PROGRAMMATIC REPORT FORMAT (maximum of 2 pages)

Grantee: University of Alabama at Birmingham, P.I. Thane Wibbels

Contract Number: 05-019R

Project Title: Simultaneous Evaluation of Loggerhead Nesting Beach Temperatures Throughout Florida: Implications for Population Sex Ratio

Report Period: Final Report 05/01/05 to 5/17/06

Project Manager(s)/Principle Investigator(s): Thane Wibbels

Tasks: The following tasks were completed according to the accepted proposal's timeline.

1) Spring 2005: Initiated collaborations with numerous loggerhead nesting beach conservation programs in Florida
2) May 2005: Deployed data loggers at mid-nest depth on loggerhead beaches throughout Florida.
3) September-October: Recovered data loggers from beaches
4) October: Downloaded data and performed comparison of temperature data from the various nesting beaches in Florida.
5) December-February: Data was analyzed and results were presented at international meetings, which included two published abstract. These presentations were given at the annual meeting of the Society for Integrative and Comparative Biology, and at the International Sea Turtle Symposium

Deliverables: We have completed all deliverables as indicated in Attachment A of the proposal.
Six Month and Final Deliverables

1) We have analyzed all temperature data and a report (and a poster) summarizing those data is available upon request. Additionally, we have digital photo library documenting the various beaches and beach locations that were examined.
2) We presented the results of the study at two international scientific meetings, and each presentations resulted in a published abstract. The two meeting were a) the Annual Meeting of the Society of Integrative and Comparative Biology (January, 2007, Orlando, FL), and the 26th Annual Symposium on Sea Turtle Biology and Conservation at Biology (April, 2007, Crete, Greece) (presentation was awarded a "runner up" prize for best student poster). These abstracts are listed below:

a) Estes, J., Wibbels, T., Wyneken, J., Ehrhart, L., Tucker, T., Carthy, R., Bresett, M., Johnson, C. 2006, Temperature comparison of Carette caretta nesting beaches throughout Florida. Integrative and Comparative Biology 45: 1129.

b) Estes, J., Wibbels, T., Wyneken, J., Ehrhart, L., Tucker, T., Carthy, R.,Scarpino, R., Martin, E.R., Bresett, M., Johnson, C., Ball, B., Schmid, J., Vaughn, J., Condran, S., Grimes, J., and Clark, P. 2006 Temperature comparison of *Carette caretta* nesting beaches throughout Florida.. Proceedings of the 26th Annual Symposium on Sea Turtle Biology and Conservation, pp 190-191.

3) As indicated in our deliverable, if we can continue the project for three years we intend to produce a manuscript on "long term" temperature comparisons and variations between loggerhead nesting beaches in Florida. We currently have a proposal submitted to your organization which would allow us to complete our third year. Our initial year was very unusual due to the high number of hurricanes that hit Florida. As such, additional years are warranted to evaluate the year to year variation in nesting beach temperatures.

Accomplishments:

All tasks were accomplished and they are itemized below.

1) During the spring of 2005, collaborations were initiated with the following groups

1) Melbourne Beach (Lewellyn Ehrhart, University of Central Florida)
2) St. Lucie Nuclear Power Plant (Michael Bresette, Quantum Resources)
3) Jupiter Beach, (Erik Martin and Bob Ernst, Ecological Associates)
4) New Symrna Beach (Erik Martin and Bob Ernst, Ecological Associates)
5) Volusia County, (Erik Martin and Bob Ersnt, Ecological Associates)
6) Juno Beach (Chris Johnson, Loggerhead Marine Life Park)
7) Boca Raton (Jeanette Wyneken, Florida Atlantic University)
8) Keywadin Island, Jill Schmid, Nature Conservancy, FFWCC
9) Sanibel Island (Jeanette Wyneken/Beverly Ball, Sanibel/Captiva Conservation Foundation/Jeanette Wyneken, Florida Atlantic University)
10) Sarasota area: Long Boat Key to Venice (multiple beaches) (Tony Tucker, Mote Marine Lab)
11) Cape San Blas (Ray Carthy, University of Florida)

2) During May of 2005 through early June, multiple trips were taken to deploy data loggers on all of beaches listed above. These locations ranged from Melbourne Beach on the Atlantic coast to Cape San Blas on the Florida panhandle. Additionally, a total of eight beaches were examined in the Sarasota area (in collaboration with Mote Marine Lab). This included beaches on Longboat Key, Lido Key, Casey Key, Siesta Key, and Venice. A total of 19 beaches were evaluated in this study. On all beaches the data loggers were buried in locations where the nesting typically occurs. These locations were determined through discussions with collaborators from each of the specific beaches. All data loggers were buried at 40 cm in depth which approximated the mid-nest depth of loggerhead sea turtles. All data logger locations were carefully noted via GPS and via triangulation to stakes that were placed high on the beach. Five data loggers were deployed on each beach for a total of 95 data loggers. Additionally, we completed a second deployment of 5 data loggers during July at Cape San Blas, because Tropical Storm Arlene and Hurricane Dennis removed our first set. We also deployed two data logger on a loggerhead nesting beach on Dauphin Island, Alabama (a hypothesized extension of the Florida panhandle subpopulation of loggerheads).

3) During late August through October, multiple trips were taken to recover the data loggers from the various beaches. Some of these trips were initiated when specific hurricanes developed and had the potential of eroding specific beaches. The great majority of data loggers were recovered, but some were not recoverable due to beach erosion and beach accretion.

4)All of the recovered data loggers had viable data that was downloaded to computer files. Those data files were exported to Excel files for analysis. Our analysis indicates that there was significant variation in beach temperatures. For example, nesting beaches on the Florida Panhandle and west coast of Florida were generally cooler than Atlantic coast beaches, thus suggesting they could be important for the production of males. Further, it was very clear that weather systems moving through some of the areas could have significant cooling effects on incubation temperatures.

5) During October 2005 through April 2007, we analyzed the data and gave two presentations regarding the data at international meetings. These presentations produced the two published abstracts that are listed above under "Deliverables".