

A hand holding a smartphone over a rocky stream bed with a small yellow flower. The phone screen shows a compass and location data. The background is a blue-tinted photograph of a stream bed with dark, wet rocks and a single bright yellow flower. A blue banner at the top contains the Sonoma State University logo and text.

# SONOMA

STATE UNIVERSITY

Center for  
Environmental Inquiry

2019

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**Claudia Luke, Director**

**What a year!** Sonoma State University is getting environmentally ready and the Center is leading the charge.

On April 5, 2019, President Sakaki signed a landmark declaration committing the campus to carbon neutrality, sustainability in education and building a resilient North Bay with community partners.

This fall, I took up the reins as SSU's sustainability programs director. I am excited to be working with faculty, students and community partners to deepen our understanding of our reliance on natural systems and expand efforts to work on real-world challenges.

Join us this year as we grow. You can support programs, partner on projects or visit our preserves. And you can meet regional experts and learn new skills as you contribute to solving North Bay challenges.

*Claudia Luke*



# WHAT WE DO

Driving our vision of environmental readiness for all.

This year, we broadened and deepened our engagement in North Bay challenges. The Center:

**Led** growth in sustainability programs across campus.

**Gave** underserved students the benefit of outdoor learning.

**Launched** high tech citizen science program to monitor regional bird diversity.

**Harnessed** new technology to bring outdoor learning into classrooms.

We're building a community of learners and problem-solvers by providing:

**First-hand** understanding of our connection with the environment.

**Skill-building** experiences that result in sustainable solutions.



**130**  
Projects

**1897**  
Students

**45**  
Faculty

**16**  
Departments

**79**  
Partnering  
Organizations

**2825**  
Community  
Members

# STATS



# FIRE

## How can we stay safe during wildfires?

The Center played a pivotal role giving first-responders information about the 80,000-acre Kincade Fire. A new tower at the Osborn Preserve connected fire-fighters with high-speed real-time images and fire behavior modeling on the ALERT Wildfire network.

[alertwildfire.org/northbay](http://alertwildfire.org/northbay)

### PARTNERS

Sonoma Water  
Sonoma County (SC) Fire and Emergency Services  
SC Sheriff's Office  
SC Office of Recovery and Resiliency  
SC Technical Services  
Pepperwood Preserve  
University of Nevada, Reno  
UC San Diego



“I feel like I really made an impact on the community and ecosystem and I hope to continue doing so.”

- Mike Stone

**50%**

Predicted increase in large fires by end of century

**5** Seconds

Kincade Fire detection by ALERT Wildfire Network

**20K**

Square miles visible by camera network

**STATS**



# CLIMATE

## How can we reduce greenhouse gasses?

Working with local D'Argenzio Winery and the Okinawa Institute of Science & Technology, students and faculty developed a compact biological system for small wineries to treat wastewater instead of hauling it to disposal sites. This year the pilot system successfully treated 3,000 liters to a level suitable for irrigation.

### STUDENTS

N. Hughes  
G. Quintero Plancarte  
I. Ramirez  
S. Samp  
T. Westover

### FACULTY

M. Cohen



“The work was incredibly rewarding and I gained a wealth of knowledge.

- Manuel Hernandez

4.2B

Gallons  
CA winery  
wastewater  
produced  
each year

3.9K

Tons CO<sub>2</sub>  
produced  
hauling  
CA winery  
wastewater  
one mile

6

Gallons  
H<sub>2</sub>O used  
to make  
1 gallon  
wine

STATS



# DROUGHT

How do we increase water storage as drought increases?

Faculty and students study rainfall, surface flow and groundwater to determine how much water is stored in Sonoma Mountain and for how long. This comprehensive approach to studying the local water cycle is needed to plan and design solutions for water storage.

## STUDENTS

D. Burgett  
M. O'Donnell  
L. Thompson

## FACULTY

R. Glas



I had the opportunity to learn outdoors using all of my senses. **You can't do that in a classroom.**

- Jacqueline Schmidt

**50%**

Santa Rosa Plain (SRP) groundwater used annually

**120K**

Acre-feet lost from SRP groundwater storage from 1976-2010

**10+**

Years decline in SRP deep aquifer levels

**STATS**



# BIO DIVERSITY

How can we remove  
invasive feral pigs without  
harming other species?

Students and faculty designed a low-cost, intelligent sensor that can be attached to pig traps. The trap only springs when pigs enter, allowing other wildlife to safely exit. The latest image-recognition technology syncs with Twitter to provide real-time notifications and updates.

## STUDENTS

R. Mitts

T. Plorin

E. Tran

## FACULTY

F. Farahmand

C. Halle

“Not only did I learn  
how land management  
helps the environment,  
but it also **helped me  
find my career path.**

- David Wentworth

**\$1.5B**

Annual  
cost of pig  
damage  
in U.S.

**97**

Listed  
species  
impacted  
by pigs  
in CA

**7K**

Square  
miles  
increase in  
pig range  
in CA  
1992–2004

**STATS**



# CULTURE

## How can we preserve our cultural heritage?

Working with the Federated Indians of Graton Rancheria, students and faculty used ground-penetrating radar to measure disturbance from firefighting activities. The new non-intrusive technology identified below-ground damage to a Native American village site allowing the team to make recommendations for preserving the significant cultural heritage site.

### STUDENTS

J. Fratterelli  
S. Kitchel  
M. Neel  
L. Niec  
B. Thao  
R. Watson

### FACULTY & STAFF

T. Whitley  
M. Konzak  
B. Mischke  
S. McGaughey  
M. Stoyka  
D. Dodd



**400+**

Cultural sites recorded within the 2017 Nuns Fire footprint

**98%**

CA lands with no cultural resource surveys

“Actively working on solutions is rewarding.”

- Marya Robinson

**STATS**



# PROJECTS

Real-world projects brought together faculty, students and partners at SSU preserves and sites throughout the North Bay. (See website for full project list.)

## Total Projects

**16**  
Fire

**35**  
Water

**10**  
Air & Climate

**48**  
Biodiversity

**18**  
Technology

**3**  
Culture

## Lands (acres)

**3,670**  
Galbreath Wildlands Preserve

**450**  
Fairfield Osborn Preserve

**40**  
Los Guillicos Preserve

## Fire

*Preventing fires with powerline arc detectors*  
M. Salem, PhD, Engineering Science

*Predicting wildfire intensity based on patterns of oak disease*  
L. Bentley, PhD, Biology, and  
M. Clark, PhD, Geography,  
Environment & Planning (GEP)

*Post-fire emergency preparedness of the wine industry*  
J. Ford, PhD, Business

## Water

*Tracking the breakdown of antibiotics in wastewater treatment plants*  
M. Perri, PhD, Chemistry

*Shaping flood channels to minimize the spread of invasive species*  
J. Guilford, PhD, GEP

*Reconstructing landslide history with seismic refraction and tomography*  
M. Mookerjee, PhD, Geology

## Air & Climate

*Carbon sequestration capacity of wetland soils*  
M. Goman, PhD, GEP

*Do non-native plants alter carbon sequestration?*  
L. Bentley, PhD, Biology

*Fog's ameliorating effect on climate change*  
D. Fernandez, PhD, CSU Monterey Bay

## Biodiversity

*Controlling yellow star thistle in native grasslands*  
R. Glas, PhD, Geology, and  
W. St. John, Biology

*Effects of tree fall on salmon habitat*  
J. Baldwin, PhD, GEP

*Monitoring changes in bird diversity with audio technology*  
C. Halle, PhD, Center for  
Environmental Inquiry

## Technology

*Using virtual reality to visualize water cycles*  
S. Kassis, PhD, Computer Science, and  
R. Glas, PhD, Geology

*Shake Alert: a public early warning system for earthquakes*  
R. Allen, PhD, UC Berkeley

*Using microwaves to detect sudden oak death infections*  
M. Salem, PhD, Engineering Science

## Culture

*Post-fire surveys for cultural resources*  
T. Whitley, PhD, M. Konzak, PhD, and  
S. McGaughey, PhD,  
Anthropological Studies Center

*Planning a future resilient to climate change*  
J. Ford, PhD, Business



# PARTNERS

45 faculty partnered with 79 organizations to immerse students in outdoor learning and work on solutions to environmental challenges in the North Bay.

## Organizations

ALERT - North Bay  
Anderson Valley Land Trust  
Anderson Valley Unified School District  
Bellevue Elementary  
California Master Naturalist  
California Native Plants Society  
City of Rohnert Park  
Creecer ConCiencia  
CSU East Bay  
CSU Monterey Bay  
D'Argenzio Winery  
Elsie Allen High School  
Essig Museum of Entomology  
Evergreen Elementary  
Federated Indians of Graton Rancheria  
Gold Ridge Resource Conservation District  
Grant Elementary  
Hahn Elementary  
Healdsburg Center for the Arts  
Homeschool Organization  
Institute for Bird Populations  
James R Reynolds Gallery  
La Tercera Elementary  
Laguna de Santa Rosa Foundation  
LandPaths  
Live Oak Elementary  
McNear Elementary

Mendocino County Resource Conservation District  
Monte Vista Elementary  
National Audubon Society  
Native Plant Society of California Sanhedrin Chapter  
Navarro River Watershed  
Occidental Arts and Ecology Center  
Pacific Gas & Electric  
Pacific Watershed Associates  
Pepperwood Preserve  
Pernusky Chatham, Inc.  
Point Blue Conservation Science  
Pollinator Partnership  
Proctor Terrace Elementary  
Rancho Adobe Fire District  
Rancho Cotati High School  
Richard Crane Elementary  
Russian River Watershed Association  
Sacramento Municipal Utilities District  
San Francisco Estuary Institute  
Santa Rosa Junior College  
Save Mount Diablo  
Shelly Benson Consulting  
Sonoma County  
So Co Agricultural & Open Space District  
So Co Fire and Emergency Services

So Co Master Gardeners  
So Co Office of Recovery and Resiliency  
So Co Sheriff's Office  
So Co Sudden Oak Death Program  
So Co Technical Services  
Sonoma Mountain Preservation Group  
Sonoma Mountain Ranch Preserve  
Sonoma Water  
SSU Facilities  
Stanford University Alumni Organization  
Strategic Energy Innovations  
Strawberry Elementary  
The Nature Conservancy  
TREE Fund  
UC Berkeley  
UC Cooperative Extension  
UC Davis Bodega Marine Reserve  
UCLA  
UC Santa Cruz  
University Elementary  
University Nevada, Reno  
University of San Francisco  
US Fish & Wildlife  
US Forest Service  
US Geological Survey  
Western Weather Group  
Yorkville Community Benefit Association

## Faculty

Jeff Baldwin, Geography, Environment & Planning (GEP)  
Elizabeth Bennett, American Language Institute  
Lisa Bentley, Biology  
Martha Byrnnne, Mathematics & Statistics  
Matthew Clark, GEP  
Mike Cohen, Biology  
Vanessa Dodge, GEP  
Farid Farahmand, Computer Science  
Judith Ford, Business and Economics  
Gurman Gill, Computer Science  
Derek Girman, Biology  
Robin Glas, Geology  
Michelle Goman, GEP  
Mary Gomes, Psychology  
Jackie Guilford, GEP  
Chris Halle, Engineering Science  
Heidi Hermann, GEP  
Claudia Holt, Psychology  
John Isom, GEP  
Tom Jacobson, GEP  
Sara Kassis, Engineering Science  
Mike Konzak, Anthropological Studies Center

Melina Kozanitas, Biology  
Justine Law, Hutchins  
Scott McGaughey, ASC  
Matty Mookerjee, Geology  
Nicole Myers, Geology  
Mark Perri, Chemistry  
Nathan Rank, Biology  
Mohamed A. Salem, Engineering Science  
Talena Sanders, Communication Studies  
Nanette Schonleber, Early Childhood Education  
Martha Shott, Mathematics & Statistics  
Daniel Soto, GEP  
Wendy St. John, GEP  
John P. Sullins, Philosophy  
Laura Watt, GEP  
Rich Whitkus, Biology  
Thomas Whitley, Anthropology  
Neil Driscoll, UC San Diego  
Daniel Fernandez, CSU Monterey Bay  
Carolyn Mehan, Pennsylvania State University  
Kent Graham, University Nevada, Reno  
Eric Hongisto, University of San Francisco

## Staff

Claudia Luke, *PhD, Director*  
Chris Halle, *PhD, Nature!Tech Lead*  
Suzanne DeCoursey, *Education Manager*  
Anne Reeves, *Marketing & Brand Strategist*  
Margot Rawlins, *Galbreath Program Coordinator*  
Kerry Wininger, *Outreach Manager*

## Student Employees

Benjamin Bassini  
Sage Harmon  
Regine Jackson  
Robyn Jensen  
Haley Kara  
Megan McGuire  
Nicolette Michel  
Alicia Nichols  
Kyle Page  
John Pocklington  
Eric Riordan  
Melanie Rodriguez  
Austin Salois  
Kate Stalnaker



# DONORS

Thank you for investing in  
environmental readiness for all.

## VISIONARIES (LIFETIME)

### \$100,000 & above

The Federated Indians of Graton  
Rancheria Tribal Council  
Fred & Jean Galbreath  
Robert & Sue Johnson  
Marthe & Stephen Norwick and the  
Stephen Norwick Memorial Fund  
William & Joan Roth  
Daphne Smith

## BENEFACTORS

### \$20,000–99,999

Alexander Leff

## PIONEERS

### \$5,000–19,999

Carol Cole Mitchel & Clark Mitchel

## EXPLORERS

### \$1,000–4,999

Mike & Paula Aja  
Susan Norwick Horrocks  
& Keith Horrocks  
Milo Mitchel  
Pearson Family Fund of the Community  
Foundation of Mendocino County  
Terri & David Yost

## GUIDES

### \$25–999

Leonard & Shahin Anable  
Philip & Mary Beard  
Dorothy Botorff  
John Branscome  
Vina & Jon Breyfogle  
Ruth Burke

Tom Cavers & Sol Garay  
Philippe Cohen & Cynthia Stead  
Wendy Cole  
Michelle & Kim Covington  
Jan & Robert DeWitt  
Dougherty Family Fund of  
the Community Foundation  
of Sonoma County  
Earthways LLC  
Scott Eberle  
Paul & Dorothea Geiger  
Susan & Joseph Gorin  
Bryant & Diane Hichwa  
Richard & Sandra Karas  
William & Susan Krawetz  
Gordon & Katie McDougall  
Kevin Munroe  
Ray Peterson  
John Sheehy & Laurie Szujewska  
M. Shimokochi & Anne Reeves  
Edward & Gayle Stephens  
Hugh Stevenson & Diane  
Paleczny-Stevenson  
Kirsten & Steve Tellez  
UBS Employee Giving Programs  
Janis & Warren Watkins  
Richard Whitkus  
Janice Wilson

## LEGACY & ENDOWED GIFTS

Fred & Jean Galbreath  
Marthe Norwick  
Georgette Skellenger  
Daphne Smith

# VOLUNTEERS

## GALBREATH PRESERVE

Andy Balestracci  
Lisa Bauer  
Mary Blair  
Alice Bonner  
Kathy Borst  
Pam Callaghan  
Jennifer  
Cheek-Payan  
Alan Chesterman  
Whitney Cox  
Joanna Cummings  
Lori Dudzik  
Deny Dudzik  
Peter Gordon  
Jill Hannum  
Kit Lee  
Sandy Mailliard  
Jane Miller  
Patrick Miller  
Kevin Munroe  
Mary Paffard  
Mark Rawlins  
Justin Van Horn

## OSBORN PRESERVE

Tori Abercrombie  
Antonio Aguilar  
Angelica Aguilar  
Claire Anderson  
Gaby Arango  
Siah Baakoi  
Judy Barcelon  
Nicole Bellmore  
Rosie Blackburn  
Thomas Bowers  
John Branscome  
Tyler Cameron  
Megan Cassidy  
Ian Critchfield  
Amy D'Auria  
Stef Delgado  
Baillie Doll  
Susan Edwards  
Samantha Elias  
Jade Eriksson  
Alison Evans  
Elizabeth Ezell  
Jessica Fisher  
Brienne Forbes  
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Rachel Freed  
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Kandis Gilmore  
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Audrey Glazier  
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Andrea Rossi  
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Fiona Smith  
Shay Stalnaker  
Jon Steenhoven  
Mike Stone  
Kate Symonds  
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Lucas VanderKar  
Emily Vaz Oliveira  
Susie Viramontes

Alba  
Maria Wacker  
Kaitlyn Wagner  
Tyler Warren  
Tim Wilbur  
Jeff Wilcox  
Avery Wilson  
Mark Winingier  
Kerry Winingier  
Aileen Winkler  
Kendra Wolf  
Celia Wynn-Gould  
Jessica Yost

## CAMPUS

Olivia Benedetti  
David Berman  
Amanda Brewer  
Emma Forester  
Dalton James  
Karl Joost  
Griffin Levy  
Nick Mayorga  
Elif Meyers  
Zoe Minshall  
Peter Newson  
Mamoru  
Shimokochi  
Brooke Sullivan  
Kat Weinzierl  
Dakota Whitman

# OPERATIONS

## REVENUE

Total: **\$625K**

**44%** SSU/CSU Funding  
**37%** Corporate Partners & Agencies  
**10%** Endowments  
**9%** Individual Donations

## EXPENDITURES

Total: **\$589K**

**74%** Outdoor Learning Programs  
**11%** Communications  
**8%** Operations  
**7%** Lands & Facilities



# THE FUTURE

Your gift empowers people from all backgrounds to seek solutions to North Bay challenges.

**AWARE**

**PREPARED**

**ENGAGED**

**ENVIRONMENTALLY  
READY**

“ The Center is **helping us solve the environmental challenges** facing our communities.

- Mike Thompson  
Asst. General Manager,  
Sonoma Water

More than half of Center funding comes from the generosity of private individuals, partners and organizations.







# Environmental readiness for all



@SSUCEI

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