Satellite tagging of European sturgeon Acipenser sturio

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Acipenser sturio
Habitats en mer et retour des géniteurs en fleuves

Satellite tagging of European sturgeon *Acipenser sturio*

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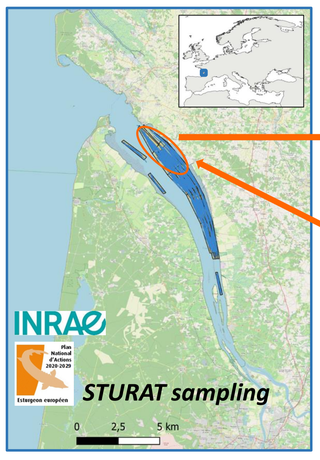
Objectives

European sturgeon migration between the estuary environment and the sea as well as its **behaviour at sea** are little-known. This experimentation intend to follow its **movement at large scale** and to identify the **characteristics of the environment use**, mainly **temperature and depth**.
For this purpose, since we focus on large individuals, **pop-up satellite archival tags** (PSATs) offer the following advantages (1) **gathering complementary and independent data from incidental observations** and (2) **recovering the data with no need to capture the fish** since the detachment is programmed.
Following Sequeira *et al.* (2019), for this type of tagging, a sample of 10 individuals is rational for **critically endangered species**. Individual information have high value and this number would allow to **assess individual variability** and **to generate first hypothesis on migratory behavior**. It is also a starting point **to evaluate if the method gives the expected quality of data**.

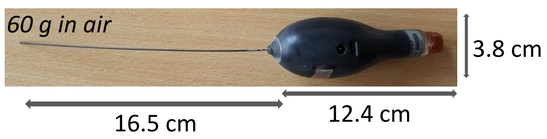
Methods

A. Sturio capture and release Gironde Estuary



Tags

PSATs MINIPAT ©Wildlife computer

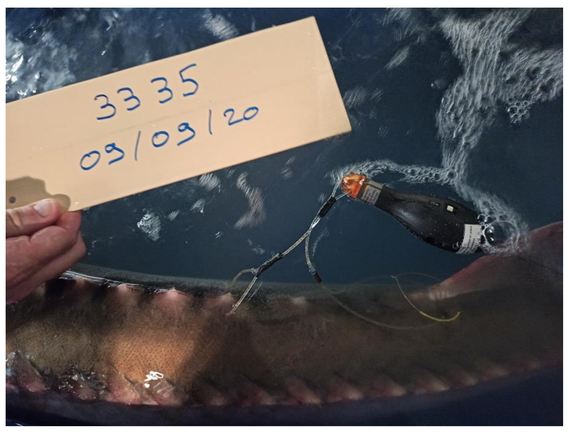


Recording programing = 6 months

Data recovery : Collect Localization Satellite (CLS) Argos system

Tagging procedure

Adapted from Beardsall *et al.* (2016) et Kough *et al.* (2018), **secured with 2 anchor points**



Communication leaflet

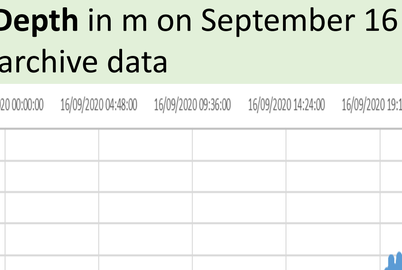
In case of incidental captures

First results

10 *A. sturio* tagged from September 9 2020 to November 26 2021

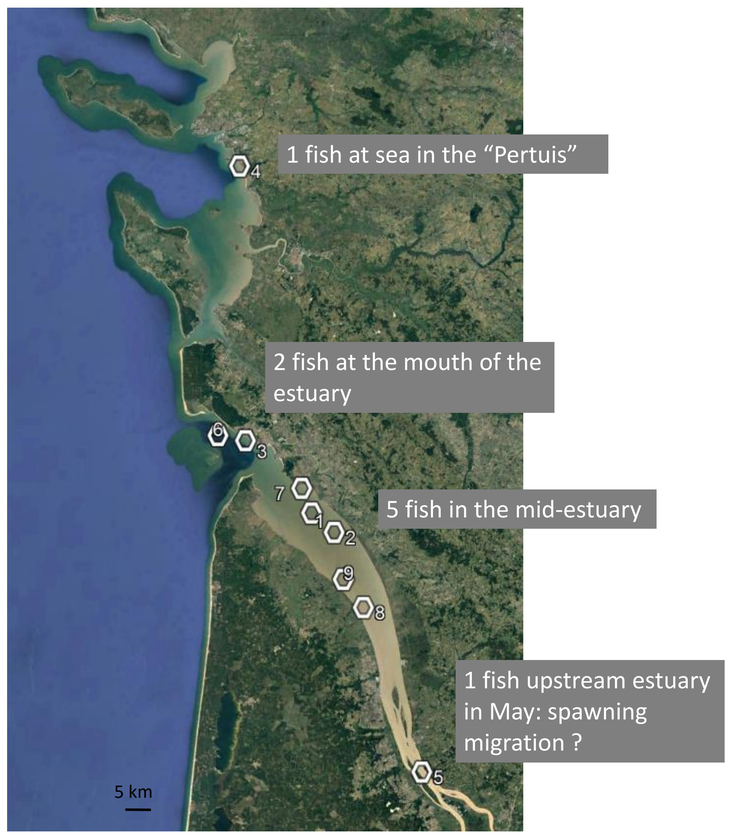
Total length 140 to 180 cm Weight 14,4 to 28,7 kg

Tags pop up between March 2021 and June 2022
Data recovered from 9 PSATs: 4 physically retrieved



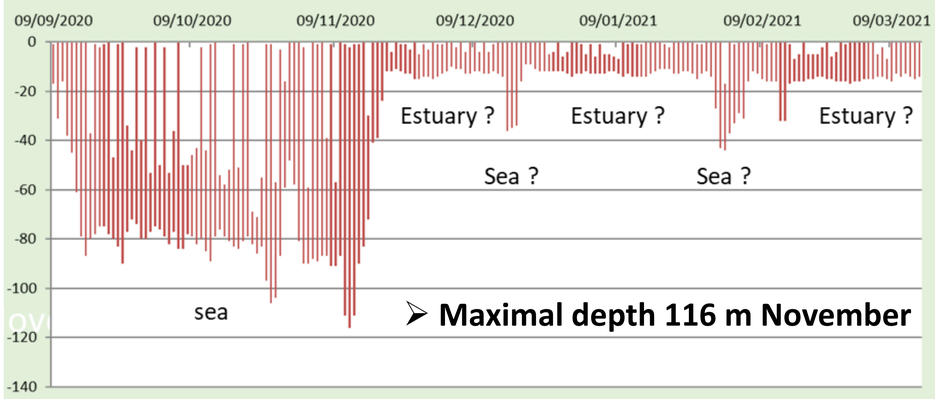
PSAT number	*A. sturio* Total length and weight	Tagging Date	Theoretical pop-up date	Real pop-up date	End of satellite transmission date	Available data	Pop-up localization
19P0736	145 cm 16,2kg	9/09/20	13/03/21	15/03/21	25/03/21°	Yes Archive Tag retrieved and downloaded	1
19P0764	166 cm 28,7kg	9/09/20	13/03/21	No satellite emission	No satellite emission	None	
19P0815	155 cm 17kg	19/04/21	16/10/21*	17/10/21	18/10/21	Yes satellite but very few	2
21P0986	180 cm >25 kg	16/09/21	20/03/22	21/03/22	31/03/22	Yes Archive Tag retrieved but difficulties for downloading	3
21P0992	170 cm 22,4 kg	16/09/21	20/03/22	No satellite emission but found by a walker on a beach	No satellite emission	Yes Archive Tag retrieved but difficulties for downloading	4
21P0967	150 cm 19,4 kg	13/10/21	16/04/22	21/04/22	06/05/22	Yes satellite	5
21P0939	162 cm 19 kg	26/11/21	01/06/22	28/02/22	22/03/22	Yes satellite	6
21P0949	155 cm 18 kg	26/11/21	01/06/22	03/06/22	23/06/22	Yes satellite	7
21P0963	140 cm 14,6 kg	26/11/21	01/06/22	01/06/22	20/06/22	Yes Archive Tag retrieved and downloaded	8
21P0983	161 cm 18,8 kg	26/11/21	01/06/22	31/06/22	20/06/22	Yes satellite	9

Pop up locations

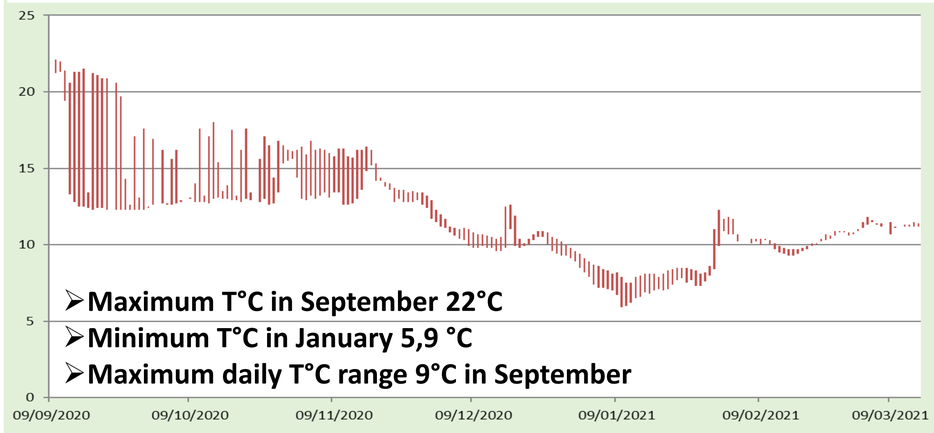


19P0736 fish raw data examples

Raw **delta Depth** in m from **September to March**



Raw **delta Temperature** in °C from **September to March**



Surfacing behavior events

Detailed Depth in m on September 16
1 value/s archive data

Mouvement from -40m to 0.5m

Discussion - Perspectives

Most tags pop up in the Gironde estuary which would suggest that fish tagged are still connected with the estuarine environment: back and forth movement ? Since fish were tagged in the estuary we may have captured the fraction of the population that is connected with the estuarine environment.
Seasonal pattern of depth and temperature use
Surfacing behavior identified as described for *A. oxyrinchus* in North America (Logan-Chesney et al. 2016)
Satisfying recovery rate of the tags 90% **but variable amount of data** depending on the emission duration through the satellite
Trajectory reconstruction: not satisfying with GP3E algorithm (©WC), other algorithms to be tested

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