

# FY 2000 Right Whale Photogrammetry Flight Report

Project: Right Whale Photogrammetry

Dates: Depart USCG Air Station Cape Cod August 5, 2000  
Conduct Photogrammetry Survey August 6-26,2000  
Return USCG Air Station Cape Cod August 27,2000

Area of Operations: Bay of Fundy, Canada (See Map)

Platform: NOAA Twin Otter (NOAA 57)

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## Introduction:

As part of a major research program developed by the National Marine Fisheries Service this study focuses on the ability to interpret physiological condition factors of right whales based on morphometric measurements.

## Project Description:

Sophisticated aerial photogrammetry camera systems of military design were used to collect images of right whales while congregated in the summer feeding grounds to the east of Grand Manan, Canada (see map). The cameras are forward image motion compensating, five (5) inch format units identified as KA76A cameras built by Chicago Aerial and originally used by the military for reconnaissance. The camera systems are integrated into a computer based Data Acquisition System (DAS) which collect data from the cameras, the aircraft's GPS system(Trimble), an aircraft-independent radar altimeter(Sperry 913), and operator input from the keyboard.

Photographs were taken using three types of film, with and without various color filters to enhance the contrast of the images. Kodak Aerochrome MS 50359 (1500'), Aerocolor III negative film 2444 (200'), and Aercon II Plus-X 3404 black and white thin base negative film (1300') were used on various days.

Altimeter readings were collected as each frame was exposed. Altimeter data was examined for

bias by photographing objects of known size (runway numbers on land and PVC pipe deployed at sea). Field resolution for each film was determined by photographing a standard USAF 8:1 Resolution Target.

Photographs were taken at various altitudes between 400 and 500 feet. The fact that an altimeter is integrated into the DAS the pilots can concentrate on aircraft and animal orientation for optimal photographic passes rather than maintaining precise altitudes. This technique allows for many more successful passes over the animals on the surface as well as precise altimeter data for each photograph. We observed no indication that the whales were responding to aircraft overflights and no response was reported by shipboard observers in the same area.

Photographic days were chosen to be below sea state Beaufort 3, and preferably sunny to maximize light penetration into the water. As this project was a component of a much larger overall research program directed at right whales there was often a ship on-site to relay local weather conditions. This feature maximized flight hours with a minimum of lost time from mission days aborted due to poor localized weather conditions.

Typical flight days required two pilots, two observers in bubble windows, a data recorder, and the camera operator. However, several days were flown with the data recorder and the camera operator being one person. The bubble window observers work in conjunction with the pilots in identifying individual whales to photograph. The pilots would adjust their course to cross as many as individuals on a single photographic pass as possible, most passes caught a single or a couple of individuals. The camera operator would trigger the cameras to fire upon the commands by the bubble observers and the data recorder would edit the DAS with specifics (unique observations) on individual passes.

Exposed film is sent directly to Precision Photo Laboratories (Dayton, OH) for processing upon the completion of a roll. Processed film will be returned to NMFS for data analysis.

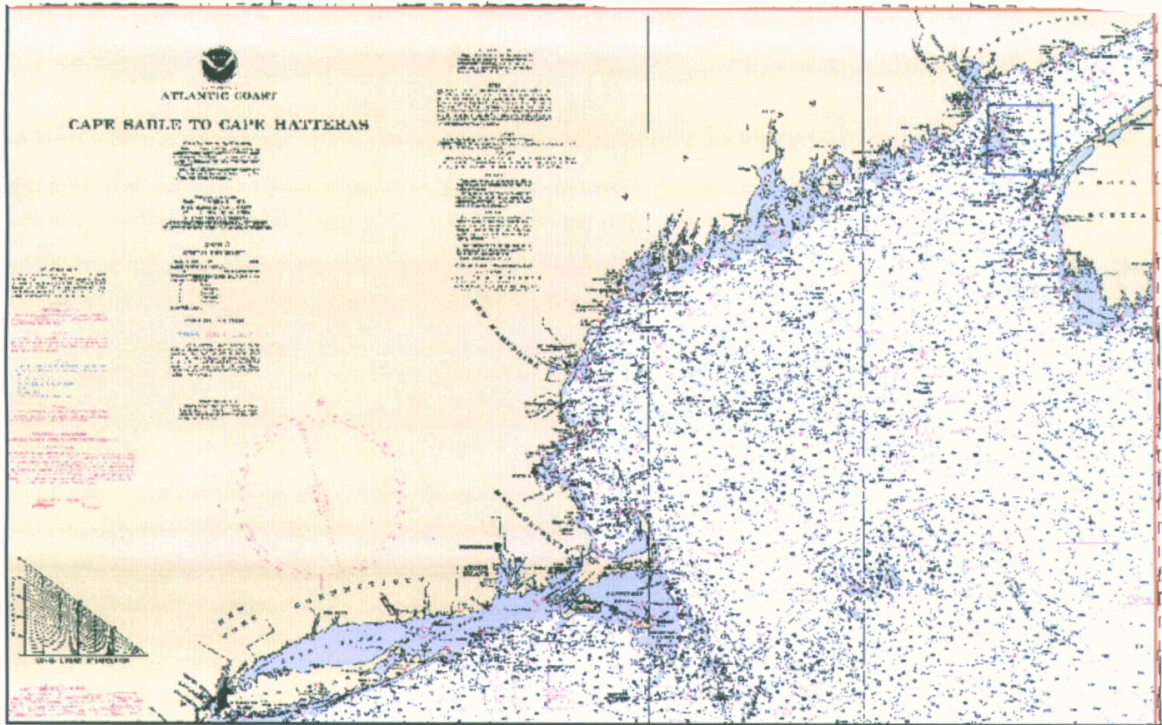
### Results:

Photogrammetry flights were conducted during nine (9) flight days during the survey period.

#### Survey Data Collected:

Photogrammetry Days Flown		9
Photographs	Aerochrome 50359	1200 feet
	Aerocolor III 2444	600 feet
	Aerecon II 3404	1800 feet

Film is being processed and details of the results will be recorded in research papers produced from this line of research.



Map: Box showing area of photogrammetry flights.