



21st ERVO Annual Meeting

June 11th - 13th, 2019 – University of Hamburg, Germany

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The 21st ERVO (European Research Vessels Operators) Annual Meeting was organized by the University of Hamburg, Hamburg (Germany) from Tuesday the 11th to Thursday the 13th of June 2019.

Minutes 21st ERVO meeting

Tuesday 11th June 2019

14:00 - 17:00 – Special Session ARICE “Arctic Research Icebreaker Consortium”

This was the first time that a half-day ERVO meeting was organized concerning the Arctic area. The objectives of the ARICE project and the main topics of this session were presented by Veronika Willmott (AWI).

Agenda:

- Towards a better coordination and harmonization of the Arctic Research Vessel fleet (V. Willmott, AWI)
- Potential beneficiaries of a better coordinated European polar research vessel fleet (J. Dahl – SPRS)
- Examples of existing system of research cooperation and coordination:
 - ISAAFFIK Arctic Gateway (K. Edelvang, DTU-Aqua)
 - OFEG barter-system (M. Ojeda, UTM-CISC)
 - A consortium that jointly funds international research cruises in the Arctic Ocean (V. Willmott, AWI)

Discussion: Needs, opportunities and challenges for long-term sharing on planning information of European Polar Research Vessels

For more details, see the presentations at <http://www.ervo-group.eu/np4/np4/44.html>

19:00 – ERVO ExCom meeting at the International Maritime Museum Hamburg

19:30 – Icebreaker cocktail at the International Maritime Museum Hamburg

Wednesday 12th June 2019

09:10 – ERVO General Assembly

After some practical arrangements, the 21st ERVO meeting started with the welcome address of Dr. Christian Betzler (Marine geologist, German Research Fleet Coordination Centre). Dr. Betzler gave an overview of the activities of the University of Hamburg. He mentioned that the Hamburg University is one of the biggest and oldest universities in Germany, becoming 100 year old this year. He gave an overview about the “numbers” of the University and its excellence. After a brief report about the history of the Centre and the 4 ships managed since 1982, Dr. Betzler spent a few words about the staff involved in the organization of this meeting and explained the two main funding models for the Centre, the first directly from German Science Foundation (RV Meteor and RV Maria S. Merian) and the second directly from the Ministry of education and research (RV Sonne).

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

09:30 – Opening of the 21st ERVO meeting – Klas Lackschewitz (GEOMAR, Germany)

The 21st ERVO meeting was officially opened at 9:45 by the ERVO Chair, Klas Lackschewitz. In the introduction Klas informed the participants about the renewal of the Executive Committee and gave an overview of ERVO activities in 2018, mentioning the forthcoming publication of European Marine Board Position Paper 25 “Next Generation European Research Vessels: Current status and foreseeable evolution”. Klas then gave the floor to Lieven Naudts who took over as ERVO Chair.

09:50 – Review and approval of ERVO 2018 minutes – Lieven Naudts (RBINS-OD Nature, Belgium)

Lieven briefly introduced himself and the new ERVO vice-chair Riccardo Codiglia.

The ERVO 2018 minutes were revised with some feedback from Pascal Morin (Ifremer). Since no other comments were received, the adapted minutes were added to the ERVO website by EurOcean.

A short overview of the previous day special session ARICE was reported to the ERVO group. This year, the ARICE session replaced the regional focus session.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

10:00 – EMB/ERVO position paper on future European RV fleet – Per Nieuwejaar (Institute of Marine Research, Norway)

Per Nieuwejaar introduced the collaboration between the European Marine Board and ERVO to produce and publish the EMB Position Paper 25. Starting from the last one (PP 10) in 2007, he stated the main Objectives of the EMB Working Group. A short introduction of the several work package leaders followed, their role in the Working Group, and the announcement of the Position Paper publication expected in autumn after the international review. One of the main messages is that the present EU RV fleet is quite large but definitely much smaller than how it is presented in the EurOcean database, moreover the fleet is ageing quickly and should continuously be modernized and renewed.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

10:30 – Coffee break and national update posters

The following posters were presented during the meeting:

Belgium - New RV Belgica
Belgium - RV Belgica
Belgium - RV Simon Stevin
France - 2018 Activity of the French Oceanographic Fleet
France - French Oceanographic Fleet
Germany - German Research Vessels
Italy - R/V Laura Bassi

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Romania - National Update
Spain - Cruise activity IEO
UK - RV Cefas Endeavour

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

Theme 1: Delegates Reports of Activity

11:00 – New member introductory presentation – Israel Oceanographic & Limnological Research - Gideon Tibor (Israel Oceanographic & Limnological Research)

Gideon gave an introductory presentation on the Israel Oceanographic & Limnological Research and its main activities. Then he reported about the RV Bat Galim, starting from the purchase choices, the preliminary tests to the installation of the hull-mounted geophysical acoustic systems. The RV Bat Galim is a powerful multipurpose low-budget regional class research vessel.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

11:15 – Marine Robotics Centre – A. Cattrijsse (VLIZ – Flanders Marine Institute)

Andre Cattrijsse gave an overview of the currently available facilities (mainly RV Simon Stevin and ROV Genesis) and how VLIZ obtained the budget to acquire an AUV and a USV. From 2019 VLIZ manages 3 robotic vehicles (ROV Genesis, an AUV Teledyne Gavia and a USV Autonaut) for which 300keuro/year operational budget is foreseen. Some examples of the applications and the limits of these vehicles in terms of water depth (more than 10 mt) and the proximity of human activity (windfarm, navigational routes, etc.) were presented. Rosemarie Butler asked about USV operating rules in port areas and Per Nieuwejaar raised the question on the real “autonomy” of those instruments.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

Theme 2: RV builds, Modifications and performance

11:30 – Replacement of the Research Cutter “UTHÖRN” from AWI – Michael Klages (Alfred Wegener Institute, Germany)

After a brief report on the conditions of the Uthörn, Michael reported on AWI's plan to build a replacement for the old Uthörn and although the project was already approved, the government conditions have changed in the meanwhile. The new ship should now be “green” (LNG or electric) which results in huge consequences regarding the build costs. The most suitable choice seems to be a (bio)methanol drive. A tender will be published based on a functional description. The goal is to have the ship delivered at the end of 2021.

There was one question about the opportunity to use fuel cells. Michael responded that the development is still ongoing and fuel cells are still too expensive.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

11:45 – Replacement of RV BELGICA (NEW RV)– Lieven Naudts (RBINS-OD Nature, Belgium)

Lieven Naudts presented the complete replacement process (timeline, design and build) of the new RV BELGICA starting with the “complicate” name-giving competition, the management disputes and ministry changes. He reported the main characteristics of the ship focusing on noise and ecological intent.

Great emphasis was given to the design of the operational space, especially of the labs, leading the shipyard to go into detail already during the basic design phase. Then Lieven gave a wide overview of the facilities/instruments available onboard (winches, acoustic instruments, etc.) and showed some examples of the large infrastructure deck arrangements. Klas asked if there was direct access to the bow containers and if they could be boarded independently, and the answers were respectively both positive.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

12:00 – RV MAR PORTUGAL – Mafalda Carapuço (Instituto Portugues do Mar e de Atmosfera, I.P., Portugal)

Mafalda Carapuço gave a summary of the complete process to get the RV Mar Portugal through the two phases of purchase and refitting where the A-frame, the winches and there working areas were the main objectives. She then presented the first tests at the dock and at sea. The first part of the project was carried out successfully. The future refits will mainly address the installation of hull-mounted geophysical and fishing instruments. Per’s compliments followed for the excellent work done and for the success of a so arduous project.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

12:15 – Replacement of RV AEGEAO (New RV) and a new deep-sea ROV – Karageorgis Aristomenis and Mavrakos Spyridon (Hellenic Center of Marine Research, Greece)

After some words on the existing RV AEGEAO, Karageorgis exposed a statistical analysis of the finances received over the years. Except for the crew salary, the ship was financed by specific projects or charter contracts. Only in the last 2 years the government became more sensitive to the necessity of a new vessel and began a dialog with the EU investment bank. Despite the country's political difficulties there is hope that the project will be successfully funded.

In the preliminary design the scientific and operational criteria led to a ship very similar to the new RV Belgica with the exception of the endurance. The total budget (equipment included) has been estimated at 45 Mln Euro, and the expected delivery time is 5 years.

Some questions were raised regarding the day rate, that is estimated to be approx. 7.000 euro/day for scientific purpose (without the crew costs), from 12.000 up to over 20.000 euro/day for charter contracts depending on the scientific equipment requirements. Finally, it was also specified that the seismic equipment cannot be included in the stated budget.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

12:30 Lunch at Hamburg University & Group Photo

13:30 – New coastal research vessel & update of RV DR. FRIDTJOF NANSEN & RV KRONPRINS HAAKON – Per Nieuwejaar and Johnny Ytreland (Institute of Marine Research, Norway)

Per Nieuwejaar reported on the project to build a coastal RV. He expressed his doubts on having a “green vessel” considering that the related technologies are very expensive and often inapplicable when you need reduce costs. A particular criticism is made on the ICES 209 requirements which is considered to be difficult to apply and anachronistic.

The call for tender for the new coastal RV failed at the first attempt. During the second call, the aim was to reduce costs reduction by choosing a standard diesel-electric propulsion, a blister instead of a drop keel, and eliminating everything that would not impact the scientific efficiency, unfortunately, 10/11 Mln euro still looks too much and the decision of the ministry to proceed is still pending.

The design for the new coastal RV is based on the Danish Aurora, all cabins are put underneath the water line and all the working area on main deck; this is allowed because of coastal/regional class (less than 12 nm) then under the national administration and not accepted by the class rules.

Per then reported on the RV Dr. Fridtjof Nansen that has been delivered 2,5 years ago. Except for the sea chest problems encountered in Bangladesh due to dirty water during the monsoon season, the ship has been a success.

Finally, Per gave an overview on the test period of RV Kronprins Haakon that has 455 guarantee claims up to know. Nevertheless, the ship is very capable, and went up to 4,05 kn in 1m ice.

The final discussion was almost completely focused on the shipyard guarantee, the timing, etc. Per’s advice was to try as much as possible during the guarantee period!

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

14:00 – RV ARANDA refit– Juha Flinkman (SYKE, Finland)

Juha Flinkman gave an idea on how difficult the refit of an old ship can be by telling his personal experience with the RV Aranda refit. Even if the project preparations are excellent, the encountered difficulties can be huge, especially when combining an old power management system with new control systems. The final setup of the systems is still in progress awaiting the final test in real ice conditions. Not only technical difficulties but also the project management was complicated leading to several mistakes and misunderstandings (e.g., the replacement of a thruster and a clutch led to several months of delay).

The final discussion was about the specific safety requirement for the containerized fuel cells and the polar code requirements to obtain the PC6 or 7 class notation. Juha stated that for RV Aranda there were no major issues, only some local hull plating needed to be replaced. Per added that it is useful to propose the solution ourselves as the interlocutors are very often inexperienced.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

14:25 – RV CELTIC VOYAGER II – Rosemarie Butler (Marine Institute Research Vessel Operation, Ireland)

After a brief overview on the 21 years old Celtic Voyager, Rosemarie gave an overview on the reasons to replace her. Mainly the ever-increasing demand for vessel time and the need to reduce the (weather) downtime and MOB/DEMOB operations were indicated. So, 5 years ago they started thinking about a new vessel that should be larger, equipped with DP and have fewer operating limits.

The current project foresees in a vessel 51.5 m long, with 20 days of endurance, 26 persons (including crew), diesel-electric propulsion and designed to operate in harsh sea conditions. Delivery is expected in late 2021.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

Theme 3: Manning, Safety and training

14:40 – Capacity building on crew, instrument technicians and operators – Per Nieuwejaar (Institute of Marine Research, Norway)

Per Nieuwejaar expressed his opinion based on 20 years of experience on foreign aid work in Africa without any results and reported the very difficult situation of the research fleet in some of the African countries. Even when they have a research vessel (as a gift!) often they do not have skilled, professional crew, instrument technicians and operators to use it. So, there are several types of support we can give, some easy and some challenging.

Basically, there are not any academic institutions offering a bachelor's degree (or any other formal training for that matter) in marine scientific instrumentation, and this is also for «developed countries»! same story for the specific RV management.

He finally concluded that to implement such skills and systems it is necessary to find a way to «share the burden» and national foreign aid agencies, or international organizations such as the UN through FAO, IOC, UNDP should build a framework where such development can take place.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

15:10 – Coffee break and national update posters

Theme 4: RV Technology

15:30 – VSAT and internet access – challenges and improvements – Johnny Ytreland (Institute of Marine Research, Norway)

Johnny Ytreland gave an overview of the three VSAT system used C, Ku and Ka band, with some examples from his personal experience. The main advice is if you use Ku band you need to plan very well the routes and accept some black outs, otherwise you need to use C band, accepting the rising costs. Of course, if your bandwidth is not too large (i.e., 1 Mbits/s) you need to block some traffic to avoid the collapse of the whole system. A discussion followed

which focused mainly on several solution and advice adopted by everyone to avoid the overload of the net onboard.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

15:50 – Communication during MOSAIC – Thomas Liebe (Reederei F. Laeisz GmbH, Germany)

In October 2019, the MOSAiC Drifting Project with the RV Polar Stern will start. Thomas Liebe gave an overview of the satellite data communication in this ambitious project. Several systems will be available on board, but only some are useful at such latitudes, with very different performances and costs. The main system on high latitude is based on Iridium technology, for MOSAiC will be available three of them (Certus up to 700 Mbit/s). The Kepler (up to 100 Mbit/s with 2.4m antenna) will be tested for large data transfer, the connection will be available only 5-10 minutes for 10 times in a day.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

16:10 – Waste treatment system/gasification system – Lothar Meinders (Briese Schifffahrts GmbH & Co. KG Research, Germany)

Lothar Meinders reported the problem of waste on board, taking the example of RV SONNE (75 people and 90 days offshore). The segregation of paper, glass and plastic is quite manageable with many benefits using modern systems, while wet garbage is more and more a challenge since in many cases, they cannot be thrown into the sea or delivered ashore. Therefore, a Micro Auto Gasification System (MAGS) was installed on board the RV SONNE solving once for all the disposal of wet garbage, but with several problem in terms of plant maintenance and management costs, overall a good result.

The final discussion was focused mainly on dimensions and costs, estimated in 250 000 euro with daily operation cost being irrelevant, but an extra dedicated full-time person was added.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

16:30 – Setting up a strategic plan for the European RVs Operators Community: first outcomes from the Eurofleets+ WP8: “Foresight and roadmap” – Giuseppe Magnifico (National Research Council of Italy, Italy) Pascal Morin (Ifremer, France)

After a brief but detailed summary of the main achievements of Eurofleets 1 and 2, Giuseppe Magnifico presented the WP8 main objectives towards a strategic plan for the future Eurofleets. The whole strategic process was explained from aspiration setting to the business model building passing through the environment analysis (PESTLE) and the decision on positioning (SWOT analysis). Then Giuseppe presented the outcomes from the first brainstorming session in the developing Eurofleets Strategic Plan and opened a discussion. In aspiration setting, the mission of Eurofleets was a first critical point. The discussion then moved into the PESTLE analysis where one of the main points is a lack of a common vision and the mistake in confusing the EU with Europe States. The importance of infrastructure for the marine science should be better explained to the community was another point of discussion. The existence of

competitors for the RV operators has finally been discussed during the SWOT analysis, if there are better methods instead of vessels, they have to be used and competition is rather on getting funding.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

Theme 2: RV builds, Modifications and performance

17:20 – French Oceanographic Fleet: Schedule for renewal – Pascal Morin (Ifremer, France)

Pascal Morin presented the renewal plan developed by the Direction of French Oceanographic Fleet; now unique entity attached to Ifremer as a legal entity. A schematic schedule of the estimate duration was reported for all the RVs (local, regional and oceanic) and the equipment. The coastal vessels (the older ones) have the priority in this plan, so in the next 3 years they plan to modernize the Cote de la Manche, Téthys and Antea, and build 3 new “medium range ship” to replace Thalia, Alis and Europe. In 2030 is expected the replacement of the RV L’Atalante followed by the withdrawal of the oldest regional vessels. The total investment until 2035 will be 221 Mln Euro.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

17:35 – How not to order a new research vessel – Niklas Andersson (University of Gothenburg, Sweden)

Niklas Andersson shared his (negative) experience in ordering and building a new vessel. He listed the several mistakes that should never be made, starting with the cheap winning bid of the tender call. The consequent choice of an inexperienced and politically owned shipyard (who tried to modify the original contract in progress) led to a real disaster. The ship’s delivery expected in 2015 will be only in September 2019 after spending about 2 million euro extra for a brand-new propulsion system. Finally in this story also the project management was inadequate and less efficient than an external company.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

17.50 – End of day 1

19:30 – ERVO Social Dinner – Restaurant “Hafenblick”

Thursday 13th June 2019

Theme 5: Common issues around research vessels

09:05 – Status of the new EurOcean RID database – Sandra Sa (EurOcean, Portugal)

Sandra Sa presented the evolution of the Research Infrastructures Database, starting from four Infobases, now there are fifteen Infrastructure Categories. It was a challenge for only 5 people to develop an integrated system in order to unify both the source files and interfaces and

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providing at the same time to several initiative (Eurofleets, etc.) specific parts of information as needed. She then gave an example of the specialized RV information and showed how the system works incl. all the new features and filters.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

09:20 – Potential improvements on the EurOcean RV and LEXI Infobases – Per Nieuwejaar (Institute of Marine Research, Norway)

Thanks to his long experience Per presented a critical analysis of the EurOcean RV and LEXI Infobases providing important ideas for the future improvements. The first suggestion is related to a better filter function, the right filters should be able to identify by a sort “ERVO certificate” the real RVs (as indicated in the EMP PP 25 report) providing a correct, accurate and valid set of information.

The second suggestion was to limit the level of technical details, very detailed information can always be asked directly to the operator! This will make the work easier and will avoid a lot of empty fields. Finally, not updated vessels should have to be deleted from database, because totally unuseful. Speaking of the equipment (LEXI), a lot of these are missing, with some categories well populated and other quite empty. It is more complicated to map and update the instruments list in comparison to the vessels, mainly because instruments are not owned or managed directly by vessel operators. A short discussion on the opportunity to make public the docs of the Eurofleets projects and Lieven’s renewed suggestion on a possible “ERVO quality control stamp” closed the presentation.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

Theme 6: Cooperation and Outreach

09:50 – EUROFLEETS+ project – Rosemarie Butler (Marine Institute Research Vessel Operation, Ireland)

Rosemarie gave an overview of the new Eurofleets+ project, the numbers, the partners also commercial, the main contacts and the current status. She mentioned the recent official launch streamed on the Eurofleets web site. She then passed to the main objectives which are even more focused on support innovation through working closer with the industry, training and education. A brief description of the three transnational access programs followed with some details on the upcoming calls. Finally, she closed the presentation mentioning the initiatives named “Blue skill labs” and “floating university.”

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

Theme 2: RV builds, Modifications and performance

10:05 – R/V Svea Sweden’s new research vessel – Lasse Thorell (SLU, Sweden)

This presentation was not on schedule because of the delivery of the ship in Vigo, but Lasse Thorell still wanted to give some information on the progress of the new ship. After a summary

of the timeline, he mentioned on a propeller problem (solved) and about the effort to build an “environmentally conscious vessel”. Moreover, particular attention has been paid to the working environment and living condition with 21 single cabins. The final discussion clarified that the crew will be 9 people and the average endurance around 16 days, depending on the number of scientists.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

10:20 – Coffee break

Theme 6: Cooperation and Outreach

10:50 – Toward a long-term TA system of Research Vessel: preliminary results of the SWOT analysis on legal frameworks – Lorenza Evangelista (National Research Council of Italy, Italy)

This presentation is focused to the main objective of WP8 of Eurofleets+ Project (more specifically on task 811), already anticipated by Giuseppe Magnifico in his presentation. After a brief introduction about the motivation, according with the EU recommendations, for a long-term TA system, Lorenza mentioned the benefits of a legal status and gave an overview of the principal RIs legal models. Those models are the starting point to define the right criteria to select a possible legal model. This will be followed by a SWOT analysis in the process to define a legal entity of a long-term coordination platform.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

11:00 – ARICE project – Veronika Willmott (Alfred Wegener Institute, Germany)

Veronica Willmott gave an overview of the ARICE project and the progress made until today. She introduced the ARICE project, explaining that the initiative was born to set up a strategy for meeting the needs for marine based research in the Arctic to strengthen collaboration between European through European Polar Board, and with USA, Canada, Japan, Korea and other nations. At the moment there are 16 partners from 13 countries, included ARCTIA which is a commercial Icebreakers operator. Then Veronika illustrated the project’s structure based on the transnational access opportunity, joint research activities and with a great effort on the networking activities (that today represent the main difference with Eurofleets Project). The first achievements were then briefly reported among which the implementation of the ARICE Operational Liaison Panel, the Industry Liaison Panel, the 2018 (closed) and 2019 (still open) call for ship-time proposal. Followed by a quick description of the heavy icebreakers arctic fleet and some consideration (recognized by the most of operators) on the limitations generated from a “national management only” of the polar infrastructures (ships) and research programs. Veronika then closed the presentation with a list of the benefits that could be given by the consortium and the proposal for ERVO polar operation sub-group in order to improve the coordination of European icebreakers operation in the Arctic.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

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11:20 – IRSO update – Erica Koning (NIOZ, the Netherlands)

Erica Koning gave an update for IRSO. The upcoming IRSO meeting will take place in Hobart (Australia) from 07-11 October 2019, all info to participate will be available in the IRSO website.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

11:35 – OFEG update – Klas Lackschewitz (GEOMAR, Germany)

Klas Lackschewitz gave an update for OFEG. OFEG, the Ocean Facilities Exchange Group, allows its members for no-cost exchanges of ship time and major marine equipment. Klas reported on the new users (CSIC, GEOMAR, CSIRO, AAD) of the Marine Facilities Software (MFP) and on the potential ones, then he referred about the availability for barter of a new seismic system by IFREMER and finally he mentioned the last OFEG-Tech meeting occurred in Toulon. Some statistic panel and an explanation on the future policy for the new member closed the brief presentation.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

11:40 – Topics, date & place ERVO 2020 – Stefan Florescu (GeoEcoMar, Romania)

Stefan Florescu introduced the 2020 meeting in Bucharest. The meeting will be hosted by the National Institute for Research and Development on Marine Geology and Geo-Ecology of Bucharest and will take place from the 1st - 3rd of June 2020. After the meeting, a tour of the Danube Delta is also offered for those interested.

For more details, see the presentation at <http://www.ervo-group.eu/np4/np4/np4/44.html>

11:45 – Closing 21st ERVO meeting – Lieven Naudts (RBINS-OD Nature, Belgium)

Lieven Naudts informed the assembly about the possibility discussed in the ExCom to involve local entities being stakeholders and also funding agencies. All other topics can be proposed by e-mail and it will be discussed by the ExCom. Then Lieven thanked all meeting participants for the good job done during this meeting and the team of the University of Hamburg for the excellent organization.

12.00 – End 2019 ERVO meeting
