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## Various meetings are held by IFOP's Director with Biobío region users

A visit to Biobío region was made by Gonzalo Pereira Puchy, IFOP's Executive Director the highest institutional authority, accompanied by a team of professionals. The objective of the activity was to learn about in the field work carried out by IFOP's scientific observers in the region, to bring IFOP's work closer to both artisanal and industrial users, and to generate ties to carry out joint activities.

Regarding the activity, Pereira explained "it was very productive and gratifying, since I was able to meet and have close contact with the region's scientific observers and see how and where fishing resources sampling is carried out.

I also met with IFOP's pre-shipment manager, Cecilia Palma, and we talked about the important work that IFOP does in certifying fishmeal.

I made a formal visit to the Asipes, (Fisheries Industrialists Association) there I met with president Macarena Cepeda and we talked about IFOP's research role, they showed me a presentation with Asipes



main functions.

I held a meeting with leaders César Jorquera, President of San Vicente fishermen's union association, and Obando Jorquera, 8th region fishermen's and shipowners' union President, where our experts responded to their queries and we promised to continue working on set.

We took a tour of Orizon plant where we were able to observe the entire production process that is carried out on horse mackerel so that it can be used for human consumption."

IFOP Director took the opportunity to introduce IFOP's



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Talcahuano new headquarters head, Juan Olivares Cayul, Pontificia Universidad Católica de Chile Biologist, who is in Master's in Biodiversity and Conservation final stage, with extensive 31 years of IFOP's experience. With a high social and labor commitment, being manager and architect of the Institutional Career plan first Collective Negotiations. His administration will be responsible of positioning IFOP in the Eighth Region and to ensure the workers well-being at Talcahuano base.

## IFOP Executive Director talks with the institution's leaders about the new Fisheries Law

On Friday, April 24th, at IFOP Valparaíso, a day of conversation was held between the Executive Director of IFOP, Gonzalo Pereira, and the leaders of the institution's unions, on the occasion they worked and discussed the role of IFOP in the new Fishing Law.

Regarding the activity, Pereira expressed "I am very satisfied with this meeting, it was a good instance to exchange ideas regarding what we think a new Fisheries Law should have or contain, mainly in our sphere, which is referred to the investigation for the fishing and aquaculture and also in the ins-



titutional aspects that concern us as an institution in charge of the research. It brought me several good ideas that have been raised by the unions."

From IFOP unions they explained "this instance meant an opportunity to share our ideas with the executive management and talk about relevant issues in the face of this great challenge that is the new Fisheries Law. Among the topics discussed, it was a pleasure to be able to agree on several work lines, highlighting the need for a baseline budget for our institute, a restructuring in the positioning of our scientific observers and the development of fishing research. We hope that this work can have a place in the new Fisheries Law project to continue strengthening our work to advise on the management and sustainability of our marine resources".

## IFOP, through its Direct Evaluations Department participates in the most important US fishing acoustics symposium

Senior researcher Álvaro Saavedra, from Direct Evaluations Department participated in "ICES Fisheries and Plankton Acoustics Symposium – From Echosounders to the Cloud: Transforming Acoustic Data to Information." international symposium, held in the city of Portland, USA, between March 27th and 30th, 2023, with two jobs.

Álvaro Saavedra presented the work titled: "Do fish swim faster in the horizontal direction than up-down?. Study case: two small pelagic fish and two demersal fish", prepared by Álvaro Saavedra and



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## IFOP points out that harmful algal blooms are not linked to anchovy stranding in Los Lagos Region Cochamó sector, Reloncaví fjord

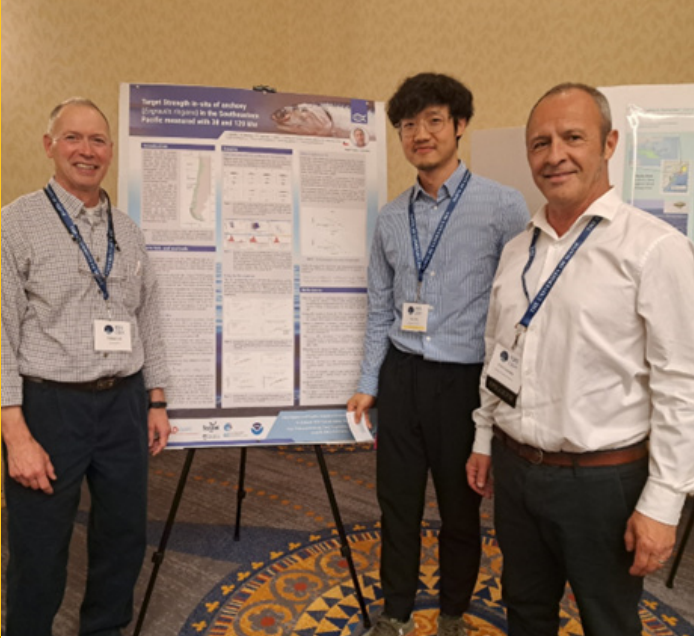
Derived from anchovies stranding, recorded in Cochamó town in the Reloncaví fjord, on April 1st and 2nd, 2023. IFOP's Harmful Algae Research Center (CREAN) evaluated oceanographic conditions, harmful microalgae and marine toxins state, in eight stations located between Cochamó and Caleta La Arena, which are permanently monitored by Red Tide Program in Fjords. Complementary information was provided by Sernapesca, who verified that the event was punctual, affected a low fish biomass, and was mainly concentrated on Cochamó beach. They also reported that, due to predators action, there were no longer any dead fish specimens left on the beach. beach or surroundings. For their part, local fishermen confirmed that stranded species corresponded to anchovy specimens.

During the last week of March, the oceanographic conditions were for a surface water layer, up to ten meters deep, characterized by a warm temperature (15°C), with low salinity (<20 UPS) and well oxygenated (<8 mL/L), conditions that are common when freshwater contributions are recorded from rivers that flow into this fjord. Regarding harmful microalgae, dinoflagellate *Dinophysis acuminata* was the species that showed highest levels of relative abundance (AR = 7 and 8), however, no marine toxins were detected in shellfish according to analyzes carried out by Health Ministerial Secretariat (Seremi) from Los Lagos, data that were confirmed by analyzes performed at CREAN through HPLC MS/MS. The species that numerically dominated phytoplankton composition were diatoms *Skeletonema* spp. and (8,100,000 – 17,974,000 cells/L) and *Ditylum brithwellii* (274,000 – 521,000 cells/L), *Ditylum brithwellii* (274.000 – 521.000 cél/L), both of very high abundance in the area.

Additionally, on April 4th, sampling was carried out at three stations in the fjord, where live phytoplankton samples were collected in order to assess ichthyotoxic microalgae's presence. The results show ichthyotoxic microalgae absence, cell abundance decrease and permanence of the dominance of *Skeletonema* spp. and *Ditylum brithwellii*, especially in stations located at the outlet of the Reloncaví fjord.



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Jorge Castillo, while research "Target Strength in situ and ex-situ of anchovy (*Engraulis ringens*) in the Southeastern Pacific" was presented in poster format" by Jorge Castillo, Álvaro Saavedra, Javier Legua and Francisco Leiva. Participation in this symposium is of great importance for the department and institute, given the relevance of hydroacoustics in the evaluation of fish stocks for fishing resources management in our country and that it facilitates knowledge exchange with more than 300 researchers worldwide who make use of large amounts of data in acoustics instrumentation collection and treatment.

This symposium marks a relevant milestone in this technology application, incorporating artificial intelligence's use and machine learning, among other modern techniques in data analysis. In addition, fishing acoustic community presented the latest advances in acoustic instrumentation new technologies development. Jorge Castillo stated that "in this symposium it will be possible to observe, among others, the use of the new manned and remote/autonomous platforms results to observe ecosystem components that could be one of the most interesting technological solutions for our country to prospect coastal sectors that until now have been expensive or impossible to monitor".

It should be noted that this Acoustics and Fishing Technology Symposium sponsored by ICES (International Council for the Exploration of the Sea), constitutes the 8th scientific event, after 50 years, the first of which was held in Bergen, Norway (1973). Previous symposia have been held in Bergen, Norway (1973, 1982 and 2008), in Seattle, USA (1987), in Aberdeen, Scotland (1995), in Montpellier, France (2002) and in Nantes, France. (2015), highlighting that IFOP researchers have participated with the results of their work since 1982.



On the other hand, from marine toxins analyzes in phytoplankton from HPLC MS/MS, only a very low concentration (0.08 ng/L) of Pectenotoxin (PTX-2) was detected, which would be related with high values of abundance of *Dinophysis acuminata*.

Oscar Espinoza González, Harmful Algae Research Center (CREAN)'s Head explained "we must remember that species such as anchovies can be affected by temperature sudden changes, salinity or lack of oxygen, however, no anomalies were observed in analyzed data. in these variables and especially in the concentration of dissolved oxygen. Neither was evidence found that the event was caused by marine toxins associated with any harmful microalgae. However, lipophilic toxins periodic evaluation should be maintained, especially due to the high levels of relative abundance of *Dinophysis acuminata* and pectenotoxins findings of phytoplankton samples. This toxin is not regulated from a Public Health point of view. On the other hand, it is proposed that high concentrations of phytoplankton, particularly *Skeletonema* spp. inside the Reloncaví fjord, it was able to induce anchovies entry into the fjord in search of this food, seeing itself confined to more closed areas such as Cochamó sector and its surroundings.

Stranding events of small pelagic fish (sardines and anchovies) have previously been recorded during the autumn in the Reloncaví fjord, a period where it is known, through oceanographic research conducted by IFOP, that water masses of more oceanic origin enter the interior of the fjord, which contain high concentrations of nutrients, favoring phytoplankton biomass increase and with it, these pelagic fish abundance.

The recorded event of stranding of fish reflects fjords and channels susceptibility to atmospheric-oceanographic variations associated with climatic change in southern Chile, which can affect precipitation patterns and freshwater inflow through river discharge. water column mixing/stratification processes, nutrients availability, variables that can modify phytoplankton composition and with it food web that includes zooplankton and fish of different sizes. Research maintenance in these systems, activities coordination that make it possible to anticipate eventual scenarios and impacts derived from climatic change, are necessary actions in a changing environment and, of course, it is imperative to continue generating information that supports decision-making and contributes to these systems sustainability.

## IFOP researchers participate in the international mountain meteorology course

Between March 13th and 18th, in Mendoza city, Argentina, the "Mountain Meteorology" second course version was held, an instance in which researchers from the Fisheries Development Institute participated; Pedro Valdebenito and Oliver Venegas. Mr. Valdebenito is in charge of analyzing atmospheric and oceanographic data, while Mr. Venegas develops meteorological information through numerical models, for the zone of fjords and channels in the southern regions of Chile.

This instance was organized by Nivology, Glaciology and Environmental Sciences Argentine Institute (IANIGLA) dependent on the Scientific and Technical Research of Argentina (National Council CONICET), which was taught by Dr. in Atmospheric Sciences Maximiliano Viale, expert in mountain meteorology, together with Dr. Federico Otero, both belonging to IANIGLA. On the other hand, Dr. Curtis James was a guest professor, academic from Applied Aviation Sciences Department of Embry-Riddle Aeronautical University, Arizona, USA.

On the occasion, researchers were able to interact with professionals from various areas both in the United States, Argentina and



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of other marine protected areas in the world, dialogue importance and of course, implicitly, knowledge management and exchange.

Koro Nui o te Vaikava – Rapa Nui local Sea Council representatives attended meeting No. 10 of Big Ocean network. On this occasion, Rapa Nui Marine Protected Area was officially named as a member of this world's oceans great network. Big Ocean is a unique peer-learning network created by large-scale MPA managers to promote highest standards in professional ocean conservation.

During the networking day with different indigenous peoples, called Caucus, working groups were developed in which attendees had the role of presenting issues related to ocean worldwide protection and administration. Defending and respecting ocean's voices in terms of knowledge exchange between indigenous peoples was a key issue to this meeting. Sebastián Yancovic Pakarati Rapa Nui people elected councilor presented two proposals to discuss problems caused by marine debris that reaches coasts and underwater mining.

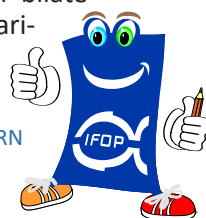
**Some of the activities that stand out in these working groups were:**

- Marine activities strengthening in relation to decision-making by young people.
- Climatic change – food security.
- Financing mechanism for marine conservation.
- Underwater Mining Prohibition.
- The importance of listening to the voices of the ocean is important for MPAs correct management and conservation.

**IMPAC5 established milestones were:**

- Brotherhood Declaration between Isla Coco of Costa Rica and with Juan Fernández Islands. This interest in twinning will allow a collaboration network creation, establishing work lines experiences exchange and joint learning.
- Hawaii relationship strengthening with Papahānaumokuākea brotherhood and interest in renewing Oceanic and Atmospheric Administration National Office (NOAA) collaboration agreement, an announcement that was followed by the US and Chile, renewing their bilateral agreement on terrestrial and marine protected areas. This important agreement between two incredible

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Chile, where mountain meteorological processes were addressed, which have a direct implication on the dynamics of the ocean, especially in fjords and channels. of the Chilean Austral South-which are immersed within a complex topography, composed of innumerable mountains and valleys. Among main issues addressed, mountain wind circulation and orographic rain stand out, which can help us to better understand the circulation of the fjords and the entry of fresh water into the estuarine system as a result of the enhancement of precipitation when this one meets a mountain.

## Rapa Nui presence at IMPAC 5

THIS PARTICIPATION WAS POSSIBLE THANKS TO BLUE NATURE ALLIANCE COLLABORATION AGREEMENT IMPLEMENTED BY THE FISHERIES DEVELOPMENT INSTITUTE (IFOP)

The Fifth Marine Protected Areas International Congress (IMPAC5) is held every 4 years, its purpose is to bring together ocean conservation professionals and high-level managers to inform, inspire and act on Marine Protected Areas (MPA's). This time the event was held in f Vancouver city, Canada. Local Rapa Nui sea council representatives– Koro Nui o te Vaikava, jointly with Ministry of the Environment representative for AMCP-MU Rapa Nui had the opportunity to participate in this conference, achieving important advances for Rapa Nui eco-region marine conservation.

IMPAC5, allowed to increase and broaden each one of the attendees knowledge so that it can later be transferred to the Rapa Nui community. In addition, it allowed networks generation with administrators

## The future projection in the framework of the administration of the MPAs of Rapa Nui from IMPAC5.

- protected areas creates a cooperative framework Polynesian natural and cultural resources protection and management. And that, despite geographical distance, makes it clear that they are united by a common culture and represent two unique marine environments in the Pacific Ocean that deserve adequate protection and management.
- The Ministry of the Environment invited the Chilean delegation that was at IMPAC 5 to participate in a conversation panel, called "Chile's marine conservation in action: National System of Marine Protected Areas progress and challenges" Its objective was to present State agencies (MMA, Sernapesca and CONAF) and local communities (Rapa Nui, Juan Fernández and Aysén) perspectives about progress and challenges in the participatory management of Marine Protected Areas in Chile.
  - Along with the above, counselors participated in a focus group with more than 20 MPA managers, organized by Colorado State University Management of Protected Areas Center, whose objective was to raise the training needs of MPA managers. indigenous communities, which was an ideal opportunity to connect and learn about other territories needs. Likewise, collaboration bridges were established with Global Fishing Watch and Sky Light for future satellite monitoring of the Exclusive Economic Zone of Rapa Nui, against industrial and illegal fishing.
  - Another important point was the meeting with Pew Bertarelli Ocean Legacy, with whom Koro Nui o te Vaikava is working for the construction and implementation of the first Ocean Science and Education center on the island, called Hare o te Moana.
  - The delegation also participated in various meetings and presentations on different areas, highlighting the meeting with the French Polynesian environment minister, presentations on biodiversity, marine corridors, public policies, conservation in the high seas, priority species, marine inspection, among others.
  - Count on the support of the brotherhood network declared in IMPAC5 for a correct implementation of AMCP-MU and MMH Management Plan to handle how to apply in an orderly manner the various programs linked to Rapa Nui marine protected areaconservation and protection.
  - Rapa Nui culture ancestral concepts recognition and rescue of Sea related issues.
  - To generate Rapa Nui Marine Protected Area governance training and presentations to Island community and students.
  - Rapa Nui Sea Science and Education Center Construction : Hare o te Moana, to train capacities and from there to manage MPAs island
  - Need for greater proximity to other AMPs at the National level.



## IFOP researchers attend the International Symposium on Sea Turtles, held in Cartagena Colombia

Researchers Patricia Zárate and Ilia Cari from Ecosystemic Approach of Oceanography and Environment Department Highly Migratory Resources Monitoring project, participated in the 41st International Sea Turtles Symposium held in Cartagena city, Colombia. The symposium, which is being held for the second time in South America, was attended by approximately 700 people.



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Researchers presented at LaudOPO Network annual meeting all progress made at the country level with respect to eastern Pacific Leatherback Turtle (*Dermochelys coriacea*) Recovery Action Plan and binational project results between Fisheries Development Institute (Chile) and Fundación MarViva (Costa Rica) “To reduce leatherback turtles bycatch in northern Chilean fisheries”. During video night, a regular event of the symposium each year, is the presentation of a clip about experimentation carried out by the researchers it was presented to evaluate circle hook effect on sea turtles caught with longline catches mitigation and mortality when catching dorado in the northern zone of Chile, an activity framed in the binational project.

In addition to this, part of the results carried out on biological samples genetic analysis from stranded turtles and incidentally captured in Chilean fisheries was presented at the scientific symposium, a work that was carried out in collaboration with researchers from the Southwest Fisheries Science Center belonging to the United States National Fisheries Service (NMFS).

Dr. Zárate, as a member, since 2010, of the Sea Turtle Specialist Group (IUCN-SSC-MTSG) of the International Conservation of Nature Union (IUCN), participated in the annual meeting where Members’ commitments and activities for this year regarding the conservation of sea turtles and their habitats were discussed.

