A Blueprint For Environmental Literacy

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

A Report by State Superintendent of Public Instruction Tom Torlakson's Environmental Literacy Task Force – 2015

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Superintendent's Message

Fellow Californians:

The critical environmental concerns that face California demand that we think deeply about how to build a future that is sustainable, healthy, prosperous, and equitable. For this reason, I convened the Environmental Literacy Task Force to develop recommendations for strengthening the environmental literacy of **all** California students.

We live in an era of easy access to technology, where it is often simpler for students to stay indoors than to venture outside and discover how to learn from and engage with the world around them. Fostering environmental literacy gives educators the opportunity to nurture the "whole child," to learn about and understand nature, and to inspire students to ask meaningful questions about the world around them and their role in it.

In addition, the goals of building environmental literacy are closely aligned with other educational priorities for our state. We are at a moment of great positive change in California's P-12 education system. The California Standards, specifically the Common Core and Next Generation Science Standards, require students to engage in rigorous thinking and problem solving. Supporting student environmental literacy supports and reinforces the California Standards.

The recommendations contained in this report hold great promise for our students, educators, and schools – including many that have already proven effective in California. Some areas need further study, discussion, and debate, and would, in some cases, require changes in law to carry them out. Others merely need nurturing and support to achieve lasting results.

The 47 individuals from across the state who came together as the Environmental Literacy Task Force did tremendous work with incredible passion, energy, and thoughtfulness. Co-chaired by Elizabeth Babcock of the California Academy of Sciences and Craig Strang of the Lawrence Hall of Science, the entire team included a diverse group of formal and informal educators, staff of my own Department of Education, and other stakeholders from across the state.

To achieve the goals outlined here, we will need the support and collaboration of a broad cross-section of the state, including educators and administrators from the formal education system; informal educators at organizations large and small; parents and community members who understand the needs of their students and their community; leaders from higher education; leaders from key state organizations, and resources from government, philanthropy, and the private sector.

This Blueprint must become a plan of action, unifying us with focus and purpose as well as concrete next steps. We must invest our very best thinking, our very best efforts, and – above all – our very best people in improving the quality and reach of student education for environmental literacy in California. We must do so for the future of our students and for California's prosperity, equity, and resource sustainability.

Sincerely,

Tom Torlakson
State Superintendent of Public Instruction

Executive Summary

A future prosperous, healthy, and safe California rests upon residents making wise environmental choices essential to our quality of life. Together, we must address climate change and energy use, use of natural and renewable resources, and protection and enjoyment of our unparalleled natural areas. In 2015, as Governor Edmund G. Brown Jr. established the nation's most ambitious California greenhouse gas reduction target, he noted, "climate change poses an ever-growing threat to the well being, public health, natural resources, economy, and the environment of California, including loss of snowpack, drought, sea level rise, more frequent and intense wildfires, heat waves, more severe smog, and harm to natural and working lands, and these effects are already being felt in the state."[1]

Developing and implementing solutions to these challenges requires an environmentally literate populace that has the skills to understand, analyze, think critically about, and address existing and future environmental issues. As Governor Brown explained his executive order for emissions reductions he said, "California sets a very high bar for itself and other states and nations, but it's one that must be reached - for this generation and generations to come."[2] California's K-12 students are the future leaders who will help reach this high bar.

Unfortunately, K-12 students in California do not currently have consistent access to adequately funded, high-quality learning experiences, in and out of the classroom, that build environmental literacy. While some students regularly participate in systematic, ongoing environmental literacy experiences, many more receive only a limited introduction to environmental content and some have no access at all.

Now is the time to tackle this challenge. Under the leadership of State Superintendent of Public Instruction (SSPI) Tom Torlakson, the Governor, and State Board of Education, and with the support of California voters and legislators, California public education is undergoing a historic transformation. Now is the moment to elevate environmental literacy as an essential element of a 21st century education in California, and to establish the leadership, collaboration, strategic partnerships, and necessary funding to ensure environmental literacy for all California students. Support for environmental education is high: 89% of Californians think that it is very important or somewhat important that local K-12 schools include environmental education.[3]

The California Standards[i] also offer a window of opportunity for integrating environmental literacy into mainstream classroom instruction. Environmental content is a key element of the new California Next Generation Science Standards (CA NGSS), with environmental topics incorporated into many of the disciplinary core ideas and performance expectations for students at each grade level. The complex thinking and problem solving abilities required of students by the California Common Core State Standards (CA CCSS) are exactly the types of skills required to meet the environmental challenges our students will face in the future. By fully implementing these curricular standards and calling attention to the environmental concepts embedded and implied within them, we can build environmental literacy for every California student.

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[i] Throughout this document, we use the term "California Standards," to refer to the full range of standards that describe our state's learning goals for students, including the Common Core State Standards (CCSS), Next Generation Science Standards (NGSS), Career and Technical Education (CTE) Model Curriculum Standards, English Language Development (ELD) Standards, Infant/Toddler and Preschool Early Learning Foundations, and future new standards in other subject areas, including History and Social Science, Social and Emotional Learning (SEL), and Visual and Performing Arts.

Given these changes, the central approach for achieving environmental literacy proposed by the Blueprint for Environmental Literacy (Blueprint) is to integrate environmental literacy efforts into California's increasingly coherent and aligned K-12 education landscape so that all teachers are given the opportunity to use the environment as context for teaching their core subjects. The figure below represents how the vision of the Task Force – achieving environmental literacy for all California students – will be achieved through this approach.

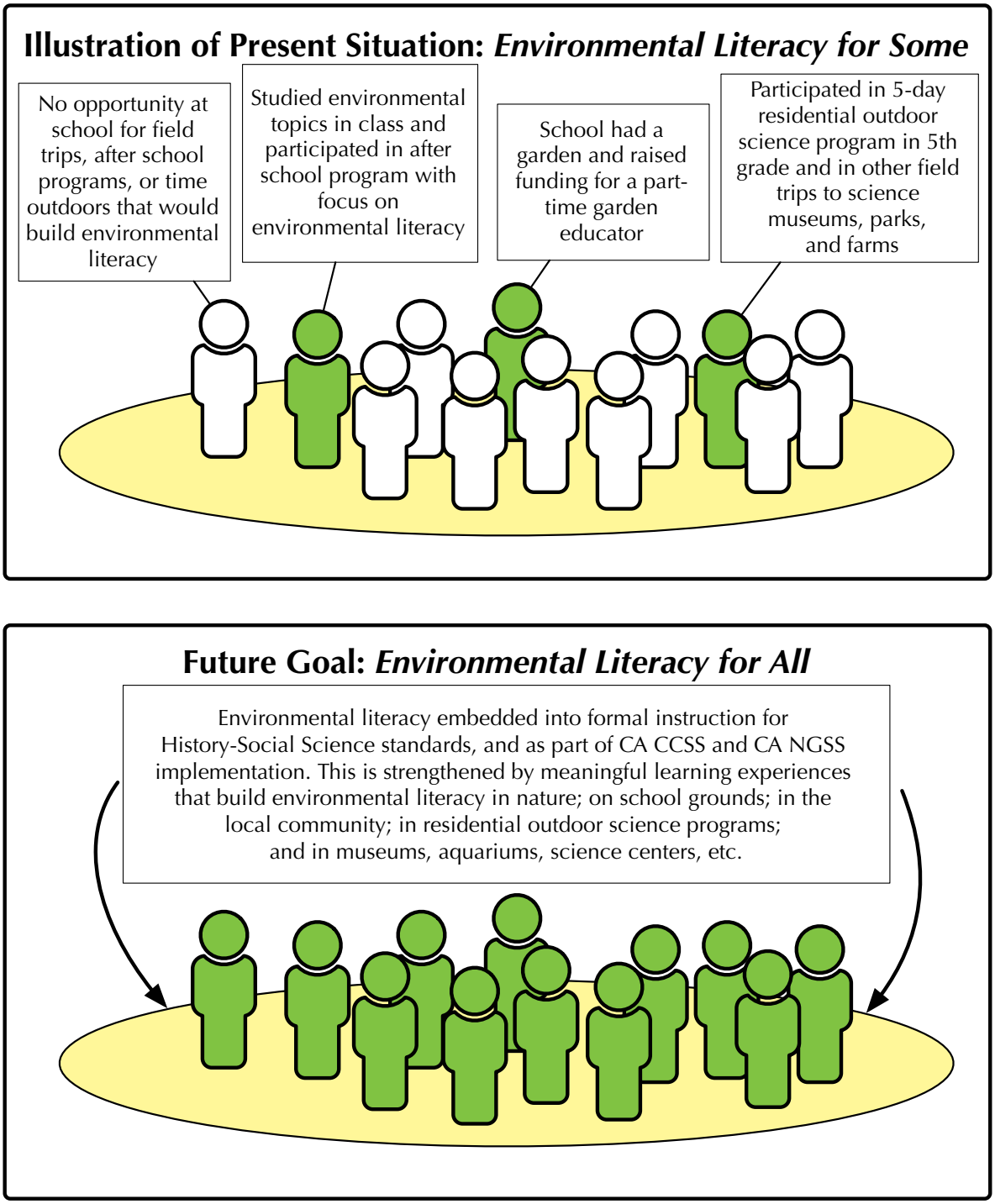

Figure 1: Achieving Environmental Literacy for All – The Central Approach

To leverage this synergistic moment in our state, State Superintendent of Public Instruction Tom Torlakson convened the Environmental Literacy Task Force (ELTF) in 2014 to create a blueprint for achieving environmental literacy for all California students. The Task Force included K-12 classroom teachers; school and district administrators; informal science educators; science, environmental, and outdoor educators; higher education faculty; and leaders from government agencies and nonprofit organizations. Task Force members worked in teams to develop recommendations on such topics as expanding access to environmental literacy and healthy, green learning environments, ensuring availability of high-quality instructional materials, ensuring integration between formal[ii] and informal[iii] (including Expanded Learning[iv]) education systems, defining environmental literacy learning outcomes and assessment, cultivating sustainable funding sources, ensuring availability of high-quality educator professional learning, and increasing access to environmental literacy experiences for California's diverse populations.

Out of this work, six guiding principles emerged as keystones for the Blueprint for Environmental Literacy for California:

1. Equity of Access;
2. Sustainability and Scalability of Systems;
3. Collaborative Solutions;
4. Commitment to Quality;
5. Cultural Relevance and Competence; and
6. Variety of Learning Experiences.

These principles are defined in more detail in the At a Glance and Introduction sections of the Blueprint.

[ii] Formal education refers to school-day instruction provided by credentialed teachers.

[iii] Informal education refers to Expanded Learning programs, community-based organizational programs, American Indian Education Centers, parks, farms, museums, aquariums, libraries, zoos, etc.

[iv] The term "Expanded Learning" refers to before and after school, summer, and intersession learning programs that focus on developing the academic, social, emotional, and physical needs and interests of students through hands-on, engaging learning experiences. Expanded Learning programs should be student-centered, results-driven, include community partners, and complement but not replicate learning activities in the regular school day/year.

Overarching Strategies

Inspired by these guiding principles, the task force developed six essential overarching strategies to achieve environmental literacy for all California students:

1. **Systematically integrate environmental literacy concepts** into statewide educational priorities, including new academic standards, new and revised curriculum frameworks, state-adopted textbooks and learning materials, professional learning programs, and the emerging new state accountability and assessment systems.[v] **Use funding allocated for implementation** of the California CCSS and NGSS to enhance professional learning for educators around environmental literacy instruction.
2. **Strengthen collaboration across the state between key stakeholders,** including formal and informal educators, state agencies, and divisions of the California Department of Education. The Task Force recommends re-envisioning, adequately funding, and increasing the capacity of the California Regional Environmental Education Community (CREEC) Network[vi] as one important way to catalyze collaboration at the regional and state levels. CREEC should also work to increase educator access to instructional materials and professional learning resources, including resources for teaching environmental literacy outdoors, in the local community, in residential outdoor science programs and other informal educational settings, and in green schools and schoolyards.
3. **Leverage the State Superintendent of Public Instruction's influence and create a public awareness campaign** to build broad support for the importance of environmental literacy, and encourage and support increased allocation of state and locally controlled funding to environmental literacy programs.
4. **Implement changes to relevant state law and policy,** and ensure that relevant existing laws are funded and effectively implemented.
5. **Create an "Environmental Literacy Steering Committee,"** with representation from multiple stakeholder groups, **which will oversee the implementation of the recommendations in this Blueprint,** including the development or strengthening of capacities necessary to implement this work.
6. **Develop a coherent strategy for funding environmental literacy across the state** by identifying the resources needed and judiciously matching existing and new funding sources with key priorities. The ultimate goal is to develop sustained funding to support statewide, enduring, and high-quality environmental literacy efforts.

Given the current educational landscape, California stands at the threshold of a unique opportunity to weave environmental literacy into a rigorous, robust education for all California students. California is exceptionally rich in natural resources, biodiversity, cultural diversity, and human capital. The state is heralded as a center for innovation and forward thinking. Our education system should reflect a steadfast commitment to educating our students to uphold, protect, and further these legacies.

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[v] The California Environmental Principles and Concepts (EP&Cs) are required by law to be included in state textbooks and instructional materials adoption criteria (Public Resources Code Section 71301(d)), which provides a foundation for inclusion of environmental content in future instructional materials.

[vi] The CREEC Network is a network of local agencies and organizations that have agreed to work together to increase environmental literacy in California. A part-time regional coordinator is employed in each of 12 regions to foster collaboration around professional development and resources for educators. See: http://www.creec.org/

California Blueprint for Environmental Literacy: At a Glance

Environmental Literacy Task Force Vision

Through a broad curriculum that includes expertly delivered classroom and out-of-classroom education by formal and informal educators, students in California will become environmentally literate and able to address current environmental challenges and prevent new ones.

Environmental Literacy Definition

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. Through lived experiences and education programs that include classroom-based lessons, experiential education, and outdoor learning, students will become environmentally literate, developing the knowledge, skills, and understanding of environmental principles to analyze environmental issues and make informed decisions.

Guiding Principles

1	**Equity of Access**: We must achieve environmental literacy for all California students, not just a few.
2	**Sustainability and Scalability of Systems:** We must identify and commit to securing dedicated and sustained funding sources for environmental literacy and work within the current context of California's education transformation to harness momentum and create long-term impact.
3	**Collaborative Solutions**: Collaboration among the many stakeholders and community partners involved in environmental literacy is critical to implementing the recommendations contained in this document.
4	**Commitment to Quality**: Students must have access to high-quality learning experiences and materials inside and outside of the classroom that cultivate environmental literacy. Formal and informal educators must have access to high-quality professional learning opportunities.
5	**Cultural Relevance and Competence**: The success of environmental literacy efforts in California will hinge upon culturally competent educators utilizing educational resources and approaches that are responsive to the culture and experiences of the state's diverse students and families.
6	**Variety of Learning Experiences**: Students can best develop environmental literacy through a combination of learning experiences in and out of the classroom, including outdoor and informal education, experiences in green school buildings and grounds, in students' local parks, and in residential outdoor science programs.

Strategies and Sub-Strategies

1 Integrate Environmental Literacy Into Existing and Future Education Initiatives.

- Integrate Environmental Literacy into Curricula and Instructional Materials.
- Make Improved, Integrated, Relevant Professional Learning More Accessible to Educators.
- Integrate Environmental Literacy in California's Existing and Future Accountability and Assessment Systems.

2 Strengthen Partnership and Collaboration Amongst Key Stakeholders.

- Strengthen the California Regional Environmental Education Community (CREEC) Network.
- Build Collaboration and Partnerships.
- Build Internal Collaboration at the California Department of Education (CDE).

3 Mobilize the Public and Leverage the State Superintendent of Public Instruction's Influence.

- Mobilize Public Will and Create Awareness of Strategies for Advancing Environmental Literacy.

4 Implement Select Changes to Relevant State Law and Policy.

5 Ensure Implementation through Capacity Building and Continuous Improvement.

- Ensure Implementation of Environmental Literacy Task Force Recommendations.
- Evaluate Progress Towards Environmental Literacy.

6 Develop a Sustainable Funding Strategy.

- Organize and Plan Funding Efforts.
- Encourage Funding through Local Control Funding Formula and Local Control Accountability Plans.
- Organize a Funding Network and Partnerships.
- Draw on New and Existing Funding Streams.
- Develop Funding Sources to Support Development of Green Schools and Schoolyards.
- Support Funding for Professional Development for the California Next Generation Science Standards.

Figure 2: A Blueprint for Environmental Literacy: At a Glance

Environmental Literacy Task Force Introduction

Overview

State Superintendent of Public Instruction Tom Torlakson convened the California Environmental Literacy Task Force (Task Force) in 2014 to create a Blueprint for Environmental Literacy (Blueprint) for all California students because he recognized that environmental literacy is fundamental to a high-quality, 21st century education. The Blueprint will guide how resources for environmental literacy should best be improved, expanded, coordinated, and integrated with new academic standards, and how efforts to realize the ambitious goal of achieving environmental literacy for all California students should be supported.

The 47-member Task Force consisted of educational and environmental education leaders from throughout the state, including: K-12 classroom teachers; school and district administrators; informal science educators; science, environmental, and outdoor educators; higher education faculty; and educational leaders from government agencies and nonprofit organizations.[vii] The Task Force was also supported by consultants from the Glen Price Group[viii] and staffed by members of the California Department of Education, who actively participated and provided input throughout the process.

The full Task Force met four times, and six smaller work teams, each focused on a specific topic area,[ix] met many times over a six-month period in 2014.

Each work team met between Task Force meetings to draft "content memos" that contained key goals, desired outcomes, and specific recommendations for their topic area.[x] These content memos were used to develop the strategic framework and foundation of this report. Additionally, a group of Task Force members participated in an ad hoc discussion group focused on equity and diversity in environmental literacy. This group provided guiding questions and support to the work teams throughout the planning process to ensure that recommendations address the diverse needs of California's students.

The Task Force also held two listening sessions to solicit input from a wider range of stakeholders. These took place on September 23, 2014 at the 2nd Annual STEM Symposium in San Diego, California and on November 5, 2014 at the Green California Schools Summit in Pasadena, California.

Additionally, this Blueprint builds upon reports and recommendations from earlier task forces convened by State Superintendent of Public Instruction Torlakson.[xi]

The Blueprint contains a set of guiding principles and six key strategies with corresponding recommendations that will support the ultimate goal of environmental literacy for all California students. It is intended to guide state level work to foster environmental literacy, and can also serve as a guide for local efforts led by Local Educational Agencies (LEAs), American Indian Education Centers, environmental education stakeholders, and other community organizations in implementing changes that will improve environmental literacy at the local level.

[vii] See the Acknowledgements section for a list of California Environmental Literacy Task Force members.

[viii] More information about the Glen Price Group is available at http://glenpricegroup.com.

[ix] See Appendix 1 for a list of the work team topic areas.

[x] The main ideas from each work team content memo are summarized in Appendix 1.

[xi] These include: A Blueprint for Great Schools, Schools of the Future, Innovate, and Greatness By Design. These reports can be found at http://www.cde.ca.gov/eo/in/.

Guiding Principles

The work of the Task Force was shaped by a set of guiding principles that frame all of the strategies and recommendations contained in this report:

1. **Equity of Access:** We must achieve environmental literacy for all California students, not just a few. The diverse student populations of California must have equity of access to learning experiences, in and out of the classroom, that lead to environmental literacy.
2. **Sustainability and Scalability of Systems:** We must identify and commit to dedicated and sustained funding sources for environmental literacy and work within the current context of California's education transformation to harness momentum and create long-term impact.
3. **Collaborative Solutions:** Collaboration among the many stakeholders and community partners involved in environmental literacy is critical to implementing the recommendations contained in this document, such as creating and linking environmental learning experiences inside and outside of the classroom, at school and beyond school. Collaborative efforts should include building strong working relationships and mutually beneficial partnerships, linking programs to create pathways for building environmental literacy, and developing new professional learning and credentialing opportunities that leverage stakeholder organizations' strengths.
4. **Commitment to Quality:** Students must have access to high-quality learning experiences and materials inside and outside of the classroom that cultivate environmental literacy. Formal and informal educators[xii] must have access to high-quality professional learning opportunities.
5. **Cultural Relevance and Competence:** The success of environmental literacy efforts in California will hinge upon culturally competent educators utilizing educational resources and approaches that are responsive to the culture and experiences of the state's diverse students and families. Professional learning opportunities must build the competence of educators to develop and teach culturally relevant instructional materials and learning experiences that better engage the diverse students of California and promote equity of access. To advance environmental literacy for all students, a shared definition of environmental literacy must be understood and promoted across cultural contexts.[xiii]
6. **Variety of Learning Experiences:** Students will best build environmental literacy through a combination of learning experiences in and out of the classroom, including outdoor and informal education, experiences in green school buildings and grounds, in students' local parks, and in residential outdoor science programs. Learning experiences outside of the classroom can be both a practical and powerful way to support student learning in the classroom, while being an important part of building environmental literacy.

[xii] This document uses the word "teachers" to mean certified K-12 school teachers; "educators" is the broad term used to reference classroom teachers, staff leading and supporting environmental education programs in formal and informal settings, and administrators supporting program implementation and development.

[xiii] As the United States becomes more racially and ethnically diverse, educators must be prepared to interact with students who bring varied perspectives, values, and behaviors into the learning environment. Cultural competency requires that educators: (1) recognize and understand the values, beliefs, behaviors, and norms of diverse student populations, (2) are aware of their own cultural identity and views about difference and how they influence their perspectives and actions, and (3) Understand how the dominance and privilege of a single race or culture in society effects social and environmental conditions and dynamics.

Environmental Literacy Background and Context

Defining Environmental Literacy

As a critical component of its work, the Task Force developed a working definition of environmental literacy. This definition recognizes that environmental literacy encompasses knowledge, the capacity to continue learning and seeking knowledge, and the skills needed to employ knowledge. The Task Force also recognized the variety of educational experiences through which students build environmental literacy, including active learning inside the classroom; on school grounds; and in residential outdoor science programs,[xiv] the local community, and the wilderness, museums, aquariums, farms, and science centers, etc. In California, learning in natural settings can take place in spectacular habitats such as the state's unique coastal and marine areas, as well as its inland rivers, mountains, valleys, and forests. After reviewing the literature on definitions of environmental literacy, Ocean Literacy and Climate Literacy (http://cpo.noaa.gov/OutreachandEducation/ClimateLiteracy.aspx), the Environmental Literacy Task Force developed a working definition to advance environmental literacy and promote healthy, sustainable learning environments for all California students:

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. Through lived experiences and education programs that include classroom-based lessons, experiential education, and outdoor learning, students will become environmentally literate, developing the knowledge, skills, and understanding of environmental principles to analyze environmental issues and make informed decisions.

The Importance of Environmental Literacy for California

Californians rely on the environment for both our economic prosperity and our quality of life. Our state history is in many ways a tale of Californians striving, and at times struggling, to balance competing demands related to the environment. We recognize that our state's environmental challenges are not just local, or even national issues, but require Californians to understand the deep connection between human societies and natural systems on a global level.

In 2002, the California Department of Education (CDE) "Education and the Environment" report noted, "...the health and welfare of our citizens demand that all Californians understand and value the environment in which they live."[4] In the years since that report was published, the impact of climate change, and critical environmental issues related to energy, water, waste, pollution, and transportation, have made it abundantly clear that the quality of California's future is fundamentally tied to environmental choices. The growing environmental challenges facing California, and indeed the world, require an educated population with the skills to understand, analyze, and take part in complex decisions regarding issues such as water use, climate change, and preservation of natural places. In a recent executive order to establish a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030, Governor Edmund G. Brown Jr. stated that "taking climate change into account in planning and decision making will help the state make more informed decisions and avoid high costs in the future."[5] Governor Brown also noted that climate change will "disproportionally affect the state's most vulnerable citizens."[6] Underserved communities often bear the brunt of many environmental issues, highlighting the need for environmental literacy efforts to focus on underserved students and include underserved groups in decision-making and planning processes.

[xiv] This is the generally accepted California term for what is known elsewhere as "residential outdoor education."

California must prepare the next generation of leaders and residents to confront and avert environmental challenges, to participate in local and statewide decisions about the environment, and to hold green jobs and grow the green economy. As a critical step in this preparation, all California's students need to have access to classroom, hands-on, and outdoor opportunities to learn about the environment and achieve environmental literacy as a core component of a 21st century education.

Overview of the Environmental Literacy Landscape in California

Limited data are available on the number of students in California with access to the types of learning experiences that build environmental literacy. Of the 520 California public school principals who chose to participate in a recent survey:

- Only 13% indicated that their schools had successfully integrated environmental education into their curricula; and
- 77% replied that they spend $5,000 or less on field trips, professional development, and curricular materials for environmental education.[7]

Chapman (2014) notes "the data show that financial, personnel, and curricular resources available for environmental education and sustainability are not equitably distributed, making it more difficult for financially disadvantaged schools and districts to become greener."[8]

California students currently learn environmental topics through varied but often disjointed experiences. These include Expanded Learning opportunities; ad hoc experiences through school, such as day and overnight trips; and programs run by individual teachers or partner organizations.

Residential Outdoor Science Schools (ROSS), many of which are part of the California Outdoor School Association (COSA), provide outdoor and overnight experiences to California students. While these programs provide powerful and cost-effective opportunities for students to have extended, transformative experiences outdoors, only about 113,000 of California students in grades 4-6 were served by these programs in 2013-2014[9] out of over 1.4 million California students in those grades during the same year.[10]

A few schools in California have formal programs that enable students to engage in environmentally-themed activities, investigations, and service-learning projects. At some schools, programs provide students with greater opportunities to work on environmental projects. These schools have implemented interdisciplinary units of instruction using the environment as a unifying theme. Some schools have developed partnerships with local organizations for this purpose.

A small but growing number of schools in California[11] have been recognized by the state of California and United States Department of Education through the Green Ribbon Schools program for exemplary integration of environmental literacy instruction with green school buildings and grounds that are used as teaching tools.[12] According to *Asphalt to Ecosystems*, "Children today experience most of their academic training indoors and spend much of their outdoor play time amidst asphalt-covered surfaces and chain link fences, cut off from nature. The design of environments that surround students as they learn is critical to deepening their understanding of the world around them and fostering a stewardship ethic that will help them care for the world as adults."[13] Programs like these are uncommon in most California districts, however, and lack sustained funding.

Other schools have individual educators with a passion for teaching environmental topics, but can offer little financial support, training, or other resources to help strengthen and expand those efforts. Many schools do not have the financial resources and other supports to develop enduring environmentally focused programs,

or to consistently provide learning experiences outside of the classroom. Students in these schools often have very limited access to Expanded Learning programs that would complement formal instruction in environmental topics.

Environmental learning materials are of varied quality and utility, and educators are generally left to determine which are instructionally sound, free of bias, and most useful. Few publishers have invested in rigorously developing field-tested curricula and materials that include assessment tools to track student progress in acquiring knowledge, skills, and the capacity to identify and solve environmental problems. To bring credibility to the field, and to increase the likelihood of environment-themed materials being integrated with standards-based instruction, materials need to be held to the same standards of quality and rigor that are used in other disciplines.

According to the Inverness Associates' survey of California public school principals, only 12% indicate that they have pursued Leadership in Energy and Environmental Design (LEED) or Collaborative for High Performance Schools (CHPS) certification in renovation and modernization, and only 8% in new school construction projects.[14, 15] Some state and local school bonds have included funds for "green" criteria, but funding levels remain inadequate. The data are limited on how many of California's more than 12,000 schools have green buildings, grounds, and operations that meet high performance sustainability criteria or the United State Department of Education's Green Ribbon Schools award criteria. However, we do know that of the approximately 1,000 school districts in California, only 33 have adopted resolutions to establish CHPS criteria for new school construction and modernization that promote sustainability.[16]

A false perception persists from the No Child Left Behind accountability era that environmental and outdoor programs are non-academic and not connected to the core curriculum.[17] Research shows, however, that in schools where environmental content is integrated as a primary part of instruction, student achievement has improved.[18] Responding to growing awareness of the importance of environmental literacy, education decision-makers have included an unprecedented number of environmental concepts in the disciplinary core ideas and performance expectations in the recently adopted California Next Generation Science Standards.

Previous Efforts to Improve Environmental Literacy in California

Significant efforts have already been undertaken in California to advance environmental literacy for K-12 students (see the timeline on the following page). Since 1976, schools have been required to adopt instructional materials that portray humanity as part of the ecological system and explain the necessity of protecting the environment.[19] In the late 1990s, the CDE formed the statewide California Regional Environmental Education Community (CREEC) Network to increase resource sharing among education providers at the state, regional, county, and local levels. In 2001, Senate Bill 373 was signed into law creating the School Diversion and Environmental Education Law, an effort to support instructional strategies that would improve recycling in California's school districts. In 2002, a report, *Education and the Environment: Strategic Initiatives for Enhancing Education in California*,[20] detailed six initiatives to strengthen environmental education in the state.

In 2003 and 2005, California Assembly Bills 1548 and 1721 set in motion the Education and the Environment Initiative (EEI) by: (1) creating the Office of Education and the Environment within the California Department of Resources Recycling and Recovery (CalRecycle); (2) mandating the creation of California's adopted Environmental Principles and Concepts (EP&Cs) to complement existing standards;[21] and (3) requiring the

creation of an environment-based "model" curriculum driven by the state's science and history-social sciences standards. The EP&Cs are required by law to be included in future textbook adoption criteria for science and history-social sciences, mathematics, and English language-arts. The EP&Cs are a possible guide for the development and implementation of *any* instructional materials that incorporate environmental content.

In 2007, Governor Arnold Schwarzenegger signed the California Children's Outdoor Bill of Rights to "encourage parents, educators, and other concerned citizens to do all they can to help our state's children experience and enjoy the wonders of Mother Nature." In 2010, the California State Board of Education unanimously approved the EEI curriculum, which includes the EP&Cs, for use throughout the state. The Office of Education and the Environment, in coordination with the CREEC Network began working with K-12 educators to implement the curriculum on a voluntary basis. In 2011, the CDE adopted the United States Department of Education Green Ribbon Schools program, a federal recognition for schools and districts that reduce environmental impact and cost, improve student and staff wellness, and provide effective environmental and sustainability literacy. A complementary state-level program, California Green Ribbon Schools, recognized its first cohort in 2014.

Also in 2011, the Schools of the Future Task Force, established by State Superintendent of Public Instruction Tom Torlakson, recommended the creation of an Environmental Literacy Plan to help organize and coordinate the state's environmental education efforts.[22] Responding to this recommendation, the Environmental Literacy Task Force was convened in 2014 to develop a Blueprint for Environmental Literacy (Blueprint) for the state, to complement blueprints completed by earlier task forces convened by the Superintendent, that focused on other key topics related to K-12 education in California.

Much remains to be done, however, to bring these efforts fully to fruition and to scale across the state. Environmental literacy cannot be a standalone subject – it must be integrated into an articulated, standards-based, sequential, and ubiquitous approach to formal K-12 instruction statewide.

The timeline to the right summarizes many of the key past efforts and events at the state level related to environmental literacy in California.

Status of Funding for Environmental Literacy

Currently, the level of funding for programs that build environmental literacy in California is insufficient to implement scaled, effective, statewide efforts. Resources are often not coordinated within the state and the philanthropic community, and they are not distributed equitably across the state.

State-level funds generally come from two sources, the Environmental License Plate (ELP) and the Office of Education and the Environment (OEE). ELP funds have traditionally been the CDE's primary source of funding for state environmental education programs like the CREEC Network. The CDE receives about $400,000 per year from the ELP, and this limited funding means that regional CREEC coordinators only serve a few hours each week, greatly limiting their capacity. The OEE provides funding for the EEI and implementing the EEI curriculum. The OEE receives approximately $2 million a year for the EEI from environmental special funds overseen by the boards, departments, and offices of the California Environmental Protection Agency.

In the private funding arena, California has been a focus for environmental philanthropy because of its precious natural resources, history of policies that protect the environment, and diverse population. Nonetheless, philanthropic investment specifically in environmental education lags behind other types of environmental philanthropy, receiving approximately 5% of all environmental grants or about $92 million per year for the entire United States.[23]

Before 2000

1976	Schools are required to adopt instructional materials that portray humanity as part of the ecological system and explain the necessity of protecting the environment.
1990s	The California Department of Education formed the California Regional Environmental Education Community (CREEC) Network.

2000 to Present

2001	SB 373: Created the **School Diversion and Environmental Education Law,** supporting instructional strategies to improve recycling in California's school districts.
2002	State Superintendent of Public Instruction's Environmental Education Task Force produces a report, ***Education and the Environment: Strategic Initiatives for Enhancing Education in California***
2003	AB 1548 (later refined with AB 1721 in 2005): Initiated the **Education and the Environment Initiative (EEI)** by creating the Office of Education and the Environment, mandating the creation of California's adopted Environmental Principals and Concepts (EP&Cs) to complement existing standards, and requiring the creation of an environment-based "model" curriculum.
2004	Approval of the **Environmental Principles and Concepts (EP&Cs),** which are required by law to be included in future textbook adoption criteria for science, history-social science, mathematics, and English language-arts.
2007	Governor Schwarzenegger signed the **California Children's Outdoor Bill of Rights** to "encourage parents, educators and other concerned citizens to do all they can to help our state's children experience and enjoy the wonders of Mother Nature."
2010	The California State Board of Education unanimously **approved the EEI Curriculum, including the EP&Cs, for use throughout the state.**
2011	The **Schools of the Future Task Force** recommended the creation of an Environmental Literacy Plan
2011	The California Department of Education launched the state's participation in the U.S. Department of Education's **Green Ribbon Schools Program**
2013	Model Curriculum Standards adopted for Career Technical Education.
2014	The **Environmental Literacy Task Force (ELTF)** was convened to develop a Blueprint for Environmental Literacy for the state

Figure 3: Promotion of Environmental Literacy in California - Key Milestones Since 1976

Blueprint for the Future: Environmental Literacy for Every California Student

The Blueprint for Environmental Literacy (Blueprint) is inspired by the Environmental Literacy Task Force's guiding principles and focuses on realizing the Task Force's overarching vision:

Through a broad curriculum that includes expertly delivered classroom and out-of-classroom education by formal and informal educators, students in California will become environmentally literate and able to address current environmental challenges and prevent new ones.

A Strategic Framework for a New Environmental Literacy System

The Task Force envisions that educators, schools, and communities will have the capacity to provide all students with the essential tools they need to understand, protect, and improve the natural environment surrounding their schools, homes, and communities, as well as California's unparalleled natural places.

In order to achieve this vision, the Task Force recommends six key strategies. These strategies were based on the recommendations articulated by each of the Task Force work teams.[xv] Each strategy contributes to the development of an integrated, well-funded, and effective statewide approach to achieving environmental literacy for every student. These strategies can and should be integrated with the major positive changes currently underway in California's educational system. The unified pedagogical focus of new academic standards will support the development of students' abilities to address environmental issues. Efforts to develop students' environmental literacy will provide real world context and support the success of these larger standards-based goals.

The Task Force recommends the following six overarching strategies:

1. Integrate environmental literacy efforts into **existing and future education initiatives**;
2. Strengthen **partnership and collaboration** among key stakeholders;
3. Leverage the **State Superintendent of Public Instruction's influence** and build public awareness;
4. Implement changes to relevant **state law and policy;**
5. Ensure strong implementation through **capacity building** and **continuous improvement**; and
6. Develop a **coherent strategy for funding environmental literacy.**

[xv] The main ideas from each work team's content memo are summarized in Appendix 1.

The figure below graphically illustrates the relationships between key strategies recommended by the Task Force, important opportunities at this moment in time, and guiding principles for the work of the Task Force.

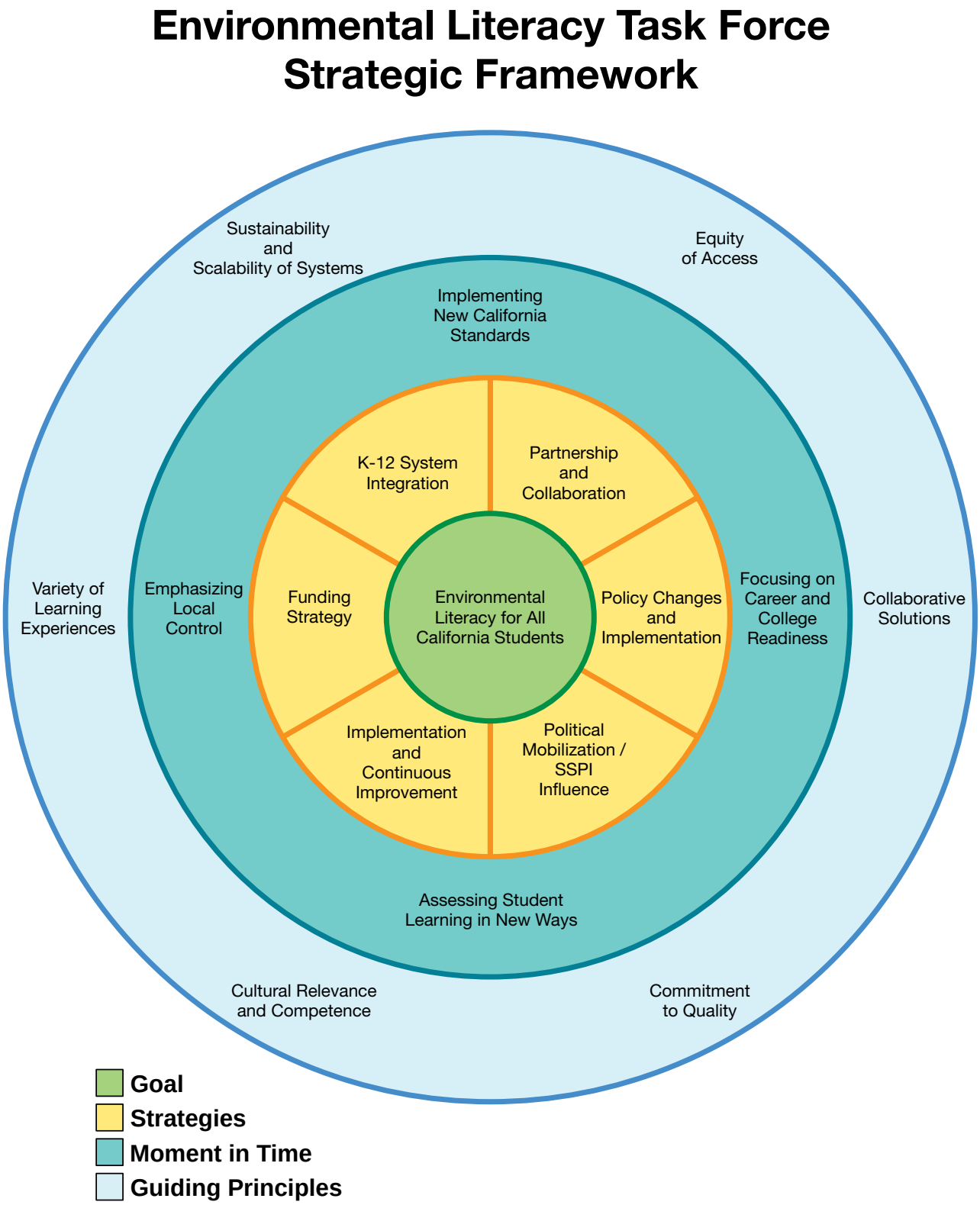

Figure 4: A Blueprint for Environmental Literacy: Strategic Framework

Current Opportunities and Alignment: A Time for Bold Action!

California faces pressing environmental challenges that require creative, bold solutions. With growing awareness of the importance of addressing these challenges, there is also a great opportunity to make environmental literacy a central part of K-12 education in California. Support for environmental education is high: 89% of Californians think that it is very important or somewhat important that local K-12 schools include environmental education.[24] Initial state-level efforts to support environmental education, new building codes and funding mechanisms that support green school buildings and grounds, and state level policies on environmental protection and human health are all indicators of a societal context that supports addressing environmental issues and providing greater support for environmental literacy for all California students.

California is in the midst of a unique and historic period of education policy coherence and alignment. K-12 academic standards have converged to focus on helping students develop higher level critical thinking skills, form their own evidence-based explanations, engage in respectful academic discourse as they consider the explanations of others, and weigh and evaluate different types of evidence to understand and address the most complex ideas and societal problems.

New accountability and assessment systems are being carefully developed to align with both the content and pedagogical approaches embedded in the new standards. Funding mechanisms have been re-designed so that districts have greater flexibility in how they use state funds. Lastly, an increased focus on college and career readiness, including Career and Technical Education (CTE), provides an avenue for incorporating environmental content into formal education programs. **Given these changes, the central strategy for achieving environmental literacy proposed by this Blueprint is to integrate environmental literacy efforts into the increasingly coherent and aligned landscape of state education priorities.**

For many years, environmental education was promoted as a stand-alone subject; advocates sought funding and resources for discrete environmental education programs, curricula, and classes, usually fighting for the already scarce funds dedicated to public education and the limited time in the school day to provide instruction in different topics. The adoption of the new California Standards provides a unique opportunity for framing environmental literacy as integral to accomplishing the state's core goals in public education. Figure 5, below, graphically represents this mutually beneficial relationship.

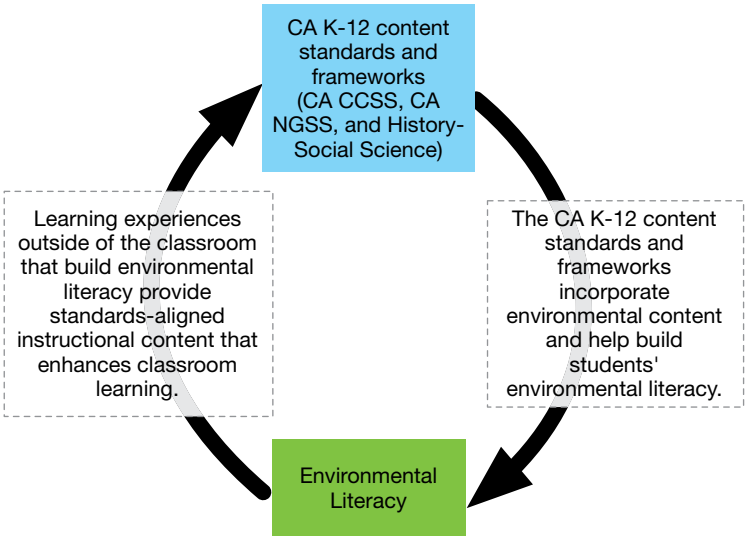

Figure 5: Positive Feedback Between Implementing California Standards and Building Environmental Literacy

California K-12 Education Standards

In 2010, California adopted the CA Common Core State Standards (CCSS), which have already had a major impact on the California education landscape. In his article "The Common Core Meets State Policy: This Changes Almost Everything," California State Board of Education President Michael Kirst points out the far-reaching impact that implementation of the CA CCSS will have on education in California.[25] In Kirst's words, "*The Common Core standards provide a great opportunity for improving student attainment, and a great challenge for California to implement. Common Core is much more than just a new array of standards. It provides a new vision for teaching and learning that builds upon what the state began in the 1990s.*"[26] As Kirst indicates, the CA CCSS represent an entirely new approach to education that will require more complex thinking from studen ts, new strategies for measuring student achievement, and a significant change in how educators approach their work. The CA CCSS will require students to learn complex thinking and problem solving, exactly the same skills needed to address complicated environmental challenges. The interdisciplinary and hands-on experiences often used to build environmental literacy provide an excellent way to engage students in their learning and to build the same skills emphasized in the CA CCSS.

Notably, California's language arts standards are titled, "California Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science and Technical Subjects." They require that students develop discipline-specific literacy capacities that are relevant and essential to each subject. As for meeting the needs of English learners, the California English Language Development Standards are aligned to the English Language Arts Standards and bridge language development instruction to the core subjects. Teachers of language arts, language development, history-social studies and science now have the shared responsibility of literacy development of all students. The new rigorous language arts standards cannot be achieved without engaging students in a content-rich, highly relevant set of learning experiences in science, mathematics, and social studies. Done well, the implementation of the CA CCSS offers the prospect for a profound transformation in the way we educate students in California.

In 2013, the California State Board of Education unanimously adopted the CA NGSS California's science curriculum framework and a statewide science implementation plan is currently under development. A draft of the framework will be released for public comment in October 2015, and the final document is scheduled for approval by the State Board of Education in September 2016.

The CA NGSS include Performance Expectations at each grade level that serve as examples of what students should be able to do in order to demonstrate their understanding of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts included in the new standards. Below are four examples of the many CA NGSS Performance Expectations that focus on key aspects of environmental literacy:[xvi]

- Kindergarten (K-ESS3-3): Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- Grade 5 (5-ESS3-1): Obtain and combine information about ways individual communities use science ideas to protect Earth's resources and environment.
- Middle School (MS-ESS3-3): Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.
- High School: HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

Given that key environmental literacy concepts are already so much a part of the CA NGSS and that new science curricula will be required by law to address the Environmental Principles and Concepts (EP&Cs), California has an unprecedented opportunity to integrate environmental literacy as an essential aspect of science literacy.

California's History-Social Science standards – while dating back to 1998 – also include environmental topics, again demonstrating the importance and relevance of environmental literacy to K-12 education in California. The following examples show how environmental literacy content is incorporated at different grade levels in the California History-Social Science standards to help students develop historical, economic, and geographic literacy:

- Grade 4 (4.3): Analyze the effects of the Gold Rush on settlements, daily life, politics, and the physical environment.
- Grade 6 (6.1): Discuss the climatic changes and human modifications of the physical environment that gave rise to the domestication of plants and animals and new sources of clothing and shelter.
- Grade 11 (11.8): Discuss the diverse environmental regions of North America, their relationship to local economies, and the origins and prospects of environmental problems in those regions.[27]

In addition to specific standards related to environmental topics, history and social science topics can be enhanced in general by the inclusion of environmental content. Development of a new curriculum framework to accompany the 1998 standards for History-Social Science is ongoing at the time of this report. The Task Force strongly recommends that this framework be richly infused with environmental content and the EP&Cs.

Building environmental literacy requires an interdisciplinary lens. The new California Standards – the CA CCSS and CA NGSS – overlap with environmental literacy in terms of the skills and types of thinking required of students and in the content students are expected to learn. Meanwhile California's 1998 History-Social Science standards also include environmental content. By integrating instruction of environmental literacy into all of these subject areas, there is an extraordinary opportunity to foster environmental literacy for all California students.

[xvi] These come from the CA NGSS pre-publication version of the standards. Available online at http://www.cde.ca.gov/pd/ca/sc/ngssstandards.asp.

New Accountability and Assessment Systems

The implementation of the new California Standards brings the potential for an excellent education for every child in the state. It is clear, however, that effective implementation of these new standards will necessitate a new system to assess whether districts and schools are making progress. Stanford Professor Linda Darling-Hammond notes, "Trying to implement ambitious goals for deeper learning through an outmoded testing model tied to a long list of punishments for children, educators, and schools is like pouring new wine into old bottles. It will certainly turn sour."[28]

California is currently in the process of radically revamping its educational accountability systems (how it defines and achieves success) and corresponding assessment systems (how we monitor student progress at the school, district, and state levels). The coming months and years will be an exciting period for this work as the California Department of Education (CDE), State Board of Education, and the California State Legislature consider new approaches to accountability and assessment which lead us away from the "test for judgment" style of the past and towards systems that "support and improve."[29]

In their paper, *Supporting Continuous Improvement in California's Education System*, Linda Darling-Hammond and David Plank offer a set of guiding principles for California's new accountability system.[30] A fundamental tenet that they propose for this system is the use of "multiple measures," as opposed to a single, one-time test that *"cannot capture the broader aspirations embedded in the new standards for problem solving, inquiry, team building, communication, collaboration, persistence, and other challenging skills*." They note that these multiple measures should, "*capture the many aspects of education valued by parents, educators, and community and should be evaluated through systems of review, judgment, and intervention that support continuous improvement.*"[31] Such an assessment system would offer more room for measuring new skills and types of learning, including components of environmental literacy.

State Board of Education President Michael Kirst has described tracking these multiple measures through a "dashboard" like tool, which would provide multiple ways of monitoring and improving. This dashboard has been described as including, "*the kinds of indicators that can inform change: not merely standardized test scores, but other measures such as the pace of student growth over time, parent engagement, student attendance and even student feedback surveys*."[32]

Currently, California is implementing the Smarter Balanced Assessments, new computer-adaptive tests that use adaptive technology to provide students with a wider range of questions to more accurately identify the knowledge and skills they have mastered.[33] A key focus of this system is to provide teachers with information on how their students are doing in a timely manner to support them in helping students learn, rather than impose high-stakes consequences on schools and teachers. The tests will provide one measure among many of subject matter knowledge, critical thinking, analytical writing, and problem solving skills.[34] This provides an opportunity to not only build in assessments of student improvement in environmental literacy, but also to think about how to measure environmental literacy in a meaningful way.

Given the scope of current and future environmental issues facing our state, it will be important to track progress in supporting development of students' environmental literacy. We recommend that the CDE integrate environmental literacy concepts in assessment items related to science and history/social science.

Emphasis on Local Control

Another seismic shift in the California education landscape is the new method for how schools are funded. On July 1, 2013 Governor Jerry Brown signed the **Local Control Funding Formula** (LCFF) into law. The LCFF makes significant changes to the finance system for K-12 schools in three primary ways by:

1. Increasing local control and flexibility over funds that had previously been earmarked for specific uses, and increasing accountability at the local level;
2. Providing increased funding for children with the greatest needs: English learners, low-income students, and foster youth; and
3. Changing the ways in which the state will support struggling school systems through a district-driven approach.

Under the LCFF, each school district must adopt a **Local Control and Accountability Plan** (LCAP) that demonstrates how actions and services are provided to improve the performance of all pupils in the state priority areas. The LCAP must also be updated annually with a description of progress toward the goals, an assessment of the effectiveness of the specific actions taken towards achieving these goals, and a description of any changes the district will make moving forward. The LCFF and LCAPs rely heavily on the concepts of subsidiarity,[xvii] and will make it easier for school districts to set priorities.

For example, districts could direct a portion of funds in their LCAPs for CA NGSS implementation. A portion of these dollars could be dedicated to professional learning designed to build educator capacity to engage students as active participants in science who have the ability to understand and apply concepts, rather than memorizing and reciting them. District LCAPs could specify that professional learning opportunities be designed to incorporate concepts of environmental literacy. This would prepare teachers to use future state-adopted curricula that incorporate the EP&Cs. LCFF funding could also, for example, support partnerships with Expanded Learning programs that focus on environmental literacy, develop sustainable school grounds that can support student learning, or provide residential outdoor science experiences. Due to the involvement of a broad range of stakeholders in developing district LCAPs, it will be essential to mobilize parents, community, educators, and administrators to support environmental literacy as a key element of a high-quality, standards-based education.

At the state level, the California Collaborative on Education Excellence (CCEE) will provide districts, charter schools, and county offices of education (COEs) with targeted technical assistance and guidance to support effective implementation of their LCAPs. As districts include environmental literacy in their plans, the CCEE could potentially serve as a key resource for best practices in this area.

[xvii] "Subsidiarity is the idea that a central authority should only perform those tasks which cannot be performed at a more immediate or local level. In other words, higher or more remote levels of government, like the state, should render assistance to local school districts, but always respect their primary jurisdiction and the dignity and freedom of teachers and students." Office of Governor Edmund G. Brown Jr. (2013). State of the State Address Remarks. Retrieved March 6, 2015, from http://gov.ca.gov/news.php?id=17906.

Focus on College and Career Readiness

In recent years, the CDE and the legislature have placed an increased emphasis on 21st century skills,[xviii] college and career readiness, and Career Technical Education (CTE). The new California Standards have been designed to prepare students for success in college and career. Beyond that, there are a number of programs in California focused on preparing students for specific career pathways. Superintendent Torlakson considers these topics to be key priorities for education in the state.

New standards, called the Model Curriculum Standards (standards) were adopted for CTE in 2013:

"The CTE Model Curriculum Standards are intended to serve the entire education community—from middle schools and high schools to postsecondary colleges and career training programs. A major aim of these standards is to prepare students for postsecondary education and training and to help them make a smooth transition into the workforce. In order for both the people and the economy of California to prosper, it is essential for all students to emerge from schools ready to pursue their career and college goals."[35]

The standards cover 15 industry sectors, of which at least three are directly related to environmental topics: Agriculture and Natural Resources; Energy, Environment, and Utilities; and Engineering and Architecture. In addition, the CTE standards include "Standards for Career Ready Practice, which describe knowledge and skills that students need prior to entering a career technical education program, as part of the career technical education sequence, or as integrated elements of other coursework in preparation for careers and college."[36] Two of these standards include skills related to environmental literacy:

1. Act as a responsible citizen in the workplace and the community. (They are aware of the impacts of their decisions on others and the environment around them, and they think about the short-term and long-term consequences of their actions.)
2. Understand the environmental, social, and economic impacts of decisions. (They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization.)

These standards indicate a close connection between environmental literacy and career readiness. The hands-on and interdisciplinary focus required for building environmental literacy also lends itself well to the grounded, real-world focus of CTE standards.

By achieving environmental literacy for all California students, we can effectively prepare them for a range of college and career pathways. In fact, while jobs in California's overall economy grew by 12% from 1995-2010, employment in the state's green economy grew by 109%.[37] Ensuring that students attain environmental literacy is also a critical investment in California's future workforce.

[xviii] Twenty-first century skills have been a focus of the California State Legislature and the CDE in recent years. Twenty-first century skills include the "4Cs" of critical thinking, communication, collaboration, and creativity. For more see: http://www.p21.org/our-work/p21-framework.

Six Key Strategies

Based on its analysis of the current California educational landscape outlined above, the Environmental Literacy Task Force recommends pursuing the six strategies in the following sections. Each of these strategies is supported by a set of sub strategies that are critical to its success. Each sub strategy is further defined by a bulleted list of specific recommendations for the CDE.

Strategy 1: Integrate Environmental Literacy Into Existing and Future Education Initiatives

The implementation and pedagogical convergence of the new California Standards, including CA CCSS, CA NGSS, History-Social Science standards, and Career and Technical Education Model Curriculum Standards, and the development of new California accountability systems, provide a key opportunity to integrate environmental literacy content into classroom instruction, and to make environmental literacy a bridge across subject areas. In addition to classroom instruction, students build environmental literacy with experiences outside the classroom, through observations and interactions in natural and urban environments, as well as informal learning settings. Therefore, students need access to learning environments outside the classroom. Formal and informal educators need the training to teach students outdoors and to connect student experiences in and out of the classroom to academic standards. Educators need support in linking student learning in the classroom to a grounded, experiential understanding of the environment.

California's K-12 student population reflects the state's rich diversity. Efforts to build environmental literacy must take into account the variety of backgrounds, languages, and life experiences of students, and must provide learning experiences that are culturally relevant and taught through culturally competent instruction. Promoting cultural competency in environmental education will require: (1) Diversity in leadership and workforce; (2) Content and teaching approaches that meet the needs of, and are relevant and responsive to, diverse student populations; and (3) Effective communication between educators and students (and their families) who come from different racial, ethnic, cultural, and socioeconomic backgrounds.

Environmental education must be threaded through all of the domains where our students learn, and be supported by professional learning for all educators in each of these domains, including: classrooms, Expanded Learning programs, informal learning environments, and environment-focused institutions within the communities where students live. By providing students the opportunity to learn in a variety of settings, they can study the actual environment in various forms, and build a much deeper understanding of the environment as subject matter. Borrowing from the field of ecology, this is an environmental education "ecosystem," which harnesses the unique contributions of different settings in symbiosis to assist all children to become environmentally literate.

Integrate Environmental Literacy into Curricula and Instructional Materials

a. Develop and increase educator access to, and use of, culturally relevant instructional materials that both address environmental topics and meet academic standards.

b. Develop criteria to help educators determine the quality of environmental curricula and instructional materials using rigorous standards comparable to those used for other subjects.

c. Encourage sharing of materials between formal and informal educational groups.

d. Consistent with the letter and spirit of existing law, incorporate the Environmental Principles & Concepts (EP&Cs) into future curriculum frameworks and related implementation plans for science (CA NGSS), History-Social Science, English Language Development, math (CA CCSS), and English Language Arts (CA CCSS). These efforts must include plans to increase awareness and understanding of the EP&Cs among educators through communication and professional learning.

e. Ensure that instructional material developers and textbook publishers fully integrate and highlight the state adopted EP&Cs in the materials they develop for science (CA NGSS), History-Social Science, English Language Development, math (CA CCSS), and English Language Arts (CA CCSS) and adopt a variety of instructional materials that contain environment-focused content for these subject areas and for the arts and physical education.

f. Include formative assessments, model lessons, and other tools that support environmental literacy in existing and future digital resource repositories that provide standards-based resources for educators.

g. Emphasize the importance of the outdoor environment as a teaching resource by encouraging school districts, county offices of education, and charter schools to create green school buildings and schoolyards and integrate use of these spaces into standards-based instruction as hands-on teaching tools and outdoor classrooms.[38]

h. Provide guidance for and promote the teaching of multiple subjects outdoors, with the goal that all students spend a minimum of forty hours of school time outdoors per year.

Make Improved, Integrated, Relevant Professional Learning More Accessible to Educators

i. Improve access to professional learning opportunities that enhance formal and informal educators' abilities throughout all phases of their careers to teach environmental literacy, both in classrooms, outdoors, and in other informal learning settings, using hands-on methods.

j. Infuse environmental literacy into all phases of professional learning for formal educators: preparation, induction, ongoing capacity building, and evaluation.

k. Provide school districts, administrators, and teachers with professional learning opportunities that demonstrate the integration of culturally relevant environmental content into other curriculum frameworks, and provide training to effectively bring and educate students outdoors.

l. Work with the California Commission on Teacher Credentialing (CTC) and California colleges and universities that offer teacher preparation programs to implement changes to California's educator preparation and credentialing systems. Provide recommendations to incorporate environmental literacy into the California Standards for the Teaching Profession (CSTPs) and the Teaching Performance Expectations (TPEs) so that educators are better prepared to cultivate their student's environmental literacy. Examples could include developing additional requirements for opportunities in which educators observe and teach at informal sites to gain exposure to environmental content during their training.

m. In the long term, seek to create either a single statewide clearinghouse or a coordinated resource exchange "network of networks" to enable efficient and effective access to environmental literacy resources. In the short term, leverage the use of existing online systems such as the State Parks Online Resources for Teachers and Students (PORTS) program for virtual fieldtrips, Massive Open Online Courses (MOOCs), the California Regional Environmental Education Community (CREEC) resource directory, social media, and video conferencing to increase educator awareness of the environmental literacy resources that are available to them.

n. Leverage existing professional learning infrastructure to improve and scale professional learning opportunities that bring together educators across learning domains to collaborate and share best practices for teaching environmental literacy. Examples of relevant existing infrastructure include professional conferences and regional organizations.

Integrate Environmental Literacy in California's Existing and Future Accountability and Assessment Systems

o. Establish environmental literacy learning outcomes for the state of California that are linked to the EP&Cs. A preliminary list of outcomes for consideration by the CDE includes: *Knowledge of Environmental Processes and Systems; Skills for Understanding and Addressing Environmental Issues; Positive Attitudes Toward the Environment; Personal and Civic Responsibility.*

p. Integrate assessment of student learning in environmental literacy with emerging state assessments systems. For example, ensure environmental topics are included in CA NGSS-aligned student assessments, and ensure that future statewide assessments of student learning address student understanding of environmental learning outcomes to the greatest degree feasible.

q. Develop multimodal means of assessing environmental literacy that are integrated with emerging state accountability and assessment systems. Consider adopting a portfolio approach that includes performance tasks and is aligned with LCFF priority areas.

r. Create a module of questions for the California Healthy Kids Survey and future student and parent surveys to understand students' environmental attitudes, motivations, and actions.

Strategy 2: Strengthen Partnership and Collaboration Amongst Key Stakeholders

Realizing the vision of environmental literacy for all students requires collaboration between schools, Expanded Learning programs, community organizations, and informal education programs in order to build an "ecosystem" that supports student learning in many domains. This collaboration is key for getting students outdoors and learning outside of the classroom in ways that support formal classroom instruction and also provide meaningful, high-quality, culturally relevant, and hands-on learning experiences. Informal and formal educators should work as critical partners, with each contributing important skills and expertise. Many of California's regional and local Expanded Learning networks, such as after school programs, could provide key opportunities for environmental literacy.

Building partnership and collaboration will also help educators access high-quality professional learning opportunities and instructional resources, share best practices, and determine the best ways to integrate environmental concepts with current and future standards. In addition, there is a need to draw upon the rich capital that exists within California's diverse communities, including mentors, traditional knowledge, and community organizations. A collaborative approach will better engage, and facilitate the sharing of expertise among these different partners to create high-quality and culturally relevant experiences for students in all domains.

The California Regional Environmental Education Community (CREEC) Network has the potential to play an important role in building statewide collaboration. CREEC is a network of local agencies and organizations that have agreed to work together to increase environmental literacy in California. With the help of CDE Environmental Education Grant funds, a part-time regional coordinator is employed in each of the 12 regions to foster collaboration around professional development and resources for educators. Each CREEC Network regional coordinator fosters communication among schools and organizations in their region that are interested in supporting environmental literacy. Collectively, the CREEC Network also maintains an online searchable database of standards-based enrichment programs, field trips, online resources and professional development opportunities from over 500 informal education providers across the state. With further resources, the CREEC Network has the potential to effectively support a range of CDE programs, including Green Ribbon Schools, STEM education, and Career Technical Education to districts and schools in each region.

While CDE's Environmental Education Grants help fund the CREEC Network, the CDE has received proportionally less funding from the State Environmental License Plate Fund in recent years. Currently, there is insufficient funding to fully support the current functions of the CREEC Network.

Greater coordination between state agencies and between the CDE's internal divisions will help align priorities at the state level to better support environmental literacy within schools. Additionally, greater collaboration between educators themselves, both in person and via online tools, will provide direct and practical support for teachers to incorporate environmental topics in their classrooms. By working collectively within a CREEC Region, educators, local educational agencies, and community organizations could begin to improve environmental literacy in their own region.

Strengthen the California Regional Environmental Education Community Network[xix]

a. Revise and re-envision the purpose of the CREEC Network to act as a coordinating agent, guided by an advisory group. CREEC will help formal and informal educators work together to: integrate environmental literacy into mainstream instruction; provide high-quality learning experiences in the outdoors, on school grounds, and in the community; and share information about funding sources to support environmental literacy programs in schools.

b. Develop and implement plans to revitalize, strengthen, fund, and expand the CREEC Network and CREEC regional hubs to provide a wider range of services for informal education providers, schools, and districts. As part of this plan, fully fund the regional CREEC Network coordinators and identify performance measures and targets for the CREEC Network.

c. Re-design and enhance the CREEC Resource Directory and link it with existing and emerging digital resource portals, such as Digital Chalkboard. Gather input from the community of formal and informal educators in California and base the new resource directory design on what educators have found most helpful and relevant to each region.

d. Build CREEC's capacity to provide guidance to educators by establishing criteria and tools for assessing the quality of materials in order to ensure that materials included in the CREEC Resource Directory are comparable in quality to those adopted by the state for science, math, language arts, and history-social science.

Build Collaboration and Partnerships

e. Incentivize collaborative work in support of environmental literacy, such as shared professional learning for formal and informal educators, and partnerships with organizations that can help reach diverse communities of students.

f. Strengthen the capacity of organizations that support student learning outside the classroom, with an emphasis on helping Title I schools provide learning experiences to their students:

   1. Strengthen the capacity of the CDE's Green Ribbon Schools program and strengthen partnerships with other key organizations, to support the greening of school facilities and schoolyards that can be used for hands-on student learning outside the classroom.

   2. Strengthen the capacity of the CDE-endorsed California Outdoor School Association (COSA) to continually improve residential outdoor science programs statewide.

g. Deepen and improve the effectiveness of collaboration among state agencies involved in supporting environmental literacy through the California Environmental Education Interagency Network (CEEIN), and with state agencies that have a statutory role in supporting environmental literacy such as CalRecycle's Office of Education and the Environment and the California Department of Parks and Recreation.

Build Internal Collaboration at the CDE

h. Actively support and coordinate staff, consultants, committees, and task forces to work and communicate collaboratively across divisions, priorities, initiatives, and content areas so that environmental literacy is seamlessly embedded within the implementation of state K-12 content standards, curriculum frameworks, and assessments:

[xix] For further details on strengthening the CREEC Network, please see Appendix 2.

1. Support communication between facilities and curriculum divisions around sustainable facilities and schoolyards initiatives.
2. Support the CDE's After School and Professional Learning and Support Divisions to develop and integrate professional learning systems that include environmental literacy for Expanded Learning, K-12, and informal educators in order to support effective integration of environmental literacy across subjects and learning contexts.

Strategy 3: Mobilize the Public and Leverage the State Superintendent of Public Instruction's (SSPI) Influence

Upon completion of the Blueprint, the SSPI and the CDE should launch a communications plan to promote the importance of environmental literacy and encourage local and state leaders to prioritize it in their work.

With implementation of the Local Control Funding Formula (LCFF) underway, school administrators, teachers, parents, and community stakeholders have a stronger voice in deciding how education dollars are spent in their local school districts. These stakeholders are consulted and engaged as part of the development process of district Local Control Accountability Plans (LCAPs), which specify how funds will be used to implement actions to meet district goals. The CDE and the SSPI can play a role in setting and communicating a broad standard for what is important in education. The SSPI can leverage this influence to promote the importance of environmental literacy and the current opportunities for districts, schools, and educators to integrate environmental literacy into instruction. In addition, the CDE can work with the legislature to sponsor relevant bills that advance the strategies outlined in the Blueprint.

Leadership from the SSPI will help build public and political will to prioritize environmental literacy as a fundamental element of high-quality 21st century education and a critical necessity for ensuring California's future health, prosperity, and security.

Mobilize Public Will and Create Awareness of Strategies for Advancing Environmental Literacy

a. Distribute the Blueprint for Environmental Literacy to a wide cross-section of the state's population and hold a variety of events to promote the report to different stakeholders, including low-income communities and communities of color. This could include holding information sessions at conferences, meetings of key educational stakeholders, and other venues; including the highlighting the Blueprint in LCFF trainings; providing opportunities for student voices to advocate for environmental literacy; and hosting an information session for current and potential future environmental education funders.
b. Communicate the importance of environmental literacy, green schools, and time spent outdoors to a 21st century education, college and career readiness, and California's economy.
c. Encourage and support school boards and superintendents to integrate culturally relevant environmental literacy programs and education experiences outside of the classroom into required coursework throughout a student's K-12 education.
d. Partner with the Curriculum and Instruction Steering Committee (CISC) of the California County Superintendents Educational Services Association (CCSESA) to develop and undertake an awareness campaign for teachers and administrators that promotes high-quality environmental literacy instructional materials aligned to the EP&Cs and California's academic standards.
e. Communicate to curriculum developers and publishers that environmental literacy is a CDE priority for inclusion in textbooks and instructional materials, and ensure they are aware of existing legal requirements for educating California's students about the environment and the EP&Cs.

Strategy 4: Implement Select Changes to Relevant State Law and Policy

Existing state law contains multiple requirements for environmental literacy, which for years, have been unfunded, underfunded, or unenforced.[39] To advance environmental literacy beyond the status quo and expand the reach to all students and schools across California requires new approaches. While relying on mandates to secure funding and resources is not a standalone strategy, select changes to, and proper funding of, existing state statutes and related policies can complement and support efforts recommended throughout this report.

a. Integrate environmental literacy into existing or new California high school graduation requirements, based on review of other states' environmental literacy graduation requirements and the development of environmental learning outcomes for the state of California.

b. Ensure that environmental literacy content is included in any future revisions to the *Preschool Learning Foundations and Frameworks Volume 3 History-Social Science* and in any related preschool educator preparation and support resources."

c. Require that all new school construction and modernization projects meet at least a Silver level of Collaborative for High Performance Schools (CHPS) or Leadership in Energy and Environmental Design (LEED) standards for buildings and the Silver level of Sustainable Sites Initiative (SITES) certification for school grounds.

Strategy 5: Ensure Implementation through Capacity Building and Continuous Improvement

In order for the recommendations in this Blueprint to become a reality, the CDE must continue to work with external stakeholders to track progress and assist with program implementation. Many of these recommendations will require ongoing collaboration, coordination, and capacity building, rather than one-time changes. A visible steering committee on environmental literacy could provide needed support to the CDE and other partners in the implementation of Blueprint recommendations by providing expert advice, ensuring environmental literacy remains a priority, and supporting and monitoring implementation efforts.

Ensure Implementation of ELTF Recommendations

a. Seek resources for and form a standing "Environmental Literacy Steering Committee for Implementation and Continuous Improvement" (Committee) to make recommendations to the California State Legislature (legislature), State Board of Education, and the SSPI for the implementation of all Blueprint recommendations and engage key stakeholders to review progress. The Committee should also work in close partnership with all stakeholders to support robust implementation of the Blueprint recommendations. Committee members should include educators and representatives from both formal and informal education, parents, and representatives that reflect the diversity of California.

b. Seek resources for and convene a sub-committee of the Environmental Literacy Steering Committee to research, develop, and distribute culturally relevant and pedagogically sound "best practices" for achieving environmental literacy, which will inform the design of environmental literacy professional learning, instructional materials, and online resources.

c. Coordinate strategies for funding the implementation of Blueprint recommendations.

Evaluate Progress Towards Environmental Literacy

d. The Committee will work with the legislature, the State Board of Education, the CDE, school districts, a small number of key stakeholders, and a research consultant, to develop an instrument that can be used

to annually evaluate the state of environmental literacy among California's students and environmental sustainability in California's schools.

Strategy 6: Develop a Sustainable Funding Strategy

The state needs a comprehensive, coordinated, and cohesive funding strategy that identifies a diverse portfolio of possible funding streams – existing and new, public and private – along with strategies to coordinate fundraising and ensure consistent funding for key statewide priorities. This cohesive funding strategy should push for multiple funding streams for local level initiatives to increase the stability of programming focused on achieving environmental literacy. In addition, local districts need access to clear guidance on possible funding sources and how they can direct existing funds, such as Local Control Funding Formula dollars, towards environmental literacy programs.

Funding sources, particularly for learning experiences outside the classroom, should be prioritized for under-resourced schools and communities, knowing that students in those communities will have less access to outdoor learning experiences, field trips, and learning experiences at informal education organizations. Furthermore, there must be continued thought given to developing funding sources for districts to support student learning outside of the classroom - including funding for field trip transportation and participation in residential outdoor science programs.

There are several sizable funding opportunities for building green school buildings and grounds that can promote environmental literacy, including new state and local school bonds and the $850 million – and growing – Greenhouse Gas Reduction Fund that distributes proceeds from California's AB32 cap-and-trade greenhouse gas emissions control law to communities for projects that help curb or adapt to climate change.[40]

The Environmental Literacy Steering Committee should play a key role in developing a cohesive statewide funding strategy and in implementing many of the recommendations below.

Organize and Plan Funding Efforts

a. Develop a comprehensive plan for supporting local environmental literacy programs in California, and prioritize the allocation of funds to schools with underserved and underrepresented populations.

b. Evaluate the feasibility of a ballot initiative to support the environmental literacy of all students in California.

c. Produce a scan of existing funding sources, and create an interactive database of probable sources of funding that could be available to the CDE, districts, schools, and informal organizations to support environmental literacy programs. Connect this database with an existing organization that can manage and maintain it.

Encourage Funding through Local Control Funding Formula (LCFF) and Local Control Accountability Plans (LCAPs)[xx]

d. Identify and develop sample language for districts to include in their LCAPs that supports environmental literacy programming and opportunities for students to learn outdoors, in their communities, on school grounds, and in museums, aquariums, farms, science centers, American Indian Education Centers, and other informal learning contexts.

[xx] Please see the section titled "Emphasis on Local Control" for more specifics on allocating funding for environmental literacy through LCAPs.

e. Coordinate with organizations like the California STEM Learning Network (CSLNet), California Science Teachers Association, ChangeScale, Blue Sky Funders Forum, and the Environmental Education Funders Collaborative to create consistent messaging and sample language for integrating environmental literacy into LCAPs to deliver high-quality instruction across a range of subjects.

f. Encourage school administrators, board members, local school and community leaders, and parents to consider including environmental literacy in their school districts' LCAPs and work to link environmental literacy to specific state education priorities.

g. The SSPI should make separate, formal presentations to California County Superintendents Educational Services Association (CCSESA), Association of California School Administrators (ACSA), California School Boards Association (CSBA), California State Parent Teachers Association (PTA), and similar groups, asking them to identify, develop, and implement strategies to support the inclusion of environmental literacy in district LCAPs, as a key strategy to helping districts to succeed with their goals for implementation of the California Standards.

h. Develop and provide to all Local Educational Agencies (LEAs) a specific list of funds that can be allocated or raised to support participation of all students in residential outdoor science schools. Work toward the goal of making a week of residential outdoor science available to every California student sometime between grades 4-8.

Organize a Funding Network and Partnerships

i. Support the development of a statewide advocacy network with regional organizations that will advocate for environmental literacy in California and support state, regional, and local partnerships to raise funds in support of environmental education.

j. The Environmental Literacy Steering Committee should systematically cultivate relationships with the most active environmental philanthropic partners and corporate giving officers to design a funding strategy for environmental literacy.

k. Develop a matching grant program that provides state funding to encourage private philanthropy to match local school district LCFF/LCAP funds, which districts dedicate to developing regional partnerships that leverage the work of informal education providers and increase learning opportunities outside of the classroom to build environmental literacy.

Draw on New and Existing Funding Streams

l. Advocate for the greatest possible percentage of the Environmental License Plate Fund (ELPF) to be dedicated to support environmental literacy programs across the state.

m. Continue to leverage environmental special funds that support CalRecycle's Office of Education and the Environment (OEE) by maintaining close interagency collaboration.

Develop Funding Sources to Support Development of Green Schools and Schoolyards

n. Explore possibilities with the California Air Resources Board and the California Environmental Protection Agency (CalEPA) for allocating a portion of the Greenhouse Gas Reduction Fund from California's cap-and-trade program for schools to use for energy efficiency improvements, renewable energy, cool roofs,

heat-island asphalt removal, "green" transportation, tree planting, environmental and outdoor education, and other greenhouse-gas-cutting programs, especially in those disadvantaged communities designated to receive 25% of these funds.

o. When writing local and state school bonds, the legislature, Governor, and LEAs should include a requirement that all new school construction and modernization projects meet rigorous green building standards, and require that a minimum of 5% of school project bonds be committed for development of multi-use outdoor ecological learning environments on school grounds.

p. Support LEAs and schools to reinvest financial savings from energy, water, and waste efficiency projects in further greening and maintaining their buildings and grounds.

q. Encourage school districts to seek partnerships with their local energy and water utilities, public agencies, city governments, and others to align their green schoolyard development efforts with wider work to improve their cities' green infrastructure.

Support Funding for Professional Development for the California Next Generation Science Standards (CA NGSS)

r. The legislature, the State Board of Education, the SSPI, and LEAs should support efforts to seek federal funding for professional development on the CA NGSS, including training on the EP&Cs.

s. All stakeholders should encourage the legislature to fully fund the implementation of CA NGSS with robust professional learning and teacher support, including a focus on environmental literacy.

Conclusion

Environmental challenges in California create a pressing need for a California populace that has the skills to think critically about environmental issues and possible solutions. A summary report, drawing from the work of more than 120 California researchers notes that, "...the latest climate science makes clear that state, national and global efforts to mitigate climate change must be accelerated to limit global warming to levels that do not endanger basic life-support systems and human well-being."[41] While of critical importance, it will not be easy to build a system that can ensure all California students, regardless of what school they attend or what neighborhood they live in, are environmentally literate. The current educational landscape in California, however, provides a unique opportunity to integrate environmental literacy as a central part of a rigorous 21st century education. The strategies and recommendations described in this document offer a blueprint for building this system. As a critical first step, we must convene the Environmental Literacy Steering Committee to guide and support the implementation of this work.

California is exceptionally rich in natural resources, biodiversity, cultural diversity, and human capital. California is heralded as a center for innovation and forward thinking. Our education system should reflect a commitment to educating a future public that can uphold, protect, and further these legacies. The time is now, and the moment is right to build an inclusive and comprehensive system to support environmental literacy for all of California's diverse students.

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Appendices

Appendix 1: Task Force Work Team Summaries

Each of the six Task Force work teams focused on a specific aspect of the environmental literacy landscape in California. The work teams developed content memos that included key background information, goals, desired outcomes, recommendations, and analysis for their topic area. Each team also developed summaries of the key ideas and recommendations described in their longer content memos. These summaries are included below to provide an overview of each work team's topic and convey an understanding of the ideas that form the foundation of this Blueprint. The work team topic areas were:

1. Expanding the Reach of Environmental Literacy and Access to Healthy, Sustainable Learning Environments;
2. Ensuring Availability of High Quality Instructional Materials;
3. Ensuring Availability of High Quality Educator Professional Learning;
4. Ensuring Integration Between Formal and Informal Education Systems and with Current Initiatives;
5. Defining Learning Outcomes and Assessment of Environmental Literacy; and
6. Cultivating Sustainable Funding Sources for Environmental Literacy.

Expanding the Reach of Environmental Literacy and Access to Healthy, Sustainable Environments

Ensuring that California's students are environmentally literate and have access to healthy, green learning environments is fundamental to providing a high-quality 21st century education. Yet, many of California's students do not receive critical environmental learning experiences in the classroom or outdoors, either on or off the school site.

There are wide disparities between those with and without access to environmental and environment-based learning experiences. California must overcome these disparities to ensure positive educational outcomes and career readiness for all of its students. To achieve this, the California Department of Education (CDE) and the State Superintendent of Public Instruction (SSPI) must become visible and vocal leaders in promoting environmental literacy as fundamental to a high-quality 21st century education and ensuring that *all* California schools and students, *regardless of income or background*, have access to high-quality, culturally-relevant environmental and outdoor education and healthy, and green school buildings and grounds that serve as learning tools for sustainability.

This work team focused its recommendations on the numerous ways that California agencies, schools, and districts can strengthen and expand environmental literacy to reach all students. Innovative opportunities can be pursued for increased funding, capacity building, and dissemination of existing best practices. Environmental and outdoor education are aligned with academic standards, including the CA Common Core State Standards (CA CCSS) and the CA Next Generation Science Standards (CA NGSS), and deliver improvements in academic achievement and children's well-being. In fact, the CA CCSS and CA NGSS cannot be met without strong environmental literacy and hands-on learning environments. Additionally, there are opportunities to simultaneously meet educational objectives while meeting other California mandates to protect our environment. This work team recommends, among other things, that the CDE work with the California Air Resources Board to access the projected ~$2.5 - $5 billion per year in the cap-and-trade program's Greenhouse Gas Reduction Fund to support environmental literacy and the greening of school buildings and grounds; strengthen existing programs like the Green Ribbon Schools award and California Regional Environmental Education Community (CREEC) to better reach and enhance environmental literacy in schools;

explore mechanisms to systematically integrate environmental literacy into each child's K-12 experience, including possible high school graduation and outdoor education requirements; and support the greening of local and state school bonds and the design and construction of "living schoolyards" to serve as multi-use, hands-on outdoor learning environments for teaching standards-based curricula at school.

California has long been at the forefront of environmental literacy efforts and green school initiatives. The state has rich assets in its talented and dedicated educators, incredible informal environmental education providers, and world-renowned natural treasures that all California residents should understand, enjoy, and steward. The CDE and the SSPI must lead this effort and ensure that no child is left inside.

Ensuring Availability of High Quality Instructional Materials

Providing high-quality environmental education and environment-based education instructional materials to all California students is essential to ensuring development of an environmentally literate population. Students must be engaged in systematic, thoughtful, high-quality lessons and investigations that support and build environmental literacy throughout their years of learning in order to develop a deep understanding of the complex relationships between human and natural systems.

In order to cultivate environmental literacy among California's six million students, environmental literacy must be integrated into an articulated, sequential K-12 mainstream approach to formal instruction statewide. By definition, this requires that accompanying instructional materials must be standards-based (i.e., support Common Core, Next Generation Science Standards, and History-Social Science Standards) and aligned to California's state-adopted Environmental Principles and Concepts. Curriculum developers should produce instructional materials that (1) enrich and/or supplant portions of current K-12 instruction; (2) complement and support one another; and (3) become a fully integrated part of formal K-12 education. Further, in order to meet the needs of **all** California students, materials that support environmental literacy must also be culturally competent and linguistically appropriate, accurately and equitably portraying the cultural and racial diversity of American society, and reflect the *Standards for Evaluating Materials for Social Content* approved by the State Board of Education (SBE).[42]

Several proposed statewide structures, systems, and protocols would help ensure that materials to support environmental literacy: (1) meet California's high standards for educational excellence; (2) are made widely known and accessible to educators; and (3) are used frequently and competently. For example, the creation of an "Environmental Literacy Steering Committee for Implementation and Continuous Improvement" could help set and apply criteria for quality in these materials so that educators can access and use such resources with confidence. Similarly, the creation and maintenance of an online statewide resource directory (e.g., a strengthened, more robust CREEC Resource Directory) would ensure educators could readily access relevant materials. In addition, fully funding a network of regional coordinators (e.g., CREEC) would: (1) help to ensure the dissemination of information among providers statewide; (2) help to increase the knowledge and effective use of environmental education resources among informal educators; and (3) increase communication and reduce the "silo" effect among informal educators and between the informal and formal provider worlds.

Lastly, in order to effectively teach environmental literacy to *all* California students, educators need instructional materials that are culturally competent, relevant to student lives, and place-based. Educators also need ongoing training to effectively use such materials in increasing all students' environmental literacy. A regional needs assessment would help determine both the availability of high-quality materials that meet these criteria, and the instructional needs of teachers with regard to such materials. All of these recommendations represent fundamental shifts in practices related to the development of instructional materials.

Ensuring Availability of High Quality Educator Professional Learning

Environmental literacy efforts can have a much greater impact if formal educators (pre-K-college), informal providers, school administrators, and facilities managers coordinate and collaborate more effectively. In addition, each of these groups need professional learning in best pedagogical practices, teaching environmental literacy through CA NGSS and CA CCSS, and teaching environmental literacy in a culturally relevant and competent way to the diverse populations in California. Furthermore, all educators need to have easy access to high-quality environmental literacy materials and be aware of the state-legislated Environmental Principles and Concepts.

To improve environmental literacy professional learning for educators will require system-level shifts, including implementing an "ecosystem" approach to professional learning for environmental literacy that links all the key domains where students learn; integrating this approach into all phases of professional learning, including preparation, induction, ongoing capacity building, and evaluation; and ensuring that environmental literacy professional learning systems are culturally relevant and work with the communities they serve to be most responsive to the state's diverse populations of educators and students. Achieving this will require: (1) policy changes, such as changes to credentialing requirements; (2) increased access to high-quality professional opportunities and learning resources; and (3) improved systems of support and connectivity between educators.

Ensuring Integration Between Formal and Informal Education Systems and with Current Initiatives

This work team focused on the ways in which environmental literacy efforts can be integrated within and across systems. As a component of this work, the team examined how to connect environmental literacy to the California Standards such as the CCSS, NGSS, and the state's Environmental Principles and Concepts; how to connect to emerging frameworks; and how to provide professional learning opportunities to formal and informal educators. The team especially focused on ways to maximize the use of resources, including existing laws and current CDE systems.

The team focused attention on way the CREEC Network could be utilized and strengthened as a tool for ensuring integration between formal and informal education systems. An expanded CREEC Network is one important way to have a statewide, leveraged, real-time environmental literacy system (see Appendix 2).

The goals of this team centered on broadening awareness of environmental literacy, advancing integration of environmental literacy into the K-12 education system, including environmental literacy as part of teacher/administrator training, and strengthening collaboration between formal and informal educators and education systems.

Defining Learning Outcomes and Assessment of Environmental Literacy

The effort to strengthen environmental literacy among all of California's K-12 students requires a clear definition of environmental learning outcomes and strategies to measure whether or not those outcomes are being met. To determine if environmental literacy learning outcomes are met requires a coherent system to assess the environmental literacy of students and to evaluate the effectiveness of environmental education in formal and informal settings. This effort must be integrated with the following: the Environmental Principles and Concepts, California Standards including the CCSS and NGSS; California Education and the Environment Curriculum (EEI); existing CDE assessment tools, structures, and surveys; the CDE Green Ribbon Schools Award and Recognition Programs; and other existing and newly created assessments. The recommendations provided by this Blueprint builds on the strong foundation of significant and sustained efforts in California by environmental educators in schools, informal environmental organizations, government agencies and non-profits over the past decade and a half.

The work team definition of Environmental Learning Outcomes is a synthesis of best practices in California and nationally and was shaped by the definition of environmental literacy adopted by the Task Force in October. Environmentally literate persons demonstrate ability in each of these four areas: knowledge of environmental processes and systems, skills for understanding and addressing environmental issues, attitudes toward the environment, and motivation and action for personal and civic responsibility.

To improve learning outcomes, assessment, and evaluation, we recommend that the CDE, in addition to adopting the definition of Environmental Learning Outcomes, implement strategies to: improve existing and proposed statewide assessments of student learning; develop portfolio guidelines for documenting student growth; create a survey of attitudes, motivations, and actions; develop and implement a green schools baseline assessment; address resource inequity that impacts environmental literacy; support the partnership between formal, school-based and informal environmental education organizations; and use this Blueprint for Environmental Literacy to develop annual goals to enhance environmental literacy and report progress.

Cultivating Sustainable Funding Sources for Environmental Literacy

In California, environmental education has never been a funding priority or seen as an integral part of the traditional curriculum. In fact, the legislature declares in California Education Code Section 8703, "without appropriate long-term funding, and without effective programs to encourage efforts and innovations at the school district level, and without needed materials and meaningful outdoor study opportunities, conservation education will remain a stepchild in the crowded family of public education."

A comprehensive set of sustainable funding strategies must advance environmental literacy for all students, leverage existing funding streams while building a network of support to efficiently identify, develop, and advocate for new ones. Environmental literacy professional learning for formal educators (pre-K-college), informal providers, school administrators, and facilities managers will have a greater impact if there is sustainable, long-term funding.

Developing a sustainable funding matrix will require regional and statewide philanthropic cooperation, the robust use of districts' Local Control and Accountability Plans, as well as the State Superintendent of Public Instruction (SSPI) working with the Governor, Secretary of Natural Resources, and the Secretary of the California Environmental Protection Agency, and other state agencies to tap into sustainable funding resources such as the Environmental License Plates Funds (and potentially developing an environmental literacy specific License Plate).

Statewide and national advocacy efforts will also be required to develop and secure sustainable funding for environmental literacy. Nationally, a multi-state consortium should be formed to advocate for federal funding for NGSS professional development. Within California, the SSPI has the opportunity to work with the California State Legislature and statewide philanthropic partners to advocate for a fully funded implementation of CA NGSS with robust professional development and teacher support and a fixed level of focus on environmental, environment-based, and outdoor education strategies that promote environmental literacy. Advocacy efforts must also include assessment of the support for a voter-approved initiative to fund the continued environmental education of all students in California.

Appendix 2: California Regional Environmental Education Community (CREEC) Network

Recommendations for Strengthening the CREEC Network

The following sections contain recommendations from both the Task Force and the CREEC Network Regional Coordinators focused on redefining the purpose and role of the CREEC Network. The recommendations suggest how the CREEC Network could provide greater levels of support for environmental literacy locally, regionally, and statewide and how an expansion of the CREEC Network's scope and reach could support the goals and recommendations outlined in this Blueprint. The CREEC Network currently receives very limited funding to support the work of CREEC Regional Coordinators and would need increased resources to support the work described below.

Redefining the CREEC Network Role

Locally/Regionally:

1. Serve as a convener and hub among schools, districts, and offices of education as well as with key local stakeholders including nonprofit providers, local government, and interested businesses.
2. Help informal providers in their regions to understand and implement the California Common Core State Standards (CA CCSS), California Next Generation Science Standards (CA NGSS), and the future new History-Social Science Curriculum Frameworks in programs offered to local schools.
3. Build local collaboratives/partnerships with key nonprofits, government agencies, foundations, and businesses to achieve common goals to support environmental literacy.
4. Convene the environmental literacy providers in all counties in each region to support the alignment of programs and professional development opportunities.
5. Collaborate more deeply with the green school, school gardens, farm to school, and living schoolyard movements to provide more service learning trainings for school facilities staff on supporting a range of projects related to school facilities, grounds, and operations.
6. Provide curriculum, sustainability, and funding specialists for each CREEC region and ultimately each school district.
7. Work with providers and teachers to develop and implement in and out of classroom learning curricula and activities.
8. Facilitate efforts to gather and use school-level information regarding program implementation to identify opportunities for improving programs.
9. Improve outreach to districts, schools, and students that are under-served by environmental literacy efforts.
10. Adapt/create tools for CREEC Regional Coordinators and providers to assess program alignment to CA NGSS and other relevant standards.

Statewide:

11. Strengthen the capacity of the CREEC Network to educate state policymakers regarding the benefits of expanding environmental education.
12. Establish and participate in a state-level advisory or coordinating council that provides guidance and common messaging across the state regarding the value and importance of environmental literacy to formal education and career readiness.

13. Convene the CREEC Regional Coordinators for professional development, networking, and participation in statewide planning and collaboration.
14. Increase operational support for the CREEC Network to a level that provides for a minimum of one full-time employee per region.
15. Develop and implement updated training for CREEC Regional Coordinators focused on culturally competent teaching strategies.

Professional Learning and Resource Sharing:

16. Strengthen the capacity of the CREEC Network to make meaningful connections between informal and formal education providers and help informal providers become aware of the instructional needs, requirements, and policies of the formal education system. In turn, inform formal educators about the offerings and areas of expertise of informal education providers.
17. Expand the role of the CREEC Network to provide professional development for formal educators on a range of topics related to teaching outdoors, providing hands-on learning experiences, and using green school buildings and grounds as teaching tools.
18. Work with local school districts to design, implement and fund environmental literacy programs that are aligned with state academic standards.
19. Work in tandem with other trainers to provide professional learning opportunities to county-level administrators, school-level teachers, and providers on how environmental education is linked to and integrated with the CA CCSS, CA NGSS, the History-Social Science standards, and STEM education.
20. Showcase ways of utilizing a variety of environmental education resources such as curricular materials, local environmental literacy opportunities, and connections with resource professionals to highlight "real world" examples and career pathways.

CREEC Portal/Website:

21. Strengthen the CREEC Network's capacity to provide and promote a resource portal for formal and informal environmental educators that includes: standards-aligned resources; professional learning resources and materials; current best practices and research on environmental education; and guidance regarding funding opportunities related to federal, state, and philanthropic grants.
22. Streamline the CREEC website such that all providers are identified on the resource directory, a calendar of events is included, and regular news is shared with visitors and subscribers.
23. Improve the CREEC online resource directory to include a filter for high quality environmental education programs, including those that support History-Social Studies and ELA standards.

Local/Regional Funding:

24. Work with school district administrators to help them understand the ways environmental literacy can support their instructional goals and identify how existing funding streams can be used strategically for environmental education.
25. Work with county offices of education and school districts to include environmental literacy in Local Control and Accountability Plans and support the use of Local Control Funding Formula (LCFF) funds for environmental literacy.
26. Participate in collaborative grant-funded projects with other stakeholders to provide professional development and implement school site environment-based education projects.

27. Build relationships with local funders/foundations/resource agencies/environmental literacy groups to identify possible matching projects for funding in the local community in support of CREEC-provider collaboration.
28. Support Math and Science Partnership grant recipients with environmental literacy resources for their projects.
29. Help informal education providers to be more understanding of and responsive to the needs of schools.
30. Co-create professional learning programs with teachers and providers. CREEC could attract funding for providing both teachers and providers with CA NGSS-based professional development.
31. Engage funders as stakeholders (within regional advisory groups) and replicate successful models focused on reaching out to local STEM-based industries for support.

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37. This figure uses the following growth sectors to represent the green economy: Renewable energy generation, energy efficiency, clean transportation, energy storage, finance and investment for green project financing and insurance and emissions trading and offsets, advanced materials, and energy infrastructure. See: Environmental Defense Fund/Collaborative Economics. Seven Growth Sectors Driving California's Clean and Efficient Economy. 2012. Retrieved May 1, 2015 from http://www.edf.org/sites/default/files/EDFSevenSectors-5.24.2012pdf.pdf.

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