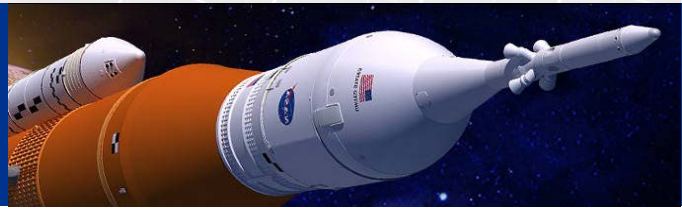
MSFC Natural Environments Weather Data Quality Control Activities

Presentation to Fall 2019 NEDOLWG



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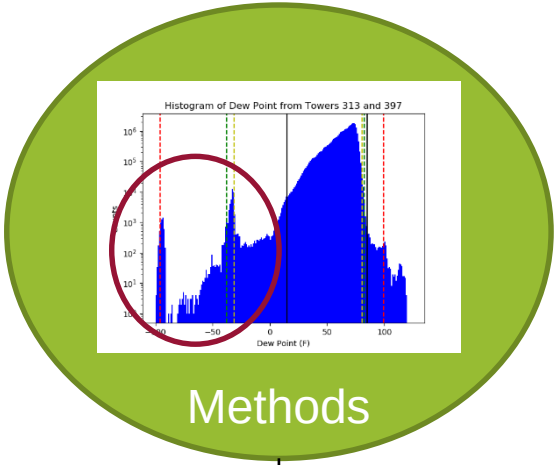
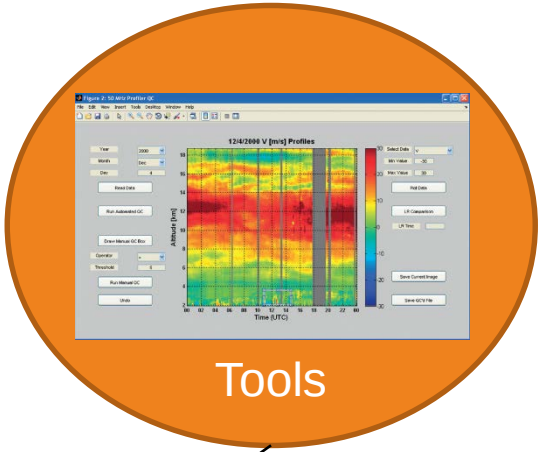
This presentation will highlight the data, methods, and tools used in EV44's efforts to generate a QC database.





QC Databases

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Who needs these QC databases?

QC
Databases

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What data have MSFC NE provided in the past?

QC Databases:
-Tower 313 (5 minute) 1995-2008
-Tower 397 (1 minute) 2013-2018
-50MHz DRWP 1997-2013
-915 MHz DRWPs 2000-2009

Non-QC Databases (Master Files):
-Towers
-Balloons (LR, HR, JS, RS)

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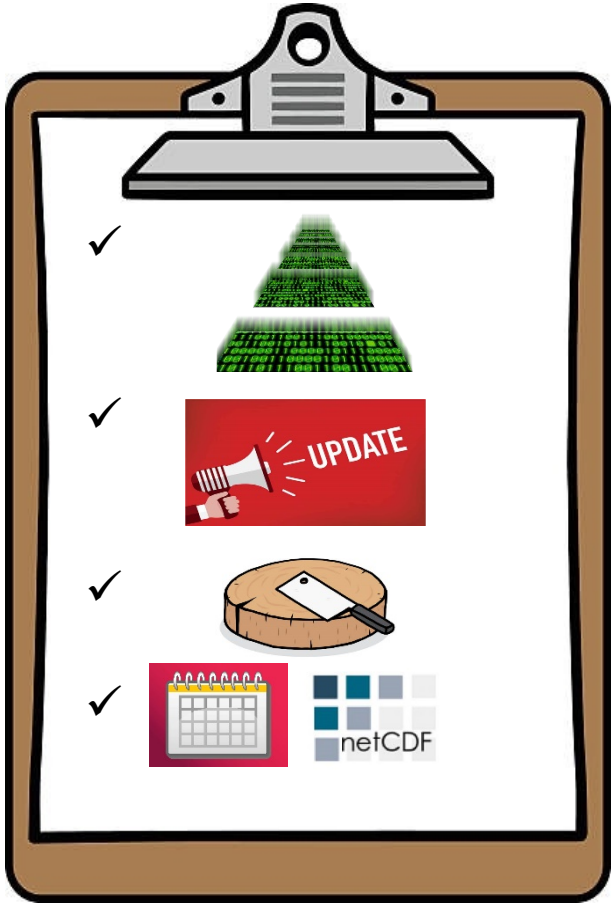
What will this new QC database look like?



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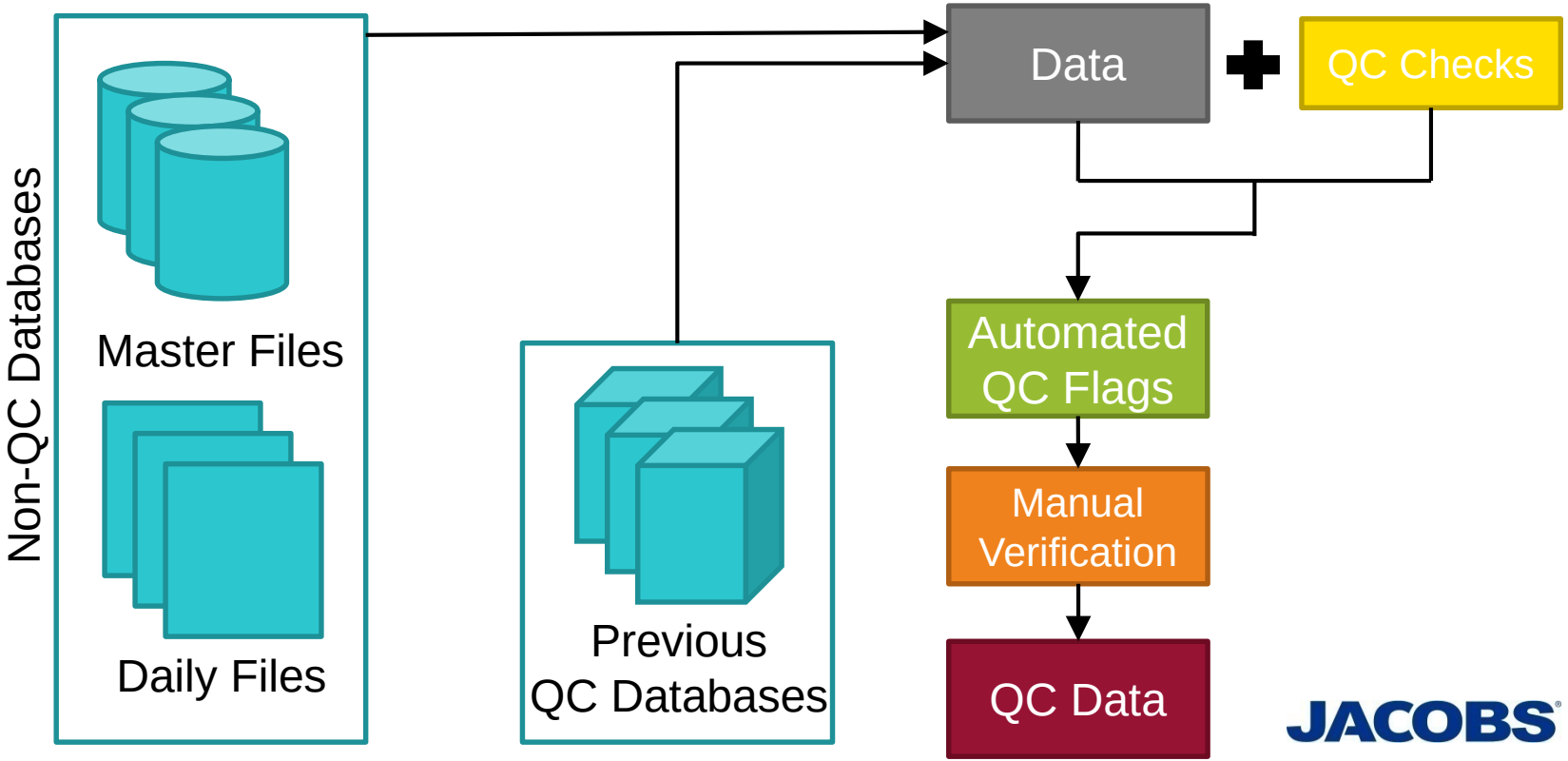
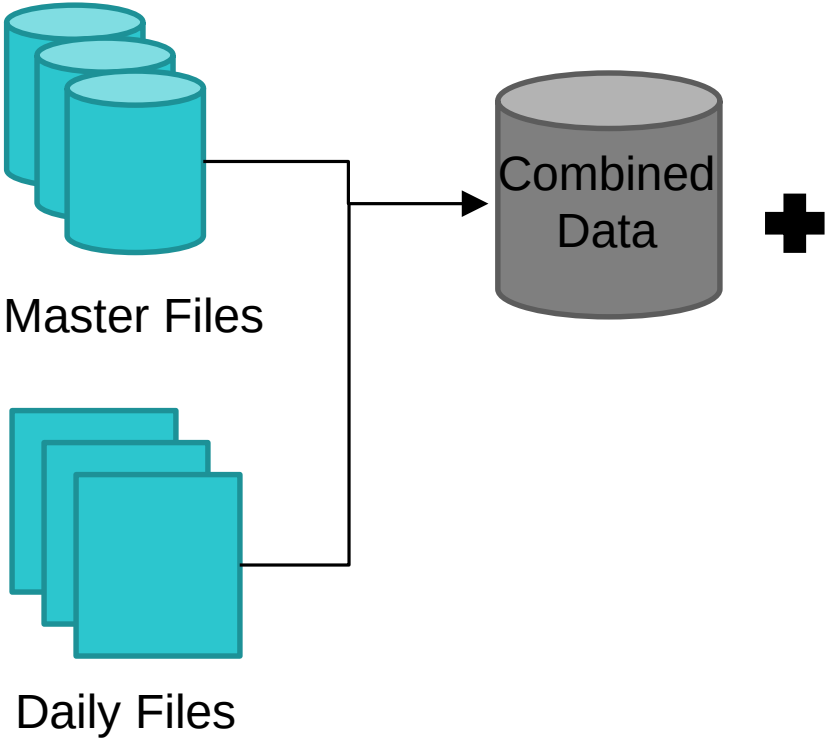
How are these new QC Databases going to be built?



Balloon data was gathered and QC Checks were determined.



QC Checks	
Altitude	Realistic
✓ Gap Check ✓ Uneven Altitude Intervals	✓ 6σ ✓ Climatic ✓ 0 Wind Speed ✓ Lapse Rate ✓ Calculated Td

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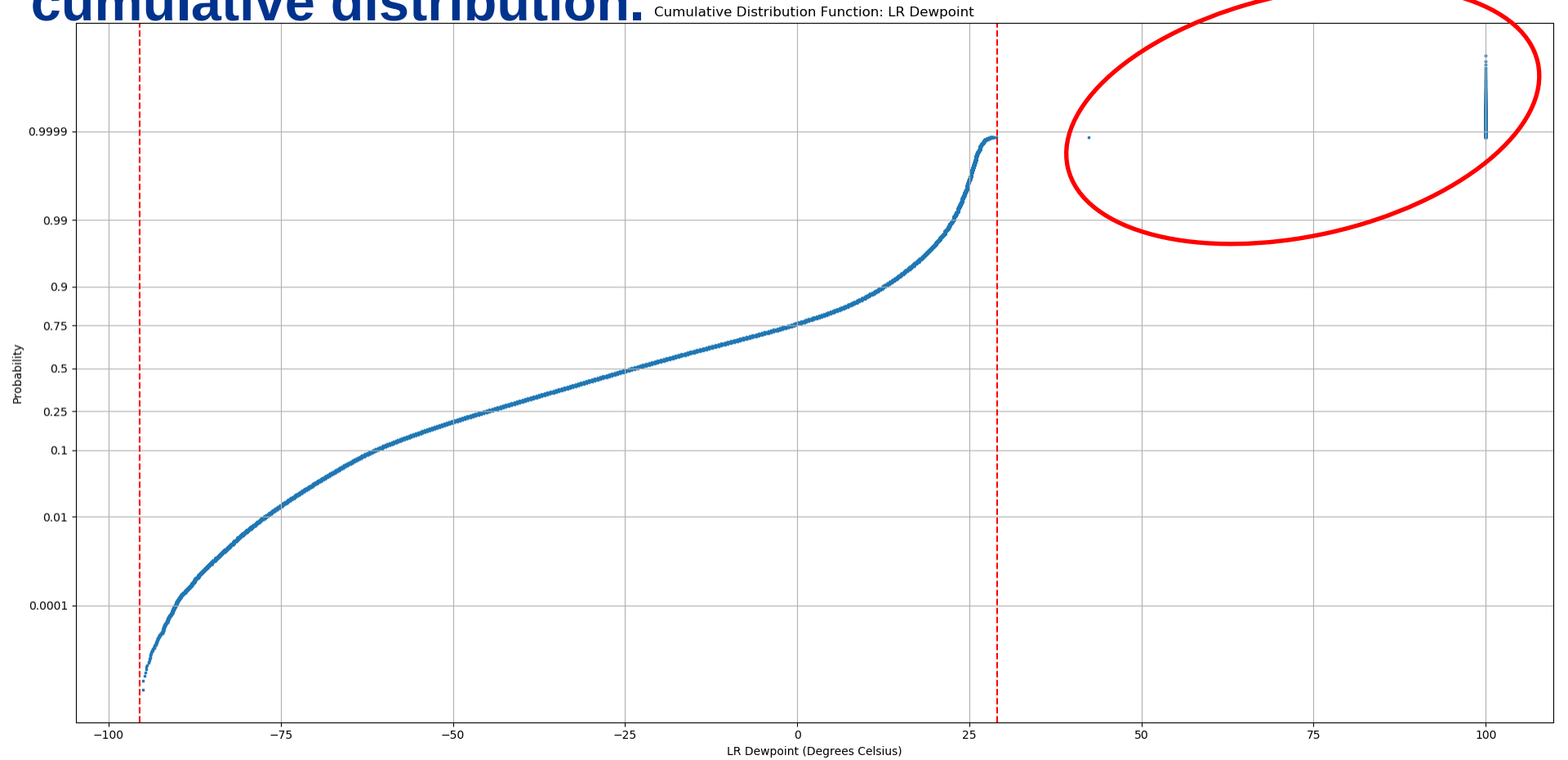
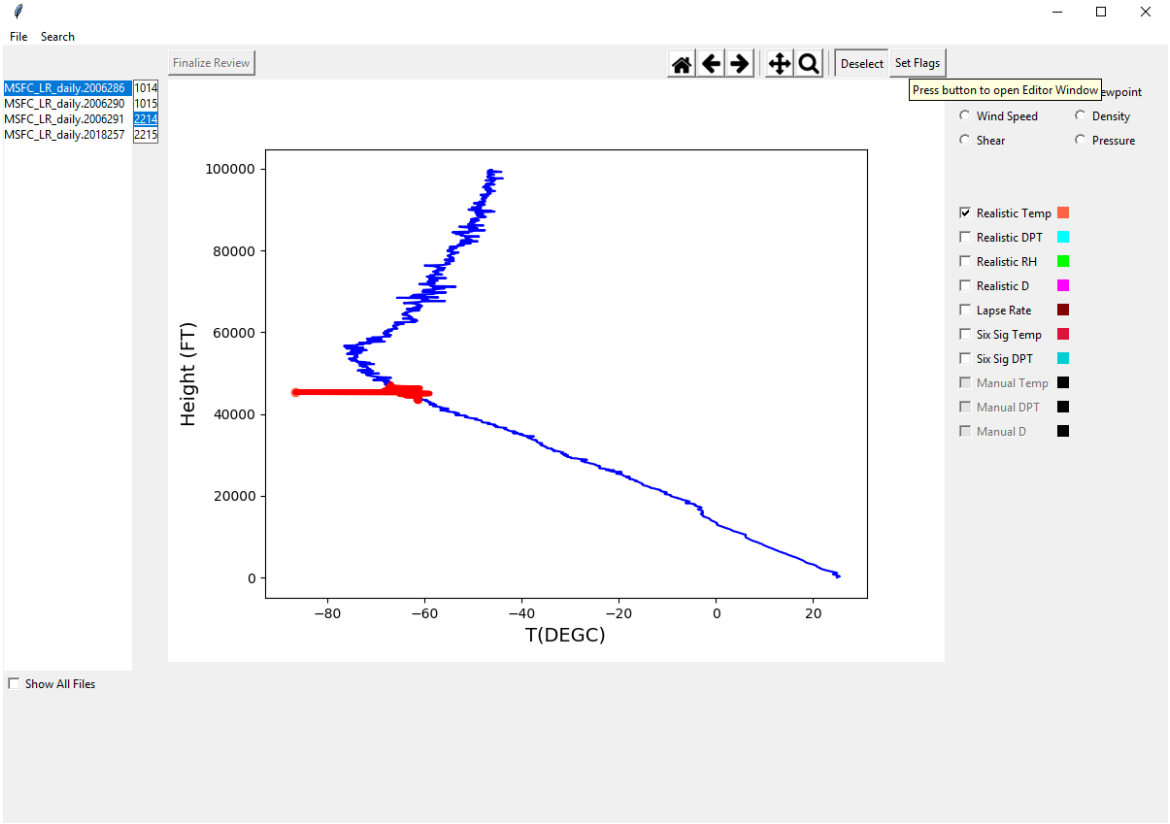
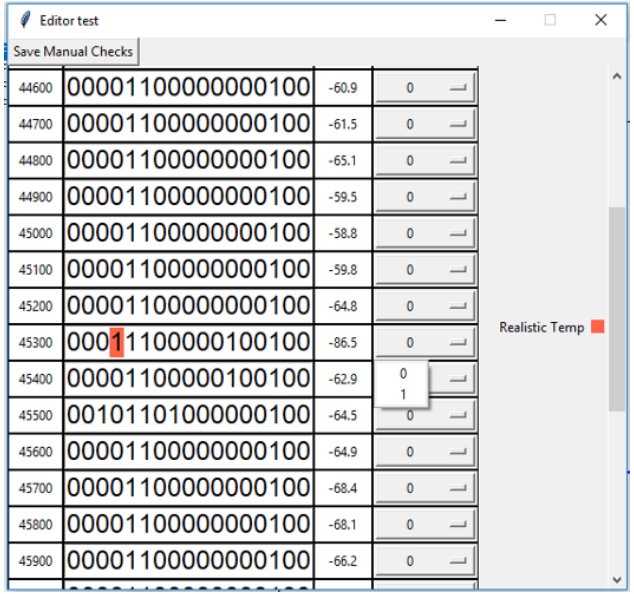
A balloon QC check threshold was defined via a cumulative distribution.



Manual verification of balloon data and automated flags was accomplished via GUI.





44600	0000110000000100	-60.9	0
44700	0000110000000100	-61.5	0
44800	0000110000000100	-65.1	0
44900	0000110000000100	-59.5	0
45000	0000110000000100	-58.8	0
45100	0000110000000100	-59.8	0
45200	0000110000000100	-64.8	0
45300	0001110000000100	-86.5	0
45400	0000110000000100	-62.9	0
45500	0010110100000100	-64.5	0
45600	0000110000000100	-64.9	0
45700	0000110000000100	-68.4	0
45800	0000110000000100	-68.1	0
45900	0000110000000100	-66.2	0

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Tower data were gathered from heritage archives and QC checks were determined.

QC Checks	
✓ Realistic ✓ Daily Median Δ ✓ Hourly Consistency ✓ Mean Wind Vector Δ ✓ Vertical Δ ✓ Horizontal Δ	✓ Derived Td ✓ Tower Obstruction ✓ Hang Up ✓ Mean vs. Peak Wind Speed

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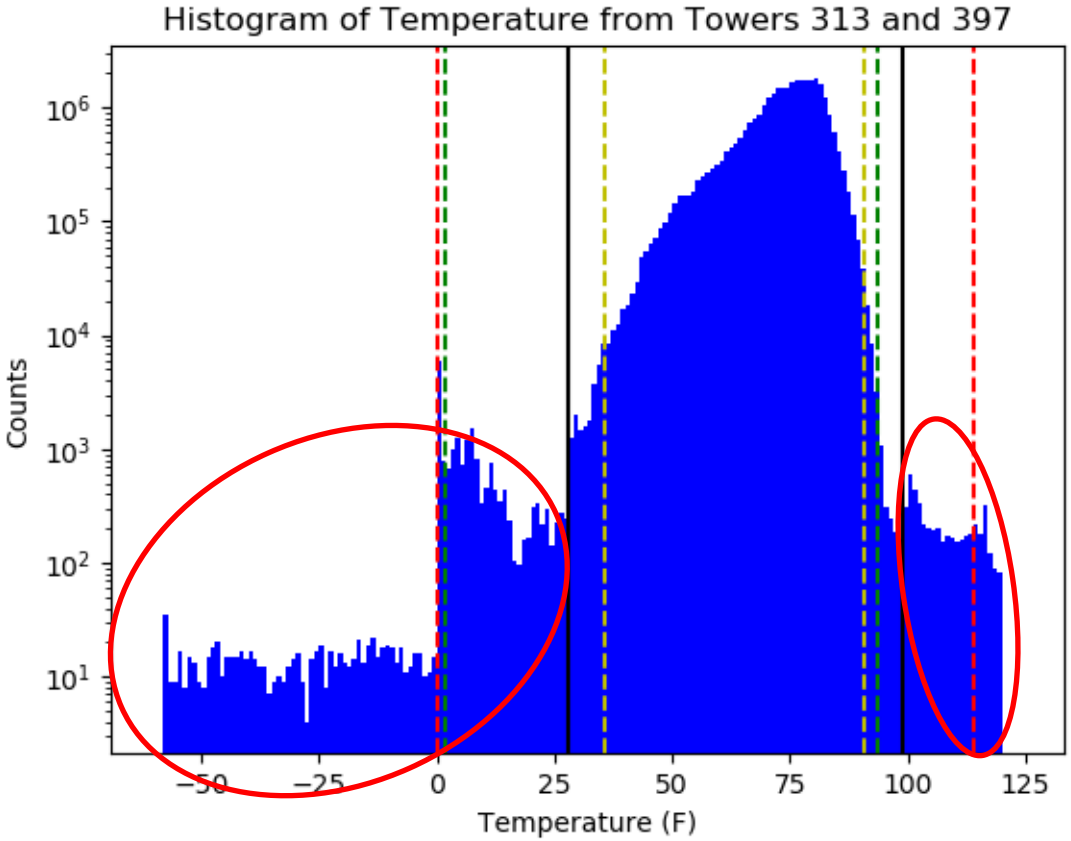
An example of how thresholds were determined for tower QC Checks.



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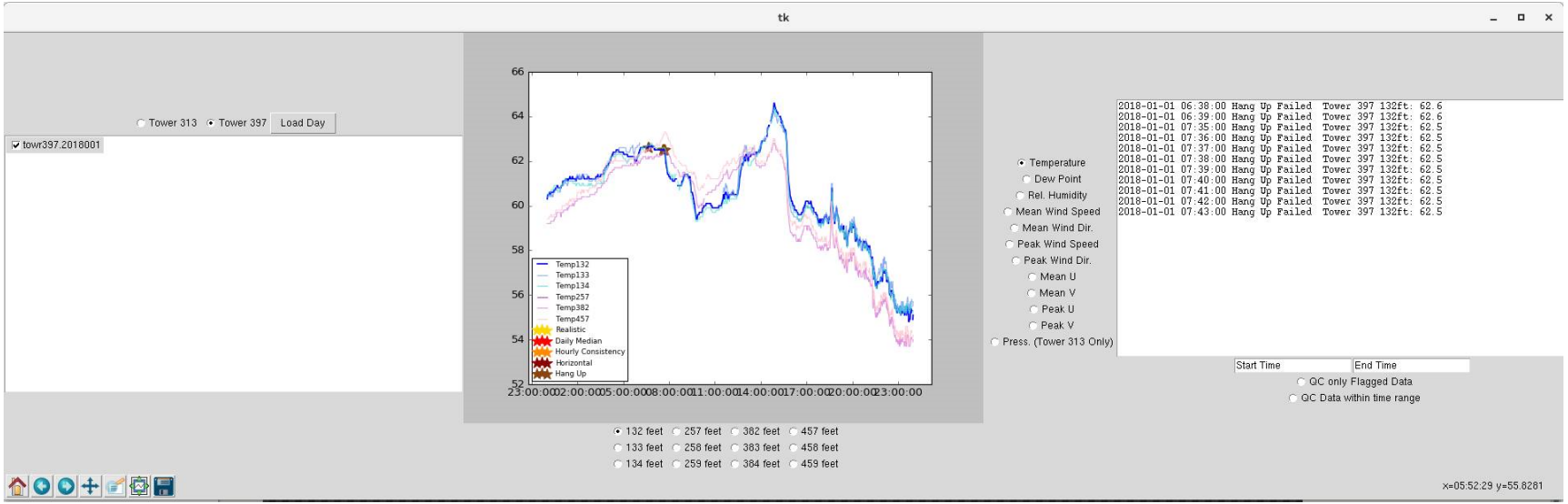
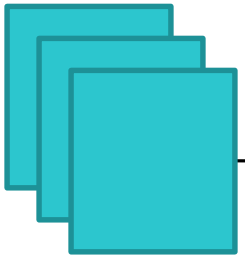
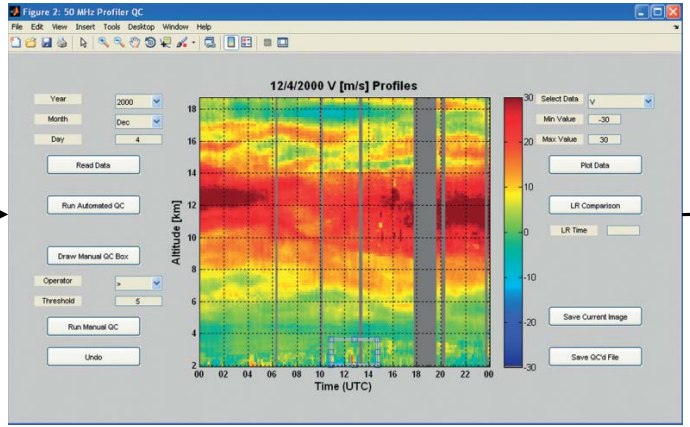
An example of how the tower QC flags are manually verified.

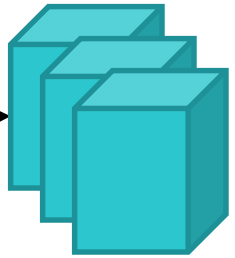


The QC process for data from the profilers has a different approach as much of the data comes with QC flags.



Daily Files





TDRWP (50 MHz) & 915 MHz DRWP QC Database

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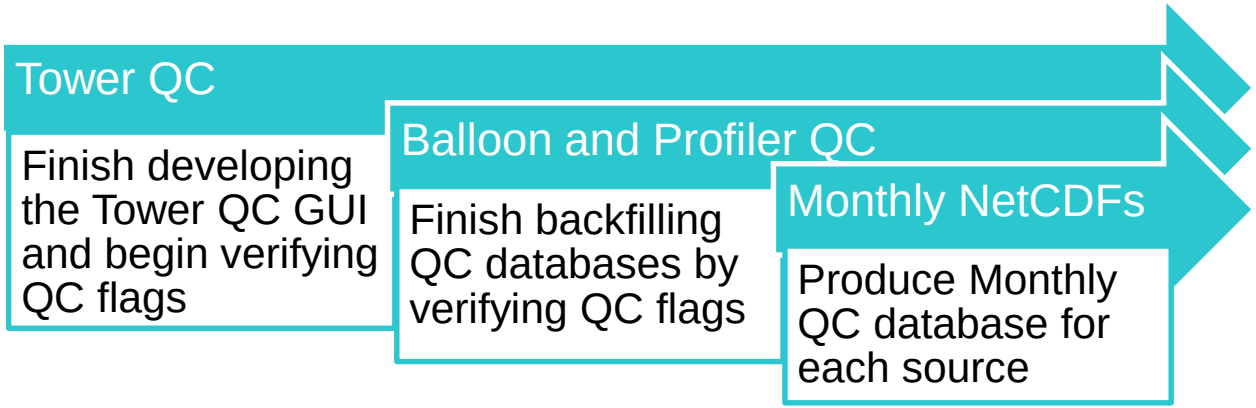
Accomplishments and forward work for MSFC NE QC efforts.

Tower QC Accomplishments	Balloon and Profiler QC Accomplishments	QC Data Produced
• Generated automed QC flags for Towers 313 and 397	• Developed Balloon GUI • Backfilled TDRWP QC database 2016-2019	• Began QC Process of long term balloon databases



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