



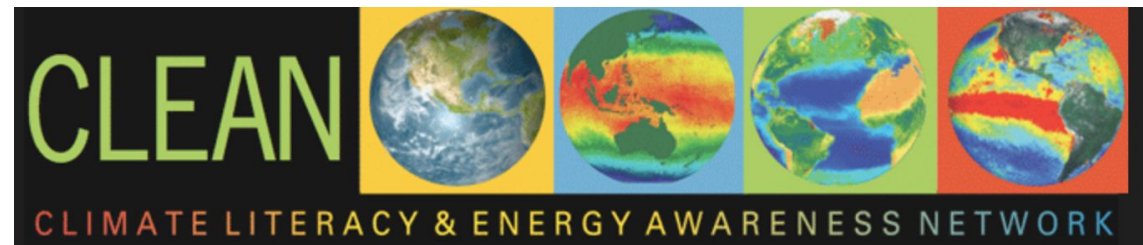
UNIVERSITY
OF
CALIFORNIA



The California
State University

ENVIRONMENTAL AND CLIMATE CHANGE LITERACY SUMMIT

December 11-12, 2019 | UCLA Meyer and Renee Luskin Conference Center | Los Angeles, CA



CLEAN Network Presentation
February 4, 2020
Amy Frame & Linda Livers
Ten Strands

Presentation Overview

- California's Context
- ECCLPS Project Overview
- Key Aspects of Summit Planning and Report Process
- Report Recommendations
- Summit Highlights
- Discussion



Presenter Bio



Amy Frame, K-12 Program Manager

Dr. Amy Frame is a credentialed teacher who has worked at almost every level of the school system, from teaching English, history, and science to coaching and managing curriculum implementation and leading as a principal. She has worked in public, magnet, charter, and independent schools. Amy has a MEd in Instructional Leadership from Harvard Graduate School of Education and an EdD in Educational Leadership from UCLA where she published her dissertation, “Assessing the Efficacy of Environmental Education on Environmental Stewardship, Civic Engagement, and College and Career Pathways.” She is committed to building stronger connections between people, communities, and the land.

aframe@tenstrands.org

Presenter Bio



Linda Livers, Project Management Consultant

Linda Livers has worked on several Ten Strands projects over the last 3 years as a project management consultant. Recent projects include project managing the UC–CSU Environmental and Climate Change Literacy Project and Summit at UCLA, assisting with implementation of a Global Climate Action Summit education affiliate event in San Francisco, coordinating advocacy work for Senate Bill 720, soliciting funders for a year-end campaign, helping to plan 3 fundraising events. Linda currently assists the Ten Strands chief executive officer with organizational operations. Her work also includes project management and administrative support for individuals by coordinating insurance policies, planning and implementing events of all sizes, and taking on various ad hoc projects.

llivers@tenstrands.org



Ten Strands

Connecting Education, Environment, and Community

Our mission is to build and strengthen the partnerships and strategies that will bring environmental literacy to all of California's K-12 students.



California's Building Blocks for Environmental Literacy

Over \$10 million in private funding has been invested:

- **Supportive context** through legislation and communications
- **Incremental infusion** of environmental literacy into state standards and frameworks and professional learning
- **Leading edge exemplars** being curated with districts and county offices to develop



CA Demographics

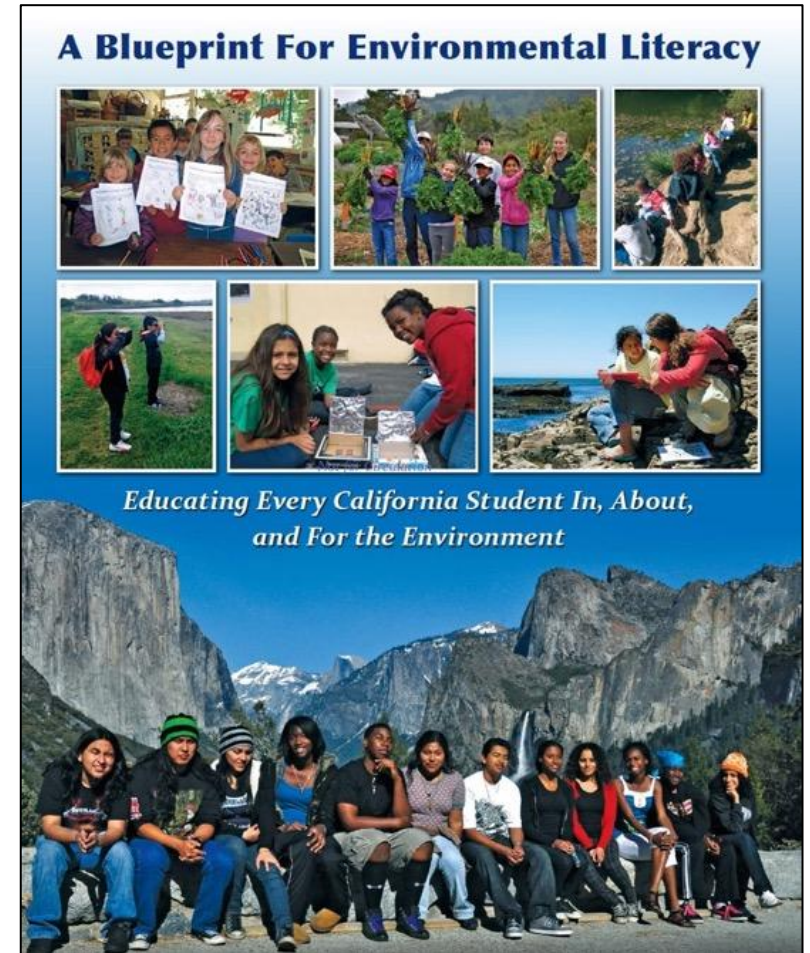
- **California's Education System**
 - 6,299,451 students
 - 266,255 teachers
 - 1,181 school districts
 - 10,315 schools
- **University of California**
 - 10 campuses, a combined student body of 280,380 students, 21,200 faculty members
- **California State University**
 - 23 campuses, 482,000 enrolled each year, 30k grad degrees every year, **prepare half of California's teachers, 1/12 of all teachers nationally**, sustainability is integrated in their teacher prep programs, 4,500+ sustainability-related courses available across the system



California's Building Blocks for Environmental Literacy

A Model for the Nation

- 2003 – Education and the Environment Initiative (EEI) becomes law - (AB 1548, Pavley)
- 2010 – State Board of Education approves EEI Curriculum
- 2015 – *Blueprint for Environmental Literacy* (Torlakson)
- 2018 – California Education Code amended to include EP&Cs, climate change, and environmental justice (SB 720, Allen)





AN ENVIRONMENTALLY LITERATE PERSON...

has the capacity to act individually and with others to support ecologically sound, economically prosperous and equitable communities for present and future generations.



CALIFORNIA
ENVIRONMENTAL
LITERACY
INITIATIVE

CA Environmental Principles and Concepts



Principle I: The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services.



Principle II: The long-term functioning and health of terrestrial, freshwater, coastal, and marine ecosystems are influenced by their relationships with human societies.



Principle III: Natural systems proceed through cycles that humans depend upon, benefit from, and can alter.



Principle IV: The exchange of matter between natural systems and human societies affects the long-term functioning of both.



Principle V: Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes.

SB 720 (Allen, 2018)



(d) The environmental principles and concepts shall include, but not be limited to, concepts relating to the following topics:

(1) Air.

(2) Climate change.

(3) Energy.

(4) Environmental justice.

(5) Environmental sustainability.

(6) Fish and wildlife resources.

(7) Forestry.

(8) Integrated pest management.

(9) Oceans.

(10) Pollution prevention.

(11) Public health and the environment.

(12) Resource conservation, waste reduction, and recycling.

(13) Toxics and hazardous waste.

(14) Water.

SB 720 (Allen, 2018)



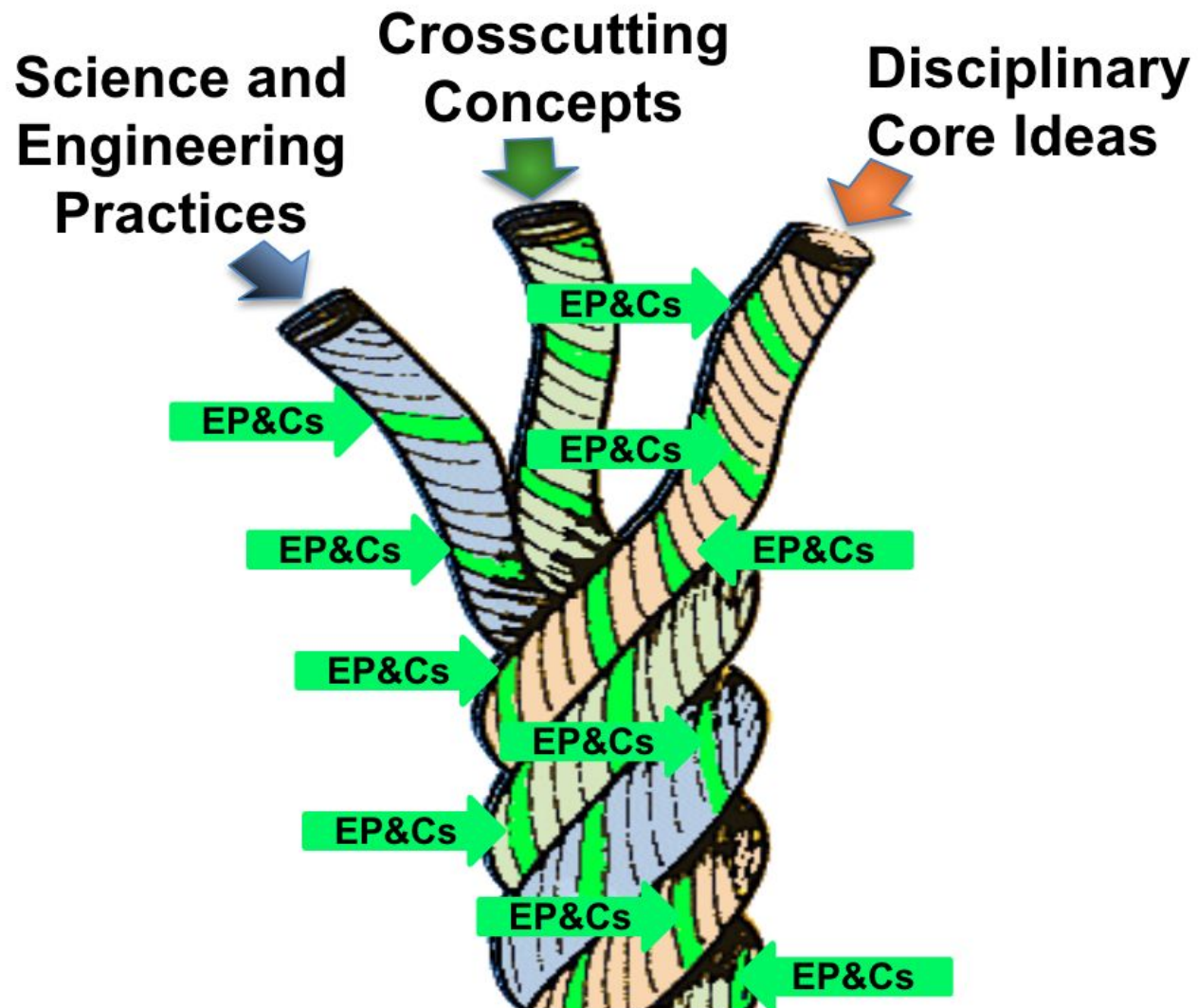
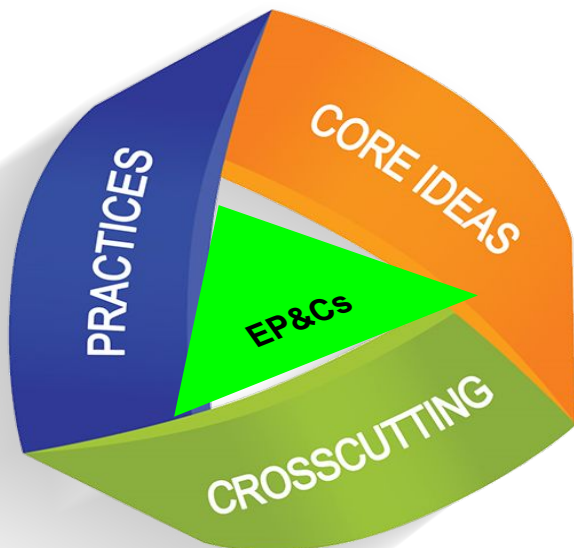
(4) Encourage and support the incorporation of the environmental principles and concepts into the credential requirements for both teachers and school administrators.

Section 51227.3 is added to the Education Code, to read:

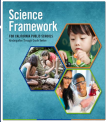


51227.3.

(a) The Instructional Quality Commission shall ensure that the **environmental principles and concepts** developed pursuant to Section 71301 of the Public Resources Code are integrated into the content **standards** and curriculum **frameworks** in the subjects of **English language arts, science, history-social science, health**, and, to the extent practicable, **mathematics** whenever those standards and frameworks are revised.

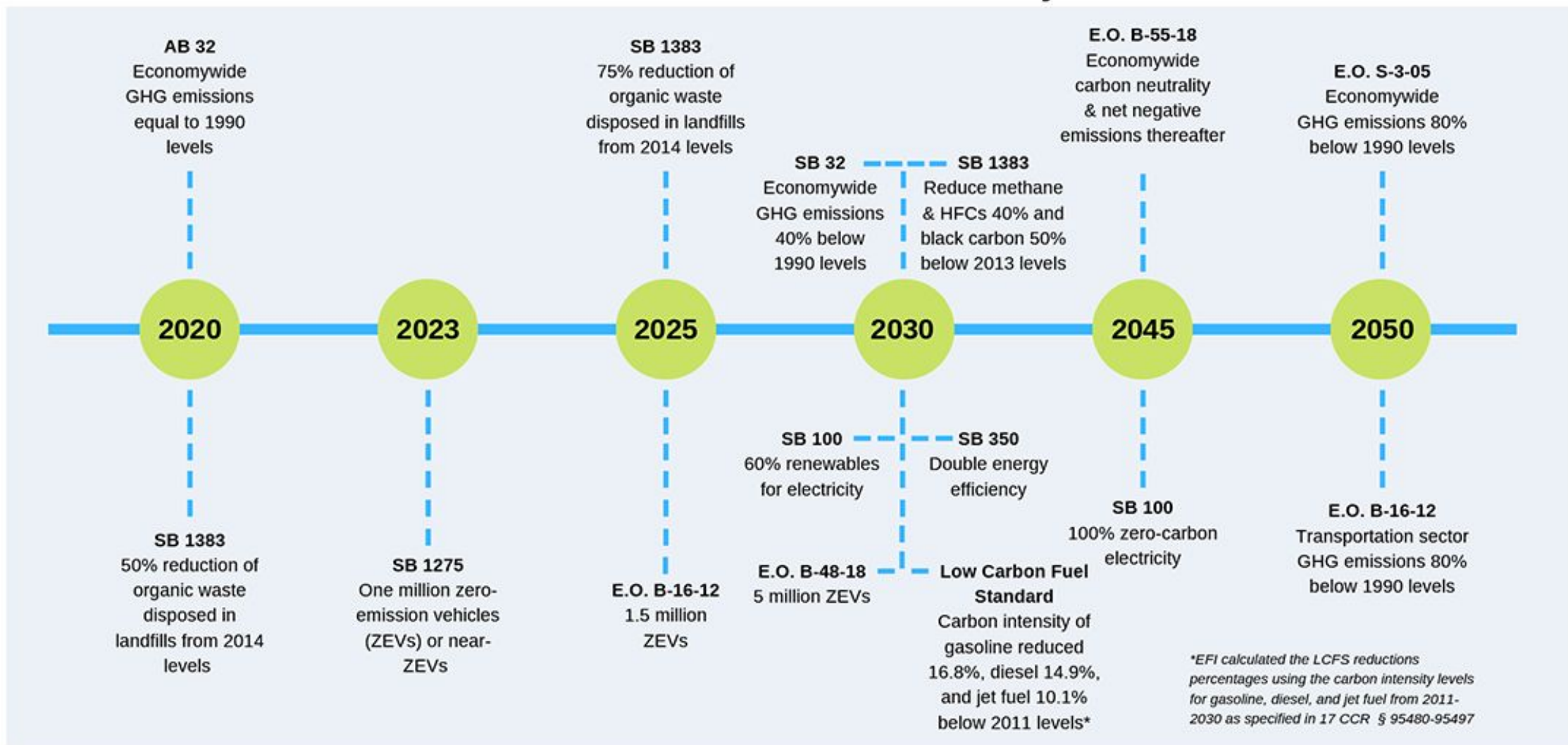
(b) The environmental principles and concepts shall be incorporated, as the state board determines to be appropriate, in the criteria developed for **textbook adoption** required pursuant to Section 60200 or 60400.



INTERSECTIONS AMONG THE THREE FRAMEWORKS

	Science Framework 	History Social Science Framework 	Health Framework 
<p>Student Inquiry</p> <p>Students investigate the communities where they live.</p>	<p>Phenomenon-based science inquiries based on the interests and needs of students and their communities.</p>	<p>Students develop inquiry-based critical thinking skills to improve their ability to make reasoned decisions based on evidence.</p> <p>Students explore their local community to make contact with times past with the people whose activities have left their mark behind on the land.</p>	<p>Analyze internal and external influences that affect health in students' communities, e.g., environmental justice issues.</p>
<p>Student Action</p> <p>Students collaborate to resolve problems and issues in their local communities.</p>	<p>Students engage in exploring societal and environmental challenges and contribute to designing and implementing solutions to these problems.</p>	<p>Promote civic engagement and deepen student understanding and the rights and responsibilities of citizenship.</p>	<p>Students use what they have learned to enhance individual and community health and resolve local health problems.</p>

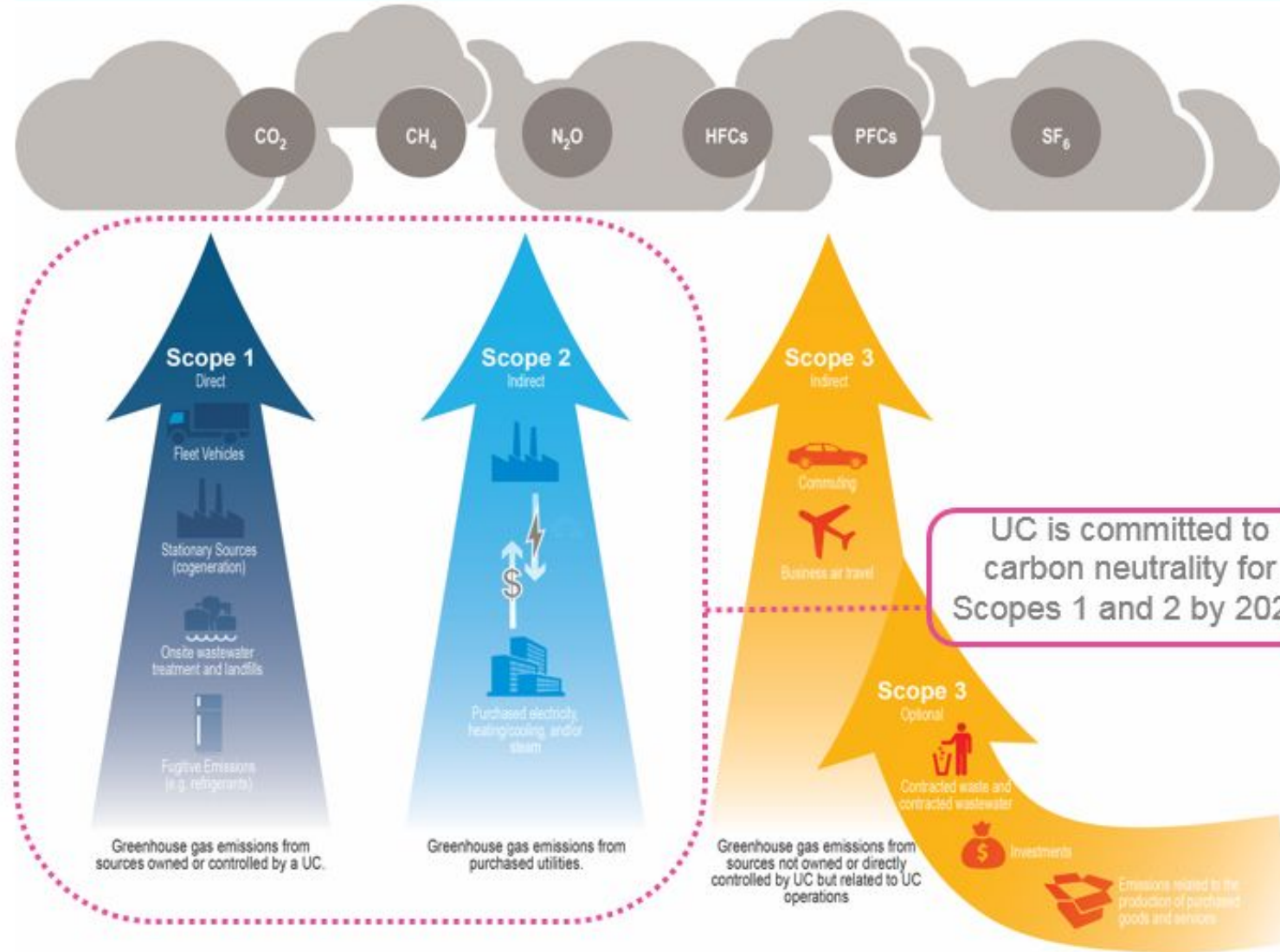
California's GHG Emissions Reduction Policy Timeline



Note: To meet its aggressive GHG emissions reduction goals, California has a number of policies aimed at reducing emissions from various sectors and end uses. Also note that bill numbers were used as a shorthand.

Source: Energy Futures Initiative

UC Carbon Neutrality Initiative



California's Environmental Literacy "Blueprints" K-12 (2015) and Higher Ed (2019)

A Blueprint For Environmental Literacy



*Educating Every California Student In, About,
and For the Environment*



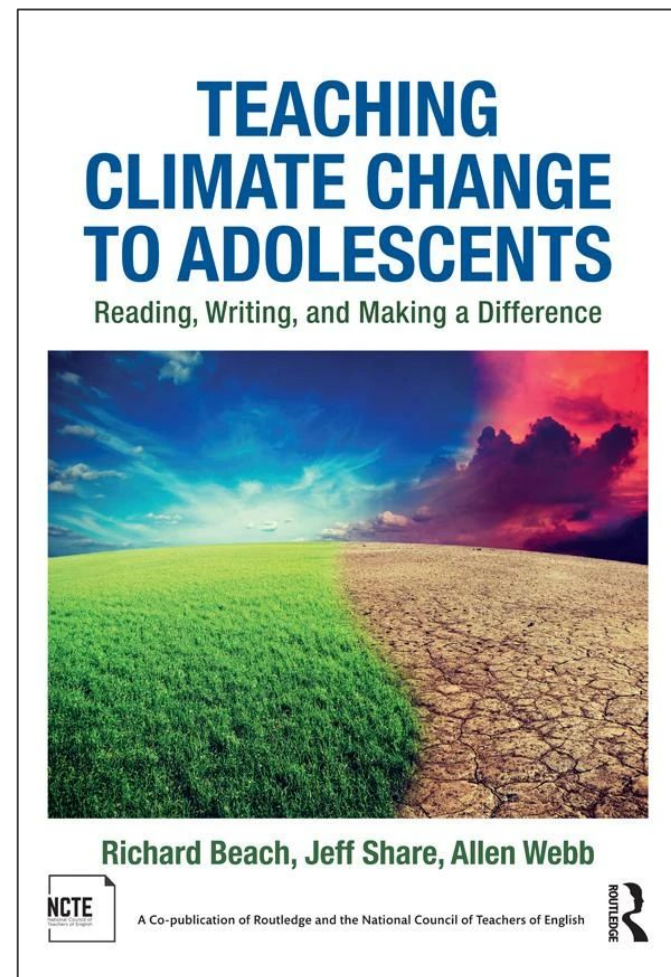
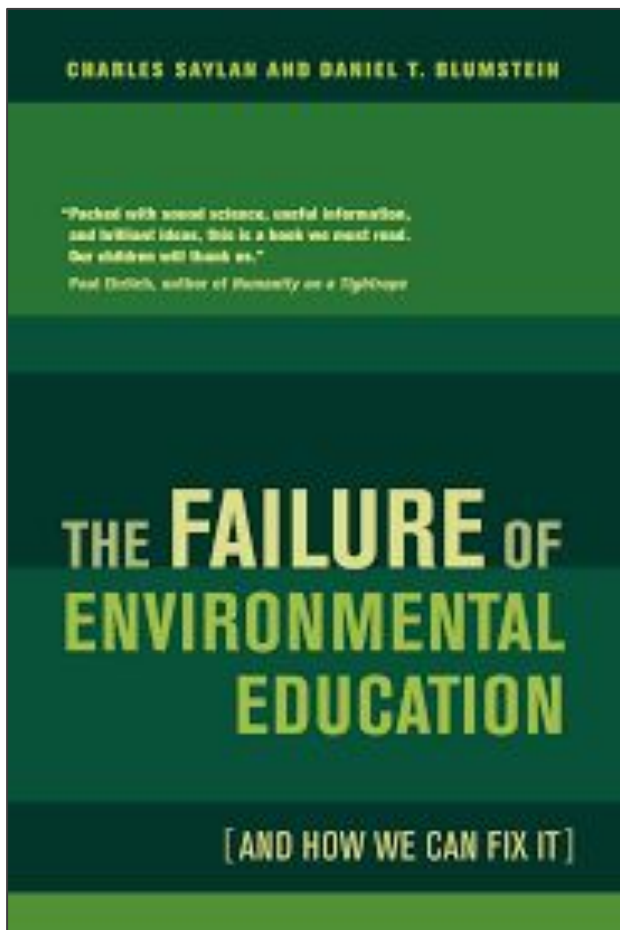


Now more than ever, climate change is an urgent issue that must be addressed. Education must be part of the solution. With that in mind, the University of California (UC) and California State University (CSU) systems are partnering with key stakeholders to support the urgent need to advance PK-12 environmental and climate change literacy by focusing on the preparation of current and future teachers to respond to these urgent issues.

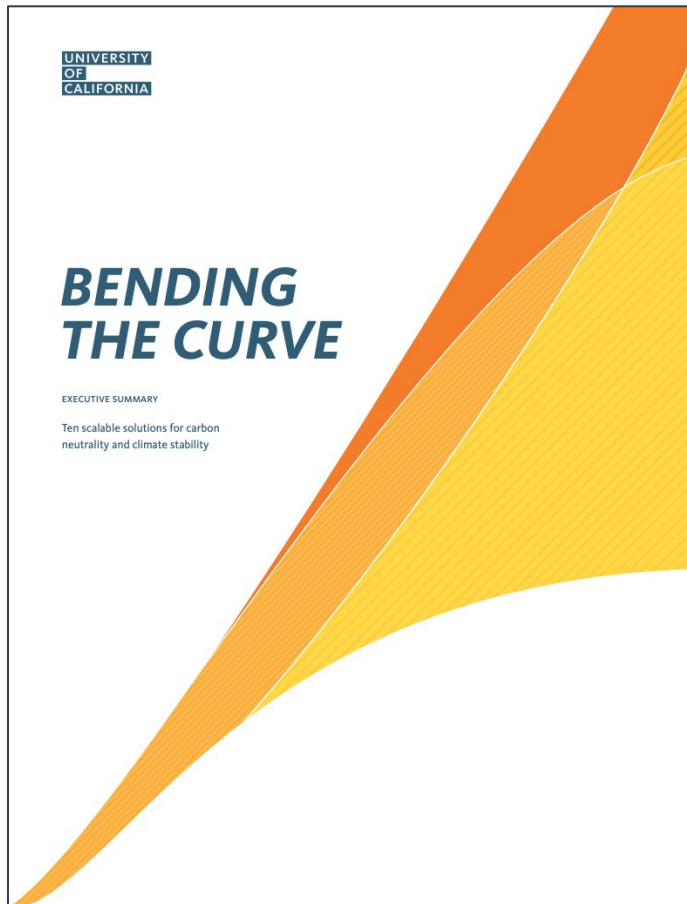
The Environmental and Climate Change Literacy Project and Summit (ECCLPS, pronounced "eclipse") Steering Committee is a collaborative effort helping to make this work possible with the goal to:

Educate 500,000 graduating high school students per year in California to become literate in environmental and climate change issues and solutions.

My UCLA Environmental Education Story



Ram's Vision: 500,000 Climate Warriors



Bending the Curve

Bending the Curve: Climate Solutions

A New Education Protocol

- Hybrid Course
- Digital Text Book
- Online Hybrid Course
- MOOC: 4 Course certification program

Developed by UC's: Innovative Initiative & UCSD-Extension (MOOC).
50 Faculty from all 10 Campuses

The image shows the cover of a book titled "BENDING THE CURVE: CLIMATE CHANGE SOLUTIONS" edited by V. Ramanathan. The cover features a close-up photograph of a person's face, with the Earth's continents and oceans overlaid on their features. The title "BENDING THE CURVE" is written vertically in large, white, sans-serif letters on the left side of the cover. The subtitle "CLIMATE CHANGE SOLUTIONS" is written vertically in smaller, white, sans-serif letters on the right side. The editor's name "V. RAMANATHAN (Editor)" is at the top. At the bottom, the names of the co-editors and producer are listed: "ADAM MILLARD-BALL (Co-editor)", "MICHELLE NIEMANN (Co-editor)", and "SCOTT FRIESE (Producer)".

ECCLPS Steering Committee Co-chairs



Marquita Grenot-Scheyer

Assistant Vice Chancellor, Educator Preparation and Public Schools Programs, CSU Office of the Chancellor



Ram Ramanathan

Distinguished Professor of Climate and Atmospheric Sciences, Scripps Institution of Oceanography, UC San Diego



Marcelo Suárez-Orozco

Wasserman Dean & Distinguished Professor of Education, Graduate School of Education & Information Studies, UC Los Angeles



Fred Uy

Director, Educator Preparation and Public School Programs and Co-Director, Center for the Advancement of Instruction in Quantitative Reasoning, CSU Office of the Chancellor

Subcommittee Co-chairs

In-service Subcommittee Co-chairs



Jill Grace

Regional Director for K-12 Alliance,
WestEd



Emily M. Schell

Executive Director, California Global
Education Project

Pre-service Subcommittee Co-chairs



Richard Arum

Dean and Professor, School of
Education, UC Irvine



Cheryl Ney

Dean, Charter College of Education,
Cal State LA

Curriculum Subcommittee Co-chairs



Karen Cowe

Chief Executive Officer, Ten Strands



Barbara Murchison

Director of the Educator Excellence
and Equity Division, California
Department of Education

Steering Committee Members

Richard Arum, Dean, School of Education, UC Irvine,
Pre-service Subcommittee Co-chair

Susan F. Belgrad, Michael D. Eisner College of Education,
CSU Northridge; CSUN STEM Innovations Team Leader

Kahri Boykin, Green Technology and Energy Conservation
Teacher, Yosemite High School, Merced Union High School
District

Karen Cowe, Chief Executive Officer, Ten Strands,
Curriculum Subcommittee Co-chair

Cyane Dandridge, Executive Director, Strategic Energy
Innovations

Jose Flores, Civic and Environmental Advisor,
Comite Civico del Valle

Amy Frame, K–12 Program Manager, Ten Strands

Jill Grace, Regional Director, K–12 Alliance, WestEd, and
Past President, California Science Teachers Association,
In-service Subcommittee Co-chair

Julie Henderson, Deputy Secretary for Health and Public Policy,
CalEPA

Peter Kareiva, Director, Institute of the Environment and
Sustainability, UC Los Angeles

Barbara Murchison, Educator Excellence and Equity Division
Director, California Department of Education,
Curriculum Subcommittee Co-chair

Cheryl Ney, Dean, Charter College of Education, and
Professor of Chemistry, CSU Los Angeles,
Pre-service Subcommittee Co-chair

Thomas Philip, Associate Professor and Director,
Teacher Education, UC Berkeley

Leslie Ponciano, Director, Research Opportunities,
CSU Chancellor's Office

Christy Porter, Senior Environmental Scientist Specialist,
Office of Education and the Environment, CalRecycle

Jody Priselac, Associate Dean, Community Programs,
UC Los Angeles

Nan Renner, Senior Director of Learning Design and Innovation,
Birch Aquarium at Scripps and CREATE (Center for Research on
Educational Equity, Assessment, and Teaching Excellence),
UC San Diego

Emily Schell, Executive Director, California Global Education
Project, San Diego State University,
In-service Subcommittee Co-chair

Samuel Shen, Professor, Department of Mathematics and
Statistics, San Diego State University

Maria Simani, Executive Director, California Science Project,
UC Riverside

Ilene Straus, Vice President, California State Board of Education

Leslie Tamminen, Director, Ocean Program,
Seventh Generation Advisors

Kimberly Waite, Teacher Leader, California Global
Education Project

Jeffrey White, Professor, Biological Sciences, Humboldt State
University

Subcommittee Members

PRE-SERVICE

Mara Brady, Associate Professor, Department of Earth and
Environmental Sciences, CSU Fresno

Katie Burns, Grant Project Coordinator, Teachers College of
San Joaquin

Agustin Cervantes, Director, Office for Student Services,
CSU Los Angeles

Marc Epstein, Director, California Environmental Technology
Education Network

Jose Flores, Civic and Environmental Advisor,
Comite Civico Del Valle

Manisha Javeri, Professor, Applied and Advanced Studies
in Education, CSU Los Angeles

Virginia Oberholzer Vandergon, Professor, Biology,
CSU Northridge

Leslie Ponciano, Director, Research Opportunities,
CSU Chancellor's Office

Jessica Pratt, Associate Teaching Professor, Ecology &
Evolutionary Biology and Co-Director, CalTeach, UC Irvine

Jeff Share, Faculty Advisory, Teacher Education Program,
UC Los Angeles

Leslie Tamminen, Director, Ocean Program,
Seventh Generation Advisors

Audra Whaley Ruben, Community Representative,
Carthay Center Environmental Studies, and CSU Los Angeles

Jeffrey White, Professor, Biological Sciences, Humboldt State
University

IN-SERVICE

Deedee Chao, Master of Science Student, Community
Development, UC Davis

Annamarie Francois, Executive Director, Center X,
UC Los Angeles

Susan Gomez Zwiep, Professor, Department of Science
Education, College of Natural Sciences and Mathematics,
CSU Long Beach

Mary Anne Pella-Donnelly, Teacher, Science,
Chico Junior High School, Chico Unified School District

Maria Simani, Executive Director, California Science Project,
UC Riverside

Anne Stephens, Assistant Professor, Department of Science
Education and Director, Inland Northern California Science
Project, CSU Chico

Fred Uy, Director of Educator Preparation and Public School
Programs, CSU Chancellor's Office

Kimberly Waite, Teacher Leader, California Global
Education Project

CURRICULUM

Shelley Brooks, Program Coordinator, California History-Social
Science Project, UC Davis

Cyane Dandridge, Executive Director, Strategic Energy
Innovations

Amy Frame, K–12 Program Manager, Ten Strands

Rebecca Heneise, Outreach Specialist and Demonstration
Teacher, Dual Language Immersion, UC Los Angeles Lab School

Frank Niepold, Senior Climate Education Program Manager,
National Oceanic and Atmospheric Administration

Christy Porter, Senior Environmental Scientist Specialist,
Office of Education and the Environment, CalRecycle

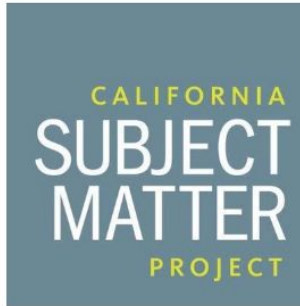
Core Coordinators at the ECCLPS Secretariat

Linda Livers, Project Management Consultant, Ten Strands

Claudia Martinez, Executive Director, Educator Programs,
Office of Diversity and Engagement, University of California,
Office of the President

Matt St. Clair, Director of Sustainability, University of California,
Office of the President

Sponsors



Partners



ECCLPS Project Manager

1. Event Coordination
2. Invites/Attendees
3. Planning and Logistics (\$250k budget)
4. Communications/Website
5. Program Support



Audience

1. Key Stakeholders — 216 attendees

- Higher Education Leaders
- K-12 Teachers
- Districts/County Offices
- State Departments/Agencies
- Students
- Nonprofits (education and non-education)
- Scientists
- Nonformal Educators (museums/aquariums)
- Philanthropy Leaders
- Principals/Administrators
- Legislators

2. Additional Parameters

- Diversity
- Geography
- Gender
- Perspectives
- Age

Demonstrating Sustainable Practices

1. Considerations

- Menu
- No plastic
- Centerpieces

2. Challenges

- Individually wrapped items
- Avoiding food waste



Report Challenges and Successes

1. Timeline and workload
2. Budget
3. Content
4. Vetting
5. Printing
6. Next steps



Questions?



STRATEGIC SUMMARY

ACHIEVING CLIMATE STABILITY AND ENVIRONMENT SUSTAINABILITY

PK-12 EDUCATION
AS PART OF THE SOLUTION
FOR BENDING THE CURVE

UC-CSU Environmental and Climate Change Literacy Project and Summit (ECCLPS) is a partnership between the University of California (UC) and the California State University (CSU) systems with key stakeholders to support the urgent need to advance PK-12 environmental and climate change literacy.



COMPREHENSIVE REPORT

ACHIEVING CLIMATE STABILITY AND ENVIRONMENT SUSTAINABILITY

PK-12 EDUCATION
AS PART OF THE SOLUTION
FOR BENDING THE CURVE

UC-CSU Environmental and Climate Change Literacy Project and Summit (ECCLPS) is a partnership between the University of California (UC) and the California State University (CSU) systems with key stakeholders to support the urgent need to advance PK-12 environmental and climate change literacy.

<https://sites.google.com/tenstrands.org/ecclps/report?authuser=0>

APPENDICES AND RESOURCES

APPENDIX 1.1

Foundational California Initiatives

Education and the Environment Initiative

Assembly Bill 1548 (Pavley, 2003) launched the Education and the Environment Initiative by mandating the creation of a multi-agency partnership to develop California's Environmental Principles and Concepts (EP&Cs) and develop a model curriculum that demonstrates how to integrate the EP&Cs into standards-based instruction for all K–12 students. The State Board of Education approved the EP&Cs in 2004.

Blueprint for Environmental Literacy

In 2014, former State Superintendent of Public Instruction, Tom Torlakson, launched a taskforce to write a Blueprint for Environmental Literacy. The Blueprint, published in 2015, is a call to action for the education community to educate every California student in, about, and for the environment. The guiding principles for taking this work to scale are equity of access, sustainability and scalability of systems, collaborative solutions, commitment to quality, cultural relevance and competence, and exposing students to a variety of learning experiences in classrooms and outdoor environmental settings.

In 2016, Torlakson formed a steering committee, which is now operating as the California Environmental Literacy Initiative (CAELI) and leading the work in PK–12 by advocating for a supportive state context, supporting the incremental infusion of environmental literacy into the PK–12 instruction, professional learning, assessment, and accountability infrastructure, and cultivating leading-edge district and county office of education exemplars.

California Regional Environmental Education Community (CREEC) Network

The California Regional Environmental Education Community (CREEC) Network fosters regional partnerships throughout the State of California to promote environmental education and environmental literacy by providing teachers with access to high quality professional learning opportunities and education resources. It is a program of the California Department of Education.

Integration of EP&Cs into the state curriculum frameworks

California's State Board of Education (SBE) has demonstrated its commitment to environmental literacy by calling for the integration of the EP&Cs into state curriculum frameworks in Science (2016), History-Social Science (2016), and Health (2019). SBE-adopted instructional materials in these content areas must integrate the EP&Cs, and the state's California Science Test (CAST) will, in part, use the EP&Cs as a context for assessing California's Next Generation Science Standards (adopted in 2013), for all students in elementary,

middle, and high school grade bands. CAST is a part of the state's accountability system.

Codification of California's EP&Cs into the California Education Code

Senate Bill 720 (Allen, 2018) codified California's EP&Cs into the California Education Code as the state's definition of environmental literacy and directed the State Board of Education (SBE), State Superintendent of Public Instruction, district superintendents, and school boards to work toward all students becoming environmentally literate members of society. It also updated the list of covered concepts to explicitly include environmental justice and climate change. By adopting the NGSS, the State Board guided all California educators to teach about climate change in accordance with the state-adopted standards.

California Science Teachers Association (CSTA) Climate Literacy Summit

In early 2018, the California Science Teachers Association (CSTA) recognized that significant gaps in teacher content knowledge and experience in teaching climate science existed. CSTA, in collaboration with partners from Scripps Institution of Oceanography and the National Aeronautics and Space Administration's Jet Propulsion Laboratory, pioneered the development of a Climate Summit for PK–12 educators and developed grade level units of study aligned to current standards (presented as three-hour short courses), and the production of a special climate edition of the *California Journal of Science Education*. All of the resources developed for this project were made free to the public.



First, the co-chairs and committee members had to get up to speed on the foundational California initiatives.

RECOMMENDATIONS

OVERARCHING RECOMMENDATIONS:

Achieving comprehensive PK–12 environmental and climate change education in the State of California will require action and commitments across many entities at all levels of education.

1. **Integrate** environmental and climate change literacy across all subjects.
2. **Earth science** is an indispensable discipline to holistically address the issues at stake.
3. The **state** of California should create a **task force** for the promotion of environmental and climate change literacy.
4. **ECCLPS** should create a **task force** for the implementation of this plan.
5. The **California Commission on Teacher Credentialing** will further refine and update opportunities for current pre-service teachers to integrate Environmental Principles & Concepts into core subjects they teach.

Teacher Performance Expectations - TPEs



Teacher education programs must ensure teachers meet these TPEs to earn teaching credentials.

TPE 3: Understanding and Organizing Subject Matter for Student Learning

- 3.1 Demonstrate knowledge of subject matter, including the adopted California State Standards and curriculum **frameworks**.
- 3.2 Plan, design, implement, and monitor instruction consistent with current subject-specific pedagogy in the content area(s) of instruction, and design and implement disciplinary and **cross-disciplinary learning sequences**, including integrating the visual and performing arts as applicable to the discipline.
- 3.6 Use and **adapt resources**, standards-aligned instructional materials, and a range of technology, including assistive technology, to facilitate students' equitable access to the curriculum.

TPE 4: Planning Instruction and Designing Learning Experiences for All Students

- 4.1 Design and implement instruction and assessment that reflects the **interconnectedness** of academic content areas and related student skills development in literacy, mathematics, science, and other disciplines across the curriculum, as applicable to the subject area of instruction.

RECOMMENDATIONS

Educating Future Teachers: Pre-Service

1. The proposed efforts should endeavor to **align with existing initiatives** to leverage resources and build capacity for implementing the report's recommendations at the system-wide, institutional, and individual level.
2. The task force should advocate for the use of **technological tools** and materials to access educational materials including climate and environmental data.



UC QUICK LINKS

[UC Office of the President \(UCOP\)](#)

[UCOP's Carbon Neutrality Initiative \(CNI\)](#)

[UCOP's Timeline of UC Sustainability](#)

[UC Policy of Sustainable Practices](#)

[UC eScholarship](#)

[UC California Digital Library](#)

UC-CSU CAMPUSES

UC-CSU NXTerra is a unique collaboration between the state of California's two public university systems — the University of California (UC) and California State University (CSU).

Browse through these campuses by scrolling down, then follow the links to learn more about climate change education and sustainability at each campus.

Get in touch if you think there's something happening on your campus that we should know about!



CSU QUICK LINKS

[CSU Office of the Chancellor](#)

[CSU Commitment to Sustainability](#)

[Sustainability News](#)

[Research Centers](#)

[Degree Programs](#)

[Learn more about the CSU system >>>](#)

RECOMMENDATIONS

Educating Current Teachers: In-Service

1. Increase **teacher confidence** in environmental and climate change literacy.
2. Promote a **fully-scaled statewide system** for high quality teacher **professional learning** around California's Environmental Principles & Concepts.
3. Obtain **administrative support** for environmental and climate change literacy in schools.
4. Emphasize action and **civic engagement** as part of environmental and climate change literacy.
5. Create **interdisciplinary** learning models across different subject areas.

CSMP has nine Subject Matter Projects. Browse the various project's programs through the links below. You may also view all programs across projects.



**The California
Arts Project**

[Get Programs »](#)



**California
History-
Social
Science
Project**

[Get Programs »](#)



**California
Global
Education
Project**

[Get Programs »](#)



**California
Mathematics
Project**

[Get Programs »](#)



**California
Physical
Education -
Health Project**

[Get Programs »](#)



**California
Reading &
Literature
Project**

[Get Programs »](#)



**California
Science
Project**

[Get Programs »](#)



**California
World
Language
Project**

[Get Programs »](#)



**California
Writing
Project**

[Get Programs »](#)

RECOMMENDATIONS

Educating Our Students: Curriculum Modernization

1. *Pre-service* course for elementary and secondary teachers should endeavor, whenever possible, to expose student teachers to state of the art environmental and climate change literacy.
2. *In-service* professional learning offerings for teachers should **strategically convene educators and relevant local working groups** or community networks to re-examine and localize PK-12 course offerings.

Model Curriculum vs. Localized Curriculum

<https://www.californiaeei.org/curriculum/>

The EEI Curriculum has 40 science units and 45 History-Social Studies units that integrated content standards with the EP&Cs.

They were written before Common Core ELA and Math and NGSS.

Our History-Social Studies standards remain in effect.

Climate change was not an explicit topic.





They remain popular with teachers for free downloads because of their quality.

- History-Social Science Units
- Science Units
- Common Core/Next Gen Science
- Nat Geo Maps
- How to Teach EEI
- How To Order
- Frequently Asked Questions

Resources

- Next Generation Science Standards Correlation Guides
- Common Core Correlation Guides
- Inventory of Science Unit Resources

Filter 

 <p>The World Around Me </p> <p>Reading Grade: Kindergarten NGSS Grade: Kindergarten</p> <p>Students learn that Earth is made up of land, air, and water. They also learn the characteristics of several ecosystems and relate those</p>	 <p>A Day in My Life </p> <p>Reading Grade: Kindergarten NGSS Grade: Kindergarten</p> <p>Water, along with soil, air, plant, and animal resources, are fundamentally important for life.</p>	 <p>Surviving and Thriving </p> <p>Reading Grade: First Grade NGSS Grade: First Grade, Second Grade</p> <p>Students discover that there must be a good fit between the physical features of plants and animals and the characteristics of the</p>	 <p>Finding Shelter </p> <p>Reading Grade: First Grade NGSS Grade: First Grade, Second Grade</p> <p>Healthy ecosystems benefit humans, as well as the plants and animals living there.</p>
--	--	---	--



The EEI Curriculum includes 40 science units that were created prior to the adoption of the California Next Generation Science Standards.

Although these units were written for California's 1998 science standards, they contain engaging resources (including visual aids, readings, activities, and maps) that are still relevant and, if thoughtfully integrated, can help support lessons and units of study focused on California's NGSS.

To learn more about how the EEI Curriculum can support the teaching of NGSS, as well as the Common Core State Standards, please visit our [Correlation Guides page](#).

Why not update EEI?

ENVIRONMENTAL TOPICS IN THE EEI CURRICULUM

<https://www.californiaeei.org/media/1087/environmental-topics-map.pdf>

“We want our students and our students want to be engaged in inquiry-based learning leading to action in their local communities in partnership with community based organizations, science rich institutions, environmental justice organizations, social justice organizations, infrastructure organizations, water, waste, energy...”

- **Karen Cowe**, Chief Executive Officer, Ten Strands

		Global Climate Change	Air	Energy	Environmental Justice	Environmental Sustainability	Fish & Wildlife Resources	Forestry	Integrated Pest Management	Integrated Waste Management	Oceans	Pollution Prevention	Public Health & the Environment	Resource Conservation & Recycling	Toxics & Hazardous Waste	Water
KINDERGARTEN	K.3.a.–The World Around Me															
	K.3.c.–A Day In My Life		•	•			•	•		•			•	•		•
FIRST GRADE	K.4.5. and K.6.3.–Some Things Change and Some Things Stay the Same			•			•	•		•						•
	1.2.a.–Surviving and Thriving		•			•	•	•						•		•
	1.2.c.–Finding Shelter					•	•	•						•		•
	1.2.d.–Open Wide! Look Inside!					•	•	•	•		•			•		•
	1.2.4.–People and Places	•		•		•	•	•			•		•			•
SECOND GRADE	1.4.2.–On the Move			•		•				•				•		•
	2.2.a. and 2.2.b.–Cycle of Life					•	•							•		
	2.2.c. and 2.2.d.–Alike and Different					•	•	•								
	2.2.e. and 2.2.f.–Flowering Plants in Our Changing Environment					•	•	•	•			•	•	•	•	•
	2.3.a and 2.3.b.–The Earth Rocks						•	•			•					•
	2.2.4.–California’s Lands: Then and Now						•	•			•			•		
	2.4.1.–From Field to Table	•				•	•						•			•
THIRD GRADE	2.4.2. and 2.4.3.–The Dollars and Sense of Food Production					•	•						•			•
	3.3.a.–Structures for Survival in a Healthy Ecosystem					•	•	•	•				•		•	•
	3.3.c. and 3.3.d.–Living Things In Changing Environments		•			•	•					•		•		•
	3.1.1. and 3.1.2.–The Geography of Where We Live				•	•	•	•			•	•				•
	3.2.2.–California Indian People: Exploring Tribal Regions					•	•	•	•		•		•	•		•
3.5.1., 3.5.2., and 3.5.3.–California’s Economy: Natural Choices						•	•	•	•			•			•	

1. Curricula should teach climate change as expressed in California's **Next Generation Science Standards (NGSS)** and **CA Science Framework** with explicit connections to **California's Environmental Principles & Concepts**.
2. Curricula should teach climate change via connections to California's Environmental Principles & Concepts and as outlined in California's adopted **frameworks in History-Social Science, and Health**.
3. Curricula should guide students to explore **real-world phenomena** through outdoor and environmental place-based experiences, participate in **problem-based learning** and apply engineering design strategies to solve real-world problems.
4. To engage and empower students, **developmentally appropriate** curricula should activate students to play a significant role in **culturally relevant community issues** in an integrated, **interdisciplinary** way. Students should identify themselves as climate leaders that can drive equitable climate solutions now and into the future.
5. The teaching of climate change needs to be **coherent and coordinated** across school and community experiences.

VIGNETTES OF BEST PRACTICES

VIGNETTE 1

Designing Solutions for California's Energy Future in the Central Valley

In 2018, a suite of PK–12 learning sequences was developed by members of the California Science Teachers Association (CSTA) in collaboration with practicing climate scientists.²³ The teachers that developed them piloted these lessons in classrooms. In addition, they underwent peer review and the Next Generation Science Standards Lesson Screener was utilized to revise and update them.²⁴

In a high school physics unit, “Considering California’s Energy Future,”²⁵ students discuss and read about the prevalent phenomena of poor air quality in their own backyard. Then students identify what they would like to know more about to determine both the causes of air pollution in the Central Valley and solutions to the problem. Students are given the opportunity to find patterns in the data they propose and explore connections between both natural and human-made events that might be causing the poor air quality. Once students determine clear causes of the Central Valley air pollution, they explore solutions to control the air quality and reduce the impacts of humans on the environment, including choices individuals, communities, and governments can make. Students use Governor Brown’s executive order on carbon neutrality and SB 100 (converting California to 100% renewable energy for electricity by 2045) as a framework for designing their solutions and present these proposals to the class for their final assessment.

This teacher- and researcher-created curriculum illustrates three related best practices. This unit addresses science and social studies standards by having students examine data and public policy documents in the context of a pressing environmental justice and community health issue (Best Practices 1 and 2, respectively). Specifically, this unit addresses the NGSS Disciplinary Core Ideas that “all forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits and new technologies and social regulations can change the balance of these factors” (ESS3-A) and “when evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts” (ETS1-B). More than just an engaging phenomenon, air quality is a highly relevant climate change-related health danger that today’s youth around the world are bringing a sense of urgency to their teachers, mentors, and employers in policy, industry, and science to solve together (Best Practice 3). This learning sequence directly addresses California’s Environmental Principles and Concepts (EP&C) Principle IV, Concept C, which states that students should understand that “the capacity of natural systems to adjust to human-caused alterations depends on the nature of

VIGNETTE 2

Career Development through Student Leadership Projects in Marin County

The Marin School of Environmental Leadership (MarinSEL) at Terra Linda High School, a project-based, environmentally focused, “school within a school” that emphasizes development in leadership and 21st Century skills, designed and supported by Strategic Energy Innovations (SEI),²⁶ is a model for transforming public education. Students dedicate four years to becoming environmental leaders and follow an Entrepreneurship Career Technical Education (CTE) pathway. They take NGSS-aligned coursework ranging from ocean acidification and energy auditing to sustainable enterprises and environmental engineering. Multiple A-G subject courses have been integrated with both environmental and leadership skill development, including English, History-Social Science, Health, and Science courses. Students are active in community projects with significant climate protection impacts during their freshman and sophomore years. In the past nine years, students have led local resilient neighborhood initiatives, reduced waste by eliminating single use plastic, and successfully petitioned for their local school district to move to 100% renewable electricity with local utilities. They created iMatter Climate Report Cards for the city and county, which resulted in a citywide youth ordinance and the entire City of San Rafael committing to 100% renewable electricity. Students intern with a local organization their senior year of high school to lead a sustainability project with organizations such as the San Rafael Airport, MCE Clean Energy, Clough Construction, Marin County Office of Education, and Zero Waste Marin.

Strategic Energy Innovation’s A-G Career and Technical Education (CTE) approved courses provide a solid foundation from which a school can help young adults expand their efforts into the community. The curriculum for courses such as “Innovations in Green Tech,” “Energy and Environmental Design,” and the “Solar Certificate” is free to California educators. They help students explore in a robust manner how to apply engineering solutions (Best Practice 4) in their own community as they transition through high school to vocational training and higher education (Best Practice 5).

VIGNETTE 3

Student Engagement through a Youth Climate Summit in Cupertino

Chemistry teacher and 2019 National Geographic Educator of the Year Kavita Gupta from Monta Vista High School hosts an annual Youth Climate Summit that unifies students, staff, and local experts around a common cause. As a teacher-leader, she brings her colleagues together from different departments for monthly planning sessions in which teachers are encouraged to address climate change where it naturally fits in their curriculum in ways that help students meet multiple standards at once. The summit itself is a presentation of learning where students share out the results of their climate-related research. Ms. Gupta’s chemistry students presented their findings in a four- to five-page paper and in poster sessions. In other 9th–12th grade classes such as journalism, ceramics, drama, and English, students demonstrated and deepened their content knowledge and expressive communication skills by performing songs, creating interactive booths, displaying artwork, and presenting short stories and websites. On the day of the summit, held at the San Jose Tech Museum, scientists and policy makers provided feedback on student presentations. Ms. Gupta reflected on the event: “High schoolers feel small with big problems. They think, ‘I don’t matter.’ I have seen what it gives kids—that confidence, and the real meaning of education. When the experts look at your work, it validates you. Many students pledged to walk to school two days a week, to do real impactful things. They used modeling and data visualization and saw how other people benefitted from their small actions. They realized ‘Yes I have a voice and a choice.’”

While standards-aligned instructional materials and district-wide adoptions of high quality published curricula are crucial assets in climate change education, the generative power of local creativity and flexibility cannot be overrated—nor can the influence of student voices be ignored. The Youth Climate Summit approach models the process of national and international collaboration and can spur schools and community members to informed action (Best Practices 4 and 5). Ms. Gupta has created an Educator Guide²⁷ to help with the process and the National Science Teaching Association (NSTA) has published a flexible and user-friendly guide²⁸ that incorporates a similar research process and youth summit.

The curriculum subcommittee created three classroom vignettes to exemplify our five best practices in real California schools.

APPENDIX 4.1 (CURRICULUM):

Climate Change Instructional Resources

The UC/CSU system K–12 educators and their partners have a wealth of well-developed, standards-aligned curricula and instructional resources from which to draw in developing pre-service, in-service, elementary, and secondary courses. For example, in 2018, the California SBE adopted science programs from 18 publishers. Each program is NGSS-aligned and incorporates the EP&Cs (<https://www.cde.ca.gov/ci/sc/im/adoptedsciprograms2018.asp>). NGSS explicitly addresses climate change from middle school to high school and proximally addresses it in all grades. In addition to publications available for purchase, the lists below highlight other free, easily accessible, climate-related instructional resources.

- ▶ **Advancing Climate Literacy through Investment in Pre-Service Educators (ACLIPSE)** Grades 6–12 instructional materials and professional learning materials in climate science activities.
<https://mare.lawrencehallofscience.org/college-courses/ACLIPSE/overview>
- ▶ **Alliance for Climate Education, Our Climate Our Future** Award-winning climate education resource for teachers and students featuring ACE’s signature mix of animation, video and interaction, including trivia questions, climate change lesson plans and more.
<https://ourclimateourfuture.org>
- ▶ **California Department of Education, Instructional Resources, Climate Change** This collection of supplementary curriculum resources can help teach students about global climate change and increase awareness.
<https://www.cde.ca.gov/pd/ca/sc/climatechange.asp>
- ▶ **California Department of Water Resources** offers resources related to California’s climate/water connection.
<https://water.ca.gov/What-We-Do/Education/Climate-Change-Poster>
- ▶ **California Education and the Environment Initiative** K–12 curriculum that demonstrates how to incorporate the EP&Cs into science and history instruction. While the EEI science units were written prior to NGSS, they include resources that may be harvested for NGSS lessons.
<https://www.californiaeei.org/curriculum/history-social-science-units/>
- ▶ **California History-Social Science Project** Resources to help students understand current events in relation to their historical context.
<https://chssp.ucdavis.edu/current-context>
- ▶ **California Science Teacher Association** K–12 learning sequences focusing on phenomena-based teaching and learning.
<https://cascience.org/climate-summit/k-12-learning-sequences/>

- ▶ **Civic Action Project (CAP)** Project-based learning that connects an issue to public policy then guides students how to take “civic actions” to impact the issue.
<https://crfcap.org/>
- ▶ **Climate Generation’s Climate Change and Energy Curricula** Grades 3–12 curriculum guides and online modules for science and humanities teachers.
<https://www.climategen.org/our-core-programs/climate-change-education/curriculum/>
- ▶ **Climate Literacy & Energy Awareness Network (CLEAN)** Learning resources, visualizations, videos, and short experiments focused on climate and energy.
<https://cleanet.org/index.html>
- ▶ **EarthLabs** Earth and environmental lab science courses, NGSS-aligned units illustrate a sequence for learning science concepts through data analysis activities, satellite imagery and computer visualizations, and hands-on experiments that illustrate processes of our Earth system.
<https://serc.carleton.edu/eslabs/index.html>
- ▶ **Ecorise** A school-based program that empowers youth to tackle real-world challenges in their schools and communities by teaching sustainability, design innovation, and social entrepreneurship.
<https://ecorise.org/about/>
- ▶ **Energize Schools: A Program of Strategic Energy Innovations** Grades 9–12 project-based learning that engages students in sustainability.
<https://www.energizeschools.org/>
- ▶ **Global Oneness Project** Aims to connect, through stories, the local human experience related to climate change.
<https://www.globalonenessproject.org/>
- ▶ **Morningside Center for Teaching Social Responsibility** Lessons and resources to help K–12 educators encourage social responsibility and foster social and emotional learning.
<https://www.morningsidecenter.org/>
- ▶ **NASA: Global Climate Change** Articles, data, lessons, and interactive components focused on climate change.
<https://climate.nasa.gov/>
- ▶ **NASA: Jet Propulsion Laboratory** Articles, data, lessons, and interactive components focused on our universe of science, technology, engineering, and math.
<https://www.jpl.nasa.gov/edu/>
- ▶ **National Climate Assessment (2018), U.S. Global Change Research Program** Assesses the science of climate change and variability and its impacts across the United States, now and throughout this century. Written to help inform decision-makers, utility and natural resource managers, public health officials, emergency planners, and other stakeholders. Thoroughly reviewed by external experts and the general public, as well as the Federal Government, and the National Academies of Sciences, Engineering, and Medicine (NASEM).
<https://nca2018.globalchange.gov/>

- ▶ **National Wildlife Federation’s (NWF) Climate Classroom** Online climate science and solutions curriculum, learning community and education policy development program to help K–16 educators develop skills in and have the tools and public support they need to teach students about the most important environmental subject they will experience throughout their lifetimes.
<https://climateclassroom.org/>
- ▶ **Nature Works Everywhere** Lessons and resources to help students learn the science behind how nature works for us and how we can help keep it running strong.
<https://www.natureworkseverywhere.org/>
- ▶ **NOAA Climate.gov** Science-based, interdisciplinary models of education and public engagement support learners of all levels and foster climate and energy literacy and action.
<https://www.climate.gov/>

Climate.gov features a page of information about teaching with the Third National Climate Assessment, including background on the report, learning pathways to help educators utilize key messages and data, region-by-region guides, and other supporting education and communication resources.
<https://www.climate.gov/teaching/national-climate-assessment-resources-educators/2014-national-climate-assessment-resources>
- ▶ **NOAA Climate.gov News and Features** A popular-style magazine for the science-interested public covering topics in climate science, adaptation, and mitigation.
<https://www.climate.gov/news-features>
- ▶ **Project Drawdown** A global research organization that identifies, reviews, analyzes the most viable solutions to climate change, and shares these findings with the world.
<http://www.drawdown.org/>
- ▶ **Project Learning Tree** Curriculum that uses trees and forests as windows on the world to increase students’ understanding of the environment and action.
<https://www.plt.org/>
- ▶ **Project Wet** offers water resource education materials that are appropriate for many different age groups and cultures. Includes a climate resilience lesson on environmental and infrastructural changes that can help to mitigate the water-related impacts of climate change in communities and on certain populations.
<https://www.projectwet.org/climate>
- ▶ **Project Phenomena** Phenomena used to provide students personal experiences with observable events where an evidence based explanation can be constructed. Website contains a searchable database of local phenomena and data aligned with NGSS three dimensions and EP&Cs.
<http://ngss.sdcoe.net/Phenomena-and-the-NGSS/The-Importance-of-Phenomena>

- ▶ **Teacher-Friendly Guide to Climate Change** Paleontological Research Institution’s book includes both the basics of climate change science and perspectives on teaching a subject that has become socially and politically polarized. For high school Earth science and environmental science teachers with classroom ready information and graphics.
<https://priweb.org/index.php/pubs-special/pubs-spec-5813-detail>
- ▶ **Understanding Global Change and Understanding Science, UC Berkeley** A conceptual framework, systems models, lessons, and assessment tools to guide the design of interdisciplinary global change curricula and to support the exploration of the nature and process of science.
<http://www.ucmp.berkeley.edu/ugc-resources/>
<https://undsci.berkeley.edu/>
- ▶ **U.S. Climate Resilience Toolkit** Website designed to help people find and use tools, information, and subject matter expertise to build climate resilience. Offers information from all across the U.S. federal government in one easy-to-use location.
<https://toolkit.climate.gov/>
- ▶ **World Climate: Climate Change Negotiations Game** Role playing exercise of the UN climate change negotiations for groups. Uses an interactive computer model to rapidly analyze the results of the mock-negotiations during the event. Available in multiple languages.
<https://www.climateinteractive.org/programs/world-climate/>
- ▶ **Young Voices for the Planet Film Series** Empowering children and youth, through uplifting and inspiring success stories, to take an essential role in informing their communities—and society at large, challenging decision-makers, and catalyzing change.
<https://www.youngvoicesfortheplanet.com/>



SUBCOMMITTEE RECOMMENDATIONS

These recommendations are offered as additions to the Subcommittee recommendations included in the Strategic Summary.

Recommendations to the UC-CSU Systems

Implicit and explicit policy changes to how higher education prioritizes and supports environmental and climate change literacy will offer support for teachers on the ground and provide incentives for administration and parents to become more interested and committed to better environmental and climate change literacy.

In terms of implicit and explicit policy changes, we offer suggested recommendations to the UC–CSU systems:

- **Leverage Existing Campus Resources**
UC and CSU systems can invest in collaborating in local working groups of university researchers and instructors from every relevant science and non-science discipline, schools of education faculty, community partners, and PK–12 leaders and teachers to revise existing courses and develop new ones for future and current teachers to better align with the goals already in place. Policies, standards, frameworks, and State Board of Education-approved published curricula exist and there are many national supplemental resources available. In order to teach these curricula, universities play a vital role in building educator content knowledge and pedagogical capacities.²
- **Environmental and Climate Change Literacy and Leadership Master's or Certificate Programs**
Create and offer master's programs or certificate programs that are focused on environmental and climate change literacy and leadership.
- **Revise Research, Tenure, and Promotion (RTP) Policies and Practices**
Encourage universities to revise their RTP policies and practices to promote cross-curricular programs. For example, encourage environmental science faculty to collaborate with schools of education to develop PK–12 professional learning programs.³
- **Pilot Group to Create Model Pre-Service Courses**
Convene a pilot group to create model pre-service courses that align with these best practices, state standards, and the California Commission on Teacher Credentialing's Teacher Performance Expectations for new teachers.

- **Extension programs for teachers**
Create and offer extension programs for teachers who want to learn about climate science. These extension programs should include an online option that working teachers can complete remotely and should consider affordability and other incentives to make it easier for teachers to access and complete such programs.
- **Short-term courses for PK–12 educators**
Create and offer short-term, single courses available for teachers who have limited time and resources, who are looking to brush up on a particular area of climate science or science teaching pedagogy.
- **Convene Pilot Groups to Facilitate the Co-creation of Refined and Localized PK–12 Curriculum**
Convene pilot groups on four campuses—two UCs and two CSUs—to facilitate the co-creation of refined and localized PK–12 curriculum units among groups of university faculty from hard science and social science departments and PK–12 leaders and teachers to advance teacher in-service professional learning.⁴
- **Create opportunities for university faculty within and beyond colleges of education to engage with PK–12 teachers and students**
Professional learning providers should collaborate with university faculty to create, provide, and support professional learning opportunities related to environmental and climate change literacy.⁵
- **Share Expectations for Student Competencies related to environmental and climate change literacy**
PK–12 educators need to know what the expectations are for foundational knowledge and skills related to environmental and climate change literacy in order to appropriately prepare students to enter state colleges and universities. If the UC and CSU articulate and share these expectations, PK–12 educators have a better understanding upon which to build their instructional programs.
- **Update High School Science A-G Requirement**
Update the high school science A-G requirement for UC eligibility from two to three years. This structural change will help ensure that students dedicate the necessary time to learn about scientific concepts and include Earth science and environmental science in their education.
- **Coordinate with UC–CSUs involved in city planning**
Loop in PK–12 educators and involve them in local planning work. Advisors from UC–CSUs are often involved in planning initiatives around sustainability, climate change, and environmental justice. Bringing in PK–12 educators offers ideas to educators on how to engage their students and helps address issues that PK–12 educators see at their respective grade levels and communities, while creating opportunities for advisors to connect with and support PK–12 educators and classrooms.

Additional Subcommittee Recommendations

Environmental and climate change literacy interconnects across all educational content and with all stakeholders. Students work and learn within the ecosystem of their campus and community; therefore, a systems approach should include parents and community, school boards and trustees, unions, nonprofits, community-based organizations, local businesses, and accrediting bodies.

These recommendations are related and build off each other to provide a more comprehensive framework for educators to succeed in teaching for environmental and climate change literacy. They also extend the professional learning recommendations presented for pre-service educators in this report.

- **Leverage existing State resources such as Residency Grants, the Integrated Teacher Education Program (ITEP), and Bilingual Authorization (BLA) grants to promote environmental and climate change literacy education**
Specifically, the development of ITEP programs explicitly focused on environmental and climate change literacy will improve the education of future teachers in this area while also increasing diversity in the teacher workforce. This is an important component of environmental justice efforts because environmental justice is intimately connected to social justice.
- **Initiate partnerships between educator preparation programs and industry sector identified high school pathway programs participating in Linked Learning**
This is a California statewide initiative that combines rigorous academics, work-based learning, and career and technical education (CTE) for middle and high school students to prepare them for college and careers. Teachers collaborate across subject areas with input from working professionals and are reinforced using scaffolded work-based learning opportunities provided by real employers culminating in senior design projects.¹⁰
- **Strategically convene in-service professional learning networks**
In-service professional learning offerings for practicing teachers should convene educators and rich local working groups or community networks to re-think and localize PK–12 course offerings. At the high school level, the foci should be on helping educators incorporate climate change content into A-G approved courses in every subject and in expanding the number of Career and Technical Education (CTE) courses in environmentally related sectors available to students.¹¹

- **Integrate guest speakers, programs, and field studies to engage students in learning about and interacting with the environment**

These experiences should build upon pre-service learning foundations for teachers and help all students to establish and develop a connection with their local environment, regardless of whether it is rural, suburban, or urban, so that they understand the issues on a personal and contextualized level.¹²

- **Create authentic learning opportunities and models for community collaboration**

Students can stimulate, apply, and enhance their learning about the environment through real life learning experiences facilitated by their teachers. Focusing on local environmental phenomena and problems is one part of this. Furthermore, job shadowing, internships, project-based learning research, interviews, service learning projects, and volunteer opportunities in community organizations, government agencies, or businesses with “green jobs” are some options to consider in helping students learn about the environment through real-world jobs, issues, and settings. These learning opportunities can and should be connected to students’ academic programs in school and personal experiences.





RECOMMENDATIONS

Recommendations to the State

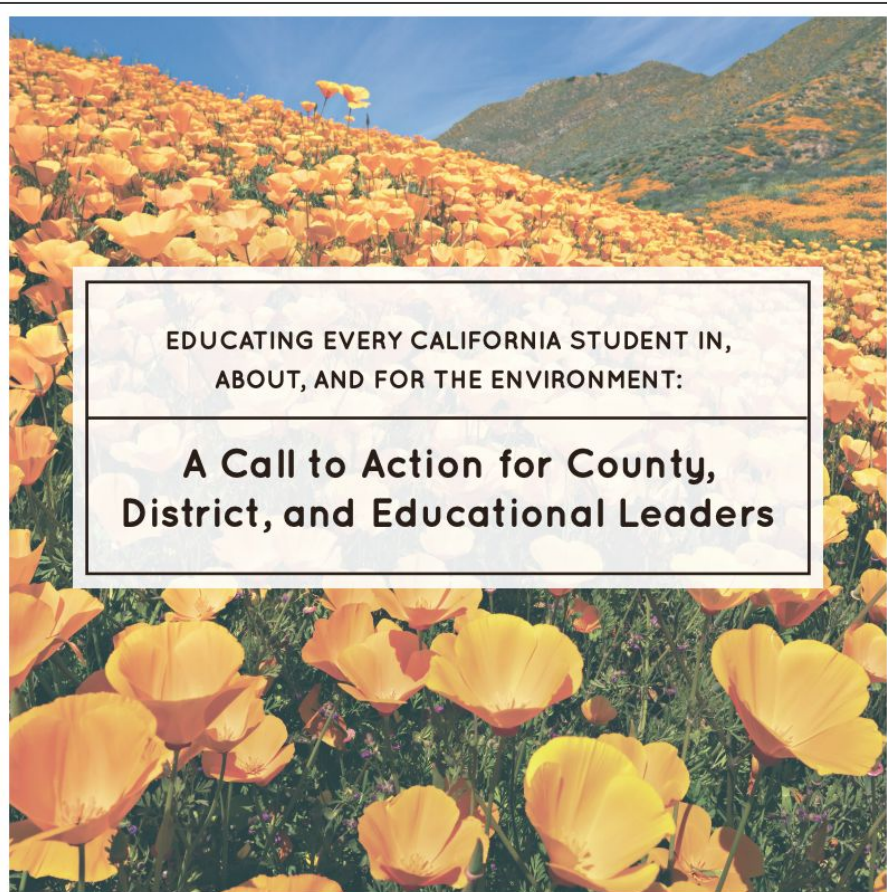
1. Update California's Education Code and subsequent earmarked funding to support **three years of science** in high school.
2. Maximize the benefits of **Local Control and Accountability Plans (LCAPs)**.
3. Target financial support from the state specifically for the implementation of new **standards and frameworks**.

High School Subject Area	State Mandated Requirements* (EC 51225.3) for High School Graduation	UC Requirements for Freshman Admissions	CSU Requirements for Freshman Admissions
English	Three Years	Four years of approved courses	Four years of approved courses
Mathematics	Two years, including Algebra I, beginning in 2003–04. (EC 51224.5)	Three years, including algebra, geometry, and intermediate algebra. Four years recommended.	Three years, including algebra, intermediate algebra, and geometry.
Social Studies/Science	Three years of history/social studies, including one year of U.S. history and geography; one year of world history, culture, and geography; one semester of American government and civics, and one semester of economics.	Two years of history/social science, including one year of U.S. history or one-half year of U.S. history and one-half year of civics or American government; and one year of world history, cultures, and geography.	Two years, including one year of U.S. history or U.S. history and government and one year of other approved social science.
Science	Two years, including biological and physical sciences.	Two years with lab required, chosen from biology, chemistry, and physics. Three years recommended.	Two years, including one year of biological and one year of physical science with lab.



California Graduation and UC/CSU Admission Requirements

<https://www.cde.ca.gov/ci/gq/hs/hsgtable.asp>



EDUCATING EVERY CALIFORNIA STUDENT IN,
ABOUT, AND FOR THE ENVIRONMENT:

A Call to Action for County, District, and Educational Leaders



CALIFORNIA
ENVIRONMENTAL
LITERACY
INITIATIVE

“Integrating subjects such as science, history-social science, health, social justice, and environmental science provides a unique opportunity to equip our students with a relevant and meaningful appreciation for stewardship of the environment, while providing valuable real-world experiences.”

TONY THURMOND,
STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

“How do we think about the world in our own backyard when we think of nature as being ‘out there’? How do we make sure they’re really learning that they need to take care of the classroom, the community, where they live, and to be aware of what’s going on globally?”

KELLEY BARRETT, SCIENCE COORDINATOR,
ANAHEIM ELEMENTARY SCHOOL DISTRICT

Environmental Literacy—California’s Promise

This matrix shows how guiding structures in California’s educational landscape—LCAPs, CA MTSS, and Environmental Literacy (as codified in SB 720)—mutually support conditions of learning, engagement, and pupil outcomes⁵.

	STATE PRIORITIES		
Planning Guidance	CONDITIONS OF LEARNING	ENGAGEMENT	PUPIL OUTCOMES
LCAP Local Control Accountability Plan ⁶	Students are provided with safe and properly maintained schools. Teachers are fully credentialed to teach their subject area and students are provided with a broad course of study that helps them develop critical thinking skills and prepares them to be civically engaged and college and career ready.	Students are provided with motivating programs, coursework, and opportunities where they feel respected, included socially and emotionally, and cared for both in and out of the classroom. Families, schools, and communities work closely together to build a strong framework for student achievement.	Student achievement means improving outcomes for all students to ensure student success.
CA MTSS California Multi-Tiered System of Support ⁶	All students regardless of age, race, zip code, language, physical challenge, intellectual ability, capacity, or competency are provided with the most inclusive learning environment. A Universal Design for Learning approach meets the needs of diverse learners through multiple means of representation and expression.	Families and community members are partners where they have options for meaningful involvement in students’ education and in the life of the school, and the school responds to family interests and involvement in a culturally-responsive manner.	All students are provided with a continuum of services that address their academic, behavioral, social-emotional learning , health, and well-being needs.
Environmental Literacy SB 720 (2018) “Environmental education: environmental principles and concepts” ⁷	Educators should “ensure that environmental literacy curriculum and learning experiences are made available on an equitable basis to all pupils and that [they] reflect the linguistic, ethnic, and socioeconomic diversity of California ... [to] provide a critical foundation of skills and knowledge to help pupils compete in a growing job market where science, mathematics, engineering, technology, and language arts proficiency are highly sought after.”	Educators have access to partnerships that provide the necessary training and resources to support the delivery of environmental literacy curriculum to California students. SB 720 directs state leaders to “assist in building and supporting partnerships and regional and statewide networks of public and private agencies and organizations, including county offices of education, school districts, and private partners, such as not-for-profit organizations, and community-based education providers that support the advancement of environmental literacy in California.”	For all students, standards-based “environmental literacy constitutes an important curriculum content area, and also provides problem solving skills and hands-on, real-world learning experiences that have been demonstrated through educational research to enhance pupils’ achievement across many subject areas, promoting understanding and engagement in learning.”

⁵ <https://www.learnonthehill.org/center-on-programs-for-schools/cap-toolkit>

⁶ <https://doe.ca.gov/MTSS/Pages/LCAP-and-MTSS-Alignment-Document.aspx>

⁷ https://leginfo.ca.gov/pub/09_01_2017_01_01_7201809B_720

Document available at:

<https://ca-eli.org/resources-administrators/>

Call to Action for County,
District, & Educational Leaders

Featured Keynotes



Edmund G. Brown Jr.

Governor (former), California



Marcia McNutt

President, National Academy of
Sciences



Janet Napolitano

President, University of California



Timothy P. White

Chancellor, California State University

Call to Action

“We [native people] managed to remember our biggest responsibilities that have been left to us by our ancestors. And that is to live and to use the instructions that have been given to us on how to be human beings, to protect that which we are a part of, the nature and the environment.”

- **Miztlayolxochitl Aguilera**, Tongva/Gabrielino and Mexica Native and B.S. Student, Chicano and Latino Studies, Certificate, American Indian Indigenous Cultures



“We are here collectively addressing [climate change] because it is the single most existential problem we face in the world today.”

- **Janet Napolitano**, President, UC



California's Systems Approach to Climate Change- It *Is* Political

“I was pleased to see in the report the approach of systems thinking. This is where the Newsome administration is in thinking about climate. It is part of and integrated into everything else we do...We need to be thinking about this across every agency and every part of the university...I want to talk about doing that both internally and externally..doing this within the university itself, not just thinking of this as something we're teaching...how do we break down some of the silos so this becomes what's underpinning everything we do?”

- **Kate Gordon**, Director, Governor's Office of Planning and Research and Senior Policy Advisor to the Governor on Climate

“If we're going to help kids learn science in ways that help them act politically, then we've got to take the political nature of these problems head on and we need to help teachers understand how to do that in classrooms in places where they might be antagonistic to that.”

- **Bill Sandoval**, Professor of Education, UCLA



Pre-service (Teacher Preparation) Roundtables

Table 1. How can we enhance the recruitment of students with interests in climate change action into the teaching profession?

1. Presenter: Jose Flores, Civic and Environmental Advisor, Comite Civico Del Valle and former educator
2. Presenter and Facilitator: Agustin Cervantes, Director, Office for Student Services, Charter College of Education, California State University, Los Angeles
3. Description: Explore current recruitment strategies into teaching with a focus on teachers of color and teachers with an interest in environmental education.

Table 2. What is the alignment between Environmental Principles and Concepts and single subject/multiple subject matters?

1. Presenters:
 1. Mara Brady, Associate Professor, College of Science and Mathematics, California State University, Fresno
 2. Virginia Oberholzer Vandergon, Professor, Biology, College of Science and Math, California State University, Northridge
2. Facilitator: Cheryl Ney, Dean, Charter College of Education, California State University, Los Angeles
3. Description: This session focuses on how the California's Environmental Principles and Concepts (EP&C's) can be integrated into both education courses and science content courses for pre-service teachers. Ways to introduce EP&C's to university faculty in both education and science are discussed and experiences are shared by presenters and participants.

Table 3. How can field work help prepare student teachers to integrate climate crisis studies?

1. Presenter: Jeffrey White, Professor, Biological Sciences, Humboldt State University
2. Presenter and Facilitator: Jessica Pratt, Assistant Teaching Professor and Faculty Director, CalTeach Program, School of Biological Sciences, University of California, Irvine
3. Description: Recent studies show that children can foster climate change concern from their parents, especially when linked to local or regional issues, which can result in meaningful local action to mitigate or adapt to the impacts of the climate crisis. Discuss the role of student teacher field work in climate crisis education from two perspectives: (1) student teachers can bring university research on climate impacts directly into classrooms, and (2) student teachers can be trained to effectively make the climate crisis a local issue by understanding the needs and concerns of the community they are working within. Examples of local and regional climate impacts are highlighted.

Table 4. What types of instructional materials and pedagogical approaches would best support teaching about the climate crisis in pre-service training?

1. Presenters:
 1. Jeff Share, Faculty Advisor, Teacher Education Program, University of California, Los Angeles
 2. Grinell Smith, Professor, Teacher Education, Connie L. Lurie College of Education, San Jose State University
2. Facilitator: Richard Arum, Dean and Professor, School of Education, University of California, Irvine
3. Description: Democratic pedagogy that is inquiry-based should address the intersections of environmental justice with social justice. Explore uses of media, technology, and popular culture to promote critical thinking about our relationship with the natural world and the climate crisis.



In-service (Teacher Professional Development) Roundtables

Table 7. How can the high school science 3-year course model (with embedded Earth and space sciences) truly promote environmental literacy development?

1. Presenters:
 1. Dean Reese, Science Coordinator, Outdoor Education and Environmental Literacy, San Joaquin County Office of Education
 2. Richard Smith, Science Teacher, Buena High School, Ventura Unified School District
2. Facilitator: Maria Simani, Executive Director, California Science Project, University of California, Riverside
3. Description: Explore the benefits and challenges of requiring 3 years of science at the high school level to promote a comprehensive science education designed to build scientific and environmental literacy including a deep understanding of climate change that empowers students to take action.

Table 8. How might Scholars, Practitioners, and Community Partners Contribute to Improving Best Practices?

1. Presenters:
 1. Thomas Herman, Director, California Geographic Alliance, San Diego State University
 2. Lynn Kim-John, Director, Science Programs, Graduate School of Education & Information Studies, Center X and Site Director, California Science Project, University of California, Los Angeles
2. Facilitator: Mary Anne Pella-Donnelly, Teacher, Science, Chico Junior High School, Chico Unified School District
3. Description: Explore opportunities for tapping into university scholars, professional learning programs, and community organizations connected to climate change and sustainability to enhance K-12 student learning.

Table 9. How might students, educators, scientists and community organizations collaborate to promote and support environmental engagement that benefits all students and the environment?

1. Presenters:
 1. Linda Chilton, Programs Manager, Sea Grant Education, College of Letters, Arts and Sciences, University of Southern California
 2. Rob Wade, Science and Outdoor Education Coordinator, Plumas County Office of Education
2. Facilitator: Kimberly Waite, Teacher, Compton Unified School District
3. Description: Explore how strong partnerships afford all students opportunities to understand and engage with authentic and relevant environmental phenomena and problems and allow them to become solution finders.

Table 10. How might we design systems of support that secondary classroom teachers need to implement environmental literacy best practices?

1. Presenter: Anne Stephens, Professor, California State University, Chico
2. Facilitator: Emily Schell, Executive Director, California Global Education Project, San Diego State University
3. Description: Explore the challenges and opportunities for creating a supportive ecosystem for secondary classroom teachers to effectively implement environmental literacy.



Curriculum Roundtable Topics

Table 13. CSTA Climate Summit—Lesson Sequences Co-created by Teachers and Scientists

1. Presenter: Stephanie Sanchez, Science Teacher, Vista Magnet Middle School, Vista Unified School District
2. Facilitator: Shannon Gordon, Education Programs Consultant, California Department of Education
3. Description: Participants learn about the lesson sequences, co-developed by California Science Teachers Association members and climate scientists, that support local, active, engaged, and authentic learning.

Table 14. Creating University Courses To Engage College Students in K-12 Classrooms

1. Presenters:
 1. Greg Grether, Professor, Ecology and Evolutionary Biology, University of California, Los Angeles
 2. Rebecca Heneise, Outreach Specialist and Demonstration Teacher, Dual Language Immersion, Lab School, University of California, Los Angeles
2. Facilitator: Amy Frame, K-12 Program Manager, Ten Strands
3. Description: Hear about a successful partnership between a university faculty member and K-12 teachers that engages college students in delivering lessons in local classrooms. Learn about the implications of research on this project and the best ways to teach complex, multi-grade level concepts in the Next Generation Science Standards. Help refine a proposed professional learning and collaboration model for universities to encourage and support faculty in future climate change-focused lesson creation.

Table 15. Supporting Youth Climate Action

1. Presenter: Maxine Jimenez, Climate Educator, Climate Corps Education Outside
2. Facilitator: Karen Cowe, Chief Executive Officer, Ten Strands
3. Description: Learn about ways to support and empower high school students through their journey to becoming climate leaders. Maxine will share effective ways that educators, teachers, and community members have successfully supported youth in their community despite limited resources.

Table 16. Leveraging NGSS—How Learning about Climate Change Progresses in the California NGSS & Coherent Systems Support

1. Presenters:
 1. Kelley Le, Teacher Network Coordinator, CalTeach Math and Science Program, University of California, Irvine
 2. Mark Stemen, Professor, Geography and Planning, California State University, Chico
2. Facilitator: Frank Niepold, Senior Climate Education Program Manager, Climate Program Office, National Oceanic and Atmospheric Administration
3. Description: Explore (1) alignment between the Next Generation Science Standards (NGSS) and climate change topics in the California 2016 Science Framework across grade levels (2) different analyses are explored on how learning progresses in the NGSS related to climate change (3) educational and science practices and resources, including the Climate Literacy and Energy Awareness Network (CLEAN)—a peer-reviewed source of over 700 high-quality, rigorously reviewed, and NGSS-aligned climate and energy educational resources for grades 6-16.



Burning Questions

- Should we call the high school graduates climate *warriors*?
- Do we need another task force or steering committee or do we need to just open a center?
- Do we need to change the teacher credential or teacher preparation program requirements or are they already baked into the system?
- If not us, who? If not now, when?

Next Steps

- Steering Committee meeting will be held in person on Marcy 4, 2020 in Long Beach.



Discussion Questions

- What have you learned that might help the ECCLPS project be successful?
- What obstacles or threats can you foresee that ECCLPS might have to overcome?
- So far, what seems most promising about the ECCLPS work?
- How might ECCLPS be a model for what might happen in other states?
- How could the ECCLPS project connect with your work?

