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THE 1926-1929 ALASKAN AERIAL SURVEY: GLIMPSES OF THE PAST AND FUTURE OF SOUTHEAST ALASKA FROM 11,000 FEET

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In the summers of 1926 and 1929 the United States Navy aerially photographed some 23,000 square miles of Southeast Alaska (approximately 61% of the area of Southeast Alaska), from Ketchikan on the south northward into Glacier Bay. This project, named the Alaskan Aerial Survey Expedition, was the first aerial photographic mapping effort undertaken in Alaska (Kennedy 1982). The project was the brainchild of R. H. Sargent, Topographical Engineer of the United States Geological Survey, Alaskan Branch, and was cooperatively planned and funded by the Naval Bureau of Aeronautics and the Departments of Agriculture and the Interior. It was undertaken to provide complete, up-to-date timber resource inventories for the Forest Service, and topographical information for the Bureau of Public Roads and the U. S. Geological Survey. Mr. Sargent acted as liaison between the Navy and the cooperating civilian agencies. Lack of funds in 1927-28 accounts for the gap between the two summers' photography.

The Navy unit assembled to accomplish the aerial photographic mission was named the Alaskan Aerial Survey Detachment; it consisted of the USS Gannet, a minesweeper converted to an aircraft tender, and a 47-man Aviation Detail flying four Loening OL-8 amphibians. The Gannet towed a 110-foot barge to provide accomodations and a photographic laboratory for the Aviation Detail. Two types of multi-lens cameras were used on the expedition. One type was mounted to take oblique photos to the right and left of the flight path. The other type of camera had a four-lens configuration and was mounted to take a vertical picture and three oblique pictures-one each to the right, left, and forward (or aft) of the vertical shot, at an angle of 35 degrees. The oblique pictures overlapped the vertical one slightly to aid in relating the four to each other. Each vertical shot overlapped the preceeding vertical to form stereoscopic pairs when viewed with the appropriate equipment. The vertical photograph covered approximately four square miles at the operational altitude of 10,900 feet (Radford 1929; Boone 1930; Literary Digest 1930).

Ponko (1979) has discussed the Alaskan Aerial Survey as an example of a cooperative venture with significant, highly visible results for the Navy, the Army Corps of Engineers, Federal civilian agencies, and the Territory of Alaska. I shall focus on the importance of the 1926-29 and subsequent aerial photography as an element contributing to the multidisciplinary study of the cultural resources of Southeast Alaska.

The achievements of the Alaskan Aerial Survey were highly significant at the time. The Forest Service benefitted from the improved knowledge of the condition and distribution of the timber resources on the Tongass National

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Forest. Regional Forester B. Frank Heintzleman, after a flight along Baranof Island, reported that he had learned more about the topography of the island during that flight than in ten years of ground observations (Literary Digest 1930). Topographers gained a tremendous body of data important for improving and correcting the maps of Southeast Alaska, including the discovery of numerous lakes (some of which were considered potential waterpower sources). The Bureau of Public Roads acquired information which improved and simplified transportation corridor planning. The value of the 1926-29 aerial photography continues through today, especially when subsequent aerial photography (Table 1) and existing historical documents are used.

What do these photographs, taken from an altitude of about two miles, reveal that is of interest to us? First, they record the nature and extent of cultural features (the built environment): trails, roads, railroads, bridges, wharves, canneries, fox farms, mines and mills, cabins, and cities, to name a few. Second, and perhaps more important, they record the disturbance of the landscape associated with these features. They also record the clearing or disturbance of the land through timber harvest, fire, and landslides. Many such features can be traced from the 1926-29 photos to the present through subsequent air photos. The photos record the development of cities and road networks, the building and abandonment of canneries, mines, or fox farms, and the shifting utilization of the timber resource. All of these are subjects worthy of historical research, through the contribution of the aerial photography.

Aerial photography is limited in the type of information it can provide the historian or archeologist bent on evaluating or discovering cultural resources in Southeast Alaska. Fortunately, we need not depend on it alone, for there is a wealth of supporting documentation for some of the cultural features we see in the photographs. Let me describe one class of documentation.

Many activities taking place on National Forest System lands are authorized and regulated through permits. Early and current direction provide for a Forest Officer to periodically inspect the activities and associated structures allowed under the permit. Starting with the original application, a permit file is developed, containing the reports of the inspections. These include verbal descriptions at least, and may go so far as to include scaled maps and drawings, and photographs. A complete file will contain not only the name of the original and subsequent permittees, but also a record of the type and number of improvements placed on the land and their condition, up to the time the premises are abandoned and the permit file is closed. This is not a unique situation. Many commercial activities, such as mines or canneries, may be relatively well documented through business records or inspections by governmental agencies other than the Forest Service.

Aerial photography ties nicely to these written records. Aerial photography provides a cross-check for the on-the-ground observations, correcting or augmenting the record. Just as important, the paper and ground-based

photographic documentation aids in learning how to interpret what we see in the aerial photos. This is vitally important when we move from the known to the unknown: the features seen in aerial photos, but for which no (or insufficient) other documentation exists. A further value of a sequence of periodic aerial photography taken over a long time span lies in our ability to identify and trace changes and rates of change, especially when dealing with abandoned, deteriorating structures. The end-point in this long sequence is to visit the site today to see what remains and what it looks like -- this is a form of ground-truthing, and it is a critical element in the process of evaluating the remnants.

We need to back up at this point and address the other class of features observable in the air photos--the disturbed, burned, or cut-over areas. Unless there is a conscious effort to keep it cleared, recently cleared forest land in Southeast Alaska will generally regenerate naturally and rapidly where ground disturbance has been minimal. Where the ground has been disturbed down to the mineral soil, the initial regeneration will likely include shrubs, forbs, and alder (red or Sitka), followed by conifers, which eventually overtake the alder and dominate the stand. As time progresses, the conifers grow up in a dense, tight stand of trees which may be referred to as "second growth." Such second growth stands are generally characterized by the relatively large number of trees per acre (at least for the first 50-60 years); the relatively uniform trunk diameter and height of the trees; the small difference in age spread represented; uniform and regularly shaped crowns; and virtually no snags (dead trees) when compared to adjacent old-growth stands. This combination of features, which often defines what is termed an "even-aged stand," is generally easily detected in aerial photographs and on the ground, though as time progresses these clues become increasingly difficult to recognize. The outer limit of detectability is currently about 140 years. Recognition of an even-aged stand of that or greater antiquity requires both an aerial photographic analyst of considerable skill and experience, and on-the-ground verification of the features detected.

As is the case with structures, sequential aerial photos reveal changes through time, and yield important clues about the nature and rate of change in the vegetation cover. Again, ground truthing is important to verify and augment what appears in the photos. Using tools such as increment borers, foresters can determine the age of the trees in a second growth stand and by extension, approximately when the area was originally cleared. These and other data allow the researcher to make the critical link between what appears in the photos and what is actually on the ground.

Up to this point I have been painting a rosier picture than perhaps is warranted. To bring us closer to reality, let us consider three factors. First, many activities which took place on the Tongass National Forest or adjacent areas may not have been sanctioned by permit--that is to say, they were unlawful activities, such as trespass cabins or timber theft. There usually are no records of this, other than the evidence in the photos and on the ground. Second, many activities simply never were considered important

enough to record in any consistent manner--they were too routine or too limited in scale or time duration. Last, it is sad but true that many records pertaining to past activities have been lost, or destroyed before their value was recognized. Again, the only record may be the evidence in the photographs and on the ground. These and similar situations emphasize how important it is to study and analyze all the lines of evidence we have remaining for any clues they may provide to identify and interpret the undocumented traces either seen in the aerial photography or discovered on the ground.

The data we acquire from aerial photography concerning the nature and rates of change in historic structures and the regrowth of the tree cover on formerly cleared areas thus has clear value for the identification and evaluation of past events and objects. It is less obvious, but no less true, that each subsequent episode of aerial photography records a future instant from the standpoint of the original 1926-29 project and any other previous photos. We should be able to apply what we have learned from past changes, to the future. Many of the structures being built in Southeast Alaska today, and many of the ground-disturbing activities taking place there now, will be visible for many years or decades; knowledge of what they might look like from the air in 10 or 50 or 100 years would be of importance to engineers, foresters, historians, and landscape architects.

Looking back in time from the Alaskan Aerial Survey, we have a unique picture of the past, and we have a unique opportunity to detect and interpret features of that past, using what we can learn from historical documents and the sequential aerial photography taken from 1926 to the present. One hundred-forty year old Russian clear cuts can be detected near Sitka; this takes us back to the mid-1840s. The clearing associated with a Native village abandoned one hundred thirty-five years ago on Admiralty Island is detectable on current aerial photographs. All else being equal, the 1926-29 photography records aspects of man's use and disturbance of Southeast Alaska since the mid-1780s. We have it on film; we just have to learn how to recognize and interpret it.

In closing, I have shown you several instances of the importance of aviation in Alaska's past: the Alaskan Aerial Survey literally changed the way the world saw Southeast Alaska. Moreover, this sixty-year-old baseline aerial photography, when added to the photography of the last forty years, forms in effect a 200 year record of land use in Southeast Alaska. Aerial photography is an invaluable tool for historic research, but realization of its benefits depends on integrating the special disciplines of aerial photographic interpretation, archival research, and forestry to unfold that unique view of the past and future.

TABLE 1

AERIAL PHOTOGRAPHY IN SOUTHEAST ALASKA
(Exclusive of Specialized Photography such as Color Infrared)

AGENCY	DATE	TYPE	COLOR/B&W	AVERAGE SCALE
U. S. NAVY	1926, 1929	HIGH ALTITUDE /1	B&W	1:20,000- /3 1:25,000
U. S. NAVY	1948-50	HIGH ALTITUDE	B&W	1:40,000
FOREST SERVICE	1960-68	RESOURCE /2	B&W	1:15,840
FOREST SERVICE	1971-79	RESOURCE	COLOR	1:15,840- 1:12,000
FOREST SERVICE	1972-79	HIGH ALTITUDE	B&W	1:50,000- 1:80,000
FOREST SERVICE	1984-86	RESOURCE	COLOR	1:12,000

NOTES

/1 High altitude photography comprises anything at a scale less than 1:15,840.

/2 Resource photography is anything at a scale greater than 15,840. Resource photography is sufficiently detailed to allow vegetation and soils identification.

/3 Following is a comparison of representative fraction scales (1:00000) with other commonly used scale expressions.

a. At a scale of 1:63,360, 1" on the photo equals 1 mile on the ground.

b. At a scale of 1:42,240, 1" on the photo equals 2/3 mile on the ground; 1 1/2" on the photo equals 1 mile on the ground.

c. At a scale of 1:21,120, 1" on the photo equals 1/3 mile on the ground; 3" on the photo equals 1 mile on the ground.

d. At a scale of 1:15,840, 1" on the photo equals 1/4 mile on the ground; 4" on the photo equals 1 mile on the ground.

e. At a scale of 1:12,672, 1" on the photo equals 1/5 mile on the ground; 5" on the photo equals 1 mile on the ground.

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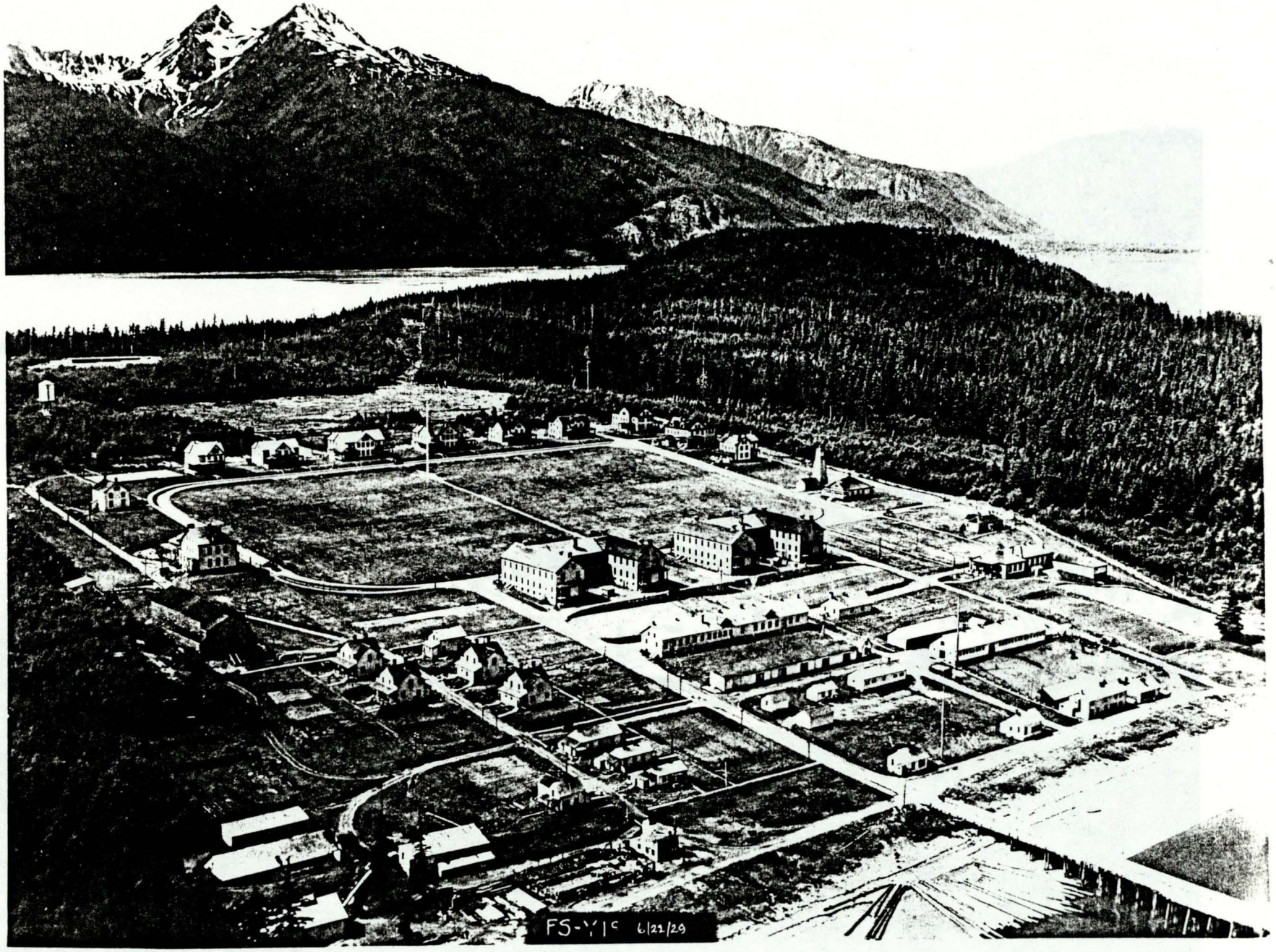
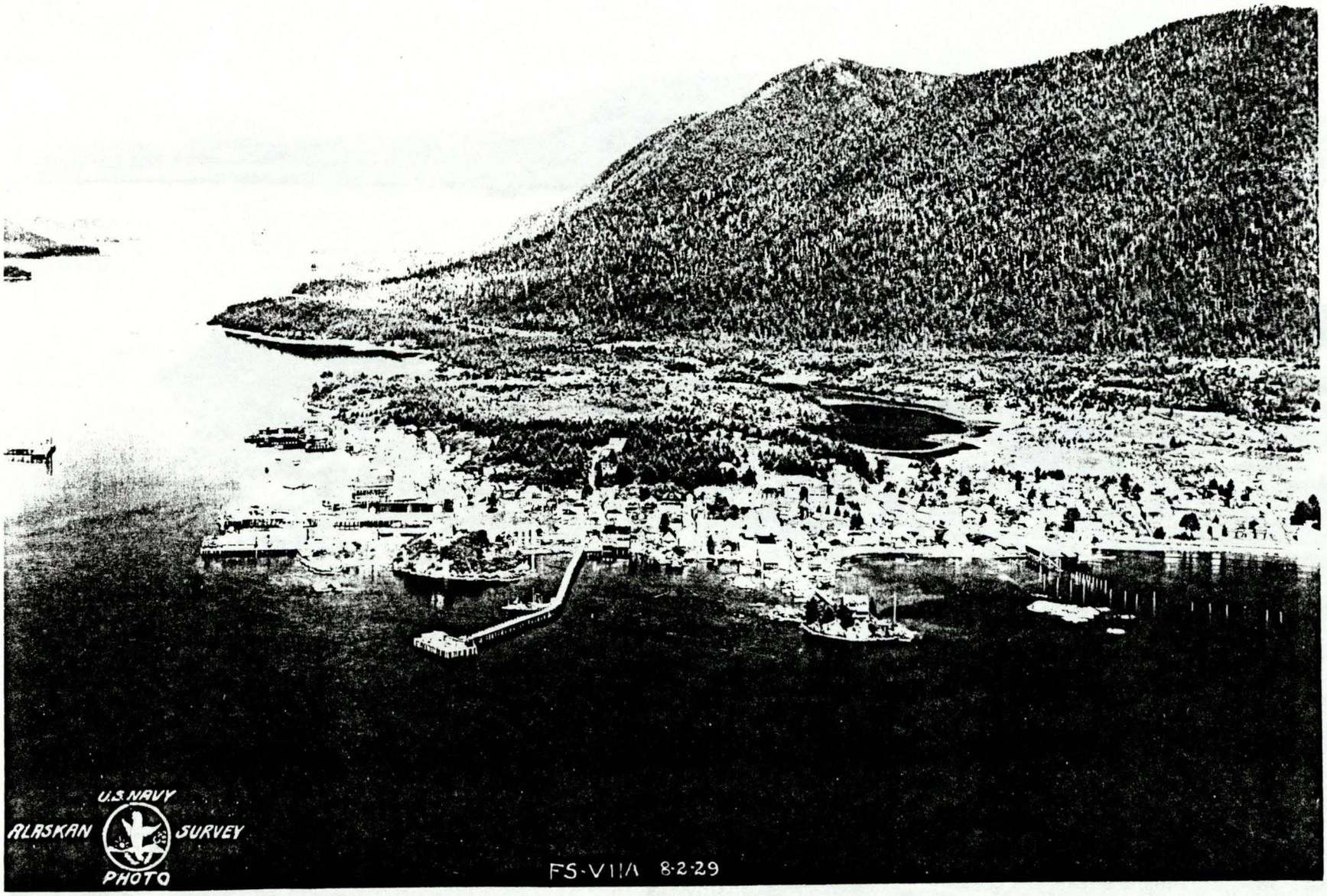
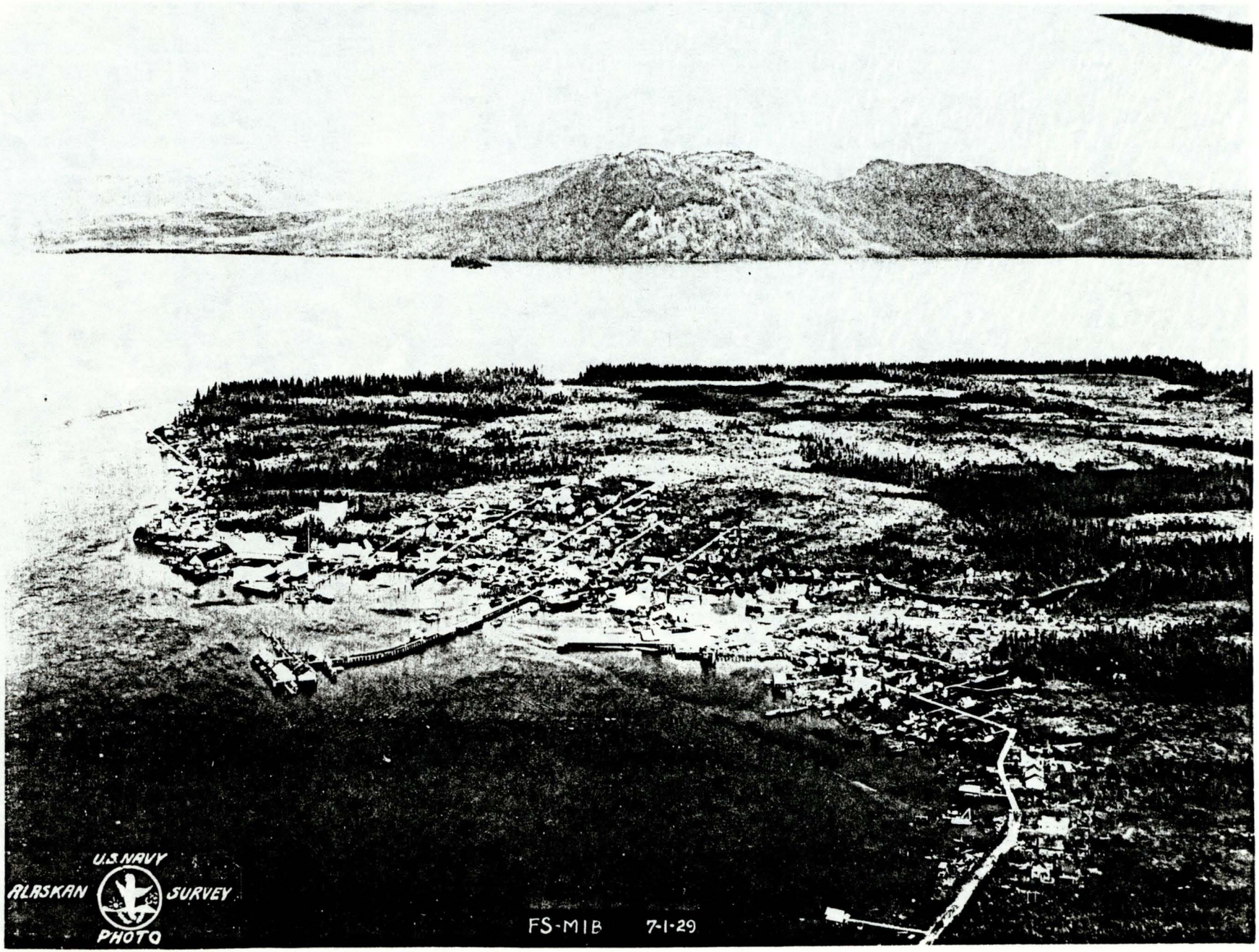


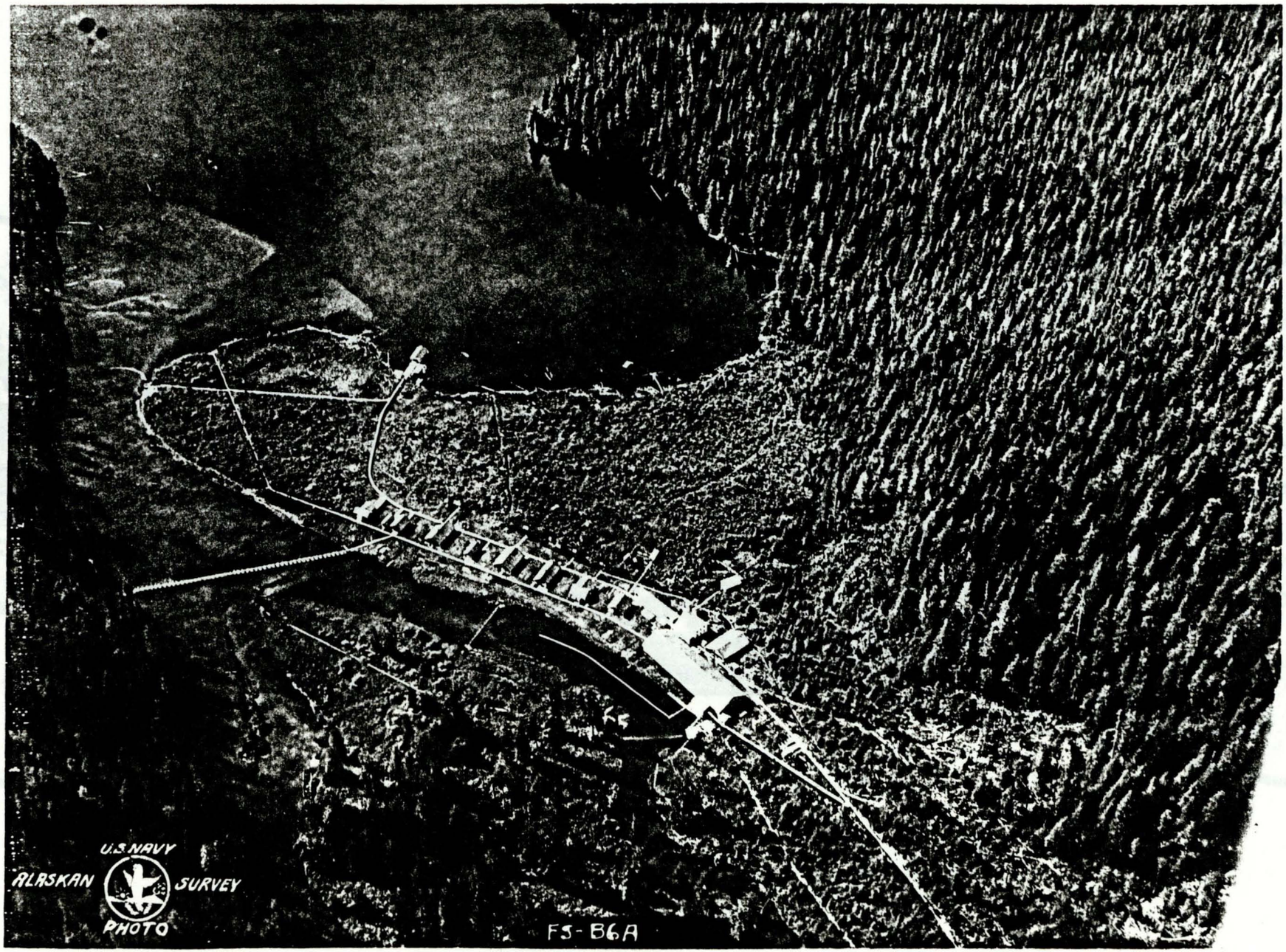
FORT WILLIAM H. SEWARD, JUNE 22, 1929



SITKA, ALASKA, AUGUST 2, 1929



PETERSBURG, ALASKA, JULY 1, 1929



LAKE McDONALD FISH HATCHERY, 1929

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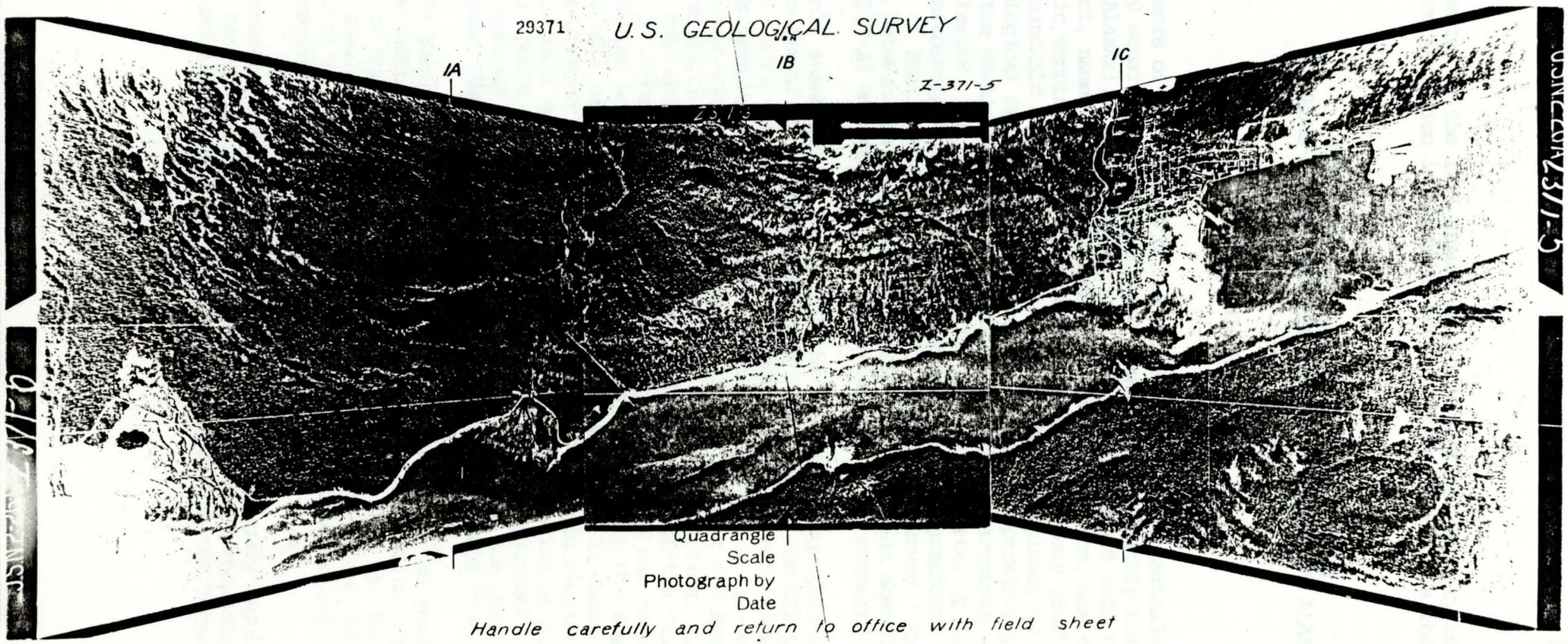

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