

CHANGES IN BODY MASS AND TOTAL BODY WATER
IN BOTTLENOSED DOLPHINS (*TURSIOPS TRUNCATUS*)

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY
OF HAWAII IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

OCEANOGRAPHY

MAY 1997

By

Molly K. Lucas

Thesis Committee:

Shannon Atkinson, Chairperson

Michael Landry

Jay Sweeney

Richard Young

ABSTRACT

The primary goals of this study were to characterize changes in body mass and total body water (TBW) in 2 adult male bottlenosed dolphins and in pregnant female bottlenosed dolphins (7 for mass gain, 3 for TBW). The secondary goals were to evaluate various morphometric models for the estimation of body mass from measurements of length and girth in *Tursiops* and to examine saliva as a diagnostic fluid for TBW studies in dolphins. TBW was measured by deuterium oxide dilution, and the bodily fluids used in the determination of deuterium oxide dilution were blood and saliva for males and saliva for females. Individual differences were found in the total protein concentration of saliva, specifically, there appeared to be a difference between the males and the females.

The data presented for male bottlenosed dolphins included changes in 1) body mass, 2) TBW(kg), 3) TBW (% of body mass), and 4) circulating testosterone concentrations between February and August of 1995 (one male) and 1996 (two males). Two of the three male profiles exhibited strong positive correlations between testosterone and each of the three other parameters, and all three of the profiles exhibited strong correlations between body mass and TBW(kg).

The data presented for female dolphins was limited to body mass changes during gestation. Reliable TBW information could not be calculated for the females because a reliable method for the normalization of differential seawater contamination in saliva samples was not found. The average percent mass gain for the seven pregnancies examined was 27%.