CORRELATION BETWEEN RED DOG AND SONORA RAINFALL
(January 9-11, 1862) --- **Using Estimated January 1862 Data**

INTRODUCTION: For the derivation of the three day estimate (January 9-11, 1862) of **11.46 inches** for Sonora, see the main report: IS THERE AN ECHO? Dr. Snell's (1861-62) Sonora Rainfall Measurements ARE VALID! See Supplement No. 1 of the main report for derivation of three day rainfall estimate (January 9-11, 1862) of **14.38 inches** for Red Dog.

TEST DESIGN: Same as used in Supplement No. 2 of main report.

Three Day Orographic Lift Factor Computations:

Step No. 1: Calculate the lift factor between Red Dog and Sonora
14.38 in. - 11.46 in. = **2.92 in.**

Step No. 2: Express the Sonora to Red Dog three day lift factor in inches of rain per 100 feet of increase in elevation.

Red Dog elevation: 2800 feet
*Sonora elevation: - 1850 feet
950 feet --- **9.5** (100 foot increments)

Divide 2.92 in. by 9.5 = **.31 in.** (rounded off to the nearest 100th)

*Note: The elevation given for Sonora is the estimated elevation where Dr. Snell made his rainfall measurements. For a discussion on how this determination was made, see page No. 3 of Supplement No. 2.

Step No. 3: Calculate the three day orographic lift factor from Red Dog to Iowa Hill:

Iowa Hill elevation: 3100 feet
Red Dog elevation : - 2800 feet
300 feet --- **3** (100 foot increments)

.31 in. x 3 = **.93 in.**

Step No. 4: Calculate the three day orographic lift factor from Sonora to Iowa Hill:

Iowa Hill elevation: 3100 feet
Sonora elevation: - 1850 feet
1250 feet --- **12.5** (100 foot increments)

.31 in. x 12.5 = **3.88 in.**

Note: The February 1986 Placerville rain gauge elevation and the estimated elevation of Dr. Snell's 1862 Sonora rain gauge were virtually the same. This lends support to our assumption that the three day (January 9-11, 1862) rainfall amounts for Sonora and Placerville were similar. In addition, an examination of our large relief map of California does not show any serious terrain impediments to the strong southerly airflow that prevails between these two points during heavy warm storm activity.

Using the Above 1862 Orographic Lift Factors: Estimate the three day rainfall amounts (Jan. 9-11) at Iowa Hill for **Route "A"**and **Route "B".**

Route "A": Red Dog – Iowa Hill
14.38 in + .93 in. = **15.31 in.**
Route "B": Sonora or Placerville – Iowa Hill
11.46 in. + 3.88 in. = **15.34 in.**

DISCUSSION OF THE RESULTS: Considering both the distances between and the differences in elevation of the various rainfall measurement points, utilized in the above anaylsis, the results are amazing.
These strikingly similar answers can be traced to the widespread and proportional nature of the precipitation patterns of the January 1862 storms.

CONCLUSION: **These results validates the three-day 11.46 inch estimate of the amount of rain that fell in Sonora during the heavy warm storm of January 9-11, 1862.**

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