CBRFC Distributed Modeling Efforts

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Kevin Werner – SCH (presenting)

Outline

- Current Applications
- Model Mechanics
- Results so far

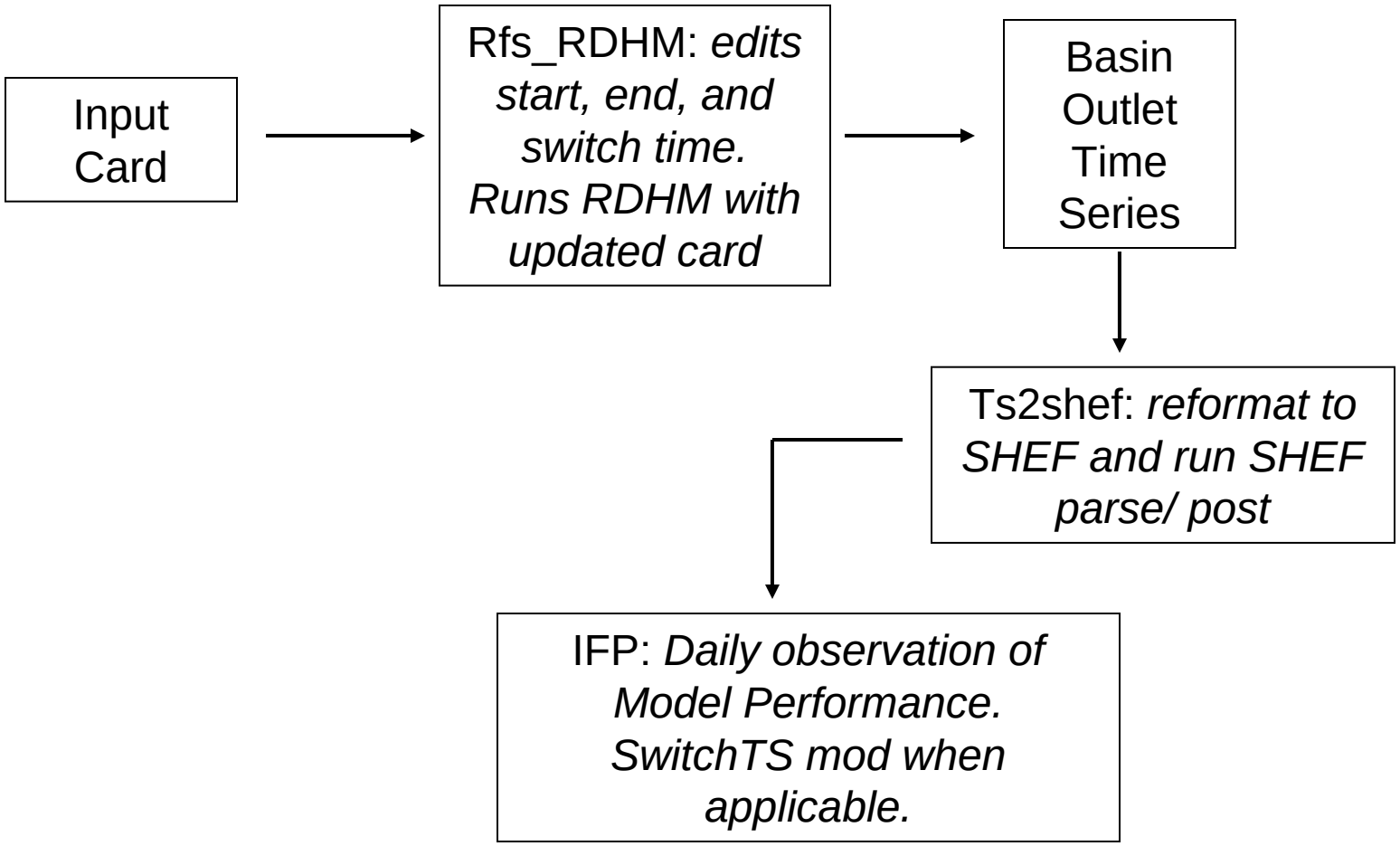
Current Applications

- **Routine Forecasts** - Basin outlet point time series display in IFP.
- **Soil Moisture -** Experimental Soil moisture forecast grids.
- **Flash Flood Support -** Probabilistic Surface Response grids.
- **Collaboration -** Extension into the Upper Colorado and collaborative updating methodology study with Rti and NOHRCS.

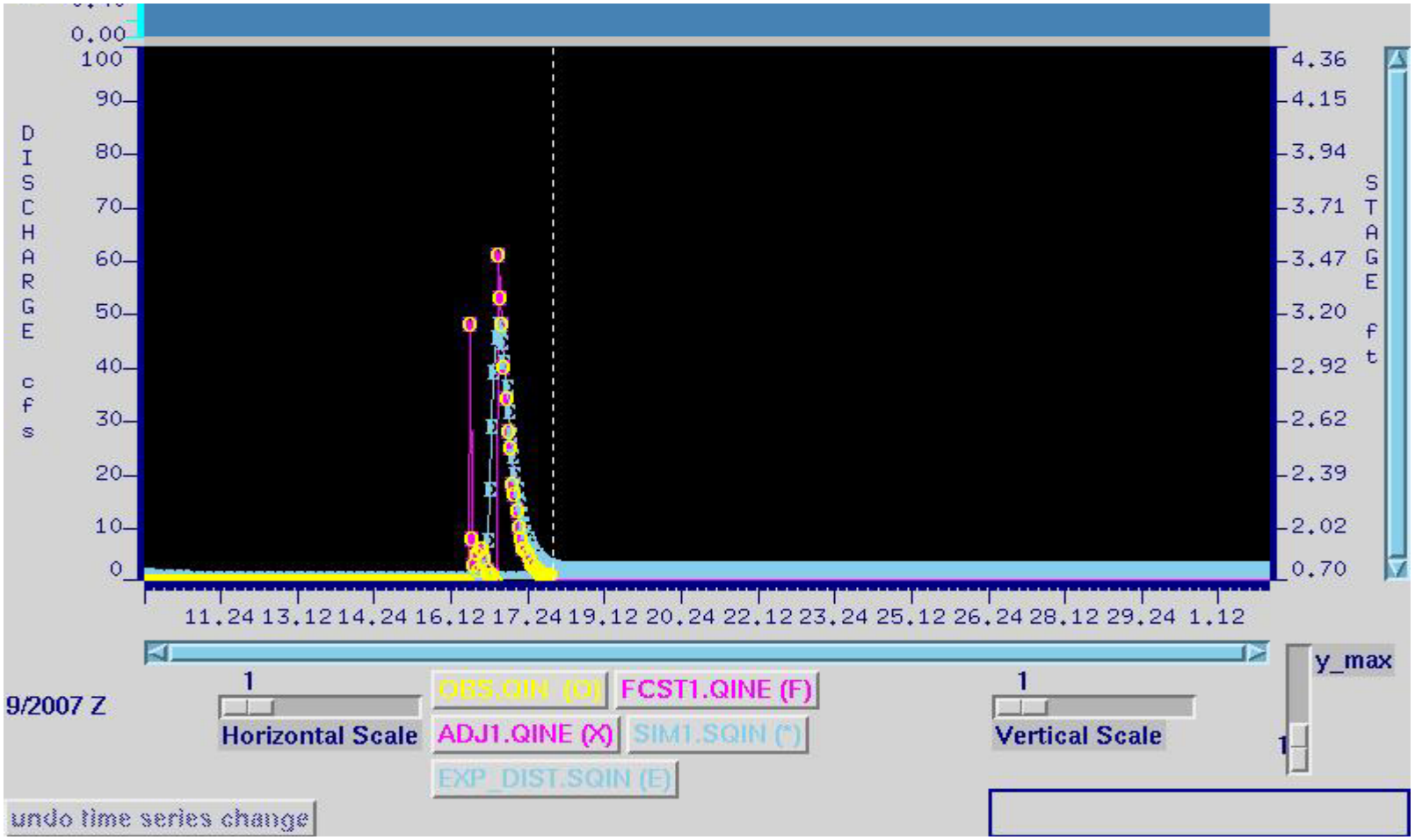
QPF

- QPF point guidance from HPC, modified by the Forecaster as necessary within Mountain Mapper (MM).
- Mountain Mapper grids are converted to 6-hourly cumulative xmrg’s.
- 6-hour future xmrg’s are disaggregated within RDHM (v2.4.1.) using uniform disaggregation

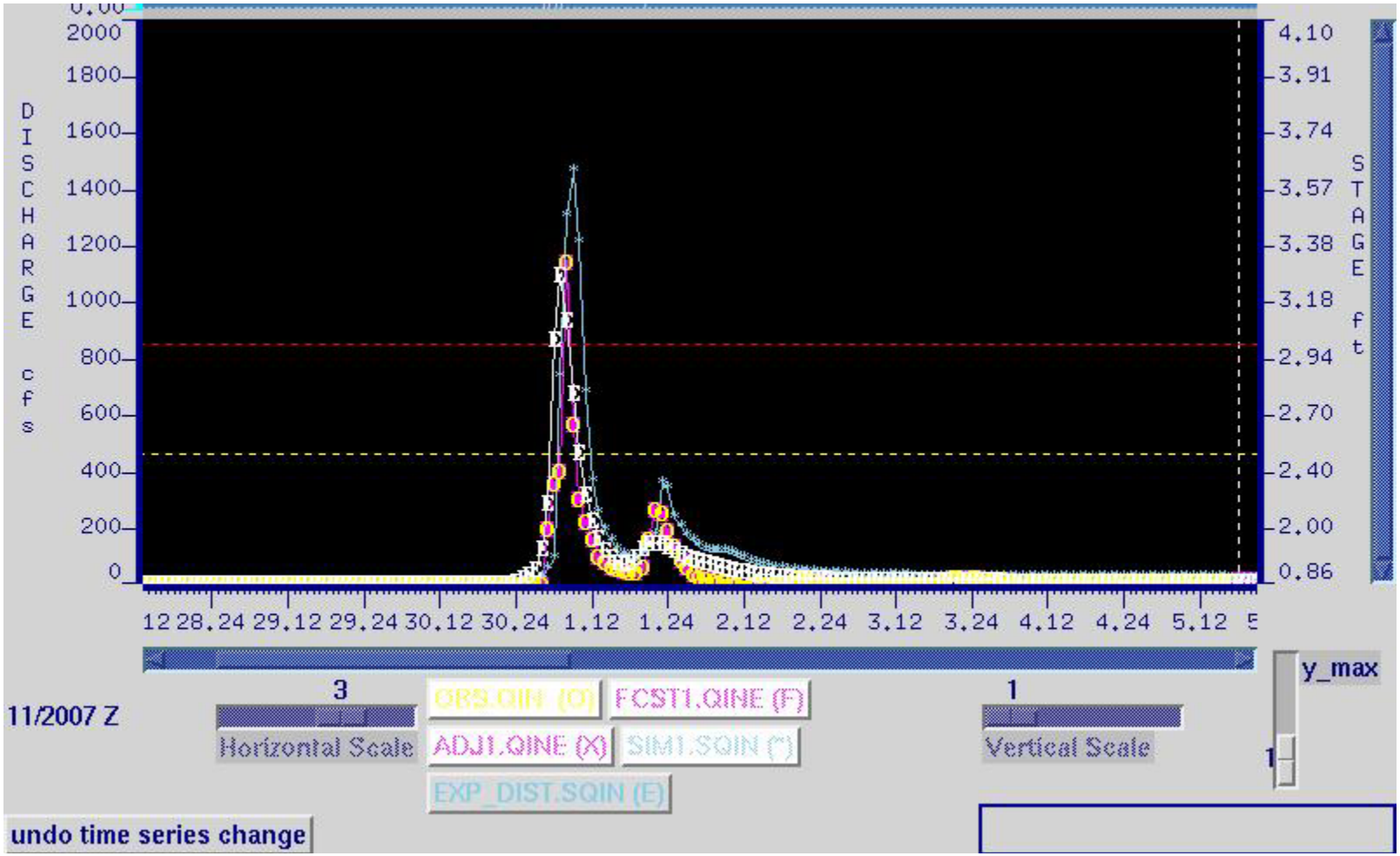
Time-Series within IFP



Cienega Creek, AZ – Low Flow Event



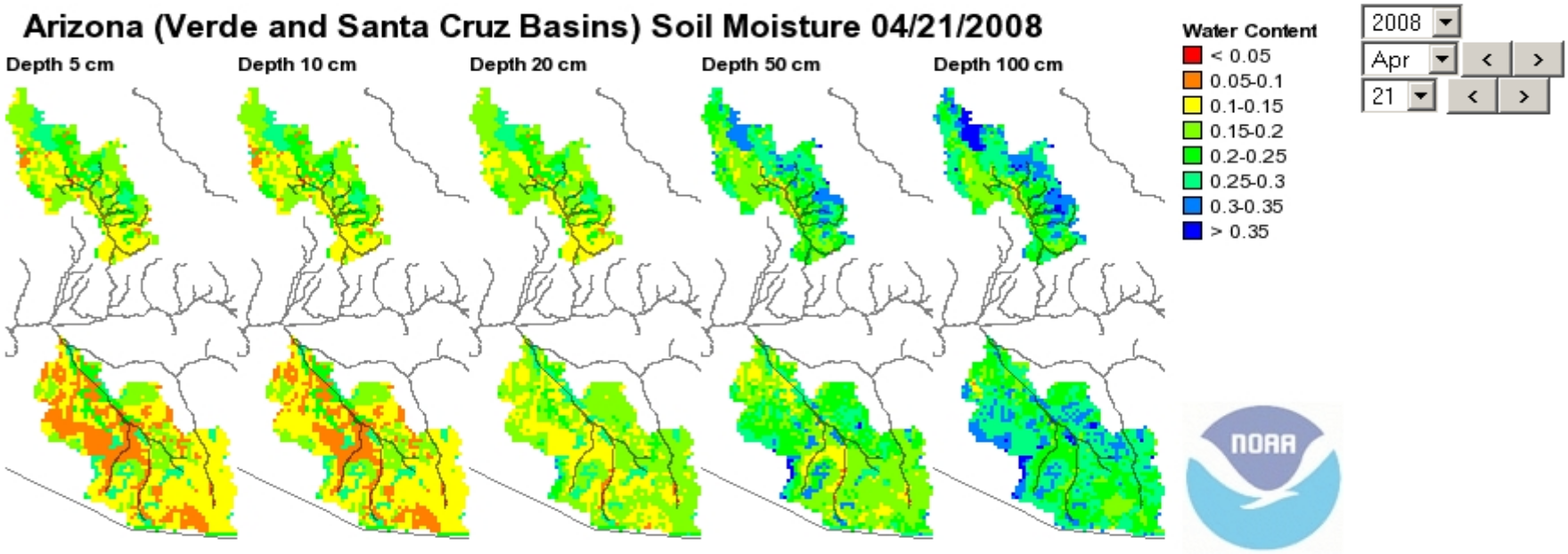
Sabino Canyon, AZ – High Flow Event



Sac-HT Soil Moisture Grids

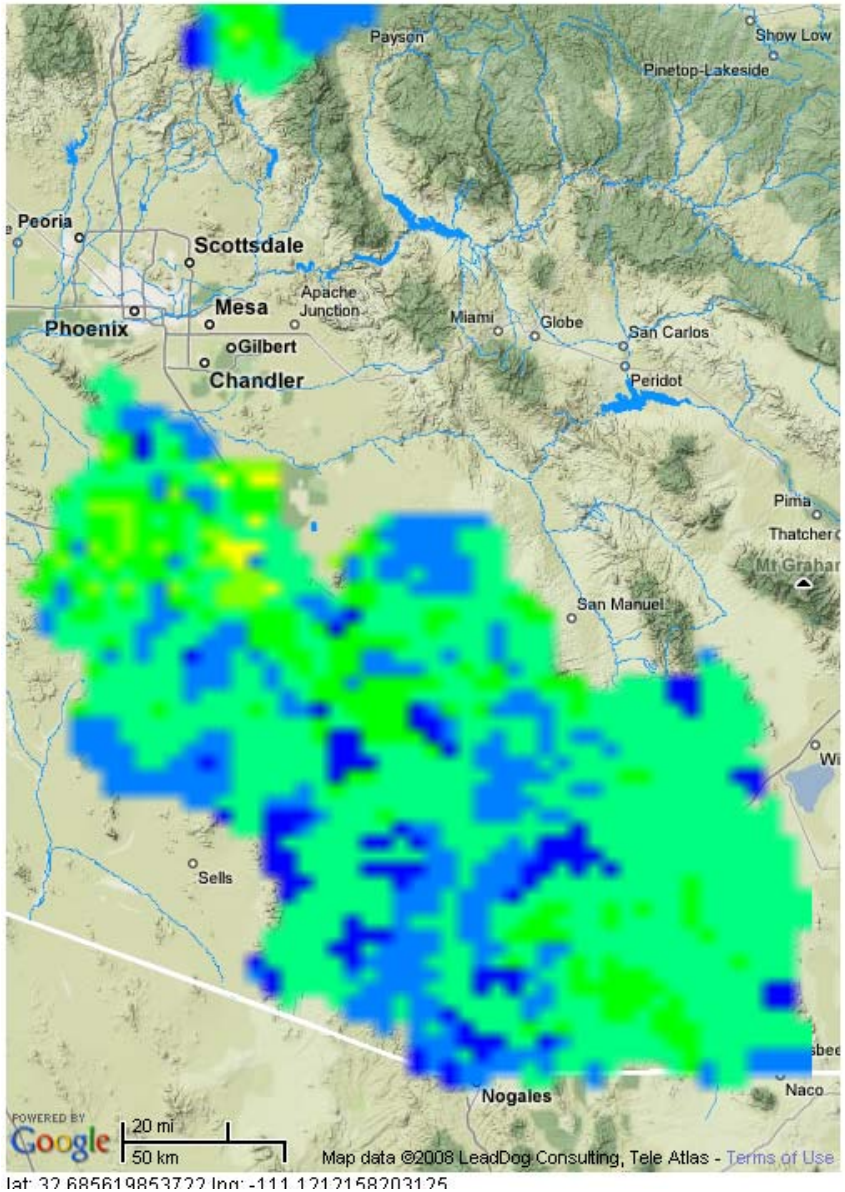
- Sac-HT generates Fractional Water Content (V_w/V_s) grids at user specified depth (5, 10, 20, 50, 100 cm).
- Based on QPE and 10 days of QPF.
- CBRFC is currently working with WFO Tucson to evaluate customer response and additional needs.
- OAR is collaborating with the placement of 6 soil moisture sensing station in the study area.

Experimental Soil Moisture



Proto-type grid viewer

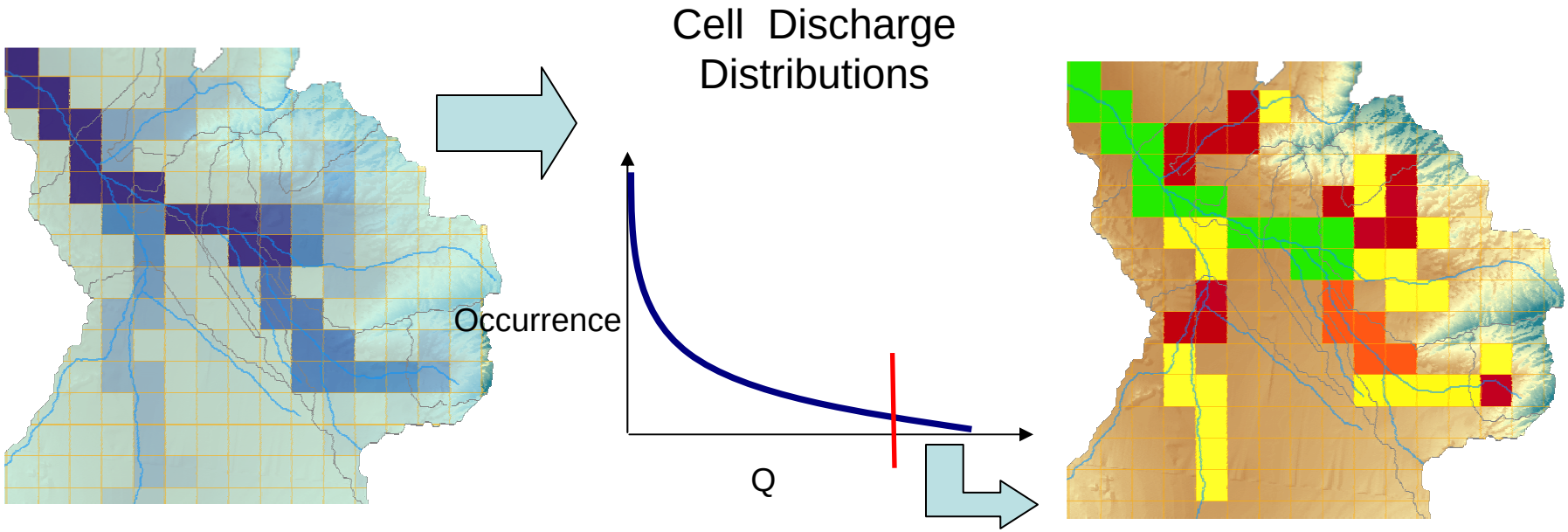
- Multiple grid type display (soil moisture, precipitation, and surface response.)
- Overlays on terrain and geographic data for better location.
- Enhanced navigation.



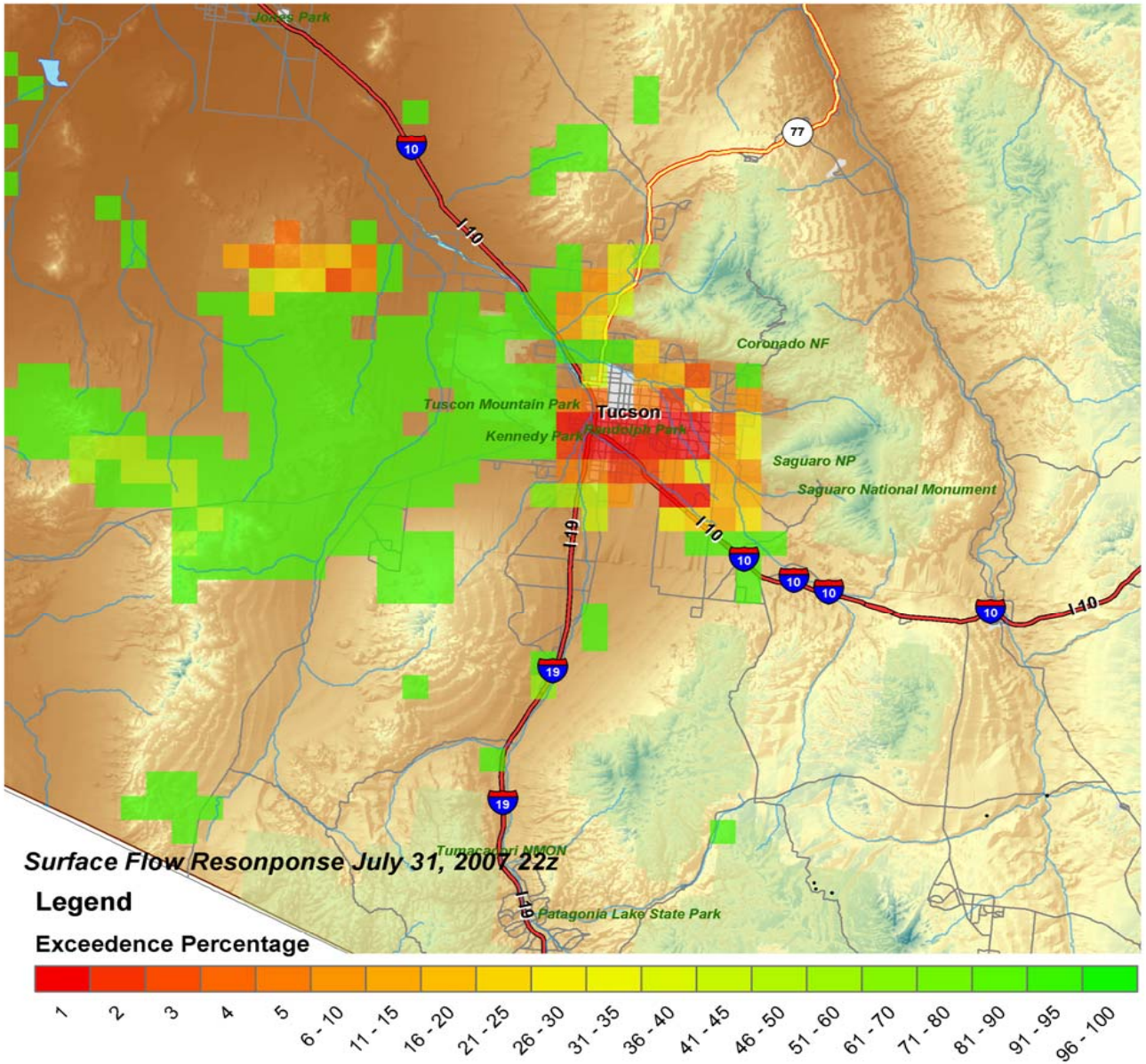
Probabilistic Surface Response

- Run the historical observed precipitation through the Hydrologic Lab – Research Distributed Hydrologic Model (HL-RDHM) saving grids of discharge and surface flow for each hour.
- Establish the hourly distribution of discharge and surface flow for each cell.
- Run the model in real-time, with quality controlled QPE and very-short-term QPF (NMQ) to produce the discharge and surface flow grids.
- For each grid cell, compare the value to the distribution of values and assign the exceedence category.

Operational Probabilistic Surface Response Concept



Exceedence Surface Flow, July 31, 2007



Improvements over existing FF Program

- Continuous model maintains soil moisture states.
- Model is connected – flows routed from cell to cell to show impacts in areas downstream from the precipitation event.
- Indicates where significant flows are occurring or could occur based on that cell's hydrologic distribution.
- In time, WFO forecaster short-term storm projections can be used to derive quantified stream response.
- Begins to bridge the gap between traditional RFC river forecasts and the Flashflood program.

Questions?

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