DEPARTMENT of the INTERIOR

news release

FISH AND WILDLIFE SERVICE

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SATELLITES AND SNOW GEESE: SPACE AGE TECHNOLOGY AIDS WILDLIFE MANAGEMENT

A million square miles of formerly inaccessible Arctic goose breeding country can be checked out in a twinkling now by the U.S. Fish and Wildlife Service using two earth satellites--giving biologists a much better handle on forecasting autumn flights of geese over North America and enabling the United States and Canada to fine tune their hunting regulations to the needs of the birds.

Snow and ice melted two to three weeks earlier than normal in the high Arctic this year, the Service discovered in its first experimental use of satellite pictures taken in June. This fact alone was good news for biologists following Arctic nesting goose populations because it sets the natural stage for a successful year of nesting, laying, and hatching eggs, as well as raising young birds.

Arctic nesting geese--which include most species common to North America--run a close race with nature each year. They arrive from their wintering grounds in warmer climes ripe to nest and lay the eggs that have been developing within them for three weeks. The male copulates with the female during spring migration and upon arriving at the traditional breeding grounds she is prepared to build her nest and lay eggs within a few days.

(more)

Timing is crucial. If geese don't get their nests built by mid-June the clock automatically runs out on the chances of young birds growing and surviving to fall migration. Arctic summers are extremely short, and geese need 21 to 25 days to incubate eggs and as many as 50 additional days for rearing goslings to flight stage.

Weather is the greatest enemy of Arctic nesting geese. Nature has adapted them in a unique way to cope with ice and snow, however. If the nesting grounds are still covered with snow or ice, when the geese arrive, they will not nest because they seem to know their eggs would not hatch in time for the goslings to attain flight before the onslaught of winter. Also, in a sort of natural "waste-not-want-not" way, the female as an added adaptation is physiologically able to "resorb" her eggs one by one until weather conditions improve. This is a process of "dissolving" the fertile egg and assimilating its chemicals back into the body rather than laying the eggs. However, such delays cannot exceed more than a few days or a week at most because she will have resorbed all of her fertile eggs and will not have time to begin once more and complete the natural cycle before the snow flies. In years when snow and ice delay nesting, the normal clutch of 4 to 5 eggs is reduced.

Arctic nesting geese often endure a boom or bust reproductive existence as a result. It is known that breeding populations of several hundred thousand geese have produced no young whatsoever in "bad" years. This seems to have happened to the Wrangel Island, U.S.S.R., snow goose population in 1974. Of 15,000 snow geese that migrated to the State of Washington and were surveyed last fall, none were immature birds, indicating that the persistence of snow and ice in Russia's far north interrupted the natural breeding cycle of this goose species. A species cannot long endure natural reversals like this before its entire population is in deep trouble. This is the fifth year the Wrangel Island snow goose population has endured such a hard time, and hunting regulations have been restricted to take pressure off this species. This year the daily bag limit on white geese throughout the Pacific Flyway has been reduced from six to three birds.

In other parts of the Arctic where 1975 was a good year the natural drama played out like a speeded-up, old-time movie around a good portion of the Arctic Circle. The 24 hour a day sunshine accelerates everything. Snow, ice, and melted water vanish quickly. Lush green grass and succulent plant life spring almost like jacks-in-the-box from the now-steaming tundra. Eggs hatch and goslings grow at an unbelievable rate as they gorge themselves on the richest of green plants for 24 hours a day. Arctic foxes pounce on the gaggles of concentrated geese. Jaegers--tern-like birds--dive onto nests and eat goose eggs, and every other living thing scatters to the four winds when bears lumber onto the scene for their share of the eggs. However, except in local situations, the net effect of predation on goose production usually is small.

The use of satellite imagery was an outgrowth of cooperative studies by the Interior Department's U.S. Fish and Wildlife Service and the Canadian Wildlife Service last fall and winter. Biologists are optimistic that this new tool will permit accurate identification of years when Arctic goose production is either very good or poor.

It was not possible previously to find out the habitat conditions and estimate production of many goose populations because of the inaccessibility of Arctic nesting areas and the high costs of placing field crews on them. Consequently, hunting regulations have sometimes failed to reflect years of poor production. Atlantic brant, for example, experienced poor production in 1971 and 1972 but this wasn't documented until the following hunting seasons. The wintering population dropped from 151,000 in January of 1971 to 40,700 in January of 1973 because of production failure and excessive harvests during the 1971-72 season. Once the decline was noted the brant season in the Atlantic Flyway was closed from 1972 through 1974. Had satellite pictures been available, it is likely that the poor production years would have been recognized, and hunting regulations would have been modified to prevent excessive harvests.

In this year's experiment U.S. and Canadian biologists used two independent sensing systems--the weather satellite launched for the National Atmospheric and Oceanic Administration (NOAA) and the Earth Resources Technology Satellite (ERTS) launched for the Interior Department.

The NOAA satellite sends back images of wide areas measuring 1,000 miles on each side. ERTS images show areas measuring 100 miles to the side. The NOAA system, then, is particularly useful for assessing snow and ice conditions over wide areas, while the ERTS pictures taken from 500 miles up are better for examining local areas in greater detail. Both systems are handicapped by the prevalence of clouds and fog lingering in June over much of the Arctic nesting areas.

As a result of satellite imagery sent back from this experimental use the U.S. Fish and Wildlife Service and the Canadian Wildlife Service jointly reported that snow and ice had disappeared this spring from traditional nesting areas two to three weeks earlier than normal. The situation was not uniformly good, however, as snow and ice lingered on the North Slope of Alaska and on Wrangel Island, U.S.S.R., an important production area for lesser snow geese destined for the Pacific Flyway. Nonetheless, fall flights of most Arctic nesting geese should contain high ratios of young birds.

Arctic breeding geese are traditional nesting birds. They'll return to the spot where they themselves were hatched and raised, no matter what the weather. Unlike the more adaptable duck, geese will not scatter or leave their nesting grounds when conditions are unfavorable. This fact will allow American and Canadian scientists using earth satellite information to develop precise historical population studies. Next year it is planned to revisit these breeding grounds via satellite and take advantage of this characteristic behavior of geese to return to traditional nesting areas.

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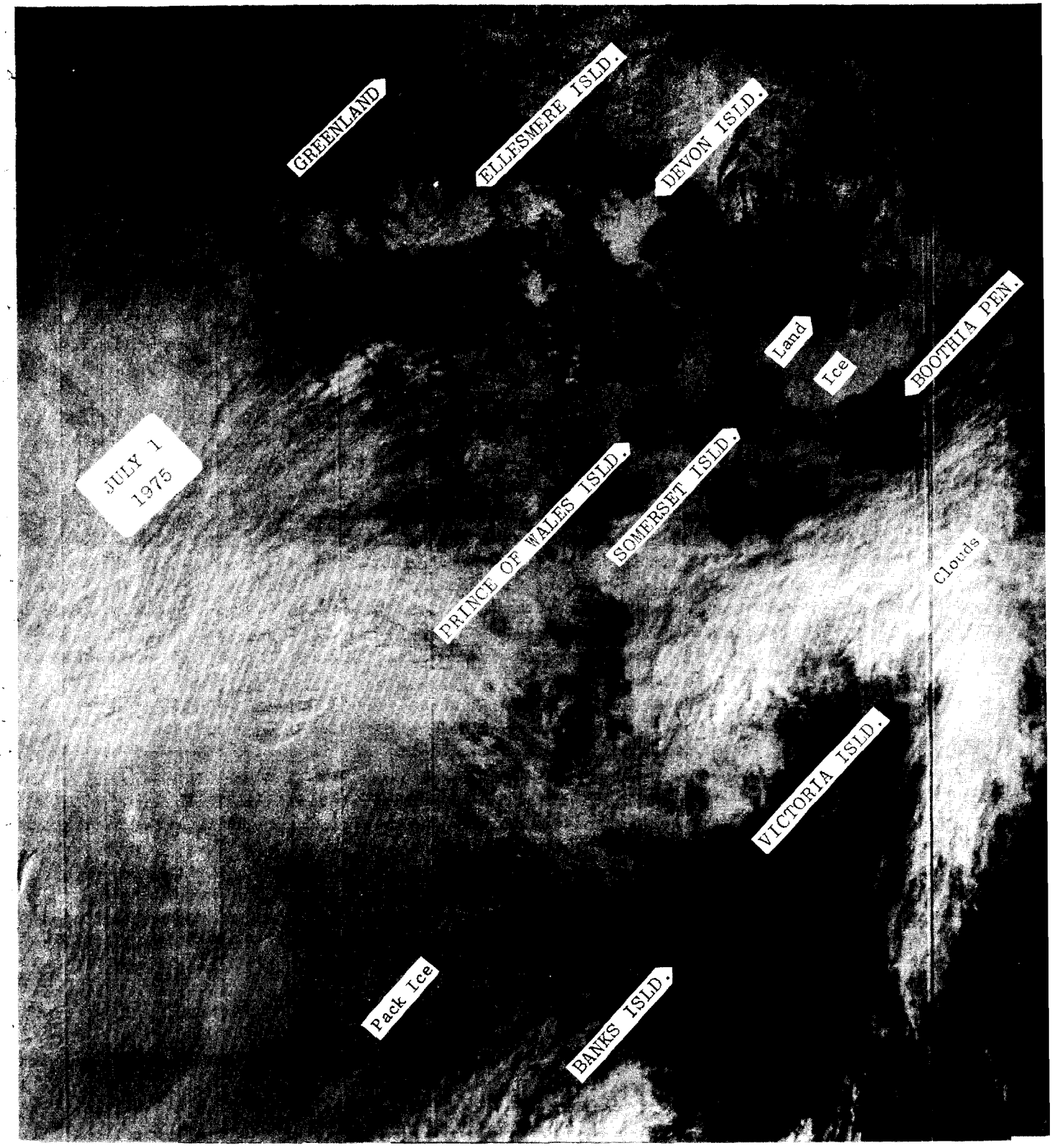

The picture shows about 1 million square miles including the major Arctic islands north of the Canadian mainland between the Beaufort Sea on the west and Baffin Bay on the east below the Arctic Circle between 70 and 80 degrees north latitude and 70 and 130 west longitude. The arrow points toward the North Pole.

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