

# from ICEFIELD to OCEAN

**How do glaciers impact Alaska's coastal ecosystems, and what do glacier changes mean for the future of this ecologically and economically valuable system?**

Coastal Alaska and British Columbia glaciers are melting faster than almost any other glaciers on Earth. Glaciers are central to many natural processes and economic activities in this region. Changes in coastal icefields and glaciers can have a ripple effect down through the watershed all the way to the ocean.

## RAIN OR SNOW?

As temperatures warm in this temperate climate, more precipitation is falling as rain instead of snow. This is already affecting the economically valuable yellow-cedar trees. Over longer time scales, this shift could lead to further declines in glacier mass.

## LIFE ON ICE

On the surface, within, and underneath—glaciers are full of life. The glacier surface collects organic matter and is home to diverse microbial communities. Runoff from glaciers provides bioavailable carbon to downstream ecosystems.

## MELTING AWAY

Rates of glacier loss are projected to increase in the region, with a 26-36 % reduction of total glacier volume by the end of the century.

## FJORD OF LIFE

Calving action and the release of cold, fresh water from tidewater glaciers creates turbidity in the water. This mixing makes fjords a unique habitat for krill, fish, sea birds and marine mammals like seals.

Freshwater runoff from glaciers helps drive the Alaska Coastal Current. This current carries heat, nutrients, and organisms towards the Arctic. Glacier runoff also adds rock derived elements such as phosphorus and iron to marine ecosystems, which fuels phytoplankton growth at the bottom of the food chain.

## DRIVING CURRENTS & PRODUCTIVITY

About 50% of the freshwater runoff into the Gulf of Alaska comes from glaciers. Watersheds with glacier ice are different from those without—they have unique physical and biological properties that support different organisms.

## GOING WITH THE FLOW

The effects of glacier runoff on rivers and estuaries help create ideal habitats for salmon. It is estimated that salmon fisheries provide almost \$1 billion per year in economic benefits to Southeast Alaska.

## SUPPORTING THE SALMON