

# Newsletter

May 2010



## DIRECTOR'S INTRODUCTION

Welcome to the fourth edition of our newsletter and – for the first time – we're combining all our activities in one bulletin.

I've now been in post for over a year and this new calendar year has begun with some very good news in that our funding proposal has been unanimously approved by Shetland Islands Council (SIC) for the next three years.

This is fantastic news for the Centre as it signals a longer term financial commitment by SIC and we are now on a level playing field with other colleges and academic institutions, which have similar agreements in place with their funding bodies.

Over the last three years, the Centre has also strategically increased its income from other external sources (steadily reducing the proportion of funding from the local Council) and we aim to continue this trend.

So, with that in mind, here's a flavour of some of the projects we're going to be involved in over the next while.

*David Gray*

Professor David Gray, Director



## TARGETING OPPORTUNITY: NEW DEPARTMENTAL STRUCTURE FOR MARINE SCIENCE

Since arriving in August last year, Dr Martin Robinson has been looking at the human and capital resources available in the Marine Science and Technology department and aligning these with local, regional and national opportunities to support the sustainability and development of local industry.

“Directly supporting local companies is and will remain our mission, but looking outward and identifying how the skills of the department match national priorities is as important, as this will allow us to reach our targets more quickly, efficiently and with greater ‘visibility’ to policy makers within Scotland and beyond.

“If a more national, European or global perspective can be placed on things that are needed by, or will benefit, the local communities and industry, greater levels of support can generally be secured. Industry and local communities can benefit from more timely delivery and value for money by the department being agile and diverse in the way that it operates.

“This will never prevent us from forgetting that Shetland is our focus; merely provide more ways in which we can provide an increasing, measurable return for the investment in us.”

With this in mind, the department has now been divided into four sections that all individually target important industries or disciplines for Shetland, wider Scotland and, in some cases, Europe, but also provide for multidisciplinary teams to pull together quickly in response to the needs of local businesses.

The four sections within the department are:

- Aquaculture Development
- Fisheries Science
- Marine Planning, Policy and Advice
- Marine Environment

Further details on why these sections are important and what they aim to do are now available on the redeveloped web pages at [www.nafc.ac.uk/mst.aspx](http://www.nafc.ac.uk/mst.aspx). The pages have been restructured to introduce the staff in each section, their roles, current projects, facilities and other information that is relevant to the research, training and services provided by the department.



## HEAD OF MARINE SCIENCE AND TECHNOLOGY INVITED TO JOIN JOINT RESEARCH THEME FOR FISHERIES, SCIENTIFIC STEERING GROUP OF MASTS

Dr Martin Robinson, head of Marine Science and Technology, is representing the NAFC Marine Centre as a participant in MASTS or the Marine Alliance for Science & Technology for Scotland.

Here he explains more about the importance of being part of this group. →

### QUESTION TIME...

**Q: Why are you on the steering group?**

**A:** MASTS brings together researchers in marine sciences from across Scotland, and the Centre has been recognised as a significant contributor to fisheries science, both regionally and nationally.

**Q: What is your role?**

**A:** The steering group discusses the best way to advance marine fisheries science in Scotland. The eight-member panel is drawn from seven organisations with a role in research.

**Q: What does MASTS hope to achieve?**

**A:** It provides an academic platform for collaboration, giving value for money to the tax payer and industry from investment in R&D. By combining knowledge and reducing duplication, projects can achieve greater impact over short time periods. Progress in research is important in the context of knowledge driven economies.

*“These investments are being made in nine joint research themes that cover regions from the coasts to the deep oceans and subjects from the effects of global change to fisheries and aquaculture. They also enhance our ability to deliver first class training in marine science to support continuity of excellent research talent in Scotland.” [www.masts.ac.uk](http://www.masts.ac.uk)*

**Q: What do you hope to achieve?**

**A:** My personal reasons for being involved come from first hand experience of the benefits that can be achieved for all stakeholders when true collaboration occurs. Although the Centre is here to support Shetland, it can best achieve this by being ‘outward facing’ to accelerate progress within the region.

## CLIMATE CHANGE RESEARCH PROJECT UNDERWAY AT NAFC

**The NAFC Marine Centre is undertaking a review of marine environmental data from the waters around Shetland to identify any evidence of long-term change in Shetland's marine environment.**

The review is being conducted on behalf of the Shetland Oil Terminal Environmental Advisory Group (SOTEAG), which has been responsible for an environmental monitoring programme to protect the environment around the Sullom Voe Terminal for more than 30 years.

**The principal aims of the work are:**

- To identify and collate relevant data from the SOTEAG environmental monitoring programme
- To identify and collate other relevant long-term marine environmental data from the waters around Shetland
- To analyse and compare these data sets to identify any long-term trends and/or periods of rapid change in Shetland's marine environment, and to compare the trends in different data sets

The work is being co-funded by Shetland Islands Council, the NAFC Marine Centre and SOTEAG/SVA (Sullom Voe Association).

Graduate trainee Nicola Davies was appointed in September 2009 to manage this one-year project. Nicola graduated from the University of Edinburgh with a BSc in Environmental Geoscience last year.

## QUESTION TIME...

**Q: What work have you undertaken since your appointment?**

**A:** I've been collating all available data and researching the effects of climate change on the seas around Shetland. I've just begun statistical analyses of the data.

**Q: What will that involve?**

**A:** I'll be looking at several data sets of the rocky shore, such as barnacles, limpets and algae. In particular, I'll be investigating whether abundances have changed and if this ties in with noticeable changes in the environment.

**Q: You mentioned that this is a 30 year study - does that add value to the project findings?**

**A:** Yes - this is probably one of the best data sets in the world because it has been carried out by the same people in the same area over a lengthy period of time. It means that we may be able to detect long-term changes if they are in fact happening.

**Q: What do you hope to achieve by the end of your one year placement?**

**A:** I hope to present a good general view of the overlying changes that may be occurring and suggest relationships in the data. Of course, my work will be just the tip of the iceberg.

**At the end of the year, a report summarising all results will be produced on a subject that is very topical in today's society.**



## NEW FISH WELFARE TRAINING COURSE ON OFFER

**Our business development manager, Alan Bourhill, has been busy developing a new fish welfare training course for Shetland's and Scotland's finfish production industries. Funding has also been secured from the European Fisheries Fund enabling Shetland Aquaculture member companies to access a total of 70 free places on the course over the next two years.**

The course has been developed for a number of reasons, not least to satisfy the requirement of the RSPCA welfare standards for farmed Atlantic salmon, monitored by Freedom Food, for ensuring personnel involved in the salmon production process are formally trained in key areas such as: recognising signs of poor welfare; investigating and monitoring health and welfare problems; and humane slaughter.

Given that around 65 per cent of all salmon produced in Scotland adheres to RSPCA welfare standards, this was recognised as an important training course to develop and make available to the industry. A well-established link exists between ensuring good welfare, economic production and good end product quality. As such, the focus of the training will be about giving industry operatives a firm understanding of welfare, the underlying physiological and

biological mechanisms that impact on health and quality, as well as identifying practical tools that will enable them to better monitor welfare during the course of their work.

**The two-day intensive training course, delivered by Aquaculture Development section staff, covers subjects such as:**

- Welfare legislation applying to farmed fish in the UK
- Welfare concepts
- Fish health and the stress response
- Disease management and welfare
- Water quality
- Humane slaughter
- Welfare and end product quality
- Measuring and monitoring welfare



Alan Bourhill commented:

"Our fish welfare course is accredited by the RSPCA and, since the first offering in February, we have trained more than 60 personnel from companies both in Shetland and on the mainland. The welfare of farmed fish is an issue that is going to continue to grow in importance, and we aim to explain to candidates the economic benefits that come from focusing on good welfare standards during production and at harvest."





## REVIEW BY HEAD OF SHETLAND SCHOOL OF NAUTICAL STUDIES JAN RIGDEN

**It has been another busy and rewarding year for the staff of Shetland School of Nautical Studies (SSNS) with a number of new initiatives and programmes developed and launched, and staff kept busy with teaching and development work. It is pleasing to me that we are now fully staffed in both Deck and Engineering sections, and we are looking forward to a period of stability in SSNS.**

There was a major change in the cadet programme for the 2009 intake; the planned demise of the Scottish Vocational Qualifications (SVQ) in both maritime and engineering operations in 2010 necessitated the development of a new cadet framework. It is still based around the SQA Higher National Certificate (HNC) and Diploma (HND), but with a new access course to ease the candidates into the higher level study. Feedback from the first group of 24 cadets and teaching staff has all been very positive – read on to find out more about their initial reactions in the case studies overleaf.

The new cadets, CP6, (the sixth year of cadets at SSNS) are now at sea studying their practical work tasks, with the engineers due to return in September for their next phase and the deck cadets in January 2011. We are looking forward to the new intake, CP7, starting in September 2010; places are still available if you haven't applied yet but you need to be quick as we expect them to be filled in the very near future.

We have also been working with Banff & Buchan College and the Maritime and Coastguard Agency (MCA) on a new approach to fishing vessel deck officer certification. This has been in development for a couple of years and is based around several of the HNC units used in the Deck OOW certificates of competence, which will give successful candidates

a Professional Development Award (PDA) in sea fishing, as well as their Certificate of Competence. The units to be used in the PDA are in the final approval stages and it is expected that the new programme will be available next year. The existing examination route to a fishing vessel deck CoC will remain and candidates will be free to choose either route. Conversion from the new route to MN certification will be easy to identify as candidates will just have to complete the HNC units that they haven't already gained as part of their fishing vessel CoC.

On the engineering front, we have recently gained approval for three new National Certificates for shore based engineers: Fabrication and Welding, Mechanical Maintenance, and Electrical Maintenance. We will be delivering these from September 2010 as part of the Modern Apprenticeship programmes and as stand alone full-time National Certificate courses.

SQA recently launched a new 'Skills for Work' Maritime Skills programme, aimed at S3 and S4 pupils. We expect to be offering this to Shetland school pupils from September 2011 and anticipate a healthy demand.

For further information on any of our courses please don't hesitate to call and we will do our best to help.



## NEW AWARD PRESENTED TO NAFC CADET

**A brand new award – sponsored by the Shetland branch of the Nautical Institute, was presented to NAFC Marine Centre deck cadet Daniel Wilson in March. The 'Nautical Institute (Shetland Branch) Prize for Endeavour and Achievement by a First Year Deck Cadet' award acknowledges Daniel's hard work in his first phase of training.**

Presenting the award, chair of the Shetland Branch, Captain George Sutherland, said: "The Nautical Institute exists to promote standards of excellence in the nautical profession. The Shetland Branch already enjoys close links with the NAFC Marine Centre and is keen to encourage the next generation of seafarers."

"I hope that the award of this first Nautical Institute Branch prize will challenge our young mariners to set a steady course towards an exciting and successful future afloat."

Commenting on his win, Daniel added: "I'm delighted to win this award, which gives me the confidence to know that, even though I've just begun my training, I'm heading in the right direction. I'd like to thank my lecturers and classmates for their help and support and, of course, the Nautical Institute for recognising my efforts in this way. As I head off to sea for my next phase of training, I hope I can continue to make such good progress."

Daniel, who is originally from Lerwick, is sponsored by Norbulk Shipping Ltd through Clyde Marine Training.

The Nautical Institute (Shetland Branch) Prize for Endeavour and Achievement by a First Year Deck Cadet will become an annual prize.

# WHOEVER SAID OIL AND WATER DON'T MIX?

The new intake of 24 Merchant Navy officer cadets that started their training at the end of last year embarked on a brand new course of study that has been developed by the Shetland School of Nautical Studies (SSNS) in partnership with several major UK nautical colleges.

It introduces a National Certificate in Maritime Studies into the first college phase to provide a wider foundation on which to build the HNC/HND studies which occur in later years of the programme. The newly designed 'ramped' course is more accessible and attractive to potential recruits.

The National Certificate is common to both the deck and engineer officer routes, which means that all students will be taught by both deck and engineering lecturers on common subjects – a completely new way of working for SSNS staff.

Engineering lecturers Howard Thomson and Jim Thomas explain more about the new course.

"We've made the course more relevant to today's industry so, for example, a greater proportion of classroom-based teaching is more focused on the job and better reflects what cadets will do in a real working environment.

"It gave us a good opportunity to overhaul the course materials and bring the programme up-to-date."

## QUESTION TIME...

**Q: What are the benefits to students?**

**A:** Cadets will be better prepared for going to sea and should be able to appreciate and put the classroom theory into practice.

**Q: How do you feel about teaching the new course?**

**A:** Most new courses take a year or two to get established so it is still early days, but we do feel happier introducing new subjects to students at a lower level.

Previously, some students may have found themselves struggling at the beginning but now we have the opportunity to build students' knowledge and skills at a better pace.

**Q: You're now also teaching deck cadets for the first time.**

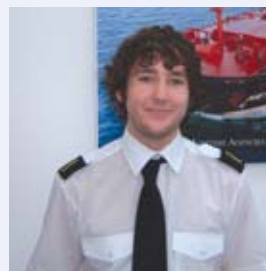
**A:** Yes and it's great! It means we need to think about how to tailor a subject, such as maths, for both audiences. For example, deck cadets will need maths for navigating and for understanding ship loading and balance, whereas our engineer cadets will use maths to get to grips with stresses, strains and fuel consumption.

We also now have even better integration between the two departments – *whoever said that oil and water don't mix?*



**ENGINEER CADET  
ANDREW GRAY**

"The programme looked like a good prospect for the future"



**DECK CADET  
STEVIE MICHAEL**

"I'm really looking forward to putting the things I've learned in the classroom into practice"

**Q: Why did you apply to the cadet training programme?**

**A:** My dad is an engineer on the ferries and that inspired me to consider a similar career. So, I applied to the cadet programme and here I am five months on. The programme looked like a good prospect for the future and centres around something I very much enjoy – working with engines.

**Q: What have you covered in the first five months?**

**A:** I've studied a lot of maths and physics and we've been applying these subjects to real marine situations. We've all appreciated the ramped level of training, which introduces subjects at a better level that we can build on.

**Q: You're off to sea soon?**

**A:** Yes – I'm really looking forward to it. I'm waiting to hear where I'll be based – I'd love to be on an icebreaker in the North or South Pole. There's a lot of technology onboard research ships and so much to learn. Plus I love the cold!

**Q: When do you complete the programme and what will happen next?**

**A:** I'll graduate with an HNC in 2012 but I hope to carry on and gain an HND. Having the higher qualification opens up a lot more doors.

I'll aim to achieve my chief's ticket but ideally I'd like to be a second engineer as this is a more practical based job. I'd also be interested in working on a fishing boat or working out in New Zealand where I have family, but eventually I know I'll always come back home.

**Q: Have you always had an interest in a career at sea?**

**A:** I studied marketing at university and then came home to work as a shipping agent at Sullom Voe. It was there that my interest in a career at sea developed.

I started on the cadet training programme in October 2009 and I'm very happy with the new course. I've learned so much already and know that, when I do go to sea later this year, I'll be armed with a lot of knowledge and will get so much more out of my placement.

**Q: How do you find the classroom teaching?**

**A:** The lecturers are great and so knowledgeable – I didn't expect so many master mariners on the teaching staff. It means that the teaching programme is supplemented with real-life experiences and tips that we can take with us in our future careers.

**Q: Are you looking forward to going to sea?**

**A:** Absolutely – but not just because I'll get to go out into the world and see places I might never otherwise have seen. I'm really looking forward to putting the things I've learned in the classroom into practice.

Being at sea will be the time when all the cadets will confirm to themselves whether they are actually suited to this kind of career – I can't wait!

## MEGRIM STUDY PROGRESSES

Last year we reported that the Centre had secured funding to enable fisheries scientist Paul Macdonald to undertake a three-year research project on megrim.

Here we find out about the progress made on the project from Paul. →



### QUESTION TIME...

**Q:** What have you been involved in since project funding was secured?

**A:** The project has been registered at the University of Aberdeen with Dr Tara Marshall supervising in Aberdeen and Dr Martin Robinson supervising at the Marine Centre, while Dr Chevonne Laurenson is on maternity leave.

I've been analysing historical survey data from the northern North Sea to investigate trends in spatial and temporal distribution and relative abundance. I've also been carrying out histological analysis on reproductive tissue samples taken from Rockall in 2009 to determine maturity stages.

As well as this, I've organised participating in research trips later in the year to gather data for the project.

**Q:** This study is also the subject of your PhD study. Can you elaborate on what you'll be researching and the value of the study to the industry in Shetland?

**A:** The project will include research on: historical trends in distribution and relative abundance in the northern North Sea; reproductive timing in the northern North Sea and spatial and

temporal differences in reproduction on the northern shelf; growth and maturation; megrim behaviour in relation to trawl gear; and discarding in the northern North Sea.

It is anticipated that the results of this study will assist in the effective management of the stock, enabling fishermen to harvest in a sustainable way.

**Q:** At the end of the three-year project, what do you hope to achieve?

**A:** By the end of the project, it is anticipated that there will be an increased understanding of the biology and ecology of megrim in the northern North Sea. The results of the study are intended to provide information to managers in order to assist in the effective management of stock.

**Q:** Will there be room to build on your findings in the future?

**A:** Yes. This research project and the Scottish Industry Science Partnership (SISP) study in 2008 are the first detailed studies to focus specifically on megrim in this area.

However, there is still a great deal that can be done to better understand this species and it is hoped that the results of this study will be able to highlight further knowledge gaps and potential future research opportunities.

**Q:** Why study megrim?

**A:** Megrim has become an increasingly important commercial species in recent years. Local fishing vessels have been reporting increases in abundance and changes in distribution. High grading, the discarding at sea of smaller legal sized individuals in favour of larger more valuable specimens, is widespread. The industry feels that the quota is too low, and that more of the smaller fish that are available could be landed and sold.

ICES advise that the state of the megrim stock is unknown and therefore total allowable catches (TAC) are set under the precautionary principal. As such, the information on population dynamics collected during this project will assist in the effective management of the stock.

## NEW RIB

Scalloway Junior High School pupils were asked to put forward suggestions for naming our new RIB.

The senior management team at the Centre short listed the names suggested and then all staff voted on the winner. The new name, **Langa**, was submitted by Ellie Inkster, age 5, primary 1.





## SHETLAND IS AHEAD OF THE REST OF THE UK IN DEVELOPING MARINE SPATIAL PLANNING

**The Scottish Sustainable Marine Environment Initiative (SSMEI) Shetland project is now entering its fifth year and is carrying out its third public consultation on the Shetland Marine Spatial Plan.**

The Scottish Government requested that the pilot run until the Scottish Marine Bill has been transposed into law, which will see a statutory framework of local marine spatial plans throughout Scotland. Therefore, Shetland is far ahead of the rest of the UK in the development of marine spatial planning.

Acknowledging the importance of marine spatial planning to Shetland and wider Scotland's future, Dr Lorraine Gray is now funded under the core activities of the Marine Planning, Policy and Advice section of Marine Sciences.

### BEYOND 2010

A new full-time project officer will be appointed to support the existing team. This post will be responsible for monitoring the added value of the Plan to the existing management regimes and overseeing projects in socio-economic values and marine renewable resource mapping.

### QUESTION TIME...

**Q: What does the Shetland Marine Spatial Plan do?**

**A:** Not only does the Plan establish a framework for guiding proposed activities, operations and developments, it also provides the opportunity for different views and interests to be accounted for through a balanced plan-development process.

**Q: What is groundbreaking about the Plan?**

**A:** The very fact that it is being used. Implementation began in 2009 and developers are already seeing the benefits.

**Q: What other outputs have come out of the pilot project?**

**A:** In 2009 and 2010, data gaps in biodiversity were addressed by accessing previous marine surveys produced by the fish farming industry. This data was then converted into a universal code (the biotope code) so that the information could be summarised and interpreted more efficiently, which helps scientists to understand the health of the seabed.

The project has also contracted out its own surveys and transferred this data into biotope code, which was then spatially referenced and used to update a seabed habitat map for Shetland.

**Q: The SSMEI pilot has become compliant with the EU INSPIRE Directive in 2010 – what does this mean?**

**A:** Legislation governing data stewardship is evolving at an international level. The fact that the SSMEI pilot in its role in data collation has become compliant with the EU INSPIRE Directive ensures that data about data (metadata) is consistent and archived so it can be easily accessed by other users.

**Q: What did the recent strategic environmental assessment of the Plan achieve?**

**A:** It is a relatively new requirement for plans such as the Marine Spatial Plan to undergo a formal assessment of its environmental effects. During 2009/10, an assessment was undertaken which has ensured that, through policy, any negative environmental effects will be minimised and all positive effects maximised.

## BIOASSAY PROJECT EXAMINES SEA LICE RESISTANCE TO TREATMENTS

The NAFC Marine Centre has secured funding from the European Fisheries Fund to undertake a two-year industry-focused bioassay study to better understand the current pattern of sea lice resistance to chemical treatments in Shetland, and to monitor and analyse its development over time.

Bioassays are a well-established way of detecting reduced sensitivity and resistance at an early stage. The regular sampling and analysis of sea lice from the different hydrographically defined management areas in Shetland to the range of treatment chemicals available to the industry will provide valuable information to company health managers and veterinarians, and enable them to make informed health management decisions.

Business development manager, Alan Bourhill, explains more about its background, methodology and anticipated outcomes: "Resistance can be defined as the selection of a population of sea lice capable of surviving a dose of a control agent that will be lethal to the majority of individuals in a population.

"Industry has a constant race on its hands to produce new chemicals and, all the while, parasites are building resistance. The cycle is less than three weeks for an egg to become a louse and lay more eggs.

"In terms of outcomes, we are hoping to establish what the current resistance levels are, do these levels change over the course of the production cycle, and is there any difference in production areas around Shetland that will have implications for management?"

The first phase of the project will involve the on-site collection of pre-adult sea lice from aquaculture sites in each of the hydrographically defined management areas in Shetland. The sea lice will be transported live to laboratory facilities at the NAFC Marine Centre where bioassays to establish sensitivities to the complete suite of chemotherapeutants available to the industry will be undertaken.

The second phase of the project will involve establishing facilities at the Centre's marine hatchery that will allow the controlled infection of salmon using sea lice cultured from egg strings in an attempt to minimise potential variables and improve the quality and resolution of the bioassays.

In both phases of the project, the results of the bioassays will be analysed and resistance ratios will be determined, allowing the comparison of results from different distinct management areas, as well as any seasonal variation that may exist and/or develop.

Key to this project is the comparison of the results from the bioassay work with those from commercial treatments.

Alan Bourhill concluded: "We are very focused on supporting industry in the decision-making process and hopefully this project will bring together a lot of work that individual companies are already doing; improving the co-ordination and discussion of the most pressing issue facing industry at the moment."

This project will be managed by aquaculture scientist/technician Gregg Arthur with assistance from aquaculture technician/instructor Saro Saravanan.



## SHETLAND HAMEFARIN UPDATE

The Centre will open its doors to visitors and exiles returning home during this year's Hamefarin fortnight (14 to 26 June).

On weekday afternoons, staff will be available to give informal guided tours around the campus where visitors can view activities and meet other staff and students.

Some student work will be on display in the engineering workshops, the bridge simulator will be running to illustrate some of the training exercises it can be used for, and a stop at Shetland Seafood Quality Control will show some of the microscopic creatures identified in the benthic laboratory.

The on-site accommodation at Port Arthur House will also be open, enabling visitors to view the modern facilities, and the tour will include a visit to our library.

Booking is not essential unless you are visiting with a group of more than ten.

Visitors may wish to enjoy a fresh seafood lunch in Da Haaf Restaurant before the tour begins or can round off the day with a hot drink and home bake in our coffee shop. Booking for lunch in the restaurant is essential (01595 880747). Please note that the restaurant will be closed on both Mondays and Tuesdays. The coffee shop will be open Monday to Friday 8.30am to 3.30pm.