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Coastal ocean suffers a season of famine

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First it was the seabirds nesting too late and washing up dead on the beach.

Then it was the fish, usually roiling in vast numbers, gone missing.

Biologists at the U.S. Fish and Wildlife Service's Oregon Coast refuges soon realized they were seeing just a small slice of a Pacific Ocean gone haywire.

A puzzling climatic pileup stretching far beyond Oregon ripped the bottom out of the coastal food chain this spring and early summer. It left seabirds starving in record numbers, some salmon nearly absent and beachgoers baffled -- and delighted -- by strangely warm water.

No one is sure why it all happened. It may be merely unusual weather. But leading scientists at Oregon State University say the bizarre happenings match the sort of freak events expected from steadily rising sea temperatures, which increasingly appears tied to human-caused global warming.

The picture has improved dramatically in the past few weeks. But that rapid correction may have fallout, priming the coast for another eerie "dead zone" like those that suffocated crabs, fish and other marine life in the summers of 2002 and 2004.

"The oceans are generally warming up, and there are all sorts of signs that something strange is afoot," said Ronald Neilson, an Oregon State professor and U.S. Forest Service researcher who specializes in climate. "It's not new to have change happen. It's how suddenly it's happening."

This year, spring and summer winds that usually draw cold water full of nutrients up from the ocean depths arrived months late. Warm water stagnated, and beachgoers reveled in waves some 10 degrees above normal.

Starved birds

But without the flush of nutrients from below, a sea usually brimming with life by spring was impoverished. Prolific plankton that sustain other sea life did not multiply, and there was little for fish, birds and others to eat.

"This kind of came out of nowhere and caught everyone by surprise," said Roy Lowe, project leader for the coastal refuges. "The birds are the most obvious victim because they float ashore, but what's happening underwater is anyone's guess."

Whether the strange events reflect one freak year or some broader trend such as global warming, the effects will reverberate through the coastal ecosystem for years.

"It's just awful," said William Sydeman, director of marine ecology for the Point Reyes Bird Observatory in California. "It's just as bad as we've ever seen it."

Common murre, among the Northwest's most plentiful seabirds, were the most obvious victims in Oregon. They feed on small fish such as anchovy, catching and carrying one fish at a time 30 or more miles back to their nests.

A record 181 adult murre turned up dead on a 4.6-mile stretch of beach just south of Newport in July, more than in any other month in the 28 years teams have surveyed the stretch.

Their fat was gone, their muscles atrophied. They had starved.

"Their digestive systems were completely empty," Lowe said.

Missing murrelets, coho

Four to six times more murre have washed up dead on Oregon and southern Washington beaches this summer than the average from the previous five years, said Julia Parrish, a University of Washington professor who leads a coastal bird survey. Brandt's cormorants, another fishing bird, have washed up dead at rates 50 to 80 times those of previous years.

Few murre chicks hatched in Oregon colonies this year, Lowe said, and many that did probably died. Same for auklets in California, which started nests but abandoned them. Nesting is down in big colonies of double-crested cormorants and Caspian terns near the mouth of the Columbia River.

"It sure wreaked havoc with seabirds," said Daniel Roby, a professor of fish and wildlife at Oregon State University. "It's been a very interesting and strange year, and nobody seems to be sure what's going on."

The implications may extend to the Northwest's timber industry, because marbled murrelets also appeared to give up on nesting. The reclusive and threatened seabirds nest in old-growth forests, and the fewer there are, the more likely logging restrictions are to continue.

Biologists saw or heard at most three murrelets while surveying at the peak of the nesting season in an ancient grove west of Salem. Usually, they record 40 to 60 during their two-hour surveys in the Coast Range.

"We could tell almost immediately something was wrong," said Gary Licata, a wildlife biologist with the U.S. Bureau of Land Management's Salem District. "The first thing that goes is breeding if they don't have enough food."

Other seabirds have probably suffered, too, but remain unnoticed because they are not as common as murrelets or tracked as closely as murrelets, Parrish said.

"When you tinker with the bottom of the food chain, you have effects rippling all the way through," said Oregon State marine biologist Jane Lubchenco.

Salmon, especially coho, nearly vanished from coastal waters. Last year, recreational anglers caught nearly 44,000 coho salmon in Oregon; this year, they caught about 5,750 -- an 87 percent decline, state estimates show. It's the lowest catch since 1998.

The few fish reeled in tended to be small, suggesting they had trouble putting on weight. No one is sure what happened to the rest. Did they find the cooler waters they prefer somewhere else? Did they perish?

"It's a big ocean, and no one really knows," said Eric Schindler, an Oregon Department of Fish and Wildlife biologist in Newport.

Absence of food-laden waters

The symptoms match what happens during El Nino climate cycles, and the biggest bird die-offs before this have struck during El Nino years. But this is not an El Nino year. Something else was at work. It is generally clear to scientists what that was, even if it's not clear why.

As the land heats up in spring and early summer, winds often blow from the cooler ocean southward onto shore. They drive warm surface water offshore. Cooler, nutrient-laden water wells up in its place.

But this year, late spring and early summer rains that loitered in the Willamette Valley kept the land cooler. Winds didn't pick up until only a few weeks ago, so the water didn't circulate.

"Winter just didn't go away this year," said Bill Peterson, an oceanographer with the Northwest Fisheries Science Center in Newport.

But the answer to why that happened is entwined with global weather patterns stretching to Alaska and beyond, where explanations become hazy. An unpredictable hiccup in the climate may be the trigger, or global warming may be altering ocean mechanics in unseen ways.

The Canadian government last month reported that sea temperatures off British Columbia reached record highs last year, and the same is likely true off Oregon,

Lubchenco said. Such warming is expected to drive more wild fluctuations in the weather.

"We understand things locally, but when you jump to a larger scale, we don't have a real good grasp," said Jack Barth, a professor of physical oceanography at OSU. "It certainly could be true global warming is influencing patterns on those scales."

Three of the past four years, "something very strange" -- either a dead zone or this year's events -- have happened off Oregon, Lubchenco said.

Possible one-two punch

It may have been a one-two punch for the seas, said Nick Bond, a research scientist at the federal Pacific Marine Environmental Laboratory in Seattle. He suggests the lack of storms last winter allowed warm water to push north in the Pacific, suppressing cooler, richer water even before vital spring winds failed to materialize.

"The water may already have been lacking nutrients," he said, leaving marine life struggling to start.

Now that the winds have returned, cold water is surging with a vengeance along the Oregon Coast. It's feeding massive blooms of phytoplankton, especially microscopic diatoms, that have clouded the water like pea soup.

If the surge slows, the bloom could crash and suck oxygen from the water as it decays. That would trigger another dead zone like last year's.

"These systems are very complex, but they are incredibly adjustable, too," Licata said. "They can take a lot of stress and still recover, as long as things don't happen year after year."

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