

# Archival tag deployments in the framework of AOTTP (Atlantic Ocean Tuna Tagging Program – ICCAT)

## Background

- Before AOTTP, no recent big scale tropical tuna tagging program in the Atlantic
- Previous important tagging programs:  
BETYP (1999-2003) → PSATs in Azores (n=23, data from 17), internal archival in Canaries (n=19, no recovery reported)



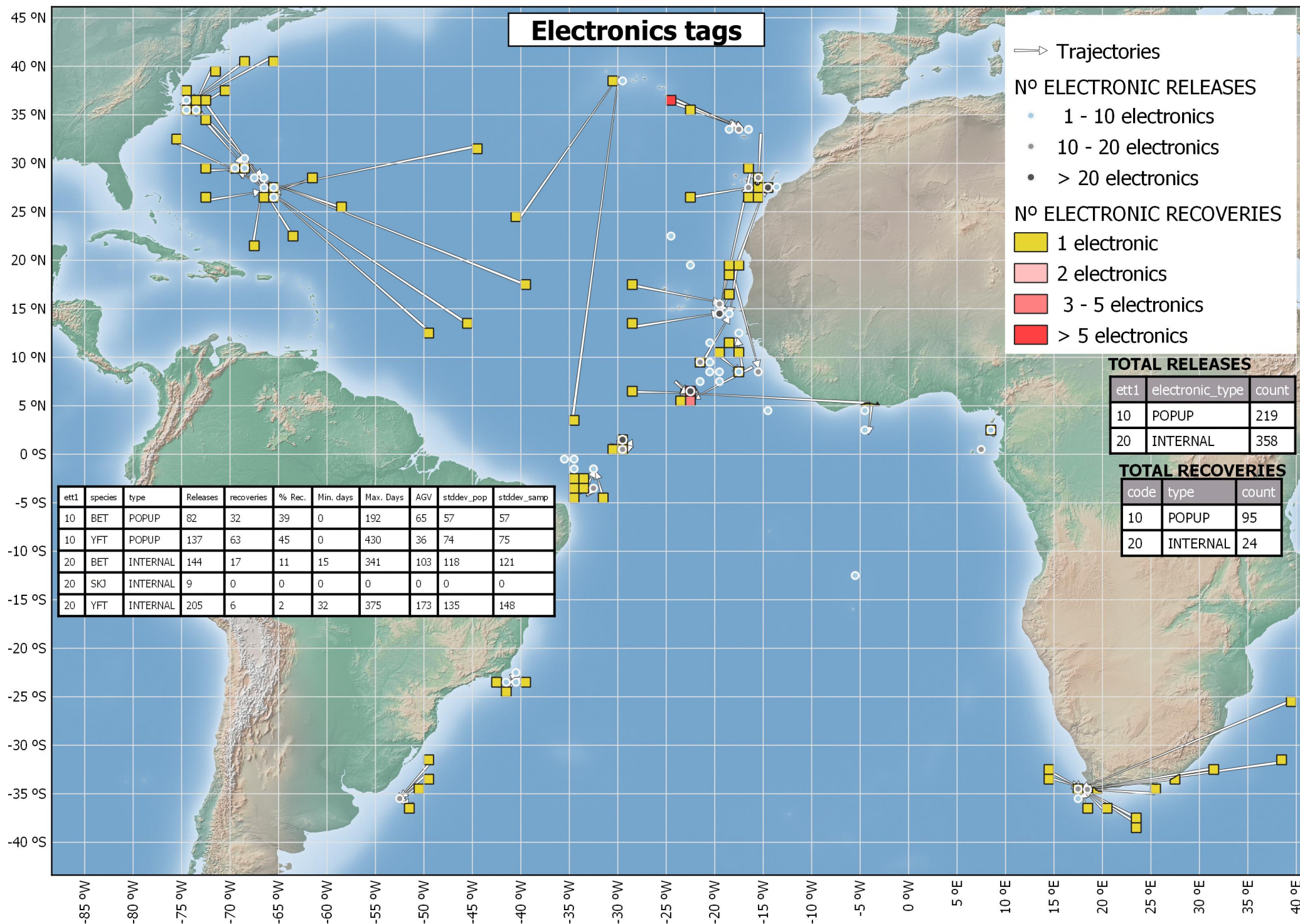
## Bigeye tuna (*Thunnus obesus*) vertical movements in the Azores Islands determined with pop-up satellite archival tags

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extending to 45° North during the northern hemisphere summer (Collete and Nauen, 1983). The population is managed as a single Atlantic stock, although uncertainties include a limited knowledge of their

# Atlantic Ocean Tropical Tuna Tagging Programme (AOTTP)

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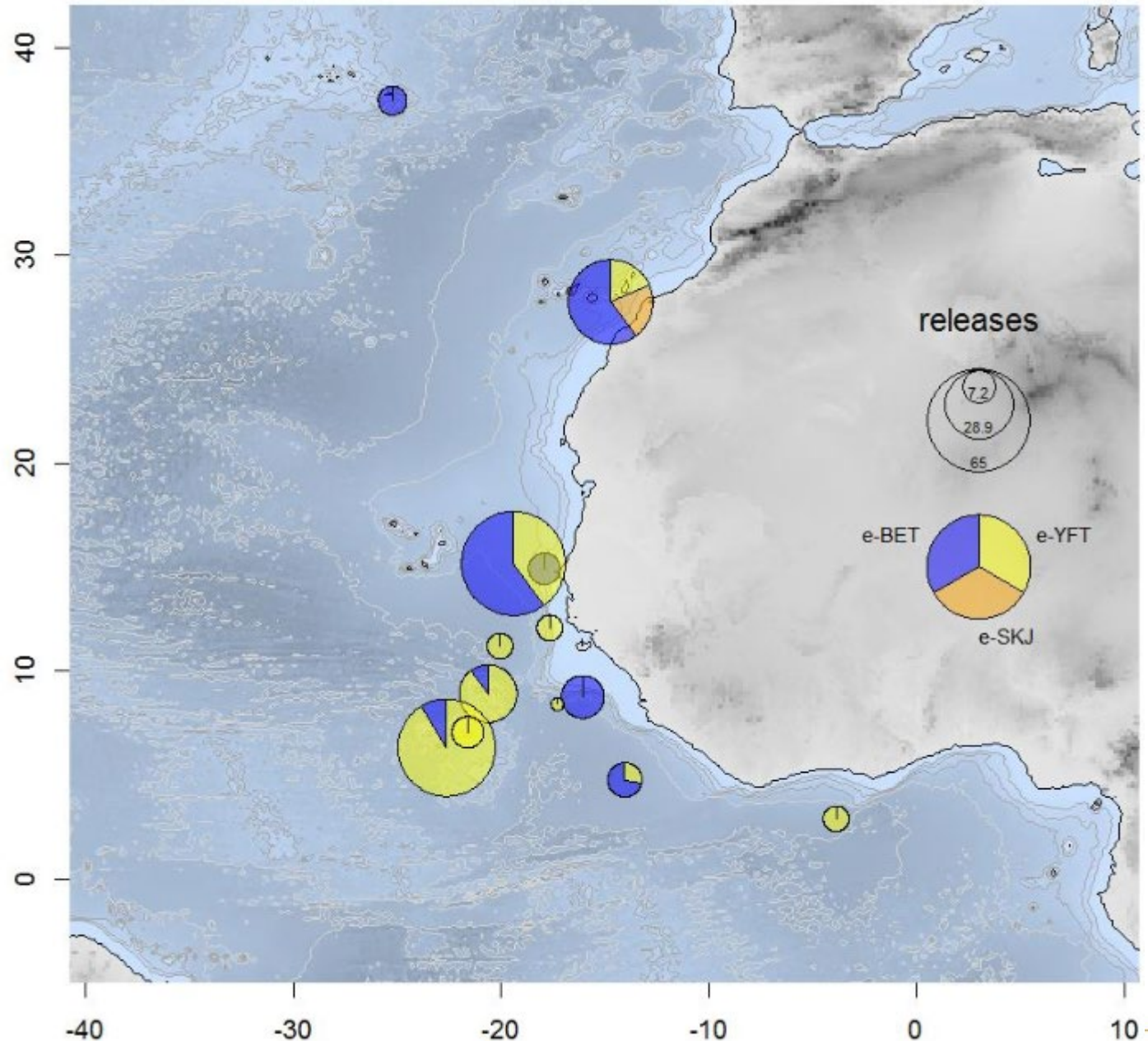


# Archival tag deployments in the framework of AOTTP (Atlantic Ocean Tuna Tagging Program)

## Deployments

- Total by Jan 2019:  
386

- Regions tagged by  
AZTI consortium:  
195 internal  
52 PSAT



## Deployments

- Regions tagged by AZTI consortium

	YFT int.	BET int.	YFT PSAT	BET PSAT	SKJ int.
<b>Azores (2016)</b>	-	0	-	5	0
<b>Canary Islands (2016)</b>	8	15	-	11	9
<b>Cabo Verde (2016)</b>	17	33	5	0	0
<b>Sierra Leone rise and Gulf of Guinea (2016-7)</b>	81	22	23	1	0
<b>Canary Islands (2018)</b>	-	5	-	5	-
<b>Cabo Verde (2018)</b>	0	5	0	2	-



## Issues encountered

- Difficulty to find suitable SKJ (size + behaviour)
- Choice of PSAT type + delays
- Premature release of PSATs
- Recovery rates lower than expected

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## Recoveries (jan 2019)

	type	supplier	released	recovered	rate recovered
<b>BET</b>	Archival	LOTEK ARCGEO9	27	9	0.33
<b>BET</b>	Archival	LOTEK LAT2810	59	1	0.02
<b>BET</b>	Satellite	Desert Star	22	8	0.36
<b>BET</b>	Satellite	Wildlife Computers	29	24	0.83
<b>YFT</b>	Archival	LOTEK ARCGEO9	4	0	0.00
<b>YFT</b>	Archival	LOTEK LAT2810	169	4	0.02
<b>YFT</b>	Satellite	Desert Star	7	2	0.29
<b>YFT</b>	Satellite	Microwave Telemetry	1	0	0.00
<b>YFT</b>	Satellite	Wildlife Computers	68	60	0.88
		TOTAL	386	108	0.28

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## Days at liberty (september 2018)

	supplier	type	n	min	max	5%	25%	50%	75%	95%
<b>BET</b>	LOTEK ARCGEO9	Archival	9	15	35	17	20	21	31	33
<b>BET</b>	LOTEK LAT2810	Archival	1	173	173	173	173	173	173	173
<b>BET</b>	Desert Star	Satellite	8	2	192	4	12	31	56	157
<b>BET</b>	Wildlife Computers	Satellite	24	0	151	1	24	64	112	146
<b>YFT</b>	LOTEK LAT2810	Archival	4	33	375	40	67	142	249	350
<b>YFT</b>	Desert Star	Satellite	2	28	44	29	32	36	40	43
<b>YFT</b>	Wildlife Computers	Satellite	60	0	91	1	4	18	30	79

Majority < 6 months



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## Planned analyses (2019 to mid-2020) and applications

- Characterizing the thermal habitat of BET and YFT as a function of SST and T<sup>2</sup> profile of water column, as in Walli et al.(2009) and Arregui et al.(2018). Goal: improve CPUE standardization.
- Integrated model including conventional and e-tag data, to characterize dispersion, regional fidelity and mixing rates, as in Schaefer et al.(2015) and Miller and Andersen (2008)
- Application to stock assessment models currently used: Stock Synthesis (BET), Stock Synthesis, VPA-2box and Aspic (YFT), Aspic (SKJ), eventually MAST (Taylor et al. 2011)

Walli A, Teo SLH, Boustany A, Farwell CJ, Williams T, et al. (2009) Seasonal movements, aggregations and diving behavior of Atlantic bluefin tuna (*Thunnus thynnus*) revealed with archival tags. PLoS ONE 4(7): e6151.

Arregui I, Galuardi B, Goñi N, Lam CH, Fraile I, et al. (2018) Movements and geographic distribution of juvenile bluefin tuna in the Northeast Atlantic, described through internal and satellite archival tags. ICES Journal of Marine Science: fsy056

Schaefer K, Fuller D, Hampton J, Caillot S, Leroy B, and Itano D (2015) Movements, dispersion, and mixing of bigeye tuna (*Thunnus obesus*) tagged and released in the equatorial Central Pacific Ocean, with conventional and archival tags. Fish. Res., 161: 336–355.

Miller TJ, and Andersen PK (2008) A finite-state continuous-time approach for inferring regional migration and mortality rates from conventional and archival tagging experiments. Biometrics, 64: 1196-1206.

Taylor NG, McAllister MK, Lawson GL, Carruthers T, and Block BA (2011). Atlantic Bluefin Tuna: A novel multistock spatial model for assessing population biomass. PLoS ONE, 6: e27693.

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