

SAN BERNARDINO VALLEY BASIN

References and Supplemental Reading

References

A

- Anning, D.W. and N.R. Duet, 1994, Summary of ground-water conditions in Arizona, 1987-90, USGS Open-file Report 94-476.
- Arizona Department of Economic Security, 2005, Workforce Informer: Data file, accessed August 2005, <http://www.workforce.az.gov>.
- Arizona Department of Environmental Quality (ADEQ), 2004, Water quality exceedences by watershed: Data file, received June 2004.
- Arizona Department of Water Resources (ADQR), 2005a, Automated recorder sites: Data files, ADWR Basic Data Unit.
- _____, 2005b, Groundwater Site Inventory (GWSI): Database, ADWR Hydrology Division.
- _____, 2005c, Wells55: Database.
- _____, 2005d, Registry of surface water rights: ADWR Office of Water Management.
- _____, 1994a, Arizona Water Resources Assessment, Vol. I, Inventory and Analysis.
- _____, 1994b, Arizona Water Resources Assessment, Vol. II, Hydrologic Summary.
- Arizona Game and Fish Department (AGFD), 2005, Arizona Waterways: Data file, received April 2005.
- _____, 1997 & 1993, Statewide riparian inventory and mapping project: GIS cover.
- Arizona Land Resource Information System (ALRIS), 2005a, Springs: GIS cover, accessed January 2006 at <http://www.land.state.az.us/alris/index.html>.
- _____, 2005b, Streams: GIS cover, accessed 2005 at <http://www.land.state.az.us/alris/index.html>.
- _____, 2004, Land ownership: GIS cover, accessed in 2004 at <http://www.land.state.az.us/alris/index.html>.
- Arizona Water Commission, 1975, Summary, Phase I, Arizona State Water Plan, Inventory of resource and uses.

F

- Freethy, G.W. and T.W. Anderson, 1986, Predevelopment hydrologic conditions in the alluvial basins of Arizona and adjacent parts of California and New Mexico: USGS Hydrologic Investigations Atlas-HA664.

G

- Gebert, W.A., D.J. Graczyk and W.R. Krug, 1987, Average annual runoff in the United States, 1951-1980: GIS Cover, accessed March 2006 at <http://aa179.cr.usgs.gov/metadata/wrdmeta/runoff.htm>.

L

- Longworth, S.A., 1991: Geohydrology and chemical quality of groundwater, San Bernardino NWR, Arizona: USGS Open File Report 90-4190, 28 pp.

O

Oregon State University, Spatial Climate Analysis Service (SCAS), 2006, Average annual precipitation in Arizona for 1961-1990: PRISM GIS cover, accessed in 2006 at www.ocs.orst.edu/prism.

T

Tadayon, S., 2004, Water withdrawals for irrigation, municipal, mining, thermoelectric-power, and drainage uses in Arizona outside of the active management areas, 1991-2000: USGS Scientific Investigations Report 2004-5293, 27 pp.

U

United States Fish and Wildlife Service (USFWS), 2003, Leslie Canyon Wildlife Refuge Land Ownership Status Boundary, accessed September 2006 at <http://www.fws.gov/data/r2gis/landstatus.htm>

United States Geological Survey (USGS), 2008, National Water Information System (NWIS) data for Arizona: Accessed October 2008 at <http://waterdata.usgs.gov/nwis>.

_____, 2007, Water withdrawals for irrigation, municipal, mining, thermoelectric-power, and drainage uses in Arizona outside of the active management areas, 1991-2005: Data file, received November 2007.

_____, 2006a, National Hydrography Dataset: Arizona dataset, accessed at <http://nhd.usgs.gov/>.

_____, 2006b, Springs and spring discharges: Dataset, received November 2004 and January 2006 from USGS office in Tucson, AZ.

_____, 2004, Southwest Regional Gap analysis study- land cover descriptions: Electronic file, accessed January 2005 at <http://earth.gis.usu.edu/swgap>.

_____, 1981, Geographic digital data for 1:500,000 scale maps: USGS National Mapping Program Data Users Guide.

Supplemental Reading

Anderson, T.W., and Freethey, G.W., 1995, Simulation of groundwater flow in alluvial basins in south central Arizona and parts of adjacent states: USGS Professional Paper 1406-D.

Biggs, T.H., Leighty, R.S., Skotnicki, S.J., Pearthree, P.A., 1999, Geology and geomorphology of the San Bernardino Valley, southeastern Arizona: AZGS Open File Report 99-19, 20 pp.

Davis, L.A., Maddock, T. and Mac Nish, R.D., 1997, Groundwater flow and interaction with surface water in San Bernardino Valley, Cochise County, Arizona and Sonora Mexico: University of Arizona Technical-Report HWR 97-030, 207 pp.

L.R. Levick, M. Reed, E. vanderLeeuw, D.P. Guertin and K. Uhlman, 2006, NEMO Watershed Based Plan Middle and Lower San Pedro Watershed, University of Arizona.

Santec Consulting and JE Fuller/ Hydrology & Geomorphology, Inc., 2000, Small and minor watercourses analysis for Cochise County, Arizona, Arizona State Land Department, Final Report.

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