

# 2023 Annual Report on the North Pacific Observer Program

for the  
North Pacific Fishery Management Council's  
Scientific and Statistical Committee

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# Outline

What we did in 2023.

What we wanted to change and why.

What we are doing in 2024 and how we decided.

What we recommend in 2025.



# 2023 Annual Report

## Chapter 3 - Deployment Performance Review



# North Pacific Observer Program Overview

## Coverage categories:

Coverage Category	Percentage (2023)			
	Monitoring	Tonnage	Vessels	Trips/deliveries
Full	≥100%	89%	15%	32%
Partial	<100%	11%	90%	68%

Note: Some vessels participate in both full and coverage categories

## Monitoring methods:

Monitoring Method	Coverage Category	
	Full	Partial
At-sea Observers	Y	Y
At-sea Electronic Monitoring (Fixed gear EM)		Y
Compliance video at-sea + shoreside observers (Trawl EM)	Y	Y



# North Pacific Observer Program Overview

## Annual Deployment Plan (ADP) and Annual Report (AR)

- **ADP** For the *upcoming* year :
  - **Draft:** Evaluate alternative allocation methods
  - **Final:** Finalize fishing effort predictions and monitoring budget, determine monitoring rates for partial coverage strata
- **AR** For the *previous* year :
  - Evaluate deployment of monitoring
- Majority of the analyses are focused on partial coverage!



# 2023 AR: Deployment Strata

## Full coverage:

1. FULL - Trips taken by vessels required to have, or opted into, full observer coverage;
2. EM TRW EFP - Trips in the full coverage trawl EM stratum harvesting pollock with pelagic gear in the BSAI

## Partial observer coverage:

1. OB HAL - Trips using hook-and-line gear
2. OB POT - Trips using pot gear
3. OB TRW - Trips using trawl gear

## Partial coverage EM:

4. EM HAL - Trips by vessels in the EM pool and fished with hook-and-line gear
5. EM POT - Trips by vessels in the EM pool and fished with pot gear
6. EM TRW EFP - Trips in the partial coverage trawl EM stratum harvesting pollock with pelagic gear in the GOA

## Zero coverage:

7. ZERO - Trips by jig vessels and vessels under 40 ft LOA



# 2023 Overview



- **350** individual observers deployed to **343** vessels and at **11** processing facilities for a total of **32,789** observer days
  - 29,232 full coverage; 3,557 partial coverage
- **179** vessels in the fixed-gear EM pool; **124** fished
  - **305** selected fixed-gear trips for EM coverage; **211** reviewed
- **85** trawl vessels in the trawl EM EFP

For the BSAI and GOA combined, **90.6%** of pelagic trawl catch was on trips in the full coverage category and **9.4%** was on trips in partial coverage

- All partial coverage trips were in the GOA and 33.5% of their catch was monitored either by an at-sea or shoreside observer
- Total monitoring of GOA pelagic trawl is higher if at-sea compliance EM is considered

For the BSAI and GOA combined, **94%** of *non*-pelagic trawl catch was on trips in the full coverage category and **6%** was on trips in partial coverage

- Partial coverage trips occurred in both the BSAI and GOA with 45% and 42% of their catch monitored, respectively
- The Pacific cod trawl CV cooperative program (PCTC) moved more partial coverage trips into full coverage in 2024



**NOAA**  
FISHERIES

## From 2023 AR Table 3-5. -- Total vessels, total trips, and sampled trips in 2023

Strata	Vessels	Trips	Sampled Trips	Coverage		Meets expected?
				Expected	Realized	
Full	101	1,592	1,588	100.0	99.7	No - lower than expected*
EM TRW EFP (BSAI)	46	1,162	1,162	100.0	100.00	Yes
OB HAL	286	1,291	251	17.9	19.4	Yes
OB POT	176	1,074	191	17.1	17.8	Yes
OB TRW	67	657	212	22.7	32.3	No - higher than expected
EM HAL	112	619	139	30.0	22.5	Preliminary rates realized as of March 31, 2024
EM POT	53	262	49	30.0	18.7	
EM TRW EFP (GOA)**	34	580	188	33.3	32.4	Yes

\* Four open access, non-pelagic, full-coverage trips targeting Pacific cod were not monitored.

\*\* Evaluation of EM trips sampled by a shoreside observer. All 580 trips were monitored by EM.





## Excerpt from 2023 AR Table 3-4. – Logged trips in each partial coverage stratum in 2023

Strata	Trip Disposition	Selected Trips	Total Trips	Actual (%)	Programmed (%)	p-value
OB HAL	Initial random selection	229	1,278	17.92	17.87	0.971
	After cancellations	177	1,146	15.45	17.87	<b>0.034*</b>
	With inherits	248	1,146	21.64	17.87	<b>0.001*</b>
	After waivers	245	1,146	<b>21.38</b>	17.87	<b>0.002*</b>
OB POT	Initial random selection	196	1,188	16.50	17.09	0.616
	After cancellations	161	1,062	15.16	17.09	0.103
	With inherits	204	1,062	19.21	17.09	0.073
	After waivers	194	1,062	18.27	17.09	0.308
OB TRW	Initial random selection	208	785	26.50	22.68	<b>0.012*</b>
	After cancellations	180	721	24.97	22.68	0.142
	With inherits	211	721	29.26	22.68	<b>0.000*</b>
	After waivers	211	721	<b>29.26</b>	22.68	<b>0.000*</b>



## Combination of 2023 AR Tables 3-2, 3-3, A-2, and A-3 : Trip cancellations and inherited monitoring in ODDS, 2022 and 2023

Strata	2022				2023			
	Randomly Selected	Canceled	Total Monitored	Inherited	Randomly Selected	Canceled	Total Monitored	Inherited
OB HAL	277	116 (41.7%)	206	74 (35.9%)	243	53 (21.2%)	245	71 (29.0%)
OB POT	228	66 (28.9%)	202	57 (28.2%)	200	37 (18.5%)	194	43 (22.2%)
OB TRW	247	55 (22.3%)	219	39 (17.8%)	219	31 (14.2%)	211	31 (14.6%)
EM HAL	230	13 (5.7%)	228	16 (7.0%)	222	25 (10.9%)	212	21 (9.9%)
EM POT	115	3 (2.6%)	118	8 (6.8%)	103	9 (6.9%)	97	5 (5.2%)

# 2023 AR: Summary of Deployment Performance Review

- At-sea observers: Costs and total monitored days were well within the expected distribution of the 2023 ADP
- No serious spatiotemporal biases in the distribution of monitoring relative to fishing effort
- Some observer effects detected (monitored *OB HAL* trips fished fewer days and had lower landed catch the unmonitored trips)
  
- Rates of cancellation/inherited trips in at-sea observer strata were high in 2022 and affected monitoring rates in 2023.
- Review times for Fixed Gear EM strata (*EM HAL* and *EM POT*) were too delayed to evaluate, similar to 2022



# 2024 Annual Deployment Plan

This is the Deployment Model on the water today!



# 2024 Annual Deployment Plan

## Challenges were to....

- Meet the data needs of users with a wide range of analytic and management objectives
- Collect data that reflects the full range of fishing activities: samples which represent the characteristics of the larger population
- Collect the best and most data under variable budgets using all the monitoring tools now available

## Proposed a variety of sampling designs:

- *Defining* the population: all fishing trips harvesting groundfish and halibut in federal fisheries
- *Dividing* this population into selection pools = **stratification**
- *Distributing* monitoring resources to the strata = **allocation**



# 2024 Annual Deployment Plan

- The 2024 Draft ADP evaluated alternative designs:
  - 3 Stratification methods x 4 Allocation methods = **12** Designs
  - 3 Budget scenarios
- Using evaluation criteria:
  - Cost variance
  - Number of sampled trips with biological/composition data
  - Interspersion: proportion of unmonitored trips nearby in space & time to monitored trips
  - Detection of rare species
  - Data timeliness
  - Trip-level variances of Chinook PSC, halibut PSC, and discards



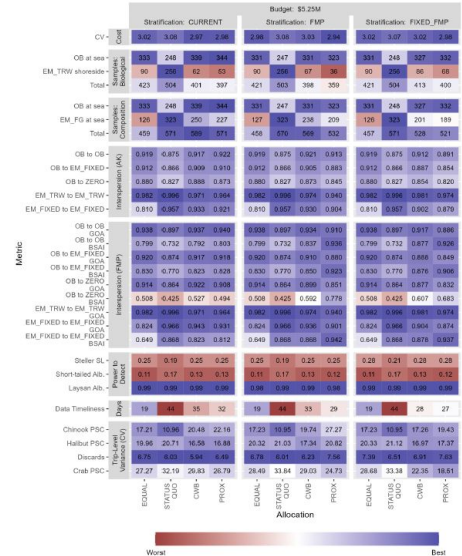
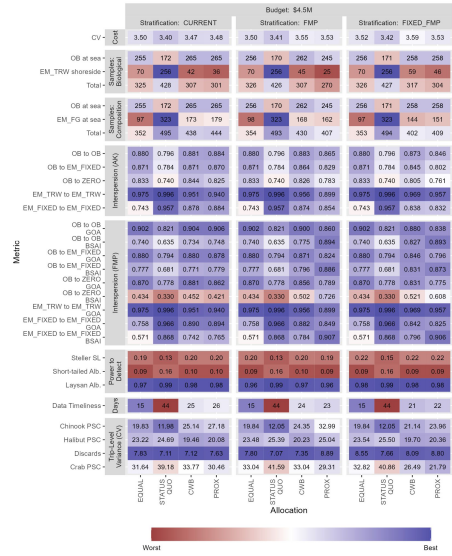
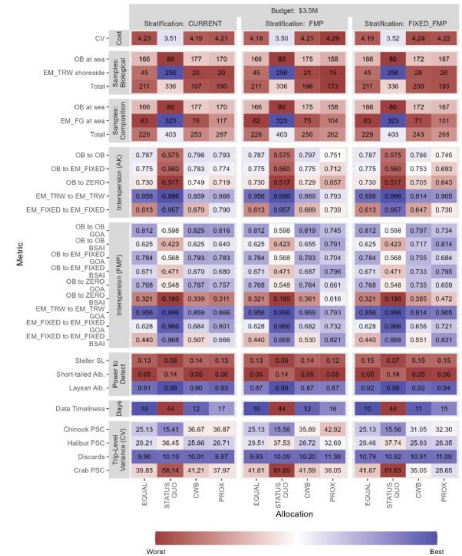
# 2024 Annual Deployment Plan

- After a lot of analyses and comparisons...

**\$3.5 M**

**\$4.5 M**

**\$5.25 M**



- Details can be found in the [Draft ADP](#)



# 2024 Annual Deployment Plan

- Chosen Design:
  - Stratification: ‘Fixed-FMP’ where **strata defined by:**
    - Monitoring method
    - Gear type defined (fixed gear or trawl gear)
    - FMP (BSAI or GOA)
  - Allocation: ‘**Proximity allocation**’, using an algorithm that
    - reduces spatiotemporal data gaps
    - guards against low sample size
    - Includes fixed-gear EM in allocation algorithm





# Evaluations of Designs

- ***Fixed FMP stratification for 2024.***



Facilitates multiple fixed gear types on the same trip.



Accounts for FMP differences without resulting in strata with too little effort.

- **When combined with *Proximity* allocation:**



Greatly improves EM timeliness.



Uses cost / effort in its algorithm to avoid over/under sampling.



Relatively good interspersation, especially in the BSAI.



Relatively good power to detect albatross in the BSAI.



Decreased between trip CV of Pacific halibut and Crab PSC



Increased between trip CV of Chinook PSC in the GOA, when trawl EM was assumed to not operate under the EFP

# 2024 ADP : Partial Coverage Stratification

Monitoring Method	2023		2024		
	Gear Type	Strata	FMP	Gear Type	Strata
At-Sea Observer	Hook and Line	OB_HAL	GOA	Fixed	OB_FIXED - GOA
	Pot	OB_POT	BSAI	Fixed	OB_FIXED - BSAI
	Trawl	OB_TRW	GOA	Trawl	OB_TRW - GOA
At-Sea EM	Hook and Line	EM_HAL	BSAI	Trawl	OB_TRW - BSAI
	Pot	EM_POT	GOA	Fixed	EM_FIXED - GOA
	Trawl	EM_TRW*	BSAI	Fixed	EM_FIXED - BSAI
Compliance EM + Shoreside Obsv	Trawl	EM_TRW*	GOA	Trawl	EM_TRW - GOA
No monitoring	Fixed	ZERO	Either	Fixed	ZERO

\*Pollock trawl EM EFP in GOA, Pollock trawl EM in BSAI is full coverage



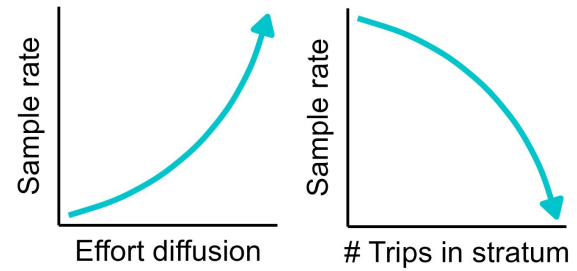
# Allocation: Distributing sampling effort to strata

**Proximity allocation** evolved from the 15% hurdle used in 2023 in the following steps:

- Analysts noticed that having a single hurdle (set at 15%) resulted in different levels of data gaps among strata.
- Analysts improved the hurdle approach by estimating the stratum-specific hurdles that would result in the same level of data gaps among strata.
- Analysts improved the stratum-specific approach by measuring data gaps with equal-sized spatial cells rather than NMFS areas which differ in size.
- Analysts improved the stratum-specific approach further by incorporating an equation that buffers against low sample sizes, thereby producing the proximity allocation method.

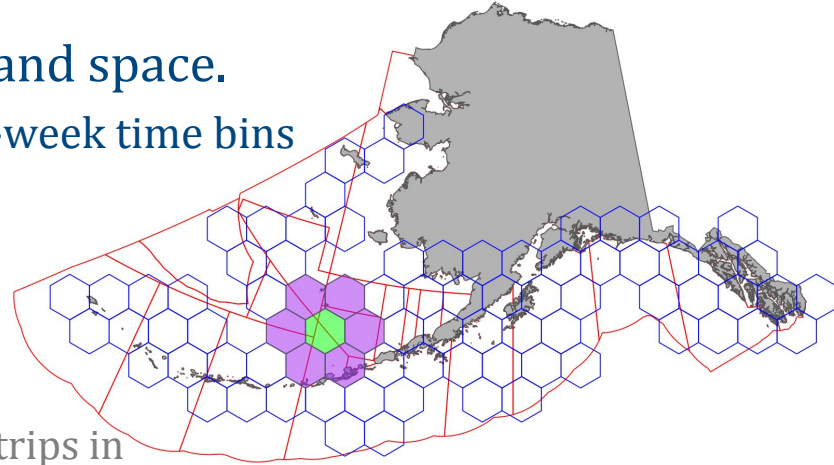


# 2024 Annual Deployment Plan



## • Proximity Allocation

- Higher rates to strata with fishing effort that is more diffuse in time and space.
  - 200km wide hexagonal cells and 1-week time bins
  - Boxes can neighbor other boxes
- Higher rates to strata with fewer trips



Proximity allocation index

Variance scaling factor

Proportion of trips in monitored neighborhoods

$$\hat{D}_h = \left[ 1 - \frac{N_h n_h}{N_h - N n_h} \right] \frac{\sum_{b=1}^{B_h} w_{bh} * (1 - \hat{A}_{bh})}{B_h}$$



# Partial Coverage Deployment Rates

## 2023 Final ADP

2023 Strata	Selection Rate (%)	Predicted <i>N</i>	Predicted <i>n</i>
OB_HAL	17.87	1,253	224
OB_POT	17.09	1,163	199
OB_TRW	22.68	805	183
EM_HAL	30.00	669	201
EM_POT	30.00	408	122
EM_TRW	33.33*	482	161
ZERO	0.00	1,559	0

## 2024 Final ADP

2024 Strata	Selection Rate (%)	Predicted <i>N</i>	Predicted <i>n</i>
OB_FIXED - GOA	13.17	2,001	264
OB_FIXED - BSAI	43.97	279	123
OB_TRW - GOA	20.58	400	82
OB_TRW - BSAI	72.28	30	22
EM_FIXED - GOA	24.20	959	232
EM_FIXED - BSAI	74.29	58	43
EM_TRW	33.33*	722	241
ZERO	0.00	1,445	0

\*Coverage rate for shoreside sampling in Pollock trawl EM EFP in GOA, which also has 100% at-sea EM compliance monitoring (note Pollock trawl EM in BSAI is full coverage)



# 2023 Annual Report

## NMFS Recommendations



# NMFS Recommendations for 2025 Draft Annual Deployment Plan

## Deployment Design

- Continue proximity allocation method for the partial coverage strata (except for trawl EM)
  - For partial coverage trawl EM maintain 33% sampling rate of EM deliveries by shoreside observers
- Maintain current stratification based on monitoring method (Observer, EM Fixed Gear, EM Trawl), Fishery Management Plan (BSAI, GOA), and gear type (Fixed, Trawl):
  - Observed fixed gear trips in the GOA (OB\_FIXED - GOA)
  - Observed fixed gear trips in the BSAI (OB\_FIXED - BSAI)
  - Observed trawl gear trips in the GOA (OB\_TRW - GOA)
  - Observed trawl gear trips in the BSAI (OB\_TRW - BSAI)
  - EM fixed gear trips in the GOA (EM\_FIXED GOA)
  - EM fixed gear trips in the BSAI EM\_FIXED (EM\_FIXED - BSAI)
  - EM trawl gear deliveries in the GOA (EM\_TRW - GOA)
  - Zero-coverage (under 40, jig, troll gear)



# NMFS Recommendations for 2025 Draft Annual Deployment Plan



## EM Video Review

- Collaborate with PSMFC to establish a video review selection rate and review strategy that will result in EM video review times that result in the most useful information for the most number of trips for a given cost
- Collaborate with PSMFC to develop specific prioritization rules that can be used to allocate review effort to the fisheries, gear types, times, and areas that are the most dependent on EM data
- Conduct an assessment of impacts of delayed or missing fixed-gear EM data and risks to management and the stocks of not having these data available (e.g. risk of exceeding TAC and PSC, risk of premature or late fishery closures)





# NMFS Recommendations for 2025 Draft Annual Deployment Plan

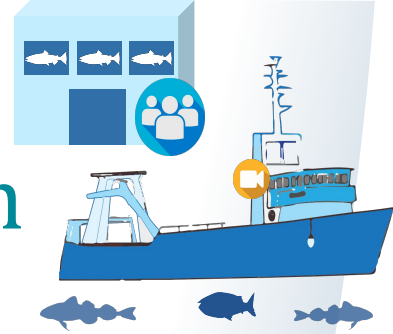


## Fixed-Gear EM

- Maintain size of 2024 EM selection pool composed of up to 177 fixed gear vessels
  - As additional funds are available, increase the number of vessels in the EM selection pool up to the Council's recommendation of 200 fixed-gear EM vessels
- Prioritize placement in the EM selection pool based on vessel size, fishing effort, minimizing data gaps, and cost efficiency
- For vessel operators with repeated problem causing data loss, disapprove Vessel Monitoring Plans and remove from these vessels from the EM pool



# NMFS Recommendations for 2025 Draft Annual Deployment Plan



## Trawl EM Implementation

- Anticipate publishing final rule to implement regulated program in 2025, including the following:
  - Vessels required to opt into the regulated program prior to November 1, 2024
  - Vessels required to have a NMFS-approved Vessel Monitoring Plan in place prior to participating in trawl EM in 2025
- Participating vessels need to transmit a Landing Notice to the shoreside processor through the NMFS approved system prior to each trawl EM offload
- EM hardware service providers would be required to have a NMFS-approved permit prior to the start of the fishing season
- NMFS will continue to evaluate shoreside sampling priorities in order to balance observer workloads for both partial and full coverage sectors
- NMFS requests collaboration from the EM service providers and the trawl EM EFP permit holders to gain a better understanding of EM trawl costs (both for EM and shoreside observers) so the agency can appropriately budget for trawl EM in the 2025 ADP



# NMFS Recommendations for 2025 Draft Annual Deployment Plan

## EM Development

- Continue to collaborate with industry partners on EM development and cost efficiency projects
- Work with Fishery Monitoring Advisory Committee and Partial Coverage Fishery Monitoring Advisory Committee to coordinate with National Fish and Wildlife Foundation grantees to plan for potential upcoming grant proposals

## ODDS

- Collaborate with the Partial Coverage Fishery Monitoring Advisory Committee (PCFMAC) to develop an ODDS trip cancellation policy that will not significantly impede industry, affords the observer provider adequate time to deploy an observer, and reduces impacts to coverage rates and non-random monitoring in time for the 2025 Annual Deployment Plan
  - Goal of reducing temporal bias introduced by trip cancellation and inherits
- Modify ODDS to implement the regulated EM Trawl program



# Input from the SSC for 2025 ADP?

- Does the SSC recommend using the current (2024) deployment design in 2025?
  - Monitoring method/Gear/FMP stratification
  - Proximity allocation
- Does the SSC have concerns about NMFS stepping away from allocating coverage toward the goal of reduced PSC and discard variance?



# Acknowledgments

- Thank you to the AFSC, AKR, and PSMFC staff who worked on the 2023 Annual Report and the 2024 Annual Deployment Plan
- Thank you to the observers, observer providers, captains, crew members, EM providers, video reviewers, and agency staff who make fishery-dependent data collection possible

