



ANNUAL REPORT 2013



Foras na Mara
Marine Institute

Serving Science and The Sea

To the Minister for Agriculture, Food and Marine

In accordance with the requirements of the Marine Institute Act, 1991, I have the honour of presenting the Annual Report and Statement of Accounts of the Marine Institute for the year ended 31st December 2013.

Mr John Killeen

Chairman (2014 – 2019)

The Marine Institute is the national agency which has the following general functions:

‘to undertake, to co-ordinate, to promote and to assist in marine research and development and to provide such services related to marine research and development, that in the opinion of the Marine Institute will promote economic development, and create employment and protect the marine environment.’

Marine Institute Act 1991

Our Vision

A thriving maritime economy in harmony with the ecosystem and supported by the delivery of excellence in our services

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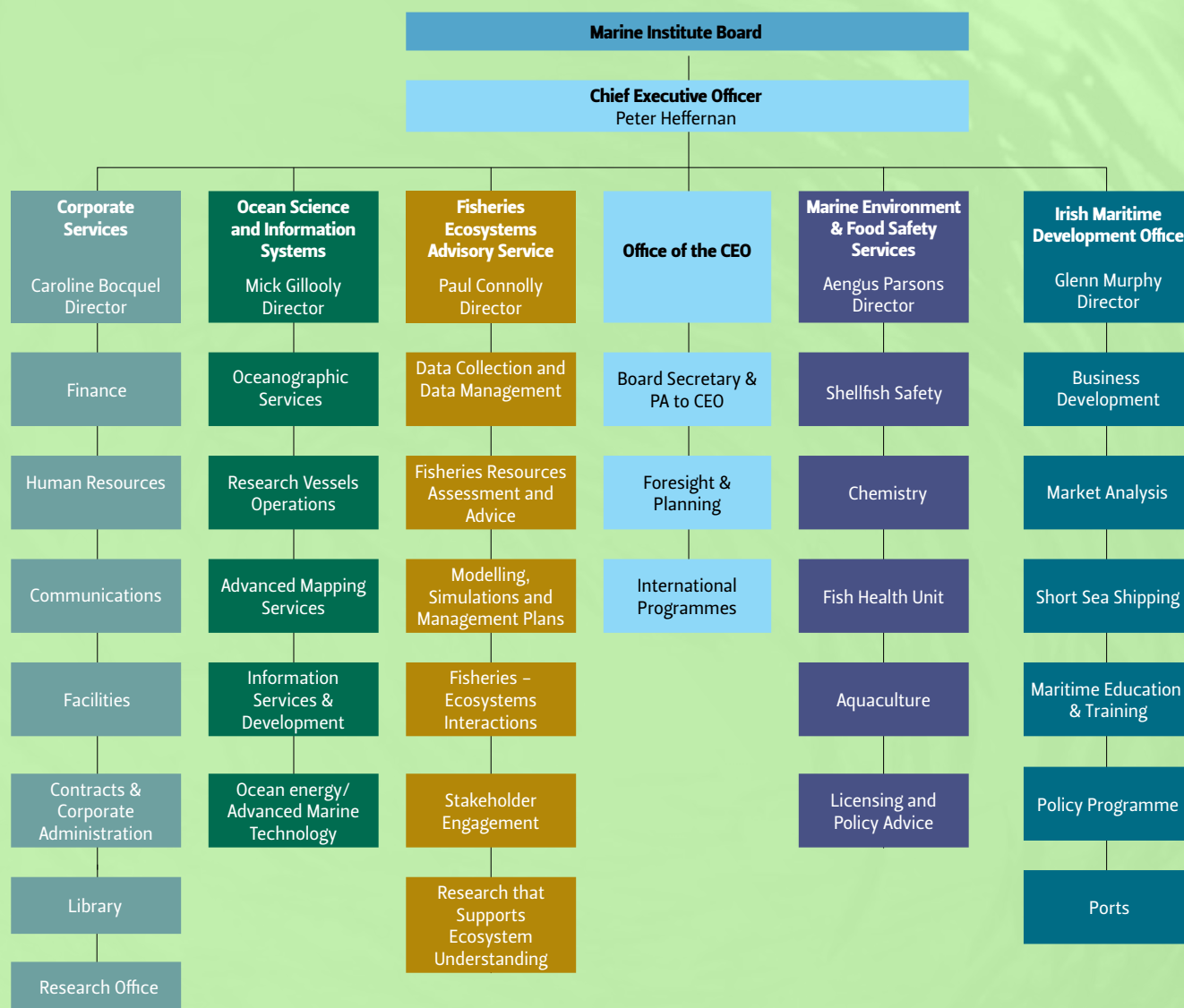
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The Marine Institute Annual Report is available in Irish
and can be downloaded from www.marine.ie

Marine Institute Organisational Structure 2013



Introduction and Organisational Structure

The Marine Institute is the national agency for marine research, technology, development and innovation. We seek to assess and realise the economic potential of Ireland's marine resource, promote sustainable development of marine industry through strategic funding programmes and essential scientific services, and safeguard Ireland's natural marine resource through research and environmental monitoring.

Ireland has a marine resource of up to 220 million acres (approx 880,000 km²) under the sea, which is over ten times its land area. The Marine Institute promotes the sustainable development of this vast marine resource through research, the application of new technologies and by providing management advice to industry, the Government and the EU.

The Institute provides essential marine research services including:

- > National research and development funding programmes
- > Fish stock assessment and management advice
- > Fish health services
- > Marine food safety monitoring
- > Environmental monitoring
- > Research vessel operations
- > Seabed mapping
- > Data management
- > Maritime development services

The Marine Institute has five service areas and the Office of the CEO. The service areas include:

- > Corporate Services
- > Ocean Science and Information Services
- > Marine Environment and Food Safety Services
- > Fisheries Ecosystems Advisory Services
- > Irish Maritime Development Office

The organisation is supported by a strong focus on corporate governance with an emphasis on prudent financial management, which was an important contributor to the success of the Institute during the challenging economic period during 2013.

This report highlights the key deliverables and progress made towards our vision during 2013.



Board Members



Mr Jim Fennell – Chairman (2008–2013)

Appointed in November 2008, Mr Jim Fennell is a Fellow of the Chartered Association of Certified Accountants who holds the position of Financial Controller and Secretary to the Governing Body of Galway-Mayo Institute of Technology (GMIT). In addition to his role at GMIT he also holds a number of directorships including: President of Galway Chamber of Commerce, An Chéim (Collaborative Higher Education Information Management), Ireland's National Education and Research Network (HEAnet), Chairman of the HEAnet Finance Sub-committee and Mayo County Council Audit Committee.



Professor Patricia Barker (2013–2018)

Prof Patricia Barker is a Fellow of the Institute of Chartered Accountants in Ireland, having qualified in 1973. Prof Barker completed a MPhil in Gender Studies in Trinity College. Her PhD developed a paradigm of disclosure of financial information to employees in organisations. She served her articles with Stokes Bros. & Pim in Dublin and worked in Peat, Marwick Mitchell in Manchester. Prof Barker then became a partner in an accounting practice in Manchester for six years and worked in Manchester University as a principal lecturer.

Prof Barker was appointed lecturer in Dublin City University (DCU) in 1980 and progressed through senior lecturer, Associate Dean (Business School) and University Vice-President (Academic) of DCU. She has worked as a visiting professor in universities in New York, Boston, Angers, Malawi, Dares Salaam, Sydney and Cape Town and has been an external examiner for universities and professional bodies. She served as Chairman of the Institute of Chartered Accountant's Accounting Committee for eight years and on the Council of the Institute of Chartered Accountants for four years in the 1990s. She is currently a member of the Council. She represented Ireland on the Accounting Standards Board in London for nine years. She chaired the expert group reporting to the European Union on the role, structure and functions of the European Court of Auditors. She had several tours of duty as Election Supervisor for the



OSCE in Bosnia-Herzegovina, Republica Serpska, South Africa, Kosovo, Kazakhstan and Belarus.

Prof Barker worked as a Human Rights Monitor in Israel and Palestine. She has been a member of the Boards of Women's Aid, Sonas Housing Association, the National Chamber Choir and the Higher Education Authority (chairing the Audit Committee), and was the Chairman of the Irish Blood Transfusion Service for three years.

Prof Barker is currently a Director of Dublin Bus Ltd. and Veritas Ltd (chairing the Audit Committees in both). She is currently a voluntary counsellor and trainer for the Dublin Rape Crisis Centre. She has written books on Group Accounting, Flexible Working in the Profession and more recently on women who have succeeded in the Accountancy profession and on Corporate Governance and Professional Ethics.

Mr Francis Coyle (2010–2015)

Mr Francis Coyle had a long career with Donegal County Council serving in various posts from 1974 to 2010. From 2001 he was Director of Services for Planning and Economic Development. Mr Coyle worked with Letterkenny Town Council and was also Manager of Ballyshannon Town Council from 2005 to 2010. Mr Coyle was the Council's European Liaison Officer with the Conference of Peripheral Maritime Regions (CPMR) for sixteen years.

During the period 1995 to 1999 he managed the Council's multi million pound Peace and Reconciliation funding and was Secretary to the Donegal Task Force for Peace and Reconciliation. Mr Coyle has also worked closely with the International Fund for Ireland and other funding mechanisms such as the EU Inter-Regional Cooperation Programme (INTERREG), and Peace III to develop multi-faceted community and recreation regeneration projects designed to enhance towns and villages, both in Donegal and on a cross border basis. He is a past Director of Donegal Airport Company Ltd and is currently engaged in project management and coordination.


Mr Paul Hyde (2012–2017)

Mr Paul Hyde (BSc Arch, MA, MPlan, MRIAI, RIBA) is the managing partner in the Hyde Partnership Architects and Town Planners, a multi disciplinary design and planning practice. He holds degrees in both Architecture and Planning & Sustainable Development. A member of the Royal Institute of Architects of Ireland (RIAI), the Royal Institute of British Architects (RIBA) and the Irish Planning Institute (IPI).

Mr Hyde has over sixteen years of professional experience relating to the building environment including both terrestrial and coastal development and spatial planning. In addition to his role in the Hyde Partnership he holds a number of committee memberships including: The Irish Planning Institute, Southern Branch and The Royal Institute of Architects in Ireland, Southern Branch and the Cork Chamber of Commerce.


Mr Lorcán Ó Cinnéide (2010–2015)

Mr Lorcán Ó Cinnéide (BA) is a former Chief Executive of the Irish Fish Producers Organisation, a leading fishing industry representative body. A graduate in Economics and Politics from Trinity College Dublin, Mr Ó Cinnéide is also a former fishing vessel owner.

Mr Ó Cinnéide was an active member of the EU Northwestern Waters Regional Advisory Council and a wide range of other fisheries management and advisory bodies in Ireland and at EU level. He has been an expert advisor to the EU on the evaluation of marine research programmes and has been involved in fishing industry development and representation for the past twenty years.

Mr Ó Cinnéide is currently a member of the Aquaculture Licences Appeals Board, Chairman of Comhairle Raidió na Gaeltachta and Secretary of the Blasket Island Foundation.


Mr David Owens (2012–2017)

Mr David Owens (A.C.A) is currently Vice President, Finance and Operations for SolarWinds (NYSE: SWI). Prior to joining SolarWinds, Mr Owens worked for Red Hat, Inc., an enterprise software company, for over seven years, where he served initially as Director of Global Logistics and Production and then as Senior Director of Finance – EMEA. Mr Owens qualified as a chartered accountant with Ernst & Young and is a member of the Institute of Chartered Accountants in Ireland.


Mr Donal Kelly (2013–2018)

Mr Donal Kelly is Managing Director of Fast Fish Ltd, a successful fish sales and oil supply business based in Castletownbere.

Mr Kelly served on the Celtic Sea Herring Management Committee for 10 years and on the West Pelagic Committee for 3 years.

Mr Kelly has served on a number of Board both in the private and voluntary sector. He has been a Cork County Community and voluntary fora, Cork County Development Board and has acted as Chairman of Castletownbere GAA, Management Committee of Berehaven Golf Club and Castletownbere Community Development Association.

Chairman's Statement



Corporate governance of the Institute was overseen by Mr Jim Fennell who completed his term as Chairman in 2013 and who I must thank for his diligence and dedication, having left the Institute in ship shape.

The Strategic Plan for the Marine Institute 2013–2016 was finalised in 2013. It has provided an essential reference for internal planning by each service area down to individuals' performance objectives set as part of the Institute's Performance

Management Development System.

During the preparation of the plan, the board of the Marine Institute considered in detail its five High Level Goals; 17 objectives and associated 88 priority actions and KPIs (see Appendix 8). From early 2013, the Board held a number of meetings and a dedicated workshop to further develop the plan in association with the CEO and senior management of the Institute. A key role for the board will be both the supervision of the implementation of the plan and supporting the executive as it balances the increased demand for services with the diminished exchequer resources.

There was some change in the executive management team with a vacancy filled for Director of Marine Environment and Food Safety Services and the position of Director of the Irish Maritime Development Office advertised in December.

The Galway Statement on Atlantic Ocean Cooperation Launching a EU – Canada – United States of America Research Alliance, signed here at the Marine Institute 24 May 2013 witnessed by the Taoiseach, Mr

Enda Kenny. T.D., highlighted our contribution to the European marine research agenda during Ireland's EU Presidency (January–June 2013).

The Marine Institute continued to play an important role supporting the work of the Government's Marine Coordination Group (MCG) as it supervises the implementation of the Integrated Marine Plan for Ireland, Harnessing Our Ocean Wealth, launched in 2012. Our CEO chaired the Enablers Task Force charged with the important task of preparing a report for the MCG on the implementation of marine spatial planning in Ireland.

The Institute continued to maintain excellence in its services with the delivery of a number of statutory monitoring programmes, research and advisory services to a range of clients.

The Marine Institute held the 10th Shellfish Safety conference and delivered a range of national monitoring programmes to ensure consumer safety in relation to seafood and the protection of the marine environment, including residues and contaminants, sea lice, biotoxins, as well as inspections and monitoring of movements of fish and shellfish stocks required under the EU Fish Health Directive and requirements of the Water Framework Directive.

The national research vessels carried out an intensive survey schedule providing an essential research platform as well as important opportunities for third level students through the 'Scientists at Sea' programme run by the Strategic Marine Alliance for Research and Training (SMART). The Advanced Mapping Services Team carried out seabed mapping and data acquisition for the INFOMAR programme in priority areas off the south and west coasts and surveyed areas off the coast of Clare to support the development of the ocean renewable energy sector.



The 'Galway Statement on Atlantic Ocean Cooperation' was signed by representatives of the European Union, the United States and Canada who have agreed to join forces on Atlantic Ocean Research.

We produced the annual Fisheries Stock Book, which is used to input into the International Council for the Exploration of the Seas fish stock advice and is a key reference in the annual Fisheries Council negotiations in Brussels; scientific input into new landings obligations (discard ban) and new regionalised focus for management introduced as part of the new Common Fisheries Policy; supported the Department of Arts, Heritage and the Gaeltacht in successfully listing five vulnerable shark species on the convention of International Trade in Endangered Species.

Our Irish Maritime Development Office published its 10th annual version of the highly regarded Irish Maritime Transport Economist and provided key advisory services to the Department of Transport Tourism and Sport in relation to the latest review of Government Ports Policy and continued its important services in the maritime business development and training areas.

We retained our Excellence Through People Accreditation during the year. This together with the strong focus on staff motivation and involvement in our strategic plan demonstrates the value the Marine Institute places on the essential role played by our staff in the achievement of our organisational goals. We continued to invest (€2.9M) in the implementation of the Sea Change Strategy (*A Marine Knowledge Research & Innovation Strategy for Ireland 2007–2013*) across a range of research areas.

Our Internal Audit Committee and the Executive executed an intensive suite of internal audits which reported maximum levels of assurance on a broad range of controls to the Marine Institute Board.

Such achievements would not have been possible without the commitment of the Chief Executive, management and staff of the Institute, who have maintained an admirable focus and commitment to the shared vision of "a thriving maritime economy in harmony with the ecosystem and supported by the delivery of excellence in our services."

John Killeen.

Mr John Killeen
Chairman
(2014–2019)



Mr Jim Fennell completed his term as Chairman for the Marine Institute board.

"The Galway Statement on Atlantic Ocean Cooperation Launching a EU – Canada – United States of America Research Alliance, signed here at the Marine Institute... highlighted our contribution to the European marine research agenda during Ireland's EU Presidency."



The CEO Dr Peter Heffernan of the Marine Institute presented the 2013 Stock Book to the Minister for Agriculture, Food & the Marine Mr Simon Coveney.

Chief Executive's Report



January to June 2013 marked the Irish presidency of the EU and the Marine Institute was privileged to play a role in support of this important national effort. Our scientific staff were directly involved in supporting Minister Coveney and his Department in their leadership role in bringing the reform of the Common Fisheries Policy to a successful conclusion, with key inputs on the discard ban and new regional management initiatives. Our scientists also assisted the Department of Arts Heritage & Gaeltacht in their work on

the Convention on International Trade in Endangered Species (listing five new vulnerable shark species).

The Marine Institute was also heavily involved in the supporting other key priorities of the Irish EU Presidency namely, the Atlantic Strategy and its associated Action Plan (launched in Brussels in May) and the signing of The Galway Statement on Atlantic Ocean Cooperation Launching a EU – Canada – United States of America Research Alliance (see Appendix 9). The Atlantic Action Plan was informed by four Atlantic Forum workshops, the final of which was organised by the Marine Institute and took place in University College Cork in March 2013.

The Galway Statement was signed on 24th May by political representatives of the EU, Canada and the USA at a special event in the Marine Institute which also included an international scientific workshop “The Atlantic A Shared Resource” (see Appendix 10). The Institute was happy to play a central role in this process on behalf of Ireland and the EU Commission.

This work in the international sphere represented roles performed by the Marine Institute in conjunction with the Irish inter-departmental Marine Coordination Group, chaired by Minister Coveney. Through the work of this MCG, Ireland played a lead role in the evolution of the EU Atlantic Action Plan, the Galway Statement and the shaping of significant marine research elements in the EU Horizon 2020 programme. The European plan for research and innovation, Horizon 2020, was launched in December 2013 with €200m targeted at marine research in the Horizon 2020 programme 2014–2015.

Another Presidency initiative was to bring a performance of the innovative ocean science literacy event, The Longest River, to a full house in Brussels. The event was in partnership by Culture Ireland and Tourism Ireland and under the patronage of both Ms Maria Damanaki and Ms Máire Geoghegan-Quinn, Members of the European Commission. The Longest River was subsequently highly commended by the Allianz Business to Arts award programme.

The Marine Institute continued to play a strong support role for the work of the Marine Coordination Group and during 2012 I chaired the Enablers Task Force established by the Marine Coordination Group to examine and report on a Marine Spatial Planning system for Ireland. The Enablers Task Force submitted its report to the Marine Coordination Group in November. In December a Development Task Force, was established under the aegis of the Marine Coordination Group to report on key actions to promote specified elements of the enterprise agenda from Harnessing our Ocean Wealth.

We concluded a new three-year Strategic Plan, developed by the board and executive of the Marine Institute, which now constitutes the key planning document and framework for which the Marine Institute will operate between now and 2016. The plan sets out a strategy to guide the

Marine Institute as we embrace continuing challenges and opportunities in our work programmes, whilst ensuring our statutory and core services are delivered to the highest achievable standards. By continuing to work together, this plan will allow us to continue to navigate the difficult economic times and help us to plan for the eventual upturn.

Through the dedication and professionalism of our staff the Marine Institute delivered the full suite of our front line services across our services teams as outlined in more detail later in this report. Amongst our larger programmes of scientific and advisory services are:

- > Annual stock assessments and fisheries scientific advice culminating in the annual Stock Book publication
- > Seafood safety statutory monitoring programmes across biotoxins; residues; fish health
- > Aquaculture monitoring
- > Marine Strategy Framework and Water Directive related programmes
- > INFOMAR (seabed mapping) survey and added value programmes and information services
- > Research vessels operations on the *RV Celtic Explorer* and *RV Celtic Voyager* and *ROV Holland I*
- > IMDO – shipping and related services sector development, as well as
- > Corporate governance; human resource and facilities management.

During the year we also hosted a visit from the Chinese Academy of Fisheries Science, building on the Memorandum of Understanding signed in 2012, to explore opportunities for collaboration on marine research, in aquaculture and food safety and staff exchanges.

The Marine Institute both funded and carried out important research activities in a number of areas in 2013. Among the highlights was the discovery of a new habitat in the Whittard Canyon system, by scientists from the Ryan Institute in the National University Ireland, Galway onboard the *RV Celtic Explorer*. A team of scientists were able to explore the canyon remotely using the *ROV Holland I*, to discover a vertical rock face half a mile below the sea surface, which extended upwards for about 150 metres, and was covered in a colony of bivalves and corals. Some of these are believed to be up to 200 years old.

The Marine Institute secured competitive external research funding awards (FP7/INTERREG) to the value of €767k during 2013. This brings our cumulative earnings 2007–2013 to €5.6 million. This is an important element of a most impressive performance by the wider Irish marine research community which has secured a cumulative approximate total of €68 million over the years 2007–2013 from EU FP7 and INTERREG funding sources. The Irish marine sector won over €48 million in competitive funding under the FP7 Programme, which represents an impressive 8% of the total national FP7 drawdown.

Scientists from our Shellfish Safety team completed the Astox2 research project which made significant discoveries about toxicity, pathways and causative species for the azospiracid toxin.

Our scientists also completed the award-winning ASIMUTH project which developed forecasting products using physical models, satellite and in-situ data to provide early warning of harmful algal blooms to allow fish and shellfish farmers to modify their culture and harvesting strategies in order to reduce potential losses.

We continued our collaboration with the Centre for Fisheries Research, Newfoundland, to carry out a transatlantic survey on the *RV Celtic Explorer*. His Excellency the Canadian Ambassador, Loyola Hearn

visited the *RV Celtic Explorer* to meet Irish and Canadian scientists and crew before it sailed from Galway Docks to St. Johns, Newfoundland and Labrador.

Raising awareness of Ireland's ocean wealth and increasing engagement with the sea is a key goal of *Harnessing Our Ocean Wealth – An Integrated Marine Plan for Ireland*. We help to make this happen through our Explorers Education Programme and various events (including the performing of *The Longest River* mentioned above).

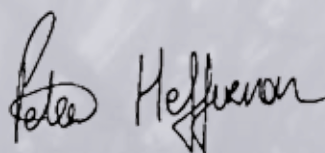
In December 2013 we hosted over 700 students on the *RV Celtic Explorer* in Galway Docks over two days where they toured the vessel and meet the scientists and crew that work on board. We expanded participation levels in the Explorers Education programme in the Galway and East coast areas, with the support of the Galway Education Centre, Galway Atlantaquaria continued the Explorers Programme in Mayo and Clare with the support from the local education centres.

Our Irish Maritime Development Office introduced an innovative new iShip Index as the world's first country index based on trade and traffic flows through its domestic ports. This quarterly weighted indicator is already being used by Irish economists as it gauges the health of the Irish shipping industry and the wider economy.

We took the SmartOcean Forum north to Belfast in November 2013 in very successful partnership with Invest NI. Over 180 individuals representing over 90 organisations participated in the largest forum to date.

I wish to record my sincere appreciation to the staff of the Marine Institute and to commend them for their commitment to public service.

My appreciation also to the board for their continued efforts and guidance. Our chairman for the last five years, Mr Jim Fennell completed his term in December. I want to pay a special tribute to him for his great guidance, thoughtfulness and advice throughout his term.



Dr Peter Heffernan
Chief Executive



The Marine Institute and Galway based choir Cois Cladaigh showcased the marine science literacy and communication event "The Longest River" as part of the celebration of Ireland's Presidency of the Council of European Union, at Eglise du Saint-Sacrement in Brussels. (Left to Right) Dr Brendan O'Connor, Director of Cois Cladaigh; Professor John Delaney, University of Washington; Ms Maria Damanaki, the EU Commissioner for Maritime Affairs and Fisheries; Dr Peter Heffernan, CEO of the Marine Institute

"Ireland played a lead role in the evolution of the EU Atlantic Action Plan, the Galway Statement and the shaping of significant marine research elements in the EU Horizon 2020 programme."



Canadian Ambassador to Ireland, His Excellency, Loyola Hearn, boarded the *RV Celtic Explorer* at Galway Docks to meet the Irish and Canadian collaborators of the transatlantic expedition from Galway to St. Johns, Newfoundland and Labrador.

Corporate Services



Corporate Services

The continuing public sector embargo on recruitment together with a difficult economic environment determined that the focus in 2013 remained on providing value for money to customers in a highly efficient manner. This was achieved through collaborations with other bodies and the provision of a responsive, dynamic service and a continued focus on strong corporate governance.

Highlights of 2013 included:

- > The retention of our Excellence Through People Accreditation (ETP) under the National Standards Authority of Ireland's (NSAI) Standard – ETP 1000:2012. This standard is Ireland's national standard for human resource management with the two main objectives being to act as a business improvement tool as well as being a driver for change and innovation, and to promote employee learning, development and involvement in line with the organisation's goals.
- > Implementation of the *Sea Change strategy – A Marine Knowledge, Research and Innovation Strategy for Ireland, 2007–2013* continued during 2013, with an additional investment of €2.9m under the Marine Institute administered the National Development Plan (NDP) Marine Research Sub-Programme bringing the total investment to-date under the NDP Marine Research Sub-Programme to €63.4m.
- > Participation in a number of key Irish and international public and outreach events in 2013 enabled the Institute to reach new audiences. This included The Atlantic— A Shared Resource event in Galway which saw the signing of the historic *Galway Statement on Atlantic Ocean Cooperation* between the EU, USA and Canada.
- > A positive profile of the Marine Institute and the *Sea Change* strategy was communicated through comprehensive use of electronic and web-based communication evidenced through the number of visitors coming through www.marine.ie.
- > Corporate Governance continued to be an important priority for Corporate Services with regular internal audits reported maximum levels of assurance on a broad range of controls to the Marine Institute Board.

Mrs Caroline Bocquel

Director: Corporate Services

Human Resources

2013 was a year that focused on the provision of services and programmes to support and engage with our staff, in particular with the delivery of programmes and services detailed in the Marine Institute Corporate Plan.

Notwithstanding the embargo on public sector recruitment, the Marine Institute focused its Recruitment and Selection activities on work experience and development programmes. In 2013, eight recently qualified graduates (Stagiaires) were recruited under a 50 week work experience programme across a range of scientific, technical and administration disciplines. Seventeen internship opportunities were offered to persons on the live register across scientific and administrative areas. Seventy-five percent of stagiaires and 67 percent of interns secured employment with other organisations after their placements with us, with 13 percent of interns going forward to study for a Masters or PhD. Three other roles were recruited during 2013, two of which were externally funded temporary roles supporting scientific research projects.

The Marine Institute retained its Excellence Through People Accreditation under the NSAI Standard – ETP 1000:2012. This reflected our investment in the development of staff, our concentration on ensuring effective leadership and focus on improving communications, whilst ensuring ongoing business improvement.

The Marine Institute learning and development focus for 2013 included personal development, management development and health & safety, as well as strategic management & planning and finance for non finance managers. We offered a varied programme of essential and developmental training tailored to support the delivery of business critical work programmes, and ensuring the ongoing development of our staff. We continued to adapt our programmes to support the evolving needs of our teams, delivering value for money, using short preview programmes and online courses, as well as self learning tools and materials.

Eight meetings were held by the Marine Institute's Health & Safety Committee which support our ETP Quality Accredited Programme and represents all locations and activities across the organisation. Health, Safety and Employee Wellbeing awareness Week in December 2013 included seminars on the responsibilities of managers and staff; occupational first aid; positive mental health at work and the importance of healthy eating and exercise. The positive safety track record is a result of the effort and support of the Health & Safety Committee and staff in the Institute.

Finance

The Marine Institute is committed to maintaining the highest standards of corporate governance and ensuring full compliance with the revised Code of Practice for the Governance of State Bodies which was published in 2009. An independent assessment of the Institute's compliance was carried out in 2013 and found that corporate governance standards are given high priority within the Marine Institute.

Under the stewardship of the Internal Audit Committee, the Marine Institute continued to undertake internal audits in 2013, all of which affirmed the Institute's high standards of governance and ensuring that an effective system of internal control is maintained and operated. This included audits on the code of practice, review of the system of internal financial controls, financial management reporting mechanisms and scientific data management. Progress on the implementation plans to address any internal audit recommendations are regularly reviewed and reported to the Internal Audit Committee and the Marine Institute Board.

The Marine Institute financial procedures and policies were updated during 2013. The 2013 budget was reviewed and approved by the Board of Directors in January 2013. Budgetary authority and responsibility is assigned for specific functions to selected managers as laid down in the policies and procedures in relation to financial and procurement issues of the Institute.

There continues to be a strong public procurement ethos and focus throughout the Marine Institute and 39 tenders were issued in 2013 of which 10 were published on the Official Journal of the European Communities (OJEU). Centralised purchasing has proven to be an efficient and effective means of reducing costs and will continue into 2014.

It is the policy of the Marine Institute to ensure that all invoices are paid promptly. Systems and procedures have been put in place to enable invoices to be tracked and to ensure that payments are made before their due date. Purchase invoices are logged on a daily basis in the finance section, and are followed up systematically to ensure that they are certified and returned for payment without delay. Payments are issued as required to ensure prompt payment. An update to our financial system took place in 2013 which now allows electronic entry and approval of purchase orders.

Facilities

The Facilities team manages the daily operations of key support services including cleaning, security, maintenance and catering within the Marine Institute's main offices and laboratories. Based primarily in the headquarters in Oranmore, the main function of the team is to maintain the standard of the facilities and deliver excellent customer services through the stores, reception and maintenance functions, to both internal and external customers.

Twelve thousand incoming telephone queries were responded to by the centralised reception in Oranmore throughout 2013 and over 406 non scheduled or planned maintenance issues were raised and closed out during the year. The key objective for the specialist and general maintenance engineers is to ensure smooth operations throughout the facilities and maintain the buildings, plant and equipment to a very high operating standard.

One of the core objectives for the team is to achieve cost efficiencies through effective procurement practices and facilities operating procedures. The use of Office of Government Procurement Frameworks and open tenders are key procurement components for the team. Centralised purchasing continues to be promoted throughout the organisation, with Facilities members taking the lead.



A group of offshore bottlenose dolphins, about 150km west of Ireland, taken during the fourth dedicated survey of cetaceans on the continental shelf edge which was conducted by scientists from the Galway-Mayo Institute of Technology's Marine and Freshwater Research Centre. The survey which is carried out on the *RV Celtic Explorer* is funded through the Marine Institute's National Research Vessel Ship – Time Programme 2013 supported by the Marine Research Sub-programme of the National Development Plan 2007–2013

“2013 was a year that focused on the provision of services and programmes to support and engage with our staff, in particular with the delivery of Programmes and Services detailed in the Marine Institute Corporate Plan.”



Imelda Hehir from the Marine Institute talks to students about her work in fisheries management on the *RV Celtic Explorer*. Over seven hundred students from Galway, Roscommon and Mayo visited the research vessel having entered the “Exploring the XTRA—Ordinary Writing Competition”.

Corporate Services



Library Services

In November 2013, the Marine Institute library joined the national open access portal for Irish research publications (RIAN). The Institute's Open Access Repository (<http://oar.marine.ie/>) contained 814 publications by the end of 2013 with 16,422 visits in 2013 and a total of 29,752 visits since its launch in March 2011. In addition to the digital full-text versions of Marine Institute publications the Repository is an important archive for electronically preserving old reports and papers. A significant feature of the repository is that performance indicators are available that show how often publications are being viewed/downloaded and from what countries. The visibility, research impact, and probability of being cited of Marine Institute publications has been greatly increased, as all records in the Repository are fully searchable by Google and other search engines. The Repository ensures the Marine Institute complies with mandates from national and international funding bodies that all publications arising from their funding be placed in an open access repository.

The Institute signed a Memorandum of Understanding with Galway-Mayo Institute of Technology during 2013 to share library resources and established a reciprocal borrowing agreement.

Communications

Proactive communications with the Marine Institute's key stakeholders continued during 2013 through a variety of media, education and outreach programmes. We commenced a project to redevelop the Institute's website which will go live in 2014 as well continuing to develop social media platforms Twitter, Facebook and LinkedIn. Our scientists@sea blog continues to be very popular with significant following and engagement from scientists and the public alike.

We delivered the Explorers Programme in Galway, Mayo, Clare, Dublin, Wicklow and Cork with support from our partners, including Galway Atlantaquaria, Sea Life Centre Bray and the Lifetime Lab Cork. The Explorers Education programme was also supported by Galway, Mayo, Clare and Blackrock education centres. The programme in Galway was restructured, offering four different marine themed modules for schools to apply for through the Education Centre. School tours were held on the *RV Celtic Explorer* where over 700 primary and secondary students had the opportunity to learn about the research conducted on the vessel, including seabed mapping, fisheries research, oceanography as well as getting a sense of life working on a research vessel.

A number of marine-related stories promoted by the Marine Institute featured prominently in the media throughout the year including a biodiversity survey by the National University of Ireland, Galway onboard the *RV Celtic Explorer* during which new deep sea habitats were discovered using the *ROV Holland I*. The survey was funded under the Sea Change Strategy with the support of the Marine Institute and the National Development Plan 2007–2013. ASIMUTH, an Irish led EU Framework 7 funded project (led by the Daithi O'Murchu Marine Research Station-DOMMRS) won the Copernicus (Global Monitoring for Environment and Security) Masters Prize for best earth-monitoring service for European citizens 2013. This pan-European project developed an online alert system to provide an early warning to the aquaculture industry of imminent harmful algal blooms.

Other events which gained significant media coverage included: *The Atlantic – A Shared Resource* event held at the Marine Institute, Galway in May, which saw the signing of an historic *Galway Statement on Atlantic Ocean Cooperation* launching a research alliance between the EU, USA and Canada; the *SmartOcean Forum* in Belfast promoted Ireland and Northern Ireland as leaders in the development of information communications technology (ICT) products and services for global marine sectors; and *The Longest River – A Marine Science, Literacy and Music* event held in Brussels promoted the importance of multidisciplinary marine research and how working across international borders is essential in achieving healthy marine ecosystems. This event was awarded highly commended in the Allianz Business 2 Arts awards.

Sea Change Management Unit and Research Office

2013 marked the final year of the term of the *Sea Change Strategy (A Marine Knowledge, Research and Innovation Strategy for Ireland, 2007–2013)*. During the year, €2.9m was invested under the Marine Institute administered NDP Marine Research Sub-Programme. A full list of the new investments in 2013 is provided in Appendix 1. The investment in 2013 brings the total investment to-date under the NDP Marine Research Sub-Programme to €63.4m (2007–2013). The vast majority (86%) of the 2013 investment was awarded to support research (143 days) and under/post-graduate training programmes (57 days) on-board the national research vessels *RV Celtic Explorer* and *RV Celtic Voyager*. The research undertaken was focused on the areas of fisheries (mackerel egg survey), marine environment (nutrient survey), oceanography/climate change, marine geology, marine technology and marine biodiversity/biodiscovery. Training programmes were provided to students from six Higher Education Institutes, either through structured, accredited specific modules or generic multi-disciplinary courses that were coordinated by the SMART Sea School in Galway – Mayo Institute of Technology.

In 2013, four final project reports were published and made available on the Marine Institute Open Access Repository. These reports provide important evidence based research findings that will assist future policy decision-making for finfish aquaculture (in relation to gill pathologies and fish diseases), seaweed aquaculture (seaweed species with commercial potential), data integration (of geoscientific data) and protecting the marine environment (by quantifying the distribution of marine mammals in Irish waters).

An additional €5m was committed, via other competitive national programmes (e.g. DAFM, HEA, SFI, EPA, IRC), to research aimed at addressing the objectives of *Sea Change*. This included a significant call that awarded €4m under the DAFM Food Institutional Research Measure (FIRM) for marine food research.

Irish marine researchers continued to enjoy success in EU competitive funding programmes (FP7 and INTERREG), with grant-aid of €12.8m being awarded in 2013. This brings the total grant-aid awarded to Irish marine researchers in the current EU funding cycle (2007–2013) to €67.5m. The total investment in marine/marine-related research in Ireland over the lifetime of *Sea Change* (2007–2013) now stands at approximately €204m of which 33% is represented by EU grant-aid for research. The final total of EU grant-aid won over this period is three times the target set in 2007.

The Research Office also provided support to Marine Institute colleagues in all service areas during 2013 in the financial management/administration of EU-funded research projects. Support is currently provided for 26 projects, valued in excess of €3.3m in grant-aid to the Institute. In the latter part of the year the focus turned to familiarisation and preparation for the next seven-year EU funding cycle; Horizon 2020.

Accessibility

The Institute was fully compliant with the Disability Act during 2013.



The Explorers Marine Education programme was re-launched with the expansion of over forty five primary schools taking part in the marine programme in Galway.

“The Longest River – A Marine Science, Literacy and Music event held in Brussels promoted the importance of multidisciplinary marine research and how working across international borders is essential in achieving healthy marine ecosystems”



Sheena Fennel from NUI-Galway demonstrates an acoustic release during the two-day practical offshore course in advanced marine technologies, which was delivered on the national research vessel *RV Celtic Voyager* to postgraduate students from the International SmartOcean Graduate Enterprise Initiative (ISGEI). The training was carried out under the *Sea Change* strategy with the support of the Marine Institute and the Marine Research Sub-programme of the National Development Plan 2007–2013.

Irish Maritime Development Office



Director's Statement

The maritime transport sector is beginning to emerge from a period of contraction and consolidation that began in 2007. Although many challenges remain, 2013 was an important inflection point. Growth returned to the total volume of trade moving through Irish ports, as the demand for raw materials in industries such as agriculture and construction increased. Throughout the period, as the economy showed signs

of recovery, the Irish Maritime Development Office's (IMDO) work programme remained tightly focused on the development of policies and practices that support growth, sustainability and job creation within the maritime transport sector. The development of such policies and practices is a collaborative effort that relied heavily on the cooperation of industry stakeholders. The results of this collaboration are manifest in the achievements of the IMDO in 2013 and in previous years. For example:

- The IMDO produces reliable and authoritative data that track the growth and development of the sector. Quarterly market commentaries are issued, in addition to the *Irish Maritime Transport Economist* (IMTE), an annual publication that has become a reference document for practitioners, representative bodies and policy makers. These publications would not be possible without the cooperation and support of shipping companies, ports and other agencies in the sector. The 10th edition of the IMTE was issued in 2013, marking an important milestone in its development. The data repository that now exists within the IMDO allowed an informed contribution to be made to the development of a new National Ports Policy, which was published by the Minister for Transport, Tourism and Sport in 2013.
- When introduced in 2002, the Irish Tonnage Tax regime arrested the decline in indigenous ship owning. It was also successful in bringing international ship owners into the scheme and attracting foreign inward investment to the Irish maritime sector. International shipping companies, introduced to Ireland by the IMDO, now feature prominently among Ireland's top companies, as reported in the Irish Times Top 1000 in May 2013. The introduction of the tonnage tax regime was a proactive initiative by Government that continues to deliver dividends to the maritime sector and broader economy. By the end of 2013, 45 companies had registered under the scheme, accounting for almost 300 vessels.
- By supporting the education and training of cadets, through the Irish Seafarers Education Assistance Scheme (ISEAS), the IMDO continues to recognise and showcase the calibre of the graduates emerging from the National Maritime College of Ireland. Through the scheme, cadets find placements with prestigious international shipping companies and many go on to have rewarding and successful careers in the maritime sector. In 2013, the ISEAS program found placements for 123 cadets with the 14 companies that participated in the scheme.
- The performance and efficiency of the maritime transport sector has repercussions for international trade, the competitiveness of our national economy and job creation. Therefore, it is incumbent on the IMDO to work closely with all commercial ports on the island, including those in Northern Ireland to drive the development of the sector. The need for efficiency and competitiveness in the sector was recognised by the Minister for Jobs, Enterprise and Innovation, who asked the Competition Authority to review the competitiveness

of Irish ports. The IMDO contributed to the consultation process by providing technical and statistical analysis, which informed the report that was released by the Competition Authority in November 2013. In addition, the IMDO carried out its annual review of the financial performance of Irish ports, which was presented to the Minister for Transport, Tourism and Sport during the year. The analysis provided a comparative review of the financial performance of ports and its findings were used by colleagues within the Department to inform wider port policy deliberations.

By engaging in initiatives such as those listed above, The IMDO encourages positive change and fulfils its mandate to support the development of the Irish maritime transport sector. Throughout 2013, the IMDO laid emphasis on those initiatives and policies that offer the potential for economic renewal and job creation.

Mr Glenn Murphy

Director: Irish Maritime Development Office

National Perspective

Turning to the performance of the Irish maritime transport sector in 2013, it is clear that a number of indicators give us cause for greater optimism than has been the case for many years.

The volume of trade that moves through Irish ports is a reliable indicator of national economic performance and activity. Although the volume of traffic moving through Irish ports remains below the historic highs of the previous decade, it is noteworthy that the iShip Index, which is an aggregate measure of trade volumes, rose to 862 points in 2013, up 3% on the previous year. Dry bulk traffic, comprising of commodities such as coal, ore and agricultural produce, rose by 6%. The break bulk index, which tracks construction related materials such as steel and timber, rose by 18%, pointing to a resurgence of the construction sector. Overall, as a barometer of economic performance, the iShip index for 2013 supports the view that steady progress is being made towards economic recovery.

A number of port companies, tasked with providing the infrastructure to meet the future demands of the Irish economy under the National Ports Policy, have submitted ambitious proposals for expansion and development. Although total port capacity is not an immediate concern, given that current volumes remain below pre-recession highs, the proposals under consideration recognise the need for additional port capacity as the economy recovers and the potential that exists in specific market segments, such as cruise business, for considerable expansion in the future.

In 2013, plans emerged for the commencement of new services to France and Spain and capacity was added to a number of existing routes. Such announcements underpin growing confidence in the recovery of the Irish economy and the belief that growth in both passenger and freight traffic is possible on a number of routes. These initiatives are welcome and represent a marked change in sentiment in relation to the growth potential of the sector.

Collectively, these indicators and trends, which are closely monitored by the IMDO, justify a degree of cautious optimism that the maritime transport sector is steadily emerging from a period of retrenchment that started in 2007.

International Perspective

Shipping is a global industry that cannot be neatly segmented into discrete geographic regions. Its assets are mobile and as a result, global trends have significant regional impact. The IMDO monitors global shipping markets and reports on the factors that influence supply, demand and pricing within the industry. Included in the analysis are: global demand; charter rates; exchange rates; interest rates; fuel prices; and a range of social, political and economic issues that impact on international shipping markets and as a result, the Irish maritime transport sector.

Global container trade grew by 5% in 2013, marginally below expectations, mainly because of underperformance in the Eurozone. Looking to the future, trade volumes are expected to increase by between 6% and 7% in 2014, as the economic recovery in the Eurozone continues.

The global containership charter market reported modest increases in 2013, as rates rose by 2.9% on average, compared to the previous year. Notably, charter rates for the vessel classes that dominate the Irish market (300 to 1000 TEU), increased by up 20% during the period. However from a historical perspective, rates remained close to an all-time low for the majority of vessel classes, and in many cases are below the level that generates an economic return for owners.

The increases in charter rates that affected the Irish market were mitigated by lower average bunker prices—down 7% from 2012, based on IFO 380. However this relief may be temporary. From the 1st January 2015, the EU Sulphur Directive comes into effect. This will substantially increase the cost of bunker fuel, with consequential increases in fuel surcharges. All ships transiting the Sulphur Emission Control Area (SECA) will be required to use fuel with a sulphur content of less than 0.1%.

Interest rates remained at historically low levels internationally. Further cuts in interest rates and even mildly negative interest rates on deposits are under consideration in order to stimulate economic activity and ease deflationary pressure within the Eurozone.

The strength of the Euro against other major currencies, in particular those of Ireland's major trading partners, added to the challenges facing Irish exporters in 2013. The Euro is expected to weaken gradually in 2014, with median forecasts suggesting an approximate depreciation of 6.0% and 5.2% against Sterling and the US dollar respectively. This move is likely to ease trading conditions for Irish exporters in these two important markets in the coming year.

Throughout 2013, the IMDO monitored the international trends that impact on the performance of the Irish maritime transport sector and these trends subsequently influenced its policy advice to government.

Industry-wide Perspective

The Irish maritime transport industry encompasses a broad range of interest groups. Its performance has a significant impact on the national economy, particularly in terms of trade and tourism. It is important therefore, as a development agency, for the IMDO to take soundings from a range of stakeholders that is representative of the industry as a whole. It is also important that the policy positions taken by the IMDO are informed by national issues, emerging issues within the EU, and relevant global developments. To this end, the IMDO cultivates strong relationships with a network of organisations and agencies that have common cause in developing the maritime transport sector in Ireland.

At a national level, the IMDO routinely engages with representative groups such as the Irish Exporters Association, IBEC and the Irish Ports Association. In supporting the development of the industry, the IMDO has established strong ties with agencies such as the IDA, Enterprise Ireland and third level institutions involved in educational programmes in the maritime sector.

At a European level, the IMDO is involved in the formulation and implementation of EU programs and disseminates relevant information concerning these programs to industry stakeholders. Currently, the IMDO participates actively in programs such as the Waterborne Project, under the Horizon 2020 Program and identifies funding opportunities for the industry and for third level institutions interested in research in the maritime sector. Through its European network of industry contacts, including permanent representatives of Irish agencies in Brussels, the IMDO is kept apprised of significant developments at EU level.

At a global level, the IMDO draws information from international shipping markets through representative organisations, or where appropriate, directly appointed agents. The IMDO has been active in markets as far apart as the USA and the Far East to generate interest in Ireland's maritime sector.

The IMDO remains closely involved in the Irish Shipping Services Centre (ISSC) project, which seeks to establish Ireland as an international shipping hub. The promoters of the project have identified the potential to create more than 3,000 new jobs in Ireland by attracting companies directly involved in the maritime sector, in addition to a broad array of ancillary services, including vessel financing, insurance, advisory and consultancy.

In 2013, the IMDO was both a listening ear to industry stakeholders and a strong voice to government in articulating the practices and policies that will enable the Irish maritime transport sector to realise its potential as a facilitator of international trade and a source of new jobs in the Irish economy.

Marine Environment and Food Safety Services



Director's Statement

The work of Marine Environment and Food Safety Services (MEFS) focuses on protecting the marine environment, providing services in support of a sustainable aquaculture industry, and ensuring consumer safety through providing seafood safety services. This work continues to support market access for Irish seafood exports. This work is

delivered via three core functions including: Monitoring; Advice and Technical Support; and Research.

Ongoing Monitoring programmes in 2013 included:

- > National Biotoxin Monitoring Programme
- > National Residues Control Programme (seafood component)
- > Inspections and monitoring of movements of fish and shellfish stocks as required under the EU Fish Health Directive
- > National Sea Lice Monitoring Programme
- > Water Framework Directive (Transitional and Coastal Waters elements).

In support of these programmes, the Marine Institute is the National Reference Laboratory for diseases in shellfish, finfish, and crustaceans; shellfish biotoxins; microbiological contaminants in shellfish; and certain chemical substances in aquaculture.

Our Irish National Accreditation Board (INAB) accredited quality system (ISO 17025), which underpins the delivery of these programmes, was further expanded in 2013, from 36 to 40 accredited test methods.

Advisory and technical services provided by MEFS in 2013 supported:

- > Appropriate Assessments of Fisheries and Aquaculture activity in Natura 2000 sites, Special Areas of Conservation and Special Protection Areas (SACs and SPAs)
- > Aquaculture licensing
- > Aquaculture Single Bay Management (SBM)
- > Delivery of key Marine Strategy Framework Directive (MSFD) milestones by the Department of Environment, Community and Local Government (DECLG) – an initial assessment of Ireland's marine environment and launch of Ireland's Marine Atlas (<http://atlas.marine.ie>).
- > Foreshore lease/licensing decisions by DECLG
- > Dumping at sea advice to the Environmental Protection Agency (EPA)
- > The work of the Marine Coordination Group's Enablers Task Force on Marine Spatial Planning.

Participation in research programmes/projects – and the dissemination of research outputs, including peer-reviewed publications – that support our core environmental and seafood safety monitoring and advisory roles played a key part in our 2013 work programme. Of particular note was the completion, with Ocean Science and Information Services, of the

award-winning ASIMUTH project, which developed forecasting products using physical models, satellite and in situ data to provide early warning of blooms to allow fish and shellfish farmers to modify their culture and harvesting strategies in order to reduce potential losses.

All of our work is carried out collaboratively with Government departments and agencies including the Department of Agriculture, Food and the Marine (DAFM); the Food Safety Authority of Ireland (FSAI); Department of Environment, Community and Local Government (DECLG), Department of Arts, Heritage and the Gaeltacht (DAHG), Sea Fisheries Protection Authority (SFPA) and the Environmental Protection Authority (EPA). MEFS also play an active role in international fora e.g. International Council for the Exploration of the Seas (ICES) and the Oslo and Paris Convention 1992 (OSPAR).

Mr Aengus Parsons

Director: Marine Environment and Food Safety Services

Monitoring Shellfish Safety

The shellfish biotoxin monitoring programme, carried out by MEFS on behalf of SFPA and FSAI, analysed just over 3,300 samples in 2013. The requirement to analyse increasing numbers of scallops harvested from classified inshore areas has resulted in a large increase in sample numbers on previous years. Elevated biotoxin levels in many shellfish production areas resulted in protracted closures of shellfisheries through the summer and in some areas right up to the end of the year. Although these are natural events and lengthy closures have been observed previously, the impact on the industry was significant. Continuous support by provision of ongoing monitoring was provided to measure the levels of toxicity in all samples submitted and issue advice, along with the SFPA, on the re-opening of areas once it was safe to do so.

Monthly monitoring of *E. coli* levels in shellfish was conducted in all production areas and the annual review of the data was carried out with the SFPA to assign appropriate classification to each area. 2013 marked the completion of two PhD projects in MEFS that added considerably to our knowledge on the distribution of Norovirus from wastewater treatment plants and the risk associated with these in shellfish.

An extensive bloom of the phytoplankton species *Phaeocystis* was detected in June of 2013 and observed using satellite imagery. It led to much public interest. This species, which is regularly observed in Irish waters, forms a floating colony of cells embedded in a polysaccharide gel matrix and led to discoloured water in several locations along the east coast. It is not known to cause a health risk to humans.

Residues and Contaminants Monitoring

The chemistry team carried out the aquaculture component of the 2013 National Residues Monitoring Programme to ensure compliance with European Commission legislation and ensure farmed fish are fit for human consumption. The results from analysis of 658 samples for a wide range of substances will be reported in 2014. The 2012 results, published in 2013, show full compliance with the European standards. Monitoring and advice on the levels of environmental contaminants in seafood was provided to the FSAI and the SFPA.

Finfish Farm Monitoring

The National Sea Lice Monitoring Programme carried out a total of 238 sea lice inspections on 24 active salmonid (salmon and trout) rearing sites during 2013, in accordance with the National Sea Lice Monitoring Protocol. Monthly reports on the monitoring results were circulated to interested parties and all the 2013 data was published in an annual report (O'Donohoe et al., 2014).

A full review was conducted of 2012 finfish farm benthic reports submitted to DAFM in fulfilment of their benthic monitoring protocols.

Fish Health

In 2013, over 3,000 finfish – primarily Atlantic salmon, but also rainbow trout, pike, perch and other coarse fish, were tested for pathogens either under health surveillance programmes; following the submission of diagnostic samples to the laboratory, or as a result of screening tests carried out for the aquaculture industry. Ireland remains free of listed finfish diseases. Two-thousand shellfish samples were tested for the presence of pathogens. Surveillance for the herpes virus (OsHV-1 μ var) in Pacific oysters was a significant focus again in 2013. The virus was detected in a further three bays, bringing the total of positive bays in Ireland to 32. The entire country, with the exception of eight bays, is considered free from *Bonamia ostreae* and the entire country remains free from *Marteilia refringens*.

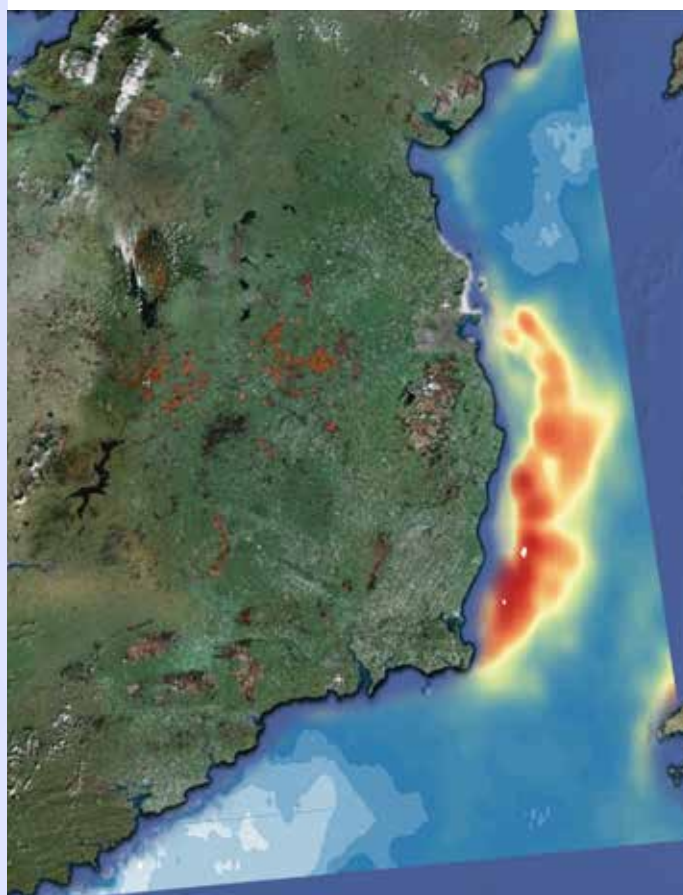
Environmental Monitoring

An extensive environmental monitoring programme was implemented on behalf of EPA and DECLG in transitional and coastal waters for physico-chemical parameters, priority substances, phytoplankton and benthic fauna to fulfil the requirements of the Shellfish Waters Directive. MEFS staff undertook a winter environmental survey in February 2013, on board the *RV Celtic Voyager*, sampling at 280 stations from the Irish Sea, and on the south and west coasts for testing of nutrients and water quality parameters. Ninety-five samples for analysis of the benthic fauna were also collected.



Ireland's marine environment and food safety was supported by ongoing monitoring, advisory and technical services and research.

“MEFS staff provided significant scientific and technical inputs into the completion and submission to the European Commission of Ireland's Initial Assessment, and subsequent public consultation, under the Marine Strategy Framework Directive.”



Phytoplankton bloom off the East coast in June 2013.

Advice and Technical Support

MEFS provide ongoing advice to DAFM in support of aquaculture licensing. During 2013 this consisted of:

- Completion of three Appropriate Assessments (AA) for marine Special Areas of Conservation (Donegal Bay, Lough Swilly and Roaringwater Bay), allowing for progress on over 150 licensing decisions. A further four AAs were progressed substantially in 2013 and will be completed in early 2014.
- Environmental Impact Assessment (EIA) screening and AA screening for licence applications in non-Natura sites.
- Advice on 56 aquaculture licences in non-Natura sites.

The Single Bay Management (SBM) process was successfully completed in all active finfish farming bays in 2013. SBM documents, including active fallow plans, were updated for all 11 finfish aquaculture operators along the coast. The SBM process is designed to coordinate fish husbandry in such a way that best practice is followed and that stocking, fallowing and treatment regimes on individual farms are compatible with the arrangements on neighbouring farMs. It has proven very effective in enhancing the efficacy of sea lice control and in reducing the overall incidence of disease in the stocks. SBM plans are subject to revision for each production cycle.

The Shellfish Safety team provided advice on the food safety of shellfish to the SFPA and FSAI for ongoing official controls under the monitoring programmes for shellfish biotoxins and microbiological classification. During 2013, MEFS assisted the competent authority during an audit of these programmes carried out by the European Commission's Food and Veterinary Office.

The Marine Institute continued to provide inputs to Bord Iascaigh Mhara in support of their consideration of potential offshore aquaculture sites.

MEFS staff provided significant scientific and technical inputs into the completion and submission to the European Commission, in mid-2013, of Ireland's Initial Assessment (an in-depth assessment of our marine environment), and subsequent public consultation, under the Marine Strategy Framework Directive (MSFD). This work, which is managed by the Marine Institute on behalf of DECLG, is being carried out by external contractors. 2013 also saw the completion and launch, on the Marine Institute's website, of Ireland's Marine Atlas. The online Marine Atlas (<http://atlas.marine.ie/>) contains spatial information on ecosystem characteristics, human activities, protected sites and administrative boundaries. The focus of work will now be directed towards developing the monitoring programme required under the Directive.

Other areas in which MEFS staff provided advice during 2013 included:

- Disposal of dredge spoil at sea – by way of participation on the EPA Dumping at Sea Advisory Committee
- Applications for Foreshore Leases/Licences – by way of participation on the DECLG Marine Licence Vetting Committee (MLVC)
- Certain environmental aspects of offshore hydrocarbon exploration and production – advice to the Department of Communications Energy and Natural Resources (DCENR) and the EPA
- Marine Spatial Planning including providing advice to the Marine Coordination Group's Enablers Task Force and to Dept. of An Taoiseach on the proposed European Directive.

Competent Authority for Fish Health

In addition to the fish health laboratory services, the Fish Health Unit of MEFS is the Competent Authority in relation to the implementation of the Fish Health Directive' (Council Directive 2006 /88/EC). The Competent Authority section directs the work of the DAFM Veterinary Inspectors who work in the aquaculture field. In 2013, 301 inspections were completed under the legislation; 1,421 movements – imports, exports and internal movements – of live aquatic animals were authorised; and 48 new Fish Health Authorisations were issued, bringing the total number of authorised Aquaculture Production Businesses in the country to 465.

Research

MEFS staff continued their involvement in European and nationally funded research programmes, carrying out applied research in support of the delivery of our monitoring programmes and advisory services. As 2013 marked the end of national and European funding cycles a number of projects concluded in 2013, including:

- The ASTOX II project provided further answers regarding the toxicology of this shellfish poison, the transfer of the toxin via shellfish and the distribution of the causative species *Azadinium spinosum* in coastal waters.
- The EU FP7-funded *Prevent Escape* project, published results in that provide a qualitative and quantitative study into the causes and extent of escapes from offshore aquaculture operations across Europe. Further peer reviewed publications are expected in the coming months.
- The award-winning *ASIMUTH* project (FP7 funded) developed forecasting products using physical models, satellite and in situ data to provide early warning of harmful algal blooms (HAB's) to allow fish and shellfish farmers to modify their culture and harvesting strategies in order to reduce potential losses. Daithi O'Murchu Marine Research Station (DOMMRS), project leaders and the Marine Institute, along with the other partners, took up the forecasting challenge to attempt to predict blooms that seriously disrupt the production plans of fish farMs. These blooms add costs not only by causing fish to die, but also through prolonged bay closures, subsequent waste disposal of fish, and increased insurance deductibles. In conjunction with our monitoring service, a weekly regional alert and expert interpretation and forecast on HABs was published via a web-bulletin. The service was designed to combine all of the available information from Earth (in-situ monitoring stations), space (satellite data) and in-silico (biological and physical oceanic models) sources for the northeast Atlantic Ocean. ASIMUTH continues after the project to provide the aquaculture industry with an overview of areas at risk of a HAB event.
- *Bivalife* (FP7 funded) – the objectives of which are to provide knowledge related to pathogens infecting oysters and mussels and to develop practical approaches for the control of infectious diseases affecting these animals.

- > An EPA-funded project on the impact of Norovirus in wastewater effluent on shellfisheries in Ireland.

Ongoing projects during 2013 included:

- > Biological Effects, which combines biological effects with chemical analysis to provide more effective assessment of pollution in Irish waters.
- > The role of passive sampling in screening and monitoring of new and emerging chemicals in the marine environment (EPA funded)—a Dublin City University led project assessing the potential of passive sampling in monitoring priority pollutants in Ireland.
- > A range of other projects, at MSc and PhD level, in shellfish microbiology, marine chemistry and fish health.

The Marine Institute continues to support Ireland's National Marine Biotechnology Programme, in particular through the provision of laboratory facilities for research projects being carried out by the National University of Ireland Galway under the Beaufort Marine Biodiscovery award led by Prof. Deniz Tasdemir.



Pat Costello from the Marine Institute - Foras na Mara Phytoplankton team shared his knowledge and promoted the theme of Ireland's Xtra ordinary marine science at the Galway Science and Technology Festival.

“The award-winning ASIMUTH project (FP7 funded) developed forecasting products using physical models, satellite and in-situ data to provide early warning of harmful algal blooms”



Jenny Ronan testing the water at Omev Island, which was one of the sampling locations for the Biological Effects and Chemical Measurements in Irish Marine Waters project. This project was jointly funded by the Environment Protection Agency and the Marine Institute and carried out under the Sea Change Strategy and the Marine Sub-Programme of the National Development Plan 2007–2013.

Fisheries Ecosystem Advisory Services



Director's Statement

Fisheries Ecosystems Advisory Services (FEAS) work in 2013 was dedicated to providing the scientific support for the implementation of the Common Fisheries Policy and in providing service delivery to our major client the Department of Agriculture, Food and Marine (DAFM). Implementing the Marine Institute Corporate Plan was achieved through the

FEAS Strategic Plan (2000 to 2013) which was used by all FEAS staff in setting job objectives for 2013 as part of the Institute's Performance Management Development System. Our outputs for 2013 were achieved by a dedicated and highly skilled service team.

Highlights for the year 2013:

- > A key element of our work during 2013 was to provide support to various Government departments during the EU Presidency, particularly in relation to DAFM, who led EU negotiations on the reform of the Common Fisheries Policy. FEAS scientists played a key role in providing scientific input to the new landings obligations (discard ban) and the new regionalised focus for management.
- > FEAS supported Department of Arts Heritage and Gaeltacht (DAHG) in successfully listing five vulnerable sharks on the Convention of International Trade in Endangered Species (CITES). FEAS secured €3.9 million in EU funding under the EU Data Collection Framework. They also participated in a number of key meetings that prepared the groundwork for the new Data Collection Framework (2014–2020).
- > A key service delivery was the annual Stock Book which formed the basis of the Ministers sustainability assessment to the Oireachtas Committee on Agriculture and Fisheries and served as a critical reference tool during the EU Fisheries Council negotiations on fishing opportunities for 2014. FEAS continue to develop local fisheries management plans for various Special Areas of Conservation (SAC) as part of Ireland's NATURA programme and worked closely with the Institute's Marine Environment and Food Safety Services team and National Parks and Wildlife Service (NPWS).
- > In relation to the implementation of the Marine Strategy Framework Directive (MSFD), the team worked closely with our colleagues in Marine Environment and Food Safety Services and played a key role in developing indicators for the status of fish stocks (D3), and biodiversity (D1). Data and knowledge are essential to the formulation of scientific advice and we worked closely with Ocean Science and Information Services on issues related to data management and upgrading of data bases.
- > Research is an important component of FEAS work and national and EU funding was secured for a range of research projects focused on strengthening our service delivery and adding value to our data assets. These included developing mixed fisheries management plans in the Celtic Seas, developing the implementation of the ecosystem approach to management, and evolving research vessel surveys to collect additional data to support the MSFD.
- > Our team also worked closely with the Sea Fisheries Protection Authority (SFPA) and served on the SFPA Consultative Committee during 2013. There was also close cooperation with the third level sector through various research projects and through the joint supervision of PhD and MSc students.

- > A considerable amount of our staff time was spent at sea, port sampling and at both national and international meetings. Internal communications are therefore a critical component of the service group programmes and regular staff and management meetings throughout 2013 ensured an efficient and effective service delivery.

Dr Paul Connolly

Director: Fisheries Science Services

The Data Collection Framework

Implementing Ireland's obligations under the Data Collection Framework (DCF) (EU Council Regulation 199/2008) supports the science needed to conduct the Common Fisheries Policy and is a central part of the teams work programmes. DAFM have given the Marine Institute responsibility to conduct the various data collection, data management and production of scientific advice required to meet our DCF obligations. FEAS submitted the new DCF National Programme for Ireland (2014–2020), the DCF Annual Report for 2012 and a detailed 2012 Cost Statement to the Commission. The 2013 DCF work programme included a comprehensive research vessel survey programme, port sampling of landings, sea sampling of discards, age profiles of the main stocks, analyses of EU logbook data and mapping fishing vessel activity from Vessel Monitoring Systems.

A total of 164 sea sampling observer trips were carried out on Irish fishing vessels resulting in 561 scientist sea days. These trips provide FEAS with invaluable "on the ground" contact with the fishing industry. A total of 483,583 fish were measured and 54,160 fish were aged to provide data for the models used in international stock assessments at ICES.

The STOCKMAN database used by FEAS was redesigned and rebuilt during 2013 and now delivers more efficient and effective data queries and outputs. The discard database was also upgraded and improved access to the EU logbook was achieved. The Marine Institute worked very closely with Bord Iascaigh Mhara who are charged with delivering the economic components of the DCF.

Research Vessel Surveys

Research vessel surveys are a critical component of the FEAS work programmes. A total of 13 surveys were conducted on the *RV Celtic Explorer*, *RV Celtic Voyager* and chartered commercial vessels in the waters around Ireland. A total of 213 sea days and 1,242 scientist days were undertaken on these surveys and this represents a major resource commitment for our staff.

The acoustic survey programmes focused on assessing the blue whiting, boarfish and herring resources. Nephrops are a vital resource for the Irish fishing industry and the underwater TV surveys were critical to the assessment of the stocks worth over €80 million to the Irish industry. The Irish groundfish survey was carried out over a 42 day period in Quarter 4 and surveyed fish stocks in the Celtic Seas and off the west and north west of Ireland. The International mackerel egg survey is carried out every three years and surveys the mackerel egg distributions from Jan to July over an area from Portugal to south east of Iceland and southern Norway.

All of these surveys were coordinated through the International Council for the Exploration of the Seas who also ensure that the protocols and methodologies used by each survey are standardised. The data from all the surveys were used in international stock assessments that informed scientific advice on fishing opportunities for 2014 and 2015.

Stakeholder Interaction

Regular meetings with the fishing industry were held through the forum of the Irish Fisheries Science Research Partnership and the Regional Advisory Councils (RAC's), particularly the North Western waters RAC and the Pelagic RAC. The key issues addressed at the quarterly Fisheries Science Research Partnership included funding mechanisms for surveys, the Marine Strategy Framework Directive, NATURA, sea bass, discard sampling, state of stocks, assessment methods, maximum sustainable yield as a target, economic case studies of Irish ports, Bord Iascaigh Mhara gear trial results, Marine Protected Areas maximum sustainable yield, International Council for the Exploration of the Seas (ICES) advice and management plans. FEAS scientists also provided key input to the Celtic Seas Herring Management Committee. A northwest herring rebuilding plan was developed with input from the Federation of Irish Fishermen and the Pelagic RAC's. Quarterly meetings were also held with the environmental non-governmental organisations and issues addressed included, maximum sustainable yield, Common Fisheries Policy reform, state of stocks, scientific advice for 2014. A new more formalised quarterly forum was established with the non-governmental organisation's (Fisheries Ecosystem Forum) and meetings will commence in 2014.

Scientific Advice

FEAS scientists participated in over 117 international expert group meetings of the EU, ICES and the Scientific Technical and Economic Committee for Fisheries (STECF). Many of these meetings were funded under the DCF. These meetings dealt with the core business of stock assessment and advice, but other scientific issues and challenges related to the implementation of the CFP, NATURA 2000 and the Marine Strategy Framework Directive were also addressed at these meetings. These meetings dealt with topics such as calibration of acoustic instruments in fisheries science; indicators for the Marine Strategy Framework Directive; maximum sustainable yield reference points for fish stocks; mackerel coastal states (e.g. negotiations between EU and Norway); horse mackerel management plans; stock assessment and advice drafting; implementation of the Data Collection Regulation; and EU discard plan and the ecosystem effects of fishing. The team also provided scientific advice on the status of inshore stocks and the shellfish Stock Book. A risk assessment framework for the assessment of fisheries in NATURA sites was developed and risk assessments were completed for all coasts. Salmon and Eel advice was developed in cooperation with Inland Fisheries Ireland and the Standing Scientific Committees for Salmon (SSCS) and Eel (SSCE). The salmon forecast model used for the provision of catch advice was updated in 2011 and 2012 and applied for the first time in 2013. Our staff contributed to the submission of the Marine Strategy Framework Directive initial assessment of Irish marine waters and work was focused on biodiversity and fisheries status indicators.

Newport Facility

The census work programmes on salmon, sea trout and eel continued from the fish traps on the Burrishoole ecosystem. In the traps census

data for 2013, a total of 6,357 wild salmon smolts were recorded moving out of the Burrishoole catchment ecosystem.

The FEAS group at Newport continued their work on the maintenance and development of long term physical, chemical and biological datasets characterising the freshwater component of the ecosystem. These data were available on the new Burrishoole dashboard which went online in 2013. The fish rearing unit continued its work, with 71,862 eyed ova retained for the ranching programme. A total of 34,028 ranched salmon smolts were released in May 2013 as part of the salmon stock assessment programme.

The PhD work on the factors that effect salmon at sea continued in cooperation with Norway and the Loughs Agency in Northern Ireland. Work continued on the acoustic tagging programme on Lough Feeagh which examined behavioural and environmental preferences of wild and ranched adult salmon. The University College Cork Beaufort Genetics project continued its work at Newport and produced many peer reviewed publications in international scientific journals. A new PhD on sea bass commenced in 2013. This will involve the application of new technologies in satellite tagging and acoustic tracking to deepen our understanding of the migration patterns of sea bass in the Celtic and Irish seas.

Applied Research

Evolving scientific advice through the application of the results from research projects is an important element of the FEAS strategy. The Beaufort Ecosystem project, funded under *Sea Change*, addressed areas such as seal predation and by catch issues, food web interactions, size based ecological modelling and identification of closed areas to protect elasmobranchs with the results published in the international literature.

In 2013, our staff secured funding and participated in a wide range of EU funded projects including the Atlantic Crab Resource Network (ACRU-NET); developing mixed fisheries management plan for the Celtic Seas (GEPETO and DAMARA); Fisheries, aquaculture and seafood processing network (COFASP); benthic ecosystem fisheries impact studies (BENTHIS); shark satellite tagging; Maximum Sustainable Yield (MYFISH); Analysis on key food webs (EUROBASIN); Development of models for estimating salmon returns (ECOKNOWS). This included evolving surveys to collect more data that can support the Marine Strategy Framework Directive. These projects have secured EU funding of €683,000 over the duration of the projects and involve close cooperation with the Irish third level including National University of Ireland Galway, University College Cork, Galway Mayo Institute of Technology and Queens University Belfast.

Research work by the Beaufort ECOSYSTEM project continues. The objective of the project, which includes the Marine Institute, University College Cork, and Queens University Belfast, is to implement the ecosystems approach to fisheries management. During 2013, great progress was made on projects involving the interaction of seabirds, seals and cetaceans with fisheries.

A range of PhD projects, supervised by our staff and funded under the Institute's *Sea Change* programme were completed in 2013. These included life history studies on deep water black scabbard fish; signal detection models with limited data; climate change geographical shifts in cod and mackerel; long-term dynamics in herring populations; spatial temporal trends in discarding Trinity College Dublin; and sustainable fisheries and the diversity of marine communities.

Ocean Science and Information Services



Director's Statement

2013 was a very busy year for Ocean Science and Information Services (OSIS) and significant work took place in each of the service areas of oceanography, seabed mapping, research vessel operations, information services, ocean energy and advanced marine technology. This activity supports considerable national and international research, technology development and innovation, as well as monitoring activities from field acquisition

through to the generation of data products and services.

OSIS participated in a range of national, European and international programmes and is particularly active across a range of EU funded programmes which improve our capacity to provide support services tailored to the needs of integrated science programmes which inform cross-sectoral policy advice.

Recognising the increasing requirement for an integrated approach to marine Research Technology Development and Innovation, OSIS provides end-to-end solutions to clients. OSIS also contributed to strategic thinking at national and international level contributing to a range of initiatives including *Harnessing Our Ocean Wealth – An Integrated Marine Plan for Ireland*, the Galway Statement on Atlantic Ocean Cooperation and the EU strategy on the Atlantic.

Mr Michael Gillooly

Director: Ocean Science and Information Services

Research Vessel Operations

Research Vessel Operations' (RVOps) mission is to coordinate and manage the operation of the Marine Institute's two research vessels, the *RV Celtic Voyager*, the *RV Celtic Explorer* and the deep-water remotely operated vehicle *ROV Holland I*. They provide support services to the users of the vessels, including instrumentation and engineering support services and extremely flexible operations.

Highlights for the year 2013:

- > Intensive survey programmes were completed on both research vessels with the *RV Celtic Explorer* completing 15 surveys totalling 292 science days (plus over 20 maintenance days and over 20 mobilisation/demobilisation days) and the *RV Celtic Voyager* completing a total of 31 surveys comprising 261 science days.
- > A "Vessel users workshop" was held in May 2013 in Oranmore which was attended by over 50 vessel users and seagoing personnel. The meeting proved to be a very useful forum for exchange of views on vessel operations and future development.
- > The deep water remotely operated vehicle *ROV Holland I* completed a successful National University of Ireland Galway (NUI Galway) led "Biodiscovery and Ecosystem function of Canyons" survey of 23 days on the *RV Celtic Explorer*.

- > The *ROV Holland I* was mobilised in its deepwater configuration onto the *ILV Granuaile* and following a successful trial of the system the vessel and ROV were contracted to complete a successful fault finding survey of the high voltage Ireland – UK subsea electrical interconnector.
- > RVOps were contracted by Kinsale Energy PLC to complete an inspection survey of its entire subsea gas pipeline network and the Alpha and Bravo production platforms using the *ROV Holland I*. This survey which was again completed using the *ILV Granuaile* (which was under charter to the Institute) and the ROV's regular team of contract pilots and contract survey personnel was completed on time and within budget and resulted in valuable external revenue for the Institute which supports core services.
- > As well as the annual blue whiting, north west herring, herring acoustic surveys for the Institute's Fisheries Ecosystem Advice Services and the 47 day Irish bottom trawl survey (IBTS) ground fish survey, the *RV Celtic Explorer* also completed two 21 day mackerel egg surveys which occur every three years as part of an internationally coordinated program

Three external charters were completed onboard the *RV Celtic Explorer* in German and International waters including surveys for BSH-Germany and National Oceanography Centre (NOC)-UK which provided a valuable external contribution to the operational budget.

- > The *RV Celtic Explorer* was chartered for 36 days in April-May 2013 again by the Centre for Fisheries and Ecosystems Research of the Marine Institute of Newfoundland for the completion of a fisheries survey which included work on the Flemish Cap and the southern Grand Banks. The survey was preceded by a nine day transit survey of the North Atlantic which was manned by Irish and Canadian scientists and on which valuable cetacean and oceanographic data were collected.
- > The *RV Celtic Explorer* was provided to the National Parks and Wildlife Service of the Department of Arts Heritage and Gaeltacht in February to complete a three day drop camera survey of the methane derived autogenic carbonate mounds in the Irish Sea to help establish a potential future Marine Special Area of Conservation.
- > The *RV Celtic Voyager* completed 30 days of Underwater TV surveys for Nephrops stock assessment including a successful survey of the prawn grounds on the Porcupine bank at depths down to 540m.
- > The annual winter monitoring survey was completed on behalf of MEFS who undertook a survey south from Dublin to Galway in January 2013.
- > A total of seven National Development Plan (NDP) shiptime funded research surveys were completed on the *RV Celtic Voyager* totalling 47 days and these were led by scientists from NUI Galway, University of Ulster, Galway-Mayo Institute of Technology and Geological Survey of Ireland (GSI).
- > A very successful program of activity was completed under the Integrated Mapping for the Sustainable Development of Ireland's Marine Resource (INFOMAR) program throughout the year comprising a total of 73 days survey on the *RV Celtic Voyager* including extensive bathymetric surveys off the south coast.
- > The *RV Celtic Voyager* also completed three hydrographic surveys and a site clearance of the Galway bay test site totalling 30 days

in support of Sustainable Energy Authority of Ireland ocean energy development .

- > Other notable *RV Celtic Voyager* activities included successful “science@sea” and smart common module training programs led by the Strategic Marine Alliance for Research and Training (SMART) team and other university lead training programs
- > To facilitate extending survey coverage into the Biologically Sensitive Area, and to underpin future Irish, EU and Trans-Atlantic research requirements, capital funding was sought and approved for survey system upgrades on both the *RV Celtic Voyager* and the *RV Celtic Explorer*, to take place in 2014.

Foreign Vessel Observer Scheme 2013

In 2013, the Marine Institute placed 12 Irish observers on board foreign vessels conducting research surveys in our waters. The total number of days spent by observers at sea was 176 with the surveys varying in length from 25 days to just 4 days. Observers participated onboard British Belgian, Dutch and Norwegian surveys.

Advanced Mapping Services

In collaboration with GSI, an independent programme review was undertaken by PricewaterHouse Coopers (PWC), in support of the successful governmental submission for a five year funding for Integrated Mapping for the Sustainable Development of Ireland’s Marine Resources (INFOMAR) continuation commitment, at €3m per annum to 2018. In line with recommendations made by PWC on increasing resourcing allocated to development of the value added aspects of INFOMAR, a business development tender was issued and one contract was awarded to the Dublin Business Innovation Centre.

During 2013 INFOMAR mapping continued off the South and West coasts on board the *RV Celtic Voyager*, completing the vessels primary commitments for Phase 1 of INFOMAR.

Significant additional data acquisition was undertaken as part of the Value Added Exploitation Programme with extensive coverage acquired offshore West Clare on the *RV Celtic Voyager* for the Sustainable Energy Authority Ireland (SEAI), to underpin the development of the marine renewable sector offshore Ireland.

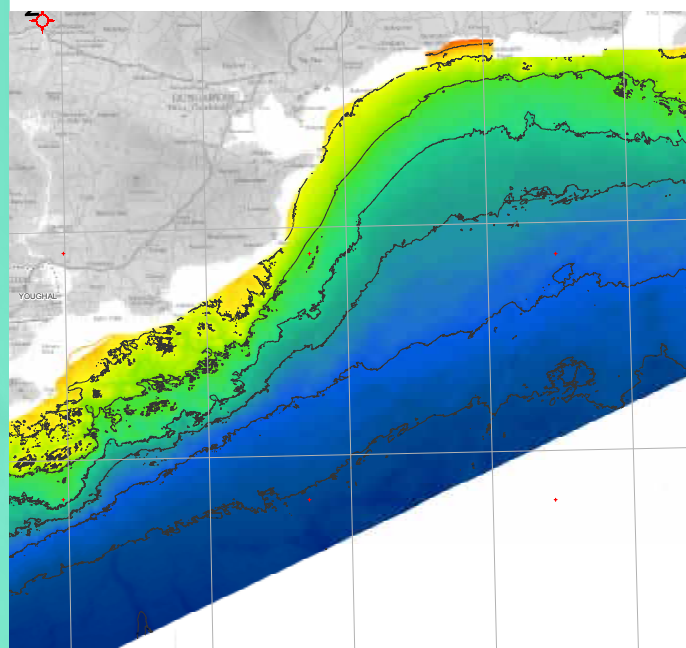
Advanced Mapping Services (AMS) coordinated INFOMAR’s 2013 Annual Seminar in University of Limerick which was an extremely successful event, with speakers from academia, industry and public sectors, both local and international. In addition to the usual presentation format, an interactive workshop session was incorporated, with technology demonstrations ranging from UAV flights, to remote ROV piloting. The level of attendance, and equal split between industry, government and academia, across multiple marine sectors, emphasised the wide impact of the programme activities.

Having focussed outreach in Ireland and UK in recent years, AMS increased the level of outreach internationally in 2013, participating in significant survey events in Portugal, US, UK and Canada. Engagement in these events facilitated networking which supported the Trans-Atlantic Cooperation meeting in the Marine Institute, and has raised the potential for collaborative research initiatives in the future.



Deployment of the Deepwater Remotely Operated Vehicle, ROV Holland I from the national research vessel *RV Celtic Explorer*

“Recognising the increasing requirement for an integrated approach to marine Research Technology Development and Innovation, OSIS provides end-to-end solutions to clients.”



The bathymetry chart produced by INFOMAR shows the contour of Youghal harbour in Cork. Charts can be downloaded from www.infomar.ie

Ocean Science and Information Services



In addition, numerous local events were supported including, Galway, Science & Technology Festival, Atlantic Ireland and SmartOcean to mention a few.

During 2013 Advanced Mapping Services completed the Mapping European Seabed Habitats (MESH) Atlantic INTEREG IVB and INIS Hydro INTEREG IVA projects.

Oceanographic Services

The Oceanographic Services team serviced over 130 requests for oceanographic data and products during 2013. They continued to provide dedicated field and model data and analysis to support advisory services provided by our Marine Environment and Food Safety services team at the Marine Institute.

The Oceanographic Services team delivered all elements of the significant work programme of the SEAI Ocean Energy service level agreement on time and within budget. This included the marine services element of a joint project involving SEAI, Marine Institute, IBM and Galway based SME, Biospheric Engineering Ltd.

Following a successful application to Science Foundation Ireland under its 2012 research infrastructure call, the team commenced a procurement programme to procure and deploy a fibre optic cable and seabed node and associated equipment. This will underpin test and demonstration activities at the quarter scale ocean energy test site and SmartBay in Galway Bay.

The national weather buoy network was supported and maintained on behalf of the Department of Transport, Tourism and Sport (DTTAS). The network performance was reviewed by DTTAS with a positive outcome in 2013 despite restricted resources. Building on the newly developed ocean models for oil spill and biogeochemical applications, a high resolution (localised fine scale) shelf model was developed. A tide prediction tool went live on the internet providing marine users with tide forecasts for up to two years ahead. The development of this application was possible due to the continued maintenance of the National Tide Gauge Network. Oceanographic Services previously provided oceanographic analysis and input to the Marine Strategy Framework Directive initial assessment and are now assisting in a gap analysis exercise and in defining the monitoring programme required under the Directive.

Key elements of the EU funded projects ASIMUTH, JERICO and MyOcean2 were successfully delivered including the production of real-time early warning HAB bulletins to the aquaculture industry, jointly with MEFS.

Oceanographic Services remains active on both the International Council for the Exploration of the Seas (ICES) WGOH and European Global Ocean Observation System (EuroGOOS) and on the Marine Observations and Data Expert Group of DG Mare. The team continued to provide input to the implementation planning and legal work required for the development of a European Research Infrastructure Consortium (ERIC) for a long term partnership on the European Multidisciplinary Seafloor Observatory (EMSO) project and an interim office was established in Rome. OSIS also participated in the CoOPEUS (linking European/US major environmental research projects), SIDERI (European partners in Argo float activities) and Fix03 (linking EU activities on fixed point marine observatories) projects and a wide range of EU and international infrastructure projects.

Information Services and Development

The Information Services and Development (IS&D) team continued to provide day-to-day technical support across the Institute. IS&D serviced over 3,059 requests for support covering technical, applications and data management queries, while furnishing in excess of 250 data requests from external parties.

IS&D were involved in 76 strategic business and technical support, operational and Marine Institute service group support projects and activities during 2013.

Key activities for IS&D in 2013 included the installation of a new more efficient internal IT server environment, the first use of cloud data hosting (HEAnet) and the establishment of high-speed network connections from Newport and Harcourt Street to Oranmore which were all objectives of the Marine Institute Information and Communications Technologies Strategy (2013–2015). The IT Operations team also oversaw the replacement of the Oranmore internal data network switching infrastructure which had reached end-of-life, and the commencement of a very significant upgrade to the *RV Celtic Explorer's* server infrastructure.

The Online Data Download Portal went live to facilitate better access to Marine Institute data, and Ireland's Marine Atlas was developed as part of the Marine Strategy Framework Directive programme. The data behind the Atlas will be maintained by the IS&D Data Management team, and in 2014 the Atlas will be upgraded to be mobile device compatible. The Data management team also supported the Data Collective Framework, INFOMAR and Marine Strategy Framework Directive programmes, and the Aquaculture Foreshore Licensing team.

In 2013 the IS&D Application Development team carried out a significant technical redevelopment of the Institute's website. The website will be populated with content in 2014 prior to being launched.

The team also commenced a major redevelopment of the HABs data system towards the end of 2013 which will greatly modernise the system, and improve data entry, reporting and the public online interfaces. This work will continue throughout 2014.

Other data-related activity included: the completion of the EU FP7 funded ENVIRO-FI Future-Internet project with partners InTune Networks which has showcased the Institute's data services; participation in the SeaDataNet II European data infrastructure project; and ongoing development work on data systems for wave and fisheries data.

IS&D were also involved in the definition of the Irish Digital Ocean concept, which aims to provide easy access to marine data from multiple sources to facilitate marine research and enable information product development. This concept will be developed further in conjunction with the Institute's internal Data Strategy in 2014.

Advanced Technology Programme

In recent years, the Advanced Marine Technology Programme (AMTP) has worked towards the objectives of creating a critical mass, multi-disciplinary industry oriented marine grouping in the area of advanced sensing, communications and informatics. The programme has supported a number of national initiatives for capacity development in this space.

OSIS brought together national stakeholders for the formation of a consortium to respond to an Science Foundation Ireland Research Centres Call under the thematic area of Earth and Ocean Observation.

The pre-proposal titled Atlantic Centre for Earth Observation (ACEObS) was led by NUI Galway and successfully invited to the full proposal stage which is due to be submitted in April 2014.

The Programme has also been working on developing opportunities in the area of Earth Observation. A number of engagements have taken place with the European Space Agency and national contact points in this area. Input has also been provided from the programme around initiatives to develop national capacities in earth observation from the marine perspective.

In late 2013, the Programme continued to mobilise the national marine technology community through brokerage of partnerships, information dissemination and liaising with all relevant national contact points where there are opportunities for marine related projects under *Horizon 2020*. At the end of 2013, notification was received that an Atlantic Area Interreg IVB project proposal called Showcase Technology Applicable to Maritime SMEs in the Atlantic Area (STAMAR) was successful.

AMTP has also been looking at future strategic development. In particular an online SmartOcean research and innovation Strategy consultation was launched in September 2013. This resulted in 35 responses with the majority coming from industry. This was followed with an industry consultation workshop at the SmartOcean Forum 2013. The outputs of these will inform strategic planning for 2014 and beyond.

The AMTP team continued to support the development of existing national test and demonstration infrastructure. This included engaging with the research and development (R&D) community around opportunities to use the SmartBay test and demonstration platform through the National Infrastructure Access Programme, visits to other facilities such as the National Maritime College of Ireland to explore how infrastructures can be promoted nationally. It also began to explore the use of additional infrastructure through engaging with other state agencies such as the Irish Air Corps and industry organisations around the use of digital infrastructure.

In 2013, AMTP began to look at the future evolution of Advanced Marine Technology and SmartOcean. OSIS began to formalise the concept of the Irish Digital Ocean and input into recommendations around research priorities for the flagship area of IT Communication Technologies and the Sea for new national marine R&D strategy 2014–2020.

In November 2013, AMTP successfully organised SmartOcean Forum 2013. This was the largest Forum to date with approximately 180 registered participants. This was a significant event as it was the first time that the Forum took place in Northern Ireland, with sponsorship from InvestNI. This was a two day event held at Titanic Belfast with over 90 organisations represented and a number of speakers, exhibitions, posters and an associated industry consultation workshop.

SmartOcean has also been profiled through engagement in a number of additional events throughout the year including the European Space Agency (ESA) Living Planet Symposium, ESA Big Data workshop, Oceans 13 conference Virginia Beach, Microsoft Innovation Day Dublin, and the Microsoft Research Cambridge Think Tank.

Work has been carried out also to move the SmartOcean web site to a dynamic information hub and to continue to build the SmartOcean online profile.



Minister for Agriculture, Marine and Food Mr Simon Coveney TD with conference delegates at Space Innovation - Powering Blue Growth conference held in Cork where European Space Agency Applauds Irish Marine Innovations.

“the Irish Digital Ocean concept ... aims to provide easy access to marine data from multiple sources to facilitate marine research and enable information product development.”



The SmartOcean Forum, that took place at the Titanic Centre, Belfast aimed to establish Northern Ireland and Ireland as leaders in the development of ICT products and services for global marine sectors. Pictured (Left to Right) Arlene Foster, Minister of Enterprise Trade and Investment, Northern Ireland and Dr Peter Heffernan, CEO of the Marine Institute.

General Administration

Liaison

The programme of the Marine Institute covers a wide range of activities that require close liaison and cooperation with many individuals and organisations. These include the Department of Agriculture, Food and the Marine, the Department of Finance, Department of Environment, Community and Local Government, Department of Transport, Tourism and Sport and other government departments and state agencies, private enterprise and the higher education sector. The Institute acknowledges the continued support and cooperation of all concerned.

Health and Safety

In accordance with the Health and Safety and Welfare Act (1989), the Marine Institute has updated all Health and Safety Statements. The Institute continues to implement appropriate measures to protect the safety and health of all employees and visitors to its premises.

Ethics and Public Office Act

All persons holding a designated position within the Marine Institute provide a statement of interests to the Public Office Commission in accordance with sections 18 and 20 of the Ethics in Public Office Act, 1995.

Employment Equality

The Marine Institute is committed to a policy of equal opportunity and adopts a proactive approach to equality. The Institute operates a number of schemes that provide staff with options in relation to meeting their career and personal needs, such as job sharing, study leave and educational programmes.

Code of Practice (Reporting)

The Marine Institute adheres to the statutory Codes of Practice for Governance of State Bodies as laid down by the Department of Finance. The Institute can confirm that Directors and employees have adopted and are trained on:

- > Formal code of conduct on conflict of interest and customer charter
- > Properly constituted Audit Committees
- > Procurement procedures
- > Sensitive Issues

Energy Efficiency Reporting by Public Sector Bodies (S.I. 542 of 2009)

Overview of Energy Usage in 2013

The predominant energy users in the Marine Institute is the headquarter office and laboratory facility and the research vessels *RV Celtic Explorer* and *RV Celtic Voyager*. Within the laboratories in Oranmore, laboratory mechanical and electrical services account for approximately 20% of the overall electrical energy consumption of the facility. Lighting, general office equipment and laboratory equipment account for the majority of the remaining electrical consumption.

In 2013 the Marine Institute consumed:

2,794,914 kWh of electricity

13,509 litres of Kerosene

345,575 litres of bulk propane gas for heating

9,271 litres of road diesel

1,376,550 litres of Marine gasoil for Marine Institute funded research surveys

Actions Undertaken in 2013

The Marine Institute installed lighting controls through the Building Management System in Oranmore via an outside light level sensor. Lighting in common areas are now activated once the external light level drops below a certain preset lux level. An estimated 30% energy efficiency on the lighting should be seen from 2014 onwards when the system will be operational. A review of the Air Handling Systems throughout the laboratories was commenced in 2013.

Actions Planned for 2014

An initial review of energy usage and facility operations in Oranmore was undertaken with a commitment to reduce consumption and bring about efficiencies during 2014.

It is envisaged that a reduction in running times will be introduced in 2014 to further reduce the energy consumption within the laboratories.

Scéim Gaeilge 2013 Update

The Grúpa Gaeilge was established to prepare the Marine Institute's Irish Language Scheme/Scéim Foras na Mara under Section 11 of the Official Languages Act 2003. The first period of the scheme Gaeilge expired in 2012 and preparation and development of the second phase of the scheme was overseen by the Grúpa Gaeilge in 2012 and 2013. This was lodged with the Irish Language Commissioners office in November 2013. The second period of the scheme builds on the extensive efforts to implement the requirements under the Act which were brought about under the first period following identification of areas for enhancement of Irish language services provided by the Institute. The second period will maintain the commitment to assess, on an ongoing basis, the level of demand for services through Irish and to ensure that the Marine Institute continues to meet this demand in a planned, coherent and accessible way. The Marine Institute continues to gauge the level of demand for its services in the Irish language by carrying out regular audits through a system of counting/measuring the level of queries/requests for services through Irish in a given period. However, in order to generate requests for services, the Marine Institute documents and promotes awareness amongst staff and clients as to which services the Institute provides in Irish.



The Biodiscovery and Ecosystem Function of Canyons Survey investigated a wide diversity of habitats and underwater communities in the Whittard Canyon system on the Irish Atlantic margin. Using the ROV *Holland 1*, on the RV *Celtic Explorer*, images of rare species were captured on camera including this giant hydroid. This research survey was carried out under the Sea Change strategy with the support of the Marine Institute and the Marine Research Sub-programme of the National Development Plan 2007–2013. The Ship–Time Programme provides access to the National Research Vessels (RV *Celtic Explorer*/RV *Celtic Voyager*) for research organisations based in Ireland.

Appendices

APPENDIX 1: NDP MARINE RESEARCH PROGRAMME 2007–2013

NDP MARINE RESEARCH PROGRAMME 2007–2013 – SHIP-TIME PROGRAMME 2013						
Sea Change Research Measure	Sea Change Research Programme	Project Type	Project Reference	Project Title	Grantee/Lead	Total Grant-Aid
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13002	Galway Bay Undergraduate Training	National University of Ireland Galway	€88,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13003	SMART Science at Sea: Multidisciplinary Ship-Based Training for Students of Marine-related Sciences	Galway-Mayo Institute of Technology	€48,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13005	SMART: Dublin City University Sensing and Bio-fouling	Galway-Mayo Institute of Technology	€16,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13006/ CV13011/ CV13021	SMART: Accredited Common Learning Module	Galway-Mayo Institute of Technology	€160,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13009	SMART: Observer Programme	Galway-Mayo Institute of Technology	€48,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13018	Undergraduate Shipboard Training in Methods of Oceanographic, Benthic, Megafauna and Fisheries Research	Galway-Mayo Institute of Technology	€48,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13010	SMART: Offshore Geological Exploration	Galway-Mayo Institute of Technology	€32,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13013	MSc Marine Biology-Cork Harbour	University College Cork	€16,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV13020	SMART: Ocean Energy	Galway-Mayo Institute of Technology	€16,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE13001	Climate Change Oceanography, Biogeochemistry & Geology Sections	Marine Institute	€170,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE13002	Cetaceans on the Frontier 4	Galway-Mayo Institute of Technology	€255,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE13003/ CE14001	Developing Geotechno-Stratigraphies	University College Cork	€221,000

NDP MARINE RESEARCH PROGRAMME 2007–2013 –SHIP–TIME PROGRAMME 2013						
Sea Change Research Measure	Sea Change Research Programme	Project Type	Project Reference	Project Title	Grantee/Lead	Total Grant-Aid
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE13004/CE13010	Mackerel Egg Survey	Marine Institute	€357,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE13007	SEDEX – Role of Nepheloid Layers in Cross Shelf Edge Sediment Transport	National University of Ireland, Galway	€17,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE13008	Biodiscovery and Ecosystem Function of Canyons	National University of Ireland, Galway	€544,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13001	Winter Environmental Survey 2013 Programme	Marine Institute	€104,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13004	De facto Elasmobranch Refuges in the Celtic Seas	Galway-Mayo Institute of Technology	€80,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13019	Dinophysis Phytoplankton Bloom Survey 2013 (DINO13)	National University of Ireland, Galway	€48,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13012	Kerry Reefs and Environs Survey	National University of Ireland, Galway	€64,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13028	Harmful Algal Bloom West Survey 2013 (HABWEST2013)	National University of Ireland, Galway	€40,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13029	Cold Water Coral Reefs Biodiversity Mapping	Trinity College Dublin	€56,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13030	Sediment Transport Assessment, Irish North Coast	University of Ulster	€40,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV13031	Paleoenvironments and Sediment Distribution West of Ireland	University of Ulster	€48,000
TOTAL						€2,500,000

Appendices

NDP MARINE RESEARCH PROGRAMME 2007–2013 FUNDED RESEARCH PROJECTS 2013

Sea Change Research Measure	Sea Change Research Programme	Project Type	Project Reference	Project Title	Grantee/Lead	Total Grant-Aid
Policy Support	Policy, Socio-Economic and Legal Research	Contract for Services	SERV-13-OCEO-014	Provide Advice to Enablers Task Force in order to Develop a Marine Spatial Planning Framework for Ireland	John Martin	€17,250
Policy Support	Policy, Socio-Economic and Legal Research	Contract for Services	MGE0381	Legal Research on National/EU Legislation that Apply in the Marine Environment	RPS Group Ltd.	€16,974
Policy Support	Policy, Socio-Economic and Legal Research	Contract for Services	SERV-13-CS-005	Desk-based Review of Best Practice in Marine Spatial Planning	Queen's University Belfast	€13,831
Policy Support	Policy, Socio-Economic and Legal Research	Desk Study	DK/ME/13/001	National, International and EU Legal Instruments Relevant to the Development of a Marine Spatial Planning Framework in Ireland	MacCabe Durney Barnes	€37,219
Industry	Shellfish Aquaculture	Tender	N/A	Production of tetraploid <i>Crassostrea gigas</i> juveniles for use as broodstock by Irish hatcheries for the production of genetic triploids	Cartron Point Shellfish	*€100,000
Discovery	Marine Technology	Networking	N/A	Oceanology International 2014	Reed Exhibitions Ltd.	€28,538
Industry	Finfish Aquaculture	Infrastructure Tender Support	N/A	Stock Identification and Migration of Sea Bass in Irish Coastal Waters	Marine Institute/ University College Cork	€63,559
Innovation Supporting	Innovation	Networking Travel Grants	NT/13/01 to NT/13/53	Attendance at/Hosting of Marine Conferences, Workshops and Events	Various	€30,071
Policy Support	Marine Environment	Post-Doctoral Fellowship	PDOC/ME/13/01	Biogeochemical cycling of carbon and nutrients in Irish marine and estuarine waters	National University of Ireland, Galway	#€44,987
Policy Support	Marine Environment	Capacity Building	N/A	Marine Institute Fulbright Fellowship	N/A	€22,000
TOTAL						€374,429

* This represents the Marine Institute's contribution to the project, which is jointly funded with Bord Iascaigh Mhara.

Jointly funded with the Environmental Protection Agency.

APPENDIX 2: IRISH PARTICIPATION IN EU RTD PROJECTS.

Since the publication of the 2007–2010 review of Irish participation in EU funded marine research projects and marine research related initiatives (ref: *New Connections: Exploring Ireland's International Marine Research Relationships: 2007–2010*), there has been the addition of 51 projects (Grant-aid >€11.7 million) in 2011–2012.

2013 has seen the addition of 16 new FP7 (grant-aid: €11 million) and 12 new INTERREG-IV (Grant-aid: €1.7 million) projects to the Irish total. This results in a total of 190 cooperative projects with grant-aid of over €67.5 million going to the Irish marine research community (including research based-SMEs) over the period 2007–2013.

It is clear that EU cooperative and competitive research funding programmes make a major contribution to the dynamism and innovation of the Irish marine research community and supplement research funding secured through national research, development and innovation programmes, such as those supported under the National Development Plan (2007–2013).

The Marine Institute participated in four of the 28 new 2013 projects (FP7: Fix03, EUROLEETS 2, INTERREG: ARCOPOLPLATFORM, STAMAR) securing grant-aid in excess of €767K.

Details of EU Research Funding opportunities are described on the Marine Institute website and a database of EU funded projects can be found at the EurOCEAN Knowledge Gate (www.kg.eurocean.org/).

A full list of FP7 projects (2007–2013) can be found in the *Blue Growth & Horizon 2020* booklet, published in December 2013 (<http://oar.marine.ie/handle/10793/921>).

EU FP7 Projects (2013):

BRAAVOO: Biosensors, Reporters and Algal Autonomous Vessels for Ocean Observation. *IDS Monitoring Ltd.*

SENSE OCEAN: Drawing together world leading marine sensor developers to create a highly integrated multifunction and cost-effective in situ marine biogeochemical sensor system. *T.E. Laboratories.*

COMMON SENSE: Cost-Effective Sensors, Interoperable with International Existing Ocean Observing Systems, to Meet EU Policies. *University College Cork / Dublin College University / AquaTT / T.E. Laboratories.*

LEANWIND: Logistic Efficiencies and naval architecture for wind installations with novel developments. *University College Cork / Gavin & Doherty Geosolutions Ltd / Rappel Enterprises Ltd / Cork Institute of Technology.*

MARIABOX: Marine environmental in situ assessment and monitoring toolbox. *Dublin City University/SmartBay.*

ASTARTE: Assessment, strategy and risk reduction for tsunamis in Europe. *University College Dublin.*

HERPISH: Herpes virus in Irish oysters and identification of resistant stocks. *University College Cork.*

BACCHUS: Impact of biogenic versus anthropogenic emissions on clouds and climate. *National University of Ireland, Galway.*

MAREFRAME: Co-creating Ecosystem based Fisheries Management Solutions. *North Western Waters Regional Advisory Council.*

SAFI: Support to Aquaculture and Fishery Industry. *University College Cork / Daithi O'Murchu Marine Research Centre.*

DANCERS: DANube Macroregion: Capacity building and Excellence in River Systems (basin, delta and sea). *University College Cork.*

TIDES: Tidal Demonstration for Energy Scheme. *University College Cork/ DPEnergy.*

DTOcean: Optimal Design Tools for Ocean Energy Arrays. *University College Cork.*

SEABIOPLAS: Seaweeds from Sustainable Aquaculture as feedstock from Biodegradable Bioplastics. *Daithi O'Murchu Marine Research Centre/ Cartron Point Shellfish Ltd.*

Fix03: Fix Point Open Ocean Observatories. *Marine Institute.*

EUROLEETS 2: New operational steps towards an alliance of European research fleets. *Marine Institute.*

INTERREG-IV (2013)

ISLES II: Irish-Scottish Links on Energy Study. *Department of Communication, Energy and Natural Resources.*

STAMAR: Showcase Technology Applicable to Maritime SMEs in the Atlantic Area. *Marine Institute/South East Regional Authority.*

ATLANTICBLUETECH: Imagine the marine bio-resources' sector for 2014–2020. *WESTBIC/National University of Ireland, Galway.*

ARCOPOLPLATFORM: Platform for improving maritime coastal pollution preparedness and response in Atlantic Area. *Marine Institute / National Maritime College of Ireland.*

TURNKEY: Transforming Underutilized Renewable Natural Resource into Key Energy Yields. *National University of Ireland.*

MAREN 2: Hydro-environmental and economics modelling of multipurpose platform marine renewable energy platformMs *National University of Ireland, Galway.*

REPUTE: Renewable Public Transport Enterprise. *Limerick Institute of Technology.*

CEAMAS: Civil Engineering Applications of Marine Sediments. *University College Cork / Cork Institute of Technology.*

Salmonids: Salmonids West Project. *Inland Fisheries/National University of Ireland, Galway.*

MaRET: Community and Business Toolkit for Marine Renewable Energy Development. *Limerick Clare Energy Agency/National University of Ireland, Galway.*

SMACS: Small Craft Emergency Response and Survival Training for Arctic Conditions. *Cork Institute of Technology, Ireland.*

APLIC: Economic and environmental sustainability of fish farming in northern Europe. *National University of Ireland, Galway.*

Appendices

APPENDIX 3: MARINE INSTITUTE PUBLICATIONS Special Reports

Marine Institute, 2013. The Stock Book 2013: *Annual Review of Fish Stocks in 2013 with Management Advice for 2014*. Marine Institute. <http://hdl.handle.net/10793/918>

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O'Reilly, E. & O'Sullivan, G. (2013). *Blue Growth and Horizon 2020, competitive marine/maritime research funding opportunities in the Horizon 2020 programme (2014–2020)*. Marine Institute. <http://oar.marine.ie/handle/10793/921>

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ISSN: 1649-5055

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Cooperative Publications

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International Council for the Exploration of the Sea (ICES) Publications

Key to ICES abbreviations:

CM	Conference and Meeting Document
ACOM	Advisory Committee
FTC	Fisheries Technology Committee
LRC	Living Resources Committee
RMC	Resource Management Committee
DFC	Diadromous Fish Committee
WKROUND	A Benchmark Workshop on Roundfish
SCICOM	Science Committee
SSGEF	Steering Group on Ecosystem Function
WGNAS	Working Group North Atlantic Salmon
WGECO	Working Group on Ecosystem Effects of Fishing Activities
WGMHM	Working Group on Marine Habitat Mapping
SSGSUE	Steering Group on Sustainable Use of Ecosystems
WGOH	Working Group on Oceanic Hydrography
CRR	Cooperative Research Report

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APPENDIX 5: CENSUS DATA FOR THE BURRISHOOLE SYSTEM 2013

Upstream census data for the Burrishoole system, 2013

Species	Salmon Leap Upstream 2013	Mill Race Upstream 2013	Totals Upstream 2013	Totals Upstream 2012	Totals Upstream 2011	Totals Upstream 2010
Wild Grilse	607	103	710	671	520	682
Wild Spring Salmon	16	7	23	18	51	16
Reared Grilse	1163	138	1301	2288	866	861
Wild Sea Trout	19	2	21	35	18	35
Wild Finnock	30	17	47	108	50	37
Wild Brown Trout	46	41	87	57	87	104

Downstream census data for the Burrishoole system, 2013

Species	Salmon Leap Downstream 2013	Mill Race Downstream 2013	Totals Downstream 2013	Totals Downstream 2012	Totals Downstream 2011	Totals Downstream 2010
Wild Salmon Smolt	4963	1394	6357	7717	6627	7123
Wild Sea Trout Smolt	404	64	468	632	620	213
Silver Eel	2720	921	3641	3335	1969	2137

APPENDIX 6: RESEARCH VESSEL PROGRAMME 2013

Days at Sea from 01/01/2013–31/12/2013	Days	Surveys	Scientist Days	Student Days
<i>RV Celtic Voyager</i>	261	31	1221	628
<i>RV Celtic Explorer</i>	292	15	2330	455
TOTAL	553	46	3551	1083

RV Celtic Voyager Activity 2013

Survey Code	Survey Name	Survey Days	No. of Scientists	Scientist Days	No. Of Students	Student Days	Student and Scientist days
CV13001	Winter Environmental Monitoring Survey (nutrients & benthic)	13	6	78	0	0	78
CV13002	Galway Bay Undergraduate Training 2013	11	5	55	90	90	145
CV13017	INFOMAR Trial	4	4	16	0	0	16
CV13003	SMART Science@Sea 2013	6	5	30	36	72	102
CV13022	SEAI Survey no.1	9	4	36	0	0	36
CV13005	SMART DCU Sensing & Biofouling 2013	2	5	10	12	24	34
CV13006	SMART Common Module Spring 2013	4	5	20	22	44	64
CV13004	De Facto elasmobranch refuges in the Irish and Celtic Seas	10	6	60	0	0	30

Appendices

RV Celtic Voyager Activity 2013

Survey Code	Survey Name	Survey Days	No. of Scientists	Scientist Days	No. Of Students	Student Days	Student and Scientist days
CV13023	SEAI SURVEY LEG 2	10	4	40	0	0	40
CV13024	SEAI SURVEY LEG 3	9	4	36	0	0	36
CV13007	INFOMAR 1	40	5	200	0	0	200
CV13025	Weather Buoy Service	4	3	12	0	0	12
CV13016	Aran & Porcupine UWTV	10	6	60	0	0	60
CV13026	Aran Islands Bathymetry	1	2	2	0	0	2
CV13015	Celtic Sea UWTV Survey	10	6	60	0	0	60
CV13019	Dino13	6	3	18	3	18	36
CV13027	INFOMAR	29	4	116	0	0	116
CV13028	HABWEST2013	5	2	10	4	20	30
CV13029	Cold water coral reefs biodiversity mapping	7	5	35	0	0	28
CV13012	Kerry reefs and environs survey	8	4	32	0	0	32
CV13014	Irish Sea and Celtic Sea	10	6	60	0	0	60
CV13032	M4 weather buoy recovery	2	0	0	0	0	0
CV13033	SEAI NO. 4	6	4	24	0	0	24
CV13031	Palaeoenvironments and sediment distribution west of Ireland	6	6	36	0	0	18
CV13030	Sediment Transport Assessment, Irish North Coast	5	5	25	0	0	15
CV13009	SMART Observer Programme 2013	4	4	16	20	40	56
CV13018	Undergraduate shipboard training in methods of oceanographic, benthic, megafauna and fisheries research	6	4	24	60	60	84
CV13010	SMART Offshore Geological Exploration	4	5	20	24	48	68
CV13013	MSc Marine Biology University College Cork (Annual Request)	2	3	6	12	24	32
CV13011	SMART Common Module Winter 2013	10	4	40	60	120	160
CV13021	Common Winter Module 2	6	7	42	34	68	110
CV13034	Wave Energy Site Clearance	2	1	2	0	0	2
TOTAL		261	137	1221	377	628	1786

RV Celtic Explorer Activity 2013

Survey Code	Survey Name	Survey Days	No. of Scientists	Scientist Days	No. of Students	Students Days
CE13001	Ocean Climate Sections and Geology: Porcupine, Rockall area	16	17	272	3	48
CE13002	Cetaceans on the Frontier 4	15	13	195	7	105
CE13016	MDACS Survey	4	12	48		
CE13003	Developing Geotechno-Stratigraphies (DGS)	5	10	50	2	10

Survey Code	Survey Name	Survey Days	No. of Scientists	Scientist Days	No. of Students	Students Days
CE13004	Mackerel Egg Survey March 2013	21	6	126	2	42
CE13005	BSH 2 charter	9				
CE13006	Blue Whiting Acoustic Survey	21	8	168		
CE13007	CE2013 Fisheries Acoustic Survey Newfoundland (Charter)	29				
CE13008	Biodiscovery and Ecosystem Function of Canyons	23	9	207	6	138
CE13009	Northwest Herring Acoustic Survey	21	10	210	1	21
CE13010	Mackerel Egg Survey July 2013	21	6	126	1	21
CE13012	BSH 3 North Sea Survey charter	39				
CE13013	Irish Groundfish Survey 2013	12	12	144		
CE13015	Celtic Sea Herring Acoustic Survey	21	19	399		
CE13014	Irish Groundfish Survey 2013	35	11	385	2	70
		292		2330		455

RV Celtic Voyager Cruise Details 2013

Survey Code	Survey Name	Chief Scientist	Organisation	Start Date	End Date	Survey Days
CV13001	Winter Environmental Monitoring Survey (nutrients & benthic)	Dr Evin McGovern	Marine Institute	28/01/2013	09/02/2013	13
CV13002	Galway Bay Undergraduate Training 2013	Dr Robin Raine	National University of Ireland Galway	11/02/2013	21/02/2013	11
CV13017	INFOMAR Trial	Mr Kevin Sheehan	Marine Institute	22/02/2013	25/02/2013	4
CV13003	SMART Science@Sea 2013	Dr Pauhla McGrane	Galway Mayo Institute of Technology	01/03/2013	06/03/2013	6
CV13022	SEAI Survey no.1	Mr Kevin Sheehan	Marine Institute	11/03/2013	19/03/2013	9
CV13005	SMART DCU Sensing & Biofouling 2013	Dr Pauhla McGrane	Galway Mayo Institute of Technology	21/03/2013	22/03/2013	2
CV13006	SMART Common Module Spring 2013	Dr Pauhla McGrane	Galway Mayo Institute of Technology	23/03/2013	26/03/2013	4
CV13004	De Facto elasmobranch refuges in the Irish and Celtic Seas	Dr Samuel Shephard	Galway Mayo Institute of Technology	27/03/2013	05/04/2013	10
CV13023	SEAI SURVEY LEG 2	Mr Kevin Sheehan	Marine Institute	06/04/2013	15/04/2013	10
CV13024	SEAI SURVEY LEG 3	Mr Kevin Sheehan	Marine Institute	17/04/2013	25/04/2013	9
CV13007	INFOMAR 1	Dr Fabio Sacchetti	Marine Institute	26/04/2013	04/06/2013	40
CV13025	Weather Buoy Service	Mr Kieran Adlum	P&O Maritime Services	05/06/2013	08/06/2013	4
CV13016	Aran & Porcupine UWTV	Dr Colm Lordan	Marine Institute	10/06/2013	19/06/2013	10
CV13026	Aran Islands Bathymetry	Dr Ronadh Cox	Unassigned	20/06/2013	20/06/2013	1
CV13015	Celtic Sea UWTV Survey	Ms Jennifer Doyle	Marine Institute	24/06/2013	03/07/2013	10
CV13019	Dino13	Dr Robin Raine	National University of Ireland Galway	04/07/2013	09/07/2013	6
CV13029	Cold water coral reefs biodiversity mapping	Mr Xavier Monteys	Geological Survey of Ireland	13/08/2013	19/08/2013	7
CV13027	INFOMAR	Dr Fabio Sacchetti	Marine Institute	10/07/2013	07/08/2013	29
CV13028	HABWEST2013	Dr Robin Raine	National University of Ireland Galway	08/08/2013	12/08/2013	5
CV13012	Kerry reefs and environs survey	Dr Louise Allcock	National University of Ireland Galway	20/08/2013	27/08/2013	8

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Survey Code	Survey Name	Chief Scientist	Organisation	Start Date	End Date	Survey Days
CV13014	Irish Sea and Celtic Sea	Ms Jennifer Doyle	Marine Institute	28/08/2013	06/09/2013	10
CV13032	M4 weather buoy recovery	Ms RV Ops Chief Scientist	Marine Institute	09/09/2013	10/09/2013	2
CV13033	SEAI NO. 4	Mr Kevin Sheehan	Marine Institute	12/09/2013	17/09/2013	6
CV13031	Palaeoenvironments and sediment distribution west of Ireland	Mr Jared Peters	University of Ulster	18/09/2013	23/09/2013	6
CV13030	Sediment Transport Assessment, Irish North Coast	Mr William Evans	University of Ulster	27/09/2013	01/10/2013	5
CV13009	SMART Observer Programme 2013	Mr John Boyd	Galway Mayo Institute of Technology	10/10/2013	13/10/2013	4
CV13018	Undergraduate shipboard training in methods of oceanographic, benthic, megafauna and fisheries research	Dr Ian O'Connor	Galway Mayo Institute of Technology	26/10/2013	31/10/2013	6
CV13010	SMART Offshore Geological Exploration	Professor Andrew Wheeler	University College Cork	03/11/2013	06/11/2013	4
CV13013	MSc Marine Biology University College Cork (Annual Request)	Dr Rob McAllen	University College Cork	07/11/2013	08/11/2013	2
CV13011	SMART Common Module Winter 2013	Dr Pauhla McGrane	Galway Mayo Institute of Technology	10/11/2013	19/11/2013	10
CV13021	Common Winter Module 2	Dr Pauhla McGrane	Galway Mayo Institute of Technology	25/11/2013	30/11/2013	6
CV13034	Wave Energy Site Clearance	Ms RV Ops Chief Scientist	Marine Institute	03/12/2013	4/12/2013	2

RV Celtic Explorer Cruise Details 2013

Survey Code	Survey Name	Chief Scientist	Organisation	Start Date	End Date	Survey Days
CE13001	Ocean Climate Sections and Geology: Porcupine, Rockall area	Dr Glenn Nolan	Marine Institute	05/01/2013	20/01/2013	16
CE13002	Cetaceans on the Frontier 4	Dr Conor Ryan	Galway Mayo Institute of Technology	21/01/2013	04/02/2013	15
CE13016	MDACS Survey	Dr Yvonne Leahy	National Parks and Wildlife Service	09/02/2013	12/02/2013	4
CE13003	Developing Geotechno-Stratigraphies (DGS)	Professor Andrew Wheeler	University College Cork	13/02/2013	17/02/2013	5
CE13004	Mackerel Egg Survey March 2013	Mr Brendan O' Hea	Marine Institute	18/02/2013	10/03/2013	21
CE13005	BSH 2	Ms Sieglinde Weigelt Krenz	BSH	14/03/2013	22/03/2013	9
CE13006	Blue Whiting Acoustic Survey	Mr Ciaran O'Donnell	Marine Institute	26/03/2013	15/04/2013	21
CE13007	CE2013 Fisheries Acoustic Survey Newfoundland	Dr George Rose	Newfoundland-Fisheries and Marine Institute of Memorial University	24/04/2013	22/05/2013	29
CE13008	Biodiscovery and Ecosystem Function of Canyons	Dr Louise Allcock	National University of Ireland Galway	30/05/2013	21/06/2013	23
CE13009	Northwest Herring Acoustic Survey	Dr Cormac Nolan	Marine Institute	22/06/2013	12/07/2013	21
CE13010	Mackerel Egg Survey July 2013	Mr Brendan O' Hea	Marine Institute	13/07/2013	02/08/2013	21
CE13012	BSH 3 North Sea Survey	Mr Holger Klein	BSH	10/08/2013	17/09/2013	39
CE13013	Irish Groundfish Survey 2013	Mr Dave Stokes	Marine Institute	25/09/2013	06/10/2013	12
CE13015	Celtic Sea Herring Acoustic Survey	Mr Ciaran O'Donnell	Marine Institute	07/10/2013	27/10/2013	21
CE13014	Irish Groundfish Survey 2013	Mr Hans Gerritsen	Marine Institute	28/10/2013	01/12/2013	35

APPENDIX 7: FOREIGN MARINE SCIENTIFIC RESEARCH (MSR) ACTIVITIES IN IRISH WATERS IN 2013

Foreign Vessel Activity 2013

Scientist Days Ireland	Scientist Days Foreign
3551	3135

Vessel Name	Country	No. of Days	No. of Scientists	Scientist Days
Benaiah IV	Britain	60	2	120
Endeavour*	Britain	16	7	112
Scotia	Britain	7	7	49
Vilnyus	Russia	10	11	110
FV Altaire*	Britain	7	6	42
Tridens*	Netherlands	12	6	72
Walther Herwig III	Germany	27	12	324
Scotia*	Britain	11	6	66
Havglans	Norway	18	5	90
Tridens*	Netherlands	23	6	138
Eros*	Norway	13	8	104
Christina S	Britain	13	6	78
Corsytes	Britain	1	4	4
James Cook*	Britain	20	25	500
Corsytes	Britain	5	6	30
Vizconde de Eza*	Spain	25	14	350
Scotia	Britain	17	8	136
Endeavour*	Britain	18	7	126
Stelissa	Britain	5	1	5
Govenek of Ladram	Britain	5	1	5
Nova Spero	Britain	6	1	6
Corsytes	Britain	15	8	120
Corsytes	Britain	4	4	16
Pelagia*	The Netherlands	20	11	220
Alboran	Spain	4	5	20
Discovery	Britain	5	5	25
Thalassa	France	9	15	135
Scotia*	Britain	4	12	48
Scotia*	Britain	7	12	84
TOTAL		387	229	3135

Appendices

APPENDIX 8: MARINE INSTITUTE STRATEGIC PLAN – EXECUTIVE SUMMARY

This plan has been written with the active engagement of the staff and board of the Marine Institute to provide clarity on our operating framework and the strategic approach that will be taken on key decisions that need to be embraced in the period 2013–2016.

The document sets out the key foundations for the current operations and roles of the Marine Institute through the first two sections.

In Section 3 we state our five key high-level goals including: service provider; research performer; research catalyst and funder; infrastructure provider; and the operation of an efficient and effective organisation. These goals support our vision of “A thriving maritime economy in harmony with the ecosystem and supported by the delivery of excellence in our services” (Figure 1). Each goal is accompanied by key objectives and priority actions that inform our detailed service area operational plans and our performance management development systems (PMDS). Table 1 provides an overview of the Institute’s five Goals and associated key Objectives.

Table 1: Marine Institute Goals and associated Key Objectives



GOAL 1: SERVICE PROVIDER

- Carry out a suite of statutory environmental, fisheries and aquaculture data collection surveys and monitoring programmes assigned to the Marine Institute by Government, to allow Ireland to meet its national and international legal obligations.
- Deliver scientific, technical and economic data services that inform policy and provide advice to Government, underpinning sectoral development and protecting the marine environment.
- Maintain international excellence in marine science and research in order to gain a better understanding of the health and functioning of marine ecosystems and provide scientific advice to meet the needs of decision-makers in the rapidly changing area of ocean governance.
- Continue to partner and collaborate with the Higher Education sector and other research performers.
- Provide services, data, and publications online, in line with the eGovernment Strategy, to improve customer services. This includes access through mobile devices and the use of social media.

GOAL 2: RESEARCH PERFORMER

- > Maintain our track record as a research performer in targeted areas and seek further opportunities to participate in competitive national and international research projects and programmes.
- > Engage with key stakeholders to maximise Marine Institute research participation and opportunities to add value to existing research programmes.

GOAL 3: RESEARCH CATALYST AND FUNDER

- > Develop and take the lead role in the implementation of national marine research agenda(s) through cross-departmental/agency and Higher Education Institute collaboration.
- > Drive the further development of national programmes in Advanced Marine Technology and Marine Biotechnology.
- > Maximise Irish participation in, and benefit from, international marine Research, Technology, Development and Innovation programmes.

GOAL 4: INFRASTRUCTURE PROVIDER

- > Maintain and, where possible, enhance key Marine Institute facilities and assets.
- > Maintain and explore opportunities to enhance key national marine infrastructures.
- > Ensure the necessary data infrastructure, guidance and supports are in place to allow delivery of efficient and effective day-to-day ICT operations; support best practice management of Marine Institute data; and promote access to national marine datasets.

GOAL 5: EFFICIENT AND EFFECTIVE ORGANISATION

- > Deliver a solution-driven, best practice human resource service with a focus firmly on the needs of all individual staff and service teams, using management information systems and effective operational practices.
- > Adhere to the highest levels of corporate governance, while delivering a very high level of value-for-money customer-driven services.
- > Maintain and enhance the Marine Institute's reputation and ability to deliver high standards of analysis and services through appropriate quality systems and efficient organisation.
- > Ensure that external communications are effective, comprehensive and relevant and help promote an awareness of Ireland's marine resource.

Section 4 describes our approach to achieving our goals, within the context of the current operating environment. Teamwork is key to this approach. We will build on our open and inclusive planning processes to address challenges and opportunities that may arise in the course of the next three years.

We will continue to identify ways in which we can implement our adaptive and cost efficiency measures to minimise the impact of further budget cuts on the delivery of front-line services. We will also explore new and innovative solutions to our service delivery model and examine the scope for new partnerships with the Higher Education Institutes, other government agencies and the private sector. Furthermore, we will strive to expand on our excellent earnings record as a research performer, through externally funded programmes.

The Institute has identified a number of tools which we can use to address the gaps which have been identified. These are innovative and show the flexibility, responsiveness and dedication to public service that is required of a modern, efficient public body. One highly cost-effective means to deliver new services is through the leveraging of EU funding and international partnerships. The Institute has built up a very strong track record of forming successful partnerships with other European agencies and institutions. Therefore, a protocol agreed in early 2013 for the recruitment of staff under other public, private and EU funding programmes is most welcome and a crucial tool to enable the Institute to achieve its objectives.

Should we reach a limit on the scope of these measures to absorb the impact of further budget cuts on front-line services, we will plan adaptive measures to achieve alignment between budget/capacity and service delivery. This approach would involve dialogue with key clients to clarify service demand prioritisation, in order to identify the most balanced outcome achievable, thus enabling us to protect our priority front-line services to the maximum extent practicable.

Finally, this plan sets out how we will identify and prepare plans to benefit from new opportunities. There are clear signals of an increase in the demand for services from the Marine Institute, in light of economic development opportunities identified in *Harnessing Our Ocean Wealth* and Government/EU resource management and monitoring requirements. Furthermore, the prospects for an increase in the priority and support for marine research and innovation at an EU level are encouraging.

This strategic approach, with its balance of reactive and proactive measures, together with the vision, values and commitment of the Marine Institute staff, will help guide the Marine Institute through the challenges and opportunities over the period 2013–2016.

Appendices

APPENDIX 9: GALWAY STATEMENT AN ATLANTIC OCEAN COOPERATION LAUNCHING AN EU-CANADA-USA RESEARCH ALLIANCE

Galway Statement on Atlantic Ocean Cooperation Launching a European Union - Canada - United States of America Research Alliance

The Signatories of this Statement meeting on the occasion of the high level event

The Atlantic – a Shared Resource, held on

23 and 24 May 2013

at the Marine Institute, Galway, Ireland

Recognizing the importance of the Atlantic Ocean to our citizens, prosperity, human health and well-being, adaptation to climate and other environmental change, and security,

Cognizant of our reliance upon the best available science and knowledge to inform decisions affecting the Atlantic Ocean,

Realizing that our countries face similar challenges in promoting a healthy and well-understood Atlantic Ocean,

Acknowledging the critical interlink between the Atlantic Ocean and the portion of the Arctic region that borders the Atlantic,

Appreciating the value of our ongoing cooperation on ocean science and observation in the Atlantic Ocean, and

Valuing the essential role of international partnership to achieve our shared objectives and the potential of greater cooperation to advance our knowledge of the Atlantic Ocean,

Intend to advance our shared vision of an Atlantic Ocean that is healthy, resilient, safe, productive, understood and treasured so as to promote the well-being, prosperity, and security of present and future generations.

This cooperation is intended to increase our knowledge of the Atlantic Ocean and its dynamic systems - including interlinks with the portion of the Arctic region that borders the Atlantic - by aligning our ocean observation efforts to improve ocean health and stewardship and promote the sustainable management of its resources. Observation is fundamental to understanding the ocean and forecasting its future. Activities may include efforts to better coordinate data sharing, interoperability and coordination of observing infrastructures and seabed and benthic habitat mapping.

This cooperation may result in mutual benefits including better ecosystem assessments and forecasts and deeper understanding of vulnerabilities and risk, including those relating to the global climate system and climate change impacts. It can also help to generate new tools to increase resilience, conserve rich biodiversity, manage risk and determine social, environmental and economic priorities.

We further intend to promote our citizens' understanding of the value of the Atlantic by promoting oceans literacy. We intend to show how results of ocean science and observation address pressing issues facing our citizens, the environment and the world and to foster public understanding of the value of the Atlantic Ocean.

We intend to advance this agenda by

- taking stock of and utilizing existing bilateral science and technology cooperation (e.g. the U.S. - European Union Science and Technology Joint Consultative Group and the Canada - European Union Science and Technology Joint Coordinating Committee) and multilateral cooperation frameworks including those related to ocean observation, and ocean literacy initiatives;
- recommending priorities for future cooperation and, where possible,
- coordinating the planning and programming of relevant activities in these areas, including promoting researcher mobility.

This cooperation could potentially involve national partners and European Commission representatives, the private sector, and the scientific community to further our efforts by harnessing the value of public-private partnerships.



This initiative is also expected to reinforce existing international efforts to advance our knowledge of the ocean, including the World Ocean Assessment.

Signed in Galway on 24 May 2013 in three originals in the English language.

For the European Union

**For the Government of
Canada**

**For the Government of the
United States of America**

**Máire GEOGHEGAN-
QUINN**
Commissioner for Research,
Innovation and Science

Edward FAST
Minister of International
Trade and Minister for the
Asia-Pacific Gateway



Dr Kerri-Ann JONES
Assistant Secretary of State
for Oceans and International
Environmental and Scientific
Affairs



Maria DAMAKI
Commissioner for Maritime
Affairs and Fisheries

APPENDIX 10: THE ATLANTIC A SHARED RESOURCE – WORKSHOP REPORT

The Atlantic – A Shared Resource, Galway, 23rd May 2013 Report of the scientific workshop

On 23rd May 2013, marine scientists from the United States of America, Canada and Europe gathered in Galway, Ireland to identify the key scientific and societal challenges that need to be addressed in order to deliver (by 2020) a predictive capacity [both short term predictions and long term forecasts] for the major risks and changes in the dynamics of the North Atlantic as outlined in the vision statement below.

In identifying key challenges, the participants support the view that a North Atlantic Ocean Observation and Forecasting Capacity is essential to address key scientific, environmental, governance, policy and societal challenges of mutual concern and that cooperation would result in mutual benefits including better ecosystem assessments and forecasts, a deeper understanding of vulnerabilities and risks including those related to global climate change and climate impacts (e.g. sea-level rise, shifts in biogeography of commercially important species, etc) and other anthropogenic impacts including those related to resource exploitation (e.g. fisheries, deep sea mining, etc). Furthermore these activities will create new opportunities for job creation and economic growth, referred to in Europe as Blue Growth.

Vision Statement:

Through seamlessly integrating science and technology and improved collaboration between Canada, the European Union and the United States of America, our common objectives are to have by 2020:

An enhanced predictive capacity for the major risks and changes in the dynamics of the North Atlantic Ocean, its ecology, circulation system, interactions between the Atlantic and Arctic as well as ocean-atmosphere connections.

Based on existing and new capability, to have implemented a fit for purpose North Atlantic multi-platform ocean observing and forecasting system driven by science and societal needs and providing real time data and long term time series.

Mapped the Atlantic to underpin the accuracy of predictive models and forecasts and identified key tectonic /volcanic sites, as well as ecologically and economically important (and potentially undiscovered) seafloor and water column habitats.

Enabled the safest operational and risk management environment for operation at sea as well as for offshore and coastal users.

Forged greatly strengthened collaborative operational and scientific undertakings of mutual benefit and integrated these activities seamlessly across the North Atlantic between Europe and the North Americas.

Supported the development, through public, academic and private sector partnerships (e.g. clusters of innovation), of a range of new and innovative knowledge based and globally traded products and services, including novel observing technologies and innovation to promote new opportunities for sustainable socio-economic growth.

Revolutionised our understanding of the role of the North Atlantic in earth system dynamics, especially with respect to interactions with coastal zones and with the Arctic, Central Atlantic and Mediterranean.

Promoted ocean literacy, engaged with societal stakeholders (including citizen participation) and inspired and educated the next generation of trans-disciplinary scientists and engineers.

The Atlantic – A Shared Resource Workshop through presentations and discussion, identified a broad suite of challenges ranging through those related to the acquisition of the knowledge required to assess and respond to climate change impacts; implement an ecosystem approach; reduce uncertainty generated by observations and modelling; improve safety at sea, human health and well-being; the identification and use of new and emerging technologies; standardisation of sampling protocols; data access and use (and reuse) and the harmonisation of habitat classification systems. This wealth of data will be retained to support and inform the more in-depth studies and initiatives that must follow if we are to realise the vision of an integrated North Atlantic Ocean Observation and Forecasting System.

Key Challenges:

- > The integration of historical and paleo data, ocean observing and forecasting systems to provide better indicators of past, current and future environmental status.
- > Advance existing technologies (including approaches emerging from other disciplines), ecosystem and biogeochemical models, as well as developing empirical and modelling approaches to enable the quantification of evolutionary change in ocean systems.
- > Quantify the effects of multiple stressors on biogeochemistry, organisms and ecosystems.
- > Proactively translate knowledge, based on an ecosystem approach, to improve the stewardship of natural resources.
- > Mainstreaming of cost effective chemical and biological (including genomic) sensors as well as robotic and autonomous systems for ocean observation.
- > Evaluate the role of biodiversity in the health and functioning of ecosystems and the maintenance of ecosystem services.
- > Determine the mechanisms initiating hazardous events and identify indicators to improve the forecast of the spatial-temporal occurrence of these events.
- > Develop and maintain the capacity for rapid response to unanticipated and episodic events that require immediate scientific investigation to advance knowledge.
- > Build an industry, academia and government cross sector vision of a shared data collection, management and information infrastructure.
- > Engage with existing international networks (e.g. GEO – Blue Planet Initiative) to set the Atlantic in a global context.
- > Standardisation of sampling and observation techniques, common data standards and harmonised habitat classification systems to facilitate open data access and the use and reuse of data.

In response to the question posed to the Workshop “Are current Ocean Observation Systems fit for purpose to address key societal

challenges? The consensus opinion was that the current patchwork of ocean and coastal observing capabilities, though providing a basis for a fit for purpose ocean and coastal observation and forecasting infrastructure, lacks the required spatial and temporal coverage, inter-operability and the full range of chemical and biological sensors needed to realise and deliver the shared vision.

Recommendations

Rapid progress towards this vision can be achieved by integrating current programmes and infrastructures on a trans-Atlantic basis. In this context, we recommend a series of Trans-Atlantic Workshops to:

- > Elaborate and distil the many suggestions put forward at the Conference and further refine a set of key Atlantic / Arctic scientific challenges that would benefit from a joint approach.
- > Evaluate the basis for and feasibility of a jointly funded and competitive research programme to address North Atlantic research issues of mutual interest.
- > Undertake a more detailed review of existing North Atlantic ocean observation capacities, address identified gaps and challenges and deliver the required predictive capacity by 2020.
- > Establish mechanisms to promote trans-Atlantic data sharing, using as a test case seabed mapping.
- > Make recommendations on the optimum approach to habitat mapping such that mapping initiatives, carried out separately or jointly, can be seamlessly merged. This will include a review of existing and emerging mapping techniques, common standards and habitat classification systems
- > Examine options for trans-Atlantic joint actions on ocean literacy and engagement with societal stakeholders.

Session Reports:

Session 3.1. Sea and Seabed Habitat Mapping

- > Establish a mechanism to examine and expand communications to bring together existing seabed and seabed habitat mapping groups and develop procedures to (a) map national territories and (b) the high seas, possibly on a cost shared basis.
- > Complete a preliminary phase of mapping the Atlantic seafloor (multibeam, backscatter and bathymetry). This mapping will underpin the accuracy of prediction models and forecasts, the accuracy of their outputs and identify areas requiring secondary phase (follow-up) mapping to include key tectonic / volcanic sites, critical habitats, seabed and water column habitats and time series mapping.
- > Establish universal standards/classification systems for seabed and seabed habitat mapping.

Session 3.2: Atlantic-Arctic trans boundary issues

- > Identify and quantify two-way Arctic-Atlantic physical, chemical and biological interactions.
- > Enhance capacity for year round multidisciplinary observations.
- > Incorporate key Arctic processes, such as sea ice in North Atlantic/ Arctic prediction systems

Session 3.3: Operational Oceanography /Forecasting

- > Operations are continually evolving so maintaining existing observation networks and associated modelling capacity (system) is critical – do not allow decline to creep in. New observational technologies should not lead to a decline in existing capabilities but should be continually assessed for their fitness for purpose.
- > Operational oceanography needs to develop and evolve. Research and innovation are continually needed to improve output, improve efficiency and lower costs of 'input' and extend capacity to new domains, for example ecosystem services.
- > A mechanism to codevelop and design future operational oceanographic services is needed. Collaboration using established fora has proven valuable in the global context (e.g. climate).
- > An Alliance of operational oceanographic services would ensure more coherent and effective monitoring and forecasting of the North Atlantic.
- > A goal over the next ten years is to improve the responsive capability (e.g. ability to deal with crises such as Deep Water Horizon).

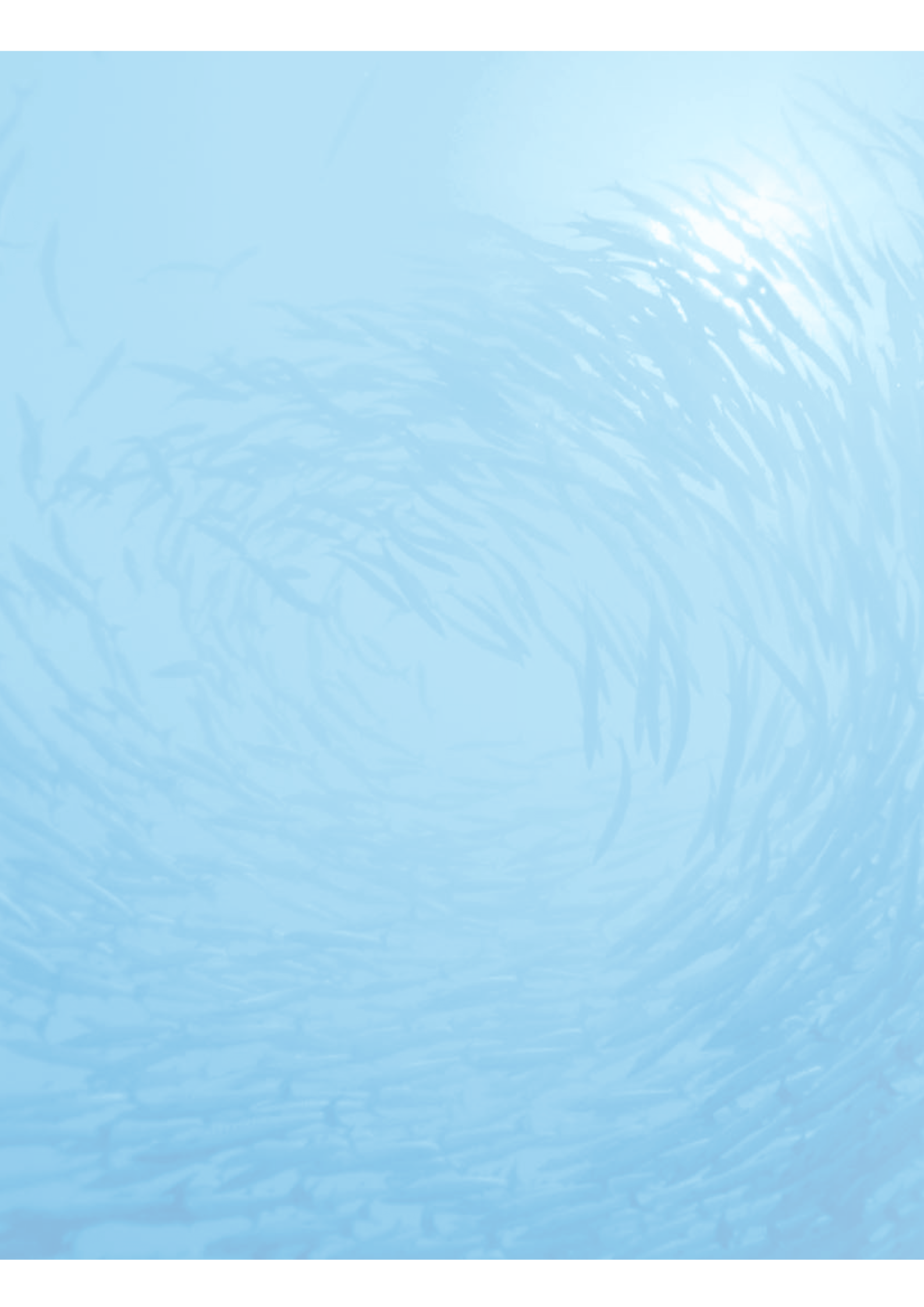
Session 3.4. Current Ocean Observing Systems

- > Improved deployment of human resources: While our technological resources are considerable and rapidly improving, we need to improve our abilities to work across disciplines and with the aid of local/user communities. Our improved ability to make observational data rapidly available has been an important step forward, but to take synthesis and understanding to the next level, we also need better integration across disciplines.
- > Adaptive Rapid Response: Responding rapidly to disasters or other episodic events requires flexible funding opportunities (e.g., the U.S. National Science Foundation's RAPID awards program) and also networks of responders ready to deploy quickly. Planning for the unexpected should include considering how models could be quickly converted to apply to systems other than the ones for which they were developed.
- > Prioritization: The observing community as a whole needs to better confront the difficult task of prioritizing observations to ensure that –in the long term–the most critical observations are made. A baseline structure should be established for the most critical observations. Designed properly, the structure could serve as a magnet for process studies.

Glossary of Abbreviations

AA	Appropriate Assessments	FEAS	Fisheries Ecosystem Advisory Services (of the Marine Institute)
ACA	Association of chartered accountants	FIRM	Food Industry Research Measure
ACEobs	Atlantic Centre for Earth Observations	FIX03	linking EU activities on fixed point marine observations
ACRUNET	Atlantic Crab Resource Network	FP7	Seventh Framework Programme
AMS	Advanced Mapping Services	FSAI	Food Safety Authority of Ireland
AMTP	Advanced Marine Technology Programme		
ASIMUTH	Applied Simulations and Integrated Modelling for the Understanding of Toxic and Harmful Algal Blooms	GEO	Group on Earth Observations
ASTOX	Azaspiracids Toxicological Evaluation, Test Methods and Identification of the Source Organism	GEPETO	Fisheries Management & Transnational Objectives
		GMIT	Galway-Mayo Institute of Technology
		GSI	Geological Survey of Ireland
BA	Bachelor of the Arts		
BENTHIS	Benthic Ecosystems Fisheries Impact Study	HAB	Harmful Algal Blooms
BSc	Bachelor of Science	HEA	Higher Education Authority
BSc Arch	Bachelor of Science – Architecture	HEAnet	Ireland National Education and Research Network
BSH	Bundesamt für Seeschifffahrt und Hydrographie – German Federal Maritime and Hydrographic Agency		
CEO	Chief Executive Officer	ICES	International Council for the Exploration of the Seas
CFP	Common Fisheries Policy	ICT	Information Communications Technology
CITES	Convention of International Trade in Endangered Species	ILV	Irish Lights Vessel
CoFASP	Fisheries aquaculture and seafood processing network	IMDO	Irish Maritime Development Office (of the Marine Institute)
CoOPEUS	Cooperation between the US and the EU in the field of environmental research infrastructures	IMTE	Irish Maritime Transport Economist
CPMR	Conference of Peripheral Maritime Regions	INAB	Irish National Accreditation Board
		INFOMAR	Integrated Mapping for the Sustainable Development of Ireland's Marine Resources
		INIS	Ireland Northern Ireland Scottish
DAFM	Department of Agriculture, Food and Marine	INTERREG	Inter-Regional Co-operation Programme
DAHG	Department of Arts, Heritage and Gaeltacht	IS&D	Information Services and Development
DAMARA	Scientific Support for the Development of a Management Plan in the Celtic Sea	ISEAS	Irish Seafarers Educational Assistance Scheme
DCENR	Department of Communications and Environment and Natural Resources	ISGEI	International Smart Ocean Graduate Enterprise Initiative
DCF	Data Collection Framework	ISSC	Irish Shipping Service Centre
DCU	Dublin City University		
DG Mare	Directorate General for Maritime Affairs and Fisheries	JERICO	Towards a joint European research infrastructure network for coastal observatories
DOMMRS	Daithi O'Murchu Marine Research Station		
DTTAS	Department of Transport, Tourism and Sport	MA	Master of Arts
		MCG	Marine Coordination Group
ECOKNOWS	Effective Use of Ecosystem and Biological Knowledge in Fisheries	MEFS	Marine Environment and Food Safety Services (of the Marine Institute)
EIA	Environmental Impact Assessment	MESH	Mapping European Seabed Habitats
EMEA	Europe Middle East and Africa	MPlan	Masters in Planning and Sustainable Development
EMSO	European Multidisciplinary Seafloor Observatory	MSc	Master of Science
EPA	Environmental Protection Agency	MSFD	Marine Strategy Framework Directive
ERIC	European Research Infrastructure Consortium	MLVC	Marine Licence Vetting Committee
ESA	European Space Agency	MRIAI	Member of the Royal Institute of the Architects of Ireland
ETP	Excellence Through People Accreditation	MYFISH	Maximum Sustainable Yield
EU	European Union		
EUROBASIN	Integrated Project on Basin – Scale Analysis	NATURA	NATURA 2000 sites are protected for flora and fauna of European importance
		NDP	National Development Programme

NOC	National Oceanographic Centre
NPWS	National Parks and Wildlife Service
NSAI	National Standards Authority of Ireland
NUIG	National University of Ireland, Galway
NYSE:SWI	SolarWinds Inc
OJEU	Official Journal of the European Union
OsHV-1 μ var	Herpes Virus
OSPAR	Oslo and Paris Convention (1992)
OSIS	Ocean Science and Information Services (of the Marine Institute)
PhD	Doctor of Philosophy
PMDS	Performance Management Development Systems
PWC	Price Waterhouse Coopers
R&D	Research and Development
RAC	Regional Advisory Council
RIAN	National Open Access portal for Irish Research Publications
RIBA	Royal Institute of British Architects
ROV	Remotely Operated Vehicle
RV	Research Vessel
RVops	Research Vessel Operations
SACs	Special Areas of Conservation
SBM	Single Bay Management
SEAI	Sustainable Energy Authority of Ireland
SECA	Sulphur Emission Control Area
SFI	Science Foundation Ireland
SFPA	Sea Fisheries Protection Authority
SIDERI	Strengthening International Dimension of Euro-Argo
SMART	Strategic Marine Alliance for Research and Training
SME	Small to Medium Sized Enterprise
SPA	Special Protection Areas
SSCE	Standing Scientific Committees for Eel
SSCS	Standing Scientific Committees for Salmon
STAMAR	Showcasing Technology Applicable to Maritimes SMEs
STECF	Scientific, Technical and Economic Committee on Fisheries
STOCKMAN	Application for monitoring the pelagic and demersal fish stocks in Irish waters
TD	Teachta Dála
TEU	Twenty Foot Equivalent Unit which denotes one container unit
UK	United Kingdom
US	United States
USA	United States of America



Financial Statements

Report of the Comptroller and Auditor General

For Presentation to the Houses of the Oireachtas

I have audited the financial statements of the Marine Institute for the year ended 31 December 2013 under the Marine Institute Act 1991. The financial statements, which have been prepared under the accounting policies set out therein, comprise the accounting policies, the income and expenditure account, the statement of total recognised gains and losses, the balance sheet, the cash flow statement and the related notes. The financial statements have been prepared in the form prescribed under Section 12 of the Act, and in accordance with generally accepted accounting practice in Ireland.

Responsibilities of the Members of the Board

The Board is responsible for the preparation of the financial statements, for ensuring that they give a true and fair view of the state of the Institute's affairs and of its income and expenditure, and for ensuring the regularity of transactions.

Responsibilities of the Comptroller and Auditor General

My responsibility is to audit the financial statements and report on them in accordance with applicable law.

My audit is conducted by reference to the special considerations which attach to State bodies in relation to their management and operation.

My audit is carried out in accordance with the International Standards on Auditing (UK and Ireland) and in compliance with the Auditing Practices Board's Ethical Standards for Auditors.

Scope of Audit of the Financial Statements

An audit involves obtaining evidence about the amounts and disclosures in the financial statements, sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of

- > whether the accounting policies are appropriate to the Institute's circumstances, and have been consistently applied and adequately disclosed
- > the reasonableness of significant accounting estimates made in the preparation of the financial statements, and
- > the overall presentation of the financial statements.

I also seek to obtain evidence about the regularity of financial transactions in the course of audit.

In addition, I read the Institute's annual report to identify material inconsistencies with the audited financial statements. If I become aware of any apparent material misstatements or inconsistencies, I consider the implications for my report.

Opinion on the Financial Statements

In my opinion, the financial statements, which have been properly prepared in accordance with generally accepted accounting practice in Ireland, give a true and fair view of the state of the Institute's affairs at 31 December 2013 and of its income and expenditure for the year then ended.

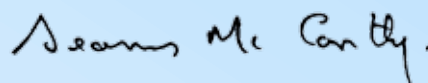
In my opinion, proper books of account have been kept by the Institute. The financial statements are in agreement with the books of account.

Matters on which I report by exception

I report by exception if

- > I have not received all the information and explanations I required for my audit, or
- > my audit noted any material instance where money has not been applied for the purposes intended or where the transactions did not conform to the authorities governing them, or
- > the information given in the Institute's annual report is not consistent with the financial statements, or
- > the statement on internal financial control does not reflect the Institute's compliance with the Code of Practice for the Governance of State Bodies, or
- > I find there are other material matters relating to the manner in which public business has been conducted.

I have nothing to report in regard to those matters upon which reporting is by exception.



Seamus McCarthy

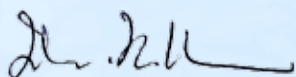
Comptroller and Auditor General
18th December 2014

Statement of Responsibilities of the Board

Section 12 of the Marine Institute Act, 1991, requires the Institute to prepare financial statements in such a form as may be

approved by the Minister for Agriculture, Food and the Marine. In preparing those financial statements, the Board of the Institute is required to:

- Select suitable accounting policies and apply them consistently;
- Make judgements and estimates that are reasonable and prudent;
- State whether applicable accounting standards have been followed, subject to any material departures disclosed and explained in the financial statements;
- Prepare the financial statements on a going concern basis unless it is inappropriate to presume that the Institute will continue in operation.



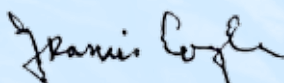
Mr John Killeen

Board Member

9th December 2014

The Institute is responsible for keeping proper books of account which disclose with reasonable accuracy at any time the financial position of the Institute and which enable it to ensure that the financial statements comply with Section 12(1) of the Act.

The Institute is also responsible for safeguarding its assets and for taking reasonable steps for the prevention and detection of fraud and other irregularities.



Mr Francis Coyle

Board Member

9th December 2014

Statement on Internal Financial Control

On behalf of the Board of the Marine Institute I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

The system can only provide reasonable and not absolute assurance that assets are safeguarded, transactions authorised and properly recorded, and that material errors or irregularities are either prevented or would be detected in a timely period.

The Board has taken steps to ensure an appropriate control environment is in place by:

- > Clearly defining management responsibilities and powers ;
- > Establishing formal procedures for monitoring the activities and safeguarding the assets of the organisation ;
- > Developing a culture of accountability across all levels of the organisation.

A review of risk management was carried out in 2013 which included:

- > An evaluation of the appropriateness and effectiveness of the existing policy and procedures in identifying and evaluating business risks;
- > The identification of the nature, extent and financial implication of risks facing the body including the extent and categories which it regards as acceptable;
- > The assessment of the likelihood and impacts of identified risks occurring;
- > An undertaking that the risk framework addresses the requirements of the Code of Practice for the Governance of State Bodies (2009)

The system of internal financial control is based on a framework of regular management information, administration procedures including segregation of duties, and a system of delegation and accountability.

In particular it includes:

- > A comprehensive budgeting system with an annual budget which is reviewed and agreed by the Board;
- > Regular reviews by the Board of periodic and annual financial reports which indicate financial performance against forecasts;
- > Setting targets to measure financial and other performance;
- > Formal project management disciplines.

The Marine Institute has established an internal audit function that operates in accordance with the Framework Code of Best Practice set out in the Code of Practice on the Governance of State Bodies. The work of internal audit is informed by analysis of the risk to which the body is exposed, and annual internal audit plans are based on this analysis. The analysis of risk and the internal audit plan for 2013 was endorsed by the Audit Committee and approved by the Board. The Audit Committee has received the report of internal audit activity in 2013, and this was presented to the Board. The report included the Internal Auditor's opinion on the adequacy and effectiveness of the system of internal financial control. The Board's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor, the audit committee which oversees the work of the internal auditor, the executive managers within the Marine Institute who have responsibility for the development and maintenance of the financial control framework, and comments made by the Comptroller and Auditor General in his management letter.

The Board reviewed and approved the effectiveness of the system of internal financial controls for 2013.

On behalf of the Board:



Mr John Killeen

Chairman

9th December 2014

Accounting Policies

Year Ended 31 December 2013

1. General

The financial statements have been prepared under the accruals method of accounting, except as stated below, and in accordance with generally accepted accounting principles. Financial reporting standards recommended by the recognised accounting bodies are adopted as they become operative.

2. Income

Income arising from Oireachtas Grant in Aid is recognised on a cash receipts basis.

3. Deferred Income

Income and advance payments received from EU and other contract research projects is treated as deferred income where the research project is ongoing and there is future expenditure to charge against the project. This income is recognised in the accounting period in which the related expenditure is charged. On completion of a project any unutilised balance on the deferred income account for that project is also brought to account as income.

4. Fixed Assets and Depreciation

Depreciation is provided for on a straight line basis at rates estimated to reduce the assets to their realisable value by the end of their expected lives. The rates in use are as follows:

Buildings	2%
Plant and Equipment	25%
Fixtures and Fittings	25%
Computers	33%
Research Vessel	4%
Research Vessel Equipment	25%
Research Vessel Refit	20%
Motor Vehicles	20%

Land is not depreciated

5. Leased Assets

Payments under operating leases (Note17) are charged to the income and expenditure account in the year to which they relate.

6. Capital Account

The Capital Account represents the unamortised value of income applied for capital purposes.

7. Foreign Currencies

Monetary assets and liabilities denominated in foreign currencies are translated at the exchange rates ruling at the Balance Sheet date. Revenues and costs are translated at the exchange rates ruling at the dates of the underlying transactions.

8. Marine Research Technology Development Innovation Projects (RTDI)

The Marine Institute enters into commitments in respect of contracts awarded for Marine RTDI projects. Expenditure is charged in the financial statements on the basis of initial payments made on signing of the project contract, an interim payment may be made subject to satisfactory performance and further payments are charged on receipt and verification of claims in respect of work completed. Costs incurred by the Institute in the administration of RTDI projects are funded by the National Development Plan (NDP) and charged to the financial statements as they are incurred.

9. Deferred Funding Asset for Pensions

The Marine Institute operates defined benefit pension schemes which are funded annually on a pay as you go basis from monies available to it, including monies provided by the Department of Agriculture, Food and the Marine.

Pension costs reflect pension benefits earned by employees in the period and are shown net of staff pension contributions which are remitted to the Department of Agriculture, Food and the Marine. An amount corresponding to the pension charge is recognised as income to the extent that it is recoverable, and offset by grants received in the year to discharge pension payments.

Actuarial gains or losses arising on scheme liabilities are reflected in the Statement of Recognised Gains and Losses and a corresponding adjustment is recognised in the amount recoverable from the Department of Agriculture, Food and the Marine.

Pension liabilities represent the present value of future pension payments earned by staff to date. Deferred pension funding represents the corresponding asset to be recovered in future periods from the Department of Agriculture, Food and the Marine.

Income and Expenditure Account

Year Ended 31 December 2013

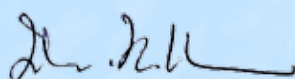
		2013		2012	
	Note	€'000	€'000	€'000	€'000
Income					
Oireachtas Grants	2		22,916		23,523
Other Income	3		12,764		11,882
Net Deferred Funding For Pensions	16		3,038		2,857
			38,718		38,262
Transfer (to)/from Capital Account	10		1,364		738
			40,082		39,000
Expenditure					
Corporate Services	4	4,419		4,488	
Marine Environment and Food Safety Services	5	6,798		7,665	
Fisheries Ecosystem Advisory Services	6	4,786		4,815	
Ocean Science and Information Services	7	12,524		11,900	
Irish Maritime Development Office	8	665		895	
Marine RTDI and SSTI Programme	12	7,750		6,772	
Pensions Costs	16	2,966		2,878	
Refund to Exchequer		0		270	
Total Expenditure	13		39,908		39,683
Surplus (Deficit)/ for the year			174	(683)	
Surplus at 1 January			1,781	2,464	
Surplus at 31 December			1,955	1,781	

Statement of Total Recognised Gains and Losses

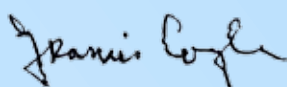
Surplus/(Deficit) for the year	174	(683)
Actuarial Gains/(Losses) on Pension Scheme Liabilities	2,339	1,360
Changes in Assumptions		
Adjustment to Deferred Pension Funding	(2,339)	(1,360)
Total Recognised Gains and Losses for the year	174	(683)

The results for the year relate to continuing operations.

The Statement of Accounting Policies and Notes 1 – 22 form part of these financial statements.



Mr John Killeen
Board Member
9th December 2014



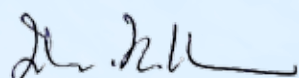
Mr Francis Coyle
Board Member
9th December 2014

Balance Sheet

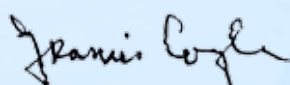
Year Ended 31 December 2013

		2013	2012
	Note	€'000	€'000
Fixed Assets	11	21,188	22,552
Current Assets			
Debtors and Prepayments	14	3,966	3,045
Banks and Cash		458	1,211
		4,424	4,256
Current Liabilities			
Creditors and Accruals	15	2,469	2,475
Net Current Assets		1,955	-
Total Assets Less Current Liabilities before Pensions			
Deferred Pension Funding		28,200	27,501
Pension Liabilities		(28,200)	(27,501)
Total Assets less Current Liabilities		23,143	24,333
Financed By:			
Capital Account	10	21,188	22,552
Income and Expenditure Account		1,955	1,781
		23,143	24,333

The Statement of Accounting Policies and Notes 1 – 22 form part of these financial statements.



Mr John Killeen
Board Member
9th December 2014



Mr Francis Coyle
Board Member
9th December 2014

Cash Flow Statement

for the Year Ended 31 December 2013

Reconciliation of operating surplus/(deficit) to net cash flow from operating activities			
	Note	2013 €'000	2012 €'000
Surplus/(Deficit) per Income and Expenditure Account		174	(683)
Interest received		0	0
Transfer to/(from) Capital Account	10	(1,364)	(738)
Depreciation	11	3,726	2,906
(Increase) /Decrease in Debtors and Prepayments	14	(921)	3,515
Increase /(Decrease) in Creditors and Accruals	15	(6)	(2,217)
Net cash inflow from operating activities		1,609	2,783

Cash Flow Statement			
		2013 €'000	2012 €'000
Net cash inflow from operating activities		1,609	2,783
Returns on investments and servicing of finance			
Interest received		0	0
Net capital expenditure			
Acquisition of fixed assets	11	(2,362)	(2,168)
Increase / (Decrease) in cash		(753)	615

Reconciliation of net cash flow to movement in net funds			
		2013 €'000	2012 €'000
Increase / (Decrease) in cash		(753)	615
Net funds at 1 January		1,211	596
Net funds at 31 December		458	1,211

Notes to Financial Statements

Year Ended 31 December 2013

1. General

The Marine Institute was established on 30 October, 1992 in accordance with the provisions of the Marine Institute Act, 1991,

“to undertake, to co-ordinate, to promote and to assist in marine research and development and to provide such services related to marine research and development, that in the opinion of the Institute will promote economic development and create employment and protect the marine environment”.

The Financial Statements cover the Year Ended 31 December 2013

2. Grant in Aid

	€'000	€'000	€'000	€'000
Current purposes				
Marine Institute – Vote 30, Subhead A.7	13,920		14,449	
Less Superannuation contributions repayable*	(433)	13,487	(421)	14,028
Capital purposes				
National Seabed Survey – Vote 29, Subhead D.7	1,404		1,495	
Marine Institute – Vote 30, Subhead A.7	1,650		1,500	
Beaufort (Note 12) – Vote 30, Subhead A.7	2,167		2,167	
Research and Technical Development Infrastructure (RTDI) (Note 12) – Vote 30, Subhead A.7	4,208	9,429	4,333	9,495
		22,916		23,523

* By agreement with the Department of Agriculture, Food and the Marine this amount is refundable in respect of employee pension contributions.

Notes to Financial Statements

Year Ended 31 December 2013

3. Other Income

	2013		2012	
	€'000	€'000	€'000	€'000
EU Contract Research				
Data Collection Framework (see note below)	3,340		2,841	
Other	800		1,258	
		4,140		4,099
Other Income				
Research Vessel Charterage	2,028		2,542	
Databuoy – Department of Transport	418		370	
Marine Strategy Framework Directive (DECLG)	479		996	
Natura (DAFM and DECLG)	333		571	
Water Framework Directive funded by EPA	940		956	
Marine NDP project co-funded by EPA	107		0	
Marine NDP project co-funded by Teagasc	893		288	
Wave Energy Test Sites Funded by SEAI	1,085		766	
Galway Bay Cable Project – Funded by HEA	300		0	
Sundry and Other Contract Income	2,041	8,624	1,294	7,783
TOTAL		12,764		11,882

The Data Collection Framework is a European wide framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.

4. Corporate Services

	2013	2012
	€'000	€'000
Wages and salaries	1,232	1,209
Administration	2,713	3,014
Depreciation	474	265
TOTAL	4,419	4,488

Administration costs include an audit fee of €19,270 in 2013 (2012: €19,270)

Notes to Financial Statements

Year Ended 31 December 2013

5. Marine Environment and Food Safety Services

	2013	2012
	€'000	€'000
Wages and Salaries: Core staff	2,749	2,736
EU Contract Staff	42	78
	2,791	2,814
Research & Development Programmes	3,749	4,595
Depreciation	258	256
TOTAL	6,798	7,665

6. Fisheries Ecosystems Advisory Services

	2013	2012
	€'000	€'000
Wages and Salaries: Core Staff	1,913	1,926
EU Contract Staff	1,412	1,378
	3,325	3,304
Research & Development Programmes	1,383	1,401
Depreciation	78	110
TOTAL	4,786	4,815

7. Ocean Science and Information Services

	2013	2012
	€'000	€'000
Wages and Salaries	1,289	1,339
Administration & Development Programmes	8,320	8,288
Depreciation	2,915	2,273
TOTAL	12,524	11,900

The total running costs of the Research Vessels and the ROV (remote operating vehicle) in 2013 was €7.520m (2012: €8.060m). €7,179m of this expenditure has been recognised in the Income and Expenditure account. €4,679m is charged to the Ocean Science and Information Services (note 7) and the remaining €2.5m is charged to the Marine RTDI and SSTI Programme (note 12). €0.341m relates to expenditure which has been capitalised and is included in fixed assets (note 11).

Notes to Financial Statements

Year Ended 31 December 2013

8. Irish Maritime Development Office

	2013	2012
	€'000	€'000
Wages and Salaries	230	326
Administration & Development Programmes	435	569
Depreciation		0
TOTAL	665	895

9. Salary Costs

	2013	2012
	€'000	€'000
Wages and Salaries: Core Staff	134 7,414	136 7,538
Pensioners and Pension Costs	15 2,966	14 2,878
Contract Staff and other payroll costs	43 3,073	47 3,104
	192 13,453	197 13,520

Pension related deductions of €0.433m were made from salaries and remitted to the Department of Agriculture, Food and the Marine.

10. Capital Account

	2013	2012
	€'000	€'000
Balance at 1 January	22,552	23,290
Transfer (to) /from Income and Expenditure Account		
Capital funding	2,362	2,168
Amortisation in line with asset depreciation	(3,726) (1,364)	(2,906) (738)
Balance at 31 December	21,188	22,552

Notes to Financial Statements

Year Ended 31 December 2013

11. Fixed Assets

Fixed Assets as stated in the financial statements are made up as follows:

	Land & Buildings	Research Vessels	Vessel Equipment	Fixtures & Fittings	Computers	Motor Vehicles	TOTAL
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
Cost or Valuation							
Balance at 1 January 2013	3,743	32,391	4,127	20,330	8,039	358	68,988
Additions at cost		140	251	1,559	416	14	2,380
Disposals at Cost						(18)	(18)
Cost at 31 December 2013	3,743	32,531	4,378	21,889	8,455	354	71,350
Depreciation							
Balance at 1 January 2013	926	14,686	3,656	19,048	7,820	300	46,436
Charge for the year	75	1,918	296	1,141	282	32	3,744
Disposal at Cost						(18)	(18)
Balance at 31 December 2013	1,001	16,604	3,952	20,189	8,102	314	50,162
Net Book Value							
At 31 December 2013	2,742	15,927	426	1,700	353	40	21,188
At 31 December 2012	2,817	17,705	471	1,282	219	58	22,552

The Marine Institute main premises are at Rinville, Oranmore, County Galway. This building is owned by the OPW. No rent is paid to the OPW for these premises.

Notes to Financial Statements

Year Ended 31 December 2013

12. Marine NDP (2000–2006), Beaufort and Marine NDP (2007–2013)

The total funding and amounts applied in 2013 was as follows:

	2013	2012
	€'000	€'000
	NDP	€'000
	2007–2013	Total
Oireachtas Income (Note 2)	6,375	6,500
Other Income (Note 3)	1,000	288
Total Income	7,375	6,788
Expenditure:		
Amounts paid to third parties	6,659	5,546
Amounts paid to the Marine Institute	913	919
Administration	178	307
Total Programme Expenditure	7,750	6,772
(Deficit)/Surplus in year	(375)	16

Marine NDP 2007–'13

Under the NDP Marine Research Sub-Programme 2007–2013, investment in marine research over the period 2007–2013 is targeted at meeting objectives, research activities and outputs of Sea Change, the national marine knowledge, research and innovation strategy. Funding is targeted at the Research Measures and Programmes of the strategy via a range of mechanisms, including competitive calls for research proposals (project-based awards, desk studies, PhDs, Post-Docs etc) and tendering for the provision of infrastructure/services. A total of 142 projects have been supported up to the end of 2013 under the Marine Research Sub-Programme of the NDP with 80 of these projects still ongoing.

The total expenditure under the Marine Research Sub-Programme up to 31 Dec 2013 was €57.5m. Commitments at 31 Dec 2013 were €12.6m.

Research Projects awarded are subject to contract which specifies that an initial payment will be made on signing of the contract; an interim payment may be made subject to satisfactory performance with final payment made on receipt of and verification of claims. Expenditure is charged in the financial statements in accordance with Accounting Policy 8.

At 31 December 2013 payments were outstanding on amounts charged to the financial statements as follows (note 15).

	2013	2012
	€'000	€'000
Amounts Outstanding	218	0

At 31st December 2013 commitments entered into but not yet charged to the financial statements in respect of RTDI projects were €12.6m with the following breakdown.

	Total
	€'000
Commitments as at 01 January 2013	14,233
Committed in 2013	6,147
Decommitted in 2013	(67)
Paid in 2013	(7,750)
Commitments as at 31 December 2013	12,563

Notes to Financial Statements

Year Ended 31 December 2013

13. Expenditure

	2013	2012
	€'000	€'000
Payroll Costs	10,330	10,496
Pension Costs	2,966	2,878
Board Costs	63	39
Annual Audit Fee	19	19
Insurance	219	240
Rent, Rates and Service Charges	328	368
Facility Costs	1,657	1,766
Telephone and Data Communications	170	211
IT Costs	704	627
Laboratory and Field Costs	786	878
Other Admin Costs	918	1,687
Travelling Expenses	867	917
Statutory Testing, Research and Surveys	3,710	4,195
Marine NDP (2007–2013)	5,250	4,272
NDP Shiptime Programme	2,500	2,500
Vessel Operation Costs	4,679	5,394
Other Sundry Equipment	69	131
Hire of Equipment and Vessels	947	159
Depreciation (Note 11)	3,726	2,906
Total Expenditure Per Income and Expenditure Account	39,908	39,683

The figures in the note excludes capital expenditure of €2.38m.

Foreign travel costs included under travelling expenses in 2013 amounted to €338,492.

14. Debtors and Prepayments

	2013	2012
	€'000	€'000
Trade Debtors	359	140
Contract Income	2,961	2,604
Prepayments	646	301
	3,966	3,045

Notes to Financial Statements

Year Ended 31 December 2013

15. Creditors and Accruals

	2013	2012
	€'000	€'000
Trade Creditors	1,017	981
Deferred Income	856	837
RTDI Accrual (Note 12)	218	0
Accruals	292	565
Payroll and Revenue Accruals	86	92
	2,469	2,475

16. Superannuation Scheme and Spouse & Children's Contributory Pension Scheme

The Marine Institute is a statutory State agency, established under section 3(1) of the Marine Institute Act, 1991 (No. 2 of 1991). Section 9(1) of the Act provides that the Institute shall make schemes for the granting of superannuation benefits to and in respect of staff members, subject to Ministerial approval. Two such approved schemes – the Marine Institute Staff Superannuation Scheme 1998 and the Marine Institute Spouses' and Children's Contributory Pension Scheme 1998 – are being operated by the Institute. The former scheme provides retirement benefits (lump sum and pension) to staff members, and death gratuity benefits in respect of death in service. The latter scheme provides pension benefits for the surviving spouses and dependant children of deceased members. Normal retirement age is a member's 65th birthday. Both schemes are defined benefit superannuation schemes. Staff Superannuation contributions are paid over to the Department of Agriculture, Food and the Marine.

In common with the generality of public service superannuation schemes, no separate fund is maintained, or assets held, to finance the payment of pensions and gratuities.

For the purposes of reporting in accordance with Financial Reporting Standard 17 (revised) – Retirement Benefits, the Institute has been advised by a qualified actuary. A valuation has been prepared by the actuary in order to assess the liabilities of the superannuation schemes at 31 December 2013.

The major actuarial assumptions are as follows:

	2013	2012	2011
Inflation rate increase (a)	2% per annum	2% per annum	2% per annum
Salary rate increase	4% per annum	4% per annum	4% per annum
Pension rate increase	4% per annum	4% per annum	4% per annum
Scheme liabilities discount rate	5.5% per annum	5.5% per annum	5.5% per annum

Average **remaining** future life expectancy according to the mortality tables used to determine pension liabilities, is as follows:

	2013	2012
Male aged 65	22	22
Female aged 65	25	25

Notes to Financial Statements

Year Ended 31 December 2013

On the basis of these and other assumptions and applying the projected unit method prescribed in FRS 17 (Revised), the pension deferred funding asset and pension liability are as follows:

	2013	2012
	€28.2m	€27.5m

As pension increases under the Marine Institute schemes are based on salary increases rather than on price increases, a price inflation assumption is not necessary for the purposes of this valuation. However, since FRS 17 requires reference to an assumed rate of inflation, the above rate would be appropriate for this purpose.

Analysis of the Total Pension Costs charged to Expenditure

	2013	2012
	€'000	€'000
Current Service Cost	1,900	1,900
Interest on pension scheme liabilities	1,500	1,400
Employee Contributions	(434)	(422)
	2,966	2,878

Analysis of the amount recognised in a statement of total recognised gains and losses (STRGL)

	€'000	€'000
Experience gains and (losses)	2,339	1,360
Changes in assumptions underlying the present value of scheme	0	0
Actuarial gain and (loss) recognised in STRGL	2,339	1,360

Net Deferred Funding for Pensions Recognised in the year

	2013	2012
	€'000	€'000
Current Service and Interest Cost	3,400	3,300
Less benefits paid in the year	(362)	(443)
	3,038	2,857

The Marine Institute recognises amounts owing from the State as an asset corresponding to the unfunded deferred liability for pensions on the basis of the set of assumptions described above and a number of past events. These events include the statutory basis for the establishment of the superannuation scheme and the policy and practice in relation to funding public service pensions, including contributions from employees and the annual estimates process. The Marine Institute has no evidence that this funding policy will not continue to meet such sums in accordance with current practice. The deferred funding asset for pensions as at 31 December 2013 amounted to €28.2million (2012: €27.5million). The quantification of the liability is based on the Financial assumptions set out in this note. The assumptions used, which are based on professional actuarial advice, are advised to the Department of Agriculture, Food and the Marine but are not formally agreed with the Department.

Notes to Financial Statements

Year Ended 31 December 2013

Analysis of movement in net pension liability during the year

	2013	2012	2011	2010	2009	2008
	€'000	€'000	€'000	€'000	€'000	€'000
Deficit at the beginning of the year	27,501	26,004	25,900	24,700	19,300	18,300
Current Service Cost	1,900	1,900	2,200	2,100	1,900	1,900
Interest on Scheme Liabilities	1,500	1,400	1,400	1,400	1,100	1,000
Actuarial (Gain) Loss recognised in the STRGL	(2,339)	(1,360)	(3,080)	(2,075)	2,625	(1,679)
Benefits paid in the year	(362)	(443)	(416)	(225)	(225)	(221)
Deficit at the end of the year	28,200	27,501	26,004	25,900	24,700	19,300

History of Defined Benefit Obligations

	2013	2012	2011	2010	2009	2008
	€'000	€'000	€'000	€'000	€'000	€'000
Defined benefit obligations	28,200	27,501	26,004	25,900	24,700	19,300
Experience Gains/(Losses) on Scheme Liabilities	2,339	1,360	3,080	2,075	(2,625)	1,679
Percentage of Scheme Liabilities	8.29%	4.96%	11.8%	8.0%	(10.6%)	8.7%
Assumption Gains/(Losses) on Scheme Liabilities	0	0	0	0	0	0
Percentage of Scheme Liabilities	0%	0%	0%	0%	0%	0%

The cumulative actuarial gain recognised in the statement of total recognised gains and losses amounts to €6,436,000.

17. Lease commitments

Operating Leases

The Marine Institute occupies leased premises at the following locations:

Lease 1: 80 Harcourt Street, Dublin 2 commenced in 1993 for a period of 22 years with five yearly rent reviews. There is a rent review every 5 years, with no more lease breaks until the conclusion of the lease in 2015.

Lease 2: Parkmore Office Park, Galway, commenced in 1999 for a period of 25 years with five yearly rent reviews.

Lease 3: Red Sail Warehouse, Galway Harbour, commenced in 2013 for a period of 11 years with a rent review in 2018.

The current annual rental charge of these leases amounts to €375,002 (2012 €327,720).

	2013	2012
Expiring within 1 year	0	0
Expiring during the years 2 to 5	235,735	235,735
Expiring thereafter	139,267	91,985

Notes to Financial Statements

Year Ended 31 December 2013

18. Investment

The Marine Institute had a 1.3% fully diluted shareholding in a company called Wavebob Ltd. This company was established to develop a concept in delivering Wave Energy. The total cost of the investment grant by the Marine Institute was €127,000. As it was not possible to accurately assess the value of the investment, the shares were not capitalised in the Balance Sheet. The company was wound up on the 26th March 2013. There was no further costs incurred by the Marine Institute.

19. Related Party Transactions

Smartbay Ltd, was established as a company limited by guarantee by the Marine Institute, DCU and NUI Galway, during February 2012 to manage Ireland's marine test and demonstration facility at Galway Bay. The company receives funding from the HEA which is used to fund a team to cover the company's operational costs for the period 2012 to 2015. Dublin City University is the lead research organisation which provides the HEA funding to Smartbay. The income received from the HEA and the expenditure incurred by Smartbay Ltd is accounted for by Dublin City University.

The Institute's CEO is a Board member and the Head of Corporate Services of the Institute is Company Secretary. During 2013, the Institute advanced funding of €38,016 to Smartbay Ltd (2012 €320,814). This expenditure is included under Ocean Science and Information Services expenditure in Note 7 in the accounts.

20. Register of interests

The Institute has adopted procedures in accordance with the guidelines issued by the Department of Public Expenditure and Reform in relation to the disclosure of interest by Board members and the Institute has adhered to these procedures. There were no transactions in the year in relation to the Institute's activities in which board members had a beneficial interest.

21. Board Fees, Board Attendance and Chief Executive Salary

The Institute has adhered to the updated Code of Practice for the Governance of State Bodies which was published by the Minister for Finance on 15 June 2009. The total remuneration paid to Chief Executive of the Marine Institute for 2013 was €141,358. There were no payments made to the Chief Executive under a performance related pay scheme or no other benefits paid as part of the remuneration package. The CEO pension entitlements do not extend beyond those of the model public sector scheme. The total expenses for business purposes paid to the CEO for 2013 was €14,604 which includes foreign travel expenses of €1,328.

Payments to the 2013 Marine Institute Board members were as follows

Board Member	Category 3	Gross Fees 2013	Expenses 2013	Total 2013
Jim Fennell	Chairperson	0	1,697	1,697
Michael Walsh	Director	0	1,568	1,568
Lorcan O Cinneide	Director	7,695	6,755	14,450
Francis Coyle	Director	7,695	6,308	14,003
Paul Hyde	Director	7,695	7,049	14,744
David Owens	Director	7,695	1,865	9,560
Patricia Barker	Director	2,073	282	2,355
Donal Kelly	Director	4,488	0	4,488
		37,341	25,524	62,865

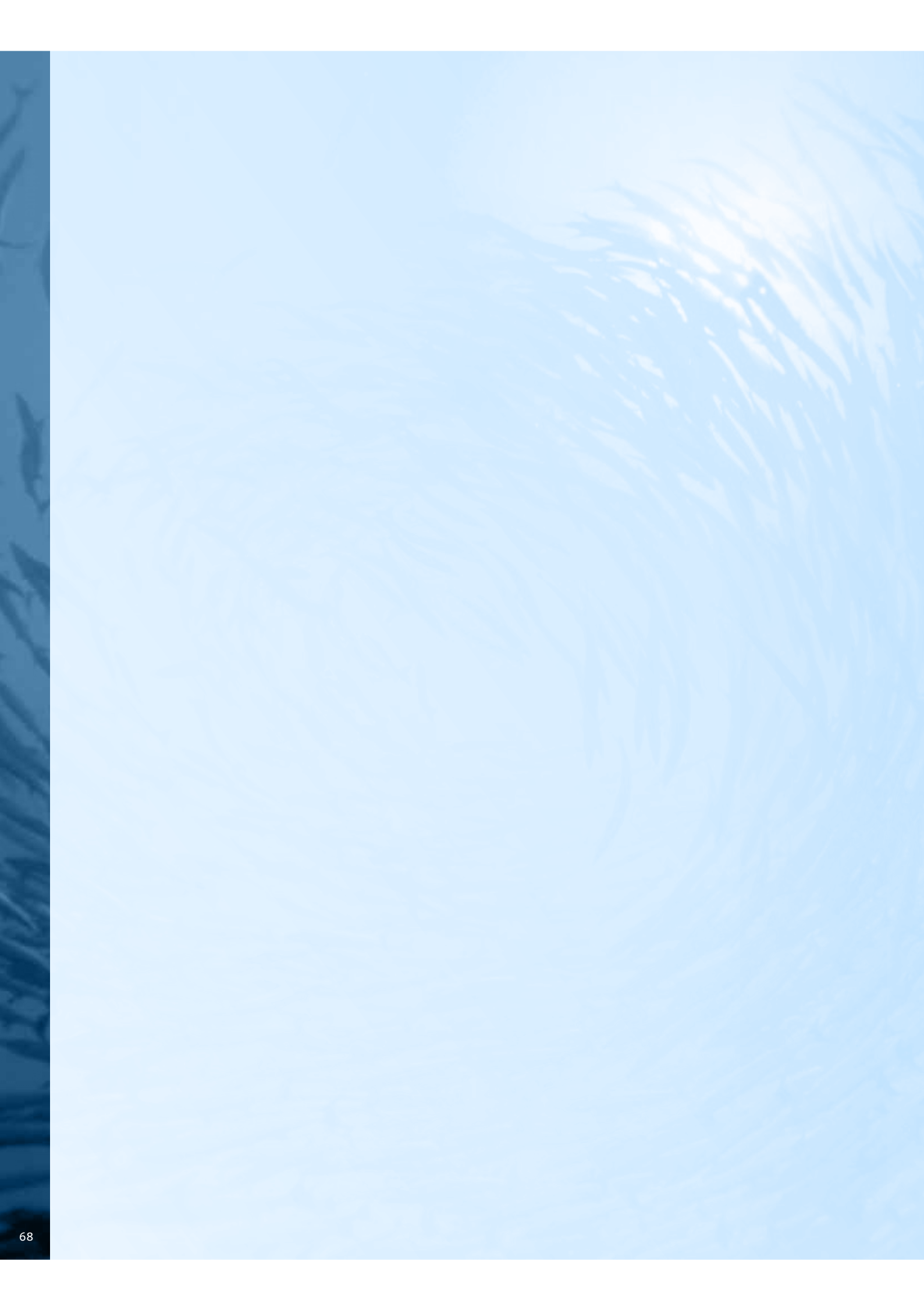
Notes to Financial Statements

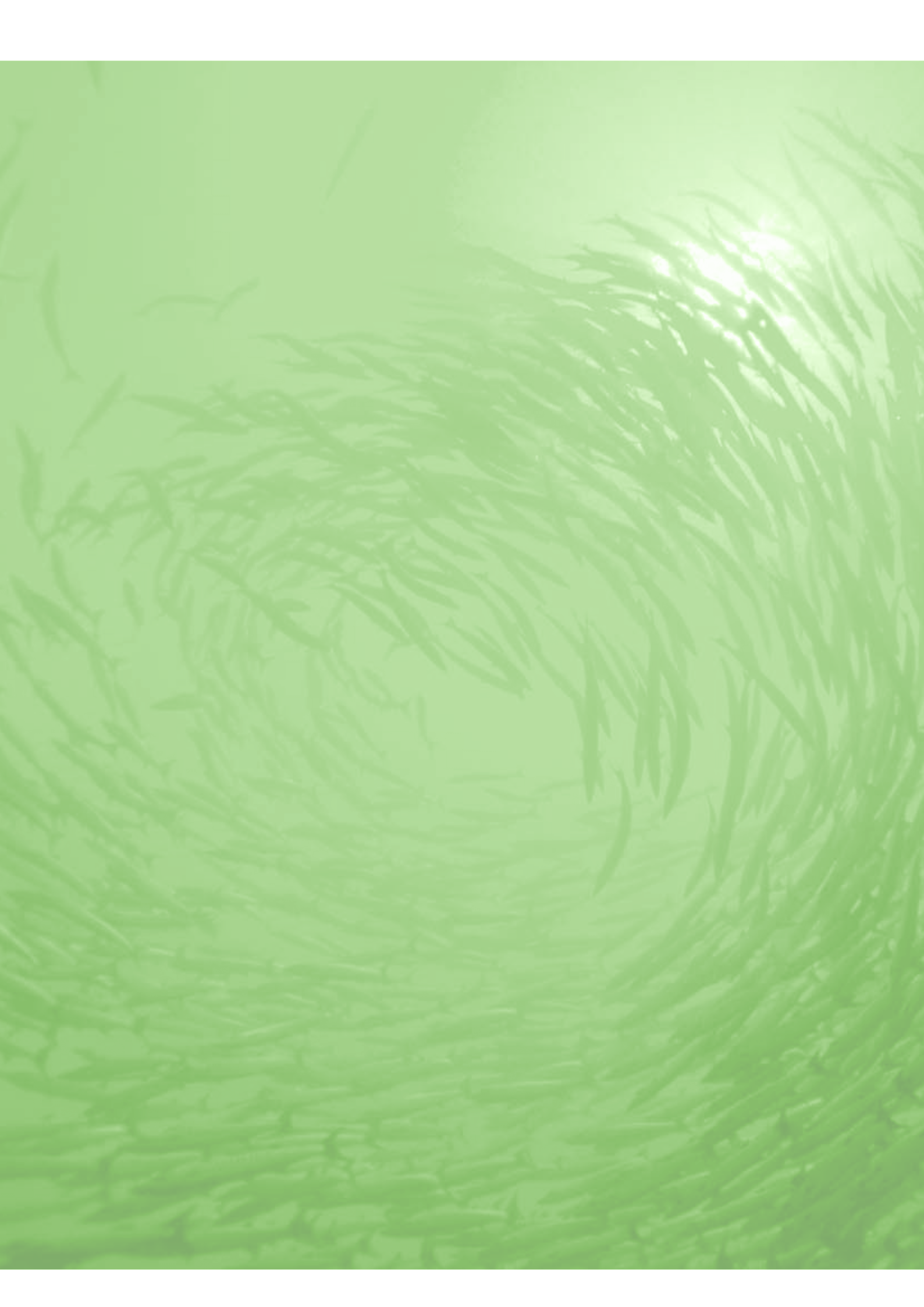
Year Ended 31 December 2013

Board Member	Category 3	Board Meetings 2013	Board Meetings Attended 2013	Term Commenced/Ended
Jim Fennell	Chairperson	10	10	Term Ended Nov 2013
Lorcan O Cinneide	Director	10	10	
Francis Coyle	Director	10	10	
Paul Hyde	Director	10	10	
David Owens	Director	10	9	
Patricia Barker	Director	10	3	Term Commenced April 2013
Donal Kelly	Director	10	5	Term Commenced May 2013

22. Board Approval

The financial statements were approved by the Board on the 09/12/2014.





The Marine Institute Annual Report is available in Irish and can be downloaded from www.marine.ie

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