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Nordmarine Meeting University of the Arctic

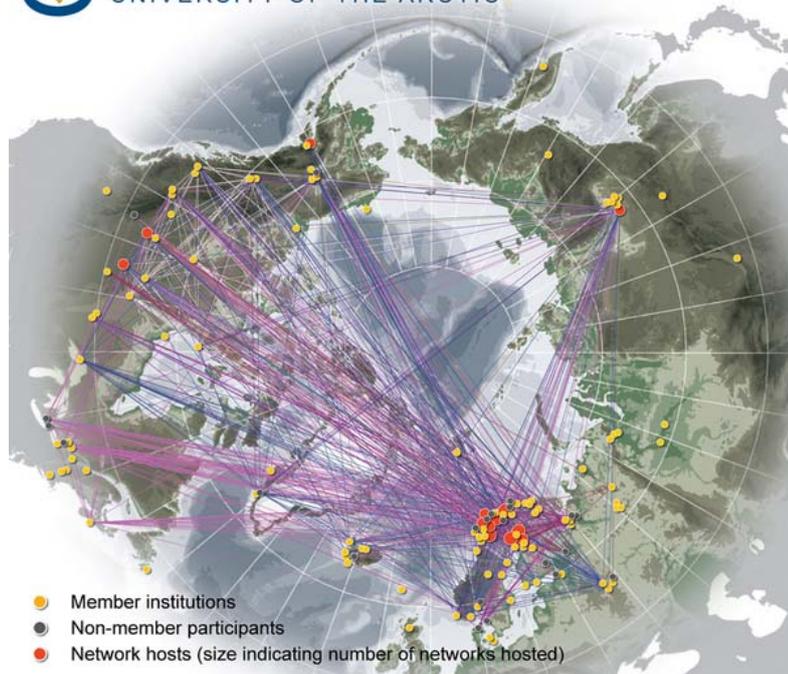
An educational co-operation among universities in the Arctic region and the formation of the thematic network "Northern fisheries"

Tromsø, 15-16 October 2012

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UNIVERSITY OF THE ARCTIC



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The meeting was held under the umbrella organization "The University of the Arctic", where The University of the Faroe Islands is a member together with a number of higher educational institutions in the High North and the Arctic (<http://www.uarctic.org/memberslist.aspx?m=589>). The University of the Arctic was an organization largely unknown for both participants from our University. This particular cooperation under the umbrella of the University of the Arctic was initiated by Hreiðar Thór Valtýsson in the late part of 2011 (see appendix 1), and was organized under the thematic network on Arctic Coastal and Marine Issues (<http://www.uarctic.org/SingleArticle.aspx?m=839&amid=9485>). We became involved when Knud Simonsen was leaving our University in the fall of 2012, and Knud forwarded the information to us.

The main organizers were University of Akureyri, and the meeting was held at the University of Tromsø, with Norwegian College of Fishery Sciences (Norges fiskerihøgskole) as host.

The participants came from 7 universities in the Arctic and Northern region:

- University of Akureyri, Iceland.
- University of the Faroe Islands.
- Turku University of Applied Sciences, Finland.
- University of Nordland, Bodø, Norway.
- University of Tromsø, Norway.
- Memorial University, St. Johns, New Foundland, Canada.
- University of Fairbanks, Alaska.

Thus, the meeting included representatives of institutions ranging from very small to quite large.

The following 17 participants joined the meeting:

1. Hreiðar Thór Valtýsson, associate professor, director of the Fisheries Centre at University of Akureyri.
2. Rannveig Bjørnsdóttir, associate professor, University of Akureyri; director of Matis Food Research, Akureyri.
3. Øgmundur Knútsson, director, School of Business and Science, University of Akureyri.
4. Hjörleifur Einarsson, professor, director, Faculty of Natural Resource Sciences, University of Akureyri.
5. Carey Bonnell, head, Marine Institute School of Fisheries, Memorial University, St. Johns, New Foundland.
6. Eydfinn Magnussen, associate professor, Dept of Science and Technology, University of Faroe Islands.
7. Svein-Ole Mikalsen, professor, Dept of Science and Technology, University of Faroe Islands.
8. Arto Huhta, principal lecturer and education manager, Faculty of Technology, Environment and Business, Turku University of Applied Sciences, Finland.
9. Kjetil Eiane, professor, Faculty of Biosciences and Aquaculture, University of Nordland, Bodø, Norway.
10. Christel Solberg, professor, Faculty of Biosciences and Aquaculture, University of Nordland, Bodø, Norway.
11. Georgina Gibson, research assistant professor, International Arctic Research Center, University of Fairbanks, Alaska.
12. Jan-Erik Angell Killie, associate professor and president, Norwegian College of Fishery Sciences, University of Tromsø.

13. Lars Figenschou, project manager, Norwegian College of Fishery Sciences, University of Tromsø.
14. Jahn Petter Johnsen, associate professor, Norwegian College of Fishery Sciences, University of Tromsø.
15. Maren Iversen, student adviser, Norwegian College of Fishery Sciences, University of Tromsø.
16. Monica Sundset, professor and vice-dean of education, Faculty of Biosciences, Fishery and Business, University of Tromsø.
17. Sigmar Arnarsson, student and secretary of the meeting, Universities of Akureyri and Tromsø.



Participants joining the meeting: Back left: Svein-Ole Mikalsen, Ögmundur Knútsson, Georgina Gibson, Eyðfinn Magnussen and Sigmar Arnarsson. In the middle: Arto Huhta, Rannveig Bjornsdottir, Christel Solberg, Carey Bonnell, Hjörleifur Einarsson, Monica Sundset and Hreidar Thor Valtýsson. Front: Maren Iversen, Lars Figenschou and Jan-Eirik Angell Killie. Kjetil Eiane and Jahn Petter Johnsen are missing on the picture.

The meeting started by giving a brief overview of our institutions, what we are teaching and researching. The experiences of student and staff exchanges were also mentioned, and they varied from random on voluntary basis to formalized agreements, although the numbers of exchanged students were not large in any case. For more details on this part of the meeting, please see the attached official report: "Nordic council of ministers application. Nordmarine Meeting in Tromsø, 15-16. October 2012. NordMarine meeting report"(appendix 2).

Subsequently, the main topics of the meeting centered on future educational cooperation with specific focus on a thematic network on "Northern fisheries":

1. Participation in the thematic network “Northern fisheries” (name not finally settled) under the Portal of the University of the Arctic. There are no specific formalities or no obligations in being a member of the thematic network. The pages can be used for advertising courses and programs held under the collaboration umbrella of the University of the Arctic. Also local courses can be advertised here.

Some of the existing thematic networks within coastal and marine issues are: exploitation of resources, transport, tourism, sustainable fisheries, aquaculture, and indigenous utilization of biological resources. In total, there are already more than 20 thematic networks within the University of the Arctic (<http://www.uarctic.org/SingleArticle.aspx?m=56&amid=68>), but the University of the Faroe Islands is not participating into any of them.

Akureyri and Tromsø held that both University of Murmansk and University of Greenland should be participating in the thematic network of "Northern fisheries", as they both are very important parts in the northern fisheries and both have large ocean areas under their jurisdiction. Especially Tromsø and Bodø have had some collaboration with Murmansk, and thereby they have some contacts there.

2A. The development of common courses within the network, mainly given through Internet and distance learning. A number of aspects were discussed, including common course description with local adaptations (especially with regard to the grading systems). It was suggested that the first course should focus on the main fisheries in each of the participating countries, and the major parameters affecting these fisheries. This could include oceanographical, political, industrial, or even social parameters, although the main focus probably would be the biological and physical parameters. Each country could give a few lectures on the subject, delivered live and interactive through Internet. There should be a common examination, potentially with additional essays, exercises or similar. The examiner should also be common for all the participants in the course to ensure equal judgment. The grading is subsequently transformed to the local grading system by a table worked out in advance. An aim could be to have launched the course during the fall 2013. To be entered into the study programmes of some of the participating institutions, a framework for the course should be worked out before Dec 1 2012. A short course description has been worked out (see appendix 3). The level of the course should at late bachelor/master.

A major problem in this context, is that the different institutions all have different structures on their programs, semesters and courses. This is less of a problem at the Master level, but a considerable problem at Bachelor level.

In later stages, a number of other courses could be worked out, potentially adapting local courses to an internet version. Some of the participating institutions have experiences with the production of online courses. Although the participating institutions use different Learning Management Systems, it seemed like this would not create major problems.

2B. An online Master Programme in Fisheries Resource Management has already been developed by the Fisheries and Marine Institute of Memorial University. However, the structure and size of the programme is different from the average European Master programme, as it scheduled for 1 year of work without a research project. The programme is briefly described in appendices 4 and 5. Still, the programme as such seems to be relevant for the Faroe Islands.

3. A common webportal for northern fisheries was discussed. This portal should focus on the catches in the northern areas with an aim of giving a complete overview of the existing fisheries. This could be a part of research projects studying how fisheries are changing over

time as a consequence of political and industrial decision, or climate change. Examples of existing portals giving partial overviews on local fisheries are www.fisheries.is and www.fisheries.no.

4. Opportunities and threats of the northern fisheries were discussed. First, the establishment of an educational collaboration builds a network and basis for collaborative research possibilities within northern fisheries and surrounding issues.

Otherwise, recruitment was a major issue. In some areas, especially Canada/New Foundland, there is a low recruitment into the fisheries and fish processing industry, and this was reflected in the interest for fishery-related studies. This was also found to some degree in Iceland. Akureyri has made a look into this, and suggested that a major problem is in the lower school system, where the fisheries are largely ignored. Thus, while young people in Iceland in general are well informed about the economical importance of the fisheries, few were interested in going into the fisheries or fishery-related studies.

Another major issue was increased value of the fisheries, for example by creating higher value of the wastes. This could further be combined by environmental protection. For example, crab and shrimp fisheries in Canada create large amount of waste (approaching 50% of catch). At present, most of this is dumped on landfills or in the sea.

5. Future meetings and fundings, etc. Some of the future meetings could be organized in connection with conferences etc. In end of Sept 2013, the World Seafood Congress will be held in St. Johns (www.wsc2013.com), and it was agreed that a meeting could be organized in this connection. However, the organizers also would like to have a meeting during the spring of 2013, as this would enhance interaction between the participants, and thereby also enhance the progression within the thematic network. Formalized collaboration agreements could be made in one to two years time when the collaboration has settled, and there is some experience in the thematic network in developing a common course. Akureyri is writing on a new application to the Nordic Council of Ministries, but other funding sources must be found in the future to finance exchange of students and staff. This also includes the participation in summer courses that some of the universities are organizing within the relevant thematic areas.

Conclusions

Advantages:

The "Northern fisheries" network under the University of the Arctic umbrella is starting up in a way that is not demanding excessive resources. The participation in this network can give access to a large number of courses both at bachelor level and master level, partly through online courses and partly by minimizing the administrative and bureaucratic threshold of exchange of students (or staff).

Disadvantages:

Some time must be devoted both to the administrative planning of the course and making the necessary lectures. Different structures of semesters and sizes and length of courses may give some problems for common courses at bachelor level. At master or PhD level the semester and course structures are less strict, and would probably not pose any significant problems.

Other points:

The forming the trans-polar University of the Arctic seem to have been largely unknown to the employees at NVD, and possibly also in the other departments. At one time or another, the University of the Faroe Islands joined this academic cooperation, but it seems like there

has not been any follow-up since that time. We do not know which intentions or aims that were considered at the time of joining the University of the Arctic, but it seems not to have been any follow-up. If this collaboration (and other collaborations) should be activities kept alive at the institutional level, some kind of measures must be taken. Our staff must be informed on the general purpose of the collaboration, and preferably each department should in particular be informed about activities that could be of interest for their work. Some of the institutions appear to have gone through some of the same type of changes as our University, including the fusion of other institutions into the University. There could be possibilities of learning from their experience how to make nursing and teacher education more research-based, including the increase of research competence in these institutions.

Questions to the leadership of the University:

1. What is the opinion of the University of the Faroe Islands on such co-operation in the Arctic region? Should we try to cooperate on a broad basis with institutions in many countries (like the University of the Arctic), should we focus on specific cooperations (for example with Háskola Islands and University of Copenhagen), or should we try to ride both horses?
2. When we are considering the thematic network "Northern fisheries", should the University join this co-operation? Will resources be allocated to this co-operation? At present, it is mainly time needed for preparation of lectures and the administration of the course (before, during, and after the course), and possibly some money for travel to cooperation meetings if the external fundings become limited.
3. There are different possibilities of cooperation under the umbrella of the University of the Arctic, like participation of students in courses organized by other universities, organization of common courses, including common on-line courses, exchange of staff, etc. Is this interesting for the University, and how can the University support the follow-up in these possibilities?
4. An international cooperation in teaching and courses makes it necessary that the involved employees feel confident in using English. This is not the case today. Does the University have any viewpoints on how to increase the competence in English?

Appendix 1

Letter confirming the participation in "Network to enhance education on marine resources and skills in utilizing them in the Arctic"



The University of Akureyri Research Center
Borgir við Norðurslóð
IS-600 Akureyri
Iceland

Att.: Hreiðar Þór Valtýsson

Torshavn 19.12.2011

Confirmation of participation in the project "Network to enhance education on marine resources and skills in utilizing them in the Arctic"

The Faculty of Science and Technology at the University of the Faroe Islands (FST/UFI) is pleased to participate in the project "Network to enhance education on marine resources and skills in utilizing them in the Arctic" in line with the specifications provided in the application submitted to the *Nordic Council of Minister' Arctic Co-operation Programme 2012-14* on the 19th of Dec., 2011

Contact person at FST/UFI will be:

Knud Simonsen (knuda@setur.fo)
Associate Professor, Oceanography,
Faculty of Science and Technology
University of the Faroe Islands
Nóatún 3.
FO-100 Tórshavn
Faroe Islands

Yours sincerely


Hans Pauli Joensen
Dean


Knud Simonsen
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Appendix 2

The common report from the meeting in Tromsø.

Preliminary report

NordMarine meeting report

Introduction

Goals

Introduction of partners participating

University of the Arctic Thematic Networks on Arctic Coastal and Marine

Issues

Distant education tools and a common course on the internet

Other Possible Outcomes of the Established Collaboration

A common web portal

Communication

Involvement of other universities

Funds available

Meetings:

Are the threats and opportunities in northern fisheries

Summary

Schedule for the meeting

Sunday October 14th

Monday October 15th at AAB (Arctic Biology) "Festsalen"

Tuesday October 16th at AAB (Arctic Biology) "Festsalen"

Wednesday October 17th

Participants

Nordic council of ministers application

Nordmarine

Meeting in Tromsø, 15-16. October 2012

NordMarine meeting report

Introduction

During October 15th and 16th October members from Northern Universities dealing with marine and fisheries related education held a meeting in Tromsø on cooperation on education. The name of the project is "NORDMARINE - Network to enhance education on marine resources and skills in utilizing them in the Arctic". The project was sponsored by the [Nordic Council of Ministers' Arctic Co-operation Programme](#).

The meeting was under the University of Arctic [thematic network on Arctic coastal and marine Issues](#) and was attended by members from [University of Tromsø](#), [University of Nordland](#), [Turku University of Applied Sciences](#), [University of the Faroe Islands](#), [University of Akureyri](#), [Memorial University of Newfoundland](#) and [University of Alaska Fairbanks](#). Thus, the meeting was truly circumpolar. Further work is planned in 2013 and 2014. The funding did only cover the participation of Nordic or Russian members but encouraged trans-Atlantic cooperation. Therefore it was of great value that members from Memorial University and University of Alaska did participate at their own expenses.

Goals

The goals of the meeting are to establish and formulate further collaboration between northern universities with marine related emphasis on education. The main theme of the collaboration will be arctic or northern fisheries. The meeting will discuss those issues and team up for further collaboration and create a network.

Goals

- Establish further collaboration
- Create a network
- Define the fisheries
- Create a webportal
- Create a Memorandum of understanding (MOU)
- Establish a circumpolar fisheries course
- Identify threats and opportunities facing northern fisheries

The meeting took place at the Department of Arctic Biology at the University of Tromsø, Norway from October 15th to 16th. People attending were

- Hreiðar Þór Valtýsson, University of Akureyri, Associate professor, director of the Fisheries Sciences Centre at the University of Akureyri.
- Rannveig Björnsdóttir, University of Akureyri, Associate professor, director of Matís Food Research Akureyri.
- Ögmundur Knúttsson, University of Akureyri, President of the the School of Business and Science.
- Hjörleifur Einarsson, University of Akureyri, Professor, director of the Faculty of Natural Resource Sciences.
- Carey Bonnell, Memorial University, head of the Marine Institute's School of Fisheries
- Georgina Gibson, University of Alaska Faibanks, research assistant professor
- Eyðfinn Magnussen, University of the Faroe Islands, Associate Professor of Biology.

- Svein-Ole Mikalsen, University of the Faroe Islands, Professor in molecular biology
- Arto Huhta, Turku University of Applied Sciences, Principal Lecturer
- Ketil Eiane, University of Nordland, professor in marine biology
- Christel Solberg, University of Nordland, professor in fish biology
- Jan-Eirik Angell Killie, University of Tromsø, president of the Norges fiskerihøgskole
- Figenschou Lars, University of Tromsø, advisor and project manager,
- Maren Iversen, University of Tromsø, administrative of studies
- Jahn Petter Johnsen, University of Tromsø, assistant professor
- Monica Sundset Alterskjær, University of Tromsø, Vice Dean of Education at Faculty of Biosciences
- Sigmar Arnarsson, student and secretary
-

Introduction of partners participating

University of Akureyri, Iceland (Unak)

A general introduction of University of Akureyri (Unak) was made, where marine related teaching and researching was introduced. Their distance learning system from the university was also included in the introduction, along with the methods associated with that. After the general introduction, it was mentioned that there is a high variability in recruiting students in fisheries studies at the university. However in recent years there have been strong year classes.

From the introduction it was mentioned that as the number of students increases they become more active and want to go abroad for further studies. Unak is therefore interested of linking northern universities together for increased opportunity for exchange. An idea rose about creating a circumpolar program for further education for the students.

There are several ways for international cooperation but a vital part in such cooperation is to establish funding. European Union (EU) funds are available, along with Nordic Council of Ministers (NCM) funding. Bilateral agreements can also be made for collaboration.

University of Akureyri wants to establish and develop collaboration and cooperation with Memorial University at Newfoundland, Canada. There are however very limited funds available for Europe-North America cooperation. However, there is North-to north.

There are very few foreign exchange students in fisheries studies at Unak. This is mainly due to a language barrier, for all the classes are taught in Icelandic, with some exceptions. There is an ongoing summer student exchange program with students from Finland, funded by the Nordplus. The trouble with that is the program is only during summer and is only available for students studying at the Nordic countries. The key for introducing more exchange at the university is to introduce courses in English. This is however hard to introduce at an undergrad (Bachelor) level. There is some staff exchange at the university, mostly through collaboration and projects.

From the introduction a discussion arose about funding from the EU. It was noted that it is hard to get EU funding for Iceland and Norway, as neither is a EU members. An EU based university or institution is always needed in addition for collaboration. In our case only Finland is a EU member.

University of Tromsø, Norway

A general introduction of the University of Tromsø was made, where ocean related teaching and researching was introduced. From that introduction a further explanation of the study program was made, where it was noted that the studies were highly praised within Norway. Further discussions about the International Fisheries Management program were made and it

was noted that that program is entirely English taught. It was noted that in that program there might be an opportunity for further development to include arctic and northern fisheries at the program.

The university has experience in receiving exchange students and offer English taught courses, such as those in the International Fisheries Management program. The university sends students abroad as well and one aspect of that is an internship. Students take an internship in a foreign country, in which they get paid for. There is a good experience with this program, for students come motivated back from the internship. This program is also thought to be a good preparation for the students when they enter the work market after their studies.

There is currently no distance learning program at the university but there is an ongoing project for promoting distance learning.

University of the Faroe Islands, Tórshavn, Faroe Islands

General introduction of the University of Faroe Islands was made, they structure and the organization. During the introduction it was mentioned that the University of the Faroe Islands is small and that needs to be taken into consideration. Lack of funding is also an issue. The university's research is mainly organized as projects, based on single a researcher or a small group. The marine related project is usually in some kind of cooperation, both internationally and with local institutions and companies. Teaching at the university takes place in Faroese, but exception of some courses that are taught in English (or in other Nordic languages). Students in the courses taught in English have generally been quite happy about it, since overall the universal language of science is English.

There is no organized international exchange of students at the university. There is only a voluntary exchange where students come by themselves and engage in the student exchange at undergrad (Bachelor) level. There is a problem with housing for the national students, and even more for potential visiting international students, as there is no official system for student housing. At master level, there is a joint master program at the university in marine ecosystem and climate. This joint program is between Bergen, Aarhus, Iceland and Faroe Islands.

It is noted that the language could be a problem for exchange students in an official exchange program or in a collaborative and trans-national course, not only among student, but also among the staff. This could be solved by language training.

After the general introduction some discussions were made. It was mentioned that the foundation of the study at the university is similar to the marine related program in Iceland and Norway. Students could therefore be sent to Iceland and Norway from the Faroe Island. However, it is difficult to receive students due to the lack of student housing, and for laboratory-intensive courses, the minimal size of the laboratory is a problem.

Brain drain is a big problem in the Faroe Islands. The university can only offer a limited number of programmes/studies. Additionally, some of the departments can only enroll students every second year due to limited staff and limited number of class rooms. More females leave than males and most of the relations are with Denmark. From this the question rose if an international distance education program could supplement with enrolment every second year. From such an idea, the distance education courses could be theoretical. But there is always a problem with lab work and to co-organize this with the traditional enrolment. To implement such changes there would need to be detailed planning, and without any guarantee in success, as for several of the programmes, and certainly in biology, many of the courses build on knowledge achieved in the previous courses.

In the Faroe Islands there is a fisheries school (Vestmanna) at high school level which takes about 20 – 25 students per year. Most of the students go straight away into the industry after the education. There are further talks about food related education in the islands that deals with high quality local products and an advanced Faroese kitchen. Those talks are at starting level.

The discussion took a new course from this and it was noted that there was a recruitment problem in some countries towards fisheries related education, such as in Iceland and Canada. There is mentality change going on in Iceland while it is an uphill battle in Canada. The image might be a problem.

University of Nordland, Bodø, Norway

A general introduction of the University of Nordland was made, where ocean related teaching and researching was introduced. The university is a quite young institution, but has around 6000 students. The faculty of bioscience and aquaculture is a quite international faculty with many international professors and other staff members. Some programs are taught in English at the university and it has not been a problem for the local students. Initially the students had some concerns about taking courses in English but those concerns are gone. This was also a concern for the faculty, for it was thought that students would avoid English taught courses, but that was not the case.

The university creates one semester study packages to attract foreign students, which is thought to be a success, for many students tend to extend their stay after one semester. The university receives more students than they send away. Norwegian students at the university are not keen on going abroad to study. This is something that the university would like to change for Norwegian universities to get funding for sending students abroad. There might be a language barrier that exists, especially in non-English speaking countries. Another issue is that there is a big jump from high school to university and that perhaps makes undergrad (Bachelor) students reluctant to go abroad. The trend is however different with graduate (Master) students, for they are more open of studying abroad. The financial side might also be a problem, especially in countries where there are tuition fees. Education is for free in the Nordic countries and increased expenses are a negative factor for students from the Nordic countries. There are some projects to encourage student exchange, like the North to North project. In that project students only pay their local rate for studying, this gives an increased opportunity for exchange.

From this a discussion, matters rose about distance learning and way of teaching. The semesters at the Nordland University follow a normal school year (autumn and spring) and the teaching of the courses is parallel. For some students this might be a problem for exchange studies or distance learning, for they can not leave for a limited time. When issuing a distance learning program, the different types of teaching (block or parallel) can be a problem. The matter of standardization is also a problem for there needs to be a way of valuating program between universities. Every course in the Nordland University is class based and there is no distance learning.

Marine Institute's School of Fisheries, Newfoundland, Canada

A general introduction of the Marine Institute's School of Fisheries was made, where ocean related teaching and researching was introduced. During the introduction, it was mentioned that there is an easy access to the programs at the university, especially at diploma level. The institute offers also programs that are purely online. For example, the Master program of Marine Studies is only taught online. This is considered by the program as a dynamic distant education system. The teaching can be both asynchronous and synchronous which is a very flexible system for the students. The development of online course like they offer takes longer time than with traditional taught courses, but when established it is easy to manage. The

downside of a program like this is that it is hard to replicate class dynamics in an online environment. They are though getting a positive feedback from the students and international students are enrolling into these program and courses. The fee varies from course to course and is the double for international student.

At the institutions there are several international projects. For example they offer staff exchange for 3-4 weeks at a time. At the institution there is also collaboration with China. They offer also student mobility program which is funded by the Canadian government. Most of the students from the institutions go to other southern countries in the exchange. There are around 30 international students at the institution, many from southern countries , such as India. There is an exchange agreement in force at the institution and they are also members of the University of the Arctic (UARctic) and the North to North program.

The Marine Institute will host the biannual World seafood congress in 2013.

University of Alaska, Fairbanks, Alaska, USA

A general introduction of the University of Alaska, Fairbanks (UAF) made, where ocean related teaching and researching was introduced. The UAF covers a large geographical separated area. The university wants to attract their educational opportunities for Alaskans. They notice that youth is not getting involved in fisheries and they want to change that. For example the UAF has established a program connected to fisheries to get more people involved.

UAF uses distant education in their teaching methods, since the area that they cover is quite large. There are good facilities for distant education such as smart classrooms and mobile smart education carts. For online education they have a web based management system but they note that it is hard to teach courses where lab work is integrated in the teaching. From that some discussions were made that UAF could perhaps incorporate the University of Akureyri teaching system, where students come for short time, usually two weeks to do the lab work in extensive teaching period. Regarding the distance education and online education there is a discussion about the IT knowledge of the teachers. This can be a big issue since there can be big differences in the IT knowledge between teachers.

It was noted that student exchange should be relatively easy for students. The UAF is participating in the North to North program and the International Arctic Research Center (IARC) summer school. The IARC program is open for everyone, also international students. The program offer programs for Master and PhD students. Through the IARC program there is also a staff exchange. At the university there is also international collaboration through workshops. There is an collaboration with Japan for there is Japanese funding at the university.

Funding for exchange programs could also be found through the National Science Foundation (NSF), the Office of Naval Research Global (ONR Global) and through the UAF School of Fisheries and Ocean Sciences.

University of Turku, Finland

A general introduction of the University of Turku was made, where fisheries related teaching and researching was introduced. It was mentioned that the university has a good collaboration with the University of Akureyri in terms of student exchange. They are also participating in the Erasmus student exchange program. There is also some collaboration with Russia, China and Vietnam. In general there are not many foreign students in Turku and that might be due to the language. The university offers some distant education but most of the focus is on local students at the university.

University of the Arctic Thematic Networks on Arctic Coastal and Marine Issues

UArctic's Thematic Networks foster issues-based cooperation within networks which are focused but flexible enough to respond quickly to topical Arctic issues. They form a natural framework for development of UArctic education and research providing an optimal structure for increasing the knowledge generation and sharing across the North.

The Thematic Networks on Arctic Coastal and Marine Issues deals with sustainable utilisation and conservation of Arctic coastal and marine environments, including exploitation of resources, transportation and tourism, focusing on sustainable fisheries, aquaculture, and indigenous utilisation of coastal environments.

The ultimate goal is to allowing people who live long distances apart to share information that can have positive effect on their being. Further goal is to enhance the cooperation of quantitative and qualitative cooperation and research on coastal and marine issues in the Arctic. A special focus will be put on value creation from marine environment as important source natural resources. Participants will be encouraged to engage in comparative dialogue so their previous local research can be viewed in regional context from different viewpoint

All the members of the meeting are invited to join the Thematic Network. It is noted that there are no financial obligations of joining and no formalities. The size of the network is its strength.

Plan of action: An invitation letter to the network will be sent out to the participants at the meeting.

Distant education tools and a common course on the internet

A discussion about the distant education tools for cooperation and a common 'Arctic and Northern Fisheries' (ANF) course on the internet were on the agenda of the meeting, and were identified as one of the main goals. It was noted that this meeting was a great opportunity to increase cooperation in distance education for 'Arctic and Northern Fisheries'.

From this a discussion started about a common 'Arctic and Northern Fisheries' course over the internet. This idea initiated after a visiting lecturer from the University of Alaska gave talk about fisheries in Alaska at the University of Akureyri. This was seen as a positive experience. The guest lecturer had extensive knowledge about the fisheries in his area of expertise and that received a positive feedback from those attending the course.

Therefore an idea initiated about a common web based 'Arctic and Northern fisheries' course. The idea is to create an online interactive course with live and recorded lectures. The idea has not been formulated but this meeting was seen as an opportunity to do so.

During the discussions it was mentioned that there is a need to have a strong lead in a project like this. Development of such course will take time; especially when so many universities and institutions are involved. A template about the course needs to be formed at the beginning to set the direction. It was further discussed that this could be established through the UArctic if they have basis for such cooperation. The course could also be an already developed course to gain legitimacy. Another concern is about the size of the course and number of students. The course should not be too big so it becomes impossible to manage and that the content will be watered outwith the help of the Arctic Portal and the Virtual Learning Tools that they have been working on to develop (???). The course should be taught at a Graduate (Master) and upper undergraduate (BSc) level. Each university should though have the final decision in what level the course will be taught in. Further formulation of the course needs to be done such as content and at which level it should be taught at. This has to be made through a

formal academic procedure to ensure that the course should not be too small, too big or too general, as it would then miss its mark. Number of students needs to be limited so it is easier to manage the course. One of the first steps is to create a course description and from there further work can be made. Learning outcomes of the course need to be clear and this should be formulated by the host university. Administration of the course should be in the hands of one university or institution, but the course should be on the course list of each university so that students should be enrolled in the course in their own university.

There will be a challenge to standardize such course, such as exams and evaluations. There are different grading systems in the universities that will participate in the program and that will be a challenge for the evaluation of the course. One question is about standardization of the course, but then the question is how to do so. Number of credits for the course is also an issue along with what kind of standards to use. EU standards could be a solution along with UArctic standards. This needs to be assessed by each university. Evaluation will need to have further discussions and must be done through an academic procedure. Further procedure of developing the course includes creating a Memorandum of Understanding between the participating partners. Participants at the meeting need also to bring this up at their home universities for further discussion.

Further details about the course were also discussed. Most of the universities have distance learning tools and online educational systems. However it was noted that other materials for the course could be used, such as online material and recordings. Interaction of students participating in the course was identified as an important factor of the course and could for example be one of the learning outcomes, learning in an international group. Students should be able to set up groups and interact with each other. Live course could help doing this, but they are not a necessity. There is a huge time difference that could be a challenge. However with strong student interaction a basis for further student exchange could be made and could for example encourage visits between universities. One part of the evaluation process is what kind of tool to use. One idea included to have students write essays on a fishery outside of their home grounds. That would encourage more learning about different systems. Engaging students in the study is important and should be taken into consideration for further formalization of the course. The theme of the course could be "From Ocean to the Market" and the title of the study could be "Arctic and Northern Fisheries" or just "Northern Fisheries".

From the discussion of the group there is a positive feedback for participation in creating a common course. It is also noted that the more will join, the better the course could be. Such course could become popular among students. It is though mentioned at the meeting that we need to do this through formal ways and do not hurry too much. The idea needs to be able to walk before it starts to run.

Other courses that could be used:

There are several existing resources that could be shared among the universities. Existing courses include:

- Course on fisheries law from Marine Institute's School of Fisheries
- Master Course from UIT about Norwegian fisheries management in historical context
 - o Jahn Petter Johnsen will send a description of the course
- Aquaculture course that is taught in at the University of Nordland that is introductory at master level

Further courses that exist could be identified and adjusted to the project.

Conclusion and action

The University of Akureyri will set up an initial plan for the development of the course. This will include a draft about the learning outcomes of the course and a course description. The initial plan will be set up with the University of Akureyri learning outcome system. In addition a one page letter about the course and the project will be made for new potential partners. These documents will be sent out as soon as they are ready and will contribute for further discussion of the development of the course.

Bullets:

- Create online course
- Create a course description
- Create a template for the course
- Form Learning objectives
- Form content
- Taught at graduate and upper undergraduate level (Master and BSc)
- Each university should decide upon the level the course will be taught in
- Strong lead is needed
- Establish through the Arctic Portal
- Not make it too big or too small
- Not make it too general
- Standardize the course
- Go through academic procedures
- One university should administrate
- Create a course description.
- Matter of evaluation process – to have it standardized or not
- Exams could also be a challenge
- Learning outcomes have to be clear – Formulated by host university
- Title – Arctic and Northern Fisheries (or just Northern Fisheries)
- Engage students
- Theme “From Ocean to Market”
- Learn in an international group
- Need to make an MOU for the group
- There needs to be some kind of limitation nr. of students for the study
- What kind of standardization to use
- The course idea need to brought to participants home universities for discussion
- Send out draft course description

Plan of action: Create learning outcomes for the common course, so if universities want to participate they can create the course for the winter 2013/214 schedule.

Other Possible Outcomes of the Established Collaboration

During the discussions, possible outcomes of establishing 'Arctic and Northern Fisheries' course were identified by the group. They include possibilities for further collaboration between the universities, such as summer schools, further student exchange, transfer and sharing. This could for example be done through existing framework of collaboration, such as through the UArctic and existing summer courses that are available. Further collaboration could be done through research between universities and staff exchange. Exchange of knowledge could also be a positive possible outcome and sharing of information.

Possible outcomes:

- Summer courses
- Student exchange, transfer and sharing
- Staff exchange
- Further research collaboration
- Knowledge exchange
- Sharing of information

Plan of action: To be worked on later

A common web portal

A common web portal could be an important tool as a source of material for possible students. There is an existing fisheries portal at the Arctic Portal that could be developed for this purpose. This has to be formalized further and could be done at later stages in the process.

Plan of action: Unak will discuss this with the Arctic portal and plan further work. This will be one of the main subjects of next meeting.

Communication

It was suggested to create a Facebook group for further communication, discussion and collaboration. Other systems can also be used, but it is decided to create a Facebook group. Member area in the proposed web portal could also be a solution. E-mails will also be used for communication and data sharing.

Plan of action: Already created Facebook group Nordmarine - Northern fisheries

Involvement of other universities

A discussion was made of how to involve other universities in the project. It was noted that there are some gap areas that need a representation, such as Russia, Greenland and Sweden. There could be a possible challenges in involving other universities, especially in terms of funding. This is might be an issue for example new USA members.

For Russia it was mentioned that if any collaboration was to be made, it should start with Murmansk State Technical University (MSTU). MSTU is discussing of creating two English taught programs and they could serve as a positive contribution to the collaboration. There is a good collaboration between The University of Tromsø and MSTU. Unak also has an open invitation to MSTU. At the moment there is an exchange program that involves students from MSTU to visit Tromsø and learn about fisheries related matters. Students from Tromsø repay the visit as well. The student exchange supervisors in Tromsø have good connection to the MSTU and can suggest a contact person.

In the case of Greenland, then there might be challenges in including a partner. The country is small and most of marine related matters through the Greenlandic Marine research institute. Contacts through Denmark could also been made on behalf of Greenland, especially universities that deal with Arctic Marine research, such as Syddansk University in Esbjerg and the Fisheries College in Aarhus.

Bullets:

- Include Murmansk State Technical University
 - o Knut Heen and Jens Revold from UIT have contacts
- Find a partner from Greenland
 - o Helle Siegstad from Greenland Institute of Natural Resources could establish contacts
- Use contacts from Denmark if none from Greenland are available
- Establish connection to Sweden

Plan of action: MSTU should be the first on the list of new members and we should actively also look for possibilities of Greenlandic partner

Funds available

Further funding for the project and possible challenges were discussed. As it has been mentioned, there are several ways of funding a project like this. The challenge is that it is sometimes hard to include all the partners in one application. Some funding opportunities encourage circumpolar collaboration and such funds could be used. There is also a case of matching funding, which can sometimes be difficult to do. Possible funds that were identified are:

- The North 2 north project for example
- The Nordic-Atlantic Cooperation Fund (NORA)
- Nordic Council of Ministers Arctic Cooperation Fund (NCM)
- National Science Foundation (NSF)

The local institutions can also try to find some funding through their universities, such as for funding of meetings etc. Another application for funding will be sent to the NCM which is based on the old application.

Action plan: A new application to the Nordic ministers for 2013 will be the responsibility of University of Akureyri (Unak). We also have to look at funds where N. Americans can be involved.

Meetings:

We should have 2 meeting a year and the meetings should be in conjunction with something else, such as workshops or conferences. In 2013 there should be a meeting for the group in Newfoundland Canada in conjunction with the World seafood conference that the Marine Institute's School of Fisheries will host in the autumn of 2013, from 28th of September to 4th of October.

Other possible conferences could be used as back to back meetings, such as the Arctic Frontiers conference in Tromsø, in January 2013. Another possible solution is to incorporate webmeetings. Such meetings are thought as a good way to reduce cost and time.

Action plan: Plan a meeting in Newfoundland in September. All members should identify other meetings, workshops and conferences in 2013 (show this on Facebook) that we could link to our meeting.

Threats and opportunities in northern fisheries

Threats and opportunities facing northern fisheries were discussed along with the role of the northern universities in that context. There are changes occurring in the north and they are already affecting some species in the area. Such changes could have negative effects for shrimp and capelin, and for crustaceans around Newfoundland and Labrador. Positive effects are showing in increased biomass of cod in the Barents Sea and positive signs are in waters off Newfoundland. Aquaculture has a potential in a changing climate. In light of such changes, the question arises about the role of the northern universities in the area. Could perhaps the universities play advisory role through research and collaboration? The role and the collaboration have to be clearly identified and deal with issues facing fisheries. There is a possibility for the group to create a collaborative research project, but a common theme has to be identified. Sharing of people and resources through the network could be a step in this process. Linking of research scientists together through our network could be done in addition. Compiling of data from each of the universities for such projects and keep them in a common database could be on basis of cooperation.

A common theme identified is more related to fisheries and aquaculture, rather than the marine ecosystem. Such a theme could include utilization of new species that could and or are emerging in the area. This could be attributed to the northern shift of species and fisheries. Another issue is to face the image of the fisheries. Some areas have a positive image, while others see the fisheries as negative. Changes in the fishing industry could also be a common theme, where fishing, processing and workforce could be identified circumpolar. Small isolated areas might also be of interest for research, such as fjords or other areas in the vicinity of the participating universities. Students could for example be engaged in this research. Mapping of the industry and the fisheries is also a potential research project and could also be interesting topic for students. Research projects that were identified:

- Arctic and sub arctic fishing
- Small isolated areas for study
- Northern shift of species and possible opportunities
- Climate change and impact on industry
- Climate change and international agreements
- Mapping of northern circumpolar fisheries
- Image of northern fisheries
- Document changes in the industry
- Document changes in the workforce in the fisheries
- Value chain and workforce in Northern fisheries
- Overcapacity of fishermen in Newfoundland

There is a common consensus that there is a good idea to identify those matters that were discussed for future collaboration and research. The focus on the educational part should however be in priority.

Action plan: To be worked on later.

Bullets:

- Common theme that we need to find for further collaboration
- Sharing of people and resources
- Identify a common research topic
- Small specific areas for case studies
- Compile data from each collaborating university

Nordic council of ministers application

Nordmarine

Meeting in Tromsø, 15-16. October 2012

Summary

Summary (for the local media)

During October 15th and 16th October members from Northern Universities dealing with marine and fisheries related education held a meeting in Tromsø on cooperation on education. The name of the project is "NORDMARINE - Network to enhance education on marine resources and skills in utilizing them in the Arctic". The project was sponsored by the [Nordic Council of Ministers' Arctic Co-operation Programme](#).

The meeting was under the University of Arctic [thematic network on Arctic coastal and marine Issues](#) and was attended by members from [University of Tromsø](#), [University of Nordland](#), [Turku University of Applied Sciences](#), [University of the Faroe Islands](#), [University of Akureyri](#), [Memorial University of Newfoundland](#) and [University of Alaska Fairbanks](#). Therefore making the meeting truly circumpolar. Further work is planned in 2013 and 2014.

Icelandic

Arctic Cooperation Programme, sem er undir Norrænu ráðherranefndinni veitti Háskólanum á Akureyri styrk upp á um 5,5 milljónir króna fyrir verkefnið "Nordmarine - Network to enhance education on marine resources and skills in utilizing them in the Arctic". Megintilgangur verkefnisins er að mynda samstafsnet norðlægra háskóla sem eru með sjávarútvegsfræðitengt nám. Fyrsti fundurinn vegna verkefnisins var haldinn í Tromsø, Noregi 15. og 16. október síðastliðinn. Ögmundur Knútsson, Hjörleifur Einarsson, Rannveig Björnsdóttir og Hreiðar Þór Valtýsson, sem jafnframt er verkefnisstjóri, fóru á fundinn fyrir hönd HA. Samstarfsháskólar á þessu verkefni eru [University of Tromsø](#), [University of Nordland](#), [Turku University of Applied Sciences](#), [University of the Faroe Islands](#), [Memorial University of Newfoundland](#) og [University of Alaska Fairbanks](#).

Nordic council of ministers application

Nordmarine

Meeting in Tromsø, 15-16. October 2012

Schedule for the meeting

Sunday October 14th

Arrivals

Monday October 15th at AAB (Arctic Biology) “Festsalen”

9:00 - 12:00 (incl. coffee break)

- Welcome
- Goal of the meeting
- Introduction on teaching and research - One presentation from each university (what are we teaching and researching regarding the ocean)
- Student/staff exchange experience - One presentation from each university
- University of the Arctic Thematic network - Introduction by Hreidar

12:00 - 13:00

- Lunch/Tapas at AAB (delivered from Tromsprodukt)

13:00-15:00 (coffee break in end)

- How can we use the web and distant education tools for cooperation - Introduction Hreidar - discussion
- Common course on the internet, we already have some ideas on a course after we had a visit from Gunnar Knapp from University of Alaska - Introduction Hreidar - discussion

15:00-17:00

- Sightseeing - Facilities at Tromsø University (and havbruksstatjonen?)

20:30

- Common dinner in the town (Arctandria)

Tuesday October 16th at AAB (Arctic Biology) “Festsalen”

9:00 - 12:00 (incl. coffee break)

- Are the threats and opportunities facing northern fisheries and what should be the role of northern universities on distributing information and educate
- Design a web site to disseminate information on northern fisheries through the Arctic Portal and the University of the Arctic
- Are there any other Universities that should be included (University of Iceland for example)

12:00 - 13:00

- Lunch/Fish soup and more at AAB

13:00 - 15:00 (incl. coffee break)

- What funds are available to strengthen this cooperation further? Especially funds that could cover European – North American circumpolar cooperation
- Next meeting and planned project work
- Conclusion - summary

15:00 - 18:00

- Tromsø sightseeing (MSc student Sigmar Arnarsson will take care of that)

Appendix 3

Description on course "Northern fisheries"

Nordic council of ministers project

Nordmarine

International course on fisheries - learning objectives

Northern fisheries

Credits: 10 ECTS

Prerequisites: Fisheries biology, marine biology, oceanography or similar courses.

Level: Postgraduate course but can be an elective for 3rd year BSc

Description: The course offers a detailed overview of fisheries and aquaculture in selected ecosystems in the Arctic ocean and adjacent waters. This includes the Bering Sea, Labrador Sea, Baltic Sea, Bering Sea, Norwegian Sea, White Sea and the waters around Iceland, Faroe Islands and Greenland. The lectures will include overview for selected regions on the local oceanography, main ecological processes, the main species targeted, the fishing fleets involved, historical development of fisheries, aquaculture experience, and on how the resources are managed. The uniqueness of the course is based on the fact that the lectures on the relevant ecosystem will be by local experts, thus an Alaskan will lecture about the Bering Sea, an Icelander about the Icelandic grounds etc.

Teaching method: All the lectures will be through the internet using distant education tools. Emphasis will be on using the internet for project work and to have students work together across national boundaries.

Lectures/ Seminars: Lectures 30 hours, project work with teacher assistance 20 hours.

Learning outcome: Upon completion of this course, the student will be able to:

- Identify the economically most important aquatic organism in the environments under consideration.
- Explain the current stock status and landings of most important species
- Contrast and critically analyse the trends in marine utilization in the region
- Work efficiently in an international group using the internet

Assessment: Written examination on the web, short essays and a group-report on practical assignments

Reading material: TBA but for example www.fisheries.is for Iceland and www.fisheries.no for Norway.

Registration: The course should be available in all participating universities and students enroll in the course in their home university.

Curriculum: TBA

Appendix 4

Mail from Carey Bonnell, head, Marine Institute School of Fisheries,
Memorial University, Newfoundland on Master programme in
'Fisheries Resource Management'

Fra: Carey Bonnell <Carey.Bonnell@mi.mun.ca>
Til: Hreiðar Þór Valtýsson<hreiðar@unak.is>, Rannveig Björnsdóttir<rannveig@mat.is>, "Ketil.Eiane@uin.no" <Ketil.Eiane@uin.no>, "Christel.Solberg@hibo.no" <Christel.Solberg@hibo.no>, "Arto.Huhta@turkuamk.fi" <Arto.Huhta@turkuamk.fi>, "Olli.Loisa@turkuamk.fi" <Olli.Loisa@turkuamk.fi>, Hjørleifur Einarsson<hei@unak.is>, Ögmundur Knútsson<ogmundur@unak.is>, Bjarni Eiríksson<bjarnie@unak.is>, "knuds@setur.fo" <knuds@setur.fo>, "EydfinnM@setur.fo" <EydfinnM@setur.fo>, "SveinOM@setur.fo" <SveinOM@setur.fo>, "lars.figenschou@uit.no" <lars.figenschou@uit.no>, "jan-eirik.killie@uit.no" <jan-eirik.killie@uit.no>, "monica.a.sundset@uit.no" <monica.a.sundset@uit.no>, "jahn.johnsen@uit.no" <jahn.johnsen@uit.no>, "maren.m.iversen@uit.no" <maren.m.iversen@uit.no>, "gagibson@alaska.edu" <gagibson@alaska.edu>
Kopi: "sar011@post.uit.no" <sar011@post.uit.no>
Dato: 21-11-2012 11:39
Emne: RE: SV: Nordic council of ministers application
Vedlegg: Masters Marine StudiesFRM2.pdf

Hello all

Following up on the draft report I wanted to touch base with everyone on a possible proposal related to one of the action items we discussed in Tromso and contained in the report.

One of the key items we discussed as a short-term action item was an interest in developing an on-line 'Northern Fisheries' course at the Masters level. The course would likely involve lectures from each of the partner universities that would focus on the fisheries within each jurisdiction. As discussed this would be delivered at the Masters level.

As mentioned in Norway we offer a Masters program in Fisheries Resource Management (see <http://www.mi.mun.ca/MMS/>) (see attached as well). As of this year the program is now offered 100% on-line. One of the elective courses that we have yet to develop is a Category A elective entitled 'Current Issues For Sustainable Fisheries'. We have not yet assigned anyone to the content development as it is a new course. If interested we would be willing to develop this course in partnership with our northern university partners along the lines of what was discussed in Tromso. This would involve allocating 3-4 lectures per university (depending on # of partners) for the course and the material would be topic specific to the region. We would be willing to take the lead on working with the necessary subject matter experts in each jurisdiction to package the material for web-delivery.

In terms of logistics and administration I believe we could likely manage this arrangement through the University of the Arctic and specifically the 'North to North program'. Given we are all members of the UA this should be workable from a logistics standpoint. We already have a student from the University of Akureyri attending our institute under this arrangement. I have met with our university's representative to the University of the Arctic and he believes this is a very workable arrangement.

If in agreement we could work on content development this winter and spring with first course delivery scheduled for September 2013. This would be quite timely given we are proposing to host a meeting in St. John's next fall.

I have discussed this with Hreiðar and he is supportive as well. There are no doubt other logistics that we would have to discuss and work-out but this should be very manageable.

If supportive we could arrange a conference call/video session over the coming weeks to discuss implementation planning.

I'll be away on a family vacation for the next couple of weeks but could certainly arrange a discussion in early to mid December.

Look forward to your thoughts.

Carey

Carey Bonnell
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Appendix 5

Advertisement for the Master programme in 'Fisheries Resource Management'
from the Marine Institute School of Fisheries, Memorial University

where **you** want to be.

MASTER OF **MARINE STUDIES** (Fisheries Resource Management)

Are you interested in the biological, ecological, oceanographic, political, economic and business aspects of fisheries management?

This innovative program enhances your work or career progression by providing a wealth of knowledge with real world applications. You will develop, through formal education, those skills that are essential to the management of fisheries resources. This multidisciplinary program provides an understanding of relevant concepts in biology, economics and business, as well as fisheries policy and planning. While focused primarily on the North Atlantic, the program also deals with major world fisheries as well as quantitative assessment methods.

Program Structure

This online program has a core plus elective structure, with two options: students may complete either: eight courses plus a major report; or ten courses. It is available on a full or part-time basis. Full-time study will allow you to complete the program in just one academic year. Successful applicants to the program may start in either the fall or winter semester of any academic year.

What You'll Need

Admission to this program is competitive. The basis for admission is typically an undergraduate degree with a minimum of a high second-class standing. International applicants with equivalent credentials will also be considered. In addition to the academic requirements, you would normally have a demonstrated commitment to the fishery.



Contact Us:

Co-ordinator of Advanced Programs
Division of Academic and Student Affairs
Fisheries and Marine Institute of Memorial University of Newfoundland
155 Ridge Road P.O. Box 4920 St. John's, NL Canada A1C 5R3
Tel: (709) 778-0522, Toll Free: 1-800-563-5799 ext. 522 E-mail: cap@mi.mun.ca

program of study.

This program is offered fully online and you may opt to complete either; eight courses plus a major report or; or ten courses.

Major Report Option

- 5 core courses
- 3 elective courses (a minimum of one course from each of Category A and B).
- Major report

Comprehensive Course Route Option

- 5 core courses
- 5 elective courses (a minimum of two courses from Category A and one course from Category B).

Core Courses

MSTM 6001 - Fisheries Ecology
MSTM 6002 - Fisheries Resource Assessment Strategies
MSTM 6003 - Fisheries Economics
MSTM 6004 - Fisheries Policy and Planning
MSTM 6005 - Overview of World Fisheries

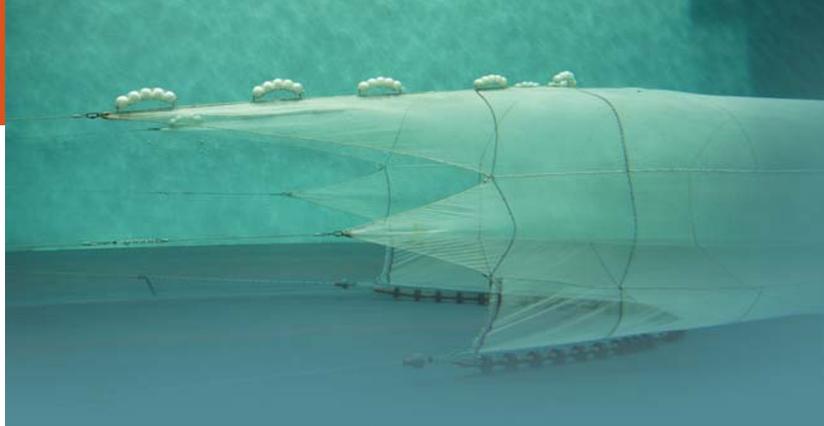
Elective Courses - Category A

MSTM 6006 - Business Management for Fisheries
MSTM 6007 - Fisheries Technology
MSTM 6008 - Social and Philosophical Issues of Fisheries Management
MSTM 6009 - Current Issues for Sustainable Fisheries
MSTM 6010 - Legal Aspects of Fisheries Resource Management

Elective Courses - Category B

MSTM 6022 - Communication and Conflict Resolution in a Technical Environment
MSTM 6023 - Strategic Planning, Policy, Participation and Management in Technical Operations
MSTM 6033 - Quality Systems
MSTM 6034 - Project Management in the Offshore, Health, Fisheries and Engineering Technology Environments
MSTM 6039 - Sustainability and Environmental Responsibility
MSTM 6044 - Marine Environment Law and Pollution Control
MSTM 6056 - Management of International Development
MSTM 6071 - Management of Aquaculture Technology

Major Report



When Can I Begin My Studies?

Applicants should submit their application to Memorial University's School of Graduate Studies by April 30 for fall admission. You can apply online at www.mun.ca/become/graduate/apply/

How much does the program cost?

For Canadian students and permanent residents enrolled in the master's program, the program fee is \$4398. The program fee for international students is \$5718. Additional fees such as student union, dental coverage, drug and health insurance and recreation fees also apply.

When are courses offered?

Each course will normally be offered only once in an academic year, with four courses offered in the fall, four in the winter and two in the spring. Full-time students are encouraged to complete the work required for the report in the summer semester.

How long will it take to complete the master's degree?

The program is available on a full-time or part-time basis. Students registered on a full-time basis will normally complete the program in one academic year.

Where can I get more information on the program?

For more information, please contact our co-ordinator of advanced programs at:

Marine Institute
1-800-563-5799, ext. 522
cap@mi.mun.ca

www.mi.mun.ca/mms
www.mun.ca/become/graduate

