

UK Funding and National Facilities (Research Vessel Facilities and Equipment)

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Research Council Funding

- **Natural Environment Research Council** primary funding source
 - Part of Research Councils UK (RCUK)
 - Potential to apply to other RC programmes e.g., EPSRC (e.g. for engineering related technology development)
- **A: Responsive mode** (blue skies). Includes **Urgency Funds**
- **B: Research Themes** (part of current focus – increasingly strategic, applied and impact focused). Relevant themes:
 - Forecasting and mitigation of natural hazards (includes “Building resilience in earthquake-prone and volcanic regions”)
 - Earth System Science
 - Sustainable Use of Natural Resources
- Increasing cross Research Council themes and programmes, e.g.:
 - Living With Environmental Change
- Impact of current economy:
 - Reduction of overall NERC budget in real terms
 - Focused on significant capital budget reduction
 - “Protecting front line science” through various measures including efficiency savings
 - External funds to support major capital investments, e.g., RRS Discovery replacement
 - Maintaining share of the budget for responsive mode research funding, although implementing “demand management”

IODP-UKIODP

- UKIODP also funded through NERC, with associated research funding
- This includes funds for site survey, post-cruise and other related research

International Collaboration

- Many examples of co-funded research
- Usage of barter/joint agreements for research vessel time and equipment usage increases opportunities (see later)
- Example: NERC & NSF funded collaboration on Iberian rifted margin
- Numerous existing UK-NZ collaborations/links (between institutions and individuals)

Research Vessels

- **RRS Discovery** – last research cruise in November, 2012 (after 50 years in service)
- **Discovery replacement** - in 2013
- **RRS James Cook** – delivered in 2006, 89 m length
- **RRS James Clark Ross** (operated by British Antarctic Survey) – polar research vessel, with full marine geophysical capabilities, 99 m length
- **Barter system** for ship time exchange
 - European Ocean Facilities Exchange Group (OFEG) and bilateral agreements (e.g., with NSF).
 - OFEG also barter marine equipment
 - Increases flexibility in scheduling and cost savings (e.g., transit)
 - Results in NERC/UK funding being used to deploy non-UK vessels and equipment (if justified)
 - E.g., UK Sumatran Consortium project: 130 days of UK-funded ship time on RV Sonne in '08-'09, including NSF exchanged ship time



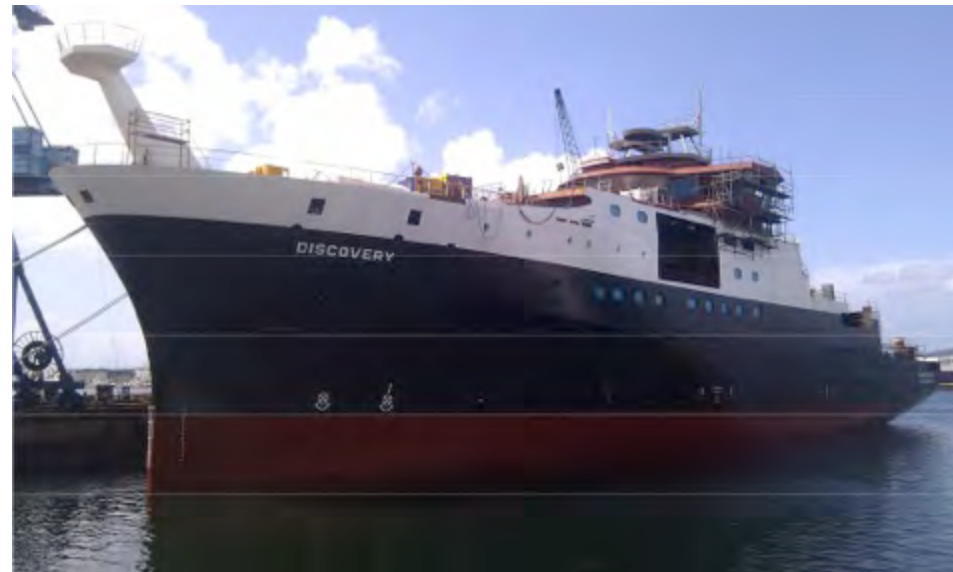
James Cook



James Clark Ross



Discovery



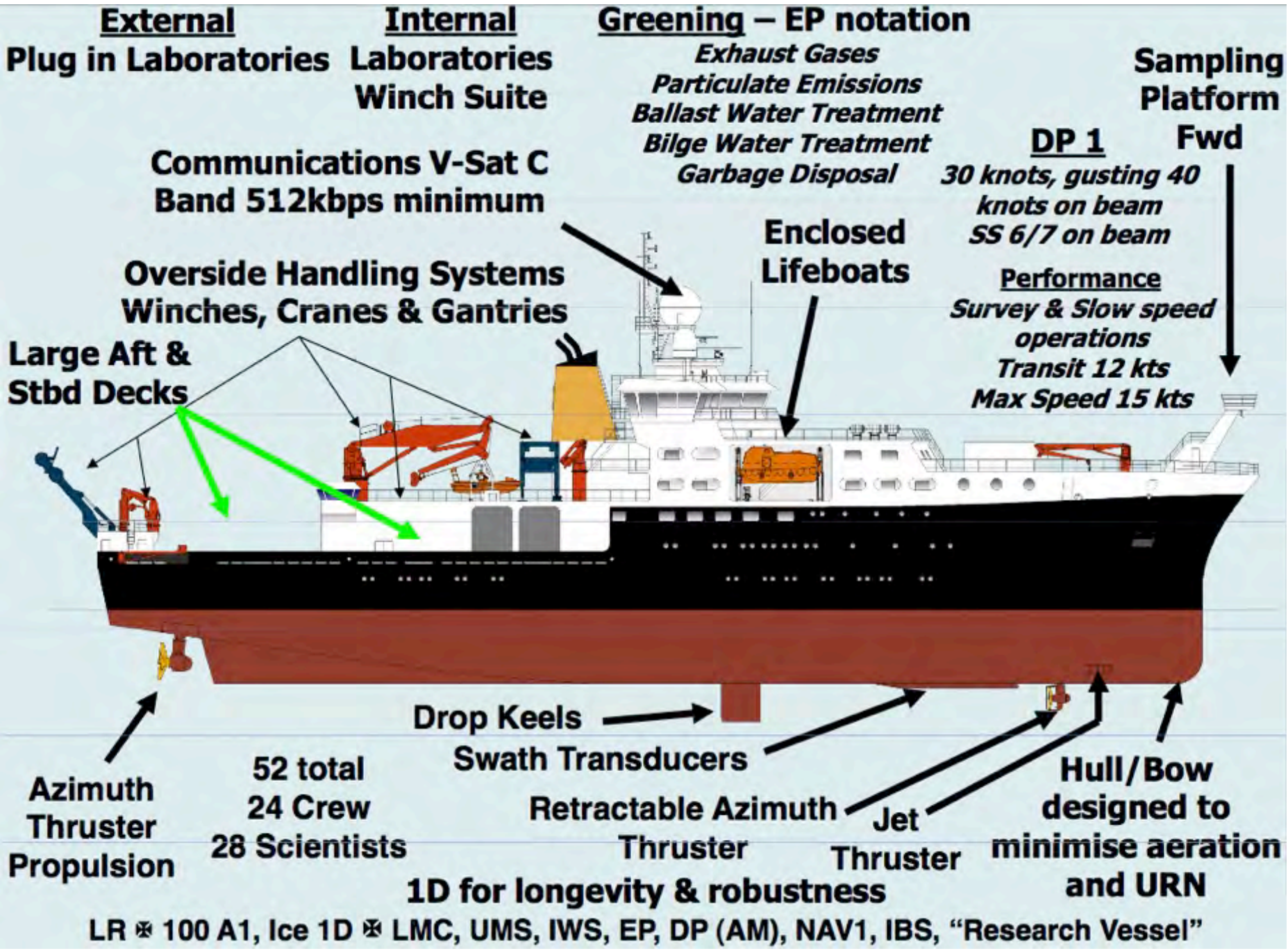
Discovery replacement

RRS James Cook

- Delivered 2006 (replaced RRS Charles Darwin)
- Length 89 m, draft 5.6 m
- Noise reduction, DP
- Fully capable for seismic surveys, ROV deployment, etc

RRS Discovery replacement

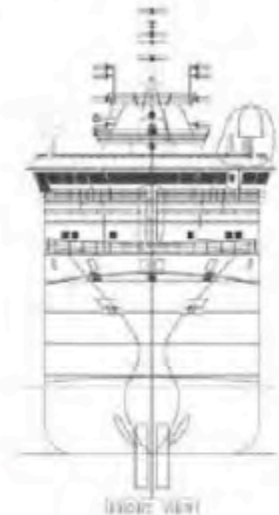
- Delivery June, 2013
- Total cost £75M
- Length: 99.7 m, draft 6.5 m
- Updated hydro-acoustics (with improved noise reduction), dynamic positioning
- Capable of ROV deployment
- Seismic surveys



RRS James Cook / Discovery Replacement Comparison

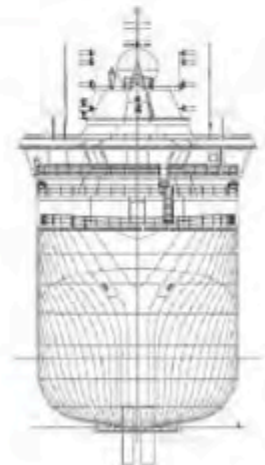
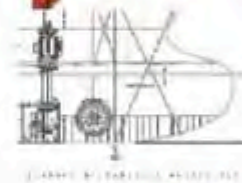
James Cook:

**L 89.5m; B 18.6m; D 5.5 – 5.7m;
Displacement 5800 T**



Discovery:

**L 99.7m; B 18.0m; 6.5m;
Displacement 6075 T**



National Marine Equipment Pool

- NERC managed and developed UK equipment for marine deployment, based at NOCS (supplemented by University/Institution owned and managed equipment)

Examples:

- **Deep Platforms** (includes ISIS ROV, deep-towed sidescan sonar (TOBI 2), guided benthic sampler (HYBIS), deep towed high res camera platform (SHRIMP))
- **Autonomous and robotic systems** (Autosub6000, Autosub Long Range)
- **Seismic systems** – a collaboration between UK and CSIC Spain: array of airguns + 2x 3000 m Sercel SEAL streamer
- **Sampling**: piston and multi coring, dredging, etc

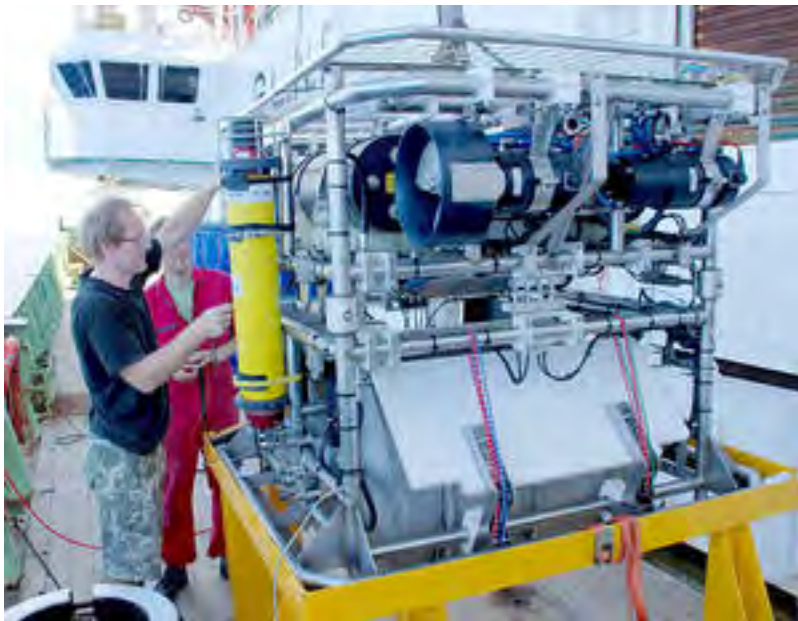
Engineering Development – key part of group, including sensor development



TOBI-2 – 30 kHz deep-towed sidescan, up to 6000 m



SHRIMP – deep towed camera platform, up to 5000 m



HYBIS – interactive benthic grab sampler/instrument deployment, up to 6000 m

Range of AUV's: AUTOSUB – now rated to 6000 m



ISIS + self contained
launch and recovery system
– to 6000 m



Seismometers and Geodesy



Geophysical
Equipment Facility
NATURAL ENVIRONMENT RESEARCH COUNCIL

- Onshore seismometers

- 207× Guralp 3T, 3ESPD, 6TD, 40TD
- 16× high freq units



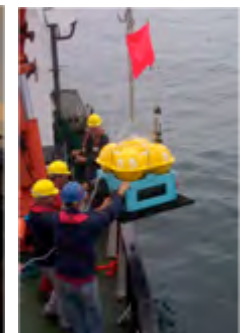
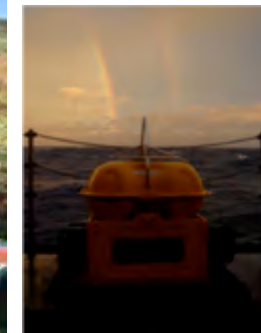
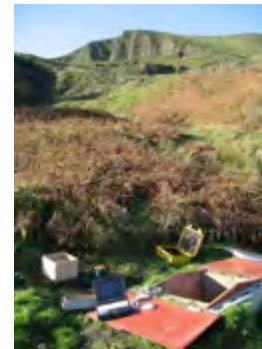
- OBS (operated by OBIF/OBIC)

- 55× 4-cpt seismographs
- 19× configurable for EM



- GPS

- 31× Leica 500/1200



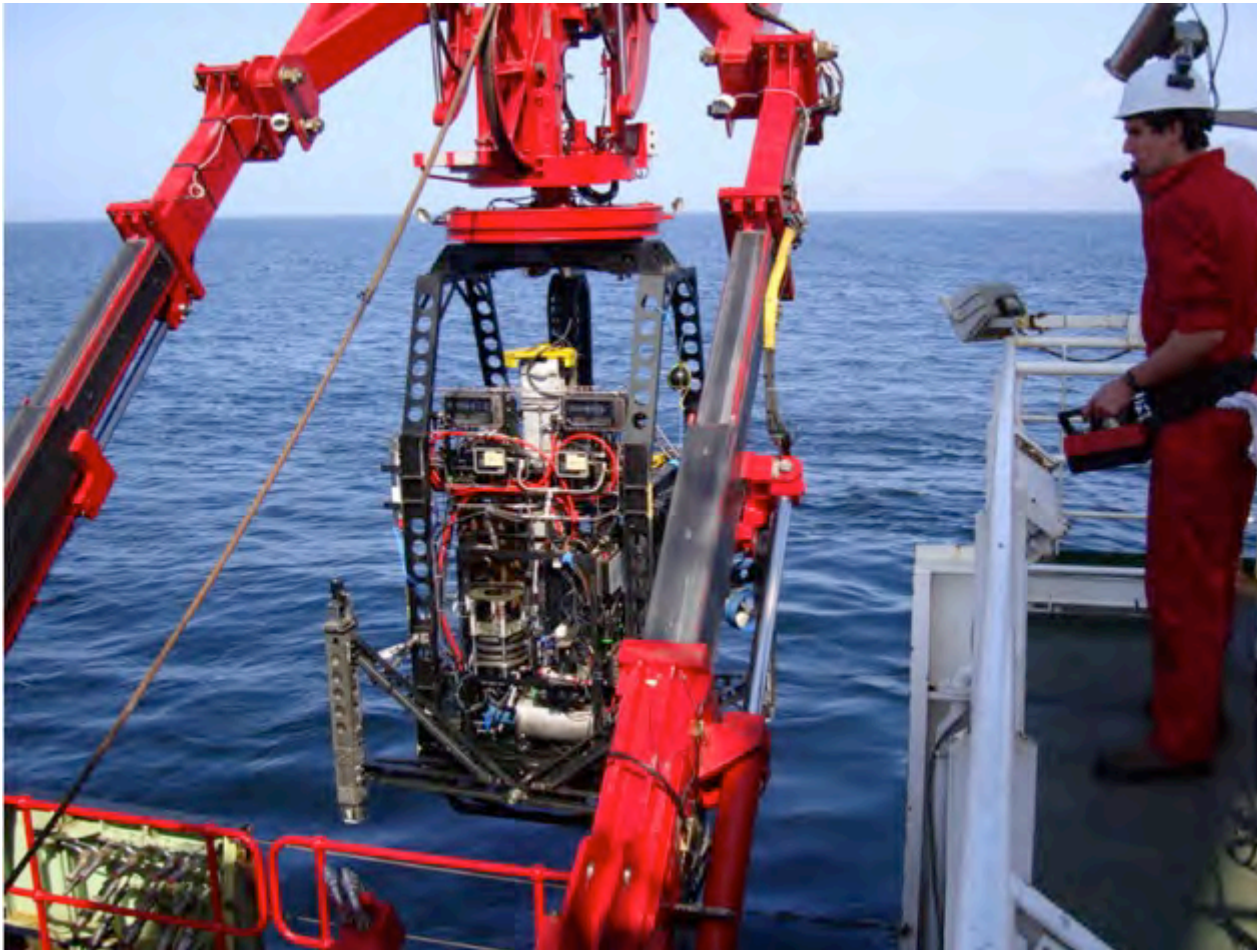
Broadband Ocean Bottom Seismology for the UK - developments

- ~10-15 instruments. Instruments will have flat velocity response from ~100 Hz to 120 s period-nanometrics trillion compact seismometers.



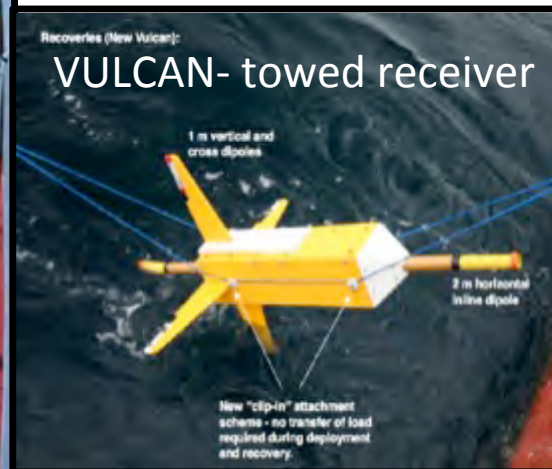
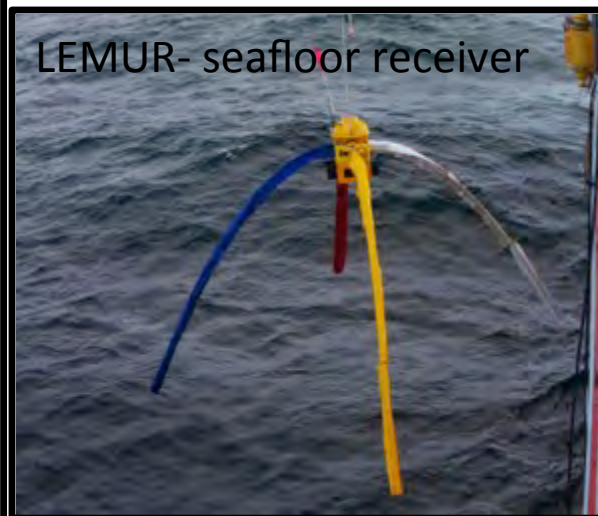
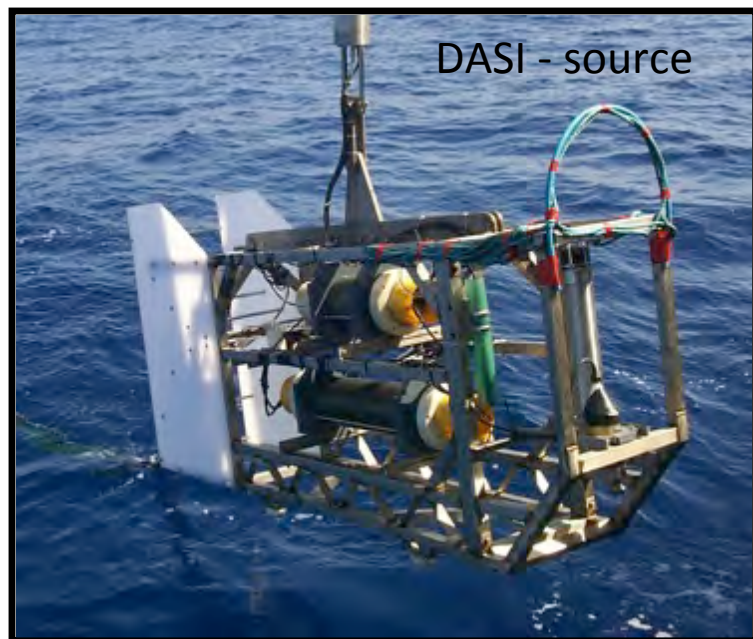
BGS Seabed RockDrill (RD2)

- Coring to 50 m below seafloor, up to 4 km water
- Becoming used as part of IODP MSP platforms



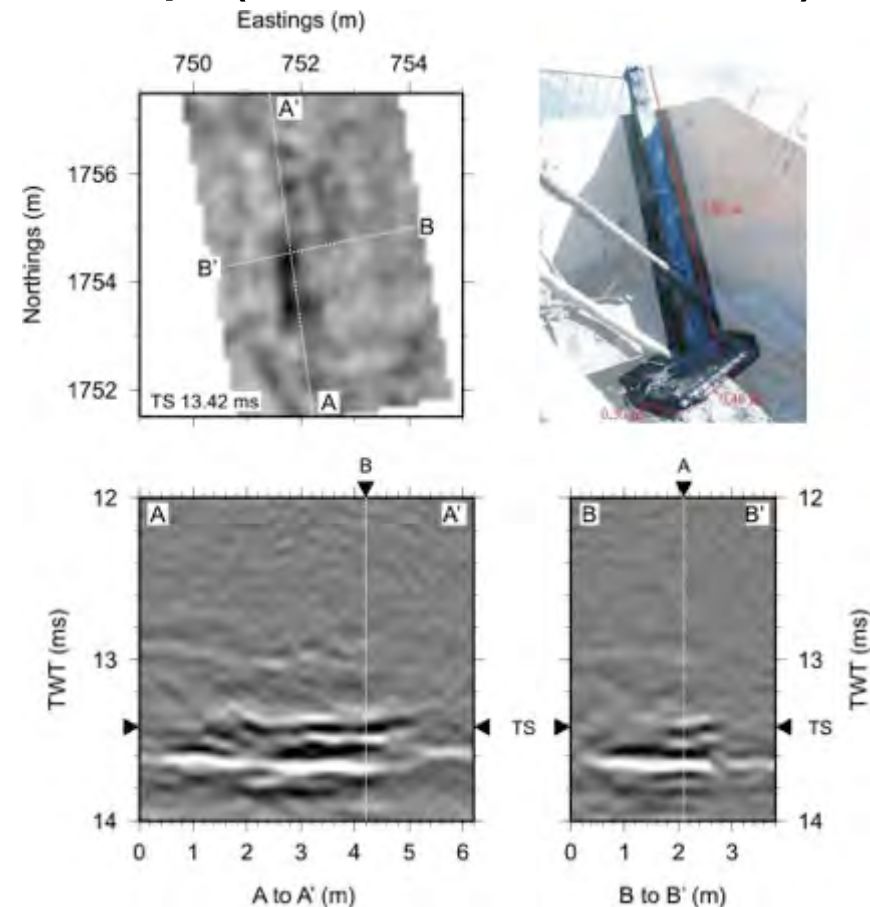
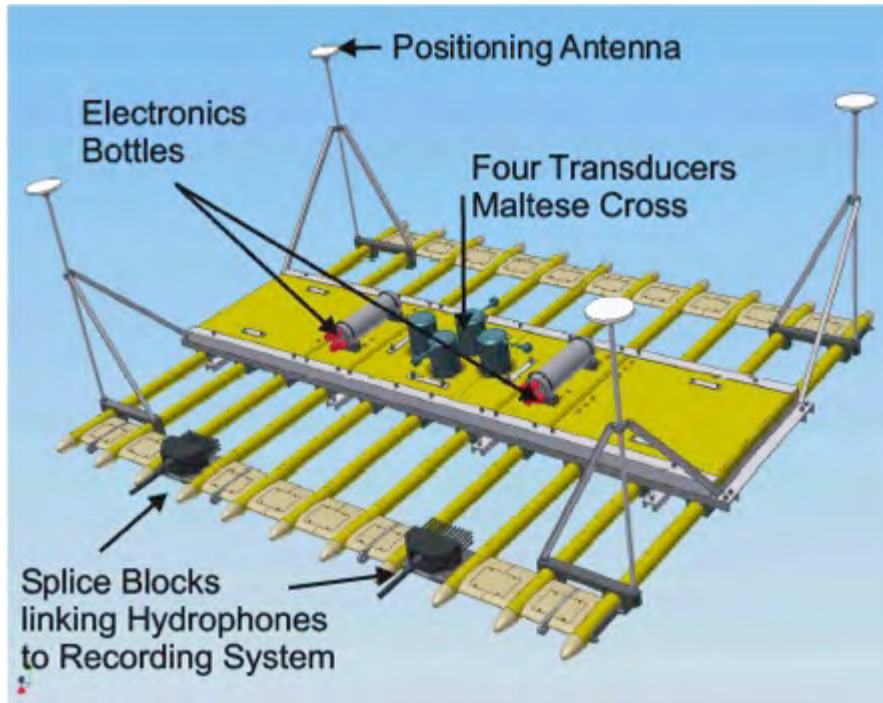
Controlled Source EM (Southampton)

- DASI-2 deep towed source, capable of 100-200 Amp transmission, 0.25-10 Hz frequency range
- Vulcan (Scripps developed) towed receiver, plus seabed receivers
- Range of depths of sub-bottom resistivity profiling, so targets from shallow hydrates to crustal scale magmatic and hydrothermal processes at MORs
- Contacts: Martin Sinha; Karen Weitemeyer



High resolution seismic and bathymetric methods (Southampton)

- Boomer and sparker source plus streamer
- Chirp source, including 3D Chirp (contact: Jon Bull)



- 4 central transducers (1.5 - 13.0 kHz)
- 60 hydrophone groups in 25 cm by 25 cm grid
- Samples reflected waveform in true 3D at horizontal resolution of 12.5 cm