

Test Case GFE Interpolation (ip 001-005)

**for the
AWIPS
Contract
DG133W-05-CQ-1067**

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Revision History

Revision	Date	Affected Pages	Explanation of Change
1.0	11 July 2008	ALL	Initial Draft
2.0	8 August 2008	6, 7, 10	Redlines per PDT
3.0	4 September 2008	ALL	Redlines per DT

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1.0 SCOPE

See Software Test Plan.

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2.0 APPLICABLE DOCUMENTS

2.1 Source Documents

- None

2.2 Reference Documents

- Legacy NWS GFE Acceptance Test Case ID Numbers: ip001 – ip005.
- Legacy NWS GFE Test Cases for Test Areas AC – VP.
- Section 3.1.3 of the AWIPS D-2D User's Manual Build 8.1.
- Software Test Plan for the Advanced Weather Information Processing System Project, Contract #DG133W-05-CQ-1067, August 2008.
- The Silver Spring NWS AWIPS 1 test bed application.
- Release OB8.1 and OB8.2 of the Weather Event Simulator (WES).
- Rational RequisitePro.

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3.0 TEST CASE DESCRIPTION

This test case verifies that the edit area NWS test cases.

3.1 Assumptions, Constraints and Preconditions

- Several weather elements are loaded
- There are multiple grids available for the weather elements (at minimum T, Td, Wind, Wx, and Hazards weather elements)
- TO9 software has been installed successfully
- CAVE, EDEX and pgAdmin III are running
- Data has been ingested
- Actions, Results, and Requirements highlighted in yellow indicate requirements and/or capabilities to be included in the scope of future task orders. They are included here for purposes of continuity and traceability with the original AWIPS I test case documents.

3.2 Recommended Hardware

See Software Test Plan.

3.3 Test Inputs

Section 4.0 below contains the test procedures for this test case. Sections 2.2 – 2.9 of the Software Test Plan contain general test inputs applicable to all TO9 test cases.

3.4 Test Outputs

The results outlined in section 4.0 are met.

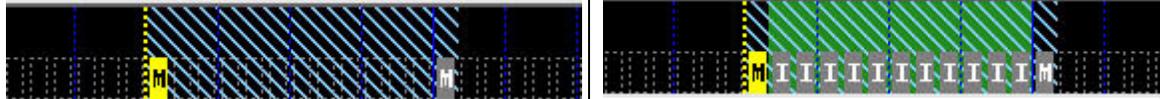
3.4.1 GFE GUIs Tested

- TBD

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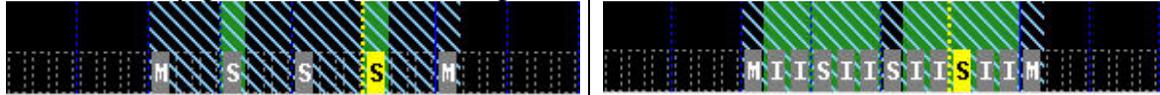
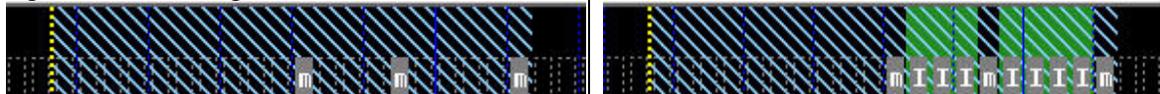
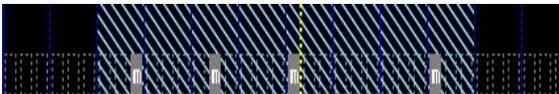
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4.0 TEST SCENARIO

Step #	Action	Result	Pass/Fail
ip001 – Interpolation Behavior with Various Grid Inventories			
Test Setup:			
GFE is running.			
<p>For each of these steps, use the ‘T’ weather element. Use various editing techniques to set up the grid inventory to that indicated in the test. Ensure that each base grid (a grid used in the calculations for interpolation) has varying data in it. Use the MB3 popup menus in the Grid Manager (GM) to ‘Copy Grid’, ‘Paste Grid’ to set up each interpolation test if necessary. Set the selection time range appropriate as the illustrations indicate using MB1 drag in the GM. These tests explore various boundary conditions, with interior and exterior grids to the selected time range.</p> <p>Set the Interpolation Algorithm for ‘T’ to ‘Cubic/NoAdvection’ using the ‘GFE’ -> ‘Editing Preferences’ -> ‘Interpolation Algorithm’ menu entry to bring up the Set Interpolation Algorithm dialog.</p> <p>To perform, use the ‘Grids’ -> ‘Interpolate...’ menu item to bring up the Interpolation dialog. In all cases, select ‘Gaps’ and MB1 click ‘OK’. After the interpolation has finished, compare the GM inventory with the illustration to ensure that all grids were created as expected. Then step through each of the frames to check for unusual results.</p> <p>After each portion of the test is complete and you have examined the results, MB1 click ‘Edit’ -> ‘Revert Forecast’ to restore the original data.</p>			
Definitions:			
Boundary Grid	If the selection time range ends or begins on a grid, then this grid is a boundary grid.		
Interior Grid	If the selection time range intersects a grid, and that grid is not a boundary grid, then it is an interior grid.		
Exterior Grid	If the selection time range does not begin or end on a grid, but there is a grid farther in the past or future from the start/end of the selection time range, then that grid is an exterior grid.		
1.	Two boundary grids, no interior grids.		
2.	Two boundary grids, single interior grid.		

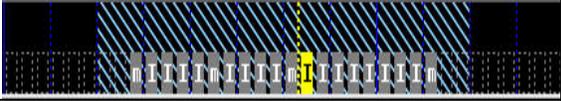
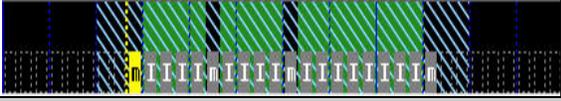
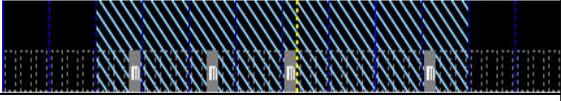
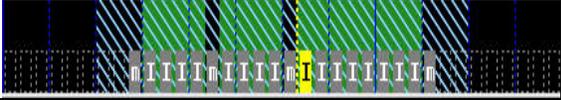
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Step #	Action	Result	Pass/Fail
3.	Two boundary grids, multiple interior grids.		
4.	One boundary grid, one exterior grid.		
5.	One boundary grid, multiple interior grids.		
6.	No boundary grids, two exterior grids.		
7.	Two internal grids, one exterior grid on right, no exterior grids on the left.		
8.	One exterior grid. It is important that there are no exterior grids to the left of your selection time range.	No interpolation is performed due to insufficient base grids.	
9.	Two exterior grids, two interior grids.		
ip002 – Interpolate based on edited data.			
10.	Select MB1 a range for a ‘T’ weather element in the GM that includes edited (indicated by ‘m’ symbol) grids.	The selection should look similar to this: 	

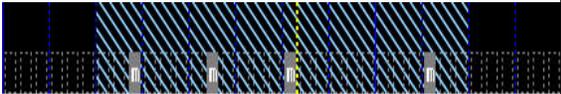
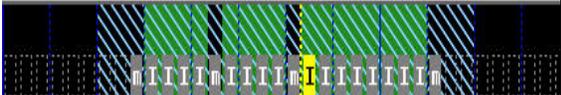
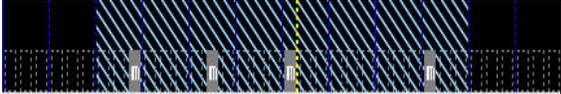
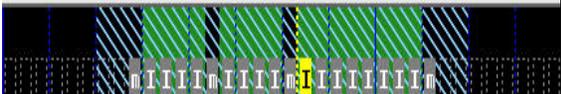
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Step #	Action	Result	Pass/Fail
11.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . Select 'Based on Edited Data' and MB1 click 'OK'.	Grids are interpolated to fill in all gaps. The new grids have an 'I' to indicate interpolation. A message indicating that interpolation is finished appears in the Status Bar . The display should look similar to: 	
12.	Save the data using the  toolbar button.	The green locks disappear, such as this: 	
13.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . Select 'Gaps' and MB1 click 'OK'.	No changes are made, as shown by the absence of 'green locks', since there is no room for grids and no grids need for interpolating. A message indicating that there are no grids to interpolate appears in the Status Bar .	
14.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . Select 'Based on Edited Data' and MB1 click 'OK'.	The grids marked as 'I' are reinterpolated, as shown by the presence of 'green locks'. A message indicating that interpolation is finished appears in the Status Bar : 	
ip003 – Interpolate Scalar, Vector, Weather, and Discrete Data			
SCALAR			
15.	Select MB1 a range for a SCALAR weather element, such as 'T', in the GM that includes several grids and several gaps.	The selection should look similar to this: 	
16.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . Select 'Gaps' and MB1 click 'OK'.	The grids are interpolated to fill in all gaps. The new grids have an 'I' to indicate interpolation. A message indicating that interpolation is finished appears in the Status Bar . The display should look similar to: 	

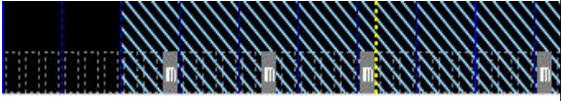
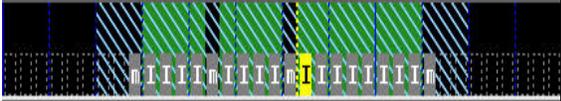
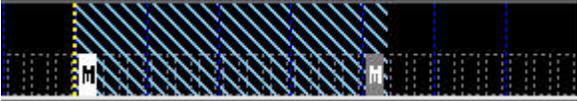
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Step #	Action	Result	Pass/Fail
17.	Step through each of the grids using the keyboard -> and <- arrow keys or other methods and check for reasonable interpolation results.	Verified.	
VECTOR			
18.	Select MB1 a range for a VECTOR weather element, such as 'Wind', in the GM that includes several grids and several gaps.	The selection should look similar to this: 	
19.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . Select 'Gaps' and MB1 click 'OK'.	The grids are interpolated to fill in all gaps. The new grids have an 'I' to indicate interpolation. A message indicating that interpolation is finished appears in the Status Bar . Display should look similar to: 	
20.	Step through each of the grids using the keyboard -> and <- arrow keys or other methods and check for reasonable interpolation results.	Verified.	
WEATHER			
21.	Select MB1 a range for a WEATHER weather element, such as 'Wx', in the GM that includes several grids and several gaps. Make sure there are areas of non- <NoWx> in your grids and place the same weather types in some of your grids to show the advection of Wx.	The selection should look similar to this: 	DR #1311
22.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . Select 'Gaps' and MB1 click 'OK'.	The grids are interpolated to fill in all gaps. The new grids have an 'I' to indicate interpolation. A message indicating that interpolation is finished appears in the Status Bar . The display should look similar to: 	
23.	Step through each of the grids using the keyboard -> and <- arrow keys or other methods and check for reasonable interpolation results.	Verified.	

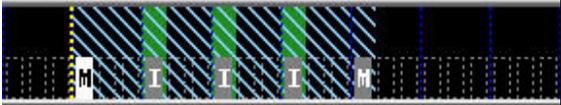
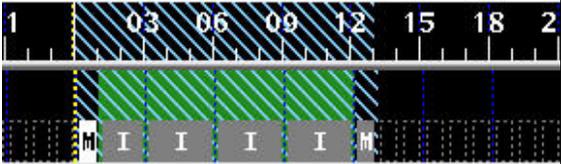
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Step #	Action	Result	Pass/Fail
DISCRETE			
24.	Select MB1 a range for a DISCRETE weather element, such as 'Hazards', in the GM that includes several grids and several gaps. Make sure there are several areas of non-<None> in your grids and place the same hazards in some of your grids to show the advection of Hazards.	The selection should look similar to this: 	DR #1311
25.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . Select 'Gaps' and MB1 click 'OK'.	The grids are interpolated to fill in all gaps, the new grids have an 'I' to indicate interpolation. A message indicating that interpolation is finished appears in the Status Bar . The display should look similar to: 	
26.	Step through each of the grids using the keyboard -> and <- arrow keys or other methods and check for reasonable interpolation results.	Verified.	
ip004 – Interpolate at various interpolation time intervals and durations.			
27.	Select a time range (MB1 drag) for 'T' in the GM that includes grids at its boundaries (first and last positions within the selected range), with no grids in the interior of that range, and gaps or shadow blocks available as the target of the interpolation operation, such as: 	The time range is set.	
28.	MB1 click 'Grids' -> 'Interpolate...' to bring up the Interpolation dialog . In the Interpolation dialog, select 'Gaps', set the Interpolation Time Interval to 1 hour, set the Interpolation Duration to 1 hour. Then MB1 click 'OK'.	The interpolation is performed at hourly intervals, and the grids are one hour in length, as shown: 	
29.	MB1 click 'Edit' -> 'Revert Forecast' to restore the original data.	The original data is restored.	

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Step #	Action	Result	Pass/Fail
30.	MB1 click ' Grids ' -> ' Interpolate... ' to bring up the Interpolation dialog . In the Interpolation dialog, select 'Gaps', set the Interpolation Time Interval to 3 hours, set the Interpolation Duration to 1 hour. Then MB1 click 'OK'.	The interpolation is performed at 3-hourly intervals, and the grids are one hour in length, as shown: 	
31.	MB1 click ' Edit ' -> ' Revert Forecast ' to restore the original data.	The original data is restored.	
32.	MB1 click ' Grids ' -> ' Interpolate... ' to bring up the Interpolation dialog . In the Interpolation Dialog, select 'Gaps', set the Interpolation Time Interval to 3 hours, set the Interpolation Duration to 3 hour. Then MB1 click 'OK'.	The interpolation is performed at 3-hourly intervals, and the grids are 3-hours in length, as shown below. Note that the grid alignment is based on the starting time of the selection time range, thus there isn't room for the first three-hour grid and thus it is only 2 hours in length in the following example. Correct behavior is that each grid will be three hours in duration, unless there is insufficient room to fit in the gap, and then its duration will be reduced. 	
ip005 – Interpolation dialog - slider behavior.			
SINGLE ELEMENT			
33.	Select a range of 'T' grids on the GM using MB1 drags . Select ' Grids ' -> ' Interpolate... ' from the GFE main menu bar to bring up the Interpolation dialog .	The time range is set. The Interpolation dialog displays.	
34.	Slide the Interval slider to the right.	The Duration slider does not move.	
35.	Slide the Duration slider to the right.	The duration slider will move to the right until it lines up with the currently set interval, then no more motion (to the right) will occur.	
36.	Set the Duration slider to a smaller value.	The Duration slider is set.	
37.	Slide the Interval slider to the left.	The Duration slider does not move until the Interval slider matches the value, then as the Interval slider is moved farther to the left, the Duration slider follows.	

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Step #	Action	Result	Pass/Fail
38.	MB1 click 'Cancel' on the Interpolation dialog .	The Interpolation dialog closes.	
MULTIPLE ELEMENTS, SAME TIME CONSTRAINTS			
39.	Select a range of 'T' and 'Td' grids on the GM using MB1 drags . MB1 click ' Grids ' -> ' Interpolate... ' from the GFE main menu bar to bring up the Interpolation dialog .	The Interpolation dialog displays.	
40.	Slide the Interval slider to the right.	The Duration slider does not move.	
41.	Slide the Duration slider to the right.	The duration slider will move to the right until it lines up with the currently set interval, then no more motion (to the right) will occur.	
42.	Set the Duration slider to a smaller value.		
43.	Slide the Interval slider to the left.	The Duration slider does not move until the Interval slider matches the value, then as the Interval slider is moved farther to the left, the Duration slider follows.	
44.	MB1 click 'Cancel' on the Interpolation dialog .		
NON-TC1 TIME CONSTRAINTS			
45.	Select a range of 'MaxT' grids on the GM using MB1 drags . MB1 click ' Grids ' -> ' Interpolate... ' from the GFE main menu bar to bring up the Interpolation dialog .	The Interpolation dialog displays. The only value displayed is the interval slider, and it is fixed at 24 hours (since the repeat time constraint for MaxT is 24 hours); there is no duration slider.	
46.	MB1 click 'Cancel' on the Interpolation dialog .		
47.	Select a range of 'MaxT' and 'MinT' grids on the GM using MB1 drags . MB1 click ' Grids ' -> ' Interpolate... ' from the GFE main menu bar to bring up the Interpolation dialog .	The Interpolation dialog displays. The only value displayed is the interval slider, and it is fixed at 24 hours (since the repeat time constraint for MaxT and MinT are both 24 hours).	
48.	MB1 click 'Cancel' on the Interpolation dialog .	The Interpolation dialog closes.	
49.	Select a range of 'T', 'Td', 'RH', 'MaxT' grids on the GM using MB1 drags . MB1 click ' Grids ' -> ' Interpolate... ' from the GFE main menu bar to bring up the Interpolation dialog .	The Interpolation dialog displays. Due to the various time constraints, the duration and the interval sliders are not present.	
50.	MB1 click 'Cancel' on the Interpolation dialog .	The Interpolation dialog closes.	
	End of test.		

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5.0 REQUIREMENTS VERIFICATION TRACEABILITY MATRIX (RVTM)

Number	Description	Test Step(s)
SYSR2404	The AWIPS GFESuite shall implement Interpolation Behavior with Various Grid Inventories.	1 – 9
SYSR2405	The AWIPS GFESuite shall implement Interpolate based on edited data.	10 – 14
SYSR2406	The AWIPS GFESuite shall implement Interpolate Scalar, Vector, Weather, and Discrete Data.	15 – 26
SYSR2407	The AWIPS GFESuite shall implement Interpolate at various interpolation time intervals and durations.	27 – 32
SYSR2408	The AWIPS GFESuite shall implement Interpolation dialog - slider behavior.	33 – 50

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