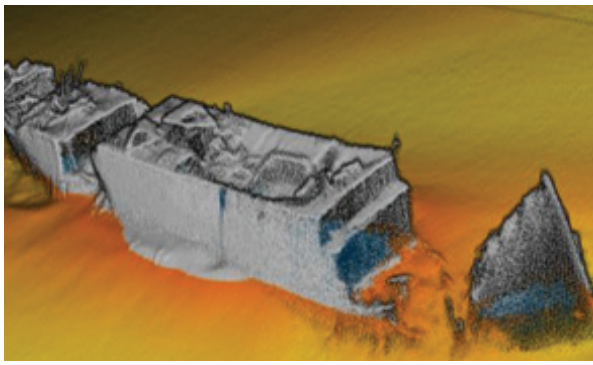
ANNUAL REPORT // 2015 »



Foras na Mara
Marine Institute

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

Foras na Mara
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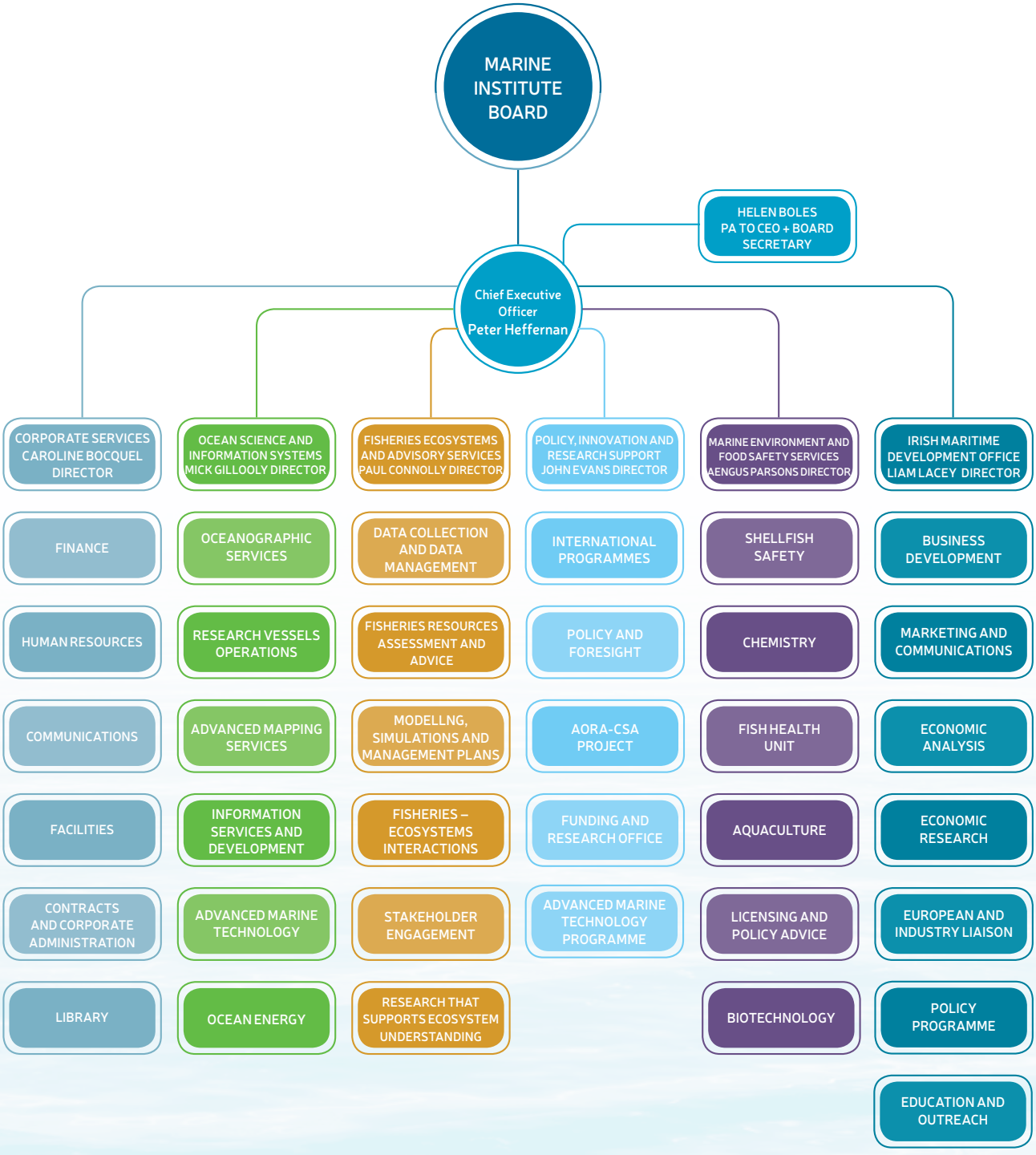
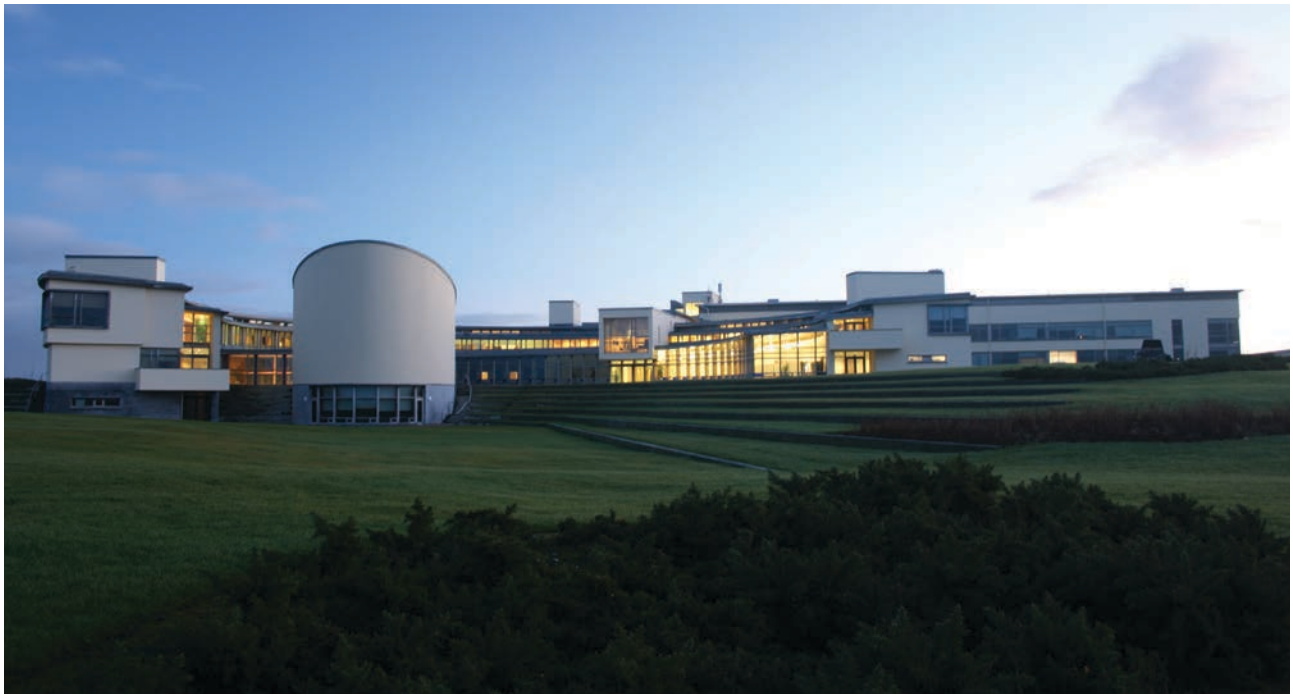
Marine Institute Organisational Structure





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, as well as safeguard Ireland's natural marine resource through research and environmental monitoring.

Ireland has a marine area of approx 880,000 km2 under the sea, which is over ten times its land area which represents an enormous seabed and aquatic resource. The Marine Institute promotes the sustainable development of this vast marine resource through research, the application of new technologies and by providing credible science-based 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 six service areas. 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
- Policy, Innovation and Research Support

The organisation is supported by a strong focus on corporate governance, integrity and ethical conduct, with an emphasis on prudent financial management, which was an important contributor to the success of the Institute during the challenging economic period during 2015. This report highlights the key deliverables and progress made towards our vision during 2015.

Board Members

Dr John Killeen (2014 – 2019)

Dr John Killeen is an engineer and a native of County Roscommon who became an Honorary Freeman of Galway City in 2012. His career spans working with Local Government with a multi-national construction company (which built the Grand Canal tunnel in Dublin in 1973) and seven years with Shell International subsidiary. Dr Killeen was President of Engineers Ireland from 1995-1996 and founding President of the Academy of Engineering in Ireland in 1996-1998. He is a retired CEO of Colas Group in Ireland and a retired managing director of Cold Chon Galway Ltd.

Dr Killeen was appointed to the West Northwest Hospital Group Board in 2013 and is currently acting as the Interim Chair. In 2009 he was chairman of the Volvo Ocean Race event in Galway and in 2012 was president of the Volvo Ocean Race finale and festival. It broke all attendance records for a sporting event in Ireland and was worth about €80m in tourism and business income to the city. Dr Killeen is President of the Timoney Leadership Institute - a charity which promotes International leadership training for Irish CEO's.

Prof 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 an 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 Tallaght Hospital and is Chair of the Education Board of the Chartered Accountants Ireland. In addition Prof Barker is Chair of the Internal Audit Committees for the Marine Institute, Dublin Bus and Rehab. 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 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 three years.

Mr Kelly has served on a number of Boards 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.

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. He worked with Letterkenny Town Council and was also Manager of Ballyshannon Town Council from 2005 to 2010. He was the Council's European Liaison Officer with the Conference of Peripheral Maritime Regions for 16 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 lll 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 Lorcán Ó Cinnéide (2010 - February 2015)

Mr Lorcán Ó Cinnéide is currently National Secretary of the Irish Fish Processor's and Exporters Association (IFPEA) and Board member of the EU processor's organisation AIPCEE. He was a member of the Board of the Aquaculture Licence Appeals Board (ALAB) and a member of the Sea Fisheries Protection Authority Consultative Committee (SFPA). He is a former CEO of a fishing representative organisation, the Irish Fish Producers Organisation (IFPO) and has participated in many forums and management structures related to the fishing industry in Ireland and at EU level over the past two decades. He has also been involved in the evaluation of various marine science programmes on behalf of the EU Commission.

A former fishing vessel owner, Lorcán has a degree in Economics and Politics from Trinity College Dublin. He maintains a wide range of local development, conservation and broadcasting interests including Chairmanship of the Comhairle RTE Radio na Gaeltachta, TV production, and as Secretary of the Blasket Island Foundation. He lives in the Dingle Peninsula, Co. Kerry.

This is Lorcán's second term as a Board member of the Marine Institute and he is a former Chairman of the Institute's Audit Committee.

Mr David Owens (2012 - 2017)

Mr David Owens (F.C.A) is currently Senior 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 and Young and is a member of the Institute of Chartered Accountants in Ireland.

Chairman's Statement

The Board of the Marine Institute maintained a strong focus on corporate governance throughout 2015 and had good engagement with the executive management team completing the annual review and update of the Institute's Strategic Business Plan.

We were very proud of the role the Marine Institute played during 2015 in national and international achievements and partnerships to promote and drive the sustainable development of the marine economy and to further our understanding of the ocean.

In June, an international team of seabed mapping experts led by Thomas Furey, Marine Institute boarded the national research vessel, RV *Celtic Explorer*, to map a transect of the Atlantic Ocean between St. John's Newfoundland and Galway Ireland. This was the first seabed mapping survey to take place under the Atlantic Ocean Research Alliance (AORA), a collaboration between the EU, USA and Canada. The Marine Institute is taking a lead role in this collaboration as the lead partner in the EU Horizon 2020 funded AORA Coordination and Support Action.

The annual Harnessing Our Ocean Wealth Conference took place in Cork as part of the inaugural SeaFest in Ringaskiddy in July. The conference was attended by more than 570 delegates while the Festival attracted over 10,000 visitors. Planning began for SeaFest 2016 and we're very much looking forward to bringing the event to Galway in July.

Recognising the contribution and quality of Marine Institute staff, the Board, together with the executive management team, made employee engagement an objective for 2015. A Great Place To Work survey of staff was carried out as well as a culture audit, and a number of initiatives were introduced focusing on enhancing employee engagement. This accreditation complements the wide range of laboratory based scientific services that are INAB accredited.

Our staff contributed to and led a number of expert working groups and as 2015 came to a close, Dr. Paul Connolly, Director of Ecosystem

Peter Heffernan, CEO Marine Institute with EU Commissioner Karmenu Vella and Craig McClean of the US Office of Oceanic and Atmospheric Research at the Harnessing our Ocean Wealth Conference held at the National Maritime College of Ireland in Cork, July 2015.

The first transatlantic seabed mapping survey under AORA, led by Thomas Furey, Marine Institute, with Marcos Miguel, Pascoa Parreira IPMA, Portugal, Fabio Sacchetti, Marine Institute and Kirk Regular, Marine Institute, Newfoundland.

and Advisory Services at the MI completed a three year term in the prestigious role as president of ICES (The International Council for the Exploration of the Seas).

The Marine Institute retained the Excellence Through People accreditation, a national standard that we have achieved continually since 2005. This reflects the Institute's investment in our staff who play a key role in maximising the efficiency of our business and building up organisational capabilities.

These achievements show both the dedication and capabilities of the people that make up the Marine Institute and I'd like to take this opportunity to acknowledge Dr Peter Heffernan and the Marine Institute staff for their achievements this year and their commitment to the delivery of excellence in the services they provide.

John Killeen
Chairman, Marine Institute

Chief Executive's Report

During 2015 we delivered key projects relating to national marine research infrastructure as well as international collaborative achievements in marine research. We saw the successful installation of Ireland's first ocean observatory in Galway Bay, with a four kilometre subsea power and data cable deployed from the RV *Celtic Explorer* in April and a cable end frame deployed in August by the Commissioner of Irish Lights vessel, ILV *Granuaile*. This collaboration[1] between the Institute, SEAI, SmartBay Ireland, MaREI, UCC and DCU is a huge step in Ireland's marine research infrastructure. It will enhance our ability to attract companies to develop and test ocean energy technology in Ireland, allowing ocean energy developers to monitor how their devices perform in the ocean, as well as providing unique real-time access to monitor ongoing changes in the marine environment.

We began work on the EU Horizon 2020 Atlantic Ocean Research Alliance (AORA) Coordination and Support Action, a project the Marine Institute is leading to support the implementation of the Galway Statement, signed here in May 2013. We made significant progress during 2015 including taking the first steps in supporting the AORA to collaboratively map the Atlantic Ocean. We worked closely with the Department of Agriculture Food and the Marine on the European Maritime and Fisheries Fund (EMFF) Operational Programme for Ireland, particularly on developing Biodiversity and Data Collection schemes. The EMFF was adopted by the EU Commission in December 2015 and the Marine Institute was allocated funding of €36 million for the new DCF until 2020.

We maintained a strong focus on the delivery of key scientific services, including seafood safety, providing scientific and technical advice to the Department of Agriculture Food and the Marine, carrying out a range of monitoring programmes to support the EU legislation including the Marine Strategy Framework Directive, the Water Framework Directive and the EU Data Collection Multi Annual Programme. We

Marine Institute staff looks on as Dr Margaret Rae, Marine Institute explains marine bio-discovery research to The Prince of Wales on his visit to the Marine Institute where he met Dr Peter Heffernan, CEO Marine Institute and An Taoiseach, Enda Kenny, May 2015.

also supported marine research through our research and funding office and provided access to the National Research Vessels, RV *Celtic Explorer* and RV *Celtic Voyager* through the Ship-Time programme.

We launched a Fellowship Programme that provides research training opportunities for scientists in marine and related disciplines leading to Masters and PhD degrees. The Cullen Fellowship programme, named in memory of Anne Cullen (1958 - 2013), who made a significant contribution to the work of the Marine Institute for over 35 years, was launched at SeaFest in July.
A major upgrade to the RV *Celtic Explorer* was

[1] *The collaboration has benefitted from funding from a number of sources including the Higher Education Authority PRTLI Programme; Science Foundation Ireland infrastructure support; Sustainable Energy Authority of Ireland, Department of Agriculture, Food and the Marine and the Marine Institute funding.*

Marine Institute Chairman, Dr John Killeen and Dr Peter Heffernan, CEO Marine Institute present the annual Stock Book to the Minister for Agriculture, Food and the Marine, Simon Coveney. The results include the latest scientific advice on those stocks fished by the Irish fleet.

carried out in January and included the installation of state of the art sonar systems for bathymetric mapping in deep and shallow waters and the installation of a deepwater sub-bottom profiler.

We presented our work to The Prince of Wales and staff from his International Sustainability Unit when he visited the Institute in May. Prince Charles met Taoiseach Enda Kenny, Minister Simon Coveney TD, as well as many of our staff who he talked to about their work on the impact of climate change on the ocean, sustainable fisheries, marine bio-discovery and international collaboration on ocean research.

We continued to promote the importance of our marine resource through the Explorers Education Programme for primary schools children, and at a number of outreach events throughout the year including, TeenTech Galway in April, and both the Galway Science & Technology Festival and the Mayo Science Festival in November.

In June we invited over 150 primary school students from five schools in Dublin, Cork, Galway, and Mayo aboard the *Celtic Explorer* to meet our scientists and learn about life on a National Research Vessel. This was part of the EU FP7 Sea for Society project to promote engagement on societal issues related to the ocean.

During Science Week in November we opened our doors in Oranmore to more than 300 transition year students as part of the Galway Science & Technology Festival, and the Sea for Society FP7 project. They met our scientists and staff to learn about the work we do, and how the science of the sea impacts on our daily lives, for example the food we eat, the air we breathe, and the water we drink.
We produced the annual *Stock Book* which contains the latest scientific advice on those stocks fished by the Irish fleet. This was delivered to the Minister in November and was a key component of his sustainability assessment presented to the Oireachtas Committee on Agriculture and Fisheries in December 2015. It was also at the heart of the negotiations at the EU Council of Ministers in December, which set fishing opportunities for 2016

Throughout the year we produced video content to bring our work and the importance of our shared marine resource to a wider audience. This included the Galway Bay Ocean Energy Test Site and Ocean Observatory and the Transatlantic Seabed Mapping Survey and can be viewed at https://vimeo.com/marineinstitute.

I sincerely thank the staff of the Marine Institute for their commitment and consistently high standard of service delivery and the Board for their dedication and diligence in maintaining the highest standards in corporate governance.

Peter Heffernan
Chief Executive

Corporate Services

Director's Statement »

The incremental improvement in the economic environment combined with significant recruitment led to the outlook in 2015 being one of growth and optimism. Throughout the year, the focus was on maximising value for money for stakeholders by providing a highly responsive, customer-driven service and a constant emphasis on strong corporate governance.

Highlights of 2015 included:

- Retention of Excellence Through People (ETP) accreditation under the National Standards agency of Ireland, Standard – ETP 1000:2012. ETP is Ireland's only national human resource management scheme dedicated to the role of people and their impact on business. The Marine Institute has held this prestigious award continuously since 2005. It reflects the Institute's investment in our staff who play a key role in maximising the efficiency of our business and building organisational capabilities
- Engaging with staff by supporting the outcomes of a *Great Place to Work* survey which aims to maximise staff morale and productivity
- Compliance with the Code of Practice for the Governance of State Bodies including regular internal audits, reported maximum levels of assurance and best practice procurement.
- Quarterly risk management reporting to the Internal Audit Committee, along with a review of risk policy and a monthly review of the risk register. Understanding the risks we face and managing them appropriately enhances the Institute's ability to make better decisions, deliver on objectives and improve performance
- Continuous development of our website www.marine.ie which recorded over 110,000 visits throughout the year. Supported by a range of on-line services and mobile-friendly access, the website will change the way we interact and improve our services
- Constant focus on health and safety practices resulted in no significant accidents and eight minor incidents. Promotion of health and safety and employee wellbeing remains a priority to maintaining a safe and healthy workplace
- Energy saving initiatives resulting in the implementation of a detailed programme continued throughout the year.

Ms Caroline Bocquel
Director: Corporate Services

Students from Coláiste na Coirbe, Galway, discover the importance of seabed mapping while using Ireland's first Augmented Reality sandbox at the Marine Institute's transition year open day November, 2015.

Primary school teachers use quadrants to collect data on Gratton Beach during the Explorers Teacher Training Workshop, July 2015, run by the Marine Institute and Galway Atlantaquaria.

Human Resources

A primary focus for the Human Resources Team during 2015 was the wellbeing of our staff. This was achieved through various programmes that are central to delivering the Institute's Strategic Plan in a culture of high performance. These included Training and Lifelong Learning; Performance Management and Development; Health, Safety and Wellbeing; Recruitment and Retention; the upgrade of our HR Management Information Systems; Employee Engagement Programme including independent surveying of staff and a focus on collaborative & inclusive communications.

A significant level of recruitment and selection activity took place during 2015. Sixty opportunities were filled including core posts and consequential vacancies as well as 25 EU and alternately-funded posts. We supported initiatives to develop graduates and people on the Live Register by providing 50 weeks work experience programmes for 12 Stagiaries and eight JobBridge Interns. These placements were across a range of scientific, technical and administration disciplines.

We also introduced a Transition Year Week programme that offered work experience and training for 20 students from schools in the local community and across Ireland.

Retention of our Excellence Through People Accreditation under the National Standards Agency of Ireland underpinned our efforts to ensure that our ethos and values are reflected in our actions. Our 2015 Learning and Development Programme concentrated on management and personal development in addition to career development and encouraging employees to look to the future. As employee engagement was a main objective we implemented programmes to support and encourage employees, based on feedback from our Great Place to Work 2015 survey of staff, and Culture Audit Review and Report. The programme included essential and mandatory training; investment in Third Level programmes; developmental coaching programmes and personal development to ensure delivery of Work Programme Priorities and the three-year rolling Strategic Plan, resulting in an investment of over €340,000 (4.4% of payroll).

The Health and Safety Committee held seven meetings with representatives from all locations delivering an ETP Certified Programme. More than 21 risk assessments were completed and eight minor incidents were reported throughout 2015. The annual Health, Safety and Employee Wellbeing promotions took place monthly from June to December. These included workshops on mindfulness; work-life balance, stress reduction, mental wellbeing, nutrition, safe driving, first-aid and fire safety.

Finance

The Marine Institute continues to comply with the Code of Practice for the Governance of State Bodies. An independent review of the Institute's compliance and of the internal controls system in place undertaken in 2015 established that it has comprehensive policies and procedures covering the key areas of governance and internal control, with corporate governance given high priority throughout the organisation.

The Marine Institute has a range of policies and procedures covering governance whereby the internal controls system in place are reviewed and updated annually. General awareness exists of the need for a strong system of internal control, some of which is underpinned by continuous improvements in information technology.

Under the stewardship of the Internal Audit Committee, the three internal audits undertaken throughout the year affirmed the Institute's high standards of governance and ensured that an effective system of internal control is maintained and operated. Audits included the Code of Practice and an IT Security and Strategic Plan Review. All internal audit recommendations arising were actioned and reported to the Internal Audit Committee and to the Board. The internal audit committee met six times and also met with the Comptroller and Auditor General to discuss the

audit certification received for 2013 and 2014. The internal audit plan for 2015 – 2016 reflects the risks identified in the Marine Institute risk register, the requirements of the Comptroller and Auditor General and the internal audit committee.

Centralised purchasing and the use of the Office of Government Procurement proved to be an efficient and effective means of reducing costs and generating savings and will continue into 2016. A strong public procurement ethos and focus continues throughout the Marine Institute. In 2015, 46 tenders were issued, of which three were published in the *Official Journal of the European Communities*. The Marine Institute also transferred Employers Liability and Public Liability Insurances to the State Claims Agency during 2015.

It is Marine Institute policy to ensure that all invoices are paid promptly within the terms of the Prompt Payment of Accounts Act, 1997 and the European Communities (Late Payment in Commercial Transactions) Regulations 2012. Systems and procedures are in place enabling invoices to be tracked and to ensure that payments are made in a timely and efficient manner. 83% of invoices with a total value of €27m were paid within 15 days to suppliers pursuant to Government Decision No. S29296 of 19th May 2009.

Facilities

The Facilities team continues to support the core function of maintaining our buildings and infrastructure to a high standard across all facilities, ensuring the offices and laboratories function smoothly while meeting the needs of our internal and external clients and partners. The team works on a cross-service basis and is involved in Health and Safety, Laboratory Management, Energy Conservation, as well as the day-to-day operations and management of services such as Reception, Stores, Maintenance, Procurement, Cleaning, Security and Catering.

One of the significant projects in 2015 was the organisation and management of the Dublin office move from 80 Harcourt Street to Wilton Park House. This involved the physical move of staff, equipment and files, as well as planning and budgetary control of the new and old offices and dilapidations.

Fourteen facility contracts were advertised, evaluated and awarded, resulting in efficiencies in areas such as cleaning, transportation, fixed-line telephony and waste services. During the year 10,855 inbound phone calls were handled and 398 non-scheduled maintenance issues were raised and closed out.

Planned Preventative Maintenance Programmes remain a top priority for the team to ensure that our world-class facilities function to a high operating standard. The Building Management System in Oranmore is used to optimise energy efficiencies where possible, and energy consumption remains a key focus. The new Dublin facility will bring about energy efficiencies in 2016 as it is a modern facility with technologies to enable improved operating procedures.

Communications

The Communications team covers a broad remit including media relations, online communications, events, education and outreach and library services. Among the key events supported in 2015 was the installation in April of a subsea cable on the seabed in Galway Bay for Ireland's first subsea ocean observatory. The cable was deployed from RV *Celtic Explorer,* connecting the Galway Bay Ocean Observatory and Ocean Energy Test site to the shore at An Spidéal.

Launched in December 2014, the new website, www.marine.ie, hosted 198,288 sessions, 110,201 unique visitors and over 500,000 page views throughout the year.

We continued to develop social media engagement on platforms such as Facebook, LinkedIn and Twitter and our scientists@sea blog http://scientistsatsea.blogspot.ie/ where scientists aboard RV *Celtic Explorer* and RV *Celtic Voyager* can share their experiences of research at sea.

Our Explorers Education Programme aims to develop ocean literacy among primary school children, teachers and educators in Ireland, and enables them to understand the ocean's influence on us and our influence on it. Working with our partners in Galway Atlantaquaria, the Blackrock Education Centre, the National SEA LIFE Centre in Bray and the Lifetime Lab in Cork, the programme grew to 148 primary schools in 2015 with over 4,500 participating students. The Institute supported the programmes with teacher training courses and a resource website www.explorers.ie which provides lesson plans and a range of educational materials for primary school teachers. A panel of international and national experts from the USA, Portugal, UK and Ireland carried out an external evaluation of the programme which achieved a 'very good' rating. A key recommendation was to expand the programme nation-wide in 2016.

We supported a number of events throughout the year including the second annual Harnessing Our Ocean Wealth Conference and SeaFest 2015 in Cork in June which attracted over 10,000 visitors over three days.

We held a range of open days during the year with 300 students attending our Transition Year Open Day in November; 150 students visiting RV *Celtic Explorer* in June and the same number visiting our research centre in Newport, Co Mayo. We also supported TeenTech, Mayo Science & Technology Festival and the Galway Science & Technology Festival Exhibition.

The visit of the Prince of Wales on 19th May provided the opportunity to showcase the Institute's work to a wide audience. During his visit, Prince Charles met Taoiseach Enda Kenny, Minister Simon Coveney, Marine Institute Chairman, Dr John Killeen and Chief Executive, Dr Peter Heffernan. The Prince also spoke to many of our staff about the impact of climate change on the oceans, sustainable fisheries, marine bio-discovery and international collaboration on ocean research.

As part of the Sea for Society FP7 project Aisling Deane from Cork Educate Together National School visited the Marine Institute's RV Celtic Explorer in Galway Harbour during an ocean awareness initiative.

During 2015 we produced video content to share some key research and infrastructure developments and other interesting events with the public. These included a video on the installation of a subsea cable in Galway Bay; a short video on the visit of the Prince of Wales and a video on the first Transatlantic Seabed Mapping survey to take place under the Atlantic Ocean Research Alliance - a collaboration between the US, Canada and Europe, carried out on RV *Celtic Explorer*.

55 news stories were published on our website www.marine.ie during 2015.

Library Services

The library continues to provide Marine Institute staff with a sustainable access model to research publications, renewing all necessary journal subscriptions and providing an inter-library loan service. The Open Access Repository (http://oar.marine.ie/) performed well in 2015, providing free online full text access to Marine Institute and staff publications. By the end of 2015, the Repository had provided access to almost one thousand publications and 14,775 visits from around the globe.

The library continues to maintain close relationships with key organisations and sits on the RIAN board, the national portal that enables searches across all Irish research publications. The library also sits on the Aquatic Science and Fisheries Abstracts board as well as the National Steering Committee on Open Access Policy in Ireland. We are active members of the International Association of Marine Science and Information Centres, presenting at its annual conference in 2015, and are the national representative for its European wing. In 2015, the Oceanus librarian collaborated with the Western Regional Section of the Library Association of Ireland to coordinate, develop, write, deliver and moderate an on-line web 2.0 course for informational professionals entitled Rudaí 23.

Accessibility

The Institute was fully compliant with the Disability Act during 2015.

Irish Maritime Development Office

Director's Statement »

The IMDO was established by statute in 1999 and has a broad remit that includes business development, policy advice and education. As a trading nation, Ireland relies heavily on the maritime sector, a point that is emphasised in a recent input / output economic study entitled *The Economic Impact of the Irish Bio-Economy*, prepared by Teagasc and the Socio-Economic Marine Research Unit at NUI Galway. The study underlines the importance of the maritime sector and recognises its embeddedness in our national economy. The work of the IMDO is central to the health, development and success of this vitally important industry sector.

Throughout 2015, the IMDO was heavily involved in:

- Encouraging investment in the maritime sector from indigenous and international sources
- Formulating policy advice on the development of the industry
- Promoting the highest standards of education and training in the industry
- Creating awareness of maritime career opportunities in Ireland, as well as those available to Irish graduates and practitioners in the global maritime economy
- Conducting market and economic analysis to support policy formulation, business development and decision making

The IMDO's objectives and mandate are closely aligned with the Government's integrated plan for the marine industry, Harnessing Our Ocean Wealth, which seeks to expand Ireland's marine economy by meeting specific GDP growth and job creation targets before the end of 2020. The IMDO participated directly in this initiative throughout 2015, undertaking international trade missions; facilitating visits by international clients and communicating effectively, through various media channels that Ireland is 'open for business' and is a highly competitive and attractive location for all forms of maritime activity.

The IMDO's policy advice and related publications are underpinned by economic research conducted within the organisation and informed by the views of industry, which are gathered by continuously engaging with relevant stakeholders. The 2015 edition of the *Irish Maritime Transport Economist (IMTE)* was made possible by the cooperation of the Irish ports and shipping community and is the culmination of the economic analysis that the IMDO undertakes each year in these important sectors. The IMTE has become a reference document for those interested in the development of the industry and informs both policy and practice in the industry. Our research found evidence that 2015 was another successful year for Irish ports and shipping companies, with annual growth in bulk and unitised trade exceeding 7%. Growth in port traffic is a reliable predictor of economic growth and augers well for the continued recovery of the Irish economy.

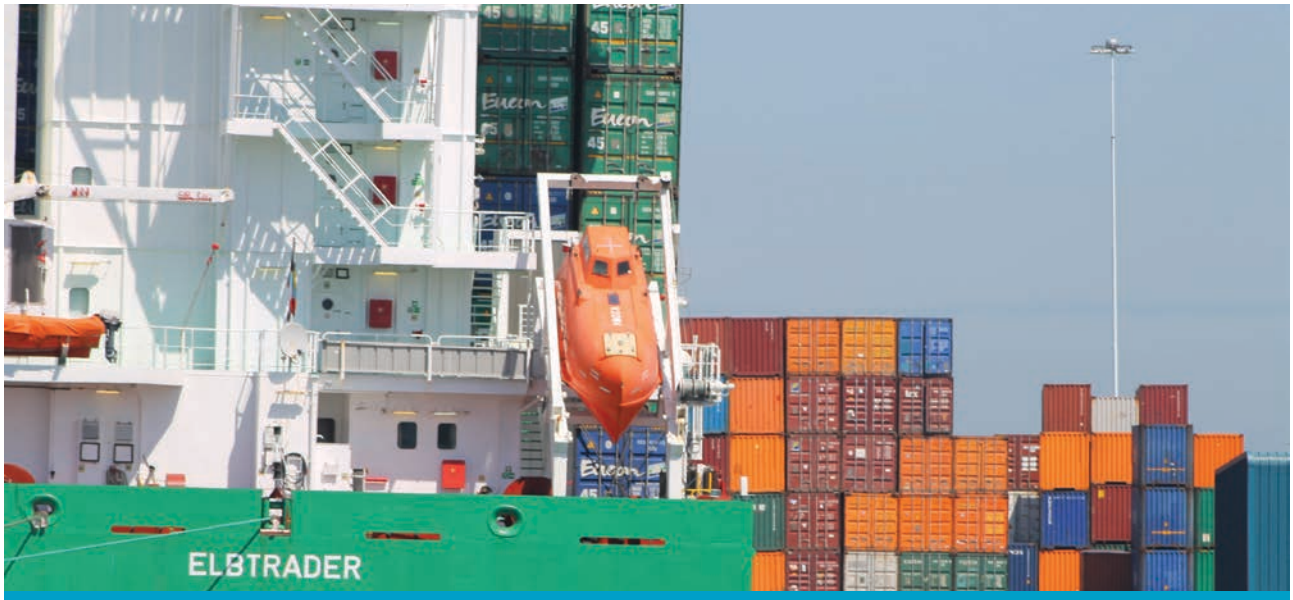
The IMDO's mandate in maritime education is fulfilled through its participation on the advisory board of the National Maritime College of Ireland; support for the training of Irish cadets through the ISEAS scheme; outreach programmes to primary and secondary school students and sponsorship of educational bodies involved in the training of maritime professionals.

The work of the IMDO would not be possible without the commitment of its staff and the support of industry. We would like to acknowledge the work of the very dedicated IMDO team throughout 2015. Through their drive and commitment, the IMDO ramped up its activity and achieved a record number of engagements with national and international clients. We would also like to acknowledge

the valuable support of colleagues in the Department of Transport, Tourism and Sport; the cooperation of other development agencies and the support of our embassies overseas, without which the IMDO's impact and reach would be greatly diminished. There is no doubt that 2016 will be a challenging and exciting year and we look forward to strengthening our relationships with the development community and to achieving our common ambition of a stronger and more vibrant maritime industry.

Liam Lacey.

Liam Lacey
Director: Irish Maritime Development Office



The publication of the 2015 edition of the Irish Maritime Transport Economist (IMTE) highlighted another successful year for Irish ports and shipping companies, with annual growth in bulk and unitised trade exceeding 7%.

Business Development

2015 was an exceptionally busy year from a business development perspective. Significant recovery in the Irish economy and the sharper focus on marine industry growth embedded in the Government's Harnessing Our Ocean Wealth strategy resulted in increased activity in all sectors. Responding to this improved business development environment, the IMDO arranged eight international trade missions to the United Kingdom, Germany, Norway, Switzerland, Greece, United Stated, Hong Kong and Singapore. During the course of the trade missions to Hong Kong and Singapore, the IMDO launched its *Ship Finance Report*. This report, which was prepared by KPMG and Dillon Eustace, experts in taxation and maritime law respectively, makes a very persuasive case for Ireland as a centre for maritime commerce. It draws attention to the experience and competitive advantages that exist in this jurisdiction in big-ticket asset finance, securitisation and structured loans. It also makes a compelling argument in relation to Ireland's ability to replicate the success of the aircraft leasing industry in the maritime domain.

The impact of the IMDO's international trade missions was greatly enhanced by the professionalism and cooperation of Ireland's diplomatic corps in the countries we visited. Working in collaboration with our diplomats in the UK, Germany, Greece, Hong Kong and Singapore, the IMDO hosted events, gained access to senior industry stakeholders and created opportunities to deliver a very clear message to the international maritime community that Ireland is 'open for business'.

In order to advance the broader business development agenda, as set out in the Harnessing Our Ocean Wealth strategy, the IMDO, in cooperation with colleagues in the Industrial Development Authority, Enterprise Ireland, Bord Iascaigh Mhara and Fáilte Ireland, hosted an investors' forum at SeaFest 2015. This event, which attracted investors from all sectors of the marine economy, showcased projects capable of delivering economic growth and job creation. In addition, the IMDO hosted visits from 21 foreign companies interested in investing in Ireland and attended seven international maritime conferences at which Ireland's advantages as a hub for maritime commerce were publicised.

As regards the domestic maritime industry, the IMDO maintained close engagement with port companies; shipping companies; ancillary service companies; professional services firms and representative bodies. The IMDO presented at the Annual Conference of the Irish Maritime Forum in Cork; the Irish Maritime Law Association; the International Conference of the Institute of Shipbrokers and a variety of industry events that offer the opportunity to galvanise the efforts of stakeholders around the common objective of developing Irelands maritime industry.

The IMDO remains supportive of the concept of an International Shipping Services Centre that seeks to establish Ireland as an international shipping hub. The centre has the potential to create 3,500 high quality jobs in Ireland and to catalyse investment in the maritime industry. The project's potential was recognised in the report of the Harnessing *Our Ocean Wealth Development Task Force*, published in July 2015.

The IMDO remains heavily involved in refining and communicating a message that Ireland is an ideal location for maritime business, with clear policies and a welcoming business environment.

Throughout 2015 the IMDO:

- Engaged with international professional services firms which play a crucial role in advising clients about jurisdictional, financial, commercial and legal issues. The professional services community continues to be an important conduit through which to access ship owners, ship management companies and investors in the maritime industry
- Continued to work closely with international membership organisations (e.g. Chambers of Shipping, Institute of Chartered Shipbrokers, and Ship Agents Associations) to create new networks in the maritime industry and building support for Ireland's value proposition around the world
- Sponsored carefully selected industry bodies and events which include: the Irish Institute of Chartered Shipbrokers; the Investors Event at SeaFest 2015; Marine Money Hamburg; Marine Money Singapore; Irish Exporters Association Annual Awards; Capital Link Maritime Forum London and the Irish Maritime Forum.

Economic Analysis

The IMDO provides regular economic commentary on the Irish maritime sector. Throughout the year, quarterly bulletins were issued to the market, in addition to bespoke reports and submissions that addressed emerging trends in the industry. The IMDO's economic analysis culminates in the annual publication of the *Irish Maritime Transport Economist* (IMTE), which is widely circulated nationally and internationally. The 12th edition of the IMTE was published in 2015, adding to an invaluable time series that tracks the growth of our maritime economy and sets it in the context of overarching macro-economic factors.

Our analysis for 2015 showed that the Irish maritime sector continued to grow strongly and by the end of the year, the iShip index reached a seven-year high of 977 points. The iShip index is a composite index combining five traffic types in a single indicator of total port throughput. Although this measure shows that total port volumes continue to recover, the index is still 65 points below the pre-recession high of 1,042 points recorded in 2007. Growth in unitised trade was most pronounced in Dublin, while bulk traffic increased significantly in Cork (12%), Waterford (10%), and Shannon Foynes (9%). The report recognises the pre-eminence of our Tier 1 ports (Dublin, Cork and Shannon Foynes) as gateways of international trade and enablers of economic growth, but equally identifies the economic contribution smaller ports make to local economies and the objective of balanced regional development.

At a macro-economic level, growth in global trade was somewhat subdued in 2015 with container trade up by only 2.4%. The relatively strong economic performance of the United States and the United Kingdom however, two of Ireland's most important trading partners and improved competitiveness in export markets resulting from a weaker Euro, resulted in Ireland's unitised trade increasing by 7% in volume terms. This growth rate is closely correlated with GDP growth, confirming that the Irish economy continues to grow at a faster pace than that experienced in most developed countries.

Policy Support and Development

In fulfilment of its mandate, the IMDO provides policy support and advice to the Minister and the Department of Transport, Tourism and Sport. This responsibility takes the form of regular market briefings; economic analysis; facilitating engagement between industry and the Department, as well as producing *ad hoc* reports on specific issues that arise from time to time.

In 2015, the IMDO assisted the development of policy through participation in a number of initiatives. The IMDO remained closely engaged in the Harnessing Our Ocean Wealth process and arranged a number of industry events at SeaFest 2015. Working closely with colleagues in the Marine Institute, the IMDO made a submission to Indecon Economic Consultants, who reviewed existing tax supports and incentives in the maritime sector. Based on extensive consultation with industry, the IMDO made recommendations aimed at stimulating growth in the maritime industry. Similarly, the IMDO has been involved in a working group, co-chaired by Cruise Ireland and Fáilte Ireland that has been examining how to maximise the contribution made by the cruise industry to the national economy. This is a cross-border initiative in which Tourism Northern Ireland and the Port of Belfast have participated and which aims to grow the island's share of cruise in the tourism market.

The IMDO has been active on a number of fronts in advancing the ambitions set out in National Ports Policy by:

- Supporting the development of Irish ports and articulating its views on their development in public fora, including an oral hearing of An Bord Pleanála, national conferences and industry events
- Addressing the need for research in port performance metrics by appointing a research fellow under the Marine Institute's Cullen Fellowship Scheme. This research project will run for three years and will inform and influence policy in relation to future port capacity
- Providing a training programme for port directors aimed at enhancing corporate governance and familiarising directors of port companies with their unique responsibilities as directors of important state bodies.

Finally, from a policy perspective, the IMDO promotes the development and implementation of EU policy by providing a liaison service between industry and European funding programmes, such as Horizon 2020 (Waterborne); the Ten-T Programme, and the INTERREG Programme. 2015 was a particularly successful year for Irish ports, with in excess of €40m being secured by Ireland's Tier 1 ports to support their future development.

Education, Training and Outreach

Virtually all of the development targets set for the Irish maritime industry recognise the importance of education,

training and skills development. The IMDO's remit includes an obligation to support education within the maritime sector and to heighten awareness by communicating effectively to national and international audiences that Ireland is 'open for business' and offers opportunities to companies and individuals to pursue their respective ambitions.

In pursuit of these objectives, the IMDO:

- Participates on the advisory board of the National Maritime College of Ireland and communicates the quality of its courses and facilities with prospective clients
- Administers the Irish Seafarers Education Assistance Scheme (ISEAS) that supports the training of cadets from the National Maritime College of Ireland. In 2015, more than €200,000 was paid out under this scheme allowing more than 80 cadets to find appropriate training with prestigious shipping companies and graduate successfully from the College
- Engages with primary school children through its *Follow the Fleet* outreach programme, allowing them to follow the voyage paths of participating vessels through Irish and international waters. In 2015, this programme was used by more than 800 schools and reached more than 25,000 primary school students
- Participates in Transition Year outreach events in the Marine Institute and the National Maritime College of Ireland, which draws attention to the diverse range of careers that can be pursued in the maritime industry and the career paths that have taken Irish mariners to the top of their professions. In 2015, the IMDO engaged with more than 1,000 Transition Year students
- Continues to support education by funding the activities of the Institute of Chartered Shipbrokers, which trains the professionals who will drive progress in the maritime industry
- Upgraded its website, making it more accessible and informative about maritime events taking place in Ireland and overseas; opportunities for foreign direct investment in Ireland; career opportunities in the maritime industry and topical issues affecting the industry. In 2015, the website achieved over 20,000 visits, with the UK, US and Germany emerging as the most frequent users.

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 industry. Throughout 2015, the IMDO laid particular emphasis on initiatives and policies that offer the potential for economic growth and job creation. In formulating its views, the IMDO engaged with industry, representative groups and professional advisors, taking part in more than 1,000 business development meetings and presenting on more than 75 occasions to industry groups and international audiences.

The maritime industry is an enabler of economic growth. Its success reflects and drives the success of the national economy. The IMDO has a pivotal role in monitoring, supporting and advancing this vitally important industry and points to 2015 as a year in which very considerable progress was made.

Marine Environment and Food Safety Services

Director's Statement »

The work of Marine Environment and Food Safety Services (MEFS) focuses on ensuring consumer protection through seafood safety monitoring and testing services; providing monitoring services to support the protection of marine environmental legislation and obligations, as well as providing advisory services to support sustainable development and management of the marine environment.

This work is delivered via three core functions: monitoring, advice and technical support, and research.

Our monitoring focus included:

- National shellfish biotoxin monitoring programme
- National residues control programme (seafood component)
- Inspections and monitoring of movements of fish and shellfish stocks as required under Fish Health legislation
- National Sea lice Monitoring programme
- Water Framework Directive monitoring programme (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 products.

Advisory and technical services to a range of Departments/Agencies included:

- Department of Agriculture, Food and the Marine (DAFM)
- Appropriate Assessments of fisheries and aquaculture activity in Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)
- Aquaculture licensing
- Single Bay Management
- Sea-Fisheries Protection Authority (SFPA) and Food Safety Authority of Ireland (FSAI)
- Food Safety
- Department of Environment, Community and Local Government (DECLG)
- Marine Strategy Framework Directive (MSFD)
- Foreshore lease/licensing decisions
- Environmental Protection Agency (EPA)
- Dumping at sea applications
- Department of Communications, Energy and Natural Resources (DCENR)
- Implementation of the Offshore Renewable Energy Development Plan

Retention and expansion of our laboratory accreditation (*ISO17025* and *ISO9001*) certification for the work of the Fish Health Competent Authority office ensured an ongoing high standard of service delivery throughout 2015.

Finally, active participation in research programmes and projects that support our core environmental and seafood safety monitoring and advisory roles was a key feature in 2015. Of particular note was our success in securing over €0.6m in Horizon 2020 funding to support two aquaculture research projects.

Aengus Parsons
Director: Marine Environment and Food Safety Services

Monitoring

Shellfish Safety

Naturally occurring biotoxins in shellfish are monitored by the Shellfish Safety team, using chemical analysis supported by phytoplankton monitoring and molecular biological assays to detect the presence of the toxin and the causative organisms. This work is carried out in co-operation with the Sea-Fisheries Protection Authority (SFPA), the Food Safety Authority of Ireland (FSAI) and industry collaboration as part of national official controls on seafood safety. In 2015, 3,111 shellfish samples were submitted on which 11,250 analytical tests were carried out.

Although lengthy closures of shellfish production areas due to the presence of these natural biotoxins were observed most recently in 2014, 2015 showed typical late summer/ autumn toxicity at moderate levels and were limited mainly to the south-west.

A record 4,200 seawater samples were analysed for toxic species in 2015. Increased phytoplankton sampling initiated in 2014, and continued in 2015, resulted in a wealth of extra information, affording more accurate forecasting of toxin outbreaks. Together with the toxin data from chemical testing, these data are combined to produce a weekly online report and give a synopsis of toxin and harmful algal bloom presence, and a short-term forecast of the likelihood of changes in status. Now displaying monitoring data, satellite and modelled information, these reports have been well received by regulatory authorities and aquaculture industry stakeholders.

Monthly monitoring of *E. coli* levels in shellfish was conducted in all production areas, followed by the annual data review in association with the SFPA to assign appropriate classification to each area. In 2015, we commenced a direct commercial testing service for norovirus (NoV) in oysters. This is an important food safety concern and the testing service provides support to industry wishing to give quality assurance to customers. In particular, the testing supports Irish producers exporting to sensitive markets in the far east.

Collaboration under the Memorandum of Understanding with the Chinese Academy of Fishery Sciences (CAFS) , signed in 2012, continued during 2015. Exchanges took place between the Marine Institute and CAFS enhancing cooperation in the areas of seafood safety and technology.

Residues and Contaminants Monitoring in Seafood

The chemistry team carried out the farmed finfish component of the 2015 National Residues Monitoring Programme to ensure compliance with European Commission legislation and to ensure farmed fish are fit for human consumption. The results will be reported in 2016. The 2014 results, which included more than 706 tests and 1,494 measurements, were published in 2015 and show full compliance with European standards. Additionally, fishery samples from non-EU countries collected at border inspection posts were tested for veterinary residues.

Monitoring of levels of environmental contaminants in Irish shellfish and wild fish was also undertaken on behalf of the FSAI and SFPA.

Finfish Farm Monitoring

The results of the sea lice monitoring and control programme are published in full annually, in the Marine Institutes Irish Fisheries Bulletin series. The Report for 2015 (Irish Fisheries Bulletin No. 46) is due to go live on the web www.marine.ie and was circulated in printed form to stakeholders at the end of March 2016.

Continuous on-farm sea lice checks have facilitated early intervention resulting in better sea lice control during 2015. The use of alternative approaches to complement husbandry and medicinal treatments, coupled with rigorous pro-active regulatory oversight, has led to improved sea lice levels over all in Ireland.

The Benthic Ecology group carried out its annual review of reports from finfish growers arising from benthic surveys to examine seabed conditions below fish cages in accordance with DAFM Benthic Monitoring Protocols. A review is prepared annually by the Benthos Ecology group and is submitted to DAFM.

Fish Health

Significant mortality events affecting Pacific oysters were recorded along the south coast and in the north of the country were associated with the presence of the bacterial pathogen *Vibrio aestuarianus*. This led to a major increase in shellfish sampling and testing for the presence of pathogens. Over 5,800 samples were tested, the majority of which was in response to the mortality events but also as part of a research project on *Vibrio aestuarianus*.

Over 3,500 finfish, primarily Atlantic salmon, but also rainbow trout, wrasse and coarse fish were tested for pathogens. This was done 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.

Environmental Monitoring

The current cycle (2010-2015) of the Water Framework Directive (WFD) environmental monitoring programme in transitional and coastal water (for physico-chemical parameters, priority substances and other pollutants, phytoplankton and benthic fauna) on behalf of EPA and DECLG concluded in 2015. The results will contribute to national reporting requirements to the European Commission, as well as regular 'state of the environment' reports published by the EPA. The next cycle of monitoring (2016-2020) has been agreed by DECLG and EPA and will be carried out by a team based in the Marine Institute and external contract support.
In January, MEFSS staff carried out the annual winter environmental survey on board RV *Celtic Voyager*, sampling

at 301 stations in the Irish Sea and along the south and southwest coasts for nutrients, carbon and other water quality parameters. One hundred and thirteen samples for for benthic fauna analysis were also collected.

Advice and Technical Support

MEFSS provided advice to the Department of Agriculture, Food and the Marine in support of aquaculture licensing, including:

- Completion of seven full Appropriate Assessments for marine SACs and SPAs at Kilkieran Bay and islands; North Inishowen Coast SAC; Gweedore Bay and islands SAC; Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC; Trawbreaga Bay SPA; Drumcliff Bay SPA; Cummeen Strand SPA. This will allow the progression of approximately 155 licensing decisions
- Advice on bird population monitoring in two SPAs (Dungarvan and Donegal Bay)
- Environmental Impact Assessment screening for non-salmonid licence applications and Appropriate Assessment screening for licence applications in non-Natura sites
- Advice on over 120 aquaculture licence applications
- Development of technical protocols for aquaculture structures
- Advice and support to Single Bay Management (SBM) committees.

The Shellfish Safety team provided advice on shellfish food safety to the SFPA and the FSAI for ongoing official controls under the monitoring programmes for shellfish biotoxins and microbiological classification.
We continued to provide support to competent authorities in Ireland and at a European level over microbiological food safety issues associated with bivalve shellfish. In particular, we participated in an ongoing European Food Safety Authority (EFSA) technical group aimed at providing support for a planned EU-wide baseline survey to determine the prevalence of norovirus (NoV) contamination in oysters. This survey is an important step towards establishing European regulatory controls.

Other areas where our advisory functions focused on in 2015 included:

- Disposal of dredge material 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
- Environmental aspects of offshore hydrocarbon exploration and production - advice to DCENR and the EPA
- Support and advice to DCENR on the implementation of the Offshore Renewable Energy Development Plan
- Input into and review of relevant Strategic Environment Assessments on behalf of DAFM.

Internationally, our scientists continue to participate in scientific and technical fora such as the International

Over €0.6 million in funding was awarded to the Horizon 2020 projects, Tools for Assessment and Planning of Aquaculture Sustainability (TAPAS) and Preventing and mitigationg farmed bivalve Diseases (VIVALDI).

Council for the Exploration of the Seas (ICES) and the Oslo and Paris Convention 1992 (OSPAR) - on topics that included aquaculture, food safety, ocean acidification, marine spatial planning and fish health.

Competent Authority for Fish Health

The Marine Institute is the competent authority for the implementation in Ireland of Council Directive 2006/88/EC, which deals with the health of aquaculture animals and the prevention and control of certain aquatic diseases. The Fish Health Unit directs the work of the DAFM veterinary inspectors who work in the aquaculture field. In 2015, 237 inspections were completed under the legislation; 1,987 movements (imports, exports and internal movements) of live aquatic animals were authorised, and 10 new Fish Health Authorisations were issued, bringing the total number of authorised aquaculture production businesses in the country to 469.

Research

Our team continued their involvement in European and national-funded research programmes; carrying out applied research to support delivery of our monitoring programmes and advisory services.

Some 2015 highlights include:

- Success in two large collaborative Horizon 2020 research projects:
- TAPAS – A four year project, led by the University of Stirling, that will develop tools for the sustainable development of aquaculture (value to Marine Institute €0.5m)
- VIVALDI – A four year collaboration, led by IFREMER (France) that will investigate solutions for the prevention, control and mitigation of the major pathogens affecting the European farmed shellfish species (value to Marine Institute €0.1m)
- EPA-funded research partnership with Dublin City University to investigate the use of passive sampling as a novel technique for marine monitoring
- Three new Cullen Fellowships in the areas of biological oceanography of toxic phytoplankton, marine spatial planning and shellfish microbiology.

Fisheries Ecosystem Advisory Services (FEAS) provide scientific advice that supports the Department of

Fisheries Ecosystem Advisory Services

Director's Statement »

Agriculture, Food and the Marine (DAFM) and the European Commission in the implementation of the Common Fisheries Policy (CFP) and certain environmental directives e.g. NATURA 2000, Marine Strategy Framework Directive (MSFD).

Most of our work in 2015 focused on:

- Delivering Ireland's obligations under the EU Data Collection Framework (DCF)
- Supporting the development of fisheries management plans
- Servicing national and international fora on the landings obligations (discard ban)
- Undertaking research that advances our capacity to give the advice decision-makers need.

A lot of time was devoted to working with DAFM on the European Maritime and Fisheries Fund (EMFF) Operational Programme for Ireland, particularly to develop the Biodiversity and Data Collection schemes.

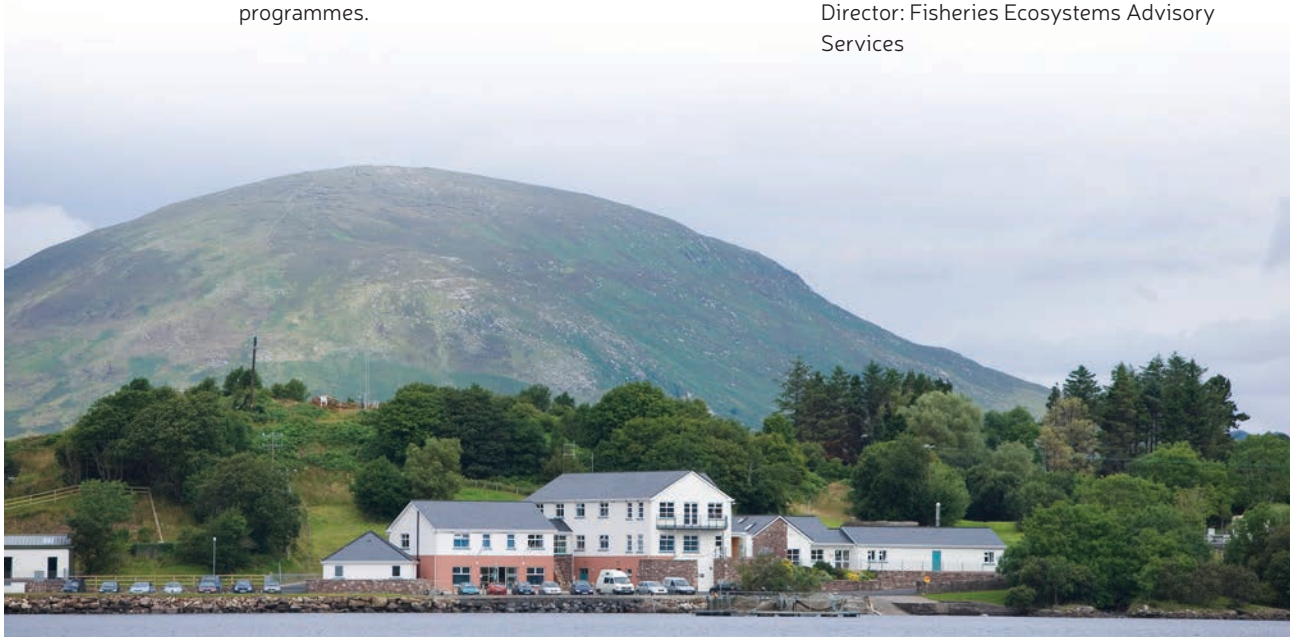
FEAS continues to integrate ecosystem considerations into its scientific work programmes.

These include:

- Developing indicators for the MSFD using DCF data
- Establishing and coordinating research vessel surveys to collect litter, bird and mammal sightings, integrating benthic sampling devices as part of surveys
- Conducting research on resource competition between seals and fish.

Throughout the year, the Institute's Performance Management Development System played a key role in linking our corporate plan goals with the work of individual FEAS staff. Internal staff communications is critical to ensuring an efficient and effective service delivery which was achieved through regular staff and management meetings.

Dr Paul Connolly
Director: Fisheries Ecosystems Advisory Services



Highlights of the year 2015

FEAS successfully carried out the DCF National Programme for 2015, and the 2014 DCF Annual Report was accepted by the EU Commission. The EMFF was adopted by the Commission in December and the Marine Institute secured €40.7 million in funding for the new DCF until 2020.

FEAS worked closely with DAFM to develop discard plans ahead of the introduction of the Landings Obligation policy for demersal fish in 2016.

A key service delivery to the DAFM is the annual *Stock Book* which contains the latest scientific advice on fish stocks exploited by the Irish fleet. This was delivered to the Minister in November and was a key component of the sustainability assessment he presented to the Oireachtas Committee on Agriculture and Fisheries in December. The *Stock Book* was also at the heart of the December negotiations of the EU Council of Ministers that set fishing opportunities for 2016.

FEAS completed a successful review of the Celtic Sea herring long-term management plan and worked closely with University College Dublin and industry to develop new genetic sequencing techniques that can be applied to separate out mixed herring stocks.

The FEAS team worked closely with Inland Fisheries Ireland (IFI) on the Standing Scientific Committee for salmon and eel and, through the group, provided the scientific advice for these important stocks. The team also worked closely with IFI and supported the Department of Communications, Energy and Natural Resources (DCENR) at the annual NASCO meeting.

FEAS worked closely with National Parks and Wildlife Service (NPWS) to compile a draft list for 68 endangered shark and ray species present in Irish waters.

DAFM established the Regional and National Inshore Fisheries Forum Framework, and FEAS provided scientific support to these new stakeholder groups.

In relation to the Marine Strategy Framework Directive (MSFD), the team worked closely with the Marine Environment and Food Safety Services. FEAS completed fisheries monitoring programmes that support the implementation of the MSFD. A key element of this work was to add value to existing fisheries programmes by treating fish stock assessment data in a different way so that they can be used in the MSFD.

Research vessel surveys are a critical component of our work. In 2015, 13 surveys resulted in 219 sea days and 1,198 scientific days at sea. These surveys represent a considerable resource commitment by the Marine Institute and are a vital part of our monitoring work. FEAS is recognised as an international expert in the field of underwater TV surveys for *Nephrops*. France chartered RV *Celtic Voyager* and the team's expertise to survey their Bay of Biscay stocks. Iceland has also requested FEAS technical support for surveys in 2016.

Our research vessel survey programme also collected litter data, and bird and mammal sightings data through partnership with Birdwatch Ireland and the Irish Whale and Dolphin Group.

FEAS staff also worked on commercial fishing vessels totalling 644 days at sea on discard trips and on experimental work to evaluate issues around the landings obligation.

International cooperation is central to FEAS work. The key fora used are the:

- International Council for the Exploration of the Seas (ICES)
- Scientific, Technical and Economic Committee for Fisheries (STECF)
- North Atlantic Salmon Commission (NASCO)
- International Commission for the Conservation of Atlantic Tunas (ICCAT)

FEAS staff also participated in 125 international scientific meetings. These focused on data quality control; stock assessment; formulating advice; evaluating management plans; survey planning, and advice methodologies.

In November, the FEAS Director completed a three-year term as President of ICES. Key achievements included the adoption of a new ICES Strategic Plan; a single unified implementation plan; developing a business model for ICES and a new format for Bureau (Board) and Council (Member Countries) meetings.

Data Collection Framework

The Marine Institute secured €40.7m funding under the European Maritime Fisheries Fund to meet Ireland's obligations under the Data Collection Framework (DCF) 2014-2020. This framework supports the science needed to implement the Common Fisheries Policy and is central to our work programmes. DAFM has given the Marine Institute responsibility to conduct the various programmes required to meet Ireland's DCF obligations including data collection and analysis, data management and the production of scientific advice. We submitted the 2014 DCF Annual Report and the new 2016 Data Collection Framework National Programme for Ireland to the Commission. This work programme included a comprehensive research vessel survey programme; port sampling of landings; sea sampling of discards; age profiles of the main stocks; EU logbook data analyses and mapping fishing vessel activity from Vessel Monitoring Systems. A total of 115 sea sampling observer trips were carried out on Irish fishing vessels resulting in 657 scientist sea days. These trips provide the team with invaluable 'on the ground' contact with the fishing industry. A total of 567,783 fish were measured and morphological data was collected from 51,721 fish and shellfish with 45,000 of these aged across all scientific programmes to provide data for the models used in international stock assessments at ICES.

The STOCKMAN and DISCARD databases are the cornerstones of our inputs to international stock assessment and delivered efficient and effective data queries and outputs. Servicing official scientific data calls is an essential component of the data collection framework. In 2015 we responded to 21 data calls, supporting the data end user needs of ICES, OSPAR, the EU Joint Research Centre and the DCF regional coordination meeting of the Northeast Atlantic. We worked closely with the Sea-Fisheries Protection Authority (SFPA) and the Irish Naval Service to secure Vessel Monitoring System and Logbook data for stock assessment purposes. The Marine Institute also worked closely with Board Iascaigh Mhara (BIM) which is charged with delivering the economic components of the DCF.

In order to support Ireland's implementation of the MSFD, FEAS reviewed and addressed the fisheries-related public consultation enquiries relating to the national monitoring programme. FEAS assisted with developing the national programme of measures that was disseminated for public consultation in autumn 2015. FEAS was closely involved in the scientific evaluation of fisheries-related criteria as part of the ICES review of the MSFD commission decision. FEAS worked with France and the UK in an ICES pilot project to develop joint monitoring initiatives and fisheries indicators for the regional implementation of the MSFD in the Celtic Seas.

Research Vessel Surveys

FEAS conducts a wide range of surveys on the RV *Celtic Explorer,* RV *Celtic Voyager* and on chartered commercial fishing vessels. These are an important element of our annual work programmes under the DCF.

In 2015 13 surveys were conducted in Irish waters comprising 184 sea days and 1,061 scientist days. The acoustic survey programmes focused on assessing the blue whiting, boarfish and herring resources. Prawns are a vital resource for the Irish fishing industry and the underwater TV survey programme was a key input to assessing this resource, worth over €80m to the Irish industry. The Irish groundfish survey was carried out over a 42-day period in November-December surveying fish stocks in the Celtic Sea and off the west and north-west of Ireland. This survey is linked into UK, French and Spanish surveys to achieve a broad picture of north-east Atlantic fish stocks. All research surveys involved international partners and were coordinated through ICES who ensure that the protocols and methodologies used are standardised. The survey data were used in international stock assessments that informed scientific advice on fishing opportunities for 2016.

FEAS conducted two industry-funded surveys. A pilot survey was carried out in February to examine the onset of NEA mackerel spawning. This was part of a wider industry-initiated project involving Denmark, Scotland, the Netherlands and Ireland, to examine recent changes in mackerel spawning behaviour and how these potentially necessitate adjustments to the temporal coverage of the

Gráinne Ni Chonchuir, FEAS, sorting sprat during the Celtic Sea Herring Acoustic Survey aboard the RV Celtic Explorer, October 2015.

ICES internationally coordinated mackerel egg surveys. A Marine Institute and industry co-funded acoustic survey on board a commercial vessel was conducted in July to assess the biomass of the NEA boarfish stock. This survey programme has been carried out in collaboration with the industry on commercial vessels since 2011 and will become integrated into the DCF survey from 2016 onwards.

FEAS also developed two new surveys for monkfish and megrim to be funded under the DCF in 2016. Both surveys will focus on delivering data that will improve scientific advice on the valuable monk and megrim stocks in Irish waters..

Stakeholder Interactions

Regular meetings with the fishing industry were held through the forum of the Irish Fisheries Science Research Partnership and the Advisory Councils, particularly the North Western Waters Advisory Council and the Pelagic Advisory Council. The Irish Fisheries Science Research Partnership forum was established by the Minister in 2008 and meets quarterly.

This year's meetings addressed:

- potential research topics
- funding mechanisms for surveys
- Marine Strategy Framework Directive
- NATURA
- Sea Bass
- implementation of the landings obligation
- discard sampling
- state of stocks
- assessment methods
- Maximum Sustainable Yield as a target
- economic issues
- BIM gear trial results
- Marine Protected Areas
- ICES advice and management plans

FEAS scientists also provided key inputs to the Celtic Sea Herring Management Advisory Committee. Quarterly meetings were held with the environmental non-governmental organisations and issues addressed included, Maximum Sustainable Yield, Common Fisheries Policy reform, state of stocks, and scientific advice for 2016.

Scientific Advice

Our scientists participated in over 125 international expert group meetings of the EU, ICES and the STECF. Many of these meetings were funded under the Data Collection Framework and dealt with the core business of stock assessment and advice. Other scientific issues and challenges relating to the implementation of the Common Fisheries Policy, NATURA 2000 and the Marine Strategy Framework Directive were also addressed.

Key topics addressed included:

- calibrating acoustic instruments in fisheries science
- indicators for the MSFD
- Maximum Sustainable Yield reference points for fish stocks
- mackerel coastal states
- horse mackerel management plans
- stock assessment and advice drafting
- implementation of the Data Collection Regulation
- EU discard plan and the ecosystem effects of fishing.

The team also provided scientific advice on the status of inshore stocks through the *Shellfish Stock Book*. DAFM established a new Regional and National Inshore Fisheries Forum, and we provided scientific support to these new stakeholder groups. Salmon and eel advice was developed in cooperation with Inland Fisheries Ireland and the Standing Scientific Committees for Salmon (SSCS) and Eel (SSCE). We carried our risk assessments for the Irish Sea and Celtic Sea areas in order to develop management plans for inshore fisheries conducted in Special Areas of Conservation. We worked closely with Marine Environment and Food Safety Services on meeting Ireland's obligations under NATURA 2000.

Newport Facility

A new Strategic Plan for the Marine Institute Newport facility was developed which will focus on establishing research clusters there. The first cluster will be established in 2016 around genetics and catchment ecosystems. The census work programmes on salmon, sea trout and eel continued from the fish traps on the Burrishoole ecosystem. Poor marine survival of wild salmon smolt in 2015 led to one of the lowest ever recorded returns of wild grilse. A total of 637 salmon were recorded from upstream traps with 8,150 recorded from the downstream traps. The team continued their work on maintaining and developing long-term physical, chemical and biological datasets characterising the freshwater component of the Newport catchment ecosystem. These data are available on the Burrishoole Catchment Dashboard which went online in 2013.

The fish rearing unit continued its work, with 62,000 eyed ova retained for the ranching programme. A total of 40,000 ranched salmon smolts were released in May as part of the salmon stock assessment and experimental research programmes.

PhD work on factors that affect salmon at sea continued in cooperation with Norway and the Loughs Agency in Northern Ireland. Four new Cullen PhDs commenced at Newport, looking at the freshwater and marine influences on a coastal lagoon, carbon budgets in the catchment ecosystem and early migration mortality in salmon and trout.

Work continued on the acoustic tagging programme on Lough Feeagh that examines behavioural and environmental preferences of wild and ranched adult salmon. The strong collaboration with the GLEON (Global Lake Ecological Observations Network) continued. The University College Cork Beaufort Genetics project continued its work at Newport and produced many peer-reviewed publications in international scientific journals. The PhD on sea bass continued and acoustic tracking arrays were deployed on the south coast. Satellite-tagged fish were released and this data will be used to identify site fidelity and the migration patterns of sea bass in the Celtic and Irish Seas.

Applied Research

FEAS carried out a range of research projects using national and international funding sources. National funding was used to run the 'Challenge II' programme that looked at fishermen's behaviour in relation to the landings obligation and its implementation (simulation of what happens on the deck at sea with various forms of the landings obligation). The sea bass work continued in the Celtic Sea with various inshore acoustic arrays set up and sea bass electronically tagged to monitor movements. The Beaufort ecosystem project secured funding from Science Foundation Ireland to examine real-time incentive management in fisheries. This work will be carried out with Queen's University Belfast. Funding was also secured under Horizon 2020 to look at strategies to eliminate discards in European fisheries (DISCARDLESS). A research programme on options for developing ecosystem based management in the Irish Sea was also completed.

The team participated in a range of EU-funded projects to develop a mixed fisheries management plan for the Celtic Sea (DAMARA); fisheries; aquaculture and seafood processing network (COFASP); benthic ecosystem fisheries impact studies (BENTHIS); shark satellite tagging; Maximum Sustainable Yield (MYFISH) and analysis on key food webs (EUROBASIN). These projects have secured €1.12m EU funding and involve close cooperation with Irish third-level institutions including NUI-Galway; University College Cork; Galway-Mayo Institute of Technology and Queen's University Belfast. FEAS also invested time to develop research proposals to fund Science Foundation Ireland, the European Research Council and Horizon 2020.

Ocean Science and Information Services

Director's Statement »

Ocean Science and Information Services (OSIS) provides services to a wide range of marine clients and programmes - nationally and internationally - and underpins much of the activity of the Marine Institute. 2015 was a busy year where significant activity took place in our work programmes including oceanographic services, advanced mapping, research vessel operations, information services and development, ocean energy and advanced marine technology.

OSIS teams participated in a wide range of national, European and international programmes and were particularly active across a range of EU-funded programmes including some new projects. This improves our capacity to provide support services tailored to the needs of integrated science programmes which inform cross-sectoral policy advice. The research vessels *Celtic Explorer* and *Celtic Voyager* had a busy year with notable programmes including trans-Atlantic research surveys and mapping transects. Advanced Mapping Services with our partners, Geological Survey of Ireland (GSI), delivered significant numbers of survey days and value-added activity as described below. There were significant advances in oceanographic activity in 2015 particularly in the area of operational models and associated services and in development of potential new EU-funded projects.

Ocean Science and Information Services was responsible for the deployment of a cabled observatory in Galway Bay in 2015 which will operate as part of the Ocean Energy Test Bed and technology test and demonstration platform in Galway Bay.

We continued to provide a wide range of services as part of our Service Level Agreement with the Sustainable Energy Authority of Ireland (SEAI). The IS & D team continued to provide support to a wide range of activities – particularly in the development of new data services. This includes the evolution of the Integrated Digital Ocean portal (www.digitalocean.ie) developed to showcase the approach with a number of new partners contributing data.

Mr. Michael Gillooly
Director: Ocean Science and Information Services

Research Vessel Operations

Mission: To coordinate and manage the operation of the Marine Institute's two research vessels, RV *Celtic Voyager*, RV *Celtic Explorer* and the deep-water Remotely Operated Vehicle (ROV) *Holland I* and provide support services to the users of the vessels, including instrumentation and engineering support services.

Highlights for 2015:

2015 was a challenging year for the Research Vessel Operations team with both vessels requiring dry docking, and an unplanned engine replacement following engine failure on the RV *Celtic Voyager*.

RV *Celtic Explorer*

The RV *Celtic Explorer* had a busy year with 323 operational days (includes passage time). The vessel sailed in late December 2014 to Falmouth Dockyard (UK) for refit and survey. In parallel with these routine works the vessel also had a new EM302 deep-water multibeam, a shallow water EM2040 multibeam and a new sub-bottom profiler installed. All work was completed on time and on budget in a tight three-week window. The vessel sailed directly from dry-dock to Hamburg to mobilise for a commercial oceanographic charter in German waters.

Following completion of work in Germany the Marine Institute's Advanced Mapping Section (AMS) and Professor John Hughes Clarke completed successful trials in the Bay of Biscay on all of the new multibeam systems. The systems passed all tests to specification. Unfortunately, bad weather forced significant curtailment of the annual Oceanography survey in late February before the vessel sailed back to Germany for another successful cruise.

During the year the vessel completed three annual acoustic surveys totalling 63 days on behalf of the Marine Institute's Fisheries Ecosystems Advisory Services (FEAS). These commenced with the internationally coordinated Blue Whiting Survey in March/April, followed by the North West Herring Survey in July, and the annual Celtic Sea Survey in October.

The vessel was adapted for cable-laying for the first time in April 2015 and successfully mobilised all the required equipment and subsea cable over the three days to install the 4.25km Galway Bay cable within an eighteen-hour timeframe.

The vessel crossed the Atlantic in late April to undertake the annual fisheries charter for Memorial University of Newfoundland, and completed a transatlantic survey led by Dr Louise Allcock (NUI Galway) *en route* which focused on deepwater species and the oceanography of eddy systems. Following the successful completion of the Memorial University fisheries survey the vessel embarked a team of seabed mappers from Europe, USA and Canada to complete a transatlantic mapping survey whilst *en route* to Galway. This survey mapped some large features (some up to 140km long, and more than 3,000m high) in detail for the first time and proved the exceptional abilities of the vessel's new deep-water multibeam system.

Following the vessel's return to Ireland in early June the ROV *Holland 1* was mobilised for a UCC-led expedition studying some new and previously unknown coral mound regions with the aid of an ROV-mounted multibeam system. This survey produced some stunning sonar and visual images of these regions and received significant media attention.

In mid-July the ROV *Holland 1* was again mobilised for a survey led by Plymouth University and was largely funded by the EUROFLEETS2 project.

Following completion of a 39 day survey on behalf of BSH in the North Sea the vessel commenced the first leg of the annual 47 day Ground Fish Survey.

The vessel again mobilised the ROV *Holland 1* for a UCD-led expedition in October which saw the ROV and the RV *Celtic Explorer* working in Spanish waters for the first time. This survey, located just southwest of Cadiz, was successful in its study of Mud Volcanoes and their associated fauna. Following the vessel's return to Galway and demobilization, the vessel completed the last remaining legs of the annual Ground Fish Surveys (35 days) before a pre-Christmas maintenance period.

RV *Celtic Voyager*

The RV *Celtic Voyager* began the year with the annual Winter Environmental Monitoring Survey followed by a variety of student training programs in Cork and Galway for the Smart Program and Galway Mayo Institute of Technology (GMIT). The vessel then completed a trial sea bass survey on behalf of the Marine Institute's Fisheries Ecosystems Advisory Services (FEAS) which aimed to catch and tag sea bass as part of an ongoing study.

The vessel then sailed to the west coast for the first survey of six of the DCENR-funded four-year OBSERVE project. The Marine Institute, along with lead partners GMIT, deployed four static acoustic moorings designed to record cetacean activity -including deep diving species - as well as acquiring 600 miles of towed passive acoustic cetacean data. These static acoustic devices were to be recovered and redeployed in summer and recovered again in November 2015.

The vessel then completed a successful eight-day trawling survey on behalf of Bangor University (Wales). This survey, "Mullet", was fully funded under the EuroFleets project. An oceanographic survey led by NUI Galway followed before the vessel sailed to Galway to commence the Porcupine / Aran UWTV Nephrops survey.

During the porcupine Nephrops survey the vessel's main engine failed, resulting in damage that was beyond economic repair. The vessel was towed to Killybegs for docking and the installation of a new Baudoin engine. The

vessel was out of service from mid-June until 19th August.

While the vessel was out of service the RV *Prince Madog* was chartered to complete the Celtic Sea Underwater TV survey. This was a shiptime-funded HABSOC survey led by NUI Galway, and the Langolf TV survey on behalf of IFREMER in the Bay of Biscay. The vessel *Song of the Whale* was chartered for two passive acoustic surveys as part of the OBSERVE survey and the ILV *Granuaile* was chartered at short notice to recover and redeploy the OBSERVE static acoustic moorings.

Following the RV *Celtic Voyager's* return to service it completed a packed survey schedule until year end. These included the successful World War I Shipwrecks survey using the vessel's EM2040 multibeam in the Irish Sea, and a geotechnical survey as part of the development of a wave energy site on behalf of ESBI.

The vessel completed a variety of training surveys on behalf of SMART and GMIT in Galway and Cork before completing renewable energy anchor trials in Scottish Waters. The vessel completed the recovery of the OBSERVE moorings on the 17th December off the west coast in heavy weather conditions immediately prior to a dry-docking over the Christmas period for some adjustments to the vessel's multibeam configuration in Killybegs.

Fleet Activity Summary 2015

Science Days at Sea from 01/01/2015 - 31/12/2015	Days	Surveys	Scientist Days	Student Days
Celtic Voyager *Includes *RV Prince Madog* Charter	210	29	1132	665
Celtic Explorer	302	17	3597	0
Total	512	46	4729	665

Research Fleet Fuel Usage 2015

Vessel	Distance Sailed	Fuel Consumption	EEOI (Efficiency measurement Metric Tonnes fuel/ Nautical Mile)
Celtic Explorer	39,777.6 Nm	1,694,650 Litres	0.042603 M3/NM
Celtic Voyager	12,966.5 Nm	221,371 Litres	0.017073 M3/NM

Foreign Vessel Observer Scheme 2015

Twenty-eight foreign vessels conducted marine research surveys in Irish waters in 2015. Of these, most were British ships (18); the rest were French (1); Norwegian (3); Spanish (1); Dutch (1); Russian (1) and Danish (1). A training vessel from the USA, the *Corwith Cramer* conducted two training surveys while in Irish waters. The Marine Institute placed 12 Irish observers - mostly recent marine science graduates - on 12 of these surveys in 2015 with a total of 273 days at sea between them.

The National Weather Buoy Network was supported and maintained on behalf of the Department of Transport, Tourism and Sport. 2015 proved to be a good year in terms of performance of the system despite adverse weather and an aging network. Due to the concerted efforts of the technical team an availability rate of 90% was maintained throughout 2015. This exceeds the required performance metrics specified in the Memorandum of Understanding with the Department of Transport, Tourism and Sport. The five buoys in the network achieved a combined number of 1,640 operational buoy days.

A steady level of activity, primarily routine maintenance and calibration, was rolled out for the National Tide Gauge Network and 13 gauges remain in operational condition.

SMART

The Strategic Marine Alliance for Research and Training (SMART) is a working, proactive, marine cluster of Higher Education Institutions (HEIs) and the Marine Institute, supported by the Higher Education Authority (HEA) led by Galway-Mayo Institute of Technology (GMIT) since 2011.

Key academic and research partners within SMART include:

- Athlone Institute of Technology
- Galway-Mayo Institute of Technology
- Marine Institute
- NUI Galway
- University College Cork
- Ulster University

The SMART consortium provides accredited, ocean science training programmes for third-level students from a range of marine science, technology and engineering degree and postgraduate programmes. This practical training at sea supports the growing marine sector by increasing capacity to produce the experienced and skilled personnel capable of working at sea and contributing to the *Blue Economy*.

SMART continued to build national and international capacity throughout 2015 in offshore coastal and ocean research and support students and early-stage researchers by developing practical educational marine science programmes focused on the three pillars of:

1. National offshore marine science training.
2. International offshore marine science training.
3. Practical SMARTSkills workshops

Highlighted activities in 2015 included:

- Delivery of 24 national and international sea-going training courses to 285 third-level students, including 176 postgraduates over 90 days at sea
- Development and delivery of two International *Floating Universities* for 50 postgraduate students (Masters and Doctoral) over 51 days
- Development of the SMARTSkills 2015 workshop to support 60 postgraduate students and early-stage researchers in association with NUI Galway on developing innovative Blue Skills in *Imaging Marine Microorganisms: Photography and Microscopy of Plankton*

Dr John Killeen, Chairman, Marine Institute, Mr Archie Donovan, GSI, Peter Heffernan, CEO, Marine Institute and Tommy Furey, Marine Institute present a 3D model of the shipwrecked RMS Lusitania to Minister Simon Coveney, December 2015.

Advanced Mapping Services

During 2015, Advanced Mapping Services (AMS) began developing the forthcoming ten-year strategy for Phase 2 of the INFOMAR programme, seeking stakeholder feedback through workshops, conferences, and in parallel through an external programme review and strategic development contract, involving stakeholder interviews, and a comprehensive data users study.

Operationally, the team extensively supported shallow water inshore seabed survey activity with a view to completing operational targets set out for phase 1 of INFOMAR (2006-2016, INtegrated mapping FOr the sustainable development of Ireland's MArine Resource).

As Phase 1 Irish shelf survey targets were met by the end of 2014, no INFOMAR seabed mapping took place on board the RV *Celtic Voyager* or the RV *Celtic Explorer* in 2015. AMS did however coordinate and participate in a variety of research, training, education, and strategic value-added survey activities on the vessels, most notably the RV *Celtic Explorer* Atlantic Transect in support of the Atlantic Ocean Research Alliance, and the RV *Celtic Voyager* investigation in partnership with University of Ulster, mapping World War 1 shipwrecks.

The team also supported the research vessel operations team with trials and commissioning of the multibeam upgrades onboard the RV *Celtic Voyager* and RV *Celtic Explorer*.

Three vacancies were filled in Q4 2015, and full-time STO positions were appointed for a Habitat Mapping specialist; a Hydrographic Data Processor and a Marine Scientist to focus primarily on development of the Value Added Programme.

Programme 1 - Data Acquisition, Management, and Interpretation:

- Survey targets have been met for 2015, with inshore seabed mapping data acquired onboard the research vessels *Keary*, *Tonn*, and *Geo*, in Bannow Bay, Kilmore Quay, Youghal, Dungarvan, Wexford Approaches, Boyne Approaches, Carlingford Lough, and Lough Foyle. Additionally, a groundtruthing campaign was undertaken to the south and west of Ireland.
- Additional 3rd party projects and surveys were supported by AMS including SEAI work in Galway Bay on the quarter-scale test site, mapping data acquisition during a ground fish survey onboard the RV *Celtic Explorer* in support of JNCC reporting on the Habitats Directive, geophysical data acquisition on the RV *Celtic Voyager* in Scotland underpinning UCD ocean energy related research.

Programme 2 - Data Integration and Exchange:

- AMS undertook the processing and data integration of the majority of the data backlog with a view to improving the lead time between acquisition data and product availability to standardise and reduce this latency, additional data processing contract personnel will have to be trained and brought in during 2016 to support the core team. Significant work was done on developing and streamlining the data processing to product work flow, and developing associated progress tracking and monitoring systems.
- The INFOMAR website requires redevelopment work and quotes were sought at the end of 2015 for a site

review and initial design work is to be undertaken during Q1 2016.
- A significant advance in 2015 has been achieved with the web map services, with a dynamic function developed enabling users to zoom to a seabed feature, and set the depth colour range to that on screen, thus highlighting the true resolution of the data, something not previously feasible.
-

Programme 3 - Value Added Exploitation:
Significant activity has been ongoing under the Value Added Programme, in line with recommendations from the 2013 PwC INFOMAR Programme Review.

The focus of this sub-programme during 2015 has been on:
- Raising public awareness of INFOMAR through use of social media, higher level engagement in national marine-related conferences and events (tourism, heritage, policy), and more active outreach during field operations
- Engagement in strategic large-scale research collaborations and initiatives
- Focus on capacity building across the skill set shortage areas related to seabed mapping required to underpin Irish SME commercial and third-level research opportunities
- Engaging research and industry in INFOMAR value-added research activity, through the GSI run research call (Q4, 2015)

Some highlights include:
- DGMARE Checkpoint project awarded Q4 2015 (ProAtlantic)
- Continued partnering on hydrographic and habitat-related INTERREG proposals, aimed at continuing research activity associated with MESH Atlantic and INIS Hydro
- Successful award to NUIG of an Advanced Mapping Services based Cullen Fellowship (PhD) to develop an integrated approach to seaweed resource assessment
- Marine Institute Fisheries Ecosystems Advisory Services funded PhD started on water column analysis of data in support of developing acoustic fisheries stock investigation approaches and fisheries management (through Ulster University).

Research activity and effort aligns with INFOMAR programme activities and challenges, and while projects will require supervision, data access, and field survey support (access to infrastructure), this value-added programme activity will build key research capacity, and encourage technology development in niche areas relating to INFOMAR.

Oceanographic Services

The Oceanographic Services team serviced over 100 requests for oceanographic data and products during 2015. They continued to provide dedicated field and model data and analysis to support advisory services provided by our Marine Environment and Food Safety Services (MEFSS) and Fisheries Ecosystems Advisory Services (FEAS) teams at the Marine Institute.

The Oceanographic Services team delivered all elements of the significant work programme of the Sustainable Energy Authority of Ireland (SEAI) Ocean Energy Service Level Agreement on time and within budget. The cable infrastructure was deployed in Galway Bay in April 2015 as part of the Ocean Energy Test Bed infrastructure, with installation of the Cabled Observatory following in August 2015, which is expected to become operational in early 2016. Operational services were provided at both the Galway Bay and Belmullet ocean energy test sites. Oceanographic Services, jointly with SmartBay, continued to manage the test and demonstration facilities at the quarter scale ocean energy test site in Galway Bay. The development of the Foreshore Lease application and associated Environmental Report and Stakeholder Engagement continued throughout 2015.

The modelling team started their work as part of the Copernicus Marine Environment Monitoring Service (CMEMS) for the Ireland-Iberia-Biscay region to validate models and contribute to associated research. Collaboration with the Galway RNLI to improve search and rescue activities in Galway Bay continued with the provision of a detailed tidal atlas, modelling services, and drifter releases for validation of the models. The team continued to provide freely available regular ocean wave and storm surge forecasts and hindcasts to end users within the Marine Institute and beyond. Remote sensing-related activities included the creation of a database of monthly and annual Sea Surface Temperature (1982-2014) and Chlorophyll *a* (1998-2013) and considerable development of proposals to expand the remote sensing capacity within the Marine Institute.

Oceanographic Services continue to work with the information services and development team to make oceanographic data available and customisable through a new data dashboard and portal environment.

Key elements of the EU-funded projects COOPEUS (linking European/US major environmental research projects), and FixO3 (linking EU activities on fixed point marine observatories) projects continued alongside the initiation of a number of H2020 projects including: the large scale AtlantOS, which will define, establish and support an Integrated Atlantic Ocean Observing System; EMSO (European Multidisciplinary Seafloor Observatory) and JERICO-Next (towards a joint European research infrastructure network for coastal observatories). The team will also contribute to the H2020 TAPAS project (developing tools for assessment and planning of aquaculture sustainability), which received funding confirmation in 2015, together with colleagues from the Aquaculture team.

The Oceanographic Services team remains active on the International Council for the Exploration of the Seas (ICES) Working Group on Oceanic Hydrography (WGOH) and Working Group on Operational Oceanographic Products

Key work carried out during a refit of the RV Celtic Explorer included the installation of state of the art sonar systems for bathymetric mapping in deep and shallow waters and the installation of a deepwater sub bottom profiler.

A new cold-water coral habitat in Irish waters was discovered by an international team of scientists led by Prof Andy Wheeler of UCC, using the ROV Holland I on the Marine Institute's RV Celtic Explorer during the QuERCi survey, June 2015.

for Fisheries and Environment (WGOOFE), the European Global Ocean Observation System (EuroGOOS) and Ireland-Biscay-Iberia Regional Ocean Observing System (IBIROOS), and the management group of Euro-Argo, the European contribution to the international Argo network of autonomous floats to monitor key ocean variables.

The team prepared the case for Ireland to join the EMSO and Euro-Argo European Research Infrastructure Consortiums (ERIC), which will ensure Ireland's place as a key player in international observational monitoring of the European marine area, and leverage future funding.

Information Services and Development

The Information Services and Development (IS&D) team continues to provide ICT and data support and development services across the Marine Institute to provide a robust operational ICT and data platform, develop new technical capabilities and support improvements in service delivery.

Operational Support

In 2015 IS&D serviced over 2,350 internal support requests covering technical, applications and data management queries, and a range of internal training.

The team provides ongoing support for network services, over 55 customised software applications and has provided direct ICT and data support for a variety of Institute programmes including the Data Collection Framework, INFOMAR seabed survey, and Natura programmes among others.

The team also coordinates the Marine Institute data request service, with 161 external requests for data in 2015. This number has decreased by over 30% in parallel with increased use of online self-service systems such as the Marine Data Online portal with usage up 63% (to 462 sessions per month) and the Irish Spatial Data Exchange with usage up 31% (to 840 sessions per month).

Project Activity

In 2015 IS&D were involved in over 30 development projects covering systems upgrades, service improvements and strategic capability development. A number of infrastructure upgrades have been completed including an upgrade of the Institute's main data storage hardware, the upgrade of the majority of PCs and servers to newer operating systems, the extension of WiFi access to the research vessels, the setup of the ICT systems at the Institute's new Wilton Place offices and the configuration of cloud productivity and communications services.
Other key activities included the ongoing upgrade of the HABs data system, a newly updated IMDO website (www.imdo.ie), and a major upgrade to Ireland's Marine Atlas (http://atlas.marine.ie). Ireland's Marine Renewable Energy Portal (www.oceanenergyireland.com) also received further updates to include new data and information. Of note is the continued high number of international users for these services. The team has also supported the use of the Irish Spatial Data Exchange service to feed into the Government's Open Data portal, increasing the national visibility of marine-related datasets from both the Marine Institute and our partners. During 2015 the Information Services and Development team has further developed the concept of Ireland's Digital Ocean (IDO), with a portal developed (www.digitalocean.ie) to showcase the approach with a number of new partners contributing data.

Initial server and network infrastructure has also been put in place to process and transmit data from the Galway Bay cabled observatory, with advanced data systems being developed to allow the data from the observatory to be consumed online in near real-time. The team has partnered with INSIGHT-NUIG on the successful OpenGovIntelligence H2020 proposal which will look at providing online "linked" oceanographic data from the cabled observatory.

Policy, Innovation and Research Support

Director's Statement »

Policy, Innovation and Research Support (PIRS) was established as a new service area within the Marine Institute during 2015. PIRS is tasked with promoting marine science for policy development and economic growth, and sees a number of work programmes transferred from Corporate Services, Ocean Science and Information Services, and the Office of the CEO.

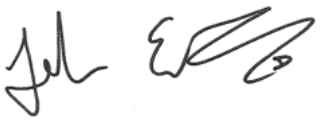
Incorporated within PIRS is the Institute's participation in the Atlantic Ocean Research Alliance Coordination and Support Action (AORA-CSA). This is a European Union coordination and support action project, funded under the Horizon 2020 (H2020) Programme for research. It supports the implementation of the Galway Statement, signed by the United States, Canada and the EU in 2013. Dr Margaret Rae was appointed project director in April, a role that includes the coordination and management of a project involving seven European partners and many international participants.

Other noteworthy activities included:

- SeaFest 2015, Ringaskiddy, Co. Cork
- Supported by PIRS, the Development Task Force delivered its report to the Marine Coordination Group (MCG). The report was endorsed by the MCG and was the subject of a Memorandum to Government and was launched at SeaFest 2015
- Dr Fiona Grant was appointed as International Programmes Manager which includes acting as National Contact Point for marine aspects of the EU Horizon 2020 programme for research funding. Information events were held in Brussels and in Dublin to promote open calls
- Irish researchers won €2.2m under H2020 funding in marine-related topics representing 4.6% of the available budget. The Marine Institute continued its representation on the European Marine Board; EurOcean, and attended the Intergovernmental Oceanographic Commission of UNESCO (IOC) meeting

The Cullen Fellowship Programme was launched to provide research training opportunities for scientists in marine and related disciplines leading to Masters and PhD degrees. The programme was set up in memory of Anne Cullen (1958-2013), who made a significant contribution to the work of the Marine Institute for over 35 years. The programme reflects the Institute's ongoing commitment to developing excellence and capacity in marine science. The Cullen Fellowships are managed by the Research & Development Office to which Dr Ciaran Kelly was appointed manager during the year.

The Advanced Marine Technology Programme continued its engagement with research and industry under the umbrella of the SmartOcean Research and Innovation Strategy. This has expanded to cover the SFI research centres and EI/IDA technology centres. Deployment of the subsea cabled observatory in Galway Bay along with other infrastructure developments has provided a step for Ireland's ambitions to become a global centre of excellence in test and development of marine technology products and services. International collaborations were also facilitated through presentations on Irish expertise at international conferences and joint networking events with colleagues in Newfoundland and Labrador and SEAI at SeaFest 2015.



Mr. John Evans
Director: Policy, Innovation and Research Support

The Marine Institute's Cullen Fellowship was launched by Minister Coveney TD, which was attended by Cathal and Ruth Cullen as well as Peter Heffernan, CEO Marine Institute, Dr John Killeen, Chairman Marine Institute and Dr Paul Connolly, FEAS, Marine Institute.

Policy Support

PIRS supported the inter-departmental Marine Coordination Group (MCG), specifically with implementating Ireland's Integrated Marine Plan, *Harnessing Our Ocean Wealth* (HOOW). Key activities during the year included secretariat support to the Marine Development Force, that was established in 2014 to report on four specific actions in HOOW. These actions, and the final report addressed business development, marketing and promotion, integrated enterprise strategy, Research and Technical Development Infrastructure (RTDI) and opportunities linked to international marine education and training. Eight high-level recommendations were outlined in the final report, supported by a proposed framework to assist the development of the marine sector in accordance with HOOW. Following government endorsement of the framework and subsequent publication at SeaFest 2015 the MCG convened an Implementation Group comprising senior representatives of Ireland's development agencies to address one of the recommendations, namely establishing an Integrated Marine Development Team. Convening over four meetings, December 2014/January 2015, the group is expected to report back to the MCG in early 2016.

Similar to 2014, the MCG, supported by the Marine Institute, held the second Our Ocean Wealth Conference in Ringaskiddy, Co. Cork. The event focussed on the commercial opportunities presented by Ireland's ocean wealth, and attracted over 500 delegates and was addressed by Ministers and Departments represented on the MCG.

The Enablers Task Force Report (establishing marine spatial planning in Ireland) and SEMRU's third Ocean Economy Report for Ireland, supported by the Marine Institute, were launched at the conference. Ireland's first maritime festival also took place during SeaFest 2015. Organised by the Marine Institute on behalf of the MCG, the event brought together state bodies, marine businesses, educators, researchers, policy makers and the general public at IMERC in Cork Harbour, location of the National Maritime College of Ireland (NMCI), UCC's Beaufort Building and home to SFI Marine Renewable Energy Centre (MaREI).

The programme included a seafood fair organised by BIM and Bord Bia; with seafood cookery demonstrations with celebrity chefs and seafaring family fun; tours of the Irish Naval ships; a Parade of Sail ending in Cork City; leisure craft and boats; exhibits on marine life and all manner of festival entertainment for all age groups. An Taoiseach Enda Kenny also officially opened UCC's state-of-the-art Beaufort Building, marking a milestone in Ireland's understanding of its ocean energy resource. The festival and associated events attracted an estimated 10,000 people. Preparations are underway for the third Annual *Our Ocean Wealth* Conference in association with SeaFest 2016, scheduled for Galway in July.

Office of Research & Development

During 2015, €4.7m was invested under the Marine Research Programme: €3m for ship-time utilising the research vessels and Remotely Operated Underwater Vehicle (ROV); and €1.7m on new research projects.

The ship-time investment funded the research vessels and the ROV for multi-disciplinary marine research and student training in Irish waters and beyond (further details provided in Appendix 1). Under the programme, 113 days provided

support for research, and 69 days to provide training on-board the RV *Celtic Explorer* and RV *Celtic Voyager*). The nine new Cullen Fellowships funded during the year brought the total to thirteen, and investment in this programme in 2015 totalled €0.6m. Co-funded programmes with the Joint Programming Initiative (JPI Oceans) were undertaken, valued just over €1.0m over the next three years. These projects include investments in Irish researchers working collaboratively with EU partners and industry in marine biotechnology and microplastics. The researchers mobility programme (Networking grants and Fulbright scholarships) continued, with an investment of €82,000 to support Irish researchers to build collaborations, and promote their research in Ireland, the EU and globally.

The final report from the AquaPlan project was published and is now available on the Marine Institute Open Access Repository. The AquaPlan project brought together key stakeholders from the finfish aquaculture industry and State agencies with the aim of drafting and implementing a national strategic plan for fish health in Ireland.

As well as handling the administration of Ship-time, Networking and Cullen Fellowships calls, the Research Office also supported Marine Institute colleagues in the financial management and administration of EU-funded research projects. Support is currently provided for 19 projects (including the new H2020 projects), valued in excess of €4.2m in grant-aid to the Marine Institute.

The online grant management system was also upgraded for external user profiles.

International Programmes

In May 2015, Dr Fiona Grant was appointed International Programmes Manager. Her role will involve acting as National Contact Point for marine aspects of Horizon 2020 funding. John Evans continues to act as National Delegate on the Societal Challenge 2 Programme Committee and was elected to the Executive Committee of JPI Oceans. Information events were held in Brussels and Dublin to promote open H2020 calls. The Brussels event was operated as a webcast with eight Societal Challenge 2 presentations and three parallel sessions. In November 133 researchers, engineers and SMEs attended the information event in Dublin. A dedicated Blue Growth session was undertaken by the Marine Institute with 30 participants. During the year Irish researchers won €2.2m in H2020 funding in marine related topics representing 4.6% of the available budget. Eight proposals with Irish partners were submitted [to the Blue Growth topics – , with 15 Irish participants – unclear]. Of those, two projects were successfully funded with five Irish partners. This represents an average 10% success rate for Irish researchers in Blue Growth, rising to 17% for individual topics. Within the Sustainable Food Security topics, two proposals (from a total of five) were submitted with two participants from Ireland. Both projects were funded, representing a success rate of between 33-50% for individual topics.

National Advanced Marine Technology Programme

During 2015 the Advanced Marine Technology Programme continued to mobilise the research and innovation community, to create a critical mass multi-disciplinary industry-oriented grouping for sensors, platforms, communications, robotics, computer vision and informatics for the marine. Some developments were achieved from a national policy perspective, such as the report of the Development Task Force launched at SeaFest 2015. The Programme also moved into a new service area: Policy, Innovation and Research Support Services (PIRS).

Significant advancement was also achieved with established centres through the SFI Research Centres Programme and the EI/IDA Technology Centres Programme to broker partnerships and opportunities among research community/industry.

One particular highlight was a workshop on Marine Data Analytics and Cloud computing held in association with the EI/IDA technology centres CeADAR and IC4 for SMEs and researchers from the SmartOcean cluster. A section of joint projects subsequently emerged from this workshop. Research visits were also carried out to Nimbus (CIT); Tyndall National Institute; Mobile and Marine Robotics Centre at UL MaRE; the Entrepreneur Ship at IMERC and others.

A subsea cabled observatory was deployed in Galway Bay in the earlier part of 2015. This is a significant step towards establishing Ireland as an international hub for marine technology development and ICT. The Programme worked with SmartBay and others and involved the research community in additional funding initiatives and international collaborations e.g. EuroGOOS Working group on HF Radars.

Another significant development was an engagement with the Irish Air Corps. The Service Level Agreement between the Marine Institute and the Department of Defence was updated to use Air Corps platforms to support research and innovation which will provide a significant opportunity to the marine research and innovation base. Many are already in the pipeline. An example of how the partnership can produce real economic benefits was demonstrated in Q4 when researchers accompanied a maritime patrol unit to better understand how algal blooms can impact marine aquaculture.

The Programme continued to promote national expertise across marine technology and related areas at national and international events, and to promote the development of international collaborations. International presentations took place in St John's, Newfoundland, and at the Ocean's conference in Washington DC. Team members also participated in other international trade shows such as *Ocean Business 2015*. To build on the research and enterprise collaboration launched between Ireland and Newfoundland and Labrador at the end of 2014, a SmartOcean Ireland/Newfoundland and Labrador

networking event was held at SeaFest 2015 in conjunction with SEAI and the Provincial Government of Newfoundland and Labrador. Following the event, two individual trips took place between Irish PIs (MMRC at UL and Tyndall National Institute) to Newfoundland. The Programme also contributed to other events at SeaFest 2015 to promote the cluster, including the trade show and parallel sessions in Marine ICT and Ocean Energy, and Business and Enterprise. Team members also facilitated at the investors' event held in advance of the conference and we look forward to building on these events at SeaFest 2016.

Atlantic Ocean Research Alliance Coordination and Support Action

The AORA-CSA held its Project Kick Off Meeting in Lisbon over June 3-4 involving all project partners and with representation from the EU Commission, NOAA, USA and DFO Canada.

In June, a multi-national team of European, Canadian, and American ocean mapping experts completed the first trans-Atlantic survey under the Atlantic Ocean Research Alliance on board the RV *Celtic Explorer* between St. John's, Newfoundland and Labrador, Canada and Galway.
In July, a second survey mapped the North Atlantic Ocean seabed between Halifax, Nova Scotia and Tromsø, Norway aboard the Canadian Coast Guard ship *Louis S. St-Laurent*. This continued the exciting science collaboration between Canada, the U.S. and the EU, demonstrating the commitment to implementing the Galway Statement which is a shared commitment to the stewardship of the Atlantic Ocean.

A trilateral governance meeting took place in St John's, Newfoundland on October 26th again with participation from Canada, Europe and the United States.

The year ended with the first board meeting of the AORA-CSA in Brussels on December 9th involving representatives from Europe, US, Canada, Brazil and South Africa.

General Administration

Audit Committee »

During the year ended 31 December 2015, the Audit Committee comprised the following non-executive members of the Board: Patricia Barker, Francis Coyle, David Owens and Lorcán Ó Cinnéide. Lorcán Ó Cinnéide and Francis Coyle each retired as a member of the Committee in February and May 2015 respectively.

While all directors have a duty to act in the interests of the company, the Audit Committee has a particular role, acting independently from the executive, to ensure that the interests of the stakeholders are properly protected in relation to the financial reporting oversight, internal control, internal and external audit, risk management and corporate governance. The main duties of the Audit Committee are to oversee the relationship with the external auditor, the Comptroller & Auditor General. During the year under review, the Audit Committee did not discuss with the external auditor the nature and scope of the audit to be undertaken, but met t with the external auditor to review his findings and the outcome of the audit, along with his recommendations contained in the Management Letter. The Committee also monitors the integrity of the financial statements prepared by the Company and the monthly management accounts prepared by management.

During the year ended 31 December 2015, the Committee kept under review the effectiveness of the Company's internal controls and risk management systems. In particular, we:

- monitored the Risk Management System and the movement of risks on the register
- engaged with the internal auditor to discuss the work programme and the outcomes of the internal audits and to assess our reliance on the conclusions of the internal auditor
- monitored the adoption and implementation of the recommendations of internal and external auditors
- engaged with the CFO and CEO to assure ourselves as to the accounting judgements applied to the financial statements
- reviewed the Health & Safety policies in place
- reviewed possible implications for the organisation under the Lobbying legislation
- prepared data to support the Chairman's letter of assurance to the Minister; and
- conducted an internal review of our performance during the year under review.

The Terms of Reference of the Audit, Finance & Risk Committee have been approved by the Board and are reviewed on an annual basis and amended as appropriate. The Committee met six times in 2015. The Audit Committee, having considered all relationships between the Institute and the internal audit firm, does not consider that those relationships impair the auditor's judgement or independence.

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, as well as 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 up-dated 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)

The headquarter office and laboratory facility in Oranmore and the research vessels *Celtic Explorer* and *Celtic Voyager* are the Institute's predominant energy users. The research vessels are of national importance and undertake scientific surveys both nationally and internationally. The vessels operate a Fuel Usage Minimisation policy, using a single engine in silent mode at all times. The *Celtic Explorer* is a diesel electric vessel, which is currently the most efficient type of vessel. Energy efficiency reports are monitored and reported monthly for both vessels.

In 2015 the Marine Institute consumed:

- 2,849,712 kWh of electricity
- 17,874 litres of Kerosene
- 402,025 litres of bulk propane gas for heating
- 6,746 litres of road diesel
- 1,259,338 litres of Marine gasoil for Marine Institute funded research surveys

An increase in consumption between 2014 and 2015 can be seen and is attribute to the following:

- Institute's Vehicle Fleet increased by 1 vehicle
- Catering services recommenced in HQ – increasing use in propane gas and electricity
- Heating issue resolved in Oranmore restaurant resulting in additional heating requirement
- Summer temperatures were lower than 2014 resulting in an increase in heating requirement

A trial was undertaken in late 2014 whereby LED lighting was installed along one corridor in our headquarters in Oranmore with external lighting levels used to control the lighting operations. Energy consumption was reduced in this area throughout 2015 and it is a programme to roll out LED lighting in other suitable areas will be undertaken in 2016.

Scéim Gaeilge 2015 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 updated scheme was confirmed by the Minister and will remain in force for a three year period from 6th October 2014. 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.

APPENDIX 1:
MARINE RESEARCH PROGRAMME 2014 – 2020
SHIP-TIME PROGRAMME AWARDS 2015

FUNDED RESEARCH PROJECTS 2015

MARINE RESEARCH PROGRAMME 2014-2020 – SHIP-TIME PROGRAMME 2015

Research Measure	Research Programme	Project Type	Project Reference	Project Title	Grantee / Lead	Total Grant-Aid
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15002	NMCI Shipboard Familiarisation and Training	Cork Institute of Technology	€32,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15003/ CV15007/ CV15028	SMART Accredited Common Learning Module (Spring and Winter 2015)	Galway-Mayo Institute of Technology	€192,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15004	Introduction to Seabed Mapping: Training for MSc Students	University College Cork	€16,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15005	SMARTH MRC Ocean Energy 2015	Galway-Mayo Institute of Technology	€32,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15006	SMART ScienceatSea 2015: 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	CV15008	Undergraduate Shipboard Training in Methods of Oceanographic, Benthic, Megafauna and Fisheries Research	Galway-Mayo Institute of Technology	€64,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15023	MSc Marine Biology Training 2015	University College Cork	€16,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15025	MSc Coastal and Marine Environments Training 2015	National University of Ireland, Galway	€24,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15026	SMART AIT MECI Common Learning Module 2015	Galway-Mayo Institute of Technology	€32,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15027	SMART UCC Offshore Geological Exploration 2015 (Cork Harbour)	Galway-Mayo Institute of Technology	€32,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	CV15034	Multidisciplinary Survey Planning - A Peer Assisted Learning Exercise Led by Postgraduate and Final Year Degree Students	Galway-Mayo Institute of Technology	€64,000
Infrastructure Supporting	Research Vessel Ship-Time	Policy Support Survey	CE15002	Trial of New Multibeam System and Deepwater Sub Bottom Profiler	Marine Institute	€162,000
Infrastructure Supporting	Research Vessel Ship-Time	Policy Support Survey	CE15003	Ocean Climate Sections and Geology: Porcupine, Rockall Areas	Marine Institute	€144,000
Infrastructure Supporting	Research Vessel Ship-Time	Policy Support Survey	CE15006	Lay Subsea Cable in Galway Bay	Marine Institute	€162,000

APPENDIX 1: (continued)
MARINE RESEARCH PROGRAMME 2014 – 2020
SHIP-TIME PROGRAMME AWARDS 2015

FUNDED RESEARCH PROJECTS 2015

MARINE RESEARCH PROGRAMME 2014-2020 – SHIP-TIME PROGRAMME 2015

Research Measure	Research Programme	Project Type	Project Reference	Project Title	Grantee / Lead	Total Grant-Aid
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE15007	Transatlantic Added Value 2015	National University of Ireland, Galway	€252,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE15009	QuERCi (Quantifying Environmental Controls on Cold-Water Coral Reef Growth)	University College Cork	€370,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE15011	Mapping the Deep: The application of predictively modelled maps and monitoring of vulnerable marine ecosystems to European MSP (marine spatial planning)	National University of Ireland, Galway	€250,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CE15012	Deep-Links: Ecosystem Services of deep-sea biotopes	University College Dublin	€514,000
Infrastructure Supporting	Research Vessel Ship-Time	Policy Support Survey	CV15001	Winter Environmental Survey of Programme Irish Coastal Waters 2015	Marine Institute	€104,000
Infrastructure Supporting	Research Vessel Ship-Time	Policy Support Survey	CV15009	Sea Bass Survey 2015	Marine Institute	€40,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV15013	DINO15 (*Dinophysis* Harmful Algal Bloom)	National University of Ireland, Galway	€48,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV15017	HABSOC15 (Harmful Algal Bloom Occurrences 2015)	National University of Ireland, Galway	€48,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV15019/ CV15031	Cetaceans on the Frontier 7	Galway-Mayo Institute of Technology	€160,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV15021	World War I Shipwrecks in the Irish Sea	University of Ulster	€112,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	CV15024	Novel Technology "Anchor Trials" for Renewable Energy	University College Dublin	€80,000
TOTAL						€2,998,000

APPENDIX 1: (continued)

MARINE RESEARCH PROGRAMME 2014 – 2020
SHIP-TIME PROGRAMME AWARDS 2015

FUNDED RESEARCH PROJECTS 2015

MARINE RESEARCH PROGRAMME 2014-2020 – SHIP-TIME PROGRAMME 2015

Research Measure	Research Programme	Project Type	Project Reference	Project Title	Grantee / Lead	Total Grant-Aid
Policy Support	Marine Environment	Postgraduate Fellowship	CF/15/01	Cullen Fellowship (PhD): The Biological Oceanography of *Azadinium*	Institute of Technology Sligo	€67,500
Industry	Seaweed	Postgraduate Fellowship	CF/15/02	Cullen Fellowship (PhD): Integrated approach to Seaweed Resource Assessment	National University of Ireland, Galway	€67,500
Industry	Fisheries Resources	Postgraduate Fellowship	CF/15/03	Cullen Fellowship (PhD): Freshwater and Marine Influences on coastal lagoon ecology	National University of Ireland, Galway	€67,500
Policy Support	Marine Environment	Postgraduate Fellowship funded	CF/15/04	Cullen Fellowship (Masters): Shellfish Microbiology	University College Dublin	€45,000
Industry	Fisheries Resources	Postgraduate Fellowship funded	CF/15/05	Cullen Fellowship (PhD): Resolving the Organic Carbon Budget of a salmonid humic lake	Dundalk Institute of Technology	€67,500
Industry	Fisheries Resources	Postgraduate Fellowship	CF/15/06	Cullen Fellowship (PhD): Early Migration Mortality in salmon and sea trout from the Burrishoole National Index River	University College Cork	€67,500
Industry	Fisheries Resources	Postgraduate Fellowship	CF/15/07	Cullen Fellowship (PhD): Early Migration Mortality in salmon and sea trout from the Burrishoole National Index River	Galway-Mayo Institute of Technology	€67,500
Policy Support	Marine Environment	Postgraduate Fellowship funded	CF/15/08	Cullen Fellowship (PhD): GIS Decision and Plan-Making Support System	Queen's University Belfast	€67,500
Policy Support	Policy, Socio-Research Economic and Legal Research	Postgraduate Fellowship	CF/15/10	Cullen Fellowship (Masters): Strategic marketing plan for developing Ireland as an International Centre for shipping services and maritime commerce	National University of Ireland, Galway	€45,000
Discovery	Marine Biodiscovery/ Biotechnology	Project-Based Award funded	PBA/MB/ 15/01	*NEPTUNA: Novel Extraction Processes for mulTiple high-value compoUNds from selected Algal source materials	National University of Ireland, Galway	€207,700
Discovery	Marine Biodiscovery/ Biotechnology	Project-Based Award funded	PBA/MB/ 15/02	*NEPTUNA: Novel Extraction Processes for mulTiple high-value compoUNds from selected Algal source materials	University College Cork	€92,300
Discovery	Marine Biodiscovery/ Biotechnology	Project-Based Award	PBA/MB/ 15/03	*SeaRefinery: The Seaweed Biorefinery for high value added products	CyberColloids Limited	€195,000
Discovery	Marine Biodiscovery/ Biotechnology	Project-Based Award	PBA/MB/ 15/04	*SeaRefinery: The Seaweed Biorefinery for high value added products	Cork Institute of Technology	€105,000
Policy Support	Marine Environment	Project-Based Award	PBA/ME/ 15/01	#BASEMAN: Defining the baselines and standards for microplastics analyses in European waters	Galway-Mayo Institute of Technology	€150,000

APPENDIX 1: (continued)
MARINE RESEARCH PROGRAMME 2014 – 2020
SHIP-TIME PROGRAMME AWARDS 2015

FUNDED RESEARCH PROJECTS 2015

MARINE RESEARCH PROGRAMME 2014-2020 – SHIP-TIME PROGRAMME 2015

Research Measure	Research Programme	Project Type	Project Reference	Project Title	Grantee / Lead	Total Grant-Aid
Policy Support	Marine Environment	Project-Based Award funded	PBA/ME/ 15/02	#EPHEMARE: Ecotoxicological Effects of Microplastics in Marine Ecosystems	University College Cork	€149,000
Policy Support	Marine Environment	Project-Based Award	PBA/ME/ 15/03	#PLASTOX: Direct and indirect ecotoxicological impacts of microplastics on marine organisms	National University of Ireland, Galway	€147,000
Innovation Supporting	Innovation	Networking Travel Grants	NT/15/01 to NT/15/91	Attendance at or Hosting of Marine Conferences, Workshops and Events	Various	€60,080
Discovery/ Industry	Marine Functional Foods/ Fisheries Resources	Capacity Building (Ireland/USA Programme)	2016/17	Marine Institute Fulbright Fellowship(s)	N/A_	€22,000
Industry	Shellfish Aquaculture	Tender	N/A	Production of tetraploid *Crassostrea gigas* juveniles for use as broodstock by Irish hatcheries for the production of genetic triploids	Cartron Point Shellfish Limited	€45,000
TOTAL						€1,735,580

** Funded under the First Call for Transnational Research Projects within the Marine Biotechnology ERA-NET.*
 # Funded under the Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans).
~This represents the MI contribution to the project, which is jointly funded with Bord Iascaigh Mhara.

APPENDIX 2:
IRISH PARTICIPATION IN EU HORIZON 2020 BLUE GROWTH AND RELATED CALLS

The Marine Institute supports Irish researchers and Small & Medium Enterprise (SME) participation in a variety of EU competitive funding programmes, in particular Horizon 2020. The Institute provides a national delegate (John Evans) for the Horizon 2020 Programme Committee for the Societal Challenge on 'Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research, and the Bio Economy' (SC2). Dr Fiona Grant acts as National Contact Point (NCP) for this societal challenge and works with other NCPs for other programmes to maximise Irish participation in the programme as part of Ireland's NCP network. SC2 includes the Blue Growth topic area which is dedicated to marine topics, and also the Sustainable Food Security, the Innovative, Sustainable & Inclusive Bio Economy and SME Instrument topic areas.

Ireland continues to perform strongly in the results of those calls launched in 2015 in relation to SC2. These included topics under the Blue Growth, Sustainable Food Security, and SME Instrument areas. No topics relating to marine were included under the Sustainable & Inclusive Bio Economy topic area. Irish performance is summarised below.

	Retained Budget 2015	IE € 2015	IE % 2015	MI € 2015	MI % 2015
Blue Growth - All Marine Topics	36,958,400	1,271,991	3.4%	0	0.0%
Sust. Food Security - 2 Marine Topics	11,425,270	955,466	8.4%	661475	5.8%
SME Instrument - 4 Marine Topics	12,093,018	636,125	5.3%	0	0.0%
2015 IRISH PERFORMANCE	**60,476,688**	**2,863,582**	**4.7%**	**661,475**	**1.1%**

The table illustrates that the Marine Institute, in addition to its catalytic role for marine research in Ireland, also performed well in its own right as a research performer participating in the TAPAS and VIVALDI projects under Sustainable Food Security. This is in line with the trend started in FP7 and continued in the 2014 H2020 results which saw strong performance by the Marine Institute and the wider marine research community in Ireland. The cumulative Irish performance in relation to marine topics under H2020 to date is shown below.

	Retained Budget Cumulative	IE € Cumulative	IE % Cumulative	MI € Cumulative	MI % Cumulative
Blue Growth – All Marine Topics	133,011,592	6,051,012	4.5%	1,593,375	1.2%
Sust. Food Security - 5 Marine Topics	33,119,115	1,764,456	5.3%	936,475	2.8%
SME Instrument - 4 Marine Topics (2015)	12,093,018	636,125	5.3%	0	0.0%
CUMULATIVE IRISH FORMANCE	**178,223,725**	**8,451,593**	**4.7%**	**2,529,850**	**1.4%**

There were seven Irish participants in projects funded under the 2015 calls, with NUI Galway being the top marine performer receiving approximately €971,000 in European funding in this area as partners in the ATLAS, CERES and VIVALDI Projects. Another notable Irish success was that of Brandon Bioscience Ltd, who were successful under the SME Instrument with the SEA-MORE-YIELD project.

The successful projects with Irish partners from SC2 are listed on the following pages. Irish researchers were also successful in a range of other programme areas including those relating to research infrastructures, climate change and energy many of which received indirect support from the Marine Institute via the NCP network.

Project Title: A Trans-AtLantic Assessment and deep-water ecosystem-based Spatial management plan for Europe (ATLAS)

Heriot-Watt University (Coordinator)

UCD (Irish Partner)
Value to Irish Partner: €225,000

NUI Galway (Irish Partner)
Value to Irish Partner: €654,991

Aqua TT (Irish Partner)
Value to Irish Partner: €142,000

Project Abstract

ATLAS creates a dynamic new partnership between multinational industries, SMEs, governments and academia to assess the Atlantic's deep-sea ecosystems and Marine Genetic Resources to create the integrated and adaptive planning products needed for sustainable Blue Growth. ATLAS will gather diverse new information on sensitive Atlantic ecosystems (incl. VMEs and EBSAs) to produce a step-change in our understanding of their connectivity, functioning and responses to future changes in human use and ocean climate. This is possible because ATLAS takes innovative approaches to its work and interweaves its objectives by placing business, policy and socioeconomic development at the forefront with science. ATLAS not only uses trans-Atlantic oceanographic arrays to understand and predict future change in living marine resources, but enhances their capacity with new sensors to make measurements directly relevant to ecosystem function. The ATLAS team has the track record needed to meet the project's ambitions and has already developed a programme of 25 deep-sea cruises, with more pending final decision. These cruises will study a network of 12 case studies spanning the Atlantic including sponge, cold-water coral, seamount and mid-ocean ridge ecosystems. The team has an unprecedented track record in policy development at national, European and international levels. An annual ATLAS Science-Policy Panel in Brussels will take the latest results and Blue Growth opportunities identified from the project directly to policy makers. Finally, ATLAS has a strong trans-Atlantic partnership in Canada and the USA where both government and academic partners will interact closely with ATLAS through shared cruises, staff secondments, scientific collaboration and work to inform Atlantic policy development. ATLAS has been created and designed with our N American partners to foster trans-Atlantic collaboration and the wider objectives of the Galway Statement on Atlantic Ocean Cooperation.

Project Title: Climate change and European aquatic RESources (CERES)

University of Hamburg (Coordinator)

NUI Galway (Irish Partner)
Value to Irish Partners: €200,000

Vet Aqua (Irish Partner)
Value to Irish Partner: €50,000

Project Abstract

CERES advances a cause-and-effect understanding of how future climate change will influence Europe's most important fish and shellfish populations, their habitats, and the economic activities dependent on these species. CERES will involve and closely cooperate with industry and policy stakeholders to define policy, environment, social, technological, law and environmental climate change scenarios to be tested. This four-year project will:

- Provide regionally relevant short, medium and long-term future, high resolution projections of key environmental variables for European marine and freshwater ecosystems
- Integrate the resulting knowledge on changes in productivity, biology and ecology of wild and cultured animals (including key indirect / food web interactions), and 'scale up' to consequences for shellfish and fish populations, assemblages as well as their ecosystems and economic sectors
- Utilize innovative risk-assessment methodologies that encompass drivers of change, threats to fishery and aquaculture resources, expert knowledge, barriers to adaptation and likely consequences if mitigation measures are not put in place
- Anticipate responses and assist in the adaptation of aquatic food production industries to underlying biophysical changes, including developing new operating procedures, early warning methods, infrastructures, location choice, and markets;
- Create short, medium and long-term projections tools for the fisheries industry as well as policy makers to more effectively promote blue growth of aquaculture and fisheries in different regions
- Consider market-level responses to changes (both positive and negative) in commodity availability as a result of climate change
- Formulate viable autonomous adaptation strategies within the industries and for policy to circumvent or prevent perceived risks or to access future opportunities
- Effectively communicate these findings and tools to potential end-users and relevant stakeholders.

Project Title: Sea-More-Yield: A Blue Biotechnology Solution for the Reduction of Pod Shatter in Bio-Oil Producing Crops

Brandon Products Limited (Coordinator)
Value to Irish Partner: €636,125

Project Abstract

Sea-More-Yield is a revolutionary non-transgenic platform for trait introduction via single 1.5L/Ha foliar spray, enabling immediate expression of desirable anti-shatter traits in OSR. This pioneering technology enables growers for the first time to modulate OSR pod physiology to minimise seed loss and yield risk with an early season spray (in the absence of pods). With a global population set to reach 9 billion by 2050, OSR is a key crop for human and animal consumption and is central to mitigating a future food and/or energy security crisis. OSR due to its relatively recent domestication suffers from a number of defects which limits its success as a modern day crop. Fully mature pods of oilseed rape are extremely prone to opening, resulting in seed loss (pod shatter). Typical losses vary between 15% and 25% of the potential yield, but reductions of up to 50% were estimated in seasons when weather conditions were poor prior to and during harvest. A reduction in the tendency of pods to opening is the number one trait sought by farmers and would serve to increase the proportion of the yield recovered by the combine harvester and thereby improve production efficiency and sustainability of OSR as alternative food and energy source. To address this industry-limiting problem, SMY offers a unique blue technology that modulates OSR pod physiology to control unsynchronized pod shatter leading to recovery of an additional 20% of the yield potential.

Project Title: Tools for Assessment and Planning of Aquaculture Sustainability (TAPAS)

University of Sterling (Coordinator)

Marine Institute (Irish Partner)
Value to Irish Partner: €542,474

Project Abstract

Aquaculture is one of five sectors in the EU's Blue Growth Strategy, aimed at harnessing untapped potential for food production and jobs whilst focusing on environmental sustainability. TAPAS addresses this challenge by supporting member states to establish a coherent and efficient regulatory framework aimed at sustainable growth. TAPAS will use a requirements analysis to evaluate existing regulatory and licensing frameworks across the EU, taking account of the range of production environments and specificities and emerging approaches such as offshore technologies, integrated multi-trophic aquaculture, and integration with other sectors. We will propose new, flexible approaches to open methods of coordination, working to unified, common standards. TAPAS will also evaluate existing tools for economic assessment of aquaculture sustainability affecting sectoral growth. TAPAS will critically evaluate the capabilities and verification level of existing ecosystem planning tools and will develop new approaches for evaluation of carrying capacities, environmental impact and future risk. TAPAS will improve existing and develop new models for far and near-field environmental assessment providing better monitoring, observation, forecasting and early warning technologies. The innovative methodologies and components emerging from TAPAS will be integrated in an Aquaculture Sustainability Toolbox complemented by a decision support system to support the development and implementation of coastal and marine spatial planning enabling less costly, more transparent and more efficient licensing. TAPAS partners will collaborate with key industry regulators and certifiers through case studies to ensure the acceptability and utility of project approach and outcomes. Training, dissemination and outreach activities will specifically target improvement of the image of European aquaculture and uptake of outputs by regulators, while promoting an integrated sustainable strategy for development.

Project Title: Preventing and mitigating farmed bivalve Diseases (VIVALDI)

Institut Francais de REcherce pour l'exploitation de la MER) (Coordinator)

NUI Galway (Irish Partner)
Value to Irish Partners: €116,059

University College Cork (Irish Partner)
Value to Irish Partners: €178,125

Marine Institute (Irish Partner)
Value to Irish Partner: €118,809

Project Abstract

The overarching goal of VIVALDI is to increase the sustainability and competitiveness of the European shellfish industry by improving the understanding of bivalve diseases and by developing innovative solutions and tools for the prevention, control and mitigation of the major pathogens affecting the main European farmed shellfish species: Pacific oyster *(Crassostrea gigas),* mussels *(Mytilus edulis and M. galloprovincialis)*, European flat oyster *(Ostrea edulis)*, clams *(Venerupis philipinarum)* and scallops *(Pecten maximus)*. The project addresses the

most harmful pathogens affecting either one or more of these shellfish species: the virus OsHV-1, Vibrio species including V. *aestuarianus*, V. *splendidus*, V. *harveyi* and V. *tapetis*, as well as the parasite *Bonamia ostreae*. The project is committed to provide practical solutions based on the most advanced knowledge. VIVALDI will dissect the disease mechanisms associated with pathogen virulence and pathogenesis and host immune responses, develop in vivo and in vitro models, and apply "omic" approaches that will help the development of diagnostic tools and drugs against pathogen targets, and breeding programmes in a collaborative effort with industrial partners. The proposal will include a global shellfish health approach, recognising that cultured bivalves are often exposed to several pathogens simultaneously, and that disease outbreaks can be due to the combined effect of two or more pathogens. The proposal will also investigate advantages and risks of the use of disease-resistant selected animals in order to improve consumer confidence and safety. VIVALDI will be both multi and trans-disciplinary. In order to cover both basic and applied levels from molecules to farm, the proposal will integrate partners with a broad range of complementary expertises in pathology and animal health, epidemiology, immunology, molecular biology, genetics, genomics and food safety.

APPENDIX 3:
MARINE INSTITUTE PUBLICATIONS

(Authors highlighted in bold indicate Marine Institute contributors)

SPECIAL REPORTS

Dransfeld, L., Maxwell, H.W., Moriarty, M., **Nolan, C., Kelly, E., Pedreschi, D., Slattery,N.,** & **Connolly, P.** (2015). *North Western Waters Atlas 3rd Edition*. Galway, Ireland: Marine Institute. ISBN 978-1-902895-59-8. Retrieved from http://hdl.handle.net/10793/1075

Irish Maritime Development Office. (2015). *The Irish Maritime Transport Economist, Volume 12, 2015*.

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Marine Institute. (2015). *The Stock Book 2015: Annual Review of Fish Stocks in 2015 with Management Advice for 2016*. Galway, Ireland: Marine Institute. Retrieved from http://hdl.handle.net/10793/1121

Marine Institute & Bord Iascaigh Mhara. (2015). *Shellfish Stocks and Fisheries Review 2014: An assessment of selected stocks*. Marine Institute & Bord Iascaigh Mhara. Retrieved from http://hdl.handle.net/10793/1063

McLeod, C., **Burrell, S.**, & Holland, P. (2015). *Review of the Currently Available Field Methods for Detection of Marine Biotoxins in Shellfish Flesh* (No. FS102086) (p. 87). Food Standards Agency Report. Retrieved from https://www.food.gov.uk/science/research/foodborneillness/shellfishresearch/fs102086

MARINE RESEARCH SUB-PROGRAMME (NDP 2007 – 2013)

Ruane, N., Geoghegan, F., Rodger, H., Murphy, K. & O'Sullivan, C. (2015). *Aquaplan: health management for finfish aquaculture*. (Marine Institute Sub-Programme 2007-2013; PBA/AF/08/003(01)). Marine Institute. Retrieved from http://hdl.handle.net/10793/1133

MARINE ENVIRONMENT & HEALTH SERIES

Glynn, D., Kelly, C., Moffat, R., Reid A., Toomey, M., O'Hea, L., Elliott, M., Hickey, C., Geary, M., Ruane, N., & McGovern, E. (2015). *Chemical Residues in Irish Farmed Finfish, 2012-2014*. (Marine Environment & Health Series No. 40). Marine Institute. Retrieved from http://oar.marine.ie/handle/10793/1093

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O'Donohoe, P., Kane, F., Kelly, S., McDermott, T., Drumm, A., & **Jackson, D.** (2015). *National Survey of Sea Lice (Lepeophtheirus salmonis Kroyer and Caligus elongatus Nordmann) on Fish Farms in Ireland - 2014* (Irish Fisheries Bulletin No.45). Marine Institute. Retrieved from http://hdl.handle.net/10793/1078

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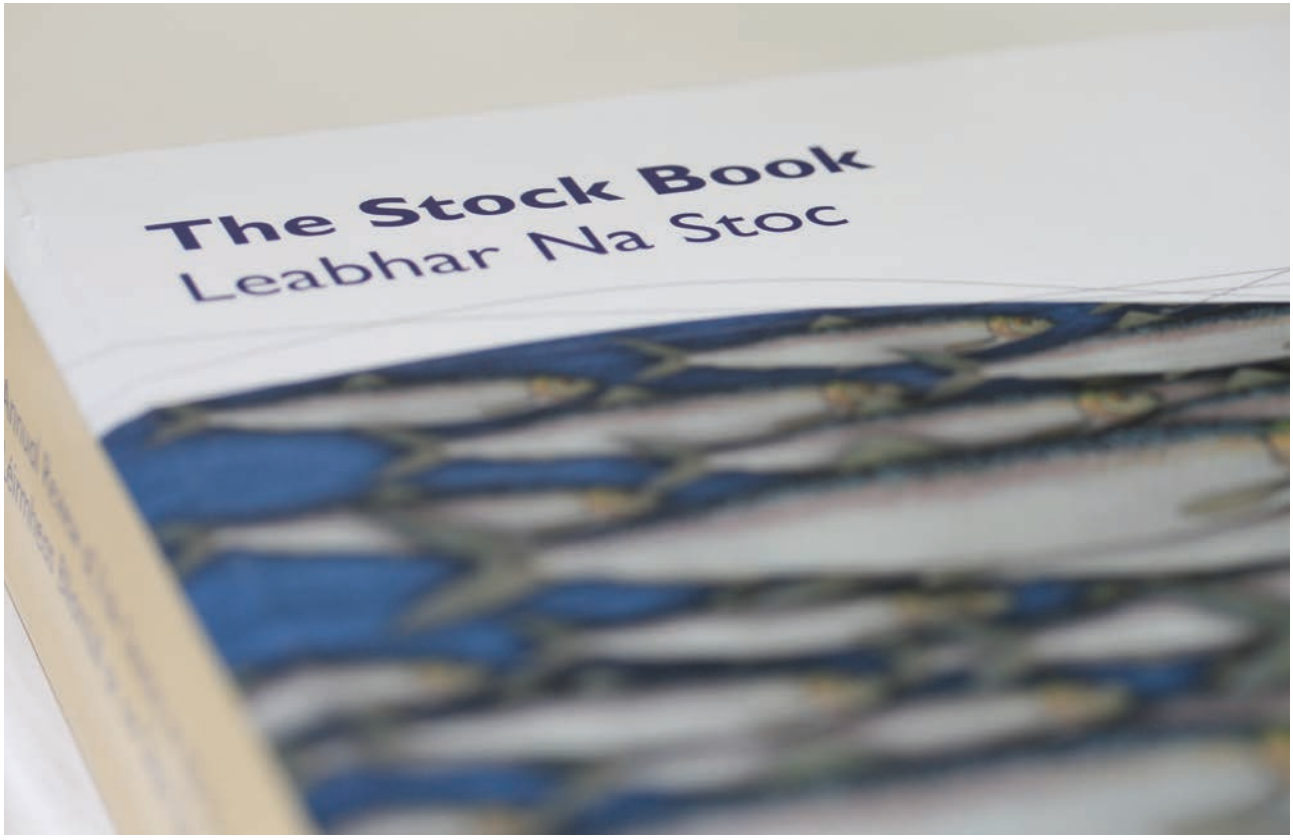
Doyle, J., Lordan, C., Fitzgerald, R., O'Connor, S., Fee, D., Butler, R., Stokes, D., Ni Chonchuir, G. ... Simpson, S. (2015). *Aran, Galway Bay and Slyne Head Nephrops Grounds (FU17) 2015 UWTV Survey Report and catch options for 2016* (UWTV Survey report). Marine Institute. Retrieved from http://hdl.handle.net/10793/1095

Lordan, C., Doyle, J., Fitzgerald, R., O'Connor, S., Blaszkowski, M., Stokes, D., Ni Chonchuir, G.,... Butler, R.,... ... Meakins, B. (2015). *The Labadie, Jones and Cockburn Banks Nephrops Grounds (FU2021) 2015 UWTV Survey Report and catch options for 2016* (UWTV Survey report). Marine Institute. Retrieved from http://hdl.handle.net/10793/1095



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Marine Institute, Institute for Marine Resources & Ecosystem Studies, Institute of Marine Research, PINRO, Faroe Marine Research Institute, Marine Scotland Marine Laboratory, ... Irish Whale and Dolphin Group. (2015). *International Blue Whiting Spawning Stock Survey (IBWSS) Spring 2015* (Working Group on International Pelagic Surveys; Working Group on Widely Distributed Stocks). Retrieved from http://hdl.handle.net/10793/1089

O'Donnell, C., Lynch, D., Lyons, K., & O'Donovan, M. (2015). *Celtic Sea Herring Acoustic Survey Cruise Report 2015, 02-22 October 2015* (FSS Survey Series: 2015/04). Marine Institute. Retrieved from http://hdl.handle.net/10793/1143

O'Donnell, C., & Nolan, C. (2015). *Boarfish Acoustic Survey Cruise Report 10 July – 31 July, 2015* (FSS Survey Series: 2015/03). Marine Institute. Retrieved from http://hdl.handle.net/10793/1142

O'Donnell, C., Nolan, C., Johnson, G., Keogh, N., van der Knaap, I., Borawska, A., & O'Donovan, M. (2015). *Blue Whiting Acoustic Survey Cruise Report, March 22 - April 01, 2015* (FSS Survey Series: 2015/01). Marine Institute. Retrieved from http://hdl.handle.net/10793/1141

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Marine Institute, AsMARA, National University of Ireland Galway & Department of Agriculture, Food and the Marine, 2015. Arsenic in Irish marine macroalgae- implications for industry. Marine Institute. Retrieved from http://hdl.handle.net/10793/1094

APPENDIX 4:
SCIENTIFIC PAPERS AND PUBLICATIONS

Brown, S. L., **Reid, D.**, & Rogan, E. (2015). Spatial and temporal assessment of potential risk to cetaceans from static fishing gears. *Marine Policy*, *51*, 267–280. http://doi.org/10.1016/j.marpol.2014.09.009

Burrell, S., Clion, V., Auroy, V., Foley, B., & Turner, A. D. (2015). Heat treatment and the use of additives to improve the stability of paralytic shellfish poisoning toxins in shellfish tissue reference materials for internal quality control and proficiency testing. *Toxicon*, *99*, 80–88. http://doi.org/10.1016/j.toxicon.2015.03.013

Chevallier, O. P., Graham, S. F., Alonso, E., Duffy, C., **Silke, J.**, Campbell, K., Botana, L.M. & Elliott, C. T. (2015). New insights into the causes of human illness due to consumption of azaspiracid contaminated shellfish. *Scientific Reports*, *5*, 9818. http://doi.org/10.1038/srep09818

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Dedman, S., Officer, R., Brophy, D., **Clarke, M.**, & **Reid, D. G.** (2015). Modelling abundance hotspots for data-poor Irish Sea rays. *Ecological Modelling*, *312*, 77–90. http://doi.org/10.1016/j.ecolmodel.2015.05.010

de Eyto, E., White, J., Boylan, P., Clarke, B., Cotter, D., Doherty, D., …**O'Maoileidigh, N.**, & O'Higgins, K. (2015). The fecundity of wild Irish Atlantic salmon *Salmo salar L*. and its application for stock assessment purposes. *Fisheries Research*, *164*, 159–169. http://doi.org/10.1016/j.fishres.2014.11.017

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Engelhard, G. H., Thurstan, R. H., MacKenzie, B. R., Alleway, H. K., Bannister, R. C. A., Cardinale, M., **Clarke**, **M. W.** … Lescrauwaet, A.-K. (2015). ICES meets marine historical ecology: placing the history of fish and fisheries in current policy context. *ICES Journal of Marine Science: Journal Du Conseil*, fsv219. http://doi.org/10.1093/icesjms/fsv219

Fennell, S., & Rose, G. (2015). Oceanographic influences on Deep Scattering Layers across the North Atlantic. *Deep Sea Research Part I: Oceanographic Research Papers*, *105*, 132–141. http://doi.org/10.1016/j.dsr.2015.09.002

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Fung, T., Farnsworth, K. D., **Reid, D. G.**, & Rossberg, A. G. (2015). Impact of biodiversity loss on production in complex marine food webs mitigated by prey-release. *Nature Communications*, *6*, 6657. http://doi.org/10.1038/ncomms7657

Harju, K., Rapinoja, M.-L., Avondet, M.-A., Arnold, W., Schär, M., **Burrell, S.**, ... Vanninen, P. (2015). Optimization of Sample Preparation for the Identification and Quantification of Saxitoxin in Proficiency Test Mussel Sample using Liquid Chromatography-Tandem Mass Spectrometry. *Toxins*, *7*(12), 4868–4880. http://doi.org/10.3390/toxins7124853

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Hernandez-Milian, G., Begoña Santos, M., **Reid, D**., & Rogan, E. (2015). Insights into the diet of Atlantic white-sided dolphins (*Lagenorhynchus acutus*) in the Northeast Atlantic. *Marine Mammal Science*. http://doi.org/10.1111/mms.12272

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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, 2015

Fish Census

The Burrishoole fish (salmon, trout, eel) census programme, which includes the upstream and downstream trap census and the juvenile stock monitoring in the streams and lakes using electrofishing and beach seine, forms the basis for much of the stock assessment and provision of stock and catch advice for salmon and eel. Research includes stock-recruitment and linking S-R with juvenile abundances, run timing, fish production analysis, fecundity and fish behaviour. Special emphasis is now also being placed on evaluation of marine survival and growth, especially in relation to changes in the environment.

Upstream census data for the Burrishoole system 2015 *(data for 2015 is provisional)*

Species	Salmon Leap Upstream 2015	Mill Race Upstream 2015	Totals Upstream 2015	Totals Upstream 2014	Totals Upstream 2013	Totals Upstream 2012
Wild Grilse	585	52	637	271	710	671
Wild Spring Salmon	9	1	10	26	23	18
Reared Grilse	1607	166	1773	1205	1301	2288
Wild Sea Trout	13	9	22	16	20	30
Wild Finnock	13	23	36	126	50	85
Wild Brown Trout	41	33	74	91	101	77

Downstream census data for the Burrishoole system 2015

Species	Salmon Leap Downstream 2015	Mill Race Downstream 2015	Totals Downstream 2015	Totals Downstream 2014	Totals Downstream 2013	Totals Downstream 2012
Wild Salmon Smolt	6057	977	8150	8150	6357	7717
Wild Sea Trout Smolt	397	31	431	427	485	632
Silver Eel	857	191	1048	3122	3633	3335

APPENDIX 6:
RESEARCH VESSEL PROGRAMME 2015

Science Days at Sea from 01/01/2015 - 31/12/2015	Days	Surveys	Scientist Days	Student Days
Celtic Voyager *Includes RV Prince Madog Charter*	210	29	1132	665
Celtic Explorer	302	17	3597	0
Total	**512**	**46**	**4729**	**665**

Research Fleet Fuel Usage 2015

Vessel	Distance Sailed	Fuel Consumption	EEOI (Efficiency measurement Metric Tonnes fuel/Nautical Mile)
Celtic Explorer	39,777.6 Nm	1,694,650 Litres	0.042603 M3/NM
Celtic Voyager	12,966.5 Nm	221,371 Litres	0.017073 M3/NM

RV Celtic Voyager Activity 2015

Survey Code	Survey Name	Survey Days	No. of Scientists	Scientist Days	No. of Students	Student Days	Student and Scientist Days
CV15001	Winter Environmental Monitoring Survey (nutrients & benthic)	13	6	78	0	0	78
CV15002	NMCI - Shipboard familiarisation and training	1	1	1	40	40	41
CV15003	Common Module Spring Part 1	4	5	20	24	48	68
CV15004	Introduction to seabed mapping - training for MSc students	2	5	10	10	20	30
CV15005	SMART HMRC Ocean Energy 2015	4	6	24	20	40	64
CV15008	Undergraduate Shipboard Training in Methods of Oceanographic, Benthic Megafauna and Fisheries Research	8	8	64	80	80	144
CV15010	Survey for Offshore Renewable Energy Programme	3	2	6	0	0	6
CV15007	SMART Common Module Spring 2015	8	5	40	52	85	125
CV15006	SMART Science@Sea 2015	7	4	28	44	88	116
CV15009	Bass Survey	10	5	50	0	0	50
CV15029	OBSERVE I	10	6	60	0	0	60
CV15011	Multiple Level Effects of Trawling (MULLET)	9	4	36	0	0	36
CV15013	DINO 15	6	3	18	0	0	18
CV15014	Porcupine-Aran 2015	10	6	60	0	0	60
CV15015	Celtic Sea UWTV Leg 1*	14	6	84	0	0	84

Survey Code	Survey Name	Survey Days	No. of Scientists	Scientist Days	No. of Students	Student Days	Student and Scientist Days
CV15017	HABSOC15*	6	4	24	0	0	24
CV15018	Langolf TV*	10	6	60	0	0	60
CV15020	Celtic Sea UWTV Leg 2	16	6	96	0	0	96
CV15021	World War I shipwrecks in the Irish Sea	7	7	49	0	0	49
CV15032	INFOMAR 2015	9	4	36	0	0	36
CV15033	ESBI Westwave geotechnical survey	11	6	66	0	0	66
CV15025	Galway Bay post-graduate Training Survey	3	6	18	12	36	54
CV15034	Multidisciplinary Survey Planning	8	6	48	74	74	122
CV15023	MSc Marine Biology University College Cork	2	2	4	16	16	20
CV15028	SMART Common Module Winter 2015	6	7	42	30	60	102
CV15026	SMART Common Module AIT Winter 2015	4	5	20	9	36	56
CV15027	SMART UCC Exploration Geology 2015	4	5	20	21	42	62
CV15024	Novel Technology "Anchor Trials" for Renewable Energy	10	6	60	0	0	60
CV15035	OBSERVE III	5	2	10	0	0	10
TOTAL		**210**		**1132**	**432**	**665**	**1797**

**These surveys were carried out on RV Prince Madog due to R.V.Celtic Voyager technical issues.*

RV Celtic Explorer Activity 2015

Survey Code	Survey Name	Survey Days	No. of Scientists	Scientist Days
CE15001	BSH Survey No. 1	13	13	169
CE15002	EM302 Acceptance Trial	9	11	99
CE15003	Ocean climate, marine chemistry and geology sections 2015	9	8	72
CE15004	BSH Survey No. 2	9	8	72
CE15005	Blue Whiting Acoustic Survey	21	10	210
CE15006	Smart Bay Cable Lay	9	14	126
CE15007	Transatlantic Added Value 2015	14	17	238
CE15008	CE2015 Fisheries Acoustic Survey Newfoundland	28	14	392
CE15015	St. Johns to Galway passage	7	7	49
CE15009	QuERCi - QUantifying EnviRonmental Controls on cold-water coral reef growth	15	13	195
CE15010	Northwest Herring Acoustic Survey	21	9	189
CE15011	Mapping the deep: the application of predictively modelled maps to European spatial planning	19	14	266
CE15013	BSH Survey No.3	39	9	351
CE15016	Irish Groundfish Survey Leg 1	12	14	168
CE15014	Celtic Sea Herring Acoustic Survey	21	16	336
CE15012	Deep-Links: Ecosystem services of deep-sea biotopes	21	10	210
CE15017	Irish Groundfish Survey Leg 2	35	13	455
TOTAL		**302**	**200**	**3597**

RV Celtic Voyager Cruise Details 2015

Survey Code	Survey Name	Chief Scientist	Organisation	Start Date	End Date	Survey Days
CV15001	Winter Environmental Monitoring Survey	Dr Evin McGovern	Marine Institute	20/01/2015	01/02/2015	13
CV15002	NMCI - Shipboard Familiarisation and Training	Mr Peter Walter	NMCI	09/02/2015	09/02/2015	1
CV15003	SMART Common Module Spring Part 1	Dr Pauhla McGrane	Galway Mayo Institute of Technology	19/02/2015	22/02/2015	4
CV15004	Introduction to Seabed Mapping - training for MSc students	Mr Darius Bartlett	University College Cork	24/02/2015	25/02/2015	2
CV15005	SMART HMRC Ocean Energy 2015	Dr Pauhla McGrane	Galway Mayo Institute of Technology	26/02/2015	01/03/2015	4
CV15008	Undergraduate Shipboard Training in Methods of Oceanographic, Benthic Megafauna and Fisheries Research	Dr Roisin Nash	Galway Mayo Institute of Technology	05/03/2015	12/03/2015	8
CV15010	Survey for Offshore Renewable Energy Programme	Mr Kevin Sheehan	Marine Institute	23/03/2015	25/03/2015	3
CV15007	SMART Common Module Spring 2015	Dr Pauhla McGrane	Galway Mayo Institute of Technology	28/03/2015	04/04/2015	8
CV15006	SMART Science@Sea 2015	Dr Pauhla McGrane	Galway Mayo Institute of Technology	12/04/2015	18/04/2015	7
CV15009	Sea Bass Survey	Ms Helen McCormick	Marine Institute	20/04/2015	29/04/2015	10
CV15029	OBSERVE I	Dr Simon Berrow	Galway Mayo Institute of Technology	05/05/2015	14/05/2015	10
CV15011	Multiple Level Effects of Trawling (MULLET) - EUROFLEETS2	Dr Marija Sciberras	Bangor University	17/05/2015	25/05/2015	9
CV15013	DINO 15	Dr Robin Raine	National University of Ireland Galway	02/06/2015	07/06/2015	6
CV15014	Porcupine-Aran 2015	Ms. Jennifer Doyle	Marine Institute	10/06/2015	19/06/2015	10

Survey Code	Survey Name	Chief Scientist	Organisation	Start Date	End Date	Survey Days
CV15015	Celtic Sea UWTV 2015 Leg 1*	Ms Jennifer Doyle	Marine Institute	29/06/2015	12/07/2015	14
CV15017	HABSOC15*	Dr Robin Raine	National University of Ireland Galway	13/07/2015	18/07/2015	6
CV15018	Langolf TV*	Dr Michele Salaun	Ifremer	20/07/2015	29/07/2015	10
CV15020	Celtic Sea UWTV Leg 2	Dr Colm Lordan	Marine Institute	19/08/2015	03/09/2015	16
CV15021	World War I shipwrecks in the Irish Sea:	Dr Ruth Plets	University of Ulster	05/09/2015	11/09/2015	7
CV15032	INFOMAR 2015	Mr Kevin Sheehan	Marine Institute	13/09/2015	21/09/2015	9
CV15033	ESBI Westwave Geotechnical Survey	Mr Brian Smith	Unassigned	22/09/2015	02/10/2015	11
CV15025	Galway Bay post-graduate Training Survey	Dr Audrey Morley	National University of Ireland Galway	07/10/2015	09/10/2015	3
CV15034	Multidisciplinary Survey Planning - A Peer Assisted Learning Exercise	Dr Roisin Nash	Galway Mayo Institute of Technology	12/10/2015	19/10/2015	8
CV15023	MSc Marine Biology University College Cork	Dr Rob McAllen	University College Cork	02/11/2015	03/11/2015	2
CV15028	SMART Common Module Winter 2015	Mr John Boyd	Galway Mayo Institute of Technology	04/11/2015	09/11/2015	6
CV15026	SMART Common Module AIT Winter 2015	Mr John Boyd	Galway Mayo Institute of Technology	10/11/2015	13/11/2015	4
CV15027	SMART UCC Exploration Geology 2015	Dr Pauhla McGrane	Galway Mayo Institute of Technology	18/11/2015	21/11/2015	4
CV15024	Novel Technology "Anchor Trials" for Renewable Energy	Mr Soroosh Jalilvand	University College Dublin	01/12/2015	10/12/2015	10
CV15035	OBSERVE III	Dr Simon Berrow	Galway Mayo Institute of Technology	11/12/2015	15/12/2015	5

**These surveys were carried out on the RV Prince Madog due to RV Celtic Voyager technical issues.*

RV Celtic Explorer Cruise Details 2015

Survey Code	Survey Name	Chief Scientist	Organisation	Start Date	End Date	Survey Days
CE15001	BSH Survey No. 1	Dr Stefan Schmolke	BSH	30/01/2015	11/02/2015	13
CE15002	EM302 Acceptance Trial	Mr. Kevin Sheehan	Marine Institute	16/02/2015	24/02/2015	9
CE15003	Ocean climate, marine chemistry and geology sections 2015	Ms. Margot Cronin	Marine Institute	25/02/2015	05/03/2015	9
CE15004	BSH Survey No. 2	Ms. Sieglinde Weigelt	BSH	10/03/2015	18/03/2015	9
CE15005	Blue Whiting Acoustic Survey	Mr. Ciaran O'Donnell	Marine Institute	22/03/2015	11/04/2015	21
CE15006	Smart Bay Cable Lay	Mr. Peter Phibbs	Unassigned	12/04/2015	20/04/2015	9
CE15007	Transatlantic Added Value 2015	Dr George Rose	Newfoundland - Fisheries and Marine Institute of Memorial University	21/04/2015	04/05/2015	14
CE15008	CE2015 Fisheries Acoustic Survey Newfoundland	Dr George Rose	Newfoundland - Fisheries and Marine Institute of Memorial University	05/05/2015	01/06/2015	28
CE15015	St. Johns to Galway passage	Mr. Thomas Furey	Marine Institute	02/06/2015	08/06/2015	7
CE15009	QuERCi -QUantifying EnviRonmental Controls on cold-water coral reef growth (Included use of ROV Holland 1)	Professor Andrew Wheeler	University College Cork	09/06/2015	23/06/2015	15
CE15010	Northwest Herring Acoustic Survey	Dr Cormac Nolan	Marine Institute	24/06/2015	14/07/2015	21
CE15011	Mapping the deep: the application of predictively modelled maps to European spatial planning(Included use of ROV Holland 1)	Dr Kerry Howell	Plymouth University	15/07/2015	02/08/2015	19
CE15013	BSH Survey No. 3	Mr. Holger Klein	BSH	07/08/2015	14/09/2015	39
CE15016	Irish Groundfish Survey Leg 1	Mr. Dave Stokes	Marine Institute	19/09/2015	30/09/2015	12
CE15014	Celtic Sea Herring Acoustic Survey	Mr. Ciaran O'Donnell	Marine Institute	02/10/2015	22/10/2015	21
CE15012	Deep-Links: Ecosystem services of deep-sea biotopes(Included use of ROV Holland 1)	Dr Jens Carlsson	University College Dublin	23/10/2015	12/11/2015	21
CE15017	Irish Groundfish Survey Leg 2	Mr. Dave Stokes	Marine Institute	13/11/2015	17/12/2015	35

APPENDIX 7:
FOREIGN MARINE SCIENTIFIC RESEARCH (MSR) ACTIVITIES IN IRISH WATERS IN 2015

Foreign Vessel Activity 2015

Scientist Days Ireland	Scientist Days Foreign
5394	3718.5

Country	Vessel Name	No. of Days in Irish Waters	No. of Scientists	Scientist Days
Britain	Corystes	32.5	7	227.5
Denmark	Ceton	1	2	2
Britain	MRV Scotia	5	7	35
Britain	Cefas Endeavour*	2	7	14
Britain	MRV Scotia	4	3	12
Britain	Discovery*	12	20	240
Netherlands	Tridens*	12	6	72
Russia	Fritjof Nansen	7	12	84
Norway	G.O Sars*	6	7	42
Britain	Benaiah IV	8	2	16
Britain	Discovery DY029	2	20	40
Britain	MRV Scotia	1	12	12
Norway	G O Sars	1	16	16
Britain	Discovery DY030*	19	20	380
Norway	Røttingøy*	15	5	75
Britain	Discovery DY031*	1	20	20
United States	Corwith Cramer	0	4	0
Britain	RRS Discovery	10	20	200
United States	Corwith Cramer	0	4	0
Britain	Discovery DY033*	22	20	440
Britain	Discovery DY034*	23	20	460
Britain	James Cook	31	10	310
Britain	Scotia	6	12	72
Spain	Vizconde de Eza*	28	15	420
Britain	Cefas Endeavour*	7	7	49
Britain	James Clark Ross	0	2	0
France	Thalassa*	18	25	450
Britain	Scotia	3	10	30
TOTAL		**276.5**	**315**	**3718.5**

**Signifies there was an Irish Observer onboard (12 in total)*

APPENDIX 8:
MARINE INSTITUTE STRATEGIC PLAN – EXECUTIVE SUMMARY

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—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.

Figure 1

Table 1: Marine Institute Goals and associated Key Objectives

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; including 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 and 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 - An Integrated Marine Plan for Ireland* 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.

APPENDIX 9:

GALWAY STATEMENT ON ATLANTIC OCEAN COOPERATION – LAUNCHING A EUROPEAN UNION – CANADA – UNITED STATES OF AMERICA 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

Máire GEOGHEGAN-QUINN
Commissioner for Research, Innovation and Science

For the Government of Canada

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

For the Government of the United States of America

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

Maria DAMANAKI
Commissioner for Maritime Affairs and Fisheries

Glossary of Abbreviations

AIT	Athlone Institute of Technology
AMS	Advanced Mapping Services
AORA-CSA	Atlantic Ocean Research Alliance – Coordination and Support Action
AsMARA	Arsenic in marine macroalgae and implications for commercial uses
B.A.	Bachelor of the Arts
BIM	Bord Iascaigh Mhara
BMW	Border, Midlands and Western Region
B.Sc.	Bachelor of Science
BSH	Bundesamt für Seeschifffahrt und Hydrographie (Federal Maritime and Hydrographic Agency of Germany)
CAFS	Chinese Academy of Fishery Science
CeADAR	Centre for Applied Data Analytics
CEO	Chief Executive Officer
CFP	Common Fisheries Policy
CIT	Cork Institute of Technology
CMEMS	Copernicus Marine Environment Monitoring Service
COFASP	Cooperation in Fisheries, Aquaculture and Seafood Processing Network
COOPEUS	Cooperation between the US and the EU in the Field of Environmental Research Infrastructures
DAFM	Department of Agriculture, Food and Marine
DAMARA	Fisheries management plan for the Celtic Sea
DCENR	Department of Communications, Energy and Natural Resources
DCF	Data Collection Framework
DCU	Dublin City University
DECLG	Department of the Environment, Community and Local Government
DFO	Department of Fisheries and Oceans
DGMARE	Directorate- General for Maritime Affairs and Fisheries
DINO15	Dinophysis harmful algal bloom 2015
DISCARDLESS	Working for less discards
DTX-2	Dinophysistoxin-2
E. Coli	Escherichia coli
EEOI	Energy Efficiency Operational Indicator
EMFF	European Maritime and Fisheries Fund
EMSO	European Multidisciplinary Seafloor Observatory
EPA	Environmental Protection Agency
ERIC	Euro-Argo European Research Infrastructure Consortiums
ESBI	Electricity Supply Board International
ETP	Excellence Through People
EU	European Union
EU FP7	Sea For Society Project
EuroGOOS	European Global Ocean Observation System
EurOcean	European Centre for Information on Marine Science and Technology
FSAI	Food Safety Authority of Ireland
GAA	Gaelic Athletic Association
GDP	Gross Domestic Product
GLEON	Global Lake Ecological Observations Network
GMIT	Galway Mayo Institute of Technology
GSI	Geological Survey of Ireland
HABS	Harmful Algal Blooms Service
HABSOC	Harmful Algal Bloom Occurrences 2015
HEA	Higher Education Authority
HEI	Higher Education Institute
HF	High Frequency
HMRC	Hydraulics and Maritime Research Centre
HOOW	Harnessing Our Ocean Wealth
HR	Human Resources
IBIROOS	Ireland Biscay Iberia Regional Ocean Observing System
ICES	International Council for the Exploration of the Seas
ICT	Information Communications Technology
IDA	Industrial Development Authority
IDO	Ireland's Digital Ocean
IFI	Inland Fisheries Ireland
IFPEA	Irish Fish Processor's and Exporters Association
IFREMER	Institut français de recherché pour l'exploration de la mer (French Research Institute for the Exploration of the Sea)
ILV	Irish Light Vessel
IMDO	Irish Maritime Development Office
IMERC	Irish Maritime and Energy Resource Cluster
IMTE	Irish Maritime Transport Economist
INFOMAR	Integrated Mapping for the Sustainable Development of Ireland's Marine Resources
INIS Hydro	Ireland, Northern Ireland, Scotland Hydrographic Survey
INTERREG EU	Inter-Regional Cooperation Programme

IS & D	Information Services and Development
ISEAS	Irish Seafarers Educational Assistance Scheme
IT	Information Technology
JNCC	Joint Nature Conservation Committee
JPI	Joint Programming Initiative
KPMG	Klynveld Peat Marwick And Goerdeler
MaREI	Marine Renewable Energy Ireland
MCG	Marine Coordination Group
MEFS	Marine Environment and Food Safety
MESH	Mapping European Seabed Habitats
MI	Marine Institute
M.Sc.	Master of Science
MSFD	Marine Strategy Framework Directive
MULLET	Multiple Level Effects of Trawling
NASCO	North Atlantic Salmon Conservation Organisation
NCP	National Contact Point
NDP	National Development Programme
NEA	North East Atlantic
NEAFC	North East Atlantic Fisheries Commission
NMCI	National Maritime College of Ireland, Cork
NOAA	National Oceanic and Atmospheric Administration
NoV	Norovirus
NPWS	National Parks and Wildlife Service
NUIG	National University of Ireland, Galway
NUIM	National University of Ireland, Maynooth
OSCE	Organisation for Security and Cooperation in Europe
OSIS	Ocean Science and Information Services
OSPAR	Oslo and Paris Convention (1992)
Ph.D.	Doctor of Philosophy
PMDS	Performance Management Development Systems
PRTLI	Programme for Research in Third Level Institutions
PwC	PricewaterhouseCoopers
QuERCi	Quantifying Environmental Controls on Cold-Water Coral Reef Growth
R & D	Research and Development
RIAN	Open Access Irish research publications managed by Irish Librarians
RNLI	Royal National Lifeboat Institution
ROV	Remotely Operated Vehicle
RTDI	Research, Technology, Development and Innovation
RTÉ	Radio Telifis Éireann
RV	Research Vessel
SACs	Special Areas of Conservation
SBM	Single Bay Management
SC2	Societal Challenge 2 (Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research, and the Bio Economy)
SEAI	Sustainable Energy Authority of Ireland
SEMRU	Socio-Economic Marine Research Unit
SFI	Science Foundation Ireland
SFPA	Sea Fisheries Protection Authority
SMART	Strategic Marine Alliance for Research and Training
SMEs	Small to Medium Sized Enterprises
SPAs	Special Protection Areas
STECF	Scientific, Technical and Economic Committee on Fisheries
STO	Scientific & Technical Officer
SSCS	Standing Scientific Committees for Salmon
SSCE	Standing Scientific Committees for Eel
TAPAS	Tools for Assessment and Planning of Aquaculture Sustainability
UCC	University College Cork
UCD	University College Dublin
UK	United Kingdom
UL	University of Limerick
UNESCO (IOC)	United Nations Educational, Scientific and Cultural Organization (Intergovernmental Oceanographic Commission
US	United States
USA	United States of America
UU	University of Ulster
UWTV	Underwater Television
WFD	Water Framework Directive
WGOH	Working Group on Operational Oceanography
WGOOFE	Working Group on Operational Oceanographic Products for Fisheries and Environment
VIVALDI	Preventing and mitigating farmed bivalve diseases

Financial Statements
Year Ended 31 December 2015

Comptroller and Auditor General
Report for presentation to the Houses of the Oireachtas

Marine Institute
I have audited the financial statements of the Marine Institute for the year ended 31 December 2015 under the Marine Institute Act 1991. The financial statements comprise the statement of income and expenditure and retained revenue reserves, the statement of comprehensive income, the statement of financial position, the statement of cash flows and the related notes. The financial statements have been prepared in the form prescribed under Section 12 of the Marine Institute Act, and in accordance with generally accepted accounting practice.

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 and for ensuring the regularity of transactions.

Responsibilities of the Comptroller and Auditor General
My responsibility is to audit the financial statements and to 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 Marine 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 Marine Institute's annual report to identify material inconsistencies with the audited financial statements and to identify any information that is apparently materially incorrect based on, or materially inconsistent with, the knowledge acquired by me in the course of performing the audit. 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:

- give a true and fair view of the assets, liabilities and financial position of the Marine Institute as at 31 December 2015 and of its income and expenditure for 2015; and
- have been properly prepared in accordance with generally accepted accounting practice.

In my opinion, the accounting records of the Marine Institute were sufficient to permit the financial statements to be readily and properly audited. The financial statements are in agreement with the accounting records.

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 if I find

- 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 Marine Institute's annual report is not consistent with the related financial statements or with the knowledge acquired by me in the course of performing the audit, or
- the statement on internal financial control does not reflect the Marine Institute's compliance with the Code of Practice for the Governance of State Bodies, or
- 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
Date: 30 June 2016

Statement of Responsibilities of the Board

Year ended 31 December 2015

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 consultation with the Minister for Public Expenditure and Reform. 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.

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 statutory requirements.

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

The Board is responsible for the maintenance and integrity of the corporate and financial information included on the Institute's website. Legislation in Ireland governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

Internal Control and Governance

The Institute has continued to adhere to the updated Code of Practice for the Governance of State Bodies. The Board Member's position in relation to Internal Control and Governance is set out in the Statement on Internal Financial Control on page 4 and the Audit Committee section included within the General Administration section of the Annual Report.

Accounting Records

The measures taken by the Board Members to secure compliance with the Institute's obligation to keep adequate accounting records are the use of appropriate systems and procedures and employment of competent persons. The accounting records are kept at the Institute's headquarters at Rinville, Oranmore, Co. Galway.

Accounting Policies

The principal accounting policies, together with the basis of preparation of the financial statements, are set out in the Significant Accounting Policies, Critical Accounting Estimates and Judgements section of these financial statements. The reporting period ended 31 December 2015 is the first period that the Institute has prepared its financial statements in compliance with FRS 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland".

Health & Safety

In accordance with the Health and Safety and Welfare Act (1989), the Marine Institute is compliant with all relevant standards. More details on Health and Safety are included under the Corporate Services section in the Annual report.

Going Concern

The Institute's financial statements have been prepared by the Board Members on a going concern basis having considered it appropriate by the Board Members to do so. This is included under critical accounting estimates and judgements on page 10.

Events after the Balance Sheet Date

The Board is not aware of any events occurring after 31 December 2015 which affect these financial statements.

Dr John Killeen
Chairperson

Date: 27 June 2016

Prof Patricia Barker
Board Member

Date: 27 June 2016

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 Board acknowledges that the system of internal financial control can only provide reasonable and not absolute assurance that assets are safeguarded, transactions are authorised, 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, authority and accountability;
- Establishing formal processes and procedures for monitoring the activities and safeguarding the assets of the organisation;
- Developing a culture of accountability across all levels of the institute; and
- Engaging with the Internal Auditor and the Comptroller and Auditor General to provide assurance as to the effectiveness and efficiency of the systems Internal Control.

A review of risk management was carried out in 2015 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 Institute including the extent and categories which it regards as acceptable;
- The assessment of the likelihood and impacts of identified risks occurring;
- The assessment of the Institute's ability to manage and mitigate the risks that do occur;
- The assessment of the costs of operating particular controls in proportion to the benefits obtained;
- 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 reporting, administration procedures including segregation of duties, systems that are designed to prevent and detect fraud 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;
- The performance of 3-4 internal audits annually; and
- Approval of expenditure in excess of €0.050m at Board meetings.

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 risks to which the Institute is exposed, and annual internal audit plans are based on this analysis. The analysis of risk and the internal audit plan for 2015 was endorsed by the Audit Committee and approved by the Board. The Audit Committee has received the reports of internal audit activity in 2015, and these have been presented to the Board. The reports include the Internal Auditor's assessment of 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 Comptroller and Auditor General, the Audit Committee which oversees the work of the internal auditor and the executive managers within the Marine Institute who have responsibility for the development and maintenance of the financial control framework.

The Board conducted a review of the effectiveness of the system of internal financial controls for 2015.

On behalf of the Board:

Dr John Killeen
Chairperson

Date: 27 June 2016

Statement of Income and Expenditure Account and Retained Revenue Reserves

Year Ended 31 December 2015

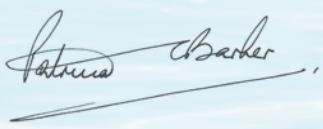
INCOME AND EXPENDITURE ACCOUNT

	Note	2015 €'000	Re-stated 2014 €'000
Income			
Oireachtas Grants	2	25,995	26,105
Other State Grants	3	5,932	5,882
EU and Other Income	4	5,104	4,331
Net Deferred Funding For Retirement Benefits	17	3,078	2,816
		40,109	39,134
Expenditure			
Salaries & PRSI	5	10,721	10,244
Retirement Benefit Costs	17	2,998	2,896
Vessel Operating Costs	6	7,265	7,469
Travelling Expenses	7	1,068	879
Grants and External Service Providers	8	8,114	7,867
Facilities Costs	9	1,892	1,699
IT, Telephone & Communications		932	843
Laboratory & Field Costs		811	810
Other Administration Costs	10	2,486	1,821
Depreciation	14	4,702	3,918
Total Expenditure		**40,989**	**38,446**
Transfer (to)/from Capital Account	13	993	(517)
Surplus for the year		113	171
Balance brought forward at 1 January		1,902	1,731
Balance carried forward at 31 December		**2,015**	**1,902**

The Statement of Cashflow and Notes 1 – 24 form part of these financial statements.

Dr John Killeen
Chairperson

Date: 27 June 2016



Prof Patricia Barker
Board Member

Date: 27 June 2016

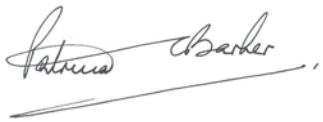
Statement of Comprehensive Income
Year Ended 31 December 2015

	Note	2015 €'000	Re-stated 2014 €'000
Surplus for the year after Appropriations		113	171
Experience (Losses) Gains on Retirement Benefits Scheme Liabilities	17	1,694	816
Changes in assumptions underlying the present value of the scheme	17	(8,466)	0
Adjustment to Deferred Benefits Scheme Funding		6,772	(816)
Total of Comprehensive Income for the year		113	171

The Statement of Cashflow and Notes 1 – 24 form part of these financial statements.

Dr John Killeen
Chairperson

Date: 27 June 2016



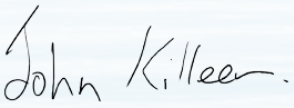
Prof Patricia Barker
Board Member

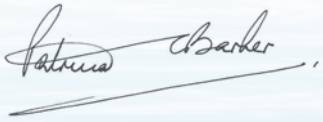
Date: 27 June 2016

Statement of Financial Position
as at 31 December 2015

	Note	2015 €'000	2015 €'000	2014 €'000	2014 €'000
Property, Plant and Equipment	14		20,712		21,705
Current Assets					
Receivables	15	4,451		5,200	
Cash and cash equivalents		581		1,334	
		5,032		6,534	
Current Liabilities					
Payables	16	3,017		4,632	
Net Current Assets			2,015		1,902
Total Assets Less Current Liabilities before Retirements Benefits			22,727		23,607
Deferred Retirement Benefits Funding	17	40,050		30,200	
Retirement Benefits Liabilities	17	(40,050)		(30,200)	
Total Net Assets			22,727		23,607
Representing:					
Capital Account	13	20,712		21,705	
Income and Expenditure Account		2,015		1,902	
			22,727		23,607

The Statement of Cashflow and Notes 1 – 24 form part of these financial statements.





Dr John Killeen
Chairperson

Date: 27 June 2016

Prof Patricia Barker
Board Member

Date: 27 June 2016

Statement of Cash Flows
Year Ended 31 December 2015

	2015 €'000	2014 €'000
Net Cash flows from operating activities		
Surplus for the financial year	113	171
Adjustments for:		
Depreciation of tangible Property, Plant and Equipment	4,702	3,988
Transfer to Capital Account	(993)	517
Decrease/(Increase) in Receivables	749	(1,234)
Decrease/(Increase) in Payables	(1,615)	1,939
Net cash flows from operating activities	2,956	5,381
Cash flows from investing activities		
Payments for tangible Property, Plant and Equipment	(3,709)	(4,505)
Net cash flows from investing activities	(3,709)	(4,505)
Net (decrease)/increase in cash and cash equivalents	(753)	876
Cash and cash equivalents at beginning of financial year	1,334	458
Cash and cash equivalents at end of financial year	581	1,334

Notes to Financial Statements

Year ended 31 December 2015

1. Accounting Policies

The basis of accounting and significant accounting policies adapted by the Marine Institute are set out below. They have all been applied consistently throughout the year and for the preceding year. The Institute has analysed its expenditure based on the nature of the expense as opposed to a programme basis. The 2014 comparative figures have been re-analysed on the same basis

General Information

The Marine Institute was established on the 30 October 1992 under the provisions of the Marine Institute Act 1991. The Institute headquarters is located in Rinville, Oranmore, County Galway H91 R673.

The Marine Institute primary objectives as set out in section 4 of the Act is "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 Marine Institute is a Public Benefit Entity (PBE)

Statement of Compliance

The financial statements of The Marine Institute for the year ended 31 December 2015 have been prepared in accordance with FRS 102, the financial reporting standard applicable in the UK and Ireland issued by the Financial Reporting Council (FRC), as promulgated by Chartered Accountants Ireland. These are The Marine Institute's first set of financial statements prepared in accordance with FRS 102. The date of transition to FRS 102 is 1 January 2014. The prior year financial statements were re-stated for material adjustments on adoption of FRS 102 in the current year. The result of this adoption can be seen in Note 22.

Currency

The financial statements have been presented in Euro (€) which is also the functional currency of the Institute. In instances where amounts have been rounded to the nearest thousand Euro, this is indicated by the symbol €'000.

Basis of Preparation

The financial statements are prepared under the accruals method of accounting and under the historical cost convention in the form approved by the Minister for Food Agriculture and the Marine with the concurrence of the Minister for Public Expenditure and Reform, in accordance with Section 22(1) of the Marine Institute Act 1991.

The following accounting policies have been applied consistently in dealing with items which are considered material in relation to The Marine Institute's financial statements

Income

Income arising from Oireachtas Grants is recognised on a cash receipts basis, except for the Oireachtas income in relation to the European Maritime and Fisheries Fund (EMFF) expenditure. This is recognised on an accruals basis as the Oireachtas income for the direct related expenditure is funded in the year after occurrence of the expenditure.

Income received in relation to EU and other contract research projects is recognised on an accruals basis whereby the income is recognised in the accounting period in which the related expenditure is charged. Income received in advance is treated as deferred income and included within Payables on the Statement of Financial Position. Expenditure incurred where the related income has not been received is treated as accrued income and shown as a Receivable on the Statement of Financial Position.

Property, Plant and Equipment and Depreciation

Property, Plant and Equipment are stated at cost less accumulated depreciation, except land, which is carried at cost. Depreciation is provided 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%
Fixtures and Fittings	25%
Computers	33%
Research Vessel	4%
Research Vessel Equipment	20 - 25%
Motor Vehicles	20%

The carrying values of the tangible assets are reviewed for impairment when events or changes in circumstances indicate that the carrying value may not be recoverable. If there is objective evidence of impairment of the value of the asset, an impairment loss is recognised in the Statement of Income and Expenditure and Retained Revenue Reserves in the year.

Leased Assets

Rental expenditure under operating leases is recognised in the Statement of Income and Expenditure and Retained Revenue Reserves over the life of the lease. Expenditure is recognised on a straight-line basis over the lease period, except where there are rental increases linked to the expected rate of inflation, in which case these increases are recognised when incurred. Any lease incentives received are recognised over the life of the lease.

Capital Account

The Institute recognises funding received for capital purposes under the Accruals Model specified in FRS102. The amount received is recognised in income on a systematic basis over the expected useful life of the asset.

Foreign Currencies

The functional currency and presentational currency of the Institute is the Euro (€).

Transactions denominated in a foreign currency are translated into the functional currency using the spot exchange rates at the date of the transactions. At the end of each financial year, foreign currency monetary items are translated to Euro using the closing rate. Non-monetary items measured at historical cost are translated using the exchange rate at the date of the transaction and non-monetary items measured at fair value are measured using the exchange rate when fair value was determined

Marine Research Programme

The Marine Institute enters into commitments in respect of contracts awarded for Marine Research Programme projects. Expenditure is charged in the financial statements on the basis of initial payments made on the 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 Marine Research Programme projects are funded by the capital vote of the Marine Institute and charged to the financial statements as they are incurred.

Employee Benefits

Short term benefits

Short term benefits such as holiday pay are recognised as an expense in the year, and benefits that are accrued at year-end are included in the payables figures in the Statement of Financial Position.

Retirement Benefits

The Marine Institute previously established its own defined benefit pension scheme, funded annually on a pay-as-you-go basis from monies provided by the Department of Agriculture, Food and the Marine and from contributions deducted from staff and members' salaries. The Marine Institute also operates the Single Public Services Pension Scheme ("Single Scheme"), which is a defined benefit scheme for pensionable public servants appointed on or after 1 January 2013. Single Scheme members' contributions are paid over to the Department of Public Expenditure and Reform (DPER).

Pension costs reflect pension benefits earned by employees, 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 Comprehensive Income, and a corresponding adjustment is recognised in the amount recoverable from the Department of Agriculture, Food and the Marine.

The financial statements reflect, at fair value, the assets and liabilities arising from The Marine Institute's pension obligations and any related funding, and recognises the costs of providing pension benefits in the accounting periods in which they are earned by employees. Retirement benefit scheme liabilities are measured on an actuarial basis using the projected unit credit method.

Receivables

Receivables are recognised at fair value, less a provision for doubtful debts. The provision for doubtful debts is a specific provision, and is established when there is objective evidence that the Marine Institute will not be able to collect all amounts owed to it. All movements in the provision for doubtful debts are recognised in the Statement of Income and Expenditure and Retained Revenue Reserves.

Contingencies

Contingent liabilities, arising as a result of past events, are not recognised when (i) it is not probable that there will be an outflow of resources or that the amount cannot be reliably measured at the reporting date or (ii) when the existence will be confirmed by the occurrence or non-occurrence of uncertain future events not wholly within the Institute's control. Contingent liabilities are disclosed in the financial statements unless the probability of an outflow of resources is remote.

Contingent assets are not recognised. Contingent assets are disclosed in the financial statements when an inflow of economic benefits is probable

Related Parties

Related party transactions have been disclosed in the notes to the financial statements in accordance with FRS 102. See note 19 for disclosure of the related party transactions during 2015.

Critical Accounting Estimates and Judgements

The preparation of the financial statements requires management to make judgements, estimates and assumptions that affect the amounts reported for assets and liabilities as at the balance sheet date and the amounts reported for revenues and expenses during the year. However, the nature of estimation means that actual outcomes could differ from those estimates. The following judgements have had the most significant effect on amounts recognised in the financial statements.

Impairment of Property, Plant and Equipment

Assets that are subject to amortisation are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less cost to sell and value in use. For the purpose of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash generating units). Non-financial assets that suffered impairment are reviewed for possible reversal of the impairment at each reporting date.

Depreciation and Residual Values

The Board Members have reviewed the asset lives and associated residual values of all fixed asset classes, and in particular, the useful economic life and residual values of fixtures and fittings, and have concluded that asset lives and residual values are appropriate.

Retirement Benefit Obligation

The assumptions underlying the actuarial valuations for which the amounts recognised in the financial statements are determined (including discount rates, rates of increase in future compensation levels, mortality rates and healthcare cost trend rates) are updated annually based on current economic conditions, and for any relevant changes to the terms and conditions of the pension and post-retirement plans.

The assumptions can be affected by:

1. the discount rate, changes in the rate of return on high-quality corporate bonds
2. future compensation levels, future labour market conditions
3. Health care cost trend rates, the rate of medical cost inflation in the relevant regions.

2. Oireachtas Grants From the Department of Agriculture, Food and Marine

	2015 €'000	2015 €'000	2014 €'000	2014 €'000
Current Purposes				
Marine Institute - Vote 30,Subhead A.7	14,345		13,479	
EMFF Income (Note 15)	3,576		3,030	
Less Superannuation contributions repayable	(426)		(404)	
		17,495		16,105
Capital purposes				
Marine Institute - Vote 30, Subhead A.7	2,100		3,387	
Marine Research Programme Vote 30, Subhead A.7 (Note 12)	6,400		6,613	
		8,500		10,000
		25,995		26,105

Since 2014, the EMFF Income has been accounted for on an accruals basis as the direct related expenditure is funded in the year after occurrence. By agreement with the Department of Agriculture, Food and the Marine, employee pension contributions are refunded directly to the Department and are shown as a reduction in grant levels.

3. Other State Grants

	2015 €'000	2015 €'000	2014 €'000	2014 €'000
National Seabed Survey – Department of Communications, Energy and Natural Resources Vote 29, Subhead D.7	1,176		1,406	
Databuoy – Department of Transport, Tourism and Sport Vote 31, Subhead C.3	413		419	
Marine Strategy Framework Directive (DECLG)	508		556	
Natura – Department of Agriculture, Food & Marine Vote 30 Subhead C.7	315		330	
Water Framework Directive funded by EPA	964		1,024	
Marine Research Prog project co-funded by Teagasc	-		517	
Wave Energy Test Sites Funded by SEAI	1,240		995	
Galway Bay Cable Project – Funded by HEA	1,316		635	
TOTAL		**5,932**		**5,882**

4. EU and Other Income

	€'000	2015 €'000	€'000	2014 €'000
EU Contract Research		1,928		1,112
Other Income				
Research Vessel Charterage	2,239		2,117	
Sundry and Other Contract Income	937		1,102	
		3,176		3,219
TOTAL		5,104		4,331

5. Wages and Salaries

	2015 €'000	2014 (restated) €'000
Core Staff	7,556	7,107
Contract Staff & Other Payroll Cost	3,165	3,137
	10,721	10,244

The average number of employees by location is as follows:

	2015 No.	2014 No.
Rinville Galway	148	138
Newport	16	15
Wilton Terrace, Dublin	14	14
Ports	6	8
	184	175

Wages and Salaries breakdown

	2015 No.	2014 No.
€60,000 - €69,999	33	38
€70,000 - €79,999	15	12
€80,000 - €89,999	2	3
€90,000 - €99,999	5	3
€100,000 - €109,999	1	1
€110,000 - €119,999	0	0
€120,000 - €129,999	0	0
€130,000 - €139,999	1	1

Total salary costs include an accrual of €0.196m (2014: €0.146m) in respect of accumulated staff annual leave entitlements. Pension related deductions of €0.426m were made from salaries and were remitted to the Department of Agriculture, Food and the Marine.

The Institute has adhered to the updated Code of Practice for the Governance of State Bodies. The total remuneration paid to Chief Executive of the Marine Institute for 2015 was €136,496 (2014 €136,496). There were no other benefits paid as part of the remuneration package payments to the Chief Executive. 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 2015 was €25,063 (2014 €18,471) which includes foreign travel expenses of €5,064.The total compensation paid to key management in 2015 was €553,996 (2014 €547,978) plus expenses of €61,525 (2014 €42,121).

Board Members

Details of Board Membership are contained within the Board Members section of the Annual Report. The following tables provide information relating to the fees and expenses paid to Board members along with details of meeting attendance in respect of the year ended 31 December 2015.

Board Member	Category 3	Gross Fees 2015 €	Expenses 2015 €	Total 2015 €	Applicable Board Meetings 2015*	Board Meetings Attended 2015	Term Commenced Or Ended
John Killeen	Chairperson	11,970	-	11,970	10	10	
Lorcán Ó Cinnéide	Board Member	1,007	-	1,007	1	1	Term ended 16/02/2015
Francis Coyle	Board Member	3,103	4,006	7,109	5	5	Term ended 25/05/2015
David Owens	Board Member	7,695	1,295	8,990	10	10	
Patricia Barker	Board Member	7,695	912	8,607	10	10	
Donal Kelly	Board Member	7,695	10,135	17,830	10	10	
		39,165	16,348	55,513			

*This is the number of Board meetings during a member's term of appointment. Lorcán Ó Cinnéide's board term ended on 16/02/2015 and Francis Coyle's board term ended on 25/05/2015.
The Audit Committee in 2015 was comprised of Prof. Patricia Barker (Chair), David Owens, Francis Coyle and Lorcán Ó Cinnéide. Lorcán Ó Cinnéide was the Chair until 16/02/2015.

6. Vessel Operating Costs

	2015 €'000	2014 €'000
Payroll and Associated Costs	3,925	3,882
Fuel	946	1,095
Insurance	232	418
Victualling	164	175
Management Fee	232	232
Port Fees and Safety	121	73
Leases	133	112
Engineering and Maintenance Costs	785	750
Operating and Administration Costs	727	732
	7,265	7,469

The vessel operating costs exclude the cost of vessel equipment and refits which are capitalised per note 14. The vessels are owned by the Marine Institute and the operations of the vessels are subcontracted to a vessel management company.

7. Travelling Expenses

	2015 €'000	2014 €'000
Travel & Subsistence		
Domestic	626	491
Foreign	442	388
	1,068	879

8. Grants and External Service Providers

	2015 €'000	2014 €'000
Marine Research Programme Grants and support costs (Note 13)	3,366	3,684
Seafarer Training & Education	212	239
Contractors and External Service Providers	3,375	3,303
Sample Analysis	431	482
Payments of Project Research Grants to Project Partners	730	159
	8,114	7,867

9. Facilities Costs

	2015 €'000	2014 €'000
Maintenance	855	679
Light & Heat	493	549
Replacements	349	227
Other	195	244
	1,892	1,699

10. Other Administration Costs

	2015 €'000	2014 €'000
Rent, Rates & Other Property Costs	325	375
Journal Subscriptions, Memberships and Library Costs	139	147
Training	151	131
Stationary & Consumables	110	68
Publications & Promotional Materials	152	145
Insurance	200	191
Audit fee	17	18
Hire of Equipment & Vessels	628	152
Sundry Equipment	503	213
Other Admin Costs	261	381
	2,486	1,821

11. Taxation

The Marine Institute is specifically exempted under the provisions of Section 32 and Schedule 2 of the Finance Act 1994. Accordingly, no taxation charge has been included in the financial statements.

12. Beaufort and Marine Research Programme 2014 2020 (NDP 2007-2013)

	2015 €'000	2014 €'000
Oireachtas Income (Note 2)	8,500	10,000
Other income	56	517
Total Income on Marine Research	**8,556**	**10,517**
Expenditure on Marine Research Programme projects	6,456	7,130
Marine Institute Capital Equipment	2,100	3,387
Total Expenditure on Marine Research	**8,556**	**10,517**

In 2015 the expenditure on Marine Research Programme projects of €6.456m includes €2.998m in ship-time award payments. The balance of €3.458m includes €3.366m spent on Marine Research Programme Grants and support costs (Note 8) and €0.092m which is included under salary costs (Note 5). The 2015 expenditure on capital equipment by the Marine Institute of €2.1m which was funded under the Marine Research Programme included (i) €0.7m on vessel equipment and refit and (ii) €1.4m on IT, Oceanographic equipment and fixtures and fittings.

Marine NDP 2007- 2013

The investment in marine research under the NDP Marine Research Sub-Programme 2007-2013 was targeted at (i) meeting objectives, (ii) research activities and (iii) outputs of Sea Change, the national marine knowledge, research and innovation strategy and Harnessing Our Ocean Wealth – An Integrated Marine Plan for Ireland (July 2012). Funding was targeted at the Research Measures and Programmes of the strategy via a range of mechanisms, including competitive calls for research proposals (e.g. project-based awards, desk studies, PhD/Post-Doctoral Fellowships, access to research vessels) and tendering for the provision of infrastructure/services.

A total of 142 projects have been supported under the Marine Research Sub-Programme of the NDP 2007-2013 with 27 of these projects still ongoing at the end of 2015. These projects are scheduled to complete in 2016.

Marine Research Programme 2014-2020

In 2014, the Marine Institute launched the Cullen Fellowship Programme, an annual programme call to provide post-graduate research training opportunities for students in marine science and related disciplines. Investment in this programme continued in 2015, and 13 Cullen Fellows have now commenced.

In order to address the goals of Harnessing Our Ocean Wealth and to maximise the use of national funding in 2015 a new investment of just over €1m was made through the EU Commission's marine biotechnology ERA-Net, which will fund two co-funded European programmes in marine biotechnology and micro-plastics, supporting five projects with seven Irish partners over three years.

A total of 71 projects have been supported under the Marine Research Programme 2014-2020 with 42 of these projects still ongoing at the end of 2015.

Research Projects awarded are subject to contract which specifies that an initial payment will be made on signing of the contract; an interim payment(s) 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 the Marine Research Programme accounting policy. At 31 December 2015 payments in the amount of €191,000 (2014: €156,000) were outstanding on amounts charged to the financial statements and are included within payables.

The total expenditure under the Marine Research Programmes from 2007 to 2015 was €71.5m. Commitments at 31 December 2015, which have not yet been charged to the financial statements, were €7.2m, analysed as follows:

	Total €'000
Commitments as at 1 January 2015	7,634
Committed in 2015	6,068
Paid in 2015	(6,456)
Commitments as at 31 December 2015	**7,246**

13. Capital Account

	2015 €'000	2015 €'000	2014 €'000	2014 €'000
Balance at 1 January		21,705		21,188
Transfer (to) /from Income and Expenditure Account				
Income allocated for Capital funding	3,709		4,505	
Depreciation charge for the year	(4,702)		(3,988)	
Net Transfer (to)/from Income & Expenditure Account		(993)		517
Balance at 31 December		20,712		21,705

14. Property, Plant and Equipment

	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 2015	3,743	32,654	6,027	24,200	8,823	338	75,785
Additions	-	694	441	2,116	440	18	3,709
Disposals	-	-	-	-	-	(15)	(15)
Cost at 31 December 2015	3,743	33,348	6,468	26,316	9,263	341	79,479
Depreciation							
Balance at 1 January 2015	1,076	18,120	4,609	21,556	8,439	280	54,080
Charge for the financial year	75	2,080	568	1,589	369	21	4,702
Disposal	-	-	-	-	-	(15)	(15)
Balance at 31 December 2015	1,151	20,200	5,177	23,145	8,808	286	58,767
Net Book Value							
At 31 December 2015	2,592	13,148	1,291	3,171	455	55	20,712
At 31 December 2014	2,667	14,534	1,418	2,644	384	58	21,705

The Marine Institute's headquarters are at Rinville, Oranmore, County Galway. This building, which is owned by the OPW, is provided rent free. The facility in Newport was gifted to the Institute by the Guinness Trust. The other various premises used by the Institute in Dublin and at the ports are held under either operating leases or rental agreements as outset in Note 18.

15. Receivables

	2015	2014
	€'000	€'000
Trade Receivables	392	206
Contract Income	128	1,423
EMFF Accrued Income (Note 2)	3,150	3,030
Prepayments	781	541
	4,451	5,200

All receivables are due within one year. Trade receivables are shown net of impairment in respect of doubtful debts.

16. Payables

	2015 €'000	2014 (restated) €'000
Amounts falling due within one year		
Trade Payables	1,242	1,994
Deferred Income	1,211	1,946
Marine Research Programme Accrual (Note 12)	191	156
Accruals	134	311
Payroll and Revenue Accruals	43	79
Holiday Pay Accrual (Note 5)	196	146
	3,017	4,632

Included in payables above are the following amounts due to the Revenue Commissioners:

	2015 €'000	2014 €'000
Professional Service Withholding Tax	50	88
PAYE/PRSI/USC	43	79
VAT	49	179
Relevant Contract Tax	5	3
	147	349

The Marine Institute comes under the remit of the Prompt Payments of Accounts Act 1997 which came into effect on the 2nd January 1998 and the European Communities (Late payment in Commercial Transactions) regulations 2002 which came into effect on the 7th August 2002. It is the policy of the Marine Institute to ensure that all invoices are paid before their due date. The late payment Interest rate is 8% per annum or a daily rate of 0.022%. No prompt payment interest or compensation was due at the financial year end.

17. Superannuation Scheme and Spouse & Children's Contributory Retirement Benefits Scheme

a. General Description of the 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 dependent 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 to the Department of Agriculture, Food and the Marine.

For the purposes of reporting in accordance with FRS102, the Institute has been advised by a qualified actuary who has prepared a full valuation in order to assess the liabilities of the superannuation schemes at 31 December 2015.

The principal actuarial assumptions, per annum, are as follows:

	2015	2014	2013
Inflation rate increase	1.65%	2%	2%
Salary rate increase	2.65%	4%	4%
Pension rate increase	2.15%	4%	4%
Scheme liabilities discount rate	2.55%	5.5%	5.5%

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 102 requires reference to an assumed rate of inflation, the above rate would be appropriate for this purpose.

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

	2015	2014
Male aged 65	20.9	22
Female aged 65	23.5	25

On the basis of these and other assumptions and applying the projected unit method prescribed in FRS 102, the deferred funding asset and retirement benefits liability are as follows:

	2015	2014
Total accrued retirement benefits liability	€40.05m	€30.2m

b. Analysis of the Total Pension Costs charged to Expenditure

	2015 €'000	2014 €'000
Current Service Cost	1,772	1,800
Interest on pension scheme liabilities	1,652	1,500
Employee Contributions	(426)	(404)
	2,998	2,896

c. Analysis of the amount recognised in the Statement of Comprehensive Income

	2015 €'000	2014 €'000
Experience gains	1,694	816
Changes in assumptions underlying the present value of scheme	(8,466)	-
Actuarial gain and (loss) recognised in the Statement of Comprehensive Income	(6,772)	816

d. Net Deferred Funding for Pensions Recognised in the year

	2015 €'000	2014 €'000
Current Service and Interest Cost	3,424	3,300
Less benefits paid in the year	(346)	(484)
	3,078	2,816

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. 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.

In line with the custom and practice as adopted by the Department of Agriculture, Food and the Marine to date, 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 2015 amounted to €40.05million (2014: €30.2million). 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.

e. Analysis of movement in net pension liability during the year

	2015	2014	2013	2012	2011
	€'000	€'000	€'000	€'000	€'000
Liability at the beginning of the year	30,200	28,200	27,501	26,004	25,900
Current Service Cost	1,772	1,800	1,900	1,900	2,200
Interest on Scheme Liabilities	1,652	1,500	1,500	1,400	1,400
Actuarial (Gain)Loss recognised in the Statement of Comprehensive Income	6,772	(816)	(2,339)	(1,360)	(3,080)
Benefits paid in the year	(346)	(484)	(362)	(443)	(416)
Liability at the end of the year	40,050	30,200	28,200	27,501	26,004

f. History of Defined Benefit Obligations

	2015	2014	2013	2012	2011
	€'000	€'000	€'000	€'000	€'000
Deficit benefit obligations	40,050	30,200	28,200	27,501	26,004
Experience Gains/ on Scheme Liabilities	1,694	816	2,339	1,360	3,080
Percentage of Scheme Labilities	4.2%	2.7%	8.29%	4.96%	11.8%
Assumption Gains/(Losses) on Scheme Liabilities	(8,466)	-	-	-	-
Percentage of Scheme Liabilities	21.1%	0%	0%	0%	0%

The cumulative actuarial gain recognised in the Statement of Comprehensive Income amounts to €480,000.

18. Operating Lease commitments

The Marine Institute occupies leased and rented premises at the following locations:

- **Lease 1:** Wilton Park House, Dublin 2, commenced in 2015 for a period of 4 years and 3 months and is due to terminate on 31st October 2019.
- **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.
- **Lease 4:** Industrial Land, Galway Harbour, commenced in 2014 for a period of 5 years with the option to extend to August 2024.
- **Lease 5:** Industrial Land, Galway Technology Park, commenced in 1988 for a period of 999 years, with five yearly rent reviews.
- **Lease 6:** Foreshore lease in Spiddal, commenced in 2006 for a period of 10 years.
- **Rental Agreements:** The Institute has a number of rental agreements relating to piers, labs and sheds, all of which are renewable on an annual basis.

The total future minimum lease payments under non-cancellable operating leases, all of which relate to Land & Buildings, are as follows:

Relating to leases:	2015 €'000	2014 €'000
Payable within 1 year	40	197
Payable between 2 and 5 years	592	-
Payable thereafter	1,267	1,422
	1,899	1,619

Operating lease payments recognised as an expense in 2015 amounted to €371,097 (2014: €378,037).

19. Related Party Transactions

The Minister for Food, Agriculture and the Marine is the primary funder of the Institute, and the ultimate controlling party. The Irish Government is recognised as a related party as the Government is deemed to have control over the Institute, as defined by FRS 102. The Institute has not disclosed related party transactions in relation to Government and Government related entities unless transactions are individually or collectively significant. In the normal course of business, the Institute has received funding from various Government bodies, which are disclosed in Notes 2 and 3. The board members are of the opinion that there are no other significant transactions with Government or Government related entities which require disclosure in relation to the financial period ended 31 December 2015.

Smartbay Ltd, was established to implement the Programme for Research in Third-Level Institutions (PRTLI) Smartbay project to manage Ireland's Marine Test and Demonstration Facility at Galway Bay. The company was established as a company limited by guarantee by PRTLI project partners Dublin City University (DCU) and National University of Galway in Feb 2012. DCU is the lead institution which provides the PRTLI funding to Smartbay.

The Institute's CEO is a Board member and the Head of Corporate Services of the Institute is the Secretary. During 2015, the Institute advanced funding of €330,125 to Smartbay Ltd (2014 €264,755). This expenditure is included within research expenditure in Note 8 to these financial statements. The payment is in respect of a contract to provide operational support in respect of the development of the Ocean Energy Test Site in Galway and the Atlantic Test Site at Belmullet and the balance outstanding to Smartbay Ltd at 31st Dec 2015 was €32,332.

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. Contingent Assets

As at 31 December 2015, the Institute had lodged an insurance claim in respect of equipment which had been damaged at sea during 2015. As both the basis and quantum of the claim had not been agreed with the insurers at year end, the Institute has not recognised an asset in relation to this claim.

22. Transition to FRS 102

Reconciliation of capital and reserves

	1 Jan 2014 €'000	31 Dec 2014 €'000
Capital and Reserves (as previously stated)	23,143	23,753
Holiday Pay Accrual	(224)	(146)
Capital and Reserves (as restated)	22,919	23,607

Reconciliation of surplus for the year

	31Dec 2014 €'000
Surplus for the year (as previously stated)	93
Holiday Pay Accrual	78
Surplus for the year (as restated)	171

The Institute has not applied paragraph 20.15A to lease incentives where the term of the lease commenced before the date of transition to FRS 102. It has continued to recognise any residual benefit or cost associated with these lease incentives on the same basis that applied at the date of transition to FRS 102.

23. Events after the end of the financial year

The Board is not aware of any events occurring after 31 December 2015 which affect these financial statements.

24. Board Approval

The financial statements were approved by the Board on the 31 May 2016.

Foras na Mara
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