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Data Article

Satellite-tracking dataset of loggerhead sea turtles tracked from western Mediterranean

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ABSTRACT

We provide the raw data of 44 satellite-tracked loggerhead sea turtles from different life-stages collected between 2016 and 2018. Depending on life-stage and tag availability a different satellite tag was attached to the loggerhead carapace. Location data were collected using the Argos system. We made publically available for the first time in the Mediterranean: (i) the satellite-tracking data for 17 one-year-aged post-hatchlings of loggerhead sea turtle came from two nests laid on the Mediterranean Spanish coast; (ii) the satellite-tracking data for 4 loggerhead nesting females collected from nesting events occurred on the Spanish Mediterranean coast. Besides, another 23 juvenile and adult loggerhead sea turtles were monitored and their data were made also available. Our dataset provide the turtle identity name or number, the date and coordinates of the location data, and the Argos location class associated. Our data contribute to the knowledge about the spatial use of the loggerhead sea turtle in the Mediterranean Sea and could be used in further analysis regarding habitat use and dispersal of this species in the Mediterranean Sea. Specially, nesting females and post-hatchlings data con-

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tribute to shed light about these life-stages related to nesting events out of the usual nesting range in the western Mediterranean, for which data still remains scarce. Also, data could be compared to further similar research in satellite-tracking loggerhead sea turtles in the Mediterranean basin.

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Specifications Table

Subject	Marine Biology
Specific subject area	Loggerhead sea turtle satellite-tracking
Type of data	Table
How the data were acquired	Location data were obtained through Argos system by satellite-tagging loggerhead sea turtles of different life-stages. Turtles were released from western Mediterranean. Satellite-tracking data were recorded from 2016 to 2018.
Data format	Raw
Description of data collection	Data was retrieved from Argos system data as provided.
Data source location	Region: Mediterranean Sea. Latitude and longitude for collected samples/data: 30–46 °N, 5.5°E–36 °W. Years: 2016-2018
Data accessibility	*Repository name: EMODNet Biology.* *Data identification number:* https://www.emodnet-ingestion.eu/submissions/submissions_details.php?menu=39&tpd=1041&step=001loggerhead *Abalo-Morla S, Belda EJ, Crespo-Picazo JL (2022) "Satellite-tracking of loggerhead sea turtles tracked from western Mediterranean".* *Direct URL to data:* https://cloud.emodnet-ingestion.eu/index.php/s/wF4jn2ypDiAgJ2U
Related research article	Co-submission: S. Abalo-Morla, E.J. Belda, D. March, O. Revuelta, L. Cardona, S. Giralt, J.L. Crespo-Picazo, S. Hochscheid, A. Marco, M. Merchán, R. Sagarminaga, Y. Swimmer, J. Tomás, Assessing the use of marine protected areas by loggerhead sea turtles (Caretta caretta) in the western Mediterranean. Global Ecology and Conservation, 38, e02196 [1].

Value of the Data

- This dataset is - to our best knowledge - the first satellite-tracking dataset publically available for both loggerhead post-hatchlings in the Mediterranean Sea and western Mediterranean nesting females.
- The dataset contribute to improve the knowledge about the spatial use of the loggerhead sea turtle in the Mediterranean Sea.
- The dataset can be used for habitat use estimation of loggerhead sea turtles at different life-stages: post-hatchlings, juveniles and adults.
- The results obtained in this research provide valuable information to be compared with other regions.
- The dataset is useful for researchers as well as for management agencies and governments implied in Mediterranean sea turtle conservation.

1. Data Description

The dataset collected include location data and the associated metadata for 44 loggerhead sea turtles satellite-tagged and released from western Mediterranean during 2016–2018. Dataset

files are deposited in the EMODNet repository. The dataset consist of a table in .csv format which compiles the Argos raw data collected (a total of 26,582 locations) of 44 satellite-tracked loggerheads. This file specifies the turtle identity name or number, the date and location coordinates, and the Argos location class. The raw data are accompanied by a metadata file in an Excel format (.xls) which compiles other relevant attributes regarding each satellite-tracked loggerhead sea turtle: the turtle identity name or number, tag number, date of deployment, coordinates of deployment (in latitude and longitude), tag type, the tag manufacter, the scientific name, the life-stage, sea turtle carapace measurements, sea turtle weight, sea turtle gender (if available), type of capture, track duration, hatch date (if available), related project name (if available), implied institutions name and name of the researcher leader. Spreasdsheet 2 of the metadata file explains all metadata fields, including abbreviations.

2. Experimental Design, Materials and Methods

Prior to tag attachment each turtle was measured and weighted (if possible) and other relevant information was recorded in the metadata file. Life-stage classification was made according Straight Carapace Length (SCL) as following: post-hatchlings (< 24 cm straight carapace length, SCL); early juveniles (between 24 and 40 cm SCL), late juveniles (> 40–70 cm SCL) and adult-size turtles (> 70 cm SCL) [1]. One-year-aged post-hatchlings ($n = 17$) were collected from two different nesting events occurred on the Spanish Mediterranean coast [1] after being raised at a recovery center and were tagged ensuring that tags do not hinder behavior or turtle growth movements [2]. Four adult females were tagged after a nesting event (or nesting attempt) in the Mediterranean Spanish coast, avoiding in all cases disturbance prior the nesting event take place. Two two-year-aged early juveniles were collected from another nest laid in the Mediterranean Spanish coast [3]; however due to their age and size were classified as early juveniles. The remaining nineteen juveniles and two adult turtles proceeded from fisheries bycatch or entanglements and were tagged and released immediately after capture, or after full recovery in rescue centers, if needed, to minimize the possibility to be compromised (Table 1).

Table 1
Satellite tracking data information by life stage. Turtle identity name or number (Turtle ID), straight carapace length (SCL, denoted by *) or curved carapace length (CCL, denoted by **), sex (M: male, F: female, U: unknown), type of capture (Nest: collected at nest, C: caught by hand for study, LL: longline bycatch and released, T: trawler bycatch, D: driftnet bycatch E: found entangled, RC: recovery at rescue centre, N: female after nesting event), deployment location, deployment date and total tracking days of each turtle.

Life stage	Turtle ID	SCL*/ CCL** (cm)	Sex	Type capture	Deployment location	EEZ release	Deployment date	Tracking days
Post-hatchlings ($n = 17$)	Cocedora	17.5 *	U	Nest	37.375 N, 1.636 W	Spain	16/06/2016	82
	Rabiosa	17.5 *	U	Nest	37.375 N, 1.636 W	Spain	16/06/2016	83
	Pichirichi	16.6 *	U	Nest	37.375 N, 1.636 W	Spain	16/06/2016	79
	Serena	16.8 *	U	Nest	37.375 N, 1.636 W	Spain	16/06/2016	102
	Toby	17.0 *	U	Nest	37.375 N, 1.636 W	Spain	28/09/2016	106
	Dora	17.5 *	U	Nest	37.375 N, 1.636 W	Spain	28/09/2016	115
	Vendetta	18.1 *	U	Nest	37.375 N, 1.636 W	Spain	28/09/2016	108
	Bonita	17.5 *	U	Nest	37.375 N, 1.636 W	Spain	28/09/2016	123
	Benicarló	21.0 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	152
	Borriana	22.0 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	261
	Castelló	22.2 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	264
	Cullera	22.4 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	69
	Denia	22.0 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	270
	Gandia	22.3 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	291
	Santa Pola	22.2 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	276
	Torrevieja	22.8 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	337
	Vinarós	23.0 *	U	Nest	39.310 N, 0.290 W	Spain	19/10/2017	269

(*continued on next page*)

Table 1 (*continued*)

Life stage	Turtle ID	SCL*/ CCL** (cm)	Sex	Type capture	Deployment location	EEZ release	Deployment date	Tracking days
Early	163348	37 0.1 *	U	T, RC	39.010 N, 0.102 W	Spain	10/04/2017	215
juveniles	60624	31.6 *	U	RC	37.579 N, 0993 W	Spain	15/10/2018	82
($n = 6$)	64584	29.0 *	U	RC	37.579 N, 0993 W	Spain	15/10/2018	92
	163910	25.6 *	U	Nest	41.129 N, 1.302 E	Spain	31/08/2016	123
	163909	29.1 *	U	Nest	41.129 N, 1.302 E	Spain	31/08/2016	37
	36539	37.0 *	U	RC	41.129 N, 1.302 E	Spain	03/07/2017	22
Late	163345	47.0 *	U	T, RC	39.000 N, 0.108 W	Spain	10/04/2017	223
juveniles	163346	58.0 *	U	T, RC	39.662 N, 0.205 W	Spain	03/02/2017	36
($n = 15$)	163347	50.0 *	U	T, RC	39.310 N, 0.290 W	Spain	07/01/2017	106
	163350	52.0 *	U	T, RC	39 N, 0.108 W	Spain	10/04/2017	44
	163351	48.0 *	U	T, RC	39 N, 0.108 W	Spain	10/04/2017	83
	163352	47.0 *	U	T, RC	39 N, 0.108 W	Spain	10/04/2017	59
	163353	40.0 *	U	T, RC	38.639 N, 0.048 W	Spain	26/01/2017	169
	163354	44.0 *	U	T, RC	39.662 N, 0.205 W	Spain	03/02/2017	265
	60611	48.0 *	U	RC	39.310 N, 0.290 W	Spain	05/07/2018	200
	66604	45.0 *	U	RC	37.579 N, 0993 W	Spain	19/11/2018	22
	64583	40.1 *	U	RC	37.579 N, 0993 W	Spain	15/10/2018	91
	62419	47.0 *	U	E, RC	36.712 N, 2.191 W	Spain	23/07/2018	24
	45951	44.0 *	U	D	39 N, 0.108 W	Spain	27/11/2017	79
	45952	45.0 *	U	T	39 N, 0.108 W	Spain	13/12/2017	49
	45950	40.8 *	U	D	39 N, 0.108 W	Spain	13/12/2017	63
Adults	60623	79.0 *	F	N	40.025 N, 0.049 E	Spain	01/07/2018	15
($n = 6$)	66605	71.0 **	U	RC	37.579 N, 0993 W	Spain	16/12/2018	28
	164928	97.0 *	M	E, RC	41.280 N, 2.090 E	Spain	18/09/2016	75
	160303	61.0 **	F	N	41.280 N, 2.090 E	Spain	24/06/2016	55
	33052	79.0 **	F	N	39.508 N, 0.321 W	Spain	27/06/2018	87
	36422	80.0 **	F	N	37.912 N, 0.722 W	Spain	09/07/2018	78

Depending on life-stage considered and tag availability a different type of satellite tag was attached to each loggerhead turtle carapace, as detailed in the metadata file. All platform transmitter terminals (PPT-tags) were attached using the method described in [3]. All SPOT and SPLASH tags were attached to turtles' carapace using epoxy resin. All POP-UP tags were attached to the edge of the most posterior scales using a nylon through a drill-hole. In all cases, turtles were released close to the capture location, if possible. Location data were collected during 2016–2018 until stop transmission using the Argos system, which classifies seven location classes of decreasing accuracy (3, 2, 1, 0, A, B, Z) [4].

Ethics Statements

The authors declare that animals experiments complied with the International Union for Conservation of Nature (IUCN) policies research involving species at risk of extinction, the Convention on Biological Diversity and the Convention on the Trade in Endangered Species of Wild Fauna and Flora. Therefore animals were treated according to all applicable international, national, and/or institutional guidelines for the care and use of animals. Animal ethics approval was granted by the Universitat Politècnica de València. The tagging of turtles was done after obtaining a permit from the regional and national Spain's Environmental Authorities (Generalitat Valenciana, Generalitat de Catalunya, Consejeria de Medio Ambiente y Ordenación del Territorio de la Junta de Andalucía, Ministerio de Medio Ambiente y Medio Rural Marino). The coordinates provided in the dataset do not allow to locate nowadays the monitored individuals.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT Author Statement

Sara Abalo-Morla: Investigation, Writing – original draft, Validation, Data curation, Visualization, Writing – review & editing; **Eduardo J. Belda:** Conceptualization, Methodology, Investigation, Supervision, Writing – review & editing, Project administration, Funding acquisition; **Jesús Tomás:** Writing – review & editing; **Jose Luis Crespo-Picazo:** Resources; **Adolfo Marco:** Resources; **Ohiana Revuelta:** Writing – review & editing.

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