

Metadata for data in CGWL.zip

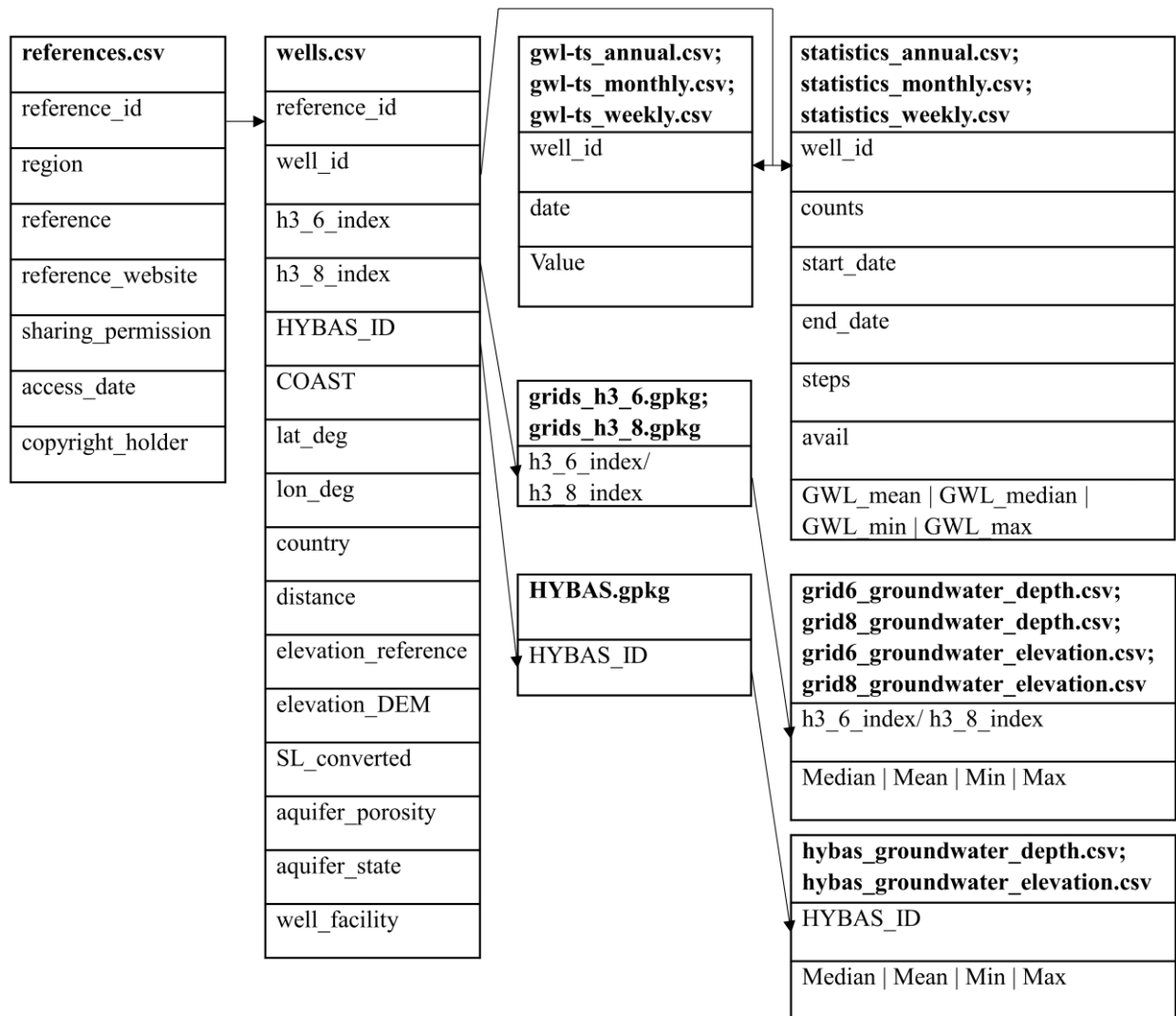


Figure 1: Structure of the CGWL dataset.

Table 1 Metadata for the groundwater level time series (*gwl-ts_weekly.csv*; *gwl-ts_monthly.csv*; *gwl-ts_annual.csv*).

Variable	Description	Type	Unit / Format	Example
well_id	Unique identifier for each well consisting of the reference_id followed by a sequential number.	String	Unique identifier	USAAA101579
date	Aggregated date of observation.	Datetime	Datetime [YYYY-MM-DD]	2002-08-26
Value	Groundwater level measured relative to below the ground surface reference point (mbrp). The ground surface reference is either natural ground (preferred) or top of casing.	Float	[m] (2 decimals)	12.27

Table 2 Metadata for the groundwater level time series statistics (*statistics_weekly.csv*; *statistics_monthly.csv*; *statistics_annual.csv*).

Variable	Description	Type	Unit / Format	Example
well_id	Unique identifier for each well consisting of the reference_id followed by a sequential number.	String	Unique identifier	USAAA101579
counts	Count of observations in the time series.	Integer	Count	250
start_date	First date of the time series.	Datetime	Datetime [YYYY-MM-DD]	2001-01-01
end_date	Last date of the time series.	Datetime	Datetime [YYYY-MM-DD]	2005-12-29
steps	Number of time steps in the time series.	Integer	Count	261
avail	Availability of data in decimal form, representing the fraction of available time steps.	Float	[-] (2 decimals)	0.95
GWL_mean	Mean value of the groundwater level time series.	Float	[m] (2 decimals)	12.34
GWL_median	Median value of the groundwater level time series.	Float	[m] (2 decimals)	12.30
GWL_min	Smallest groundwater level value in the time series.	Float	[m] (2 decimals)	10.85
GWL_max	Largest groundwater level value in the time series.	Float	[m] (2 decimals)	14.02

Table 3 Metadata for the well locations (*wells.csv*).

Variable	Description	Type	Unit / Format	Example
reference_id	Unique identifier for the reference. Consists of the 3166-1 alpha-2 country code followed by a group identifier for the reference.	String	Unique identifier	USAAA
well_id	Unique identifier for each well consisting of the reference_id followed by a sequential number.	String	Unique identifier	USAAA101579
h3_6_index	Unique identifier for each H3 grid cell at resolution 6, representing a geographic area in the H3 hexagonal grid system ¹ .	String	H3 index	862a1341ffffff
h3_8_index	Unique identifier for each H3 grid cell at resolution 8, representing a geographic area in the H3 hexagonal grid system ¹ .	String	H3 index	882a134e6dffff
HYBAS_ID	Unique identifier for each HydroBASIN at resolution 12 ² .	String	HydroBASIN identifier	5120778930
COAST	Flag (1) indicates a coastal HydroBASIN ² .	Integer	[-]	1
lat_deg	Latitude coordinate of the well location.	Float	Degrees [°] (3 decimals)	39.983
lon_deg	Longitude coordinate of the well location.	Float	Degrees [°] (3 decimals)	-75.050
country	3166-1 alpha-2 country code.	String	Code	US
distance	Distance to the nearest coastal segment ² .	Float	Meters [m] (2 decimals)	43.20
elevation_reference	Elevation of the well location as provided by the reference data source. Used to convert between groundwater depth and groundwater elevation.	Float	Meters above sea level [masl] (2 decimals)	7.78
elevation_DEM	Elevation of the well location based on the Digital Elevation Models (DEM) CoastalDEM ⁴ and NASADEM ⁵ . Used to convert between groundwater depth and groundwater elevation when elevation_reference was not available.	Float	Meters above sea level [masl] (2 decimals)	8.10
SL_converted	DEM-derived groundwater depth cases were flagged with 1.	Integer	[-]	1
aquifer_porosity	Categorized porosity type of the aquifer, derived from keywords in the raw data. Possible values: pore, karst, fissure.	String	Text descriptor	pore
aquifer_state	Categorized hydrological state of the aquifer, derived from keywords in the raw data. Possible values: unconfined, semi-confined, confined, semi-artesian, artesian.	String	Text descriptor	confined
well_facility	Flag (1) indicating possible human influence, such as pumping or artificial recharge, based on keywords in the raw data.	Integer	[-]	1

Table 4 Metadata for the references (*references.csv*).

Variable	Description	Format
reference_id	Unique identifier for the reference. Consists of the 3166-1 alpha-2 country code followed by a group identifier for the reference.	String
region	Name of the geographical region or country of the reference.	String
reference	Name of the data provider, given in the form: A – B (C), where A is the portal/application (if applicable), B is the responsible authority, and C is the jurisdiction.	String
reference_website	Website for data access or contact information.	String
sharing_permission	Details about the sharing or licensing permissions applicable to the data.	String
access_date	Date when the data was accessed.	Datetime [YYYY-MM-DD]
copyright_holder	Multiple copyright holders where explicitly stated in the source licence/terms, otherwise responsible authority (reference).	String

Table 5 Metadata for the grids (*grids_h3_6.gpkg*; *grids_h3_8.gpkg*).

Variable	Description	Type	Unit / Format	Example
h3_6_index/ h3_8_index	Unique identifier for each H3 grid cell at resolution 6/ 8, representing a geographic area in the H3 hexagonal grid system ¹ .	String	H3 index	862a1341ffffff/ 882a134e6dffff
geometry	Geospatial representation of the hexagonal grid's location, stored as a polygon in the GPKG file.	Geometry	Polygon [GPKG]	Polygon

Table 6 Metadata for the basins (*HYBAS.gpkg*).

Variable	Description	Type	Unit / Format	Example
HYBAS_ID	Unique identifier for each HydroBASIN at resolution 12 ² .	String	HydroBASIN identifier	5120778930
geometry	Geospatial representation of the basin, stored as a polygon in the GPKG file.	Geometry	Polygon [GPKG]	Polygon

Table 7 Metadata for the groundwater depth in grids (*grid6_groundwater_depth.csv*; *grid8_groundwater_depth.csv*).

Variable	Description	Type	Unit / Format	Example
h3_6_index/ h3_8_index	Unique identifier for each H3 grid cell at resolution 6/8, representing a geographic area in the H3 hexagonal grid system ¹ .	String	H3 index	862a1341ffffff/ 882a134e6dffff
Median	Median groundwater depth for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.45
Mean	Mean groundwater depth for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.40
Min	Minimum groundwater depth for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.33
Max	Maximum groundwater depth for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.46

Table 8 Metadata for the groundwater depth in basins (*hybas_groundwater_depth.csv*).

Variable	Description	Type	Unit / Format	Example
HYBAS_ID	Unique identifier for each HydroBASIN at resolution 12 ² .	String	HydroBASIN identifier	5120778930
Median	Median groundwater depth for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.45
Mean	Mean groundwater depth for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.40
Min	Minimum groundwater depth for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.33
Max	Maximum groundwater depth for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.46

Table 9 Metadata for the groundwater elevation in grids (*grid6_groundwater_elevation.csv*; *grid8_groundwater_elevation.csv*).

Variable	Description	Type	Unit / Format	Example
h3_6_index/ h3_8_index	Unique identifier for each H3 grid cell at resolution 6/8, representing a geographic area in the H3 hexagonal grid system ¹ .	String	H3 index	862a1341ffffff/ 882a134e6dffff
Median	Median groundwater elevation for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.45
Mean	Mean groundwater elevation for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.40
Min	Minimum groundwater elevation for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.33
Max	Maximum groundwater elevation for each H3 grid cell, derived from well data within the grid.	Float	Meters [m] (2 decimals)	3.46

Table 10 Metadata for the groundwater elevation in basins (*hybas_groundwater_elevation.csv*).

Variable	Description	Type	Unit / Format	Example
HYBAS_ID	Unique identifier for each HydroBASIN at resolution 12 ² .	String	HydroBASIN identifier	5120778930
Median	Median groundwater elevation for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.45
Mean	Mean groundwater elevation for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.40
Min	Minimum groundwater elevation for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.33
Max	Maximum groundwater elevation for each basin, derived from well data within the basin.	Float	Meters [m] (2 decimals)	3.46

¹ Uber Technologies Inc (2024)

² Lehner and Grill (2013)

³ Sayre et al (2021)

⁴ Kulp and Strauss (2019)

⁵ NASA JPL (2020)

References

¹ Uber Technologies Inc: H3: Hexagonal hierarchical geospatial indexing system [software], <https://h3geo.org/>, 2024.

² Lehner, B. and Grill, G.: Global river hydrography and network routing: baseline data and new approaches to study the world's large river systems, *Hydrological Processes*, 27, 2171–2186, doi:10.1002/hyp.9740, 2013.

³ Sayre, R., Butler, K., van Graafeiland, K., Breyer, S., Wright, D., Frye, C., Karagulle, D., Martin, M., Cress, J., Allen, T., Allee, R., Parsons, R., Nyberg, B., Costello, M., Harris, P., and Muller-Karger, F.: A global ecological classification of coastal segment units to complement marine biodiversity observation network assessments, *Oceanography*, 34, 120–129, doi:10.5670/oceanog.2021.219, 2021.

⁴ Kulp, S. A. and Strauss, B. H.: New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding, *Nature Communications*, 10, 4844, doi:10.1038/s41467-019-12808-z, 2019.

⁵ NASA JPL: NASADEM Merged DEM Global 1 arc second V001 [data set], NASA Land Processes Distributed Active Archive Center, doi:10.5067/MEASURES/NASADEM/NASADEM_HGT.001, 2020.