

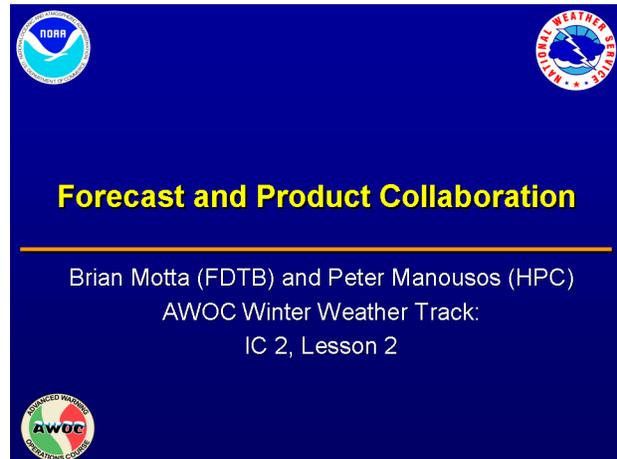
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## 1. IC2.2: WFO/HPC Collaboration

**Instructor Notes:** Welcome to the AWOC Winter Track Instructional Component 2, Lesson 2. This presentation, Forecast and Product Collaboration, should last approximately 30 minutes. The two instructors for this lesson are Brian Motta, instructor for the Forecast Decision Training Branch in Boulder, and Peter Manousos, SOO of the HPC.

**Student Notes:**



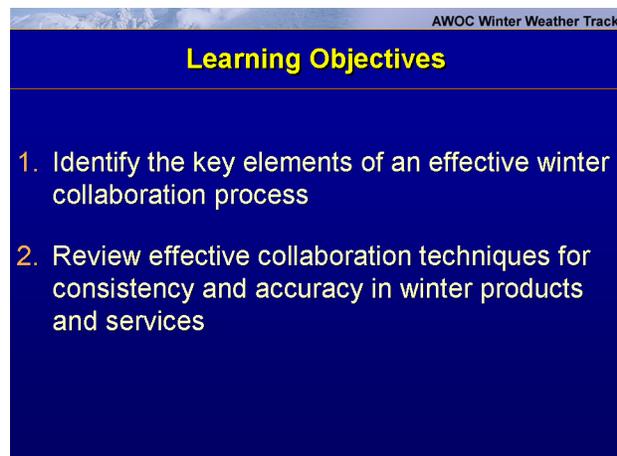
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## 2. Learning Objectives

**Instructor Notes:** There are two objectives with this lesson. The first objective is to identify the key elements of an effective winter collaboration process. The second objective is to review effective techniques, which preserve and create consistency and accuracy in products and services.

**Student Notes:**



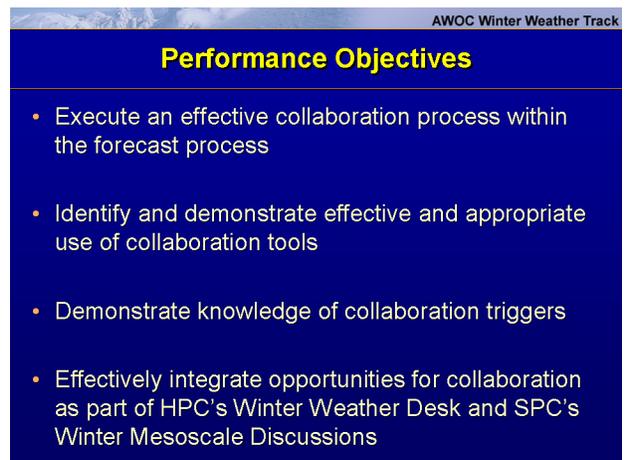
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### 3. Performance Objectives

**Instructor Notes:** Execution of an effective collaboration process within the forecast process requires every forecast shift and those additional situationally-dependent expectations, including initiation of collaboration with other NWS forecasters at local, regional, and national levels. The identification, effective demonstration, and appropriate use of collaboration tools is important because each tool has advantages which assist other forecasters in key activities such as shift change briefings, intentions to modify grids, and effective/coordinated timing of publishing changes to the National Digital Forecast Database (NDFD). The importance of collaboration triggers can be realized up-front in high-impact weather situations. A key part of a successful collaboration process is anticipating your role in collaboration events and allocating the time necessary to participate before, during and after grid editing tasks. In-depth knowledge of schedules, guidance products, and available assistance from HPC and SPC in the winter weather forecast process is important. Local product users may also be using national center guidance and products too. Note that particular aspects and threats of winter weather may cover large areas and have significant timing and intensity uncertainties. Strategies for handling such events and providing a common base for collaboration are important outcomes of national center collaborations such as the Winter Weather Desk at HPC.

**Student Notes:**



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#### Performance Objectives

- Execute an effective collaboration process within the forecast process
- Identify and demonstrate effective and appropriate use of collaboration tools
- Demonstrate knowledge of collaboration triggers
- Effectively integrate opportunities for collaboration as part of HPC's Winter Weather Desk and SPC's Winter Mesoscale Discussions

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### 4. Outline

**Instructor Notes:** The collaborative process is a necessary and ongoing part of the forecast process. Key aspects and best practices for WFOs will be presented along with the lessons learned. Of particular note are the high impact events which may demand modifying workload assignments and monitoring SPC and HPC products and guidance more intensively than usual.

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## Outline

- WFO Process/Guidelines
- HPC Winter Weather Desk

## 5. Collaboration Definition

**Instructor Notes:** An effective collaboration process is defined as an exchange of information at key decisional times which include the inheritance of the forecast grids from the previous shift, the consideration of new guidance, and proposed changes to the National Digital Forecast Database (NDFD). Often, the needed changes to the grids are greater than those which are required to be collaborated. See the speaker notes for details on the specific collaboration thresholds: Refer to NWSI 10-506 (Revised Winter 2006) for a New Threshold Memo.

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## Collaboration Definition

**A collaborative forecast process:**

- defined by needs
- exchange ideas, discuss alternatives, reach joint conclusions
- required to resolve discrepancies exceeding collaboration thresholds as stated in NWS policy

Refer to NWSI-506 for updated information on specific collaboration thresholds

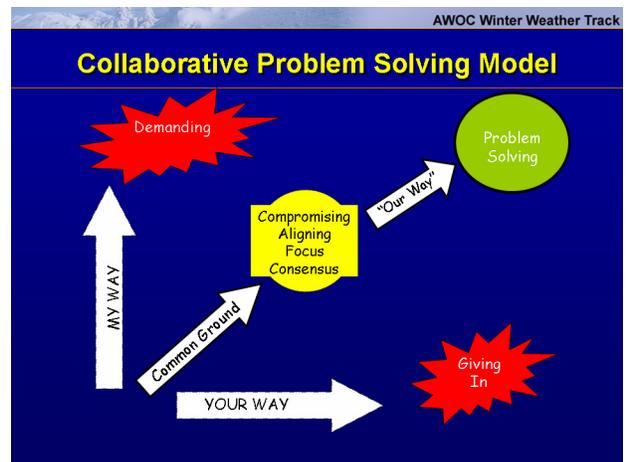
## 6. Collaborative Problem Solving Model

**Instructor Notes:** It is important to consider that several tools are in widespread use for collaboration. While office schedules and duty priorities can cause offices to become asynchronous in their communications, there are opportunities for different kinds of interactions. As an example, it is important to make initial and final contacts for collaboration. These are key points in the collaboration process and the previous and next shift's assessment and awareness. Recognizing the responsibilities of your neighboring offices

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is a key to timing your exchanges whether they be by chat, phone, Intersite Coordination Grids, AFDs, etc. It's important to consider the "big picture" differences early and discuss the regional timing and placement of features exceeding collaboration thresholds. This early "heads up" can save significant time when including local effects later in the forecast process. Recall that the gridded forecasts are used to generate a number of forecast products both at the national and local levels. In addition, particularly for high-profile events, users may be referencing national products from the Storm Prediction Center (SPC) and the Hydro-meteorological Prediction Center (HPC). This presents an added level of collaboration above that needed for bordering CWAs. One common challenge is to avoid simple half-way compromises when time gets short as deadlines approach. In order to have the best result, collaborate significant changes early and confirm grid edit intentions with your neighboring office(s) as far in advance as possible or agree to make the changes by a later time.

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## 7. Collaboration Methodology

**Instructor Notes:** A key time saver and workload reducer is a good forecast process collaboration methodology. When possible, use the existing grid forecast as the basis for changes. Express your initial thoughts in chat so that others can be aware. Identify grids that will need little if any change and those needing major changes. Consider the following factors in deciding when and where event-based changes are needed: New model guidance (beware of model flip flops), dropping the first period, adding new Day 7, local customer needs/deadlines (e.g. DOT, media, etc.), or observed weather doesn't match the forecast. Be sure to address major points and significant changes as early as possible in the process. The best forecast collaborators do so in a focused and conservative way. For instance, you have an impending winter storm with several precipitation types. One decision to make is what aspects of the forecast you need to resolve first and which may cause you to collaborate. If there is agreement on the amount, timing and location of the heavy snow, then it makes sense to consider aspects related to possible ice accumulation and collaborate those in areas expected to be hard hit. You may be less concerned about the dewpoint or wind speed until the most important aspects of the storm are in-hand. Also consider that additional forecasters may be needed to complete the edits.

Synoptic scale changes to the current forecast database can help focus you early in the forecast process and will help to avoid potential problems and wasted time later. Typically, there are both early and late NCEP collaboration opportunities which you may trigger or participate in by collaborating with NCEP. Using the chat, ISC, and grid discrepancy tools, your ever-present goal as a forecaster should be to converge toward a solution based on sound reasoning from the most likely solution presented by the available guidance.

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### Collaboration Methodology

- Only make event-based changes where needed
- Focus on high-impact weather elements
- Agree to synoptic scale changes to existing grids
- Share scientific techniques/methods
- Use ISC grids to identify boundary issues/edits
- Convergence toward a solution

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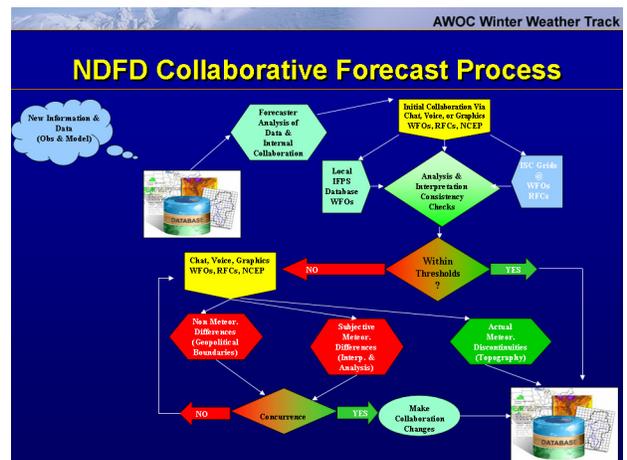
## 8. NDFD Collaborative Forecast Process

**Instructor Notes:** This diagram attempts to highlight the overall collaboration process which can be cyclical in nature as forecasts become complex and high-impact. Note that the process starts with new information, typically new observations or model guidance but it may be triggered by a collaboration request from another office. Upon analysis and internal consideration of new information, WFOs collaborate with other WFOs or NCEP centers early in the process to assess what changes may be needed to the official NDFD database. The local forecast database can then be modified given the early sense of the changes to the forecast. While this initial collaboration may begin edits to the database, it's important to consider changes as collaboration continues. It has become practice for the WFOs which are expected to be most heavily impacted to take the lead in the collaboration and communicate changes or further adjustments as necessary. After working through the InterSite Coordination grids, further grid edits ensure that the weather elements are within the collaboration thresholds for the NDFD. An important aspect of collaboration is when the grids will be published to the central NDFD server. If the grid publishing times are not coordinated and executed as planned, the database will display the "popcorn" appearance as WFO grids get published at different hours. It's important to allow enough time for completed grid edits of high-impact weather elements so that the corporate appearance of the NWS products depicts the situation as neighboring offices intended. When CWA border values are within collaboration thresholds and publishing times are agreed upon, the grids should be sent to the NDFD. When grids are found to not be within collaboration thresholds, additional collaboration may be needed. There are three categories of changes. The first cause of values exceeding the collaboration

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thresholds is that the actual meteorology places those gradients and border differences at that location. This can occur with sharp fronts or in areas where topography forms a natural discontinuity. In this circumstance, no editing or collaboration is needed, the grids are ready to publish when the time (hour) is agreed upon by your adjacent or affected CWAs. The second category of causes of values exceeding collaboration thresholds is subjective meteorological differences in interpretation and analysis. These can arise from different model preferences, forecasting techniques, smart tools, and differences in timing and track forecasts. These can be resolved if one understands the reasons for the differences and there is an exchange of preferences. NCEP centers can help with issues such as heavy snowfall gradients, precipitation type, and rain/snow lines. Perhaps the most difficult area to collaborate is local effects since they can vary over short distances. In such circumstances, it may be helpful to consider climatology, forecaster experience, and the impact of forecasting those local effects on customers and partners. 3) The third category of values exceeding the collaboration thresholds occurs when non-meteorological gradients exist along or near CWA borders. These grid differences tend to show up as marked discontinuities which would not actually occur along CWA boundaries. These circumstances require that the forecasters resolve the differences before publishing their grids officially to the NDFD server. In such cases, more collaboration is needed and possibly assistance from NCEP. When collaboration changes are agreed to and the edits can be completed, those grids can then be published to the official NDFD server. After publishing, the cycle begins again.

### Student Notes:



## 9. NCEP Winter Weather Support for WFOs

**Instructor Notes:** NCEP provides winter weather support to WFOs via two National Centers – HPC and SPC. SPC provides winter weather support in the nowcast time frame and HPC provides winter weather support out to day 3.

**Student Notes:**


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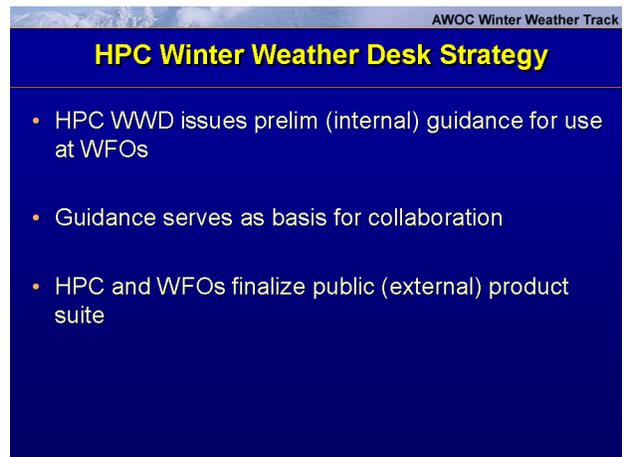
### NCEP Winter Weather Support for WFOs

- SPC provides products tailored for the 0-6h time frame
- HPC provides products tailored for the 12-84h time frame

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## 10. HPC Winter Weather Desk Strategy

**Instructor Notes:** Winter Weather Desk (WWD) strategy and process are based heavily off of WFO feedback (Winter Weather Experiments 2002 through 2004). WWD Internal guidance is based on GFS, NAM, SREF and other models available at HPC. Collaboration occurs routinely in 12 Planet or verbally by phone. Both parties (HPC and WFO) issue a public product suite. HPC's public suite are probability graphics tailored to compliment WFO grids. Collaboration is the key link to ensure the HPC probabilities are in sync with WFO grids. This process allows NWS users to obtain what's most likely to occur (via WFO grids), and a sense of the potential of the event (via HPC probabilistic products).

**Student Notes:**


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### HPC Winter Weather Desk Strategy

- HPC WWD issues prelim (internal) guidance for use at WFOs
- Guidance serves as basis for collaboration
- HPC and WFOs finalize public (external) product suite

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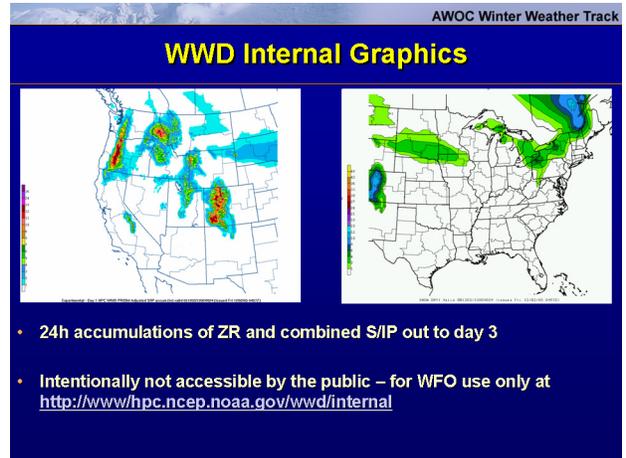
## 11. WWD Internal Graphics

**Instructor Notes:** Accumulations are drawn at HPC on a "storm scale", not quite mesoscale and not quite as coarse as synoptic scale. Details such as LES and terrain enhancement are included. HPC uses a technique called Parameter-elevation Regressions on Independent Slopes Mode (PRISM) to downscale the storm scale renditions of

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accumulations to 5km for use in the intermountain region. Additionally, diagnostic fields routinely referred to by the WWD forecaster are available for the GFS, NAM and SREF at <http://www.hpc.ncep.noaa.gov/mdd/mddoutput>. This page houses diagnostic fields with a strong emphasis on QPF, F-gen, dendritic growth and banding.

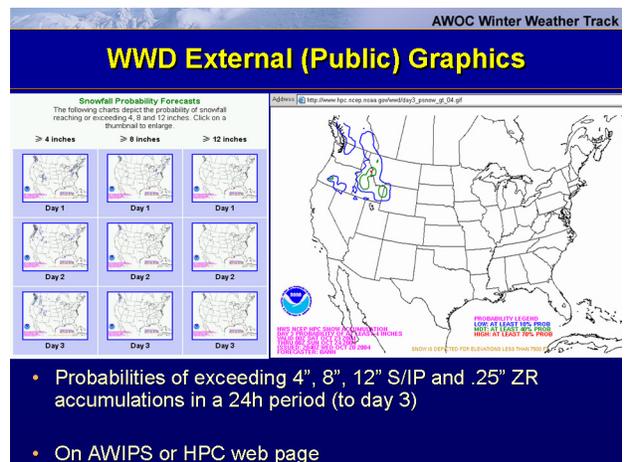
### Student Notes:



## 12. WWD External (Public) Graphics

**Instructor Notes:** The internal graphics, post collaboration, serve as the basis for the probability graphics. These CRITICAL differences in thinking on a storm scale between HPC and WFOs are collaborated.

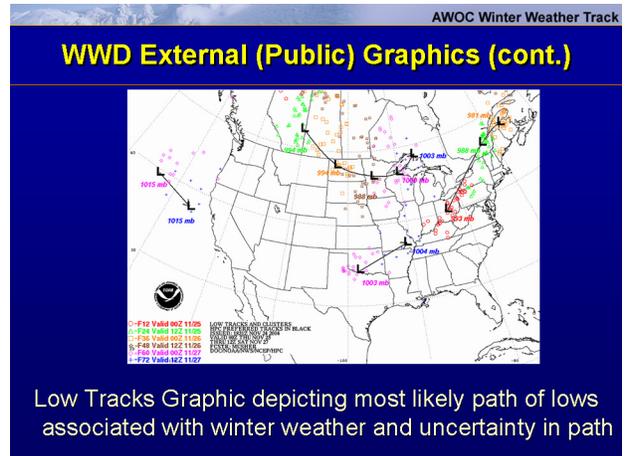
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## 13. WWD External (Public) Graphics (Cont.)

**Instructor Notes:** A version of this graphic tailored for the public is also available on HPC's web page.

**Student Notes:**



## 14. WWD Collaboration

**Instructor Notes:** Additionally, HPC can be used as a vehicle to convey model info not readily available in AWIPS to the forecaster at a WFO. Local expertise resides at WFO, not HPC, therefore storm scale accumulations are provided by HPC. And so HPC leaves decision for issuance of highlights (watches, warnings, advisories) to the WFOs.

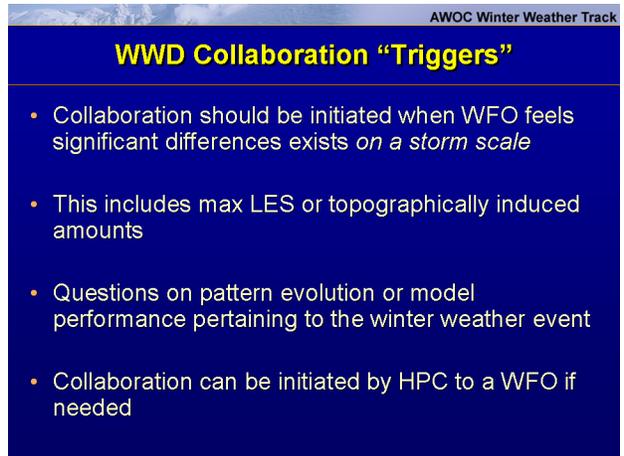
**Student Notes:**

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- The figure is a slide titled "WWD Collaboration" from the "AWOC Winter Weather Track" series. It contains four bullet points:
- Approach is to have HPC available as a resource for impressions of large scale pattern evolution - early in the WFO forecast process
  - Not HPC's role to collaborate watches, warnings, or advisories
  - 12 Planet ID is hpc\_wwd
  - Audio alarm triggers "HPC hpc NCEP ncep WWD wwd"

## 15. WWD Collaboration "Triggers"

**Instructor Notes:** 1-2" differences in regions where expected amounts straddle Watch/ Warning issuance should be collaborated. However, differences of 2" in a heavy snow event typically do not warrant collaboration. The bottom line is if you need to talk – you can call or chat.

**Student Notes:**



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### WWD Collaboration “Triggers”

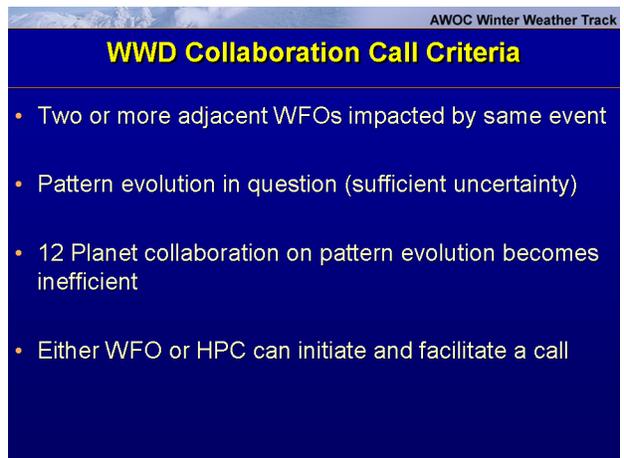
- Collaboration should be initiated when WFO feels significant differences exists *on a storm scale*
- This includes max LES or topographically induced amounts
- Questions on pattern evolution or model performance pertaining to the winter weather event
- Collaboration can be initiated by HPC to a WFO if needed

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## 16. WWD Collaboration Call Criteria

**Instructor Notes:** Calls are not needed routinely, but can be quite helpful, especially when typing on 12 Planet becomes too cumbersome. It doesn't matter who initiates or facilitates a call, so long as communication is occurring.

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### WWD Collaboration Call Criteria

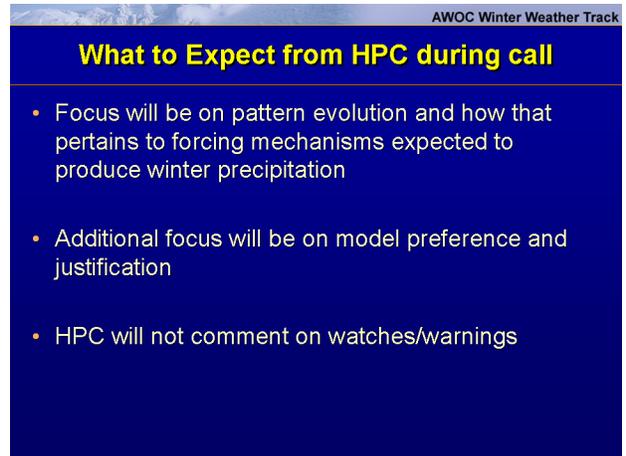
- Two or more adjacent WFOs impacted by same event
- Pattern evolution in question (sufficient uncertainty)
- 12 Planet collaboration on pattern evolution becomes inefficient
- Either WFO or HPC can initiate and facilitate a call

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## 17. What to Expect from HPC During Call

**Instructor Notes:** HPC participation in WFO initiated calls will end when calls naturally gravitate towards highlight collaboration (watch/warning). Again, local expertise resides at WFOs. Therefore HPC feels WFOs should be making final call on issuance of watches/warnings.

**Student Notes:**



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### What to Expect from HPC during call

- Focus will be on pattern evolution and how that pertains to forcing mechanisms expected to produce winter precipitation
- Additional focus will be on model preference and justification
- HPC will not comment on watches/warnings

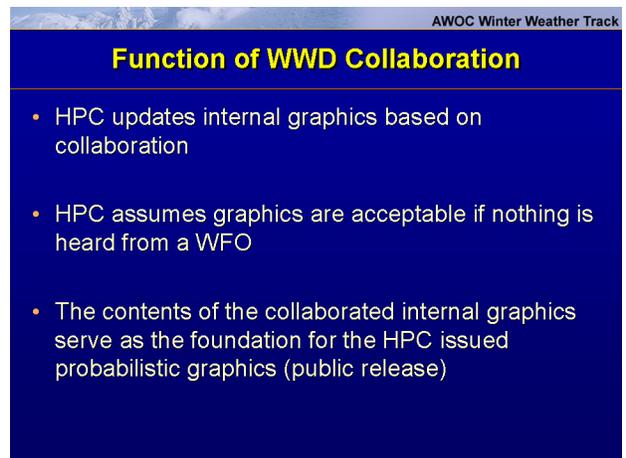
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## 18. Function of WWD Collaboration

**Instructor Notes:** Goal is to ensure our NOAA's NWS WFO/HPC products are consistent so users get the same message from HPC and WFOs.

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### Function of WWD Collaboration

- HPC updates internal graphics based on collaboration
- HPC assumes graphics are acceptable if nothing is heard from a WFO
- The contents of the collaborated internal graphics serve as the foundation for the HPC issued probabilistic graphics (public release)

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## 19. WWD Deadline Summary

**Instructor Notes:** Printable “under the glass” table.

Student Notes:

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### WWD Deadline Summary

- 0500/1700Z – Day 1 prelim graphic available
- 0545/1745Z – Day 2 prelim graphic available
- 0615/1815Z – Day 3 prelim graphic available
- 0930/2130Z – Final products available
- Optimal WFO/HPC Collaboration window  
0500/1700Z – 0815/2015Z

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## 20. SPC Support

**Instructor Notes:** SPC focuses on nowcasting time frame. If you ask SPC about events in 12-84h time frame they will refer you to HPC and vice versa. If an event is ongoing, the Mesoscale Discussions (MDs) will be issued at least every 6 hours. Unscheduled MDs are issued as needed.

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### SPC Support

- Issuance of Mesoscale discussions and web based graphics – issued every 6h during events
- Use of observations and short term NWP output to support discussions and graphics
- 12 Planet ID is spc\_4



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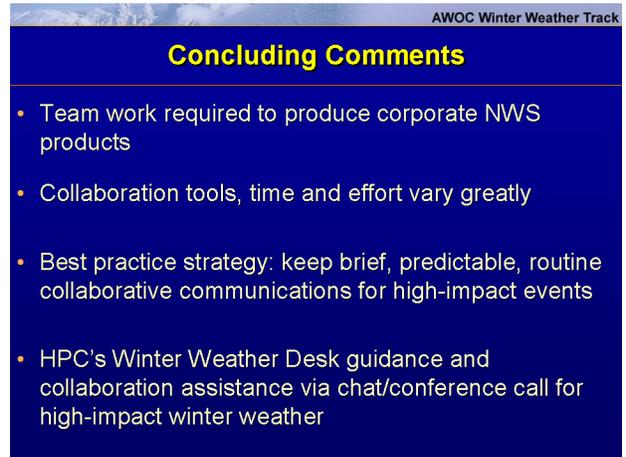
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## 21. Concluding Comments

**Instructor Notes:** Good collaboration requires team work. It is the foundation of the current NDFD product generation. Collaboration works best when it is treated as a process integrated within the forecast process. Collaboration should begin early in the forecast process and be appropriate to the forecast challenges in the time and effort expended. While collaboration time can be minimized, at least a small amount of time should be devoted to it. Collaboration should continue throughout the forecast process until the grids are published as agreed upon. Finally, there can be valuable insights into model performance and guidance from NCEP (HPC and SPC) during winter weather situations.

Consider high-impact winter weather a collaboration trigger with HPC because customers and partners will likely get information from both sources.

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### Concluding Comments

- Team work required to produce corporate NWS products
- Collaboration tools, time and effort vary greatly
- Best practice strategy: keep brief, predictable, routine collaborative communications for high-impact events
- HPC's Winter Weather Desk guidance and collaboration assistance via chat/conference call for high-impact winter weather

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## 22. Collaboration

**Instructor Notes:** Take a few moments to complete the quiz questions on this slide.

**Student Notes:**

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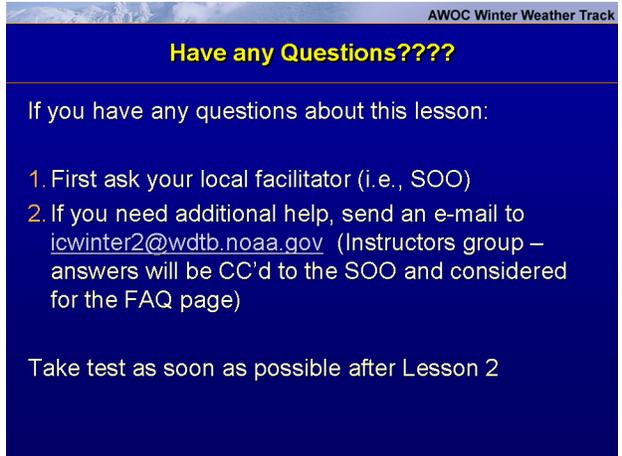
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## 23. Have any Questions????

**Instructor Notes:** If you have any questions about this lesson, first ask your local AWOC facilitator. If you need additional help, send an e-mail to the address provided. When we answer, we will CC your local facilitator and may consider your question for our FAQ page. We strongly recommend that you take the exam as soon as possible after completing Lesson 2.

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### Student Notes:

A blue slide with a white header bar at the top that reads "AWOC Winter Weather Track". The main content is in yellow text on a blue background. It asks "Have any Questions????", provides instructions on how to ask for help, and tells students to take a test after Lesson 2.

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**Have any Questions????**

If you have any questions about this lesson:

1. First ask your local facilitator (i.e., SOO)
2. If you need additional help, send an e-mail to [icwinter2@wdtb.noaa.gov](mailto:icwinter2@wdtb.noaa.gov) (Instructors group – answers will be CC'd to the SOO and considered for the FAQ page)

Take test as soon as possible after Lesson 2