

SOUTHEAST ALASKA DROUGHT IMPACTS

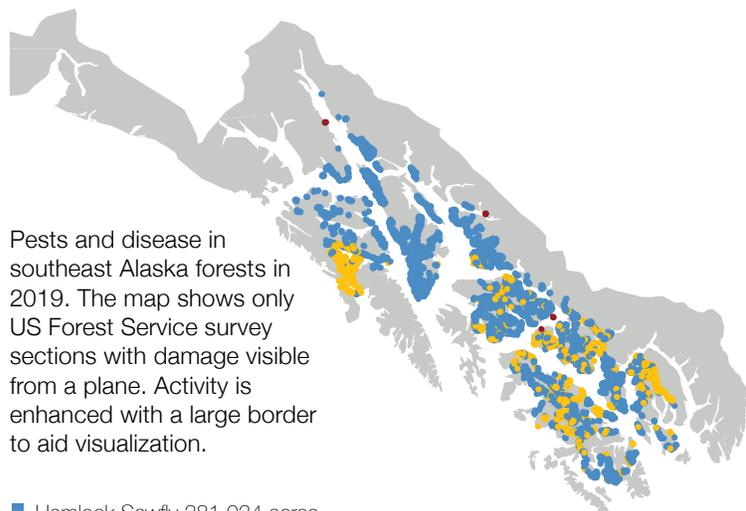


Although southeast Alaska is one of the rainiest areas in North America, it was plagued by drought from October 2016 to December 2019. “Extreme drought” was declared by the U.S. Drought Monitor in summer 2019. This designation, based on intensity and impacts, is a national rating. Extreme drought ranks a three on a scale of 0–4.

The Southeast Alaska Drought project is studying this drought, its causes, impacts, and the likelihood of future droughts like it. The project is a partnership between the Alaska Center for Climate Assessment and Policy at the UAF International Arctic Research Center and the NOAA Physical Sciences Laboratory, with funding from the National Integrated Drought Information System.

Bug outbreaks

A hemlock sawfly outbreak across southeast Alaska began in 2018, ultimately defoliating 530,000 acres of forest. The warm and dry conditions in 2018 and 2019 were indirectly tied to the outbreak. Sawfly are always present in southeast, but in normal, cool, and wet summers, fungal diseases keep sawfly numbers down. The drought limited this fungal growth, allowing sawfly larval populations to grow to outbreak status.



Pests and disease in southeast Alaska forests in 2019. The map shows only US Forest Service survey sections with damage visible from a plane. Activity is enhanced with a large border to aid visualization.

- Hemlock Sawfly 381,034 acres
- Spruce beetle 235 acres
- Yellow-Cedar decline 19,995 acres

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Low water levels

Lakes and reservoirs across southeast reached record lows during the 2016–2019 drought. Several communities experienced water restriction. Others that rely on local hydroelectric companies for power switched to diesel generators. Electricity costs rose in Juneau as Alaska Electric Light & Power was unable to produce enough electricity for “interruptible customers”—those who can make their own energy but purchase it when available, therefore offsetting the amount other customers pay.

Warm water and low stream flows in 2019 kept salmon in deeper, cooler offshore waters and delayed their movement into streams to spawn. At least one salmon mortality event was recorded when pre-spawning fish moved into a slough that later dried up. Late in the drought, hatcheries struggled to supply enough fresh, cool water to incubators. These salmon impacts were much less severe than other parts of Alaska where 2019’s unprecedentedly warm river and ocean surface waters caused massive die-offs.

Though disguised by lush vegetation, a partially dried stream bed is visible near Juneau in August 2019. Photo by Molly Tankersley



HOW LONG TILL DROUGHT IMPACTS OCCUR?

Drought in southeast Alaska looks very different from other parts of the world. Despite receiving less than half of the normal winter precipitation during the 2016–2019 drought, communities like Ketchikan still saw 100 inches of annual rainfall. Human and natural systems in southeast’s rainforest are adapted to persistently wet conditions. Some plants and animals are unable to survive prolonged dry periods. Likewise, water-related infrastructure may not be designed to withstand low rain or snow.

Short-term impacts

Some impacts occur after only a short period of dryness. For example, surface soils and ground cover can dry out rapidly, which can increase wildfire risk and cause vegetation to wilt. Communities like Wrangell, with limited water storage capacity, can run low on water after only a few months.

Water restrictions



Wrangell declared a water emergency several times when the reservoirs feeding their water supply dropped too low. Outside water use and consumption were limited, and leak repairs were prioritized.

Wildfire



Tongass National Forest responded to 32 wildfires in 2018. 15–20 fires/year is normal in the forest.

Bug outbreak



A sawfly outbreak hit the southern Panhandle in summer 2018, spreading to the central Panhandle in 2019.

Water restrictions

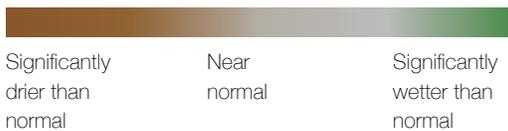


Haines issued water restrictions when Lily Lake, which supplies 80% of their water, reached a record low. Water no longer flowed by gravity and had to be pumped, reducing the amount of water reaching the community by almost half.

Short-term impacts



Long-term impacts



Long-term impacts

Other impacts take a year or more to materialize. Once these long-term impacts are triggered, short periods of wetness have little effect, and recovery can be slow. For example, it took two years of drought for the massive Snettisham reservoir feeding Juneau to drop low enough to restrict power to certain users.

**Selected examples represent only a few of the impacts southeast experienced during this drought.*



A poor berry crop limited subsistence at Metlakatla.

Subsistence



Low Crater & Long lake levels forced Juneau’s Snettisham Hydroelectric Facility to cut off power to Greens Creek Mine.

Energy reductions



Reservoirs feeding Ketchikan & Metlakatla hydropower dropped too low, communities switched to mostly diesel generators.

Diesel energy



Macaulay Salmon Hatchery in Juneau moved juvenile chinook out to salt water months earlier than usual due to insufficient cool water.

Hatcheries