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CAVE MAP SYMBOLS

NSS Standard Cave Map Symbols, 1976
THE 1976 NSS STANDARD MAP SYMBOLS

Standing Committee on Cave Map Symbols*
NSS Section on Cave Geology and Geography

INTRODUCTION

Cave maps are the basic documents of speleology. An adequate map shows not only the width and trends of the passages. It contains, also, the location of the cave, directions for reaching it, a geological summary, an outline of hydrology and meteorology, data on biota and their ecology, serious history, an indication of the scenic values of the cave, and advice on the skills and equipment required to explore it. In short, the map must be a concise, encyclopedic summary of the cave.

This information, permanently recorded in the form of printed maps, must be communicated through time as well as across space. Effective communication depends upon symbols definitions of which are uniform throughout the world and unchanging through time. Neologisms should be introduced only when needed to express new concepts or to record new perceptions; in no case should new symbols conflict with those previously adopted. Individuality is preferred in layout, draughting, and lettering; it must be foreseen absolutely in regard to the symbols used in the map, in order to protect the primary information-transfer function of the map.

Maps intended for permanent reference should be surveyed to CRG Grade SB, Level 2 standards (or higher) and published at a scale of not less than 1:240. Such a map, sometimes called an "accurate outline survey," shows all of the passages in their proper (compensated) trends, widths, slopes, and interrelationships. It is a skeleton, only, but will serve as a reliable base to which specialists may later add their own data. Maps drawn from less precise surveys or published at smaller scales must be regarded as special-purpose maps and usually are wasted effort. They cannot meet the needs of specialists and will have to be done over in the future.

Cave cartographers, like other information specialists, are severely handicapped if limited to only a small vocabulary of symbols with which to formulate and to express their ideas. A complex care can no more be represented by a dozen symbols than Basic English can accurately convey the nuances of Shakespeare. Twenty-nine of the most-often-used symbols are presented separately on pages 36 and 37 as a vocabulary of "basic cave map symbols," but they are meant as an aid to beginning cavers, just as a pocket dictionary is meant for beginning language students. Cave cartographers cannot conceptualize and execute highly informative maps until they acquire a large vocabulary of symbols.

The 19 panels of 1976 NSS Standard Map Symbols which follow are largely compatible with lists of symbols published by AMCS, CRF, MSS, and other active mapping organizations in the United States. The Committee has obtained lists of symbols published elsewhere in the Americas, in Europe, and in the Near East; the NSS symbols are in many cases compatible with these symbols, also. We have made a deliberate attempt to achieve uniformity with the symbols proposed by the Union Internationale de Spéléologie, but this has been neglected in a few cases (viz., "breakdown") where other symbols are so deeply ingrained in North American usage that attempts to change them would be futile.

PRESENTATION

Once a map has been surveyed, draughted, and field-checked, it becomes the pleasure of the cartographer to render the data in a clear, concise, and attractive fashion. The cave cartographer should entertain a passion for his work, but altogether too many maps reveal a love that languished. They are poorly laid out, hastily executed, and unequal to their calling.

The style in which a map is drawn is a matter of personal choice. All symbols proposed in this report remain clear and unambiguous, regardless of the materials and techniques used. A computer print-out can be as satisfying as an ornately inked map, providing that it is sufficiently detailed, has an open and legible construction, and is pleasing to behold. There is no conflict between utility and art; there are conflicts both between haste and utility and between haste and art.

The pencil layout and inking of each panel of map symbols in this report involved about 4 hours of work. No cave map should be attempted in less time, not even the smallest. We hope that the recently instituted annual NSS Cave Map Salon will encourage more careful work by cave cartographers.

Most cave cartographers, especially inexperienced ones, would be well advised to use guides and adhesive transfers rather than pen-and-ink. Good map design can partially compensate for the rigidities of draughting aids, and professional-appearing work can be produced after a few hours of practice. However, all serious cartographers should consider that pen-and-ink methods, once learned, are the cheapest, quickest, and most versatile of all. The most complex maps can be executed on an ordinary table with only a few dollars worth of pens, a style book, and a bottle of ink. Symbols and lettering can be easily adapted to the scale of the map and to the space available if done free-hand, but require a large investment in materials if done with guides and transfers.

The reader may consult Brod (1962), Hedges (1975-76), and Hosley (1971) for extended discussions of cartographic philosophy and techniques. The Geographical Institute of the University of Wroclaw (Poland) offers an MA program in cave mapping.

THE STANDARD MAP SYMBOLS

The 1976 NSS Standard Map Symbols were adopted by the Board of Governors on 2 July 1976. They may be freely copied by anyone for non-profit use and should be distributed as widely as possible. Maps newly draughted for publication in The NSS Bulletin should follow the 1976 NSS Standard Map Symbols; they may not include symbols conflicting with these. Older maps can be published as originally drawn.

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* James Hedges, Bill Russell, Bob Thrus, William B. White

† The latest UIS report on map symbols, "Signes Spéléologiques Conventionnels" by Fabre and Audéat, is available for 25F (postpaid) from: CERGA, B.P. 5060, 34033 Montpellier Cedex, France. Bank foreign-exchange fees are roughly four times the cost of the publication, however. We recommend that it be obtained from Tony Oldham (Rhychybyri, Celybych, Dyfed SA41 3RB, U.K.) or another bookseller who will accept payment in dollars.

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Twenty-nine of the most frequently used

Basic Cave Map Symbols

from the
NSS Standard Map Symbols, 1976

Passage Features

Entrance passage sketched passage underlying passage ceiling height slope pit dome floor ledge ceiling ledge

Speleothems

Stalagmite stalactite small column large column soda straws flowstone rimstone dam

Floor Materials

Bedrock clay or silt sand gravel or cobbles small breakdown large breakdown

Miscellaneous

cross section stream water survey station elevation above datum elevation below datum
Chimaerical Caverns

38° 58' 30" N Lat.
76° 30' 10" W Long.
15 meters A.D.

Anne Arundel County
Maryland

Illustrating the 1976 NSS Basic Cave Map Symbols

Surveyed by James Hedges, 6 February 1979
length 40m, depth 21m, relief 40m
South River 1/2 quadrangle
Agua formation
PASSAGES

Entrance

Drip line

Passage

Vertical entrance, depth

Cross section

use key letter only if section is not drawn adjacent to passage

Pillar (bedrock)

Underlying and overlying passages

Unmapped passage

Slope

Measured slope

Vertical drop, depth

Artificial floor ledge, height

Ceiling ledge, height

Passage height (air-filled)

Water depth

Artificially enlarged passage

Change in grade of survey
SPELEOTHEMS

- Traverse blockage
- Alluvial blockage
- Breakdown blockage
- Vegetal debris blockage
- Detrital fill blockage
- Continues, low
- Continues, narrow
- Indeterminate wall
- Floor elevation = datum
- Strike and dip

Legend:
- only narrowest part is black
- Column present
- Stalactites present
- Stalactite over stalactite
- Stalactites with stalactites
- Large stalactite
- Large stalagmite (peak)

Dashed line shows limit of exploration

Sulfur Zones

Vegetal debris blockage

Continued, low
SPELEOCLASTS

Large breakdown

Small breakdown

Fallen speleochems

Clay and silt

Sand

Cobbles

Chert

Heteroplocrapite

Vertebrate remains

Invertebrate remains

Large feces

Guano

Vegetal debris
**SPELEOGENS**

- Bedrock floor
- Joint-controlled cavity
- Natural bridge (bedrock)
- Ceiling channel/floor slot
- Scallops: specify form and flow
- Anastomoses
- Vertical shaft
- Pit
- Dome
- Echinoliths
- Splash cups or drill holes
- Mud cracks
HYDROLOGY

Intermittent stream

Small stream

Large stream

Conjectural stream

Intermittent lake

Lake, with depth

Small rapids

Large rapids

Waterfall

Submerged ceiling

Intermittent sump

Sump

Fluctuating lake

Resurgence perennial/seasonal

Sink

Diffuse sink
**BOTANY**

- Water, pure/unsafe
- Wall seepage
- Roof seepage
- Current velocity
- Lowest known discharge
- Highest known discharge
- pH
- Water temperature
- Green plants
- Mold
- Fungi
- Seedlings
- Roots
**METEOROLOGY**

- **Daylight limit**
- **Thermocline**
- **Relative humidity**
- **Air temperature**
- **Ground temperature**
- **Barometric pressure**
- **Warm air current**
  - name units of measurement
- **Cold air current**

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**CULTURE**

- **Datum**
- **Light fixture**
- **Marked survey station**
- **Pavement**
- **Artificial wall**
- **Trail, paved/unpaved**
- **Stair, lower end open**
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**BASIC REFERENCES**


Hedges, James (1975-6) — *Qué es lo que debe Mostrar un Mapa de Cueva?: El Gudcharo* 8-9:66-111.


**SUPPLEMENTARY READINGS**


Cave Research Foundation (1966) — *Flint Ridge Cave System Map Folio*: Columbus, Cave Research Foundation, 34 sheets.


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