



ANNUAL REPORT
2009



Marine Institute
Foras na Mara

Serving Science and The Sea

To the Minister for Agriculture, Fisheries and Food

In accordance with the requirements of the Marine Institute Act, 1991, I have the honour of presenting the Annual Report and Statement of Accounts of the Marine Institute for the year ended 31st December 2009.

Jim Fennell, Chairman

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

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

Marine Institute Act 1991

Our Vision

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

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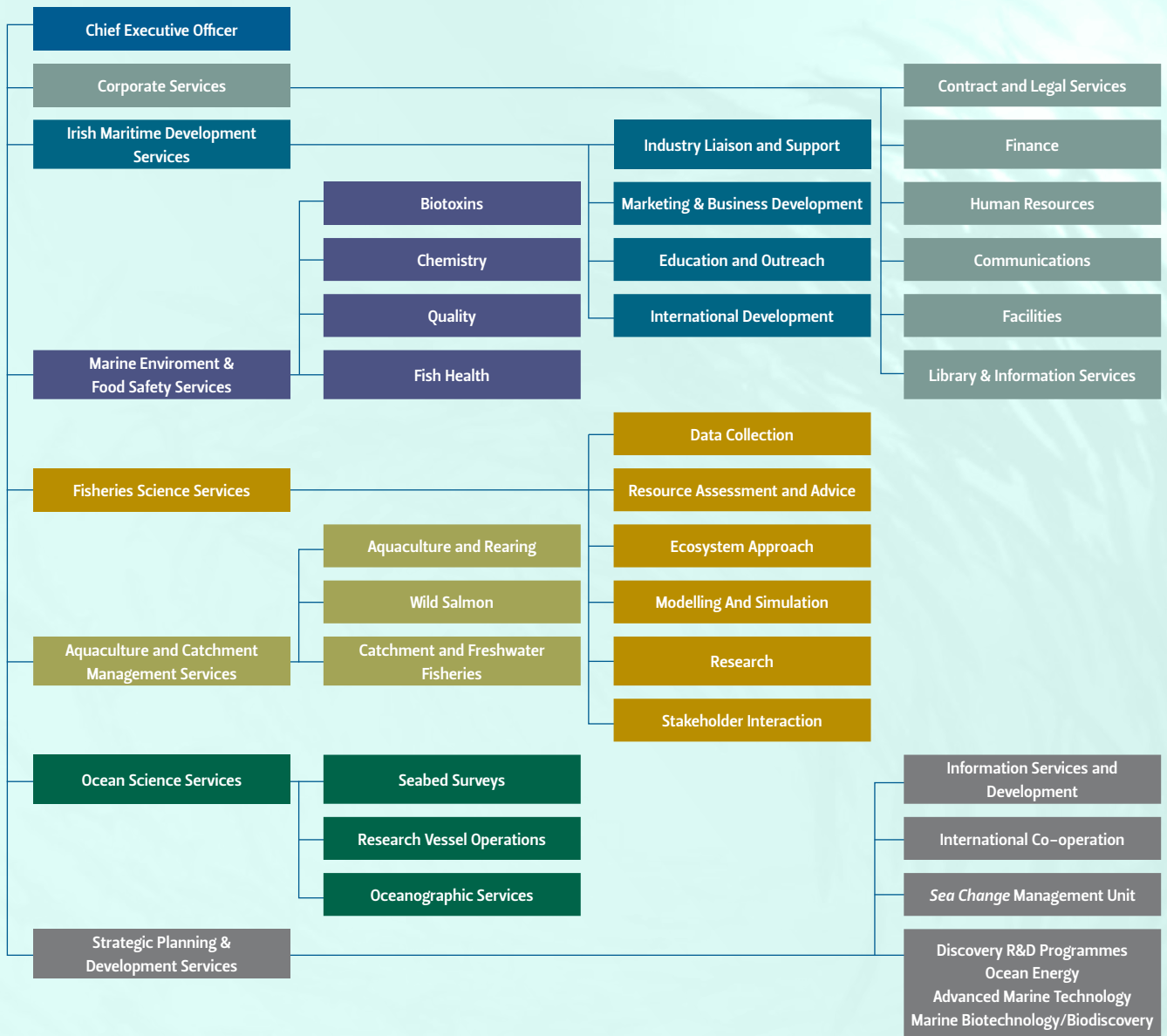
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Marine Institute Organogram 2009



Introduction and Organisational Structure

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

Ireland has a marine resource of 220 million acres under the sea, which is over ten times its land area and until recently was largely unexplored. We promote the sustainable development of this vast marine resource through research, the application of new technologies and by providing management advice to industry, the Government and EU.

The Institute provides essential marine research services including:

- > National research and development funding programmes
- > Fish stock assessment

- > Fish health services
- > Marine food safety monitoring
- > Environmental monitoring
- > Research vessel operations
- > Seabed mapping
- > Data management
- > Maritime development services

To provide these services to the highest degree of excellence, and to plan for future developments, the Institute is structured into seven Service Teams, as outlined in the organogram opposite.

This report highlights the key deliverables and progress made towards our vision during 2009.



Board Members



Mr. Jim Fennell – Incoming Chairman (2008–2013)

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



Mr. Richie Flynn (2007–2012)

Mr. Flynn is currently the Executive Secretary of the IFA's Aquaculture Section, incorporating the Irish Salmon Growers' Association, the Irish Shellfish Association and the Irish Trout Producers' Group. He is the current Chairman of the EU Commission's Aquaculture Advisory Committee. Mr Flynn holds a Bachelor of Arts degree in Communications Studies from Dublin City University and is a former member of the Irish Executive Council of the National Union of Journalists (NUJ).



Ms. Terry Fleming (2004–September 2009)

A tax and financial consultant, Terry Fleming has over 20 years' experience as a corporate tax adviser with PricewaterhouseCoopers. She has worked on a wide variety of tax consulting, due diligence and corporate restructuring projects for a portfolio of major Irish and multinational clients, both publicly quoted and privately owned. Educated at UCD and DCU, she is a member of the Irish Taxation Institute. She is currently working as an independent consultant.



Prof. Bernie M Hannigan (2007–2012)

Professor Hannigan is Pro-Vice Chancellor (Strategic Projects) at the University of Ulster, Northern Ireland. On a part-time basis, she is seconded to the position of Director of Research / Chief Scientific Advisor to the Department of Health, Social Services and Public Safety, Northern Ireland. Previous roles at the University included Pro Vice Chancellor (Research and Innovation) and Dean of the Faculty of Life & Health Sciences, also at Ulster. Professor Hannigan is an Immunologist with particular interest in the relationships between nutrition and immune competence. Educated at Trinity College Dublin and the Royal College of Surgeons in Ireland, she has published almost 100 peer-reviewed papers, supervised over 20 students to successful doctoral graduation and attracted significant external research funding from a variety of UK and international sources. Externally Professor Hannigan is, and has been, director of a range of organisations that include science parks, knowledge / technology exchange and the support of emerging technology-based companies. Her membership of the Board of Invest Northern Ireland helped to ensure that the potential economic contribution of the universities was included in regional development strategy within the province.



**Ms. Dairine Mac Fadden
(2005–2010)**

Dairine Mac Fadden is a solicitor originally from Donegal but now based in Dublin. She graduated from UCD with a law degree (B.C.L.) and returned there later to do a Diploma in European Law, followed by a Masters Degree in Law by thesis on the Common Fisheries Policy. She has worked as In-house Solicitor for RTÉ and also for TG4 and has represented commercial fishermen throughout Ireland while in general practice. She is currently engaged as a consultant in a solicitor's practice in Dublin.



Dr. Emer Rogan (2007–2012)

Emer Rogan is a lecturer in the Dept. of Zoology, Ecology and Plant Science, University College, Cork. She completed her BSc in UCD in 1984 and her PhD in UCC in 1990 on plankton ecology. Since then, her main research focus has been on marine mammal ecology and biology, marine mammal fisheries interactions and also the functioning of marine ecosystems, relating dietary analysis to bioaccumulation, migratory patterns and oceanographic and bathymetric parameters. She has supervised over 20 MSc and PhD students in marine mammal and fisheries ecology and has authored many papers in academic and professional journals, press articles and book chapters. Dr Rogan is a member of the Scientific Committee (and convener and chair of the Small Cetacean Sub-Committee) of the International Whaling Commission, the IUCN Cetacean Specialist Group and ICES working group on Marine Mammal Ecology.



Dr Eleanor O'Higgins (2007–2012)

Eleanor O'Higgins (BA, MSc, MBA, PhD) is on the faculty of the Business Schools at UCD and a Visiting Fellow at the London School of Economics and Political Science. She specialises in teaching, research and publications in corporate governance, strategic management, business ethics and corporate social responsibility. She is the author of numerous papers in academic and professional journals, newspaper articles, book chapters and case studies. She is a director of Transparency International Ireland and a member of the Press Council of Ireland and of the Board of Management of The Centre for Corporate Governance at UCD. Previously, she worked as a research psychologist at Harvard University Medical School, a clinical psychologist in the Irish health services and as staff development manager in RTÉ. She has served on the board of directors of IDA Ireland and of the Well Woman Group of health clinics, and had held various leadership positions in the US Academy of Management.



Mr. Michael Walsh (2007–2012)

Michael Walsh was one of the founders of the Irish South & East Fishermen Organisation, which was formed in 2002. He then worked at setting up the Irish South & East Fish Producers' Organisation which received recognition in December 2004. He currently holds the position of CEO of the Irish South & East Fish Producers' Organisation and is Chairmanship of the Federation of Irish Fishermen, which was founded late 2006. Mr Walsh has some 15 years' fishing experience and a vast knowledge of various types of sea fishing and fishing patterns. He crewed on board many sea fishing vessels, before becoming skipper in 1994 following his completion of the Skipper Limited Certificate of competency at the BIM Fisheries School in Greencastle, Co Donegal.

Chairman's Statement



In common with other organisations in the State Sector, the Marine Institute was buffeted by the economic storm that blew during 2009 bringing budget cuts and an embargo on recruitment. Throughout this challenging period however, those working in the Institute have continued to deliver an impressive suite of scientific and advisory services including the management of *Sea Change – A Marine Knowledge, Research & Innovation Strategy for Ireland 2007–2013*, to fully maximise the economic, social and environmental contribution of Ireland's

marine resources through the application of research and development, innovation and technology transfer.

I am pleased to report that, by holding to that course during the difficult circumstances of 2009, the challenges laid down in *Sea Change* are already being met in terms of both new and increased Irish marine capacity in SMART technology, bio-discovery, functional foods and the field of socio-economic analysis. In addition, work at the Institute's wave energy test site in Galway Bay has facilitated the continued development of a number of technology solutions for this new form of sustainable energy, which will now pass to a larger site for commercial scale test and evaluation.

Furthermore, the performance of Ireland in marine science and technology has won us considerable recognition in Europe, both in the record amount of money awarded to Irish marine projects in the Seventh Framework Programme (FP7), and in the eyes of key decision-makers in Brussels, whose opinions are crucial if the programmes put in train under *Sea Change* are to fulfil their goals.

Closer to home, the maintenance of excellence in meeting the statutory obligations of the Institute to the Department of Agriculture, Fisheries and Food (DAFF) together with a number of other government

departments and its responsibilities to provide scientific advice and services to support the sustainable development of established industries continued. Work undertaken with industry through the Irish Fisheries Science Research Partnership (IFSRP) has achieved a new spirit of collaboration and co-operation. This was clearly visible in the work undertaken with the economically important *Nephrops* fishery, where science and industry developed an agreed plan to close the Porcupine Bank and help rebuild the *Nephrops* fishery there.

Ireland's contribution to fisheries science was also recognised during the year by the election of Dr. Paul Connolly – a leading Marine Institute fisheries scientist – to the position of First Vice-President of the International Council for the Exploration of the Seas (ICES).

Following the awarding of responsibility to the Institute in 2008 for the implementation of the EU Fish Health Directive, staff from the Institute continued to work with the aquaculture industry to minimise the risk to stock from disease. Testing of fish and shellfish also continued in our laboratories to ensure that consumers continued to receive nothing but the highest quality products from Irish aquaculture farms.

During 2009, the Institute also continued to support maritime transport – Ireland's largest revenue-generating marine sector – through the activities of the Irish Maritime Development Office (IMDO). This included market analysis, advice and promotion of Ireland as a base for international shipping companies. I am pleased to report that, in spite of the difficult economic circumstances during 2009, six new cargo vessels were delivered to Ireland or to Irish-owned companies and the year ended with the announcement by the US NASDAQ-listed TBS group of its intention to establish operations in Ireland in 2010.

2009 also saw the Institute's research vessels *RV Celtic Explorer* and *RV Celtic Voyager* reach record performance levels in terms of days-at-sea. A number of flagship projects, including the discovery of a previously unknown deepwater coral reef by a team of scientists from the National University of Ireland, Galway using the Marine Institute's remotely operated vehicle (ROV) *Holland 1*, were also facilitated by the Institute, as

was the deployment of the first of a new generation of data buoys as part of the Irish weather buoy network.

In addition to the delivery of these challenging work programmes in support of our existing marine sector, the needs of the next generation of stakeholders in Ireland's 220 million acre marine resource was not forgotten. Sustainability was the common thread running through all Marine Institute programmes in 2009, while active marine education and outreach programmes such as the IMDO's *Follow The Fleet* and the primary school marine education programme *Explorers* were continued and developed.

The Marine Institute is proud to play a role through our CEO in the work of the Marine Coordination Group established by An Taoiseach to address the major opportunities for socio-economic benefits to be achieved through a well coordinated cross-government national policy development vehicle.

I would therefore like to applaud the staff of the Institute, not only for their unwavering attention to the immediate needs of the present in spite of difficult circumstances, but also their clear vision of the future and their dedication to "a thriving maritime economy in harmony with the ecosystem and supported by the delivery of excellence in our services," which has supported us all during a very challenging year.

Finally, I would like to thank and pay tribute to the immense contribution made by Ms Terry Fleming, who retired from the Board in 2009.



Jim Fennell
Chairman



"I would therefore like to applaud the staff of the Institute, not only for their unwavering attention to the immediate needs of the present in spite of difficult circumstances, but also their clear vision of the future."



Chief Executive's Report



2009 saw the economic growth that had sustained Ireland in recent years give way to downturn, presenting the Marine Institute with the twin challenges of navigating the difficult circumstances of the present while keeping our eyes firmly fixed on our vision of the future. Reduced resources, in terms of both finance and personnel, coupled with increased service delivery demands placed many challenges on staff, who I am pleased to say responded with great commitment and co-operation.

The exchequer embargo on recruitment created an unintended yet significant impact on the business of the Institute in 2009, in that the Institute was unable to recruit staff whose salaries were paid for completely by EU FP7 projects. Significant efforts to unlock this situation, with the support of our parent department DAFF, were at an advanced stage at year end however and we are optimistic that 2010 will see us fully involved with EU FP7 projects again. We remain committed to working closely with our government and a range of departments to tackle the challenges ahead and anticipate further service delivery demand increases driven by the Marine Strategy Framework Directive (MSFD), the Water Framework Directive (WFD) and other marine spatial planning initiatives in 2010.

In spite of all these challenges, and through an inclusive process of adaptive management, including a sharp focus on driving down costs and overheads, we were able to maintain the integrity of our key frontline services across the organisation. Furthermore, we maintained a strong momentum on *Sea Change* – A Marine Knowledge, Research and Innovation Strategy for Ireland 2007 – 2013. This programme, aimed at applying the best of Irish science and technology to the sustainable development of our marine sector, began to bear fruit in 2009 with a number of significant advances including: commitment of €2.15m to the support of research and training on board the national research vessels. This brought total investment in marine-related research over the period 2007–2009 to around €119m, funded by NDP funds managed by the Institute, other national funds and international funding. The *Sea Change* Team also actively supported R&D programmes in Marine Biotechnology, Advanced Marine Technology and Renewable Ocean Energy. All this was done in close liaison with key development agencies such as the IDA, Enterprise Ireland and Sustainable Energy Authority Ireland (SEAI) as well as a wide range of other partners in the commercial and research sectors.

Our International Co-Operation Programme continued to not only play a leading role in drafting the European Marine Research Agenda, but also in assisting Irish marine researchers to navigate the intricacies of EU research funding. In 2009, Irish marine researchers participated in 43 FP7 projects and 15 INTERREG-IV projects involving a total of €21.5 million in grant aid. This is a record performance level representing a more than 160% increase on the FP6 (2002–2006) success rate.

Significant progress was also made in the mapping of Ireland's seabed territory through our partnership with the Geological Survey of Ireland in the INFOMAR inshore mapping programme of the Irish National Seabed Survey, which presented its results over a two-day conference in Dublin in October, attended by delegates from all over the world. Further offshore, the newly-acquired deepwater Remotely Operated Vehicle (ROV) *Holland 1* undertook survey operations deployed from the RV *Celtic Explorer* on the Rockall Bank, the Porcupine Bank and in the Celtic Margin Canyons, work which would have been impossible for Ireland to undertake even ten years ago.

Our Fisheries Science Services (FSS) team continued the research required to supply scientific advice to DAFF for the sustainable management of Ireland's fish stocks in 2009. It also engaged with industry and other key stakeholders through the Industry-Science Partnership to provide decision makers with the advice that will be needed in the near future. This integrated advice on how to maintain our fish stocks as part of the overall marine ecosystem into the future involves gathering information on such diverse subjects as climate change, the impacts of coastal fishing on sensitive habitats, data management and data integration. In 2009 14 fisheries surveys totalling 1,278 scientist-days at sea were completed by FSS staff on research vessels and chartered commercial fishing vessels.

The Institute provided a wider range of monitoring and marine environmental services to government in 2009 than ever before. These included advice on marine licensing of all kinds, on shellfish safety, residues, fish health and marine environmental chemistry. Furthermore, the number of test methods employed by the Institute accredited to ISO 17025 standard by the Irish National Accreditation Board (INAB) increased to 31, demonstrating our commitment to excellence. Research was also conducted on a wide range of environmental issues ranging from the impact of increased atmospheric carbon dioxide on ocean chemistry and ecosystems to finfish health issues and toxic algal blooms. 2009 also saw the Marine Institute begin to authorise aquaculture operations as the newly appointed competent authority for the implementation of the European Fish Health Directive, together with a programme of site inspections to fish farms all over the country.

The Irish Maritime Development Office of the Marine Institute (IMDO) continued to support and assist shipping companies with advice and analysis against a very difficult economic backdrop. The Annual Irish Maritime Transport Economist bulletin continued to be a reference source for the industry, for the media and for government, with two industry briefings held, in Dublin and Belfast in April. IMDO continued to manage the government's Irish Seafarer Educational Assistance Scheme (ISEAS) with over 93 students and 11 companies benefiting from seagoing training payments. In addition, the ever-popular Follow the Fleet educational programme had its most successful year ever with just under 500 schools subscribed.

In July, record rainfalls caused major flooding around the Institute's Aquaculture and Catchment Management Services (ACMS) facility at

Newport, Co. Mayo, emphasising the relevance of the work on climate change that is undertaken there using the unique fifty-year data set of environmental measurements available from the Burrishoole catchment. In addition to this work, monitoring and research on aquaculture, environmental research and migratory species such as salmon, sea trout and eels continued, as did our involvement in the monitoring and control of sea lice on marine salmon farms in support of the DAFF sea lice pest control strategy. The international SALSEA Merge project, aimed at tracking the fate of salmon smolts at sea, extended well north of the Faroes, above the Arctic Circle, this year, with work underway to determine the origin of each individual fish sampled at sea in order to map migration routes.

Our research vessel fleet completed 54 surveys totalling 560 science-days between the RV *Celtic Explorer* and RV *Celtic Voyager*. These included three acoustic fisheries surveys, a deepwater fisheries survey and the annual ground fish survey, as well as 28 days of underwater television surveys on prawn grounds and a ten-day herring recruitment survey. Mapping work was undertaken in the Shannon Estuary and Dingle Bay, off the south coast and in the Irish Sea east of Dublin. 2009 also saw the mobilisation of Ireland's first deepwater Remotely Operated Vehicle (ROV) *Holland 1* which undertook three underwater surveys totally 28 days.

All this work continued thanks to the solid foundation provided by our Corporate Services Team by way of facilities, human relations, finance and communications support. Our Explorers primary marine education and outreach programme now extends to schools in counties Galway, Mayo and Clare while our website recorded a record hit rate during 2009.

During a visit to the Institute in October, the European Commission's Director General for Research José Manuel Silva Rodriguez described the Marine Institute as a "star" in Atlantic marine research. This, in my view, is a great tribute to the management and staff of the Institute for their continued commitment and enthusiasm during a difficult year. For this, I would like to thank them, along with the Chairman and Board of Directors for their guidance and support during the year. As people who study the sea, we know that all troughs pass and that the crests of waves will always return. In the meantime, we keep our eyes firmly on the horizon and continue to plan for the future.



Peter Heffernan
Chief Executive



“As people who study the sea, we know that all troughs pass and that the crests of waves will always return. In the meantime, we keep our eyes firmly on the horizon and continue to plan for the future.”





Corporate Services



Director's Statement

The public sector fiscal pressures, including the embargo on recruitment, determined that the focus in 2009 continued to be on organisational efficiencies and cost savings together with the provision of a highly responsive, dynamic service and a continued focus on strong corporate governance. Highlights of 2009 included:

- > The full implementation of a Management information Systems for Human Resources, Pensions and Payroll;
- > Excellence Through People Gold Standard Accreditation was awarded to the Institute for the third time in recognition of our human resource management programme. The primary purpose of the standard is to encourage the development of employees to their full potential so as to maximise their contribution to the organisation and their own future careers;
- > A positive profile of the Marine Institute and the *Sea Change* strategy was communicated through comprehensive use of electronic and web-based communication evidenced through increased numbers of visitors coming through www.marine.ie;
- > Efficiencies continued to be achieved by the award of key contracts through a record number of public tender processes resulting in significant savings that were reinvested in core programmes;
- > Corporate Governance continued to be an important priority for Corporate Services, with regular internal audits reporting to the Marine Institute Board the achievement of maximum levels of assurance on a broad range of controls.

Ms. Caroline Hepburn
Director: Corporate Services

Human Resources

2009 saw the full implementation of new Management information Systems for Human Resources, Pensions and Payroll as well as the ongoing implementation of the 2009 to 2013 Human Resources Charter, ensuring that continued best practice, efficient support services are delivered.

The Marine Institute secured Gold Standard Excellence Through People Accreditation for the third time. The Learning & Development focus for 2009 was Management and Team Development, Communications and Building Effective Relationships and Risk Management. Investment in eLearning tools and online training maximised value for money and reduced the cost of training expenditure without diminishing the training available.

Recruitment activity was significantly reduced during the year with the introduction of the Public Sector embargo. The Quality Accredited Health & Safety Programme in the Institute saw the Committee hold eight meetings during 2009, highlighting the importance of Health and Safety across all Marine Institute facilities. Health, Safety and Employee Wellbeing Awareness was promoted in early November, focusing on physical wellbeing, healthy eating, mental health awareness and health & safety in the workplace.

Accessibility

The Institute was fully compliant with the Disability Act during 2009.

Communications

To ensure cost-effectiveness in corporate communications with our key stakeholders during 2009, outside that already undertaken directly by the various Service Teams in the course of their daily work, effort was focused on electronic and web-based communications, education and outreach, and the maintenance of effective media relations. As a result, 700 media hits were achieved in 2009, while the website at www.marine.ie attracted 264,099 visitors (up 8.46% on 2008) of which 148,670 were new visitors (up 12.73% on 2008). The five-year plan to develop the "Explorers" marine education programme for primary schools continued to build on its success in the Galway area with meetings in Dublin, Mayo and Clare to extend the programme there in 2010. The highlight of the year was the "Explorers" education tent at the Volvo Ocean Race in Galway, which drew some 6,000 students and 300 teachers from 166 schools with displays of seabed mapping, environmental management, marine life and deepwater corals between the 25th May and the 5th June.

Finance

As part of the corporate focus on continuing full compliance with the Code of Practice for the Governance of State Bodies, the Marine Institute continued to conduct internal audits under the stewardship of the Board's Internal Audit Committee in 2009. There were also regular reviews of the system of internal financial controls and efficiencies during 2009.

Value for money, budgetary management, compliance with financial procedures and strong corporate governance remained key corporate objectives of the finance department. There continued to be a strong focus on adherence to public procurement procedures and there were 42 tenders issued in 2009 of which 39 were awarded in 2009 and 5 of these were published on the OJEU. The production of the annual financial accounts together with the delivery of best practice support, assistance and management information to staff, management and the Board to support the goals of the Marine Institute were an important focus.

Facilities

The management of the Institute's facilities in Galway, Newport and Dublin, together with a number of regional port locations, was maintained at a high level in support of the delivery of frontline services to our clients and stakeholders. In excess of 25,000 incoming telephone queries were handled. The facilities team played a significant role in leading the organisation's efficiencies drive throughout 2009, through maximising tendering for consumables and specialist services and in improving the effectiveness and efficiency of overhead maintenance costs such as fixed line voice carriers and electricity and gas consumption.

Library

The library focused on delivering cost efficient core library services by developing its e-resources. The majority of the library's journal subscriptions are now for online rather than print versions of journals. This approach results in enhanced access for our library users who can now access subscribed journals from their desktops and, from a library management perspective, leads to efficiencies and cost savings.

Additionally, new policies were implemented to ensure compliance with international best practice in the management of Marine Institute publications to maximise their accessibility to Marine Institute staff, researchers and the general public. In 2009 the Institute was accepted as the National Partner contributing to the ASFA (Aquatic Science & Fisheries Abstracts) international database which is made up of organisations representing 40 countries worldwide. This addition will benefit the Marine Institute and Irish scientists through having increased world-wide visibility for their publications.



“Value for money, budgetary management, compliance with financial procedures and strong corporate governance remained key corporate objectives.”



Irish Maritime Development Office (IMDO)



Director's Statement

The IMDO is a body under the aegis of the Department of Transport and acts as the National agency responsible for supporting the development of Irish the shipping, ports and shipping service sectors. The office works across four thematic areas, supporting Irish maritime development, trade and traffic analysis, maritime career support and expert policy advice to the Department of Transport.

The consequences of the global and domestic economic recession continued to make themselves felt during 2009 resulting in extremely challenging market and operating conditions for Irish shipping companies. Domestically, the much predicted "soft landing" failed to materialise and the Irish economy had to endure a painful year in recession. Irish shipping firms were, like many other industries, forced to make critical cost and capacity adjustments in 2009 as the economic downturn substantially impacted on tonnage volume, shipping capacity and freight rates. Irish-based shipping companies operating in international charter markets also had to endure testing and volatile conditions during the year. Global markets were still adapting to the bursting of the biggest market bubble in history, surpassing previous boom-to-bust cycles.

The change that occurred in the Irish economy last year was clearly reflected in the sharp downturn in volume activity through our ports. Underlying weakness in consumer confidence had seen import volumes plummet, particularly in cheap high-volume consumables originating in Asia. The boom in the Irish economy in previous years and the surge in the housing market fuelled domestic consumption of foreign imports with unitised volumes doubling during the previous seven years. Our two largest trading partners, the USA and UK, remained in recession for a large part of 2009, which put further pressure on our export volumes in an already challenging global market.

Against a very turbulent and difficult economic backdrop the IMDO continued to support and assist companies across our main programme areas.

Mr. Glenn Murphy

Director: Irish Maritime Development Office (IMDO)

Focus on Irish shipping market

Our initial estimates for the full year in 2009 point to severe volume corrections across all five key market segments: load on/load off (lo/lo), roll on/roll off (ro/ro), liquid, dry and break bulk. After record market highs in 2007 each market segment recorded a 36 month volume low at varying points in 2009. The lo/lo and ro/ro markets appear to have declined, generally in line with our forecast of approximately 23% and 15% respectively. The deterioration in bulk volumes was far more severe than projected, with dry bulk volumes down 29%, Tanker volumes declining by 22% and break bulk by a staggering 48%, the latter being largely attributed to the demise of residential construction demand. Small upward adjustments in import volumes were notable in the third quarter which was partly attributed to some replenishment of stock inventories coupled with improved optimism in consumer confidence ahead of the Christmas period. Laden Irish export volumes also showed some signs of resilience during the third and fourth quarters. Overall most markets appeared to bottom out during 2009 with some marginal volume recovery notable, however the overall correction in total volumes shipped has been quite severe. The IMDO will publish a full analysis of 2009 trends and developments in the Irish and global shipping markets in April 2010, with its Seventh Annual Irish Maritime Transport Economist bulletin.

The IMDO actively monitored developments in of the European Commission's Marco Polo and Motorways programmes throughout the year. In total, the IMDO is currently supporting twelve Irish companies, ports and organisations with potential programme applications.

Focus on Business Development

Our focus from a development perspective in 2009 was to work closely with our Irish-based ship owners and to maintain regular dialogue on current issues of concern to them. Internationally we adapted a more passive approach to seeking inward investment as many owners struggled to deal with what lay ahead of them in their respective markets.

We estimate that there were 232 vessels owned, managed and operated by Irish-based shipping companies at the end of 2009. After previous record investments announced by Irish interests in 2007-2008, there was significantly less activity in the new building market last year by Irish owners. We estimate that six new vessels, previously contracted, were delivered over the course of the year. However several other owners remained active in the market during the year with some notable disposals and acquisitions taking place. At the time of writing we are pleased to note that despite the problems that had manifested themselves globally, all Irish companies that began 2009 are continuing to trade and operate fleets.

The year ended with the announcement by US NASDAQ-listed TBS Group of its intention to establish operations in Ireland in 2010. We are also optimistic that, while the global market looks to rebuild itself, further new foreign direct opportunities will continue to emerge. We are optimistic that these will provide Ireland with the opportunity to continue to expand its maritime cluster while also creating new high calibre service-based employment.

Market Publications and Events

A core aspect of the IMDO's day-to-day role is our fundamental/technical analysis of Irish ports and shipping traffic and reporting to the Department of Transport. In April the IMDO published its 6th annual *Irish Maritime Transport Economist*. The data were widely published and used as a reference source in wider publications and media journals during 2009. We hosted two industry briefings in Dublin and Belfast on the 1st and 2nd April.

The IMDO published eleven separate European shipping reviews between Ireland and its major foreign markets during the course of the year and regularly uses its market information to provide route and country information to companies seeking to establish or expand shipping services to or from Ireland.

In June we co-organised the Second European Shortsea Congress which was held in Liverpool and attended by over 150 key industry delegates. A Shipping Finance Industry Briefing was hosted in December which was oversubscribed and plans to host a similar industry event during 2010 are underway.

The IMDO continued its support of the "Irish Exporters Shortsea Shipping Award", won this year for the second time by the Doyle Shipping Group. We also continued our strategic marketing support for *Cruise Ireland* and made several keynote presentations during the year, including the inaugural John De Courcy Ireland Paper for the Chartered Institute of Transport and Logistics.

Traffic via the website IMDO.ie increased by 15% with the shipping e-zine series continuing to be popular with visitors. As a result of our promotional and redevelopment efforts traffic through our web based e-platforms increased by more than 20%, with over 1.2 million hits and 150,000 unique visitors for the year.

Supporting Education Development

The IMDO manages the government's Irish Seafarer Educational Assistance Scheme (ISEAS). In 2009 more than 93 students and 11 companies benefited from seagoing training payments and company support. We also provided grant aid to 27 seafarers that enabled them to achieve higher certificates of professional competency and training. In 2009 we supported a pilot programme run by the National Maritime College of Ireland (NMCI) to train former fishermen to achieve conversion tickets to work in the merchant marine sector. IMDO are also pleased to advise that, based on the success of this scheme, we will be supporting another larger programme in 2010. We estimate that over the last five years 22% of all Irish seafarers benefited from training supports funded by IMDO.

The IMDO continued to provide funding and support to the Institute of Chartered Shipbrokers (ICS) lecture programme which is held at DCU in Dublin, attracting a record number of students who passed examinations in 2009. IMDO also sponsors the maritime student of the year awards with both the IICS and also the Chartered Institute of Transport and Logistics.

The Follow the Fleet (FTF) programme had its most successful year ever with just under 500 schools subscribed, with a potential outreach of 24,000 primary school children. In October we launched a FTF competition which we were delighted to have sponsored by Transas Ireland.



"Our focus from a development perspective in 2009 was to work closely with our Irish-based ship owners and to maintain regular dialogue on current issues of concern to them."



Marine Environment & Food Safety Services



Director's Statement

Over the course of 2009 Marine Environment & Food Safety Services (MEFS) provided essential scientific advice and a range of marine environmental and marine animal health monitoring services. These services were provided through expert knowledge and research with the aim of protecting the marine environment; ensuring Irish seafood

products meet approved standards and informing policy development. These services were provided principally to the Department of Agriculture, Fisheries and Food (DAFF), to other government departments including the Department of Environment, Heritage and Local Government (DoEHLG), the Department of Communications, Energy and Natural Resources (DCENR) and the Department of Transport (DoT). Services were also provided to other State agencies such as the Food Safety Authority of Ireland (FSAI), the Environmental Protection Agency (EPA) and the Sea Fisheries Protection Authority (SFPA).

In addition to the busy range of programmes that MEFS supports annually on an ongoing basis, 2009 saw the team participating in a number of new initiatives. These included the commencement of a baseline data collection survey of Natura 2000 sites in cooperation with the National Parks and Wildlife Service (NPWS) in order to facilitate the setting of conservation objectives for these sites by NPWS. MEFS also supported the DoEHLG and other government departments in preparatory working associated with the Marine Strategy Framework Directive.

Staff from MEFS also responded to emerging threats to the Irish aquaculture industry, including the emergence of significant mortalities in Irish stocks of the Pacific Oyster (*Crassostrea gigas*) during the summer period. Analysis by the Marine Institute concluded that the presence of a variant strain of OSHv1 was a significant factor in the mortalities. Subsequently MEFS staff members were instrumental in ensuring that a Commission regulation on the oyster mortalities afforded the best possible protection of both Ireland's health status and trading position.

I am very pleased to report that the MEFS team continued to demonstrate its commitment to achieving high quality and to meeting our legislative obligations by further increasing the number of accredited test methods accredited in accordance with ISO 17025 by the Irish National Accreditation Board (INAB) to 31 with a further seven methods put forward for accreditation. These accredited tests cover the full range of monitoring in Shellfish Safety, Residues, Fish Health and Marine Environmental Chemistry.

Mr. John Evans

Director: Marine Environment and Food Safety Services

Research

The MEFS team continued to participate in research projects that are closely linked to its monitoring activities and in support of the requirements of its government and industry customers. Marine Chemistry projects included "Impacts of increased atmospheric CO₂ on Ocean Chemistry and ecosystems", in collaboration with the National University of Ireland, Galway (NUIG) and "Biological effects and chemical measurements for the assessment of pollution in Irish Waters", led by Trinity College Dublin (TCD) in collaboration with the Enterprise Ireland Shannon Aquatic Toxicity Laboratory and Dublin Institute of Technology (DIT).

The GillPath and AquaPlan projects, both of which address issues relating to the Irish Finfish Aquaculture sectors continued, as did the ASTOX II project which is addressing issues surrounding Azaspiracid toxins in Shellfish.

A range of other projects in shellfish microbiology, marine chemistry and fish health are also being conducted at Masters Degree and PhD level within the Institute.

Advice and Monitoring

MEFS provided a range of scientific advice and monitoring services to DAFF and a number of other departments.

Advice provided to DAFF dealt with Foreshore Lease and Licence Applications, Dumping at Sea applications, aquaculture licences and monitoring. The Institute also had preliminary discussions with DoEHLG and the Environmental Protection Agency EPA to whom some of these licensing responsibilities will pass under planned legislative changes.

- > Members of the MEFS team also advised DCENR and Sustainable Energy Authority of Ireland (SEAI) on preparations for the Strategic Environmental Assessment of offshore renewable energy and are participating in it. MEFS staff also continued to advise DCENR on certain environmental aspects of offshore hydrocarbon exploration and production.
- > In parallel to providing advice to DEHLG and other government departments on the implications of the Marine Strategy Framework Directive, contact was maintained with the EPA and Government on the resourcing of the Monitoring programme for plants, benthic organisms and chemistry in transitional and coastal waters to meet the needs of the Water Framework Directive (2000/60/EC) were continued. MEFS also continued to provide scientific advice and data to support the implementation of the Water Framework Directive (2006/60/EC) to the EPA and to River Basin Districts as requested.
- > The MEFS team were active in contributing to the work of both the OSPAR Convention and ICES. Staff prepared contributions for, and participated in the review of, the planned OSPAR North-East Atlantic Quality Status Report due for publication in 2010.
- > Final preparations were made by the Institute to develop skills in the area of molecular biology and virology in preparation for assessment by the Irish National Accreditations Board under EN/ISO 17025. These include methods for the detection of noravirus, Koi Herpes Virus, Oyster Herpes Virus and Infectious Salmon Anaemia.

Seafood Safety

The Marine Institute is the EU Designated Irish National Reference Laboratory for both Marine Biotoxins and the monitoring of bacteria and viruses in bivalve molluscs. The Biotoxin Unit provides a weekly monitoring service, which includes monitoring of phytoplankton and biotoxins in shellfish flesh, for over 50 shellfish production areas. The programme ensures Irish compliance with EU regulations on shellfish safety.

Targets to have over 95% of results published within three working days were met by the Institute. Results of analyses are issued by Fax, e-mail and SMS text messages to regulators including the FSAI, the SFPA and the shellfish industry and published on the Institute's web site at <http://www.marine.ie/habsdatabase>. Shellfish toxins present throughout the summer and into winter months were identified and advice on closures provided in liaison with the regulatory authorities. Ongoing microbiological testing of shellfish production areas was used to update the classification of shellfish production areas, and advice was provided to regulatory authorities.

The Marine Institute is also the EU Designated Irish National Reference Laboratory for a number of chemicals in use in aquaculture. We participated in the national residues monitoring programme as required under the Residues Directive, as it has done since 1999. Results of the previous years finfish aquaculture monitoring were reported to DAFF, FSAI, Sea Fisheries Protection Authority (SFPA) on time in March 2009 for onward transmission to the EC. For the third year running no non-compliant samples were detected; a very positive message for the industry. Following reporting to clients annual results from individual fish-farms are compiled and transmitted to the farms.

Monitoring under the national programme for chemical contaminants in shellfish, to assist in meeting national obligations under the Shellfish Waters Directive, 2006/113/EC was carried out. Sampling on an expanded range of shellfish production areas was carried out and 129 oysters and mussel samples were tested for trace metals, polychlorinated biphenyls (PCBs) and pesticides. A range of fin-fish species landed at four major Irish ports were also tested for trace metals, PCBs and pesticides.

Competent Authority for Fish Health

Following the transposition of the Fish Health Directive into Irish law, the Marine Institute is now the competent authority for the implementation of the directive. As a result, during 2009 the Institute commenced authorising aquaculture operators following reviews of relevant bio-security and animal management plans. The Institute also commenced a programme of inspections of aquaculture operators, in close partnership with industry, to ensure compliance with the Directive.

During the course of the year the Institute observed a significant increase in mortalities of Native Oysters at several locations around the country. Investigations revealed the likely cause to be the OSHv1 virus, combined with environmental factors. The Fish Health Unit of the Institute monitored the situation closely and advised industry on the risks associated with the importation of seed likely to be the source of the infection. Movement restrictions were also imposed in line with the requirements of the Fish Health Directive.

The Fish Health Unit (FHU) within MEFS is the designated National Reference Laboratory (NRL) for Fish Diseases as well as the designated National Reference Laboratory for Mollusc Diseases and diseases of crustacea. It supports the aquaculture industry and inland fisheries in maintaining Ireland's fish health status through the provision of statutory services and diagnostic support.



“Targets to have over 95% of results published within three working days were met by the Institute.”



Fisheries Science Services



Director's Statement

The world of fisheries science is changing rapidly and must now be viewed in the context of wider ocean governance (i.e. the management of an entire sea area rather than just the fish in it). The reform of the Common Fisheries Policy (CFP), the new EU Marine Strategy Framework Directive (MSFD) and our obligations under various international agreements to implement an

Ecosystem Approach to fisheries management are all drivers for change. A key challenge for FSS is to both deliver the current requirements of our major client, Department of Agriculture Fisheries and Food (DAFF), and to carry out the research required to deliver the new form of scientific advice that decision makers will need in the near future. A key achievement of FSS in 2009 was to achieve this balance. Linking up with other service groups within the Institute is key to delivering the new scientific advice of the future. In 2009, FSS continued its strong engagement with MEHS on the impacts of coastal fishing in sensitive areas and on the MSFD. There was a very active collaboration with SPDS on data management and data integration. FSS also played a key role with OSS, MEHS and ACMS on the Climate Change Group. FSS invested considerable time and effort in analysing fishing activity in a new and innovative way, through linking Vessel Monitoring System (VMS) data and EU Logbook data. An atlas of fishing patterns and activity was published in late 2009 and this new way of looking at vessel activity received a very positive response from scientists, industry and policy makers. The challenges imposed by the delivery of integrated advice will continue.

Dr. Paul Connolly

Director: Fisheries Science Services

The Data Collection Framework

In 2009, the Marine Institute secured EU funding of € 3 million under the Data Collection Framework (DCF). This funding supports the data collection and provision of scientific advice required to support the Common Fisheries Policy (CFP). The extensive DCF reportage to the EU, involving the submission of National Programmes, Cost Statements and Technical Reports were completed on time. These reports were evaluated by the EU and, as a result, all funding sought was secured. Throughout 2009, extensive sea based and land based sampling programmes were conducted. These programmes examined fleet activity, landings profile, discarding, age profile of the stocks' spawning success (fish of the future). These data were pooled with other international data sets at the International Council for the Exploration of the Seas (ICES) and formed the basis of the scientific advice produced in 2009. International co-operation is an integral part of the work of FSS and in 2009, our scientists participated in over 100 international meetings on a range of issues including survey co-ordination and planning, stock assessment, formulation of advice, management, advancing scientific advice and EU research projects.

Surveys

Research vessel surveys are a critical part of the work of FSS. In 2009, a total of 14 surveys, comprising 196 sea days and 1,278 scientist-days were completed by FSS staff on research vessels and on chartered commercial vessels. The acoustic survey on blue whiting and the groundfish survey programme carried out in the Celtic Seas and West of Ireland are important international surveys involving Ireland, Norway, Russia, Netherlands, UK and France. The survey results are used in the scientific assessments of the stocks, but they are evolving to support the needs of the new Marine Strategy Framework Directive (MSFD). Underwater TV surveys were carried out on the important prawn stocks in the Celtic Seas, Aran Grounds and in the Irish Sea. The close cross border relationship continued with our Northern Ireland colleagues in relation to the prawn surveys in the Irish Sea.

Working with Industry

The strong working relationship with industry continued in 2009. The new long term management plan for cod, developed by the EU, placed great demands on FSS. A series of detailed analyses on the activities of the Irish fleet off the North West of Ireland and in the Irish Sea were conducted in

order to inform the discussions with Industry on the best options available for the Irish fleet. The work of Irish Fisheries Science Research Partnership (IFSRP), established by Minister Killeen in 2008, continued with a focus on measures to protect depleted prawn stocks on the Porcupine Bank (west of Ireland) and on areas where industry disagreed with the scientific approach (e.g. the scientific advice on stocks with limited data). The group is also addressing the difficult issue of the implementation of an “Ecosystem Approach” to fisheries management and how fishermen’s knowledge can be incorporated into the scientific process.

Research

Research is key to evolving the current scientific advice so it can meet the future needs of decision makers. FSS continued to engage in a suite of 13 national and international research projects in 2009. The EU DeepClean project examined the impacts of discarded gill nets off the west of Ireland and Scotland. A new Principal Investigator (PI) commenced work on the Sea Change funded Beaufort Project, which will develop capacity on the island of Ireland to implement the Ecosystem Approach to Fisheries Management. FSS also co-supervised a range of PhD projects with the third level focused on modelling and simulation, climate and fisheries, discard modelling, integration of data sets, and examining the ecological footprint of fishing activity.

Supporting DAFF

The DAFF are key clients of the Marine Institute. A key part of FSS work in 2009 was to support the work of DAFF in relation to the Common Fisheries Policy (CFP) and in relation to national inshore fisheries issues. FSS supported DAFF at the EU Fisheries Council in December, where fishing opportunities (i.e. fishing quotas) for the Irish fleet are determined. The annual Stock Book, with all the latest scientific advice on fish stocks was delivered to DAFF in July. FSS also supported DAFF in the critical negotiation with Norway on fishing opportunities for mackerel and on the redistribution of horse mackerel catches in the newly established management areas. A key feature of our work in 2009 also included the provision of scientific advice to DAFF in relation to the Inshore Fisheries Management Framework, particularly on lobster management and in the development of coastal fisheries management plans for sensitive inshore habitats. The Ireland response to the EU Green Paper on the Reform of the CFP was completed by DAFF and FSS supported the stakeholder engagement process and the formulation of the final response.



“The world of fisheries science is changing rapidly and must now be viewed in the context of wider ocean governance”



Aquaculture & Catchment Management Services



Director's Statement

2009 was the year when an extreme weather event, similar to that predicted under various climate change scenarios, severely impacted on the Burrishoole experimental catchment at Newport, County Mayo. On 2nd July, an unseasonable storm resulted in record rainfall which caused major flooding in the Newport area. In total some 52 millimetres (two inches) of rain fell

in just over just two hours. The water level in one of the experimental streams rose from less than one metre to over five metres during the same period, resulting in several major landslides and washing away three bridges. Such extreme events, normally considered to occur less than once in 250 years, have the potential to cause extreme damage and appear to be on the increase.

To address some of these issues, a team of scientists from the National University of Ireland, Maynooth, Trinity College, Dublin and the Marine Institute have been working over the past two years on the RESCALE Project. Using the unique fifty year environmental dataset available at Burrishoole, RESCALE has adapted a number of Global Climate Models to a local level to predict the likely changes in temperature, rainfall and flow rates in the rivers and streams of the catchment. The study is near completion and results indicate that temperatures have increased over the time since observations began. This is particularly true of winter temperatures which have risen significantly since 1988. Changes in rainfall are also projected, with winter increases of 10–20% and summer decreases of between 8–18%. To fully understand these changes it is critical to continue our monitoring of marine and freshwater ecosystems, maintain our data series and build the necessary capacity to understand the effects of climate change on individual river catchments, coastal regions and local economies.

The ACMS team was also involved in a broad range of monitoring and research work in support of national objectives in the areas of aquaculture, environmental research and migratory fish species during 2009. In the aquaculture area we continued to support DAFF in the monitoring and control of sea lice through the continued implementation of the DAFF sea lice pest control strategy. Research work continued on the EIRCOD project, which is funded under *Sea Change*, to design, establish and operate a cod brood stock and breeding programme, customised for the Irish environment and underpinning the native aquaculture industry. To date, some 30 separate cod families have been acquired for the breeding programme covering 2007, 2008 & 2009. In 2010 it is planned to collect wild ova which should increase to 50 the number of families available in the hatchery. Significant advances have also been made in development and refinement of hatchery and larval rearing technologies and protocols at the Martin Ryan Institute facility at Carna.

Work on the SALSEA programme intensified in 2009. In June/July 2009 the RV *Celtic Explorer* steamed far north above the Arctic circle searching for salmon post smolts. Over 800 post-smolts were taken in three surveys, carried out by scientists from Ireland, the Faroe Islands and Norway. Over 1,700 contemporary samples have been taken from the surveys in 2008 and 2009 and these will be tested for a broad range of

genetic and biological parameters. A wealth of other biological material and oceanographic data was also collected. A full update on the work of SALSEA Merge to date is available on www.salmonatsea.com. Analysis is underway to determine the origin of each individual salmon captured at sea, and to link this with the marine growth dynamics, survival and feeding of specific river stocks of Atlantic salmon. Work has also begun on mapping the migration routes of the salmon post-smolts at sea.

Dr. Ken Whelan

Director: Aquaculture and Catchment Management Services

Research Projects

EU FP7 / Prevent Escape

Escapes of fish from sea-cages have been reported for almost all major species presently cultured across Europe, including Atlantic salmon, sea bream, sea bass, Atlantic cod and rainbow trout. Prevent Escape (www.sintef.no/preventescape), aims at improving both fish farming technology and the way that technology is used in the sea to better protect against escape incidents. The project is specifically designed to conduct and integrate biological and technological research on a pan-European scale to improve recommendations and guidelines for aquaculture technologies and operational strategies that reduce escape events. Prevent Escape (April 2009 – April 2012) involves 11 partners from six countries (Norway, Greece, Spain, Malta, Scotland and Ireland) and is led by SINTEF Fisheries and Aquaculture.

EU / ECOKNOWS and POSE

Over the past year ACMS were successful partners in two major projects to build uncertainty and the existence of multiple species into traditional fisheries management models. ECOKNOWS will improve the use of ecosystem and biological knowledge in fisheries science and management through a more inclusive application of existing knowledge in addition to scientific data. This inclusion of risk and uncertainty, as has been shown in the case of salmon management models, fosters a much greater level of credibility among stakeholders. The POSE study will carry out a very similar Bayesian based modelling exercise for adult silver eels whose numbers are dropping dramatically throughout Europe and where an even greater level of uncertainty exists in relation to population estimates.

EPA / ILLUMINATE

The EPA funded ILLUMINATE project, which estimated anthropomorphic pressures on two Irish lakes, was completed successfully in September 2009 and the final report will be delivered to the EPA in early 2010.



Migratory Fish

International Salmon Management

ACMS has continued to provide technical advice to DCENR on wild salmon issues. 2009 saw the completion of the (North Atlantic Salmon Conservation Organisation) NASCO Focus Area Report on Habitat Management and an update on the 2008 Focus Area Report on Salmon Management by contracting parties. Ireland was highly commended for their recent management initiatives and their current salmon management policies and strategy with regard to habitat protection and enhancement.

The National Salmon Standing Scientific Committee, now in its tenth year, has provided an assessment of salmon stocks in 2009 and with catch advice in 2010. This group, chaired by the Marine Institute, reported that marine survival of Irish and international stocks of Atlantic salmon are continuing to decline. This decline is attributable to continued poor survival of salmon at sea. The need for ongoing research into the exact causes of this decline was stressed in the group's report.

Eels

ACMS provided scientific advice on eels to the Department of Communications, Energy and Natural Resources (DCENR) and the National Eel Working Group and, through their involvement with ICES and EIFAC, supported the international EELIAD project which is revealing eel mortality both in the marine and freshwater environments.

Beaufort Fish Population Genetics

By the end of 2009, some 22 projects were integrated within the Beaufort Fish Population Genetics initiative. These include population studies, field experiments, ranching and breeding programmes. Genetic analyses conducted by the Beaufort team in 2009 included genetic stock identification, mixed stock fisheries analysis, individual assignment, phylogeography, parental assignment, adaptation and gene expression studies. As required by the award, contributions to the building of research capacity included 12 grant proposals which were submitted to national and international funding bodies, of which seven were successful. The resulting grant awards leveraged directly through Beaufort have a total value €1.13m. In 2009 the Beaufort team published 14 peer review publications, five non-peer review publications, five posters and 21 formal presentations to symposia, workshops and stakeholder meetings.

SALSEA Merge

SALSEA Merge (see www.salmonatsea.com) is an international programme of research into the decline in marine survival of salmon stocks. A 16 day post-smolt sampling cruise was carried out on board the RV *Celtic Voyager* and the RV *Celtic Explorer* in May 2008. This was followed by a 15 day cruise carried out by the Faroese research vessel, the RV *Magnus Heinason*. A total of 797 post smolts and older salmon were collected over the course of the two cruises. A Norwegian cruise took place from the 26th July to the 9th August, 2008 aboard the RV *Eros*. A total of 88 salmon were taken in 31 net hauls, providing a total of 885 samples from the three ocean cruises. The areas fished had not previously been surveyed systematically for post smolts. The westerly distribution of the smolts was of particular interest.

A full update on the three cruises is available on www.salmonatsea.com. At present analysis is underway to determine the origin of each individual salmon captured at sea. Work is also ongoing on the growth of the salmon at sea. Work has also begun on mapping the migration routes of the salmon post smolts at sea.



“To fully understand these changes it is critical to continue our monitoring of marine and freshwater ecosystems, maintain our data series and build the necessary capacity to understand the effects of climate change.”



Ocean Science Services



Director's Statement

2009 was a year of significant challenge for Ocean Science Services (OSS) with increased workloads in the SSTI-funded climate change and marine exploration programmes, as well as our normal wide range of national and international activities, including the development of EU funded research programmes. Three new projects were approved in the last quarter of the year: MESH Atlantique, EASYCO and ARCOPOL.

OSS also provided operational and research support services to other Marine Institute programmes, to the Irish RTDI community and to international marine research projects where Irish researchers were significant partners. OSS is also very active in a range of European and international programmes and meetings. These services were successfully continued despite budgetary and staffing difficulties due to the national economic situation. For this I must thank the staff of OSS.

Notable highlights are included here and in Appendix 6 on the Research Vessel Programme 2009.

- > Intensive survey programs were completed on both research vessels with the *Celtic Explorer* completing 20 surveys totalling 305 science days and the *Celtic Voyager* completing a total of 34 surveys comprising 255 science days.
- > The deep water Remotely Operated Vehicle (ROV) *Holland I* came into service in 2009 and was mobilised for three surveys totalling 53 survey days after completing acceptance trials in January.
- > 2009 saw the completion of an intensive fisheries programme which included three acoustic survey programmes, a deepwater fisheries survey as well as the annual groundfish survey completed using the *Celtic Explorer*. The *Celtic Voyager* completed 28 days of underwater TV surveys for *Nephrops* stock assessment and a ten day herring recruitment survey.
- > The original INFOMAR project approval was received in 2006 for €12m for the first three years (2006 – 2008), and despite the economic climate, further approval was received in Quarter 4 2008 for project continuance at the same level of funding for the life of NDP to 2013. A final 2009 budget allocation of €3.363m was received, enabling a significant programme of work to be undertaken.

- > INFOMAR 2009 survey operations included R.V. *Celtic Voyager* data acquisition in the Shannon Estuary, Dingle and Wexford, as well as the Southwest, Southeast and Eastern Priority Areas (Fig. 1). A groundtruthing programme was undertaken in Donegal / Sligo, and the Geological Survey of Ireland's (GSI)'s R.V. *Keary* was commissioned and undertook completion of Dublin Bay surveying for inclusion in the forthcoming revised (United Kingdom Hydrographic Office) UKHO Admiralty Chart.
- > The R.V. *Celtic Explorer* and R.V. *Celtic Voyager* were successfully fitted with bridge based OLEX fisheries navigation software, with all INSS multibeam data embedded. This enables 3D seabed visualisation during fisheries surveys, as well as automated (unmanned) live capture of multibeam and seabed classification data during these operations. Fisheries programmes were further supported in 2009 through additional acquisition of INFOMAR data during the Aran Grounds Survey.
- > The national pool of equipment was expanded though (European Regional Development Fund) ERDF funding to include three high specification real time data buoys that were launched and are operating in support of SmartBay and fisheries.
- > Marine Institute ocean forecast products are now fully integrated into the FP6 ECOOP EU wide system of ocean forecasts. See <http://www.ecoop.eu/products.php> where descriptions and 'Quick View' can be accessed.
- > Considerable capacity has been built in climate and ecosystem modelling, supported through the procurement of the dedicated High Performance Computing Cluster. This new infrastructure will enable scientists to produce predictions of Ireland's marine climate under various greenhouse gas emission scenarios for the 21st century.
- > Work on developing a follow-on strategy for the Marine Climate Change Programme is ongoing.

Mr. Michael Gillooly
Director: Ocean Science Services

Research Vessel Operations

OSS continued to coordinate and manage the operation of the R.V. *Celtic Voyager*, the R.V. *Celtic Explorer* as well as the Deepwater Remotely Operated Vehicle (ROV) *Holland I* and provide support services to the users of the vessels, including instrumentation and engineering support and extremely flexible operations. The Integrated Marine Exploration Programme (IMEP) continued to provide support for research and training surveys, in addition to delivering *Science@Sea* courses for third-level students and support for European Deep Sea Research Projects.

Oceanographic Services Section

This section provided comprehensive oceanographic services underpinning many national programmes. Key services included the management of the national equipment pool and management and operations of Irish Marine Data Buoy Network. Oceanographic Services provided significant input to the provision of a data service to the marine community, as well as remaining active in ocean modelling and coastal oceanography, including the development of the Irish National Tide Gauge Network. This system achieved 19 gauges in 2009 with plans to install a further five in the Dublin area. In 2009, responsibility was assumed for environmental measurements at the Wave Energy Test sites in Galway Bay and Belmullet, Co. Mayo.

Marine Climate Change Section

The Marine Climate Change Section completed an ambitious two-year multi-disciplinary programme building on historic datasets and current surveys across the Marine Institute, together with other relevant national and international activities which formed a key contribution to Ireland's national climate change research and monitoring programme.

Advanced Mapping Services

This section conducted integrated survey activity within the INFOMAR seabed mapping programme, in partnership with the GSI. Marine mapping expertise was also provided in support of other national programmes and in the promotion of research and development within the areas of resource mapping. Other value-added products, services and ancillary projects from the survey activity were also implemented, along with data exchange and integration of the results derived from the INFOMAR programme.

Advanced Mapping Services also undertook and coordinated a significant work programme during 2009 in collaboration with GSI, on behalf of National Parks & Wildlife Services (NPWS), involving mapping of offshore geogenic reef habitats using the R.V. *Celtic Explorer*, the ROV *Holland I*, and the deep ocean underwater video camera. With the assistance of an international research team, survey operations on the Rockall Bank, the Porcupine Bank, and the Celtic Margin Canyons were completed.

The Joint Irish Bathymetric Survey Project (JIBS) commenced on 10 April 2007 and was completed on 31 October 2008. This project was lead by the Maritime and Coastguard Agency (MCA) with the Marine Institute of Ireland as project partner funded through the INTERREG IIIA programme. Priority areas of a three nautical mile coastal strip between Inishowen Head and Melmore Head were surveyed on the R.V. *Celtic Voyager* totalling 420 km².



“Considerable capacity has been built in climate and ecosystem modelling, supported through the procurement of the dedicated High Performance Computing Cluster.”



Strategic Planning & Development Services



Director's Statement

2009 got off to a very positive start with an informal presentation in January to the newly established EU DG MARE Directorate D on the Irish Marine Research Strategy Sea Change which was followed by a visit of an EU delegation, led by the EU Director General for Research, Mr José Manuel Silva Rodriguez, to the Marine Institute headquarters in Galway in September.

During 2009, the International Co-operation Programme team continued to work to facilitate Irish participation in EU competitive research programmes. At the close of the year, Irish marine researchers were participating in 43 FP7 projects with grant-aid valued at €17.5 million and 15 INTERREG-IV projects with grant-aid valued at €4million. A further 12 INTERREG-IV projects with grant aid of around €3.4 million have been approved subject to successful contract negotiation (see Appendix 2). Directories of these successful projects were published by the Institute in 2009.

Throughout the year we continued to progress the implementation of the *Sea Change* Strategy. Building upon the 2007 and 2008 investment commitments, new investment of €2.15m was committed in 2009, supporting research and training onboard the national research vessels. This brings the total committed under the NDP Marine Research Sub-Programme to €49.7m, with total investment, both nationally and internationally, in marine-related research over the period 2007-'09 now standing at approximately €119m. 41% of these funds come from NDP funds managed by the Institute, while 39% comes from other national funds and 20% from international funding.

The Sea Change Team were actively engaged in supporting three major emerging national R&D programmes in Marine Biotechnology, Advanced Marine Technology and Renewable Ocean Energy, details of which are provided below. The year involved intense liaison with the key development agencies, e.g. IDA, Enterprise Ireland and SEAL, as well building new and strengthening existing partnerships with SMEs, MNCs and researchers, in order to move these programmes from aspirational to operational. To further progress these programmes, two national co-ordinators were appointed in DCU and NUIG in Advanced Marine Biotechnology and Marine Biotechnology, respectively.

Over the year, the Information Services & Development Group delivered a number of new and upgraded systems including the extensive new Survey Planning System for the national marine research fleet to manage ship-time applications and survey planning, an upgraded intranet site, and an Irish language section on the Institute's website. The broadband connections to Oranmore, Newport and Harcourt Street were also significantly enhanced, most notably in Oranmore with connection to the very high speed HEAnet network of one Gigabit bandwidth. In February the Irish Spatial Data Exchange (ISDE) project, which allows users to easily find and access marine data held by various organisations including the Marine Institute, DCENR, GSI, EPA, DEHLG and UCC, was awarded a Cross Agency eGovernment Award. The system has also been proposed as a component of the national INSPIRE Directive infrastructure linking all public environmental data holders. 2009 also saw the Institute connecting Irish marine data to the European SeaDataNet portal which will eventually allow data to be easily accessed online from 40 national organisations across 35 European countries.

Finally, the SPDS team actively participated in a number of national and international fora providing strategic input and advice. These included ongoing strategic advice on the development of renewable ocean energy, preparation of a submission to the Government's Innovation Task Force, input into the development of a 2020 Strategy DAFF, and ongoing input at an EU level aimed at influencing the international marine research agenda.

Ms. Yvonne Shields

Director: Strategic Planning and Development Services

International Co-Operation

The International Co-Operation Programme continued to play a leading role in defining the European Marine Research Agenda whilst in parallel supporting Irish marine researchers competing for EU research funded projects.

Highlights included:

- > The participation of international researchers in Irish Workshops on Marine Socio-Economics, Climate Change Impacts and Marine Sensor Technologies.
- > The successful completion of the 13 country EU FP6 MarinERA Project (2004-2009) and the preparation of a successful follow-up FP7 SEAS-ERA Project (2010-2014) involving 19 European coastal states, excluding the Baltic.
- > Participation in a number of international activities and workshops defining European marine research priorities in Brussels, Lisbon, Ostend, Prague, Rome, Sopot and Tromsø.
- > In May, Dr Niall McDonough left the International Co-Operation Team, where he was Team Leader, to take up the prestigious role of Executive Secretary at the Ostend-based Marine Board-ESF.

Sea Change Management Unit (SCMU)

Building upon the 2007 and 2008 investment commitments, new investment of €2.15m was committed in 2009, supporting research and training onboard the national research vessels. This brings the total committed under the NDP Marine Research Sub-Programme to €49.7m. Details of these investments are provided in Appendix 1. 2009 saw the roll-out, on a trial basis, of a new online Research Information Management System (RIMS), to assist in the ongoing reporting and management of funded projects and reporting of data on the performance indicators and high-level impacts for Sea Change. In addition to the investment commitments in marine research, SCMU activity in 2009 focused on: project management and monitoring of ~40 projects; programme development initiatives; and strengthening existing and building new partnerships with both the public and private sectors. Further information on SCMU activities in 2009 is provided in the Sea Change Annual Progress Report for 2009.

Discovery R&D Programmes

The *Sea Change* team were actively engaged in supporting three major national marine R&D programmes: the National Marine Biotechnology Programme, which incorporates the Beaufort Marine Biodiscovery Project and the Marine Functional Foods project, the Advanced Technology Programme, which incorporates the SmartBay initiative, and the Renewable Ocean Energy Programme.

In 2009 the Biodiscovery Laboratory, which is housed in the Institute and operated by NUIG, became operational with 73 samples taxonomically verified, stored and in process of extraction.

In the Advanced Technology Programme, the SPDS team continued to work in partnership with the HE research community. Highlights included the organisation of multiple stakeholder consultation meetings including an Industry Workshop in July. Outputs included the formation of an industry-led strategy group, comprising key individuals from industry (IBM, Intel, ESRI Ireland Ltd., and InTune Technologies Ltd.) and representatives from development agencies (IDA, Enterprise Ireland, SFI and SEI). The Group is working with the Institute in the development of industry-related initiatives including the formation of an Ocean Technology Innovation Cluster.

The SmartBay pilot infrastructure, which is being operated by the Institute, continued to generate exciting outputs based on collaboration between industry and academia in terms of data analytics, environmental monitoring and wireless communications and the various partners involved are actively pursuing their R&D and testing activities. A proposal to significantly expand the current SmartBay infrastructure was submitted for funding under the HEA's PRTL in July 2009. Partners include Dublin City University (DCU), NUIG, National University of Ireland, Maynooth (NUIM) and University College Dublin (UCD), Intel, IBM and the Marine Institute.

Ocean Energy was another very active area for the SPDS team. Activities in 2009 included ongoing technical support to the quarter-scale test site off Spiddal and technical services and deployment of infrastructure related to the commissioning of an offshore grid connected full scale test site at Belmullet Co. Mayo. The Institute continued to be an important source and provider of oceanographic and meteorological data, providing access to these datasets via its website and data request facilities. In addition to the direct operational support provided to researchers and developers, SPDS continued to provide a strategic and advisory role to SEI via attendance at monthly Ocean Energy Advisory Group and Ocean Energy Steering Group meetings.

Information Services and Development

Information Services and Development (IS&D) continued to provide day-to-day technical support across the Institute (servicing in excess of 3,000 requests for support covering technical, applications and data management queries), whilst also servicing in excess of 250 data requests from external parties. In addition to these support services, IS&D were involved in excess of 50 projects (focusing on Strategic Business and Technical Support, Operational and Marine Institute Service Group Support Projects). Highlights include:

- > Development and rollout of the Survey Planning System
- > A significantly upgraded intranet site for information sharing
- > Broadband upgrades for all sites including HEAnet connection



“Throughout the year we continued to progress the implementation of the *Sea Change* Strategy.”

- > Optimisation of Chemistry Reporting
- > The inclusion of data from new oceanographic sensors in MI information systems
- > Initial development work to support Fish Health Directive compliance work
- > In partnership with the GSI / DCENR, DEHLG and EPA the development of the Irish Spatial Data Exchange (ISDE);
- > Significant progress in the Integrated Data Repositories project to develop processes and tools to promote better management of research data; and
- > Connection of Institute data to the European SeaDataNet data portal

IS&D also provided support and guidance related to the *Sea Change* Knowledge & Information Management Programme.

General Administration

Liaison

The programme of the Marine Institute covers a wide range of activities that require close liaison and co-operation with many individuals and organisations. These include the Department of Agriculture, Fisheries and Food, the Department of Finance and other government departments and state agencies, private enterprise and the higher education sector. The Institute acknowledges the continued support and co-operation 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.

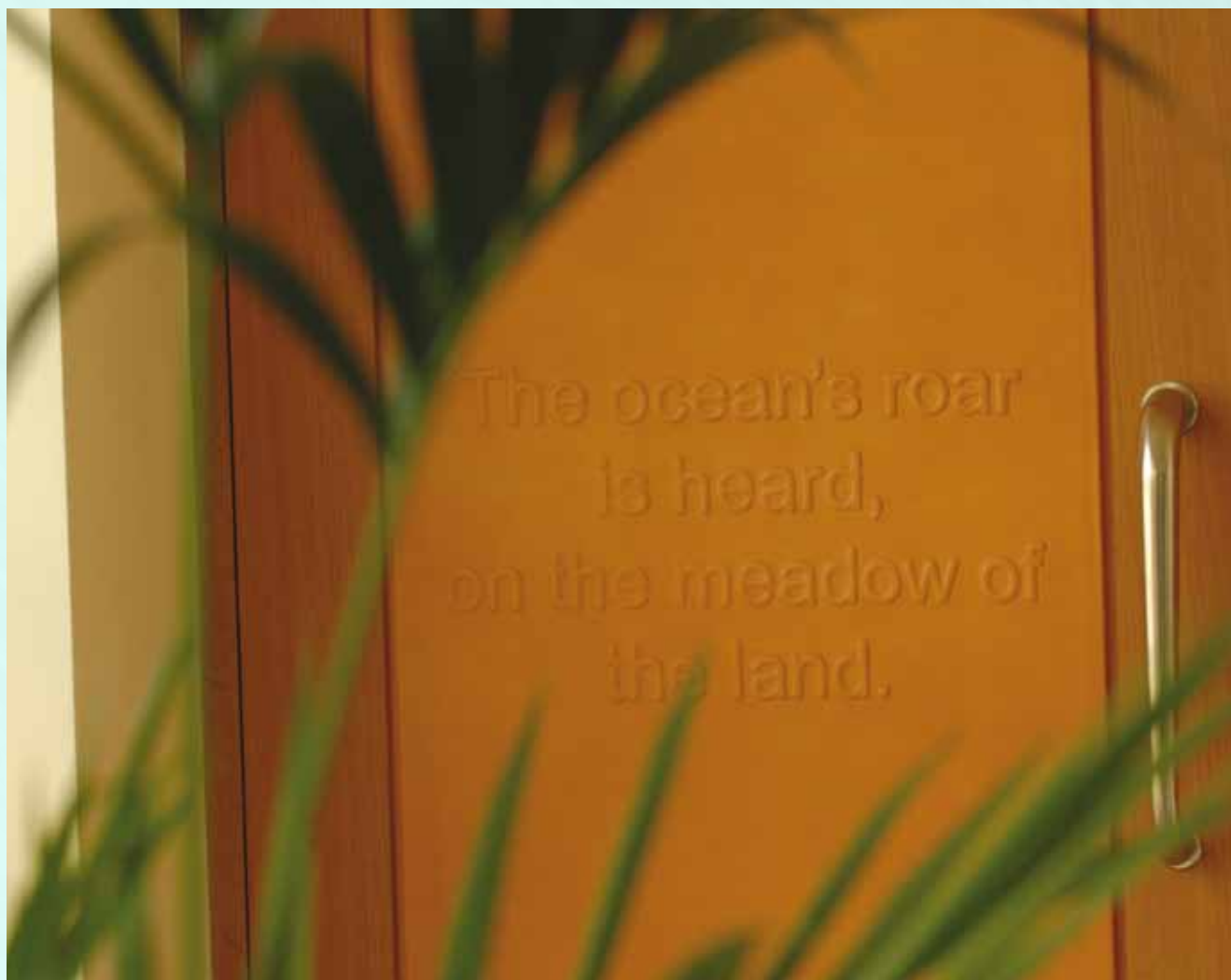
Employment Equality

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





Appendices

APPENDIX 1: NDP MARINE RESEARCH PROGRAMME 2007–2013 SHIP-TIME PROGRAMME AWARDS 2009

NDP MARINE RESEARCH PROGRAMME 2007–2013 – SHIP-TIME PROGRAMME 2009

Sea Change Research Measure	Sea Change Research Programme	Project Type	Project Reference	Project Title	Grantee / Lead	Total Grant-Aid
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-01	Student Training in Dublin Bay	TCD	€35,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-03	Advanced techniques in oceanography; a joint GMT/NUIG training cruise for final year undergraduate students	GMT	€48,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-04	Undergraduate basic training in oceanographic and fisheries sampling at sea	GMT	€56,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-05	Undergraduate shipboard training in methods of oceanographic, benthic and fisheries research	GMT	€28,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-07	UCC Multidisciplinary Offshore Training for Marine Undergraduates	UCC	€14,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-08	Fronts and coastal processes affecting dispersal and entrainment of jellies, zooplankton and rafts	NUIG	€80,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-09	Introduction to seabed mapping – training for MA students	UCC	€14,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-10	MSc Marine Biology – Cork Harbour	UCC	€14,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-11	Wildlife Biology: Introduction to Marine Exploration	IT, Tralee	€14,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-ST-09-25	21st Century Graduate: Integrated marine training for the next generation of marine scientists	UU	€102,000
Infrastructure Supporting	Research Vessel Ship-Time	Dedicated Training Programme	RV-BrightSparks-09-01	Is the Labadie Bank a hotspot for primary production and higher trophic feeding in the Celtic Shelf?	NUIG	€40,000
Infrastructure Supporting	Research Vessel Ship-Time	Integrated Research Survey	RV-ST-09-06	Novel Imaging and control technology research on ROV Latis with Integrated Science Survey Missions (Dedicated Training & Integrated Research Survey components)	UL	€136,000

NDP MARINE RESEARCH PROGRAMME 2007–2013 – SHIP–TIME PROGRAMME 2009						
Sea Change Research Measure	Sea Change Research Programme	Project Type	Project Reference	Project Title	Grantee / Lead	Total Grant–Aid
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–12	Cetaceans on the Frontier: Atlantic Front Ecosystems and Foraging Niches	GMIT	€238,000
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–14	A multidisciplinary investigation of ecosystem hotspots and their importance as fish habitat along the Irish and Biscay continental margins	NUIG	€504,000
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–16	A multidisciplinary investigation of the highly dynamic Irish shelf edge system: Implications of along–shelf edge transport and cross–shelf edge exchange for biogeochemical cycling and ecosystem functioning	NUIG	€153,000
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–17	Carbon Cycling in Marine Pockmarks and Coastal Areas	DCU	€48,000
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–18	Harmful Algal Blooms in thin layers: origins and transport	NUIG	€64,000
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–20	Advancing understanding of Atlantic Salmon at Sea: Merging Genetics and Ecology to resolve stock–specific migration and distribution patterns	MI	€105,000
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–22	Irish Coral Carbonate Mound Development and Growth ROV Survey	UCC	€189,000
Infrastructure Supporting	Research Vessel Ship–Time	Integrated Research Survey	RV–ST–09–23	Irish Sea Marine Assessment (ISMA)	UCC	€112,000
Infrastructure Supporting	Research Vessel Ship–Time	Dedicated Training Programme	–	Science@Sea	Various	€153,000
TOTAL						€2,147,000

Appendices

APPENDIX 2: IRISH PARTICIPATION IN EU RTD PROJECTS

European Union Framework (FP) and Regional Development (INTERREG) Programmes play a major role in facilitating and supporting Irish participation in competitive pan-European co-operative marine research and development projects and initiatives.

Between 2007 and 2009, Irish researchers have been successful in 43 FP7 marine projects (total grant-aid circa €17.5 million). In 2009 a Report profiling the successful FP7 projects during the period 2007–2008 was produced (see Publications, Appendix 3). The projects listed here are those approved in 2009, in addition to three collaborative projects (AIRSEA, STANDPOINT, WAVETRAIN-II) and four SME projects (HYFFI, MusselsAlive, OYSTERCOVER, SETTLE) omitted from the 2007–2008 Directory.

During the same period (2007–2009), 15 INTERREG-IV Projects (grant-aid €4million) were approved for funding (see Publications, Appendix 3). In 2009, a further 12 INTERREG-IV projects have been approved subject to successful contract negotiation (grant-aid circa €3.4 million). These projects will be profiled in the 2010 Annual Report.

Details of EU Research Funding opportunities are described on the Marine Institute Internal Funding Opportunities web-page: www.marine.ie/home/funding/InternationalFunding/ and copies of the Directories can be downloaded from www.marine.ie/home/publicationsdata/publications/

AIRSEA: Air-sea fluxes of climatically relevant gases in the marine atmosphere boundary layer. *National University of Ireland, Galway (NUIG).*

AQUAMED: The future of research on aquaculture in the Mediterranean Region. *AquaTT*

Aqualnova: Supporting governance and multi-stakeholder participation in aquaculture research and innovation. *AquaTT.*

CLAMER: Climate Change and Marine Ecosystem Research Results. *National University of Ireland, Galway (NUIG).*

COEXIST: Interaction in Coastal Waters: A Roadmap to sustainable integration of aquaculture and Fisheries. *Coastal and Marine Resource Centre (UCC)/ AquaTT.*

ECOKNOWS: Effective use of ecosystems and biological knowledge of fisheries. *Marine Institute.*

EELA-2: E-Science Grid Facility for Europe and Latin America. *Coastal and Marine Resource Centre (UCC).*

GEO-SEAS: Pan-European Infrastructure for Management of Marine and Ocean. Geological and Geophysical Data. *Coastal and Marine Resource Centre (UCC). / Geological Survey of Ireland (GSI).*

HYFFI: Hydrocolloids as functional food ingredients for gut health. *Cybercolloids Ltd./Marigot Ltd.*

MARINA: Evaluation of multi-purpose platforms for marine renewable energy. *Hydraulic and Maritime Research Centre (UCC).*

Marine TT: European Marine Research Knowledge Transfer and Uptake of Results. *AquaTT.*

MusselsAlive: Development of best practice and new technology for grading, handling, transportation, conditioning and storage of mussels for SMEs in the European mussel industry. *Irish Farmers' Association (IFA).*

ODEMM: Options for Delivering Ecosystem Based Marine Management. *Marine Law and Ocean Policy Research Centre Services.*

ORECCA: Offshore Renewable Energy Conversion Platforms Coordination Action. *Hydraulics and Maritime Research Centre (UCC).*

OYSTERECOVER: Establishing the scientific bases and technical procedures and standards to recover the European flat oyster production through strategies to tackle the main constraint, bonamiosis. *UCC/ Clew Bay Marine Forum Ltd./ Clew Bay Oyster Cooperative Society Ltd./ Atlantic Shellfish Ltd.*

SEAS ERA: Towards an Integrated European Marine Research Strategy and Programme. *Marine Institute.*

SETTLE: Bivalve conditioning and settlement – keys to competitive hatchery production. *Cartron Point Shellfish Ltd.*

SHOAL: Search and Monitoring of Harmful contaminants, other pollutants and leaks in vessels in port using a swarm of robotic fish. *Tyndall Institute (UCC).*

STANDPOINT: Standardisation of Point Absorber Wave Energy Convertors by Demonstration. *Wavebob Ltd..*

SUPPORT: Security Upgrade for Ports. *Nautical Enterprise Ltd.*

TEAMSAFETY: The development project for an innovative 3D virtual team-training maritime safety simulation platform. *Sea and Shore Safety Ltd.*

WaveTrain II: Initial training network for wave energy research professionals. *Hydraulics and Maritime Research Centre (UCC).*

APPENDIX 3: MARINE INSTITUTE PUBLICATIONS

Special Reports/Books

Atlas of the Commercial Fisheries Around Ireland: 2009 Review of the Fisheries of Relevance to Ireland

Marine Institute, Fisheries Science Services, (2009). ISBN: 978-1-902895-46-8.

Herring: Linking Biology, Ecology and Population Status in the context of Changing Environments: Conference Report. (2009)

Clarke, M.W., Brophy, D., Dickey-Collas, M., Fiksen, Ø, Hatfield, E.M.C., Hay, D.E., Nash, R.D.M., Norcross, B.L., Slotte, A. (eds.). Marine Institute, (2009). ISBN: 978-1-902895-39-0.

MEFEPO North Western Waters Atlas

Cannolly, P.L., Kelly, E., Dransfeld, L., Slattery, N., Paramour, O.A.L., Frid, C.L.J. Making the European Fisheries Ecosystem Plan Operational Marine Institute, Fisheries Science Services, (2009). ISBN: 978-1-902895-45-1.

Status of Irish Aquaculture, 2007

Browne, R., Deegan, B., Watson, L., MacGiolla Bhríde, D., Norman, M., O'Cinnéide, M., Jackson, D., O'Carroll, T. BIM, Marine Institute, Údarás na Gaeltachta, (2009). ISBN: 978-1-903412-37-4.

The Stock Book. Annual Review of Fish Stocks in 2009 with Management Advice for 2010

Marine Institute, (2009).

Interim Assessment (Regulation 31) of the Impact of Mussel fishing and Ongoing on Castlemaine Harbour SAC and SPA. (2009).

Fisheries Science Services, Marine Institute.

An impact assessment report to DAFF on the mussel fishing and production plan for 2009 submitted for licencing to DAFF by the Castlemaine Harbour co-operative Society Ltd. 48pp.

Interim Assessment (Regulation 31) of the Impact of Cockle Fishing on the Conservation Status of Dundalk Bay SAC and SPA. (2009).

Fisheries Science Services, Marine Institute.

An impact assessment report to DAFF on a cockle fishing plan for 2009 submitted for licencing to DAFF by the Dundalk Bay Local Advisory Committee. 41pp.

The Status of Irish Salmon Stocks in 2008 and Precautionary Catch Advice for 2009.

O'Maoiléidigh, N., Boylan, P., Crozier, W., Gargan, P., McGarrigle, M., McGinnity, P., Marnell, F., deEyto, E., Roche, W., Lawler, I., Doherty, D., White, J., McCrory, T., O'Higgins, K.

Marine Institute, (2009).

Draft Report of the Standing Scientific committee to the Department of Communications, Energy and Natural Resources: (2009)

International Co-operation Publications

Irish Marine Projects supported by the EU INTERREG IV Programme in 2007-2008

O'Sullivan, G., Pedreschi, D., Guilfoyle, C. Marine Institute, (2009), 24pp.

Irish participation in EU FP7 funded competitive marine research projects during the period 2007-2008

O'Sullivan, G., McDonough, N., Pedreschi, D. Marine Institute, (2009), 35pp.

Irish Fisheries Bulletin Publications

ISSN: 1649-5055

No.32, (2009)

National Survey of Sea Lice (*Lepeophtheirus Salmonis* Kroyer and *Caligus elongatus* Nordmann) on Fish Farms in Ireland - 2008

O'Donohoe, P., Kane, F., Kelly, S., Nixon, P., Power, A., Naughton, O., Tully, D., Jackson, D.

Marine Institute, (2009).

Irish Fisheries Investigation Series

ISSN: 0578-7467

No.21, (2009)

Using a multivariate approach to define Irish metiers in the Irish Sea

Lordon, C., Davie, S.

Marine Institute, (2009).

Marine Environment and Health Series

ISSN: 1649-0053

No. 36, (2009)

Irish Sea Marine Aggregate Initiative (IMAGIN): Technical Synthesis Report

Sutton, G. Marine Institute, (2009)

No. 37, (2009)

Proceedings of the 9th Irish shellfish Safety Workshop

Gilmartin, M., Silke, J. (eds.).

Marine Institute (2009).

Appendices

APPENDIX 4. SCIENTIFIC PAPERS & PUBLICATIONS

A review of phytoplankton ecology in estuarine and coastal waters around Ireland

O'Boyle, S., **Silke, J.**

Journal of Plankton Research, (2009), 32 (1), pp99–118.

An integrated approach to the toxicity assessment of Irish marine sediments. Application of porewater Toxicity Identification Evaluation (TIE) to Irish marine sediments

Macken, A., Giltrap, M., Foley, B., **McGovern, E., McHugh, B.**, Davoren, M.
Environment (International Volume), (2009), 35 (1), pp98–100.

Bayesian survey-based assessment of North Sea plaice (*Pleuronectes platessa*): extracting integrated signals from multiple surveys

Bogaards, J.A., **Kraak, S.B.M.**, Rijnsdorp, A.D.

ICES Journal of Marine Science, (2009), 66(4), pp665–679.

Biased stock assessment when using multiple, hardly overlapping, tuning series if fishing trends vary spatially

Kraak, S.B.M., Daan, N., Pastoors, M.A.

ICES Journal of Marine Science, (2009), 66(10), pp2272–2277.

Bioassay-directed fractionation of marine sediment solvent extracts from the east coast of Ireland

Giltrap, M., Macken, A., **McHugh, B.**, Hernan, R., O'Rourke, K., **McGovern, E.**, Foley, B., Davoren, M.

Chemosphere, (2009), 76, pp357–364.

Comparative accumulation and composition of lipophilic marine biotoxins in passive samplers and in mussels (*M. edulis*) on the West coast of Ireland

Fux, E., Bire, R., Hess, P.

Harmful Algae, (2009), 8 (3), pp523–537.

Development and Single-Laboratory Validation of a Pseudofunctional Biosensor Immunoassay for the Detection of the Oxadaic Acid Group of Toxins

Steward, L.D., **Hess, P.**, Connolly, L., Elliott, C.T.

Analytical Chemistry, (2009), 81 (24) p10208–10210.

Distribution patterns of ichthyoplankton communities in different ecosystems of the Northeast Atlantic

Dransfeld, L., Dwane, O., Zuur, A.F.

Fisheries Oceanography, (2009), 18 (6), pp470–475

DSP toxin production *de novo* in cultures of *Dinophysis acuminata* (Dinophyceae) from North America

Hackett, J.D., Tong, M., Kulis, D.M., **Fux, E., Hess, P., Bire, R.**, Anderson, D.M.

Harmful Algae, (2009), 8 (6), pp873–879.

Formation of Azaspiracids-3, -4, -6, and -9 via Decarboxylation of Carboxyazaspiracid Metabolites from Shellfish

McCarron, P., **Kilcoyne, J.**, Miles, C.O., **Hess, P.**

Journal of Agriculture and Food Chemistry, (2009), 57 (1), pp160–169.

Habitat mapping for conservation and management of the southern Irish Sea (HABMAP)

Robinson, K., Darbyshire, T., Van Landeghem, K., Lindebaum, C., McBreen, F., Creaven, S., Ramsay, K., Mackie, A.S.Y., Mitchell, N., Wheeler, A., Wilson, J., **O'Beirn, F.**

BIOMÔR (2009) (*Studies in Marine Biodiversity and systematics from the National Museum of Wales*), Report No. 5(1).

Herring: Linking biology, ecology, and status of populations in the context of changing environments. (2009)

Daan, N., **Clarke, M.W.**, Dickey-Collas, M., Slotte, A. (Eds.)

ICES Journal of Marine Science, (2009), 66, pp1649–1823.

Impact of naturally spawning captive-bred Atlantic salmon on wild populations: depressed recruitment and increased risk of climate-mediated extinction

McGinnity, P., Jennings, E., **deEyto, E.**, Allott, N., Samuelsson, P., **Rogan, G., Whelan, K.**, Cross, T.

Proceedings of the Royal Society B: Biological Sciences, (2009), 276 (1673), pp3601–3610. doi:10.1098/rspb.2009.0799

Inferring marine distribution of Canadian and Irish Atlantic salmon (*Salmo salar* L.) in the North Atlantic from tissue concentrations of bio-accumulated Caesium

Spares, A.D., Reader, J.M., Stokesbury, J.W., **McDermott, T.**, Zikovsky, L., Avery, T.S., Dadswell, M.J.

ICES Journal of Marine Science (2009), 64, pp394–404.

Landscape features influence intra-river population genetic structure in Atlantic salmon (*Salmo salar* L.)

Dillane, E., McGinnity, P., Coughlan, J., Cross, M., **deEyto, E.**, Prodohl, P., Kenchington, E., Cross, T.

Molecular Ecology, (2009), 17 pp4786–4800.

“Linking Herring”: do we really understand plasticity? (2009)

Dickey-Collas, M., **Clarke, M.W.**, et al.

ICES Journal of Marine Science, (2009), 66, 1649–1651

Liquid chromatography-tandem mass spectrometry method for the detection of marine lipophilic toxins under alkaline conditions

Gerssen, A., Mulder, P.P.J., **McElhinney, M.A.**, de Boer, J.

Journal of Chromatography, (2009), 1216 (9), pp1421–1430.

Low frequency variability and long term trends in Irish sea surface temperature records

Cannaby, H., Hüsrevoğlu, Y.S.

ICES Journal of Marine Science, (2009), 66, pp1480–1489.

Modelling the initiation and spread of infectious pancreatic necrosis virus (IPNV) in the Irish salmon farming industry: the role of inputs

Ruane, N., Murray, A., **Geoghegan**, Raynard, R.

Ecological Modelling, (2009), 220, pp1369–1374.

Molecular differentiation of infectious pancreatic necrosis virus isolates from farmed and wild salmonids in Ireland

Ruane, N., McCarthy, L., Swords, D., Henshilwood, K.

Journal of Fish Diseases, (2009), 32, pp979–987.

Pathogen Control in Primary Production: Bivalve shellfish Doré, W.J.

Foodborne Pathogens – Hazards, Risk Analysis and Control.

(2nd Edition), Chapter 9, (2009), ISBN: 978-1-84569-362-6.

Performance of the EU-harmonised mouse bioassay for lipophilic toxins for the detection of azaspiracids in naturally contaminated mussel

(*Mytilus edulis*) hepatopancreas tissue homogenates characterised by liquid chromatography coupled to tandem mass spectrometry

Hess, P., Butler, T., Petersen, A., **Silke, J., McMahon, T.**

Toxicon, (2009), 53 (7–8), pp713–722.

Real-time PCR Detection of *Dinophysis* Species in Irish Coastal Waters
Kavanagh, S., Brennan, C., O'Connor, L., Moran, S., Salas, R., Lyons, J., Silke, J., Maher, M.

Marine Biotechnology (Online First Service). (2009), DOI 10.107/s10126-009-9238-6.

Shellfish Mariculture in Drakes Estero, Point Reyes National Seashore, California

Peterson, C.H., Costa-Pierce, B.A., Dumbauld, B.R., Friedman, C., Hofmann, E.E., Kite-Powell, H., Manahan, D.T., O'Beirn, F., Payne, R.T., Thompson, P., Whitlatch, R., Roberts, S., Bostrom, J., Chiarello, H. *National Academy of Sciences, The Academies Press, Washington DC*. (2009), 128pp.

Solid phase extraction for removal of matrix effects in lipophilic marine toxin analysis by liquid chromatography-tandem mass spectrometry

Gerssen, A., McElhinney, M.A., Mulder, P.P. J., Bire, R., Hess, P., de Boer, J. *Analytical and Bioanalytical Chemistry*, (2009), 394, pp1213-1226.

The Recruitment of Atlantic salmon in Europe

Friedland, K.D., MacLean, J.C., Hansen, L.P., Peyronnet, A.J., Karlsson, L., Reddin, D.G., O'Maoiléidigh, N., McCarthy, J.L. *ICES Journal of Marine Science* (2009), 66 (2), pp289-304.

The use of caged *Nucella lapillus* and *Crassostrea gigas* to monitor tributyltin induced bio-effects in Irish coastal waters

Giltrap, M., Macken, A., Davoren, M., Minchin, D., McGovern, E., Foley, B., Strand, J., McHugh, B. *Environmental Toxicology and Chemistry*, (2009), 28 (8), pp1671-1678.

Use of FRNA bacteriophage to indicate the risk of norovirus contamination in Irish oysters

Flannery, J., Keaveney, S., Doré, W. *Journal of Food Protection*, (2009), 72 (11), pp2358-2362.

Viral gametocytic hypertrophy of the Pacific oyster *Crassostrea gigas* in Ireland

Chesslett, D., McKiernan, F., Hickey, C., Collins, E. *Diseases of Aquatic Organisms*, (2009), 83, pp181-185.

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

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

The URL for all ICES CM documents is: <http://www.ices.dk/products/CMdocs/CM-2009/CM2009.pdf>

Atlantic Salmon Stock Assessment using DIDSON in Ireland and Newfoundland/Labrador – Development of a Semi-automated Counting Technique

Brennan, L., Whelan, K., O'Maoiléidigh, N., Bond, N. and Reddin, D. *ICES Working Group on North Atlantic Salmon, Working Paper 31, 2009.*

DFC Report of the Working Group on North Atlantic Salmon (WGNAS) O'Maoiléidigh, N., White, J.

ICES Advisory Committee ICES CM 2009/ACOM:06. 30th March – 8 April, Copenhagen, Denmark, 2009.

Food-web models as tools for ecosystem-based management

Rossberg, A.G., Reid, D.G. *ICES CM 2009/P:10.6, Ecological food-web and network analysis: a tool for ecosystem-based management? August, 2009.*

National Report for Ireland – the 2008 Salmon Season

O'Maoiléidigh, N., Cullen, A., McDermott, T., Bond, N., McLaughlin, D., Rogan, G., Cotter, D., White, J. *ICES Working Group on North Atlantic Salmon April 2009, Copenhagen, Denmark. Working Paper 30, 2009.*

Overview of Cod (*Gadus morhua*) survey data in the Celtic Sea from the Irish Groundfish Survey

Stokes, D. *ICES working document in Report of the Benchmark and Data Compilation Workshop for Roundfish (WKROUND), ICES CM 2009/ACOM:32, Copenhagen, Denmark, 16-23 January, 2009.*

Possible genetic interactions between reared strains and wild populations of cod (*Gadus morhua*): lessons from salmon (*Salmo salar*) common garden field experiments

Cross, T. F., McGinnity, P., Carlsson, J., Coughlan, J., Dillane, E., deEyto, E., FitzGerald, R., Prodöhl, P. *2009/Q:10. ICES Theme Session: Interactions between aquaculture and wild stocks: comparative experience for Atlantic cod and Atlantic salmon, Berlin, Germany, 2009.*

Report of the SCICOM Working Group on Science Leadership (SWGSL) O'Maoiléidigh, N.,

ICES SWGSL Report 2009, ICES Science Committee, SCICOM, May, 2009.

Report of the Workshop on Learning from Salmon Tagging Records (WKLUSTRE)

Hansen, L.P., Bakkestuen, V., White, J., Russell, I., Jacobsen, J.A., Potter, T. *ICES CM 2009/DFC:05, Ref. SSGEF, WGNAS WGRECORDS SCICOM. ICES SCICOM Steering Group on Ecosystems function, 16-18 September 2009.*

Spatio-temporal dynamics of Atlantic cod (*Gadus morhua*) in the Irish and Celtic Sea: results from a collaborative tagging programme

Bendall, V., O'Cuaig, M., Schön, P.J., Hetherington, S., Armstrong, M., Graham, N., Righton, D. *ICES CM 2009/J06, Integration of individual-based information into fishery and environmental management applications, Berlin, Germany, 2009.*

Report of the Workshop on Age Reading of European and American Eel (WKAREA)

Poole, R. *ICES CM2009/ACOM:48; 63pp + Annex Manual, April, 2009.*

Report of the Study Group on Anguillid Eels in Saline Waters (SGAESAW). Poole, R.

ICES CM2009/DFC:06; 189pp.

Report of the 2009 Session of the Joint EIFAC/ICES Working Group on Eels Poole, R.

ICES CM2009/ACOM:15; 139pp and country reports. September, 2009. Also in EIFAC Occasional Paper No.45.

Appendices

Fisheries Science Service, Marine Institute – Contributing author(s) to the following ICES Committees

Report of the Benchmark Workshop on *Nephrops* (WKNEPH)

ICES CM 2009/ACOM:33.

Report of the Herring Assessment Working Group for the Area South of 62 N, 17–25 March 2009,

ICES Headquarters, Copenhagen, Denmark, 648 pp.

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Appendices

APPENDIX 5: CENSUS DATA FROM THE BURRISHOOLE SYSTEM, 2009

Fish Trap Census

Upstream census data for the Burrishoole system, 2009 (Data for 2009 is provisional)

Species	Salmon Leap Upstream 2009	Mill Race Upstream 2009	Totals Upstream 2009	Totals Upstream 2008	Totals Upstream 2007	Totals Upstream 2006
Wild Grilse	381	156	537	551	981	360
Wild Spring Salmon	28	12	40	23	12	32
Rearred Grilse	361	92	453	1750	2040	685
Wild Sea Trout	27	15	42	11	12	6
Wild Finnock	67	23	90	24	61	24
Wild Brown Trout	44	43	87	72	91	49

Downstream census data for the Burrishoole system, 2009

Species	Salmon Leap Downstream 2009	Mill Race Downstream 2009	Totals Downstream 2009	Totals Downstream 2008	Totals Downstream 2007	Totals Downstream 2006
Wild Salmon Smolt	7077	903	7980	6909	6685	7926
Wild Sea Trout Smolt	630	27	657	395	593	628
Silver Eel	2421	454	2875	2257	2549	2158

APPENDIX 6: RESEARCH VESSEL PROGRAMME 2009

	Days at sea	No. of Surveys	Scientist Days	Student Days
<i>RV Celtic Voyager</i>	255	34	1530	531
<i>RV Celtic Explorer*</i>	305	20	3796	102
Total	560	54	5326	633

RV Celtic Voyager

Chief Scientist	Organisation	Description	Start Date	End Date
Dr Evin McGovern	Marine Institute	Annual Nutrients Survey	19 January	29 January
Dr Rachel Cave Dr Dave McGrath	GMIT/NEIGH	NUI Galway / GMIT Student Training	12 February	19 February
Hans Gerritsen	Marine Institute	Biological Survey	21 February	02 March
Dr Max Kosechenko	Coastal & Marine Resources Centre	CMRC Survey	03 March	04 March
Dr Pauhla McGrane	Marine Institute	Integrated Marine Exploration Programme Training	05 March	15 March
Fergal McGrath	Marine Institute	INFOMAR Shannon Survey	18 March	31 March
Sheena Fennell	Marine Institute	M4 Data buoy Service	02 April	04 April
Dr Pauhla McGrane	Marine Institute	Integrated Marine Exploration Programme Training	18 April	21 April
Dr Brian Kelliher	Dublin City University	Dublin City University Survey	22 April	28 April
Sheena Fennell	Marine Institute	Data buoy Service	29 April	02 May
Dr Glenn Nolan	Marine Institute	Oceanographic Survey	03 May	07 May
Dr Niall Ó Maoiléidigh	Marine Institute	Salsea	08 May	12 May
Fergal McGrath	Marine Institute	INFOMAR Dingle Survey	15 May	11 June
Dr Mark Johnson	National University of Ireland, Galway	National University of Ireland Galway	13 June	22 June
Dr Colm Lordan	Marine Institute	Nephrops Under Water TV Aran Grounds Survey	23 June	02 July
Sheena Fennell	Marine Institute	M5 Data buoy Service	04 July	06 July
Dr Colm Lordan	Marine Institute	Nephrops Under Water TV Celtic Sea Survey	10 July	19 July
Dr Robin Raine	National University of Ireland, Galway	HABs Survey	20 July	27 July
Fergal McGrath	Marine Institute	INFOMAR	28 July	18 August
Sheena Fennell	Marine Institute	Data buoy Service	20 August	22 August
Prof Jim Wilson	Trinity College Dublin	Trinity College Dublin Student Training	23 August	24 August
Kevin Kelleher	Radiological Protection Institute of Ireland	Radiological Protection Institute of Ireland	25 August	25 August
Dr Colm Lordan	Marine Institute	Nephrops Under Water TV – Irish Sea Survey	26 August	04 September
Dr Dave McGrath	GMIT/NEIGH	NUI Galway / GMIT Student Training	07 September	12 September
Kathryn Hughes	National University of Ireland, Galway	Bright Sparks	15 September	19 September
Dr Andy Wheeler	University College Cork	University College Cork	28 September	18 October
Prof Jim Wilson	Trinity College Dublin	Trinity College Dublin Student Training	19 October	21 October
Sheena Fennell	Marine Institute	M2 Data buoy Service	21 October	25 October
Dr Micheal Hall	Institute of Technology Tralee	Institute of Technology Tralee Student Training	27 October	28 October
Dr Andy Wheeler	University College Cork	University College Cork Student Training	29 October	30 October
Dr Pauhla McGrane	Marine Institute	Integrated Marine Exploration Programme Training	31 October	01 November
Dr Emer Rogan	University College Cork	University College Cork Student Training	02 November	03 November
Dr Pauhla McGrane	Marine Institute	Integrated Marine Exploration Programme Training	05 November	08 November
Dr Ian O Connor	GMIT/NEIGH	Galway Mayo Institute of Technology Student Training	11 November	14 November
Sheena Fennell	Marine Institute	Data buoy Service	18 November	19 November
Fergal McGrath	Marine Institute/Geological Survey Ireland	INFOMAR Irish Sea Survey	25 November	10 December
Sheena Fennell	OSS, Marine Institute	M3 Weather buoy recovery	13–November	15–November
Sheena Fennell	OSS, Marine Institute	M2 Weather Buoy Service	3–December	5–December
Dr. Rob McAllen/ Dr. Pauhla McGrane	Marine Institute I/UCC	UCC Training	12–November	12–November
Dr. Pauhla McGrane	Marine Institute	IMEP Training	17–November	18–November
Fergal McGrath	AMS, Marine Institute	INFOMAR Bathymetric Survey	19–November	2–December

Appendices

RV Celtic Explorer

Chief Scientist	Organisation	Description	Start Date	End Date
Will Handley	Marine Institute	ROV FOAT	5 January	13 January
Dr. Stefan Schmolke	BSH	BSH 1 Northsea oceanographic	19 January	29 January
Dr Glenn Nolan	Marine Institute	Oceanographic ss + M6	5 February	15 February
Dr Daniel Toal	University of Limerick	ROV Trial	27 February	6 March
Dr. Stefan Schmolke	BSH	BSH 2 North sea Oceanographic Survey	11 March	21 March
Ciaran O'Donnell	Marine Institute	Blue Whiting Acoustic Survey	27 March	16 April
Dr Boris Dorschel	University College Cork	ROV Survey Coral Mounds	17 April	25 April
Dr Anthony Grehan	NUI Galway	ROV Survey Biscay/ West	26 April	19 May
Dr Lutz Reinhardt	BGR	NORDSEE09	24 May	10 June
Dr Christain Mohn	National University of Ireland, Galway	Climate Change Survey	14 June	22 June
Dr Niall O Maoleideigh	Marine Institute	Salsea	23 June	2 July
Ciaran O'Donnell	Marine Institute	North West Herring Acoustic	3 July	22 July
Dr Peter Linke	IFM-GEOMAR	ROV Survey	26 July	14 August
Dave Wall	Irish Whale and Dolphin Group	Cetacean Survey	18 August	31 August
Dr Janine Guinan	National Parks and Wildlife Service	ROV Survey	1 September	21 September
Dave Stokes	Marine Institute	Groundfish Leg 1	25 September	7 October
Ciaran O'Donnell	Marine Institute	Celtic Sea Herring Acoustic	8 October	28 October
Dave Stokes	Marine Institute	Groundfish Legs 2 & 3	29 October	1 December
Brendan O'Hea	Marine Institute	Deepwater Fishing survey	2 December	15 December
Dr Rory Quinn	University of Ulster	University of Ulster Student Training Survey	16 December	21 December

Highlights for the year 2009 included:

- > A very successful suite of activities was completed under the INFOMAR programme throughout the year comprising a total of 77 days survey on the *Celtic Voyager* including a challenging bathymetric survey of the Shannon Estuary as well as surveys in Dingle Bay, off the south coast and in the Irish Sea east of Dublin.
- > Four external charters were completed onboard the *Celtic Explorer* in German waters for German Research Institutions which provided a valuable external contribution to the operational budget. These included two oceanographic surveys, a seismic survey and an ROV survey using the Kiel 6000 ROV in the North Sea.
- > The *Celtic Explorer* completed the Coralfish survey for NUI, Galway which was funded under the NDP shiptime programme which saw the *Holland I* ROV acquire spectacular footage of coral mounds in Irish and French waters including footage from a previously unknown coral province offshore the south west of Ireland.
- > The final two surveys of the internationally co-ordinated *SALSEA* study on the movement of salmon at sea were completed on the *Celtic Explorer* and *Celtic Voyager* and the *Celtic Explorer* ventured north of the Arctic Circle in the course of the survey.
- > The *Celtic Explorer* and *Holland I* completed an intensive three week survey on behalf of the National Parks and Wildlife Service which aimed to identify and study potential offshore candidate special areas of conservation.
- > University College Cork completed a very successful Irish Sea Marine Assessment (ISMA) survey using the *Celtic Explorer* which was part industry and part NDP shiptime funded and included bathymetric data acquisition as well as vibrocoring in potential renewable energy locations in the Irish Sea.
- > Other notable surveys funded under the NDP shiptime programme included a survey using University of Limerick's *Latis* ROV, a two week EEZ wide study of cetacean activity led by the Irish Whale and Dolphin Group both completed on the *Celtic Explorer* and a study of marine pockmarks using the *Celtic Voyager* undertaken by Dublin City University.
- > The Integrated Marine Exploration Programme (IMEP) field-team provided over 460 days of ship-based support for research and training surveys.
- > Two-day *Science@Sea* ship-based training programmes were delivered to 48 undergraduate students and 22 Ph.D. and M.Sc. students onboard the *Celtic Voyager*.
- > Provision of funding for Sea-survival Training for over 20 early stage researchers.
- > *Discover Science@Sea* training courses were provided for 48 transition year students.
- > The ESONET NoE (European Seas Observatory Network – Network of Excellence) project was very active in 2009 and OSS led WP5 (Implementation Strategies).
- > The Marine Institute was successful in winning funding for a demonstration mission to the Porcupine Abyssal Plain (PAP) site in conjunction with EuroSITES partners, NERC–NOCS in the UK, IFM–Geomar in Germany and NIOZ in the Netherlands.
- > The EMSO project (European Multidisciplinary Seafloor Observatory) had their 18 month partners meeting in April 2009. The Marine Institute through IME is a work package leader for business planning and legal work. A new European Research Infrastructure Consortium (ERIC) legal framework has been developed to facilitate the legal and governance structures of projects on the ESFRI Roadmap.
- > The second deployment of four Argo floats took place on board the *Celtic Explorer* in the Rockall Trough in spring 2009

Appendices

APPENDIX 7: FOREIGN MARINE SCIENTIFIC RESEARCH ACTIVITY IN IRISH WATERS IN 2009

Scientist Days Ireland
5326

Scientist Days Foreign
7698

Vessel Name	Country	No. of Days	No. of Scientists	Scientist Days
<i>Cefas Endeavour</i>	Britain	12	14	168
<i>Benaiah IV</i>	Britain	49	2	98
<i>Cefas Endeavour</i>	Britain	10	14	140
<i>Cefas Endeavour</i>	Britain	14	18	252
<i>Golden Emblem</i>	Britain	28	2	56
<i>FRV Scotia</i>	Britain	21	12	252
<i>Tridens</i>	Holland	23	6	138
<i>F.S. Heincken</i>	Germany	23	12	276
<i>FRS Scotia</i>	Britain	16	7	112
<i>Ligrunn</i>	Norway	30	4	120
<i>Cefas Endeavour</i>	Britain	10	9	90
<i>RSS James Cook</i>	Britain	13	31	403
<i>Prince Madog</i>	Britain	5	11	55
<i>RSS James Cook</i>	Britain	20	31	620
<i>Prince Madog</i>	Britain	5	11	55
<i>Prince Madog</i>	Britain	15	11	165
<i>RRS Discovery</i>	Britain	33	28	924
<i>Pelagia</i>	Holland	29	10	290
<i>RSS James Cook</i>	Britain	40	31	1240
<i>Glamar</i>	Britain	30	12	360
<i>Cefas Endeavour</i>	Britain	24	7	168
<i>Vizconde de Eza</i>	Spain	27	13	351
<i>Pelagia</i>	Holland	23	10	230
<i>Pelagia</i>	Holland	22	10	220
<i>Thalassa</i>	France	28	15	420
<i>Cefas Endeavour</i>	Britain	31	9	279
<i>FRV Scotia</i>	Britain	18	12	216
TOTAL		599	352	7698

Glossary of Abbreviations

ACMS	Aquaculture and Catchment Management Services (of the Marine Institute)	MEFS	Marine Environment and Food Safety Services (of the Marine Institute)
BIM	Bord Iascaigh Mhara (the Irish Sea Fisheries Board)	MESH	Mapping European Seabed Habitats
CEO	Chief Executive Officer	MI	Marine Institute
CFP	Common Fisheries Policy	MTDS	Marine Technical and Development Services
CMRC	Coastal & Marine Resources Centre, Cork	NASCO	North Atlantic Salmon Conservation Organisation
DAFF	Department of Agriculture, Fisheries and Food (Formerly DAF – Department of Agriculture and Forestry)	NDP	National Development Programme
DCMNR	Department of Communications Marine and Natural Resources	NMCI	National Maritime College of Ireland, Cork
DCU	Dublin City University	NPWS	National Parks and Wildlife Service
DEHLG	Department of the Environment, Health and Local Government	NUIG	National University of Ireland, Galway
DIT	Dublin Institute of Technology	NUIM	National University of Ireland, Maynooth
EC	European Commission	NUJ	National Union of Journalists
EELIAD	European Atlantic Eels and an Assessment of their Decline	OJEU	Official Journal of the European Union
EEZ	European Economic Zone	OOW	Officer of the Watch
EIFAC	European Inland Fisheries Advisory Commission	OSPAR	Oslo and Paris Convention (1992)
EPA	Environmental Protection Agency	OSS	Ocean Science Services (of the Marine Institute)
ERDF	European Regional Development Fund	PCB	Polychlorinated biphenyls
ESF	European Science Foundation	PST	Personal Survival Training
ESONET	European Seafloor Observatory Network	R&D	Research and Development
EU	European Union	RDS	Royal Dublin Society
FHU	Fish Health Unit	ROV	Remotely Operated Vehicle
FP6	Sixth Framework Programme	RTD	Research, Technology and Development
FP7	Seventh Framework Programme	RTDI	Research, Technology, Development and Innovation
FSS	Fisheries Science Services	RTÉ	Radio Teilís Éireann
GMIT	Galway Mayo Institute of Technology	RV	Research Vessel
GSI	Geological Survey of Ireland	SALSEA	International Salmon At Sea research programme
HABS	Harmful Algal Blooms Service	SCMU	<i>Sea Change</i> Management Unit
HEA	Higher Education Authority	SFI	Science Foundation Ireland
ICES	International Council for the Exploration of the Seas	SINTEF	Stiftelsen For Industriell og Teknisk Forskning – Norwegian research organisation
IDA	Industrial Development Authority	SMEs	Small to Medium Sized Enterprises
IFA	Irish Farmers Association	SMS	Short Message Service
IMCORE	Innovative Management For Europe's Changing Coastal Resource	SPDS	Strategic Planning and Development Services
IMDO	Irish Maritime Development Office	SSTI	Strategy for Science Technology and Innovation
IMEP	Integrated Marine Exploration Programme	TCD	Trinity College Dublin
INAB	Irish National Accreditation Board	UCC	University College Cork
INTERREG	EU Inter-Regional Co-operation Programme	UCD	University College Dublin
IS&D	Information Services and Development	UK	United Kingdom
ISDE	Irish Spatial Data Exchange	UL	University of Limerick
ISEAS	Irish Seafarers Educational Assistance Scheme	UN	United Nations
JIBS	Joint Irish Bathymetric Survey	US	United States
MCA	Maritime and Coastguard Agency	USA	United States of America

Financial Statements



Report of the Comptroller and Auditor General

For Presentation to the Houses of the Oireachtas

I have audited the financial statements of the Marine Institute for the year ended 31 December 2009 under the Marine Institute Act 1991. The financial statements, which have been prepared under the accounting policies set out therein, comprise the Accounting Policies, the Income and Expenditure Account, the Statement of Total Recognised Gains and Losses, the Balance Sheet, the Cash Flow Statement and the related notes. The financial reporting framework that has been applied in their preparation is applicable law and Generally Accepted Accounting Practice in Ireland.

Responsibilities of the Board

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

Responsibilities of the Comptroller and Auditor General

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

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

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

Scope of Audit of the Financial Statements

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

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

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

Opinion on the Financial Statements

In my opinion, the financial statements, which have been properly prepared in accordance with Generally Accepted Accounting Practice in Ireland, give a true and fair view of the state of the Institute's affairs at 31 December 2009 and of its income and expenditure for the year then ended.

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

Matters on which I Report by Exception

I report by exception if

- > I have not received all the information and explanations I required for my audit, or
- > my audit noted any material instance where moneys have not been applied for the purposes intended or where the transactions did not conform to the authorities governing them, or
- > the Statement on Internal Financial Control does not reflect the Institute's compliance with the Code of Practice for the Governance of State Bodies, or
- > I find there are other material matters relating to the manner in which public business has been conducted.

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



John Buckley

Comptroller and Auditor General

18 November 2011

Statement of Responsibilities of the Board

Section 12 of the Marine Institute Act, 1991, requires the Institute to prepare financial statements in such a form as may be approved by the Minister for Agriculture, Fisheries and Food. 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 Section 12(1) of the Act.

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



Board Member
11 November 2011



Board Member
11 November 2011

Statement on Internal Financial Control

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

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

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

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

A review of risk management was carried out in 2009 which included:

- > An evaluation of the appropriateness and effectiveness of the existing policy and procedures in identifying and evaluating business risks;
- > The identification of the nature, extent and financial implication of risks facing the body including the extent and categories which it regards as acceptable;
- > The assessment of the likelihood of identified risks occurring;
- > An undertaking to continue working closely with Government and various Agencies to ensure that there is a clear understanding of the Marine Institute's goals and support for the Institute's strategies to achieve those goals.

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

- > A comprehensive budgeting system with an annual budget which is reviewed and agreed by the Board;

- > Regular reviews by the Board of periodic and annual financial reports which indicate financial performance against forecasts;
- > Setting targets to measure financial and other performance;
- > Formal project management disciplines.

The Marine Institute has established an internal audit function that operates in accordance with the Framework Code of Best Practice set out in the Code of Practice on the Governance of State Bodies. The work of internal audit is informed by analysis of the risk to which the body is exposed, and annual internal audit plans are based on this analysis. The analysis of risk and the internal audit plan for 2009 was endorsed by the Audit Committee and approved by the Board. The Audit Committee has received the report of internal audit activity in 2009, and this was presented to the Board. The report included the Internal Auditor's opinion on the adequacy and effectiveness of the system of internal financial control. The Board's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor, the audit committee which oversees the work of the internal auditor, the executive managers within the Marine Institute who have responsibility for the development and maintenance of the financial control framework, and comments made by the Comptroller and Auditor General in his management letter.

The Board reviewed and approved of the effectiveness of the system of internal financial controls in 2009



Jim Fennell, Chairman
11 November 2011

Accounting Policies

Year ended 31 December 2009

1. General

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

2. Income

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

3. Deferred Income

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

4. Fixed Assets and Depreciation

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

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

Land is not depreciated

5. Leased Assets

Payments under operating leases (Note18) are charged to the income and expenditure account in the year to which they relate.

6. Capital Account

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

7. Foreign Currencies

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

8. Marine Research Technology Development Innovation (RTDI) and Strategy for Science, Technology and Innovation (SSTI) projects

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

9. Deferred Funding Asset for Pensions

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

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

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

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

Income and Expenditure Account

Year ended 31 December 2009

	Note	2009		2008	
		€'000	€'000	€'000	€'000
Income					
Oireachtas Grants	2		28,867		32,113
Other Income	3		8,289		10,836
Net Deferred Funding For Pensions	17		2,775		2,679
			39,931		45,628
Transfer (to)/from Capital Account	12		3,869		(2,471)
			43,800		43,157
Expenditure					
Corporate Services	4	4,728		5,981	
Strategic Planning and Development Services	5	2,656		2,752	
Marine Environment and Food Safety Services	6	6,067		5,302	
Fisheries Science Services	7	4,291		5,372	
Aquaculture and Catchment Management Services	8	2,298		2,642	
Ocean Science Services	9	8,827		10,347	
Irish Maritime Development Office	10	1,066		1,217	
Marine RTDI and SSTI Programme	13	10,937		10,250	
Pensions Costs	16	2,530		2,483	
Total Expenditure			43,400		46,346
Surplus/(Deficit) for the year					
			400		(3,189)
Surplus at 1 January					
			1,469		4,658
Surplus at 31 December					
			1,869		1,469
Statement of Total Recognised Gains and Losses					
Surplus/(Deficit) for the year			400	(3,189)	
Actuarial Gains/(Losses) on Pension Scheme Liabilities			(2,625)	1,679	
Changes in Assumptions			0	0	
Adjustment to Deferred Pension Funding			2,625	(1,679)	
Total Recognised Gains and Losses for the year			400	(3,189)	

The results for the year relate to continuing operations.

The Statement of Accounting Policies and Notes 1–23 form part of these financial statements.



Jim Fennell, Chairman
11 November 2011




Board Member
11 November 2011

Balance Sheet

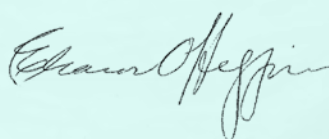
As at 31 December 2009

	Note	2009		2008	
		€'000	€'000	€'000	€'000
Fixed Assets	13		31,132		35,001
Current Assets					
Debtors and Prepayments	15	3,416		4,068	
Banks and Cash		2,396		3,344	
		5,812		7,412	
Current Liabilities					
Creditors and Accruals	16	3,943		5,943	
Net Current Assets			1,869		1,469
Total Assets Less Current Liabilities before Pensions					
Deferred Pension Funding		24,700		19,300	
Pension Liabilities		(24,700)		(19,300)	
Total Assets less Current Liabilities			33,001		36,470
Financed By:					
Capital Account	12	31,132		35,001	
Income and Expenditure Account		1,869		1,469	
			33,001		36,470

The Statement of Accounting Policies and Notes 1-23 form part of these financial statements.



Jim Fennell, Chairman
11 November 2011



Board Member
11 November 2011

Cash Flow Statement

For the year ended 31 December 2009

Reconciliation of operating surplus/(deficit) to net cash flow from operating activities

	Note	2009 €'000	2008 €'000
Surplus/(Deficit) per Income and Expenditure Account		400	(3,189)
Interest received		(12)	(41)
Transfer to/(from) Capital Account	12	(3,869)	2,471
Depreciation	13	5,531	5,573
Decrease/(Increase) in Debtors and Prepayments		652	508
(Decrease) /Increase in Creditors and Accruals		(2,000)	1,414
Loss on Disposal of Assets	13	1	
Net cash inflow from operating activities		703	6,736

Cash Flow Statement

	Note	2009 €'000	2008 €'000
Net cash inflow from operating activities		703	6,736
Returns on investments and servicing of finance			
Interest received		12	41
Net capital expenditure			
Acquisition of fixed assets	13	(1,677)	(8,045)
Proceeds from disposal of assets	13	14	
Increase / (Decrease) in cash		(948)	(1,268)

Reconciliation of net cash flow to movement in net funds

	2009 €'000	2008 €'000
Increase / (Decrease) in cash	(948)	(1,268)
Net funds at 1 January	3,344	4,612
Net funds at 31 December	2,396	3,344

Notes to the Financial Statements

Year Ended 31 December 2009

1. General

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

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

The Financial Statements cover the Year Ended 31 December 2009

2. Grant in Aid

	2009		2008	
	€'000	€'000	€'000	€'000
Current purposes				
Marine Institute	17,695		18,338	
Less Superannuation contributions repayable*	<u>(469)</u>	17,226	<u>(417)</u>	17,921
Capital purposes				
National Seabed Survey	1,793		1,462	
Marine Institute	750		2,400	
SSTI Programme (Note 13)	1,750		2,730	
Research and Technical Development				
Infrastructure (RTDI) (Note 14)	4,844	<u>11,641</u>	7,600	<u>14,192</u>
		<u>28,867</u>		<u>32,113</u>

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

3. Other Income

	2009		2008	
	€'000	€'000	€'000	€'000
EU Contract Research				
Data Directive (see note below)	2,286		2,258	
Other	<u>616</u>		<u>1,931</u>	
		2,902		4,459
Other Income				
Research vessel charterage	1,492			
Databuoy – Department of Transport	722		2,474	
Change Management Fund	821		606	
Sundry and Other Contract Income				
	2,362	5,837	3,297	6,377
TOTAL		8,289		10,836

The Data Directive is a European wide Directive establishing a community framework on the collection and management of data needed to conduct the Common Fisheries Policy.

Notes to the Financial Statements

Year Ended 31 December 2009

4. Corporate Services

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	1,216	1,357
Contract Staff	0	0
	1,216	1,357
Administration	2844	3,573
Depreciation	668	1,051
TOTAL	4,728	5,981

Administration costs include an audit fee of €20,500 in 2009 (2008: €20,500)

5. Strategic Planning and Development Services

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	1,029	1,124
Contract Staff	0	0
	1,029	1,124
Research & Development Programmes	1,140	1,108
Depreciation	487	520
TOTAL	2,656	2,752

6. Marine Environment and Food Safety Services

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	2,458	2,435
EU Contract Staff	0	0
	2,458	2,435
Research & Development Programmes	3,434	2,661
Depreciation	185	206
TOTAL	6,067	5,302

7. Fisheries Science Services

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	1,262	1,028
EU Contract Staff	1,334	1,335
	2,596	2,363
Research & Development Programmes	1,538	2,779
Depreciation	157	230
TOTAL	4,291	5,372

Notes to the Financial Statements

Year Ended 31 December 2009

8. Aquaculture and Catchment Management Services

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	1,418	1,407
EU Contract Staff	0	10
	1,418	1,407
	1,418	1,417
Research & Development Programmes	702	1,028
Depreciation	178	197
TOTAL	2,298	2,642

9. Ocean Science Services

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	548	609
EU Contract Staff	0	0
	548	609
Administration & Development Programmes	5,992	7,723
Depreciation	178	2,015
TOTAL	8,827	10,347

The total running costs of the Research Vessels for 2009 was €8.732m including deprecation of €1.79m. €6.306m has been charged to Ocean Science Services above with the remaining €2.426m charged to the Marine NDP shiptime programme.

10. Irish Maritime Development Office

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	315	318
EU Contract Staff	0	0
	315	318
Administration & Development Programmes	748	885
Depreciation	3	14
TOTAL	1,066	1,217

11. Salary Costs

	2009 €'000	2008 €'000
Wages and Salaries: Core staff	142	136
Pensioners and Pension Costs	8,246	8,278
Contract Staff and other payroll costs	10,224	10,221
	49,407	79,478
	201,12,487	225,13,288

Pension related deductions of €0.470m were made from salaries and remitted to the Department of Agriculture, Fisheries and Food.

During 2009, twelve employees completed temporary contracts of employment with the Marine Institute with 104 weeks or more continuous service and they were not being replaced. In compliance with the Redundancy Payments Acts 1967 to 2007, statutory redundancy payments were made to each of these employees. This amounted to a total of €46,980.

Notes to the Financial Statements

Year Ended 31 December 2009

12. Capital Account

	2009		2008	
	€'000	€'000	€'000	€'000
Balance at 1 January		35,001		32,919
Transfer (to) /from Income and Expenditure Account Capital funding	1,677		8,012	
Amortisation in line with asset depreciation	(5,331)	2,471	(5,541)	
Amount released on disposal of Fixed Asset	(15)	(3,869)		2,471
		31,132		35,390
Fixed Asset adjustment (Note13)		0		(389)
Balance at 31 December		31,132		35,001

13. Fixed Assets

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

	Land & Buildings €'000	Research Vessels €'000	Vessel Equipment €'000	Fixtures & Fittings €'000	Computers €'000	Motor Vehicles €'000	TOTAL €'000
Cost or Valuation							
Balance at 1 January 2009	7,036	30,883	2,702	21,334	7,865	279	70,099
Additions at cost	0	0	493	832	327	25	1,677
Disposal						(46)	(46)
Cost at 31 December 2009	7,036	30,883	3,195	22,166	8,192	258	71,730
Depreciation							
Balance at 1 January 2009	1,404	8,936	2,425	15,357	6,799	177	35,098
Adjustment Charge for the year	140	1,530	260	2,796	773	32	5,531
Disposal						(31)	(31)
Balance at 31 December 2009	1,530		2,685	18,153	7,572	178	40,598
Net Book Value							
	2,796						
At 31 December 2009	5,492	20,417	510	4,013	620	80	31,132
At 31 December 2008	5,632	21,947	277	5,977	1,066	102	35,001

Included in the gross balance of Land and Buildings is an amount of €1.206m which represents the professional valuation of the Fisheries Research Centre in Abbotstown, Dublin at 1 January 1996. Title is vested in the Minister for Agriculture, Fisheries and Food. The Institute remains in occupation of the Abbotstown facility and is in the process of making arrangements for the remaining staff to be accommodated in the Dublin area. The Institute was in occupation of the Abbotstown facility but the site was vacated during 2010. As a result the professional valuation at 1 January 1996 has not been revised.

Notes to the Financial Statements

Year Ended 31 December 2009

14. Marine RTDI and Strategy For Science, Technology and Innovation (SSTI) Programme (2000–2006) (2007–2013), National Development Plan

The total funding and amounts applied in 2009 was as follows:

	2009 €'000 NDP & SSTI 2007–2013	2009 €'000 NDP 2000–2006	2009 €'000 Total
Oireachtas Income (Note 2)	9,098		9,098
Expenditure:			
Projects	8,489	550	9,039
Administration	279	83	362
Total Programme Expenditure	8,768	633	9,401
Surplus / (Deficit) in year	330	(633)	(303)

The total programme expenditure of €9.039m includes both research and capital expenditure. €1.773m of the €9.039m total expenditure was paid to the Marine Institute in 2009 where the balance of €7.266m represents amounts awarded and paid to other parties.

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

	2009 €'000	2008 €'000
Marine RTDI and SSTI Programmes Expenditure	9,401	14,038
Assets purchased under the ERDF Fund	0	(5,091)
Depreciation on ERDF assets	1,536	1,303
TOTAL	10,937	10,250

NDP 2000–2006

Under the Laboratory Infrastructure Sub-Measure of the Marine RTDI Measure the Marine Institute purchased fixed assets for €5.091m in 2008 which were funded through the ERDF programme. The depreciation on these assets was €1.536m for 2009 and €1.303m in 2008.

The primary objectives of the Marine RTDI Measure (NDP 2000–2006) are to enhance and consolidate the performance of the marine sector in Ireland through support for R&D and technology transfer activities and provide the RTDI capacity and infrastructure to enable Ireland to fully utilise her marine resource potential in a sustainable manner. Expenditure comprises PhD Scholarships, Post Doctorate Scholarships, Michael Manahan Fellowship, Desk Studies, Applied/Industry Projects, Networking and Technology Transfer projects and Strategic projects.

The total investment in RTDI projects under the National Development Plan (NDP) between the period 2000 –2006 assisted 226 projects representing an investment of €16.289m of which the outstanding commitments of €0.373m represent the final payments.

Marine NDP 2007–2013

Under the NDP Marine Research Sub-Programme 2007–2013, investment in marine research over the period 2007–2013 is targeted at meeting objectives, research activities and outputs of Sea Change, the national marine knowledge, research and innovation strategy. Funding is targeted at the Research Measures and Programmes of the strategy via a range of mechanisms, including competitive calls for research proposals (project-based awards, desk studies, PhDs, Post-Docs etc) and tendering for the provision of infrastructure/services. A total of 54 projects have been supported up to 2009 under the Marine Research Sub-Programme of the NDP with 44 of these projects still ongoing.

In late 2006, the Marine Institute secured funding of €7.41m over 24 months under the Governments Strategy for Science, Technology and Innovation (SSTI) for three research programmes:

a. Marine Functional Research Programme b. Marine Climate Change Programme c. Integrated Marine Exploration Programme.

Notes to the Financial Statements

Year Ended 31 December 2009

The total commitments entered into at 31 Dec 2009 for Marine Research Sub-Programme of the NDP and SSTI were €53.8m of which the outstanding commitments of €27.3m represent the remaining payments.

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

At 31 December 2009 payments were outstanding on amounts charged to the financial statements as follows (note 16).

	2009 €'000	2008 €'000
Amounts Outstanding	13	885

At 31st December 2008 commitments entered into but not yet charged to the financial statements in respect of RTDI projects and SSTI programmes were €30.93m with the following breakdown.

	NDP and SSTI 2007-2013 €'000	NDP 2000-2006 €'000
Commitments as at 31 December 2009	29,924	1,006
Committed in 2009	6,158	
Decommitted	0	0
Paid in 2009	(8,768)	(633)
Commitments as at 31 December 2009	27,314	373

15. Debtors and Prepayments

	2009 €'000	2008 €'000
Trade Debtors	2,518	2,257
Contract Income	772	1,729
Prepayments	126	82
	3,416	4,068

16. Creditors and Accruals

	2009 €'000	2008 €'000
Trade Creditors	1,610	2,393
Deferred Income	1,949	1,761
RTDI Accrual(Note 13)	13	885
Accruals	55	53
Payroll	316	851
	3,943	5,943

Notes to the Financial Statements

Year Ended 31 December 2009

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

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

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

For the purposes of reporting in accordance with Financial Reporting Standard 17 – Retirement Benefits, the Institute has been advised by a qualified actuary. A valuation has been prepared by the actuary in order to assess the liabilities of the superannuation schemes at 31 December 2009.

The major financial assumptions used to calculate liabilities under FRS 17 are as follows:

	2009	2008	2007
Inflation rate increase (a)	2% per annum	2% per annum	2% per annum
Salary rate increase	4% per annum	4% per annum	4% per annum
Pension rate increase	4% per annum	4% per annum	4% per annum
Scheme liabilities discount rate	5.5% per annum	5.5% per annum	5.5% per annum

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

	2009	2008
Total accrued pension liability	€24.7m	€19.3m

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

	2009 €'000	2008 €'000
Analysis of the amount charged to operating profit		
Current Service Cost	1,900	1,900
Interest on pension scheme liabilities	1,100	1,000
Employee Contributions	(470)	(417)
	2,530	2,483
Analysis of the amount recognised in a statement of total recognised gains and losses (STRGL)		
Experience gains and (losses)	(2,625)	1,679
Changes in assumptions underlying the present value of scheme liabilities	0	0
Actuarial gain and (loss) recognised in STRGL	(2,625)	1,679

Notes to the Financial Statements

Year Ended 31 December 2009

Note 17. continued

	2009 €'000	2008 €'000
Net deferred funding for pensions in the year		
Current Service and Interest Cost	3,000	2,900
Less benefits paid in the year	(225)	(221)
	2,775	2,679

The Marine Institute recognises these amounts 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 backing for the superannuation scheme and the policy and practice in relation to funding public service pensions, including contributions from employees and the annual estimates process. The Marine Institute has no evidence that this funding policy will not continue to meet such sums in accordance with current practice. The deferred funding asset for pensions as at 31 December 2009 amounted to €24.7 million (2008: €19.3million). 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, Fisheries and Food but are not formally agreed with the Department.

	2009 €'000	2008 €'000
Analysis of movement in liability during the year		
Deficit at the beginning of the year	19,300	18,300
Current Service Cost	1,900	1,900
Interest on Scheme Liabilities	1,100	1,000
Actuarial (Gain) Loss recognised in the STRGL	2,625	(1,679)
Benefits paid in the year	(225)	(221)
Deficit at the end of the year	24,700	19,300

18. Lease commitments

Operating Leases

The Marine Institute has entered into the following lease agreements:

The Marine Institute holds operating leases for Machine, Equipment and Motor Vehicles. The charge to the Income and Expenditure accounts in 2009 was 57,057 (2008 €64,264)

Obligations under operating leases comprise

	2009 €	2008 €
Expiring within 1 year	57,057	64,264
Expiring during the years 2 to 5	0	0
Expiring thereafter	0	0

The Marine Institute occupies leased premises at the following locations:

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

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

Lease 3: Warehouse, Galway Harbour, commenced in 2000 for a period of 25 years with five yearly rent reviews

The rental charge of these leases amounts to €306,611 (2008 €306,611)

Notes to the Financial Statements

Year Ended 31 December 2009

18. Lease commitments (continued)

Obligations under finance lease comprise

	2009 €	2008 €
Expiring within 1 year	0	0
Expiring during the years 2 to 5	0	0
Expiring thereafter	306,611	306,611

19. Investment

The Marine Institute has a 5% shareholding in a company called Wavebob Ltd. This company was established to develop a concept in delivering Wave Energy. The total cost of the investment is €127,000. As it is not possible to accurately assess the value of this investment, the shares are not capitalised in the Balance Sheet.

20. Joint Venture – Marine Technical and Development Services Ltd. (MTDS)

The Marine Institute is a partner in a joint venture company, Marine Technical and Development Services Ltd., which was incorporated in 1998. It holds 51% of the equity capital with the remainder held by Marine Technology Ltd (25%) and another shareholder (24%). MTDS is located in Galway and its primary business is the management, crewing and operation of the research vessels *Celtic Voyager* and *Celtic Explorer*. MTDS ceased to trade on the 5th March 2006 and a voluntary wind-up commenced in Dec 2010 and will be finalised during 2011. There will be no impact in the accounts of the Institute as a result of the winding up.

21. Register of interests

The Institute has adopted procedures in accordance with the guidelines issued by the Department of Finance 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.

22. Board Fees and Chief Executive Salary

The Institute has adhered to the updated Code of Practice for the Governance of State Bodies which was published by the Minister for Finance on 15 June 2009. The Annual Basic Salary of the Chief Executive of the Marine Institute for 2009 was €150,712. There were no payments made to the Chief Executive under a performance related pay scheme or no other benefits paid as part of the remuneration package. The CEO's pension entitlements do not extend beyond those of the model public sector scheme.

Payments to the 2009 Marine Institute Board members were as follows:

Board Member	Category 3	Gross Fees 2009	Expenses 2009	Total 2009
Jim Fennell	Chairperson	13,066	423	13,489
Richard Flynn	Director	8,400	664	9,064
Terry Fleming	Director	6,330	2,520	8,850
Darina McFadden	Director	8,400	2,530	10,930
Michael Walsh	Director	8,400	1,842	10,242
Bernie Hannigan	Director	8,400	1,688	10,088
Eleanor O Higgins	Director	8,400	839	9,239
Emer Rogan	Director	8,400	-	8,400
		69,796	10,506	80,302

23. Board Approval

The financial statements were approved by the Board on the 11th November 2011.

Notes

Notes



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