

## datapackage.yaml

```
1 name: glenglat
2 version: 1.0.0-rc2
3 created: '2024-07-10T07:58:00Z'
4 title: Global englacial temperature database
5 profile: tabular-data-package
6 description: Open-access database of englacial temperature measurements compiled from data submissions and published
  literature. It is developed on [GitHub](https://github.com/mjacqu/glenglat) and published to [Zenodo]
  (https://doi.org/10.5281/zenodo.11516611).
7 keywords: [glacier, temperature, borehole, ice, firn, englacial, global, compilation]
8 languages:
9   - en
10 licenses:
11   - title: Creative Commons Attribution 4.0 International
12     name: CC-BY-4.0
13     path: https://creativecommons.org/licenses/by/4.0
14 contributors:
15   - title: Mylène Jacquemart
16     path: https://orcid.org/0000-0003-2501-7645
17     organization: Laboratory of Hydraulics, Hydrology and Glaciology (VAW), ETH Zurich, Switzerland | Swiss Federal Research
  Institute for Forest, Snow and Landscape Research (WSL), Switzerland
18     email: jacquemart@vaw.baug.ethz.ch
19     role: author | curator
20   - title: Ethan Welty
21     path: https://orcid.org/0000-0001-8046-2210
22     organization: World Glacier Monitoring Service (WGMS), Department of Geography (GIUZ), University of Zurich (UZH),
  Switzerland
23     role: author | curator
24   - title: Guillem Carcanade
25     organization: Laboratory of Hydraulics, Hydrology and Glaciology (VAW), ETH Zurich, Switzerland
26     role: curator
27   - title: Lander Van Tricht
28     path: https://orcid.org/0000-0001-7619-8955
29     role: curator
30   - title: Gwenn Flowers
31     path: https://orcid.org/0000-0002-3574-9324
```

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32   role: contributor
33 - title: Shin Sugiyama
34   path: https://orcid.org/0000-0001-5323-9558
35   role: contributor
36 - title: Tika Ram Gurung
37   path: https://orcid.org/0000-0003-4287-6150
38   role: contributor
39 - title: Rainer Prinz
40   path: https://orcid.org/0000-0003-4032-773X
41   role: contributor
42 - title: Martina Barandun
43   path: https://orcid.org/0000-0003-1820-7600
44   role: contributor
45 - title: Olivier Gagliardini
46   path: https://orcid.org/0000-0001-9162-3518
47   role: contributor
48 - title: Lonnie G. Thompson
49   path: https://orcid.org/0000-0001-5371-2579
50   role: contributor
51 - title: 张通 [Zhang Tong]
52   email: tzhang@bnu.edu.cn
53   organization: Beijing Normal University (BNU), China
54   role: contributor
55 - title: Marcus Gastaldello
56   email: marcus.gastaldello@unifr.ch
57   organization: University of Fribourg (UniFr), Switzerland
58   role: contributor
59 resources:
60 - name: source
61   description: Sources of information considered in the compilation of this database. Column names and categorical values
62   closely follow the Citation Style Language (CSL) 1.0.2 specification. Names of people in non-Latin scripts are followed by a
63   latinization in square brackets (e.g. `B. C. Загороднов [V. S. Zagorodnov]`) and non-English titles are followed by a
64   translation in square brackets.
65   path: data/source.csv
66   format: csv
67   dialect:
68     header: true
```

```
66     delimiter: ','
67     lineTerminator: "\n"
68     quoteChar: '"'
69     doubleQuote: true
70 profile: tabular-data-resource
71 schema:
72     fields:
73         - name: id
74           description: Unique identifier constructed from the first author's lowercase, latinized, family name and the
publication year, followed as needed by a lowercase letter to ensure uniqueness (e.g. `Загороднов 1981` → `zagorodnov1981a`).
75           type: string
76           constraints:
77             required: true
78             unique: true
79         - name: author
80           description: Author names (optionally followed by their ORCID in parentheses) as a pipe-delimited list.
81           type: string
82           constraints:
83             required: true
84             pattern: '^[^s]+( [^s]+)*'
85         - name: year
86           description: Year of publication.
87           type: year
88           constraints:
89             required: true
90         - name: type
91           description: |-
92             Item type:
93
94             - article-journal: Journal article.
95             - book: Book (if the entire book is relevant).
96             - chapter: Book section.
97             - document: Document not fitting into any other category.
98             - dataset: Collection of data.
99             - map: Geographic map.
100            - paper-conference: Paper published in conference proceedings.
101            - personal-communication: Personal communication between individuals.
```

```
102         - speech: Presentation (talk, poster) at a conference.
103         - report: Report distributed by an institution.
104         - thesis: Thesis written to satisfy degree requirements.
105         - webpage: Website or page on a website.
106     type: string
107     constraints:
108         required: true
109         enum:
110             - article-journal
111             - book
112             - chapter
113             - dataset
114             - document
115             - map
116             - paper-conference
117             - personal-communication
118             - speech
119             - report
120             - thesis
121             - webpage
122 - name: title
123   description: Item title.
124   type: string
125   constraints:
126     pattern: '[^\s]+( [^\s]+)*'
127 - name: url
128   description: URL (DOI if available).
129   type: string
130   constraints:
131     pattern: 'https?:\/\/\.'+'
132 - name: language
133   description: |-
134     Language as ISO 639-1 two-letter language code.
135
136     - de: German
137     - en: English
138     - fr: French
```

```
139         - ko: Korean
140         - ru: Russian
141         - sv: Swedish
142         - zh: Chinese
143     type: string
144     constraints:
145         required: true
146         enum:
147             - de
148             - en
149             - fr
150             - ko
151             - ru
152             - sv
153             - zh
154 - name: container_title
155   description: Title of the container (e.g. journal, book).
156   type: string
157   constraints:
158     pattern: '[^\s]+( [^\s]+)*'
159 - name: volume
160   description: Volume number of the item or container.
161   type: integer
162 - name: issue
163   description: Issue number (e.g. `1`) or range (e.g. `1-2`) of the item or container, with an optional letter prefix
164   (e.g. `F1`).
165   type: string
166   constraints:
167     pattern: '[a-zA-Z]?[0-9]+(-[0-9]+)?'
168 - name: page
169   description: Page number (e.g. `1`) or range (e.g. `1-2`) of the item in the container.
170   type: string
171   constraints:
172     pattern: '[0-9]+(-[0-9]+)?'
173 - name: version
174   description: Version number (e.g. `1.0`) of the item.
175   type: string
```

```
175     constraints:
176         pattern: '[0-9]+(\.[0-9]+)*'
177 - name: editor
178     description: Editor names (e.g. of the containing book) as a pipe-delimited list.
179     type: string
180     constraints:
181         pattern: '[^\s]+( [^\s]+)*'
182 - name: collection_title
183     description: Title of the collection (e.g. book series).
184     type: string
185     constraints:
186         pattern: '[^\s]+( [^\s]+)*'
187 - name: collection_number
188     description: Number (e.g. `1`) or range (e.g. `1-2`) in the collection (e.g. book series volume).
189     type: string
190     constraints:
191         pattern: '[0-9]+(-[0-9]+)?'
192 - name: publisher
193     description: Publisher name.
194     type: string
195     constraints:
196         pattern: '[^\s]+( [^\s]+)*'
197     primaryKey: [id]
198     missingValues: ['']
199 - name: borehole
200     description: Metadata about each borehole.
201     path: data/borehole.csv
202     format: csv
203     dialect:
204         header: true
205         delimiter: ','
206         lineTerminator: "\n"
207         quoteChar: '"'
208         doubleQuote: true
209     profile: tabular-data-resource
210     schema:
211         fields:
```

```
212     - name: id
213       description: Unique identifier.
214       type: integer
215       constraints:
216         required: true
217         unique: true
218         minimum: 1
219     - name: source_id
220       type: string
221       description: Identifier of the source of the earliest temperature measurements. This is also the source of the
borehole attributes unless otherwise stated in `notes`.
222       constraints:
223         required: true
224     - name: glacier_name
225       description: Glacier or ice cap name (as reported).
226       type: string
227       constraints:
228         required: true
229         pattern: '^[^\s]+( [^\s]+)*'
230     - name: glims_id
231       description: Global Land Ice Measurements from Space (GLIMS) glacier identifier.
232       type: string
233       constraints:
234         pattern: 'G[0-9]{6}E[0-9]{5}[NS]'
235     - name: location_origin
236       description: |-
237         Origin of location (`latitude`, `longitude`):
238
239         - submitted: Provided in data submission
240         - published: Reported as coordinates in original publication
241         - digitized: Digitized from published map with complete axes
242         - estimated: Estimated from published plot by comparing to a map (e.g. Google Maps, CalTopo)
243         - guessed: Estimated with difficulty, for example by comparing `elevation` to a map (e.g. Google Maps, CalTopo)
244       type: string
245       constraints:
246         required: true
247         enum: [submitted, published, digitized, estimated, guessed]
```

```
248 - name: latitude
249   description: Latitude (EPSG 4326).
250   type: number
251   unit: degree
252   constraints:
253     required: true
254     minimum: -90
255     maximum: 90
256 - name: longitude
257   description: Longitude (EPSG 4326).
258   type: number
259   unit: degree
260   constraints:
261     required: true
262     minimum: -180
263     maximum: 180
264 - name: elevation_origin
265   description: |-
266     Origin of elevation (`elevation`):
267
268     - submitted: Provided in data submission
269     - published: Reported as number in original publication
270     - digitized: Digitized from published plot with complete axes
271     - estimated: Estimated from elevation contours in published map
272     - guessed: Estimated with difficulty, for example by comparing location (`latitude`, `longitude`) to a map of
contemporary elevations (e.g. CalTopo, Google Maps)
273   type: string
274   constraints:
275     required: true
276     enum: [submitted, published, digitized, estimated, guessed]
277 - name: elevation
278   description: Elevation above sea level.
279   type: number
280   unit: m
281   constraints:
282     required: true
283     maximum: 9999.0
```

```
284 - name: label
285   description: Borehole name (e.g. as labeled on a plot).
286   type: string
287 - name: date_min
288   description: Begin date of drilling, or if not known precisely, the first possible date (e.g. 2019 → 2019-01-01).
289   type: date
290   format: '%Y-%m-%d'
291 - name: date_max
292   description: End date of drilling, or if not known precisely, the last possible date (e.g. 2019 → 2019-12-31).
293   type: date
294   format: '%Y-%m-%d'
295 - name: drill_method
296   description: |-
297     Drilling method:
298
299     - mechanical: Push, percussion, rotary, ...
300     - thermal: Hot point, electrothermal, steam, ...
301     - combined: Mechanical and thermal
302   type: string
303   constraints:
304     enum: [mechanical, thermal, combined]
305 - name: ice_depth
306   description: Starting depth of ice. Infinity (INF) indicates that ice was not reached.
307   type: number
308   unit: m
309 - name: depth
310   description: Total borehole depth (not including drilling in the underlying bed).
311   type: number
312   unit: m
313 - name: to_bed
314   description: Whether the borehole reached the glacier bed.
315   type: boolean
316   trueValues: ['True']
317   falseValues: ['False']
318 - name: temperature_accuracy
319   description: Thermistor accuracy or precision (as reported). Typically understood to represent one standard
deviation.
```

```
320     type: number
321     unit: °C
322     - name: notes
323     description: Additional remarks about the study site, the borehole, or the measurements therein. Souces are
referenced by their `id`.
324     type: string
325     constraints:
326     pattern: '[^\s]+( [^\s]+)*'
327     - name: curator
328     description: Names of people who added the data to the database, as a pipe-delimited list. Additional details about
each can be found under `contributors`.
329     type: string
330     constraints:
331     required: true
332     pattern: '[^\s]+( [^\s]+)*'
333     missingValues: ['']
334     primaryKey: [id]
335     foreignKeys:
336     - fields: [source_id]
337     reference:
338     resource: source
339     fields: [id]
340     - name: profile
341     description: Date and time of each measurement profile.
342     path:
343     - data/profile.csv
344     - data/prinz2022-nunatarssuaq/profile.csv
345     - data/flowers2022-little-kluane/profile.csv
346     - data/flowers2022-south/profile.csv
347     - data/gurung2022-rikha-samba/profile.csv
348     - data/lee2019-jarvis/profile.csv
349     - data/carturan2023-ortles/profile.csv
350     format: csv
351     dialect:
352     header: true
353     delimiter: ','
354     lineTerminator: "\n"
```

```
355     quoteChar: ''
356     doubleQuote: true
357 profile: tabular-data-resource
358 schema:
359     fields:
360         - name: borehole_id
361           description: Borehole identifier.
362           type: integer
363           constraints:
364             required: true
365         - name: id
366           description: Borehole profile identifier (starting from 1 for each borehole).
367           type: integer
368           constraints:
369             required: true
370             minimum: 1
371         - name: source_id
372           description: Source identifier.
373           type: string
374           constraints:
375             required: true
376         - name: measurement_origin
377           description: |-
378             Origin of measurements (`measurement.depth`, `measurement.temperature`):
379
380             - submitted: Provided as numbers in data submission
381             - published: Numbers read from original publication
382             - digitized: Digitized from published plot(s) with Plot Digitizer
383           type: string
384           constraints:
385             required: true
386             enum: [submitted, published, digitized]
387         - name: date_min
388           description: Measurement date, or if not known precisely, the first possible date (e.g. 2019 → 2019-01-01).
389           type: date
390           format: '%Y-%m-%d'
391         - name: date_max
```

```
392     description: Measurement date, or if not known precisely, the last possible date (e.g. 2019 → 2019-12-31).
393     type: date
394     format: '%Y-%m-%d'
395     constraints:
396         required: true
397 - name: time
398     description: Measurement time.
399     type: time
400     format: '%H:%M:%S'
401 - name: utc_offset
402     description: Time offset relative to Coordinated Universal Time (UTC).
403     type: number
404     unit: h
405 - name: equilibrated
406     description: Whether temperatures have equilibrated following drilling.
407     type: boolean
408     trueValues: ['True']
409     falseValues: ['False']
410 - name: notes
411     description: Additional remarks about the profile or the measurements therein. Sources are referenced by their
`id`.
412     type: string
413     constraints:
414         pattern: '^[^\s]+( [^\s]+)*'
415 missingValues: ['']
416 primaryKey: [borehole_id, id]
417 foreignKeys:
418 - fields: [borehole_id]
419     reference:
420         resource: borehole
421         fields: [id]
422 - fields: [source_id]
423     reference:
424         resource: source
425         fields: [id]
426 - name: measurement
427     description: Temperature measurements with depth.
```

```
428 path:
429   - data/measurement.csv
430   - data/prinz2022-nunatarssuaq/measurement.csv
431   - data/flowers2022-little-kluane/measurement.csv
432   - data/flowers2022-south/measurement.csv
433   - data/gurung2022-rikha-samba/measurement.csv
434   - data/lee2019-jarvis/measurement.csv
435   - data/carturan2023-ortles/measurement.csv
436 format: csv
437 dialect:
438   header: true
439   delimiter: ','
440   lineTerminator: "\n"
441   quoteChar: '"'
442   doubleQuote: true
443 profile: tabular-data-resource
444 schema:
445   fields:
446     - name: borehole_id
447       description: Borehole identifier.
448       type: integer
449       constraints:
450         required: true
451     - name: profile_id
452       description: Borehole profile identifier.
453       type: integer
454       constraints:
455         required: true
456     - name: depth
457       description: Depth below the glacier surface.
458       type: number
459       unit: m
460       constraints:
461         required: true
462     - name: temperature
463       description: Temperature.
464       type: number
```

```
465     unit: °C
466     constraints:
467         required: true
468     missingValues: ['']
469     primaryKey: [borehole_id, profile_id, depth]
470     foreignKeys:
471     - fields: [borehole_id, profile_id]
472       reference:
473         resource: profile
474         fields: [borehole_id, id]
475
```