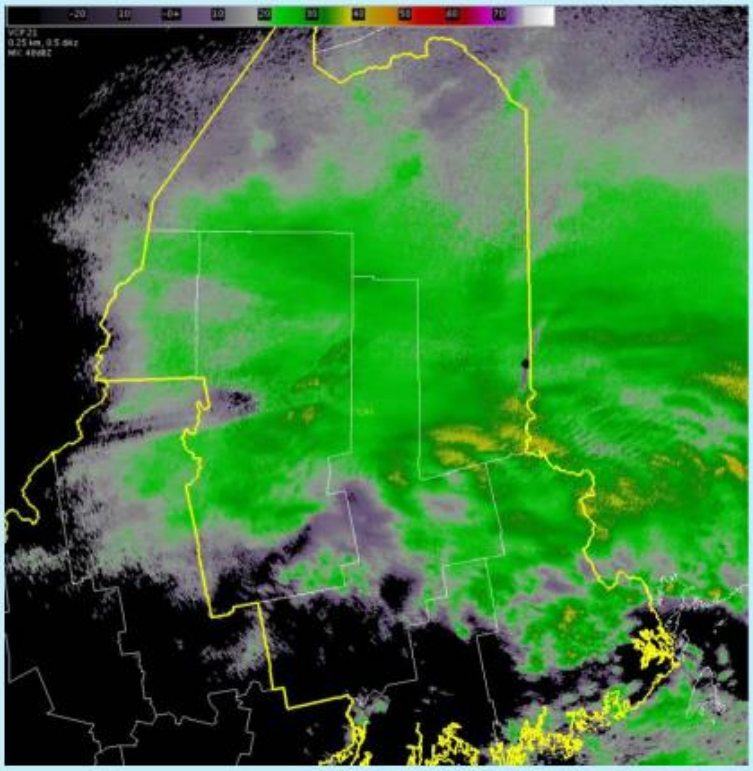
- ☐ Notify them that short/near term forecaster has not yet updated the forecast, so you're not really quite sure how much they get. Looking at the radar, it appears that within the next couple of hours, precip activity should subside but you're really not confident in that either. Ask them to call back in about an hour.
- ☐ Tell them you are too busy to talk right now, and to check the Point n' Click.
- ☐ Give them exact information about timing and amounts and explain how the Dual-Pol data you are interrogating substantiates their claim of the heavy sleet.
- ☐ Walk them through the current trend of the moderate to heavy returns on the radar and based on a general trend, the activity should only about another half an hour, maybe slightly longer. Give your confidence in a general range of timing and amounts, and a notice of more potential mixed precipitation, so they are aware.

10). Precipitation-type Analysis: 1520 UTC (KCBW)

At this time (1520 UTC) and on the lowest degree tilt from KCBW, there is a broken line of lowered CC values that is approximately where snow transitions to sleet/ice.

On the map image, click on the approximate location of this transition zone, **within the CWA boundary**!

Use the available Dual-Pol products and country boundaries to locate this zone, then click "Submit".



Your radar (KCBW) is currently in VCP 21 and has been since the precipitation arrived earlier this morning. Having gone through a bulk of the event, interrogating radar data and seeing the results, answer the following question. Would you (the radar operator) keep KCBW in VCP 21 going forward? Which of the following responses represents reasonable thinking? More than one answer may apply.

- ☐ Yes. VCP 21 is doing just fine with its 14 elevation scans. There's no need to get faster scans. I have enough to look at in terms of all these Dual-Pol products as it is. I don't think I need more data to look through. It's almost data overload at this point.
- ☐ No. A faster VCP is just going to put unnecessary wear-and-tear on the radar. What if it goes down during the event?
- ☐ No. With the precipitation becoming light, my signal-to-noise ratio is falling below my comfort level, especially considering that some of the precipitation is freezing rain. I'd like to go to VCP 31 or 32.
- ☐ Yes. This stratiform precipitation is pretty light but I want good precipitation estimates, so it would be best to just leave it as is.
- ☐ Yes. You can only use VCPs like 12 and 212 during severe weather and we obviously have precip on the scope, so we can't switch to 32 or 31.
- ☐ No. Waiting 6 to 7 minutes for these lowest cuts is a little slow. It's a little tough to follow the trends on this p-type transition zone and may be better with some faster scans.

12). IDSS Question 4. Time: 1705 UTC

The Washington Co. Emergency Manager calls and says that just noticed you updated the forecast for the rest of the day to include freezing rain for their area. They are already dealing with a number of traffic accidents, saying that the northern half of the county "is a mess right now". They want to know if this next wave of precipitation is going to cause them any further issues for their area, and when will it end? Which of the following potential responses best addresses their concern and questions?

- ☐ Tell them you need to wait and see what the 18Z models come out with to really get a good handle on where the freezing line is going to be this evening.
- ☐ Mention that they are almost in the clear now but they should probably get some more tow trucks out because roads could get really icy. Once the sun goes down, temps will drop back below freezing and rain will freeze on contact across the area. Models are back and forth about how much QPF they will get, but it's looking like round 2 will be worse than round 1.
- ☐ Tell them "nothing has changed since the last time you called."
- ☐ Mention that precipitation is gradually ending across the area, with some of light rain or mix for the next couple of hours. Tell them what you know about current temps and potential near-term trends and talk about your confidence with the potential for freezing rain this evening.