Cave Diving Fatalities

- The Past
- Summary of Current Data
- The Future
  - Data Collection
  - Incident Rate
  - Non-Fatal Incidents
The Past

- Originally to learn why cave diving fatalities occurring
- Demonstrate how “safe” cave diving could be
- Data collection “uneven” at best
  - Thanks to past coordinators, especially David Desautels
Source Data

1997
- 429 cases
- Sources
  - NSS-CDS: 258
  - NACD: 361
  - Other: 87
- Cave Trained: 40

1999
- 478 cases
- Sources
  - Combined
  - 14 “new” cases
  - 35 “old” cases
- Cave Trained: 47
Summary of Current Data

- Overall review
- Open water vs cave training
- Trends?
Fatalities by Year

 Fatalities

# Fatalities

n=475
Geographic Location

- Foreign: 74 fatalities
- USA: 401 fatalities

Total: 475 fatalities

n=475
Fatalities by Gender

Number

Male 439
Female 21

n=460
Age of Decedents

# Fatalities

n=427
Multiple Fatalities

- 2 fatalities: 39%
- 3 fatalities: 11%
- 4 fatalities: 4%
- 1 major incident: 46%

n=475
Number of Incidents

- 92 incidents
- 17 incidents
- 5 incidents

Fatalities per Incident

- 1
- 2
- 3
- 4
- 220

n=334
Cave Certification

- Yes: 7
- No: 143
- Inst: 4
- Full: 31
- Cavern: 1
- Category 2: 1
- Basic: 3

n=190
Final Cylinder Gas Pressures

# Fatalities

- 0: 337
- 1-500: 31
- 501-1000: 14
- 1001-1500: 13
- 1501-2000: 11
- 2001-2500: 4
- 2501-3000: 1

n=411
Dive Depths

# Fatalities

<table>
<thead>
<tr>
<th>Depth Range</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>95</td>
</tr>
<tr>
<td>1-50</td>
<td>60</td>
</tr>
<tr>
<td>51-100</td>
<td>158</td>
</tr>
<tr>
<td>101-150</td>
<td>55</td>
</tr>
<tr>
<td>151-200</td>
<td>29</td>
</tr>
<tr>
<td>201-250</td>
<td>18</td>
</tr>
<tr>
<td>250-300</td>
<td>9</td>
</tr>
<tr>
<td>&gt;300</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: n=427
Number of Lights Carried by Victims

- 0: 36%, 144
- 1: 49%, 198
- 2: 9%, 20
- 3: 5%, 36
- 4: 0%, 5
- 5: 1%, 3

Total: n=403
Number of Divers in Team

- 1 diver: 15 fatalities
- 2 divers: 106 fatalities
- 3 divers: 55 fatalities
- 4 divers: 30 fatalities
- 5 divers: 3 fatalities
- 6 divers: 7 fatalities
- 7 divers: 3 fatalities
- 8 divers: 8 fatalities
- 9 divers: 7 fatalities
- 10 divers: 2 fatalities

Total number of fatalities: 236
Fatalities Involving Divers Certified Full Cave or Above

# Fatalities


n=42
Dive Depths of Cave Certified Victims

The bar chart shows the number of fatalities in different depth ranges. The ranges are:
- 0 fsw: 1 fatality
- 1-50 fsw: 5 fatalities
- 51-100 fsw: 9 fatalities
- 101-150 fsw: 6 fatalities
- 151-200 fsw: 7 fatalities
- 201-250 fsw: 2 fatalities
- 250-300 fsw: 5 fatalities
- >300 fsw: 2 fatalities

The total number of fatalities (n) is 37.
Causes of Fatalities Among Trained Cave Divers

- Adv Equip
- Air Rule
- Cave In
- Depth
- Entanglement
- Gas Mix
- Heart Attack?
- Hypothermia
- Line Gap
- Maintenance
- Solo
- Training
- Drugs
- Gear Removal

n=40
The Future

- Data Collection
- Incident Rate
- Non-Fatal Incidents
Data Collection

- UCRR Efforts
  - Spearheaded by Henry Nicholson
  - Coordination of all groups collecting data
  - Information cleared through Annette Long

- New Accident Reporting Form

- Past Information
  - “Completion” of files
  - Documentation filed

- Web Site Reporting and Presentation
Incident Rates

■ What are they?
■ Quantification of activity levels
  - Voluntary reporting by divers of annual activity
  - Site activity reporting
  - Database of combined cave(rn) training
  - Summarization of award data (Abe Davis, etc)
  - “Specialized” equipment, techniques
■ Importance to diving community
■ Importance to cave diving community
Non-Fatal Incidents

- Should we collect them?

- Types
  - Air management problems
  - Equipment/maintenance problems
  - Events related to “advanced” equip/techniques
  - Other

- Importance to cave diving community
  - Pro-active development of the recreation
  - Texts and training concerns
  - Trends
By collecting non-fatal incident data, would we be compromising our perceived safety record?

Should we include “marginal” cases?
- Cave diver who died at entrance at start of dive because he forgot to turn air on
- 2 ffw on steps
- Rebreather in spring pool

Availability of source data

Extension to other “technical” penetration diving activities
WE NEED YOUR HELP!!
Acknowledgements

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