CHARACTERIZATION OF SPRINGS IN EASTERN NEVADA

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Abstract

- Multiple classification systems for springs exist in the literature. Most of these systems are based on a single variable (e.g. flow volume). Each classification is useful for a particular discipline. Terminology between different systems may be similar even if the criteria are different.
- The most common terms used to classify springs, in current usage, in eastern Nevada are "local" and "regional". Because of the local hydrogeology, "carbonate" is often used as a synonym for "regional", even though the two terms have very different hydrogeologic and hydrogeochemical connotations. These general classification systems create uncertainty in spring characterization.
- One classification system was proposed and utilized to evaluate 60 springs. This system incorporates flow volume, variability of discharge, temperature of spring water, ambient air temperature, response to precipitation variability, catchment recharge volume, major ion geochemistry, minor ions, stable and radioisotope, and hydrogeologic and geomorphic setting. The individual parameters are scored using a weighted average, incorporating the multidisciplinary nature of hydrology.

Location of Dry Lake Valley, Lincoln County, Nevada

Fundamentals and Nomenclature

- Outline of Ground-Water Hydrology, with Definitions (O. E. Meinzer, 1923)
  - Provided 11 classification groups for springs based on:
  - character of openings, geologic structure, rock type, geologic horizon, "sphere" of water, quantity, flow variability, permanence, quality, temperature, and related features
- Most are descriptive (qualitative) terms

Classification by Average Discharge

- Springs classified in 8 magnitude classes (literally orders of magnitude in metric units but rounded for Imperial units)
- First - largest =< 100 cfs and Eighth - smallest > 1 pint per minute (~0.00001 cfs)
- O. E. Meinzer, Outline of Hydrology, with definitions (1923)

Classification by Variability

- Variability = 100 X (max Q – Min Q / Ave Q)
- Specified restrictions
  - Existing records will underestimate absolute or actual variability
  - Long gage records best
  - Variability must be expressed as a specified period of record

Questions ??