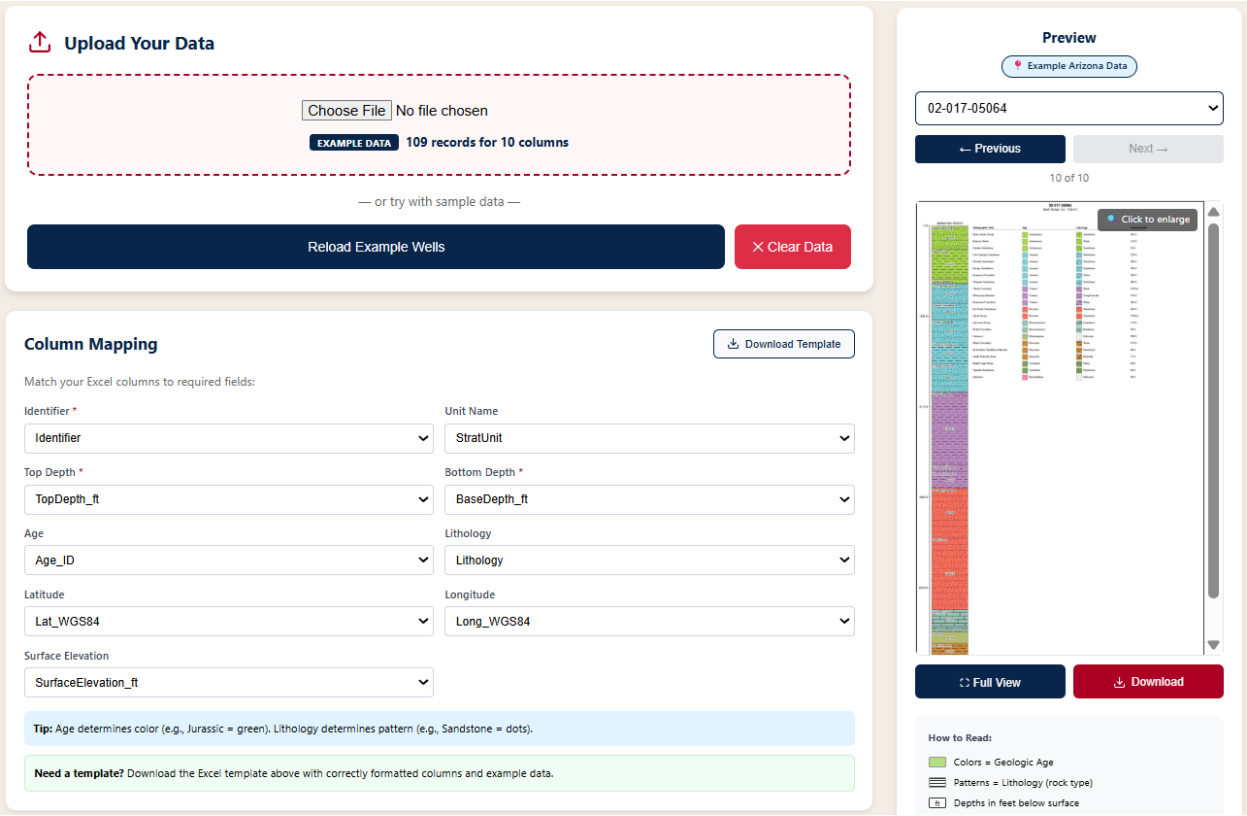
Stratigraphic Column Generator Web Tool v1.0

By Leah Zaitlin and Tawnya Wilson

Arizona Geological Survey, University of Arizona, Tucson, AZ

Open File Report: 26-1

2026



Screen capture of the Stratigraphic Column Generator website interface showing the data upload and field mapping sections on the left and the column preview, which is pre-loaded with examples of wellbores in Arizona on the right.

QR code links to the Stratigraphic Column Generator website.

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Arizona Geological Survey

Philip A. Pearthree, State Geologist and Director

Manuscript approved for publication in January 2026
Printed by the Arizona Geological Survey

For an electronic copy of this publication: library.azgs.arizona.edu

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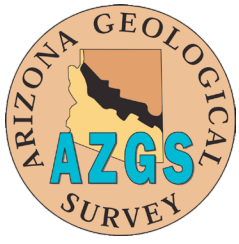
Recommended Citation: Zaitlin, L.R., and Wilson, T.C., 2026[LT10.1], Stratigraphic Column Generator Web Tool v1.0. https://tools.azgs.arizona.edu/stratigraphy/stratigraphy.html



INTRODUCTION

The Stratigraphic Column Generator is a web-based tool that automatically generates graphical stratigraphic columns labeled by formation, colored by age, and patterned by the dominant lithology with user input data. This tool was created to more readily understand the relationship of rock units, particularly their thicknesses, at depth. The motivation for this project was driven by a newly derived compilation of wellbore formation tops from legacy oil and gas well files (original source data: Arizona Oil & Gas Conservation Commission, 2025), geologic age, and dominant lithology throughout Arizona. While this tool was originally intended for use at borehole scale it can also be utilized for outcrop sections and regional or generalized stratigraphic columns.

METHODS

Tool Development

This tool was developed using Claude Anthropic's AI assistant. The development process involved prompting Claude to generate HTML, React, and JavaScript code based on user-provided data and specifications. Features such as data input handling, pattern integration, and export functionality were progressively added using a conversational approach. This method was also used for debugging and refining the code. The GitHub platform was used for project management and software versioning. The entire codebase for the project is publicly available through GitHub under a MIT open-source license. Users may suggest future enhancements or bug issues for the tool as issues through GitHub.

Website Configuration

The website interface was designed based on the University of Arizona Brand Guidelines to create a clear and functional layout. Claude was used to develop this interface, with an emphasis on ease of use. The tool was prepared to be hosted as part of a site designed to provide accessible geologic tools. The site was deployed on an Amazon Web Services instance under the University of Arizona's Campus Cloud Infrastructure program.

TOOL FUNCTIONALITY

The Stratigraphic Column Generator is a browser-based application that processes stratigraphic information into exportable column images. Users upload tabular data using a provided Microsoft Excel workbook template or their own XLSX file and define custom field mappings to match the tool's inputs. Only three fields are required to generate a column: *identifier*, *top depth*, and *bottom depth*. The *identifier* field enables multiple stratigraphic columns to be generated simultaneously, with one column created per unique identifier. Additional options include *unit name, age, lithology, latitude, longitude*, and *surface elevation*.

The tool creates vertical stratigraphic columns in which each interval is rendered proportionally based on thickness. Individual units are labeled by *unit name*, colored by geologic *age* and

patterned by *lithology* within the column. The standard colors follow the International Chronostratigraphic Chart for the geologic periods of Quaternary to Cambrian and the Precambrian Eon. Patterns are derived from Daven Quinn's Geologic Patterns for the Web, which is based on the FGDC Digital Cartographic Standard for Geologic Map Symbolization. Users can upload their own custom color or pattern mapping templates, as well as toggle on and off the pattern fill, under Advanced Settings. The accompanying legend displays the stratigraphic *unit name*, *age*, *lithology*, and calculated thickness for each segment.

Users can download all rendered columns as PNG files in a zipped package. The zip file also includes a Microsoft Excel workbook containing the *latitude*, *longitude*, *identifier*, and image path for each record. Guidance is provided within the tool for uploading these images to ArcGIS Pro, however the images can be used for any purpose, including professional publications.

USE OF AI DECLARATION

Claude AI was used to develop this tool, from initial concept through final implementation. Beginning with how a web tool could visually represent stratigraphic logs from Excel data. Features were progressively added through an iterative, conversational process. University of Arizona Brand Guidelines were provided to stylize the interface.

RECOMMENDED CITATION

Figures generated using this web tool for publications, presentations, websites, or other media should cite this publication.

Zaitlin, L.R., and Wilson, T.C., 2026, Stratigraphic Column Generator Web Tool v1.0. https://tools.azgs.arizona.edu/stratigraphy/stratigraphy.html

ACKNOWLEDGEMENTS

We would like to thank Brian Gootee, Douglas Meredith, and Andrew Zaffos at the Arizona Geological Survey for their guidance and insight during tool development and testing.

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