New Sitka research could help berry pickers adjust to climate change

By **Anna Canny, KTOO - Juneau** - August 21, 2023

Slow developing blueberries in a Douglas Island yard in early July 2021. (Photo by Matt Miller/KTOO)

Lisa Sadleir-Hart has filled her freezer with berries from her backyard in Sitka for more than 25 years. But this year, that freezer will be emptier.

"The crop looks terrible," Sadleir-Hart said. "I hardly have any on my bushes."

She said her bushes developed differently as spring turned to summer.

"I noticed that leafing out of the salmonberries seemed to take longer. It happened later," Sadleir-Hart said. "And then boy, we sure didn't have the number of flowers and buds that we did last year."

Scientists and harvesters alike believe that berries have declined in Southeast Alaska in recent years, as human-caused climate change has reshaped the environment. A new project at the Sitka Sound Science Center will closely monitor berry plants throughout the seasons, to help both recreational and subsistence harvesters plan for the future.

In Southeast Alaska, and across the state, climate change is bringing more rainfall, less winter snowfall and hotter temperatures. According to the project's lead researcher Alex

McCarrel, those changes disrupt berry development because a berry plant's life cycle is precisely tuned to its environment.

Each stage of development corresponds with the way the weather unfolds throughout the seasons.

"When the leaves are budding out, or when the flowers are going to be blooming," McCarrel said. "When can we expect the berries to ripen? Or when is that best week you want to be picking berries."

The study of those seasonal life stages is known as phenology. And it's the foundation of some of the most important interactions in nature.

For example, a flower will typically bloom when pollinators are awake and hungry. And a knowledgeable harvester will typically know what time of year a bush will be most full of berries.

"Timing is everything," McCarrel said. "And that is changing."

To track those changes, McCarrel and collaborators at the U.S. Forest Service have deployed 16 trail cameras that are pointed at berries all season long. The cameras take thousands of time lapse photographs that can capture the precise timing of each critical life stage.

Each camera is placed next to a monitoring device that records precipitation, humidity and soil temperatures across a variety of microclimates in Sitka. McCarrel can pair that climate data with the photographs at the end of each summer to see how changes in the environmental conditions shape berry development.

The project also engages harvesters. Throughout the summer, volunteers like Sadleir-Hart noted how many ripe berries they could pick in the five minute time period, returning to the same patch once a week. Those records give McCarrel a more concrete idea of when maximum berry yield occurred for each bush.

By recording that data year to year, McCarrel and her team can start to identify patterns and trends that link specific climate conditions to changes in berry availability and timing.

That data is especially valuable for protecting food security. Sadleir-Hart, an educator for the Sitka Local Food Network, said that many rural Alaskan households rely on wild berry harvests.

"You know what berries cost in the grocery store," she said. "They are not going to be able to replace that."

And tribal natural resource departments have identified wild berries as one of the top resource concerns under climate change.

But without data, it's challenging to develop concrete adaptation and mitigation strategies. McCarrel said that the results of this research could help to solve that. Her hope is that the data could be used to inform new harvesting strategies.

"They can make decisions like, 'I guess I'll have to go out one week earlier than I did 10 years ago,'" McCarrel said. "Or I might need to look for better berries, higher up. Another 500 feet of elevation, because my spot is getting too hot."

And if berry harvesters know how to change, it could help keep their freezers full.

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