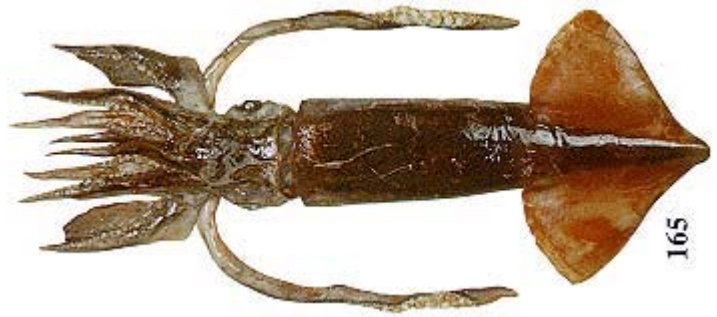
CPUE standardization of neon flying squid caught by Chinese Taipei squid jigging fishery up to 2025

Chinese Taipei

28-30th July 2026

Neon flying squid (NFS)

- Name
  - *Ommastrephes bartramii*
  - Red squid, Aka-ika
- Geographical distribution
  - Temperate and subtropical waters



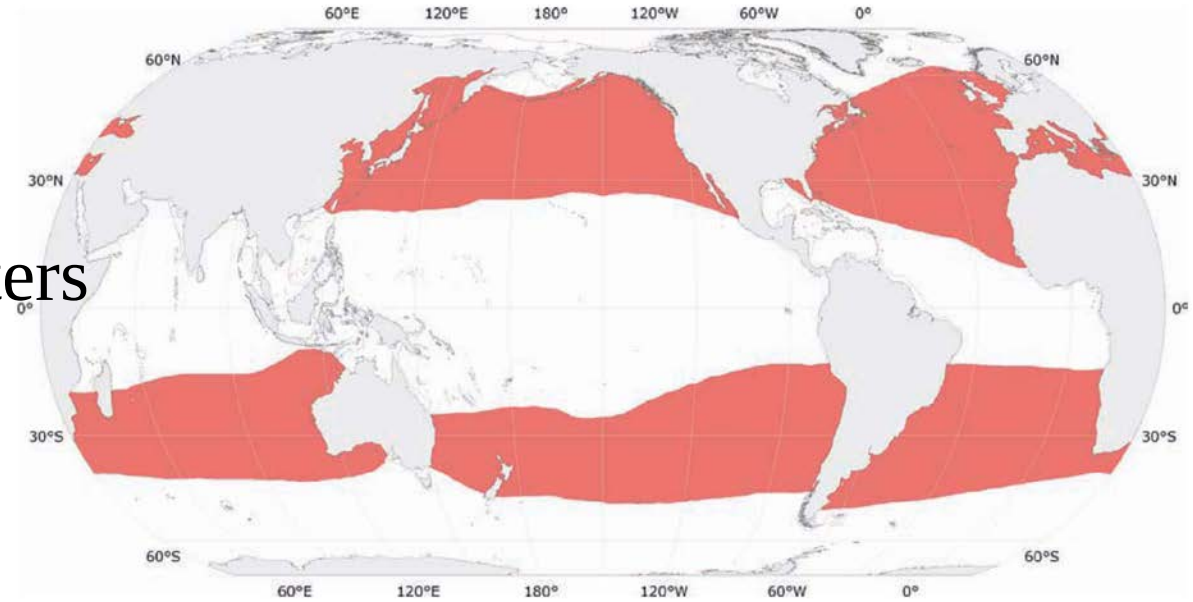


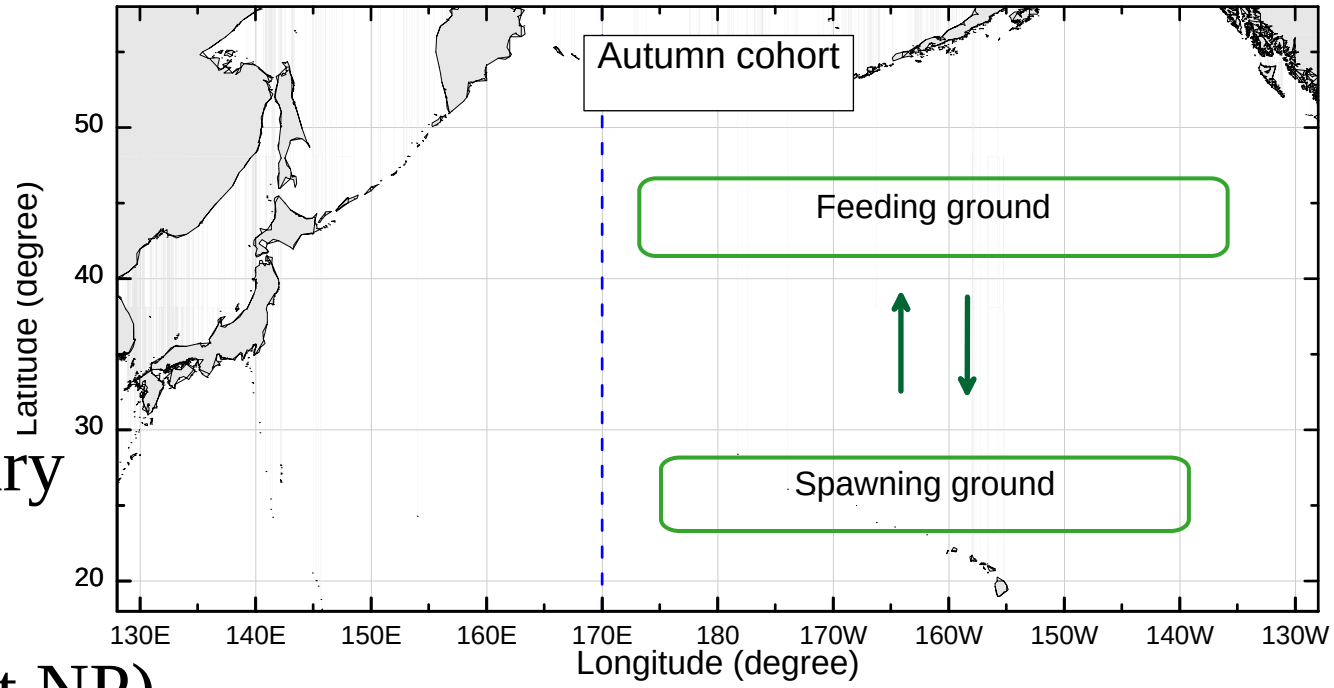
Fig. 291 *Ommastrephes bartramii*
Known distribution

Jereb & Roper eds. (2010) Cephalopod of the World.

NFS populations in the North Pacific

- Two cohorts
  - Autumn cohort
  - Winter-spring cohort

Autumn cohort

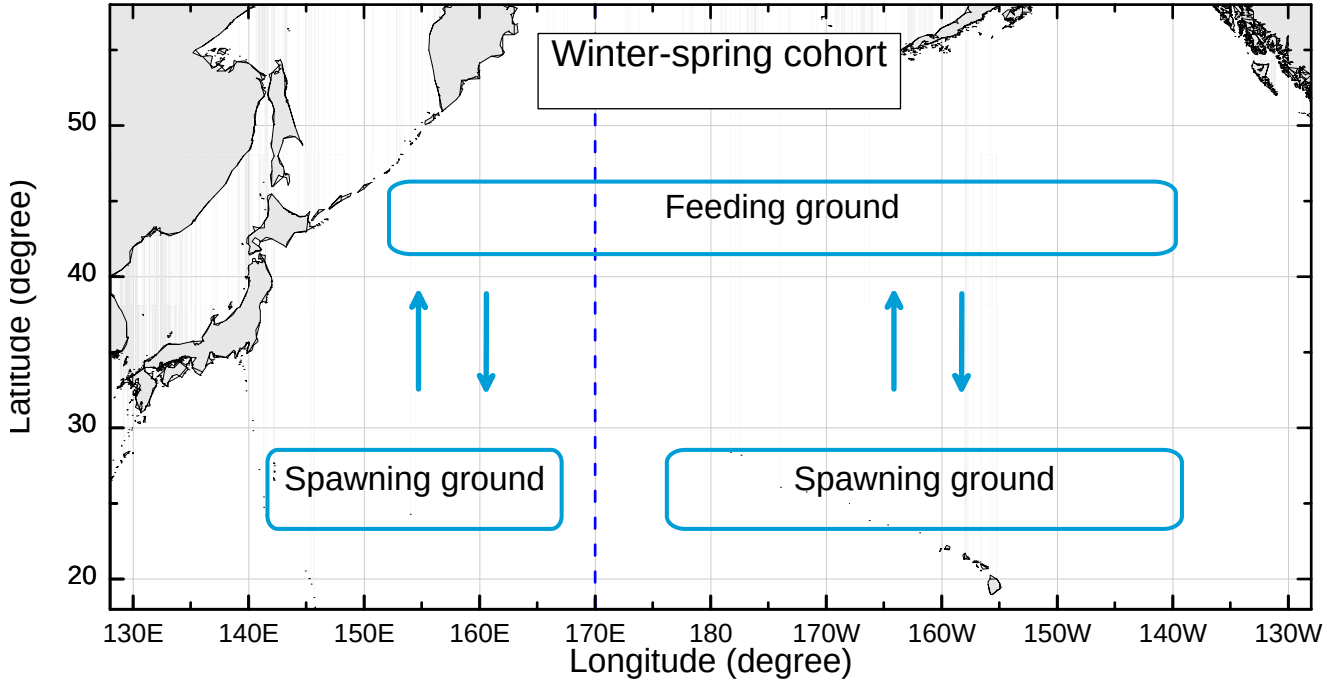


- Hatching dates
  - From September to February
- Feeding grounds
  - East of 170°E (rare in West NP)
  - ML ≥35 cm during June-September
  - Female dominant

- Caught in east of 170°E: Autumn cohort (NE stock)

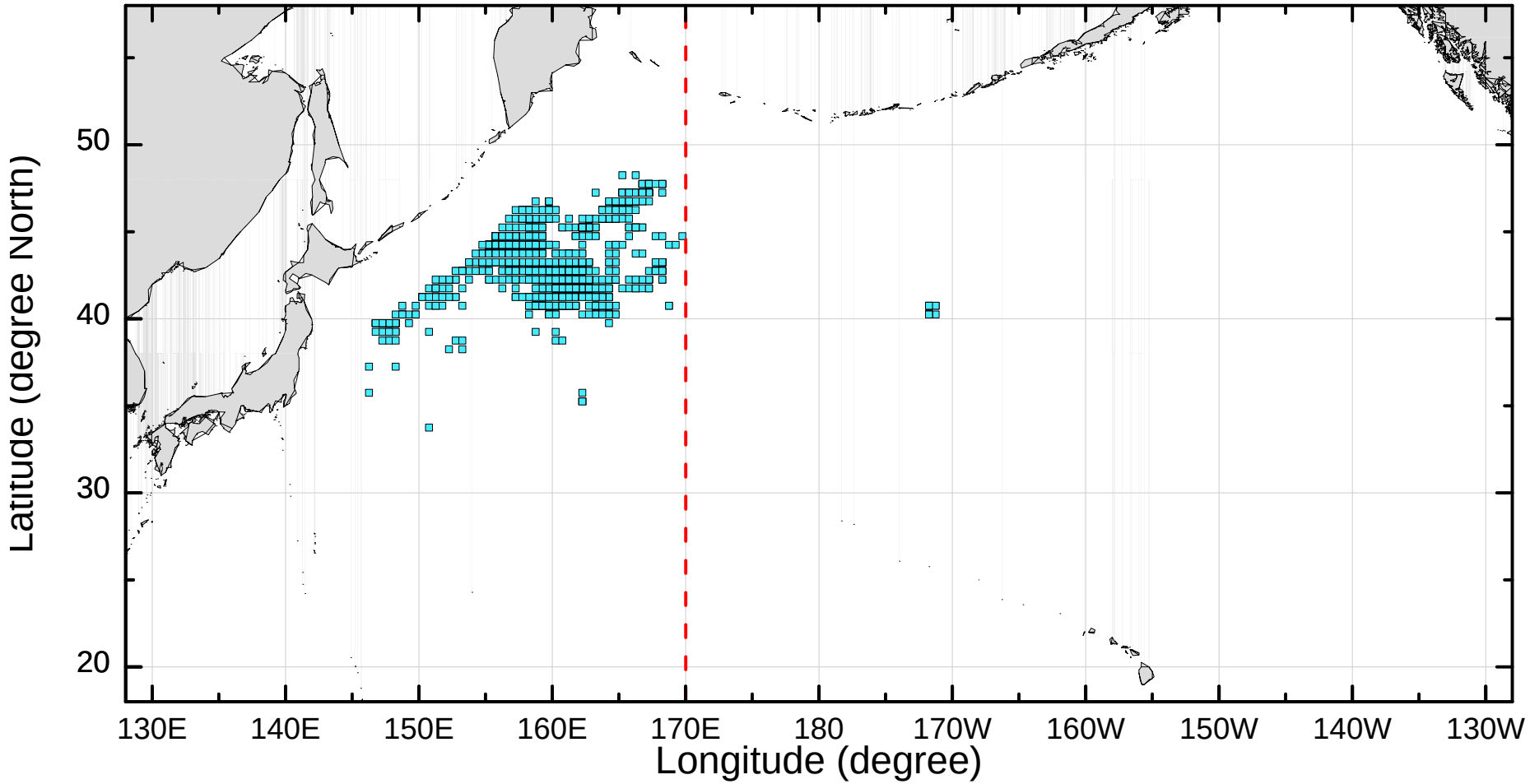
Winter-spring cohort

- Hatching dates
  - From January to August
- Feeding grounds
  - Across the North Pacific
  - ML <30 cm during June-September



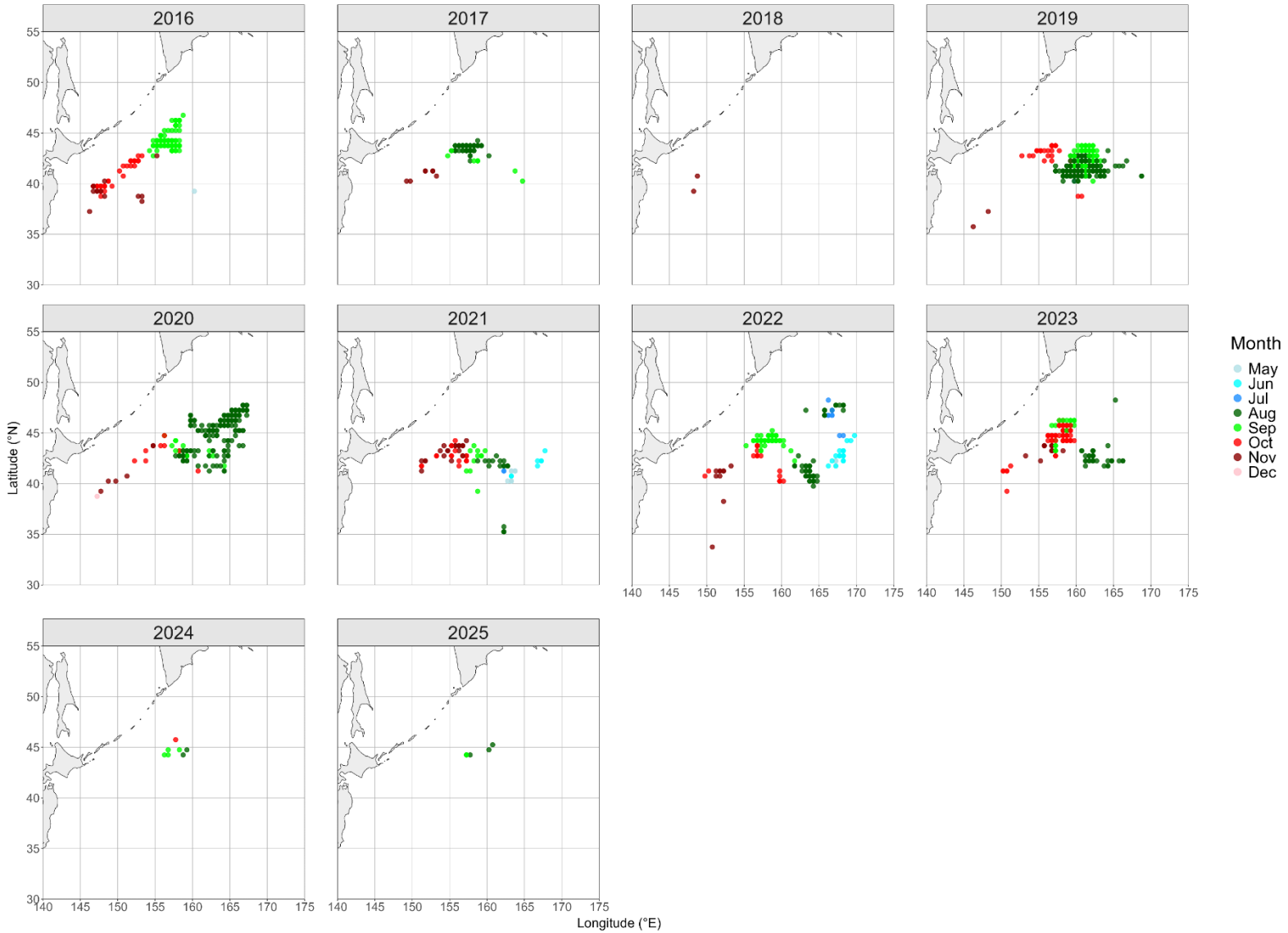
- Caught in west of 170°E: Winter-spring cohort (NW stock)

Distribution of Chinese Taipei NFS fishery (2016-2024)



Target on Winter-spring cohort

Distribution of fishing effort (2016-2025)



GLM

$$\ln(CPUE) = \beta_0 + Year + Month + Lat + Lon + GT + SST + \epsilon$$

Explanatory variables

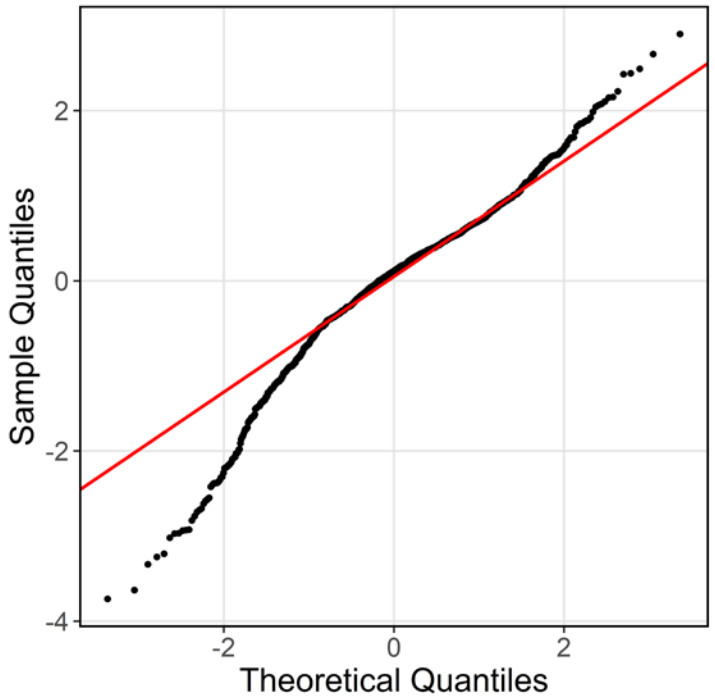
Variable	Code	No. of categories	Description
Year	Year	10	2016-2025
Month	Month	5	July–November
Latitude	Lat	25	$0.5^\circ \times 0.5^\circ$ grids (33.75°N – 48.25°N)
Longitude	Lon	48	$0.5^\circ \times 0.5^\circ$ grids (146.25°E – 169.75°E)
Vessel size (Gross tonnage)	GT	4	(1) <950; (2) 950-1050; (3) 1050-1200; (4) ≥1200 (tons)
Sea surface temperature	SST	4	(1) <16; (2) 16-17; (3) 17-18; (4) ≥18 ($^\circ$C)

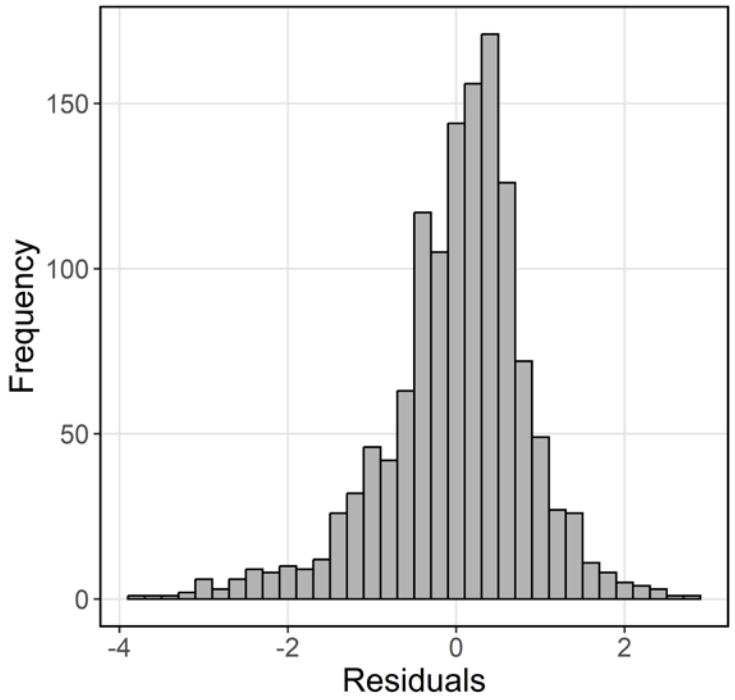
Correlation matrix

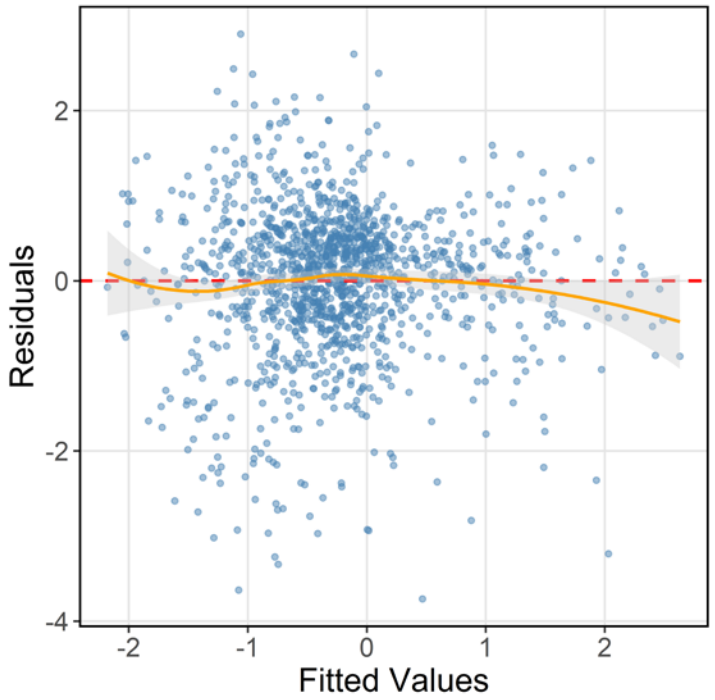
Model selection

No.	GLM model	ϕ	Adj. R^2	Dev. expl. %	AIC	BIC	d
1	$\beta_0 + \beta^Y_{year_i}$	0.924	0.285	29.04	3606.4	3663.3	1194.4
2	$\beta_0 + \beta^Y_{year_i} + \beta^A_{Lat_i}$	0.875	0.323	34.03	3559.4	3740.5	1110.5
3	$\beta_0 + \beta^Y_{year_i} + \beta^A_{Lat_i} + \beta^M_{month_i}$	0.852	0.341	35.98	3528.3	3730.0	1077.6
4	$\beta_0 + \beta^Y_{year_i} + \beta^A_{Lat_i} + \beta^M_{month_i} + \beta^G_{GT_i}$	0.841	0.349	36.95	3514.5	3731.7	1061.4
5	$\beta_0 + \beta^Y_{year_i} + \beta^A_{Lat_i} + \beta^M_{month_i} + \beta^G_{GT_i} + \beta^O_{Lon_i}$	0.803	0.379	42.02	3499.3	3959.6	976.0
6	$\beta_0 + \beta^Y_{year_i} + \beta^A_{Lat_i} + \beta^M_{month_i} + \beta^G_{GT_i} + \beta^O_{Lon_i} + \beta^S_{SST_i}$	0.800	0.381	42.39	3496.9	3972.8	969.8

Model diagnostic





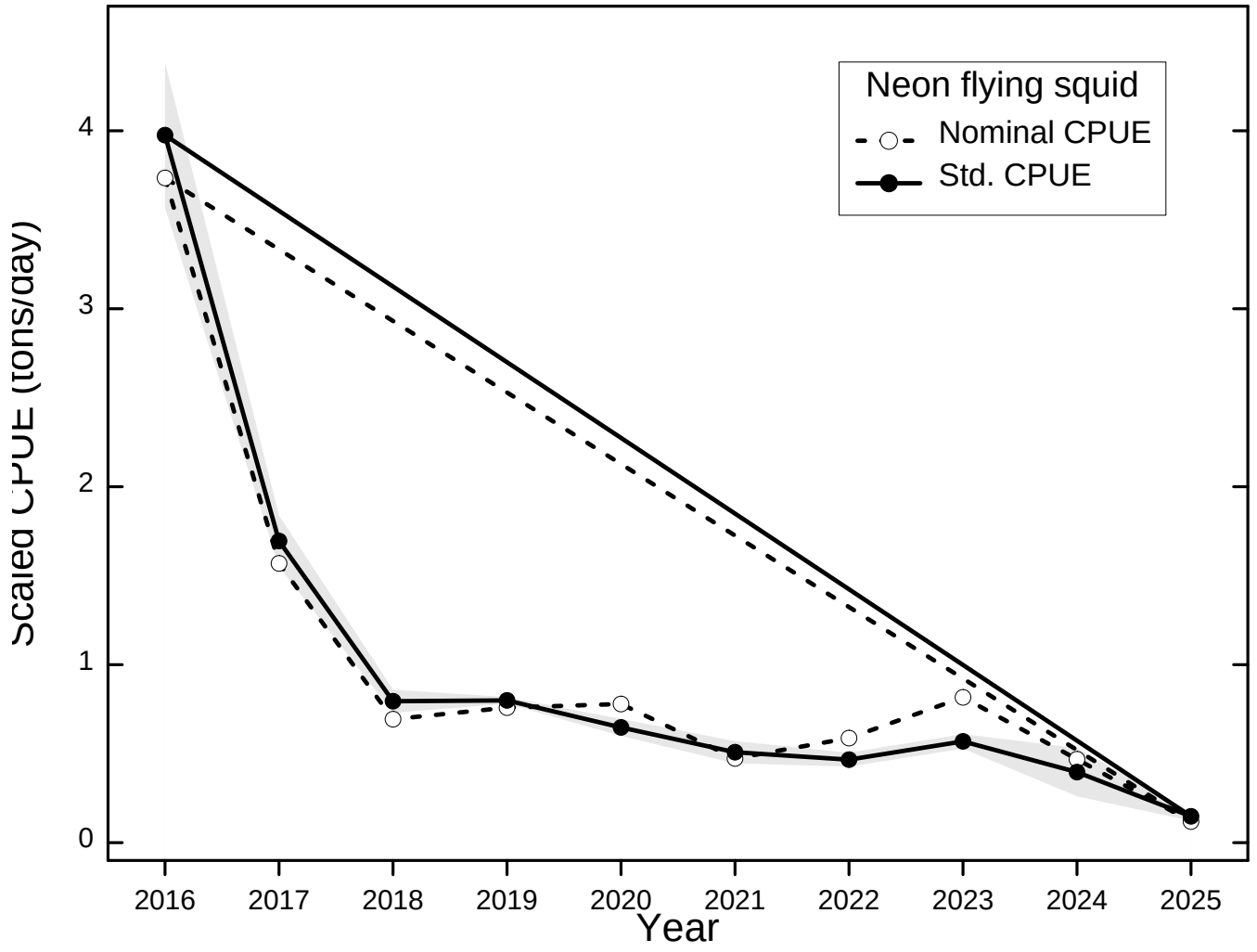


Analysis of deviance table

Variables	*SS*	df	*F*	*p*-value	Significance codes
Year	488.87	9	67.89	<0.001	***
Lat	83.93	24	4.37	<0.001	***
Month	32.87	4	10.27	<0.001	***
GT	16.26	3	6.77	<0.001	***
Lon	85.31	47	2.27	<0.001	***
SST	6.27	3	2.61	0.050	*

Significance codes: ***, < 0.001; **, < 0.01; *, < 0.05

NFS CPUE trend



Year	Nominal CPUE	Std. CPUE	SD	CV (%)	Lower 95% CI	Upper 95% CI
2016	4.77	3.98	2.46	61.8	3.57	4.38
2017	2.00	1.70	0.68	40.0	1.55	1.84
2018	0.89	0.80	0.05	5.9	0.73	0.86
2019	0.97	0.80	0.22	27.8	0.78	0.82
2020	0.99	0.65	0.31	47.6	0.60	0.70
2021	0.60	0.51	0.27	54.1	0.45	0.57
2022	0.75	0.47	0.25	53.2	0.43	0.51
2023	1.04	0.57	0.25	43.6	0.53	0.61
2024	0.60	0.40	0.18	46.3	0.26	0.53
2025	0.15	0.15	0.03	19.1	0.12	0.17

Summary

- Chinese Taipei’s NFS fishery
  - Part-time fishery alongside Pacific saury fishery
  - Target on winter-spring cohort (west to 170°E)
- CPUE trend
  - Decreased during 2016-2018, stable during 2019-2022, decreased during 2023-2025

Supplementary