

A Rock Drill For ROV Use

Long history of support from the marine community regarding the need for a drill to support biological, geochemical and geologic researchers:

History of statements of need:

- (Earlier?)

- DESCEND 1999

<http://www.unols.org/meetings/1999/199910dcd/199910dcdmi.htm#V_Key>

- Drills workshop (TAMU) (Sager et al., 2001AGUSM...V62A05S)

- DESSC support letter for WHOI Rock-Core Proposal, 2002

A Rock Drill For ROV Use



MBARI drill sled



Drill sled mounted beneath Tiburon ROV

Recent users (Endeavour Keck Expedition, 2004)

Deborah Kelley, U. Washington

Andrew Barclay, U. Washington

Jim Gill, UCSC

William Wilcock, U. Washington

Doug Toomey, U. Oregon

Taimi Mulder, Canadian Geol. Survey

John Ristau, UBC

Mike Perfit, U. Florida

Paul McGill, MBARI

Debra Stakes, MBARI

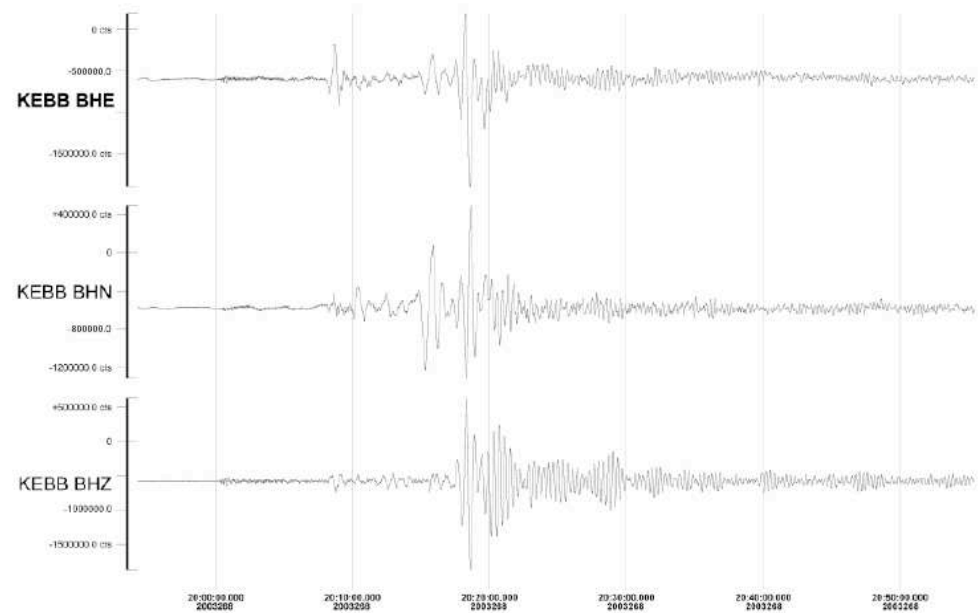
Endeavour Keck Expedition

See AGU - B13A-0180 -
Wilcock et al., 1340h
Wednesday



Jason 2 bottom photo, seismometer
emplaced in lava flow (and friend).

Left: Seismogram obtained from
borehole seismometer



Filter: None, Amp: Auto

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Comments from Seismologists on Endeavour Keck Expedition

Andrew Barclay, U. Washington *“All four instruments recorded a year's worth of local and regional events; the signal to noise of known events has been very good.”*

William Wilcock, U. Washington *“The data quality is very high - I do not think I have ever seen shear waves that are so well recorded for local mid-ocean ridge earthquakes.”*

Doug Toomey, U. Oregon *“These are some of the best S wave I have seen for microearthquakes recorded on ocean bottom seismometers.”*

Cost Associated with Drill

Cost for existing MBARI drill:

Amount invested in drill (get correct amount from Dolly – *what we think we know now: NSF initial investment ~\$100K conversion for use on Jason II ~\$80K - Amount MBARI wants to recoup - ~\$70K (for Tiburon refit work)*)

Cost for a new drill: ~\$500K (based on costs estimated from WHOI 2002 proposal)

MBARI Commitment to Transfer to Technology to the Science Community:

- MBARI desires to transfer the drill to the community
- Leasing from MBARI is not compatible with MBARI engineering needs
- Costs of transfer remain at issue

Borehole Observatory Site, Hole 1200C

Issues to address for transfer:

- Cost (*to be worked out between funding agencies and MBARI*)
 - Horizontal vs vertical drilling think should go into this?
 - Current configuration adequate (horizontal)
 - Desire to redesign for vertical use?

- Accessibility and transferability

Currently useful for large ROVs (Jason 2, Tiburon, ROPOS??), possible in future for New Alvin if sub design accommodates

Needs for Operation and Maintenance:

- Mob/demob: S. Etchemendy estimates ~ 5 work days
- Aboard ship: – pre-use prep ~8 hrs depending on intended use, upon recovery ~12 hrs cleaning/greasing
- Ashore: inspection pre-use ~1d, parts take ~ month to arrive, any modifications as needed for special use could take days to weeks, any major modification to accommodate new capabilities could be expensive and take considerable time.

Needs Potential Operators:

- Facility (academic? other entity?)

- Advantages: infrastructure and experienced personnel

- Disadvantages: dedication time for personnel, additional costs to facility

- Individual operator

- Requirements

- expertise/experience in operation

- retinue of support personnel

- liaison with user community and operators of ROVs/Subs

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Recommendation from Submergence Community

- In Favor of drill _____
- Not In Favor of drill _____