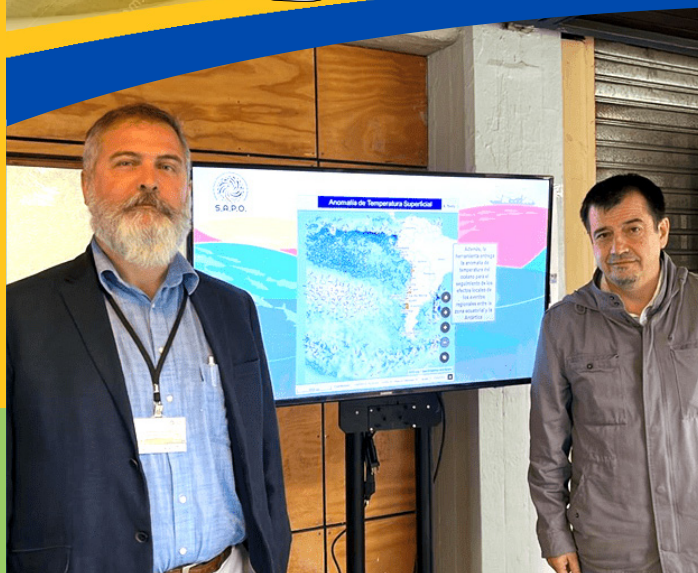


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There is no worrying evidence of harmful algal blooms during the summer of 2023 in Los Lagos region

Dr. Leonardo Guzmán, Head of IFOP Aquaculture Research Division (para la foto de don leo)

Specialists in harmful algae blooms from Fisheries Development Institute (IFOP) and the Center for Harmful Algae Studies (CREAN) of this Institute, Dr. Oscar Espinoza González and Dr. Leonardo Guzmán Méndez, have deemed it necessary to extend this statement, given the worrying news on the matter, which have recently appeared in the national media.

So far in 2023, provided data by two monitoring programs for Harmful Algal Blooms (FAN) and marine toxins developed by IFOP through CREAN, contrary to what has appeared in the press, show a scenario peace of mind when it comes to harmful microalgae and marine toxins. As in 2022, during the current summer period there has not been a worrying increase in microalgae, especially those that usually cause public health problems and affect productive activities. However, in certain sectors there has been a significant increase in Dinophysis acu-



minata, a dinoflagellate associated with toxins known as pectenotoxins (PTX), which fortunately are currently not regulated, since they do not cause public health problems.

For this reason, it is in our interest to transmit a tranquility message given that our early warnings are based on information that comes from at least 300 monitoring sites between the Biobío (36°S) and Magallanes y Antártica Chilena (55°S) regions. The data obtained from the different variables that have been regularly monitored by these research for 15 years now allow us to have more and better information, which allows a better diagnosis, support, generation of



Editorial committee

Gonzalo Pereira P. / Executive Director
Gabriela Gutiérrez V. / Journalist

Graphic design

Mario Recabal M. / Senior graphic designer

knowledge and delivery of well-founded opinions about the atmospheric and oceanographic processes that determine the occurrence and intensity of HABs in central and southern Chile.

With summer's season arrival and with consequent change in meteorological and oceanographic conditions that it produces, the probabilities of HAB occurrences increase. Therefore, in a localized manner, it should not be surprising that some flowering could occur in very specific sectors, but in general they do not represent great geographical coverage problems, which imply strong impacts on social and economic environment and that put risk on public health and hinder productive activities such as fishing and aquaculture. Due to this, it is necessary to know the current state of HAB and marine toxins, to have short-term projections in sectors that support resource extraction, salmon farming and mites, central aspects of the work carried out in IFOP's CREAM.

Our recommendation in this period of the year is to maintain vigilance, the flow of information and a responsible attitude towards a potential area affected by harmful events, where it is convenient, attend and listen to the guidelines provided by the authority, in order to protect the people's health and minimizing the impacts on productive activities.

Abate Molina ship set sail for anchovy research between Atacama and Coquimbo regions

Today, February 13th, Abate Molina scientific vessel set sail from Valparaíso's port to evaluate anchovy stock between e Atacama and Coquimbo regions.

The cruise's head is Francisco Leiva and the vessel's captain is José Echeverría, together with IFOP professionals and technicians and for 27 days they will work to find out the status of the anchovy.

The Cruise's specific objectives are:

- To carry out 44 acoustic transects between 25°00'S parallel (Paposo roadstead), in Antofagasta region, up to the 32° 10'S parallel (Pichidanguí), southern limit of Coquimbo region.



- To evaluate shore bias in front of Caldera and Coquimbo.
- To carry out a sufficient number of reconnaissance fishing sets to characterize anchovy stock
- To carry out oceanographic stations in study area.

First Climatic Change congress organized by Valparaíso's Rectors Council

Between January 16th and 18th 2023, the First Climatic Change Congress was held at Universidad de Playa Ancha. This regional initiative had the support of Universidad Tecnica Federico Santa María, Pontificia Universidad Católica de Valparaíso, Universidad de Playa Ancha and the Universidad de Valparaíso grouped in the Valparaíso's Rectors Council (CRUV) (consejoderectoresvalparaiso.cl).

CRUV Universities rectors, Science and Technology Ministerial Secretariat from Central Macrozone Dr. Jorge Soto and a representative of Environmental Ministerial Secretariat Chilean Navy and National Research Institutes representatives participated in the inaugural ceremony. The best theses related to Climatic Change from Universities which belong to CRUV were rewarded.

Dr. Rivera, event organizer pointed out that this is the first step to inte-



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CREAN-IFOP researchers were part of Ocean Manifesto fourth edition

Between May and December 2022 CREAN-IFOP researchers Oscar Espinoza G., and Pamela Carbonell A. worked with 1st to 6th grade children from of Pichicolo Rural School located in Hualaihue, in order to compile the sea importance for their community, and thus, reflecting this relationship in drawings that were integrated into a calendar made up with coastal communities of Illa de Arousa, Galicia-Spain and Pomo Indians Kashaya Band, California, and whose edition has been led since its inception by tMarine Research-CSIC Oceanography Department

Responses by Pamela Carbonell

How did Ocean Manifesto come about?

Ocean Manifesto was born to raise society's awareness about the need to protect marine ecosystems and, at the same time, to take advantage of end of the year's solidarity to support Bicos de Papel families who are affected by childhood cancer in Spain.

What can we find in this year's edition?

In this year's edition, we can find three towns linked to two oceans, the Atlantic and Pacific, which came together to give as a final result a collaborative work between Galicia, Mapuche-Huilliche indigenous communities and California pomo. All are coastal communities and united by their strong bond with the sea.

The drawings illustrate each calendar's month and reflect the love for the sea, its care importance, and impact on their lives. The calendar edition was carried out in English, Spanish, Galician, Kashaya and Mapudungun.

"I feel admiration for the sea because it is very helpful to us" Dominique Uribe, 11 years old. Her partner Evelyn Torres, 10, "feels the responsibility of taking care of the sea to make it grow." Carla Núñez, 14, from Galicia, imagined a colorful and rich underwater background to relate that "the ocean is the first thing she sees when she gets up and that transmits tranquility and joy. "É unha parte de min", she shares.



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grate and strengthen climatic change issues from regions. This initiative will be repeated in 2024, opening the call at the international level.

Marine Biologist Manuel Ibarra, in charge of SERNAPECSA Valparaíso region's Marine Parks explained that it is necessary to address Marine Protected Areas importance in Climatic Change mitigation and biodiversity conservation in upcoming congresses.

IFOP was represented by oceanographer Milena Pizarro and Dr. Jaime Letelier, from its Fisheries Research Division Oceanography and Environment Department's Head. Dr. Letelier presented a virtual panel "Climatic change monitoring system for fisheries and aquaculture resilience in Humboldt currents great ecosystem (S.A.P.O.)" by authors Jaime Letelier, Andrés García, Sergio Palma (EDF) and Hernán Reyes.

Dr. Letelier pointed out data monitoring systems importance and their inter-institutional and multinational integration with different sectoral objectives, in order to obtain integrated historical information that allows reducing long-term predictive models uncertainty . At the same time, he pointed out the need to continue promoting and supporting Initiatives such as the CRUV Climatic Change Congress, especially if they are regional initiatives.

What did this activity mean for Pichicolo children?

It allowed children to learn about other cultures, other languages, as well as realizing that, like many coastal communities, they share a deep love for the sea, thanks to the strong bond they have with their families, transmitting deep respect and care.

In the closing activity, carried out a few days ago at Pichicolo Rural School, a copy was given to each of the children, and to the “oceanic rapporteurs” who participated throughout this time, in addition to being able to connect remotely with children from Galicia And California where they shared their experiences and explained each one of their drawings.

COLABORADORES/AS Y ARTISTAS

Comunidad Kashaya, California



Stewarts Point Rancheria, Nina Hapner, Amy Little, Abreanna Gomes, Athena Stra, Otis Parrish, Koda Pinola, Kendall Pinola, Addison Gomes, Peyton Gomes, Severino Gomes y Anthony Pinola.

IES Illa de Arousa, Galicia (España)



IIM-CSIC Vigo, Carmen G. Castro, Susana F. Bastero, Rosa Bañuelos, Trinidad Rellán, Manuel E. Garci, IES da Illa de Arousa, Chao Bañobre, Aida Gómez, Alfonso Cabaleiro, Amanda González, Carla Núñez, Estela Rial, Alan Iglesias, Ingrid Vázquez, Xoán Somoza y David Iglesias.

Comunidad Huilliche-Mapuche, Hualaihué



IFOP-CREAN Puerto Montt, Oscar Espinoza, Pamela Carbonell; Escuela Pichicolo, Bárbara Vargas, Daniela Uribe, Ingrid White, Patricio Castro, Emilio Acevedo, Jean Barrientos, Francisca Aucapan, Benjamín Tureuna, Consuelo Llancapani, Flor Vargas, Jendely Barrientos, Yailin Uribe, Antonella Alveal, Benjamín Ulloa, Elizabeth Durán, Matías Poveda, Vicente Vargas, Evelyn Torres, Moisés Sandoval, Bastián Vargas, Yerik Nail, Kalfulikán Antifirre, Ángela Gómez, Dominique Uribe y Yosué Rojas. Municipalidade de Hualaihué Víctor Uribe, Relatores, Héctor White, Francisco Aucapán, Francisco Durán, Kere Kere, Inés Guerrero.



Red Tide phenomenon will be discussed by three experts in a new Scientific Café

IFOP AND MACH PROJECT EXPERTS WILL ANALYZE THIS NATURAL PHENOMENON IN A DISCUSSION MODE

Understanding how algal blooms phenomena is produced in the waters, how they affect aquaculture activity and human life and how this will be some of the keys to analyze in next Puerto Montt Scientific Café called “Red Tides talk”, which will take place held next Thursday, January 19th at 7:00 p.m. at the Toco Madera Restaurant.

In the opportunity, 3 experts in the area will participate and will analyze this natural phenomenon, which becomes more relevant in areas like ours with marine ecosystems in which different productive areas of aquaculture proliferate, from mussel farming to the high presence of markets. and fishing coves. For this reason, it is relevant, they consider, to promote spaces for citizen education regarding events popularly known as “Red Tide.”

The specialists who will participate in this Scientific Café that will take place in a discussion format will be Dr. Pamela Carbonell, CREAN IFOP Aquaculture Researcher; Dr. Leonardo Guzmán. IFOP Aquaculture Research Division Head and Dr. Alejandro Murillo, Algae Monitoring Project Coordinator in Chile MACH, who throughout their experiences have dedicated themselves from different perspectives to scientific dissemination. and research on the matter.

In this regard, Dr. Alejandro Murillo invites general community and also people who work around aquaculture to participate in this instance, where this issue will be discussed with an important local focus.



Dr. Leonardo Guzmán, Jefe de la División de Investigación en Acuicultura de IFOP

“We invite the Puertomontt’s community, scientific community and interested people in general to be part of this conversation about natural events colloquially known as “Red Tide”, why these algae blooms occur, and in

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particular harmful algae and how they affect to the coasts of Chile, from a multifactorial point of view”, expresses Murillo.

Those interested in participating in person can register at the premises located at Av. Juan Soler Manfredini corner Liborio Guerrero, Balneario Pelluco in Puerto Montt, or in the online form available at <https://forms.gle/bty5zidxniiZntKw9> Coffees will be delivered Free to the first 20 attendees. The Scientific Coffee will also be broadcast live through the Facebook page PARExploraLagos <https://www.facebook.com/PARExploraLagos/>



Dra. Pamela Carbonell, Investigadora en Acuicultura de CREAN IFOP.



Dr. Alejandro Murillo, Coordinador del Proyecto de Monitoreo de Algas en Chile MACH.

Ministry of Science, Technology, Knowledge and Innovation PAR Explora Los Lagos Regional Associative Project is executed by Universidad Austral de Chile, Puerto Montt Headquarters. Puerto Montt Scientific Coffee is carried out in conjunction with environmental Science Linkage and Communication Unit, UACH Puerto Montt Headquarters. The Toco Madera Restaurant in Puerto Montt.

Yael Cisternas IFOP scientific observer, embarked on UNIONSUR factory ship

Yael Cisternas became the first female IFOP scientific observer to embark on a factory ship for 51 days. This southern demersal fishery also takes place in the rough seas of the southern part of our country, which becomes an extra challenge to develop scientific work.



This event marks a precedent in the field work on board, directed by sampling management department, and confirms, at the same time, that gender roles can be diversified, and thus integrate more female observers to the component of sampling relative to the fleet of factory vessels in the country.

Gonzalo Muñoz, Sampling Management Department (DGM) (S) Head pointed out that for several years now Fisheries Development Institute (IFOP) Scientific Observers (SO) have been incorporated into field work on board, in order to the vessels of the great fishing fleet of our country. In a first stage, from the year 2000, in industrial warehouses in the south-central zone with sufficient independent accommodations for them, which carry out extractive activities,



mainly in their base ports vicinity of and, therefore, limited fishing trips in time. And then, over the years and, especially due to his good performance, professionalism, responsibility and quick adaptability to work on board, added to the greater demand for biological and fishing information by Fisheries and Aquaculture Undersecretary (SSPA), they were also incorporated into artisanal fleets, specifically in launches, which have operational characteristics similar to those of ships.

However, until the recent trip made by the scientific observer, Yael Cisternas Céspedes, marine biologist (E), on board UNIONSUR factory ship, Fisheries Development Company (EMDEPES) records, no observer from the institute had embarked in a ship of these characteristics. large size (105 meters in length, length) and with the particularity that she processes and preserves her catch on board (mainly in surimi format), which makes it easier for her fishing trips to extend over several months.

Yael added “in general terms, it has been a great learning experience for both parties and a demonstration that the incorporation of female personnel as part of the crew is not an impossible niche to include and explore, where the skills of both genders instead of collide, they manage to complement and adapt according to the needs that arise, where the main pillars for this great achievement are based on respect and agreements, the same pillars that sustain our society. This being the first step for the incorporation of female personnel in industrial vessels and finally in the fishing world.

Crew School Students visit Abate Molina scientific vessel

On December 28th a group of Crew School students accompanied by a teacher, visited Fisheries Development Institute's Abate Molina scientific vessel.

On the occasion, the students and the teacher were received by Gonzalo Pereira Puchy IFOP Executive Director, boat's captain, crew and researchers who explained them how each ship's equipment work.



The Abate's tour was very interesting and entertaining for the students since, in a didactic way, the professionals answered all the questions asked by the youngsters. They also got to know laboratories, command bridge, cabins, kitchen and they had a live on field experience in how to work on a scientific ship.

Gonzalo Pereira, IFOP Executive Director explained “for us it is very important to receive these young people who are so motivated to work on the ship today, we signed an agreement with the Crew School, through which the students will be able to carry out their internships in this ship and in the next research ships that we have”

Cesar Galleguillos, added “as a science professor at Valparaíso Crew and Port School, I feel that our institution and its students approach to scientific research world carried out by IFOP through its vessel, allows us to approach and expand our maritime territory knowledge. In relation to our visit, made to Abate Molina boat, I feel that it is an opportunity where our students can demonstrate skills acquired within their training process, as well as being an instance to acquire new knowledge in relation to IFOP's research, development and sampling.



A collaboration agreement is signed by IFOP and Valparaíso Crew School

STUDENTS WILL BE ABLE TO CARRY OUT THEIR PROFESSIONAL INTERNSHIP ON ABATE MOLINA SCIENTIFIC VESSEL.

On December 27th, in Valparaíso, a collaboration agreement was signed between Fisheries Development Institute (IFOP) and Valparaíso's Crew and Port School. Through which students of Crew members School's middle-level technical careers will be able to carry out their practical internships; Crew members of merchant and special ships, administration mention logistics and port operation, in IFOP considered the most prestigious institution dedicated to fishing and aquaculture research.

The document was signed by Gonzalo Pereira Puchy, IFOP Executive Director and by Luis Atineos Lázarte, Valparaíso's Crew and Port School Director. The ceremony was held at IFOP Valparaíso, with the participation of workers from both institutions and students.



Gonzalo Pereira, referred to the agreement "signing this agreement is very important because our institution currently manages a research vessel and has a 15 people crew, which performs operation of vessel operational, next year on this date we will have a new research ship, which will also be in charge of IFOP, then have an agreement with Valparaíso's Crew School, which allows us to access young people in the areas that are required in the operation of these ships and thus be able to count on with these professionals and the crew school to have a space in which young people can carry out their professional practical internship and have the opportunity of acquiring real practical knowledge of what they are learning in the classrooms".

The agreement also establishes that IFOP undertakes through its Marine Operations Department to hold exhibitions and guided tours for students, thus disseminating the work carried out at IFOP, particularly by this Department.

IFOP, in the event of new job opportunities arising in the Department, will communicate these to the Crew School and will prioritize the hiring of students who completed their internship with a good performance evaluation in the Marine Operations Department, for positions that are relevant with their training and motivation.

The Crew School, is committed to facilitating the dissemination of internship opportunities offered by the Marine Operations Department, within its Institution, as well as to disseminate IFOP's institutional work regarding the Institutional Mission-Vision. And to disseminate among its alumni Fisheries Development Institute Marine Operations Department available job opportunities.

The Crew School will provide its facilities to IFOP (Auditorium and/or classrooms) for the development of training and/or dissemination activities, subject to their availability.

Patricio Herrera, IFOP Marine Operations Department's head, added "it is important that new generations get to see in the maritime sector a concrete possibility of professional development. At the Crew School we find young people who are interested in navigation and the scientific work that we do on board the B/C Abate Molina. For them we will have, at first, room for their professional practice needs and later, certain possibilities of employment alternatives".

Javier González in charge of IFOP Training added "this is an excellent opportunity for collaboration between two institu-



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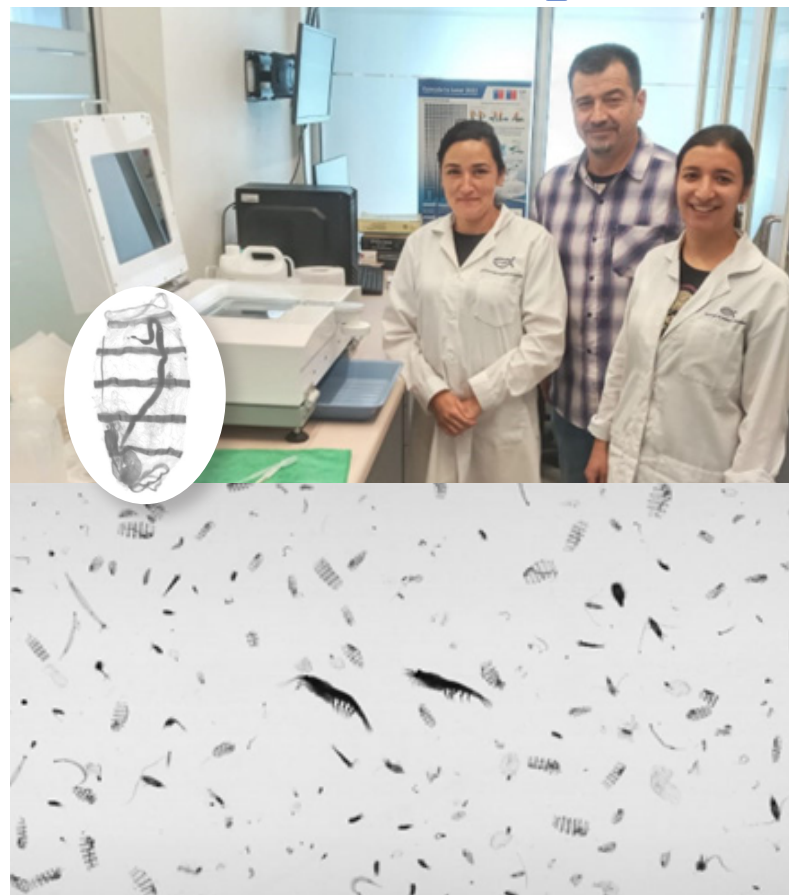
tions with a long history and common objectives. In addition to allowing us to install scientific curiosity in the students of the Crew School, through the talks that will be given and the work that they will be able to observe. In terms of employability, it is also a good instance, since it allows students to project themselves as part of the crew of a scientific ship, aspire to develop in IFOP and for our part it allows us to choose to have the incorporation of new people who have the support of the excellent academic, technical and value training provided by the Crew School.

Digital plankton library is implemented by IFOP's Oceanography and Environment Department

The Oceanography and Environment Department has been developing since 2021, under CORFO auspices an historical biological samples digitalization program called "Plankton Digital Library".

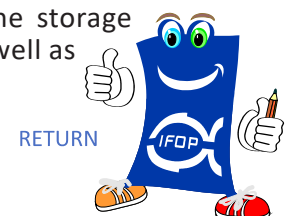
Since the 1970s, the Oceanography and Environment Department has accumulated more than 30,000 jars with zooplankton samples from the ocean throughout the Chilean Exclusive Economic Zone, always looking for distribution and abundance of larvae and eggs of organisms that support national fisheries. At the same time, these samples contain the entire zooplankton community that accompany them. For some decades these samples were accumulating in IFOP warehouses. And since 2015, with Oceanography and Environment Department's formation the idea of recovering these samples that are unrepeatable in time and space and that account for the oceanic conditions of decades ago began to take shape.

Dr. Jaime Letelier, Oceanography and Environment Department's head. Andrés García Engineer, René Veragua technician, Francisca Osorio and Débora Alborno lab analysts, Guillermo Galindo senior technologist, Dr. Jessica Bonicelli and Hernán Reyes oceanographer, Oceano-



graphy section head, particularly he is giving a new value to these samples, through a process of digitalization and reanalysis through image recognition programs. This project began with planktonic sample digitization equipment called ZooScan purchase (<https://www.ocean-net.es/catalogo/producto/zooscan>), later specialized courses were carried out in the use of the equipment, to later begin the digitization process that is estimated for the current samples will last at least 8 years. It should be noted that one of the main objectives is to extract bioclimatic indicators and make these images available to the scientific community for original scientific studies.

On December 19th, 2022, a new milestone was reached in this project with CORFO financing a Supermicro server which was acquired and installed, with two 16-core INTEL Ice Lake 4309Y processors, 128 Gb of RAM and 40 Tb of disk. hard drive for storage and advanced image recognition processing. This server is the first piece of a cluster system of multiple servers that work in parallel and that facilitates the storage and recognition of images, as well as multiple users work of.



IFOP carried out an Oceanographic Cruise in Almirante Montt Gulf in the Magallanes and Chilean Antarctic Region

The oceanography team from Fisheries Development Institute, environment department carried out an oceanographic cruise in Almirante Montt Gulf and surrounding channels. It took place between November 7th and 22nd and included researchers Patricio Salas, Javier Cortés, Miguel Vergara and Marcela Toro participation, all from Putemún Research Center in Castro.

This activity is carried out within “Monitoring and Modeling of Spatial and Temporal Variability of Oceanographic Processes in Channels and Southern Fjords” project’s framework and is part of the permanent cruises that are carried out seasonally in the region.

One of this project objectives is to characterize chemical-biological conditions (temperature, salinity, dissolved oxygen, nutrients, phytoplankton biomass) seasonal variability in the Almirante Montt Gulf.

Researcher, Patricio Salas, oceanographic cruise’s leader indicated that “this is the continuation of the first cruises that were carried out in the area in 2013. With these measurements, continuity will be given and at the same time the data obtained previously will be updated. In addition, he indicated that the techniques for anchoring lines with ADCP have been significantly improved, which is why it is expected to obtain more representative and better data quality.

The following specific activities were carried out on this cruise:

- Oceanographic equipment Installation: ADCP, temperature sensors, dissolved oxygen, pressure and installation of 1 weather station in the area.

- Water Sampling with Niskin bottles to obtain chemical-biological information.
- Measurements at predefined stations with CTD-O.

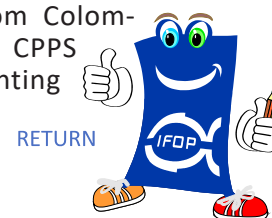
Researcher, Javier Cortés, tells us that “ RedMet new weather stations implementation, which the group of researchers has been developing on its CHONOS web visualization platform, is a good initiative as a center for information developers. Since it allows other research groups to better understand ocean-atmosphere processes which manifest themselves at local levels. This also tells us that it is extremely important to continue expanding this network of weather stations in order to achieve greater data coverage and facilitate atmospheric behavior observation.

The cruise team must return in January 2023 to continue with its sampling work and in addition to carrying out a transect with towed ADCP (Doppler).

IFOP presented the preliminary results of Southeast Pacific XXV Joint Regional Oceanographic Research Cruise held in 2022

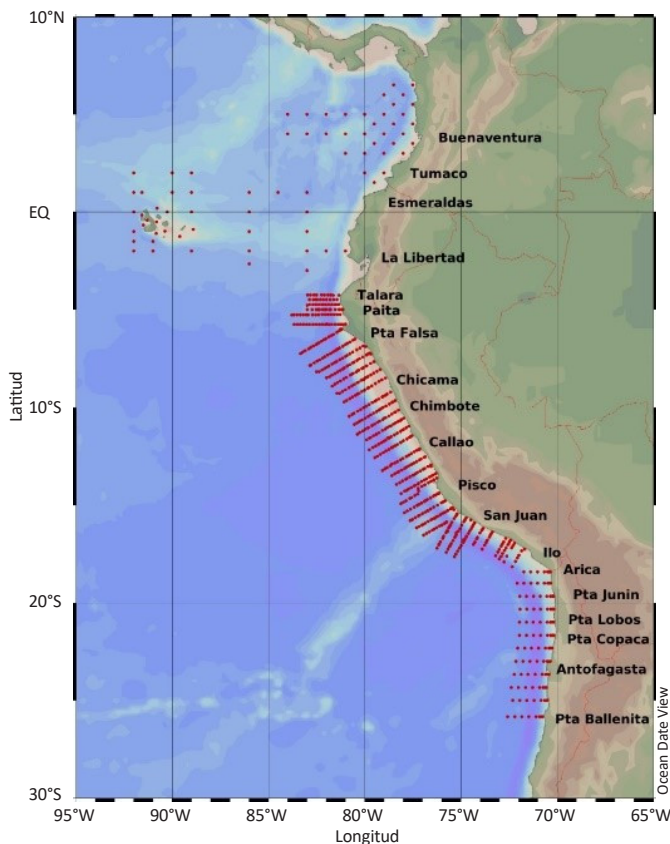
The XXXI ERFEN Program Regional Scientific Committee Meeting (Protocol on the Program for the Regional Study of the El Niño Phenomenon in the Southeast Pacific – ERFEN) of the Permanent Commission of the South Pacific (CPPS) was held in the city of Santiago de Chile between on December 13th and 15th, 2022.

The meeting was chaired by Juan Quintana Chilean Meteorological Directorate meteorologist, and included delegations from Colombia, Ecuador, Peru and Chile, CPPS member countries. Representing





País	Institución especializada	Buque	Nº días	Fechas de inicio-término	Estaciones
Colombia	Centros de investigaciones oceanográficas e hidrográficas del Pacífico	ARC Providencia	30	07 sep – 06 oct	32 oceanográficas
Ecuador	Instituto Oceanográfico y Antártico de la Armada	BAE ORION	13	14 sep – 26 sept	38 oceanográficas
Perú	Instituto del Mar del Perú	BIC Luis Flores BIC José Olaya E/P Incamar1	51	12 sept – 01 nov	370 oceanográficas 570 superficiales
Chile	Instituto de Fomento Pesquero	B/I Abate Molina	39	24 sept – 01 nov	96 oceanográficas



our country, professionals from Chilean Meteorological Directorate, Chilean Navy Hydrographic and Oceanographic Service, Fisheries and Aquaculture Undersecretariat, and Fisheries Development Institute, made various presentations in the field of fisheries, meteorology, and local oceanographic conditions.

Oceanographer Hernán Reyes, Department of Oceanography and Environment, Oceanography Section's head and of the XXV Joint Regional Oceanographic Research Cruise in the Southeast Pacific Regional Scientific Coordinator presented the joint cruise's main results. IFOP professional began his report by indicating that the cruise work plan was prepared between May 24th and 26th, 2022 at the Coordinating Committee annual meeting presented the results, to finally highlight the cruise's objective, which is to describe oceanographic and meteorological conditions off the western coast of South America recorded during the cruise period, analyze the effects of the macro-scale ocean-atmospheric scenario in the Tropical Pacific on regional dynamics during the cruise period, and develop a regional climate diagnosis and the forecast of the ENSO scenario in the region for the first quarter of 2023.

In the joint cruise, a total of 1,100 stations were carried out, ranging from the Colombian Pacific coast to the south of the Antofagasta area.

The main conclusions indicated that the joint cruise took place during the La Niña event that generated a weak cold situation along the entire South American coast, including Galapagos. In the Colombian area, conditions were close to normal. For its part, the surface wind was more intense in its southern component in the areas of Peru and Chile, although it decreased in intensity in October 2022. At a subsurface level, cold conditions reached at least up to 50 m in the northern area. and central Peru (Paita and Callao). In a biological aspect, phytoplankton decreased in the summer period of 2022 in the equatorial zone and off the coast of Peru, however, in the last quarter of 2022 it registered productive and habitual concentrations throughout the study area. The forecasts indicate that there is a probability of the propagation of the warm equatorial Kelvin Waves towards the coast of South America, the decrease in the intensity of the positive anomalies of the South Pacific Anticyclone (APS), the decrease of the negative anomalies of the surface temperature of the sea (ATSM) in the equatorial region and the South American coast, that is, to go from a cold condition, La Niña, to a normal condition as of March 2023.

Dr. Jaime Letelier, Oceanography and Environment Department head, highlighted the international importance of this joint cruise, in which four nations with adjacent maritime interests have come together since the late 1990s and share experiences and information under the wing of the CPPS, and which has allowed us to improve our knowledge of the great Humboldt Current System.



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Various schools in the region were part of a Scientific tour developed by IFOP Aysén professionals

During November and December, a team of IFOP professionals, led by its head of office, Alejandra Lafon, carried out various scientific activities in Puerto Melinka and Puerto Aguirre, in which they visited Melinka High School and Pedro Aguirre Cerda School in Puerto Aguirre. In them a talk and practical workshop “Red tides, what are they and how has their distribution changed?” was developed.

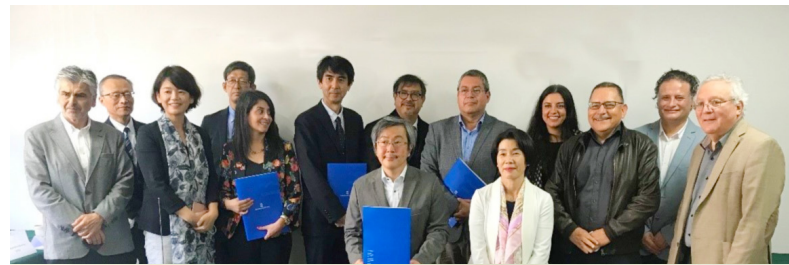
In these talks in a didactic and pleasant language, children and young people are explained about Red Tide, what it is and the damage that can be caused by consuming a product contaminated by it. It is also reinforced to buy certified products. Since Red Tide, if not treated on time it can be deadly.

In Melinka, Lorena Ramírez, a red tide analyst, carried out a practical activity in which students were able to see microalgae under a microscope.

Alejandra Lafon explained “In Puerto Aguirre I was with Lorena and also with José Ojeda (DGM field coordinator), in the practical activity in this place we saw the morphology of mussels and bivalves, to understand how shellfish are toxic with red tide, all these Field activities are part of the role of disseminating our institutional work to the community and students in order to share our research in a playful and informative way. This time in collaboration with Explora group from Universidad Austral de Chile, Patagonia Campus.

The final evaluation of an important international Chile-Japan study on red tides has been successfully completed

Between December 5th and 15th, at Universidad de los Lagos in the city of Puerto Montt, presented its research’s final evaluation “Project for monitoring methods development and a forecast system of harmful algal blooms for sustainable coastal aquaculture and fisheries in Chile”, which ends at the end of March 2023.



The project aims to introduce new technologies for harmful microalgae detection using biomolecular methods, along with developing tools to forecast blooms of these organisms. This project has been possible thanks to funding from the International Cooperation (JICA) and Science and Technology (JST) agencies, both from Japan, in addition to the contributions made by each of the participating institutions.

Researchers from the Universities of Hiroshima, Kyoto, Okayama and the National Institute for Research in Fisheries Sciences of Japan participated, together with Universidad de Antofagasta, La Frontera, Los Lagos and Fisheries Development Institute. An international expert hired specifically for this purpose, Dr. Mimi Sheikh, the representatives of JICA and JST, participated in this evaluation process, who were in charge of the final evaluation of the different activities involved in this

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research. The evaluation process culminated with the signing of the minutes of the 4th meeting of the Joint Coordination Committee (JCC) and the final evaluation document of the project, by Messrs. Shoji Osawa, Resident Representative of JICA-Chile, Yutaka Fukase, Leader JICA Evaluation Team, Dr. Fumito Maruyama, Scientific Leader of the Project, Dr. María Elena Arias, Research Director of the University of La Frontera and Gonzalo Pereira, Executive Director of the Fisheries Development Institute.

As research's projections the importance of the applicability and use of the tools developed in the short, medium and long term, the strengthening of collaboration between the participating institutions and relations between public and private areas and academia were revealed.

Biobío region now accounts modern scientific equipment for sardines and anchoveta research

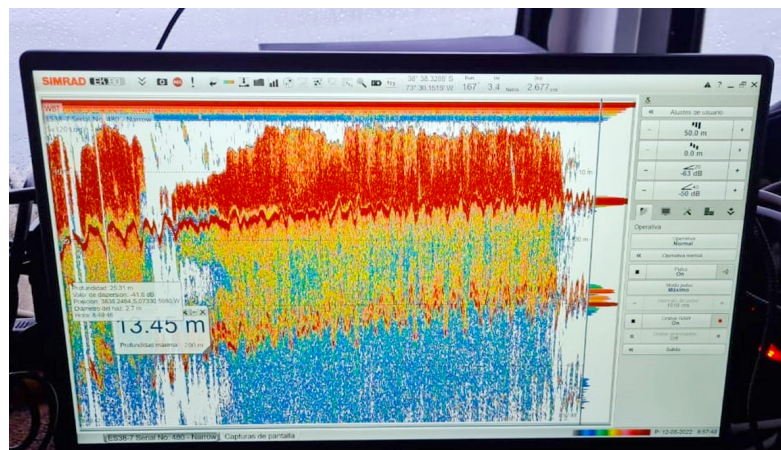
Through being awarded a project with Biobío Regional Government funds (SAFA Project), IFOP acquired scientific acoustic system, consisting of a SIMRAD EK 80 brand echo sounder with a split beam transducer of 38 kHz frequency. This system is installed in artisanal purse seine boats to carry out research in order to evaluate small pelagics stock and thus to estimate recruitment periods biomass, which occurs mainly in summer and autumn of each year.

Jorge Castillo, IFOP fishing engineer explained "EK 80 scientific echosounder consists of an electronic instrument which produces an electrical pulse that is transformed into sound by means of its transducer and in this way a sound pulse is transmitted to the sea echoes that returned by fish schools are transformed into an electrical pulse by the transducer and are processed by the computer that contains the instrument. These data are analyzed by IFOP specialists for biomass estimation. In this case, we take advantage of the fact that fish schools echoes intensity is proportional to individuals m3 density a charac-

teristic that finally allows estimating the biomass in the sea".

Alberto Fuentes, SAFA-IFOP Projects's Head, added "this scientific equipment was acquired under SAFA program (Transfer for common sardine and anchovy resources monitoring associated with Biobío Region artisanal fishing fleet), implemented by Fisheries Development Institute (IFOP) and financing by Biobío Regional Government (GORE) which seeks to strengthen and complement artisanal fishery research and monitoring programs for common sardines and anchovy in the Biobío Region, in order to ensure the activity sustainability of over time, strengthening collaborative work relationship between the artisanal fishing sector of the Region, sectoral institutions, IFOP and the Regional Government".

SAFA Program considers within its components, common sardine and anchovy resources biomass acoustic evaluations reinforcing activities developed by IFOP, in the sampling fleet captured fish by spawning and recruitment periods and in closures periods which allows supporting decisions to modify administrative measures, improving resources administration with a more sustainable approach.



SAFA Program implies extending monitoring period to cover fixed and variable closure period of this small pelagic fishery, as well as improving spatial coverage, including areas that have not been part of the historical cruises and that can be carried out near of the coast. In this way, it complements and expands IFOP scope and SUBPESCA ASIPA Program (Fisheries and Aquaculture decision-making Comprehensive Consultancy), strengthening relevant information co-



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lection to support management measures and consequently decision-making in fisheries management effectiveness and relevance. SAFA has a two years duration and will serve to improve knowledge about common sardine and anchovy resources.

Rodrigo Daroch, from the Gore Biobío Industry Promotion Division, explained “for this Biobío Regional Government Fisheries Unit it is relevant to be able to count on analysis and scientific background such as, in this case biomass acoustic evaluations, which supply fishing information in this case sardine and anchovy fisheries.

Ruth Hernández, IFOP researcher, commented “during the year we have held workshops for users, local authorities and our peers, in order to publicize SAFA project, its scope and promoting it with fishermen different unions and organizations to support it. In addition to collecting concerns and doubts that arise during these instances. In the last workshop jointly carried out with ASIPA, the project’s partial results were presented, such as number of trips made to date, vessels that have actively participated in research fishing calls and hydroacoustic cruise’s results carried out in May this year. It is hoped that these instances stimulate and encourage more users to apply for research fishing”.

Atlantic squid Population dynamics is similar to that of cuttlefish

IGNACIO PAYÁ, IFOP RESEARCHER, STANDS OUT AFTER PARTICIPATING IN AN INTERNATIONAL WORKSHOP ON *ILLEX ARGENTINUS*

IFOP researcher Ignacio Payá (<https://www.researchgate.net/profile/Ignacio-Paya>) participated in the first international scientific workshop on south-west Atlantic squid, *Illex argentinus*, (Conference: First International

Scientific Workshop for the Argentine Short-fin Squid – capes) that was held in November 2022 at P. Universidad Católica de Chile Marine Research Coastal Station (<http://ecim.bio.puc.cl>).



The workshop was organized by the Applied Ecology and Sustainability Center (CAPES) and aimed to ensure formal establishment of science-based regional management for this fishery.

Renowned scientists in biology and squid stock assessment from South America and Europe participated. The basic biology, population dynamics and abundance assessment methods of squid in FAO area 41 were reviewed.

Payá presented a review of his experience as a member of the cuttlefish (*Dosidicus gigas*) working group at the South Pacific Regional Fisheries Management Organization (RFMO-PS, www.sprfmo.int), examining implementation times and progress made. for cuttlefish. The researcher highlighted that, although the size of the squid (approx. 30 cm ML) is much smaller than that of chilean cuttlefish (approx. 70 cm ML), these populations have several common characteristics such as their short life (1-2 years), high productivity, extensive trophic and reproductive migrations, and a complex structure with local populations and different size groups (phenotypes) whose abundance is related to environmental conditions. They also share the large Chinese fleet made up of around 300 jigging boats that each year fish for squid in international waters and then migrate to the Pacific Ocean through Magellan Strait for cuttlefish fishing in RFMO area. -. The operation of this large fleet in the Atlantic is still unregulated, so it is necessary to establish a formal regional management based on fisheries science.



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Quellón, Chiloé Strengthening Scientific Observers Team Workshop

“STRENGTHENING SCIENTIFIC OBSERVERS TEAM WORKSHOP IN QUELLON, CHILOE WAS HELD AT ACHS PREMISES”

The activity was attended by Leonardo Caballero Sampling Management Department Head; Héctor Huerta South Austral Zone General Coordinator and Field Coordinators, Vivian Pezo and Dagoberto Subiabre. The workshop aims to make information available to scientific observers team, valuable instances for strengthening knowledge and clarifying doubts on various topics related to their work, which included Fisheries Development Institute (IFOP) general aspects of vision and mission, the Institute's role in the fishing field and relevance of fishing projects in Chilean fishing regulations and on the scope and proposals for modification of the Regulation of Scientific Observers ROC (Decree No. 193-13).

The workshop also had the valuable and enthusiastic participation via meet, of Head of the Strengthening Workshop Project of the Scientific Observer Team of Quellón, Chiloé”.

On November 29 and 30, the “Strengthening Workshop of the Quellón Scientific

Observer Team, Chiloé” was held at the ACHS premises. Benthic Monitoring, Andrés Olgún and data managers Luc. The activity was attended by Leonardo Caballero Sampling Management Department's Head, Héctor Huerta Southern Austral Zone General Coordinator and Vivian Pezo and Dagoberto Subiabre Field Coordinators this workshops aims to make available to the scientific observers team, valuable instances of knowledge reinforcement and doubts clarification in various topics related to their work, which included Fisheries Development Institute (IFOP). general aspects of vision and mission, Institute's fishing field role in and fishing projects relevance in Chilean fishing regulations and on the scope of Scientific Observers Regulation ROC (Decree No. 193-13) modification proposals Claudio Vicencio and José Fuentes, who through their presentations highlighted importance, scope and requirements of the projects that are developed in this important port,



as well as information management, particularly in relation to registry, workflow, coding, typing, verification and validation of data.

It is worth noting IFOP Human Resources Department invaluable support this activity materialization, who through the participation of Claudia Zepeda and a legal adviser, explained and clarified concepts on labor law and OCs internal applicable regulations particularly on Internal Regulations scope, IFOP Workers rights and obligations and Article 22. Shift Work Contract scope and particularities.

This appointment included Risk Prevention and Occupational Health aspects, by Vanessa Oyarzun prevention specialist from Puerto Montt headquarters and ACHS advisor Luna Muñoz. Who presented legislation and internal regulations relevant aspects related to safety measures at work and worker responsibilities, especially in self-care in shipping activities.

On the second day, “Strategic Alignment Workshop” was held by psychologist and coach Angélica Soto Quintana, who led a morning full of group interaction activities with the aim of aligning the professional management of Scientific Observers, towards Institutional mission fulfillment, through strengthening of the sense of belonging, recognition of good individual and collective practices, and to concrete actions to achieve objective's commitment.



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