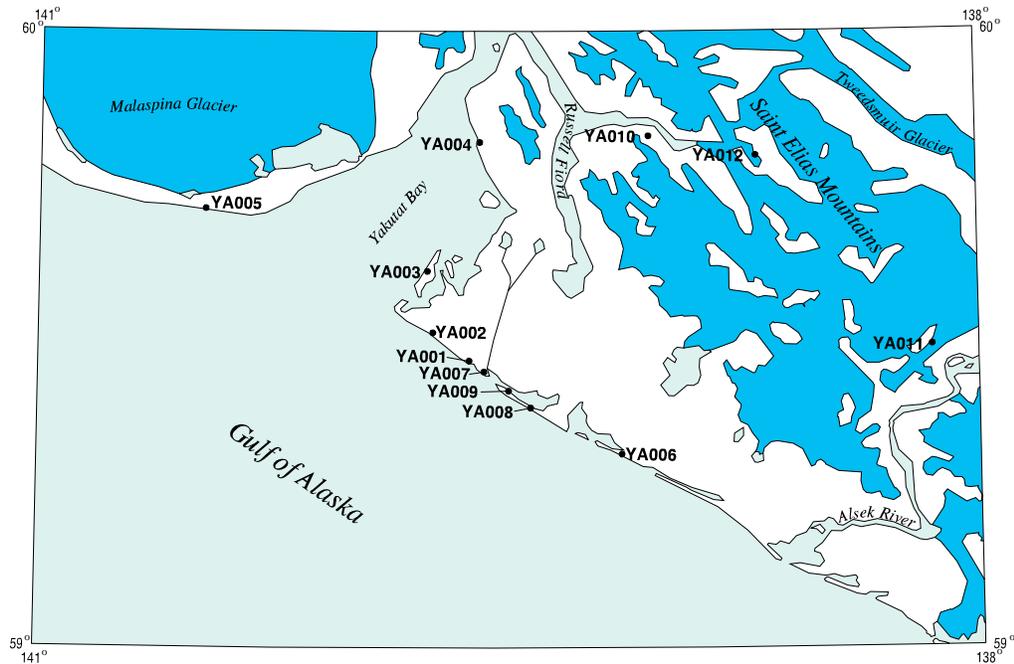


Yakutat quadrangle

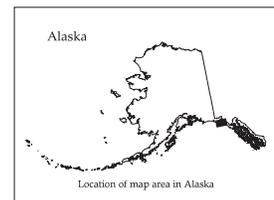
Descriptions of the mineral occurrences shown on the accompanying figure follow. See U.S. Geological Survey (1996) for a description of the information content of each field in the records. The data presented here are maintained as part of a statewide database on mines, prospects and mineral occurrences throughout Alaska.



*Distribution of mineral occurrences in the Yakutat
1:250,000-scale quadrangle, southeastern Alaska*

This and related reports are accessible through the USGS World Wide Web site <http://ardf.wr.usgs.gov>. Comments or information regarding corrections or missing data, or requests for digital retrievals should be directed to Donald Grybeck, USGS, 4200 University Dr., Anchorage, AK 99508-4667, email dgrybeck@usgs.gov, telephone (907) 786-7424. This compilation is authored by:

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OPEN-FILE REPORT 99-333

Site name(s): Unnamed (Gulf of Alaska beaches, Yakutat quadrangle segment)

Site type: Mine

ARDF no.: YA001

Latitude: 59.45

Quadrangle: YA B-5

Longitude: 139.62

Location description and accuracy:

This site is the segment of the Gulf of Alaska beach placer system that exists on the Yakutat quadrangle. The coordinates are the approximate center of the beach in the quadrangle. The beach extends from 141.0 longitude and 59.753 latitude at the west edge of the quadrangle to 138.16 longitude and 59.0 latitude where the Yakutat quadrangle abuts the Mt. Fairweather quadrangle. West of Yakutat, the beach placer is interrupted by Yakutat Bay, about 18 miles wide at its mouth. Beach placers occur within Yakutat Bay on the west side of Khantaak Island (YA003) and on the west facing Logan Beach (YA004) near the head of Yakutat Bay. The Yakutat segment includes the Akwe (YA006), Situk (YA007), Blacksand (YA008), also Blacksand Island (YA009) beach placers, all of which have been described separately here and by Cobb (1972). Data on the Logan, Khantaak, Yakutat, Blacksand, Blacksand Island, and Akwe beach placers are also summarized by MacKevett and Holloway (1977, p. 84; also map 77-169A).

Commodities:

Main: Au, Fe, PGE, Ti

Other: Cr, Fe, Garnet, REE, W, Zr

Ore minerals: Gold (native), ilmenite, magnetite, monazite, PGE, rutile, scheelite, zircon

Gangue minerals: Apatite, garnet, hornblende, olivine, pyroxene, sphene

Geologic description:

The Yakutat beaches in general are well sorted sandy to gravelly sand to sandy boulder beaches with abrupt back beaches bounded by wave-cut cliffs. Economic beach placer deposits of the system are formed in a high-energy beach environment changing significantly on a seasonal, or occasionally, on a daily basis (Foley and others, 1995).

There are several sources for the heavy minerals contained in the placer deposits. The westernmost beaches of the system are cut in glacial moraine and outwash brought down by Malaspina Glacier. Placer sources are also in the streams arising from the glacier, examples named west to east--Fountain, Alder, Manby, Kame, and Grand Wash--which bring down tremendous quantities of alluvium which is then density-separated by beach

and long shore currents. Tertiary rocks of the Malaspina area are also a secondary source of heavy-minerals incorporated in the placer deposits (Plafker and Miller, 1957, 1958). The placers on the east side of Yakutat Bay, the Logan Beach and Khantaak, and the deposits further east, such as the major Yakutat beach, are developed on unconsolidated deposits of Holocene age. These sediments, in turn, derived some of their heavy minerals from poorly consolidated rocks of Tertiary age (Reimnitz and Plafker, 1976; Tarr, 1909; Miller, 1961; and Wright, 1969 and 1972) .

The ultimate sources of most of the placer minerals are the crystalline and intrusive rocks that lie northeast of the Gulf of Alaska Tertiary province (Hudson, Plafker, and Lanphere, 1977; Hudson, Plafker, and Turner, 1977), and this material is distributed and locally concentrated by alluvial and marine processes. In the southeast part of the system, the Alsek River could intersect mafic-ultramafic source materials that would furnish Ti, Fe, Cr, and PGE to the system.

Production from the beaches has been small, but has occurred over a long interval of time, dating back to before 1890 (Spencer and Schrader, 1901; Brooks, 1904; Blackwelder, 1907; Tarr, 1906; Tarr and Butler, 1909; Brooks, 1918; Brooks, 1923). Most of the production has come from small-scale placer operations operating on heavy-mineral concentrate layers less than a foot to several feet thick, but the beaches contain concentrations of up to several percent of 'valuable heavy minerals' defined as ilmenite + rutile + zircon, that constitute a medium- to large-scale resource (Thomas and Berryhill, 1962; Foley and others, 1995) which could be exploited on a larger scale. Locally, the deposits contain concentrations of monazite and scheelite, sources respectively of REEs and tungsten. PGEs are local trace components of some of the heavy-mineral placers (Foley and others, 1989).

Offshore concentrates almost certainly exist, as do onshore inland concentrations produced at varying seastands. Some indication of the extent of the fossil beaches preserved on the upland is given in the Yakutat and Akwe River drainage areas where MacKevett and Plafker (1970, p. 1) locally show the preserved upland beaches. Some of the placer deposits have magnetic signatures (Johnson and Plafker, 1969).

Some of the beach placer system, as at Yakutat, is on native-owned or U.S. Forest Service land where it might be exploited commercially.

Alteration:

Age of mineralization:

Holocene

Deposit model:

High-energy beach sand deposits derived from steep upland terrane.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:

Workings have been mostly small scale using pans, rockers, and sluices. Some attempts have been made to process the resource on a larger scale but have not been successful. Exploration work, mostly by the U. S. Bureau of Mines, has been by hand and powered augers and hand-dug cuts and trenches. The studies by Thomas and Berryhill (1962) and Foley and others (1995) have concentrated on the industrial metals iron, titanium, and zirconium instead of the gold or PGEs sought by the small-scale miners. The Bureau demonstrated that significant placer resources exist; probably the most promising deposit is the Yakutat beach. Churn drill testing for heavy mineral concentrates, by private companies, with uncertain results, reportedly occurred in 1957 (Thomas and Berryhill, 1962; Foley and others, 1995, p. 23).

Production notes:

Production of 3700 ounces of gold is reported for the region from Yakutat Bay to Lituya Bay (Reimnitz and Plafker, 1976).

Reserves:

Resources have been calculated (Foley and others, 1995) in the Yakutat area, based on an assumption of a placer deposit that is 300 m wide by 24 km long with a wedge shaped beach ranging from 0 to 11 m thick. This volume contains 36 million cubic meters of beach sand equivalent to 57 million metric tons of sand that contains an average of 3.4 percent valuable heavy minerals (ilmenite + rutile + zircon). The range in values found along the beach was from 0.2 to 14.8 percent valuable heavy minerals. The resource contains native gold and PGEs of uncertain amount (Foley and others, 1995).

A less-quantified resource from the Situk River southeasterly to Boussole Bay (the latter bay is in the Mt. Fairweather quadrangle) consists of about 192 million metric tons of sand containing about 3 percent valuable minerals. This segment is fed by glaciers and rivers whose source is in the mafic-ultramafic complex region of the Fairweather Range.

Additional comments:

The titanium resource is relatively low grade and consists mostly of ilmenite rather than rutile. The placer deposits were formed by high-energy single pass systems rather than by complex transgressions and regressions that produced the rutile-based titanium placers characteristic of beach placers derived from the erosion of stable regions. Nevertheless, the resources are significant, and could be important if the high-titanium placer deposits are depleted. Clifton and Luepke (1987) have studied the Yakutat beach placers as part of their comprehensive study of the Pacific beach placers from Alaska to Baja California.

Other minerals and metals, such as gold and PGEs will add value, as could garnet, now not considered as a valuable mineral. Large-scale mining might also produce tungsten (scheelite), REEs (from monazite), and chromite. Some of the gold and PGEs and other valuable minerals are very fine-grained; Cook (1969) has studied flotation and ultrafine gravity techniques on the recovery of the fine-grained minerals.

The offshore potential is essentially unevaluated. Equipment used for operations offshore, as well as those on the modern beach, needs to be able to withstand, or move quickly from the paths, of major storms.

Some of the deposits, as those in Wrangell-St. Elias National Park, the Logan Beach in

the Russell Fiord Wilderness area, and those southeast of Dry Bay in Glacier Bay National Park and Preserve are withdrawn from mineral entry. Placer deposits northwest of Dry Bay, extending westerly to past Yakutat, are in non-wilderness Tongass National Forest or on native-owned lands and might be developed.

References:

Schrader and Spencer, 1901; Brooks, 1904; Tarr, 1906; Blackwelder, 1907; Tarr, 1909; Tarr and Butler, 1909; Brooks, 1918; Brooks, 1923; Miller, 1961; Thomas and Berryhill, 1962; Plafker and Miller, 1957; Plafker and Miller, 1958; Cook, 1969; Johnson and Plafker, 1969; Wright, 1969; Wright, 1972; MacKevett and Plafker, 1970; Cobb, 1972 (MF-408); Cobb, 1973; Reimnitz and Plafker, 1976; Hudson, Plafker, and Lanphere, 1977; Hudson, Plafker, and Turner, 1977; MacKevett and Holloway, 1977; Clifton and Luepke, 1987; Foley and others, 1989; Foley and others, 1995.

Primary reference: Foley and others, 1995.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 02/04/99

Site name(s): Yakutat Beach**Site type:** Mine**ARDF no.:** YA002**Latitude:** 59.500**Quadrangle:** YA C-5**Longitude:** 139.746**Location description and accuracy:**

This deposit (a beach placer) extends northwesterly from the mouth of Lost River for about 10.5 miles to Ocean Cape, thence 1.5 miles to Pt. Carrew, thence 1.5 miles southeasterly along the south coast of Monti Bay to the Ankau tidal inlet. The deposit is about half on Yakutat quadrangle C-5 and half on B-5; the coordinate location point is the join of the two quadrangles. The Yakutat beach placer is number 5 of Cobb (1972); also see Cobb (1979).

Commodities:**Main:** Au, Fe, Ti**Other:** Garnet, PGE, W, Zr**Ore minerals:** Gold (native), ilmenite, magnetite, PGE, rutile, scheelite, zircon**Gangue minerals:** Garnet, hornblende, pyrite, pyroxene, sphene, topaz**Geologic description:**

The Yakutat beach is developed on a wide band of unconsolidated sediments of Holocene age (MacKevett and Plafker, 1970; Foley and others, 1995; Wright, 1969; Wright, 1972). The deposit consists of transient modern beach concentrations and somewhat older and more stable layers and lenses of materials relatively rich in heavy minerals in the upland beach. Although less well known than some of the other Gulf of Alaska beaches (for example, Yakataga), the Yakutat beach is enriched in economic heavy minerals (ilmenite + zircon + rutile) relative to the Yakataga and Mt. Fairweather beaches studied by the U. S. Bureau of Mines (Foley and others, 1995). The Yakutat beach is the northwestward continuation of the Situk and Blacksand beach deposits.

Potentially productive segments of the beach consist mainly of medium coarse sand in relatively continuous layers as much as several feet thick.

Native gold, platinum minerals, rutile, and scheelite occur locally in concentrates.

Foley and others (1995) estimate about 3.4 percent total economic heavy minerals (ilmenite + rutile + zircon) in a prism averaging about 5.5 meters thick that extends for several kilometers along the coast. These investigators found gold in more than 10 percent of their samples of heavy-mineral concentrates. Thomas and Berryhill (1962) re-

ported about 35 pounds of iron per cubic yard of material in their samples from the Yakutat beach.

Alteration:

Age of mineralization:

Holocene

Deposit model:

Beach placer: heavy-mineral ilmenite-rich. Characterized by small amounts of gold and PGEs. High energy beach processes.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:

The Yakutat beach has been extensively explored by the U.S. Bureau of Mines (Thomas and Berryhill, 1962; Foley and others, 1995) using hand and powered augers and excavation. Foley and others collected 213 samples (nos. 164-258) from the Yakutat beach as defined here. (Samples nos. 242-245 were collected on Tawah creek, a tributary to Lost Creek.)

The two studies by the Bureau complement each other. The report by Thomas and Berryhill (1962) contains some data on scheelite and other trace minerals not given by Foley. Foley and his coinvestigators worked especially on total economic heavy metal minerals--ilmenite + zircon + rutile. Data on gold and platinum group minerals were gathered as part of the broader investigation and are not quantitative. Both gold and platinum metals would be recovered in a large-scale placer mining operation for titanium and zircon at Yakutat.

Reconnaissance-type samples were collected by MacKevett and Plafker (1970) and Reimnitz and Plafker (1976) of the U.S. Geological Survey.

Production notes:

Some gold has probably been recovered from the area.

Reserves:

The beaches at Yakutat are broader than those in the Cape Yakataga area. Including a very small part of the Situk beach, Foley and others (1995, p. 56) assumed a wedge-shaped prism 0 to 11 meters deep, averaging 300 meters wide for a linear distance of 24 km down the coast. This prism contains 36 million cubic meters of beach sand, or approximately 57 million tonnes of sand. This mass contains from about 0.2 to 14.8 percent valuable heavy minerals (ilmenite + zircon + rutile) and averages about 3.4 percent valuable heavy metals.

Somewhat more than 10 percent of the samples collected by Foley and others contained

gold, detected either in head samples or in spiral concentrates. The minimum limit of detection for gold in Foley's investigation was 0.028 grams/tonne (ppm).

Thomas and Berryhill (1962) reported about 35 pounds of iron, 20.5 pounds of titania and traces of gold and scheelite in the Yakutat and closely related beaches.

Foley and others (1995, table 3) also investigated recovery of gold and PGEs by flotation.

Additional comments:

The Yakutat beach deposits are a significant resource of ilmenite-based titanium and associated other metals. Titanium mainly occurs in iron-rich minerals that probably were derived mostly from mafic-ultramafic rocks, not the metamorphic terranes that are the hosts of high-grade titanium (rutile) deposits. The placer deposits are essentially lag deposits produced in a young, high-energy environment (Foley and others, 1995, p. 56).

The Yakutat area is within the Tongass National Forest and probably could be developed.

References:

Thomas and Berryhill, 1962; Wright, 1969; Wright, 1972; MacKevett and Plafker, 1970; Cobb, 1972 (MF-408); Reimnitz and Plafker, 1976; Cobb, 1979 (OFR 79-1246); Foley and others, 1995.

Primary reference: Foley and others, 1995; Thomas and Berryhill, 1962.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 04/15/99

Site name(s): Khantaak Beach**Site type:** Mine**ARDF no.:** YA003**Latitude:** 59.611**Quadrangle:** YA C-5**Longitude:** 139.759**Location description and accuracy:**

The auriferous Khantaak beach trends north-northeast (on the northwest shore) of a low island northwest of Yakutat. The location given is the approximate midpoint of the beach, about 0.7 mile southwest of triangulation station Arest. The placer deposit is number 4 of Cobb (1972).

Commodities:**Main:** Au**Other:** Fe, Ti**Ore minerals:** Gold (native), ilmenite, magnetite**Gangue minerals:** Garnet**Geologic description:**

The Khantaak Island placer is cut into and largely derived from glacial gravel that forms the island. Winnowing from wave action on very low grade glacial gravel has resulted in transient ruby-black sand layers 0.1 to 0.2 feet thick dispersed along the beach. These layers contain trace amounts of gold and subeconomic amounts of magnetite and ilmenite. Locally the heavy sand layers were rich enough to mine (Tarr, 1906; Tarr, 1909, Tarr and Butler, 1909).

Brooks (1918) reported the existence of gold, but absence of platinum in placer material from the north part of the island.

In addition to the placer gold occurrences on the west facing part of island, Reimnitz and Plafker (1976) reported one sample from the Yakutat side of the island with 0.006 ppm gold.

Alteration:**Age of mineralization:**

Holocene

Deposit model:

Beach placer: concentration by winnowing of low-grade glacial gravels.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Tarr and Butler (1909, p. 165, 167) reported \$3000 in gold produced in 1891, and a probable total of a few hundred ounces of gold from this historic beach placer in 1892, and as late as 1905. Thomas and Berryhill (1962) collected some samples from Khantaak beach in a Bureau of Mines beach sand investigation.

Production notes:

Total maximum is a few hundred ounces of native gold.

Reserves:

Additional comments:

Glacial gravels derived from metamorphic rocks in the Chugach terrane (Hudson, Plafker, and Turner, 1977).

References:

Tarr, 1906; Tarr, 1909; Tarr and Butler, 1909; Brooks, 1918; Thomas and Berryhill, 1962; Cobb, 1972 (MF-408); Reimnitz and Plafker, 1976; Hudson, Plafker, and Turner, 1977.

Primary reference: Tarr and Butler, 1909.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 12/07/98

Site name(s): Logan Beach**Site type:** Mine**ARDF no.:** YA004**Latitude:** 59.820**Quadrangle:** YA D-5**Longitude:** 139.592**Location description and accuracy:**

Logan Beach is within Yakutat Bay, immediately south of Logan Bluffs; it extends about 2 miles north and 3 miles south of cited coordinate location which is in section 21, T. 24 S., R. 34 E., of the Copper River Meridian. The locality is number 3 of Cobb (1972).

Commodities:**Main:** Au**Other:** Fe, Mo**Ore minerals:** Gold (native)**Gangue minerals:** Garnet, magnetite**Geologic description:**

Logan beach is a wave-cut beach formed from gravelly terrace deposits of glacial material which form the bluffs behind the beach. The bedrock on the upland hills to the east of the deposit consists of graywacke and argillite of the Yakutat Group of Jurassic and Cretaceous age (MacKevett and Plafker, 1970). At the beach, gold occurred in thin transient deposits enriched in garnet or magnetite; the beach placer was derived by winnowing wave-action on weakly auriferous glacial gravels.

The placer could also contain reworked materials brought down from the Jura-Cretaceous bedrock. MacKevett and Plafker (1970, pl. 1) report anomalous amounts of molybdenum (3 to 10 ppm) in two stream sediment samples from the Logan Beach. Molybdenum is commonly enriched in organic shales as well as granitic rocks, but its source in the bedrock behind the Logan Beach is unknown.

Reimnitz and Plafker (1976, pl. I) reported 0.010 ppm gold in one sample from the beach.

Alteration:**Age of mineralization:**

Holocene

Deposit model:

Beach placer

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Surface workings, rockers and sluices. The occurrence is one of the first placers discovered in the Yakutat quadrangle (Tarr, 1906; Tarr and Butler, 1909).

Production notes:

The beach had a very limited production--a maximum of a few hundred ounces of gold.

Reserves:**Additional comments:**

The Logan beach placer is within the Russell Fiord Wilderness area of Tongass National Forest.

References:

Tarr, 1906; Tarr and Butler, 1909; Brooks, 1918; Thomas and Berryhill, 1962; MacKevett and Plafker, 1970; Cobb, 1972 (MF-408); Reimnitz and Plafker, 1976.

Primary reference: Tarr and Butler, 1909.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 04/15/99

Site name(s): Unnamed (east of Sitkagi Bluffs)

Site type: Occurrence

ARDF no.: YA005

Latitude: 59.70

Quadrangle: YA C-7

Longitude: 140.47

Location description and accuracy:

The occurrence is a beach placer, locally auriferous, that extends between Sitkagi Bluffs (the front of Malaspina Glacier) and Point Manby. It includes auriferous sample 33 of Reimnitz and Plafker (1976, pl. 1). The coordinate location is about half way between Manby Point and the Bluffs--the outfall of Malaspina Glacier. The beach segment is about 10 miles long.

Commodities:

Main: Au

Other:

Ore minerals: Gold (native)

Gangue minerals:

Geologic description:

The locally auriferous beach between Sitkagi Bluffs and Point Manby was produced by wave and long shore action on glacial moraine and outwash from the Malaspina Glacier and on alluvium brought down by the high energy streams that drain the glacier. The ultimate source of gold is in the upland hard rock terrane, but intermediate sources exist, as in the glacial deposits and the Yakutat Formation (Reimnitz and Plafker, 1976).

Reimnitz and Plafker (1976) also found gold at the three localities that they sampled along the beach, including a maximum of 0.890 ppm gold in sample number 33.

Alteration:

Age of mineralization:

Holocene

Deposit model:

Placer; modern beach, largely derived from glacial-fluvial material brought down by Malaspina Glacier.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: No

Site Status: Inactive

Workings/exploration:

This segment of the Yakutat beach placers was sampled in at least three locations by Reimnitz and Plafker (1976, samples numbers 33, 34, and 35). All three sample localities had detectable gold; samples 33 and 35, respectively, contained 0.890 and 0.030 ppm of gold. The gold was determined by atomic absorption; some of it, therefore, may be in combined rather than free state. There are no workings.

Production notes:

None known.

Reserves:

Additional comments:

The entire length of the beach placer is in Wrangell-St. Elias National Park and Preserve.

References:

Reimnitz and Plafker, 1976.

Primary reference: Reimnitz and Plafker, 1976.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 12/14/98

Site name(s): Akwe Beach**Site type:** Occurrence**ARDF no.:** YA006**Latitude:** 59.31**Quadrangle:** YA B-4**Longitude:** 139.14**Location description and accuracy:**

The placer extends along the Gulf of Alaska coast between the mouths of the Italo and Akwe Rivers; it is about 7 miles long. The coordinate location given is the approximate midpoint of the deposit which is partly in the Yakutat B-3 quadrangle. The deposit was noted by Cobb (1979, p. 17), and is Cobb's number 9 (1972).

Commodities:**Main:** Au, Fe, Ti**Other:** Cr, Zr**Ore minerals:** Chromite, gold (native), ilmenite, magnetite, rutile, zircon**Gangue minerals:** Garnet**Geologic description:**

The Akwe beach placer is developed on a wide band of unconsolidated deposits of Holocene age (Foley and others, 1995, figure 4). These deposits formed in marine and terrestrial environments and are in unconformable contact with bedrock of Tertiary and older age (Reimnitz and Plafker, 1976, p. 4-8).

The placer deposits mostly consist of medium coarse sand. They formed in a high energy environment. The deposits are products of winnowing by strong tidal currents, storms, and generally northwest-moving long shore currents. In addition to deriving materials by reworking of the unconsolidated deposits, rivers and streams bring down a constant supply of alluvium that is reworked and stratified by size and density.

Deposits enriched in ilmenite and magnetite are locally preserved in uplifted strand lines back of the modern beaches. These enriched layers are relatively continuous and as much as several feet thick. Gold locally occurs with ruby and black sands on the modern beach in thin transient lenses and wedges. Zircon and rutile are locally enriched.

Samples collected at Akwe beach by Thomas and Berryhill (1962) contained as much as 5.3 pounds/cubic yard of titania and 10.5 pounds/cubic yard of iron. Foley and others (1995) found gold, titanium, and zircon in samples from the Akwe beach.

The ultimate source of the heavy minerals enriched in the placers is in the hard rock deposits of the Fairweather Range.

Alteration:**Age of mineralization:**

Holocene

Deposit model:

Beach placer: ilmenite-based deposit, minor gold

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** Undetermined.**Site Status:** Undetermined**Workings/exploration:**

The area has been sampled fairly extensively by the Bureau of Mines in two investigations. Samples of beach sands collected by Thomas and Berryhill (1962, table 17, p. 30-33) contained as much as 5.3 pounds titania/cubic yard, 10.5 pounds of iron/cubic yard and a trace of chromite. Samples of auger holes of about 1.2 m length reported by Foley and others (1995, figure 15, Appendix A) contained gold, titanium, and zircon. A head split of sample number 281 contained 0.056 grams/ton of gold; a spiral concentrate of the same sample contained 2.01 percent titanium and 535 ppm zirconium. A spiral concentrate derived from sample number 283 contained gold; it also contained 1.89 percent titanium and 526 ppm zirconium.

Production notes:**Reserves:****Additional comments:**

The deposit is in Tongass National Forest. Lands immediately offshore belong to the State of Alaska.

References:

Thomas and Berryhill, 1962; Cobb, 1972 (MF-408); Reimnitz and Plafker, 1976; Cobb, 1979; Foley and others, 1995.

Primary reference: Thomas and Berryhill, 1962; Foley and others, 1995.**Reporter(s):** C. C. Hawley (Hawley Resource Group)**Last report date:** 04/15/99

Site name(s): Situk Beach**Site type:** Occurrence**ARDF no.:** YA007**Latitude:** 59.44**Quadrangle:** YA B-5**Longitude:** 139.58**Location description and accuracy:**

Situk beach extends southeasterly from the mouth of Lost River to the village of Situk, an approximate distance of 2.4 miles. The coordinates are the approximate mid-point of the beach deposit. The beach is southeast of the Yakutat beach (YA002) and northwest of the Blacksand beach (YA008). This beach placer was included with the Blacksand beach placer by Cobb (1972) as number 6.

Commodities:**Main:** Au, Fe, PGE, Ti**Other:** Zr**Ore minerals:** Gold (native), ilmenite, magnetite, PGE, zircon**Gangue minerals:** Garnet**Geologic description:**

The beach placer is developed on unconsolidated marine and terrestrial deposits of Holocene age and mainly consists of medium coarse sands with pebbly and rocky layers (Reimnitz and Plafker, 1976). When sampled by Foley and others (1995), there were transient layers as much as 0.3 meters thick that were rich in heavy minerals.

Samples collected by Thomas and Berryhill (1962) and Foley and others (1995) locally contained abundant heavy metals. Titania was found to almost 54 pounds/cubic yard; iron to about 150 pounds/cubic yard. Gold was found by Foley and others (1995, Appendix A) in several samples.

Alteration:**Age of mineralization:**

Holocene. Probably mainly derived from reworking of low-grade glacio-fluviatile deposits of Pleistocene and Holocene age.

Deposit model:

Beach placer: single-cycle product of high-energy environment.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** Yes; small**Site Status:** Probably inactive**Workings/exploration:**

The Situk beach was explored by auger holes and grab samples of heavy concentrate layers in the modern beach. An auger hole reported by Thomas and Berryhill (1962, sample number 25) contained 0.5 ppm gold, 53.9 pounds/cubic yard titania and 150.3 pounds/cubic yard iron. Three samples--localities 266, 267, and 268--were collected by Foley and others (1995, figure 16, Appendix A). A sample of a modern heavy mineral concentrate layer (no. 267 - 0.3 meters) contained 1.298 grams/ton gold in head split along with 4.05 percent titanium and 2534 ppm zirconium. A spiral concentrate of the same sample contained 0.113 grams/ton gold, 4.86 percent titanium, and 3032 ppm zirconium. Four samples (series no. 266 of a total of 5.5 meters) were collected from the tidal beach; five samples (series no 267 of 9.4 meters) were taken of back beach material near a lagoon. Spiral concentrates of tidal flat samples contained up to 4.72 percent titanium and 0.198 grams/ton gold in the same interval. Back beach samples contained as much as 3.34 percent titanium and a trace of gold over 1.8 meters. One other head sample of the back beach had a trace of gold. There are no workings, but the beach is accessible from the village of Yakutat.

The area was also sampled by MacKevett and Plafker (1970).

Production notes:

Probably some gold has been produced.

Reserves:**Additional comments:**

Historic mining activity; generally low-grade, but high-grade transient beach deposits exist.

References:

Thomas and Berryhill, 1962; MacKevett and Plafker, 1970; Cobb, 1972 (MF-408); Reimnitz and Plafker, 1976; Foley and others, 1995.

Primary reference: Foley and others, 1995.**Reporter(s):** C. C. Hawley (Hawley Resource Group)**Last report date:** 04/15/99

Site name(s): Blacksand Beach**Site type:** Occurrence**ARDF no.:** YA008**Latitude:** 59.38**Quadrangle:** YA B-4**Longitude:** 139.43**Location description and accuracy:**

The Blacksand beach placer is about 10 miles long extending northwesterly between the Ahrnklin and Dangerous Rivers. The coordinate location is the approximate mid-point of the beach, which extends northwesterly into the Yakutat B-5 quadrangle. The deposit coincides with a named geographic feature (Blacksand Spit); it is location 7 of Cobb (1972). It is southeast of the Situk beach placer (YA007).

Commodities:**Main:** Au, Fe, Ti**Other:** PGE, Zr**Ore minerals:** Gold (native), ilmenite, magnetite, PGE, rutile, zircon**Gangue minerals:** Garnet**Geologic description:**

The Blacksand deposit is on a modern spit that extends along the coast line for about 10 miles. It was derived by high-energy reworking of underlying unconsolidated sediments of Holocene age (Foley and others, 1995; Reimnitz and Plafker, 1976) and from the density stratification of the alluvium constantly brought down by the Ahrnklin and Dangerous Rivers, which head in the Fairweather Range.

Black and garnet sand lenses 0.1 to 0.2 feet thick contain interlocked magnetite-ilmenite or garnet and, more rarely, gold. Cobb (1979, p. 19) cites a reliable report of a PGE (platinum) from the mouth of the Situk River.

Alteration:**Age of mineralization:**

Holocene

Deposit model:

Beach placer: single-cycle deposits of high-energy systems.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** Yes; small**Site Status:** Undetermined**Workings/exploration:**

The beach has been mined on a small scale for many years. It was sampled by Thomas and Berryhill (1962), MacKevett and Plafker (1970; sample no. 67Apr76C), Reimnitz and Plafker (1976, samples 39, 40, and 41), and by Foley and others (1995, samples 276, 277 and 278). Thirteen beach locations were sampled by Thomas and Berryhill; their sample number 26 (table 12) contained 0.00012 ounce/cubic yard gold, 11.7 pounds/ cubic yard titania, and 25.8 pounds/cubic yard iron. Six of the thirteen samples contained 10 pounds or more of titania/cubic yard. The maximum amount of titania reported by Thomas and Berryhill was 47.4 pounds/cubic yard; maximum iron was about 150 pounds/cubic yard. Reimnitz and Plafker (1976) reported from 0.010 to 0.050 ppm gold in their samples. Gold was determined by atomic absorption, hence it may not correlate with the amount that could be recovered by placer mining and processing. Gold was not found by Foley and others (1995) in their head splits, but was reported in two of three spiral concentrates of the samples. Spiral concentrates also contained as much as 3.1 percent titanium and 1665 ppm zirconium.

Production notes:**Reserves:****Additional comments:**

The beach is in the Tongass National Forest.

References:

Thomas and Berryhill, 1962; MacKevett and Plafker, 1970; Cobb, 1972 (MF-408); Reimnitz and Plafker, 1976; Cobb, 1979 (OFR 79-1246); Foley and others, 1995.

Primary reference: Thomas and Berryhill, 1962; Foley and others, 1995.**Reporter(s):** C. C. Hawley (Hawley Resource Group)**Last report date:** 04/15/99

Site name(s): Blacksand Island Beach**Site type:** Mine**ARDF no.:** YA009**Latitude:** 59.417**Quadrangle:** YA B-4**Longitude:** 139.500**Location description and accuracy:**

The Blacksand Island placer extends for about 3.5 miles along the southwest shore of the island immediately northeast of the mouth of the Ahrnklin River. It is back of the Blacksand (Spit) placer (YA008). The coordinate location given is the approximate mid-point of the placer. The placer continues for about an equal distance (1.75 miles) north-westerly in the Yakutat B-5 quadrangle. The deposit is given as location 8 in Cobb (1972).

Commodities:**Main:** Au, Ti**Other:** Fe, Zr**Ore minerals:** Gold (native), ilmenite, magnetite, rutile, zircon**Gangue minerals:** Garnet**Geologic description:**

The Blacksand Island placer is in the depositional drainage area of the Ahrnklin River, hence possibly deltaic. The island could also be, in part, an older beach deposit that formed before Blacksand Spit. Irregular beach concentrates of black sand occur with interlocked magnetite-ilmenite and small amounts of gold.

Alteration:**Age of mineralization:**

Holocene

Deposit model:

Riverine delta and beach deposit

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** Yes; small

Site Status: Inactive

Workings/exploration:

The occurrence is one of the older placer deposits reported along the coast. Minor and generally unsuccessful mining activity was reported by Blackwelder (1907, p. 86-87); Thomas and Berryhill (1962) reported that there was some private churn drilling done about 1957, but the results are unknown. Foley and others (1995) reported analytical results from one sample--no. 276. The sample contained 0.63 percent titanium in a spiral concentrate split and did not contain gold in either the head- or spiral-concentrate splits.

Production notes:

Very minor production took place in the 1890s and early 1900s.

Reserves:

Additional comments:

Information is lacking about the private drilling that was reported by Thomas and Berryhill in 1962. It is assumed, from the sparsity of recent work, that the grade of the deposit is low.

References:

Blackwelder, 1907; Thomas and Berryhill, 1962; Cobb, 1972 (MF-408); Cobb, 1979 (OFR 79-1246); Foley and others, 1995.

Primary reference: Thomas and Berryhill, 1962.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 04/15/99

Site name(s): Unnamed (south of Nunatak Fiord)

Site type: Occurrence

ARDF no.: YA010

Latitude: 59.83

Quadrangle: YA D-3

Longitude: 139.05

Location description and accuracy:

The locality is a lode occurrence on The Nunatak south of Nunatak Fiord about 8 miles east of the mouth of the fiord. The occurrence is number 1 of Cobb (1972). The approximate location of the site was estimated from pl. 1 of MacKevett and Plafker (1970).

Commodities:

Main: Au

Other: Co, Cu

Ore minerals: Chalcopyrite ?

Gangue minerals: Quartz

Geologic description:

Sulfide-bearing quartz veins a few inches wide occur in weakly metamorphosed schistophyllite of original sedimentary and volcanic origin. The rocks belong to the Yakutat group. A representative sample of quartz vein material collected by MacKevett and Plafker (1970) contained anomalous amounts of gold, cobalt, and copper.

Alteration:

Age of mineralization:

Tertiary?

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: Undetermined.

Site Status: Undetermined

Workings/exploration:

Outcrop sample.

Production notes:**Reserves:****Additional comments:**

MacKevett and Plafker (1970, sample number 67APr-34A) reported 0.08 ppm gold, 200 ppm cobalt, and 300 ppm copper in a grab sample of a quartz vein, chosen as representative of numerous quartz veins found at and near this location. Data on the occurrence are given in Cobb (1979).

References:

MacKevett and Plafker, 1970; Cobb, 1972 (MF-408); Cobb, 1979 (OFR 79-1246).

Primary reference: MacKevett and Plafker, 1970.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 04/15/99

Site name(s): Unnamed (near Hill 5605 above Alsek River and within about 2 miles of the U.S.-Canada border)

Site type: Occurrence

ARDF no.: YA011

Latitude: 59.489

Quadrangle: YA B-1

Longitude: 138.149

Location description and accuracy:

Occurrence is at an elevation of about 3700 feet about 0.5 mile southeast of hill 5605 (section 17, T. 28 S., R. 43 E., of the Copper River meridian). It is 3 miles from the Alsek River and about 2 miles southwest of the U.S.- Canadian Border. Accuracy is within 0.15 mile. The occurrence is location number 2 of Cobb (1972).

Commodities:

Main: Au, Cu

Other:

Ore minerals:

Gangue minerals:

Geologic description:

The area is mainly underlain by schists of uncertain age, possibly Mesozoic or older, but also possibly metamorphosed Yakutat Group rocks of Jurassic and Cretaceous age. These rocks are cut by a granitic rock of Cretaceous or Tertiary age, part of an extensive pluton mostly exposed south of the large unnamed glacier south of the occurrence (MacKevett and Plafker, 1970). The mineral occurrence constitutes a hydrothermally altered zone about 100 feet wide in quartz diorite. A representative sample of the zone contained 0.08 ppm gold and 200 ppm copper.

Alteration:

The occurrence is a hydrothermally altered zone, of unspecified type, in an intrusion.

Age of mineralization:

Cretaceous or younger

Deposit model:

Shear zone

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:

Surface exposures only. MacKevett and Plafker (1970, table 1) reported 0.08 ppm gold and 200 ppm copper in sample 68APr85E. The occurrence was cited in Cobb (1972; 1979).

Production notes:

Reserves:

Additional comments:

Proposed as an occurrence because of the width of the anomalous zone (100 feet) suggesting more detailed sampling could be warranted. The site is in Tongass National Forest and appears to be open for mineral location.

References:

MacKevett and Plafker, 1970; Cobb, 1972 (MF-408); Cobb, 1979 (OFR 79-1246).

Primary reference: MacKevett and Plafker, 1970.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 04/15/99

Site name(s): Unnamed (southwest of Mt. Wade)

Site type: Occurrence

ARDF no.: YA012

Latitude: 59.798

Quadrangle: YA D-2

Longitude: 138.706

Location description and accuracy:

Occurrence is 1.5 miles southwest of Mt. Wade on the Alaska border. The occurrence is at an elevation of about 5500 feet about 0.1 mile northeast of the summit of hill 5790 (section 17, T. 24 S., R. 40 E., of the Copper River meridian). The location is probably accurate within 0.25 mile.

Commodities:

Main: Cu, Zn

Other:

Ore minerals: Sulfides

Gangue minerals:

Geologic description:

The occurrence consists of sulfide-bearing amphibolite in a foliated series of mica schist, metavolcanics, and marble of Paleozoic age (MacKevett and Plafker, 1970). The amphibolite contained 0.15 percent zinc, 500 ppm copper, and weakly anomalous amounts of cobalt, nickel, titanium, and vanadium.

Alteration:

Age of mineralization:

Deposit model:

Mineralized mafic extrusive ?, Volcanogenic ?

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:

Surface exposures only. MacKevett and Plafker (1970, table 1) reported 500 ppm copper and 1500 ppm zinc in sulfide-bearing amphibolite.

Production notes:**Reserves:****Additional comments:**

The site is in Tongass National Forest and appears to be open for mineral location. The occurrence is low-grade, but of possible interest as a possible volcanogenic occurrence in layered metavolcanic rocks.

References:

MacKevett and Plafker, 1970

Primary reference: MacKevett and Plafker, 1970.

Reporter(s): C. C. Hawley (Hawley Resource Group)

Last report date: 04/15/99

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