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# Capelin Stock Update

2J3KL Capelin Science Update

Newfoundland & Labrador

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# Main takeaway

While we observed mainly a positive environment for Capelin production in 2021, low larval productivity suggests continued low stock productivity. Given this species' significant ecological role, a cautious approach to managing the fishery is advised.

# Key points to understand about Capelin

- Capelin are a key prey species in the Newfoundland and Labrador marine ecosystem.
- Capelin are a short-lived species. Since the stock collapsed in 1991, many Capelin are maturing at age 2, which is 1 to 2 years earlier than during the 1980s. As a result, there are currently few older ages in the stock due to high post-spawning mortality.
- Capelin stocks can undergo dramatic year-to-year changes in abundance. This is largely due to environmental conditions experienced by eggs and larvae.
- Recent research has shown timing of spawning to be an important driver of year-class strength, with better larval survival from earlier spawning.

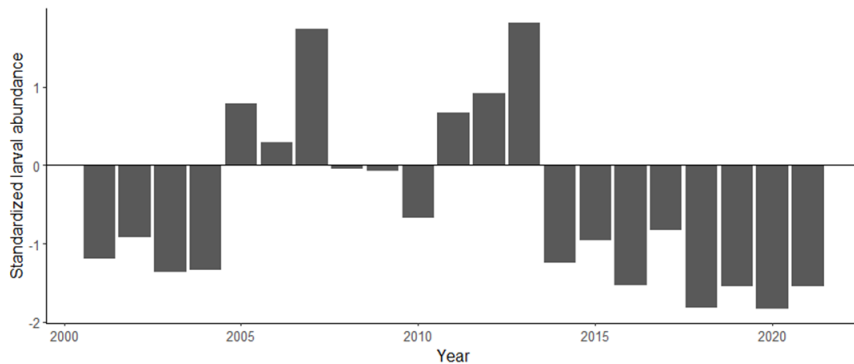
# Key points to understand about Capelin

- Abundance of Capelin at a given age (year-class) is driven by at least three critical environmental factors:
  - Spawning times
  - Feeding and transport conditions for larvae
  - Feeding conditions experienced by adults in the fall and spring prior to spawning, a period when starvation-related stress may result in high mortality
- Cod consumption of Capelin increases or decreases in response to the amount of Capelin available in the environment. This affects cod biomass.

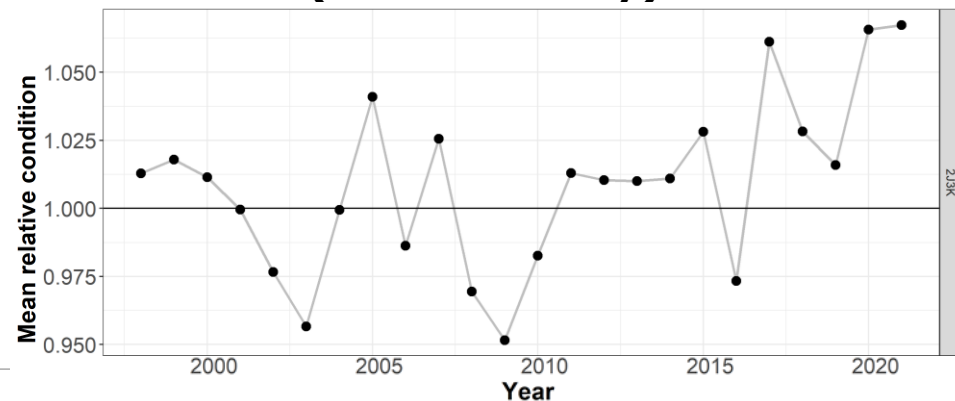
# 2022 Science results

- We observed mainly favourable environmental conditions for Capelin in 2021 including: the earliest beach spawning since the 1980s, good fall Capelin condition, increased prevalence of Capelin in cod and turbot stomachs suggesting increased availability of Capelin, high numbers of age-2 Capelin in the partial acoustic and fall multispecies surveys, warming ocean trends, earlier spring blooms, and increased abundance of large copepods.
- However, Capelin larval productivity remains low in 2021, suggesting a weak 2021 year-class.

## Capelin larval productivity

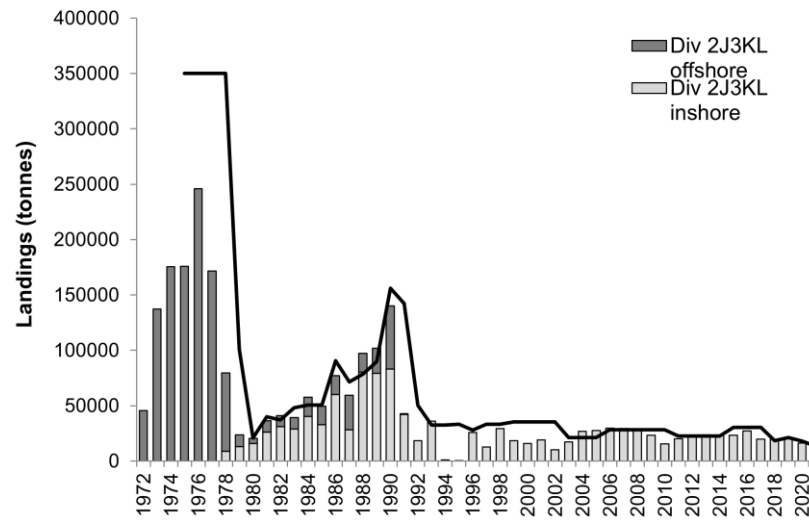


## Age-1 and 2 capelin condition in the fall (Div. 2J3K only)



# Science results

- The commercial fishery landed 102% of the Total Allowable Catch (TAC) for Divisions 2J3KL in 2021 (13,945 t of the 13,565 t TAC).
- On average, Capelin landed in 2021 were larger compared to 2020, but smaller than fish landed in 2014-2015.



# Key takeaways

- A modified survey was completed in June, but its results are not directly comparable to previous spring surveys.
- The 2021 partial spring acoustic survey index was within the forecasted prediction presented at the 2021 Capelin assessment, with no evidence of unexpected declines or increases in the stock. Due to data limitations, the Capelin forecast model could not be used to provide advice for the 2022 Capelin fishery.
- The commercial fishery landed 102% of the Total Allowable Catch (TAC) for Divisions 2J3KL in 2021 (13,945 t of the 13,565 t TAC).
- We observed mostly a positive environment for Capelin production in 2021. However, low larval productivity, a key input in the forecast model, suggests continued low stock productivity.

# Data limitations in 2021

- A Capelin Science Response process was conducted March 14-15 2022. An update typically includes internal experts to produce a Science Response Report (SRR) where the need for advice is urgent or an advisory framework for the issue has already been developed. A Full stock assessment includes both internal to Fisheries and Oceans Canada and external experts and produce publications including a proceedings report, potentially multiple research documents, and a Science Advisory Report (SAR).
- Data limitations included:
  - A partial Capelin acoustic survey in June (rather than usual May survey)
  - No fall bottom-trawl survey coverage in Div. 3L which affected predator diet, Capelin condition, and spatial distribution data
  - No acoustic survey in 2020 and a partial acoustic survey in 2021 in addition to a lack of fall Div. 3L data prevented use of the Capelin forecast model



# Next steps

- The Capelin Science Response Report will be available on the CSAS website.
- Fisheries management will be consulting with stakeholders and Indigenous groups on March 29 2022. The Science advice will be presented and discussed at that time.
- The stock assessment advice, along with recommendations from DFO Fisheries Management, and input from industry will be considered by the department when developing future Total Allowable Catch (TAC) and other management measures.