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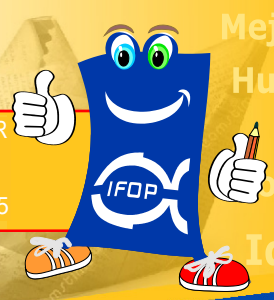

IFOP INFORMATION BULLETIN

El Ifopino

IN THIS NUMBER

IFOP Attends Science Fair at Playa Ancha University

With a fair focused on environmental protection, the traveling magazine "Cambalache" from the University of Santiago de Chile (USACH) arrived at UPLA to present its ninth edition, dedicated to ocean preservation and the importance of marine species.

In this new issue, the magazine featured researchers from the university's Faculties of Engineering and Natural and Exact Sciences, who presented their work on the aforementioned topics.

The event, organized by the UPLA's General Directorate of Environmental Outreach, was attended by students from various high schools and colleges in Valparaíso, who were able to interact and learn about caring for nature and marine animals through games, experiments,

and demonstrations. The event also included the participation of students from the UPLA Environmental Hub and the Fisheries Development Institute (IFOP).

The USACH magazine "Cambalache" tour arrived at UPLA. Ana María Fernández Tapia, Vice Rector of Community Relations at the University of Santiago de Chile, explained that "this has been a magazine focused on dis-

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Mario Recabal M. / Senior graphic designer

seminating the knowledge produced by our universities, and this has been the second year of the tour. The goal is to share knowledge on environmental issues and how to protect the oceans in a more entertaining way, not so far removed from what we do at the university. This time, the articles were written by experts from the UPLA School of Engineering and the School of Natural and Exact Sciences, covering various topics."

The rector of the Universidad de Playa Ancha, Carlos González Morales, praised the initiative and commented, "The magazine 'Cambalache' is a traditional resource that disseminates our nation's scientific knowledge and today places special attention on the care of our oceans. The visit of the students who came to the event from various educational institutions in Valparaíso is important, as it is important for them to learn about respect for nature, and the oceans in particular."

Attendees participated in two talks given in the Dr. Félix Morales Pettorino Classroom. The first was "Water Desalination" with USACH researcher Paula Madariaga; and the second was "Effects of Desalination in the Valparaíso Region" by María José Díaz of the UPLA Environmental Hub. Additionally, the UPLA TV report "Sea Turtles: From Costa Rica to Chile" was shown.

Ilia Cari Leal, a researcher at the Fisheries Development Institute (IFOP), explained that "of the seven species of sea turtles that exist worldwide, five are in Chile. Currently, some of these turtles are threatened with extinction because their populations have declined due to various anthropogenic threats such as overfishing, pollution, and others. It's good to encourage children at an early age to learn how we can protect the oceans."

USACH's "Cambalache" Magazine Tour Arrives at UPLA

Experience

Vanessa Agüero Villarroel, a teacher at Alfredo Nazar Feres High School in Valparaíso, stated, "For the children and for everyone, it's a wonderful experience to get out of the classroom and learn somewhere else. Having the fair allows them to interact, play, and learn about the ocean—I learned it myself. The children take away fond memories, and I think it's something we'll want to repeat. We'd like them to visit our school so everyone can learn about the oceans."

IFOP Scientific Observer Embarks on Research Cruise in Argentina

Between August 7 and 29, Senior Scientific Observer Guillermo Carrasco Cisternas, who works at the IFOP Talcahuano headquarters as part of the institution's Sampling Management Department (DGM), will participate in the cruise "Global Assessment Campaign of Hake (Merluccius hubbsi) Abundance. Area between 41°S and 48°S (Southern Effective)," which will be carried out by the National Institute of Fisheries Research and Development (INIDEP) of Argentina.

This activity is being carried out within the context of the Collaboration Agreement between IFOP and INIDEP, and corresponds to the first stage of the "Scientific Observer Exchange Program" between the two institutions.

This collaboration aims to contribute to the professional development of Scientific Observers from both nations, as well as to provide an incentive for this group of workers, generating motiva-

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tion and enthusiasm. This experience undoubtedly allows Scientific Observers to internationalize skills and specializations that contribute to achieving the highest standards in fisheries observation, promoting the productivity and quality of the data collected, and also contributing to a pleasant and motivating work environment.

Guillermo will sail from Mar del Plata on the Fisheries and Oceanographic Research (BIPO) vessel Víctor Angelescu to participate in the first 22-day phase of the campaign. The chief scientist of this cruise is Dr. Gustavo Álvarez Colombo, whose main objectives are to estimate the biomass, abundance, distribution, and concentration areas of hake in the southern basin; determine the length and age structure of hake and pollock (Genypterus blacodes); and delimit the concentration and distribution areas of associated demersal resources such as pollock, nototenia, squid, spider crab, shrimp, and chondrichthyans.

In this regard, IFOP Executive Director Gonzalo Pereira Puchy stated, “Guillermo Carrasco’s embarkation on INIDEP’s main research vessel, the “Victor Angelescu,” is an important milestone in the cooperation between the Fisheries Research Institutions of Argentina and Chile. It should also be noted that the start of the research cruise coincided with the signing of two new cooperation agreements between INIDEP and IFOP, one of which relates specifically to the exchange of scientific observers.”

The General Coordinator of the DGM, Mg. Gonzalo Muñoz Herrera, added that this type of event strengthens ties between institutions with the same principles, mission, and vision for the sustainability of fishery resources and their ecosystems, along with building strong and mutually beneficial professional relationships for both research institutes.

Dr. Daniela Yepsen of IFOP speaks at the European Marine Biology Symposium

The European Marine Biology Symposium (EMBS) is one of the oldest and most prestigious marine scientific conferences in Europe, held annually since 1966. The 58th edition of the event was held in Bodo, Norway, bringing together specialists from various academic institutions and research centers in Europe, North America, and South America.

Dr. Daniela Yepsen, a researcher in the IFOP Fisheries Assessment Department, explained, “On this occasion, I presented spatiotemporal distribution models, using the common hake as an example species. Their construction incorporated information obtained from direct assessment cruises, as well as information from the DEP’s Monitoring Program for the main demersal and deep-water fisheries. These models complement the advice we provide to the scientific and technical committees, and in the future, we hope to apply them to other species, as they allow us to identify not only how the resource is distributed, but also how the fishing fleet is distributed.”

Daniela added, “On a personal level, participating in these types of events is essential to staying up-to-date on the development of new methodologies and lines of research in other countries, allowing

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us to identify ideas applicable to our institutional context. Likewise, having an active international presence contributes to supporting the quality of the Institute's researchers.

For IFOP, participation in conferences at this level is strategically important, not only because it strengthens collaborative networks and generates institutional visibility, but also because it allows us to continue improving the technical and scientific advisory work provided to the State."

IFOP and the European Union Promote Sustainable Aquaculture in Guatemala with a Trout Egg Hatchery

Within the framework of the Chile-European Union Joint Triangular Cooperation Fund, the Aquaculture Research Division of the Fisheries Development Institute (IFOP) is leading an ambitious project that seeks to strengthen food safety and security for the Guatemalan population by optimizing freshwater fish aquaculture, with an emphasis on trout.

The main objective of the project is to implement a specialized trout egg hatchery in Guatemala, utilizing the facilities of the Center for Marine Studies (CEMA) of the University of San Carlos de Guatemala (USAC). As a first activity, professionals Carolina Rösner and Mario Rivas conducted a comprehensive on-site assessment of the state of the existing infrastructure and equipment, in addition to identifying additional requirements for creating a hatchery that meets local environmental conditions.

One of the main technical challenges identified was the need to control the temperature of the water used, since natural sources have an average temperature close to 23°C, a level higher than the optimum for trout incubation, which requires specialized equipment for cooling and maintenance. As a result, together with the CEMA team, a hatchery was designed and will be implemented soon.

Another relevant stage was the visit to local trout farming projects, including a farm in Nueva San Catarina Ixtahuacan, Sololá department, where IFOP researchers, along with CEMA Director Erick Villagrán, and extension teachers, were able to learn about the production situation and the main challenges facing Guatemalan producers.

The project also includes direct training in Chile for six Guatemalan professionals—teachers and producers—in all phases of trout farming. This

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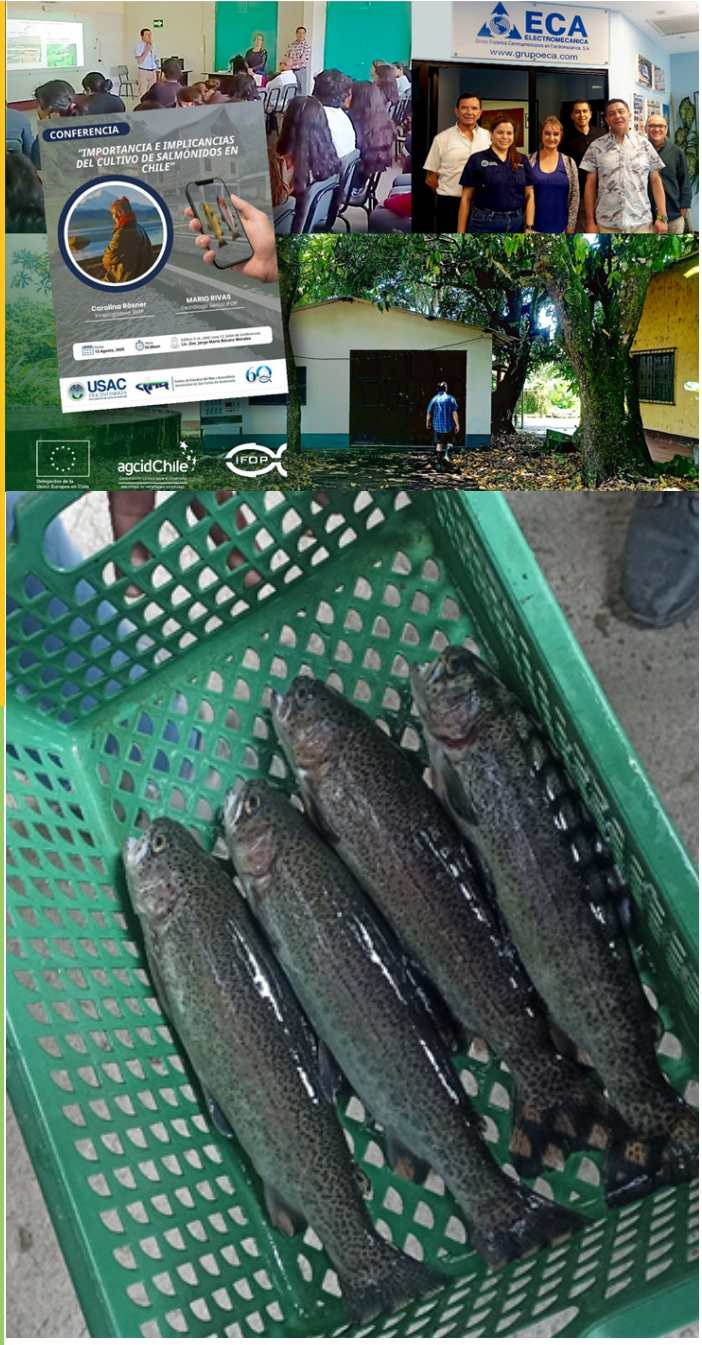


training took place in October at the IFOP Hueihue Mariculture Center. Finally, outreach and communication activities are planned in Guatemala during December, which will highlight the scientific, technical, and social contribution of this initiative to the promotion of safe and productive aquaculture in that country.

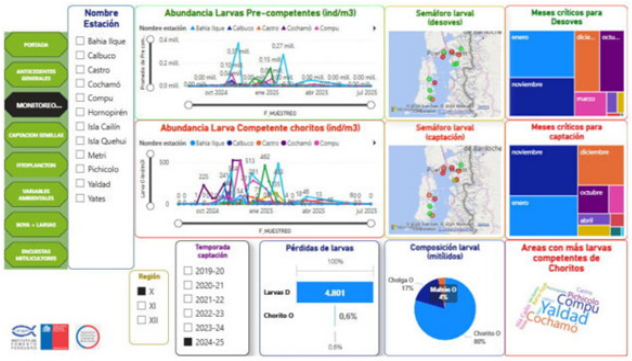
This work not only contributes to diversifying the production of safe food in Guatemala, but also strengthens triangular scientific and technological cooperation between Chile, the European Union, and Latin American countries seeking to develop sustainable aquaculture strategies. This project will last six months, with a planned completion date of December 2025.

IFOP Leads National Workshop on Mussel Larval Monitoring

THE EVENT WAS HELD VIRTUALLY, BETWEEN 9:20 A.M. AND 12:30 P.M. ON FRIDAY, AUGUST 22, 2025.

Last Wednesday, August 22, the Fisheries Development Institute (IFOP) held a workshop to disseminate the results of the "Mussel Larval Availability Monitoring and Surveillance Program for the Sustainability of Aquaculture in the Southern Region of Chile, Stage XII 2024-2025." This study, in place since 2013, is part of the ongoing monitoring programs implemented by IFOP and defined by the Undersecretariat of Fisheries and Aquaculture (SUBPESCA) and funded by the Undersecretariat of Economy and Small Businesses.

The event, held via Zoom, brought together more than 105 attendees, who showed great interest in the various presentations.



The event included two guest speakers: Dr. Carlos Molinet and PhD candidate Joseline Büchner. Both presented research results related to mussel farming, derived from FIPA projects and doctoral theses, respectively. In addition, IFOP professionals involved in the program presented the main results of larval monitoring and described the mussel spat collection activity. They invited attendees to interact through the "Endemic Seed" digital platform, available to the entire community at: https://www.ifop.cl/monitoreo-larvas-de-mitilidos/

The full workshop registration can be viewed here: https://www.youtube.com/watch?v=Szdb2df2Jzc

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Mussel Farming in Chile: Growth and Challenges

Chilean mussel farming has experienced sustained growth over the past two decades, increasing from 23,996 tons in 2000 to 405,639 tons in 2024, consolidating Chile as the second-largest producer and world's leading exporter of mussels.

A key characteristic of this industry is its dependence on juvenile seeds obtained from the wild. Therefore, capture-based aquaculture requires specific management and regulation to ensure the sustainability of the resource.

Role of the monitoring program

The mussel larvae monitoring program, established under the Permanent Research Program of the General Law on Fisheries and Aquaculture, is essential for decision-making and is part of the Studies and Programs portfolio of the Environment Department of the Aquaculture Division of IFOP. Its contributions include generating essential biological and environmental information for understanding the natural processes that influence larval availability, supporting the sustainable management of seed capture, improving seed efficiency and quality, reducing losses and by-products, and promoting the implementation of adaptive management plans.

The "Endemic Seed" platform provides open access to this data, facilitating analysis and production planning.

IFOP Participates in School Scientific Research and Innovation Meeting in the Los Lagos Region

On August 27 and 28, the Fisheries Development Institute (IFOP) participated in the School Scientific Research and Innovation Meeting, organized by the PAR Explora Los Lagos, as part of the celebration of Explora's 30th anniversary.

The event brought together students and teachers from public and private schools throughout the region, along with institutions linked to science, technology, knowledge, and innovation (CTCI). In this space, IFOP had the opportunity to contribute to the evaluation of school projects, an experience highly valued by the institution, as it allows for the recognition and motivation of young talents who are taking their first steps in scientific research.

In addition, IFOP participated in the co-design meeting for activities, strengthening its collaborative work with the regional CTCI ecosystem and reaffirming its commitment to scientific dissemination.

"We are very pleased to have been part of this event, which not only showcases students' creativity and effort, but also provides them with a space for appreciation and motivation to continue developing their talents in science and innovation," stated IFOP.

This year, unlike previous years, there was no open call for interactive booths. In the context of Explora's 30th anniversary, a select group of institutions, including IFOP, were directly and narrowly invited in recognition of their history of collaborative work and their contribution to the scientific development of the region.

The Explora Los Lagos PAR highlighted IFOP's cooperation and the value of its participation in an initiative that allows the students who will represent the region at the National Congress of School Science, to be held this year in Puerto Montt,

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to discuss their work.

The event also highlighted the importance of providing opportunities for children and young people from different parts of the region. Working alongside scientific advisors, they expressed inspiration and hope to continue learning and delving deeper into the world of science.

The Fisheries Development Institute (IFOP) actively participated in the Science Festival (FECI), held within the framework of the 20th Explora Los Lagos Regional Congress on School Research and Innovation. This is a highly attended scientific outreach event that brings together school communities and the general public around science, technology, and innovation.

The Science Festival, organized nationally since 2019 by the Ministry of Science, Technology, Knowledge, and Innovation, seeks to create spaces for people of all ages throughout the country to discover the science that surrounds them and the knowledge they possess.

In this edition, the central theme was "The Link between Freshwater and Saltwater Studies," and the teams from the IFOP Aquaculture Research Division, Puerto Montt, presented various initiatives:

A teaching module on cell recognition and Didymosphenia geminata blooms, led by researcher Mario Ortiz.

Chilean mussel aquaculture, presented by researcher Macarena Herrera from the Mussel Larval Monitoring Program, who showcased the "Endemic Seed" platform along with samples used in the ongoing monitoring of this study.

IFOP's presence at FECI reaffirms its commitment to scientific outreach, bringing the progress of its research to the community and helping to spark the curiosity and motivation of children, young people, and the general public toward marine science and aquaculture.

Second Workshop on the Biological and Fisheries Data Exchange Protocol for the Shared Anchovy Stock in Southern Peru and Northern Chile

The "Biological and Fisheries Data Exchange Protocol Workshop for the Shared Anchovy Stock in Southern Peru and Northern Chile" was held in Viña del Mar from September 1 to 5. This activity was part of the programming of the Binational Working Group (GTB) on Fisheries Biology and the Scientific and Technical Subcommittee (SCCT) of the Humboldt II Project, an initiative implemented by the Undersecretariat of Fisheries and Aquaculture of Chile and the Vice Ministry of Fisheries and Aquaculture of Peru, with funding from the

Global Environment Facility (GEF). Specialists in anchovy reproductive biology, fishery monitoring, and estimation of catch per unit of effort and age and growth from the Peruvian Institute of the Sea (IMARPE) and the Chilean Institute for Fisheries Development (IFOP) participated in this workshop.

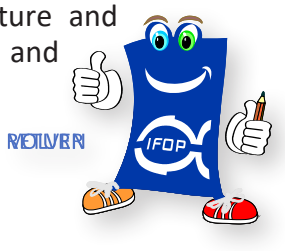
The objective of the workshop was to agree on and draft a protocol for exchanging data from the anchovy fisheries in southern Peru and northern Chile, which is routinely collected by the two institutions responsible for scientific research for stock management, and thus advance stock modeling.

At the opening ceremony, Gonzalo Pereira, Executive Director of IFOP, explained, “At the end of this second workshop of the fisheries biology group, we will be able to exchange data to facilitate the analysis of the anchovy stock in southern Peru and northern Chile. He emphasized that once the Humboldt II project’s activities began in March 2024, a very intensive and productive agenda has been achieved. Since then, the five GTBs considered in the SCCT have held six in-person workshops and several virtual ones, with significant participation from professionals from both institutions and extensive technical work, which will allow us to work for many years to come. The Director highlighted the professionalism of the members of both IFOP and IMARPE teams in achieving the project’s goal.”

Alejandro Gertosio, Binational Coordinator of the Humboldt II project, stated: “This is the second workshop on standardizing fisheries biological data collection, and one of our project aspirations is to facilitate technical bodies in achieving standardization of anchovy biological and fisheries data collection in the study area in both countries. In this way, the coordinated work of the five GTBs aims to support Peru and Chile in improving the optimal exploitation of fisheries resources, in this case anchovy.”

Dr. Marilú Bouchon, General Director of Pelagic Research at IMARPE, emphasized that participating in this workshop fills us with joy and pride because both countries are making progress in standardized mechanisms for the exchange of scientific data and methodologies to conduct an anchovy assessment that allows for the sustainable use of the stock and also strengthens ties between the two institutions. This is something that helps both countries.”

Carola Hernández, Senior Researcher at IFOP, Head of the Chilean delegation, said, “This workshop is a continuation of the first workshop held in Lima in June of this year, where sampling methodologies and procedures for data collection were reviewed. The importance of this second workshop is that it allows for the exchange of biological and fisheries data through protocols that establish the data and/or information to be exchanged, their structure and descriptors, those responsible, and delivery dates.”



IFOP participated in the "1st Caletas Los Vilos 2025 Meeting"

The 1st Caletas 2025 Meeting was held in Los Vilos, where fishermen from the province gathered to discuss and delve into topics related to Fishing, Aquaculture, Marketing, Legislation, and Gender, alongside institutional representatives related to artisanal fishing. The purpose was to open a conversation, with a view to contributing to local economic development and the development of a healthy, sustainable, and sustainable lifestyle. The topics covered included current fishing legislation and its challenges, fishing and aquaculture productivity, education, the environment, sustainability, and social organization. Representatives from artisanal fishing organizations in the Los Vilos commune participated, as well as institutions such as the Coquimbo Regional Government (GORE), the Undersecretariat of Fisheries and Aquaculture, SERNAPESCA, the Los Vilos Mayor's Office, the Catholic University of the North, CEAZA, PROCHILE, the Coquimbo Municipal Fisheries Office, IFOP, MOP, and Minera los Pelambres, among others. Representatives Carolina Tello and Daniel Manouchehri also participated.

The Fisheries Development Institute was represented by researchers Andrés Olguín, Nicolás Adasme, Gabriela Arenas, Bryan Bularz, and Luis Ariz. IFOP actively participated in the poster exhibition with content related to topics of interest to artisanal fishing in the Los Vilos commune, such as AMERB and benthic resources in general. IFOP also gave two oral presentations on benthic fisheries. The first presentation, by Andrés Olguín, Senior Researcher, focused on the study "Benthic Fisheries Monitoring: Permanent Biological Fisheries Monitoring." He summarized the progress achieved over the 40 years it has been implemented throughout continental Chile, presenting its evolution, objectives, and achievements, highlighting the importance of having a monitoring program of this magnitude and nature. One of the study's greatest strengths lies in its databases (more than 2 million landing records and more than 6.5 million specimens measured in more than

60 studied resources), the result of information gathered by IFOP technical staff at the country's main landing centers.

The second presentation was given by Luis Ariz, Head of the Management Areas Section, who presented the topic: "AMERB Monitoring Program developed by IFOP – An Integrative Approach to Sustainable Development in Artisanal Fisheries." He outlined the main thematic areas addressed by the Section in its role as advisor to the Undersecretariat of Fisheries and Aquaculture. Regarding the AMERB regime, he highlighted its performance in its socioeconomic, administrative, and biological fisheries areas. AMERB is understood as a system that integrates the dimensions of fishing organizations (social and human capital), the space where fishing activities are possible (physical capital), the resources extracted (natural capital), and the socioeconomic benefits, all within a context of vulnerability and the implementation of sectoral policies. Furthermore, in a pilot study on the implementation of the Pilot Cove Law, the cove was considered as a productive unit that integrates AMERB and small-scale aquaculture, achieving a comprehensive characterization of the system, which provides useful information for prioritizing decision-making by

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those institutions involved in the development of artisanal fishing.

Andrés Olguín stated: "I value the holding of events like these, where representatives of artisanal fishing, public and research institutions, and political and administrative authorities can come together and discuss. It's rare that a municipality organizes events like this where artisanal fishing is the main player."

For his part, Luis Ariz stated: "Events like this are important to us; they bring us closer to the reality experienced by those who live along the coast and make a living from artisanal fishing. Exchanging and listening to opinions regarding the development of artisanal fishing helps and guides us on the path to improving our methodological approaches that seek to understand the complex artisanal fishing system, thereby allowing us to be more assertive in our decision-making recommendations for those responsible for the sustainable development of fishing…"

Local and international experiences are gathered to optimize the country's electronic monitoring system

The international workshop "Advancing Electronic Fisheries Monitoring in Chile" was held on September 9 and 10. It was organized by the National Fisheries and Aquaculture Service (Sernapesca) and the Undersecretariat of Fisheries and Aquaculture (Subpesca) with support from Future of Fish and The Nature Conservancy (TNC) to evaluate the current electronic monitoring monitoring, control, and supervision program for the industrial fleet and prepare for its incorporation in a segment of the artisanal sector in certain fisheries.

The electronic monitoring system, which incorporates the installation of onboard cameras, has been operating since 2020 in 100% of the industrial fleet and is complemented by a series of fishing activity recording and monitoring tools to monitor regulatory compliance associated with operations in authorized areas, discards, and bycatch, among other issues. The incorporation of the artisanal fleet with vessels over 15 meters in length is planned for 2026, working in the fisheries of swordfish, cod, and pelagic species such as horse mackerel, sardines, and anchovies.

The national director of Sernapesca, Soledad Tapia Almonacid, explained that the objective of the workshop focused on "informing what electronic monitoring means, showing the results we have had throughout its implementation in recent years, which have been very successful, and also to clarify any doubts for all sector stakeholders, so that they can share and discuss the challenges, explore the available technologies, and also learn about other international experiences applied with the same objective."

For his part, the Undersecretary of Fisheries and Aquaculture, Julio Salas, addressed the importance of electronic monitoring for resource sustainability: "We must base our decisions on robust, transparent, and verifiable information. Electronic monitoring provides us with a foundation of scientific and technical evidence that strengthens management and governance, and is also a decisive tool in the fight against Illegal, Unreported, and Unregulated Fishing."

The event provided a platform for learning about local and international experiences with presentations by industry representatives and artisanal fishers, who discussed the factors that facilitated its implementation, as well as the challenges that remain to be addressed to improve its application.

Electronic monitoring providers also participated in the event to consider alternatives based on new technological advances developed in recent years, which would optimize currently used systems and address gaps such as data storage, transmission, and image analysis.

Integration and Collaboration

Natalio Godoy, leader of TNC Chile's Oceans Strategy, commented, "For several years, we have been supporting critical pillars for fisheries sustai-

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nability and biodiversity conservation through collaboration agreements with both Sernapesca and Subpesca. In this context, electronic monitoring is a fundamental tool not only in terms of oversight but also for biodiversity conservation. We believe that collaboration is a fundamental part of advancing maritime conservation and fisheries management, and we are very pleased to be supporting this institutional framework."

For his part, Diego Undurraga, Director of the Future of Fish Foundation, added: "These have been very interesting sessions, with representatives from many sectors, where we were able to discuss the Chilean context, what the successes and pending challenges have been. We also had international speakers to share experiences, learn from other models, and see how to continue improving the design for the great challenge of incorporating the artisanal fleet into the electronic monitoring program and, in turn, improve the existing program for the industrial fleet."

The meeting featured international speakers who provided insight into the experience of electronic monitoring and fisheries data analysis applied in countries such as New Zealand, the United States, and Canada, from fishers, suppliers, and analysts.

The workshop also incorporated an academic perspective with the presentation of the results of a study funded by the Fisheries and Aquaculture Research Fund (FIPA) on Electronic Monitoring in Chile, led by researchers M. José Pérez and Maritza Sepúlveda. The study focused on the design of management of information recorded by image recording devices and data from electronic fishing logbooks.

In this regard, Gonzalo Pereira, executive director of the Fisheries Development Institute (IFOP), concluded that "The theme of this event is the electronic monitoring of fishing activity, which has been gradually implemented in Chile as an initiative to regulate and understand discards and bycatch, based on a new approach that was quite innovative from an oversight perspective, but which over the years has been finding new uses and new contributions, which interest us as IFOP, such as research."