

## REGIONAL ADOPTED GRIDDED METHODOLOGIES AND COLLABORATION POLICIES FOR WFO CREATED QPF

The purpose of standardizing the Western Region QPF methodology is to provide a uniform starting point for WFO NDFD grid editing. This in turn will help facilitate WFO collaboration and create smoother spatial and temporal transitions in the regional and NDFD QPF grid field. The methodology is tailored to the particular RFCs operations that serve the WFO. This is being done to take advantage of the QPF expertise found at each RFC. The required methodology will be limited to cool season rain events.

The software component for achieving this standardization is the required use of QPFHelper smart tool.

QPFHelper has the capability to ingest text data produced by each RFC based on its forecast. The AWIPS PIL for each RFCs QPS message is shown below.

<u>RFC</u>	<u>QPS product</u>
CBRFC	SLCQPSSTR
CNRFC	RNOQPSRSA
NWRFC	PDXQPSPTR*

\*NWRFC's product also contains points for the MBRFC domain in Montana

This product can be used as input into QPFHelper. Typically, the QPS product is issued twice a day, but unless the RFC is in 24 hour operations, no product is available on the forecaster's mid shift.

- RFC QPS text products are available at 1530Z (based on 1015Z final HPC and model QPF) and 2100Z (based on HPC preliminary 18Z and model 12z QPF). NWRFC only issues the QPS once a day at 15Z and updates it in the afternoon if events warrant.
- HPC preliminary Day 1 -3 QPF grids are available by 0600/1800 UTC.
- HPC PC final Day 1-3 QPF text products are not available from HPC until 0800/2000 UTC

QPFHelper will fall back to using the HPC text data when the most recent RFC QPS product is at least eight hours old. QPFHelper will create a yellow banner message to alert the forecaster when this has occurred and that it is using the HPC QPF text product.

Using the QPS (or QPF product) is the standard method to initialize QPF grids from RFC guidance in WR. At this time, the special 4 km RFC QPF grid that was being distributed to WFO's has been terminated. However, a 10-km RFC mosaic grid is available for display in GFE's RFCQPF database.

As part of the methodology, the forecaster is encouraged to derive their QPF independently of POP. In order to achieve that goal, the forecaster will need to populate their POP grid before using the QPFHelper tool. The tool will automatically check for: 1) areas where POP is greater than 50% and no QPF, QPFHelper Tool populates with .01, and 2) QPFHelper Tool eliminates all QPF where POP is 0%. No other POP restraints will be incorporated in this methodology. The combination of using minimum POP restraints and the required use of the QPFHelper Tool should help mitigate many of the current collaboration ambiguities practiced by our offices.

Additional grid editing guidance by RFC domain:

### **1. WFOs in Eastern Montana (MBRFC Domain) QPF Editing Methodology for Cool Season Precipitation Events.**

- WFOs will utilize the QPFHelper SmartTool in the GFE to generate/modify QPF grids.
  - This provides a method to generate high resolution QPF grids from low resolution QPF guidance which may better represent variability within areas of complex terrain.
  - Forecasters may initialize their points with the previous forecast, guidance of their choice, including grids from numerical models, grids from HPC, or grids from the MBRFC HAS unit.
    - WFOs will identify their preference for initialization within 12Planet for a cold season, stratiform event.
    - HPC preliminary Day 1 and 2 QPF grids are available by 0600/1800 UTC.
    - HPC preliminary Day 3 QPF will be provided by 0600/1800 UTC through a SHEF encoded text file (QPSPQR) for geographically pre-defined points within each CWA.
    - Day 3 QPF grids are not available from HPC until 0800/2000 UTC.
  - Not all grids for a given forecast cycle must be initialized from the same source.
  - Forecasters should use the QPFHelper SmartTool exclusively to arrive at forecast QPF.
    - If problems exist with getting the desired result from the tool in specific geographic regions, the WFO is encouraged to have their

IFPS focal point add additional points for QPF specification to the QPFHelper tool rather than using the pencil, adjust, or other tools.

- The philosophy of this effort is that if all the WFOs are using the same tool in the GFE which utilizes the PRISM climatology as a background field, QPF grid consistency will be improved.
- When the POP is 50% or greater at a grid point, the corresponding QPF will be at least .01 hundredth of an inch.
- When the POP is below 50%, the corresponding grid point may or may not have a non-zero QPF.
  - The forecasters are encouraged to derive their QPF independent of the POP by using the QPFHelper tool.
- Forecasters will view the Articulate Training created by WR SSD on the QPFHelper tool.
  - Each WFO SOO will ensure that each forecaster understands the QPFHelper tool functions and is familiar with using the tool.
- Local QC tools must be run to ensure that weather grids contain precipitating weather for corresponding non-zero QPF grids.
- Verification efforts this winter will help refine this methodology.

## **2. WFOs in the CBRFC Domain - QPF Editing Methodology for Cool-season Precipitation Events.**

- WFOs will utilize QPFHelper SmartTool in the GFE to generate/modify QPF grids.
  - Forecasters may initialize their points with the previous forecast or guidance of their choice, including grids from numerical models, grids from HPC, or grids from the CBRFC HAS unit.
  - QPF grids at the WFO may be initialized from a variety of guidance sources or the previous forecast. Not all grids for a given forecast cycle must be initialized from the same source.
  - Forecasters should try and use the QPFHelper SmartTool exclusively to arrive at their forecast QPF. If problems exist in specific geographic regions with getting the desired result from the tool, the WFO is encouraged to have their IFPS focal point add additional points for QPF

specification to the QPFHelper tool rather than using the pencil, adjust, or other tools.

- The philosophy of this effort is that if all the WFOs are using the same tool in the GFE that uses the PRISM climatology as a background field, we will have much greater QPF grid consistency, even if different initial guidance grids are used from one office to another.
- The WFOs and CBRFC will exchange QPF grids via Intersite Coordination grids (ISC) in the GFE framework.
  - The CBRFC will have the ability to mosaic these grids for display on a GFE client in the RFC.
  - CBRFC HAS grids of QPF will be made available to the WFOs via ISC for display and manipulation in the GFE at the WFO.
- When the POP is 50% or greater at a grid point, the corresponding QPF will be at least .01 hundredth of an inch. When the POP is below 50%, the corresponding grid point may or may not have a non-zero QPF.
  - The forecasters are encouraged to derive their QPF independent of the POP by using the QPFHelper tool.
- Forecasters should view the Articulate Training on the QPFHelper tool that was created in WR/SSD.
  - Each WFO SOO should ensure that each forecaster understands how the QPFHelper tool functions and is familiar with using the tool.

### **3. WFOs in the CNRFC Domain - QPF Editing Methodology for Cool Season Precipitation Events.**

The required method for initiating and modifying any 6-hr QPF grid will be through use of the QPFHelper tool. Figure 1 is a screen capture of the tool. Although various “QPF sources” can be used as background, forecasters are expected to start with the **QPS Text Product** option. The tool will check to make sure it is reading from the latest guidance available. There should be little reason to use another QPF source (QPS text missing). Any deviation from the QPS text product will be coordinated with neighboring offices. It is expected that deviation would be rare during the day when forecasters should be coordinating directly with the HAS on expected QPF.

The *QPS Points* selection is defaulted when the QPS text product is used no matter what is selected for “Sample Set” Based on some preliminary tests with this tool it is recommended that the default analysis type be set to *SERP*. This tends to minimize the spread of light amounts of precipitation over areas away from where the points are located. Once you have initialized the 6-hr QPF using the QPS text product you can add more definition in your QPF by selecting one of your local pre-defined “Sample Sets” that place points at strategic locations in your CWA that have known precipitation characteristics. This should allow you to adjust the QPF without using other GFE tools like the pencil tool etc. Check border consistency before publishing and sending grids to the NDFD and WR gridded data base.

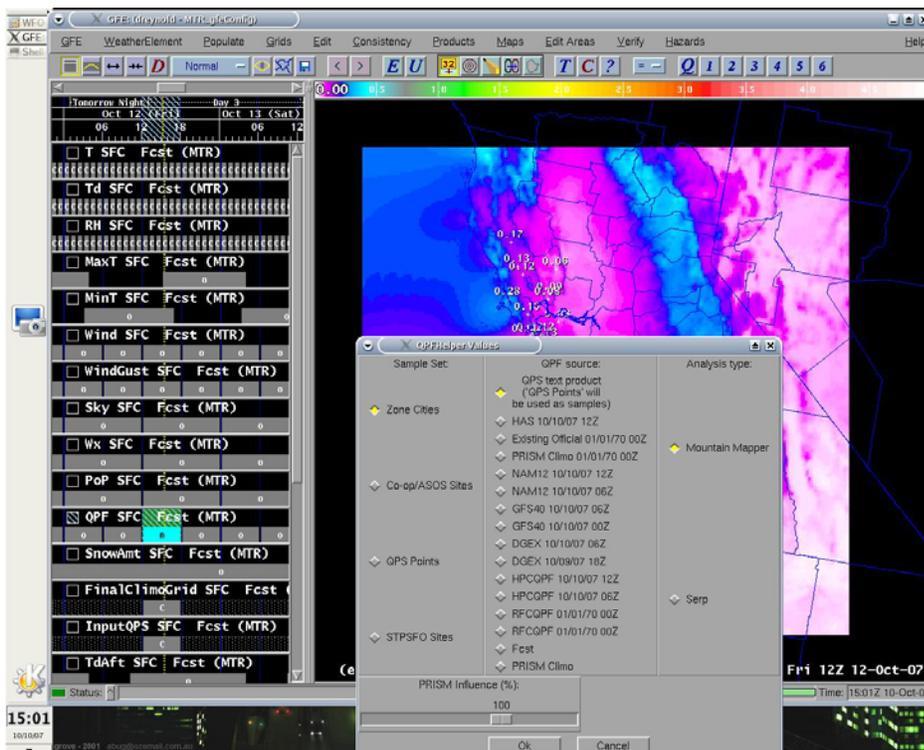
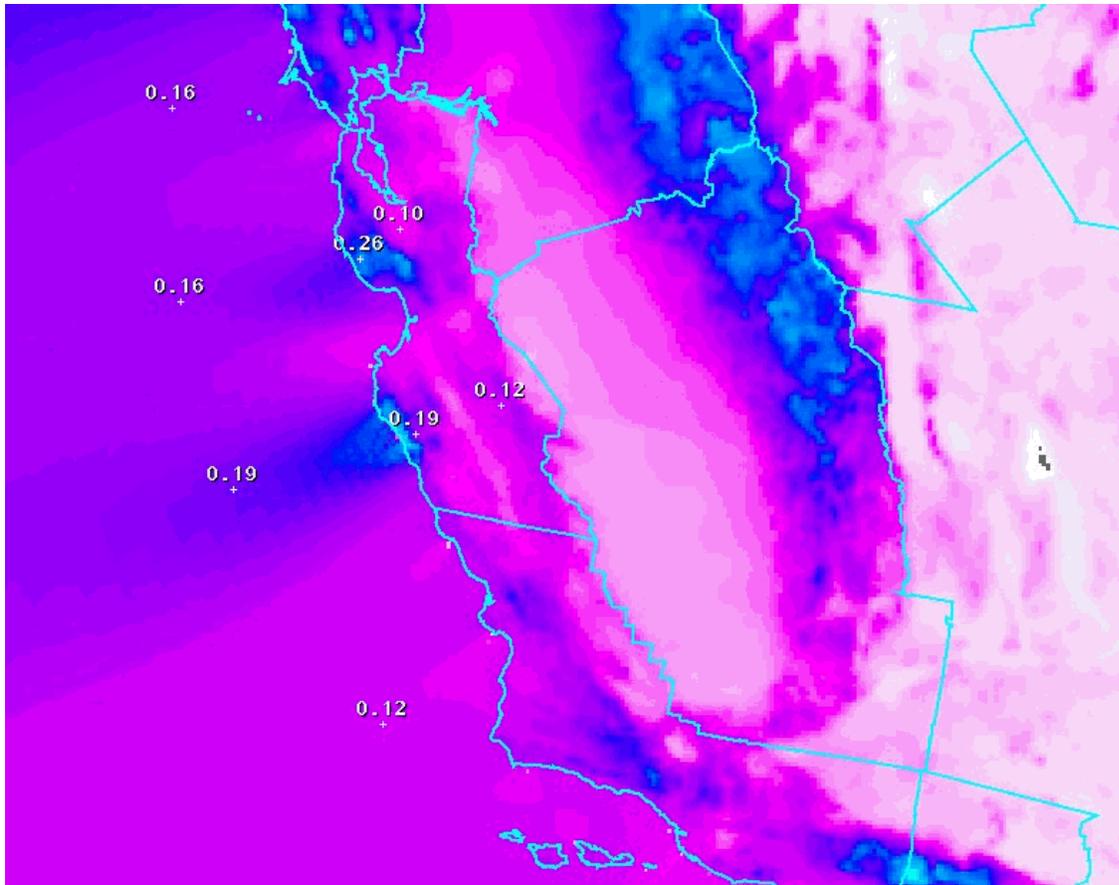


Figure 1 QPF\_Helper tool Gui

## Coastal Offices

You will note that when the QPS points are brought up, there are points over the ocean that your office requested. You will also note that the tool will generate a smooth transition from ocean to coast utilizing a methodology developed by SSD for over water QPFs based on PRISM, see Figure 2. This capability was established to eliminate the practice of placing .01 in over the water when your PoPs were non-zero.



**Figure 2 QPF\_helper tool production of QPF over the ocean.**

Under rapidly changing weather conditions, it may be necessary to update the QPF more often than twice per day. This will be a short fused, event driven situation and forecaster discretion is advised. However these changes must also be coordinated with bordering offices. Usually these changes will be applied directly to the existing QPF forecast to minimize the collaboration effort. The easiest way to accomplish this under most circumstances will be to make adjustments up or down of some of the QPS sites utilizing the QPFHelper Tool.

#### **4. WFOs in the NWRFC Domain - QPF Editing Methodology for Cool Season Precipitation Events.**

- WFOs will utilize the QPFHelper Smart Tool in the GFE to generate/modify QPF grids.
  - This provides a method to generate high resolution QPF grids from low resolution QPF guidance that may better represent variability within areas of complex terrain.
  - Forecasters may initialize their points with the previous forecast, guidance of their choice, including grids from numerical models, grids from HPC or grids from the NWRFC HAS unit.

- WFOs will identify their preference for initialization within 12Planet.
  - The resultant grid must result in meteorologically reasonable transitions along borders.
  - Grids for a given forecast cycle may be initialized from more than one source.
  - WFOs are encouraged to consider the NWRFC HAS grids in their analysis.
  - Significant differences between NWRFC and WFOs forecasts should be collaborated with the RFC, especially during high water periods.
  - The HAS QPS and grid products will normally be available by 16Z.
- Whichever method is used to initialize grids, forecasters should use the QPF helper tool to modify the grids whenever possible.
    - If problems exist with getting the desired result from the tool in specific geographic regions, the WFO is encouraged to have their IFPS focal point try adding additional points for QPF specification to the QPFHelper tool rather than using the pencil, adjust, or other tools.
    - If the QPF Helper tool simply will not produce the desired results, local tools may be used. However, the office should work with SSD to improve the functionality of the tool.
  - The philosophy of this effort is that if all the WFOs are using the same tool in the GFE, which utilizes the PRISM climatology as a background field, QPF grid appearances will be similar for all offices.
- When the POP is 50% or greater at a grid point, the corresponding QPF will be at least .01 inches.
  - When the POP is below 50% but equal to or above 15%, the corresponding grid point may or may not have a non-zero QPF.
  - When the POP is below 15%, there will be no QPF.
    - The forecasters are encouraged to derive their QPF independent of the POP by using the QPFHelper tool.

- The 15% value for lower boundary of QPF was chosen mainly to ensure there is consistency between the QPF and Wx grids.
- Forecasters will view the Articulate Training created by WR SSD on the QPFHelper tool.
  - Each WFO SOO will ensure that each forecaster understands the QPFHelper tool functions and is familiar with using the tool.