THE ALASKACURRENT

Commentary | Juneau | Southeast | News | Environment

Many cruise ships emit super pollutants despite clean fuel alternatives

By **Rachel Levy** August 27, 2025

The Grand Princess is one of many ships visiting Juneau to use an open-loop scrubber. Falsey touted as a green business strategy, ships burning HFO with a scrubber emit constant streams of air and water pollution despite other fuel alternatives. Photo by Rachel Levy.

By the time the summer tourism season comes to an end, Juneau will have answered around 675 calls made by cruise lines looking to dock their ships in the city's downtown. The majority travel the Inside Passage burning Heavy Fuel Oil (HFO) along the way.

Well documented are the marine impacts of HFO. On average, each generator on these ships emits the equivalent of an Olympic-sized swimming pool's worth of acid every hour — and large ships typically have multiple generators. The heavy-metal-rich wastewater has been linked to elevated cancer and immunosuppression in marine mammals, disruptions to zooplankton at the base of the food chain, and endocrine disruption, cognitive impairment and cancer in humans. From the marine environment perspective, there's no doubt that the use of HFO directly impacts human health, regional commercial fisheries and the ecosystems vital to sustaining tourism.

A recent report from Pacific Environment adds new urgency around black carbon emissions stemming from HFO.

“[Black carbon is] what they call a short-lived pollutant: it has a very intense and large impact in the short term, but it only persists in the atmosphere a very short time, compared to CO2,” said Kay Brown, the Arctic Policy Director at Pacific Environment. “Black carbon has a very big impact immediately, and by switching to cleaner fuels, we could have a commensurate improvement.”

Black carbon is considered a “super pollutant” — per unit of mass, it has a warming impact up to 1500 times greater than that of CO2. It will linger in the atmosphere for three-to-four days where it absorbs sunlight and traps heat. When deposited on land through precipitation, this dark residue, now soot, decreases the reflectivity of ice and snow, accelerating melt in those areas. As the ice melts, darker land and water surfaces are exposed which in turn end up absorbing more heat – creating a positive feedback cycle.

Additionally, this super-pollutant has a knack for infiltrating biological systems and has even been found in placental tissue. Studies link black carbon to birth complications, as well as lung and heart diseases — posing the greatest threats to the most vulnerable populations. Each day as those ships enter Gastineau Channel, they emit this detrimental superpollutant directly into the heart of the city.

Focused primarily on the Arctic region, the Pacific Environment report notes that these emissions are a direct contributor to rising temperatures in Alaska. Compared to the lower-48, the temperatures in this state are rising about 50% faster.

Local studies have confirmed the presence of black carbon on the Juneau Ice Field. One study found that the weather patterns in Juneau generally direct air from high-use municipal and vessel areas towards parts of the Juneau Ice Field that had the highest occurrence of black carbon. Another showed that the ice field’s albedo, or ability to reflect sunlight, has significantly decreased from 1987 to 2018. This 1500-square-mile sheet of ice could completely disappear by 2200, a prediction exacerbated by these black carbon emissions.

“It would be ideal if they would take into account that it’s been studied now for almost 15 years, and that at some point we just need to move forward with the solutions and not allow the detractors or others who have different interests to further delay the process,” Brown said.

The solution is available and has already been required in ports around the world: switch from HFO to cleaner fuels like Marine Gas Oil (MGO).

Most ships docking in Juneau still burn HFO and use Exhaust Gas Cleaning Systems (“scrubbers”) that remove toxic pollutants only to discharge them into the ocean instead of the air. An ICCT study found that ships burning HFO with scrubbers emit over 80% more black carbon than ships using MGO without scrubbers. Burning MGO eliminates the need for scrubbers altogether, resulting in less black carbon and acid washwater discharge.

“The ecosystems are really important to local communities, and particularly to people who harvest and subsist on the coastal resources. These pollutants accumulate in the food chain and affect the health of many species of fish and marine mammals,” Brown said.

Notably, some cruise lines operating in the region have already switched. Disney Cruise Lines uses MGO fleet-wide, and the Norwegian Spirit also runs solely on MGO.

According to Aaron Brakel of the Southeast Alaska Conservation Council, aside from the Disney fleet and Norwegian Spirit, all of the ships not using HFO are smaller vessels with capacities for less than 1,000 passengers. In 2024, 16 of the 46 ships that visited Alaska throughout the course of the season fit into this category, meaning the majority are still using HFO.

Many cruise lines argue that the cost difference makes switching to MGO unfeasible. Yet a 2018 study of a passenger ship operating summer Arctic routes found that passing the cost to passengers would raise ticket prices by just €7 per day.

Ironically, cruise ships that continue using HFO are degrading the very ecosystems they rely on to attract passengers. They're also jeopardizing commercial fisheries, subsistence communities, and public health, the foundations of life in Alaska.

Nearby ports, like the Port of Vancouver and the entire state of California, already have regulations in place and Brown hopes that the International Maritime Organization will follow suit and mandate a transition to cleaner fuels at a larger scale.

"We know that this is one action that could be done fairly simply and straightforwardly, to require the fuel switch, to require cleaner fuels, particularly in the Arctic, where the science is fairly well settled," Brown said. "The time to do it is now because the crisis is accelerating."

Plumes of dark exhaust, full of black carbon, can regularly be seen from the downtown docks. Photo by Rachel Levy,

Rachel Levy

+ posts

Rachel Levy is a Juneau-based photojournalist whose work culminates at the intersections of environmental justice, arts and culture, and sustainable tourism. A 2022 graduate of Harvard University's Environmental Policy program, she is also the director of the award-winning documentary "Hidden in Plain Sight" that exposes the labor exploitation and colonial framework burdening Tanzania's safari industry.