



Northern Periphery and
Arctic Programme

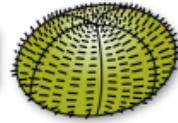
2014–2020



EUROPEAN UNION

Investing in your future
European Regional Development Fund

URCHIN
Utilising the Arctic Urchin Resource



URCHIN project 24 month newsletter

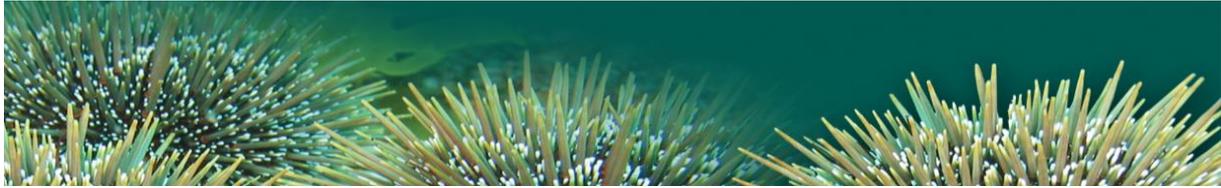
Welcome to the 24 Month URCHIN newsletter describing the project activities between (and including) November 2016 and April 2017. The contents of the newsletter include the activities of the various project partners over the last 6 months and a brief summary of what to expect in the URCHIN project over the final 6-12 months of the project.

We hope you enjoy and as always please do not hesitate to contact the project co-ordinator and/or the project partners in each of the participating NPA countries for further information regarding the URCHIN project (contact details are listed at the end of the newsletter).

Best regards,

Phil James (Nofima)

URCHIN Project Co-ordinator



Project partner activities during the last six months:

Nofima, Norway:

As the Project Coordinator Nofima continued to liaise with NPA Secretariat regarding project reporting and logistics.

Nofima have focused on the completion of two reports and a publication in the Journal of Fisheries over the past 6 months. These reports and paper present the results and findings from trials and research over the previous 6-12 months and can be found and downloaded from the URCHIN website as well as the URCHIN project 'Research Gate' site.

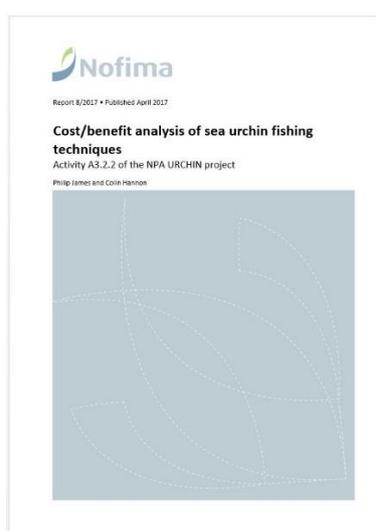
Titles of publications in the past 6 months:

1. Commercial scale sea urchin roe enhancement in Norway: Enhancement, transport and market assessment.
2. Cost/benefit analysis of sea urchin fishing techniques
3. Efficiency of trap type, soak time and bait type and quantities for harvesting the sea urchin *Strongylocentrotus doebachiensis* (Muller) in Norway

1)

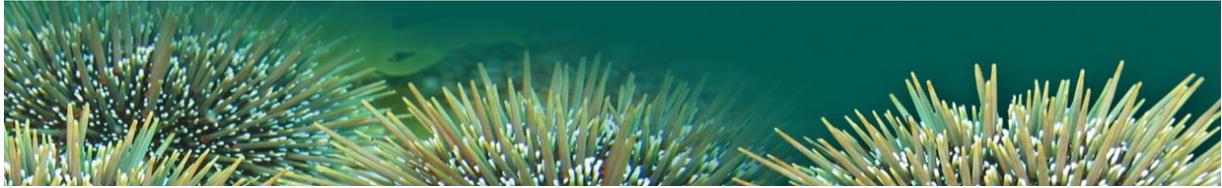


2)



3)





Ireland (Marine & Freshwater Research Centre, Galway Mayo Institute of Technology and SME partners):

During November 2016 Colin from GMIT participated at the 7th strategy forum of the European Union Strategy for the Baltic Sea Region (EUSBSR) in Stockholm (8-9th November) representing the URCHIN project as a workshop panellist for blue growth project clustering session. The event was well attended and it allowed for project discussion and dissemination.



Queuing in the snow in Stockholm for the EUSBSR workshop

In the last six months preparation for the sea urchin roe enhancement trial began in Ireland with the transfer of information and technology from Nofima to GMIT. The Nofima sea urchin feed (supplied by Urchinomics) was received in December and delivered to the SME partners in Co. Cork. The trial is a collaboration between Dunmanus Seafoods, Atlantic Sea Urchins and BIM the Irish Sea Fisheries Board. The set up and logistics of the trials are ongoing and a full trial will commence shortly.

An URCHIN project page was set up in Research Gate and all available completed reports were uploaded. This has already proved to be a useful tool to track research uptake and dissemination.

Monitoring of ranched sea urchins in Co. Sligo and Co. Mayo is ongoing in conjunction with associated partners, however wintery conditions have made it difficult to sample.



Greenland (Royal Greenland):

Royal Greenland have worked in collaboration with Matis to complete the sea urchin market report. This report will describe the world sea urchin markets and will give recommendations on the most suitable markets for sea urchins harvested in the NPA. Royal Greenland undertook a substantial amount of market research and this has been incorporated into this report.

Royal Greenland will host a sea urchin stakeholder seminar in Greenland in June 2017 and preparations for this meeting are underway.



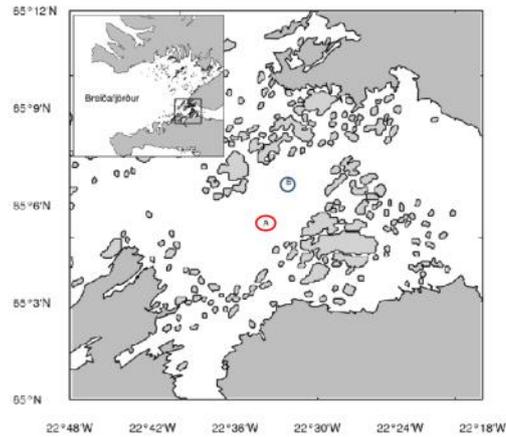
Iceland:

Matis:

During the period, Matis initiated trials to estimate the shelf life of live sea urchin, simulating conditions during production and transport to market. In addition, work to estimate the shelf life of roe and the effects of various treatments on the quality of roe has started. Work continued on collecting information and compiling it into a Market report for sea urchins.

Hafrannsóknastofnunar (Marine Research Institute) and Thorisholmi:

The investigation of roe yield, gametogenesis and spawning of the green sea urchin at two different sites in Breidifjörður west Iceland continued throughout the last six months. Thorisholmi has collected 30 samples each month from September 2016 at two different fishing sites in Breidifjörður (area B at 32 m depth and A 60 m depth). The samples have been sent to MRI in Reykjavik for investigation. The sampling will continue until September 2017.



Location of the two different sampling sites (B and A) in Breidifjörður.

In April 2017 a total of 240 urchins have been collected at each site. For each sample the test diameter for each urchin was measured to the nearest 0.1 mm and the wet weight was estimated to the nearest 0.1 mg. The urchins were then opened, drained and weighed again and the water content in each individual estimated. The gonads were removed and weighed. The GI (gonad index) was calculated using the following formula:

$$\text{GI (\%)} = \frac{\text{Wet weight of gonad (g)}}{\text{Total wet weight of sea urchin (g)}} \times 100$$



Gonads of different colours from the April samples

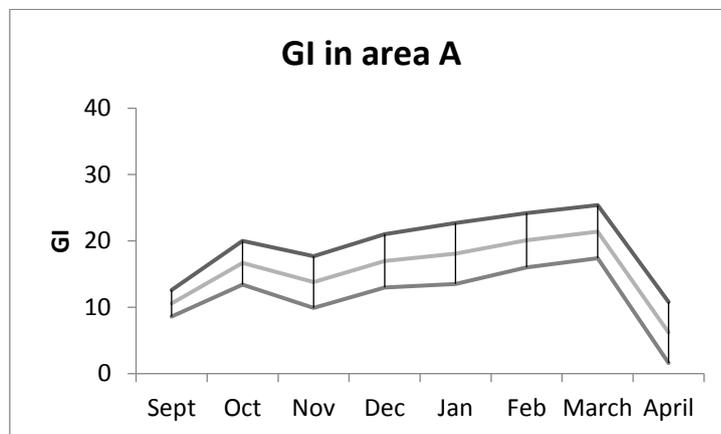
For the histological preparation of the gonads, a sample from a central portion of the gonad from each urchin was preserved in 10% formaldehyde. From this fixed tissue, slices measuring about 5 mm were taken from the midsection for histological preparation. This process was carried out at a Vefjarannsóknastofan. The resulting histology slides are observed and photographed on a Zeiss Axioplan-2 light microscope at 4-10x.

The stained gonad preparations from each urchin will be staged into four different developmental stages: Stage I: post spawning, Stage II: NP growth, Stage III: Development of reproductive cells (gametogenesis) and NP utilisation, Stage IV: Spawning and pre-spawning (end of gametogenesis, NP exhaustion and spawning).

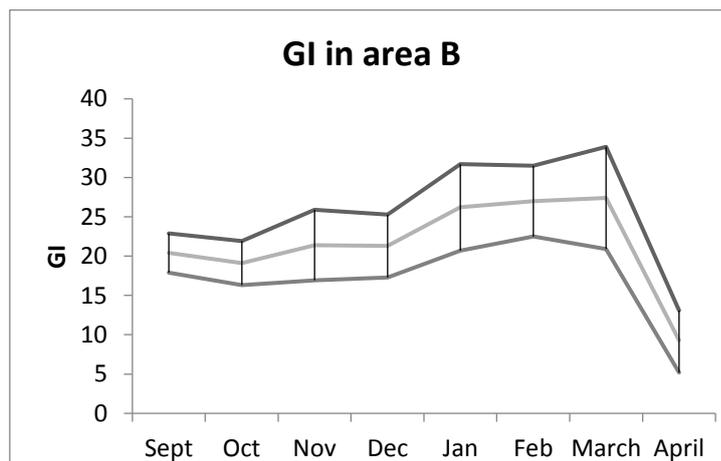
To obtain monthly volume fractions for gonial cells, nutritional phagocytes (NP) and residual and new gametes, the relative proportion of different cell types within the germinal epithelium of each gonad will be evaluated by stereology after over-laying photographs of sections with a grid. Primary oocyte long diameter will be measured where the nucleolus is evident.

The average size (diameter, wet weight), gonad weight, water content of the urchins and gonad index (%) at each sampling site (B and A) from September 2016 to April 2017 have been reported. The mean test diameter from both sampling sites B and A were similar, 60.2 ± 3.3 and 61.6 ± 2.5 mm respectively but there were differences between sites for the amount of water the urchins contained.

The gonad index (calculated from undrained individuals) was relatively high at both sampling sites in September (20.4 and 10.6 respectively). At both sites the GI increased from September until a maximum was reached in March. A drop in the GI in April indicated a spawning event at both sites.



Mean gonad index and standard deviation for sea urchin from area A (60 m) from September 2016 -April 2017.



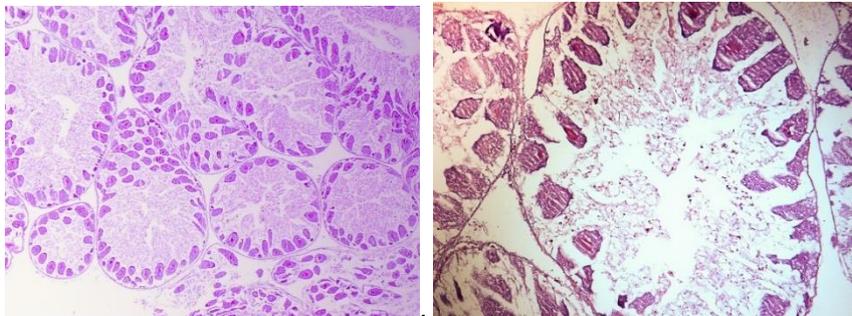
Mean gonad index and standard deviation for sea urchin from area B (32 m) from September 2016 -April 2017.

The colour of the roe varied from both sites from bright yellow, orange to brown. The roe were starting to run (spawning) at both sites in February as can be seen on the figures below.

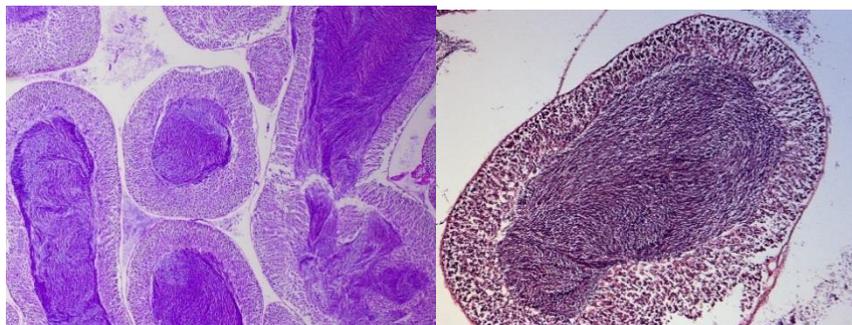


Roe from both investigation sites. On the left, Site B (32m) and to the right, Site A (60m). Sampling was conducted in February 2017.

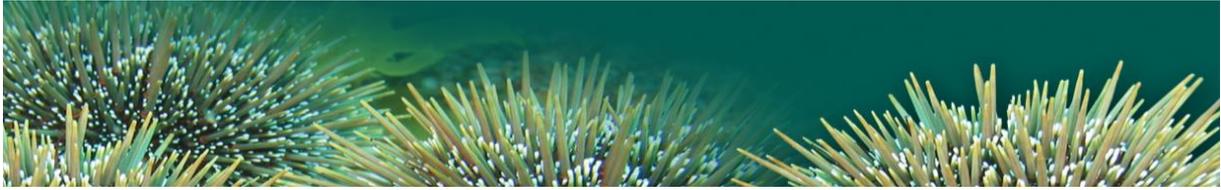
Results from September sampling indicate that the reproductive cells were developing in both sexes (Stage III). In the females the primary oocytes were seen along the achinal wall and the nutritive phgocytes (NP) in the middle. In the males the reproductive cells develop and migrate into the center and the number and size of NP decreases.



Photomicrographs of gamets from a female in September 2016 (4 and 10x).



Photomicrographs of gamets from a male in September 2016 (4 and 10x).



One year to go!

The last six months have primarily been spent consolidating and reporting the research and trials previously completed within the URCHIN project. In addition, preparations for the upcoming trials and research in the summer of 2017 are well underway and we look forward to the next six months and the developments they will bring in the participating NPA countries.

If you have any queries related to the project, please contact one of the following national contact points to discuss possible involvement in the URCHIN project and the sea urchin fishery in the Northern Periphery and Arctic area.

Norway:	Phil James	philip.james@nofima.no
Ireland:	Collin Hannon	colin.hannon@gmit.ie
Iceland:	Guðrún Þórarinsdóttir	gutho@hafro.is
	Guðmundur Stefánsson	gudmundur.stefansson@matis.is
Greenland:	Nikoline Ziemer	nikz@royalgreenland.com

(If you are outside of these NPA countries, please do not hesitate to contact Phil James at Nofima, Norway for further information)

Upcoming URCHIN Project events:

1. Greenland sea urchin workshop/seminar (co-ordinated by Royal Greenland)

Where: Nuuk, Greenland

When: June 22 2017

Theme: **Possibilities, potential and pitfalls for developing an urchin industry in Greenland**

Details will be available on the URCHIN website, or contact Nikoline Ziemer (nikz@royalgreenland.com) or Philip James (philip.james@nofima.no) for further details.



2. Norwegian sea urchin stakeholder seminar (in conjunction with the ECOURCHIN project)

Where: Oslo, Norway

When: October 3rd 2017

Theme: **Possibilities, potential and pitfalls for developing an urchin industry in Greenland**

Contact Philip James (philip.james@nofima.no) for further details if you are interested in attending this meeting (Note visitors from outside Norway are also welcome!).



3. URCHIN project meeting (details to come as soon as they are available)

Where: Norway, Iceland or Ireland

When: Sept/Oct/Nov 2017

Theme: Yet to be decided

Watch out for more details on the URCHIN website, contact Philip James (philip.james@nofima.no) for further details



We would welcome your participation in these events. Please contact the project coordinator if you are interested in attending or, if you would like further information.