

The 2014 Multi-Radar/Multi-Sensor (MRMS) HWT-Hydro Testbed Experiment

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Experiment Activities

- July 7 – August 1, 2014 in Norman, OK
- Featured 17 NWS forecasters from across the U.S.
 - **Issued experimental probabilistic flash flood watches and warnings with impact characterization**
- Utilized over 30+ experimental MRMS-Flooded Locations & Simulated Hydrographs (FLASH) tools (**J.J. Gourley**)
- Coordinated daily with WPC's FFaIR Testbed

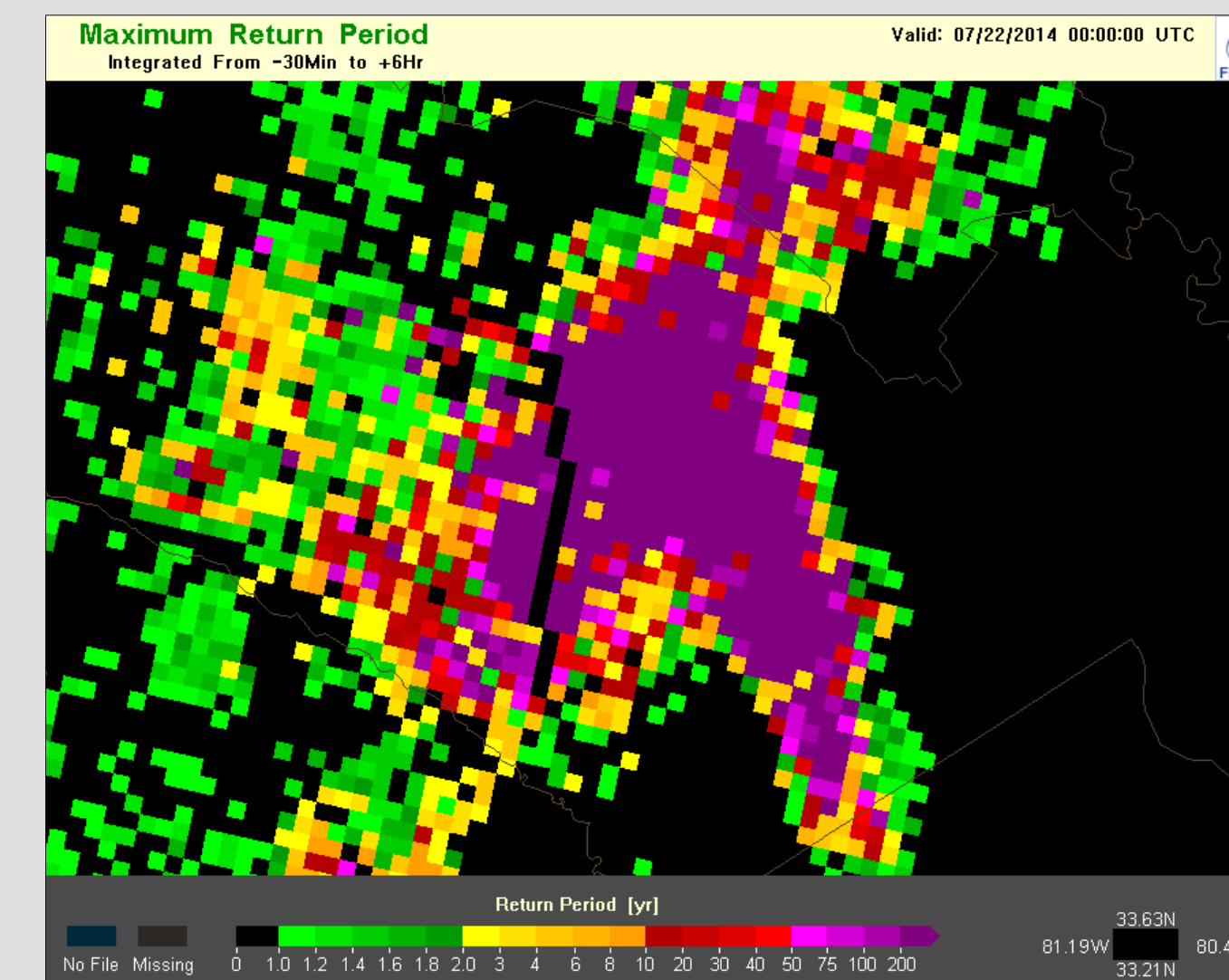
Main Goals of HWT-Hydro

1. Issue experimental FF watches between 0 – 6 hours before event & experimental FF warnings just prior to and during an event
2. Operate a near-real-time multi-source FF observation database
3. Subjective evaluation of all experimental observations, tools, and forecast products
4. **Prepare FLASH tools for transition to NWS operations**

Experiment Datasets

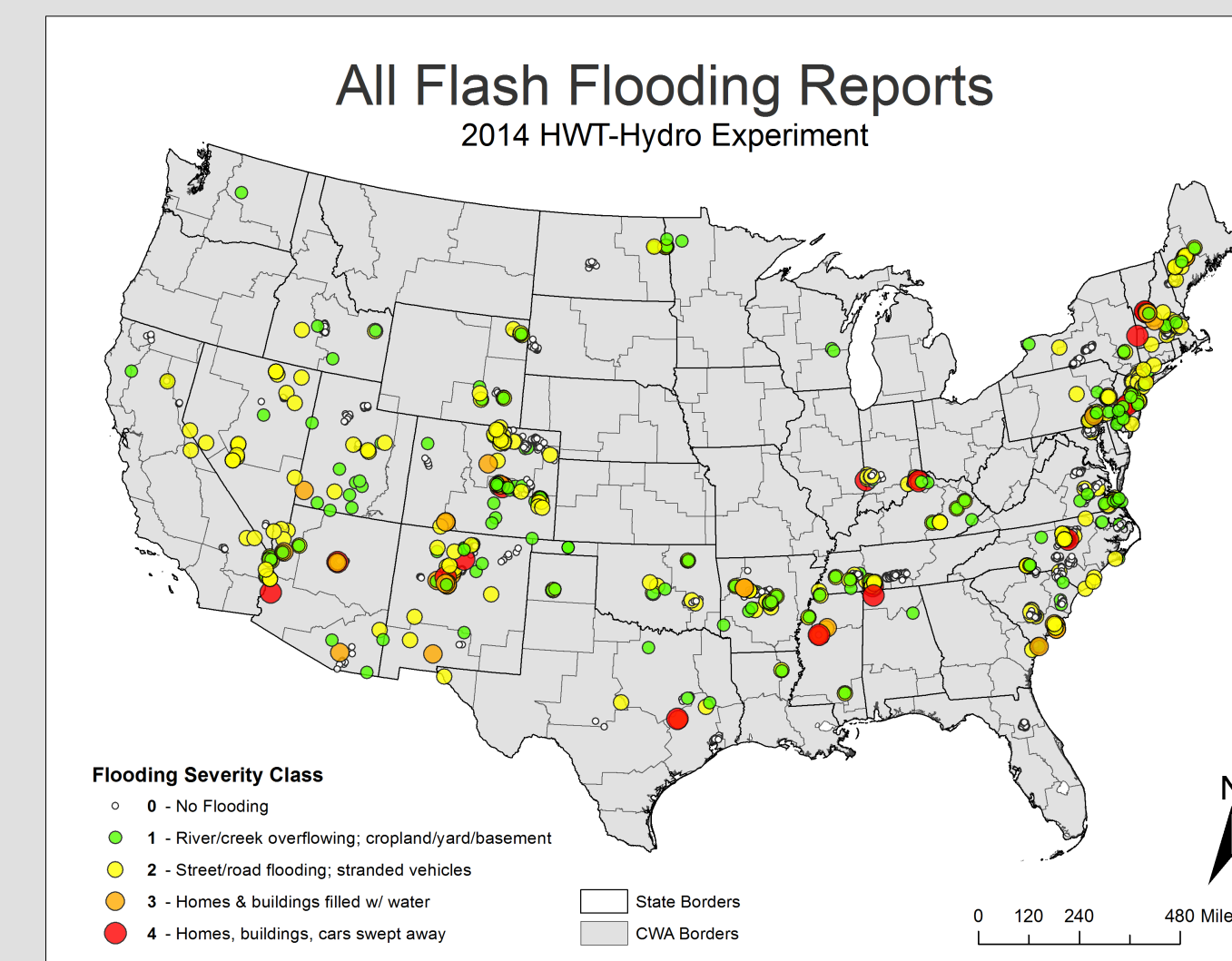
Forecast Tools

- **Hydrologic models**
- Precipitable water
- QPE/QPF
- Flash flood guidance (FFG)
- Precipitation return periods
- Radar



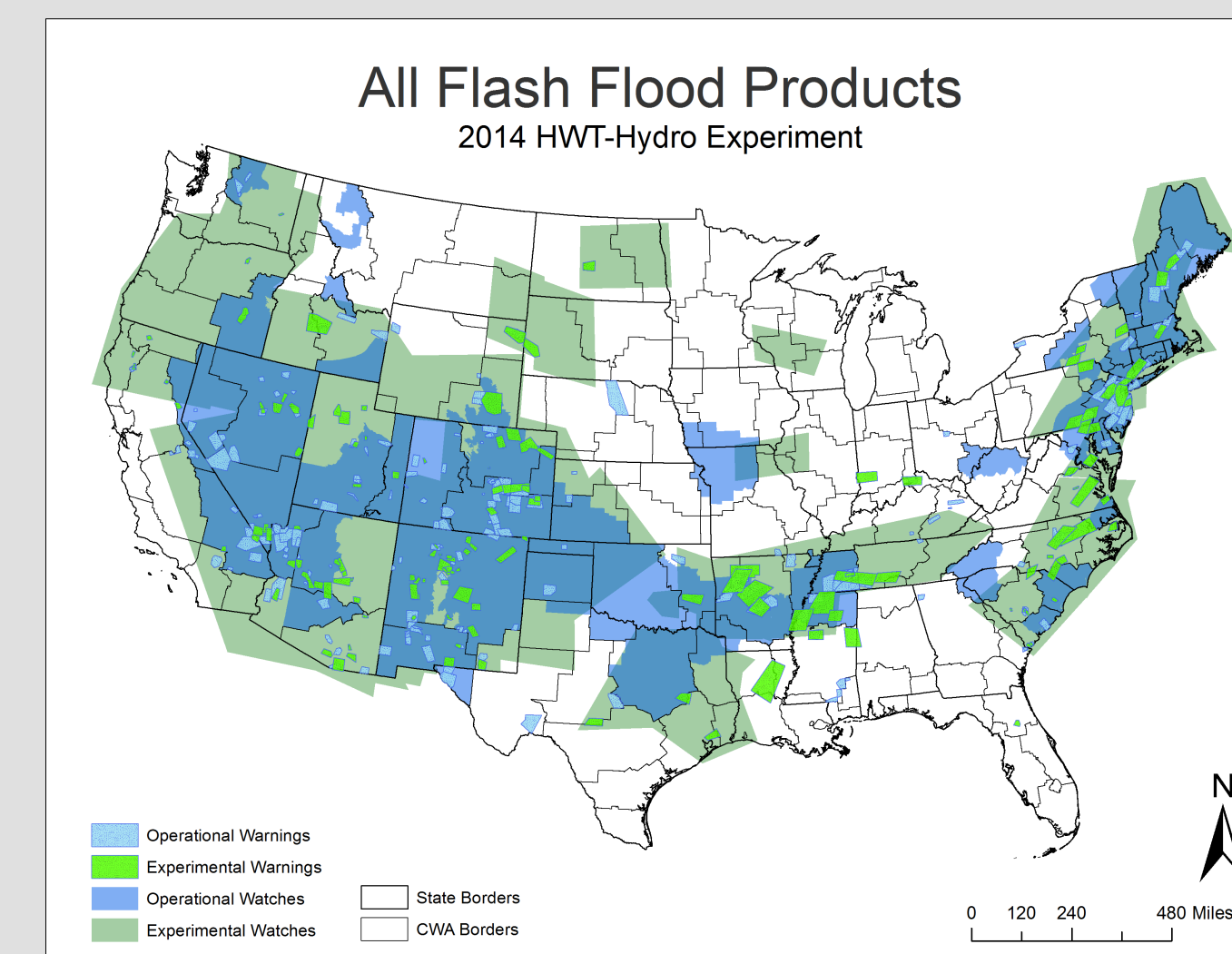
Observations

- USGS Stream Gauges
- Local Storm Reports
- Storm Data
- **mPING (Kim Elmore)**
- **SHAVE (Travis Smith)**



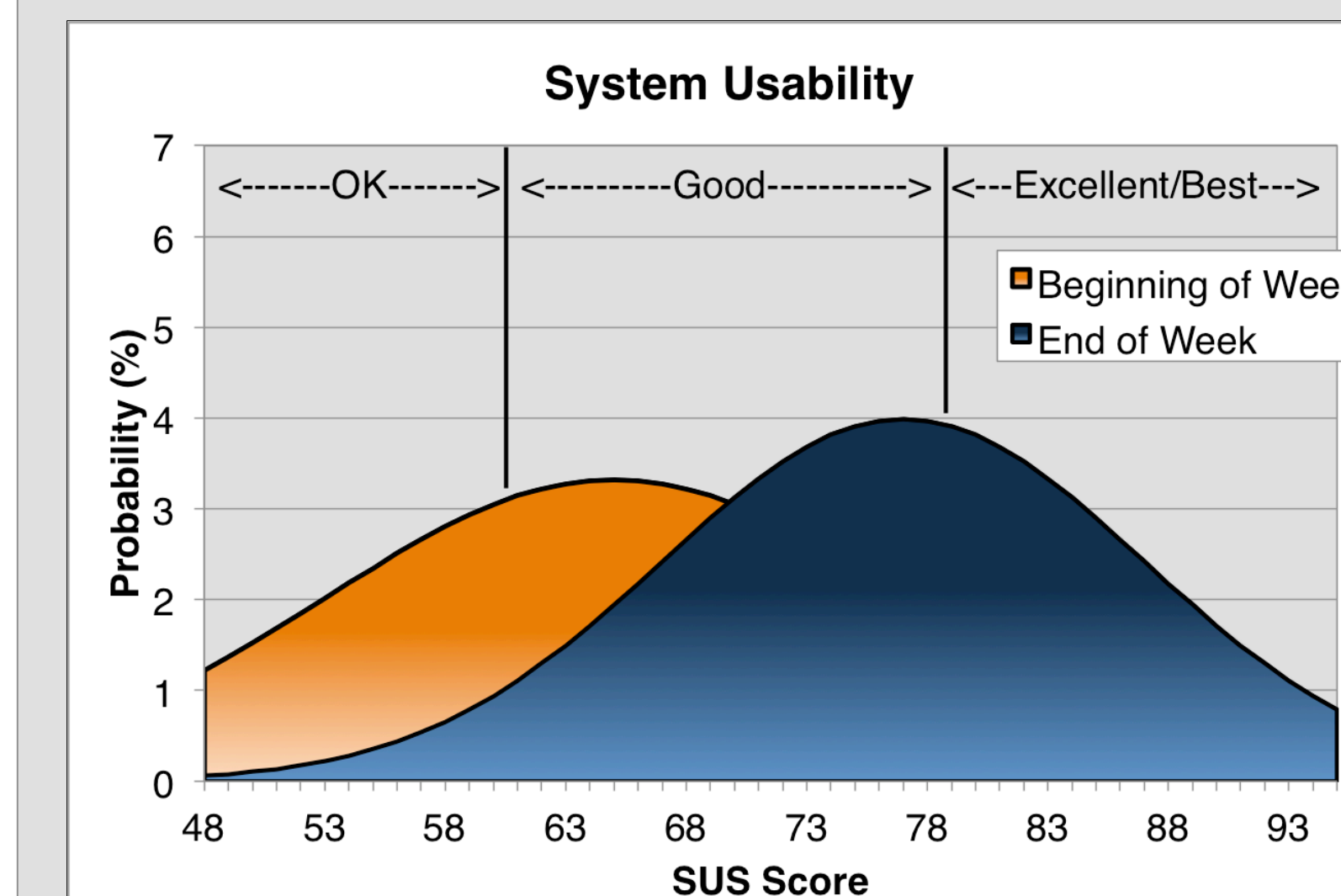
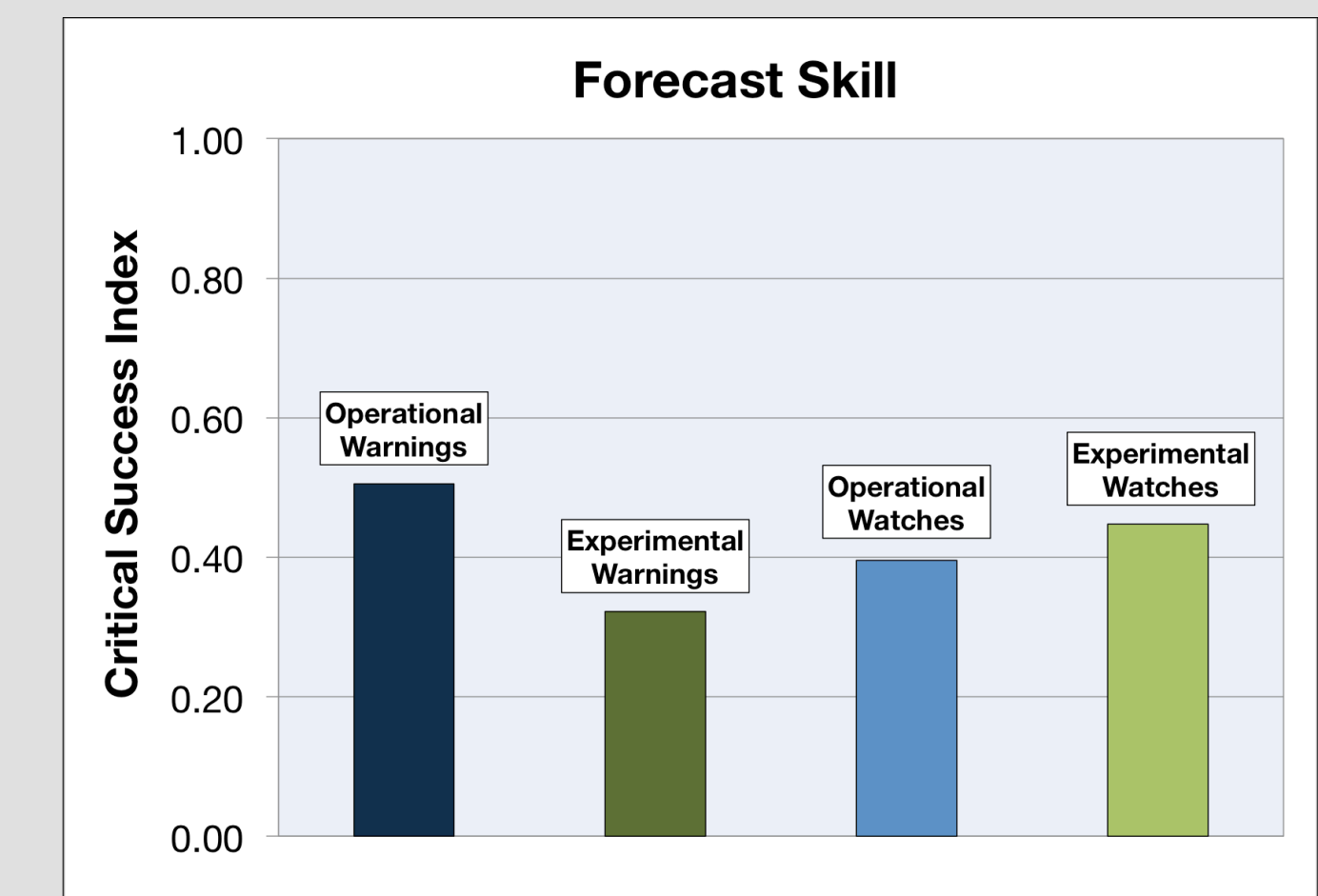
Products

- Operational Warnings
- Experimental Warnings
- Operational Watches
- Experimental Watches



Experiment Results

- Skill of experimental watches comparable to operational watches*
- Skill of experimental warnings less skillful than operational warnings**



- Easy learning curve of FLASH system
- Improved system usability after 1-week of use
- Will help in creating a smooth transition to NWS operations

- Suite of experimental tools increased forecaster confidence
 - Daily subjective evaluations of tools/products
 - 'Tails from the Testbed' webinars
- Forecasters liked assigning uncertainty and magnitude estimates to their watches/warnings (work needed to ensure reliability)



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Forecast Tools

Hydrologic models

Precipitable water

Quantitative Precipitation Estimate (QPE) / Quantitative Precipitation Forecast (QPF)

Flash Flood Guidance (FFG)

Precipitation Return Periods

Radar

1. Prepare FLASH tools for transition to NWS operations
2. Develop and utilize a near-real-time multi-source FF observation database
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Experimentation

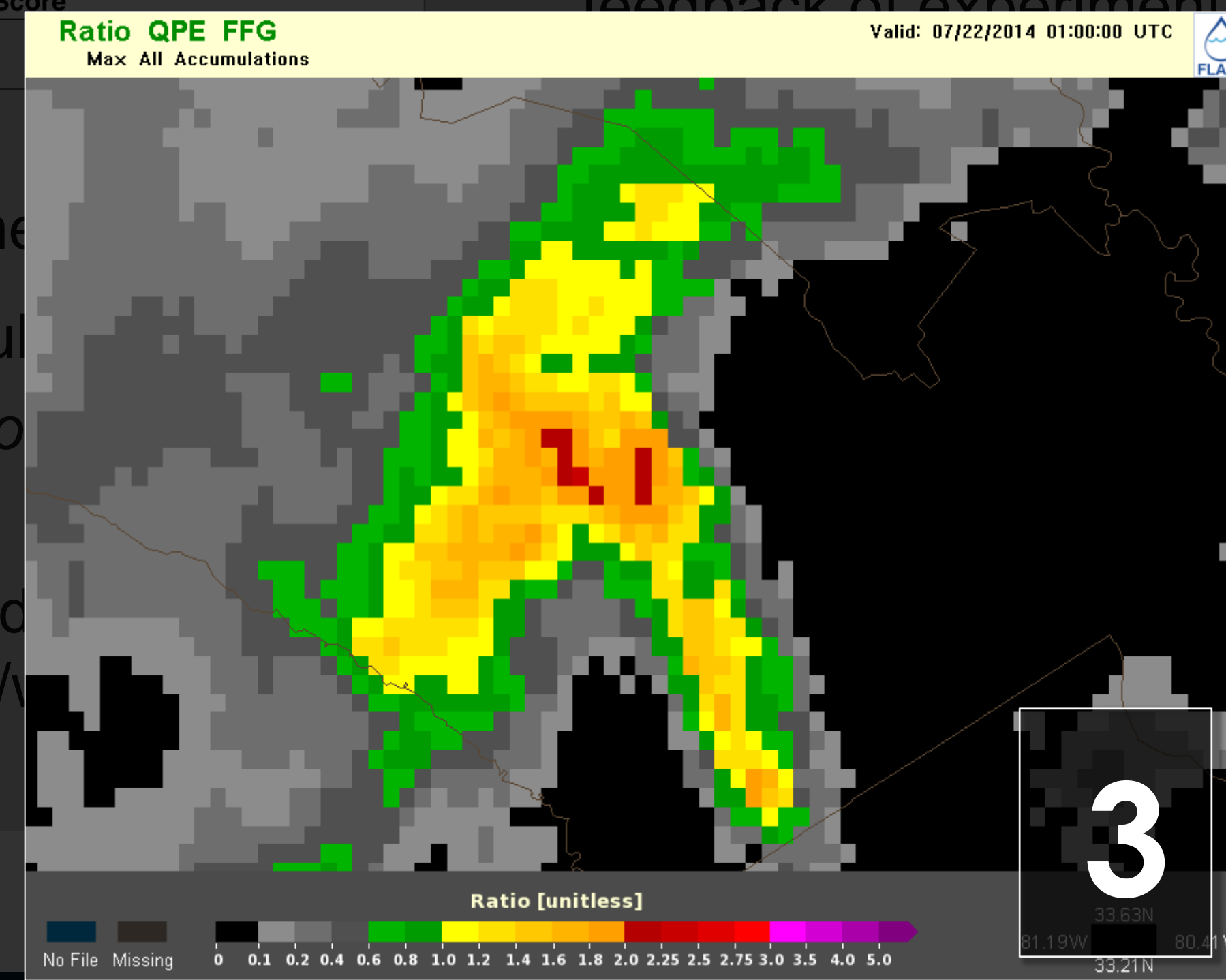
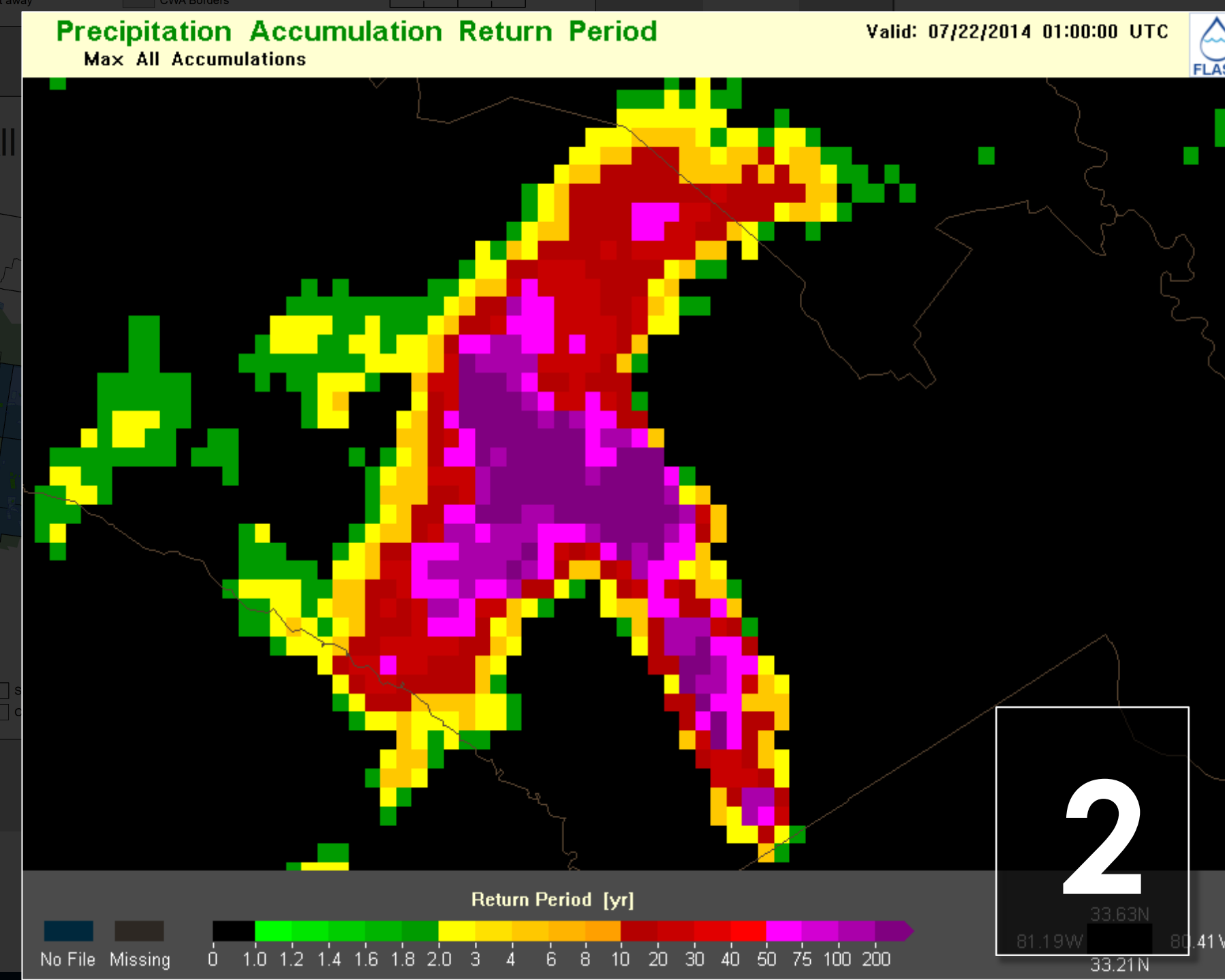
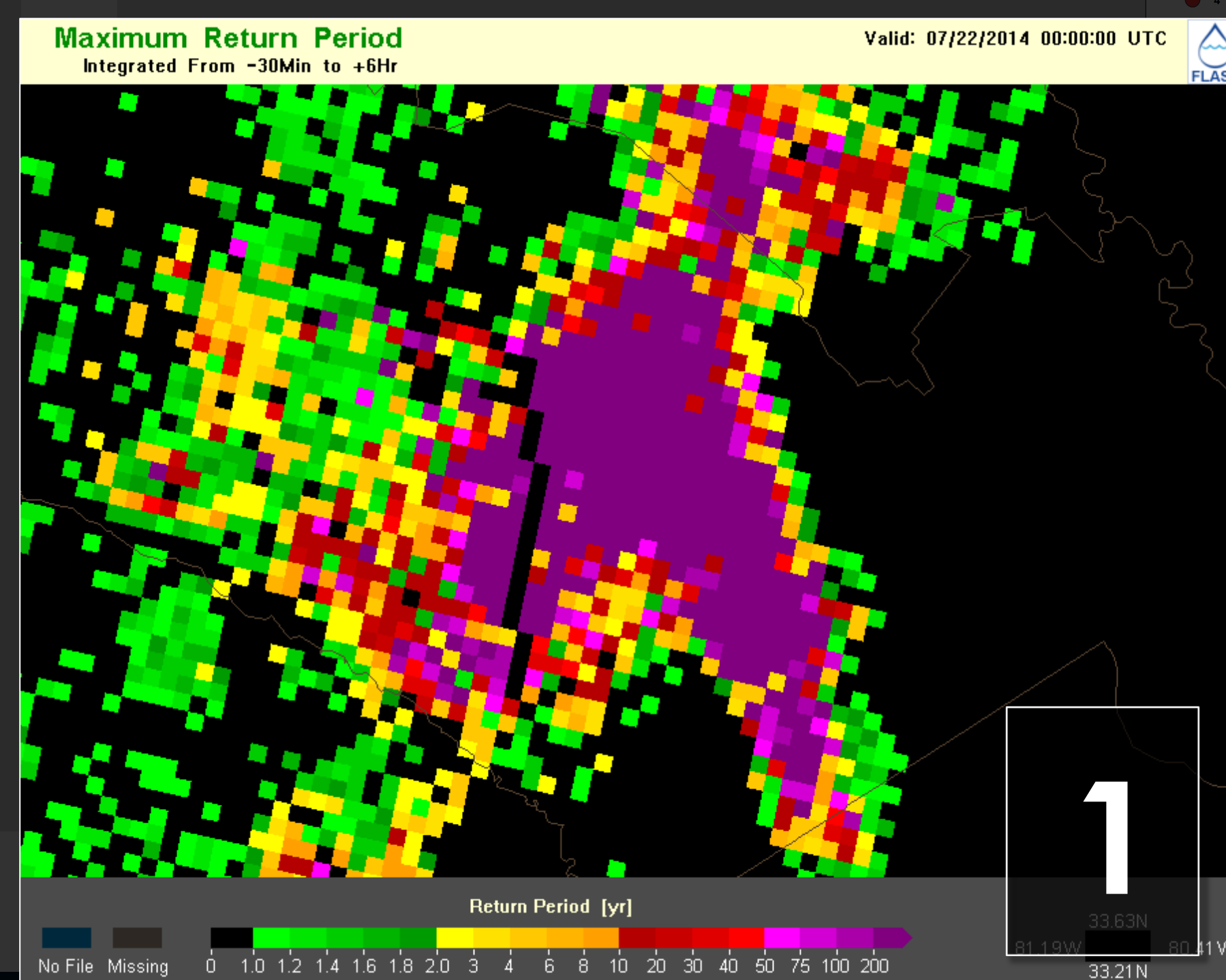
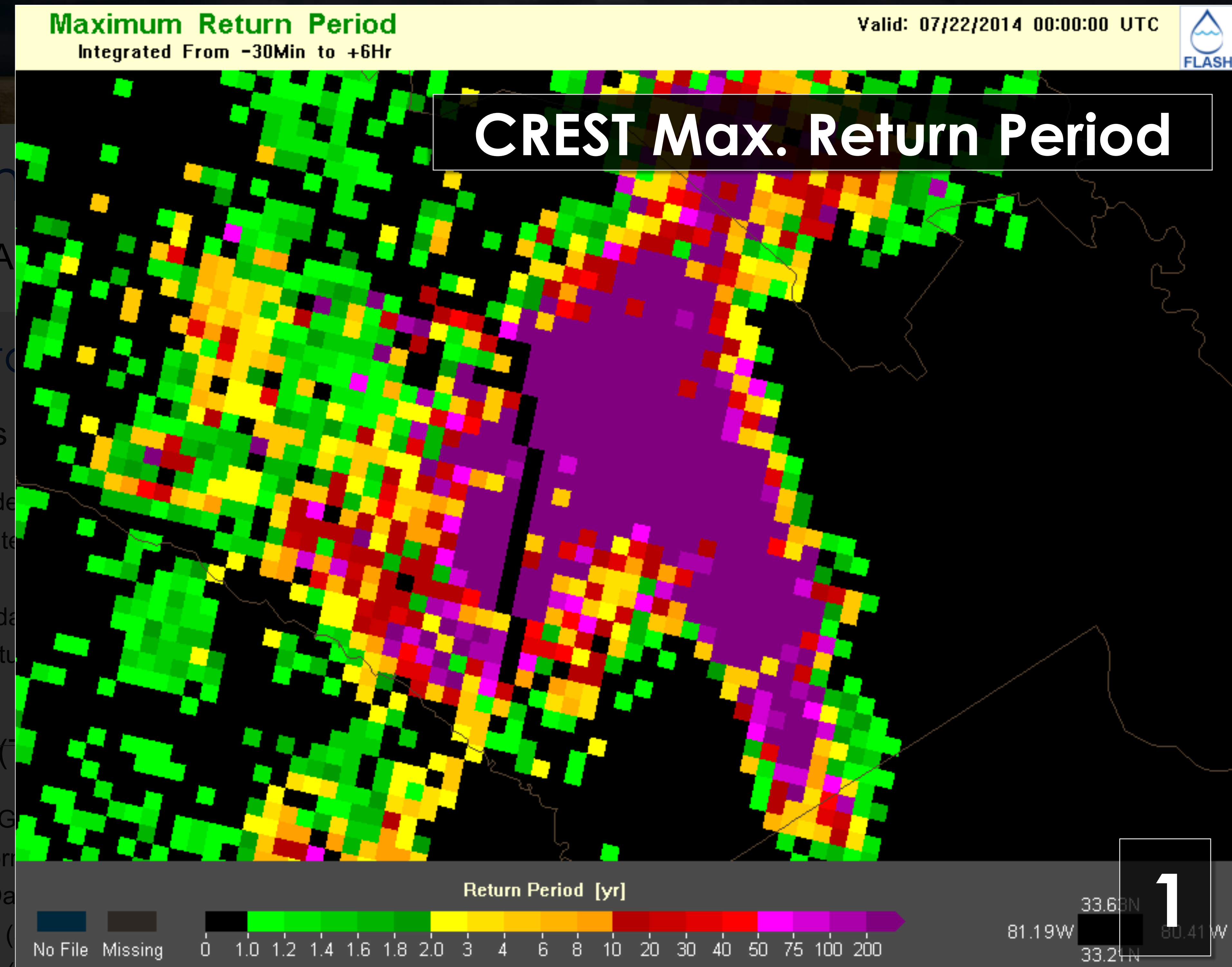
Forecast Tools

- Hydrologic models
- Precipitable water
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- Flash flood guidance
- Precipitation return periods
- Radar

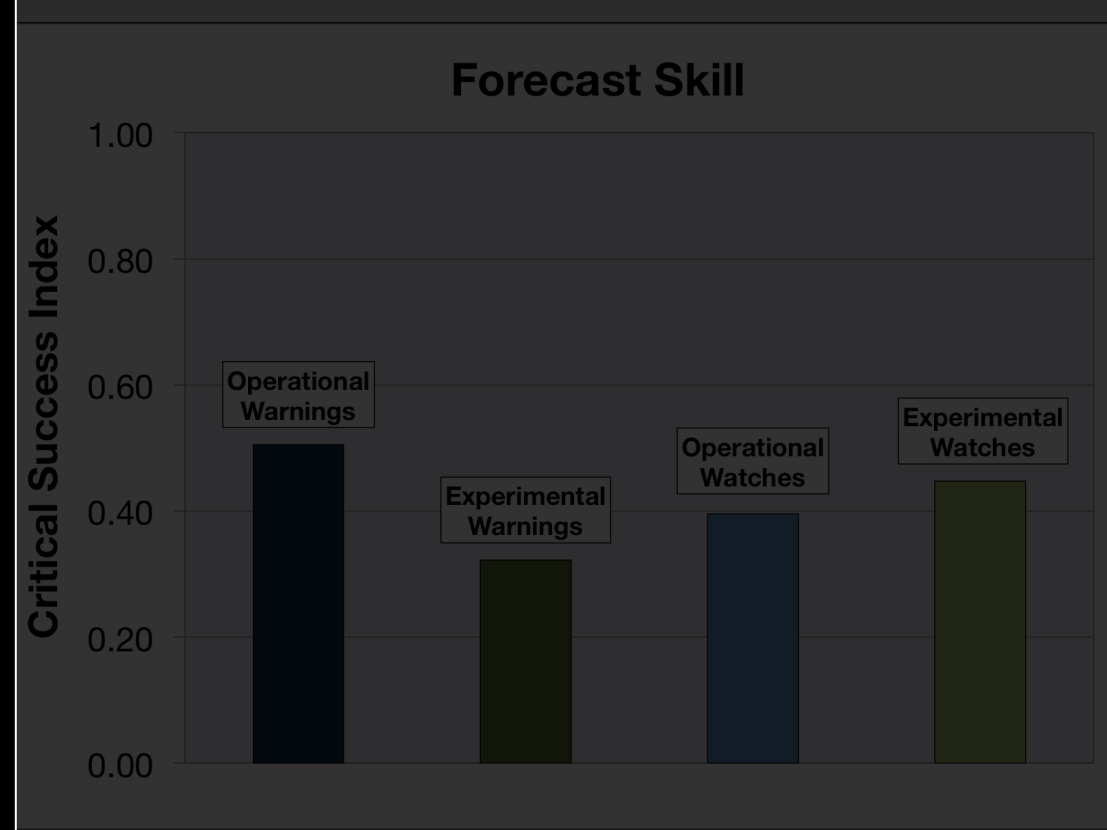
Observations

- USGS Stream Gages
- NWS Local Storm Reports
- NCDC Storm Data
- mPING reports
- SHAVE reports (124 = 1,130 files)

Products (Total: 519)



Return Period



Easy learning curve of FLASH system

Improved system usability after 1-week of use

Overall, positive participant feedback of experiment



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Forecast Tools

- Hydrologic models

Featured 17 NWS forecasters from across the U.S.

- Precipitable water

- Issued experimental probabilistic flash flood

- Quantitative Precipitation Estimate (QPE) / Quantitative Precipitation Forecast (QPF)

- Flash Flood Guidance (FFG)

- Precipitation Return Periods

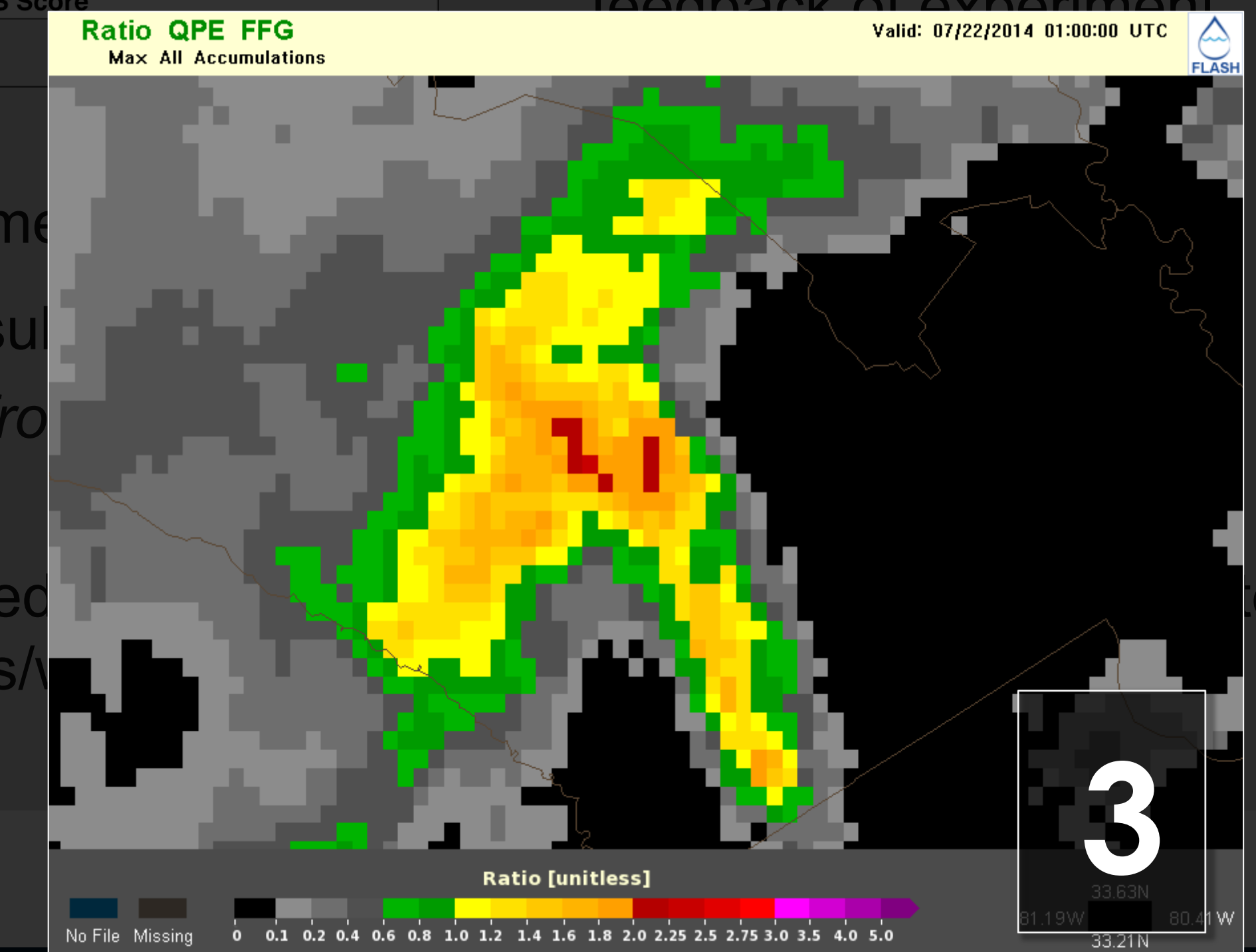
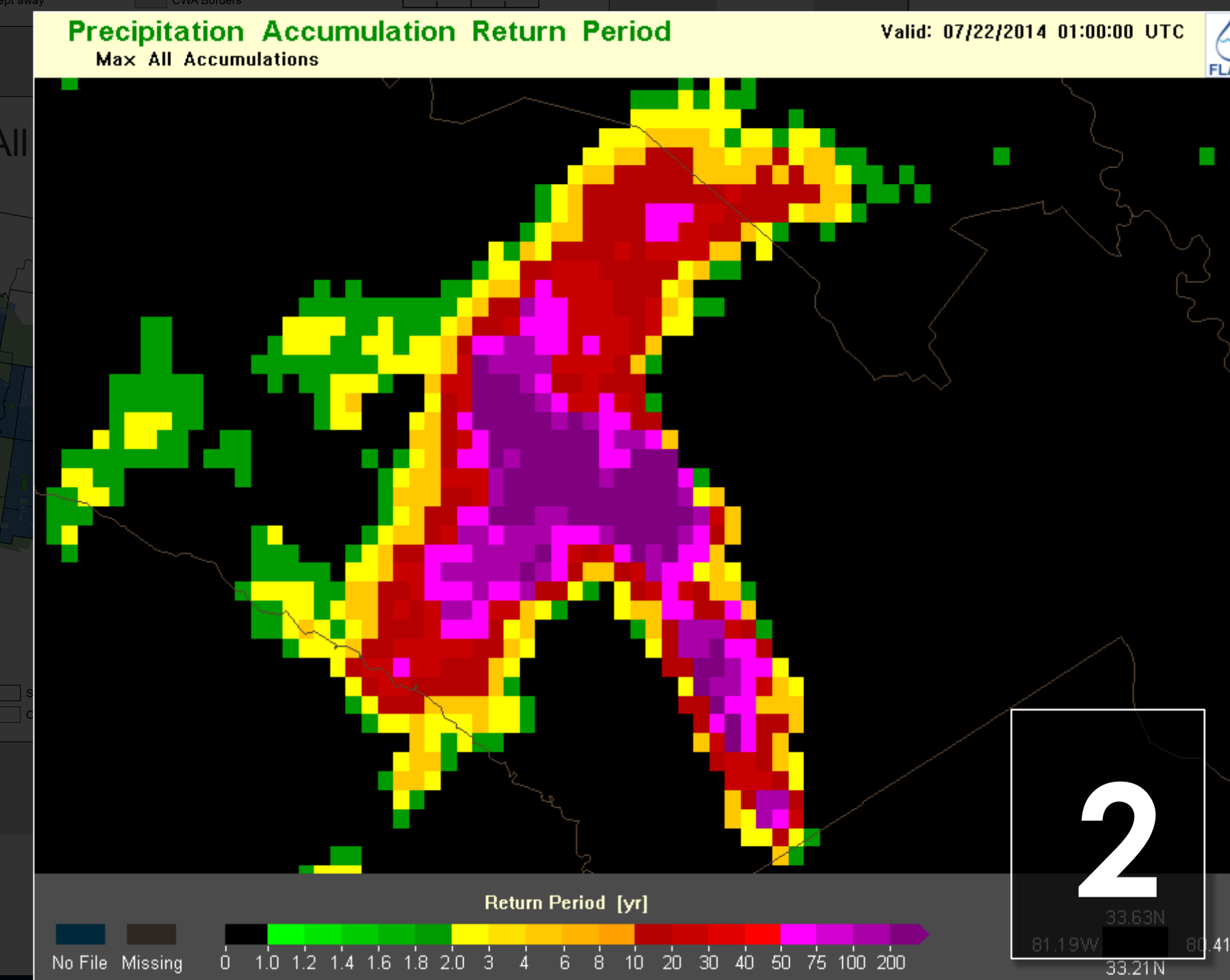
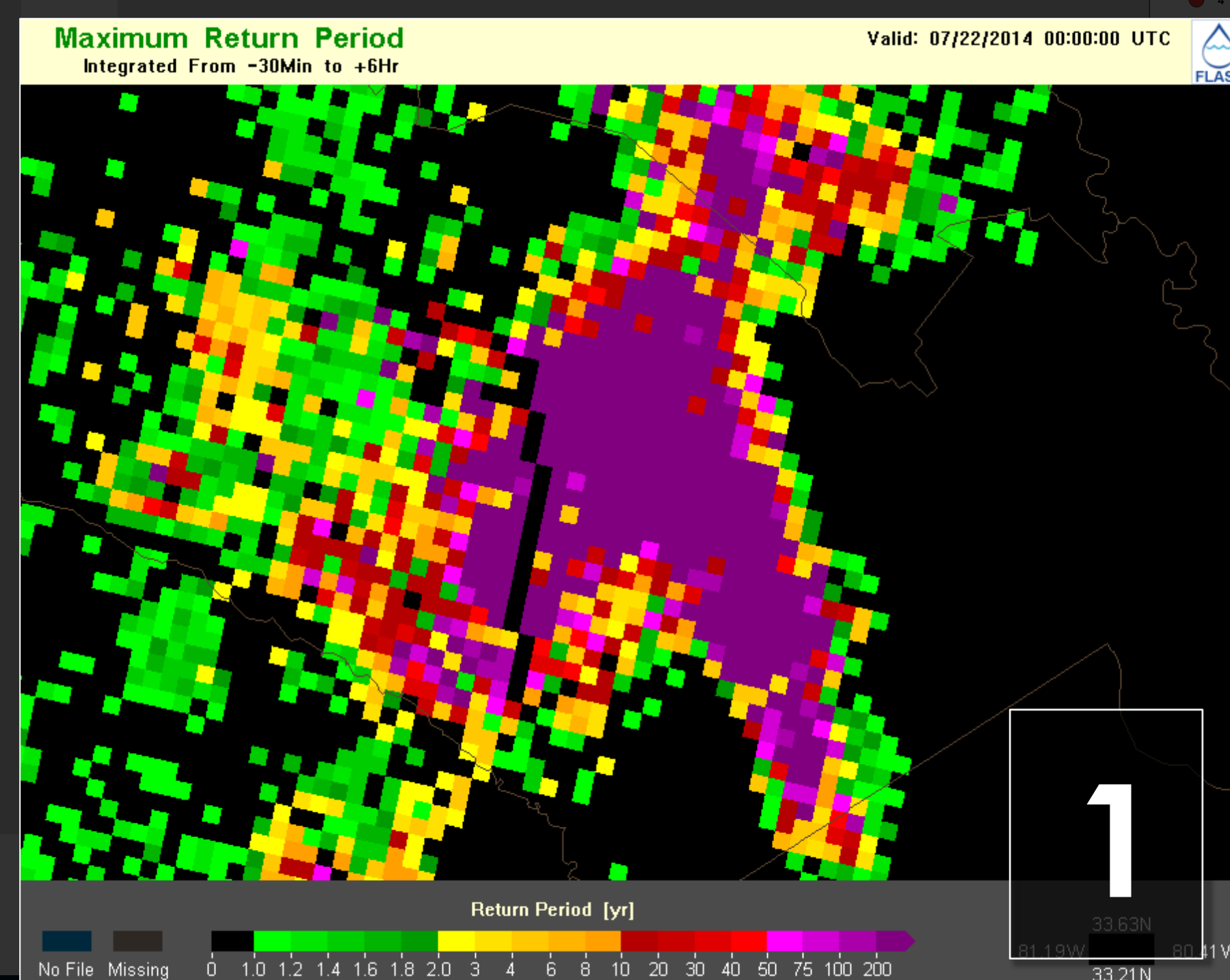
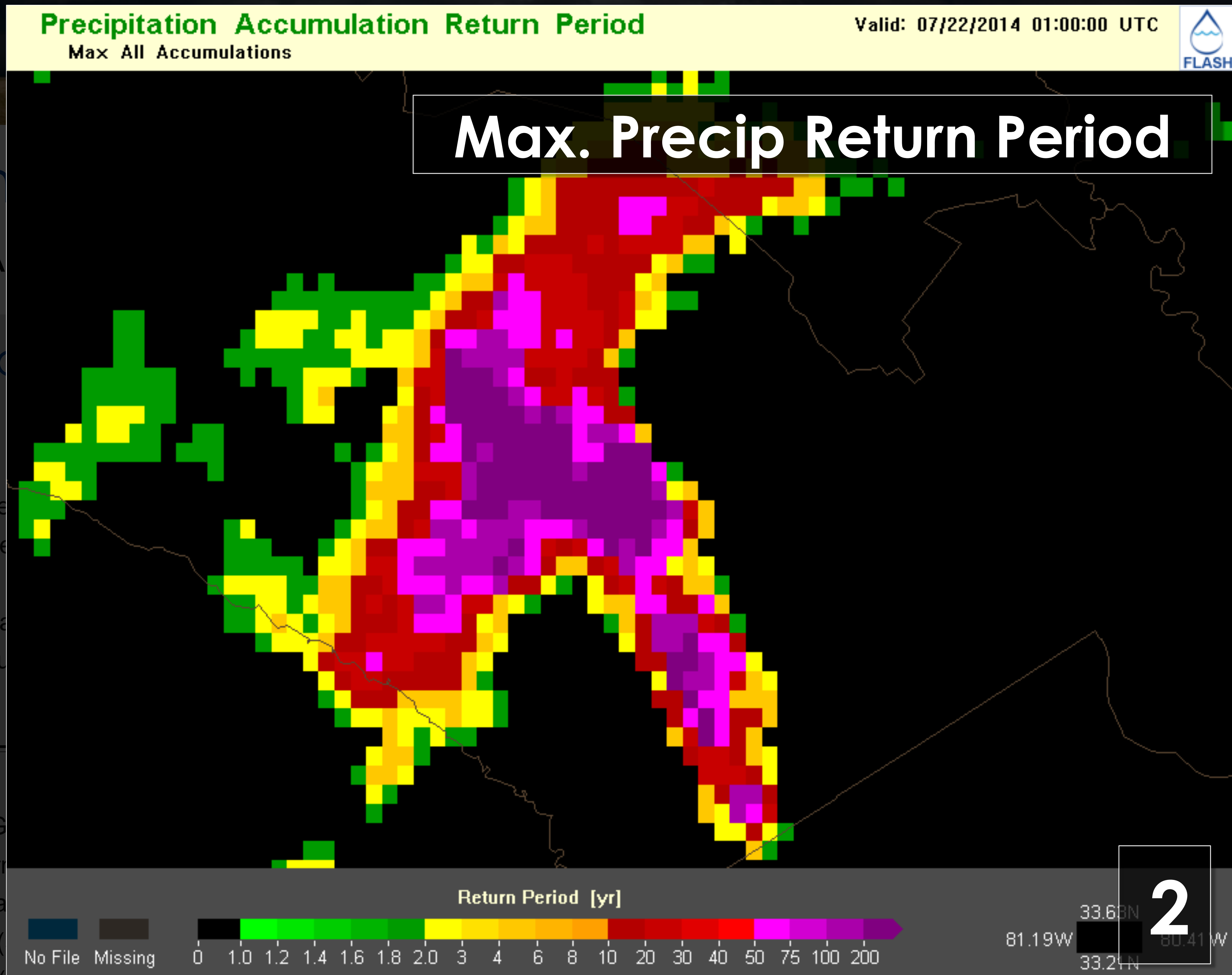
Prepare FLASH tools for transition to NWS operations

- Radar

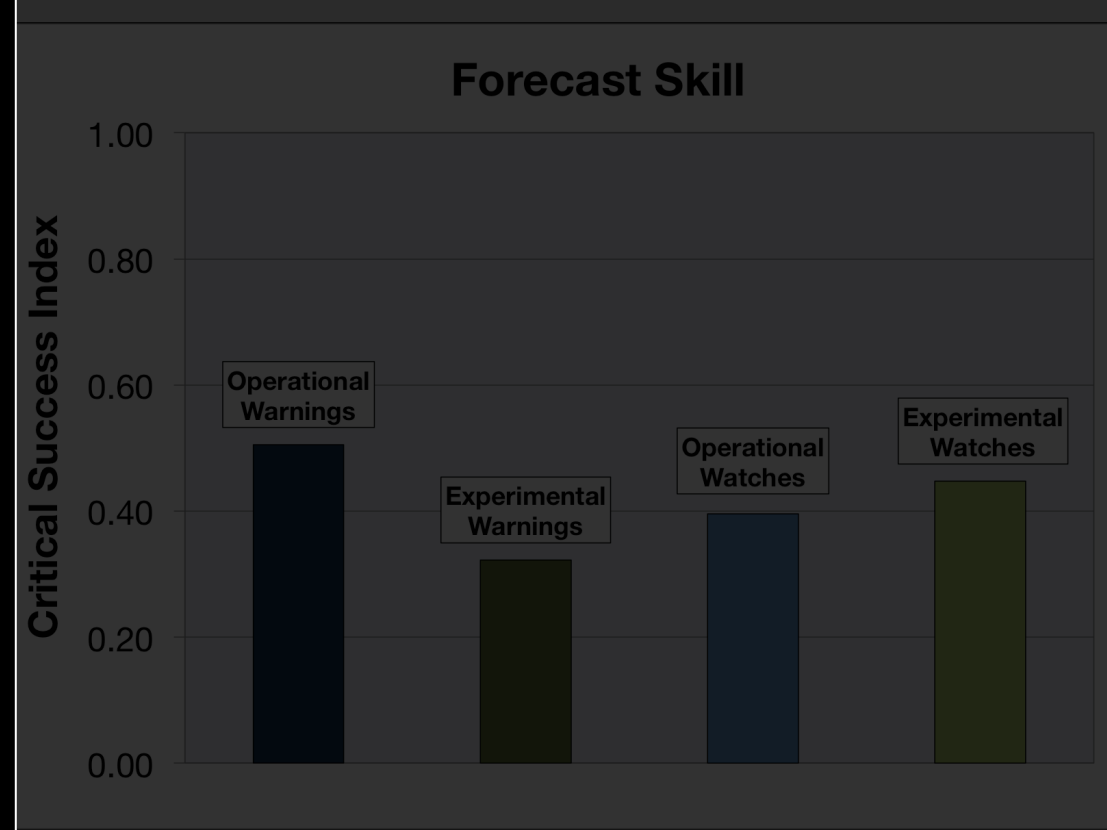
- 2. Ingest, utilize a near-real-time multi-source FF observation database

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- 4. Subjective evaluation of all experimental observations, tool, and forecast products



Return Period



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Forecast Tools

- Hydrologic models

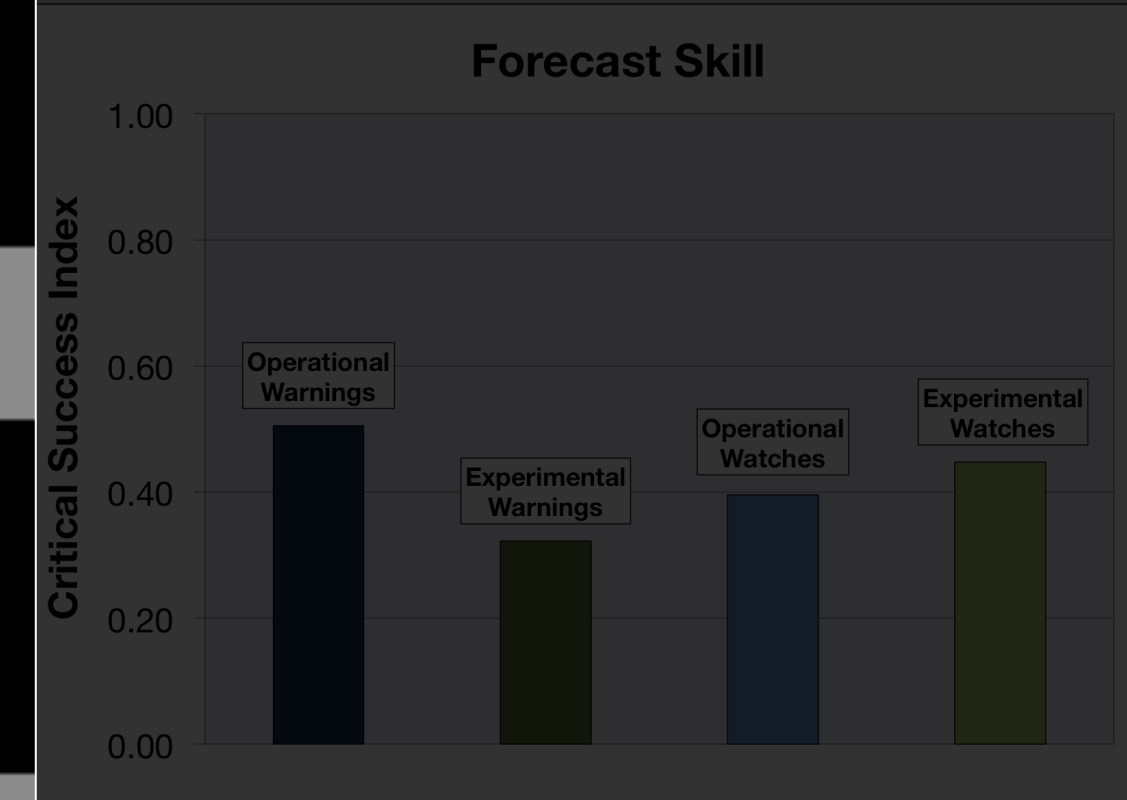
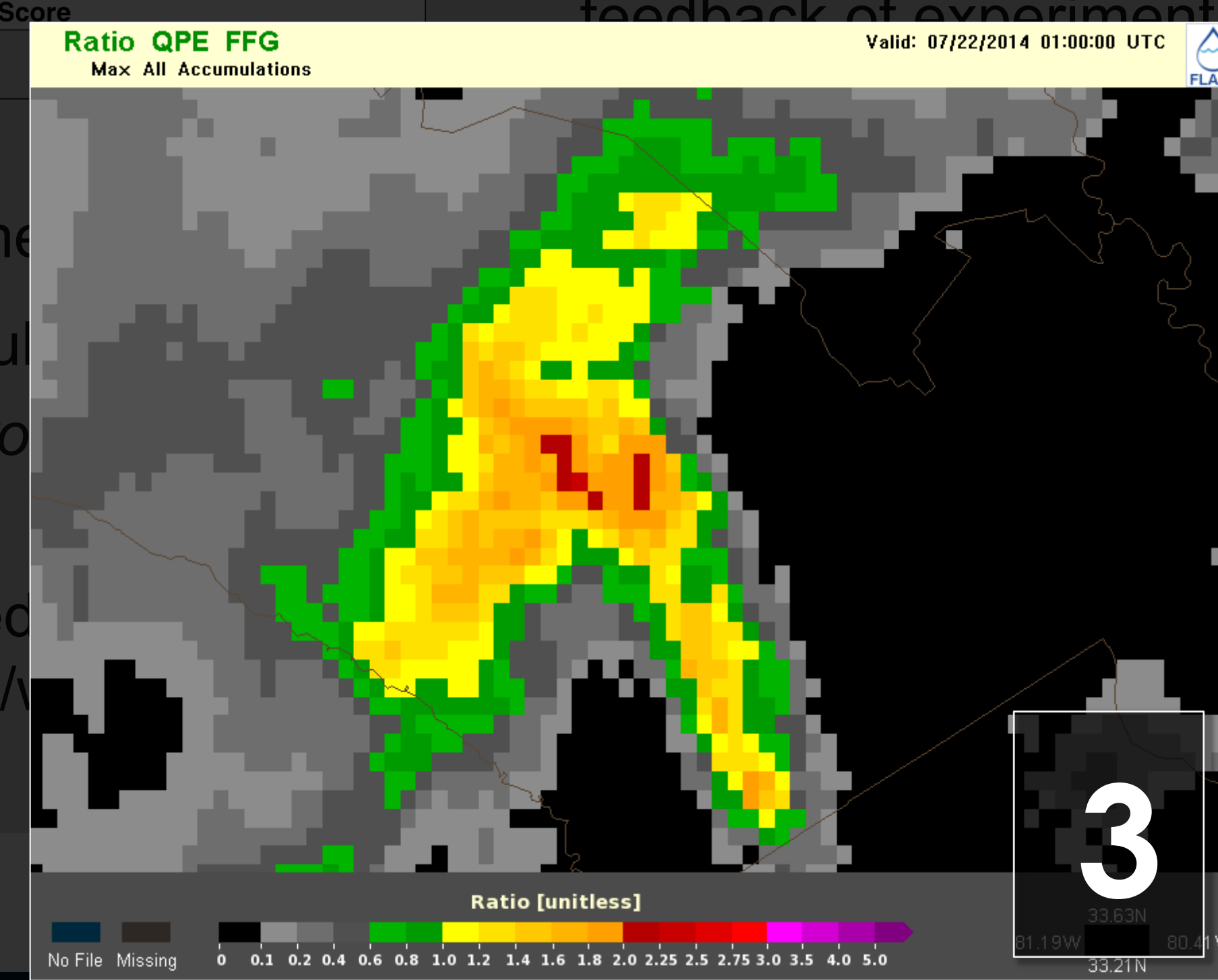
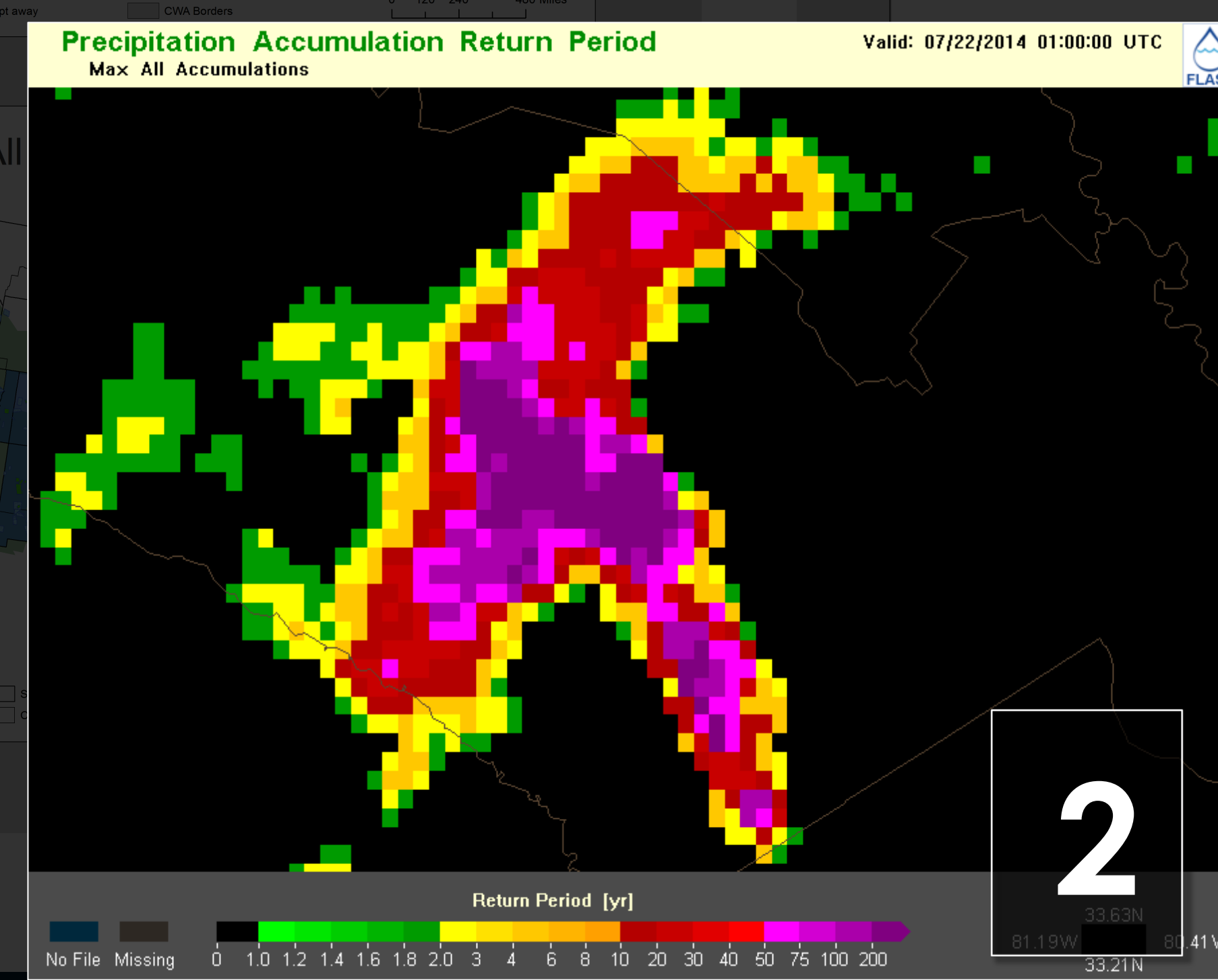
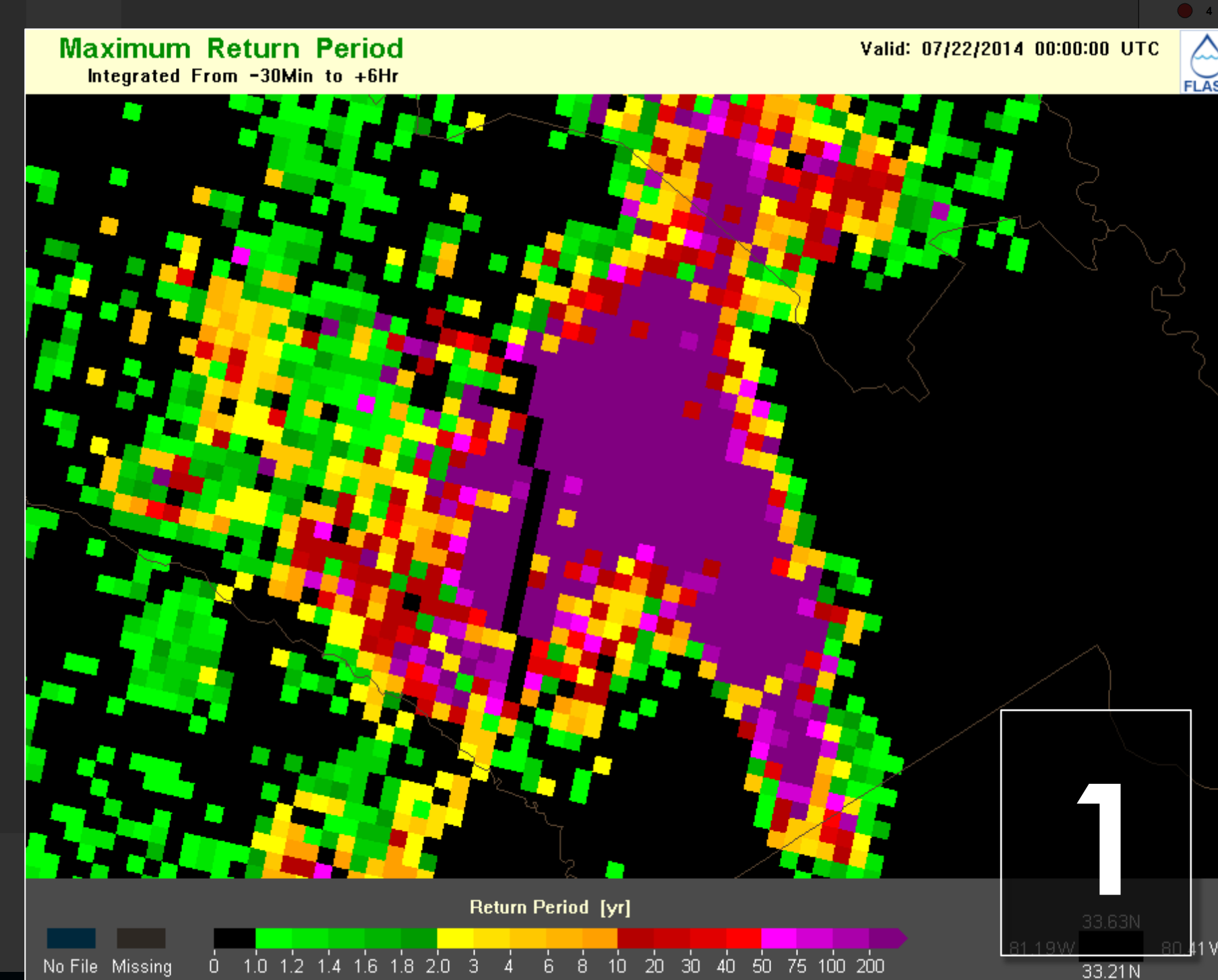
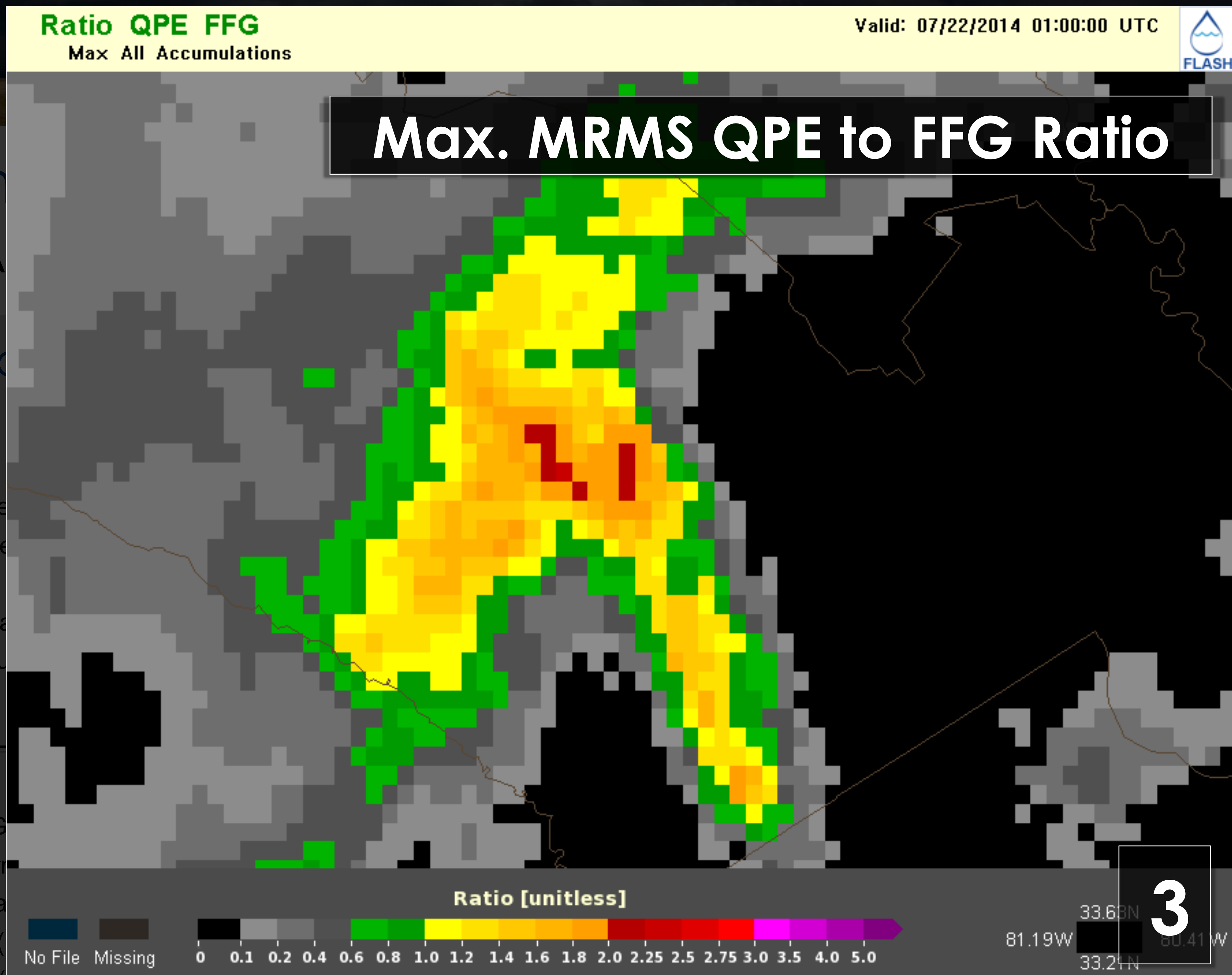
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- Flash Flood Guidance (FFG)

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Experiment

- Forecast Tools

- Hydrologic models
- Precipitable water
- QPE/QPF
- Flash flood guidance
- Precipitation return periods
- Radar

- Observations (FFG)

- USGS Stream Gages
- NWS Local Storm Reports
- NCDC Storm Data
- mPING reports (124 = 1,130 huff)
- SHAVE reports

- Products (Total: 519)



The 2014 Multi-Radar

Brandon R. Smith, J.J. C

Experiment Activities

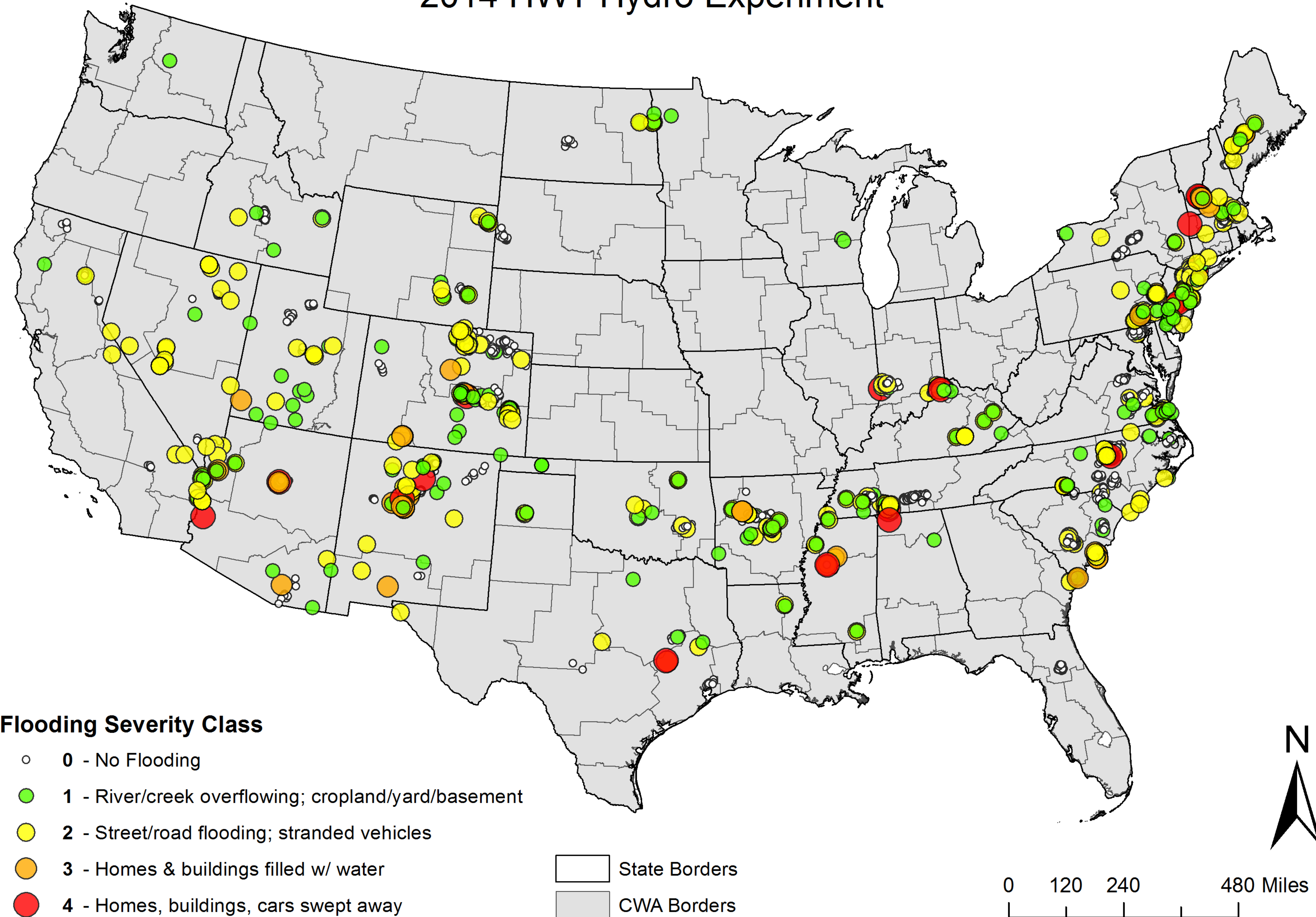
Observations (Total: 606)

- July 7 – August 1, 2014 in Norman, OK
- **USGS Stream Gauges (9)**
 - Issued experimental probabilistic flash flood watches and warnings with impact characterization
- **NWS Local Storm Reports (250)**
 - Utilized a suite of 30+ experimental MRMS-FLASH tools in NWS forecast offices
- **NCDC Storm Data (184)**
 - Coordinated daily with WPC's FFaIR Testbed
- **mPING reports (39)**
- **SHAVE reports (124 / 1,130 null)**

1. Prepare FLASH tools for transition to NWS operations
2. Ingest, utilize a near-real-time multi-source FF observation database
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All Flash Flooding Reports

2014 HWT-Hydro Experiment



The 2014 Multi-Radar

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Experiment Activities

- July 7 – August 1, 2014 in Norman, OK

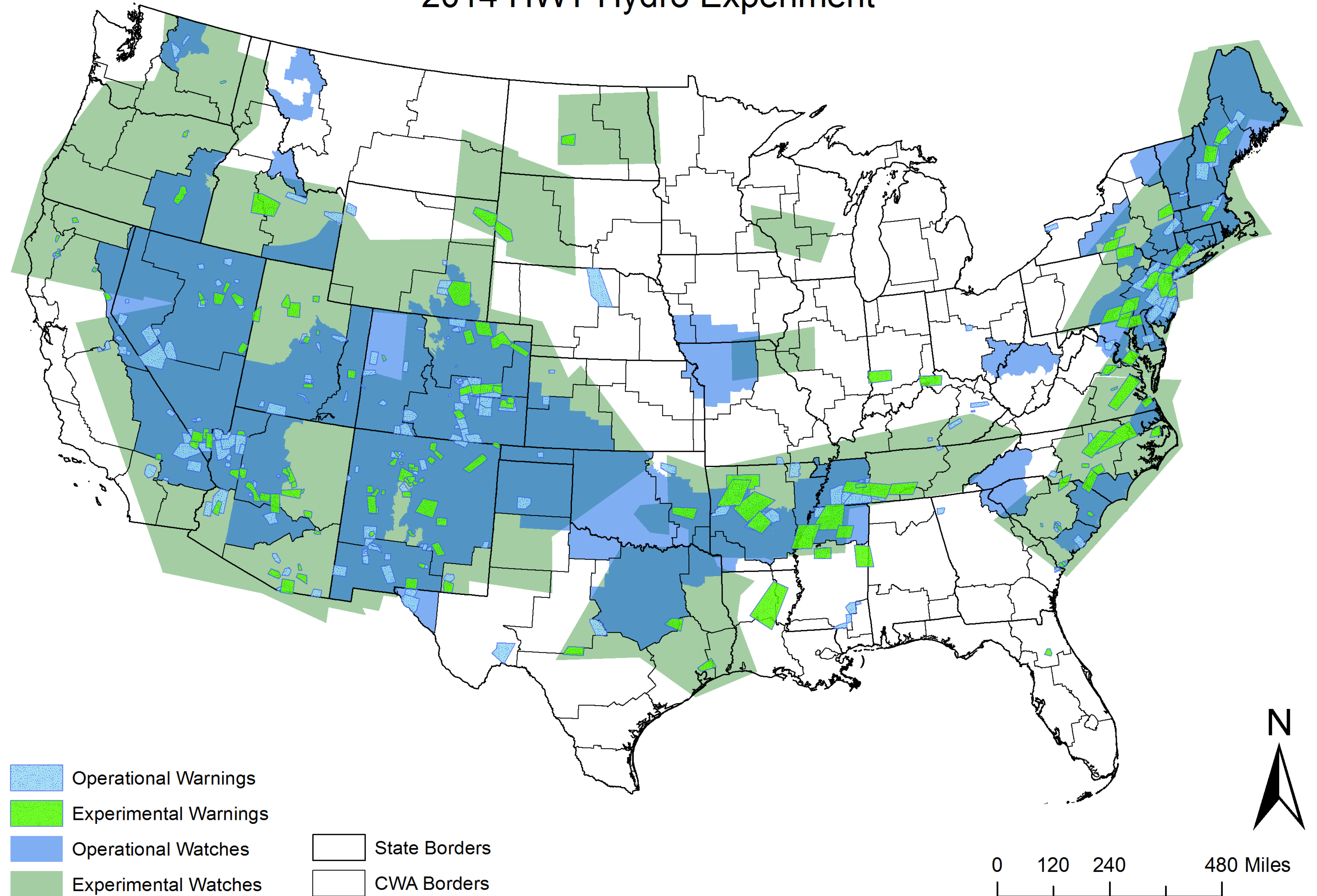
Products (Total: 519)

- Issued experimental probabilistic flash flood
- Operational FF Warnings (236)**
- Utilized a suite of 30+ experimental MRMS-FLASH tools
- Experimental FF Warnings (153)**
- Coordinated daily with WPC's FFaIR Testbed
- Operational FF Watches (79)**
- Experimental FF Watches (51)**

1. Prepare FLASH tools for transition to NWS operations
2. Ingest, utilize a near-real-time multi-source FF observation database
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All Flash Flood Products

2014 HWT-Hydro Experiment



The 2014 Multi-Radar

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- **Skill of experimental watches comparable to operational watches***

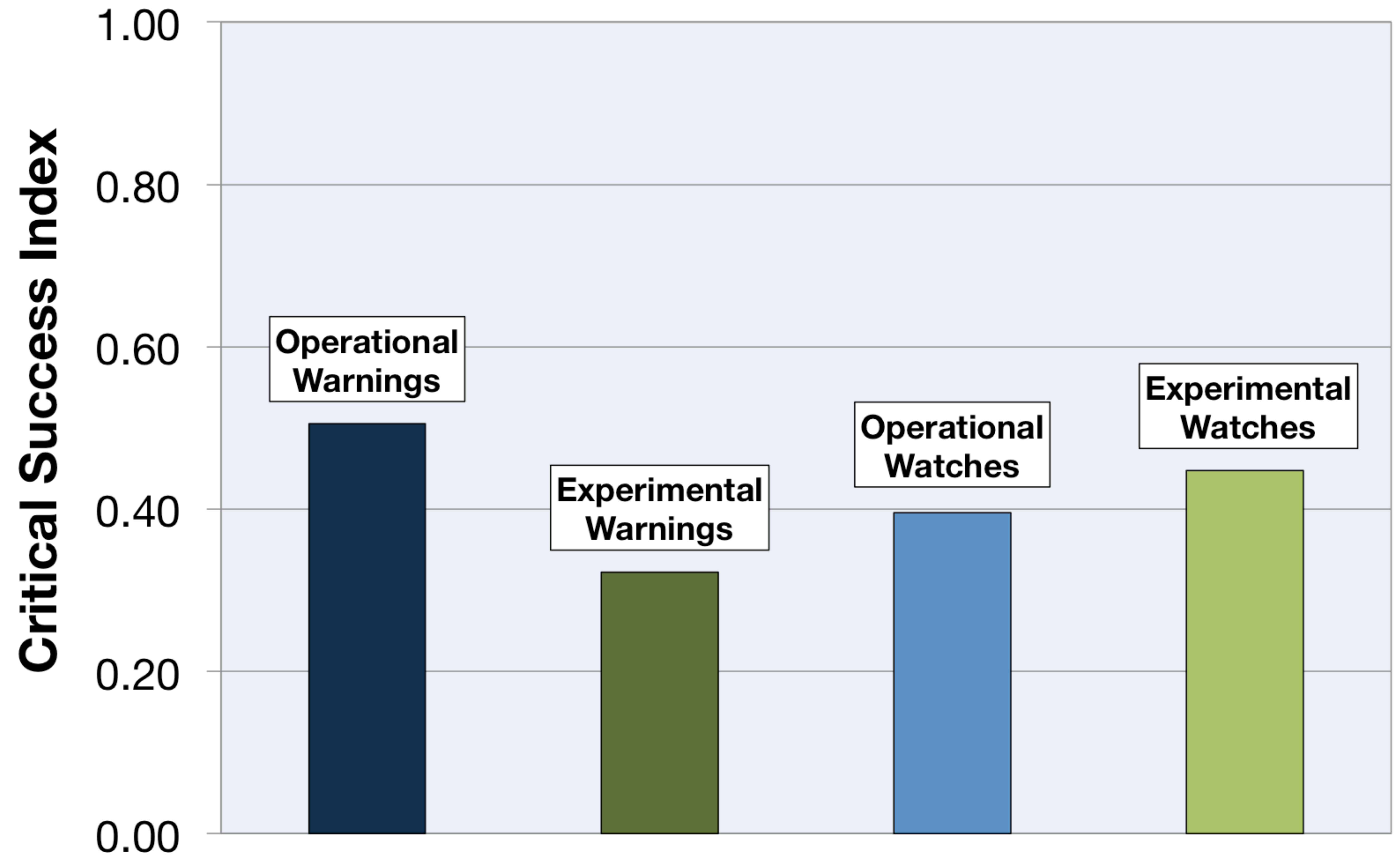
- Featured 17 NWS forecasters from across the U.S.
 - *Large watch sizes might skew the results*
 - *Issued experimental probabilistic flash flood watches and warning with impact characterization*

- Utilized a suite of 30+ experimental MRMS-FLASH tools
- **Skill of experimental warnings less skillful than operational warnings****

- Not a factor of the experimental tools
- Combination of report availability & lack of local knowledge

1. Preparation of reports
2. Integration of reports into a database
3. Issuance of watches between 0 – 6 hours before event & experimental FF warnings just prior to and during an event
4. Subjective evaluation of all experimental observations, tool, and forecast products

Forecast Skill



The 2014 Multi-Radar

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Experiment Activities

- July 7 – August 1, 2014 in Norman, OK

- **Easy learning curve of FLASH system**

experimental probabilistic flash flood watches and warning with impact characterization

- **Improved system usability after 1-week of use**

- Coordinated daily with WPC's FFaIR Testbed

- **Will help in creating a smooth transition to NWS operations**

Main Goals of HWT-Hydro

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System Usability

