2024 Regional Symposium Series

Detailed Program & Book of Abstracts

Small-Scale Fisheries Regional Symposium for Latin America and the Caribbean

'Bright Spots ~ Hope Spots'

October 1-4, 2024

Mazatlán, México

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SYMPOSIUM PROGRAM

All sessions will be held at the Torre Académica, Universidad Autónoma de Sinaloa, Mazatlán, Mexico

All time shown in Mexican Pacific Standard Time (GMT -7).

Presentations in all plenary sessions (except Sessions 2, 7, 9) will be in English. Note, however, that presenters in Session 8(A) can choose to present either in English or Spanish.

TUESDAY, OCTOBER 1ST – DAY 1
COMMUNITY DAY

A trip to the nearby fishing community.

WEDNESDAY, OCTOBER 2ND – DAY 2

REGISTRATION

Wednesday, October 2nd, 8:30–9:00

WELCOME AND OPENING

Wednesday, October 2nd, 9:00–9:30

SESSION 1:
SSF GUIDELINES, HUMAN RIGHTS & INDIGENOUS RIGHTS

Wednesday, October 2nd, 9:30–10:30

Chair: TBC

Speakers:

- **Svein Jentoft**, The Arctic University of Norway, Norway
  The SSF Guidelines as a marching order for small-scale fisheries researchers

- **Patrick McConney**, The University of the West Indies / CERMES, Barbados
  Seeking success in small-scale fisheries stewardship

- **Miguel Gonzalez**, York University, Canada
  The right of self-determination of Indigenous and Afro-descendant peoples in transboundary maritime situations

BREAK (10:30-11:00)

SESSION 2:
SMALL-SCALE FISHERIES IN THE MESOAMERICAN REEF REGION: CURRENT CHALLENGES AND ACTION ALTERNATIVES

Special roundtable organized by Felipe Eloy Sosa-Cordero [Esp]

Wednesday, October 2nd, 11:00–12:30

Chair: TBC

Speakers:

- **Adrián Cervantes-Martínez**, Universidad Autónoma del Estado de Quintana Roo, Mexico
  Historical analysis of artisanal fishing of the Spiny Lobster Panulirus argus (Latreille, 1804) in two fishing areas in Quintana Roo, Mexico

- **Laura Elena Carrillo Bibriezca**, El Colegio de la Frontera Sur (ECOSUR)-Unidad Chetumal, Mexico
  Environmental stressors and their impacts on the environmental component of socio-environmental fisheries systems

- **Judith Adriana Morales López**, MAR Fund, Mexico
  Red regional de pesquerías sostenible del Arrecife Mesoamerican

- **Antonella Rivera**, The Coral Reef Alliance-Western Caribbean, Honduras
  Drivers and collaborative solutions to IUU fishing in the Cayman Crown Reef [Virtual]

- **Felipe Eloy Sosa-Cordero**, El Colegio de la Frontera Sur (ECOSUR)-Unidad Chetumal, Mexico MAR Fund, Mexico
  Small-Scale Fisheries in the Mesoamerican Reef region: Current challenges and action alternatives

- **Lourdes Vásquez-Yeomans**, El Colegio de la Frontera Sur (ECOSUR)-Unidad Chetumal, Mexico
  Connectivity in the Mesoamerican Reef System: An unprecedented experience on the recruitment of postlarvae of reef fishes

LUNCH (12:30-13:30)

SESSION 3:
ADAPTATION, CONSERVATION & SUSTAINABILITY

Wednesday, October 2nd, 13:30–15:00

Chair: TBC

Speakers:

- **Silvia Salas**, Centro de Investigación y de Estudios Avanzados del IPN, Unidad Mérida, Mexico
  Economic diversification of the small-scale fishers of the Yucatan Peninsula, México: Challenges and incentives

- **Jorge Ramírez-González**, Fundación Charles Darwin, Ecuador
  Tracing the traceability of Galapagos Marine Reserve fishery products

- **Félix Burgos**, Fundación Charles Darwin, Ecuador
  Fostering entrepreneurship and innovation for transforming small scale fisheries value chains: The case of EmprendeMar, Galápagos, Ecuador

- **Eileen Michelle Del Aguila Camacho**, Universidad Autónoma de Baja California Sur, Mexico
  Fishing for science: The role of small-scale fisheries in the study of sharks, rays, and chimeras (Chondrichthyes) in México

- **Jaime Aburto**, Universidad Católica del Norte, Chile
  The Juan Fernández Archipelago Multiple Use Marine Protected Area and its local community, a Bright and Hope Spot

BREAK (15:00-15:30)

SESSION 4:
ECOSYSTEM, CLIMATE CHANGE & ADAPTIVE MANAGEMENT

Wednesday, October 2nd, 15:30–17:00

Chair: TBC

Speakers:

- **Francisco Arreguín-Sánchez**, Instituto Politécnico Nacional, Centro Interdisciplinario de Ciencias Marinas, Mexico
  Variable carrying capacity, dynamic sustainability, and adaptive fisheries management: Four case studies of small-scale fisheries in the Upper Gulf of California
  [Virtual]

- **Miguel Ángel Ojeda Ruiz**, Universidad Autónoma de Baja California Sur, Mexico
  Understanding the diversification process of small-scale fishers: Corridor La Paz Bay-La Ventana, BCS, Mexico

- **Iván Ali Oribe Pérez**, Instituto Mexicano de Investigación en Pesca y Acuacultura Sustentables, Mexico
  Effect of climate change on the condition and allometry of different Fishery resources from the Southern Gulf of Mexico
  [Virtual]

- **Ian Miguel Herrera Santana**, Universidad Autónoma de Nuevo León, Mexico
  Ecological risk assessment of elasmobranch species by the effect of artisanal fishery in La Pesca, Tamaulipas

- **Miguel A. Cabrera**, Centro de Investigación y de Estudios Avanzados del IPN, Unidad Mérida, Mexico
  Are small-scale fishers generalist or specialists in Puerto Morelos, Mexico? Fishing strategies and adaptations

WELCOME RECEPTION
FACIMAR
17:30 – 20:30

THURSDAY, OCTOBER 3rd – DAY 3

SESSION 5:
FOOD, LIVELIHOODS & VALUE CHAIN

Thursday, October 3rd, 9:00–10:30

Chair: TBC

Speakers:

- **Cesar Viteri Mejía**, Fundación Charles Darwin, Ecuador
  Policies supporting artisanal fisheries can improve food security and nutrition on the Galapagos Islands

- **Katina Roumbedakis**, Instituto de Investigaciones Marinas Spain / Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, CINVESTAV, Mexico
  A comparative analysis of small-scale octopus value chains in Latin America

- **Alesa Flores-Guzmán**, COBI, Mexico
  Social responsibility in artisanal fishing in Mexico: Why it matters and what is evaluated in the context of fishery improvement projects

- **Juan Carlos Hernández-Padilla**, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, CINVESTAV, Mexico

[Virtual]

Extreme contingencies and their impact on small-scale fisheries in Dzilam de Bravo, Yucatan: Challenges and response measures

- **Brenda Edith Viramontes Juárez**, Universidad Autónoma de Nuevo León, Mexico
  Trade and consumption of elasmobranch fishery products in the Área Metropolitana de Monterrey, Nuevo León, Mexico

BREAK (10:30-11:00)

SESSION 6:
WOMEN, COMMUNITY & EMPOWERMENT

Thursday, October 3rd, 11:00– 12:30

Chair: TBC

Speakers:

- **Rosa Isela Hirales Cota**, Universidad Autónoma de Baja California Sur, Mexico
  Women's participation and contribution in small-scale fisheries production: A case study in Baja California Sur, Mexico

- **Brandon Escarcega Miranda**, IIO-UABC, Mexico
  Acceptance of the ike jime in some small-scale fisheries in the Mexican North Pacific

- **María de Lourdes Jiménez Badillo**, Instituto de Ciencias Marinas y Pesquerías, Universidad Veracruzana, Mexico
  Factors that promote or limit the development of the small-scale fishing communities in Mexico

- **J. de Jesús Villanueva-Fortanelli**, Facultad de Ciencias del Mar-Universidad Autónoma de Sinaloa, Mexico
  Vulnerability of small-scale fishermen in two coastal communities in the Mexican Northwest Pacific

- **Ricardo Torres Lara**, Universidad Autónoma del Estado de Quintana Roo, Mexico
  Caribbean lobster fishery: A case of community success

LUNCH (12:30-13:30)

SESSION 7:
KNOWLEDGE, CULTURE & TRADITION [ESP]

Thursday, October 3rd, 13:30–15:00

Chair: TBC

Speakers:

- **Carolina Peláez Gonzalez**, Universidad Autónoma Metropolitana, Mexico
  Culturas marítimas, género y emociones: Una aproximación a la organización laboral del parque industrial Alfredo V. Bonfil

- **Natalia Balzaretti Merino**, Mexico
  La Pesca en la Bahía de Bandera y sus desafíos ante el Turismo

- **Myrna Leticia Bravo Olivas**, Universidad de Guadalajara, Mexico
  Cambios históricos de la pesca ribereña en la Bahía de Banderas

- **Nicolás Zapata Sánchez**, Charles Darwin Foundation, Ecuador
  Key actor mapping for the social analysis of the small-scale fisheries value chain on the continental coast of Ecuador: The case of Manta and Jaramijó

- **Maria Fernanda Chávez-Pérez**, The Nature Conservancy, Peru
  A non-traumatic gender approach in communities

[Virtual]

- **Jorge Emiliano Gerónimo Salaya**, CICIMAR-IPN, Mexico
  Resiliencia ante la pandemia del COVID-19: Lecciones aprendidas de los pescadores artesanales del Golfo de Ulloa, México
  [Virtual]

SESSION 8(A):
COLLECTED SHORT PRESENTATIONS

Thursday, October 3rd, 15:30–17:30

Chair: TBC

Speakers:

- **Ana María Hernandez Chamorro**, Universidad Autónoma del Estado de Quintana Roo, Mexico
  Characterization of bycatch and trade in shark and ray products in the Mexican Caribbean, Quintana Roo

- **Alejandra González Mata**, Universidad Autónoma del Estado de Quintana Roo, Mexico
  Characterization of artisanal fisheries and trade of elasmobranchs in Yucatan (preliminary results)

- **Karla L. Velarde-Mota**, Facultad de Ciencias del Mar, Universidad Autónoma de Sinaloa, Mazatlán, Mexico
  Uso de hábitat de juveniles de tiburón martillo (Sphyrna lewini) en el sur del Golfo de California

- **Lluvia Montserrat Cruz Ramos**, Facultad de Ciencias del Mar, Universidad Autónoma de Sinaloa, Mexico
  Diseño y construcción de modulo de cultivo para langosta Panulirus Inflatus y Panulirus Gracilis en la bahía de Mazatlán

- **Alesa Flores-Guzmán**, COBI, Mexico
  Insights and improvement opportunities: Three years implementing the Social Policy for FIPs

- **Néstor Alonso Castillo Méndez**, Universidad Autónoma de Nuevo León, Mexico
  Richness and functional ecology of freshwater ichthyofauna at the Monterrey Metropolitan Zone, Nuevo León

- **Ivone Giffard-Mena**, Universidad Autonoma de Baja California, Mexico
  Artificial Intelligence in fisheries and aquaculture

- **Jesús Manuel Díaz Gaxiola**, Tecnológico Nacional de México Campus Los Mochis, Mexico
  Fortalecimiento de la actividad científica como mecanismo para la sustentabilidad de las pesquerías del norte de Sinaloa

- **Carlos Alberto Amezcua Gómez**, Instituto Mexicano de Investigaciones en Pesca i Acuacultura Sustentables, Mexico
  Pesquería del pulpo verde (Octopus Hubbsorum) en el Pacífico Central Mexicano (oportunidades y riesgos)

- **Francisco Arreguin-Sanchez**, Instituto Politécnico Nacional, Centro Interdisciplinario de Ciencias Marinas, Mexico
  New approach for estimating the Limit Biological Reference Point for annual species in data limited fisheries
  [Virtual]

- **Jorge Luis Alvarez Gutierrez**, CICIMAR, Instituto Politécnico Nacional, Mexico
  Impact of artisanal fisheries on the stock of Barred Sand Bass (Paralabrax nebulifer) on the west coast of Baja California Sur, Mexico

- **Miguel Ángel Ojeda Ruiz**, Universidad Autónoma de Baja California Sur, Mexico
  Financial inclusion and use of TICS among small-scale fishers in BCS, México

- **Jaqueline Muñoz Lizárraga**, Universidad Autónoma de Sinaloa, Facultad de Ciencias del Mar, Unidad Mazatlán, Mexico
  Deficiency regulation of regional fisheries and reproductive threat by nematode parasites of 'pacific silverstripe halfbeak' hyporhamphus spp. (hemiramphidae) in Mazatlán, Sinaloa

- **Edilia López-García**, Universidad Autónoma de Nuevo León, Mexico
  The importance of the biogeography component in the management of sharks, rays and skates in small-scale fisheries

- **Yaneth Sanchez Camara**, Universidad Autónoma de Sinaloa, Facultad de Ciencias del Mar, Unidad Mazatlán, Mexico
  Efecto de la concentración del Fósforo sobre el contenido de lípidos y perfil de ácidos grasos de Thalassiosira weissflogii y Chaetoceros muelleri

- **Paola Alejandra Pérez Valtierra**, Universidad Autónoma de Nuevo León, Mexico
  Vulnerability evaluation of icthyofauna in the Metropolitan Area of Monterrey, through Productivity and Susceptibility Analysis

- **David Petatán-Ramírez,** Instituto Politécnico Nacional, Centro Interdisciplinario de Ciencias Marinas, Mexico
  Changes in the relative importance of species in small-scale fisheries in Mexico (2000-2022)

BREAK (15:00-15:30)

SESSION 8 (B):
DISCUSSION ABOUT SMALL-SCALE FISHERIES/LARGE SCALE FISHERIES COMPARATIVE ANALYSIS

Thursday, October 3rd, 15:30–17:30

A brainstorming exercise about how to assess the impacts of fisheries of different scales related to overfishing, overcapacity, IUU, bycatch and subsides. All are welcome.

Moderator: Ratana Chuenpagdee

FRIDAY, OCTOBER 4th – DAY 4

SESSION 9:
METODOLOGÍAS PARTICIPATIVAS Y ENFOQUES TRANSDISCIPLINARES DE INVESTIGACIÓN PARA LA PESCA ARTISANAL

Special session organized by Pablo De La Cruz and Ana Minerva Arce-Ibarra [Esp & Eng]

Friday, October 4th, 9:00– 0:30

Chair: TBC

Speakers:

- **Ana Minerva Arce-Ibarra**, Independent Researcher/ Consultant, Mexico
  How to weave praxis from theory on transdisciplinary approaches applied to small-scale producers and fishers

- **Maria L. Cruz-Torres**, Arizona State University, USA
  Women, fisheries, and work in Northwestern Mexico

- **Martín Correa Arce**, Universidad Autónoma Comunal de Oaxaca, Mexico
  Commonality and fisheries

- **Martha García Ortega**, El Colegio de la Frontera Sur, Mexico
  Crisis globales en el Sistema Arrecifal del Caribe Mesoamericano: Arribazón de sargazo y SARS-CoV-2

- **Joel Bojóquez Sauceda**, Mexico
  Las instituciones que articulan la gobernanza de la pesquería de Camarón en el ANP Marismas Nacionales Sinaloa

BREAK (10:30-11:00)

SESSION 10:
GOVERNANCE & BLUE JUSTICE

Friday, October 4th, 11:00–12:30

Chair: TBC

Speakers:

- **Sarah de Oliveira**, UNESP, Brazil
  Between theory and implementation: Incoherence of official health inspection for the artisanal fisheries value chain

- **César Vázquez-González**, PRONATURA VERACRUZ A.C., Mexico
  Alvarado Lagoon System, Veracruz, an example of hope-complexity: Growth of small fisheries and reforestation of coastal wetlands

- **Adrian Núñez**, El Colegio de la Frontera Sur, Mexico
  The coexistence of small-scale fisheries and oil industry: Insights of well-being and trade-offs in the Gulf of Mexico

- **Edgar Eduardo Becerril García**, Memorial University, Canada
  Between economy and justice: Challenges in the artisanal catches of hammerhead sharks under climate change scenarios

- ***Gustavo Adolfo Marconcin Faria,*** UNESP, Brazil
  Viability of using bycatch from artisanal fishing of the seabob shrimp (Xiphopenaeus kroyeri) in school meals: a prospective study

LUNCH (12:30–13:30)

SESSION 11:
PLENARY DISCUSSION ABOUT THE FUTURE OF SMALL-SCALE FISHERIES IN LATIN AMERICA & THE CARIBBEAN

Friday, October 4th, 13:30–15:00

Chair: TBC

CLOSING REMARKS

Friday, October 4th, 15:00–15:15

Abstracts

The Juan Fernández Archipelago Multiple Use Marine Protected Area and its local community, a Bright and Hope Spot

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Ignacio Petit
Oceana

Scheila Recabarren
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The Juan Fernández (JF) archipelago is located in the Pacific Ocean 700 km west of the coast of central Chile. It is considered a biodiversity hotspot, with one of the highest known endemism for marine ecosystems. Isolation and a population of no more than 1,000 people have allowed the development of a lobster fishery for more than a century, based on local regulations, which have been taken up by the authority. In the seamounts surrounding the island, a strong artisanal and industrial fishery was developed, which caused a sharp decline in the biomass of fish that were fished by the small-scale fishery of JF. As a way to protect marine ecosystems, in a bottom-up process, fishers and the local community led the process for the declaration of an MPA. In 2016, the Multiple Uses Marine Protected Area "Juan Fernández Sea" was declared, with a total area of 24,000 km2. In a process of local governance unprecedented in Chile, the local community formed a community organization for the co-management of the MPA. Part of the approval process of the management plan requires the zoning of activities in the MPA. After more than four months of a process coordinated by a local team, 17 participatory workshops were held. Also, a door-to-door outreach was also carried out, reaching over 350 people in the local community. As a result of the process, the zoning, which respects the local community's desire to make the entire MPA available for sustainable, low-impact activities. All these efforts make JF a place to be a Bright Spot.

Keywords: Small-scale fishery, bottom-up, local governance

Impact of artisanal fisheries on the stock of Barred Sand Bass (*Paralabrax nebulifer*) on the west coast of Baja California Sur, Mexico

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Francisco Arreguín-Sánchez
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It is assumed that the coastal fishery for barred sand bass is undergoing a period of harvest at maximum production capacity, and this is inherent to the population dynamics of each cohort. This work assesses the impact of artisanal fisheries on the barred sand bass stock on the west coast of Baja California Sur using an age-structured model that will provide useful biological reference points (BRPs) for sustainable harvest. The inputs to the age-structured population model correspond to catch information in several individuals by age class over the period assessed (2010-2019) and fishing effort (days fished). Natural mortality, catchability, and selectivity were estimated independently. Once this was done, the model estimated fishing mortality, harvest rate, stock size, and estimated catch, with prior adjustment. The model will be fitted through a function that minimizes the difference between the calculated and observed catches by varying a vulnerability matrix, From the harvest rates the PRBs will be derived. Possible management measures for the fishery will be evaluated in consultation with the sector.

Keywords: Sustainability, overexploitation, fisheries modelling

Pesquería del pulpo verde (Octopus Hubbsorum) en el Pacífico Central Mexicano (oportunidades y riesgos)

Amezcua Gómez, Carlos Alberto
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Bravo-Olivas Myrna Leticia
Universidad de Guadalajara Centro Universitario de la Costa, Mexico

La pesca del pulpo artesanal es una actividad económica tradicional, que sirve para el sostén de las familias ya sea por autoconsumo ó para obtener recursos monetarios para el sustento de las familias que habitan en la costa de la región Pacifico Central Mexicano (PCM), esta región abarca los estados de Jalisco, Colima y Michoacán, México. Este trabajo tiene como objetivo caracterizar la pesquería artesanal del pulpo en el PCM, así como determinar los niveles de captura y las fluctuaciones a través del tiempo, como metodología se visitaron las diferentes Sociedades Cooperativa Pesqueras, sitios de desembarque y pescaderías de la Costa Sur de Jalisco, las cuales proporcionaron la información requerida y permitieron la manipulación de sus capturas, se utilizaron datos de captura-esfuerzo provenientes de dos tipos de base; SIPESCA (del 2000 al 2020) y bitácoras de pago de los compradores. Como resultado se describe la maniobra para la captura, la jornada de trabajo, centros de acopio y unidades de pesca, CPUE, Descripción del histórico de capturas, RSM, las fluctuaciones de la pesquería de pulpo, el estatus de la población explotada, las fortalezas, oportunidades, debilidades y amenazas de esta pesquería.

Keywords: Pulpo, Pacifico Central Mexicano, Pesquerías

How to weave praxis from theory on transdisciplinary approaches applied to small-scale producers and fishers

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There are many theoretical approaches on transdisciplinarity but few clear concrete examples on how we could apply them to small-scale producers and fishers. The aim of this study is to examine several examples that provide concrete tools to illustrate a transition from theory to praxis on transdisciplinary research. It is argued that one of the practical components of a transdisciplinary approach involves an illustration on 'how to weave' or integrate the parts of a whole (i.e., the story of the study or research, from start to finish), and relates to transition from the multidisciplinary or additive aspect of the research process, first to an interdisciplinary realm, and then to transdisciplinarity. This research used a literature review of the author including her experience on transdisciplinarity during the past two decades. Results show that to integrate the parts of a transdisciplinary research study, each member of a research team firstly would need to acknowledge that he/ she is in dialogue with the 'different'; afterwards she/ he needs to identify some commonalities which may bridge or connect either different branches of knowledge (from the different experts) or subcomponents of complex systems, among others. A concrete tool for the former is to use theoretical concepts, such as 'territory', and livelihood, whereas connecting the two components of a complex socio-environmental system (i.e., the social with the environmental part), the praxis of fishing itself could be regarded as a 'connector', in which a social praxis (fishers) meets environmental processes.

Keywords: Transdisciplinarity, complex systems, territory

Variable carrying capacity, dynamic sustainability, and adaptive fisheries management: Four case studies of small-scale fisheries in the Upper Gulf of California

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Fish stock assessment is crucial for maintaining and managing fisheries. It helps determine the appropriate fishing intensity and timing to sustain fish populations. One key assumption in conventional models is a stable carrying capacity (K) over the analyzed period. However, recent evidence suggests that environmental changes, including climate shifts, can impact marine populations, challenging this assumption. In this study, the effects of six environmental variables on fishery resources in the Upper Gulf of California (UGC) is explored. Notably, chlorophyll and salinity emerged as critical habitat variables. To account for a variable K, a procedure using a dynamic biomass model was designed. This approach allowed to estimate harvest rates associated with biological reference points (BRP) relative to year-to-year available biomass, underlying the dynamic sustainability concept. Applying this procedure to four small-scale fisheries in the UGC—representing species like the white clam (*Dosinia ponderosa*), pompano (*Trachinotus rhodopus*), goldspotted sand bass (*Paralabrax auroguttatus*), and the sharptooth smooth-hound (*Mustelus dorsalis*)—the comparative consequences of considering variable versus constant K are discussed, under the scope of adaptive management strategies.

Keywords: Variable carrying capacity, adaptive fisheries management, Upper Gulf of California

New approach for estimating the Limit Biological Reference Point for annual species in data limited fisheries

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For many fisheries, especially small-scale ones, only catch and fishing effort records exist. While this information can be used in dynamic biomass models to assess the state of exploitation for a fish resource, they are not applicable to short living (annual) species. Under these circumstances, it is difficult to provide estimates of a Limit Biological Reference Point (LBRP) to support management strategies and measures. An alternative approach for estimating LBRP is presented, based on monthly catch and effort data. Indicators of survival (St), and recruitment (Rt) rates are constructed, defining as base recruitment level when Ln(St/Rt) = 1; corresponding this equality to the LBRP. To estimate the harvest rate at time t, (HRt); biomass, (Bt), is initially obtained from the relationship Bt = Ut/qt, where (Ut) is the catch per unit effort, and (qt) is the catchability coefficient. So, the harvest rate can be computed as HRt = Ct/Bt), and Kobe plots can be constructed with values of (HRt), and (St) or (Rt). The application of this procedure to estimate the LBRP for annual species is shown, using the sequential shrimp fishery in the Gulf of California as an example. The Kobe plot illustrates the fishery's situation over the past 15 years, showing that the resource is presently being exploited around its maximum production capacity. Two key aspects are also discussed: the effect of environmental variability on LBRP, and interpretation of the LBRP in a sequential fishery, and particularly for the small-scale fleet.

Keywords: Short (annual) living species, Limit biological reference point, Poor data conditions

La Pesca en la Bahía de Bandera y sus desafíos ante el Turismo

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El uso excesivo y cambio de uso de territorio de los ecosistemas costeros ha llevado a una transformación en las especies, costumbres y saberes de las comunidades, esto podría estar relacionado con una serie de colonialidades, término que se refiere a entender cómo las prácticas y mentalidades coloniales persisten y continúan afectando las relaciones sociales, económicas, políticas y culturales del mundo moderno, perpetuando la desigualdad y dominación. Por lo que, este trabajo tuvo como objetivo analizar la correlación de las prácticas pesqueras con las colonialidades de poder y de territorio a partir del Conocimiento Ecológico Local de los pescadores de la Bahía de Banderas. La perspectiva decolonial permitió observar las problemáticas que enfrenta la región con vocación turística. Los datos se recolectaron de 43 pescadores de nueve cooperativas que aceptaron participar en diez conversatorios. Los conocimientos ecológicos de los pescadores revelaron mayor asociación con la colonialidad de poder, asociada a la abundancia de especies y prácticas pesqueras. Estas develaron patrones repetitivos orientados a obtener beneficios personales, especialmente en prácticas de pesca ilegal y en su trato hacia las especies. En el caso de las colonialidades de territorio, los pescadores expresaron como se perciben desplazados de sus espacios de pesca, resultado de la presencia del turismo que compiten por el uso del territorio. La pesca ribereña en la región como consecuencia de la baja de especies y del poco interés de los jóvenes, podría desaparecer en su forma artesanal y transitar hacia la pesca deportiva en los años siguientes.

Keywords: Territorio, pesca, turismo

Between economy and justice: Challenges in the artisanal catches of hammerhead sharks under climate change scenarios

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Sharks have influenced diverse cultures for thousands of years. Traces of their traditional use are tangible in Mexican small-scale fisheries, which play a crucial role in supporting multiple families and value chains by catching diverse marine species. In tropical and subtropical environments, the capture of hammerhead sharks poses challenges for sustainability due to their status as endangered species. Additionally, these small-scale fishers face pressures linked to blue injustices from unsustainable blue economy initiatives related to other sectors such as tourism. To offer a perspective on the challenges and opportunities of these communities, the capture of hammerhead sharks was analyzed during 2021-2023, and biodiversity records were consulted to understand the impact of climate change on the distribution of four species of hammerhead shark (*Sphyrna lewini, Sphyrna mokarran*, *Sphyrna tiburo* and *Sphyrna zygaena*). Catches in the Gulf of California accounted for 5-19% of the shark or “cazon” (<1.5 m shark) species, while in the rest of the country they accounted for <3%. The models on lost and gained areas highlight the ability to strengthen monitoring and generate traceability schemes that contribute to the resource's sustainable use, conservation and revaluation.

Keywords: Hammerhead sharks, species distribution models, small-scale fisheries

Las instituciones que articulan la gobernanza de la pesquería de Camarón en el ANP Marismas Nacionales Sinaloa

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El trabajo analiza los arreglos institucionales, basados en derechos de propiedad sobre los recursos naturales, que son fundamentales para la articulación de un régimen de gobernanza para la pesca de camarón en Marismas Nacionales Sinaloa(MNS), asumiendo que la pesquería está estructurada como un sistema socio-ecológico sustentado en un recurso de uso común y, además, que las cooperativas pesqueras (depositarias de los derechos de propiedad formales sobre el recurso) son el eje, alrededor del cual existe un entramado institucional que orienta la gestión de la actividad pesquera. A su vez analiza los derechos de propiedad sobre el recurso identificados en la pesquería, con base en atributos como la cantidad y calidad de los derechos. También el régimen de gobernanza, estableciendo las consideraciones ecológicas y las capacidades organizativas de las cooperativas que influyen en la diferenciación espacial de la gobernanza, distinguiéndose cuatro esquemas de gobernanza en MNS.

Keywords: Gobernanza, Arreglos institucionales, Derechos de propiedad

Cambios históricos de la pesca ribereña en la Bahía de Banderas

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La sobreexplotación de los ecosistemas costeros ha generado una serie de transformaciones en las especies, costumbres y saberes de las comunidades de los pescadores. Gracias a su relación con el territorio, estas comunidades podrían revelar dichos cambios que aporten en la gestión de los recursos pesqueros. Por lo que este trabajo analizó los cambios históricos en la distribución territorial de las especies con importancia pesquera ribereña de la Bahía de Banderas. Los datos se recolectaron en diez conversatorios con miembros de nueve cooperativas pesqueras de la bahía. También se consultaron libros, memorias y artículos de divulgación. Los resultados revelaron transformaciones en el uso del territorio y prácticas pesqueras, paralelo a la disminución en la presencia de especies a lo largo de los años. Las especies más afectadas señaladas por los pescadores son los pargos, de manera más específica el huachinango y flamenco, así como tiburones y garlopa. Mencionaron la sobrepesca como principal factor que contribuyó a esta disminución, resultado de prácticas inadecuadas y pesca ilegal. También señalaron otros factores como contaminación del agua, presencia de residuos tóxicos, contaminación auditiva por el tráfico marítimo turístico y huracanes que han impactado negativamente la pesca. Se reveló una compleja interconexión entre el cambio en el uso del territorio, así como la influencia de factores externos en la transformación de la pesca en la Bahía de Banderas. Es necesario caminar hacia una gestión participativa que no solo priorice necesidades de sectores económicamente fuertes como el turismo e ignore sectores primarios como la pesca.

Keywords: Conversatorios, conocimiento ecológico tradicional, turismo

Fostering entrepreneurship and innovation for transforming small scale fisheries value chains: The case of EmprendeMar, Galápagos, Ecuador

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The COVID-19 pandemic disrupted the Galapagos Islands' economic development model, which relied on tourism and the continental food supply. In response, entrepreneurship and innovation emerged as drivers of change and resilience within the artisanal fisheries value chain. Employing Theory U, we facilitated the co-creation of a Vision for the Galapagos seafood system. This Vision outlines a set of values and principles for a desired shared future. It serves as an ethical compass to guide fisheries interventions in the Galapagos. For entrepreneurs who share this Vision, it has contributed to the development of business models aligned with this new vision, along with value propositions generating economic, environmental, social, and inspirational returns. In 2021, a cluster of five ventures sharing this Vision organically formed a platform called the Entrepreneurship Community. This Community

now encompasses over 20 businesses dedicated to transforming seafood systems for greater resilience, prosperity, fairness, and continental autonomy. Concurrently, the EmprendeMar program was developed as an initiative to support the generation, incubation, and acceleration of new business ideas aligned with the Galapagos seafood vision. It also applies funding mechanisms to de-risk new small ventures. The Entrepreneurship Community and EmprendeMar Program have positioned Galapagos as a beacon of hope and innovation for small-scale fisheries, resilience, and entrepreneurship, with success stories to share. The next steps involve scaling the EmprendeMar to the Ecuadorian coast and joining forces with government programs, international cooperation, NGOs, and private initiatives. The ultimate goal is to increase the supply of seafood products with purpose in Ecuadorian markets.

Keywords: Small-scale fisheries, food security, resilience

Are small-scale fishers generalist or specialists in Puerto Morelos, Mexico? Fishing strategies and adaptations

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Small-scale fisheries contribute with food, jobs, foreign currency, and stability to coastal communities in Mexico. Despite of this contribution, management of fisheries has generally concentrated on stock assessment information to define management schemes and ignore or have limited information regarding the fishing operations and adaptations that fishers develop to maintain their livelihoods. We contend that understanding fisher behavior can contribute to propose viable management strategies. Their fishing operation are linked to a decision-making process regarding to what, how and where to fish. They need to consider regulations, weather conditions, and the dynamics of the species targeted. This research was undertaken in Puerto Morelos, Quintana Roo, Mexico. The objective of the study was to understand the fishing strategies developed by fishermen and identify whether they changed in different periods, assuming adaptation over time with respect to the target species. We estimated the Index of Fishing Importance of Species (IFIS), quasi-rent, CPUE by gear and method, and seasonal trends in catches by species. The results showed the use of diving and hook and line as the most important

methods, and those that contributed with the higher quasi-rent. Differences in the IFIS were observed between periods; changes in the presentations of products were also observed. Fishers' strategies in Puerto Morelos seem to follow a generalist pattern, the adaptations are highly associated to marked demand.

Keywords: Fishing strategies, Quasi-rent, CPUE

Environmental stressors and their impacts on the environmental component of socio-environmental fisheries systems

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The socio-environmental fisheries systems of the Mexican Caribbean are facing increasing challenges due to abrupt environmental changes that were not anticipated in management plans. Since 1970, events such as hurricanes, coral bleaching, and the invasion of lionfish have significantly impacted the Mesoamerican Reef System (MRS). Additionally, the recent proliferation of sargassum and diseases like PaV1 in spiny lobsters and coral diseases exacerbate the situation. These factors are correlated with the rise in global temperature, which has increased by 1°C since 1970, intensifying the frequency and severity of these phenomena. Our study examines these factors from a historical perspective, highlighting an upward trend in their impact. The consequences for small-scale fisheries are alarming, reducing the number of days suitable for fishing and affecting the health of marine ecosystems. The combination of these stressors creates a negative feedback loop that threatens biodiversity and the socio-economic sustainability of communities dependent on the MRS. Based on this evidence, we propose a reflection on integrated management approaches that address both environmental sustainability and the needs of local communities to mitigate these effects and ensure the resilience of the socio-environmental fisheries system.

Richness and functional ecology of freshwater ichthyofauna at the Monterrey Metropolitan Area, Nuevo León

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The Monterrey Metropolitan Area (MMA) is in northeastern México, in Nuevo León and it consist of 13 municipalities; has several freshwater areas, such as rivers, lakes and dams. These are habitat for to about 75 fish species, either endemic, native and exotic. Besides the richness of ichthyofauna, the diversity in ecological roles reflects the health of the ecosystems. Fish species have ecological roles as bioindicators, maintain nutrient cycle, participates in trophic nets, contribute to ecosystem ecological health. In addition, some fish species are important for locally market or recreational fishing in some areas at the MMA. Understanding the functional ecology of fishes from MMA is fundamental to improve fisheries management strategies and protect the aquatic resources. For this purpose, a functional ecology analysis was carried out, collecting biotic (habits and geometric morphometric characteristics) and abiotic (habitat characteristics) data on fish species identified from the MMA. Preliminarily, a Principal Component Analysis (PCA) revealed three main groups of body shapes: elongated fish with hydrodynamic forms for better mobility, higher-bodied fish with varied maneuvering capabilities, dorsoventrally depressed fish adapted to benthic environments. Additionally, the PCA identified four principal functional groups: the first group that includes Poeciliids fishes, the second group comprised Characids and Cyprinids, the third group consists of Cichlids and Centrarchids, while Loricariids and Catostomids forms a separate functional group. Understanding the diversity and ecological functions of fish in the MMA is essential to assess the services they provide to ecosystems and to establishing the health of the region's water bodies.

Keywords: Fishes, anthropized areas, geometric morphology

Historical analysis of artisanal fishing of the Spiny Lobster *Panulirus argus* (Latreille, 1804) in two fishing areas in Quintana Roo, Mexico

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The spiny lobster *Panulirus argus* (Latreille, 1804) is a commercial species along the Quintana Roo coasts of the Mexican Caribbean, whose economic importance has reached international levels, totaling around 11,000 tons equivalent to more than 8 million dollars annually in recent decades. Sustainable fishing using artisanal methods and understanding the life cycle of this species is vital for preserving the fishing resource in Quintana Roo state. The Sociedad Cooperativa Pesquera focuses on loop and trap fishing with autonomous diving on Isla Cozumel and artificial shelters in Bahía del Espíritu Santo. This study presents the historical analysis of artisanal fishing of this commercially important species, based on studies conducted in Isla Cozumel and Bahía del Espíritu Santo in Quintana Roo, Mexico, over a trajectory of 15 years. It evaluates the trend of spiny lobster fishing at different economic levels, as well as the social impact and the importance of preserving this fishing resource. By employing these artisanal methods in both sites, fishing has been maintained over the decades without a decline in production, demonstrating that sustainable fishing is achievable on a local scale in areas that represent one of the largest national and international suppliers of this fishing resource in Mexico.

Keywords: Artisanal fishing, *Panulirus argus,* Mexican Caribbean

A non-traumatic gender approach in fisheries communities

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La igualdad de género y el empoderamiento de las mujeres son esenciales para el desarrollo sostenible, equitativo e inclusivo. Muchos proyectos de conservación han integrado el enfoque de género, a través del fortalecimiento de las capacidades de las mujeres para aumentar su participación en la toma de decisiones y su empoderamiento económico. Sin embargo, muchos de estos esfuerzos orientan las intervenciones al trabajo únicamente con mujeres y no se enfocan a transformar las dinámicas de género en las comunidades de pescadores en el ámbito reproductivo, incrementando la carga de trabajo de las mujeres y niñas; además, en muchos casos, la implementación del enfoque de género se da como algo secundario y se integra al último momento en el diseño de los proyectos, sin tener en cuenta un presupuesto específico y actividades que consideren las necesidades diferenciadas de hombres y mujeres. Todo esto puede llevar a generar menos apertura y resistencia de los miembros de las comunidades a una mayor participación de la mujer fuera del ámbito de lo doméstico, generando un mayor reto para empoderar y fortalecer a las mujeres y niñas de las comunidades pesqueras. Esta presentación expone estrategias y actividades que han facilitado una transformación no traumática de las dinámicas comunitarias en materia de género. Se ha incrementado la agencia de las mujeres, sensibilizando a la comunidad y cambiando percepciones sobre el rol y la participación de las mujeres. Esto ha abierto puertas para una mayor participación de las mujeres en los espacios comunitarios sin violencia.

Keywords: Empoderamiento de mujeres, conservación, comunidades de pescadores

Commonality and fisheries

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Along the costal lagoons of Tehuantepec's Istmus in the State of Oaxaca, the binizá nation unfolds in maritime dimensions linked to trade routes and both salt and freshwater fisheries. That is where communality flourishes in activities that coastal humans have uptaken since the most ancient times. However, throughout the institution of public education policies communality has found it ever harder to be woven. Current work's purpose is to address the following questions, how does commonality manifest in fishery linked livelihoods? The mind map known as Commonalities' flower is used as a tool to spot communal relations and their social function in fishery orientated society.

Keywords: Commonality, livelihoods, education

Diseño y construcción de módulo de cultivo para langosta *Panulirus inflatus* y *Panulirus gracilis* en la bahía de Mazatlán

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Panulirus inflatus y *P. gracilis* son aprovechadas en el sur de Sinaloa. La tasa media de crecimiento anual en producción en la última década es de 0.29%. Esta pesquería presenta su máximo rendimiento sostenible. Por lo que su maricultivo será un respaldo significativo, aunque aún no existe un diseño para su engorde; se propone el diseño de un módulo de cultivo para estas especies. En el presente estudio se construyó un sistema con jaulas sumergibles para la bahía de Mazatlán, Sinaloa. Su diseño se basó según la biología y morfología de las especies; el cual consta de dos jaulas circulares sumergibles con dimensiones: diámetro = 1.85 m; Altura = 0.7 m. Cuenta con un sistema de flotación de tubo de polietileno de 1" que ejerce una fuerza de 1.7 kg con anclaje de un solo punto y lastre de 3.5 kg de plomo. Para la sección del bolso se utilizó red de Nylon malla de 1" #15, encabalgado con coeficiente = 1.0 a las relingas, la pared con ciclos de corte AB; las tapas del bolso constan de 4 cuadrantes cuyos bordes interiores tienen ciclo de corte AB; los bordes que unen a la relinga tienen ciclos de corte AB, 1T1B, AT. Sobre los tubos de flotación y lastre se colocaron soportes de CPVC para unir el bolso. Este estudio representa una alternativa para disminuir el impacto pesquero en la población silvestre. Además, este conocimiento puede ser utilizado para fines de repoblación y la conservación de los ecosistemas acuáticos.

Keywords: Alternativa, jaulas sumergibles, encabalgado

Women, fisheries, and work in Northwestern Mexico

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Despite decades of work by development agencies, NGO's, governments, and scholars to highlight or make visible the multiple roles of women in fisheries, most of women's work still goes unnoticed, often does not show up in government statistics, and it is not recognized or attributed any social value. In Mexico, the lack of attention to the role of women in fisheries has produced a blurry picture of the real dynamics and the current issues facing fishing-dependent communities there. Moreover, the many environmental and economic challenges facing coastal communities in Mexico suggests that women's labor has become increasingly important for household survival in the region. For example, women's work as shrimp traders is crucial to ensure the daily survival of many households, and in many cases actually provides the only available income. Also, shrimp trading activities are not only connected to broader social and economic issues; they are also embedded in the regional and local cultures. Drawing from long-term anthropological ethnographic fieldwork, and framed within a Feminist Political Ecology Approach, this paper discusses the manner in which women in Northwestern Mexico were able to craft and sustain a long-term livelihood as shrimp traders despite the many political, economic, and social challenges they face. Lastly, this presentation argues that because fisheries development policies are not gender neutral, special efforts should be undertaken to recognize and acknowledge women's experiences and their potential contribution to the management and conservation of fisheries systems.

Keywords: Sinaloa, women shrimp traders, gender

Fishing for Science: The Role of Small-Scale Fisheries in the Study of Sharks, Rays, and Chimeras (Chondrichthyes) in Mexico

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On the extensive Mexican coastlines, small-scale fishers, with their knowledge and skills, use and share various aquatic resources, from invertebrates and small fish to large predators like sharks, rays and chimeras. These resources provide nutrients and livelihood for thousands of families, particularly those with low incomes. However, the role of small-scale fishers is not limited to food security and poverty alleviation. They also contribute to the development of scientific knowledge through their collaboration with academics. The impact of this collaboration, which was the focus of a survey conducted among 40 experts linked to the research of these resources in Mexico, provides evidence of the influence and relevance of fishers in diverse local, national, and international scientific publications. The survey, which included demographic data such as years of conducting research, career, age, academic degree, and gender of the participants, also provided information on the regions studied, species captured, disciplines covered, number of scientific publications, fishing contributions, fisher remuneration and impact on research. The results underscore the pivotal role of small-scale fisheries as a driver for scientific studies of sharks, rays and chimeras in México, as well as the implications of small-scale fisheries' capacities in daily biological monitoring and the co-creation of knowledge for traceability improvements.

Keywords: Artisanal fishing, biological monitoring, resource management

Between theory and implementation: The incoherence of official health inspection for the artisanal fishing value chain

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Since 1950, Brazilian legislation has determined, to guarantee public health, the prior inspection of animal origin products and the registration of production units within the official inspection body. Such legislation, historically harmonized with international requirements and based on industrial production, long commercial chains and high health risks, is inappropriate for traditional small-scale artisanal fishing production. Obstructing the formalization of the value chain, this health regulation prevents artisanal fishing communities from having full access to public policies. This obstacle makes women invisible, who are the majority in the workforce in the processing and commercialization stages, as well as maintaining transgenerational poverty and food

insecurity in the sector. In this case study, we characterize the traditional production, since 1845, of salted and dried fish by an artisanal fishing community on the coast of São Paulo/Brazil. We demonstrate, through laboratory analyzes and implementation of good manufacturing practices, that, despite some legal requirements not being fully met, the product is safe to consume. This case illustrates the incoherence and social and economic injustice caused by the Brazilian legal structure. Additionally, we debated how some proposals for regulatory innovations, such as the Artisanal Seal and Small Agroindustry, do not consider the reality of artisanal fishing, as well as perpetuating fallacies between theory and the implementation of public policy. Therefore, it is urgent to value the artisanal fishing sector through an adequate and inclusive legal structure for family and community processing units.

Keywords: Artisanal fishing value chain, health inspection, invisibility

Fortalecimiento de la actividad científica como mecanismo para la sustentabilidad de las pesquerías del norte de Sinaloa

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Al igual que en el resto de las actividades primarias productivas, la pesca requiere de estudios y análisis que permitan un mayor y mejor conocimiento, con el fin de comprender a las poblaciones de peces, sus ciclos de reproducción, hábitats, relaciones tróficas, entre otras, lo que ayuda a establecer medidas de manejo y conservación del hábitat para la toma de decisiones informadas. Todo lo anterior garantiza la conservación de los recursos marinos, la viabilidad económica de la pesca y el bienestar de las comunidades que de ella dependen. Basado en lo anterior, estudiantes de Biología del Instituto Tecnológico de Los Mochis, de la asignatura de Biología Pesquera, realizaron una serie de estudios biológico-pesqueros a diversos recursos, tanto marinos como dulceacuícolas (3 y 4 sitios respectivamente) durante el semestre enero-junio de 2024. Los recursos pesqueros evaluados fueron la mojarra negra, lisa, mojarra plateada, roncacho y tilapias y bagres. Los estudios se enfocaron en la determinación de edad y crecimiento a través de lectura de anillos de crecimiento en estructuras óseas (otolitos y vértebras) y el establecimiento de los parámetros de la ecuación de Von Bertalanffy, el espectro trófico de cada especie, su madurez sexual y fecundidad, así como edad de primera madurez sexual, obtención del factor de condición múltiple y la relación longitud peso por sexos. Además del índice intestinal y los índices gonadosomáticos y hepasomáticos. Esta información permitirá capturas de tallas adecuadas y temporadas y zonas de veda, maximizando las capturas sin detrimento de las poblaciones ni de los ecosistemas.

Keywords: Comunidades, ciencia pesquera, sustentabilidad

Acceptance of the ike jime in some small-scale fisheries in the Mexican North Pacific

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Inadequate handling, during and after slaughter, reduces the quality and value of fish products. That is why one of the main bottlenecks for commercializing fish products is quality, which is linked to the requirements and preferences of the seafood market. In Japan, a slaughter method known as Ike jime or brain puncture is used. Ike jime reduces the suffering of the organism, preservers its flavor and texture, and improves the product quality. For this reason, three methods of fish slaughtering (asphyxiation, thermic shock, and Ike jime) in yellowtail jack (Seriola lalandi) were carried out in this study to evaluate the quality of the fish through the senses using 5-point hedonic tests. The nutritional profile and a cost-benefit analysis were determined for the different slaughtering methods and finally the damage present in the tissues of the different types of slaughtering was compared by histology. dinners preferred the quality attributes that were mostly present in Ike jime compared to the asphyxiation and thermic shock methods. Nutritional quality showed that Ike jime maintained protein and lipid levels longer and preserved product quality and the histology tissues showed most damage by the manipulation in asphyxiation and thermic shock compared with ike jime. Likewise, the financial viability of traditional fishing and Ike jime showed a cost-benefit ratio +200%

higher than traditional fishing. Based on the results, the use of Ike jime as a slaughtering method was found to be more profitable, in response of a quality improvement, which is perceived and appreciated, during commercialization.

Keywords: Ike jime, quality, value added

Insights and improvement opportunities: Three years implementing the Social Policy for FIPs

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Social Responsibility (SR) in Fishery Improvement Projects (FIPs) involves integrating practices and policies that aim not only for environmental sustainability but also for the well-being and development of fishing communities and workers. This holistic approach ensures that improvements in fisheries are fair and beneficial for all stakeholders. In 2021, a policy was introduced to incorporate SR into FIPs, along with a tool to evaluate it. Since then, there has been debate about its feasibility in small-scale fisheries compared to large-scale ones. Just over three years into the implementation of this policy, interviews were conducted with various individuals from the value chain, FIP implementers, and Fishery Progress staff in Latin America. This work presents findings based on these stakeholders' experiences with the implementation of the Social Policy. Several socially oriented solutions that fishing cooperatives had already adopted before the policy's introduction were identified, including emergency and retirement funds, educational scholarships, social prevention measures, and gender equality promotion within the value chain. Although the policy is relatively new, it is generally accepted among those involved in fishing, and proposals have been made to enhance its application in small-scale fisheries in Latin America.

Keywords: Social welfare, FIPs, social Policy

Social responsibility in artisanal fishing in Mexico: Why it matters and what is evaluated in the context of fishery improvement projects

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Social Responsibility in fisheries, as part of primary production systems, is closely tied to the ethical standards and labor guarantees provided by employers or responsible groups to the entire workforce within the value chain. It involves organizational management that prioritizes respect for people, ethical values, the community, and the environment. This study examines the features of Social Responsibility Assessments in Fishery Improvement Projects (FIPs). We analyzed a diagnostic tool that covers three key areas: i) human and labor rights, ii) equality, equity, and livelihoods, and iii) food security and community

conditions across five fisheries in Mexico. The study looked into the challenges of implementing these assessments, as well as the opportunities and strengths they present. Findings reveal that in Mexico, there is a high to medium risk in protecting human rights and dignity, primarily due to limited access to healthcare and labor rights. Equality of opportunity is a medium risk, with a notable lack of official recognition for women in the fishing industry. In terms of food security and nutrition, there is a noticeable lack of basic services in fishing communities. The study also discusses how these findings can help identify labor risks and propose strategies to improve working conditions in the fishing sector and its communities.

Keywords: Human and labor rights, Value network, Social Responsibility Assessment

Crisis globales en el Sistema Arrecifal del Caribe Mesoamericano: Arribazón de sargazo y SARS-CoV-2

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1) Las poblaciones costeras y grupos de pescadores artesanales en el Sistema Arrecifal del Caribe Mesoamericano enfrentaron dos crisis globales que agudizaron los problemas socioambientales críticos por el arribazón de sargazo y la emergencia epidemiológica de la SARS-CoV-2 a lo largo de una década (2014-2023). Desde las experiencias de zonas turísticas de México y Belice se registraron problemas comunes distinguiendo la intervención de los respectivos gobiernos omisos a la consulta social. 2) El objetivo es reflexionar sobre los diversos procesos socioeconómicos y de salud pública para entender la amalgama sociopolítica que da forma a un marco socioambiental vulnerable regional. 3) Se plantea la hipótesis de la acumulación crítica global como un problema emergente que revela y exacerba las desigualdades estructurales e impiden establecer políticas de intervención de corte preventivo regional. 4) El trabajo de campo cualitativo (2022-2023) se realizó en 14 localidades. 5) Resultados. La población local fue desplazada en la organización reactiva en el manejo del sargazo contribuyendo a la acumulación de problemas para la economía pesquera; mientras, en la atención a los problemas de salud pública provocados por el alga marina se careció de registros clínicos. En tanto, la pandemia del COVID-19 agudizó los impactos socioeconómicos por la premisa de “quédate en casa” multiplicando la problemática local. En ambas crisis se padeció las restricciones al turismo, principal fuente económica en la zona. 5) La acumulación crítica demuestra la alta vulnerabilidad de las poblaciones y regiones pesqueras sin que a la fecha se haya sistematizado las respuestas locales y el impacto de la gestión gubernamental.

Keywords: Emergencias globales, políticas públicas, conocimiento local

Resiliencia ante la pandemia del COVID-19: Lecciones aprendidas de los pescadores artesanales del Golfo de Ulloa, México

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La pesca es el principal motor económico del Golfo de Ulloa; sin embargo, el sector pesquero ribereño se caracteriza por un alto nivel de pobreza y marginación. A esto se suman las afectaciones socioeconómicas generadas por el COVID-19 en 2020, que condujeron a una inseguridad alimentaria transitoria durante 2021. No obstante, en 2022, el sector pesquero ribereño demostró resiliencia al poder recuperar la condición normal de seguridad alimentaria. Las principales consecuencias que los afectaron fueron el cierre de los puertos para reducir la movilidad, la baja demanda del producto y las enfermedades. Su resiliencia se demostró al complementar los ingresos de la pesca con otros empleos y, en algunos casos, con aportes de otros miembros de la familia. Sin embargo, esto evidenció una falta de estabilidad económica en el sector, debido el ingreso de la actividad pesquera es insuficiente para acceder a los alimentos. Otra limitante para los pescadores de la zona es la disponibilidad de recursos pesqueros, ya que los efectos ambientales que disminuyen la abundancia de la productividad primaria están impactando negativamente en los ingresos de los pescadores y su capacidad para mantenerse en la actividad pesquera.

Keywords: Seguridad alimentaria, empleo alterno, cooperativa pesquera

AI models for optimizing aquaculture and fishing

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Artificial Intelligence (AI) represents a technological forefront poised to revolutionize the sector. This project aims to integrate producers, researchers, students, and government entities to analyze data and visualize critical sector information. Using AI models for optimizing aquaculture and fishing. This integrated approach is expected to enhance efficiency and sustainability, reducing costs and improving yields. We invite all stakeholders to join the project and contribute through technological innovation.

Keywords: Mexico, communication, socioecological systems

The right of self-determination of Indigenous and Afro-descendant peoples in transboundary maritime situations

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My presentation traverses three thematic areas in studies on Indigenous Peoples and national borders: the right to self-determination, fishing activities in maritime areas subject to contentious dynamics between States, and the cultural relationships of exchange and mobility that Indigenous Peoples and Afro-descendant populations have historically cultivated to preserve their identities and livelihoods. The presentation will share examples from the Caribbean region of Nicaragua and the Archipelago of San Andres, Providencia and Santa Catalina in the western Caribbean of Colombia. The author will also share with the audience the objectives of a transnational and collaborative research project taking place in Panama, Costa Rica and Colombia and entitled "Emancipatory Horizons for the Self-Determination of Indigenous and Afro-descendant Peoples in Central America", funded by the Social Sciences and Humanities Council of Canada.

Keywords: Indigenous self-determination, maritime rights, small-scale / artisanal fisheries

Characterization of artisanal fisheries and trade of elasmobranchs in Yucatan (preliminary results)

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Elasmobranchs (sharks and rays) are cartilaginous fish that inhabit most marine ecosystems. Due to their life histories, they act as density regulators and bioindicators of ecosystem health. They also have great cultural and economic importance, especially in tourism and fishing activities. In Yucatán, the capture of sharks and rays is largely conducted through multispecies artisanal fishing, where a wide variety of species and resources are captured during a single fishing trip. These catches, whether targeted or incidental, are used as alternative resources and are influenced by the availability and seasonality of more economically important resources, serving as a source of employment for fishing communities. However, many species of elasmobranchs are threatened by overfishing worldwide. In México, the official categories “cazón”, “tiburón” and “rayas y similares” do not differentiate between species but rather by size, making it difficult to obtain accurate data on populations under fishing pressure. This work presents a biological-fishery characterization of the artisanal exploitation of elasmobranchs in Yucatán, including information on the value chain. The information was obtained through the analysis of specialized official data, sampling at landing sites, and semi-structured interviews with different actors in the value chain: fishers, traders, processing companies, and consumers

in Celestún, Progreso, Mérida and Dzilam de Bravo. The result will help complement the knowledge base necessary for decision-making regarding the artisanal fishery of elasmobranch in Yucatán, with the hope of moving towards a sustainable use of these resources.

Keywords: Elasmobranchs, artisanal fishery, Yucatán

Characterization of bycatch and trade in shark and ray products in the Mexican Caribbean, Quintana Roo

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Sharks and rays are cartilaginous fishes with very particular life history characteristics, which make them indicators of the health of marine ecosystems. Approximately one million tons of sharks and rays are caught worldwide each year, usually as bycatch. Consequently, there has been a worldwide concern about the populations of these organisms, since their disappearance can have serious effects on marine ecosystems, ranging from changes in abundance, population structure, and even extinction of the species. The elasmobranch fishery in Mexico is one of the most important, however, they are mainly captured in fisheries focused on other resources. For this reason, monitoring the effects of bycatch on elasmobranch populations in the Mexican Caribbean through surveys of artisanal fishermen and analysis of landings is of utmost importance. Although some studies on the historical trend of the elasmobranch fishery in the state of Quintana Roo have already been carried out, it is important to continue

monitoring bycatch, This is done through semi-structured surveys and by visiting the landing sites in order to obtain a better approach to the populations of rays and sharks that are being affected in Quintana Roo, and additionally, to generate a baseline to future recommendations for the improvement of management plans and decision making for the conservation of elasmobranchs.

Keywords: Bycatch, sharks and rays, Quintana Roo

Extreme contingencies and their impact on small-scale fisheries in Dzilam de Bravo, Yucatan: Challenges and response measures

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In the Yucatan coasts, small-scale fishing is one of the main economic activities for coastal communities. However, this activity carries its own risks and both people and resources are exposed to them, generating a condition of greater socioeconomic vulnerability. The objective of this study was to identify how fishers were affected after the arrival of covid19, as well as to identify the main sources of stress and response measures in the community of Dzilam de Bravo. To this end, pre-covid19 and post-covid19 information was collected through surveys to fishers and community workshops on socioeconomic aspects, vulnerability and adaptive capacity, as well as an analysis of the catch and its value of commercially important fisheries. The results suggest that the changes and impacts on the catch and value of the main fisheries (Octopus, Red grouper, Lane snapper, Black grouper and Yellowtail snapper) were different, and it is necessary to consider the

local context of each one of them. In the case of grouper, in 2020 (post-covid19) with respect to 2019 (pre-covid19) $70,420 USD were lost, while in octopus for the same period the losses were higher, 1.2 million USD, although the following year there was a significant economic recovery in this fishery. Among the environmental risk factors, hurricanes are considered the main source of stress, while savings and government support were seen as the main contingency response measures. Strengthening these response measures is crucial to reduce socioeconomic vulnerability and translate them into effective public policies.

Keywords: Vulnerability, adaptive capacity, impacts in capture and value

Ecological risk assessment of elasmobranch species by the effect of artisanal fishery in La Pesca, Tamaulipas

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There is a lack of information about the artisanal shark fisheries in Mexican north Gulf of Mexico and the species that sustain it. This challenges the development of management and conservation strategies for this group which, due to their biological characteristics, are susceptible to overfishing. Our study aims to identify the ecological vulnerability of elasmobranch species subject to fishing pressure, performing a productivity and susceptibility analysis (PSA). PSA was conducted by using literature biological data of the organisms caught in La Pesca, Tamaulipas, Mexico and semi-conducted surveys applied to artisanal fishermen. Our results shows that at least eleven species of selachians and four batoids are involved in this important economic activity, presenting levels of biological productivity rounding 1.77 and 2.23, susceptibility values were between 1.91 and 2.09. Minimum ecological risk value was observed in *Rhizoprionodon terranovae* (1.26) and the highest in *Gymnura micrura* (2.14). More regional studies are needed in order to increase the quality of biological productivity data for the elasmobranch species that sustain the artisanal fishery in Tamaulipas.

Keywords: Elasmobranchs, vulnerability, artisanal fisheries

Women's Participation and Contribution in Small-Scale Fisheries Production: A Case Study in Baja California Sur, Mexico

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Fishing is a significant activity in Baja California Sur, involving both women and men. However, statistical data is lacking to determine the extent of gender participation accurately. Public fishing arrival reports from 2000 to 2023 were analyzed to address this gap, identifying the gender of fishing permit holders. Results indicate that 9% of the fishing economic units are registered under women's names, responsible for 3% of the total artisanal fishery production, accounting for 2.1% of the sector's monetary income. The primary species harvested by women include clams (32%), squid (17%), and sharks (15%). These results indicate a gradual increase in female participation, particularly in economic units registered under their names. However, it is essential to consider that the landing reports, submitted by the fishers themselves, may contain errors or estimations, meaning the results should be interpreted as general trends rather than exact figures. This rise in female participation raises questions about the processes that have facilitated this change and underscores the crucial role of public policies in supporting greater inclusion across the fisheries value chain.

Additionally, the study highlights the heterogeneity of the fisheries in the state, with significant examples such as clam fisheries along the Pacific Coast, which represent a substantial portion of the production, finfish in the Gulf of California, and the vital contribution of sharks and rays in areas such as Bahía Tortugas and La Paz, where female-led economic units have been integrated.

Keywords: Female participation, small-scale fisheries, economic units

The SSF Guidelines as a marching order for small-scale fisheries researchers

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2024 marks the 10th anniversary of the SSF Guidelines. They were a landmark achievement when FAO member states endorsed them in 2014 and have proven to change the political discourse on fisheries around the world. There is clearly a need for the SSF Guidelines to take hold and for maintaining their implementation momentum. They were never expected to have immediate effect and they still need to be better known. The SSF Guidelines are also a marching order for small-scale fisheries researchers. With the funding comes the social responsibility to contribute to solving the problems of small-scale fisheries people that keep them marginalized, disempowered, and impoverished. Additionally, as small-scale fisheries researchers contribute to implementation of the SSF Guidelines, they should not miss out the opportunity to contribute to the general understanding of what the implementation of international codes involve.

Factors that promote or limit the development of the small-scale fishing communities in Mexico

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Small-scale fisheries are highly vulnerable to external pressures such as: hurricanes, floods, land use change, beach loss, sewage contamination, oil spills, port activity, red tide, fluctuations in the supply-demand of fishery products, among others. Several initiatives have been implemented to contribute to strengthening the capacities of fishing communities in Veracruz, Mexico. Despite the success of these interventions, their permanence over time has been interrupted. A timeline analysis of the interventions carried out led to the identification of the following factors as development promoting factors: new agro-food policy objectives, academic sector approach, environmental awareness of fishermen, producers sensitive to change, nearby development poles and as limiting factors: the lack of empowerment, lack of recognition as small businessmen, inefficient organizations, unrecognized leadership, lack of seed capital, educational level and quality of life, among others. These elements make it possible to generate guidelines for action to support the viability and sustainability of small-scale fisheries.

Keywords: Fishing communities, developing factors, limiting factors

The importance of the biogeography component in the management of sharks, rays and skates in small-scale fisheries

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Small-scale fisheries are an important component of commerce, exploiting different important marine resources, such as sharks and rays. These species are an important resource in Mexico as they are mainly commercialized as food. Positioning Mexico within the top 20 in fish production. In Mexico there are 206 species of elasmobranchii, 111 sharks and 95 rays, and according to the National Fishing Charter, several species are caught as main targets by fisheries. Many of these species have experienced a noticeable decline in their numbers and fall under one of the nine IUCN Red list categories either as not evaluated, data deficient, vulnerable, endangered or critically endangered. In order to make the management of these fishery resources even more efficient, it is necessary to increase knowledge about the biology of the species, particularly information related to population growth and reproductive aspects; this is essential due to the effects generated by overfishing of some populations, as well as the biotic characteristics of some species that increase their vulnerability to overexploitation. Here, we analyze the biogeography of species to clarify the deficiency of data regarding the environmental factors that determine the distributions of elasmobranchs, leading to the improvement of management strategies. We categorized 27 sharks and 32 rays within three different marine biogeographical regionalizations and compiled ecological information for each one. Preliminary results show that bathymetry and temperature play an important role in the distribution of elasmobranch species. However, it is clear the need to increase knowledge on biology and ecology of these species.

Keywords: Zoogeography, environmental factors, sharks and rays

Viability of using bycatch from artisanal fishing of the seabob shrimp (*Xiphopenaeus kroyeri*) in school meals: A prospective study

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The exploitation of *X. kroyeri* holds significant social importance for small-scale fisheries in Brazil. The bycatch associated with the trawl fishing, besides highly diverse, may exceed the quantity of shrimp. In this study, we mapped the species comprising the bycatch in one family from the south of Brazil, for one year. The main economically valuable species were collected to produce mechanically separated meat (MSM), which was physicochemical and microbiological characterized and had its yield calculated. Economic, sanitary, and technological feasibility were analyzed for obtaining MSM at the family processing unit, aiming application in local school meals. The bycatch ichthyofauna of *X. kroyeri* represented 32.8% of the fishing production, consisting of two main species suitable as high-quality nutritional raw material: *Paralonchurus brasiliensis* and *Steliffer* spp., representing 41.5% and 38.9%. The MSM from these species showed a 38.6% yield and is viable, especially for smaller fish with low productivity and yield for fillets. The family unit showed adequate conditions for producing school meal products, such as artisanal fish burgers and sausages. However, they require facility adjustments and technical assistance to obtain registration with the local official inspection body. These adjustments can be partially funded by local government programs. Additionally, registration will reduce the family's dependency on selling shrimp to the local industry. By enabling them to process and sell the product directly, their income could increase by 86%. Public policies tailored on the reality of the small-scale fisheries value chain must be developed to facilitate easier access to regularization within the official inspection service.

Keywords: Bycatch, school meal, economic viability

Red Regional de Pesquerías Sostenible del Arrecife Mesoamericano

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En 2017, en el marco de la reunión de la Organización Pesquera del Golfo y el Caribe (GCFI), MAR Fund, y socios sentaron las bases para la creación de la Red Regional de Pesca Sostenible en el Sistema Arrecife Mesoamericano (SAM). En 2018 se organizó la reunión para establecer la Red creando el Comité Ejecutivo. En 2019 se redactaron los estatutos, objetivos y la misión de la Red - promover y apoyar la sostenibilidad de las pesquerías, (pequeña escala) como un sistema integral en el SAM-. Se elaboró un análisis estratégico para apoyar la sostenibilidad de las pesquerías artesanales en el SAM, como base para establecer el plan de trabajo de la Red. En 2019, se finalizaron los estatutos y se crearon seis equipos y un plan de trabajo. En 2020, COBI, llevó a cabo un taller para la homologación de metodologías de monitoreo de zonas de recuperación pesquera. En 2021 se contrató una coordinadora de la Red quien actualizó el plan de trabajo de cada grupo y dio seguimiento a la elaboración de un logo, su manual y una página web. En 2022, MAR Fund contrató otra coordinadora para reactivar las Red y organizar la Asamblea General. En octubre de 2022 MAR Fund y ECOSUR, sometieron una propuesta a Waitt Fundation, pero no fue seleccionada. Desde entonces la Red se encuentra en pausa por falta de financiamiento. Es necesario discutir con los socios la pertinencia de la Red, su estructura, diseño y evaluar alternativas para reactivarla a largo plazo.

Keywords: Red, pesquerías, sostenibles

Seeking success in small-scale fisheries stewardship

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Over the past decade, since the global adoption of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines), several initiatives have tackled the institutionalisation of stewardship in small-scale fisheries in Latin America and the Caribbean. TBTI had a working group on this topic, the UN Food and Agriculture Organization (FAO) has had multi-country projects, non-state groups from academia to producer organizations have led or participated in such quests. The authors recall their experiences in the above scenarios across the region to reflect on the continuing quest for sustainable success in stewardship. This acknowledges that images and achievement of success can look very different to the diverse stakeholders in small-scale fisheries. We see that there is hope, but much depends upon getting leading actors and institutional arrangements right, and in developing adaptive capacity through collective learning-by-doing. We are especially encouraged by increasing inclusion of women and youth in stewardship.

Keywords: Stewardship, institution, adaptation

Deficiency regulation of regional fisheries and reproductive threat by nematode parasites of 'pacific silverstripe halfbeak' hyporhamphus spp. (hemiramphidae) in Mazatlán, Sinaloa

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"Nowhere else the "Pajarito" has had the impact that it has in Mazatlán as a tradition on the table" [Enrique Vega Ayala - chronicler of Mazatlán]

This multidisciplinary research was elaborated in Sinaloa, Mexico; a state with great development of regional activities, such as fishing. This activity provides food and economic security by playing an important role in community development. There is very important regional fishing resource of the genus Hyporhampus, the "Pacific silverstripe halfbeak" or "Pajarito" a pelagic species normally found in coastal waters on the Mazatlán Bay, during April and May. It is considered as a delicacy and part of the traditional cuisine of the region. The "Pajarito" is a migratory species that search for refuge in the "3 Islas" to reproduce and during its visit contributes to improve the income of many families in the region. However, in recent years the population of "pajarito" has been impacted by the lack of fishing regulation, combined with the presence of nematode parasites found in the gonads, which could limit

its fertility during its reproductive season. In this context, knowledge of their parasitic fauna is essential to understand different aspects of the biology, behavior, reproduction, structure and development of the populations of these fish as hosts. However, despite its regional economic and nutritional importance, there is still little knowledge about its parasitic fauna. Therefore, the objective of this research was to determine the prevalence and reproductive impact of nematodes in the gonads of a commercially important marine fish that is consumed locally in a coastal area of the Tropical Pacific."

Keywords: Fisheries, Mexican Pacific Coast, Hemiramphidae

The coexistence of small-scale fisheries and oil industry: Insights of well-being and trade-offs in the Gulf of Mexico

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The rapid expansion of the oil industry in the Gulf of Mexico (GOM) has led to significant socioenvironmental challenges. The well-being framework allows understanding people's connections with ecosystems, emphasizing their relational and subjective importance, and their material contributions to a well-lived life. The study focuses on the fishing communities in Tabasco and Campeche, Mexico, and their coexistence with the oil industry. It incorporates fishers' perspectives on their well-being, analyzing the local socio-environmental costs and benefits of oil expansion to identify trade-offs and potential opportunities between the two sectors. The findings revealed similarities in several aspects of the well-being framework, such as similar physical needs within the material dimension, with notable differences in incomes and compensations. The relational dimension highlights the contributions of small-scale fisheries and the disparities in government support during emergencies. The subjective dimension exposed higher costs than benefits from the oil industry. However, fishers' job satisfaction was high across all communities, emphasizing the culture and familiar tradition that small-scale fisheries represent, which are also at risk due to the exponential oil expansion in the GOM. Trade-offs in economic, environmental, space management, and social dimensions were identified, suggesting that small-scale fisheries present a high vulnerability to the oil industry. Collaborations across sectors that incorporate socio-environmental perspectives, along with the perceptions and needs of fishing communities in policymaking, are essential to ensuring the sustainability and preservation of small-scale fisheries cultural heritage, thereby fostering a harmonious coexistence between both sectors.

Keywords: Social well-being, oil industry, Gulf of Mexico

Financial inclusion and use of TICS among small scale fishers in Baja California Sur, Mexico

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Historically the fishing sector in Baja California Sur has being relevant for employment, local economies, and food security. However, deals with significant treats, including gender disparities, digital exclusion, and inequity access to financial services. Previous studies identified digital inclusion and access to financial services as key drivers for fishers' communities' sustainability and increase in quality of live standards. Both drivers have potential to provide knowledge, abilities and the necessary resources However, small-scale fisheries are limited in taking advantage of both information and communication technologies and accessing financing that could help improve their socio economic development. According to the 2030 Agenda, such inclusion is a catalyst that can contribute to the development of communities and achieve the SDGs. For the above, the objective proposed is to determine the degree of financial and digital inclusion of small-scale fishers and aquaculture producers in Baja California Sur. A transdisciplinary research approach is used that includes quantitative and qualitative methods. It is developed through surveys and workshops to validate results. Surveys have been applied in the municipality of La Paz, the communities visited include Punta Coyote, San Juan de la Costa, La Paz, El Sargento and La Ventana. We analyze the information using statistical and data visualization tools, such as STATA and Tableau. Differences between fishermen and communities will be analyzed, using statistical correlation techniques between survey variables, and the impacts of financial and digital inclusion on social and economic indicators. It is

expected to obtain a detailed diagnosis on the levels of financial and digital inclusion in the communities studied, impacts and identify the main gaps to propose improvement mechanisms.

Keywords: Small-scale fishers, financial inclusion, digital inclusion

Understanding the diversification process of Small-Scale Fishers: Corridor La Paz Bay-La Ventana, BCS, Mexico

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Fishing is a fundamental economic activity in the development of coastal areas. However, it experiences processes of overexploitation, deterioration of ecosystems, increased social pressure, and technical and administrative inefficiencies, among other challenges that compromise the sustainability and well-being of many highly dependent and highly vulnerable communities. Given this scenario, fishers incorporate strategies to improve their condition, highlighting economic diversification. This study to fishers among communities in the corridor La Paz Bay-La Ventana, included qualitative and quantitative research techniques, validation processes for database information, application and analysis of surveys, fieldwork, and results validation workshops with fishers and representatives. Among the results, the economic diversification of fishers is higher than other BCS regions, and although the activities reported are diverse, they are mainly related to tourist services. It was detected that some fishers tend to switch to other economic activities for periods of time, highlighting construction, agriculture, commerce, and even the leasing of part of their heritage. A positive relationship between diversifying, with higher per capita income levels and vulnerability reduction was confirmed. By using the DPSIR framework a conceptual model of fishers' diversification was built. Among the identified pressures are changes in policies and production levels, increase in the number of boats and

users, affecting the fisheries dynamics, impacting socially and economically to small scale producers. Among the impacts highlight the increase in fishers' capacities, higher per capita incomes, vulnerability reduction, but also spatial congestion. The expected responses are better surveillance, capacity controls, enforcement of conservation measures and spatial planning.

Keywords: Economic diversification, participatory research, DPSIR

Effect of climate change on the condition and allometry of different Fishery resources from the Southern Gulf of Mexico

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For several years, it has been recognized that temperature plays a crucial role in species distribution, metabolism, and development. The global climate change disturbance has gradually increased average temperatures in marine ecosystems. This rise in environmental energy significantly threatens species' development, physiology, and overall condition with diverse life cycles. In response to this, our research was designed to be comprehensive and thorough, comparing long-term fishery databases—spanning over ten years—on the weight and length of different fishery resources with temperature and primary productivity data from Southern of the Gulf of Mexico (GoM). We calculated each species' allometry index (β) using the fisheries

biometric data. Our results reveal that the increasing temperature and decreasing productivity in the GoM and the Caribbean Sea have caused significant variations in β for the species, exhibiting an inversely proportional pattern of change. Specifically, the long-lived *E. morio* and other fish species showed a decrease in β from 3.1 in 1986 to 2.8 in 2020, while the short-lived *O. americanus* exhibited an increase in β from 2.1 in 2007 to 3.8 in 2023. These changes could indicate substantial effects on growth and distribution patterns, thereby jeopardizing the sustainability of their fisheries.

Keywords: Climate change, fishes & octopus, allometric coefficient

Culturas marítimas, género y emociones: Una aproximación a la organización laboral del parque industrial Alfredo V. Bonfil

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El parque industrial Alfredo V. Bonfil, ubicado en el puerto de Mazatlán, Sinaloa, es uno de los espacios comerciales e industriales de las principales pesquerías del país, como es el atún y el camarón, en el que diariamente una gran población de hombres y mujeres, provenientes de las zonas urbanas y rurales del municipio, laboran todos los días y configuran gran parte de su trayectoria de vida alrededor de este. Por lo que, el objetivo de la presentación es caracterizar a "El Bonfil", conocido así por los oriundos del puerto, como un espacio de constitución de una cultura marítima en la que confluyen diversos saberes e identidades alrededor de las actividades pesqueras. Se explora desde una dimensión analítica de los cuerpos y las emociones, la pertenencia al espacio y las diferencias de género encarnadas en hombres y mujeres, como un lente que permite observar la dimensión social y cultural de este espacio pesquero, tan relevante en la historia y presente de la pesca en México.

Keywords: culturas marítimas, género, emociones

Vulnerability evaluation of icthyofauna in the Metropolitan Area of Monterrey, through Productivity and Susceptibility Analysis

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Freshwater ecosystems have been affected by the exposure to stressors related to anthropogenic activities. It is considered that the risk or vulnerability of aquatic fauna has increased in conjunction with the growth of the human population, particularly the freshwater ichthyofauna. Furthermore, the lack of recent biological information of fish species makes it difficult to estimate vulnerability and how to prioritize management, conservation and research efforts. The Productivity and Susceptibility Analysis (PSA) is a semi-quantitative evaluation that considers the productivity and the susceptibility (biological and ecological response to external factors that exert pressure) to obtain relative vulnerability. PSA is used to analyze vulnerability of species where biological information is scarce, or the available information is not sufficient for traditional evaluations. This analysis was created in response to the need to evaluate species of economic importance and how they are affected by fisheries and has been modified in such a way that it can be adapted to different species under different pressure factors. We proposed the adaptation of the PSA for freshwater species affected by different anthropogenic factors in the Monterrey Metropolitan Area. We sampled different sites to obtain a list of species for the PSA. Through the consultation of literature, experts and in situ observations, the attributes of susceptibility (how the species responds to different factors) and productivity (characteristics of the species) were modified to obtain the vulnerability.

Changes in the relative importance of species in small-scale fisheries in Mexico (2000-2022)

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Small-scale fisheries represent half of the catches of marine species, in addition to generating thousands of direct and indirect jobs and providing food security to communities. Over time, fisheries change, for example, due to changes in the ecosystem associated with the climate, changes in fishing gear, changes in the market preferences, among others. Due to the aforementioned factors and the high variety of species captured in Mexico, determining their importance can be a complex task. In this work, capture reports between the year 2000 and 2022 were analyzed. The records were divided for the Pacific and Atlantic Oceans and filtered to analyze only the records corresponding to small-scale fisheries, using as parameters the number of fisheries offices, the volume of capture, frequency of registration and number of permits. The importance of each fishery was determined for each year in the time series. The results show how the importance of species has changed in each ocean, highlighting for the Pacific Ocean the white and brown shrimp, red snapper, tilapia, horse mackerel, shark and snapper while in the Atlantic Ocean the species were the snook, sierra, horse mackerel, snapper, cojinuda and the red snapper. Additionally, the importance index allows us to know the behavior of fisheries over time, showing those that have decreased and those that are growing.

Keywords: fishery statistics, fishing index, spatiotemporal analysis

Tracing the traceability of Galapagos Marine Reserve fishery products

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The Galapagos Marine Reserve (GMR) is a multiple-use reserve where small-scale fishing is permitted exclusively for the local community. Fishing in Galapagos is a socio-cultural activity of economic, ecological, and food security importance. Government, fishers, and NGOs have agreed that a good way to encourage responsible fishing in Galapagos

is to add value to seafood products through traceability. In 2021, the Charles Darwin Foundation (CDF) installed the first seafood traceability systems on five fishing vessels in Galapagos. Shellcatch Inc. technology was used, consisting of an electronic monitoring kit (gps and onboard camera), electronic logbook, electronic QR tags, and an enabling market platform to connect fishers with the marketplace. This first experience demonstrated that Shellcatch technology is viable for small-scale fishing in Galapagos. Evidence for the successful implementation of this model can be found with the first beta testing fishers who frequently traded traceable fish and use traceability for their market differentiation. Other NGOs are currently expanding the implementation of the Shellcatch system in Galapagos, reaching 21 traceability systems, and are achieving pilot commercial transactions between fishers and local restaurants. These experiences have prompted the Jocotoco Foundation, together with CDF, to facilitate the creation of a Responsible Fishing Network made up of fishers, chefs, and scientists to promote the capture and consumption of Galapagos seafood with traceability. In addition, a protocol was developed for the analysis of Shellcatch traceability system videos, which is applicable for consumer verification and scientific research purposes. Now that traceability technology has been demonstrated to be feasible in Galapagos, the next step is to consolidate the market for traceable seafood products from the GMR.

Keywords: Traceability, Galapagos, small-scale fishery

Drivers and collaborative solutions to IUU fishing in the Cayman Crown Reef

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The Cayman Crown reef is a vital part of the Mesoamerican Reef System, yet it faces significant pressure from illegal, unreported, and unregulated (IUU) fishing, in part from Honduran fishers. This study investigates the socioeconomic drivers behind IUU fishing in the Cayman Crown reef by analyzing 117 household surveys across 13 fishing communities traditionally known for this activity. Our findings reveal specific communities that depend heavily on the reef, the underlying reasons for this dependence, and the extent of their reliance on its resources. To address these challenges, two stakeholder workshops were conducted, bringing together NGOs, fishers, co-managers, and government authorities. Through structured discussions and collaborative breakout sessions, participants identified five key strategies to mitigate IUU fishing: capacity building, governance enhancement, environmental awareness, livelihood diversification, and bilateral collaboration. These strategies emphasize the importance of empowering local fishers through education and governance, fostering

cross-border cooperation, and promoting livelihood diversification to reduce dependency on the reef. This study provides valuable insights on the socioeconomic landscape driving IUU fishing in the region and proposes actionable solutions to mitigate these practices among Honduran fishers in the Cayman Crown reef. By doing so, it highlights the reef as a 'hope spot' for conservation, sustainable management, and the well-being of the dependent communities.

Keywords: Illegal, Unreported and Unregulated Fishing (IUU), Cayman Crown Reef, Collaborative governance

A comparative analysis of small-scale octopus value chains in Latin America

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Octopus small-scale fisheries are a highly important economic and subsistence activity, being a source of income and food security for several coastal communities worldwide, especially for women, that can operate in one or several nodes of the value chains. In general, small-

scale octopus fisheries do not require expensive investments with fishing gears and other materials. Additionally, these fisheries generally operate with a targeted species, have low unintentional catches and do not cause widespread seabed damage, which is a strong stand from the sustainability perspective. Despite its significant importance and increasing market demand, little information is available about octopus value chains and trade interactions worldwide. In this study, we will contrast and discuss the characteristics and operations of three diverse octopus small-scale fisheries in different countries in Latin America: Mexico, Brazil and Chile. These fisheries vary in regards to the target species, fishing method and fishing gear; environmental, social, economic, cultural and institutional contexts; contribution to local communities and/or global markets. We will provide a general understanding on key aspects of each of these fisheries, explore governance aspects related to management and decision-making processes and give an overview of the participation of women in the octopus value chains. Finally, we will explore the main challenges faced by these fisheries and opportunities that could improve octopus value chain efficiency, sustainability and cause positive socio-economic impacts for the local communities.

Keywords: Octopus small-scale fisheries, Supply chains, Governance

Economic diversification of the small-scale fishers of the Yucatan Peninsula, México: Challenges and incentives

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Small-scale fisheries are generally multi-species and multigear in nature, although there may be some fishers who specialize in one or a few species given the use of a particular gear. In this framework, fishers may opt for species diversification depending on access to them, their preferences and skills, while meeting market demands. Diversification of catches using the portfolio concept has been considered as an adaptive strategy to reduce economic risks and increase fishers' resilience, especially in the face of changing conditions. The aim of this study was to understand the economic contribution of small-scale fisheries to the communities of the Yucatan Peninsula and fishers adaptations. In doing so, the differences among six communities given the use of different fishing gears were contrasted. We collected information at the time of landing, recording the catch per species, type of gear, costs of the trips, the yield and the species caught per trip, as

well as the price paid to the fishers for the different species, which allowed us to calculate the average quasi-rent and quasi-income per fisherman. Differences in catch composition and quesi-rent by gear and community were observed. We discuss regarding the incentives that keep fishers in the activity supported by a portfolio of alternatives in the face of changing conditions.

Keywords: Portfolio diversification, adaptive strategies, fishers' incentives

Efecto de la concentración de fósforo sobre el contenido de lípidos y el perfil de ácidos grasos en *Thalassiosira weissflogii* y *Chaetoceros muelleri*

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Las microalgas contienen ácidos grasos de cadena larga: araquidónico (ARA), eicosapentaenoico (EPA) y docosahexaenoico (DHA), los cuales son esenciales para el crecimiento de los organismos bajo cultivo. La calidad nutricional de las microalgas depende de la especie, pero también puede ser modulada mediante las condiciones del cultivo. El objetivo de este estudio fue analizar el contenido de lípidos y la producción de ácidos grasos en las microalgas *T. weissflogii* (TH-W-1) y *C. muelleri* (CH-M-1) en respuesta a diferentes concentraciones de fósforo: f, f/2, f/4, f/0, siendo el f, el tratamiento control. Se encontró diferencias significativas en relación al contenido de lípidos entre las microalgas; el contenido de lípidos en TH-W-1 cultivada en f/2 (13.28 ± 4.25 mg·g-1) fue significativamente mayor en relación a lo registrado en todos los tratamientos de CH-M-1. Además, el contenido de PUFA en TH-W-1 fue de 14.11±1.55% y de 3.97±0.99% para el EPA y DHA, respectivamente, no se detectó ARA en esta especie. Mientras que, en CH-M-1 el ARA registró valores de 9.84±0.81%, y de 7.35±0.67% y 0.84±0.17% de EPA y DHA respectivamente. El contenido de EPA y DHA en TH-W-1 fue significativamente mayor al contenido registrado en CH-M-1. Se concluye que TH-W-1 representa una fuente mayor de lípidos, en comparación con CH-M-1, registrándose el mayor contenido en el tratamiento f/2 (13.28±4.25 mg·g-1). Asimismo, TH-W-1 es una mejor fuente potencial de EPA y DHA (14.11±1.55% y 3.97±0.99%), en

comparación con CH-M-1 (7.35±0.67% y 0.84±0.17%), mientras que para el ARA (9.84±0.81%) la especie idónea es CH-M-1. en la historia y presente de la pesca en México.

Keywords: Diatomeas, cultivo de microalgas, ácidos grasos esenciales

Small-Scale Fisheries in the Mesoamerican Reef region: Current challenges and action alternatives

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Small-scale fisheries have ecological, social, and economic relevance along the coasts of the Mesoamerican Reef region (MAR), including Belize, Guatemala, Honduras, and Mexico. The scale fish is a multi-specific resource with a predominance of groupers and snappers, targeted by an artisanal fishery that contributes substantially to food security at local and regional levels. Also, this fishery is essential to the livelihoods of the region's coastal communities. The MAR's fishery resources are marine populations with robust biological connectivity derived from life histories, the marine current system, and physical structures at different spatio-temporal scales. In addition to scale fish and lobster fisheries occupying a vital place in the region, the participants in the table will present the MAR's physical features and outcomes of regional efforts in monitoring fish recruitment over the last decade. Despite their relevance, further work is needed in monitoring, assessment, and sustainable management of the target resources of small-scale fisheries in the MAR region. Hence, the purpose of this roundtable includes the discussion of the current conditions of the scale fish and lobster fisheries, as well as the illegal, unreported, and unregulated (IUU) fishing in the region. Identifying the primary needs of knowledge about these resources will allow us to trace the route for

their sustainable use. The aim is to adopt a regional, multidisciplinary approach from diagnosing the problems to designing action programs for monitoring, stock assessment, and developing sustainable management strategies. As a first step in collaborative action, we propose the reactivation of the Mesoamerican Reef Sustainable Fisheries Network.

Keywords: Scale fish multi-specific resource, data-limited fisheries, sustainable fishing

Caribbean lobster fishery: A case of community success

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Lobster is a valuable marine resource in Mexico, especially in the Caribbean region, from where it is distributed globally. Lobster is a resource reserved to fishing cooperatives. We focus on a successful coop working in the central area of the state coast. Punta Herrero is a small fishing community where a single cooperative faces many challenges: it has no space to expand operations, alternative economic activities are restricted to have the approval by a Biosphere Reserve, also lacks of infrastructure services, catches were lowering in 2013-2016; climate change has exacerbated impacts from tropical storms, higher surface water temperatures, coral bleaching and sargassum seaweed arrivals. In order to adapt to new economic and environmental conditions, cooperative´s members decided to adapt to those conditions through a methodology framework designed to perform a bioeconomic analysis. It was divided into statistical analysis of catch and income records, and problem identification and hierarchical grouping, through SOWT analysis. Main findings are that cooperative´s strengths are related to their operational, fishing issues, such as a high level on organizational fishing operations, environmental awareness, social responsibility; openness to research findings and technological innovation, and valuable empirical ecological knowledge. Two management strategies were proposed: diversification of economic activities, and sustainable fishing. Nowadays, a tourism cooperative is in operation; coop has doubled its average catches since 2016, and have certified them in the Marine Stewardship Council; 90% of catches are sold to Asia. Other strengths uncovered recently are strtong family ties, and the emergence of a young female, community leader.

Keywords: Lobster fishery, community success, artisanal fisheries

Connectivity in the Mesoamerican Reef System: An unprecedented experience on the recruitment of postlarvae of reef fishes

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Over eleven years, 2013-2023, the recruitment of reef fish postlarvae in the Mesoamerican Reef System (MAR) has been monitored through the ECOME project (Ejercicio de COnectividad en el MEsoamericano) promoted by the staff of El Colegio de la Frontera Sur (ECOSUR). The project's objectives are: 1) Contribute to the inventory of the diversity of fish species in the postlarvae stage that are recruiting along the MAR, 2) Estimate the trends in recruitment of selected fish species, 3) Promote the appropriation of the ECOME methodology, and 4) Develop a participatory monitoring network in the region. Annually, the ECOME project has involved 8 to 12 Marine Protected Areas (MPAs) in Mexico, Belize, Guatemala, and Honduras. Simultaneous monitoring is fulfilled at least once a year, with the same standardized methodology in reef lagoon habitats, from 7 to 8 consecutive nights, including the new moon. To date, 13 ECOME exercises have been conducted, allowing the collection of more than 6200 organisms belonging to 35 families and 110 species. Among the recorded families having ecological and economic value are snappers (Lutjanidae), mojarras (Gerreidae), parrots (Scaridae), surgeons (Acanthuridae), grunts (Haemulidae), botetes (Tetraodontidae). During the ECOMEs, we observed noticeable variations in the abundance of several families. More than 800 people have participated in this project, with 650 working days in field and laboratory. ECOME is a unique regional project that has succeeded in consolidating collaborative efforts of MPAs staff and academics from four countries on a platform of common goals using low-cost methods.

Keywords: Recruitment index, reef fish postlarvae, marine protected areas

Uso de hábitat de juveniles de tiburón martillo (*Sphyrna lewini*) en el sur del Golfo de California

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El tiburón martillo común (*Sphyrna lewini*) es la especie más abundante en las capturas de elasmobranquios en el Golfo de California (GC), y esta región se considera un posible hábitat de crianza para juveniles. Las áreas de crianza se caracterizan por ser zonas costeras, lagunas en su mayoría, donde los recién nacidos y juveniles de menos del año pasan una etapa de desarrollo importante; debido a esto, los estudios sobre biología en estas zonas son cruciales para mejorar estrategias de manejo pesquero. La genómica poblacional permite evaluar patrones de diferenciación genética asociados al comportamiento de los individuos y presiones ambientales; es por ello, que el objetivo de este estudio fue evaluar el uso del GC por individuos inmaduros de *S. lewini* mediante la evaluación de Polimorfismos de Nucleótido Simple (SNPs por sus siglas en inglés). Se obtuvieron 4938 SNPs, de los cuales 241 fueron putativamente adaptativos. El patrón de variación neutral mostró homogeneidad genómica entre sitios, mientras que la variación adaptativa mostró diferenciación en la región. Este patrón de diferenciación genómica adaptativa entre regiones podría reflejar la residencia de los individuos a lagunas costeras. Estos resultados

demuestran la importancia de las zonas estuarinas y costeras del sur del GC para la crianza del tiburón martillo común.

Keywords: Residencia, conectividad, selección natural

Alvarado Lagoon System, Veracruz, an example of hope-complexity: Growth of small fisheries and reforestation of coastal wetlands

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The Alvarado Lagoon System (SLA) is located in the Papaloapan river basin, the second most important in Mexico due to its surface and flow, in Veracruz, in the Gulf of Mexico. The SLA is the most complex wetland system in Veracruz, and it supports an important diversity of small-scale fisheries such as: chucumite, snook, tilapia, crystal shrimp, crab, etc. Likewise, the SLA supports the livelihood of 10,000 fishermen and approximately 2,500 families, who take advantage of the catchments for self-consumption and local-regional trade. However, the sustainability of fishing depends on the conservation of coastal wetlands (mangroves and flooded forests or forested wetlands), which

have historically been under pressure from activities such as livestock and sugarcane crops. Notwithstanding, in recent years, projects such as: pond clearing, rehabilitation of canals and novel design of mangroves and flooded forests reforestation have influenced a paradigm shift in how communities manage ecosystems. The results are overwhelming; on the human side, the projects have generated more than 375 jobs and benefited more than 1,500 people directly, and they have indirectly benefited more than 4,500 fishermen, whose income is above the minimum line of well-being; Ecologically, hydrological connectivity has been favored, which has increased the productivity of the lagoons where fishing is carried out. This has strengthened the capital-assets of communities and improved socioeconomic conditions and social-ecological resilience to better their absorptive and adaptive capacities in order to face human and natural disturbances.

Keywords: Capital-assets, Social-ecological resilience, Absorptive-adaptive capacities

Vulnerability of small-scale fishermen in two coastal communities in the Mexican Northwest Pacific

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The importance of small-scale fisheries is increasingly being recognized and this interest has been reflected in a growing number of studies that take this into account. Many studies have been possible due to the direct participation of small-scale fishers from the communities under study. For the present study, two locations in southern of Sinaloa (Mexico), one with urban characteristics and the other rural, were selected. In each, work was done with a group of fishers. Knowledge of small-scale fishers was used so that they themselves, through a participatory workshop, evaluated vulnerability at: community (uncertainty in income), household (tropical cyclones), individual (accidents during fishing operations) and of fishing resources (to anthropogenic and natural impacts) levels. In total, 39 indicators were developed considering exposure, sensitivity, and adaptive capacity,

distributed among the different types of vulnerability. A statistical analysis was performed on the vulnerability results. A socioeconomic survey was also conducted and subsequently a Kendall test was performed for some of these indicators (age of fishermen, education, livelihoods of those who provide income and contribution of fishing to household income, state of fishery resources). The results of the evaluated vulnerabilities and the tau test (Ƭ) are presented and discussed, showing the viability and usefulness of the methodology used with a view to improve the resilience of small-scale fishers households and fishery resources in the face of an increasingly changing environment and a challenging future.

Keywords: Artisanal, self-assessment, bottom-up

Trade and consumption of elasmobranch fishery products in the Área Metropolitana de Monterrey, Nuevo León, México

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One of the México's greatest sources of economic richness is fisheries activity, and elasmobranch resources are really important for feeding the country. This is because we have two oceans with different environmental conditions that provide a diverse kind of elasmobranch resources. Although Nuevo León is not a coastal state, the consumption of marine products has led to the development of a market network involving fisheries from coastal states. However, it is unknown how much of what is caught and transported to the state is consumed locally. For this reason, interviews were conducted at four different levels: owners, sellers, fishermen and customers. It was observed that there is actually a consumption of elasmobranchs in the state, with cazon (small sharks) fillet being the most predominant product reported. Currently, the sale of cazon and manta ray meet is low, mainly because most of the local population prefers to feed on red meat and other better-known fish and seafood products, such as tilapia, catfish, salmon, tuna and shrimp. Therefore, there are few places with a commercial influx of elasmobranch products at the main cities of Nuevo León. Based on the interviews, it seems that consumption of elasmobranch is not important for local population compared with other big cities in Mexico; However, due Monterrey is one of the three cities with the highest population density, it is important to keep monitoring the trade of these products and relate it with the national reports, as some of the elasmobranch populations could experience some fishing stress.

Keywords: Sharks, manta rays, commerce

Policies supporting artisanal fisheries can improve food security and nutrition on the Galapagos Islands

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This study analyses the contribution of artisanal fisheries to the four pillars of food security and nutrition (FSN): availability, accessibility, use, and stability, in the Galapagos archipelago. It reveals good local seafood availability and supply stability in Galapagos. Supply consistently meets demand, even with a significant portion exported. Local options satisfy nearly all tourist needs, except for imported seafood products requested by visitors. Furthermore, artisanal fishers supply demonstrated remarkable resilience during the COVID-19 crisis, highlighting the adaptability and responsiveness of the local artisanal fishers to crises. The study highlights local seafood system´s vulnerabilities. International market demands, including those of tourists, influence the allocation of fishing effort. Such demands can

weaken availability of food staples if fishing prioritizes exports, and can further destabilize populations of already overfished, tourist-desired species. Physical access to seafood products is jeopardized by: the lack of infrastructure such as fish handling and value-adding facilities; and, the adoption of fisheries management-driven policies, aiming to conserve some species and ignoring food security. Seafood use is impacted by unmet basic needs, like lack of clean water and proper waste management systems. They hinder adequate seafood handling and consumption, worsening local diets and contributing to high overweight and obesity rates. Synergies between local farming and fishing can strengthen the islands' food system resilience. Comprehensive policies integrating terrestrial and marine systems can address Galapagos' FSN challenges systematically and create positive externalities for ecosystem conservation by reducing the need for importing food and minimizing the risk of invasive species introduction.

Keywords: Artisanal fisheries, food security, resilience

Key actor mapping for the social analysis of the small-scale fisheries value chain on the continental coast of Ecuador: The case of Manta and Jaramijó

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Small-scale fisheries are an important livelihood for coastal communities in Ecuador, contributing to stimulate local economies and supporting national food security. However, these fisheries face significant challenges from both social and environmental dimensions, including significant sharks' bycatch that threaten Ecuador fisheries sustainability and high inequalities across the value chain that exacerbate vulnerabilities of the coastal communities. Understanding the intricacies and needs of stakeholders requires a comprehensive analysis of concerning issues and opportunities around the artisanal fisheries value chain. This study uses Key Actor Mapping (KAM) as a method for identifying the primary actors involved in the artisanal fisheries value chain, and understanding their needs, interests and their influence exerted within the territory. The KAM approach helps to get a glimpse of the complex network of interactions among fishers, intermediaries, merchants and policymakers within the artisanal fisheries value chain in Manta and the neighbor city of Jaramijó (Manabí, Ecuador). This analysis has revealed the challenges small-scale fisheries face and map out the power dynamics among stakeholder participating in the value chain. There is a power imbalance between fishers and traders, which is originated from the product´s perishable nature and the limited opportunities to access new markets. Applying the KAM approach provides insights into these challenges, while also allows us to identify opportunities to scope local projects emerged to support fishing communities through cooperativism and entrepreneurs. Opportunities to scope projects aimed to empower local fisheries communities in innovative initiatives, aiming to promote sustainable fisheries, while reducing inequalities and strengthening coastal community livelihoods.

Keywords: Small-scale fisheries, key actor mapping, cooperativism