

4005

4005

Form 504	
DEPARTMENT OF COMMERCE	
U. S. COAST AND GEODETIC SURVEY	
State: <i>Alaska</i>	
11-5613	
DESCRIPTIVE REPORT.	
<i>Topo</i>	Sheet No. <i>4005</i>
LOCALITY:	
<i>Icy Bay</i>	
<i>East shore</i>	
1922	
CHIEF OF PARTY:	
<i>H. B. Campbell</i>	

ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY

AND REFER TO NO.

15-HCC

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
WASHINGTON

February 26, 1923.

Memorandum to Chief, Division of Charts:

Attached is a copy of a letter addressed to Lieut. H. B. Campbell regarding the errors to be expected from methods used in locating his triangulation stations in Icy Bay. Your attention is called to the estimated error in geographic position of station South Base upon which position the triangulation in Icy Bay was based.

As requested in your memorandum of February 13, 1923, the field computations of the triangulation in Icy Bay have been checked by this Division.

B. V. Hodgson
Assistant Chief, Division of
Geodesy.

February 26, 1923.

To: Lieut. H. B. Campbell,
U. S. Coast and Geodetic Survey.

Through: Inspector, Coast and Geodetic Survey,
202 Burke Building,
Seattle, Washington.

From: The Director.

Subject: Report on triangulation - Icy Bay.

In accordance with the request contained in your report on the triangulation in Icy Bay during 1922, I am sending you herewith an estimate of the accuracy of the positions of the triangulation stations established.

2. The geodetic positions depend upon the position of South Base which was determined by the mathematical solution of the three point problem, the observations being upon Mt. St. Elias, Mt. Cook and Mt. Seattle. These three peaks were determined from weak intersection angles, and no doubt the observations were made upon rather indefinite points. In the adjustments the directions received very large corrections, 45" on Mt. St. Elias, 21" on Mt. Cook, and 41" on Mt. Seattle. The error in the positions of these three points is no doubt increased by the fact that your observations in 1922 were taken upon these peaks from a different direction than from which they were originally determined. There is, therefore, a considerable uncertainty as to whether the ^{indefinite} ~~directed~~ points observed upon in your observations were the same as those observed upon when the peaks were located.

3. Taking these facts into consideration, and also the distance of South Base from the objects observed upon, it is believed that if South Base is determined within less than 1/4 mile of its true position that this accuracy is accidental. Consequently, it should be considered that until a better triangulation connection is made that the work in Icy Bay is on an independent datum rather than on Southeast Alaska Datum.

4. I realize the fact that the determination of the points in Icy Bay is the best that could be made under the circumstances. Assuming that the position of South Base is correct,

DESCRIPTIVE REPORT

TOPOGRAPHIC SHEET "A"

1922

ICY BAY - ALASKA.

Launch "WILDCAT"

M. Leff, Aid, Topographer.

By H. B. Campbell, H. and G. E., in charge.

DESCRIPTIVE REPORT OF TOPOGRAPHIC SHEET "A".

S.Base - Latitude $59^{\circ} 52' 21''.49$ Longitude $141^{\circ} 27' 09''.34$

Magnetic variation, mean of 2 values this sheet - $300^{\circ} 19'.5$ E

The work on this sheet was started as soon as possible after our arrival in Icy Bay, to enable the party to begin the hydrography. It is done on a scale of 1:10000 with no projection. We neither had a position nor an azimuth at the time this sheet was being done. Positions of triangulation signals were plotted by computed distances on directions that were laid out with an alidade in the field and in some cases by computed angles. This sheet is transmitted to the office with no projection because it is believed that one can be fitted there better than here. M. Leff, Aid, was the topographer.

This sheet includes most of the shore line of importance on the East side of Icy Bay and the outside coast line for about four statute miles East of Icy Bay. This shore line forms the Southwest corner of the great flat or bench lying between the foot hills of the St. Elias Alps and the Gulf of Alaska. This flat extends all the way from Icy Bay to Disenchantment Bay and the greater part of it is covered by the Malaspina Glacier.

This glacier does not at present discharge ice into the sea at any place except in Icy Bay. Its edges have receded from the beach line in most places, probably more just Northeast of the locality of this sheet than elsewhere.

The sandspit which protects Riou Bay from the sea has apparently been formed by the action of the sea on the submerged Southwest edge of the flat mentioned above. True West of this spit the water deepens rapidly to the deep part of the Bay and to the South and East the shoaler water on the bar is found. The spit is of sand and gravel, and is very flat and low. On the extremely high spring tide of September 22nd, 1922, it was but very little above the water. At its narrowest place, about 1400 meters Southeast of Δ Riou, the sea completely covered the spit for a distance of several hundred meters on that date. The beach on the outside of the spit slopes gently downward. At the end it is extremely flat and the changes in the heights of tides make an appreciable difference in the distance it is safe for a ship to approach the water line in passing.

The top and sides of the sandspit are clear of large boulders. There is considerable driftwood, consisting mostly of logs, tree trunks and a few timbers, scattered along its top. These are found almost entirely on the Western part, that is West of the part that has been previously described as being covered on September 22nd. There is more drift to be found in the center and on the inshore or Northeastern half of this section than there is on the offshore half. Some of the drift is partly buried in the sand and some heavy logs have been thrown more than half way over the spit. It seems that this may be accepted as proof that in the heaviest storms the seas wash nearly all the way over the spit but have not force enough ordinarily to carry heavy pieces beyond the center line of the spit.

On the beach at the extreme head of Riou Bay, near Δ S.Base, some small drift is found and a few medium sized pieces. The Eastern 1000 meters of the spit is lower than the rest and is comparatively free of drift wood. It seems that this may be accepted as proof that the storm seas wash over the Eastern part of Riou spit with sufficient force to take with them moderate sized pieces of drift wood.

The Eastern end of Riou spit is at a clay bluff 330 meters East of \odot Tri. The limits of this clay bluff where it approaches the shore line are indicated on the sheet. It forms the edge of an extensive flat about twenty to thirty feet above sea level.

For a distance of about 1000 meters along the shore line East of the Eastern end of Riou spit, the high water line is formed by the base of this bluff. For its Western 550 meters this bluff is steep and the seas break against it. It is gradually being eroded and its edge is best avoided. Its height here is about thirty feet. The clay is hard and compact. Large chunks of it sometimes become detached and slip into the water, where they retain their form for some time. In this locality the top of the bluff has a low, narrow, and irregular fringe of alders. The remaining 450 meters of this bluff high water line has at its base a flat sloping gravel beach which bares at low water and which permits one to pass ^{section of the}apout along it. There are also numerous gullies and easy slopes in this bluff which permit one to climb or descend it. The bluff gradually decreases in height to the Eastward and more sand and gravel moraine is found on it. Directly behind this part of the bluff the alders are denser than farther to the West and extend farther inland.

At the point previously mentioned, 1000 meters along the beach East of the Eastern end of Riou spit, the bluff leaves the high water line and goes inshore. East of this point the high water line is formed on a gravel beach which contains a great many hard heads or small boulders. The bluff as it recedes from the high water line becomes much lower and is but a few feet in height behind the two lakes between this point and \odot Tall, marking the limit of the alder growth. The two lakes just West of \odot Tall are shallow and usually brackish being just above the level of the spring tides. Behind these lakes is a dense growth of alders.

\odot Tall is located on a small area of land that is slightly higher than the surrounding beach and is covered with bushes. To the East of \odot Tall the broad sand beach continues as far as the shore line was surveyed. The nature of the land behind the beach varies somewhat. North of \odot Tall is a bare flat which extends inland. This flat is about at the level of the high spring tides and a good deal of it will probably cover on the highest tides of the year. There are a few small sloughs or depressions in it. Its surface is of mud and occasional outcrops of gravel indicate that the mud is but a surface deposit of silt. This clear flat extends inland for about 1000 meters and then narrows and divides, its branches being lost in the gravel mounds and alders.

East of this flat for about 2200 meters there is a dense growth of alders and willows on a glacial moraine deposit. But few elevations were

determined. In general the elevation of the tops of the trees in this area is between fifty and one hundred feet. This growth extends inland for about two miles. On the Southeast corner of this growth O Frog is located.

To the East of O Frog is a wide mud flat extending far inland behind the strip of sand beach which forms the shoreline. Most of this flat is covered by a deposit of fine silt such as is carried in suspension in glacial streams. There are some places in which the surface is of gravel. On its Western part the ground is solid to walk on but would be somewhat sticky in wet weather. This flat has on it scattered growths of small bushes and a very little grass. For the most part it impresses one as being a clear flat extending to the East to the locality of the E Yahtse River. The banks of this stream are wooded in places. The E Yahtse River is glacial, carries a great deal of silt in suspension and is very swift. I do not know for sure, but I do not believe it is fordable. The native who traps this section reports that he keeps a canoe for crossing.

From the lake 200 meters West of O Tall a small stream runs East. It is very small and the tide backs up it for some distance. 300 meters East of O Tall it is joined by another small stream which drains the flat to the North. From this junction the stream flows East in a depression of the beach for 800 meters where it empties into a slough. The beach traversed by this stream is of fairly soft sand with a silt deposit in the stream bed. The bed of the stream from its junction to where it empties into the slough occupies a fairly wide depression in the beach. The sides of this depression have gentle slopes.

The slough into which this stream discharges is tidal in character but carries also the water from the small stream just East of O Frog. At low water this slough may be waded without difficulty as then there is but little water in it and the bottom, though of silt on the sand, is not dangerously soft where noted. It was noted that in making the trip to the E Yahtse River the native who traps this locality crossed this slough near where the whale is stranded and went down the beach line.

The bed of the small stream which empties into this slough just East of O Frog is very level for some distance. A short way from its mouth, about a mile, there is more current and the water is very good for this locality, being clear and fresh.

From the locality of O Tall to the Eastward the low water line is dotted in. The outside of the beach slopes downward gradually and the sea breaks a short distance outside the low water line, indicating that the downward slope continues, for some distance at least, offshore. No breakers were noticed at any distance off this beach. Farther to the East, off the mouth of the E Yahtse River, there are apparently extensive submerged flats built out by the glacial stream. The breakers on this flat are extensive and can be seen from the West for a long distance.

The shoreline on the inside of Riou spit has a generally uniform slope to the water somewhat steeper than that on the outside. The beach is usually of hard or soft sand or of gravel. From the high water line the slope is quite gradual to the low water line just outside of which it usually drops quite steeply to the depths of the Bay. Near its Eastern end the spit is not only lower but flatter. The head of Riou Bay in the locality of Δ S.Base has a wide sand beach with very shoal water off it. Behind this sand is some gravel with a few small boulders; this is just back of the high water line. About twenty meters behind the high water line at the head of Riou Bay lies the foot of a steep slope which rises to the flat on which Δ S.Base is located. This bank can be climbed anywhere on this side without difficulty and there are some places where the slope is very gradual, as in the small stream bed and on the sides of the mounds. The location of this bluff is indicated by hachure lines on the sheet.

Northward along the East shore of Riou Bay the flat sand beach continues for about 1000 meters North of Δ S.Base. 880 meters North of Δ S.Base on the edge of the bluff just behind the high water line is a dock site stake, the position of which is shown on the sheet. It is believed that the dock site was staked for the Alaska Development Syndicate. Eighty meters West of this dock site stake is a large boulder which apparently has been deposited there by the ice. It lies between the high and low water lines and projects about three feet out of the water at high tide. It is of use as a landmark. Just North of this dock site stake there is a high water slough extending into the low mud and sand flat. Into this slough a small creek empties which drains the flat lying in the locality of the base line. The head of this creek is on the flat South and West of Δ N.Base. The country here is level and there is a flat divide, to the East of which a creek runs East and approaches the outside shoreline just East of \odot Tall. Near the high water line the water in this creek is not much good for the highest tides flood up it and cover a great deal of this flat, filling many of the water courses. On the extreme tides a great deal of sea water floods back through this slough into the many small water courses that run all over this part of the flat.

To the North of this slough the shoreline continues to be of sand but there is no bluff close behind it. After a moderate rise of a few feet from the high water line it continues flat and, near the sea, quite bare for several hundred meters inland. I have walked over most of this flat and although in many of the stream beds the mud is quick for small areas one can cross without difficulty nearly anywhere.

Nine hundred meters North of the dock site stake and four hundred meters offshore was located the first of a number of large boulders which are found near the beach from this point North. This boulder is awash at low water at which stage of the tide the water is about one fathom deep there. From here North these boulders are found in increasing numbers. Those noted were out in at low water with the plane table. These boulders are numerous and those located are mostly within the one fathom curve. They must have been left there by the glacier as it receded because

icebergs large enough to carry boulders of this size could hardly get as close inshore as these boulders are found. In landing on this beach with a small boat, if there is a swell running, care must be used to avoid these boulders.

About 500 meters North of O Bow are found the first of a number of small lakes which lie close to the beach. The largest two of these, one just North of O Brow and the other 500 meters North of A Ridge, lie on the flat beach, being barely above high water. I do not believe that these lakes are fit sources of fresh water. I tasted one of them and it was quite fresh but I believe that a certain amount of salt water must get in them on the highest tides and during the storms. Behind these lakes is a very irregular moraine deposit, between some of the mounds of which lie other lakes. These usually have neither inlets nor outlets. This leads one to the conclusion that they are fed from ice under the moraine.

To the West of the lakes in this locality lies a large reef which extends well offshore and to which I gave the name "Moraine Reef". With a moderate swell running into the Bay there are a number of breakers on this reef and cuts were taken to some of these with a plane table from this shore. Directions and vertical angles were taken with the alidade and as most of the reef falls off the sheet these cuts have been plotted on the boat sheet and the limits of the reef, which were not determined by sounding, are roughly dotted in.

The general character of this beach continues the same as far North as the Northern end of Moraine Island. There is a flat sand beach of varying width from the high water line back to the base of the mounds of moraine which are usually quite steep. From the high water line to the low water line the beach slopes usually moderately sharply. The sand is usually soft and generally clear of boulders. A small boat could be hauled to the high water line in most places without difficulty. The sea sometimes breaks against this beach sufficiently to make small boat landing wet work and dangerous where there are off lying rocks. These rocks can usually be avoided with care.

The pass between the South end of Moraine Island and the mainland bares at low water. There are some boulders between high and low water here and care should be used even with a small boat in going through this pass if there is any sea running.

Moraine Island is of sand and gravel moraine. The hills on it are bare except for a very little grass, and they appear from the South and West to be flat topped and barren. The sides of the hills are generally very steep. On some parts of the beach, which is of sand and gravel, a great number of boulders are found. This is especially so at the Northwest corner of the Island. The inshore or Eastern side of the Island is practically clear of boulders. The slopes of the hills on the Eastern side are more gentle than those on the West. From the East the hills can be climbed without difficulty.

In the bight behind Moraine Island are found two small islands of gravel moraine. These appear as barren gravel heaps with quite steep sides. The low water line around the Western one of these two islands extends 150 meters to the West of the high water line. This is of considerable importance as this bay will be used to some extent as an anchorage and the sounding has not been done.

The beach in this bay is of sand and gravel, many small boulders being found. It is generally quite narrow as the bases of the moraine mounds on the shore extend nearly to the high water line in many places.

In the extreme Eastern head of this bay is a small fresh water stream, which is the seepage from two lakes a few hundred meters inland. Fair fresh water may be obtained here by dipping it up.

The moraine deposits behind this bay are very rugged and irregular. Their appearance from offshore as well as from a short distance is so confusing that they have no value as landmarks. There are no features apparent on any of them that would enable a person to tell one from another.

The sand and gravel beach continues Northward to the end of this sheet without any changes in its nature.

The character of the land on this sheet except near the shore line is shown on the sheet by pencilled notes. The soil as a rule consists of either sand and gravel or mud. Where it is not sand and gravel it is usually a thin deposit of silt on top of sand and gravel. The limits of the alder growth shown by my notes on this sheet are approximate. No doubt this growth is rapidly extending itself. In many places scattered groups of alders are found. The nature of the land is of little importance to navigation or for any other purpose. The moraine is in nearly all cases so irregular and indefinite as to be of no use. The plain which lies on the Eastern part of the area covered by this sheet extends in the direction of the East Yahtse River apparently as far as that river.

The bird and animal life on this side of Icy Bay is about the same as that on the West side. There are some ducks, geese and a few white swan. Bear tracks are sometimes seen but the party saw no bear on this side. There are reported to be goat in the ridges behind the glacier but it seems that they would be practically inaccessible there. Fox were seen on this side of the Bay and tracks that were possibly wolf or wolverine, possibly both. There are probably marten, mink and weasel on this side of the Bay as well as the other. No one has ever crossed the lower part of the Guyot Glacier, although it has been crossed behind the Robinson Mountains before it becomes crevassed, and I do not believe that animal life ever crosses from one side of the Bay to the other.

There were but few berries found on this side of the Bay. There are strawberry plants on some of the flats but only a few berries developed

this last season.

The East side of Icy Bay is trapped by an Indian from Yakutat called Kyak Tom. Practically no information of value could be had from him. He is firmly convinced that he owns this section. He has a camp on the East bank of the East Yahtse River. I do not know what sort of a camp it is but as he usually comes to Icy Bay in September or October by boat and stays until February, there is probably some shelter. During the February freeze up he walks to Disenchantment Bay on the West side of which he is met by a boat from Yakutat.

Feb. 26, 1923.

Respectfully Submitted

H B Campbell
H B G. Engineer

STATISTICS FOR SHEET "A"

Shore line -----17 stat. mi.

Shore line of ponds, sloughs, etc. 4.5 " "

Area -----22 sq. mi.

TRIANGULATION STATIONS on Topographic Sheet "A" # 4005

Bank	59-55-07.03 (217.6)	141-23-12.94 (201.1)
Black	59-55-46.85 (1449.9)	141-21-02.83 (39.3)
Isle	59-57-37.27 (1153.4)	141-22-56.85 (882.3)
North Base	59-52-51.31 (1587.9)	141-25-37.33 (581.0)
Pyra	- 59-52-04.82 (149.2)	141-27-10.17 (158.3)
Ridge	- 59-54-19.10 (591.1)	141-24-08.33 (129.5)
Riou	- 59-53-29.88 (924.7)	141-28-03.41 (53.0)
South Base	59-52-21.49 (665.1)	141-27-09.34 (148.3)

PLANE TABLE LOCATIONS on Topographic Sheet "A"

Bold	59-54 - (1033m)	141-24 - (600m)
Bow	59-53 - (1196m)	141-25 (787m)
Brow	59-54 - (260)	141-25 (110)
Dome	59-52 (317)	141-23 (890)
End	- 59-53 (1480)	141-27 (805)
Flag	59-53 (676)	141-28 (323)
Flat	59-51 (342)	141-28 (143)
Frog	59-51 (1302)	141-23 (344)
Hill	59-53 (77)	141-24 (165)
Let	59-55 (74)	141-21 (692)
Sole	59-55 (556)	141-22 (144)
Tail	59-51 (1475)	141-25 (816)
Tri	59-52 (716)	141-27 (652)
Wolf	59-51 (1780)	141-24 (568)

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

TOPOGRAPHIC TITLE SHEET

A The finished Topographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Register No. 4065

~~State~~ . Territory of Alaska

General locality . Icy Bay

Locality . East shore

Chief of party . H.B. Campbell, H. and G. Engineer

Surveyed by . M. Leff, Aid.

Date of survey . June and July, 1922.

Scale . 1:10000

Heights in feet above high water

Contour interval . 20 . feet

Inked by Lettered by

Records accompanying sheet (check those forwarded): Photographs, ^{XX}

Descriptive report, ^{XX} Horizontal angle books, ^{XX} Field computations,

Data from other sources affecting sheet Report on air plane
landing fields.

Remarks: