



**ECORD Council**

**ESO Update – October 2015**



**David McInroy**

**ESO Science Manager**

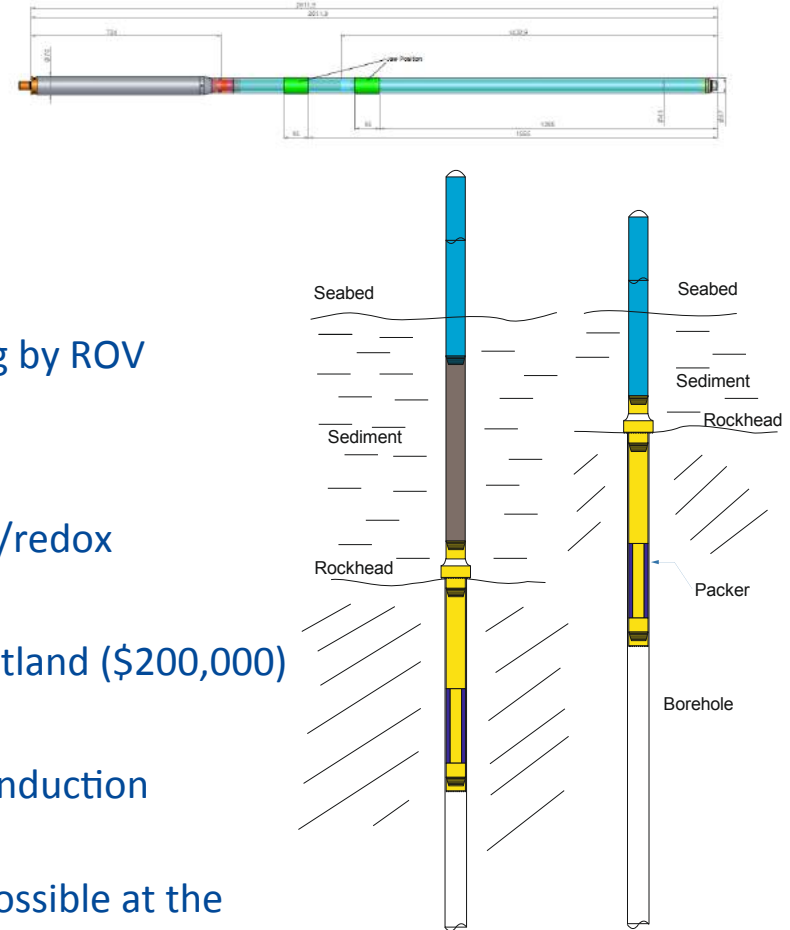
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# Summary

1. 2015 activities
  - a) Seafloor drill technical development for IODP Expedition 357: Atlantis Massif
  - b) IODP Expedition 357 – UNDERWAY
  - c) IODP Expedition 364: Chicxulub Impact Crater – planning
  - d) IODP Proposal #813: Antarctic Cenozoic Paleoenvironment – planning
  - e) IODP Proposal #708: Central Arctic Paleoceanography – planning
2. 2016 budget and budget request
  - a) Majority of budget is for IODP Expedition 364 – Offshore (Apr-May) and OSP (Sep-Oct)
  - b) Some costs for Expedition 357 OSP (Jan-Feb)
  - c) Some costs for future expedition planning (ongoing)

# 2015 Seafloor Drill Developments

- 2014: Engineering development budget granted (\$868,500), development program conducted throughout 2015.
- BGS and MARUM (MeBo) agreed to collaborate on developing tools that can work on both drills:
  - Dual induction resistivity probe
  - Magnetic susceptibility probe
  - Borehole packer system (expanding packer)
  - Drill string plug for post-expedition fluid sampling by ROV
  - Drill-mounted tracer delivery system
  - Drill-mounted water sampling system
  - Drill-mounted sensor package – CTD/DO/CH<sub>4</sub>/pH/redox
- 2015: ECORD co-funded test cruise offshore Oban, Scotland (\$200,000)
  - To test newly refurbished RD2.
  - To test new technical developments – only new induction resistivity tool was ready for offshore testing.
  - Remaining developments were tested as far as possible at the workshops of BGS and MARUM.
  - All developments are ready and installed for Expedition 357.

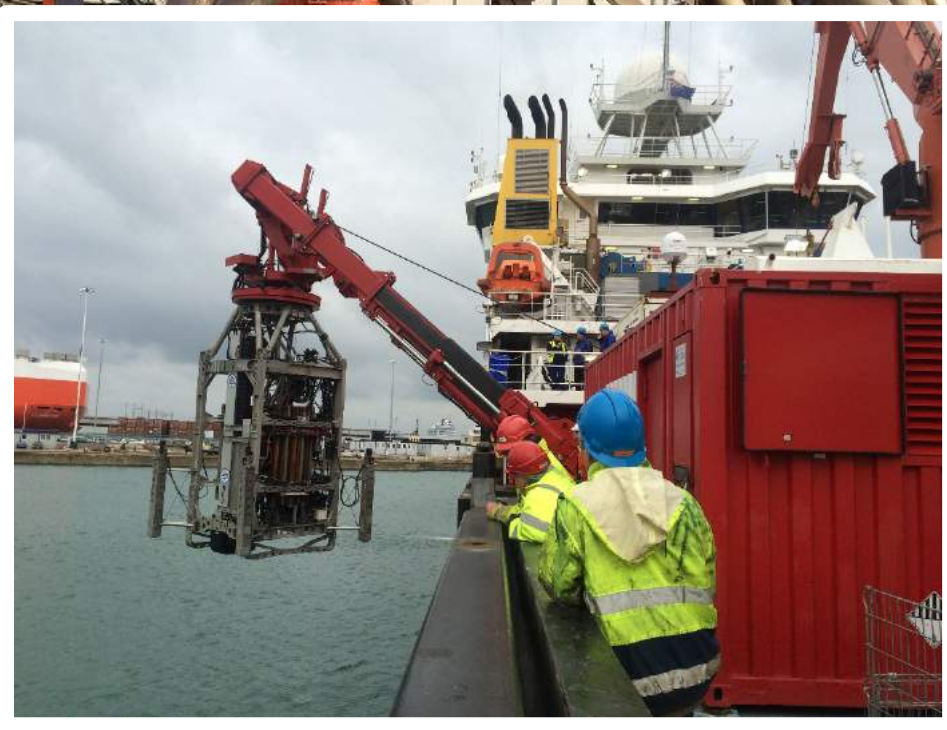
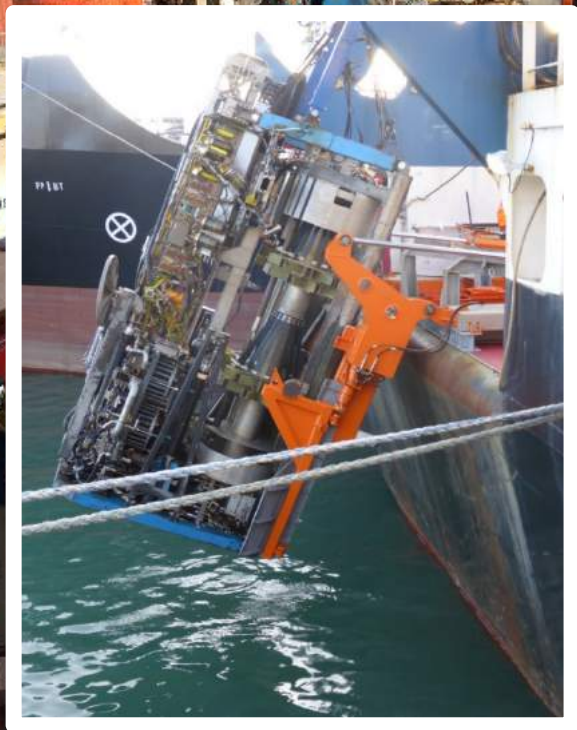


# RD2 Test Cruise (ECORD / BGS / Industry)

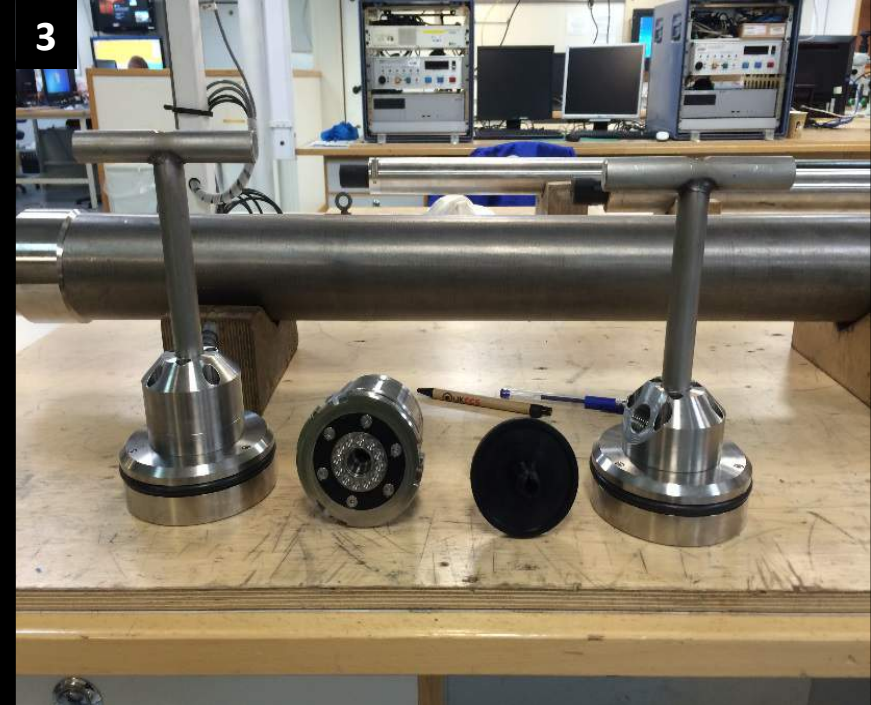
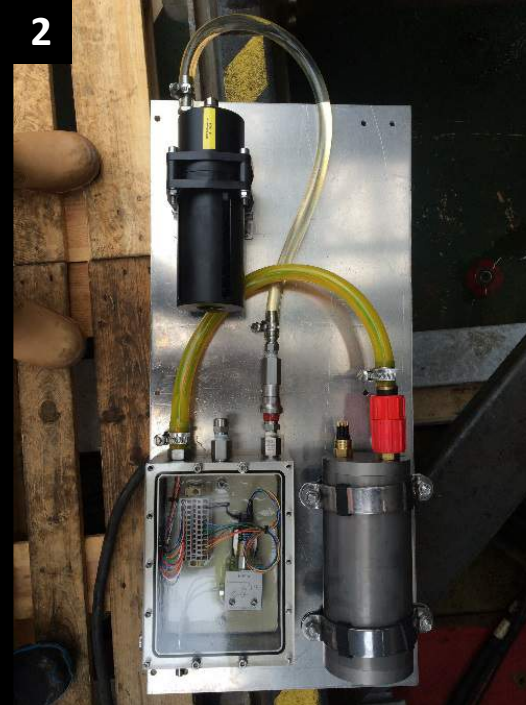




# Expedition 357 Mobilisation, 16<sup>th</sup>-26<sup>th</sup> Oct







1. Magnetic Susceptibility and Dual Induction Resistivity logging tools;
2. Tracer delivery system;
3. Borehole plug caps;
4. Water sensors and samplers;
5. Borehole plug (with swelling packer).



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## Science & Environment

### Expedition seeks Atlantis microbes

By Jonathan Amos  
BBC Science Correspondent

22 October 2015 | Science & Environment



The carbonate towers were dubbed the "Lost City of Atlantis" because they reminded scientists of cathedrals and skyscrapers.

Monday will see an international team of scientists set sail for the mid-Atlantic on a quest to sample microbes living deep in the ocean floor.

The expedition will use new types of rock drill to retrieve cores from up to 80m below the seafloor.

The target of interest is the Atlantis Massif, a

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## ULKOMAAT

### Meren tutkimus: Atlantin valtameri



Kansainvälinen tutkimusryhmä soltaa keskelle Atlanttia James Cook -tutkimuslaivalla, joka on laivassa Britannialta.

### Lyhyesti

#### Opposition ehdokas yllätti Argentiinan presidentinvaaleissa

Oppositioista edustava konservatiivien ehdokas Mauricio Macri yllätti olevan voittajana sunnuntai-ilta jätettyä Argentiinan presidentinvaalien ensimmäisen kierroksen. Aistatut tulokset kertovat.

Tulos on johtamassa talouden kierreeseen. Lähin vasemmistolainen valppuvaluen ehdokas Daniel Sciola voitti. Kun aistatut olivat 71 prosenttia, Macri jätti 36 prosenttia osuudella. Sciola oli aistamassa 35 prosenttia, uustoitamisto fustiers kertoo.

#### Lautatörmäyksessä loukkaantui 100 Hongkongissa

Kokoo sata ihmistä loukkaantui lauantai-öönä Hongkongin edustalla sunnuntai-alkuillasta, kertoo uutistoimisto Reuters.

Macrona Hongkongin palamassa ollut lautta törmäsi viikkoon lauantai-öönä Kanadassa kolumbiassa, jota ei tuoreillaan osutti kertoi tarkemmin. Palkatun poltti tuki onnettomuuden syistä. Lautta ei tiettävästi upottanut ihmisiä, mutta se muutti silloin ja alkoi voutaa.

#### Viisi hukkuu valassafarilla Kanadassa

Ainakin viisi Britannian kansalaista on kuollut Kanadassa valassafarilla, kertoo Britannian ystäväläyhet BBC. 27:31 turvatoimittamien vene katosi satatietä tutkimuslaivasta syystä lähtöä Vancouverin saarta Kanadan läntisellä osuudella sunnuntai-ilta puolella paikallista aikaa.

Yksi ihmisen on yhä kadonnut, mutta ranskalaiskaverien on

### Merenalainen vuori kiinnostaa tutkijoita

Kivestä voi löytää uudenlaista elämää. Mikrobiologia kehittyi koko ajan.

Antamari Sipit H5  
Lontoo

Maavoimien talous aistatut, otti

Fakta

Työtä tehdään kellon ympäri

Atlantis-vuori (Atlantis Massif) sijaitsee keskellä Atlantin valtameriä ja on noin 4 kilometriä korkea ja noin 16 kilometriä leveä.

Yhdysvallat

Atlantis Massif -vuori

Atlantis valtameri

ESPAÑA

MAROKKO

AFRIKKA

Tulla tai maan alkuaikana, tutkijayhteisön kesken jättäjä

san kamerat. Koneet myös tal-  
lentavat kameran tarkun ajan.

BUSINESS DIRECTORY LOOK UP ON DISCUSS BUY/SELL SCORECARD

# Daily Echo

Southampton 24th

Unipol Sai

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199 James Cook in Southampton



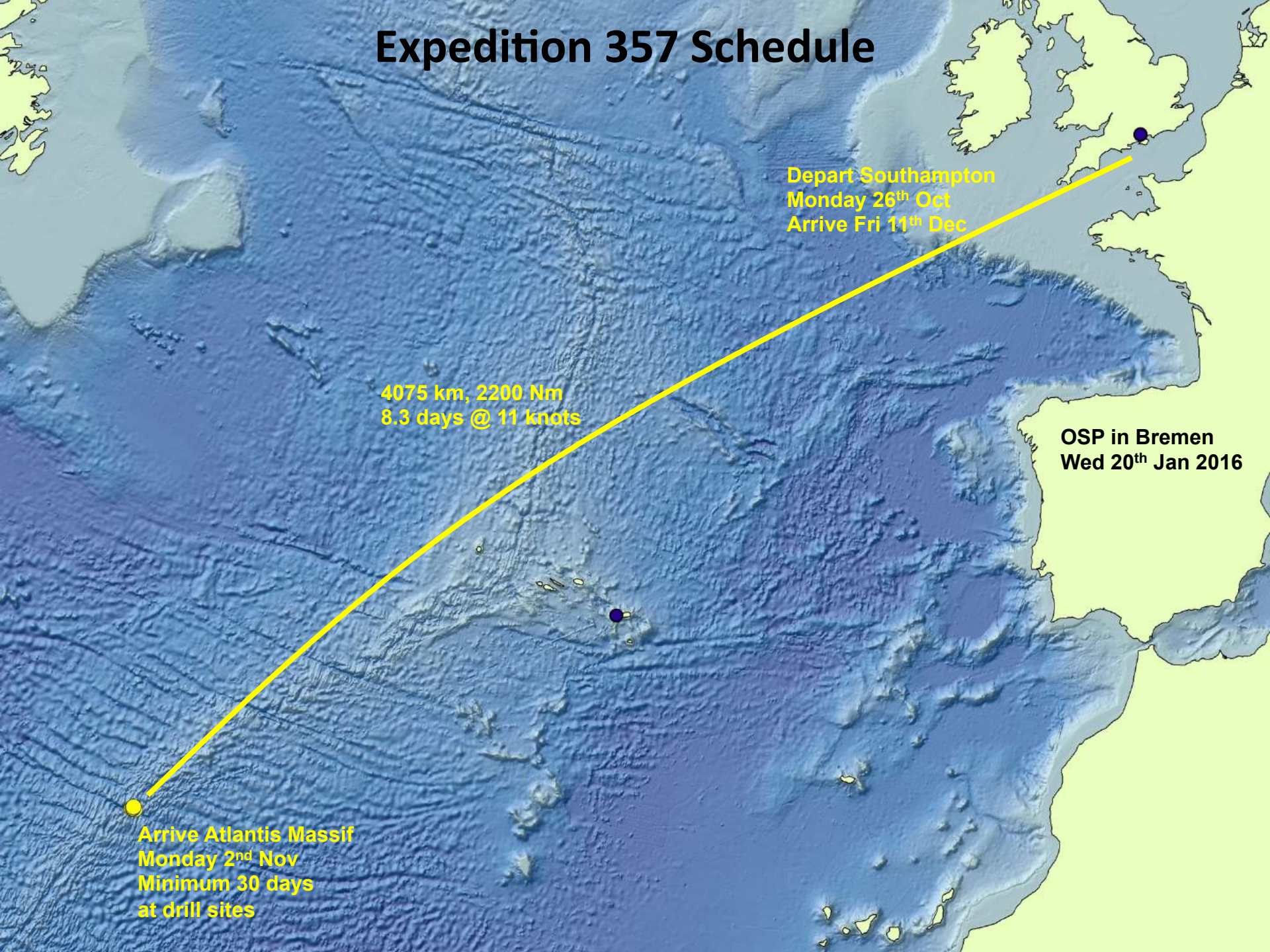
# Expedition 357 Schedule

Depart Southampton  
Monday 26<sup>th</sup> Oct  
Arrive Fri 11<sup>th</sup> Dec

4075 km, 2200 Nm  
8.3 days @ 11 knots

OSP in Bremen  
Wed 20<sup>th</sup> Jan 2016

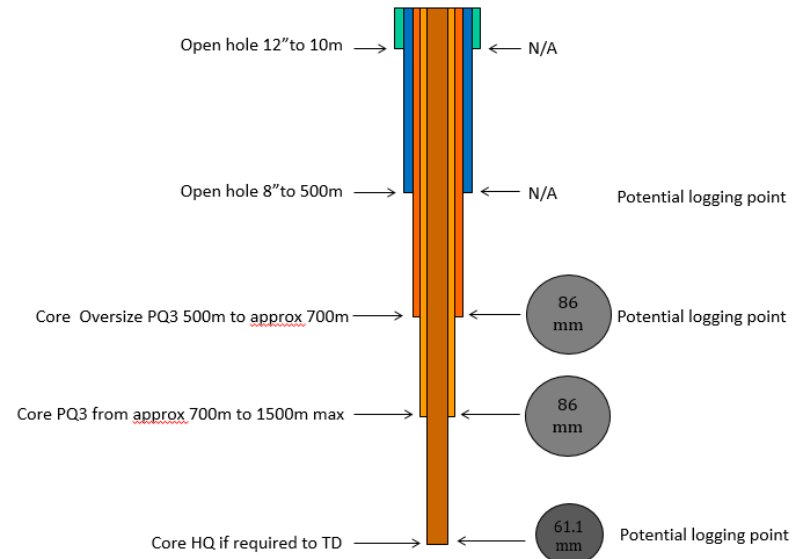
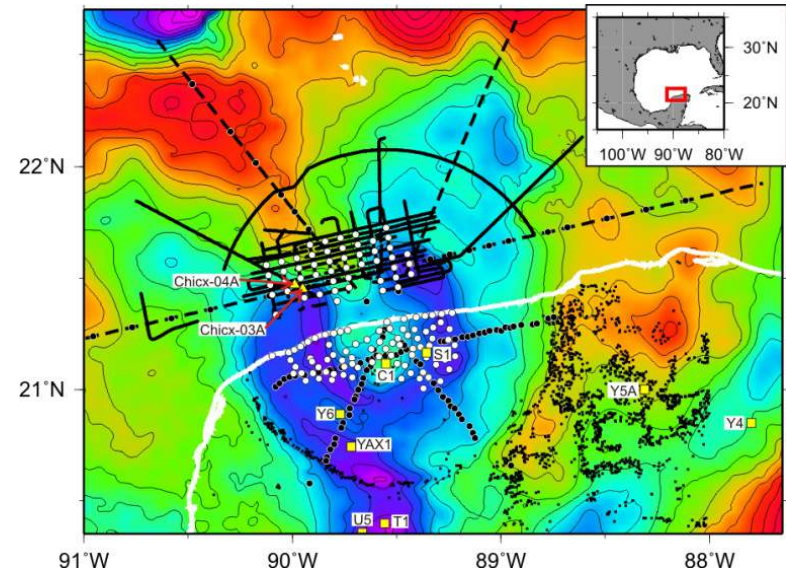
Arrive Atlantis Massif  
Monday 2<sup>nd</sup> Nov  
Minimum 30 days  
at drill sites





# Expedition 364 Chicxulub Impact Crater

- On the verge of signing the drilling contract.
- Contractor: DOSECC, Vessel: L/B Kayd
- Rig is capable of reaching 1500 mbsf.
- This is a one hole expedition - multiple pipe size 'step downs' mitigate the risk of getting stuck and increase the chance of reaching TD.



# Expedition 364 Chicxulub Impact Crater

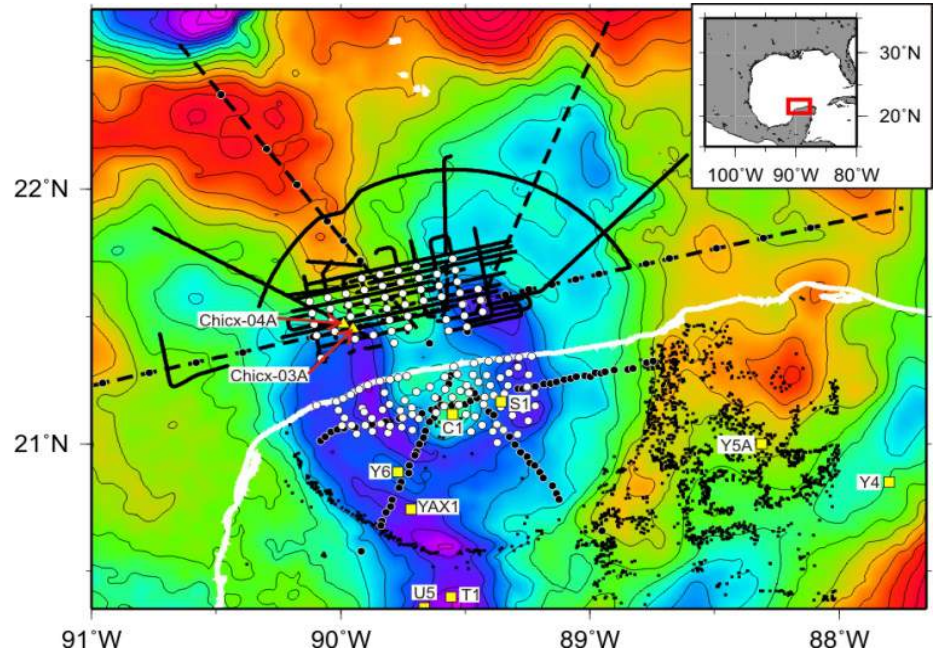
| Open hole rate | Coring rate | Duration to 1500 mbsf | Cost to 1500 mbsf | Cost to 1200 mbsf |
|----------------|-------------|-----------------------|-------------------|-------------------|
| 50m/day        | 30m/day     | ~50 days              | \$8.9M            | \$8.0M            |
| 40m/day        | 25m/day     | ~60 days              | \$9.6M            | \$8.5M            |
| 30m/day        | 20m/day     | ~70 days              | \$10.6M           | \$9.3M            |

- Table presented to ECORD FB in March.
- ECORD FB set self-imposed limit of \$8.5M (cost to ECORD);
- ICDP has provisionally awarded \$1M for ICDP-focussed activity, expedition budget is \$9.5M;
- ESO max. estimate for Expedition 364 is \$10M.
- There are options:
  - Approve the full \$10M, should reach 1500 mbsf.
  - Or keep the expedition budget capped at \$9.5M, ESO stop coring when the money runs out. 1200 mbsf < TD <1500 mbsf.
  - Can have a dialogue between ESO and ECORD during the expedition with progress/cost forecasts.

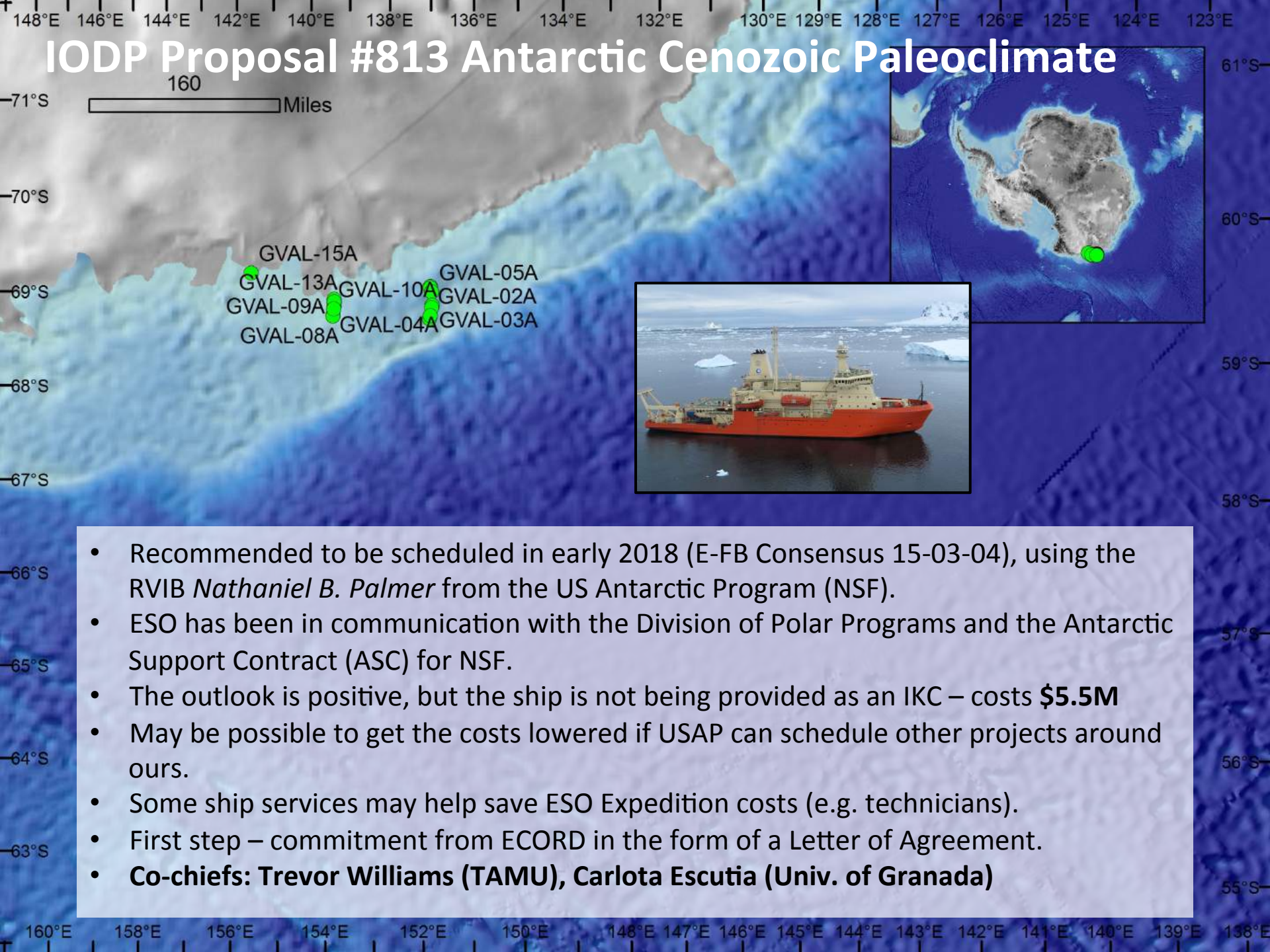


# Expedition 364 Chicxulub Impact Crater

- Permit applications submitted to the British Embassy in Mexico City, now passed onto to the SRE – Mexican Secretariat of Foreign Affairs and other agencies.
- Discussions ongoing regarding project MoUs between ECORD and Mexican institutes – possibility of a support vessel IKC from UNAM significantly reduced. ESO needs to contract its own supply vessel.
- **New development:** the Mexican Navy has shown a very strong interest in supporting the project. They have offered a support vessel for free for the entire project, ESO just pay fuel, and acknowledge the Navy on the Expedition reports. Could potentially be worth \$250k.



# IODP Proposal #813 Antarctic Cenozoic Paleoclimate

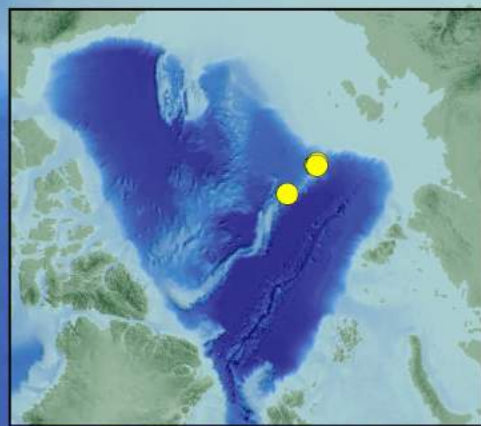


- Recommended to be scheduled in early 2018 (E-FB Consensus 15-03-04), using the RVIB *Nathaniel B. Palmer* from the US Antarctic Program (NSF).
- ESO has been in communication with the Division of Polar Programs and the Antarctic Support Contract (ASC) for NSF.
- The outlook is positive, but the ship is not being provided as an IKC – costs **\$5.5M**
- May be possible to get the costs lowered if USAP can schedule other projects around ours.
- Some ship services may help save ESO Expedition costs (e.g. technicians).
- First step – commitment from ECORD in the form of a Letter of Agreement.
- **Co-chiefs: Trevor Williams (TAMU), Carlota Escutia (Univ. of Granada)**



173°E 170°E 167°E 164°E 161°E 158°E 155°E 152°E 149°E 147°E 145°E 143°E 141°E 139°E 137°E 135°E 133°E 131°E

79°N  
80°N  
81°N  
82°N  
83°N  
84°N  
85°N  
86°N  
87°N



LR-01A LR-02A  
LORI-16A

LORI-5B

140  
Miles

## 708-Full Add ACEX2

- Water depth: 1405 m
- Last addendum called for three deep holes in deep water (2.6-3.6 km of drillstring).
- Would require an ACEX-style fleet, with 'top-end' geotechnical rig on a sizable icebreaker – doesn't currently exist
- Stronger rig is required to handle >2km of pipe.
- Casing will be required (extra space and time needed)
- Long site residency, risk of being pushed off station
- If no ice, may still get high sea states
- Can proposal be approached differently?
- Proponents have chosen new sites – under ESO review.
- Addendum to be submitted to the E-FB.
- R/V Polarstern offered as IKC (AWI/Germany).



72°N  
73°N  
74°N  
75°N

149°E 139°E 131°E 125°E 120°E 116°E 113°E 110°E 108°E 106°E 104°E 103°E 102°E 101°E 100°E 99°E

# ESO 2016 Budget

| Description                                | Total                | Change   |  |
|--|----------------------|----------|--|
| Management and Administration              | \$ 799,456           | ➡ + 4%   | 60 day expedition, 2 x OSPs                |
| Technical, Engineering and Science Support | \$ 10,705,030        | ➡ +140%  | Expedition contracts, ESO expedition costs |
| Engineering Development                    |                      |          |  |
| Core Curation                              | \$ 70,724            | ↘ -9.9%  |  |
| Data Management                            | \$ 295,262           | ➡ + 9%   | 60 day expedition, 2 x OSPs                |
| Publications (maximum)                     | \$ 150,000           | ➡ 0%     |  |
| Outreach                                   | \$ 86,334            | ↘ - 6.5% |  |
| <b>Total</b>                               | <b>\$ 12,106,806</b> |          |  |

Expedition 364 = \$10.081 M

ESO non-expedition costs = \$2.088 M ➡ 0% on 2015

Technical Engineering and Science Support (\$10.7M):

Drilling/platform/logging contract = \$7.97M

Equipment/consumables/shipping = \$0.94M

Salaries, all partners = \$1.6M

Travel = \$0.15M

**Request from ECORD = \$11.1M**