Indian Ocean Loggerheads

Recent issues of the SWOT Report have contained articles about the natural history, status, and distribution of loggerhead turtles in the Pacific Ocean (vol. XIII), as well as in the Atlantic Ocean and Mediterranean (vol. XIV), including maps of at-sea biogeography for these three large ocean biomes. Data have now been compiled from the Indian Ocean as well, to complete the first global map of loggerhead telemetry (pp. 32–33). This is the unique story of Indian Ocean loggerheads, in the final chapter in this series of ocean-scale overviews.
Global distributions of the loggerhead have been divided into 10 regional management units, or RMUs (SWOT Report, vol. XII, pp. 30–33). Four of these RMUs are in the Indian Ocean, the largest being in the northwest (figure 1). The Northwest Indian Ocean RMU surrounds the islands of Masirah (Oman) and Socotra (Yemen), where several tens of thousands of females nest. Nest in rookery size is the Southeast Indian Ocean RMU, around Western Australia, which has about 2,500 nesting females annually. Then comes the Southwest Indian Ocean RMU, whose rookeries are shared between South Africa and Mozambique, with fewer than 1,000 annual nesters. These three RMUs are globally ranked as second, third, and fourth, respectively, in terms of the abundance of nesting female loggerheads. The Northeast Indian Ocean RMU, in the Bay of Bengal, is ranked as the world’s smallest rookery, with likely fewer than 50 annual nesters. These three RMUs are globally ranked as second, third, and fourth, respectively, in terms of the abundance of nesting female loggerheads. The Northeast Indian Ocean RMU, in the Bay of Bengal, is ranked as the world’s smallest rookery, with likely fewer than 50 annual nesters. The most conspicuous aspect of the movement of loggerheads among the largest three of these rookeries, as shown by telemetry studies, is the commonly observed movement of the turtles along a north-south transequatorial axis. This movement contrasts with the east-west migrations of loggerheads typical to the northern and southern hemispheres of both the Atlantic and Pacific oceans, where turtles typically do not cross the equator. Rather, they follow the currents of their respective north and south oceanic gyres between feeding, breeding, and developmental habitats. The atypical loggerhead movement patterns in the Indian Ocean may derive from the fact that the Indian Ocean is the only major basin that is closed in the north by a continental shelf, thereby creating unique oceanographic and atmospheric phenomena. This north-south migration of Indian Ocean loggerheads is best documented in juveniles from the Mascarene Plateau (55° S latitude), which have been tracked north to Oman and even to the Arabian Sea. Preliminary analysis of recent tracking of neonate loggerhead turtles indicates that they do not take the same path as adults. More peculiar is that the eastern edge of the Indian Ocean loggerhead distribution seems to truncate, and the animals do not venture into the Pacific Ocean. This border is where Southeastern Indian Ocean RMU loggerheads meet those nesting in Queensland, which forces off the Great Barrier Reef (the Southeastern Pacific RMU). This apparent abrupt separation may be due to the limitations of our loggerhead tracking efforts to date, or could be caused by some other unknown factor that restricts their distribution. However, given that this RMU boundary lies roughly along a north-south line formed by the Torres Strait Islands, a narrow waterway that was previously a land bridge between Papua New Guinea and Cape York in northern Australia, it is likely a biogeographic relic from before the last ice age, when these islands and the current maze of shallow reefs and surrounding seas were above sea level.

The situation along the Southern African continent is very different. The fast-flowing Agulhas Current hugs the coast, flowing in a southwesterly direction toward the colder coast at Cape Agulhas, the continent’s southernmost point. Here it splits off partially into the Atlantic Ocean, or turns on itself and flows eastward again, to just north of the Arctic Circumpolar Current (figure 2). Modern tools such as ocean particle modeling can be used to predict the distribution of posthatchlings from the time they leave the nesting grounds. In one such model based on 2018 conditions, southwestern Indian Ocean loggerheads were shown to disperse with the Agulhas Current and end up either in the Agulhas Retroflection or in the Benguela Current (on the west coast of South Africa), with a portion ending up in the cold Southern Ocean. These locations have a high probability of mortality. Despite these useful modeling tools, there is still considerable uncertainty about the duration of the lost years or the location of the ontogenetic shift from the pelagic phase to the neritic, nor is it known with certainty which rookery these young loggerheads would reach as adults. However, what we do observe from global sea surface temperatures is that the western Indian Ocean is a much more favorable habitat for loggerheads than either (a) the southern or southwestern edges of the African continent or (b) the southwest coast of Australia, since posthatchling turtles are unlikely to survive long-term or abrupt exposure in those cold waters. Indeed, the juvenile and adult turtles that have been tracked in the past tended to avoid the cold water of the Atlantic and Southern Oceans and appeared to be strong enough swimmers to navigate the currents and avoid the southeastern seas, which are notorious for their strong westerly winds and high waves.

Also curious to note is that the southwestern and southeastern Indian Ocean loggerhead rookeries are both located at about 27°S latitude, with the closest southernmost tips of their respective continental landmasses also lying at approximately the same latitude (that is, Cape Agulhas, South Africa, and a point near Albany, Western Australia, both at about 35°S latitude, the latter being the southwesternmost point of Australia). So far south are these two rookeries, when compared with other loggerhead rookeries globally, that it is easy to assume some migration of animals into the other ocean basins, yet such migration does not seem to happen.

Sea turtles that manage to avoid the troubled cold waters to the south and stay in the warmer seas of the Indian Ocean still face many challenges, two significant ones being fisheries bycatch and plastic pollution. Many of the sea turtle tracks from the southwest Indian Ocean that are presented in the global map (pp. 32–33) were from rehabilitated juvenile and subadult turtles caught in commercial fisheries near La Réunion. They are the lucky turtles, because they were rescued, rehabilitated at Kélonia (the sea turtle rescue center of Réunion), and released to the wild. However, an estimated 3,500 interactions between sea turtles and longline fisheries take place each year in the Indian Ocean, and whereas fishing pressures in the exclusive economic zones of most countries are managed, the high-seas impacts of turtle bycatch are believed to be shockingly high. Moreover, plastic pollution is ubiquitous throughout the Indian Ocean and presents a noteworthy threat to all age classes of loggerheads. Interestingly, studies have shown that a large amount of plastics found in the water actually originated on the eastern side of the ocean basin, where some of the most polluting countries are located. The impact of these turtles and plastic interactions has not yet been properly quantified, but unlike many of the fishing activities that are often size selective, with larger turtles being more vulnerable, plastic is an indiscriminate killer. Sea turtles of all sizes, including posthatchlings from their first days of feeding, have been seen to ingest or become entangled in plastics, which can result in malnutrition, disease, intestinal blockage, and often death. Scientists working on loggerheads in both the Atlantic and the Pacific Oceans have generated vast amounts of original knowledge in recent decades, making those loggerheads among the best studied sea turtle populations on Earth. Meanwhile, the Indian Ocean still has many unique features to explain and rare mysteries to tackle, and her loggerhead turtles exhibit striking patterns not seen anywhere else.
The following data records refer to satellite telemetry datasets from tags that were deployed on loggerhead turtles worldwide and were combined to create the map on pp. 32–33. The data are organized first by ocean basin and then by country of deployment. For information regarding data processing and filtering, see the note on the map on p. 32. These data were generously contributed to SWOT by the people and partners listed subsequently. Records that have a SWOT ID can be viewed in detail in the SWOT online database and mapping application at http://seamap.env.duke.edu/swot, which contains additional information about the projects and their methodologies. To save space, we have used the following abbreviations in the data source fields: (1) “STAT” refers to Coyne, M. S., and B. J. Godley. 2005. Satellite Tracking and Analysis Tool (STAT). An integrated system for archiving, analyzing, and mapping animal tracking data. Marine Ecology Progress Series 301: 1–7. (2) “SWOT Online Database” refers to Kott, C. Y., E. Fujihaka, A. DiMatteo, B. P. Wallace, B. J. Hutchinson, J. Cleary, P. N. Halpin, and R. B. Mast. 2015. The State of the World’s Sea Turtles Online database. Data provided by the SWOT Team and hosted on OBIS-SEAMAP. Oceanic Society, IUCN Marine Turtle Specialist Group, and Marine Geospatial Ecology Lab, Duke University. http://seamap.env.duke.edu/swot. (3) “OBIS-SEAMAP” refers to Halpin, P. N., A. J. Read, E. Fujihaka, B. D. Best, B. Donnelly, L. J. Hazen, C. Kot, K. Urian, E. LaBrecque, A. DiMatteo, J. Cleary, C. Good, L. B. Crowder, and K. D. Hyrenbach. 2009. OBIS-SEAMAP. The world’s leading center for marine mammal, sea bird, and sea turtle distributions. Oceanography 22: 104–116. When listed, that sources indicated that the dataset was contributed through STAT, SWOT, or OBIS-SEAMAP.
Biology of Sea Turtles in Brazil through Satellite Telemetry; 10 adult Lepidochelys olivacea; tags deployed; 10 adult Caretta caretta; tags deployed in 2013

Data Sources: (1) Monteiro, D. 2018. Brazil Trawl-Caught Turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/346) on December 4, 2018. (2) (3) (OBIS-SEAMAP) SWOT Contact: Danielle Monteiro

CANAĐA

Data Record 12
Title: 11 Caretta caretta; tags deployed at sea

CANNARY ISLANDS (SPAIN)

Data Record 13 SWOT ID: 496
Title: Project Title: Canary Islands OAP
Project Partner: Universidad de Las Palmas de Gran Canaria and Centro de Recuperación de la Selvicultura, Cabildo Insular de Gran Canaria
Data Sources: (1) Juvenile Caretta caretta; tags deployed between 2008 and 2010
(2) (3) (OBIS-SEAMAP) SWOT Contact: Antonio Machado

Data Record 14
Title: Project Title: Juvenile loggerheads (1999–2010) tags deployed in the Canaries Islands
Project Partners: Universidad de Las Palmas de Gran Canaria and Sociedad Herpetológica Española
Data Sources: (1) Juvenile Caretta caretta; tags deployed in the Canaries Islands
(2) (3) (OBIS-SEAMAP) SWOT Contact: Nuria Vara Cruz

Data Record 15 SWOT ID: 347
Title: Project Title: Islas Canarias (Projecto Aegina). Juvenile Loggerheads
Project Partner: Instituto Canario de Ciencias Marinas, Gobierno de Canarias; Instituto Nacional de Desarrollo Pesquero (INP); Dirección General del Ambiente; Ministerio de Ambiente, Agricultura e Pesca
Data Sources: (1) Juvenile Caretta caretta; tags deployed in 2006
(2) (3) (4) (OBIS-SEAMAP) SWOT Contact: Nuria Vara Cruz

Data Record 16 SWOT ID: 1444
Title: Project Title: LIFE Caretta caretta
Project Partner: LIFE Caretta caretta
Data Sources: (1) Cruz, N. 2016. Canary Islands Data Downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1444) on February 12, 2017, originated from STAT (http://www.seaturtle.org/tracking/index.html?project_id=66). (2) (3) (SWOT Online Database. SWOT Contact: Nuria Vara Cruz

Data Record 17 SWOT ID: 1801
Title: Project Title: Juvenile Loggerheads: Canary Islands Reintroduction Program—ADS Biodiversidad
Project Partners: Acción para el Desarrollo Sostenible y Conservación de la Biodiversidad (ADS Biodiversidad) and Centre of Cabildo de Fuerteventura (Muro Jable)
Data Sources: (1) Juvenile Caretta caretta; individuals are 3 years old and have not been reared in captivity; tags deployed at Cofete Beach
(2) (3) (OBIS-SEAMAP) SWOT Contact: Nuria Vara Cruz

Data Record 18 SWOT ID: 349
Title: Project Title: Cayman Islands 2003. Loggerhead and Green Turtles
Project Partner: Marine Turtle Research Group, Cayman Islands Department of Environment
Data Sources: (1) Adult Caretta caretta; tag deployed July 2003

CAYMAN ISLANDS

Data Record 19 SWOT ID: 350
Title: Project Title: Cayman Islands 2004. Loggerhead and Green Turtles
Project Partner: Marine Turtle Research Group, Cayman Islands Department of Environment
Data Sources: (1) Adult Caretta caretta; tags deployed 2004 and 2006

Data Record 20 SWOT ID: 1292
Title: Project Title: Caribbean Colombian Sea Turtle Satellite Tracking
Project Partner: Sea Turtles and Mammal Conservation Program, UTRUCO–Colombian Caribbean, Universidad Jorge Tadeo Lozano (UTRCO), and Mundo Marino Aquarium, Museo del Mar Foundation
Data Sources: (1) Neonate, 1 juvenile, and 1 adult Caretta caretta; tags deployed in 2016, 2017, and 2018 respectively
(2) (3) (OBIS-SEAMAP) SWOT Contact: Yonit Swimmer

SPAIN

Data Record 21 SWOT ID: 1146
Title: Project Title: Spain Turtles Merged Tags Merged
Project Partners: Fisheries Bycatch Research Group, NOAA, and K. Yam, Tulmoon, University of North Carolina, Wilmington
Data Sources: (1) Juice, 5 neonate, and 21 subadult Caretta caretta; tags deployed between 2008 and 2012
(2) (3) (5) (OBIS-SEAMAP) SWOT Contact: Nuria Vara Cruz

Data Record 22 SWOT ID: 1401
Title: Project Title: Conservación y Preservación de Tortugas Marinas
Project Partners: Fundación para la Conservación y Recuperación de Animales Marinos and Universidad Pontificia de València
Data Sources: (1) 3 juvenile and 3 adult Caretta caretta; tags deployed in Tarragona, Spain, in 2016.
(2) Data includes an adult male loggerhead that traveled across the Atlantic to waters east of Florida, United States
(3) (4) (5) (OBIS-SEAMAP) SWOT Contact: Nuria Vara Cruz

USA

Data Record 23
Title: Project Title: Cape Canaveral Male Loggerheads
(3) (OBIS-SEAMAP) SWOT Contact: Nuria Vara Cruz

Data Record 24
Title: Project Title: Florida Keys

Data Record 25 SWOT ID: 996
Title: Project Title: North Carolina Rehabilitated Sea Turtle Monitoring Project
Project Partners: Karen Bessey, Sea Turtles Rehabilitation Center, and North Carolina State University

Data Record 26
Title: Project Title: Canary Islands Caretta caretta; tags deployed at sea
(SWOT Contact: Kate Mansfield

Data Record 27
Title: Project Title: College of Wilim and Mary and Virginia Institute of Marine Science
Data Sources: (1) 7 juvenile and 10 adult Caretta caretta; tags deployed in February 12, 2017, originated from STAT (http://seamap.env.duke.edu/dataset/349) on December 4, 2018.
(2) (3) (OBIS-SEAMAP) SWOT Contact: Morris Farman

Data Record 28 SWOT ID: 410
Title: Project Title: Virginia Aquarium Prague Response Program
Project Partners: Virginia Aquarium Prague Response Program, Virginia Aquarium and Marine Science Center, and Seaturtle.org
Data Sources: (1) 57 juvenile, 3 subadult, and 1 adult Caretta caretta; tags deployed between 2007 and 2016 in prison facilities in Florida
(2) (3) (OBIS-SEAMAP) SWOT Contact: James Ledbetter

Data Record 29 SWOT ID: 410
Title: Project Title: Virginia Aquarium Prague Response Program
Project Partners: Virginia Aquarium Prague Response Program, Virginia Aquarium and Marine Science Center, and Seaturtle.org
Data Sources: (1) 57 juvenile, 3 subadult, and 1 adult Caretta caretta; tags deployed between 2007 and 2016 in prison facilities in Florida
(2) (3) (OBIS-SEAMAP) SWOT Contact: James Ledbetter

Data Record 30 SWOT ID: 978
Title: Project Title: Virginia Aquarium Sea Turtle Research
Project Partners: Virginia Aquarium and Marine Science Center Foundation
Data Sources: (1) Adult, 7 subadult, and 2 unknown-life-stage Caretta caretta; tags deployed on wild-caught or bycatch caught in 2013 and 2016
(2) (3) (OBIS-SEAMAP) SWOT Contact: Susan Barca

Data Record 31 SWOT ID: 1018
Title: Project Title: Virginia Aquarium and U.S. Navy Sea Turtle Research
Project Partners: Virginia Aquarium Research and Conservation Department, and U.S. Fleet Forces Command, Naval Facilities Engineering Command (NAVFAIC Atlantic)
Data Sources: (1) 4 neonate, and 11 unknown-life-stage Caretta caretta; tags deployed between 2013 and 2015
(2) (3) (OBIS-SEAMAP) SWOT Contact: Susan Barca

Data Record 32 SWOT ID: 655
Title: Project Title: Florida Long-Term Sea Turtle Monitoring Project
Data Sources: Matthews Godfrey and Karen Bessey

Data Record 25 SWOT ID: 996
31

DATA RECORD 33 | SWOT ID: 1342
Project Title: Florida Loggerhead Migration Project
Project Partner: National Marine Fisheries Service Office of Protected Resources

DATA RECORD 34 | SWOT ID: 1490
Project Title: Juvenile Loggerhead Use of the Gulf Stream off Cape Hatteras, North Carolina
Project Partners: North Carolina Renewable Energy Program, Protected Resources Branch of the National Oceanic and Atmospheric Administration Beaufort Laboratory, University of North Carolina Coastal Studies Institute, North Carolina Aquarium at Pine Knoll Shores and Roanoke Island, and University of Central Florida
MetaData: 3 juvenile caretta caretta; head-started turtles originally collected from North Carolina nests; tagged turtles released in Sargassum mats in the gulf stream off the coast of North Carolina in May.

DATA RECORD 35 | Project Title: Moto Marine Lab Males
MetaData: 7 adult male caretta caretta

DATA RECORD 36 | Project Title: Actia Carr Interesting Loggeheads
MetaData: 14 adult female caretta caretta

DATA RECORD 37 | Project Title: Loggerhead Mammal Center Tracking
MetaData: 7 adult, 3 juvenile, and 6 subadult caretta caretta

DATA RECORD 38 | Project Title: Western Australia Loggerheads
MetaData: 31 caretta caretta

DATA RECORD 39 | Project Title: Mozambique Satellite-Tagged Loggerhead Turtles from Mozambique, 2012, under the South African Ocean Fisheries Project (SWOP)
Data Sources: (1) Project Partners: Association for Investigating Casteiro e Marinha, Irmão, and Kérène; MetaData: 3 adult female caretta caretta; tags deployed in April 2014.

DATA RECORD 40 | Project Title: Mozambique Nesting Females Careta

DATA RECORD 41 | Project Title: Aluminium-Tagged Loggerhead Turtles in the South Atlantic

DATA RECORD 42 | SWOT ID: 1014
Project Title: Movements of Late Juvenile Loggerhead Sea Turtles from Reunion Island (Co-PI: kneeling and former caretta caretta)
Project Partners: Kérène and former MetaData: 22 adult caretta caretta; tags deployed in La Réunion (France) in May 2010.

DATA RECORD 43 | Project Title: Loggerhead Mammal Center Tracking
MetaData: 38 adult caretta caretta; tags deployed in South Africa

DATA RECORD 44 | Project Title: Japan

DATA RECORD 45 | Project Title: Post-nesting Migrating Loggerhead Turtles around Japan
Data Sources: (1) Project Partners: Lindsey Dubbs

DATA RECORD 46 | Project Title: Data were compiled from various studies carried out by the NOAAPacific Islands Fisheries Science Center (PIFSC) in collaboration with many partners. See cited literature for project partners and other details.

DATA RECORD 47 | Project Title: Eastern Pacific
Data Sources: (1) Project Partners: Vanessa, 2020. Satellite-tracking of turtle caretta caretta tagged in the eastern Pacific

DATA RECORD 48 | Project Title: Monitoring the Movements of Juvenile Loggerhead Sea Turtles from Reunion Island (Co-PI: kneeling and former caretta caretta)
Project Partners: Kérène and former MetaData: 22 adult caretta caretta; tags deployed in La Réunion (France) in May 2010.

DATA RECORD 49 | Project Title: Movements of Late Juvenile Loggerhead Turtles from Reunion Island (Co-PI: kneeling and former caretta caretta)
Project Partners: Kérène and former MetaData: 22 adult caretta caretta; tags deployed in La Réunion (France) in May 2010.

DATA RECORD 50 | Project Title: Monitoring the Movements of Late Juvenile Loggerhead Sea Turtles from Reunion Island (Co-PI: kneeling and former caretta caretta)
Project Partners: Kérène and former MetaData: 22 adult caretta caretta; tags deployed in La Réunion (France) in May 2010.

DATA RECORD 51 | Project Title: Pacific Turtle Tracks: Grupo Tortugero
Data Sources: (1) Project Partners: Grupo Tortugero

DATA RECORD 52 | Project Title: Monitoring the Movements of Late Juvenile Loggerhead Sea Turtles from Reunion Island (Co-PI: kneeling and former caretta caretta)
Project Partners: Kérène and former MetaData: 22 adult caretta caretta; tags deployed in La Réunion (France) in May 2010.

DATA RECORD 53 | Project Title: Monitoring the Movements of Late Juvenile Loggerhead Sea Turtles from Reunion Island (Co-PI: kneeling and former caretta caretta)
Project Partners: Kérène and former MetaData: 22 adult caretta caretta; tags deployed in La Réunion (France) in May 2010.
DATA RECORD 70 | SWOT ID: 1666
Project Title: CARESAT
Project Partners: Islamaga Group; Department of Biology, University of Pisa; Porko Regional della Maremma (Maremma Regional Park)
Metadata: 3 juvenile and 2 subadult Caretta caretta; tags deployed on turtles off the coast of Tuscany, Italy, in 2005.
Data Sources: (1) Islamaga Group and Department of Biology, University of Pisa. Loggerheads in the Mediterranean: Metadata, unpublished tracks. Personal communication with Paolo Casale.

DATA RECORD 71 | SWOT ID: 1862
Project Title: WWF Italy
Project Partners: Sea Turtle Network, WWF Italy; Instituto Italiano di Protezione della Fauna marine.
Data Sources: (1) Casale, P. 2018. WWF Italy. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1091) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 79 | SWOT ID: 1384
Project Title: WWF Italy—Mantledria
Project Partners: WWF Italy—Mantledria; Università di Roma TRE, Centro Cultura del Mare Associazione di Promozione Sociale (APS), Lega Navale di Mantledria; University of Rome "La Sapienza".
Metadata: 3 juvenile and 2 subadult Caretta caretta; individuals were incidentally caught by trawlers fishing in the Gulf of Mannfredonia.
Data Sources: (1) Casale, P. 2018. WWF Italy—Mantledria. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1091) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 80
Project Title: Habitual Use by Foraging Sea Turtles in the Mediterranean
Project Partners: Stella Zoológica Anton Dohrn, Marine Turtle Research Center (MTRC) Meta data: 1 juvenile, 3 subadult, and 2 adult Caretta caretta; tags deployed in 2013 and 2014.
Data Sources: (1) Lepidochelys kempi (DEKAMER); Centro Regionale di Recupero Fauna Selvatica e Tartarughe Marine, Comiso, Sicily (Italy). Metadata: 7 juvenile and 2 subadult Caretta caretta; tags deployed on turtles off the coast of Sicily in 2016–2017 that originated from a doomed hatchery in the Adriatic Sea.

DATA RECORD 81 | SWOT ID: 1401
Project Title: Preservación y Observación de Tortugas Marinas

DATA RECORD 82
Project Title: Costa de coreña

DATA RECORD 83
Project Title: Adulta corena taggato: depollato su un individuo incidentemente catturato da traghetti pescherecci nel corso di un periodo di cattura nel canyon. Meta Data: 3 adult Caretta caretta; tag deployed on a rehabilitated individual.
Data Sources: (1) Luschi, P. 2018. CARESAT. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1091) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 84
Project Title: Caretta caretta
Data Sources: Mercanci, R. 2017. Movimenti e distribuzione della Caretta caretta nel mare Mediterraneo; Università di Pisa, Italy. Meta Data: 4 adult Caretta caretta.

DATA RECORD 85

DATA RECORD 86
Project Title: Caretta caretta

DATA RECORD 87
Project Title: Caretta caretta

DATA RECORD 88
Project Title: Andalucia, Spain: Small loggersheds from a nest at Palo (Almeria)
Project Partners: Doñana Biological Station, Consejería de Medio Ambiente y Sostenibilidad (CSEMA) (CSIC), Instituto de Electromagnetismo y Nanociencia (CENIM); Instituto de Electromagnetism and Nanosciences; University of Malaga; University of Palermo; University of Valencia.
Meta Data: 8 small juvenile and 2 juvenile Caretta caretta; nests buried in Valencia (Spain) and Catalonia from natural nests found in Spain in 2014, 2015, and 2016. The eggs were trisomic, and the hatchlings were headed in five different centers.
Data Sources: (1) Belda, E. 2018. Unpublished data. Deniz Kaplumbagaları Turku Kozman Laboratuvarı ve DEKAMER, TURKEY.

DATA RECORD 89 | SWOT ID: 1146
Project Title: Data Sources: Swimmer, Y. 2017. Spain tags released.

DATA RECORD 90 | SWOT ID: 1310
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 91 | SWOT ID: 1134
Project Title: Tracking Small Loggerheads from Spain
Project Partners: Fisheries Bycatch Research Group Meta Data: 2 subadult and 2 juvenile Caretta caretta; tags deployed in June and July of 2016.
Data Sources: (1) Swimmer, Y. 2018. Spain, Balsicas Islands 2015 loggerhead turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1310) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 92 | SWOT ID: 980
Project Title: Tracking of Mediterranean Marine Turtles
Project Partners: University of Valencia, Universitat Politècnica de València (UPV), Ministerio de Agricultura, Pesca y Alimentación, Spain.
Meta Data: 3 juvenile and 1 subadult Caretta caretta; tags deployed between 2018 and 2019.
Data Sources: (1) Serrano, C. 2018. Investigación de la movilidad en el litoral valenciano, en el marco del Proyecto LIFE 15 IF5 E02 ZD. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1095) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 93 | SWOT ID: 1304
Project Title: Tracking Small Loggerheads from Spain
Project Partners: Fisheries Bycatch Research Group Meta Data: 2 subadult and 2 juvenile Caretta caretta; tags deployed in June and July of 2016.
Data Sources: (1) Swimmer, Y. 2018. Spain, Balsicas Islands 2015 loggerhead turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1305) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

DATA RECORD 94
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 95
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 96
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 97 | SWOT ID: 1854
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 98 | SWOT ID: 1980
Project Title: Tracking in the Adriatic Sea
Project Partners: Islamaga Group; Department of Biology, University of Pisa and PISA-Adria-Data.
Metadata: 5 juvenile, 1 subadult Caretta caretta; tags deployed between 2006 and 2008 at sites throughout the northern Adriatic Sea.

DATA RECORD 99
Project Title: Tracking Small Loggerheads from Spain
Data Sources: (1) Swimmer, Y. 2018. Spain, Balsicas Islands 2015 loggerhead turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1305) on December 4, 2018. (2) STAT. (3) OBIS-SEAMAP.

TUNISIA
DATA RECORD 94
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 95
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 96
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

TURKEY
DATA RECORD 96
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.

DATA RECORD 97
Project Title: Data Sources: Swimmer, Y. 2018. Spain tags deployed.