

The background of the slide is a photograph of a sunset over the ocean. The sun is low on the horizon, creating a bright starburst effect. The sky is a deep blue with some lighter clouds. The water is dark green and choppy. In the foreground, there is a large, dense school of fish, possibly salmon, swimming towards the viewer. The fish are silvery and catch the light, creating a shimmering effect. The overall mood is serene and natural.

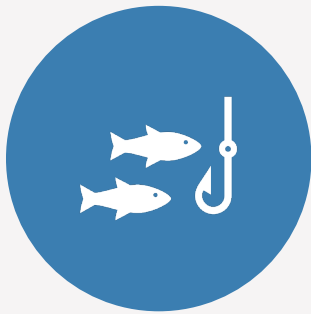
Bycatch Avoidance Programs in Alaskan Fisheries

Sea State Inc.

Fishing with Data

Steve Martell, Merrill Rudd, & Karl Haflinger

Quick Primer: What does Sea State Do?



FISHERIES **INFORMATION**
SERVICE PROVIDER



TECHNICAL SUPPORT FOR
FISHING COMPANIES AND
FISHERIES COOPERATIVES



DATA AND POLICY
ANALYSIS

Distinct count of
Management Sector

Distinct count of
Vessel Id

Number of Records

Total Fmp Groundfish
Weight

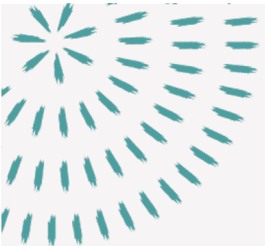
85

76,7

26,897,485

Clients

IFQ AFA MS BSAI id b a d T id nt-CPP tC d
R c fi hP g am ct FLC - GOA
FLC - BSAI - n n-C d AFA CV GOA N n- id b a d d TLAS - BSAI
AFA MS GOA id b a d
AFA BS id b a d AFA CV Di ct d P Il c
AFA CV BSAI id b a d
FLCA80 S ct BS A80 S ct GOA
Sh If d B at B i t i Bay Ala a S af d
R c fi hP g am ct id b a d
Gulf Mi t Inc
TLAS - GOA SMPC - Stat Manag d Pacific C d
Blu N th Ri h i
CDQ AFA CP di ct d Il c
Whiting M th hi S ct PWCC AFA MS Di ct d P Il c
AFA CV BSAI c d x m t AFA CV GOA id b a d CPP tC d - BSAI



Information Sources



OBSERVER
PROGRAM



CATCH
ACCOUNTING



ELECTRONIC
FISH TICKETS



E-LOGS



VMS & AIS



ENVIRONMENTAL
DATA



Raw Data



2000 - 2022



Data from >50,000
annual fishing events

Technical Support

- Quota tracking
- Time-area closures
- Weekly reporting and alarm notifications
- Bycatch risk management
- Implement cooperative agreements
- Data analysis and risk assessment

Accession Name: Reports: Whiting Working Group: Vessel PDR Assignments

Whiting Bycatch VMS Maps

SHORESIDE WHITING COOP

Year: 2017

Select Current User: admin.whiting_allsectors

Enter a Delivery

Coop Harvest and Status of Reserve Accounts (lbs)								
Species	Harvest YTD	Allocation	Remaining	% Used	Initial Reserve	Reserve Used	Initial Reserve Ratio (x1000)	Current Reserve Ratio (x1000)
Pacific Hake	224,306,025	230,474,930	6,168,905	97.32 %	N/A	N/A	N/A	N/A
Dark Blotched Rockfish	40,914	89,241	48,327	45.85 %	48,834	7,671	0.387	7.834
Pacific Ocean Perch	92,429	111,865	19,436	82.63 %	82,411	12,552	0.485	3.151
Yelloweye Rockfish	0	103	103	0.00 %	2	0	0.000	0.017

Vessel Harvest							
Vessel	Pacific Hake	Dark Blotched Rockfish	Pacific Ocean Perch	Yelloweye Rockfish	Canary Rockfish	Rougheye Rockfish	Chinook Salmon
Arctic Fury	28,047,289	3,074	6,275	0	4,689	1,826	30
Bay Islander	9,506,586	1,636	211	0	1,439	157	3
Jamie Marie	20,125,362	1,293	4,128	0	15,111	18	58
Lisa Melinda	12,608,995	929	5,877	0	9,045	10	44
Miss Sarah	13,852,909	1,122	590	0	7,193	319	41
Muir Milach	10,121,306	364	1,134	0	11,541	0	34
Nordic Star	351,543	3	40	0	82	0	0
Northern Ram	12,169,789	14,390	823	0	3,347	0	212
Pacific Challenger	8,392,403	320	41,201	0	1,423	0	90
Pacific Future	12,830,151	4,180	5,327	0	3,757	29	55
Pacific Ram	12,874,056	2,771	344	0	1,884	11	35
Perseverance	13,954,247	821	5,834	0	6,741	9	83
Raven	22,324,729	1,951	9,403	0	16,424	94	104
Sea Clipper	25,589,653	2,811	4,565	0	8,430	24	120
Sea Storm	3,561,641	0	132	0	14,638	0	21
Seeker	17,995,366	5,249	6,545	0	5,204	0	82

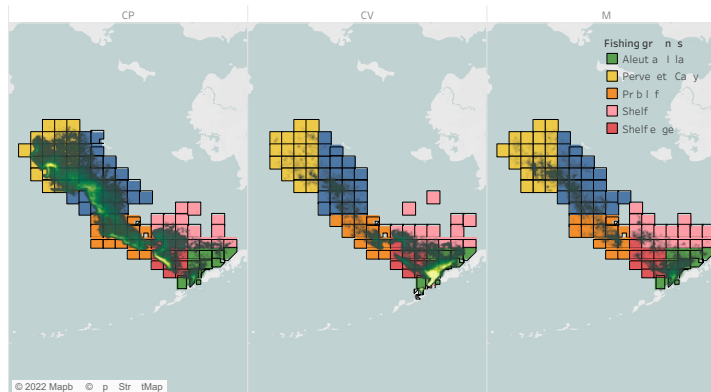
Vessel Restricted QP % Used					
Vessel	Pacific Hake	Dark Blotched Rockfish	Pacific Ocean Perch	Yelloweye Rockfish	
Arctic Fury	99.18 %	74.92 %	98.51 %	0.00 %	0.00 %
Bay Islander	94.30 %	52.39 %	9.69 %	0.00 %	0.00 %
Jamie Marie	99.09 %	62.77 %	99.47 %	0.00 %	0.00 %
Lisa Melinda	98.42 %	28.44 %	100.00 %	0.00 %	0.00 %
Miss Sarah	99.34 %	41.25 %	50.56 %	0.00 %	0.00 %
Muir Milach	100.00 %	24.48 %	96.35 %	0.00 %	0.00 %
Nordic Star	35.15 %	1.27 %	27.03 %	0.00 %	0.00 %
Northern Ram	88.09 %	99.31 %	60.25 %	0.00 %	0.00 %
Pacific Challenger	93.68 %	9.48 %	100.00 %	0.00 %	0.00 %
Pacific Future	98.69 %	87.96 %	100.00 %	0.00 %	0.00 %
Pacific Ram	96.54 %	87.86 %	15.59 %	0.00 %	0.00 %
Perseverance	100.75 %	31.34 %	100.00 %	0.00 %	0.00 %
Raven	99.75 %	89.45 %	96.78 %	0.00 %	0.00 %
Sea Clipper	98.42 %	86.55 %	94.28 %	0.00 %	0.00 %
Sea Storm	79.15 %	0.00 %	14.33 %	0.00 %	0.00 %
Seeker	98.66 %	93.97 %	94.46 %	0.00 %	0.00 %

0-49% of initial amount in restricted QP account in green, 50-79% in yellow, 80-99% in amber, 100% or greater in red

Vessel Bycatch Rate (x1000)					
Vessel	Pacific Hake	Dark Blotched Rockfish	Pacific Ocean Perch	Yelloweye Rockfish	
Arctic Fury	N/A	0.110	0.201	0.000	
Bay Islander	N/A	0.172	0.022	0.000	
Jamie Marie	N/A	0.064	0.171	0.000	
Lisa Melinda	N/A	0.074	0.336	0.000	
Miss Sarah	N/A	0.081	0.043	0.000	
Muir Milach	N/A	0.036	0.112	0.000	
Nordic Star	N/A	0.009	0.114	0.000	
Northern Ram	N/A	0.060	0.068	0.000	
Pacific Challenger	N/A	0.000	0.286	0.000	

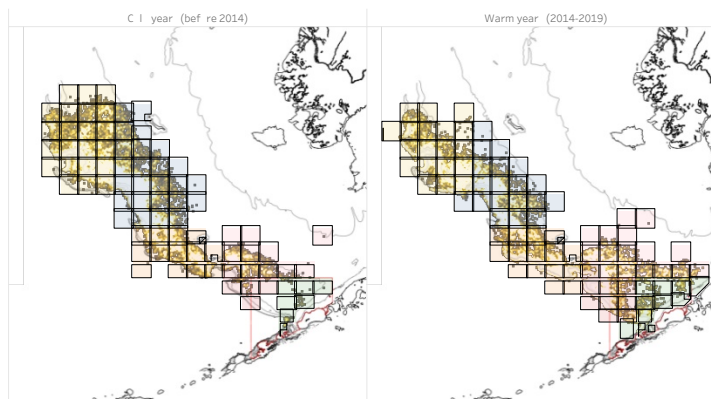
The five pr p e fi h ggr u are ma ta e whe break g w p ll ck CPUE by ve el type a c l v . warm year . The five fi h g gr u are m t by u f r catcher-pr ce r wherea catcher-ve ela m ther h p CPUE are c ce trate area l (hel c ta tfr m the curre tge et carea).

CPUE by Ve el Type



The fi h ggr u are m tappare t ur g warm year but al apply t c l year .

CPUE f r C l v . Warm Year



Data & Policy Analysis

Examples:

Bycatch Programs

AFA Pollock

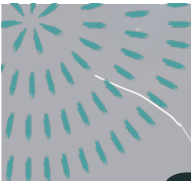
- Chinook & Chum salmon rolling hotspot weekly closures

A80

- Halibut avoidance program reporting
- Maximum Retained Amounts (MRA's for FMP species)

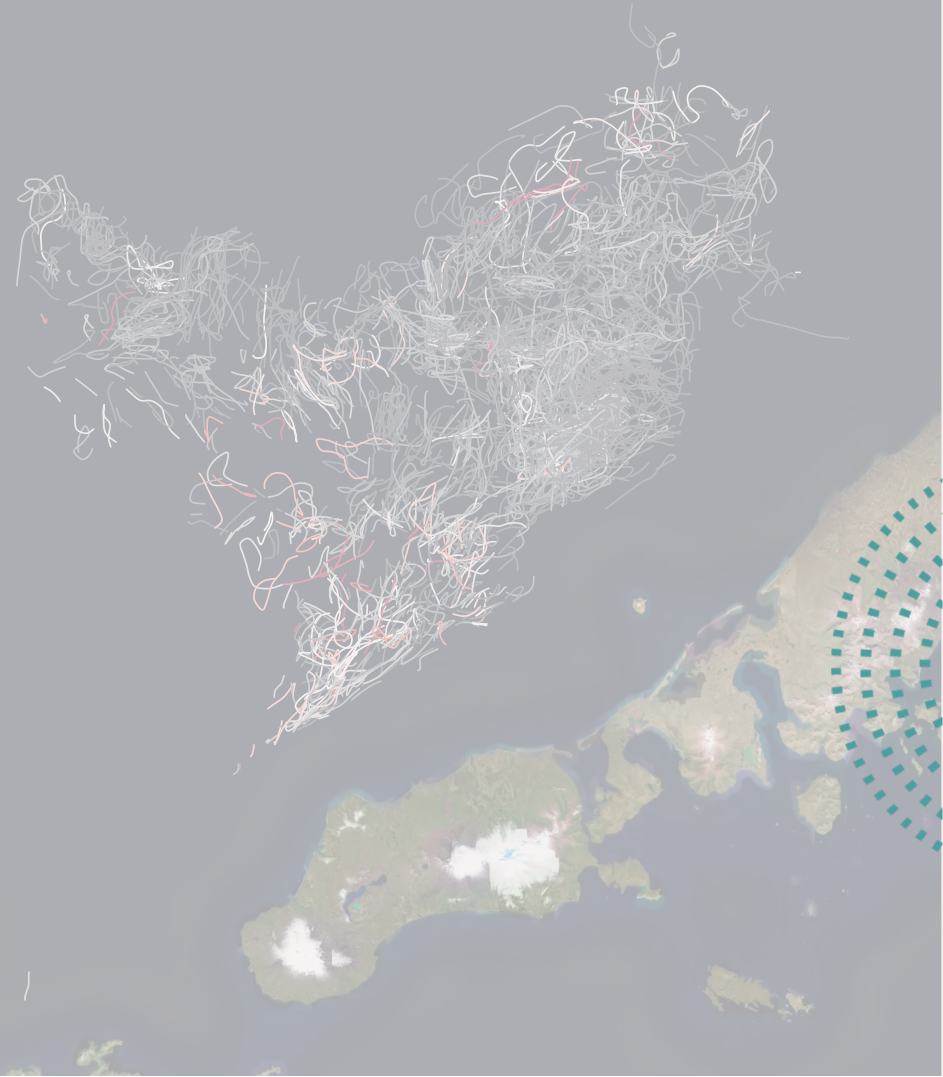
FLC

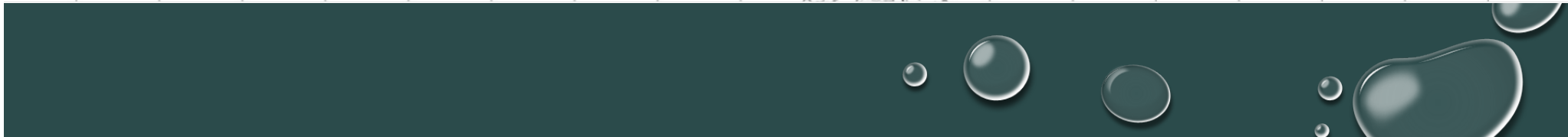
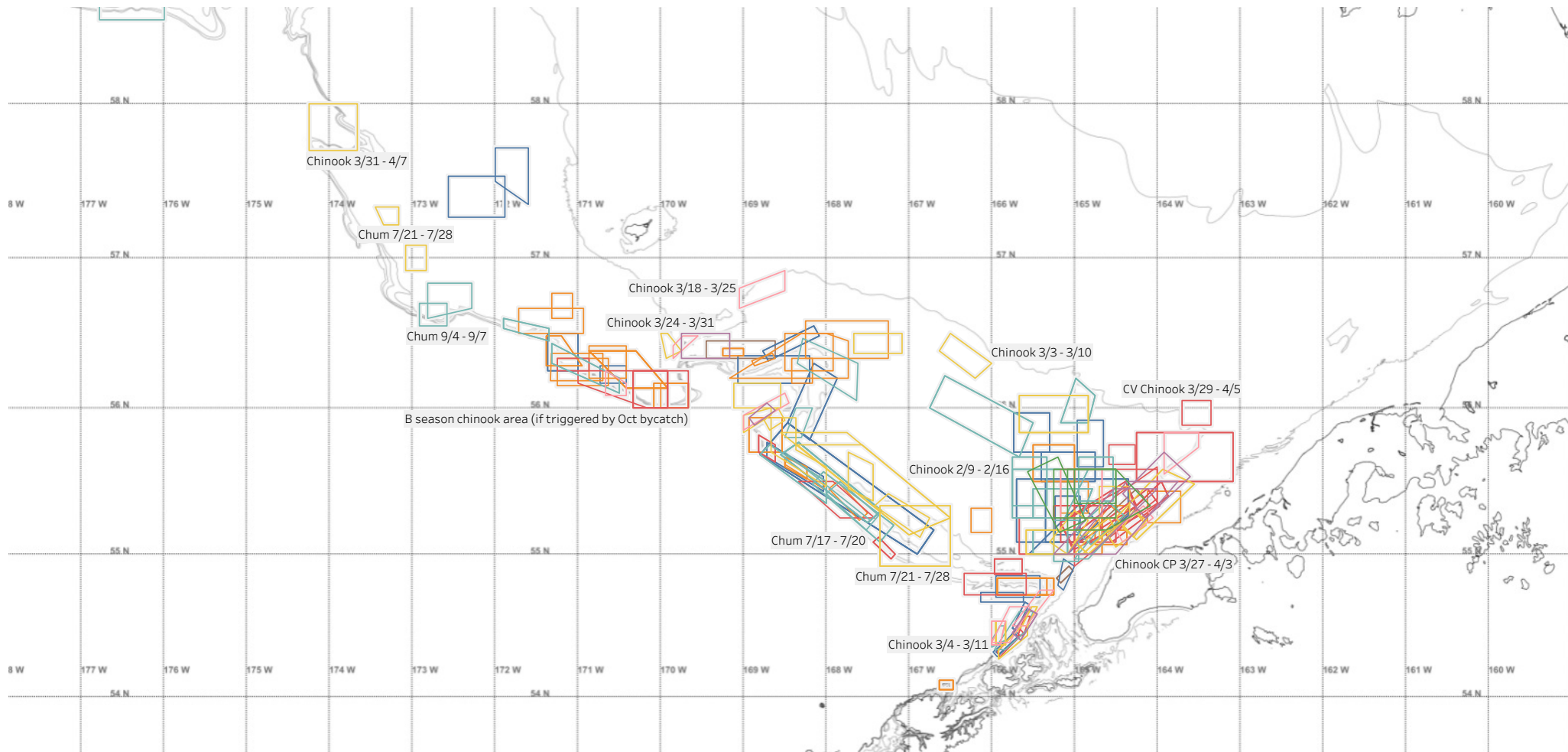
- Halibut, seabirds, & king crab bycatch hotspots.

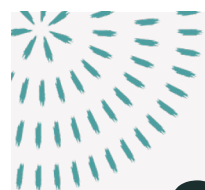


Salmon Bycatch Avoidance Areas

- Real-time data
 - VMS
 - Observer sampling (100% sampling coverage)
 - Fish ticket data (CV)
 - EM Data
- Statistical analysis at ADF&G stat area
 - Mean & Variance of salmon per ton of pollock







Salmon Bycatch Avoidance Areas

- Generate weekly bycatch avoidance area notice.
- Fleet communication via google groups.
- Bycatch competition



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Season catch and bycatch by sector

Year	Sector	Pollock Catch MT	Chinook Catch N	Chum Catch N	Chinook Rate N/MT	Chum Rate N/MT	Pollock Allocation MT	Pollock % Caught
2021	C/P	260,544	4,087	51	0.016	0.000	276,414	94%
	Mothership	44,233	619	9	0.014	0.000	53,460	83%
	Shoreside	148,411	2,801	20	0.019	0.000	267,299	56%
	Total	453,189	7,507	80	0.017	0.000	597,173	76%
2022	C/P	220,264	1,911	16	0.009	0.000	221,051	100%
	Mothership	41,475	242	0	0.006	0.000	42,768	97%
	Shoreside	195,225	2,709	12	0.014	0.000	213,840	91%
	Total	456,964	4,862	28	0.011	0.000	477,659	96%

Totals for season through 3/31/2021 & 3/31/2022

All of the CP's are finished and it is very likely that this will be the last remaining notice for the offshore sector.

I'm rolling over last weeks closure in 655430 as this past weeks data still indicates there are still Chinook salmon in this area. The Chinook salmon rate in 655500 is also above the base rate this week. I've put in a closure out in the area where I think the Chinook are more abundant in and around the 60 fathom contour ledges in that area. The fleet has moved on, so I'm not certain if the Chinook are moving to the northeast.

-Steve

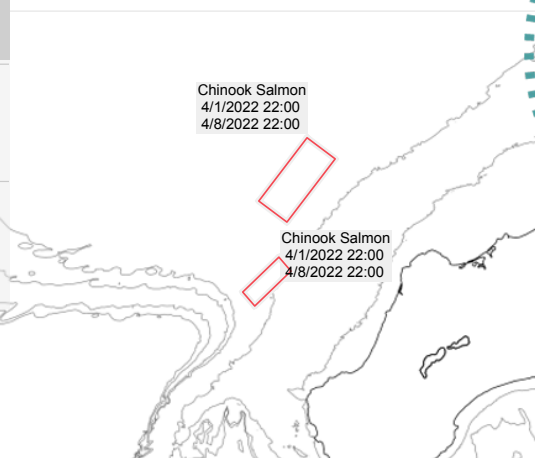
Map of bycatch avoidance areas

Bycatch avoidance areas effective 4/1/2022 22:00 to 4/8/2022 22:00

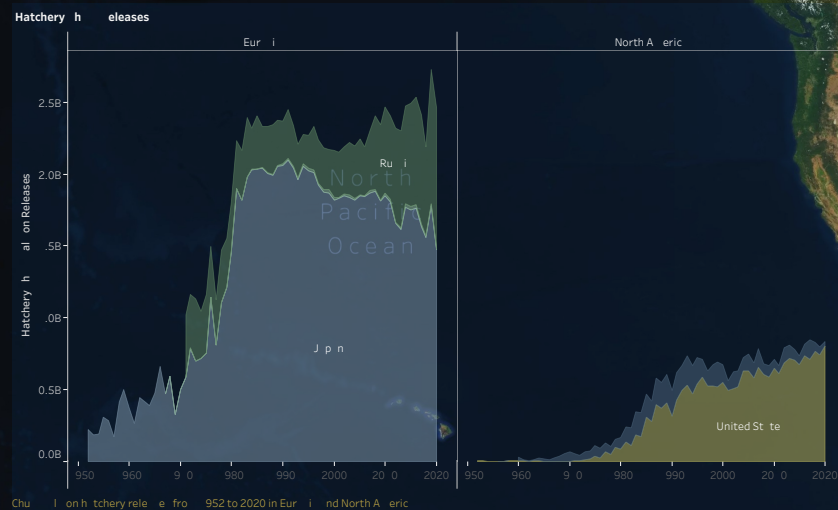
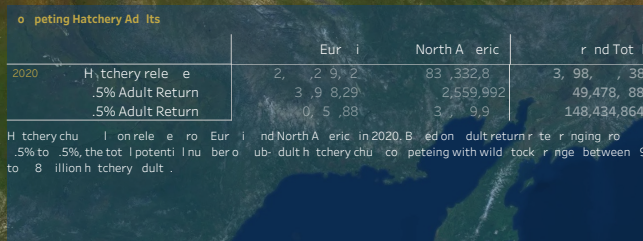
1	Chinook Salmon	55° 12' N	164° 57' W
		55° 03' N	165° 09' W
		55° 00' N	165° 02' W
		55° 09' N	164° 50' W
		55° 12' N	164° 57' W
2	Chinook Salmon	54° 55' N	165° 04' W
		54° 50' N	165° 13' W
		54° 48' N	165° 10' W
		54° 53' N	165° 01' W
		54° 55' N	165° 04' W

Chinook Salmon
4/1/2022 22:00
4/8/2022 22:00

Chinook Salmon
4/1/2022 22:00
4/8/2022 22:00



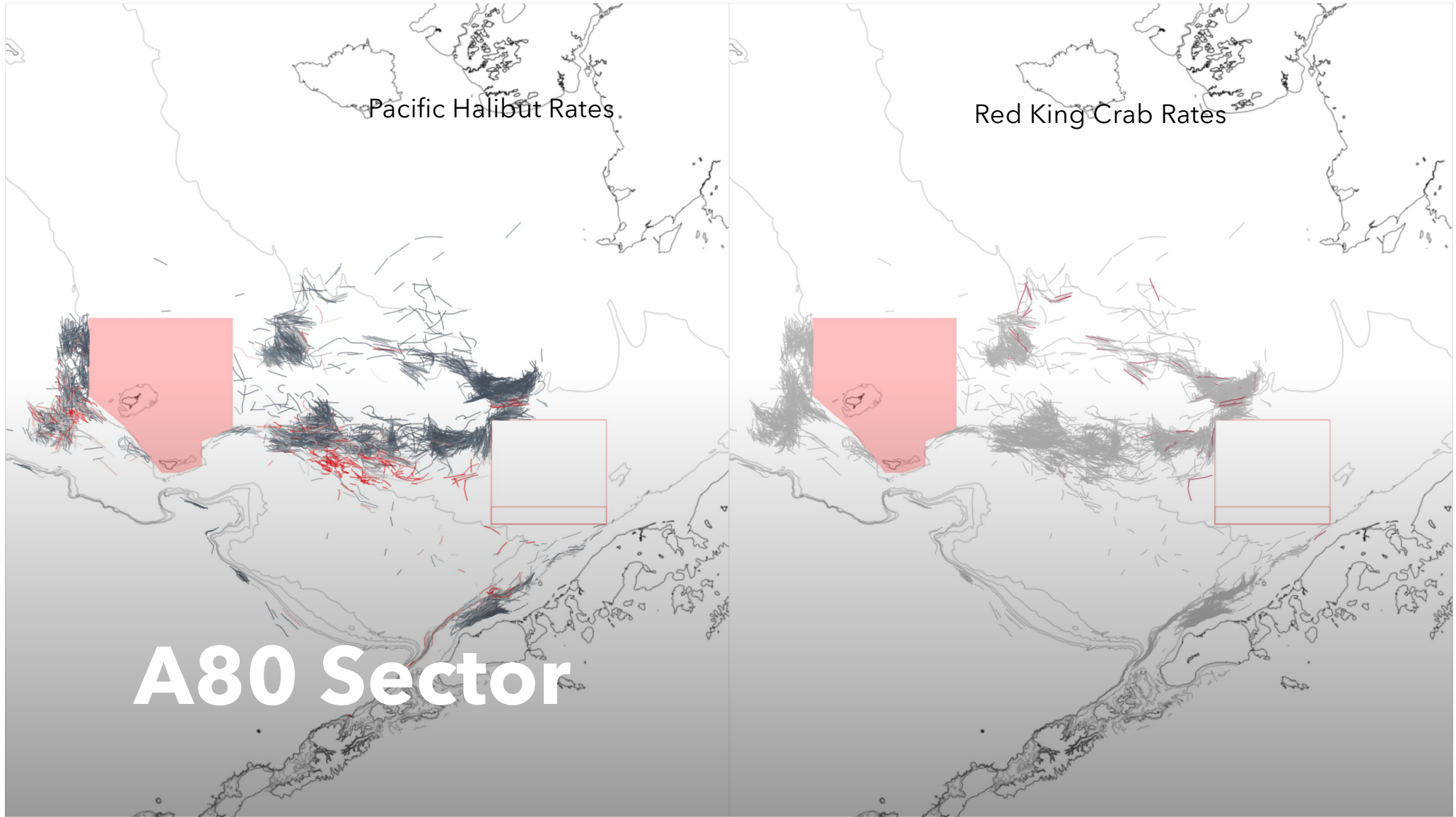
Hatchery Chinook Salmon -- Potential Competition with wild Alaska Chinook Salmon



Pacific Halibut Rates

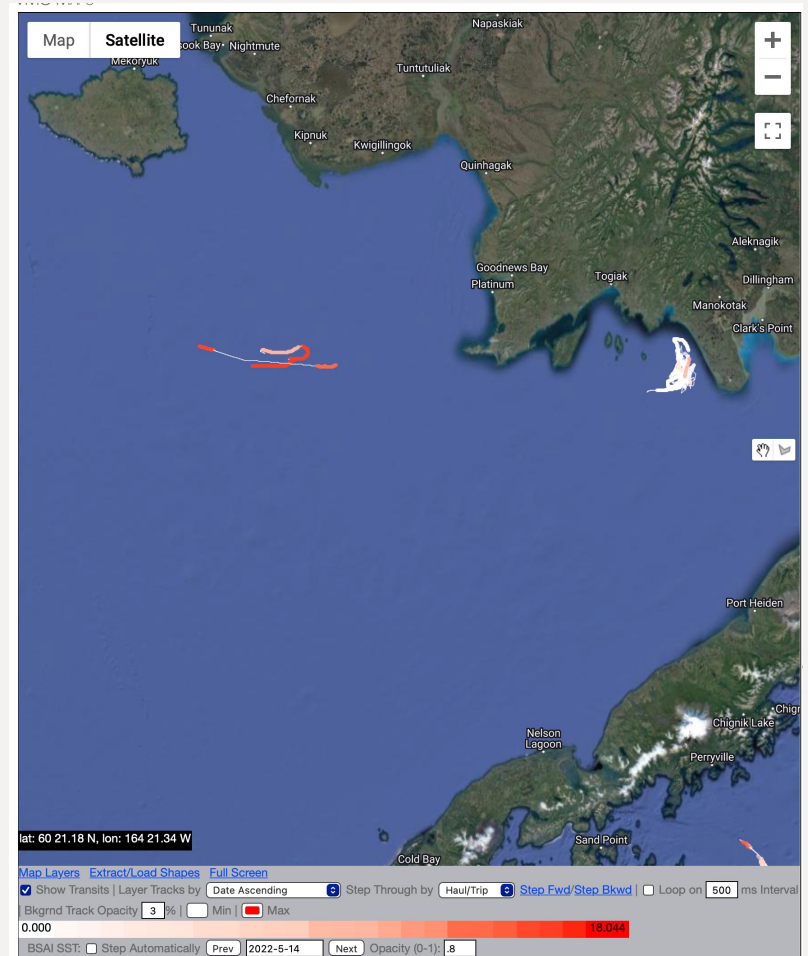
Red King Crab Rates

A80 Sector



A80 Bycatch Performance Reports

- Daily monitoring vessel bycatch rates.
- Vessel rates monitored using traffic lights.
- Incentive is to avoid being an outlier.
 - \$50,000 fine for exceeding the vessel outlier provision.



Map Satellite



- ✓ NPT Haul 49 3/15/2022 - 22 KG/MT GF
- ✓ NPT Haul 50 3/15/2022 - 49 KG/MT GF
- ✓ NPT Haul 51 3/15/2022 - 46 KG/MT GF
- ✓ NPT Haul 52 3/15/2022 - 41 KG/MT GF

Bycatch Alarms

Automated email system to alert the fleet of hauls exceeding a bycatch threshold rate.

Google

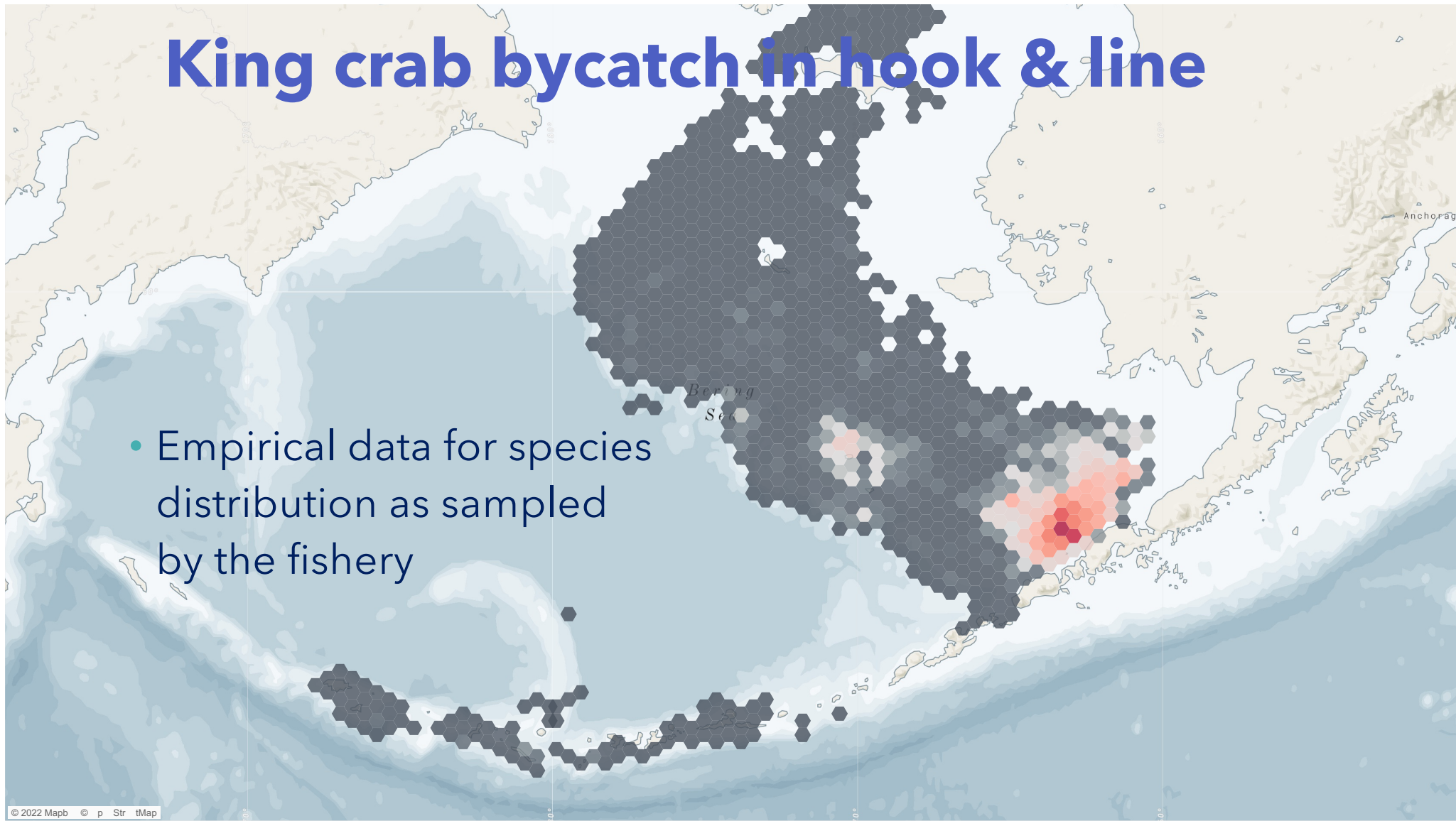
[Map Layers](#) [Extract/Load Shapes](#) [Full Screen](#)

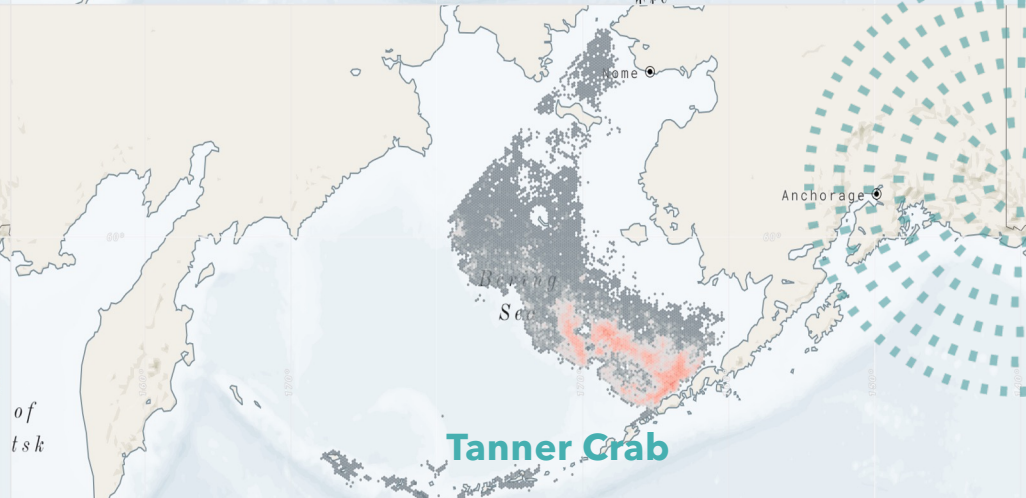
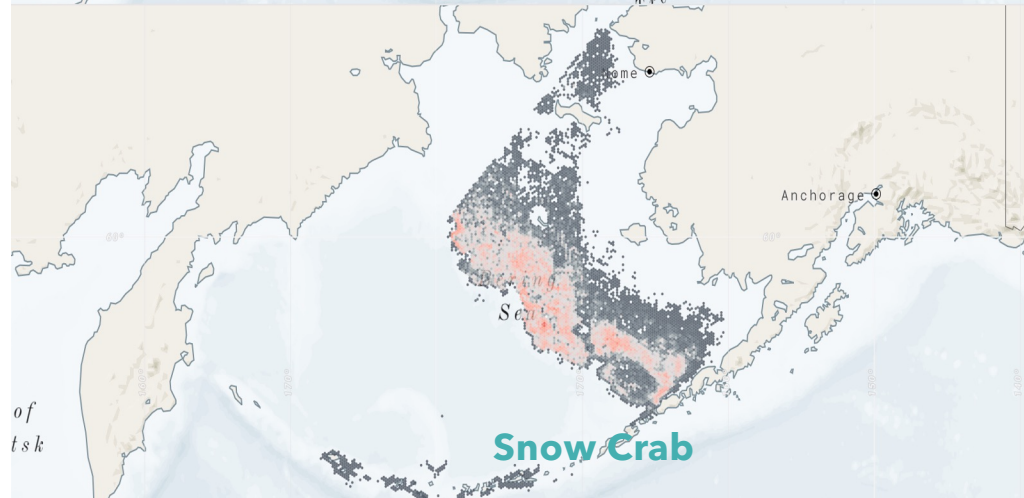
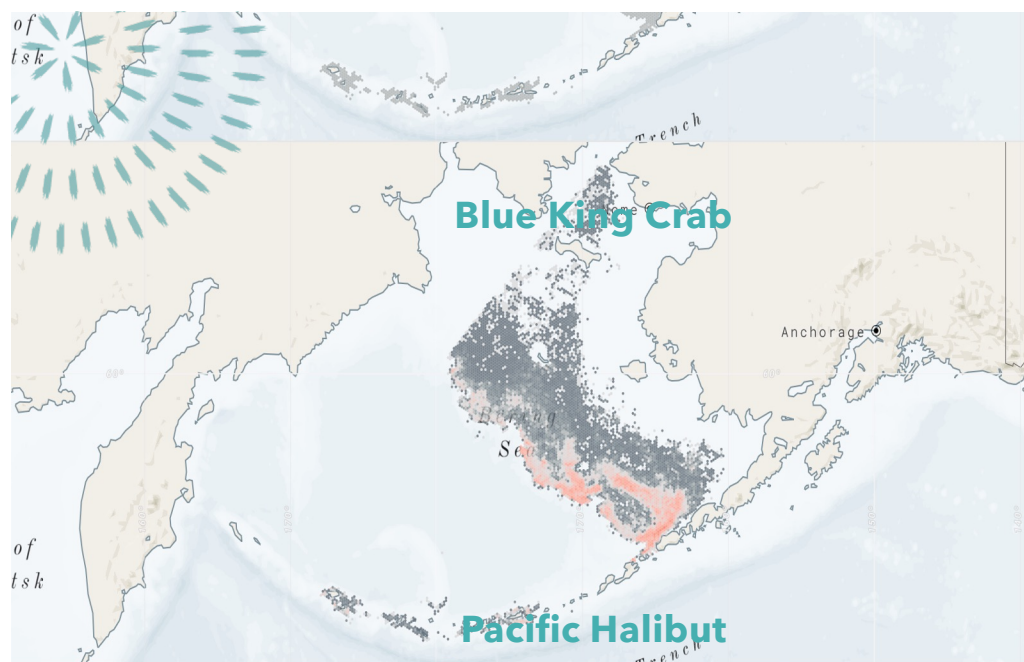
Keyboard shortcuts | Map data ©2022 Imagery ©2022 TerraMetrics | 50 km | [Terms of Use](#)

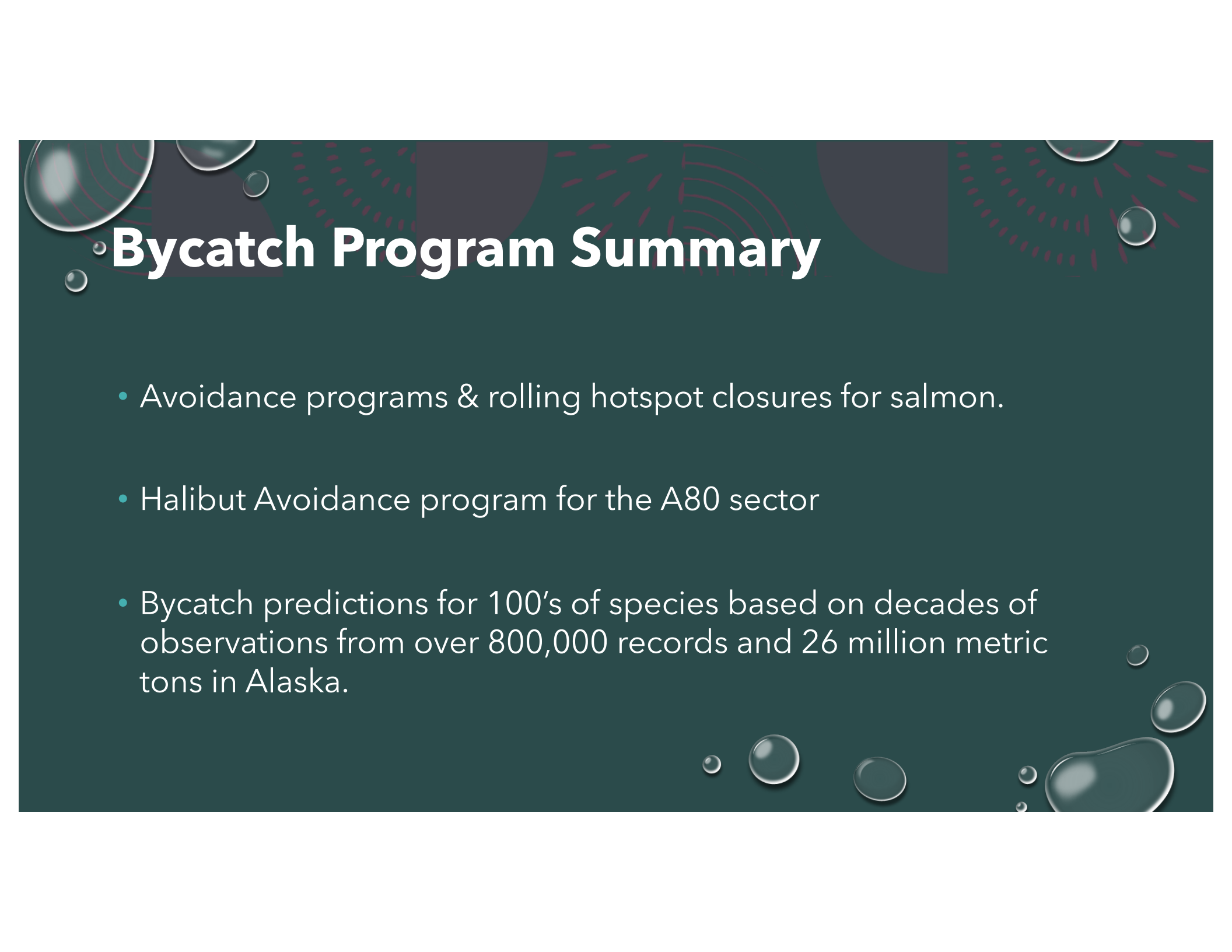
☒ Show Transits | [Step Fwd/Step Bkwd](#) | ☐ Loop on | 500 ms Interval | Bkgrnd Track Opacity 3 %
BSAI SST: ☐ Step Automatically | [Prev](#) | 2022-5-14 | [Next](#) | Opacity (0-1): .8

King crab bycatch in hook & line

- Empirical data for species distribution as sampled by the fishery







Bycatch Program Summary

- Avoidance programs & rolling hotspot closures for salmon.
- Halibut Avoidance program for the A80 sector
- Bycatch predictions for 100's of species based on decades of observations from over 800,000 records and 26 million metric tons in Alaska.

Questions

