

**ACTIVITIES OF THE CBRFC
SUPPORT OF THE BURN AREA IN ARIZONA**

Presentation to WFO-FLG and Interested Parties

August 21, 2002

Dave Brandon – HIC - CBRFC



Monitored new USGS River Gages through Satellite
Adapted Synthetic Rating Tables
Set up new forecast segments in NWSRFS

Carizzo	Ck Near Show Low	-CRZA3	(old)
Carizzo	Ck Near Cibecue	-CBEA3	(new)
Corduroy	Ck Near Show Low	-SOWA3	(new)
Cibecue	Ck Near Overgaard	-OVGA3	(new)
Cibecue	Ck Near Chrysotile	-CBQA3	(old)
Cibecue	Ck At Cibecue	-CBCA3	(No gage)

Hourly Time Steps

Multi_Precipitation_Estimator (RADAR and Ground Truth)

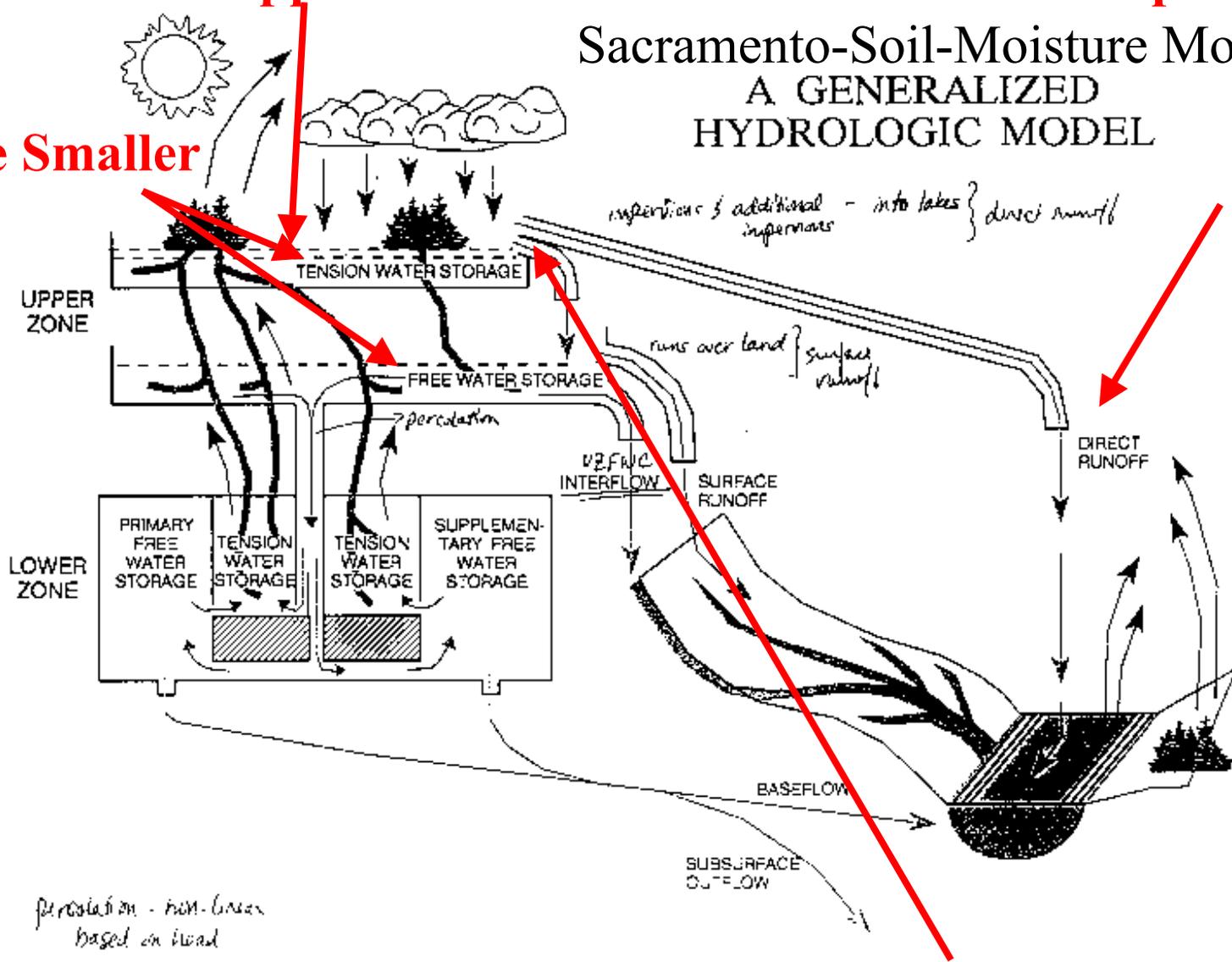
Include Snow Model

Adapted Sacramento-Soil-Moisture Model to Burn Area

Decreased Upper Zone Tension and Free Water Capacity

Sacramento-Soil-Moisture Model A GENERALIZED HYDROLOGIC MODEL

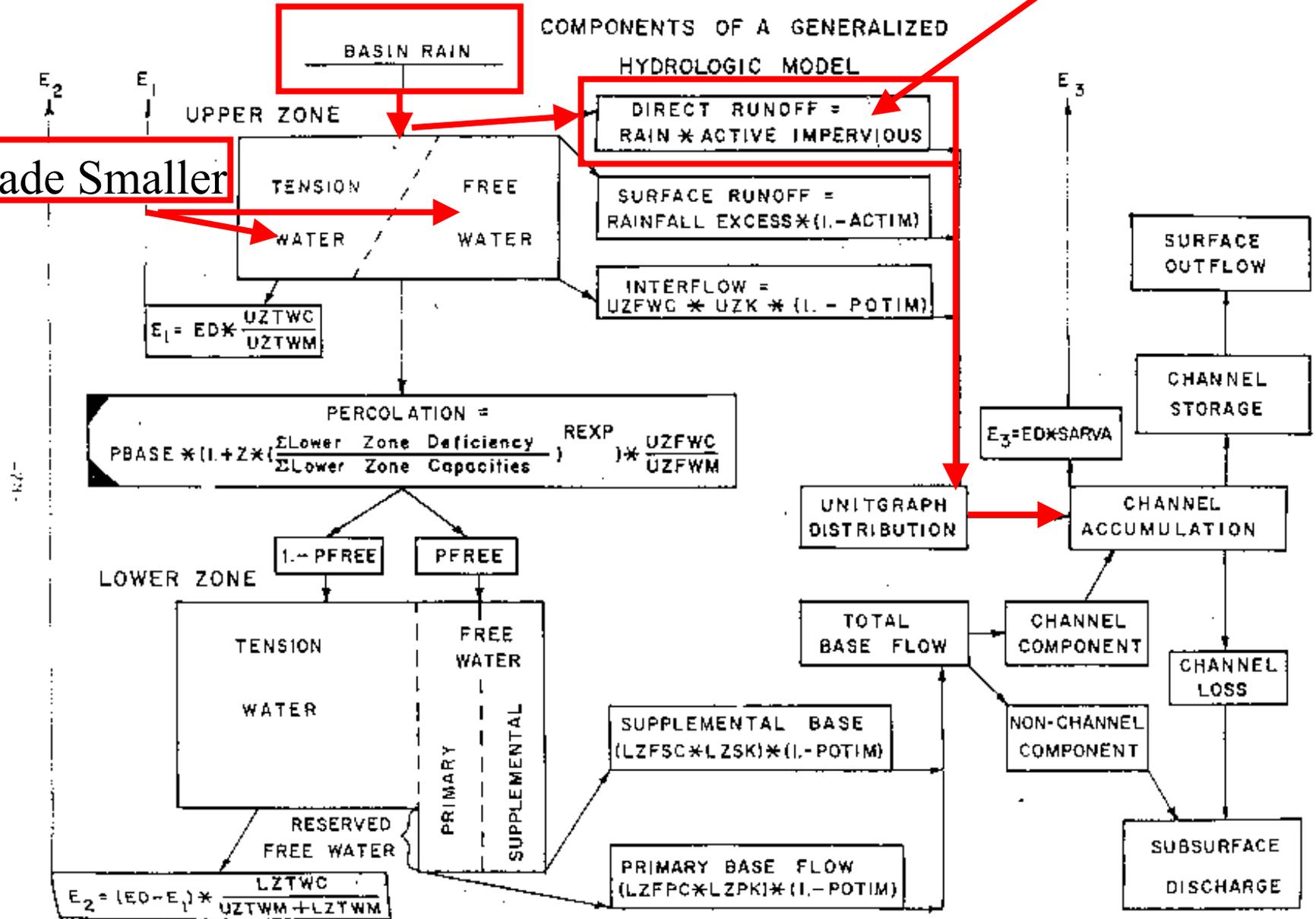
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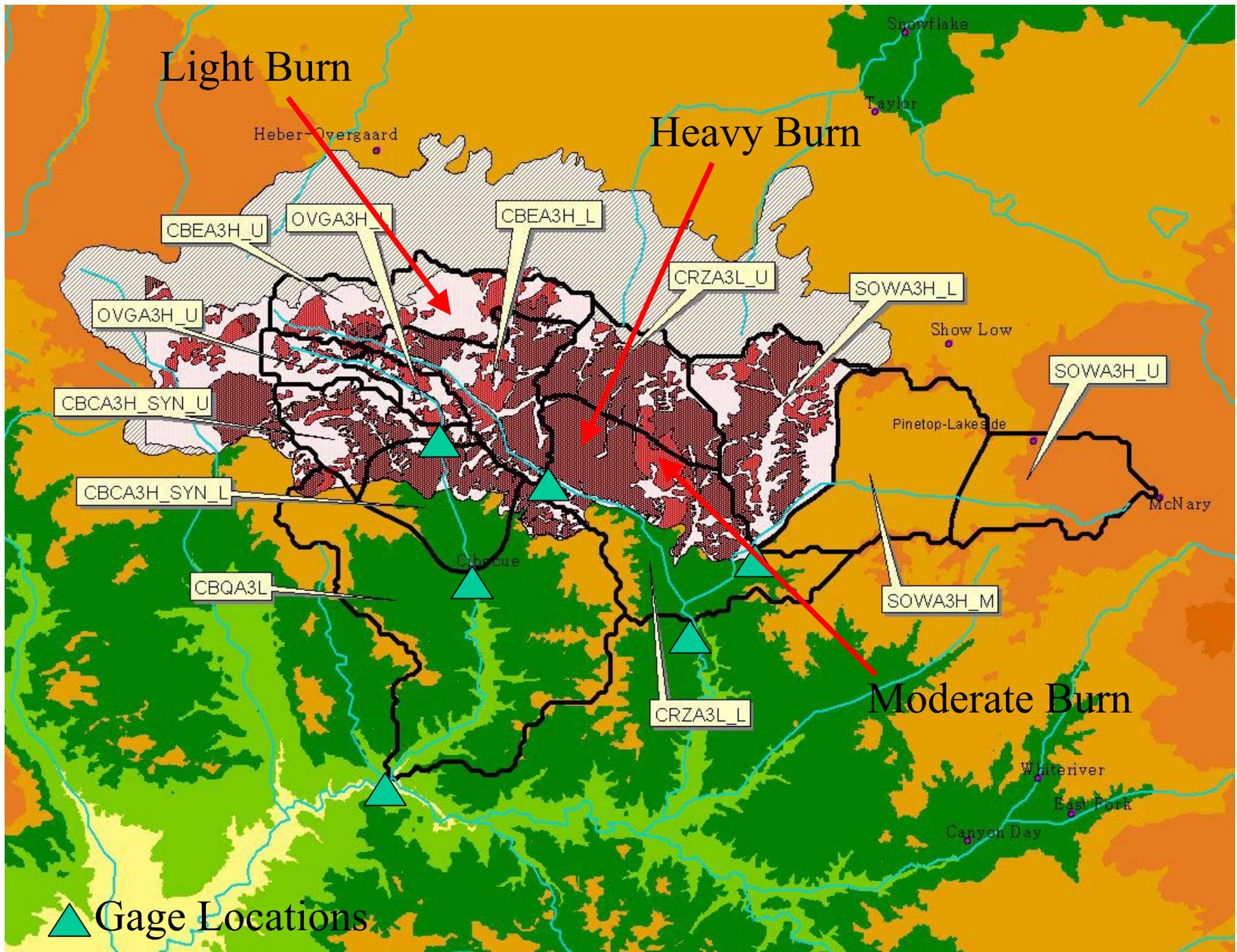


Increase impervious due to burn area-produces more/rapid runoff.

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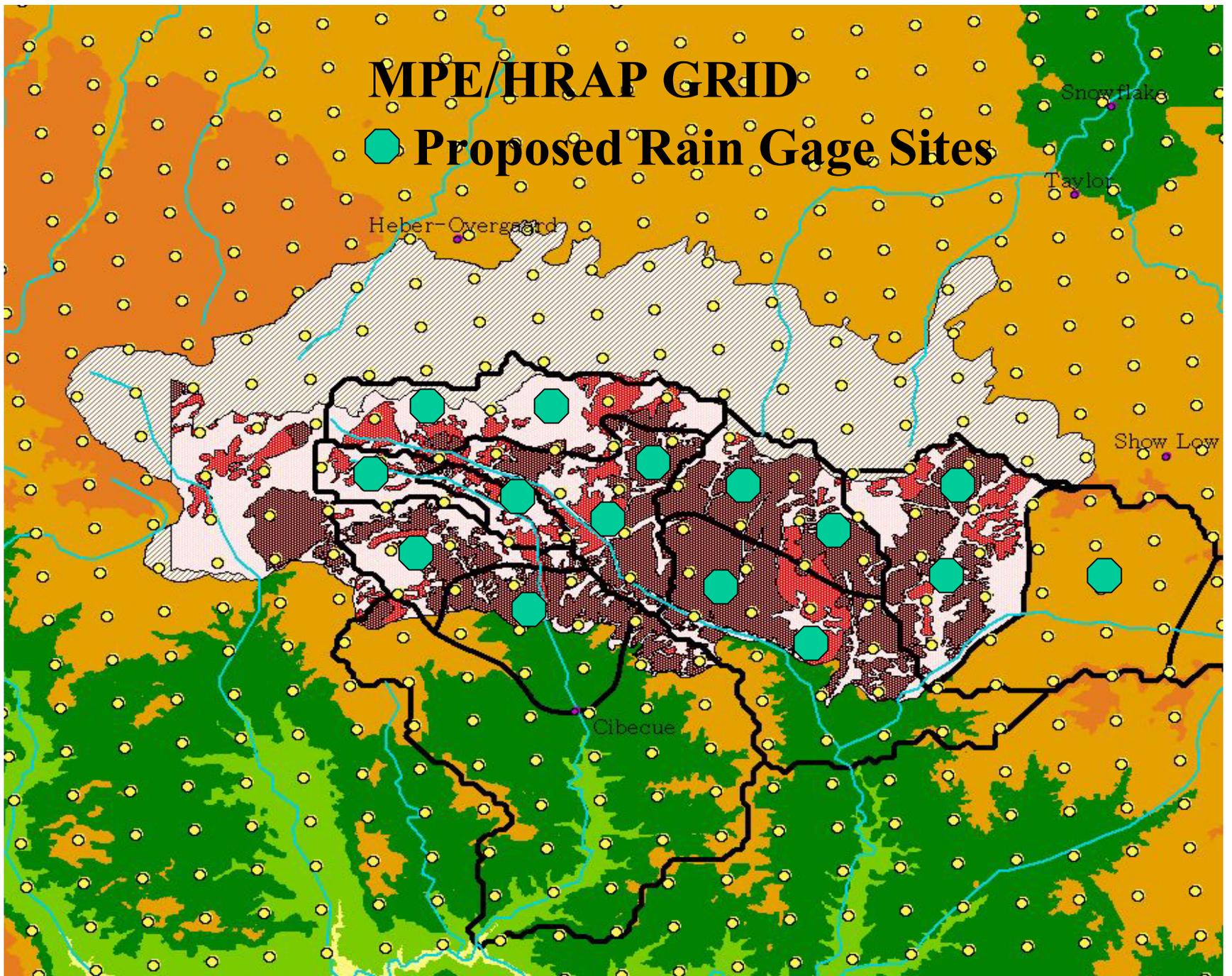
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MPE/HRAP GRID

● Proposed Rain Gage Sites



Limitations and Source of Error In Modeling Burn Areas

Synthetic Rating Tables (large error)

Bankfull/Flood Stage Estimated

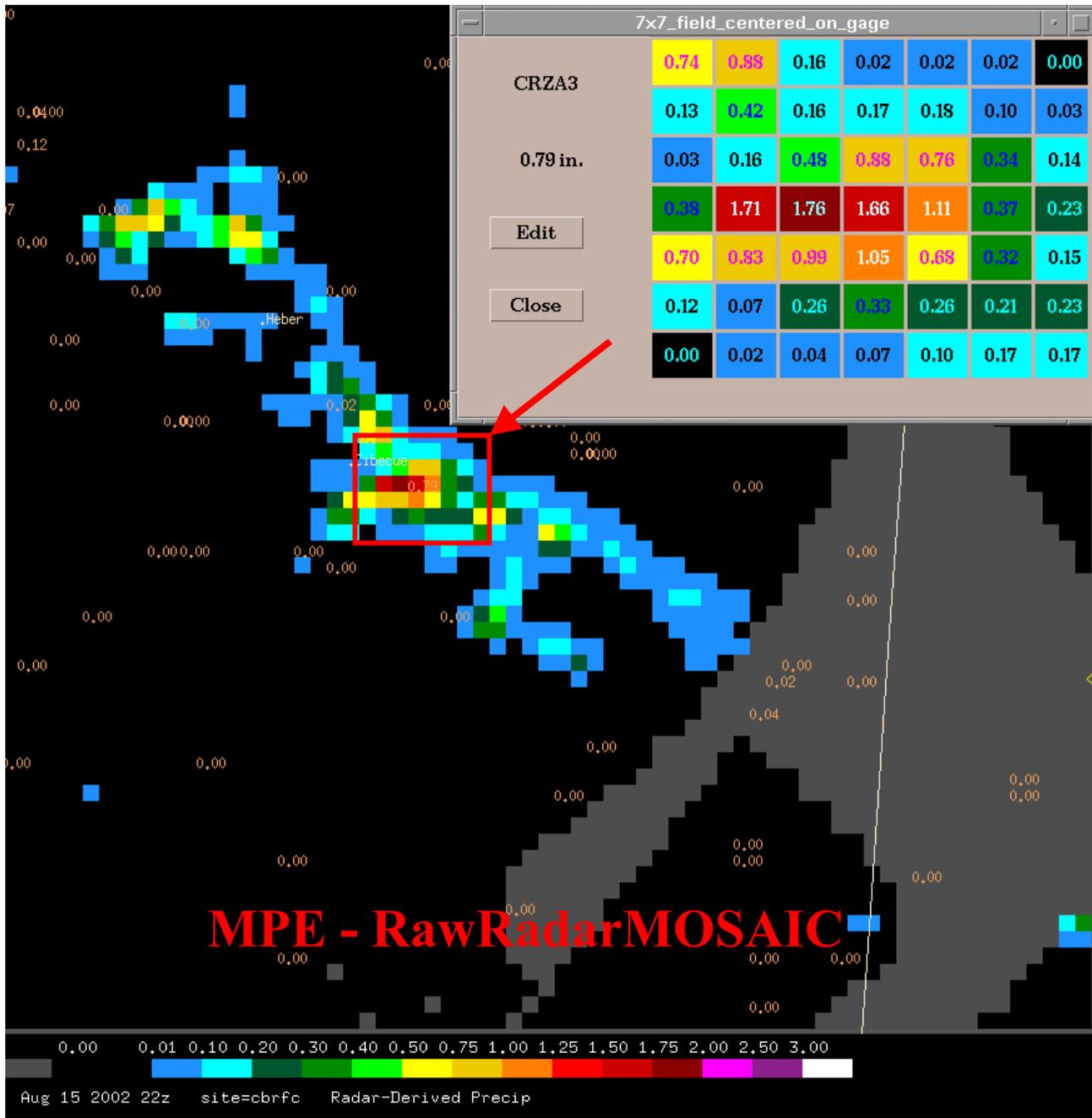
Stuck/Clogged River Gages

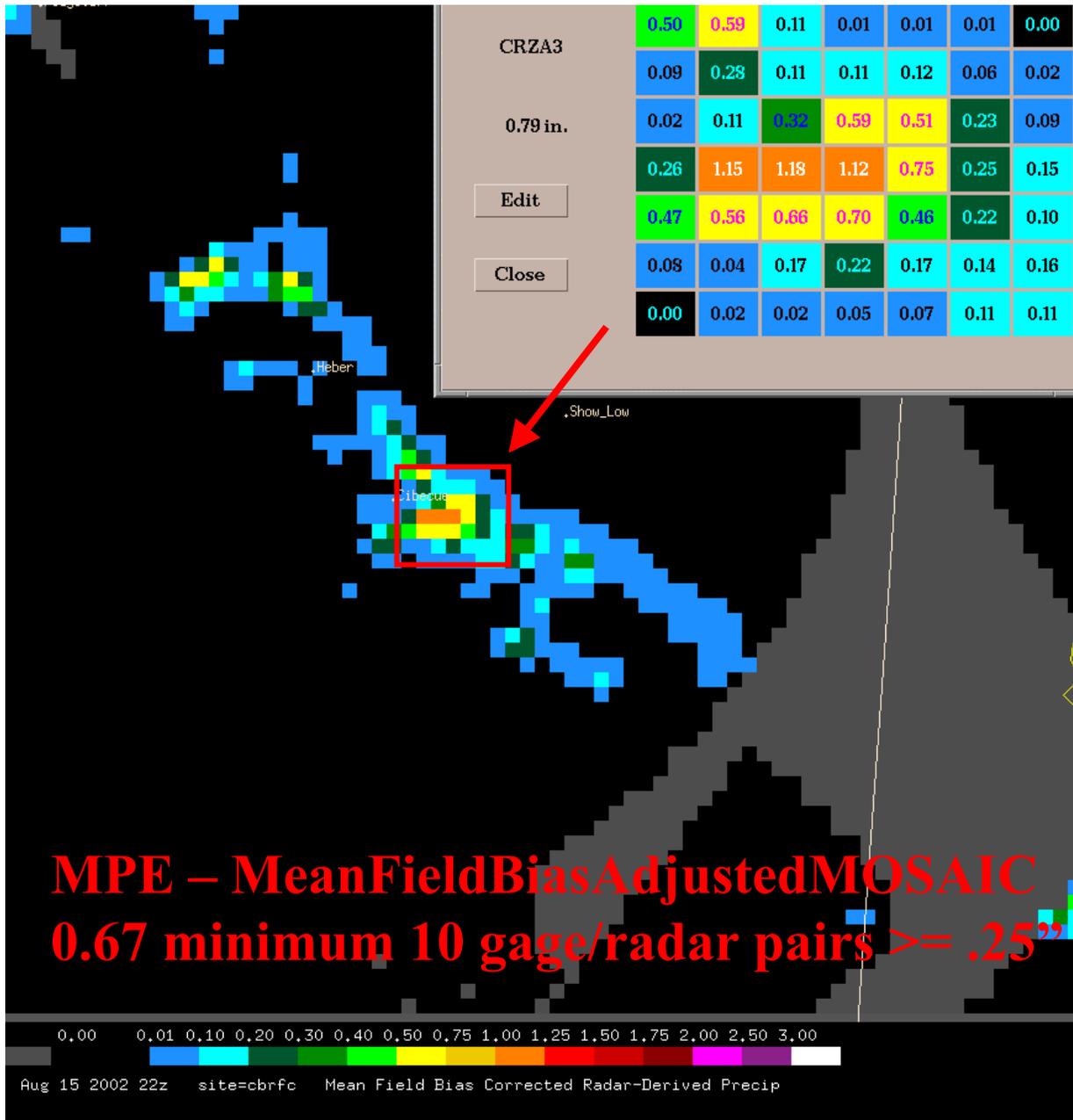
Assume Mean Areal Precipitation

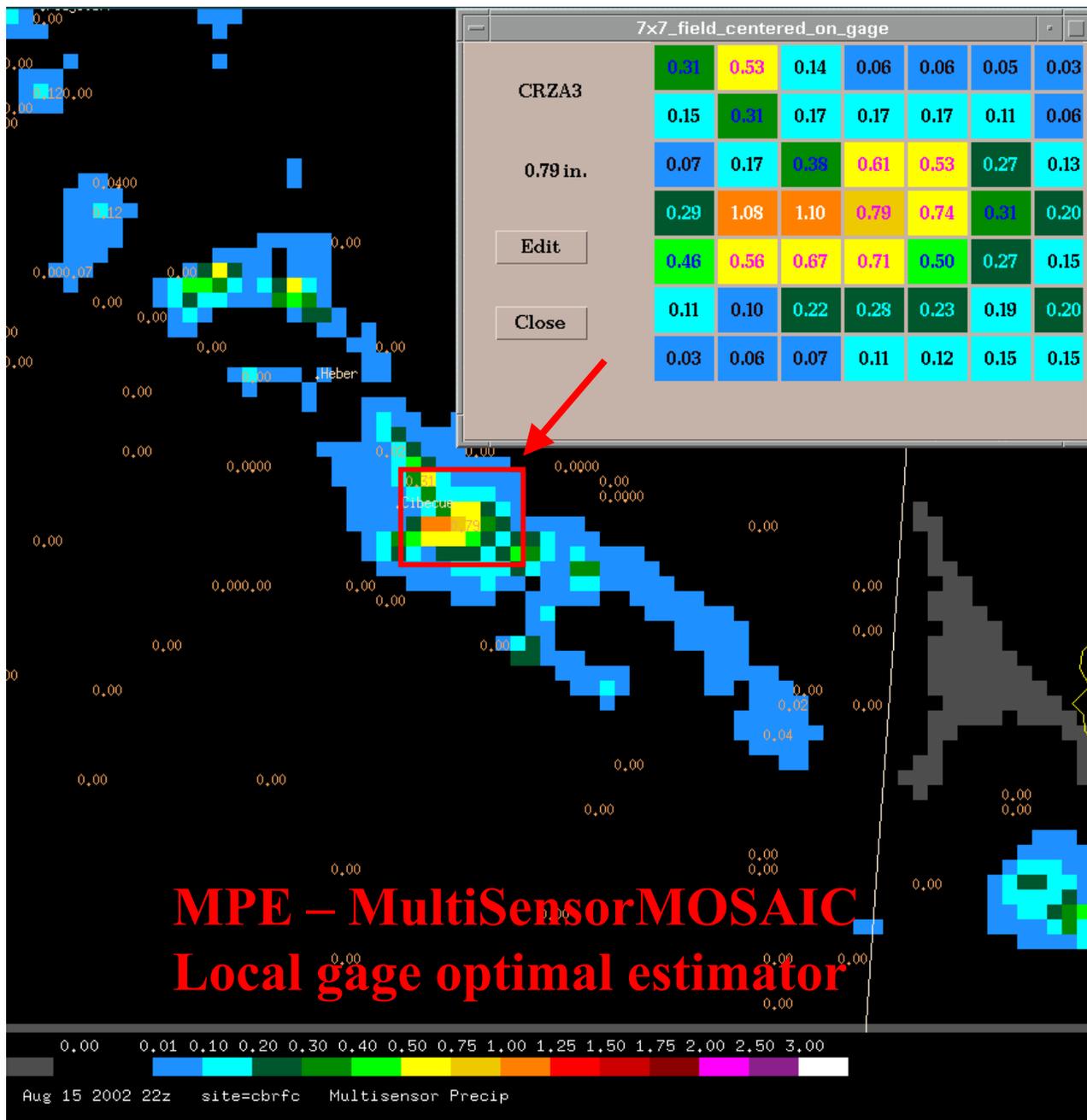
Missing RADAR/Gage Data

No historical data to calibrate model

Few Real time precipitation gages in area







RETURN PERIOD = 5 YRS

DUR (hrs)	PRECIP (in)	PEAK FLOW (cfs)					
		CBEA3	SOWA3	CRZA3	OVGA3	CBCA3	CBQA3
1	1.5	6400	5400	23000	2900	7000	7000
3	2.0	12000	9000	33000	6000	13300	13400
6	2.5	15000	9900	38500	6800	15000	15800
24	3.5	5000	3700	16000	1000	2800	4300

RETURN PERIOD = 10 YRS

DUR (hrs)	PRECIP (in)	PEAK FLOW (cfs)					
		CBEA3	SOWA3	CRZA3	OVGA3	CBCA3	CBQA3
1	1.8	11200	8400	32400	5900	13000	13200
3	2.3	16000	12000	42500	8400	17800	18200
6	3.0	20300	13500	53000	9000	22000	24800
24	4.0	6500	8400	22000	1600	4600	9800

RETURN PERIOD = 25 YRS

DUR (hrs)	PRECIP (in)	PEAK FLOW (cfs)					
		CBEA3	SOWA3	CRZA3	OVGA3	CBCA3	CBQA3
1	2.1	16000	11400	42000	9000	19500	19600
3	2.7	21600	15600	54600	12000	25000	26000
6	3.5	25800	21000	66700	11400	29000	35000
24	4.5	8000	12200	30200	2200	6300	14800

MODEL BANKFULL/FLOOD FLOWS (cfs)

	CBEA3	SOWA3	CRZA3	OVGA3	CBCA3	CBQA3
bankfull	6574	8000	17000	2000	6506	11000
flood	14000	14000	29100	5200	12000	15000

Two Large Historical Events-Example of MAPs that Occur

10/20/72 EVENT

AREA	PRECIP (in)				
	12Z-18Z	18Z-00Z	00Z-6Z	6Z-12Z	TOTAL
UPPER	0.93	1.12	0.21	0.23	2.49
LOWER	1.20	1.27	0.19	0.42	3.08

PEAK FLOW (cfs)

CBEA3	5500
SOWA3	5000
CRZA3	19300
OVGA3	1400
CBCA3	3500
CBQA3	4100

Note: these are 6 hour MAPS
and not 1 hour Maps

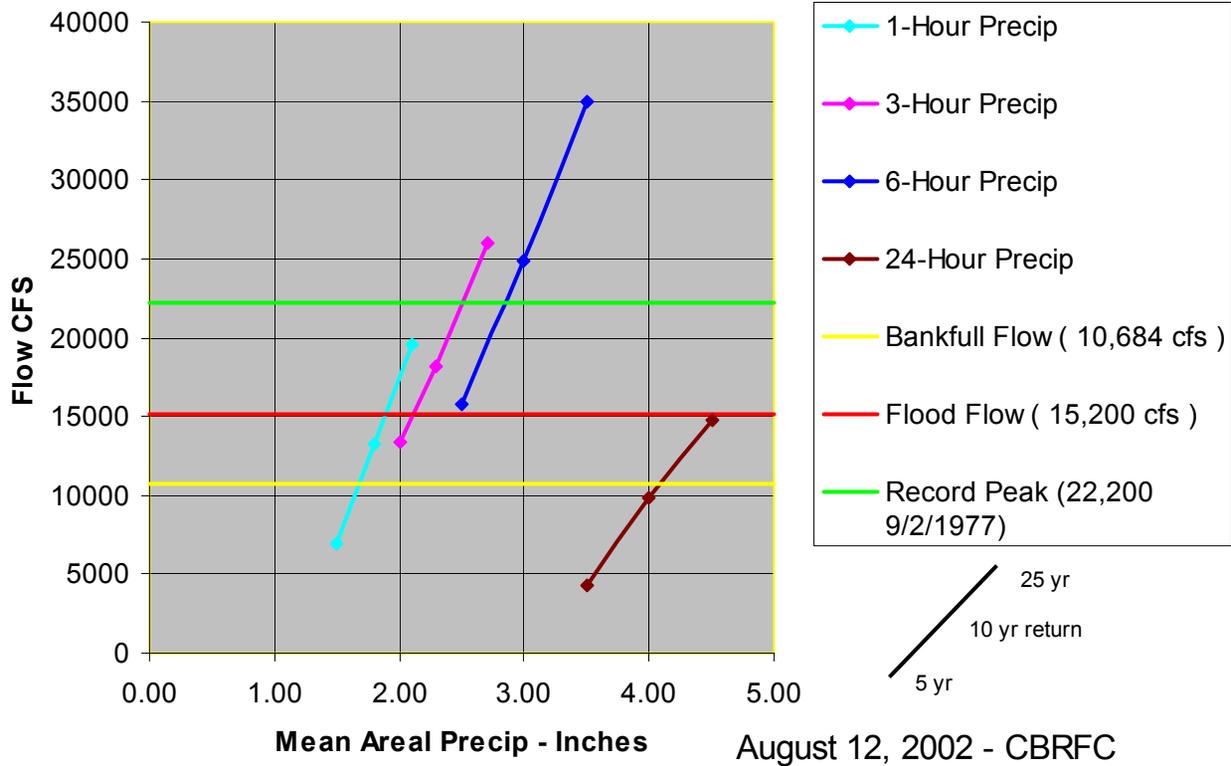
12/18 -12/19/78 EVENT

AREA	PRECIP (in)									
	12Z-18Z	18Z-00Z	00Z-6Z	6Z-12Z	12Z-18Z	18Z-00Z	00Z-6Z	6Z-12Z	TOTAL	
UPPER	0.14	0.31	0.34	0.70	0.97	0.77	0.47	0.15	3.85	
LOWER	0.16	0.37	0.34	0.69	0.92	0.71	0.38	0.13	3.70	

PEAK FLOW (cfs)

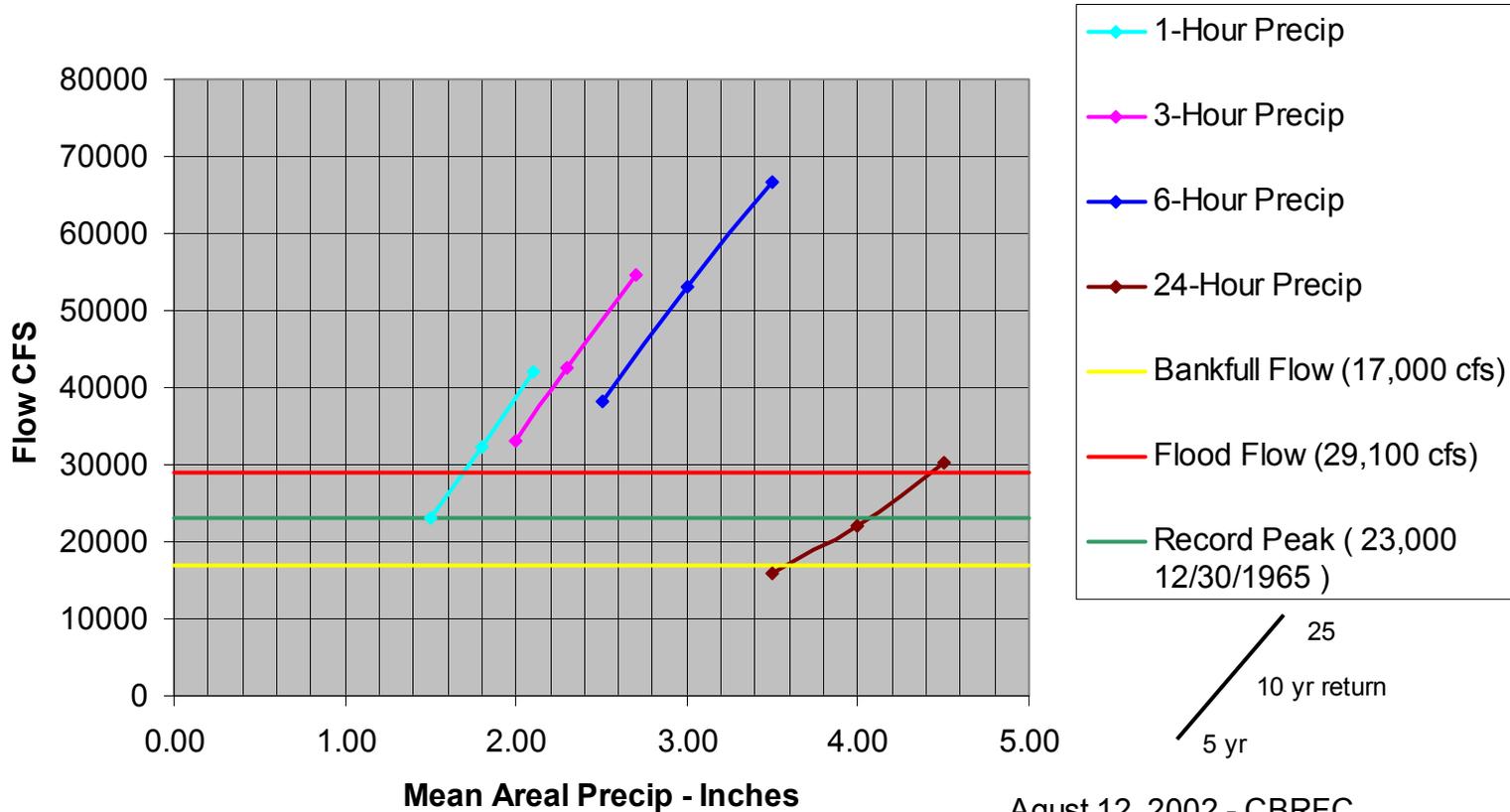
CBEA3	4200
SOWA3	2700
CRZA3	12300
OVGA3	570
CBCA3	1500
CBQA3	2400

**Estimated Peak Flows at Cibecue Ck Near Chrysotile
CBQA3 (old gage)
For Various Mean Areal Precipitation Amounts
(Computed from NWSRFS - Adapted to Burn Area)**



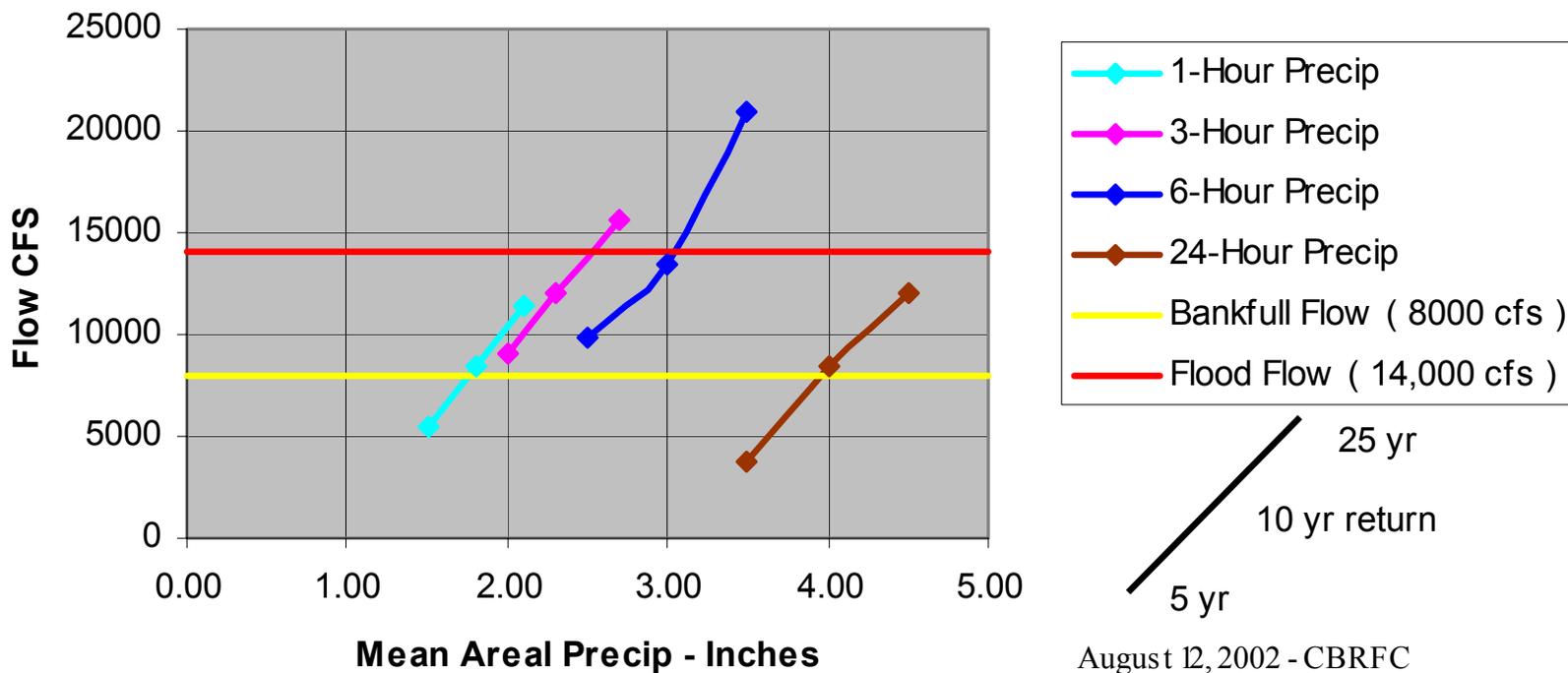
August 12, 2002 - CBRFC

**Estimated Peak Flows at Carizzo Ck Near Show Low
CRZA3 (old gage)
For Various Mean Areal Precipitation Amounts
(Computed from NWSRFS - adapted to Burn Area)**



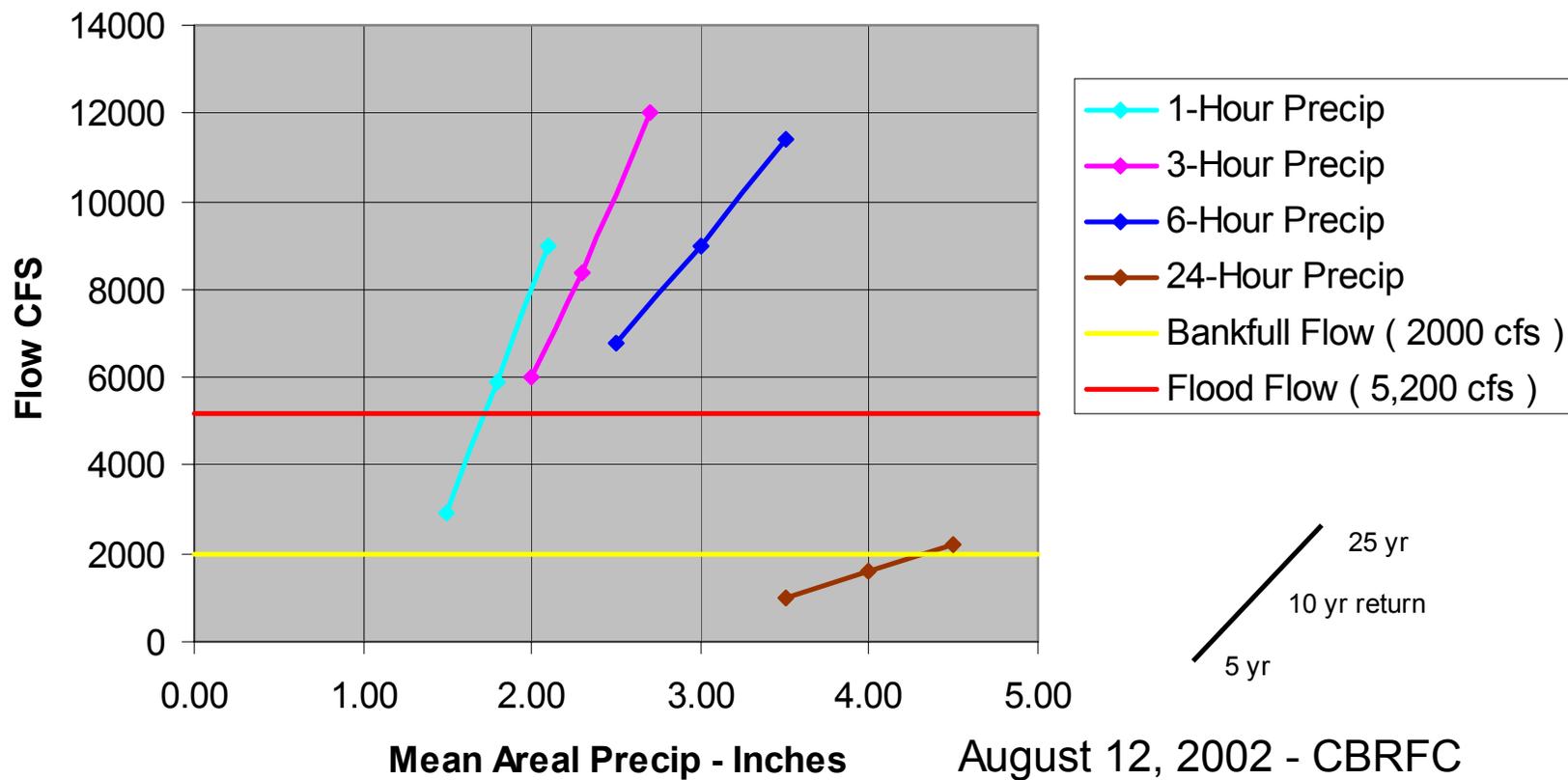
August 12, 2002 - CBRFC

**Estimated Peak Flows at Corduroy Ck Near Show Low -
SOWA3 (new gage)
For Various Mean Areal Precipitation Amounts
(Computed from NWSRFS - Adapted to Burn Area)**

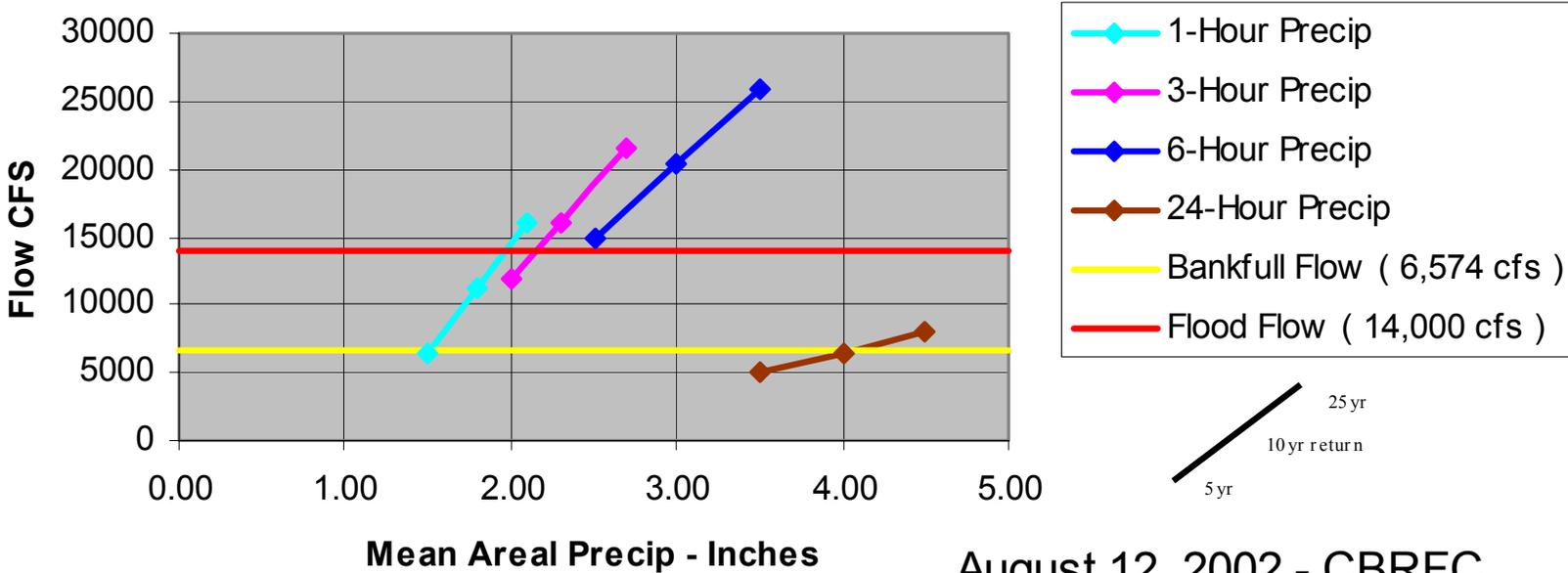


August 12, 2002 - CBRFC

**Estimated Peak Flows at Cibecue Ck Near Overgaard
OVGA3 (new gage)
For Various Mean Areal Precipitation Amounts
(Computed from NWSRFS - Adapted to Burn Area)**

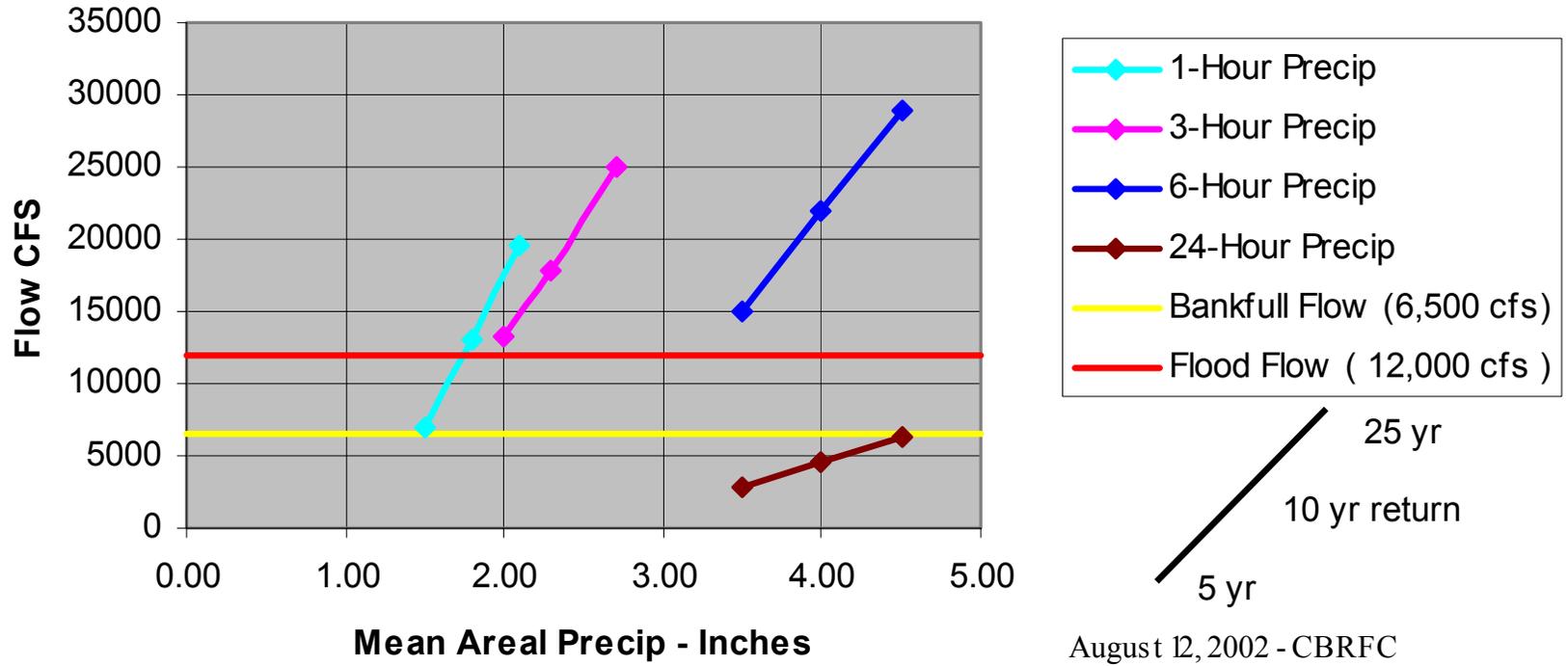


**Estimated Peak Flows at Carrizo Ck Near Cibecue
CBEA3 (new gage)
For Various Mean Areal Precipitation Amounts
(Computed from NWSRFS - Adapted to Burn Area)**



August 12, 2002 - CBRFC

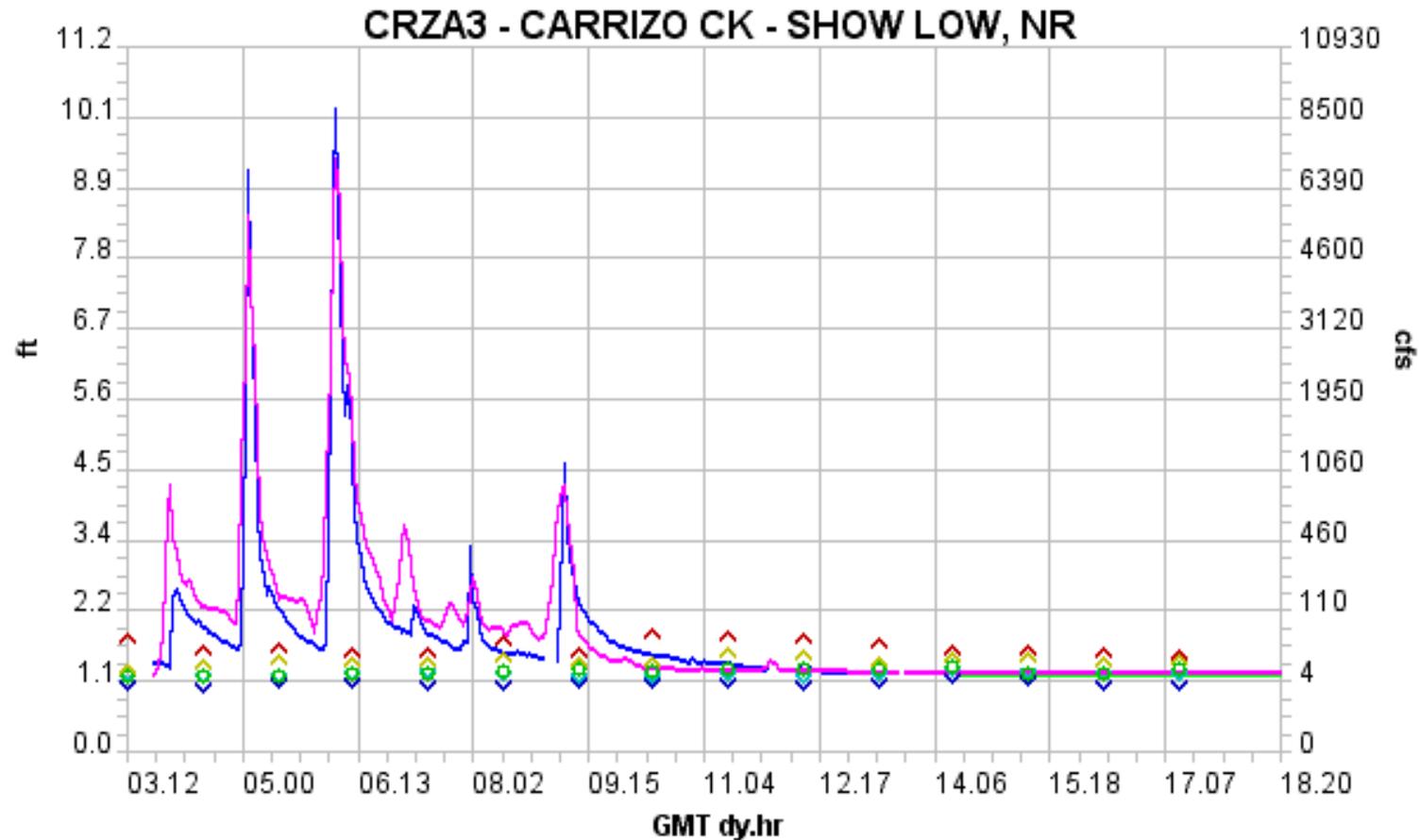
**Estimated Peak Flows at Cibecue Ck At Cibecue
CBCA3 (synthetic gage)
For Various Mean Areal Precipitation Amounts
(Computed from NWSRFS - Adapted to Burn Area)**



Observed vs Simulated From NWSRFS Model

CRZA3 Observed/Simulated Hydrograph

The current time is: [08/13.20:38 GMT](#).



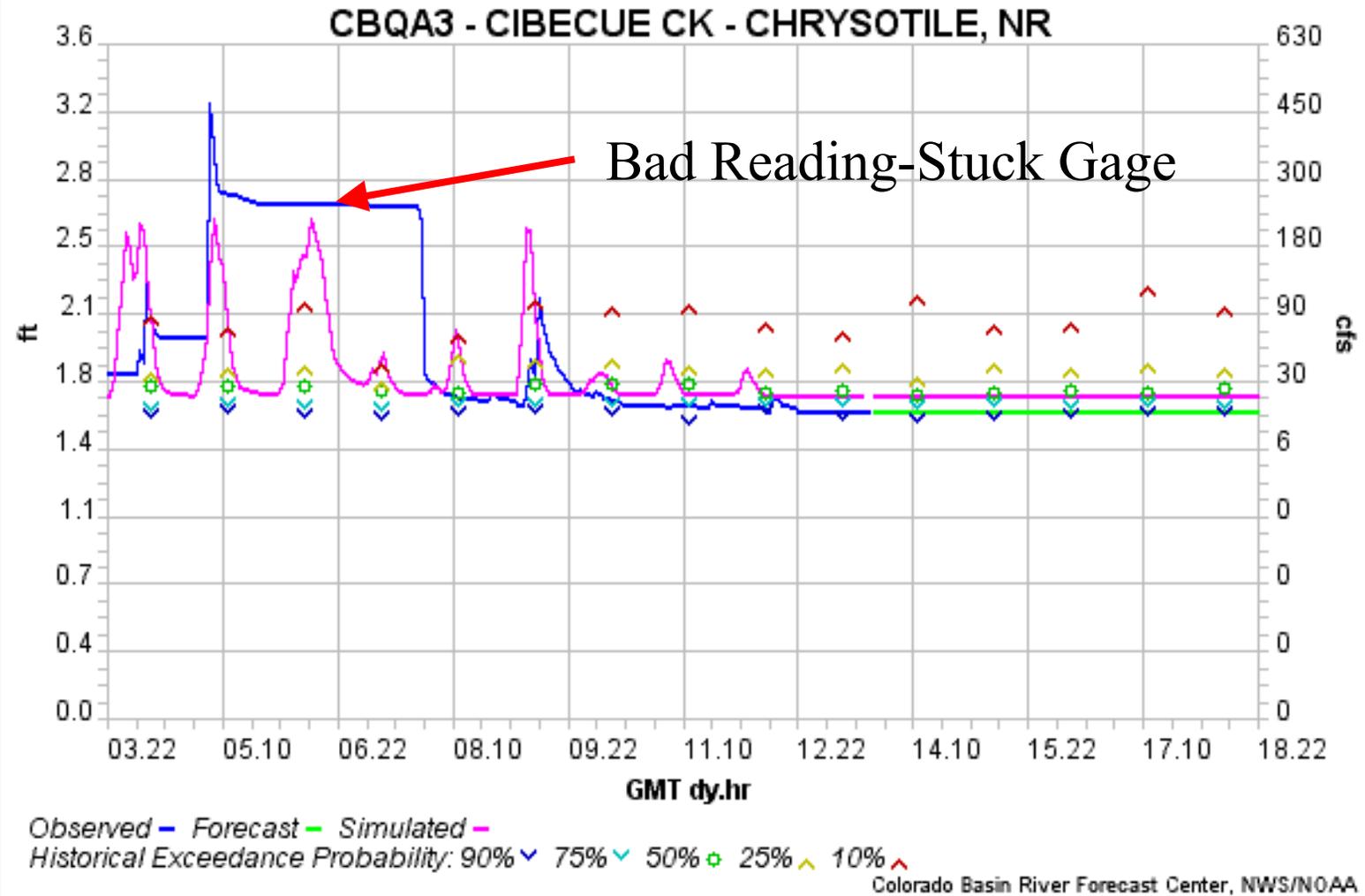
Observed — Forecast — Simulated —

Historical Exceedance Probability: 90% ▾ 75% ▾ 50% ○ 25% ▲ 10% ▲

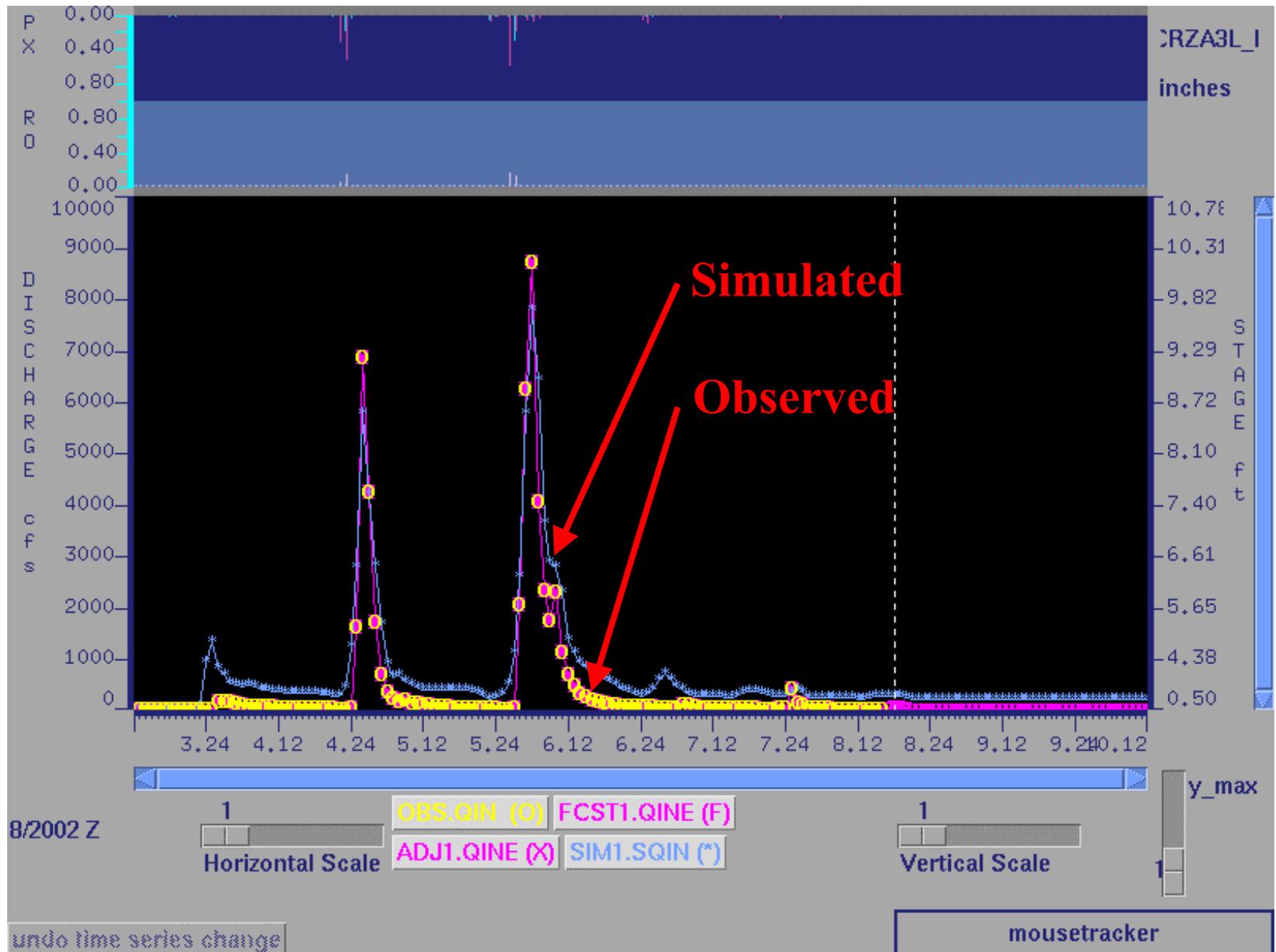
Colorado Basin River Forecast Center, NWS/NOAA

CBQA3 Observed/Simulated Hydrograph

The current time is: [08/13.22:27 GMT](#).



Example Display From NWSRFS-IFP



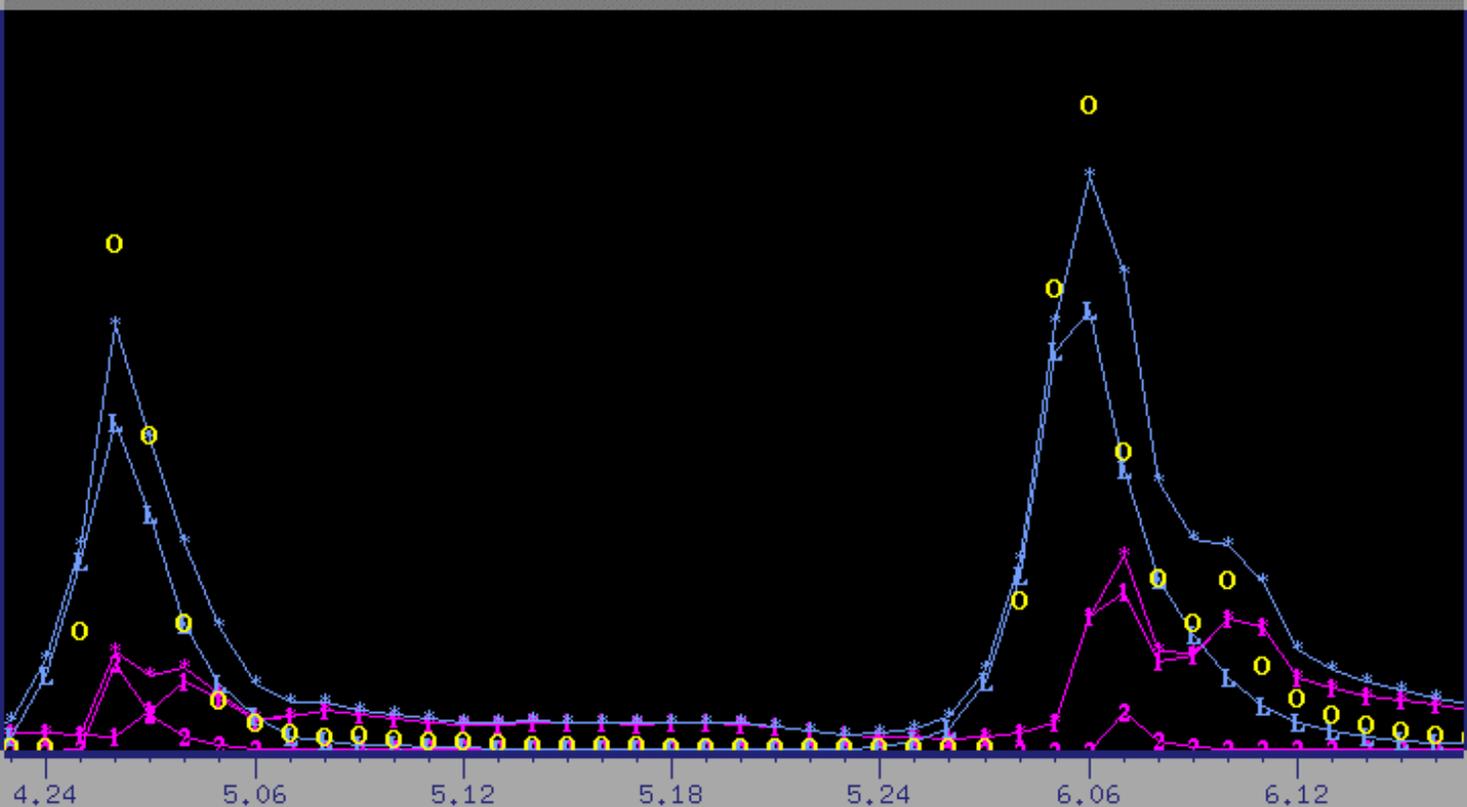
Example Display From NWSRFS-IFP

CRZA3L_H

inches

P
X
R
D

DISCHARGE
cfs



8/2002 Z

4
Horizontal Scale

- OBS.QIN (O)
- TOTROUTE.QINE (*)
- CBEA3.QINE (1)
- SOWA3.QINE (2)
- LOCAL1.SQIN (L)
- SIM1.SQIN (*)

1
Vertical Scale

y_max
1

undo time series change