Leiðandi
vettvangur í tíu ár

A depth-dependent assessment of annual variability in gonad index, reproductive cycle (gametogenesis), and roe quality of green sea urchin (*Strongylocentrotus droebachiensis*) in Breiðafjörður, Iceland

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Presentation Outline

- Markets and Roe Quality
- Research Aims
- Methods
- Results/Major Findings
- Conclusions
- Questions

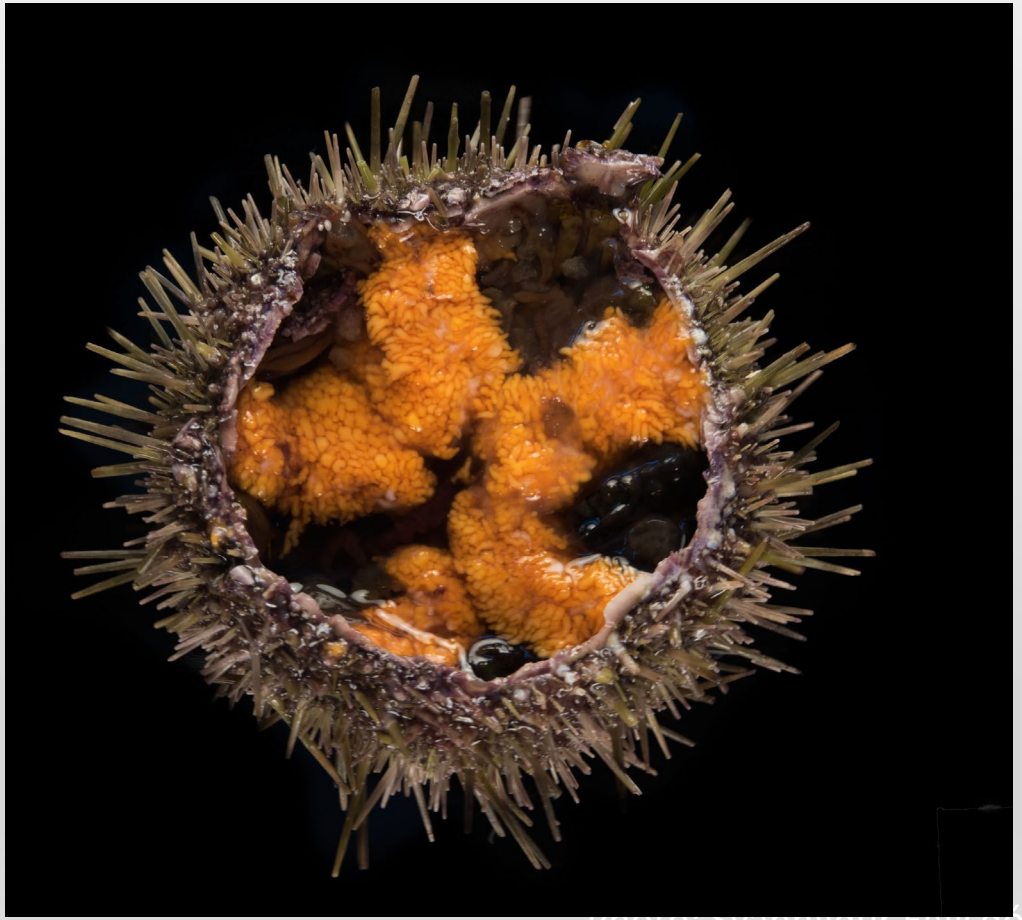


Photo: Svanhildur Egilsdóttir

Markets and Roe Quality

- Small, high value fishery- 1 million € exports in 2017
- Largest markets Japan, China, US, and France
- Iceland exports to US, Asia, and Europe- France largest market
- Quality assessed
  - Gonad Indices (higher the better)
  - Coloration- color preferences vary by markets
  - Uniformity- color and texture*
  - Taste- negligible iodine taste

Class	Colors	Possible Utilization
First	Yellow, Light Yellow, Orange, Light Orange	Live, Chilled
Second	Dark Yellow, Dark Orange	Frozen, Cured/Salted
2nd-3rd	Light Red, Red, Curry Yellow, Curry, Curry Brown	Frozen, Cured/Salted
Unacceptable	Dark Red, Light Brown, Brown, Dark Brown, Curry Grey	Discarded

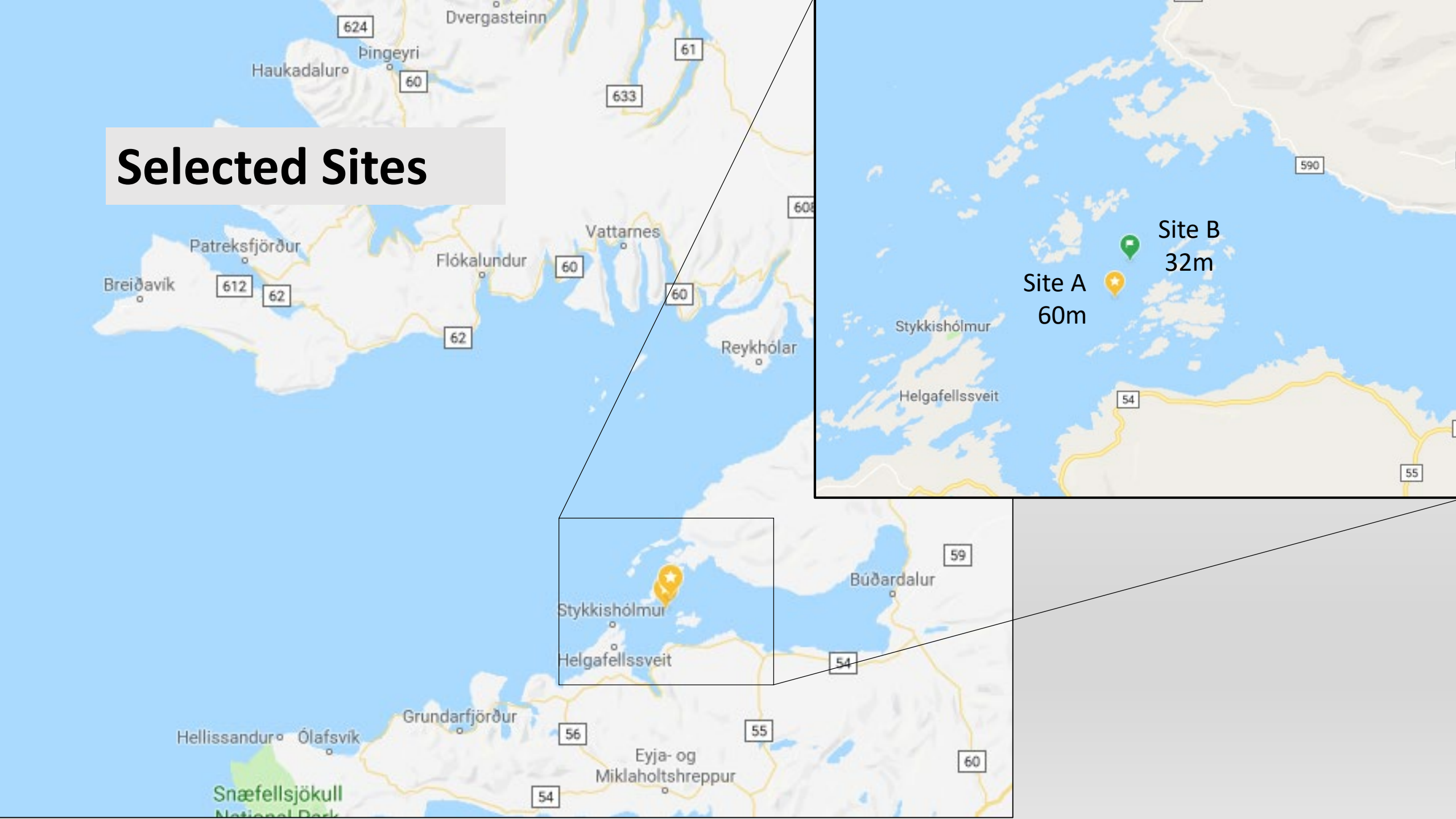
McBride; 2005; Shpigel et al., 2005; Ásbjörnsson, 2011; Stefánsson et al., 2017

Research Aims

1. Assess the impact (if any) depth has on gonad indices (GI), gametogenesis, reproductive stages, and spawning events at two depths in Breiðafjörður.

2. Determine the presence and proportion of high-quality roe available at 32m and 60m depth.

Selected Sites



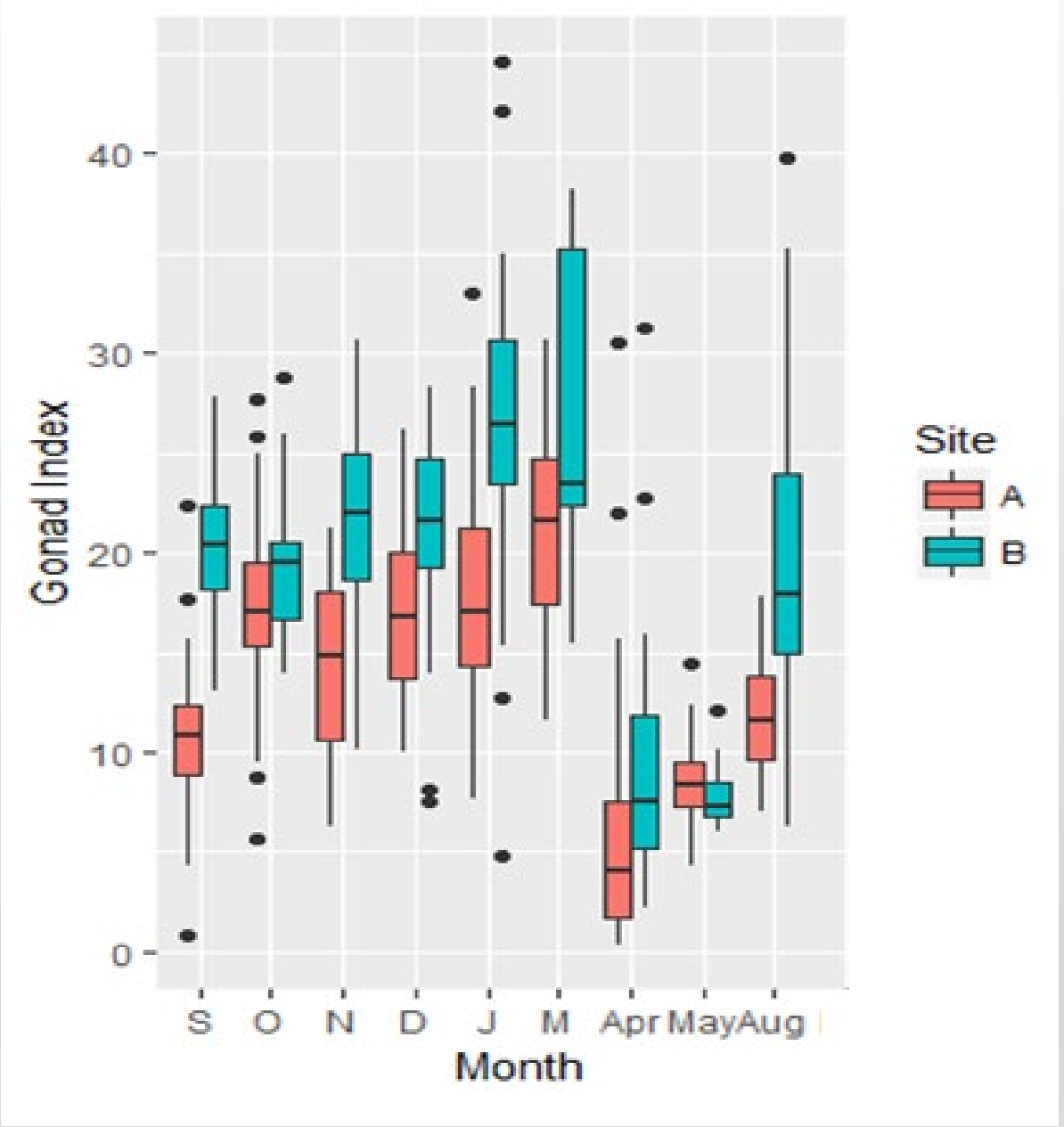
Methods:

- Weights, lengths, photos, histology samples/slides
- Sex ratios, gonad indices, roe color ranking, and spawning cycle determined
- Spawning cycle determined based on NOFIMA standards- 4 stages
- Ranking: 1st, 2nd, 2nd-3rd, and unacceptable

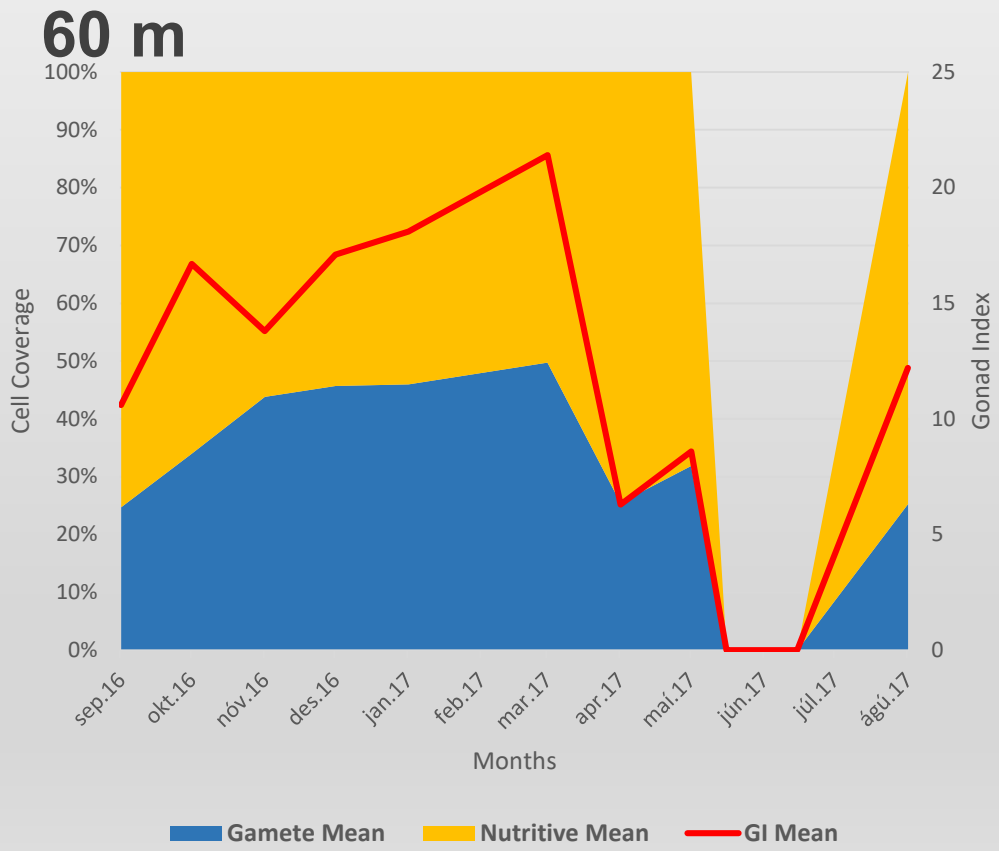
Green sea urchin roe and intestines

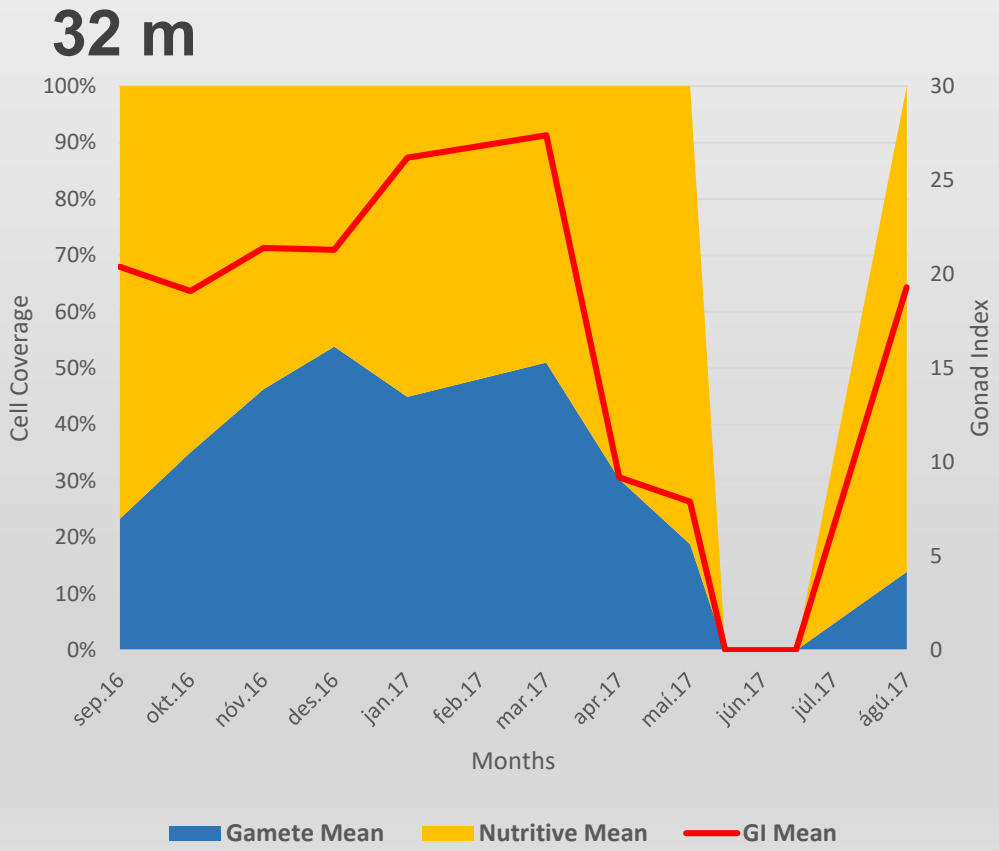
Results:
Gonad Index and Spawning

- $\left[\frac{gonad\ wet\ weight}{total\ wet\ weight}\right] * 100$
- Average GI relatively high at both sites August-March
- Mean GI average of 25% higher at shallower depth, Site B
- Spawning occurs before the April collection at both sites, coinciding with a significant drop in GI
- By August, the median GI has increased above 10% at both sites



Results:
Gametogenesis vs. Gonad Index



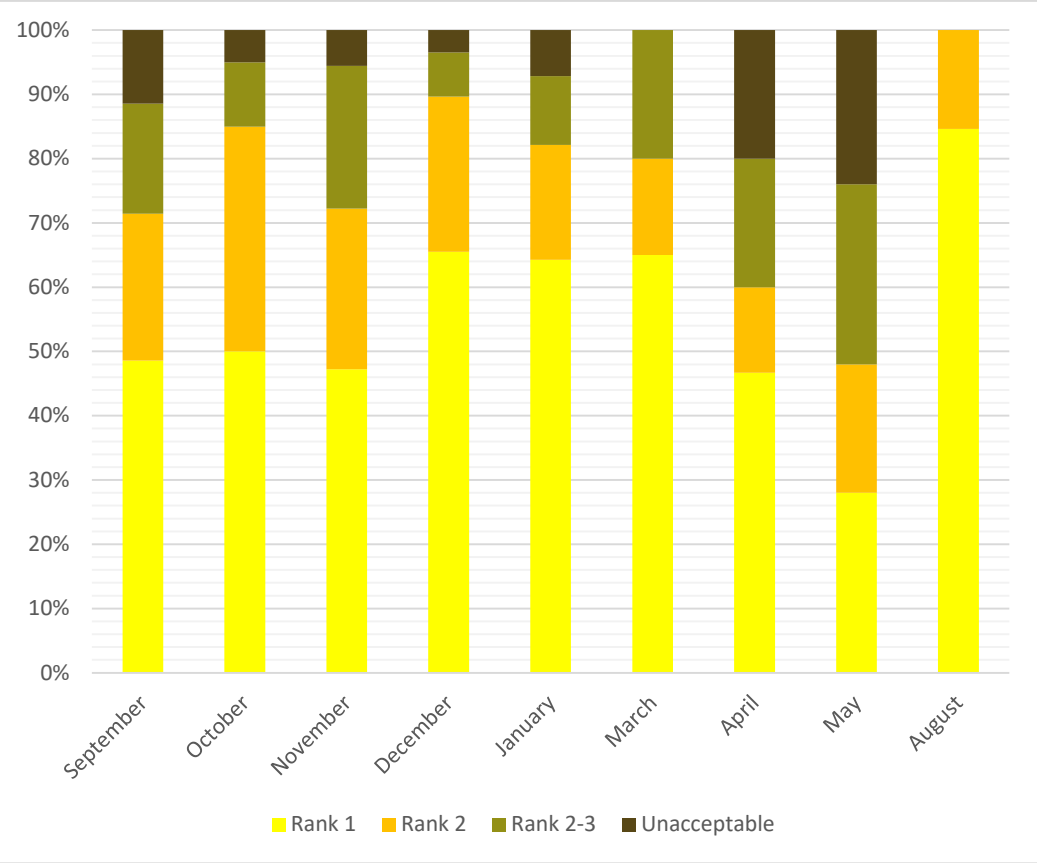


Results:
Sex Ratios

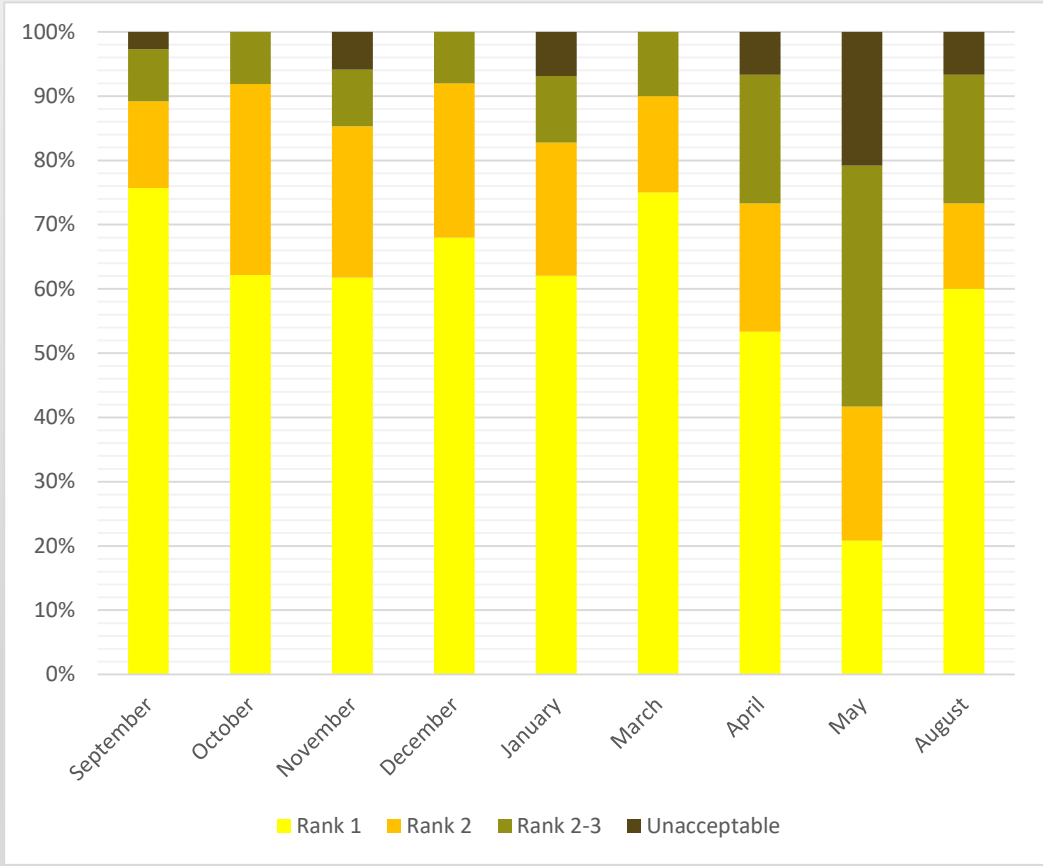
	60m	% Total	32m	% Total	All Sites	% Total
Female	108	49.77%	112	53.08%	220	51.40%
Male	109	50.23%	99	46.92%	208	48.60%
Total	217	100.00%	211	100.00%	428	100.00%

Results:
Visual Roe Quality Ranking by Site

Site A: 60m



Site B: 32m



Conclusions

- Gametogenesis and spawning is relatively uniform at both depths, with a major onset of spawning occurring late March/early April- similar circumpolar distribution
- Depth does not appear to have a significant impact on roe coloration or spawning cycle
- Depth was found to impact GI, with higher GI at shallower depths, though both sites had high GI August-March

Conclusions

- High quality roe was found at 32m and 60m depth sites most months in Breiðafjörður
  - 60 m and 32m yielded roe with GI>10% and a high rate of 1st class color from August-March
  - Few instances of unusable quality roe throughout harvest year at both sites
- The global market has grown in the past years- higher demand, possibly lowered standards, allowing less desirable quality roe to be sold

Quæstiones?

Photo: Svanhildur Egilsdóttir

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FULBRIGHT