INTER-AMERICAN TROPICAL TUNA COMMISSION

2ND WORKSHOP ON CLIMATE CHANGE

(by video conference)
06-08 April 2026

WORKSHOP REPORT

This document provides a report on the 2nd Climate Change Workshop – focused on introducing and discussing, the proposed climate change workplan's climate-related fisheries tools – held virtually from April 6 to 8, 2026. The purpose of the workshop was to begin Phase 4 (Creating tools) in the proposed climate change workplan (SAC-15-12) and respond to a SAC-15 recommendation and Resolution C-24-10 advising the staff to continue to develop and discuss the details of the climate change workplan.

The 2nd Workshop on Climate Change was held by videoconference from 6 to 8 April 2026. The workshop agenda and the list of participants is provided in Annex 1 and 2, respectively.

The meeting was chaired by Dr. Jon Lopez, head of the IATTC Ecosystem and Bycatch Program.

The chair provided some background elements for the workshop. The IATTC staff developed a proposed climate change workplan which provided a general structure to promote climate-resilient tuna fisheries in the EPO (SAC-15-12), in the understanding that the details of the workplan and its implementation would be elaborated in consultation, as appropriate, with all relevant stakeholders at workshops and other meetings of the IATTC and its subsidiary bodies. This process, as proposed, anticipates five phases: 1) Planning, 2) Deciding on goal and scope, 3) Developing a framework, 4) Creating tools, and 5) Tool application and/or management implementation. After the completion of the 1st Workshop on Climate Change focused on Phases 2 and 3, staff recommendations on the main goal, scope, and framework of the climate change workplan were revised (SAC-16 INF-P), presented to the EBWG and the SAC, and were ultimately endorsed by the SAC (SAC-16 recommendations). The 2nd IATTC Climate Change Workshop convened staff, invited experts, CPC representatives, and other participants to learn about and discuss Phase 4 (Creating tools) of the workplan and Step 2 of the framework (Assessing impacts and vulnerabilities).

Across three days, the workshop was structured around three tool levels: ecological and ecosystem tools; fishery and socioeconomic tools, and management tools. There was also discussion on multi-level tools that integrate across ecological, fishery, and governance dimensions. The workshop was designed as a mini symposium where external speaker presented on a tool or tools they have developed or used in their work to assess the impacts of climate change on fisheries. The workshop also served to socialize the IATTC's current climate-related fisheries tools and gather feedback on the staff's tool priorities recommendations (see document CC-02-01).

Day 1: Ecological and ecosystem tools

The first day opened with remarks from IATTC leadership emphasizing climate change as a present and growing challenge for marine ecosystems and fisheries, and framing the workshop as part of the response to the Commission's climate change resolution and the Scientific Advisory Committee's guidance. Dr. Dan Crear then reviewed progress on the IATTC climate change workplan and recalled that the IATTC has

already completed the initial phases of the workplan and has moved to the current phase focused on strategic tool development.

Dr. Dan Crear also showcased climate-related work already underway at IATTC, including an environmental database covering 17 oceanographic variables across the Convention Area, species distribution models (SDMs) for tunas and key vulnerable bycatch species, and laboratory-based physiological research at the IATTC's Achotines Laboratory in Panama. Dr. Crear announced that IATTC had secured external funding from the Blue Convergence Fund to support the tool of climate scenario planning.

The ecological tools session featured presentations on:

- Species distribution models (SDMs): Heather Welch presented SDMs as flexible tools to explain species-environment relationships and predict distributions across past, present, seasonal, and future time scales. Examples included retrospective analyses, dynamic management applications, seasonal forecasts, and climate projections. Discussion highlighted key strengths of SDMs, but also uncertainties around extrapolation under future climate conditions.
- Climate vulnerability assessments (CVAs): Tyler Loughran presented NOAA's Highly Migratory Species Climate Vulnerability Assessment, showing how exposure and sensitivity analyses can be combined to rank stock vulnerability. The presentation emphasized the value of CVAs in synthesizing diverse information and identifying both vulnerable species and research gaps.
- Eastern Tropical Pacific (ETP) sharks and rays CVA: Dr. Florencia Cerutti described an assessment of 132 chondrichthyan species in the ETP. The work found that coastal species, especially rays, were particularly vulnerable to climate, and highlighted the importance of coastal nursery habitats and the utility of vulnerability assessments for identifying management priorities and data gaps.
- Physiological/Laboratory studies: Yole Buchalla presented experiments examining effects of ocean acidification and warming on early life stages of yellowfin tuna and Pacific bluefin tuna. These studies, many of which were conducted at IATTC's Achotines Laboratory, demonstrated how mechanistic laboratory research can support models of recruitment variability, population responses, and climate impacts.
- SEAPODYM and climate-driven tuna distribution shifts: Dr. Simon Nicol described the spatial ecosystem and age-structured population dynamics model (SEAPODYM), which integrates oceanography, prey fields, movement, and fishing to project tuna abundance and distribution under climate scenarios. The presentation stressed both the usefulness of basin-scale projections and the sensitivity of fine-scale outputs to model assumptions and environmental forcing.

After ecosystem and ecological tools were presented on, the staff launched a poll that asked the workshop participants to identify which ecological/ecosystem tools would most likely help IATTC understand the impacts of climate change on IATTC's Antigua Convention conservation and management targets (e.g., tuna, tuna-like species, non-target species, shared ecosystems). Polling results showed strongest support

for oceanographic and climate data and species distribution models as key ecological tools, followed by ecological climate vulnerability assessments. Participants generally viewed these as the most immediately useful tools for helping IATTC understand climate impacts on Convention species and ecosystems. Discussion also reflected interest in the complementarity of tools rather than reliance on any single method.

Day 2: Fishery, socioeconomic, and management tools

The second day focused first on strategic tools for evaluating climate impacts on fisheries and fishing communities, followed by tools focused on how institutions and managers can prepare for climate impacts.

The fishery and socioeconomic tools session featured presentations on:

- Socioeconomic assessment/indicators: Dr. Yunzhou Li presented lessons from work on fishery socioeconomic vulnerability and resilience, drawing from a global review of climate vulnerability assessments and a case study from China's domestic marine fisheries. Her presentation underscored that climate impacts are not only ecological but also social and economic, affecting livelihoods, communities, and governance systems. She reviewed a wide array of social and economic indicators used in fishery CVAs and described an integrated social-ecological risk framework combining species vulnerability, fishery dependence, and adaptive capacity.
- Fisher behavior: Dr. Felipe Quezada Escalona followed with a synthesis of global case studies on climate impacts on small pelagic fisheries and an empirical analysis of fisher behavior in the California Current. He showed that fishers respond to changing species availability through spatial movement, switching target species, or exiting fisheries, and emphasized that these responses depend on fleet characteristics, licensing flexibility, and infrastructure. His presentation illustrated how climate-related species shifts can translate into changes in behavior, profitability, and management needs.

After fishery and socioeconomic tools were presented on, the staff launched a poll that asked the workshop participants to identify which fishery/socioeconomic tools would most likely help IATTC understand the impacts of climate change on IATTC's Antigua Convention conservation and management targets (e.g., fishing vessels, fishing industry and communities). Polling results indicated that participants saw fisheries socioeconomic indicators, socioeconomic CVAs, and bioeconomic models as the most useful fishery-level tools. There was also a strong point made on directly engaging fishers to validate and complement some of the other socioeconomic modeling tools.

The management strategic tools session featured presentations on:

- Fisheries managers perceptions: Dr. Emily Ogier described Australia's climate risk assessment for fisheries management, a structured process that combines ecological risk, fishery risk, and management response options. She emphasized that the process helped management bodies think systematically about response options, though it also revealed the challenge of evaluating how effective individual management responses might actually be. The presentation also stressed

the value of facilitated workshops, scenario thinking, and building mental readiness for long-term change.

- Climate risk assessment tools for fisheries management: Katie Schleit and Amy Irvine presented work on the Climate Risk Index for Biodiversity (CRIB) and its applications in Canada, NAFO, and New Zealand. They showed how climate vulnerability indices can be applied at stock, regional, and ecosystem scales, and how prototype visualizations can support managers in integrating climate risk into fisheries and area-based management. Their presentation highlighted the importance of adaptable data layers, visualization tools, and usability for managers.

After management strategic tools were presented on, the staff launched a poll that asked the workshop participants to identify which management tools would most likely help IATTC understand the impacts of climate change on IATTC's fisheries management system. For management-level tools, the clearest preference was for conservation and management measure risk assessments, followed by manager workshop discussions.

Day 3: Multi-level tools and integration

The third day focused on strategic tools that span multiple levels (ecological/ecosystem, fishery/socioeconomic, and management levels).

The multi-level tools session featured presentations on:

- Tuna shifts to tuna price changes: Dr. Justin Suca and Dr. HingLing Chan presented linked work from Hawaii on climate impacts on bigeye tuna distribution, quality, and price. Suca showed how SDMs and observer data can distinguish environmental associations of juvenile versus adult bigeye tuna, while Chan described a tuna price model linking sea surface temperature, trip length, body size, supply, and damage to market value. Together, these talks illustrated how ecological shifts can cascade into fishery economics and fisher decision-making.

- Scenario planning: Kiley Dancy then presented the East Coast U.S. climate scenario planning initiative, a multi-organization process developed to examine how climate-driven species shifts and other changes could affect fisheries governance. She reviewed the scoping, scenario development, and application phases, and showed how the process led to a "potential action menu" that continues to guide coordination and investment among management bodies. This presentation was especially relevant because IATTC staff announced they had secured funding to conduct a comparable scenario planning exercise in the eastern Pacific.

- Management strategy evaluation (MSE): Dr. Thomas Carruthers argued than waiting for scientifically unassailable climate projections, MSE provides an already-established framework for testing how different management procedures perform across hypothetical climate scenarios. He drew on examples including Atlantic Bluefin Tuna and North Atlantic Swordfish to show MSE can identify climate-robust management procedures without requiring forecasts that can't survive peer review.

- Climate Test: Dr. Thomas Carruthers followed his first talk with second talk on the tool, "Climate Test" which frames climate robustness as a mathematical property of a management procedure rather than a prediction — asking "at what magnitude of change does this procedure break?" and assigning it a simple rating. He argued this approach can be appended to any existing MSE process as a straightforward, defensible tool for guiding climate-resilient management decisions.
- Climate-Resilient Fisheries Planning Tool: Dr. Jacob Eurich closed the workshop with a presentation on the Climate Resilient Fisheries Planning Tool, developed through academic and applied work to help fisheries define, assess, and plan for climate resilience. He emphasized that resilience involves ecological, human, and governance systems together, and that planning tools can help translate climate information into actionable strategies through participatory processes.

The final poll asked participants which strategic tools IATTC should prioritize over the next three years. Participants ranked multi-level tools highest as a general category. Among specific tools, the strongest support went to species distribution models, oceanographic and climate data, climate-informed management strategy evaluation, ecological climate vulnerability assessments, and climate-informed stock assessments. Climate scenario planning and management risk assessment tools also received substantial support. Discussion at the end of the workshop emphasized the need for a balanced toolset, continued fisher engagement, and clearer articulation of what climate-resilient fisheries should mean in practice for IATTC.

Overall, participants appeared to support the staff's preliminary recommendation that IATTC should prioritize a climate vulnerability assessment and a climate scenario planning exercise over the next three years, while continuing to develop and integrate ongoing work on SDMs, oceanographic indicators, laboratory studies, ecosystem models, and climate-informed assessment approaches. The workshop showed strong interest in better understanding and preparing for climate impacts in the EPO.

Annex 1. Agenda

Day 1: 3pm-6pm PST

1. Welcome and approve agenda (10 min): 3:00-3:10
2. Update on climate change work at IATTC (15 min): 3:15-3:30
    a. Presented by Dan Crear
3. Questions/Comments (15 mins): 3:30-3:45
4. Break (15 min): 3:45-4:00
5. Ecological Assessment tools (all talks 15 mins w/ 5 min questions)
    a. 4:00-4:20: Heather Welch (University of California Santa Cruz/NOAA) – Species Distribution Models (long and short-term projections, MHW, ENSO)
    b. 4:20-4:40: Tyler Loughran (Azura Consulting LLC for NOAA) – Climate Vulnerability Assessments (Atlantic highly migratory species)
    c. 4:40-5:00: Florencia Cerutti-Pereyra (IFREMER- MARBEC) – Climate Vulnerability Assessment (Eastern Tropical Pacific sharks)
    d. 5:00-5:20: Yole Buchalla (IATTC) – Physiology studies (tuna larvae/eggs)
    e. 5:20-5:40: Simon Nicol (SPC) – Age structured tuna population model (SEAPODYM)
6. Thoughts/discussions/short poll on ecological assessments: 5:40-6:00
7. Close meeting

Day 2: 3pm-6pm PST

8. Welcome (10 min): 3:00-3:10
9. Fisheries Assessments tools (all talks 15 mins w/ 5 min questions)
    a. 3:10-3:30: Yunzhou Li (Stony Brook University) – Socioeconomic assessment/indicators
    b. 3:30-3:50: Felipe Javier Quezada Escalona (Universidad de Concepción) – fisher behavior
10. Break (10 min): 3:50-4:00
11. Thoughts/discussions/short poll on fisheries assessments: 4:00-4:20
12. Management Assessment tools
    c. 4:20-4:40: Emily Ogier (University of Tasmania) – Fisheries managers perceptions
    d. 4:40-5:00: Katie Schleit/Amy Irvine (Oceans North) – Fisheries managers perceptions
13. Thoughts/discussions/short poll on management assessments: 5:00-5:20
14. Close meeting

Day 3: 3pm-6pm PST

15. Welcome (10 min): 3:00-3:10
16. Assessments spanning multiple levels
    a. 3:10-3:40: HingLing Chan (NOAA) & Justin Suca (University of Hawaii) – Tuna shifts to tuna price changes
    b. 3:40-4:00: Kiley Dancy (MAFMC) – Scenario Planning
17. Break (10 min): 4:00-4:10
    c. 4:10-4:30: Tom Carruthers (Blue Matter Science) – Management Strategy Evaluation
    d. 4:30-4:50: Tom Carruthers (Blue Matter Science) – MSE/Stock Assessment (Climate Test)
    e. 4:50-5:10: Jacob Eurich (Environmental Defense Fund) – Climate-Resilient Fisheries Planning Tool
18. Break (10 min): 5:10-5:20
19. Activity/poll/final discussions: 5:20-5:50
20. Recap/close meeting

Annex 2. List of workshop participants

Name	Organization
Thelma Quintero	ARAP
Evelyn Ríos	ARAP
Jorge Alejandro Villavicencio Mendoza	Atunec
Luigi Antonio Benincasa Azua	Atunec
Eider Andonegi	AZTI
Gorka Merino	AZTI
Tyler Loughran	Azura Consulting
Charles Coc	Belize High Seas Fisheries Unit
Tom Carruthers	Blue Matter Science
Jonathan Gonzalez Bedoya	Blue Point Foundation
Jorge Borja	Cape Cod
Raul Edgardo Cortez Cota	Cendepesca
Tania Norori	COBI
Martha Lucia De La Pava	Comisión Colombiana del Océano
Bertha Alicia Soler Benitez	Comisión Nacional de Acuacultura y Pesca
Isabel Cristina Reyes Robles	Comisión Nacional de Acuacultura y Pesca
Jessica Maria Mestas Rodriguez	Comisión Nacional de Acuacultura y Pesca
Manuel Correia	Copresidente EBWG
Cristopher Avalos	DIPESCA
Rubí Rivas	DIPESCA
Limbert Cortez	Direccion General de Intereses Maritimos, Fluviales, Lacustres y Marina Mercante
Marco Herminio Osorto Nuñez	Direccion General de Pesca y Acuicultura
Jacob Eurich	EDF
Henry Mauricio Abad Vargas	ESPOL
Maria Jose Marin Jarrin Na	ESPOL
Miguel Guevara	ESPOL
Luis Guerra	Facultad de Ciencias del Mar
Martha Elena Betancourt Aguirre	FIDEMAR
Michel Dreyfus	FIDEMAR
María Patricia Díaz	Fipesca
Mary Thiess	Fisheries & Oceans Canada
Daisuke Ochi	Fisheries Research & Education Agency
Abelardo A. Riera F.	FUNDATUN
Alvin Delgado Martinez	FUNDATUN
Katherine Bernal	Government of Vanuatu
Edgar Perez	Guayatuna S.A.
Marisol Aguilar	IATTC
Arnulfo Franco	IATTC
Brad Wiley	IATTC
Carolina Minte-Vera	IATTC
Dan Ovando	IATTC
Daniel Margulies	IATTC
Enrique Urena	IATTC
Jean-Francois Pulvenis	IATTC
Marlon Roman	IATTC
Melanie Hutchinson	IATTC
Rosa Runcie	IATTC
Salvador Siu	IATTC
Susana Cusatti	IATTC

Alex Da Silva	IATTC
Barbara Cullingford	IATTC
Dan Crear	IATTC
Jon Lopez	IATTC
Leanne Fuller	IATTC
Yole Buchalla	IATTC
Lourdes Ramos Alonso	IEO.CSIC
Florencia Cerutti	IFREMER- MARBEC
Ana Renza Paola Alegre Norza Sior	IMARPE
Tony Anculle	IMARPE
Rubén Choto	Inocar
Jorge Tam	Instituto del Mar del Perú
Renaldy Barnuty	Instituto Nicaragüense de Pesca y Acuicultura
Veronica Caceres	Inter-American Convention for the Protection and Conservation of Sea Turtles
Hilario Murua	ISSF
Johnny Chavarría	ISTTE
Hiroki Yokoi	Japan Fisheries Research and Education Agency
Yuji Uozumi	Japan Tuna Fisheries Co-operative Association
Lenin Franco	Lenin
Cecilio Ramírez	LUMITOP S.A.
Kiley Dancy	MAFMC
Jonathan López Cedeño	Ministerio de Agricultura, Ganadería y Pesca
Carmen Lopez	Ministerio de Ambiente y Desarrollo Sostenible (País: Colombia)
Javier Garcia	Ministerio de Comercio, Industria y Turismo
Leonel Bohorquez	Ministerio de Relaciones Exteriores
Elena Quintero	Ministerio del Poder Popular de Pesca y Acuicultura
Jatu F Nugrohorukmi	Ministry of Marine Affairs and Fisheries of the Republic of Indonesia
Mumpuni Cyntia Pratiwi	Ministry of Marine Affairs and Fisheries of the Republic of Indonesia
Virda Wulandari	Ministry of Marine Affairs and Fisheries of the Republic of Indonesia
Afzil Ramadian	Ministry of Marine Affairs and Fisheries of the Republic of Indonesia
Ana Belem Meraz Dominguez	MT PESCA INDUSTRIAL SA DE CV
Marco Antonio Alcaraz Perez	MT PESCA INDUSTRIAL SA DE CV
Fayakun Satria	National Research and Innovation Agency
Lilis Sadiyah	National Research and Innovation Agency
Enrique Peters	No
Jennifer Cudney	Observer
HingLing Chan	Observer
Katie Schleit	Oceans North
Amy Irvine	Oceans North
Miguel Roca	Pescimera
German Fonseca	Programa Nacional de Observadores de Colombia
Bernal Alberto Chavarria Valverde	Repulica De Guatemala
Thomas Schiff	Schiff & Assoc
Nima Farchadi	SDSU
Qinin Lin	Shanghai Ocean University
Shiyu Yang	Shanghai Ocean University
Simon Nicol	SPC
Cristhian Castro	SRP
Yunzhou Li	Stony Brook University
Claire Ober	Stony Brook University

Robynn Laplante	The Nature Conservancy
Rebecca Scott	The Ocean Foundation
Dave Gershman	The Pew Charitable Trusts
Guillermo Moran Broja	Tunacons
Pedro Santistevan	Tunacons
Fabian Viteri	UEES
Felipe Javier Quezada Escalona	Universidad de Concepción
Elmer Ovidio Quispe Salazar	Universidad Peruana Cayetano Heredia
Carolina Espino Leal	Universidad Autónoma de Sinaloa
Alan García	Universidad Técnica de Manabí
Heather Welch	University California Santa Cruz
Mitchell Lennan	University of Aberdeen
Justin Suca	University of Hawaii
Emily Ogier	University of Tasmania
Erika Ramirez Catuto	Viceministerio de Acuacultura y Pesca
Enrique Blacio	Viceministerio de Acuacultura y Pesca
Diego Manosalvas	Viceministerio de Acuacultura y Pesca
César Egas	Viceministerio de Acucultura y Pesca
Corey Niles	Washington Department of Fish and Wildlife
Phillip Dionne	Washington Department of Fish and Wildlife
Christopher Biggs	Washington Department of Fish and Wildlife
Clayton Wraith	WFOA
Maria Schoenbeck	ZMT