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# NEAR-SHORE DISPERSAL OF PAPUAN LEATHERBACK HATCHLINGS USING ACOUSTIC TELEMETRY

by Geoffrey Gearheart

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## PROCEEDINGS OF THE THIRTY-FIRST ANNUAL SYMPOSIUM ON SEA TURTLE BIOLOGY AND CONSERVATION



10 to 16 April 2011 San Diego, California, USA

Compiled by: T. Todd Jones & Bryan P. Wallace

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149

May 2012 (Updated November 2012)



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Compiled by:

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#### PRESIDENT'S REPORT

The President's Report may be found in its entirety in the Marine Turtle Newsletter 130:30-33, 2011 entitled 'President's Report for the 31st Annual Symposium on Sea Turtle Biology and Conservation 'The Next Generation of Research and Conservation', 10-16 April 2011, San Diego, California, USA.'

by Jeffrey Seminoff, President, ISTS

http://www.seaturtle.org/mtn/archives/mtn130/mtn130p30.shtml

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#### STUDENT AWARDS

There were 181 student presentations – 58 papers and 123 posters with \$5,500 US awarded to 12 recipients. The awards committee was composed of Lisa Campbell, Matthew Godfrey, and Jeanette Wyneken. Student judges: Karen Arthur, Larisa Avens, Ray Carthy, Paolo Casale, Emma Harrison, Craig Harms, Jennifer Keller, Mike James, Cynthia Lagueux, Kate Mansfield, Catherine McClellan, Zoe Meletis, Terry Norton, Dave Owens, Andrea Phillott, Nick Pilcher, Peter Pritchard, Kim Reich, Erin Seney, Kelly Stewart, Tony Tucker, Roldan Valverde, and Thane Wibbels. The awards were financed by the International Sea Turtle Society. (Note that as in previous years, the judges decided not to award prizes in certain categories, based on their ranking system)

#### **Breeding Biology**

#### **Best Oral Presentation**

Anthony Rafferty, Pilar Santidrián Tomillo, James Spotila, Frank Paladino, Richard Reina. Embryonic death is linked to maternal identity in the leatherback turtle (*Dermochelys coriacea*). (Monash University) \$500

#### **Runner Up Oral Presentation**

Jeanne Garner, Tomo Eguchi, Duncan MacKenzie, Scott Jacques. Evaluating steroid hormone data in association with reproductive parameters in a population of endangered leatherback sea turtles and the application to conservation and management. (Texas A&M University) \$250

#### **Best Poster Presentation**

Hannah B. Vander Zanden, Karen A. Bjorndal, Alan B. Bolten. Nutrient transport by green turtles. (University of Florida) \$500

#### Conservation through Social, Economic, Cultural, & Legal Pathways

#### **Best Oral Presentation**

Courtney Shephard. Optimizing U.S. Endangered Species Act protection by integrating recovery planning, Section 7 Consultations, and incidental take authorizations: A sea turtle case study. (Duke University). \$500

#### Foraging, Physiology, & Movements

#### **Best Oral Presentation**

Simona Ceriani, James D. Roth, Daniel Evans, Llewellyn M. Ehrhart. Satellite tracking confirms the use of stable isotopes to infer foraging grounds of loggerhead turtles (*Caretta caretta*) nesting on Florida's East coast. (University of Central Florida). \$500

#### **Runner Up Oral Presentation**

Alexander R. Gaos, Rebecca L. Lewison, Ingrid L. Yañez, Wallace J. Nichols, Andres Baquero, Michael Liles, Mauricio Vasquez, Jose Urteaga, Bryan Wallace, Jeffrey A. Seminoff. Satellite telemetry reveals novel insights into the biology and conservation of hawksbill turtles (*Eretmochely imbricata*) in the eastern Tropical Pacific. (San Diego State University). \$250

#### Foraging, Physiology, & Movements

#### **Best Poster Presentation**

Morgan Young, Michael Salmon, Richard Forward. Visual wavelength discrimination by the loggerhead turtle. (Florida Atlantic University). \$500

#### **Health & Rehabilitation**

#### **Best Poster Presentation**

Virginie Plot, Jean-Patrice Robin, Thomas Jenkins, Sabrina Fossette, Jean-Yves Georges. Physiological state and condition in nesting leatherback turtles in French Guiana. (Université Strasbourg) \$500

#### April 2011 San Diego, California, USA

#### **Population Assessment**

#### **Best Oral Presentation**

Brian M. Shamblin, Mark G. Dodd, Kristina L. Williams, Michael G. Frick, Terry M. Norton, Stephanie Ouellette, Rebecca Bell, Douglas M. Hoffman, Debra Barnard-Keinath, Gale G. Bishop, Scott Coleman, Stacia Hendricks, Tammy Smith, Campbell J. Naim. Genetic mark-recapture of the female loggerhead population nesting in Georgiam 2008-2009: Abundance, nest site fidelity, and relatedness. (University of Georgia). \$500

#### **Best Poster Presentation**

Vanessa Bezy, Roldan A. Valverde. Comparison of methodologies for estimating the nest density of olive ridley arribadas at Ostional, Costa Rica. (UNC – Wilmington). \$500

#### **Threats**

#### **Best Oral Presentation**

Qamar Schuyler, Kathy A. Townsend, Justin Marshall. To eat or not to eat? The roles of choice and vision in ingestion of marine debris by sea turtles. (University of Queensland). \$500

#### **Best Poster Presentation**

Leigh Ann Harden, Amanda S. Williard. Using spatially explicit predator-prey model to investigate bycatch risk of terrapins in crab pots. (UNC – Wilmington). \$500

Proceedings of the 31st Annual Symposium on Sea Turtle Biology and Conservation

#### **ISTS AWARDS 2011**

Award certificates were designed by Dawn Witherington.

#### President's Award

Margie Stinson

#### Ed Drane Award for Volunteerism (new award)

Ed Drane

#### **Life Time Achievement Award**

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#### **Champions Awards**

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#### **Grass Roots Awards (new award)**

Ingrid Yañez

#### KEYNOTE PRESENTERS

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The Eastern Pacific: Where the Turtles are all Different

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#### Saving Sea Turtles of Sri Lanka

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#### Kurma

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#### Sanctuary in the Sea: a Gulf of the Farallones Experience

**Bob Talbot** 

#### Sea Turtle Conservation with Grupo Tortuguero

Roger Roth, presented by Wallace J. Nichols

## NEAR-SHORE DISPERSAL OF PAPUAN LEATHERBACK HATCHLINGS USING ACOUSTIC TELEMETRY

# Geoffrey Gearheart<sup>1</sup>, Adi Maturbongs<sup>2</sup>, Ricardo Tapilatu<sup>2,3</sup>, Peter Dutton<sup>4</sup>, Janet Sprintall<sup>1</sup>, and Gerald Kooyman<sup>1</sup>

<sup>1</sup> Scripps Institution of Oceanography, La Jolla, California, USA

As part of a multi-year effort to study the oceanic dispersal of leatherback hatchlings departing the nesting beaches of Papua's Bird's Head Peninsula (Indonesia), a pilot study was carried out to determine the most efficient tracking method and yield preliminary data on near-shore dispersal. Both acoustic and VHF (radio) tags were tested in the field, using stationary buoys and live hatchlings. The results show the superiority of acoustic tags in terms of directionality, the most important parameter when tracking small organisms at sea. This led to the development of an optimum setup for acoustic tracking and the first recorded tracks of western Pacific leatherback hatchlings. Fifteen trajectories with lengths of up to 7 km and 6 hours duration show the feasibility of the method and provide preliminary information on swimming behavior and surface currents that mediate dispersal. The high temporal resolution of the data enabled us to measure the impact of (1) the drag of the tracking set (bobber and transmitter) and (2) the influence of age at release (time elapsed between natural emergence and release for tracking) on displacement speed and swimming direction (offshore bearing). The results suggest that the tracking set slows down the displacement speed of the hatchlings by 38 %, however, when entrained in a Westward surface current, there was no difference in displacement speed of turtles dragging the tracking set vs. turtles swimming freely. Overall, hatchlings' swimming direction was not affected by the tracking set. The same results were obtained when comparing the displacement speed of turtles that emerged naturally from their nests vs. hatchlings dug up from hatched/predated nests ("stragglers"). Refining the analysis to take into account the age at release on displacement speed, it was found that hatchlings less than 24 hrs old swam significantly faster than hatchlings of 48 hours or more. Interestingly, "stragglers" performed better than 48+ hatchlings. The results suggest that when entrained in currents matching or exceeding their sustained maximum swimming speed, the tracking set did not influence hatchlings' swimming behavior. These findings furthermore suggest that hatchling dispersal is primarily influenced by their initial ability to become entrained in the strong near-shore current. Conversely, in calm waters, hydrodynamic drag becomes an issue. The impact of the hatchling's age on displacement speed provides additional evidence supporting the immediate release of hatchery turtles.

<sup>&</sup>lt;sup>2</sup> Universitas Negeri Papua, West-Papua, Indonesia

<sup>&</sup>lt;sup>3</sup> University of Alabama-Birmingham, USA

<sup>&</sup>lt;sup>4</sup> NOAA-SWFSC, La Jolla, California, USA

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