

THE IMPACT OF HURRICANE FORCE WIND FIELDS IN THE NORTH PACIFIC
OCEAN ENVIRONMENT

A THESIS SUBMITTED TO THE GLOBAL ENVIRONMENTAL SCIENCE
UNDERGRADUATE DIVISION IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE
IN
GLOBAL ENVIRONMENTAL SCIENCE
MAY 2011

By

Selen Yildiz

Thesis Advisor

Dr. Steven Businger

ABSTRACT

This study analyzes the distribution of hurricane force winds in extratropical cyclones as documented by Quikscat wind data over the North Pacific Ocean from January 2003 through May 2008. Interannual variability and influence of the ENSO cycle are presented. When WAVEWATCH III model forecasts associated with these intense storms are compared with buoy observations over the eastern and central Pacific, it is shown that the model significantly underestimates the large swell events. The case study showed that the wave steepness is larger than the majority of cases where ships were damaged. The winds driving the WAVEWATCH III model are under predicted by NOAA's operational global weather model, which leads to under prediction of the large waves.