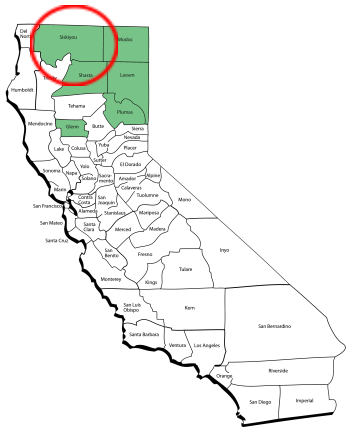
CS4NorCal
Computer Science and STEM Education Rural Implementation Project

May Newsletter: Spotlight on Siskiyou

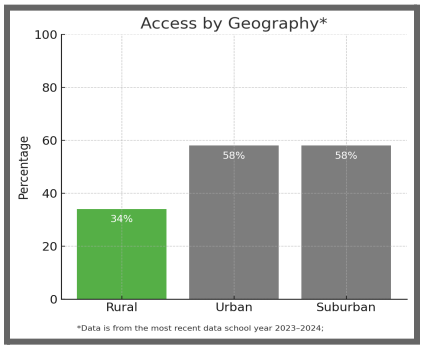


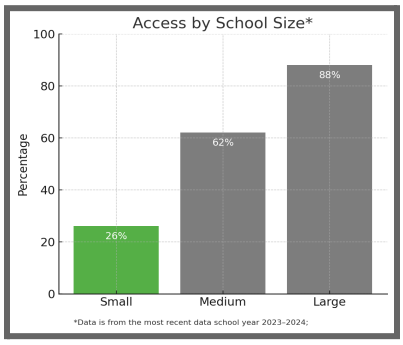
Siskiyou County Manages Its Expanse with Computer Science Education

by Kathy Hamilton, Director, CS4NorCal

Characterized by its large territorial size and sparse population, Siskiyou County's K-12 education landscape also has been marked by limited offerings of Computer Science in its K-12 schools. However, that is changing.

Like many rural school districts in California, Siskiyou County faces challenges that urban and suburban areas cannot imagine. Limited tax bases, vast geographic areas, and higher costs of service delivery mean these districts operate on razor-thin budgets even in the best of times. One result is that these districts and their students **lack access to computer science education**.





CS4NorCal, a professional learning and research project serving over 100 schools in Glenn, Lassen, Modoc, Plumas, Shasta and **Siskiyou counties**, promotes equitable access to computer science education for small and rural schools in Northern California. The project, started in June 2021, brings resources and builds capacity and partnerships to create opportunities to establish CS pathways in similar districts throughout the state. It is sponsored by the Small School Districts' Association and funded by a $4 million federal grant.

Siskiyou County by the Numbers

Siskiyou County is located in the northwestern part of California, bordering Oregon, and is the fifth-largest county in the state by area, equivalent to the land area of the state of Hawaii. The county is one of the most ecologically diverse regions in the country and includes 14,100-foot Mount Shasta, lakes, forests and rivers. The county's abundant water has been determined to be *"so pure"* that it sources bottled water sold nationally. Siskiyou County is highly rural with a focus on outdoor recreation and natural beauty. Over 60% of its rugged terrain is managed by state and federal agencies. The county's economy is supported by tourism, agriculture and forestry.

The county was formed in 1852 when gold was discovered near Yreka and is rich in Native American history, including Petroglyph Point, one of the largest panels of Native American rock art in the United States.

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Since 2000, the population of Siskiyou county has been fairly static; in 2020 it was 44,076. Yet, many of Siskiyou towns are experiencing declining population and only five are home to more than 1,000 residents. The county seat and the largest city is Yreka at 7,807 residents.

Educational Landscape

The Siskiyou County Office of Education (COE) serves 24 public school districts – the majority of which include a single K-8 school. All told, 44 TK-12 schools enroll approximately 5,600 students.

The schools include 34 traditional schools, three continuation high schools, five community day schools, and two charter schools. The districts range in size from five students (Klamath River Elementary) to about 900 students (Yreka Union Elementary). The households of only one district (Junction, enrollment 23) have a broadband rate commensurate with the state's (91.5%), while all others are below 90%. In five districts (Butte Valley, Delphic, Gazelle, Klamath River and Weed, combined enrollment 727), the broadband rate is below 80%.
(Source: National Center for Education Statistics.)

In 2020, prior to joining the CS4NorCal project, six of 15 Siskiyou County schools serving grades 9-12 (including continuation, community day and adult schools) reported offering a foundational computer science course (Computer Science for California - The Data); and only 6% percent of high school students enrolled in a CS course. While County Office of Education leaders acknowledged an interest in offering CS instruction, perceived challenges included:

- A lack of appreciation for the value of CS, including disdain / fear about technology,
- Multiple technology challenges, including: inequitable access, low broadband, lack of funds to update ed. technology, concerns about privacy / security, and limited IT support
- Many small K-8 schools (53%) with multi-grade classes
- Limited access to qualified instructors

Yet, Siskiyou COE's team also recognized that their districts had assets that could strengthen efforts to implement CS pathways. These included:

- **A high interest in after-school enrichment programs**
- A coding grant in three elementary districts
- Support for math and science programs that could complement learning about computational thinking
- Strong interest in hands-on technical education – for college or career preparation
- An early vision to support computer science through integration and reduce perceived skepticism about CS in high school

Siskiyou County Participation in CS4NorCal

As of the summer of 2024, 46 educators (including teachers, administrators, and other support staff) have participated in at least one CS4NorCal Professional Learning (PL) activity. Additionally, 20 have participated in two or more PL events – representing 19 county schools (56%), 14 districts (58%) and the County Office of Education.

One unique characteristic of Siskiyou County is the preponderance of small single-school K-8 districts (71% all districts, 11 of which enroll fewer than 100 students). It's typical in Siskiyou County that most educators teach multiple grade levels. Three of the CS4NorCal exemplars in Siskiyou show how tiny schools implement CS.

Implementation Exemplars

The community of Dunsmuir is served by two school districts: Dunsmuir Elementary enrolls 90 students (K-8), and Dunsmuir Joint Union High (9-12) enrolls 61 – yet they have been at the forefront of CS implementation since 2021. Alysia Garcia, a high school teacher with credentials in English Language Arts and Career Technical Education, was a member of CS4NorCal's first cohort of participants joined by her principal Ray Kellar. Ms. Garcia has completed a full suite of CS4NorCal's professional development workshops, including *Exploring Computer Science, Computer Science Integration* and *Implementing 4 Impact*; she is also a Computer Science Teachers Association (CSTA) facilitator for the Far North Chapter, as well as for Exploring Computer Science Workshops. Her implementation of CS is unique among the project's high schools as she integrates the subject into a required 9th-grade course, *Communications and Computer Applications.*

The successful implementation of CS at ***Dunsmuir High School*** is a result of the vision, steady planning and creativity of Ms. Garcia and Mr. Keller. Ms. Garcia's *Communications and Computer Applications* course provides a foundational CS experience that could evolve into a CS pathway via independent study or concurrent enrollment with the local community college.

Meanwhile, ***Heather O'Connor*** has become the CS expert for Dunsmuir Elementary since completing the first year of *Elementary 4 Computing* training in 2022. In addition to serving as a T-K/pre-K teacher at the school, Ms. O'Connor offers computer science enrichment after school (2 times a week) to students in grades T-K to 5. In prior years, she has provided push-in CS and technology instruction in the K-5 classrooms and a family engagement event, *CS is Elementary.*

Junction Elementary, located three hours from the county seat (Yreka) serves 23 students, more than 60% of whom are Native American. In 2021, the school's upper elementary and middle school teacher, Mike Peck, completed CS4NorCal's *Computer Science Discoveries* workshop. In 2022, he completed *Elementary 4 Computing*, where he was joined by the after-school coordinator Terra Gaytan. Mr. Peck's goal was simple: to make CS available to all of the school's students before he retired. Junction students have access to CS instruction via integrated lessons (in the regular school day) as well as an after-school coding club. According to Ms. Gaytan, students spend an entire week preparing for the annual international *"Hour of Code"* event.

Emerging Multi-grade CS Pathways

California adopted K-12 CS standards in 2018 that describe concepts and practices articulated across four grade bands from pre-K to grade 12. The guidelines for the standards also stipulate

that standalone CS courses for students in grades 9-12 be compatible with University of California a-g courses and Career Technical Education pathways. One of the principles underlying the development of the standards declares ***"every student should have continuous opportunities and multiple entry points to engage in computer science education."*** In service of these objectives, CS4NorCal has encouraged and nurtured emerging multi-grade pathways in participating counties. In small, rural communities, a multi-grade continuum of CS instruction might occur in a single K-8 or K-12 school or between multiple elementary and secondary school districts.

> *"The teacher training allows our students to have an even playing field... because this is not the Bay Area. The students here are not exposed to technology, jobs, careers or even basic coding."*
>
> Lorraine Joling, Retired Administrator, Yreka Elementary School District

The Yreka Union Elementary School District, comprising three schools, is a Siskiyou County model for an emerging CS pathway. Under the leadership of recently retired superintendent Lorraine Joling and pioneering teacher Shanna Shack, the district joined CS4NorCal in 2021. Ms. Shack, a veteran middle school instructor at Jackson Street Elementary (grades 4-8) with a long-time interest in technology, completed three workshops: *Computer Science Discoveries*,*Computer Science Integration* and *Equity-Minded Computer Science Instruction*. Then, she launched a computer science elective for her students as part of a required elective-rotation wheel course. In 2023, three additional Jackson Street teachers and a colleague from Evergreen Elementary (grades K-3) started the professional learning program.

Karla Shelby, Computer Teacher
Yreka Elementary School District

An instructor from Yreka High School (YHS) joined CS4NorCal in 2023, completing the structure for a K-12 CS pathway in the community. Four additional elementary schools that feed into YHS from outlying communities bolster this budding network of computing. The potential for and interest in additional multi-grade CS pathways in Siskiyou County exist at Golden Eagle Charter School and in the Scott Valley Unified School District -- both of which have supported five (or more) staff members participating in CS4NorCal.

CS Champion and Emerging Subject-Matter Experts

In order to develop local capacity to sustain CS pathways, CS4NorCal targeted County Offices of Education to serve as the hub of activity for computer science education, including representation on the project Steering Committee and professional learning Task Force. Each COE was asked to identify one person to serve as its CS Champion. Siskiyou COE's CS Champion, Marian Murphy-Shaw is a model of an effective advocate for computer science; she became a subject-matter expert through her participation in four CS4NorCal workshops and many *Community of Practice m*eetings. Moreover, several teachers in Siskiyou County have also become CS Champions at their schools and in their communities.

> *"You know, a pencil is just a tool. Everybody needs a pencil at some point in some subject. Computer science is the same. It is the tool. It is the the knowledge and the ability to process, communicate, innovate and it's a job skill that we're giving our kids fluency in... just like English or using a pencil."*
>
> Marian Murphy-Shaw, Teacher and CS Champion, Siskiyou County

Ms. Murphy-Shaw came into the CS4NorCal orbit as the math and science instructional coordinator for the Sacramento County of Education (SCOE). She was eager to bring computer science into her portfolio and advocate for its adoption among county schools. As CS Champion, she helped develop a county vision for CS and assembled a planning committee with representation from local schools, businesses, non-profit organizations and the community college. Ms. Murphy-Shaw also served as project's evaluator to the COE data specialist to assist with data collection. School administrators and teachers are thankful for her persistence in recruiting CS4NorCal participants.

Ms. Garcia from Dunsmuir High School is a champion for CS in her community AND statewide. Since completing the *Exploring Computer Science* workshop in 2021, she has become a fully certified ECS trainer and is now facilitating workshops in California and other states. She and Ms. O'Connor also share their experiences and expertise with other educators at state and regional CS and STEM conferences.

Siskiyou County's implementation of computer science education is an example of what can be accomplished in small, remote school districts by teachers /administrators with a vision and plan. They understand that CS is a necessity for their students to succeed in the jobs of the future. *"This is not a should-we-do-it?"* said Lorraine Joling, Retired Administrator, Yreka Elementary School District. ***"These kids have to prepare for a future that we can only imagine."***

Siskiyou SUCCESS!

Components of Siskiyou County's success include **consistent leadership** and vision from the **County Office of Education**, interest and **support from school leaders** and the **passion of creative teachers**. Siskiyou County schools use many resources to address the challenges of impacted master schedules and credentials:

- Special CS event days such as *Girls who Code, Hour of Code* and *CSPD week*
- After-school and enrichment programs
- Integration of CS with other core content
- CTE pathways and connection to independent study and concurrent enrollment programs, and

Finally, multiple teachers affirm that anyone can teach CS! ***"You don't have to know a lot to start,"*** said Ms. O'Connor (pictured above) at Dunsmuir Elementary School. ***"You can get into the basics and learn with the kids…so don't be afraid to try!"***

To learn more about how rural schools in Northern California are increasing CS instruction, visit CS4NorCal's interactive Implementation Dashboard.