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Chile participates in Regional Sea Seminar held in Ecuador

The Sea's Regional Seminar, care, opportunities and challenges was held at Universidad de Machala, Ecuador. It was organized by the General Directorate of Maritime Interests of the Navy. Representatives from France, Ecuador, Peru, Venezuela and Chile participated in the activity. Our researcher from Fisheries Development Institute Nancy Barahona Toledo attended from our country.

The seminar objective was to provide knowledge about the sea in order to generate positive attitudes towards care and conservation of marine resources, creating reflection spaces on pollution, sustainable development and improving artisanal fishing community life's quality.

Nancy Barahona explained "The seminar was organized mainly for those who directly or indirectly use the Sea to carry out their work activities and live nearby, state and non-governmental institutions, social actors in order to: Promote the sea as a source of work, livelihood and development mainly for the inhabitants of the coastal sector of Ecuador; to inform attendees about fishing population dynamics in El Oro (Ecuador) province ; provide participants with bioremediation of marine and coastal pollution theoretical and prac-



tical tools in aquaculture activities and to present innovative initiatives for conservation and management of biodiversity of marine ecosystems in Ecuador and in other countries.

The researcher presented the work "Artisanal fisheries in Chile, Management plans: a way of co-management and fishery resources care." She said in my presentation I am presenting "background information on fishery and aquaculture resources and landings in Chile. Emphasis was placed on artisanal fisheries and open access areas fishing management plans. Background information was given on its generation, the role of scientific com-

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mittees and management committees. In turn, the management areas (AMERB) and the marine coastal spaces of native peoples (ECMPO) were highlighted in the benthic area. Associated with proper care given, she raised issues such as red tide that affects our country and climatic change, which is a cross-cutting issue, ending with a series of challenges.”

Nancy Barahona Toledo, is an Execution Engineer in Fisheries and Master in Environmental Education, with extensive experience in fisheries research and extensive experience in monitoring benthic fisheries operated by the artisanal fleet in Chile and biological fisheries studies. With great interest in biological processes associated with these fisheries and resource – environment – user relationships (artisanal fishers), all in order to contribute to the management plans implementation. Head of the Benthic Fisheries Monitoring project and member of the Benthic Technical Scientific Committee.

“Hidden crops” scope worldwide research is led by Chile

This research is intended to support small-scale fisheries development through a socially and environmentally sustainable approach. A key element to technically support this is to “illuminate” various fisheries contributions.

Recently it was a known fact that Chilean Fisheries Development Institute (IFOP) will participate in the global study “Illuminating Hidden Crops” (Illuminating Hidden Harvests, IHH), which is coordinated by the Food and Agriculture Organization of the United Nations (FAO, for its acronym in English), WorldFish and Duke University (United States) and where different international organizations will be participatig.

To delve into its scope, AQUA spoke with Luis Parot, IFOP’s executive director and also with Elizabeth Palta head of Fisheries Economics Section of the same institute,.

The first to respond was Parot:

Why Chile, and specifically IFOP, were invited to participate in this research?

This research aims to highlight small-scale fishing role, or artisanal fishing, in achieving Sustainable Development Goals (SDGs) in the world. In this second version of IHH study, 56 countries participate, and Chile was selected for the importance of fishing as a source of employment and the importance of fishing in terms of catches in the global and national context. On the other hand, IFOP has led the incorporation of the ecosystemic approach in fisheries research, an approach fully aligned with the spirit of this study, which seeks to show not only the biological and fishery indicators of fisheries, but also those referred to human dimension of those who exercise these fisheries.

What importance do you give to the invitation to participate in this research made to IFOP ?

IFOP is the Chilean reference in fisheries, aquaculture research in oceanography and climatic change, in charge of scientific and technical advice to public institutions, for regulatory and administrative measures.

In the international sphere, IFOP maintains collaboration agreements with prestigious research centers, which allows us to do joint studies, also positioning ourselves as an international reference in these matters.

In that sense, FAO, as a United Nations agency, commissioned IFOP for this project, without a doubt, a recognition of the institute’s trajectory and the skills of its researchers, qualified by FAO, as local experts in priority countries.

In the case of Chile, the three researchers that make up the team of this project (know about their experience below), have extensive knowledge of small-scale fisheries and their value chain. Such experience is fundamental in this study, which requires a broadening of the view from fishing itself, to its contributions in the social, economic and environmental fields, including aspects related to population nutrition and governance.

According to you: What impact could this research have in the worlds fishing activity research ad specially in Chile?

The important contribution of fisheries to global human well-being is frequently underestimated, either because existing studies are partial or come from methodologies of different standards, which does not allow a worldwide projection. This report will provide background information that will contribute to a greater understanding of the impact of small-scale fisheries world-



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wide and locally. Having this knowledge is essential for decision makers and policy makers, as it will allow ex-dimensioning the impact of programs and decisions on the management of small-scale fisheries.

Elizabeth Palta

How and what type of information will be collected for this study purpose ?

The study aims to support small-scale fisheries development through a socially and environmentally sustainable approach. A key element to technically support this is to illuminate these fisheries various contributions. Small-scale fishing provides livelihoods for many people, and contributes substantially to the local and national economy, and to economic growth. However, due to its diverse and dispersed nature, it is difficult to quantify and understand its multiple contributions.

In Chile, the artisanal landing (close to 1.5 million tons per year) is not homogeneous along the more than 6 thousand kilometers of coastline, is composed of about 200 species and provides direct livelihood to more than 100,000 homes , which far exceeds industrial fishing. It is estimated that 20% of women participate in fishing activities, while in the previous and post fishing activities, the participation of women is over 50%. These results are fundamental when it comes to understanding small-scale fisheries contribution to the national economy, and the impact that situations such as climatic change or increased fishing effort can bring.

Why will the IFOP Economics Section, which you lead, actively participate in this research?

This research should collect and submit a set of relevant data on fisheries, demography, employment, fish consumption and nutrition to a synthesis and estimation process. In this context, the experience of the Economics Section in the generation of information on the value chain of the national fisheries and aquaculture industry, of economic and socioeconomic antecedents of the fisheries, alltogether with the team competences in the quantitative and qualitative fields , accredits us extensively to carry out this study.

The project team is composed of researchers Johanna Rojas, Andrea Araya, myself, and sociologist David Miranda, who supports us in the social area.

We hope to be able to provide the most up-to-date and accurate statistics on the contributions and impacts of Chilean artisanal fisheries, in environmental, economic, food security and governance terms at national and global levels.



How long will the research last?

This is a very complex research, of many interesting challenges, with many collaborators, which requires the cooperation and goodwill of many people in 56 countries. It is an unprecedented effort in this area.

Data collection is planned during 2019, but a global report is expected in 2020. The project provides a 'snapshot' of the current contributions of small-scale fisheries, but also analyzes change drivers, in order to envision progress in the short and medium term.

Our results will be sent in the coming months to FAO central headquarters in Rome (Italy), who will issue a global report in 2020, in an initiative that integrates methods and results of country case studies, thematic studies and global synthesis of Small-scale fishing in the world.

Experience

Johanna Rojas Rojo, is an execution engineer in aquaculture and an industrial management engineer. Her interest areas: the generation of economic and socioeconomic data on fisheries and aquaculture, and seafood consumption. She currently works as a researcher in the Economics Section of the Fisheries Development Institute , responsible for collecting data on manufacturing and foreign trade of the national fisheries and aquaculture industry.

Andrea Araya Arriagada, is a marine biologist and master in Marine Sciences. Her interest areas are: data analysis, bio-economic modeling and economic valuation in both the fishing and aquaculture area. Currently, she works as a researcher at IFOP Economics Section, responsible for fisheries systematization and analysis of economic and socioeconomic data.

Elizabeth Palta Vega, a fishing engineer, currently works leading the economic team of Fisheries Development, Institute which conducts studies of monitoring economic indicators, value chain, bioeconomic modeling, economic valuation, consumption of seafood and socio-economic diagnoses of artisanal and industrial fisheries and national aquaculture.



Workshop on Management Areas is organized by IFOP and The Nature Conservancy

In Valparaíso, consultants, experts and authorities linked to fisheries administration regime of the Benthic Resources Management and Exploitation Areas (AMERB) met to discuss direct assessment standard methodologies for brown algae, hard bottomed and soft bottoms invertebrates.

The activity was organized by IFOP Fisheries Development Institute within the framework of the Fisheries Monitoring Program under the Management Area Regime, in the research line on quality information management generated in Management and Exploitation of Benthic Resources Areas (AMERB), which seeks to provide background information to assess Fisheries Administration Regime comprehensive performance. With the important support of The Nature Conservancy (TNC) in organizing the event, consultants were invited to carry out studies in Management Areas, also professionals from IFOP, SUBPESCA, National Fisheries and Aquaculture Service, and experts related to the TNC, among which was Dr. Ana Parma and a delegation of researchers from Peru Institute of the Sea (IMARPE), related to benthic fisheries studies.

Luis Ariz, Management Areas Section Head, explained that: "Almost 20 years after AMERB regime implementation, there are still problems with data quality generated in management areas studies, this has been due to the lack of protocols for samples under standard procedures execution. The activity is part of IFOP's work, at Undersecretariat of Fisheries and Aquaculture request, and refers to drafting of documents on Management Areas Direct Evaluation Procedures, such that spatial and temporal comparison of generated information in AMERB studies carried out by the consulting companies in charge. The quality of the information is a relevant issue in the efficient management of fisheries, so that the collaborative efforts that emerge from the active participation in the workshop are important for the improvement of the Management Areas regime".

For her side, Gabriela Arenas IFOP Management Areas Section researcher, who is in charge of the information work line on quality management at AMERB, said: "The workshop has been framed within the process developed to the definition of



direct evaluation procedure in AMERB, resulting in an important instance in which relevant AMERB regime representatives have presented their observations, requirements and experiences in sampling execution, revealing critical aspects in terms of operability and management. The activity carried out with an important call was an instance in which different technical and operational aspects regarding sampling procedures were discussed, resulting in important recommendations which will be considered for improvement".

Dissemination Workshop on results of the Highly Migratory Resource Monitoring Program, ecosystemic approach.

On July 31, the results of the Highly Migratory Resources Monitoring Program were presented in one of the conference rooms of Baburizza Palace in Valparaíso. Dr. Patricia Zárate, project manager, together with a work team that involves observers, researchers from IFOP and from several Universities analyzed the results of the observations made during 2018.

Among the guests were representatives of the Scientific Committees, the Undersecretariat of Fisheries, the National Fisheries and Aquaculture Service, the DIRECTEMAR and national universities. Among the main results were the trajectories of the swordfish and sharks resulting from the tagging program that combined with satellite and oceanographic information provide new information on the migration cycles of these species.



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In addition, their stomachs analysis results, isotopes and fatty acids of muscles that have delivered critical information of their diet during much of their life cycle were presented, which contributes to having an ecosystemic view of these organisms that move to the width of the Pacific Ocean. On the other hand, important aspects and mitigation measures of the incidental fishing of turtles, birds and marine mammals were analyzed, as well as methodological aspects of the estimation of abundance of marine mammals that may be affected by fishing activity in the Exclusive Economic Zone of Chile .

Dr. Jaime Letelier, Department of Oceanography and Environment head stressed that “the samples, data and results of this project in its 2018 phase, as well as its continuation are essential to generate necessary knowledge for fishing activity sustainability based on the conservation and management of Swordfish, sharks and dorado.”

IFOP invites to CHONOS diffusion workshop: Oceanography at the community service

It's free and it will take place on Tuesday, September 10th at Hotel Esmeralda (Esmeralda St nº266) in Castro city between 09:00 and 13:00 hrs.

It is the second year in a row, that Fisheries Development Institute will hold an informative workshop that will be taught by IFOP's physical oceanography group in Castro (chonos.ifop.cl), and will have several presentations in which achieved progress in the field of physical oceanography and its applications for the sustainable development of the productive activities that are carried out in the marine systems of southern Chile will be announced.

The presentations cover topics related to operational systems of oceanographic forecasting, connectivity, water exchanges, biogeochemical cycles and benthic

communities structuring (for more details see attached program poster). In addition to knowledge dissemination and IFOP activities, the workshop aims to be a place and occasion for exchange of ideas and experiences that allow new future objectives establishment at the service of the community from sustainable development. Therefore, IFOP has considered inviting participants in the workshop, community representatives, political authorities and the administration (Subpesca, Sernapesca), Regional Government and related field researchers. To make a reservation, contact gabriel.soto@ifop.cl or pablo.reche@ifop.cl.



National and international experts discuss loco current status

On August 12th and 13th , at Universidad Catolica de Valparaíso Marine Sciences School, a team of national and foreign professionals gathered to share their research concerning loco (*Concholepas concholepas*).

The activity was organized by the Oceanography and Environment Department from the Fisheries Development Institute (IFOP) Management Areas Section . The workshop aimed to analyze loco resource status of knowledge emphasizing on connectivity between management areas along chile coast.

Gabriel Jerez from Fisheries Undersecretariat, noted the economic importance of the conservation of this resource sustainability for many of the artisanal fishermen communities in Chile. Dr. Leyla Cárdenas, from



Universidad Austral de Chile, showed both, similarities and differences presented by the specie present through genetic techniques throughout Chile: “we have been investigating the resource for 15 years, in a first stage we began to identify locust species, after many years of work we managed to identify that there is only one kind of locust, which is a virtue of the species that has managed to maintain in its cohesive evolutionary history as a single specie in an environment as variable as Chile”. These tools could help to perform resource’s traceability by discouraging illegal fishing as well as repopulation programs evaluation.

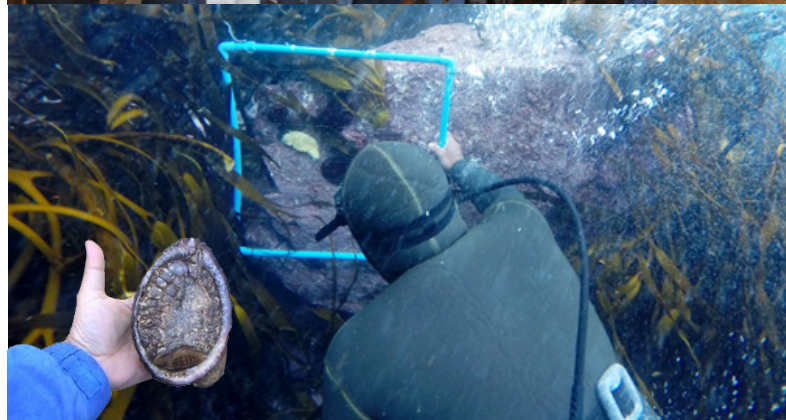
On the other hand, Dr. Lysel Garavelli from the Pacific Northwest National Laboratory showed the results of a biophysical model implementation and how simulations give us the first approximations of connectivity between areas. Dr. Garavelli noted that “it uses hydrodynamic models; that allow to see temperatures, currents, speed and currents directions. The research results show us that the larvae move with sea currents up to 200 km ”

Dr. Patricio Manríquez from Arid Zones Advanced Studies Center, CEAZA, showed the progress made in analyzing these populations displacement using stable isotopes. Dr. Manríquez pointed out that “it is necessary to establish what happens in the sea with locust larvae displacement, since they have rhythms of activity, they have the ability to go up and down in the water column, to respond to temperature, presence of food and therefore these traits have to be considered when studying locust resource ”

Luis Ariz, head of management areas section, explained the importance of strengthening the “Fisheries Monitoring Program Under Management Areas Regime” that is part of the project portfolio of the Performance Agreement of the Undersecretariat of Economy (MINECON) and the Advisory for decision-making in Fisheries and Aquaculture (ASIPA) carried out by IFOP. This program has set national technical standards for the direct evaluation of this and other benthic resources and is taking up the path of developing basic and applied scientific knowledge as a basis for the recommendation of management decision making.

The workshop’s main conclusions show the need to move forward with new, though expensive, techniques such as genetics, modeling and Isotopes to answer old questions and consider that knowledge gaps in the life of this organism require more basic research. ”

Dr. Jaime Letelier, IFOP, oceanography and environment department head referred to the workshop as “a significant advance in tnew available knowledge review , new techniques and gaps that must be ad-



ressed through basic scientific research, especially considering aspects as varied as the contamination by coastal edge floating plastics or light pollution that alters the organisms life cycles, indicated by Dr. Manríquez, as well as the climatic change new context which involves temperature increase and ocean acidification that without doubt alter the physiology and habitat in our locust sensitive life cycle ”.

Abate Molina vessel sailed off to research common hake

The cruise will last 42 days, between July 24th and September 4th

On July 24th, Abate Molina IFOP’s scientific ship set sail from Valparaíso’s port to evaluate through hydroacoustic method, common hake stock between the northern limit of the Coquimbo region to the Los Lagos region

As head of the cruise is Esteban Molina and the captain of the ship is Enrique Quiero sailing with a crew of 28 people among investigators and ship’s crew.

Specific objectives of the study are:

To estimate common hake stock size and its spatial distribution in the area and period of study.

To characterize evaluated stock demographic composition through biological indicators analyzed in a spatial context.





To characterize common hake evaluated stock reproductive activity from the data obtained in research sets.

To characterize incidental fauna in directed common hake fishing in the area and period of study, with special emphasis on cuttlefish (*Dosidicus gigas*).

To characterize spatial and bathymetric distribution of ichthyoplankton, eggs and larvae of common hake and to determine bio-oceanographic conditions present in the area and period of study.

Fisheries Under Management Areas Regime Monitoring Program Result's Workshop

At Valparaiso's Marine Sciences School from Pontificia Universidad Católica dependencies IFOP Fisheries Development Institute, conducted "Fisheries Under Management Areas Regime Monitoring Program Result's Workshop, 2018", which is developed by IFOP Management Areas Section, in order to show AMERB regime analysis results and properly advise the Fisheries and Aquaculture Undersecretariat

The workshop was attended by professionals from the Fisheries and Aquaculture Undersecretariat Benthic Resources Unit, consultants, researchers and representatives of Non-Governmental Organizations, where the following topics were addressed:

Quality Information Management, corresponding to standard sampling formulation procedures and data delivery by Technical Organizations.

Information transfer automation, referring to the information transfer mechanism and management areas data research, carried out by the Fisheries Undersecretary Technical Organizations.

Environmental monitoring, carried out by IFOP through sampling network of structuring species of benthic communities (brown algae) and water temperature recording implementation.

Biological monitoring, where the evolution of biological-productive indicators for main resources extracted from the regime was presented.

Monitoring of socio-economic and organizational variables, focused on profitability evaluation at the level of management and fishermen areas, as well as determining fishermen organizations management capacity attached to AMERB regime.

Population connectivity locust research, through hydrodynamic modeling and simulation of larval dispersion of this species.

It is possible to consider that the regime has meant an important change in comparison to the administration models based on free access, recognizing in Artisanal Fishermen Organizations (OPA) their collaborative capacities to assume tasks of fishery resources management and the activity sustainable development propensity.



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