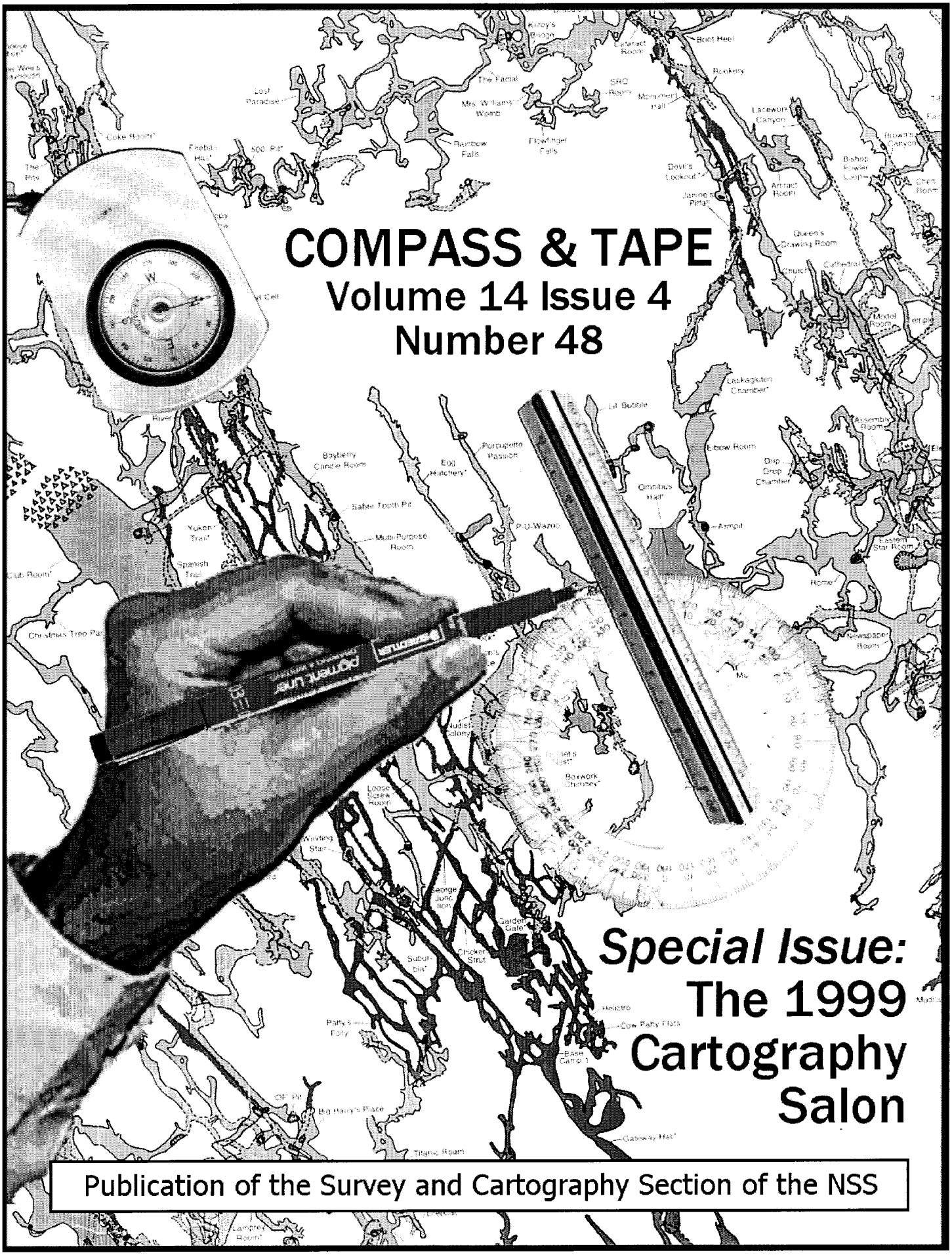


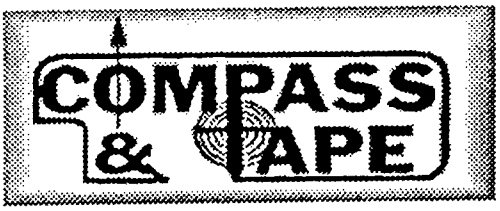
# COMPASS & TAPE


## Volume 14 Issue 4
## Number 48


## *Special Issue:* The 1999 Cartography Salon


Publication of the Survey and Cartography Section of the NSS

# Survey and Cartography Section




The Survey and Cartography Section (SACS) is an internal organization of the NSS that is devoted to improving the state of cave documentation and survey, cave data archiving and management, and of all forms of cave cartography.

Membership: Membership in the Section is open to anyone who is interested in surveying and documenting caves, management and archiving of cave data and in all forms of cave cartography. Membership in the National Speleological Society is not required.

Dues: Dues are S4.00 per year and includes four issue of *Compass & Tape.* Four issues of the section publication are scheduled to be published annually. However, if there are fewer, then all memberships will be extended to ensure that four issues are received. Dues can be paid in advance for up to 3 years ($12.00). Checks should be made payable to *'SACS"* and sent to the Treasurer.

*Compass & Tape:* This is the Section's quarterly publication and is mailed to all members. It is scheduled to be published on a quarterly basis, but if insufficient material is available for an issue, the quarterly schedule may not be met. *Compass & Tape* includes articles covering a wide range of topics, including equipment reviews, techniques, computer processing, mapping standards, artistic techniques. All forms of cave cartography and publications of interest and appropriate material reprinted from national and international publications. It is the primary medium for conveying information and ideas within the U.S. cave mapping community. All members are strongly encouraged to contribute material and to comment on published material. Items for publication should be submitted to the Editor.

NSS Convention Session: SACS sponsors a Survey and Cartography session at each NSS Convention. Papers are presented on a variety of topics of interest to the cave mapper and cartographer. Everyone is welcome and encouraged to present a paper at the convention. Contact the Vice Chair for additional information about presenting a paper.

Annual Section Meeting: The Section holds its only formal meeting each year at the NSS Convention. Section business, including election of officers, is done at the meeting.

Back Issues: SACS started in 1983 and copies of back issues of *Compass & Tape* are available. The cost is $1.00 each for 1-2 back issues, $0.75 each for 3-6 back issues and $50 each for more than six back issues at a time. Back issues can be ordered from the Vice Chair.

Overseas Members: SACS welcomes members from foreign countries. The rate for all foreign members is US$4.00 per year and SACS pays the cost of surface mailing of *Compass & Tape.* If you need air mail delivery, please inquire about rates. All checks MUST be payable in USS and drawn on a U.S. bank.


| | | | |
|---|---|---|---|
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# Inside:



Front Cover: **Mapping Tools** *by S.A. Schmitz*
Superimposed on **Wind Cave** *by Jim Nepstad*

Back Cover: **Arabica Cave Plan** *by Carlene Allred*

"Arabica" was named by a member of the first team (of 2) to enter the cave. He was a Russian named Sergey Levachev, and he named the cave after his caving club back home. I would have included the Russian spelling in the map title, but our computer fonts didn't include Cyrillic letters.

The cave plot was produced by computer using SMAPS. The cave was drawn by hand on two sheets of drafting film. I would have preferred to do it all on one sheet, but I didn't have any film big enough, and also, how could I ever get anything larger copied? I didn't want to reduce it anymore for the full size map. The type was produced by computer using Pagemaker and printed out on laser printers. Because I couldn't find a decent copy machine in my home state of Alaska, I had to send the originals (after copying the pieces first) to a good caving friend who has access to a good giant copy machine. As a result of his generous help, my map won the medal this year instead of his. I felt kind of bad about that.

I myself am one that can't make it to conventions. I did make it to one a couple of years ago and learned a lot. That's probably why this map won this year.

- Carlene Allred

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The editor reserves the right to select which of the submitted materials will be used for publication. Of the material selected the editor reserves the right to delete redundant or inappropriate material, to correct errors of spelling, grammar, or punctuation, and to edit for clarity, so long as such alternations do not change the meaning or intent of the author(s). In the event that significant changes are contemplated, the author(s) will be consulted and given the opportunity to review the changes prior to publication.

# From the Editor:

When SACS first initiated the Cartographic Salon it was with the intent of raising the quality of speleocartography and to provide a venue for cartographers to display their work. In addition, it was hoped that the Salon would encourage exchange of ideas and showcase innovative techniques. Integral to the Salon is the end-of-week critique session where the Salon judges meet with cartographers (and anyone else interested) to explain the criteria they used in judging the maps, and offer suggestions on how to improve the maps.

The Salon has been successful on all fronts. The Cart Salon has become one of the highlights of the NSS Conventions. Map entries are submitted by cartographers of all levels and the critique sessions are always well attended. And the quality of all cave maps in general has indeed improved.

This special issue of *Compass & Tape* is especially useful to those cartographers who haven't attended NSS conventions or who have never submitted maps to the Salon. Thanks to Scott for putting in the time and effort to get all of the maps, critiques and judges comments together to share with all Section members and cartographers. -Pat Kambesis

Thank you, Patricia. I had the privilege of attending the annual meeting of the Survey and Cartography section at 1999's Idaho Convention. Our treasurer, Bob Hoke, reported that the section had an excess of funds. I made the suggestion that we use some of the excess to publish a special issue that would showcase the winners and notable entries of the Cartographic Salon with an eye towards explaining what the judges were looking for in an award-winning Salon entry. The members attending the meeting liked the idea and, because I was the one to open my mouth, they appointed me to put together the issue you now have in your hands.

Attending any Cartography Salon is an excellent learning experience. By comparing the work of different cartographers brought together into the same room, you pick up new techniques and get exposed to new ideas. And the judges' critiques of these works show both the flaws and the strengths of each cartographic effort.

But not every cave cartographer can make it to the NSS Convention. It is my hope that this special issue of "Compass and Tape" will expose all you would-be cave cartographers who subscribe to our newsletter to this learning experience. In this way we may all benefit from the judging at 1999's Map Salon.

I wish to thank the Hazel Barton, Steve Reames, and Brent Aulenbach for their contributions to this project, to all of the entrants who have allowed their work to be displayed herein, warts and all, so that we may learn from them. And I especially wish to thank Carol Vesely for her valuable insights and encouragement. - Scott Schmitz

**SUBMISSIONS**

All types of material related to cave survey and survey data, cartography, and cave documentation in general, are welcome for publication in *Compass & Tape*. Manuscripts are accepted in ANY form but are most welcome on 3.5 inch diskettes either IBM compatible or Mac format or via e-mail. Typed material is next best although we will accept handwritten material as long as it is legible. Artwork is any form, shape or size is also welcome.

Send all submission for *Compass & Tape* to:

Patricia Kambesis
P.O. Box 343
Wenona,IL 61377
815-863-5184
E-mail: pkambesis@bigfoot.com

## Judges Comments from the 1999 NSS Cartography Salon

*by Steve Reames*

### Initial Comments

Many years ago, the Cartography Salon was started with the specific goal of encouraging cavers to improve the quality of maps. I take the word "encouraging" to be very important. As you read these reviews, remember that it's easy to find the flaws in someone else's map. But just finding flaws isn't very "encouraging." It's just as important to identify the strong points of each map. This helps not just the author, but also others who look at the map and take away the best features to use on their own projects.

There is another important characteristic of the salon that is worth pointing out. It is a competition. As a competition, each map is compared against others in the same category. Some of the entries lacked cross sections or vertical profiles. The author can always say, justifiably, that the cave is level, and doesn't need a profile. That may be true, but if your competitors have profiles, that puts you at a disadvantage. It's not that the map is bad, its not that the map isn't useful. It's just the nature of competitions.

# Cartographic Salon Entries and Winners 1999 NSS Convention

*by Hazel Barton*

This year 31 maps were accepted for display, representing 11 US States and three countries, including; Indonesia, Mexico and China.

### Apprentice Category

1. **Ponderosa Cavern**, Quintana Roo, Mexico
   *Gary Walten*
2. **James Cave**, Lee County, Virginia
   *Jim West and Kenneth Storey*
3. **Pruitt's Pit Cave**, Rockcastle County, Kentucky
   *Jim West and Kenneth Storey*
4. **Achilles Heel**, Heceta Island, Alaska
   Connie LaPerriere
5. **Ayers-West Cave**, Hancock County, Tennessee
   *Jim West and Kenneth Storey*
6. **Gear Grabber Grotto**, Fayette County, Pennsylvania
   *Alex Boughamer*
7. **No Bufferin**, Heceta Island, Alaska
   *Connie LaPerriere*
8. **Bray Ice Cave**, Siskiyou County, California
   *Bighorn Broeckel*

### Apprentice Category : Honorable Mention

1. **Popoose Cave**, Idaho County, Idaho
   *Pete Crecelius*
2. **Hellsinky**, Heceta Island, Alaska
   *Connie LaPerriere*
3. **Las Grutas De Cuesta Chica**, Tabasco, Mexico
   *Abigail Wines*

### Apprentice Category : Merit Award

1. **Goa Hatu Saka**, Seram, Indonesia
   *Chris Andrews*
2. **Eiswert Cave #2**, Lycoming County, Pennsylvania
   *Jim 'Crash' Kennedy*

### Experienced

1. **Down Draft Cave**, Skamania County, Washington
   *Garry Petrie*
2. **Badger Cave**, Guizhou Province, China
   *Peter Bosted*
3. **Lilburn Cave**, Tulare County, California
   *Peter Bosted*
4. **Coyote Cave**, Wind Cave Ntl. Park, S. Dakota
   *Joel Despain*
5. **Parson's Cave & Franklin's Pit**, Wise County, Virginia - *Bill Balfour*
6. **Dynamite Cave**, Skamania County, California
   *Garry Petrie*
7. **Caves of Basket Bay & Kook Creek**, Chichagof Island, Alaska – *Carlene Allred*
8. **La Cueva De Los Ecos**, San Luis Potosi, Mexico
   *John Ganter*

### Experienced: Honorable Mention

1. **New Cave**, Skamania County, Washington
   *Garry Petrie*
2. **Lime Creek Cave**, Eagle County, Colorado
   *Paul Burger*

### Experienced: Merit Award

1. **Narrows Cave**, Williams Canyon, Colorado
   *Paul Burger*

### Master/Professional

1. **Wind Cave**, Wind Cave National Park, South Dakota
   *Mike Hanson*
2. **Hurricane Crawl Cave**, Sequoia and Kings Canyon National Parks, California - *Joel Despain*
3. **Links Cave and Missing Link Cave**, Giles County, Virginia - *Mike Futrell*

### Master/Professional: Honorable Mention

1. **Sexton Cave Section, Kazumura Cave**, Hawaii
   *Carlene Allred and Bob Richards*

### Master/Professional: Merit Award

1. **Cueva De Villa Luz**, Tabasco, Mexico
   *Bob Richards*

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## MEDAL

**Arabica Cave**, Heceta Island, Alaska
*Carlene Allred and David Love*

## APPRENTICE CATEGORY

***Bray Ice Cave***
**Bill Broeckel**
Apprentice

# BRAY ICE CAVE GOES TO IDAHO
By Bill Broeckel

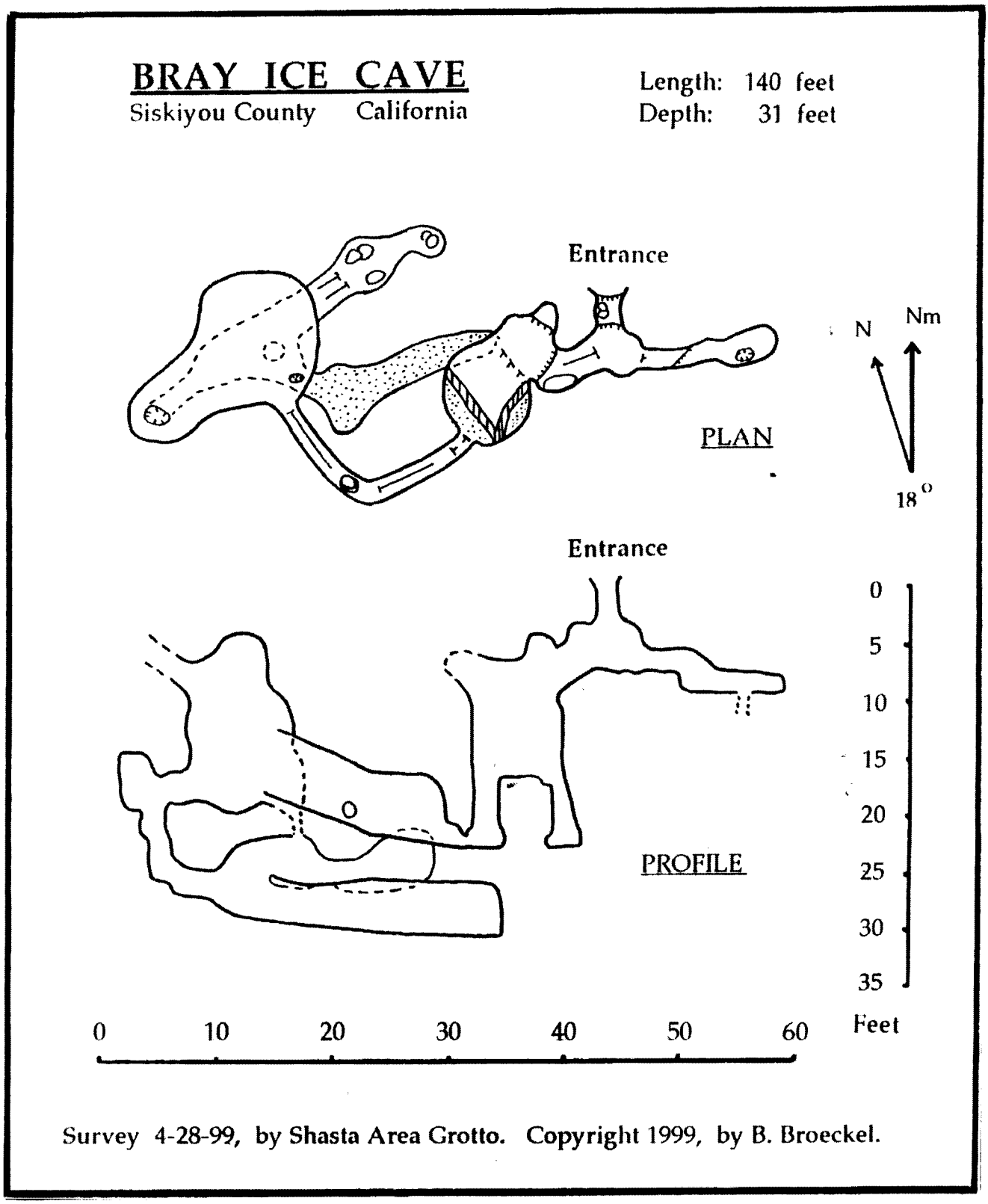
This is the story about how the map of Bray Ice Cave got entered into the cartography salon at the 1999 NSS Convention. The forest service had recently acquired some Orr Lake property in a land trade, and this management area now included the parcel containing Bray Ice Cave. Dr. William Halliday described this cave in Caves of California with the following comment. "This is a lava tube cave near the town of Bray. There are local reports that the small stream entering this cave formerly emerged from a penetrable passage 5 miles away. At present, however, no penetrable route exists." Armed with this reference, my wife and I set out on July 2, 1998, to check it out. We wanted to see what kind of cave it really was, since it was coming into public ownership and under the influence of the Federal Cave Resource Protection Act. We found that there was a cave there, and the map was prepared to prove its existence to the government.

Bray Ice is a small lava cave that never goes as a typical tube, but the devious passages around large blocks have some interesting 3-D complexity. The survey shows that Bray ice Cave is 31 feet deep and contains 140 feet of difficult passageways. The cave seemed well-suited for a map with directly correlating plan and profile views, which is my favorite type of cave map. My mind gets some kind of pleasure from depicting the relationship between plan and profile, which is somehow related to the joy of caving itself.

Although I'm well into my 40s, I'm only a beginner in cave mapping. Making my own maps has been a good way to get more cave maps into the grotto newsletter. I rarely make conventions, and never enter salons. But this year I was going, and I heard that there was a new beginner category in the cartography salon, and that all entries at this level were virtually assured of awards. This wasn't exactly the case, but these ideas were in my head. At the last minute, I put some copies of Bray Ice Cave into a manila envelope and drove off to Idaho.

I arrived late, but the people at the salon were really nice about including my entry into the competition. My 8x11 photocopy looked a little small compared to the other maps, which all appeared utterly fantastic to me, and I started to have some doubts about my chances. Now I have to confess something, maybe some others can relate to this. I enjoy looking at my own maps. Like Narcissus, I find myself gazing at my own cave map images, admiring them, and seeing if they still contain the joy of caving. I think this is part of the fun of making the things.

So I still had some hope, because this map had been pretty dependable for me personally. But I wasn't surprised when no ribbons appeared on my map, with the other maps so impressive. Also, it was dawning on me that there was a lot more to this map contest then I knew about. So I was pretty well braced and only a small part of my heart died that day. However, there were some more daggers to the chest later on when the judges reviewed everything with the contestants. It turned out that this little map of mine had a large number of problems.




The judging process was very analytical and detailed, and those who served as judges did a great and difficult job. The session itself was grueling and went on for hours. But I probably learned more about cave maps that day then any previous day of my life. The judges found all kinds of problems with all the maps, but they were also good about saying some nice things they liked about the maps. This went a long

ways in healing the dagger wounds and reversing the heart damage and stuff like that.

I believe everybody gains from the salon. Cave mapping is a discipline and the salon is a powerful testing place. However, preparing a map for publication and preparing a map for competition are two different birds. You need a cave with some complexity so you can demonstrate your skill in portraying that complexity in a clear and readable fashion. There are a lot of specific dos and don'ts to attend to. When everything is said and done, you end up with a perfect competition map that is too overdone for some other uses of cave maps.

When I can go to another convention, maybe I'll try again, especially since I will still qualify at the beginner level. If I could change the judging criteria, I would add some balancing factors such as suitability for publication and simplicity. This would reward those cartographers with the knack for bringing out the personality of a cave with a few inspired strokes of the pen, and the deft use of symbology. Does the map reproduce the cave, does it convey my eye through the passage, does it guide me on a journey through the cave, does it answer my questions about the cave? All these are important. But most important to me, does the map convey the love and joy of the cave? That's what I really look for in cave maps. Long live the salon and the love and joy of the caves!

**Brent Aulenbach:** Don't use underlines in the cave's name. Use larger letters for the cave entrance than the rest of the cave. While the balance and layout are nice, the map needs cross-sections. There are no ceiling heights and no elevations. There is no mention of the survey method. The symbols need referencing, especially the non-standard symbols.

The map shows good penmanship but there could be a bit more detail. The complex representations are good on the profile but confusing on the plan. The underlying passages need to be dashed past the border.

**Hazel Barton:** This was a well-drawn map, with excellent penmanship. I particularly liked the layout in which there was a nice balance of the map (note the position of the scale bars). It was nice to see the date of the magnetic North arrow and the scale bar was interesting. Overall this was a good map for this level.

There were, however, a couple of problems that cost the cartographer an award. Primarily there were no ceiling heights or cross-sections; therefore, the only vertical control came from the profile. Also, try to indicate your source for symbols, especially when non-standard symbols are used.

**Steve Reames:** This nice, simple map communicates almost everything someone would need to go explore this cave. The profile is good, and the map overall has a symmetrical and balanced layout. Penmanship is good, and floor detail is adequate.

Adding a few details would add a lot to this map. Adding vertical control, cross sections, and ceiling heights would help the reader visualize the cave a little better. There is no survey method mentioned, and no legend. The legend becomes a problem here because of the non-standard slope symbol (long bar with the shape of a "T").

This map is a great entry, and with the addition of a few items (probably making the map bigger as a result) it could become a strong competitor in the salon.

## *James Cave*

**Jim West and Kenneth Storey**

Apprentice

**Hazel Barton:** I liked the use of photographs on this map, something I have avoided in the past. But they created a good balance and prevented the map from looking too dark and visually dominant. The only drawback was that the photographs didn't add much to the map, compared with a map created by John Ganter (not shown) that had photographs at each location where the passages changed - like enhanced cross-sections. Photographs can be extremely useful in such circumstances.

There were a few features I really liked with this map, such as shadowing the cave itself to make it visually dominant. The only drawback was that the shadow was also around the pit-depth boxes and ceiling-height circles, making them really dark. This was a vertical cave, so a profile would have been very nice and perhaps helped balance the map. Moving the bottom part of the cave so the map fits on the paper was a bad move - caves are much prettier in their full glory, rather than chopped into bits. I recommend that cartographers always start in the middle of a sheet of mylar/paper much, much bigger than they anticipate needing. That way, the map can expand and overcrowding is avoided (this is always my biggest mistake. I've started a few maps over because I didn't leave enough room for profiles, wasting many hours of work). In this case, the map was confined by the need to fit in an 11x17 sheet, but perhaps a smaller scale on the map or shrinking down a larger original would have provided that little extra space.

**Brent Aulenbach:** The entrance to the cave needs to be more obvious. Don't particularly like the style of the scale bar. Passage continuation detracts from a visually nice map.

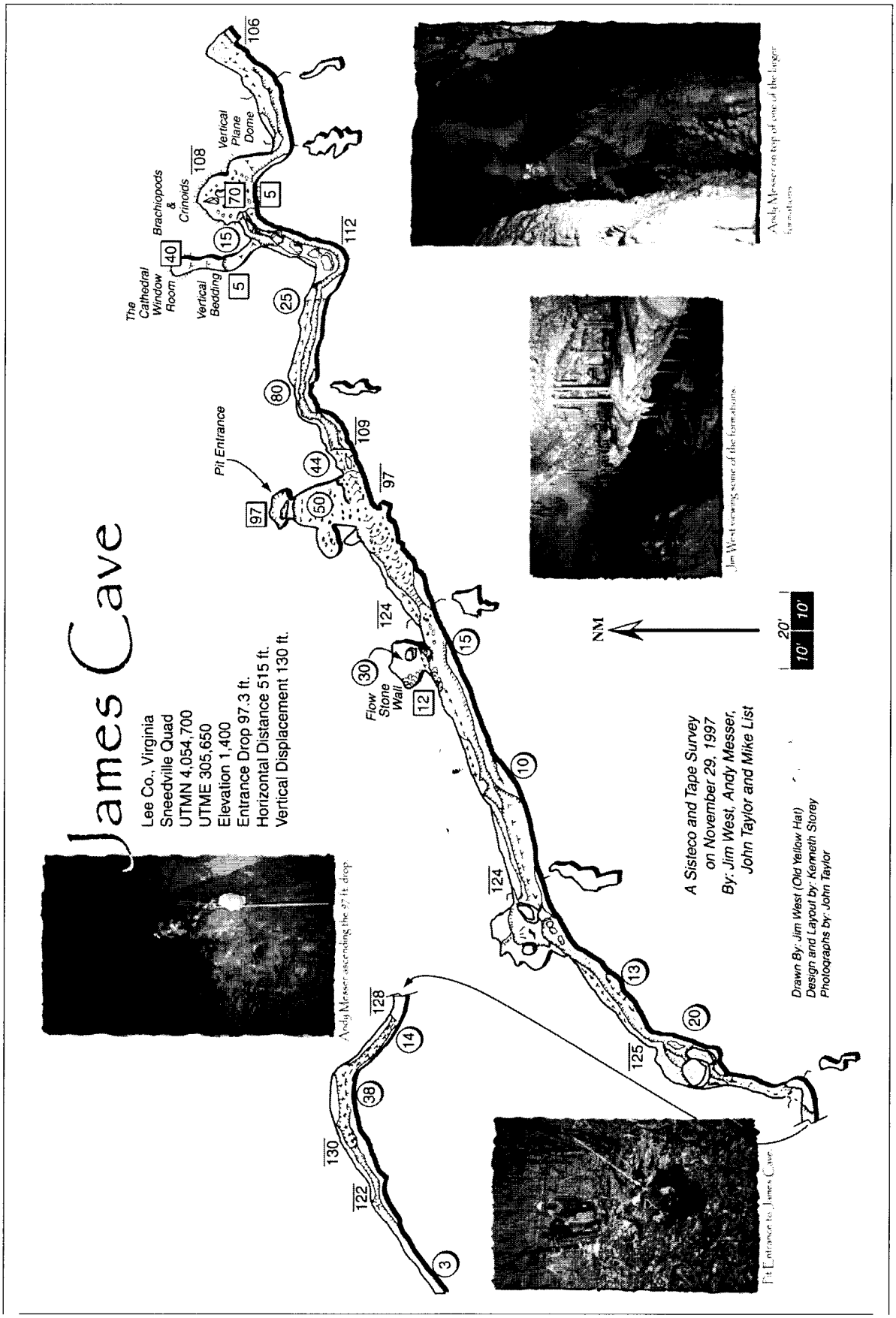
The cross-sections are missing leader lines or the leader lines are not standard. Map could use a profile for vertical extent. The plan has lots of ceiling heights and elevations, but can't recognize pits. Missing who drafted the map. No symbol reference. Box use confusing. Need zone on UTM.

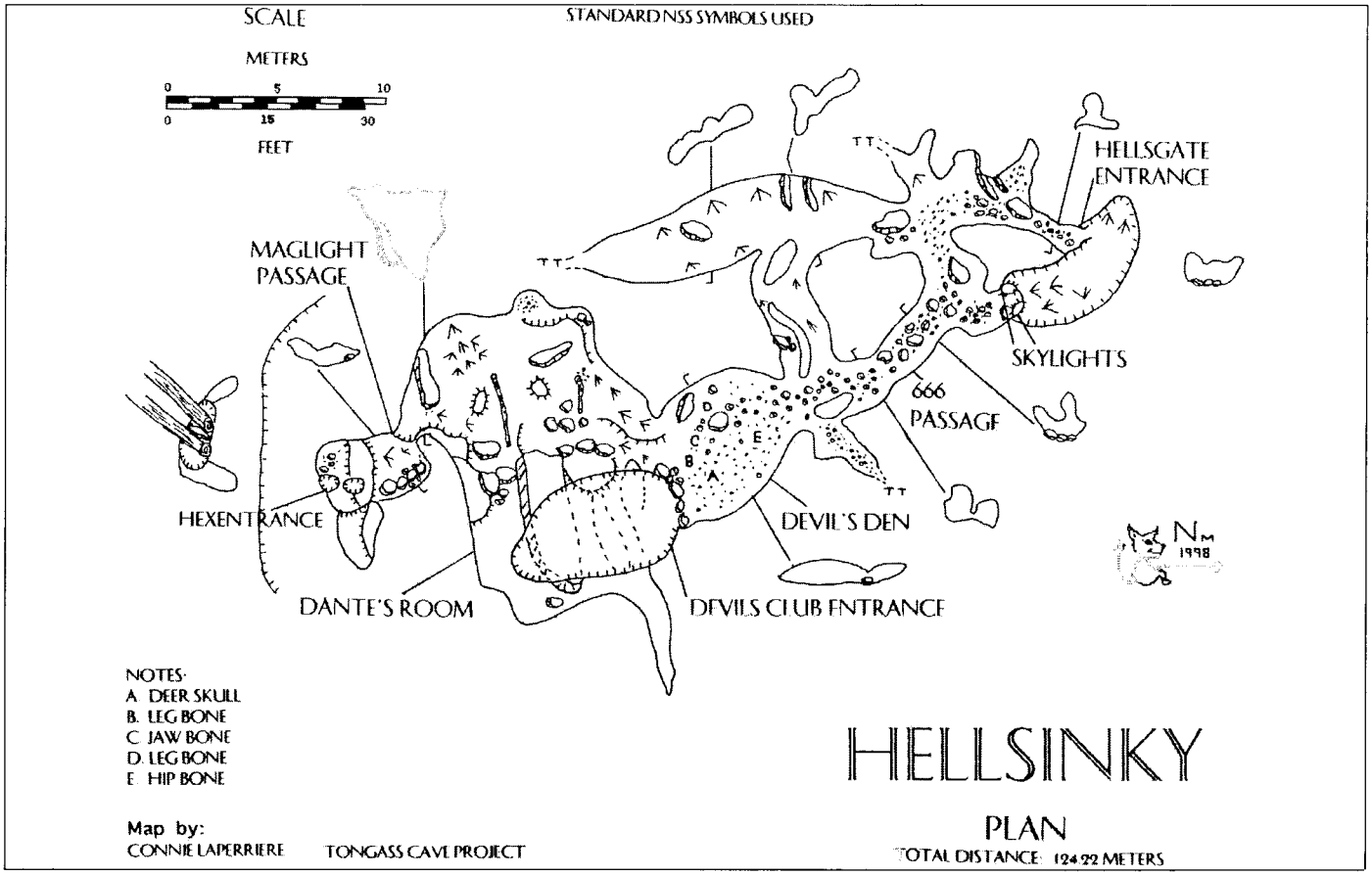
Like the rough edges on the pictures but the detail work is sloppy.

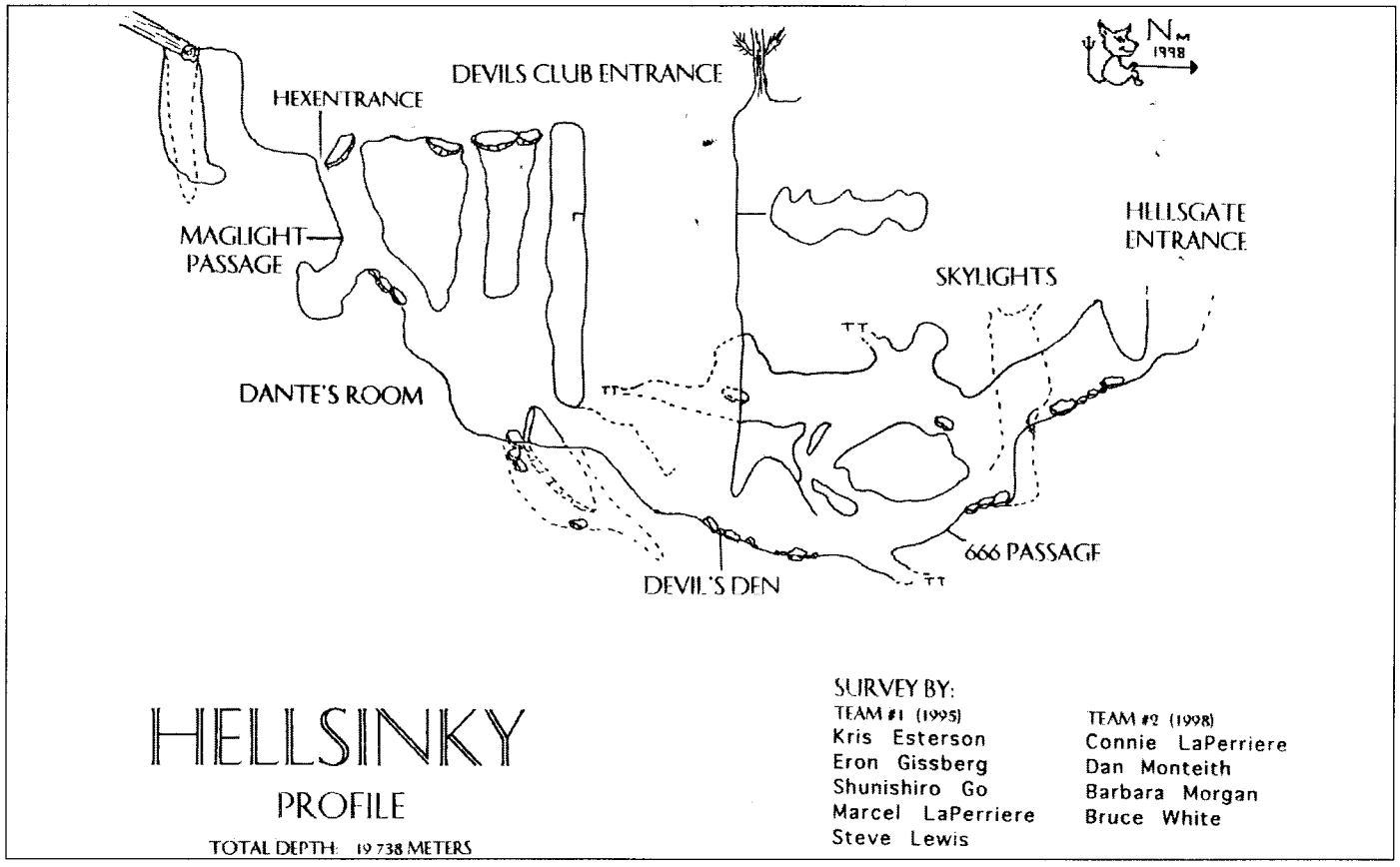
**Steve Reames:** Jim has added several nice features to this map that make it stand out over the others. The title with the color inversion is a nice touch. The ragged edge on the photos along with the drop shadows makes the photos a little more interesting. The shading on the main passage also gives the map a feeling of depth.

There are a number of errors, mostly minor, that can be easily changed to improve the map. When UTM coordinates are used to locate the cave, the zone number needs to be included. The entrance designation could be a little bigger to make it stand out against the other labels. Some of the drops and distances are a bit confusing: for example, where's the 70-foot pit located? There are several ledge symbols in the same vicinity, so it's hard to tell which one the "70" applies to. One of the cross-sections is missing its leader line.

There are a couple other things that I would change, but not all the judges would agree with me. The identity of the cartographer is confusing: who of the several listed names really drew the map? I also don't like the scale bar - it's a bit ugly. The break in the passage in the lower left corner is unattractive, even though the intent is clear. All things considered, this is a very nice map.


James Cave
Lee Co., Virginia
Sneedville Quad
UTMN 4,054,700
UTME 305,650
Elevation 1,400
Entrance Drop 97.3 ft.
Horizontal Distance 515 ft.
Vertical Displacement 130 ft.
Pit Entrance
The Cathedral Window Room
Vertical Bedding
Brachiopods & Crinoids
Vertical Plane Dome
Flow Stone Wall
NM
20'
10'
10'
A Sisteco and Tape Survey
on November 29, 1997
By: Jim West, Andy Messer,
John Taylor and Mike List
Drawn By: Jim West (Old Yellow Hat)
Design and Layout by: Kenneth Storey
Photographs by: John Taylor


SCALE
METERS
0 5 10
0 15 30
FEET
STANDARD NSS SYMBOLS USED
HELLSGATE ENTRANCE
MAGLIGHT PASSAGE
SKYLIGHTS
666 PASSAGE
HEXENTRANCE
DEVIL'S DEN
DANTE'S ROOM
DEVILS CLUB ENTRANCE
NOTES:
A. DEER SKULL
B. LEG BONE
C. JAW BONE
D. LEG BONE
E. HIP BONE
HELLSINKY
PLAN
Map by:
CONNIE LAPERRIERE
TONGASS CAVE PROJECT
TOTAL DISTANCE: 124.22 METERS


DEVILS CLUB ENTRANCE
HEXENTRANCE
MAGLIGHT PASSAGE
HELLSGATE ENTRANCE
SKYLIGHTS
DANTE'S ROOM
666 PASSAGE
DEVIL'S DEN
HELLSINKY
PROFILE
TOTAL DEPTH: 19.738 METERS
SURVEY BY:
TEAM #1 (1995)
Kris Esterson
Eron Gissberg
Shunishiro Go
Marcel LaPerriere
Steve Lewis
TEAM #2 (1998)
Connie LaPerriere
Dan Monteith
Barbara Morgan
Bruce White

## *Hellsinky*

**Connie LaPerriere**

Apprentice: Honorable Mention

**Hazel Barton:** A number of people came up to me at convention and complained that this map had received an award, whiles others (such as James Cave, with it's great photographs) had not. There was a good reason for this - this map had everything. Everything that has in the past been required from a good map in the cartographic salon: a nice profile, cross-sections, good floor detail, and good explanations. This was a simple map (and not as visually captivating as other maps), but you can go to this cave and know what to expect. There were a few problems, my main concern was separating the plan and profile onto separate sheets of paper. Keep all the information about the cave together on one sheep of paper, I personally feel that this is much more aesthetic and practical. Also, I'm going to nail you if things that appear on the plan aren't represented on the profile (if the profile slices a big rock, put the rock in the cross-section - a particular point to make with the sketchers).

Some things that folks should be careful with Connie missed on this map. The first is to always remember to copyright your map, this needs the copyright symbol, followed by your name and a date (usually the year). With the copyright laws in the US, you can copyright your work even without filing the paperwork. Then, if someone infringes the copyright and you wish to stop him or her, you can file the copyright then. You need to do this to protect your work and also the cave maps; without copyright control there is no way to limit distribution of the map, should it enter a public forum. So be careful!!

The second is to watch is caver-slang. On this map, the cave is simply called 'Hellsinky'. I know as cavers we never commonly use the 'cave' or 'cavern' suffix, but you need to use the full title on a map. This is a document of a geological feature, present it as if it were to appear in a book or in someone's thesis; in this case is it 'Hellsinky Cave'?

**Brent Aulenbach:** Needs larger fond or bold to distinguish the entrance. Needs scale on the vertical. Keep scale, north arrow, legend and notes info together.

The cross-sections have non-standard leaders that touch the walls, making the cross-sections confusing on vertical. Needs shading of "pillars(?)". Also needs ceiling heights, scale on profile, and elevation. Also missing the survey methods and the publication data. Symbols need a more complete reference.

While the map has nice profile work, the line weight for the walls could be thicker.

**Steve Reames:** Overall, Connie has created a simple but nicely done map. The plan and profile are split across two pages to accommodate the desired scale. Both pages are nicely balanced, and I particularly like the scale bar. One of the minor missing elements is a scale bar on the profile page: you can't assume the scale is the same across different pages.

The cross-sections were both a plus and a minus in this case.
There are many cross-sections, which is good, but sometimes a large rock that was drawn in the plan did not appear in the cross-section. One of my personal pet peeves is that leader lines for cross-sections shouldn't touch the passage walls. The lines should stop just short of the walls. Using a heavier line weight for the walls would also help to differentiate between the passage walls and other items such as structural details and leader lines. The entrance labels could also be improved by making them a little bigger.

While adding the total distance and depth on the map is nice, they are too small on this map and hard to read. The map should have a date. Another minor item is the use of the phrase "Standard NSS Symbols." It would be nice to say "1976 NSS Standard Symbols" because there has been some discussion about updating this list, and if that happens no one will know which set you were referring to.

# *Las Grutas De Cuesta Chica*

**Abigail Wines**

Apprentice: Honorable Mention

**Hazel Barton:** This was a really excellent map, especially for this level. It would have been even better but for one thing, the layout. There were 5 caves on this map along with their associated profiles, although at first glance that was difficult to determine. I personally would have lined things up as thus:

Plan #1 Profile #1 Map title
Plan #2 Profile #2 Title block
Plan #3 Profile #3 Information
Plan #4 Profile #4 Location maps

I think this would have given the map better balance and made things a little more obvious. There were very few problems, which the other judges have pointed out. Particularly irksome was the language switching - it's always important to maintain consistency, for example all the notes are in English. In this case, as a computer drafted map it would be possible to quickly produce two versions of this map - one in Spanish, one in English. In this way appropriate maps could be distributed and everyone is happy.

The use of color enhanced the map nicely, and good line weights were used for the maps, but be careful to put scale bars in for the profiles – this also provides some geological information.

**Brent Aulenbach:** The entrance names could be bigger. The visual impact is clean and neat. The layout is hard to follow. Numbered caves don't logically follow across the page. It is hard to match up the profiles, especially with north-south profiles. Some profiles are too close to the edge of the map. Nice profiles, though.

There are no ceiling heights, no elevations. The symbols are nice, but the dripline should be labeled. Good additions in the site details, but the English and Spanish subtitles are switched on some labels.

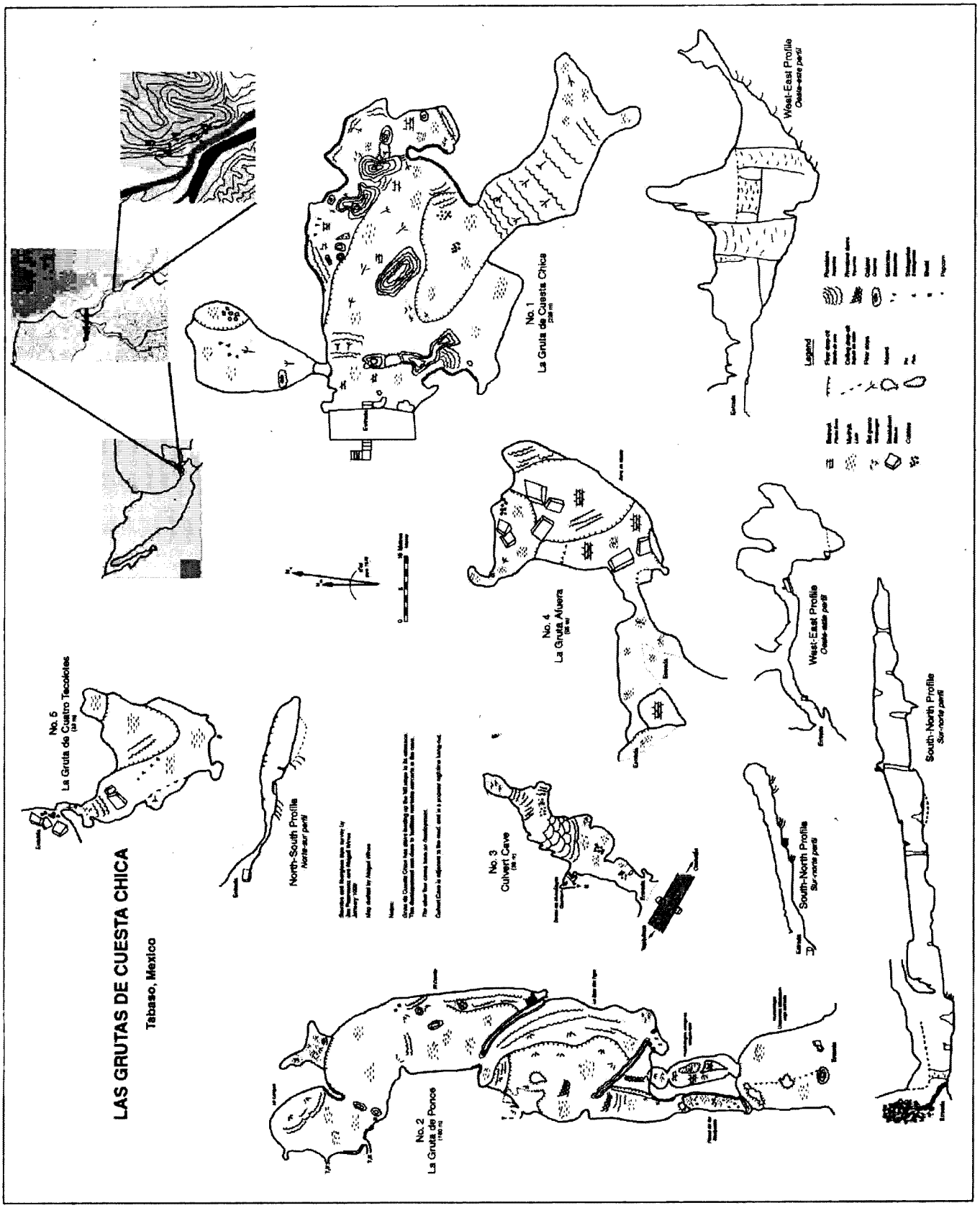
**Steve Reames:** This map was a nicely done entry in the Apprentice Category. The overall appearance was very neat, with good penmanship and line weights. The color map sequence is very good and helps people who aren't intimately familiar with Mexico, like me, to locate the cave.

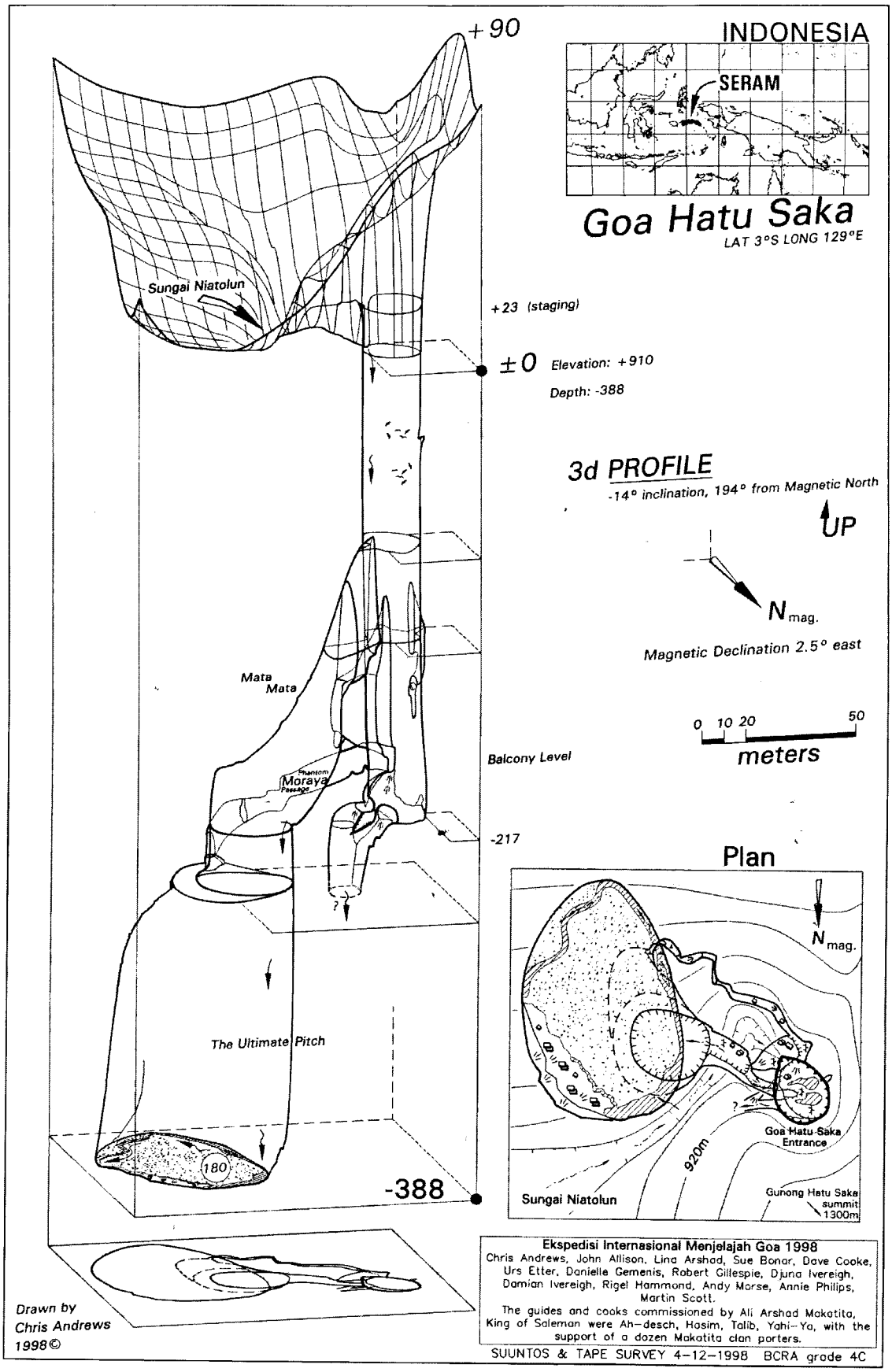
Although the overall balance was good, the layout suffered a bit. The caves were scattered randomly about the page, with no discernible flow or order. Two things complicated this: the plans and profiles are intermixed, and some of the profiles are N-S while others are E-W. A "conventional" map would have a heavy, black line separating the plan and profile. In this case, that convention is harder to apply because there are many caves.

Adding vertical control and ceiling heights would help the reader visualize the caves a little better. Although I encourage the use of both Spanish and English where appropriate, there were some inconsistencies. Most of the labels were a large, bold font, with the translation put in a smaller font below. But sometimes Spanish was the primary text, with English beneath, and sometime vice versa. I would suggest picking one language as the primary and always use the larger font for that language.

**Notes about the map from Abigail Wines:**

- This map has been reduced in scale to fit on a 8.5 x 11" paper.
- This copy has not been edited or changed in any way since the map saloon at the convention, so the judges' comments will make sense.
- I used to following methods to draft this map:
  1. I first drew a paper copy of the map of each cave.
  2. I scanned these maps into my computer.
  3. I then used the scanned copy as a template for tracing in the computer. I used the program Adobe Photoshop for this.
  4. I then assembled the final map, added text and printed it in a full-size format using Adobe Illustrator.


LAS GRUTAS DE CUESTA CHICA
Tabasco, Mexico
No. 1
La Gruta de Cuesta Chica
No. 2
La Gruta de Ponce
No. 3
Culvert Cave
No. 4
La Gruta Alvera
No. 5
La Gruta de Cuatro Tecolotes
North-South Profile
West-East Profile
South-North Profile
Legend


+90
INDONESIA
SERAM
Goa Hatu Saka
LAT 3°S LONG 129°E
Sungai Niatolun
+23 (staging)
±0 Elevation: +910
Depth: -388
3d PROFILE
-14° inclination, 194° from Magnetic North
UP
N mag.
Magnetic Declination 2.5° east
Mata
Mata
Phantom
Morava
Passage
0 10 20 50
meters
Balcony Level
-217
Plan
The Ultimate Pitch
180
-388
N mag.
Goa Hatu Saka
Entrance
920m
Sungai Niatolun
Gunong Hatu Saka
summit
1300m
Drawn by
Chris Andrews
1998©
Ekspedisi Internasional Menjelajah Goa 1998
Chris Andrews, John Allison, Lina Arshad, Sue Bonar, Dave Cooke, Urs Etter, Danielle Gemenis, Robert Gillespie, Djuna Ivereigh, Damian Ivereigh, Rigel Hammond, Andy Morse, Annie Philips, Martin Scott.
The guides and cooks commissioned by Ali Arshad Makatita, King of Saleman were Ah-desch, Hasim, Talib, Yahi-Ya, with the support of a dozen Makatita clan porters.
SUUNTOS & TAPE SURVEY 4-12-1998 BCRA grade 4C

# *Goa Hatu Saka*

**Chris Andrews**
Apprentice: Merit Award

Survey data was entered into the Larry Fish COMPASS program and then transferred via DXF into AutoCAD Release 14. Using some AutoCAD 3D rotational capabilities and by changing the elevations, I was able to sketch the known sections of the cave at each survey station. I could then rotate the cave to my final presentation view, and sketch in between the elevation sketches to give my representation a good 3D filled in appearance. Sort of by hand, by using my preferred CROSS-digitize pen on an NT system. By using "polylines" within AutoCAD, I was able to associate visible line thickness for specific entities; this was the key to allow the expedition members, interested in printing the map, to access the map via a web site (http://www.tpp.org/seram/HatuSaka.gif) and make their own accurate line weight copy.

The surface topography was creatively converted from a field hand sketch I had made at the time of the expedition to the visual representation seen on the map. The surface topography contains a mix of 3D and mostly self-corrected 2D alterations created in the final presentation view. I basically had
to erase and sketch over the 3D surface patch into the desired shape of the actual cave opening.

The final orientation was set within AutoCAD as a specific UCS (user coordinate system). The map is more of an illusion than an actual 3D surface rendition, which would require more sophisticated computer tools. Besides, the main reason I became a cave cartographer was to find a way back toward more illustrative artistic talents.

The small map in the corner showing the location of the Island of Seram was a raster image inserted into the actual AutoCAD file.

The oblique text was stylized and rotated to appear 3D, but I now believe this only confused the map. The map took approximately 3 months to fine tune, so you often learn to live with mistakes knowing repairs are needed. Time allowing, I would have liked to have kept it more simple. It is always interesting to see how a cave map develops and I hope I'm fortunate enough to finish this one.

Excerpt from the published manuscript highlighting the exploration in Int'l Caver #24 (Expedition member Rob Gillespie, or Garaman, from Colorado picked up a short-lived nickname during our expedition):

*At –388m, Garaman and I began a long rope survey ascent to connect with previous stations left at the Mata Mata Balcony, 160 metres above. With each of us again carrying a 30 metre measuring tape chained together, and Garaman positioning hand instruments below me, I weighted the rope and began with one of our expeditions most challenging surveys. High above the chamber, on rope, separated by a required 50 metres from Garaman, the acoustics turned horrendous.*

*At that moment occasional gusts of wind were passing over my carbide tip causing the surrounding illumination to flicker with disturbed carbonic whining. Falling water droplets extinguished the helmet-mounted flame and threatened to send me into blackness; save for the two mini-mags, the size of broken pencils, hung around my neck string used for viewing survey stations. This revolving disposition became a surreal setting that mimicked the interior of a candle lit castle, while bouncing from a thread of rope in vertigo space. It was all somewhere between the razor sharp rock and an indiscernible unreachable darkness. All the while, Garaman was at times screaming numbers I could not understand since he was unable to write on drenched arms.*

*It was all very wet. I tied my loose piece of webbing around the rope, denoting a station, and then hoping for the best continued upward. My tape measure was on the locked position and, as I climb, I forgetfully pull Garaman 's reel from his neck Noticing this possible error, I unfastened the swivel arm and the tape reel smashes into Garaman 's helmet below.*

*The whole timely matter on rope had me nearly wetting my own drawers. My prior lunch of repetitive dried sardine shaped fish and cork textured Sago cakes, the likes filled with some molasses sugar substance, were also bellowing inside my stomach with a burning intensity. I could hardly be further comforted by the thought that this lifeline we both bounced totally free from, though properly backed up, was solely tensioning off Garaman 's singular fresh bolt.*

April 15, 1998
Chris Andrews
Chrisandrews@juno.com
427 South Loomis Street Suite B
Fort Collins, Colorado 80521

**Hazel Barton:** This is a fine example of a visually dominant map that immediately leads your eye to the cave map. In this case, the cave is a vertical system and hence Chris chose to display it as a profile. This is perfectly acceptable, the aim of a map should be to tell you how to negotiate the cave. There are no hard and fast rules on how to do this, however I personally prefer to see a dominant profile in vertical systems. Chris has taken this one step further and presented a 3D representation of the cave, that tells us more than a regular profile. I particularly liked the 3D topography around the entrance, giving information about the approach to the cave.

There are a couple of things I would have done differently. When I see 3D profiles like this I like to see wall details, as you would expect if you were truly viewing the cave in 3 dimensions. The use of shades of gray was a nice touch, however the floor detail would have been better in black to 'ground' the map. Another issue was the vertical scale, try to be consistent with the gradations. For example, Chris used +90, 0, -217 and -388. A more even scale could have been, +100, 0, -100, -200, etc. I did like the use of the BCRA grade on the map to define the accuracy to which the map was made. This is not something that is standard practice in the US, but allows an extremely short summary of how the data was produced anything from a memory sketch up to all features in the cave being coordinated).

Chris did an excellent job with this map, and is definitely on my list of cartographers from which to expect great things in the future!'

**Brent Aulebach:** The vertical entrance needs a label. The scale bar rates a 10, although it is strange in style. The tilted fonts are distracting, as are the different font sizes crammed on the vertical depth.

The layout is crammed! The profile is nice, but could use a consistent scale on the vertical. Should have combined all the survey info into the same box. Symbol explanation needs reference! Contour map has only one label and no intervals stated. Location map is nice.

Graying is nice but not used consistently. Font choice has problems. Otherwise, the map has nice vertical representation.

**Steve Reames:** This map is a great example of how to adapt standard cartography techniques to match the cave. This is a vertical cave: making the plan the dominant part of the map would tell the reader almost nothing. Chris instead chose to emphasize the vertical aspect of the cave by making the profile the dominant part, and adding to that by using 3-D effects to make it stand out. This technique is common in Europe, especially in Switzerland where almost all the caves are vertical fissures. Also useful for the U.S. reader is the world map with insets that answer the question "Where the heck is Goa Hatu Saka? (answer: Indonesia)"

The nice plan map with contour lines is diminished only by the lack of labeled contour intervals. I was able to determine the shape of the pit entrance, but now how steep it was. The overall layout is fair, but the lower right hand corner is a bit too busy. Rearranging this, adding a vertical scale bar and adding a reference to a standard legend would improve this map and eliminate most of its weaknesses.

A number of trivial things could also be fixed. The entrance is labeled in the plan but not the profile. The words "The Ultimate Pitch" are part gray and part black, which is distracting to read. Overall this map is an excellent effort.

## *Eiswert Cave #2*

**Jim Kennedy**

Apprentice: Merit Award

Eiswert #2 was completely surveyed in a single trip, necessary because the cave generally has no caver access. A detailed sketch was made, including a running profile. This proved very useful when the map was drafted years later and my memory wasn't so sharp. The original sketch was made on vellum, and I even went so far as to ink the passages on mylar.

Then it sat, and I moved to Texas. I made one abortive attempt to scan what I had inked and convert everything to vector graphics with Corel Draw. I ran into many problems, and was not familiar enough with that software to complete the task.

A couple more years went by. Finally, feeling pressure to finish a bunch of old projects (mainly by accumulating new ones at a really rapid rate!), I scanned the inked mylar again on my home computer (the trusty PowerMac). This had to be done in four pieces, since the original was about 22" x 26". I opened all the sections in PhotoShop, spliced them back together, and cleaned up all the "noise" accumulated in the scanning process. I also thickened some line weights. I then finished the detail in the profile and cross-sections, lettered everything, and rearranged all the components to a pleasing visual balance.

I then sent it off via email to my mapping partner and another caver/cartographer buddy familiar with the cave. They sent back comments and suggestions, which I incorporated into the final map. I wanted to print it out bigger than 8.5x11 for the Salon, so I just copied the whole thing (1.4 mb) onto a Zip disk, and went to Kinko's.

I find that hand-drawing the maps, scanning them, and lettering everything by computer is pretty efficient. In particular, it really allows me lots of freedom in my page layout. If my north arrow looks funny in one place, I just move it! If the text looks too crowded, a simple command takes care of the problem without the need to completely redo everything. Drawing is still faster by hand (for me), but all of my lettering and layout is now done by computer. The added benefits are that the map is easily scalable, and it is already digital, allowing for easier distribution, including publishing.

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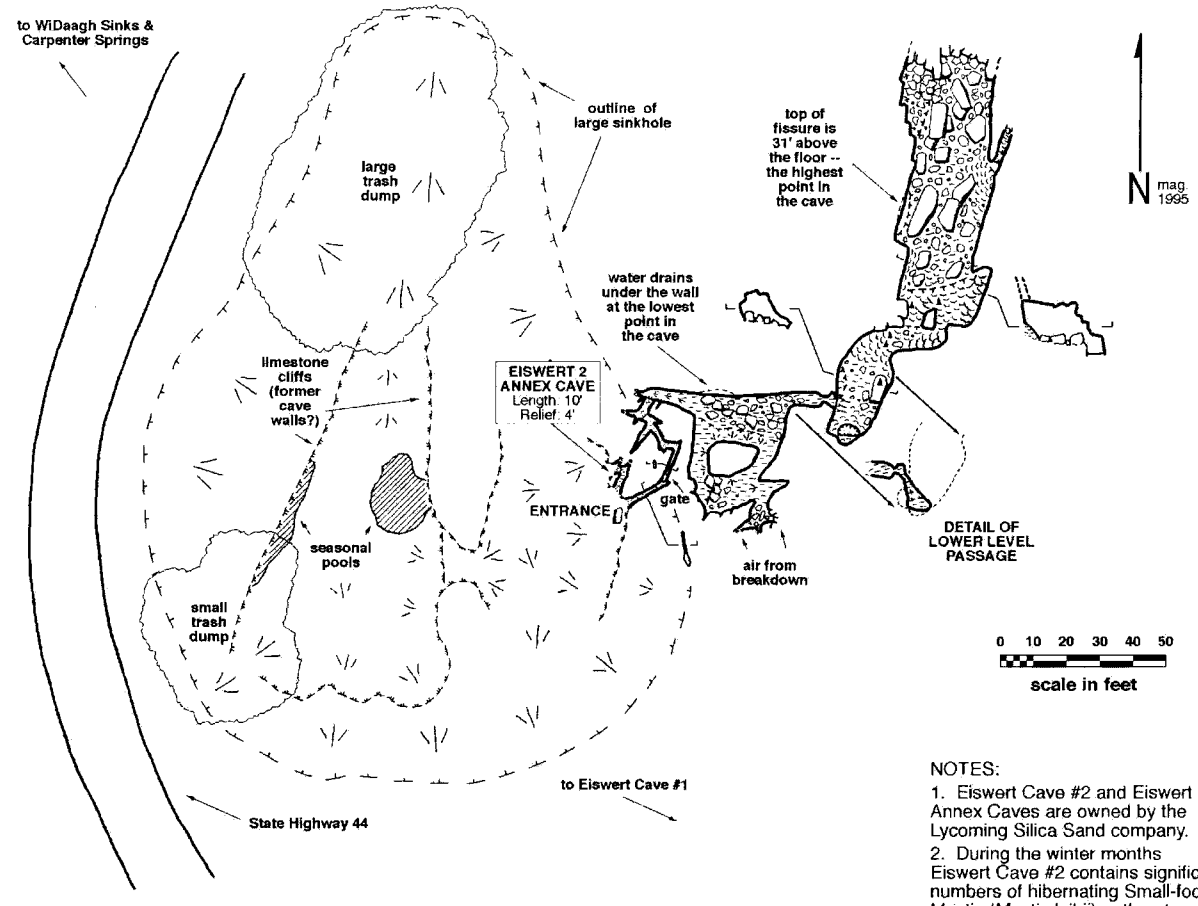
**Hazel Barton:** This was another outstanding map at this level. It was a simple map of a simple cave system. It's very important when designing map layouts not to get too clever, sometimes the simplest, cleanest maps tell you more about the cave than a map that someone has decided to add pages of superfluous information too.

There are not many additions I can add that have not been covered by Brent and Steve. One thing I would advise folks to look out for is the symbols they use. This was particularly a problem on this map because of the lack of a legend and Jim's choice of symbols. This is not a problem if the symbols are explained, however I would tend to avoid using symbols that are common for one thing in place of another. Always remember who the target audience is, cavers tend to use the same symbols (compare how close the US and European systems are), so avoid throwing off your audience. If you forget a common symbol and don't have access to the NSS standards list, call someone. You'll get laughed at, but at least mistakes can be changed before you've printed 3000 copies of the map.

**Brent Aulenbach:** The north arrow needs to be with the scale. The map needs to state that the profile is a running profile. Good cross-sections. A couple more cross-sections would be nice. Need ceiling heights and heights above and below the entrance on plan. The symbols need a reference.




# EISWERT CAVE #2

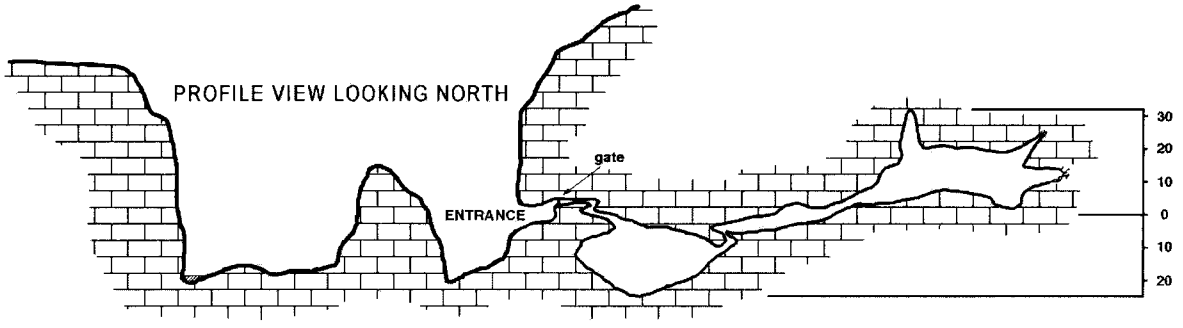
## LYCOMING COUNTY, PENNSYLVANIA

## Linden 7.5' Quadrangle

*Suunto and Tape Survey*
*20 February 1995*
*by Jim Kennedy and John Chenger*
*Map 12 May 1999*
*by Jim "Crash" Kennedy*

NOTES:

1. Eiswert Cave #2 and Eiswert 2 Annex Caves are owned by the Lycoming Silica Sand company.
2. During the winter months Eiswert Cave #2 contains significant numbers of hibernating Small-footed Myotis (*Myotis leibii*), a threatened bat species. The cave has been gated in cooperation with the Pennsylvania Game Commission for their protection.
3. The Eiswert caves are formed in carbonates of the Trenton group of Ordovician age.
4. Eiswert Cave #2 is also known as "Brassiere Cave" to local spelunkers.
5. Eiswert Cave #2 is located at 41°09'23" N latitude, 71°12'58" W longitude, and 700' msl elevation.
6. Eiswert #2 Cave has 449' of surveyed passages. Internal relief is 57' (+32, -25).

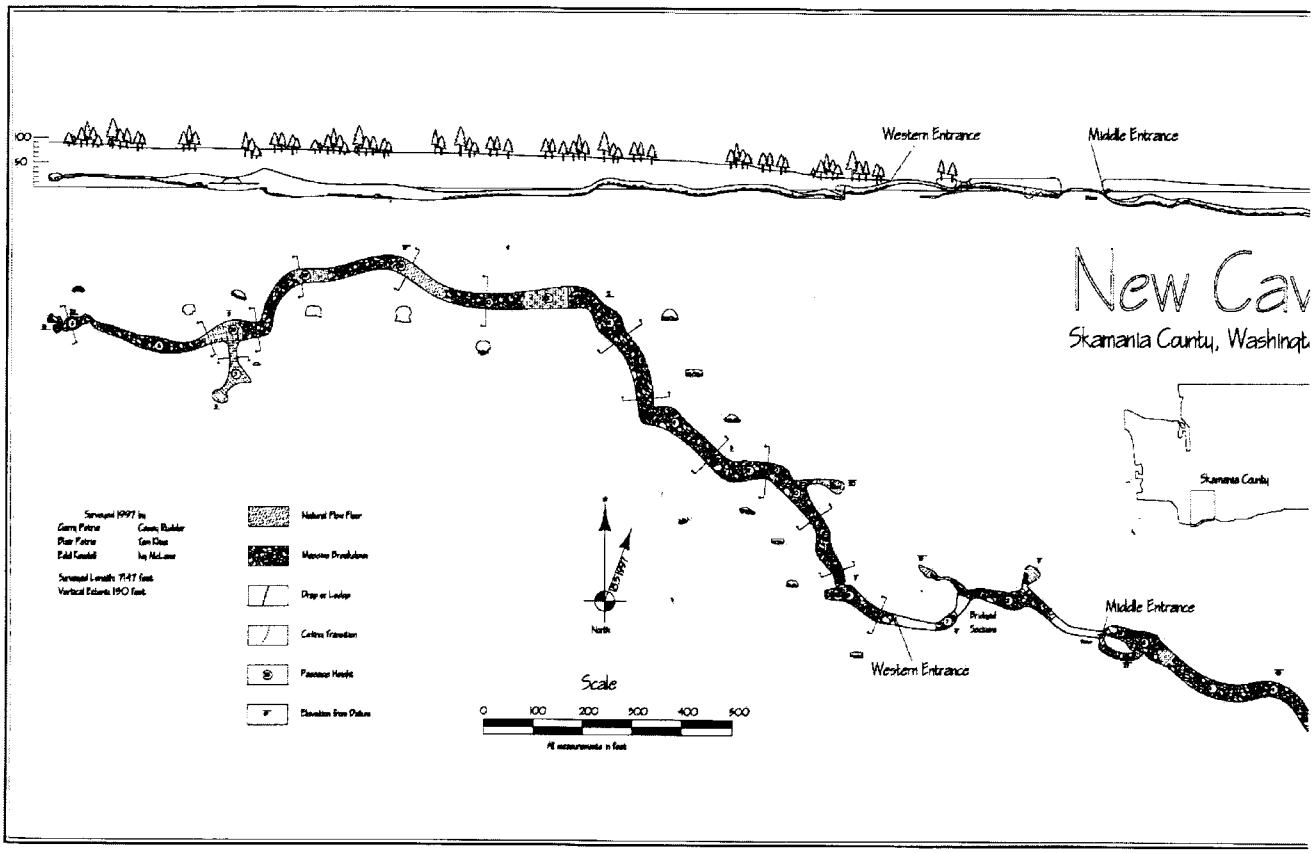


Good information and surface detail. While the penmanship is neat, the notes are crammed. The complex representation needs work – lower level pull out is confusing, can't tell where it goes.

**Steve Reames:** This map is generally pleasing to look at. The line weights are good and the layout is nicely balanced. The extra information adds to the interest. The profile is very nice, but missing the information as to whether it is a projected or running profile. If it's a projected profile, then the scale is off. More cross sections would be nice; not a lot, just one or two more.

Even though this map has a lot of extra information, it is missing reference to a standard legend. Just a little more space would be nice, but it is also clear that Jim designed this map for publication and was limited by the 8 1/2" x 11" constraints.

## EXPERIENCED CATEGORY




***New Cave***
**Garry Petrie**
Experienced: Honorable Mention

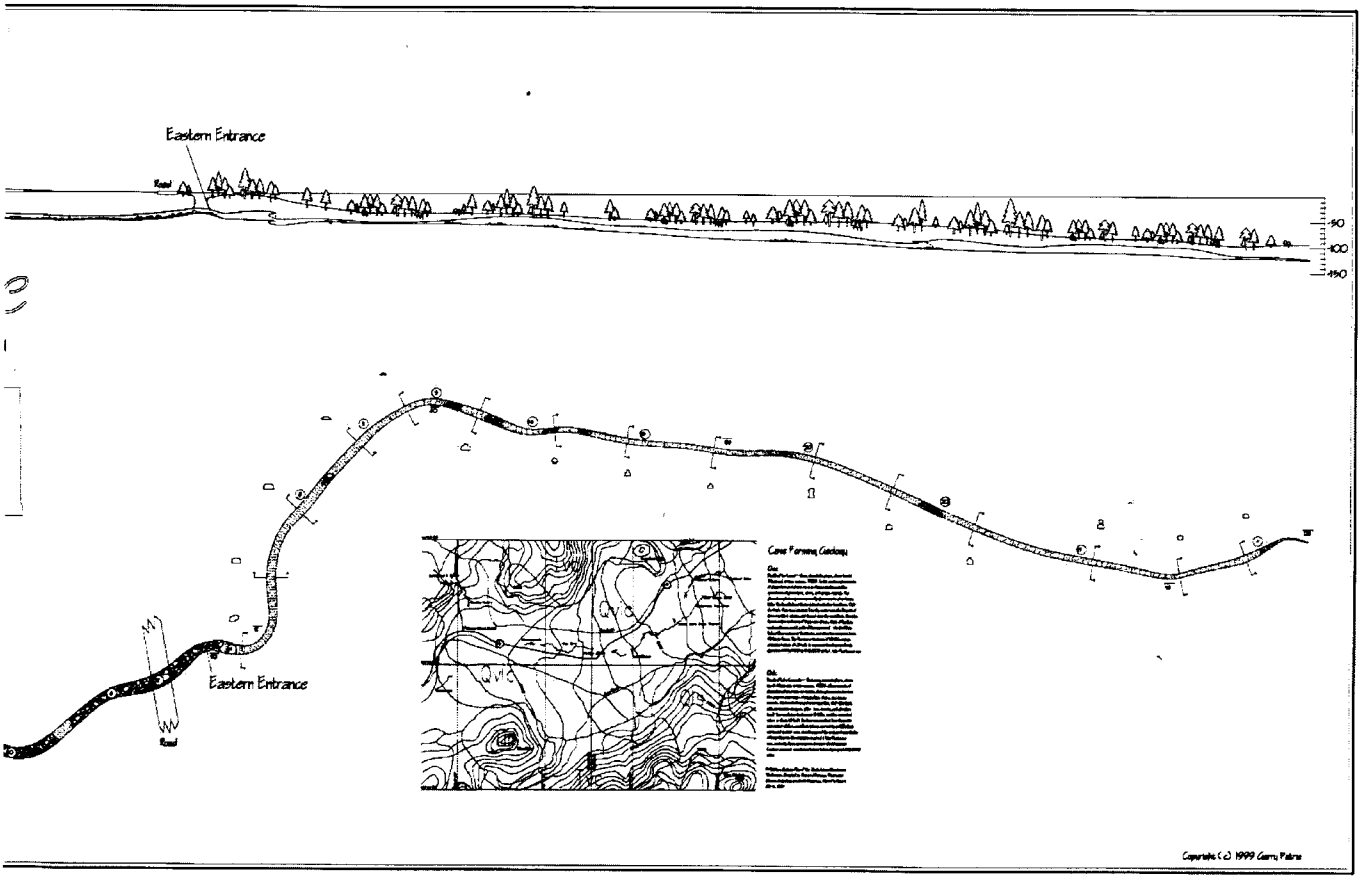
**Hazel Barton:** This was a good map with great visual dominance, but as has been stated by the other judges, up close it lost some impact due to printing problems (pen plotting), however I did not deduct points for lack of hardware. One of the problems I had with this map was how the scale bar was so visually dominant and threw off the balance of the map. With such a heavy, black, scale bar it weighted the map on that side. A smaller scale bar would have solved this problem.

Another issue was one that swings back and forth at every cartographic salon: should the ceiling heights be inside or outside of the cave. I prefer them outside of the cave because they take up too much room in the passage

(especially in smaller passages) and are, well, ugly. Others argue that putting them outside of the cave passage doesn't tell you exactly where in the cave the ceiling is that height, especially in large rooms that are a hundred feet across. Obviously the ceiling is not going to be a uniform height the whole way across - so what height do you use? I prefer to use the average height of the room. I also believe that placing the markers outside of the cave helps to achieve balance, along with the cross-sections and writing. Look at Carlene and David's map of Arabica, this is a classic example of how this balance works.

One other small problem was the cross-sections, or rather lack of them in the center of the map. This is a common problem when you have different sketchers, who might do an excellent job, but forgot to get cross-sections, or a profile. Leaving a big gap once again creates balance problems. You have two options:

1) Use fewer cross-sections so there isn't a large 'hole' in the data.
2) Go do another trip to get the cross-sections that were missed.




Guess which one I always do? Yep, drag your survey crew back for one more trip and ignore them when they complain, they should have got it right the first time.

**Brent Aulenbach:** The entrance leader lines should go to the middle of the entrance on the profile. Some cross-sections are far away from their respective leader lines. Missing a region of cross-sections. Some problems with the profile – dashed passages are supposed to be behind (more north) but are not always done.

Would prefer a survey date range instead of just the year. Some symbols are missing, such as the walls and underlying walls.

Geologic description, topo with line plot nice but need to see caves and geologic boundaries. The elevation lines touch numbers. Good detail. Some problems with the complex areas of the profile.

**Steve Reames:** This is a good map with very good balance and layout. I particularly like the topo map inset that locates the cave with respect to the surface terrain. Anyone who has spent hours searching for a lava tube can appreciate this addition.

There are a number of small improvements that can be made on this map. In the profile, dashed lines were used inconsistently sometimes the dashed passage was in front, sometimes behind. This was complicated by the fact that dashed lines were missing from the legend, so we couldn't tell which way it was supposed to be. Also in the profile, the datum line was a little distracting. I would prefer seeing a special line pattern, such as dash-dot-dash to separate the datum from the surface and cave passages. The north arrow could be improved by labeling the true and magnetic arrows, and adding the word "degrees" after the 18.3 (after all, we don't really know if it's degrees or grads). In the vertical control, the level lines were sometimes on top of the number, and sometimes too far away. In one case the level line crossed through the loop of the number "9".

This map illustrates a fundamental problem with the use of computers in cave mapping: how to print a final map. Both software and hardware have improved over the last few years to the point that caves can be easily drawn on computer systems available to many cavers. The problem is getting the map out of the computer. Taping together 8 1/2 x 11 sheets is unattractive, unless a final version is inked on mylar. This tends to defeat many of the benefits of computer drafting. Some people have access to large-format raster printers (e.g. HP DesignJet) that can make beautiful maps (see Paul Burger's map of Narrows Cave). Although many reproduction companies have these printers, the cost is still $5 to $10 per square foot. Until the price comes down, this approach will not be practical for most cavers. There are many pen plotters available on the surplus market. Garry has used a pen plotter for this map of New Cave. The downside is that the line weights are all the same. It is possible to use 0.3mm and 0.7mm pens on the plotter, but even this doesn't work well on large plots. At convention this was obvious when one moved about ten feet away from the maps and looked at the whole wall. The hand-inked maps stood out nicely, while the New Cave map tended to disappear.

This problem can be somewhat ameliorated by making smaller maps. This makes the fixed line weight of the plotter more dominant with respect to the size of the cave. In the long run, it is unlikely that pen plotters will be able to make competitive maps. This is not to say that the maps aren't useful, or that they are inferior. But the salon is judged without respect to the method used for making the map, and therefore the nicer looking pen and ink maps, along with computer raster graphics maps, will tend to be ranked higher.

## *Lime Creek Cave*

**Paul Burger**

Experienced: Honorable Mention

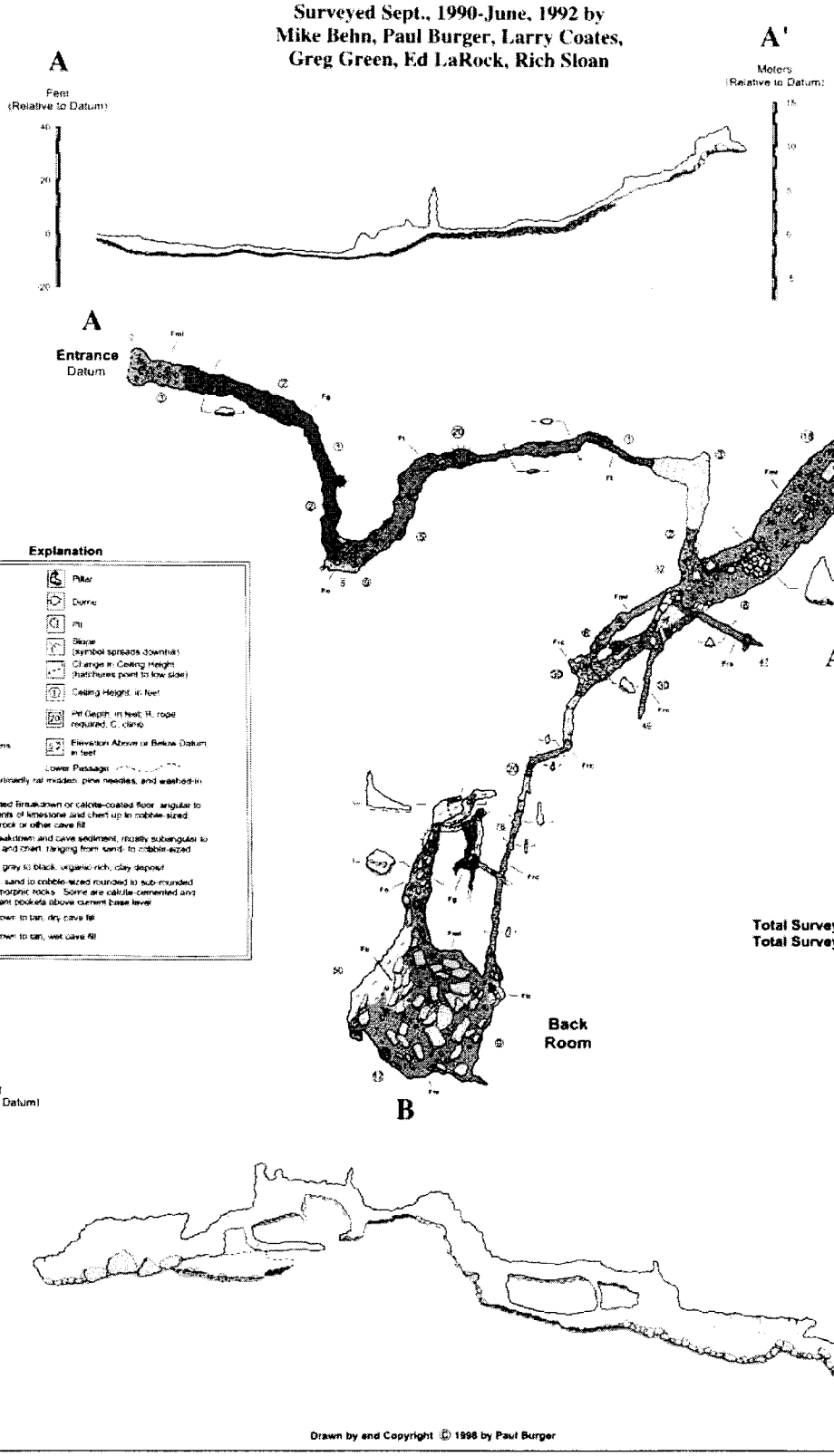
The Lime Creek Cave map was produced using Compass and Canvas 5 from Deneba software on a Pentium 350 Intergraph workstation with 256MB of RAM. I had drafted this map eight years ago with pen and ink, but needed to update it for my master's thesis. I scanned my existing map using a HP flatbed scanner at 300 dpi in sections that were about 8.5 x 14".

I had to use the original line plots and go back into the cave to generate profiles because they were not done when I surveyed the cave. I also mapped the cave sediment deposits as part of my thesis onto Xerox copies of the plan map. It took me two trips to generate the profiles, map the sediments, and draw a few more cross-sections (In retrospect, I should have done even more sections).

# Lime Creek Cave

## Eagle County, Colorado

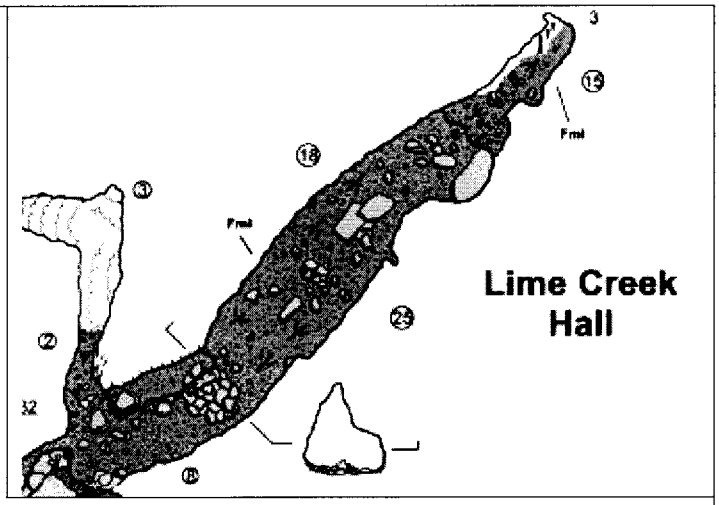
**Surveyed Sept., 1990-June, 1992 by**
**Mike Behn, Paul Burger, Larry Coates,**
**Greg Green, Ed LaRock, Rich Sloan**



I digitized the map on-screen using the mouse and the same layers I used for the Narrows Cave map. I added a layer called Sediments for the geology and made sure that it was below the other layers so that the floor detail would show up. The final drawing was 2 MB in Canvas format and was plotted on an HP DesignJet 750C, large-format printer directly from Canvas.

I established my own color scheme and classification for the sediment mapping which worked well for my thesis, but wasn't aesthetically-pleasing enough. The organic fill color was too dark and masked the floor detail, and the use of white to represent flowstone made it stand out too much. Overall, I felt that I was able to portray a great deal of information quickly using color fills. Even non-geologists could understand what I was trying to portray. I think the use of color to represent information (even floor detail) is an underutilized, accessible tool that we now have at our disposal.

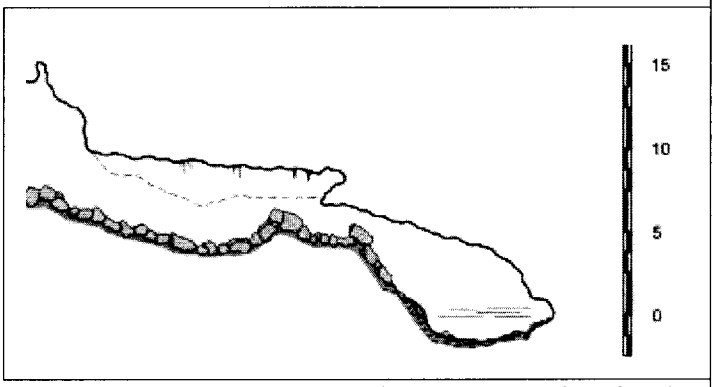
**Hazel Barton:** This is a great example of how color can be used to enhance a map, in this case, to show the geology of the cave (I believe this map was used in Paul's Masters thesis). It's very difficult to use color well and not be accused of 'trying to hide something' - something I have heard many times when presenting professional posters. People then to be blinded by the 'gosh-golly, look at all that color' effect (see Villa Luz) and don't see the errors. However, in this case, Paul pulls it off. The use of color is to enhance the map. There were a few problems, and I think all the judges picked up on the colors chosen as being a little too dark. Very often, printers don't give you what you expect - a color on the screen may be much darker when the ink dries on the paper. Always print test strips before the final product (another trick I've learned through professional posters). Apart from that, this was a great map. I do like to see a little more surface information around the entrance (I hate traversing cliffs, cause I'm bad at it - it would be nice to know such things to help find the entrance).



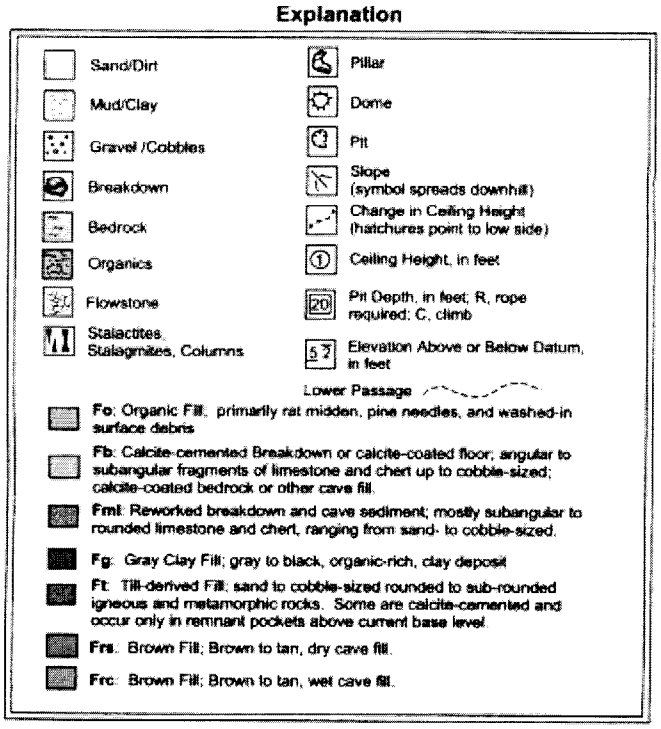

**Detail of Lime Creek Hall**

**Brent Aulenbach:** The entrance is not labeled in the profile. Is the north arrow true north or magnetic north? The map's visual impact is clean and neat.

The profile and plan need to be labeled. The explanation is a bit cramped. It's possible to put the letters in the profile somewhere else so as not to stick up so much. The cross sections are a little close to the cave walls, and the big rooms need cross sections as well. There is no mention of the survey method used, and there is no explanation for the soda straw symbols, and no explanation of the wall symbols.




The detail of the fill and sediment types is nice but it is a bit dark, making it hard to see the floor detail. The lower passage seems added, squeezed in. The circles for the ceiling height are too small. And the complex representation is not too complex.




**Steve Reames:** This map of a small cave in Colorado is primarily of interest for its use of color. There is still much discussion in the cartography community about how color should be used on a map. I personally believe that color should enhance the information content of the map, not just make it look prettier. This map is a good example of the appropriate use of color. The different colors indicate geological characteristics of the cave. The colors are very useful for correlating the plan and profile, and at one spot I was able to figure out which passage went high and which went low based on the geology. This map has very good balance and layout.

There were a number of minor things that could be improved. The gray and purple colors were a little too dark, making it difficult to see the floor detail that was drawn in black. The cross sections were drawn too close to the passage walls; there's plenty of space to move them further out. The vertical scale bars were ugly in my opinion, but other people thought they were OK. The legend was missing the symbol for soda straws. In a number of places the circles used in the ceiling height symbols touched the numbers inside of them. It would help to make the circles a bit larger.

## *Narrows Cave*

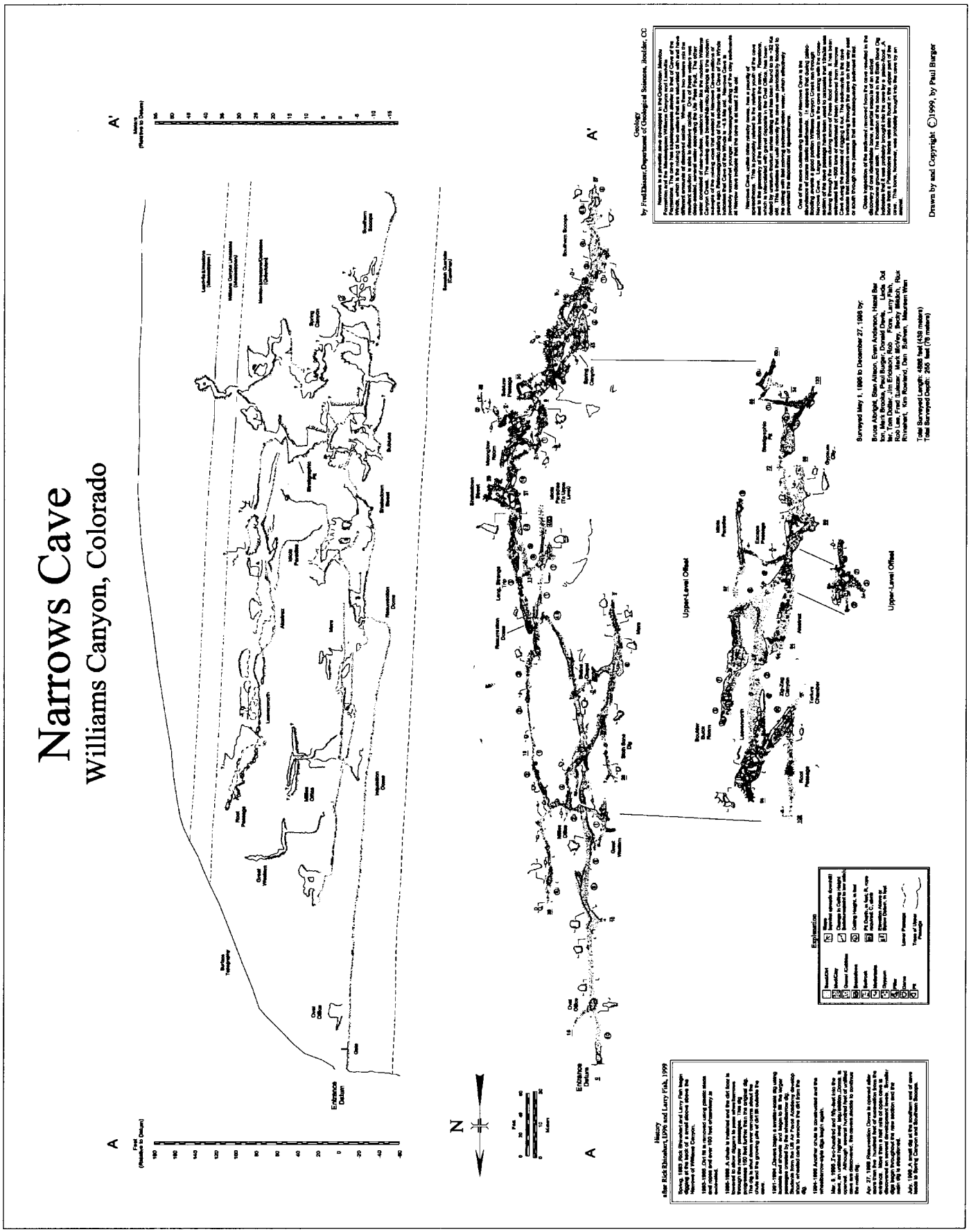
**Paul Burger**

Experienced: Merit Award

The Narrows Cave map was produced using Compass and Canvas 5 from Deneba software on a Pentium 350 Intergraph workstation with 256MB of RAM. The first 2000 feet of cave, including the profile was done using traditional-style cartography. I created a pencil draft of the map on gridded mylar at twenty feet per inch. I scanned the pencil drawing using a HP flatbed scanner at 300 dpi in sections that were about 8.5 x 14". The scanned grids from the mylar allowed me to reassemble the pieces back into a full-size drawing in the computer.

Using the mouse to digitize, I traced over my working map with vector lines. I used the following scheme for my layers:

| Layer Name | Description |
|---|---|
| Walls | passage walls |
| Structural | slope lines, dome and pit symbols, change in ceiling heights, etc. |
| Detail | floor detail |
| Sections | cross-sections |
| Stations | station symbols and labels (turned off for final plotting) |
| Elevations | selected station elevations |
| Ceiling Heights | selected passage ceiling heights |
| Scale | scalebar and north arrow |


Narrows Cave
Williams Canyon, Colorado
A
A'
Entrance Datum
Entrance Portal
N
Upper-Level Offset
Upper-Level Offset
Explanation
Geology
by Fred Ekblaw, Department of Geological Sciences, Boulder, CO
History
after Rick Ekblaw's, Larry Fish, 1999
Surveyed May 1, 1999 to December 27, 1999 by:
Bruce Albright, Stan Allison, Evan Anderson, Hazel Bar
ton, Mark Brooke, Paul Burger, Donald Davis, Linda Dut
ler, Tom Dutler, Jim Erickson, Rob Fors, Larry Fish,
Rick Ekblaw, Fred Ekblaw, Mark Kelley, Kevin Mahon, Rick
Rinehart, Kim Rowland, Dan Sullivan, Maureen Wen
Total Surveyed Length: 1888 feet (438 meters)
Total Surveyed Depth: 255 feet (78 meters)
Drawn by and Copyright ©1999, by Paul Burger

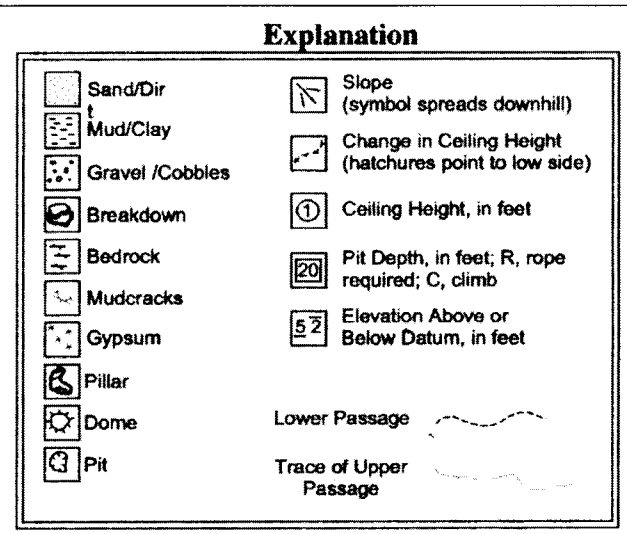
| Layer Name | Description |
|---|---|
| Text | cave name, surveyors, general map text |
| Explanation | cave legend |
| Bitmap | a temporary layer that holds the bitmap, it is deleted after the digitizing for each section is done |

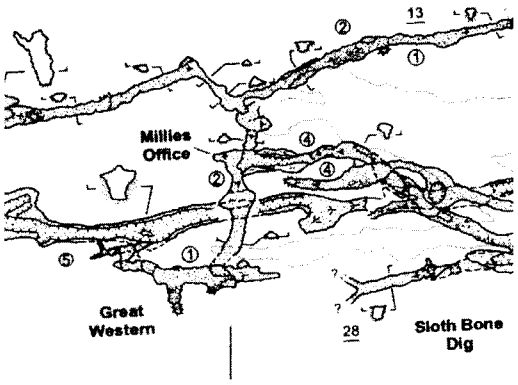
Once the master map was digitized, it was fairly easy to add more passage as they were discovered and surveyed. For each new section or survey, I drafted a 20 ft/inch pencil draft on mylar and scanned that in. The grids on the mylar and a line plot brought in as a DXF file were used to ensure the new areas were in the right place. I then digitized the new passages.

The plan map was broken into four main sections to keep the file sizes manageable: the profile, the entrance to Resurrection Dome, Resurrection Dome to Southern Scoops, and the upper level. For the final map, I brought the sections in and aligned them using a line plot brought in as a DXF file. I added the text blocks, explanation, scale and north arrow last and then played with the layout until I liked it.

The final drawing was 7.5MB in Canvas format and was plotted on an HP DesignJet 750C, large-format printer directly from Canvas. After convention, I took the judges comments (at least the ones I liked) and integrated them into the final map. Most of the comments were about layout and a couple of computer-generated errors, but I was able to produce an updated map in less than an hour.

**Hazel Barton:** This was the other contender for the medal this year. It was very close, but we just couldn't give the medal to this map because there were too many minor errors. It's really easy to ignore the small things, such as a pen blob here, or smudge there, and hope that the judges ignore it to. But when you compete for the medal, it's just unacceptable. If you don't like that kind of critique, then don't enter your map for competition. We'll tell you how great a map you created, as in this case, it was a great map, but we won't give you a medal for errors. In this case, it was the 't'. In the legend, there was a problem with the printing of the final map that caused the last letter of the line above to be wrapped, leaving a hanging 't', an easily fixable error.



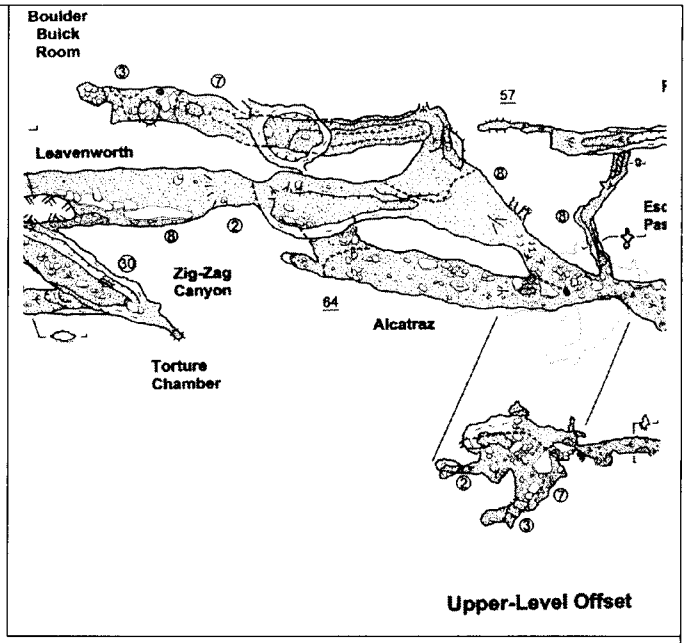




There were also a few layout issues. In this case I would have made the map and profile about a third larger to take up more of the paper and moved the legend and other information to a column on the right side of the map. This would have balanced the map better and allowed for more of the detail in the plan and profile to be apparent. Another slight problem was how close the cross-sections were to the passages, my first thought on seeing the map was the lack of cross-sections: they were there, just buried. This is an excellent example of what can be done with computer-aided drafting, how a computer-drawn map can still have the quality of a hand-drawn map. In addition, within only a few hours it's possible for Paul to change everything we've pointed out, with a hand-drafted map, this would take days.

**Brent Aulenbach:** Is the north arrow true north or magnetic north? The divisions on the scale bar are strange, and I don't like scale bars used for the profile. The profile should be used for elevation, not scale. White space takes away from some of the map's visual impact. There is too much white space. The map should go across the entire page.

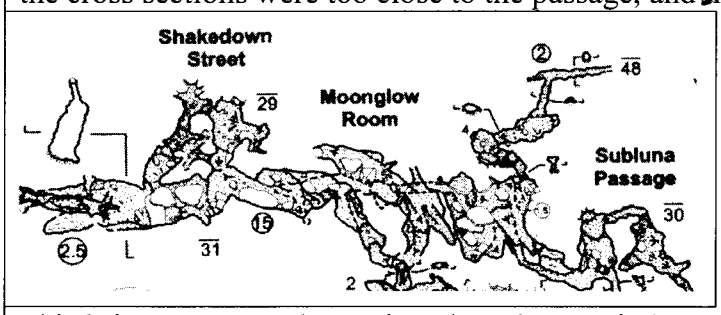
The cross sections are too close to the cave passage, and the large section of the upper level needs cross sections as well. There is no mention of the survey method used, and there is no explanation of the wall symbols.

The map has good geology, history and stratigraphic detail. The circles for the ceiling height are too small and need to be place more consistently distant from the cave walls. Some are too close. Also, good editorial stuff with nice detail. But to be picky, should have had some explanation on the sand and dirt, history dates get too close to description (maybe right justify the dates?), all the symbols are explained except for the passages. M"3"/s should be superscript and the abbreviations "Ma" and "Ka" need to be defined.




**Steve Reames:** Of all the maps under consideration for the medal, the judges argued the longest over this map and Carlene Allred's Arabica Cave. Narrows Cave is complex, and this map does a good job of portraying this cave. The penmanship and detail is excellent. The use of solid and gray dashed lines makes it easy to understand which passages are further away from the viewer. The balance and layout are also excellent.

Even the best maps have small flaws, and this one was no exception. The white space on the left and right detracts from the visual impact. If the cave was about 1/3 bigger it would fill the page better. Most of the cross sections were too close to the passage, and in some cases they were almost impossible to see.




Like Lime Creek Cave above, the numbers in the ceiling height circles touched the circles. Although the vertical control was excellent, there was one flaw. The upper-upper-level offset needs at least one control point to establish its relationship to the other offsets. The text section on geology was a definite plus, but a number of typographic errors reduced its value.

This brings up a good question about how to judge text sections. There were two abbreviations, "Ma" and "Ka" that weren't defined. This caused me, being a non-geologist, come confusion (Ma = million years ago, Ka = thousand years ago). I objected to the fact that there were undefined terms present, but the cartographer pointed out that any geologist would immediately know what those terms meant. So how should the salon judge these sections? Should all text be required to be written in plain English? Or should specific topics be written at a level appropriate to someone experienced in the field? If we assume the latter, should the judges bring in a geologist to evaluate any geology text? How about history? There are still many unanswered questions.

As a postscript, Paul took the salon critique sheet after Convention and fixed all the minor mistakes. The improved map was then released in the Colorado caving community, so we all have the use of a top-quality product. This illustrates the power of computer-generated maps.

# PROFESSIONAL CATEGORY

## *Sexton Section of Kazumura Cave*

**Bob Richards**

Professional: Honorable Mention

For the Sexton Cave map size and the number scans were the issues to overcome. This project involved taking pages from the Kazumura Atlas that I helped produce with Kevin & Carlene Alired two years earlier. I told Carlene that I had a vision that some day it would be possible to output a map on one sheet of paper showing the entire Kazumura Cave system. She had a name for this map, "Mother of All Maps". I thought it would be possible but told Carlene I would try one section of the system first on my home PC. Kazumura has five sections with Sexton being the longest. It would provide me with a good test to see if a large-scale map could be done on the computer. I had access to a large new plotter that would allow maps to be output up to 54" wide and any length. Since lava tubes are linear, this made an ideal test for a large cave map. To show floor detail of Sexton Cave it would have to be a large plot. My final map layout was roughly 4 feet by 18 feet in length.

The Kazumura Atlas consisted of 80 tabloid size pages that were inked by Carlene. So as not to redraft her excellent work, I would scan the individual pages, merge them on the computer and show the cave as one continuous map. I started by scanning the 15 pages of the Sexton section. At first I thought it would be a quick and simple project of scanning the profile and plan views as separate files for a total of 30 files. However, I soon realized that merging the scans of the plan view did not always line up for my map layout. The profile scans did line up great, but the plan view pages that had upper level passages would not line up on my drawing. So I had to go back and scan them as individual files.

One atlas page required six individual scans. I ended up with 54 scans on this map. To hold cave floor detail I scanned them in at 400 dpi, which is twice the resolution I use when I'm using a scan as my tracing template. The file size grew to over 30 megabytes.

After outputting a small test section I was not satisfied with the outcome. So I went back to each individual scan and cleaned them up in Photoshop. I digitally erased all lettering and cross-section lines so all that remained was the cave walls, floor detail and cross-sections. I imported the clean scans into FreeHand and used a Helvetica font for my lettering and a fine pen line weight for the cross-section lines. This allowed me to output a cleaner image than the original scans.

My goal was to represent and show the great linear distance of this lava tube. I also wanted to use very little color so the eyes would be drawn to the cave itself. It gave this map a clean black and white appearance. This was achieved by adding a light grey background color to the profile and combined plan view areas. This gave the large map an airbrushed look around the cave passages to show off the floor detail better.

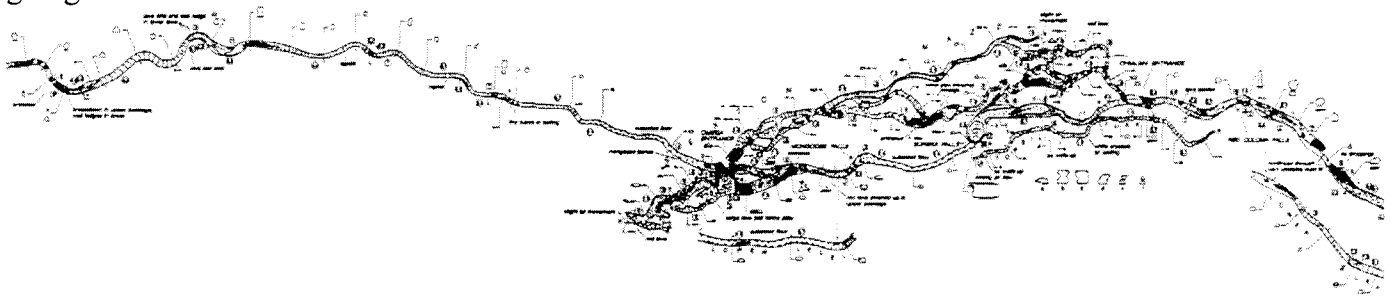
Outputting such a large map took hours on the plotter, not to mention the many hours on the computer to get the Sexton Cave section ready for the NSS salon. When asked to reduce this 18-foot long map down to a size for Compass & Tape, I knew it would be impossible to hold any detail. The gray background fades to white at this scale. However, you can see how the layout and balance flow on this giant map entry.

**Hazel Barton:** When folks first walked through the door of the salon, this was the map that grabbed their attention - it was huge. But as always, visual impact does no excuse poor map quality. Upon closer inspection in became apparent that there were a few issues. Primarily, this map was constructed from the book that Bob created with Carlene and Dave Allred in 1997. Bob pieced the pages of the book together to create a map of a section of Kazamura (he didn't tell us this, we worked it out from looking at the map).

While this map is not exactly practical for the average caver, this would look stunning in a visitor center somewhere.

At this level of competition, we weren't about to give Bob any breaks. With all the extra space on this huge piece of paper, he was no longer limited by the confines of an 11 x 17 inch sheet, as a result he had plenty of room to roam - which he didn't. In places, such as the large offset, Carlene was restricted to within an inch or so of the main passage by page constraints. Bob didn't have this problem, and could really have spread the offsets out and make things less cluttered.

Overall the balance of the map was good, but as stated, the layout could have really been blown-out, moving out cross-sections and lettering, to take advantage of the extra space available on the large sheet of paper. Another thing I would have liked to have seen is some information on how the Sexton section of Kazamura is defined. One thing I really liked were the additional depth bars and white lines for reference on the profile, this made it really apparent along the whole, very long, profile, exactly what was going on.

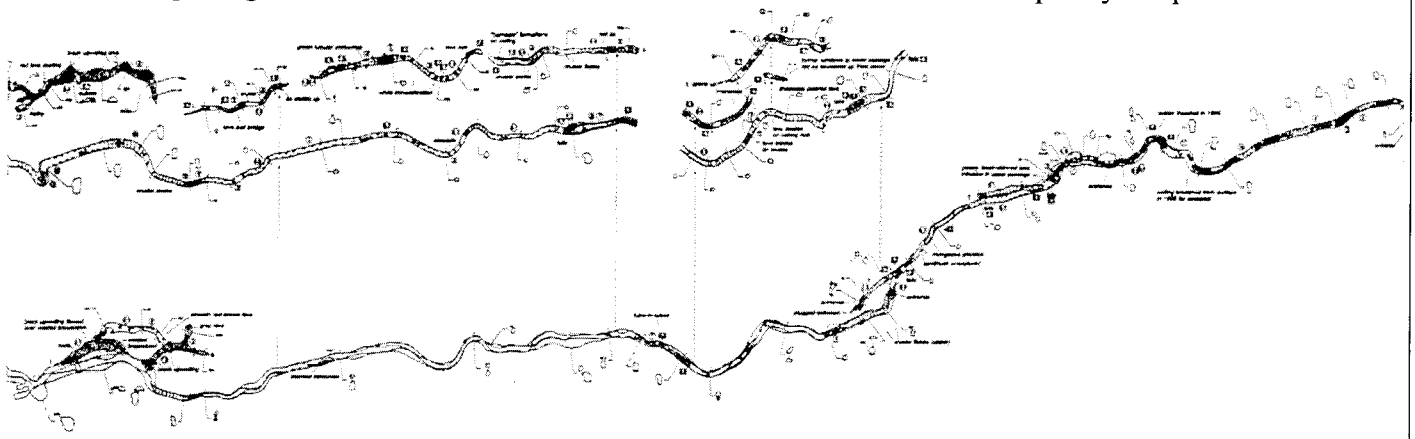


**Brent Aulenbach:** The entrance font size is the same size as comments, which is smaller than the named areas, making entrance especially hard to find. The north arrow and scale bar are small, as if made for a real small page and not a big map.

Lots of white space above and below profile. Plan breakouts are sometimes crunched – take advantage of the space. Looks like map was made for a small page. Some of the leader lines of the cross-section touch the cave walls, while some cross-sections are missing leader lines altogether. However, a good number of cross-sections. Nice vertical control, like multiple elevation rules, labels and lines to help interpret the map.

Nice explanation, geologic and locator maps. However, the geologic map and locator maps were not referenced! Some sloppy details such as overlapping ceiling heights, leader lines on explanatory text not going to an item and strange leader lines off of the drop symbols.

Nice breakout idea on the plan, but there are inconsistencies in how the breakouts are done. Sometimes the detail is drawn on both main passage and breakout, sometimes only on the breakout and two of three passages. And the breakouts are close to each other when there is plenty of space.



**Steve Reames:** This map was an interesting study in what can be done with today's technology. The source material was a book of maps by Kevin and Carlene Allred that won the medal in 1997. Bob took these maps, scanned them into a computer, and assembled the 20-foot-long map shown here. This took a computer with a lot of RAM, and a number of programming tricks in order to assemble this monstrous map. Seeing this map makes you realize that Kazumura Cave is huge. Then realizing that this is just one section of the cave is mind boggling.

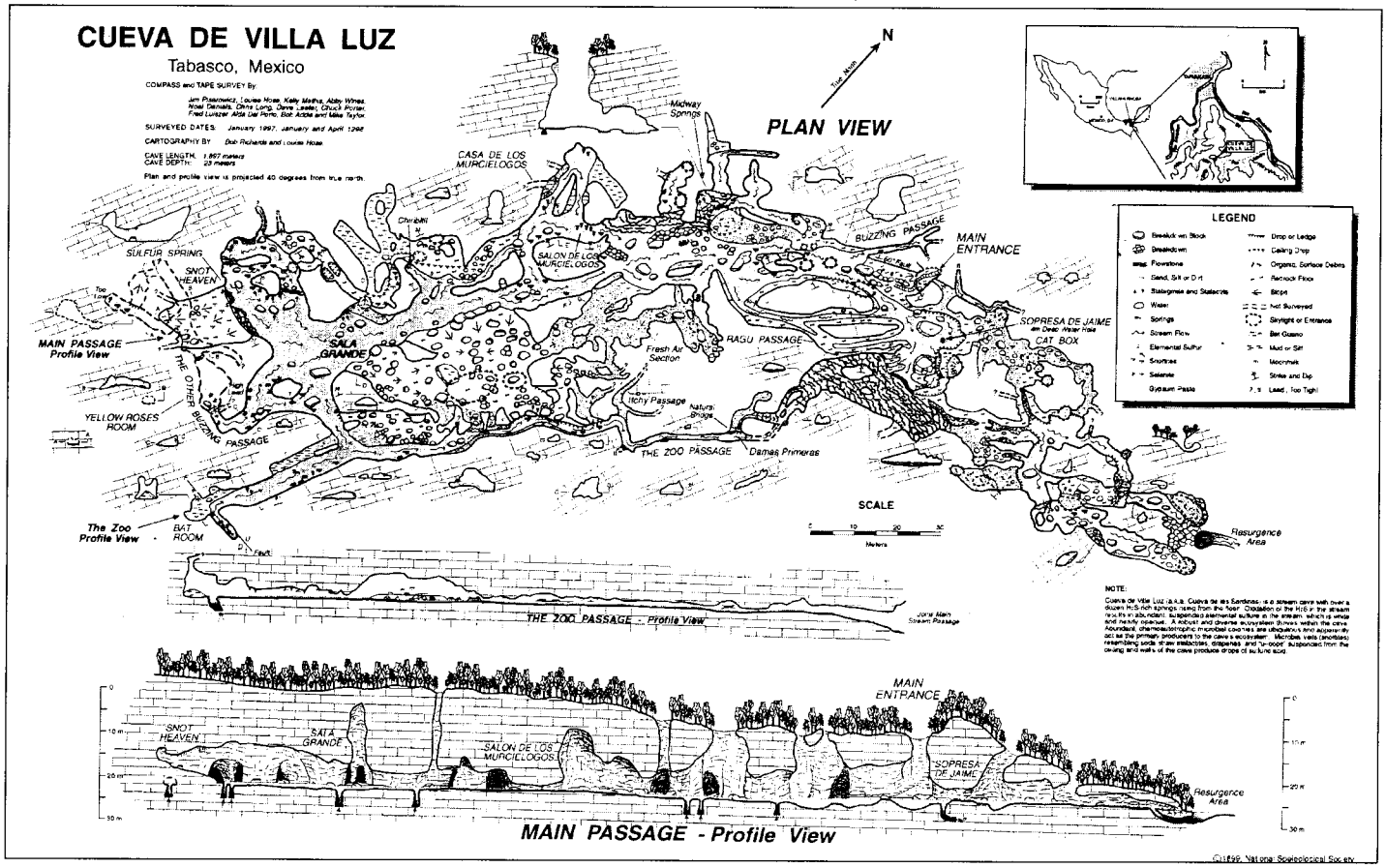
In assembling this map, Bob did very little modification to the original drawings. The result had some drawbacks. The titles and cross sections were too close to the passage. Now that we have this huge canvas to work with, the map would have been much better if the detail was spread out a bit more. For example, the entrance names were tiny in comparison to the size of this map. In many places the leader lines touched the walls. The north area seemed unreasonably confined. All these things could have been fixed if the space available had been fully used. This was probably the single biggest weakness of this map.

The airbrush effect helped show where the passage was, and this definitely helped the appearance of the map. The profile was very nice, and the associated extra comments about leads, rigging, and obstacles were a definite plus. As a proof-of-concept, this map is another step forward in the changing world of cave cartography.

## *Cueva de Villa Luz*

**Bob Richards**

Professional: Merit Award




My computer-generated maps were done using FreeHand and Photoshop software. The Cueva de Villa Luz map was done the same way that I set up computer graphic maps in the past, which is by scanning in a rough pencil draft. Using the scan as my tracing template, I proceed to add all

the features using FreeHand tools to draft the map. One of the final steps is deleting the scanned image, which leaves a vector file (line art) with no raster (bitmap) data. This keeps the drawing file size quite small. The Villa Luz map is a little over 2 megabytes.

This was a joint project with Louise Hose who had done the field work with other cavers. She provided me with the survey notes and compass line plot data. It was my job to provide her with a finished map suitable for publication in the Cave & Karst Journal. That map was a color tabloid size print. The salon entry was enlarged 200% to provide a poster size print roughly 2 feet by 3 feet. It was output on a HP plotter at 600 dpi. This high resolution allowed me to hold the fine line detail as seen in the profile view and floor detail. For this C & T issue I turned off the background color and output it as a black & white print, keeping printing costs to a minimum. That's the beauty of computer generated maps, color and size can be changed quickly. With FreeHand software, it is easy to use the Find and Replace window to replace colors and/or line weight for suitable low cost printing.

**Hazel Barton:** The very first thing I wrote on my judging sheet was 'beautiful map'. If maps are judged purely on their visual impact, then this map would have won hands down. However, maps are many other things: guides, scientific figures, historical. At this level of judging we take all these into account. The other judges have pointed out a lot of the inconsistencies in this map, so I'm not going to relist them. Once again, Bob has done something quite special, in this case created a computer drafted map that is closely approaching art. The way that the side passages were shaded in the profile give a three-dimensional feel to the map. However, one problem was that this complex shading was omitted from the Zoo-Passage profile. If you are going to do something this creative, be consistent with it, otherwise you leave a large hole if it is omitted.

The map was a little cluttered with the cross-hatching around the profiles, it would have been much cleaner if these had been left out - especially as our resident geologist Brent pointed out that the hatching does not match the indicated strike and dip.

Once again Bob has raised the bar for the rest of us on just what is possible in the field of cave cartography - exactly the point of the cartographic salon.

**Brent Aulenbach:** Besides the main entrance, which is labeled, the other entrances are hard to spot. The scale bar is hard to find and should be grouped with the legend. There are no elevations with the zoo passage profile.

While the visual impact is very nice, the balance is heavy on the upper right corner. The cross-sections are nice, although one is reversed. The layout is cramped with the limestone pattern around the cross-sections distracting.

The limestone patterns on the profiles are stylized and do not reflect the real dip. There is an inconsistent background pattern between the two profiles. Need to state that the profile is a projected profile with passages omitted. Really like the technique of shading passages off behind the main passage. Good detail. However, there or no elevations or ceiling heights.

Good penmanship. Good simplification on projected profiles. Not a real complex cave. Good site map, strike and dips, and mineralogy. Cross hairs of strike and dip should be where measured – maybe using a leader?

**Steve Reames:** Bob Richards has been leading the pack for several years now, showing what can be achieved with an illustration program (Aldus Freehand, in this case). This map arguably had the greatest visual impact of any map in the salon. The pink, blue, and brown coloration made this map almost jump off the wall. This map was the same as appeared in the April, 1999 issue of the Journal of Cave and Karst Studies.

This map had numerous strong points: Effective use of color; shading on main passage profile; topo

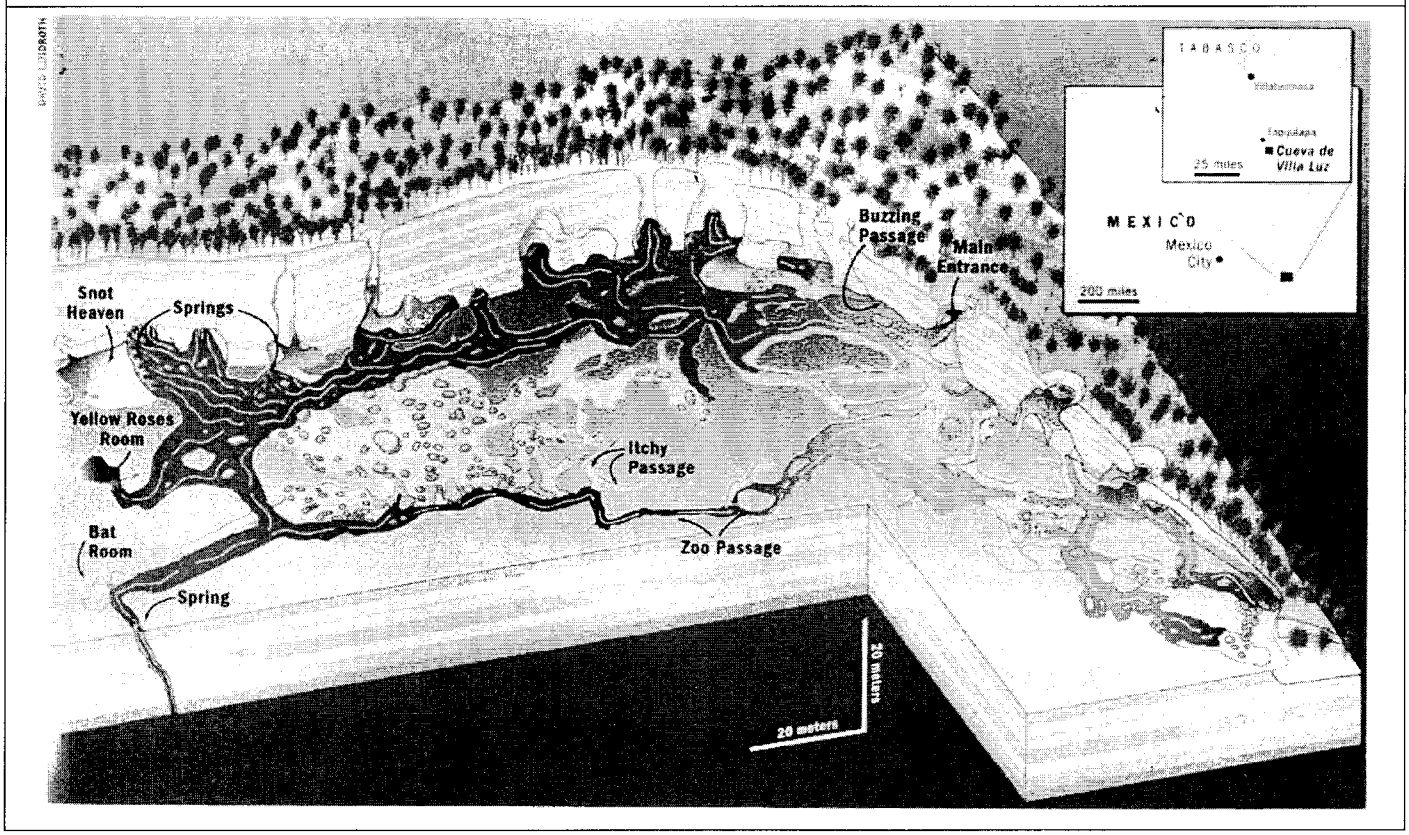
map inset; extra information on biology and geology. There are certainly a lot of things to like on this map. There were also some weaknesses. The Zoo Passage is missing a vertical scale. One of the cross sections in the lower-right corner is reversed. A better explanation of the Main Passage profile would be nice. The profile is not really 40 degrees off north as stated. It would have been more accurate to say something like "Profile along main stream; side passages omitted for clarity." This is important because the main stream takes a sharp bend in the middle. We couldn't tell at first whether the profile stayed at 40 degrees (which would compress part of the profile) or whether it followed the stream.

The map really needs vertical control and ceiling heights. The profile tells us some of this information, but this map is complex in two dimensions, and the profiles don't cover everything.

I often overheard visitors to the cartography salon look at the maps and say among themselves "this map's going to win." But most casual observers are heavily influenced by visual impact. The judges use over a dozen criteria, and visual impact is just one of them. So a visual impact score of 10 doesn't guarantee a win if there are weaknesses in other areas.

In defense of Bob, this map was designed specifically for the NSS News. As a result, it was necessary to leave out vertical control and ceiling heights for clarity. This map achieves its goal of balancing appearance and detail in a publication. But in the Professional Category, the judges expect near perfection. This map is perfect for what it was designed for, and was still a strong competitor in the salon.

**Guest Editor's Note:** At the Judge's Critique, Bob Richards confessed to me that he felt the map of Cueva de Villa Luz, published in the April, 1999 issue of *Natural History,* had a better solution to the cross-sectional problem that Bob had struggled with. Ironically, the map in *Natural History*, drawn by professional cartographer David Lindroth, used the three-dimensional blocking technique that Bob himself had pioneered. It is interesting to compare Bob's map to this map done by a paid professional for a widely circulated magazine.



MEDAL

## *Arabica Cave*

**Carlene Allred and David Love.**

Experienced

Carlene has now won 2 medals and moves up to the Master/Professional division

**Hazel Barton:** This was an absolutely outstanding map. It had great visual impact, and held up under closer inspection and scrutiny. Once again Carlene produced a absolutely wonderful map, with extreme detail, excellent penmanship, little confusion - and most importantly from a caver's standpoint, a usable map.

The biggest problem I had was the plan and profile being on separate pieces of paper. The cartographers also neglected ceiling heights, which leads to the age-old argument: "if I have a profile, I don't need ceiling heights", this is a huge problem if you've lost the 'other bit of paper' that had the ceiling heights on it. As a general rule, always include the ceiling heights, even with a detailed profile. Just imagine the worst case scenario, you need to carry a stretcher though the cave: where can we walk, where are we going to need more manpower to drag it? You don't want to spend time cross referencing the plan with the profile to make that determination, especially if someone lost your profile!! The majority of the time, the profile is used to give you an overall feeling of what the cave is doing.

I really like the three-dimensions that have been added to the profile by shading and some passage modeling, this gives a real feeling of depth to the profile, without using an extremely complex 3D representation. The balance of this map was very good. I had a few subtle changes, for example, moving the title block up 3 inches to help balance the white space under the plan. Also if the survey names had been written horizontally they would have balanced out the white spaces a little more. Perhaps if the plan had some shading around it, like the profile, it would have balanced with the profile better, as opposed to appearing a little 'light'.

What a wonderful map this was.

**Brent Aulenbach:** Layout was confusing near the Big Fatty Entrance. Shift the level boxes over away from the Superstitious Entrance. There could be more consistency in layout between plan and profile, such as the location of insert map, location of legends, labels for profile plan, and the location of the north arrow and scale.

Good floor detail on the profile, making this map easy to use. However, there are no ceiling heights and elevations are sparse.

What is the dot within a triangle symbol? It should be labeled as the location of a given elevation. Missing ceiling height on Bomber Ballroom and missing the elevation of the high dome on the profile. And the symbol for ceiling height and dripline are the same.

You needed to make some comment on the geology and the air temperature of the cave. However, there is nice detail and penmanship. Great work! I like the level breakout boxes on the plan, and there is good 3D representation on the profile.

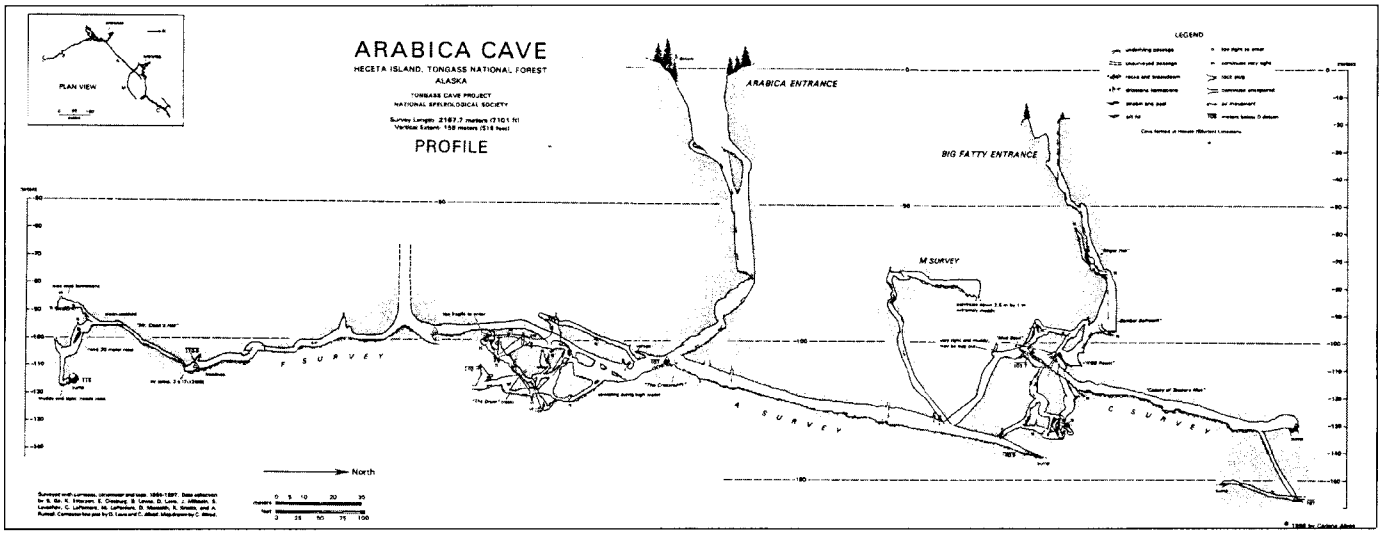
**Steve Reames:** Since this map was the medal winner, it's obvious that the judges liked this one. The map is strong in the basics: good balance and layout, penmanship, and floor detail. The profile on this map is outstanding, and definitely added to the visual impact of this map. The trees and shading add a certain depth that most profiles lack.

A few things could be added to this already excellent map. The vertical controls were a little too far apart; I'd like to see more of them. Although the profile is good, adding ceiling heights to the plan would help the casual reader. There was one label goof. The eye reads

the phrase "Big Fatty Entrance can be dug out. . ." when in reality the label "Big Fatty Entrance" and the note "can be dug out. . ." are two different places. The leader lines clarify this, but it would help to move the labels further apart.

We noticed that in the plan, the inset was on the right and the legend was on the left. On the profile this was reversed. My eye tended to bounce back and forth when viewing plan and profile: it might be nicer to put the legend on the same side on both plan and profile. On the other hand, this could disrupt a very nice map balance, so I'm not sure what the right answer is.

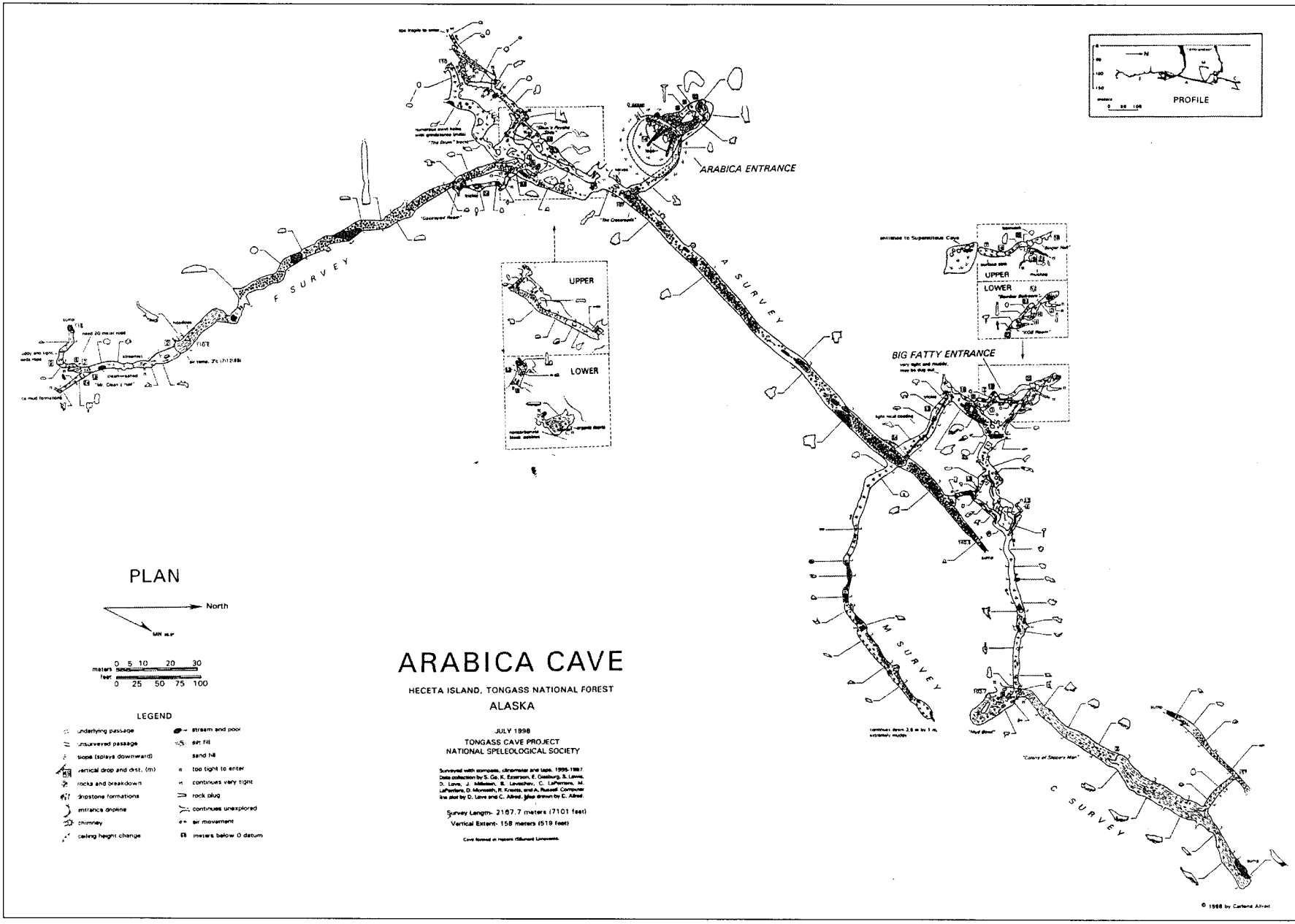
One of the strengths of this map is the attention to detail. There aren't many of the minor errors that were present on the other maps. In fact, this map was almost flawless, making it hard to judge in a certain sense. It was this attention to detail that made the final difference.




**Critique of the 1999 Cartographic Critique**

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 1. The judging of my map was fair | 1 | 2 | 3 | 4 | 5 |
| 2. The judging in general was fair | 1 | 2 | 3 | 4 | 5 |
| 3. The judges provided useful feedback | 1 | 2 | 3 | 4 | 5 |
| 4. The judges used reasonable criteria | 1 | 2 | 3 | 4 | 5 |
| 5. I like the three category split | 1 | 2 | 3 | 4 | 5 |
| 6. We should keep the cartographic salon in this format | 1 | 2 | 3 | 4 | 5 |
| 7. I would like to see Brent Aulenbach judge again | 1 | 2 | 3 | 4 | 5 |
| 8. I would like to see Hazel Barton judge again | 1 | 2 | 3 | 4 | 5 |
| 9. I would like to see Steve Reames judge again | 1 | 2 | 3 | 4 | 5 |
| 10. I learned something new about making cave maps | 1 | 2 | 3 | 4 | 5 |

**Additional Comments**




# ARABICA CAVE

HECETA ISLAND, TONGASS NATIONAL FOREST

ALASKA

JULY 1998

TONGASS CAVE PROJECT

NATIONAL SPELEOLOGICAL SOCIETY

Surveyed with compass, clinometer and tape, 1995-1997.
Data collection by S. Ca, K. Eraerson, E. Cassburg, S. Lewis, D. Love, J. Millstein, B. Lavadchev, C. LaPerriere, M. LaPerriere, D. Monteith, R. Kreins, and A. Russell. Computer line plot by D. Love and C. Alfred. Map drawn by C. Alfred.

Survey Length- 2167.7 meters (7101 feet)

Vertical Extent- 158 meters (519 feet)

Cave formed in massive Silurian Limestone.