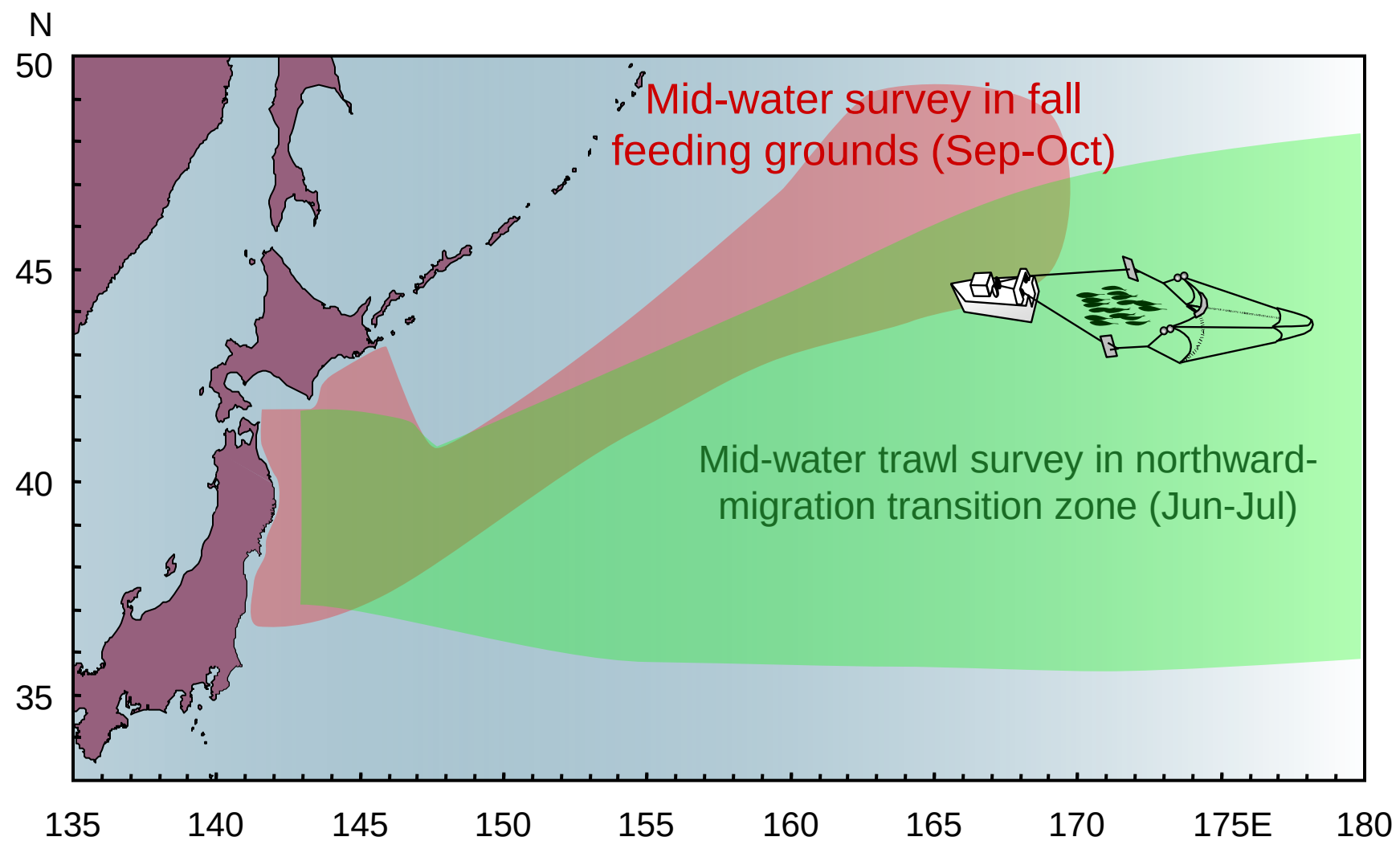


Potential fishery-independent abundance indices for age-0 and age-1 Japanese sardine in the Pacific stock

Shota Nishijima, Sho Furuichi, Ryuji Yukami, Yasuhiro Kamimura,
and Akihiro Manabe

Japan Fisheries Research and Education Agency

Midwater trawl surveys in summer and fall

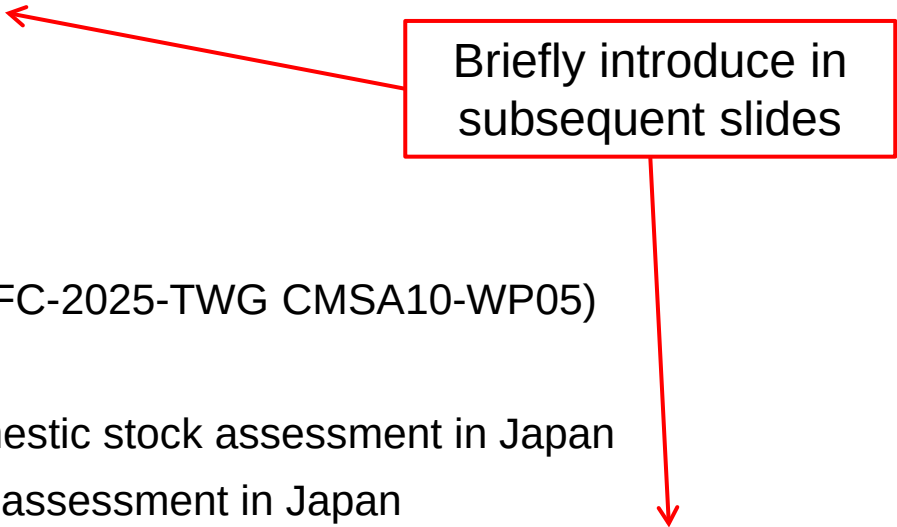


Current progress of usage of the survey data

Summer survey

- Pacific saury: Standardized biomass index (NPFC-2025-SSC PS15-WP01)
- Chub mackerel: Standardized recruitment (age 0) index (NPFC-2025-TWG CMSA10-WP08)
- Japanese sardine:
 - Standardized abundance indices for ages 0 and 1 fish have been used for the domestic stock assessment in Japan ([Furuichi et al. 2026](#))
 - Age determination is performed using otoliths
 - Standardized by VAST (almost same method as chub mackerel)

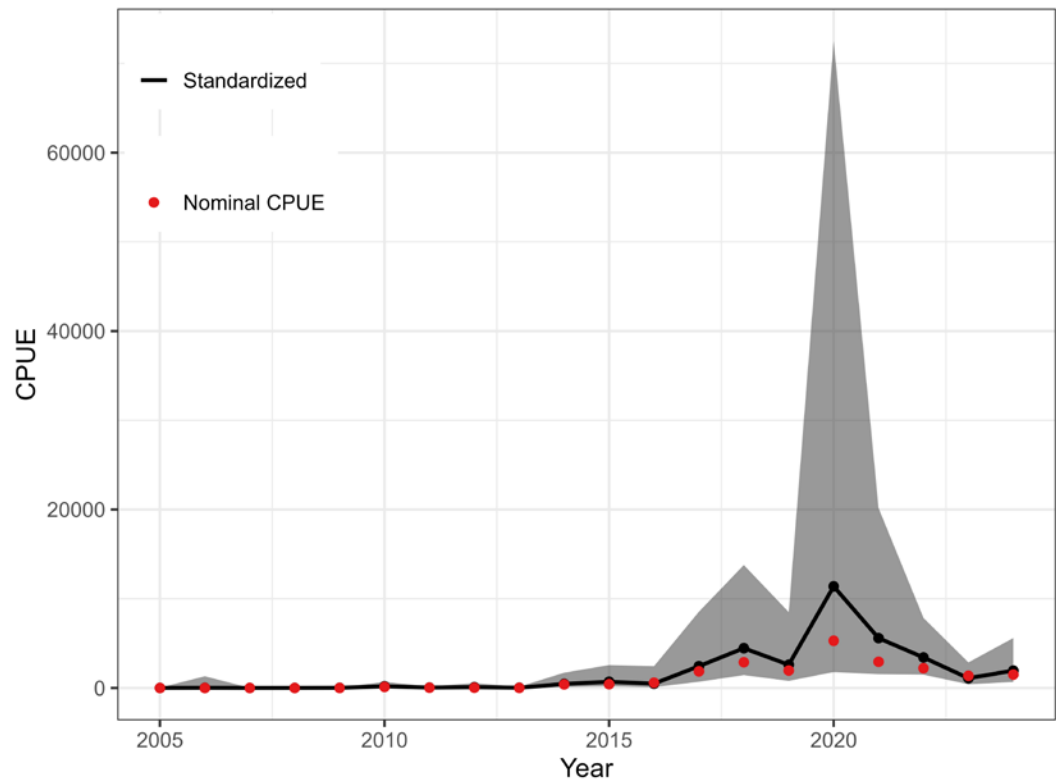
Briefly introduce in subsequent slides



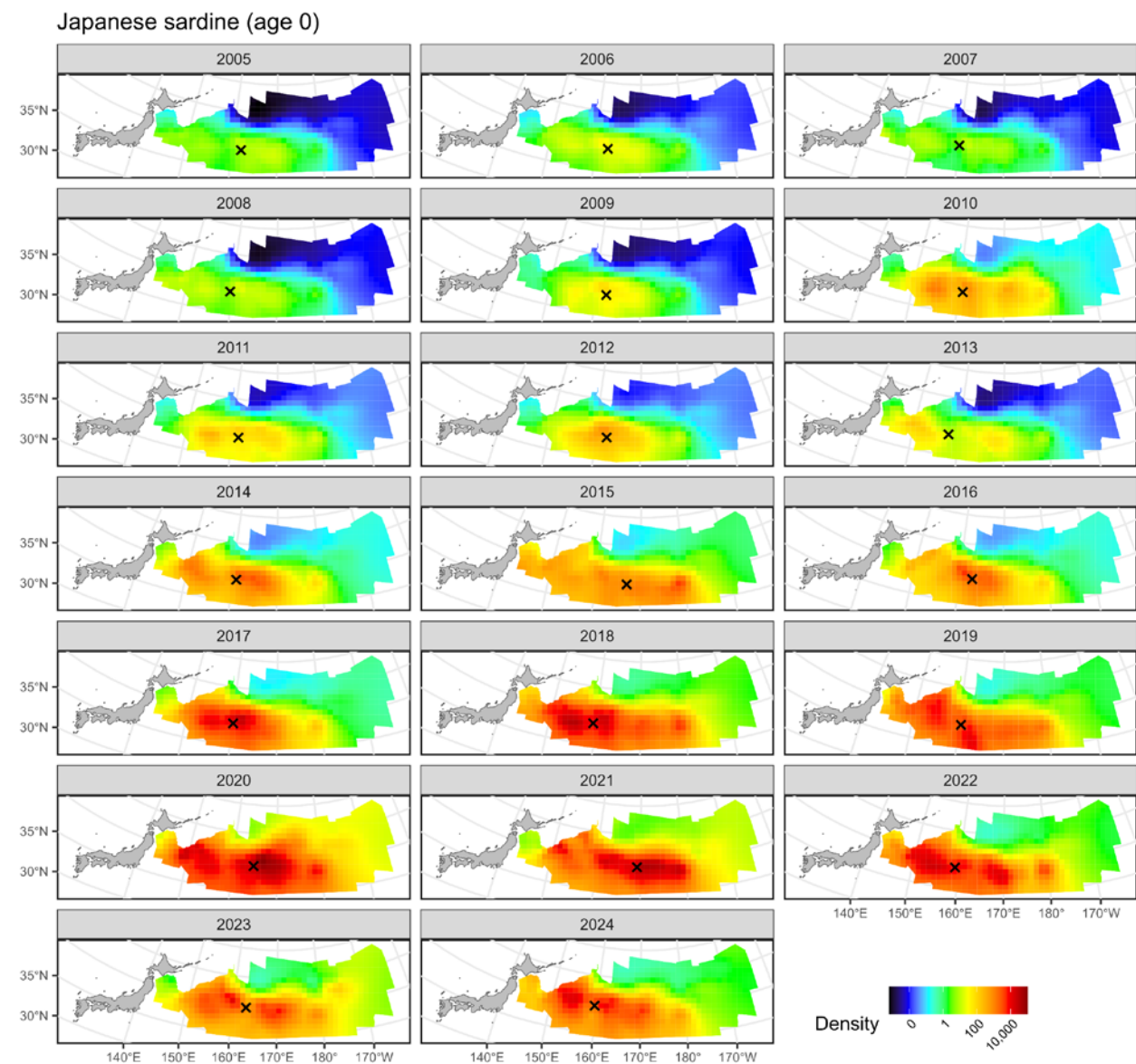
Fall survey

- Chub mackerel: Standardized abundance indices for ages 0 and 1 fish (NPFC-2025-TWG CMSA10-WP05)
- Japanese sardine:
 - Acoustic survey has been used as age 0 abundance index for the domestic stock assessment in Japan
 - CPUE standardization had not been conducted for the domestic stock assessment in Japan
 - Conducted a preliminary analysis of CPUE standardization for ages 0 and 1 fish in preparation for this meeting (SSC JS01)
 - Age determination is performed using otoliths
 - Standardized by VAST (almost same method as chub mackerel)

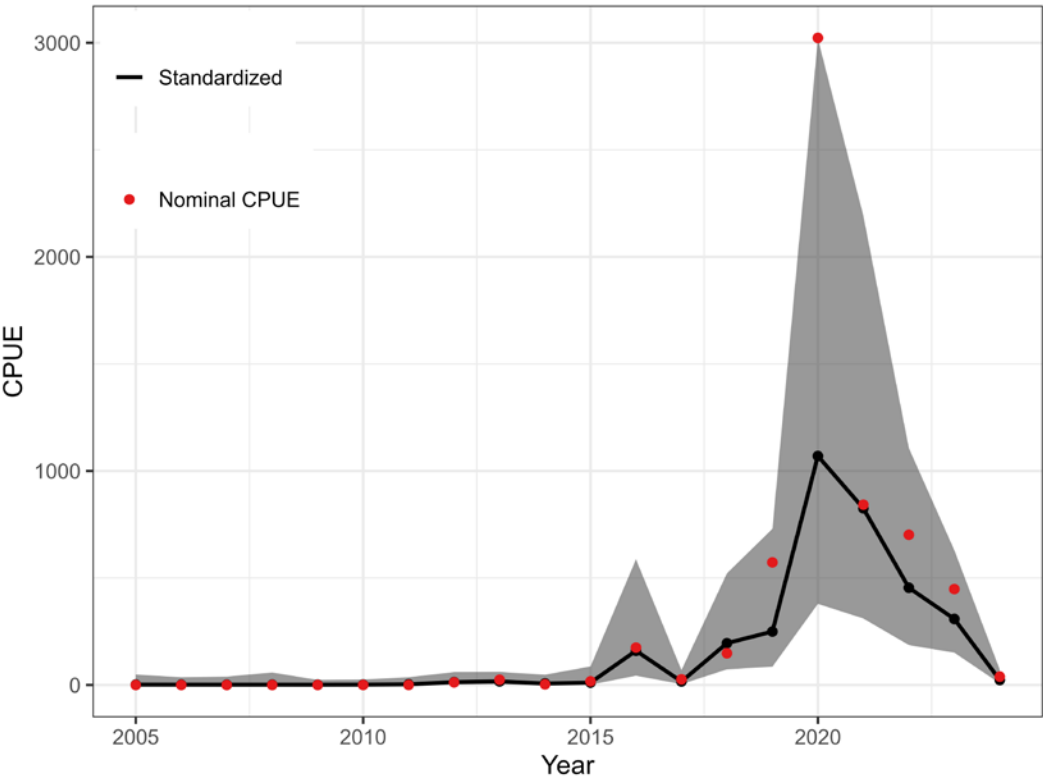
Standardized abundance index for age 0 from the summer survey



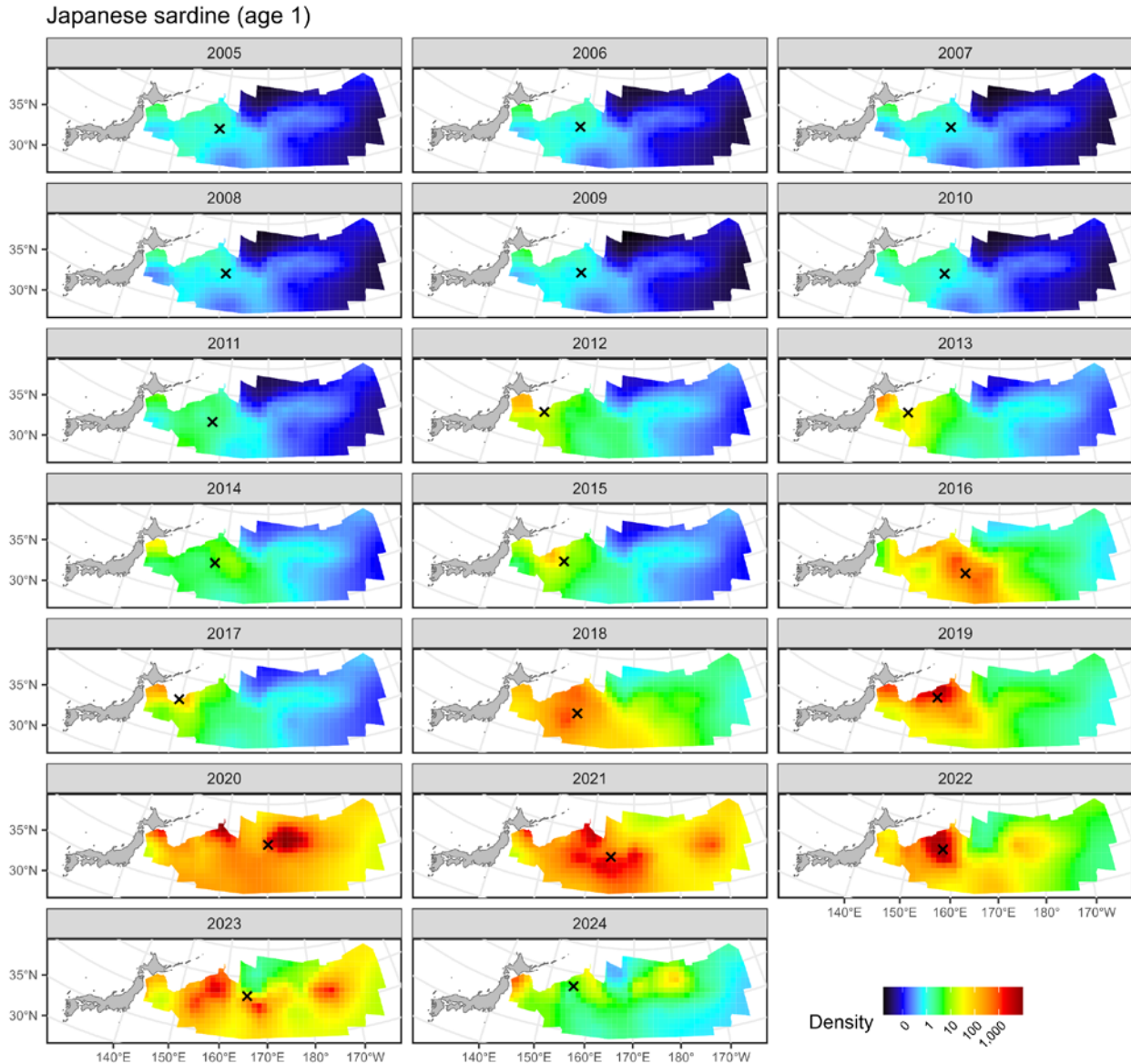
- Widely distributed in the range of 150–180 degrees east longitude
- Although the number of age 0 fish of JS had increased in the late 2010s, it has been on a downward trend since 2020.



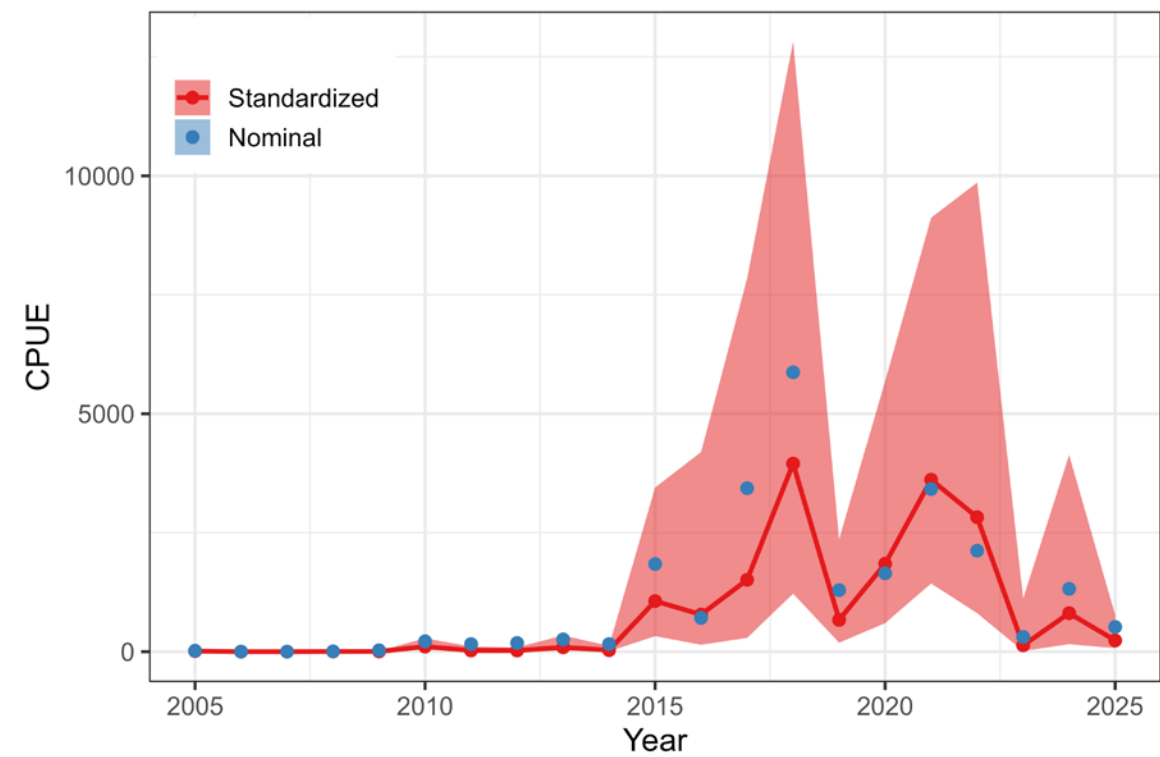
Standardized abundance index for **age 1** from the **summer survey**



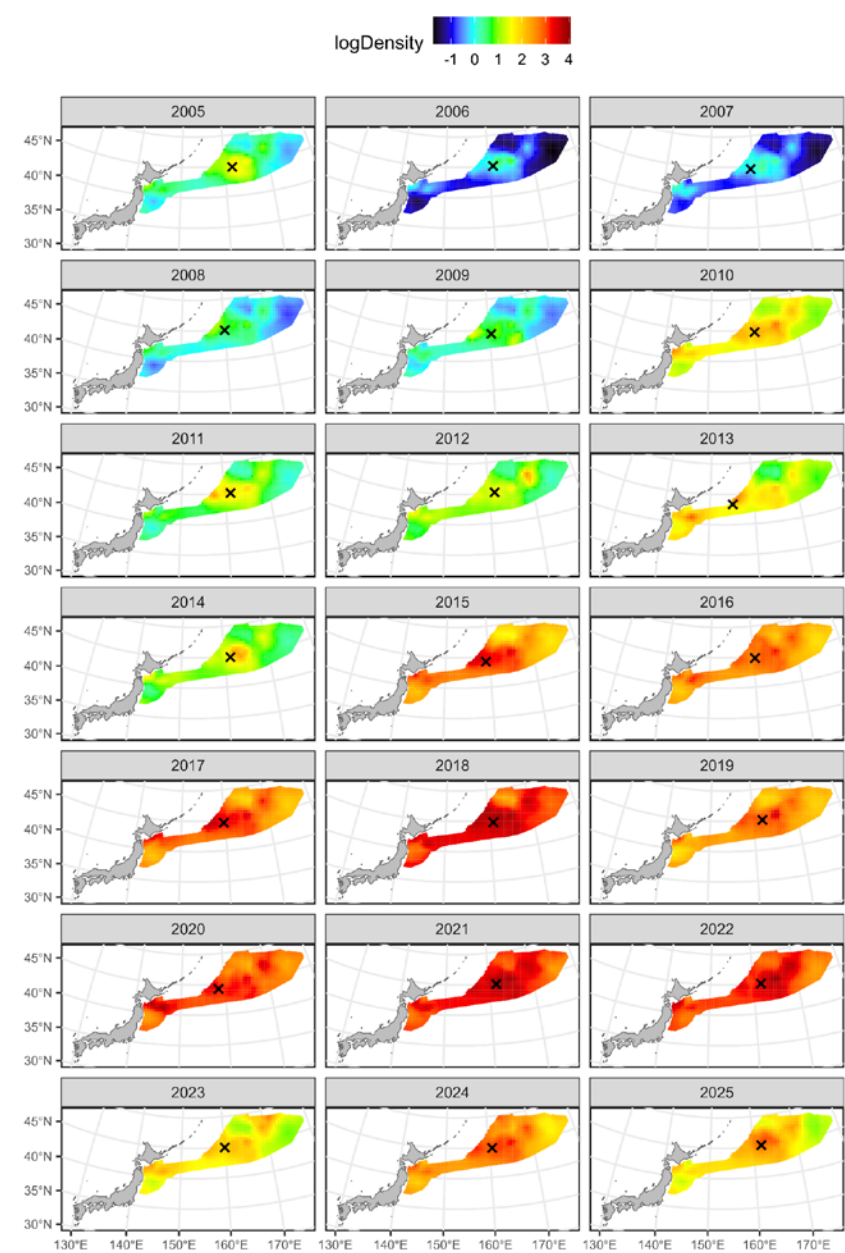
- Age 1 fish of JS are mainly distributed in the range of 150–160 degrees east longitude, but have been found further east offshore in a few years (2020, 2021, 2023)
- Although the number of age 1 fish of JS had increased in the late 2010s, it has been on a downward trend since 2020



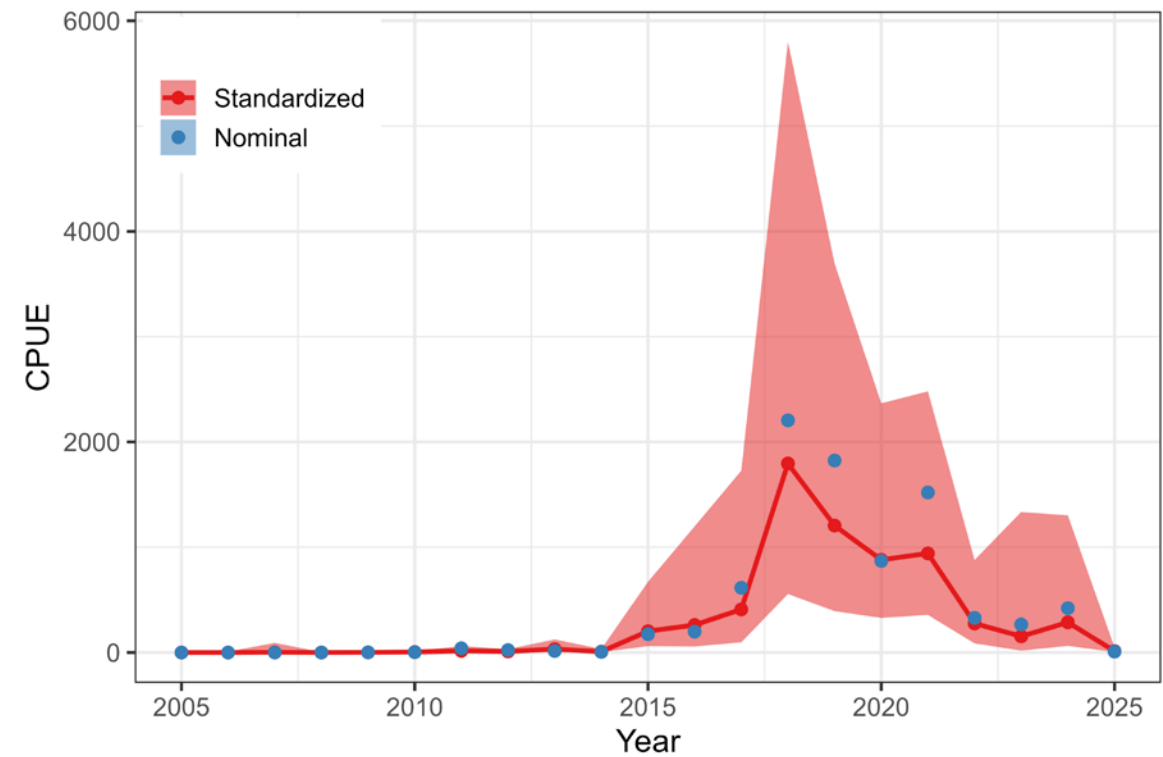
Standardized abundance index for **age 0** from the **fall** survey



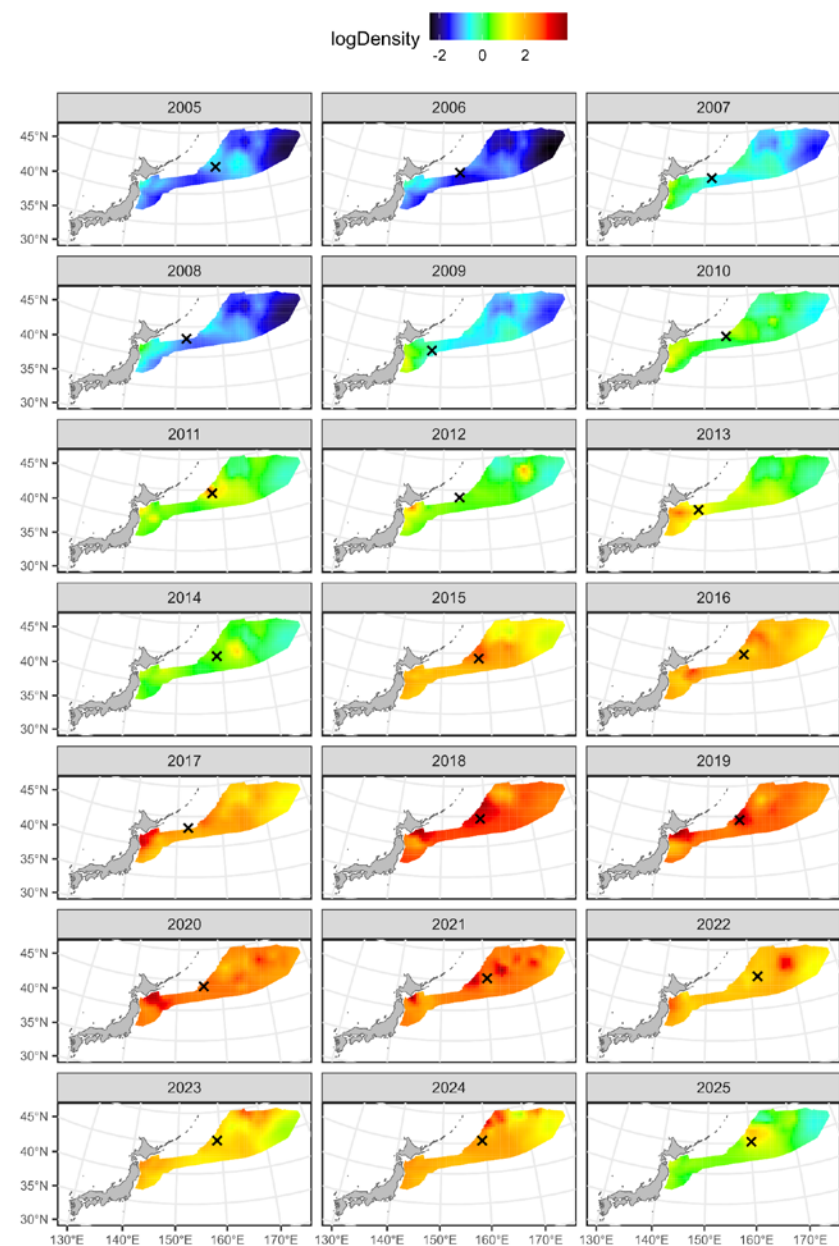
- Widely distributed in the range of 140–170 degrees east longitude
- Although the number of age 0 fish of JS had increased in the late 2010s, it has been on a downward trend since 2021.



Standardized abundance index for **age 1** from the **fall** survey



- The distribution pattern of age 1 fish for JS has changed annually
- Although the number of age 1 fish of JS had increased from 2015 to 2018, but thereafter, it has been on a downward trend



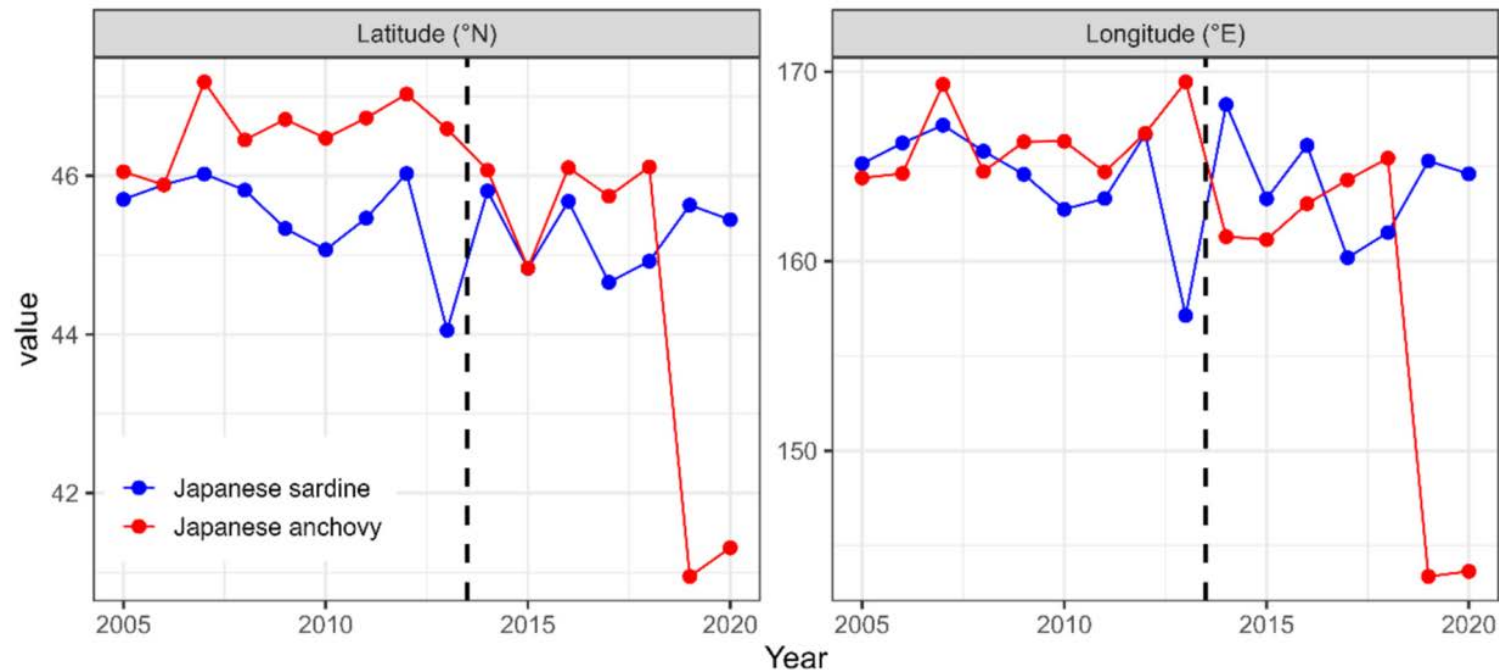
A case study with the fall survey published

Species-Specific Temporal Shifts in Distribution Patterns of Japanese Sardine and Japanese Anchovy in the Western North Pacific in Relation to the Pacific Decadal Oscillation

Kazunari Higashiguchi  | Shota Nishijima | Yasuhiro Kamimura  | Sho Furuichi | Ryuji Yukami

Fisheries Resources Institute (Yokohama), Japan Fisheries Research and Education Agency, Yokohama, Japan

Higashiguchi et al. (2026) Fisheries Oceanography



- The center of gravity (CoG) for Japanese sardine (estimated by VAST) was relative stable over years
- The CoG for Japanese anchovy had moved southward and westward

Please check it out for details!

Summary and next steps

- Recruitment of Japanese sardine is highly variable.
- Japan has conducted surveys for more than 20 years to estimate the abundance of age-0 recruits and age-1 fish in the Pacific stock of Japanese sardine.
- These long-term survey data can be standardized using VAST.
- Understanding trends in young-fish abundance is essential for accurate stock assessment and forecasting.
- We plan to submit a working paper to the Data Preparatory Meeting for SSC JS and would appreciate consideration of the potential use of these standardized indices.