Topic	H2020 – INFRAIA-2018-2020
Short Title	Eurofleets+
Title	An alliance of European marine research infrastructures to meet the evolving requirements of the research and industrial communities
Project Number	824077
Delivery Date	29.09.2023
Deliverable No	D4.14
Lead Beneficiary	Alfred Wegener Institute
Dissemination Level	Public

Report on cruise implementation, post cruise assessment and lessons learned

Document information	
Document Name	Report on cruise implementation, post cruise assessment and lessons learned
Document ID	Eurofleets+_D4.14_Report_on_cruise_implementation_V2
Revision	V2
Revision Date	19.10.2023
Author	Anneli Strobel (AWI), Bernadette Ni Chonghaile (MI)
Security	Public

Approvals			
	Name	**Organisation**	**Date**
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History			
Revision	**Date**	**Modification**	**Author**
Version 1	17.03.2023	First Draft	Anneli Strobel
Version 2	29.09.23	Final Draft	Anneli Strobel, Bernadette Ni Chonghaile

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1 Introduction

Eurofleets+ Work Package (WP) 4 is devoted to the practical management of all the calls for proposals. The management includes the preparation of the EUROFLEETS+ access programmes, call dissemination, launching of the calls, the proposal evaluation handling, the selection procedures and post-cruise project evaluation.

This deliverable here focusses on the results of the Transnational Access (TNA) activities.

It is dedicated to (1) the implemented TNA projects of the Ship-time and Marine Equipment Application (SEA) Programme call “OCEANS” and “REGIONAL”, and (2) of the implemented projects of the Co-Principal Investigator (Co-PI) and Remote Transnational Access (RTA) programmes offered by EUROFLEETS+. The two latter TNA programmes are running calls, which allow the continuous submission of proposals until call closure in 2022.

A central aim of EUROFLEETS+ was to provide access to research vessels for all European scientists and their partners, in particular for scientists from nations with limited, or no, access to research vessels and other marine infrastructure. EUROFLEETS+ has offered fully funded transnational access to 14 Ocean/Global and 16 Regional vessels and associated equipment.

In the lifetime of the project, 27 proposals (in 23 cruises) were implemented on 16 of the EUROFLEETS+ consortium’s vessels and with 4 different pieces of Marine Equipment.

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2 Cruise implementation

2.1 The Operational Liaison Panel

Next to the Scientific Liaison Panel (SLP) that took care of the evaluation of the proposals for ship-time, the EUROFLEETS+ Operational Liaison Panel (OLP) played an important role in placing the best proposals on research vessels and in scheduling the cruises. Therefore, the tasks of the OLP are described here in more detail:

The OLP consisted of fleet managers and research vessel operators nominated by EUROFLEETS+ beneficiaries and appointed by the EUROFLEETS+ Consortium. The OLP was composed of permanent members from EUROFLEETS+ beneficiaries and individual research vessel operators managing those ships, which were requested in proposals under evaluation. The EUROFLEETS+ Consortium appointed the chair of the OLP.

The mandate of the OLP was to make recommendations on the logistical feasibility of proposals - primarily regarding the area of operation and timing of cruises- during the evaluation process. Additionally, it provided recommendations on the choice of research vessel and equipment. The decision on which cruises the successful proposals shall be placed was based on the following criteria:

- Feasibility based on geographic availability of vessel to work area,
- Availability of vessel within required time period for survey,
- Suitability of vessel/vessel equipment for the proposed work program, e.g., Dynamic positioning, deep-water multibeam echosounder, number of berths etc.
- Other factors, e.g., interoperability, diplomatic clearance issues.

Each of the proposals ranked 'A - Recommended for Scheduling' by the SLP were logistically evaluated by the OLP in order of priority – A, A1, A2, etc. Following contact with each of the infrastructure operators to determine availability of the vessels/marine equipment and capability to conduct the proposal's objectives, some highly ranked proposals were considered to be logistically non feasible due to availability in the requested area and with the Eurofleets+ resources available within the time frame of the project.

The proposals that were ranked highly by the SLP and logistically feasible were put in direct contact with the vessel operators to commence negotiation about specific dates for the surveys. On receiving confirmation from the infrastructure operator that dates were agreed, funding was offered to the PI and if accepted the End User Agreement prepared. Every effort was made to implement all proposals not logistically feasible on the 1st or 2nd choice vessel/marine equipment on an alternative infrastructure.

2.2 Cruise implementation

The proposals implemented on the research vessels and with the marine equipment of the EUROFLEETS+ consortium are specified in the Annex.

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The sections below provide an overview of the proposals recommended for scheduling by the SLP, and the decision on their implementation by the OLP.

2.2.1 OCEANS Call

Table 1: OCEANS Call proposals recommended for scheduling and ranking by the SLP, and decision by the OLP on their implementation.

Vessel/infrastructure	Cruise ID	SLP Ranking	OLP evaluation / decision
AUV Hugin	028	**A1**	Implemented
Arni Freidrickson	021	**A1**	Implemented
Celtic Explorer	022	**A1**	Implemented
Celtic Explorer + ROV Holland	051	**A2**	Implemented on GO SARS + ROV Aegir
Celtic Explorer	032	**A3**	Funding of other, higher ranked projects
DANA	035	**A1**	Implemented
Pelagia	027	**A1**	Implemented
Pelagia + ROV Genesis/ROV Marum Squid	040	**A3**	Funding of other, higher ranked projects
Pelagia	007	**A2**	Implemented
Ramon Margalef	029	**A3**	Funding of other, higher ranked projects
Sanna	043	**A2**	Implemented
Sanna	048	**A1**	Implemented
Tangaroa	014	**A1**	Implemented
Tangaroa	023	**A2**	Requested timing and port of mobilisation/demobilisation logistically not feasible
Tangaroa	011	**A3**	Implemented
Thalassa	017	**A1 Thalassa/A1 Ramon Margalef**	Implemented on board RV Belgica

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Thalassa + HROV Ariane	033	**A3**	Funding of other, higher ranked projects
Thalassa + ROV Marum Squid/ROV Luso	047	**A2**	Implemented on RV Belgica + ROV Max Rover

Scientific evaluation / SLP ranking:

Altogether, 34 proposals were submitted for the SEA Programme "OCEANS" on Global/Ocean going Research Vessels and Marine Infrastructures. All proposals met the required criteria for an eligible proposal (see Deliverable D4.3, Call documentation for the SEA Programme; Co-PI Programme; and RTA Programme).

Figure 1 shows the requested research vessels of the 34 eligible proposals. The RV Tangaroa received most proposals, followed by RV Pelagia and RV Thalassa. The high demand was certainly due to the unique opportunity to apply for facilitated, free-of-charge TNA to a New Zealand research vessel, through a centralised, Horizon2020 TNA project. Other research vessels or marine equipment were not requested, e.g. the RV Magnus Heinason, RV Mar Portugal, RV Alliance, RV Coriolis II, RV Atlantic Explorer, ROV Luso and the Telepresence Unit.

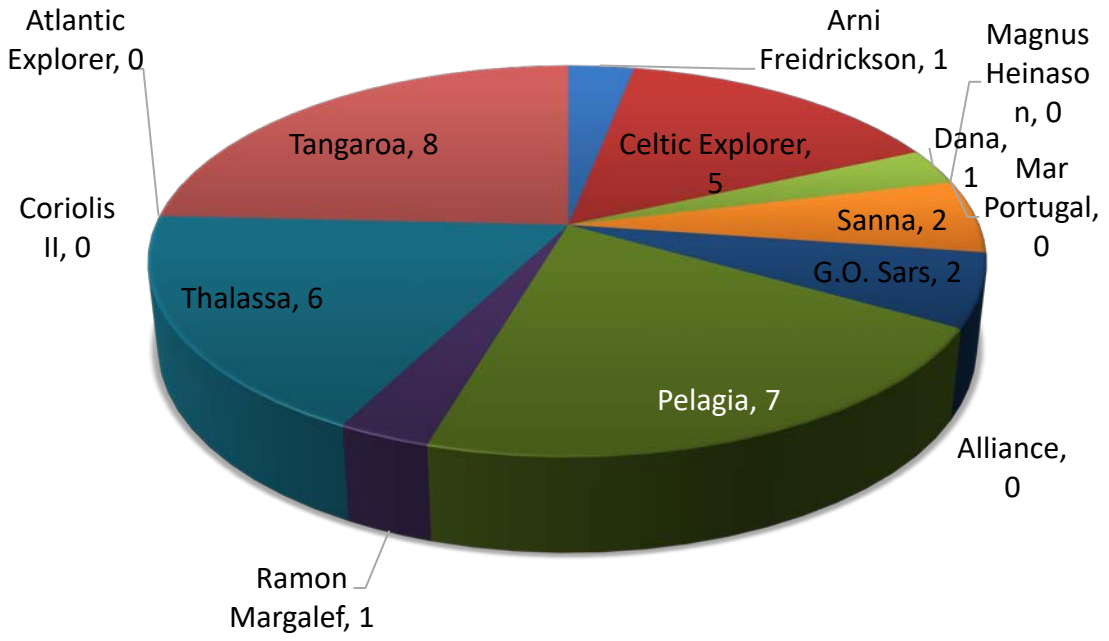

Figure 1. Research Vessels requested by the applicants for the "OCEANS" SEA Programme Call as 1st choice.

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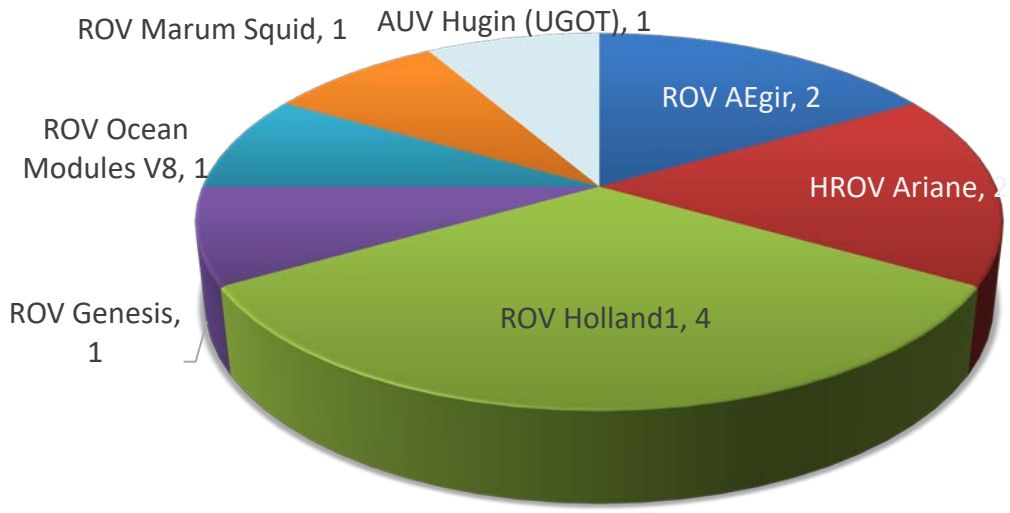

Figure 2. Marine Equipment requested by the OCEANS Call applicants as 1st choice. The offered ROV Luso, AUV Hugin (FFI) and Telepresence Unit were not requested by the applicants.

In general, most of the proponents requested access for Geology-related cruises (30%) (Figure 3).

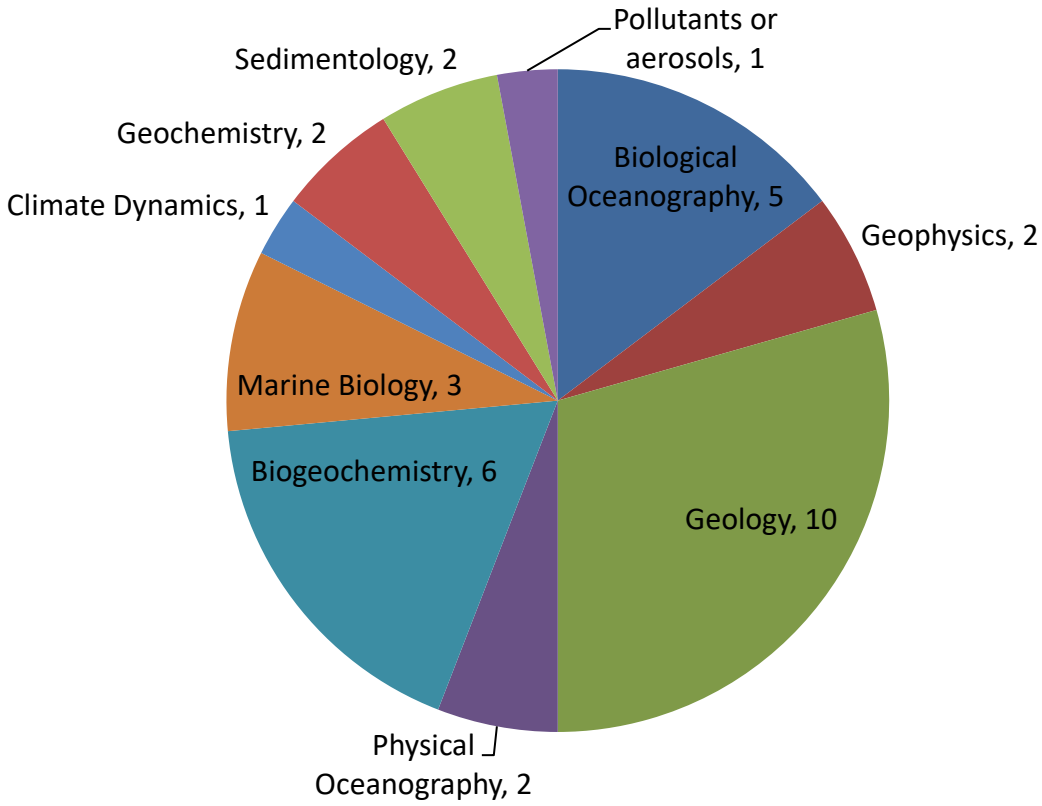

Figure 3: Main scientific disciplines of "OCEANS" Call applications

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During the proposal evaluation process, the EF+ Scientific Liaison Panel assigned each proposal to the following categories defined previously in the "Guidelines for Applicants":

- A - Recommended for scheduling
- B - Additional proposals
- C - Not recommended for scheduling

Based on the discussion and agreement of the SLP, all proposals recommended for scheduling ("A) were ranked as 1st choice (A1), 2nd choice (A2), …etc. for each of the infrastructures offered in the SEA Programme.

18 projects out of the 34 proposals requesting access on a Global/Ocean class research vessel or marine equipment, were evaluated as A – recommended for scheduling ("success rate" 53%). Nine proposals were not recommended for scheduling at all.

The placement of the proposals FOCUS-AUV, iMAR, VISIT, SENERGY, PORO-CLIM, Calypso, GShark2020, IOPD and GLICE by the OLP was straightforward. In all cases, the A1 and A2 ranked proposal could be accommodated on the vessel/marine equipment of first choice.

Proposal BENCHMARK requested RV Celtic Explorer and ROV Holland as first choice. As the proposed scientific programme was also feasible on board RV G.O. Sars, this project was implemented on G.O. Sars, together with ROV Ægir 6000.

Project TAIPro2021 received a high ranking for RV Thalassa (1st choice), and was suggested to be scheduled with highest priority on RV Ramon Margalef (2nd choice) as other projects requesting the RV Margalef were ranked lower and OASIS project also requesting the RV Thalassa was ranked A2. During further logistical evaluation, and consultation with the PI, TAIPro2021 was scheduled on the RV Belgica due to proximity to the work area during the time requested, technical capability and having a larger number of berths available.

Project OASIS requested RV Thalassa and ROV Marum Squid. The OLP initially scheduled the implementation on board RV Thalassa utilising the ROV Ariane but due to diplomatic clearance issues had to be cancelled and was subsequently implemented on RV Pelagia, together with ROV Max ROVER.

Most other proposals ranked lower than A1 and A2 could not be implemented due to resources available. In case of RV Tangaroa, an A2 ranked proposal could not be implemented, as the requested timing and port of mobilisation and demobilisation were logistically not feasible. Project HYDEE OBS(A3) was chosen and implemented instead, on board RV Tangaroa.

The Covid-19 pandemic had a significant impact on cruise scheduling particularly in 2020 and 2021. Most vessels were not operating at all for most of 2020 so many cruises scheduled to take place then were postponed until 2021 and 2022. Due to the resulting congestion in vessels' schedules it continued to have an impact on 2022 and even 2023 schedules. The SENERGY cruise was originally scheduled to take place in April 2020, was postponed to August 2020 then June 2021 and was again

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postponed to June 2022 when it was finally implemented. GSHARK was postponed from 2020 to 2021 and CALYPSO, GLICE and GRACE were all postponed from 2021 to 2022 due to Covid.

Only one cruise (FOCUS- AUV) utilising UGOT's AUV on the RV Tangaroa in New Zealand was implemented in 2020. Due to the level of Covid-19 travel restrictions in place at that time, there was an additional cost involved in implementing the project, as a result of AUV technicians having to spend a quarantine period in isolation on arrival in New Zealand and higher transportation coupled with travel costs.

Some travel restrictions imposed both nationally and organisationally remained in place in 2021 which resulted in reduced scientific numbers on-board cruises. Some cruises which did go ahead in 2021 (iMAR, PORO-CLIM) had a reduced number of scientists on board due to social distancing rules still being implemented by vessel operators on-board their vessels and travel restrictions in place in scientists' organisations.

During the logistical evaluations, the number of days offered to cruises were at times increased from the number of days requested. This was done for various reasons; to allow a contingency for weather downtime and mobilisation and demobilisation which were sometimes not included in proposal's work plans (SENERGY (days increased from five to eight), PORO-CLIM (days increased from twelve to thirteen), OASIS (increased from ten to twelve)). The number of days for the Focus-AUV project were increased from the fourteen requested to twenty-nine as this was the length of the cruise that the AUV was to be utilised on which was confirmed post proposal submission.

The number of days offered were at times decreased also for a variety of reasons; for budgetary purposes, if the number of days simply weren't available in the vessel's schedule or if the number of days requested exceeded the number of days the vessel was available to the project. (CALYPSO decreased from twenty-three to seventeen, BENCHMARK decreased from eleven to ten days, TAIPro21 decreased from fourteen to ten).

If the first or second choice vessel/equipment was not available or were not logistically feasible, every effort was made to implement the projects on alternative platforms. Vessels were deemed not logistically feasible if for example the work area was too far away from their home port or location at the time of the proposed cruise and would result in a long passage to the work area which was considered not value for money and detrimental to the environment. Research vessels in the area were therefore logistically evaluated and offered as an alternative if feasible.

Alternative vessels were also offered if many highly ranked proposals were received for one vessel and a similar vessel (size, location and capability) was not requested but available and capable of conducting the proposed work e.g. the RV G.O. Sars was offered instead of the RV Celtic Explorer for BENCHMARK cruise, the RV Belgica was offered instead of the RV Thalassa for TAIPro21.

2.2.2 REGIONAL Call

Table 2: REGIONAL Call proposals recommended for scheduling and ranking by the SLP, and decision by the OLP on their implementation.

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Vessel/infrastructure	Cruise ID	SLP Ranking	OLP evaluation / decision
Aegeo (HCMR, Greece)	006	**A2**	Implemented, RV Laura Bassi
Aegeo (HCMR, Greece)	009	**A3**	Other projects ranked higher, no additional budget
Aegeo (HCMR, Greece)	023	**A4**	Other projects ranked higher, no additional budget
Aegeo (HCMR, Greece)	024	**A1**	Implemented, RV Belgica, AUV Barabas
Aegeo (HCMR, Greece)	025	**A1**	Implemented
Angeles Alvarino (IEO, Spain)	002	**A1**	Implemented, RV Aegeo + ROV Max Rover + AUV Barabas
Aranda (SYKE, Finland)	007	**A**	Implemented
Atlantic Explorer (BIOS, Bermuda)	027	**A**	Implemented
AUV VLIZ	026	**A**	Logistically not feasible
Laura Bassi (OGS, Italy)	015	**A1**	Cancelled due to COVID
Laura Bassi (OGS, Italy)	021	**A2**	Cancelled due to COVID
Laura Bassi (OGS, Italy)	022	**A3**	Other projects ranked higher, no additional budget
Mare Nigrum (GEOCOMAR, Romania)	005	**A1**	Cancelled due to COVID
Mare Nigrum (GEOCOMAR, Romania)	008	**A1**	Implemented on RV TUBITAK MARMARA
Sarmiento de Gamboa (CSIC, Spain)	004	**A1**	Implemented
SOCIB (SOCIB, Spain)	014	**A1**	Implemented
Sarmiento de Gamboa (CSIC, Spain)	019	**A2**	Implemented, RV Ramon Margalef

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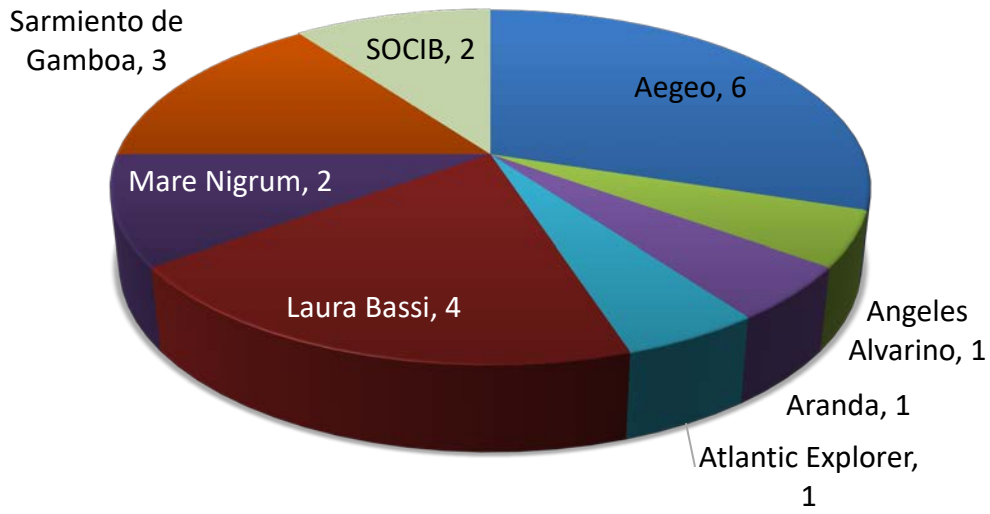

Figure 4: Research Vessels requested by the applicants for the "REGIONAL" SEA Programme Call as 1st choice.

Among the Marine Equipment offered within the "REGIONAL" Call, AUV VLIZ was requested 3 times, AUV ASTERx or IDEFx two times, and ROV Ocean Modules two times.

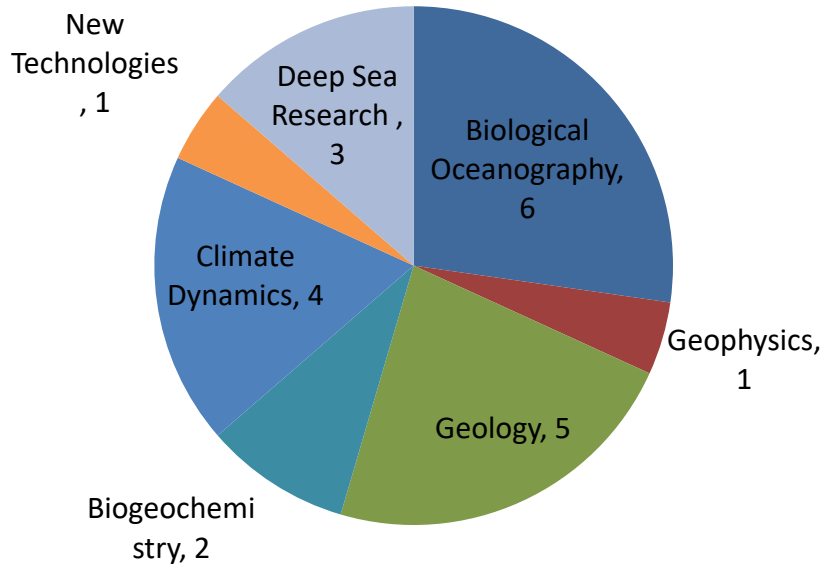

Figure 5: Main scientific disciplines of "REGIONAL" Call applications

In the REGIONAL Call, proposals MYRTOON, CABLE, FIGURE, PHYCOB, SINES and GRASSMAP were implemented on board the research vessel they had also applied for as first choice.

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Proposal POSEIDON (006) was implemented on board RV Laura Bassi instead of RV Aegeo as the RV Aegeo had two Eurofleets+ cruises already scheduled. A2 and A3 ranked proposals were logistically re-evaluated in late 2022 when budget became available due to the cancellation of two Antarctic cruises on the RV Laura Bassi. The RV Laura Bassi had the capability and was available near the POSEIDON work area at the requested time. The number of days offered was reduced to ten from the twelve days requested to match the resources available.

Proposal GRACE was implemented on board RV Belgica, with AUV Barabas (VLIZ). Originally, it requested time on board RV Aegeo, together with the AUV Barabas (VLIZ) but the work area is not in the RV Aegeo's normal area of operation and would involve a long passage to and from the work area. The RV Belgica on the other hand spends a significant amount of time working in that area of the Mediterranean each year and was therefore a better fit.

Project ERODOTO originally requested the RV Angeles Alvarino, AUV Barabas and the ROV Ocean Modules V8. The RV Angeles Alvarino does not operate in the region requested and would involve a long passage to and from the work area which would use up most of the requested days. Therefore, the RV Aegeo was logistically evaluated and was confirmed to be available. During further logistical analysis it was confirmed that the ROV Ocean Modules V8 was not interoperable with the RV Aegeo and the project was implemented on the RV Aegeo along with the ROV Max Rover and the VLIZ AUV Barabas. The number of days offered was increased from the ten requested to twelve as very little mobilisation or demobilisation time was factored into the work plan.

Proposal Carbo-Acid (A2) was scheduled on RV Ramon Margalef (2nd choice) as the RV Sarmiento de Gamboa (1st choice) was not available at the requested time.

Proposal 026 SWEETCORAL (A1) did not pass the logistical evaluation. The AUV VLIZ (Barabas) was originally requested for 5 days' work in the Gulf of Mexico. The AUV operator looked at the cost and the technical aspect of implementing the cruise and consulted with the PI regarding the cruise objectives. The VLIZ AUV operator had a number of concerns and declined to implement the project. Main concerns were in relation to the capability of the AUV to undertake the applicant's scientific objectives, the interoperability of the AUV with the proposed local vessels, the cost of transporting the AUV to Mexico, and the fact that the AUV would be held in Customs for a period meaning it would be unavailable for other work for a substantial period. Other AUV operators were then consulted and IFREMER's two AUVs (AUV ASTERx & IDEFx) were reviewed for suitability as they were available. On reviewing the specifications and photos of the vessels proposed to undertake the work, IFREMER's AUV Operators agreed that the vessels were not suitable for deploying their AUVs.

Two cruises and a Co-PI project (ROSEBUD, ICON & IDEA) scheduled on the RV Laura Bassi Antarctic expedition in 2023 were cancelled in summer 2022. The cruises had already been postponed in 2022 due to Covid but the vessel operators (OGS) were hopeful they could be implemented in 2023. Unfortunately, the Eurofleets+ Coordinator was formally informed in June 2022 that due to congested schedules caused by Covid-19 and communication from the Italian Ministry in charge of the Antarctic Expeditions to give priority to Italian projects in the 2022-2023 expedition, the Eurofleets+ cruises could not be accommodated. As the Eurofleets+ project ends in October 2023, there was no further option to re-schedule.

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SLOGARO II cruise scheduled to take place on the RV Mare Nigrum in the Black Sea was postponed twice in 2021 and again in 2022 due to Covid-19 and then eventually cancelled due to the work area's proximity to the war in the Ukraine and the likelihood that the situation there would not improve within the project lifetime.

2.2.3 Running Calls

In total, 13 proposals were submitted to the two EF+ running calls, 11 of them to the Co-PI call, 2 to the RTA call.

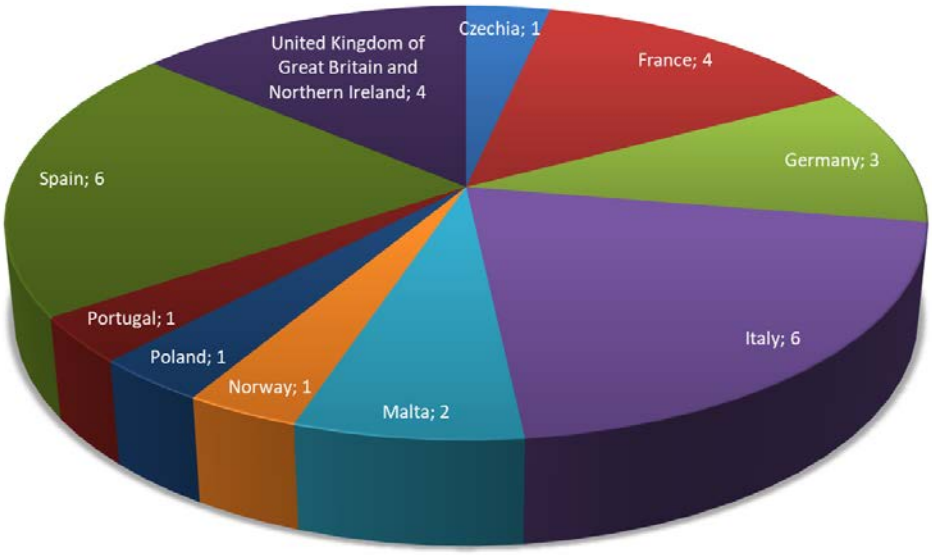

Figure 6: Overview of the nationalities of the PIs and project partners who have applied for a Running Call project.

All running call proposals but one Co-PI project were recommended for implementation by the SLP (see Table 3).

Table 3: Running Call proposals recommended for scheduling and ranking by the SLP, and decision by the OLP on their implementation.

Vessel/infrastructure	Cruise ID	SLP decision	OLP evaluation / decision
RV Aegeo	028	Recommended for implementation	Logistically not feasible
RV Aranda	021 DOMUSe	Recommended for implementation	Implemented on RV Aranda (on CABLE cruise)

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RV Atlantic Explorer	026 CARING	Recommended for implementation	Implemented on RV Atlantic Explorer (on FIGURE cruise)
RV Belgica	014 SEAQUAKE	Recommended for implementation	Implemented on RV Belgica (on GRACE cruise)
RV Belgica	023	Recommended for implementation	Logistically not feasible
RV Belgica	024	Recommended for implementation	Logistically not feasible
RV Laura Bassi	020	Recommended for implementation	Logistically not feasible
RV Sanna	007	Recommended for implementation	Logistically not feasible
RV Sarmiento de Gamboa	019	Not recommended for implementation	Logistically not feasible
RV SOCIB	010	Recommended for implementation	Logistically not feasible
RV Thalassa	018 UNSEEN	Recommended for implementation	Implemented on RV Pelagia (on OASIS cruise)
RV Thalassa	013 (RTA) IsoMed	Recommended for implementation	Implemented on RV Belgica (on TalPro2022 cruise)
Not specified by applicant	016 (RTA)	Recommended for implementation	Logistically not feasible

Among the ten positively evaluated Co-PI projects, four were implemented together with the SEA Programme cruises CABLE, GRACE, FIGURE and OASIS. The RTA project IsoMed was performed as part of the TalPro2022 cruise.

The other six Co-PI projects and one of the RTA projects could not be implemented together with scheduled SEA Programme cruises. Two Co-PI projects (023 & 024) both requested to join the TALPro2022 cruise on the RV Belgica, on logistical analysis it was confirmed that there was no room in the vessel's schedule to extend the cruise by even one day in order to implement the Co-PI project.

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The only potential SEA cruise that the Co-PI project No. 019 could be implemented on was ERODOTO and unfortunately the vessel was already full to capacity not only with the ERODOTO scientific team but with AUV and ROV operators involved in the cruise.

The Co-PI project 007 requested a berth alongside either the GLICE or IOPD cruises on the RV Sanna, however the work area in question was not in the RV Sanna's normal area of operation and space on board was also an issue. The 010 Co-PI proposal did not pass the logistical review as after in-depth technical assessment by vessel's technicians it was concluded that the vessel/equipment did not have the capacity to achieve the proposal.

Co-PI project 020 was scheduled alongside the ICON SEA cruise on the RV Laura Bassi but unfortunately both were cancelled due to schedule congestion on the RV Laura Bassi's Antarctic expedition caused by Covid-19.

It was not possible to implement the RTA project No. 016 as Eurofleets+ vessels were either not in the relevant work area or did not have the technical capability.

3 Summary of the TNA carried out in EUROFLEETS+

The EUROFLEETS+ system to provide ship-time on a big suite of European Research Vessels has proven to be very successful. Altogether, fifty-six proposals for ship-time on Ocean and Regional Research Vessels and Marine Equipment were submitted in two separate SEA-Programme calls ("OCEANS", "REGIONAL"), reflecting the high demand for marine research cruises in Europe. Similarly, the high interest of Early Career Researchers to get experience as a cruise PI was mirrored in the eleven proposals received for the Co-PI programme. The RTA programme only received two applications. One reason for this could be that it was not sufficiently clear to applicants which experiments or samples they could receive from which SEA Programme cruises.

Thirteen cruises of the "OCEANS" Call and ten cruises of the "REGIONAL" Call have been successfully carried out. The operational areas of the research vessels that were applied for in the SEA Programme Calls are given in Figure 6. The majority of the cruises took place on vessels operating in the Mediterranean, the Atlantic and Black Sea, followed by the North Atlantic and the Pacific/Southern Ocean.

65% of the cruise reports were delivered in time. The others were mostly delayed by a few days or weeks. Only two of the cruise reports were delayed for several months, due to data embargo or delayed processing of the cruise data.

The Covid-19 pandemic was responsible for many cruises being postponed and rescheduled much later than planned and directly or indirectly for 3 scheduled cruises being cancelled entirely. It resulted in the Eurofleets+ project being extended by nine months to enable a number of cruises (five) to be implemented in 2023. The pandemic also prevented the planned number of scientists from participating during many cruises and increased logistical costs both within the project and costs covered directly by the scientists. It also prevented some Co-PI opportunities due to social distancing measures in place on-board vessels.

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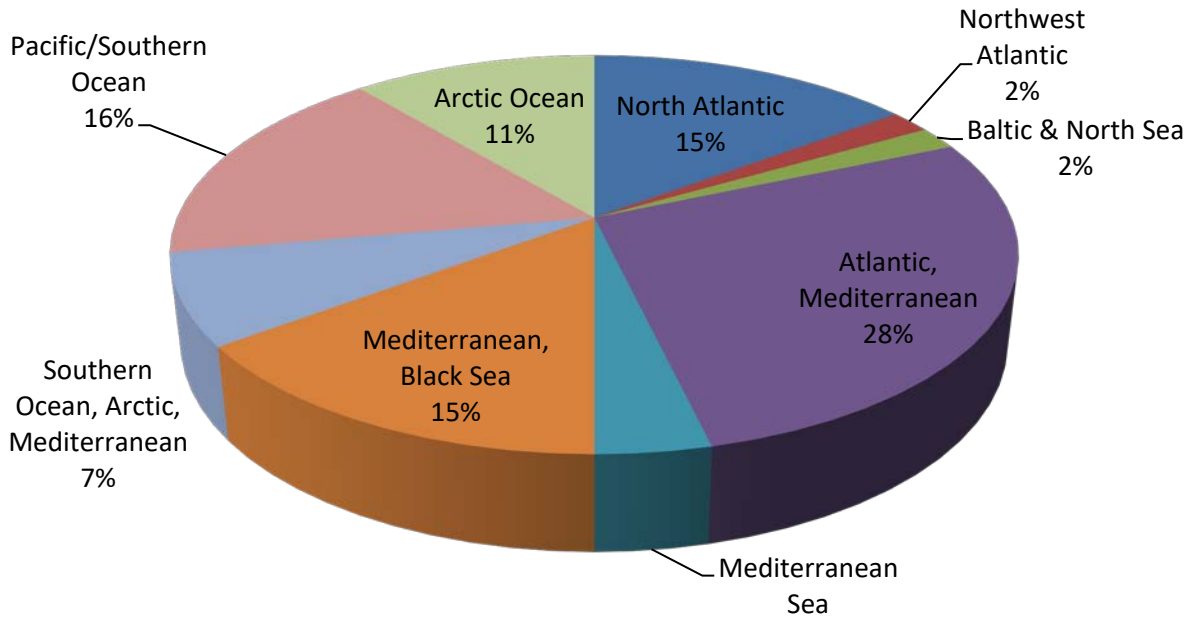

Figure 6: Operational areas of the requested Research Vessels in the EUROFLEETS+ SEA Programme.

3.2.1 Cruise participants

Altogether, 166 project partners, including Principal Investigators, were funded through the EUROFLEETS+ SEA Programme. The Principal Investigators of the cruises came from all over Europe and international collaborators from the United States of America, Canada, New Zealand, Australia etc. have been involved in the cruises as well (Figure 7). Most of the cruise participants came from Spain, followed by Portugal and United Kingdom of Great Britain and Northern Ireland (Figure 7).

While the OCEANS Call funded three Early Career PIs, the 2nd SEA Programme Call, the REGIONAL Call, funded as many as six Early Career PIs (Figure 8). This reflected that the particularly the REGIONAL call infrastructures were of interest for ECRs, and the guidance given for the applications helped also ECRs to successfully apply for ship time.

The cruise reports of all the EUROFLEETS+ cruises carried out showed that a total of 130 students took part in the cruises and received training. Women made up the larger proportion of the students trained: 73 were female, 57 male. It should be noted that these were not always financed by EUROFLEETS+. The high number of students who received training through ship time provided by EUROFLEETS+ can be considered a complete success for the training of future scientists.

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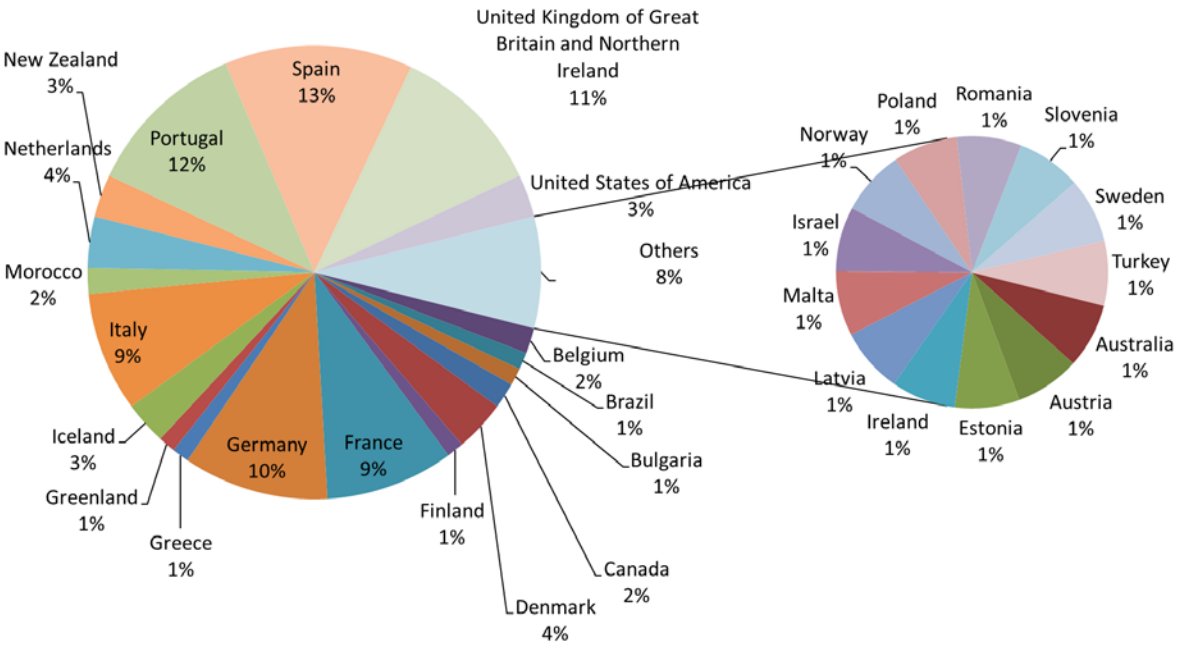

Figure 7: Overview on the nationalities of the participants of the EUROFLEETs cruises.

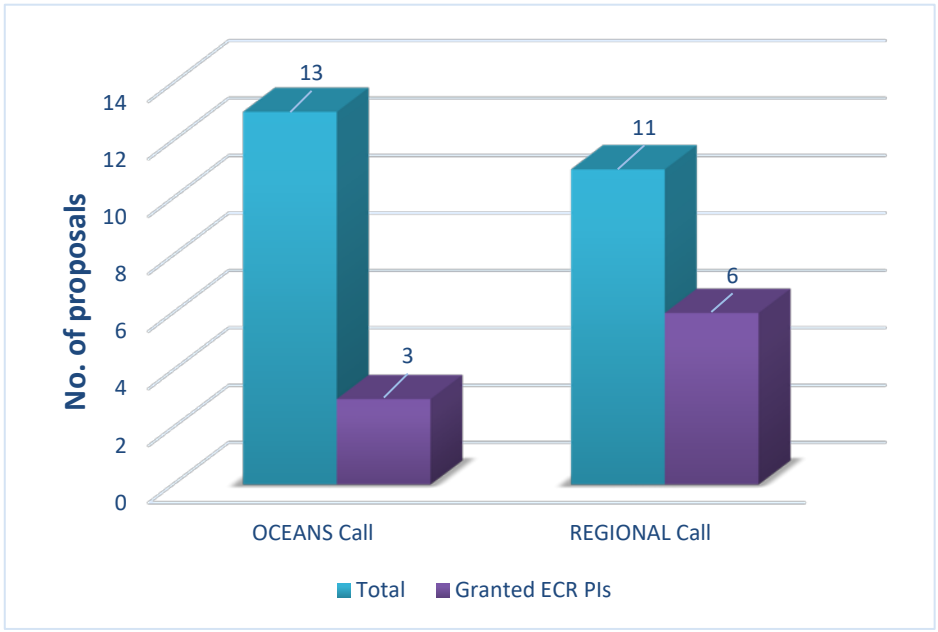

Figure 8: Number of Early Career Researcher Principal Investigators funded through the SEA Programme.

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4 Infrastructure operator experience

For all the operators, the information in the proposals was sufficient to enable all aspects of campaign preparation both from an operational point of view (logistics, personnel needs) and from the point of view of the necessary documentation. The communication with the PI was fluid and good at all times.

There was additional administrative effort required for some infrastructure operators due to Covid-19, for cruises scheduled in 2021 and early 2022 in particular. The travel and social distancing restrictions and testing/vaccine requirements made organising logistics for international cruises much more challenging so operators' efforts in implementing so many Eurofleets+ cruises successfully should be recognised.

Some operators who provided transnational access (in 2023 especially) expressed concerns that their daily rate had increased significantly from the daily 'unit cost' being charged to Eurofleets+ as the costs used to calculate the unit cost are from 2016-2017 accounts and most costs, but fuel in particular has increased substantially since then.

5 Lessons learned

A series of lessons learned during the preparation and development of the campaigns are summarized below:

1.- COVID-19 Pandemic

Despite the Covid-19 pandemic causing a lot of disruption to vessels' schedules, a high number of proposals were implemented. Some of the issues caused by the pandemic have already been described but in general terms, much additional effort and planning was required in particular as travel restrictions and social distancing requirements varied from country to country, vessel to vessel and from month to month at times.

Keeping communication lines open between the vessel and equipment operators, Cruise PIs, science teams and project coordinator throughout the period was key. It was evident where communication was strong between the science teams and the infrastructure operators that cruise planning and logistics management was more efficient and encountered less problems. Flexibility and reacting to last minute changes was also key in implementing the cruises successfully during this time.

2. - Estimated Access Costs

While most vessel and equipment operators reported their access costs on the basis of unit costs, some access costs were based on estimated actual costs. This made budgeting the Transnational Access activity quite difficult. It was made even more difficult due to the increase in fuel, shipment and transportation costs as a result of Covid-19 and the war in Ukraine. This resulted in the actual costs reported being much higher than estimated. The project extension of 9 months also contributed to higher costs as the timeframe from when the costs were estimated (2018) to when the cruises actually took place was longer than expected.

The uncertainty regarding the budget required to implement cruises when infrastructures were reporting actual costs sometimes delayed confirming with PIs (of A2 and A3 ranked proposals in

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particular) that their proposals could be implemented as the actual costs of implemented cruises were still unavailable. It was important that PIs were contacted regularly and kept informed and updated of the situation. While it is difficult for operators of newly acquired infrastructure in particular to provide access on the basis of unit costs, it should be endeavored as far as possible.

3. - Diplomatic Clearance

Research Vessels conducting research in another country's waters must apply for diplomatic clearance or Marine Scientific Research(MSR) permits generally 6 months before the cruise. There were a number of issues encountered in relation to obtaining permits. Clearance was refused twice for one cruise (OASIS) and a vast portion of the work area was in the other jurisdiction. The cruise was cancelled at the last minute the first time and a contingency plan in Spanish waters was put in place for the rescheduled cruise a year later. Despite the application form being submitted well in advance of the required six months' notice the second time, clearance was still refused.

Diplomatic clearance to one country's waters was also refused to the TalPro2022 cruise and ERODOTO cruise was postponed by a couple of weeks due to the MSR application form not being submitted on time. Some jurisdictions have ongoing disputes over boundary lines and some countries' application process requires a lot of additional information which is time consuming and unexpected.

It's clear that even though six months' notice is the amount of time advised by United Nations Convention on the Law of the Sea (UNCLOS), in reality much longer is needed to prepare the MSR application forms for some countries. Only three months is required by other countries. Therefore, preparations for the diplomatic clearance should begin very early in the cruise planning process in particular when there are multiple jurisdictions which was the case for some Eurofleets+ cruises. Contingency plans should be in place in case the MSR permit is refused and the risk with disputed maritime borders recognized and highlighted to all involved. MSR applications are the responsibility of the Research Vessel Operator and the Principal Investigator of each individual cruise.

4.- Data management

At the time of the submission of this deliverable, most cruises data providers had started transferring their collected datasets. The data still outstanding is mostly laboratory analysis or data processing. Reference Data Centers (RDCs) are following-up the data submissions and regularly enquire about pending datasets. RDCs are also in contact with PIs to get proper data and metadata to proceed to data ingestion. However, communication can take time, many emails are exchanged to get the required information. Submission of data to Phase 2 needs a significant amount of work for formatting and harmonizing the data to be published on Sea Data Net (SDN) CDIs service. As the project comes to an end, the challenge will be to process most of the remaining datasets by the end of the project. For that reason, the cruise PIs have been contacted to fasten their samples and data analyses and to make their data available as soon as possible. It is requested that funded cruises submit all their data to the project RDCs by the end of the project. As the embargo on many datasets extends beyond the end of the project, RDCs have started asking data providers if their embargo can end sooner. If not, the embargoed data will need to be followed up beyond the end of the project to convert the restricted access licences to an open licence.

5. Cruise Summary Reports.

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Cruise Summary Reports (CSRs) are the usual means for reporting on cruises or field experiments at sea. They provide metadata for scientists, data managers and programme managers to find information on who has collected what, when and where.

CSR submission progressed well during the project. Despite the migration of the CSR submission infrastructure to a new instance, all CSRs for 2021 and 2022 were submitted. In several cases, the RDCs took over the submission of the CSR on behalf of the PIs to facilitate their work. The submission of the CSRs for 2023 had been somewhat delayed, but the RDCs were in good contact with the PIs to request submission and provide support as needed.

The RDCs kept track of the submissions and had to contact the PIs if they were not progressing on time. In case of late submission, reminders were sent and support was offered. In several cases, the delays were due to confusion between the CSR and the Cruise Report. The RDCs took the time to explain the difference and further support the submission. In case of difficulties with the submission of the CSR, PIs were assisted by their assigned RDCs or the sdn User Desk.

Note: the cruise data management follow-up is reported in D4.12 *Second data management follow-up report for funded cruises*. For more detailed description on the data management status cruise by cruise, progress, difficulties and lessons learned, refer to the D4.12 report.

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6 Annex: Infrastructures, Scientific Disciplines and Areas of Operation of the EUROFLEETS+ cruises

Vessel/infrastructure	Cruise Name	No. of EF+ Funded Days	Scientific disciplines	Geographical Area	Dates
UGOT Hugin AUV	Focus-AUV	29	Geology, Marine Biology, Sedimentology	Kaikōura Canyon, New Zealand	30 September – 29 October 2020
Celtic Explorer	PORO-CLIM	13	Climate dynamics, Geophysics, Sedimentology, Training	NE Atlantic (S Rockall Plateau; Eriador Seamount; Porcupine Basin & Ridge; East Thulean Rise)	05 - 30 May 2021
Pelagia	iMAR	17	Biological Oceanography, Geology, New technologies	Mid-Atlantic Ridge inside the Portuguese EEZ of the Azores	18 May – 3 June 2021
DANA	GSHARK	7	Marine Biology	Bredefjord, Greenland. Easily accessible (embark/disembark) from Narsaq, Greenland	03 July - 12 August 2021
GO Sars_ROV Aegir	BENCHMARK	10	Marine Biology, Physical Oceanography	Denmark Strait, between 64 and 68.5°N	01-10 August 2021
Tubitak Marmara	PHYCOB	7	Biological Oceanography	Western Black Sea	9 – 15 September 2021
Aegeo	MYRTOON	10	Climate dynamics	Eastern Mediterranean, SW Aegean Sea, Myrtoon Basin	29 September – 8 October 2021
SOCIB	GRASSMAP	7	New technologies, Marine Biology	Mallorca and Cabrera islands	14 – 20 September 2021

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Pelagia	CALYPSO	17	Physical Oceanography	Alboran or Balearic sea	16 February – 10 March 2022
Aranda	CABLE	8	Biological Oceanography	Gulf of Finland, Baltic Proper	22-29 April & 10-13th October 2022
Aranda	DOMUSe (Co-PI on CABLE)	1	Biogeochemistry, biological oceanography	Gotland Deep Baltic Sea	14th October 2022
Belgica_AUV Barabas	GRACE	11	Geology Geophysics Physical Oceanography Sedimentology	Ceuta Canyon and adjacent areas (West Moroccan Mediterranean margin)	28 April - 11 May 2022
Belgica_AUV Barabas	SEAQUAKE (Co-PI on GRACE)	3	Geology, Geophysics, New Technologies, Sedimentology	Ceuta Canyon and adjacent areas (West Moroccan Mediterranean margin)	During GRACE cruise
Belgica	TAIPro2022	10	Physical Oceanography	Algero-Provencal Basin, Sicily Channel, Tyrrhenian Sea, Ligurian Sea	17-26 May 2022
Belgica	IsoMed (RTA TAIPro2022)	RTA	Biological Oceanography	Tyrrhenian Sea	17-26 May 2022
Arni Friedrikson	SENERGY	8	Marine Biology	North Western Iceland	18 - 25 June 2022
Sanna	IOPD	12	Biogeochemistry, Climate dynamics, New technologies, Marine Biology Polar Biology, Training	Godhabfjord, Ameralik fjord and the shelf area connecting these fjords in Nuuk, Greenland	28 June - 10 July 2022
Atlantic Explorer	FIGURE	8	Biological Oceanography, Biogeochemistry Microbiology Physical Oceanography	Gulf Stream (NW Atlantic)	21-30 July 2022
Atlantic Explorer	CARING (Co-PI on FIGURE)	2	Biological Oceanography, Biogeochemistry, Microbiology, Physical Oceanography	Gulf Stream (NW Atlantic)	DURING FIGURE cruise

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Ramon Margalef	CARBO-ACID	10	Biogeochemistry, Marine Chemistry, Physical Oceanography	Iberian margin	3-12 August 2022
Sanna	GLICE	14	Biological Oceanography, Biogeochemistry, Physical Oceanography	Disco Bay, West Greenland coastline	10-24 August 2022
Sarmiento de Gamboa	SINES	9	Biogeochemistry	Northeast Atlantic, Western Iberian Margin	11-20 September 2022
RV Tangaroa	HYDEE-OBS	8	Geophysics	Hikurangi Margin, North Island, New Zealand	21 - 30 March 2023
RV Tangaroa	VISIT	12	Geophysics	East coast of North Island, New Zealand	31 March - 11 April 2023
RV Pelagia_ROV MAX Rover	OASIS	12	Geology New technologies, Marine Biology, Physical Oceanography	SE Alboran Sea (W Mediterranean)	26 March - 7 April 2023
RV Pelagia_ROV MAX Rover	UNSEEN (Co-PI on OASIS cruise)	1	Biological Oceanography, Pollutants or aerosols, Sedimentology	SE Alboran Sea (W Mediterranean)	During OASIS cruise
RV Laura Bassi	POSEIDON	10	Geophysics	Ionian Islands	13 May - 5 June 2023
RV Aegeo_ROV Max Rover_AUV Barabas	ERODOTO	12	Deep Sea Research, Geology, Geophysics	Squillace Canyon, Italy	9 -30 June 2023

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