Decision Support in the Upper Gila River: Making the Most of Local Resources for National Benefit

W. Paul Miller, Service Coordination Hydrologist

Upper Gila River State of the Watershed

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Eastern Arizona College – Thatcher, AZ
Who Are We?

- Part of NOAA - NWS, one of 13 RFCs nationwide
- An operational field office located in Salt Lake City, UT
- Highly collaborative, reliant on partners and data
- All about decision-support!
Who We Are

• Work with a broad and diverse set of stakeholders
  – Weather Forecast Offices and Reclamation
  – Municipal and Agricultural Water Users
  – USGS, NRCS, and many other federal agencies
  – State agencies, Academics, NGOs, Tribes

• Receive data from many of these sources
River Forecast Centers (RFCs)
- Support for WFOs
- River levels and flows
- Reservoir inflows
- Each RFC is unique

CBRFC
- Seasonal Water Supply forecasts, in addition to many other products
  - Most advanced, involved
  - Reclamation is a key stakeholder
  - www.cbrfc.noaa.gov

Weather Forecast Offices (WFOs)
- Everyday weather
- Extreme weather
- Warnings, watches, and advisories
- Floods, tornadoes, heat, etc...
Forecasting in the Upper Gila Watershed

- Short term forecasts at 19 locations
  - Updated at least daily
  - More frequently if needed
- Seasonal water supply forecasts at 5 locations
  - Forecast Jan – May runoff
  - Official forecast issued each month, but guidance issued every day
Developing a Forecast

Trace Ensemble for
GILA - GILA, NR
Developing a Forecast

• Consume as much observed data as we can
  – Temperature
  – Precipitation
  – Streamflow
  – Reservoir Operations
  – Measured Depletions

• Strong ENSO events

• Modeled Data
  – Soil Moisture
  – Freezing Levels
  – Develop a snowpack from observed precipitation data
  – Unmeasured Depletions

• Remote Sensing
  – Snow Coverage (qualitatively)
  – Dust (quantitatively)
Forecasting in the Upper Gila River Basin

- We do really well...
  - Wintertime storm events
  - Routing upstream observed flows
  - Supporting flash flood events
- We are challenged by...
  - Summertime storm events, monsoon events
  - Freezing level accuracy
  - Lack of observations in some areas
  - Changes in channel geometry during and after storm events
  - Flash flood events

- Updating calibrations in the Lower Colorado River Basin
100% Snow does not mean 100% Runoff!
Reaching our Stakeholders
Reaching our Stakeholders

Support flood warning efforts by weather forecast offices
Opportunities in the Upper Gila River Basin

- Upper Gila River Basin is relatively data sparse
- We could improve precipitation gage density by partnering with USGS
  - About $1,000
  - Gage at streamflow sites
  - Very helpful for forecasting in the area
Opportunities in the Upper Gila River Basin

We can incorporate and use new data, especially if it’s projected to be long-term and dependable.

Could also use more data regarding use in the basin.

Future calibration will incorporate any new streamflow stations in the Upper Gila River Basin.
Coordination Efforts

• Annual Stakeholder Open House
  – Broad range of stakeholders
  – Introduce new products and services
  – Reinforce traditional products and services
  – Important for us to get feedback
• Frequent webinars
  – Water supply, peak flows
  – Custom Webinars for your group
  – WFO Coordination
Coordination Efforts

- Participation in stakeholder-run meetings and events
- Participation in multi-agency efforts
  - Landscape Conservation Cooperatives
  - Climate Science Centers
  - NOAA RISAs (like CLIMAS)
  - Others
- Direct contact by phone, e-mail, etc...
Challenges Ahead

- Climate Change and its Impacts
  - Stationarity is in the past – but it’s also how we look forward
  - Extreme Events – persistent drought and intense rains can impact our forecasts, and our stakeholder’s ability to manage resources effectively

- Infrastructure and Operations
  - How do we continue to bridge the research to operations gap? AND the operations to research gap?
  - Our model from the 1970s was not built for the data we have access to now, so we have to be innovative

- Outreach
  - Facilitating cooperative and continued decision support
  - Reaching those partners we haven’t met yet
  - A diverse area with diverse needs! Great Basin, Lower Basin, Upper Basin... and the users within those areas...
Moving Forward

If we want to continue to thrive in a Cadillac Desert, we have to carpool!

We need to encourage the notion of a hydrologic community – we’re one basin.

New partnerships, new voices, and new ideas are going to be needed – we can help!
Upcoming Open House

- **October 30\textsuperscript{th} and 31\textsuperscript{st}**
  - Half day on October 30\textsuperscript{th} covering “CBRFC 101”
  - This year, we’ll focus on how stakeholders use our forecast on the 31\textsuperscript{st}
- Free!
- Great way to see what others are doing, exchange information and ideas
Questions?

Contact us!

paul.miller@noaa.gov
cbrfc.operations@noaa.gov

801-524-5130 x335 or press “1” to speak to a hydrologist

www.cbrfc.noaa.gov