The Peruvian Anchovy Fishery

Understanding Supply, Sustainability and Global Impact

Speakers:

Diego Balarezo, Commercial Manager, Hayduk Corporation

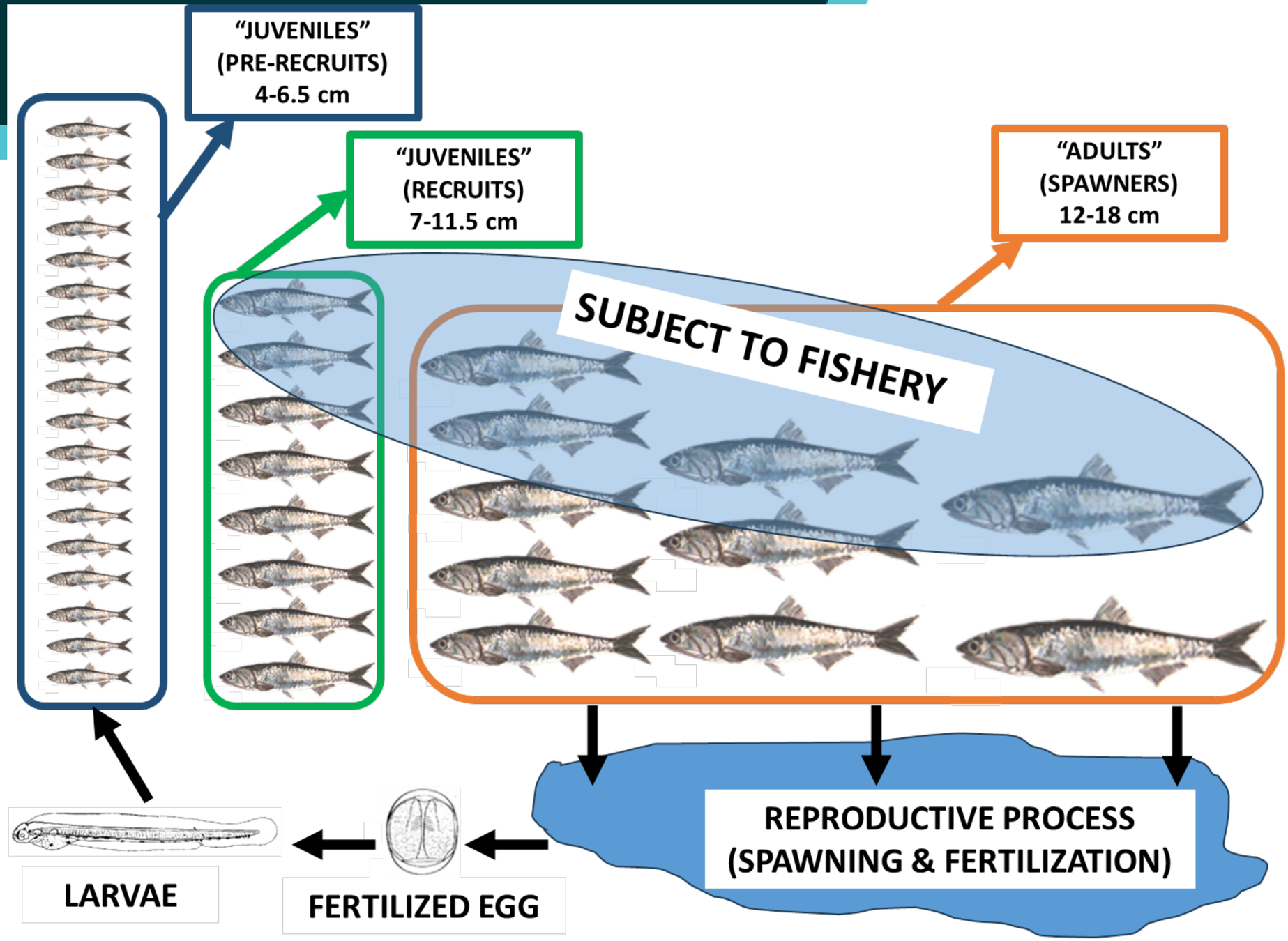
Gonzalo Cáceres, Commercial Director, TASA

Martin Santivañez Yuffra, Fisheries Research Lead, Copeinca

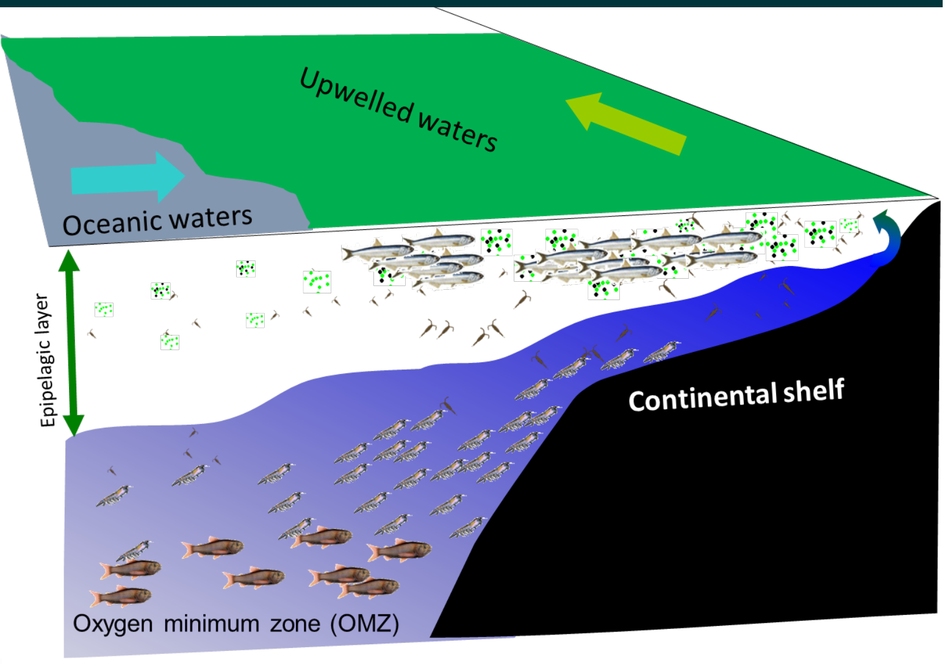
Iván Geller, Corporate Head of Sales, Austral Group

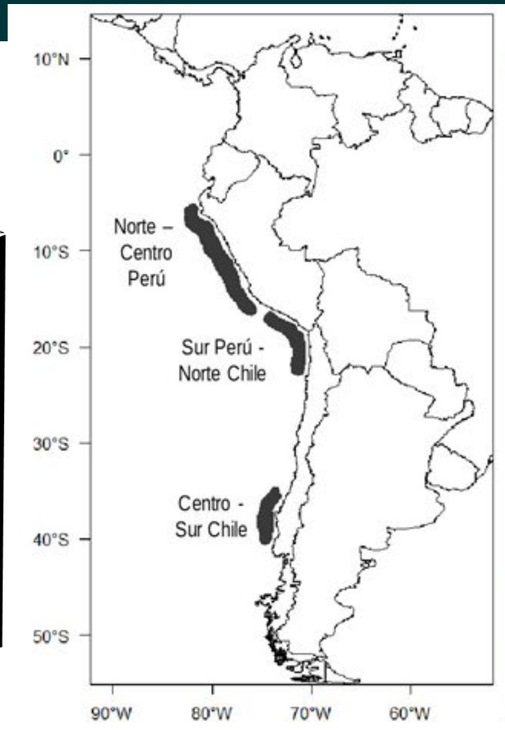
GOED OMEGA-3

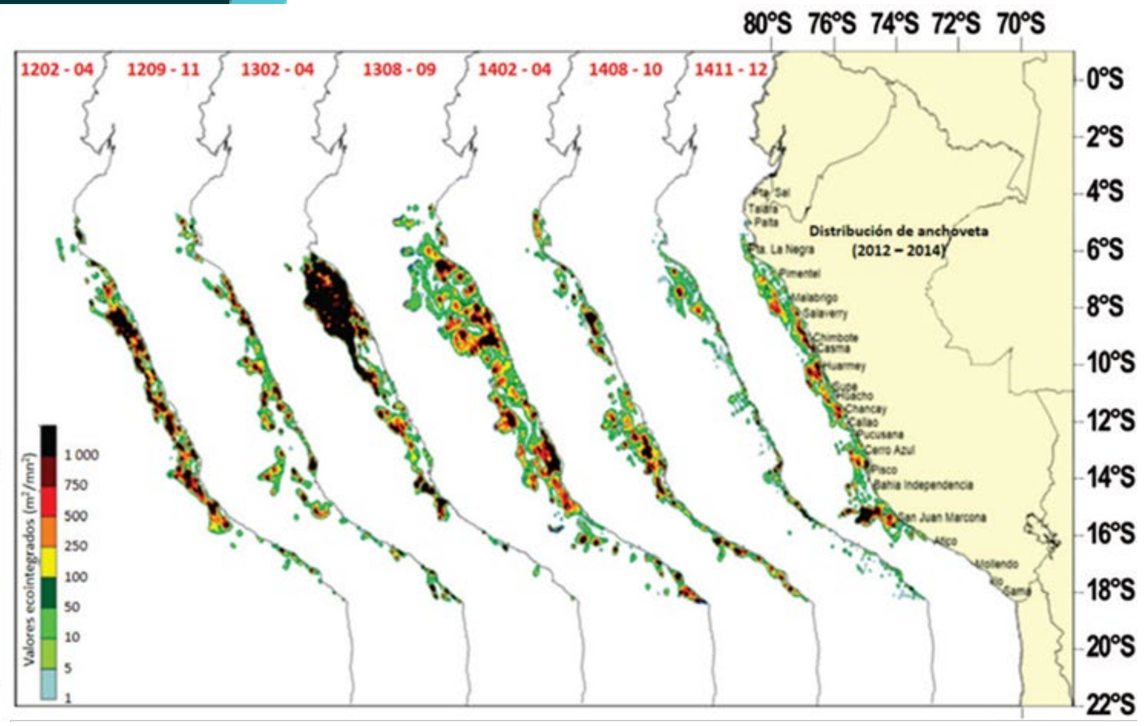
PERUVIAN ANCHOVY (*Engraulis ringens*) LIFE CYCLE

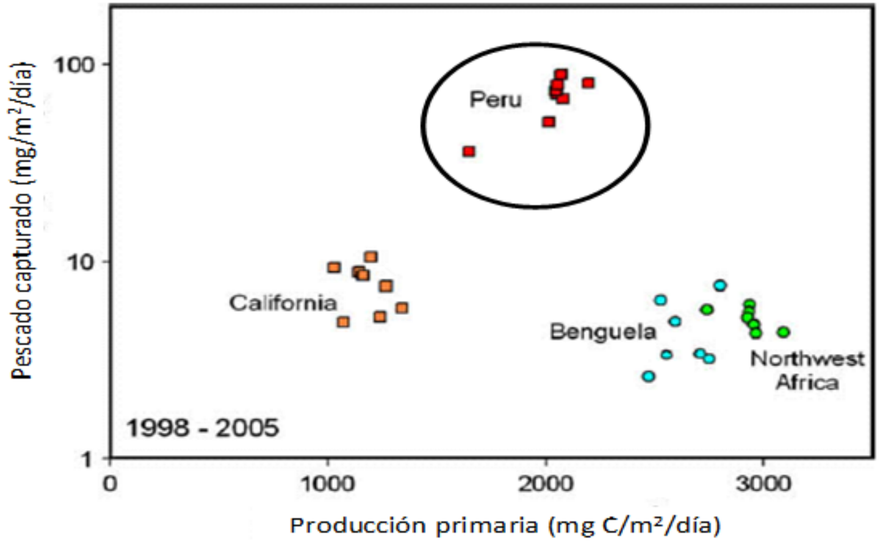


PERUVIAN UPWELLING ECOSYSTEM & ANCHOVY STOCKS

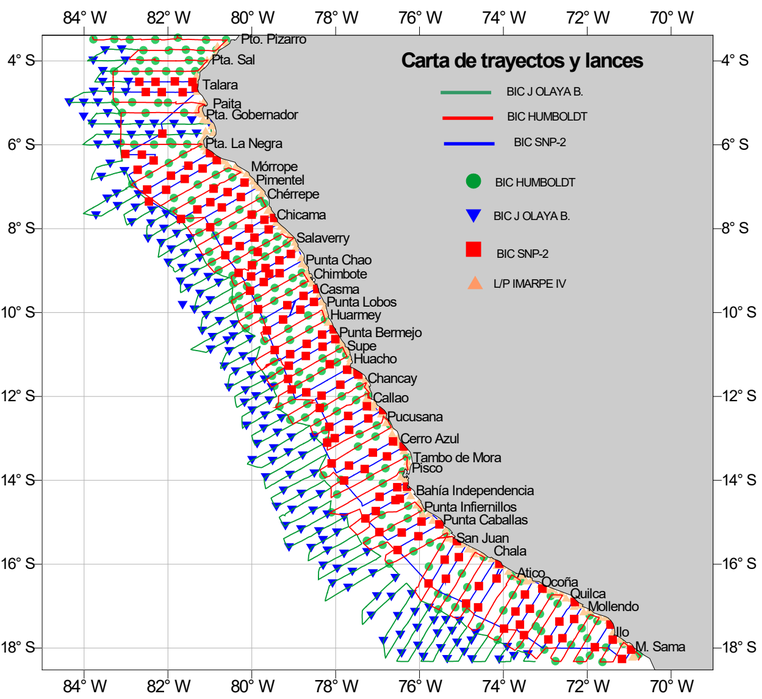








FROM BIOMASS ESTIMATION TO QUOTA ALLOCATION & START/END OF A FISHING SEASON



F	E	Cuota	BDR	riesgo_5	riesgo_4.5	riesgo_4
0.34	0.249	1.86	6.09	3	0	0
0.35	0.255	1.90	6.02	4	0	0
0.36	0.261	1.95	5.95	5	0	0
0.37	0.267	2.00	5.93	7	0	0
0.38	0.273	2.05	5.90	8	0	0
0.39	0.279	2.08	5.80	9	0	0
0.40	0.285	2.13	5.74	11	0	0
0.41	0.291	2.18	5.81	12	0	0
0.42	0.297	2.22	5.70	14	1	0
0.43	0.303	2.27	5.67	16	1	0
0.44	0.308	2.31	5.57	18	1	0
0.45	0.314	2.35	5.53	20	1	0
0.46	0.319	2.40	5.52	23	2	0
0.47	0.325	2.44	5.50	25	3	0
0.48	0.330	2.49	5.47	26	3	0
0.49	0.336	2.52	5.34	30	4	0
0.50	0.341	2.56	5.37	33	5	0
0.51	0.347	2.61	5.36	35	7	0
0.52	0.352	2.66	5.35	37	7	0

1) BIOMASS ESTIMATION

If the survey finds that:

-There are at least 5 MT of spawning (adult) biomass.

-Reproductive process has ended.

-Fraction of juveniles is not so big.

Then 2)

2) DECISION TABLE

-Possible quotas not higher than 35% of the spawning biomass.

-Risks mainly based in environmental escenarios (warm, neutral or cold conditions).


El Peruano / Jueves 11 de abril de 2024 NORMAS LEGALES

2278383-1

Autorizan inicio de la Primera Temporada de Pesca 2024 del recurso anchoveta en la Zona Norte - Centro del Perú

RESOLUCIÓN MINISTERIAL
N° 000118-2024-PRODUCE

3) QUOTA ALLOCATION & START OF FISHING SEASON

-Quota is picked from decision table.

-Quota is selected in function of socioeconomical factors.


El Peruano / Viernes 12 de enero de 2024 NORMAS LEGALES

PRODUCE

Dan por concluida la Segunda Temporada de Pesca 2023 del recurso anchoveta y anchoveta blanca, correspondiente a la Zona Norte-Centro del Perú

RESOLUCIÓN MINISTERIAL
N° 00008-2024-PRODUCE

4) END OF FISHING SEASON

Motives:

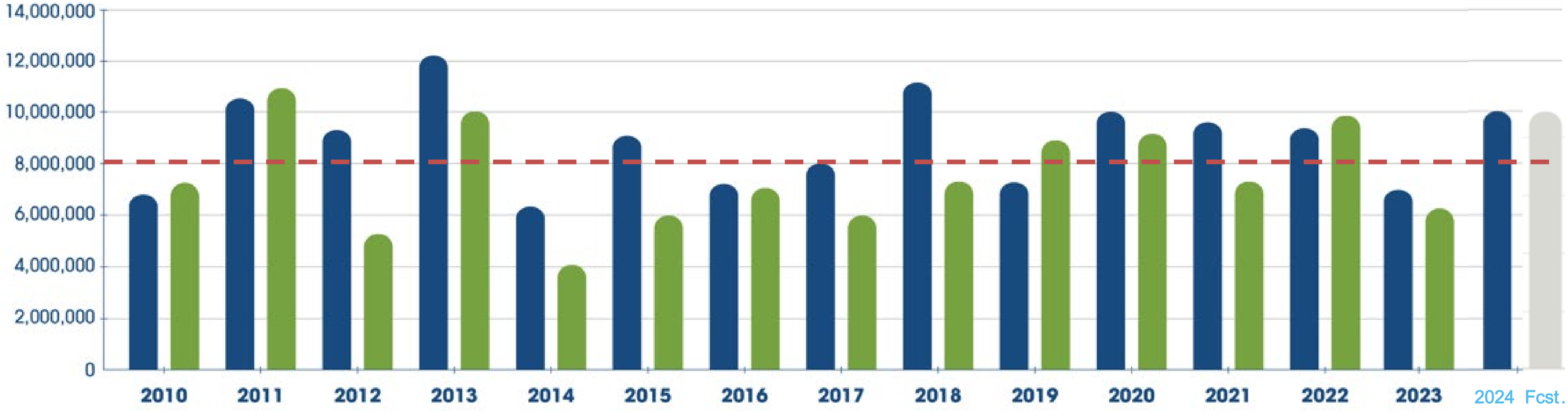
-Quota completion.

-Start of reproductive process.

-Maximum allowable juvenile catch is about to be reached.

The Peruvian anchovy biomass has remained stable in the last decade

Biomass per season

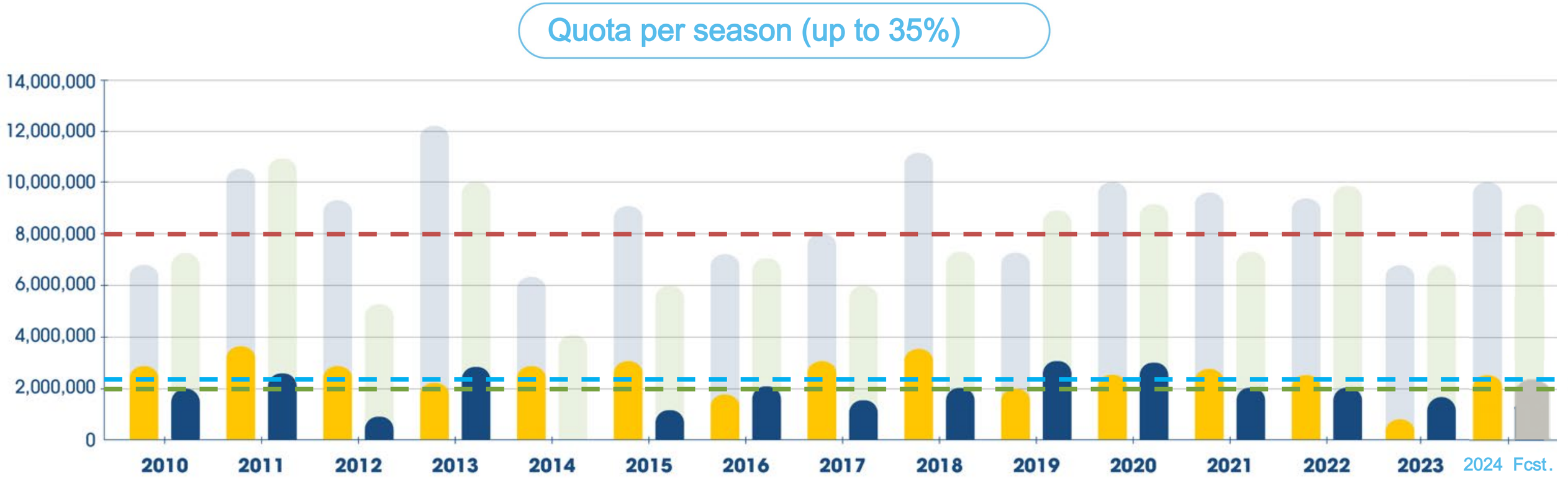


Fishing quota never exceeds 35% of anchovy biomass

Fishing of juveniles not higher than 5% of the biomass

Responsible sector thanks to self bans

The quotas have been established based on a healthy biomass



8,274,800
Average Biomass

2,318,508
Average Quota

2,008,731
Average Landings

Peru:

The Humboldt Current provides an abundance of nutrients to supports one of the richest ecosystems in the world.

Peruvian Fishing Industry

1.5%
of National GDP

+700,000
direct and indirect jobs

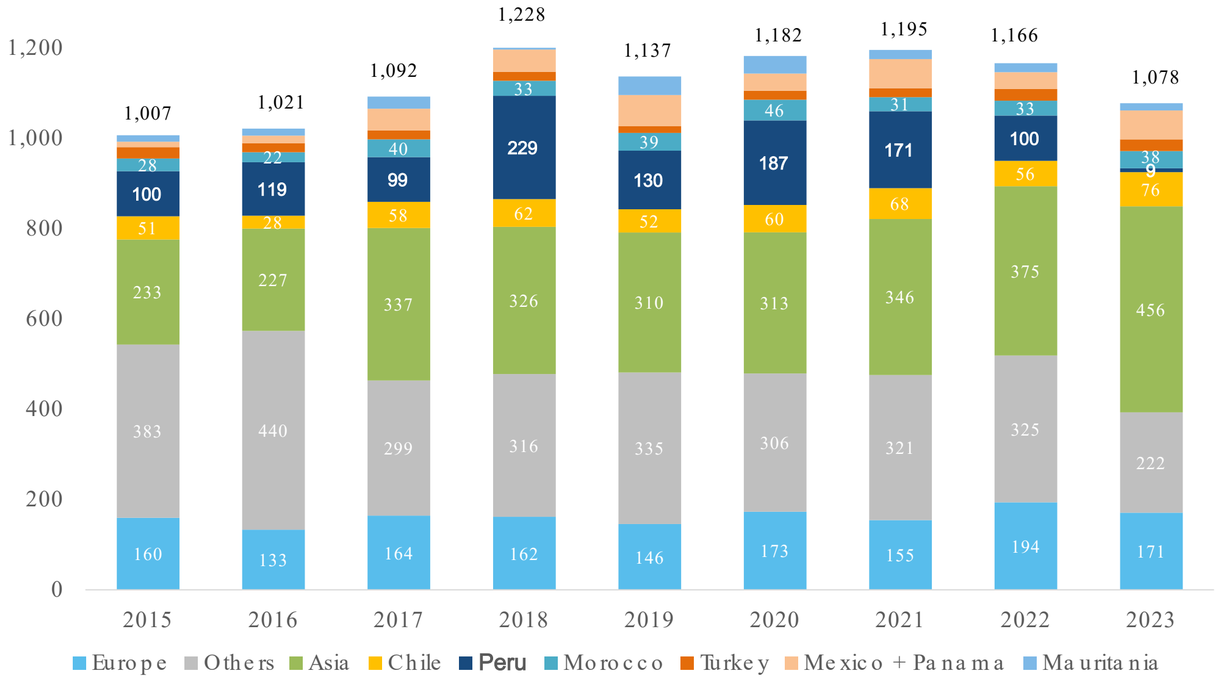
7%
of total Peruvian exports

Peruvian Fish Meal

> 48% of global fishmeal exports

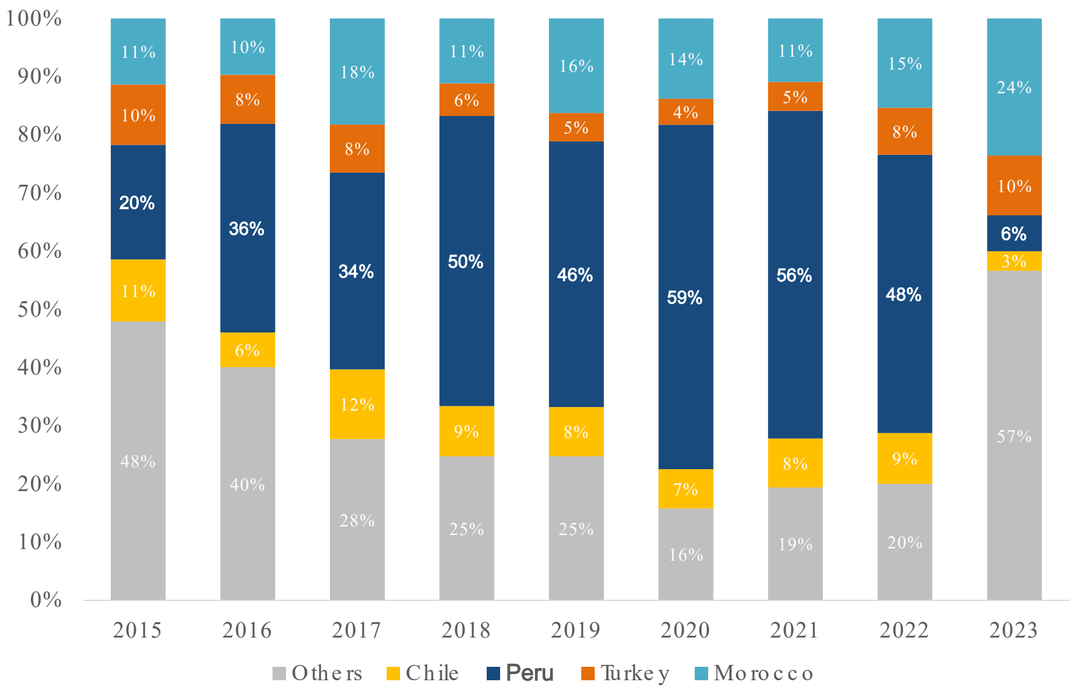
Crude fish oil - world supply

Crude fish oil supply (k MT)



Peru represents ~20% of the worldwide fish oil Supply in a regular year.

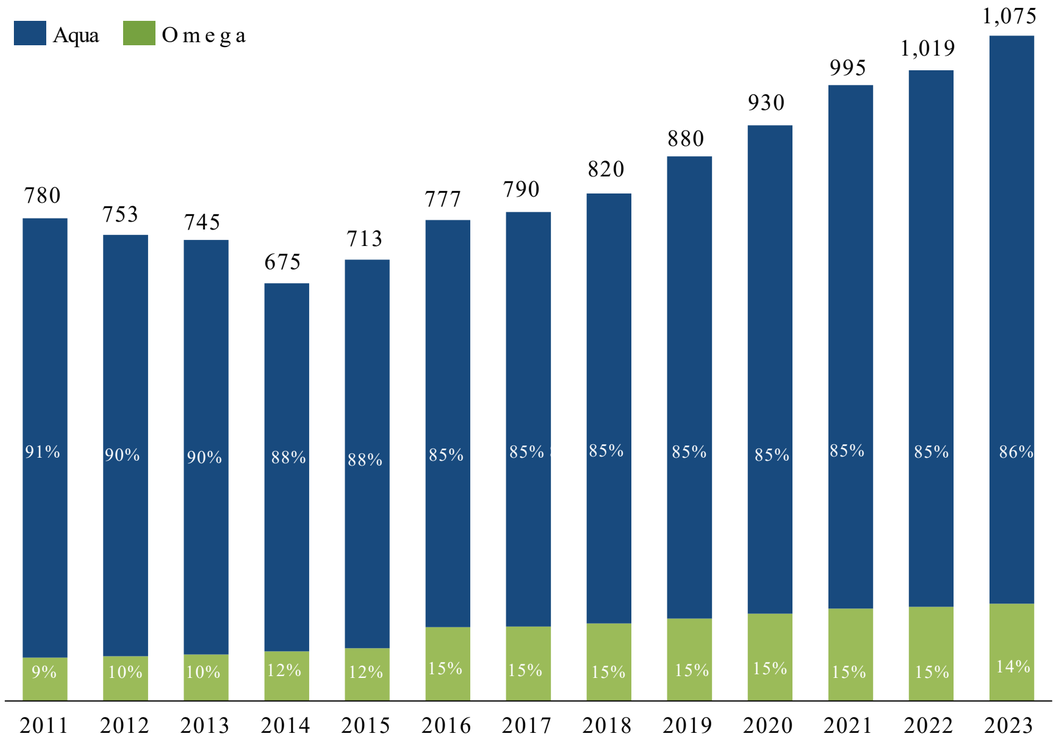
Crude fish oil supply with Human Consumption certification and high EPA/DHA value



Peru leads high EPA-DHA production.

Crude fish oil - world demand

Demand of crude fish oil (k MT)



Source : Holtermann

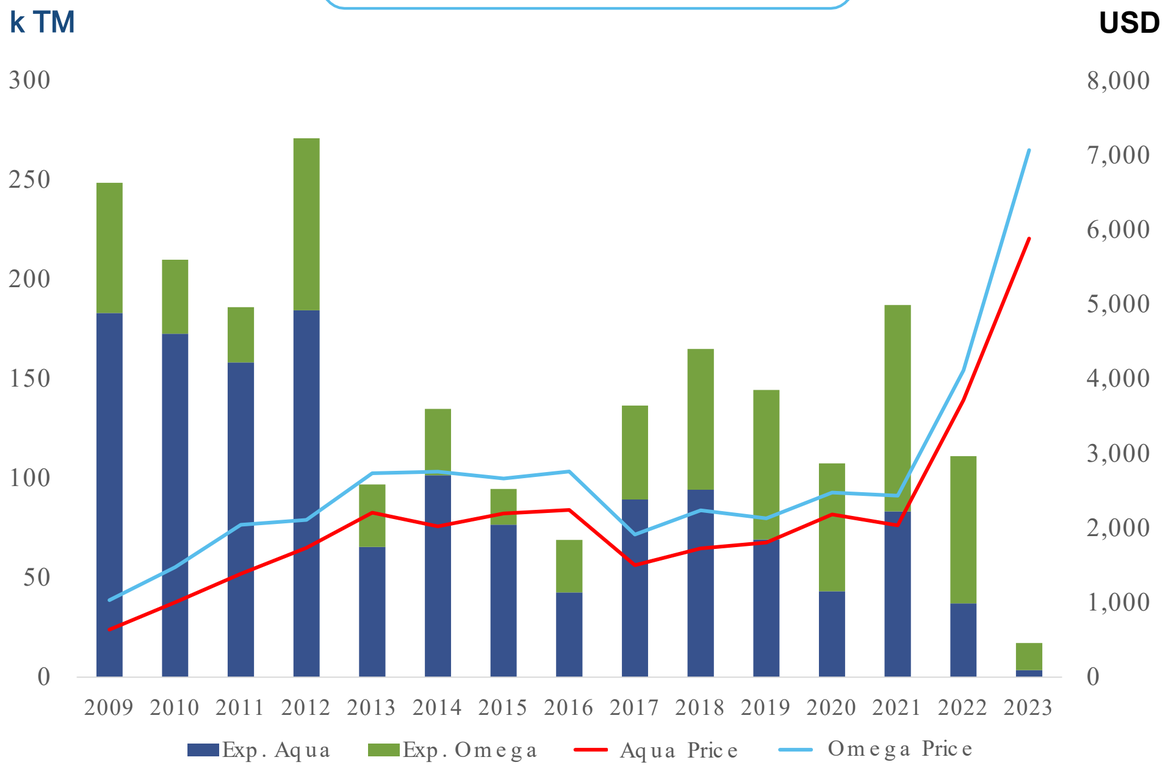
Aqua demand in average ~700 K TM :

- Crude fish oil used on salmon feed : ~450 K TM (64% of Aqua demand)
- Crude fish oil used on other species ~280 K TM

Omega demand in average ~230 K TM

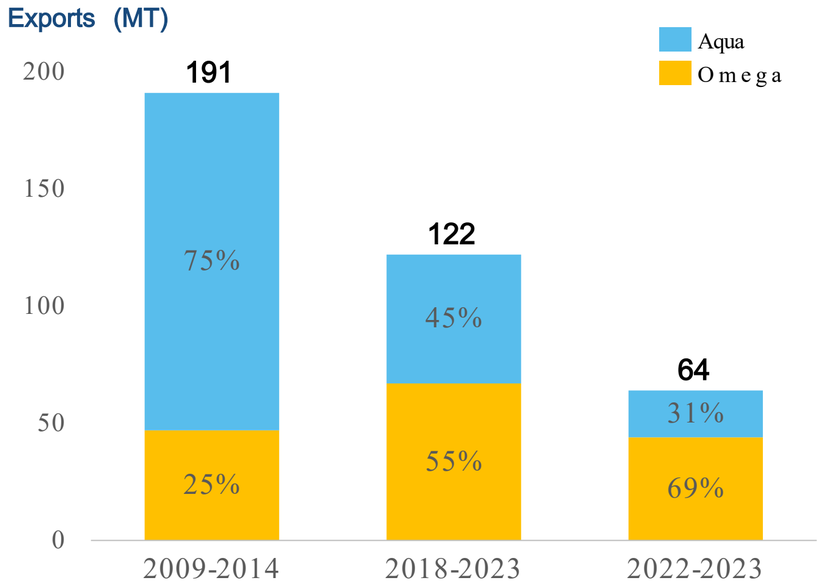
Peruvian Crude Fish Oil

Peruvian Exports



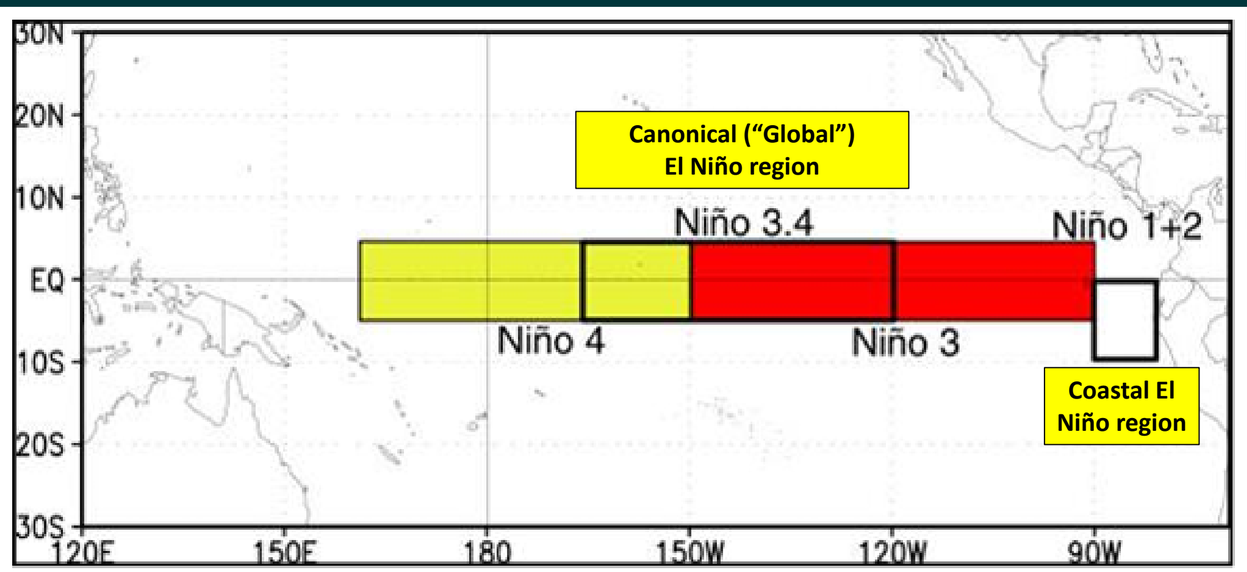
Source : Veritrade

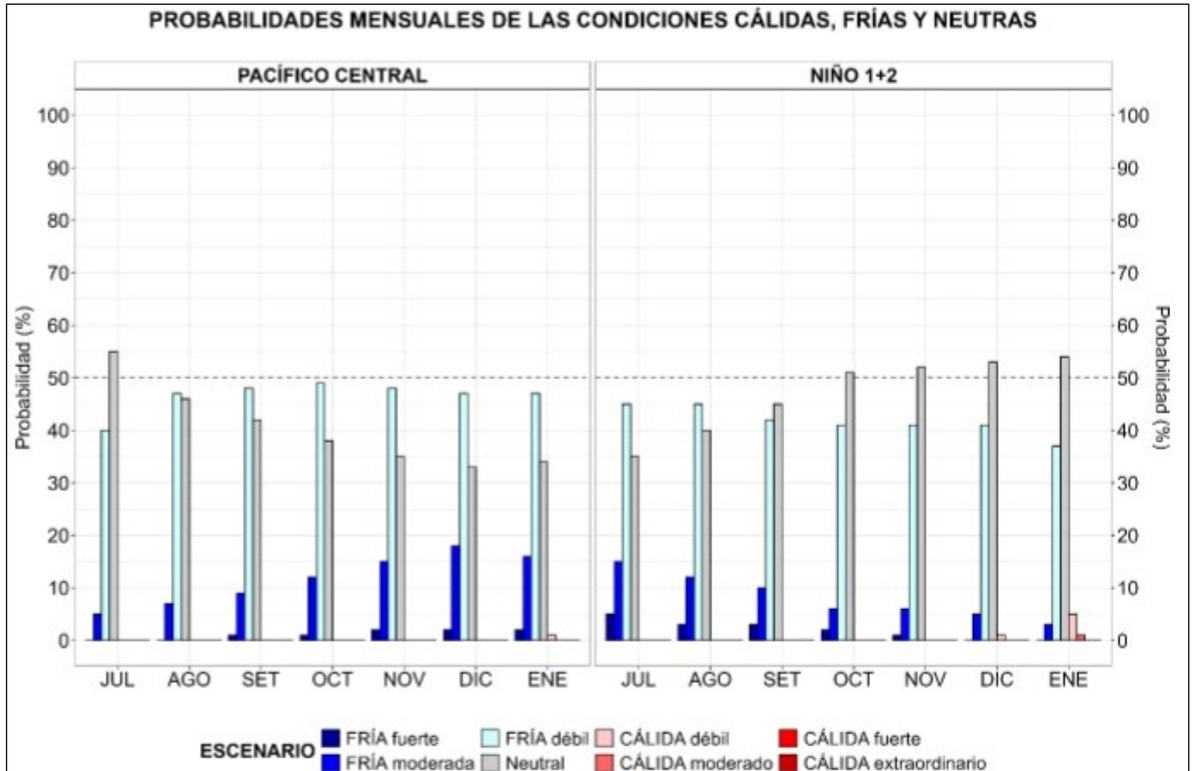
3 different periods: Omega the new main market

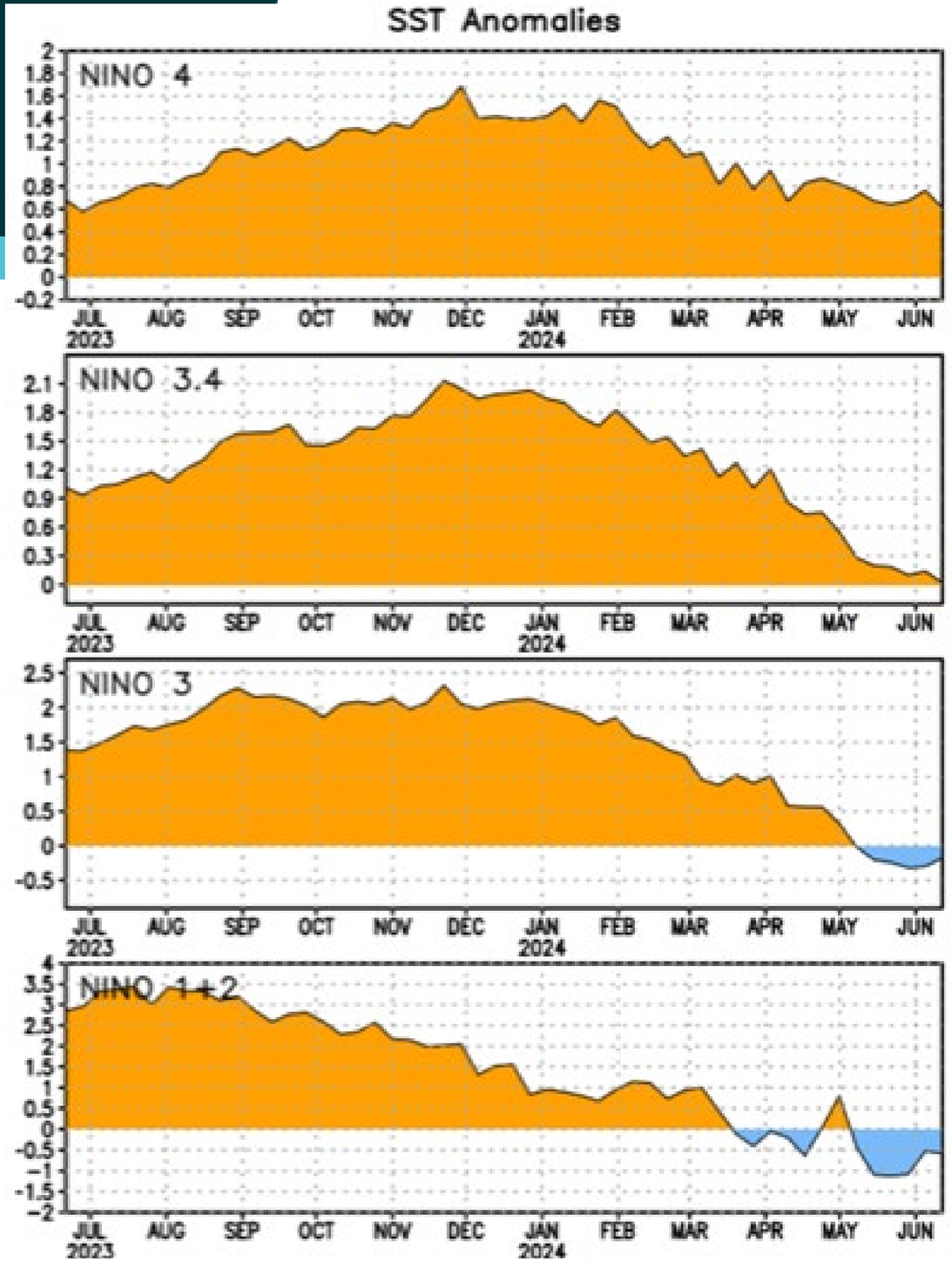


	2009 -2014	2018 -2023	2022 -2023
Price Aqua	1,499	2,892	4,800
Price Omega	2,026	3,411	5,593

COASTAL & GLOBAL ENSO EVENTS

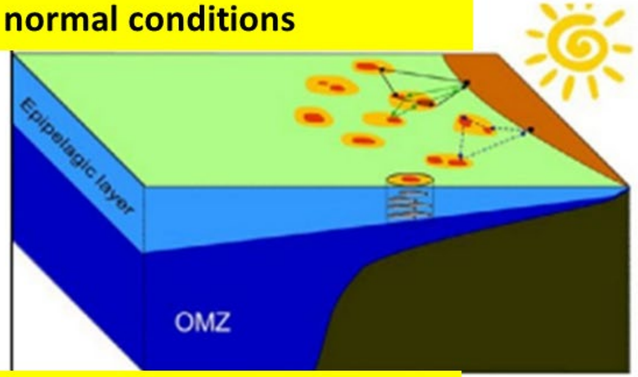




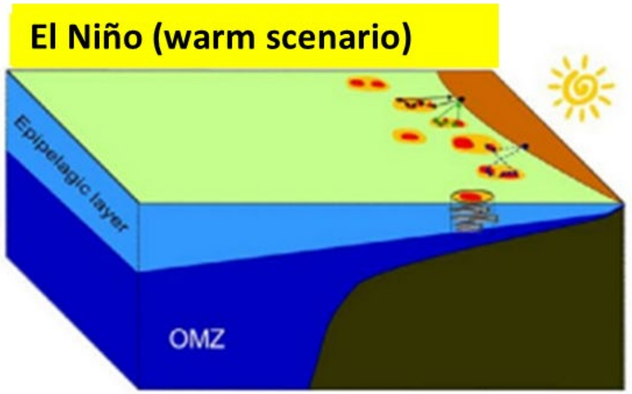


IMPACTS OF ENVIRONMENTAL CONDITIONS IN ANCHOVY DYNAMICS & QUOTA COMPLETION

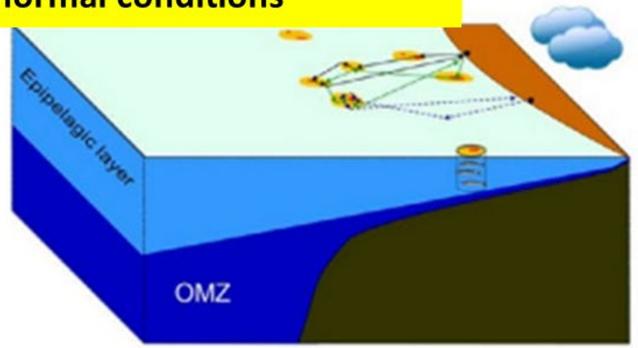
December to May under normal conditions



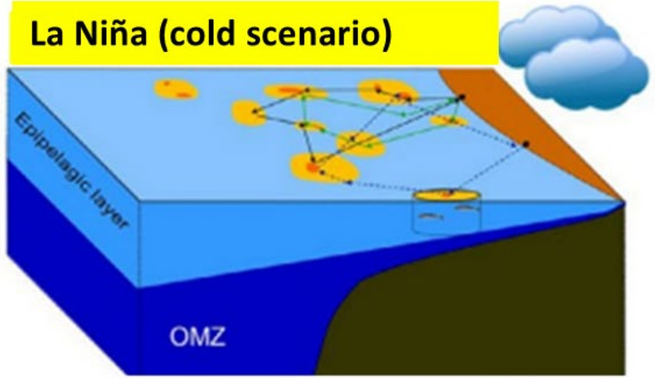
El Niño (warm scenario)



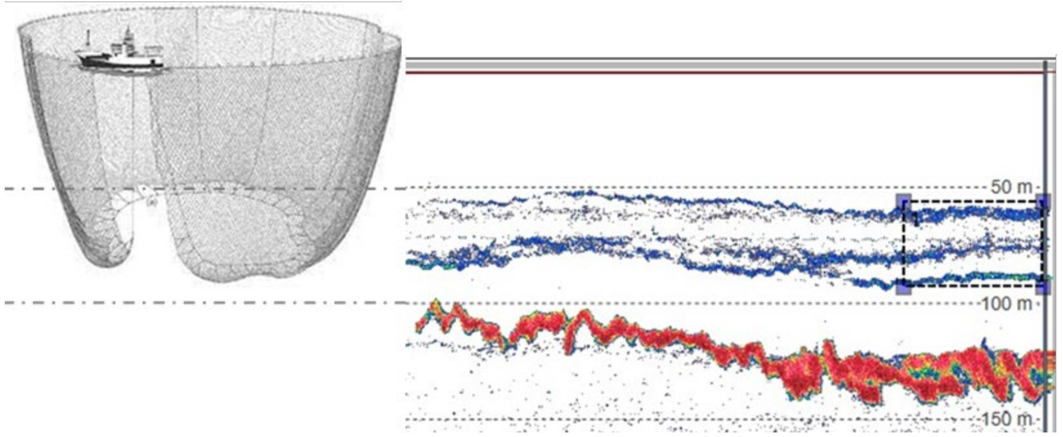
June to November under normal conditions



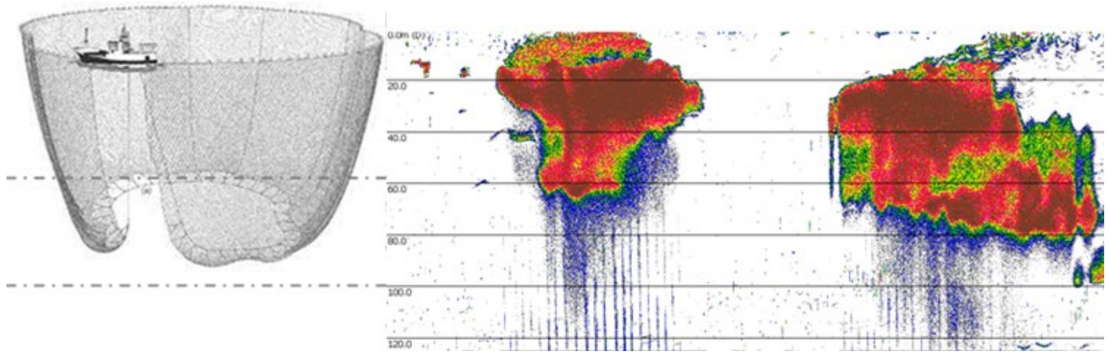
La Niña (cold scenario)



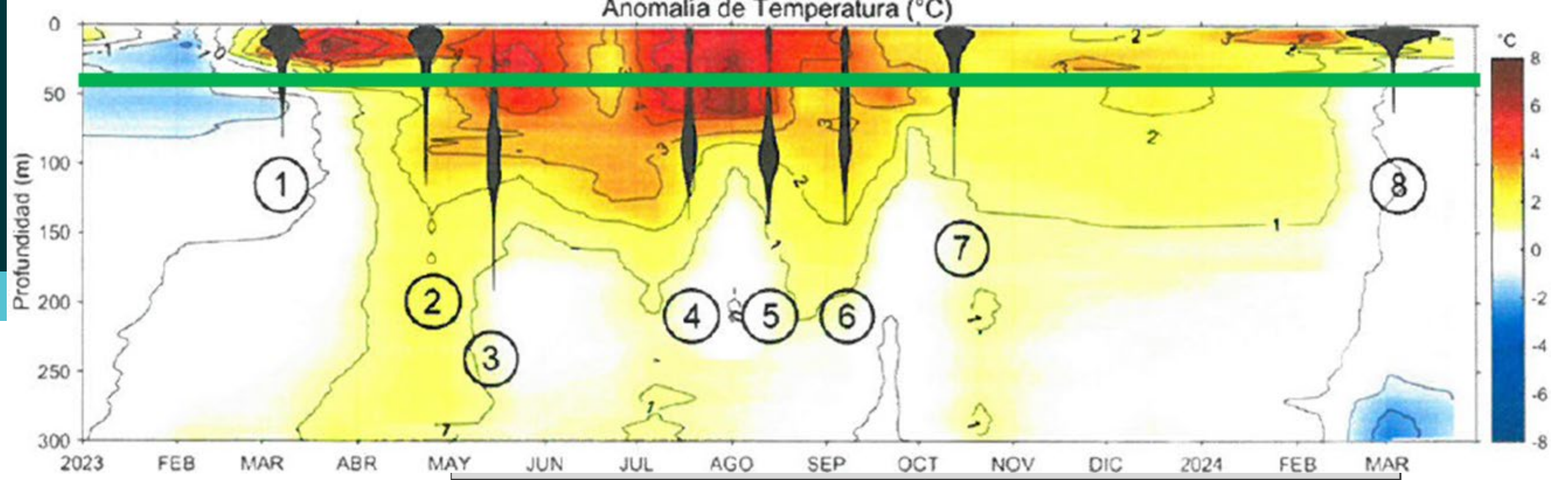
ANDES 53 (JUNE 2023)

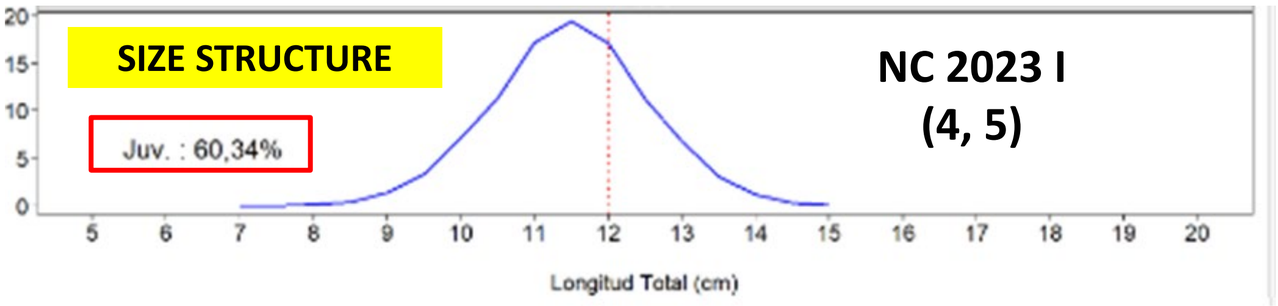


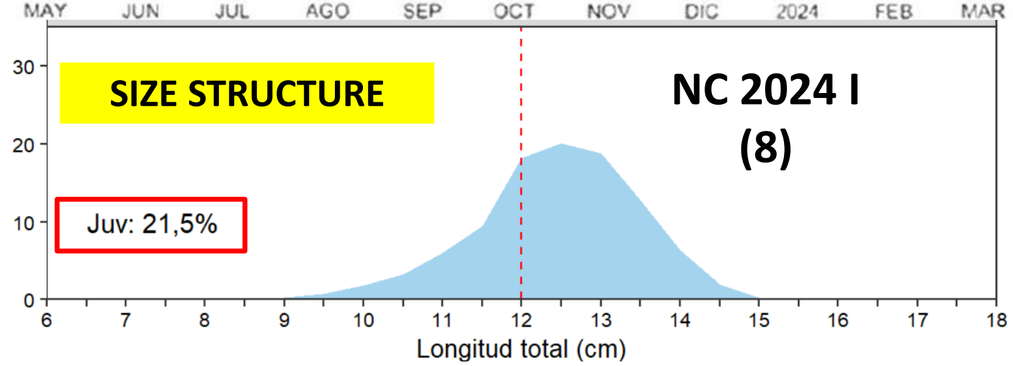
ANDES 31 (MAY 2024)

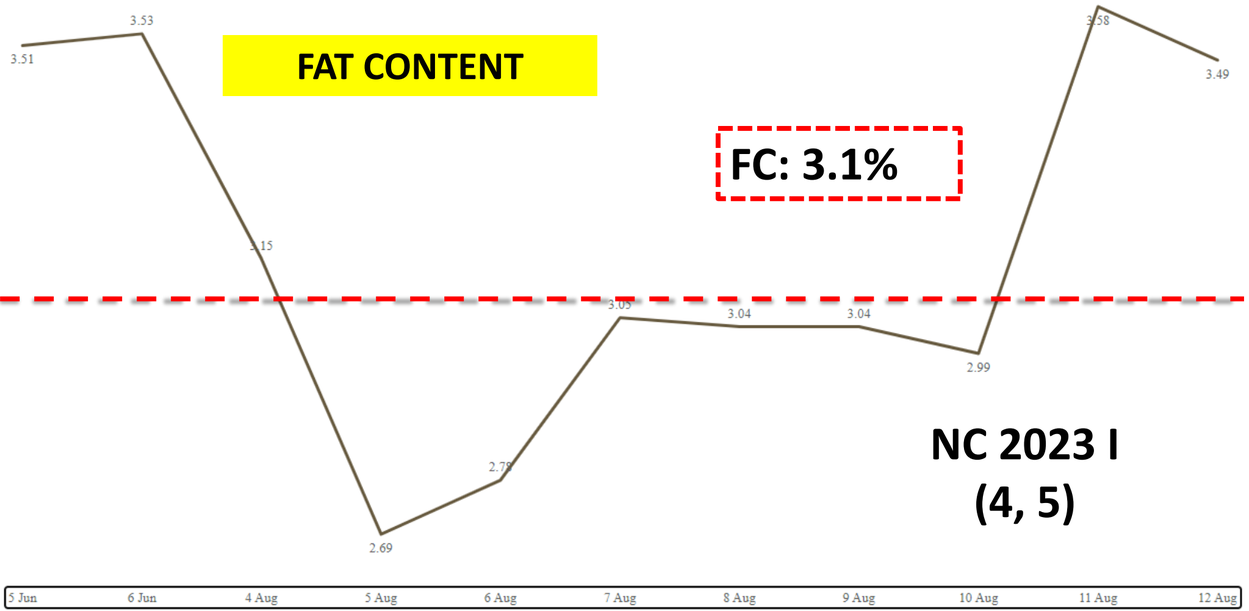


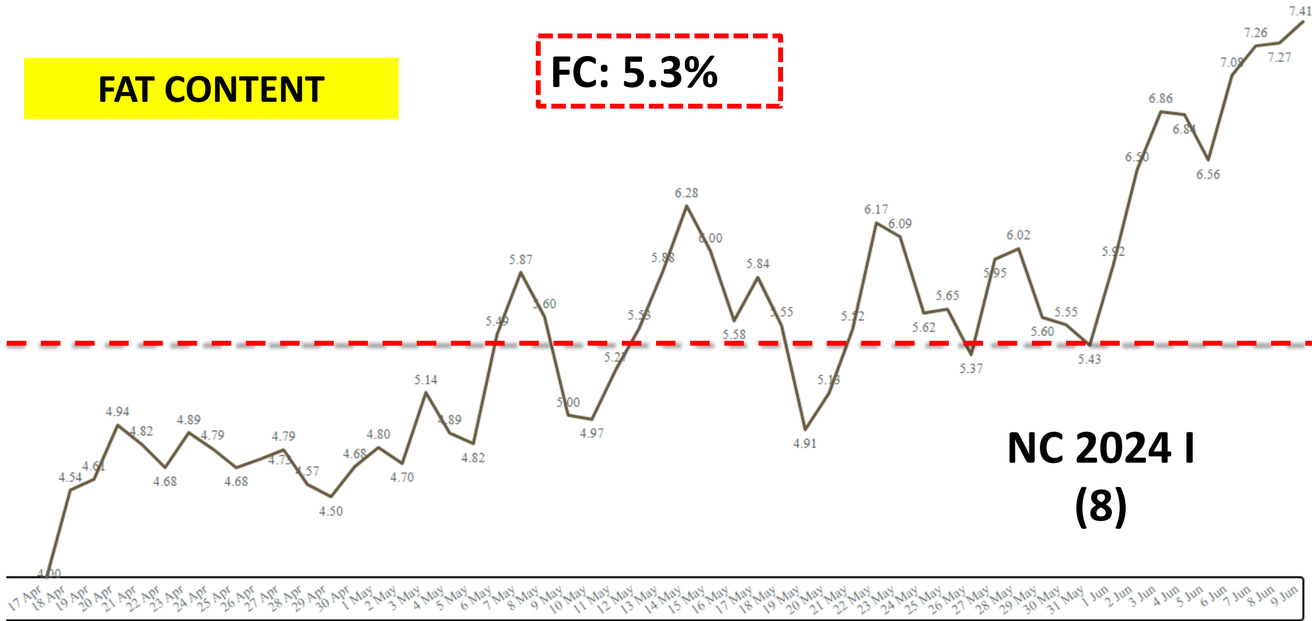
IMPACTS OF ENVIRONMENTAL CONDITIONS IN FISH OIL VOLUME











Guaranteeing a sustainable fishing industry

Biomass standards

1991 - GENERAL FISHERIES LAW	Regulation of fishing rights and planning.
2008 - QUOTA LAW	Established a maximum catch quota per vessel, and a maximum catch of 35% of the biomass
2014 - SISESAT	Satellite monitoring of vessels for fishing areas control and traceability
2013 - SURVEILLANCE PROGRAM	Prevents illegal fishing and ensures transparency of landings with on-board and plant inspectors
2019 - SANIPES	Supervision of health and sanitary requirements of the industry

Environmental standards

2018 - LMP EFFLUENTS	Maximum Permissible Limits for effluents for fishing and Fishmeal Fish oil production.
2009 - LMP EMISSIONS	Maximum Permissible Limits for emissions for fishing and Fishmeal Fish oil production.
CHANGE OF ENERGY MATRIX	Change from direct drying to Steam Dried. Emission reduction.

Peruvian Fishing Industry: Leading in Low Carbon Footprint and Sustainability

AquaFeed.COM | Newsroom | Products | Commodities | Regions | Resources | Buyers' Guide

Suppliers' News

Peruvian fishmeal and fish oil have lower carbon footprint than other aquafeed ingredients

Austral Group released the results of its Product Carbon Footprint for fishmeal and fish oil, the most precise study carried out to date for products derived from the Peruvian anchovy.

Credits: Austral Group

MAY 16, 2024

Life-cycle assessment of Peru's anchoveta fishery reveals it is "probably one of the lowest-carbon animal protein systems in the world"

"The most important thing at the end of the day for the Peruvian fishmeal industry is that it needs to keep a healthy fishing stock"

Cliff White published in Environment & Sustainability

Ian Vázquez-Rowe is the director of Red Peruana Ciclo de Vida y Ecología Industrial (PELCAN) and a researcher at the Pontificia Universidad Católica del Perú | Photo courtesy of IFFO

Carbon Footprint Study of Peruvian Anchovy Fishmeal and Fish Oil

Main Features:

- Austral's product carbon footprint for the years 2019 and 2021
- Fishmeal and fish oil with 100% anchovy as raw material
- Production of 122,165 tons of fishmeal and 15,869 tons of fish oil in 2021
- ISO 14067 Standard
- Considers 3 stages: Extraction, transformation and transportation of finished product to the port of destination
- Considers 3 allocations: Energy, economic and mass

Main Inputs:

- Life Cycle Inventory (LCI) methodology (=LCA excluding the Environmental Impact Assessment phase)
- Using Simapro 9.4.0.2 software and Ecoivent 3.8 database
- It is the most updated existing product footprint for anchovy fishmeal and fish oil
- Considers **>97% of primary data**
- A comparison was made with existing literature

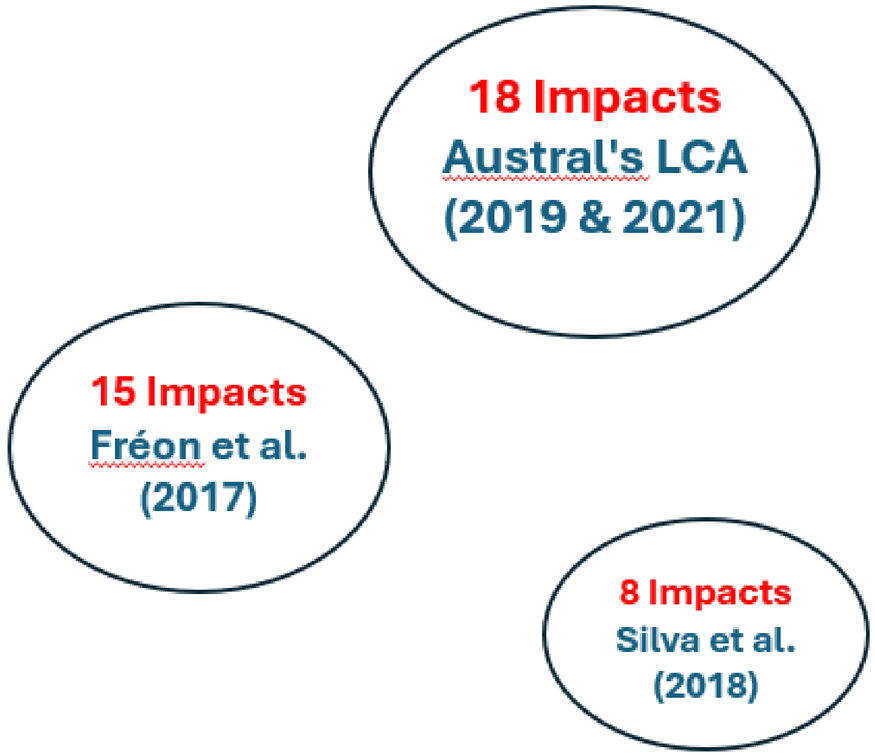
LCA Study of Peruvian Anchovy Fishmeal and Fish Oil

- To be Released Soon -

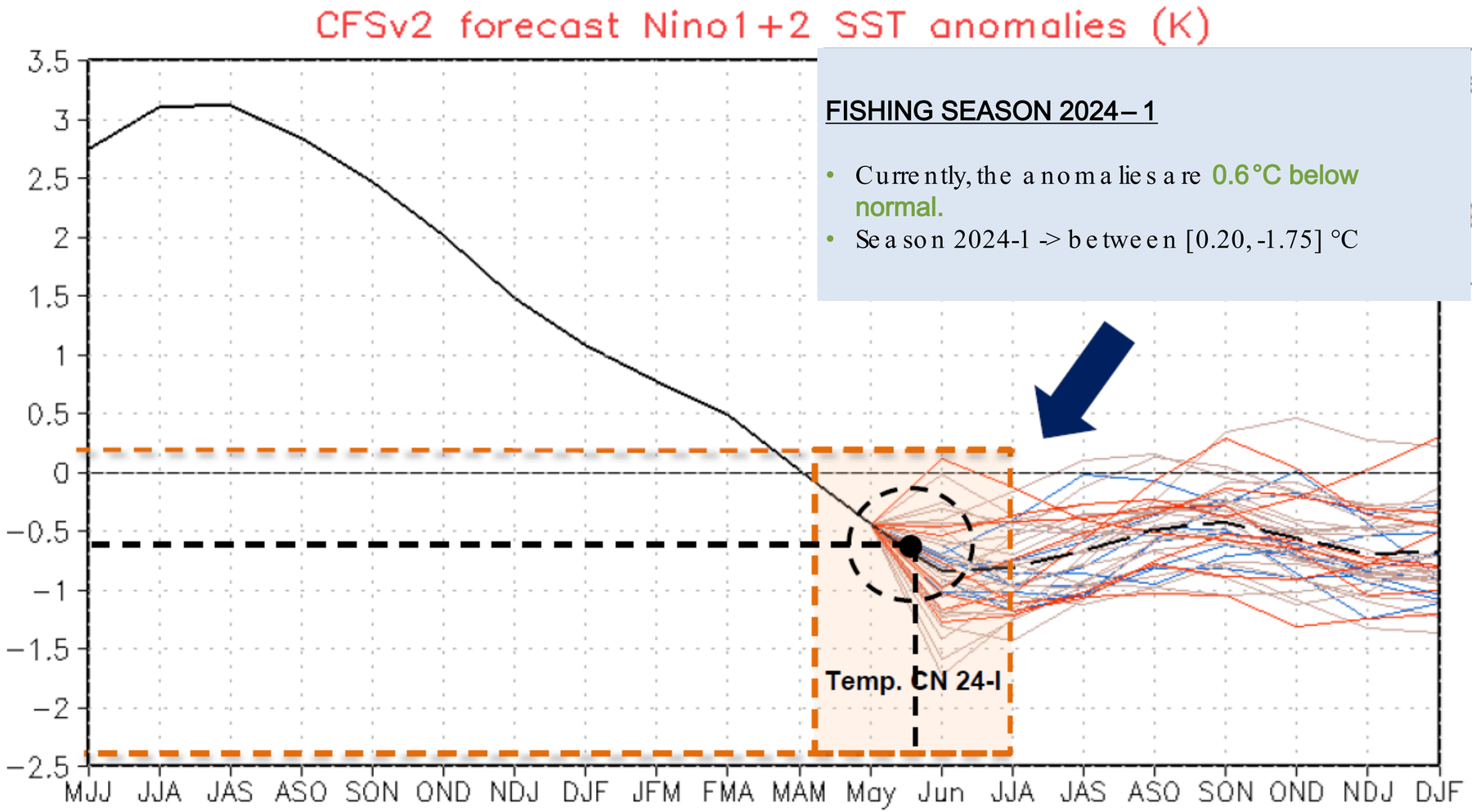
Austral's LCA (2019 & 2021)

Impact category	Unit
Global warming	kg CO2 eq
Stratospheric ozone depletion	kg CFC11 eq
Ionizing radiation	kBq Co-60 eq
Ozone formation, Human health	kg NOx eq
Fine particulate matter formation	kg PM2.5 eq
Ozone formation, Terrestrial ecosystems	kg NOx eq
Terrestrial acidification	kg SO2 eq
Freshwater eutrophication	kg P eq
Marine eutrophication	kg N eq
Terrestrial ecotoxicity	kg 1,4-DCB
Freshwater ecotoxicity	kg 1,4-DCB
Marine ecotoxicity	kg 1,4-DCB
Human carcinogenic toxicity	kg 1,4-DCB
Human non-carcinogenic toxicity	kg 1,4-DCB
Land use	m2a crop eq
Mineral resource scarcity	kg Cu eq
Fossil resource scarcity	kg oil eq
Water consumption	m3

Impact Categories Count: Austral vs. Literature



What happened in 2023 and how we see 2024?

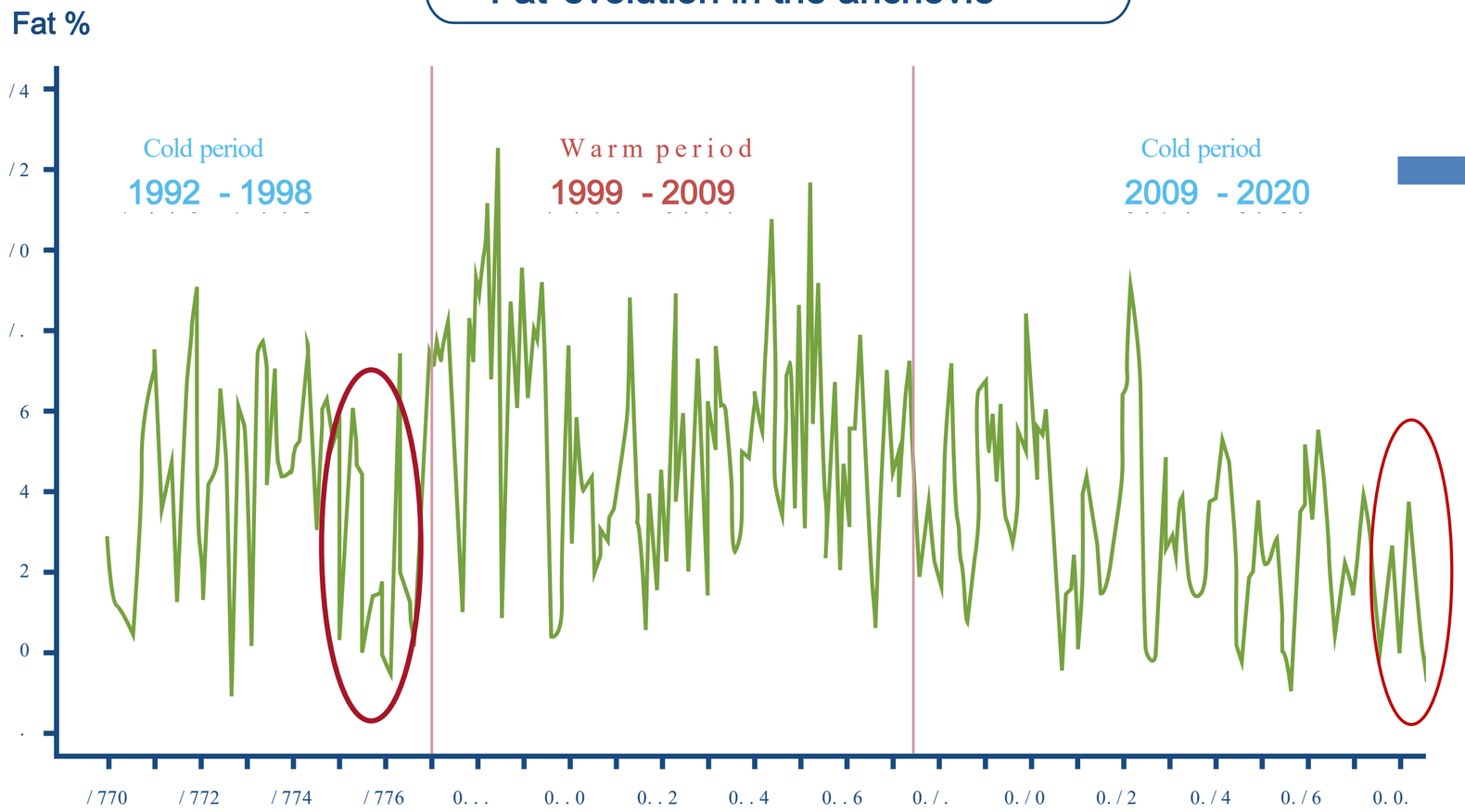


FISHING SEASON 2024 – 1

- Currently, the anomalies are 0.6 °C below normal.
- Season 2024-1 -> between [0.20, -1.75] °C

What happened in 2023 and how we see 2024?

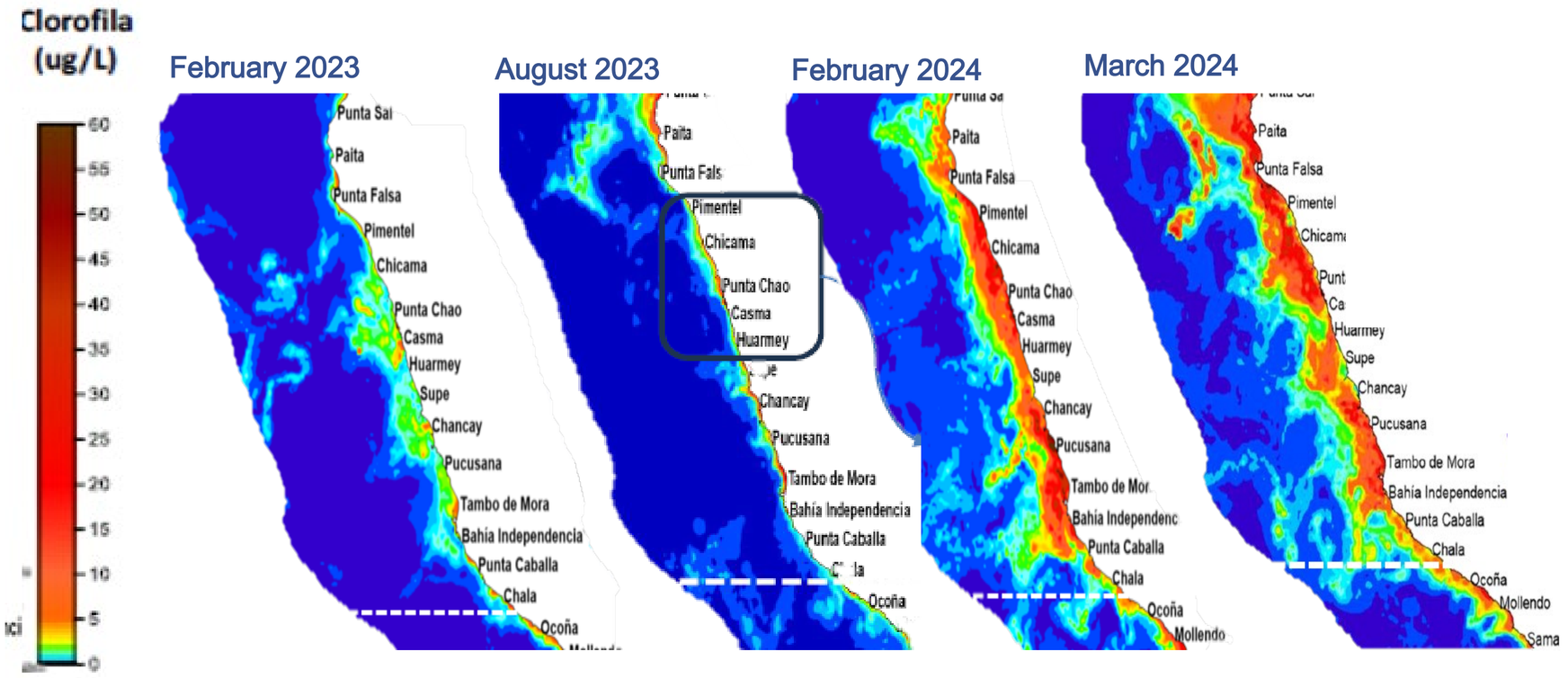
Fat evolution in the anchovie



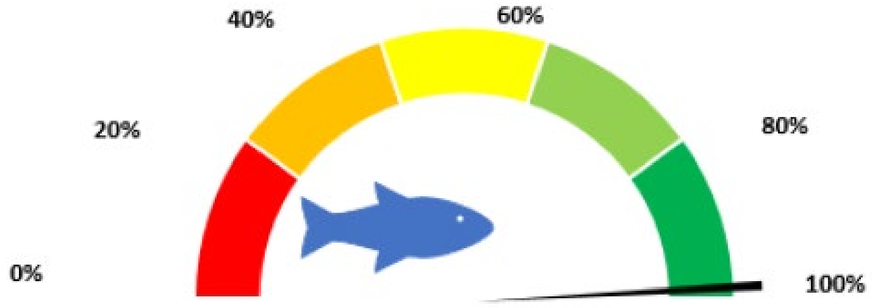
- When the ocean in the peruvian coast is in neutral conditions, we have over 4.5% of fat in the anchovie
- In years with Niño, we usually find anchovies with less fat %

*Fat % in the anchovie depends on what they eat, when the eat phytoplankton (plants) the y usually have less fat % as when they eat zooplankton (animals)

Chlorophyll evolution in Peruvian coast 2023 - 2024

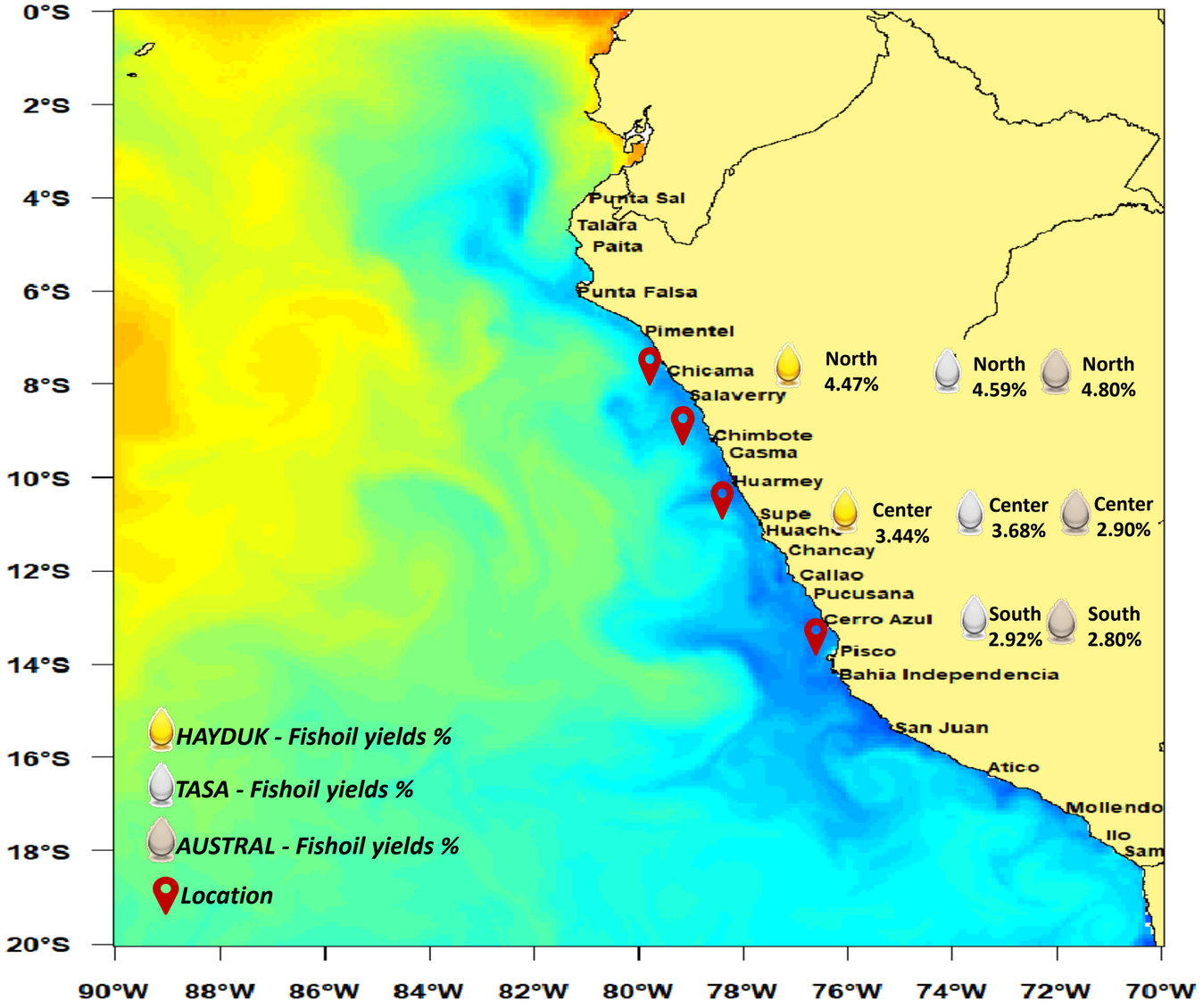


98.21%



Season North Center 2024 I : % Advance Quota National

OWN FLEET : ANCHOVY LANDING BY COMPANY				
COMPANY	QUOTA (MT)	% NATIONAL PART	LANDINGS (MT)	%ADVANCE QUOTA
COPEINCA - CFG	397,693	16.07%	388,235	97.62 %
TASA	345,895	13.98%	318,816	92.17 %
DIAMANTE	225,277	9.10%	225,377	100.04 %
EXALMAR	187,213	7.56%	162,508	86.80 %
AUSTRAL	172,870	6.98%	172,911	100.02 %
HAYDUK	162,768	6.58%	164,680	101.17 %
OTHER	983,285	39.73%	998,062	101.50 %
TOTAL	2,475,000	100.00%	2,430,589	



OMEGA PROFILES									
COMPANY	HAYDUK			TASA			AUSTRAL		
	EPA Min	DHA Min	EPA + DHA Min	EPA Min	DHA Min	EPA + DHA Min	EPA Min	DHA Min	EPA + DHA Min
NORTH	18.44	9.43	27.87	18.66	9.95	28.61	18.79	9.35	28.14
CENTER	18.31	10.20	28.51	19.02	10.08	29.10	18.86	11.40	30.26
SOUTH	-	-	-	20.39	11.09	31.48	20.79	11.22	32.01

North: Malabrigo, Chimbote, Samanco / Center: Supe, Vegueta, Callao / South: Pisco

What happened in the past and how we see 2024?

PERU	2015		2016		2017		2018		2019		2020		2021		2022		2023		2024
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st
Quota (in M MT)	2.58	1.11	1.80	2.00	2.80	1.49	3.32	2.10	2.10	2.70	2.41	2.78	2.50	2.05	2.79	2.28	1.09	1.68	2.47
Catch (in M MT)	2.51	1.09	0.92	1.95	2.37	0.70	3.32	2.10	2.05	1.00	2.36	2.45	2.46	2.00	2.35	1.91	0.23	1.26	2.46
% Fat in anchovy	No data	No data	4.85%	5.14%	4.44%	4.95%	6.54%	4.26%	5.62%	4.80%	4.85%	6.82%	5.32%	3.92%	4.62%	2.60%	3.10%	2.00%	5.15%
Oil Yield (%)	3.30%	2.43%	3.09%	3.98%	2.93%	3.91%	5.33%	2.40%	4.36%	3.34%	3.43%	5.40%	3.93%	2.26%	3.31%	0.83%	1.25%	0.46%	3.86%
Oil Production (in Ktons)	82.8	26.5	28.4	77.6	69.4	27.4	177.0	50.4	89.4	33.4	80.9	132.2	96.7	45.2	77.7	15.9	2.9	5.8	94.9
Production (in KMT)	109		106		97		227		123		213		142		94		9		94.9

Thank you!

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