

AN EVALUATION OF CLIMATE CHANGE EFFECTS DURING THE LAST 150 YEARS ON THE SIZE OF NORTH AMERICAN DUCK EGGS

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ABSTRACT

During extreme or prolonged drought conditions, prairie ducks are known to overfly the prairies to more northern habitats (Hansen, H.A., and D.E. McKnight. 1964. Emigration of drought-displaced ducks to the Arctic. *Trans. North Am. Wildl. Conf.* 29:119-127.), to have shorter nesting seasons, and to have eggs or clutches which may be reduced in size due to reduced food resources and/or reduced body condition of the female. Life history theory predicts that larger eggs often result in greater offspring fitness; however, in less than optimum environmental conditions fecundity (e.g., average clutch size) may be reduced to favor fewer eggs of optimal (larger) size. Duck egg size metrics may be our best indicators of climate change effects (global warming effects) on future North American waterfowl populations. Our primary study objective was to determine if duck egg size (length, width and volume) measurements would vary among various geographical regions or time period/ years with wet or dry weather conditions (i.e., multiple years with above or below mean annual precipitation amounts). We obtained lengths and widths (mm) of approximately 68,000 North American duck eggs of 34 different Anatidae species from current field research (1980-2010) and from 16 museums across North America. Egg measurements were acquired from eggs collected from 1859 through 2011. Prior published and non-published egg metrics data were also used to facilitate the comparison of data from different areas and time periods of collection. All eggs were geo-referenced using GIS software, and then sorted according to species, ecological region, wetland type used and diet type used during nesting season. We will present results which indicate a significant size difference in eggs of certain species over the last 150 years and a size difference between eggs of the same species across geographic regions, and across time in certain geographic regions.