annual report

annual report

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Marine Institute
Foras na Mara

serving science and the sea

To the Minister for Communications, Marine and Natural Resources

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 2002.

John P. Crowley, Chairman.

Do Aire Cumarsáide, Mara agus Acmhainní Nádúrtha

Do réir na riachtanas atá leagtha síos san Acht um Fhoras na Mara, 1991, is cúis onóra dom an Tuarascáil Bliaintúil agus na Cúntais do Fhoras na Mara don bhliain dár chríoch 31u Nollaig, 2002 a thíolacadh.

Séan P. Ó Cruadhlaoich, Cathaoirleach.

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

Is é Foras na Mara an ghníomhaireacht náisiúnta a bhfuil na feidhmeanna ginearálta seo a leanas aici:

"taighde agus forbairt mara a ghabháil de láimh, a chomhordú, a spreagadh agus cuidiú leis sin agus cibé seirbhísí a ndáil le taighde agus forbairt mara a chur ar fáil ar seirbhísí iad, i dtuairim an Fhorais, a spreagfaidh forbairt eacnamaioch agus a chruthóidh fostaíocht agus a chosnóidh an timpeallacht mhara."

An tAcht um Fhoras na Mara, 1991

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Further information on the Marine Institute is available on the Marine Institute's web-site: ***www.marine.ie***

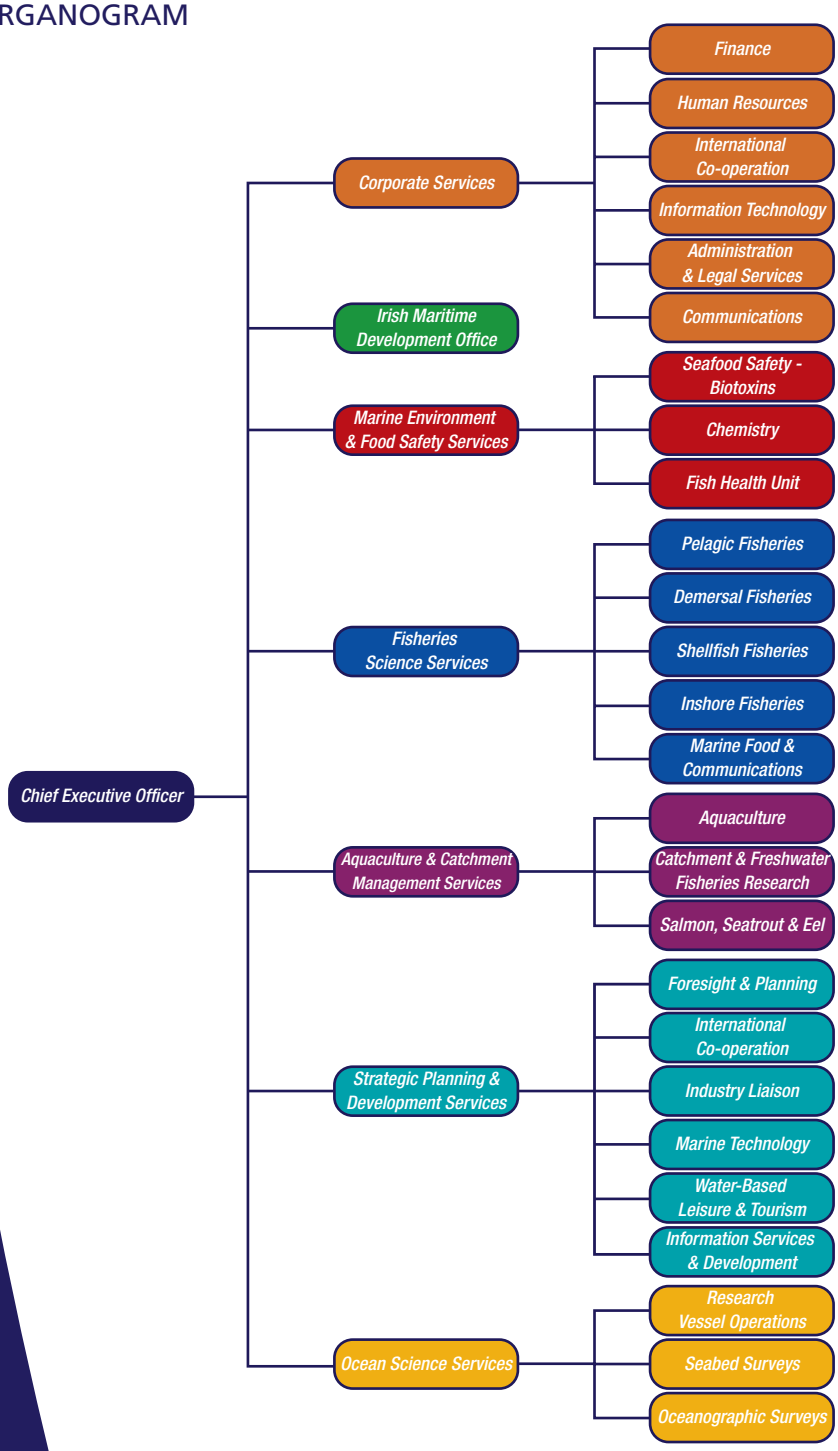
INTRODUCTION - ORGANISATION STRUCTURE

The potential exists to transform the Irish marine resource into a thriving and enduring maritime economy. The Marine Institute provides both government and industry with scientific services, conducts research, facilitates and participates in research partnerships, manages that national Marine RTDI Funding Measure and provides information on international marine RTDI funding opportunities.

In 2003, the Marine Institute was restructured to include two new service teams - Ocean Science Services and Strategic Planning and Development Services - to strengthen the Institute's services in these areas. The new structure allows the Institute to sustain current momentum in RTDI in key operational areas while planning for future developments which will shape the course of Irish marine development in the years ahead.

This report highlights the key deliverables of the Marine Institute in 2003.

ORGANOGRAM



DETAILS OF BOARD MEMBERS

1 Dr. J. P. Crowley (Chairman) (Reappointed 2003 - 2005)

M.V.B., M.R.C.V.S., B.Ag.Sc., Ph.D., Dr Crowley has had a distinguished career in agricultural research (An Foras Taluntais) and as general manager, South Western Services Co-Op, Bandon, Co. Cork. He also holds qualifications in Public Management (Institute of Public Administration), in Marketing (Harvard Business School) and in Co-Op Management (Irish Management Institute).

2 Mr. Fergus Cahill (1996-2006)

A former Naval Officer and Chief Executive Officer of the Irish National Petroleum Corporation (INPC), Mr. Cahill is currently Chairman of the Irish Offshore Operators' Association and Marine Technical Development Services Ltd.

3 Ms Mary Dooley (2002-2007)

A Fellow of the Institute of Chartered Accountants in Ireland, a member of the Financial Executives Association and of a number of commercial, cultural and charitable organisations. She has held senior management positions in the entertainment, pharmaceuticals, health and education industries in Ireland, working with Ryan Hotels Plc., Warner Communications Inc., Bristol Myers Inc., St. James Hospital and the National University of Ireland, Galway.

board members

4 Mr. Richie Flynn (2001-2006)

Mr. Flynn is currently the executive secretary of IFA's Fish Farming Section incorporating the Irish Salmon Growers' Association and the Irish Shellfish Association. He holds the position of Chairman of the EU Commission's Aquaculture Advisory Committee and of the Environment Committee, Federation of European Aquaculture Producers.

5 Capt. Dave Hopkins (2000-2006)

A master mariner since 1976, Capt. Hopkins is a director of Irish Mainport Holdings and Hopkins Communications Ltd. Vice President of the International Federation of Shipmasters, council member of the Irish Chamber of Shipping and the Emergency Rescue and Recovery Vessel Association and Chairman of the Irish Offshore Services Association.

6 Mr. Joey Murrin (1998-2003)

Formerly Chairman and Director of Bord Iascaigh Mhara and CEO of Killybegs Fishermens' Organisation. Chairman of the National Salmon Commission.

7 Mr. John O'Carroll (2001 - 2006)

Mr O'Carroll is currently involved in Aquaculture production and marketing.

8 Dr. Brendan O'Connor (1998-2003)

Managing Director of Aqua-Fact International Services Ltd., an environmental consultancy company. Holds a B.Sc. (Hons) and Ph.D in Zoology from the National University of Ireland, Galway.

9 Sean O'Donohue (2001-2006)

CEO of Killybegs Fishermen's Organisation, Mr O'Donoghue has a long established career in fisheries management working in the Department of Marine and BIM for twenty years prior to his present position. He has played a key role in a number of important fisheries issues such as fleet renewal and modernisation, TACs and quotas negotiations and the review of Common Fisheries Policy. He is chairman of the North West Pelagic Management Committee and represents the European Association of Producer Organisations on working group IV of the EU Commissions' Advisory Committee on Fisheries and Aquaculture.

chairman's statement

2003 was a period of enormous advance for the Institute - the arrival of the Celtic Explorer with her extended capabilities, the turning of the sod on Oranmore and the opening of the expanded Newport facility were all milestones of which we can be proud. What makes these achievements even more significant is that they were undertaken against the background of the major upheaval in the move to Galway. This move was carried out, without serious trauma, through careful management, ongoing dialogue and the commitment of the staff which I, on behalf of the Directors, pay tribute to here.

Celtic Explorer is a flagship for Ireland and for marine science. She has already proved her worth as a seagoing research platform accomplishing several groundbreaking missions during the year in marine survey work, environmental monitoring, oceanography and fisheries science. But as well as a wonderful tool for science, she is also a symbol of what the Institute can achieve in realising the sustainable development of our marine resource. Anyone attending the commissioning event in Galway and seeing the faces of the ten thousand visitors who went aboard that weekend could not fail to be impressed with the level of interest shown, particularly by young people. Theirs is the future, and one of the priorities of the Institute during 2003 was to increase their level of awareness of Ireland's marine resources.

During the year, my fellow Board Members and I received a number of detailed briefings from the individual Service Teams within the Institute.

We looked at work being undertaken on the development of the Irish shipping industry by the IMDO and studies on the future of ocean energy through our Marine Technology Programme.

We learned how fisheries science was being applied to conserve sensitive spawning areas that were threatened by the proposed abolition of the protective zone known as 'The Irish Box.' We looked at migration studies on cod and the results of detailed surveys of herring and blue whiting using sound.

We were told of the huge advances that have been made in mapping the deep oceans off our west coast; of the opportunities this detailed knowledge offers and the threat to sensitive habitats from over exploitation.

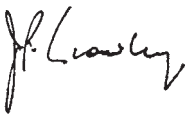
Details of the practical assistance given to the aquaculture industry through fish health screening and quality assurance were given to us. We learned of the various internationally recognised accreditations won for our procedures and laboratories by the staff and how they were being put to good use.

We attended the opening of the expanded Newport facility and marvelled at its unique location as a research base for studying the many and varied factors that effect river catchments.

Finally, we undertook a major gap analysis to identify areas in which the Institute had yet to fully engage in its mission to develop our marine resources. These findings, together with the results of public consultations and specially commissioned studies, will be used to chart a new course over the next five years.

All of this work was underpinned by a strong focus on our corporate governance. I am indebted to the Board Internal Audit Committee who ensured that an effective system of internal financial control was maintained that supports the achievement of Marine Institute policies, aims and objectives.

I look forward to being part of this great adventure and would extend the sincere thanks and congratulations of the Board to the management and staff of the Institute for their dedication and enthusiasm in this year of such profound change.



Dr. J. P. Crowley

chief executive's report

2003 saw the Marine Institute maintain a high service delivery standard in all areas and achieve a number of historic milestones, in spite of being involved in the major change process of relocation from Dublin to Galway.

- The research vessel *RV Celtic Explorer* - at €31 million, the single biggest investment in research and development infrastructure in the history of the State - was delivered to Galway, on time and on budget.
- This vessel was worked up during the first few months of the year and has since undertaken a number of groundbreaking missions, including the National Seabed Survey, the International Bottom Trawl survey for groundfish around the Irish Coast and acoustic surveys for herring off the northwest coast and in the Irish Sea. During 2003, the *RV Celtic Explorer* spent a total of 236 days at sea.
- This ship is arguably the Institute's biggest communications asset and the best use was made of her while not at sea in a number of education events including her commissioning in Galway in May, which saw 10,000 people visit *RV Celtic Explorer*, her sister ship *RV Celtic Voyager* and the associated marine science exhibition at Galway docks over two days. School tours were also arranged for students at Greenore in December and again in Galway for students of local schools in Oranmore as part of Science week.
- The sod was turned on the Institute's new headquarters and laboratory facilities at Oranmore, Co. Galway. This will be a world-class research centre of which Ireland can be justly proud, rivalling those of Scripps, Woods Hole and Kiel.
- The Institute's upgraded and extended research facility at Newport, Co. Mayo was opened. This laboratory is uniquely placed between a freshwater lake and the sea at Burrishoole, offering an ideal research opportunity as well as forty years of total fish census from its fish traps. Its work will be considerably aided by participation in the recently announced €4 m AquaReg project for aquaculture and catchment research.
- The argument for the retention of part of the Irish Box as a conservation area was won during 2003 due, in no small way, to the information supplied by the Institute's Fisheries Science Services Team, which demonstrated beyond doubt that the waters off the south and southwest of Ireland were a vital spawning grounds for a number of commercially important species. This information, together with wide ranging studies on the levels of all commercial stocks around our coasts, was published in the Institute's annual Stock Book and used to guide negotiations on fish quotas in December.
- The dramatic fish kill in Inver Bay brought the full services of the Marine Institute to bear in a detailed investigation that included examination of the oceanographic, environmental and fish health factors involved. The detailed report, running to 129 pages, was subsequently published and is available from our website.
- One major breakthrough during the year was the successful campaign by the Irish Maritime Development Office on tonnage tax. This, together with a major marketing drive for the Irish shipping industry, including an exhibition in Oslo during the year, is bringing about a renaissance of interest in this vital industry.
- Ireland enjoys an enhanced role in European marine science policy development and has its highest historical number of Working Group Chairs in ICES - the International Council for the Exploration of the Seas.
- Careful management of the change process involved in the move from Dublin to Galway through constant dialogue between management and staff saw the majority of Institute personnel successfully installed in temporary accommodation at the Galway Technology Park by the end of the year, pending the construction of the new Oranmore facility.

Peter Heffernan

Dr. Peter B. Heffernan

Caroline Hepburn
DIRECTOR

DIRECTOR'S STATEMENT

2003 saw another year of change in the Institute, with a doubling of the number of staff based in Galway to ca. 100 people. It was a dynamic year, and one that was both challenging and rewarding for staff. Corporate Services continued to underpin the ongoing change and development in the Institute, providing a wide range of services to ensure systems and expertise were in place to optimise opportunities and to support a wide range and diversity of projects. A detailed Service Level Agreement was jointly developed and signed with the Department of Communications Marine and Natural Resources (DCMNR).

corporate services

The highlights of the year were:

- The continuing move of staff to Galway and support of staff remaining in Dublin.
- Our ongoing commitment to excellence in our compliance with the Government Guidelines for State Bodies and the Ethics in Public Office Act 1995, by introducing a Vendor List, a comprehensive Fixed Asset Register and a Cost Benefit Analysis system. We continue to strengthen our commitment to excellence in our Corporate Governance.
- The Commissioning of the new National Research Vessel, *RV Celtic Explorer* in Galway in April was a national milestone, proceeded by a very successful National Schools Program to promote the ship and marine awareness generally. 10,000 visitors attended the *RV Celtic Explorer*, the *RV Celtic Voyager* and an interactive exhibition over three days to make this the largest marine science event ever held in Ireland.
- *RV Celtic Explorer* was also host to 300 local secondary school students at Greenore, Co. Louth in November and 340 students from Oranmore primary and secondary schools who toured the ship in December.
- A new Intranet was launched in December 2003 to provide a virtual communications forum for Marine Institute staff at various locations including, Galway, Newport, Abbotstown, Harcourt Street and the ports.
- A very successful recruitment campaign saw the appointment of 37 new staff in addition to 13 internal appointments in what formed a fundamental part of the continued success of a change process without compromising the delivery of our services.
- Investment under the RTDI sector of The National Development Plan (NDP) continued in 2003, with new project funding of €571,000 invested in 4 desk studies, 1 Post Doctorate, 2 additional Industry Liaison Officers, 7 Applied Industry projects, 23 Networking and Technology Transfer grants and 1 Technical Assistance project. This represents an investment of €944,000 and brings the total expenditure to date on RTDI projects to €3.263m, with a total value of €5.764m.

Accounts: A full financial report is contained in the second part of this report.

Caroline Hepburn
DIRECTOR - Corporate Services

The role of Corporate Services is to provide a quality support service that promotes, advises, communicates and assists work across the organisation in a friendly and efficient manner.

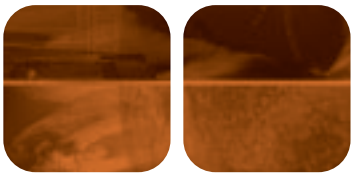
HUMAN RESOURCES

Recruitment

The Recruitment & Selection policy was reviewed and updated in 2003, and a very successful recruitment campaign saw the addition of 37 new staff and 13 internal appointments. The Marine Institute won the Excellence in Recruitment Advertising Awards for its 'Fond of the Bed?' advertisement.

Performance Management Development System (PMDS)

The PMDS process was reviewed during 2003 to ensure that the system continued to have a strong impact on the development of employees and the improvement of the standard of service provided by the Marine Institute. The Institute fully embraced the continual development of PMDS, as recommended under the National Programme for Sustaining Progress, along with the need to be more efficient, the promotion of stable industrial relations and improved customer service standards,



Training

Training continues to be a vital part of our investment in staff, with 3% of the annual salary budget committed to training during 2003. Both in-house courses and external courses were delivered on a regular basis, in response to needs identified through the PMDS process. There was a strong focus on personal development and coaching style training in 2003, as well as the ongoing specific skills-based training designed to maximise employees' opportunities and expertise. It was identified that the Marine Institute would work towards applying for Excellence Through People Accreditation.

Health & Safety

Health and Safety remained a priority for 2003 with the transfer of a number of staff to the new building at Galway Technology Park. Safety committee meetings were held every six weeks in the main Marine Institute Facilities. The focus for those involved was to raise awareness of Safe working practices and procedures and implement a rigorous mandatory Health and Safety training programme. Statements were reviewed for all main Facilities and 25 new Health and Safety related policies were launched. The aim will be to amalgamate all statements and policies to produce a central Marine Institute Statement for 2004.

There were no major accidents or incidents reported during 2003.

ENVIRONMENT

The Marine Institute Environmental & Waste Management Policy was introduced in July 2003 and remains a live, working document. It has been reviewed, revised and updated to emulate statements and policies required by companies operating under ISO 14001 (Environmental Management Systems). An annual review will take place each year and the Policy will be updated as required.

To accompany the Policy, there is an Environmental Statement outlining the specific objectives of the Marine Institute and an Environmental Booklet has been produced to give staff tips on actions that can be taken to be more environmentally friendly both at home and at work. An updated booklet will be produced annually to identify and target different environmentally friendly challenges.

The main aim of the policy is to promote recycling, re-using and reducing of the waste we produce. It will ensure the Marine Institute operates under a pro-active approach to the environment. Environmental Audits are carried out annually, with results and corrective actions available for staff to view on the intranet. A Legal Register will be held centrally, containing all environmental legislation and regulations relevant to the Marine Institute.

corporate services

COMMUNICATIONS

The Marine Institute achieved significant milestones in 2003, which were highlighted to key audiences through exhibitions, open days, media relations and the Marine Institute web page www.marine.ie

Events

Significant media coverage, including national TV, radio and press, was secured for a number of events:

- The commissioning of the *RV Celtic Explorer* on April 11th - 13th when 10,000 people visited the research vessel and associated marine science exhibition at Galway Harbour.
- The opening of Marine Institute's upgraded research facilities in Newport, Co Mayo on 13th June 2003 and an open day.
- The turning of the first sod on the Marine Institute's new headquarters in Oranmore.

The Marine Institute participated in a number of other exhibitions, including the Boat Show and the Galway Science and Technology Festival, and provided sponsorship for marine science awareness initiatives including the new science publication Science SPIN and World Ocean Day.

Marine Awareness in Schools

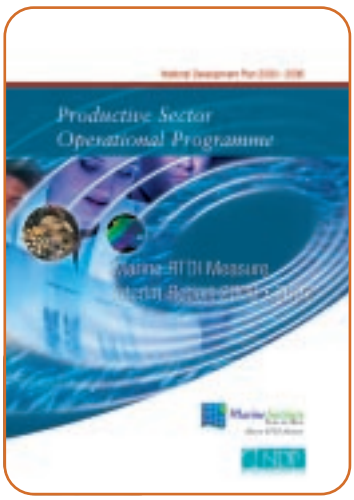
The Institute ran a national competition for primary school students, coinciding with the launch of the *RV Celtic Explorer*, with 1,677 entries, and an environmental awareness competition in Newport to coincide with the opening of its upgraded research facilities in Newport, with over 200 entries of a very high standard. A web page for schools was added to the Institute's web site at www.marine.ie

Coastview for schools, a CD based on the National Coastline Survey, was tailored to the science and geography curricula to provide teachers with a practical teaching aid.

The *RV Celtic Explorer* was host to two open days for schools In Greenore, Co. Louth where 300 local secondary school students visit the vessel in November and in Galway in December when 340 students from Oranmore primary and secondary schools toured the *RV Celtic Explorer.*

Internal Communications

A new Intranet was launched in December 2003 to provide a virtual communications forum for Marine Institute staff at all locations. It was developed in consultation with staff through the Partnership Group.



NATIONAL DEVELOPMENT PLAN

The Marine Institute, acting on behalf of the Department of Communications, Marine and Natural Resources, is the Implementing Body for the €52.6 million Marine RTDI Measure of the National Development Plan 2000-2006.

The Marine RTDI Measure consists of the following Sub-Measures:

1 Provision of enhanced research vessel capacity to cover outer continental shelf activities.

2 Up-grade of key national marine laboratories and facilities to provide necessary capacity and infrastructure to support planned activities.

3 Establishment of a Marine RTDI Fund to support project-based RTDI in key target areas.

PROGRESS IN 2003

Sub-Measure 1: RV Celtic Explorer

The new multipurpose 65m National Research Vessel *RV Celtic Explorer* was Commissioned on the 11th April 2003, and started work in May.

Sub-Measure 3: Marine RTDI Fund

The 3rd round of funding was launched in March 2003. The successful projects included:

- 7 Applied (Industry) Projects (total grant €374,490).
- 2 Desk Studies (total grant €166,137)
- 1 Fellowship (total grant €135,000).
- 22 Sponsorship/Networking Awards (total grant €32,796)
- 1 Technical Assistance Project (total grant €38,350)

In the case of the Applied (Industry) Projects the total value of the projects supported was €630,456, with €374,490 (59% of costs) being provided as grant-aid.

A seminar for all Scholars & Fellows was held in September. It provided an opportunity for all grantees to present their work and outline their plans for the future, in addition to providing a networking forum, allowing them to liase with Industry and government agencies. It demonstrated clearly the high caliber of researchers in receipt of funding in line with the overall aim of the NDP Marine Programme in developing essential innovation capabilities in marine environmental, fisheries, aquaculture, and marine biotechnology research.

An NDP Marine RTDI Interim Report was published in 2003, which details activities and achievements for the Marine RTDI Programme 2000-2002. This document, together with a summary document of all 2003 awards, is available on the Marine Institute website at: www.marine.ie/marinertdi

Glenn Murphy
DIRECTOR

DIRECTOR'S STATEMENT

2003 saw a number of key measures; developed by IMDO over the previous three years, begin to show solid signs of economic impact on the expansion of the Irish maritime services cluster.

Both fleet size and shore and sea-based employment in the Irish international shipping service sector demonstrated strong positive signs of growth during the year against a preceding period of acute decline during the 1990s. Significantly, the high added value services sectors in marine finance, leasing and IT have also showed real potential as emerging sectors. *2003 was the strongest year so far in the sector's recovery cycle.*

Main highlights:

- Employment in the seagoing and ship owning sector increased by 16.8% during the year.
- The Irish merchant fleet underwent an economic revival over the period with an estimated increase of 68% in the overall capacity of the fleet
- Launch of the International Direct Investment Campaign generated serious interest from overseas service groups in locating to Ireland.

irish maritime development office

- Emerging international ship financing sector.
- Major developments in the advancement of the knowledge pool.
- Dedicated focus on short sea economic development and competitiveness.
- More capacity, new routes and services added to Irish maritime supply chain.
- Over €150 billion in goods using the Irish maritime ports and shipping supply chain.
- Strong demand at 3rd level for courses in Nautical Science and Marine Engineering at CIT.

The sector's renaissance was led essentially by Irish owners such as Irish Continental Group and Arklow Shipping Ltd. This growth was not restricted to the larger owner/operators however, since other smaller niche Irish operators added new vessels and capacity to their respective fleets during the year. This turnaround was driven in part by a number of precise measures devised by the IMDO and introduced by the Government to boost the sector.

The evolving shipping services cluster also saw encouraging signs of growth and development in the high added-value sectors of banking, accounting and legal services. A significant development in 2003 saw Bank of Ireland establish a dedicated International Shipping Finance team in Dublin. A number of other non-Irish IFSC banks have followed suit and are now also offering International Shipping Finance and Leasing funding from Dublin.

The short sea sector, which supports and services the Irish economy also continued to expand, adding more capacity and competition.

The IMDO looks forward to 2004, buoyed by the sector's recovery and positive economic growth indicators. We are looking forward to continuing our mission to create a dynamic and competitive international shipping services sector in Ireland.

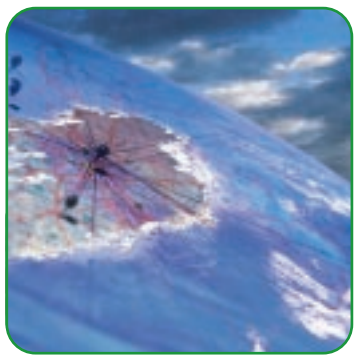
Glenn Murphy
DIRECTOR - Irish Maritime Development Office

The Irish Maritime Development Office has a statutory mandate to promote growth in the Irish shipping sector and to attract to Ireland additional marine related operations, along with key players in international shipping and ancillary services.

STRATEGIC MARKETING AND DEVELOPMENT CAMPAIGN.

In 2003 the IMDO implemented a comprehensive marketing campaign, building on the success of the previous year's marketing strategy.

One of the main objectives of the marketing strategy for 2003 was to ensure that integrated promotional campaigns were implemented. By coordinating all of the marketing activities, the office not only ensured maximum exposure was accomplished, but also economies of scale, enabling the office to ensure 'value for money' was achieved though its marketing activities. The office has now established a credible brand interface within the national and international markets in which it operates.



A greater emphasis was placed on e-marketing activities in 2003 than in the previous years. The office identified e-marketing as a far more cost efficient and effective means of delivering its message to a mass or specific target market. Several high profile e-marketing campaigns were implemented throughout the year in some of the shipping industry's most respected publications, as well as numerous niche sector publications. The e-promotional activity was supported with a targeted print campaign. A number of the e-promotion and print campaigns were planned to coincide with our direct development activities in key sectoral or geographic areas during periods of specific event participation or high-level business development visits.

As a direct result of the office's comprehensive targeted marketing activities in 2003, the total number of hits to the IMDO website increased to over 400,000, with an increase of 32.7% on the number of visitors over 2002.

Four editions of the e-newsletter were prepared and hosted on the web portal, reporting on the progress of the office's activities. An e-mail alert was sent to over 1,000 national and international contacts for each e-newsletter.

The Office undertook a proactive program to support and develop the shipping knowledge pool with particular emphasis on seafarer training and professional shore based shipping services.

The Office also maintained its dedicated portal **www.careersatsea.ie**, which also enjoyed healthy viewing figures during its first year of operation. The office also supported and attended 9 careers events and presentations throughout the country in 2003.

As part of its direct marketing campaign the office launched a comprehensive informational and communication pack "Your Business in Ireland". It was despatched to over 500 carefully targeted individuals in 300 of the world's largest shipping corporations. This included 16 niche sectors in over 12 global shipping centres. The awareness and information provided through this campaign secured a high level of foreign interest in Irish developments.

INTERNATIONAL BUSINESS DEVELOPMENT PROGRAM.

The Office built upon its successful campaign in 2002; following the announcement of the Irish Tonnage Tax regime, with focused business development, direct marketing, and indirect promotional programmes; by continuing to evolve its strategy with a more direct campaign in 2003 at a higher level.

In June, Mr Dermot Ahern T.D, Minister for Communications Marine and Natural Resources, officially launched the IMDO's international inward investment campaign. The launch event was held aboard the LE Eithne in Oslo during NORSHIPPING, the world's largest maritime conference and exhibition. Over 150 guests attended the IMDO event hosted by the Irish Ambassador to Norway, His Excellency Donal Hamill. Guests included leading international ship-owners, heads of the world's largest shipping representative bodies and ambassadors and dignitaries from over 20 shipping nations.

• The IMDO undertook a number of direct international business & trade development missions in 2003. The programme was a mix of high level meetings, including 28 key target multinational corporations, presentations to senior executives, trade missions and exhibitions in Europe, the Far East and the US.

irish maritime development office

• The Office was supported in certain key markets by the Irish ambassadors in Norway and Korea. Ireland's extensive overseas network including IDA Ireland, Enterprise Ireland, the Department of Foreign Affairs and a number of international professional bodies also supported the office with its programme during the year.

• The international sector demonstrated encouraging signs of growth potential in 2003. The IMDO assisted a number of national and worldwide maritime firms to establish diverse international maritime operations in Ireland. These included Mediterranean Shipping Co. (MSC), which established new logistics operations in Dublin, and Transas Ltd., one of the world's largest maritime technology providers, who established their international headquarters in Cork. In the ship finance and leasing sectors, Bank of Ireland established a new Maritime Services Division in Dublin, followed soon after by Lombard Global finance, which confirmed its intention to establish a dedicated marine leasing team from their IFSC office.

• The IMDO also provided advice to the Government on a number of sector-specific tax and fiscal measures for the sector, including a report recommending a ring-fenced tax-based leasing measure for the sector. Discussions are on going with various Government departments regarding these items.

NATIONAL PROGRAM.

Maritime Transport Economics & Short Sea Shipping.

The Irish short-sea shipping sector is the largest segment of the Irish shipping service sector, employing just over 4,500 people. The sector in 2003 has continued to expand more or less in parallel with the growth and expansion of the Irish economy.

In July, an Industry Liaison Officer was appointed to the IMDO through the NDP to focus on specific short sea and maritime transport economic issues.

- In September 2003, the IMDO commissioned a high-level desk study on Inter-European Short Sea Shipping trade corridors, the results of which are expected in 2004.
- In November 2003, the Office funded and awarded a three-year high-level Post-doctoral fellowship at an Irish university on the subject of Maritime transport economics; a topic identified as a major gap area at the national level.

- The IMDO provided key high-level expert policy advice to DCMNR on a number of important European issues in relation to short-sea transport policy.
- The Office directly assisted 10 Irish companies with their submissions and modelling for the EU funded Marco Polo programme.

- The IMDO represents Ireland on the European Short Sea Network (ESN) - the European Commission's appointed body to deal with the pan-European issues of maritime transport logistics. As part of our work with the ESN, we drafted the outline marketing strategy and development plan for 2003-2005, attended 12 virtual and 3 face-to-face network meetings.
- There were several new additions to the short-sea service sector in 2003 with the arrival of new services, such as MSC feeder services from Dublin, Cork and Belfast to their European hubs, Another interesting development was the addition by Norfolk Line of two new purpose-built 45' container short-sea vessels on their Irish routes, increasing capacity while also reducing transit time between Waterford and Rotterdam by 20%. In 2003 the sector also saw other operators such as Stena, Geest, Eucon and Mac Andrews all add new vessels or capacity.

Building the Knowledge Pool.

- The Office continued its remit to support and assist with Irish seafarer training and development. In March the DCMNR officially transferred the responsibility for the administration and development of the seafarer-training grant to the office.
- The IMDO provided direct educational support to Irish shipbrokers and also to the International Maritime Institute at the National College of Ireland, which is expected to be formally launched in 2004.
- The IMDO provided key high-level expert policy advice to DCMNR on a number of important fiscal and educational issues, as well as on challenges facing the sector.

Micheal Ó Cinnéide
DIRECTOR

DIRECTOR'S STATEMENT

The MEFS team, based in Dublin and Galway, carries out a wide range of research and monitoring tasks in the areas of marine environment and seafood safety. 2003 was a very busy year for MEHS. The highlights included:

- The Marine Institute carried out a major investigation into the mortalities of 1 million salmon at sites in Inver Bay and McSwyne's Bay, Donegal. Members of the Fish Health, Marine Chemistry and Oceanography teams devoted a significant proportion of the section's time in the latter half of 2003 to the investigation into the fish kill. Several interim reports were produced and reviewed with officials from DCMNR and with the aquaculture industry in Donegal.

- Marine Institute staff worked closely with the Environmental Protection Agency (EPA), Duchas, Radiological Protection Institute of Ireland (RPII) and with other agencies to prepare the first Marine Monitoring Plan for Ireland. This National Environmental Monitoring Plan for Transitional, Coastal & Marine Waters: a Discussion Document was launched in November 2002 and is intended to provide a basis for monitoring coastal waters under the EU Water Framework Directive.

marine environment & food safety services

- The Institute worked closely with the Food Safety Authority of Ireland (FSAI), in accordance with the Service Contract, by which the Institute is listed as an Official Agency under the FSAI Act, 1998. The MEFS team carried out a total of 13,368 tests during 2003 in a wide range of monitoring programmes for the seafood sector, including biotoxins in shellfish, trace metals in fish and shellfish and residue levels in farmed fish. These food safety programmes provide a solid basis for the Irish seafood sector to meet EU regulations and to ensure full consumer safety for the Irish and export markets.

- The MEFS team continued to make excellent progress in the development and maintenance of its quality assurance programme. In 2003, the team expanded the scope of its INAB/ISO 17025 accreditation, Reg. No. 130T and 140T, to eight test methods in chemical and microbiological disciplines including the sampling protocol for residues surveillance under Council Directive 96/23/EC. In addition to the INAB external assessments in 2003, MEFS were audited by the FSAI and the EU FVO conducted external audits as part of their NRL duties and maintained a thorough internal audit schedule. MEFS continued during 2003 to partake and achieve excellent results in external proficiency testing schemes and inter-laboratory comparison studies.

- Scientific staff continued to provide an active advisory role to DCMNR, dealing with Dumping at Sea applications, aquaculture licences and monitoring, shellfish safety and fish health.

Micheal Ó Cinnéide

DIRECTOR - Marine Environment and Food Safety Services

MEFS provides scientific services and advice on seafood safety and on the status of the marine environment for clients such as the fish and shellfish industry, the DCMNR, the FSAI, EU Commission and the Oslo-Paris Commission (OSPAR). It carries out monitoring programmes to meet Ireland's EU commitments in shellfish safety, residues and contaminants in seafood and fish health.

MARINE CHEMISTRY

The Marine Chemistry section provides food safety and environmental research, monitoring and technical advisory services to a range of clients including government Departments, Agencies and industry. Monitoring is carried out on behalf of DCMNR and the Department of Agriculture and Food (DAF), and under service contract to FSAI who play a co-ordinating role.

Food Safety

Shellfish growing waters: In 2003, oysters and mussels were sampled from 28 locations for testing for trace metals and chlorinated hydrocarbons (PCBs and pesticides).

Environmental contaminants in port fish landings: Annual monitoring of a range of fish species landed at 5 Irish ports was carried out for trace metals and chlorinated hydrocarbons.

Reporting: Results for 2002 shellfish and port fish monitoring programmes were reported to relevant authorities. 4 publications presenting the results are available to download from the Marine Institute website (See Appendix **)

Residues surveillance of farmed fish: A broad testing programme for unauthorised substances, veterinary residues and environmental contaminants was undertaken. 32 individual monitoring reports were issued, primarily to fish farms sampled under the programme. 180 target and 42 suspect samples were collected during 2003. 13 target samples from 3 different farms were reported as positive.

Environmental

OSPAR & ICES: Monitoring for environmental contaminants were carried out in accordance with the OSPAR Co-ordinated Environmental Monitoring Programme (CEMP). Data management protocols were enhanced and a number of datasets were reported to the ICES databank for assessment by OSPAR and the EEA. Key elements included:

- A revised sampling strategy for the annual winter nutrient survey of the Irish & Celtic seas. 281 stations were sampled for seawater and 54 CTD casts deployed.
- A survey of a broad range of hazardous substances in sediments from Cork Harbour.

MEFS staff continued to participate in the DCMNR Marine Licence Vetting Committee (MLVC), providing ongoing advice on dumping at sea, permit applications and the suitability of sediments for disposal at sea. MEFS provided national delegates to a number of expert working groups and committees of OSPAR & ICES and under the EU Marine Strategy.

Other highlights included:

- Participated in Irish implementation of the Water Framework Directive through expert groups, (North South Technical Advisory Group and National Dangerous Substance Expert Group) and provision of data and advice to River Basin District Projects.
- Completion of BROC (Biological Reference Materials for Organic Contaminants) project.
- Ongoing postgraduate project with DIT on multi-residue analysis for environmental contaminants.
- Continued participation in the QUASIMEME laboratory proficiency-testing programme

SEAFOOD SAFETY - BIOTOXINS

The Marine Institute is the EU Designated National Reference Laboratory for Marine Biotoxins in Ireland and provides a weekly monitoring service of toxin-producing phytoplankton and biotoxins in shellfish flesh, for all shellfish harvesting areas. This ensures compliance with EU regulations on shellfish safety and that product placed on the market is safe for human consumption. Results are issued weekly by fax, e-mail and SMS text messages to regulators including the FSAI, Government Departments and the shellfish industry. In 2003, an on-aline Harmful Algal Blooms database (HABS) was developed and all results are published on the Institute's web site at http://www.marine.ie/habsdatabase

Biotoxin Monitoring

8,399 samples were tested in 2003 compared with 8,824 in 2002. 92% of DSP/AZP analysis results by both bioassay and LC-MS were issued within three working days of the receipt of the sample in the laboratory, exceeding the 90% target set in Service Contract with the FSAI. The slight decrease in the number of shellfish samples tested in 2003 relative to 2002 was due to the relatively low level (3%) of toxicity recorded. The reduction in frequency of testing was agreed by the MSSC based on the analysis by the Marine Institute of historical data.

As recorded in 2002, AZP toxins were virtually absent from shellfish in 2003 with only two samples from a total of 2,796 tested having concentrations above the regulatory limit. The main toxins detected were okadaic acid and DTX-2. A comparison of the mouse bioassay and LC-MS method of testing showed a 98% agreement. The Biotoxin Section is seeking accreditation for a further three analytical methods.

The 4th Irish Marine Science Biotoxin Workshop was organised in association with the FSAI and BIM on 7th November with over 120 attendees, and papers from Ireland, the UK and the USA.

marine environment & food safety services

Research Partnerships

- BOHAB - "Biological Oceanography of Harmful Algal Blooms off the west coast of Ireland".
- ASTOX - "Isolation and purification of azaspiracids from naturally contaminated materials and evaluation of their toxicological effects".
- RASTA project with Food Safety Promotion Board funding.
- ASP and PSP inter-comparison studies organised by the EU Reference Laboratory, Vigo, Spain.
- Study on the development of a multi-toxin method of sample analysis by LC-MS method, organised by the Cawthron Institute, New Zealand.
- Collaborative organisation of, and successful participation in, an international proficiency-testing scheme for domoic acid.
- Collaboration and co-supervision of two MSc students at Letterkenny Institute of Technology (LYIT), working on methodology for the determination of domoic acid in shellfish and the influence of scallop size and depth on the content of domoic acid.

Scientific Conferences

Staff of the Biotoxin Unit participated in a number of scientific conferences, including the annual meeting of the European Committee for Normalisation (CEN) in Yerseke (April 2003), the annual meeting of European Network of National Biotoxin Reference Laboratories organised by the Community Reference Laboratory in November 2003 and the international workshop/conference on technologies for monitoring of Harmful Algal Blooms and marine toxins in Nelson, New Zealand in November 2003.

Presentations on the Irish Biotoxin Monitoring Programme were given by MI staff at the French Workshop on Natural Aquatic Toxins, the 8th Canadian Workshop on Harmful Marine Algae, the annual meeting of the Association of Scottish Shellfish Growers and the annual meeting of the Aquaculture Association of Canada.

FISH HEALTH UNIT

The Fish Health Unit (FHU) supports the aquaculture industry and the inland fisheries sector in maintaining Ireland's superior fish health status. It provides both statutory services (in line with EU Directives), and diagnostic support, including bacteriology, virology, histology, parasitology and molecular biology.

In the capacity of National Reference Laboratory for both fish and shellfish diseases, members of the FHU participated in two Annual Reference Laboratory meetings, in Brussels and in Weymouth, England.

In 2003:

- All marine and freshwater finfish sites were inspected and sampled for the presence of List 2 and List 3 diseases as per Council Directive 91/67/EEC.
- All O. edulis growing areas were tested twice per year (spring and autumn) for the presence of the List 2 parasites Bonamia ostrea and Marteilia refringens.

- An epidemiological study of Bonamiosis in wild oyster beds in Achill, Co. Mayo attempted to determine the origin of the disease and prevent further spread. Both Achill and Blacksod Bay have lost the Approved Zone Status for the disease, the origin of which could not be determined with certainty.
- 2,237 finfish and 414 shellfish were examined for diagnostic purposes.
- Summer Mortality Syndrome continued to cause significant mortalities in Pacific oysters in the southern coast, linked to environmental stress and the physiological state of the animals.
- Extensive testing took place to facilitate the €6,000,000 export trade of live fish and shellfish to other EU member States and to Third Countries such as Chile
- An epidemiological screening programme was carried out on wild fish in Belacragher Bay, Co. Mayo in relation to the isolation of ISAV in that area in 2002. ISAV was not isolated.
- A clinical case of IPN was identified in salmon fry in a hatchery in the west of Ireland in March 2003. More than 600 fish were screened following the outbreak.
- FHU participated as part of a multidisciplinary team, which investigated the loss of farmed fish in Donegal Bay in the summer of 2003. No primary fish pathogens were identified.
- FHU jointly supervised a PhD project on diseases of clams, at UCC. Collaboration was also established with DIT, through a PhD project on abalone and several 4th year student projects.

Advice on Fish Health:

Advice was provided to:

- DCMNR, the EU Commission, OIE and industry with respect to the presentation of reports and epidemiological data on the outbreaks of Bonamiosis in two areas in Co. Mayo.
- DCMNR in relation to the compilation and submission of applications to the EU Commission for Additional Guarantees in relation to the diseases IPN, BKD, SVC and G.salaris, under Articles 12 and 13 of Directive 91/67/EEC. Ongoing advice is also provided in relation to the use of veterinary medicines, and finfish and shellfish movements within the country, as well as from abroad.
- The Irish Fish and Shellfish Health Advisory Committee (IFSHAC).
- DCMNR and the EU Commission (DG SANCO) on the drafting of Commission Decisions relating to fish and shellfish health.
- The ICES Working Group on Pathology and Diseases of Marine Organisms.

Dr. Paul Connolly
DIRECTOR

DIRECTOR'S STATEMENT

Against a background of declining fish stocks, reform of the Common Fisheries Policy and an increasing public concern about the state of ocean resources, fisheries science is facing many challenges.

There are new demands for improved data as well as better and timelier scientific advice. Greater emphasis is being placed upon an 'ecosystem approach', which studies not only individual fish stocks, but also all the other elements of the ecosystem in which it lives, including the physical environment, other fish stocks, predators, prey and the food web as a whole. This interdisciplinary approach gives a far more realistic picture of the fisheries environment, but requires considerably greater scientific resources to put into full effect.

2003 was a very challenging and rewarding year for Fisheries Science Services.

fisheries science services

- The first Western International Bottom Trawl Groundfish survey was carried out on the *RV Celtic Explorer*. This 45 day survey was multidisciplinary in nature and the fisheries team was joined by the sea bed survey team, a whale and dolphin watching group, and an oceanography team in what we believe will become the model for such surveys in the future.
- Acoustic Surveys were carried out to assess the state of herring stocks off the Northwest coast and in the Celtic Sea using the commercial vessel MFV Regina Ponti.
- Underwater television was used successfully to assess stocks of Dublin Bay Prawn (Nephrops norvegicus) off the Aran Islands. In August and September, a joint survey project between FSS and the Department of Agriculture and Rural Development Northern Ireland (DARDNI) led to the successful completion of the first underwater television survey of the western Irish Sea Nephrops stock.
- The Greencastle Codling Project was initiated, to examine whether seasonal closure of juvenile grounds could be an effective alternative management measure for cod. It was instigated by the local fishing industry, who are working in close cooperation with FSS scientists and with BIM
- A number of inshore surveys, for juvenile bass, spider crab, bivalves and shrimp were conducted including a preliminary investigation of the cockle fishery in Annagasen, Co Louth. FSS collaborated with BIM on a tag and recapture study of brown crab in the southeast.
- Achieving international excellence in fisheries science is the primary objective of FSS. In 2003, four FSS staff took the chairs of major Working Groups at ICES, as well as an influential position on the ICES governing bureau. This reflects the growing reputation of the Marine Institute as an international centre of excellence for marine science.

Dr. Paul Connolly
DIRECTOR - Fisheries Science Services

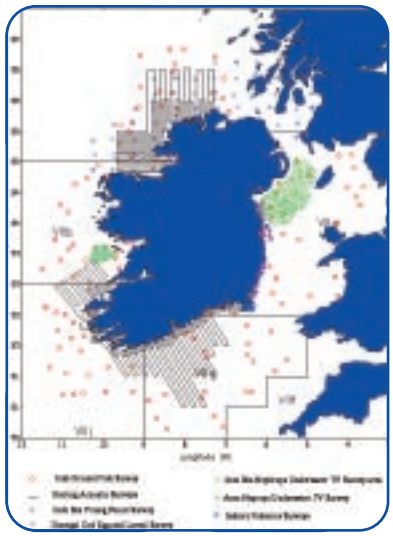
The Fisheries Science Services Team assess, research and advise on the sustainable exploitation of living marine resources in the waters around Ireland. The primary customers of FSS are the Department of Communications, Marine and Natural Resources and its primary role is the provision of scientific advice to underpin management decisions.

ASSESS

The Fisheries Science Services Team secured funding of €1.6 million under the EU Data Collection Regulation, 1543/2000 (DCR) to collect data on fleet activity, discards, landings, the length and age of fish landed, research surveys and the biological status of fish stocks in the waters around Ireland.

Landings were sampled at ports, fishermen's' Co-operatives, fish processors and auction sites around the coast by contracted port samplers employed by FSS, as well as the other FSS staff. Discards were assessed by Fisheries Assessment Technicians (FATs) based at the Institute's port facilities at Killybegs, Greencastle, Rossaveal, Castletownbere, Dunmore East and Howth.

Two acoustic surveys and one groundfish survey were carried out by FSS in 2003, with a total of 86 days at scientific study at sea. These surveys assessed herring stocks off Donegal and in the Celtic Sea and a comprehensive groundfish survey examined whitefish stocks in the waters all around Ireland.



The groundfish survey was conducted using the *RV Celtic Explorer*. The uniquely silent nature of the vessel, which is powered by diesel-electric motors, was a huge asset to the acoustic work, while the stability of the ship as a working platform, combined with her increased endurance at sea, meant that the entire groundfish survey could be conducted as one, continuous mission and not in a series of legs on different vessels as in the past.

Experiments were carried out with new and improved sampling methods during 2003.

Trials were undertaken with new types of fishing gear to assess their effectiveness, both in terms of fish caught and as 'technical conservation measures' aimed at allowing unwanted fish to escape before being hauled to the surface, thereby reducing the number of discards and contributing significantly to fish stock conservation.

Also during 2003, two studies were conducted on populations of Dublin Bay Prawn *(Nephrops norvegicus* or 'Scampi') using underwater television. *Nephrops* live in burrows in muddy sand areas and are notoriously difficult to count for population analysis studies. By filming the seabed at a *Nephrops* fishery, observing animals and counting the burrows, scientists can arrive at a far more accurate assessment of total population size than by conventional fishing methods.

In 2003, two such surveys were carried out - one on the prawn grounds off the Aran Islands, using the *RV Celtic Explorer* and another in the Irish Sea, in collaboration with colleagues from the Department of Agriculture and Rural Development, Northern Ireland.

FSS participated in 26 international scientific meetings - with ICES, STECF (the Scientific, Technical and Economic Committee for Fisheries) of the EC, NEAFC (the North Eastern Atlantic Fisheries Commission) and the EU itself.

The meetings were central to the role of FSS in providing scientific advice to DCMNR and the EU. It is essential to work on the international stage in close collaboration with other national laboratories.

FSS also continued to work closely with industry as members of the North West Pelagic Management Committee, the Sea Fisheries Advisory Committee to the Department of Communications, Marine and Natural Resources, on collaborative research projects and on an ad hoc basis around the ports or at sea.

Communication with industry was maintained at a high level through articles in the trade press, regular dialogue with industry representative bodies and attendance at meetings around the coast.

Information on the various stock levels, as well as on species characteristics and new developments in the fisheries, were regularly updated on the Marine Institute web page, www.marine.ie.

RESEARCH

Research is an essential component of fisheries science and a number of research projects were undertaken that enhanced FSS's assessment and advisory role, including:

fisheries science services

NDP Projects

Post-doctoral and post-graduate studies, funded under the Marine Research Measure of the National Development Programme and supervised by FSS included research on the impact of discard data on the assessment and management of fish stocks around Ireland, the biology, dynamics and fisheries for hake, the larval ecology of selected fish species, modelling and simulation of fish stock dynamics, and biology, dynamics and fisheries for blue whiting. A desk study on the opportunities offered by seaweed aquaculture in Ireland was also undertaken.

Westher

A EU-funded project involving six partners in Ireland, the UK and Germany, uses established and novel biological methods to discriminate between the different stocks of herring around the west coasts of Britain and Ireland.

EASE (European Advice System Evaluation)

To identify an appropriate allocation of resources to support fishery management issues, rationalise collection of data essential for the CFP, and methods to improve the reliability and usefulness of the scientific advice for fisheries management.

Mutfishare

Aimed at contributing to the building of a European Research Area on fisheries and aquaculture and supporting the Common Fisheries Policy. The main objectives are to enable the coordination and integration of research in these fields within the Community.

Greencastle Cod Tagging Project

An industry-led project undertaken in collaboration with the Foyle Fishermen's Co-op, the Killybegs Fishermen's Organisation, Greencastle Fish Exports and BIM to demonstrate the change in yield resulting from a voluntarily closed fishing area and the pattern of movement of cod from the Greencastle fishery.

Crab Tagging

A joint project with BIM aimed at tracking the movement of Brown Crab (*Cancer pagurus*) in the southeastern fishery.

ADVISE

The provision of high quality scientific advice was again evident in the delivery of the annual Stock Book in November 2003 - published in fully bound printed format, on CD and on the Institute web site. The book contained the latest advice for those stocks of interest to Ireland and was a valuable reference for DCMNR and industry in various fisheries negotiations with the EU during the annual Fisheries Council meeting in Brussels in December.

2003 saw major negotiations with the EU on the possibility of scrapping the conservation area known as the 'Irish Box'. FSS worked very closely with DCMNR on this issue and was able to provide scientific data that proved the waters around Ireland contain some of the most important spawning and nursery areas for commercial fish stocks in the North - East Atlantic, including:

- Major spawning areas for mackerel, horse mackerel and blue whiting off the west coast
- Major spawning areas for hake, megrim and herring off the south coast.
- Very important nursery areas for herring, haddock, hake, whiting and megrim in the shelf waters off the south and west coasts

This information formed an integral part of the case made by Ireland on the biologically sensitive nature of the seas around Ireland and led to the retention of an Irish Conservation Box (ICB) off the south and west coasts. This ICB will be subject to new effort regimes on a non-discriminatory basis and various technical measures.

FSS scientists contributed data to and participated in a number of ICES assessment working groups for all major species including hake, monk, megrim, northern and southern shelf demersal stocks, herring, northern pelagic and blue whiting, mackerel, horse mackerel, sardine and anchovy, Nephrops, sea bass and crab. Working groups on mackerel and horse mackerel egg surveys, aerial and acoustic surveys for mackerel, blue whiting acoustic survey planning, survey trawl gear, commercial catch, discards and biological sampling, and the International Bottom Trawl Survey Working Group were also attended.

FSS also presented a number of scientific papers to the ICES Annual Science Conference in Copenhagen, and at the FAO workshop on assessment of deepwater fish stocks in New Zealand.

Ken Whelan
DIRECTOR

DIRECTOR'S STATEMENT

The highlight of 2003 for ACMS staff was the opening of the Newport research facility by Minister Ahern on the 13th June. Newport now comprises a world-class wild fisheries and aquaculture research facility, supporting a broad range of work related to wild salmon, aquaculture, inland fisheries, environmental and hydrological research. Other major scientific and management initiatives included:

- Confirmation of EU support for the €4m AquaReg project on aquaculture and integrated management of coastal areas was received. The project was launched in August at the AquaNor trade exhibition in Trondheim, Norway and in Ireland at the Brádan aquaculture conference in November.
- Publication by staff of 30 scientific reports and papers, many of which have appeared in peer-reviewed journals. One particularly noteworthy study, examining the genetic impacts of cultured salmon on wild stocks, was described by one of Europe's leading geneticists as: "Seminal and one of the most important field studies on the genetics of salmonids carried out to date" (See Appendix 4.)

aquaculture & catchment management services

- ACMS were also heavily involved during the year in the preparation of reports and advice on the management of wild salmon and eel stocks.
- 424 sea lice inspections were carried out on farmed salmonids along the west coast. While no appreciable difference in mean numbers of ovigerous female lice per fish over 2002 is apparent, there is an annual upward trend since 2001.
- A number of research programmes into novel sea lice treatments and studies on infestation dynamics in farmed and wild stock were carried out.
- A major review of Single Bay Management was carried out in each bay in the country, with 16 meetings facilitated by the Marine Institute along the west coast.
- Environmental and phytoplankton monitoring was carried out on six sentinel finfish farm sites with over 400 phytoplankton samples taken and weekly summary reports compiled.
- The Institute supplied eyed ova to the Rhine Salmon Rehabilitation Programme and co-ordinated the sale of 750,000 salmon ova to Germany.
- Core environmental and fisheries monitoring programmes continued on the Burrishoole and in North West Mayo.

Dr Ken Whelan
DIRECTOR - Aquaculture and Catchment Management Services

The Aquaculture and Catchment Management team offer key services in the sustainable management of both aquaculture and freshwater catchment resources.

AQUACULTURE SERVICES

Single Bay Management

During 2003, 16 meetings were facilitated by the Marine Institute in finfish-producing bays along the west coast, leading to a major review and an updated management plan for each bay. These include production cycle plans detailing the separation of finfish generations and the fallowing of sites to assist disease and parasite control.

Sea Lice Research

Sea lice research programmes undertaken by the Institute in 2003 included investigations into novel treatments, studies on infestation dynamics in wild and farmed fish and sea lice biology.

Sea Lice Monitoring

In 2003, 424 sea lice inspections were carried out on farmed salmonids along the west coast. There was no appreciable difference in mean number of ovigerous female lice recorded per fish for 2003 and 2002 (Fig. 1).

However a small increase in the May mean mobile lice value is apparent. The annual trend shows increasing lice levels (both ovigerous and total mobile Figs. 1 & 2) from the end of the spring period onwards. Factors that may have contributed to the overall sea lice levels for 2003 include sea temperature and fish health problems.

Lice levels on smolts in 2003 were controlled in all bays during the spring period. Outside of this period, levels exceeding 2.0 ovigerous female lice per fish were only found on two occasions.

Lice levels on rainbow trout were generally low throughout the year. There were four sites stocking rainbow trout in 2003. A total of 33 farm visits were undertaken. Lice levels in excess of treatment trigger levels were only recorded on two separate inspections during the year.

ENVIRONMENTAL MONITORING

The temperature monitoring programme of fish farms along the west coast commenced in 2002 and, by 2003, temperature probes were located in 20 locations. These probes were downloaded and maintained on a monthly basis.

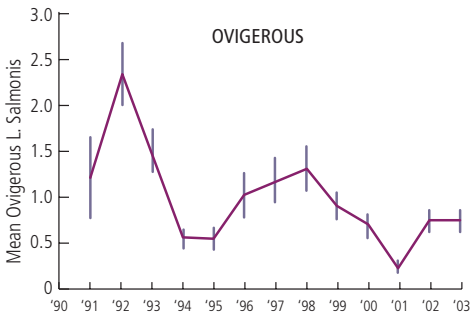


Fig 1: May mean (SE) ovigerous L. salmonis on one sea-winter salmon

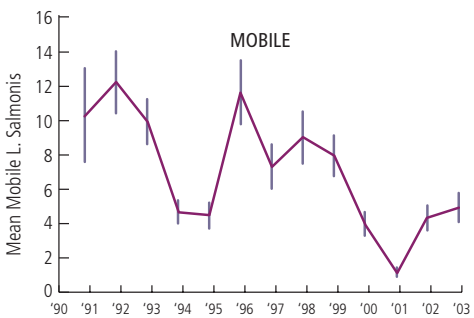


Fig 2: May mean (SE) mobile L. salmonis on one sea-winter salmon

PLANKTON MONITORING

Over 400 phytoplankton samples were taken during sea lice inspections at inshore and offshore finfish farm sites. Weekly summary reports were then compiled and sent via email/fax to the relevant farmers. Where potentially harmful phytoplankton species were identified, reports were immediately forwarded to the relevant farms and aqua vets. In October 2003, a preliminary investigation of nuisance zooplankton was undertaken in the southwest. Four sites were sampled for the presence of the siphonophore Muggiaea atlantica that was found at all the sites surveyed but only at low densities.

REARING

The Institute continued to supply eyed ova to the Rhine Rehabilitation Programme and co-ordinated the sale of 750,000 ova to Germany. Scottish salmon smolts transferred to cages in March 2003 were part of an ongoing programme to evaluate Norvax mono PD vaccine. Total salmonid production in 2003 included 850,000 salmon ova, 126,000 salmon parr, 120,000 salmon smolts for farming and ranching, and 8,700 rainbow trout for stocking in Ballinlough.

aquaculture & catchment management services

CATCHMENT AND FRESHWATER FISHERIES RESEARCH

In addition to core programmes in the Burrishoole catchment, ACMS was involved in:

- ISA virus risk assessment on wild sea trout in Bellacreagher Bay, Co. Mayo
- Juvenile salmonid population estimates for rivers in north Co. Mayo on behalf of the North Western Regional Fisheries Board
- **REDCAFE:** predation project studying current information on cormorant/fisheries interactions and identifying ways of reducing conflict between conservationists and fisheries interests.
- **SALIMPACT:** assessing the impact of aquaculture on the immune response genes (MHC - major histocompatibility complex) of natural salmonid populations.
- **CLIME:** developing a range of methods and models that can be used to assess the impact of present and future climatic conditions on lakes and their catchments in partnership with Trinity College, Dublin.

Burrishoole Index System

Two traps have been in operation since 1958 and 1970, respectively. They monitor the movement of all salmonids and eels, both adult and juvenile, upstream and downstream. Data from the facility are used extensively both nationally and internationally (ICES, EIFAC, NASCO). Fish monitoring continued in 2003. Both upstream and downstream counts are given in Appendix 5 including data from 2002 for comparison.

The high-resolution instrumentation and data acquisition in the Burrishoole catchment has facilitated a number of hydrology studies investigating the relationships between rainfall, stream flow and suspended sediment transport. Results from these studies will assist in the refinement of current afforestation and other land use practices.

SALMON

The return rate of wild grilse to Burrishoole in 2003 was 6.5%, lower than the 9.9% in 2002 when wet and stormy weather, which may have resulted in a reduced drift net catch, and provided ample water for fish to enter freshwater. The total number of ranched fish returns includes both the Burrishoole ranch strain and experimental groups.

The number of wild salmon smolts migrating downstream during 2003 was 7248, down from 8687 in 2002. The highest number of salmon smolts recorded at Burrishoole in recent years was 9588 in 1998.

The salmon smolt run at Burrishoole has increased significantly since the mid-90s when anglers were first obliged to return all wild salmon caught.

National Salmon Commission

In 2003, for the first time, the spawning stock required for all accessible river habitats was estimated for each river in Ireland. An estimate of spawning requirements for each of the 17 salmon Fishery Districts was obtained by summing the individual requirements for each river in each district. Since 1997, only five of the 17 Districts have met their conservation limits fully, while six are meeting less than half of their spawning requirement.

The report of the National Coded Wire Tagging and Tag Recovery Programme for 2002 was completed and circulated in August 2003. The report is based on the examination of 77,000 salmon in 2002 with the recovery and processing of over 7,000 tags. The tagging of smolts for 2003 (returning in 2004 and subsequent years) was also completed in March 2003. This will greatly complement the information being generated from the fish counters. Sampling of commercial catches for salmon tagged as smolts and released in 2002 (returning in 2003) is ongoing.

FISH COUNTERS

Fish counts were verified from 15 sites in 2003 and data were available on a monthly basis from the fish counter website.

SEA TROUT

Numbers of sea trout migrating upstream through the traps remained low in the Burrishoole system. A total run of 78 sea trout (76% finnock) and 40 unsilvered trout were counted upstream, leading to the lowest spawning escapement yet recorded.

EEL

The unique dataset on silver eel downstream migration, including daily counts, eel sex, size and migration patterns were continued in 2003, with 3,919 eels being recorded. The downward trend in eel catches observed throughout much of Europe has not been observed in Burrishoole.

Michael Gillooly
DIRECTOR

DIRECTOR'S STATEMENT

This year saw the establishment of Ocean Science Services, comprising the existing Research Vessel Operations and newly formed Seabed Survey and Oceanographic Services Sections. Consequently, the year saw considerable effort in planning and recruitment, as well as delivering on a wide range of services.

Highlights included:

- Successful shakedown and commissioning of the *RV Celtic Explorer* for operations commencing in April 2003, following its delivery in December 2002.
- Successful delivery of schedule for *RV Celtic Explorer* from April to December.
- Successful delivery of the 2003 *RV Celtic Voyager* Programme
- Improved service delivery through implementation of revised survey planning system
- Service Level Agreement drafted for technical support provider.

ocean science services

- Increased delivery of integrated cross-sectional and inter-service group services, including vessels, equipment and expertise.
- Successful ramp-up and delivery of Seabed Survey Programme, including major technical planning, recruitment, and contracting of external services to enable commencement of survey at end of April.
- Developing plans for a range of value-added and ancillary projects in the Irish National Seabed Survey (INSS).
- Deployment of fourth meteorological buoy by the *RV Celtic Explorer* off the NW coast and planning for build of fifth buoy in the National Weather Data Buoy network.
- Planning for the development of improved services in the data buoy programme (including increased instrumentation payload, data management services and web-based services etc.)
- Initiation of review of national marine modelling capabilities and assessment of internal requirements to facilitate planning for modelling activities in 2004.
- Improved equipment pool management and enhanced equipment calibration and maintenance.
- Improvement of archival systems and delivery of data services, including vessel underway data.

The emphasis in 2003 was on building up a capability, which in time can provide integrated services to most operational requirements of national and international marine researchers.

Considerable progress has been made and, with significant infrastructure and capability in place, it is planned that the service will continue to broaden and improve.

Michael Gillooly
DIRECTOR - Ocean Science Services

The R.V. Operations team is responsible for the management, development and promotion of the Marine Institute's two research vessels the RV Celtic Voyager and the RV Celtic Explorer. Our aim is to manage the Marine Institute's Vessels in a safe, cost effective and professional manner, in support of the implementation of the national sea-going programme of strategic research and monitoring.

The R.V. Operations team were engaged in the following activities for 2003:

- Operation and implementation of all survey programmes in the 2003 *RV Celtic Explorer* and *RV Celtic Voyager* Schedules
- Liasing on behalf of the institute with the service provider MTDS Ltd. and users of the vessels
- Development of a Service Level Agreement between the Marine Institute and the service provider
- Liasing with Damen Shipyards re. issues identified during the 12-month warranty period for the *RV Celtic Explorer*
- Ensuring that a value for money approach was adopted on all matters concerning the operation of the vessels

The main highlight during 2003 was the commissioning of the new *RV Celtic Explorer*, which was delivered to the Marine Institute in December 2002. One of the principle activities during the first quarter of 2003 was to ensure that the vessel and all onboard equipment systems were fully operational before survey operations commenced in May. A comprehensive shakedown programme was initiated. This involved a range of sea trials designed to encompass the various survey operations, which the vessel is designed to undertake during normal survey operations. The sea trials involved a series of rigorous tests and calibrations to ensure that all onboard mechanical, electronic, acoustic and scientific instrumentation systems functioned according to the manufacturers' specifications. All sampling devices and nets used during hydrographic, geophysical, oceanographic and fisheries surveys were tested during this period.

After the completion of the shakedown period the *RV Celtic Explorer* was engaged in the following research and monitoring activities, comprising 236 days at sea during 2003: National Seabed Survey, Oceanographic Survey, Fisheries International Bottom Trawl Survey, Herring Acoustic Survey and the deployment of a Meteorological Buoy.

The *RV Celtic Voyager's* survey programmes brought the vessel all around the East, South and West coasts of Ireland throughout the vessel's 184 days at sea during 2003. These programmes, which form part of the Marine Institute's remit to carry out marine research and monitoring included: Annual Nutrient Monitoring, Egg and Larval Surveys, Groundfish Surveys, Deployment of a Meteorological Buoy and Oceanographic Surveys. The *RV Celtic Voyager* has also been involved with a number of other research institutions and universities in carrying out student training programmes, phytoplankton sampling, and investigations into the distribution of harmful algae, radiological monitoring and benthic sampling under the Water Framework Directive.

SEABED SURVEYS 2003

The seabed survey team were active in the following projects during 2003:

- Irish National Seabed Survey Zone 2 - *RV Celtic Explorer*
- Irish National Seabed Survey Greater Dublin Bay - *RV Celtic Voyager*
- UKHO Calibration on the *RV Celtic Voyager*
- Irish Groundfish Stock Assessment programme

The seabed survey team were assembled throughout the year and commenced work on Zone 2 of the Irish National Seabed Survey (INSS), Zone 2 in May 2003, employing the *RV Celtic Explorer* as a survey platform.

The survey plan for 2003 was predefined by the Geological Survey of Ireland (GSI). The vessel carried out systematical survey work from the extreme northwest section of Zone 2, progressively southward towards Malin Head, on the Donegal coast. In total, 33,602 line kilometres were surveyed covering an area of 10,028km2.

ocean science services

The multi beam echo sounder provided the primary data set, with bathymetric data augmented by a multi frequency single beam echo sounder. Gravity and magnetometer data were also recorded and the shallow superficial geological conditions resolved using a 3.5kHz pinger system. Accurate positions were provided by Fugro HP DGPS. Work is currently being carried out on the 2004 survey planning, which will include a series of additional ancillary projects.

The Dublin Bay survey was carried out in November 2003 from the *RV Celtic Voyager*. In total, 201km^2 of survey data were recorded over the period of the survey. The multi beam system again formed the primary data set and all data were collected to the specifications set for the INSS. The data set was ratified for UKHO acceptance by the successful completion of a cube calibration in December 2003.

In October-December 2003, the seabed survey team participated in the Irish section of the International Bottom Trawl annual Groundfish Survey (IBTS). It was the hope that multibeam data may assist in the planning of the following days trawling through determination of safe sea floor regions by analysis of bathymetry and backscatter data. This proved successful and on average, two additional sites were identified nightly; assisting with the planning of trawl sites and gathering more information that can be fed into the INSS database.

OCEANOGRAPHIC SERVICES TEAM

In 2003 the Oceanographic Services team continued to provide high quality oceanographic support to Marine Institute groups such as marine fisheries, environment and aquaculture management to external agencies and to the Irish public at large. This included the provision of data from research vessels and weather buoys as well as making available satellite images and the outputs of ocean simulation models to facilitate scientists, managers and policy makers around Ireland.

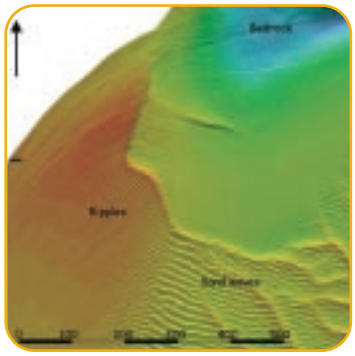
Irish Data Buoy Network

The Irish data buoy network of five offshore sentinel platforms provided real-time weather and oceanographic measurements from around the Irish coast to Met Eireann and the general public in 2003. The data were used to enhance weather forecasts and provide more detailed sea area information to mariners around our coast. Further background to the data buoy network can be found at www.marine.ie/databuoy

Marine Equipment Pool

Current meters and profilers, temperature/salinity probes, towed undulating CTD systems and fluorometers were maintained for hire during 2003 by users in the Marine Institute, industry and 3rd level research.

Information on the equipment pool can be viewed at the Institute web site on www.marine.ie/rnd+facilities/marine+institute+facilities/equipment+pool/default1.htm

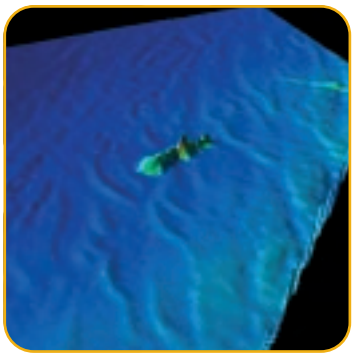


Data service provision

Many MI groups and external organisations requested data from MI research vessels in 2003, as well as access to historical data sets in existing Marine Institute databases.

Marine Emergency Response

In 2003 oceanographic sampling and analysis around environmental events such as the fish kill in Inver Bay, Donegal, helped to shed light on the processes involved. Understanding such events is critical to ensuring possible prediction and management in the future.



Large scale ocean and climate programmes

Provision was made to ensure that all data gathered from Marine Institute vessels or platforms would be available for large-scale ocean and climate programmes. Such programmes are essential for the better prediction of climate change and the effects of environmental disasters.

Support of Irish research vessels and the national seabed survey

In 2003, the Oceanographic Services Team was responsible for the acquisition, archiving and processing of all core oceanographic measurements made every time the Institute's vessels left port.

Satellite remote sensing and ocean optics

Satellite information can provide near real-time ocean temperature and colour images, which are highly beneficial in planning cruise programmes and guiding research. In 2003 the Oceanographic Services Team collected, processed and archived a wide range of such images in support of Ireland's diverse research in our coastal seas.

Yvonne Shields
DIRECTOR

DIRECTOR'S STATEMENT

In 2003 the Institute established a new Service Area - Strategic Planning & Development Services, rationalising some of our existing services and expanding others into six sections. Considerable progress was made in all areas and many new projects and partnerships were initiated and new opportunities evaluated. The highlights include:

- The Marine Institute chaired the EU CREST working group on the 'Mutual Opening of Member States Research Programmes in Marine Science', which recommended the establishment of a Marine European Research Area Network (ERA-Net). A project proposal was subsequently submitted to the EU Commission and has been successful.
- Irish third level sector participants secured significant funding in newly approved FP 6 and INTERREG projects with the support of the International Programmes Section.
- In its first year the newly established Industry Liaison Service facilitated over 100 queries, assisted 46 SMEs with the preparation of R&D funding proposals and managed the implementation of 12 industry projects under the Institute's Marine RTDI Industry Measure.

strategic planning & development services

- A series of prioritised studies were initiated by the Marine Technology Section to evaluate opportunities for further development and R&D investment in Ocean Energy, Biotechnology and Advanced ICT Technologies. The results of these studies will assist in the development of a new programme in these areas in 2004.
- The ESRI undertook a major evaluation of national participation and expenditure in the marine tourism and leisure sector as a follow-up to the previous very successful survey in 1996. Brady Shipman & Martin also undertook a study on behalf of the Institute of the potential of the Marine Leisure Sector to contribute to the rejuvenation of Small Ports and Harbours. Both studies will be published in 2004.
- The Institute was successful in receiving funding from the Information Society Fund for a range of projects under its Data Warehouse Initiative. Our major flagship project, the Online Data Catalogue that provides a one-stop shop for identifying and accessing marine data holding in Ireland, was completed in 2003.
- Significant progress was made in the delivery of IT services to staff, with the launch of a new on-line IT help desk, upgrades to technical infrastructure and the introduction of new more modern software applications.
- The SPDS work programme was delivered in active partnership with other agencies, third level groups and the private sector at national and international level.

Yvonne Shields
DIRECTOR - Strategic Planning and Development Services

FORESIGHT AND PLANNING

One of the new functions to be established under SPDS in 2003 the role of the foresight and planning team is to lead the Institute's foresight and strategic planning efforts including the identification of national and international RTDI (research, technology, development and innovation) trends and opportunities, the development of RTDI plans, policies and initiatives, monitoring of RTDI performance and impacts and co-ordination of stakeholder involvement.

Over the period 2004 - 2005, the Institute plans to undertake a review of the National Marine RTDI Plan (1998) and to prepare a new strategy for period 2005-2010. In preparation for this a number of studies were commissioned in 2003 including:

- Identification and Evaluation of appropriate Marine Science &Technology Performance Indicators
- Marine RTDI Foresight Review, including UK, Norway, USA, Canada and Japan
- An Economic Assessment of the Contribution of Marine Related Activities and Resources to the Irish Economy
- A joint DAF, EPA and COFORD foresight study on Rural and Coastal Ireland in 2025.

- Significant progress was made towards establishing a formal liaison mechanism with the third level sector. Agreement was reached with CHUI and TechNet to act as facilitators on behalf of the universities and Institute's of Technology respectively.
- The Institute commissioned a Feasibility Study on the establishment of a Large Scale Inshore Resource Mapping Project and held a stakeholders workshop in Dublin Castle. This report coupled with a Strategy for Inshore Mapping report will be published in 2004.

INTERNATIONAL CO-OPERATION

Co-Operation with Europe

- Publication of Navigating the Future - II. Integrating Marine Science in Europe (ESF-MB Position Paper 6. March 2003) and European Strategy on Marine Research Infrastructure (Academy of Finland. April 2003).
- Chairmanship of the EU CREST Working Group on "the Mutual Opening of Member States Programmes in Marine Science."
- Series of workshops on the EU's Global Monitoring for Environment & Security (GMES) initiative organised in association with the Environmental Agency, the EU Commission and the European Space Agency.
- Close co-operation with Forfas and the EU Commission to ensure inclusion of marine science and technology in the EU Framework programmes.
- Irish participation secured in 1st call under 6th Framework programme.
- Several important projects secured under the EU INTERREG Programmes (see Appendix 1).
- Vice Chair of European Science Foundation Marine Board.

Ireland/USA Co-operation

- Co-operation with the NOAA in the US continued with collaboration on a workshop on deep-sea corals in Galway in January, scientific exchanges on physical/bio-physical modelling, harmful algal blooms and biotoxins, as well as support for research/training fellowships in marine modelling, salmon migration and fisheries recruitment.

Ireland/Canada Co-operation

Following continued dialogue within the Ireland-Newfoundland partnership, a meeting of 25 Irish companies, institutions and their Canadian counterparts resulted in four Memoranda of Understanding and other agreements for joint product development.

INDUSTRY LIAISON SERVICE

Established as a new service in 2003, to actively support the development of the maritime industry sector through the provision of research and development services directly to SMEs through:

- The management and monitoring of two Industry RTDI support measures under the NDP Marine RTDI Measure (2000-2006) aimed at SMEs - Applied Industry RTDI Programme and Networking/Technology Transfer Programme.
- Publication of "A Guide to NDP Industry RTDI Grant Aid Programmes relevant to the Marine Sector" (2002).
- Publication of Directory: Research and Development Capability in Third Level Institutions in the Western Region (2001).
- Establishment of AquaReg Programme (Norway/Ireland/Spain) to provide research funding to SMEs and to link them with RTD providers in the aquaculture sector (funded by INTERREG-IIIC Programme).
- Establishment of TRIDENT network to link SME RTD needs with R/D providers in the Atlantic Arc Region (funded by INTERREG-IIIB Atlantic Arc Programme).

strategic planning & development services

- The Industry Liaison Service is currently compiling a directory of Irish marine SMEs and through the EU funded TRIDENT project is assessing their specific R/D needs and requirements.

In addition during its first year, the ILS has dealt with over 100 inquiries, assisted 46 SMEs to prepare R&D funding proposals and business plans and supported 12 SMEs to implement R&D projects with grant aid from the NDP Applied Industry RTDI Programme.

MARINE TECHNOLOGY PROGRAMME

In 2003 the Technology Programme focused on identifying key areas in which concerted marine RTDI measures can lead to the establishment and growth of new knowledge-intensive industries:

- **Ocean Energy (OE):** Following the publication, jointly with Sustainable Energy Ireland (SEI), of the consultation document on strategies for the harnessing of Wave and Tidal resources in Ireland in 2002, the two agencies collaborated on a series of studies in 2003 These include:

1 An assessment of Ireland's Tidal Resource, commissioned by SEI

2 Preparation of a Protocol for OE device development, commissioned by MI

3 An Assessment of the Potential Economic Benefits from the Development of Ocean Energy, jointly commissioned by MI and SEI.

- These studies will be completed in the first half of 2004 and are expected to form the basis for an intensified programme of activity in Ocean Energy.
- **Marine Biotechnology:** In order to more fully assess this potential and to identify the niche areas in which Ireland should aim to invest, the Institute commissioned a study on international developments in this field and on potential areas for development in Ireland. This will completed in 2004 and will augment the outcome of a Workshop with invited international experts, planned for early in 2004.
- **Advanced Technologies:** Ireland has invested heavily in recent years in developing infrastructure and skills in ICT and other advanced technologies. It is also clear that very significant new technologies are being developed, drawing on advances in materials technology, ICT, nanotechnology and biotechnology, that will open up entirely new possibilities in ocean measurement, monitoring and resource exploitation, and that

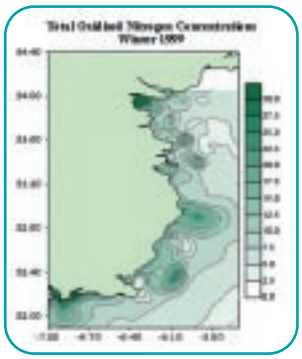
provide opportunities in themselves for wealth creation. The strengthening of links between the marine sector, research centres and industry can facilitate the development and commercialisation of innovative technologies. The Institute has initiated a process of identifying niche areas in which Ireland has both the opportunity and the capabilities to develop innovative and novel products and services. In 2003 the Institute commissioned a study whose ultimate aim is the development of advanced systems for the monitoring of water quality. A further study to identify the potential for development of Offshore Aquaculture and the original technology development opportunities for Ireland was also initiated, jointly by the Institute and BIM, in 2003.

MARINE TOURISM AND LEISURE

The Institute commissioned a major ESRI research study of the domestic marine tourism and leisure market in 2003, for publication in 2004. It will provide valuable information to help identify potential development opportunities within the sector.

The Institute provided advice and support to groups preparing project proposals under the NWE INTERREG programme. This resulted in Ireland securing some €1.5 million in funding to enhance developments in leisure boating and water sports including:

- Assistance towards the development of a 46-berth marina in New Ross.
- Feasibility study on connecting the Erne canal network to Donegal Bay.



- A series of workshops aimed at enhancing the quality of marina standards.

Other highlights include:

- An extensive review of the Visitor Moorings Network.
- Desk studies on Marine Recreation and the Process of Rejuvenation of Small Ports and Harbours and The Feasibility of a National Database of Marine Infrastructure (with a pilot database being developed).
- A number of initiatives under the Donegal County Development Strategy 2002 - 2012, including a discussion document on the feasibility of a Sealife Centre and a partnership with Limavady Borough Council/University of Ulster on a pilot project on beach management.

INFORMATION SERVICES AND DEVELOPMENT

Restructured in 2003 this section combines elements of the former Corporate Services, IT Group (CS) with the Marine Data Centre (Science Technology and Innovation) to manage and deploy Information Technology Solutions.

The Data Warehouse Programme of projects funded by the Information Society Fund continued to deliver new and innovative information services. These include a Data Warehouse Programme, Online Data Catalogue, Information Mapping Services and Survey Planning System to assist users of the National Research Vessels.

- The On-line Data Catalogue available at www.maps.marine.ie provides access to details of marine data holdings of the Marine Institute and other agencies.
- The Data Visualisation tool provides real time visual displays of underway data being collected by the National Research Vessels and the Data Extraction Utility allows scientists working on the Vessels immediate access to underway data being collected by ships systems.

In addition, IT preparations for the new facility in Oranmore continued as follows:

- The Wide Area Network that connects Marine Institute sites together for email and other data services was moved to the Government VPN in order to improve the stability and efficiency of the network.
- The Marine Institute IT Server Infrastructure was upgraded to allow more modern software applications be run and facilitate flexibility in staff usage of IT systems.
- A Staff Intranet to improve internal communications was published. The Intranet features a number of on-line bulletin boards together with online tools such as room booking utility and a service desk for reporting facilities and IT issues.

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 Communications, Marine and Natural Resources, 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 - INTERREG - IIIA IRELAND/WALES (2000 - 2006)

In 2003, ten co-operative marine networks/projects, involving Irish and Welsh intuitions, were approved for INTERREG Funding in 2003 (Grant-Aid Rate: 75%). Total grant-aid approved to these projects was €4.6 million of which €1.7 million (40%) went to the Irish partners.

Successful projects included:

Preparatory Actions:

Mapping Designated Areas (NATURA 2000 sites) in the Irish Sea INTERREG Region (MAPTURE). University College, Cork.

Networks:

Coastal Communities Network (CoCoNet) University College Cork/University of Wales, Cardiff.

Coastal Zone Management Network (CZM-Net) Enterprise Ireland/Carmarthenshire County Council.

Co-operative Projects:

Leatherback Turtles (Dermochelys coriacea) in the Irish Sea - populations, origin and behaviour. University College Cork. University of Wales, Swansea.

Clean Coasts An Taisce/Keep Wales Tidy Campaign.

The Use of Ferries to Observe the Water Quality of the Irish Sea National University of Ireland, Galway/University of Wales, Bangor.

Predictive Irish Sea Models (PRISM) Enterprise Ireland/University of Wales, Bangor.

Shellfish Aquaculture in the Irish Sea- Detection and prevention of diseases in Crassostrea gigas University College Cork/University of Wales, Bangor.

Development of Mussel Hatchery Techniques in Ireland/Wales University College Cork.

Sustainable management of near shore water quality for aquaculture, recreation and tourism (SMART). University College Dublin/University of Wales, Aberystwyth.

Further details and contact points for these projects are contained in the Waterford Workshop Report (October 2003) available on request from the Marine Institute.

APPENDIX 2 - NDP MARINE RTDI MEASURE 2003

Sub-measure 3. Marine RTDI Fund

Applied (Industry) Marine RTDI Programme (Seven projects - Total €374,490)

- **Technological & Scientific Development of Turbot Broodstock & Management of Larviculture in Ireland (Part II). Grant-Aid €58,100**
  Turbot Iarthar Chonamara Teo./3rd Level RTDI Performer: Zoology, Ecology and Plant Science, NUI-Cork.
- **A Novel System for Intensive Larval Culture of the Sea Urchin Paracentrotus livicus: the DAR System. Grant-Aid €52,925**
  Dunmanus Seafoods Ltd./3rd Level RTDI Performer: Aquaculture Development Centre, NUI-Cork.
- **Development of artificial roe enhancement diet based on waste products form the fishing industry. Grant-Aid €54,308**
  Red Mills Ltd./3rd Level RTDI Performer: Aquaculture Development Centre, NUI-Cork.
- **Establish a commercial use for starfish. Grant-Aid €66,264**
  Connemara Seafood Ltd./RTDI Performer: The National Food Centre, Teagasc.
- **Dunlop Offshore Cage Development Programme. Grant-Aid €42,868**
  Bonner Engineering Ltd./3rd Level RTDI Performer: None.
- **The Development of Soil-Structure Interaction Models for Deepwater Environments - SOILSIM. Grant-Aid €54,067**
  Marine Computation Services Ltd./3rd Level RTDI Performer: None
- **B2D2Wave Energy Device. Grant-Aid €59,925**
  Ocean Energy Ltd./3rd Level RTDI Performer: Hydraulics & Maritime Research Centre, NUI-Cork.

Desk Study (Total €45,000).

- **Irish Short Sea Shipping Inter-European Trade Corridors. Grant Aid: €45,000**
  Logistecon Ltd.

Fellowship (Total €135,000).

- **Irish Maritime Shipping Cluster- Financial & Economic Market Modelling. Grant Aid: €135,000**
  National College of Ireland, Dublin

Sponsorship/Networking Awards (Total €32,796): Workshops/Conference Grants

- **Sponsorship - Viral Diseases in farmed Salmonid Fish, Galway July 2003. Grant-Aid €500**
  Beneficiary: Vet-Aqua International.
- **Sponsorship - Biofilms in Industry - Medicine & Biotechnology, Galway August 2003 Grant-Aid €500**
  Beneficiary: Microbiology Dept., NUI, Galway.
- **Sponsorship - Sensors & their Applications - Workshop, Limerick September 2003. Grant-Aid €500**
  Beneficiary: Institute of Physics, University of Limerick.
- **14th Irish Environmental Researchers Colloquium - ENVIRON 2004. Limerick January 2004 Grant-Aid €5,000**
  Beneficiary: Department of Life Sciences, University of Limerick.
- **Sediment Profile Imagery Colloquium of Experts - SPICE , Galway April 2004. Grant-Aid €4,710**
  Beneficiary: Martin Ryan Institute, NUI, Galway.
- **Marine Geological & Biological Habitat Mapping (GEOHAB) Symposium. Galway May 2004 Grant-Aid €4,750**
  Beneficiary: NUI, Galway.
- **13th International Conference on Aquatic Invasive Species, Clare September 2004. Grant-Aid €5,000**
  Beneficiary: Sligo Institute of Technology.

Travel/Mobility Grants

- **Attendance at Aqua Nor 2003: (Norway: August 2003) Grant-Aid €500**
  Recipient: David Murphy, Aqua TT UETP Ltd.
- **Attendance at Aqua Nor 2003 (Norway: August 2003). Grant-Aid €500**
  Recipient: Caoimhe Boylan, Aqua TT UETP Ltd.
- **Attendance at Aqua Nor 2003 (Norway August 2003) Grant-Aid €500**
  Recipient: Erin McVeigh, Aqualex Multi Media Consortium Ltd.
- **Attendance at Aqua Nor 2003 (Norway August 2003) Grant-Aid €500**
  Recipient: John Coleman, La Tene Maps
- **Attendance at Aqua Nor 2003 (Norway August 2003). Grant-Aid €500**
  Recipient: James Ryan, Consultant
- **Attendance/Presentation - 18th International Radiocarbon Conference (Japan September 2003) Grant-Aid €500**
  Recipient: Sinead Keogh, UCD

- **Attendance/Presentation - 2nd International Deep Sea Coral Symposium (New Zealand, September-03) Grant-Aid €500**
  Recipient: Mona McCrea, ECS Ltd.,
- **Attendance/Participation - SETAC - 24th Annual Conference& Training Course. (Texas, November 2003). Grant-Aid €500**
  Recipient: Dara Vaughan, NUI, Galway
- **Attendance/participation - Plymouth Routines In Multivariate Ecological Research - (UK, November 2003). Grant-Aid €500**
  Recipient: Dr. Roisin Nash, NUI, Galway
- **2nd Value Added Seafood Conference (UK, November 2003). Grant-Aid €500**
  Recipient: Declan Connolly, Irish Seaflood.com
- **Attendance/Presentation - 15th Biennial Conf - Biology of Mammals (UK, November 2003) Grant-Aid €500**
  Recipient: Ruth Leeney, UCD
- **Attendance- Oceanology 2004 (USA, December 2003). Grant-Aid €500**
  Recipient: John Coleman, La Tene Maps
- **Attendance - 18th International Seaweed Symposium (UK, March 2004). Grant-Aid €500**
  Recipient: Dr. Robert Wilkes, Irish Seaweed Centre, NUI, Galway

Other Marine RTDI Networking/TT Grants

- **Scientific Cruise - Training through Research - RV Professor Logachev. Grant-Aid €500**
  Recipient: James Riordan, University of Limerick
- **Inward bound Expert - Graduate School of Oceanography, Rhode Island. Grant-Aid €4,893**
  Recipient: Dr. Glenn Nolan, Marine Institute

Technical Assistance Projects

- **Strategic Assessment of Biotechnology. Grant-Aid: €34,848**
  Contractor: CIRCA Group Ltd.
- **SMART Novel Technology Feasibility Study Grant-Aid: €20,000**
  Contractor: National Microelectronics Research Centre (NMRC)
- **Socio-Economic Assessment of the Marine Sector. Grant-Aid: €76,290**
  Contractor: Peter Bacon & Associates

APPENDIX 3 - MARINE INSTITUTE PUBLICATIONS

Special Reports

- The Stock Book: annual review of fish stocks in 2003 with management advice for 2004. (2003) ISBN: 1-902895-22-3.

Fishery Leaflet Series ISSN: 0332 - 1789

- 182. Fahy, E., O'Toole, M., Stokes, D., and Gallagher, M. (2003). Appraisal of the whelk (*Buccinum undatum*) fishery on a part of the Codling Bank following extraction for beach restoration at Bray, Co. Wicklow.
- 183. O'Donohoe, P., Kennedy, S., Copley, L. Kane, F., Naughton and Jackson, D. (2003). National survey of sea lice (*Lepeophtheirus Salmonis Kroyer* and *Caligus Elongatus Nordmann*) on fish farms in Ireland - 2002

Fisheries Bulletin ISSN : 0332 4338

- 21. Fahy, E, J Carroll, M O'Toole and J Hickey A *preliminary account of fisheries for the surf clam* Spisula solida (*L*) (*Mactracea*) in Ireland. Fisheries Bulletin No 21: 27 pp

Marine Environment and Health Series ISSN: 1649 0053

- **6.** Minchin, D. (2003) *Monitoring of tributyl tin contamination in six marine inlets using biological indicators*
- **7.** Glynn, D., Tyrrell, L., McHugh, B., Rowe, A., Costello, J. and McGovern, E. (2003) *Trace metal and chlorinated hydrocarbon concentrations in shellfish from Irish waters, 2000*
- **8.** Tyrrell, L., Glynn, D., Rowe, A., McHugh, B., Costello, J., Duffy, C., Quinn, A., Naughton, M., Bloxham, M., Nixon, E and McGovern, E. (2003). *Trace metal and chlorinated hydrocarbon concentrations in various fish species, landed at selected Irish ports 1997-2000.*
- **9.** Telfor, T. and Robinson, K. (2003). *Environmental quality and carrying capacity for aquaculture in Mulroy Bay Co. Donegal*
- **10.** Glynn, D., Tyrrell, L., McHugh, B., Rowe, A., Monaghan, E., Costello, J. and McGovern, E. (2003) *Trace metal and chlorinated hydrocarbon concentrations in shellfish from Irish waters, 2001*
- **11.** Grehan, A., Long, R., Deegan, B., and O'Cinneide, M. (2003) *The Irish Coral Task Force and Atlantic Coral Ecosystem Study - Report on Two Deep Water Coral Conservation Workshops held in Galway in 2000 and 2002.*

- **12.** McHugh, B., Glynn, D., Nixon, E. and McGovern, E. (2003). *The occurrence and risk assessment of the pesticide toxaphene in fish from Irish waters.*
- **13.** Tyrrell, L., Glynn, D., McHugh, B., Rowe, A., Monaghan, E., Costello, J. and McGovern, E. (2003). *Trace Metal and Chlorinated Hydrocarbon Concentrations in Various Fish Species Landed at Selected Irish Ports.*
- **14.** McLoughlin, M, Peeler, E, Foyle K, Rodger H, O Ceallachain, D, and Geoghegan, F. (2003). *An Epidemiological Investigation of the Re-Emergence of Pancreas Disease in Irish Farmed Atlantic Salmon in 2002.*

APPENDIX 4 - PUBLICATIONS

Anon (2003) Aquaculture Section: National Survey of Sea Lice on Fish Farms, December 2002-June 2003. Interim Report for the Aquaculture and Catchment Management Services Group, 18pg.

Aprahamian, M., Smith, K.M., McGinnity, P., McKelvey, S. and Taylor, J. (2003). Restocking salmonids - opportunities and limitations. *Fisheries Research* 62, p211-227.

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APPENDIX 5 - BURRISHOOLE TRAP CENSUS

Table 1. Upstream census data for the Burrishoole system, 2003.

Species	Salmon Leap Upstream 2003	Mill Race Upstream 2003	Totals Upstream 2003	Totals Upstream 2002
Wild Grilse	463	81	544	648
Wild Spring Salmon	14	4	18	2
Reared Grilse	937	219	1156	859
Wild Sea Trout	9	10	19	35
Wild Finnock	24	35	59	80
Wild Brown Trout	28	12	40	68

Table 2. Downstream census data for the Burrishoole system, 2003.

Species	Salmon Leap Downstream 2003	Mill Race Downstream 2003	Totals Downstream 2003	Totals Downstream 2002
Wild Salmon Smolt	7102	146	7248	8625
Wild Sea Trout Smolt	764	23	787	1272
Silver Eel	3766	175	3919	2863

APPENDIX 6 - RESEARCH VESSEL PROGRAMME 2003

a) Celtic Voyager

Institute	Scientist/Service Area	Dates	Location	Description
Marine Institute	MEFS	13/01/03 - 28/01/03	Irish Sea	Annual Nutrients Survey
Marine Institute	SPDS	20/03/03 - 23/03/03	Cancelled	Data Buoy Maintenance
NUI Dublin	Dr. Colman Gallagher	24/03/03	Dublin Bay	Student Training
GMIT	Dr. David McGrath	27/03/03 - 28/03/03	Galway Bay	Student Training
GMIT	Dr. David McGrath	29/10/03 - 30/10/03	Galway Bay	Student Training
NUI Galway	Ms. Patricia Brannick	29/03/03 - 30/03/03	Galway Bay	Student Training
NUI Galway	Prof. Julie Fives	31/03/03 - 01/04/03	Galway Bay	Student Training
NUI Cork	Dr. Emer Rogan	05/04/03	Cork Harbour	Student Training
Radiological Protection Institute of Ireland	Dr. Tom Ryan	19/06/03 - 20/06/03	North Irish Sea	Radioactivity Survey
Marine Institute	OSS	13/06/03 - 16/06/03	M3-South West	Data Buoy Maintenance
Marine Institute	OSS	02/07/03 - 06/07/03	M1-West Coast	Data Buoy Maintenance
Marine Institute	OSS	20/03/03 - 22/03/03	M2-East Coast	Data Buoy Maintenance
Marine Institute	OSS	14/10/03 - 17/10/03	Cancelled	Data Buoy Maintenance
Marine Institute	FSS	28/04/03 - 09/05/03	Celtic Sea	Mackerel Egg Survey
Marine Institute	FSS	23/06/03 - 30/06/03	Aran Islands	Nephrops Survey
Marine Institute	FSS	15/09/03 - 26/09/03	Irish Sea	Nephrops Survey
Marine Institute	MEFS	19/07/03 - 24/07/03	West Coast	Biotoxins Survey
Marine Institute	MEFS	20/05/03 - 21/05/03	West Coast	Biotoxin Survey
NUI Galway	Dr.. Nick Morley	08/07/03 - 17/07/03	West Coast	Multidisciplinary Survey
NUI Galway	Dr. Robin Raine	10/08/03 - 14/08/03	West Coast	Phytoplankton Survey
NUI Galway	Prof Brendan Keegan	04/02/03 - 08/02/03	West Coast	Benthic Survey
NUI Galway	Prof Brendan Keegan	22/04/03 - 26/04/03	West Coast	Benthic Survey
Dublin City Council	Prof Brendan Keegan	14/09/03	Dublin Bay	Benthic Survey
NUI Cork	Mr Gerry Sutton	29/09/03 - 04/10/03	Wexford/Waterford Coast	Underwater Television Survey
Southampton Oceanographic Centre	Mr. Keith Birch	20/10/03 - 22/10/03	West Coast	Deployment of Rain Buoys
Geological Survey of Ireland	Mr. Mick Geoghegan	01/12/03 - 03/12/03	Dublin Bay	National Seabed Survey
Marine Institute & EPA	Francis O Beirne Shane O' Boyle	21/08/03 - 31/08/03	Irish Coastal Waters	Water Framework Directive Survey

b) Celtic Explorer

Institute	Scientist	Dates	Location	Description
Marine Institute	Dr. Fiona Fitzpatrick	17/04/03 - 16/09/03	West Coast	National Seabed Survey
NUI Galway	Dr. Martin White	06/10/03 - 18/10/03	West Coast	Oceanographic Survey
Marine Institute	Dr. Rick Officer	19/10/03 - 30/11/03	West Coast, Celtic Sea, Irish Sea	Groundfish Survey

APPENDIX 7 - FOREIGN MARINE SCIENTIFIC RESEARCH (MSR) ACTIVITIES IN IRISH WATERS IN 2003

Country	Vessel Name	Dates	Research Activity
BELGIUM	Belgica	30/04/03 - 16/05/03	Oceanography
FRANCE	Marion Dufresne	22/06/03 - 24/06/03	Oceanography
FRANCE	Thalassa	01/11/03 - 30/11/03	Fishery
GERMANY	Walther Herwig III	20/03/03 - 29/03/03	Fishery
GERMANY	Poseidon	12/07/03 - 13/07/03	Technology
GERMANY	Polarstern	01/06/03 - 20/06/03	Geology
GERMANY	Polarstern	28/06/03 - 08/07/03	Geology
GERMANY	Meteor	24/07/03 - 28/08/03	Oceanography
NETHERLANDS	Pelagia	22/07/03 - 21/08/03	Geology
NETHERLANDS	Pelagia	22/08/03 - 12/09/03	Geology
NORWAY	Johan Hjort	29/05/03 - 28/04/03	Fishery
RUSSIA	Smolensk	15/03/03 - 15/04/03	Fisheries
RUSSIA	Professor Logachev	03/07/03 - 15/09/03	Geology
SPAIN	Visconda De Eza	04/09/03 - 06/10/03	Fishery
UK	Corystes	17/02/03 - 10/03/03	Fishery
UK	Scotia	26/02/03 - 17/03/03	Fishery
UK	Cirolana	04/03/03 - 04/04/03	Fishery
UK	Discovery	01/04/03 - 08/05/03	Equipment Trials
UK	Prince Madog	03/07/03 - 03/08/03	Oceanography
UK	Discovery	26/07/03 - 14/08/03	Oceanography
UK	Prince Madog	27/07/03 - 13/08/03	Oceanography
UK	Corytes	04/09/03 - 28/09/03	Fishery
UK	Scotia	12/11/03 - 04/12/03	Fishery
UK	Endeavour	03/11/03 - 04/12/03	Fishery

APPENDIX 8 - CONFERENCE /WORKSHOP SPONSORSHIP IN 2003

January	SALGEN Workshop, Newport, January 14th
January	Deep-Sea Coral Workshop, NUI Galway
February	Irish Maritime Federation Boat Show, Dublin 26th - 28th February.
September	Ireland/Wales INTERREG-IIIA Programme (2000 - 2006) Workshop
October	Irish Marina Operators Association (IMOA) Launch event
November	Galway Science and Technology Exhibition
November	Bradán Salmon Farming Conference and Exhibition, Galway.
November	4th Annual Biotoxin Workshop, Rinville

glossary of abbreviations

ACFM	Advisory Committee on Fisheries Management
ACMS	Aquaculture and Catchment Management Services (of the Marine Institute)
ALO	Aquaculture Liaison Officer
ARC	Aquaculture Research Committee
ASP	Amnesic shellfish poisoning
AZP	Azaspracid poisoning
BIM	Bord Iascaigh Mhara (the Irish Sea Fisheries Board)
CEFAS	Centre for Environment, Fisheries and Aquaculture
CEH	Centre for Ecology and Hydrology
CEO	Chief Executive Officer
CFP	Common Fisheries Policy
CMA	Connecticut MaritimeAssociation
CTD	Conductivity, Temperature and Depth
DAF	Department of Agriculture and Forestry
DARDNI	Department of Agriculture and Rural Development, Northern Ireland
DAS	Data Acquisition System
DCMNR	Department of Communications Marine and Natural Resources
DG SANCO	European Commission Health and Cosumer Protection Directorate
DIT	Dublin Institute of Technology
DSP	Diarrhetic Shellfish Poisoning
DTX-2	Dinophysistoxin -2
EIFAC	European Inland Fisheries Advisory Commission
EPA	Environmental Protection Agency
ERA	European Research Area
ESF	European Science Foundation
ESF-MB	European Science Foundation - Marine Board
EU	European Union
FATS	Fisheries Assessment Technicians
FHU	Fish Health Unit
FP6	Sixth Framework Programme
FSAI	Food Safety Authority of Ireland
FSS	Fisheries Science Services
GIS	Geographic Information System
GMIT	Galway Mayo Institute of Technology
GSI	Geological Survey of Ireland
HABS	Harmful Algal Blooms Service
HMRC	Hydraulics and Maritime Research Centre
ICES	International Council for the Exploration of the Seas
ICT	Information Communications Technology
IFA	Irish Farmers Association
IFREMER	Institut français de recherché pour l'exploration de la mer (French Research Institute for the Exploration of the Sea)
IFSHAC	Irish Fish and Shellfish Advisory Committee
IHO	International Health Organisation
ILAB	Irish Accreditation of Laboratories
ISA	Infectious Salmon Anaemia
ISAV	Infectious salmon anaemia virus
ISEAS	Irish Seafarers Educational Assistance Scheme
ISPG	Irish Seafood Producers Group
IT	Information Technology
IMDO	Irish Maritime Development Office
INTERREG	EU Inter-Regional Co-operation Programme
LC/MS	Liquid Chromatography - Mass Spectrometry
MARLAB	Fisheries Research Services Marine Laboratory
MEFS	Marine Environment and Food Safety Services (of the Marine Institute)

MHC	Major Histocompatibility Complex
MI	Marine Institute
MOU	Memorandum of Understanding
MSR	Marine Scientific Research
MTDS	Marine Technical and Development Services
NAB	National Accreditation Board
NDP	National Development Programme
NEAFC	North East Atlantic Fisheries Commission
NOAA	National Oceanic and Atmospheric Administration
NSC	National Salmon Commission
NUIC	National University of Ireland, Cork
NUIG	National University of Ireland, Galway
NZ	New Zealand
OIE	Office International des Epizooties (World Organisation for Animal Health)
OSPAR	Oslo and Paris Convention (1992)
OSS	Ocean Science Services (of the Marine Institute)
OST	Office of Science and Technology
PAD	Petroleum Affairs Division
PMDS	Performance Management Development Systems
PSP	Paralytic Shellfish Poisoning
QUASIMEME	Quality Assurance of Information for Marine Environmental Monitoring in Europe
R&D	Research and Development
RASATA	Rapid Azapriacid Shellfish Toxin Analysis
RPB	Radiological Protection Institute of Ireland
RTD	Research, Technology and Development
RTDI	Research, Technology, Development and Innovation
RV	Research Vessel
SCOFCAH	Standing Committee on the Food Chain and Animal Health
SDMS	Ships Data Management System
SME's	Small to Medium Sized Enterprises
SPDS	Strategic Planning and Development Services
STECF	Scientific, Technical and Economic Committee on Fisheries
STI	Science Technology and Innovation
TAC	Total Allowable Catch
TCD	Trinity College Dublin
UCC	University College Cork
UETP	University Enterprise Training Partnership
UK	United Kingdom
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNICPOLOS	United Nations Informal Consultative Process on the Oceans and the Law of the Sea
US	United States
USA	United States of America

report of the comptroller and auditor general

for Presentation to the Houses of the Oireachtas

I have audited the financial statements on pages 5 to 17 under the Marine Institute Act, 1991.

Respective Responsibilities of the Institute and the Comptroller and Auditor General

The accounting responsibilities of the Institute are set out in the Statement of Responsibilities of the Marine Institute on page 45. It is my responsibility, based on my audit, to form an independent opinion on the financial statements presented to me by the Institute and to report on them.

Basis of Audit Opinion

In the exercise of my function as Comptroller and Auditor General, I conducted my audit of the financial statements in accordance with auditing standards issued by the Auditing Practices Board and by reference to the special considerations which attach to State bodies in relation to their management and operation.

An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgments made in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Institute's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations that I considered necessary to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement whether caused by fraud or other irregularity or error. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion

In my opinion, proper books of account have been kept by the Institute and the financial statements, which are in agreement with them, give a true and fair view of the state of affairs of the Marine Institute at 31 December 2003 and of its income and expenditure and cash flow for the year then ended.

John Purcell
Comptroller and Auditor General
Date

statement of responsibilities of the marine institute

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 Communications, Marine and Natural Resources. In preparing those financial statements, 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.

Dr. J. P. Crowley
Chairman

Mary Dooley
Board Member

statement of 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.

The Board has established processes to identify and evaluate business risks by:

- Identifying the nature, extent and financial implication of risks facing the body including the extent and categories which it regards as acceptable;
- Assessing the likelihood of identified risks occurring;
- Working closely with Government and various Agencies to ensure that there is a clear understanding of Marine Institute's goals and support for the Agencies' 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.

Marine Institute has an internal audit function, which operates in accordance with the Framework Codes 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 plans are endorsed by the Audit Committee and approved by the Board. At least annually, the Internal Auditor provides the Board with a report on internal audit activity. The report includes 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 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.

A review of the effectiveness of the system of internal financial controls was not carried out in 2003, but it is the intention of the Board to conduct this in 2004.

On behalf of the Board:

Dr. J. P. Crowley
Chairman

Mary Dooley
Board Member

accounting policies

Year Ended 31 December 2003

1. General

The financial statements have been prepared under the accruals method of accounting and in accordance with the 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. Fixed Assets and Depreciation

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

Land & Buildings	2%
Fixtures & Fittings	20%
Computers	25%
Research Vessel	4%
Research Vessel Equipment	25%
Motor Vehicles	20%

4. Leased Assets

Rental payments under operating leases are dealt with in the income and expenditure account in the year to which they relate. There has been no recourse to finance leasing.

5. Capital Account

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

6. 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.

7. Investment

Investments are stated at the lower of cost or net realisable value.

8. Salmon Research Agency of Ireland Incorporated

The operations of the Salmon Research Agency of Ireland Incorporated were integrated with those of the Institute with effect from 1 July 1999. The Salmon Research Agency of Ireland Incorporated was wound up on the 19th Dec 2003 and accordingly its fixed assets were transferred to the Institute on that date.

income and expenditure account

Year Ended 31 December 2003

	Note	2003 €	2003 €	2002 €	2002 €
Income					
Oireachtas Grants			22,926,498		29,573,566
Other Income	8		4,758,223		3,197,172
Salmon Research Operations.	18		250,000		344,000
			27,934,721		33,114,738
Transfer to Capital Account	7		5,225,042		(8,616,617)
			33,159,763		24,498,121
Expenditure					
Corporate Services	9	5,517,772		6,170,540	
Strategic Planning and Development	10	2,677,972		7,625,447	
Marine Environment and Food Safety Services	11	4,768,309		4,618,129	
Fisheries Science Services	12	3,079,966		2,902,618	
Aquaculture and Catchment Management Services	13	2,260,989		2,652,443	
Ocean Science Services	14	8,960,746		—	
Irish Maritime Development Office	15	802,292		511,299	
Total Expenditure			28,068,046		24,480,476
Surplus for the year			5,091,717		17,645
Surplus at 1 January			442,165		424,520
Surplus at 31 December			5,533,882		442,165

The Institute has no gains or losses in the financial year or the preceding financial year other than those dealt with in the Income and Expenditure account.

The results for the year relate to continuing operations.

The Statement of Accounting Policies and Notes 1 - 20 form part of these financial statements.

Dr. J. P. Crowley
Chairman

Mary Dooley
Board Member

balance sheet

As at 31 December 2003

	Note	2003 €	2003 €	2002 €	2002 €
Fixed Assets	2		35,912,213		41,137,255
Current Assets					
Debtors & Prepayments	5	7,083,860		1,460,833	
Bank		(453,761)		897,755	
		6,630,099		2,358,588	
Current Liabilities					
Creditors & Accruals	6	1,096,217		1,916,423	
Net Current Assets			5,533,882		442,165
Net Assets			41,446,095		41,579,420
Financed By:					
Capital Account	7	35,912,213		41,137,255	
Income and Expenditure Account		5,533,882		442,165	
Total Reserves			41,446,095		41,579,420

The Statement of Accounting Policies and Notes 1 - 20 form part of these financial statements.

Dr. J. P. Crowley
Chairman

Mary Dooley
Board Member

RECONCILIATION OF OPERATING SURPLUS TO NET CASH FLOW FROM OPERATING ACTIVITIES

	Note	2003 €	2002 €
Surplus per Income & Expenditure Account		5,091,717	17,645
Interest received		(12,630)	(5,420)
Transfer to Capital Account		(5,225,042)	8,616,617
Depreciation	2	3,283,861	3,708,866
(Increase) in Debtors & Prepayments		(5,623,027)	(789,720)
(Decrease) /Increase in Creditors & Accruals		(820,206)	272,480
Net cash inflow from operating activities		(3,305,327)	11,820,468

CASH FLOW STATEMENT

			2003 €	2002 €
Net cash inflow from operating activities			(3,305,327)	11,820,468
Returns on investments and servicing of finance				
Interest received			12,630	5,420
Net capital expenditure				
Acquisition of fixed assets		2	(3,197,729)	(12,325,483)
Adjustment	7		5,138,910	—
(Decrease) in cash			(1,351,516)	(499,595)

RECONCILIATION OF NET CASH FLOW TO MOVEMENT IN NET FUNDS

	2003 €	2002 €
(Decrease) in cash	(1,351,516)	(499,595)
Net funds at 1 January	897,755	1,397,350
Net funds at 31 December	(453,761)	897,755

notes to financial statements

Year Ended 31 December 2003

1. General

The Marine Institute was incorporated under 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 Institute was established by the Minister for the Marine and Natural Resources on 30 October 1992.
The Financial Statements cover the Year Ended 31 December 2003

2. Fixed Assets

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

	Land & Buildings €	Research Vessels €	Vessel Equipment €	Fixtures & Fittings €	Computers €	Motor Vehicles €	TOTAL €
Cost or Valuation							
Balance at 1/1/03	6,891,521	32,346,592	1,857,586	8,874,346	2,580,874	136,582	52,687,501
Additions	123,913	1,835,325	95,899	754,991	367,801	19,800	3,197,729
Adjustment	—	(5,138,910)	—	—	—	—	(5,138,910)
Cost at 31/12/03	**7,015,434**	**29,043,007**	**1,953,485**	**9,629,337**	**2,948,675**	**156,382**	**50,746,320**
Depreciation							
Depreciation at 1/1/03	563,648	1,830,741	1,073,542	6,103,179	1,924,955	54,181	11,550,246
Charge for the year	140,346	956,164	288,836	1,450,319	416,919	31,277	3,283,861
Depreciation at 31/12/03	**703,994**	**2,786,905**	**1,362,378**	**7,553,498**	**2,341,874**	**85,458**	**14,834,107**
Net Book Value							
At 31/12/03	**6,311,440**	**26,256,102**	**591,107**	**2,075,839**	**606,801**	**70,924**	**35,912,213**
At 31/12/02	6,327,873	30,515,851	784,044	2,771,167	655,919	82,401	41,137,255

Included in the gross balance of Land and Buildings is an amount of €1,206,251 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 and Food. Subsequent to the Government decision to relocate the Marine Institute to Galway it is envisaged that the Abbotstown facility will be vacated in 2005. As a result the professional valuation at 1 January 1996 has not been revised. The remainder of the assets are stated at cost.

Additions include fixed assets (to the value of €123,913) transferred from the SRA to the Marine Institute on the winding up of the SRA on 19/12/03.

Adjustment refers to the VAT refund detailed in Note 7.

notes to financial statements

Year Ended 31 December 2003

3. 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 €126,974. As it is not possible to accurately assess the value of this investment, the shares are not capitalised in the Balance Sheet.

4. Lease commitments

The operating lease relates to the lease of the premises at 80 Harcourt Street, Dublin 2. The lease is for a period of 22 years from 1 September 1993. The annual rent is €152,369. There is a rent review every 5 years, with lease breaks in the 7th and 14th year.

The Marine Institute entered into a five year lease for its temporary premises at Galway. The lease is for a period of 5 years from 1 February 2002. The annual rent is €307,277. There is a no rent review. There are lease breaks in the 3rd and 4th year.

The new facility in Galway is expected to be completed in 2005, and the title will remain vested in the Minister for Finance. The Institute will have sole tenancy of this property and there will be no lease or rental costs.

There are eleven staff based in Harcourt Street and there is an ongoing requirement to accommodate another twelve staff for conducting meetings in Dublin. The Institute is actively looking for a more appropriate space to accommodate all Dublin based staff in one facility, at which point Harcourt Street will be sub-let until 2007.

There were no finance lease commitments at 31 December 2003.

5. Debtors and Prepayments

Debtors and Prepayments are made up as follows:

	2003 €	2002 €
Contract Income	1,112,785	920,503
Sundry Debtors & Prepayments	832,165	540,330
VAT Refund	5,138,910	0
	7,083,860	1,460,833

VAT Refund: Capital funding received by the Marine Institute in previous years was used to fund the purchase of the research vessel, Celtic Explorer, the cost of which was transferred to the Capital Account in accordance with the Institute's Accounting Policies. The cost included VAT in the amount of €5,138,910. In 2003, Revenue ruled that the VAT liability on the vessel was zero and the VAT paid was refundable. The Debtors account is being adjusted accordingly. See also Note 7.

6. Creditors and Accruals

Creditors and Accruals are made up as follows:

	2003 €	2002 €
Sundry Creditors and Accruals	1,096,217	1,916,423
	1,096,217	1,916,423

notes to financial statements

Year Ended 31 December 2003

7. Capital Account

	2003		2002	
	€	€	€	€
Balance at 1 January		41,137,255		32,520,638
Transfer from Income and Expenditure Account:				
Capital funding	3,197,729		12,325,483	
VAT Refund	(5,138,910)		—	
Amortisation in line with asset depreciation	(3,283,861)	(5,225,042)	(3,708,866)	8,616,617
Balance at 31 December		35,912,213		41,137,255

VAT Refund: Capital funding received by the Marine Institute in previous years was used to fund the purchase of the research vessel, Celtic Explorer, the cost of which was transferred to the Capital Account in accordance with the Institute's Accounting Policies. The cost included VAT in the amount of €5,138,910. In 2003, Revenue ruled that the VAT liability on the vessel was zero and the VAT paid was refundable. Accordingly, the VAT refund is being taken back into income and the Capital Account is being adjusted accordingly. It is intended that the repayment will be put towards capital expenditure in the future. See also Note 5.

8. Other Income

	2003		2002	
	€	€	€	€
EU Contract Research				
Data Directive (see note below)	1,325,448		798,186	
Codling Project	125,824		—	
Other	192,278		224,375	
		1,643,550		1,022,561
Mapping of Marine SAC's - Duchas	—			546,000
Research Vessel Charterage	—			147,291
Grant in Aid - Capital (B8)	—			693,000
Other Income				
Databuoy	685,000			788,320
Information Society	749,362			—
Sundry and Other Contract Income	1,680,311	3,114,673		—
TOTAL		4,758,223		3,197,172

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

notes to financial statements

Year Ended 31 December 2003

9. Corporate Services

	2003 €	2002 €
Wages and salaries	899,622	824,387
Severance and Pension	207,446	415,798
Marine RTDI Fund (2001-2006), National Development Plan	1,343,004	2,128,081
Administration	2,647,267	2,335,814
Depreciation	420,433	466,460
TOTAL	5,517,772	6,170,540

The Severance and Pension is made up of severance €44,484(2002; €262,222) and pension costs of €162,961 (2002; €153,576). The Institute operated a voluntary severance scheme in accordance with terms agreed by the Department of Communications, Marine and Natural Resources and the Department of Finance.

The RTDI fund expenditure in 2003 is made up of PhD Scholarships, Post Doctorate Scholarships; Michael Manahan Fellowship; Desk Studies; Applied/Industry Projects and Networking projects - fifty-five projects totalling €1,130,032 and administration costs of €212,972.

Administration costs include an audit fee of €9,950 in 2003 (2002; €9,000).

notes to financial statements

Year Ended 31 December 2003

MARINE RTDI FUND (2001-2006), NATIONAL DEVELOPMENT PLAN

The Income and Expenditure in 2003 was as follows:

	2003 €	2002 €
Total Income	1,450,000	2,150,000
Expenditure:		
Projects	1,130,032	1,713,615
Infrastructure	0	265,951
Administration	212,972	148,515
Total Expenditure	**1,343,004**	**2,128,081**
Surplus/(deficit) in year	106,996	21,919

The primary objectives of the Marine RTDI Measure 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.

10. Strategic Planning and Development

	2003 €	2002 €
Wages and Salaries	868,832	828,862
Research & Development Programmes	1,602,713	1,721,247
Research Vessel Operations (incl depreciation)	—	4,653,590
Depreciation (Excl Research Vessel)	206,427	421,748
TOTAL	2,677,972	7,625,447

Strategic Planning and Development in 2002 was under the name Science, Technology and Innovation and the Figures for 2002 included the Research Vessel Operations which are now under the service area Ocean Science Services.

notes to financial statements

Year Ended 31 December 2003

11. Marine Environment and Food Safety Services

	2003 €	2002 €
Wages and Salaries	1,709,112	1,385,972
Research & Development Programmes	2,502,037	2,674,999
Depreciation	557,160	557,158
TOTAL	4,768,309	4,618,129

The Wages and Salaries figure in 2003 is comprised of in total by core staff of €1,661,421(2002; €1,385,972) and EU Contract staff of €47,691 (2002; €0) Marine Environment and Food Safety Services in 2002 was under the name Marine Environment and Health Services.

12. Fisheries Science Services

	2003 €	2002 €
Wages and Salaries	1,539,932	1,159,881
Research & Development Programmes	1,353,340	1,540,976
Depreciation	186,694	201,761
TOTAL	3,079,966	2,902,618

The Wages and Salaries figure in 2003 is comprised of core staff of €783,941 (2002; €685,398) and EU contract staff €755,991 (2002; €474,483)

Fisheries Science Services in 2002 was under the name Marine Fisheries Services.

13. Aquaculture and Catchment Management Services

	2003 €	2002 €
Wages and Salaries	1,004,144	935,090
Research & Development Programmes	1,043,380	1,398,525
Depreciation	213,465	318,828
TOTAL	2,260,989	2,652,443

The Wages and Salaries figure in 2003 is comprised of core staff of €967,496 (2002; €904,762) and EU contract staff €36,648 (2002; €30,328)

Aquaculture and Catchment Management Services in 2002 was under the name Salmon Management Services.

notes to financial statements

Year Ended 31 December 2003

14. Ocean Science Services

	2003 €	2002 €
Wages and Salaries	317,403	—
Administration & Development Programmes	7,020,327	—
Depreciation	1,623,016	—
TOTAL	8,960,746	—

15. Irish Maritime Development Office

	2003 €	2002 €
Wages and Salaries	183,170	173,961
Administration & Development Programmes	618,385	337,338
Depreciation	737	—
TOTAL	802,292	511,299

16. Superannuation

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 the approval of the Minister with responsibility for the Marine Institute (currently the Minister for Communications, Marine and Natural Resources) given with the consent of the Minister for Finance. Two such schemes - the Marine Institute Staff Superannuation Scheme 1998 and the Marine Institute Spouses' and Children's Contributory Pension Scheme 1998 - are currently 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. Superannuation entitlements arising under the schemes are paid out of current income and are charged to the Income and Expenditure Account, net of staff superannuation contributions, in the year in which they become payable.

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. No provision is made in the financial statements in respect of any liability accruing in regard to future benefits.

For the purposes of reporting in accordance with Financial Reporting Standard 17, Retirement Benefits (transitional arrangements), 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 2003.

The FRS 17 valuation includes staff transferred from the Salmon Research Agency.

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

Inflation rate increase (a)	2% per annum
Salary rate increase	4% per annum
Pension rate increase	4% per annum
Scheme liabilities discount rate	6% per annum

notes to financial statements

Year Ended 31 December 2003

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

	2003 €	2002 €
Accumulated liabilities in respect of active Scheme members	4.30m	3.74m
Liabilities in respect of existing pensioners and deferred pensions	3.30m	3.28m
Total accrued pension liability	7.60m	7.02m

(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.

17. Joint Venture - Marine Technical and Development Services Ltd

The Marine Institute was involved in the set up of a joint venture company called Marine Technical and Development Services Ltd. The Marine Institute is a 51% shareholder, with the remaining shareholding being between Marine Technology Ltd. holding 25% and another stakeholder holding 24% respectively. The company was incorporated in 1998. Marine Technical Development Services Ltd was established to help develop innovative and commercially viable companies and products in the field of marine technology. Its primary business is the management, crewing and operation of the research vessel 'Celtic Voyager'. Marine Technical and Development Services Ltd is located in Galway. The Marine Institute is required by law to offer the Vessel Superintendency Services contract by public tender, and began this process in May 2004. MTDS will be liquidated upon the award of a contract to a new Service Provider. The audited turnover year ended 31 December 2003 was €4,448,358 and the audited profit for the period was €24,846. The total value of transactions entered into with Marine Technical and Development Services Ltd during the period was €4,431,100 (net of VAT).

18. Salmon Research Agency Operations

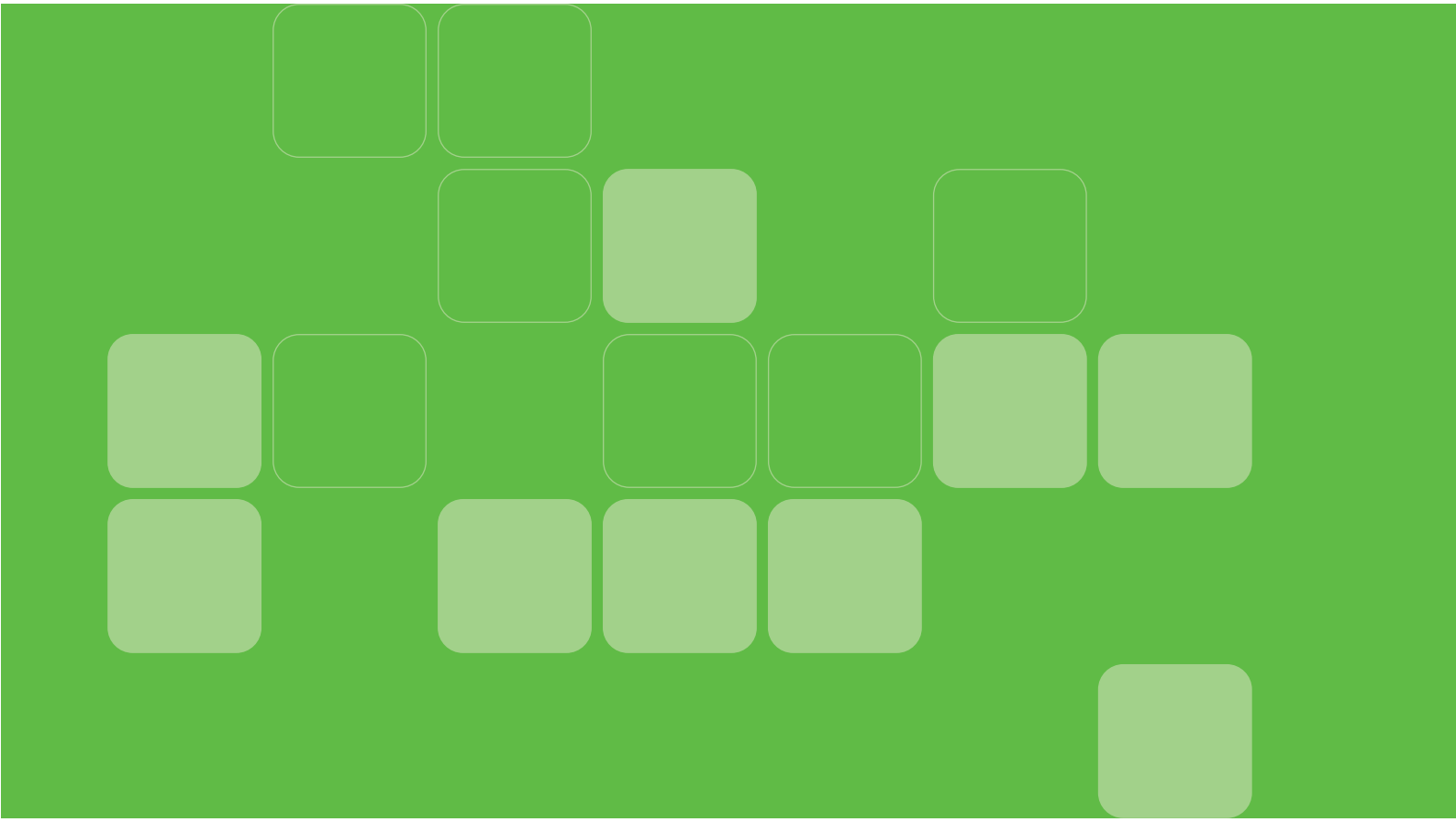
The Institute receives a €250,000 Oireachtas Grant towards the running of the operations of the Salmon Research Agency.

19. Register of interests

The Institute has complied with the guidelines issued by the Minister for Finance and in addition has fulfilled the requirements of the Ethics in Public Office Act, 1995. During the year the aggregate amount of contracts entered into where an interest had been declared amounted to €154,273.

20. Board Approval

The financial statements were approved by the Board of the Marine Institute on the 28th of September 2004.



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Foras na Mara

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