

annual report



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exploring new horizons

To the Minister for the 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 2001.

John P. Crowley, Chairman.

Do Aire na Mara agus Acmhainní Náúúrtha

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, 2001 a thíolacadh.

Sean P. Ó Cruadhloich, 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 eacnamaíoch 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 is there to transform the Irish marine resource into a thriving and enduring maritime economy. The Institute provides both Government and Industry with scientific services, conducts research, facilitates and participates in partnerships and provides access to funding. In order to perform these tasks effectively it is structured in six service divisions focused on sustaining current momentum in RTDI and supporting key operational capabilities of the marine sector.

This report highlights the key deliverables from the Institute from the year 2001.

ORGANOGRAM



DETAILS OF BOARD MEMBERS



1 Dr. J. P. Crowley (Chairman) (1998-2003)
 M.V.B., M.R.C.V.S., B.Ag.Sc., PhD., Dr Crowley has had a distinguished career in agricultural research (An Foras Talúntais) 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 (1996-2001)
 A former Naval Officer and Chief Executive Officer of the Irish National Petroleum Corporation (INPC). Mr. Cahill is currently the Irish representative for Phillips Petroleum, Chairman of the Irish Offshore Operators' Association and Marine Technical Development Services Ltd.

3 Mrs. Mary Brophy (1996-2001)
 Founder and Executive Director of the National Specialised Equestrian Training College (Festina Lente Foundation), providing training and employment for people with intellectual, physical and sensory disabilities.



board members

4 Mr. Joey Murrin (1998-2003)
 Chief Executive of Killybegs Fishermen's Organisation (retired in July 2000). Formerly Chairman and Director of Bord Iascaigh Mhara.

5 Dr. Brendan O'Connor (1998-2003)
 Managing Director of Aqua-Fact International Services Ltd., an environmental consultancy company. Holds a B.Sc. (Hons) and PhD in Zoology from the National University of Ireland, Galway.

6 Capt. Dave Hopkins (2000-2001)
 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.

7 Mr. John O'Carroll (2001 - 2006)
 Mr O'Carroll is currently a Director of the ISPG -the largest salmon export company in Ireland and owns a salmon farm in the Connemara Gaeltacht area. As a Biology graduate, Mr O'Carroll has over 25 years experience in the aquaculture industry.



8 Mr. Sean O'Donoghue (2001-2006)
 CEO of the Killybegs Fishermen's Organisation and a key member of Ireland's Common Fisheries Policy Strategy Review Group. Mr O'Donoghue has a long established career in Fisheries Management working in the Department of the Marine and BIM. He played a key role during the Irish Presidency of the EU in 1996 and the implementation of the Whitefish renewal scheme. He has a key role in negotiations to establish Irish Total Allowable Catches.

9 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.



chairman's statement



During the year under review, we have witnessed continued progress in service delivery as the Institute seeks to maintain the International status and standards, which it has established in recent years. Shared knowledge and partnerships with other bodies, both nationally and internationally, have provided a strong foundation on which national marine research can develop. During this year the great variety of strategic projects undertaken shows the breadth and the scope of the Institute's capabilities.

The relocation to Galway has presented major challenges; these have been met head-on with unity and determination. The Executive has located a site for our new headquarters in Oranmore, has secured an interim premises nearby and has successfully negotiated the terms and conditions for staff. This achievement is a reflection of a strong senior management team with a dedicated focus. I also commend the work of the OPW, in delivering imaginative initial design plans that reflect the views of both the Staff and the Board for our new headquarters building.

There have been a number of important achievements during the year that will help to underpin the future development of marine Ireland. These include, the introduction of a tonnage tax for the shipping sector, an expanded biotoxin service to the shellfish industry and government, vital scientific input for fisheries negotiation in Brussels and the launch of the marine measure of the National Development Plan.

The achievements that I have highlighted are only a reflection of the very extensive work undertaken during the year. It is clear that the Institute is fulfilling its remit to ensure that Ireland can realise its marine resource potential. I am confident that the Institute will continue to make a strong contribution to marine research and development at a national and international level.

On behalf of the Board, I would like to congratulate and thank the staff and management for the ongoing progress and commitment in 2001. Finally, I wish to acknowledge and thank the other Board Members for their constant dedication to the affairs of the Marine Institute.

Dr. J.P. Crowley

chief executive's report



The past year presented tremendous challenges and change for the Marine Institute. This has led to an enhanced delivery of key services and scientific advice about the marine sector to Government, Industry and the EU. It has furthered the development of partnerships both nationally and internationally that will increase Ireland's ability to identify, participate in and benefit from partnerships in marine RTDI projects of strategic national importance. Crucial steps were also taken to establish our new-world class marine facility in Galway, which will become a pivotal point for Irish marine research. Progress this year will without doubt provide powerful direction and new opportunities for marine Ireland in the future.

Key milestones this year included:

1. Major progress to advance the Government's decision to relocate the Institute to Galway.
 - An agreement was negotiated and agreed with staff on a mechanism to progress the relocation process in a partnership manner.
 - A change management process was introduced to support the major logistical transfer of infrastructure, staff and projects to the Galway headquarters.
 - A site was acquired in New Harbour, Oranmore following an intensive site assessment by the OPW.
 - Initial design concepts for a world class facility were completed. Measures were put in place to incorporate staff ideas in the design and layout decisions.
 - An interim facility was acquired in Galway Technology Park to facilitate enhanced service delivery until the permanent facility is completed in 2004.
2. The Partnership Committee established under the Programme for Prosperity and Fairness spearheaded a Performance Management Development System for the Institute. This will introduce comprehensive and effective management of work processes and targets to meet organisational goals.

3. Implementation of the marine RTDI Measure of the National Development Plan advanced in key areas. The construction of the new *RV Celtic Explorer* is well underway with delivery scheduled for 2002. A wide range of Desk studies, PhD, MSc and Post Doctoral Fellowships, in key areas of national importance, were advertised.
4. The rapid progress of the IMDO and its beneficial impact on the Irish shipping sector can be gauged by the inclusion of a Tonnage Tax in the December 2001 Budget. Along with the implementation of the IMDO strategic plan, this bodes well for the future of the sector.
5. A mini-survey of Galway Bay was carried out utilising multibeam sonar technology onboard the *RV Celtic Voyager*. This exercise was undertaken as part of the Institute's preparatory work for the extensive surveying it will undertake from 2002 on the National Seabed Survey, in partnership with the Geological Survey of Ireland.
6. The National Biotoxin Monitoring Programme at the Institute was significantly expanded in 2001 in response to demands for food safety by the shellfish & aquaculture industry and Government. This involved major investment in capital and human resources.
7. Research infrastructure including, laboratory, administrative, water treatment and fish holding facilities at our facility in Newport, Co. Mayo was significantly developed by the capital improvements project.
8. Strategic new alliances with Canada including an Memorandum of Understanding with the Canadian Centre for Marine Communications and our active participation in the Ireland Newfoundland Board developed our strong international collaboration which already exists with the EU and America.
9. Continuous efforts were made to strengthen existing and build new partnerships with a wide range of national state departments and agencies, third level institutions and the private sector who have an active interest in Ireland's tremendous marine resource.

Dr. Peter B. Heffernan



Niall Gibbons
DIRECTOR

DIRECTORS STATEMENT

This was a year of significant change and progress. Corporate Services underpinned many major developments within the organisation and in association with national and international partners.

- Progress was made on the relocation of the Marine Institute to Galway. A site was located and interim offices were secured. A number of staff made key contributions in preparing for an effective transfer of people and IT systems to the interim offices early in 2002. An agreement was negotiated and agreed in conjunction with staff in relation to the relocation process.
- There was an ongoing commitment to comply with the Government Guidelines for State bodies and the Ethics in Public Office Act 1995. This was evident in the high standards of best practice and corporate governance.

corporate services

- A new Performance Management Development System was developed in-house. This was introduced to staff through ongoing training and will make sure the Institute has the process and procedures in place to comply with Programme for Prosperity and Fairness standards in 2002.
- Recruitment of 31 staff supported development in a number of teams throughout the Institute, to boost delivery of key services.
- Ongoing International collaboration is an essential part of enhancing our capability and sharing knowledge. Work continued with the USA, Canada, Europe, New Zealand and the Far East.
- Advances were made in the launch of the marine research measure of the National Development Plan. Web pages were developed to host all the information relating to the proposals and applications for funding. The first call was initiated in September and evaluations will begin early next year.

The groundwork has clearly begun on a variety of dynamic and challenging projects. The Corporate Services team has supported this and will continue a high level of service to sustain the momentum in 2002.

Niall Gibbons

DIRECTOR - Corporate Services

ACCOUNTS

A full financial report and statement is contained in the second part of this report and will be added later in the year.

HUMAN RESOURCES

Performance Management Development System (PMDS)

PMDS is a requirement of the Partnership 2000 Agreement. Performance management is the link between the high level goals of the organisation and the everyday work. A system to help Marine Institute staff understand and achieve this was devised during 2001. Ongoing training has been organised to introduce staff to the rationale behind PMDS and clearly outline the process and procedures required in order to meet Programme for Prosperity and Fairness standards during 2002.



Recruitment

A successful recruitment campaign secured 31 new employees to various divisions throughout the organisation.

Training

An induction programme was introduced for new recruits. Training courses were designed and delivered in house to provide staff with specific skills relating to their work programme, and employees were actively encouraged to pursue training that would enhance their career prospects.

Health and Safety

A Health and Safety Statement was devised for the Institute and circulated to all staff members. Appointed Officers in all locations received training appropriate to their work places including first aid, laboratory safety, safety at sea and safety representation.

INFORMATION TECHNOLOGY

The key focus for the IT unit was upgrading current systems and ensuring effective transfer processes to new facilities.

The upgrading of existing IT communications links to Institute sites enhanced delivery of electronic services to customers/public. IT facilities were improved for staff working on regional sites and employees travelling abroad who needed remote access.

Systems were transferred into new office facilities in Newport and technical preparations made for the move to an interim headquarters in Galway early 2002.

LIBRARY

The library upgraded its catalogue to CAIRS Total Library. This is now accessible via the intranet to all members of staff, and will soon be available to the public.

INTERNATIONAL CO-OPERATION

Ireland/USA Co-Operation

Scientific collaboration, initiated in 1995 with the US National Oceanic & Atmospheric Administration (NOAA), was reviewed at a high level Joint Workshop in January 2001. Co-operation in the areas of Ocean Data Management and modelling, Fisheries, Harmful Algal Events (HAEs) and Salmon Migration and Aquaculture continued through exchange visits, joint projects and workshops.

The Institute also participated in an evaluation of a US AID funded project “Red Sea Peace Park - Co-operative research, monitoring and management program” during April 2001.

European Science Foundation - Marine Board

The Marine Institute continued an active role on the ESF-Marine Board, providing strategic advice on two prominent ESF Reports: “Navigating the Future-Towards a Marine European Research Area” & “Marine Biotechnology-A European Strategy for Marine Biotechnology”.

corporate services

The Marine Institute chaired the 3rd Meeting of European Research Vessel Operators Group (Rome) and hosted an ESF-MB Marine Biotechnology Feasibility Working Group Meeting in Galway.

EU Framework Research Programmes

In May 2001, the Institute published a “Directory of Marine R&D Projects involving Irish partners within the Marine Sector of the EU 5th Framework Programme” providing details of 18 R&D projects with Irish partners supported by the EU 5th Framework Programme. A list of projects in 2001 can be seen in Appendix 1.

The Institute continued to provide information and direction to the EU 6th Framework Programme (2000-2006) to be launched in 2002, via Forfas and the EU Environment and Sustainable Development Committee.

EU INTERREG Programme

An Irish/Welsh Workshop was hosted on Coastal Zone Management Projects supported under the INTERREG-II (1994-1999) Programme. This brought the Maritime Ireland/Wales INTERREG-II to a conclusion.

Four additional INTERREG-II Project Reports were published in 2001 (see Appendix 2) and the Welsh Museum published the INTERREG-II funded BIOMOR 2 Report: ‘Benthic Biodiversity in the Irish Sea - The South-West Irish Sea Survey.’

The Marine Institute’s International Co-operation Office worked closely with the Irish Department of Finance and the Welsh European Funding Office to define a new priority ‘Marine and Coastal Development and the Environment’ for inclusion in the Maritime Ireland/Wales INTERREG-III (2000-2006) to be launched in 2002.

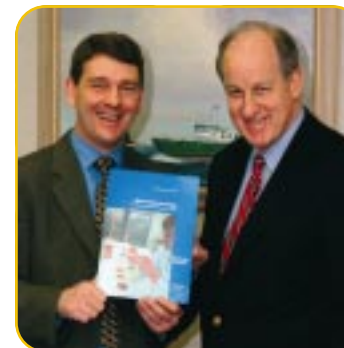
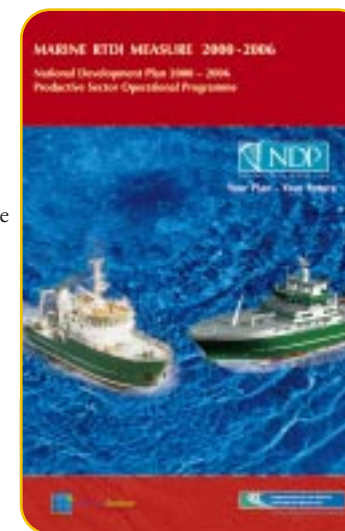
A Directory of Marine Projects funded under the INTERREG-IIc Atlantic Arc Programme (1994-1999) is in preparation to complement the Directory of Ireland/Wales INTERREG-II projects published in 2000.

Marine RTDI Measure NDP 2000-2006

The Marine Institute, is the implementing body for the €52.6 million marine RTDI measure on behalf of the Department of the Marine and Natural Resources.

The Marine RTDI Measure, consists of the following sub-measures:

- 1 Provision of enhanced research vessel capacity to cover outer continental shelf activities.
- 2 Upgrade 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 TO-DATE

Sub-Measure 1: RV Celtic Explorer

The keel of the new 65m multipurpose research vessel *RV Celtic Explorer* was laid in July 2001 at the Damen Shipyard in Galati, Romania. The new vessel is scheduled for delivery in 2002. Detailed progress on the construction of the *RV Celtic Explorer* can be found on page 29.

Sub-Measure 3: Marine RTDI Fund

Details of proposed grant-aid supports under Sub-Measure 3 were announced by the Minister for the Marine & Natural Resources at a Marine NDP Programme launch held in July 2001.



A “Preliminary Assessment of Modelling Capabilities in Ireland” was undertaken in September/October. The report is posted on the Marine Institute’s NDP website.

A first call for proposals was launched in September under sub-measure 3 (marine RTDI fund), incorporating 11 Desk Studies & 13 Fellowships. (Appendix 3) Proposals received by the deadline of December 14, 2001 will be evaluated by an independent panel in January 2002.

All information relating to the marine RTDI measure is contained on the website www.marine.ie/marinertdi



Glenn Murphy
DIRECTOR

DIRECTORS STATEMENT

In 2001, the IMDO fulfilled its remit to “promote, assist and develop” and at the same time delivered change that will underpin the future development of the Irish shipping industry.

The announcement of a tonnage tax in the December 2001 budget was a direct result of a campaign spearheaded by the office and represents the most vital achievement of the year.

The industry had been on the verge of economic extinction with many owners preparing to re-flag their vessels overseas and to move their vessel management structures when the measure was not introduced in 1999. A strong campaign supported by the IMDO Advisory Group convinced Irish owners to suspend their plans while the office undertook a revaluation of the previous campaign.

In August an impact assessment was presented to a number of Government Departments. It underlined the economic implications for industry if tonnage tax was not introduced and the positive impact and potential to develop the sector if it was. The delivery of the tonnage tax saw immediate benefits when the new *MV Arklow Rose* registered under the Irish Flag in late December 2001.

irish maritime development office

Significant market research during the year revealed that although 99% of Ireland’s trade moves by sea and through Irish ports, there was no definitive place where information on the services that logistically connect these trades could be located. As a result the office started building an interactive web portal to host comprehensive information on companies involved in the Irish shipping service sector. The site www.imdo.ie is on target to be launched in January 2002.

2001 was a successful year, which also saw vital progress in the areas of mercantile legislation, marketing and seafarer training.

Glenn Murphy

DIRECTOR - Irish Maritime Development Office

The Irish Maritime Development Office (IMDO) has a statutory remit to assist in the promotion and development of the shipping and shipping service industries. 2001 was a highly productive year with continued development on a strategic work plan. This resulted in significant milestone achievements, notably;



TONNAGE TAX

The Minister for Finance announced the inclusion of a tonnage tax regime for the 2001 Budget. This was the direct result of a detailed impact report supporting the introduction of a ‘Tonnage Tax regime for the Irish Shipping Industry’, submitted by the IMDO to Government. This measure will take effect from January 1st 2002 subject to EU approval.

A tonnage tax means that a company is taxed based on the tonnage of their fleet instead of notional corporate profits. It will have a significant impact on the Irish shipping industry and act as a catalyst for future growth in the

E-MARKETING - WWW.IMDO.IE

An E-platform that will promote and assist the Irish shipping services sector was developed and constructed by the Office. It is the only comprehensive online source for information on the Irish shipping services sector. The site, www.imdo.ie, received hundreds of visitors during a trial phase during October. The site will be officially launched in January 2002.

STRATEGIC MARKETING

The office undertook an international marketing campaign outlining Ireland’s ambition to establish itself as an international shipping service centre. The Office targeted over

sector. A post budget tonnage report on specific tax measures sought by the industry was commissioned in late December.

MERCANTILE SHIPPING LEGISLATION

In 2000, a radical reform of Ireland’s outdated Mercantile Shipping Legislation, was requested by the Minister for the Marine and Natural Resources. By December 2001, the IMDO, in consultation with industry and legal experts, drafted new Heads of Bills that will bring registry legislation up to best practice internationally. These were presented to the Minister and it is anticipated that the proposals will become law in the 3rd quarter of 2002.

ISEAS - IRISH SEAFARERS EDUCATION ALLOWANCE SCHEME

A detailed report, which proposed a revision to the existing seafarer training grant scheme, was presented to the DoMNR. Fully endorsed by industry, it recommended additional assistance to cadets and experienced seafarers to reflect new international developments.

500 companies nationally and 2,000 internationally with direct mail, supported by target advertising. Fifteen major shipping centres were identified and visited by the IMDO and meetings were conducted with senior management at some of the world’s largest shipping corporations. The Office has also been very active enhancing relationships with related Irish agencies and organisations.

ADVISORY GROUP

An expert Advisory Group with members of the shipping industry and services sector, ports, IDA, independent financial, legal and business experts and government departments, meets on a regular basis to provide guidance and advise the IMDO on strategic issues and reports relating to the Offices activities.



Micheal Ó Cinnéide
DIRECTOR

DIRECTORS STATEMENT

Marine Environment and Health Services had a high level of activity in 2001 featuring:

- Recruitment of eight new staff in early 2001 and the revamping of the Biotoxin Unit, to provide a national service based on phytoplankton, bioassays and chemical tests.
- The EU Food & Veterinary Office (FVO) carried out an audit of the Irish seafood monitoring regime in July 2001. Published results show that the Institute carries out duties as the National Reference Laboratory for Marine Biotoxins to high standards.
- Members of the Fish Health team expanded the range of services to Irish industry to include shellfish diagnostics and worked closely with the EU Commission on the review of European fish health directives.

marine environment & health services

- The Chilean authorities carried out a detailed audit of the Irish system for fish health, in order to certify salmon ova for export to Chile. The Institute provided a comprehensive dossier on fish health issues and the audit was successful. As a result, some 2.5 million salmon ova were exported from Ireland in the 2001 season.
- During 2001 team members were active in the design phase for the Institute's new facilities in Galway.
- Scientific staff continued to provide an active advisory role to the Department of the Marine & Natural Resources, dealing with 300 queries on issues including 'Dumping at Sea' applications, aquaculture licences and monitoring, shellfish safety and fish health.
- The MEHS team made solid progress in its Quality and Accreditation programme during the year, led by the full time Quality Manager.
- Technical advice was provided on a range of marine environment issues to the DoMNR. This involved participation at the Marine Licence Vetting Committee (MLVC), the Aquaculture Licence Advisory Committee (ALAC) and advice on Ireland's obligations on marine pollution issues under the OSPAR Convention. Staff also participated in the new co-ordination group for the Water Framework Directive, chaired by the DoE.

A strong team has been developed and this, in conjunction with the implementation of a quality programme, will ensure a high standard of service to all customers in the future.

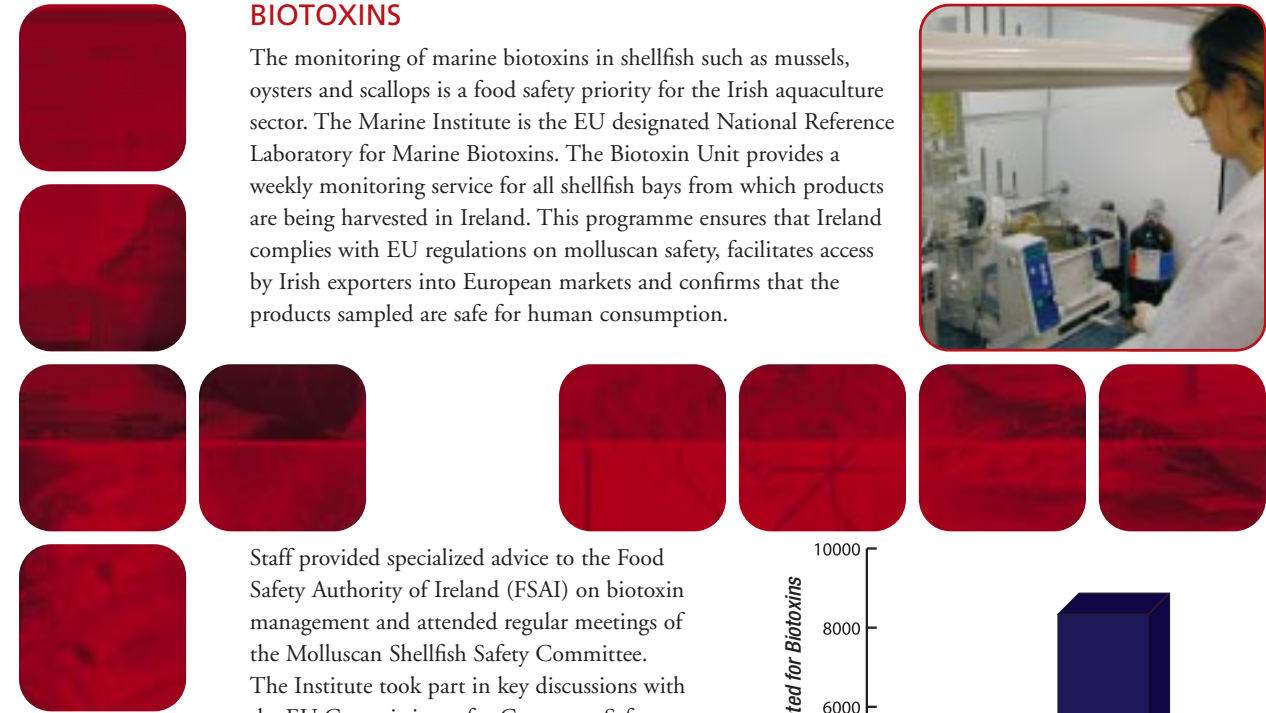
Micheal Ó Cinnéide

DIRECTOR - Marine Environment and Health Services

The MEHS primary role is to research and monitor interactions between a range of human activities and the marine environment. Scientific staff provide essential services to the aquaculture industry, ports, the Irish government and the EU in the areas of biotoxin monitoring, fish health and marine chemistry.

BIOTOXINS

The monitoring of marine biotoxins in shellfish such as mussels, oysters and scallops is a food safety priority for the Irish aquaculture sector. The Marine Institute is the EU designated National Reference Laboratory for Marine Biotoxins. The Biotoxin Unit provides a weekly monitoring service for all shellfish bays from which products are being harvested in Ireland. This programme ensures that Ireland complies with EU regulations on molluscan safety, facilitates access by Irish exporters into European markets and confirms that the products sampled are safe for human consumption.

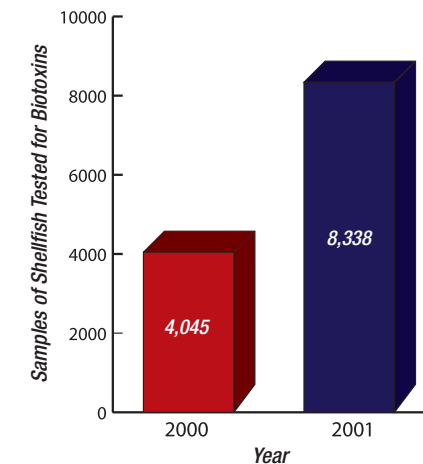


Staff provided specialized advice to the Food Safety Authority of Ireland (FSAI) on biotoxin management and attended regular meetings of the Molluscan Shellfish Safety Committee. The Institute took part in key discussions with the EU Commissioner for Consumer Safety, on the need to harmonise Biotoxin testing across the EU. Staff from the Marine Institute and FSAI participated in the EU Working Groups in April, May and October 2001 which were set up to review the biotoxin regulations.

The EU Food & Veterinary Office (FVO) carried out an audit of the Irish monitoring regime under EU Directive 91/492 in July 2001. The published results of the FVO audit confirmed that the Marine Institute carries out its duties as the National Reference Laboratory for marine Biotoxins to high standards.

Scale Up of Biotoxin Monitoring

During 2001, the Marine Institute responded to requests from FSAI and industry to scale up the national biotoxin monitoring programme. A total of 8,338 samples of shellfish were tested for biotoxins in 2001, doubling volumes tested (4,045 samples) in 2000 (See graph). Based on discussions at the Molluscan Shellfish Safety Committee, an integrated programme was developed which consisted of three types of test for each bay:



- Bioassays were carried out on 4,150 samples for Diaretic Shellfish Poisoning (DSP) and on 322 samples for Paralytic Shellfish Poisoning (PSP) in 2001.
- Chemical testing by the LC-MS method was introduced on a national basis in April 2001. 3,031 samples were tested for DSP/AZP and a further 835 samples, primarily of scallops, were tested for Amnesic Shellfish Poisoning (ASP) in 2001.
- A national Phytoplankton monitoring service was initiated in January 2001. Over 2000 samples of seawater from aquaculture bays were analysed for the presence of potentially toxic Phytoplankton; 164 reports were issued by fax/email to shellfish producers.

Over 17% of shellfish samples tested by bioassays or chemical methods during 2001 were positive, in that the level of biotoxin present was above EU threshold levels. This showed a higher toxicity during 2001 than in recent years.

The 2nd Irish Marine Science Biotoxin Workshop was organised in association with Bord Iascaigh Mhara and the Irish Shellfish Association. It provided a forum for researchers, shellfish farmers and regulators to learn about and give feedback on current developments in biotoxin monitoring and research. The Institute published the Proceedings of the workshop and circulated these to 350 producers, state agencies and researchers.

Biotoxin Research and Development

The research programme to understand the dynamics of harmful algal events (HAE) and biotoxins continued and Ireland hosted the ICES Working Group on Harmful Algal Bloom Dynamics in Dublin. This provided a forum to review the latest research in Europe and North America on this complex issue.

Biotoxin Unit staff along with researchers from NUI Galway and CEFAS (UK) conducted a 10 day research survey on the *RV Celtic Voyager*, which focused on the oceanography and distribution of phytoplankton off the west coast, from Mizen Head to Malin Head. A significant new bloom of the species *Alexandrium tamarense*, was identified which has been linked to PSP outbreaks. Follow up bioassays tests by the Institute on west coast shellfish did not detect any PSP toxins in the product.

Co-operation on biotoxin monitoring and research continued with the Cawthron Institute, New Zealand. Their staff visited Dublin to advise on the setting up of the new LCMS laboratory.

marine environment & health services

The Institute set up a new programme for the production of Azaspiracids based on training given to a senior member of the Biotoxin Unit at Tohoku University, Japan in the analytical techniques for the isolation of the toxin Azaspiracid.

Biotoxin Unit staff worked closely with the Marine Data Centre to design and develop an online Harmful Algal Bloom Database. This will speed up the collection and analysis of data from the approved national laboratories involved in the biotoxin monitoring programme.

MARINE CHEMISTRY

The Marine Chemistry team carried out a range of monitoring and research tasks in 2001, including detailed analyses on the levels of contaminants and nutrients in the Irish marine environment. This work has taken on a new importance in regard to seafood safety.

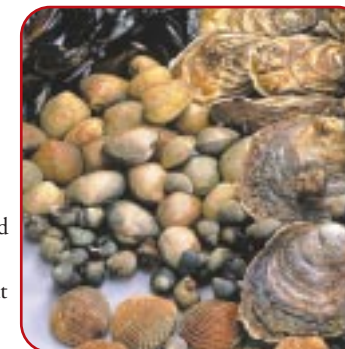
Seafood Safety

In accordance with EU Directive 79/923/EEC, the Chemistry Unit monitors shellfish and wild caught fish from Irish waters for the presence of contaminants such as Mercury, Cadmium, Lead and PCBs, to ensure that these seafood products are safe for human consumption.

In accordance with EU Directive 96/23/EC, the Chemistry Unit tests farmed Irish finfish for the presence of residues such as veterinary drug treatments, Mercury, Cadmium, Lead and PCBs, to ensure that these seafood products are safe for human consumption. In March 2001, the Marine Institute provided its annual report on residues in farmed fish to the Department of Agriculture, Food & Rural Development, who forward the data to the EU. Individual reports were provided to 16 salmon and trout producers who had supplied the samples.

The Chemistry team provided a report for the FSAI on PCB levels in Irish fish (1993-2000) and assisted the FSAI in responding to a UK food scare re levels of dioxins in salmon. As a follow on, the Institute worked with FSAI in 2001 to prepare samples for a major baseline study of dioxins and dioxin like PCBs in Irish wild and farmed salmon. Staff members also participated in the work of the FSAI Sub Committee on Food Additives.

The Institute completed its involvement in the MATT (Monitoring and Analysis of the Toxicity of Toxaphenes) project in 2001 and a final report was submitted to the EU Commission. This project was aimed at determining the levels of toxaphene in seafood from European waters.



Environmental Monitoring and Nutrients in the Irish Sea

An annual research survey to measure nutrient levels in the western Irish Sea has taken place since 1990. This programme was continued in 2001 on the *RV Celtic Voyager* when 276 samples were analysed for nutrients and salinity. The data series from this programme was made available during the year to researchers at the School of Ocean Studies, University of Wales, as part of a joint project to investigate the dynamics of eutrophication in the Irish Sea.

This year the Institute became actively involved in the implementation of the EU Water Framework Directive (WFD), which was signed in December 2000. This major piece of European legislation will require a scaling up of Irish chemical and biological monitoring in estuarine and coastal waters from 2004. The Institute worked with the EPA and colleagues from Northern Ireland to plan the WFD marine monitoring programme.



The Institute worked with the Irish Whale and Dolphin Watch Group to assess the environmental signals and level of contaminants in bottlenose dolphin samples from the east coast, which included analytical chemistry on 216 determinants.

Advice

The Institute provided advice on 25 individual applications by port companies for 'Dumping at Sea' permits, including specifications on sampling and analysis. In certain cases (Greenore), the Institute provided three reports and advice to the consultants on the remediation of sediments in the port area.

Staff members participated in the work of the Dublin Bay Water Quality Management Group, which is chaired by Dublin Corporation.

The report on Trace Metals and Contaminants in Irish Shellfish (1997-1999) was submitted to the Department during 2001.

Quality Assurance

Solid progress was made in the Quality and Accreditation programme during 2001. The National Accreditation Board (NAB) carried out a pre-audit assessment of the Residues programme in Autumn 2001, which confirmed that the tests were ready for full NAB audit.

As part of the quality policy, the Chemistry Unit takes part in the EU wide QUASIMEME (Quality Assurance of Information for Marine Environment Management in Europe) programme twice yearly. This involved 300 analytical tests in 2001 and the proficiency results were of a high standard.

FISH HEALTH

The primary role of the Fish Health Unit (FHU) is to support the aquaculture industry and the inland fisheries sector in maintaining a high fish health status for Irish fish. The Marine Institute provides both statutory services (in line with EU Directives) and diagnostic support. Staff numbers in the FHU increased to nine during 2001, providing a full range of analytical skills in the areas of histology, bacteriology and virology. The unit has begun to implement a comprehensive quality assurance system.

marine environment & health services

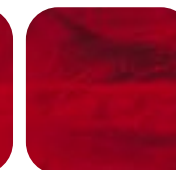
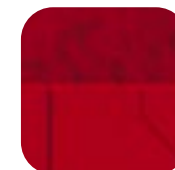
Laboratory Activities

The main programmes during 2001 were:

- All freshwater hatcheries and marine finfish sites were inspected, in accordance with Directive 91/67/EEC. In the course of this work, the FHU sampled 1,975 finfish and 998 shellfish samples for the presence of specified List 2 and List 3 diseases.
- FHU staff examined 750 finfish and 532 shellfish samples as part of the diagnostic service to the aquaculture industry, primarily as pre-movement screening checks.
- FHU carried out a national survey for the presence of Infectious Salmon Anaemia (ISA), which has caused severe problems in the salmon farming industries in Norway, Scotland, Faroes and in Canada. A total of 1,020 fish from marine aquaculture sites and 51 wild returning salmon were tested. No evidence of the ISA virus was detected. The Institute published the Proceedings of the seminar on ISA in Salmon.
- FHU certified salmon ova for export to overseas markets such as Chile, in accordance with the methods prescribed by the OIE (Office Internationales des Epizooties - World Organisation of Animal Health). In 2001, a total of 300 salmon broodstock were tested and Ireland provided a comprehensive dossier on fish health issues to the Chilean authorities.
- FHU carried out clinical examinations of live fish and shellfish 48 hours prior to export to other EU countries. Thirty four finfish and 25 shellfish consignments were certified for export in 2001. The total value of exports certified was €3.6 million.
- The unit took part in a multi-disciplinary survey of salmon mortalities in the River Erne, at the request of the Electricity Supply Board. Thirty fish were examined virologically and a further 79 fish were tested histologically. A report was supplied to the project co-ordinator.
- Staff tested 134 samples of farmed salmon and trout for the presence of anti-microbial residues, in compliance with the Directive 96/23/EC. No evidence of anti-microbial residues was detected.
- The FHU successfully completed the annual proficiency test, which is carried out by the EU Reference Laboratory at Aarhus, Denmark.

Advice

Senior staff attended 6 meetings of an EU Commission Working Group, which is reviewing fish health legislation. Ireland supplied advice to the Commission on policy in relation to fish diseases such as ISA. The Irish programme for Approved Zone status was prepared and presented with respect to the diseases *Bonamia ostrea* and *Martelia refringens*, which can impact severely on native *Ostrea edulis* oysters.



The Institute is designated by the EU as the National Reference Laboratory for Fish Viruses. In this context, FHU staff attended the annual meeting of the EU Reference Laboratories in Padova, Italy.

Staff had a leading role the Irish Fish and Shellfish Health Advisory Group which aims to facilitate communications and to provide policy advice on fish & shellfish health issues. This group, including representatives from the DoMNR, the aquaculture industry, private veterinarians and researchers met four times and commissioned a survey on the availability of veterinary medicines for aquaculture.



The FHU continued to provide regular advice to the Department on the use of veterinary medicines (6 dossiers), finfish movements within Ireland (89 applications), shellfish movements (46 applications), finfish imports from abroad (31 cases) and shellfish imports from abroad (81 cases).



Dr. Paul Connolly
DIRECTOR

DIRECTORS STATEMENT

The marine fisheries team, assess, research and advise on the state of the marine fisheries resource. During 2001, the industry produced Irish landings of 260,000 tonnes, valued at €254 million.

The main commercial fish stocks in Irish waters are managed by the EU under the Common Fisheries Policy (CFP). Fisheries research is critical to the CFP, providing information and advice on the life history, exploitation and current state of fish stocks underpinning all EU fisheries management policy. The work of the team informs Department of Marine and Natural Resources (DoMNR) policy objectives, management and development strategies for marine fisheries through the Annual Stock Book.

marine fisheries services

This year Industry links were strengthened through the Pelagic Management Committees in the north west and in the Celtic Sea. Real time scientific advice was provided, which was incorporated into the management decisions of these committees, particularly in relation to the Celtic Sea herring stocks.

There are serious concerns about the state of a number of key EU fish stocks. The EU has established recovery plans in order to rebuild these depleted stocks. Ireland is at the centre of the current wave of EU fish stock recovery plans. Throughout 2001, the Institute continued to work closely with the DoMNR, BIM, Industry and EU in the formulation and monitoring of cod and hake recovery plans.

Other highlights of the year included:

- A comprehensive Irish National Programme which was compiled by Marine Fisheries Services and DoMNR. This was submitted to the EU to secure funding under the Data Collection Regulation.
- A joint Irish-US (MI-NOAA) Egg and Larval Survey took place off the South coast of Ireland using specialist sampling equipment from the US.
- Two Irish surveys as part of an international mackerel egg survey programme using the *RV Celtic Voyager* and the MFV *Emerald Dawn*.
- Joint Industry-MI investigation of the summer distribution of Celtic Sea herring using acoustic and fishing surveys.

Dr. Paul Connolly

DIRECTOR - Marine Fisheries Services

ASSESSMENT

Fisheries 'data' are the raw materials required for stock assessment. A new EU regulation on data collection (EU Council Regulation 1543/2000) will radically change the way assessment data are collected throughout Europe. In 2001, a comprehensive Irish National Programme was compiled along with DoMNR and submitted to the EU to secure funding for the first five year cycle of the programme from 2002 to 2006. The Irish programme consisted of modules on port sampling, sea sampling of discards, analysis of fleet activity, age estimation work, research surveys, various biological studies and data management.

All the modules contain specific targets and a major component of the work programmes focused on the estimation of data quality (precision of the data).



During the fish stocks data collection programme, 350,000 fish were measured and 22,000 fish were aged. In 2001, research surveys (groundfish, acoustic and egg & larval) were conducted in the Irish Sea, Celtic Sea and off the west of Ireland. A total of 16 research surveys (264 sea days) were carried out on the *RV Celtic Voyager* and on commercial charters. 481 sea days were spent on research and commercial vessels. In addition, 119 sea days were spent on 8 foreign research vessels operating in Irish waters. Fisheries Assessment Technicians (FAT's) completed 118 sea days on discard trips on commercial vessels.

Staff presented Irish data and participated at the International Council for the Exploration of the Seas (ICES) stock assessment Working Groups on Herring, Mackerel, Horse Mackerel, Blue Whiting, Northern Shelf, Southern Shelf, Nephrops, Deep Water Fisheries, Discards and Bottom Trawl Surveys.



There are serious concerns about the exploitation of haddock at Rockall. The Institute participated at a special ICES meeting to examine catches of haddock in 'non-ICES' international waters at Rockall.

Work continued on various inshore fisheries projects involving whelk, razor clams, brown crab and sea bass. Staff worked closely with the BIM Inshore facilitators and with the ministerial Inshore Fisheries Group.

RESEARCH PROJECTS

Six EU funded research projects were undertaken in 2001. The objective of these projects was to deepen scientific knowledge and improve scientific advice.

SAMFISH (January 2000 - March 2002)

This project focuses on the co-ordination of sampling in western EU waters with 8 partners from Ireland, UK, France, Spain and Portugal. The work concentrated on improved data collection, assessment of non-TAC species (lemon sole), precision of data, data base development and enhanced communication with Industry.

IPOSTS (April 1999 - March 2001)

This project on survey standardisation involves France, Ireland and the UK. Results of comparative fishing trawls between *RV Celtic Voyager*, *RV Thalassa* (France), and *RV Scotia* (Scotland) were analysed and submitted in the final report in November 2001.

Irish Sea Egg Production (March 1999 - February 2001)

Ireland and the UK carried out a new egg based assessment method for Irish Sea cod and plaice. The results in the final report revealed a higher biomass estimate than the traditional assessment methods.

marine fisheries services

DELASS (January 2000- December 2002)

Twelve partners from Ireland, UK, Holland, Denmark, Germany, France, Spain and Portugal collected new data that will facilitate the assessment of shark species in EU and north Atlantic waters. This year Irish work has focused on blue shark and ray species.

Biology of Monk and Megrin (January 1999 - March 2001)

This EU funded project involving Ireland and the UK focused on the biology of monk and megrim stocks in the waters to the west of Scotland. Ireland conducted the research on megrim. The final report was submitted to the EU in May 2001.

International Mackerel Egg Survey (January - August 2001)

This project involved Ireland, UK, Germany, Holland, Denmark, Norway, Spain and Portugal. Twelve surveys were carried out between January and June, from the Bay of Biscay to the West of Scotland, to examine egg abundance and distribution for use in stock assessment. Ireland conducted two of the surveys on the *RV Celtic Voyager* and *MVF Emerald Dawn*.

Herring in Celtic Sea (BIM / NDP Project)

Herring stocks are in a critical state. To assess the situation, a comprehensive survey programme was carried out in Celtic Sea area to examine the abundance and distribution of the herring stock throughout the summer of 2001 when the fishery is closed. The results were used to develop the management advice for 2002.

Collaborative research work also continued on various Institute funded programmes on the Fish Freshness Meter with Dublin City University, on seaweed with NUI, Galway, and whiting, megrim biology with Galway Mayo Institute of Technology.

In ongoing co-operation with NOAA, a special egg and larval survey was carried out off the south coast using specialised equipment (MOCNESS - Multiple Opening and Closing Nets and Environment Sensor System) from the US. A joint MI-NOAA team used the MOCNESS on *RV Celtic Voyager* to examine the vertical distribution of eggs and larvae at two important spawning sites. A PhD Fellowship was set up between NOAA and NUIG in order to process and publish the results.



ADVICE

Staff made vital contributions at the ICES Advisory Committee on Fisheries Management (ACFM) and the EU Scientific Technical Committee for Fisheries (STECF) in relation to the state of EU fish stocks and formulating the management advice used by the EU Commission.

The annual 'Stock Book' was produced in November 2001 (hardcopy and CD version). This gives a comprehensive overview of fisheries management advice for the coming year. It is an essential tool used by DoMNR and industry for TAC negotiations and at other fisheries meetings. The Institute participated with DoMNR and BIM at the EU Council of Fisheries Ministers in December 2001.

Essential advice was provided on the Cod and Hake Recovery Plans at meetings in Brussels between EU, DoMNR and Industry.

An Irish policy on the management of deep-water fisheries was formulated for the Department in close collaboration with BIM.

Participation at various Local Pelagic Management Committee meetings provided real time advice on the status of pelagic stocks. The committee uses the advice to make critical management decisions.



Ken Whelan
DIRECTOR

DIRECTORS STATEMENT

A high standard of scientific output in 2001 supported essential advice to the wild salmonid area, inshore fisheries and the aquaculture industry. In addition to the ongoing assessment, tagging, sea lice monitoring programmes and infrastructure development, staff supported several major scientific and management initiatives.

- The main part of the Newport infrastructure development programme was completed during 2001. This enabled staff to address the analysis of long-term fish and environmental data sets.
- The Institute hosted the 6th International Workshop on Salmonid Smoltification in Westport, which focussed on the compilation and publication of the long-term temperature related data sets on fish migration and survival patterns.
- Conservation limits for wild salmon stocks in the 17 fishery districts were compiled. This work resulted in detailed proposals for a unique system of TAC's and quotas for wild Irish salmon stocks.

salmon management services

- The aquaculture team had a key role in supporting the implementation of the aquaculture protocols in 2001. The co-ordinated management of sea lice levels and fallowing strategies resulted in the lowest ever levels of spring juvenile sea lice on farmed adult salmon.
- Environmental and hydrological models developed for the Burrishoole catchment were used to develop a long-term monitoring strategy for a major industrial development in North Mayo. The full instrumentation of the catchment is now largely complete and it offers a unique experimental site for those interested in the assessment and management of natural and anthropogenic environmental factors within a freshwater catchment.
- Staff produced 19 scientific reports and papers. A number of papers, dealing with sea trout broodstock and enhancement programmes, have been submitted to peer-review journals (see Appendix 4).

Ken Whelan
DIRECTOR - Salmon Management Services

AQUACULTURE SERVICES

CLAMS - Co-ordinated Local Aquaculture Management System

CLAMS - Clew Bay was launched in December 2001. The associated management plan provides a concise description of the area in terms of physical characteristics, history, aquaculture operations and future developmental potential. It provides a sound basis for the sustainable development of aquaculture and a forum to discuss and resolve the many challenges facing local industry as it develops.

The CLAMS process continued successfully in Kilkieran Bay, throughout 2001. The Single Bay Management group Feirmeoirí Bradán Cill Chiaráin Teo, met regularly to synchronise lice management plans. Synchronous treatments were arranged in March and May, which resulted



in the lowest ever spring sea lice infestation levels on adult salmon.

Sea lice Monitoring on Fin Fish Farms

The national sea lice monitoring programme involves 14 annual visits to fish farms around the coast and the sampling of each year class of salmon. The results are collated on a monthly basis and made available to a wide range of interest groups, including industry, the Department of the Marine and Natural Resources, Fisheries Boards and private fishery owners. Throughout 2001 low sea lice levels were generally recorded from all farms, particularly in May, when the abundance of both ovigerous and total mobile lice was lower than any previous year and continued the downward trend since 1998.

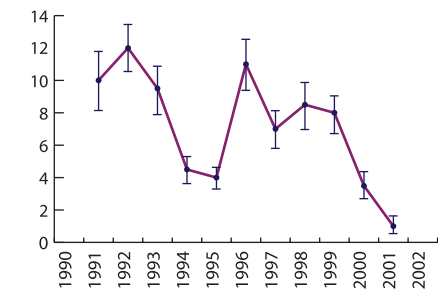


Figure 1 Mean (SE) ovigerous L. salmonis on one sea-winter salmon.

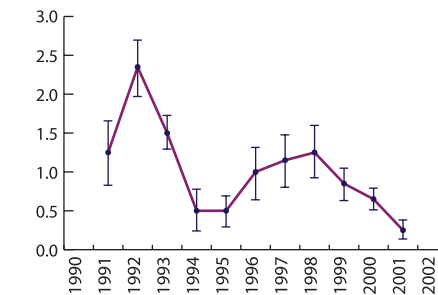


Figure 2 Mean (SE) mobile L. salmonis on one sea-winter salmon.

SALMON RANCHING

Line bred Burrishoole stock is produced in an ongoing core ranching programme, in association with the Institute's national coded wire tagging programme. Information on marine survival and exploitation is used by the International Council for the Exploration of the Sea (ICES) and the North Atlantic Salmon Conservation Organisation (NASCO).

A research project was initiated in 2001 to address concerns that sea lice infestations on wild salmon may be a source of mortality in the first few weeks at sea. Experimental groups were differentially microtagged at the Institute's rearing facility and Delphi hatchery and treated with SLICE, an anti-lice agent. The return rates of grilse in 2002 will provide valuable data on the effects of sea lice infestations on migrating wild salmon smolts.

The joint programme with NUI, Galway: Enhancing Multi Sea Winter salmon (MSW) return phenotypes in Atlantic salmon: a test of hypothesis regarding a threshold effect, continued in 2001. Using MSW and grilse adults from line bred Shannon stocks, a series of crosses were produced and released as five microtag groups in 2001. Further crosses were produced in 2001.

Salmonid Production

Salmonid production comprised over 600,000 salmon ova, 140,000 reared and ranched smolts and 9,000 rainbow trout. Growth and survival was good throughout the year and supplies of eyed ova continued to the Rhine Rehabilitation Programme in Germany. The sale of 1.3million ova from Burrishoole, Corrib, Delphi and Shannon stocks was co-ordinated.

salmon management services

EXPERIMENTAL RESEARCH SERVICES

Burrishoole Trap Census

Fundamental to the Newport Research Facility are the two traps, which monitor the movement of all salmonids and eels, both adult and juvenile, upstream and downstream. Data from the facility are used extensively, nationally and internationally (ICES, EIFAC [European Inland Fisheries Advisory Commission], NASCO). Fish trapping continued in 2001 and provisional upstream and downstream counts are given in Appendix 5.

Salmon

The return rate of wild grilse to Burrishoole decreased from 8.1% in 2000 to 6.5% in 2001. The 2001 return rate was the second lowest recorded over the past decade.

The total number of ranched fish returns includes both the Burrishoole ranched strain and experimental groups. Only the Burrishoole ranched strain is used to calculate the reared return rate to Burrishoole and shows a decrease from 2.9% in 2000 to 2% in 2001.

There was an increase, from the previous year, in the number of wild salmon smolts migrating downstream in 2001. The average number of salmon smolts recorded at Burrishoole in the past ten years is 6,167 smolts.

Sea Trout

Returns of sea trout in 2001 were low, indicating the critical status of the stock. The 2001 count (99 sea trout and finnock) was the lowest on record, down from an annual mean of 2500 and 1350 in the 1970s and 1980s respectively. Recruitment of smolts has also dropped to 532, the lowest recorded to date. This figure may be contrasted with an annual mean of over 4000 for the 1970s and 1980s.

Silver Eel

The unique dataset on silver eel downstream migration, including daily counts, gender, size and migration patterns was continued in 2001. A count of 3853 silver eels, migrating downstream in the autumn, was the highest recorded since 1982. There is no evidence of a downward trend in eel stock in the Burrishoole system. In addition to advising nationally on the management and conservation of eel stocks the division was also involved with an EU Concerted Action on glass eel monitoring stations and produced a report on glass eel monitoring in Ireland.

Catchment Studies

The Burrishoole catchment is an ideal base to carry out quantitative environmental studies relating to water quality, habitat, hydrology and overall catchment management techniques. The facilities being developed will offer a unique base for large multidisciplinary research programmes in quantitative environmental management and climate change.

Under the ongoing programme of environmental and habitat studies, based in the Burrishoole catchment and originally supported by the EU LIFE and REFLECT programmes a number of significant advances were made in 2001. These programmes involve collaboration with Trinity College Dublin, the Institute of Freshwater Ecology (UK), Empresa Municipal de Abastecimiento y Saneamiento de Aguas de Sevilla (Spain) and Thames Water plc (UK). Spate system models and automated hydrological sampling techniques, developed at Burrishoole are being used by Enterprise Oil to monitor the potential impacts from a gas terminal located in the North Mayo area.



OTHER RESEARCH PROJECTS

EU SALIMPACT (2001 - 2003)

The aim of the EU SALIMPACT programme is to assess the impact of aquaculture on the immune response genes of natural salmonid populations. In 2001, the Institute's main role was establishing an experimental population of crossbred salmon with differing degrees of MHC (Major Histocompatibility Complex) variability in the Rough River, Burrishoole catchment. This is a major European study involving the collaboration of laboratories from Ireland, Holland, Norway and UK.

Trawling for Salmon Post-Smolts

In collaboration with the Central Fisheries Board an initial survey was conducted to ascertain if salmon post-smolts could be captured at sea. The study is intended to investigate levels of sea lice infestation and requires the capture of smolts, which are in good condition with minimal scale loss. The study will continue in 2002.

Sea Lice Resistance to Chemotherapeutants (2001 - 2004)

The overall objective of this EU funded project is to investigate and monitor the level of resistance in sea lice against chemotherapeutants commonly applied against *L. salmonis* in Norway, Scotland, Ireland and eastern Canada. The Institute's sea lice team provides sea lice samples throughout the three-year period. In 2001, five samples were taken between June and September from three regions in Ireland - the northwest, the west and the southwest. These samples will be used for a range of biochemical analysis. Analysis is ongoing.

salmon management services

SALMODEL (2000 - 2003)

This EU funded Concerted Action is to develop a scientific basis for conservation limits of wild Atlantic Salmon in the North East Atlantic. The first report of this group was completed in 2001. Participation on this group helped to estimate the national TAC and quota estimates.

WILD SALMON SERVICES

National Salmon Commission

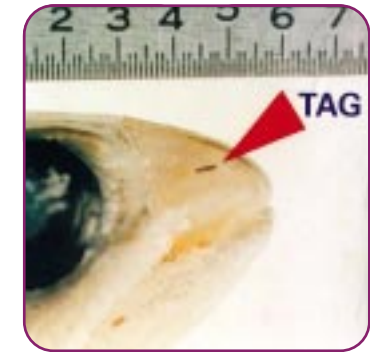
The Marine Institute continued its participation in the Standing Scientific Committee of the National Salmon Commission. In 2001, the SSC estimated conservation limits for each of the 17 fisheries districts and established the scientific basis for a Total Allowable Catch (TAC) and quota system to maintain Ireland's salmon stocks above their conservation limits.

National Microtagging Programme

During the past year, almost 300,000 hatchery-reared salmon smolts and 5,000 wild salmon smolts were tagged with coded microtags. Release locations included the Burrishoole and Bunowen rivers (Co. Mayo) and Cong, Delphi, Casla and Screebe rivers (Co. Galway). These fish will return as grilse in 2001 (the year following release) and as MSW in subsequent years.

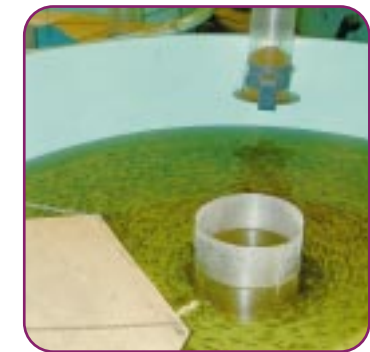


A tag recovery programme is carried out in all of the major salmon landing ports in Ireland, and between 40 to 50 % of the nationally declared catch is examined each season. Some 100,000 salmon were examined for the presence of tags and approximately 6,000 tags were recovered. These tags provided information on the age, growth rate, migration and survival of Irish salmon stocks in 2001.



National Salmon Catch Statistics

In 2001, the implementation of a carcass tag scheme and mandatory reporting of catches in logbooks greatly facilitated the collection of catch statistics. An examination of catch statistics for 2001 suggests that the total salmon catch was approximately 270,000 salmon compared to 230,000 in 2000. This increase is thought to reflect the improved reporting of the catches compared to the older method of examining dealer's registers.



International Fora

Staff made key contributions at NASCO, and chaired ICES North Atlantic Salmon Working Group. Presentations were also made at the ICES Annual Science Conference in Oslo on establishing conservation limits for Irish Salmon Stocks and to the Atlantic Salmon Trust in Aberdeen. The Institute was the national correspondent to EIFAC with regard to eel management.



Yvonne Shields
DIRECTOR

DIRECTORS STATEMENT

This year has seen a major expansion of activities associated with the research vessels and the commencement of many new projects in Technology, Tourism and in the Marine Data Centre. Highlights for the year include:

- Execution of the *RV Celtic Explorer* build-project which at December is firmly on schedule for delivery at the end of 2002.
- Completion of a major planning exercise to identify the resources required for the expansion of Research Vessel Operations with the arrival of the new ship.
- Publication of a National Development Strategy for Marine Leisure Infrastructure.
- Approval from the government's Information Society Fund for significant investment in the development of a suite of e-Services to be delivered over the next three years.

science technology & innovation services

- Launch of the M2 Data Buoy on the East Coast coupled with the placing of a contract with an Irish marine technology company for the delivery of an innovative new data acquisition system for future buoys.
- On-going collaboration with the Geological Survey of Ireland in the National Seabed Survey.
- Signing a Memorandum of Understanding between the Marine Institute and the Canadian Centre for Marine Communications to facilitate co-operation and partnership in the technology sector.
- Delivery of Marinotech, a business development programme attended by more than 40 participants in Galway, Limerick, Tralee and Letterkenny to explore the business opportunities presented by emerging new technologies, such as wind and wave energy, IT communications, aquaculture and pharmaceuticals.

Yvonne Shields

DIRECTOR - Science, Technology and Innovation Services

RV OPERATIONS

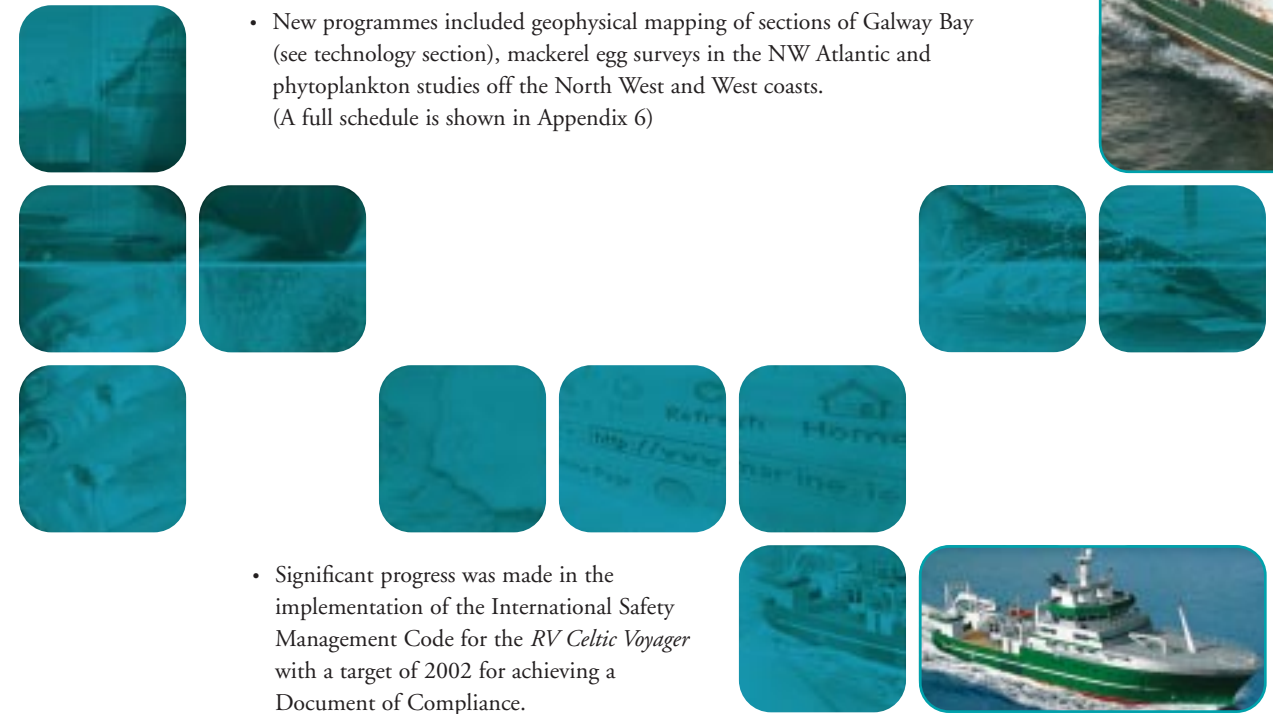
There was a major expansion of activity this year with a busy operational programme for the *RV Celtic Voyager* and the commencement of the build project for the new national research vessel, *RV Celtic Explorer*.

MTDS a joint venture with Marine Technology Ltd continued to provide vessel management, crewing and technical support services for the *RV Celtic Voyager*.

RV Celtic Voyager

2001 was a successful operational year with 23 separate scientific research programmes carried out during 252 days at sea. Key highlights included:

- New programmes included geophysical mapping of sections of Galway Bay (see technology section), mackerel egg surveys in the NW Atlantic and phytoplankton studies off the North West and West coasts. (A full schedule is shown in Appendix 6)



- Significant progress was made in the implementation of the International Safety Management Code for the *RV Celtic Voyager* with a target of 2002 for achieving a Document of Compliance.
- A new Data Acquisition System and Ship-Shore Survey Data Management System for the *RV Celtic Voyager* was designed and developed by the Data Centre for installation in 2002. In parallel with this activity an upgrade of the ships IT systems was completed in late November. The calibration status of all scientific equipment was reviewed and a number of instruments were re-calibrated.
- Eight Irish observers took part in scientific research by foreign vessels in Irish waters this year.

RV Celtic Explorer

The build of the new research vessel in Romania made considerable progress during the year.

- Lloyd's Register approved the main construction drawings in March.
- Construction of the hull began in June, with keel-laying taking place on the 6th of July, marking what is traditionally an important milestone in the build of any vessel.
- Testing of the noise critical electric motors took place at the factory in Spain in November. This was successful and will help meet new low noise requirements identified by ICES which will make the ship one of three silent ships in Europe.
- As of December 2001, the build of the vessel is on schedule and within budget.



MARINE TOURISM AND LEISURE PROGRAMME

Planning and strategic development were the key focus of the Marine Tourism Section this year with a number of national and regionally focused projects producing results.

To promote and support the on-going development of the sector, two strategic publications were produced:

- 'A Development Strategy for Marine Leisure Infrastructure' - identifying indicative locations around the coast with potential for the development of boating facilities.
- 'Guidelines for Planning a Marina Development' - illustrating the planning process and highlighting the appropriate steps to be taken in preparing an application for planning permission and a foreshore lease for a coastal marina development.

A demonstration project highlighting development opportunities and outlining a strategy for increasing marine leisure activity throughout Waterford Estuary was produced in partnership with the Port of Waterford, South East Tourism and Waterford & Wexford County Councils. A report 'Options for Marine Leisure Development in Waterford Estuary' was produced.

science technology & innovation services

A major project examining the potential to develop and promote marine eco-tourism at international level was undertaken. This resulted in the following publications:

- 'Planning for Marine Ecotourism in the EU Atlantic Area - Good Practice Guidance'.
- 'Genuinely Sustainable Marine Ecotourism in the EU Atlantic Area - A Blueprint for Responsible Marketing.'

Approximately 14 tourism SME's in West Clare participated in a 6 month pilot project to develop a marine ecotourism brand and product marketing group. A key deliverable was an innovative web site - www.irrus.com. and the publication of a suite of marketing materials. A report on the findings of the pilot project was published 'Marine Ecotourism - A Marketing Initiative in West Clare' (Marine Resource Series No. 21).

The Marine Institute were a sponsor of the European Association of Tourism and Leisure Education 10th Anniversary conference. It incorporated a Marine Tourism focus examining sectoral policy, management and development strategies as well as business opportunities. Marine Ecotourism provided a case study for the Marine Tourism Workshop.

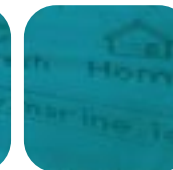
The feasibility of developing an artificial reef in the Beara Peninsula was explored in the publication: 'Artificial Reefs Feasibility Study', (Marine Resource Series No. 20).

A network of 11 key Statutory Agencies, including the Marine Institute, commenced a collaborative study to identify pilot projects for marine leisure development throughout County Galway. A development strategy will be published in the first half of 2002.

MARINE DATA CENTRE

In 2001, the Marine Data Centre undertook a range of new initiatives focused on delivering on the government's e-services strategy for the public sector. An e-services strategy was prepared for the Marine Institute and submitted to the Department of An Taoiseach.

In line with this strategy which promotes the delivery of information and key services over the Web, the Data Centre began to develop a new Marine Institute website. The site will host new features such as a media centre, online data and industry information services and links to the MI Library. The new technology underlying the web site will help ensure the Institute can maintain regular up-dates with relevant information for industry and scientific users.



In September, the Data Centre began to develop a new online ship to shore data management service for the research vessels. This Survey Data Management Service (SDMS) will streamline the management of vessel operational planning from data acquisition, to processing and reporting. It will also monitor before, during and after survey activities in a customer-friendly, automated way. This means a summary of all vessel activities can be posted on the web site automatically when each research programme is completed providing easy access to survey data and reports.



A review of vessel instrumentation, calibration and data management procedures was carried out to upgrade the vessel data management service. From the requirements identified, quality control routines and instrumentation calibration procedures were developed and an inventory was compiled of historic surface underway data since 1995. A new Data Acquisition System (DAS) was installed on the *RV Celtic Voyager* and will replace the existing system in 2002. Links between it and the new SDMS will allow vessel users further access to the surface underway data.

The Marine Institute implements a monitoring programme for the detection of marine biotoxins in shellfish. The online Harmful Algal Bloom monitoring database was developed to cater for the collection and analysis of data from the approved national laboratories involved in the programme.

A joint Irish/US workshop held in Dublin examined work which had been achieved to date and set objectives for the coming year. These included continued data collection to support modelling efforts; calculation of flow fields of physical circulation patterns in Irish waters; objective analysis of CTD data; preparation of scientific reports on modelling and an update of the Inventory Report, 'Oceanographic Data Coverage of the Irish Near Field Study Area'.

Other highlights this year included initial work on the design of a corporate data base, the provision of statistical services for marine fisheries, involvement in the trial seabed survey cruise and substantial upgrades to hardware and software within the Data Centre and on the *RV Celtic Voyager*.

science technology & innovation services

MARINE TECHNOLOGY

To prepare for the Institute's formal participation in the National Seabed Survey in 2002, a mini survey of Galway Bay was undertaken. The survey was conducted in partnership with Canadian Centre for Marine Communications, on the *RV Celtic Voyager*. It involved the collection of multi-beam sonar and magnetic data from some areas in Galway Bay. The main aim was to test new systems and equipment on the vessel to ensure data quality standards could be met.

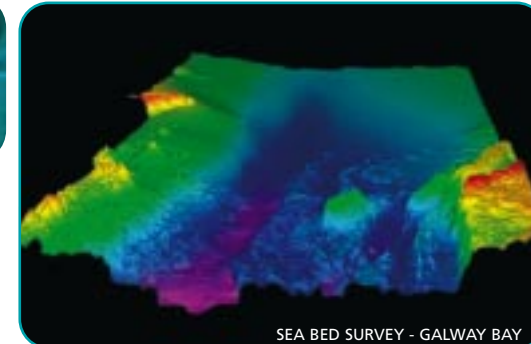
The *RV Celtic Voyager* successfully deployed the second buoy (M2) in the National Marine Data Buoy Network in early 2001. It was deployed 20 nautical miles east of Dublin. A new Data Buoy Website provides hourly observations of local wind, wave and general weather conditions for the two buoys in place in the Irish Sea and West of the Arran Islands.

The Marine Institute acted as a national contact point for a range of private sector, wave energy initiatives in 2001. A close relationship was developed with the Irish Energy Centre and the Institute represented Ireland at the International Energy Agency Conference.

A complete audit of MI oceanographic equipment was completed in 2001 and formal procedures were put in place for the operation of a National Equipment Pool. Equipment is available for short or long term lease through this service.

The Marine Enterprise Investment Programme (MEIP), which provides a single point of contact for a range of state supports available to businesses in the marine sector, had a busy year. More than 130 companies were supported through a variety of services; straightforward advice was given to 43 companies, a business advisory service to 60 companies, assistance with business plans to 26 companies and advice on funding submissions to 8 companies.

Marinetech, a business development course was designed by the MEIP to stimulate innovation and development in companies active in the marine technology sector. The course consisted of five, 2 hour sessions and ran successfully with more than 40 attendees in Galway and Limerick with video conferencing to Letterkenny and Tralee.



COMMUNICATIONS

The Institute used events, publications, the website and media to profile a wide variety of Marine Institute activities and achievements throughout the year. More than 650 general information requests were serviced through our information request system. An internal newsletter was set up on line to maximise internal communications.

See appendices 2 and 7 for a list of publications and sponsorships respectively supported by the Communications team.



Prompt Payment of Accounts Act, 1997

(The Accounts are currently being audited by Comptroller and Auditor General and will be available later this year)

general administration

Liaison

The programme of the Marine Institute covers a wide range of activities, which require close liaison and co-operation with many individuals and organisations. These include the Department of the 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 from all concerned.

Health and Safety

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

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 which provide staff with options in relation to meeting their career and personal needs, such as job sharing, study leave and educational programmes.

appendices

APPENDIX 1 - EU FUNDED MARINE RTDI PROJECTS 2001.

Irish marine research organisations were partners in (13) successful co-operative EU projects under the EU 5th Framework Programme (1988-2002). The value to Irish participants is estimated to be €18 million.

Energy, Environment & Sustainable Development Programme.

Advanced Mapping with sonar and video (AMASON)

- National University of Ireland, Galway
- Marine Informatics & Information Software (Dublin)

European Cetacean Photo ID System (EUROPHLUKES)

- National University of Ireland, Cork

Joint European Ocean Drilling Initiative

- Geological Survey of Ireland

European Marine Seismic Metadata & Information Centre

- Geological Survey of Ireland

Concerted Action on Offshore Wind Energy in Europe

- National University of Ireland, Cork

Research & development of an economical biological sensor for detection of marine pollution by hydrocarbons (POLIOSENSOR)

- Stocker Yale Ltd (Ireland)

A novel surfactant from safe and sustainable exploitation of seaweed (SEASURF)

- Irish Seaweed Industry Organisation / National University of Ireland, Galway

Quality of Life and Management of Living Resources Programme

Establishing traceability for cod - determining location of spawning and harvest

- National University of Ireland, Dublin

Impact of aquaculture on the immune response genes of natural salmonid populations: spatial and temporal genetic signatures and potential fitness consequences

- Marine Institute
- National University of Ireland, Cork

A functional gnomonic approach to measuring stress in fish aquaculture

- National University of Ireland, Galway

Economic Assessment of European fisheries

- Economic & Social Research Institute (ESRI)

Costing the impact of demersal fishing on marine ecosystem processes and biodiversity

- Ecological Consultancy Services Ltd (Ireland)

Improving the quality of cultivation of scallop to ensure viable aquaculture production.

- North West Shellfish Ltd (Ireland)

APPENDIX 2 - MARINE INSTITUTE PUBLICATIONS 2001

Special Reports

Options for Marine Leisure Development in Waterford Estuary.
Marine Institute ISBN: 1-902895-17-7

Guidelines for a Marina Development.
Marine Institute ISBN: 1-902895-16-9

A development strategy for Marine Leisure Infrastructure.
Marine Institute ISBN :1-902895-15-0

An Annual Review of Fish Stocks in 2001 with Management Advice for 2002.
Marine Institute

Interreg Series ISSN 1393-9025

5 A Guide to Best Practice in Seascape Assessment.
Hill, M., Briggs, J., Minto, P., Bagnall, D., Foley K., & A. Williams

Irish Fisheries Investigations ISSN 0578 7467

8 The distribution and abundance of cephalopod species caught during demersal trawl surveys west of Ireland and in the Celtic Sea.
Lordan, C ; Warnes, S ; Cross, T. & Gavin Burnell

9 The Magharees spider crab *Maja squinado* fishery in 2000.
Edward Fahy

10 Distribution, population structure, growth in reproduction of the razor clam *Ensis arcuatus* (Jeffries) (Solenaceae) in coastal waters of Western Ireland.
Edward Fahy et al

Marine Resource Series ISSN 1363 4643

15 A Monograph Study of Offshore Fishing and Social Change in Kilmore Quay, Co. Wexford.
Peter Collier

16 An Assessment of the Irish Wave Energy Resource (In prep)
Tony Lewis

17 The occurrence of sea lice (*Lepeophtheirus salmonis* Krøyer) on farmed salmon in Ireland 1995- 2000.
Copley, L, McCarney, P, Jackson, D, Hassett, D, Kennedy, S and Cíara Nulty

18 Phase II: Strain Hybridisation field experiments and genetic fingerprinting of the edible brown seaweed *Alaria esculenta*.
Kraan S, & Micheal D. Guiry

19 Impact assessment of Hand and Mechanical Harvesting of *Ascophyllum nodosum* on Regeneration and Biodiversity.
Lorna Kelly et al

20 Artificial Reefs Feasibility Study.
O'Leary, E, Hubbard, T, and D. O'leary

21 Marine Ecotourism - A marketing initiative in West Clare.
Zena Hooctor

Marine Environment and Health Series ISSN: 1649 0053.

1 Trace metal and chlorinated hydrocarbon concentrations in shellfish from Irish waters, 1997-1999.

McGovern, E.; Rowe, A.; McHugh, B.; Costello, J.; Bloxham, M.; Duffy, C. & E. Nixon

2 The Fate of Oxytetracycline in the Marine Environment of a Salmon Cage Farm.
Coyne, R; Smith. P and C. Moriarty

Brochures

- Irrus Pamphlet -Marine Ecotourism in West Clare
- NDP Brochure
- Tourism and Technology Posters
- Into Deeper Waters - New Fisheries to be harvested with caution
- Some inshore stocks exploited by the Irish Fleet
- Marine Institute monitoring programme for contaminants in Fish and Shellfish
- Marine Institute monitoring programme for veterinary residues and environmental contaminants in farmed fish.

Sea State - Newsletter

No.11 Summer 2001

CD ROMS

- National Coastline Survey
- CD 3 Co. Cork
- CD 4 Co. Kerry
- CD 5 Co. Limerick & Co. Clare
- CD 6 Co. Galway
- CD 7 Co. Mayo

APPENDIX 3 -NDP 2000-2006 MARINE RTDI PROJECTS ADVERTISED IN 2001

ANNEX : Launch of NDP Marine RTDI Programme

On 27th September 2001, the Marine Institute published an open call for proposals under "Supporting Measures" for 11 Desk Studies and 14 Fellowships. Details were published in the press and on the Marine Institute's Marine RTDI Website (www.marine.ie/marinertdi). 49 competitive proposals were received by the deadline of 14th December.

Michael Manahan Marine Research Fellowship (2002)

1 Prestigious Research Fellowship in Marine Science Policy, Marine Socio-Economics or Law of the Sea.

Desk Studies (11)

- 1 Identification and evaluation of appropriate marine S&T Performance Indicators.
- 2 Marine RTDI Foresight Review.
- 3 Disposal and re-utilisation of fish and fish processing waste (including aquaculture wastes).
- 4 A Review of the origins and appropriateness of the current fish stock assessment and management areas for the waters around Ireland.
- 5 The use of recovery plans to rebuild depleted fish stocks - a review.
- 6 Review and evaluation of marine environmental impact indicators and their application in Ireland.
- 7 Feasibility study on the establishment of a large scale inshore resource mapping project.
- 8 Strategic review of the feasibility of seaweed aquaculture.
- 9 Feasibility study on the establishment of a national salmon broodstock programme.
- 10 Scoping study to assess the feasibility, potential use and methodology for establishing a national marine leisure infrastructure database to support planning and development in the sector.
- 11 Development of guidelines for the integration of marine recreational activities in the rejuvenation/regeneration of small harbours and ports.

Post-Doctoral Fellowships (7)

- 1 Modelling and simulation of fish stock dynamics in the waters around Ireland.
- 2 Sea-lice biology and interactions.

- 3 Investigations into the hatchery rearing of Cod (*Gadus morhua*) in Irish conditions.
- 4 Investigations into a reliable supply of scallop (*Pecten maximus*) for the inshore fishery and aquaculture industries.
- 5 Adding value to the seaweed sector (User defined Post-doctoral Fellowship).
- 6 Monitoring and predicting the influence of climate change on the marine flora and fauna of the islands of Great Britain and Ireland using intertidal indicators. (Irish component of UK MarClim Project).
- 7 Marine Biotechnology (User Defined Post-doctoral Fellowship).

Post-Graduate Fellowships (6)

- 1 The biology, dynamics and fisheries for hake (*Merluccius merluccius*) in the waters around Ireland.
- 2 The impact of discarding on the management advice for key Irish fisheries.
- 3 The larval ecology of selected fish species in the waters around Ireland.
- 4 The biology, dynamics and fisheries for blue whiting (*Micromesistius poutassou*) in the waters around Ireland.
- 5 Modelling of Alexandrium bloom dynamics in Cork Harbour.
- 6 Shellfish diseases (User defined Fellowship).

APPENDIX 4 - PUBLISHED REPORTS

Many scientists in the Marine Institute have had their papers peer reviewed and published or included in official journals. These are highlighted below. Marine Institute authors are highlighted in Bold

Righton; John, Metcalfe, Julian; **Connolly,Paul**; (2001) Different Behaviour of North Sea and Irish Sea cod. NATURE, Vol 411, May 2001 p 156

Clarke, Maurice; **Connolly, Paul** Bracken, John; (2001). Aspects of the reproduction of the deep water shark *Centroscymnus coelepis* and *Centrophorus squamosus* from west of Ireland and Scotland. Jou. Mar. Biol. Ass. UK; 81, 1019-1029.

Officer, Rickard; Dixon, Cameron, Gorfine, Harry; (2001) Movement and re-aggregation of the Blacklip abalone, *Haliotis rubra* Leach, after fishing. Jou. Shellfish. Res. Vol. 20, No2, 771-779

Officer, Rickard; Haddon, Malcolm; Gorfine, Harry; (2001) Distance based abundance estimation for abalone. Jou. Shellfish. Res. Vol. 20, No2, 781-786

Borges, Lisa; (2001) A new maximum length for the snipefish *Macroramphosus scolopax*. *Cybiurn*, 25(2): 193-194.

Anon. 2001. Annual Report 2000. Annual Statistics Report of the Burrishoole Research Facility No. 46: 41pp.

Byrne, C.J., Holland, C.V., Poole, R & Kennedy, C. R. (in press). Comparison of the macroparasite communities of wild and stocked brown trout (*Salmo trutta L.*) in the west of Ireland. *Parasitology* (in press).

Byrne, C.J., Poole, W.R., Dillane, M.G. & Whelan, K. (in press). The Irish sea trout enhancement programme: an assessment of the parr stocking programme into the Burrishoole catchment. *fisheries Management & Ecology* (in press).

Jennings, E., Allott, N., McGinnity, P., Poole, R., Quirke, W., Twomey, H. & George, G. (2000). The north Atlantic oscillation: effects on freshwater systems in Ireland. *Biology & the Environment* 100B (3); 149-157.

O' Maoiléidigh N., McLaughlin D., Cullen A., McDermott T. & Bond N. (2001). Carcass tags and logbooks for managing Irish salmon stocks. In *Catchment Management - Proceedings of the 31st Annual Study Course of The Institute of Fisheries of Fisheries Management* (ed. C. Moriarty), Trinity College, Dublin.

O' Maoiléidigh N., Potter E.C.E., McGinnity P., Whelan K.F., Cullen A., McLaughlin D. & McDermott T. (2001). Attainment of conservation limits in the Burrishoole River, Co. Mayo, Ireland since 1980 - implications for local management. ICES Theme Session on Setting Conservation Limits for Salmon. ICES CM 2001/M:08.

O' Maoiléidigh N., Browne J., Cullen A., McDermott T., Bond N. & O' Farrell M. (2001). River Erne coded wire tagging programme - Investigations of smolt passage and marine survival. In *Erne Salmon Management Programme* - (eds. R.G. Mathers and K. Crowley). Northern Regional Fisheries Board, Ballyshannon, Ireland.

O' Maoiléidigh N., Browne J., Cullen A., McDermott T., Bond N. & O' Farrell M. (2001). River Erne coded wire tagging programme - Investigations of smolt passage and marine survival. In *Erne Salmon Management Programme* - (eds. R.G. Mathers and K. Crowley.) Northern Regional Fisheries Board, Ballyshannon, Ireland. (EU INTERREG II, Sub - programme (iv), Agriculture/Fisheries/Forestry).

O' Maoiléidigh N., Bond N. & O' Farrell M. (2001). Tracking the movements of wild and hatchery-reared salmon (*Salmo salar*) in the River Erne. 1991, 1992, 1997 and 1998. In *Erne Salmon Management Programme* - (eds. R.G. Mathers and K. Crowley). Northern Regional Fisheries Board, Ballyshannon, Ireland. (EU INTERREG II, Sub -programme (iv), Agriculture/Fisheries/Forestry).

O' Maoiléidigh N., Potter E.C.E., McGinnity P., Whelan K.F., Cullen A., McLaughlin D. & McDermott T. (2001). The Significance and Interpretation of Net Catch Data. *Proceedings of the Atlantic Salmon Trust Catch Data Workshop, Lowestoft.* (in press).

Poole, W.R. (2001). Monitoring of eel recruitment in the Republic of Ireland. In: *Monitoring of glass eel recruitment* (Ed. W. Dekker). Report of a Working Group, Management of the European Eel: Establishment of a Recruitment Monitoring System, Glass Eel. EU Contract No. 98/076: Vol. 2A: 119-129.

Poole, W.R., Byrne, C.J., Dillane, M.G., Whelan, K. & Gargan, P.G. (in press). The Irish sea trout enhancement programme: a review of the broodstock and ova production programmes. *Fisheries Management & Ecology* (in press).

Poole, W.R., Nolan, D.T., Wevers, T., Cotter, D. & Tully, O. (in press). An ecophysiological comparison of wild and hatchery-raised Atlantic salmon (*Salmo salar L.*) smolts from the Burrishoole System, Western Ireland. *Aquaculture* (in press).

Poole, W.R., O'Maoileidigh, N., Jackson, D., Gargan, P. & Keatinge, M. (2001). Review of sealice monitoring and sea trout/seallice database. Report to the Minister for the Marine & Natural Resources; 24pp.

Wilkins N.P., Cotter D. & O' Maoiléidigh N. (2001) Ocean migration and recaptures of tagged, triploid, mixed-sex and all-female Atlantic salmon (*Salmo salar L.*) released from Rivers in Ireland. *Genetica* SA25: 1-16.

Whelan, K.F., Whelan, B.J. & Rogan, G. (2001). Catch as a predictor of salmon stock in the Burrishoole Fishery, Co. Mayo, Western Ireland. *Proceedings of the Atlantic Salmon Trust Catch Data Workshop, Lowestoft.* (in press).

Whelan, K.F. Burrishoole catchment, in *Catchment Management - Proceedings of the 31st Annual Study Course of The Institute of Fisheries of Fisheries Management* (ed. C. Moriarty), Trinity College, Dublin.

APPENDIX 5 - BURRISHOOLE TRAP CENSUS

Table 1. Upstream census data for the Burrishoole system, 2001.

Species	Salmon Leap Upstream 2001	Mill Race Upstream 2001	Totals Upstream 2001	Totals Upstream 2000
Wild Grilse	283	81	364	555
Wild Spring Salmon	4	10	14	6
Reared Grilse			791	1390
Wild Sea Trout	34	11	45	45
Wild Finnock	24	20	44	66
Wild Brown Trout	41	13	54	63

Table 2. Provisional downstream census data for the Burrishoole system, 2001.

Species	Salmon Leap Downstream 2001	Mill Race Downstream 2001	Totals Downstream 2001	Totals Downstream 2000
Wild Salmon Smolt	4418	1964	6382	5789
Wild Sea Trout Smolt	497	35	532	769
Silver Eel	3283	570	3853	2631

APPENDIX 6 - RV CELTIC VOYAGER SURVEYS 2001

Institute	Scientist / Scientific Group	Location	Description
Marine Institute	STI	Cork Harbour	Gear trials
Marine Institute	MFSD	Celtic Sea	Herring Acoustic Survey
Marine Institute	MEHS	Irish Sea	Annual nutrients monitoring
UCD	Dr. Colman Gallagher	Dublin Bay	Student training
Marine Institute	STI	West Coast	Data buoy deployment
GMIT	Dr. Dave McGrath	Galway Bay	Student training
NUIG	Dr. Martin White	Southwest Shelf	Oceanographic survey and buoy retrieval
NUIC	Dr. Emer Rogan	Cork Harbour	Student training
Marine Institute/NOAA	MFSD	Celtic Sea and Irish Sea	Egg larval survey
Petroleum Affairs Division, DoMNR	Dr. Peter Croker	Dublin Bay	Hydrographic and geophysical survey of the Codling fault zone
TCD	Dr. Jim Wilson	Dublin Bay	Student training
Marine Institute	STI	East Coast	Deployment of East coast data buoy
NUIG	Dr. Robin Raine	Southwest	Algal bloom investigations
UCC	Coastal Resources Centre	Waterford/Wexford Coast	Scallop grounds survey using acoustic technology
Marine Institute	MFSD	Northwest coast	Mackerel Egg survey
NUIG	Dr. Glenn Nolan	West/ North west Shelf	Phytoplankton investigations
Marine Institute	STI	Galway Bay	Hydrographic Survey of Galway Bay
RPII	Dr. Tom Ryan	East Coast	Annual monitoring
Marine Institute	STI	West Coast	Buoy servicing
TCD	Dr. Jim Wilson	Dublin Bay	Student training
Marine Institute	MFSD	Celtic Sea and Irish Sea	Annual groundfish survey
GMIT	Dr. Brian Ottway	Galway Bay	Student training

APPENDIX 7 - CONFERENCE / WORKSHOP SPONSORSHIP

- 11th Irish Environmental Researchers Colloquium (DCU, January 2001).
- Marine Biodiversity in Ireland and Adjacent Waters (Ulster Museum - April 2001)
- Marine Science Society (NUI-Galway)
- 12th International Byozoology Conference (TCD - July 2001)
- ForeSea Initiative: An Operational Nowcasting and Forecasting System for European Seas (Dublin - November 2001)
- European Association of Tourism and Leisure Education 10 th Anniversary Conference
- Rio + 10 Conference, Achievement and Challenge (UCD- September 2001)

glossary of abbreviations

ALAC	Aquaculture Licensing Assessment Committee	MATT	Monitoring and Analysis of the Toxicity of Toxaphene
ASP	Amnesic shellfish Poisoning	MEIP	Marine Enterprise Investment Programme
BIM	Bord Iascaigh Mhara	MEHS	Marine Environment and Health Services
CPUE	Catch per unit effort	MFSD	Marine Fisheries Services Division
DAS	Data Acquisition System	MLVC	Marine License Vetting Committee
DSP	Diarrhetic shellfish poisoning	MHC	Major Histocompatibility Complex
DCU	Dublin City University	MSW	Multi Sea Winter Salmon
EIFAG	European Inland Fisheries Advisory Commission	MTDS	Marine Technical and Development Services
EPA	Environment Protection Agency	NASCO	North Atlantic Salmon Conservation Organisation
ERDF	European Regional Development Fund	NDP	National Development Plan
ERM	Enteric Redmouth Disease	NOAA	National Oceanic and Atmospheric Administration
EU	European Union	NUIC	National University of Ireland, Cork
FAIR	Fisheries and Agriculture Industry Research	NUIG	National University of Ireland, Galway
FAPAS	Food Analysis Performance Assessment Scheme	OIE	Office Internationales des Epizooties
FATS	Fishery Assessment Technicians	OSPAR	Oslo and Paris Convention (1992)
FIEFA	Framework for Improved European Fish Assessment	PCBs	Polychlorinated biphenyl
FSAI	Food safety Authority Ireland	PSP	Paralytic Shellfish Poisoning
FVO	Food and Veterinary Office	QUASIMEME	Quality Assurance of Information for Marine Environmental Monitoring in Europe
GIS	Geographic Information System	R&D	Research and Development
GMDSS	Global Maritime Distress and Safety System	RDS	Royal Dublin Society
GMIT	Galway Mayo Institute of Technology	RPII	Radiological Protection Institute Ireland
GPS	Global Position Fixing System	RTDI	Research, Technology, Development and Innovation
GSI	Geological Survey of Ireland	RV	Research Vessel
HAE	Harmful Algal Event	SBM	Single Bay Management
HR	Human Resources	SMEs	Small to Medium sized Enterprises
ICAMS	Integrated Coastal Analysis and Monitoring System	SDMS	Survey Data Management System
ICES	International Council for the Exploration of the Sea	STI	Science, Technology and Innovation Services
IMDO	Irish Maritime Development Office	UCD	University College Dublin
INTERREG	EU Inter-Regional Co-operation Programme	WFD	Water Framework Directive
MAST	EU Marine Science and Technology Programme		

Financial Statement and Audit Report

*(The Accounts are currently being audited by Comptroller
and Auditor General and will be available later this year)*

