



NWS

Outline of Presentation

Forecast Process

A Little Bit About our Models

Future Precipitation - QPF

Web Page



NWS

Mission: Protection Lives/Property-Enhance National Economy
Joint Effort Between WFO and RFC

Event Driven (rain, snowmelt) River Forecasts

Flash Flood Guidance

Recreational Forecasts (River trends – Peak Flows)

Water Supply => Reservoir Management (Drought?)



Last Year 2004



This Year 2005

Pictures: Courtesy of Kelly Redmond



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Forecasting: What goes into the forecast?

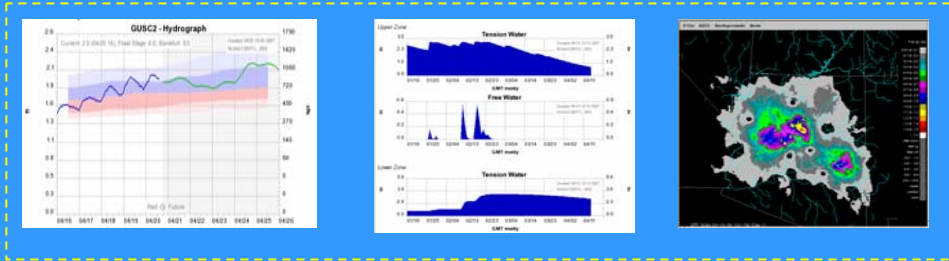
Flow

Soil Moisture

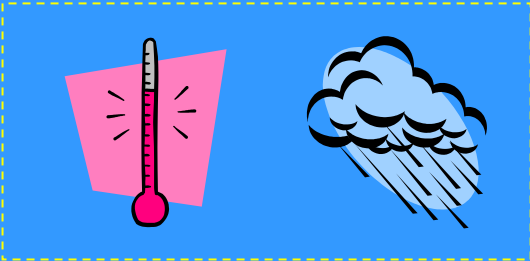
Precipitation

Temperature

Precipitation



Present Conditions



Future Conditions

What goes wrong when?

Expected Forecast

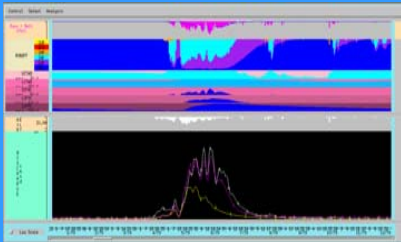
Result: Too Much

Result: Too Little

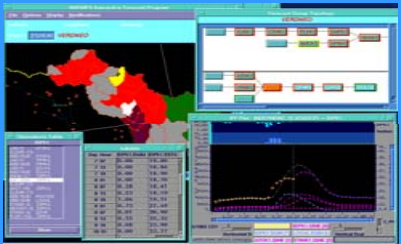


National Weather Service River Forecast System

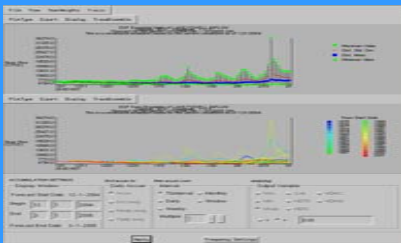
Three Interconnected Components
Forecasts For Hours To Seasons



1 Calibration System
Interactive Calibration Program



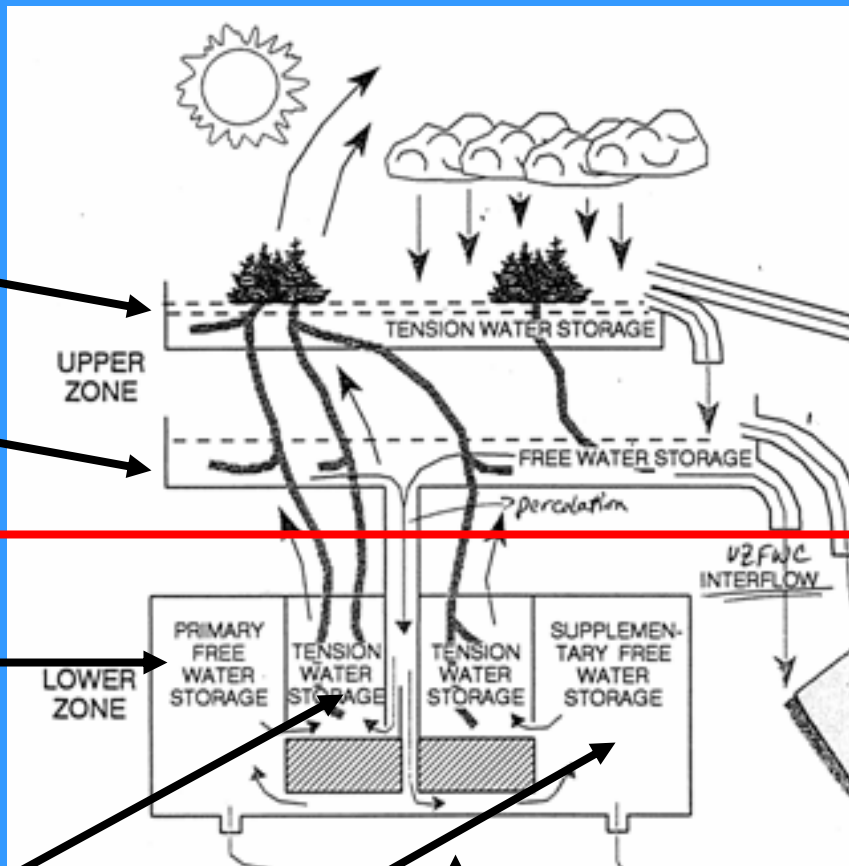
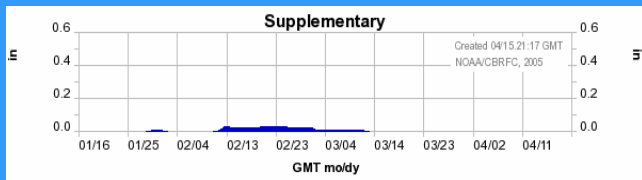
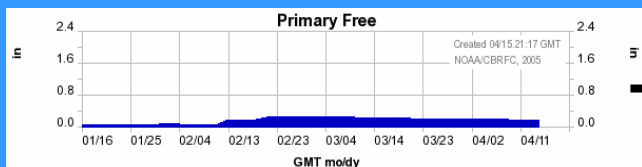
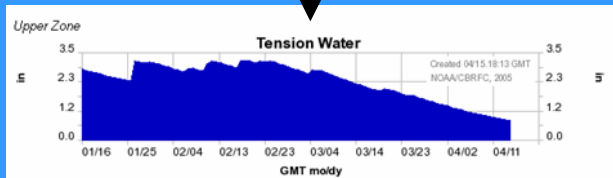
2 Operational Forecast System
Interactive Forecast Program



3 Ensemble Streamflow Prediction System
ESP Analysis/Display Program

Soil Moisture Accounting

Example of Soil Moisture In Each 'Tank'



RUNOFF

INTERFLOW

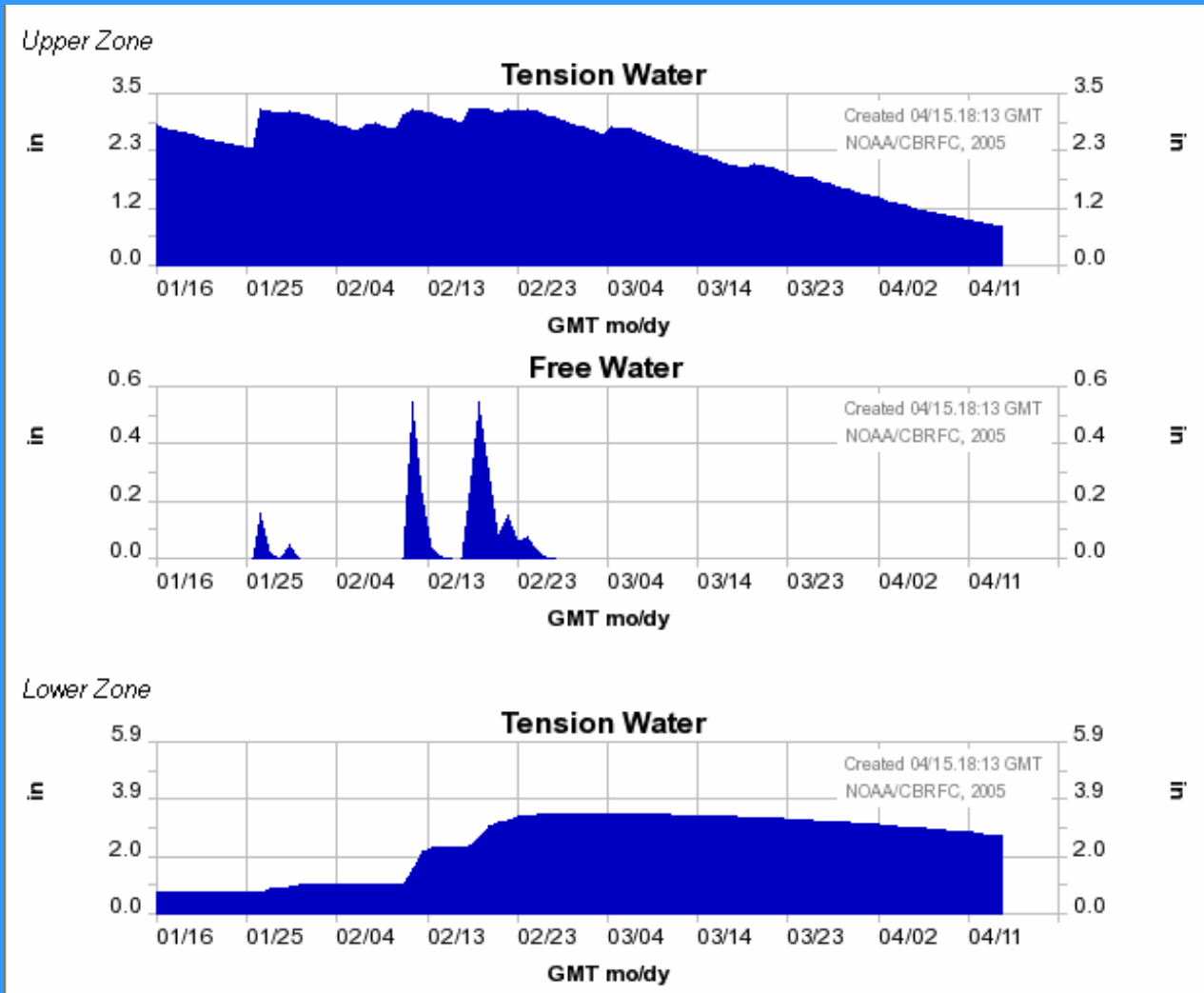
BASEFLOW

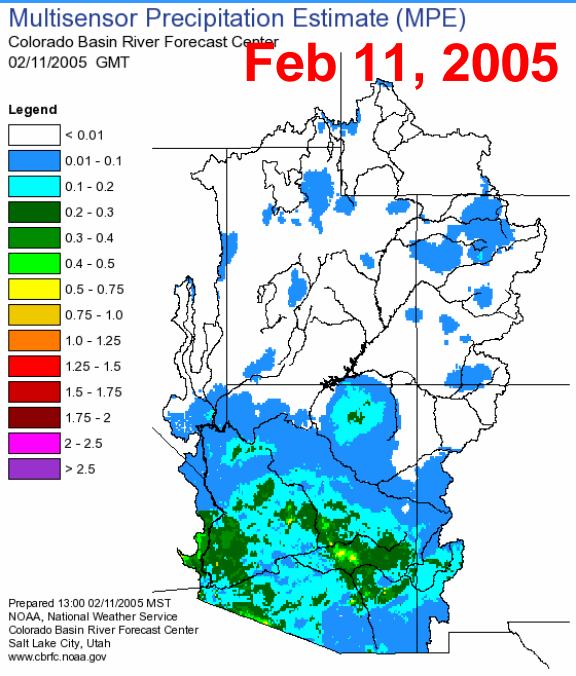
Generalized Sacramento
Soil Moisture Accounting
Model



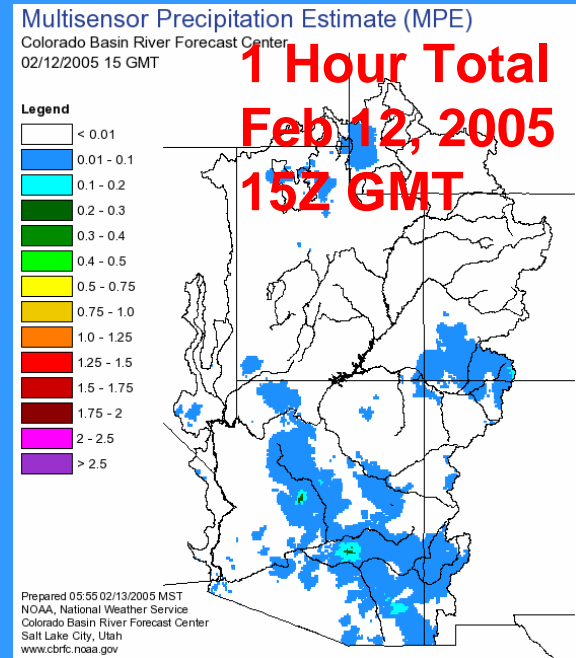
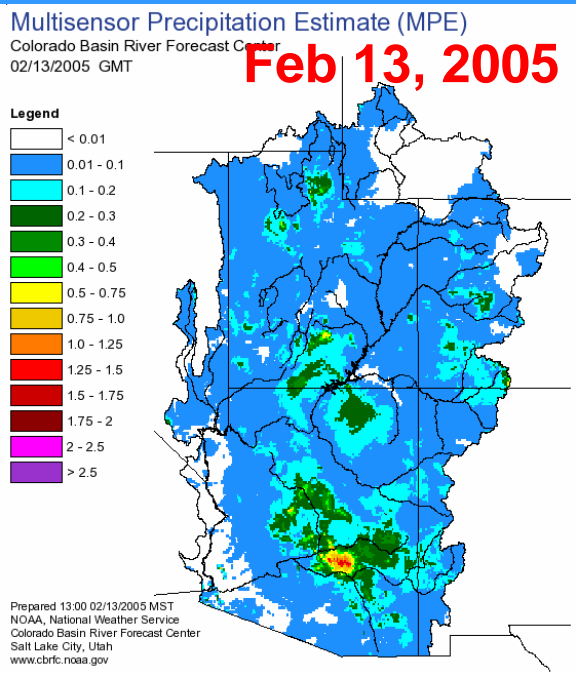
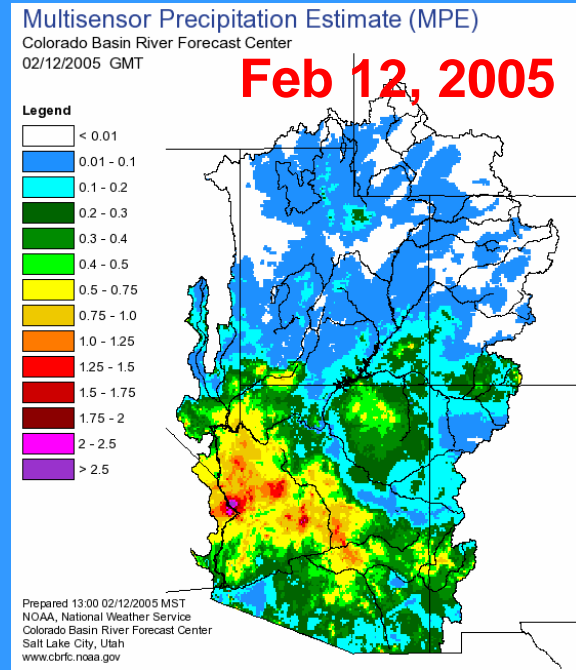
CAVE CK - CAVE CK, NR, COTTONWOOD WASH, BLO (CAVA3)

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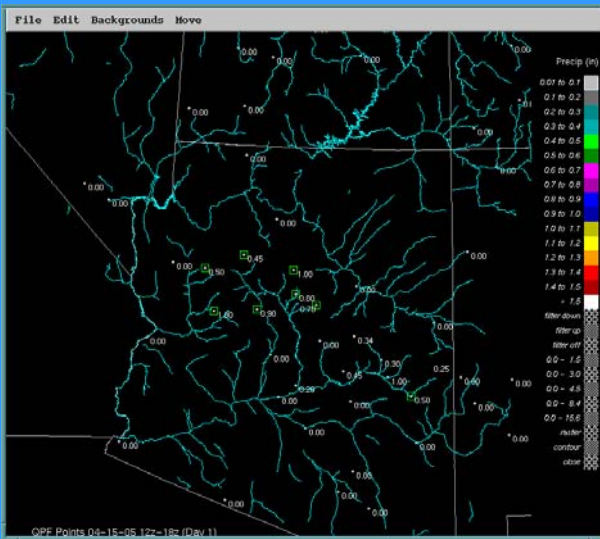




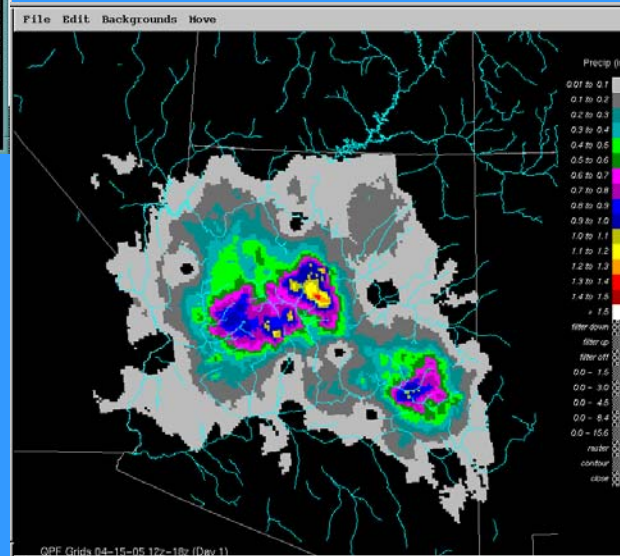
Observed Precipitation



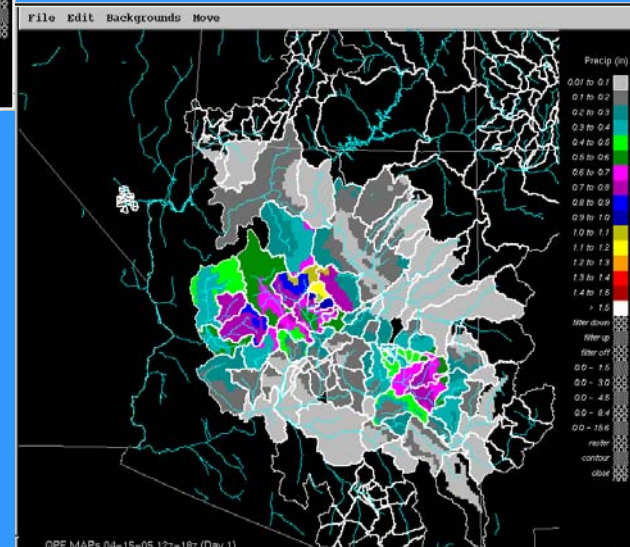
Future Precipitation & Temperature & Freezing Level



Point Values
(Hydrologic
Prediction
Center)



Grid Values
(Prism
Scaling)



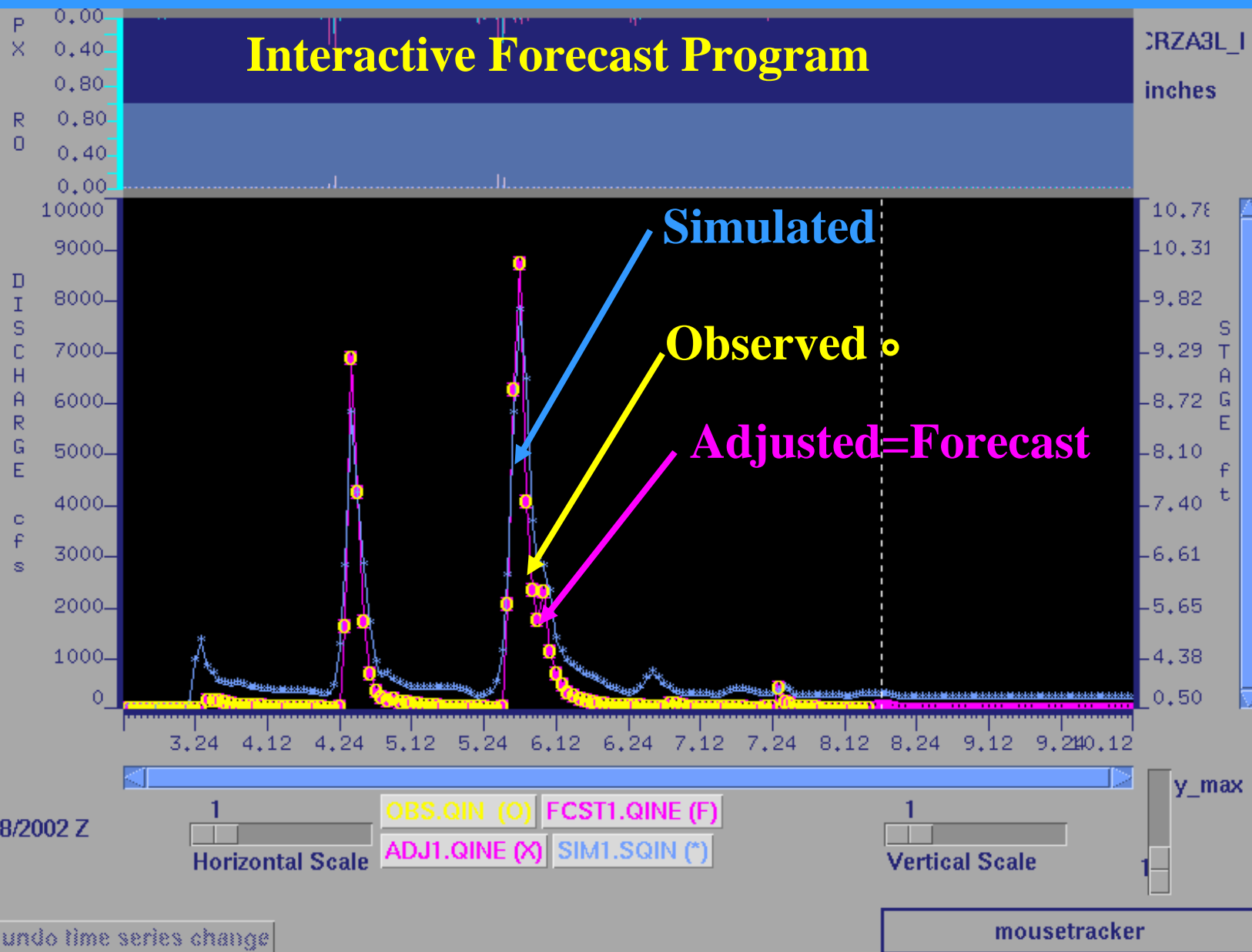
Basin Values

Example Display From NWSRFS-

Interactive Forecast Program

CRZA3L_I

inches



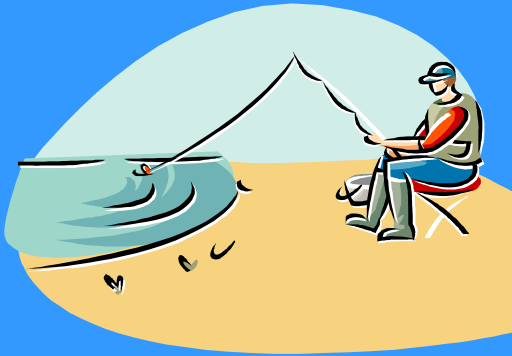


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Lack of Data – Future Uncertainty

OKAY!

So Why ???!!!



Inputs:

Conditions in the river basin

Future Precipitation ??

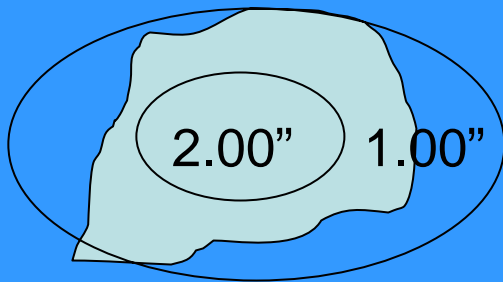


Future Uncertainty - Precipitation

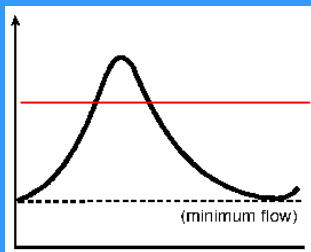
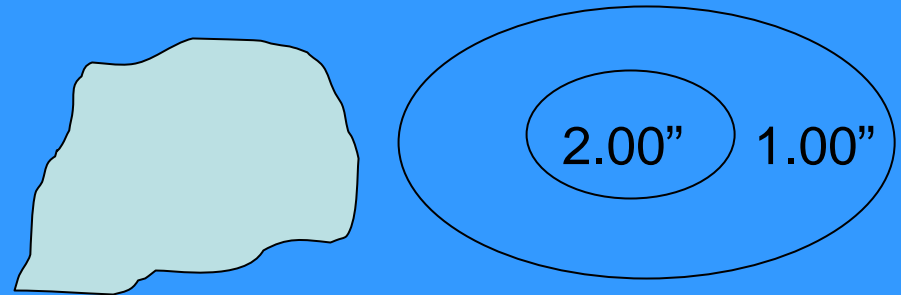
NWS

Amounts & Timing Are Perfect: BUT Wrong Basin

Forecast



Result



Flood Stage



No Rise

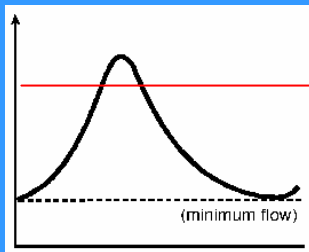
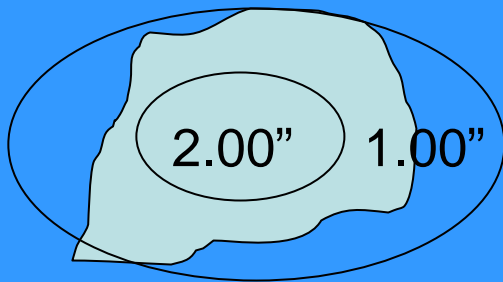


Future Uncertainty - Precipitation

NWS

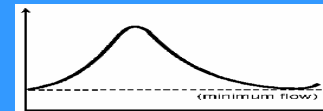
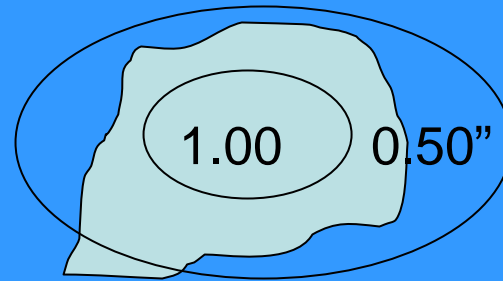
Basin Is Right: BUT Forecast Amounts Too High

Forecast



Flood Stage

Result



Peaks Lower

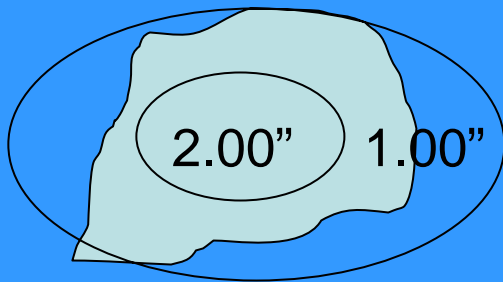


Future Uncertainty - Precipitation

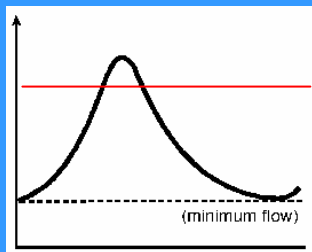
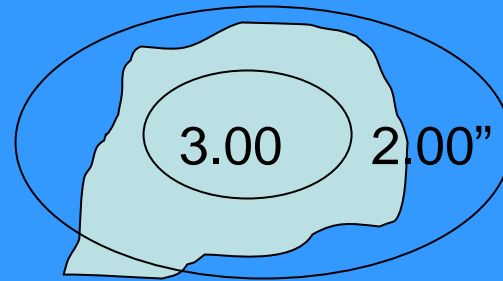
NWS

Basin Is Right: BUT Forecast Amounts Too Low

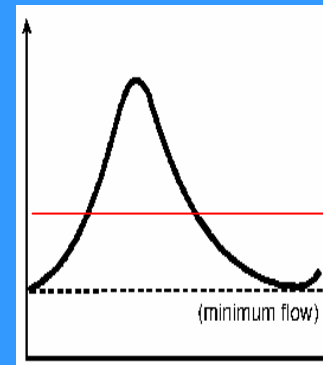
Forecast



Result



Flood Stage



Peaks Higher



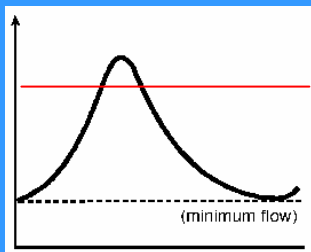
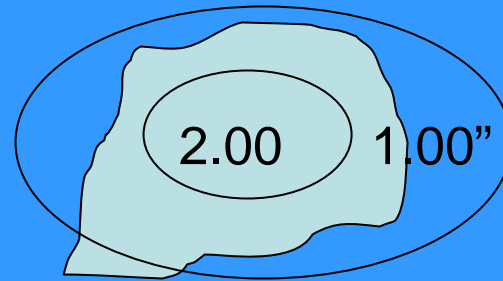
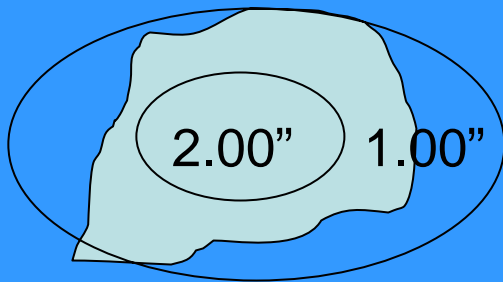
Future Uncertainty - Precipitation

NWS

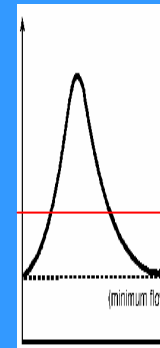
Basin Is Right-Amounts are Right: wrong intensity

Forecast For 24 Hours

Result: Packed Into 6 hours



Flood Stage



Peaks Faster & Higher



NWS

Sometime It Just Seems Hopeless



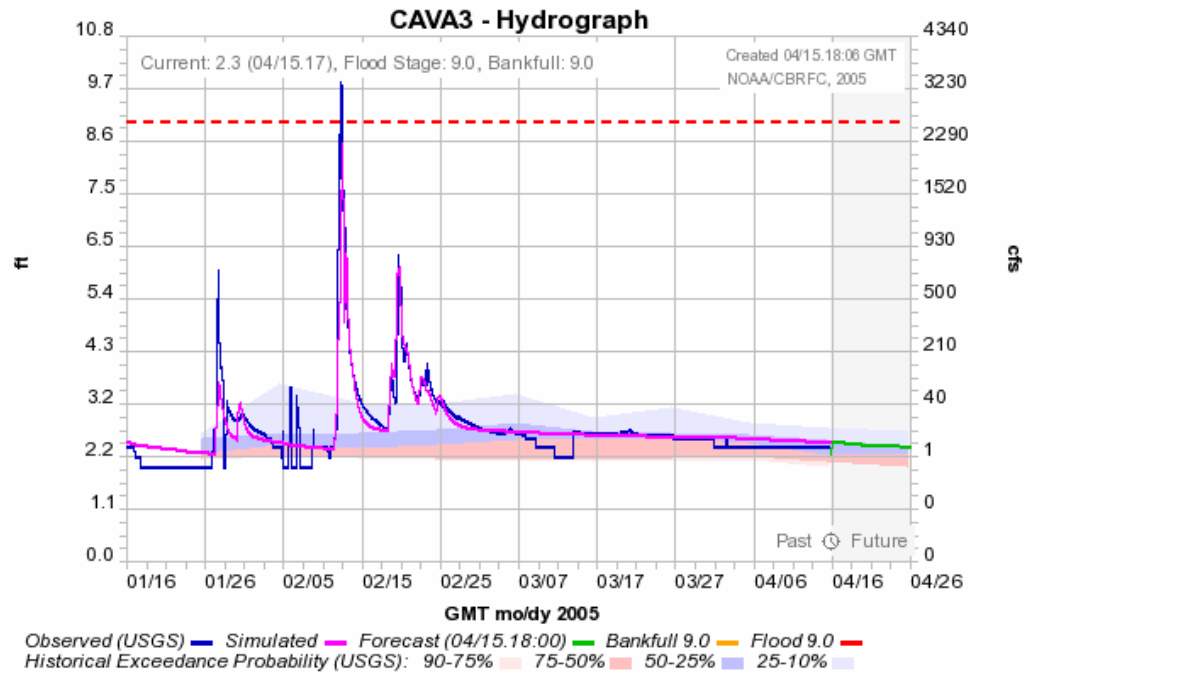
Glen Sampson

Example:
Hydrograph Plot
CBRFC Web Site

CAVE CK - CAVE CK, NR, COTTONWOOD WASH, BLO (CAVA3)

Forecasts on this web page are not official and should be used only as guidance.

Official warnings and forecasts can be found [here](#).



Hydrograph Options	Graphs	Tabular Data	Information
<input type="checkbox"/> Critical Stages	<input checked="" type="checkbox"/> Precipitation	<input type="checkbox"/> Precipitation	<input type="checkbox"/> Gage Info
<input checked="" type="checkbox"/> Simulated	<input type="checkbox"/> Temperature	<input type="checkbox"/> Temperature	<input type="checkbox"/> Basin/Location Maps
<input type="checkbox"/> Raw Data	<input type="checkbox"/> Freezing Level	<input checked="" type="checkbox"/> Freezing Level	<input type="checkbox"/> Aerial/Topo 16 mpp
<input checked="" type="checkbox"/> Linear Flow	<input type="checkbox"/> Snow	<input type="checkbox"/> Snow	<input type="checkbox"/> Photos
<input type="checkbox"/> Historical Peak	<input type="checkbox"/> Soil Moisture	<input type="checkbox"/> Soil Moisture	
<input type="checkbox"/> Yearly Peaks	<input type="checkbox"/> Rating Table	<input type="checkbox"/> Rating Table	
<input type="checkbox"/> Daily Maxima	<input checked="" type="checkbox"/> Hydrograph	<input type="checkbox"/> Critical Stages	
<input checked="" type="checkbox"/> Statistics		<input type="checkbox"/> Peaks	
<input type="checkbox"/> Contingency		<input type="checkbox"/> Flows	
<input type="checkbox"/> Adjust			
<input type="checkbox"/> Requery			
<input type="checkbox"/> Forecasts			

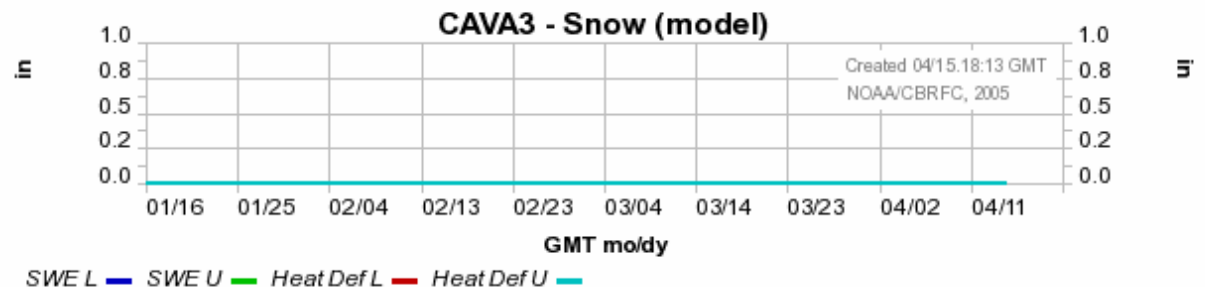
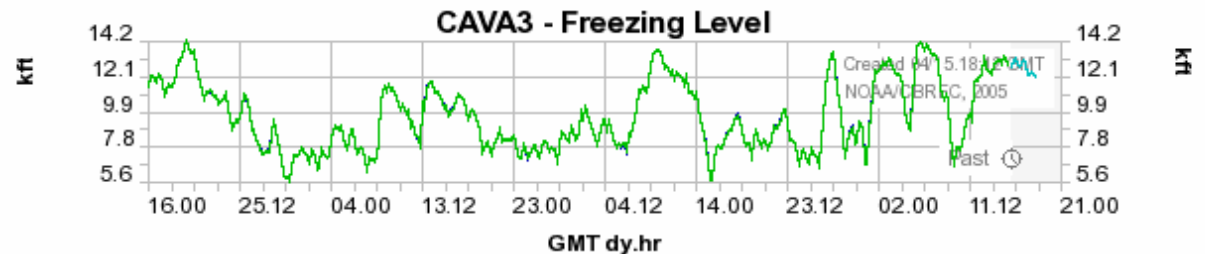
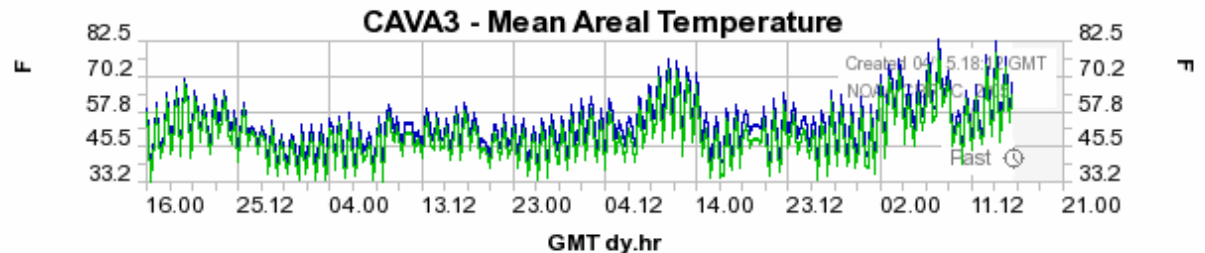
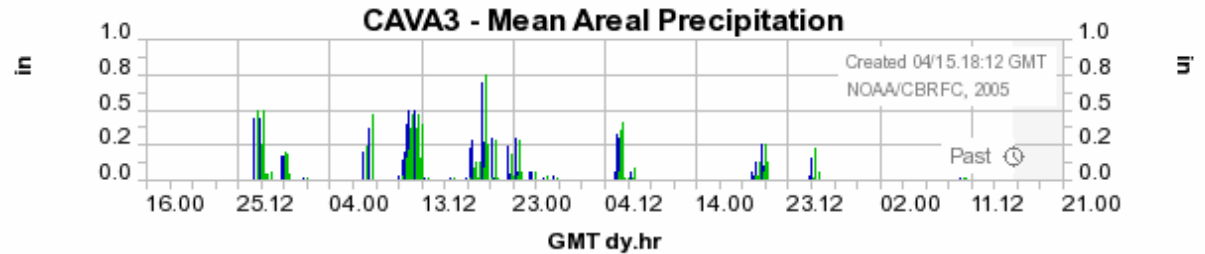
Years: 1981-1989
 Date: 04/15/05
 Past Days: 90
 Future Days: 10
 ESP: Off
 Analog Years: Off
 Analog Years Period: Off

Apply display

Example:
Model Inputs
CBRFC Web Site

CAVE CK - CAVE CK, NR, COTTONWOOD WASH, BLO (CAVA3)

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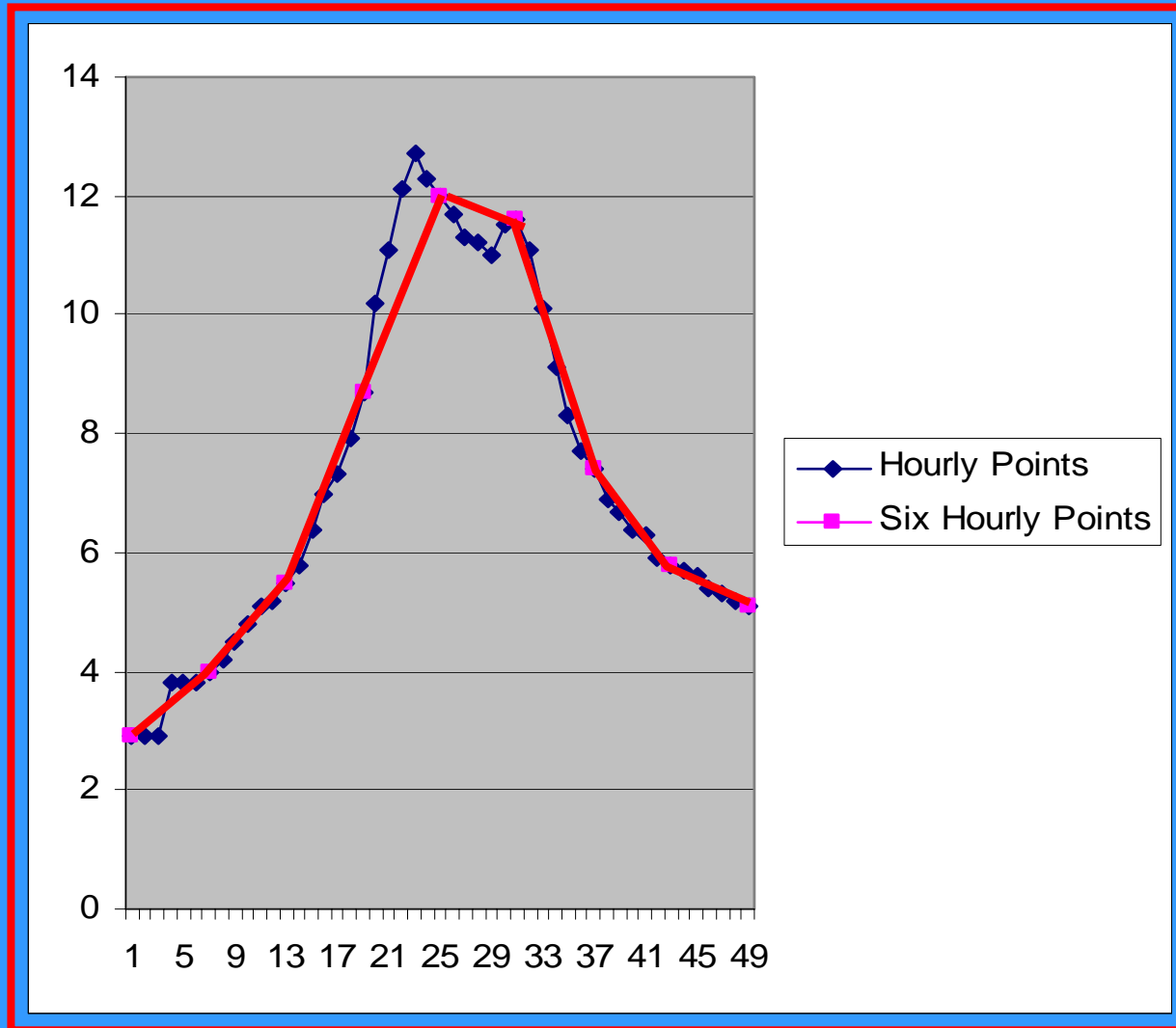




NOAA

NWS

We Now Use 1-Hour Unitgraphs



- Verified
- Screened
- Time Distributed
- Manual
- Questionable
- Partial
- Estimated
- Bad
- Missing

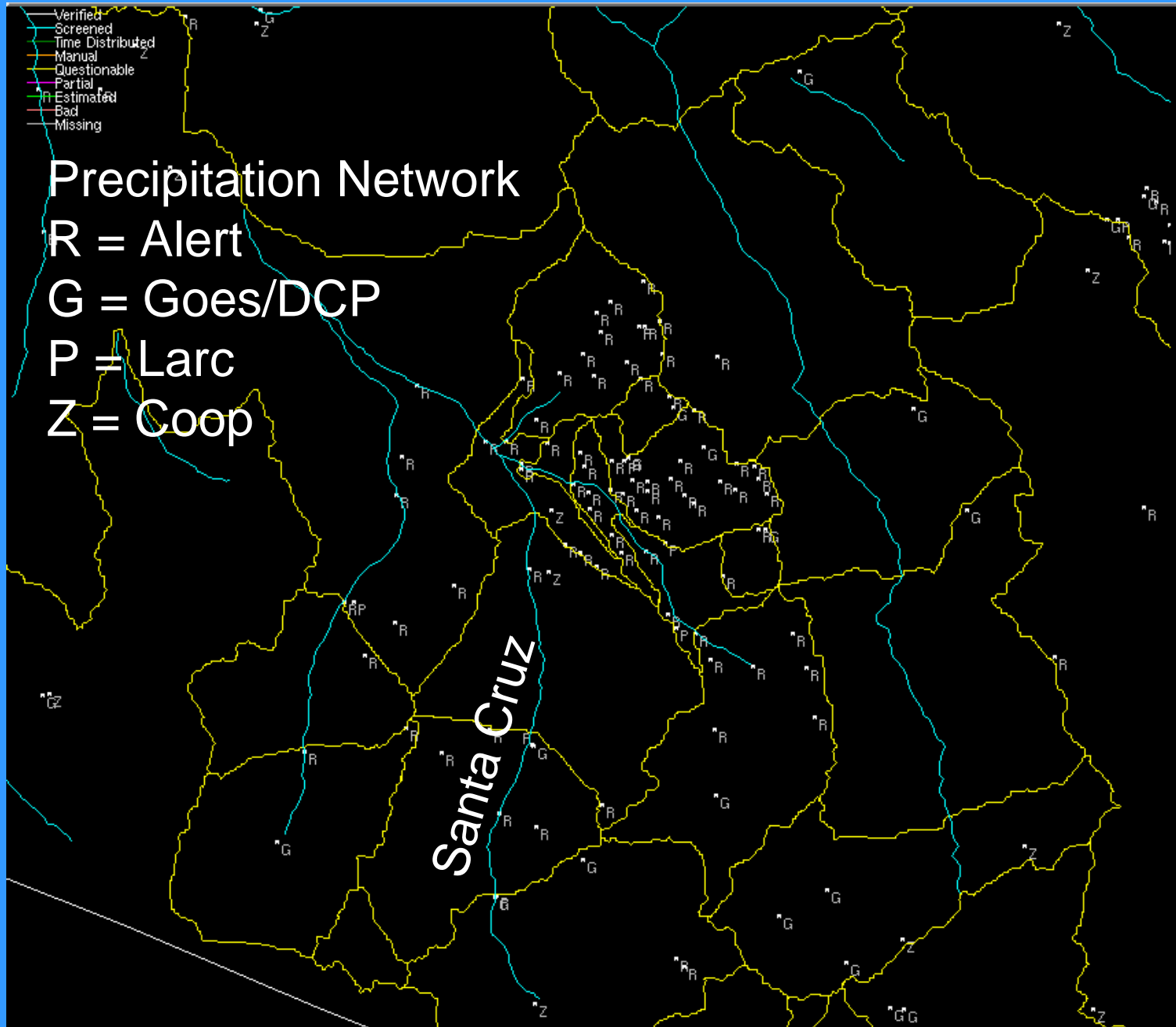
Precipitation Network

R = Alert

G = Goes/DCP

P = Larc

Z = Coop



- Verified
- Screened
- Time Distributed
- Manual
- Questionable
- Partial
- Estimated
- Bad
- Missing

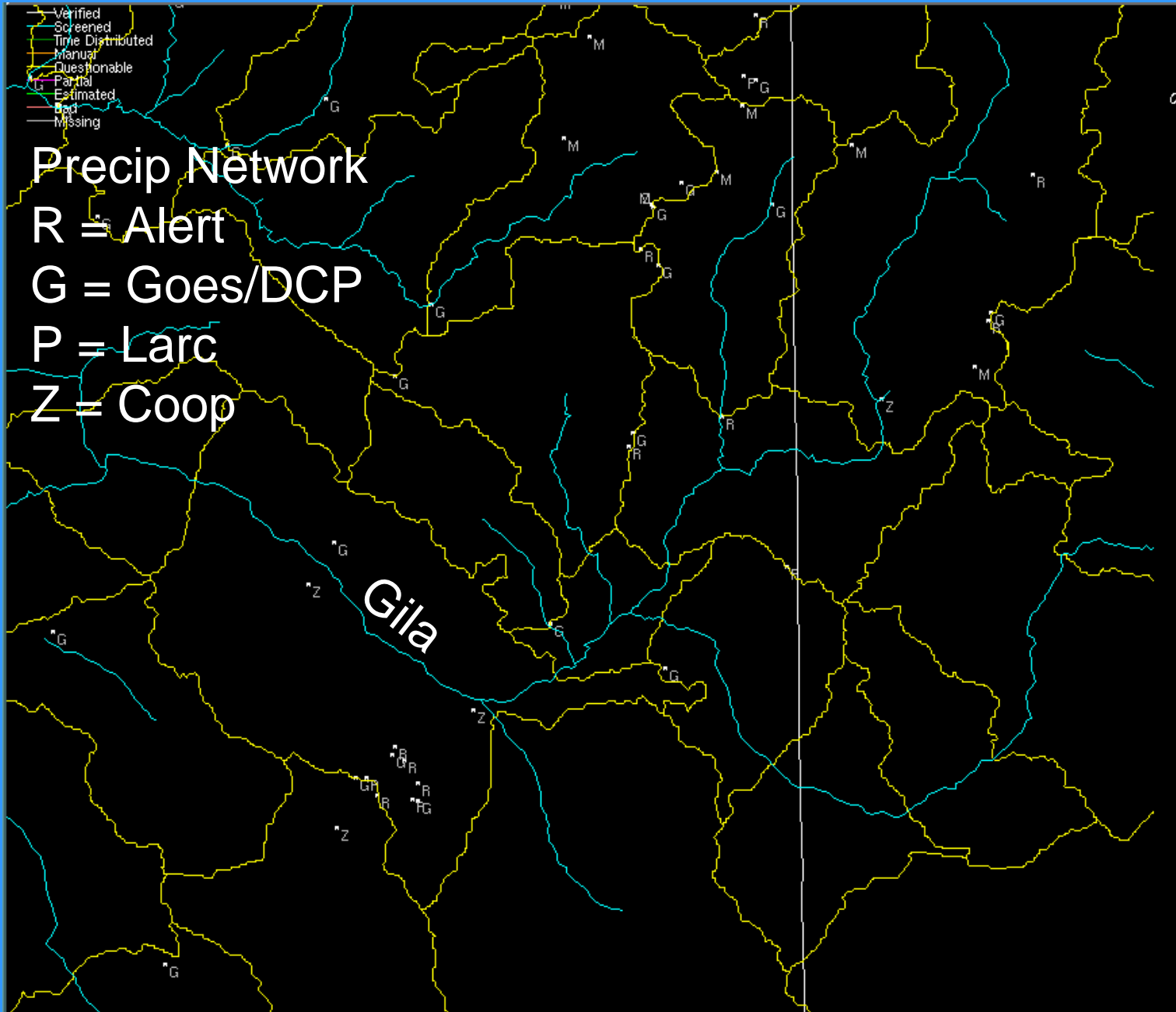
Precip Network

R = Alert

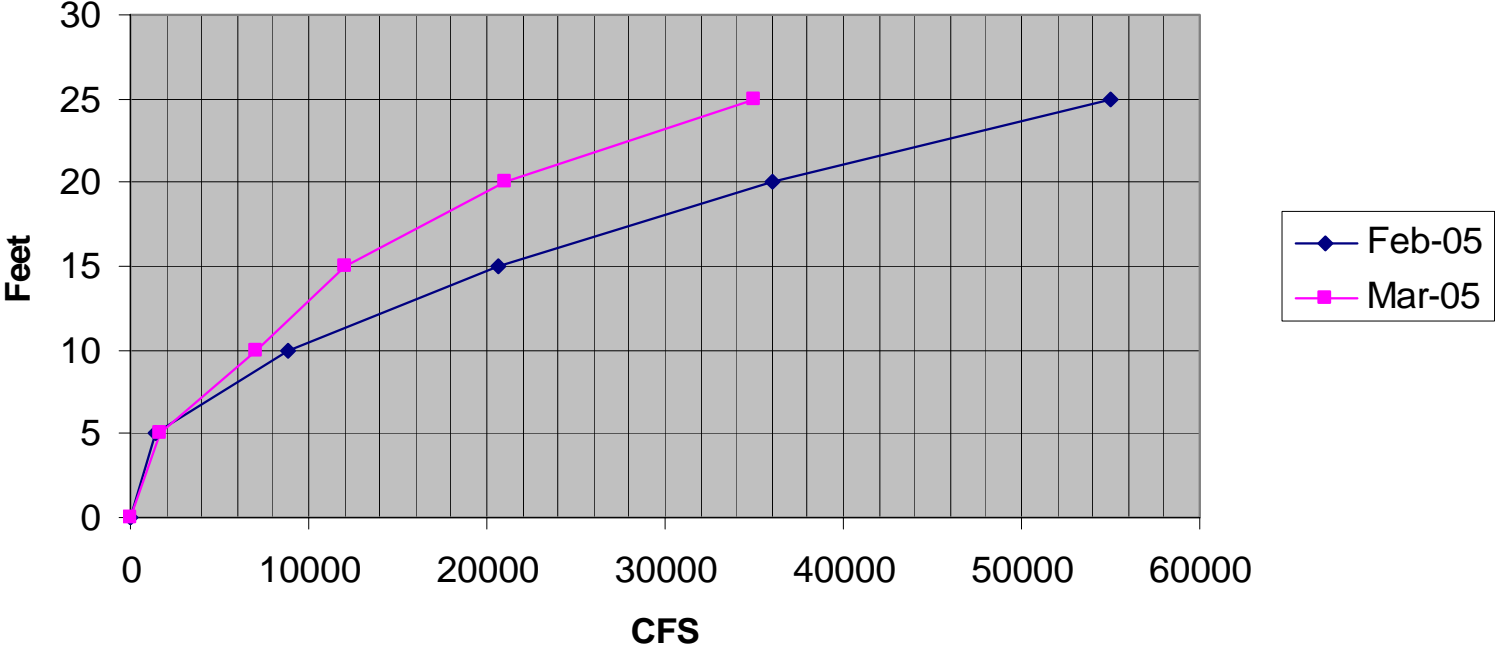
G = Goes/DCP

P = Larc

Z = Coop



Rating Tables - Gila Clifton GCFA3





NWS

Forecast Points

1. Forecast Point
 - Full E-19
 - Critical Stages Defined
 - Used for public releases
2. Guidance Forecast Point
 - Partial E-19
 - Natural BF, Natural FS for Reach
3. Data Point
 - No E-19
 - Natural BF