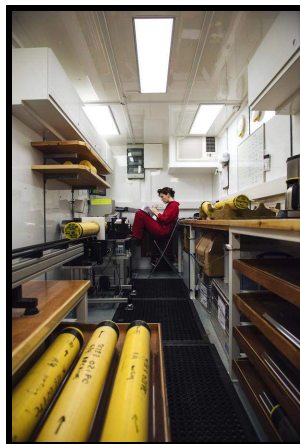# Downhole logging and core petrophysics

Sarah Davies

ESO logging and core petrophysics

sjd27@le.ac.uk

Petrophysics Staff Scientists & Petrophysicists

Expertise in downhole logging & core petrophysics programs

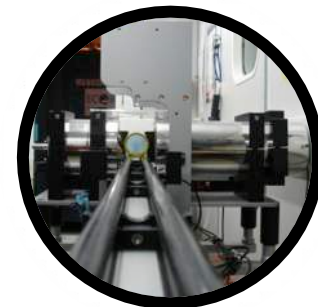Dedicated equipment for core logging & discrete measurements
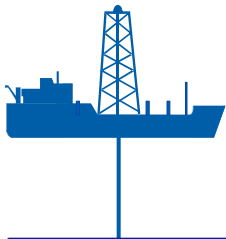
Data calibration & quality control

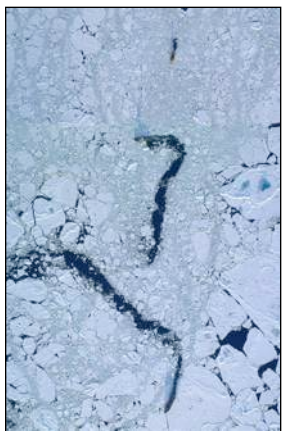Evaluation & interpretation of these data

EPC Activities as part of the ECORD Science Operator

- Post-expedition activities

- Preparation for upcoming expeditions

- Capability development and training for IODP MSP Expeditions

- Other key activities, including education & training
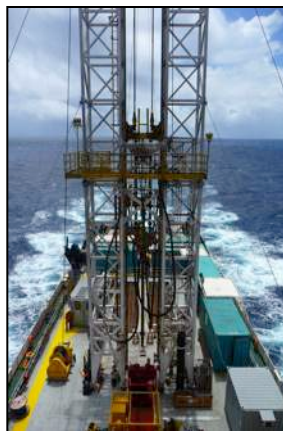
Downhole Logging for MSP Expeditions

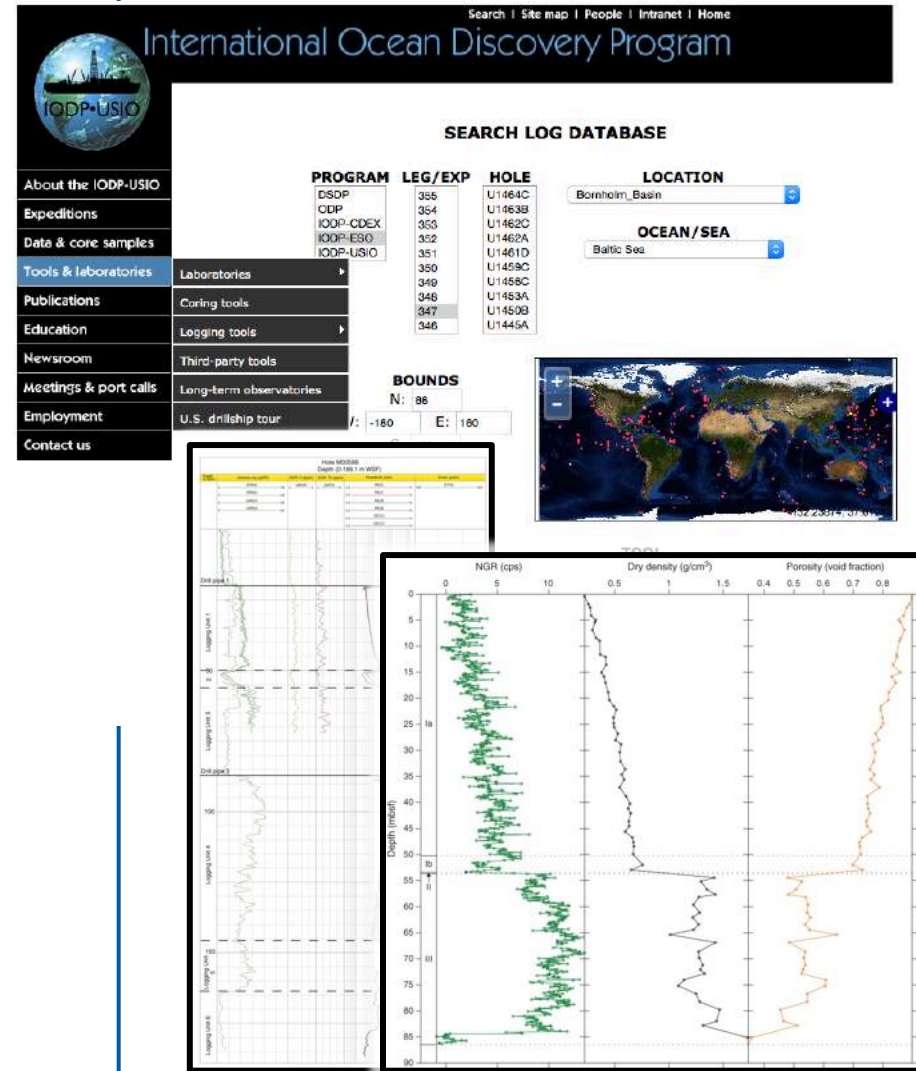| ACEX	Tahiti	New Jersey	GBREC	Baltic	Atlantis
Exp 302	Exp 310	Exp 313	Exp 325	Exp 347	Exp 357
Schlumberger	EPC	EPC & University of Alberta	EPC	Weatherford	Seabed rock drill MARUM & BGS

- X364: Logging contractor EPC & Alberta

Expedition 347 – Baltic Sea Palaeoenvironment

- EPC staff prepared expedition logging data for archiving in the IODP legacy database hosted by the Lamont Doherty Earth-Observatory

- Petrophysics Staff Scientist attended second post-cruise meeting, September 2015
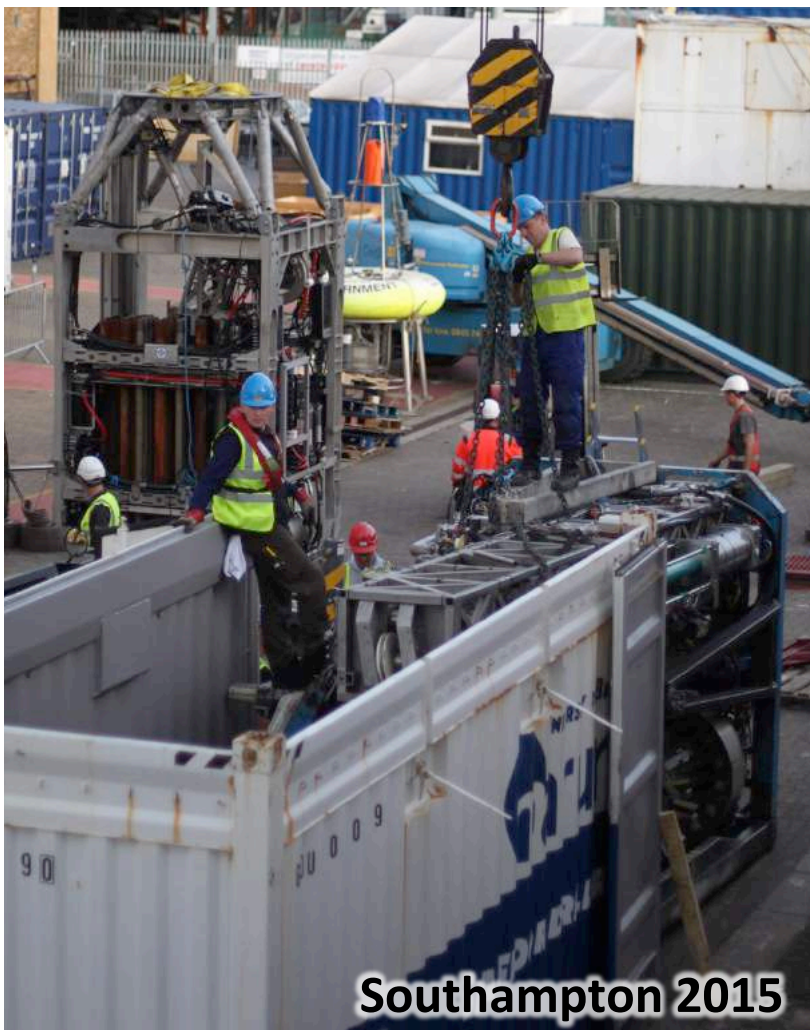
Expedition 357 – Atlantis Massif

EPC have worked closely with BGS & MARUM during downhole logging tools development for seabed rockdrill deployment

EPC provided a logging engineer for the RD2 test cruise (August 2015) offshore West of Scotland. Personnel provided technical support and guidance on the logging tools and associated data.

http://www2.le.ac.uk/departments/geology/news/robots-rocks-and-research-drilling

Expedition 357 – Atlantis Massif

Southampton 2015

EPC have participated in:

- two training sessions for the ANTARES tools in Bremen (May & September, 2015)

- ANTARES logging tool test deployments from the RD2 at test borehole at BGS Edinburgh (October 2015)
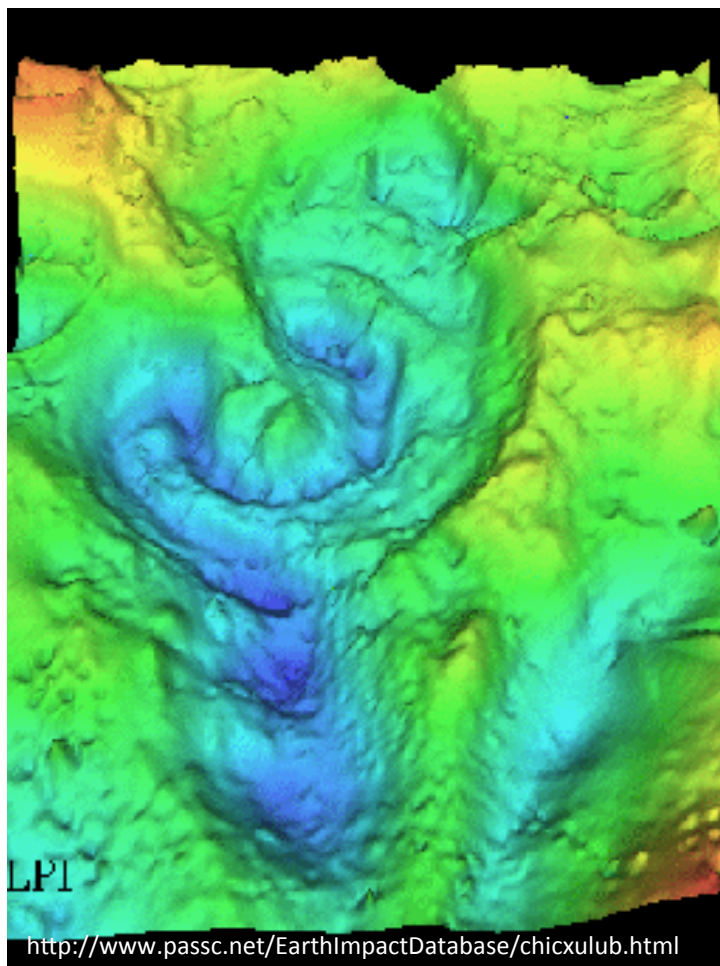
Expedition 357 – Atlantis Massif

- Cable-less, memory tools
- One tool per hole

- 4 tools options across the 2 drills
  - Magnetic Susceptibility
  - Electrical Resistivity
  - Spectral Gamma Ray
  - Optical Image/Acoustic Caliper/
    Total Gamma Ray

Expedition 364 – Chixculub

http://www.passc.net/EarthImpactDatabase/chicxulub.html

• ESO Petrophysics Contact attended Merida Meeting in Mexico

• EPC personnel have discussed the logging requirements with co-chiefs

• Permitting for the radioactive source for the Standard MSCL is ongoing including through discussions with British Embassy

Capability development:
# Refurbishment Offshore Petrophysics Container

As it was ....

Capability development:
Refurbished Offshore Petrophysics Container

As it is …

Credit: Alex Ingle Photography

• Increased core storage

• Extended Standard MSCL-capability to include double magnetic susceptibility loop option & potential to extend sensor capability in future

• Maintain option for second 'fast-track' MSCL (MSCL-152), as successfully used on Expedition 347

• Fully tested in month-long research cruise (JC123)
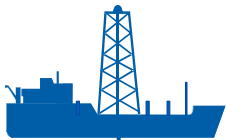
Capability development:
Core Petrophysics
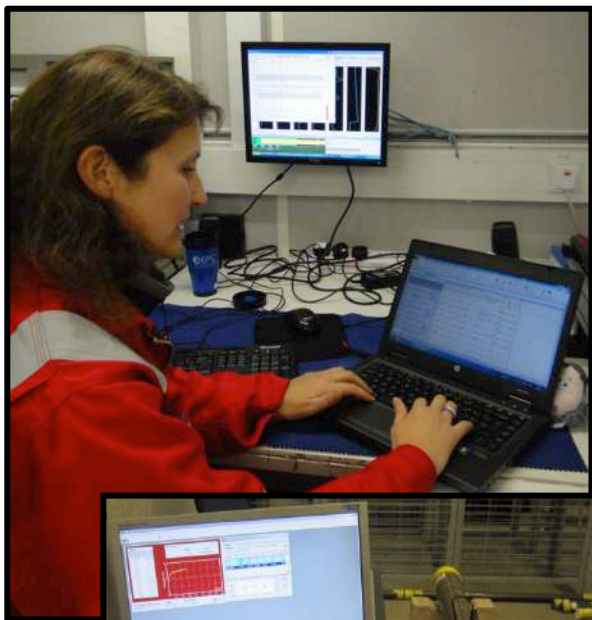
• Updating operating procedures for core petrophysics measurements

• Other EPC equipment, e.g. TEKA-04 (EPC Aachen), has been maintained with software updates and scoping options for Expedition 364 measurements
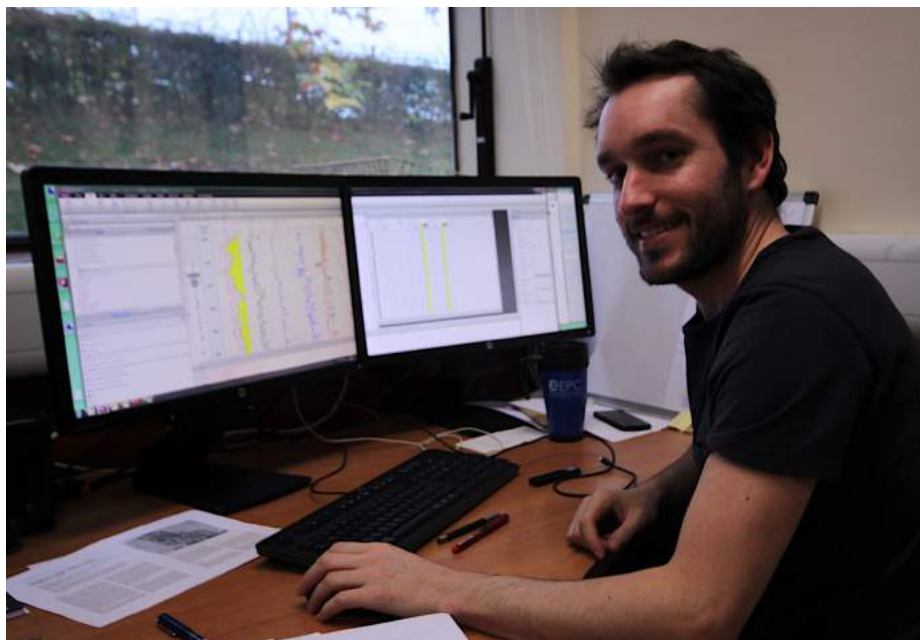
Capability development:
Downhole Logging

• EPC's downhole logging equipment, including its stackable ultra-slimline tools tested in 2014-15

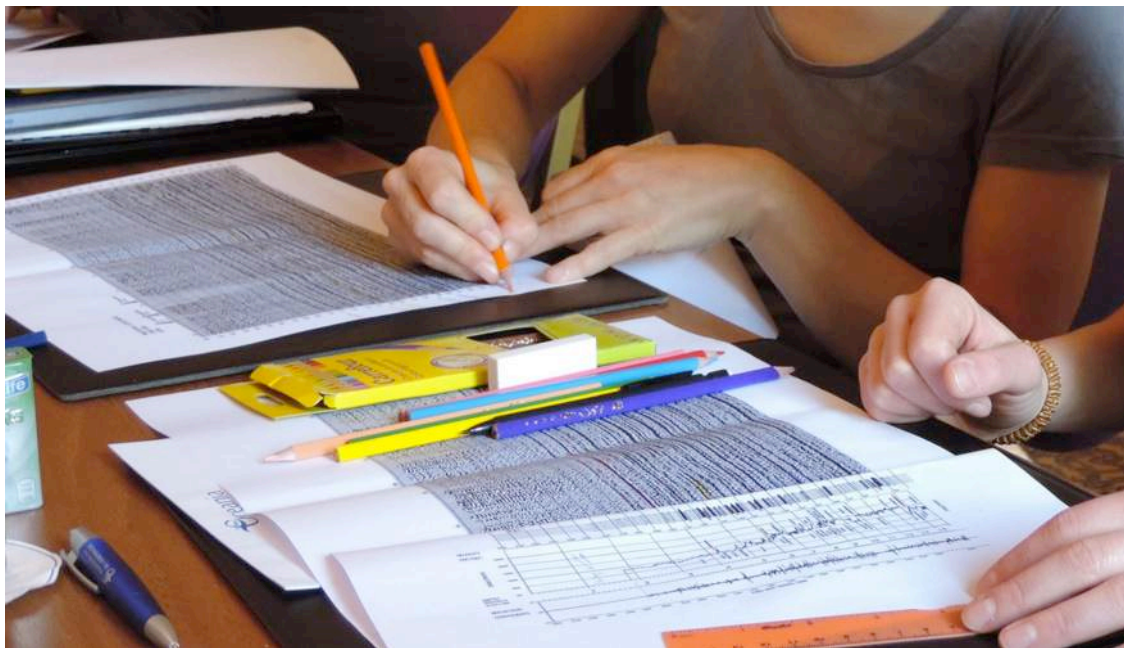• Will be used during Chixculub IODP Expedition 364

Preparation for future IODP MSP Operations

- Bespoke Techlog training from Schlumberger
- Software training in fundamentals of Petrel
- EPC Logging deployment training, Montpellier
- Offshore survival training
- MSCL training at Geotek Ltd
- Radiation safety training
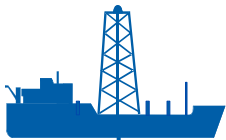
Education & Training

- EPC personnel lead training sessions for early career scientists

- Convene industry-IODP seminars

Education, Training & Outreach

ECORD 'Virtual Drillship' 2015

University of Leicester — Department of Geology

ECORD Distinguished Lecturer Programme

Reconstructing Palaeo-Circulation:
Reading sediment drifts
with the aid of IODP information

Tuesday 5 May 2015, 4.00 pm
Dr. Gabriele Uenzelmann-Neben

ECORD Summer School 2015

British Science Festival 2015