Whale Identification

There is sufficient variation in the markings of humpback whale flukes (the lobes of the tail) to allow photo identification of individual whales. By comparing such features as pigment patterns, the location of natural marks and scars, and the size and shape of the notch between the flukes, researchers are able to identify and track individual whales over long periods to determine the distribution and migration of whales.

A team of researchers from the National Marine Mammal Laboratory (NMML), Seattle, Washington, with collaboration from the College of the Atlantic, Bar Harbor, Maine and other organizations, has developed an advanced computerized photo matching technique for whale identification. **Below,** NMML's Sally Mizroch, who was active in the development of the photo matching system, is using the system to match whale flukes. **At right,** Seattle high school students get a chance to see how the system works at a traveling exhibit developed by the Pacific Science Center of Seattle with the help of Sally Mizroch and other NMML researchers.

Based on a computer program developed under NASA contract, the new technique employs digitized imagery and a video disc that can store as many as 54,000 single frame images of whale flukes. The software, known as R:BASE for DOS, stores digitized descriptions of the images, compares a new photo with the description, ranks stored photographs on the basis of similarity to the new photo, and

presents the ranked images on a video screen in fractions of a second for matching and identification.

The system was tested on NMML's North Pacific humpback whale photo collection, which numbers more than 9,300 photos contributed by 22 research groups working in all areas of the North Pacific. Some 2,400 photos, representing about 790 individual whales, were cross-matched and assigned identification numbers.

The computer program is one of a series of spinoff R:BASE products developed by Microrim®, Inc. Redmond, Washington. Microrim was founded in 1981 by company president Wayne Erickson and other members of a team that had developed for NASA a database management system to store the voluminous data for analyzing heat shielding tiles on the Space Shuttle Orbiter. Called RIM (for Relational Information Manager), the system served as the developmental base for the whole R:BASE line, now the second largest selling line of microcomputer database management software in the world. NMML researchers saw the potential of the R:BASE product for use in the whale identification process, bought the program off the shelf and adapted it to the photo matching technique. Computer assisted matching of humpback whales has made it possible to compare large numbers of whale identification photos from many regions, thus aiding in management of this endangered species.

Spinoff software provided a base for an advanced computerized photo matching technique for whale identification