



Murray Foundation Newsletter

Grants to Support Student-Research

The objective of the Newsletter of January 2019 is to describe the activities of the Foundation and the areas of support for student-research. In this edition and future Newsletters, it is intended to also pass on messages that students have sent us on whether they thought that their grants had been useful in supporting their studies, the contacts they made that could be valuable for their research activities, for their thesis and for potential future collaboration with other laboratories and Institutes.



The Foundation believes strongly in the European dimension of student training and the value of collaborative projects at all levels of studies. Working together within a European environment is immensely enriching and helping students in this context is an important objective of the Foundation.

Purpose of the Foundation

The Murray Foundation is registered in the United Kingdom as a charity (UK Charity Commission No. 1162333). The Foundation's purpose is, for the public benefit, to advance education, to encourage and support dissemination of research and technical information in the area of environmental processes:

General objectives are:

1. To support students of Universities and Institutes in the UK and Europe in developing their studies through participating in European projects related to environmental protection. For example, support could be provided to cover mission costs, participation in Congresses, project meetings etc.
2. Provide support to students who wish to participate to advanced training courses, research projects as a part of a summer course, fieldwork, and in support of a High School or University thesis. These grants are available for short-term activities that provide students with experience of value to their on-going studies.
3. Provide University Undergraduate Scholarships (up to six months), co-support European Joint Masters degrees and Erasmus Mundus (Erasmus+ 2014-2020) projects.
4. Collaborate with High Schools to provide opportunities to develop students' understanding of science in the 'real world' (including the study of Science at university) – for example, where students undertake some kind of research alongside members of universities and/or get to spend time with people involved in 'real' research projects. Support High School-Company partnerships in the region.
5. Develop collaboration with firms running educational programs with the aim of co-financing students/trainees engaged in the study and development of environmental technology
6. Support mature students coming back to studies after careers in industry etc.
7. Publish research and technical information relevant to the activities of the Foundation.

Activities: January – December 2018

Since January 2018 there has been a steady increase in activities for the Foundation with the decision to continue supporting (for a further two years) High Schools Student Science grants (initiated in 2017) in association with the Operation Wallace Trust (UK charity number 1078362) through Awards to five schools taking part in expeditions. Following this we held discussions to widen our collaboration with them to also cover University student activities and this support will begin in the January 2019 with 10 MF Awards (see: <https://www.opwall.com/about-opwall/grants/>)

Reports by the five schools who won MF-Opwall Awards in 2018 season are published in this Newsletter and vividly describe their experiences during research activities in Ecuador & Galapagos, Croatia, South Africa, Ecuador & Galapagos, and Madagascar (see list of Schools below).

As a part of our increasing focus on University projects supporting student theses an important action has been the creation of the Prof. John Riley Scholarships at the University of Liverpool. These Scholarships are described in more detail below.

We also supported the participation to scientific symposiums of students from the University of New Caledonia, Pacific; University of the Reunion, Indian Ocean; Centre Scientific of Monaco, and from the Universities of Tel Aviv and Haifa. Participation allowed students to present their results and discuss their work with senior scientist as well as investigating potential future collaboration.

After the very successful meeting of 2016 in Murcia (Spain), we have also have continued to support the biannual European Symposium on Coastal Lagoon Ecosystems, held in Athens in March 2018. The Foundation Awards supported the participation of 10 students studying at Universities in Europe (Greece, Spain, Italy, Lithuania, and the UK) as well as 3 students from Universities in North Africa (Algeria and Morocco).

High Schools Expedition Projects

The Foundations objectives for this activity initiated in the autumn of 2016 are to:

1. Provide opportunities to develop students' understanding of science in the 'real world' (including the study of Science at university) – for example, where students undertake some kind of research alongside members of universities and/or get to spend time with people involved in 'real' research projects.
2. Visits to school from experts to give lectures on work being done might also be worth exploring (Run a "Scholar's" programme for academically able students; look for support from experts in their fields to challenge students and broaden their horizons).
3. Student exchange with High Schools in Europe within a common science Network (support Summer Schools Science Networks?)
4. Support inter High School joint student projects.

Operation Wallacea is a biodiversity and conservation research organization running projects in remote locations across the world. Students from UK schools take part in these expeditions which are designed with specific wildlife conservation aims in mind – from identifying areas needing protection, through to implementing and assessing conservation management programmes. The expeditions represent a real opportunity for school students to gain first-hand understanding of the function and importance to local communities of fragile ecosystems, and to take part in the collection of scientific data required to understand their evolution.

In 2018 ten UK schools applied for the five MF Awards (<https://www.opwall.com/about-opwall/grants/>), providing serious competition! The level of all the presentations was very impressive, describing the objectives of the students to take part in the expeditions, their fund-raising efforts (very imaginative and successful) and the support they managed to generate in their town and the school neighborhood. The Trustees had a difficult decision in choosing Award winners! A significant factor (but by no means the only consideration) in the eventual list was the advice of Operation Wallacea (Ms. Shannon Cameron) on the

Schools/students that she felt most closely coincided with the Foundations objectives of helping students from less favored areas.

Schools that won awards:

1. Allestree Woodlands School (Allestree, Derbyshire), visit Croatia.
2. Boston College (Boston, Lincolnshire), visit South Africa.
3. Dulwich College (Dulwich Common, London), visit Ecuador & Galapagos.
4. Hyndland Secondary School (Glasgow, Scotland), visit Ecuador & Galapagos.
5. King Edwards C of E School (Romford, London), visit Madagascar.

University Student Science Projects:

The Foundation is particularly pleased to have received an increasing number of University student science projects proposals. The Foundation's support is based on the premise that such projects are valuable in helping students learn new procedures, collaborate on joint activities or investigate complimentary areas of their University programmes that will be directly useful for their University diploma. Very often these are summer courses specializing in research techniques, participation in joint projects with other institutions, analysis of field data etc. The results being useful for a research paper for example, as well as the student's thesis.

Student projects from the University of Liverpool, the Centre Scientifique de Monaco and the University of Haifa are presently being supported and we are looking forward to receiving their reports. A Master of Science research project on coral reefs: Epibenthic Community Structure Surveys Through Advanced 3D Photogrammetry, proposed by a student of The Marine Imaging Laboratory, The Hatter Department of Marine Technologies University of Haifa, Israel, is published on our website.

Scholarships in memory of Prof J.P. Riley

After discussions with Prof. J. Sharples Head of the Department of Earth, Ocean and Ecological Sciences, University of Liverpool, the Foundation proposed to create the **Prof. John Riley Scholarships** for students of the University.

An understanding of the importance of the chemical processes of the seas owes an extremely important debt to John Price Riley, who was Professor of Oceanography of the University of Liverpool during the 1960-1980's. During this period, the development of chemical techniques needed for the understanding of biogeochemical processes became a major focus of study and along with increasingly sophisticated analytic techniques provided a progressive understanding of the function of trace nutrients and their cycling, biological activity, the role of gases, the impact of redox and PH controls, diagenesis, role of sedimentation and many other processes etc. To appreciate the mechanisms controlling such complex systems required not only advances in analytical methods but also the development of very large-scale international studies that could make use of these continually developing techniques and provide a global understanding of the role of such processes.

In 1965, volume 1 of Chemical Oceanography by Prof. Riley and colleagues was published by Academic Press, to be followed over the next 20 years or so by 9 other volumes (in collaboration with G. Skirrow, Volumes 1-4, and R. Chester, Volumes 5-10, of the Department of Oceanography, University of Liverpool). The range of subjects treated in these volumes was vast and provided accounts in depth of topics across the whole range of marine chemical interests.

The significance and impact of the Chemical Oceanography series can be clearly seen through the international reputation of the authors, many were leading researchers in their domain, who contributed to the chapters of succeeding volumes. The fact that the series covers such an extensive period in chemical oceanographic research provides a long-term view and it is particularly instructive to see how advances in techniques and understanding occurred over the intervening years. The reputation and role of the

Oceanographic Department of the University of Liverpool today, as a center of excellence and stimulus in significantly developing advances in oceanography is a major tribute to the vision of Prof. Riley.

Three students studying at the University were funded for projects relating to "Shelf Seas, their importance for the global ocean system and their social and economic value".

8th European Symposium on Coastal Lagoon Ecosystems:

The Foundation continued its financial support of the bi-annual European symposium on Coastal Lagoon Ecosystems, held in Athens in 20-23 March 2018 (<http://eurolag8.org/>). At the request of the Foundation an independent Science Committee of the congress considered applications and awarded grants (see Fellowships). Below is a photo the group of students and early career scientists from Europe and North Africa who won awards.



Students and early career scientist from Europe and North Africa who won awards.

The symposium attracted more than 100 scientists and covered a wide range of themes including the potential impact on management strategies in the context of climatic change.

Coastal lagoons Evolution, Functioning & Climatic changes

This session included studies of lagoons through the application of numerical models, mainly in the field of hydrodynamics and sediment transport. Development of numerical models especially suited for the interactions between the sea and lagoon exchange rates and water renewal were presented.

Presentations included studies on the consequences of species loss in lagoons through computer simulations; on the potential impacts of climate change on the trophic state, fisheries and ecosystem services of coastal lagoons; and on the impacts of sea level rise on coastal wetlands and lagoons.

Fisheries and Aquaculture

This session included studies on the role of fisheries and their economic value; on potential mussel farming and its impact on coastal lagoons; Presentations were made on linking the trophic status of lagoons with their productivity and cultivation methods of seaweeds and their applications for biomass production and water bio-depuration.

Biodiversity and water quality

The session included studies on a) the impact of diverse human activities (from structural changes, including restoration activities, to various pollutants) on benthic and planktonic communities and their functioning; b) the influence of spatial and temporal variability and heterogeneity on lagoonal biodiversity; c) genetic and population dynamic studies, both focusing on whole communities as well as on selected

organisms; and d) the application and improvement of biotic and functional indices for the classification of the ecological quality status of transitional ecosystems.

Goods and Services: Conservation, Management and Sustainable Use

This session focused on socio-economic factors, ecosystem services and the involvement of stakeholders and communities in decision making. The application of various toolkits, driving and feedback mechanisms and the systems approach framework was presented for diverse managerial scenarios; a number of other presentations pointed out the importance of involving stakeholders and local communities in the management of transitional water systems.

European Networks and Projects Transitional areas and Lagoons

Several regional and pan-European projects on lagoon research and management were presented. These included Lagoons for Life which investigates the effect of global change on lagoonal ecosystems and proposes assessment strategies; the Danubius-RI project which provides tools and models for a more holistic approach on assessing the River-Sea system; as well as projects targeting specific research questions such as the standardised assessment of woodborers, systematic planning of tourist activities (in the framework of the EU-BONUS project) and strategies for phytoremediation in the Baltic Sea.

Grants by Theme, Country, and Institute for the Period January-December 2018

The final section of the present Newsletter shows the range of research themes covered by the Foundation during 2018, the number of students supported and their Universities.

1. Coastal Lagoon Ecosystems

European Coastal Lagoon Symposium (8th Eurolag Conf. – Athens 20-23 March 2018)

- Ten students studying in Europe:
Greece (Institute of Marine Biology, Crete, Hellenic Centre for Marine Research, Athens, University of Petras).
Spain (University of Murcia),
Italy (University of Messina),
Lithuania (Klaipeda University),
United Kingdom (University of Portsmouth).
- Three students supported from North Africa:
Algeria (University Badji Mokhtar Annaba)
Morocco (University Hassan II, Casablanca)

2. Coral reef systems, their functioning under present and probable future Environmental changes

- Four students studying in:
France: (Institute of Research for Development (IRD), Noumia, New Caledonia, Pacific,
IRD-CNRS University of Reunion, Indian Ocean, CRIODE, Papetoai, Moorea, French Polynesia)
Monte Carlo - Centre Scientific de Monaco
Israel, Inter-University Institute for Marine Sciences, Eilat

3. Shelf Seas, their importance for the global ocean system and their social and economic value (Professor John Riley Scholarships)

- Four students studying in:
United Kingdom (University of Liverpool).

4. Desertification and Agriculture, future management of water resources.

- One student studying in Israel (The Porter School of Environmental Studies, University of Tel Aviv)

5. High School Student Project Network – UK in collaboration with Wallacea Trust (UK)

- Students from five High/Grammar Schools (through the MF collaboration with Wallacea Trust/Operation Wallacea)

Allestree Woodlands School (Allestree, Derbyshire)

Boston College (Boston, Lincolnshire)

Hyndland Secondary School (Glasgow, Scotland)

Dulwich College (Dulwich, Surrey)

King Edward School (Romford, London)

See the School's post-expedition report in the publication section

Finally, some photos received from students over 2018

