

EARTH TALK



Questions & Answers
About Our Environment

Dear EarthTalk: Why did 34 million wild sockeye salmon return to the Fraser River in British Columbia this year? The run had been declining for 20 years before now.

— David B., Seattle, WA

The miraculous sockeye salmon run in western Canada's Fraser River watershed in the summer and fall of 2010—indeed the biggest run in 97 years—still has fishers, researchers and fishery managers baffled. Just a year earlier only one million fish returned to spawn.

No one seems to be able to say for sure what caused the massive 2010 run, but most agree that it probably had to do with the very favorable water conditions that were present in 2008 when the sockeyes were juveniles.

"They're very vulnerable at that stage of their life," reports John Reynolds, a salmon conservation expert at Canada's Simon Fraser University.

Roberta Hamme, a researcher with Canada's University of Victoria, suggests in a recent study published in *Geophysical Research Letters* that the

ash fall from the eruption of Alaska's Kasatochi volcano in 2008 may be one reason for the huge 2010 run.

Iron in the ash, which was spewed far and wide by the erupting volcano and then dispersed further by turbulent weather, served as a fertilizer throughout the North Pacific.

The result was huge algae blooms that dramatically improved the fish's food supply. A similar large Fraser River salmon run in 1958 was likewise preceded by a huge volcanic eruption in Alaska.

What was particularly striking about 2010's mammoth run was the contrast against 2009, when the Fraser River sockeye run was a disaster by all accounts.

It capped 20 years of decline and was so much worse than anyone had expected that the Canadian government formed a commission to investigate possible causes, reported Daniel Jack Chasan on the Pacific Northwest news website, *Crosscut*.

The situation was terrible in 2008, as well, so much so that on the U.S. side of the border, then-Commerce Secretary Carlos Gutierrez declared the Fraser salmon fishery a disaster and allocated \$2 million to U.S. tribes and commercial fishermen to make up for their loss of income.

But strangely enough, just as the Canadian commission began investigating the paltry 2009 run, said Chasan, commercial fishermen "started hauling in more Fraser River sockeye than any of them had ever seen."

Generally speaking, scientists and environmentalists are well aware of why



Some 34 million sockeye salmon returned to Canada's Fraser River this past summer and fall, following years of decline that had many scientists worried about the future of the fish and the industry built around it. There is now great optimism for better times ahead. (Photo by John Warrenchuck, Wikipedia)

wild West Coast salmon runs have been declining over the past century: namely pollution at almost every inch along the thousand mile river-to-sea-and-back underwater journey, overfishing in both rivers and the ocean, and man-made obstructions to fish passage.

But environmentalists are now optimistic that the huge 2010 sockeye run is a sign of better times ahead. Perhaps improved logging practices, a resurgence in organic farming, new protections for upstream habitat or restrained commercial fishing catch limits—or some combination thereof—has begun to make a difference in salmon survival.

In any event, the salmon runs typically peak every fourth year—2010

was supposed to be a peak year but substantially exceeded expectations. Only time will tell if the masses of sockeyes in the Fraser in 2010 were a fluke or foreshadow better days ahead for the environment—and for the fish and people in it.

CONTACTS: John Reynolds, www.sfu.ca/biology/faculty/reynolds/The_Reynolds_Lab/; *Geophysical Research Letters*, www.agu.org/journals/gl/; *Crosscut*, www.crosscut.com.

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