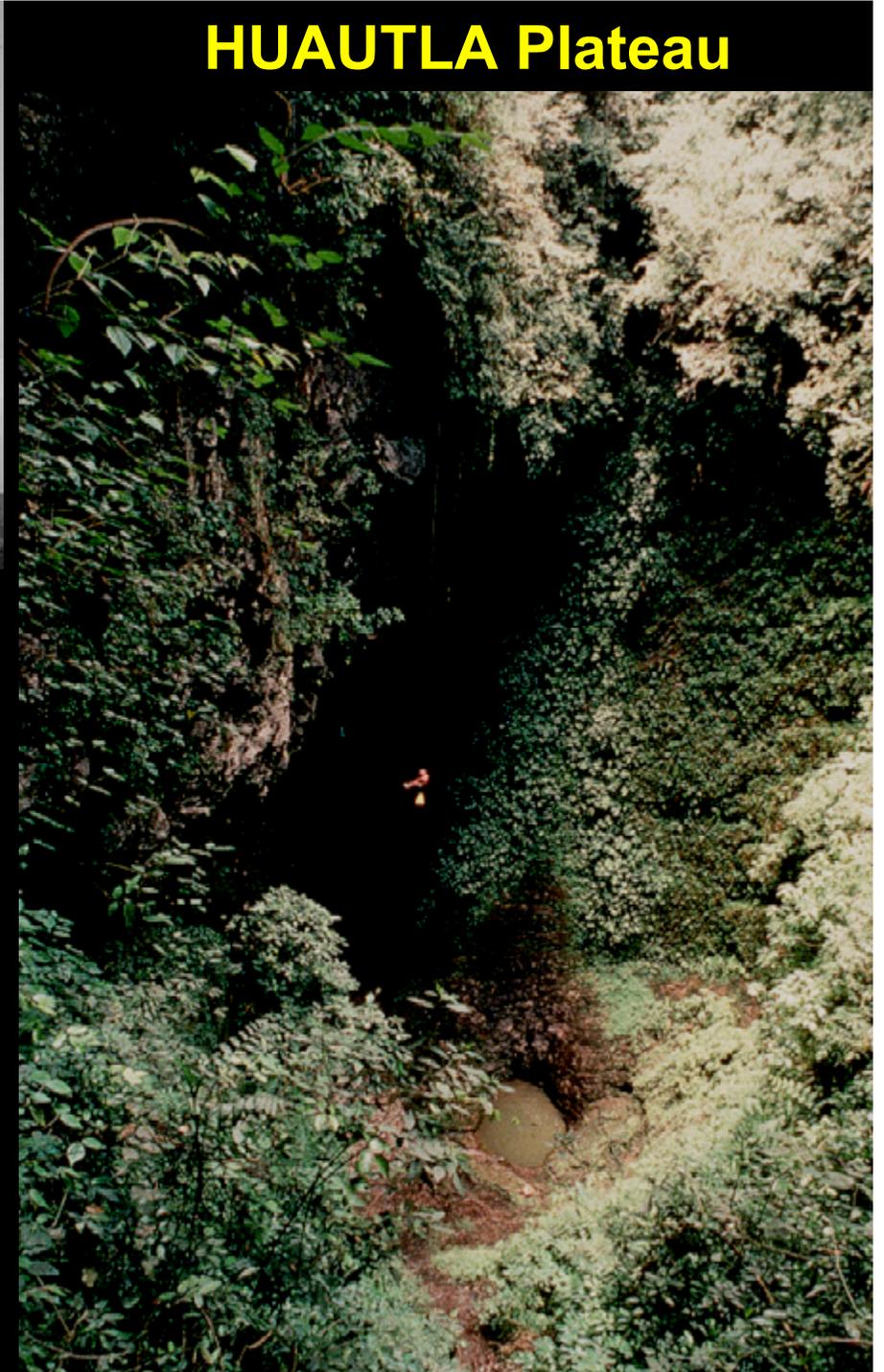


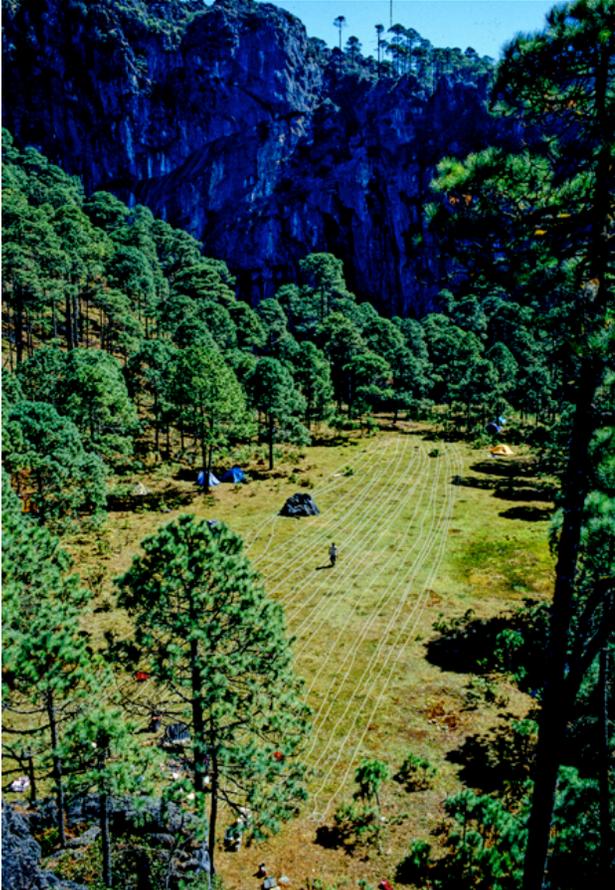
**“People cannot discover new lands until
they have the courage to lose
sight of the shore,”
Andre Gide**

**“If at first the idea is not absurd,
then there is no hope for it,”
Albert Einstein**

HUAUTLA Plateau

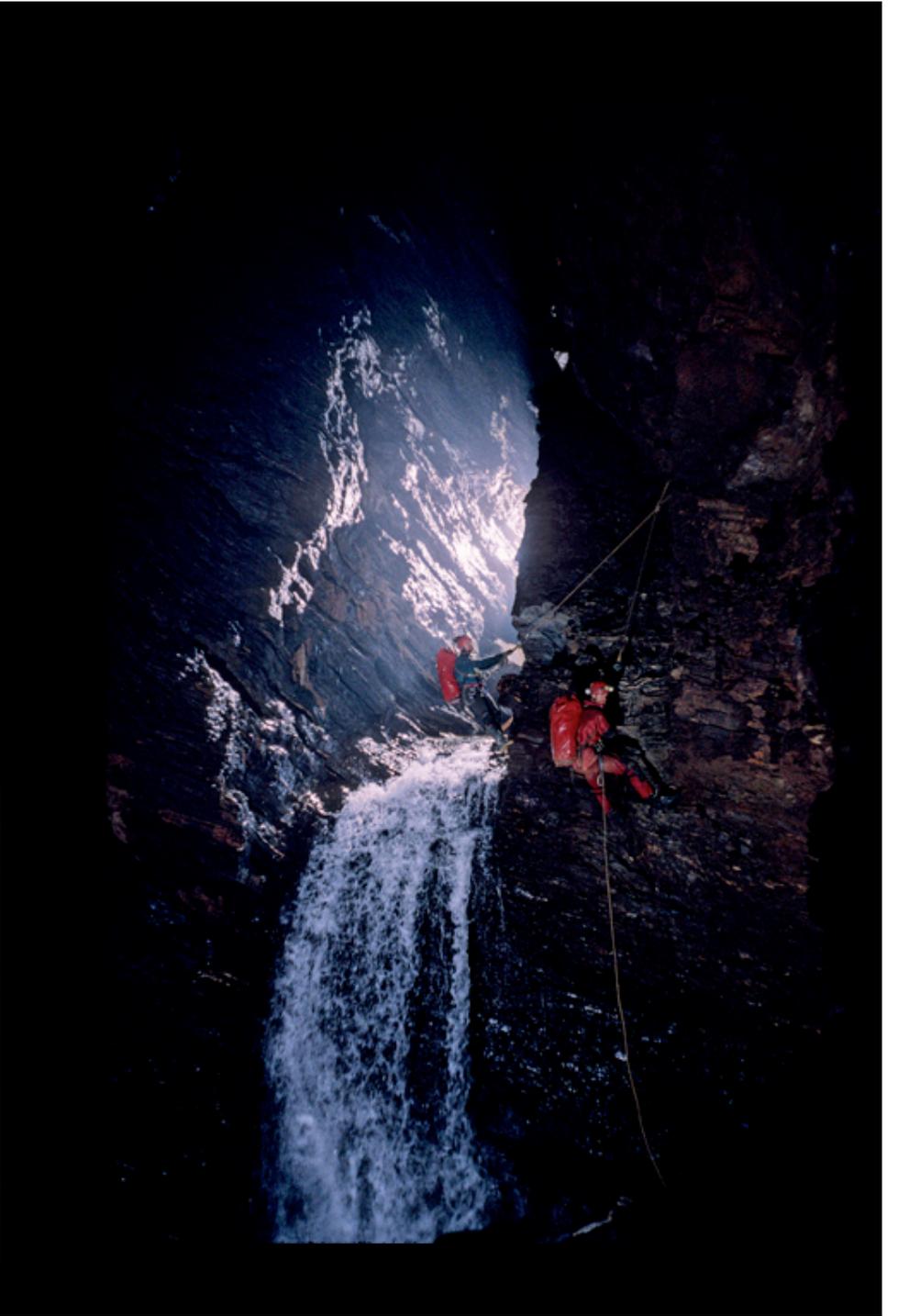


Cueva CHEVE



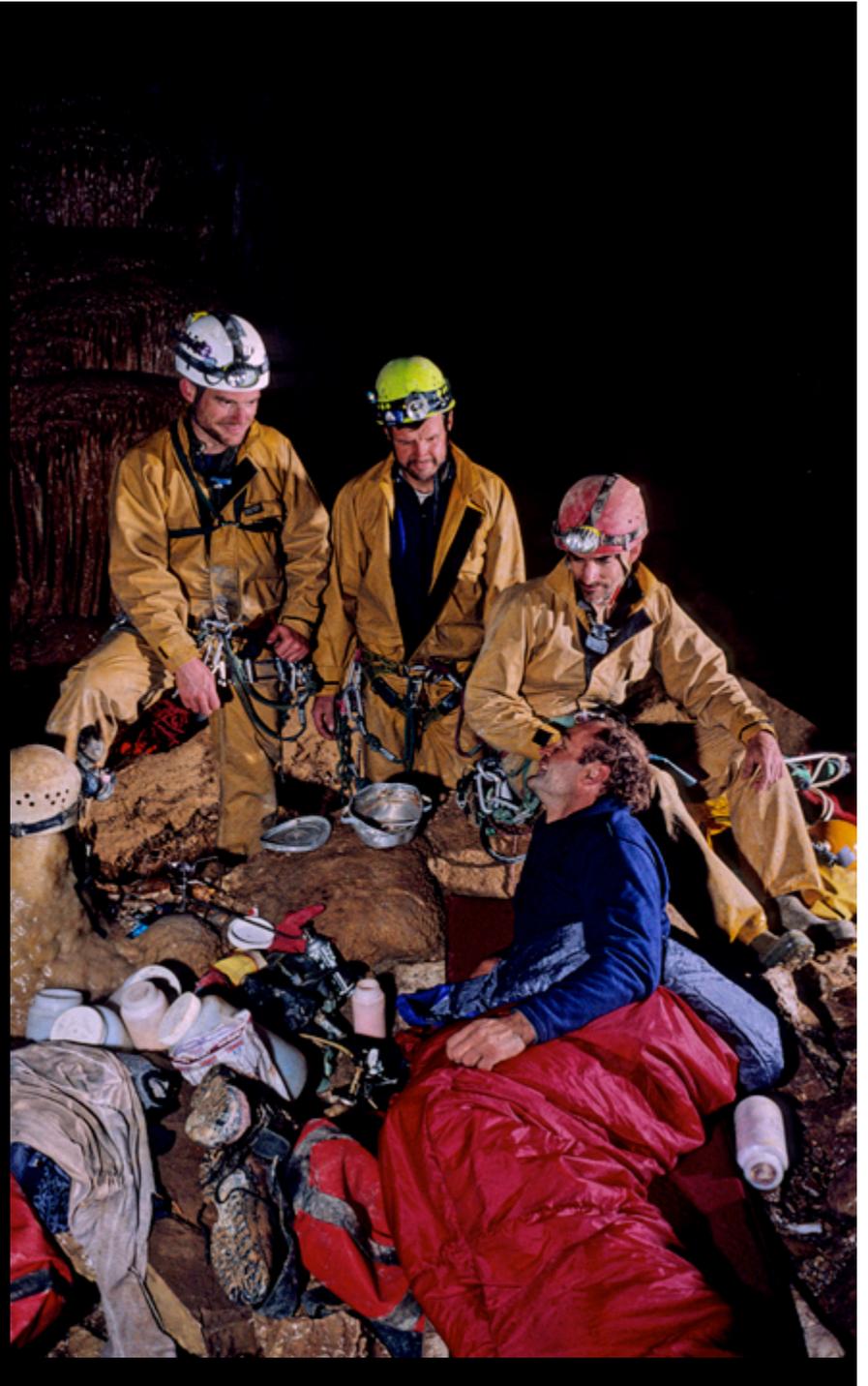


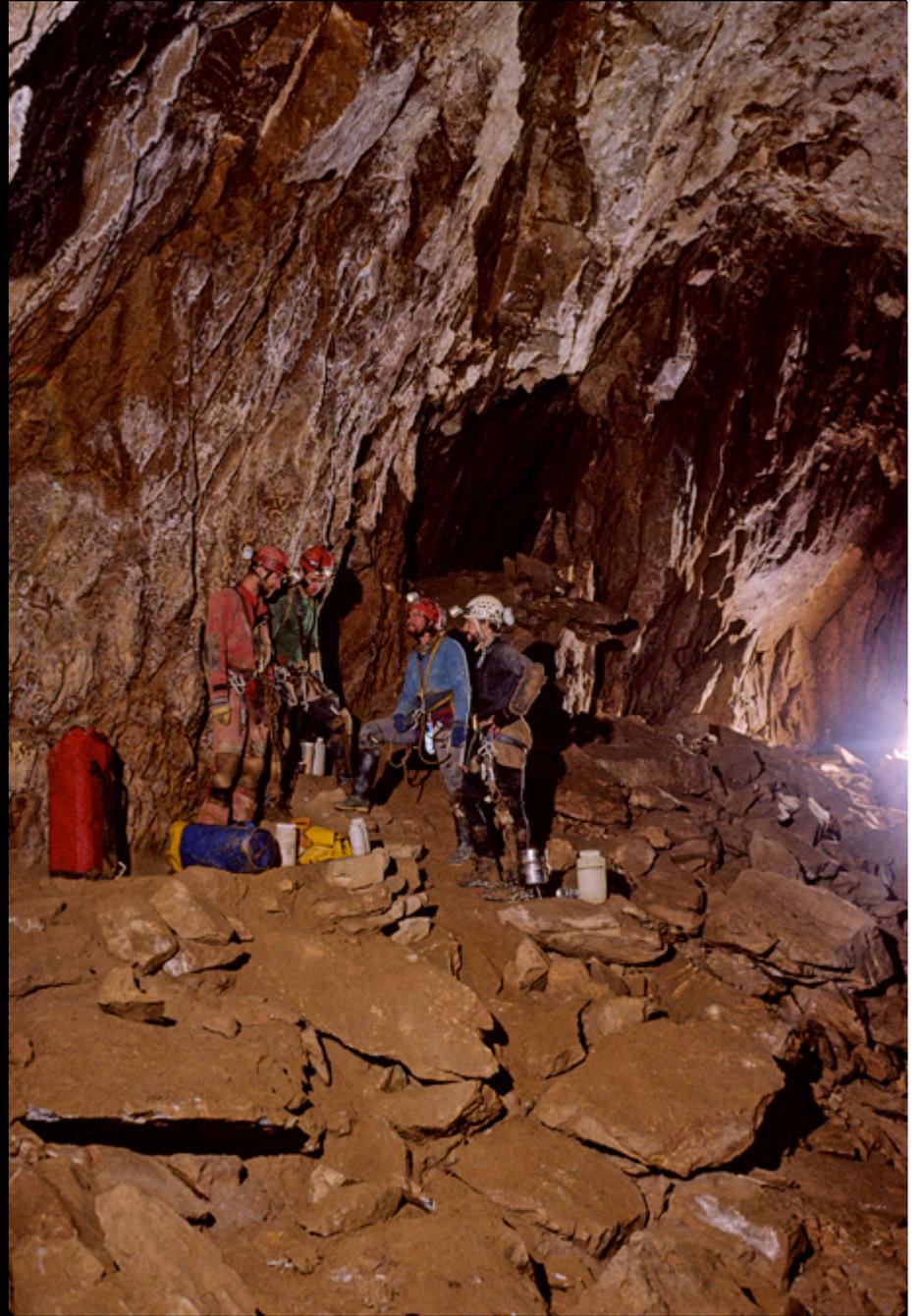




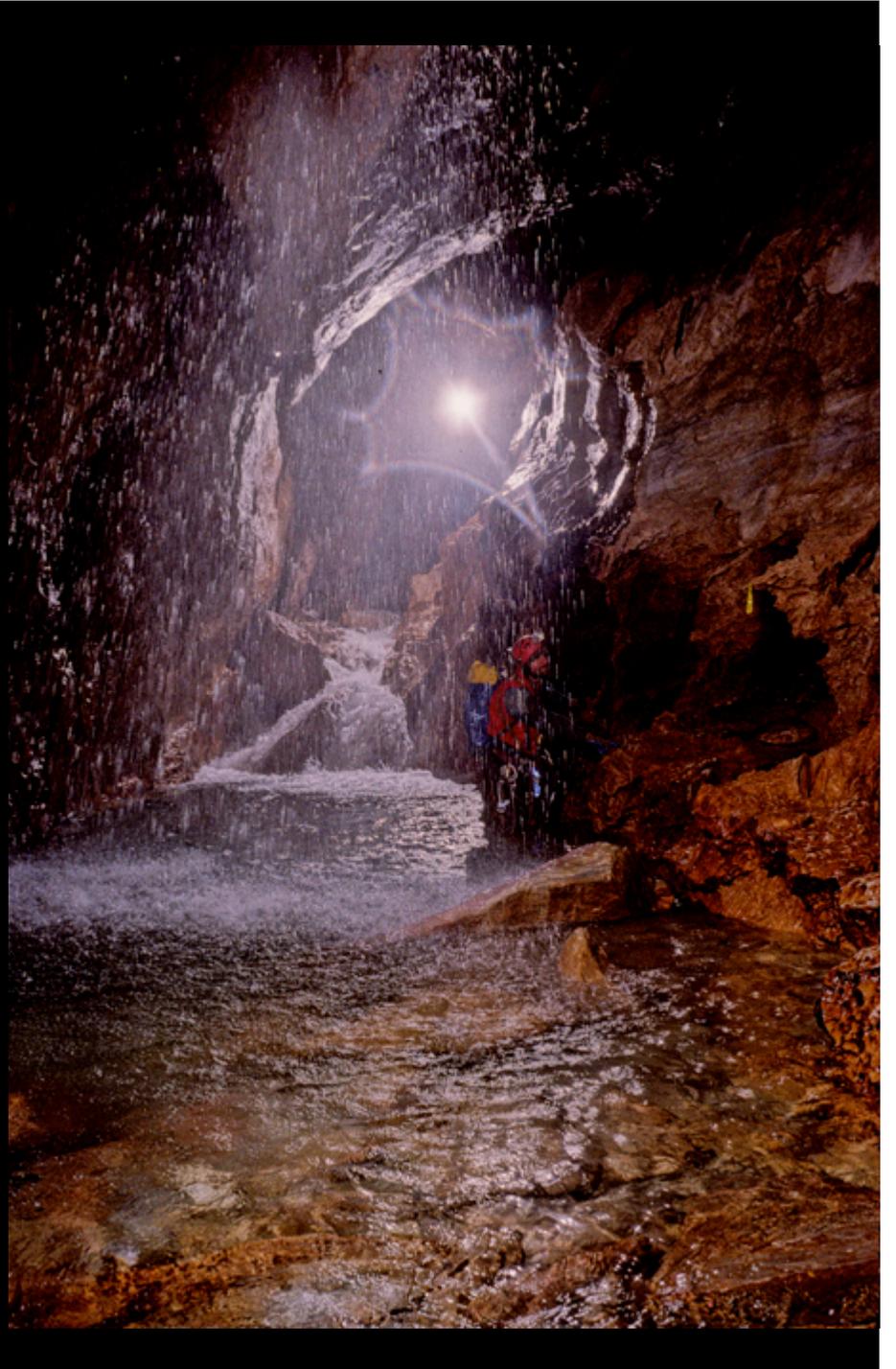








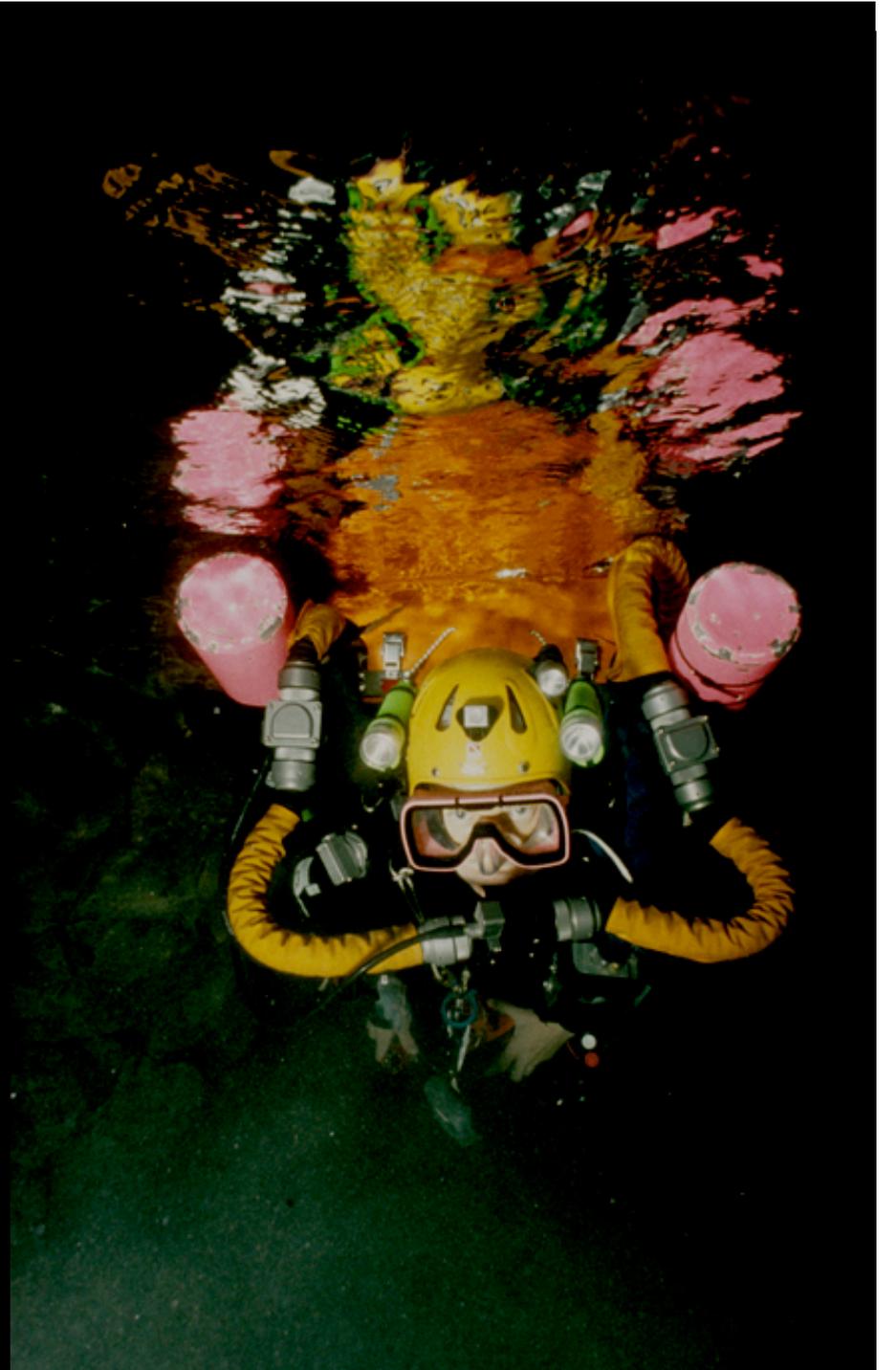




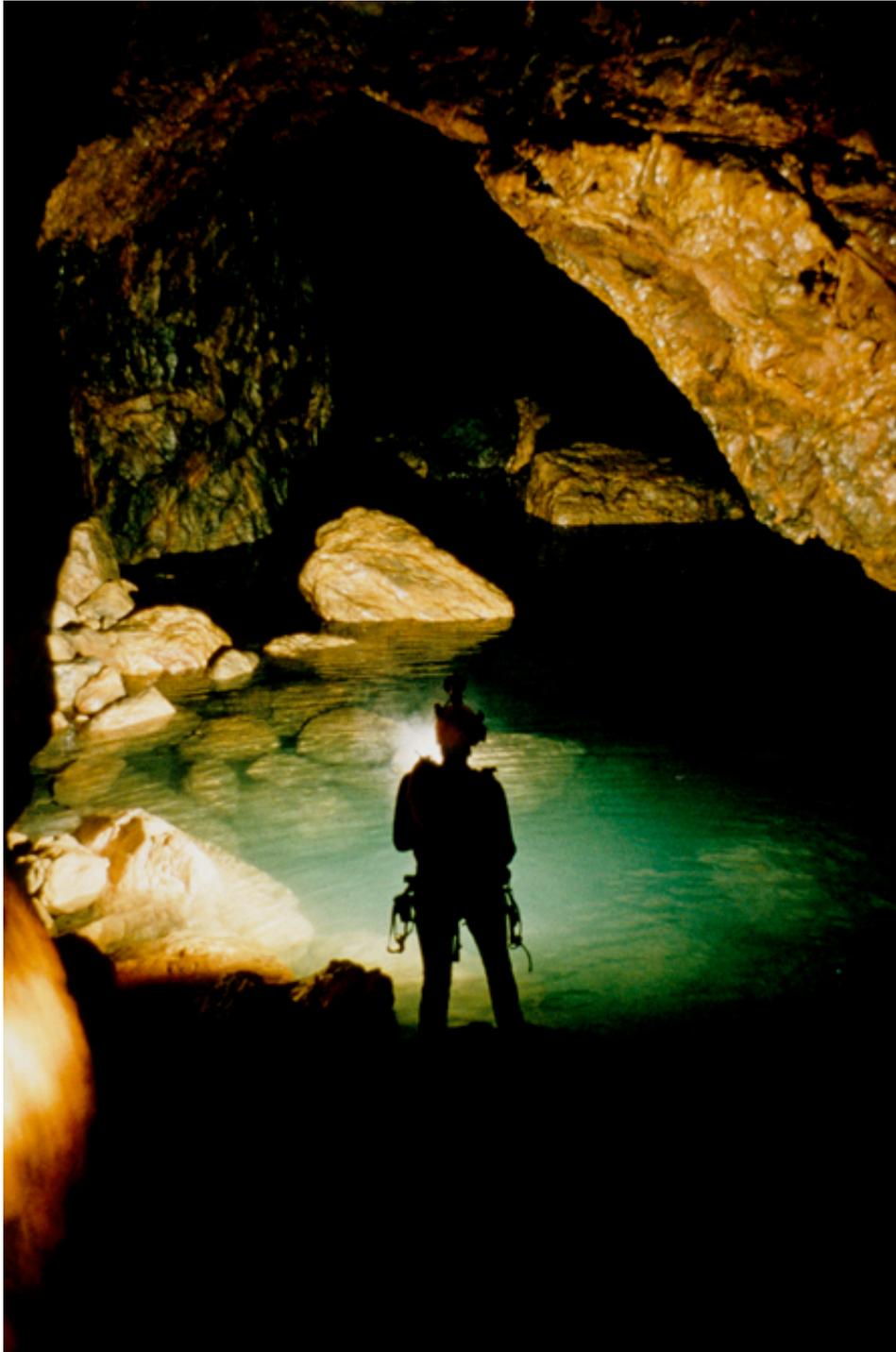


**Cheve Current Status:
-1484 m in breakdown
Beyond Sump 2**

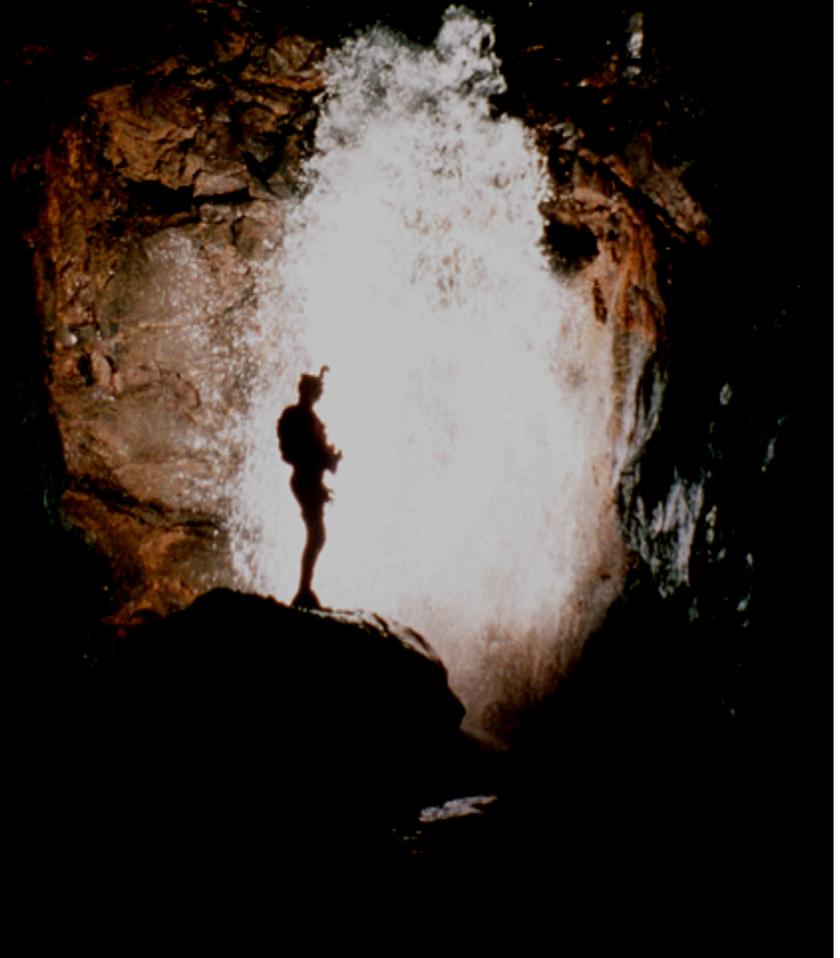








**Current Status:
-1475 m at Sump 9**



The Tools:

50 m / day
ascents now
achievable



Rebreathers
Now standard



Wakulla 2

THE U.S. DEEP-CAVING TEAM INC.



Dual backpack-mounted MK5, as finally used during the final month of the Wakulla 2 expedition. The system had a range of 18 hours at 100m depth.

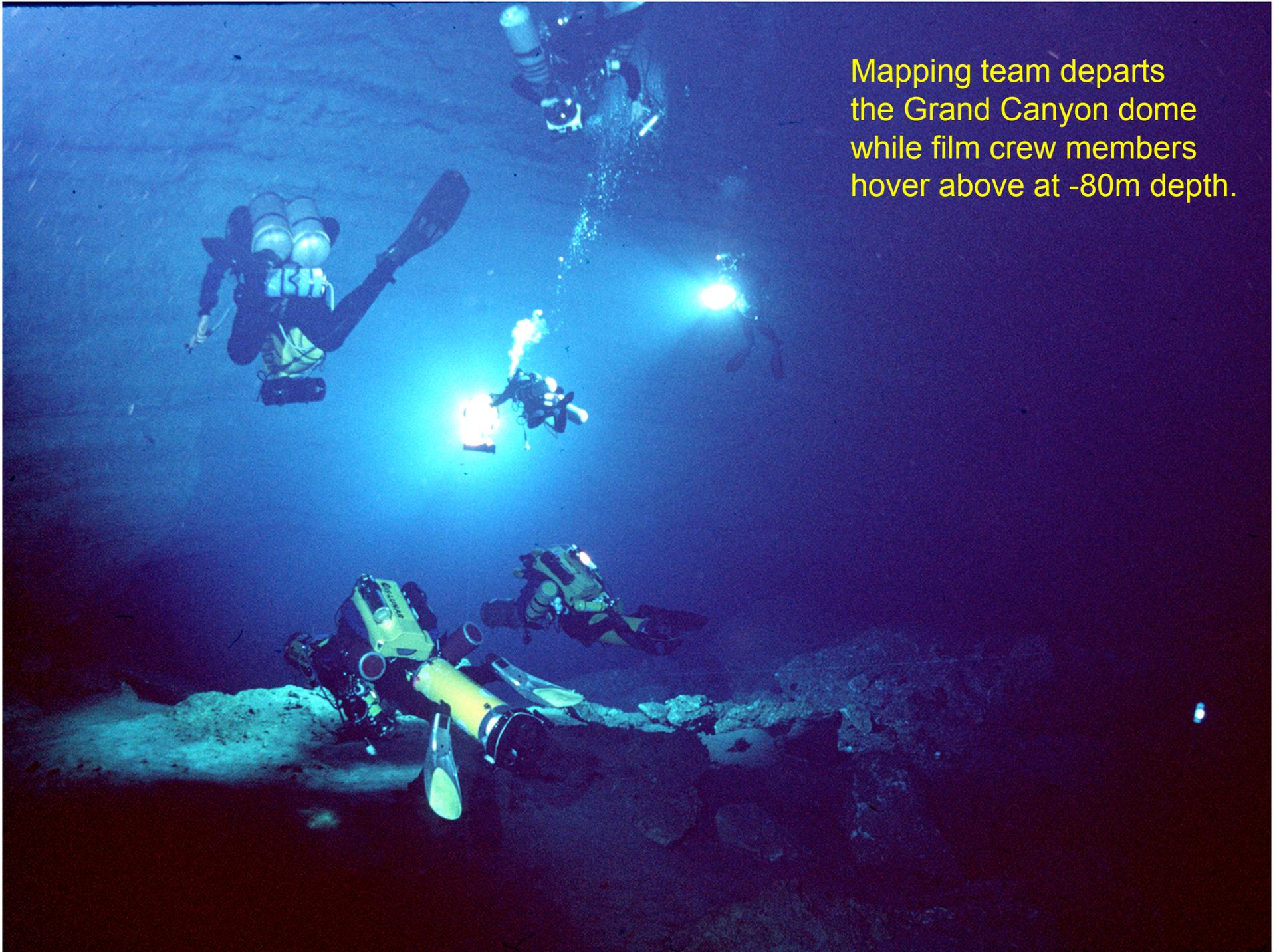


Exploration team departs for O-tunnel in Wakulla Springs with dual MK5 backpack and twin 20-kilometer range vehicles (one in front, one towed).



**Typical Mapping Mission at
Wakulla Springs. Lead diver, with
MK5 backpack, drives the 3D mapper.
Support diver carries extra propulsion
units. Personnel transfer capsule
waits at upper left for pressurized
recovery of dive team at -30m.**



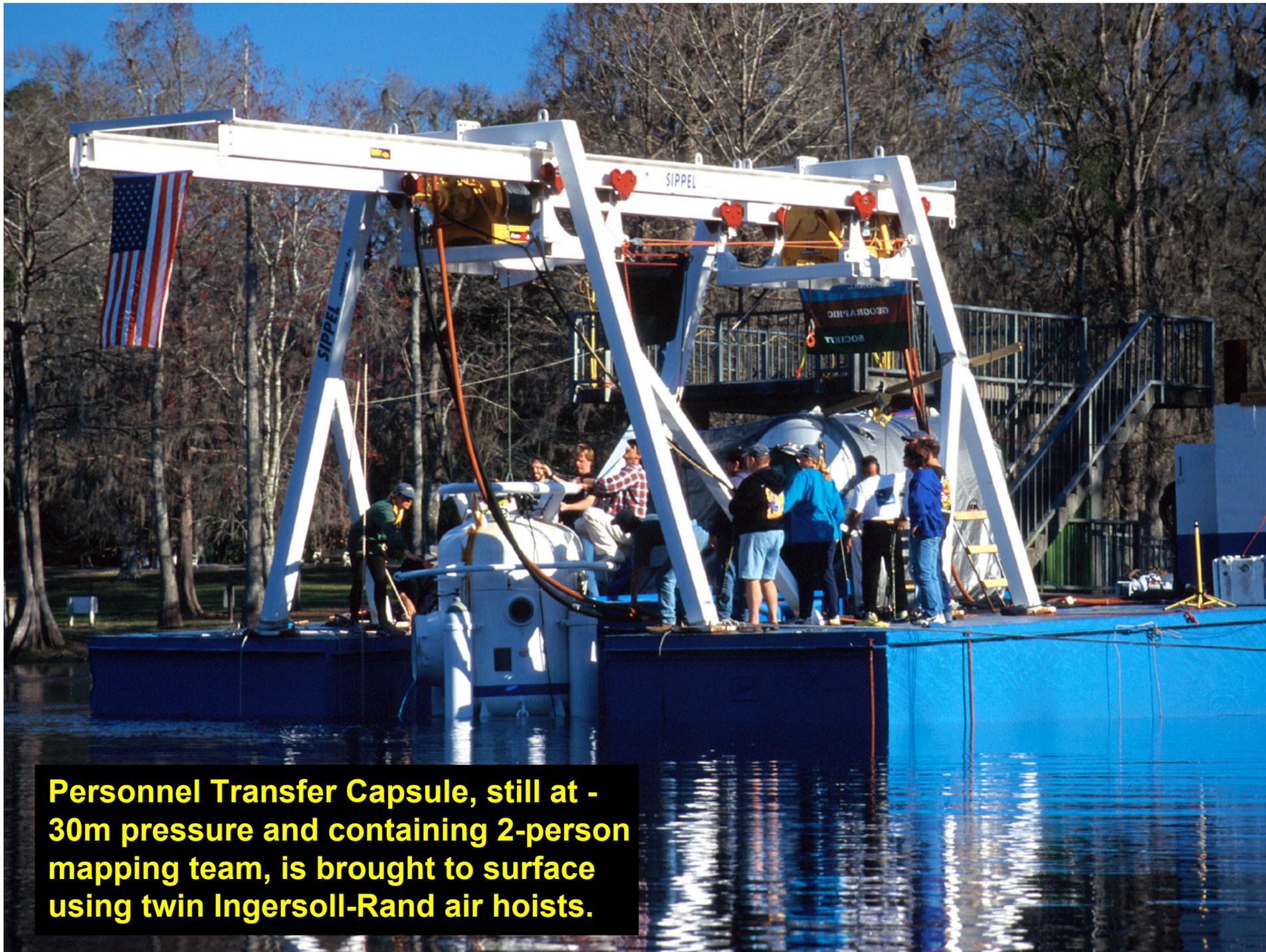


Mapping team departs
the Grand Canyon dome
while film crew members
hover above at -80m depth.



Mission Control closed-circuit video monitor showing dive team return at -30m.





Personnel Transfer Capsule, still at -30m pressure and containing 2-person mapping team, is brought to surface using twin Ingersoll-Rand air hoists.



PTC is docked with the habitat and the crew enters the decompression chamber

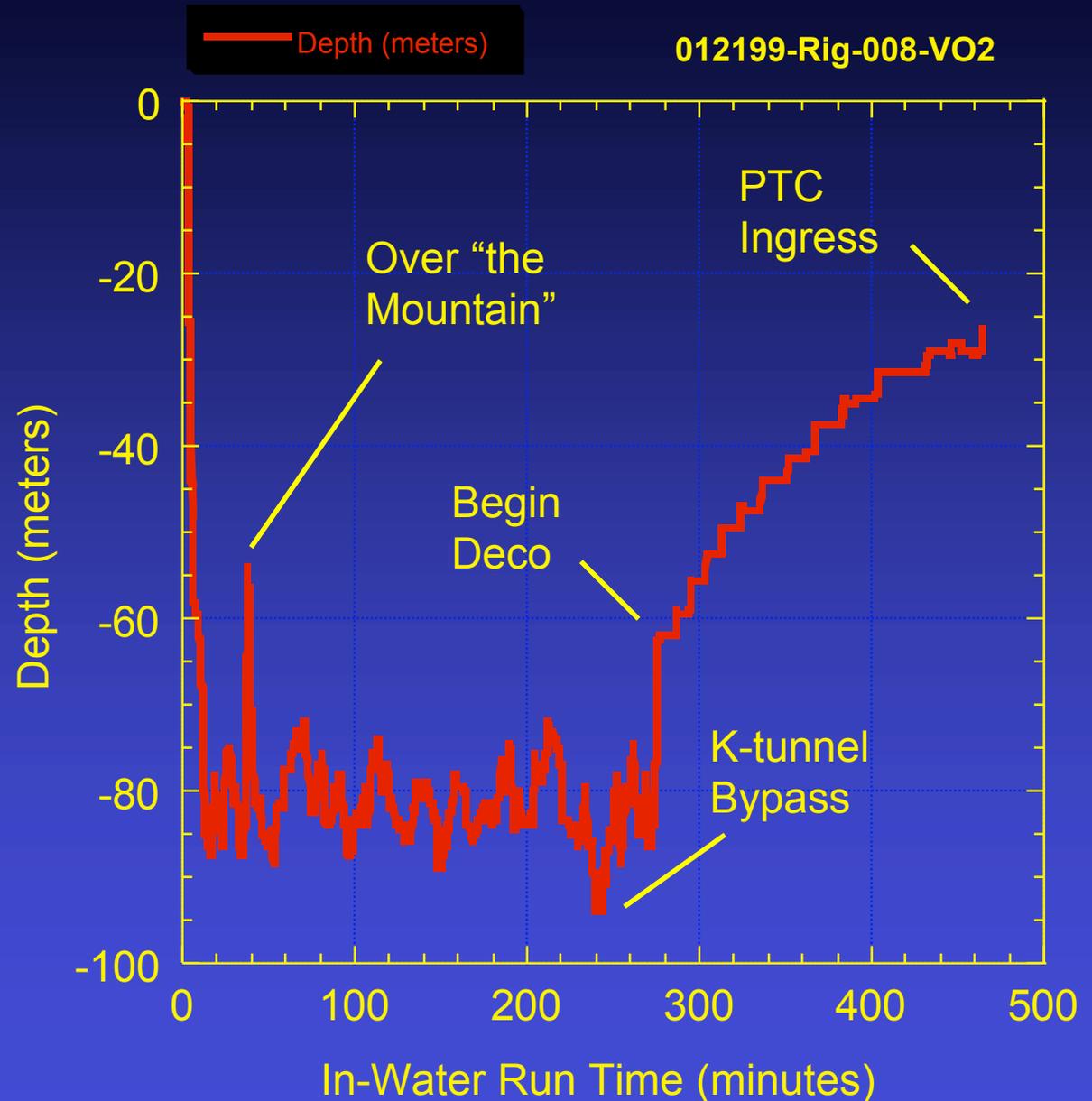


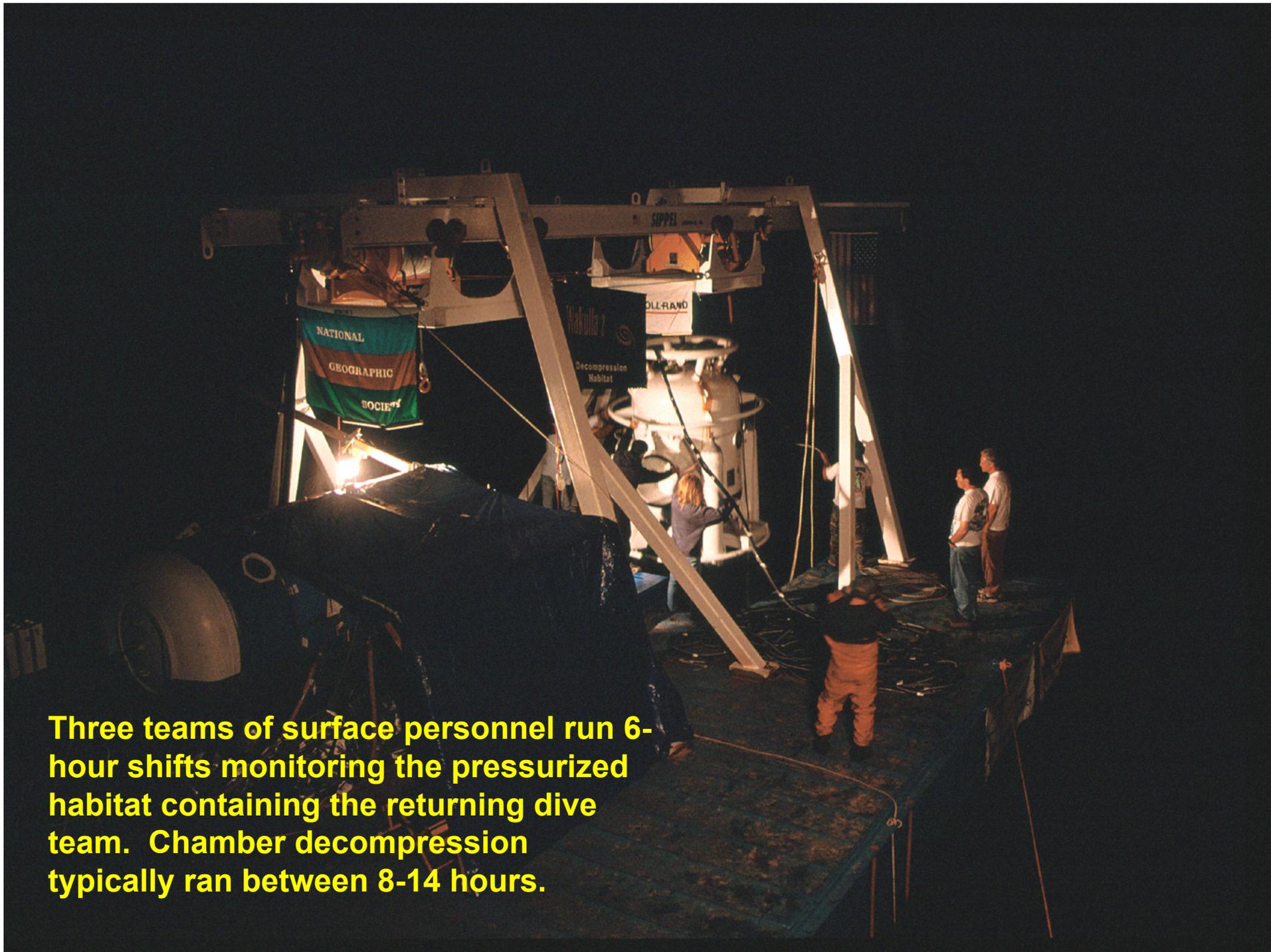
Surface personnel retrieve MK5 backpacks and download decompression data to a laptop computer. Chamber decompression is then calculated from this data.

Depth-vs-Time: O-Tunnel Radio Location Mission January 21, 1999

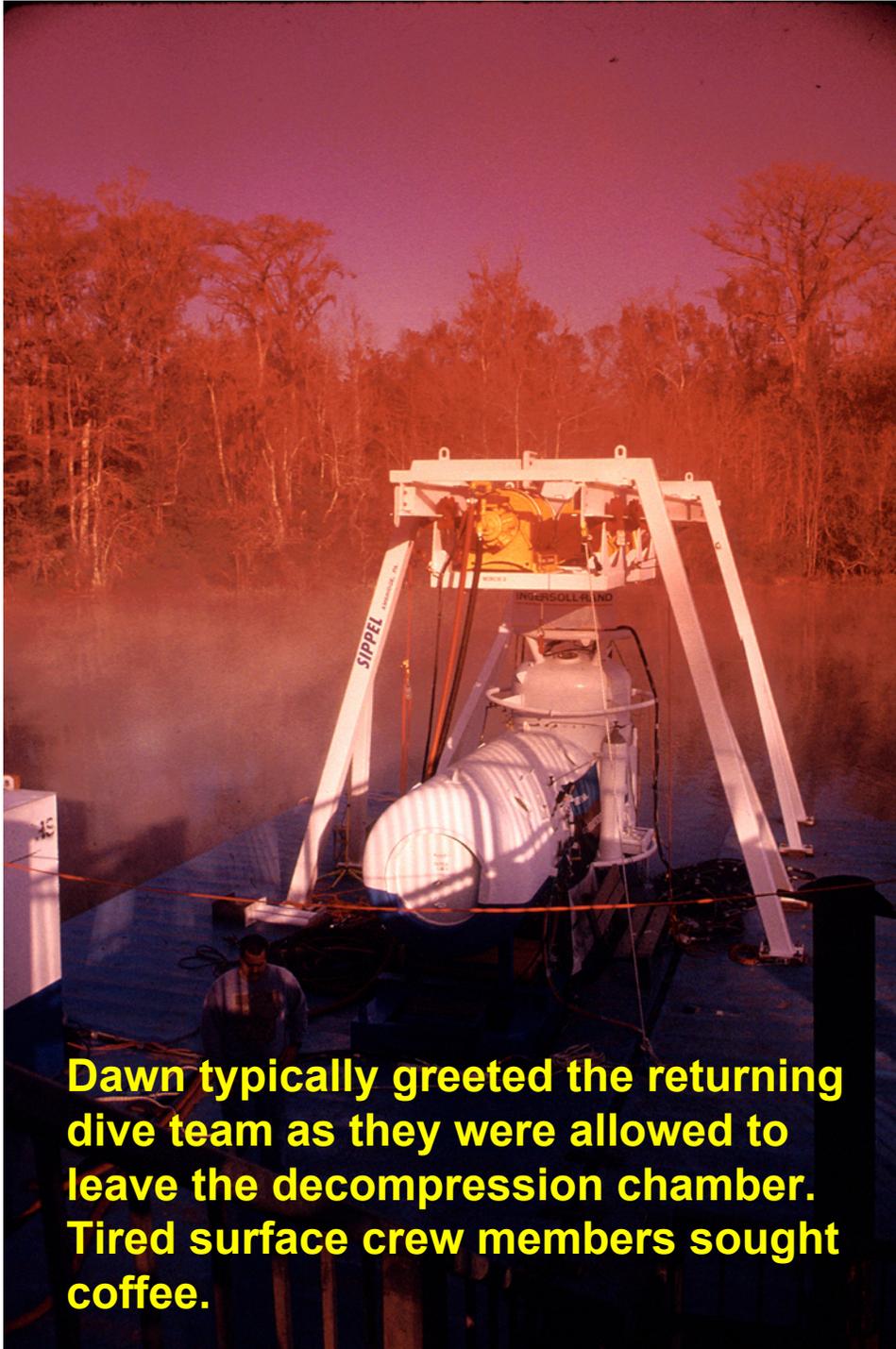
The MK5 backpack logged the depth of the diver for every 0.3 meters of change in depth. The depth-time profile shown here represents a 4 hour and 37 minute duration spent at approximately 90 meters depth inside the cave.

Decompression, beginning at approximately 60m depth, lasted another 3-1/2 hours before the divers could enter the PTC and be transported to the surface based habitat.

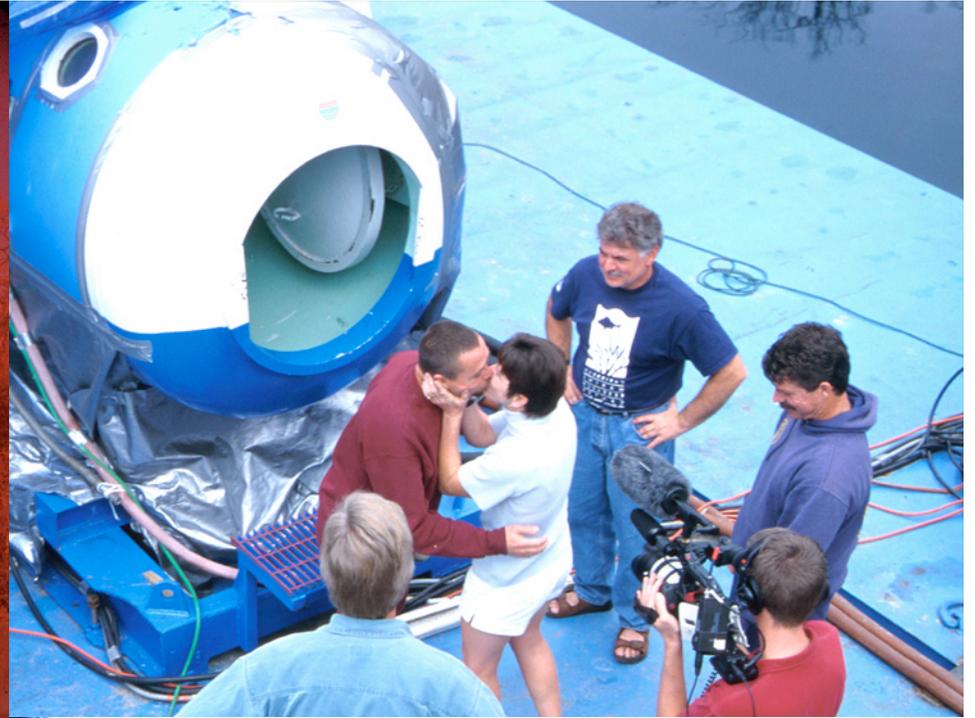




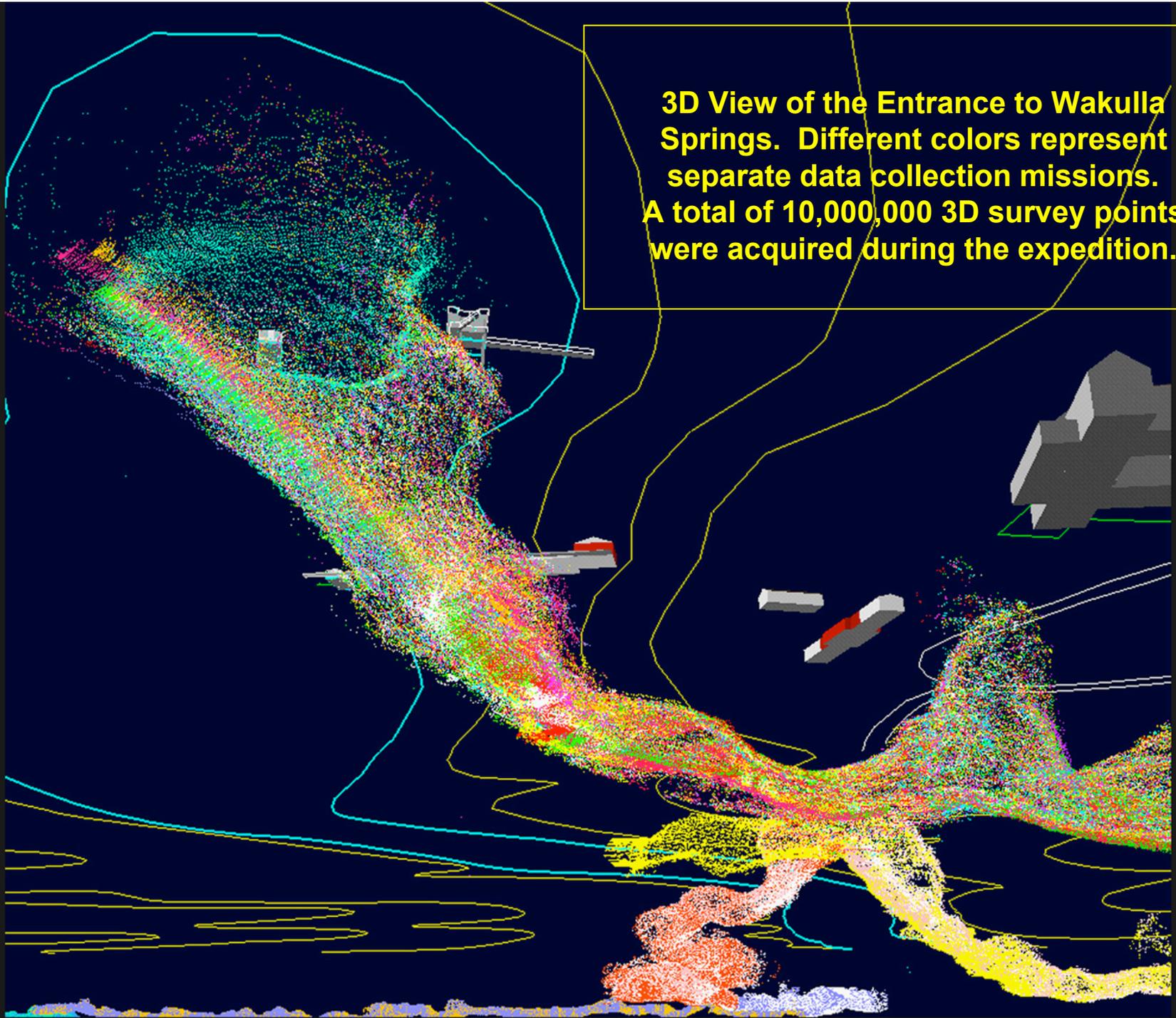
Three teams of surface personnel run 6-hour shifts monitoring the pressurized habitat containing the returning dive team. Chamber decompression typically ran between 8-14 hours.



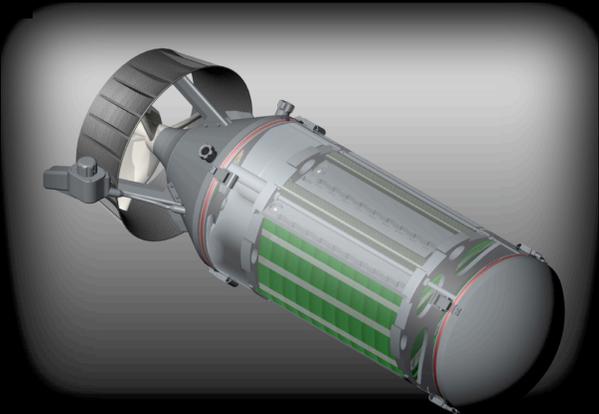
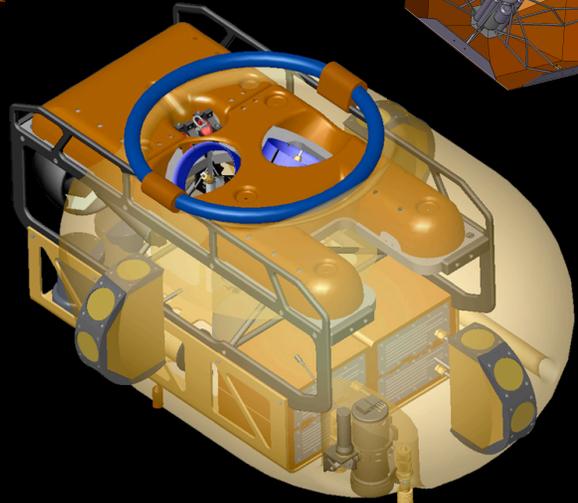
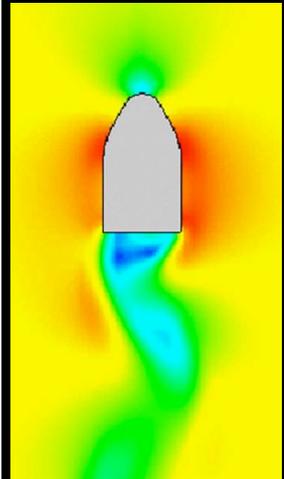
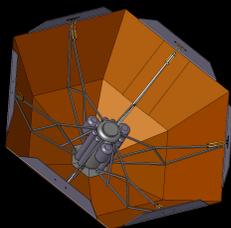
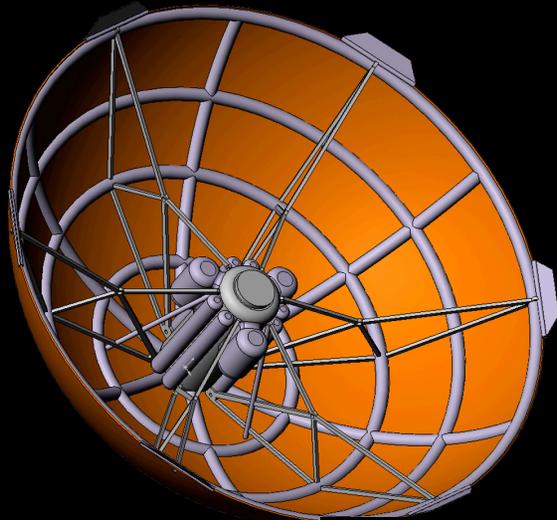
Dawn typically greeted the returning dive team as they were allowed to leave the decompression chamber. Tired surface crew members sought coffee.



3D View of the Entrance to Wakulla Springs. Different colors represent separate data collection missions. A total of 10,000,000 3D survey points were acquired during the expedition.



STONE AeroSPACE



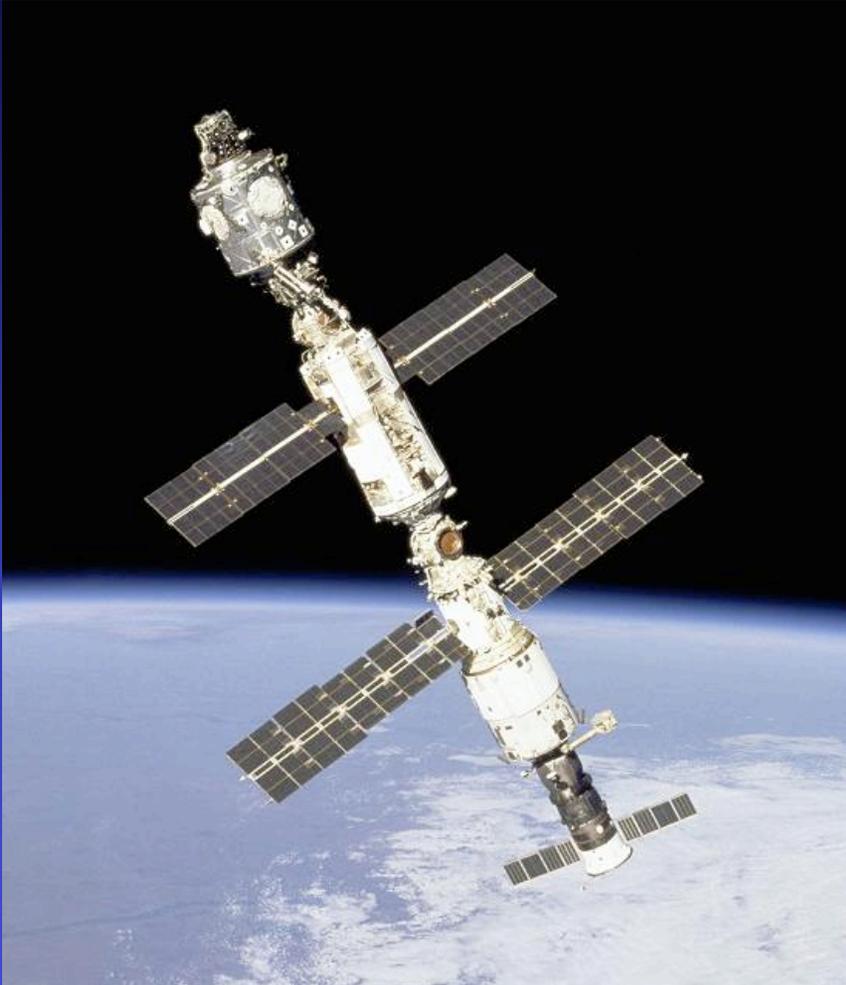
The Four “Holy Words” of a true Explorer.... Frequently abused

Exploration
Training (Exercise)
Reconn (Mission)
Expedition

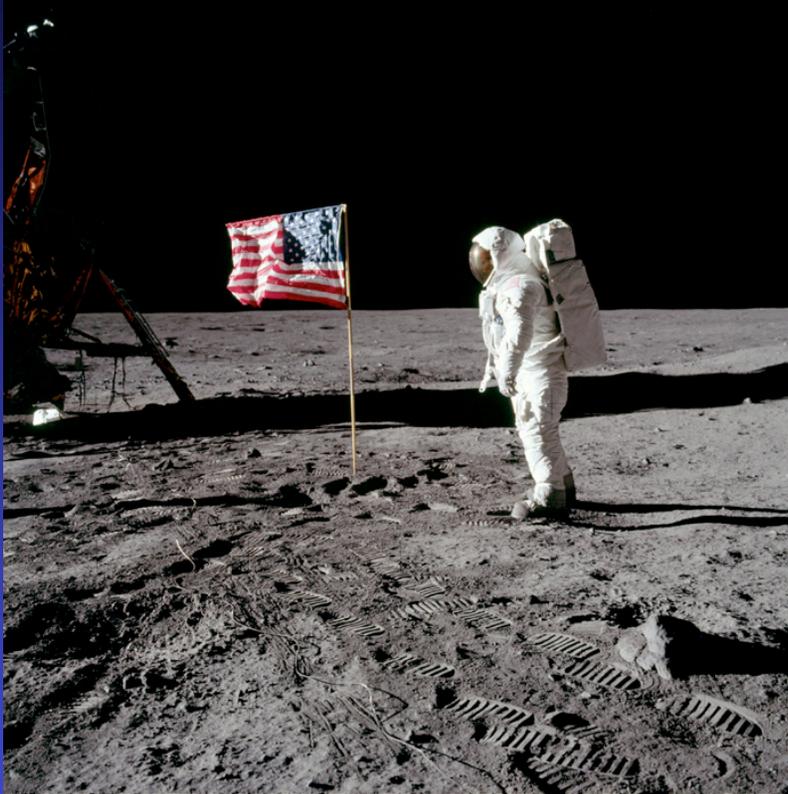
Exploration



Training Exercise



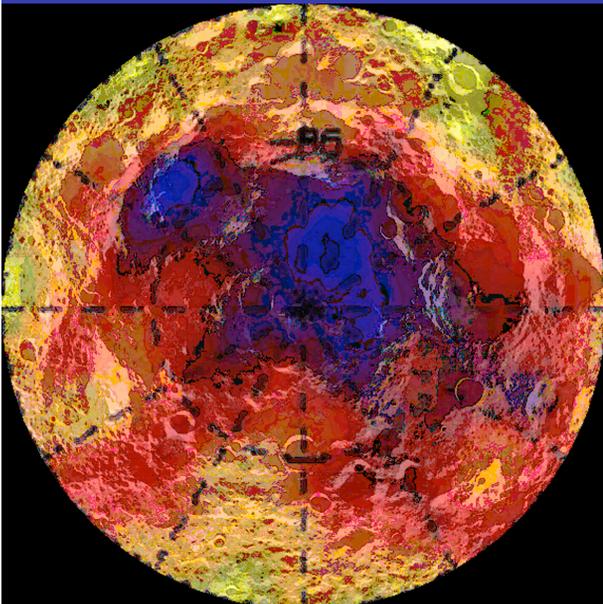
Reconn Mission



Expedition (to the moon) ...

**Will not happen in our lifetime under
the current “system”**

**Reason #1: ROI is -\$300B+
Corollary: Risk aversion permits
no operational solution**



Some Interesting Stats from Wakulla 2:

- Project field duration: 90 days
- Four 2-person exploration/mapping teams + one backup crew member (9 total) on a 4-day rotation
- 150 total project staff (mexico, canada, belgium, britain, germany, australia, U.S.)
- 20-25 crew on duty on any given day
- Shore launch; PTC and chamber recovery from 30m
- 6-person PTC ingress & gear recovery team
- 3 rotating crews of 2-3 chamber operators on 4-hour shifts
- Safety review board for each mission
- Full Dress-Rehearsals for each mission (in basin)

Some Interesting Stats from Wakulla 2:

- Written checklists:
 - PLSS (pre and post mission)
 - Underwater vehicle (pre and post mission)
 - 3D mapper (prep and data download)
 - Personnel Transfer Capsule (pre and post mission)
 - Hyperbaric Habitat (pre and post mission)
 - MK5 Tissue Downloads (post mission)
 - Chamber Deco Schedule (post mission)
 - Pizza topping

Some Interesting Stats from Wakulla 2:

- 34 primary exploration and mapping missions
- Hundreds of support dives (including 634 rebreather dives)
- Typical mission in-water duration: 8-9 hours (4-5 in cave)
- Typical chamber decompression 10-12 hours
- Total mission duration (average): 18-23 hours
- Typical range from PTC: 3-4 kilometers
- Typical return time to PTC: 2-2.5 hours
- Mean operating depth: 85-90 meters
- Breathing Gas: 90% Helium / 10% Oxygen
- Suit Inflation Gas: Argon
- Typical CO2 absorbent used: 1.4 kg / 9 hours
- Typical oxygen consumption (inwater): 0.5 liters/minute
- 32 Pizzas & two Turkey dinners consumed at 2 bar
- You cannot whistle above 2.5 bar
- Birthday cake compresses to 1/3 its height at 3 bar