

= Glacier Bay Basin =

Glacier Bay Basin in southeastern Alaska , in the United States , encompasses the Glacier Bay and surrounding mountains and glaciers , which was first proclaimed a U.S. National Monument on February 25 , 1925 , and which was later , on December 2 , 1980 , enlarged and designated as the Glacier Bay National Park and Preserve under the Alaska National Interest Lands Conservation Act , covering an area of 3 @, @ 283 @, @ 000 acres ( 1 @, @ 329 @, @ 000 ha ) . In 1986 , UNESCO declared an area of 57 @, @ 000 acres ( 23 @, @ 000 ha ) within a World Biosphere Reserve . This is the largest UNESCO protected biosphere in the world . In 1992 , UNESCO included this area as a part of a World Heritage site , extending over an area of 24 @, @ 300 @, @ 000 @-@ acre ( 98 @, @ 000 km2 ) which also included the Wrangell @-@ St. Elias National Park , Kluane National Park ( Canada ) and Tatshenshini @-@ Alsek Park ( Canada ) . Part of the National Park is also designated a Wilderness area covering 2 @, @ 658 @, @ 000 acres ( 1 @, @ 076 @, @ 000 ha ) .

Glacier Bay , the body of water , covers an area 1 @, @ 375 square miles ( 3 @, @ 560 km2 ) of glaciers and accounts for 27 % of the Park area . It was a large single glacier of solid ice till early 18th century . It started retreating and evolved over the centuries into the largest protected water area park in the world . Glacier Bay , on the Gulf of Alaska , was known as the Grand Pacific Glacier about 4 @, @ 000 feet ( 1 @, @ 200 m ) thick and about 20 miles ( 32 km ) in width which has since then , over the last more than 200 years retreated by 65 miles ( 105 km ) to the head of the bay at Tarr Inlet , and in this process left separate 20 other glaciers in its trail . In 1890 , the name ? Glacier Bay ? as such was given to the bay by Captain Lester A. Beardslee of the U.S. Navy . It was first proclaimed a U.S. National Monument on February 25 , 1925 , by President Calvin Coolidge .

The Glacier Bay has many branches , inlets , lagoons , islands , and channels that holds prospects for scientific exploration and visual treat . Thus , the area is popular as a cruise ship destination during summer season . However , there are restrictions imposed by the National Park Service on the numbers of vessels that can operate in a day to 2 cruise ships , 3 tour boats , 6 charter vessels , and 25 private vessels . According to National Park Service statistics for calendar year 2009 , 444 @, @ 653 people visited Glacier Bay , with 422 @, @ 919 of those being cruise ship passengers .

= = History = =

Geologists believe that Glacier Bay existed during a minimum of four Glacial periods ending with the Little Ice Age , which has a 4 @, @ 000 @-@ year @-@ old record , as the latest period . All glaciers in the park today are said to be remnants of this glacial period .

The earliest recorded history of the Glacier Bay area starts with the 1741 Russian expedition of Vitus Bering and Aleksei Chirikov . La Perouse ( after whom one of the glaciers in the bay was named subsequently ) established contact with the local inhabitants , the Tlingits at Lutya Bay , in 1786 . This was followed by the Russians staking their claim to the region .

In 1794 , Joseph Whidbey , master of the Discovery during George Vancouver 's 1791 @-@ 95 expedition , reported that his exploration of this part of the coast was blocked by a wall of 2 miles ( 3 @. @ 2 km ) width and 1 @, @ 200 metres ( 3 @, @ 900 ft ) ) thick . Vancouver claimed the land for Britain in conflict with an earlier Russian claim , which was resolved by the Anglo @-@ Russian Convention of 1825 . The United States purchased Alaska from the Russians in 1867 with a claim under that treaty of owning all lands up to " the summit of the mountains situated parallel to the coast " . The United States and Canada agreed that an arbitration board would draw the exact boundary . The arbitration award given in 1903 resolved the Alaska boundary dispute by drawing a line that linked the mountain peaks in this area . Because the agreement froze the exact boundary in 1903 , further retreat of the glacier does not alter the boundary as the coast extends northward . As a result , the northern edge of Tarr Inlet is approaching the boundary .

With the discovery of gold in the area , gold rush brought miners to the area . In 1890 , Willoughby Island in Glacier Bay was the scene of a meeting of the miners , which was followed by the establishment of the Berry mining district . In the 1890s , a salt mine was established at Bartlett Cove . Fox farms and a cannery were also established ; however , the cannery was abandoned in

1935 .

John Muir , the naturalist , conservationist and scientist , pioneered the focus of the world on the Glacier Bay phenomenon . During his research Muir had witnessed the glaciers in action . He had noted that the ice had retreated almost all the way up . In 1888 ( 1889 is also mentioned in some references ) when John Muir first visited the Bay , this wall was 48 miles ( 77 km ) and retreated from the sea by 44 miles ( 71 km ) . Now , it stands retreated to 65 miles ( 105 km ) , as a remnant of the old wall of the glacier system and has 16 major tidewater glaciers ( 10 , 12 and 15 are also mentioned in some references ) .

In 1899 , wealthy railroad magnate Edward Harriman arranged for a maritime expedition called the Harriman Alaska Expedition to Alaska comprising an elite community of scientists , artists , photographers , and naturalists to explore and document the Alaskan coast . The voyagers , spent two months traveling from Seattle , along the coast of Alaska , to Siberia , and back again . In many ways , the expedition was an intersection of 19th @-@ century science and 20th @-@ century science . The expedition claimed to have discovered some 600 species that were new to science , including 38 new fossil species . They charted the geographic distribution of many species . They discovered an unmapped fiord and named several glaciers . John Muir and his friend Harriman who were members of this expedition were instrumental in governmental lobbying on National Park legislation says . The Herriman expedition was instrumental in documenting the extent of the glacier 's retreat in 1899 .

John Muir was seeking corroboration of the continental glaciation theories of Louis Agassiz , whose controversial Etudes sur les Glaciers was published in 1840 . The year 1893 recorded the arrival of the first tourist ship at the entrance to the Bay , at Bartlett Cove , which over the years has become central to the tourist trade in the Glacier Bay . By 1916 , the Grand Pacific Glacier was at the head of Tarr Inlet , about 65 miles ( 105 km ) from Glacier Bay 's mouth . This is the fastest documented glacial retreat ever . In 1925 , Glacier Bay was declared a national monument .

For centuries , the Glacier Bay has been the home land of the Huna Tlingit native tribes of Alaska . Their oral traditions indicate being displaced by the last advance of the glacier . They continue to be part of the Bay residents and it is woven into the " tapestry of their lives " .

= = Geography = =

Glacier Bay is subsumed within the larger about 3 @. @ 3 @-@ million @-@ acre ( 13 @, @ 000 km<sup>2</sup> ) National Park and Preserve . The preserve , which is a spectacular ensemble of marine and terrestrial life , is delimited by : The Tongass National Forest borders on the east and north east ; by the international boundary with Tatshenshini @-@ Alsek Wilderness Provincial Park in British Columbia , Canada on the north ; by the waters of Cross Sound and Icy Strait border on the south ; and by the Pacific Ocean on the west . When President Calvin Coolidge declared the Glacial Bay to be a national monument , in 1925 , the objective clearly stated was :

The Alaska National Interest Lands Conservation Act of 1980 changed its status to a National Park and Reserve covering an area of 3 @, @ 283 @, @ 000 acres ( 1 @, @ 329 @, @ 000 ha ) including 57 @, @ 000 acres ( 23 @, @ 000 ha ) as a preserve : However , 2 @, @ 670 @, @ 000 acres ( 1 @, @ 080 @, @ 000 ha ) have been declared as Wilderness . The Glacier Bay also encompasses about 400 acres ( 160 ha ) of two mining claim groups , and about 3 @, @ 000 acres ( 1 @, @ 200 ha ) allotted to Alaska Natives ; some small private tracts are also reported within the limits of the Glacier Bay .

The Glacier Bay Basin is now a myriad combination of tidewater glaciers , snow @-@ capped mountain ranges , ocean coastlines , deep fjords , and freshwater rivers and lakes that provide widely varying land and seascape and ? hosts a mosaic of plant communities and a variety of marine and terrestrial wildlife . ?

Glacier Bay is covered with 1 @, @ 375 square miles ( 3 @, @ 560 km<sup>2</sup> ) of glaciers which accounts for 27 % of the Park area with most glaciers originating in mountains with elevation range of 8 @, @ 000 ? 15 @, @ 000 feet ( 2 @, @ 400 ? 4 @, @ 600 m ) . There are over 50 named glaciers ( both tidewater and terrestrial glaciers ) ; 10 tide water glaciers - one on the east arm of the bay and all

others on the west arm reach shorelines and calved ) ( literal meaning : " breaking off " ) to produce icebergs . Seven of these glaciers are reported to be active tidewater glaciers , which depict the calving phenomenon , which means that they break into icebergs and fall into the sea with thundering noise raising large waves . The McBride Glacier is the only tidewater glacier in the eastern arm at a distance of 40 nautical miles ( 74 km ) from Bartlett Cove . Of the other glaciers on the western arm , Johns Hopkins Glacier is at the farthest end ? 63 nautical miles ( 117 km ) from the entrance to the bay while the Margerie Glacier is about 55 nautical miles ( 102 km ) away .

The National Park Service manages a total of 607 @, @ 099 acres ( 245 @, @ 684 ha ) of marine waters of the Glacier Bay . It covers a coastline of 1 @, @ 180 square miles ( 3 @, @ 100 km<sup>2</sup> ) including some reach of the coast outside the Bay . Glacier Bay Basin as such has a coast line of 760 square miles ( 2 @, @ 000 km<sup>2</sup> ) including all islands ; the coast line without counting islands accounts for statute 563 miles ( 906 km ) . The deepest point in the bay is 1 @, @ 410 feet ( 430 m ) below sea level with the diurnal tides occurring every 6 hours , with a tide range of ? 5 to 18 feet ( ? 1 @. @ 5 to 5 @. @ 5 m ) ( upper limit of the range is reported to be 23 feet ( 7 @. @ 0 m ) .

According to the recorded findings , most glaciers are retreating except the Johns Hopkins Glacier , which is advancing and the Margerie Glacier which is stable . The glacier thinning or retreating process is attributed to lesser incidence of snowfall on the hills , raising temperatures in the winter season followed by decrease in cloud cover and precipitation during the summer season .

Post Little Ice Age Rebound in the Glacier Bay Basin has been studied by researchers of the Geophysical Institute , University of Alaska Fairbanks , Alaska in association with National Park and Preserve Service , under a National Science Foundation grant using GPS geodesy combined with studies of raised shorelines and tide gauges . The studies have established that the fastest rates of glacier rebound in the world are now taking place in the Glacier Bay region . The studies have also reported that " these adjustments to LIA loading and unloading are producing significant stresses on the earth ' s crust which can affect seismicity and regional tectonics . The rising land also is continually changing the geomorphic texture of shoreline throughout the Park and causing changes in hydrologic patterns , erosion , and sedimentation . All these changes have a direct impact on the ecosystems of the Park . "

Glacier Bay can be approached only by boats or ships and partly by hiking along three trails ( 10 miles ( 16 km ) ) and by kayaking along 700 miles ( 1 @, @ 100 km ) ) of shore line . The nearest road head and airport are in the small town of Gustavus , which is known as the southern gateway to the Glacier Bay . However , Gustavus as such is approachable only by air and sea . Juneau , the capital of Alaska , is about 60 miles ( 97 km ) ) . The approximate distance between Anchorage and Juneau is 567 miles ( 912 km ) } .

The advancing and retreating characteristics of the glaciers in the Glacier Bay are explained in simple terms as a steady state of snow getting converted into ice on the hills . Ice , as a lens of water on the base of bedrock , slides by gravity downwards . The good moraine of rock and rubble insulates it from water erosion . As a result , during freezing temperatures that exists all the year , the glacier advances . When the insulation and erosion effect of the hills gets reduced erosion sets in and along with rising temperatures the glaciers start retreating . Another unpredictable phenomenon that is observed in many glaciers in the Glacier Bay is that of calving . Calving is a process in which blocks of ice get detached or break off from the glacier , irrespective of weather conditions , all the year round , and crash into the sea with thundering noise creating a boiling like turbulence .

The Glacier Bay was closed for ships almost a decade after the 1899 earthquake ( magnitude 8 @. @ 4 on the Richter Scale ) . This was on account of the shattered ice blocks which filled the Bay consequent to the earthquake . Even though the Bay is in volcanic activity region of the Pacific " Rim of Fire " , active volcanoes have not been recorded within the Glacier Bay Basin . However , these two factors have been inferred to have effects on the environmental changes occurring in the Glacier Bay .

= = = Archeological findings = = =

Archaeological findings have been unearthed at two sites in the Glacier Bay , which links the region to Holocene period . On the Baranoff Island , a prehistoric finding dates occupation of the region between 3200 and 4600 BP . Another finding in the form of a house , microlithic tools and heavy wood working tools at Ground Hog Bay has been dated to about 2000 BP . This is stated to be " towards the end of the Hypsithermal ( thermal maximum climatic fluctuation ) and the beginning of the Little Ice Age " . Thus , it has been interpreted by comparison with similarly placed locations in the region , such as the southern coast of British Columbia , that the type of culture seen here is comparable to the culture that existed during historic times on the Northwest Coast . The potential for finding more such sites are stated to be high .

#### = = = Ethnographic aspects = = =

The Tlingits regard Glacier Bay as their sacred homeland . The National Park Service takes the view that " Glacier Bay National Park is the spiritual homeland of the Huna Tlingit , and Glacier Bay National Preserve is the homeland of the Ghunaaxhoo Kwaan unit of the Yakutat Tlingit Tribe " . The tribes ' oral history supports that they were pushed out and migrated south when the glacier advanced . They moved back to the area when the Glacier retreated in the 1880s . There are 60 odd proto @-@ historic or historic sites in the Glacier Bay , which are identified with Tlingit Indians or European Americans . They are an integral part of Northwest Coast people inferred to be belonging to Haida , Tlingit or Eyak clans . Their settlements existed even in the 1880s in Dry Bay , Excursion Inlet , Point Couverden and the Port Frederick area ( now known as Hoonah ) and Dundas Bay . A Tlingit cemetery of the period has also been located in the park area . Seasonal hunting , gathering and fishing was their way of life , woven around a central village , with shifting fishing and hunting camps . The food source of the natives was the rich Salmon fish resources of the area . A complex society evolved with rich artistic traditions . Tlingits claimed their fishing @-@ dependent lifestyle was helped during the National Monument years , which kept out commercial fishing . After the area became a National Park , their fishing and hunting activities were curtailed except for certain religious exemptions . However , the National Park administration is closely interacting with the Tlingits to foster their cultural heritage . They are allowed access to the park to " harvest berries , a variety of seafoods , and traditional use items such as spruce roots and mountain goat hair ( for weaving traditional blankets ) " . In addition the park is planning to establish a Tlingit longhouse near its main office , where Tlingit culture would be fully highlighted and also facilitate holding of cultural events .

#### = = = Climate = = =

The bay has a cool wet , coastal temperate rainforest climate . Three climatic zones have been discerned in the Glacier Bay ; the outer coast along the Gulf of Alaska , which records mild temperatures and higher precipitation . However , it experiences less snowfall , the upper Glacier Bay where it is much colder and heavy snowfall occurs , and the lower Glacier Bay , which experiences heavy rainfall throughout the year .

In the Bay as a whole , the summer temperatures vary between 50 ° F ( 10 ° C ) ) and 60 ° F ( 16 ° C ) , while the winter temperatures lie in the range of 20 to 30 ° F ( ? 7 to ? 1 ° C ) , with minimum going up to ? 10 ° F ( ? 23 ° C ) .

Annual precipitation is in the form of rainfall and snowfall . On an average , 228 days are recorded as precipitation days per year , and precipitation is in the range of 70 ? 80 inches ( 180 ? 200 cm ) including 14 feet ( 4 @.@ 3 m ) of annual snowfall ; the highest recorded snowfall is of the order of 100 feet ( 30 m ) in the Fairweather Mountains .

#### = = Flora and fauna = =

The environment of Glacier Bay has been categorized under four main land ecosystems namely , the wet tundra , the coastal western hemlock / Sitka spruce forest , the alpine tundra , and the

glaciers and ice fields ; within the Bay proper , further break up into three major marine ecosystems are marked namely , ? within in and around continental shelf , wave @-@ beaten coasts , and fjord estuaries . ?

Plants progressively moved in as the glacier retreated , so a 200 @-@ year @-@ old spruce and hemlock forest presently exists at the entrance , grading up to more primitive plants such as mosses and lichens at the head of the bay . Because of current local climate change some glaciers are now retreating at a rate of up to a quarter of a mile per year .

The retreat of the glaciers exposed land areas and as a result ? Plant communities and animal populations ranging from " pioneer species " in areas recently exposed by receding glaciers to climax communities in older coastal and alpine ecosystems ? have emerged .

#### Wild life

In general , wild life in Glacier Bay , has been identified under aqua fauna , avifauna and fauna ; 160 marine and estuarine fish species , 242 bird species and 41 species of mammals have been recorded .

#### Bears

Bears , both black and brown , are seen in Glacier Bay in the intertidal zone which they frequent for foraging . They are also seen ? scraping barnacles off of rocks and munching mussels . ? Invariably they are spotted wandering alone along the beaches of the Glacier Bay in search of salmon . The habitats of the black bears are generally the southern forested areas of the bay . However , the brown bears are mostly found in the northern , more recently glaciated zones of the Glacier Bay . Occasionally , black bears are sighted near the glaciers or near Gustavus town . Black bears with black dots and brown bears with brown dots have been seen over the last 10 years . Their travel routes have been identified as along the easy tracks such as along beaches , stream beds and river valleys . The most commonly identified locations for sighting bears in the Glacier Bay are : The Bartlett Cove , the Bartlett River , the Beardslee Islands and North and South Sandy Cove locations for black bears , while brown bears are seen to the north of Tidal Inlet in the west arm of glacier and north of Adams Inlet in the east arm . They are also seen swimming in the Bay , crossing from one bank to the other . Salmon are their favorite food , apart from bumblebees , sand fleas , bird eggs , birds , voles and marine mammal carcasses .

#### Whale

Humpback whales have been sighted in the lower region of Glacier Bay ; also in Sitakaday Narrows , Whidbey Passage and the waters around South Marble Island . For kayakers , Hugh Miller Inlet and the Beardslee Islands are good locations to see humpback whales from a safe distance of about a quarter mile . Other marine whales sighted are grey , minke , fin , and killer whales ( orcas )

#### Seals and porpoise

Harbor seals , northern fur seals , sea otters , harbor porpoises , Dall 's porpoises and Steller sea lions are also seen in Glacier Bay .

#### Other fauna

Land mammals sighted in Glacier Bay are : blue bears ( glacier ) , moose , Sitka black @-@ tailed deer , mountain goat , wolf , coyote , lynx , wolverine , marmots , land and river otters , weasels , ermine , mink , squirrels , beaver and red fox . Porcupines , voles , shrews , hares , and bats are also found .

#### Avifauna

200 species of birds have been recorded in the Bay . These include : the bald eagle , golden eagle , raven , northern hawk owl , sandhill crane , loon , Steller 's jay , murre , cormorant , puffin , murrelet , oyster catchers , herons , geese , ducks , ptarmigan , crow , osprey , blue grouse , woodpecker , pigeon guillemot , sparrow , sandpiper , plover , Arctic tern , kittiwake and gulls .

#### Fish

Fish species found in the bay are : Chinook , chum , sockeye , pink and coho salmon , halibut , trout , steelhead , Dolly Varden , lingcod , whitefish , blackfish , char and herring . As for shellfish , there are Dungeness crabs , scallops , shrimp and clams . Salmon are very important food of bears , particularly in the late summer and fall . In the southern part of the bay , there are streams which

abound in salmon . They are also seen colonizing in the northern bay , consequent to the retreat of many glaciers and the streams emerging . These salmon food sources are expected to support more bear populations in the years ahead .

#### Vegetation

Plant recolonization and succession has occurred in Glacier Bay as a result of the retreat of the glacier bay in the last about 300 years . The succession , which occurred in the new wilderness of Glacier Bay was stated to be a raw landscape . A simile given is that ? It was like seeing an owl with no feathers ? . A vegetative wilderness has been created , which has resulted in the coastal forest . 333 Vascular plant species of individual taxa have been recorded in the Glacier Bay . Dense thickets of Sitka alder and devil 's club abound along the shoreline .

#### = = Landmarks = =

There are 50 odd glaciers identified in the Glacier Bay , which are both terrestrial and tidewater type . Some of the major inlets , glaciers and the mountains in the order of their location from the entry have been identified from the National Park Service Map . At the entry to the Bay there are ( as read from the map ) : The small Gustavus town and then the Visitor Center of the National Park Service and the Glacier Bay Lodge followed by several islands within the main channel . On the western side of the channel , the first inlet is the Muir Inlet which has several inlets and glaciers such as Adam ? s Inlet , Casement Glacier , McBride Glacier , Riggs Glacier , Muir Glacier followed by the Wachusett Inlet . Coming out of the Muir inlet and entering and cruising toward the north along the main Bay , on the west shore are the Gelkie Inlet , Reid Glacier and Lamplugh Glacier fed by Brady Ice field and Brady Glacier , followed by Johns Hopkins Glacier , Margerie Glacier and the Great Pacific Glacier at the head of the Bay . The east shore line has the Queen Inlet with its Carroll Glacier , and the Rendu Inlet with its Rendu Glacier . The Fairweather Range of hills which feeds the Johns Hopkins and Margerie Glaciers form the western boundary of the Glacier Bay and the highest mountains seen here are the Mt . Fairweather ( 15 @ , @ 300 feet ( 4 @ , @ 700 m ) ) , Mt . Quincy Adams ( 13 @ , @ 650 feet ( 4 @ , @ 160 m ) ) , Mt . Salisbury ( 12 @ , @ 000 feet ( 3 @ , @ 700 m ) ) , Mt . Crillon ( 12 @ , @ 276 feet ( 3 @ , @ 742 m ) ) , Mt . Bertha ( 10 @ , @ 204 feet ( 3 @ , @ 110 m ) ) , Mt . Abbe ( 8 @ , @ 750 feet ( 2 @ , @ 670 m ) ) and Mt . Cooper ( 6 @ , @ 780 feet ( 2 @ , @ 070 m ) ) . The major island , opposite to the Johns Hopkins Inlet , is the Russel Island in the midst of the main channel .

#### = = = Muir Glacier = = =

The Muir Glacier was named after John Muir , the naturalist , who identified it in 1889 . The Muir Glacier was once a tide water glacier with a width of 1 @ . @ 5 miles ( 2 @ . @ 4 km ) , a length of 2 miles ( 3 @ . @ 2 km ) , and a height of 265 feet ( 80 @ . @ 8 m ) . It has now turned into terrestrial glacier ; it has receded and does not flow into the sea . Its retreat has been very rapid and well @ - @ documented since its Little Ice Age maximum position at the mouth of Glacier Bay around 1780 . During its retreating stage which began in 1889 , calving was intense . The flow was at the rate of about 6 @ , @ 000 feet ( 1 @ , @ 800 m ) per year or about 16 feet ( 4 @ . @ 9 m ) per day until 1979 and as a result the glacier became terrestrial by 1993 . The flow was reported to be 0 @ . @ 5 feet ( 0 @ . @ 15 m ) per day between 1999 and 2001 . The glacier is now only 0 @ . @ 5 miles ( 0 @ . @ 80 km ) in width , 150 feet ( 46 m ) in height , and extends for 13 miles ( 21 km ) . Morse Glacier is its tributary and is also retreating faster than the Muir . Further , during this process of retreat , glacial till left behind two large deltas extending to a width of about 1 @ , @ 400 feet ( 430 m ) at the water edge during low tide .

#### = = = Reid Glacier = = =

The Reid Glacier was named by the members of the Harriman Alaska Expedition for Harry Fielding Reid ( 1859 ? 1944 ) , professor of geology at Johns Hopkins University , who was well known for

his studies of glacier flow and stratification in Alaska and the Alps . The glacier has its origin in Brady Icefield and has a flow rate of 15 feet ( 4 @. @ 6 m ) per day . At the water edge , its width is 0 @. @ 75 miles ( 1 @. @ 21 km ) , rises to a height of 150 feet ( 46 m ) and stretches to a length of 10 miles ( 16 km ) and flows into Bigourdan Fjord . In view of fast rate of retreat , this glacier has turned from tide water to terrestrial glacier , particularly on its eastern and western one third widths . Sediment deposits from the glacier have gradually filled the eastern and western margins at its inlet , as seen during low tides . The central one third of the glacier , however , touches water edge with a recorded depth of 30 feet ( 9 @. @ 1 m ) of water , during high tide . The walls of the fjord of the glacier , however , also show marks of lateral deposits of the glaciers right up to rock faces .

= = = Lamplugh Glacier = = =

The Lamplugh Glacier was named by Lawrence Martin of the U.S. Geological Survey ( USGS ) around 1912 for the English geologist George William Lamplugh ( 1859 ? 1926 ) , who visited the Glacier Bay in 1884 . The Glacier originates in the Brady Icefield to the east of Fairweather Range . The glacier has a width of about 0 @. @ 75 miles ( 1 @. @ 21 km ) at the water face . Its rises to height of 150 ? 160 feet ( 46 ? 49 m ) with depth of 10 ? 40 feet ( 3 @. @ 0 ? 12 @. @ 2 m ) at the waterline . It stretches to over 16 miles ( 26 km ) . The ice flow rate from the glacier is estimated at 900 ? 1 @, @ 000 feet ( 270 ? 300 m ) per year and is noted to be receding in the central and eastern part of the ice face due to calving ; the western part is , however , seen mostly grounded except during the high tide range . In the central part , a subglacial stream has developed which is seen to shift its position laterally . This phenomenon is attributed to the deposition of fluvial sediment in the embayment . It forms a delta , as observed during low tide . It also results in water turning from brown to tan milky .

= = = Johns Hopkins Inlet = = =

The Johns Hopkins Inlet is a stunning 9 @- @ mile ( 14 km ) long fjord , which has several tide water glaciers . The Lamplugh Glacier is about 1 @. @ 5 miles ( 2 @. @ 4 km ) away from the inlet and further inside is the Johns Hopkins Glacier , which is now the largest tidewater glacier in Glacier Bay and adjacent to it is the Gilman Glacier followed by the Hoonah Glacier further up . All these glaciers are tidewater glaciers . Ice blocks float in the inlet and it is quite hazardous for boating or kayaking ; both activities have to be done with great caution . Johns Hopkins Inlet is closed to boats in May and June in order to protect unweaned harbor seal pups .

= = = Johns Hopkins Glacier = = =

The Johns Hopkins Glacier rises from the Fairweather Range on the east slopes of Lituya Mountain and Mount Salisbury and has a westerly flow towards the head of Johns Hopkins Inlet , 1 mile ( 1 @. @ 6 km ) southwest of the terminus of Clark Glacier and 79 miles ( 127 km ) northwest of Hoonah . Its rock , ice and snow depict a variety of impressive colors such as grey , blue and white . It was named in 1893 by H.F. Reid after the Johns Hopkins University in Baltimore , Maryland , which sponsored an expedition to this glacier . It is the only advancing tidewater glacier now ( its advance started in 1924 when Grand Pacific Glacier started receding towards Tarr Inlet ) and is combined with Gilman Glacier ( first got attached to Hopkins in the 1990s , broke off and rejoined several times and once again it appears joined since 2000 ) ; both are advancing as one single ice block , and at the waterfront , has a width of 1 mile ( 1 @. @ 6 km ) with a depth of 250 feet ( 76 m ) , rises to a height of 250 feet ( 76 m ) and stretches to about 12 miles ( 19 km ) upstream . Submarine calving has also been recorded .

The Johns Hopkins Glacier , for example , cannot be approached any nearer than about 2 miles ( 3 @. @ 2 km ) by sea because of the volume of the ice blocks that break loose from its cliffs . Most visitors to the park come by cruise ship and thus view the glaciers from the water .

### === Gilman Glacier ===

Gilman Glacier got attached to Johns Hopkins Glacier sometime in 1990 . In the following decade , the two glaciers merged and de @-@ merged several times . However , in 2000 it was again attached to Johns Hopkins glacier and the two together are stated to be advancing along the 150 @-@ to @-@ 200 @-@ foot ( 46 to 61 m ) steep ice face .

### === Tarr Inlet ===

The Tarr Inlet at the head of the Glacier Bay is a scene of ice and snow , and " sits cater @-@ corner to Johns Hopkins Inlet " . This inlet provides excellent views of the Grand Pacific Glacier to its north and the Margerie Glacier to its west . The west shore line of this inlet is steep and rocky , extends to 4 miles ( 6 @.@ 4 km ) up to a small stream where a beach has been formed . A further 3 miles ( 4 @.@ 8 km ) along the channel , a glacier knob is seen in the center of the west shore of the inlet . A cove formation here provides for good camping grounds , where strong winds and ice flows are experienced . This location also provides a panoramic view of the Tarr Inlet . Two miles north of this location is the Margerie Glacier . Grand Pacific Glacier is located to the east side of the Margerie Glacier at the head of the Tarr Inlet where extensive gravel outwash is seen . From Grand Pacific , the Tarr Inlet continues for 5 miles ( 8 @.@ 0 km ) with steep gravel shore line interspersed with minor streams separated by gravel outwash .

### === Margerie Glacier ===

The Margerie Glacier is a 21 miles ( 34 km ) long tide water glacier that begins on the south slope of Mount Root , at the Alaska @-@ Canada border in the Fairweather Range ( elevation above 9 @,@ 000 feet ( 2 @,@ 700 m ) ) , and flows southeast and northeast to Tarr Inlet , one mile ( 1 @.@ 6 km ) north of the terminus of Grand Pacific Glacier and 87 miles ( 140 km ) northwest of Hoonah . It was named for famed French geographer and geologist Emmanuel de Margerie ( 1862 ? 1953 ) , who visited Glacier Bay in 1913 . Located at the deep end of the Glacier Bay , Margerie Glacier extends over a width of about 1 mile ( 1 @.@ 6 km ) and extends upstream for a length of 21 miles ( 34 km ) till its source on the southern slopes of the hill of Mount Root , at the Alaska @-@ Canada border . Mount Root ( elevation 12 @,@ 860 feet ( 3 @,@ 920 m ) ) , named Boundary Peak 165 , is a mountain in Alaska and British Columbia , is part of the Fairweather Range of the Saint Elias Mountains .

### === Grand Pacific Glacier ===

The Grand Pacific Glacier , at the head of the Tarr Inlet on the north , has a streaked face covered with gravel and stones ( more than 3 feet ( 0 @.@ 91 m ) ) thick in many areas ) . Landslides and medial moraines cover much of eastern side of the glacier extending to about two @-@ thirds width of the ice face . It is not an active glacier . In the earlier 18th century , it was a one single block of ice at the Gulf of Alaska , when Captain Vancouver first saw it , which has receded to the present location that is 65 miles ( 105 km ) ) from the Glacier Bay inlet . At the present site , Grand Pacific Glacier has a width of 2 miles ( 3 @.@ 2 km ) ) with a water depth of 30 feet ( 9 @.@ 1 m ) ) and with an average height of 150 feet ( 46 m ) ) and stretches to 35 miles ( 56 km ) ) . It calves into the Tarr Inlet and its western two thirds part is formed by the tributary Ferris Glacier . Its flow rate is reported to be about 1 @,@ 500 feet ( 460 m ) ) per year or about 4 feet ( 1 @.@ 2 m ) ) per day . However , the eastern part of the Glacier is reportedly moving at the rate of about 15 ? 180 feet ( 4 @.@ 6 ? 54 @.@ 9 m ) ) per year . Margerie Glacier had merged with this glacier in 1992 . As the glacier started receding it got demerged from Margerie and only a small stream separates the two glaciers now .

### === Fairweather Range ===



The Fairweather Range is the unofficial name for a mountain range located in the U.S. state of Alaska and the Canadian province of British Columbia . It is the southernmost range of the Saint Elias Mountains . The northernmost section of the range is situated in Tatshenshini @-@ Alsek Provincial Park while the southernmost section resides in Glacier Bay National Park in the Hoonah @-@ Angoon Census Area . In between , it goes through the southeastern corner of Yakutat Borough . Peaks of this range include Mount Fairweather , the highest point in British Columbia and Mount Quincy Adams 4 @,@ 150 meters ( 13 @,@ 620 ft ) .

Between the bay and the coast , snow @-@ clad peaks of the Fairweather Range capture the moisture coming in off the Gulf of Alaska and , in turn , spawn the park ? s largest glaciers . Mt . Fairweather is the tallest peak in the Fairweather Range and is very much unlike its name as it has a very harsh terrain .

#### Mt . Fairweather

The Mt . Fairweather ( officially gazetted as Fairweather Mountain in Canada but referred to as Mount Fairweather ) , is located 20 kilometers ( 12 mi ) east of the Pacific Ocean in the Glacier Bay region . While most of the mountain lies within the City and Borough of Yakutat , the summit is also in Tatshenshini @-@ Alsek Provincial Park , British Columbia ( Canada ) , making it the highest point in that province . It is also designated as Boundary Peak 164 or as US / Canada Boundary Point # 164 . The mountain was named on May 3 , 1778 by Captain James Cook , apparently for the unusually good weather encountered at the time . The name has been variously translated . It was called " Mt . Beautemps " by La Prouse ( 1786 , atlas ) , " Mte . Buen @-@ tiempo " by Galiano ( 1802 , map 3 ) , " Gor [ a ] -Khoroshy @-@ pogody " on Russian Hydrographic Dept . Chart 1378 in 1847 , and " G [ ora ] Fayerveder " by Captain Tebenkov ( 1852 , map 7 ) , Imperial Russian Navy . It was called " Schonwetterberg " by Constantin Grewink in 1850 and " Schonwetter Berg " by Justus Perthes in 1882 . Mt . Fairweather was first climbed in 1931 by Allen Carpe and Terris Moore .