

# Western Regional Water Commission

## STAFF REPORT

**DATE:** October 12, 2017

**TO:** Chairman and Members, Western Regional Water Commission (“WRWC”)

**FROM:** Chris Wessel, WRWC Water Management Planner

**SUBJECT:** Report on the analysis of historical precipitation data collected by Washoe County; discussion and possible approval of a proposal from the Desert Research Institute (“DRI”) for continuation of the regional precipitation monitoring project; and, if approved, authorize the Chairman to execute an amendment to the Interlocal Agreement with DRI, in an amount not to exceed \$20,000 from the Regional Water Management Fund (“RWMF”), for that purpose

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### **SUMMARY**

Dan McEvoy, PhD, Applied Climatologist at DRI, has reviewed the long term data collected as part of the regional precipitation monitoring program originated by Washoe County in the mid-1990s. The original purpose of the monitoring program was to establish observed precipitation in hydrobasins identified for future potential sustainable water importation projects. In order to validate the usefulness of the data, Dr. McEvoy proposed to conduct the following analysis:

- Conduct a thorough Quality Assurance/Quality Control of all Network data to eliminate any spurious measurements;
- Evaluate the Network’s value on the performance of gridded data products in the data sparse regions of Washoe County by comparison of observed values to modeled grid data. Error statistics including correlation, bias, and root mean squared error will be computed at each station using the entire record; and,
- Summarize the results from the data analysis and discuss implications for potential hydrologic applications using the Network data such as groundwater recharge estimates and precipitation trend analysis.

Dr. McEvoy will provide a brief presentation to the WRWC regarding his analysis.

The Northern Nevada Water Planning Commission (“NNWPC”), at its August 2, 2017 meeting, recommended that the WRWC approve DRI’s proposal for continuation of the regional precipitation monitoring project for the 2017-2018 water year, in an amount not to exceed \$20,000 from the RWMF.

### **BACKGROUND**

Washoe County sponsored a precipitation gauge monitoring program over the last 17+ years, through its former Department of Water Resources, as part of its early regional water resource planning efforts. Since the consolidation of the County's water utility with the Truckee Meadows Water Authority, the precipitation gauge monitoring program no longer had a funding source. Recognizing the importance and value of precipitation data for regional water planning

purposes, staff investigated continuing the program as part of the WRWC's statutory regional water planning mandate.

The program involves data collection and maintenance of 77 manual “can” gauges (the "Network") where measurements are collected. The gauges are serviced twice a year. The intended use of the precipitation data was to validate existing perennial groundwater recharge estimates within the targeted hydrobasins. The Network data has recently been compiled electronically and provides a unique opportunity to analyze the quality of Network precipitation records and use the data to validate spatial estimates of precipitation, while potentially improving existing groundwater recharge estimates.

**PREVIOUS ACTION**

At staff’s request, DRI submitted a proposal, which was recommended for approval by the NNWPC at its May 4, 2016 meeting, and subsequently approved by the WRWC at its September 21, 2016 meeting, to provide DRI personnel to assist in the monitoring and maintenance of the Network (\$21,883); and, 2) perform an extensive analysis on the Network precipitation records and compare data to several gridded precipitation products (\$16,106), a one-time expense.

**FISCAL IMPACT**

The fiscal impact to the RWMF will be \$20,000 which was anticipated in the fiscal year 2017-2018 approved budget. Budget authority is located in Fund Group 766, Fund 7066, Account Number 710100, Professional Services, Cost Object WP310008.

**RECOMMENDATION**

Staff recommends that the WRWC accept the report, approve an expenditure in the amount of \$20,000 from the RWMF to fund 2017-2018 water year regional precipitation monitoring activities, as proposed by DRI; and, if approved, authorize the Chairman to execute an amendment to the Interlocal Agreement with DRI, for that purpose.

**POSSIBLE MOTION**

Should the Commission agree with the NNWPC’s recommendation, a possible motion would be “Move to approve DRI’s proposal to continue the regional precipitation monitoring project for the 2017-2018 water year, and authorize the Chairman to execute an amendment to the Interlocal Agreement with DRI, in an amount not to exceed \$20,000 from the RWMF, for that purpose.”

CW:jp

Attachment: DRI Proposal

**Washoe County Rain Gauge Network: Continued Operation Plan and Historical Data Analysis**

Personnel: Dan McEvoy, Greg McCurdy, and Albert Wolf, Desert Research Institute (DRI) and Western Regional Climate Center (WRCC)

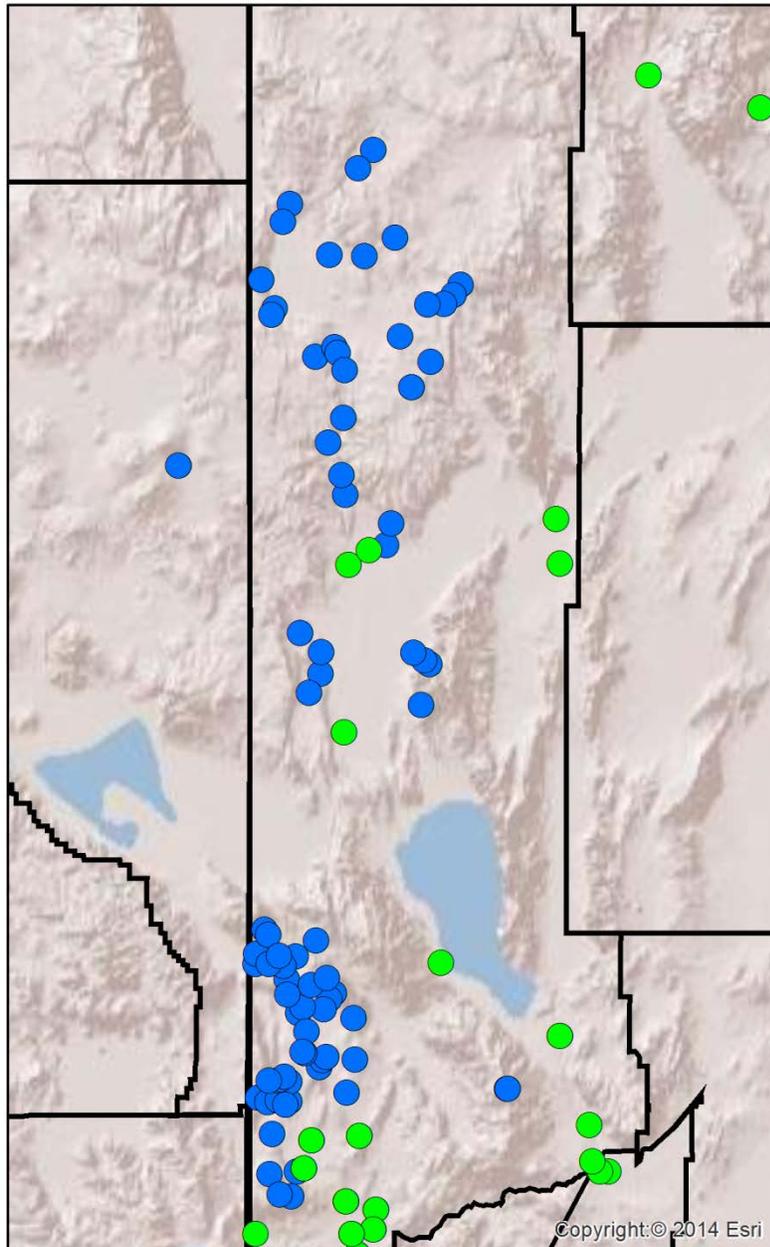
**Purpose**

Washoe County installed and maintained a storage rain gauge network (Network) of over 80 gauges with records that date back to the late 1990s. Following the recent merger of the Washoe County water utility with Truckee Meadows Water Authority, the Network program responsibilities have been assumed by the Western Regional Water Commission (WRWC). The program involves data collection and maintenance of manual gauges where measurements are collected and gauges are serviced twice a year. The intended use of the precipitation data was to validate and potentially improve existing groundwater recharge estimates that are commonly calculated using Hardman maps or Parameter Regression on Independent Slopes Model (PRISM; Daly et al. 1994) data. Additionally, Network could be used to provide improved monitoring of regional water sources and supplies. Precipitation measurements outside of the Network are sparse in this region, especially central and northern Washoe County, and minimal efforts have been put into validating spatial estimates of precipitation. The Network data has recently been compiled electronically and provides a unique opportunity to analyze the quality of Network precipitation records, use the Network data to validate spatial estimates of precipitation, and potentially improve existing groundwater recharge estimates. We are proposing to have Desert Research Institute (DRI) continue assisting in the monitoring and maintenance of the network.

**Scope of Work**

*Network Monitoring and Maintenance*

DRI has a long history of weather station installation and maintenance and Greg McCurdy and Albert Wolff have extensive experience in this field and have spent significant time in remote regions of Nevada. DRI will assist WRWC staff in the collection and maintenance of the Network. This partnership between WRWC and DRI staff will help to develop familiarity with the locations of gauges, routes to follow, measurement process, precipitation record keeping, and gauge maintenance. Fieldwork will be conducted twice a year, one in the Fall and one in the Spring, to the Network to empty gauges, record precipitation measurements, and perform maintenance on all gauges.



- Network locations
- PRISM control points

Figure 1. Network locations (blue dots) and PRISM control points (green dots) used in Jeton et al. (2005).

**Cost Estimate**

The *Network Monitoring and Maintenance* cost is estimated not to exceed \$20,000 for fiscal year 2017-2018 .