**Salmon sharks might play a role in king salmon declines**

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Is the warm belly of the salmon shark the answer to the decline of the king salmon in Western Alaska? Fisheries biologist Andy Seitz likes to think it is, based on astonishingly high temperatures transmitted from electronic tagging devices attached to the chinooks.

From somewhere in the Bering Sea where the highest temperatures are around 50 degrees Fahrenheit and often close to freezing, came readings between 70 and 75 degrees,  comfortable room temperature, but a mysterious "tropical oasis" in the famously frigid waters.

And those are the same warm temperatures found in the digestive systems of salmon sharks, he said. Of 23 "pop-up satellite tags" attached to the fish, 17 transmitted information of ocean conditions back to the mainland. Of those 17, he said, seven reported the unusually warm temperatures, and he's "pretty sure" that meant they were recording data from inside shark stomachs. A total of 790 days of temperature and light data was recorded, he said.

Salmon sharks, he said, normally swallow indigestible objects while feeding. A few days later, they spit it back out. The transmitters were attached to the salmon  with connectors that decay and break loose in around 50 days, and then float to the surface and upload their data to a satellite high up in sky.

Seitz, of the University of Alaska Fairbanks' School of Fisheries and Ocean Sciences, gave an update on his three-year research project, titled "Life and death of big king salmon in the Bering Sea" at the Unalaska Public Library on Monday.

From the 1960s through the 1990s, king salmon were abundant in the Bering Sea, but sharply declined around 2000, Seitz said, puzzling scientists who wondered, "Where are all the kings?"

Seitz said there are two leading theories for the decline, involving different predators, people or bigger animals. The people-based theory is  "fisheries induced evolution," meaning the fish are shrinking in size because catching too many of the bigger ones removes the genes that produce big fish. Individual chinooks have declined in size by an average of 20 percent since the early 1990s, he said. The other theoretical contender involves salmon sharks and marine mammals, and Seitz thinks one of his tagged fish was eaten by a sea lion, based on a recorded high temperature.

Nobody knows for sure what's causing the decline of king salmon in the Bering Sea.

"That's the million-dollar question," said Seitz, adding, "People are devoting their careers to this." Personally, he thinks salmon sharks are the culprits.

The project is federally funded through the Arctic Yukon Kuskokwim Salmon Satellite Initiative, studying chinook from rivers in Bristol Bay and elsewhere in Western Alaska. The $375,000 budget from the National Marine Fisheries Service buys the pricey tags, at $4,000 each, and covers his costs of traveling in the remote region.

The satellite tags are reusable, but Seitz doesn't expect to recover any from the Bering Sea because the area is just too vast. However, in similar studies in other smaller and more contained areas, like Glacier Bay, he said he was able to recover them.

In a study of Dolly Varden in the Arctic Ocean, he said tags were recovered in Kivalina and Kaktovik. In another salmon study in the Gulf of Alaska, several were recovered at the Homer Spit, and the tags display his contact information.

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