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The workshop "Women in Marine Sciences", organized by IFOP, was a success

On October 9, in Valparaíso and within the framework of its activities for the 60th anniversary of its creation, the Fisheries Development Institute held the event Women in Marine Sciences, in which 4 outstanding researchers narrated their life and academic experiences to become the professionals they are today. On the occasion, all the work carried out by women at IFOP was honored.

The event was attended by Deputy Jorge Brito, the Seremi for Women Camila Lazo, the Director of IFOP Gonzalo Pereira, the National Director of Sernapesca Soledad Tapia, workers from IFOP, Sernapesca and Subpesca.

Among the guests at the event we have Dr. Patricia Zárate from IFOP, who told the attendees that she liked science and the sea in particular since she was a child. She also referred to all the experiences she lived through in order to study



her doctorate in the USA, and motivated young people to fight for their dreams, since you have to persevere for what you like.

Another of the guests, Dr. Ana Parma, told in a very playful way what it is like to be a woman in marine sciences. She is an Argentine expert in management areas and among other things she said that for her her family was always the main support to be able to work at sea, since, many times with her husband who also worked in marine research, they had to go with the children to work in the fields, which she



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she is, encountered a series of obstacles “for being a woman,” something that fortunately has changed a lot today.

Soledad Tapia, National Director of Sernapesca, referred to the activity: “It has been a beautiful experience because we have heard the life story of 2 doctors, a life story with a lot of sacrifice, but with perseverance, with good results. We have been able to share their life stories, I am very excited because in one way or another one sees part of one’s story reflected in these colleagues, so my congratulations to IFOP for recognizing all the women who work at IFOP.”

Chile will host the largest international scientific meeting on Harmful Algal Blooms

The organization of the next International Conference on Harmful Algae (ICHA) is progressing by leaps and bounds. This will be held for the first time in our country, this being its twenty-first version. In the last 40 years, these conferences have been held in very diverse countries, and the most recent ones were held in Japan (Hiroshima, 2023), Mexico (La Paz, 2021), France (Nantes, 2018), Brazil (Florianópolis, 2016), New Zealand (Wellington, 2014), among others. The ICHA is organized by more than 60 national scientists from various institutions, headed by the Institute for Fisheries Development (IFOP), and with the important collaboration of the University of Magallanes (UMAG), University of Los Lagos (ULA), San Sebastian University (USS), University of Concepción (UDEC), University of Chile (UCHILE), Catholic University of the North (UCN), University of Atacama (UA), Andean Plankton, Salmon Technological Institute (INTESAL), National Oceanographic Committee (CONA), National Fisheries Service (SERNAPECSA), Undersecretary of Fisheries and Aquaculture (SUBPESCA) and Undersecretary of Public Health (SSP).

described as very magical, since her children grew up surrounded by nature and watching the work of their parents.

Dr. Gemita Pizarro, an IFOP expert on red tide, told us about the beginnings of red tide studies in Punta Arenas, where there was a very small group of people who had to do wonders with the few resources they had at that time and how the decision, determination, and passion for research have made IFOP a world reference in red tide today.

Dr. Doris Oliva focused on summarizing how women have taken an important place in marine sciences, since the pioneers, among whom



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Host City

The Conference will be held in Punta Arenas, capital of the Magallanes and Chilean Antarctica region, being the southernmost area of Chilean Patagonia. This city is located on the northern coast of the Strait of Magellan, which connects the Atlantic and Pacific oceans. The region is recognized worldwide as a natural laboratory, with fjords, channels, islands, glaciers, mountains, forests, steppes and unique wildlife, and also as a relevant sector for Harmful Algal Blooms (HAB) events, which highlights its scientific and historical significance.

About the Conference

ICHA is the main world conference on these events, and is an initiative of the International Scientific Society on Harmful Algae (ISSHA). The main objective of this conference is to provide a forum to learn about the degree of progress in scientific and technological knowledge on HABs (from molecular biology to the use of satellite images), which will be presented to an estimated international scientific audience of 500 people, as well as decision makers from both the public and private sectors.

For these purposes, a Local Organizing Committee will be established in December 2023, led by Dr. Leonardo Guzmán (IFOP), and is made up of 5 subcommittees, which are in charge of planning and organizing ICHA 2025 (Internal Subcommittee, Dr. Máximo Frangópulos; Finance Subcommittee, Rodrigo Leiva; Fundraising Subcommittee, Dr. Patricio Díaz; Scientific Subcommittee; Dr. Catharina Alves de Souza; Public Relations Subcommittee, Dr. © Pamela Carbonell).

Some important dates

The conference will be held from October 19 to 24, 2025, and the call for oral or panel papers will open on January 20, 2025. Registration and respective payments can be made from January 13, 2025.

More information

www.icha2025.org

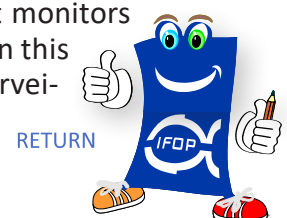
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Outstanding participation of IFOP in the LACQUA 2024 International Conference

LACQUA 2024 International Conference (Latin American & Caribbean Aquaculture) was held, which corresponds to one of the important scientific-technical events in the area of aquaculture, which are usually held in Latin America. On this occasion, on behalf of the Fisheries Development Institute, the researcher from the Department of Hydrobiological Health, Juan Carlos Quintanilla, participated.

At the activity, the IFOP representative presented the work “Health Status of wild fish and free-living salmonids in freshwater and marine bodies of southern Chile: More than a decade of monitoring”, which is carried out within the framework of the permanent research program executed by IFOP. In his presentation, he announced the historical results of the monitoring carried out on wild fish and free-living salmonids, in the detection of the main pathogens causing High Risk Diseases (HRD), emphasizing the importance of this program, since it is the only study in the country that monitors the health status of wild fish. In this regard, he highlighted the survei-



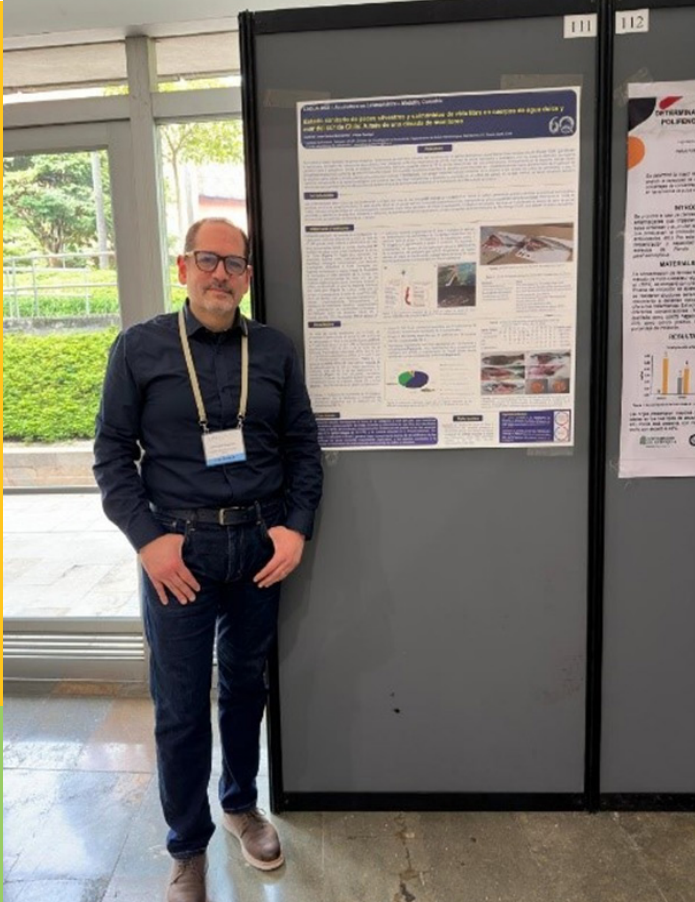
Excellent participation of IFOP Aysén in the Science Festival “Everything has its science”

Between October 3 and 6, the Regional Museum of Aysén together with the Ministry of Science organized a full agenda of activities, aimed at making science a party, where children and the community are enchanted, entertained and learn about various scientific topics and subjects.

Once again the Fisheries Development Institute participated in the activities carried out in the City of Aysén, highlighting its presentation, since the IFOP stand was one of the most visited.

The IFOP exhibition included a tour in which the community was explained the work of our institution, the important work carried out by the Scientific Observers in IFOP, who are in charge of collecting data through sampling of the resources extracted throughout the country. In this way, the necessary information is obtained to carry out actions that help protect the resources of the sea.

At the stand, visitors were able to learn about the marine resources of the Aysén area, and all the work that IFOP is doing on harmful algal blooms commonly known as red tide and *Didymosphenia geminata*, commonly called “didymo” or “rock snot” was shown.



llance carried out on 14 pathogens from fish captured in 21 areas distributed between the regions of La Araucanía to Magallanes and the Chilean Antarctic.

The results showed that of the total number of pathogens monitored, only the viral pathogens *Piscine orthoreovirus* (PRV) and Infectious Pancreatic Necrosis Virus (IPNV) and the bacterial pathogens *Flavobacterium psychrophilum*, *Renibacterium salmoninarum* and *Piscirickettsia salmonis* have been detected. For the latter, the high detection rates recorded in the wild species sea bass and sea silverside stand out, which usually cohabit in the environment of the cages where salmonids are farmed. These findings raise the epidemiological importance that wild species could have in their role as potential reservoirs, maintainers and/or transmitters of pathogens that cause EAR, and that affect farmed salmonid species.



IFOP participates in the workshop “Evaluation of the nesting activity of the Green Turtle (*Chelonia mydas*) in the Galapagos Islands

Puerto Ayora, Galapagos, Ecuador, Dr. Patricia Zárate, senior researcher of the Department of Oceanography and Environment participated as co-organizer and speaker of the workshop “Evaluation of the nesting activity of the Green Turtle (*Chelonia mydas*) in the Galapagos Islands”,

The workshop organized by Dr. Macarena Parra, principal investigator of the green turtle nesting project of the Charles Darwin Foundation (FCD), was aimed at park rangers of the Galapagos National Park Service (SPNG) and had as its main objective to evaluate the monitoring activities of the green turtle nesting in the Galapagos Islands, with a view to optimizing the protocols used and to guarantee the collection of comparable data over time and at a regional level. The Director of Public Use of the SPNG, Mariuxi Farias, gave the welcoming remarks and highlighted the importance of the event to strengthen the capacities and improve the knowledge of the park rangers, who are currently the main people in charge of collecting data at the nesting sites.

Dr. Zárate, who reactivated the research on the green turtle in the Galapagos Islands in 2000, when she worked for the CDF and who currently studies the turtles in the feeding areas of this species in our country, explained “the green turtles that we observe in Chilean waters come from the nesting colony of the Galapagos Archipelago, that is, they are born on the nesting beaches of the islands and travel to Chile to feed, when the breeding season arrives, they return to the islands to mate and nest, this cycle is repeated many times throughout their life.”

Dr. Zárate opened the workshop with a keynote lecture in which she reviewed the research

and main results carried out on the green turtle in the Galapagos, highlighting the contribution made by the first researchers in the 70s and 80s, such as Drs. Peter Pritchard and Derek Green and biologist Mario Hurtado. Later, Dr. Zárate focused on the connectivity of the green turtle in the region and the threats that these organisms face in their feeding areas. She explained, “Green turtles that leave the islands leave the protection provided by the Galapagos Marine Reserve, becoming exposed to fishing activity, one of their main threats. The implementation of standardized methodologies in these habitats will allow us to generate critical information for the conservation of the populations of this species in the Eastern Pacific.”

The workshop also included the participation of Dr. Jeffrey Seminoff from the Southwest Fisheries Science Center of the National Marine Fisheries Science Center (NOAA-NMFS) and evaluator for the International Union for Conservation of Nature (IUCN), who spoke about the latest evaluation process for the green turtle and the importance of maintaining long-term efforts to monitor the nesting activity of this species at key sites in the Galapagos and in feeding areas.

During the workshop, group work was carried out where park rangers, former volunteers, coordinators and researchers evaluated nesting monitoring. From this work, a series of recommendations were developed for the standardization and improvement of the data collected. The event culminated with a practical activity where park rangers and former volunteers, under the supervision of Drs. Parra and Zárate, monitored nesting under different simulated scenarios using models and green turtle shells on a beach at the CDF Scientific Station.

The conclusions and recommendations of the workshop were discussed by SPNG authorities and officials, Dr. Parra from the CDF and Dr. Zárate from IFOP who commented “the population diagnoses of species as long-lived as sea turtles require long time series, with similar monitoring efforts so that they can be compared and applied to the management of this species. Only in this way will it be possible to establish the con-





ervation status and threat level of this species at a regional and global level.”

IFOP researchers receive training in dissolved oxygen analysis

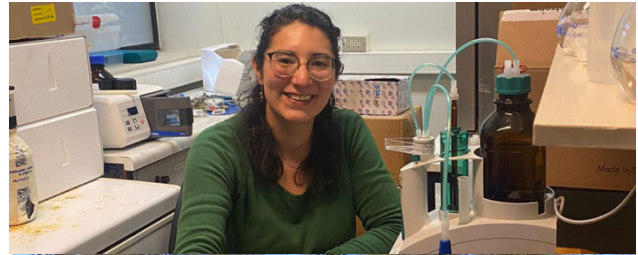
Researchers Marcela Toro and Jurleys Vellojin received training at the Oceanographic Instrumentation Center (CIO) of the University of Concepción to perform autonomous dissolved oxygen analysis using the WINKLER method using the automatic AULOX instrument, which is manufactured by this entity.

This equipment was acquired by the Oceanography and Climate group of the Putemún Research Center – Castro, in order to improve the methods of measurement and analysis of dissolved oxygen samples. This method allows validating the accuracy of the dissolved oxygen (DO) measurement of the CTD-O, used at IFOP, this being a strategy of the institution in the advancement of the development of best prac-

tices of chemical analysis for environmental research in aquaculture sites.

This equipment will be used in oceanographic campaigns of the permanent monitoring of the IFOP, which are carried out in fjords and inland sea of Chiloé, Aysén and in the subantarctic zone, specifically in Golfo Almirante Montt. In this last place, dissolved oxygen measurements will begin, with AULOX in the campaign that will be carried out in the Austral summer of 2025. The project that will initially benefit from this acquisition is the Monitoring and Modeling of the Spatial and Temporal Variability of Oceanographic Processes in Austral Channels and Fjords project.

During the training carried out at the Oceanographic Instrumentation Center, the researchers acquired theoretical and practical knowledge of the analysis of dissolved oxygen with the WINKLER method, thanks to the excellent planning and organization of the CIO – UDEC team.



Habitat-forming organisms, benthic enhancement and conservation aquaculture for the sustainability of the marine economy of our country at ISSESR7

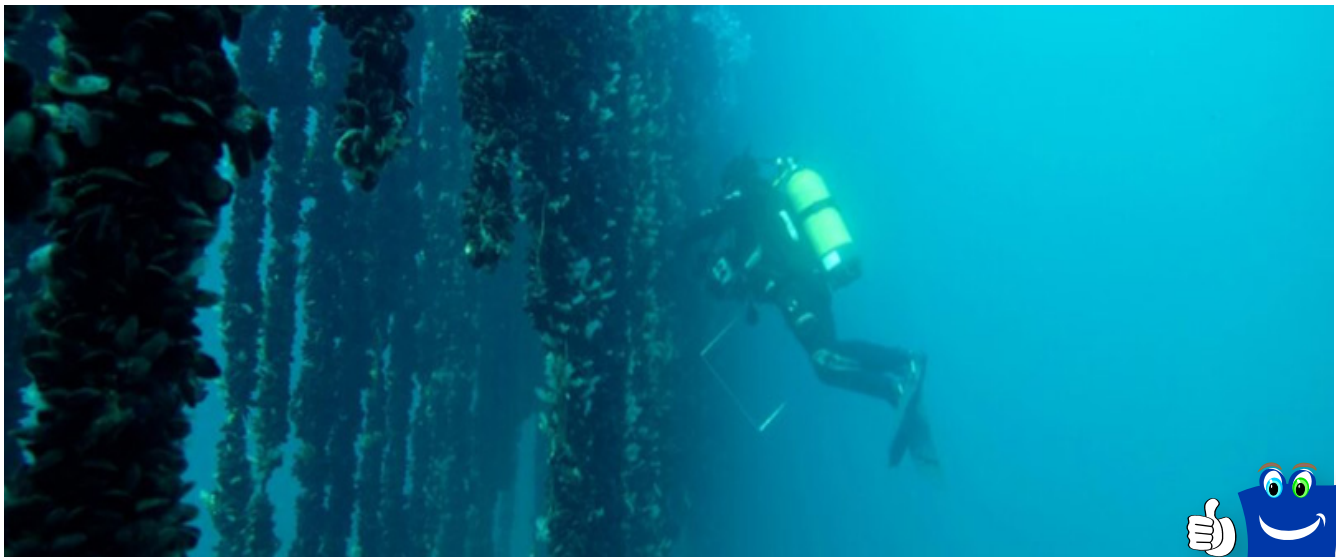
7TH SYMPOSIUM OF STOCK ENHANCEMENT AND SEA RANCHING

With a selection of around 60 research projects, including 8 keynote lectures and posters, registration remains open to participate. The sessions will have simultaneous translation. ISSESR7 will be held at the Club House Rooms of the Cabaña del Lago Hotel in Puerto Varas between Tuesday, November 5 and Thursday, November 8.

Between November 5 and 8, ISSESR7 (7th International Symposium of Stock Enhancement and Sea Ranching) will be held, organized by the Institute for Fisheries Development (IFOP). This symposium focuses on the dissemination and transfer of the sciences of stock enhancement, restocking and conservation assisted by aquaculture to improve the sustainability of the marine economy. In its seventh and first edition in Latin America, a special emphasis is placed on conservation and restoration aquaculture for the improvement of benthic species.

Thus, recent advances in improving the stock of habitat-forming species will be one of the topics of the ISSESR7 program, where the presentations by Dr. Andrew Jeffs (Faculty of Science, University of Auckland) entitled: “Lessons learned from the restoration of over-exploited mussel reefs in New Zealand; and the presentation by Dr. Emilee Benjamin (Institute of Marine Science, University of Auckland) “Reviving the seabed: Enriching biodiversity and habitat complexity with bivalve shells from aquaculture. Among the national exhibitors, Dr. Carlos Molinet (UACH/INCAR) will contribute with “Use of restorative aquaculture to reduce the impacts of the invasive anemone *Metridium senile* on local sea urchin banks” and Dr. Luis Henríquez (IFOP) with the presentation “Banks under crops – Opportunities for habitat improvement and species abundance in small-scale mussel aquaculture”

In a similar vein, this time, addressing the restoration of oyster banks, the keynote lecture by Dr. Edward Camp (University of Florida, School of Forest Resources and Conservation) will be presented, entitled: Combining oyster improvement, fishery management and aquaculture to favor fisheries and ecosystems; and the presentation “Multidimensional approach for restocking and restoration of natural banks in open access areas subject to benthic resource management plans: the case study of Ancud Bay. Ricardo Riquelme (Associate Researcher, Universidad Santo Tomás).

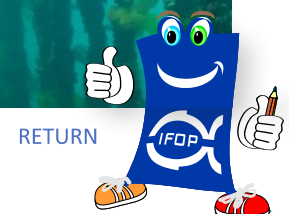


Currently, the concepts of conservation and restoration aquaculture refer to the planned use of crops for the protection of a natural resource (Froelich et al., 2017), also seeking to design an aquaculture capable of generating positive effects on ecological, economic and social needs, mitigating, in turn, the negative effects of the unsustainable use of the ecosystem (Theuerkauf et al., 2019; Carranza et al., 2020). In this context, the country's mussel farming based on the intensive cultivation of "ecosystem engineers" such as mussels has advantages. This bivalve species is capable of generating biogenic habitats (emergent banks) under the cultivation facilities, where they can recruit and inhabit benthic invertebrates of interest, such as sea urchins, crabs and other edible bivalves. Similarly, macroalgae aquaculture meets conservation objectives as it can also generate habitat usable by invertebrate and fish species, mitigating the effect of climate change stressors by releasing oxygen and utilizing nitrogen, phosphorus and carbon from the water column. Consequently, the adoption and development of this aquaculture concept capable of generating biomass, and in turn, a resource for environmental restoration, may become increasingly relevant to socio-economies based on the use and extraction of natural resources from the sea.

ISSESR7 also includes advances in animal release strategies and post-release ecology, the human dimension in restocking, perspectives on long-term assessments, hatchery rearing, domestication and fitness, artificial habitats and marine ranching, as well as strategic alliances between stakeholders for the future. In celebration of the 60th anniversary of the creation of the IFOP, we present an approach that strategically combines fisheries and aquaculture sciences, as a relevant topic for the development of tools that reduce negative effects on the ecosystem linked to the economic growth of today's society.

Keynote talks from the 7th International Symposium on Stock Enhancement and Sea Ranching:

- Seven Ways for Falling: Reconstructing Four Decades of Stock Data for Key Commercial Species in Southern Chile. Dr. Luis Outeiro.
- Framing the Integration of Social and Human Dimensions in Conservation Hatcheries and Stocking Program Management. Dra. Hannah Harrison.
- Current State of Chilean fisheries. Dr. Carlos Montenegro .
- Reflections on community-based fisheries management across socio-economic divides: Fishers' perceptions on sustainability and management in Australia and Vanuatu. Dra. Clara Obregón (modalidad virtual).
- The Beauty of Interactions: The Hologenome in Marine Organisms and its Potential Use in Restorative Aquaculture. Dr. Cristian Gallardo-Escárate.
- Advancing Hatchery Management: Strategies for Enhancing Hatchery Fish Fitness, Minimizing Wild-Hatchery Interactions, and Exploring Alternative Techniques. Dr. Seth White.
- Combining oyster enhancement, fisheries management, and aquaculture to improve fisheries and ecosystems. Dr. Edward Camp.
- Evaluating artificial reef use and sea ranching systems in China and assessment of future directions: a literature review and meta-analyses. Dr. Zhongxin Wu.



Professional exchange between the Fisheries Development Institute (IFOP) and the Peruvian Sea Institute (IMARPE)

Within the framework of the Humboldt II project, a binational Chile-Peru initiative, co-financed by the Global Environment Facility (GEF) and implemented by the United Nations Development Program (UNDP) and executed by the Undersecretariat of Fisheries and Aquaculture (Subpesca) and the Vice Ministry of Fisheries and Aquaculture of the Ministry of Production of Peru (PRODUCE), the exchange of professionals is being carried out between the Fisheries Development Institute (IFOP) and the Peruvian Sea Institute (IMARPE) in the anchovy evaluation cruises in the shared stock of southern Peru and northern Chile. This activity is part of the program of the Binational Direct Assessment Working Group that seeks to exchange experiences and standardize methodologies for the quantification of biomass using acoustic methods and Daily Egg Production (MPDH).

On behalf of IFOP, the Direct Assessment Technician Adrián Ibieta will participate on board the BIC Luis Flores Portugal, who will participate in the anchovy survey between October 10 and 22 to evaluate the southern area of Peru between Puerto Chala and the border with Chile and on behalf of IMARPE, the Acoustic Researcher Gustavo Cuadros will embark on the BC Dra. Barbieri on the anchovy assessment cruise between the Arica and Parinacota Region and the Antofagasta Region participating in the assessment between the border with Peru and Iquique between November 18 and 29.



IFOP Participation in the 12th Meeting of the Scientific Committee of the OROP-PS

Lima, Peru, September 30 to October 5

For the third consecutive year, Ignacio Payá, a researcher from the IFOP Resource Assessment Department, was the spokesperson for the Chilean delegation at the XI Meeting of the Scientific Committee (SC) of the South Pacific Regional Fisheries Organization (OROP-PS). The meeting took place from September 30 to October 5 in Lima, Peru. The Chilean delegation was chaired by Aurora Guerrero and was made up of a total of 14 members. Ignacio Payá, who also has the role of Vice President of the Scientific Committee, indicated that the role of spokesperson consists of transmitting, arguing and justifying the scientific position of the Chilean delegation on the different topics of the Scientific Com-



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mittee, which include: the horse mackerel fishery, the squid fishery, deep-water fisheries, the impact on vulnerable marine environments and the ecosystem approach to fisheries. In the case of the horse mackerel fishery, the main topics were the stock structure, stock assessment, stock status, biologically acceptable catch (catch quota) and progress in the implementation of the evaluation of management strategies. While in the case of the squid fishery, the main topics were the genetics of the different morphs (sizes that the squid reach), fishing effort, relative abundance indices and the different stock assessment models. The IFOP researcher José Zenteno, who served as a reporter for the deep-water fisheries group, also participated in the team of experts advising the delegation.

Participation in workshops prior to the 12th Meeting of the Scientific Committee of the OROP-PS

Mackerel Connectivity Workshop, Lima, Peru, 26-27 September

IFOP participated in the Workshop of the Connectivity Working Group of the Jack Mackerel Working Group. This workshop aimed to make progress in developing a research strategy to elucidate the population structure of jack mackerel using the latest scientific tools available. The workshop included the participation of researchers from Chile and Peru, including IFOP researchers Víctor Catastí, Camilo Rodríguez, Ignacio Payá and José Zenteno. During the development of this workshop, the reviews carried out for the eleven research topics selected by the Connectivity Team were presented. Each subgroup presented a review of each topic, which consisted of the compilation of

information in the literature on the scientific basis of each discipline, the state of the art in terms of available methodologies, a critical analysis of their application for the determination of connectivity in the jack mackerel population, and an evaluation of the limitations and viability of these methods. A discussion was then held on each topic, where each line of research was assessed in terms of its importance for connectivity, as well as the logistical costs for its incorporation into a research program associated with jack mackerel connectivity. Camilo Rodríguez (Otolith microchemistry) and José Zenteno (Fishing dynamics) presented on behalf of IFOP.

During the development of the workshop, participation opportunities were generated for researchers, within voting schemes by show of hands, which allowed prioritizing the different lines. After successive rounds of voting, the 4 lines of research to be prioritized were determined: Genetics, Marking, Early stages and Reproduction. Finally, all the reviews were compiled into a document and recommendations were agreed to the SPRFMO Commission, which were subsequently presented and approved during the Scientific Committee (SC) sessions.





SQUIDSIM 1.02 (part of his PhD thesis at the University of Barcelona), and it was agreed to use it as the simulation model for the research group.

Stock assessment workshop for cuttlefish at the SPRFMO.

Lima, Perú, 29 de septiembre

Ignacio Payá y Karen Belmar participaron en el taller dgnacio Payá and Karen Belmar participated in the stock assessment workshop for cuttlefish at the OROP-PS, which aimed to analyze the results of the different assessment models used for cuttlefish. I. Payá presented the update of the continuous-time production model (SPiCT) applied to cuttlefish in the entire FAO area'87, which includes the SPRFMO area and the EEZs of Chile, Peru and Ecuador. Dr. Gang Li (China) presented a Bayesian production model with environmental variables. Dr. R. Roa (CALAMASUR) presented a production model adjusted to biome estimates made with zone-based depletion models. The three models presented high uncertainty in their results, but suggest that the stock in 2022 was around the maximum sustained yield. It was highlighted that there is a 2-year delay between the determination of the stock status and the current condition of the resource. This is even more relevant this year, as there has been a decline in cuttlefish sizes and fishing yields in Peru and the equatorial zone. Because of this, the commission was advised to request data from coastal countries and apply an assessment approach within the fishing season.

SPRFMO Jumbo Squid Fisheries and Population Dynamics Simulation Workshop

Lima, Peru, 27-28 September

Ignacio Payá, Karen Belmar and José Zenteno from IFOP participated in the SPRFMO SC Jumbo Squid Assessment Simulation Task Team (SPRFMO SC Jumbo Squid Assessment Simulation Task Team) workshop. This workshop aimed to agree on the technical terms of reference for the implementation of a simulation program for the population dynamics and fisheries of squid in the SPRFMO, which will allow testing the robustness of the stock assessment models, and developing operational models for the evaluation of squid management strategies. Simulation scenarios were defined in terms of population and fisheries structure, uncertainty of processes and observations, and incorporation of the effect of the environment and climate change. I. Payá presented the simulation model



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