The **Pacific Loggerhead**, So Excellent a Connector

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It has been 20 years since the satellite track of Adelita hit the mainstream media and newly birthed internet, sharing the real-time migration of a loggerhead sea turtle from Baja California, Mexico to Japan with millions of people worldwide. Captured in Mexico's Gulf of California as a small juvenile and reared in captivity for more than a decade, Adelita couldn't wait to return home once released. Up to that point, nobody could have imagined that a turtle could swim more than 11,500 kilometers (7,145 miles) in only 368 days.

Satellite telemetry was still in its early years, and having a track of this magnitude highlighted the value of this technology for visualizing ocean connectivity and for revealing obscure aspects of sea turtle life histories. Moreover, Adelita became a *spokesturtle*, showing the world just how magnificent Pacific loggerheads could be. In fact, hers was the first track of *any* animal swimming across *any* ocean, and the simplicity of that remarkably straight path slicing across the vast Pacific was inspiring. Adelita not only demonstrated the value of satellite telemetry for understanding sea turtles; her odyssey also reminded conservationists of the power of using captivating animal stories to create enthusiasm among local and international audiences through media, children's books, and more. Her name was Adelita—not tag #07667—and she became one of the world's most famous living sea turtles.

Today, Pacific loggerheads are by far the most satellite-tracked creatures on Earth. Nearly 400 loggerheads have been followed in the North Pacific using satellites since Adelita's maiden track, and at least 200 more have been tracked in the South Pacific. We now have a stunning map resembling a network of crisscrossed circuits connecting the furthest stretches of the eastern and western North Pacific—a level of connectivity rarely observed in the natural world—as well as a huge swath of loggerhead tracks on both sides of the South Pacific (see pp. 16–17). This map is derived from the largest collection of Pacific loggerhead tracks ever assembled, and, when combined with overlays of oceanography and fisheries data, the priority areas for conservation action nearly leap off the screen.

The Pacific is the largest, most dynamic ocean basin in the world, and that makes the migrations of these turtles so amazing. From the time hatchling loggerheads depart nesting beaches in Japan, Australia, and New Caledonia to some 30 years later when they return as adults, each individual will have traveled tens of thousands of kilometers, interacting with countless habitats and dodging myriad human threats. From east to west, the Pacific stretches roughly 17,000 kilometers (10,563 miles) at its widest. It's an enigmatic sea: its submarine trenches are deeper (10,994 meters/36,069 feet) than the highest mountains. The Kuroshio Current off Japan can rage at nearly 11 kmph (7 mph). And in the abnormally cold eastern tropical equatorial waters, penguins swim with green turtles and iguanas. Taking this all in helps us understand the fascinating story of Pacific loggerheads.

There are two distinct loggerhead populations in the Pacific: (1) a northern group that nests almost exclusively in Japan, with many young traversing the North Pacific to U.S. and Mexican waters, and (2) a southern group that nests in Australia and New Caledonia and spans the South Pacific all the way to Peru and Chile. These two populations mirror each other across the equator. During the 1970s and 1980s, Pacific loggerheads in both hemispheres were declining fast because of threats on nesting beaches and in the sea. The conservation outlook was very bleak for both populations, and by the 1990s some scientists were forecasting that they would be functionally extinct within less than one human lifetime.

The alarming declines in annual loggerhead nesting throughout the western Pacific put conservation biologists on red alert, and both the eastern and western Pacific populations became the focus of important research and conservation efforts. Pioneers such as George Balazs, Jeffrey Polovina, and Don Kobayashi began studying loggerheads in the open ocean, while others such as Colin Limpus and Naoki Kamezaki were expanding protection on nesting beaches and in coastal foraging areas and conducting massive flipper-tagging and recapture programs. Later, Brian Bowen, Alberto Abreu-Grobois, Peter Dutton, and Michelle Boyle began to establish the east-west genetic links for loggerheads on both sides of the equator. The combined work of these early luminaries built a foundation of biological information that revealed the population structures of the North and South Pacific loggerhead subpopulations long before satellite telemetry studies provided indisputable proof of transoceanic migrations.

Significant progress has been made in understanding the ecology and movements of loggerheads in the northern and southern hemispheres since, but each question answered seems to yield a dozen more. What proportion of turtles in the North Pacific eventually makes it from Japan to Mexico's Baja California Peninsula? What is the age of maturity for loggerheads in the Pacific, and is it different in the north and south? Why has the return of subadult loggerhead turtles to coastal habitats of the southwest Pacific declined markedly over the past two decades? Why do adult loggerheads in the North Pacific feed in both oceanic and coastal habitats whereas those in the South Pacific are almost all coastal foragers? Is ingestion of plastic debris an important threat for juvenile loggerheads? What is the impact on loggerheads of illegal, unreported, and unregulated (IUU) fishing in the high seas? How will climate change affect nesting beaches and sex ratios of emerging hatchlings?

We don't have all the answers, but it's clear that the more we look, the more we learn. For example, new discoveries in the eastern North Pacific have revealed that loggerheads are present in a wider range of areas than previously known. They occur in the tens of thousands along the U.S. coast of southern California during El Niño periods, and they gather in the Gulf of California more than we knew just a few years ago. Long-term tracking of individual loggerheads in Australia has also revealed that they mature later and live longer than we realized. And, to the north in Japan, research has shown that the environment within which loggerheads forage can dramatically affect their size and reproductive outputs.

There is still much to learn about Pacific loggerhead biology, and many hurdles remain for their conservation. Clearly a huge challenge to their survival is bycatch mortality in fisheries. Given their delayed maturity, their transpacific movements, and the fact that fishing occurs almost everywhere, it is a near certainty that huge numbers of turtles will interact with fishing gear during their lives. But what then is their probability of survival? Intuition would suggest that it's low, but recent research has shed a sobering light on just how low survivorship can be. For example, the Gulf of Ulloa along the Pacific coast of

A loggerhead turtle that has been seen for three consecutive years on the same reef patch off the shores of Amami-Oshima, Japan. © KATSUKI OKI; PREVIOUS SPREAD: A barnacle-encrusted loggerhead exhales as it surfaces off the coast of Baja California Sur, Mexico. © WEDGE CREATIVE I WEDGECREATIVE.COM

the Baja California Peninsula is the site of the highest bycatch mortality rates among artisanal fisheries worldwide (see *SWOT Report*, vol. III, p. 14). Today, the predicted survivorship of loggerheads spending more than 20 years in that area is less than 10 percent, emphasizing the urgent need for conservation measures.

Thankfully, several bright spots appear in this literal sea of bycatch. The use of circle hooks in place of J hooks is a perfect example; whereas circle hooks don't always stop turtles from interacting with hooks, they can lower mortality among turtles by reducing the incidence of deep hooking. Illuminating gillnets with LEDs has proven to reduce turtle bycatch by more than 60 percent in Peru. And in the South Pacific, the compulsory use of turtle excluder devices has coincided with an increase of nesting females at index beaches. In the North Pacific, TurtleWatch—a mapping tool that integrates fisheries effort and loggerhead habitat preferences to give real-time estimates of loggerhead hotspots (see *SWOT Report*, vol. IV, pp. 36–37)—has improved predictive abilities and allowed fishers to avoid bycatch in the Hawaii-based longline fisheries. Those are just a few of the many technological advances in bycatch reduction that most fishers are eager to adopt, because they too look to minimize interactions with turtles that can ruin their gear and slow their operations.

Assuring the success of these new technologies requires broad scale buy-in from stakeholders. North Pacific loggerheads may traverse the waters of three or more nations during their lives, and their South Pacific counterparts may pass through a dozen or more countries and territories. This fact has sparked several important cross-border management alliances. The North Pacific Loggerhead Trinational Recovery Team, for instance, brings together policymakers from Japan, Mexico, and the United States to manage a multinational conservation action plan. The Convention on Migratory Species plays a similar role among the South Pacific nations of Australia, Chile, Ecuador, Fiji, New Caledonia, Peru, and Tonga.

Of course, much conservation *planning* occurs at the state, national, and international levels, but a significant amount of conservation action occurs at the community level. Local support is built through field-based collaboration, trust building, artful leadership, and the often-slow shifting of narratives and paradigms. In eastern Australia, for example, more than 50,000 loggerhead hatchlings enter the sea, in addition to those from in situ nests, thanks to hundreds of trained volunteers who rescue doomed eggs and relocate them to safer sand following protocols from the Queensland Department of Environment and Heritage Protection. In Peru, the nonprofit ProDelphinus has used high-frequency (HF) radio to connect Peruvian fishers at sea with biologists on shore to promote the safe release of turtles and to gather and share information on turtle captures (see *SWOT Report,* vol. VII, p. 15). And an international fisher exchange program between Japan, Mexico, and Hawaii led to conservation breakthroughs in Baja California, Mexico, where one major fishing cooperative retired its bottom-set longline gear to adopt adopt bycatch-free fishing methods, thus sparing hundreds of turtles. In Japan, a similar exchange resulted in fishers teaming with scientists to develop turtle-friendly pound nets (see *SWOT Report*, vol. VII, pp. 16–17).

We are at an exciting time in the history of Pacific loggerhead research and conservation. The wealth of new knowledge and early signs of population increases at the nesting beaches after decades of decline are extremely encouraging. These gains can be attributed to a combination of (1) long-term indefatigable nesting beach protection by locals; (2) at-sea efforts led by policymakers and implemented by countless fishers who work the nets and longlines in more than a dozen Pacific countries; and (3) the goodwill and commitment of hundreds of nonprofits, communities, and individuals who care about the future of loggerheads and the health of their habitats. From individuals to organizations to nations, we've seen countless examples of people uniting to study and save this species. ¡Viva Adelita! ■

Loggerhead Turtle Satellite Telemetry Data in the Pacific Ocean

Japan
Taiwan
Hawaii
United States
Mexico
New Caledonia
Peru

N

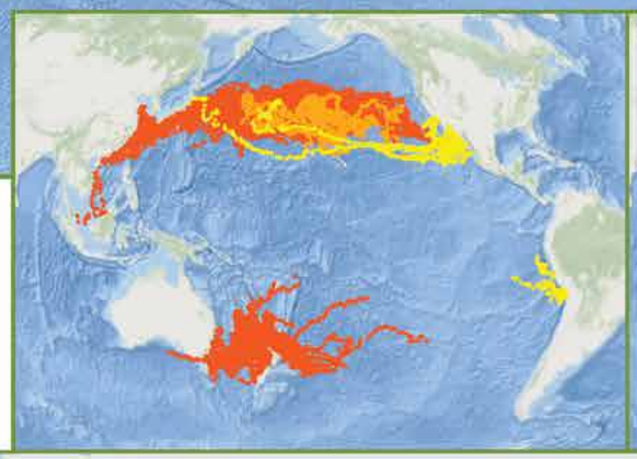
1000 km

scale: 1:40,000,000 **projection:** Winkel-Tripel (central meridian 165W)
data: Telemetry locations and Regional Management Units — the SWOT Team and reviewed literature (see complete data sources and citations on pages 54–55); Ocean Basemap — Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors; country borders — GADM database of Global Administrative Boundaries.
notes: Hexagon height and color is determined by the number of telemetry locations within each feature. Color bins were determined by splitting the count data into quintiles. Visual outliers were removed but telemetry datasets were not otherwise filtered or altered. This map is not intended to be a comprehensive source of all loggerhead telemetry data for the Pacific Ocean or an authoritative source for the studies cited.
produced in partnership with: Oceanic Society, OBIS-SEAMAP, seaturtle.org and the IUCN-MTSG.

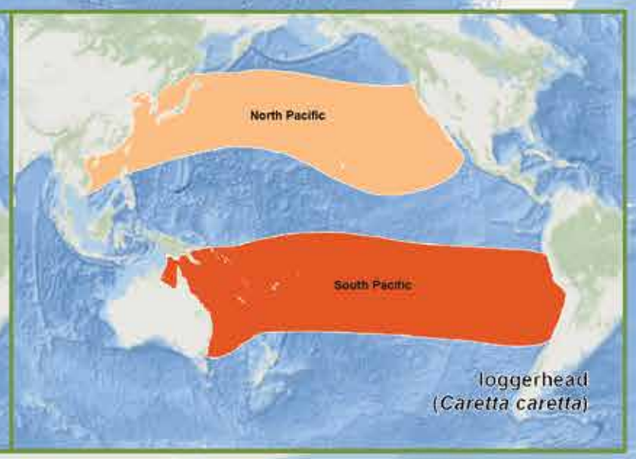
count of locations per hexagon
- ≤ 2812
- ≤ 136
- ≤ 47
- ≤ 16
- ≤ 5

telemetry locations by deployment origin
- Eastern Pacific
- Central Pacific
- Western Pacific
- country borders

Locations by Deployment Origin



Regional Management Units



LOGGERHEAD SATELLITE TELEMETRY IN THE PACIFIC OCEAN

The following data records refer to satellite telemetry datasets for loggerhead turtles in the Pacific Ocean that were combined to create the map on pp. 16–17. These data, consisting of more than 130,000 locations, were generously contributed to SWOT by the people and partners listed below. We are grateful to Jeffrey Seminoff and T. Todd Jones for their assistance in developing the maps and identifying datasets for inclusion, and we especially thank George Balazs and T. Todd Jones for their efforts collecting and sourcing the data provided by NOAA. In mapping the data, obviously erroneous points (e.g., on land) were removed. Some datasets were filtered prior to being shared with SWOT and those were not filtered further. The map is for illustrative purposes and should not be considered an authoritative source of tracking data for the studies cited. 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**.

For reasons of space, the following abbreviations are used in the data source fields below: (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 Kot, C. Y., E. Fujioka, A. D. 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. Fujioka, 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 data center for marine mammal, sea bird, and sea turtle distributions. *Oceanography* 22(2):104–115. When listed, these sources indicate that the dataset was contributed online through STAT, SWOT, or OBIS-SEAMAP.

DATA RECORD 1

Metadata: 4 adult female *Caretta caretta*; tags deployed in Japan. A total of 5 tags were deployed, but only 4 transmitted.
Data Sources: Hatase, H., N. Takai, Y. Matsuzawa, W. Sakamoto, K. Omuta, K. Goto, N. Arai, and T. Fujiwara. 2002. Size-related differences in feeding habitat use of adult female loggerhead turtles *Caretta caretta* around Japan determined by stable isotope analyses and satellite telemetry. *Marine Ecology Progress Series* 233:273–281.
SWOT Contact: Hideo Hatase

DATA RECORD 2 | SWOT ID: 1546

Project Title: Post-nesting migration of loggerhead turtles around Japan 2005
Project Partners: Atmosphere and Ocean Research Institute, University of Tokyo, and Yakushima Sea Turtle Research Group
Metadata: 2 adult female *Caretta caretta*; tags deployed in Japan in 2005.
Data Sources: (1) Hatase, H., K. Omuta, and K. Tsukamoto. 2007. Bottom or midwater: Alternative foraging behaviours in adult female loggerhead sea turtles. Journal of Zoology 273:46–55. **(2)** Hatase, H. 2017. Post-nesting migration of loggerhead turtles around Japan 2005. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1546) on 2017-10-10. **(3)** STAT. **(4)** OBIS-SEAMAP. **(5)** SWOT Online Database.
SWOT Contact: Hideo Hatase

DATA RECORD 3 | SWOT ID: 1265

Project Title: Loggerhead turtle movements in the Southern California Bight
Project Partners: NOAA-NMFS Southwest Fisheries Science Center, NMFS West Coast Regional Office, and Aquarium of the Pacific.
Metadata: 3 *Caretta caretta*; tags deployed in southern California.
Data Source: (1) NOAA Southwest Fisheries Science Center. 2018. Satellite tracking of three loggerhead turtles in Mexico: Personal communication. In *SWOT Report—The State of the World's Sea Turtles*, vol. XIII (2018). **(2)** Seminoff, J., and T. Eguchi. 2016. Loggerhead turtle movements in the Southern California Bight. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1265) on 2017-10-02. **(3)** OBIS-SEAMAP. **(4)** SWOT Online Database. **(5)** STAT.
SWOT Contact: Jeffrey Seminoff

DATA RECORD 4 | SWOT ID: 931

Project Title: Peru Cabezonas
Project Partners: Jeffrey Mangel, ProDelphinus, NOAA Southwest Fisheries Science Center, Peter Dutton, Jeffrey Seminoff, Denise Parker
Metadata: 15 subadult *Caretta caretta*; tags deployed in Ilo and Pucusana, Peru, from 2003 to 2007, on turtles that were bycaught in line fisheries. Only 14 tags transmitted effectively.
Data Sources: (1) Mangel, J. C., J. Alfaro-Shigueto, M. J. Witt, P. H. Dutton, J. A. Seminoff and B. J. Godley. 2011. Post-capture movements of loggerhead turtles in the southeastern Pacific Ocean assessed by satellite tracking. *Marine Ecology Progress Series* 433:261–272. **(2)** STAT. **(3)** SWOT Online Database.
SWOT Contact: Jeffrey Mangel

DATA RECORD 5

Metadata: 12 *Caretta caretta*; tags deployed in Baja California Sur, Mexico, from 1996 to 2005.
Data Sources: Peckham, S. H., D. Maldonado Diaz, A. Walli, G. Ruiz, L. B. Crowder, and W. J. Nicholes. 2007. Small-scale fisheries bycatch jeopardizes endangered Pacific loggerhead turtles. *PLoS ONE* 2(10): e1041.
SWOT Contact: Hoyt Peckham

DATA RECORD 6

Project Title: Adelita
Metadata: 1 *Caretta caretta*; tag deployed in Baja California, Mexico. This turtle, known as "Adelita," was the first loggerhead to be tracked crossing the Pacific Ocean; the tag was deployed on July 19, 1994, on the central Pacific coast of the Baja California peninsula and was recovered, dead in a set net, by a fisherman off the coast of Kyushu, Japan, 478 days later (November 9, 1995) after traveling 10,600 km.
Data Sources: (1) Nichols, W. J., A. Resendiz, J. A. Seminoff, and B. Resendiz. 2000. Transpacific migration of a loggerhead turtle monitored by satellite telemetry. *Bulletin of Marine Science* 67:937-47; **(2)** Resendiz, A., B. Resendiz, W. J. Nichols, J. A. Seminoff, and N. Kamezaki. 1998. First confirmed east-west transpacific movement of a loggerhead sea turtle, *Caretta caretta*, released in Baja California, Mexico. *Pacific Science* 52(2):151–153
SWOT Contact: Wallace J. Nichols

DATA RECORD 7

Project Partners: Data were combined from various studies carried out by the NOAA Pacific Islands Fisheries Science Center (PIFSC) in collaboration with many partners. See cited literature for project partners and other details.
Metadata: 28 *Caretta caretta*; tags deployed at various locations in the Central North Pacific Ocean on turtles caught incidentally in commercial longline fisheries.
Data Sources: (1) Polovina, J. J., D. R. Kobayashi, D. M. Ellis, M. P. Seki, and G. H. Balazs. 2000. Turtles on the edge: Movement of loggerhead turtles (*Caretta caretta*) along oceanic fronts in the central North Pacific, 1997-1998. *Fisheries Oceanography* 9(1): 71–82. **(2)** Polovina, J. J., E. Howell, D. M. Parker, and G. H. Balazs. 2003. Dive-depth distribution of loggerhead (*Caretta caretta*) and olive ridley (*Lepidochelys olivacea*) sea turtles in the central North Pacific: Might deep longline sets catch fewer turtles? *Fisheries Bulletin* 101(1):189–193. **(3)** Chaloupka, M., D. Parker, and G. Balazs. 2004. Modelling post-release mortality of loggerhead sea turtles exposed to the Hawaii-based pelagic longline fishery. *Marine Ecology Progress Series* 280:285–293. **(4)** Polovina, J. J., G.H. Balazs, E. A. Howell, D. M. Parker, M. P. Seki, and P. H. Dutton. 2004. Forage and migration habitat of loggerhead (*Caretta caretta*) and olive ridley (*Lepidochelys olivacea*) sea turtles in the central North Pacific Ocean. *Fisheries Oceanography* 13(1): 36-51. **(5)** Polovina, J., I. Uchida, G. Balazs, E. A. Howell, D. Parker, and P. Dutton. 2006. The Kuroshio Extension bifurcation region: A pelagic hotpot for juvenile loggerhead sea turtles. *Deep Sea Research Pt II: Top. Studies Oceanography* 53(3-4):326–339. **(6)** Kobayashi, D. R., J. J. Polovina, D. M. Parker, N. Kamezaki, I.-J. Cheng, I., Uchida, P. H. Dutton, and G.H. Balazs. 2008. Pelagic habitat characterization of loggerhead sea turtles, Caretta caretta, in the North Pacific Ocean (1997–2006): Insights from satellite tag tracking and remotely sensed data. *Journal of Experimental Marine Biology and Ecology* 356:96–114. **(7)** Howell, E. A., P. H. Dutton, J. J. Polovina, H. Bailey, D. M. Parker, and G. H. Balazs. 2010. Oceanographic influences on the dive behavior of juvenile loggerhead turtles (Caretta caretta) in the North Pacific Ocean. *Marine Biology* 157:1011–1026. **(8)** Abecassis, M., I. Senina, P. Lehodey, P. Gaspar, D. Parker, G. Balazs, and J. Polovina. 2013. A model of loggerhead sea turtle (*Caretta caretta*) habitat and movement in the oceanic North Pacific. *PLoS ONE* 8(9): e73274. **(9)** Parker, D. M., G. H. Balazs, M. R. Rice, and S. M. Tomkeiwicz. 2014. Variability in Reception Duration of Dual Satellite Tags on Sea Turtles Tracked in the Pacific Ocean. *Micronesica* 2014–03. **(10)** Briscoe, D. K., D. M. Parker, S. Bograd, E. Hazen, K. Scales, G. H. Balazs, M. Kurita, T. Saito, H. Okamoto, M. Rice, J. J. Polovina, and L. B. Crowder. 2016. Multi-year tracking reveals extensive pelagic phase of juvenile loggerhead sea turtles in the North Pacific. *Movement Ecology* 4:23.
SWOT Contact: T. Todd Jones

DATA RECORD 8

Project Partners: Data were combined from various studies carried out by the NOAA Pacific Islands Fisheries Science Center (PIFSC) in collaboration with many partners. See cited literature for project partners and other details.
Metadata: 178 *Caretta caretta*; tags deployed in Japan on animals that were captive reared by the Port of Nagoya Public Aquarium and animals that were caught incidentally in fisheries.
Data Sources: (1) Polovina, J., I. Uchida, G. Balazs, E. A. Howell, D. Parker, and P. Dutton. 2006. The Kuroshio Extension bifurcation region: A pelagic hotpot for juvenile loggerhead sea turtles. *Deep Sea Research Pt II: Top. Studies Oceanography* 53(3-4):326–339. **(2)** Kobayashi, D. R., J. J. Polovina, D. M. Parker, N. Kamezaki, I.-J. Cheng, I. Uchida, P. H. Dutton, and G.H. Balazs. 2008. Pelagic habitat characterization of loggerhead sea turtles, *Caretta caretta*, in the North Pacific Ocean (1997–2006): Insights from satellite tag tracking and remotely sensed data. *Journal of Experimental Marine Biology and Ecology* 356:96-114. **(3)** Abecassis, M., I. Senina, P. Lehodey, P. Gaspar, D. Parker, G. Balazs, and J. Polovina. 2013. A model of loggerhead sea turtle (*Caretta caretta*) habitat and movement in the oceanic North Pacific. *PLoS ONE* 8(9): e73274. **(4)** Parker, D. M., G. H. Balazs, M. R. Rice, and S. M. Tomkeiwicz. 2014. Variability in Reception Duration of Dual Satellite Tags on Sea Turtles Tracked in the Pacific Ocean. *Micronesica* 2014–03. **(5)** Saito, T., M. Kurita, H. Okamoto, I. Uchida, D. Parker, and G. Balazs. 2015. Tracking male loggerhead turtle migrations around southwestern Japan using satellite telemetry. *Chelonian Conservation and Biology* 14(1):82–87. **(6)** Briscoe, D. K., D. M. Parker, G. H. Balazs, M. Kurita, T. Saito, H. Okamoto, M. Rice, J. J. Polovina, and L. B. Crowder. 2016. Active dispersal in loggerhead sea turtles (*Caretta caretta*) during the 'lost years'. *Proceedings of the Royal Society B* 283: 20160690. **(7)** Briscoe, D. K., D. M. Parker, S. Bograd, E. Hazen, K. Scales, G. H. Balazs, M. Kurita, T. Saito, H. Okamoto, M. Rice, J. J. Polovina, and L. B. Crowder. 2016. Multi-year tracking reveals extensive pelagic phase of juvenile loggerhead sea turtles in the North Pacific. *Movement Ecology* 4:23.
SWOT Contact: T. Todd Jones

DATA RECORD 9

Project Title: Loggerhead turtle movement off the coast of Taiwan
Project Partners: Data are from the NOAA Pacific Islands Fisheries Science Center (PIFSC) in collaboration with many partners. See cited literature for project partners and other details.
Metadata: 34 *Caretta caretta*; tags deployed on turtles caught as bycatch in the Taiwanese coastal poundnet fishery from 2002 to 2008, Taiwan.
Data Sources: (1) Kobayashi, D. R., J. J. Polovina, D. M. Parker, N. Kamezaki, I.-J. Cheng, I. Uchida, P. H. Dutton, and G.H. Balazs. 2008. Pelagic habitat characterization of loggerhead sea turtles, *Caretta caretta*, in the North Pacific Ocean (1997–2006): Insights from satellite tag tracking and remotely sensed data. *Journal of Experimental Marine Biology and Ecology* 356:96–114. **(2)** Kobayashi, D.R., I.-J. Cheng, D.M. Parker, J.J. Polovina, N. Kamezaki, and G.H. Balazs. 2011. Loggerhead turtle (*Caretta caretta*) movement off the coast of Taiwan: characterization of a hotspot in the East China Sea and investigation of mesoscale eddies. *ICES Journal of Marine Science* 68(4): 707–718. **(3)** Parker, D., G. Balazs, and J. Polovina. 2015. Loggerhead turtle movement off the coast of Taiwan. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1304) on 2017-02-23. **(4)** OBIS-SEAMAP.
SWOT Contacts: Denise Parker, George Balazs, Jeffrey Polovina, and T. Todd Jones

DATA RECORD 10

Project Partners: NOAA Pacific Islands Fisheries Science Center (PIFSC) and Aquarium des Lagons, Noumea, New Caledonia
Metadata: 52 juvenile *Caretta caretta*; tags deployed in 2008 and 2012 on animals that were captive reared by the Aquarium des Lagons in Noumea, New Caledonia.
Data Sources: (1) Kobayashi, D. R., R. Farman, J. J. Polovina, D. M. Parker, M. Rice, and G. H. Balazs. 2014. "Going with the flow" or not: Evidence of positive rheotaxis in oceanic juvenile loggerhead turtles (*Caretta caretta*) in the South Pacific Ocean using satellite tags and ocean circulation data. *PLoS ONE* 9(8): e103701. **(2)** Christiansen, F., N. F. Putman, R. Farman, D. M. Parker, M. R. Rice, J. J. Polovina, G. H. Balazs, and G. C. Hays. 2016. Spatial variation in directional swimming enables juvenile sea turtles to reach and remain in productive waters. *Marine Ecology Progress Series* 557:247–259.
SWOT Contact: T. Todd Jones

DATA RECORD 11 | SWOT ID: 126

Project Title: Pacific turtle tracks: Turtle-Safe Seas Project
Project Partners: Blue Ocean Institute
Metadata: 1 *Caretta caretta*; tag deployed in Baja California, Mexico.
Data Sources: (1) Nichols, W. 2014. Pacific turtle tracks: Turtle-Safe Seas Project. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/126) on 2017–02-17. **(2)** OBIS-SEAMAP. **(3)** SWOT Online Database.
SWOT Contact: Wallace J. Nichols

DATA RECORD 12

Project Title: Pacific Turtle Tracks: Grupo Tortuguero
Project Partners: Grupo Tortuguero
Metadata: 12 *Caretta caretta*; tags deployed in Mexico from 1996 to 2001.
Data Sources: (1) Nichols, W. 2016. Pacific Turtle Tracks: Grupo Tortuguero. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/317) on 2016-07-07. **(2)** OBIS-SEAMAP. **(3)** STAT.
SWOT Contact: Wallace J. Nichols

DATA RECORD 13 | SWOT ID: 1176

Project Title: Tortugas Marinas del Golfo de California
Project Partners: Instituto Politécnico Nacional CIIDIR Sinaloa, Red Tortuguera A.C., Grupo Tortuguero de las Californias A.C., Smithsonian Mason School of Conservation, Instituto de Ciencias del Mar y Limnología/UNAM, and the local fishing communities of La Reforma and Angostura.
Metadata: 6 *Caretta caretta* adults and subadults; tags deployed in the Gulf of California, Mexico.
Data Sources: (1) Zavala, A. 2016. Tortugas Marinas del Golfo de California. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1176) on 2016–07-07. **(2)** OBIS-SEAMAP. **(3)** STAT. **(4)** SWOT Database Online.
SWOT Contact: Alan Zavala

DATA RECORD 14

Metadata: 12 loggerheads; tags deployed in Baja California Sur, Mexico.
Data Source: Animal Telemetry Network. 2018. 12 loggerhead turtle tracks in Baja California Sur, Mexico. Accessed January 11, 2018 at http://oceanview.pfeg.noaa.gov/ATN/. ATN POC: Dr. Scott Eckert.
SWOT Contact: Animal Telemetry Network