POST 2024 New Scientific Ocean Drilling, The International Ocean Drilling Programme - IODP³

N.EGUCHI, Director General, MarE3/JAMSTEC & G. CAMOIN / IODP3 Planning Working Group)

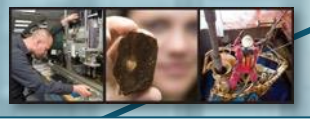
MOHOLE
1958-1966

Deep Sea Drilling Project (DSDP) 1968-1983

Ocean Drilling Program (ODP) 1985-2003

Integrated Ocean Drilling Program (IODP-1) 2003- 2013

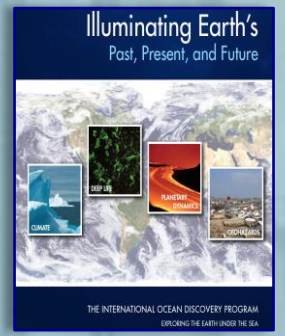
Start 2013



International Ocean Discovery Program (IODP-2)

End 2023

New End 2024



2024 | 2025 | 2026 | 2027 | 2028 | 2029

IODP
INTERNATIONAL OCEAN DISCOVERY PROGRAM

Platform Providers operating on an MSP mode

IODP³

ECORD
EUROPEAN CONSORTIUM FOR OCEAN RESEARCH DRILLING

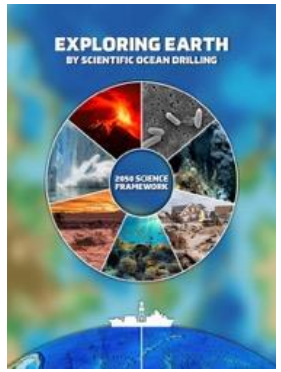
NSF ODP

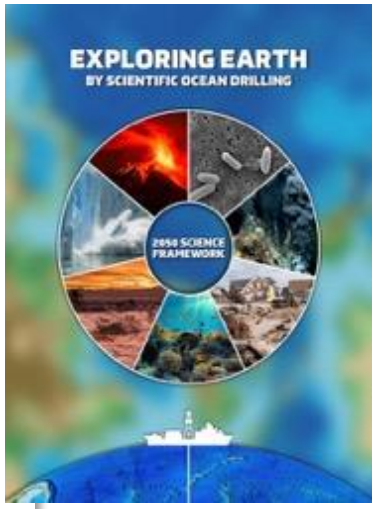
CHINA - CMP

Non-platform providers

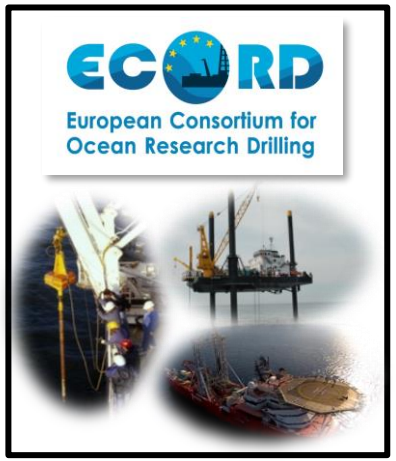
Prog. A	Prog. B	Prog. C

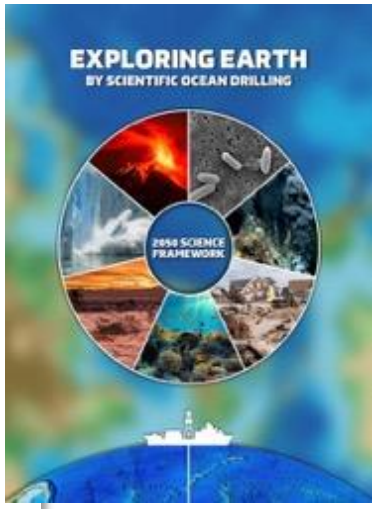
A unique situation in the history of scientific ocean drilling





- ✓ **ECORD-Japan partnership, through a MoU**
- ✓ **Basic principles of the programme**
  - *Single international Science Framework*
  - *International staffing of expeditions and advisory panels*
  - *Transparent, open, flexible and international*
  - *Program-wide standard policies and guidelines*
  - *Sustainable management of knowledge-based resources*
  - *Public access to knowledge-based resources*

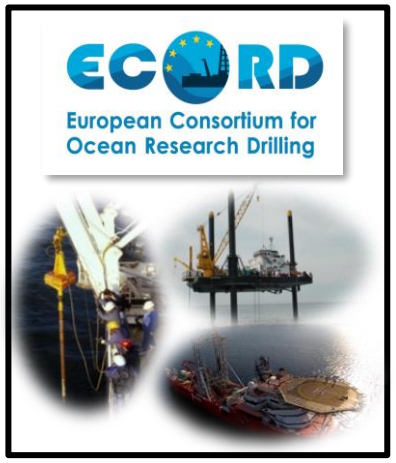


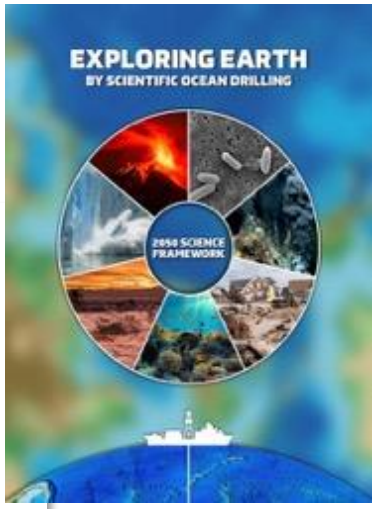


✓ ***Recognition that:***

- the enduring principles as stated in the Science Framework 2050 document are critical in providing the foundation for a cohesive set of ground rules for IODP3

- the implementation of the Science Framework 2050 must be driven by a common proposal process powered by bottom-up submission of drilling proposals by international teams of scientists with an open, transparent merit-based review process

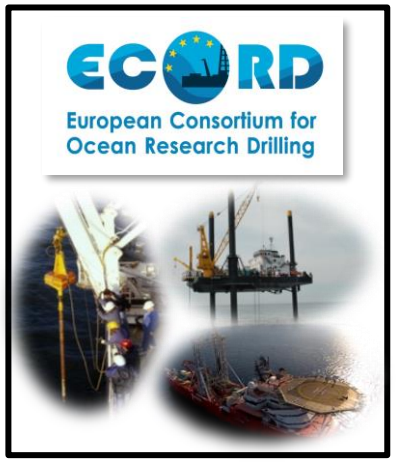




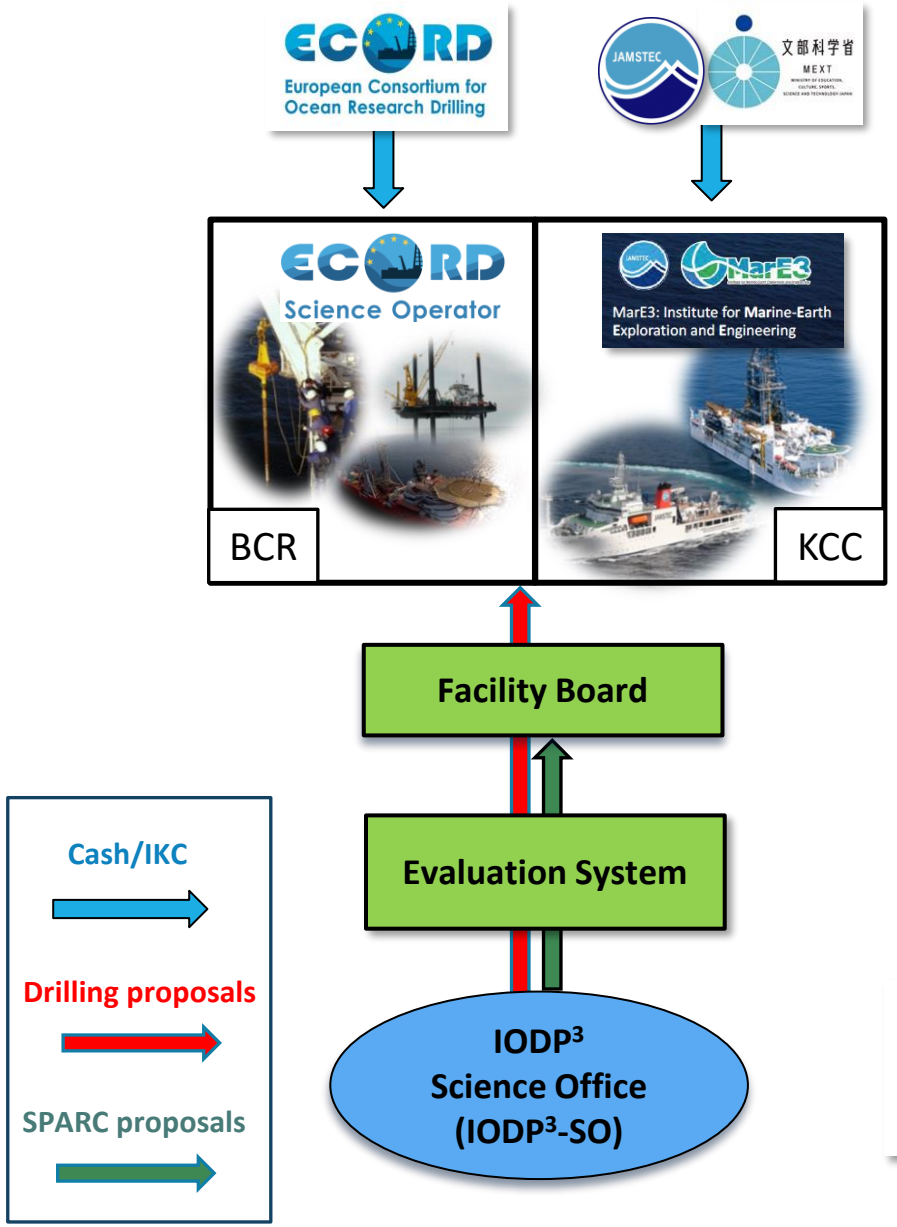
✓ *Implementation and funding of:*

- offshore expeditions following an expanded MSP concept by diversifying drilling and coring technologies and applying them to all drilling environments

- Scientific Projects using Ocean Drilling ARChives (SPARCs) that are international and multidisciplinary projects that have objectives originating from or that are based on ocean drilling archives



- ✓ ***ECORD and Japan will keep their own identity and entities***
- ✓ ***3 joint entities:***
  - *'Vision Task Force'*
  - *'Communication Task Force'*
  - *'Magellan³ Workshop Programme'*



Science Framework Working Group

2020 Consensus Statements

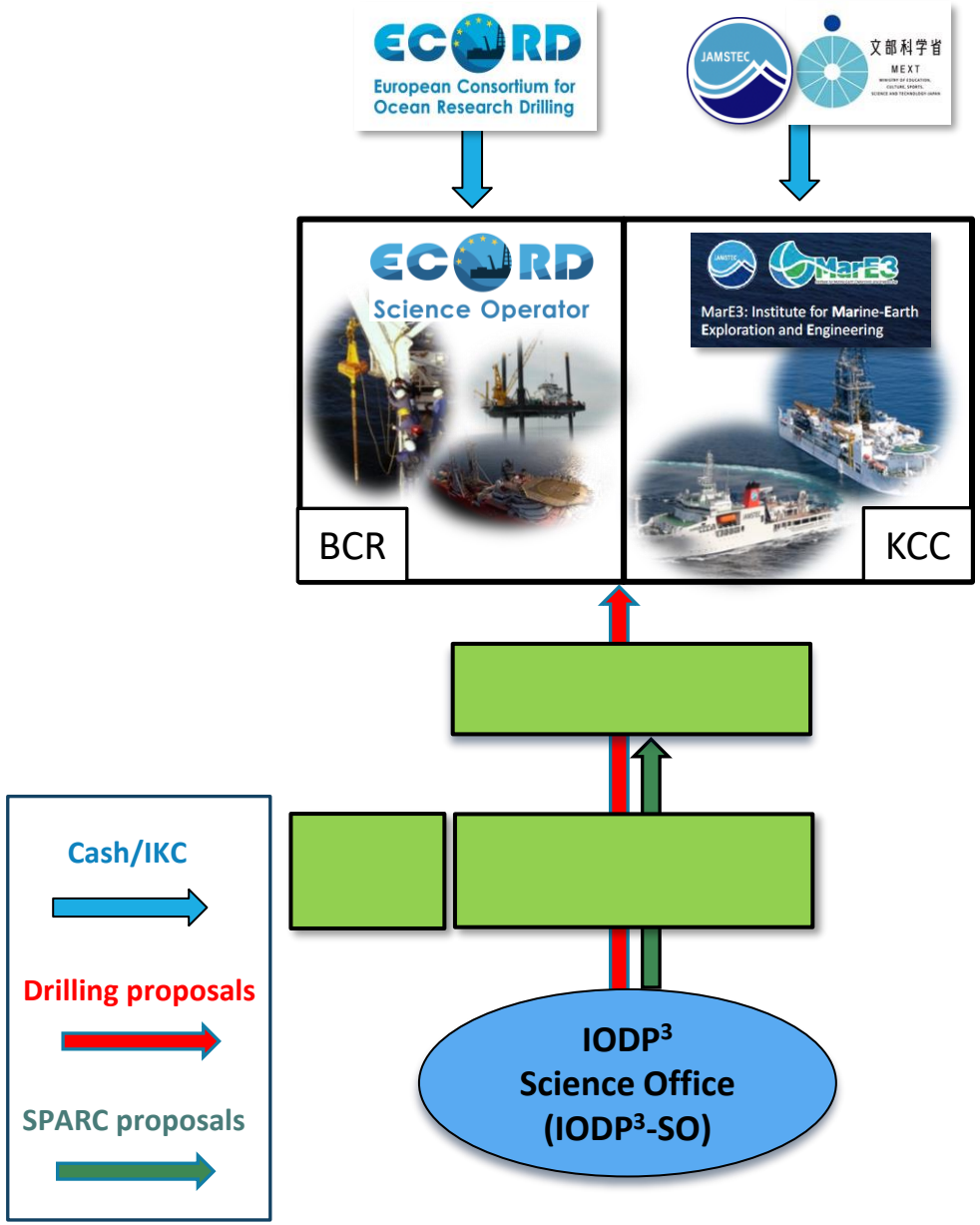
CONSENSUS STATEMENT #2

Implementation of the ***2050 Science Framework*** must be driven by a ***Common Proposal Process*** powered by bottom-up submission of proposals, prepared by international teams of scientists, and developed through an open, transparent, and merit-based peer-review process.

SUPPORTING OBSERVATIONS AND IDEAS

- Current panels and Facility Boards are working well and should be used as our starting point to develop a new scientific advisory structure in support of the innovative 2050 Science Framework.
- All proposals should come through a common review process and the new scientific advisory structure should prioritize promoting important science endeavors and projects.

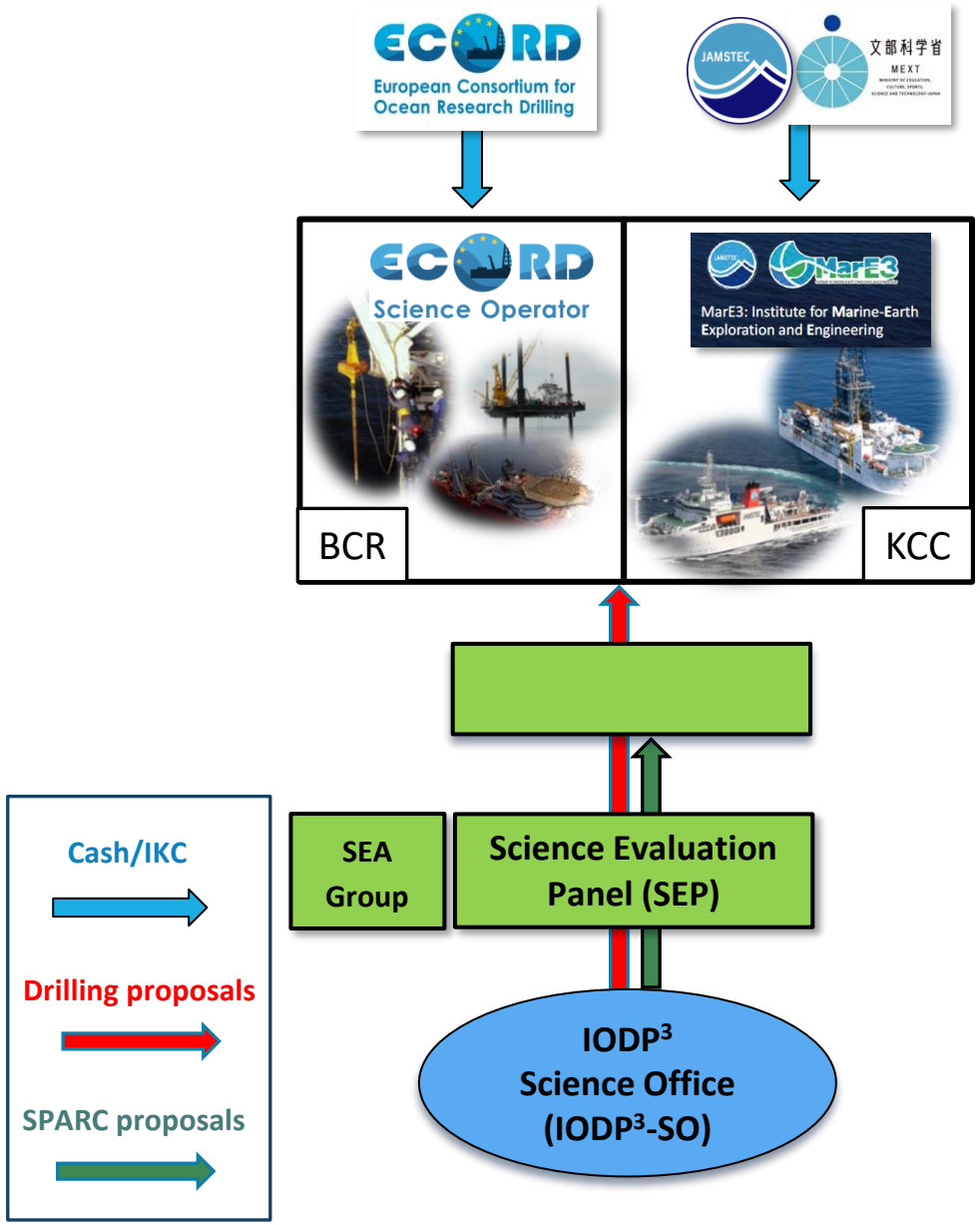
IODP³ was conceived from an international perspective and will start on 1st January 2025



IODP³ Science Office (IODP³-SO)

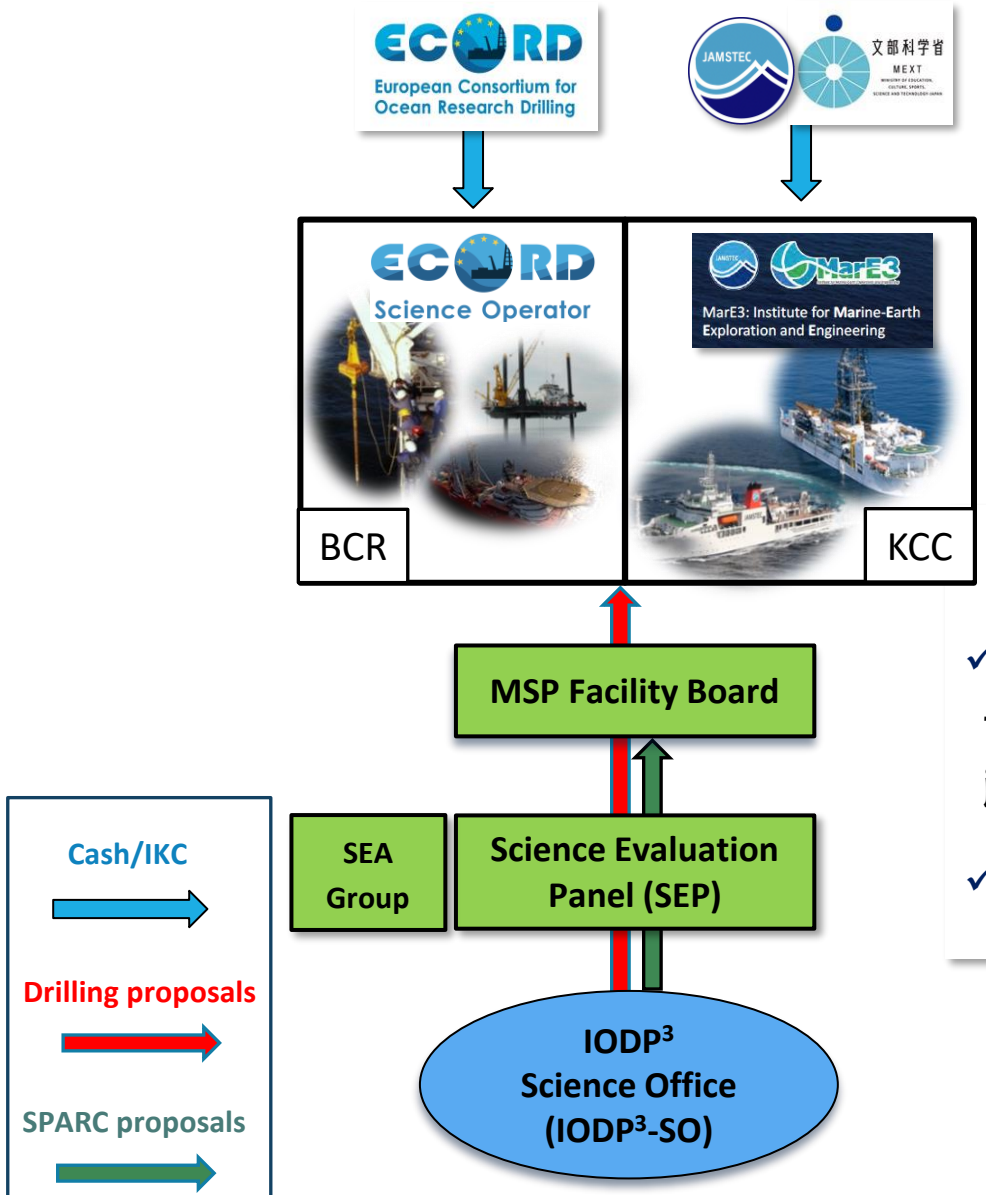
- ✓ will provide logistical support for IODP³ panels and groups
- ✓ will develop, implement and manage:
  - the community-led, bottom-up drilling proposal submission and evaluation system (and associated databases)
  - the participant portal and IODP³ website for all aspects of IODP³ activities
  - an online, open-access publication system for IODP³
  - expedition-related reports
  - an expedition-based bibliographic database.
- ✓ Start phase: late Spring 2024 for a smooth transition from current SSO

> *Call for applications issued on 18 September, 2023*



IODP³ Evaluation System

- ✓ The IODP³ Science Evaluation Panel will be the entity responsible for scientific peer review and evaluation of drilling proposals submitted by the international scientific ocean drilling research community and of the SPARC proposals submitted by IODP³ members
- ✓ Composition: Core group of about 30 scientists/experts + Ad-hoc members
- ✓ The SEA (Safety and Environmental Advisory) Group : Pool of experts to identify potential risks early in process (@SEP and/or during workshops). Operators will have responsibility for safety and environmental issues of the Programme

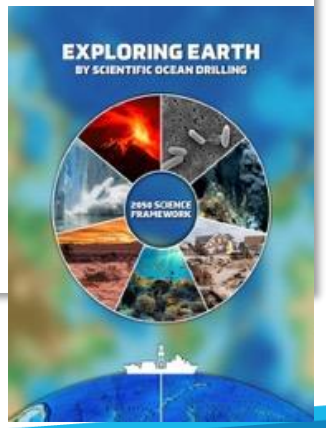


IODP³ MSP Facility Board

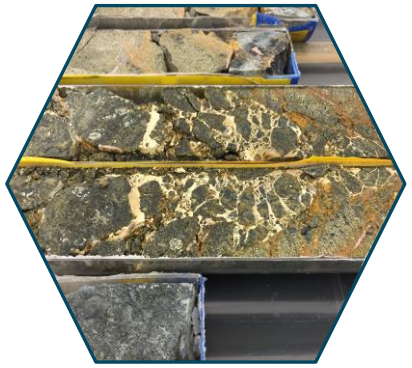
- ✓ Selection and scheduling of drilling/coring proposals for implementation by the ECORD Science Operator (ESO), JAMSTEC, or as expeditions implemented jointly by ESO and JAMSTEC/MarE3
- ✓ Selection and scheduling of SPARC proposals

Scientific Projects using Ocean Drilling ARChives (SPARCs)

- ✓ The IODP³ SPARCs initiative supports large-scale research projects that may address any aspect of the "2050 Science Framework: Exploring Earth by Scientific Ocean Drilling"
- ✓ SPARCs will have objectives that maximise the return on the legacy assets (i.e. cores, samples and data) from current and past scientific ocean drilling programs without new drilling or other operations at sea
- ✓ SPARCs will provide a mechanism for the international ocean drilling science community to develop large-scale interdisciplinary collaborations, further extending the legacy asset-based concepts introduced towards the end of the International Ocean Discovery Program (LeAPs, ReCoRD, AILAF).

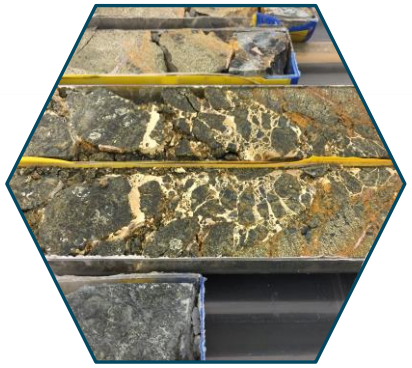


Scientific Projects using Ocean Drilling ARChives (SPARCs)



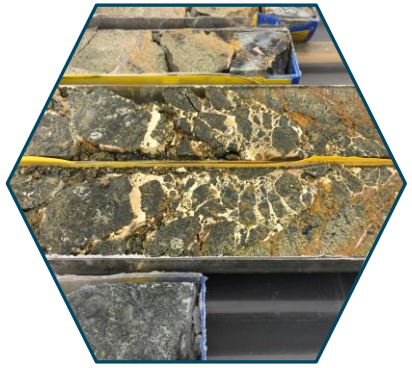
- ✓ SPARC proposals will be reviewed by the SEP
- ✓ Accepted proposals will be forwarded by SEP to the MSP-FB, along with associated nominations for Co-Chief Scientists, and the MSP-FB will select which projects to fund for implementation in each annual round
- ✓ **An open call for international scientific participation** will be issued for each scheduled SPARC
- ✓ Applications for participation will be evaluated by the IODP³ Programme Member Offices (PMOs)
- ✓ PMOs will take into account the need to balance required expertise, national quotas (according to financial contributions to IODP³), gender and career stages

Scientific Projects using Ocean Drilling ARChives (SPARCs)



- ✓ Each SPARC will have a **funded duration of three years and will receive €300,000** for its implementation. Proposals should have a maximum of five co-proponents
- ✓ The co-proponents of a funded SPARC will automatically become Science Party members (with two selected as Co-Chief Scientists), but the remaining Science Party members will be selected following an open call for applications
- ✓ The **overall size of the final Science Party for a SPARC is flexible** and can be adapted to project needs

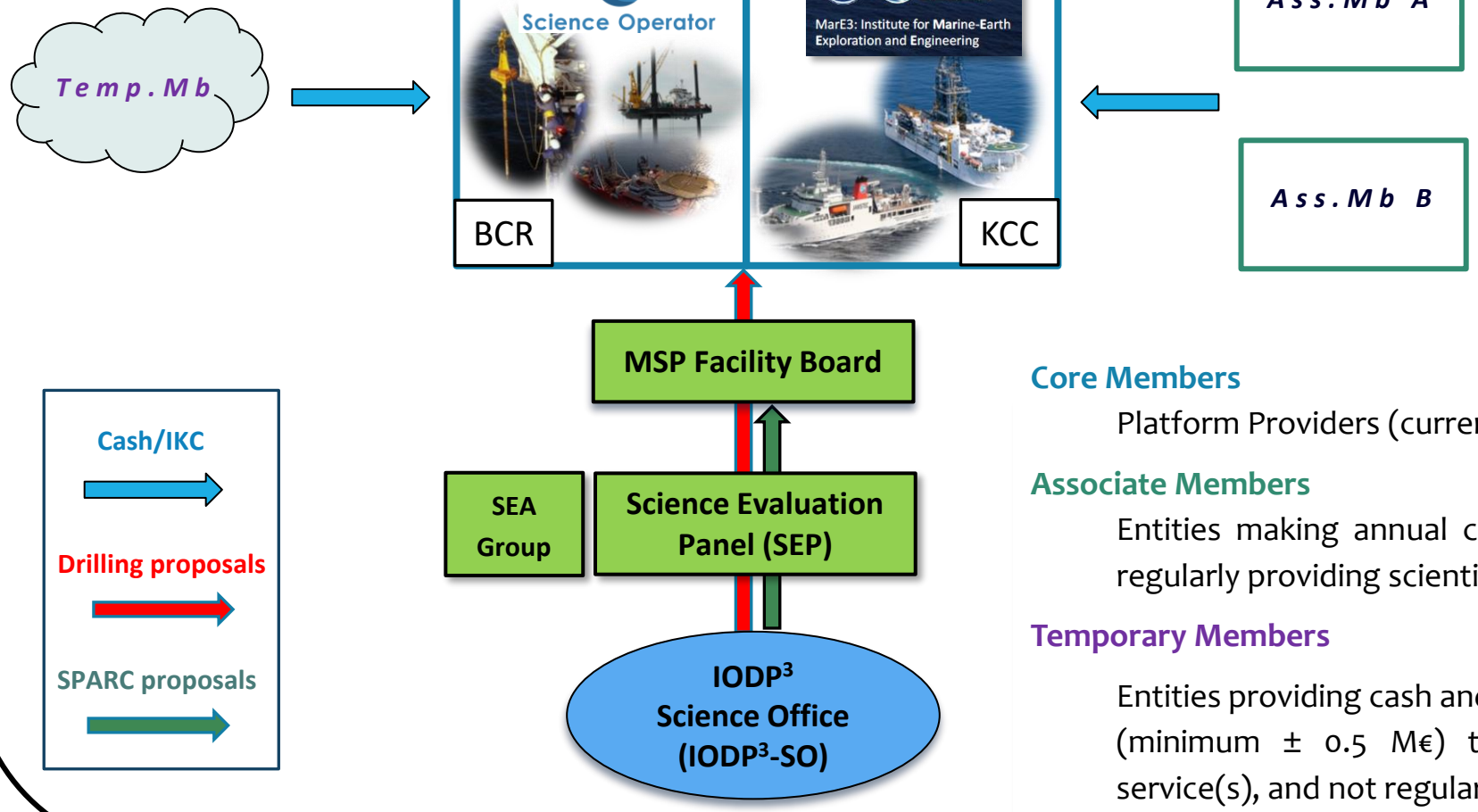
Scientific Projects using Ocean Drilling ARChives (SPARCs)



SPARCs will have the potential to:

- ✓ *expand the shore-based participation of scientists in scientific ocean drilling*
- ✓ *increase the value of scientific ocean drilling legacy data beyond the existing mechanisms of sample requests to core repositories*
- ✓ *generate data that can provide crucial information for the development of future drilling proposals*
- ✓ *contribute to the implementation of the FAIR data in scientific ocean drilling*
- ✓ *generate particularly attractive research opportunities for ECRs: from training to leadership*
- ✓ *reinforce the bottom-up, proposal driven, international character of scientific ocean drilling*

IODP³



Core Members

Platform Providers (currently ECORD and Japan)

Associate Members

Entities making annual cash contributions to IODP³ (± 1 M€) and not regularly providing scientific ocean drilling platform(s) to IODP³.

Temporary Members

Entities providing cash and/or project-based in-kind contributions (minimum ± 0.5 M€) to access IODP³ expedition(s) and/or other service(s), and not regularly providing scientific ocean drilling platform(s) to IODP³

IODP³

Scientific Drilling Forum

ECORD
European Consortium for Ocean Research Drilling

JAMSTEC

文部科学省 MEXT

Temp.Mb

ECORD Science Operator

MarE3: Institute for Marine-Earth Exploration and Engineering

BCR

KCC

Ass.Mb A

Ass.Mb B

OTHER SCIENCE PROGRAMMES / INITIATIVES / ORGANIZATIONS

icdp

Berth exchanges

OCEAN DRILLING PROGRAM

MSP Facility Board

SEA Group

Science Evaluation Panel (SEP)

IODP³ Science Office (IODP³-SO)

Cash/IKC

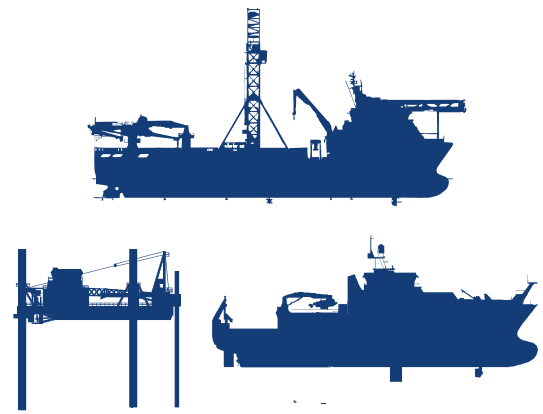
Drilling proposals

SPARC proposals

POTENTIAL NEW PARTNERS / MEMBERS

IODP³ Operational plans: the Mission-Specific Platform concept

MSP Operational flexibility - Technology

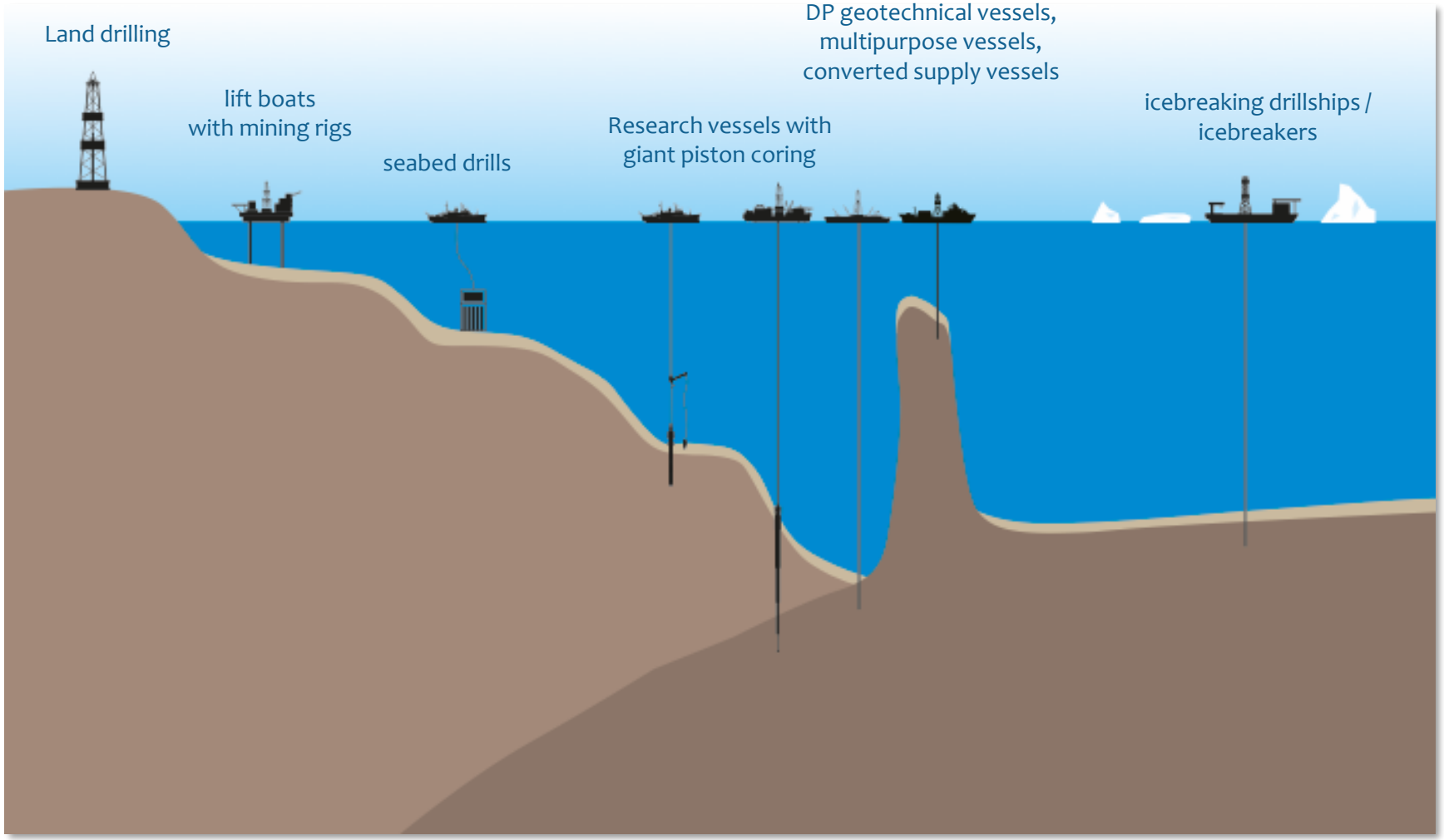


Any suitable vessel

A wide array of drilling and coring systems:

- icebreaking and high-class drillships
- riserless/riser drilling
- lift boats with mining rigs
- seabed drills
- giant piston coring

- ✓ Select the adequate technology to achieve scientific objectives
- ✓ Tailor expeditions to better adapt to the scientific needs
- ✓ New opportunities provided by technological development
- ✓ Regional and/or technological clustering
- ✓ Encourage implementation in several phases ('Flagship Initiatives' / 'Missions')



MSP expeditions will continue to offer scientific drilling access to a full range of geographic areas and drilling depths, drilling environments and science targets, including through collaboration with other programmes and initiatives (e.g., L2S transects)

L2S drilling transects - Crossing the boundaries

land to sea

(L2S) drilling

transects

A successful breakthrough

IODP
INTERNATIONAL OCEAN DISCOVERY PROGRAM

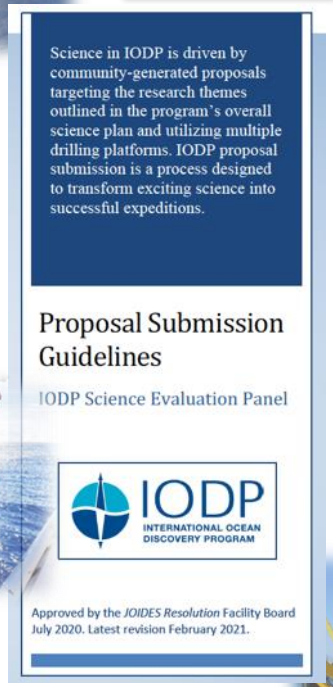
icdp

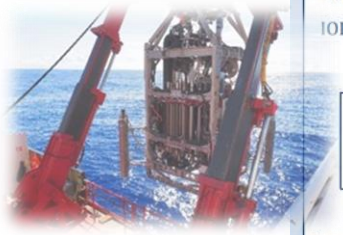
- ✓ Replace Amphibious Drilling Proposals (2014)
- ✓ Are those for which full achievement of the scientific objectives require scientific drilling at both onshore and offshore sites or at shallow marine sites
- ✓ Can be jointly implemented by IODP³ and ICDP
- ✓ Provide opportunities for operational collaboration between domains

ENABLING ELEMENT 2 LAND TO SEA

MSP Operational flexibility – Expedition format

- ✓ **MSP expedition durations will be flexible**, and will be determined by scientific requirements
- ✓ Expeditions may be as short as 14 days, as long as up to several weeks or, for exceptional expeditions, up to several months
- ✓ Shorter expeditions may offer the opportunity for geographical and/or technical clustering





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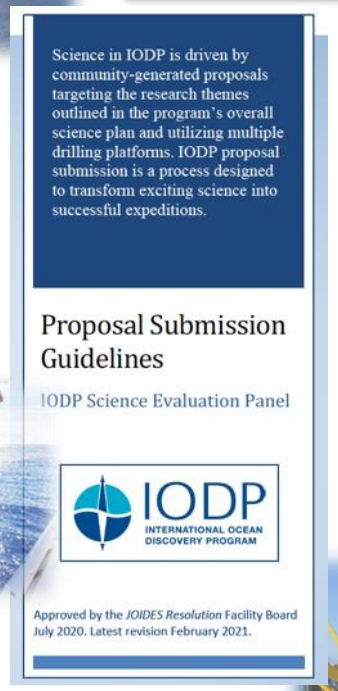
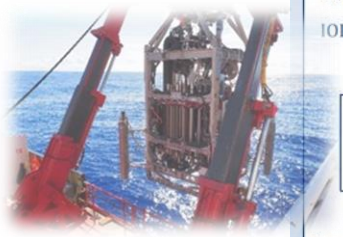




Three different implementation plans:

A) **Basic Plan** to guarantee the fulfilment of the **crucial scientific objectives**

B) **Intermediate Plan** in which specific priority sites are proposed for drilling/coring to guarantee the achievement of **major scientific objectives** and benefits achievable beyond the Basic Plan

C) **Full Plan** including all proposed sites for drilling/coring to achieve all **scientific objectives to their full extent** and benefits achievable beyond the Intermediate Plan

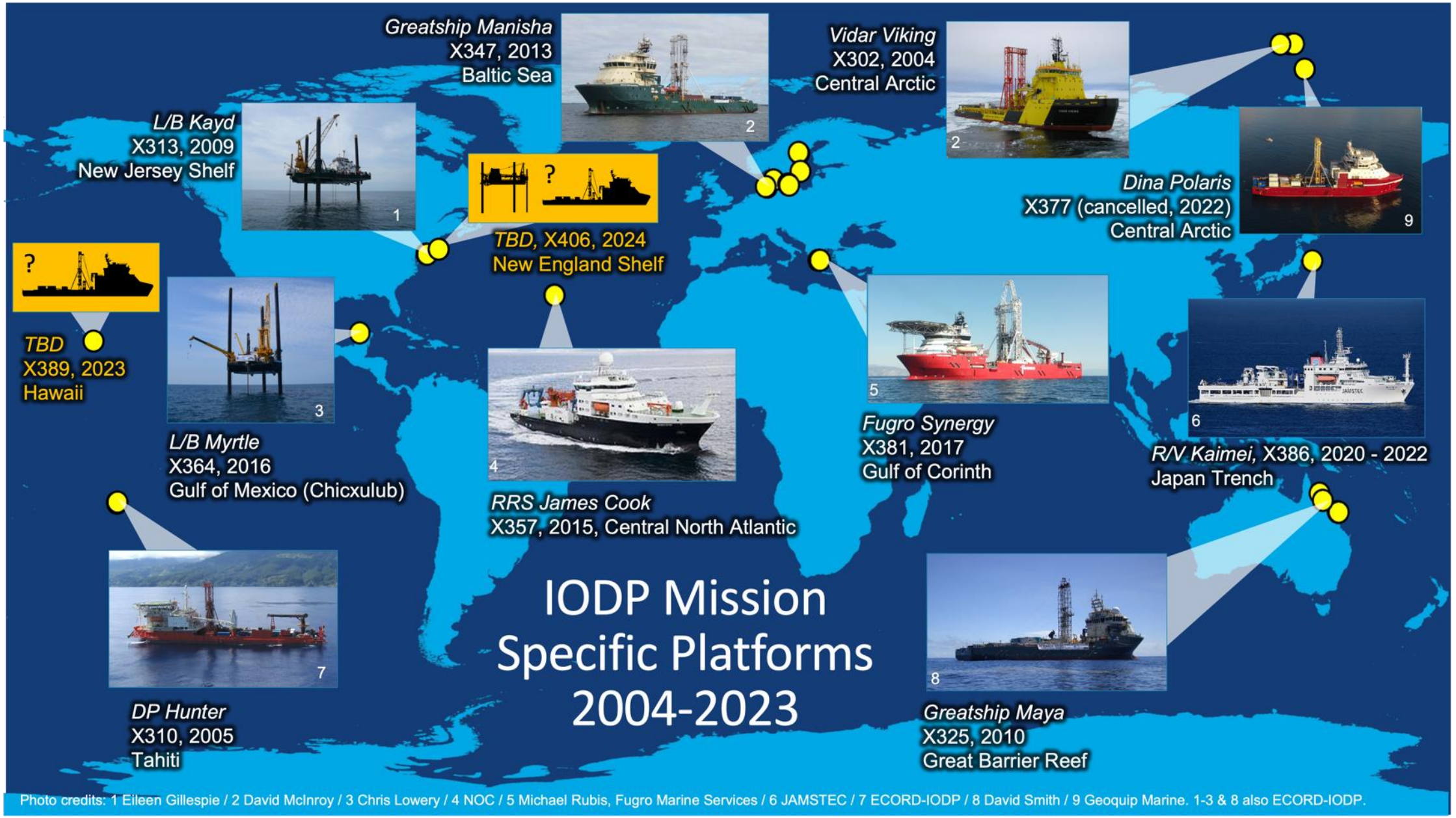
MSP Operational flexibility – Expedition participation

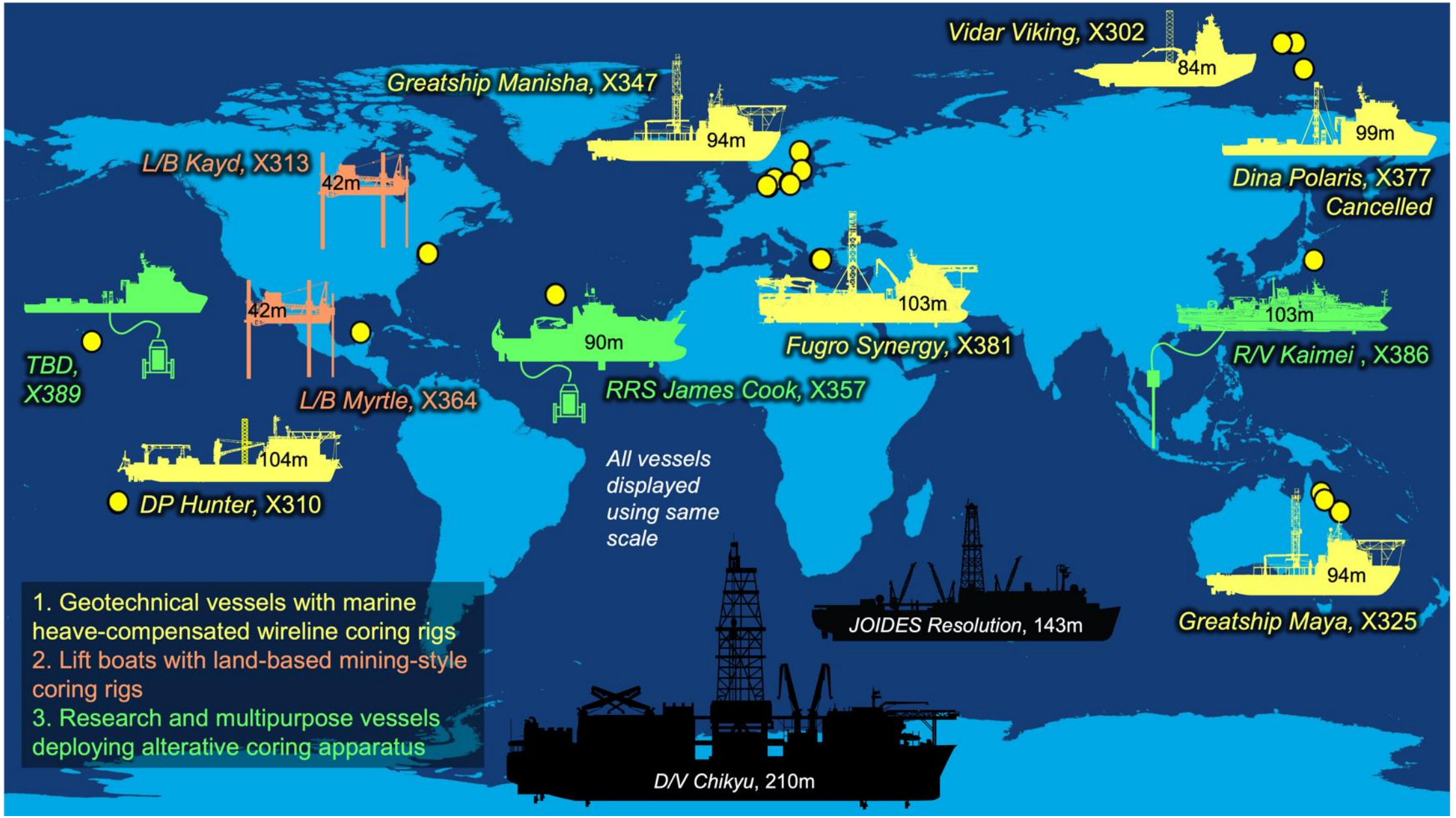
- ✓ ***Co-chief Scientists not counted towards quotas and may come from non-member nations***
- ✓ ***Size of the Science Party will be flexible*** *and will be determined by scientific requirements*

3 routes available to join the Science Party:

1) **Apply to the PMOs to sail offshore and/or attend the OSP - Highest priority** - . Successful applicants will be instructed to submit a sample request based on the research plan described in their application
2) **Propose to the PMOs a research plan pre-expedition, without the intention to sail or attend the OSP – Second priority - .** Successful proponents will be invited to submit a sample request based on their proposal
3) **Submit a sample request to the Sample Allocation Committee (SAC) during the moratorium either individually, or as a named collaborator on a sample request by a Science Party member - Lowest priority -**

- ✓ *Anyone who is granted samples or data access during the moratorium is a* ***Science Party member***
- ✓ *Any researcher can submit a post-moratorium sample request, which is assessed by curatorial staff at the appropriate repository*


Greatship Manisha
X347, 2013
Baltic Sea
Vidar Viking
X302, 2004
Central Arctic
L/B Kayd
X313, 2009
New Jersey Shelf
TBD, X406, 2024
New England Shelf
Dina Polaris
X377 (cancelled, 2022)
Central Arctic
TBD
X389, 2023
Hawaii
L/B Myrtle
X364, 2016
Gulf of Mexico (Chicxulub)
RRS James Cook
X357, 2015, Central North Atlantic
Fugro Synergy
X381, 2017
Gulf of Corinth
R/V Kaimei, X386, 2020 - 2022
Japan Trench
IODP Mission
Specific Platforms
2004-2023
DP Hunter
X310, 2005
Tahiti
Greatship Maya
X325, 2010
Great Barrier Reef
Photo credits: 1 Eileen Gillespie / 2 David McInroy / 3 Chris Lowery / 4 NOC / 5 Michael Rubis, Fugro Marine Services / 6 JAMSTEC / 7 ECORD-IODP / 8 David Smith / 9 Geoquip Marine. 1-3 & 8 also ECORD-IODP.


Vidar Viking, X302
84m
Greatship Manisha, X347
94m
99m
Dina Polaris, X377
Cancelled
L/B Kayd, X313
42m
103m
Fugro Synergy, X381
103m
R/V Kaimei , X386
42m
90m
TBD,
X389
L/B Myrtle, X364
RRS James Cook, X357
104m
DP Hunter, X310
All vessels displayed using same scale
94m
Greatship Maya, X325
JOIDES Resolution, 143m
D/V Chikyu, 210m
1. Geotechnical vessels with marine heave-compensated wireline coring rigs
2. Lift boats with land-based mining-style coring rigs
3. Research and multipurpose vessels deploying alterative coring apparatus

MSP type	Coring methods	Water depths	Max pipe deployable
Scientific Drilling Vessel or Geotechnical vessel deploying marine heave-compensated wireline coring	Advanced piston coring Extended coring Extended nose sampling Rotary coring Seabed template	20 m > Max pipe deployable, up to >7000 m (for riserless drilling). 2500 m for riser drilling	2000 m > 8000 m Exceptional max. 11-12 km (deep water/riser drillship)

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Lift boat or fixed platform deploying onshore mining-style wireline coring	Advanced piston coring Extended coring Rotary coring	4 m > 55 m Non-typical max. 84 m Exceptional max. 110 m	Typical max. 2400 m

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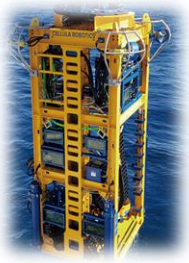
Research, multipurpose, or icebreaker vessel deploying seafloor drill (SFD)	SFD advanced piston coring, extended coring, and rotary coring	10 m > capacity of the SFD, typically 2-4 km	Typical max. penetr.: 125m Except. max. penetr. : 200m



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Research, multipurpose, or icebreaker vessel deploying giant piston corer (GPC) and Boring Machine System	Giant piston coring	10 m > Max depth capacity of the GPC, typically up to full oceanic depth	Typical max. penetr.: 40m Except. max. penetr.: 70m

Takeaways

- ✓ ECORD and Japan built a fully international programme, **IODP^3**, inspired by the 2050 Framework and based on Mission-Specific Platform (MSP) expeditions, which will begin immediately after the conclusion of the current IODP phase i.e., on 1st January 2025

- ✓ Mission-Specific Platform (MSP) expeditions of flexible duration from the shore to the deep ocean using a variety of drilling technologies and sampling methods

- ✓ IODP^3 will be based on the 'philosophy' of previous international scientific ocean drilling programmes and be transparent, flexible and open to the international community

- ✓ ECORD and Japan will keep their own functioning and identity and create three joint entities

- ✓ ECORD and Japan have invited other international entities to join this initiative and share overarching resources

- ✓ MSP expeditions will (continue to) offer scientific drilling access to a full range of geographic areas and drilling depths, drilling environments and science targets, including through collaboration with other programmes and initiatives (e.g., L2S transects)

- ✓ MSPs offer new opportunities provided by technological development and can be assembled to accommodate novel instrumentation and/or analyses if required

- ✓ MSP expeditions, by their nature, offer a remarkable operational flexibility concerning the duration of the expeditions, their staffing and their funding > optimization of scientific outcomes and maximum return on investment

- ✓ **S**cientific **P**rojects using **O**cean **D**rilling **ARC**hives (**SPARC**s) have the potential to increase the value of scientific ocean drilling legacy data and will be part of IODP^3

Thank you! And any question?