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IFOP attends coordination meeting of joint regional oceanographic research cruise

EVERY YEAR BETWEEN AUGUST AND OCTOBER, CHILE, COLOMBIA, ECUADOR AND PERU INTERVENE I THE CRUISE. OUR COUNTRY PARTICIPATES WITH IFOP OCEANOGRAPHY AND PLANKTON GROUP USIG ABATE MOLINA RESEARCH VESSEL.

In Bogotá, Colombia, from May 27th to 31st 2019, within the South Pacific Permanent Commission framework (CPPS, <http://cpps-int.org/>), which groups the pacific coast region countries, the MEETING OF THE COORDINATING COMMITTEE OF THE XXII REGIONAL CRUISE OF OCEANOGRAPHIC RESEARCH IN THE SOUTHEAST PACIFIC and the XII MEETING OF THE SPECIALIZED DATABASE WORKING GROUP (GTE-BD) OF THE REGIONAL CRUISES was held. In this call, the oceanographer Carolina Calvete, chief of CENDHOC Division of SHOA, and Hernán Reyes, head of the Oceanography Section, belonging to the Department of Oceanography and Environment (DOMA), of IFOP Valparaíso, represented Chile in the database group, by the Regional Cruise Committee (CCR-ERFEN).



Among the activities scheduled for this meeting were two introductory courses, "Oceanographic Data Standardization Course" and "Oceanographic Data Management Course applying standards and best practices recommended by UNESCO-IOC-IO-DE", taught by the Colombian Center for oceanographic data (CECOLDO). Within the framework of this annual meeting of the CCR-ERFEN, the document "Development of the Regional Climatology Project" was prepared by the task force formed by the national representatives of each state in this committee. The coordination of the regional cruise XXII, year 2019, in which Chile, Colombia Ecuador and Peru participate, will be in charge of Colombia, a position that was delivered by Chile (IFOP) that acted as coordinator of the XXI cruise (year 2018).

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CHONOS oceanographic monitoring website is modernized by IFOP

Fisheries Development Institute (IFOP) is celebrating CHONOS re launching, a web portal which hosts southern Chile oceanographic information system (available for free use at www.ifop.cl/chonos). This new version of CHONOS maintains its public role of serving as a source of oceanographic information to government users and the general public. It has significant improvements in the previously existing tools: MOSA, parti-MOSA and CLIC, to which the new ones are added ATLAS and Real-Time

Luis Parot Donoso IFOP executive director highlighted "Fisheries Development Institute fulfills a public role of excellence, which is why this oceanographic monitoring website is available to all people who want to use it, it is free and easy to access. We are very proud of these advances on our web page since, it is the product of hard work performed by IFOP great professional team "

Web page applications

ATLAS is a historical data explorer based on hydrodynamic modeling of oceanographic variables such as currents, temperature, salinity (and derivatives of these as water renewal, stratification, etc.) in hourly data and monthly averages. In the words of Elías Pinilla, IFOP researcher "ATLAS allows us to condense the enormous amount of information derived from our numerical models into simple spatial and temporal datasets that can be used by any user".

On the other side, Real-Time allows to visualize graphs of atmospheric variables that are updated hourly (speed and direction of the wind, atmospheric pressure, precipitation, etc.) from IFOP weather stations at Los Lagos region, from Reloncaví to Melinka.

MOSA-ROMS: 3 days Oceanographic forecast operational model from Los Lagos region and Aysén Region; it has incorporated atmospheric operational forecast MOSA-WRF visualisation offering a wide spectrum of atmospheric variables for consultation, such as wind speed, air temperature, humidity and precipitation. For Oliver Venegas, IFOP researcher and responsible for atmospheric modeling, "it is a great achievement to implement the high resolution atmospheric forecasting system MOSA-WRF, since it will allow us to have a better and more detailed knowledge and prediction of the atmospheric patterns of North Patagonia, which in turn will help improve oceanographic prediction. "

Parti-MOSA: Particle dispersion predictions for Los Lagos and Aysén Region have increased particle driftst prediction from 3 to 10 days forward, which, according to Osvaldo Artal, IFOP researcher at Castro, "will allow To deal with health situations, polluting or maritime safety and rescue emergencies in advance. "

Finally, **CLIC** connectivity tool has significantly improved the resolution, allowing us to know how particles are transported through marine currents between different areas. You can choose between passive particles or provide these particles with response to environmental conditions, so that they can simulate dispersions of various inert or biological agents (such as sea lice that affect salmon farming).



Simultaneously IFOP is announcing CHONOS new version through workshops at users request. These have taken place in Coyhaique (May 14, Aysén and Magallanes Environmental Assessment Service), Castro (May 23, Technological Institute of Mitilicultura) and Valparaíso (June 4, University of Valparaíso and June 5, Fishing Promotion Institute).

Peruvian Researcher conducts an internship at IFOP

Luis La Cruz, researcher at the Institute of the Sea of Peru, (IMARPE) conducted an internship, jointly with Fishing Developmet Institute hydroacoustic area experts.

He works at the Hydroacoustic Functional Area in Peru and traveled



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to Chile to share experiences with Fisheries Development Institute researchers, especially in acoustic processes automation.

The researcher participated in the hydroacoustic evaluation of small pelagic in Aysén of General Carlos Ibáñez del Campo Region cruise, to know in the field IFOP researchers way of work.

Luis commented “This initiative comes from good relations between IFOP – IMARPE institutions and the perspectives that encompass each of the leading acoustics of Chile and Peru. The exchange of work experiences is sought and generate greater added value to the results of the hydroacoustic evaluation cruises of the region.

I participated in the Pelaguín 1904 cruise, in the area of acoustics that was equipped with the EK80 scientific echo sounder of 38 and 120 kHz. At the same time, I participated during biometric-biological sampling and during oceanographic stations. In the city of Valparaíso I made a presentation to the acousticians of the department of direct evaluations on the application of automation tools for the process of acoustic multifrequency data.

The experience was very rewarding, I had the opportunity to work aboard the craft fishing vessel “El Daubio Azul”. Teamwork was excellent, I was able to develop with ease and confidence.

The dialogue on acoustic fishing issues with IFOP researchers has led me to strengthen my knowledge. I met a group with great strengths, it was very interesting to have exchanged opinions with them. The acoustics team of Peru is equally numerous and the expectation is to continue with the exchange of researchers to strengthen the acoustics of the región”

IFOP leads a new Web platform creation with data on Fisheries, Aquaculture and Climate Change

IT WILL BE FREE, AND OF PUBLIC ACCESS WILL GATHER INFORMATION ABOUT; TEMPERATURE, SALINITY, OXYGEN, SWELLS, WIND, CURRENTS, TURBULENCE

The workshop about the project called “Interoperable Information System (SDII)” was held at Fisheries Development Institute (IFOP) offices, it was developed by the Department of Oceanography and Environment (Doma) supported by the Department of Information Technology and the Department of the Environment of the Division of Aquaculture of the Fisheries Development Institute in conjunction with FAO.

This project’s objective is to systematize and integrate data on fisheries, aquaculture and climate change, to generate information for users through a web platform. This site will allow a simple visualization of the information provided by climate change indicators and variables of local conditions for the use of the authorities, fishermen, municipalities, coastal communities and the public in general.

Dr. Jaime Letelier, project manager, explained “From the Climatic Change fisheries and aquaculture, point of view is becoming evident as a threat to the sustainability of the activity and therefore to global food security. The risk or vulnerability of these activities as well as the coastal infrastructure to environmental change is shaking the political and administrative structures that depended on the relative stability of the climate and ecosystems.”

Félix Inostroza, national coordinator of FAO’s project on climatic change in fisheries and aquaculture commented, “the importance of the project relies in the generation of a large database with information on fisheries, aquaculture and climate change that FAO intends to be public and available to all people and institutions that require it.

In the first instance and thanks to the vision of the authorities that direct them, the project is being supported by representatives of the Undersecretariat of Fisheries and Aquaculture, the National Fisheries and Aquaculture Service, the Ministry of the Environment, the Hydrographic and Oceanographic Service of the Navy,



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the center for the study of multiple forcings on marine socio-ecological systems (MUSELS) of the Universidad de Concepción. Once the first phase of this project is consolidated, the incorporation of other public and private institutions is expected “.

FishPath workshop organized by IFOP and TNC Chile

Fisheries Development Institute jointly with The Nature Conservancy (TNC) organized a fishpath workshop aimed at the use of this tool for old black (*Graus nigra*) fishery in Chile. The workshop focused on building the basis for fishery catch strategies development, with different field stakeholders participation, including fishermen from different coves.

What is FishPath?

FishPath is a process supported by a tool that includes a dynamic questionnaire that is applied to a group of administrators, fishermen and fishery managers in question. The questionnaire helps to understand fishery characteristics including biological attributes and life history of the species, the fleet's operational characteristics, management costs, community's socio-economic aspects, as well as standards and laws that affect fishery.

The FishPath process and tool is unique and was designed by TNC in collaboration with NOAA-the National Oceanic and Atmospheric Administration of the United States of America, the Scientific and Industrial Research Organization of the Confedera-

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tion of Australia (CSIRO), and the SNAPP consortium (Science for Nature and People Partnership, a consortium dedicated to solving conservation issues that benefit man and nature).



Once the participants of the process complete the questionnaire dynamically in a workshop, the FishPath tool integrates answers specified by the users and identifies a set of management strategies suitable for target fishery, including data collection interventions, stock assessment, and management rules. FishPath can also identify additional data or changes in the fishery that can help achieve the specified sustainability goals.

With FishPath the user has in his hands a guide of all the options of data collection, stock assessment, and management rules since it integrates around 50 options in each of the sections and provides information on when and in what type of fishery, each of these options is appropriate.

In Isla Laitec, IFOP researcher, offers educational talks to schoolchildren

The Lastenia Oyarzún Andrade school, located in Quellón commune 25 girls and boys from 1st to 8 years of age and a teaching staff of 4 teachers and 2 assistants in education.



Chilean Delegation participated in the Albatrosses and Petrels Conservation meeting held in Brazil

In Florianopolis, Brazil, Secondary Capture Working Group ninth meeting (SBWG9) and the Stocks and Conservation Status Working Group fifth meeting (PaCSWG5) were held, both working groups belonging to the Conservation of Albatrosses and Petrels Agreement (ACAP).

International meeting twich aims to share twork and researchresults, to review some regulations and procedures as well as plans and programs, ad also to begin the for the eleventh meeting of the Conservation of Albatrosses and Petrels Agreement advisory committee preparation(ACAP).

The national delegation was represented by Marcelo García professional fromSubsecretariat of Fisheries and Aquaculture (Subpesca) Conservation and Biodiversity Unit, Luis Adasme from Fisheries Development Institute (IFOP),Cristián Suazo from ATF Chile, both members of SBWG, as well as Verónica López (NGO Oikonos) PaCSWG member .

During the meeting about 50 members participated among secondary capture working group official members , as well as agreement,group observers such as Japan, United States, China.

Marcelo García from Fisheries Undersecretary highlighted the meeting's progress in of advice matters over mitigation measures and good practices, certifications and seabird bycatch risk assessments , all high interest matters to Chile in its application path on its fisheries management ecosystemic approach . The professional highlighted Chile's progress in controlling the use of mitigation measures through on-board cameras monitoring operation and its plans to reduce our fisheries discarding and incidental capture, and the Working Groupsmembers in tmitigation measures search, as well as in the advice provided by this agreement to tOROPS.

Luis Adasme, professional from IFOP Fisheries Evaluation Department, said that "Knowledge exchange with other researchers in the field and learning about bycatch mitigation advances and best practices in relation to seabirds bycatch, are valuable opportunities for Chile. On the other hand, these instances allow us to show the work and advances achieved by our country in



Paulo Mora, Fisheries Development Institute offered the talk "Discovering the world benthic resources of subject to fisheries on the island of Chiloé" at the Lastenia Oyarzún Andrade school, located at Quellón commune of.

Paulo said: "This was an opportunity to bring our daily work closer to the students. For most children it is a world full of new and amazing species, that draws their attention for their incredible life forms and their particular biology. The species of benthic invertebrates are extracted by artisanal fishermen, who in some cases are their parents or grandparents, therefore, it is necessary that these children, who are linked to the sea and its resources daily, be linked to the ocean sd its resources in a daily basis , so they ca be introduced to concepts such as sutainability and conservation.

Karen Ledesma, the establishment director said "For us the talk is important, mainly because we live on an island, therefore, to see and recognize the marine benthic species that inhabit the sea in our area, is very significant, mainly for children, since they did not have much knowledge in the field of these species.

The talk was educational and necessary for the students, it helped us to know the work of the IFOP scientists dedicated to the research and conservation of the sea and its resources. For the students it was very important, the activity they liked a lot, it was an intense and wonderful day for them and for all of us as a school, we took advantage of the exposed topics, since having a marine biologist in the classroom is a resource very powerful educational ".



IFOP at Marine Sciences Congress

Between May 27th and 31st, XXXIX Marine Sciences Congress is organized by Arturo Prat University Natural Renewable Resources School, this year the theme is "Biodiversity recovery and protection in a global change scenario"

Summaries of IFOP presentations

Pilot experience for the monitoring of "huiros" brown algae fishery in Chilean northern zone. Pablo Araya

"Huiros" fishery are the main representatives of benthic landings, but there is no associated indicators monitoring for their management. This work objective was to contribute to its construction through a pilot experience. Results of the developed work are delivered. in five monitoring sites in the Atacama and Coquimbo regions, both on the beach and in industry, It is verified that it is possible to establish a monitoring, which must be expanded gradually and gradually over time. This type of work requires the commitment and participation of the actors in the activity.

"Fishing information generation: participatory work among researchers and artisanal fishermen" .Autors: Andrés Olguín and Paulo Mora

The presentation is based on describing collaborative work between Fisheries Development Institute (IFOP) and Ancud Trawl Committee, in terms that fishermen themselves, through fishing logs implementation, collect information during their daily extractive activity. Among the most relevant results, it is established that information compiled in logs provides valuable background information for fishery correct management in the area and that users are able to participate in the generation of relevant information of their target resource without being questioned.

"First plan for discards reduction in demersal crustacean fishery in Chile: implemented measures review" Victoria Escobar

The presentation shows discard research program in demersal crustacean trawl fisheries development (nylon shrimp, prawns). In addition, the importance of this program results that have allowed on the one hand to identify discard composition, to know the causes of discarding and on the other hand the generation of base



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this research line that is in direct coherence with the ecosystemic approach currently promoted by Fisheries Law (LGP) ".

Cristian Suazo, Albatross Task Force coordinator – Chile (ATF-Chile) from Bird Life International, outlined team's experiences progress made in mitigation measures research and development to contribute to seabirds incidental capture reduction such as fardellas.

Verónica López Oikonos Ecosystem NGO Project Manager in Chile who has worked for more than 10 years with white pearl (*Ardenna creatopus*), a species that belongs to this agreement, commented "White pearl only reproduces in our country, but it has a long Migration to Canada every year during Chilean winter This agreement is very useful for this highly migratory species, since it allows us to share information between countries, recognize areas where there are risks of bycatch and work together to investigate and try to reduce these threats."

The exclusive economic zone of Chile covers a considerable section of the Humboldt Current, which represents one of the most productive marine ecosystems in the world and an important feeding area for 15 species of albatrosses and petrels included in the ACAP. Also, under its jurisdiction it has several breeding sites of global relevance, which comprise 21% of the world population of black-browed albatrosses.



Karen Belmar cuttlefish catches variation (*Dosidicus gigas*) from San Antonio and Talcahuano fleets between 2015-2018

Cuttlefish has been relevant in the fishing framework of the country, before the decline of other fisheries, however, there has been a change in the fishing operation. The objective of the work was to determine if there are biological-fishery indicators variations in cuttlefish catches of artisanal and industrial fleets between 2015 and 2018, in Valparaíso and Biobío Regions. Preliminary results show significant variations, in terms of fishing effort in both fleets and also a change in structure size, evidencing a decrease in the mantle length of the cuttlefish caught.

Site is in fact important: Cultivation Experiences macroalgae cultivation i two Chiloe locations. Sebastián Cook, Luis Henríquez, Francisco Galleguillos, Pablo Leal, Sandra Saavedra & Francisco Cárcamo

Macroalgae aquaculture in Chile has a tradition based on vegetative monocultures of *Agarophyton chilensis*, whose destiny is the production of raw material of low and unstable commercial value, which have been introduced throughout the country. The selection of aquaculture site, poorly studied in Chile, can improve the yield, quality, management and administration of crops, as well as, determine special characteristics to enhance production. This study evaluates two crops of *Chondracanthus chamissoi* and *Macrocystis pyrifera* maintained for two years. production cycles in Chiloé. Nutrients, epibionts and production indicators showed differences that would allow defining inherent characteristics of the cultivation site

Biological physical interaction processes at Chiloé inland sea: Anthropic activities and eutrophication as determinants of primary productivity Dr. Pablo Rojas

It explains causes and consequences caused (on water quality and condition of associated benthic system) a notable increase in nutrients contributions of (eutrophication) from productive activities that take place in the Inland Sea of Chiloé.

To address this problem, it was necessary to incorporate oceanographic criteria, as well as quantitative modeling tools (hydrodynamics and biogeochemistry) to evaluate the impact of the incorporation of organic matter and metabolic waste from the productive activities that take place in the aquatic environment. zone.



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information for the creation of a discard mitigation plan in these fisheries developed by the Subpesca.

Exploitation strategies economical effects in fisheries . Study Case: demersal crustaceas in Chile. Camilo Torres

Through bioeconomic modeling, strategies proposed exploitation effect for demersal crustacean fishery in Chile was studied. This analysis allowed to integrate biological and fishery aspects with fishery social and economic areas in order to evaluate effects that administration oriented measures could generate to maintain biomass at the level of Maximum Sustained Performance (MRS), in relevant indicators for the sector such as the net benefit, the equivalent employment and the annual bonus allowance.

"Gill net selectivity factor used in common hake (*Merluccius gayi gayi*)artisanal fishery in Chile 's central zone ", Jorge Sateler work done in conjunction with Dante Queirolo from PUCV.

The gillnet is the main fishing gear used in artisanal hake fishery and its different configurations play a fundamental role in the size structure of the catches. Taking into account data from the 2001-2015 fishery, compiled by the Monitoring program, selectivity factor that determines the retention probability for the size of the different mesh sizes used in this period and which could have been the most important was estimated. The most efficient.

Entrepreneurs

Jacqueline Parada was part of “Handmade Science”, an initiative which aims to connect Art and Science showing existing biodiversity through ceramic pieces representation inspired by the amazing world that exists within a water seadrop.

Jacqueline commented “The company Big Chile a Country Identity App that works like a puzzle with different themes from heritage to innovation. Free download, is available for App Store and Google Play, during 2018 a new series sought to visibilize and disseminate entrepreneurs in our country, with their initiatives to contribute to society and the environment, so they looked for studycases all around Chile, choosing 2 people per region (male and female) and I was one of the chosen, becoming part of Big Chile Series, Entrepreneurs, “We focus on your Idea” which spread on different platforms: App Big Chile Metro from Santiago”



Ximena Puentes with her wonderful natural bodycare products.