

An aerial photograph of a vibrant turquoise lake nestled in a mountain valley. The water is exceptionally clear, showing a gradient from light turquoise near the shore to a deeper blue in the center. The surrounding mountains are steep and rugged, with patches of snow and sparse vegetation. The sky is a clear, pale blue.

# Influence of ecological factors on Pacific herring reproduction efficiency

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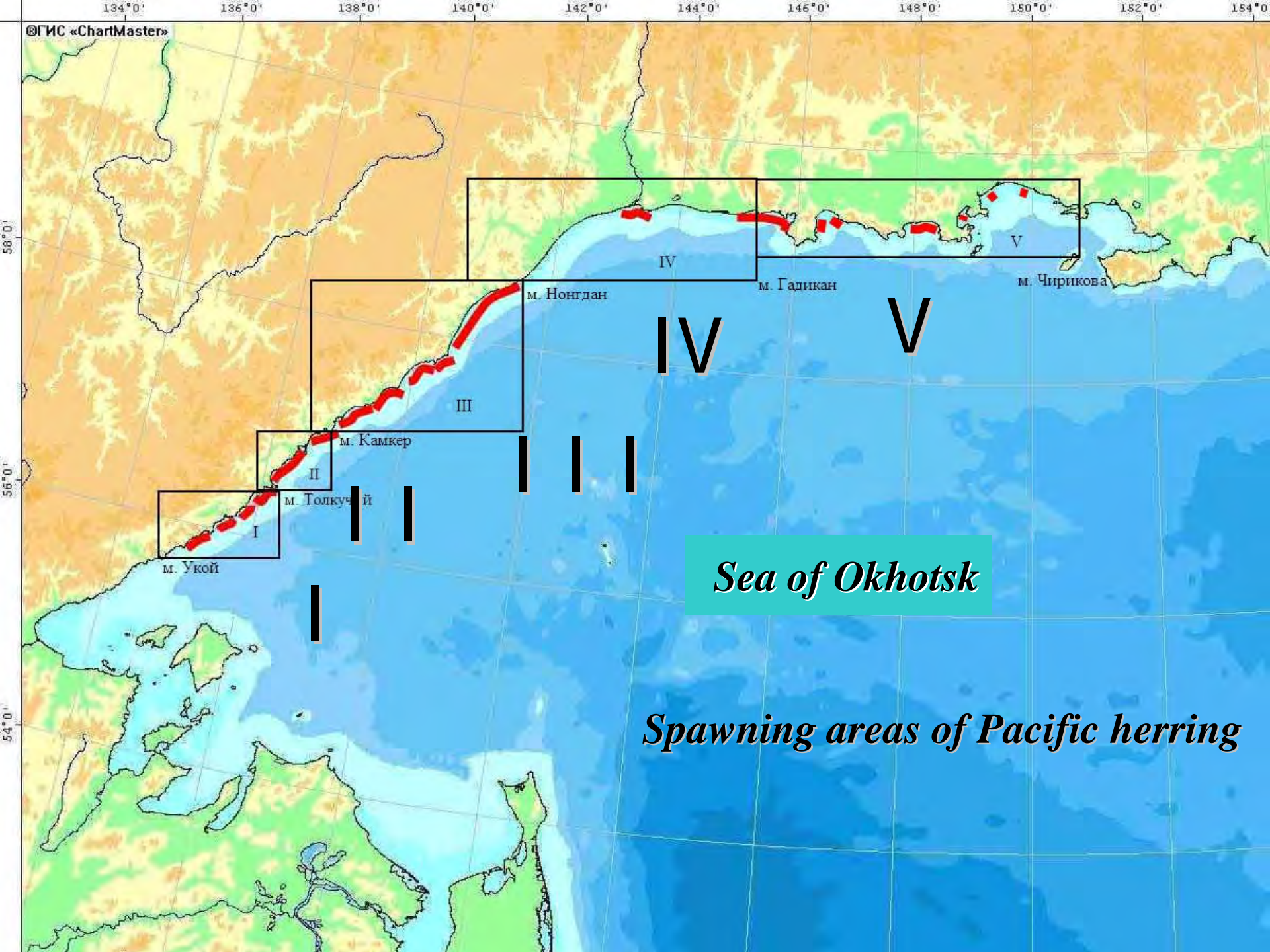
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A scenic view of a river or lake with a sandy beach and a forested background. The water is clear and blue, reflecting the sky. The background shows a dense forest of trees, some with snow on their branches, suggesting a winter or early spring setting. The overall atmosphere is calm and natural.

## Main determinative factors on spawn efficiency:

- Type and dynamic of ice cover in spawning area before and during spawning period.
- Distribution of herring breeders at the spawning area
- Storms at time of herring early ontogenesis
- Water temperature before spawning
- Spawners density and substrate type





*Sea of Okhotsk*

*Spawning areas of Pacific herring*

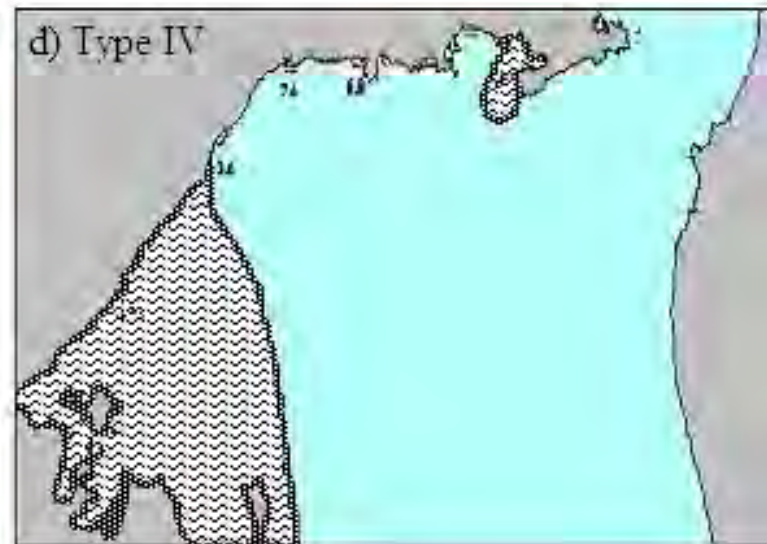
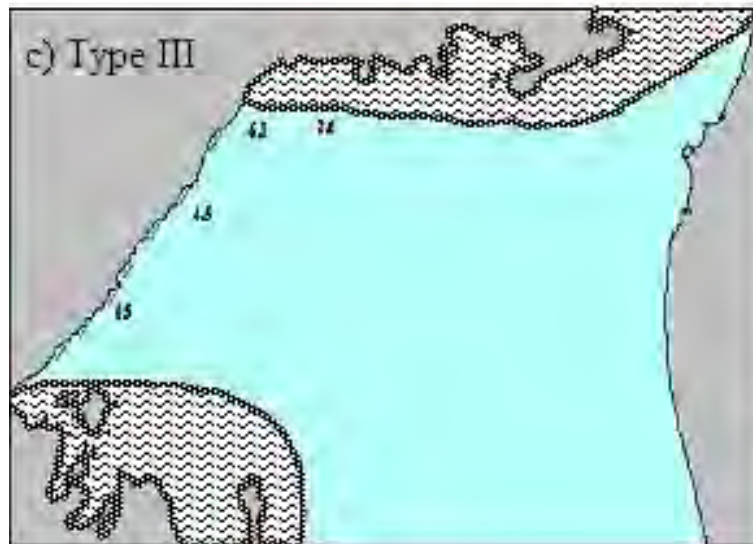
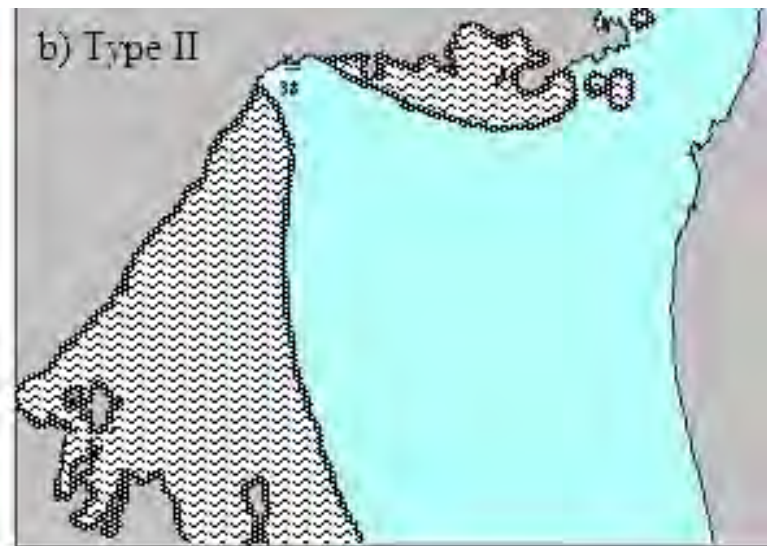


Closed type of spawning area (Aldoma Bay)





Open type of spawning area (Khanyangda Cape)



Types of spawning area (Tyurnin, 1973)



Type II  
Ice barrier of spawning areas of Kruglaya Bay  
(5 June 2001)



# Ice accumulation at spawning areas near Feodor Bay

Optimal incubation temperature 4-6 C°







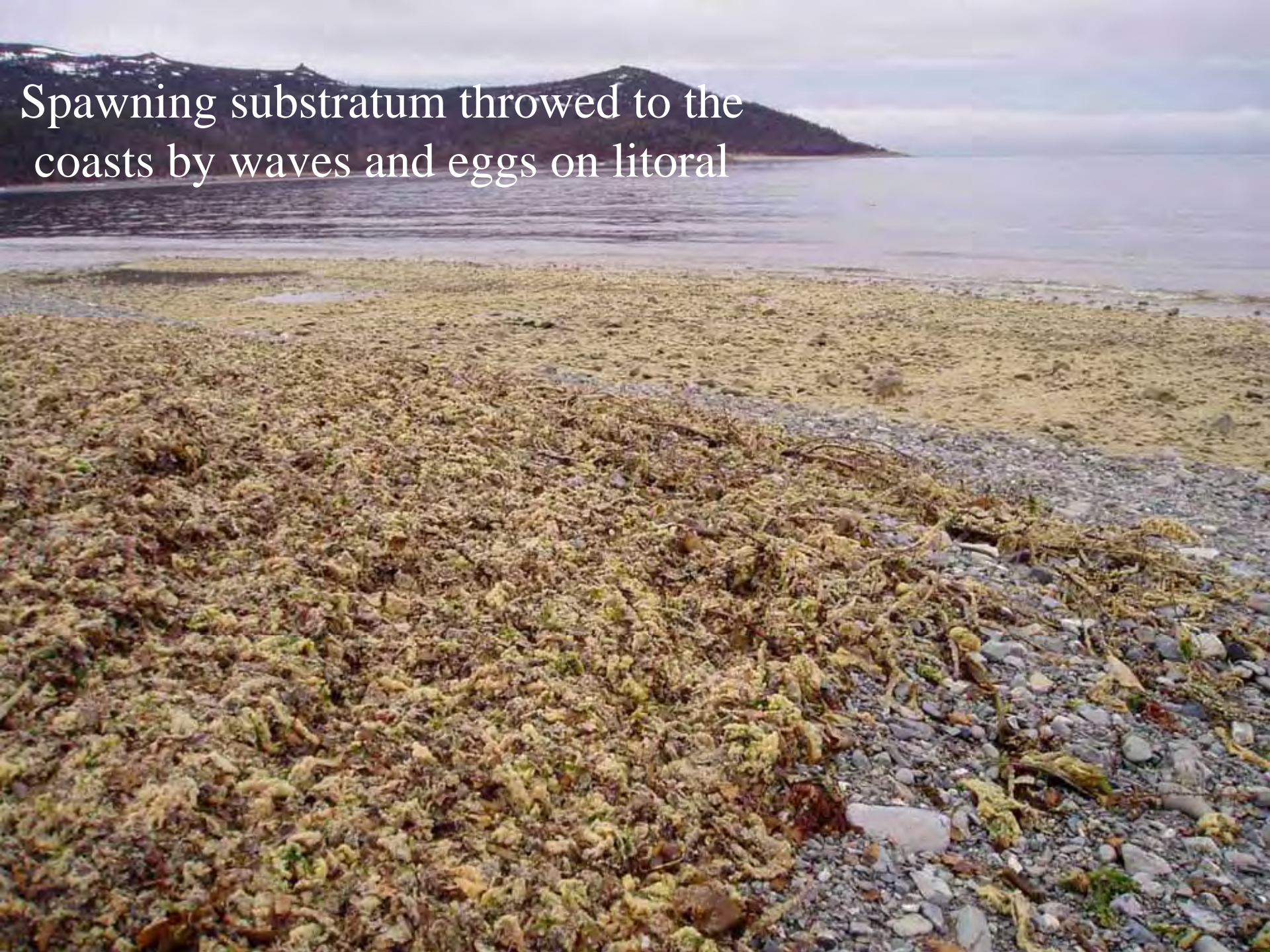
Herring spawning in ebb tide pools





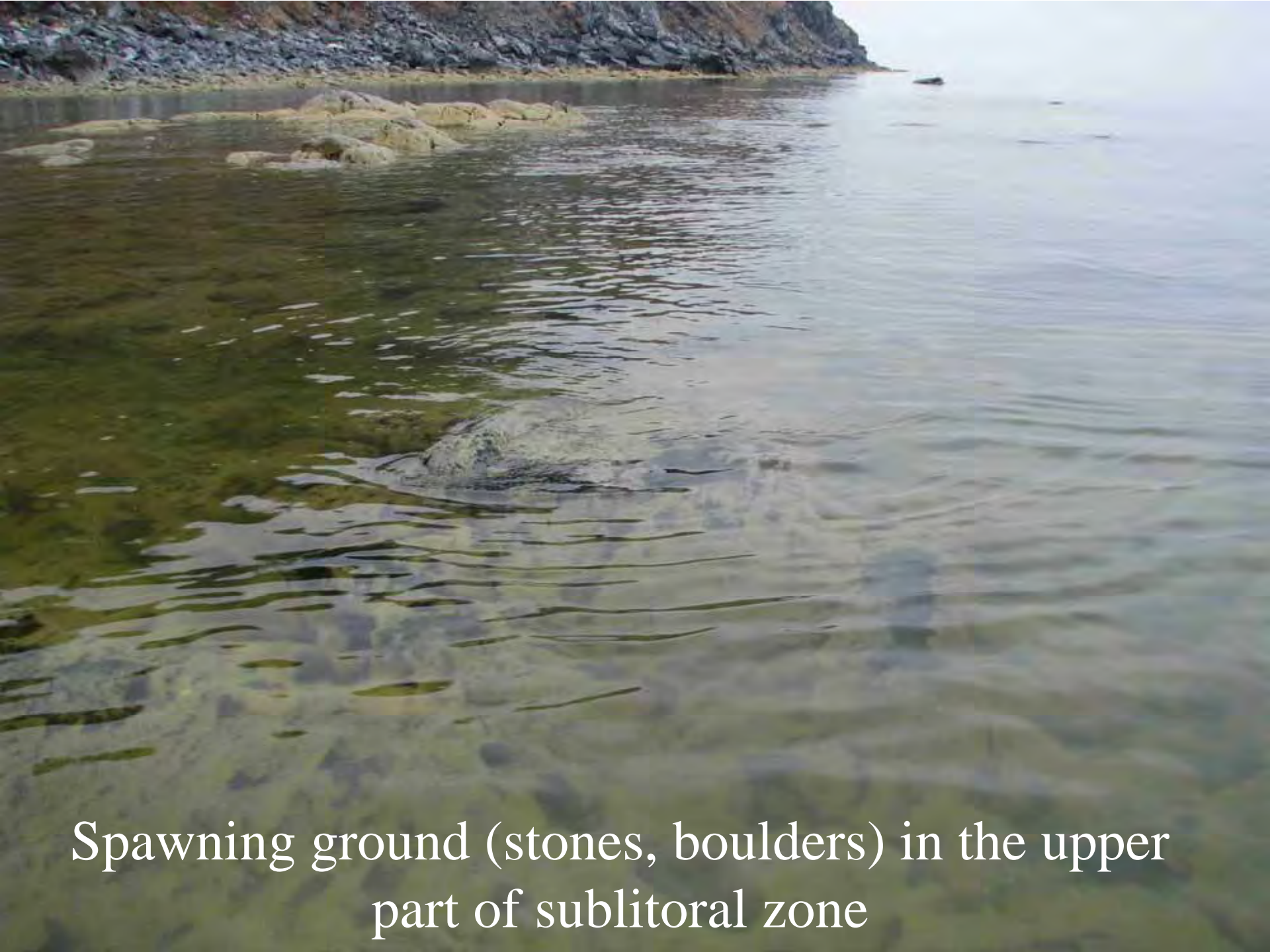
Herring spawn at shore tideland





Spawning substratum throwed to the  
coasts by waves and eggs on litoral





Spawning ground (stones, boulders) in the upper part of sublittoral zone

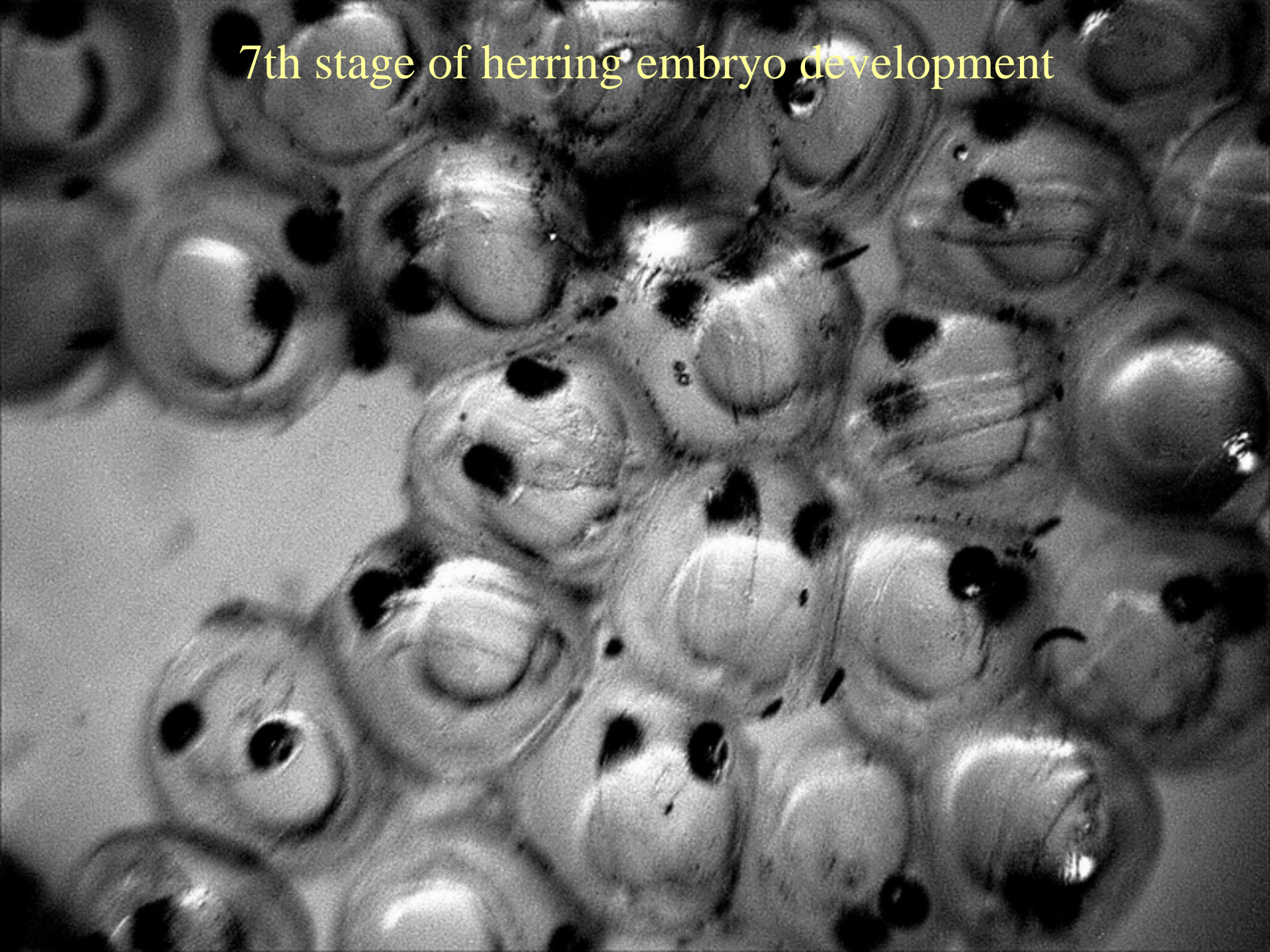


# Normal development of herring embryo





7th stage of herring embryo development





An underwater photograph showing a large, dark, textured substrate, likely a piece of Laminaria, in a greenish, slightly turbid water environment. A white arrow points from the text below to a small, light-colored spot on the substrate, which is identified as a fallen egg. The substrate has a complex, layered appearance with various shades of brown and green.

Fallen eggs from *Laminaria* substrate

Yerineyskaya bay, mixed algae: *Cystoseira*, *Rhodophyta*, *Laminaria*





Sea mammals and birds



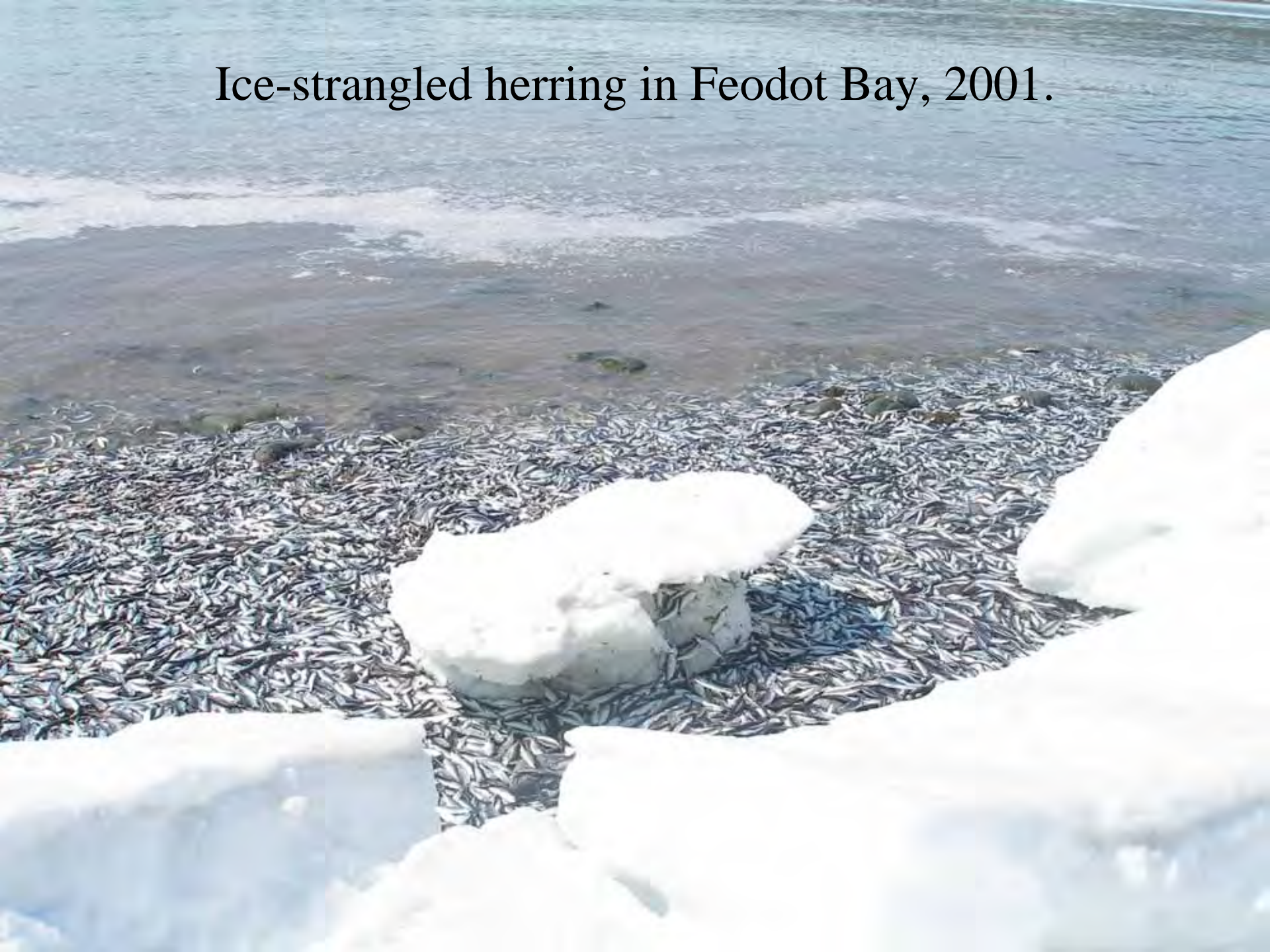


Fish and invertebrates





Ice-strangled herring in Feodot Bay, 2001.







Ice-strangled herring  
in Aldoma Bay, May  
2011.

