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Reconnaissance Estimates of Recharge Based on an Elevation-dependent Chloride Mass-balance Approach

prepared by

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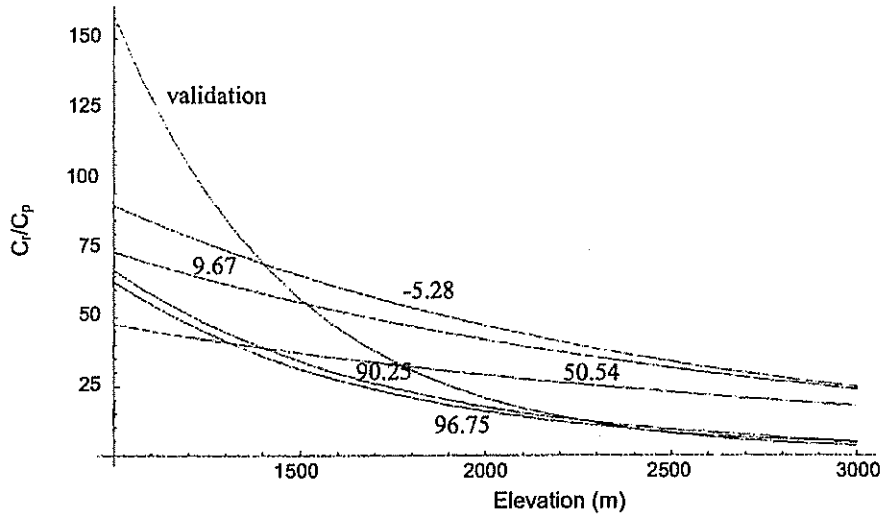

Figure 22. Graph of equations from Table 7 and the validation equation.

CONCLUSIONS

Comparison of Recharge Estimates Derived from the Elevation-dependent Chloride Mass-balance Approach to Recharge Estimates Derived from Other Sources

Comparison to Rush (1970) and the Maxey and Eakin Approach

As previously described, recharge estimates were determined using the Maxey and Eakin (1949) method and the variation of the Maxey and Eakin method published in Rush (1970). These recharge estimates are tabulated in Table 10 along with recharge estimates derived from the regression equations that closely approximate the 5th, 50th, and 95th percentile distribution of recharge (herein described as the 5th, 50th, and 95th percentile estimates). Estimates of recharge for hydrographic basins entirely contained within DOE (1997a) or D'Agnese *et al.* (1997) and this study are also included in Table 10. It must be cautioned that previously published estimates of recharge are being compared to recharge estimates developed from regression equations associated with the 5th, 50th, and 95th percentile for the entire study area. These values are used as analogues for the 5th, 50th, and 95th percentiles for the respective basins. The true variability of recharge estimates for each basin would require application and ranking of all 1,000 realizations solely to that basin, which was not done for this project. As a result, some of the 95th percentile estimates in Table 10 are less than the 50th percentile estimate for three of the basins (Amargosa Desert, Death Valley, and Rock Valley) simulated using the spatial distribution of alluvium as the lower limit of recharge.

The most significant observation to come from Table 10 is the relatively greater quantity of total recharge that is predicted by the elevation-dependent chloride mass-balance approach relative to the Maxey and Eakin and Rush (1970) estimates. The Maxey and Eakin estimate differs from case 312 (alluvial mask) by 4.31×10^6 m^3/yr and from case 428 (alluvial-elevation mask) by 3.06×10^6 m^3/yr. The Maxey and Eakin estimate is equivalent to the 27th (alluvial mask) and 34th (alluvial-elevation mask) percentile of the cumulative distributions for the two sets of elevation-dependent chloride mass-balance estimates. The Rush (1970) estimate differs from

Table 10. Comparison of recharge estimates derived from the elevation-dependent chloride mass-balance approach to previously determined recharge estimates.

Hydrographic Basin	Maxey and Eakin (1949)	Rush (1970)	DOE (1997a)	D'Agnese (1997)	Elevation-dependent Chloride Mass-balance					
					Case 647** 5.28%	Case 312** 50.54%	Case 680** 96.75%	Case 355*** 4.92 %	Case 428*** 50.97%	Case 214*** 95.17%
Amargosa Desert	2,677	0	---	---	446,063	828,078	697,975	98,639	150,888	216,514
Buckboard Mesa	4,525,945	1,762,739	4,745,370*	839,500*	3,139,837	5,188,177	8,104,412	3,098,714	5,488,973	7,794,055
Crater Flat	202,386	263,613	97,455	146,000	505,994	902,607	943,259	322,023	502,433	719,904
Death Valley	0	0	---	---	2,811	5,339	3,926	0	0	0
Frenchman Flat	304,330	92,407	---	---	1,059,187	1,873,493	2,051,251	652,590	1,032,254	1,477,533
Gold Flat	4,107,212	1,944,640	---	---	2,320,755	3,751,832	6,532,107	2,569,508	4,747,792	6,722,533
Groom Lake Valley	3,827,360	1,510,092	---	---	1,485,817	2,431,661	4,002,325	1,514,207	2,735,074	3,878,504
Indian Springs Valley	0	58,812	---	---	73,075	126,840	152,675	57,967	93,417	133,536
Jackass Flats	407,859	1,094,145	See Buckboard Mesa	See Buckboard Mesa	934,830	1,631,069	1,930,998	683,071	1,111,862	1,588,152
Kawich Valley	2,938,078	1,828,278	---	---	1,114,125	1,761,602	3,424,930	1,323,481	2,545,179	3,594,467
Mercury Valley	0	118,129	---	---	250,142	445,172	471,330	143,994	228,604	327,129
Oasis Valley	5,549,749	1,328,152	---	---	3,869,183	6,560,609	8,998,234	3,517,128	6,009,997	8,554,983
Papoose Lake Valley	174,858	289	---	---	62,628	107,586	135,976	45,557	73,847	105,522
Rock Valley	26,479	52,617	0	---	168,196	305,694	288,820	56,889	88,190	126,422
Yucca Flat	1,882,885	602,157	2,953,000	2,299,500	1,393,743	2,343,692	3,363,325	1,287,435	2,197,714	3,128,581
Summary	23,949,818	10,656,070	---	---	16,826,408	28,263,542	41,101,546	15,371,203	27,006,221	38,367,934

*Buckboard Mesa and Jackass Flats combined.

**Spatial distribution of alluvium defines the lower limit of recharge (herein defined as the alluvial mask)

***Spatial distribution of alluvium and areas with elevation less than 1237 m defines the lower limit of recharge (herein defined as the alluvial-elevation mask).