

International study to shed light on the mysterious lives of salmon at sea

By [Aaron Bolton, KBBI-Homer](#) March 29, 2019 [Environment](#) [Fisheries](#) [Nation & World](#) [Oceans](#) [Science & Tech](#) [Wildlife](#)

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A chum salmon leaps out of the water in Cold Bay. ([Creative Commons](#) photo by [K. Mueller/U.S. Fish and Wildlife Service](#))

Scientists know surprisingly little about a salmon's life outside of their freshwater and nearshore habitats. But an ambitious study is attempting to change that.

The [International Year of the Salmon](#) put together an expedition with 21 international scientists in the Gulf of Alaska, all in the hopes of understanding more about the mysterious lives salmon lead in the open ocean.

The International Year of the Salmon is a quasi-international organization aimed at bringing attention to all five species of Pacific salmon, as warming ocean temperatures affect their survival at sea.

“We will set the conditions that we need for salmon and people to be resilient as we’re dealing with this change in climate,” Mark Saunders explained.

Saunders works for the North Pacific Anadromous Fish Commission, and he helped establish the International Year of the Salmon initiative. The project is bringing scientists, fishery managers and policymakers together from Japan, Russia, the U.S. and Canada in the hopes of making salmon management in the Pacific Ocean an international effort.

“We’re looking for those projects that we believe are transformational, and then going after the funding to do it,” Saunders added.

One of the projects was a five-week expedition that acted as a first-of-its-kind stock survey for salmon in the Gulf of Alaska.

“The central Gulf of Alaska is a nexus of where salmon — almost all of the species — utilize, in the winter, that environment. And so the question was, what are the mechanisms that are affecting abundance?” Saunders said.

By abundance, Saunders means an estimate of how many salmon are swimming in the ocean.

The expedition ended recently in Vancouver, Canada, and the scientists on board the ship are coming back with a wealth of material that will inform numerous studies. But Saunders said the most applicable will be at-sea abundance estimates for each species, something not currently utilized in the U.S. and Canada.

“In fact, the Russians utilize their abundance estimates for pink and chum from these late winter surveys to inform forecasts for the upcoming season,” Saunders noted. “It may have value from a from an annual fisheries management perspective. A big part of this is trying to make sure that what’s coming out of this is going to be useful for management.”

There are larger questions the study may be able to start answering, such as at-sea competition between [hatchery and wild fish](#).



Pink salmon, plus an occasional silver and red, congregate in a pool above the weir before spawning. (Photo by Matt Miller/KTOO)

One of the expedition members, Charlie Waters, is a research fish biologist with the National Oceanic and Atmospheric Administration. He said studying salmon toward the tail end of winter will allow researchers to understand how species are surviving during this time of low food abundance.

“If salmon don’t eat enough before they hit this winter period, they may not have enough energy stores to survive these harsh winter conditions,” Waters said.

He will use ear bones from both the [chum and pink salmon](#) he’s studying to identify whether they’re wild- or hatchery-origin fish. A hatchery fish’s otoliths, or ear bones, are marked by changing water temperatures while in incubators at hatchery facilities. Those marks act much like a bar code, specifically identifying which hatchery facility they came from.

Using other tissue samples, Waters can then assess whether the fish are starving and, therefore, if they might die. He also took stock of available food sources.

“We can estimate the amount of energy, the amount of food that’s available in the Gulf of Alaska. Then we compare that with the energetic needs of the salmon,” Waters explained. “So we can get a rough estimate of how many salmon potentially could the Gulf of Alaska support.”

That will help answer whether large releases of hatchery pinks and chums from Pacific Rim countries are impacting wild fish in the open ocean.

“For hatchery and wild chum salmon for example, you can estimate the degree to which they’re competing for food resources. But then you can also compare different species,” Waters added.

Still, he said this is only a one-year snapshot and that conditions in the gulf change from year to year. Both Waters and Saunders hope international surveys of the Gulf and the broader Pacific Ocean will become an annual occurrence.