



## Onshore Science Party: IODP Expedition 386: Japan Trench Paleoseismology



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IODP Expedition 377: Arctic Ocean Paleoceanography (ArcOP)  
IODP Expedition 386: Japan Trench Paleoseismology  
IODP Expedition 389: Hawaiian Drowned Reefs

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The International Ocean Discovery Program (**IODP**) - [www.iodp.org](http://www.iodp.org) - is an international research programme dedicated to advancing the scientific understanding of the Earth through drilling, coring, and monitoring the sub-seafloor. The European Consortium for Ocean Research Drilling (**ECORD**) - [www.ecord.org](http://www.ecord.org) - supports the participation of European and Canadian scientific communities in IODP and provides funding for the implementation of mission-specific platform expeditions. ECORD is funded by 15 countries (*see back page*).

IODP is funded by the US National Science Foundation (NSF), Japan's Ministry of Education, Culture, Sports, Science, and Technology (MEXT); ECORD; the Australian-New Zealand IODP Consortium (ANZIC); India's Ministry of Earth Sciences; China's Ministry of Science and Technology; the Korea Institute of Geoscience and Mineral Resources (KIGAM); and Brazil's Ministry of Education (CAPES).

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**Cover photo:** Team of the 'OSP Phase 1' onboard *Chikyu*, IODP Expedition 386: Japan Trench Paleoseismology. Credits: ECORD/IODP/JAMSTEC



Gilbert Camoin



Guido Lüniger



Nadine Hallmann

## Mission-specific platform expeditions

### IODP Expedition 386:

#### Japan Trench Paleoseismology



Following the successful implementation of the offshore phase of IODP Expedition 386: Japan Trench Paleoseismology (Co-chief Scientists: M. Strasser, ECORD-Austria and Ken Ikehara, Japan), the onshore phase has been conducted on board *D/V Chikyu* docked in Shimizu from 14 February through 15 March 2022. In addition, a personal sampling party is planned in November 2022.

Besides its operational success, this expedition has demonstrated that a collaborative approach involving different IODP Platform Providers (ECORD Science Operator - ESO - and the Institute for Marine-Earth Exploration and Engineering - MarE3 - within JAMSTEC in the case of IODP Expedition 386) and the provision of in-kind contributions (IKC) represent a model for future scientific ocean drilling expeditions implemented in an MSP mode.



### IODP Expedition 377:

#### Central Arctic Paleoceanography (ArcOP)



Since 2020, ESO and EMA have collaborated with the Swedish Polar Research Secretariat (SPRS) to set up operational, funding and communication plans related to the implementation of IODP Expedition 377: Central Arctic Paleoceanography (ArcOP; Co-chief Scientists: R. Stein, ECORD-Germany and K. St. John, USA) that was recommended for scheduling by the ECORD Facility Board (EFB) in March 2019. This expedition has been seen as a first-priority expedition for ECORD by the EFB and has benefitted from IKCs provided by SPRS and the Federal Institute for Geosciences and Natural Resources (BGR) in Hannover, Germany. In early April, the ECORD Council has decided to postpone the implementation of this expedition, initially scheduled in August and September 2022, by two to three years based on the uncertainty of offshore operational safety given the current geopolitical situation.



### IODP Expedition 389:

#### Hawaiian Drowned Reefs



At its next meeting that will be held on 20 and 21 September 2022 in Aix-en-Provence, France, the EFB will consider the scheduling of another MSP expedition for 2024 or 2025, after the implementation of IODP Expedition 389: Hawaiian Drowned Reefs (Co-chief Scientists: J. Webster, ANZIC and A. C. Ravelo, USA), which is now planned for September-October 2023.

### MSP proposals

The MSP proposals that currently reside at the EFB and at the Science Evaluation Panel (SEP), as well as the MSP drilling proposals that will arise from MagellanPlus workshops that will be held within the next two years, will form the basis of the post-2024 MSP expedition schedule. The success of the last MagellanPlus calls for workshop proposals dedicated to MSP drilling demonstrates the prominent role that the MSP concept will play in the future to fulfill the scientific objectives of the 2050 Science Framework.

The operational flexibility provided by the MSP concept, including a Basic Plan that corresponds to the minimum requirements for expedition success and variable operational times that are shorter than the standard two-month expedition, might serve as a model for the implementation of expeditions in post-2024 scientific ocean drilling.

*continued* →



The end of the International Ocean Discovery Program on 30 September 2024

will mark a major change in the organization of international activities related to scientific ocean drilling, with a transition from a single international programme operating with independent platform providers to some form of ‘alliance’ of independent and collaborative programmes.

Over the last months, ECORD has been actively involved in the planning of post-2024 international scientific ocean drilling initiative(s) that will be based on the 2050 Science Framework and in which ECORD intends to play a prominent role. After defining and shaping its post-2024 plans internally, ECORD has initiated bilateral meetings with its current IODP partners to exchange views on post-2024 scientific ocean drilling initiative(s).

The broad outlines of ECORD’s plans have already been presented during IODP meetings (IODP Facility Boards and Forum meetings) and have culminated in the recent IODP Forum and Inter-Governmental meetings that were held in a hybrid form on 11-13 October 2021 (Rome, Italy).

A major outcome of bilateral meetings with current IODP partners was the decision by ECORD, JAMSTEC and MEXT to build a combined post-2024 programme, while keeping their own functioning and identity.

At the IODP Forum extraordinary meeting that was organized by ECORD and held in Vienna, Austria on 7 and 8 April 2022, ECORD and Japan have presented a first outline of the architecture of this programme, as well as their joint vision for a future alliance of ocean drilling programmes, including how higher-level functions such as the proposal and data management (currently the main responsibility of the current Science Support Office – SSO-) and the proposal review process (currently the remit of the current Science Evaluation Panel – SEP - and Environmental Protection and Safety Panel - EPSP -) should operate post-2024 in such an alliance to address the goals of the 2050 Science Framework. In parallel, communication plans to inform ocean drilling science communities about the rapidly

evolving situation of the post-2024 plans have been set up and two first webinars have been organized on 12 and 14 April 2022. These plans will develop further in the next months.

#### The ‘Alliance’ of collaborative programmes

Any development of post-2024 international scientific ocean drilling initiatives would therefore require current and new platform providers to confirm their participation and work together on a sustainable implementation model, including use of available facilities, and general coordination of independent programmes under the auspices of an ‘Alliance’. The 2050 Science Framework (<http://www.iodp.org/2050-science-framework>), which represents a new and innovative approach for conducting science using a portfolio of offshore drilling platforms, must be the foundation of such future initiatives. However, there are still uncertainties regarding the availability of drilling platforms to conduct post-2024 scientific drilling related the 2050 Science Framework.



#### Core and data legacies

The development of post-2024 initiatives will also require continuity of core and data legacies, in order to maintain one of the key basic principles of the successive international scientific ocean drilling programmes. The related agreements among current IODP partners will have to be formalized to ensure the continuity of legacy activities throughout the transition between IODP and future scientific ocean drilling initiatives. This is especially of prime importance for the Bremen Core Repository – BCR -, which 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, to date more than 160 km of cores acquired during 91 expeditions before the implementation of a number of JR expeditions in these regions before the end of the current programme. The provision of a new IODP Core Repository by China in a new phase of scientific ocean drilling would require coordination and agreements between the proposed new core repository and the current IODP core repositories.

A prominent role for Mission-Specific Platforms (MSP)



Mission-Specific Platform (MSP) expeditions will play a prominent role in achieving the goals of the 2050 Science Framework.



### Diversification of drilling and coring technologies

ECORD intends to further develop the MSP concept by diversifying drilling and coring technologies, including riserless drilling, and applying them to all geological environments, as determined by scientific priorities, operational efficiency and better value for money.



### Active collaboration with other platform providers

ECORD intends to foster active collaboration with other platform providers, as well as other programmes and initiatives with similar scientific objectives, and implement joint expeditions in “MSP-mode”, regardless of the technology and/or the drilling/coring needs.



As part of the ECORD-Japan emerging plans, JAMSTEC has considered the use of vessels to be operated on an MSP mode and using alternative coring tools, such as Giant Piston Coring (GPC) and Boring Machine System (BMS).



At the last IODP Forum meetings, China has presented thorough post-2024 plans and reiterated its intentions to become a new platform provider to implement expeditions on an MSP mode by using different vessels with distinctive capabilities to address various scientific objectives of the 2050 Science Framework. During their bilateral meetings, ECORD and China have expressed interest in a direct co-operation for the first MSP expedition(s).



NSF has reiterated its intentions to potentially use the JR in a non IODP-style context beyond 2024. At its 2021 Autumn meeting, the ECORD Council has expressed interest in obtaining details about operational costs associated with the post-2024 use of the JR. This information will be essential for a cost-benefit analysis before any decision can be taken. A possible demobilization of the JR in 2025 will be considered if a viable business model cannot be defined. In parallel, NSF initiated also the process to acquire a new globally ranging non-riser scientific drillship in the next decade.

There are still many challenges to tackle and many issues to be solved to delineate the final architecture of the ECORD-Japan programme and of the ‘Alliance’ of collaborative programmes within the next months. However, based on the well-established operation of the ECORD infrastructure, its successful implementation, its competitiveness in the international research landscape and maximum return from investment, a bright future is promised to ECORD in its intentions to play a prominent role in post-2024 scientific ocean drilling.

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## In memory of Professor Dick Kroon

Professor Dick Kroon  
24 December 1957 – 24 May 2022 †



We are deeply saddened and shocked by the recent passing of our dear friend and colleague Professor Dick Kroon, Regius Professor of Geology at the University of Edinburgh.



For more than 30 years, Dick personified an exceptional love story with Scientific Ocean Drilling. He sailed on six ODP/IODP expeditions, including two as Co-Chief Scientist, and was a pioneer in the use of stable isotope stratigraphy and planktonic foraminiferal micropaleontology in the recovery of paleoceanographic and climate records from the Pleistocene to the Cretaceous in almost all the oceans of our planet. His exceptional scientific legacy, including more than 150 publications and the training of ~30 PhD graduates (most of whom now hold academic roles themselves), will continue to guide and inspire research long into the future.

Dick was also a central player in the leadership of the two last scientific ocean drilling programmes, first by serving as Chair of IODP-Netherlands (2002-2006), then as Co-Chair of the IODP Science Evaluation Panel for five years (2012-2016) and finally as Chair of the IODP Forum (2019-2021), the highest-level entity in the current program. In this latter role, he became the face of the International Ocean Discovery Program, which benefited immensely from his unique scientific knowledge, superbly diplomatic approach to working with partners around the world, and his unparalleled ability to enthuse and bring out the best in everyone. This is exemplified by the way he helped orchestrate the production of the “2050 Science Framework: Exploring Earth by Scientific Ocean Drilling”, that sets out a compelling scientific vision for our future and is an enduring legacy of his influence and passion.

The scientific drilling community will sorely miss Dick’s boundless and infectious enthusiasm and insightful views, as well as his rich character and acute sense of humour. Those of us who were lucky enough to work closely with Dick, and to know him well, have lost a truly special colleague and friend. His memory will not fade away and he will of course live on in our hearts and memories.

In October 2021, we honoured Dick with an ECORD Award in recognition of his exceptional contribution to Scientific Ocean Drilling (<https://www.ecord.org/7th-ecord-award-dick-kroon/>). Sadly, Dick was never able to receive his Award in person. In his gracious acceptance letter, Dick wrote that “Scientific Ocean Drilling is fun” and “the future looks bright”, but since his passing the IODP sky has sadly been very much dimmer.

Our sincerest condolences go to Dick’s wife and children, Erica, Gebien and Tim, all of his family, and to his innumerable friends around the world, to whom he left these beautifully poignant words:

*“The situation is disconcerting we cannot do much about it. Thank you for thinking of me. Dick”.*

Gilbert Camoin and Antony Morris



A memorial service for Dick Kroon will take place at sea on his beloved *JOIDES Resolution* in the Atlantic Ocean. Observing a minute of silence onshore will take place at 10.30 UTC/GMT on Wednesday 6 July 2022.



Dick Kroon in the Arabian Sea with *JOIDES Resolution* in the background, ODP Leg 117.  
Credit: IODP

## Letter from the IODP Forum Chair



Henk Brinkhuis

Dear ECORD & IODP community!

I am writing to you in that classic IODP fashion I guess, late at night, in the wee wee hours (see [https://www.youtube.com/watch?v=JXDtdV3\\_bEs](https://www.youtube.com/watch?v=JXDtdV3_bEs) for Chuck Berry reference) leaving behind my fellow IODP Expedition 396 participants at the pub in Bremen. We are enjoying the Expedition 396 onshore sampling at MARUM these days, working in three shifts, a well-oiled machinery of international hard rock petrologists and sedimentary geologists working together – uncovering the shrouded relationships between Mid-Norwegian Continental Margin Magmatism and the Paleocene Eocene Thermal Maximum (PETM), dynamics of super greenhouse worlds, and much more. All compliments go once more to the folks at the IODP BCR at MARUM, for their everlasting, relentless and most excellent support, making this all happen. In a few days from now, we will go home with a brilliant harvest of over 20,000 high quality samples... and that is just the beginning.

on both the status of the current program as well as, and notably so on, the shape of things to come, post 2024. Consensus statements include e.g., the Forum appreciating the recent efforts by the Facility Boards to support a smooth transition to potential future program(s) and ECORD's increased support for workshops aimed at developing new MSP proposals, recently including those with Japan in particular. Furthermore, the flexible and inclusive approach proposed at the recent integral PMO meeting to the organization of the community in support of Flagship Initiatives in the 2050 Science Framework was embraced. Indeed, the Forum agreed with establishing a visionary “Ground Truthing Future Climate Change” steering committee and workshop as an important first step – with ample opportunity for important scientific and societal impact.



Stacy Yager (Ball University, USA) and Mei Nelissen (NIOZ/Utrecht University) slicing the PETM muds to shreds. Credits: H. Brinkhuis, ECORD/IODP.



The rather colorful collection of pre-PETM volcanics seeing the light of day. Credits: H. Brinkhuis, ECORD/IODP.





Regarding the post IODP phase, several new avenues of international cooperation were further discussed, ranging from the announcement of future continued ECORD-Japan cooperation, to NSF considering extending the JOIDES Resolution from 2025 to 2028. Discussions focused on mechanisms for achieving the goals of the 2050 Science Framework, development of new technology, governance models, an overarching versatile strategic communications plan to berth allocation across the alliance, and in-kind contributions between partners. It was also noted that in addition to formal mechanisms, any future alliance would benefit from continuing to encourage collaborations that grow from the science community. Moreover, the Forum discussions led to acknowledging the importance of IODP-ICDP collaboration, and that cooperation with ICDP should be more visible, and Land-2-Sea proposals better coordinated in the future.

While no definitive structures emerged as yet, as chair, I noted a clear and shared desire to continue to build on the successful international cooperation of the past decades. This, combined with a strong sense of urgency, and acknowledged global need for high impact scientific

ocean drilling form a solid basis for continued positive discussions, at the next meeting, likely in September 2022 in New York.

Further, by the time you are reading this, news on the current gatherings in the US on the Science Mission Requirements (SMRs) for a potential new drillship that would serve a new U.S.-led science program will come soon. Meanwhile, ECORD continues to move forward in various ways in these critical times, spearheading the Magellan Plus workshops directed towards new and innovative MSP proposals including cooperation with ICDP. We continue to need your input and participation to secure any future program.

At the same time, reality demands us to acknowledge also recent international tension, war, worries, issues and problems, globally, and certainly also for ECORD. It was also unavoidable to postpone the Expedition 377: Arctic Ocean Paleooceanography (ArcOP) which was to take off this summer. Yet – as a community, I know we are strong, and we will overcome this episode even stronger, as one.



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IODP Forum Chair  
Utrecht University  
Ocean Systems Research Department, Royal NIOZ, NL

The Expedition 396 sampling party taking a breather (with cookies!). Sarah Lambert of Utah University smiling at you. Credits: H. Brinkhuis, ECORD/IODP.



View from *Chikyu* during 'OSP Phase 1' for ODP Expedition 386.  
Credits: ECORD/IODP/JAMSTEC.





Gabriele Uenzelmann-Neben

## ECORD Facility Board News

### Scheduling of MSP expeditions



The onshore Phase 1 of Expedition 386 Japan Trench Paleoseismology could be carried out successfully despite the difficulties resulting from the COVID-19 pandemic. Report writing (Phase 2) and personal sampling (Phase 3) are to follow.



Preparations for the offshore phase of Expedition 389 to be implemented in 2023 Hawaiian Drowned Reefs have begun.



Due to uncertainties regarding safety issues Expedition 377 ArcOp unfortunately had to be postponed by two to three years (see ECORD Headline # 20).

Meanwhile, the EFB is contributing to the development of a post-2024 mission specific platform expeditions programme.

The EFB has noticed with great delight that MSP proposals are continuously being submitted to SEP. Those proposals will form the backbone of the successful establishment of a post-2024 MSP expedition programme. The EFB thus encourages proponents to pursue the development and submission of MSP proposals.

Gabriele Uenzelmann-Neben  
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Chair of the ECORD Facility Board



### MSP 2020-2023 operational plan

2013 - 2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>347</b> Baltic Sea Paleoenvironment	<b>357</b> Atlantis Massif Serpentinization and Life	<b>364</b> Chicxulub K-Pg Impact Crater	<b>381</b> Corinth Active Rift Development	No expedition	ECORD renewal	No expedition	<b>386</b> Japan Trench Paleoseismology	No expedition	<b>389</b> Hawaiian Drowned Reefs
Drillship <i>Greatship Maya</i>	RRS <i>James Cook</i> & Seabed drills ( <i>MeBo</i> & <i>RD2</i> )	Liftboat <i>Myrtle</i>	Drillship <i>Fugro Synergy</i>				<i>Kaimei</i> & <i>Chikyu</i>		<i>TBD</i>
							<b>377</b> Arctic Ocean Paleocyanography	postponed	



#### EFB waiting room ⌚

<b>#637</b> New England Shelf Hydrogeology	<b>#813</b> Antarctic Cenozoic Paleoclimate	<b>#730</b> Sabine Bank Sea Level
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- Completed MSP expeditions
- MSP proposals in the EFB waiting room
- Postponed MSP expeditions
- Scheduled MSP expeditions



David McInroy



Sarah Davies



Ursula Röhl



Jez Everest

## Implementation of MSP expeditions

### Expedition 386: Japan Trench Paleoseismology



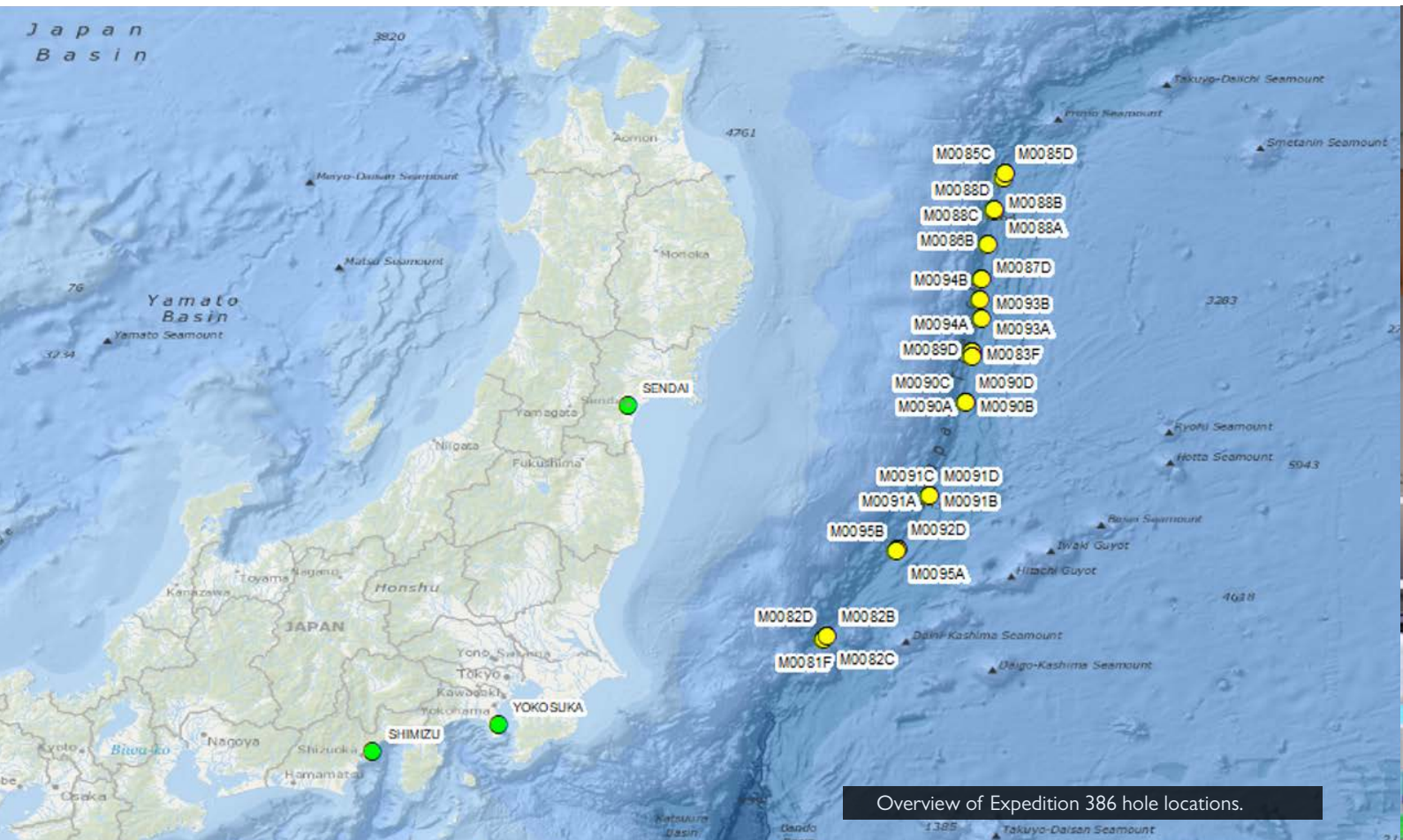
In the previous ECORD Newsletter we reported on the offshore phase of Expedition 386 (13 April - 1 June 2021) and the preparations that were made by ESO and JAMSTEC's Institute for Marine-Earth Exploration and Engineering (MarE3) for the Onshore Science Party (OSP).

The OSP was implemented in a 'hybrid' mode, with the first intense phase running from 14 Feb - 15 Mar 2022.

Due to COVID-19 entry restrictions into Japan at the time, only the eight Science Party members based in Japan could physically attend the OSP, and were supported by MarE3 staff and additional technicians and students. ESO and the Science Party are extremely grateful to the science and operator 'Chikyū Team' for their 24/7 contribution, which focussed on core splitting, imaging, core description, initial geochemistry, palaeomagnetic measurements and sampling for other IODP analyses.

Co-chief Scientists:	<b>Michael Strasser</b> <b>Ken Ikehara</b>
Offshore dates:	<b>13 April - 1 June 2021</b> on board <i>R/V Kaimei</i> from/to Yokosuka
Onshore Science Party dates:	<b>14 February - 15 March 2022</b> on board <i>D/V Chikyū</i> docked in Shimizu

The remaining 24 Science Party members remotely attended the OSP from their institutions and homes around the world, and contributed to data entry, data review and reporting. Running an OSP in this way was extremely challenging, not least because of the wide range of time zones involved when working with an international Science Party. ESO and MarE3 are extremely grateful to the OSP 'Remote Team' for engaging online at all hours of the day.



Overview of Expedition 386 hole locations.

The MarE3 team coordinated the daily operations onboard *Chikyu*, while the ESO team took responsibility for the overall OSP management, coordination, data management, and communication. Daily Zoom meetings were held between ESO and MarE3 and also between the operators and the Science Party. Although the *Chikyu* was docked in the Port of Shimizu, the ship was still a free-standing facility and MarE3 arranged mobile data connections to enable efficient communication between ship and shore. ESO also utilised an online collaboration workspace for the Science Party, which was very successful and we intend to use such a system for all future MSP expeditions. The ESO Bremen team provided the MARUM IODP Cloud system as the expedition's live data management tool.

Since the expedition's work force was distributed around the world, the operators devised a plan where certain samples were periodically shipped to ESO laboratories at the universities of Bremen and Leicester, and also the home laboratories of Science Party members in certain cases. This allowed a near-normal MSP analytical plan to be carried out, but with a lag in data production due to shipping times.

Although a shipping lag was anticipated, shipping times were greater than expected. The science and operator teams also found that working remotely across different time zones was slower than hoped, and we quickly realised that we needed to adapt the OSP hybrid model to allow for a more 'extended OSP' throughout the year. Thus the intense *Chikyu* phase was coined 'OSP Phase 1', where the team completed the core splitting and all associated *Chikyu* activities. This phase is now being followed by OSP Phase 2 (from March to November 2022), with the remote OSP measurements completed in the early part of Phase 2, and the bulk of the expedition reporting completed as far as possible with the data generated so far. The final OSP Phase 3 will be the Personal Sampling Party (PSP), where the Science Party will have the opportunity to meet on the *Chikyu* in November to take samples for their post-expedition research. Final standard core measurements (shear vane and penetrometer) will be taken during OSP Phase 3, with the final additions made to the expedition reports. At the end of the year the OSP will be declared complete, and the start of the 1-year moratorium period will begin.

Expedition 386 webpage: <https://www.ecord.org/expedition386/>



Onboard *Chikyu* during 'OSP Phase 1' for IODP Expedition 386.  
Credits: ECORD/IODP/JAMSTEC.

# Expedition 377: Arctic Ocean Paleooceanography (ArcOP)



## Planning summary

The overall goal of this expedition is to recover a complete stratigraphic sedimentary record on the southern Lomonosov Ridge to study the continuous, long-term Cenozoic climate history of the central Arctic Ocean. Higher-resolution studies of Arctic climate change in the Pleistocene and Neogene will be possible because the chosen location experienced sedimentation rates two to four times higher than successions sampled at Expedition 302 (ACEX) sites.

ESO continued planning activities with the Swedish Polar Research Secretariat (SPRS), Arctic Marine Solutions (AMS) and Geoquip Marine, despite growing uncertainty and speculation about the impacts of the war in Ukraine on the viability of the expedition. ESO and AMS staff visited the drillship *Dina Polaris* in Providence, USA, on 4 February during a crew change period. The *Dina Polaris* was investigating ground conditions for offshore windfarm installations offshore eastern US, after which she was to head back to Europe for further work before beginning the ArcOP contract.

ESO, SPRS, AMS and Geoquip Marine met in person in St Gallen, Switzerland, 24-25 March, to discuss operational planning in detail. This was the first time all 4 operational partners have met in person since the ArcOP project was initiated, and it was a great opportunity to cement many operational aspects that were



Co-chief Scientists:	<b>Ruediger Stein</b> <b>Kristen St. John</b>
Offshore dates:	Previously <b>Aug - Sep 2022</b> Now <b>postponed 2 - 3 years</b> on board <i>Dina Polaris</i>
Onshore Science Party dates:	to be confirmed

under discussion online for many weeks: general expedition plan and timing, ice management, positioning, station keeping, coring, rig operations, coring equipment, science logistics, deck plan, installation plan, crewing, medevac plan, personnel certification and risk analysis.

On 4 April, ECORD Council agreed to postpone ArcOP for 2-3 years due to uncertainties regarding safety issues with the implementation of the expedition as currently planned. ECORD Council have asked SPRS, AMS and ESO to review the operational plans with the aim of implementing the ArcOP science objectives according to a new time-plan that addresses the safety concerns. Any new plan identified will be subject to approval by the ECORD Council.

In the meantime, the invited Science Party will remain in place and on hold, until the future options for ArcOP are identified and understood.

Expedition 377 webpage: <https://www.ecord.org/expedition377/>

Expedition 377 Scientific Prospectus: [http://publications.iodp.org/scientific\\_prospectus/377/](http://publications.iodp.org/scientific_prospectus/377/)



Icebreaker *Oden* that will be used during IODP Expedition 377: ArcOP in 2022. Credit: Lars. Lehnert, SPRS

## Expedition 389: Hawaiian Drowned Reefs



### Summary and restart of planning for 2023

The overall goal of this expedition is to core a series of twelve fossil coral reefs surrounding the island of Hawaii, that formed as the reef communities successively grew and were drowned by rising sea-levels and/or the near constant subsidence of the crust around the ever-growing volcanic archipelago of Hawaii. Hawaii hosts a unique succession of expanded reef sequences, key for the recovery of high-resolution climate and reef response records, due to its location away from the influence of any of the large Quaternary ice-sheets or strong boundary ocean currents that can mask the sea-level and paleoclimate signals. The information contained in these natural fossil reef archives will help scientists reconstruct sea-level change at a much higher resolution than previously possible at a stable far-field site. It will also enable them to investigate the links between global sea-level change and global climate change, and therefore the mechanisms that control abrupt climate change.

Planning for IODP Expedition 389: Hawaiian Drowned Reefs resumed after the ECORD Facility Board recommended its re-scheduling at their September 2021 meeting.



Co-chief Scientists:	<b>Jody Webster</b> <b>Christina Ravelo</b>
Offshore dates:	<b>Sep - Oct 2023</b> TBD
Onshore Science Party dates:	TBD

ESO resumed planning for this expedition, including fresh scoping of academic and commercial seafloor drills and discussions with potential drilling contractors.

Between 3 Feb – 17 Mar, ESO ran a Prior Information Notice for drilling and vessel services, to inform the market of the imminent opportunity and to solicit feedback from interested suppliers. This led to a full tender call which will be live between 14 Apr – 19 May. We are hopeful of receiving viable and competitive bids, from which we can identify a preferred supplier and move forward with a contract and begin detailed operational planning.

ESO anticipate issuing a new Call for Scientists for this expedition in summer 2022, which will be advertised via IODP-related channels.

Expedition 389 webpage: <https://www.ecord.org/expedition389/>

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Corals within a core obtained during IODP Expedition 325 onboard *Greatship Maya*. Credits: J. Webster, ECORD/IODP.



Nadine Hallmann



Lucas Lourens

## MagellanPlus: Mechanisms of rifting of large continental blocks

(1-3 December 2021, Espoo, Finland)

### Mechanisms of rifting of large continental blocks – a case study at the Baltic Sea

The aim of the workshop was to gather expertise in addressing scientific objectives and conduct reconnaissance discussions associated with the Mesoproterozoic evolution of our planet during the so-called “boring billion”, with specific reference to the Bothnian Sea in Northern Fennoscandia. After some rescheduling we were able to arrange the workshop in the beginning of December 2021 at the Geological Survey of Finland. The COVID-pandemic likely cut some interest, but we still managed to get in many key contributions from the Nordic countries, Poland, Germany and Peru. The total number of participants was 26, which provided thematic coverage over a wide spectrum of geoscientific disciplines, and included three young scientists (PhD studies). The workshop resulted in fruitful networking and screening of ideas to set the focus of the future IOPD-proposals. Currently, the organizing team (C. Beier, J. Virtasalo and P. Skyttä) is preparing a proposal for pre-IODP-proposal geophysical imaging of the Bothnian bay, along with discussions about pre-proposal geophysical imaging that will be required to complement the existing datasets.

The preservation of terrestrial and marine sediments in continental and shallow marine rift systems and the associated basins preserves a unique spatial and temporal record of climate change and weathering in the continental environment. The underlying basement in addition, allows to constrain the mechanisms of rifting which include rift formation, reactivation and the evolution of marine and terrestrial sediments. Understanding marine and terrestrial rift systems is not only of curiosity driven scientific relevance but of importance for many of the global gas and oil resources that form in these enigmatic divergent plate boundary environments. Understanding the plate

tectonic evolution and associated environmental changes during the Mesoproterozoic from 1600-1000 Ma, frequently referred to as the Boring Billion, remains a challenging prospect because of a limited preservation of the associated sedimentary and igneous rocks. Despite the assumed stalled geological evolution, this period of time is also associated with critical and substantial evolutionary events, i.e. the appearance of eukaryotes, the origin of multicellularity and sexual reproduction that may later act as pathways for the rise of the metazoans.

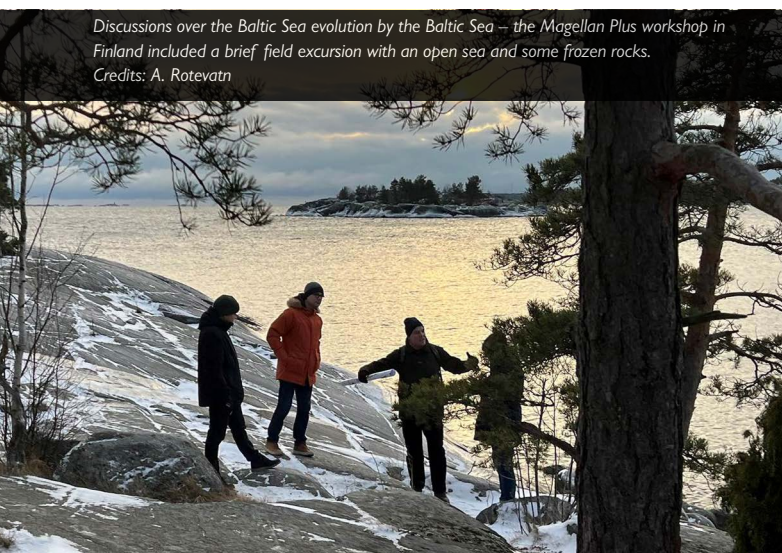
A key rationale for ocean drilling in the Bothnian Sea is that the preservation of the sedimentary and igneous rock record in the marine environment is a unique representation of the Mesoproterozoic evolution of the Baltic Shield during a crucial period of climate and ecological evolution. It seems that the structural inheritance from the Paleoproterozoic (or even Archean) has led to the preservation of the thick Mesoproterozoic sediment sequence below continental erosion level is at least partly controlling the current morphology of the Bothnian Sea. The lack of preserved, equivalent on-land lithologies due to the long-period of fluvial and glacial erosion and the preservation of the Palaeoproterozoic basement on land, stresses the need for a detailed, stratigraphic record in the Bothnian Sea.

The key scientific objectives developed as the result of the workshop include:

- Deciphering the record of climate change and evolution of Earth's surface environment in the Mesoproterozoic in a period over which preservation and knowledge of climate change and rates of weathering and erosion are limited.
- A Palaeomagnetic record through the Mesoproterozoic allows to constrain the plate tectonic evolution from 1.6-1.25 Ga.
- Estimating rates and processes of tectonic uplift as a response to isostatic uplift following deglaciation
- Determine the residence time of groundwaters and microbiomes in Mesoproterozoic sandstones as a window to ancient microbiota and its evolution in a closed system.
- Testing seismic models of the Mesoproterozoic rock record using drill samples.

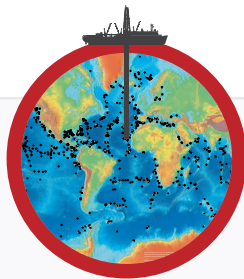
Pietari Skyttä, *University of Turku*  
Christoph Beier, *University of Helsinki*  
Joonas Virtasalo, *Geological Survey of Finland*

More on MagellanPlus Workshop Series Programme: <https://www.ecord.org/science/magellanplus/>



Discussions over the Baltic Sea evolution by the Baltic Sea – the Magellan Plus workshop in Finland included a brief field excursion with an open sea and some frozen rocks.  
Credits: A. Rotevatn





## Upcoming MagellanPlus Workshops

### REGULAR WORKSHOPS

**Belize Barrier Reef Workshop** (8-10 July 2022, Frankfurt/Main, Germany)  
IODP-drilling off of the Belize Barrier Reef (Central America) to reconstruct postglacial environmental changes.  
Contacts: Eberhard Gischler ([gischler@em.uni-frankfurt.de](mailto:gischler@em.uni-frankfurt.de)); Stefano Fabbri ([stefano.fabbri@geo.unibe.ch](mailto:stefano.fabbri@geo.unibe.ch)); Flavio Anselmetti ([Flavio.anselmetti@geo.unibe.ch](mailto:Flavio.anselmetti@geo.unibe.ch))

**COSNICA Workshop** (27-30 September 2022, Graz, Austria)  
The life cycle of a microplate at a convergent margin. More info: <http://cosnica.uni-graz.at>

**SCYLLA Workshop** (September 2022, Bologna, Italy)  
Serpentine diapirs in the Calabrian subduction system return lower plate mantle from Earth's oldest ocean.  
Contacts: Luca Gasperini ([luca.gasperini@ismar.cnr.it](mailto:luca.gasperini@ismar.cnr.it)) and Alina Polonia ([alina.polonia@ismar.cnr.it](mailto:alina.polonia@ismar.cnr.it))

**NorthGreen Workshop** (21-23 November 2022, Copenhagen, Denmark)  
Northeast Greenland: Unlocking records from sea to land.  
Contact: Contact: Lara F. Pérez ([lfp@geus.dk](mailto:lfp@geus.dk))

### EXPLORATORY WORKSHOPS

**Natural Hazards Workshop** (7-9 July 2022, Lisbon, Portugal)  
Mission-specific platform approaches to assessing natural hazards that impact society.  
Contact: Hugh Daigle ([daigle@austin.utexas.edu](mailto:daigle@austin.utexas.edu))

**IO:DIP – Indian Ocean: Delving Into the Past** (September 2022, Graz, Austria)  
The life cycle of a microplate at a convergent margin. More info: <http://indian-ocean.uni-graz.at>

**More info:** <https://www.ecord.org/science/magellanplus/>

# IODP Expedition 398: Hellenic Arc Volcanic Field

## Volcanism and tectonics in an island arc environment: Christiana-Santorini-Kolumbo Volcanic field, Greece

T.H. Druitt<sup>1</sup>, S. Kutterolf<sup>2</sup>, T.W. Höfig<sup>3</sup> and 932-Full2 proponents

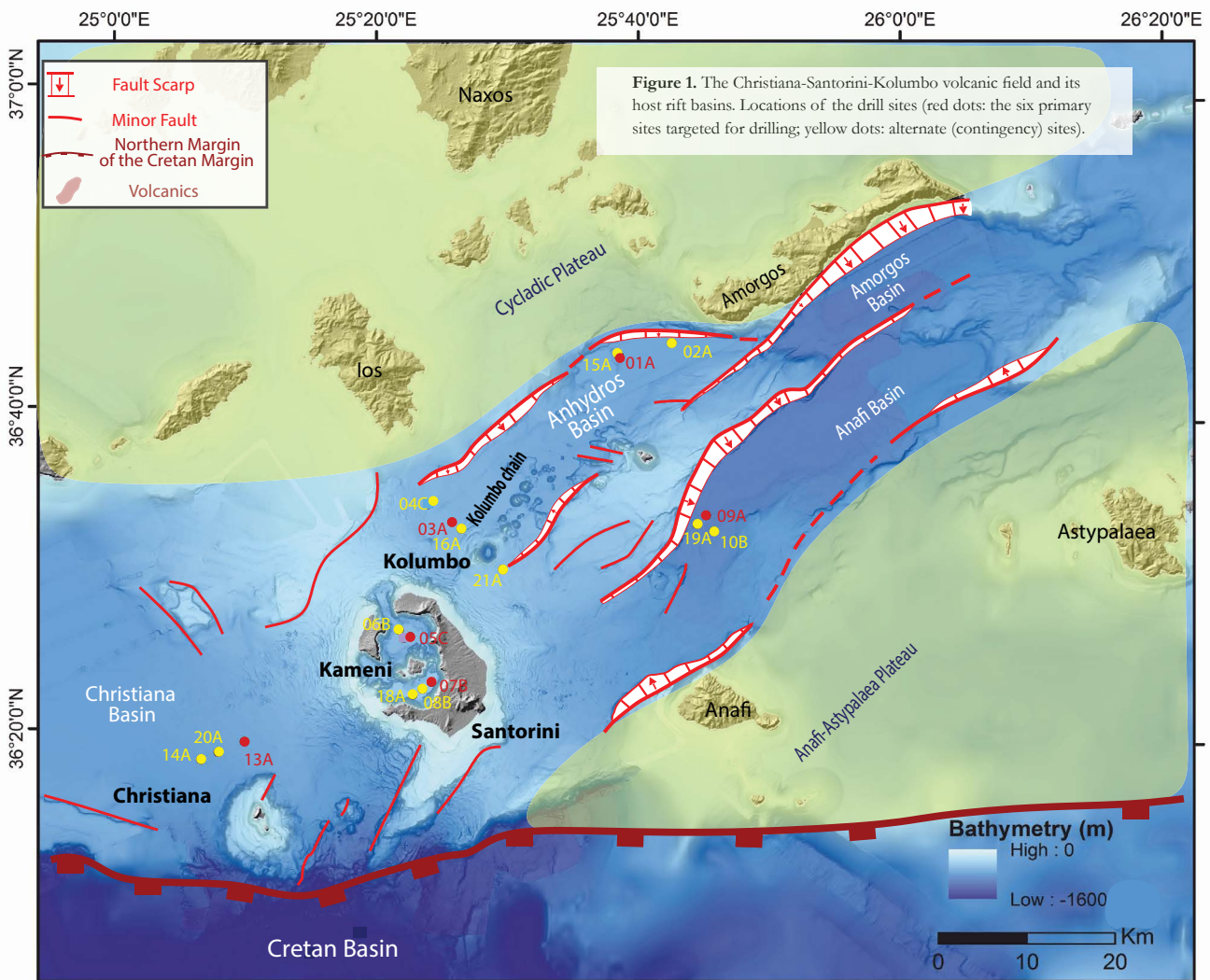
<sup>1</sup>Co-chief Scientist, Magmas and Volcanoes Laboratory, University of Clermont Auvergne, France, [tim.druitt@uca.fr](mailto:tim.druitt@uca.fr)

<sup>2</sup>Co-chief Scientist, Research Division 4: Dynamics of the Ocean Floor, GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany

<sup>3</sup>Expedition Project Manager/Staff Scientist, International Ocean Discovery Program, Texas A&M University, USA

IODP Expedition 398: Hellenic Arc Volcanic Field will take place aboard the *JOIDES Resolution* from 11 December 2022 to 10 February 2023.

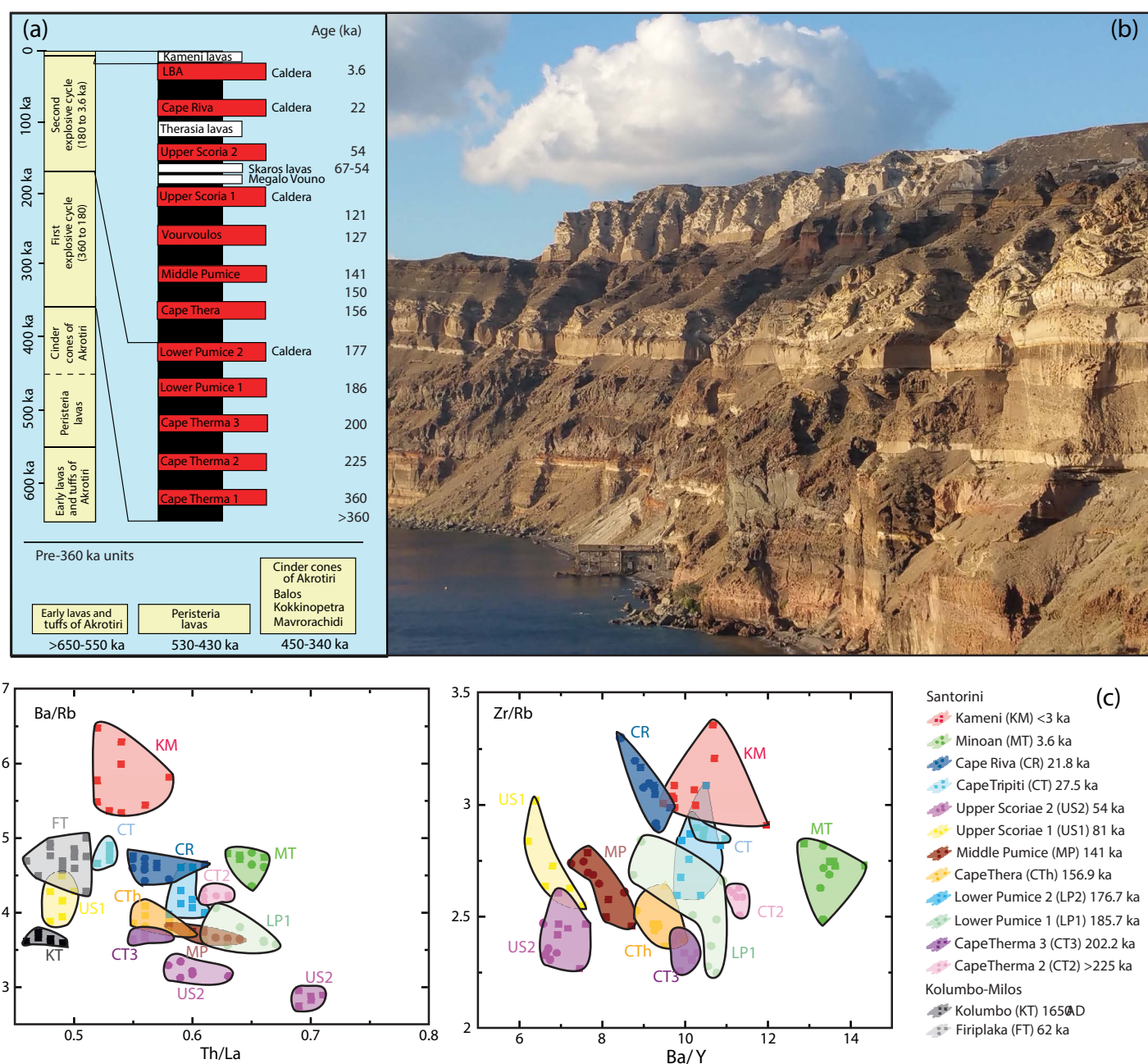
The Christiana-Santorini-Kolumbo (CSK) volcanic field on the Hellenic volcanic arc is a unique system for studying the links and feedbacks between crustal tectonics, volcanic activity, and magma genesis. It consists of three large volcanic centres and a line of submarine cones located in rift zone that cuts across the volcanic arc. The marine basins around the CSK field contain volcano-sedimentary fills up to several hundreds of meters thick, providing rich archives of volcanic products, tectonic evolution, magma genesis and paleo-environments. IODP scientists will drill four sites in the rift basins and two additional sites inside Santorini caldera. Deep ocean drilling will enable us to identify, characterise, and interpret depositional packages visible on seismic images, chemically correlate primary volcanoclastic layers in the rift fills with their source volcanoes, provide a tight chronostratigraphic framework for rift tectonic and sedimentary histories, document past eruptive events relevant to modern-day hazards assessments, and seek deep-subsurface microbial life.



Expedition 398 (Druitt et al., 2022) will address fundamental questions concerning magmatism and eruptive activity at island-arc volcanoes, such as what governs the development of crustal magmatic systems, whether volcanoes are dominantly effusive or explosive in behaviour, and how the crust makes space for large, shallow magma chambers into which calderas collapse. In particular, it will examine the roles of crustal rifting by documenting the correlations between volcanic, magmatic and tectonic histories of the region. It will also document the interactions of volcanism with the marine environment, including the entry of pyroclastic flows into the sea and the dynamics of undersea explosive eruptions of silicic magma. The role of volcanoes as hosts of deep microbial life will be studied.

The CSK volcanic field is an excellent place at which to address such issues (Fig. 1). Situated in the centre of the Hellenic volcanic

arc, it is one of the most active volcanic fields in Europe (Druitt and Vougioukalakis, 2019). The volcanic arc owes its existence to subduction of the African plate beneath the Eurasian plate. Back-arc extension due to slab rollback since the Pliocene has thinned the Aegean continental crust, creating horsts and grabens. The CSK volcanoes lie in a 100-km-long, NE-SW rift system and include the extinct Christiana Volcano, the 11x7-km Santorini caldera with its intracaldera Kameni Volcano, the 480-m-high submarine Kolumbo Volcano, and the 22 submarine cones of the Kolumbo chain (Fig. 1; Nomikou et al., 2018). All of these volcanoes have discharged their volcanic products into the adjacent marine basins, creating a rich archive of past eruptions. Santorini is one of the most explosive arc volcanoes in the world (Fig. 2A and B); its onshore products have been mapped, dated, and chemically fingerprinted (Fig. 2C; Kutterolf et al., 2021), and its historical eruptions are well documented. Kolumbo Volcano has had at least five large explosive eruptions, the last in 1650.



**Figure 2.** (A) Chronostratigraphy of Santorini Volcano, showing Plinian eruptions (in red) and inter-Plinian periods (in black and white). Most of the Plinian eruptions poured pyroclastic flows, and showered fallout tephra, into the surrounding marine basins. (B) Lavas and tuffs from eruptions of Santorini preserved onshore in the caldera cliffs. The lateral equivalents of many of these tuffs are expected to be encountered in the marine cores. (C) Juvenile glasses of many of the eruptions of the Christiana-Santorini-Kolumbo volcanic field (and of neighbouring Milos Volcano) can be distinguished based on their trace element signatures. See Druitt et al. (2022) for the data sources for figures A and C.

Santorini had an episode of bradyseismic unrest in 2011–12, raising awareness of the eruption threat at these islands visited by two million tourists per year.

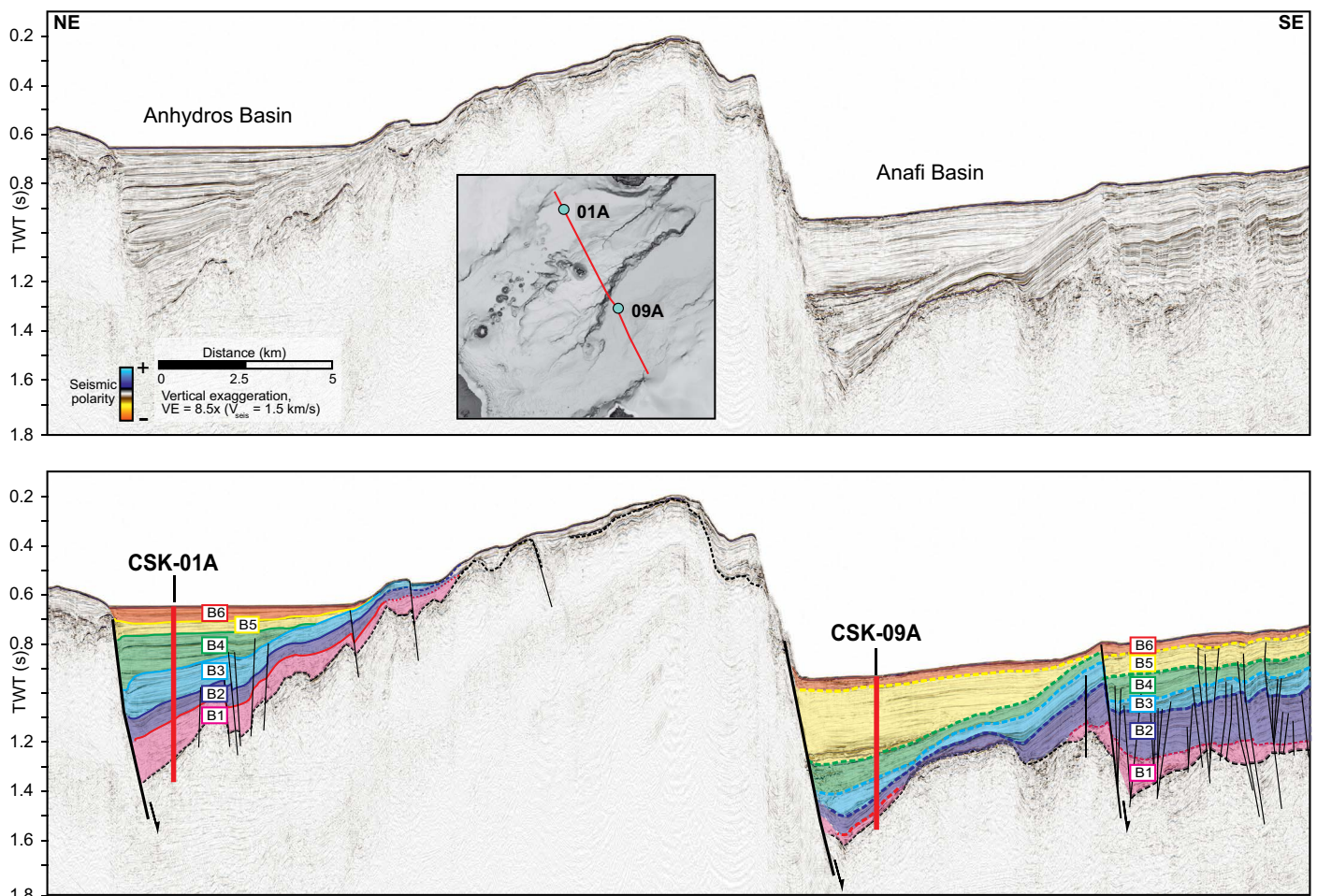
Deep drilling will take place at four sites in the rift basins around Santorini, penetrating several hundred metres of Pliocene-Quaternary volcano-sedimentary fill as far as the Alpine basement (Fig. 1). Another two sites will drill to about 300 m below the seafloor inside the caldera (Fig. 1). The drilling will be implemented in the context of a dense network of seafloor seismic reflection profiles summing to 3,350 km in length that exists across the rift zones, giving high-resolution images of sedimentary fills and faults (Fig. 3). In 2015, an active seismic tomography experiment of the CSK system (PROTEUS: Plumbing Reservoirs Of The Earth Under Santorini) imaged an upper-crustal magma reservoir beneath Santorini and extending north-eastwards towards Kolumbo Volcano (McVey et al., 2019). It is rare to deep-drill in the context of a high-resolution seismic tomography experiment. Multibeam bathymetric surveys have imaged submarine volcanic edifices and calderas. Shallow subsurface ash layers have been sampled by gravity coring across the Eastern Mediterranean, and many have been correlated with onshore products back to 200,000 a (Kutterolf et al., 2021). The collective knowledge from previous and ongoing studies (Druitt and Vougioukalakis, 2019) provides the backdrop for an expedition covering not only all four research themes of the

current IODP Science Plan 2013-2023, but also many Strategic Objectives and Flagship Initiatives laid out by the 2050 Science Framework for Scientific Ocean Drilling.

### Relationships between volcanism and crustal tectonics in an active rift environment.

Crustal tectonics is known to strongly influence volcanism, but it has rarely been studied at high spatial and temporal resolutions. Crustal thickness and thermal structure affect the production of magmas in the mantle and their subsequent evolution through crystal fractionation, crustal contamination, and magma mixing. Extensional crustal motions across many island arcs create space for magma ascent and influence the depths and sizes of magma storage regions. By integrating the volcanic and tectonic records, Expedition 398 will bring to light the effects of crustal tectonics on volcanism at the CSK field.

A record of Santorini volcanism exists since 650,000 a, but it is only detailed since 360,000 a (Fig. 2A). While the onshore record is inevitably discontinuous, the deep marine record promises to be much more complete. Apart from its 1650 eruption, the past volcanism of Kolumbo seamount is poorly documented and that of Christiana is unknown. Offshore drilling will enable IODP scientists to use the thick volcano-sedimentary records of the rift basins and Santorini caldera as time capsules for reconstructing a complete volcanic history of the area since rift inception in the Pliocene.



**Figure 3.** Locations and seismic context of primary Sites CSK-01A and CSK-09A in the Anhydros and Anafi basins northeast of Santorini. The basin fills have six seismic stratigraphic units, B1-B6, following Nomikou et al. (2018).

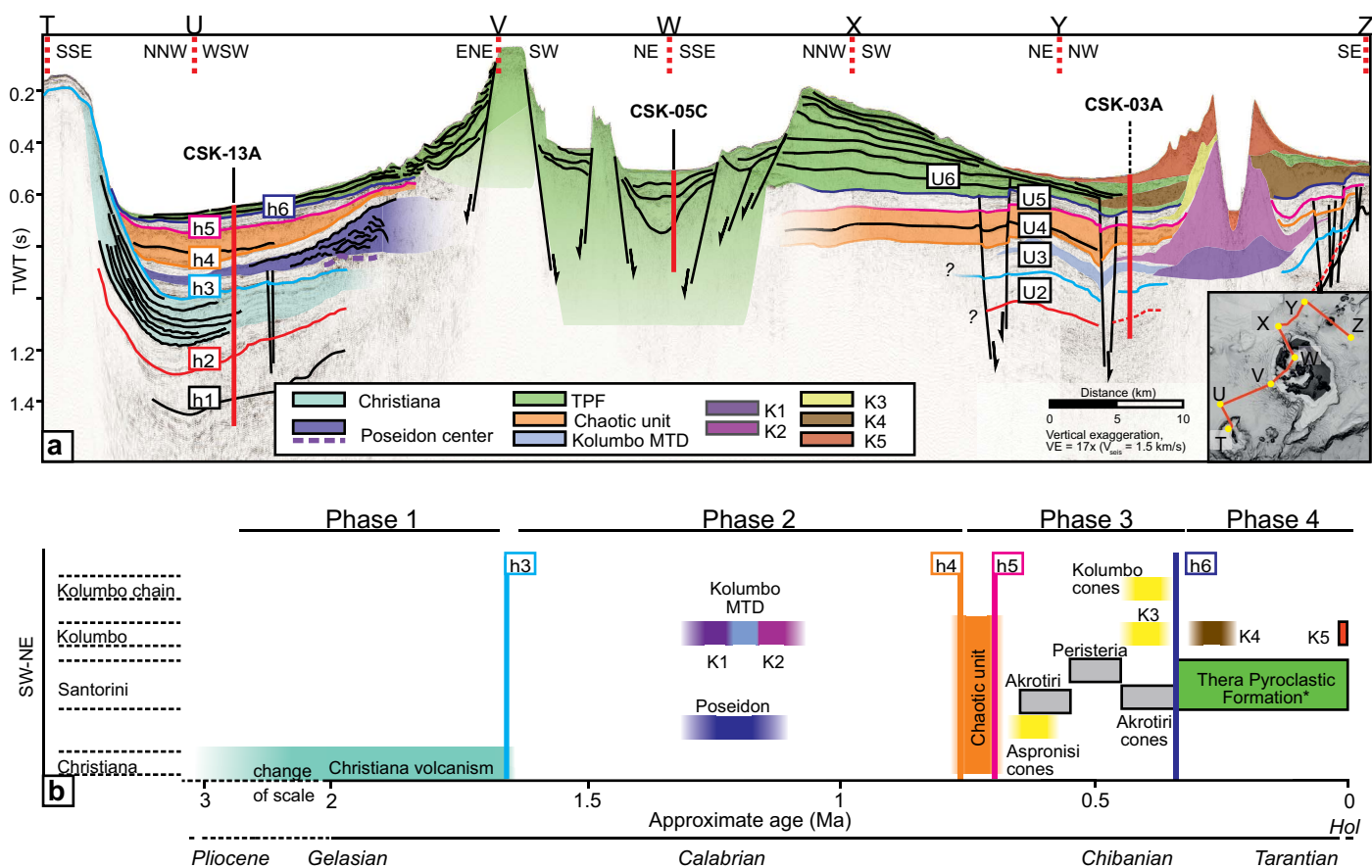
Eruption products are expected to be preserved in the rift basins as tephra fallout and as turbidites channelled down the basin axes. This will enable correlation of primary volcanoclastic beds between cores, as well as linking of core material to the source volcano, using major and trace element compositions of glasses, crystal-hosted glass inclusions, and phenocrysts, reinforced by physical properties measured aboard the *JOIDES Resolution*. Correlation of volcanoclastics to source volcanoes will exploit established chemical and mineralogical differences between the different volcanic centres, extending chemical correlation databases already developed for the <200,000 a tephra layers (Fig. 2C). Key volcanic layers will be dated by methods such as  $^{40}\text{Ar}/^{39}\text{Ar}$  and zircon (U-Th)/He to pin the stratigraphy revealed by the drill cores with absolute chronologies.

Deep drilling will also enable reconstruction of the histories of subsidence of the rift basins through use of sediment-focused chronostratigraphic techniques (biostratigraphy, oxygen isotope and sapropel records, magnetostratigraphy) into which the volcanic record and absolute dates will be integrated, enabling construction of a Bayesian age model for each basin.

Seismic profiles in the Pliocene-Quaternary rift basin fills reveal six main seismic stratigraphic units separated by onlap surfaces, recording initial symmetric rifting followed by NW-tilted, more

asymmetric rifting (Fig. 3). The expedition will reconstruct the tectonic history of each basin using the network of seismic reflection profiles that will be matched to the stratigraphic history of the cores. Drilling and subsequent downhole logging will enable groundtruthing of marine seismic profiles, characterisation and dating of seismic packages, and measurements of the physical properties of submarine strata. Integration of volcanic history, basin subsidence history and tectonic history will allow us to seek relationships between volcanism and major tectonic events, thereby testing recently published interpretations (Fig. 4; Preine et al., 2022). When did volcanism start relative to rifting? Do the tectonic events recorded by major onlap surfaces in the rift basins correlate with activation of the different volcanic centres, changes in eruptive style (e.g. the onset of explosive activity at Santorini 360,000 a), changes in magma composition, or particularly large eruptions?

Sampling of the different volcanic products of Christiana, Santorini and Kolumbo back to 3–4 Ma will also enable reconstruction of a time series of magma petrology and geochemistry. These data will enable petrologists to constrain how mantle source characteristics and heterogeneity, degree of magma contamination by the crust, and the role of lower crustal amphibole have varied in space and time across the volcanic field as the crust has extended and thinned.



**Figure 4.** (A) Composite seismic profile across the Christiania-Santorini-Kolumbo volcanic field, from Christiania to Kolumbo, showing three of the primary drill sites. The bases of seismic units U1 to U6 are defined by reflectors h1 to h6, respectively. The products of Kolumbo Volcano are subdivided into five seismically defined units, K1 to K5. TPF – Thera Pyroclastic Formation of Santorini (<360 ka). MTD – Mass Transport Deposit. (B) Interpretation of the chronostratigraphic context of the different seismic units, to be tested by deep-drilling during Expedition 398. Modified from Preine et al. (2022).

## Products, processes and impacts of an iconic caldera-forming eruption.

The Late-Bronze-Age (LBA; also called 'Minoan') ~1630 BCE eruption of Santorini is an iconic event in both volcanology and archaeology. It poured many cubic kilometres of pyroclastic flows into the sea, caused collapse of a caldera, buried a thriving Bronze-Age town, and may have played a role in the decline of the contemporary Minoan civilisation on Crete. Seismic studies have imaged the LBA products both outside and inside of the caldera, although their identification on seismic profiles is uncertain due to the many other eruptions and tuffs with which they can be confused. By penetrating the products outside of the caldera, the expedition will be able to groundtruth the seismic images, refine volume estimates, and study how pyroclastic flows transform into submarine debris flows, then turbidity currents, as they enter the sea. Inside Santorini caldera, it will drill to 250–350 m below the seafloor at two sites (one each in the northern and southern caldera basins) and obtain sections into the thick accumulation of intracaldera tuffs that may tell us whether the caldera collapsed during and/or after the eruption.

## Hazards from explosive submarine eruptions in a region visited by two millions tourists a year.

Shallow-marine explosive eruptions of water-rich silicic magmas have occurred repeatedly in the neighbourhood of Santorini. One of these centres is the Kameni volcano inside of Santorini caldera, and the other is the Kolumbo seamount. Kameni has mostly erupted lava over the last two thousand years, most recently in 1950, but a thick package of submarine deposits visible on seismic images suggests a history extending back to shortly after the LBA eruption. Kolumbo Volcano erupted explosively in 1650, killing 70 people on Santorini through gas release and tsunami inundation, but seismic profiles indicate a long prior history of explosive eruptions about which we know very little. Three quarters of global volcanism occurs under the sea, but the dynamics of submarine eruptions is poorly understood, particularly those of water-rich silicic magmas at island arcs. By drilling through the explosive products of these two volcanoes, Expedition 398 will be able to reconstruct the frequencies, magnitudes and processes of shallow-marine explosive eruptions and learn how to account for them in hazards assessments.

## The subsiding Aegean basin and deep microbial life.

Drilling in the rift basins will pierce the entire basin stratigraphy and reach the basement unconformity (Fig. 3; pre-subsidence land surface). This will allow reconstruction of the environmental histories of the basins from continental to deep-marine stages through time series of paleoenvironmental data from the cores using assemblages of calcareous nannofossils, benthic foraminifera, dinoflagellates, and pollen, refined by stable oxygen/carbon isotopes and organic biomarkers.

A final objective concerns the presence of deep microbial life. The present-day caldera floor of Santorini harbours highly diverse, metabolically complex microbial communities in the form of bacterial mounds. Drilling into the caldera fill will be carried out under clean conditions, enabling the expedition scientists to seek and characterise any living or fossilised seafloor communities

present and, by applying the latest developments in analytical (geo)microbiology technologies, to document the sizes, genetic variabilities, and metabolic functions of subsurface ecosystems to 250–350 m seafloor depth.

## Acknowledgments.

We wish particularly to thank C. Hübscher, P. Nomikou, D. Papanikolaou and J. Preine, who contributed very significantly to the proposal for IODP Expedition 398. J. Preine kindly prepared Figs. 3 and 4.

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Corals within a core obtained during IODP Expedition 325 onboard *Greatship Maya*. Credits: G. Tulloch, ECORD/IODP.





Angelo Camerlenghi



Hanno Kinkel

## Relocation of ESSAC office to Trieste, Italy

The ESSAC Office has left Plymouth (UK) to move to Trieste (Italy) in January 2022.

Former Chair Tony Morris has handed the position to **Angelo Camerlenghi**.

**Hanno Kinkel** remains as ESSAC Science Coordinator.

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Trieste, Italy. Credits: Photo 7915319 by Jackallxxx | Dreamstime.com

## ECORD Educational activities

### ECORD Training activities

Training activities are resuming ‘in person’ after two years of online mode due to the pandemic.

The **ECORD Summer School in Bremen**, this year addressing Sea Level, Climate Variability and Coral Reefs, and the **Urbino Summer School in Paleoclimatology** are open for applications. Grants are available to support the travel costs. The **ECORD Summer School in Leicester on Downhole Logging for IODP Science** has closed the terms for applications and will be held online from 4 to 8 July.

The ECORD Training Course “Virtual Ship Experience” had to be cancelled in 2022 because the early dates of the course in spring did not allow planning. We hope that it will be offered in 2023.

### ECORD Grants and Scholarships

ECORD has provided grants to eight participants in the Glacial Sedimentation School (GLASS): Interpreting past climate using Antarctic and Greenland sediment cores Corvallis, Oregon, USA, 23–27 May 2022.

More grants and scholarships are available to PhD Students and Early Career Researchers.

Angelo Camerlenghi - *incoming ESSAC Chair*  
[acamerlenghi@inogs.it](mailto:acamerlenghi@inogs.it)

Hanno Kinkel - *ESSAC Science Coordinator*  
[ESSAC@ogs.it](mailto:ESSAC@ogs.it)

Download flyer ECORD Summer Schools 2022 at <https://www.ecord.org/?download=16058>



Onboard *Chikyu* during 'OSP Phase 1' for IODP Expedition 386.  
Credits: ECORD/IODP/JAMSTEC.





Angelo Camerlenghi



Hanno Kinkel

## Scientific objectives, implementation, and staffing

### JOIDES Resolution Expeditions



#### IODP Expeditions 391-392

The JR accomplished Expedition 391 - Walvis Ridge Hotspot across 2021/2022, featuring ECORD co-chief scientist Kaj Hoernle, and Expedition 392 – Agulhas Plateau Cretaceous Climate in winter-spring 2022, featuring two ECORD Co-chief scientists, Gabriele Uenzelmann-Neben and Steven Bohaty.



#### IODP Expeditions 390-393

After a long and complex staffing phase, the twin JR Expeditions 390-393 (South Atlantic Transects) started operations totalling 18 ECORD scientists, including Roz Coggon and Damon Teagle as Co-chief scientists.

#### IODP Expeditions 397 and 397

The JR will then move towards the north Atlantic and will enter the Mediterranean Sea after more than 20 years. Expedition 397 - Iberian Margin Paleoclimate has been staffed with two ECORD Co-chief scientists David Hodell and Fatima Abrantes, and Expedition 398 – Hellenic Arc Volcanic Field is closing the staffing process in these days, also featuring two ECORD Co-chief scientists Timothy Druitt and Steffen Kutterolf.

Be ready to see the *JOIDES Resolution* drilling only 1km off the coasts of Santorini. *The JOIDES Resolution* will touch port in Lisbon and Tarragona.

Congratulations to all who sailed and have been selected to sail in these expeditions!

After the Aegean Sea the *JOIDES Resolution* will head towards the Northern Atlantic (Exp. 399 Building Blocks of Life, Atlantic Massif) followed by the NW Greenland Glaciated Margin (Expedition 400) to end the planned activities in 2023.

The last expeditions before the end of the current phase of the Program will be decided by the JR Facility Board in May 2022.

### MSP Expeditions



#### IODP MSP Expedition 377: ArcOP

The long-planned MSP Expedition 377 Arctic Ocean Palaeoceanography has been postponed. We know that this has caused disappointment to many of us, but it was the right choice to ensure that the expedition will happen safely, although in the future.

#### IODP MSP Expedition 389

The next MSP expedition will be Exp. 398 Hawaiian Drowned Reefs in 2023.



## Post-2024 activity

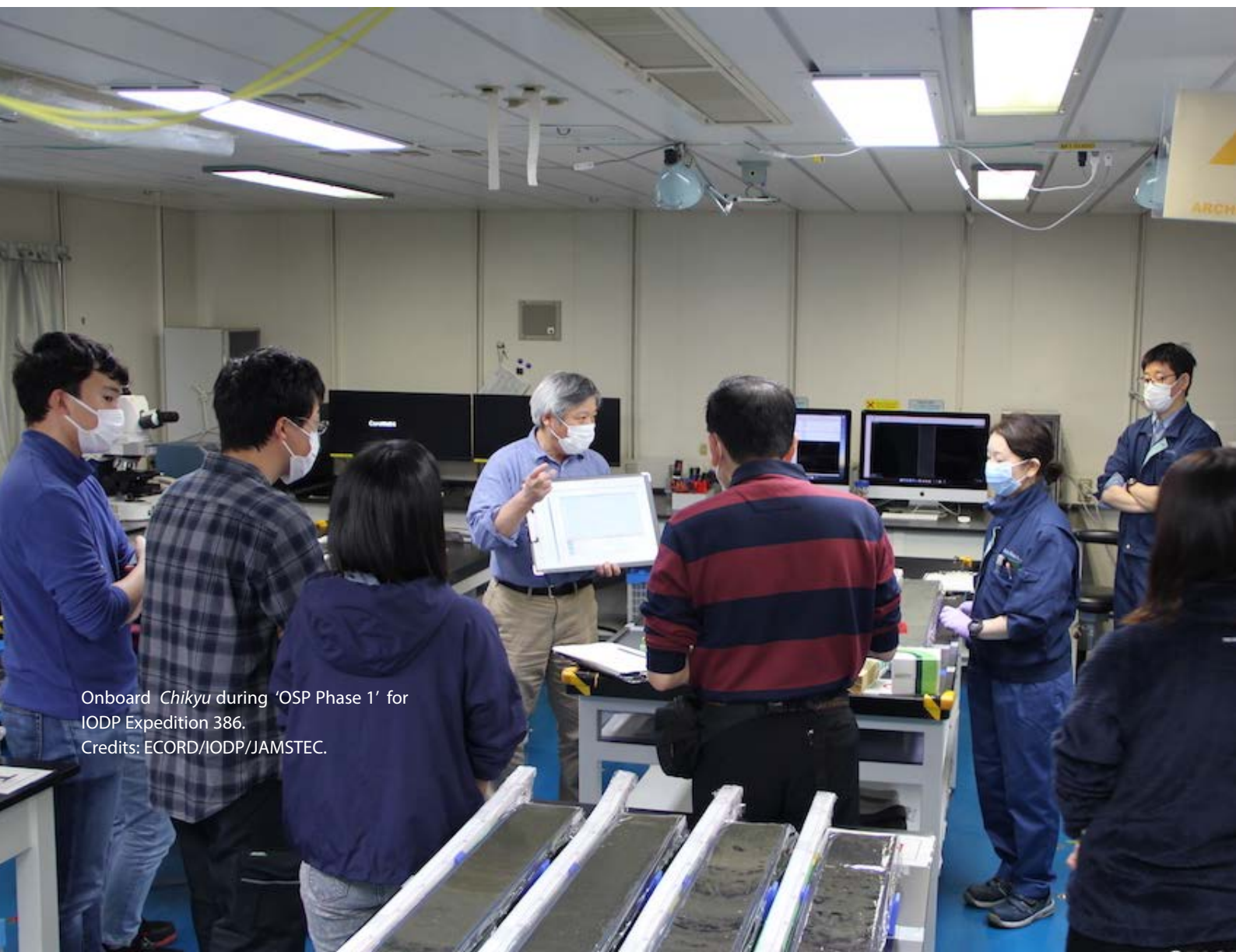
The future is in our hands. Nothing can be said about expeditions schedule after 2024. We encourage the ECORD scientific community to engage in proposal writing, teaming with Japanese and international colleagues using the opportunities for funding workshops and grants offered by the MagellanPlus Program, considering Land-to-Sea drilling as a possibility to better address scientific objectives across the coastline. Mission Specific Platform drilling will become increasingly important in future scientific drilling, including riserless drilling in deep waters.

Angelo Camerlenghi - *ESSAC Chair*  
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Hanno Kinkel - *ESSAC Science Coordinator*  
[ESSAC@ogs.it](mailto:ESSAC@ogs.it)



<https://www.ecord.org/about-ecord/management-structure/essac/>



Onboard *Chikyu* during 'OSP Phase 1' for IODP Expedition 386.  
Credits: ECORD/IODP/JAMSTEC.



## EOTF News and Activities



Malgo Bednarz



Ulrike Prange



David McInroy



Hanno Kinkel



Nadine Hallmann



Jez Everest

Throughout the difficult pandemic time (starting early 2020) the majority of meetings and conferences as well as exhibitions, where the EOTF usually promotes ECORD mission and activities, have been either cancelled, rescheduled or have taken place virtually. Restrictions that were put in place in multiple countries caused uncertainty resulting in limited number of participants, and therefore, presented a minor opportunity for ECORD outreach activities. The EOTF, similarly to the outreach teams of JAMSTEC/MarE3 and IODP China, decided not to participate physically in the AGU 2021 (13-17 December), but to focus on virtual means to promote ECORD during this conference. (see page 39).

In early 2022 the EOTF started preparing for EGU 2022 (3-8 April). A joint ECORD-ICDP virtual booth has been organized. Considering the low number of attendees at the EGU 2022, ECORD and ICDP decided to have a small booth (see page 39).

EOTF members are using the pandemic time to develop new ideas and materials for the future, as well as to explore new ways of promoting ECORD.

2021 has been a year of intense outreach work focused on Expedition 386 and especially on Expedition 377 (see page 37).

## Projects

### Permanent/long-term exhibitions

The EOTF has been working towards ECORD presence at permanent exhibitions in museums 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 Puffersphere for dedicated exhibitions.

#### Exhibition in the Natural History Museum Vienna

The EOTF is working with the Natural History Museum (NHM) Vienna to promote scientific drilling on the occasion of the newly planned, long-term (>10 years) exhibition at the NHM Vienna. The NHM Vienna exhibition will concentrate on geology with the focus on climate and major changes in the atmosphere and biosphere. The EOTF organized fabrication of core replicas and other models for the exhibition, which are now delivered to the NHM Vienna. The planning that started in 2020 was postponed due to COVID-19 pandemic, and the opening of the exhibition, originally planned for 2021 is now postponed to 2022 and scheduled for 22 November 2022.



The EOTF invited the ICDP outreach team for this initiative and joint planning for participation in the permanent exhibition at the NHM Vienna is still in place. This joint ECORD-ICDP project will deliver a section in the exhibition where scientific drilling will be promoted and explained. ECORD and ICDP donated various materials to the NHM Vienna. Video footages and other digital resources are also being provided to the NHM Vienna.

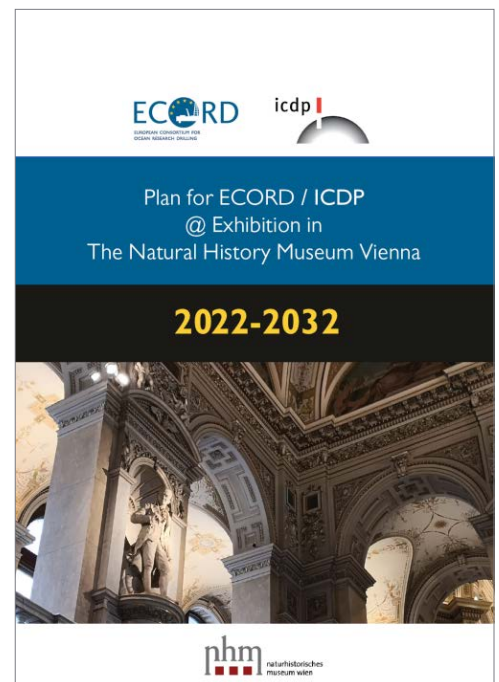
Physical materials provided to NHM Vienna for the exhibition:

#### Core replicas:

1. PETM; Hole 1262C - Core 5H, Section 4 - (80 cm),
2. Tahiti sea level: Core 310-M0024A-010R-001(100 cm),
3. Chicxulub Impact Crater: Core 364-M0077A-081R-002 (80 cm),
4. Chicxulub Impact Crater: Core 364-M0077A-040R-01 (130 cm),
5. Great Oxidation Event (Pechenga Greenstone Belt) – (100 cm),

#### Coral models associated with Tahiti Sea level core replica:

1. *Porites lobata*;
2. *Pocillopora eydouxi*.



### ECORD and ICDP at the opening ceremony for the Exhibition at NHM Vienna

It is planned that selected representatives of ECORD and ICDP will give talks during the exhibition opening ceremony at the NHM Vienna.

Anticipated opening date:  
22 November 2022

## ECORD Puffersphere



The ECORD Puffersphere presents ECORD and its MSP concept on an interactive spherical display, which is to be loaned to museums and aquariums across Europe and showcased at meetings and conferences. The ECORD Puffersphere is targeted at the general public. The scientific content focuses on an introduction to the four IODP science themes,

IODP/ ECORD drilling vessels, selected IODP/ ECORD expeditions covering all IODP themes and the three IODP core repositories. It also illustrates and/or animates selected scientific data of ocean acidity, sea-level rise, draining the oceans and tectonic plates.

Puffersphere is going to be displayed this summer at the Interactive Science Museum “Immaginario Scientifico” in Trieste, Italy (<https://www.immaginarioscience.it/eng-page>).

More info about the Puffersphere display: <https://pufferfishdisplays.com/displays/>

Joint ECORD-ICDP booth at EGU 2022 in Vienna, Austria.  
Credits: H. Kinkel, ECORD/IODP.



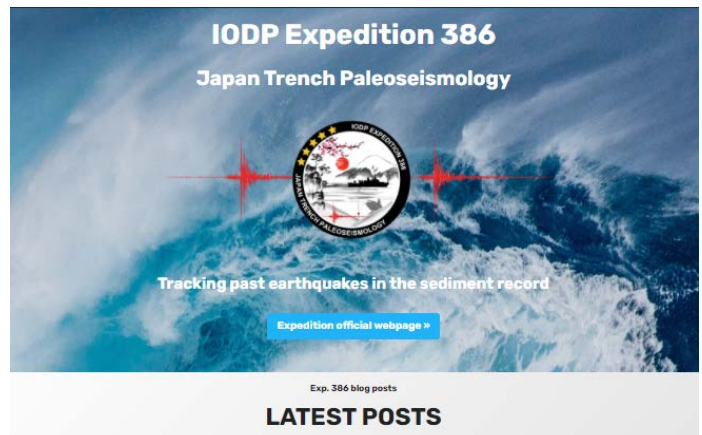
## Outreach activities related to MSP Expeditions

### Outreach for Expedition 386: Japan Trench Paleoseismology

With the completed offshore phase of Expedition 386, the EOTF together with the outreach team of JAMSTEC/MarE3 planned for the outreach actions focused on the Onshore Science Party that took place from 14 February to 15 March 2022 on board *Chikyu* docked in Shimizu.



As agreed on the second day of the EOTF fall meeting #20 (24 November), JAMSTEC/MarE3 controlled outreach actions during the onshore phase of the expedition. Owing to the COVID-19 restrictions, no media were allowed onboard, therefore, the EOTF and JAMSTEC/MarE3 focused only on digital/virtual/streamlined outreach actions, mainly focused on social media, high-quality video materials and photography as well as blog posting.



Expedition 386 blog: <https://expedition386.wordpress.com/>  
Expedition 386 webpage: <https://www.ecord.org/expedition386/>

Participants of a hybrid IODP-ICDP Townhall meeting at the Joint ECORD-ICDP booth at EGU 2022 in Vienna, Austria.  
Credits: H. Kinkel, ECORD/IODP.



## Outreach for Expedition 377: Arctic Ocean Paleoceanography (ArcOP)

Planning for outreach actions related to ArcOP continued in collaboration with the Swedish Polar Research Secretariat (SPRS) and AMS (Arctic Marine Solutions). The EOTF and Co-chief Scientists discussed future plans and delineated outreach objectives and actions to be undertaken for this challenging expedition.



The EOTF finalized two ArcOP dedicated documents focusing on: 1) a general explanation of the ArcOP objectives and operations; and 2) “Introduction to outreach plans and actions” for dissemination to Science Party members and onboard staff.

### Documentary about Expedition 377 and ECORD

The Galaxie Group (a company selected for the production of the ArcOP TV Documentary) has started working on the documentary with assistance from the EOTF and Co-chief Scientists as well as in cooperation with SPRS and AMS. The company delivered the initial synopsis delineating the general plan for both, the science, and the “story” part of the documentary. After amends and comments on the synopsis by the EOTF and Co-Chief Scientists, the finalized synopsis was ready to be shared with possible broadcasters by Galaxie Group.

### ArcOP Onboard Outreach Officer

The EOTF selected a Science Communication Specialist as ArcOP Onboard Outreach Officer to be responsible for ECORD outreach actions and activities during the offshore and onshore stages of the expedition. The EOTF has been working with the future ArcOP Onboard Outreach Officer in order to prepare for a successful outreach campaign starting before the offshore phase.

Expedition 377 blog: <https://expedition377arcop.wordpress.com/>  
Expedition 377 webpage: <https://www.ecord.org/expedition377/>



Joint ECORD-ICDP booth at EGU 2022 in Vienna, Austria.  
Credits: H. Kinkel, ECORD/IODP.

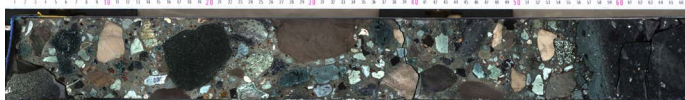
Icebreaker Order that will be used during IODP Expedition 377 ArcOP in 2022. Credit: Lars Larsson, SPRS

## Resources

### Core replicas

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

The EOTF ordered fabrication of eight new core replicas from among which, four will be donated to the NHM Vienna (*see page 28*).



More info: <https://www.ecord.org/resources/core-replicas>

### Models of corals

Four realistic (1:1 scale) models of two species of corals were fabricated. These models will accompany the new core replica from Expedition 310: Tahiti Sea Level (<https://www.ecord.org/resources/core-replicas/core-replica-tahiti-sea-level-iodp-expedition-310/>). Two of the models were donated to the NHM Vienna for the permanent exhibition (*see page 28*).



Realistic models of specimens of corals identified in cores from Exp. 310. Left: *Porites lobata*; right: *Pocillopora eydouxi*. Produced by Kamyk.pl.

### ECORD publications, brochures and flyers

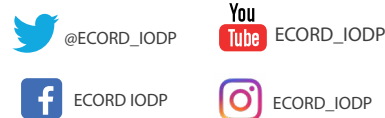
The digital version of the ECORD Annual Report 2021 was published in April 2022 and is available for download on the ECORD website (<https://www.ecord.org/?download=16014>).



ECORD Annual Reports: <https://www.ecord.org/resources/reports/activities/>  
ECORD Newsletters: <https://www.ecord.org/resources/ecord-newsletter/>  
ECORD brochures and flyers: <https://www.ecord.org/resources/brochures/>

## ECORD online

The EOTF keeps working on the active presence of ECORD in the Internet through social media (Facebook, Twitter, Instagram and Youtube – see back page) and through ECORD website improvements and additional applications.



## How to loan a core replica?

To order a loan, contact Malgo Bednarz ([bednarz@cerege.fr](mailto:bednarz@cerege.fr)) with inquiry about the availability of any particular core replica.

ECORD shares the core replicas on a temporary basis with scientists and teachers under the conditions described in the loan document, with special attention to core replica preservation and treatment (core replica may not be visually or physically altered in any way). Core replicas are loaned free of charge with the ordering university/research institution covering the shipment of core replicas back to EMA.



## ECORD at conferences, events and meetings

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### AGU 2021 (13-17 December, New Orleans, USA)

Following the continuing restrictions related to COVID-19, the EOTF together with JAMSTEC and IODP China decided not to physically participate in the AGU Fall Meeting 2021. The EOTF cooperated with USSSP who help with the promotion of ECORD while at the AGU 2021 booth in New Orleans. The EOTF and ICDP sent promotional materials to USSSP representatives, and arranged a set of daily Zoom sessions during the AGU.



- Dedicated subpage on ECORD website  
[www.ecord.org/ecord-icdp-at-agn-2021](http://www.ecord.org/ecord-icdp-at-agn-2021)

### Ocean Sciences Meeting 2022 (27 February - 4 March 2022, Honolulu, virtual)

In late September 2021, the EOTF submitted an abstract to the OSM 2022. An oral presentation was planned during IODP Session (DS05): Time travel, legacy and Frontiers: Scientific Ocean Drilling connects the past, present and future workings of our planet. The talk focused on the MSP concept, ArcOP as one of the most challenging expeditions, and challenges in outreach.



### EGU 2022 (3-8 April 2022, Vienna, Austria)

After two years without physical EGU meetings due to the COVID-19 crisis, the EOTF and ICDP organized a joint booth at the EGU 2022, as well as a joint hybrid Town Hall meeting.

Initially planned for 3-8 April, the EGU 2022 was postponed due to the COVID-19 crisis and took place on 23-27 May (read more on [page 35](#)). A PETM core replica was displayed at the booth.



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ECORD Science Operator



## Calendar of meetings, workshops and conferences in 2022

<b>2022</b>		
<p>11-13 January <b>SEP</b> La Jolla, CA, USA</p>	<p>24-26 May <b>JR Facility Board</b> Washington, DC, USA</p>	<p>14-15 September <b>IODP Forum</b> Palisades, NY, USA</p>
<p>22-24 February <b>EPSP</b> College Station, TX, USA</p>	<p>23-24 June <b>ECORD Council Spring Meeting #8</b> Virtual</p>	<p>16 September <b>PMO Meeting</b> Palisades, NY, USA</p>
<p>22 February <b>ECORD Outreach TF Meeting #21</b> Virtual and Vienna, Austria</p>	<p>29-30 June <b>SEP</b> Southampton, UK</p>	<p>20-21 September <b>ECORD Facility Board Meeting #11</b> Aix-en-Provence, France</p>
<p>1-2 April <b>MagellanPlus Workshop: Oceanic Life Cycle of Tectonic Plates</b> Vienna, Austria</p>	<p>7-9 July <b>MagellanPlus Workshop: Natural Hazards</b> Lisbon, Portugal</p>	<p>27-30 September <b>MagellanPlus Workshop: COSNICA</b> Graz, Austria</p>
<p>2-3 April <b>IODP Forum</b> Vienna, Austria</p>	<p>8-10 July <b>MagellanPlus Workshop: Belize Barrier Reef</b> Frankfurt/Main, Germany</p>	<p>14 November <b>ESSAC Fall Meeting #18</b> Gargonza, Italy</p>
<p>25-26 April <b>ESSAC Spring Meeting #17</b> Stockholm, Sweden</p>	<p>30-31 August <b>Chikyu IODP Board</b> Kobe, Japan</p>	<p>18 November <b>ECORD Outreach TF Meeting #22</b> Gargonza, Italy</p>
<p>19-22 May <b>MagellanPlus Workshop: TIMOR</b> Vienna, Austria</p>	<p>September <b>MagellanPlus Workshop: IO:DIP</b> Graz, Austria</p>	<p>15-16 November <b>ECORD Council-ESSAC Meeting #11</b> Gargonza, Italy</p>
<p>23-27 May <b>EGU 2022</b> Vienna, Austria</p>	<p>September <b>MagellanPlus Workshop: SCYLLA</b> Bologna, Italy</p>	<p>12-16 December <b>AGU 2022</b> Chicago, IL, USA</p>



Check for updates: <https://www.ecord.org/calendar/>



Operations onboard R/V *Kaimei* during IODP Expedition 386. Credits: N. Okutsu, ECORD/IODP/JAMSTEC

ICDP Activities Spring 2022

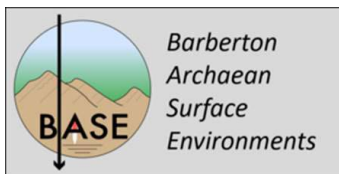
Although the Corona pandemic is still around and certainly will be around for longer, many ICDP-funded projects either have already kicked off or will do so soon. In recent months, two ICDP projects have drilled boreholes in Switzerland/Germany respectively Italy.

News from ICDP projects

With several running and upcoming drilling projects, ICDP is currently very active. ICDP Drilling Overdeepened Alpine Valleys (DOVE) has reached an important milestone with successful drilling and great core recovery in Switzerland (Basadingen) and Germany (Tannwald). After an interruption of several months during winter, the ICDP project STAR will resume drilling activities in June to drill and instrument the remaining three of six scheduled holes. STAR (A Strainmeter Array Along the Alto Tiberina Fault System, Central Italy) drills 80 to 160 meter deep boreholes in Gubbio (Central Italy) to address the low-angle fault paradoxon by long-term monitoring with strainmeters,

seismometers and fiberoptics. Another ICDP drilling project in Italy named DIVE (Drilling the Ivrea-Verbano zonE) is in final preparations, we expected drilling of the first of the two 1,000 m deep boreholes to start in summer. The Ivrea-Verbano zone provides a truly unique natural laboratory to fundamentally advance our understanding of the continental lower crust and the crust–mantle transition zone (the “Moho”) by a combination of geoscientific approaches and scientific drilling, a zone that, as we all know, has to date, been beyond our reach. Furthermore, drilling is in planning in Denmark (PVOLC) and the Bushfeld complex in South Africa.

**BASE: Barberton Archean Surface Environments project**



One ICDP project currently underway, **BASE (Barberton Archean Surface Environments project)**, is not only very successful in drilling and sampling, but is

also very active in outreach and is well received by the scientific community. BASE targets precambrian sedimentary strata, the so-called Moodies Group, in the Barberton Greenstone Belt in South Africa. With an age of about 3.22 Ga, the Moodies Group sediments are among the oldest well-preserved shallow water

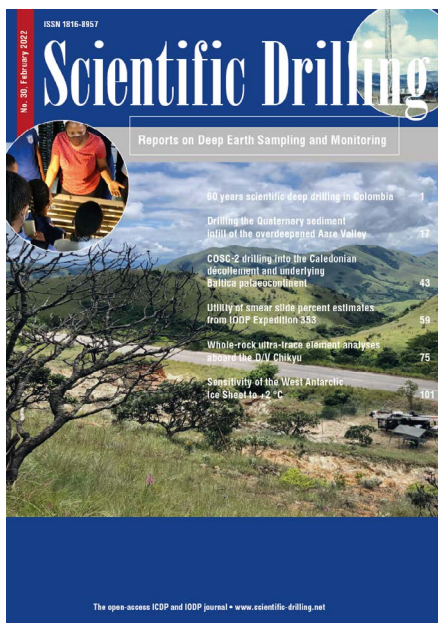
layers in the world. Eight drill holes, five of which have been already completed, produce - resp. will produce - up to 500 m core from each hole.

The extensive outreach program includes a visitor center with information programs for locals and students and vlogging and interviews with local TV and radio stations. An article published in SCIENCE reports on *Earth’s oldest living landscape spotted in South African rock cores* derived from BASE drilling in Barberton. (see more at <https://www.science.org/content/article/earth-s-oldest-living-landscape-spotted-south-african-rock-cores>)



Impression from one BASE drill site (top and bottom left) and activities at the BASE Outreach Center (top and bottom right). Credits: Ch. Heubeck





## SCIENTIFIC DRILLING | Volume 30 | February 2022

Volume 30 of the ICDP-IODP program journal SCIENTIFIC DRILLING, published in February, comprises three Science Reports, two reports on Technical Developments, and one Workshop Report. The overall focus of this volume is on key aspects of geological rock cycling processes that have been addressed by drilling projects or are on the agenda for the near future, including one study on orogenic exhumation, deformation, and emplacement of deep crustal metamorphic rocks in the Scandinavian Caledonides (Lorenz et al., 2022), how mountains are affected by the most powerful abrasional mechanism – glacial erosion – and the related sediment deposition (Schwenk et al., 2022), and paleontological evidence from the tropics collected over decades of deep drilling in Colombia (Hooghiemstra et al., 2022). A workshop report (Patterson et al., 2022) lays out the ambitious plan to recover Antarctic glacio-marine strata through sea-ice to shed light on the stability of ice sheets at large. Two methodological studies, one on semiquantitative sediment characterization by smear slides during IODP Expedition 353 (Phillips and Littler, 2022) and the other on laser ablation-inductively coupled plasma mass spectrometry aboard D/V *Chikyū* (Rospabé et al., 2022) complete this issue of Scientific Drilling.

SCIENTIFIC DRILLING is an Open Access journal with no publication costs for authors. We kindly invite the scientific drilling community to consider publication in SCIENTIFIC DRILLING.

## IODP-ICDP conference activities

The **EGU 2022** General Assembly was held in Vienna from 23 to 27 May 2022. Participation has been on-site and virtually.

ICDP and IODP representatives have been on-site to meeting you at the ICDP-IODP booth and during the session.

The **IODP-ICDP Session** “Achievements and perspectives in scientific ocean and continental drilling” (SSP1.2) was held on Tue, 24 May, 08:30–11:44 (CEST) in Room -2.32/33 and online.

The **ICDP-IODP/ECORD Town Hall Meeting** has been organized on Tue, 24 May, 18:00 CEST as pure online event (zoom) and focus on news from both programs with plenty of time for discussion. Meeting-ID: 838 5213 9544, code: drilling.



Vienna, Austria & Online | 23–27 May 2022

My profile My network

IODP-ICDP Session "Achievements and perspectives in scientific ocean and continental drilling" (SSP1.2)  
TUE, 24 MAY, 08:30–11:44 (CEST) ON-SITE/VIRTUAL

ICDP-IODP/ECORD Town Hall Meeting TUE, 24 MAY, 18:00 (CEST) ZOOM

Thomas Wiersberg & Ursula Heidbach - [icdp-outreach@gfz-potsdam.de](mailto:icdp-outreach@gfz-potsdam.de)  
Helmholtz Centre Potsdam, GFZ

More information about ICDP: <https://www.icdp-online.org>



## Denmark

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Planning for expedition 400 (CENICE) to study the Cenozoic paleoclimate history of Baffin Bay and northwest Greenland is ongoing. The expedition has been scheduled for 2023 with Prof. Paul Knutz from the Geological Survey of Denmark and Greenland (GEUS) as one of the co-chiefs. Preparations include several physical meetings at College Station, Texas with participation of Co-chief.



Christian Tegner (Aarhus University, sailing scientist) and Senior Researcher Kasia K. Śliwińska (GEUS, shore-based scientist) are involved in the IODP Expedition 396: “Mid-Norwegian Continental Margin Magmatism”. They both will participate in the sampling party which will take place in Bremen 21-28 April 2022.

A MagellanPlus workshop “Northeast Greenland: Unlocking records from sea to land”, funded through the MagellanPlus workshop programme, will be held in fall or winter 2022. Organisers are Lara F. Pérez (PI), GEUS; Paul C. Knutz, GEUS; John Hopper, GEUS; Marit-Solveig Seidenkrantz, AU; Matt O’Regan, Stockholm U.

One Danish PhD student, Joanna M. Davies from Aarhus University has been invited to partake in the IODP school “GLacial Sedimentation School (GLASS): Interpreting past climate using Antarctic and Greenland sediment cores”, held 23-27 May in Oregon, USA.

In 2021 Tirza Weitkamp (Vrije Universiteit Amsterdam; currently PhD at Stockholm University) completed her master thesis

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ESSAC Delegate

Paul Knutz - [pkn@geus.dk](mailto:pkn@geus.dk)  
ESSAC Alternate

at GEUS (under the Erasmus+ program) under supervision of Kasia K. Śliwińska. The thesis focused on the dinocyst stratigraphy and the paleoenvironment across the Eocene - middle Oligocene succession in the Site DSDP 112 (Labrador Sea). A manuscript is under preparation.

Samples from past IODP expeditions continue to be central for several Danish research projects. Recent examples include investigation of dinocysts from several DSDP, ODP and IODP sites (published 2020; <https://jm.copernicus.org/articles/39/139/2020/>) and reconstruction of a sea surface temperature record from the ODP Site 647 (Labrador Sea) across the Eocene-Oligocene transition (under revision for the Climate of the Past <https://cp.copernicus.org/preprints/cp-2021-184/>) by Kasia K. Śliwińska (GEUS). Other examples are investigations by Senior Researcher Lara F. Pérez (GEUS) of the advance and retreat of West and East Antarctic Ice Sheets during Miocene based on sites from IODP Expedition 374 in the Ross Sea (ANtarctic DRILLING Project) and of the Late Miocene to present-day variability of the oceanographic flows through the Drake Passage (Antarctica) based on samples from IODP Expedition 382. Finally, samples from Exp. 303 (Labrador Sea) form the basis of the EU MSCA project IceLab by Henrieka Detlef, Aarhus University; this project aims to determine the role of sea ice in past events of ice sheet collapse, in particular Heinrich events in the North Atlantic-Labrador Sea region.



## Germany

germany@ecord.org

In 2021, the activities of IODP Germany were still influenced by the ongoing pandemic. The annual IODP-ICDP colloquium, usually taking place in March each year was postponed one more time, and has been replaced by a one-day online meeting in March 2021. The next colloquium is scheduled for 1 to 3 November 2022 in Potsdam. The German IODP and ICDP communities are looking forward to sharing new results face-to-face for the first time since 2019.

However, IODP Germany is pleased that the last three JOIDES Resolution expeditions (396, 391, 392) have been co-led by German co-chiefs. Finally, we like to announce the upcoming MagellanPlus Workshop on drilling off the Belize Barrier Reef (Belize Barrier Reef Workshop), which will be held in Frankfurt/Main from 8 to 10 July this year.

Lisa M. Egger - [iodp@bgr.de](mailto:iodp@bgr.de)  
IODP Germany coordination office

The Swiss Geoscience Meeting is the annual event for Swiss Geoscientists to meet, network and be updated on what has transpired scientifically in the preceding year. After a year of a mostly online scientific life, we were looking forward to the annual gathering of the Swiss drilling community in Geneva on 19-20 November 2021. With much disappointment, it became necessary for yet another meeting to be held virtually online. Nonetheless, a full program with 17 contributions spanning the broad spectrum of the geosciences illustrated that progress on the scientific drilling front was happening regardless of restrictions, delays, difficulties, and networking via zoom.



Swiss-Drilling.ch is scheduling its 5<sup>th</sup> Swiss Drilling Day on 9 June 2022. As a community, we look forward to gather in person to update and be updated on all things related to Swiss Scientific Drilling. Time is set aside to talk, chat, discuss and question projects, programs, and proposals.

Miriam Andres - [miriam.andres@geo.unibe.ch](mailto:miriam.andres@geo.unibe.ch)  
SwissDrilling Coordination Office

SwissDrilling: <http://www.swissdrilling.ch>

The Magellan Workshop “Mechanisms of rifting of large continental blocks – Baltic Sea case study” was held successfully in Helsinki-Espoo 1-3 December 2021. The workshop resulted in fruitful networking and screening of ideas. Mesoproterozoic sandstones under the Bothnian Sea were identified as the potential target of future IODP-proposal. Currently, the organizing team (P. Skyttä, J. Virtasalo and C. Beier) is planning a pre-proposal deep-seismic survey to the area. [More on page xx.](#)

Paleoenvironment. Participants of the Exp. 347, Outi Hyttinen and Arno Kotilainen, have continued publishing results from the expedition.

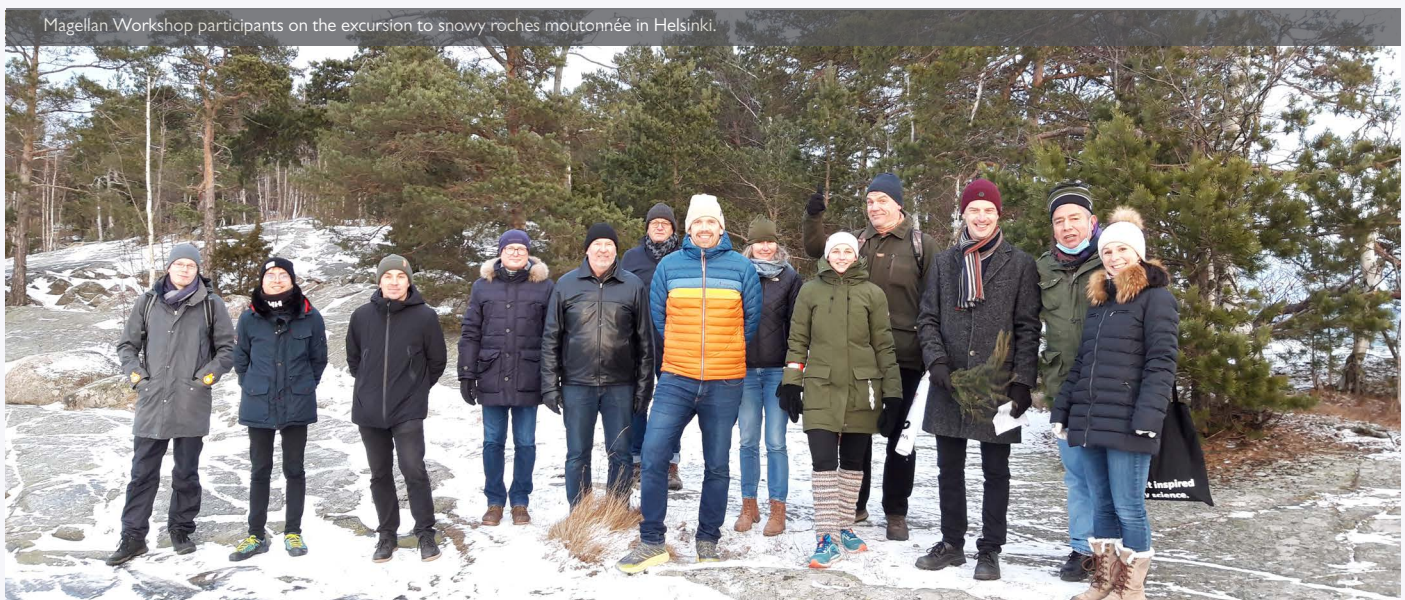
Joonas Virtasalo participated in the virtual OSP of Expedition 386: Japan Trench Paleoseismology. In March 2022, selected core samples from Japan arrived at the Geological Survey of Finland for micro-CT imaging.



Raisa Alatarvas has continued her PhD project at the University of Oulu, using materials from the Exp. 347 Baltic Sea



Joonas Virtasalo - [joonas.virtasalo@gtk.fi](mailto:joonas.virtasalo@gtk.fi)  
ESSAC Alternate



Magellan Workshop participants on the excursion to snowy roches moutonnées in Helsinki.

We assist at a new dynamic of the French involvement in the IODP Program, including the important and precious work of Co-chief Scientists in recent times. We welcome the nominations of Anne Briaïs (Geo-Océan, Plouzané) as Co-chief Scientist of IODP Expedition 395: Reykjanes Mantle Convection and Climate ([link](#)) that is postponed to 2023, and Timothy Druitt (LMV, Clermont-Ferrand) as Co-chief Scientist of IODP Expedition 398: Hellenic Arc Volcanic Field ([link](#)) that will be held at the end of 2022. Their engagement at early stages of project development will be a major asset for the success of these expeditions.

Regarding the IODP Expedition 395, although they have been forced by the pandemic that has led to the postponement of the expedition from 2020 to 2023, the scientists are about to meet at last in person in College Station. They will gather to describe the cores collected in 2021 during an expedition where none of the academic scientists were onboard. The first results from the Expedition 395C, and those of Exp. 395 now scheduled in 2023, will provide insights into the relationships between the mantle circulation deep in the Earth and the oceanic circulation in the North Atlantic. We are eager to see the first core on deck!

Furthermore, a documentary about Jules Vernes writings versus our current knowledge about deep earth dynamic is being shot. The documentary will be broadcast on a famous french TV channel in early 2023. In the making of the documentary, a film crew went to Oman last march to evoke the project of deep ocean drilling of the Moho and the earth's mantle. Benoit Ildefonse from Géosciences Montpellier went with them on the “paleo-Moho” exposed in the Oman ophiolite and that was drilled in the frame of the ICDP “Oman Drilling Project” whose cores were described onboard the *Chikyu* during the summer 2018. They visited also other outcrops of the Oman ophiolite where units of the oceanic crust are exposed, including the sheeted dyke complex and lava flows. We look forward to the release of this documentary!

More at <https://www.iodp.org/234-5-the-mohole-a-crustal-journey-and-mantle-quest-ildefonse> and [mohole.org](http://mohole.org)

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Chair of the IODP-France Office

IODP France: <http://iodp-france.org>



1. From left: Khanjar Al Sindi (fixer, Barasti productions llc), Benoit Ildefonse (Scientist, Géosciences Montpellier), Marc Soupa (sound, images drones), Véronique Préault (director), Guillaume Bression (images), Ahmed Al Bahlouli (fixer, Barasti productions llc). Credit: B. Ildefonse  
 2. From left: Marc Soupa (sound, images drones), Guillaume Bression (images) and Véronique Préault (director). (Credit: B. Ildefonse)  
 3. Guillaume Bression (images). Credit: B. Ildefonse



### Improving IODP-Italy funding scheme

IODP-Italy has covered so far travel costs for Italian successful applicants to the ECORD/IODP calls. The national advisory committee is currently re-shaping the funding scheme, as well as its tools and processes. The new funding opportunities will provide Italian scientists with additional financial support to develop their post-cruise research: specific application rules and forms will be available on the website [www.iodp-italia.cnr.it](http://www.iodp-italia.cnr.it) for shipboard and shore-based scientists on one side, and for eligible post-moratorium researchers on the other side. The number of funding recipients will be subject to the annual financial resources. The new IODP-Italy funding scheme is to be launched in Spring 2022.

### Scientific participation to the programme - Highlights

#### Shipboard scientists:

Three Italian researchers are science party members of the joint Expeditions 390 and 393 South Atlantic Transect: J. Dinarès-Turell (INGV) is currently sailing as a Paleomagnetist on IODP Exp. 390, while two early career researchers will sail onboard IODP Expedition 393, C. Amadori (Univ. of Pavia) as a Physical properties specialist/Stratigraphic correlator and C. Robustelli Test (Univ. of Turin) as a Paleomagnetist.

#### Italian representatives:

In the frame of ECORD panel members turnover within SEP, A. Sanfilippo and M.F. Loreto have been recently appointed in the Science Subgroup and Site subgroup, respectively. P. Vannucchi will serve for one more year on the IODP Science Evaluation Panel.

### IODP-Italy at the International Workshop C4 “Climate Change and Carbon Cycle” (Pisa, June 2022)

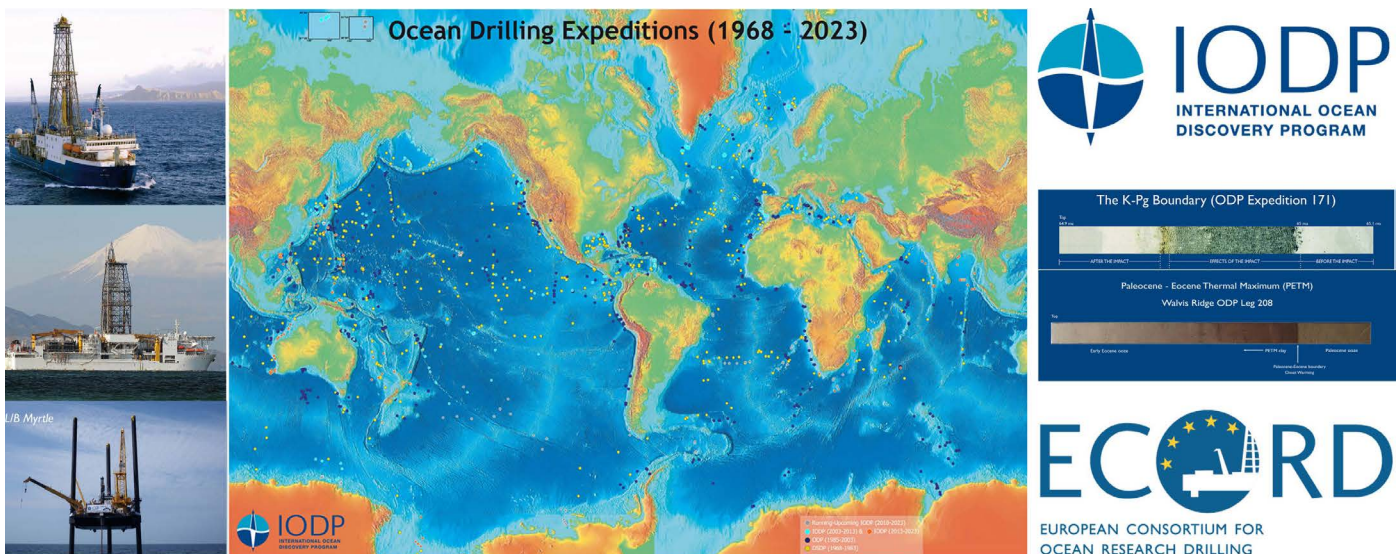
IODP-Italy will co-organize the interactive laboratory “Discovering the Deep” during the International Workshop C4 “Climate Change and Carbon Cycle” (Pisa, 22-24 June 2022) <https://dta.cnr.it/climate-change-and-carbon-cycle/>. The key target of the C4 workshop is to bring together scientists interested in Global Changes, Climate System and Carbon Cycle. As a contribution to the knowledge exchange and cross-pollination within the interdisciplinary scientific communities, IODP-Italy will provide a brief introduction to the International Ocean Discovery Program and show the unique core replicas supplied by ECORD. IODP-Italy and ECORD goodies and materials will also be distributed to the attendees.

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ECORD Council Delegate

(CNR) IODP-Italy Scientific Secretariat and the national IODP-Italia Committee

IODP-Italy: [www.iodp-italia.cnr.it](http://www.iodp-italia.cnr.it)



Website banner presenting the interactive laboratory “Discovering the Deep” co-organized by IODP-Italy in the frame of the International Workshop C4 “Climate Change and Carbon Cycle” 2022.

It's great to have IODP expeditions running with science parties onboard again, and to have had UK participants onboard. Over Christmas David Buchs (Cardiff University), Mike Widdowson (University of Hull) and Ethan Petrou (University of Oxford) sailed on Expedition 391: Walvis Ridge Hotspot. Next in line was Expedition 392: Agulhas Plateau Cretaceous Climate, including Thomas Wagner (Heriot-Watt University) and Odysseas Archontikis (University of Oxford) as well as Co-chief Scientist Steve Bohaty, who recently moved to Universität Heidelberg after several years at the University of Southampton.



Thomas Wagner and Odysseas Archontikis on Expedition 392 in March.

Expedition 390: South Atlantic Transect is now underway, led by Co-chief Scientist (and lead proponent) Roz Coggon (University of Southampton). Elliot Carter (University of Manchester), Andrew McIntyre (Open University) and Lewis Grant (University of Southampton) are also members of the science team currently at sea on the *JOIDES Resolution*.



In early April Michelle Harris (University of Plymouth) led the organising committee (Tom Belgrano (University of Southampton), Lydéric France, Jürgen Koepke, Johan Lissenberg,

Alessio Sanfilippo, Esther Schwarzenbach) of the successful ECORD & ICDP MagellanPlus workshop “Investigating the Oceanic Life Cycle of Tectonic Plates with Mission-Specific Drilling”. The workshop was preceded by an online event in February, with the main workshop held in a hybrid format hosted at the University of Plymouth and online. The Workshop was attended by 41 participants from several IODP member countries, including 20 who were present in person. The aim of the workshop was to stimulate discussions for new MSP-focused IODP projects that would address Strategic Objective 2 of the new Science Framework: “The Oceanic Life Cycle of Tectonic Plates”. Breakout groups discussed three key topics: drilling zero age basalt; mantle processes in the context of continental break-up and subduction initiation; and mantle processes in the context of mid-ocean ridges. The event was a great success and the community is in a strong position to develop MSP proposals to address Strategic Objective 2.

Tim Reston (University of Birmingham) was selected as new Co-Chair of the IODP Science Evaluation Panel (SEP) and began his term by co-chairing the January 2022 SEP meeting with Lisa McNeill (University of Southampton). Lisa’s term as Co-Chair ended in April 2022, and moving forward, Tim will work with Lisa’s successor, Kathie Marsaglia (California State University, Northridge).

Dick Kroon (University of Edinburgh) stepped down as IODP Forum Chair in late 2021 after three years of service, as his term came to an end. After an extended term as ESSAC Chair, Tony Morris (University of Plymouth) handed over the baton to Angelo Camerlenghi (National Institute of Oceanography and Experimental Geophysics, Trieste) in January. Tony will continue to serve on ESSAC as Vice-Chair and UK Representative.

UK IODP will host two sessions at the upcoming event Challenger 150: The Challenger Society Conference 2022, which will be held in London from 6-8 September 2022. Damon Teagle (University of Southampton) will chair a session on Deep Sea Mining - geology, resource, legal, technical, and societal aspects, and Paul Wilson will chair a session on Insights from marine sediments. Abstract submission is open until 15th May here: <https://www.nbm.ac.uk/our-science/science-events/the-challenger-society-conference-2022-in-london.html>.

We are pleased to announce that the current phase of the UK IODP research programme (2020-2024) includes a scheme to support UK scientists to undertake small scale IODP related activities.

This could include but is not limited to the organisation of, or participation in, workshops, training, outreach or other events.

Any activity that benefits UK IODP will be considered for funding. Applicants can apply for between £2k and £10k.

Applications will be accepted from individuals employed by a UK research organisation and should include a description of what the funding will be used for and an explanation of its relevance to IODP. Any proposed workshops must make use of IODP samples, data, and/or results, or involve planning for the collection of such materials. Find out more at <https://www.ukiodp.org/funding>

Jude Coggon - [info@ukiodp.org](mailto:info@ukiodp.org)  
 Acting UK IODP Knowledge Exchange Coordinator  
 University of Southampton, UK

UK-IODP webpage: <https://nerc.ukri.org/research/funded/programmes/ukiodp/>

Two years after initial plans to host the ESSAC Spring Meeting in Sweden were cancelled because of the pandemic, ESSAC delegates were finally able to convene in Stockholm on 25-27 April 2022. Helen Coxall (Stockholm University) hosted the 2-day meeting at the Department of Geological Sciences on a sunny campus where the cherry blossoms added to a sense of spring. The meeting, for the first time chaired by Angelo Camerlenghi (Italian delegate and the new ESSAC Chair, beginning the University of Trieste's administrative support to ESSAC), was followed by a geological excursion, guided by Steffi Burchardt (Uppsala University), to the island of Utö to examine 2 billion-year-old sedimentary and volcanic rocks from an ancient subduction zone. Current Swedish participation in IODP includes Science Party contributions to (shore-based) initial results for IODP Expedition 395: Reykjanes Mantle Convection and Climate) and Expedition 386: Japan Trench Paleoseismology).



ESSAC delegates from France, Sweden, the UK, Finland, Norway, Italy, Portugal and Germany in front of the Department of Geological Sciences at Stockholm University.



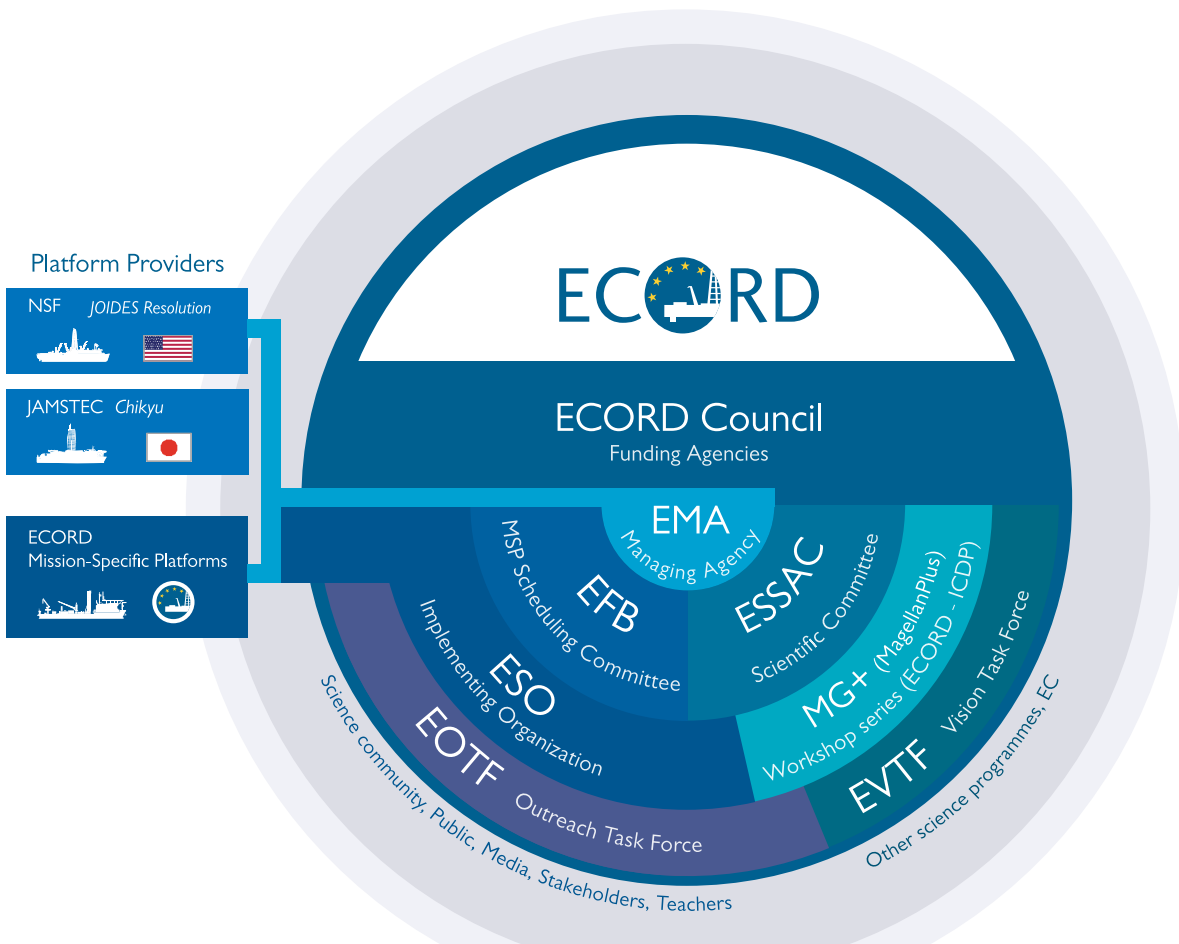
Steffi Burchardt (front left) explaining the complex history of Paleoproterozoic sedimentary and volcanic rocks on the island of Utö.

Jorijntje Henderiks - [jorijntje.henderiks@geo.uu.se](mailto:jorijntje.henderiks@geo.uu.se)  
ESSAC delegate Sweden

<b>ACEX:</b> Arctic Coring Expedition	<b>IODP:</b> Integrated Ocean Drilling Program (2003-2013) & International Ocean Discovery Program (2013-2023)
<b>AGU:</b> American Geophysical Union	<b>JAMSTEC:</b> Japan Agency for Marine Earth Science and Technology
<b>AMS:</b> Arctic Marine Solutions	<b>J-DESC :</b> Japan Drilling Earth Science Consortium
<b>ANZIC:</b> Australian and New Zealand IODP Consortium	<b>JOIDES:</b> Joint Oceanographic Institutions for Deep Earth Sampling
<b>ArcOP:</b> Arctic Ocean Paleoceanography, IODP Expedition 377	<b>JpGU:</b> Japan Geoscience Union
<b>BCR:</b> Bremen Core Repository	<b>JR:</b> <i>JOIDES Resolution</i>
<b>BGR:</b> Bundesanstalt für Geowissenschaften und Rohstoffe - Federal Institute for Geosciences and Natural Resources	<b>JRFB:</b> JOIDES Resolution Facility Board
<b>BGS:</b> British Geological Survey	<b>JRSO:</b> JOIDES Resolution Science Operator
<b>BMS:</b> Boring Machine System	<b>MarE3:</b> Institute for Marine-Earth Exploration and Engineering
<b>CCOD:</b> Canadian Consortium for Ocean Drilling	<b>MARUM:</b> Zentrum für Marine Umweltwissenschaften der Universität Bremen - Center for Marine Environmental Sciences, University of Bremen
<b>CIB:</b> <i>Chikyū</i> IODP Board	<b>mbsf:</b> metres below seafloor
<b>CNR:</b> Consiglio Nazionale delle Ricerche – National Research Council, Italy	<b>mbsl:</b> metres below sea level
<b>CNRS:</b> Centre National de la Recherche Scientifique - National Center for Scientific Research, France	<b>MCIN:</b> Ministry for Science and Innovation, Spain
<b>DAFSHE:</b> Danish Agency for Science and Higher Education	<b>MeBo:</b> Meeresboden-Bohrgerät - seafloor drill
<b>DFG:</b> Deutsche Forschungsgemeinschaft - German Research Foundation	<b>MEXT:</b> Ministry of Education, Culture, Sports, Science & Technology, Japan
<b>ECORD:</b> European Consortium for Ocean Research Drilling	<b>MoU:</b> Memorandum of Understanding
<b>EFB:</b> ECORD Facility Board	<b>MSP:</b> Mission-specific platform
<b>EGU:</b> European Geosciences Union	<b>NHM:</b> Natural History Museum
<b>EMA:</b> ECORD Managing Agency	<b>NSF:</b> National Science Foundation, USA
<b>EOTF:</b> ECORD Outreach Task Force	<b>NWO:</b> Nederlandse Organisatie voor Wetenschappelijk Onderzoek - Netherlands Organisation for Scientific Research
<b>EPC:</b> European Petrophysics Consortium	<b>ÖAW:</b> Österreichische Akademie der Wissenschaften - Austrian Academy of Sciences
<b>EPSP:</b> Environmental Protection and Safety Panel	<b>ODP:</b> Ocean Drilling Program
<b>ESO:</b> ECORD Science Operator	<b>OSP:</b> Onshore Science Party
<b>ESSAC:</b> ECORD Science Support and Advisory Committee	<b>PI:</b> Principal Investigator
<b>EVTF:</b> ECORD Vision Task Force	<b>PMO:</b> Program Member Office
<b>FB:</b> Facility Board	<b>SEP:</b> Science Evaluation Panel
<b>FCT:</b> Fundação para a Ciência e a Tecnologia - National Funding Agency for Science and Technology	<b>SMR:</b> Science Mission Requirements
<b>FNS:</b> Fonds National Suisse de la Recherche Scientifique - Swiss National Science Foundation	<b>SPRS:</b> Swedish Polar Research Secretariat
<b>FY:</b> Fiscal Year	<b>SSO:</b> Science Support Office
<b>GPC:</b> Giant Piston Corer	<b>UKRI:</b> UK Research and Innovation
<b>GSI:</b> Geological Survey of Ireland	<b>USSSP:</b> U.S. Science Support Program
<b>IBM:</b> Izu Bonin Mariana	<b>VR:</b> Vetenskapsrådet - Swedish Research Council
<b>ICDP:</b> International Continental Scientific Drilling Program	
<b>IKC:</b> In-kind contribution	



Onboard *Chikyu* during 'OSP Phase 1' for IODP Expedition 386.  
Credits: ECORD/IODP/JAMSTEC.



## ECORD Member Countries



- |                       |           |   |
|-----------------------|-----------|---|
| <b>Austria</b>        | <b>1</b>  | Österreichische Akademie der Wissenschaften (ÖAW)             |
| <b>Canada</b>         | <b>2</b>  | Canadian Consortium for Ocean Drilling (CCOD)                 |
| <b>Denmark</b>        | <b>3</b>  | Danish Agency for Science and Higher Education                |
| <b>Finland</b>        | <b>4</b>  | Suomen Akatemia   |
| <b>France</b>         | <b>5</b>  | Centre National de la Recherche Scientifique (CNRS)           |
| <b>Germany</b>        | <b>6</b>  | Deutsche Forschungsgemeinschaft (DFG)                         |
| <b>Ireland</b>        | <b>7</b>  | The Geological Survey of Ireland (GSI)                        |
| <b>Italy</b>          | <b>8</b>  | Consiglio Nazionale delle Ricerche (CNR)                      |
| <b>Netherlands</b>    | <b>9</b>  | Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) |
| <b>Norway</b>         | <b>10</b> | Forskingsradet  |
| <b>Portugal</b>       | <b>11</b> | Fundação para a Ciência e a Tecnologia (FCT)                  |
| <b>Spain</b>          | <b>12</b> | Ministerio de Ciencia, Innovación (MCIN)                      |
| <b>Sweden</b>         | <b>13</b> | Vetenskapsradet (VR)  |
| <b>Switzerland</b>    | <b>14</b> | Fonds National Suisse (FNS)                                   |
| <b>United Kingdom</b> | <b>15</b> | United Kingdom Research and Innovation (UKRI)                 |



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