



D16.2

Synthesis report on staff exchange and how this service can be sustained by RIs?

WORK PACKAGE 16 – Staff Exchange

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TERMINOLOGY

A complete project glossary is provided online here:

<https://envriplus.manageprojects.com/s/text-documents/LFCMXHHCwS5hh>

PROJECT SUMMARY

ENVRIplus is a Horizon 2020 project bringing together Environmental and Earth System Research Infrastructures, projects and networks together with technical specialist partners to create a more coherent, interdisciplinary and interoperable cluster of Environmental Research Infrastructures across Europe. It is driven by three overarching goals: 1) promoting cross-fertilization between infrastructures, 2) implementing innovative concepts and devices across RIs, and 3) facilitating research and innovation in the field of environment for an increasing number of users outside the RIs.

ENVRIplus aligns its activities to a core strategic plan where sharing multi-disciplinary expertise will be most effective. The project aims to improve Earth observation monitoring systems and strategies, including actions to improve harmonization and innovation, and generate common solutions to many shared information technology and data related challenges. It also seeks to harmonize policies for access and provide strategies for knowledge transfer amongst RIs. ENVRIplus develops guidelines to enhance transdisciplinary use of data and data-products supported by applied use-cases involving RIs from different domains. The project coordinates actions to improve communication and cooperation, addressing Environmental RIs at all levels, from management to end-users, implementing RI-staff exchange programs, generating material for RI personnel, and proposing common strategic developments and actions for enhancing services to users and evaluating the socio-economic impacts.

ENVRIplus is expected to facilitate structuration and improve quality of services offered both within single RIs and at the pan-RI level. It promotes efficient and multi-disciplinary research



offering new opportunities to users, new tools to RI managers and new communication strategies for environmental RI communities. The resulting solutions, services and other project outcomes are made available to all environmental RI initiatives, thus contributing to the development of a coherent European RI ecosystem.

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Synthesis report on staff exchange and how this service can be sustained by RIs

INTRODUCTION

Since knowledge is recognised as Europe's main driving force for innovation (H2020), there is a growing demand to share this knowledge among European researchers. Therefore, during the last years several instruments have been provided by the European Commission to foster mobility of researchers within the European research area such as the EURAXESS or the MSCA mobility funds.

Mobility is also an important issue for the institutional back bones for high level research in Europe, the European Research Infrastructures (RI). Research Infrastructure staff usually are highly specialized researchers, technicians and managers who represent rare and precious resources for RIs in particular during the construction and early operational phases of a RI. These persons provide unique skills and are capable to, e.g., handle and analyse large data sets, to work in a highly interdisciplinary research environment, to design, manage and operate complex technological infrastructure architectures and to develop and maintain new and innovative



scientific instrumentation. Further, RI staff usually is able to carry out this work under difficult conditions, e.g. during field work and infrastructure set up at remote stations occasionally under harsh and hostile environmental conditions.

Consequently, human capital has been recognized as the most important resource by the ESFRI Long-term Sustainability Working Group¹ which states that the “*dependence of the performance of RIs on these people with the right skills and experience throughout their lifecycle should not be left to chance so a set of measures are recommended to mitigate this risk*”.

ENVRIplus aimed to facilitate the exchange of knowledge among staff working in RIs or staff related to the implementation of new RIs. The project has implemented an Exchange of Personnel (EoP) programme to enhance cross-RI mobility of involved RI staff, to disseminate the know-how of RI specialists, to advance ad-hoc projects by having the chance to meet and discuss with relevant RI experts and to share practical hands-on experiences on common RI operation procedures. The exchange was planned to take the form of short stays in the RI, organized either on a unilateral (1 person from one RI goes to another RI), bilateral (between two RIs involving 1 person from each RI), or involving more than two institutes and related staff. The supported principal activities should focus on cross-fertilisation of ideas and experiences of RI staff and promote knowledge transfer of new technologies, best practices, protocols, approaches and policies of RIs instead of data acquisition or fundamental research.

In a broader, more figurative sense, EoP is comparable to a student exchange with respect to its European dimension, although the latter is more about acquiring language skills and getting to know another culture, while the former is about the successful functioning of a research institution and the content of the research as such. It is therefore safe to assume that the benefits in question will be felt at the human level, from employee to employee, as well as between institutions.

This document gives an overview on staff exchange activities supported by the ENVRIplus EoP programme, their results and associated costs. It further aims to identify sustainability concepts allowing the continuation of staff exchange activities beyond the duration of the ENVRIplus project.

Staff exchange synthesis report

Managing the staff exchange

To manage the ENVRIplus EoP programme, we have provided dedicated application templates as well as a clear set of eligibility criteria for applicants. These have been described in detail in deliverable D16.1.

Both the application templates as well as the eligibility criteria have been published at the ENVRIplus website² and have been circulated by email among project partners.

In general, the application procedure aimed to be clear, simple and hurdle-free requiring only a minimal set of information about the planned activities of an EoP. The application template (Fig. 1) had to be filled with some general information of the staff to be exchanged as well as about the sending and hosting institutions and their relation to the involved RIs. An estimate of the costs as well as the planned duration of the stay had to be provided. Further, the planned activity

¹ ESFRI Scripta Volume II: Long-Term Sustainability of Research Infrastructures, https://www.esfri.eu/sites/default/files/u4/ESFRI_SCRIPTA_TWO_PAGES_19102017_3.pdf

² <http://www.envriplus.eu/2017/05/18/envriplus-call-for-staff-exchange-is-open/>



had to be shortly described with respect to planned methodology, implementation and impact. Further, the available access options for participant to the involved RIs physical or data infrastructures had to be clarified.

ENVRiplus Exchange of Personnel programme		
Application template*		
1. Research Infrastructures involved & supervisor / person responsible:		
1. FixO3 and EMSO (IFREMER) Nadine Lanteri, responsible of EMSO France web site and dataflow for FixO3 Service Activity EMSO Azores, EMSO Nice. nadine.lanteri@ifremer.fr	2. EPOS (CNRS/IPGP) Wayne Crawford, responsible for EPOS Task 8.4 (Access to seismological waveforms) relative to ocean bottom seismometers (OBS) crawford@ipgp.fr	3.
2. Names of all applicants, position, status (permanent / non-permanent, post doc, technician...), short CV:		
1. Cecile Parulisot Senior engineer in geophysics data management Permanent Host team at Ifremer Brest and organization of the stay, Nadine Lanteri, responsible of EMSO France web site and dataflow for FixO3 Service Activity EMSO Azores, EMSO Nice.	2. Manadou Lamine Fall database engineer / (ENVRiplus & EPOS contracts at IPGP-CNRS) Non permanent 2015: Geophysicist and Geostatistician (Estimages, Paris) 2015: Masters Petroleum Geology & Reservoir Engineering (ENSG Nancy, France) 2013: Masters Geophysics (EOST Strasbourg, France)	3.
3. Date / Duration of each EoP:		
1. Two (2) days in Paris	2. One week in Brest	3.
4. Cost estimation + cost items for each EoP:		
1. Cost estimation 1450€ - 800€ Voyage - 200€ On site transportation - 150€ Per diem x 3 days	Cost estimation 1520 € - 600€ Voyage - 200€ On site transportation - 120€ Per diem x 6 days	3.
5. Description of planned activities, their impact on the cross-fertilization, planned methodology and implementation = WPs involved: Integration of seismological data (EPOS WPs) into EMSO France website/database (currently environmental, biological and chemical data). Definition of common metadata format and data flow. Discussion of formats/integration for pressure and temperature data. This exchange will contribute through a better understanding of existing dataflows inside EPOS, FixO3 and EMSO to the state of the art of European benthic stations to promote a "new generation of benthic station for seismic measurement" (Task 4.3 of ENVRiPLUS, in which both IFREMER and CNRS-IPGP are involved).		
6. Access options to RI data infrastructure and logistic, technical support offered by involved RI: EMSO and FixO3 data management infrastructure (servers), emso.fr.org and SEANOE Seismic sensor prototype and laboratory, testing facilities, electronic platforms (At IFREMER Brest)		
Reimbursement		
The applicants shall be reimbursed according to the applicable rules and regulations of their respective home institutions. The applicant is responsible for applying for and accounting the EoP at his or her institution of employment. The institution shall reimburse the applicant according to applicable national rules and regulations.		
The applicable national regulations shall be the basis for the cost estimation, which is part of the EoP application to the ENVRiplus Executive Board. If required, the EB (or UniHB) will provide a letter of confirmation on the reimbursement of the EoPs costs based on the estimated details on the application, if the EoP is approved.		
After successfully completing the EoP the employing institution shall be reimbursed by the UniHB invoice by providing a list of the total costs of the EoP and a formal invoice to the UniHB.		
Requirement: The employing institution of the applicant is either partner of ENVRiplus or a verifiable associated RI. If exceptionally the applicant is employed by an external institution, the hosting institution shall reimburse the applicant according to applicable national law and charge the costs to the UniHB.		

Fig. 1 A sample application for the ENVRiplus EoP programme

These applications had to be submitted by email to the leader of WP16.1 who performed an initial completeness and consistency check and helped the applicants to complete the templates. Finalized applications were then forwarded to the ENVRiplus Executive Board (EB) which nominated a group of internal reviewers who were tasked to provide their recommendations to the EB. The final approval or rejection of applications was met by the EB and communicated to the applicants.

The first call for applications for the ENVRiplus EoP programme was published on the ENVRiplus website during February 2016 and finalized by the end of August 2016.

Since the response to the first call was below our expectations, several measures were undertaken to make the EoP more attractive. In summary, the following improvements for the modalities of the EoP scheme could be reached:

1. An amendment to the ENVRiplus DoA for WP16 was prepared and approved by the EC which allowed applications from non-RI beneficiaries as well as from organizations outside the ENVRiplus partnership that have a clear and established relationship with the participating RI's.
2. The EoP programme no longer preferred bi- or trilateral exchanges but also allowed to apply for several kinds of knowledge sharing activities such as boot camps or workshops which allowed now to support T16.1 activities and related best practices workshops.
3. The deadlines for application submissions were removed. Instead, applications were reviewed by EB members immediately after submission, which significantly improved and accelerated the decision process.

With these new rules, the second call for applications for the ENVRiplus EoP programme was launched in March 2017 and published on the project web page. The second call for applications



closed in March 2019 and was thus kept open almost until the end of the ENVRIplus project.

A brief overview on staff exchange activities

Activities performed during the first call

During the first call, four staff exchange proposals could be funded, namely:

Drone Workshop: This activity focussed on the exchange of technical and theoretical experiences regarding unmanned vehicles or drones. Participants from **JERICO**, **GROOM** and **ANAEE** met in Livorno, Italy, organized a technical workshop hosted by ANAEE and took the opportunity to perform hands-on work on various drone types brought to the meeting by some of the participants. Several marine drones were tested and compared on-site in a nearby harbour basin.



Fig. 2. Participants of the drone workshop discussing marine drone technologies.

EuroGOOS ICOS policy: A high level meeting was organised at the ICOS headquarter in Helsinki, Finland, during which policy, strategies & communication best practises were discussed and shared between **ICOS** and **EuroGOOS** staff as well as science-policy activities and communication strategies between RIs and/or the EC. The stay further allowed the participants to attend the ICOS Scientific Conference.

ICOS coastal station: The main objective of this activity was to develop a method to classify the data from coastal stations in order to answer the following question: Do they represent open ocean or coastal processes? It further aimed to provide RI guidelines to classify coastal stations. A visit by a **JERICO** researcher at the coastal **ICOS** station Östergarnsholm in Gotland, Sweden, was organised and the planned work successfully resulted in a submitted manuscript on the criteria, classification and recommendations of coastal stations.

Seismic data integration: The integration of seismological data from **EPOS** into the **EMSO** France node's website/database focussing on Ocean Bottom Seismometers (OBS) data was the main objective of this activity, which included work on common software, common metadata format and data flow. The activity resulted in the adoption of a domain specific software SDPchain ("Seismological Data Preparation Chain") and the transformation of OBS data from the EMSO-MOMAR site (using SDPchain). Further, it contributed to a new EMSO-France data portal.

Activities performed during the second call

During the second call, nine EoP activities were supported by ENVRIplus, namely:

ACTRIS observation data: The activity focussed on how scientists exploit **ACTRIS** observation data in scientific investigations. The aim was to learn about observation data interpretation processes in atmospheric research and the purposes for which scientists interpret ACTRIS observation data. In particular, a visiting researcher from **EMSO/PANGAEA** investigated how the transition from observation data to information (and knowledge) about atmospheric physical phenomena (e.g. events or processes) under investigation takes place, and how RIs can support research communities in implementing and executing such data science workflows, e.g., in Virtual Research Environments..

Recommender Systems: The goal of the research performed during this EoP between **CSIRO** and **PANGAEA** was to adapt and test the recommendation approach (data recommender) in the context of European environmental research infrastructures and their data repositories. PANGAEA was used as a use case to investigate the recommendation approach as this repository hosts data from various RIs. As a result, the technical requirements for building a data recommender with the ElasticSearch engine at PANGAEA were defined as well as the relevant conceptual architecture which enabled the subsequent implementation of the concept.

GEOSS Workshop: The activity aimed to provide training and an interdisciplinary platform for data providers and managers interested in making their data discoverable through GEOSS GCI. A workshop was organized at PLOCAN (**JERICO**) with participants from **EMSO, GEO, GEOSS**. The workshop was designed to deliver hands-on training for data providers in sustainably, registering their data and enabling the GEODAB-broker services.

EMSO-JERICO SWE: The objective of this EoP was to improve the interoperability and data sharing within marine coastal and open ocean research infrastructures. It exemplarily focussed on shared nodes of the **EMSO** and **JERICO** Network by applying Open Geospatial Consortium standards, specifically on the Sensor Web Enablement (SWE) set of standards such as the Sensor Observation Service (SOS) or the sensor and instrument description standard SensorML.

Aerosol Use Case: This activity was planned as part of ENVRIplus TC 17 (see D9.2), entitled “Connecting the particle formation research community to research infrastructure” (aka “aerosol use case”). The visit of a **PANGAEA** related researcher at one of the **ACTRIS** stations allowed a first meeting with the aerosol research community to present the use case and discuss how to advance the work in collaboration with the research community. The visit resulted in a major enhancement of the use case and its contribution to D9.2 as a D4Science Virtual Research Environment³ integrated in the EOSC Portal Marketplace⁴.

VRE workshop: A workshop was organised to bring together the ENVRIplus RIs **ICOS** and **EISCAT** with the **D4Science** technology provider as well as **EGI** to improve the D4Science VRE support for the ENVRI community by integrating EGI Jupyter notebooks. In this workshop, three ENVRIplus use cases evaluated this service: IC 3, which aims to support individual scientists from the **EISCAT 3D** community to process their experimental data using their own algorithms; TC 17, which aims to develop a VRE for the aerosol research community; and IC 13, which aims to optimise **ICOS** data processing, to process data from multiple sites simultaneously and/or in Near Real Time modality.

Economics of Research Infrastructures: This activity dealt with business development and RI

³ <https://services.d4science.org/web/particleformation>

⁴ <https://marketplace.eosc-portal.eu/services/new-particle-formation-event-analysis>



economics in general and aimed to exchange ideas and experiences related to the economics of RIs. Specifically, a visiting staff from **PANGAEA** was interested to learn from **EGI** and ESFRI Research Infrastructures (**EMSO, ACTRIS, ICOS**) about solutions for funding and transfer of funds within distributed multinational infrastructures, pros and cons of legal forms and organisational structures, contractual frameworks, business development and commercialization as well as legislative, administrative and fiscal impositions or restrictions.

Governing Access: The purpose of this EoP activity was to exchange experience and knowledge between three very different and diverse research infrastructures (**SIOS, ACTRIS, EISCAT**) as well as to share best practices and discuss problematic issues in the context of governing and facilitating access and sustainability. One additional purpose was to introduce tools that are adaptable to Environmental research infrastructures.



Fig. 3.: Participants of the Governing Access staff exchange at Clermont-Ferrand.

Sustainability of Access: This activity was a continuation of the ‘Governing Access’ activity described above that aimed at additional knowledge exchange between numerous research infrastructures (**ACTRIS, DANUBIUS, EISCAT, EUFAR, EUROCHAMP, FIXO3, SIOS**) in the context of governing and facilitating access and sustainability. On-site visits were planned at the Abisko Research Station. It aimed to compare common procedures and strategies based on RI reference documents and existing policy documents.

Summary of costs associated with the staff exchange

The table below shows a summary of all costs associated with the ENVRIplus staff exchange programm covering both calls. Whereas the first call mobilised only four activities summing up to about 21000 €, the modified modalities for the second call allowed to fund nine activities summing up to about 50000 €.

Activity	Cost (€)	Sum per call (€)	Total costs (€)
1st call:			
Drone Workshop	11,000.00		
EuroGOOS ICOS policy	3,100.00		

ICOS coastal station	3,840.00		
Seismic data integration	2,970.00	20,910.00	
2nd call			
ACTRIS observation data	3,055.00		
Recommender Systems	4,270.00		
GEOSS Workshop	7,450.00		
EMSO-JERICO SWE	6,643.60		
Aerosol Use Case	799.00		
VRE workshop	5,000.00		
Economics of RIs	6,010.00		
Governing Access	4,137.00		
Sustainability of Access	11,663.59	49,027.59	
			69,937.59

Sustainability concept for an ENVRI staff exchange programme

The necessity to ensure the sustainability of the EoP programme results from the obvious benefit of intra-European research networking and the concrete need to ensure this beyond the forthcoming end of the project on April 30, recently prolonged until July 31, 2019. The obvious benefit is essentially based on the direct interaction between individuals who would not have met and interacted in other circumstances. Further, new drivers such as the EOSC, but also internationally accepted standards in the areas of good governance, compliance and ethical management are accelerating the development towards increasingly standardized processes in an increasingly globalized and virtualized (research) world. This also results in new constraints towards a more focused solution orientation as well as new challenges for the form of cooperation.

It starts with recognizing that things potentially run better, i.e. smoother and more efficiently in a heterogeneous international community that is oriented towards the same goals and interests. A such community, intelligently based on the division of labour, creates added value and enhances prosperity for all, whether through targeted cost savings through better economies of scale, or through better results and advances in knowledge overall. This also applies unreservedly to cross-border scientific research. Mutual visits promote interdisciplinary thinking, work motivation, employee satisfaction and the exchange of opinions and solutions, and eventually contribute to solving repetitive problems. The wheel does not have to be reinvented every day by every person and networking is an intelligent add-on to science & research. This is the core essence of EoP, making it valuable and worth preserving.

Thus, a well prepared and executed EoP programme potentially has a strong positive economic impact on the available budget for RIs, their research and development. In order to extend the positive effect of the EoP into the future and thus maintain access for as many employees as possible, one can imagine several options with the main design parameters being on the one



hand the way in which EoPs are initiated, planned and executed, and on the other the differentiation according to the form of financing. To this end, the necessary budgetary resources must be titled, quantified and the source must be indicated.

Budgetary issues

Annual monetary requirement: It can be assumed that the EoP costs reported here represent a good basis for future planning. In addition to the sum of the costs for the individual EoPs, a certain overhead for a (possibly proportionate) programme manager or coordinators/evaluators/budget controllers must be included. These roles do not necessarily require dedicated staff but associated work requires some funding. Additionally an amount has to be foreseen for public relations/advertising as well as for maintaining an adequate IT infrastructure that relies on tried and tested software resources. A fixed annual budget would certainly be very helpful. Based on the experiences we made during the ENVRplus project, about 15.000 - 20.000€ would provide the necessary funding for about 5-8 EoP activities including bilateral RI visits and on-site RI meetings or workshops for smaller groups.

Budget items to be considered:

The following table gives an overview of the anticipated costs associated with a continued, managed EoP.

Item/Role	Estimated annual budget (€)	Comment
Administration	4.000	0.5-1 PM admin staff costs
Overheads	1.000	Office space, IT etc.
EoP Budget	20.000	Money to be distributed
Total	25.000	

The above numbers are based on the assumption that about 5-8 EoP activities will be funded and some funding to compensate administrative costs are available.

It can be assumed that the ratio between the actual EoP budget and administrative costs improves with a higher EoP budget to distribute.

Projected cost increases: It must be assumed that the cost increases for EoPs correspond approximately to inflation. It is safe to assume that the average annual cost increase is therefore likely to be 3-4% since the main items are airline tickets, hotel accommodations and extra meals. Since the sending unit continues to pay salary and no additional wage components are paid, there are no additional personnel costs.

Organisational and funding issues

Several options are possible to support the sustainable continuation of the ENVRplus EoP beyond the project's lifetime with respect to organisational form and the necessary funding of the whole scheme:

- With regard to the organisational form, a **virtual mode**, web-based and unstaffed 'portal solution' rivals with a **institutionalised mode** relying on dedicated staff with a fixed office and clearly defined tasks and responsibilities.



- With regard to financing, a solution derived from an overarching EU budget, a solution based on the regular budget of a specially nominated institution or a solution based on membership fees/donations/endowment income can be considered.

In principle, it is of course also conceivable that the respective RIs bear EoP costs and organise staff exchanges on the basis of mutual agreements. All mentioned sustainability models do have their pros and cons.

In the **virtual mode**, the focus is on procedural streamlining, cost savings and speed. The downside is anonymity and a possibly higher inhibition threshold for first-time EoP users. In spite of the more cost-efficient organizational structure, at least basic financial resources are required here as well, of course. This mode would benefit from the fact that the *ENVRI community* is to some extent already accustomed to virtualized functional mechanisms. In this mode it would perhaps be worthwhile to check to what extent the recently started EOSC can be integrated in a supportive way.

In the **institutionalised mode**, the aspects of personal responsiveness, reliability and accountability would be more prominent. Here, a viable organizational or legal form would also have to be chosen, which would not only meet the effective operational requirements but also allow a maximum of controlling interventions while at the same time comply with local law. However, this is a political issue that needs to be agreed on by the ENVRI community.

In summary and in the light of the reasons given, it is highly desirable that the EoP programme, which has been so successful to date, should continue beyond the end of the project. The most feasible way to sustain an ENVRI EoP beyond ENVRIplus would most likely start in '**virtual mode**' under the umbrella of the ENVRI community, which would be a good organisational background and already provides the necessary RI network. For sustained funding, a mixed-model seems to be most appropriate which would include EU funds such as e.g. ENVRI-FAIR travel funds and moderate financial travel support from the involved RIs. The continuation of the EoP - in whatever form and possibly independent of any program - can only be warmly recommended.

CONCLUSIONS

The ENVRIplus staff exchange programme has been organised through two calls. During the project, the modalities for the staff exchange were simplified and the scope of potential beneficiaries broadened.

As a result, thirteen activities involving RI staff with different expertise, ranging from administrative support to technical and IT specialists as well as domain scientists, could be supported. Associated costs total about 70,000 € which is below the originally expected amount.

This report, provided a sustainability concept that proposes several possibilities to sustain a staff exchange program, e.g., under the umbrella of the ENVRI community which might be the most appropriate solution to sustain the EoP scheme and their positive impact on the RI community.

IMPACT ON PROJECT

In general, the staff exchange programme can be regarded as highly beneficial for involved RIs. It was successfully launched and could motivate a large number of RI staff to engage, travel and share their knowledge within the ENVRI community. This knowledge transfer contributed to some highly useful products and ENVRI services which now are promoted as the ENVRIplus Science Demonstrators (see D9.2) such as the Sensor Registry (Use Case TC_4), the Support EISCAT_3D Users to Reprocess Data Using User's Algorithms (Use Case IC_3) and the New



particle formation event analysis on interoperable infrastructure (Use Case TC_17). Thus, the impact of the staff exchange on the overall project was significant.

