

Comisión Interamericana del Atún Tropical  
Inter-American Tropical Tuna Commission



# Actividades de investigación – Research activities

(SAC-13-01)

**13ª Reunión del Comité Científico Asesor - 16-20 de mayo de 2022 (por videoconferencia)**  
**13<sup>th</sup> Meeting of the Scientific Advisory Committee - 16-20 May 2022 (by videoconference)**

# Temario - Outline

- *Informe de actividades* (SAC-13-01)
- *Proyectos seleccionados* (por *Tema*):
- *Planes de trabajo*:
  - Plan de trabajo para mejorar las evaluaciones de poblaciones y calendario de las evaluaciones (item 6.d)
  - Evaluaciones de Estrategias de Ordenación (item 7.a)

- *Staff Activities Report* (SAC-13-01)
- *Selected projects* (by *Theme*):
- *Work plans*:
  - Work plan to improve stock assessments and assessment schedule (item 6.d)
  - Management Strategy Evaluation (MSE) (item 7.a)

# Estructura del Informe de actividades del personal (SAC-12-01)

## Structure of Staff Activities Report (SAC-12-01)

<b>PROJECT A.3.b: Develop databases of biological and fisheries parameters to support Ecological Risk Assessment and ecosystem models</b>	
<b>THEME:</b> Data Collection	
<b>GOAL:</b> A. Database maintenance, preservation, and access	
<b>TARGET:</b> A.3. Standardize and automate data submissions	
<b>EXECUTION:</b> Data Collection and Database Program, Biology and Ecosystem Program	
Objectives	Develop a comprehensive database of best-available biological and fisheries data to provide key parameters for Ecological Risk Assessment (ERA) and ecosystem models
Background	<ul style="list-style-type: none"><li>• The <a href="#">Antigua Convention</a> requires the IATTC to ensure the sustainability of target, associated, and dependent species affected by EPO tuna fisheries, and the ecosystem to which they belong.</li><li>• ERA and ecosystem models, used by IATTC staff to assess the ecological impacts of tuna fisheries in the EPO, require information on biological, physiological and trophodynamic characteristics of thousands of species in the EPO ecosystem.</li><li>• A database with the most up-to-date information for impacted species is required to expedite the initial parameterization, or updating, of future models.</li></ul>
Relevance for management	<ul style="list-style-type: none"><li>• The database will contain data needed for ERAs and ecosystem models, used to identify and prioritize data collection, mitigation, and/or management measures for vulnerable species.</li><li>• The databases could be shared with scientists of CPCs.</li></ul>
Duration	48 months
Workplan and status	<ul style="list-style-type: none"><li>• Jan–Apr 18: Create a basic database structure ready to be populated with biological parameters and associated literature sources.</li><li>• Ongoing: Conduct biological and ecological literature searches for species that interact with EPO fisheries</li><li>• Ongoing: Conduct literature searches for species that interact with EPO fisheries, identify fishery-related susceptibility parameters for bycatch species, create database</li></ul>
External collaborators	Scientists from CPCs interested in contributing to and/or using the databases
Deliverables	Comprehensive life history and susceptibility information that can be shared with IATTC (for a particular region and/or fishery).

## Informe de avances del proyecto (segunda página) Project progress report (second page)

<b>PROJECT A.3.b: Develop databases of biological and fisheries parameters to support Ecological Risk Assessment and ecosystem models</b>
<b>Updated:</b> March 2019
<b>Progress summary for the reporting period</b> <ul style="list-style-type: none"><li>• Life history database is in development for all species reported to have interacted with purse-seine and large-scale longline fisheries</li><li>• Values for fisheries-related susceptibility parameters have been obtained for many of the bycatch species</li></ul>
<b>Challenges and key lessons learnt</b> <ul style="list-style-type: none"><li>• Database development will be ongoing and parameter values will be updated as new literature and improved data becomes available</li></ul>
<b>Reports/publications/presentations</b> <p>Two manuscripts that use this life history and susceptibility data have been submitted to scientific journals</p>
<b>Comments:</b>

## Descripción del proyecto (primera página) Project description (first page)



# Uso de la nueva página web de la CIAT para buscar proyectos del PCE

## Use new IATTC website to browse the SSP for projects

### Demo with new website

CIAT IATTC

MEETINGS PUBLICATIONS NEWS RESOLUTIONS CONTACT

ESPAÑOL

ABOUT US SCIENTIFIC RESEARCH AIDCP DATA MANAGEMENT RESOURCES

Home / Research / Research projects

## Research projects

DESCRIPTION PROJECTS

Q Search

1. Theme 2. Goal 3. Target

4-Ecological impacts of fishing: assessment and mi --- ---

Programs Search title Date from Date to Completed Clear

--- ... .. Any Yes No Ongoing

1 2 >

14 PROJECT(S)

**L.1.a - Develop habitat models for bycatch species caught in the EPO to support ecological risk assessments (ERAs)**

01 Jun 2018 - 01 Jun 2019 **Funded**

**Objectives:**

- To use presence-only catch data to develop habitat models for all bycatch species caught in EPO tuna fisheries to facilitate mapping of their geographic range.
- To make distribution maps available in a format suitable for use as base

**L.1.b - Develop a flexible spatially-explicit ERA approach for quantifying the cumulative impact of tuna fisheries on data-limited bycatch species in the EPO**

01 Jan 2018 - 31 Dec 2021 **Funded**

**Objectives:**

- To develop a spatially-explicit model for quantifying the cumulative impact of multiple fisheries on data-limited bycatch species in the EPO
- To use the model to prioritize potentially vulnerable species for further





# Temas - Themes



Recolección de datos en apoyo científico de la ordenación

Data collection for scientific support of management

Estudios del ciclo vital en apoyo científico de la ordenación

Life-history studies for scientific support of management

Pesquerías sostenibles

Sustainable fisheries

Impactos ecológicos de la pesca: evaluación y mitigación

Ecological impacts of fisheries: assessment and mitigation

Interacciones entre el medio ambiente, el ecosistema, y la pesca

Interactions among the environment, the ecosystem and fisheries

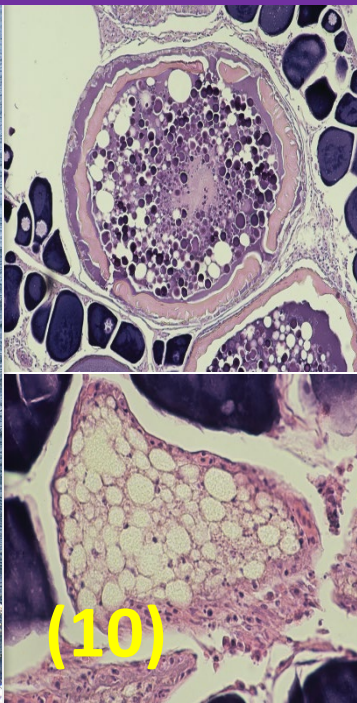
Transferencia de conocimientos y fomento de capacidad

Knowledge transfer and capacity building

Excelencia científica  
Scientific excellence



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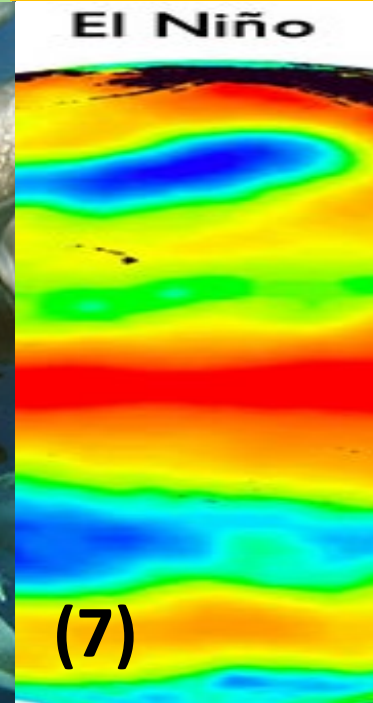
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# Recolección de datos en apoyo científico de la ordenación

## Data collection for scientific support of management



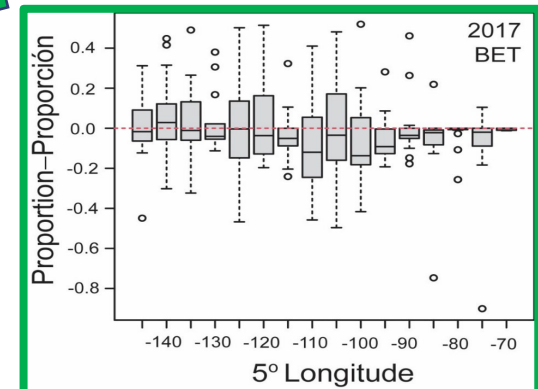
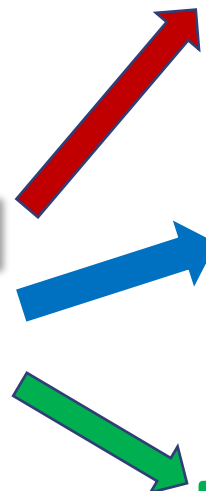
<b>1. DATA COLLECTION FOR SCIENTIFIC SUPPORT OF MANAGEMENT</b>
<b>A.1.a:</b> Database and Observer Data Collection Program Regular Activities
<b>A.3.a.</b> Conversion of all remaining Visual Basic 6 (VB6) computer programs to Visual Basic Net (VB.net).
<b>A.3.b:</b> Develop databases of biological and fisheries parameters to support Ecological Risk
<b>B.1.a (new):</b> Improving smart species identification tools
<b>B.3.a (new):</b> Individual Vessel Limit pilot study
<b>C.1.a:</b> Investigation of purse-seine catch composition bias associated to the COVID-19 pandemic
<b>C.2.b:</b> Pilot study of electronic monitoring (EM) of the activities and catches of longline vessels



item 8.b  
SAC-13 INF-E



item 8.a  
SAC-13 INF-D



item 6.a  
SAC-13-05



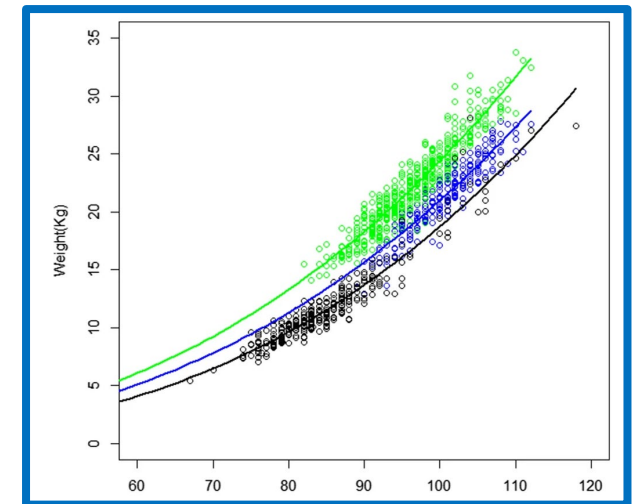
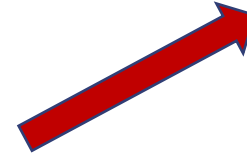
# Estudios del ciclo vital en apoyo científico de la ordenación

## Data collection for scientific support of management



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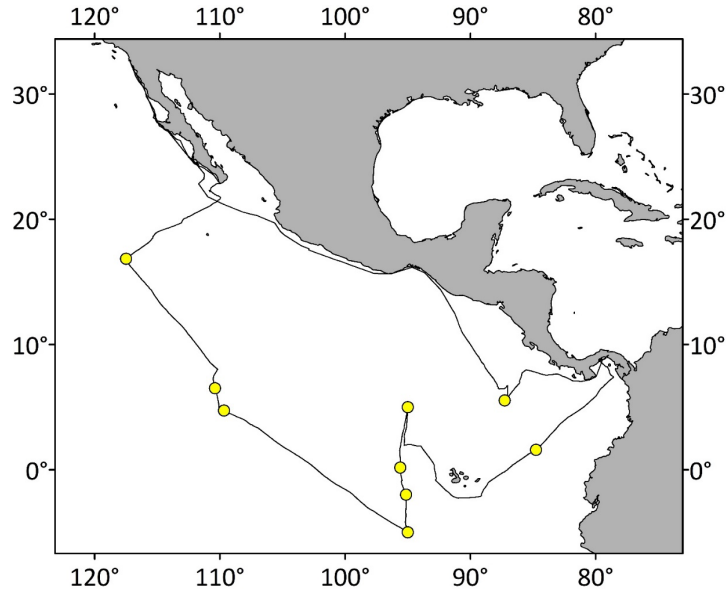
2. LIFE-HISTORY STUDIES FOR SCIENTIFIC SUPPORT OF MANAGEMENT	
E.2.a:	Investigate spatiotemporal variability in the age, growth, maturity, and fecundity of yellowfin tuna in the EPO
E.3.a:	Investigate geographic variation in the movements, behavior, and habitat utilization of yellowfin tuna in the EPO
E.4.a:	IATTC Regional Tuna Tagging Program (RTTP) - EPO
E.5.a:	Evaluate the Pacific-wide population structure of bigeye and skipjack tunas, using genetic analyses
E.5.b:	Investigate the spawning ecology of captive yellowfin tuna, using genetic analyses
F.2.a:	Investigate the movements, behavior, and habitat utilization of silky sharks in the EPO
F3.a:	Feasibility study to develop a sampling program for updating morphometric relationships and collecting biological samples for priority species in EPO tuna fisheries: Phase 1
G.1.a:	Studies of pre-recruit survival and growth of yellowfin tuna, including expanding studies of early-juvenile life stages
G.2.a:	Develop comparative models of pre-recruit survival and reproductive patterns of Pacific tunas
G.3.a:	Develop a larval growth index to forecast yellowfin recruitment



# IATTC Regional Tuna Tagging Program - Results

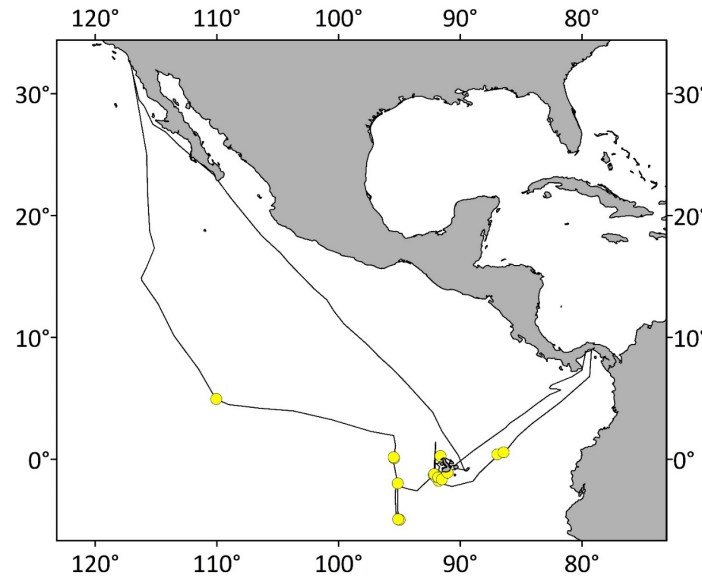
## Cruise 1

6 March to 30 April 2019



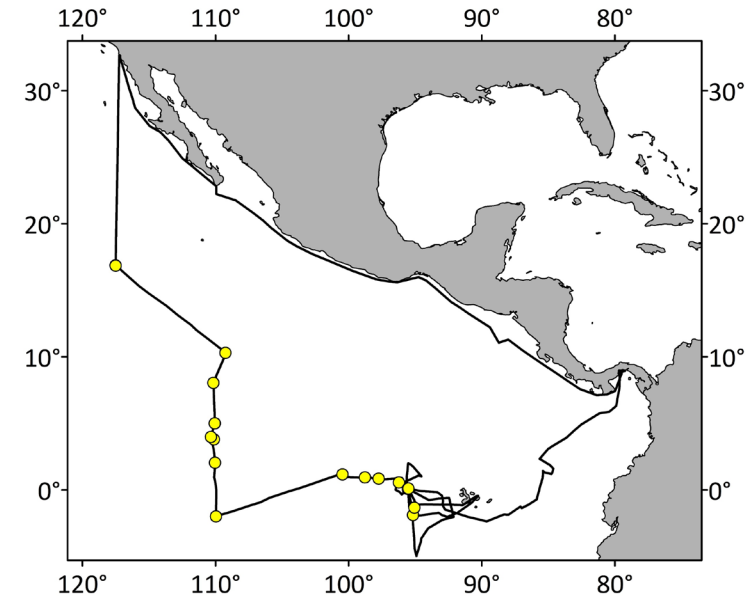
## Cruise 2

1 February to 30 April 2020



## Cruise 3

1 March 2020 - ongoing



The yellow dots are where tagging events occurred



# IATTC Regional Tuna Tagging Program – Cruise 3 results

Tag Type	BET	SKJ	YFT	Total
Plastic Dart	114	135	611	860
Archival	11	26	218	255
<b>Total</b>	<b>125</b>	<b>161</b>	<b>829</b>	<b>1,115</b>

# IATTC Regional Tuna Tagging Program - Results

**TABLE 1.** Releases and returns of plastic dart tags, by year of release and days at liberty. Percent of total tag returns which were validated by tag recovery specialists as high confidence are provided. Fish were tagged under the IATTC Regional Tuna Tagging Program (RTTP) in the EPO (1999-2020).

**TABLA 1.** Liberaciones y devoluciones de marcas de dardo plásticas por año de liberación y días en libertad. Se proporciona el porcentaje del total de devoluciones de marcas que fueron validadas por especialistas en recuperación de marcas como de alta confianza. Los peces fueron marcados bajo el Programa Regional de Marcado de Atunes (PRMA) de la CIAT en el OPO (1999-2020).

Year	SKJ Released	Returned					Total (%)	Percent High Confidence (n)
		<30	30-89	90-179	180 – 365	>365		
2019	177	6	19	5	2	1	35 (19.8)	60.0 (21)
2020	5854	730	466	210	71		1,569 (26.8)	18.3 (287)
All	6031	736	485	215	73	1	1,604 (26.6)	19.2 (308)

2022      135

# IATTC Regional Tuna Tagging Program - Results

**TABLE 2.** Releases and returns of archival tags, by year of release and days at liberty. Fish were tagged under the IATTC Regional Tuna Tagging Program (RTTP) in the EPO (1999-2020).

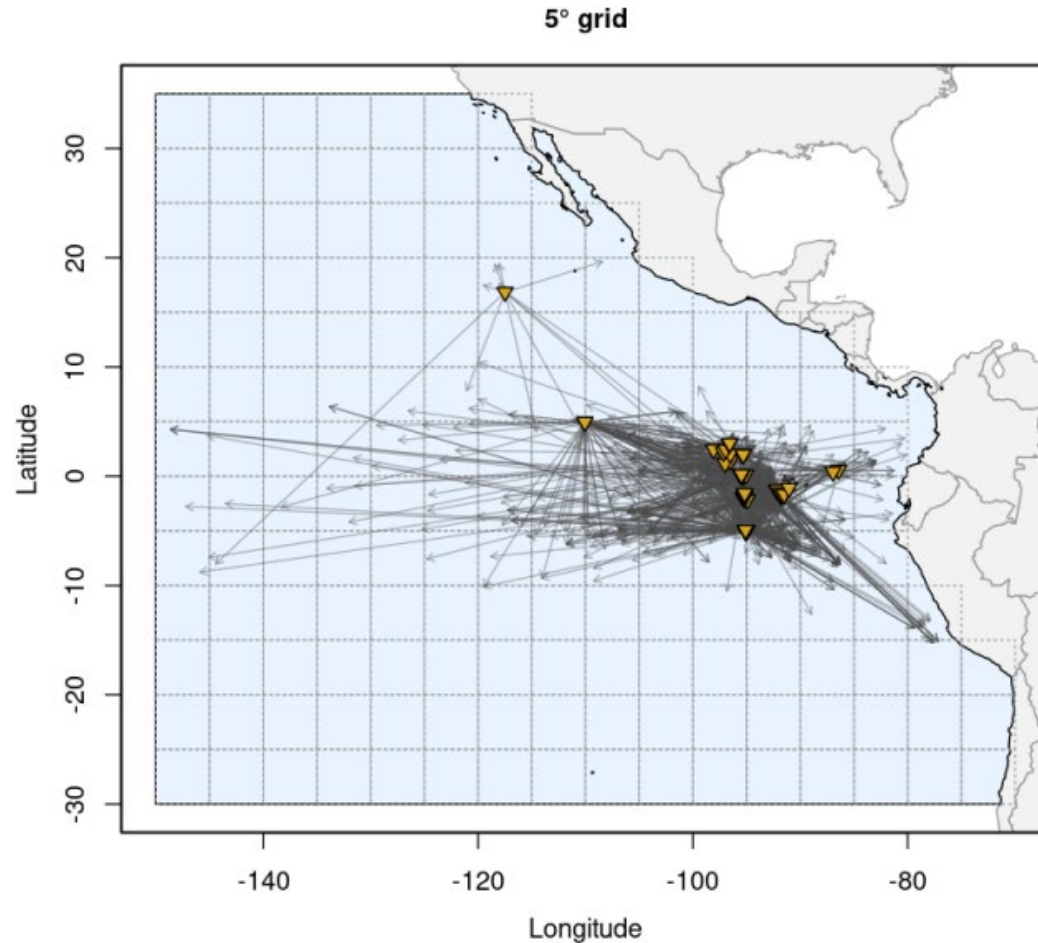
**TABLA 2.** Liberaciones y devoluciones de marcas archivadoras por año de liberación y días en libertad. Los peces fueron marcados bajo el Programa Regional de Marcado de Atunes (PRMA) de la CIAT en el OPO (1999-2020).

Year	SKJ Released	Returned					Total (%)
		<30	30-89	90-179	180 – 365	>365	
2019	43	3	0	0	2	0	5 (11.6)
2020	185	10	13	9	3	NA	35 (18.9)
All	228	13	13	9	5	0	40 (17.5)

2022 26



# IATTC Regional Tuna Tagging Program - Results



item 6.d.ii: SKJ  
spatiotemporal  
modeling (SAC-13-08)

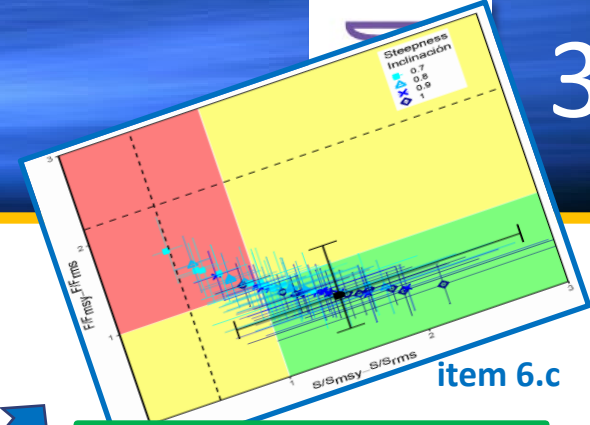
**FIGURE 4.** Skipjack tuna linear displacements ( $n = 700$ ) for fish at liberty greater than 30 d shown as dots, color coded for six distinct release locations, shown as squares. Fish were tagged under the IATTC Regional Tuna Tagging Program (RTTP) in the EPO (1999-2020).

**FIGURA 4.** Los desplazamientos lineales del atún barrilete ( $n = 700$ ) para peces en libertad mayor a 30 d se muestran como puntos, codificados por colores para seis lugares distintos de liberación, se muestran como cuadrados. Los peces fueron marcados bajo el Programa Regional de Marcado de Atunes (PRMA) de la CIAT en el OPO (1999-2020).

# Pesquerías sostenibles

## Sustainable fisheries

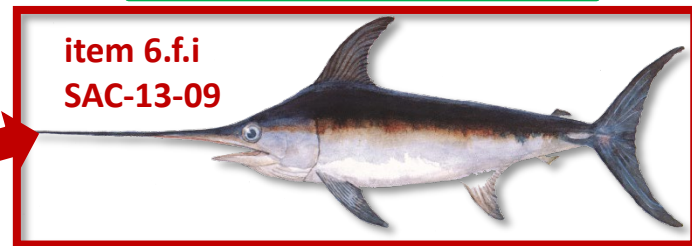
<b>3. SUSTAINABLE FISHERIES</b>
H.1.a: Improve the bigeye tuna stock assessment phase 2
H.1.b: Improve the yellowfin tuna stock assessment phase 2: Explore alternative hypotheses of stock structure and life-history for YFT in exploratory stock assessment models
H.1.c: Investigate potential changes in the selectivity of the longline fleet resulting from changes in gear configuration
H.1.d: Improve indices of abundance based on longline CPUE data
H.1.e: Construct indices of abundance and composition data for longline fleets
H.1.f: Improving the methodology of the risk analysis
H.3.a: Analysis of recent skipjack tagging data
H.3.b: Skipjack Stock assessment
H.3.c: Estimate skipjack growth rates from recent tagging data
H.4.a: Conduct routine stock assessments of tropical tunas
H.6.a: Participate in assessments of shared species by the International Scientific Committee (ISC)
H.7.b: South Pacific swordfish assessment
H.7.c: Participate in south Pacific albacore assessment
H.8.b: Second trial dolphin survey
H.8.c: Cow-calf separation
I.1.a: Conduct a Management Strategy Evaluation
J.2.a: Quantify the relationship between v and mortality
J.2.b (new): Identifying operational characteristics of the eastern Pacific Ocean
J.3.a: Developing alternative buoy-derived tuna biomass indexes
K.1.a: POSEIDON project



item 6.c



item 6.d (SAC-13-07/08)



item 6.f.i  
SAC-13-09



item 6.f.ii (SAC-13 INF-S)



SAC-13 INF-F, SAC-13-01



FAD-06-03



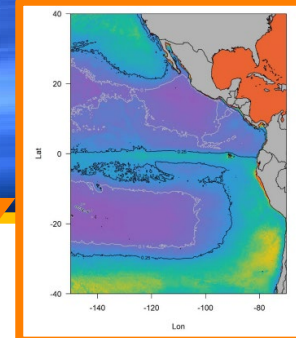
item 7.a (SAC-13 INF-C)

# Impactos ecológicos de la pesca: evaluación y mitigación

## Ecological impacts of fisheries: assessment and mitigation



4. ECOLOGICAL IMPACTS OF FISHERIES: ASSESSMENT AND MITIGATION	
L.1.a:	Develop habitat models for bycatch species caught in the EPO to support ecological risk assessments (ERAs)
L.2.b (new):	Vulnerability assessment of shark bycatch in EPO tuna fisheries using the EASI-Fish approach
species in the EPO	
L.2.d (new):	Pacific-wide vulnerability assessment of pelagic shark species caught as bycatch in tuna fisheries
L.2.e (new):	Vulnerability assessment and efficacy of potential conservation measures for the east Pacific leatherback turtle stock
M.1.b:	Test sorting grids
M.1.c:	Acoustic discrimination to avoid purse seine catches of undersized yellowfin tuna
M.1.d:	Developing and testing bycatch release devices in tuna purse seiners
M.2.b:	Evaluate best handling practices for maximizing post-release survival of silky sharks in longline fisheries, and identification of silky shark pupping areas for bycatch mitigation
M.2.c:	Manta and devil ray post-release survival, movement ecology, and genetic population
M.3.b:	Spatial and temporal closures and the tradeoff between bycatch and target catches
M.5.a:	Develop and test non-entangling and biodegradable FADs
M.5.c:	Definition of guidelines to reduce the impact of lost and abandoned FADs on marine turtles



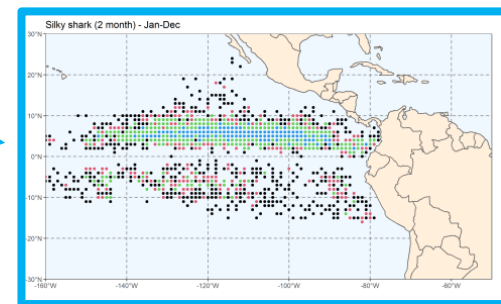
BYC-11-01



item 11.a  
SAC-13-11



BYC-11-02



BYC-11-04



FAD-06-02

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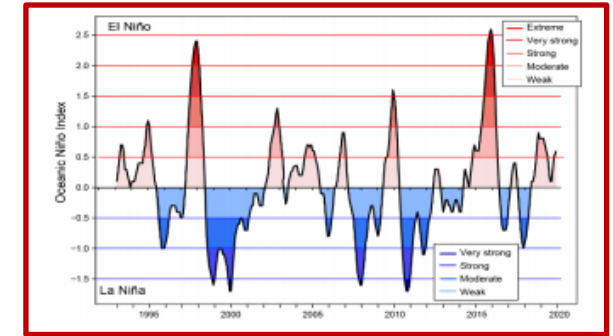
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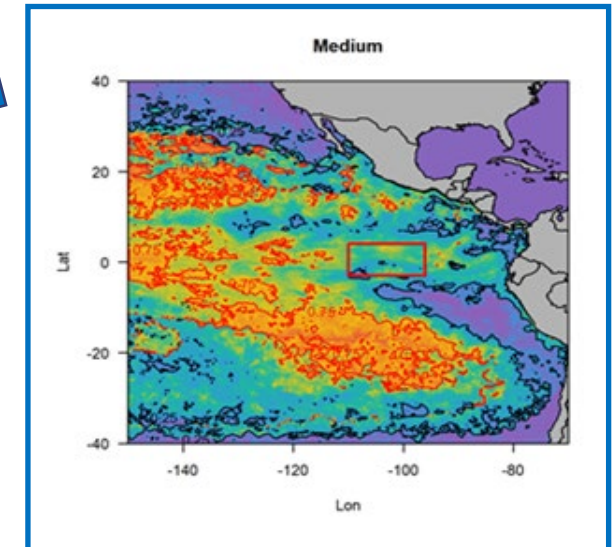
BYC-11 INF-A







item 10.a  
SAC-13-10



- 5. INTERACTIONS AMONG THE ENVIRONMENT, THE ECOSYSTEM, AND FISHERIES
- N.1.b: Investigate the effects of wind-induced microturbulence on yellowfin larval survival
- N.1.c: Developing dynamic species distributions models to inform conservation and management of non-target species and communities in the eastern Pacific Ocean
- N.2.a. Develop models of the effects of climate change on pre-recruit life stages of tropical tunas
- N.2.b: Supporting climate-ready and sustainable fisheries: using satellite data to conserve and manage life in the ocean and support sustainable fisheries under climate change**
- O.2.a: Develop and implement analytical tools for understanding the trophic ecology of apex predators
- O.2.b: An updated ecosystem model of the tropical EPO for providing standardized ecological indicators for monitoring of ecosystem integrity
- O.2.c: Temporal network analysis of bycatch communities caught in purse-seine fisheries





## 6. KNOWLEDGE TRANSFER AND CAPACITY BUILDING

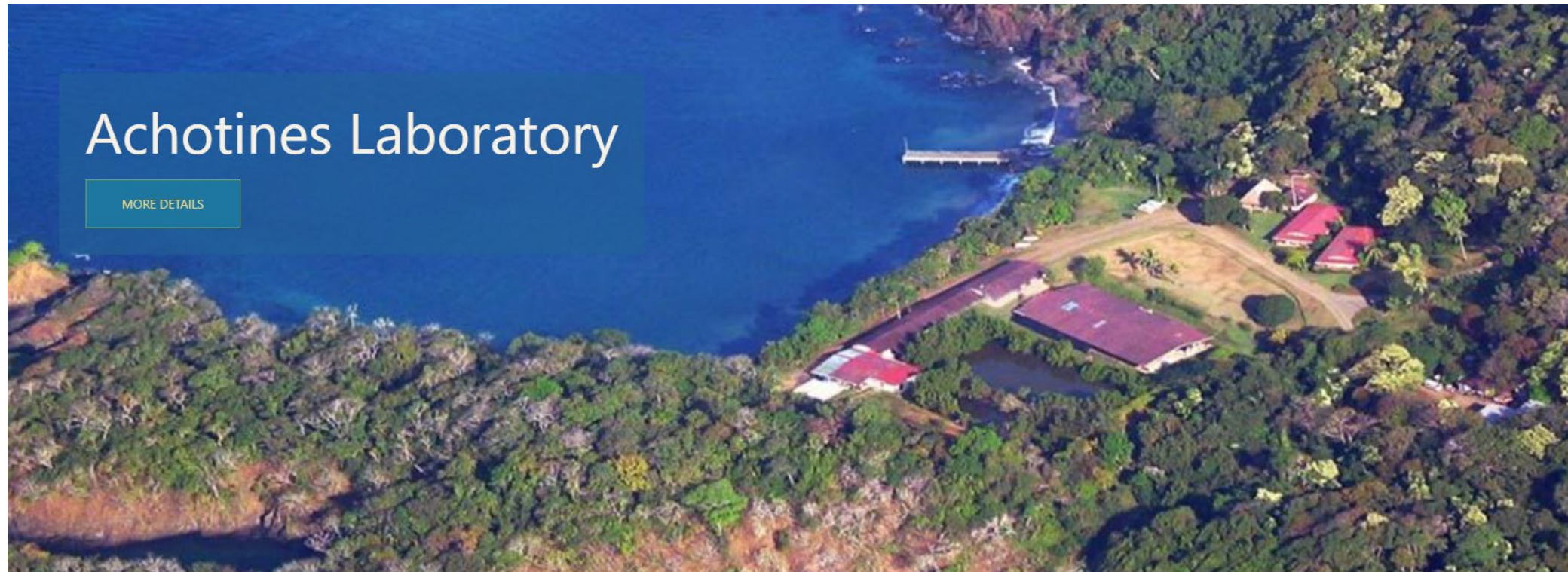
**P.1.a:** Fulfil requests for development of database and data processing applications for entities outside the IATTC

**P.1.b:** Respond to requests for scientific analyses

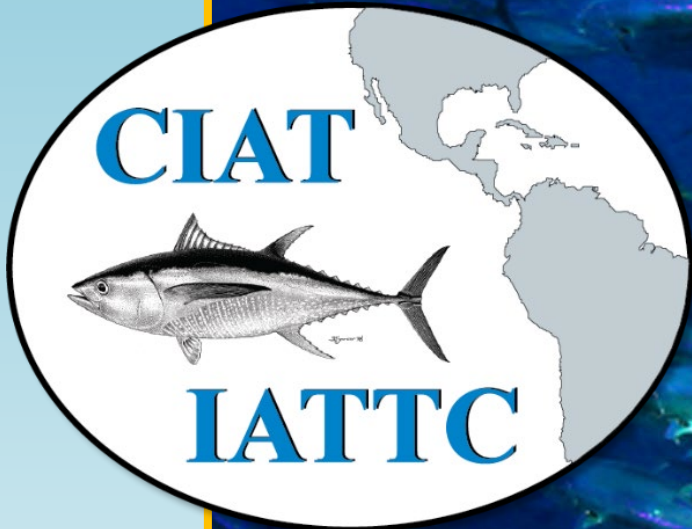
**Q.1.a:** Achotines Laboratory support of Yale University's Environmental Leadership Training Initiative (ELTI) in Panama

## 7. SCIENTIFIC EXCELLENCE

### U.1.a: Long-term plan to strengthen research at the Achotines Laboratory







¿Preguntas?  
Questions?

