

Leiðandi  
vettvangur í tíu ár



# UNDERSTANDING THE SPATIAL DISTRIBUTION OF ARSENIC, CADMIUM, AND MERCURY IN THE WESTFJORDS OF ICELAND

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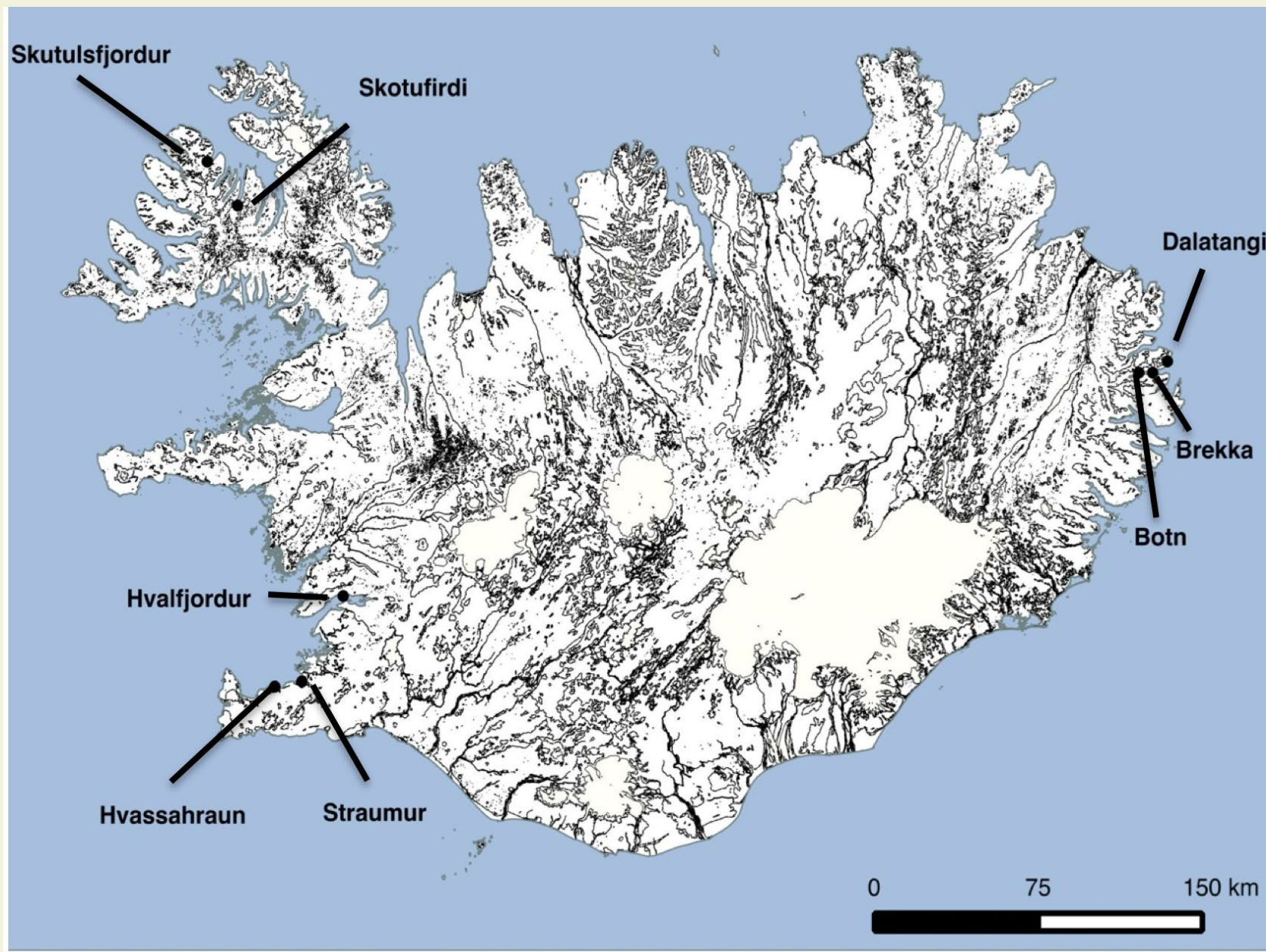
SJÁVARÚTVEGS  
RÁÐSTEFNAN

ISI ICELAND  
SEAFOOD



HAMPIÐJAN

*Hilfa Óhásid*



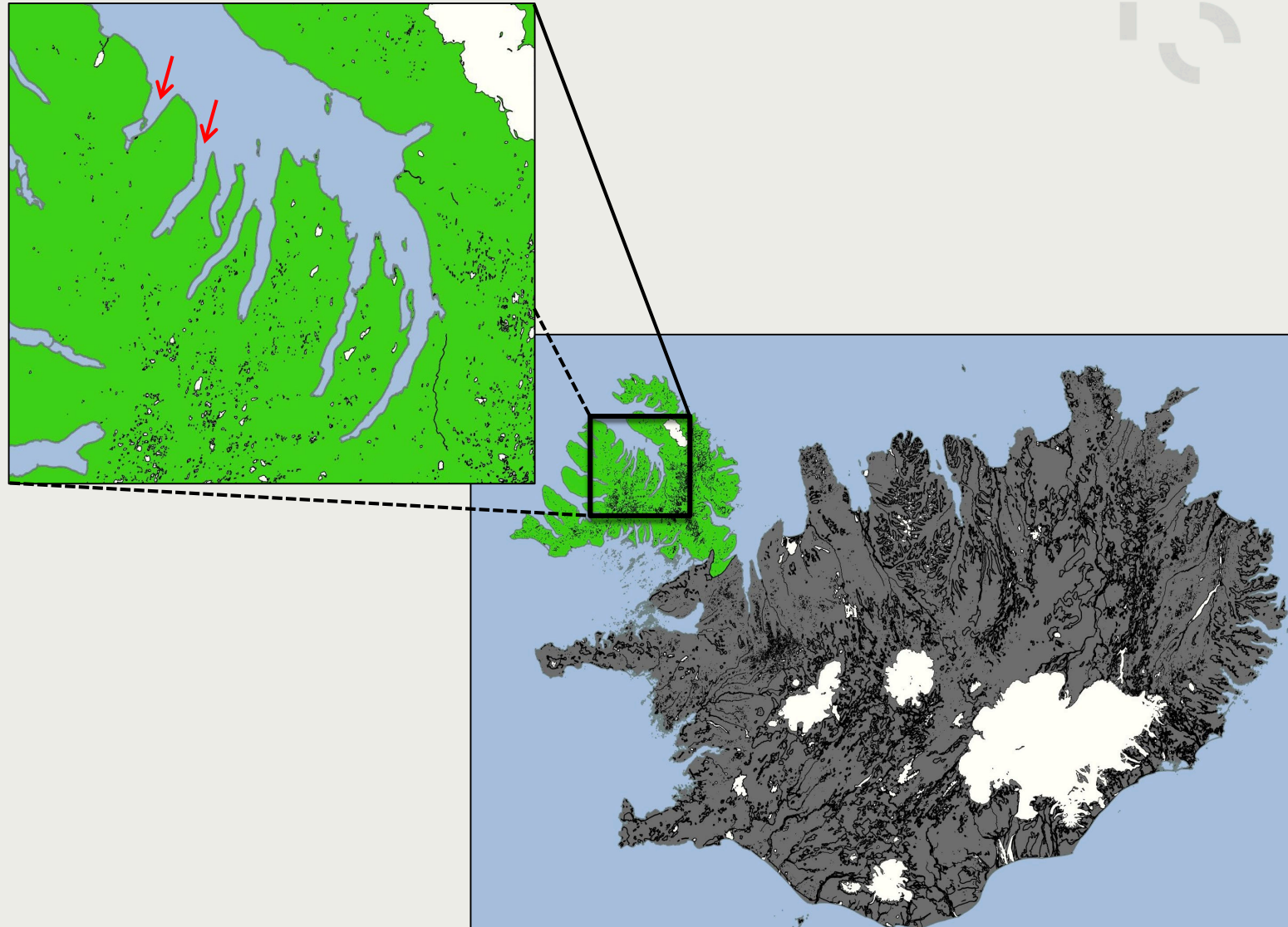
## BACKGROUND

20+ years of biomonitoring in Iceland using blue mussels (*Mytilus edulis*) for various pollutants

Previous results for Skutulsfjörður and Álftafjörður show high levels for As and Cd

# STUDY AREA: WESTFJORDS OF ICELAND

- Arsenic has remained high in Skutulsfjörður over time
- 60 mg/kg (dw) compared to 10-20 mg/kg (dw) found in other regions
- Since Sturludottir et al (2013), no further investigation in this area





# Sample Sites

Legend

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Cities

▲

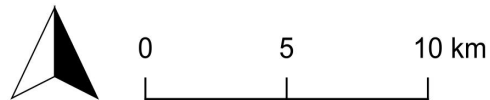
All Sites

□

Land

□

Ocean



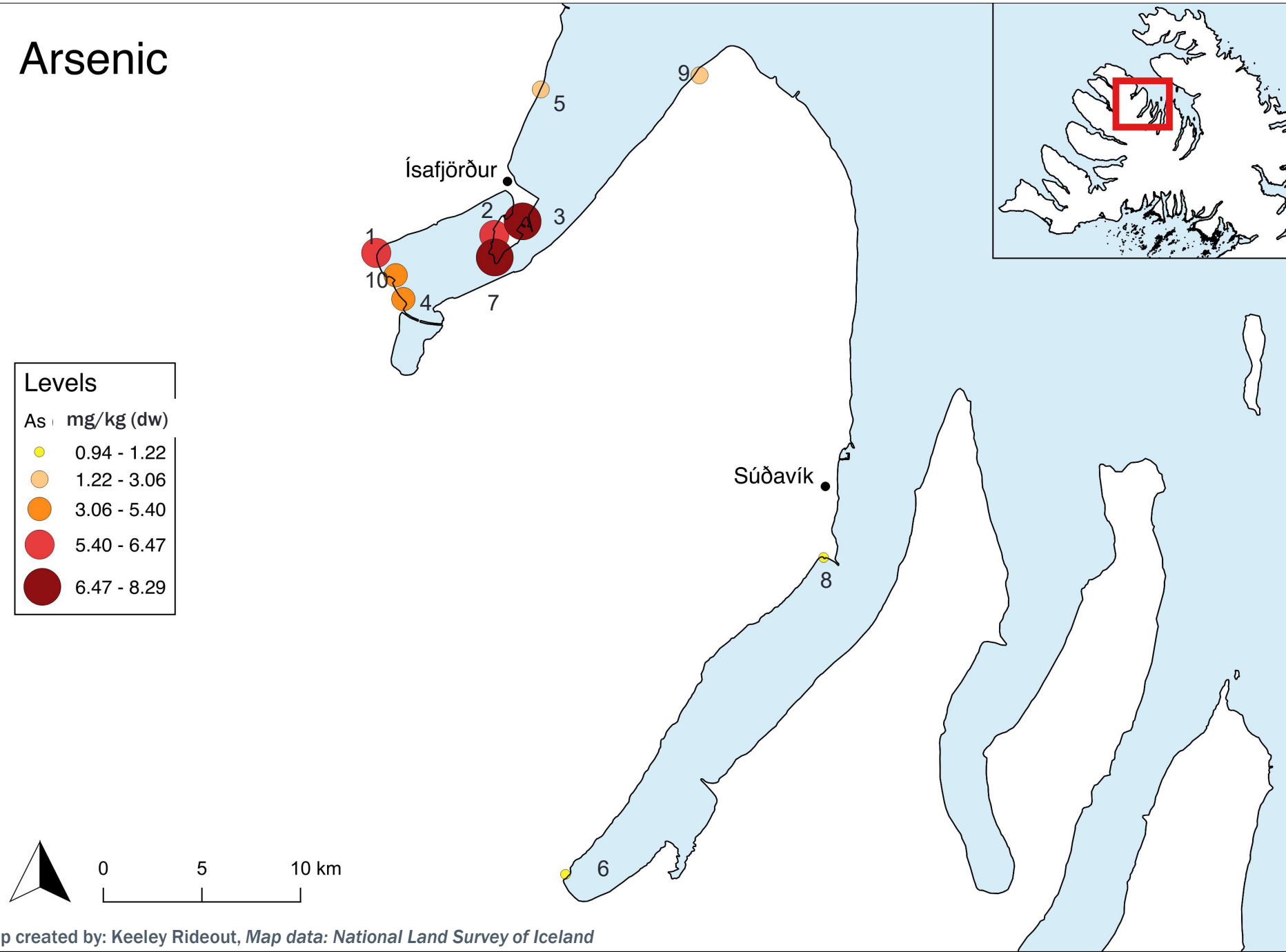
Map created by: Keeley Rideout, Map data: National Land Survey of Iceland



## SAMPLING

10 sites  
Blue mussels 4-6cm  
50+ mussels from each site  
All sites sampled during low tide  
27 August - 9 Sept. 2018  
Site 10: Official sampling site

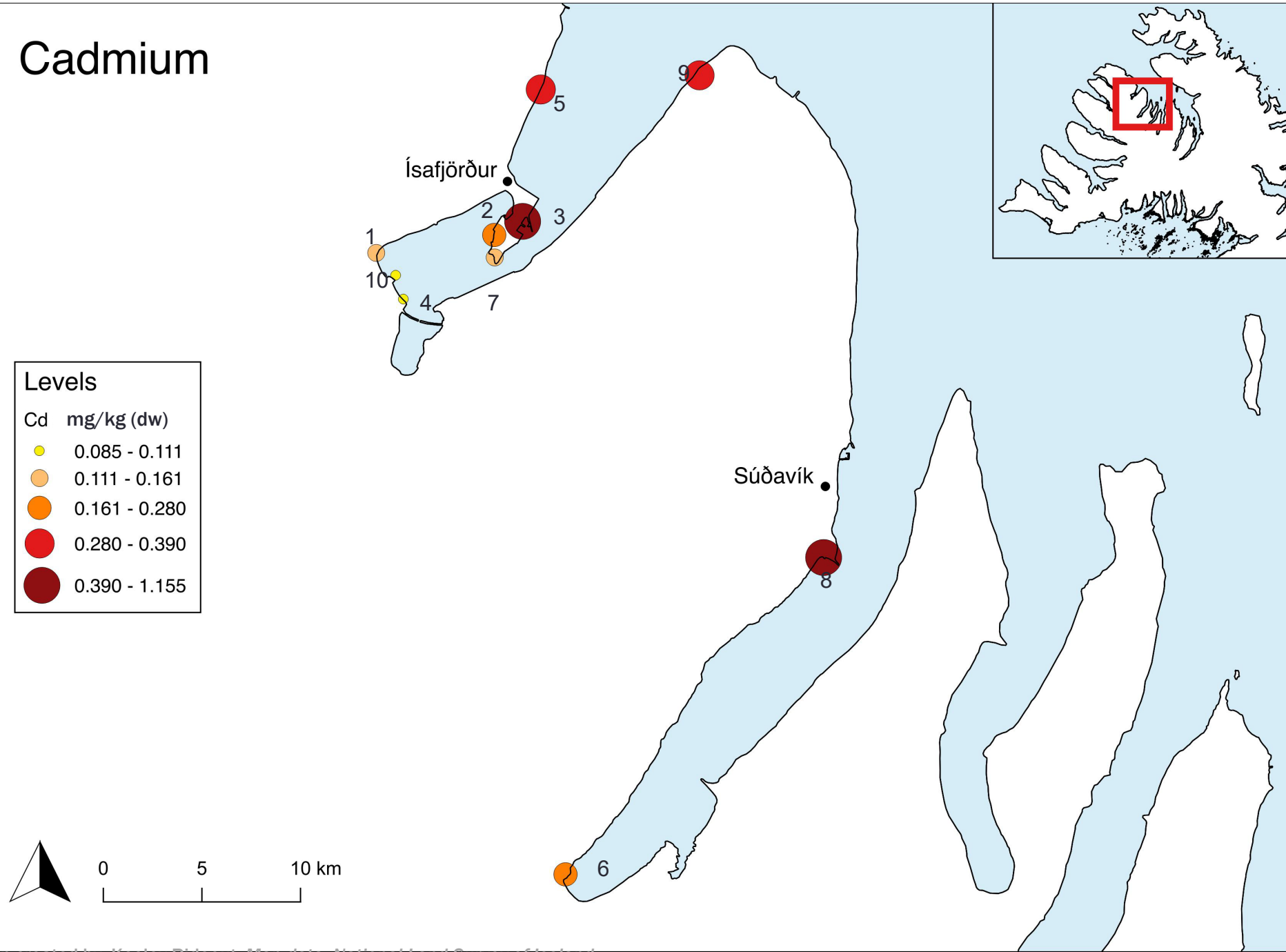
# Arsenic



## RESULTS AS

| As Concentrations<br>mg/kg (dw) |       |
|---------------------------------|-------|
| site 7                          | 83.87 |
| site 4                          | 66.18 |
| site 1                          | 61.45 |
| site 10                         | 59.06 |
| site 3                          | 55.84 |
| site 2                          | 54.44 |
| site 9                          | 30.65 |
| site 5                          | 24.05 |
| site 6                          | 11.43 |
| site 8                          | 9.41  |

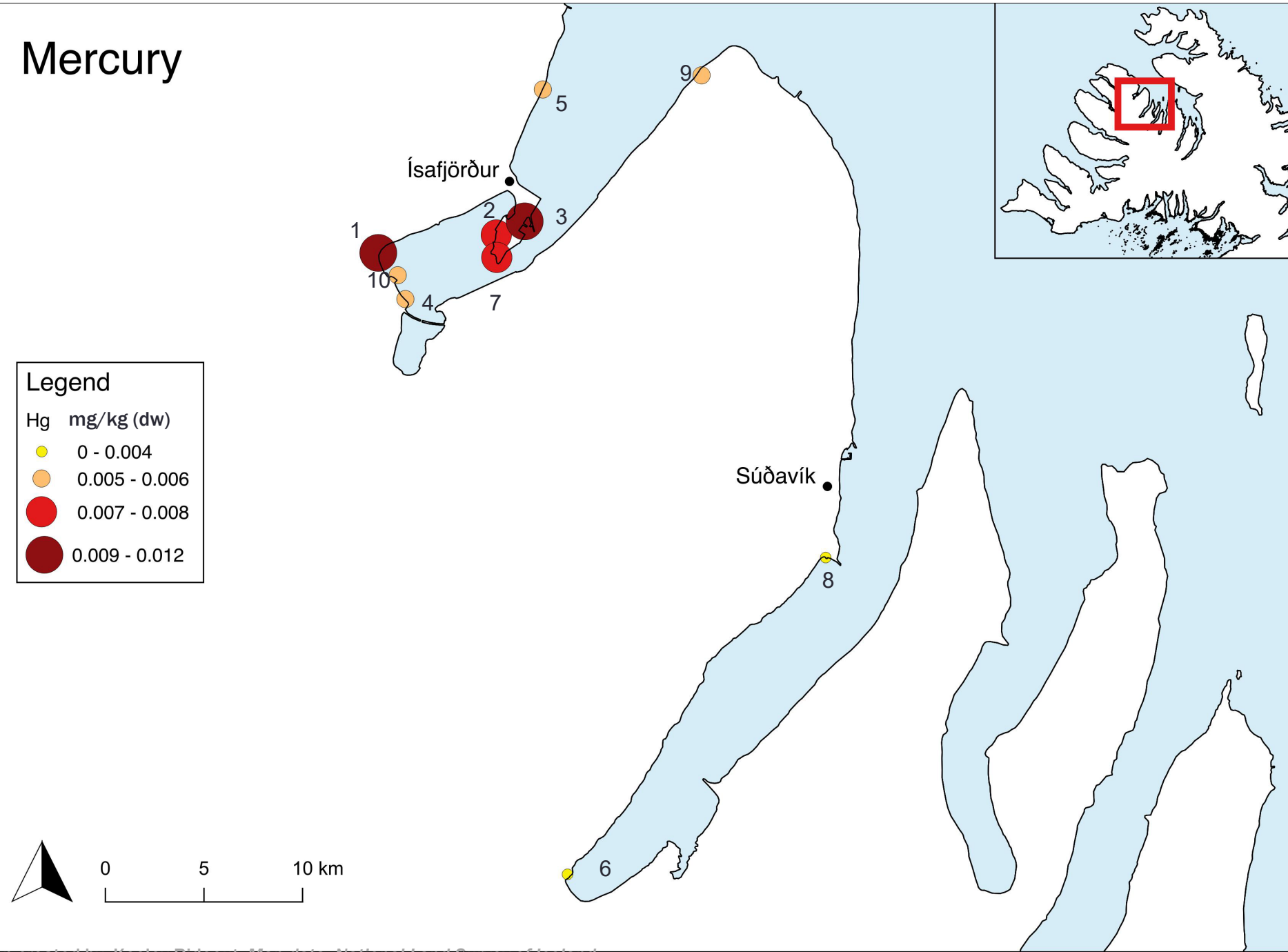
# Cadmium



## RESULTS CD

| Cd Concentrations<br>mg/kg (dw) |      |
|---------------------------------|------|
| site 3                          | 8.68 |
| site 8                          | 5.31 |
| site 5                          | 3.92 |
| site 9                          | 3.47 |
| site 6                          | 3.41 |
| site 2                          | 1.62 |
| site 1                          | 1.59 |
| site 7                          | 1.29 |
| site 10                         | 1.28 |
| site 4                          | 1.04 |

# Mercury



## RESULTS HG

| Hg Concentrations<br>mg/kg (dw) |      |
|---------------------------------|------|
| site 3                          | 0.09 |
| site 1                          | 0.09 |
| site 4                          | 0.08 |
| site 10                         | 0.07 |
| site 7                          | 0.07 |
| site 2                          | 0.07 |
| site 5                          | 0.06 |
| site 9                          | 0.06 |
| site 6                          | 0.05 |
| site 8                          | 0.03 |

# High Concentrations

Contaminants

◆

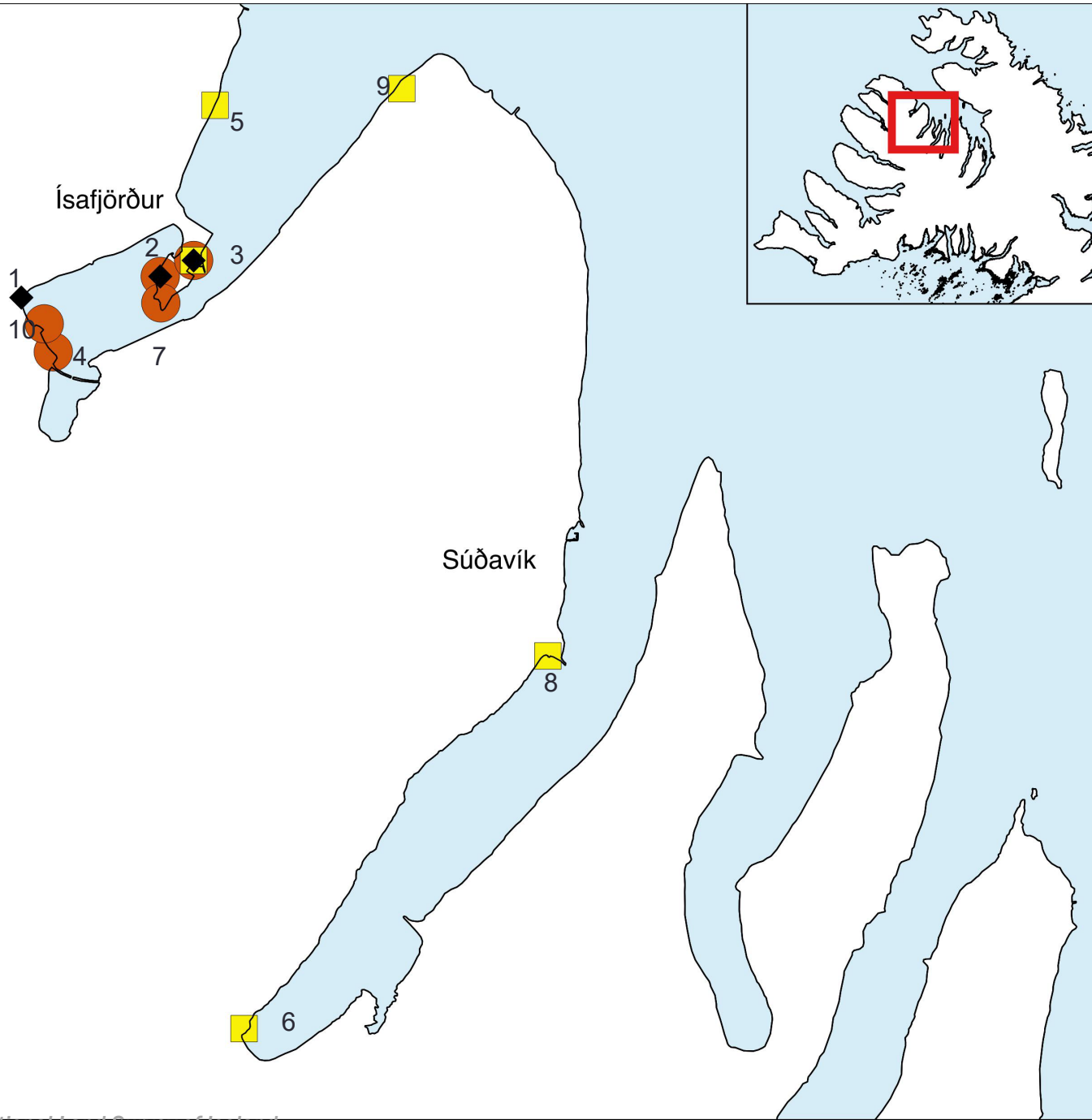
Mercury

■

Cadmium

●

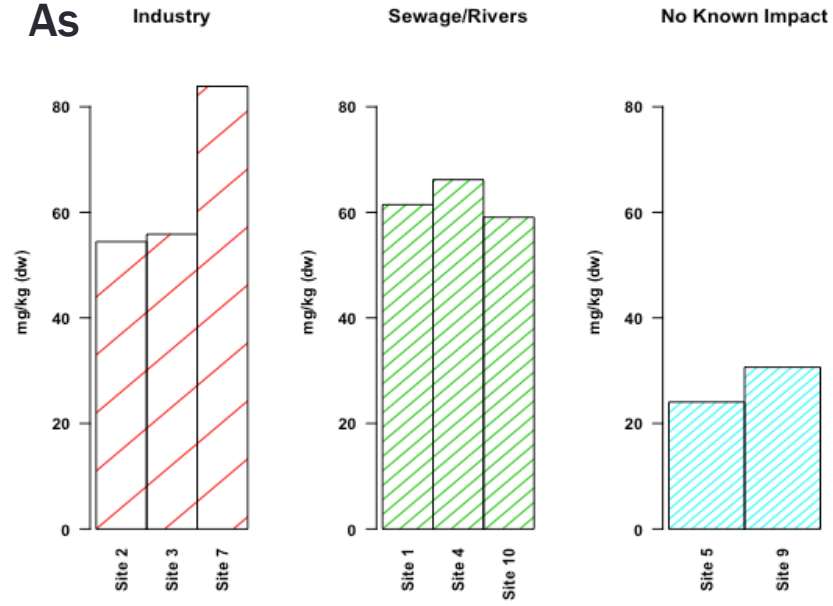
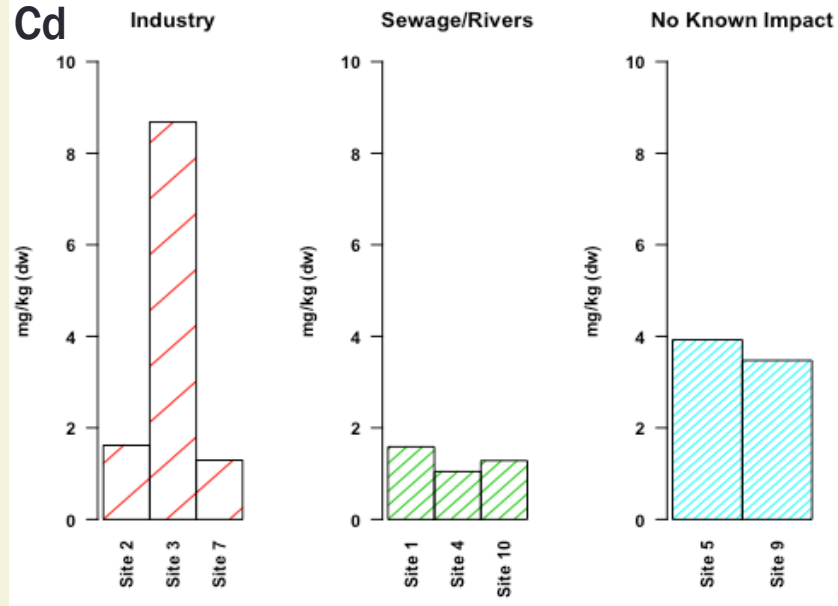
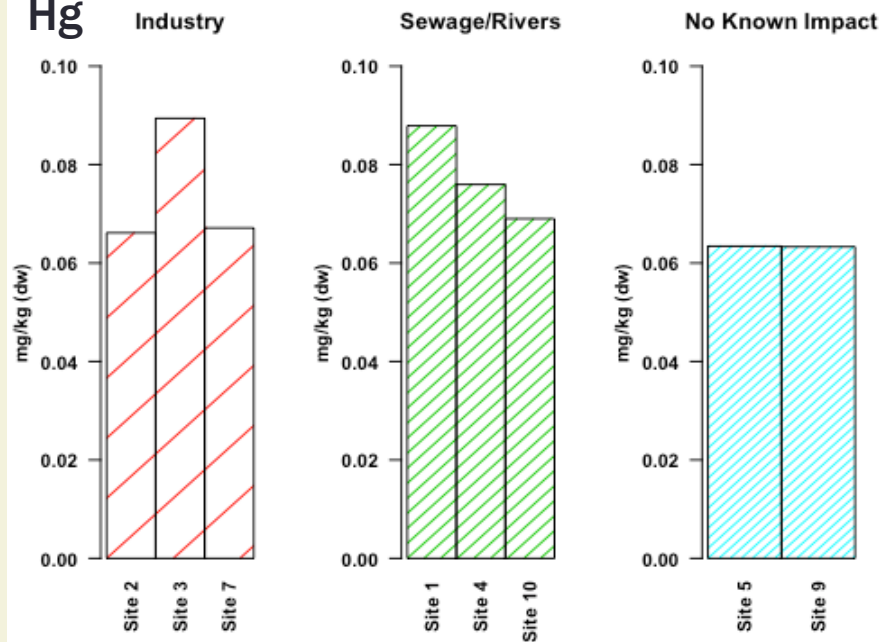
Arsenic



## HIGHEST CONCENTRATION OF AS, CD, OR HG FOUND PER SITE RELATIVE TO THE OTHER SAMPLING SITES

| Site #  | As    | Cd   | Hg   |
|---------|-------|------|------|
| site 1  | 61.45 | 1.59 | 0.09 |
| site 2  | 54.44 | 1.62 | 0.07 |
| site 3  | 55.84 | 8.68 | 0.09 |
| site 4  | 66.18 | 1.04 | 0.08 |
| site 5  | 24.05 | 3.92 | 0.06 |
| site 6  | 11.43 | 3.41 | 0.05 |
| site 7  | 83.87 | 1.29 | 0.07 |
| site 8  | 9.41  | 5.31 | 0.03 |
| site 9  | 30.65 | 3.47 | 0.06 |
| site 10 | 59.06 | 1.28 | 0.07 |



**As****Cd****Hg**

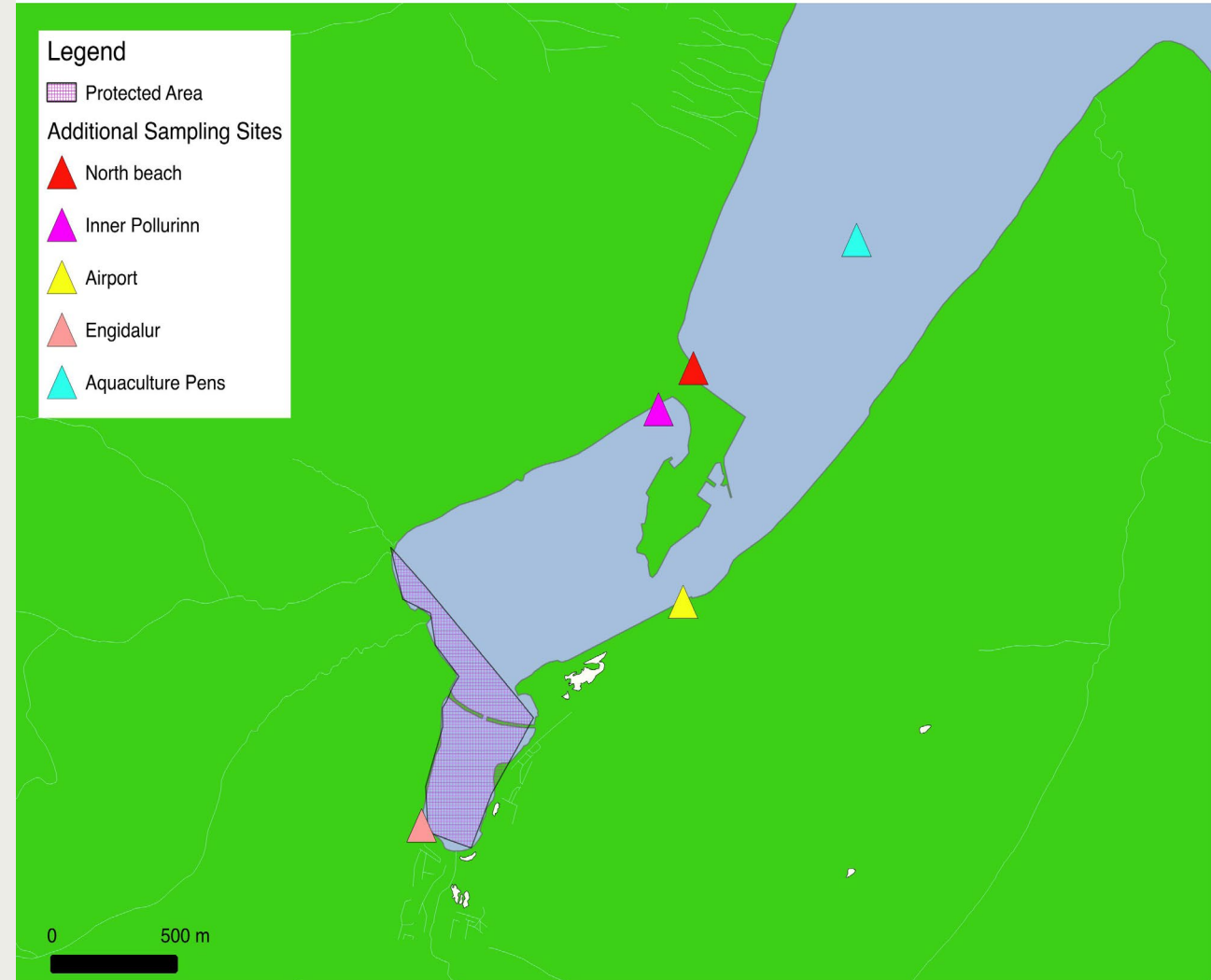
## CONTRIBUTING FACTORS

Environmental factors may contribute to the varying levels of As, Cd, and Hg in blue mussels around Skutulsfjörður

- Sewage
- Rivers
- Industry

# FUTURE RESEARCH

- Future research in this area should include:
  - More sampling locations
  - Identifying more suitable reference sites
  - Arsenic speciation
  - Transplanted mussels
  - Resume monitoring in Álftafjörður if production of the maerl factory occurs





## CLOSING REMARKS

There are too many unknowns to not tackle the knowns in our environment.



**Háskólasetur  
Vestfirðja**  
University Centre  
of the Westfjords