

INTER-OFFICE MEMORANDUM

SUBJECT: Mt. Princeton Temperatures

DATE 1-15-79

TO: W. M. Dolan, H. J. Olson, H. D. Pilkington, F. Dellechiaie, J. Deymonaz,
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FROM: A. L. Lange

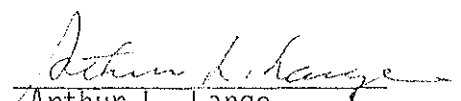
Of the thermal properties that we usually examine in our surveys, that of the temperature at 100m is the nearest to reality. Gradients vary with lithology; heat flow values are dependent on estimates or laboratory measurements of conductivities; and 200° depths are--for the most part--fantasy. Near-surface temperatures, on the other hand, are either actual measurements, or extrapolations from measurements 60 meters or less above that depth. Thus, patterns in 100m temperatures are a reasonably reliable mapping tool of moderate-depth temperature regimes.

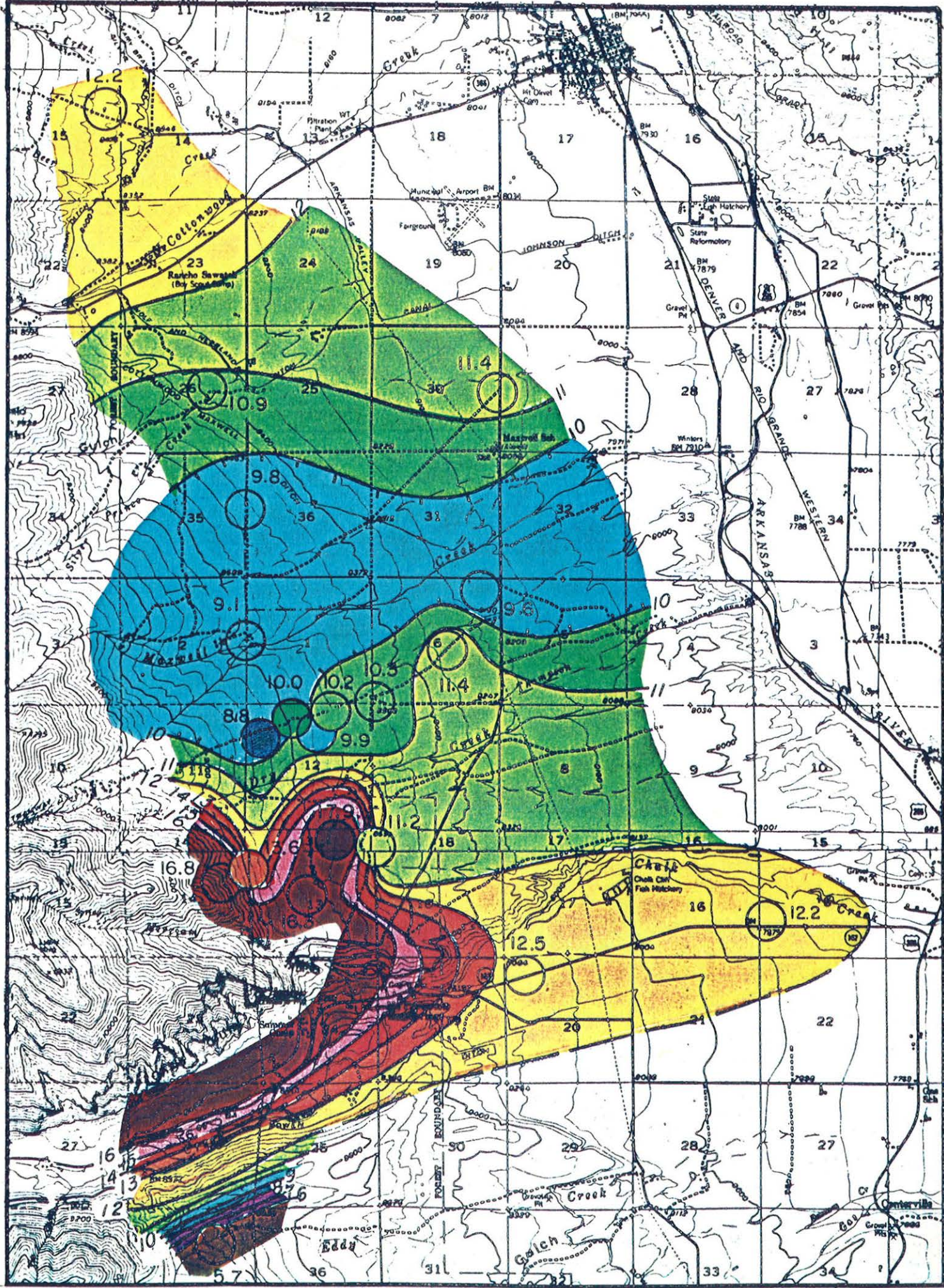
The 100m-depth map at Mt. Princeton (Figure 1) reveals a subtle tongue of warmth extending eastward from Chalk Creek Canyon. The anomaly is not closed off southward in the valley, so we can say nothing concerning its extent in that direction. A similar feature is suggested for Cottonwood Canyon, but control measurements are too sparse to define it.

On geologic grounds, the Chalk Creek valley is regarded as a fault zone. Other geophysical properties behave anomalously in the same area. It would be logical to expect that leakage from a geothermal reservoir associated with the mountain front could promulgate along the Chalk Creek zone, tempered in the near-surface layer by descending groundwater and underflow. The reservoir itself might occupy the zone of weakness. This possibility is particularly attractive in the event that the more certain heat under the mountain is made inaccessible to us.

Additional measurements across Chalk Creek would be required to confirm the thermal effect noted here. Of most value would be a fence of thermal gradient holes (even 3-meter holes might work). Refined self-potential measurements are warranted because an SP effect has been seen, and some credible electrical soundings should be made across the zone. Should Chalk Creek prove to be worthy of a deeper test, then Cottonwood Creek should be examined as well.

Einstein once remarked, "The Creator may be subtle, but he is not malicious". Possibly these subtle temperature differences are telling us of something interesting at depth. One further caution: in our land contractions, we should be wary, lest we "throw out the baby with the bathwater."


Arthur L. Lange



T52S
T53S

38°45'

Fig. 1 Temperature at 100m.