European Consortium for Ocean Research Drilling

ANNUAL REPORT 2024/25

From 2003 to 2013, the European Consortium for Ocean Research drilling (ECORD) was part of the Integrated Ocean Drilling Program (IODP-1 2003-2013), which became the International Ocean Discovery Program in October 2013.

ECORD coordinated the European contribution to the programme through the mission-specific platform (MSP) concept, which allowed the ocean research community to work in technically challenging conditions where the US drillship *JOIDES Resolution* and the Japanese drilling vessel *Chikyu* are unable to operate. The development of the MSP concept has therefore added a new dimension to ocean drilling.

The ECORD Science Operator (ESO) consortium has successfully managed five MSP expeditions for IODP-1 to the Arctic (2004), Tahiti (2005), New Jersey (2009), the Great Barrier Reef (2010), and the Baltic Sea (2013). ECORD's scientific and operational accomplishments have been prolific and of high quality, and are recognised by our global partners as a crucial contribution to the largest marine geosciences programme in the world.

The International Ocean Discovery Program (IODP-2), which started on 1 October 2013, builds on this legacy and addresses global challenges facing current and future generations with new research approaches, expanded scientific communities and continued development of its unique collaborative model.

ECORD funds and implements MSP operations for IODP as an independent platform provider, with the aim to carry out high-profile expeditions and to maintain the implementation of one expedition per year if funding allows for the duration of the 2013-2023 programme. MSPs might include specifically outfitted polar vessels, jack-up rigs, geotechnical vessels, seabed-drilling systems, long-piston coring, anchored barges and others, as determined by scientific priorities and operational efficiency. From 2015 to 2021, ESO has successfully managed four expeditions to the Atlantis Massif, the Chicxulub Impact Crater, the Rift of Corinth and the Japan Trench Paleoseismology.

ECORD makes financial contributions to the US National Science Foundation (NSF) and to the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) for support and access to the *JOIDES Resolution* and the *Chikyu* respectively. Members of ECORD can therefore take part in all IODP expeditions that address research topics such as climate and ocean change, biodiversity, sub-seafloor life, origin of life, natural hazards on human time scales, as well as the internal structure and dynamics of our Planet.

Front cover: OnshoreoOperations activities during IODP³ - NSF Expedition 501. Credit: Diekamp@ECORD_IODP3_NSF.
Published by the ECORD Managing Agency (EMA) - June 2026.
Layout and design: Nicole Beneventi (EMA Outreach Officer).
www.ecord.org

European Consortium for Ocean Research Drilling

ECORD Annual Report 2024/2025

1 January 2024 - 31 December 2025

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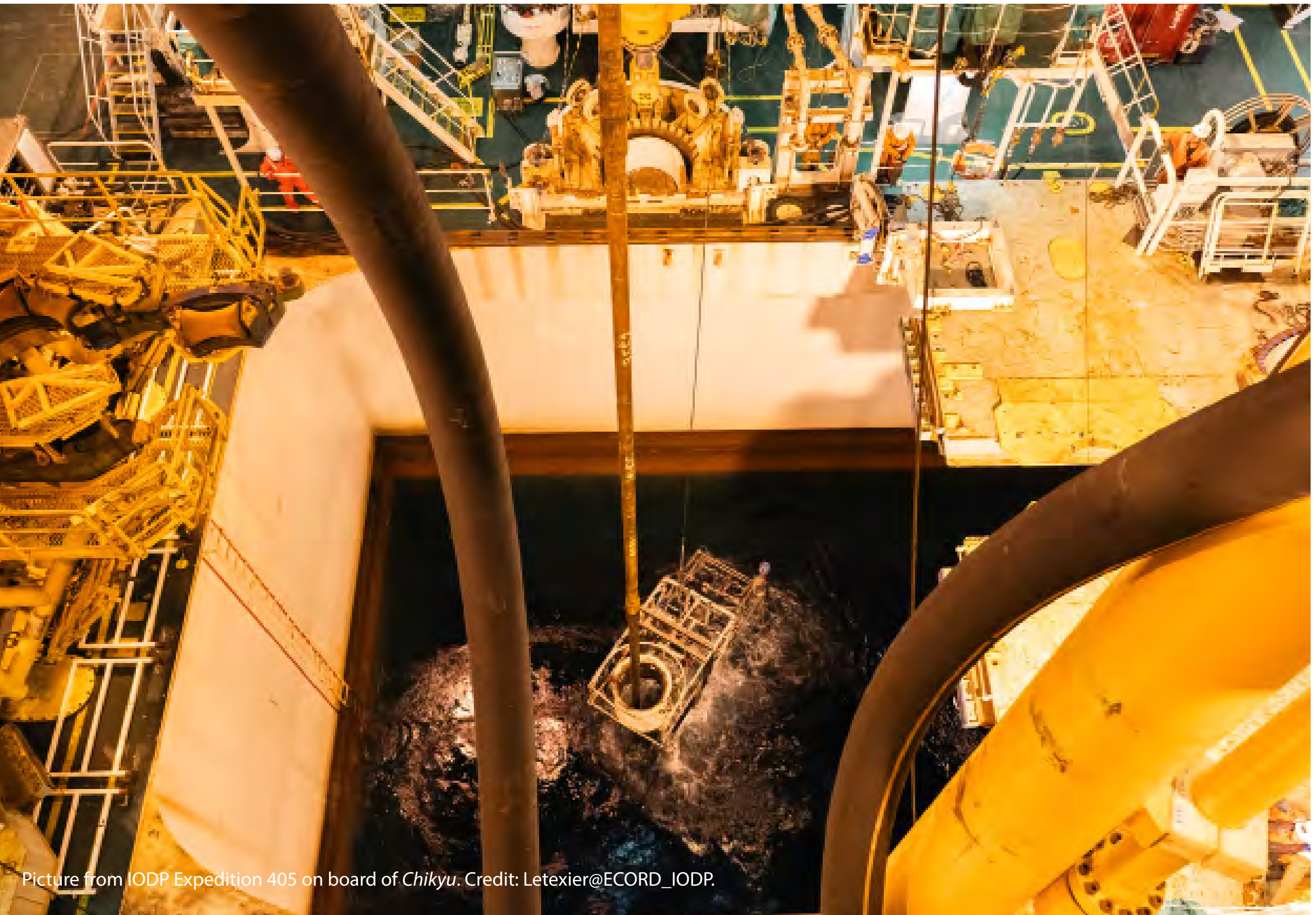
I. ECORD entities

European Consortium for Ocean Research Drilling

ECORD entities in the International Ocean Discovery Program and the International Ocean Drilling Programme

As defined in the 2019-2023 ECORD Memorandum of Understanding, ECORD includes five entities (ECORD Council, ECORD Managing Agency - EMA, ECORD Facility Board - EFB, ECORD Science Operator - ESO, ECORD Science Support and Advisory Committee - ESSAC), two task forces (ECORD Vision Task Force - EVTF and ECORD Outreach Task Force - EOTF) and a workshop programme (MagellanPlus Workshop Series Programme).

As defined in the 2025-2029 ECORD Agreement, ECORD includes five entities: ECORD Council, ECORD Managing Agency - EMA, ECORD Science Operator - ESO, ECORD Science Support and Advisory Committee - ESSAC and the ECORD Financial Committee - EFC.



Picture from IODP Expedition 405 on board of *Chikyu*. Credit: Letexier@ECORD_IODP.

ECORD Council

www.ecord.org/about-ecord/management-structure/council/

The **ECORD Council** is the funding entity for ECORD and provides oversight for all ECORD activities.

The ECORD Council in the International Ocean Discovery Program

Chair: Annalisa Iadanza (Italy; 1 January to 31 December 2024)

Outgoing Vice-Chair: France Lagroix (France; 1 January to 30 June 2024)

Incoming Vice-Chair: Michael Webb (UK; 1 July to 31 December 2024)

Council Core Group
- **Michael Webb** (UK)
- **France Lagroix** (France)
- **Guido Lüniger** (Germany)
- **Tomas Andersson** (Sweden)
- **Annalisa Iadanza** (Italy)

Annalisa Iadanza
ECORD Council Chair 2024

Annalisa Iadanza is a Senior Scientific Officer and Programme Manager at the Department of Earth System Sciences and Environmental Technologies, National Research Council (CNR-DSSTTA). She heads Departmental Communication and Outreach, serves as the national representative for the ECORD-IODP[3] programme and the Belmont Forum international partnership, and provides strategic support to departmental geoscience initiatives. She earned a PhD in Environmental and Resource Geology in 2011 and then completed a postdoctoral position in Sedimentology at the University of Roma Tre in 2014. From 2015 to 2022, she acted as the IODP-Italy scientific secretariat and has been a member of the ECORD Council since 2020.

The ECORD Council in the International Ocean Drilling Programme

Chair: Michael Webb (UK; 1 January to 31 December 2025)

Outgoing Vice-Chair: Annalisa Iadanza (Italy; 1 January to 30 June 2025)

Incoming Vice-Chair: Guido Lüniger (Germany; 1 July to 31 December 2025)

Mike Webb
ECORD Council Chair 2025

Mike Webb is the Head of Marine Research at the UK's Natural Environment Research Council (NERC). He is responsible for developing and delivering large marine research programmes, and overseeing the programming of NERC's research ships and marine facilities. Before joining NERC in 1999, he did a coastal oceanography PhD at the University of East Anglia, followed by a postdoc at the University of Cambridge. Mike has been a member of the ECORD Council since 2009.

EMA (ECORD Managing Agency)

www.ecord.org/about-ecord/management-structure/ema/

Director	**Gilbert Camoin** (CEREGE, France)
Assistant Director	**Nadine Hallmann** (CEREGE, France)
Outreach Officer	**Malgo Bednarz** (CEREGE, France) in 2024; **Nicole Beneventi** (CEREGE, France) in 2025
Administrator	**Patricia Rieu** (CEREGE, France)

ECORD Managing Agency

EMA is the management body of ECORD. EMA is in charge of the management of the ECORD budget and the contracts with the ECORD partners, the representation of ECORD in all IODP entities and the link between these entities and the ECORD members.

Gilbert Camoin
EMA Director

Gilbert Camoin, PhD, DSc, is a senior research scientist at the CNRS (Centre National de la Recherche Scientifique) and works currently at the CEREGE (Centre Européen de Recherche et d'Enseignement de Géosciences de l'Environnement) in Aix-en-Provence, France. His major research activities are mainly focused on the records of sea-level, environmental and climatic changes by coral reefs and other carbonate systems. He has authored more than 150 peer-reviewed papers and supervised 11 PhD students and eight post-docs. Gilbert sailed on ODP Leg 144 and several other cruises, was then lead PI of Proposal 519 (Tahiti and Great Barrier Reef drilling) and Co-chief Scientist on IODP Expedition 310. He served as Chair of the ODP/IODP-1 Environment Science Steering Evaluation Panel (2001-2005), Chair of the ECORD Science Support and Advisory Committee - ESSAC - (2007-2009), Member of the IODP-1 Science Planning Committee (2007-2010), and Member of the IODP-2 Science Plan Writing Committee (2010-2011). He was appointed as Director of the ECORD Managing Agency in January 2012.

ESSAC (ECORD Science Support and Advisory Committee)

www.ecord.org/about-ecord/management-structure/essac/

ECORD Science Support and Advisory Committee

ESSAC is the ECORD science committee and is responsible for the scientific planning and coordination of ECORD's contribution to IODP. ESSAC aims at maximising the scientific and technological contribution of ECORD to IODP, as well as promoting appropriate representation of the ECORD scientific community in the IODP Science Advisory Structure.

	ESSAC in IODP	ESSAC in IODP^3
Chair	**Angelo Camerlenghi** (OGS Trieste, Italy; 1 January to 31 December 2024)	**Angelo Camerlenghi** (OGS Trieste, Italy; 1 January to 31 December 2025)
Outgoing Vice-Chair	**Antony Morris** (Plymouth University, UK; 1 January to 30 June 2024)	
Vice-Chair	**Carlota Escutia** (Spain; 1 July to 31 December 2024)	**Matt O'Regan** (Stockholm University, Sweden; 1 January to 31 December 2025)
Science Coordinator	**Hanno Kinkel** (OGS Trieste, Italy)	**Hanno Kinkel** (OGS Trieste, Italy)

ESSAC (ECORD Science Support and Advisory Committee)

Angelo Camerlenghi
ESSAC Chair

Angelo Camerlenghi, PhD, is a senior research scientist at the National Institute of Oceanography and Applied Geophysics – OGS based in Trieste, Italy. His research is in the field of geological oceanography, addressing ocean margins evolution, fluid flow and gas hydrates, and recently the Mediterranean salt giant. He has led several international projects and research cruises worldwide and is author of 136 scientific publications listed in Scopus.

Angelo sailed on ODP Leg 117 (Indian Ocean) as technician while a MS student at Texas A&M University, on ODP Leg 146 (Cascadia Margin) as sedimentologist, and on ODP Leg 178 (Sea-Level Change and Glacial History, Antarctic Peninsula) as co-chief scientist. He was the lead proponent of the Eastern Mediterranean drilling (ODP Leg 160) and is now leading the IODP Multiple Platform Drilling Proposal Uncovering a Salt Giant. He served as member of the Site Survey Panel (1992-95), Italian Delegate in ESSAC (2004-2005) and member of the Steering Committee of the IODP-IMI Workshop on Geohazards, Portland, Oregon in 2007. He is ESSAC Chair since January 1st 2022.

Working with the glove bag, Expedition 501. Credit: Stewart@ECORD_IODP3_NSF.

ESO (ECORD Science Operator)

www.ecord.org/about-ecord/management-structure/eso/

ESO is the implementing organisation of ECORD and is tasked with planning and delivering mission-specific platform (MSP) expeditions for the International Ocean Discovery Program (IODP). ESO is a consortium of three European scientific institutions: the British Geological Survey (BGS); the MARUM – Center for Marine Environmental Sciences, University of Bremen, Germany; and the European Petrophysics Consortium (EPC). Each partner contributes specific expertise to ESO, allowing the consortium to build tailored expeditions to suit the requirements of proposals selected for implementation by the ECORD Facility Board. BGS coordinates proposal scoping, expedition planning and project management, contracting of drilling services and vessels, operational oversight, and project permitting. MARUM manages the curation services and scientific facilities required by MSPs, provides data management services, and coordinates the implementation of the Onshore Science Party, hosted at the IODP Bremen Core Repository and laboratories of the University of Bremen. EPC comprises two European universities: University of Leicester (UK, lead partner) and University of Montpellier (France). The consortium provides operational, technical and high-level scientific support for MSP expeditions. EPC is part of the International Scientific Logging Consortium which provides staff for IODP non-riser expeditions.

David McInroy
ESO Science Manager

David McInroy is Team Leader for Ocean Geoscience at the British Geological Survey in Edinburgh, UK, and is tasked with progressing deep sea geoscientific research within the BGS Marine Geoscience Directorate. David is a geologist and geophysicist with a research background in the evolution and hydrocarbon prospectivity of the UK's Atlantic Margin, and has participated in geophysical data acquisition cruises on the UK's continental shelf. From 2003-2010, David was Expedition Project Manager for IODP Expeditions 302, 310 and 313, and since 2010 has held the role of ESO Science Manager.

British Geological Survey (BGS), UK	
Science Manager / Outreach Manager	**David McInroy**
Operations Manager	**Leonardo Barbosa**
Operations Support	**Grant Affleck**
Expedition Project Managers	**Jeremy Everest Hannah Grant Margaret Stewart Raushan Arnhardt**
Data Manager	**Mary Mowat**
IT Support	**Alan Douglas Julian Gray**
MARUM, Germany	
Curation and Laboratory Manager	**Ursula Röhl**
Assistant Laboratory Manager	**Patrizia Geprägs**
Curatorial Scientists	**Holger Kuhlmann**
Curatorial Technicians	**Janine Migge Nina Rohlfs**
Media Relations	**Ulrike Prange**
Data Management	**Vera Bender**
Geochemists	**Luzie Schnieders Chang Liu**
Petrophysics Technician	**Vera Lukies**
IT specialisst	**Oliver Blasczczyk Caroline Daniel**
University of Leicester, UK	
EPC Manager	**Sarah Davies**
EPC Project Manager	**Benjamin Palmer**
Petrophysics Staff Scientists	**Tim van Peer Marisa Rydzy Andrew McIntyre**
University of Montpellier, France	
Petrophysics Staff Scientist	**Johanna Lofi Erwan Le Ber Laurent Brun**

EFB (ECORD Facility Board)

www.ecord.org/about-ecord/management-structure/efb/

EFB is the key planning forum for MSP expeditions and is responsible for scheduling drilling proposals and for advising on the long-term planning of ECORD's activities and functions, through operational and management oversight of MSP expeditions. EFB is composed of a Science Board, the ECORD Vision Task Force (EVTF) and partners' representatives (NSF and MEXT). Since 2025 the Facility Board is an IODP³ entity: see section 11 for the MSP-Facility Board.

Chair	**Alexandra Turchyn** (University of Cambridgel, UK)
Members of the Science Board	**Gabriele Uenzelmann-Neben** (AWI, Germany) **Michele Rebesco** (OGS, Italy) **Beth Christensen** (Rowan University, USA) **Yasuhiro Yamada** (Kyushu University, Japan) **Jody Webster** (University of Sydney, Australia)

Sasha Turchyn
ECORD Facility Board Chair

Sasha Turchyn is a Professor of Geochemistry in the Department of Earth Sciences at the University of Cambridge, in Cambridge, England. At its broadest level her research focuses on the processes that bring carbon to and from the surface in the carbon cycle. This includes studies of biogeochemistry and geomicrobiology of marine sedimentary environments, studies of hydrothermal circulation and its role in the carbon cycle, volcanic carbon and sulfur fluxes, and paleoceanographic studies to understand how these processes change over time. After university, Sasha worked as a field engineer in the oil industry on offshore platforms in the North Sea before returning to get her PhD. She has built her career using legacy assets including core samples and porefluid samples, as well as leveraging existing data acquired through DSDP/ODP/IODP with numerical models. Sasha has published over 120 papers and was awarded the Berner Lecture (EAG), the Dansgaard Award (AGU) and the Pilkington Prize for teaching excellence (Cambridge). Sasha joined the EFB science board in January 2020 and was appointed chair in January 2023.

EVTF (ECORD Vision Task Force)

The **EVTF** is the ECORD strategic entity in charge of developing a long-term scientific and funding strategy, and monitoring the ECORD progress toward the completion of the IODP Science Plan. The EVTF is composed of the ECORD Council Core Group, including the ECORD Council Chair and Vice-Chair, the ESSAC Chair, the EMA Director and Assistant Director and the ESO Science Manager.

Since 2025 the Vision Task Force is an IODP³ entity: see section 11 for the Vision Task Force - VTF.

EOTF (ECORD Outreach Task Force)

The **EOTF** coordinates ECORD communication tasks, such as outreach/public information and educational activities related to IODP in ECORD countries. The EOTF is composed of the EMA Outreach Officer (Chair) and Assistant Director, the ESO Outreach and Media Relations Managers and the ESSAC Science Coordinator. The EMA Director and the ESSAC Chair act as observers. Since 2025 the ECORD Outreach Task Force is an IODP³ entity: see section 11 for the Communication Task Force - CTF.

MG+ (MagellanPlus Workshop Series)

www.ecord.org/science/magellanplus/

The **MagellanPlus Workshop Series Programme** is designed to support ECORD scientists in developing new and innovative science proposals to meet the challenges of the IODP Science Plan and the 2050 Science Framework. This programme is co-funded by ECORD and the International

EFC (ECORD Financial Committee) in IODP³

EFC provides advice and guidance to the ECORD Council on the ECORD financial issues and budget follow up.
Members of the EFC: Myriam Stephanus (CNRS, France), Ana Amorim (FCT, Portugal), Jessica Surma (NERC, UK)

ECORD and IODP³ meetings and conferences

The table on the next page summarizes the ECORD and IODP/IODP³ meetings that have been held in 2024 and 2025, as well as the two major conferences (EGU in Vienna and AGU in New Orleans) where IODP/IODP³-related sessions and booths have been organized.

ECORD Council meetings

The **ECORD Council** meets twice a year: a spring meeting involving the members of the ECORD Council and of the EVTF, and a fall meeting jointly with ESSAC involving representatives of all ECORD entities as well as representatives from other ECORD entities, IODP/IODP³ partners (funding agencies, operators and science committees), IODP/IODP³ liaisons and collaborating science programmes.

EOTF meetings

The **ECORD Outreach Task Force (EOTF)** meets twice a year, in February/March and in fall; additional meetings are held as appropriate. Outreach liaisons from IODP partners and ICDP usually attend the EOTF meetings.

ESSAC meetings

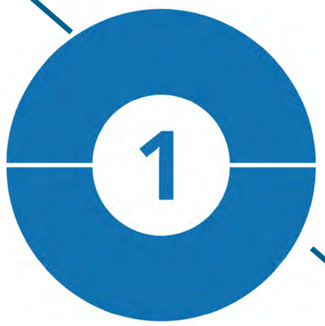
The **ECORD Science Support and Advisory Committee (ESSAC)** meets twice a year: a spring meeting involving ESSAC Delegates and EMA and ESO representatives, and a fall meeting jointly with the ECORD Council.

EVTF meeting

The **ECORD Vision Task Force (EVTF)** meets twice a year, immediately prior to the annual meeting of the EFB and the ECORD Council-ESSAC joint meeting. Additional meetings are held as appropriate.

EFC meeting

The **ECORD Financial Committee (EFC)** has been established in 2025 and meets at least once a year. The EFC is composed of one representative of each of the three major contributing members and two additional members of ECORD.



EFB meeting

The **ECORD Facility Board (EFB)** meets once a year. Liaisons from ECORD entities and representatives from IODP partners (funding agencies, operators and science committees) attend the EFB meetings.

ECORD representatives at IODP meetings

ECORD representatives act as members and/or liaisons to meetings of IODP entities:

- the *JOIDES Resolution* Facility Board (JRFB),
- the *Chikyu* IODP Board (CIB),
- the Science Evaluation Panel (SEP),
- the Environmental Protection and Safety Panel (EPSP),
- the IODP Forum.

See chapter 11 for ECORD participation on panels of the International Ocean Discovery Program.

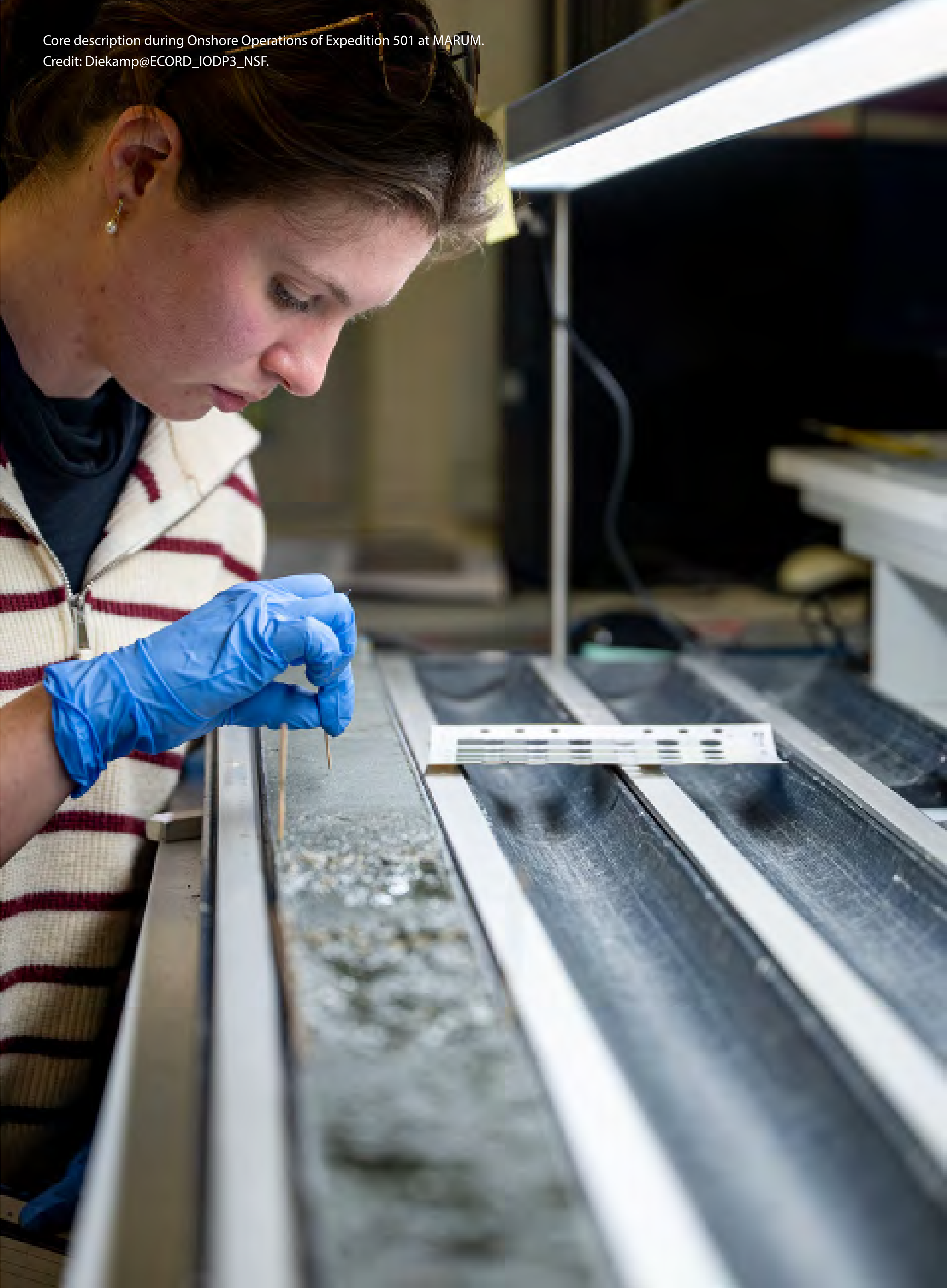
ECORD representatives at IODP³ meetings

ECORD representatives act as members and/or liaisons to meetings of IODP³ entities:

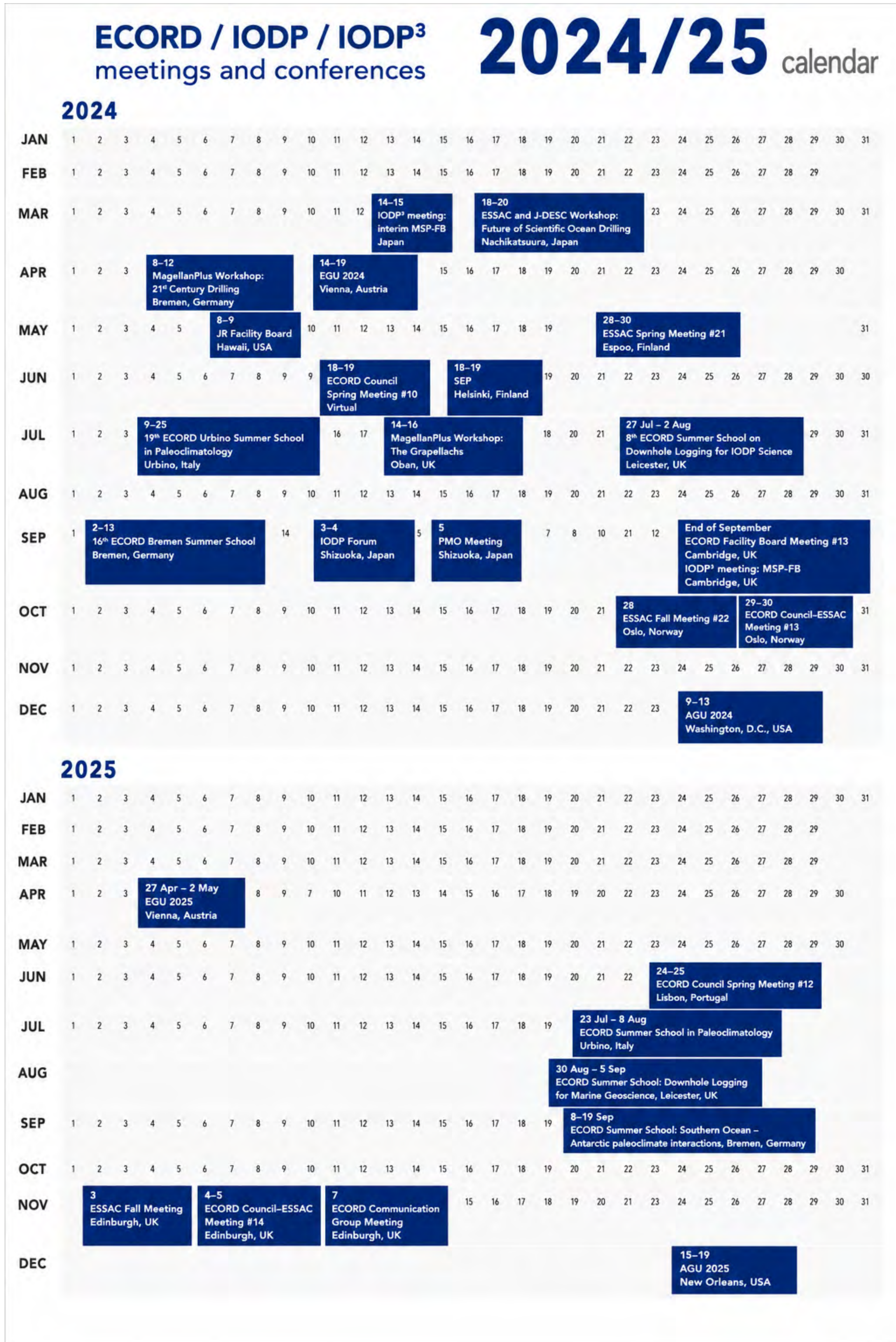
- the Mission Specific Platform-Facility Board (MSP-FB),
- the IODP³ Executive Board,
- the Science Evaluation Panel (SEP),
- the Safety and Environment (SEA) Group,
- the Vision Task Force (VTF),
- the Communication Task Force (CTF),
- the Scientific Drilling Forum.

See chapter 11 for ECORD participation on panels of the International Ocean Drilling Programme.

Picture from IODP Expedition 405 on board of *Chikyu*. Credit: Letexier@ECORD_IODP.



Core description during Onshore Operations of Expedition 501 at MARUM.
Credit: Diekamp@ECORD_IODP3_NSF.



2. FY2024 and 2025 highlights

Credit: Miller@ECORD_IODP.

FY2024 and 2025 highlights

This report concerns the last two years, 2024 and 2025, which have seen major changes regarding the organization of international activities related to scientific ocean drilling.

After decades of unified international programmes, from the Deep-Sea Drilling Project (DSDP) to the International Ocean Discovery Program (IODP-2), the end of IODP on 30 September 2024, has marked an abrupt transition from a single international programme operated by independent platform providers to independent ocean drilling programmes.

Based on its well-established operation, its successful implementation and competitiveness in the international research landscape, the ECORD infrastructure has taken advantage of this new scenario and has initiated a new way of operating scientific ocean drilling while benefiting from its 22 years of experience involving innovations in all fields. ECORD's role, through its ECORD Vision Task Force, which was created at the start of IODP-2, has been instrumental in initiating the International Ocean Drilling Programme ($IODP^3$), which started on January 1st, 2025.

This report therefore provides the opportunity to summarize ECORD's activities in the last unified programme, IODP-2, and to highlight ECORD's roles in defining new concepts and approaches, which have been instrumental in developing a new phase of international scientific ocean drilling.

Since its creation in 2003, ECORD has developed a unique European distributed research infrastructure that connects research facilities at multiple sites across Europe and Canada that are engaged in multidisciplinary aspects of subsurface scientific research and have a longstanding culture of cooperation on science, technology, and education. ECORD's contributions to IODP science have been remarkable during the Integrated Ocean Drilling Program (IODP-1; 2003-2013) and the International Ocean Discovery Program (IODP-2; 2013-2024), especially including its leading role in the submission of drilling proposals concerning all IODP capabilities, its active participation to all IODP expeditions and the introduction of a new concepts and their successful implementation: Mission-Specific Platform (MSP) expeditions using diverse drilling and coring facilities and, more recently, Scientific Projects using Ocean Drilling ARChives (SPARCs) from the start of $IODP^3$.

ECORD combines research, education and innovation and offers a unique portfolio of science and educational activities, world-class capabilities, state-of-the-art technology, and remarkable knowledge-based resources. This portfolio has been significantly enriched since the start of the International Ocean Discovery Program to better serve the European and Canadian Earth and environmental science communities. Based on its well-established operation, its successful implementation and competitiveness in the international research landscape, the ECORD infrastructure has taken advantage of this new scenario and has initiated a new way of operating scientific ocean drilling while benefiting from its 22 years of experience involving innovations in all fields.

On 25 April 2023, ECORD has celebrated its 20th anniversary at the occasion of the General Assembly of the European Geosciences Union that was held in Vienna.

ECORD membership and budget

ECORD's membership in IODP-2 was based on two Memoranda of Agreement covering two successive periods: 2013-2018 and 2019-2023. An addendum to the 2019-2023 ECORD MoU has been signed to extend ECORD's participation through the additional year (2024) of IODP. The number of ECORD members has decreased from 19 to 15 during this programme, following the withdrawal of Belgium, Iceland, Israel and Poland. Finland withdrew its participation after the end of IODP, before the launching of the International Ocean Drilling Programme ($IODP^3$) on January 1st, 2025. ECORD included 14 members at the start of $IODP^3$.

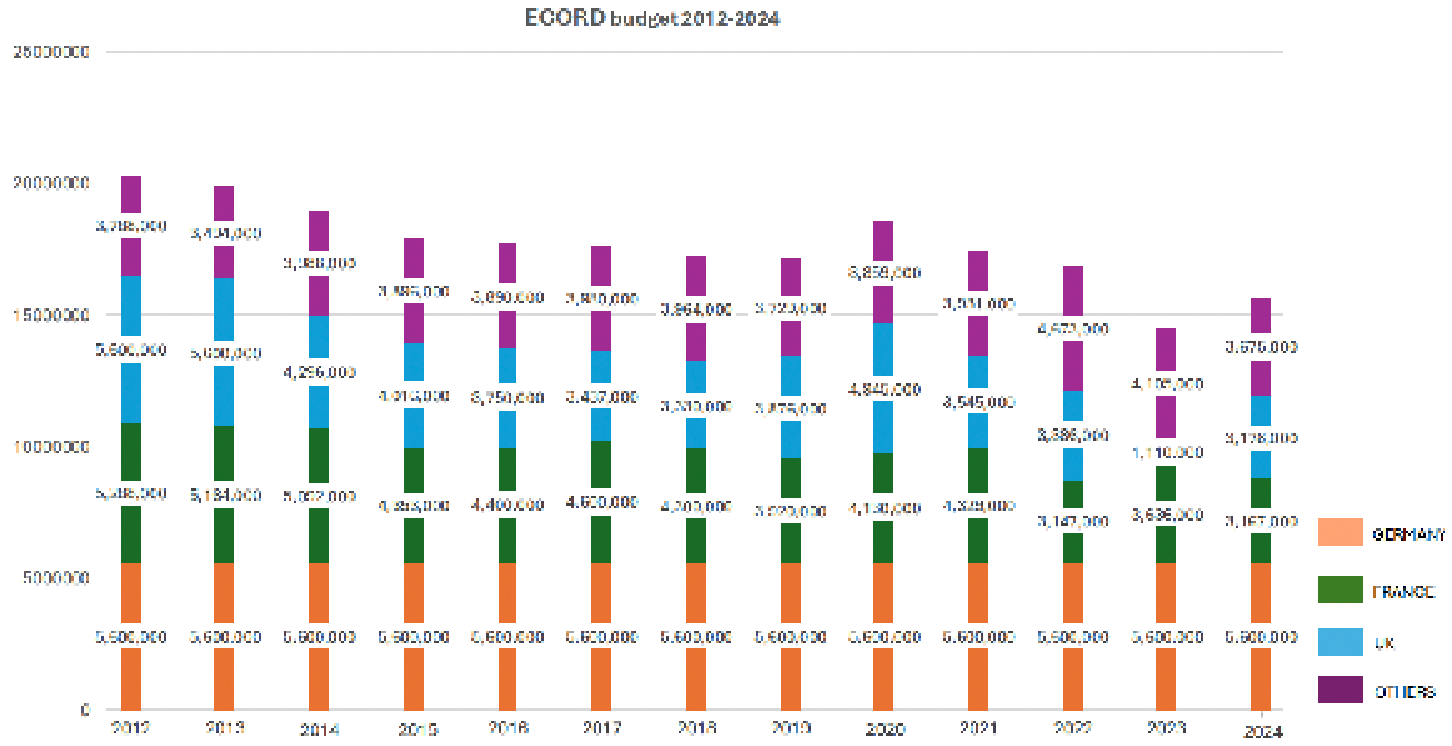
ECORD is funded exclusively by its members. During IODP-2, contributions to the ECORD budget were unevenly distributed between its members, ranging from $80K to $5.6M.

The ECORD budget has been reduced from $20M in 2013 to $15.6M in 2024, largely due to a decrease in contributions from France and the United Kingdom, from $5.6M to $3.18M and $3.17M, respectively (see figures below).

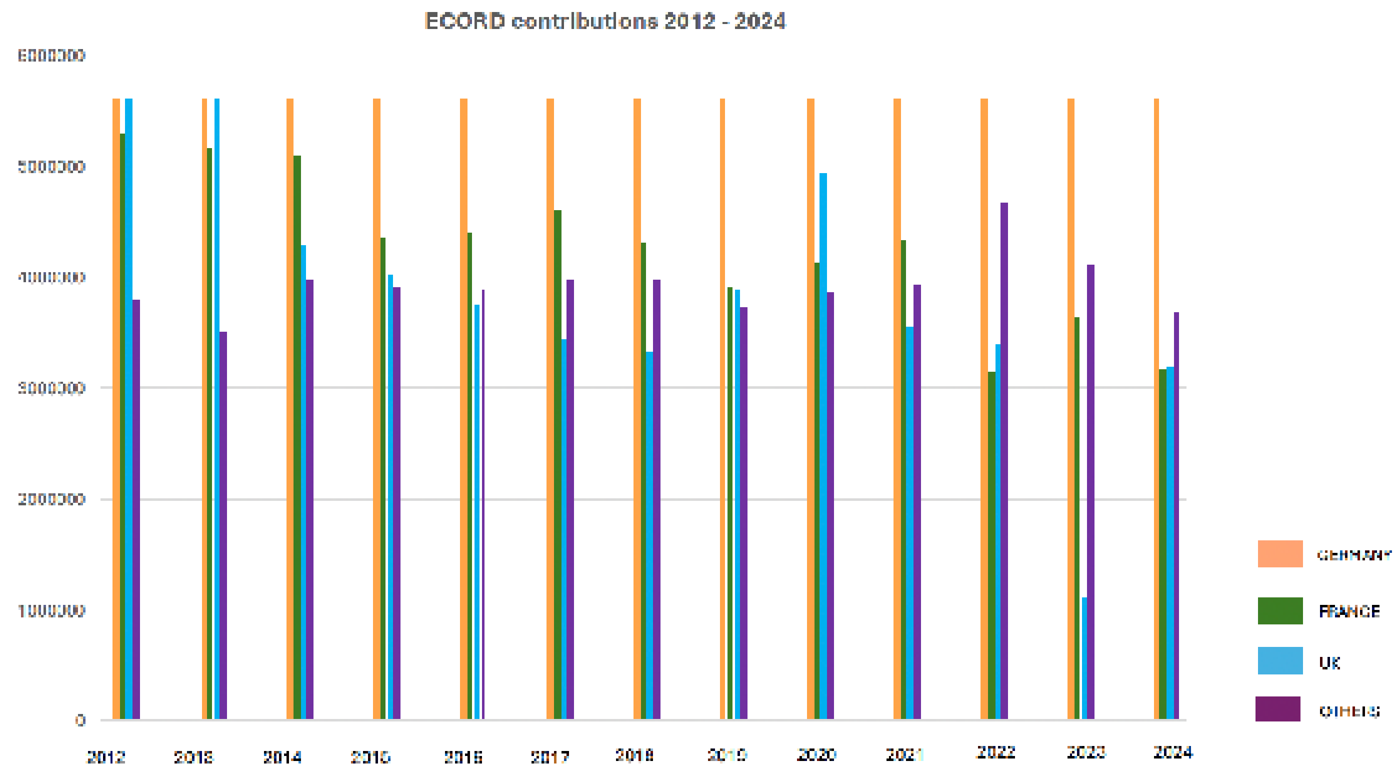
This represents a loss of $4.4M (22%) between 2013 and 2024, without considering average inflation rates of about 20% during that period. ECORD running costs were very stable, amounting to $3.5M, allowing to dedicate about 80% of the ECORD budget to the funding of IODP expeditions.

In 2025, the first year of IODP[3], ECORD members' contributions amounted to €15.5M.

ECORD Budget 2012-2024



ECORD Contributions 2012-2024



Operating and participating to MSP expeditions in IODP-2 and IODP³

Mission-specific platform (MSP) expeditions are ECORD's landmark since 2004 when this concept was first introduced to IODP-1 to "go where no scientific drilling project has gone before" and to tailor offshore expeditions to scientific objectives and environmental constraints.

ECORD became one of the three Platform Providers in IODP-2, which has seen a remarkable development of ECORD's innovative approaches and concepts, especially the MSP concept that was expanded, thus providing the opportunity to drill in very diverse environments (see Section 3). So far, IODP-1 and IODP-2 MSP expeditions rank among the most scientifically productive expeditions, generating more than 600 peer-reviewed publications based on MSP-derived samples and data.

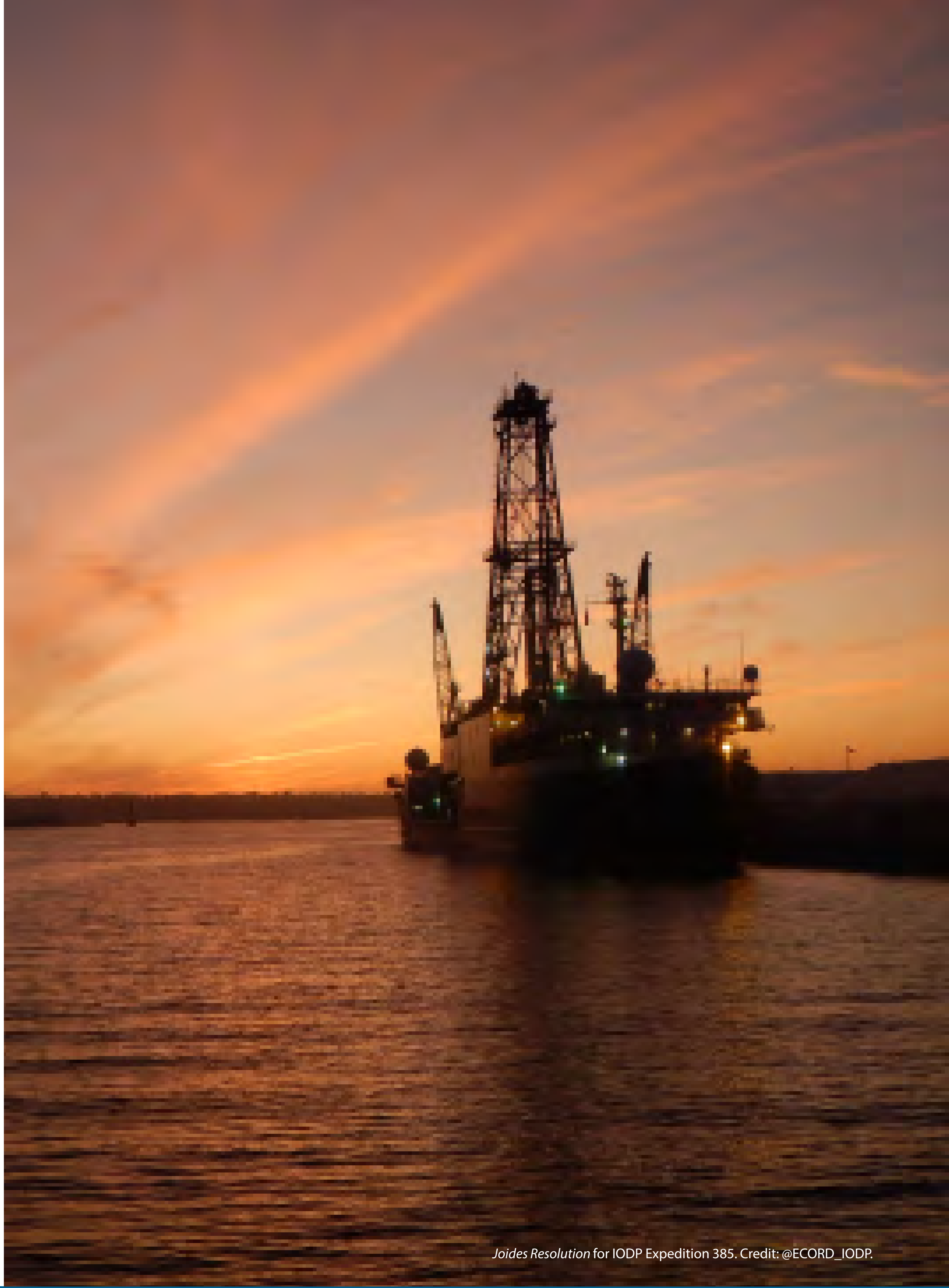
The ECORD Science Operator (ESO) has implemented five MSP expeditions during IODP-2 in five different oceans and seas, from shallow waters of the Yucatan shelf to the ultra-deep hadal depths of the Japan Trench, in water depths ranging from less than 20 m to over 8 km and a wide range of penetrations from less than 40 m to over 1,300 m below seafloor (mbsf).

The IODP Expedition 377: Arctic Ocean Paleoceanography (ArcOP), which was scheduled in 2022, was cancelled due to geopolitical issues. The use of various drilling and coring technologies, including remote seafloor drilling and giant piston coring in addition to offshore heave-compensated and onshore-mining-style wireline coring, allowed to collect just over 3.8 km of high-quality cores from 115 boreholes in various lithologies, from fossil coral reefs to sedimentary sequences overlying an impact crater to highly deformed altered ultramafics.

These MSP expeditions concerned diverse scientific objectives dealing with climate and sea-level changes, deep biosphere, geohazards, impact structures and Earth dynamics. 64 ECORD scientists representing 14 ECORD members, including four Co-Chief scientists participated to IODP-2 MSP expeditions. About half of ECORD scientists were early-career scientists and PhD students.

ESO has implemented in 2025 the first IODP³ expedition: IODP³-NSF Expedition 501: New England Shelf Hydrogeology, which had the objectives to determine the origin and volume of offshore freshwater in the subseafloor of the New England Shelf and to better understand this hydrogeological phenomenon worldwide.

Future IODP³ expedition schedule will partly rely on MSP proposals that currently reside at the IODP³ MSP Facility Board (MSP-FB) and at the Science Evaluation Panel (SEP), including Land-to-Sea Transects to be conducted in conjunction with ICDP (see Section 5). New MSP proposals are expected to be submitted to IODP³ and resulting from MagellanPlus and Magellan³ workshops organized in 2024 and 2025. Scientific objectives of active and upcoming MSP proposals are quite diverse in terms of science topics, drilling and coring systems and geographical areas, thus demonstrating the prominent role that the MSP concept will play in the future to fulfill scientific objectives of the 2050 Science Framework.



Joides Resolution for IODP Expedition 385. Credit: @ECORD_IODP.

Participating to *JOIDES Resolution* and *Chikyu* expeditions

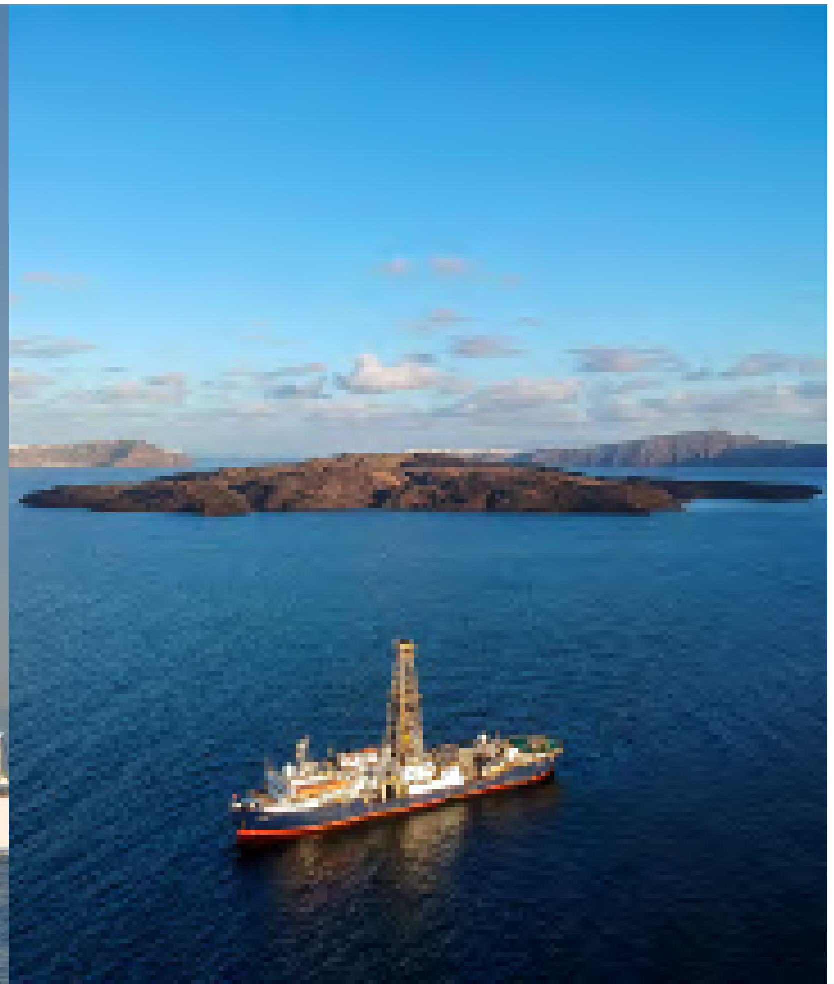
ECORD's partnership with NSF and JAMSTEC in IODP-2 was based on Memoranda of Understanding (MoU) that allowed ECORD scientists to participate to expeditions implemented by the *JOIDES Resolution* (JR) and *Chikyu.*

Forty-six expeditions were implemented by the *JR* and five by *Chikyu* during IODP-2. IODP Expedition 403: Eastern Fram Strait implemented in June to August 2024 has been the last expedition of the *JR* after 29 years of outstanding services for three successive international ocean drilling programmes.

The *JR* has been demobilized soon after, implying the cancellation of IODP Expedition 404: Arctic-Atlantic Gateway Paleoclimate, which was initially scheduled in September and October 2024.

IODP Expedition 405: Japan Trench Tsunamigenesis was implemented by *Chikyu* from September to December 2024 and has been the last IODP expedition.

Three hundred fifty-seven and forty-five ECORD scientists representing 16 ECORD members participated to IODP-2 *JR* and *Chikyu* expeditions, respectively. Forty-three ECORD Co-Chief Scientists were nominated (see Section 4).

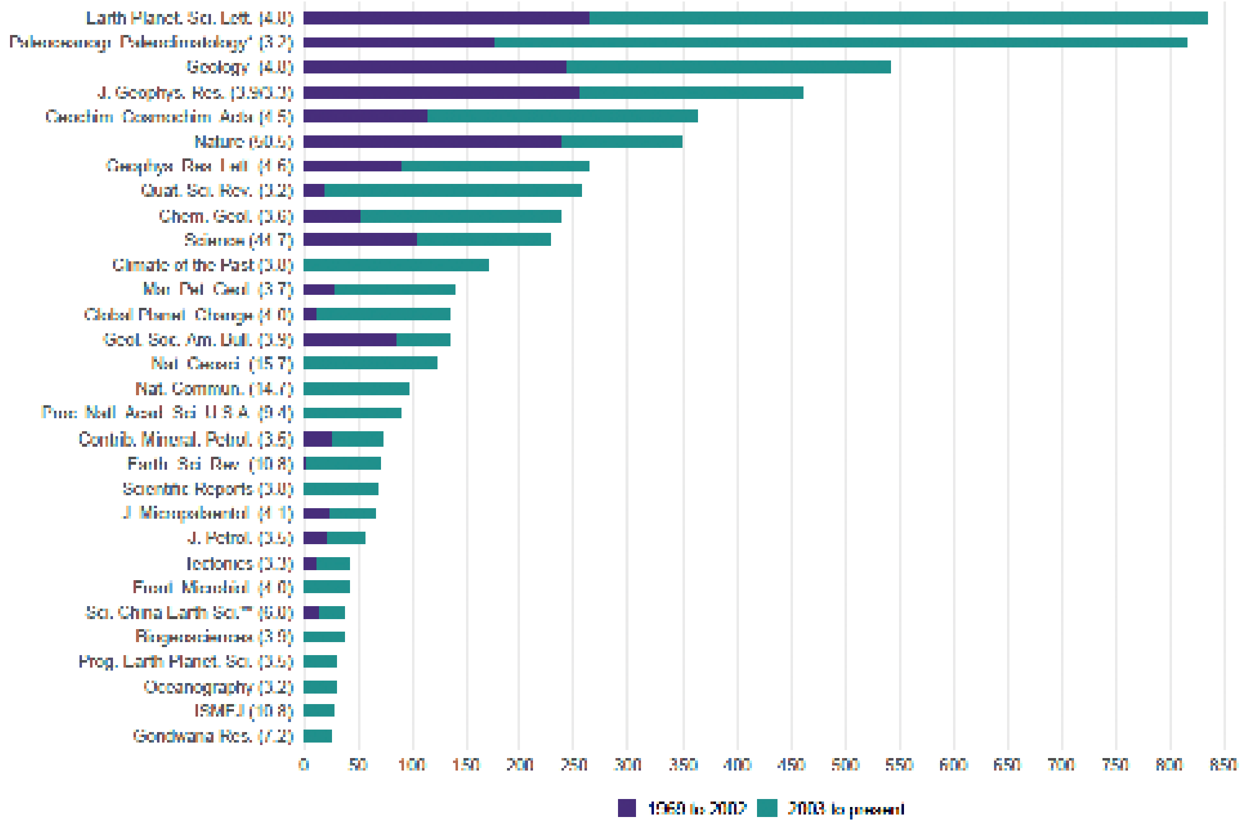


Promoting IODP science

The Scientific Ocean Drilling Bibliographic Database and Publication Impact Report (*http://iodp.tamu.edu/publications/AGI_studies/2023_Pub_Impact.pdf*), which is published annually, monitors the valorization of scientific achievements of successive ocean drilling programmes through publications related to successive ocean drilling programmes from 1969 through June 2024.

A total of 5,852 research papers out of 14,410 Program-related papers that have been published in non-Program publications (~41% of the serial publications in the database) were published in 30 highly ranked peer-reviewed journals, based on the Clarivate Analytics 2023 journal impact factor (See Figure and Table below). This demonstrates the impact of the ocean drilling science and the attractivity exerted by scientific ocean drilling programmes on science community. It must be reminded here that scientists were encouraged to publish post-cruise research results in English language peer-reviewed journals rather than the Program Proceedings volumes since 1996 only.

The figure below includes the highly ranked journals that have published a total of 40 or more research papers related to DSDP and ODP (1969–2002) and IODP (2003–2024). Journal impact factors are shown in parentheses. The following table presents the data behind this graph.



Journal	Journal Impact Factor (2023)	Number of Program-related papers published		
		1969–2002	2003–2024	Total
Nature	50.5	239	109	348
Science	44.7	105	123	228
Nature Geoscience	15.7	0	123	123
Nature Communications	14.7	0	96	96
Earth-Science Reviews	10.8	2	69	71
The ISME Journal	10.8	0	28	28
Proceedings of the National Academy of Sciences of the U.S.A.	9.4	0	90	90
Gondwana Research	7.2	0	26	26S
Science China Earth Sciences	6.0	14	24	38
Earth and Planetary Science Letters	4.8	265	569	834
Geology	4.8	244	297	541
Geophysical Research Letters	4.6	92	173	265
Geochimica et Cosmochimica Acta	4.5	115	248	363
Journal of Micropalaeontology	4.1	24	43	67
Global and Planetary Change	4.0	12	123	135
Frontiers in Microbiology	4.0	0	42	42
Journal of Geophysical Research (Solid Earth, Oceans)	3.9/3.3	255	206	461
Geological Society of America Bullettin	3.9	87	48	135
Biogeosciences	3.9	0	37	37
Climate of the Past	3.8	0	172	172
Scientific Reports	3.8	0	69	69
Marine and Petroleum Geology	3.7	29	111	140
Chemical Geology	3.6	53	184	237
Contributions to Mineralogy and Petrology	3.5	27	45	72
Journal of Petrology	3.5	22	35	57
Progress in Earth and Planetary Science	3.5	0	30	30
Tectonics	3.3	13	30	43
Paleoceanography and Paleoclimatology	3.2	177	640	817
Quaternary Science Reviews	3.2	19	238	257
Oceanography	3.2	0	30	30

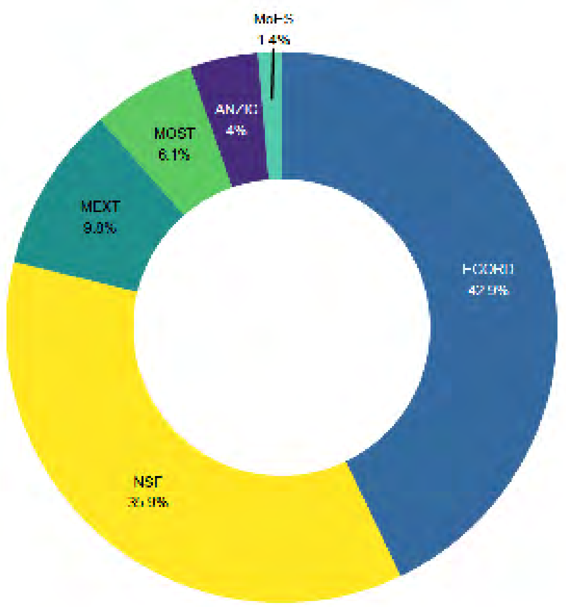
Highly ranked peer-reviewed serials publishing Program-related expedition research results (1969–2024).

As every year, the 2024 Scientific Ocean Drilling Bibliographic Database and Publication Impact Report reflects the outstanding intellectual contribution of ECORD scientists to scientific ocean drilling science. With 15,519 out of 36,181 serial contributions (42.8% of total publications) related to the successive ocean drilling programmes, the ECORD scientific community demonstrates its leading role in the international geoscience landscape (see Table and Figure below).

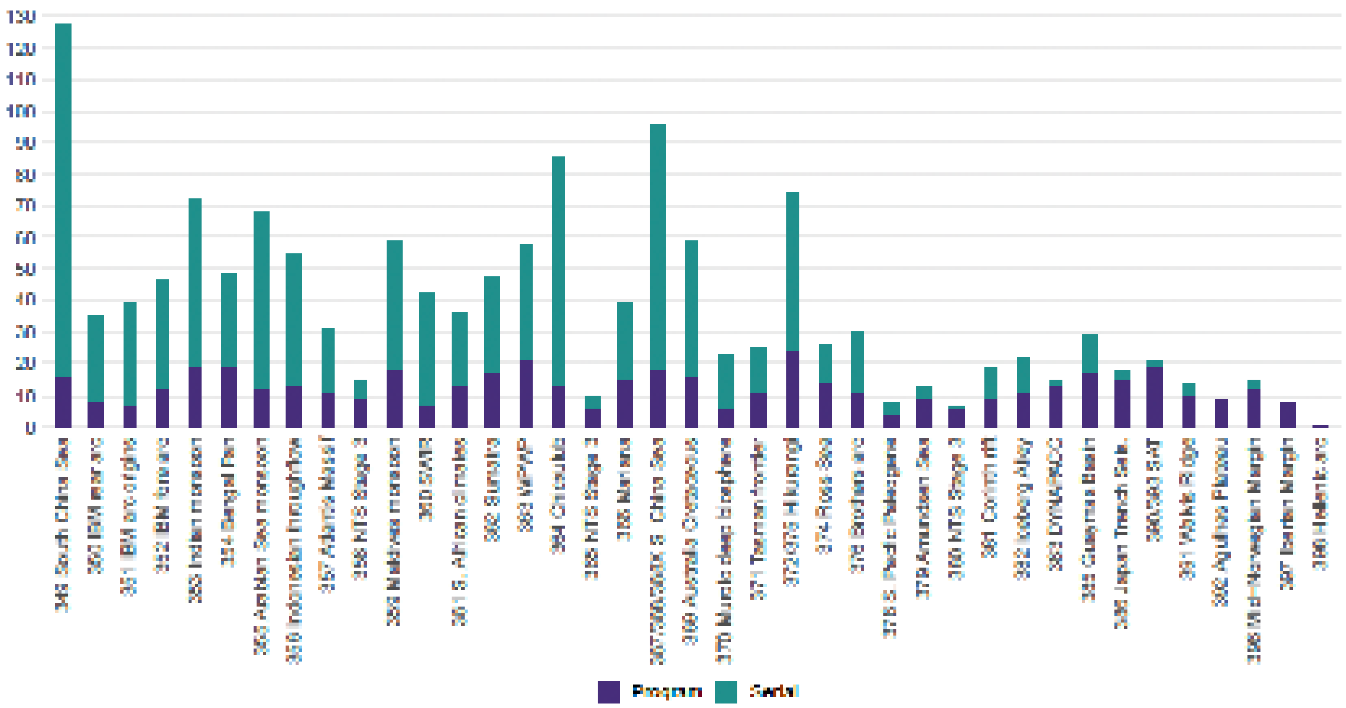
IODP member country or consortium	First authors of serials	Serial contributions by country	Serial contributions by author	Total contributions by all authors
Australia/New Zealand Consortium	**453**	**791**	**997**	**1,450**
Australia	273	524	633	906
New Zealand	180	267	364	544
China	**944**	**815**	**1,248**	**2,192**
ECORD	**5,370**	**7,838**	**10,149**	**15,519**
Austria	34	102	108	142
Canada	393	517	615	1,008
Denmark	85	149	164	249
Finland	12	20	24	36
France	760	1,098	1,552	2,312
Germany	1,304	1,745	2,292	3,596
Ireland	7	47	51	58
Italy	381	511	665	1,046
Netherlands	292	407	444	736
Norway	173	269	308	481
Portugal	21	87	103	124
Spain	224	405	508	732
Sweden	133	205	225	358
Switzerland	200	333	358	558
United Kingdom	1,351	1,943	2,732	4,083
India	259	191	238	497
Japan	936	1,240	2,600	3,536
United States	4,675	4,373	8,312	12,987
Total papers:	**12,637**			**36,181**

Serial publication for peer-reviewed serials showing counts by first author, contributing country, contributing authors, and total contributions by all authors from IODP-2 member countries (1969–2024).

MSP expeditions, which are implemented only since 2004 and represent less than 10% of the IODP expeditions, have generated a significant proportion of peer-reviewed scientific publications arising from IODP-1 and IODP-2. The second figure below summarizes peer-reviewed scientific publications related to IODP-2 expeditions.



Total serial contributions by all authors from current IODP funding entities (1969–2023).



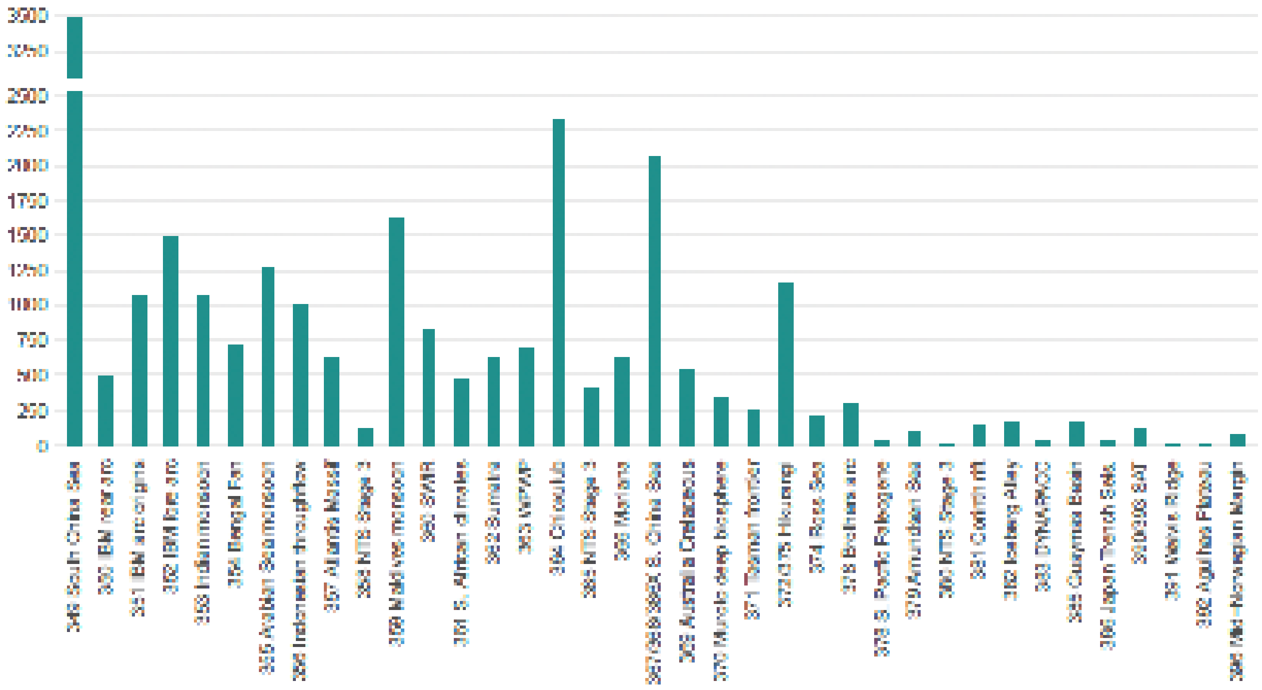
Number of Program and serial publication records for IODP-2 expeditions.

The figure below shows Program and non-Program serial, miscellaneous, and thesis/dissertation publication records related to IODP-2 (Expeditions 349–372, 374–376, 378–383, 385, 386, 390–393, and 396–398) and sorted by the four major themes of the IODP science plan (Illuminating Earth's Past, Present, and Future: The Science Plan for the International Ocean Discovery Program 2013–2023). Science plan themes are tied to the primary objectives of each expedition.

- Climate and Ocean Change: Reading the Past, Informing the Future (Expeditions 353–356, 359, 361, 363, 364, 369, 371, 373, 374, 377–379, 382, 383, 392, 396, and 397)
- Biosphere Frontiers: Deep Life and Environmental Forcing of Evolution (Expeditions 357, 364, 366, 370, 374, 376, 385, and 390/393)
- Earth Connections: Deep Processes and Their Impact on Earth's Surface Environment (Expeditions 349–352, 356, 357, 360, 367–369, 371, 376, 381, 384, 390–393, 396, and 398)
- Earth in Motion: Processes and Hazards on Human Time Scales (Expeditions 357, 358, 362, 365, 366, 372/375, 376, 380, 381, 386, and 398)

International Ocean Discovery Program publication records (all types) by IODP Science Plan theme (2013-2024).

The 2023 Scientific Ocean Drilling Bibliographic Database and Publication Impact Report collected citation data through Google Scholar in July 2024. Program publications and non-Program serial publications containing research results from IODP expeditions have been cited in other research articles more than 101,400 times between 2003 and 2023. Expedition-related science continues to be cited in other research for many years after publication.
The figure below includes available citation counts for Expeditions 349-396.



Number of tiles Program or non-Program serial publications from IODP-2 were cited by other research articles (2014-2023). MSP expeditions are expeditions 357, 364, 381 and 386.

Sampling during Expedition 501. Credit: LeBer@ECORD_IODP3_NSF.

Managing knowledge-based resources

IODP and ECORD implement a sustainable sample and data curation management plan of data conservation and provision to the science community. Hundreds of kilometres of core, other types of samples (fluids, biota) and data have been acquired and stored in three core repositories (Gulf Coast Repository, College Station, USA; Kochi Core Center, Kochi, Japan; Bremen Core Repository – BCR, Bremen, Germany) where they are made accessible to the international community for post-moratorium studies, including the IODP[3] 'Scientific Projects using Ocean Drilling Archives' (SPARCs).

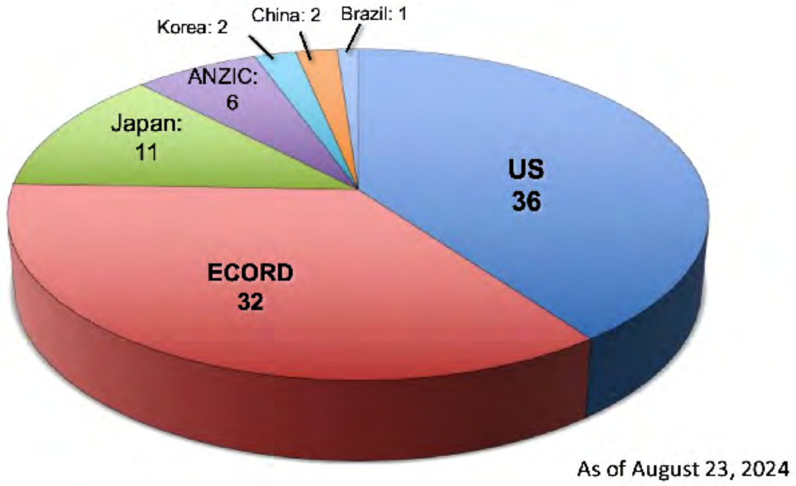
The BCR hosts all cores recovered from the Atlantic and Arctic oceans as well as the Mediterranean, Baltic and Black Seas since the beginning of scientific ocean drilling programmes (see Section 7). The collection at the BCR currently holds more than 192 km of cores acquired during 106 expeditions. 8,437 sample requests were related to cores now stored at BCR (DSDP/ODP/IODP; since 1969) and 1,990,000 samples were taken from these cores, involving several thousands of individual scientists since 1994. In 2024, a total of 71,300 samples were taken at the BCR for 265 requests (of which 132 were submitted by scientists based in ECORD-countries).

ECORD has developed and maintained several databases to make available to the science community all the necessary information to the development of drilling proposals and to allow the scientists to get access to the data collected during the drilling expeditions and keep track of ECORD activities in IODP (see Section 6 – 'Archiving IODP cores: the Bremen Core Repository' -). Over 1.99 million of samples that were taken on cores stored at the BCR are entered into a database, the 'BCR DIS Internet Interface', that is accessible to the general public for post-moratorium samples.

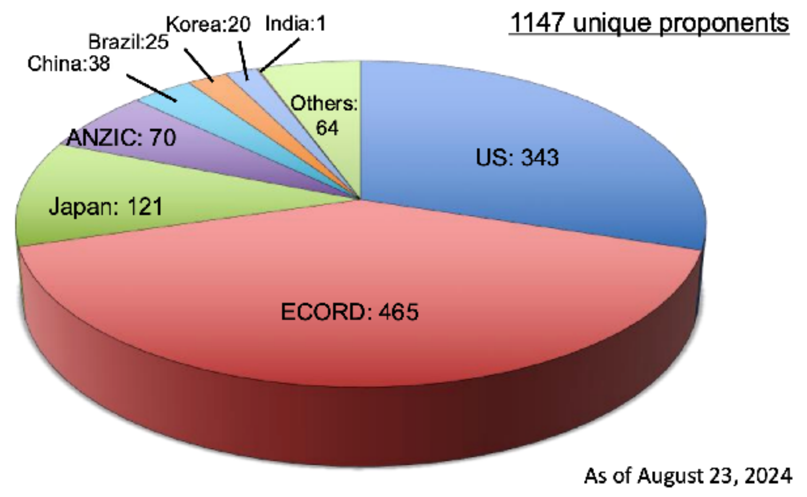
During the last months of IODP-2, EMA has negotiated an MoU with NSF for the period from October 1st, 2023, to 30 September 30th, 2029, regarding the storage and archiving of NSF-owned cores recovered from previous ocean drilling programmes at the Bremen Core Repository (BCR). These cores will continue to be stored, archived, and sampled at the BCR at no cost to NSF and remain available for scholarly studies, e.g. investigations on legacy material (cores and data), sampling, and education, to all global scientists following guidelines approved by the *JOIDES Resolution* Facility Board. The intention of all past IODP partners was to preserve the core distribution amongst the three repositories (BCR, Gulf Coast Repository and Kochi Core Center) and to maintain the continuity of core and data legacies to better serve the needs of the global science community.

Engaging the community

ECORD's contribution to IODP-2 science has been outstanding, including the submission of drilling proposals concerning all IODP capabilities. ECORD had a leading role in proposal submission constantly above 37% during IODP-2. As of 23 August 2024, 465 out of 1147 unique proponents were from ECORD member countries,



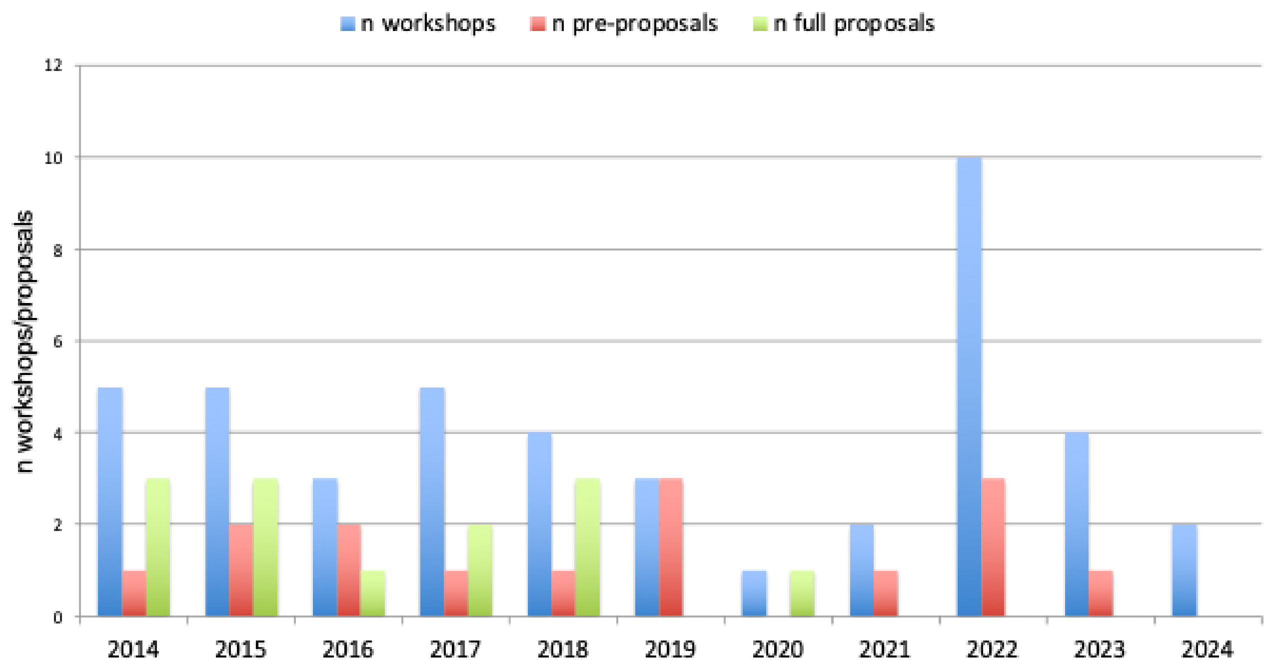
Distribution of unique proponents by countries for 90 active proposals.



Distribution of lead proponents by countries for 90 active proposals.

The leading role of ECORD scientists in the submission of IODP-2 proposals partly relies on the success of the ECORD-ICDP MagellanPlus Workshop Series Programme, which provided a substantial support to ECORD scientists to develop innovative drilling proposals concerning diverse scientific topics addressed by facilities provided by the three IODP-2 platform providers and/or the International Scientific Continental Drilling Program (ICDP). During IODP-2, 45 MagellanPlus workshops have been organized (on average four workshops per year), involving more than 1,700 scientists (24% of early-career scientists on average) from 45 countries (15 ECORD, 7 IODP partners and 23 non-IODP countries) (see Section 8). Twenty-eight drilling proposals were submitted to IODP-2 (see figure below).

MAGELLAN PLUS
WORKSHOP SERIES



Distribution of MagellanPlus workshops and related proposals in IODP-2.

Training the next generation of scientists from ECORD members and promoting IODP science in ECORD and non-ECORD countries are major goals for ECORD. The outstanding portfolio of science and educational activities that ECORD has gradually developed during IODP-2 with high demand from scientists, students and early-career scientists (see Section 8 – ' Engaging the community').

ECORD Summer Schools (*https://www.ecord.org/education/summer-schools/*) were initiated in 2007 and developed greatly during IODP-2. Three ECORD Summer schools were sponsored by ECORD annually during IODP-2:

- the ECORD Bremen Summer School, held in September at MARUM, University of Bremen, Germany, focused on a specific scientific topic defined annually;
- the ECORD Urbino Summer School in Paleoclimatology (USSP) held in July in Urbino, Italy;
- the ECORD Summer School on "Downhole Logging for IODP Science" organized in July by the ECORD Petrophysics Consortium (EPC) at the University of Leicester, UK.

In addition, ECORD has also sponsored other summer schools, such as e.g., the INA (International Nannoplankton Association) Summer School on Evolution and Taxonomy (INASSET) that was held at the University of Parma, Italy in 2023.

ECORD Summer Schools are well-established and were attended annually by many Master and PhD students, as well as postdoctoral research fellows from ECORD member countries and beyond. ESSAC supported 197 students from 17 ECORD member countries with ECORD Scholarships to participate in ECORD Summer Schools.

The ECORD Training Course (*http://www.ecord.org/education/summer-schools/*) was created in 2015 and held annually, except during in 2020 and 2021 due to the pandemic) at MARUM. This one-week course focuses on IODP core-flow procedures and is tailored to prepare participants for sailing on an offshore drillship expedition through a unique 'virtual drill ship' approach including core description, analyses and sampling.

ECORD Research Grants (*http://www.ecord.org/education/research-grant/*), initiated in 2007, aims at fostering participation of early-career scientists in ocean drilling research and encourage them to develop their own projects and collaborate with other research groups outside their home institutions. During IODP-2, 88 students from 14 different ECORD member countries were supported by ECORD Research Grants to conduct innovative research on core material and data related to past DSDP / ODP / IODP expeditions.

ECORD educational activities that were initiated and developed during IODP-1 and IODP-2 - ECORD Summer Schools, ECORD Training Course and ECORD Research Grants - will continue in IODP³. The ECORD-ICDP MagellanPlus Workshop Series Programme will also continue in IODP³ as 'Magellan³ Workshop Series' to support scientists from IODP³ and ICDP to develop new and innovative IODP³ proposals for offshore expeditions and SPARC (*https://iodp3.org/iodp3-organisation/magellan3/*).

Communicating

Promoting activities and accomplishments of IODP to various audiences, including scientists, classrooms and the general public, was a major goal of ECORD through its Outreach Task Force (EOTF), which was created at the start of IODP-2. The EOTF constantly updated and created communication and educational material (core replicas, leaflets, videos, brochures, etc.) to be distributed across ECORD members for exhibitions and exhibition booths, as well as through MagellanPlus workshops, ECORD Training Course and Summer Schools (see Section 9). The EOTF has seen a remarkable development in 2023, with the production of exhibition material (ECORD Sphere, core replicas, 3D models etc.) for permanent and temporary exhibitions in museums and aquariums e.g. at the Natural History Museum in Vienna, Austria, at the Cosquer Méditerranée museum in Marseille, France, and at the German Maritime Museum in Bremerhaven, Germany. This development ushered a new communication environment for ECORD.

News promoting ECORD and MSP expeditions frequently appeared on national and international Internet portals, TV stations and newspapers (see Section 9).

IODP³ consists of an international scientific collaboration addressing important questions in Earth, Ocean, Environmental and Life sciences described in the 2050 Science Framework, based on the study of rock and/or sediment cores, borehole imaging, in-situ observatory data, and related geophysical imaging obtained from the subseafloor.
IODP³ will adopt a transparent, open, flexible, and international modus operandi, programme-wide standard policies and guidelines, sustainable management, and publicly accessible knowledge-based resources. IODP³ has adopted the 2050 Science Framework Enduring Principles.

IODP³ Partnership

As Platform Providers, ECORD and Japan are the IODP³ Core Members. International governmental and non-governmental entities not regularly providing scientific ocean drilling platform(s) to IODP³ can become:

- Associate Members by making annual cash contributions to IODP³ (on the order of 1 M€); ANZIC has joined IODP³ in June 2025 as Associate Member. Brazil started discussions with ECORD regarding its potential participation to IODP³.
- Temporary Members by providing cash and/or project-based in-kind contributions (IKC) (with a minimum of 0.5 M€) to access IODP³ expedition(s); the National Science Foundation (NSF) was a Temporary Member in 2025 based on their cash contribution to the IODP³-NSF Expedition 501 New England Shelf Hydrogeology.

IKC and/or cash contributions from any IODP³ member or non-member country/institution are potentially acceptable to fund offshore expeditions. IKCs may include essential scientific or operational services that the IODP³ would normally pay for, fully/partly funded drilling platforms, support vessels, hazard site survey (if required), permitting assistance, onshore facilities near drill sites (if required), ice management, and remote logistical assistance etc.

ECORD started to exchange ideas, views and information with other international research programmes that employ scientific drilling to explore Earth and planetary processes, including the U.S. Sub-Seafloor Sampling Program (S3P), China's Deep Ocean Drilling Programme (DODP) and the International Scientific Continental Drilling (ICDP). ECORD considers the development of these partnerships to be necessary to ensure the success of IODP³ scientific objectives and to bringing benefits to the international scientific community.

IODP³ Expeditions

IODP³ investigations will be based on research proposals that address the objectives of the 2050 Science Framework, or other outstanding new research ideas. IODP³ will implement and fund: Offshore expeditions and Scientific Projects using Ocean Drilling ARChives (SPARCs).

Offshore expeditions - IODP³ offshore expeditions are implemented by the IODP³ Operators, ESO and/or JAMSTEC-MarE3 following an expanded Mission Specific Platform (MSP) concept by diversifying drilling and coring technologies - riserless and riser drilling, giant piston coring - and applying them to all drilling environments, as determined by scientific priorities, operational efficiency, and better value for money. Two JAMSTEC vessels, *D/V Chikyu* and *R/V Kaimei*, are identified as MSP facilities.

Three offshore expeditions have been scheduled for the first year of the programme: the IODP³-NSF Expedition 501: New England Shelf Hydrogeology, the IODP³ Expedition 502: Impact of Petit-Spot Magmatism on Subduction Zone Seismicity and Global Geochemical Cycles, and the IODP³ Expedition 503: Hadal Trench Tsunamigenic Slip History. Land-to-Sea Transects (L2S), requiring scientific drilling at both onshore and offshore sites or at shallow marine sites to be implemented jointly with the International Scientific Continental Drilling Program (ICDP) are one of prime objectives for IODP³.

The duration of IODP³ expeditions is flexible and is determined by scientific requirements and available funds. The size of expedition Science Parties is flexible and is determined by scientific requirements.

IODP³ includes services provided by the Bremen (BCR) and Kochi (KCC) core repositories.

IODP³ offshore expeditions are intended to have no significant environmental impact, and they are carried out in conformance with the highest accepted levels of environmental sensitivity.

IODP³ offshore expeditions are undertaken by international teams of scientists - Science Team - selected by the MSP Operator(s) and the Co-chief Scientists, based on recommendations made by Program Member Offices (PMOs). Staffing decisions will consider, as far as possible, the goal of achieving the maximum diversity of gender, career stage, nationality, disciplinary, cultural in science parties.

IODP³ will provide open access to all expedition samples and data once the expedition Science Team members have had the opportunity to complete the initial studies within the established moratorium period, typically one year. After the expiration of the moratorium period, the programme will make samples, cores, and data available to any scientist, in accordance with the IODP³ Samples, Data and Obligations Policy following the FAIR data principles. Our previous IODP partners recognised the flexibility and effectiveness of the MSP concept and have decided to adopt it for the development of their programmes: the US Scientific Ocean Drilling (US SciOD) and the Chinese Deep Ocean Drilling Program (DODP). Even if this concept has been very efficient since it has been introduced by ECORD, the implementation of future MSP expeditions will include many challenges, the principal one being rising operational costs vs. flat or decreasing budgets. This implies an agile strategy, including collaborations with other ocean drilling programmes, In-Kind Contributions (IKCs) from IODP³ members and other potentail partners, clustering expeditions based on a technological and/or geographical approach.

Scientific Projects using Ocean Drilling ARChives (SPARCs) - IODP³ 'Scientific Projects using Ocean Drilling Archives' (SPARCs) provide a mechanism for the international scientific ocean drilling community to propose new large-scale projects that may address any aspect of the 2050 Science Framework and involving interdisciplinary collaborations. SPARCs represent a real innovation and a new way to maximise the return on legacy assets (i.e. cores, samples, and data from current and past scientific ocean drilling programmes) without new drilling or other operations at sea.

SPARCs must address globally significant processes/problems and use innovative, creative, and multidisciplinary approaches that could include, for example, the production of large new datasets from samples, integration of data across multiple expeditions and/or multiple boreholes, and/or the application of new methods or technologies (e.g., AI, 'big data' approaches) that were not available when the legacy assets were collected. The scientific ambition of SPARC projects must far exceed that of standard requests for samples or data as they are intended to provide a new avenue to facilitate collaboration at scales larger than conventional single or multi-proponent sample requests. In parallel, standard requests for samples and data can be submitted at any time.

Each SPARC has a funded duration of three years and receives €300,000 for its implementation. SPARC proposals should have a maximum of five co-proponents. All co-proponents of a funded SPARC will automatically become Science Team members (with two selected as Co-Chief Scientists), but the remaining Science Team members will be selected following an open call for applications. The overall size of a final SPARC Science Team is flexible and can be adapted to project needs but will normally consist of a minimum of 15 scientists, with no fixed upper limit. SPARCs are open the international science community.

Three SPARC proposals have been submitted in 2025 and are implemented in 2026:

- P1102-S - OJP-ASH - The volcanic ash record from Ontong Java Plateau (Lead Proponent: Robert Musgrave, ANZIC-Australia)
- P1104-S - SIGNALS - Stratigraphic Integration of North Atlantic Legacy Sites (Lead Proponent: David Hodell, ECORD-UK)
- P1108-S - ENIGMA: ExploratioN Into a Global early Miocene Anomaly (Lead Proponent: Adam Woodhouse, ECORD-UK).

Forward look

After decades of unified international programmes, from DSDP to the International Ocean Discovery Program, major changes regarding the organization of international activities related to scientific ocean drilling have occurred since the end of 2024. The end of IODP has marked an abrupt transition from a single international programme operated by independent platform providers to independent ocean drilling programmes. Based on its well-established operation, its successful implementation and competitiveness in the international research landscape, the ECORD infrastructure has taken advantage of this new scenario and has initiated a new way of operating scientific ocean drilling while benefiting from its 22 years of experience involving innovations in all fields.

Gilbert Camoin
ECORD Managing Agency Director 2012-2025
IODP³ Managing Agency Director 2025

Nadine Hallmann
ECORD Managing Agency Director 2026-
IODP³ Managing Agency Director 2026-

Thanks to …

Finally, after working 25 years in scientific ocean drilling programmes, from ODP to IODP³, I take the opportunity to express my warm thanks and gratitude to all friends and colleagues with whom it has been a privilege to develop new initiatives and concepts, which ensured the success and continuity of these long-standing international initiatives. It is with great emotion that I will look back on ECORD's major achievements, as well as the challenges we have faced over the past fourteen years. It has been an unforgettable experience during which I gave my all, had the privilege of working alongside remarkable people, and was able to form friendships with some of them.

Gilbert Camoin, 29 April, 2026

Related websites

- *http://www.ecord.org*
- *http://www.iodp.org*
- *http://www.iodp3.org*

Credit: LeBer@ECORD_IODP3_NSF.

3.1 Operating and participating in mission-specific platform (MSP) expeditions

2024

View from *MMA Valour* during IODP Expedition 389.
Credit: M. Parker@ECORD_IODP.

IODP Expedition 389
Hawaiian Drowned Reefs

Co-chief Scientists	**Jody Webster** (University of Sydney, Australia) **Christina Ravelo** (University of California, Santa Cruz, USA)
Expedition website	*www.ecord.org*

At the start of 2024, planning and preparation continued for the Expedition 389 XCT scanning programme and the OSP. Planning had to be adjusted at short notice due to unexpected shipping delays of the core from Hawaii, combined with additional delays due to the Houthi missile crisis in Yemen affecting international shipping through the Red Sea.

The first core consignment from the first leg of the offshore phase arrived at the BGS-CSF on 3 January, and the refrigerated container was placed outside and connected to power to maintain refrigeration of the core. Systematic scanning of the cores started the same day and continued until 26 January following normal workday hours. A total 175 m of core was scanned, including additional high-resolution scans for selected intervals. Staff from ESO-BGS and ESO-EPC contributed to the XCT scanning, working alongside BGS-CSF technical staff.

The second core consignment arrived at the BGS-CSF on 7 February, and core scanning continued that day. During the following 12 days, 264 m of core was scanned, including additional high-resolution scans for selected intervals. To catch up on lost scanning time due to shipment delays, the scanning team worked 24 hours and at weekends to ensure the cores could be delivered to the OSP.

In parallel to the XCT scanning programme, intense planning for the OSP continued in Bremen; hotel reservations were confirmed, catering orders placed, local transport and logistics arranged, lab maintenance, upgrades and refitting carried out, local staff planning took place, and incoming sample request and scientist data were recorded into the mobile Drilling Information System (mDIS). The OSP hardware plan was finalised, which involved the procurement of hardware required for the OSP due to the delayed arrival of the offshore lab containers. All data management and personal workstation hardware was set up in the lab spaces and science offices, WiFi vouchers procured for external guests, Corelyzer exports were fixed for mDIS389 (mDIS Exp. 389 instance), and the VCD sheet reports were edited according to Science Party feedback.

The OSP took place from 6 to 26 February at the IODP Bremen Core Repository, MARUM, with further analytical laboratories accessed through the Department of Geosciences at the University of Bremen. There, the 31 invited Science Party members from 12 different countries met for the first time.

The Science Party, together with the ESO team, worked in two overlapping shifts between 7:30 -22:30 to maximize the core flow for all the laboratories, and to ensure the ambitious target of processing at least 22m of core per day was met. The 21 days of the OSP presented an excellent opportunity for detailed description, meeting of all Science Party members, further development of joint research endeavours, and sampling for post-expedition research.

During the OSP, the cores were opened, analyzed, sampled and described in detail. IODP standard measurements were made, and samples were taken for individual post-expedition research projects and for acquiring the programme´s legacy data. Automated cropping of linescan images was developed during the OSP and contributed to the efficient access to data for the Science Party. For the first time during an OSP, hyperspectral analysis of the split cores was used to support analysis of the carbonate material with the aim of delivering carbonate mineral maps to guide sampling of the corals. The equipment and data were provided by a commercial provider, TheiaX, and EPC staff published the blog post "Hyperspectral scanning – Maps of Light"" on the Expedition 389 blog.

By the end of the OSP, it was clear that the team had succeeded in obtaining a high-resolution continuous record of environmental data from shallow-water corals for the first time.

On 4 March, an online feedback survey was issued to the expedition participants (Science Party and operator staff). Feedback was collected to inform the ESO and Co-chief review reports which were supplied to the ECORD Facility Board (EFB) time for the Expedition 389 Review which was held adjacent to the EFB meeting on 24 September, Cambridge, UK. Following immediate internal feedback after the OSP, the ESO-Bremen team optimized the slabbed section images workflow via the installation of additional peripheral hardware on the XRF scanner (used for line scanning).

The expedition's Preliminary Report was published on 8 May: Webster, J.M., Ravelo, A.C., Grant, H.L.J., and the Expedition 389 Scientists, 2024. Expedition 389 Preliminary Report: Hawaiian Drowned Reefs. International Ocean Discovery Program. *https://doi.org/10.14379/iodp.pr.389.2024*

Since the end of the OSP, the ESO team continued to coordinate the Science Party and ESO participants for the 1st Post-expedition Meeting (Editorial), which was held in TAMU on 26-30 August.

The Science Party and their collaborators are continuing their post-expedition research. The majority of papers from this expedition are expected to be submitted before October 2026 and will be listed in the Expedition-related bibliography in due course.

IODP Expedition 386

Japan Trench Paleoseismology

Co-chief Scientists	**Michael Strasser** (University of Innsbruck, Austria) **Ken Ikehara** (Geological Survey of Japan)
Expedition website	*www.ecord.org*

The Science Party and their collaborators are now conducting their own post-expedition research. The majority of papers from this expedition are expected to be submitted to peer-reviewed journals before July 2025, and will be listed in the Expedition-related bibliography in due course.

IODP³ Expedition 501

New England Shelf Hydrogeology

Co-chief Scientists	**Brandon Dugan** (Colorado School of Mines, USA) **Rebecca Robinson** (University of Rhode Island, USA)
Expedition website	*www.ecord.org*

At the end of the previous year in December 2023, a Request for Proposals (RFP) for drilling services for Expedition 501: New England Shelf Hydrogeology closed with no bids submitted due to a lack vessel availability.

Starting in early 2024, the ESO team made preparations to run a new tendering exercise for an offshore operation running sometime between May – August 2025. The ESO team met with multiple suppliers in formal and informal market engagement sessions to convey the special requirements of this expedition. A re-drafted tender specification was issued in August with a closing date of 27 September. ESO received a number of bids, which were evaluated by the operations team in October with a view to agreeing a contract with a supplier by mid-December.

With bids now in hand, ESO began finalising plans for the offshore phase in the final months of 2024.

ESO facility, service and general activities

Throughout 2024, ESO representatives participated in various standing programme meetings required for the smooth functioning of IODP and ECORD, including the ECORD Facility Board, ECORD Council, ECORD Vision Task Force, ECORD Science Support & Advisory Committee, ECORD Outreach Task Force, Chikyu IODP Board, IODP Science Evaluation Panel, and IODP Forum. Additionally, ESO staff attended ECORD-Japan IODP[3] planning meetings throughout the year, as well as various working groups set up to address the challenges of transitioning to new post-2024 ocean drilling programmes.

EPC has invited the National Institute of Oceanography and Applied Geophysics - OGS (Geophysics Research Section), Italy, to be part of EPC from 2025, and has included this in the ECORD MoU 2025-2029. OGS has high-level expertise on borehole seismic imaging and will assist science parties with petrophysical modelling.

To support the development of future proposals that may utilise mission-specific platforms, the following workshops were attended by ESO staff in advisory roles:

- Meeting with P839 Amundsen Sea proponents, 12 January, online.
- Meeting with P1005 Sunda Sea Level and Weathering proponents, 16 January, Edinburgh.
- P1017 British-Irish Ice Sheet history IODP Workshop, 25 January, online.
- MagellanPlus Workshops "21st Century Drilling Workshop: Building capacity in the digital domain on scientific ocean drilling legacy material", 7 February (online), 1 and 18 March (online), 8-12 April (Bremen), 3-12 November (Bremen).
- IODP[3] Proposal Workshop, 18-20 March, Nachikatsuura, Japan.
- IODP[3]-ICDP Land2Sea Meeting, 24 June, online.
- MagellanPlus Workshop: "Drilling the Tonian to Cryogenian boundary in the Inner Hebrides, Scotland", 14-16 July, London.
- All-Ireland Scientific Ocean Drilling meeting, 19 September, Dublin.

The ESO-Bremen team continued to support expeditions implement by the JR Science Operator, including:

- On 15 February, BCR received a total of about 2.5 km of working-half cores from IODP Expedition 401: NW Greenland Glaciated Margin from the *JR*.
- On 25 March, BCR received a total of about 3.3 km of archive-half cores from IODP Expedition 398: Hellenic Arc Volcanic Field from the GCR.
- On 08 May. BCR received about 1.15 km of working-half cores from IODP Expedition 402: Tyrrhenian Continent–Ocean Transition from the *JR*.
- On 24 May, BCR received about 3.3 km of archive-half cores from IODP Expedition 395/395C: Reykjanes Mantle Convection and Climate from the GCR.
- On 21 June, BCR received a total of about 1.5 km of archive-half cores from IODP Expedition 397: Iberian Margin Paleoclimate from the Cambridge.
- On 24 June, BCR received a total of about 1 km of working- and archive-half cores from IODP Expedition 399: Building Blocks of Life, Atlantis Massif from the GCR.

The following training and development activities were undertaken by ESO staff in 2024:

- T. van Peer obtained a Fellowship of the Higher Education Academy.
- J. Everest renewed his drone pilot licence after sitting an exam and flight test for an unmanned aerial vehicle (UAV) General Visual Line of Sight Certificate (GVC).

Leonardo Barbosa joined the BGS on 20 May, and is the new ESO Operations Manager. Leo brings industry and consulting experience in offshore operations management and planning. Key experiences include: offshore operations, overseeing exploratory drilling at Petrobras (at sea), execution management of offshore wells, project management of large-scale projects, consulting for various oil and mining companies on organisational structure, project readiness, cost assurance, and more.

Benjamin Palmer joined the ESO-EPC team on 2 September as the new IODP Project Officer at the University of Leicester.

Data Management

Throughout 2024, the maintenance of the ESO cloud system continued, including the implementation of additional daily backup routine to separate physical storage. The new mDIS was implemented at the Expedition 389 OSP, and was very successful. Other data management tasks focussed on the post-processing of OSP data (data hygiene), ESO cloud user account management, and maintenance of the ESO Cloud backend (migration from MySQL to Postgres database).

ECORD's achievements in the International Ocean Discovery Program

Introduction

Mission-Specific Platforms (MSPs) have been an important IODP platform for two decades since 2003, operating alongside the *JOIDES Resolution* and *D/V Chikyu*. Over this time, MSPs have capitalised on alternative platforms and methods, and enabled the scientific community to access drilling targets that were otherwise out of reach. As international scientific ocean drilling transitions to a new phase from 1 January 2025, we reflect on the ECORD Science Operator (ESO) contribution to the International Ocean Discovery Program (2013-2024).

MSPs were introduced to the Integrated Ocean Drilling Program (IODP) in 2003 to "go where no scientific drilling project has gone before", and to build on the achievements of the wildly successful *JOIDES Resolution* in the Ocean Drilling Program (ODP Final Technical Report 1983-2007, 2007). Since 2013, the ECORD Science Operator (ESO) has implemented five IODP MSP expeditions in five different oceans and seas. During this time, and unlike the previous Integrated Ocean Drilling Program (2003-2013), remote seafloor drilling and giant piston coring featured on MSP expeditions in addition to offshore heave-compensated and onshore-mining-style wireline coring. Equally diverse were the environments in which these technologies were deployed, from the shallow waters of the Yucatan shelf to the ultra-deep hadal depths of the Japan Trench.

MSP statistics reflect the diversity of platforms used (Table 1); water depths ranged from less than 20 m to over 8 km, and, while the deepest borehole was over 1300 m below seafloor (mbsf), many penetrations were less than 40 mbsf. Since 2013, MSPs have recovered just over 3.8 km of core from 115 boreholes in formations ranging from fossil corals in some of the most environmentally sensitive regions on Earth, to highly-deformed, biosphere-hosting altered ultramafics from the middle of the Atlantic Ocean.

Expedition no. (year) Reference	Expedition name	Platform type	No. of sites	sites nos.	No. of holes	No. of cores	Deepest penetration (mbsf)	Core recovery (m)	Core recovery (%)	Main lithologies
357 (2015/16) Früh-Green et al. (2016)	Atlantis Massif,	Research vessel & SFD	9	M0068-M0076	17	68	16	57	53	Altered mafics and ultramafics
364 (2016) Morgan et al. (2017)	Chicxulub K-T Impact Crater	Liftboat & mining rig	1	M0077	1	303	1335	840	100	Suevite, melt rock, shocked basement
381 (2017/18) McNeill et al. (2019a)	Corinth Active Rift Development	Geotechnical vessel & rig	3	M0078 -M0080	4	500	705	1645	86	Mud, silt, sand,
386 (2021/22) Strasser et al. (2023)	Japan Trench	Research vessel & GPC	15	M0081-M0095	58	58	39	833	88	Clay, silt, sand
389 (2023/24) Webster et al. (in press)	Hawaiian Drowned Reefs		15	M0096-M0110	35	524	73	426	66	Coral framework, carbonates

Table 1. MSP expedition statistics 2013-2023. SFD: seafloor drill; GPC: giant piston corer.

The MSP concept is to source platforms from the commercial or research market on a case-by-case basis. This offers the flexibility to deviate from traditional IODP coring methods used by the *JOIDES Resolution* and *D/V Chikyu*. In the MSP model, vessels of opportunity are commercially contracted, or sourced through partnerships, and equipped with appropriate coring and scientific facilities to deliver the objectives of the IODP proposal underpinning any given expedition.

Typically, MSPs are not scientific research platforms; they have limited accommodation, and require containerised core curation, refrigerated core storage, database, science, and office facilities to accommodate essential IODP activities. Thus, the offshore phases of MSP expeditions focussed on core collection, core curation, measurement of ephemeral properties of the whole cores, and downhole logging. To fulfil IODP requirements, core splitting, core description, and all other analyses were postponed to the Onshore Science Party, an up to four week long workshop held at the IODP Bremen Core Repository (BCR) and laboratories at the MARUM, University of Bremen, Germany.

The Onshore Science Party is central to the MSP concept. Moving the main analytical effort from the vessel to an onshore location reduces the berthing required and maximises vessel options. The main compromise of this model is that the full intellect of the Science Party is not brought to bear during drilling, however this can be mitigated by ever-improving offshore communications which in future may lead to hybrid participation of the offshore phase. The Onshore Science Party has proven to be successful in maintaining a large Science Party without the obligation to sail, and has improved inclusivity by allowing the participation of scientists who may not be able to sail for medical, family, domestic or other reasons.

Remote Seafloor Drilling - Expedition 357: Atlantis Massif Serpentinization and Life (2015) and Expedition 389: Hawaiian Drowned Reefs (2023)

The most ambitious use of alternative coring methods in IODP was in 2015, on Expedition 357: Atlantis Massif Serpentinization and Life (Früh-Green, 2017). Two seafloor drills (SFDs) were selected, the British Geological Survey Rockdrill 2 (RD2) (Figure 1) and the MARUM MeBo70 (MeBo: Meeresboden-Bohrgerät, Figure 2), deployed from the UK research vessel *RRS James Cook* (Figure 3) which was provided as an In-Kind Contribution by the UK's Natural Environment Research Council. The SFDs were selected to improve recovery in altered and highly variable shallow oceanic basement rocks, which at the time was another notoriously problematic lithology in scientific ocean drilling.

SFDs have two key characteristics which may improve recovery in certain lithologies; they deploy lighter coring tools akin to mining-style tools, and they operate in the absence of heave so have good control on bit weight. SFDs were chosen for this expedition to acquire good quality cores of the surface carbonate cap and hard rocks at depth, and to plug the boreholes to enable future observation of their equilibrated fluids after drilling. The target penetration depths of the expedition were shallow, only up to 70 mbsf, and water depths ranged between 720 and 1770 m.

Both SFDs used for Expedition 357 were remotely operated systems that were lowered onto the seabed, with power and control maintained from the vessel via an umbilical cable. The systems used 3.5 in (88.9 mm) OD mining-style drill rods, with 3.86 in (98 mm) (RD2) or 4.06 in (103 mm) (MeBo70) outer bits, with both systems producing 61.1 mm diameter cores. Seawater was the drilling fluid used in all holes, with no addition of muds.

The RD2 was a lightweight system (five tons in water) and designed to core up to 55 mbsf in up to 4000 m water depth, while the MeBo70 weighed 7.5 tons in water and was designed to core up to 70 mbsf in up to 2,000 m water depth. In both systems, drill rods, core barrels, logging tools and borehole plug units were stored in rotatable magazines to be selected, handled and deployed robotically as necessary. Expedition 357 required the boreholes to be sealed after coring, to allow repeat access to fluid samples in the future by remotely operated vehicle. A downhole plug was developed from modified drill pipe, and slightly adapted to fit each SFD. The plug used a water-expandable material (Elastomer 1000/60 from Reactive Downhole Tools), which swelled slowly to allow time to complete the drilling before the borehole became sealed. The tops of the plugs were sealed by a ball valve insert, with multiple systems of O-rings to prevent bottom seawater intrusion into the borehole. In addition, the interior components of the plugs in contact with potentially corrosive borehole fluid were made of titanium, ceramic-coated steel, polyetheretherketone or nylon plastic, to be as unreactive as possible to increase plug longevity and

Figure 1: The BGS Rockdrill 2 (RD2) being launched during IODP Expedition 357. Credit: D. Smith@ECORD_IODP.

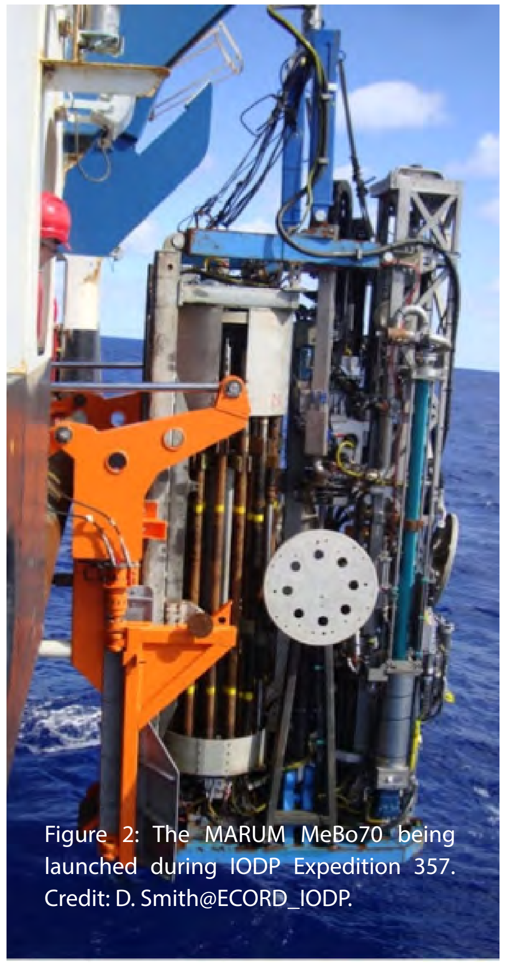


Figure 2: The MARUM MeBo70 being launched during IODP Expedition 357. Credit: D. Smith@ECORD_IODP.

Figure 3: *RRS James Cook* preparing to depart for IODP Expedition 357. Credit: H. Kuhlmann@ECOR_IODP.

In addition to the borehole plugs, the SFDs were used as vehicles to carry additional sampling and analysis equipment to the borehole. These included downhole memory logging tools, on-board water sampling apparatus, a tracer delivery system, and an on-board sensor package to deliver real-time dissolved oxygen, dissolved methane, pH, oxidation-reduction potential, temperature, and conductivity data during coring. These data enabled in-situ confirmation of ephemeral events such as gas release during coring. This development was the first time such fluid monitoring had been conducted during drilling in an IODP expedition.

Despite technical issues, core quality was high and recovery averaged 53% with two of the deepest boreholes recovering 72% and 75% in water depths up to 1500 m. Such recovery in shallow mantle sequences was unprecedented in the history of ocean drilling. Expedition 357 recovered high-quality cores from actively serpentinising lower crustal and shallow mantle sequences of the detachment fault zone of the Atlantis Massif, considerably improving knowledge about the extent and activity of the biosphere, and the role of serpentinisation in driving hydrothermal systems that sustain microbiological communities (Früh-Green & Orcutt, 2019).

A similar SFD approach was taken for Expedition 389: Hawaiian Drowned Reefs in 2023 (Webster et al., in press). A SFD system was selected for two reasons, the first being that a small-scale seafloor drilling system was more likely to be granted research permission from Hawaiian authorities than a larger-scale vessel-based system, and that the no-heave, lighter seabed system was more likely to yield better core recovery of highly porous reef lithologies.

The drilling contractor was Benthic, a brand in the geo-services segment of Acteon Data and Robotics, who provided their 5th generation Portable Remotely Operated Drill (PROD5) system (Figure 4), carried on the sub-contracted multipurpose vessel MMA Valour (Figure 5).

The expedition recovered a total of 426 m of core from 35 holes across 15 sites, with an average recovery of 66% (Webster et al., in press). This represents the best recovery of the three MSP expeditions that targeted reef lithologies, most likely due to the no-heave, lighter seabed system. The PROD5 also successfully cored hard basalt intervals and avoided some of the problems encountered by the RD2 and MeBo on Expedition 357. This is likely due the PROD being a more powerful system (greater torque and flush rates), aided by the use of drilling mud applied to the borehole from onboard reservoirs.

Results from this expedition are anticipated to advance global research on sea-level change and climate variability, specifically during several poorly understood periods over the last 500,000 years, and how coral reef systems respond both geologically and biologically to rapid changes in sea-level and climate.

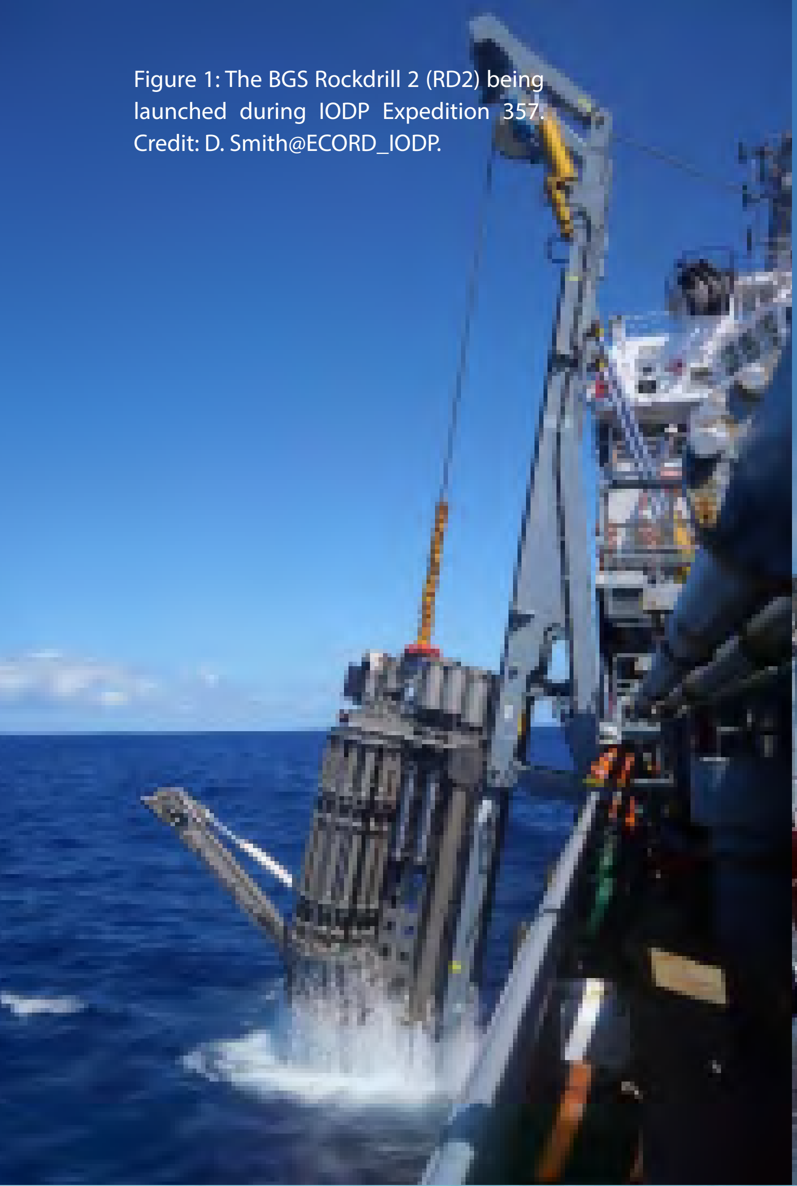


Figure 1: The BGS Rockdrill 2 (RD2) being launched during IODP Expedition 357. Credit: D. Smith@ECORD_IODP.

Figure 6: Fugro Synergy mobilising IODP Expedition 381, Gulf of Corinth. The crane is about to lift and reinstall the top section of the drill rig, which was temporarily removed to clear the Rio-Antirrio Bridge. Credit: C. Cotterill@ECORD_IODP.

Figure 5: *MMA Valour,* contracted for IODP Expedition 389, Hawaii. Credit: MMA Offshore, source https://www.mmaoffshore.com/vessel-fleet/mma-

Standing platforms in very shallow water - IODP Expedition 364: Chicxulub Impact Crater (2016).

Mining-style drill string and coring tools were successfully demonstrated for scientific ocean drilling by Expedition 310: Tahiti Sea Level in 2005 (Camoin et al., 2007), and later by Expedition 313: New Jersey Shallow Shelf in 2009 (Mountain et al., 2010).

A land-based, mining-style technical setup was deployed for Expedition 364: Chicxulub Impact Crater (Morgan et al. 2017), using the liftboat *L/B Myrtle* in the shallowest water MSP expedition ever – only 19.8 m. Like its sister vessel *L/B Kayd* used for Expedition 313, the *L/B Myrtle* is a three-legged, self-propelled 245 class liftboat which was contracted for the expedition by the drilling contractor Drilling, Observation and Sampling of the Earth's Continental Crust (DOSECC).

For Expedition 364, the coring rig was the International Continental Scientific Drilling Project (ICDP) Atlas Copco T3WDH mining rig, cantilevered off the bow of the *L/B Myrtle* (Morgan et al 2017).

Normally used for land drilling, mining-style systems operate in the complete absence of heave. This allows lighter drill pipe and coring tools to be used, since they are not expected to cope with the stresses and strains of heave compensation. Mining-style drill pipe and coring tools are typically narrower, have thinner walls, and are lighter than their marine counterparts. Combined with the absence of heave, this means systems can be run at higher rotational speeds with narrower diamond-impregnated drill bits, improving core quality. Additionally, the annulus between the drill pipe and the borehole wall is narrower, which allows for the efficient flow of drilling mud, efficient cuttings clearance, and better preservation of borehole wall integrity.

In this expedition the coring method performed spectacularly, achieving an incredible 100% core recovery down to 1335 mbsf, with a slightly larger core diameter of 83 mm compared to standard IODP core of about 63 mm.

Also, for the first time on an MSP expedition, the systematic X-ray CT (XCT) scanning of whole cores was carried out between the offshore phase and the Onshore Science Party. XCT is one of the most effective non-destructive methods for 3D imaging the internal density and chemical composition of whole cores in high-resolution before they are split. XCT scanning of the Expedition 364 cores was performed by Weatherford Laboratories, Houston, when over five million slice images were created, with the raw data processed by Enthought, Inc. (Austin, TX, USA) to clean and correct the XCT data.

The success of the drilling produced a near continuous lithological record of the Chicxulub Impact Crater, including the Cenozoic post-impact infill, tsunami deposits, breccia, and basement rocks of the main target: the peak ring (Morgan et al. 2016).

Overcoming Physical Obstacles - Expedition 381: Corinth Active Rift Development (2017).

MSPs have found their niche in various aspects of IODP expeditions. Often it is the vessel type or coring technology that sets them apart, but MSPs have also been required for more mundane reasons such as being able to pass under low bridges.

In 2017, on Expedition 381 (McNeill et al. 2019a), the high-end geotechnical drilling vessel Fugro Synergy was contracted to meet both the expedition's coring specification (maximum borehole depth was 750 mbsf) and the requirement to pass under the Charilaos Trikoupis Rio-Antirrio Bridge at the mouth of the Gulf of Corinth, with a road deck only 57 m above sea surface.

Typical geotechnical rigs are shorter than the towering derricks of the *JOIDES Resolution* or *Chikyu* and can deploy scientific coring in these previously unreachable areas. The drilling contractor (Fugro) had to remove the upper section of the drilling derrick during transit under the bridge and replace it during the final mobilization at the Port of Corinth prior to visiting the first site (Figure 6).

The drilling system on the Fugro Synergy centres on the Fugro Seacore R-190 drilling rig, supported by a Fugro SeaDevil template. The SeaDevil could clamp the drill string at the seabed (rotary action was still driven from the drill rig) and feed the drill pipe into the formation from the seabed. Decoupled from vessel heave and midwater pipe flex, the SeaDevil could finely control bit weight and penetration rate, provide accurate depth position, and improve the quality of the samples recovered.

Figure 7: *R/V Kamei*, departing for IODP Expedition 386. Credit: @JAMSTEC.

Figure 8: Recovery of the GPC on *R/V Kaimei*, IODP Expedition 386, Japan Trench. Credit: G. Tulloch@ECORD_IODP.

Expedition 381 recovered 1645 m of core at 86% recovery in consolidated and unconsolidated sand-, silt- and mud-(stone) and conglomerates, and produced the longest and highest resolution record of sediment flux and paleoenvironmental changes when a young rift connects to the global ocean. The results from the expedition show 10-100 kyr-scale cyclic variations in basin paleoenvironment as eustatic sea level fluctuated with respect to sills bounding the semi-isolated Gulf of Corinth (McNeill et al. 2019b).

Giant Piston Coring – Expedition 386: Japan Trench Paleoseismology (2021)

Expedition 386: Japan Trench Paleoseismology continued the philosophy of using alternative but appropriate coring methods, by utilising giant piston coring (GPC) for the first time in IODP (Strasser et al. 2023). This expedition was the first joint operator expedition between ESO and the Institute for Marine-Earth Exploration and Engineering (MarE3) within the Japan Agency for Marine-Earth Science and Technology (JAMSTEC).

The platform selected for Expedition 386 was the research vessel *R/V Kaimei* (Figure 7), provided and operated by JAMSTEC. The *R/V Kaimei* was equipped with a GPC system capable of deploying a 20, 30, or 40 m GPC using a 12,000 m cable to reach the hadal depths (~8000 m) of this expedition. Using the GPC system on the *Kaimei* (Figure 8), 833 m of core was collected from 58 boreholes in ultra-deep hadal environments along the axis of the Japan Trench in around 8 km water depth, with an average recovery of 88%. This expedition proved that GPC can provide an IODP-scale expedition, and provide the significant volume of core material required by the Science Party to meet a diverse range of research objectives.

The overarching goal of Expedition 386 is to find and analyse records of past great earthquakes in the trench-fill basins of the Japan Trench (Strasser et al. 2023). The Science Party are working to identify the sedimentologic, physical, chemical, and biogeochemical proxies of event deposits in the cores, recognise and date past giant earthquakes, and separate them from smaller earthquakes and other driving mechanisms. The spatial and temporal distribution and variability of such event deposits will be explored, and ultimately a long-term earthquake record for giant earthquakes will be developed.

Expedition 386 was not only a technical success, but also a collaborative success for the operators. The operators worked together across time-zones to overcome the challenges presented by the Covid-19 pandemic, including working out how to implement a hybrid Onshore Science Party for the first time. The collaborative success of Expedition 386 adds to the confidence of the new ECORD-Japan partnership that will underpin the International Ocean Drilling Programme (IODP[3]) from 2025.

Conclusions

MSPs have been essential tools for scientific ocean drilling over the last 11 years, allowing samples and data to be collected in new geographical areas from new geological targets. The success of MSPs is rooted in the flexibility to contract, or source from partners, appropriate vessels and coring technology, be it offshore heave-compensated wireline coring, onshore-mining-style wireline coring, remote seafloor drilling or giant piston coring. Combining this flexibility with Onshore Science Parties, which reduce the need for large offshore science teams, the vessel options for scientific ocean drilling has been extended beyond the *JOIDES Resolution* and *Chikyu* and their operational limitations.

Despite their overwhelming success, MSPs have experienced several challenges over the last 20 years, including occasional failed tendering in periods of high market demand, rising costs and flat/shrinking budgets, missing out on the economy of scale that dedicated IODP vessels can provide, and the difficulty of passing IODP coring experience between transient contracted drilling teams.

ECORD and ESO are extremely proud of MSP achievements over the last 11 years, and now look forward to developing the MSP concept further and building a new set of achievements with its partners in the next decade of IODP[3].

L/B Myrtle drillship for IODP Expedition 364: Chicxulub K-Pg Impact Crater. Credit: @ECORD_IODP.

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3.2 Operating and participating in mission-specific platform (MSP) expeditions

2025

ECORD Science Operator (ESO) activities in 2025 mainly focussed on three mission-specific platform expeditions: Expedition 501: New England Shelf Hydrogeology, Expedition 507: GLACE-NS (Late Cenozoic Glaciers, Landscapes, Climates, and Ecosystems of the North Sea), and Expedition 389: Hawaiian Drowned Reefs.

The Offshore Operation for Expedition 501 took place from 19 May to 1 August 2025, sailing from and to Bridgeport, Connecticut, USA. The Onshore Operation (OnO, the new title for the Onshore Science Party) took place from 14 January to 11 February 2026 in Bremen, Germany. In parallel, initial preparations were made for Expedition 507 in the second half of the year. Activities associated with Expedition 389 mainly focussed on post-expedition support.

Sampling during Expedition 501: New England Shelf Hydrogeology. Credit: LeBer@ECORD_IODP3_NSF.

IODP³ Expedition 501
New England Shelf Hydrogeology

Co-chief Scientists	**Brandon Dugan** (Colorado School of Mines, USA) **Rebecca Robinson** (University of Rhode Island, USA)
Expedition website	*www.ecord.org*

This expedition was successfully implemented in May to July 2025, and cored into the Atlantic continental shelf offshore New England, USA, to explore current and past states of fluid composition, pressure, and temperature in continental shelf environments. This location is a remarkable example of where the distribution of freshwater within the continental shelf sediments is far out of equilibrium with modern sea level, with low salinity groundwater in shallow Pliocene-Pleistocene sand aquifers over 100 km from shore. Freshwater-saltwater boundaries are abrupt, indicating the disequilibrium nature of such systems. This expedition will help to better constrain rates, directions, and mechanisms of groundwater flow and chemical fluxes in continental shelf systems, and will test process-based models for shelf freshwater off New England and other systems around the world.

At the end of the previous year in December 2024, a contract award was made to Matrix Offshore Services, Tennessee, to provide the *L/B Robert* equipped with a Boart Longyear mining rig for Expedition 501. The expedition was provisionally scheduled to start on 1 May, 2025, from a port in the New England area.

In early 2025, planning discussions between ESO and Matrix continued, covering detailed aspects of operations such as the deck plan, ESO container fastening, vessel logistics, and schedule. ESO prepared its own equipment and services for the offshore operation, namely equipment maintenance, testing, and certification, stock checks, organising shipping, staff training and supporting staff to obtain travel documentation to work in the USA. Other critical activities included science planning, with ESO and the Co-Chiefs handling and evaluating incoming sample requests and designing the shipboard workflows, which included groundwater testing and sampling procedures.

In March, ESO participated in a community engagement tour in cooperation with Co-chief Brandon Dugan. The tour included school visits, distribution of materials, an interview in the Cape Region, and provision of information for tourism bureaus, local shops and chambers of commerce. Mobilisation for the expedition took place in Bridgeport, Connecticut, between 28-30 April 2025, attended by various team members from all ESO partners. The main tasks were to install the ESO laboratory containers on the vessel, check and test the equipment, make the necessary cable runs, finalise the IT network, make final detailed plans with the Matrix drilling team and ship crew, and introduce the Science Team to the vessel.

The expedition was originally planned to depart on 1 May. Ultimately, the final permit from the US Army Corps of Engineers was awarded on 17 May, with two days wait-on-weather required before sailing on the 19 May. For a day-by-day account of the expedition, daily and weekly reports and participant blogs are available on ECORD's Expedition 501 webpage.

The *L/B Robert* left port on the 19 May and transited to the first Site M0111. Being a standing platform, a pre-load sequence was required, after which the vessel jacked up to working height, approximately 10 m above wave height. Operations began immediately following the standard approach of running casing into the seabed, followed by hydraulic piston coring (HPC). HPC was switched to Extended Nose Coring (EXN) or rotary Alien Coring (ALN) when recovery and/or advance became poor. After modest coring success, Hole M0111A was abandoned at 67 mbsf due to a stuck core barrel, and adjacent Hole M0111B was started. Any lithologies that showed resistance to coring (for example, suspected glauconitic sands) were overcome by non-coring rotary drilling through such intervals, then switching back to HPC or EXN coring.

During these early stages of the Offshore Operation, the Expedition 501 Science Team began initial description of cores, analysis of water chemistry, and bulk physical properties based on multi-sensor core logger (MSCL) data. The sedimentology team provided a preliminary lithological description based on core section photographs taken while the cores were in the liners. The aqueous geochemistry team collected interstitial water samples using Rhizon and squeeze cake sampling methods for salinity, ammonium, alkalinity, and pH analyses. In addition, the geochemistry team and microbiology team completed sample splits and preservation for shore-based interstitial water and microbiological analyses.

Expedition 501: New England Shelf Hydrogeology. Credit: Le Ber @ECORD_IODP3_NSF.

The physical properties team conducted non-invasive measurements of P-wave velocity, bulk density, magnetic susceptibility, electrical resistivity, and natural gamma radiation using the MSCL. The data was ready offshore for initial interpretation and correlation with seismic interpretations, preliminary core descriptions, and interstitial water data.

Hole M0111B progress initially stalled due to a break in the casing. To overcome this issue, the PQ drill rods were run back into the hole to 120 mbsf, and used as casing through which smaller-diameter HQ drill rods and BHA were run for coring. This is a 'piggy-back' approach which was also used successfully in Expedition 313: New Jersey Shallow Shelf in 2009.

On 29 May, the first groundwater pump test was carried out at around 231 mbsf, in an interval that was not recovering well, suggesting a major change in lithology. No formation water was recovered, yet the test provided learning opportunities for the rig crew, the ESO team, and the Science Team. These initial tests also confirmed the functionality of the packer system, submersible pump, and sampling manifold system. Coring resumed, and further groundwater pump tests were attempted at 272 mbsf, eventually achieving a stable flowrate that enabled the cleaning of the borehole and samples of formation fluid to be taken. Multiple drawdown and recovery periods provided valuable data to determine in situ hydrogeological properties. Water quality monitoring during the test provided information on fluid electrical conductivity, temperature, and pH. All these data are crucial to meeting the objectives of Expedition 501.

After the pump test, coring resumed. Loose sands continued to affect recovery in places, and a stuck core barrel eventually parted, leading to the removal of the drill string from the borehole. After re-running the BHA, gamma ray logging through pipe was conducted. On completion, PVC casing was successfully run to a depth of 343 mbsf, and the metal drill pipe removed. PVC casing was selected to prevent the loose lithologies from collapsing and trapping the logging tools, while the non-metal PVC material did not interfere with the tool sensors. Logging through the PVC casing then followed, using gamma radiation (total and spectral), magnetic susceptibility, electrical resistivity, and nuclear magnetic resonance. Logging of Hole M0111B finished on 7 June, and the *L/B Robert* was moved to Hole M0111C.

The top 150 mbsf of Hole M0111C was punctuated by HPC coring attempts and open hole drilling, after which the rotary Alien Corer (ALN) was used. At 171 mbsf, the packer was deployed and groundwater pumping commenced, eventually reaching a steady flow of 6 L/min. Groundwater and noble gas samples were successfully taken, after which coring resumed. At TD (231 mbsf), a second groundwater pump test was carried out, followed by a through-pipe gamma log run before successful removal of the packer. All downhole equipment was recovered on 17 June, and the *L/B Robert* transited to site M0112.

Coring commenced at Hole M0112A using a combination of HPC and ALN corers with excellent recovery (up to 89%). Coring of Hole M0112A was completed on 29 June to a depth of 328.71 mbsf, which was followed by the downhole logging program.

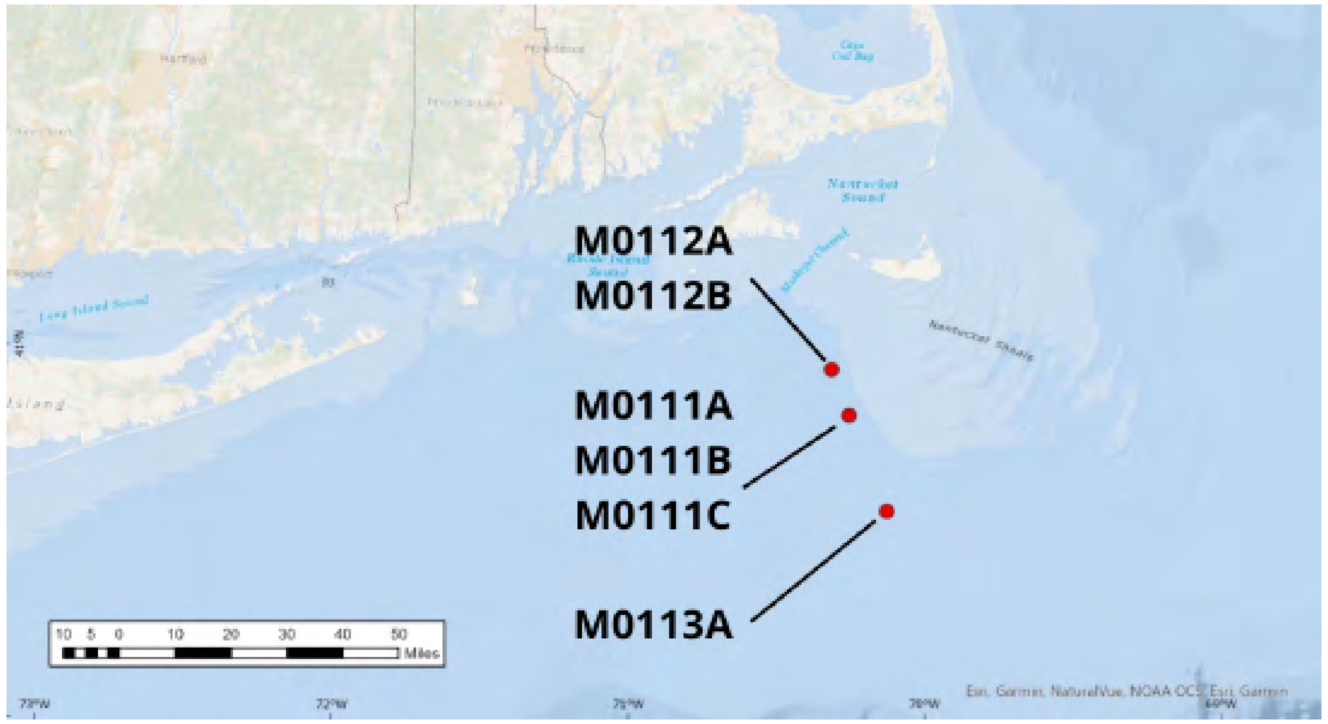


Figure 1. Location of Expedition 501 holes.

After switching to a new hole location, coring commenced at Hole M0112B. Three groundwater pump tests and water sampling were carried out at around 110 mbsf, 171 mbsf and 255 mbsf (TD). At TD, a through-pipe gamma ray log was run successfully, followed by the installation of a SCIMPI, a Simple Cabled Instrument for Measuring Parameters In-Situ. The ship crew, drillers, and Expedition 501 team helped to deploy the SCIMPI, which was successfully installed in less than three hours. The SCIMPI system has four measurement modules at four depths that will be sealed in the borehole as it collapses. Each measurement module will record in situ pressure, temperature, and electrical resistivity for multiple years before being recovered during a future, non-drilling operation. The drill pipe and casing were then tripped out and the deck cleared for transit to new Site M0113.

Coring proceeded at M0113A until 273 msbf, when a potential aquifer sand was recovered. After proving sufficient thickness, it was decided to set the packer and attempt to extract water from the formation. The initial extraction of water from the drill string proceeded well until the pump failed. Rebound of the water level was recorded but after an hour it was noted there was no further increase in water into the string. After resuming coring for short interval, a second pump test was attempted, and groundwater was successfully extracted from the borehole. Once the level of the head had settled, the water was replenished at a constant rate and there was little need to adjust the pump speed to maintain the flow. This final test was extremely successful, and all samples requested were collected and consistent data recorded.

The pumping test provided significant volumes of water for aqueous geochemical, noble gas, and microbiological analyses and sample collection. The test also provided a large time-series data set to help address the physical and chemical hydrogeology of this offshore freshened groundwater aquifer.

Coring resumed and TD was reached after steady progress using the HPC & ALN core barrels. A through-pipe gamma ray log was run, followed by the full logging suite through PVC casing. On completion, the second and final SCIMPI was successfully deployed into the borehole before midnight, marking the last science operation of Expedition 501.

Given the societal relevance and public interest in this expedition, several outreach activities were designed and implemented by ESO, ECORD, IODP and IODP³ partners, and the Science Team. These included periodic visits to the platform by appointed Offshore Outreach Officers from Europe and the USA, participant blogs, social media posts, collection of imagery and video by participants, ship-to-shore events, radio interviews, media visits to the platform, press releases, and responding to press enquiries.

The *L/B Robert* jacked down and was floating free of the seabed at 1740 hrs on 31 July. The vessel, with its full complement comprising Expedition 501 Science Team members, the ESO team, contractors from Matrix Offshore Services, drilling crew from Boart Longyear, mud engineering team from IMDEX, and the ship's crew from Seacor Marine, departed for Bridgeport, Connecticut.

Hole	Proposal site	Lat ,Long WGS84	Water depth (m)	Hole depth (mbsf)	Sum of cored intervals (m)	Core recovery (m)	No. of cores	No. of cores
M0111A	MV-03C	40.8747 -70.2697	42	63.65	49.58	48.85	29	98.5%
M0111B	MV-03C	40.8746 -70.2697	42	392.93	336.05	201.06	171	59.8%
M0111C	MV-03C	40.87411 -70.2697	42	231.36	96.26	65.57	38	68.1%
M0112A	MV-08A	40.87411 -70.2697	41	328.71	319.51	255.96	217	80.1%
M0112B	MV-08B	40.9976 -70.333383	41	339.82	103.26	59.25	55	57.4%
M0113A	MV-04C	40.618333 -70.136972	54	325	323.19	241.14	208	74.6%

Table 1. Summary of Expedition 501 holes completed. Note: hole depth includes open hole intervals (no coring attempted).

The *L/B Robert* docked in Bridgeport on the 1 of August, 74 days after leaving, and the tremendously successful Offshore Operation phase of Expedition 501 officially came to an end.

The Offshore Operation recovered a total of 871.33 m of core from six holes across three sites, with an average recovery of 71%. See Table 1 for a summary of the holes completed, and Figure 1 for the actual locations of the drilled holes.

IODP³ Expedition 507

GLACE-NS

During the reporting period, ESO conducted market engagement with potential drilling suppliers for Expedition 507: GLACE NS, in preparation for running a formal tendering process for an offshore operation in late summer 2026.

On 9 April, a Preliminary Market Engagement Notice was published by UK Research and Innovation (UKRI) on behalf of ESO (closing date 1 July). This notice served as an early notification to potential suppliers of the upcoming opportunity, and allowed them to register interest and access preliminary information.

On 22 August, a full Tender Notice was published by UKRI, that called for full bids from suppliers (closing date 12 September). At the end of the reporting period, ESO-BGS evaluated the bids to identify the preferred bidder, in preparation of notifying the winner in October.

In parallel, ESO liaised with the IODP³ Science Office to issue the Call for Participation for this expedition on 30 September (closing date 1 December).

IODP Expedition 389

Hawaiian Drowned Reefs

The Proceedings volume for this expedition was published on 26 February 2025. ESO-Bremen carried out shrink wrapping of Expedition 389 cores in preparation for transport to GCR at the end of the moratorium period.

ESO are offering support to the Co-chief Scientists to organise the 2nd Post-expedition Meeting, date and location to be confirmed.

The Science Party and their collaborators are continuing their post-expedition research. The majority of papers from this expedition are expected to be submitted before October 2026 and will be listed in the Expedition-related bibliography in due course.

ESO facility, service and general activities

Throughout 2025, ESO representatives participated in various standing programme meetings required for the smooth functioning of IODP³ and ECORD, including the MSP Facility Board, ECORD Council, ECORD Science Support & Advisory Committee, IODP³ Communications Task Force, IODP³ Science Evaluation Panel, the IODP³ Safety and Environment Advisory Group, and the Scientific Drilling Forum.

General training and development of ESO staff continued throughout 2025, including:

- Training of ESO-Bremen staff to operate the new mobile rack system of the refrigerated core store in University of Bremen's new Center for Deep-Sea Research (Zentrum für Tiefseeforschung, ZfT) building. Additionally, the Bremen team assisted with the commissioning of the new Geochemistry Laboratory in the ZfT, principally documenting instrumentation and purchasing lab equipment.
- Training of relevant ESO-EPC staff by the University of Leicester Tax Office on importing and exporting goods for research purposes and value-added tax.
- Training of relevant ESO staff on the new UK Procurement Act 2023 that came into effect in February 2025.

The ESO-Bremen team continued to support expeditions implement by the *JR* Science Operator, specifically the Sampling Party for IODP Expedition 403: Eastern Fram Strait Paleo-Archive, with 22,000 samples taken, packed and shipped. Cooperation continued with the Gulf Coast Repository when the Expedition 389 cores and sample material were shipped there for final archive in June.

New team member Janine Migge joined ESO (Bremen) on 18 April, initially to provide curatorial cover for another team member on parental leave. On 1 September, the ESO-Bremen team welcomed two new members: Dr. Chang Liu will serve as the ESO Geochemist (while another member is on a long-term leave), and Caroline Daniel the IT and Data Management team. Both appointments were made to allow timely preparation and training ahead of the Expedition 501 Onshore Operation in January 2026.

Data Management

In 2025, ESO continued data archiving and publication to PANGAEA (Expedition 386: Japan Trench Paleoseismology continuation, Expedition 389: Hawaiian Drowned Reefs initiation), which involved preparation of IGSN registrations and the revision of dataset harmonization to adhere to new PANGAEA submission standards.

A new mDIS (mobile Drilling Information System) instance for Expedition 501: New England Shelf Hydrogeology was generated, and set up pre-mobilisation on ESO's offshore servers as part of readying the expedition's data management hardware.

The ESO Nextcloud, which ESO uses to ingest, manage and share expedition data during the acquisition and moratorium phases of expeditions, was upgraded and maintained, with user accounts created and issued for the Expedition 501 Science Team.

ECORD's perspectives in the International Ocean Drilling Programme (IODP³)

Introduction

Mission-The shift from the International Ocean Discovery Program (2013–2024) to its successor, the International Ocean Drilling Programme (IODP³, beginning in 2025), provides an ideal opportunity to review the Mission-Specific Platform (MSP) strategy. This approach will remain a core element of the next phase of scientific ocean drilling, along with its associated benefits and challenges.

Over the past two decades, the ten MSP expeditions and their associated technologies have proven indispensable to scientific ocean drilling. Although ten expeditions may seem modest compared to the 69 conducted by other IODP platforms during the same period, MSPs have enabled sampling and data collection from previously inaccessible regions and geological targets. These expeditions rank among the most scientifically productive of the IODP era, generating more than 600 peer-reviewed publications based on MSP-derived samples and data (see bibliographies in online IODP Proceedings volumes).

The primary strength of MSPs lies in their flexibility: the ability to select platforms and coring systems tailored to scientific objectives and environmental constraints without maintaining costly permanent infrastructure. This adaptability allows ECORD, through its suppliers, to incorporate technological advances and meet project-specific requirements effectively. However, this flexibility comes with trade-offs. MSP expeditions are typically one-off operations, which drives up costs and limits the accumulation of institutional drilling expertise. Each expedition requires mobilising a different platform, often involving extensive mobilisation and demobilisation if coring systems are not pre-installed. Combined with slower coring rates, this results in higher costs per expedition and per metre of core compared to regular, larger drillship operations.

Another challenge is the lack of continuity in drilling teams and equipment between MSP expeditions—even when the same contractor is involved. Despite ESO's efforts to transfer knowledge, building cumulative IODP coring experience within transient contractor teams is nearly impossible. Consequently, each expedition represents a steep learning curve for contractors, as industry rarely performs continuous, high-quality coring from seabed to target depth. These learning curves, along with troubleshooting bespoke technical setups, often consume the first one to two weeks of an expedition. While containerised scientific infrastructure helps maintain consistency in curation, analysis, and data management, technical issues remain an inherent risk.

Future MSP selection will continue to depend on factors such as water depth, penetration depth, lithology, additional requirements (e.g., casing or groundwater sampling), site accessibility, security, permitting, platform availability, and cost. Of these, platform availability—closely tied to market demand and pricing—is the most unpredictable. Offshore industry booms, such as those driven by windfarm development, can inflate costs and reduce vessel availability, sometimes resulting in failed tenders or delays under UK government procurement rules. Specialist vessels, including icebreakers and deep-water drillships, are particularly difficult to secure, especially for remote proposals near the Antarctic margin. Raising expedition budgets can improve vessel availability by incentivising contractors to prioritise scientific projects over routine commercial work. However, public funding for ocean drilling faces increasing pressure, and MSP costs have risen sharply due to global inflation following the Covid-19 pandemic and geopolitical disruptions. Alternative strategies are therefore essential. Previous MSPs have successfully reduced costs through In-Kind Contributions (IKCs), such as research vessels for shallow coring. Yet securing these vessels is challenging due to competing national priorities and seasonal demand for icebreakers.

Another potential cost-saving measure—still untested—is clustering proposals to enable multi-expedition contracts. This approach could share mobilisation costs and create larger, more attractive contracts for drilling companies. Implementing such a strategy would require significant coordination and transparency within the scientific community regarding future geographic and technological plans.

Conclusion

For the past 20 years, MSPs have been vital to expanding the geographic and scientific reach of ocean drilling, enabling access to targets beyond the operational limits of *JOIDES Resolution* and *Chikyu*. Their success stems from the ability to source appropriate vessels and coring technologies—whether offshore wireline systems, onshore mining-style rigs, seafloor drills, or giant piston corers—combined with Onshore Science Parties that reduce offshore staffing needs.

Despite these achievements, MSPs face persistent challenges: rising costs amid shrinking budgets, vulnerability to market fluctuations, lack of economies of scale, and difficulties in transferring drilling expertise between transient teams. Nevertheless, ECORD and ESO remain proud of MSP contributions and are committed to refining the concept and delivering new successes in the coming decade under IODP³.

4. Participating in 2024 *JOIDES Resolution* and *Chikyu* expeditions, and ECORD partnership in the International Ocean Discovery Program

The *JOIDES Resolution's* during IODP Expedition 403: Eastern Fram Strait Paleo-Archive.
Credit: @ECORD_IODP.

Participating in 2024 IODP expeditions

In 2024, ECORD, as a contributing member of the *JOIDES Resolution* (JR) Consortium, was entitled to an average of seven scientists on every IODP expedition onboard the drill ship *JOIDES Resolution*.

Scientists are chosen following an open call for applications and a competitive selection process. After a nomination proposal by ESSAC, staffing discussions are held with the implementing organisations, the appointed Co-Chief Scientists and the IODP member countries/consortia.

Participation of ECORD scientists is proportional to the financial contributions of the member countries to the ECORD budget following a quota system. Selection of ECORD members of shipboard Science Parties is, therefore, based on both scientific merit and a time-averaged country quota. However, country quotas do not apply when a specific expertise is requested through a Special Call, or if the expedition occurs in territorial waters of an ECORD member country. In both cases, scientists from ECORD member countries can also sail following Special Calls or sail as observers.

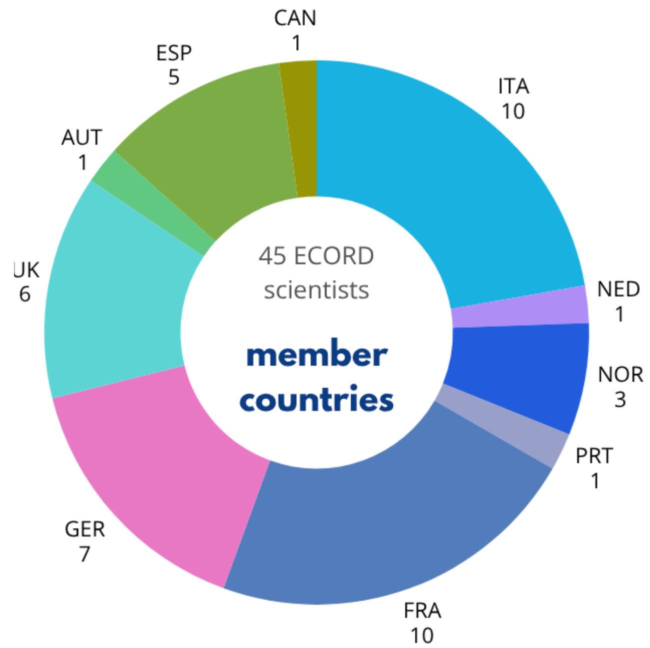
The three expeditions with the *JOIDES Resolution* in 2024 mark the end of an era, as the ship was decommissioned after IODP Expedition 403. On these expeditions a total of 27 ECORD scientists sailed, four as Co-Chief Scientists, and six were selected during Special Calls or as observers.

The last IODP expedition has been implemented with the *Chikyu* drilling offshore Japan during IODP Expedition 405. Eighteen ECORD scientists participated in this expedition, of whom two were Co-Chief Scientists and four were selected following a Special Call.

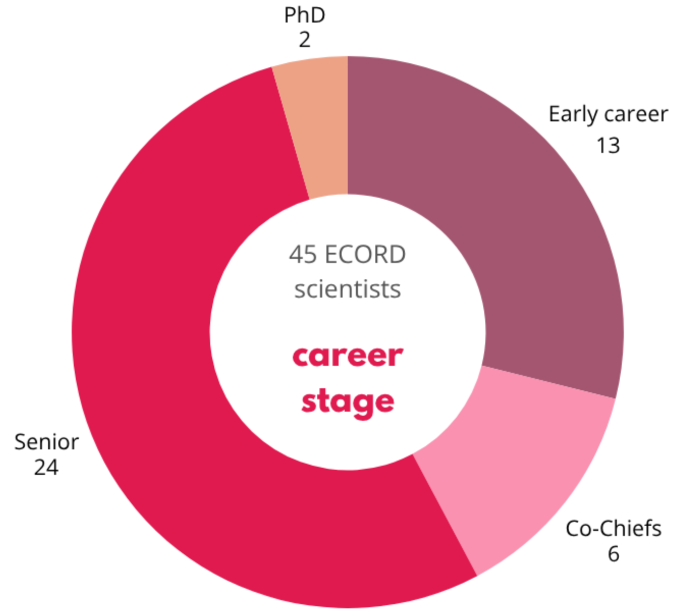
In 2024, **three expeditions** were implemented by the *JOIDES Resolution* and **one expedition** by the *Chikyu*.

A total of **45 ECORD scientists** from 10 ECORD members were invited to participate, including **six Co-Chief Scientists.**

Exp. 401 | Exp. 402 | Exp. 403 | Exp. 405



Distribution of ECORD scientists in 2024 *JOIDES Resolution* and *Chikyu* expeditions by country.



Distribution of ECORD scientists in 2024 *JOIDES Resolution* and *Chikyu* expeditions by career stage (n = 45).

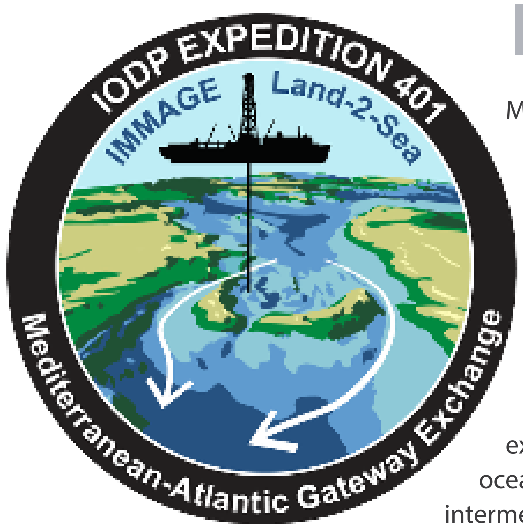
2024 *JOIDES Resolution* and *Chikyu* expeditions

Expedition name	#	Dates	Ports	Oper.
Mediterranean-Atlantic Gateway Exchange	401	Dec. 10, 2023 – Feb. 9, 2024	Amsterdam / Napoli	JRSO
Tyrrhenian Continent-Ocean Transition	402	Feb. 9 – Apr. 8, 2024	Napoli / Napoli	JRSO
Eastern Fram Strait Paleo-archive	403	June 4 – Aug. 2, 2024	Amsterdam / Amsterdam	JRSO
Japan Trench Tsunamigenesis	405	Sept. 6 – Dec. 20, 2024	Shimizu / Shimizu	MarE3

IODP Expedition 401

10 Dec. 2023 – 9 Feb. 2024

Mediterranean–Atlantic Gateway Exchange



Exp. 401 Principal goals

Marine gateways play a critical role in the exchange of water, heat, salt, and nutrients between oceans and seas. The advection of dense waters helps drive global thermohaline circulation, and because the ocean is the largest of the rapidly exchanging CO_2 reservoirs, this advection also affects atmospheric carbon concentration. Changes in gateway geometry can therefore significantly alter both the pattern of global ocean circulation and associated heat transport and climate, as well as having a profound local impact.

Today, the volume of dense water supplied by Atlantic–Mediterranean exchange through the Gibraltar Strait is amongst the largest in the global ocean. For the past 5 My, this overflow has generated a saline plume at intermediate depths in the Atlantic that deposits distinctive contouritic sediments in the Gulf of Cadiz and contributes to the formation of North Atlantic Deep Water. This single gateway configuration only developed in the early Pliocene, however. During the Miocene, a wide, open seaway linking the Mediterranean and Atlantic evolved into two narrow corridors: one in northern Morocco, the other in southern Spain. Formation of these corridors permitted Mediterranean salinity to rise and a new, distinct, dense water mass to form and overspill into the Atlantic for the first time. Further restriction and closure of these connections resulted in extreme salinity fluctuations in the Mediterranean, leading to the formation of the Messinian Salinity Crisis salt giant.

Investigating Miocene Mediterranean–Atlantic Gateway Exchange (IMMAGE) is an amphibious drilling proposal designed to recover a complete record of Atlantic–Mediterranean exchange from its Late Miocene inception to its current configuration. This will be achieved by targeting Miocene offshore sediments on either side of the Gibraltar Strait during International Ocean Discovery Program (IODP) Expedition 401 and recovering Miocene core from the two precursor connections now exposed on land with future International Continental Scientific Drilling Program (ICDP) campaigns. The scientific aims of IMMAGE are to constrain quantitatively the consequences for ocean circulation and global climate of the inception of Atlantic–Mediterranean exchange, to explore the mechanisms for high-amplitude environmental change in marginal marine systems, and to test physical oceanographic hypotheses for extreme high-density overflow dynamics that do not exist in the world today on this scale.

IODP Expedition 402

9 Feb. 2024 – 8 Apr. 2024

Tyrrhenian Continent–Ocean Transition

Exp. 402 Principal goals

A tenet of plate tectonics is that divergent plates cause the asthenospheric mantle to ascend, decompress, and melt, producing new magmatic crust. However, drilling west of Iberia in the 1980s discovered a continent–ocean transition (COT) made of exposed mantle, revising models of lithospheric thinning and melt generation and defining magma-poor margins. A long-standing argument about mantle in COTs concerns its nature as either subcontinental or being exhumed during ultraslow seafloor spreading. Additionally, two models attribute the apparent lack of melts either to slow extension resulting in low ascent rates with enhanced asthenospheric cooling and reduced melt production or to upwelling mantle originally too depleted to produce a significant melt fraction. The debate on COT models is limited by the scarce evidence obtained in ultra-deepwater drilling, restricted to a few basement highs. Thus, 30 y after its discovery, the nature and genesis of COTs is still controversial. The comparatively shallow water depth and thin sediment cover of the Tyrrhenian Sea provide an optimal location to test COT formation models by drilling. The Tyrrhenian is the only example where extensive modern geophysical data has accurately mapped basement domains of a conjugate pair of COTs. They can be characterized with unprecedented detail in a single drilling expedition to study the time and space evolution of COT processes. Expedition 402 will drill two perpendicular transects. An east–west transect will target the progression from magmatic crust to exhumed mantle; a north–south transect will map the fault zone that exhumed the mantle. Drilling will sample the complete sediment section including Messinian deposits, the sediment/basement interface, the mantle, the associated magmas, and the products of syntectonic, and possibly ongoing, fluid-rock interactions to evaluate the hydrosphere–lithosphere geochemical exchange and potential related ecosystems.

Scientists during IODP Expedition 401. Credit: @ECORD_IODP.

IODP Expedition 403

4 June 2024 – 2 Aug. 2024

Eastern Fram Strait Paleo-Archive

Exp. 403 Principal goals

The North Atlantic and Arctic Oceans are unquestionably major players in the climatic evolution of the Northern Hemisphere and in the history of the meridional overturning circulation of the Atlantic Ocean. The establishment of the modern North Atlantic Water (NAW) transporting heat, salt, and moisture to the Northern Hemisphere has been indicated as one of the main forcing mechanisms for the onset of the Northern Hemisphere glaciation. NAW controls the extent and dynamics of circum-Arctic and circum-North Atlantic ice sheets and sea ice in addition to deep water and brine production. How the ocean system and cryosphere worked during past warmer intervals of high insolation and/or high atmospheric CO_2 content is still largely unknown and debated. The required information can only be attained by offshore scientific drilling in high-resolution, continuous, and undisturbed sedimentary sequences identified on the western continental margin of Svalbard (eastern side of the Fram Strait) along the main pathway and northern penetration of the NAW flowing into the Arctic Ocean. The area around Svalbard is very sensitive to climatic variability and it can be considered as a "sentinel of climate change." Further, the reconstruction of the dynamic history of the marine-based paleo-Svalbard-Barents Sea Ice Sheet is important because it is considered the best available analog to the modern, marine-based West Antarctic Ice Sheet, for which the loss of stability is presently the major uncertainty in projecting future global sea level rise in response to the present global climate warming.

IODP Expedition 405

6 Sep. 2024 – 20 Dec 2024

Tracking Tsunamigenic Slip Across the Japan Trench (JTRACK)

Exp. 405 Principal goals

The 11 March 2011 M 9.0 Tohoku-oki earthquake was one of the largest earthquakes ever recorded and was accompanied by a devastating tsunami. Slip during the earthquake was exceptionally large at shallow depth on the plate boundary fault, which was one of the primary factors that contributed to the extreme tsunami amplitudes that inundated the coast of Japan. International Ocean Discovery Program Expedition 405 aims to investigate the conditions and processes that facilitated the extremely shallow slip on the subduction interface in the 2011 Tohoku-oki earthquake. Proposed work includes coring and logging operations at two sites in a transect across the trench. The first site, located within the overriding plate, will access the fault zone in the region of large shallow slip, targeting the plate boundary décollement, overlying frontal prism, and subducted units cut by the décollement. The second site, located on the Pacific plate, will access the undisturbed sedimentary and volcanic inputs to the subduction zone. A borehole observatory will be installed into the décollement and surrounding rocks to provide measurements of the temperature in and around the fault over the following several years. Sampling, geophysical logs, and the observatory temperature time series will document the compositional, structural, mechanical, and frictional properties of the rocks in the décollement and adjacent country rock, as well as the hydrogeologic structure and pore fluid pressure of the fault zone and frontal prism—key properties that influence the effective stress to facilitate earthquake slip and potential for large slip. Results from Expedition 405 will address fundamental questions about earthquake slip on subduction zones that may directly inform earthquake and tsunami hazard assessments around the world.

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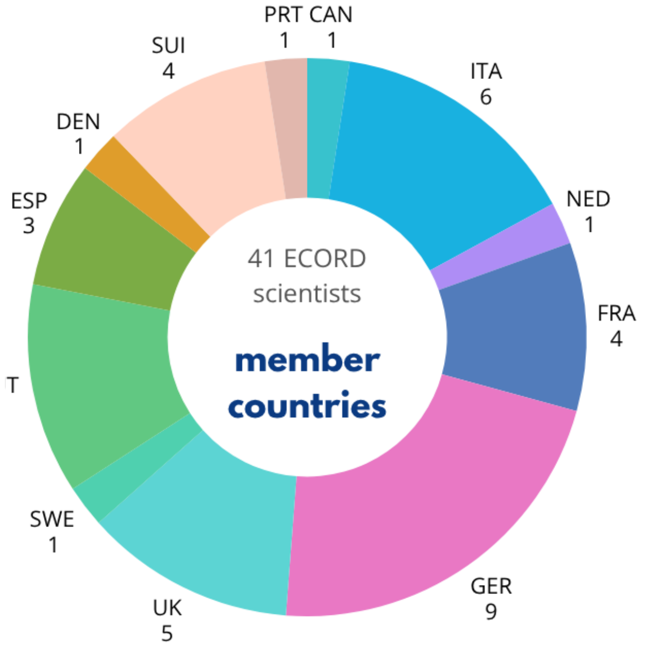
Participating in 2025 IODP expeditions

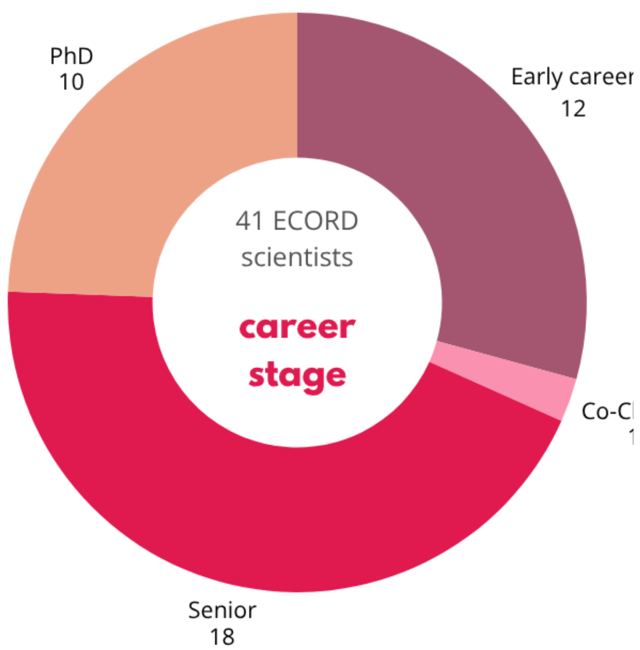
In 2025, **three IODP³ expeditions** were implemented.

A total of **38 ECORD scientists** from 12 ECORD members were invited to participate, including **one Co-Chief Scientist**.

Exp. 501 | Exp. 502 | Exp. 503 |



Distribution of ECORD scientists in 2025 IODP³ expeditions by country (n = 41)



Distribution of ECORD scientists in 2025 IODP3 expeditions by career stage (n = 41)

2025 IODP³ expeditions

Expedition name	#	Dates	Ports	
New England Shelf Hydrogeology	501	May 19 – Aug. 1, 2025	Bridgeport/Bridgeport	ESO
Impact of Petit-Spot Magmatism on Subduction Zone Seismicity and Global Geochemical Cycles	502	Oct. 30 – Nov. 23, 2025	Sendai/Sendai	MarE3
Hadal Trench Tsunamigenic Slip History - Buried in Trench	503	Nov. 24 – Dec. 12, 2025	Sendai/Shimizu	MarE3

Credit: Leber@ECORD_IODP3_NSF.

IODP³ Expedition 501

19 May – 1 Aug. 2025

New England Shelf Hydrogeology

Exp. 501 Principal goals

Coastal hydrological systems provide significant freshwater to coastal communities around the world, and the offshore component of these systems is poorly understood. While volumetrically significant, onshore-offshore freshened water is also susceptible to contamination due to rising sea level. To date, we know very little about the dynamics these shoreline-crossing groundwater systems and the age of the water in these systems, and even less about their influence on cycling of nutrients and rare earth elements.

The northeast coast of the United States is perhaps the best understood example of an offshore freshwater system, and multiple studies have been undertaken to determine the origin and volume of offshore freshwater. Coring and sampling the subseafloor offshore Massachusetts, USA, will provide data for understanding the processes driving emplacement of freshwater lenses offshore New England and elsewhere globally, and lead to a better understanding of this worldwide hydrogeological phenomenon. This is essential for protection and sustainable management of offshore freshwater systems and for better understanding biogeochemical and elemental cycling in continental shelf environments.

Dedicated drilling, coring, and laboratory analyses focused on the New England shelf onshore-offshore hydrogeological system are required to fully understand emplacement processes and dynamics. We plan a three site transect to depths less than 550 m below seafloor along the US Atlantic continental shelf south of Massachusetts, USA to address the following key scientific questions:

- What is the distribution of freshwater, fluid pressures, and temperatures across the New England Atlantic continental shelf?
- How old is the groundwater and when was it emplaced?
- Was freshwater recharged by basal melting of ice sheets, infiltration from proglacial lakes, and/or direct recharge from precipitation?
- Do fluid pressures reflect equilibrium conditions or are overpressuring mechanisms involved?
- What are the current concentrations, production/consumption rates, and cycling of methane, nutrients, and rare Earth elements in shelf sediments?
- What are the rates of decomposition of sedimentary organic matter and which redox processes/microbial communities are involved?
- What are the magnitudes of long-term fluxes of methane and nutrients from the shelf due to periodic flushing during the Pleistocene?
- Does the emplacement of ice sheet meltwaters in confined aquifers create a unique environment for methane?
- What is the sea-level history along this glaciated margin?

ECORD expedition 501 participants:

Cristina Corradin: National Institute of Oceanography and Applied Geophysics – OGS, Italy

David Bekaert Inorganic: Centre de Recherches Pétrographiques et Géochimiques, Lorraine, France

Rolf Kipfer: Swiss Federal Institute of Aquatic Science and Technology, Eawag, Switzerland

Alize Longeau : Centre de Recherches Pétrographiques et Géochimiques, Lorraine, France

Paul Moser Röggla: Swiss Federal Institute of Aquatic Science and Technology, Eawag, Switzerland

Thomas Müller: GEOMAR, Kiel, Germany

Boris van Breukelen: Delft University of Technology, Netherlands

Verena Heuer: MARUM, University of Bremen, Germany

Sophie ten Hietbrink: Stockholm University, Sweden

Mojgan Soleimani: University of Montpellier, France

Davide Gamboa: University of Aveiro, Portugal

Valentina Rossi: National Research Council of Italy – Institute of Geosciences and Earth Resources, Italy

EPM ECORD Science Operator

Jeremy Everest, UK

Margaret Stewart , UK

Petrophysics Staff Scientists ECORD Science Operator:

Erwan Le Ber, France

Andrew McIntyre, UK

IODP³ Expedition 502

30 Oct - 23 Nov 2025

Impact of Petit-Spot Magmatism on Subduction Zone Seismicity

Exp. 502 Principal goals

International Ocean Drilling Programme (IODP3) Expedition 502 plans to explore the nature of the acoustic basement in the outer rise area of the NW Pacific subduction system, where layer-1 pelagic sediment of the subducting old (120–130 Ma) Pacific Plate is exceptionally thin. The hypothesis is that the acoustically thin sediment cover can be attributed to basalt sill intrusions or sheet lava extrusions in and on the pelagic sediment package by basalts fed by petit-spot magmatism. This hypothesis will be tested to see if petit-spot magmatism at the outer rise is more widely distributed than previously thought. The existence of widely-distributed petit-spots would strongly impact the subduction system, including rupture nucleation and slip propagation of plate boundary megathrust earthquakes, as well as effect changes to the geochemical cycle of arc magmatism and the global volatile cycle due to the differing materials associated with the subducted oceanic plate. Testing this hypothesis will shed light on the impacts of subduction inputs and help to determine the global role of petit-spot magmatism, both of which are important elements of the scientific objectives of the International Ocean Drilling Programme (IODP3). deep-sea sediments.

IODP³ Expedition 503

24 Nov. – 12 Dec. 2025

Hadal Trench Tsunamigenic Slip History - Buried in Trench

Exp. 503 Principal goals

Hadal trenches are the deepest places in the ocean, where one tectonic plate slips beneath another, generating powerful earthquakes that can trigger devastating tsunamis. By drilling into these remote seafloor basins to recover sediments buried for thousands of years—samples no one has ever accessed before—we are uncovering the hidden long-term history of giant earthquakes and exploring how these extreme events shape deep-sea ecosystems and drive biogeochemical cycles of carbon and other critical elements in our Earth system. Our targets are:

- Uncover the hidden history of earthquakes and tsunamis in Japan Trench, by drilling into one of the deepest parts of the World´s ocean.
- Understand how and when giant earthquakes struck in the past.
- Evaluate the influence of earthquake-induced fluid migration (discharge) in trench-fill sediments.
- Learn how massive earthquakes impact Earth's carbon cycle and deep-sea life, by recovering never-before-seen deep-sea sediments.

ECORD expedition 502 participants:

Paola Vannucchi: University of Firenze, Italy

Katie Preece: Swansea University, UK

Lottie Atton: University of Plymouth, UK

Olivier Fabbri: University of Marie and Louis Pasteur, France

Jennifer Lington: University of Southampton, UK

Matt Ikari: MARUM, Universitat Bremen, Germany

Rachel Lauer: University of Calgary, Canada

Francesco Narduzzi: Università di Pavia, Italy

Research plan only

Edoardo Barbero: CNR - National Research Council Institute of Geoscience and Earth Resources, Italy

Eun Young Lee: University of Vienna, Austria

Jason Phipps Morgan: Instituto de Ciencas del Mar (ICM) – CSIC, Spain

Jose-Abel Flores: Universidad de Salamanca, Spain

Sebastien Pilet: University of Lausanne, Switzerland

ECORD expedition 503 participants:

Charlotte Pizer: University of Innsbruck, Austria
Matthias Zabel: MARUM - Universität Bremen, Germany
Wenjie Xiao University of Southern Denmark, Denmark
Maria Gea: University of Innsbruck, Austria
Claudio Robustelli: University of Turin, Italy
Paula Diz: Universidade de Vigo, Spain
Dina Hanifah: MARUM - Universität Bremen, Germany
Mishelle Muthre: CNRS, Université de Rennes, France
Pauline Cornard: University of Bremen, Germany
Stephen Bowden: University of Aberdeen, UK
Michael Stipp: Martin Luther University Halle-Wittenberg, Germany
Research plan only
Christian März: University of Bonn, Germany
Jussi Hovikosko: Geological Survey of Finland, Finland
Science Communicators
Garrido Sebastian: Heriot-Watt Univeersity, UK
Melanie Bartos: University of Innsbruck, Austria
Nan-Chin Chu: Ifremer, France
Assistant Expedition Project Manager (A-EPM) :
Margaret Stewart: British Geological Survey, UK

Credit: Letexier@ECORD_IODP.

5. Anticipating future offshore expeditions in the International Ocean Drilling Programme

Jody Webster(Co-chief Scientist, University of Sydney, Australia) takes a closer look at a freshly recovered core onboard *MMA Valour* during IODP Expedition 389.
Credits: M. Parker, ECORD/IODP.

Over the 2024–2025 period, we have been working within the new programme on strategic planning and scientific prioritization to strengthen ECORD's role in delivering high-impact offshore scientific ocean drilling expeditions. Efforts have focused on aligning proposal pressure, vessel access, technical capabilities, and community engagement to ensure that upcoming expeditions address key scientific challenges in Earth system science while remaining operationally feasible and cost-effective.

Future offshore expeditions are shaped by evolving scientific priorities and costs across IODP^3. Particular scientific emphasis has been placed on climate sensitivity, ocean circulation change, cryosphere dynamics, natural hazards, subseafloor biosphere processes, and the energy transition.

The interim MSP Facility Board met in Kobe, Japan in March 2024 to discuss both aspects of the way the Facility Board would work in the new programme as well as to formally recommend implementation of proposal 637 (New England Shelf Hydrogeology) as Expedition 501, proposal 939 (Tohoku Petit Spot Magmatism) as Expedition 502, and proposal 1010 (JTRACK Deep Time Paleoseismology) as Expedition 503, all of which were scheduled and completed in 2025. The interim MSP Facility Board also considered scientific priorities for the new programme as well as vessel capabilities, the availability of the JAMSTEC research vessels and the costs that will be available for implementing scientific ocean drilling.

The final meeting of the ECORD Facility Board, which was held jointly with the Chikyu IODP Board, was held in September 2024 in Cambridge, England. At this meeting there were no proposals to consider implementing or scheduling, so a broader discussion was held about scientific priorities moving into the new programme. Included in this discussion was considerations about cost-effectiveness and the geographic distribution of proposals, which proposals made for 'low hanging fruit' and how to collaborate with the other ocean drilling programmes. Representatives from NSF and the JOIDES Resolution Facility Board were also present. Following this meeting bespoke letters were sent to all proponents with proposals at the ECORD Facility Board suggesting things they might consider if they decided to submit their proposal for implementation in the new programme, including everything from revised implementation plans to potentials for in-kind contributions.

A total of 16 proposals were submitted initially into IODP^3, evaluated at a Science Evaluation Panel Meeting in February 2025, and passed to an online meeting of the interim MSP Facility Board held also in February 2025, to decide operations for 2026. At this meeting it was decided that IODP^3 would recommend implementing proposal 1012 (North Sea Paleoclimate) in 2026. Factors that contributed to this decision included the likelihood of procuring a suitable vessel, the scientific aims of the proposal, and the benefits of scheduling an expedition where permitting issues were less likely to be a challenge.

A further three proposals were passed to the interim MSP Facility Board for our in-person meeting in Yokohama, Japan in May 2025, in addition to three SPARC proposals (expeditions involving legacy assets). All three SPARC proposals were endorsed by the MSP Facility Board, and are currently being implemented as Expeditions 504S, 505S, and 506S. In addition, the MSP Facility Board recommended implementation of proposal 1004 (Nadir Impact Crater) in 2027, and proposal 1106 as Expedition 502e, an engineering leg for Expedition 502: Tohoku Petit Spot Magmatism in 2025.

SPARCs - Scientific Projects using ocean drilling ARChives

IODP^3 Expedition 504S: Volcanic ash record from the Ontong Java Plateau: testing models of subduction reversal and wind transport in the western equatorial Pacific

IODP^3 Expedition 505S: ENIGMA: ExploratioN Into a Global early Miocene Anomaly

IODP^3 Expedition 506S: SIGNALS: Stratigraphic InteGration of North Atlantic Legacy Sites

Upcoming IODP^3 expeditions

IODP^3 Expedition 507: GLACE-NS: Late Cenozoic Glaciers, Landscapes, Climates, and Ecosystems of the North Sea in 2027

IODP^3 Expedition based on IODP proposal 1004: Nadir K-Pg Impact Crater in 2028

Currently, the following proposals are at the MSP Facility Board for implementation in the coming years:

P708 – Arctic Ocean Paleoceanography (ArcOP)
P730 – Sabine Bank Paleosealevel
P813 – Antarctic Cenozoic Paleoclimate
P839 – Amundsen Sea Ice Sheet History
P857C – Messinian Evaporite Demises
P864 – Equatorial Atlantic Gateway
P941– Godzilla Megamullion Lithospheric Architecture
P945 – Brazilian Equatorial Margin Paleooceanography
P967 – Ontong Java Nui LIP
P971 – Kane Megamullion Deep Drilling
P976 – North Iceland Rift Propagation
P979 – Arctic Atlantic Gateway Paleoclimate
P998 – Antarctic Cryosphere Origins
P1005 – Sunda Shelf Sea Level
P1015 – Campeche Bank Sediment Drifts
P1105 – Hyuga-Nada Observatory

Offshore expedition readiness depends heavily on vessel availability and technical capability. During 2024–2025, ESO has continued engagement with marine operators to evaluate vessel suitability for anticipated drilling targets, including deep-water sediment coring, shallow platform drilling, and more typical MSP operations. A central component involves logistical scenario planning. This includes assessing port access, permitting frameworks, geopolitical constraints, seasonal weather windows, and equipment mobilization timelines. Increased attention has been paid to high-latitude operations, where ice conditions, remote access, and environmental compliance require long lead times.

Operational modelling has also been conducted to anticipate cost structures under varying fuel price and vessel scenarios. The goal has been to preserve flexibility while maintaining scientific ambition. Early risk identification particularly related to subsea infrastructure, drilling hazards, or environmental constraints has been incorporated into pre-expedition planning. Future offshore expeditions increasingly rely on technological innovation to meet scientific objectives. ECORD-supported initiatives have explored improvements in coring systems, downhole logging integration, and real-time data acquisition. Particular focus has been placed on enhancing recovery in challenging lithologies, such as unconsolidated glacial sediments and hard volcanic sequences.

Recent global disruptions, including supply-chain instability and geopolitical tensions, have reinforced the need for resilience planning. This includes undertaking scenario analyses to assess the vulnerability of offshore scheduling to port closures, shipping delays, and equipment shortages. Diversification of suppliers and early procurement strategies have been explored to mitigate these challenges. Contingency planning now routinely incorporates alternative ports, substitute equipment pathways, and flexible scheduling options. Environmental risk assessment has also been strengthened. Anticipated expeditions in sensitive marine environments are subject to rigorous environmental impact evaluation, ensuring compliance with national and international regulations. Early dialogue with permitting authorities has shortened approval timelines and reduced uncertainty. We are continually working to identify international partners with whom to implement ('co-badge') offshore scientific ocean drilling and have encourage lead proponents of the various proposals to do the same. We are looking many years into the future, including towards the International Polar Year 2032 for clustering of expeditions.

In summary, 2024–2025 has been a period of preparation and execution. By integrating scientific foresight, operational modeling, technological innovation, and community development via Magellan[3] workshops, ECORD is positioning itself to deliver robust, high-impact offshore expeditions in the coming years.

Proposals at the MSP Facility Board

Proposal	Type	Short Title	Lead proponent	Country
708	Add 5	Arctic Ocean Paleoceanography (ArcOP)	Juliane Müller	Germany
730	Full 2	Sabine Bank Sea Level	Frederick Taylor	USA
813	Full	Antarctic Cenozoic Paleoclimate	Trevor Williams	USA
839	Full	Amundsen Sea Ice Sheet History	Karsten Gohl	Germany
857C	Add 2	Messinian Evaporite Demises	Claudia Bertoni	UK
864	Full 2	Equatorial Atlantic Gateway	Tom Dunkley Jones	UK
941	Full 2	Godzilla Megamullion Lithospheric Architecture	Yasuhiko Ohara	Japan
945	Full 2	Brazilian Equatorial Margin Paleooceanography	Luigi Jovane	Brazil
967	Full 2	Ontong Java Nui LIP	Takashi Sano	Japan
971	Full 2	Kane Megamullion Deep Drilling	Alessio Sanfilippo	Italy
976	Full	North Iceland Rift Propagation	Hans Christian Larsen	Denmark
979	Full 2	Arctic Atlantic Gateway Paleoclimate	Wolfram Geissler	Germany
998	Full	Antarctic Cryosphere Origins	Robert McKay	New Zealand
1005	Full 2	Sunda Shelf Sea Level	Peter Clift	UK
1015	Full	Campeche Bank Sediment Drifts	Christopher Lowery	US
1105	Full	Hyuga-Nada Observatory		

Related websites

- http://www.ecord.org/about-ecord/management-structure/ efb/
- *http://www.iodp.org/active-proposals*
- http://www.iodp.org/facility-boards#SEP

IODP³ Expedition 507

GLACE-NS

Lead proponent: **Andrew Newton** (Queen's University Belfast, UK)

Expedition website https://iodp3.org/expedition/507/

2027 Scientific objectives

IThe intensification of glacial-interglacial cycles at the onset of the Pleistocene (~2.6 Ma) was a critical tippingpoint in Earth's climate history. The increased severity of cold conditions triggered the development of continentalscale ice sheets, whose timing and extents are recorded in the North Sea Basin (NSB). Unlike the onshore record, the NSB preserves an almost complete record of glacial erosion and deposition from European ice sheets and Europe's large river systems. This has resulted in a 1.2-km-thick Pleistocene record of climatic and environmental change. Relatively little is known about global ice sheet fluctuations, except for estimates on ice volume with poor spatiotemporal control. There is evidence that Pleistocene ice sheet feedback loops affected the evolution of the global climate system through complex ocean-atmospherecryosphere linkages. Thus, the Pleistocene sequence preserved in the North Sea is a significant, and arguably unique, palaeo-climate archive capturing such linkages. While the NSB is covered by extensive seismic and borehole data, the late Pliocene- Pleistocene interval lacks samples providing geological control on existing interpretations. In this pre-proposal, we outline the merits of a NSB drilling expedition to unravel how glaciers, landscapes, climate, and ecosystems evolved and interacted through the late Pliocene and Pleistocene. The drilling campaign would contribute knowledge on natural climate variability and vulnerability, analogues of past warmer climates, tipping points, and rates of change. The mid-latitude location will allow for linkages between low- and high-latitude records, and the potential feedbacks and teleconnections of northwest European climate with other parts of the climate system – e.g., the influence of European Ice Sheets on the position of North Atlantic storm tracks. A particular focus on ecosystem evolution will reveal climate- and biologyrelated feedbacks, resilience, recovery, and carbon cycle dynamics. The results from a successful drilling campaign tie into IODP Strategic Objectives 3-5 and Flagship Initiative 1 (ground-truthing future climate change). It will contribute to better calibration of numerical Earth- system models, knowledge on climate sensitivity and variability, and a wider appreciation of feedbacks between different parts of the Earth-system. The ability to cover such a wide range of themes, at a scale that captures changes from across northwest Europe, can only be achieved through continuous coring of the uniquely-complete late Pliocene- Pleistocene NSB succession. The fact that such insight can be generated from a modest amount of drilling emphasises why the Plio- Pleistocene NSB should be considered a high-value target for the IODP.

IODP³ Expedition based on IODP proposal 1004

Nadir K-Pg Impact Crater

Lead proponent: **Uisdean Nicholson** (Heriot-Watt University, UK)

2028 Scientific objectives

The hypervelocity impact of large asteroids and comets represent an important geological hazard and can cause major perturbations of Earth's climate and biological systems. Seismic sections across the 8.5-km wide Nadir structure offshore Guinea, West Africa, show numerous characteristics consistent with a complex impact crater. The feature is relatively shallow, at only ~300-400 m below the seafloor, and uniquely accessible by riserless drilling. Leveraging planned IODP Expeditions in the Central Atlantic, nine days of drilling are required to test the hypothesis that this structure was caused by a marinetarget impact of Late Cretaceous to Early Paleogene age. Drilling will allow to test conceptual and numerical models of crater formation based on seismic data. The proponents also seek to determine the age of the impact lithologies and therefore determine the age of the crater. This will allow to test the hypothesis that the Nadir structure could be an impact that was coeval with the Chicxulub impact event in Mexico (or part of an impact cluster. If the crater pre-dates or corresponds with the K-Pg boundary, then the selected sites will provide a high-resolution archive including K-Pg impact ejecta and the Paleogene recovery of life following the K-Pg mass extinction. It will also provide an important low-latitude record of early Cenozoic oceanographic and climatic conditions, likely including the Paleocene-Eocene Thermal Maximum (PETM) and Eocene hyperthermal events.

IODP Proposal P708

Arctic Ocean Paleoceanography (ArcOP)

Lead Proponent: **Juliane Müller** (Alfred Wegener Institute, Germany)

Scientific objectives

Prior to 2004, the geological sampling in the Arctic Ocean was mainly restricted to near surface Quaternary sediments. Thus, the long-term Pre-Quaternary geological history is still poorly known. With the successful completion of the Arctic Coring Expedition - ACEX (IODP Expedition 302) in 2004, a new era in Arctic research has begun. Employing a novel multi-vessel approach, the first MSP expedition of IODP has proven that drilling in permanently ice-covered regions is possible.

During ACEX, 428 meters of Quaternary, Neogene, Paleogene and Campanian sediment on Lomonosov Ridge were penetrated, providing new unique insights into the Cenozoic Arctic paleoceceanographic and climatic history. While highly successful, the ACEX record also has three important limitations. Based on the original age model, the ACEX sequence contains a large hiatus spanning the time interval from late Eocene to middle Miocene, i.e., 44.4 to 18.2 Ma. This is a critical time interval, as it spans the time when prominent changes in global climate took place during the transition from the early Cenozoic Greenhouse world to the late Cenozoic Icehouse world.

Furthermore, generally poor recovery during ACEX prevented detailed and continuous reconstruction of Cenozoic climate history. Finally, a higher-resolution reconstruction of Arctic rapid climate change during Neogene to Pleistocene times, could not be reached during ACEX in 2004. A return to the Lomonosov Ridge for a second MSP - type drilling campaign within IODP might fill these major gaps in our knowledge on Arctic Ocean paleoenvironmental history through Cenozoic times and its relationship to the global climate history.

Overall goal of the proposed drilling campaign is the recovery of a complete stratigraphic sedimentary record on the southern Lomonosov Ridge to meet our highest priority paleoceanographic objective, the continuous longterm Cenozoic climate history of the central Arctic Ocean. Furthermore, sedimentation rates two to four times higher than those of ACEX permit higher-resolution studies of Arctic climate change in the Pleistocene and Neogene. As demonstrated in the proposal, this goal can be achieved by careful site selection, appropriate drilling technology, and applying multi-proxy approaches to paleoceanographic, paleoclimatic, and age-model reconstructions.

IODP Proposal P730

Sabine Bank Sea Level

Lead Proponent: **Frederick Taylor** (The University of Texas at Austin, USA)

Scientific objectives

Western Pacific Warm Pool (WPWP) coral records of Quaternary climate and sea level continue underachieving their potential due to scarcity of samples. Pre-LGM corals are even rarer than post-LGM with virtually no records prior to ~15 ka; only MIS 3 sea level peaks are dated by corals, while low stands remain poorly defined. Some issues that fossil corals from Vanuatu would illuminate include pre-Holocene WPWP climate variability, including the El Niño-Southern Oscillation (ENSO) and decadal-scale variability, annual cycle sensitivity to insolation, and the response of the South Pacific Convergence Zone (SPCZ) to changes in background conditions and concrete paleosea level evidence. Dated corals from SB and BG would provide unprecedented constraints on the trajectory and rates of convergence and subsidence of a tectonic plate back into the mantle. Because of their geochemical character, corals are perhaps the most precisely datable natural material that records interannual, decadal, and centuryscale SST and SSS variability via ^{18}O, Sr/Ca, and, possibly, other proxies at sub-annual resolution. Drilling rapidly subsiding reefs at Sabine Bank and Bougainville Guyot is a new strategy offering many advantages. Both reefs have ridden eastward over the New Hebrides trench outer rise (NHTOR) at mean rates of ~85 mm/yr and are descending into the trench. Bougainville Guyot was drilled at 1066 m depth at ODP Site 831 with extremely poor core recovery. However, an incredibly well preserved ~350 ka Porites sp. coral from ~ 240 mbsf produced one of the only credible pre-MIS 5e coral records. This example illustrates how rapid subsidence can facilitate coral preservation. Sabine Bank's surface lies at 5 - 35 m depths and MCS profiles indicate up to 500 m of carbonate subdivided into four major units overlying a faulted basement. SB drilling would produce at least a post LGM record, and possibly much more. The western ends of SB and BG are ~100 ka younger in their stratigraphic evolution than the western ends. This enables a strategy of drilling younger strata at the western edges of SB and BG and progressively older strata toward the trench to compensate for the limitations of the Marum Mebo 200 Drill which presently has a 70 mbsf capacity, but is being improved to drill to 200 mbsf.

IODP Proposal P813

Antarctic Cenozoic Paleoclimate

Lead Proponent: **Trevor Williams** (Texas A&M University, USA)

Scientific objectives

Along the George V and Adélie Land (GVAL) shelf of Antarctica, shallowly-buried strata contain a record of Antarctica's climate and ice history from the lush forests of the Eocene greenhouse to the dynamic ice sheet margins of the Neogene. Over these times, Antarctica and the Southern Ocean have played a central role in controlling sea level, deep-water formation, ocean circulation, and exchange of carbon dioxide with the atmosphere. Yet currently there are very few direct records of Antarctic climate and ice conditions from close to the continent. On the GVAL shelf, short piston cores and dredges have recovered Cretaceous and Eocene sediment at the seabed. In 2010, IODP Expedition 318 recovered earliest Oligocene and early Pliocene subglacial and proglacial diamicts, providing direct records of ice advances across the shelf at these times, and confirming that target sediments are accessible at shallow burial depths. However, challenging ice and drilling conditions from the JOIDES Resolution resulted in poor core recovery and abandoning sites before the stratigraphic targets were reached. Here, it is proposed to use the MeBo sea bed drill for improved core recovery and easier access to the shelf. It is proposed to drill two stratigraphic transects of shallow (~80 m) holes to investigate Antarctica's role in icehouse and greenhouse climates, and the transitions between the two. To investigate Oligocene to Pliocene ice sheet dynamics, strata above and below regional erosional and downlap surfaces are targeted to date and characterize major episodes of ice sheet advance and retreat. These direct records of ice extent on the shelf can be set in the context of Southern Ocean records of temperature, ice-rafted debris (IRD) and latitudinal fluctuations of the opal belt, and hence ice behavior can be related to paleoclimate conditions. The ice and climate history of the GVAL margin can provide warm-world scenarios to help understand ice sheet instability in analogous future warm climates.

In the Cretaceous and Eocene greenhouse target intervals: temperature and vegetation records will provide high-latitude constraints on pole-equator temperature gradients and their evolution; the proximity of the sites to the coastal lowlands will enable us to assess the hypothesized role of thawing permafrost in Eocene hyperthermal events; and late Eocene cooling and possible pre-cursor glaciations can also be documented by drilling.

IODP Proposal P839

Amundsen Sea Ice Sheet History

Lead Proponent: **Karsten Gohl** (Alfred Wegener Institute, Germany

Scientific objectives

The West Antarctic Ice Sheet (WAIS) is largely marine-based and, thus, highly sensitive to climatic and oceanographic changes. It probably had a very dynamic history over the last several million years. A complete collapse of the WAIS would result in a global sea-level rise of 3.3-4.3 meters, yet, the world's scientific community (e.g. IPCC 5th Assessment Report 2013) is not able to predict its future behaviour. Moreover, knowledge about past behaviour of the WAIS is poor, in particular during geological times with climatic conditions similar to those expected for the near and distant future. Reconstructions and quantifications of partial or complete WAIS collapses in the past are urgently needed for constraining and testing ice sheet models that aim to predict future WAIS behaviour and the potential contribution of the WAIS to global sea-level rise. Large uncertainties exist regarding the chronology, extent, rates, and spatial and temporal variability of past advances and retreats of the WAIS across the continental shelves. These uncertainties mainly result from the fundamental lack of data from drill cores recovered proximal to the WAIS. The continental shelf and rise of the Amundsen Sea are prime targets for drilling, because the records are expected to yield archives of pure WAIS dynamics unaffected by other ice sheets, and the WAIS sector draining into the Amundsen Sea Embayment (ASE) currently experiences the largest ice loss in Antarctica. A series of drill sites are proposed for the ASE shelf where seismic data reveal oceanward dipping sedimentary sequences that span the time from the pre-glacial depositional phase to the youngest glacial periods. Our strategy is to drill transects from the oldest sequences close to the bedrock-basin boundary at the middle-inner shelf transition to the youngest sequences on the outer shelf in both the western and the eastern ASE. These transects will provide a detailed history of the glacial cycles in the Amundsen Sea region and allow comparison to the WAIS history known from the Ross Sea sector. In addition, deep-water sites on the continental rise of the Amundsen Sea are selected for recovering continuous records of glacially transported sediments and detailed archives of climatic and oceanographic changes throughout glacial-interglacial cycles. We will apply a broad suite of analytical techniques, including multi-proxy analyses, to address our objectives of reconstructing the onset of glaciation in the greenhouse to icehouse transition and processes of dynamic ice sheet behaviour during the Neogene and Quaternary.

IODP Proposal 857C

Messinian Evaporite Demises

Lead Proponent: **Clauda Bertoni** (University of Oxford, UK)

Scientific objectives

Approximately 6 Myrs ago, during the Messinian Salinity Crisis (MSC), the Mediterranean was transformed into a giant saline basin. This geologically short-term event (~640 ka) deposited up to 2 km of salt in the deep basin, producing the largest, youngest, and least deformed salt giant on Earth. Drilling the upper reaches of the Mediterranean Salt Giant offers exceptional opportunities to understand: (1) dramatic environmental changes and salinity fluctuations experienced during terminal stages of the MSC and (2) development of an exceptionally active deep biosphere involved in extensive mineral transformations.

After salt emplacement, the Mediterranean underwent dramatic environmental changes: 1) its deep basins were presumably subaerially exposed and became host of huge fluvial depositional systems from surrounding land-masses, 2) it experienced rapid basin-wide salinity decreases from hypersaline into brackish water conditions resulting in enigmatic Lago-Mare sedimentary accumulations and 3) it underwent a rapid return to normal open marine conditions following the catastrophic refilling of the basin with Atlantic waters during the Zanclean megaflood event, interpreted as the largest known event of this kind. The drivers responsible for the rapid and dramatic basin-wide salinity fluctuations, from hypersaline to brackish to open marine conditions, are presently unknown. The Mediterranean's near land-locked physiography makes it highly sensitive to subtle changes in insolation and associated fluctuations in freshwater input. The central and eastern Mediterranean MSC deposits are ideally located for understanding how this hydrological evolution was forced by water exchanges between Mediterranean sub-basins and the Paratethys and Atlantic Ocean, and by the climatically-influenced input of freshwater from major circum-Mediterranean rivers.

The halite – gypsum – Lago Mare succession of the terminal MSC offers a means to test our hypothesis that the upper reaches of the Mediterranean Salt Giant contain one of the most active deep biosphere environments on Earth. We propose that microbes in this deep biosphere (1) use sulphate minerals as a source of oxidative power, (2) catalyse formation of massive amounts of mineral dolomite and (3) thrive within fluid inclusions of evaporite minerals over geological timescales. Recent observations in the Ionian Abyssal Plain suggest on-going microbially-mediated dolomitization over an area as large as the island of Sicily.

We propose to drill two sites in the Ionian Basin and two in the Levant Basin, penetrating the terminal MSC successions: open-marine Pliocene siliciclastic deposits hosting the hypothesized active dolomitization front; lacustrine Lago-Mare sulphate evaporites, carbonates, marls, and siliciclastic accumulations; and Upper Messinian salts.

IODP Proposal 864

Equatorial Atlantic Gateway

Lead Proponent: **Tom Dunkley Jones** (University of Birmingham, UK)

Scientific objectives

This proposal seeks to answer first order questions about the tectonic, climatic and biotic evolution of the Equatorial Atlantic Gateway (EAG). It is proposed to target sequences of Late Cretaceous and Cenozoic sediments offshore NE Brazil, just south of the theorized final opening point of the EAG. These sequences are accessible to conventional nonriser drilling in the vicinity of the Pernambuco Plateau, part of the northeastern Brazilian continental shelf. This region was chosen to satisfy two key constraints that other regions in Equatorial Brazil could not meet: first, Aptian-Albian aged sediments, that record the main phases of the South Atlantic marine incursion, are present at depths shallow enough to be recovered by non-riser drilling; second, Late Cretaceous and Paleogene sediments preserved on the Pernambuco Plateau, are close enough to the continental margin, and at shallow enough paleo water depths (<2000 m) to provide well-preserved organic biomarkers and calcareous microfossils for multi-proxy studies of greenhouse climate states. New records in this region will allow us to address major questions within four key themes: A) The early rift history of the Equatorial Atlantic; B) Biogeochemistry of the restricted Equatorial Atlantic; C) The long-term paleoceanography of the Equatorial Atlantic Gateway; and, D) the limits of tropical climates and ecosystems under conditions of extreme warmth. Tackling these major questions with new drilling in the EAG region will advance our understanding of the long-term interactions between tectonics, oceanography, ocean biogeochemistry and climate, and the functioning of tropical ecosystems and climate during intervals of extreme warmth.

IODP Proposal 941

Godzilla Megamullion Lithospheric Architecture

Lead Proponent: **Yasuhiko Ohara** (Hydrographic and Oceanographic Department of Japan)

Scientific objectives

Our knowledge of modern oceanic crust comes largely from the three locations of the "ODP/IODP reference sites of oceanic crust": Atlantis Bank (Holes 735B and U1473A), Atlantis Massif (Hole U1309D), and Hess Deep (Sites 894, 895 and U1415). However, a significant fraction of the ocean floor is created in back-arc basins, where water plays a major role in generating back-arc basin basalts, strikingly contrasting with magmatic process at mid-ocean ridges. In addition, much of our understanding of all oceanic crust comes from ophiolites, which are largely attributed to supra-subduction zone environments. A better understanding of the architecture of back-arc basin crust should be a necessary contribution that will bridge the results of ophiolite analog studies and the overall geology of oceanic crust. However, there has been no single long section of lower oceanic crust and uppermost mantle of back-arc basin to understand the differences that likely characterize the architecture and composition of the oceanic lithosphere at this key tectonic setting.

The Godzilla Megamullion is the largest known oceanic core complex, located in the extinct Parece Vela Basin in the Philippine Sea. It is uniquely defined by its vast area of exposed lower crust and upper mantle material after ~4 m.y.-long detachment faulting. The Godzilla Megamullion records secular evolution of mantle melting beneath a dying back-arc spreading ridge along the length of the detachment. Furthermore, strong heterogeneity in P-wave velocity structure is observed along the length of the megamullion, with normal oceanic crust-like structure in the distal (= breakaway) to medial parts, and high-velocity bodies in the proximal (= termination) part.

Here, we propose a two-leg riserless drilling program of the Godzilla Megamullion. By placing three 400- to 800 m-deep drill holes along its length, we will obtain key data to better understand and constrain the composition of back-arc basin oceanic crust and uppermost mantle, as well as the architecture of oceanic core complexes. The extinct back-arc basin environment at the Godzilla Megamullion further provides a unique opportunity to explore life in an oceanic crust after extinction of its hydrothermal activity. Our proposed drilling program will allow us to test if and how life has been able to adapt to the drastic changes of its living environment.

IODP Proposal 945
Brazilian Equatorial Margin Paleooceanography

Lead Proponent: **Luigi Jovane** (Instituto Oceanografico da Universidade de Sao Paulo, Brazil)

Scientific objectives

Tropical regions are a major source of heat to mid- and high-latitudes. The Atlantic Ocean-Atmosphere system is unique as it is the only system that currently transports heat across the equator. Therefore, to accomplish accurate global climate reconstructions in large-scale climate models it is essential to understand the sensitivity of Atlantic climates in the geologic past and to implement this into numerical models. This, however, has been hampered for most of the Cenozoic due to the lack of sufficient low-latitude sediment records. Here we propose to investigate Cenozoic paleoceanographic changes driven by long and short-term forcing from the Eocene greenhouse to Quaternary icehouse conditions, through the reconstruction of atmospheric, oceanographic and biological processes. The Brazilian Equatorial Margin (BEM) is a passive and stable continental margin that developed following the Mid-Cretaceous opening of the central Atlantic Ocean. A peculiar aspect of this margin is that it remained tectonically "passive" and approximately at the same equatorial latitude since its formation and, consequently, it has maintained continually an oligotrophic inter-tropical environment. This project will take advantage of these unique attributes for obtaining high-quality sedimentological, paleoclimatic, and paleoceanographic data for the Cenozoic. We propose drilling transects across the BEM from the uppermost part of the continental slope to the abyssal plain near Fortaleza (Ceará and Potiguar Basins). The expected stratigraphic continuity along these transects will allow a detailed study of the relation between pCO2, climate changes and existing eustatic constraints throughout the Cenozoic by providing the fundamental parameters for calculating climate sensitivity. This stratigraphic record will define the low-latitude climatic response to the major Cenozoic climatic events, such as the EECO, MECO, EOT, OMT, MCO and iNHG (see text for details). Sediments are expected to yield calcareous and organic microfossils, which will allow us to study the response of tropical ecosystems to these climatic events and provide independent basis for climate and carbon cycle reconstructions. By undertaking a depth transect of sites selected from a wealth of seismic reflection data, progress on all of the scientific objectives will be achieved even if some unresolvable geologic risks are found in the cored sections. In particular, these sites were chosen to establish a landmark for high-resolution Eocene-Mio/Pliocene tropical climate reconstructions, which will provide the following outcomes: 1) quantify the relationship between tropical climate (temperature), atmospheric pCO2 and eustasy; 2) evolution of the Atlantic Meridional Overturning Circulation driven by longer (tectonic) and shorter term (Milankovitch) forcings.

IODP Proposal 967
Ontong Java Nui LIP

Lead Proponent: **Takashi Sano** (National Museum of Nature and Science, Japan)

Scientific objectives

Large Igneous Provinces (LIPs) such as the Ontong Java Plateau (OJP) in the western equatorial Pacific provide information on mantle processes and composition, and their formation may have had global environmental consequences. The OJP is the largest oceanic plateau and is probably the most voluminous igneous edifice on Earth. Despite its importance, the size, volume, and formation rate of the OJP are not yet well constrained. The maximum extent of OJP- related volcanism may be even greater than currently estimated, because volcanological studies indicate that long lava flows (or sills) from the OJP may have reached the adjacent Nauru, East Mariana, and possibly Pigafetta basins. Moreover, the similarity in age and geochemistry of lavas from the Ontong Java, Hikurangi, and Manihiki plateaus suggests that they may have formed together as a single LIP (Ontong Java Nui, OJN). If true, the massive volcanism may have covered >1% of Earth's surface and OJN's magma source would have involved a major part of Earth's upper mantle (16-48 % of mid- Cretaceous asthenosphere!), presumably lower mantle, and possibly some core material. The lack of detailed knowledge of the size, age, and composition of the OJP has given rise to various models such as a surfacing mantle plume head, bolide impact, and fusible mantle melting, but no model satisfies all observational data and no consensus has been reached on its origin.

Likewise, geodynamic effects, evolution, and hydrothermal alteration of the OJP have not been clarified yet.

The OJP is divided into the High Plateau to the west and the Eastern Salient to the east. Basaltic basement of the OJP has been cored at seven Deep Sea Drilling Project (Site 289) and Ocean Drilling Program (Sites 803, 807, 1183, 1185, 1186, and 1187) sites – but these are exclusively located on the High Plateau. Assuming that the proposed OJN reconstruction is correct, the approximate center would be the Eastern Salient, the crust and lithosphere of which may have been thinned by rifting and breakup of the various plateaus. Therefore, the Eastern Salient is the best area to test the OJN hypothesis. In order to examine the true extent of the OJP (i.e., whether the flows in the Nauru, East Mariana, and Pigafetta basins, as well as the Manihiki, and Hikurangi plateaus are parts of the OJN), we propose drilling five sites on the Eastern Salient and adjacent basins to recover sediment and igneous basement samples with variable compositions.

IODP Proposal 971

Kane Megamullion Deep Drilling

Lead Proponent: **Alessio Sanfilippo** (University of Pavia, Italy)

Scientific objectives

This proposal is for two 500-m deep holes on the long-lived detachment fault footwall at the Kane Megamullion, an oceanic core complex (OCC) located at 23°N on the Mid Atlantic Ridge (MAR). The site of the first hole, KNA-01A, is on peridotite, which based on seismic structure and geologic reconnaissance represents exhumed mantle directly exposed on the seafloor. The second site, KNC-01A, is on talc-serpentine schist, which is believed to mask a 264 km2 gabbro body close to the same lithospheric flow line. There are 4 principal objectives: (1) Test the seismic and geologic interpretations of the Kane OCC sub-surface structure. (2) Test the variability of crustal architecture with decreasing melt flux in 3D. (3) Examine hydrothermal alteration processes in lower crustal and mantle lithologies as a function of depth and temperature. (4) Explore heterotrophic and chemolithoautotrophic lifestyles in the lower oceanic crust and upper mantle at the Kane OCC. The drilling strategy calls for both sites to be drilled to 500-m using a drill-in hard-rock guide base, and then to deepen whichever hole is in the best shape. Based on the tectonic setting, and past drilling history at Atlantis Bank, and Atlantis Massif, JRSO calculates these holes can be drilled in 33.6 days, assuming an 8.8 days Barbados-Bermuda transit. Based on a standard leg, this leaves 5 days contingency, or sufficient for an additional ~130 m of drilling.

IODP Proposal 976

North Iceland Rift Propagation

Lead Proponent: **Hans Christian Larsen** (Geological Survey of Denmark and Greenland, Denmark)

Scientific objectives

Our overarching goal is to constrain a possible S-N asymmetry in the dynamics and composition of the Iceland plume by investigating the temporal and compositional development of the crust between the Greenland-Iceland-Faeroe Ridge Complex (GIFRC) and the Jan Mayen Fracture Zone (JMFZ). This area experienced a different and more complex development than that south of the GIFRC, which formed by spreading along the Reykjanes Ridge (RR) ever since breakup at ~55 Ma. Spreading between the GIFRC and the JMFZ took place along the Aegir Ridge (AER) in the Norwegian sea for about 20 Ma forming a distinct igneous breakup margin along the Jan Mayen Microcontinent (JMMC). However, since ~50 Ma, the plume that generated the thick crust below the GIFRC, is interpreted to have sourced a north-ward propagating Iceland Plateau Rift (IPR) that worked in parallel with the AER, prior to the initiation of the Kolbeinsey Ridge (KR). The thickness of IPR igneous crust is considerably thicker than normal oceanic crust. The two overlapping spreading systems (AER-IPR) are interpreted as a coupled pair of propagation and retreating rifts connected by a pseudo transform fault (PTF). Four stages of IPR rifting can be mapped. The propagating IPR tore off a sliver of the East Greenland continental margin (JMMC), which suffered rift-tectonism as well as complex transpressive deformation of crustal block rotation within the JMMC domain. By ~23 Ma, the IPR developed into the present-day KR, the AER became extinct and tectonism within the JMMC ceased. The northward IPR propagation away from the plume centre, thickened crust and an anomalously shallow depth of the Iceland Plateau suggests that strong dynamic influence was exerted by the plume. Interestingly, zero-crust along the KR is more depleted than south of the GIFRC, along the RR, suggesting that the northern component of the Iceland plume exhibits different dynamics than its more enriched southern component. Mapping the temporal and compositional development of northward rift propagation back to ~50 Ma will constrain a fundamental asymmetry within the plume and how variable it has been. This is also the first testing of a large-scale propagating-retreating rift model by ocean drilling, rift propagation into continental lithosphere, and deformation along a PTF. Furthermore, the drilling enigmatic stratigraphic relationship between north Atlantic continental flood basalts and that of initial igneous crust forming along AER can be addressed on the JMMC hosting remnants of the East Greenland basalts.

IODP Proposal 979

Arctic Atlantic Gateway Paleoclimate

Lead Proponent: **Wolfram Geissler** (Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Germany)

Scientific objectives

Today's polar cryosphere reflects a climate state that developed during a stepwise global cooling during the Cenozoic greenhouse-to-icehouse climate transition. Polar ocean gateways such as the Drake Passage in the Southern Hemisphere and the Arctic-Atlantic Gateway (AAG) in the Northern Hemisphere played pivotal roles in changing the global climate through their influence on oceanic circulation, heat transport and ice sheet development. The Arctic Ocean was isolated from the global oceanic thermohaline circulation system during most of its geological history. This gradually changed when Greenland and Svalbard began to move apart from each other, initiating the opening of the AAG through the Fram Strait. Although this gateway is known to be important in Earth's past and modern climate, little is known about its Cenozoic development. Indeed, the opening history and AAG's consecutive widening and deepening must have had a strong impact on circulation and water mass exchange between the Arctic Ocean and the North Atlantic.

As a first order approximation, the timing of Fram Strait opening can be inferred from geophysical and stratigraphic records as well as modelling studies which form the basis of the hypotheses to be tested with this proposal. Climate and tectonic modelling studies suggest that a certain width and depth of the Fram Strait are required to allow the bi-directional exchange of water masses of Atlantic and Arctic origin through the AAG. To test these models, direct geological evidence from ocean drilling sediment records from three primary sites between 73°N and 78°N are needed to constrain the age of the opening, widening, and deepening of this deep-water Arctic-North Atlantic Oceans connection.

These sites will provide unprecedented sedimentary records from the Eocene/Oligocene through the Miocene that will unveil (1) the history of shallow-water exchange between the Arctic Ocean and the North Atlantic and its impact on the global cryosphere evolution, and (2) the development of the AAG to a deep-water connection and its influence on global climate changes. By filling the current time gap of ~20 million years in the AAG region with new, well-dated borehole material, we will address these large uncertainties and gaps in the paleoclimate record.

IODP Proposal 998
Antarctic Cryosphere Origins

Lead Proponent: **Robert McKay** (Victoria University of Wellington, New Zealand)

Scientific objectives

Antarctica's ice sheets profoundly influence the global climate system and carbon cycle by impacting ocean and atmospheric circulation, biogeochemical cycles, and sea level. Large ice sheets developed in Antarctica as the Earth transitioned from the warm, high-CO2 Greenhouse world of the Paleocene-Eocene, into the moderate-CO2 world of the Oligocene-Miocene. However, constraints regarding the timing and magnitude of Antarctica's earliest ice sheets come mostly from indirect inferences based on distant marine geochemical records that are a mix of ice volume and temperature signals - rather than a direct, ice-proximal perspective from the Antarctic continental shelf. There are very few direct records of Eocene-Cretaceous climates at high latitudes in Antarctica, and new records will provide important constraints of the magnitude of polar amplification during greenhouse climates.

Several mechanisms exist to explain Antarctic glacial onset, including declining atmospheric CO2 and the tectonic opening of the Southern Ocean. It is also generally assumed that initial ice sheet expansion near the Eocene/Oligocene boundary was limited to terrestrial East Antarctica ice sheets, because ice could not easily expand across a marine-inundated West Antarctica in the moderate-CO2 worlds and warmer Oligocene climates. However, late Cretaceous-Cenozoic rifting, alongside Neogene erosion, has led to widespread subsidence in West Antarctica. A more elevated West Antarctica in the Oligocene could hold more terrestrial ice than today, even though the climate was warmer-than-present. Consequently, the ice sheet evolution of the Ross Sea is hypothesized to be strongly-coupled to the tectonic and subsidence history of West Antarctica, rather than climate forcings (e.g. temperature, CO2) alone. Therefore,obtaining direct records of rift timing and climate/glacial history is required to understand these competing influences. A further implication of understanding the tectonic history of West Antarctica, is that active rifting in the Ross Sea is thought to be a keystone in resolving models of Cenozoic global plate motion circuits.

The Ross Sea is perfectly situated to obtain new perspectives on the tectonic influences on Antarctica's climatic and ice sheet evolution. It is located within West Antarctic Rift System, which allows for direct assessment of rift timing, but also has formed large sedimentary basins that capture climatic records at high latitudes in Antarctica since Late Cretaceous times. We target 2-3 continental shelf drill sites in the Ross Sea, which form a longitudinal-transect designed to capture this integrated history of tectonic, climate and glacial influences from both East and West Antarctica.

IODP Proposal 1005
Sunda Shelf Sea Level

Lead Proponent: **Peter Clift** (University College London, UK)

Scientific objectives

During Late Pleistocene glacial to interglacial cycles, the low-latitude tropics were affected by repeated emergence and submergence of some of the world's largest continental shelves. Initial studies suggest that enhanced silicate chemical weathering of exposed sediments and intensified cycling of organic carbon, associated with the growth of rainforests during times of exposure of the 'Maritime Continent', had a significant effect on global atmospheric CO2 variability through glacial cycles. Unlike their high-latitude equivalents, tropical shelves played a key role in regulating global climate since the onset of polar glaciation in the Pliocene, but this process is presently poorly understood because previous scientific drilling was largely focused on the continental slope and deep-water basins.

We will test the impact of the Maritime Continent on global climate in the recent geological past, spanning multiple glacial to interglacial sea-level cycles. The Sunda Shelf in SE Asia is the world's largest tropical shelf, and thus potentially had the greatest impact on global glacial climate since the Pliocene. Moreover, the Sunda Shelf may have been a site of extensive methane-emission from coastal wetlands that formed during times of rising and high sea-levels, but were subsequently eroded during sea-level regressions, further amplifying glacial-interglacial climatic contrasts. Repeated exposure of the shelf during glacial periods drove drainage reorganization of the large rivers that converge in the area. Such reorganization and splitting both restricted and expanded drainage basins, enhancing speciation rates and thereby resulted in the modern diversity hotspot in this area. The region was also a critical gateway for human migration. However, without constraints on drainage evolution and the fauna or flora in the past these concepts remain untested.

Coring a transect across the shelf from nearshore to the shelf break in the eastern shelf, south of the Mekong Delta, will permit a silicate weathering and organic carbon budget to be reconstructed when coupled with regional seismic datasets. The proposed study region also spans the boundary between the Mekong in the east and the Chao Phraya (Johore) River in the west. Continuous marine deposition along its eastern edge aids biostratigraphic dating of more terrestrial strata preserved further west. The sedimentary sequences recovered will be used to evaluate and quantify the contribution that glacial sea-level lowstand exposure of this extensive tropical shelf made as a globally significant CO2 and methane sink/source, and assess whether this tropical region acted as a second set of "Lungs of the Earth".

IODP Proposal 1015
Campeche Bank Sediment Drifts

Lead Proponent: **Christopher Lowery** (University of Texas Institute for Geophysics, USA)

Scientific objectives

The North Atlantic western boundary current represents the northward-flowing limb of Atlantic Meridional Overturning and thus plays a key role in hydrography and climate on both a regional and global scale. Recent analyses of instrumental observations of the best-known part of this western boundary current, the Gulf Stream, indicate a reduction in current flow as a result of anthropogenic warming. The possible outcomes of such a slowdown, and its implications for global climate, hydrography, ecosystems, and the people who depend on them, are still uncertain. An important part of the urgent effort to answer those questions is reconstructing the history of the western boundary current in order to determine how it responded to past warming events, the mechanisms controlling its behavior, and how that behavior impacted climate and ecosystems. The Loop Current is the main feeder current for the Gulf Stream and a key component of the western boundary current system. As it flows into the Gulf, the Loop Current impinges on the seafloor on the eastern Campeche Bank, leaving a record of its passing in the form of contourite drifts. These drift deposits are sedimentary archives of western boundary current flow which record the inception and evolution of the Loop Current, and can provide an important way to reconstruct western boundary current flow through the Cenozoic and how that current changed in response to events on a range of timescales, from millennial-scale events like deglacial transitions and shifts in the intertropical convergence zone to long-termer term warm climate states like the mid Pliocene Warm Period and Miocene Climate Optimum, to tectonic gateway changes like the closure of the Central American Seaway. Understanding the response of the Loop Current to these events can help us understand how sensitive it is to such changes, and whether it is susceptible to threshold behavior.

We propose a Mission Specific Platform expedition utilizing a standard geotechnical vessel to drill the pelagic carbonates of the eastern Campeche Bank sediment drifts to 1) date key reflectors and tie shifts in depositional regime to the climatic and tectonic history of the Cenozoic, 2) utilize a suite of proxy tools to reconstruct changes in current flow in response to those climatic and tectonic events and 3) reconstruct ecosystem changes in response to changing current properties. This work addresses the Flagship Objective "Ground Truthing Future Climate Change" and a number of Strategic Objectives.

IODP Proposal 1105

Hyuga-Nada Observatory

Scientific objectives

Shallow slow earthquakes, which last minutes to years, are important indicators of subduction megathrust slip behavior and future seismic and tsunami potential. Subducting plate roughness and seamounts have been proposed to promote slow earthquakes by inducing local hydrologic and geomechanical heterogeneity. The Hyuga-Nada region offshore Kyushu, Japan is an outstanding locale for drilling and observatory experiments to investigate these effects. Slow earthquakes are repeatedly observed on and near the subducting Kyushu-Palau- Ridge, a chain of seamounts, thus providing excellent opportunities to explore the effects of seamount subduction on geomechanical/hydrologic/thermal properties, and ultimately tremor, earthquake and slow slip generation. Long-term monitoring enabled by a planned permanent network (N-net) will allow subsurface processes during frequent (~1 year) episodic slow earthquakes and ~M7 earthquakes (~20-30 year interval) to be captured with high fidelity. Drilling, logging, and coring will provide key constraints on the stress state, hydrologic processes, and sediment physical properties in the region above the ridge. We propose to drill and install observatories at three primary locations in Hyuga-Nada to address two hypotheses: 1) Seamount subduction creates spatially variable stress and consolidation states and creates substantial deformation within the upper plate leading to complex plate boundary slip behavior; 2) The majority of plate motion at Hyuga-Nada is accommodated by episodic slow slip events, very low-frequency earthquakes and tremors, whose spatiotemporal distribution is strongly influenced by seamount subduction. We will drill primary holes at three distinct sites relative to the subducting seamount, to characterize subsurface properties and conditions through core analysis, LWD and APCT-3. These sites and analysis will characterize the in-situ thermal, hydrologic, and stress state, fracture density and subsurface fluid flow. Spatial variations in the upper plate deformation caused by seamount subduction will be revealed by comparing results from holes in the leading and lateral edges, and above the currently subducting seamount; these observations are important for constraining geomechanical, hydrological, and thermal models. At two of the sites, we will install a "Fiber-CORK" observatory equipped with conventional pressure and temperature sensors and cutting-edge fiber-optic sensors. One site will be connected to the N-net node for real-time data streaming. The combination will fill observational gaps in a spectrum of slip behavior, a small portion of which is observable with current seismic and geodetic instrumentation. Fully characterizing slow earthquakes will reveal the degree to which they accommodate plate motion, and whether strain is accumulated for past and future earthquakes.

SPARCs - Scientific Projects using ocean drilling ARChives

IODP³ Expedition 504S

Volcanic ash record from the Ontong Java Plateau: testing models of subduction reversal and wind transport in the western equatorial Pacific

Co-Chief Scientists: **Robert Musgrave** (University of Newcastle, Australia)
Ann Dunlea (Woods Hole Oceanographic Institution, USA)

The Ontong Java Plateau (OJP) is the largest oceanic plateau in the world. Collision of the OJP with a trench north of the Solomon Islands arc resulted in congested subduction, and the initiation of new subduction on the southern flank of the arc. This process is regarded as the prototypical example of subduction reversal. Plateau collision also resulted in the emplacement of basaltic and sedimentary rocks of the Malaita Terrane (Solomon Islands).

Three hypotheses for the collision have been advocated. Hypothesis 1 holds that collision occurred at ~25 Ma, shutting down subduction and accreting the Malaita Terrane. However, with no local stratigraphic signal for collision at 25 Ma, this event was described as "soft docking". Initiation of new subduction south of the arc was delayed until the late Miocene. Soft docking has since been invoked in other collisional settings, and the 25 Ma event cited as the cause of a change in Australian plate motion. Hypothesis 2 dismisses the soft docking concept and considers a latest Miocene collision. Soft docking is also dismissed by Hypothesis 3, which posits a two-stage collision involving an earlier (late Eocene) collision of a fragment rifted from OJP and a later (late Miocene) collision of the main body of OJP.

ODP drilling of the OJP carbonate sequence has recovered multiple volcanic ash layers. Ashes spanning the late Eocene to late Oligocene have been interpreted as evidence of the close approach of the OJP to the arc, supporting Hypothesis 1. No analysis of these ashes has been reported in the literature. It is unknown whether the ashes are products of arc volcanism or are derived from the Samoan hotspot. Sedimentary rocks from the Malaita Terrane contain volcaniclastic components, but these have had only limited analysis. The SPARC proposal will isotopically fingerprint the OJP ashes. These will be geochemically and geochronologically compared with volcaniclastic rocks from the Malaita Terrane (to be analysed in a parallel study) and with existing analyses from the Samoan chain.

Identifying the source of the OJP ashes will also provide data on wind directions responsible for ash transport and paleoclimatic implications. By combining this information with a broader analysis of dispersed ash and other aeolian sediments in the carbonate sequence, we will reconstruct the Eocene to Miocene history of aeolian transport to the western equatorial Pacific. The results will allow us to track the emergence and amplification of the East Asian

IODP³ Expedition 505S: ENIGMA

ExploratioN Into a Global early Miocene Anomaly

Co-Chief Scientists: **Adam Woodhouse** (Cardiff University, UK)
Jennifer Kasbohm (Carnegie Institution for Science, USA)

The Miocene Epoch (23.03–5.33 Ma) was a pivotal period of climate and biosphere evolution, yet the early Miocene (23–17 Ma) remains poorly understood due to a scarcity of high-resolution records. Recent studies suggest that around 19 Ma, a major but enigmatic biotic and environmental shift occurred, marked by significant declines in shark diversity, restructuring of marine vertebrate communities, and widespread planktonic and benthic ecosystem changes across trophic levels. These shifts coincided with geochemical anomalies, including a

contraction of tropical oxygen-deficient zones, disruptions in primary productivity, and isotopic signals indicative of climate perturbations. The underlying mechanisms driving these changes remain unclear, as do their broader implications for oceanic ecosystem evolution as a whole.
The ENIGMA project aims to resolve the causes and consequences of this early Miocene anomaly by analyzing comprehensive marine sediment records. By integrating micropaleontological, geochemical, and sedimentological data from legacy scientific ocean drilling cores, we will assess how paleoceanographic changes influenced primary productivity, nutrient cycling, and marine biodiversity. A focus on complete early Miocene sequences, particularly in the Atlantic sector, will provide a basin-wide perspective on these transformations. Our findings will enhance understanding of the early Miocene's role in shaping the modern ocean system and contribute critical insights into ecosystem resilience and climate change dynamics over geological timescales.

IODP³ Expedition 506S: SIGNALS

Stratigraphic InteGration of North Atlantic Legacy Sites

Co-Chief Scientists: **David Hodell** (University of Ccambridge, UK)
Arisa Seki (Fukada Geological Institute, Japan)

The North Atlantic plays a crucial role in regulating global climate due to its proximity to major ice sheets and sensitivity to changes in the Atlantic Meridional Overturning Circulation (AMOC). Over millennial and orbital timescales, the region has experienced abrupt climate shifts with significant global implications. Despite the wealth of sediment cores recovered from North Atlantic legacy sites through International Ocean Discovery Program (IODP) and predecessor programs, many remain underutilized due to challenges in stratigraphic correlation and integration. IODP3 Expedition 506S "SIGNALS – Stratigraphic InteGration of North Atlantic Legacy Sites" aims to synthesize and integrate these legacy records into a coherent, four-dimensional stratigraphic framework to provide a regional reconstruction of past climate variability on millennial to orbital timescales since the late Miocene.
SIGNALS will enhance stratigraphic correlation, refine age models, and synchronize proxy datasets for multiple legacy sites across the North Atlantic spanning a wide range of climatic and bathymetric gradients. The expedition will capitalize on advanced methods, including machine learning and signal correlation algorithms, to rapidly produce high-resolution data by automated processing of core images, point counting, and precise stratigraphic correlation. The IODP3 Expedition 506S Science Team will work collaboratively to produce training datasets to refine AI models, stratigraphic correlation methods, and age models.
SIGNALS will address methodological issues associated with estimating uncertainty in stratigraphic correlations and the limits of temporal resolution at each site given varying sedimentation rates, bioturbation, and sampling frequency. Furthermore, we will develop process models to understand how orbitally-driven climatic changes are expressed as cycles in the stratigraphic record of each site. By analyzing high-resolution geochemical and sedimentological proxies in a robust stratigraphic framework, the expedition will reconstruct climate evolution and ocean circulation changes across the North Atlantic since the late Miocene. It will focus on major climatic transitions and provide robust regional paleoclimate data for numerical modelling and assimilation studies.
Beyond research advancements, SIGNALS will foster collaboration by developing user-friendly computational tools, training early-career researchers, and making data publicly accessible through open repositories. The expedition will contribute to other programmes, such as PAGES PMIP, TIMES, Beyond-EPICA Oldest Ice, by providing robust paleoclimatic information for assimilation and comparison. SIGNALS aligns with key objectives of the 2050 Science Framework, including: Earth's Climate System, Feedbacks in the Earth System, Tipping Points in Earth History, and Global Cycles of Energy and Matter. Additionally, it addresses the themes of Technology Development and Big Data Analytics through machine learning applications and automated data collection.


IODP Expedition 405 on board of *Chikyu*. Credit: Letexier@ECORD_IODP.

6.1 Selected 2024 IODP publications from ECORD scientists

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publications

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Lab work during Expedition 501: New England Shelf Hydrogeology.
Credit: LEBER@ECORD_IODP3_NSF.

7. Archiving IODP cores: the IODP Bremen Core Repository in the International Ocean Discovery Program and in the International Ocean Drilling Programme

Core description at the Bremen Core Repository, onshore operations of IODP3-NSF Expedition 501.
Credits: Diekamp@ECORD_IODP3_NSF.

IODP Bremen Core Repository (BCR)

www.marum.de/en/Research/IODP-Bremen-Core-Repository.html

The Bremen Core Repository (BCR) at the MARUM, University of Bremen, Germany, is one of the three scientific ocean drilling programmes core repositories. The other two are the Gulf Cost Repository (GCR) located at Texas A&M University in College Station (USA) and the Kochi Core Center (KCC) in Kochi (Japan). In accord with scientific ocean drilling programmes convention and practice, the BCR hosts all the cores recovered since the beginning of scientific ocean drilling from the Atlantic and Arctic Oceans as well as the Mediterranean, Baltic and Black Seas. The BCR is also responsible for organizing and hosting the Onshore Operations and providing mobile laboratories and scientific expertise for mission specific platform expeditions (MSPs).

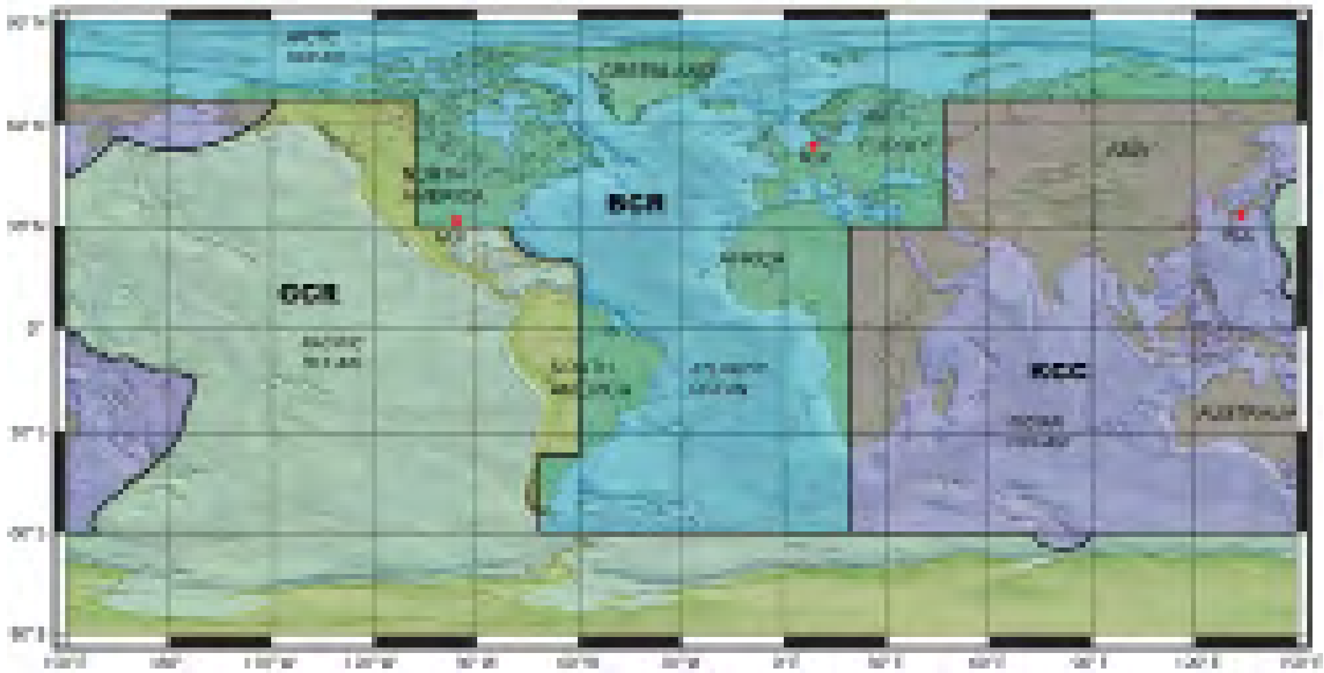
BCR was founded in 1994 and moved to the MARUM building on the University of Bremen campus in 2005. During the DSDP/ODP Core Redistribution project (2006-2008) the collection grew from 75 km to 140 km of cores, currently the collection holds more than 193 km of cores acquired during 107 expeditions. With the opening of the Center for Deep-Sea Research at the University of Bremen a new reefer was made available for the BCR. The Center for Deep-Sea Research (ZfT) was established in the immediate vicinity of MARUM. The ZfT will investigate fundamental processes in the deep sea. Organizationally, the ZfT will be located under the umbrella of the MARUM Research Faculty.

marum
Center for Marine Environmental Sciences University of Bremen

Universität Bremen

ECORD
European Consortium for Ocean Research Drilling

IODP³ INTERNATIONAL OCEAN DRILLING PROGRAMME



Geographic Assignment of Core Samples to Repositories.
Adapted from Firth, JV, Gupta, LP and Röhl, U (2009) New focus on the Tales of the Earth - Legacy Cores Redistribution Project Completed. Scientific Drilling, 7. 31-33. doi:10.2204/iodp.sd.7.03.2009. [Map Mar 15, 2016].
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Samples and requests at BCR

BCR statistics

A total of 129,351 samples were taken at the BCR for 547 requests (of which 252 were submitted by scientists based in ECORD member countries).

All BCR samples (over 2,06 million samples/more than 8,777 sample requests, including samples taken earlier at the ECR for legacy cores that are now at BCR) are entered into a database, the BCR DIS Internet Interface, that is accessible to the general public for post-moratorium samples (web interface for curatorial data: *http://dis.iodp.pangaea.de/BCRDIS/*).

Repository and sample statistics

	Expeditions	Amount of core (km)
	107	193
	Sample Requests (from ECORD countries)	Samples taken
Bremen Core Repository FY24/25	547 (252)	129,351 (33,123)
Bremen Core Repository (since opening in 1994)	6431	1,384,532
From all cores stored at BCR	8777	2,061,737

Data management at BCR

Database: the BCR DIS Internet Interface

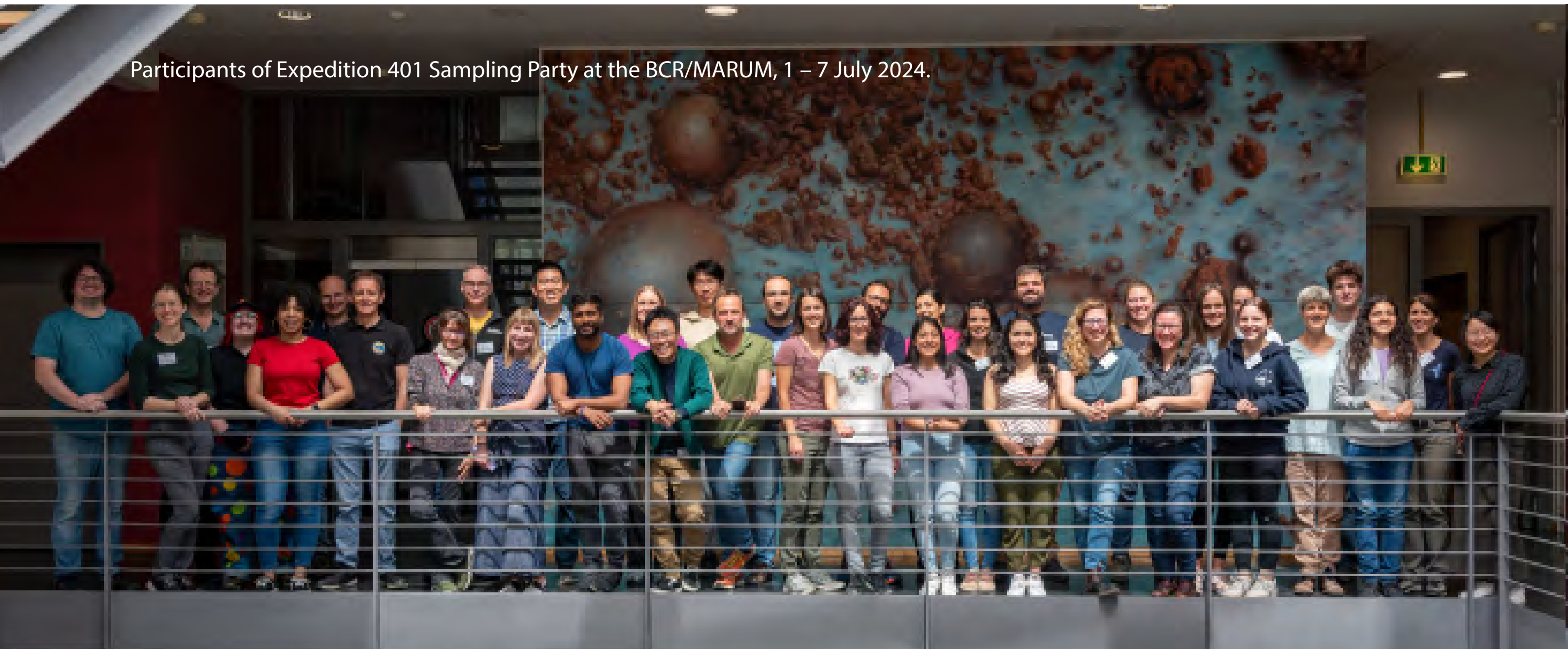
Since 11 May 2023, the new mobile Drilling Information System (mDIS) is in full operation for all core sampling at BCR. Significant progress has been achieved also in the day to day running operation of this new database for BCR. We are in close contact with the developers and other users of the mDIS for further improvements of the mDIS.

IODP Expedition 389: Hawaiian Drowned Reefs was the first expedition that benefited during the offshore phase from the features of this new database. The mDIS was also running for the Onshore Science Party for IODP Expedition 389: Hawaiian Drowned Reefs at BCR, 6 - 26 February 2024.

In August 2024, we achieved the migration of the final remaining datasets (IODP Expedition 397 Sample Party´s sample lists) from the legacy CurationDIS to the mDIS (curation version).

SEDIS: The Scientific Earth Drilling Information Service

The Scientific Earth Drilling Information Service – SEDIS (*http://sedis.iodp.org/*) is continued and being maintained.



Participants of Expedition 401 Sampling Party at the BCR/MARUM, 1 – 7 July 2024.

MSP Expeditions at BCR

IODP Expedition 386: Japan Trench Paleoseismology

After the end of the moratorium (March 2023) the expedition's data transfer to PANGAEA has been accomplished.

IODP[3] Expedition 501: New England Shelf Hydro-geology

Bremen participated at the Offshore with a total of eight staff members, two laboratory and two reefer containers, to cover the duration of this expedition between the mobilization at the end of April and the demobilization in early August at Bridgeport. MARUM will host the Onshore Operation for this Expedition between 14 January and 11 February 2026 for processing the total amount of 871.83 meters of core, extended core description and standard measurements as well as sampling for post-expedition research.

IODP Expedition 389: Hawaiian Drowned Reefs

The BCR hosted and ran the Onshore Science Party for this expedition between 6 and 26 February 2024. For efficiency and similar to all other MSP expeditions, the 34 scientists and ESO personnel worked in two overlapping shifts (Shift A: 07:30 to 18:15, Shift B: 11:45 to 22:30) and 7 days/week.

The total duration of the Onshore Science Party was 21 days (one day introduction/meetings, 18 days processing core, two days report writing). From IODP Expedition 389 a total of 599 core sections have been split, analyzed and sampled with a total of 5796 samples.

BCR staff received the core shipment from the UK (CT scanning) during the OSP and the laboratory containers from the port of demobilization in Hawaii, Kapolei, at MARUM not before 19 March 2024.

Cores from *JOIDES Resolution* expeditions for the BCR

We closely collaborated with the GCR on planning the respective Sampling Parties (SPs) held from 15 – 21 January 2024 for Expedition 395: Reykjanes Mantle Convection and Climate, and from 18 – 22 March 2024 for Sample Party for Expedition 400: NW Greenland Glaciated Margin, from 1 – 13 July 2024 for Expedition 401: Mediterranean–Atlantic Gateway Exchange and from 20 to 29 Jan 2025 for Expedition 403: Eastern Fram Strait Paleo Archive. By the end of the SPs, a total of about 19,803 samples (Exp. 395), a total of about 11,244 samples (Exp. 400), 15,263 (Exp. 401), and a total of 22,202 samples (Exp. 403) were taken.

Participants of Expeditions 390/393/390C/395E Sampling Party, 15 – 21 January 2024.

IODP Expedition 400:
NW Greenland Glaciated Margin

On 15 February 2024 we received a total of about 2.5 km of W-half cores from the JR.

IODP Expedition 398:
Hellenic Arc Volcanic Field

On 25 March we received a total of about 3.3 km of A-half cores from the GCR.

IODP Expedition 402:
Tyrrhenian Continent–Ocean Transition

On 8 May we received a total of about 1.15 km of W-half cores from the JR.

IODP Expedition 395/395C:
Reykjanes Mantle Convection and Climate

On 24 May 2024 we received a total of about 3.3 km of A-half cores from the GCR. On 13 Feb 2025 we received archive-half core sections.

IODP Expedition 397:
Iberian Margin Paleoclimate

On 21 June we received a total of about 1.5 km of A-half cores from Cambridge.

IODP Expedition 399:
Building Blocks of Life, Atlantis Massif

On 24 June we received a total of about 1 km of working- and archive-half cores from the GCR.

IODP Expedition 403:
Eastern Fram Strait Paleo-Archive

On 5 August we received a total of about 5.4 km of A-half cores from the JR.

IODP Expedition 384, 395C, 397, 400:
Eastern Fram Strait Paleo-Archive

On 16 September we received a total of about 2,5 km of A-half cores from the JR.

IODP Expedition 397:
Iberian Margin Paleoclimate

On 25 September we received a total of about 1,4 km of A-half cores returned from the Portuguese Institute of the Sea and Atmosphere (IPMA). On 22 October we received the remaining portion of A-half cores from Lisbon, Portugal.

On 13 February we received archive-half core sections from IODP Expedition 400: NW Greenland Glaciated Margin, and IODP Expedition 402: Tyrrhenian Continent-Ocean Transition from the GCR.

Meetings

In 2024, the BCR Manager attended the ECORD – Japan Webinar (January), the iMSP-Facility Board Meeting (March in Kobe, Japan), the EGU General Assembly 2024 (April in Vienna), the IODP SEP Meeting (June in Helsinki, Finland), the ECORD Council Spring Meeting (June, online), the IODP Forum meeting (September in Shizuoka, Japan), the ECORD Facility Board (EFB) meeting (September in Cambridge, UK), the ESSAC and ECORD Council Meetings (October in Oslo, Norway), and the AGU Fall Meeting (December, Washington D.C.).

In 2025, the BCR Manager attended the EGU General Assembly 2025 (April in Vienna), the IODP^3 SEP Meeting (May in Vienna, Austria), the IODP^3 MSP-FB and ExB - Executive Board Meetings (May, Yokohama, Japan), the ECORD Council Spring Meeting (June, Lisbon, Portugal), the Scientific Drilling Forum meeting (October in Sicily, Italy), the ESSAC and ECORD Council Meetings (November in Edinburgh, Scotland), and the AGU Fall Meeting (December, New Orleans, USA).

(right): Arrival of Expedition 398 archive halves
(left): U-channel samples taken during Expedition 400 Sample Party. Credit: Röhl@MARUM_IODP.

Visitors at the BCR

The location of the BCR on the University of Bremen campus has proven to be very convenient for many visitors, ranging from walk-in scientific visitors, the general public, school classes (including skype conferences to geo show "unterirdisch" in Köln and Hanover in conjunction with IODP/ICDP and at the occasion of the German IODP/ICDP Meeting at the University of Hannover), and visiting students' groups from other universities in Germany and Europe and official delegations visiting the University of Bremen.

In 2024, amongst others, the BCR was visited by:

- S. Preuschmann, project coordinator at Deutsche Allianz Meeresforschung (Alliance of leading German Research Institutions)
- about 30 students from the City University of Applied Sciences, Bremen
- 25 Science Party members incl. the EPM, Co-Chief Scientist
- IODP Curator for GCR M. Penkrot, participating in the Sample Party for IODP Expedition 395
- Fanni Aspetsberger, Head of Press & Communications at Max Planck Institute for Marine Microbiology, Bremen and A. Daschner, Head of Public Relations at the Leibniz Center for Marine Tropical Marine Research, Bremen
- a delegation from the Royal Netherlands Institute for Sea Research (NIOZ)
- M. Boggasch, President from the University of Arts, Bremen
- K. Mossdorf, Senator for Environment, Climate and Science in Bremen
- participants of a workshop on sustainability at the University of Bremen
- participants in the Status Conference German Research Vessels held at the University of Bremen
- 23 Science Party members including the EPM, Co-Chief Scientists, Superintendent for GCR, participating in the Sample Party for IODP Expedition 400
- a group of 20 geocachers, about 15 international scientists of the Hanse-Wissenschaftskolleg (Institute of Advanced Studies)
- a delegation from Taizhu University, S. Warocquier from the École nationale supérieure des Arts décoratifs de Paris (EnsAd), France
- about 15 school kids visited MARUM and BCR for developing their career paths during the so-called "future day"
- about 20 visitors from a local repair café
- about 20 visitors from Bremen adult education center

Live broadcast to the GIFT Workshop at the 2025 EGU Conference, Vienna, with U. Röhl, U. Prange, N. Strackbein, and H. Kuhlmann. Credit: Nitsch@MARUM_ IODP3.

- a delegation from the senator for Environment, Climate, and Science, incl. State Councilor I. Strebl
- about 12 participants of the 2nd Ocean Floor Symposium held at MARUM
- H. Heegewaldt, President of the Federal Maritime and Hydrographic Agency (BSH), Hamburg
- a group of about 20 students from the National University of Engineering (UNI), Lima, Peru under auspices of the German Academic Exchange Service (DAAD)
- a group of about ten students participating in the summer academy of the University of Bremen
- about six students in teaching profession at the University of Bremen working on the project "Geological Evidence for Climate Change

In 2025, amongst others, the BCR was visited by:

- members of The Association of German Engineers, the University´s president Jutta Günther, and the Senator for the Environment, Climate, and Science of the State of Bremen Kathrin Moosdorf at the occasion of the opening of the Center for Deep-Sea Research (ZfT)
- Professor Masao Iwai, Vice-Director of the Marine Core

Research Institute, Kochi University, Japan

- members of Bremen State Parliament
- participants of the 10th International Conference on Arctic Margins (ICAM) at the University of Bremen,
- a delegation from the supervisory board of the German Aerospace Center,
- about 90 members of the "Network for highly gifted people" in Germany (MENSA),
- representatives from German Federal Foundation for Environment,
- representatives from The Association of German Engineers,
- M. Petersen, Vice President for Teaching and Studies and M. Boehnke, Vice President of International Affairs, Academic Qualification, and Diversity, University of Bremen,
- J. Cabral Vazquez from Petrobras, Brazil,
- scholars of the Alexander von Humboldt Foundation,
- Tiemo Wölken, member of EU Parliament,
- M. Petersen, spokesperson of the Committee on the Environment
- H. Hasegawa from the Department of Earth and Planetary Science at Kochi University, Japan
- Minoru Ikehara from the Department of Earth and Planetary Science at Kochi University, Japan
- participants of the 3rd Ocean Floor Symposium held at MARUM
- Gee-Soo Kong and Yu Shin from the Korea Institute of Geoscience and Mineral Resources (KIGAM), South Korea
- participants of the federal state police chiefs' union meeting in Bremen
- participants of the plenary meetings of the National Data Infrastructure (NFDI4) consortia "Earth System Sciences" and "Biodiversity"
- a delegation from various Chinese institutes and universities associated to ocean drilling

Live broadcast for the 2025 GeoShow "Unterirdisch" held at the University of Tübingen, with J. Nitsch (left) and H. Kuhlmann (right) at the BCR reefer side. Credit: @ MARUM_ IODP3.

Media

Equally important for informing and educating the general public of our goals and scientific and technical achievements are the frequent visits by media representatives (television, radio and print). For example, S. Fröhlich, editor for FOCUS Magazin, science journalists J. Kückens and M. Büker, and P.M. del Mar Repp Alvarez, studying Arts at the University of Halle, Germany.

Media

In 2024 and 2025, the BCR provided core material again for numerous course studies run by various instructors. The BCR is also an ideal place to train students, with the opportunity to work on real cores and have access to laboratory facilities. In the past years the 16th ECORD Summer School that was dedicated to the topic "From Ridges to Flanks to Margins – lithosphere dynamics and connections to global environmental changes" was held on 2 – 13 September 2024 and the 17th ECORD Summer School was dedicated to the topic "Southern Ocean - Antarctic paleoclimate interactions" and held from 8 to 19 September 2025 (see also Section 8: Engaging the community on page XY). In 2024 and 2025, the BCR provided core material again for numerous course studies run by various instructors. The BCR is also an ideal place to train students, with the opportunity to work on real cores and have access to laboratory facilities. In the past years the 16th ECORD Summer School that was dedicated to the topic "From Ridges to Flanks to Margins – lithosphere dynamics and connections to global environmental changes" was held on 2 – 13 September 2024 and the 17th ECORD Summer School was dedicated to the topic "Southern Ocean - Antarctic paleoclimate interactions" and held from 8 to 19 September2025 (see also Section 8: Engaging the community on page 126).

IODP Expedition 389 onshore science party participants inspecting core sections in BCR´s reefer. Credit:M. Parker@ECORD_IODP.

8. Engaging the community

ECORD Summer School: Downhole Logging for IODP Science, 2025: Sarah Davies (EPC, University of Leicester, UK) shows the participants of the Summer School how to read from lithology visible in some cores at the BGS. Credit: LeBer@ECORD_IODP.

2024 and ECORD's achievements in the International Ocean Discovery Program

Workshop on the Future of Scientific Ocean Drilling

In 2024, ESSAC was heavily involved in organizing the Second Phase Workshop on the Future of Scientific Ocean Drilling – Towards submission of drilling proposals for IODP[3] together with our colleagues from J-DESC.

The workshop took place In Nachikatsuura, Japan from 18 to 20 March 2024, followed by a two-day field trip.

The Scientific Drilling community had submitted 87 abstracts. In total, 248 participants registered to the workshop, with 131 participants on site and 117 participants online.

The workshop was a great success in terms of brokerage of scientific ideas to generate input for the thematic and geographic focusing of the early phase of IODP[3], including the need to implement Flagship Initiatives as described in the 2050 Science Framework document.

The full workshop report can be downloaded *here.*

Training Young Scientists

A major goal of ECORD is to train the next generation of scientists from member countries and promote IODP-motivated science. The ECORD Summer Schools, initiated in 2007, are well-established and are attended annually by many Masters and PhD students as well as postdoctoral research fellows from ECORD member countries and beyond. Three ECORD Summer schools were supported by ECORD in 2024 (Urbino, Leicester, Bremen).

ESSAC supported 38 students with ECORD Scholarships to participate in the summer schools.

Participants and organisers of the Workshop on the Future of Scientific Ocean Drilling.

The ECORD Summer Schools 2024

European Consortium for Ocean Research Drilling

ECORD Summer School

Downhole Logging for IODP Science

Leicester, UK (University of Leicester, UK)

Deadline for summer school applications: 25 March 2024

27 Jul - 2 Aug

27 July - 2 August 2024
Deadline to apply for a scholarship: 14 April 2024
Deadline for application to the Summer School: 25 March 2024

For more information please visit:
https://le.ac.uk/iodp/summer-schools/current

ECORD and NESSC Summer School

(Past) Climates and the Earth System

Urbino, Italy

Deadline for summer school applications: 25 March 2024

9 - 25 July

9 - 25 July 2024
Deadline to apply for a scholarship: 14 April 2024
Deadline for early-registration to the Summer School: 25 March 2024

For more information please visit:
https://urbinossp.wordpress.com/

Bremen ECORD Summer School

From Ridges to Flankes to Margins-litho-sphere dynamicy and connections to global environmental change

MARUM, University of Bremen, Germany

Deadline for summer school applications: 31 May 2024

2 - 13 Sept

2 - 13 September 2024
Deadline to apply for a scholarship: 14 April 2024
Deadline for early-registration to the Summer School: 31 May 2024

For more information please visit
www.marum.de/Ausbildung-Karriere/ECORD-training/ECORD-Summer-Schools.html

8th ECORD Summer School on Downhole Logging for IODP Science

Leicester, UK, 27July -2 August 2024

15 participants

https://le.ac.uk/iodp/summer-schools/previous

Fifteen early career scientists from across the world participated in the 8th ECORD Summer School: Downhole-Logging for IODP Science held from 27 July to 2 August 2024. As in the previous years, the European Petrophysics Consortium (EPC) / IODP team organised the course within the School of Geography, Geology and the Environment at the University of Leicester.

The 2024 curriculum included an introduction to Petrophysics and training on the downhole logging software WellCAD which is frequently used to visualize, interpret, and downhole petrophysical data. Distinguished experts delivered guest lectures, offering valuable insights and expertise, including Angelo Camerlenghi (OGS), Yohei Hamada (JAMSTEC), Margaret Stewart (BGS), Jochem Kück (ICDP), and Lara Perez (Geological Survey of Denmark and Greenland, GEUS). The course participants were introduced to drilling vessels and technology used in scientific ocean drilling, discussed the future of scientific ocean drilling, learned about of downhole logging applications both, off- and onshore, and gained insight into the latest petrophysical research conducted in polar regions. In addition to the lectures, the summer school again offered an assortment of fun exercises and group projects in which the students could test and present their newly gained petrophysical knowledge. One highlight of this year's summer school was the field trip to the British Geological Survey, where the participants were given a tour of the largest core storage facility in the UK.

Social events organized throughout the week facilitated further scientific discussions and networking outside of the formal summer school sessions. Participants and instructors enjoyed visits to the geology gallery at Leicester Museum & Art Gallery, the King Richard III Visitor Centre, and the Leicester Space Center. Rounding out the social activities was the Summer School dinner at a local Leicester curry hotspot, where everyone enjoyed a night of delicious food and great company.

ECORD 16th Bremen Summer School

on "From Ridges to Flankes to Margins - lithosphere dynamics and connections to global environmental change",

MARUM, University of Bremen, Germany, 2 -13 September 2024

https://www.marum.de/en/ECORD-Summer-School-2024.html

19 participants

Nineteen participants from six different nations took part in the 16th ECORD Bremen Summer School held at MARUM, University of Bremen (Germany). Wolfgang Bach (Univ. Bremen) had put together an outstanding scientific programme around the overarching theme of the 2024 summer school.

Several presentations related to IODP and the Shipboard Simulation at the Bremen Core Repository (BCR) labs were also given. Holger Kuhlmann presented on "Virtual Drillship Experience Introduction" and IODP core curation, as well as the tour through the BCR´s facilities.

BCR and ESO Bremen teams play a key role in the organization of ECORD Bremen Summer Schools. Practical exercises on IODP shipboard methodologies as well as lectures and interactive discussions on the main IODP scientific themes compose the program of these summer schools. Andrew McIntyre from the ECORD Petrophysics Consortium (EPC) also contributed to the summer school by providing a presentation including interactive exercises on downhole logging.

In addition, ECORD sponsored seven students to participate in the GLAcial Sedimentation School (GLASS), which was held at the IODP Gulf Coast Repository, Texas A&M University in College Station, Texas on 14-19 July 2024. The aim of the workshop is to:

- Train a cohort of young scientists to interpret the stratigraphy of polar marine sediment cores in the context of ice, climate, and source-to-sink processes to improve our understanding of past and future ice sheets in Greenland and Antarctica.
- Prepare young scientists for upcoming Greenland and Antarctic expeditions and for their future research.
- Cultivate the wider polar marine sediments community.

The total amount of the scholarships was of 10.500 €, for travel and housing support.

Participants and some of the lecturers of the ECORD Summer School 2024 "From Ridges to Flankes to Margins - lithosphere dynamics and connections to global environmental change" at BCR/MARUM. Credit: Diekamp@MARUM_ECORD_IODP.

ANZIC Masterclass 2024

ECORD provided a scholarship for one participant from an ECORD member country to participate in the ANZIC Marine Geoscience Masterclass 2024 in Southeast Queensland on 15-25 January 2024.

ECORD Distinguished Lecturer Programme

The ECORD Distinguished Lecturer Programme (DLP) is designed to bring the exciting scientific discoveries of IODP to the geosciences community in ECORD and non-ECORD countries. The Distinguished Lecturers covered all four main thematic areas of the IODP Science Plan 2013-2023.

After a successful call in 2023, the DLP has been resumed in 2024 and into 2025.

6 lecturers

Six Speakers gave a wide variety of excellent talks, that were hosted by 38 Institutions in Europe, Canada and the United States.

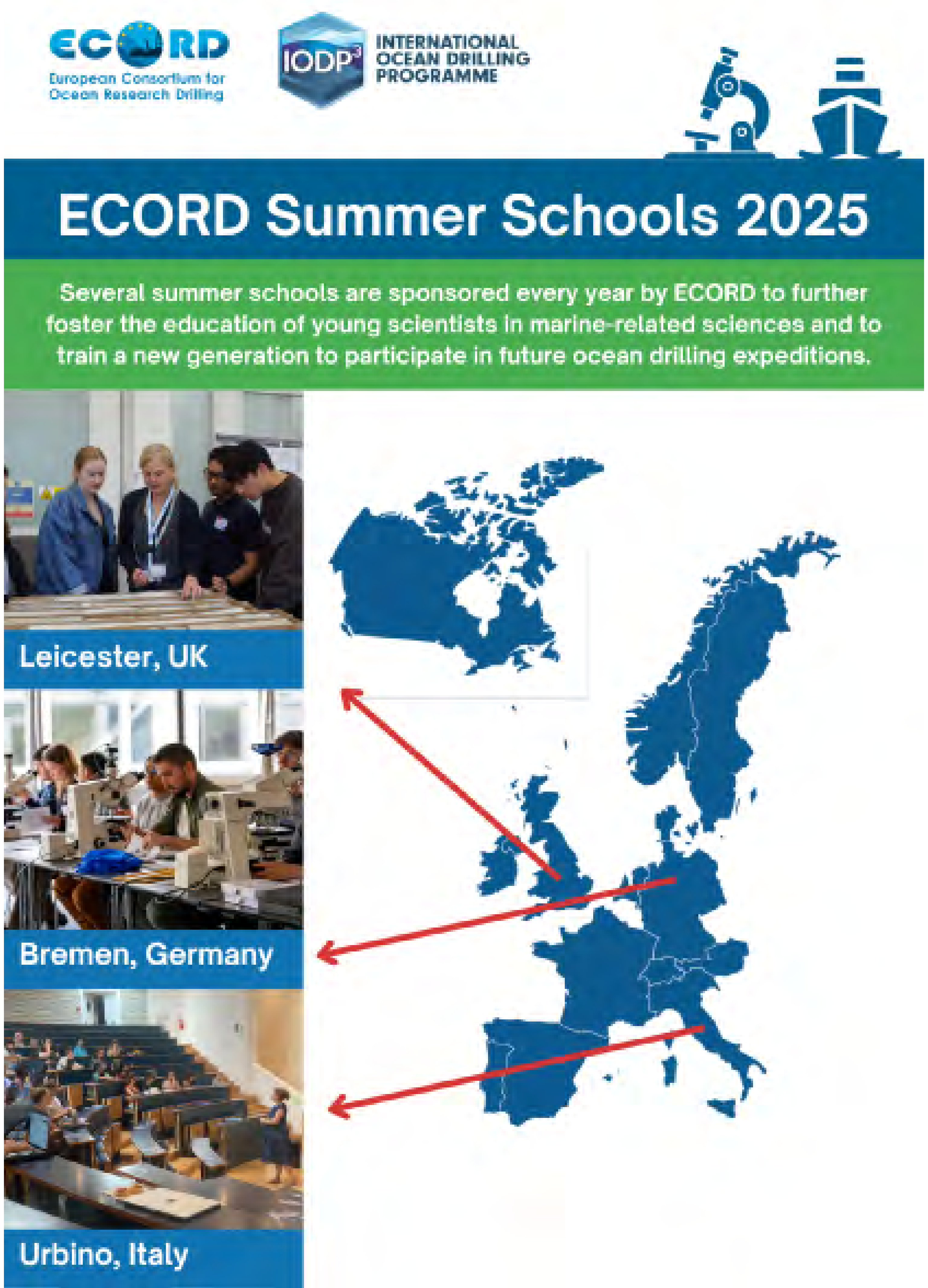
- **Drilling Down the Data: A Deep Learning Dive into IODP Cores**. Cédric M. John (Queen Mary University London, UK);
- **Ice sheet and ocean interaction, paleoclimate and paleoceanographic record during past glacials and interglacials.** Laura De Santis (National Institute of Oceanography and Applied Geophysics OGS Trieste, Italy);
- **The starring role of Scientific Ocean Drilling to discover the changing states of Earth's Climate during the past 66 million years.** Thomas Westerhold (MARUM University Bremen, Germany);
- **Drilling volcanic rifted margins to understand large igneous provinces and associated global warming. Sverre Planke** (University of Oslo, Norway);
- **Deciphering Antarctic continental slope processes: new insights through ocean drilling.** Jenny A. Gales (University of Plymouth,UK;
- **The IODP South Atlantic transect: Low-temperature Ridge Flank Contributions to Global Biogeochemical Cycles and Archives of Changing Global Conditions.** Rosalind M. Coggon (University of Southampton, UK).

2025 and ECORD's achievements in the International Ocean Drilling Programme

Training Young Scientists

A major goal of ECORD is to train the next generation of scientists from member countries and promote IODP-motivated science. The ECORD Summer Schools, initiated in 2007, are well-established and are attended annually by many Masters and PhD students as well as postdoctoral research fellows from ECORD member countries and beyond. Three ECORD Summer schools were supported by ECORD in 2025 (Urbino, Leicester, Bremen).

ESSAC supported 20 students with ECORD Scholarships to participate in the summer schools.



9th ECORD Summer School on Downhole Logging

Leicester, UK, 30 August - 5 September 2025

19 participants

https://le.ac.uk/iodp/summer-schools/previous

19 students from seven countries have arrived at University of Leicester for this year's Summer School.

The Summer School introduces the interpretation and applications of downhole logs and physical property data primarily from the International Ocean Drilling Programme (IODP[3]). The course explores the relevance and unique insights of these data for a range of fields, including paleoclimatology, sedimentology, hydrogeology, and broader geological and ecological processes such as sediment provenance and water column productivity.

Read more on: https://le.ac.uk/iodp/summer-schools

Training on the WellCAD software programme at the ECORD Summer School on Downhole Logging. Credit: LeBer@ECORD_IODP3_EPC_2025.

ECORD 17th Bremen Summer School

on "Southern Ocean - Antarctic paleoclimate interactions"

MARUM, University of Bremen, Germany, 8 -19 September 2025

30 participants

https://www.marum.de/en/research-academy/ECORD-training/ECORD-Summer-Schools/2025.html

Thirty participants from 13 different nations took part in the 17th ECORD Bremen Summer School held at MARUM, University of Bremen (Germany). Frank Lamy (AWI) had put together an outstanding scientific programme around the overarching theme of the 2025 summer school. For the detailed programme see https://www.marum.de/en/research-academy/ECORD-training/ECORD-Summer-Schools/2025.html.

Several presentations related to Scientific Ocean Drilling and the Shipboard Simulation at the Bremen Core Repository (BCR) labs were also given. Holger Kuhlmann presented on "Virtual Drillship Experience" introduction and core curation, a tour through the BCR´s facilities was also given. As always, Ursula Röhl and Thomas Westerhold engaged the participants in a drilling proposal writing class on the last day of the summer school.

BCR and ESO Bremen teams play a key role in the organization of ECORD Bremen Summer Schools. Practical exercises on IODP shipboard methodologies as well as lectures and interactive discussions on the main IODP scientific themes (https://iodp3.org/about/our-science/) compose the program of these summer schools. Andrew McIntyre from the ECORD Petrophysics Consortium (EPC) also contributed to the summer school by providing a presentation including interactive exercises on downhole logging.

Participants and some of the lecturers of the ECORD Summer School 2025 " Southern Ocean - Antarctic paleoclimate interactions" at BCR/MARUM. Credit: Diekamp@MARUM_ECORD_IODP3.

Summer School on Evolution and Taxonomy (INASSET)

In 2025, the INA (International Nannoplankton Association) Summer School on Evolution and Taxonomy (INASSET) was held at the University of Lyon, France, from 29 June to 5 July 2025.

ECORD provided financial support, as biostratigraphy was and is an essential tool in Scientific Ocean Drilling and we are grateful to INA for organising high-quality training.

The 2025 course dealt with Cenozoic palaeoceanography and nannofossil biostratigraphy from the Paleocene to Holocene and 20 participants from all around the world participated. Invited lecturers covered a wide range of topics from paleoceanography and biostratigraphy, statistical treatment of data, sample preparation to Scientific Ocean Drilling.

https://ina.tmsoc.org/meetings/summerschool2025/INASSET%202025%20leaflet.pdf

ANZIC Masterclass 2025

ECORD provided a scholarship for one participant from an ECORD member country to participate in the ANZIC Marine Geoscience Masterclass 2025: Climate & environmental influences on carbon cycling in Fiordland, New Zealand.

https://www.iodp.org.au/masterclass-2025/

JSPS Core to Core Program

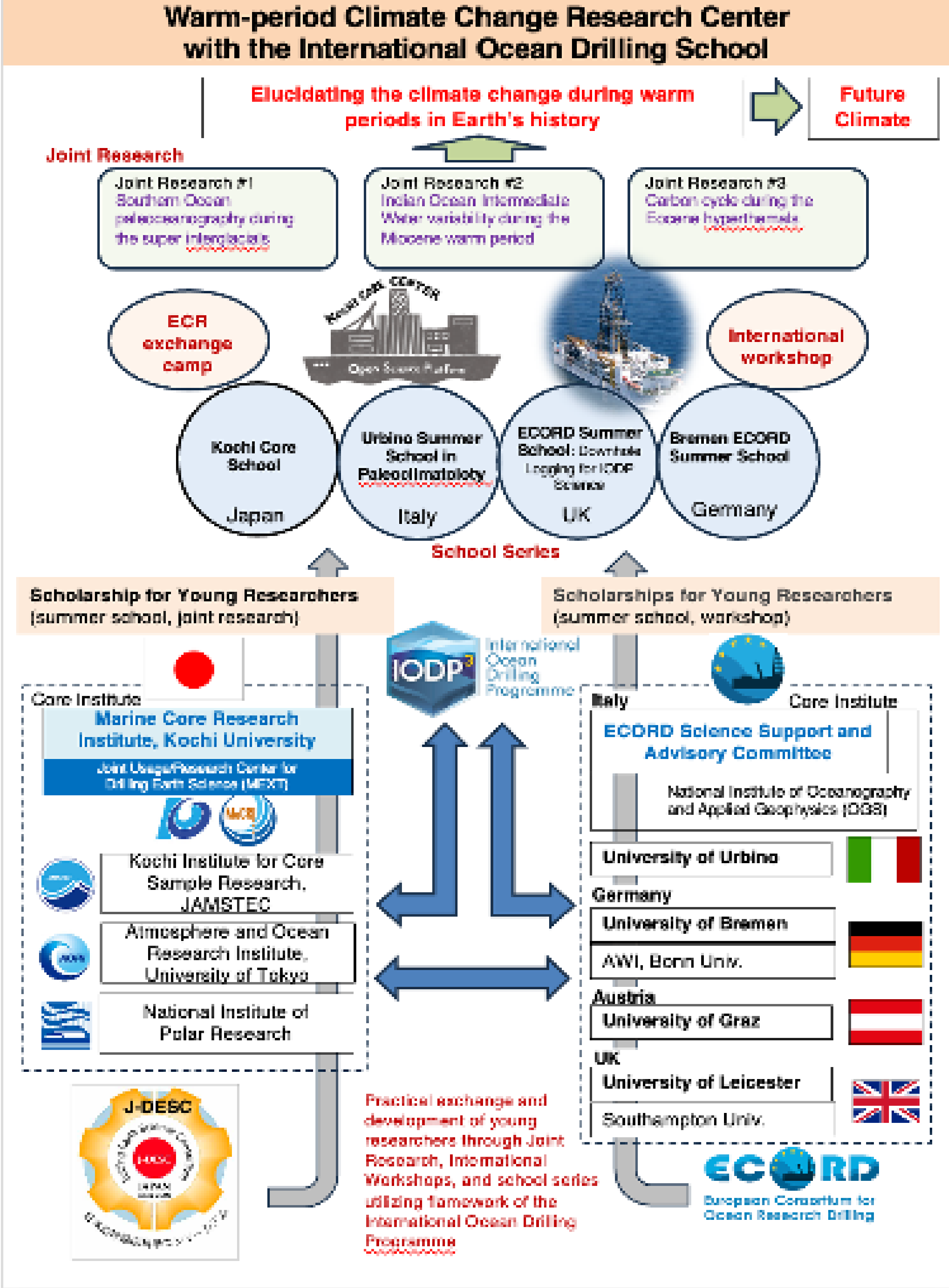
Warm-period Climate Change Research Center with the International Ocean Drilling School.

Since 2025, ESSAC is coordinating a Japan Society for the Promotion of Science (JSPS) Core to Core Program together with the Marine Core Research Institute in Kochi, Japan.

The aim of the JSPS Core to Core Program is designed to create top world-class research centers that partner over the long term with other core research institutions around the world in advancing research in leading-edge fields, on issues of high international priority. ECORD is providing matching funds to the programme, which mainly consist of our direct support to educational activities (Summer Schools and Scholarships) as well as travel support for ECORD scientists to participate in workshops and/or training courses in Japan.

Kick-off symposium in 2025

From 22 to 24 October the Kick-Off Symposium: International Symposium for Warm-period Climate Change Research Center with the International Ocean Drilling Program School, was held in Kochi, Japan. In total, approximately 80 participants (including online participants) took part, with 65 participants on-site. ECORD has provided Travel Funds to eight scientists from ECORD member countries.



MagellanPlus Workshop Series Programme

3 workshops

The ECORD/ICDP MagellanPlus Workshop Series Programme is designed to support scientists from ECORD and ICDP member countries to develop new and innovative science proposals that follow the major themes of the 2050 Science Framework and the ICDP Science Plan.

The MagellanPlus Workshop Series Programme funds workshops and/or travel grants that are expected to lead to or foster high-quality and innovative scientific drilling proposals for submission to IODP and ICDP.

Three calls for workshop proposals were issued in 2024 for the organisation of workshops in late 2024 or in 2025.

At the 15 January deadline, one proposal was received and funded after revision. At the 15 May deadline, two proposals were received, of which one was funded. At the 15 September deadline, three proposals were received, of which two were funded.

Three workshops have been organized in 2024.

MagellanPlus: : **21st Century Drilling Workshop I and II** - Building Capacity in the Digital Domain on scientific ocean drilling legacy material MARUM, Germany, April and November 2024

Convenors	Anna Joy Drury (University of Leicester, UK), Beth Christensen (Rowan University, USA), Gerald Auer (University of Graz, Austria), Thomas Westerhold (MARUM, University of Bremen, Germany), Ulla Röhl (MARUM, University of Bremen, Germany)

Workshop I: BCR, MARUM, University of Bremen, Germany, 8-12 April 2024

Workshop II: BCR, MARUM, University of Bremen, Germany, 3-12 November 2024

The success of 50+ years of scientific ocean drilling through the International Ocean Discovery Program (IODP) and its predecessors has resulted in a wealth of legacy material stored in the IODP repositories and databases. It is now possible to generate digital representations of cores (e.g., through software packages like CODD) and use these as a primary data source. Integrating these digitally-derived core records with re-analysis of the physical legacy cores offers scope to increase the capacity and utilisation of legacy material.

Best practices for enhancing this capacity have been explored during two linked five day MagellanPlus '21st Century Drilling' workshops at the BCR and MARUM, University of Bremen. The workshops were linked together to advance our understanding of the extent of Miocene ice rafted debris (IRD) in the Atlantic sector of the Southern Ocean.

19 scientists from seven different countries attended this first workshop, the first legacy asset project at the BCR. New records were generated from redescribing and scanning ODP Leg 114 cores to advance the understanding of the Miocene in the South Atlantic.

A total of 355 samples were taken from the working halves and detailed VCD conducted, including line scan imaging and intense XRF core scanning of more than 170 core sections.

20 scientists from nine different countries attended the second workshop - for us the first legacy asset project at the BCR. From re-describing and scanning ODP Leg 177 core sections new records have been generated to advance the understanding of these Miocene cores from the South Atlantic. A total of 470 samples were taken from 195 working halves and detailed VCD including Line scan imaging and an intense XRF core scanning program of more than 272 archive half core sections have been conducted.

Group picture of the 21st Century Drilling Magellan Plus Workshop I participants. Credit: Diekamp@MARUM_ECORD_IODP.

Group picture of the 21st Century Drilling Magellan Plus Workshop II participants. Credit: Diekamp@MARUM_ECORD_IODP.

MagellanPlus: **The Garvellachs**

The Garvellachs: Drilling the Tonian to Cryogenian boundary in the Inner Hebrides, Scotland

London, UK, 14-16 July 2024

Convenors Graham Shields (University College London, UK), Elias Rugen (University College London, UK)

This workshop brought together an international group of scientists from diverse disciplines and career stages to lay the groundwork for a new drilling proposal focused on the Garvellach Islands in the Inner Hebrides, Scotland. Discussions centred on potential drill sites, operational logistics, and scientific goals within the framework of the ECORD Mission Specific Platforms.

The workshop aimed to recover the highest-resolution record of the late Tonian to Cryogenian transition, a key interval in Earth's history marking the onset of the global Sturtian glaciation.

The workshop was attended by 30 guests, including 12 early-career researchers. A further three people joined online.

The group was extremely diverse with attendees from nine different countries and 18 different institutes. The workshop had two main themes: (1) highlighting the importance of the proposed drilling site as a globally unique locality for scientific research into the late Tonian and 'Sturtian Snowball Earth' glaciation; and (2) laying the foundations for a new IODP/ICDP proposal for a future drilling project in the Inner Hebrides for the 2025 call. There was a general consensus that a 'Land to Sea' project may be the best way forward to ensure that we maximised the record leading into the Cryogenian.

Participants of the MagellanPlus Workshop: The Garvellach. Credit: @ECORD_IODP.

Travel Grants

In addition to workshop funding, the MagellanPlus Workshop Series Programme supports the participation of ECORD and ICDP scientists in international IODP and ICDP workshops held in other countries. Travel support will not exceed 1,500 € per scientist and 5,000 € per workshop. In 2024, ECORD supported two scientists to attend one USSSP workshop.

USSSP Workshop: Targeting Pacific Highs for Past Records of Warm Climates

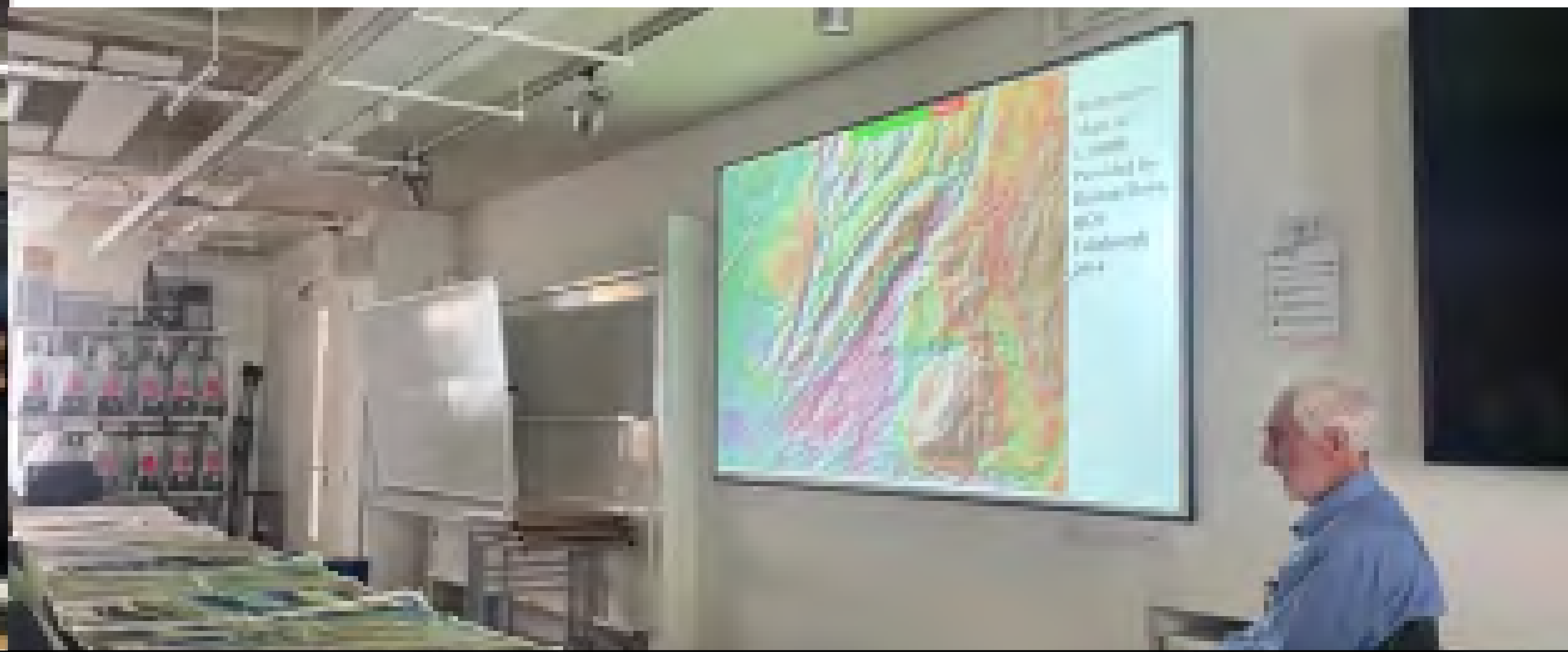
Put-In-Bay, Ohio, USA, 1-4 October 2024

Convenors Elizabeth M. Griffith (Ohio State University, USA), Bärbel Hönisch (Lamont-Doherty Earth Observatory, USA), Donald Penman (Utah State University), Wiliam Sager (University of Houston, USA), Thomas Westerhold (MARUM, University of Bremen, Germany), James Zachos (University of California, USA)

The workshop sought to lay out strategies to study, retrieve, and expand paleoclimatic archives of past, warmer-than-today climate intervals, contributing to Flagship Initiative 1, "Ground truthing future climate change," and Flagship Initiative 4, "Diagnosing ocean health" from the 2050 Science Framework.

A more detailed understanding and better geographic coverage of past conditions throughout the Pacific, which is the oldest and largest of the major ocean basins on our planet, is key to improving our understanding of past warm climates dynamics, the resilience and structure of marine ecosystems during warm climate states and climate perturbations, as well as the evolution of mean climate sensitivity through time and in response to various forcings, including changes in ocean productivity and carbon storage.

Several pre-proposals were outlined at the workshop by participants, and plans were made to develop these into full proposals. The workshop identified three "core repository expeditions" that should include scanning cores using updated instrumentation, revising the biostratigraphic zonations, obtaining geochemical data and physical properties data, redoing sedimentological descriptions, imaging the archive half, etc., as well as sampling cores for pilot studies to investigate potential of legacy material. Several site seismic survey missions are currently planned. During the workshop a drilling expedition proposal opportunity with the *D/V Chikyu* drilling Shatsky Rise was developed and will be pursued.



MagellanPlus Workshop: The Garvellach. Credit: @ECORD_IODP.

2025

Magellan^3 Workshop Series Programme

The Magellan^3 Workshop Series Programme brings together the international scientific drilling community to spark new ideas and collaborations for the next generation of Earth, life, and environmental research.

Designed to bridge continents and disciplines, the programme supports workshops that develop innovative proposals for ocean, land-to-sea, and Scientific Projects using Archived Research Collections (SPARC), drawing on both new expeditions and existing core materials.

Funding of up to €15,000 is available per workshop, enabling researchers to convene, exchange ideas, and refine their proposals. In addition, individual travel grants are offered to support researchers in participating in related scientific activities, fostering broader engagement and knowledge exchange. Jointly supported by ECORD, ANZIC, and J-DESC, Magellan^3 aims to nurture creative science that aligns with the 2050 Science Framework and the ICDP Science Plan, helping to define the future directions of scientific drilling.

Guidance and oversight are provided by the Magellan^3 Science Steering Committee (SSC), comprising 13 members from the three partner entities, who work together to shape the programme's vision and ensure a balanced and forward-looking portfolio of workshops. Proposals can be submitted to the steering committee twice a year.

Two calls for workshop proposals were issued in 2025 for the organisation of workshops in late 2025 or in 2026. At the 15 March deadline, seven proposals were received, of those three proposals were funded and two needed to be revised. At the 1 September deadline, the two revised proposals were received.

The last three MagellanPlus workshops have been organized in 2025. The first Magellan^3 workshops have been granted in 2025, but will be organized in 2026.

MagellanPlus: **NHIS**

NHIS: Evolution of the Northern Hemisphere Ice Sheets: timing, drivers, and interconnections

Belfast, UK, 4-7 February 2025

Convenors	Sara Benetti (Ulster University, UK), Wolfram Geissler (AWI, Germany), Georgina Heldreich (Ulster University, UK), Colm Ó Cofaigh (Durham University, UK)

The aim of this workshop was to explore synergies among different ocean drilling initiatives and ideas targeting the evolution of the Northern Hemisphere ice sheets and feedback mechanisms in the North Atlantic and Arctic oceans, and the gateways into other ocean basins.

46 people attended the workshop, four of whom online, from ten European countries, the UK, Canada, the USA, Japan and New Zealand, and across 35 universities and research institutions. A fourth of the attendees were ECRs.

As organisers, we felt that the workshop was successful with many meaningful conversations, new ideas and connections formed and the time to further develop ongoing collaborations. Groups formed organically and several people were refining ideas and proposals until it was time to leave. The community has many ideas that can address several of the IODP 2050 Science Objectives and Flagship Initiatives.

MagellanPlus: **HIGHLAND**

HIGHLAND: Holocene Insights Gained from High resolution drilling in North Victoria Land

Bologna, Italy, 25-27 June 2025

Convenors	Francesca Battaglia (ISP-CNR, Italy), Laura De Santis (OGS Trieste, Italy), Michele Rebesco (OGS Trieste, Italy), Tommaso Tesi (ISP-CNR, Italy)

The event brought together 63 participants (39 in person and 24 online) from nine countries, representing a wide range of disciplines including marine geology, glaciology, oceanography, sedimentology, geophysics, and polar engineering.

The main goal of the workshop was to catalyze the development of a new interdisciplinary drilling proposal focused on Edisto Inlet, Northern Victoria Land, Antarctica a small, underexplored fjord at the marine margin of the East Antarctic Ice Sheet. Participants reviewed existing geophysical, sedimentological, and oceanographic datasets and concluded that Edisto Inlet offers an exceptional natural archive to reconstruct ice– ocean–climate interactions during the Late Quaternary and Holocene.

Thick sediment drifts and high sedimentation rates provide the opportunity to recover continuous and high-resolution records of past environmental variability, directly addressing IODP^3 priorities on Earth's climate history and polar sensitivity.

Participants of the MagellanPlus Workshop: HIGHLAND. Credit: @ECORD_IODP

MagellanPlus: **Land-to-Sea Shaking Studies**

Land-to-Sea Shaking Studies: Unlocking the full potential of subaqueous paleoseismology at active plate boundaries Taipei, Taiwan, 21-24 October 2025

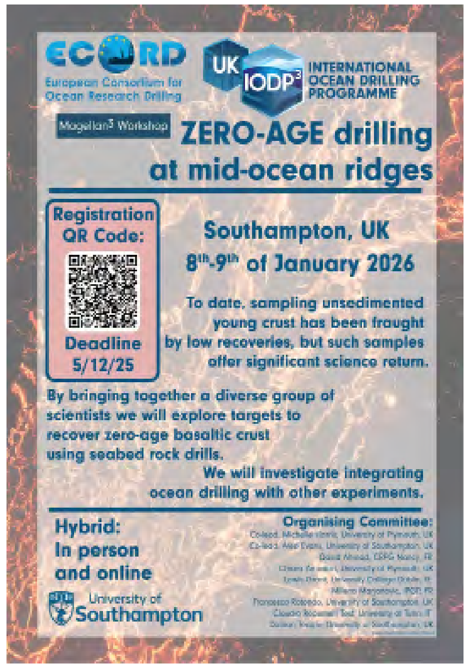
Convenors	Charlotte Pizer (UIBK, Innsbruck, Austria), Michael Strasser (UIBK, Innsbruck, Austria), Jamie Howarth (VUW, New Zealand), Katleen Wils (Ghent University, Belgium), Ken Ikehara (AIST, Japan), Ryo Nakanishi (Kyoto University, Japan), Cecilia McHugh (Queens University of New York, USA), Chloe Seibert (University of Minnesota, USA), Jyh-Jaan Steven Huang (NTU Taipei, Taiwan), Tzu Ting Chen (NTU Taipei, Taiwan)

The aim of this workshop was to gather international experts ranging from marine seismologists to limnologists, and students to senior scientists, to discuss and develop future proposals aimed at tracking earthquake shaking across land to sea transects to enhance fundamental understanding of rupture processes, earthquake recurrence and associated hazards at active plate boundaries.

Future Magellan³ Workshops

So far, five Magellan³ workshops are planned for 2026 based on the Magellan³ workshop proposals received in 2025:

- Michelle Harris (University of Plymouth, UK) et al.: ZERO-AGE drilling at mid-ocean ridges; Southampton, UK, 8-9 January 2026
- Florence Schubotz (MARUM, University of Bremen, Germany) et al.: Young & Cool - Installing long-term observatories to study microbiological processes on the Mid-Atlantic Ridge flank; MARUM, University of Bremen, 11-13 March 2026
- Uisdean Nicholson (Heriot-Watt University, Edinburgh, UK) et al.: Impact Crater Evolution and Terrestrial Environmental Consequences (i-CREATE); Heriot-Watt University, Edinburgh, 27 April - 1 May 2026. Co-funded by USSSP.
- Michele Rebesco (OGS Trieste, Italy) et al.: MANI_IN_PASTA - MAximising existing and New Information IN PAst circulation STAbility; Trieste, Italy, 11-13 May 2026
- Yuki Morono (JAMSTEC, Japan) et al.: Go Beyond the Limit (GBL) - Defining the termination of habitability and the nature of the non-biosphere; Kochi Core Center, Japan, 17-19 June 2026



Travel Grants

In addition to workshop funding, the MagellanPlus Workshop Series Programme supports the participation of ECORD and ICDP scientists in international IODP and ICDP workshops held in other countries. Travel support will not exceed 1,500 € per scientist and 5,000 € per workshop. At the beginning of 2025, the last two MagellanPlus travel grants have been used to support two scientists to attend one USSSP workshop. No Magellan³ travel grants have been granted in 2025.

USSSP 21st Century Drilling Workshop Workshop

21st Century Drilling: Building Capacity in the Digital Domain on scientific ocean drilling legacy material Gulf Coast Repository, Texas A&M University, College Station, Texas, USA, 24-28 February 2025

Convenors	Convenors: Beth Christensen (Rowan University, USA), Laurel Childress (Texas A&M University, USA), Anna Joy Drury (University of Leicester, UK), Gerald Auer (University of Graz, Austria), David de Vleeschouwer (University of Münster, Germany)

There is great international interest in utilizing the full range of 50+ years of archived data and material available within IODP.

Without a drill ship, the U.S. scientific community is challenged to answer new scientific questions using existing material. Most significantly, until we have additional options, legacy material will be the primary source of data for answering new scientific questions in deep time. However, there are challenges with working from existing material and this workshop aimed to train early to mid-career faculty who will seek to write proposals using legacy materials.

The workshop included fundamentals of curation, core description, and physical properties measurements, and in doing so highlighted how new science can evolve from revisiting existing core. Participants have been introduced to potential pitfalls and solutions for working with legacy material.

The workshop was designed to: 1) broaden participation and knowledge of the early and mid-career scientific ocean drilling community, 2) teach fundamentals of working with legacy core materials, and 3) prepare participants to develop legacy core research proposals. ECORD supported one scientist from the UK and one from Austria to attend this USSSP workshop.

9. Communicating

Outreach teams of ECORD ICDP and IODP^3 at the AGU 2025 "Scientific Drilling Booth" in New Orleans. Credit: Beneventi@ECORD_IODP.

9. Communicating

Promoting IODP activities and accomplishments to large, often non-scientific, audiences is a major and ongoing goal of the ECORD Outreach Task Force (EOTF).

ECORD Outreach Task Force

During the last few years, the EOTF has broadened the scope of its activities to strengthen ECORD's presence in both permanent and temporary exhibitions at national museums across Europe. In 2023, ECORD contributed to the permanent exhibition "The Earth – a Dynamic Planet" at the Natural History Museum in Vienna, Austria, a long-planned project that attracts approximately 800,000 visitors annually.

Within ECORD, outreach responsibilities are shared among several bodies: the ECORD Managing Agency (EMA), which oversees coordination, publications, and web communications; the ECORD Science Operator (ESO), which manages Mission-Specific Platform (MSP) expeditions and media activities; and the ECORD Science Support & Advisory Committee (ESSAC), which is responsible for educational initiatives.

These activities are coordinated through the EOTF.

More info

- *www.ecord.org/outreach*
- *www.ecord.org/resources*

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From 2025 several members of the EOTF group are also part of the Communication Task Force of IODP^3 , an entity responsible for the communication and promotion of the scientific and operational activities and of the achievements of IODP3. The CTF coordinates IODP3 outreach, public information and educational activities.

ECORD Outreach Task Force meetings

ECORD Outreach Task Force meetings are attended by ECORD and ICDP outreach teams to enhance cooperation between ECORD and ICDP. Outreach teams representing other IODP entities are frequently invited to join EOTF meetings.

The EOTF met twice during 2024:

EOTF meeting #25 in Naples, Italy

EOTF meeting #26 online

and twice during 2025:

EOTF meeting #27 in Trieste, Italy

EOTF meetinf #28, in Edinburgh, Scotland

Promoting IODP/IODP³/ECORD at conferences, exhibitions and workshops

Under the umbrella "Scientific Drilling", the EOTF promotes both ocean and continental drilling programmes (IODP/IODP3 and ICDP) at major international conferences such as the EGU (European Geosciences Union, Europe) and AGU (American Geophysical Union, USA), which are attended by thousands of scientists from around the world. While the EOTF did not participate in AGU in 2024, it returned in 2025 with a shared booth, re-establishing its presence at the meeting and continuing its outreach activities.

EGU 2024 14-19 April 2024, Vienna, Austria

https://egu24.eu/

The outreach teams of ECORD and ICDP welcomed visitors at a joint ECORD/IODP-ICDP booth under the common banner of Scientific Drilling. They hosted visitors at booth numbers 48 and 49 in the Entrance Hall, where the ECORD Sphere was also set up. They met with representatives of JAMSTEC/MarE3, who, together with the ECORD team, promoted scientific ocean drilling and the new International Ocean Drilling Programme (IODP3).

A joint ECORD–ICDP Town Hall Meeting took place on 16 April 2024 at the Natural History Museum Vienna.

The ECORD–ICDP Scientific Session "Achievements and perspectives in scientific ocean and continental drilling" at the EGU General Assembly 2024 was held as an ITS/SSP session. Compared to the previous year, one change had been made: Harue Masuda was replaced by Norikatsu Akizawa (University of Tokyo) in the team of co-conveners. In the session description, the importance of scientific results derived from the use of scientific drilling legacy samples and data was emphasized.

The EGU 2024 team of co-conveners consisted of Angelo Camerlenghi, Thomas Wiersberg, Jorijntje Henderiks, Cindy Kunkel, and Norikatsu Akizawa.

EGU 2025 27 April-2 May 2025, Vienna, Austria

https://egu25.eu/

The outreach teams of ECORD and ICDP welcomed visitors at a joint ECORD/IODP3-ICDP booth under the banner of Scientific Drilling. Attendees explored booths 48 and 49 in the Entrance Hall, where the ECORD Sphere was also on display. On 28 April 2025, a joint ECORD-ICDP Town Hall Meeting was held at the Natural History Museum Vienna.

The ECORD-ICDP Scientific Session on "Achievements and Perspectives in Scientific Ocean and Continental Drilling" at the EGU General Assembly 2025 showcased the latest breakthroughs, innovative methodologies, and emerging directions in both ocean and continental drilling. These events highlighted the global collaboration and ongoing advances that continue to drive scientific drilling forward.

AGU 2025 15-19 December 2025, New Orleans, US

https://egu25.eu/

The outreach teams of ECORD, ICDP, IODP3 and SODCO were pleased to invite visitors to the joint IODP³/SODCO/ICDP booth under the banner of Scientific Drilling at the AGU 2025 Annual Meeting.

The booth was located at number 436 in the Ernest N. Morial Convention Center, Halls B2–C. Visitors were welcomed to learn more about the latest developments and discoveries from the international scientific drilling programmes, meet the teams, and explore current and future projects. The initiative highlighted how ocean and continental drilling efforts contribute to advancing the understanding of Earth's dynamic systems.

Expeditions Outreach

IODP Expedition 405: Tracking Tsunamigenic Slip Across the Japan Trench (JTRACK)

Expedition 405 adopted a novel outreach model by placing outreach officers from ANZIC, ECORD, USSSP, and JAMSTEC directly on board *Chikyu*. The goal was to communicate JTRACK science to diverse audiences, including scientists, students, educators, stakeholders, and the public.

Using photography, video, illustration, and journalism, the team produced ship-to-shore broadcasts, interviews, blogs, videos, comics, magazine articles, and social media content.

Many initiatives continued beyond the expedition, resulting in more than 330 outreach outputs to date.

IODP³ Expedition 501: New England Shelf Hydrogeology

Each Mission Specific Platform expedition differs in objectives, vessels, and procedures, requiring teams to adapt accordingly.

For this expedition, outreach began well before departure through in-person engagement in the Cape Cod region. Led by Co-Chief Scientist Brandon Dugan, the team visited schools on Nantucket and Martha's Vineyard, as well as local institutions such as libraries, chambers of commerce, and visitor centers, to introduce the project, foster dialogue, and establish contacts for continued exchange before, during, and after the expedition. WHOI Communications supported these efforts, which were well received locally and continued after the offshore phase, including presentations such as the Woods Hole Science Stroll.

The science team worked closely with institutional communicators and was supported offshore by three rotating communicators—Andrea Lee Vale, Maryalice Yakutchik, and Maike Rademaker—who managed the blog and social media. Media outreach included a launch release, a closing news item, and coordination across PMOs (USSSP, ANZIC, and JAMSTEC). The ECORD Communication Group's decision to use journalist outreach officers helped secure broad international coverage, including Associated Press, CNN, CBS, and Deutschlandfunk.

Picture from IODP expedition 405 on board of Chikyu. Credit: Letexier@ECORD_IODP

ECORD at museums and exhibitions

The EOTF has been working towards ECORD's presence at permanent and short-term exhibitions in museums all around Europe. This includes fabrication and donation (or long-term loans) of materials for museums and research institutions as well as loans of the ECORD Sphere for dedicated exhibitions.

Permanent exhibitions

The presence of ECORD in permanent exhibitions is a priority for the EOTF as it secures a perpetual, widespread and stable source of information for the general public about scientific ocean drilling and the role of our consortium in this global research initiative. Since 2022, ECORD is proud to have its presence at three permanent exhibitions, including one that was officially opened in

As of 2023, exhibits that promote ECORD are:

Cosquer Méditerranée museum, Marseille, France:
La Grotte Cosquer, since 2022

https://www.grotte-cosquer.com

Natural History Museum Vienna, Austria:
"The Earth – A Dynamic Planet", since 2023

https://www.nhm-wien.ac.at/en/exhibitions/permanent_exhibitions/mezzanine_level/hall_6-9_earth_history

German Maritime Museum, Bremerhaven Germany:
"Ship Realms - The Ocean and Us", since 2024

https://www.dsm.museum/en/museum/exhibitions/ship-realms-the-ocean-and-us

ECORD and ICDP at the Natural History Museum Vienna (NHM)

Permanent exhibition since February 2023 , Vienna, Austria

The planning for this exhibition started in 2020, but was postponed due to the COVID-19 pandemic, and the opening of the exhibition, originally planned for 2021, was postponed to February 2023.

Since 21 February 2023, ECORD and ICDP are eventually present at the National History Museum in Vienna. ECORD and ICDP representatives were invited for the Opening Day Celebration, during which Gilbert Camoin (ECORD) and Thomas Wiersberg (ICDP) gave talks about scientific drilling to about three hundred international guests at this official, high-profile event (photo next page).
The permanent exhibition in the Geology section Hall 6: "The Earth – a dynamic Planet" at the NHM Vienna presents five core replicas donated by ECORD and ICDP with corresponding information and video materials. The four core replicas donated by ECORD are: PETM, Tahiti and two from the Chicxulub Impact Crater. ICDP donated a core replica from the Great Oxidation Event (ICDP project FAR-DEEP).

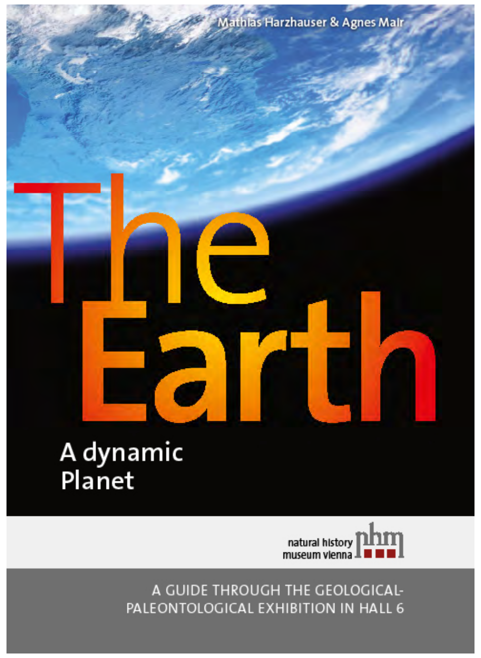


Photo gallery: Exhibition opening day:
https://www.ecord.org/resources/gallery/photos/ecord-iodp-events/ecord-nhm-exhibition-opening-day/

Photo gallery: ECORD materials at the NHM exhibition:
https://www.ecord.org/resources/gallery/ecord-at-exhibitions/ecord-in-nhm-vienna/

Official webpage of the exhibition:
https://www.nhm-wien.ac.at/en/exhibitions/permanent_exhibitions/mezzanine_level/hall_6-9_earth_history

ECORD at German Maritime Museum (DSM): "Ship Realms - The Ocean and Us"

Permanent exhibition to be opened in July 2024

https://www.dsm.museum/en/museum/exhibitions/ship-realms-the-ocean-and-us

The EOTF has been working with the museum on a permanent exhibition focused on laboratory settings since 2022. For the new exhibition ECORD agreed to provide a core replica from IODP Expedition 310: Tahiti Sea Level, a 3D coral model, and information related to the Expedition 310. Additionally, an interview with the expedition Co-chief Scientist Gilbert Camoin was filmed in October 2023 at MARUM, and will be set as an audio-visual element of the permanent exhibition to accompany the materials provided by ECORD. The opening of the exhibition at the DSM is planned in Summer 2024.

The new permanent exhibition "Ship Realms - The Ocean and Us" at German Maritime Museum (DSM) / Leibniz Institute for Maritime History in Bremerhaven will have a specific focus on marine research. One of the interactive exhibits will feature IODP Expedition 310: Tahiti Sea-Level Change. It will show scientific findings on the effects of the meltwater pulse 1A had on the coralline growth thousands of years ago. One of the drill cores of that expedition will be made "readable" to a broad museum audience by scanning it with a screen that can enlarge the core to a microscopic level and convey all information from microbialite to the change from Pocillopora to Porites. It shows how sensitive corals are to environmental change and also how important are the drill cores of coralline sediments as a historic data storage waiting for us to be deciphered. The exhibition at the German Maritime Museum will be opened on 17 July in Bremerhaven.

Dr. Pablo v. Frankenberg, Curating Consulting for DSM

ECORD Sphere

The ECORD Sphere was exhibited in Vienna, Bremen, and Berlin in 2023. Its next stop was the Science Center in Faro, Portugal, where it was featured in an exhibition related to IODP Expedition 401 (December 2023 – February 2024).

In February 2024, the ECORD Sphere was displayed in Naples, Italy, to mark the start of IODP Expedition 402 (coinciding with the JR's presence at the port of Naples).

In April 2024, it traveled to Vienna for EGU 2024 and subsequently to the University Museum at Utrecht University, The Netherlands, for display. Its most recent public appearance was at EGU 2025 in Vienna.

The ECORD Communication Group is currently planning additional short-term exhibitions across Europe to continue sharing the ECORD Sphere with a wider audience.

ECORD Sphere webpage:
https://www.ecord.org/resources/ecord-sphere/

Core replicas

EIght replicas of ODP and IODP drilled cores are available for various activities and display at temporary exhibitions and conferences in Europe and Canada.

The ECORD Communication Group ordered the fabrication of several new core replicas, from among which, some were donated to museums and other found their home at the EPC (University of Leicester) as the ECORD hub for replica loans within the UK.

Institutions interested in borrowing ECORD core replicas for educational or exhibition purposes can submit a request through the ECORD website.

Detailed information about each core, including expedition details and scientific findings, is also available online. Each replica comes with an A3-format poster, available in English and Spanish. Additional languages will be available in the future.

More: *https://www.ecord.org/resources/*

Future look

From 2013 to 2024, communication and outreach within the International Ocean Discovery Program have evolved significantly in response to a rapidly changing media landscape.

The expansion of digital channels—including Facebook, Instagram, X (formerly Twitter), and Mastodon, with Bluesky and LinkedIn to be added—has required increasingly tailored, audience-specific strategies to effectively engage diverse target groups. At the same time, the accelerating news cycle has intensified competition for attention, making it essential to connect expedition content more directly to broader societal relevance rather than presenting it in isolation.

Given the long timeframes inherent to expedition-based research, communication teams have adapted their approach to maintain a continuous narrative arc from expedition planning through to the publication of results. These efforts have been further shaped by staff transitions and by shifting audience expectations and motivations, requiring ongoing alignment of program objectives with public engagement strategies.

Woods Hole Science Stroll promoting Expedition 501. Credit: Prange@ECORD_IODP3_NSF.

10. FY24 and FY25 budgets

Core description during Onshore Operations of Expedition 501 at MARUM, February 2026. Credit: @Diekamp@ECORD_IODP3_NSF.

FY24 and the International Ocean Discovery Program

ECORD is currently funded exclusively by its 15 member countries.

In FY24, the total ECORD contributions amounted to $15.62M USD (below). Since 2014, the ECORD budget decrease is of $2.36M USD, due to a decrease in member contributions (France and the United Kingdom) and strong fluctuations in exchange rates between the US Dollar and the national currency contributions of five ECORD countries (France, UK, Denmark, Spain and Ireland).

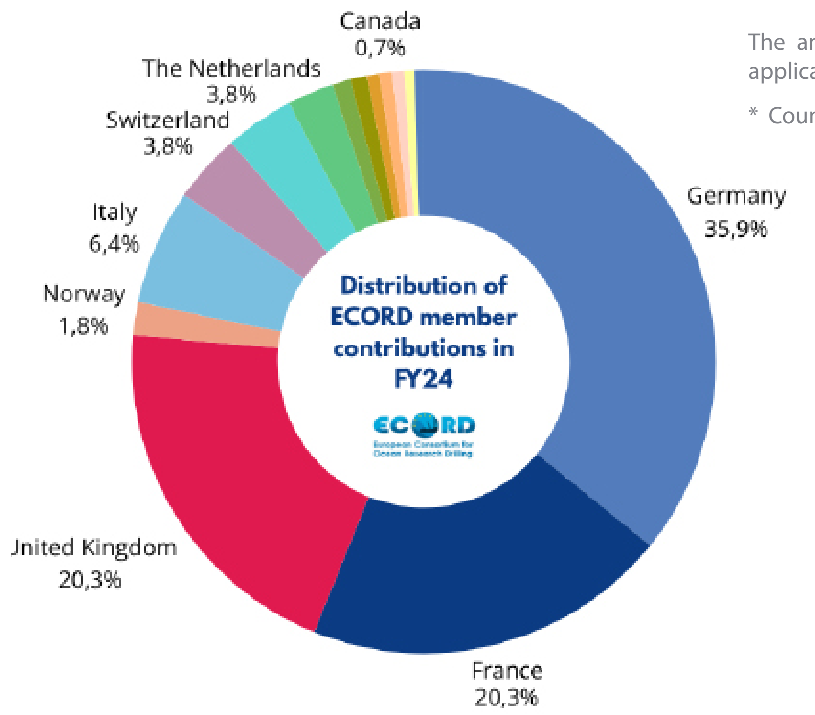
The ECORD budget is seen as a minimum budget due to the opportunity for members to make direct cash and/or in-kind contributions (IKC) that allow them to increase their contributions to ECORD on an expedition-by-expedition basis.

The contributions to the ECORD budget are unevenly distributed between the member countries, ranging from $5.6M to $80K USD (below). Based on their contributions, each ECORD member country receives a participation quota for all IODP expeditions. However, the participation of ECORD member countries to the ECORD educational programme (page 126) is not based on financial contributions.

ECORD contributions FY24 (USD)	
DFG (Germany)	5,600,000
CNRS (France) *	3,167,000
UKRI (United Kingdom) *	3,177,979
Forskningsradet (Norway)	282,780
CNR (Italy)	1,000,000
FNS (Switzerland)	600,000
NWO (The Netherlands)	600,000
VR (Sweden)	400,000
MCIN (Spain) *	158,300
DAFSHE (Denmark) *	143,290
GSI (Ireland) *	105,540
CCOD (Canada)	115,000
ÖAW (Austria)	100,000
FCT (Portugal)	90,000
Academy of Finland	80,000
TOTAL	**15,619,889**

The amount in dollars is based on exchange rates (when applicable) at the time of the payment by the relevant partner.

* Countries paying their contribution in their own currency.



Distribution of ECORD member contributions for FY2024

The three major ECORD contributors, Germany ($5.6M USD), the United Kingdom ($3.18M USD) and France ($3.17M USD) and provide 76,5% of the total ECORD budget. The contributions of other member countries range from $80K to $1M USD.

The table below summarises the ECORD budget for FY24.

FY23 ended with a positive balance of $13.58M USD, which was carried over to FY24. Together with the FY24 member contributions of $15.62M USD and the reimbursement from Rosmoport, the FY24 income yielded $30.9M USD. The expenses were of $29.54M USD and include the implementation costs of Expedition 501: New England Shelf Hydrogeology. FY24 expenses included the funding of the IODP³ Science Office. The ECORD budget showed a positive balance of $1,359,315 USD at the end of 2024 and this sum was carried forward to the ECORD FY25 budget.

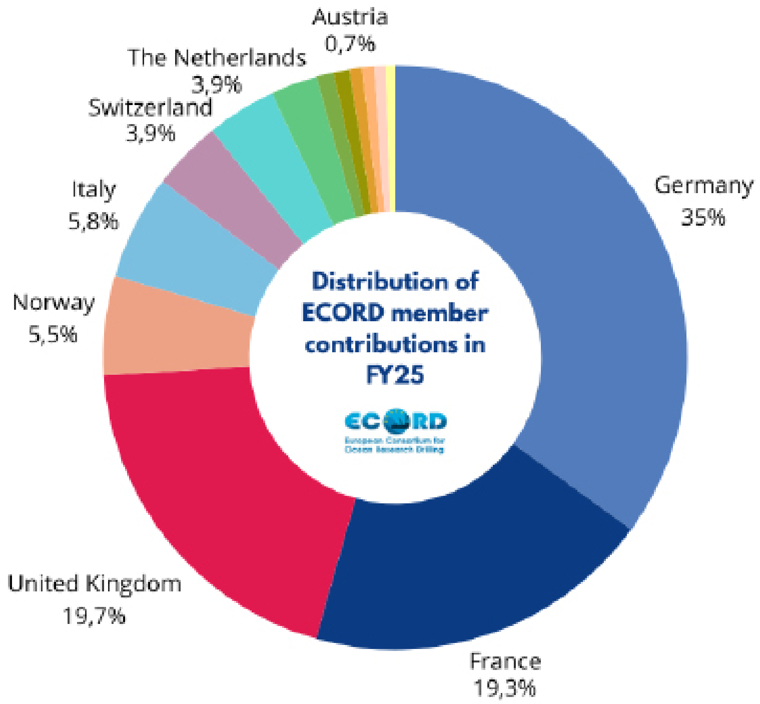
	ECORD **FY2024** Budget (in USD)	
FY23 balance	13,582,930	
FY24 contributions	15,619,889	
Reimb. Rosmoport	1,700,000	
ECORD-NSF MoU		3,500,000
ECORD-JAMSTEC MoU		1,000,000
ESO fixed costs		2,073,754
ESO X389 OSP		722,383
ESO X501		20,159,023
EMA		313,075
MagellanPlus		86,800
IODP Chairs Support		208,048
ESSAC		371,260
BCR		511,044
Outreach basic		79,329
IODP³ Science Office		507,675
SPRS legal fees 11113		11,113
TOTAL	30,902,819	29,543,504
Expected FY24 balance	**1,359,315**	

Credit: LeBer@ECORD_IODP3_NSF.

FY25 and the International Ocean Drilling Programme

The total contributions for FY25 from the 14 contributing ECORD member countries are about €15.5M USD (see table below).

ECORD member country contributions for FY25 (in €)		
DFG (Germany)	5,430,000	
CNRS (France)	3,000,000	
UKRI (United Kingdom)	3,050,000	2,600,000 £
Forskningsradet (Norway)	850,000	
CNR (Italy)	900,000	
FNS (Switzerland)	600,000	
NWO (The Netherlands)	600,000	
VR (Sweden)	400,000	
MICIU (Spain)	150,000	
DAFSHE (Denmark)	133,000	
ÖAW (Austria)	110,000	
CCOD (Canada)	100,000	
GSI (Ireland)	100,000	
FCT (Portugal)	82,000	
TOTAL	**15,505,000**	



Distribution of ECORD member contributions for FY2025

The three major ECORD contributors, Germany (€5.43M USD), the United Kingdom (€3.05M USD) and France (€3M USD) and provide 74% of the total ECORD budget.

The contributions of other member countries range from €82K to €900K USD.

The table below summarises the expected ECORD budget for FY25

FY24 ended with a positive balance of €1,42M, which was carried over to FY25. Together with the FY25 member contributions of €15.5M and the EMA underspent, the FY25 income yielded €17.3M. The expenses were of €3.3M. The ECORD budget showed a positive balance of €13,967,006 at the end of 2025 and this sum was carried forward to the ECORD FY26 budget.

	ECORD **FY2025** Budget (in €)	
FY24 balance	1,419,315	
FY25 contributions	15,505,000	
Underspent EMA	372,500	
TOTAL	17,296,815	
ECORD fixed cost		
ESO		2,098,492
EMA		197,500
ESSAC		288,500
BCR		432,842
Support ECORD Co-Chairs		20,000
ECORD Outreach		56,475
ECORD website		21,000
Management costs		215,000
TOTAL		3,329,809
FY25 balance	**13,967,006**	

Credit: Letexier@ECORD_IODP.

ECORD contributed €13.9M to the IODP3 FY25 budget. The Associate Member ANZIC contributed €1.13M. JAMSTEC provided an in-kind contribution in the amount of €14.14M, which presents the operational costs for IODP³ Expedition 502: Impact of petit-spot magmatism on subduction zone seismicity and global geochemical cycles and for IODP³ Expedition 503: Hadal trench tsunamigenic slip history - buried in trench. NSF contributed €4.34M to the implementation of IODP³-NSF Expedition 501: New England Shelf Hydrogeology.

	IODP³ FY25 Budget (€)	
INCOME (€)		
ECORD's FY25 contribution	13,967,006	
ANZIC's FY25 contribution	1,129,000	
NSF contribution to X501	4,340,000	
INCOME (IKC)		
JAMSTEC IKC X502 X503	14,139,031	
TOTAL	33,575,037	
EXPENSES		
X501 Operational costs		8,508,503
X502-X503 Operational costs		14,139,031
IODP³-SO		829,563
Magellan³		70,000
IODP³ Science Collaboration		20,000
TOTAL		23,567,097
FY25 balance	**10,007,940**	

	IN-KIND CONTRIBUTIONS (€)
JAMSTEC - *Chikyu* expeditions (58 d)	5,676,921
JAMSTEC - *Chikyu* maintenance (58 d)	8,462,110
TOTAL	14,139,031

	CASH CONTRIBUTION (€)
NSF - X501 Operational Costs	4,340,000

Budget of ECORD Entities

ECORD Managing Agency

The table below summarises the EMA budget for FY24, FY25 and FY26 as approved by the ECORD Council in June 2023, June 2024 and June 2025, respectively.

EMA budget for FY24 to FY26	FY24	FY25	FY26	FY25-FY26 variance
Salaries *				
Outreach Officer	71,400	55,000	70,000	15,000 (+)
TOTAL	71,400	55,000	70,000	15,000 (+)
Compensation for the Director*	50,000	50,000	50,000	0
Overheads CEREGE	0	0	2,000	2,000 (+)
TOTAL	50,000	50,000	52,000	2,000 (+)
Travels**				
Travels EMA / IMA Management	50,000	45,000	45,000	0
Travels EMA Communication	10,484	10,484	10,000	484 (-)
TOTAL	60,484	55,484	55,00	0
Meetings**				
Invited speakers ECORD meetings	3,000	1,500	3,000	1 500 (+)
Organisation ECORD meetings	20,000	10,000	10,000	0
Organisation of SEP June meeting	10,000	0	0	0
Organisation of IODP³ meetings	0	30,000	20,000	10 000 (-)
TOTAL	33,000	41,500	33,000	8500 (-)
Consumables / Office costs**				
EMA/IMA Management	6,000	6,000	6,000	0
EMA Communication	2,863	2,863	2,800	63 (-)
TOTAL	8,863	8,863	8,800	63 (-)
Overheads CEREGE	42.080	0	0	0

* To be administered by CNRS DR12
** To be administered by CNRS DR16

Basic Outreach activities**	FY24	FY25	FY26	
Annual Report	2,000	0	0	0
ECORD Newsletter	4,500	0	0	0
Managing core replicas	8,378	3,378	3,000	378 (-)
EGU and other conference booths	16,411	16,411	17,000	589 (+)
EGU Townhall Meeting	0	0	15,000	15,000 (+)
ECORD website (maintenance and development)	1,371	1,371	14,000	29 (+)
Shipping	4,000	4,000	8,000	0
Goodies	10,000	10,000	10,000	0
Pre- and Post- cruise flyers	968	968	900	68 (-)
Expedition logos, stickers and posters	3,000	3,000	3,000	0
TOTAL	50,628	43,128	58,300	15,172 (+)
GRAND TOTAL	**316,455**	**253,975**	**277,100**	**23,125 (+)**

ECORD Science Support and Advisory Committee (ESSAC)

The table below summarises the ESSAC budget for FY24, FY25 and FY26 as approved by the ECORD Council in June 2023, June 2024 and June 2025, respectively.

ESSAC budget for FY24 to FY26					
	FY24		**FY25**	**FY26**	**FY25-FY26 variance**
	€	USD	€	€	€
Salaries					
Science Coordinator (Grade 8/43)	69,000	85,560	73,500	134,358	60,858 (+)
Compensation for the Chair	50,000	62,000	50,000	50,000	0
Compensation for the Vice-Chair	5,000	6,200	5,000	5,000	0
Additional administrator	3	0	0	4,030	4,030 (+)
Travels and subsistence					
Science Coordinator	8,387	10,400	8,500	8,500	0
Chair	22,016	27,300	22,000	22,000	0
Office Costs	6,452	8,000	6,500	6,500	0
Meetings					
ESSAC Spring meeting	3,226	4,000	4,500	4,500	0
ESSAC Fall meeting	3,226	4,000	3,500	3,500	0
Travel support invited speakers	3,468	4,300	3,500	3,500	0
Travel Support ESSAC Liaison to SEP and other meetings	3,468	4,300	3,500	3,500	0
Conference Travel Support or non-ECORD countries	4,597	5,700	3,500	3,500	0
Education and Outreach					
ECORD DLP Support	14,919	18,500	15,000	15,000	0
ECORD Summer Schools	38,065	47,200	38,000	38,000	0
ECORD Training Course	6,452	8,000	6,500	6,500	0
ECORD Scholarships	15,000	18,600	15,000	15,000	0
ECORD Research Grants	30,000	37,200	30,000	30,000	0
Initiatives to foster scientific collaboration between Europe and Japan	16,129	20,000	20,000	20,000	0
TOTAL	**299,405**	**371,260**	**308,500**	**373,388**	**64,888 (+)**

ECORD Science Operator

The table below summarises the expenditure breakdown of ESO for FY24 in US dollars.

ESO 2024 expenditure breakdown (in USD)									
	2024 Annual Program Plan Budget				2024 Expenditure				2024 variance (surplus returned to ECORD)
	BGS	MARUM	EPC	Total	BGS	MARUM	EPC	Total	
Management and administration	353,361	197,221	510,384	1,060,966	417,928	197,221	510,384	1,125,533	-64,567
Salary	279,361	139,221	460,384	878,966	628,157	139,221	460,384	1,227,762	-348,796
Travel	50,000	26,000	26,000	102,000	41,667	26,000	26,000	93,667	8,333
Supplies	7,000	7,000	7,000	21,000	0	7,000	7,000	14,000	7,000
Shipping	0	0	0	0	16,216	0	0	16,216	-16,216
Communication	2,000	0	0	2,000	2,037	0	0	2,037	-37
Equipment	5,000	15,000	7,000	27,000	27,308	15,000	7,000	49,308	-22,308
Other	10,000	10,000	10,000	30,000	-297,457	10,000	10,000	-277,457	307,457
Technical, Engineering and Science Support	17,992,098	1,703,730	1,681,150	21,376,978	17,906,849	1,703,730	1,681,150	21,291,729	85,249
Personnel	865,098	730,230	583,150	2,178,478	546,660	730,230	583,150	1,860,040	318,438
Travel	64,000	44,000	36,000	144,000	29,431	44,000	36,000	109,431	34,569
Supplies	0	726,500	0	726,500	0	726,500	0	726,500	0
Shipping	50,000	180,000	20,000	250,000	113,844	180,000	20,000	313,844	-63,844
Communication	10,000	0	0	10,000	235	0	0	235	9,765
Contractual Services	0	0	1,040,000	1,040,000	0	0	1,040,000	1,040,000	0
Equipment	3,000	3,000	2,000	8,000	13,655	3,000	2,000	18,655	-10,655
Other	17,000,000	20,000	0	17,020,000	17,203,024	20.000	0	17,223,024	-203,024
Core Curation	0	107,640	0	107,640	0	107,640	0	107,640	0
Personnel	0	91,140	0	91,140	0	91,140	0	91,140	0
Travel	0	6,000	0	6,000	0	6,000	0	6,000	0
Supplies	0	3,500	0	3,500	0	3,500	0	3,500	0
Shipping	0	7,000	0	7,000	0	7,000	0	7,000	0
Data Management	47,273	212,078	15,240	274,591	29,472	212,078	15,240	256,791	17,801
Salary	13,273	139,078	15,240	167,591	22,438	139,078	15,240	176,756	-9,165
Travel	8,000	8,000	0	16,000	159	8,000	0	8,000	8,159
Supplies	6,000	0	0	6,000	0	0	0	0	6,000
Coms.	0	0	0	0	37,175	0	0	37,175	-37,175
Contractual	0	50,000	0	50,000	0	50,000	0	50,000	0
Equipment	20,000	15,000	0	35,000	6,822	15,000	0	21,822	13,178
Outreach	47,956	60,359	26,670	134,985	52,469	60,359	26,670	139,498	-4,512
Salary	31,956	52,359	26,670	110,985	27,794	52,359	26,670	106,823	4,162
Travel	8,000	8,000	0	16,000	0	8,000	0	8,000	8,000
Supplies	8,000	0	0	8,000	0	0	0	0	8,000
Equipment	0	0	0	0	24,675	0	0	24,675	-24,675
Grand Total	18,440,688	2,281,028	2,233,444	22,955,160	18,406,717	2,281,028	2,233,444	22,921,190	33,971

The table below summarises the expenditure breakdown of ESO for FY25 in euros.

ESO 2025 expenditure breakdown (in EUR)									
	2025 Annual Program Plan Budget				2025 Expenditure				2025 variance (surplus returned to ECORD)
	BGS	MARUM	EPC	Total	BGS	MARUM	EPC	Total	
Management and administration	520,621	181,810	339,918	1,042,349	429,365	181,810	339,918	951,093	91,256
Salary	446,621	123,810	289,918	860,349	392,466	123,810	289,918	806,194	54,155
Travel	50,000	26,000	26,000	102,000	30,236	26,000	26,000	82,236	19,764
Supplies	7,000	7,000	7,000	21,000	0	7,000	7,000	14,000	7,000
Shipping	0	0	0	0	634	0	0	634	-634
Communication	2,000	0	0	2,000	1,122	0	0	1.122	878
Equipment	5,000	15,000	7,000	27,000	4,906	15,000	7,000	26,906	94
Other	10,000	10,000	10,000	30,000	0	10,000	10,000	20,000	10,000
Technical, Engineering and Science Support	4,283,065	200,740	286,655	4,770,460	3,026,633	200,740	286,655	3,514,028	1,256,432
Personnel	396,065	113,740	200,655	710,460	693,627	113,740	200,655	1,008,022	-297,562
Travel	64,000	44,000	44,000	152,000	111,453	44,000	44,000	199,453	-47,453
Supplies	0	0	0	0	0	0	0	0	0
Shipping	0	20,000	0	20,000	20,000	47,087	0	67,087	-47,087
Communication	0	0	0	0	23,251	0	0	23,251	23,251
Contractual Services	0	0	40,000	40,000	0	0	40,000	40,000	0
Equipment	3,000	3,000	2,000	8,000	-13.466	3,000	2,000	-8,466	16,466
Other	3,820,000	20,000	0	3,840,000	2,164,681	20.000	0	2,184,681	1,655,319
Core Curation	0	91,065	0	91,065	0	91,065	0	91,065	0
Personnel	0	74,565	0	74,565	0	74,565	0	74,565	0
Travel	0	6,000	0	6,000	0	6,000	0	6,000	0
Supplies	0	3,500	0	3,500	0	3,500	0	3,500	0
Shipping	0	7,000	0	7,000	0	7,000	0	7,000	0
Data Management	81,922	150,040	0	231,962	37,868	150,040	0	187,908	44,054
Salary	47,922	116,040	0	163,962	10,951	116,040	0	126,991	36,971
Travel	8,000	8,000	0	16,000	0	8,000	0	8,000	8,000
Supplies	6,000	0	0	6,000	0	0	0	0	6,000
Coms.	0	0	0	0	0	0	0	0	0
Contractual	0	11,000	0	11,000	-4,000	15,000	0	11,000	0
Equipment	20,000	15,000	0	35,000	30,904	11,000	0	41,904	-6,904
Outreach	55,349	51,905	23,905	131,159	35,767	51,905	23,905	111,577	19,582
Salary	39,349	43,905	23,905	107,159	35,161	43,905	23,905	102,971	4,188
Travel	8,000	8,000	0	16,000	67	8,000	0	8,067	7,933
Supplies	8,000	0	0	8,000	0	0	0	0	8,000
Shipping	0	0	0	0	517	0	0	517	-517
Equipment	0	0	0	0	22	0	0	22	-22
Grand Total	4,940,957	675,560	650,478	6,266,995	3,529,633	675,560	650,478	4,855,671	1,411,324

The table below summarises the ESO budget for FY26 as approved by the ECORD Council in June 2025.

ESO 2026 budget (in EUR)				
	BGS	MARUM	EPC	Total
Management and administration	589,713	234,945	524,053	1,348,711
Salary	515,713	176,945	474,053	1,166,711
Travel	50,000	26,000	26,000	102,000
Supplies	7,000	7,000	7,000	21,000
Shipping	0	0	0	0
Coms.	2,000	0	0	2,000
Contractual	0	0	0	0
Equipment	5,000	15,000	7,000	27,000
Other	10,000	10,000	10,000	30,000
Technical, Engineering and Science Support	16,229,755	1,131,670	1,242,307	18,603,732
Salary and Fringes	1,097,755	529,670	480,007	2,107,432
Travel	64,000	44,000	44,000	152,000
Supplies	0	430,000	0	430,000
Shipping	50,000	105,000	25,000	180,000
Communication	15,000	0	0	15,000
Contractual Services	0	0	586,300	586,300
Equipment	3,000	3,000	102,000	108,000
Other Direct Costs	15,000,000	20,000	5,000	15,025,000
Core Curation	0	101,745	0	101,745
Personnel	0	86,945	0	86,945
Travel	0	6,000	0	6,000
Supplies	0	2,800	0	2,800
Shipping	0	6,000	0	6,000
Data Management	88,301	166,240	18,560	273,101
Personnel	54,301	132,240	18,560	205,101
Travel	8,000	8,000	0	16,000
Supplies	6,000	0	0	6,000
Contractual Services	0	11,000	0	11,000
Equipment	20,000	15,000	0	35,000
Outreach	62,089	68,800	35,690	166,579
Personnel	46,089	58,800	35,690	140,579
Supplies	8,000	0	0	8,000
Shipping	0	0	0	0
Equipment	0	0	0	0
Sub Total	16,969,858	1,703,400	1,820,610	20,493,868

Bremen Core Repository (BCR)

The table below summarises the BCR budget for FY24, FY25 and FY26 as approved by the ECORD Council in June 2023, June 2024 and June 2025, respectively.

BCR budget for FY24 to FY26					
	FY24		**FY25**	**FY26**	**FY25 FY26 variance**
	€	USD	€	€	€
Salaries and Fringes (1,6 FTE)	294,224	364,838	209,766	218,813	9,047 (+)
Student workers, incl. SPARC projects in FY26	32,200	39,928	33,971	30,500	3,471 (-)
Travels	1,680	2,083	1,540	3,050	1,510 (+)
Supplies, , incl. SPARC projects in FY26	28,700	35,588	77,000	31,720	45,280 (-)
Shipping, incl. SPARC projects	35,700	44,268	91,000	73,810	17,190 (-)
Curation database updates	13,328	16,527	13,308	7,320	5,988 (-)
SEDIS 24/7 maintenance/ upgrades (0,08 FTE)	6,300	7,812	6,300	6,100	200 (-)
Total	**412,132**	**511,044**	**432,885**	**374,729**	**58,156 (-)**

Onshore Operations of Expedition 501 at MARUM, February 2026. Credit: Diekamp@ECORD_IODP3_NSF.

11. ECORD participation on panels of the International Ocean Discovery Program and the International Ocean Drilling Programme

The International Ocean Discovery Program (IODP) is composed of three platform providers (NSF-USA for *JOIDES Resolution*, MEXT/JAMSTEC - Japan for *Chikyu* and ECORD for mission-specific platforms - MSPs), three Facility Boards, two IODP advisory panels, a Science Support Office and the IODP Forum. The ECORD participation in IODP entities in 2024 is listed below.

JOIDES Resolution Facility Board - **JRFB**

http://www.iodp.org/facility-boards#JRFB

The *JOIDES Resolution* Facility Board - JRFB is the planning forum for expeditions using the *JOIDES Resolution*.

ECORD Members of the JRFB
Gilbert Camoin (France)
Steffen Kutterolf (Germany)

Chikyu IODP Board - **CIB**

https://www.jamstec.go.jp/cib/

The *Chikyu* IODP Board - CIB is the planning forum for expeditions using *Chikyu*.

ECORD Members of the CIB
Gilbert Camoin (France)
Achim Kopf (Germany)

ECORD Facility Board - **EFB**

https://www.ecord.org/about-ecord/management-structure/efb/

ECORD Facility Board is the planning forum for expeditions using mission-specific platforms.

ECORD Members of the EFB

Science Board:

Alexandra Turchyn **(Chair)** (UK)
Gabriele Uenzelmann-Neben (Vice-Chair) (Germany)
Michele Rebesco (Italy)

ECORD Vision Task Force members:

Tomas Andresson (Sweden)
Angelo Camerlenghi (Italy)
Gilbert Camoin (France)
Annalisa Iadanza (Italy)
France Lagroix (France)
Guido Lüniger (Germany)
Dave McInroy (UK)
Ursula Röhl (Germany)
Mike Webb (UK)

Science Evaluation Panel - **SEP**

http://www.iodp.org/program-organization/science-evaluation-panel

Science Evaluation Panel (SEP) is a JRFB advisory panel that evaluates the scientific objectives and relevance of proposed expeditions using all IODP platforms.

SEP ECORD Members

Science:

Christoph Beier (Finland)
Clara Bolton (France)
Anne Briais (France)
Gerald Dickens (Ireland)
Michelle Harris (UK)
Matt Ikari (Germany)
Eryn McClymont (UK)
Tim Reston (UK) **(Co-Chair)**
Mike Weber (Germany)

Site:

Laura De Santis (Italy)
Maria Filomena Loreto (Italy)
Jonas Preine (Germany)
Nick Schofield (UK)

Environmental Protection and Safety Panel - **EPSP**

www.iodp.org/program-organization/environmental-protection-and-safety-panel

The Environmental Protection and Safety Panel (EPSP) is a JRFB advisory panel that evaluates the environmental protection and safety of proposed expeditions using all IODP platforms.

EPSP ECORD Members
Martin Hovland (Norway)
Philippe Lapointe (France)
Toby Harrold (Spain)
Dieter Strack (Germany)

IODP Forum

http://www.iodp.org/iodp-forum

The IODP Forum is the custodian of the Science Plan and is a venue for exchanging ideas and views on the scientific progress of the Program. The Forum also provides advice to IODP Facility Boards on Platform Provider activity.

Many ECORD representatives from all ECORD entities have attended the meeting of the IODP Forum held in Shizuoka, Japan on 3 and 4 September 2024.

IODP Forum Chair
Henk Brinkhuis (The Netherlands)

The International Ocean Drilling Programme (IODP³) is composed of the following entities: Executive Board (ExB), IODP³ Managing Agency (IMA), Mission Specific Platform Facility Board (MSP-FB), Science Evaluation Panel (SEP), Safety and Environment Advisory (SEA) Group, IODP³ Science Office, Vision Task Force (VTF), Communication Task Force (CTF) and the Magellan³ Workshop Series Programme (MG3). The ECORD participation in IODP³ entities in 2025 is listed below.

The IODP³ Executive Board - ExB

https://iodp3.org/iodp3-organisation/iodp3-executive-board/

The IODP³ Executive Board (ExB) is the IODP³ governing body for overseeing the programme and ensuring effective decision-making.

ECORD members of the ExB
Tomas Andersson (Sweden)
Carlota Escutia (Spain)
Annalisa Iadanza (Italy)
John Jamieson (Canada)
Martina Kern (Switzerland)
France Lagroix (France)
Guido Lüniger **(Co-Chair)** (Germany)
Vitor Magalhães (Portugal)
Lara Perez (Denmark)
Bernhard Plunger (Austria)
Edina Pozer (Norway)
Niels van den Berg (The Netherlands)
Koen Verbruggen (Ireland)
Mike Webb (UK)

IODP³ Managing Agency - IMA

https://iodp3.org/iodp3-organisation/iodp3-managing-

The IODP³ Managing Agency (IMA) will be overseen by the Director of the EMA and managed by the CNRS.

Nadine Hallmann (France)

Mission Specific Platform Facility Board - MSP-FB

https://iodp3.org/iodp3-organisation/iodp3-msp-facility-board/

The Mission Specific Platform Facility Board (MSP-FB) is the key entity for the annual planning of IODP³ activities by selecting drilling/coring and SPARC proposals to be implemented.

Members of the MSP-FB
Marguerite Godard (France)
Tom Dunkley Jones (UK)
Sasha Turchyn ((UK)
Gabriele Uenzelmann-Neben **(Co-Chair)** (Germany)

Science Evaluation Panel - SEP

https://iodp3.org/iodp3-organisation/science-evaluation-panel

The Science Evaluation Panel reviews drilling/coring and SPARC proposals submitted to IODP³ and advise on other scientific matters when deemed necessary.

SEP ECORD Members
Tim Reston, **(Co-Chair)** (UK)
Science:
Gerald Auer (Austria)
Marianne Conin (France)
Gerald Dickens (Ireland)
Anna Joy Drury (UK)
Jörg Geldmacher (Germany)
Michelle Harris (UK)
Matt Ikari (Germany)
Erin McClymont (UK)
Alessio Sanfilippo (Italy)
Mike Weber (Germany)
Hildegard Westphal (Germany)
Site:
Wolfram Geissler (Germany)
Gilles Lericolais (France)
Jonas Preine (Germany)
Laura de Santis (Italy)

Safety and Environment - SEA

https://iodp3.org/iodp3-organisation/sea-group/

The Safety and Environment (SEA) Group is an advisory body to the MSP-FB, SEP and IODP³ Operators and is considering safety and environmental protection issues related to MSP expeditions.

SEA Group ECORD Members
Toby Harrold (Spain)
Martin Hovland (Norway)
Philippe Lapointe (France)
Dieter Strack (Germany)

IODP³ Science Office - IODP³-SO

https://iodp3.org/iodp3-organisation/iodp3-science-office/

The IODP³ Science Office provides logistical support to the ExB, MSP-FB, SEP and the SEA Group, oversees proposal submission and review processes, manages the proposal and site survey databases and the IODP³ website, is responsible for review and publishing of scientific reports related to IODP³ expeditions.

IODP³-SO members
Antony Morris **(Lead Director)** (UK)
Chiara Amadori (UK)
Jodie Fisher (UK)
Myriam Kars (UK)

Vision Task Force - VTF

https://iodp3.org/iodp3-organisation/vision-task-force/

The Vision Task Force (VTF) develops and oversees a long-term scientific and funding strategy for the programme.

VTF ECORD members
Tomas Andersson (Sweden)
Angelo Camerlenghi (Italy)
Gilbert Camoin (France)
Annalisa Iadanza (Italy)
France Lagroix (France)
Guido Lüniger (Germany)
Dave McInroy (UK)
Ursula Röhl (Germany)
Mike Webb (UK)
Sasha Turchyn (UK)

Communication Task Force - CTF

https://iodp3.org/iodp3-organisation/communications-task-force/

The Communication Task Force (CTF) coordinates the communication and promotion of IODP³ science, operational activities and achievements.

CTF ECORD members
Nicole Beneventi **(Co-Chair)** (France)
Angelo Camerlenghi (Italy)
Gilbert Camoin (France)
Jodie Fisher (UK)
Nadine Hallmann (France)
Myriam Kars (UK)
Hanno Kinkel (Italy)
David McInroy (UK)
Antony Morris (UK)
Matt O'Regan (Sweden)
Ulrike Prange (Germany)

Magellan³ Workshop Series Programme - MG3

https://iodp3.org/iodp3-organisation/magellan3/

The Magellan³ Workshop Series Programme (MG3) is the IODP³ support programme for the development of new and innovative scientific drilling/coring proposals and SPARCs.

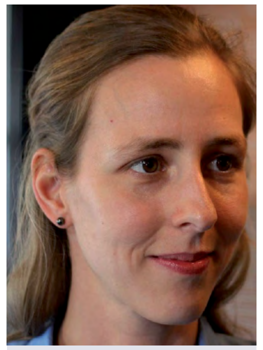
MG3 ECORD members
Catalina Gebhardt **(Co-Chair)** (Germany)
Johan Lissenberg (UK)
Verena Heuer (Germany)
Lucas Lourens (The Netherlands)
Elmar Albers (Germany)
Edoardo Dalla Nave (Italy)
Christoph Heubeck (Germany)
Marguerite Godard (France)

IODP³ INTERNATIONAL OCEAN DRILLING PROGRAMME

ECORD European Consortium for Ocean Research Drilling

Contributors

Nicole Beneventi
EMA Outreach Officer



Nadine Hallmann
EMA Assistant Director

Gilbert Camoin
EMA Director

Sarah Davies
EPC Manager

Angelo Camerlenghi
ESSAC Chair

David McInroy
ESO Science Manager

Alexandra V. Turchyn
EFB Chair

Ursula Röhl
ESO Curation and Lab Manager

Hanno Kinkel
ESSAC Science Coordinator

Ulrike Prange
ESO Media Relations

IODP Expedition 399. Credit: @ECORD_IODP.

Ab List of acronyms

ABS: American Bureau of Shipping

ACC: Antarctic Circumpolar Current

ACEX: Arctic Coring Expedition

AAD: Australian Antarctic Division

ADP: Amphibious Drilling Proposal

AGU: American Geophysical Union

AIS: Antarctic Ice Sheet

AIST: National Institute of Advanced Industrial Science and Technology

ANZIC: Australian and New Zealand IODP Consortium

APL: Ancillary Project Letter

ArcOP: Arctic Ocean Paleoceanography, IODP Expedition 377

AWI: Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven

BCR: Bremen Core Repository

BGR: Bundesanstalt für Geowissenschaften und Rohstoffe - Federal Institute for Geosciences and Natural Resources, Hannover

BGS: British Geological Survey

CCOD: Canadian Consortium for Ocean Drilling

CEREGE: Centre Européen de Recherche et d'Enseignement des Géosciences de l'Environnement - Centre for Research and Education in Environmental Geosciences, Aix-en-Provence

CIB: *Chikyu* IODP Board

CNR: Consiglio Nazionale delle Ricerche - National Research Council of Italy

CNRS: Centre National de la Recherche Scientifique - National Center for Scientific Research, France

CRISP: Costa Rica Seismogenesis Project

CT: Computed Tomography

DAFSHE: Danish Agency for Science and Higher Education

DFG: Deutsche Forschungsgemeinschaft - German Research Foundation

DIS: Drilling Information System

DLP: Distinguished Lecturer Programme

DSDP: Deep Sea Drilling Project

EC: European Commission

ECORD: European Consortium for Ocean Research Drilling

EFRAM-ARC: Eastern Fram Strait Paleo Archive

EFB: ECORD Facility Board

EGU: European Geosciences Union

EMA: ECORD Managing Agency

EOTF: ECORD Outreach Task Force

EPC: European Petrophysics Consortium

EPGFZ: Enriquillo-Plaintain Garden Fault zone

EPSP: Environmental Protection and Safety Panel

ESO: ECORD Science Operator

ESSAC: ECORD Science Support and Advisory Committee

ETH: Eidgenössische Technische Hochschule - Swiss Federal Institute of Technology, Zurich

EVTF: ECORD Vision Task Force

ExB: Executive Boardin IODP³

FCT: Fundação para a Ciência e a Tecnologia - Foundation for Science and Technology, Portugal

FNS: Fonds National Suisse de la Recherche Scientifique - Swiss National Science Foundation, SNSF

FY: Fiscal Year

GCR: Gulf Coast Repository

GEOMAR: Helmholtz Centre for Ocean Research Kiel

GFZ: Deutsches GeoForschungsZentrum - German Research Centre for Geosciences, Potsdam

GPC: Giant Piston Coring

GSI: The Geological Survey of Ireland

IBM: Izu-Bonin-Mariana

ICDP: International Continental Scientific Drilling Program

Ifremer: Institut Français de Recherche pour l'Exploitation de la Mer – French Research Institute for Exloitation of the Sea

IGSN: International Geo Sample Number

IKC: In-Kind Contribution

INSU: Institut National des Sciences de l'Univers - National Institute of Sciences of the Universe, France

IODP: Integrated Ocean Drilling Program (2003-2013) & International Ocean Discovery Program (2013-2024)

IODP³: IODP-cubed; International Ocean Drilling Programme to be started on 1 January 2025

ISOLAT: Integrated Southern Ocean Latitudinal Transects

JAMSTEC: Japan Agency for Marine-Earth Science and Technology

J-DESC: Japan Drilling Earth Science Consortium

JOIDES: Joint Oceanographic Institutions for Deep Earth Sampling

JR: *JOIDES Resolution*

JRFB: *JOIDES Resolution* Facility Board

JRSO: *JOIDES Resolution* Science Operator

KAUST: King Abdullah University of Science and Technology

KCC: Kochi Core Center

K-Pg: Cretaceous–Paleogene

LSCE: Laboratoire des Sciences du Climat et de l'Environnement - Laboratory for Sciences of Climate and Environment, Gif-sur-Yvette

LWD: Logging While Drilling

MarE3: Marine-Earth Exploration and Engineering Division

MARUM: Center for Marine Environmental Sciences, University of Bremen

mbsf: metres below sea floor

mDIS: mobile Drilling Information System

MDP: Multi-phase Drilling Project

MeBo: Meeresboden-Bohrgerät - seafloor drill

MG+: MagellanPlus Workshop Series Programme

MINECO: Ministerio de Economía y Competitividad - Ministry of Economy and Competitiveness, Spain

MoU: Memorandum of Understanding

MPI: Max Planck Institute

MPT: Mid-Pleistocene Transition

MSCL: Multi-Sensor Core Logger

MSP: Mission-Specific Platform

NADIR: Nice Amphibious Drilling In-situ Monitoring and Risk Analysis

NanTroSEIZE: Nankai Trough Seismogenic Zone Experiment

NOC: National Oceanography Centre, Southampton

NSF: National Science Foundation

NWO: Nederlandse Organisatie voor Wetenschappelijk Onderzoek - Netherlands Organisation for Scientific Research

ÖAW: Östereichische Akademie der Wissenschaften - Austrian Academy of Sciences

OCT: Ocean-Continent Transition

ODP: Ocean Drilling Program

OGS: National Institute of Oceanography and Applied Geophysics

OSP: Onshore Science Party

PIN: Prior Information Notice

PMO: Program Member Office

PROCEED: Expanding Frontiers of Scientific Ocean Drilling

RD2: Rockdrill2

SEA: Safety and Environment Advisory Group in IODP³

SEDIS: Scientific Earth Drilling Information Service

SFWG: Science Framework Working Group

SEP: Science Evaluation Panel

UKRI: United Kingdom Research and Innovation

USSP: Urbino Summer School in Paleoclimatology

USSSP: U.S. Science Support Program

IODP Expedition 389. Credits: M. Parker@ECORD_IODP

www.ecord.org

info@ecord.org

@ECORD_IODP

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Austria	1	Österreichische Akademie der Wissenschaften (ÖAW)
Canada	2	Canadian Consortium for Ocean Drilling (CCOD)
Denmark	3	Danish Agency for Science and Higher Education
France	4	Centre National de la Recherche Scientifique (CNRS)
Germany	5	Deutsche Forschungsgemeinschaft (DFG)
Ireland	6	The Geological Survey of Ireland (GSI)
Italy	7	Consiglio Nazionale delle Ricerche (CNR)
Netherlan4ds	8	Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO)
Norway	9	Forskningsradet
Portugal	10	Fundação para a Ciência e a Tecnologia (FCT)
Spain	11	Ministerio de Ciencia, Innovación (MCIN)
Sweden	12	Vetenskapsradet (VR)
Switzerland	13	Fonds National Suisse (FNS)
United Kingdom	14	United Kingdom Research and Innovation (UKRI)

http://www.ecord.org

info@ecord.org