

A hand holding a smartphone displaying a compass app. The background is a close-up of brown, jagged rocks with a single yellow flower. The phone screen shows a compass rose with cardinal directions (N, S, E, W) and a scale. The phone's back is visible, showing the text "109° E", "© 2014 Apple Inc. All rights reserved.", "iPhone 5s", and "Apple".

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

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 CO₂
produced
hauling
CA winery
wastewater
one mile

6

Gallons
H₂O 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 Byrnrne, 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 Winingar, *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 Bottorff
 John Branscome
 Vina & Jon Breyfogle
 Ruth Burke

Tom Cavers & Sol Garay
 Philippe Cohen & Cynthia Stead
 Wendy Cole
 Michelle & Kim Covington
 Jan & Robert DeWitt

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Scott Eberle
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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 Baako
 Judy Barcelon
 Nicole Bellmore
 Rosie Blackburn
 Thomas Bowers
 John Branscome
 Tyler Cameron
 Megan Cassidy
 Ian Critchfield
 Amy D'Auria
 Stef Delgado
 Baillie Doll
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 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



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Director

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