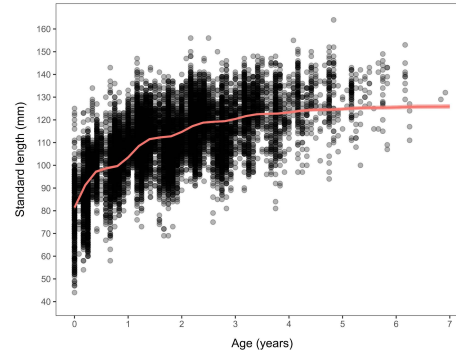




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Southwest Fisheries Science Center Coastal Pelagic Species Research Update



Presenter

Annie Yau, Fisheries Resources Division Director



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Outline

- CPS Assessment Schedule
- Survey Updates
 - Summer CPS Survey 2023 results
 - Summer CPS Survey 2024 planning
 - Integrated Survey 2025
- Life History Research
- Genetic Research
- FUTURE SEAS update

CPS Assessment Schedule



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- **Pacific Sardine benchmark** assessment 2024
 - STAR Panel held Feb 21-23 at SWFSC
 - SSC/PFMC review and adoption (this mtg)
- **Pacific Sardine update** assessment 2025
 - SSC CPSSC review in late Feb 2025
 - SSC/PFMC review and adopt in Apr 2025
- **Pacific mackerel catch-only update** 2025
 - SSC CPSSC review in Spring 2025
 - SSC/PFMC review and adopt in Jun 2025

Survey Updates



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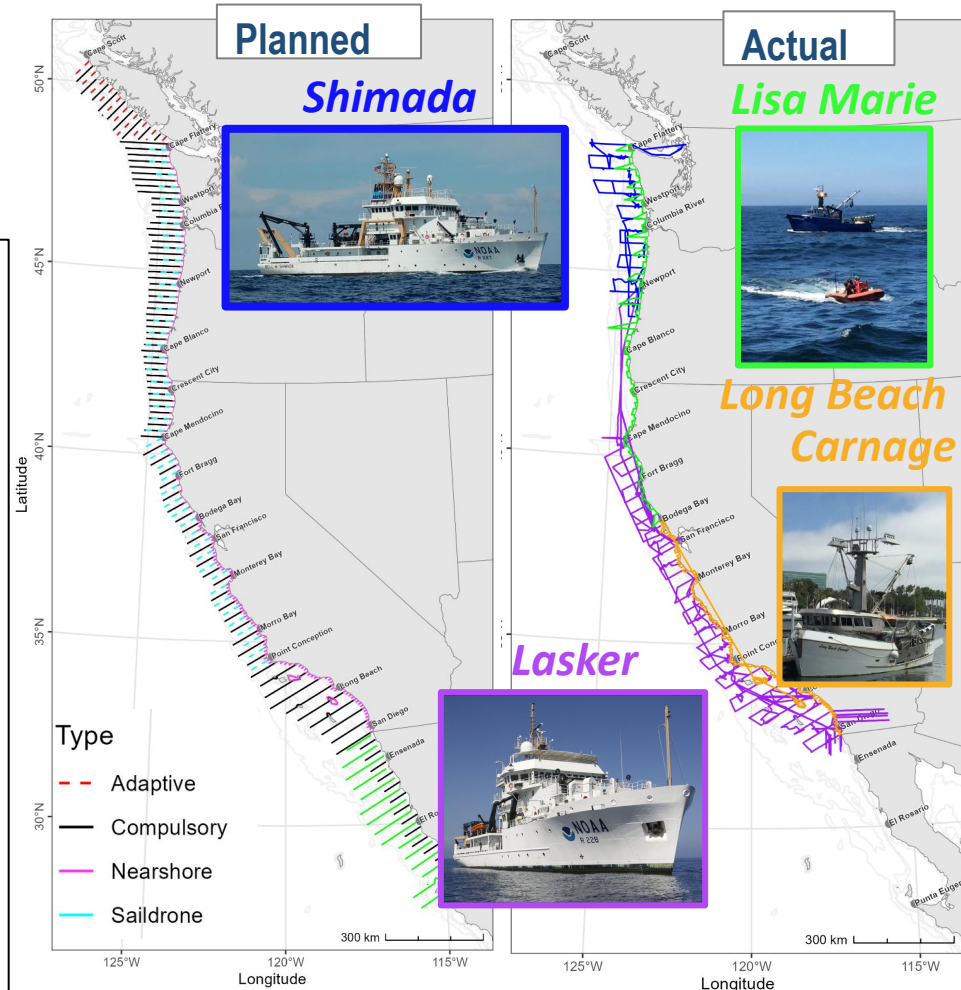
CPS Survey Summer 2023 results

Plan:

- **81 DAS** on NOAA *Lasker*: Punta Eugenia, Baja CA to Vancouver Is.
- *Lisa Marie* & *Long Beach Carnage*: US West Coast (Nearshore)
- Saildrone (157 DAS): Pt. Conception to Cape Flattery

Actual:

- **52 DAS**: 37 DAS on *Lasker* (San Diego to Cape Mendocino), and 15 DAS on *Shimada* (Florence, OR to Cape Flattery)
- *Lisa Marie* & *Long Beach Carnage*: as planned with greater sampling lag
- Saildrone (not shown due to sampling lag)



Survey Updates



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CPS Survey Summer 2023 results

All CPS | Biomass (Core + Nearshore)

Species	Stock	Region	Biomass			CV
			(t) Mean	95% CI (Lower)	95% CI (Upper)	
<i>Pacific Herring</i>	All	All	84,965	42,215	156,387	27
<i>Northern Anchovy</i>	Central	All	2,608,829	312,653	4,957,227	48
	Northern	All	11,343	491	30,265	72
<i>Pacific Sardine</i>	Northern	All	77,252	17,856	171,829	47
	Southern	All	96,045	54,648	150,026	21
<i>Pacific Mackerel</i>	All	All	34,857	4,357	86,886	70
<i>Jack Mackerel</i>	All	All	158,409	50,492	270,262	28

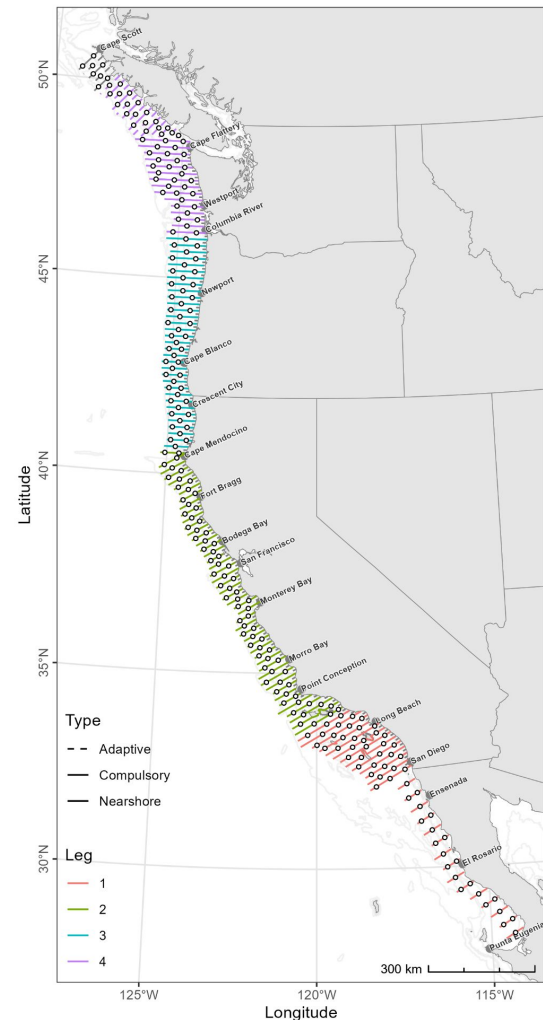
Survey Updates



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CPS Survey Summer 2024 plan

- 85 Days At Sea (DAS) on *Lasker*
 - 5 DAS testing Multi-Function Trawl
 - 80 DAS surveying
 - Baja MX to Vancouver Island
- *Lisa Marie* and *Long Beach Carnage*: US West Coast nearshore sampling



Survey Updates



Integrated West Coast Pelagics Survey

- Planning ongoing for 2025 operational integrated survey on the *R/V Shimada*
- A joint SWFSC-NWFSC planning workshop was held in La Jolla in January
- Multi-Function Trawl (MFT) with net mensuration system procured; duplicate procurement in progress
 - December 2023 - Sea trials (*Lasker*)
 - Summer 2024
 - *Shimada & Franklin* (Canada)- net comparison testing of MFT with Aleutian Wing Trawl (AWT); evaluate MFT performance for hake
 - *Lasker* - MFT testing and incorporation in CPS Survey
 - Spring 2025 - Evaluate performance on charter vessel

Survey Updates



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Integrated West Coast Pelagics Survey

- Hiring additional staff - project coordinator, data processing automation, eDNA development and exploration
- Outreach events on a monthly basis are being provided to give updates to stakeholders, answer their questions, address their concerns
 - April 8, 2024 - 6:00 pm - Hybrid here in GAP/Elliott room and virtually
 - More to be scheduled...

<https://www.fisheries.noaa.gov/west-coast/science-data/integrated-west-coast-pelagics-survey>

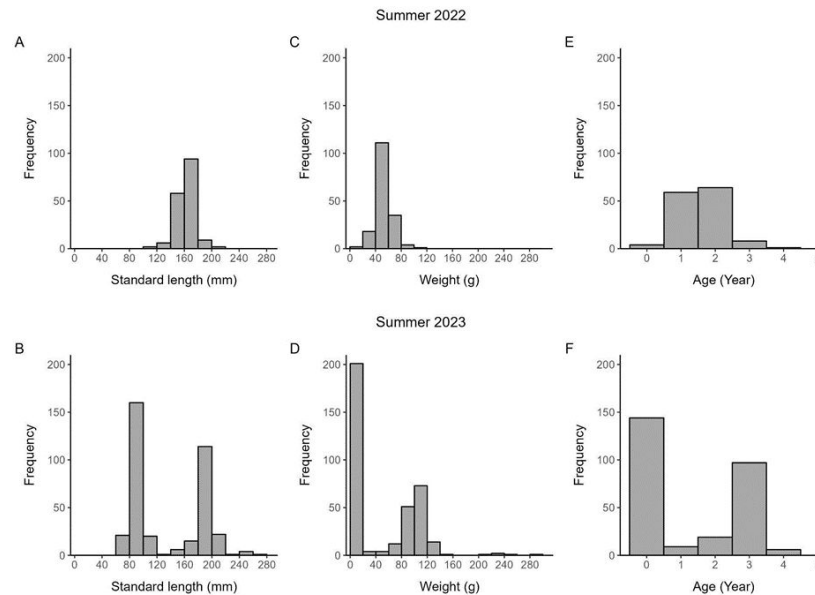


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Life History Research

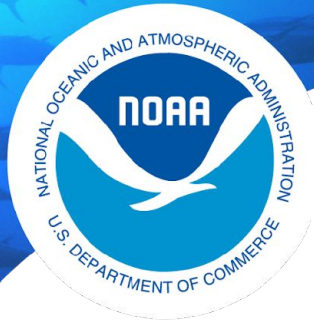
2024 Pacific Sardine Benchmark Assessment

- Life history update included in the assessment report
 - All northern stock sardine aged from CPS surveys conducted in 2022 & 2023



Life History Research

Published Research on CPS Ageing



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- **CSNA growth model including seasonality**
Schwartzkopf et al. 2023. Modeling somatic and otolith growth of the central subpopulation of northern anchovy by incorporating seasonality. Fishery Bulletin 121:172-187.
- **FT-NIRS method for estimating CPS ages**
Saas et al. 2024. Development of methods for collecting spectral data from fourier transform near-infrared spectroscopy to age three small coastal pelagic species. NOAA Tech Memo.
- **Aerial survey Pacific sardine biomass**
Dorval et al. 2024. Computing bias and variance for Pacific Sardine biomass estimated from aerial surveys in California nearshore waters. Fisheries Research 274:106999.
- **Sardine growth validation**
James et al. 2024. Validation of periodicity of growth band formation in Pacific Sardine from a captive growth experiment. Marine Biology 171:105.

Life History Research

Ongoing Research on CPS



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- **Review of sardine population structure**

- Evaluation of evidence supporting subpopulation hypothesis (Craig et al. in prep)
- Evaluation of somatic growth patterns as supporting evidence of subpopulations (Erisman et al. in prep)
- Evaluation of revised habitat model (Erisman et al. in prep)
- A stable-isotope model using otoliths to validate the habitat model (Dorval)

- **Ageing sample sizes**

Determining appropriate sample sizes for ageing of CPS for inclusion in stock assessments (Schwartzkopf et al. in prep)

- **Variability in sardine age and growth**

Variability in age and growth of Pacific Sardine in US waters during the recent period of low population biomass, 2012-2021 (James et al. in prep)

- **Growth, recruitment, climate, stocks**

- Relationships between somatic growth, recruitment, climate, and stocks using otolith biochronologies (James & Erisman)





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Ongoing Genetics Research

- **Population structure in Pacific sardine**

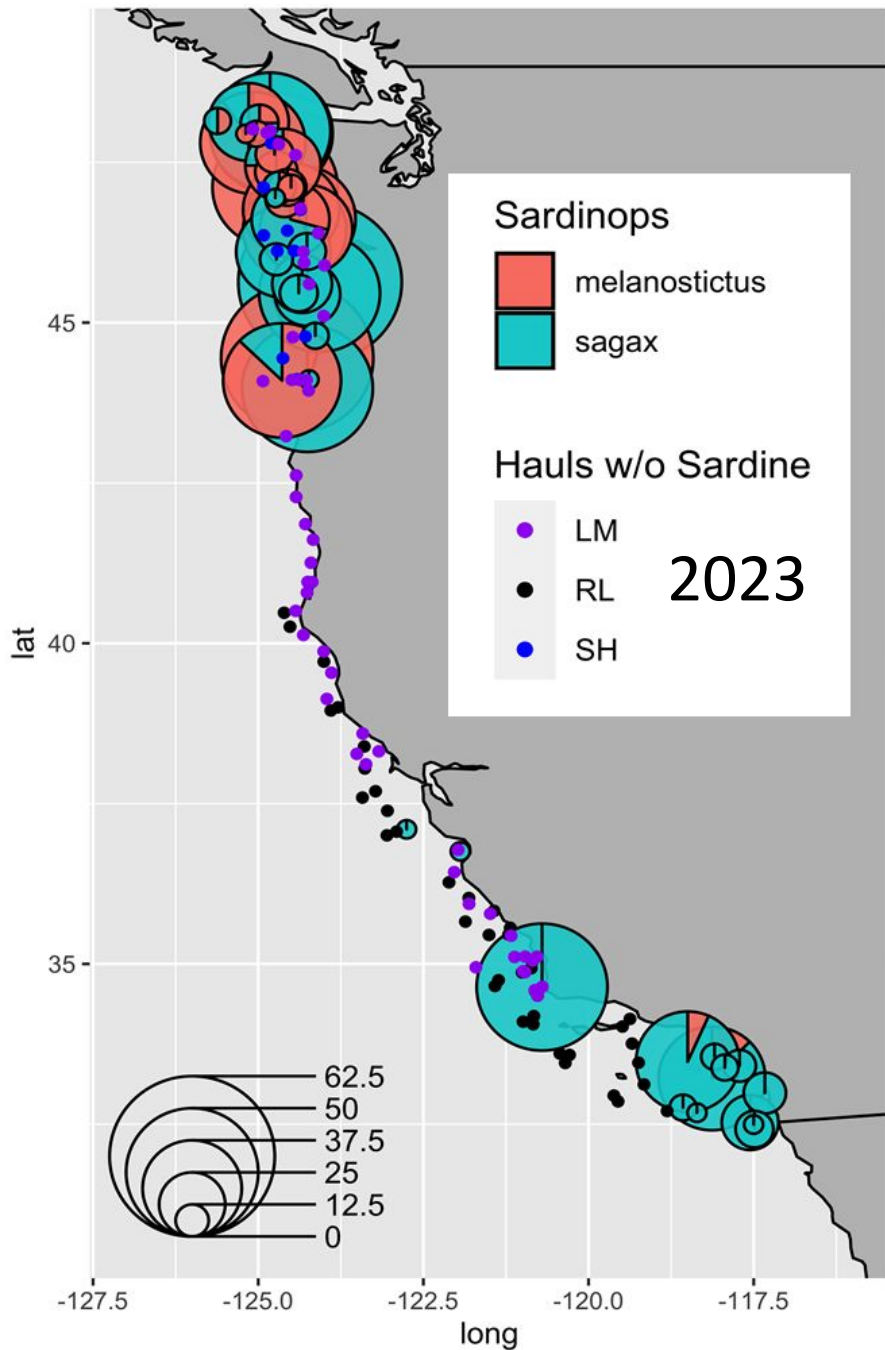
Using whole genome sequencing to investigate population structure; completed for west coast (USA and Mexico), awaiting data from Gulf of California to complete analysis.

- **Japanese Sardine**

DNA sequencing for archived tissue samples from SWFSC surveys completed for 2013-2023. Japanese sardine were found in 2022 and 2023 from southern California to Oregon/Washington



Genetics Research: Japanese sardine



Year	# Genotyped	Pacific Sardine	Japanese Sardine
2023	825	491	334
2022	172	100	72
2021	81	81	0
2019	198	198	0
2018	131	131	0
2017	269	269	0
2016	622	622	0
2015	175	175	0
2014	211	210	1
2013	892	892	0

FUTURE SEAS Update



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Stakeholder engagement:

- Nov 2022 [Stakeholder engagement meeting report](#) available in NOAA library
- Results up to date shared at virtual stakeholder workshop on Feb 5, 2024

Publications:

- Climate-driven MSE ([Wildermuth et al. 2023](#))
- Economic analysis of response to environmentally driven shifts in CPS availability ([Quezada et al. 2023](#))
- Work highlighted in [Appendix E, Developing Indicators of Climate Change and Variability, of Ecosystem Status Report](#) presented at March 2024 PFMC meeting



Questions?

