John Muir Glacier is an exception to current trends; this glacier is officially classed as healthy and is currently advancing each year

CUNARD

Science & Climate Change of Glacier Bay.

As the site of one of the fastest known glacial retreats in the world, Glacier Bay has always been a place of change. The first generation of scientists to head to Glacier Bay seized a unique opportunity to document and study how landscapes and ecosystems change over time. As Alaska emerges as a bell-weather, signalling how life may change as our planet warms, Glacier Bay now provides a living laboratory for a new generation of scientists, where they can watch, measure and seek to understand the challenges that may lie ahead, in a future, warmer world.

The tradition of scientific study is deeply rooted within Glacier Bay. When the Scottish naturalist John Muir first visited Glacier Bay in 1879, his goal was to study the region's glaciers, with the hope that he would come to understand how ice could sculpt such dramatic scenery. He returned to the Bay in 1891 with his companion Harry Fielding Reid and together they made detailed notes and maps that became the foundations for centuries of future studies. The ecologist William S. Cooper began his studies in 1916, focusing on the process of plant succession, whereby sequential communities of plants and animals colonise virgin land, in this case land that had been recently exposed by the retreat of glaciers. In 1925, in response to Cooper's work, Glacier Bay was designated as a National Monument, officially set aside "for the scientific study of glacial behaviour and the development of flora and fauna in these virgin regions".

Fast-forward to today, and science still lies at the heart of Glacier Bay National Park and Preserve. Fulltime scientists comprise some 25% of the parks 60+ fulltime staff, however visiting scientists and academic teams from around the world also head to the park, to study natural processes as they play out in the waters, the landforms, the flora and the fauna of the Bay. Today, scientific studies stretch across the full gamut of the park's natural systems, ranging from studies focusing on microbial life in the depths of the fjords to broad based studies documenting changes in glacial mass and extent.

Like most glaciers in the park, Reid Glacier is currently receding rapidly

Currently, Glacier Bay is at the forefront of research into how our changing climate may impact the natural world, especially within cooler regions such as Alaska. Within the park, receding glaciers are certainly the most visible signs of change. However this is a natural process, albeit increasing in speed as the climate warms. For park biologists, more far-reaching concerns relate to how climate change may impact the underlying mechanisms and balance points that support and maintain the park's ecosystems. Impacts may be are wide-ranging: Increasing acidification within marine systems has the potential to impede the development of the microscopic marine organisms that support extensive marine-based food webs. Higher volumes of freshwater run-off into streams and rivers within the park could alter river chemistry and hinder vital salmon runs, impacting whole swaths of marine and terrestrial plants and animals, and within shoreline forests, warmer over-wintering temperatures could extend the range of invasive pest species such as bark beetle, leading to tree die-off and increasing the risks of extensive forest fires.

Looking ahead, it will no doubt take the ingenuity and resourcefulness of future generations of scientists to meet and address these changes. But hopefully, the landscapes, seascapes and ice-scapes of Glacier Bay will provide both the inspiration and resources they will need to further our understanding of our planet's natural systems and processes, and continue the work of those early scientists who first explored the Park.