



Food and Agriculture
Organization of the
United Nations



Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien

TECHNICAL WORKSHOP ON GLOBAL HARMONIZATION OF TUNA FISHERIES STATISTICS

CWP AD-HOC TASK GROUP ON REFERENCE
HARMONIZATION

OVERVIEW OF IOTC FISHERIES DATA REPORTING AND MANAGEMENT PROCESSES

IOTC HISTORY AND MANDATE

- The agreement for the establishment of the Indian Ocean Tuna Commission (IOTC) was signed in **1993** and entered in force in **1996**;
- The IOTC agreement covers **16** tuna and tuna-like species...
- ... within an area of competence corresponding to the **Western** and **Eastern** Indian Ocean (FAO areas F51 and F57);
- As of January 2018, the IOTC has **34** CPCs of which **31** are *contracting parties* while **3** are *cooperating, non-contracting parties*;
- IOTC mandate is **not** to directly collect data: rather, the IOTC Secretariat **receives** information from CPCs and **contributes** to strengthen data collection at national level through *capacity building* activities.

IOTC REQUIREMENTS

- **50** *active* IOTC Resolutions (binding)
- **31** have reporting obligations
- **83** total reporting requirements
- Reporting ***information*** (e.g. Resolution 16/07 – *Banning of artificial lights to attract fish*)
- Reporting ***data*** (e.g. Resolution 15/02 – *Mandatory statistical information*)

IOTC RESOLUTIONS (SCIENCE)

- **15/02** – Mandatory statistical data (all fisheries)
- **15/05** – Conservation of marlins
- **17/05** – Conservation of sharks
- **17/08** – Procedures on a Fish Aggregating Devices (FADs) mgmt. plan

- **11/04** – Observers coverage
- **13/04** – Interaction with cetaceans
- **13/05** – Interaction with whale sharks

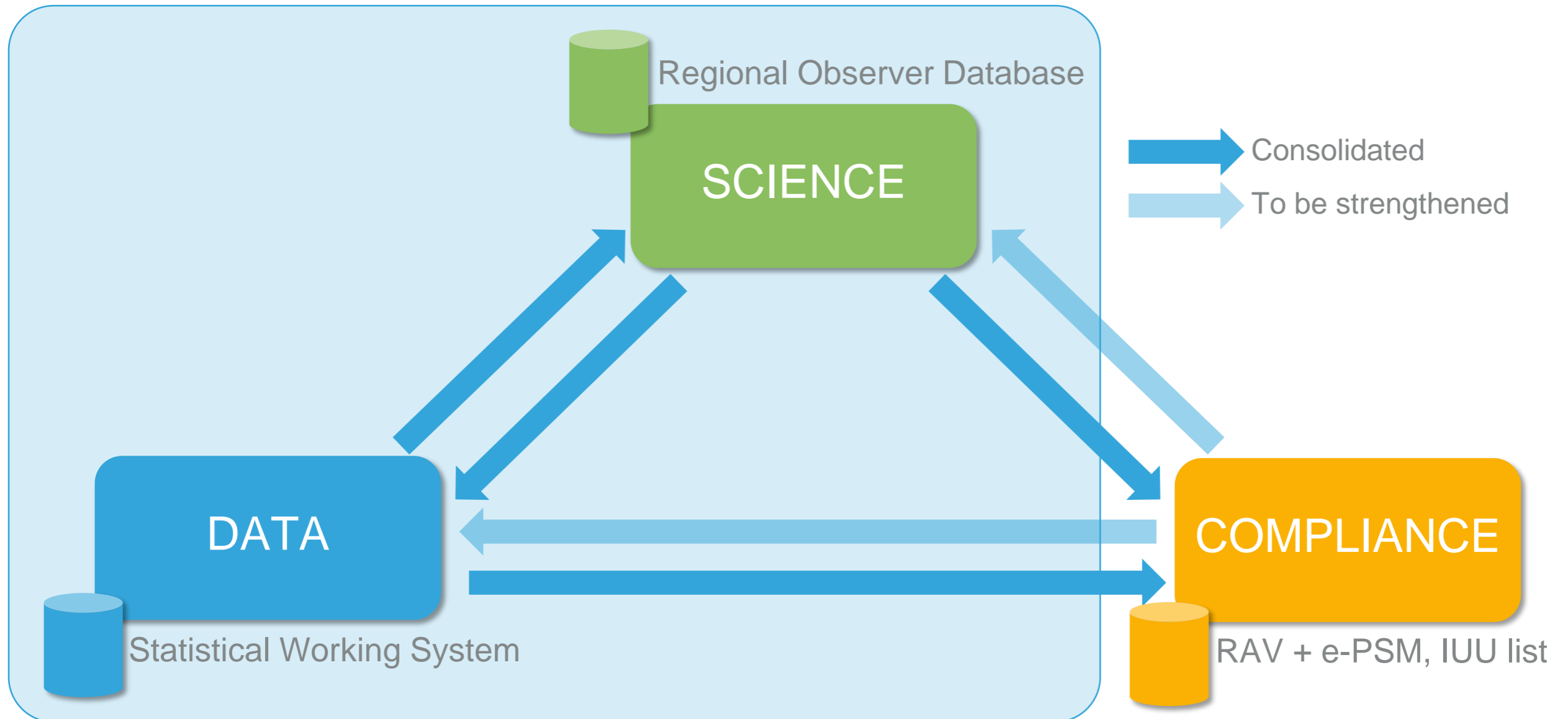
IOTC RESOLUTIONS (COMPLIANCE)

- **01/06** – Import of frozen bigeye tuna caught by large-scale LL vessels
- **05/03** – Catch composition landings (foreign vessels)
- **10/08** – Attributes of active domestic vessels
- **10/10** – Import, landing, transshipment of tuna and tuna-like products in port
- **14/05** – Attributes of foreign vessels licensed to fish IOTC species in the waters of coastal States
- **15/04** – Attributes of authorized vessels
- **17/08** – Procedures on a Fish Aggregating Devices (FADs) mgmt. plan

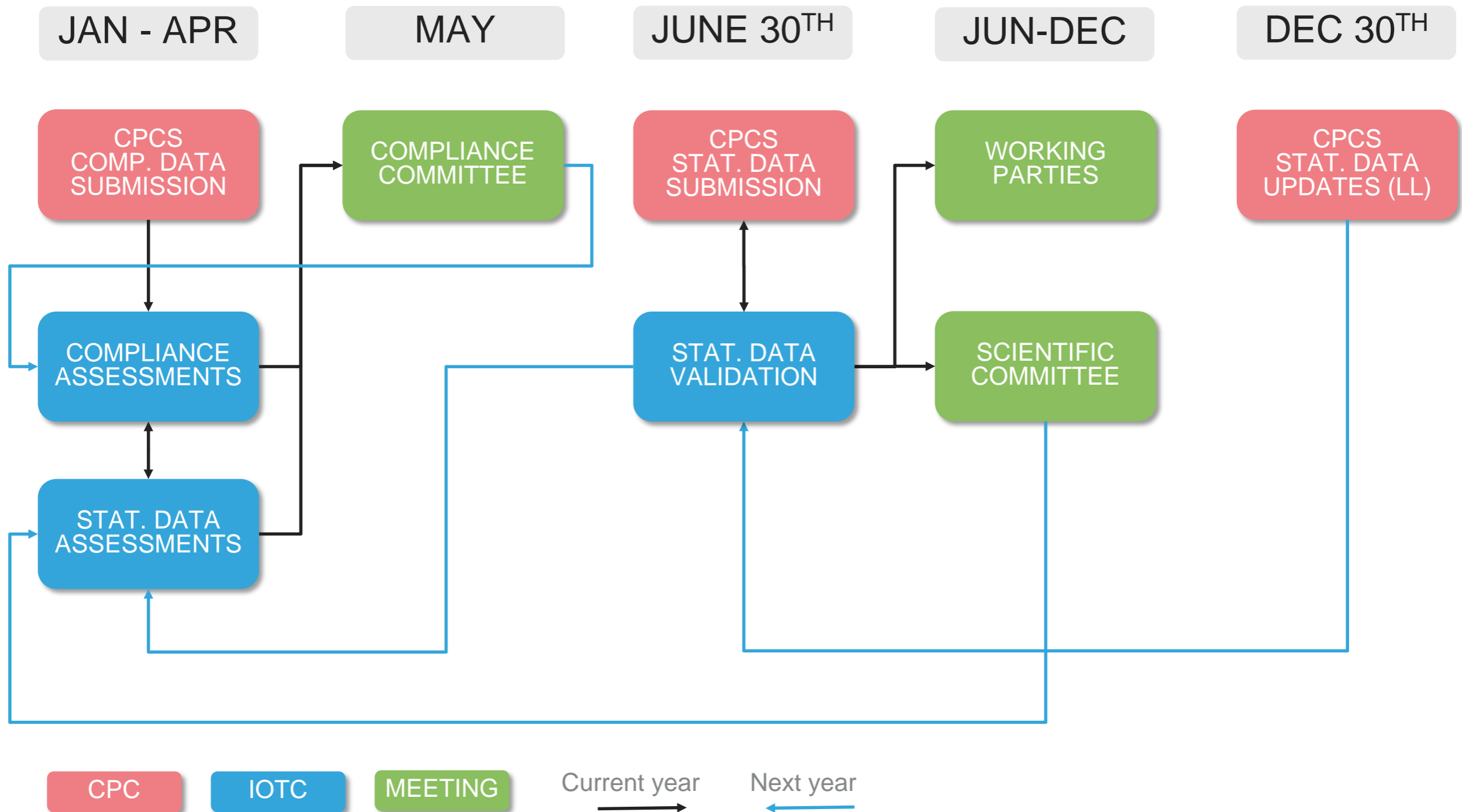
IOTC SECRETARIAT STRUCTURE

Three distinct, interacting **sections**, sharing information with CPCs, scientists, policy makers and stakeholders

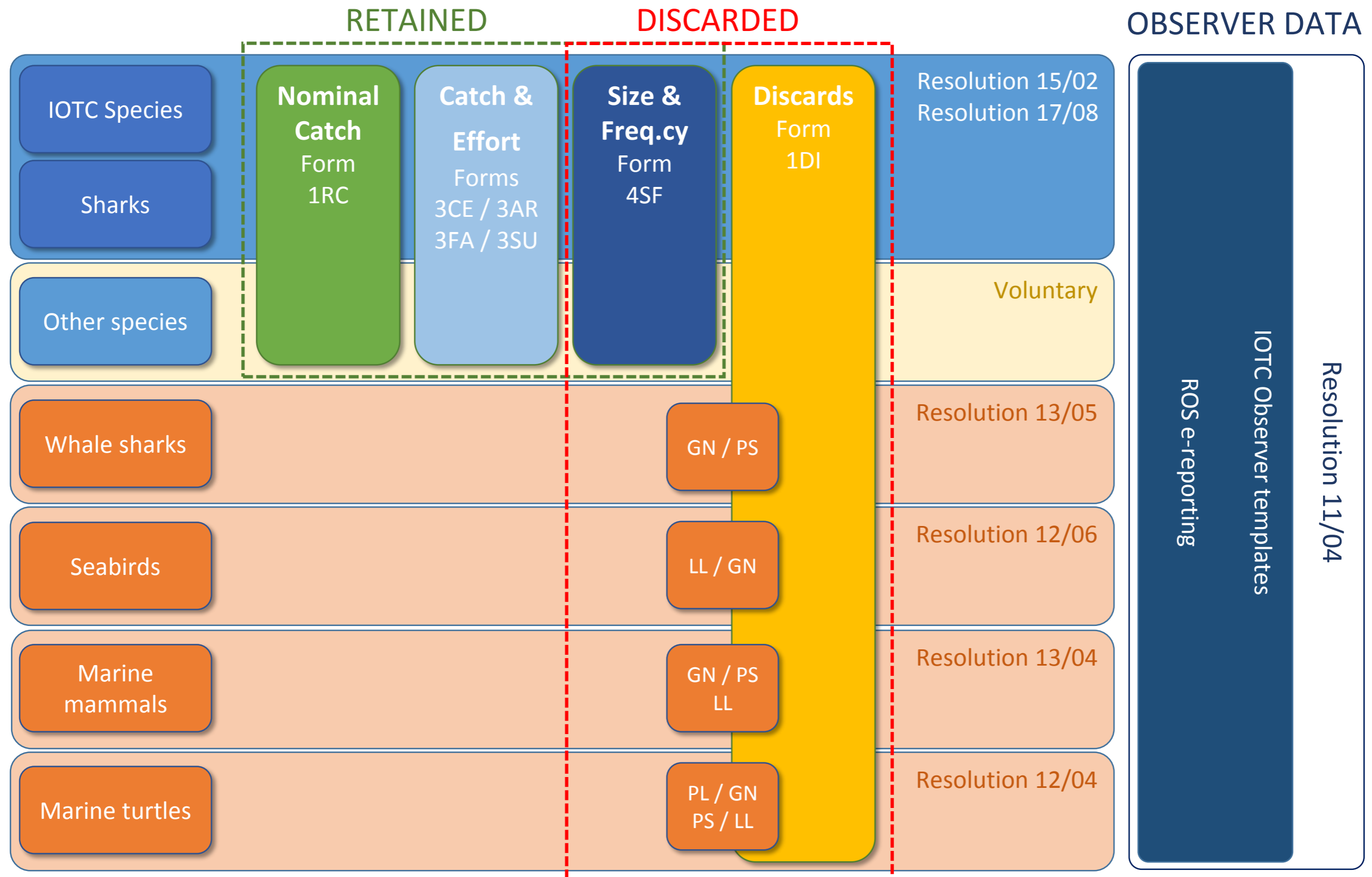
CWP focus



IOTC TIMELINE



DATA REPORTING REQUIREMENTS



IOTC MAIN DATA SETS

* currently subject to revisions

	DATA SET	FORM	TIME RES.	AREA RES.	NOTES
OBLIGATORY	Nominal catches in live weight	1_RC*	Year / Quarter	IO areas (W/E)	---
	Discard levels in live weight or numbers	1_DI*	Year	IO areas (W/E)	---
	Catch-and-effort in live weight or numbers	3_CE	Month	1°x1° CWP grids	Surface fisheries
	Catch-and-effort in live weight or numbers	3_CE	Month	5°x5° CWP grids	Longline fisheries
	Catch-and-effort in live weight or numbers	3_AR	Month	CWP grids + custom areas	Coastal fisheries
	FAD numbers, interactions and catches	3_FA*	Month	1°x1° CWP grids	Surface fisheries
	No. of support vessels and effort (days at sea)	3_SU	Month	1°x1° CWP grids	PS fisheries
	Size-frequency data	4_SF	Month	5°x5° CWP grids	At least 1 fish should be sampled per each MT of catches reported for the strata
VOLUNTARY	No. of fishing crafts by type of fisheries and craft size	2_FC	Year	Not applicable	---
	Average fish prices by type of fish product and market	7_PR	Month	Not applicable	---
	Country indicators (e.g. GDP, OECD status etc.)	N.A.	Year	Not applicable	---

IOTC MAIN DATA SETS | DETAILS

- **Nominal Catches:** annual report of total catches (in weight) by fleet, gear, species (IOTC and non-IOTC) and IO area
 - Includes retained catches and catches used as bait / for crew consumption;
- **Discards:** annual report of discards (in weight or number) by fleet, gear, species and IO area
 - Shall include also relevant non-commercial species (mammals, seabirds, cetaceans, whale sharks and sea turtles);
- **Catch-and-effort:** annual report of efforts and catches (in weight or number) by month, fleet, gear, species (IOTC and non-IOTC) and grid / irregular area
 - Depending on the gear type, catches can be either in numbers (longline) or weight;
 - Also, the minimum grid resolution changes accordingly, and goes from 1x1 degrees grids (surface fisheries) to 5x5 degrees grids (longline fisheries) to any grid / irregular area (coastal / artisanal fisheries);
- **Size-frequency:** annual report of size measurements (mostly, lengths) by month, fleet, gear, species and type of measure.

IOTC MAIN DATA SETS | ADDITIONAL NOTES

- Datasets reported using the IOTC forms are expected to come with the following metadata, either at *global* or at *each strata* level:
 - **Sender / National Organization **contact details****
 - **Type** of data (*final / preliminary*)
 - **Target species** for the specific fleet + gear combination
 - **Data source** (i.e. *how the original data was collected*)
 - **Data processing** (i.e. *what type of estimation procedure has been applied to produce the final data*)
 - **Coverage level** (i.e. *how extensively the strata have been sampled*)

EXAMPLES | FORM 4_SF – SIZE-FREQUENCY

AFFICHER FORMULAIRE EN FRANÇAIS

DISPLAY LISTS IN

SUBMISSION CONTACT

NAME PHONE No

E-MAIL

ORGANISATION

NAME PHONE No

E-MAIL

REPORTING COUNTRY #VALUE!

FLAG COUNTRY #VALUE!

DATA PROCESSING #VALUE!

DATA SOURCES #VALUE!

REPORTING YEAR #VALUE!

MONTH #VALUE!

TYPE OF CATCH SAMPLED #VALUE!

TYPE OF MEASUREMENT #VALUE!


MEASURING TOOL #VALUE!

PSLS #VALUE!

NO. OF FISH #VALUE!

MONTH	GRID				AREA	ESTIMATION	SIZE CLASS		NO. OF FISH
	SIZE	QUADRANT	LATITUDE	LONGITUDE			LOW CLASS	HIGH CLASS	
1	6	1	0	45 6100045	AV	38	40	206.15	
4	6	1	0	45 6100045	AV	38	40	558.35	
5	6	1	0	45 6100045	AV	38	40	394.19	
7	6	1	0	45 6100045	AV	38	40	102.48	
8	6	1	0	45 6100045	AV	38	40	132.65	
9	6	1	0	45 6100045	AV	38	40	154.37	
10	6	1	0	45 6100045	AV	38	40	3023.84	
11	6	1	0	45 6100045	AV	38	40	476.2	
12	6	1	0	45 6100045	AV	38	40	8.8	
1	6	1	0	45 6100045	AV	40	42	173.67	
4	6	1	0	45 6100045	AV	40	42	327.23	
5	6	1	0	45 6100045	AV	40	42	231.02	
7	6	1	0	45 6100045	AV	40	42	436.89	
8	6	1	0	45 6100045	AV	40	42	565.5	
9	6	1	0	45 6100045	AV	40	42	658.1	
10	6	1	0	45 6100045	AV	40	42	2626.28	
11	6	1	0	45 6100045	AV	40	42	413.59	
12	6	1	0	45 6100045	AV	40	42	7.64	
1	6	1	0	45 6100045	AV	42	44	549.53	
4	6	1	0	45 6100045	AV	42	44	244.35	
5	6	1	0	45 6100045	AV	42	44	172.51	
7	6	1	0	45 6100045	AV	42	44	1644.86	
8	6	1	0	45 6100045	AV	42	44	2129.07	
9	6	1	0	45 6100045	AV	42	44	2477.69	
10	6	1	0	45 6100045	AV	42	44	3413.55	
11	6	1	0	45 6100045	AV	42	44	537.57	
12	6	1	0	45 6100045	AV	42	44	9.93	
1	6	1	0	45 6100045	AV	44	46	1160.38	
4	6	1	0	45 6100045	AV	44	46	176.2	
5	6	1	0	45 6100045	AV	44	46	124.39	
7	6	1	0	45 6100045	AV	44	46	3153.48	
8	6	1	0	45 6100045	AV	44	46	4089.58	
9	6	1	0	45 6100045	AV	44	46	4759.22	
10	6	1	0	45 6100045	AV	44	46	5720.03	
11	6	1	0	45 6100045	AV	44	46	900.79	
12	6	1	0	45 6100045	AV	44	46	16.64	
1	6	1	0	45 6100045	AV	46	48	2534.69	
4	6	1	0	45 6100045	AV	46	48	453.42	
5	6	1	0	45 6100045	AV	46	48	320.11	
7	6	1	0	45 6100045	AV	46	48	5299.36	
8	6	1	0	45 6100045	AV	46	48	6859.4	
9	6	1	0	45 6100045	AV	46	48	7982.56	
10	6	1	0	45 6100045	AV	46	48	26572.54	
11	6	1	0	45 6100045	AV	46	48	4184.65	
12	6	1	0	45 6100045	AV	46	48	77.31	
1	6	1	0	45 6100045	AV	48	50	1361.74	
4	6	1	0	45 6100045	AV	48	50	287.48	
5	6	1	0	45 6100045	AV	48	50	202.96	
7	6	1	0	45 6100045	AV	48	50	2523.69	
8	6	1	0	45 6100045	AV	48	50	3266.63	
9	6	1	0	45 6100045	AV	48	50	3801.51	
10	6	1	0	45 6100045	AV	48	50	41878.87	
11	6	1	0	45 6100045	AV	48	50	6595.09	
12	6	1	0	45 6100045	AV	48	50	121.84	

EXAMPLES | OBS. DATA REPORTING TEMPLATE

 Indian Ocean Tuna Commission Operation information - LL Form OP-LL											
IOTC Trip number				IOTC operation/set number							
Operation details (LL)											
Set start date and time					Set start location						
DD	MM	YYYY	hh	mm	Latitude	(units)	Longitude	(units)			
Target species											
Comments											
Line setting											
Length mainline set			No. hooks between floats			Line set type					
No. floats set			No. hooks set			Branchline set interval (m)					
Shallowest hook depth			No. light sticks								
Deepest hook depth			No. shark lines set								
Branchlines											
Type A					Type B						
Section 1		Section 2		Section 3	Section 4 (leader)	Section 1		Section 2		Section 3	Section 4 (leader)
Material						Material					
Diameter (mm)						Diameter (mm)					
Length (m)						Length (m)					
Type C					Type D						
Section 1		Section 2		Section 3	Section 4 (leader)	Section 1		Section 2		Section 3	Section 4 (leader)
Material						Material					
Diameter (mm)						Diameter (mm)					
Length (m)						Length (m)					
Branchline											
Type	A	B	C	D							
No. set											
Bait					Hooks						
Type					A	B	C	D			
Species					Number set						
Ratio											
Dye colour											
Bycatch mitigation measures used											
Low light night setting			Underwater setting								

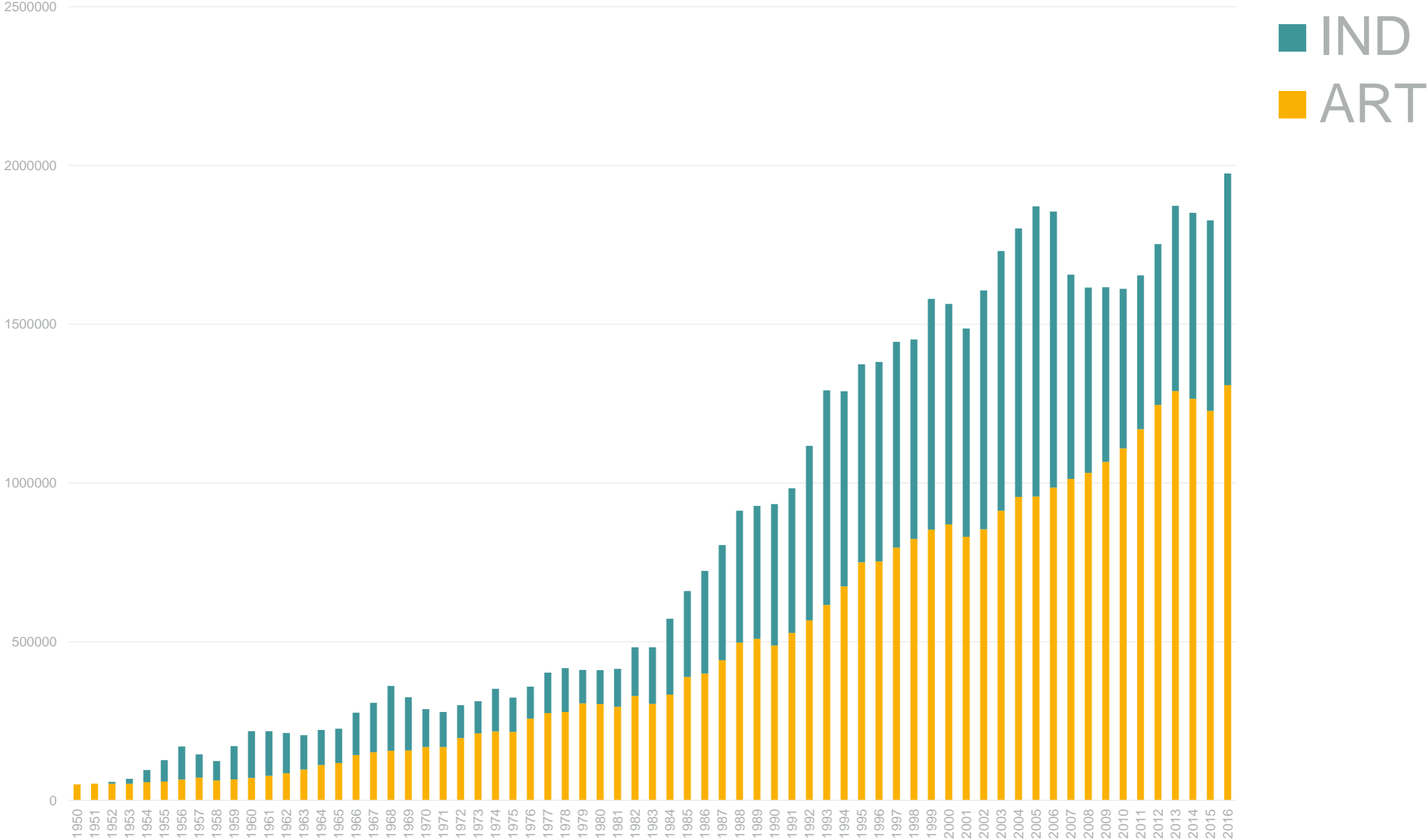
PRACTICAL ISSUES

- IOTC forms and templates are **RECOMMENDED**, not mandatory
 - CPCs tend to submit data in whatever format they consider more appropriate or comfortable, sometimes in an incomplete way;
- IOTC forms include **reference lists** and **basic quality checks**, and are password protected to avoid tampering
 - CPCs often use their own copy of the forms, lacking data input checks and proper, standardized reference data;
- IOTC forms have a **rigid structure**, suited to be filled *manually* by a trained clerk
 - This can be impractical for some data sets; many CPCs lack adequate capacity to design automated processes to correctly fill the forms with required data;
- Scientific observer data often come in formats (PDF, Word document) **not suitable for acquisition and processing**
 - The ROS pilot project considers – among its outputs – standardized data collection and reporting tools

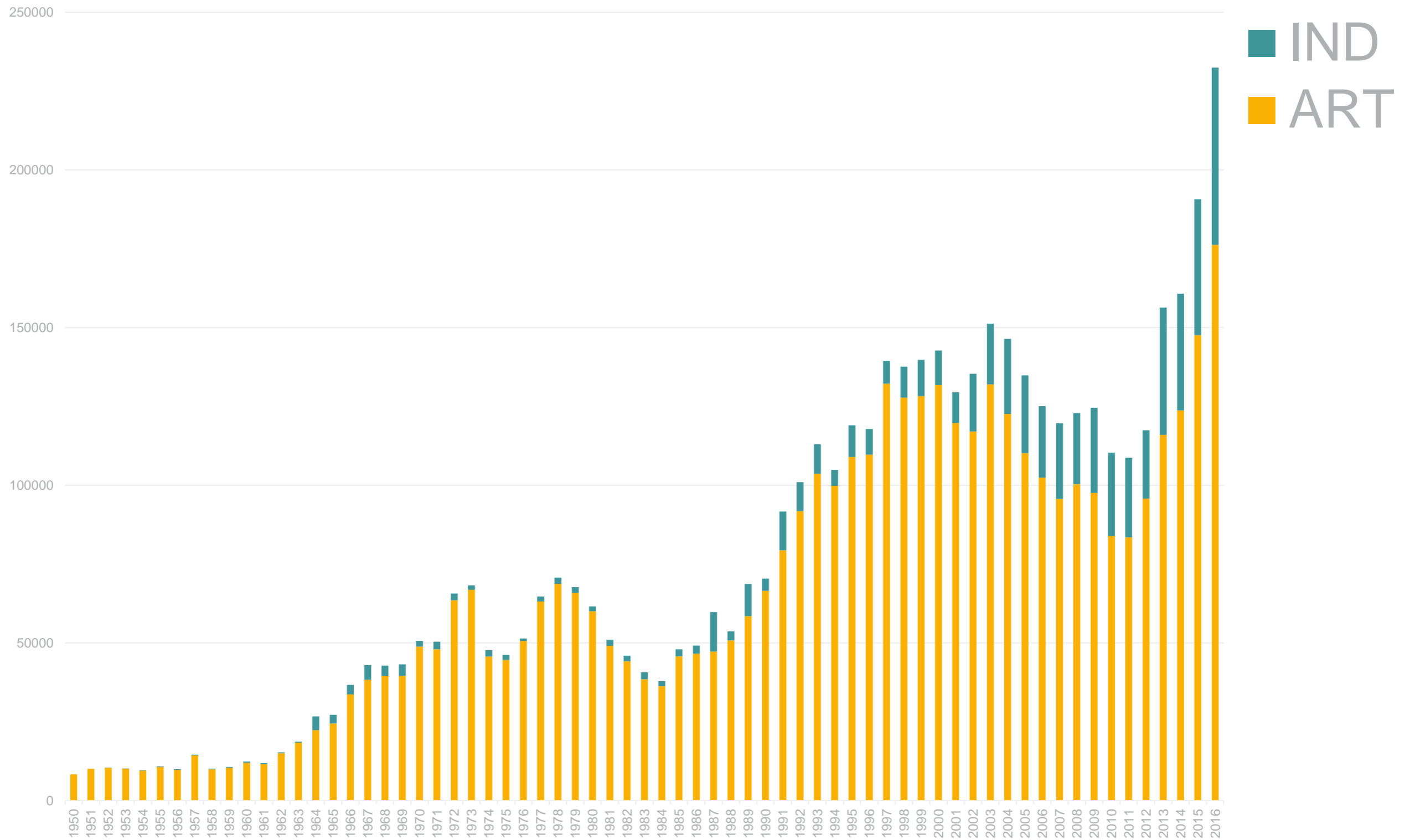
KNOWN ISSUES AND CHALLENGES

- Over two-thirds of all catches reported to the IOTC Secretariat in recent years comes from **ARTISANAL** fisheries;
- The fraction of artisanal catches is even higher if we limit the analysis to **non-IOTC species** only;
- Collection and reporting of data from artisanal, small scale fisheries poses a number of **relevant challenges** that are currently affecting the proper reporting of nominal catches and geo-referenced catch-and-effort data for these fisheries;
- Some countries (LKA, IRN, KEN, COM) are improving their own data collection processes and systems, also with **support from the IOTC Secretariat** (data compliance and support missions);
- A project to support data collection from **recreational fisheries** (mostly, billfish species) completed its first phase in Q4-2017;
- The overall issues with artisanal fisheries in the region are still far from being resolved, though.

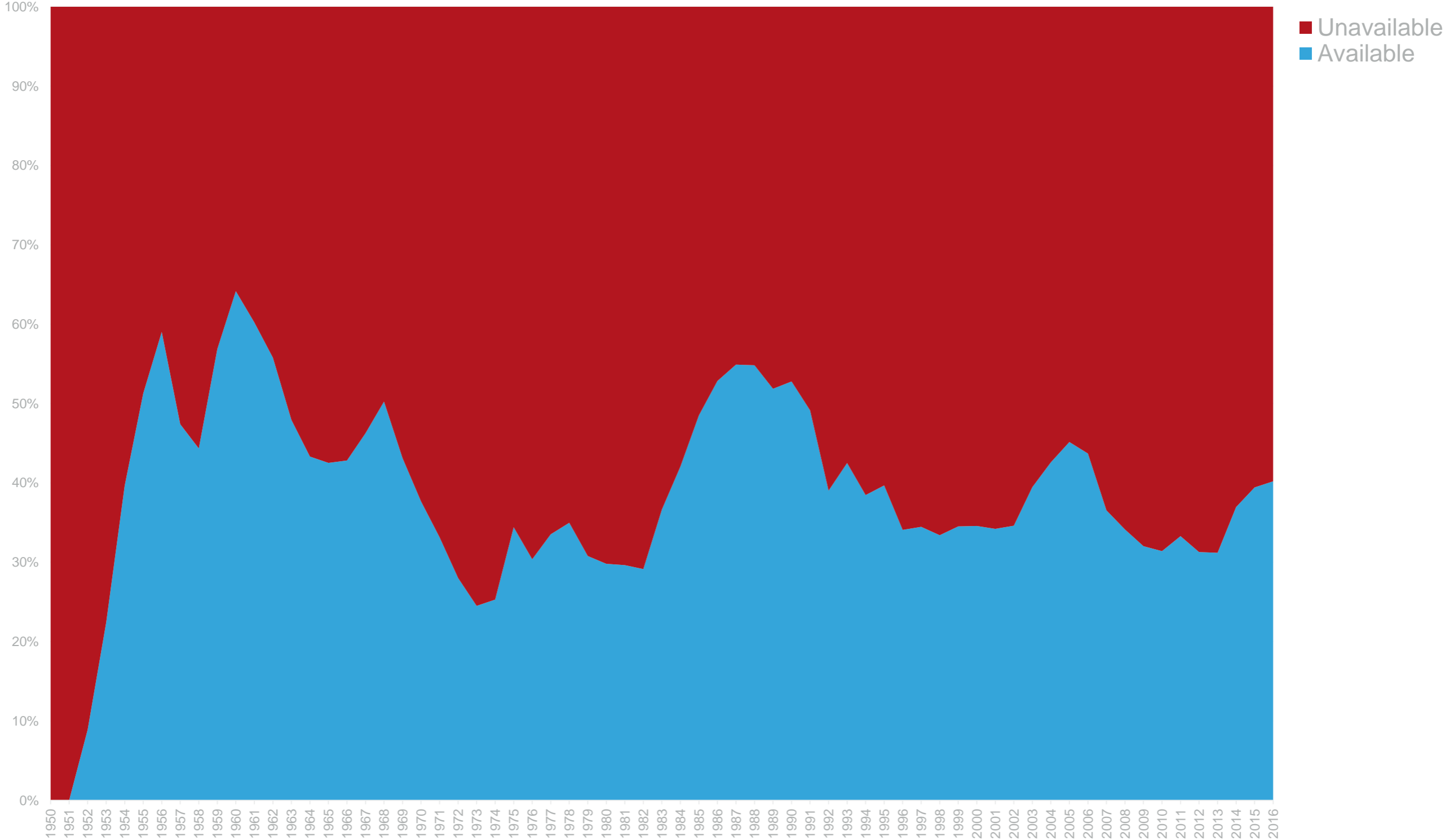
ARTISANAL VS. INDUSTRIAL CATCHES (ALL)



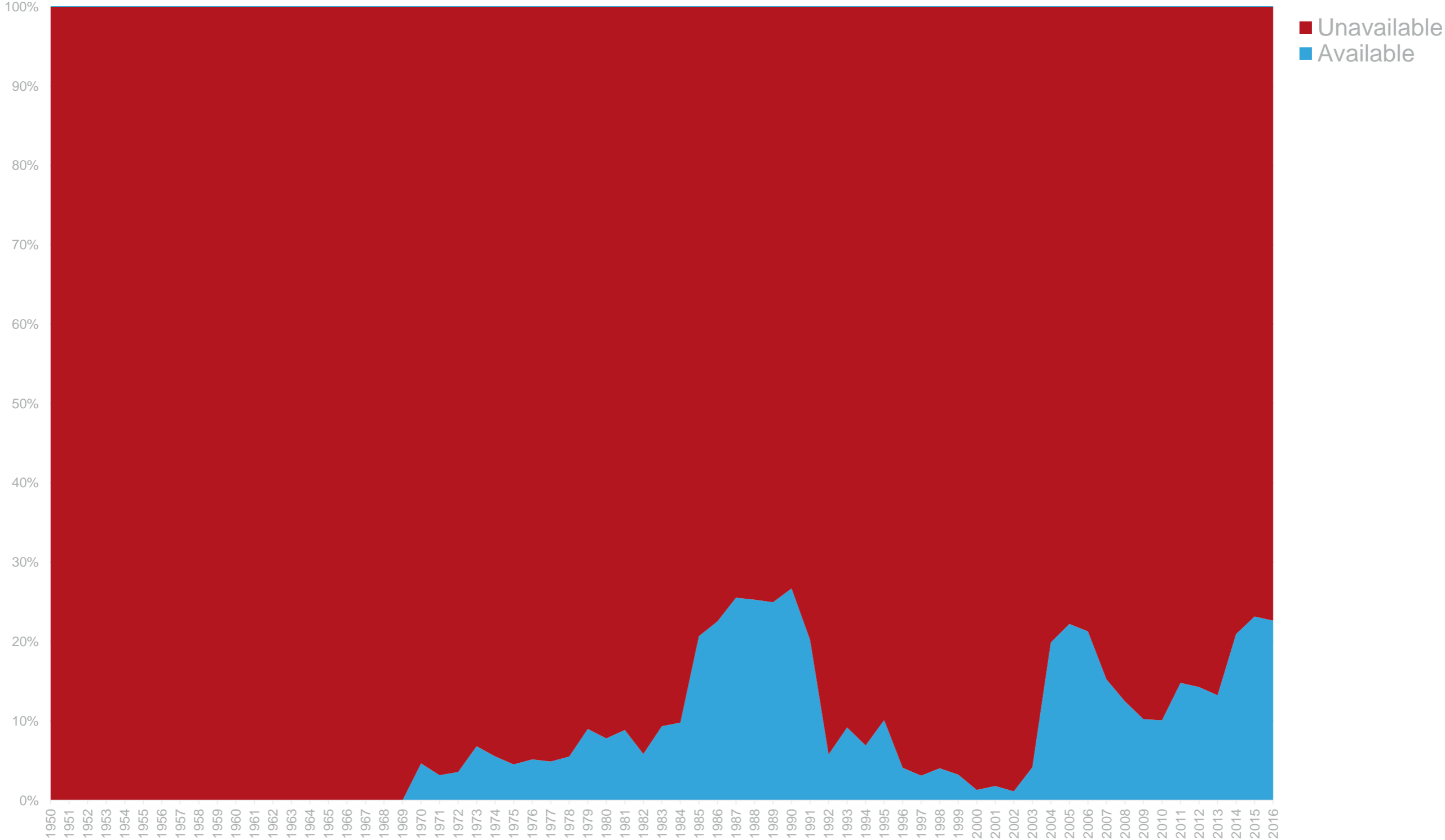
ARTISANAL VS. INDUSTRIAL CATCHES (NON-IOTC)



% GEOREFERENCED CATCHES (ALL)



% GEOREFERENCED CATCHES (ARTISANAL)



CONCLUSIONS

- Peculiarities of fisheries operations within the region require **non-standard codes** for gears and species (mainly);
- Adoption of **IOTC forms** for data reporting is still a problem for many countries;
- Difficulties in obtaining adequate and comprehensive data from **artisanal, small-scale fisheries**;
- The **Regional Observer Scheme** pilot project is still under way;
- **Harmonization** of reference codes and data sets / concepts is *possible* and *welcome*, particularly in the context of worldwide initiatives (Global Tuna Atlas). *With caveats!*

END OF THE FIRST PART

Following slides describe the current state of the art in terms of IOTC processes vs. proposed CWP harmonization tasks.

These should fit within the topics of session #2

CWP PROPOSED STANDARDS

- The outcomes of the first consultation among CWP members (June 2017) have been well received by participants;
- IOTC involvement is only expected / required **within the Capture Production domain**;
- **Two types** of standardization efforts to consider:
 - adoption of CWP-proposed **data structures and definitions**;
 - adoption of CWP-proposed **reference classifications**;
- The IOTC Secretariat provided feedback (January 2018) in terms of *how proposed structures match with current IOTC data requirements*

DSD | *GLOBAL CAPTURE PRODUCTION*

- The CWP proposed structure (**CWP-Ref-Harm-DSDs V2.0**) represents an *aggregated* version of the corresponding IOTC closest data set (**Nominal Catches**, Form 1_RC);
- In particular, compared to the DSD, the existing IOTC data set:
 - **Requires** *fleet* information (can differ from country / flag);
 - **Can** accommodate *quarterly* information;
 - **Requires** *gear* information;
 - **Lacks** whatsoever reference to *monetary value*

DSD | *CATCH*

- The CWP proposed structure (**CWP-Ref-Harm-DSDs V2.0**) seems to roughly correspond to the IOTC ***Catch-and-Effort*** data set (Form 3_CE / 3_AR);
- In particular, compared to the DSD, the existing IOTC data set:
 - **Requires** *fleet* information (can differ from country / flag);
 - **Does not** require *vessel type* information;
 - **Requires** *time* information (1 month resolution);
 - **Requires** *area* information (either CWP grids or irregular areas, depending on the gear)

DSD | *CATCH AND EFFORT*

- The CWP proposed structure (**CWP-Ref-Harm-DSDs V2.0**) describes logbook-level data, that **are not directly available to the IOTC Secretariat**;
- In particular, existing IOTC scientific data sets:
 - **do not** expect *vessel identifier* / GT / LOA information;
 - **do not** expect *vessel operation* start / end timestamps;
 - **do not** expect *vessel position* start / end coordinates;
- *Potentially*, part of this information **can** be submitted to the IOTC Secretariat through Scientific Observers reports, although with references to distinct fishing operations in a given trip

CWP AND IOTC REFERENCE CLASSIFICATIONS

Concept	CWP	IOTC	Notes
Country / Flag state	ISO 3166 / UN	ISO 3166	IOTC also considers 'NEI' – <i>Not Elsewhere Identified</i>
Fleet	---	Custom	IOTC adopts a combination of <i>flag country</i> and <i>reporting country / entity</i> to uniquely qualify a fleet from three different points of view (<i>as reported / scientific / official</i>)
Fishing area	FAO / CWP	Custom / CWP	IOTC adopts the CWP standard for regular grids (1x1 to 30x30) and a proprietary standard for irregular areas (not necessarily matching with FAO areas / subareas)
Aquatic species	ASFIS / ISSCAAP	ASFIS	IOTC adopts a <i>customized</i> version of the ASFIS list that includes a number of <i>aggregated</i> entries (e.g. YFT + SKJ, all billfish combined etc.) that are statistically relevant yet originally not available within the ASFIS list
Catch type	CWP	Custom (CWP based)	IOTC requires catch type references only within the Nominal Catch data set, and these are based on the CWP catch concepts, although using proprietary codes
Catch unit type	Not formally defined	Custom	KG / MT / NO
Effort unit type	CWP	Custom	IOTC classification expects multiple possible effort unit types by gear, with different priorities. CWP classification is unique, and divided in 3 levels (A, B, C)
Vessel type	ISSCFV	Not required / not used	IOTC scientific data sets do not require any reference to vessel types. Where needed (e.g. IOTC RAV) IOTC adopts a subset of the ISSCFV classification
Gear type	ISSCFG	Custom	IOTC adopts a gear classification that is <i>loosely</i> based on the ISSCFG and that includes a number of gears that are of statistical relevance within the region

REFERENCE CLASSIFICATIONS ISSUES | GEARS

IOTC		ISSCFG	
Name	Group	Code	Code
<i>Longline targeting swordfish</i>	Longline	ELL	09.32
<i>Longline Fresh</i>	Longline	FLL	09.32
<i>Longline operated attached to Gillnet</i>	Longline	LG	07.9
<i>Longline</i>	Longline	LL	09.32
<i>Exploratory longline</i>	Longline	LLEX	09.32
<i>Longline and Handline combination</i>	Longline	LLHA	09
<i>Coastal Longline and Troll line combination</i>	Longline	LLTR	09.39
<i>Trolling mechanized</i>	Line	TROLM	09.5
<i>Trolling non-mechanized</i>	Line	TROLN	09.5
<i>Hook and line</i>	Line	HOOK	09.9
<i>Trawl and Hooks and Line</i>	Other	TWLHT	09.9

ISSCFG / CWP		
Name	Std. abbr.	Code
<i>Hooks and lines</i>	---	09
<i>Handlines and hand-operated pole-and-lines</i>	LHP	09.1
<i>Mechanized lines and pole-and-lines</i>	LHM	09.2
<i>Set longlines</i>	LLS	09.31
<i>Drifting longlines</i>	LLD	09.32
<i>Longlines (nei)</i>	LL	09.39
<i>Vertical lines</i>	LVT	09.4
<i>Trolling lines</i>	LTL	09.5
<i>Hooks and lines (nei)</i>	LX	09.9
<i>Gillnets and entangling nets (nei)</i>	GEN	07.9

HARMONIZATION ISSUES

- IOTC classifications (especially for what concerns Gears) are often **region-specific** and with different granularity than CWP / standard ones;
- This means that they **cannot** be mapped onto CWP standards without introducing information *aliasing*;
- IOTC vs. CWP reference code mappings **can** be *produced* and *maintained*, yet they're not always *reversible* (e.g. ELL / FLL / LL / LLEX gear codes are **all** mapped to 9.32 – Drifting longlines in the ISSCFG classification, according to the Global Tuna Atlas);
- When disseminating *harmonized* tRFMO-specific data sets (e.g. Global Tuna Atlas) the reference code mappings used for the harmonization **should** be disseminated as well

CONCLUSIONS

- IOTC is well positioned in the process of adopting standard coding systems for the *exchange* of information;
- Due to specificities within the region, standard codes cannot be implemented / adopted *internally*;
- A first attempt at producing IOTC vs. standard reference codes mappings has been done both with CWP and with IRD (Global Tuna Atlas) with some *caveats*;
- CWP proposed DSDs and concepts *do not* completely match with data reporting requirements for IOTC CPCs;
- Whatever choice is taken to support information exchange, CWP should strive for *simplicity* and *effectiveness*

REFERENCES

- Fishing gear classification (ISSCFG):
 - <http://www.fao.org/cwp-on-fishery-statistics/handbook/capture-fisheries-statistics/fishing-gear-classification/en/>
- IOTC Resolution 15/02:
 - <http://www.iotc.org/cmm/resolution-1502-mandatory-statistical-reporting-requirements-iotc-contracting-parties-and>
- Reporting data to IOTC:
 - <http://www.iotc.org/data/reporting-data-iotc>
- IOTC data submission forms:
 - <http://www.iotc.org/data/requested-statistics-and-submission-forms>

THANK YOU FOR YOUR ATTENTION!

ANY QUESTIONS?

