Global Warming and El Niño-Southern Oscillation Cycles Effect on Sea Turtles

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Besides anthropogenic influences, the effects of temperature and El Niño-Southern Oscillation (ENSO) Cycles on Chelonoidea are a secondary effect towards the decline of the population of the three main species that nest off the east coast of Florida. The purpose of this project is to analyze the full effect of temperature and ENSO Cycles on the health of sea turtle populations worldwide. This includes the effects of weather patterns on incubation length, ENSO effects on the percentage of false crawls, percentage of in nest fatalities, and number of eggs per nest. Three conclusions were proven: 1) When stronger ENSO are present, there was a greater percent of C. caretta false crawls than the percent of false crawls occurring at weak ENSO. This correlation was statistically proven with 99.5% confidence (t=3.428, P-Value=0.002,n=13). 2) A confidence interval showed that when a stronger ENSO is present a greater percent of C. caretta clutch fatalities occurred compared to weak ENSO Cycles. 3) When C. caretta, Chelonia mydas, or Dermochelys coriacea nests are laid in El Niño years they contain more eggs per clutch than those laid in La Niña years. This was statistically proven with a p-value of 0.0475 giving us 99.5% confidence in ENSO years as a predictor for egg count per clutch. Through studies of both temperature and ENSO cycles and their effects on nesting success of sea turtles a health analysis was formulated to aid in determining the effects of weather patterns on the success of both in situ nests and relocated nests, enabling conservationists to better create an inexpensive and viable protection plan for these endangered species.

Awards Won:
Third Award of $1,000