

FINAL REPORT

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Based on observations at several sites, the work NMWRRI funded shows that snowmelt is a significant (often 40-60) contributor to groundwater recharge in the Southwest. In addition, the mechanisms contributing to stable isotope alteration in snow were investigated, providing a deeper understanding of the process, allowing further research to begin at a higher level of understanding. The methodologies described in the dissertation can be applied to other sites in the Southwest to estimate contribution of snowmelt at those specific locations. One predicted impact of climate change due to increased atmospheric CO₂ is that the proportion of snow in precipitation in the western USA will decline over the next 50 years. If these predictions are correct, climate change could have a significant impact on groundwater resources in the Southwest.

The support of NMWRRI is acknowledged in the dissertation, and was acknowledged in two talks presented at Geological Society of America annual meetings and one poster at the American Geophysical Union Fall meeting (Earman et al., 2002; Earman et al., 2003; Earman and Phillips, 2003). A talk at the Geological Society of America annual meeting this November will also acknowledge NMWRRI (Earman et al., 2004). At least one manuscript dealing with the research funded by NMWRRI will be submitted for publication in a peer-reviewed journal, and I will forward a copy upon publication. In addition, coverage of the research (and NMWRRI's funding of it) appeared in both the Socorro El Defensor Chieftan and the Magdalena Mountain Mail.

Once again, I'd like to thank the NMWRRI for providing the grant. I feel the work I conducted with the grant money was interesting, and can contribute to more effective water resources management in the future. The grant funded the vast majority of the work described in Chapter 4 of my dissertation, *Groundwater recharge and movement through mountain-basin systems of the Southwest: A case study in the Chiricahua Mountains-San Bernardino Valley system, Arizona and Sonora* (New Mexico Tech, Department of Earth and Environmental Science, Socorro, New Mexico, December 2004) and some of these results contributed to work described in other chapters.

References

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- Earman, S., McPherson, B.J.O.L., Phillips, F., Ralser, S., and Herrin, M., 2002. Hydrogeologic Framework and Groundwater Characteristics, San Bernardino

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