



# DOH Workshop

## ABRFC Short Term Ensembles Experiences

OHD - June 10, 2004

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DOH - ABRFC

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# ABRFC Background



- Why did ABRFC participate?
  - Customer requirement limited for long range probabilistic information, but high for short range probabilistic information
  - Major floods on mainstem Arkansas typically last 7 days
  - Typical flooding is on the order of 1 to 3 days.
  - ABRFC expects to use a total suite of probabilistic forecasts to satisfy customer demand.



## ABRFC Experiences



- Began involvement in late 2002.
- First runs made in May, 2003.
- Selected 5 basins in Southwest Missouri.
- Wide selection of rainfall events; average annual rainfall equals 42 inches.
- Made first report on results to Probabilistic forecasting workshop held at Kansas City MO, Aug 2003.
- Made another presentation of results of verification to Ensemble workshop April, 2004



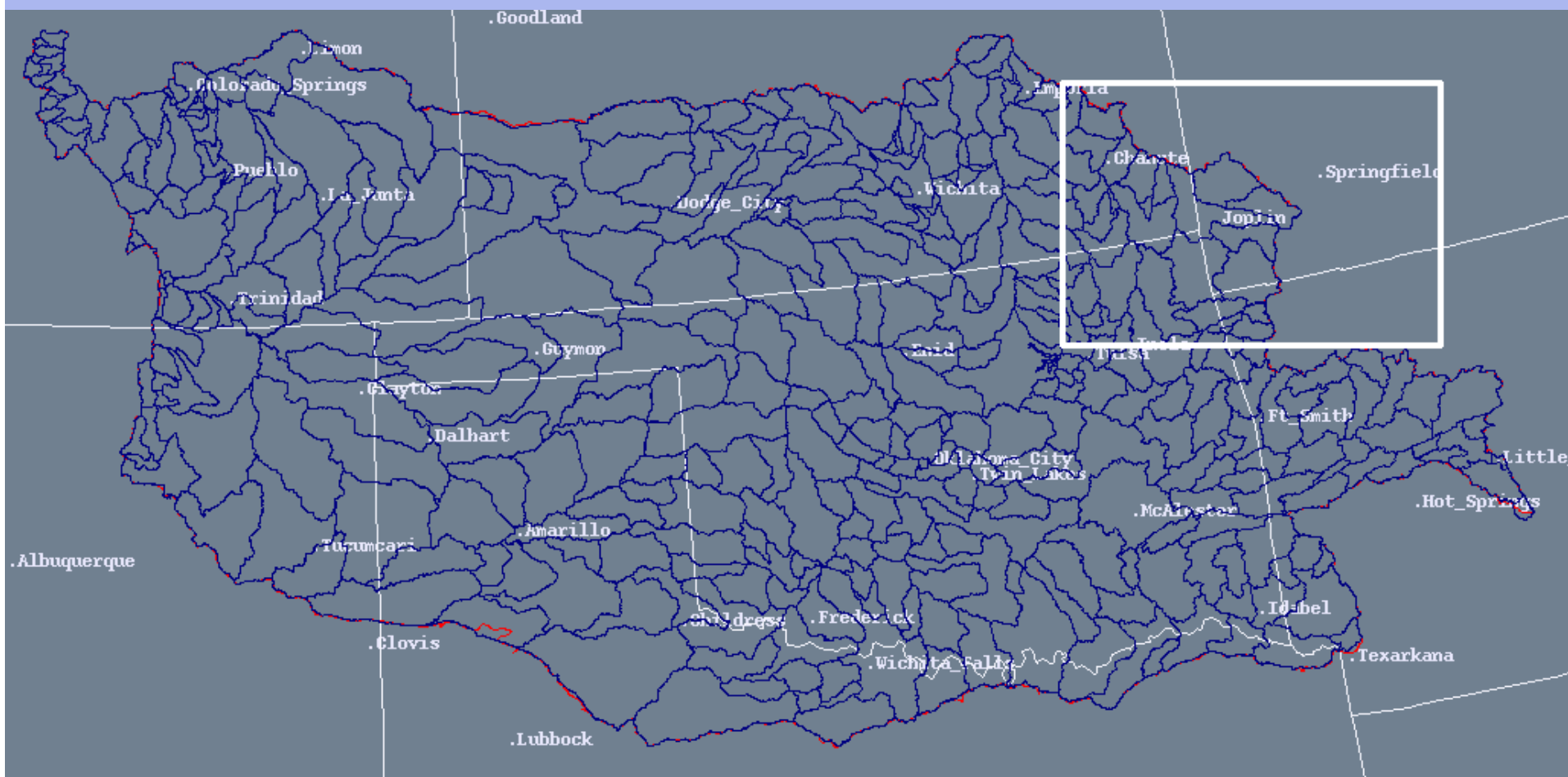
## ABRFC Data Requirements



- QPF/QPE archive used for calibration is currently 44 months long; April 2000-Nov 2003.
- Hope to move to QPF archive using 48 hours as compared to 24 hours currently using. Currently only have 14 months (March 2003 – May 2004) of 48 hour data. HPC may have data back to Nov 2001.
- Important point is that long archive of QPF/QPE database is desirable.



# Project Area



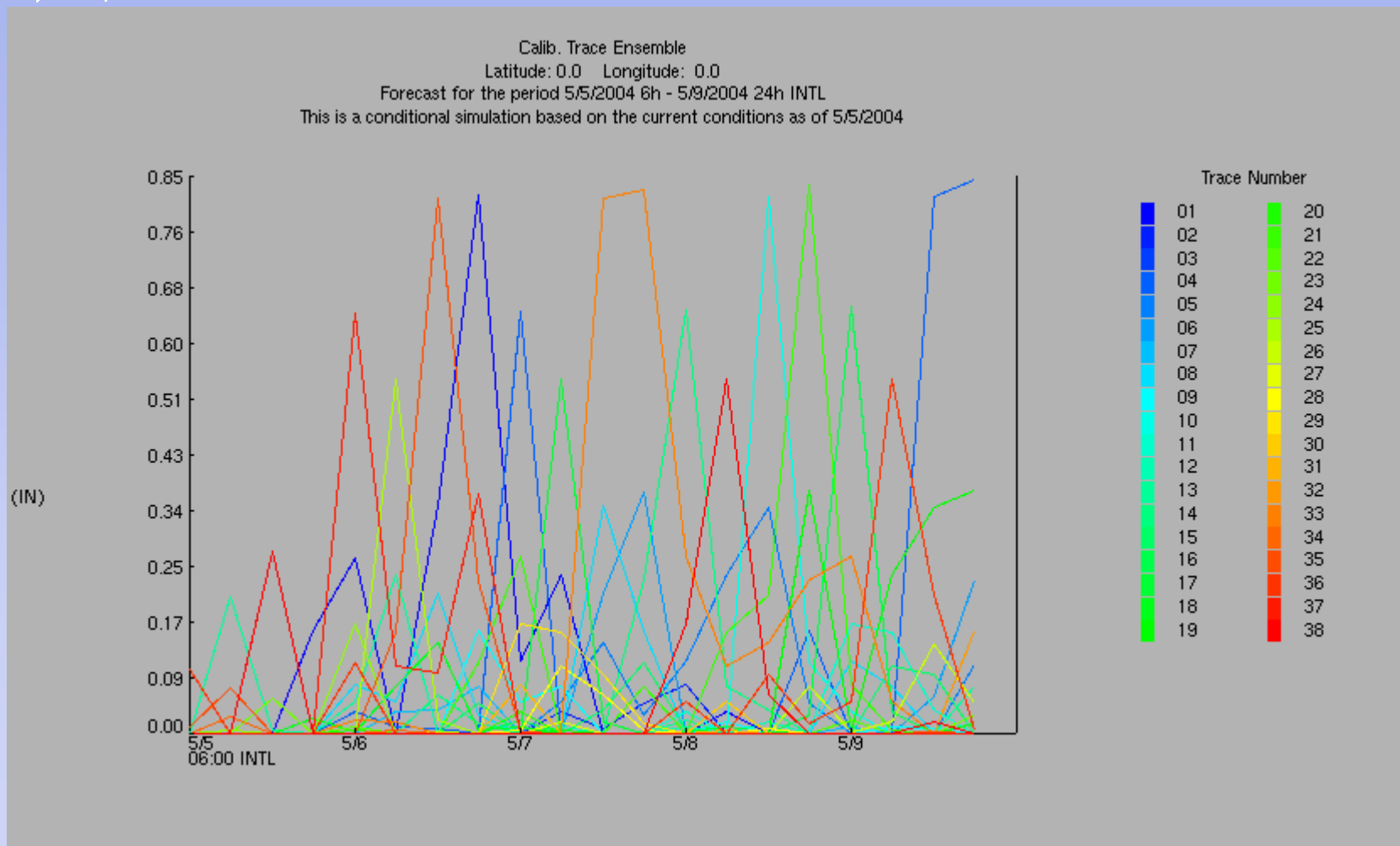


# Study Basins



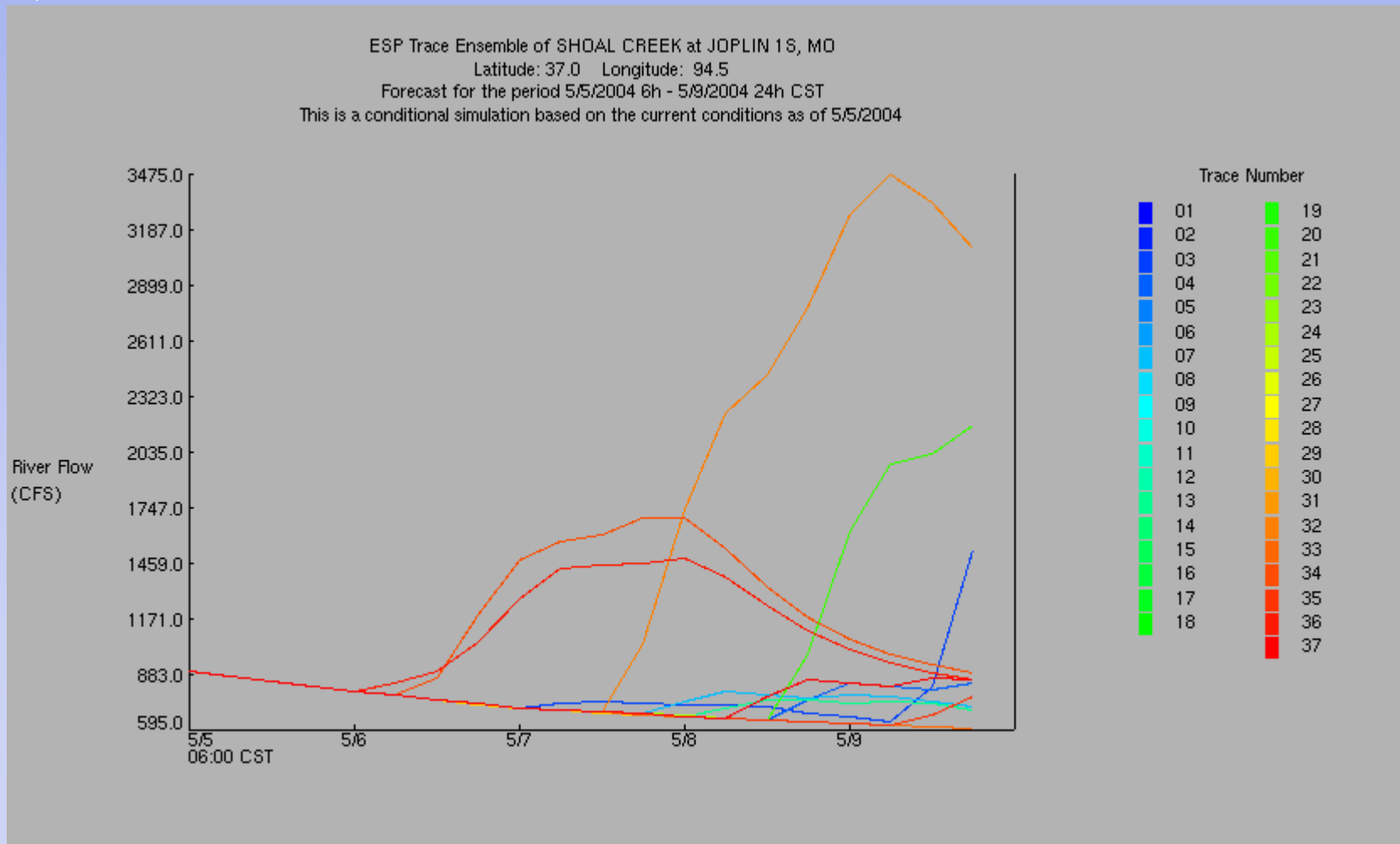


# Example of QPF





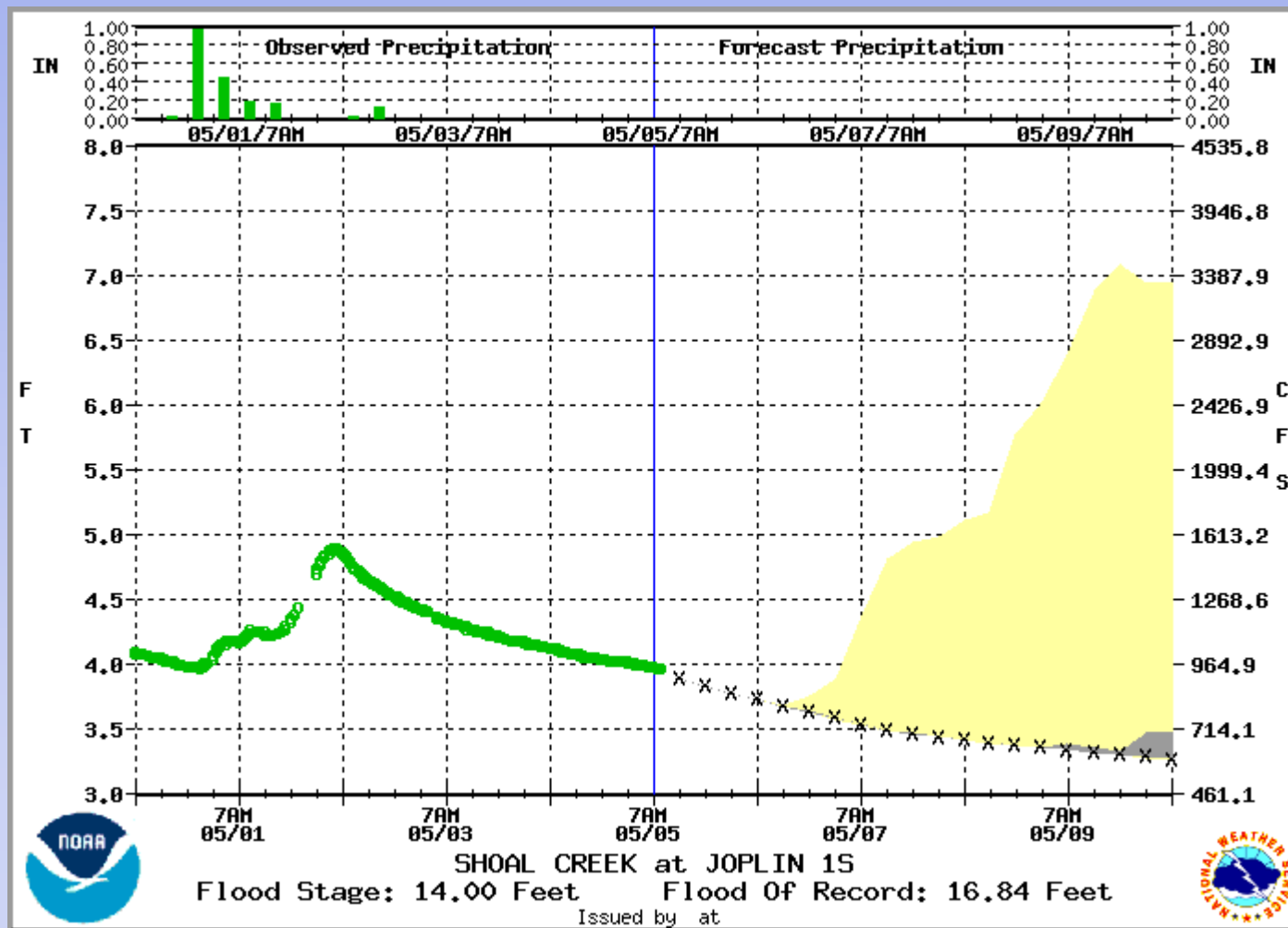
# Example of Spaghetti Chart





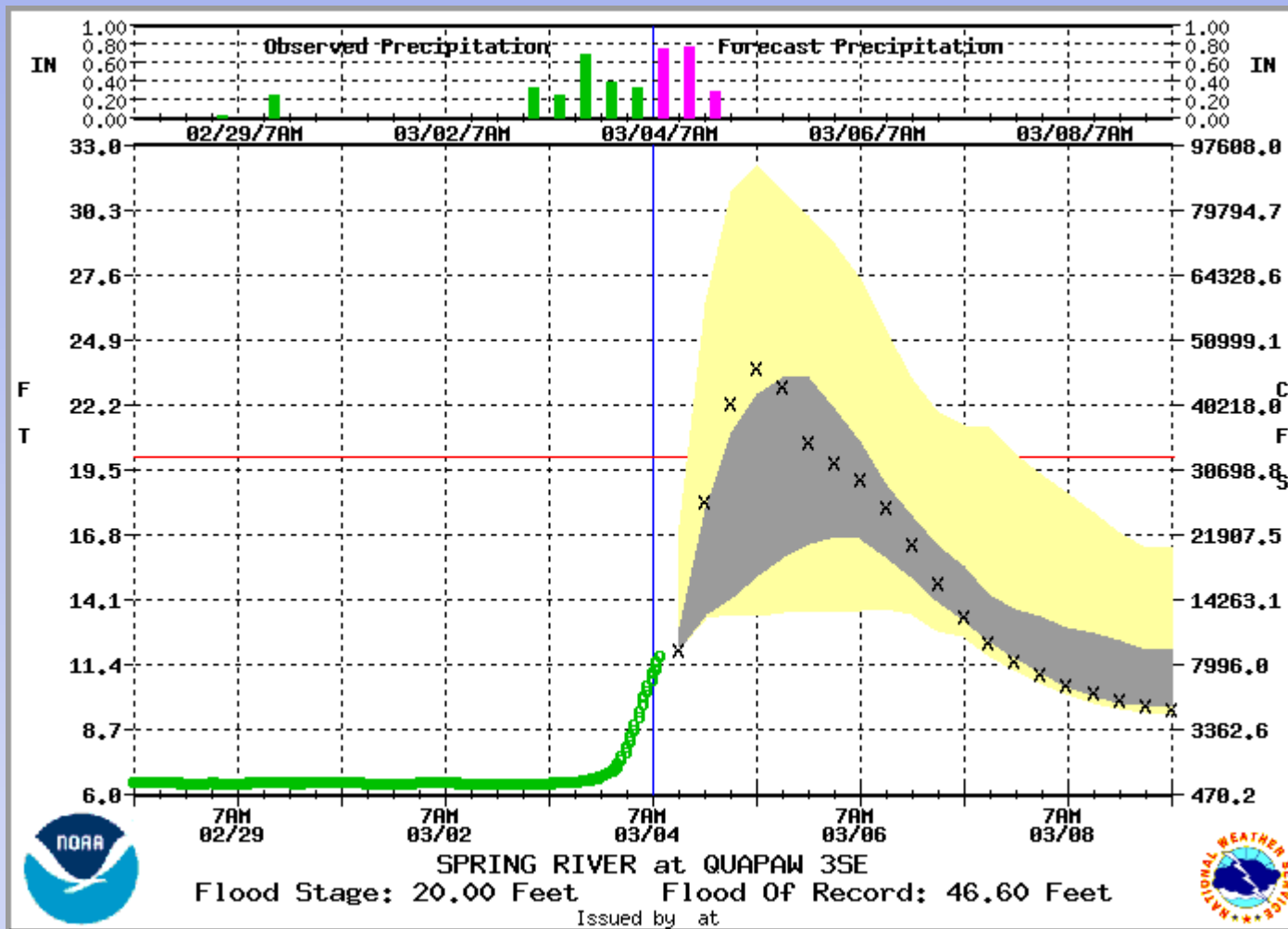


# Example of Public Forecast





# Example of Public Forecast





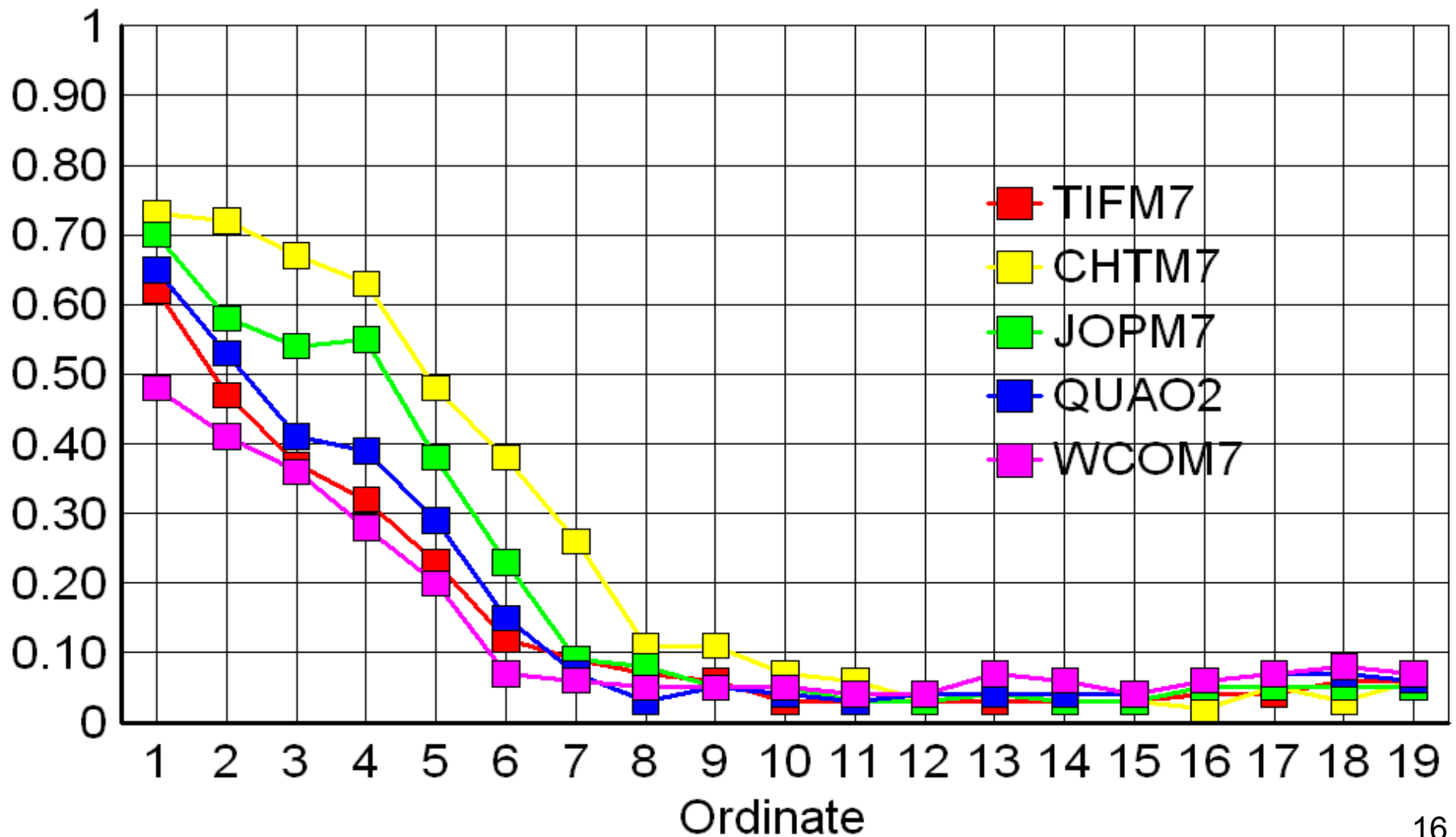
# Verification of Short Term Forecasts



- Ran verification statistics for period of October 15th, 2003 until April 7, 2004 (175 days, or 48% of a year)
- Several large rainfall events included as well as sustained dry periods.
- Determined reliability statistics for each ordinate of xsets forecast to see if it varied by time period.
- Had ESPADJQ technique turned on during entire period.
- Results varied from point to point, but showed we need additional work on algorithm as distinct biases were evident.
- Unsure of why distinct differences between forecast points.

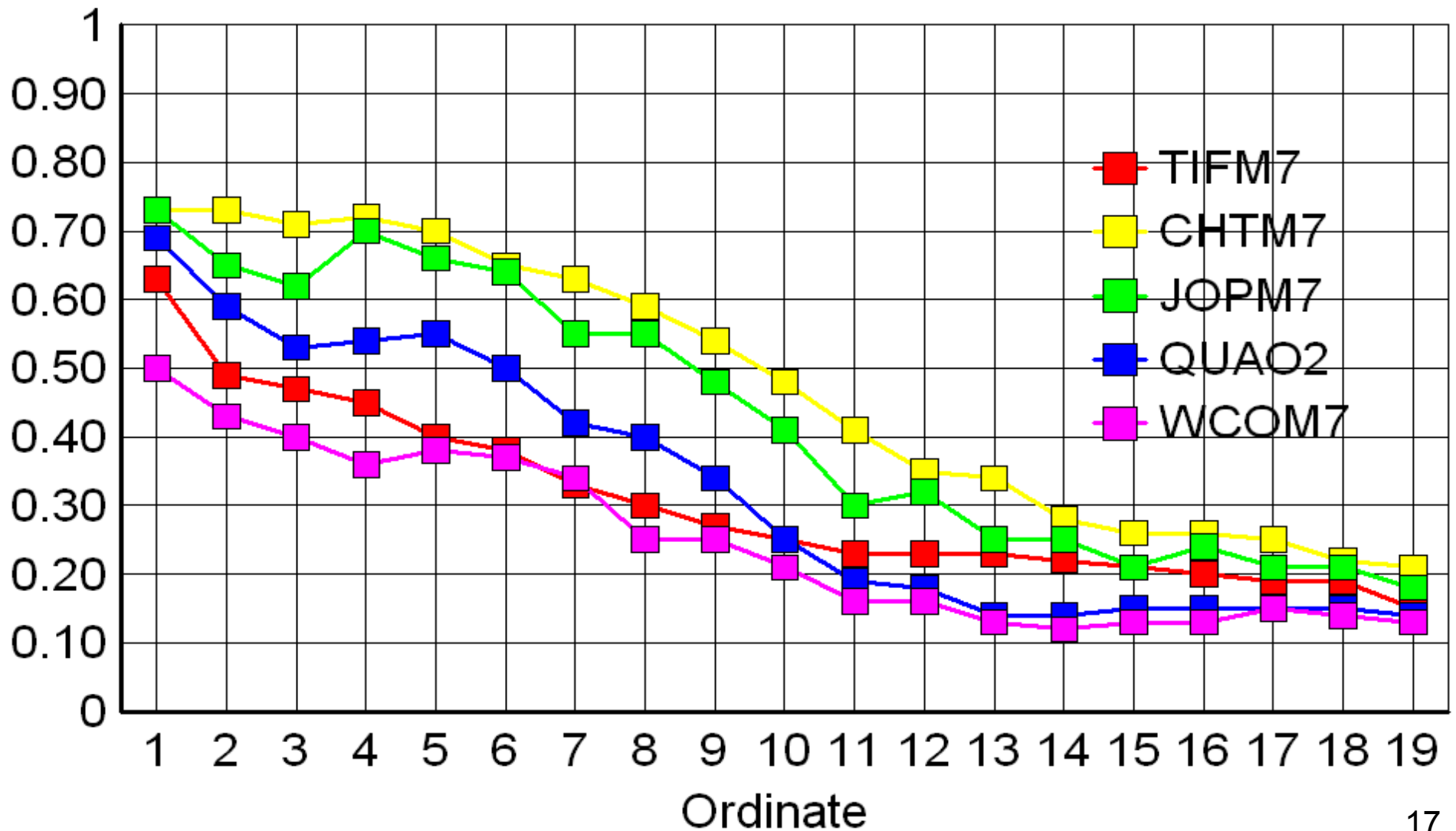
# All points 10/15/03-4/7/04

## 2 percent exceedance by Ordinate



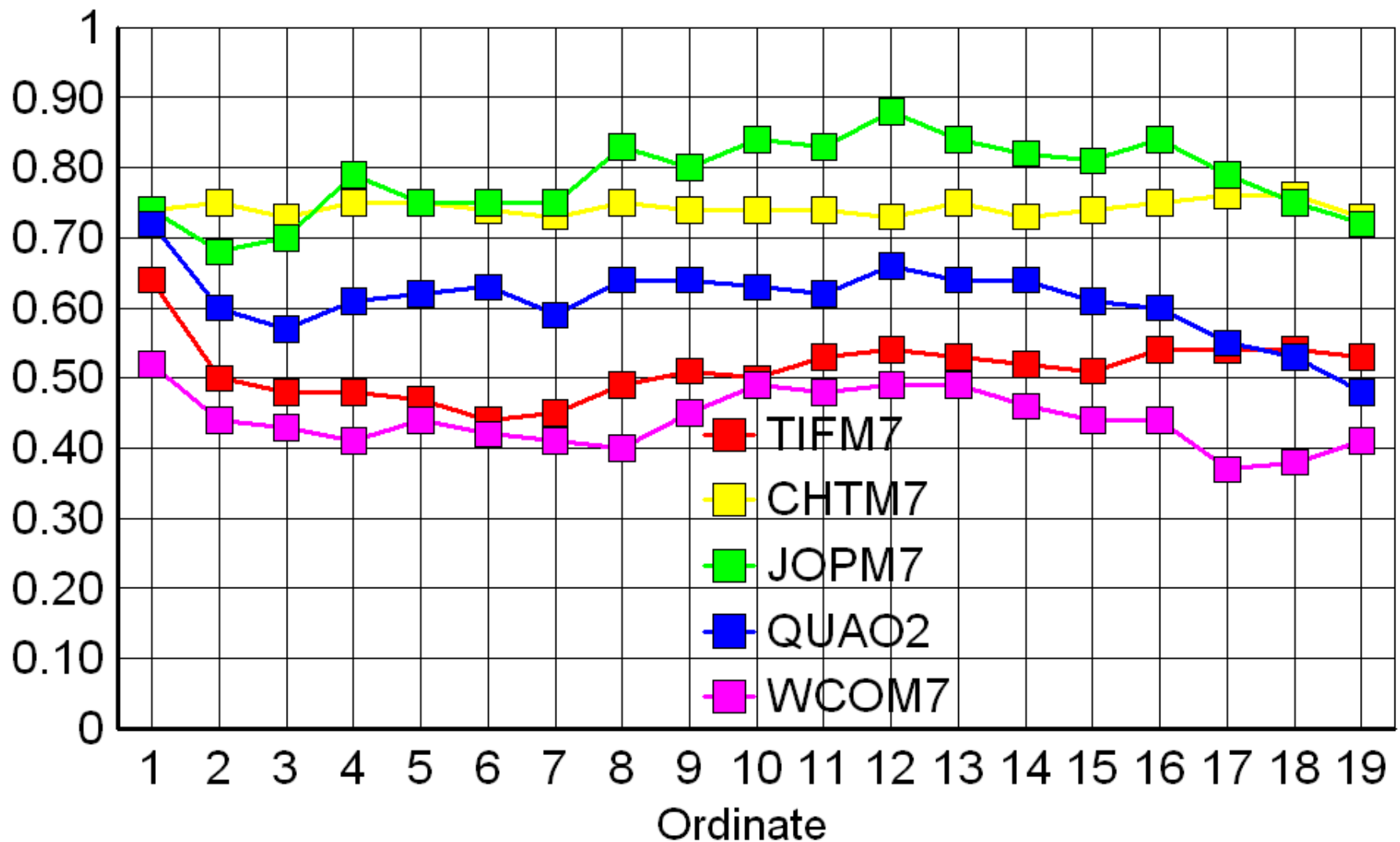
# All points 10/15/03-4/7/04

## 10 percent exceedance by Ordinate



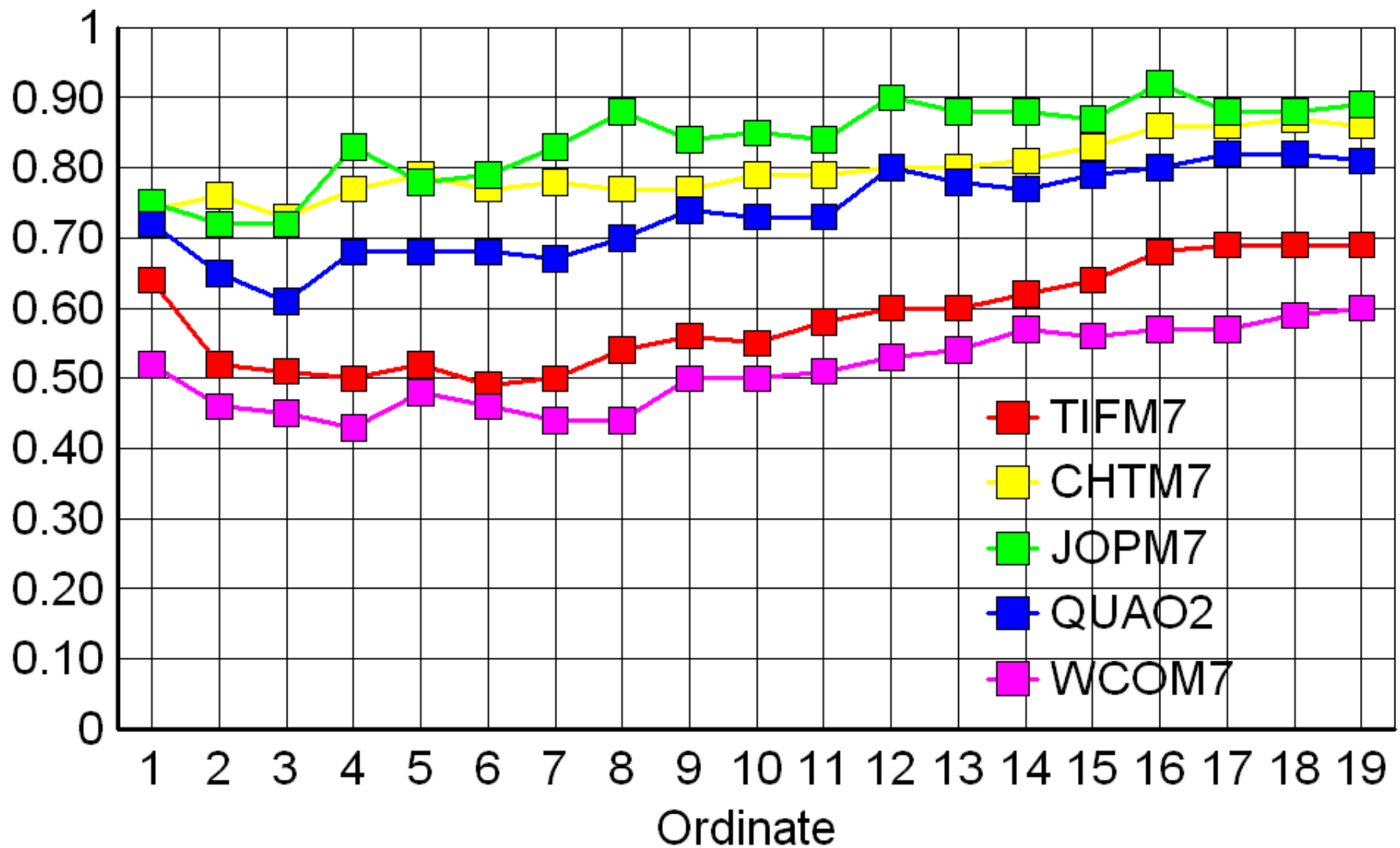
# All points 10/15/03-4/7/04

## 25 percent exceedance by Ordinate



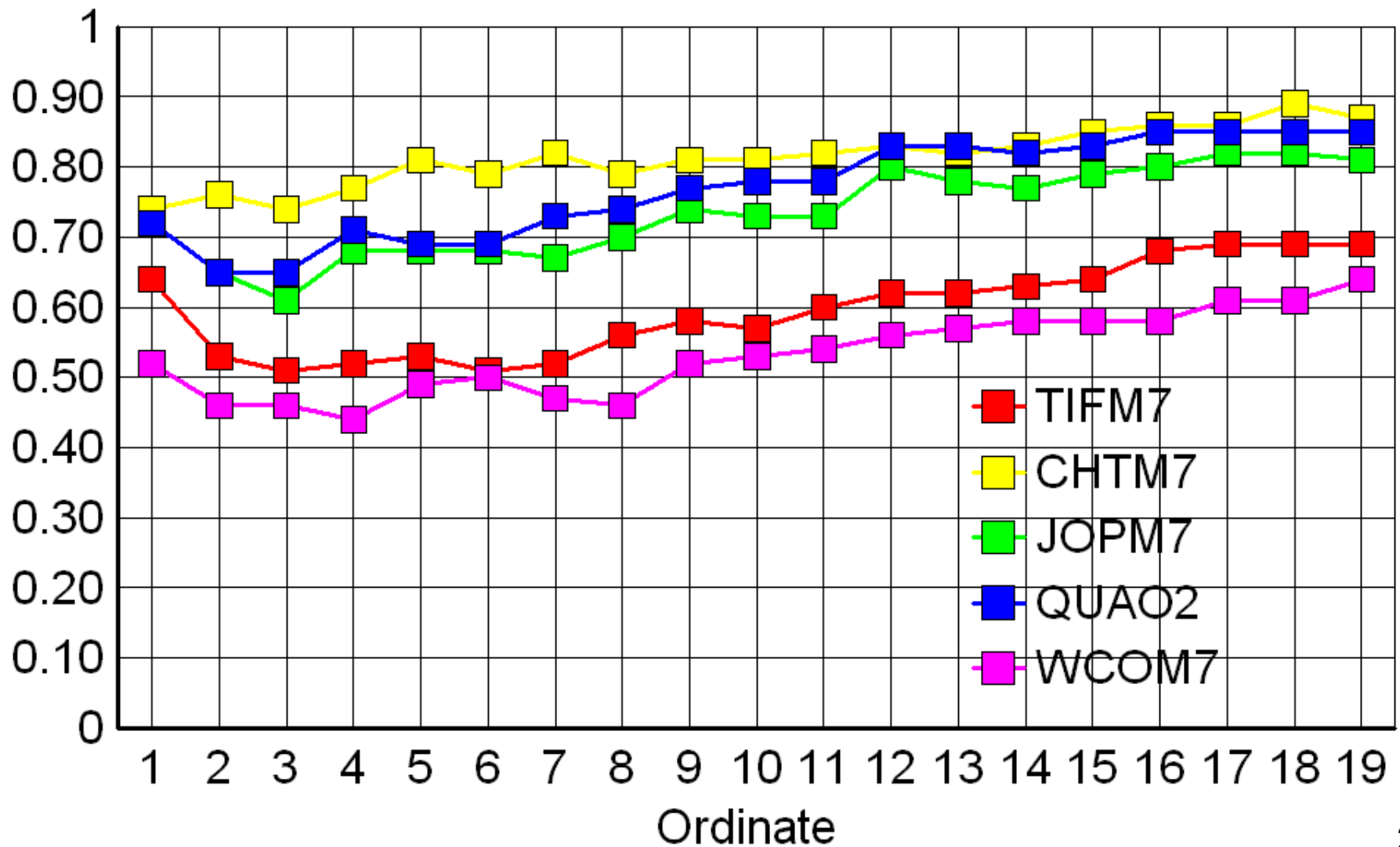
# All points 10/15/03-4/7/04

## 50 percent exceedance by Ordinate



# All points 10/15/03-4/7/04

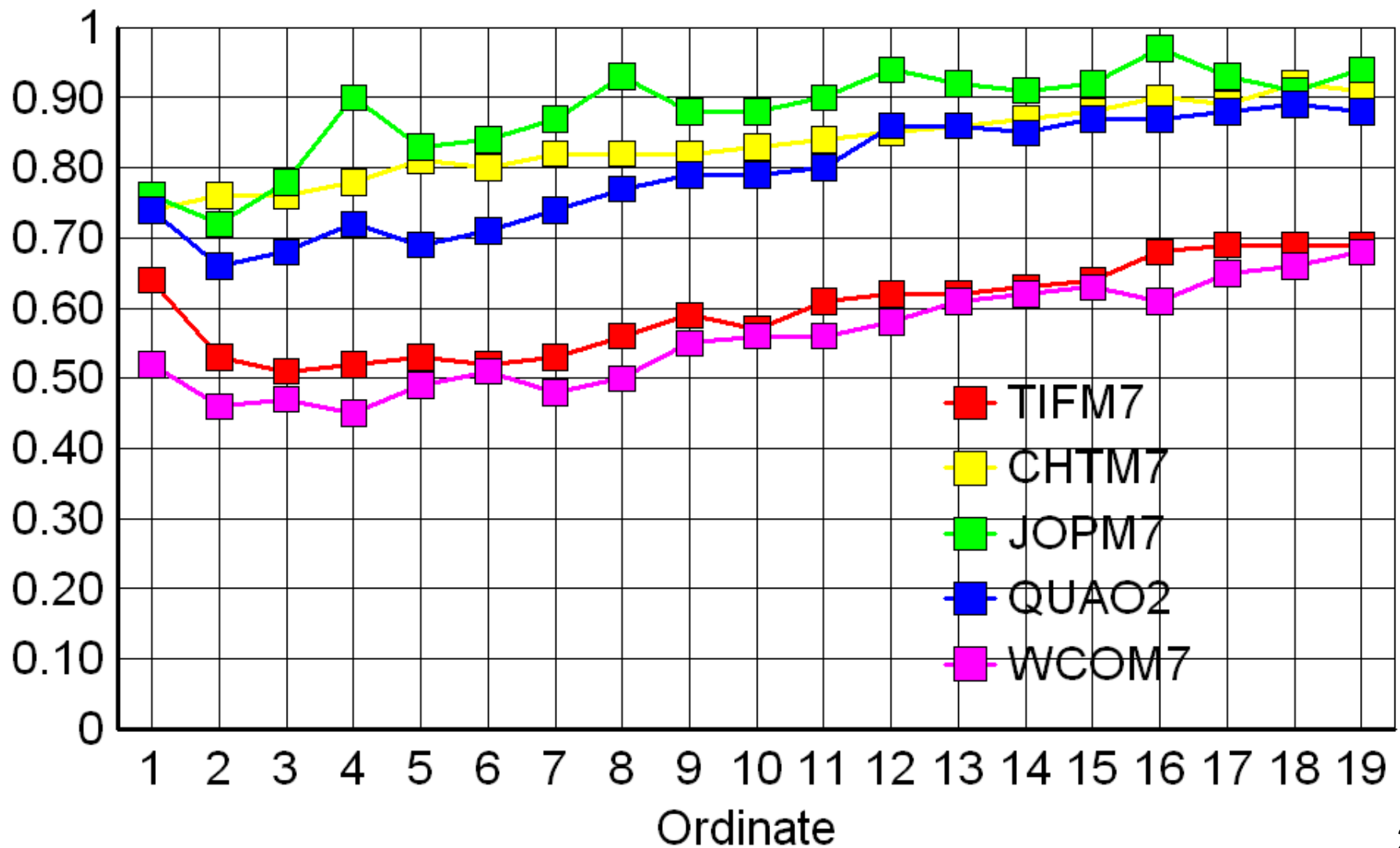
## 75 percent exceedance by Ordinate





# All points 10/15/03-4/7/04

## 90 percent exceedance by Ordinate





# Conclusions



- Hydrologic based uncertainty is not currently accounted for, and needs to be added.
- Algorithm needs to be refined as strong biases shown for all points verified.
- Patterns are evident in verification trends, but what do they mean??



## Future work, other studies



- Continue to run short term probabilistic forecasts, adding any enhancements from OHD.
- Continue to document results.
- Participate in AHPS funded project to determine QPF reliability with HPC.
- Output from AHPS project may be 5, 25, 75 and 90% probability QPFs for all 5 basins in OHD test.
- Will produce 5 different forecasts with these QPFs and run verification.
- Can compare reliability charts of two methods.
- Easier to explain procedure to our customers.