

Integrated 1:100,000-scale surficial and bedrock geologic mapping of the Indian Springs quadrangle, northwest of Las Vegas, Nevada, USA

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Overview

We present a preliminary new 1:100,000-scale geologic map of the Indian Springs $30' \times 60'$ quadrangle, southern Nevada. The mapping is based on unpublished work by P.L. Guth and J.C. Yount and prior products, with considerably updated structural and stratigraphic interpretations from high-resolution satellite imagery, elevation models, and fieldwork. The surficial and bedrock geologic maps are integrated here, but they remain stand-alone maps in a growing database of seamless digital mapping that employs the new Seamless Integrated Geologic Mapping (SIGMa) extension to the Geologic Map Schema (GeMS).

New geologic mapping



Figure 1 (above)

Index map of southern Nevada. Geology generalized from Garrity & Soller, 2009, Database of the geologic map of North America: USGS Data Series 424, http://pubs.usgs.gov/ds/424.

- We created a new digital geologic map of the Indian Springs $30' \times 60'$ quadrangle, northwest of Las Vegas, NV (Fig. 1).
- Due to access restrictions over most of the area, almost no fieldwork has been conducted for several decades.
- Bedrock and surficial geologic mapping was compiled principally from unpublished work by P.L. Guth and J.C. Yount from the early 1990s that covers this quadrangle. Their mapping was integrated with legacy maps (see Fig. 4 side panel).
- We considerably updated linework and stratigraphic and structural interpretations using modern, high-resolution satellite imagery and elevation models.
- We conducted limited fieldwork on the northeastern flanks of the Spotted Range and the eastern flanks of the Pintwater Range in support of this mapping and related active research.
- Fig. 3 integrates new, separate surficial (Fig. 4) and bedrock (Fig. 5) geologic maps that we created for this area.

Acknowledgements

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Approach & workflows



Figure 2 (above) Sample view of the stratigraphic unit table for the bedrock mapping, employing the Seamless Integrated Geologic Map Schema (SIGMa) extension to the Geologic Map Schema (GeMS).



Figure 3 (above) bedrock mapping.

- modeling.

	HierarchyKey 🔺	ProvinceRank	GeologicProvinces_ID
IN	013-000-000	geologic province 1	DGP376
IN Western intracratonic Laurentia platform	013-001-000	geologic province 2	DGP377
IN Western intracratonic Laurentia platform Southern Rocky Mountain Paleozoic platform	013-001-001	geologic province 3	DGP378
IN Western intracratonic Laurentia platform Northern Rocky Mountain Paleozoic platform	013-001-002	geologic province 3	DGP507
IN Western intracratonic Laurentia platform Deep marine basins	013-001-003	geologic province 3	DGP508
IN Western Laurentia Paleozoic miogeocline	013-002-000	geologic province 2	DGP502
IN Western Laurentia Paleozoic miogeocline Shallow continental shelf and near-shore depositi	013-002-001	geologic province 3	DGP503
IN Western Laurentia Paleozoic miogeocline Transitional continental shelf depositional system	013-002-002	geologic province 3	DGP504
IN Western Laurentia Paleozoic miogeocline Continental outer shelf to slope depositional system	013-002-003	geologic province 3	DGP505
IN L Western Leurestie Belennie missensies L Dans medias hading	012 002 004	applagic province 2	DCDEOG

Sample view of the SIGMa geologic provinces table for the

• Following decades of work, geologic maps at various scales are now available covering the entire United States.

• However, these maps are often not integrated, resulting in abrupt discontinuities that obstruct application of map data toward analyses that span map boundaries.

• Seamless digital geologic mapping is being compiled across two profiles in the western U.S. as part of the usgs Geologic Framework of the Intermountain West project.

• The surficial and bedrock maps are separate products in a collaborative enterprise geodatabase.

• Bedrock geology for this quadrangle, as well as for other parts of the transects, is projected below Quaternary cover, an approach that enables novel applications for end users including direct use of this map as an input for multiscale 3D

• The databases employ the Seamless Integrated Geologic Mapping (SIGMa) extension to the Geologic Map Schema (GeMS). Sample tables are shown in Fig. 2 & 3.

• This approach provides expanded functionality for regionaland Nation-scale geologic mapping.

• For example, stratigraphic units (Fig. 2) are associated with nested geologic provinces (Fig. 3) and deposit types. These capabilities enable powerful scalability, search, custom map creation, and analysis functions for end users.











quadrangle, southern Nevada.

Figure 5 (far left)

Preliminary surficial geologic map of the Indian Springs quadrangle.

Figure 6 (near left)

Preliminary bedrock geologic map of the Indian Springs quadrangle. Bedrock units are projected below cover.