



Milner-King Hill Reach Gains

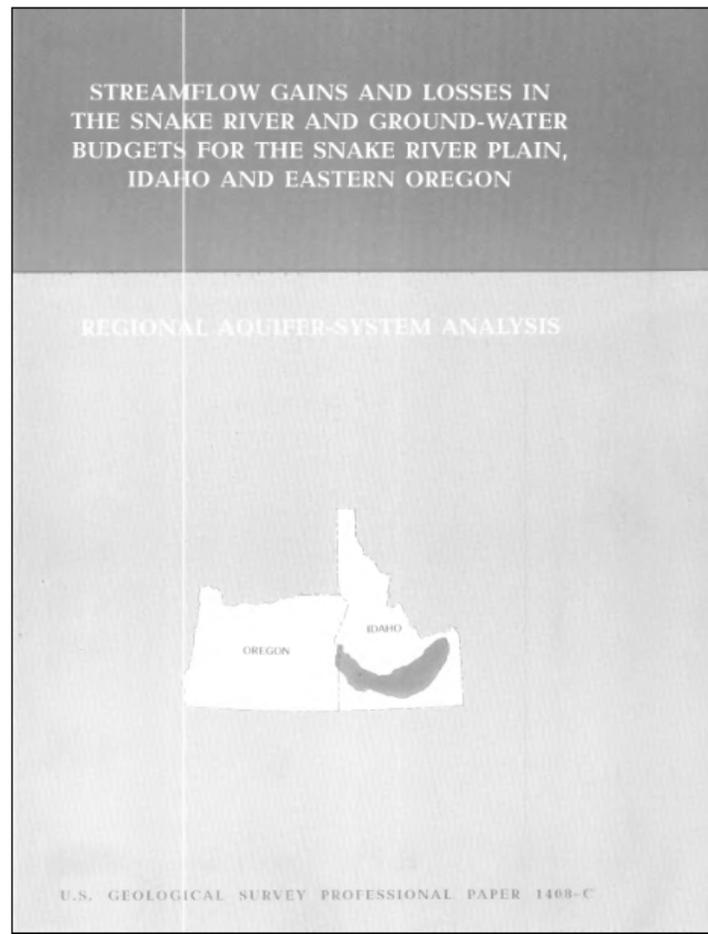
Allan Wylie IDWR



Justification for Subtracting 10% off of the gains between Kimberly and King Hill

- September 2009 ESHMC meeting
 - The committee agreed to abandon the steady state river and spring targets used in version 1.1 and subtract out 10% assumed underflow from the south side from the gaged spring reach gains.
- Kjelstrom 1995 PP 1408-C

Kjelstrom 1995 1408-C



Kjelstrom 1995 1408-C pg C26

Annual streamflow gains in the Snake River from north-side ground-water discharge within this reach (*Milner-King Hill*) were estimated by water-budget analysis (Thomas, 1969, p. 26) for water years 1902-66 and were extended by Kjelstrom (1986) to 1980. Kjelstrom (1986) correlated total estimated north-side ground-water discharge with measured discharge at 10 spring sites for the period 1951-80. That correlation was used instead of water-budget analysis to estimate total north-side discharge since 1950.

Thomas, 1969 Water Information Bulletin 9

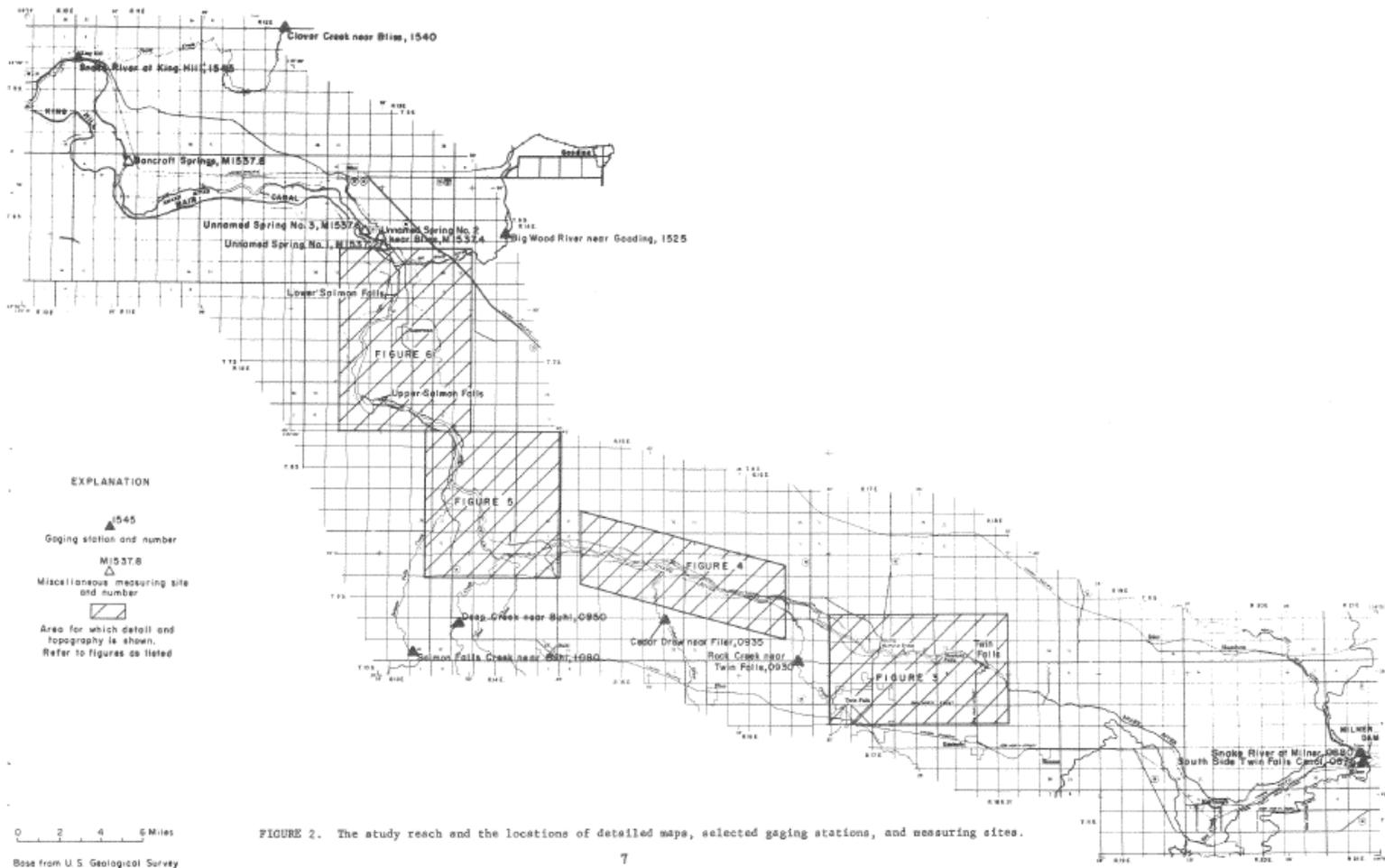


Kimberly-Buhl

Thomas, 1969 WIB 9 pg 18

The inflow between river gages near Kimberly, 0900, and near Buhl, 0940, is more than 20 percent for the total inflow in the study reach (fig. 7). *About two-thirds of the flow in this subreach is spring flow from the north side. The remainder is nearly all return flow from irrigation on the south side.*

Thomas, 1969 WIB 9 Figure 7



Buhl-Lower Salmon Falls, nr Hagerman

Thomas, 1969 WIB 9 pg 18-23

The subreach between the river gages near Buhl, 0940, and below Lower Salmon Falls, near Hagerman, 1350, receives more than half the total inflow to the study reach. *About 10 percent of the inflow in this subreach is in measurable wasteways from the south side, about two-thirds is from measured springs along the north side in the subreach, and the remainder flows from springs and seeps not measured, most of which are along the north side.*

Lower Salmon Falls, nr Hagerman–King Hill

Thomas, 1969 WIB 9 pg 23

More than 80 percent of the inflow in the subreach between the river gages below Lower Salmon Falls, near Hagerman, 1350, and. at King Hill , 1545, is from Malad Springs, M1534. Flow at the gage Big Wood River near Gooding, 1525, is deducted from inflow in this subreach as noted in the introduction.

Inflows from the South Side

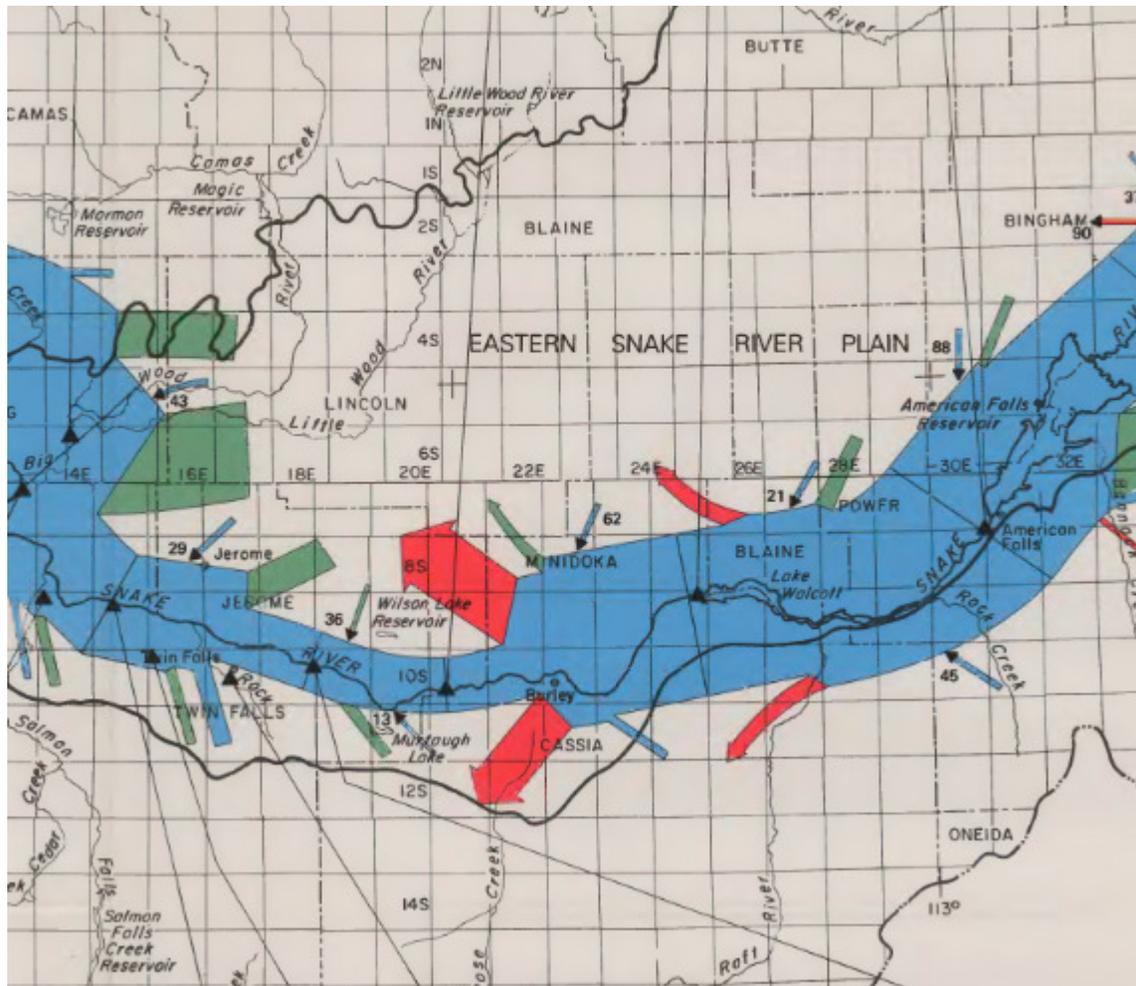
Thomas, 1969 WIB 9 pg 23-25

Pg 23-Most of the flow entering the study reach from the south side is return flow from water that has previously been utilized for irrigation.

Pg 24-About two-thirds of the total return flow into the study reach from the south side enters the Snake River in the lower channels of Rock Creek, Cedar Draw, Deep Creek, and Salmon Falls Creek, and above the Kimberly gage, 0900.

Pg 24-Inflow to the study reach from all measurable south-side surface flows, including the channels mentioned, was determined by rounds of measurements to be 1,650 cfs in September 1958, 1,160 cfs in March 1959, and 1,280 cfs in August 1959. Unmeasured inflow from the south side through seeps or inaccessible channels is estimated to be 150 cfs.

Kjelstrom 1986 HA 680



Kimberly-Buhl

Kjelstrom 1995 1408-C pg C27

The Snake River gained about 880,000 acre-ft from ground water between Kimberly and Buhl (pl. 1, sites 10 and 11, respectively) in water year 1980; about 810,000 acre-ft was from the north side. The relation between monthly total streamflow gains estimated from water-budget analysis and north-side gains estimated from measured spring discharge is shown in figure 29. The difference, assumed to be south-side gain, appears to be greater during the irrigation season. Average annual south-side gain from 1951 to 1980 was 80,000 acre-ft.

$810/880 = 92\%$ from ESPA

Kimberly-Buhl

Kjelstrom 1995 1408-C Figure 29

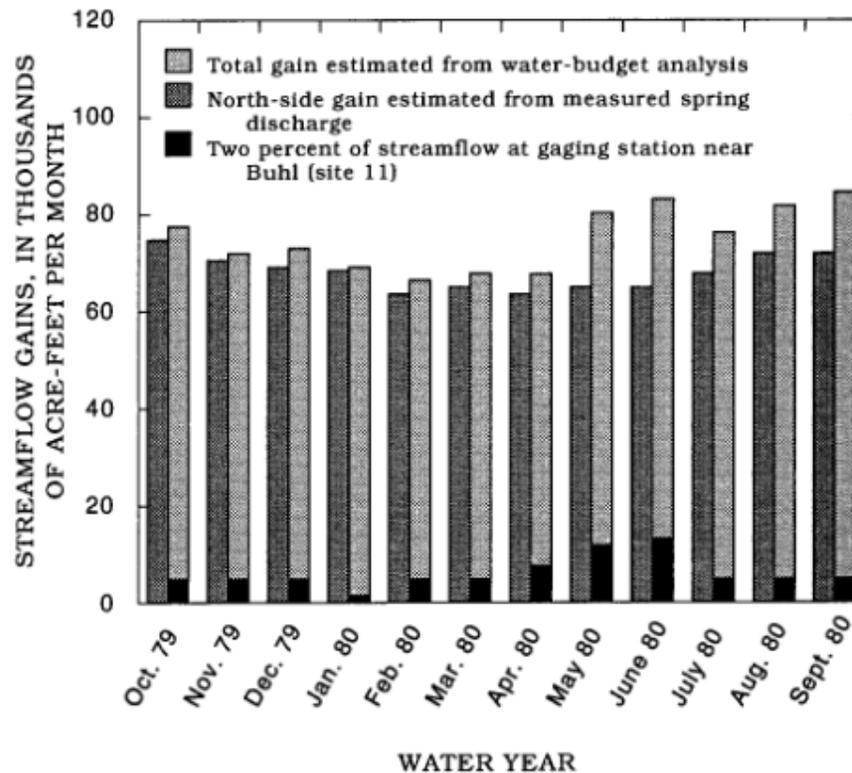


FIGURE 29.—Monthly total streamflow gains in the Snake River between Kimberly (site 10) and Buhl (site 11) estimated from water-budget analysis, and north-side gains estimated from measured spring discharge, water year 1980.

Buhl-Hagerman (Lower Salmon Falls) Kjelstrom 1995 1408-C pg C27

The Snake River gained about 2,650,000 acre-ft from ground water between Buhl and Hagerman (pl. 1, sites 11 and 12, respectively) in water year 1980. On the basis of measured spring discharge, about 2,510,000 acre-ft was estimated to be from the north side. The relation between monthly streamflow gains estimated from water-budget analysis and north-side gains estimated from measured spring discharge is shown in figure 30. North-side spring discharge is typically greatest in October and least in the spring.

$2510/2650 = 94.7\%$ from ESPA

Buhl-Hagerman (Lower Salmon Falls Kjelstrom 1995 1408-C Figure 30

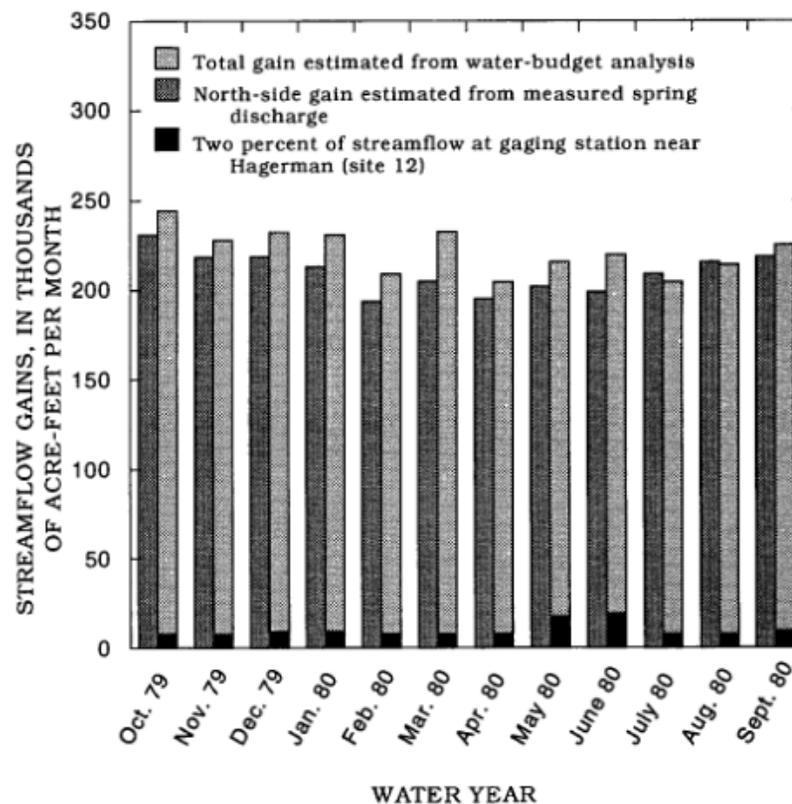


FIGURE 30.—Monthly total streamflow gains in the Snake River between Buhl (site 11) and Hagerman (site 12) estimated from water-budget analysis, and north-side gains estimated from measured spring discharge, water year 1980.

Hagerman (Lower Salmon Falls)-King Hill Kjelstrom 1995 1408-C pg C28

The Snake River gained about 1,020,000 acre-ft from ground water between Hagerman and King Hill (pl. 1, sites 12 and 13, respectively) in water year 1980. Most of the gain was from spring discharge along the north side. The relation between monthly streamflow gains estimated from water-budget analysis and north-side gains estimated from measured spring discharge is shown in figure 33.

Hagerman (Lower Salmon Falls)-King Hill Kjelstrom 1995 1408-C Figure 33

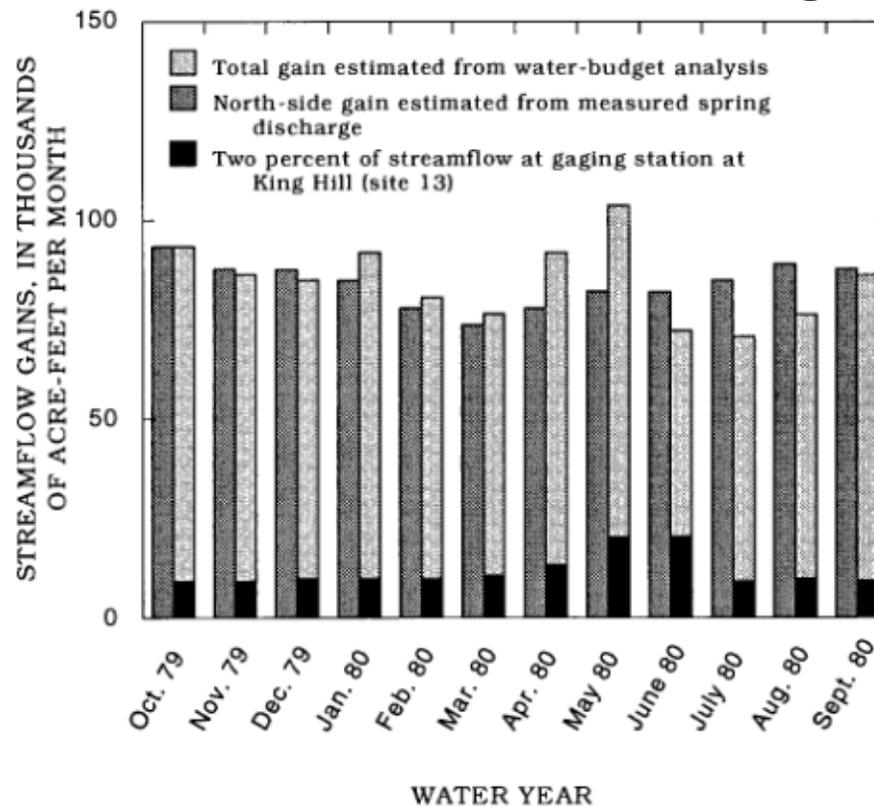


FIGURE 33.—Monthly streamflow gains in the Snake River between Hagerman (site 12) and King Hill (site 13) estimated from water-budget analysis, and north-side gains estimated from measured spring discharge, water year 1980.



END

