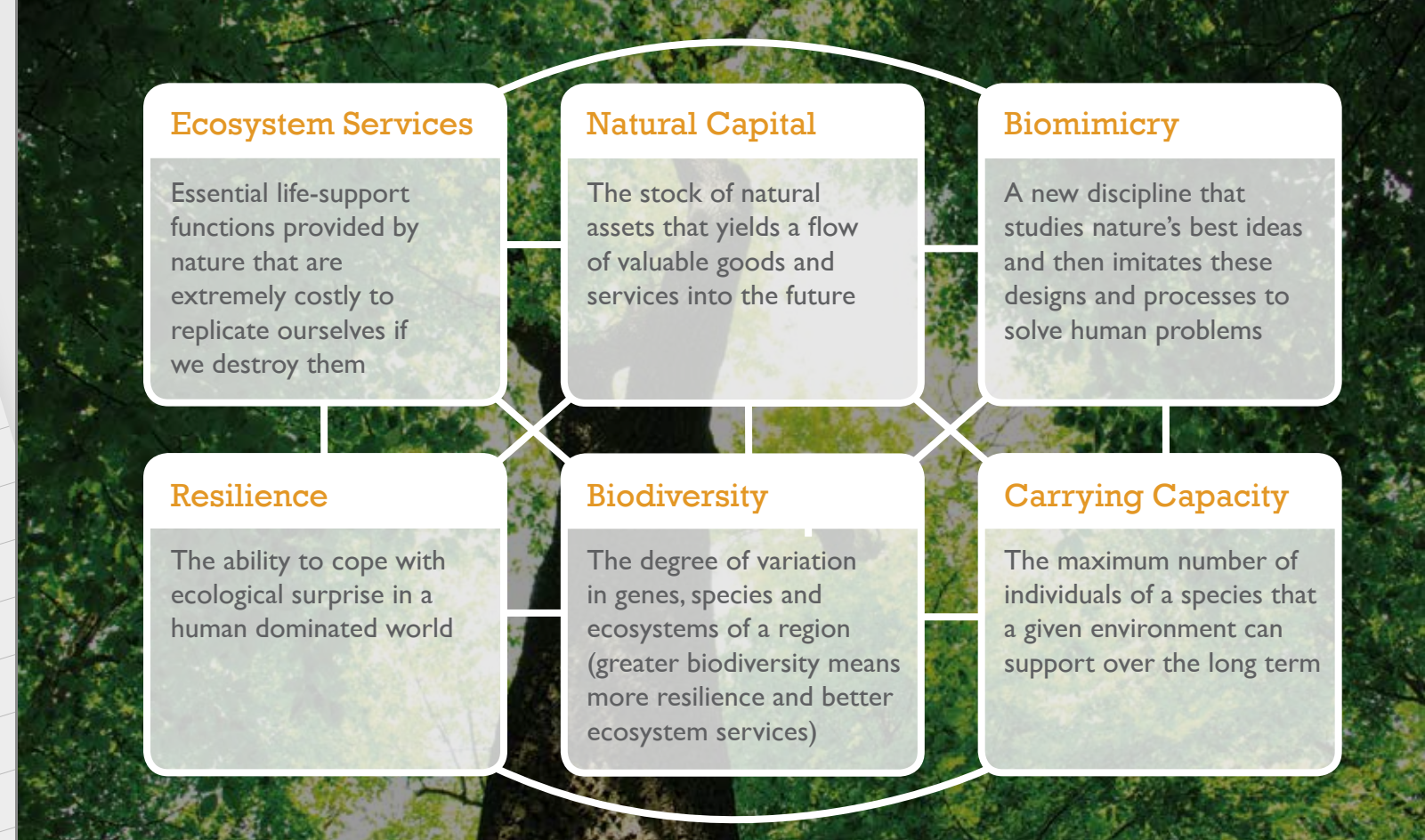


# Educating for a Sustainable Future

**A**re you aware that, even if you never set foot outside your house, you're still deeply connected to nature? Have you ever considered that the cereal you eat each morning is made possible only due to the wind (thanks to pollination), or that the glass of clear, clean water from your faucet was likely purified for you by a wetland or the root system of an entire forest? These are examples of the new concept of "ecosystem services": those essential life-support functions provided by nature that are extremely costly to replicate ourselves if we destroy them.

A new way of understanding how critically dependent our lives are upon nature's support is emerging. Much of this new perspective is grounded in the growing recognition of the interconnectedness and interdependency of all life on the planet. New concepts such as natural capital, biomimicry, carrying capacity, resilience and biodiversity along with ecosystem services and many others are illuminating

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## Ecosystem Services

Essential life-support functions provided by nature that are extremely costly to replicate ourselves if we destroy them

## Natural Capital

The stock of natural assets that yields a flow of valuable goods and services into the future

## Biomimicry

A new discipline that studies nature's best ideas and then imitates these designs and processes to solve human problems

## Resilience

The ability to cope with ecological surprise in a human dominated world

## Biodiversity

The degree of variation in genes, species and ecosystems of a region (greater biodiversity means more resilience and better ecosystem services)

## Carrying Capacity

The maximum number of individuals of a species that a given environment can support over the long term

our deep relationship with the natural world, and these concepts are forming a new foundation for the field of environmental literacy.

Environmental literacy has profound implications for how we understand our place on this planet. It grows out of the deep recognition that we humans are part of a larger system that has important limits as well as rules by which we have no choice but to live if the human species is to survive over the long term. It also incorporates "systems thinking"—a way of thinking that emphasizes the qualities of relationships, connectedness and context present in any system, whether an ecosystem or a school system.

This new perspective is emerging not a moment too soon, as we wrestle with finding systemic solutions to

the interconnected challenges of mitigating and adapting to climate change; sustaining our nation's lands, waters and other natural resources as well as our economic competitiveness; achieving energy independence and security; creating more livable communities; and transitioning to a green economy.

## Successful Models for Teaching Environmental Literacy

Successful models of schools committed to environmental literacy are leading the way. They share a set of embedded values in common that drive all school activity toward helping students become true citizens of the 21st century. The best of these model schools employ a comprehensive "whole school" approach, seeking to both produce environmentally literate graduates as well as to eliminate

their negative environmental impact, while using their own built and natural environment as a learning laboratory and a model of best practice for their host communities.

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A teaching garden at the Environmental Charter High School provides hands-on learning that compliments the vigorous in-classroom curriculum.



For example, the Environmental Charter High School in Los Angeles combines “a rigorous college-preparatory curriculum with hands-on learning opportunities in the community.” While 80 percent of the students are financially disadvantaged, all students must be admitted to a four-year university in order to graduate. The school’s philosophy employs project- and service-based learning as well as an interdisciplinary approach that incorporates environmental science and ecology-inspired activities across all disciplines. In addition to classroom programs, students are required to apply concepts and skills gained in class to problem-solve local civic and environmental issues. Founded by a group of parents, educators, businesses and non-profits in 2000, the school has experienced dramatic improvements in academic results. The school was called “a model of learning” by President Obama,<sup>1</sup> and *US News & World Report* placed it in the top 3 percent of US public high schools.

The Willow School, a small independent K–8 day school in New Jersey, is committed to combining academic excellence, the joy of learning and experiencing the wonder of the natural world. With the help of the Cloud Institute for Sustainability Education, the school faculty has seamlessly embedded the attributes of sustainability education across the curriculum. The buildings and grounds are a laboratory for academic inspiration and sustainability education where students develop a sense of place, become stewards of their environment and learn to appreciate their role in restoring balance to the natural world. For example, students have the opportunity to plant, weed and harvest crops; in social studies, they study cultures and consider the reciprocal relationship between humans and their environment.

**Environmental Charter High School • Los Angeles, CA**

- Rigorous college-preparatory curriculum
- Hands-on learning opportunities in the community that support real-world applications
- Interdisciplinary approach that incorporates environmental science and ecology-inspired activities



Photo courtesy The Willow School

**The Willow School • Gladstone, NJ**

- Building and grounds are a laboratory for academic inspiration and sustainability education, with meadows, butterfly gardens, water harvesting and wetland
- Students have opportunity to plant, weed & harvest crops
- School faculty have seamlessly embedded the attributes of sustainability education across the curriculum

**The Need for Systemic Change**

Successful model schools offer hope. But with over 100,000 public K–12 schools in the nation, they remain a drop in the bucket. After 30 or more years of environmental education, how environmentally literate are our students? All indications are that we fail as a nation to grasp those essential insights necessary to function on a daily level as proper stewards of both our environment and our children’s future. While our awareness of environmental issues appears to be growing, our understanding of these issues is not, and this gap seems to be increasing at the very moment in history when it needs to be rapidly shrinking. For example, a recent study by the Organization for Economic Co-operation and Development (OECD) found that the average US student scores only just above basic proficiency in environmental science, and ranked the US 34th out of 57 countries.<sup>2</sup> While the US ranked above Uruguay and Thailand, we fell below Estonia, Croatia and the Slovak and Czech Republics as well as Canada, Japan, Australia, Russia and the UK.

The school grounds were designed to be integral to all aspects of the curriculum, incorporating natural meadows, butterfly gardens, water harvesting, hedgerows and a constructed wetlands to filter wastewater so it provides clean water to the groundwater system.

Evergreen Community Charter School, a public school in North Carolina, aims to prepare students for successful lifelong learning, environmental responsibility and service. Environmental education and thinking critically about community issues are woven throughout the curriculum, fostering an understanding of ecology and environmental stewardship as well as a sense of respect and wonder for the natural world. Every student is empowered to take action and seek solutions for environmental concerns. Students learn from local experts in many fields, including natural history and conservation, government, business, current events, education and social studies. The school’s property is home to many sustainable features such as rooftop solar panels, biodiesel-powered school buses, rain gardens, organic gardens, a greenhouse, bioswales, a natural trail and woods play area and composting systems.

**Evergreen Community Charter School • Asheville, NC**

- Rooftop solar panels, rain & organic gardens, composting
- Aims to prepare students for successful lifelong learning, environmental responsibility and service
- Students learn from local experts in many fields, including natural history and conservation, government, business, current events, education and social studies



Photo courtesy Evergreen Community Charter School

In students' knowledge about the environment and environment-related issues, the US ranks:



• While the US ranked above Uruguay & Thailand, we fell **below** Estonia, Croatia, the Slovak and Czech Republics, Canada, Japan, Australia, Russia and the U.K.

Systemic change—changing whole education systems, not just changing individual schools one by one—is clearly needed to move our education system quickly in the right direction. One of the more promising systemic change efforts is California's Education and Environment Initiative (EEI), a \$9 million partnership between the State Board of Education, the Office of the Secretary for Education, the State Department of Education and the California Natural Resources Agency. The EEI curriculum, comprising 85 units teaching science and history-social science academic standards, is expected to bring environmental education into the classrooms of 1,000 California school districts serving 6 million students by using the environment as a context for standards-based instruction. The EEI website notes: "Everyone and everything is linked to the environment. California's economic prosperity, the health of its citizens, in fact, our whole future depends on the health of the environment in which we live. Integrating education about the environment into our K-12 school system will make learning relevant to today's world and prepare

students to be knowledgeable citizens who can make informed decisions about California's future."<sup>3</sup> Unfortunately, this terrific state-level initiative is the exception rather than the rule.

### The Need for Leadership

Systemic change needs to be led from the top as well as the bottom. As acknowledged by President Obama, the transition to a clean, green economy needs to be a top priority—a transition that recognizes and supports the vital connections between climate change, economic stimulus, energy security and job training. Navigating this transition to a green economy will require creating a broad base of environmentally literate citizens who can make well-informed decisions as consumers, workers, business owners, investors and voters. Each year, 3 million graduates enter the workforce armed with the attitudes, skills and knowledge either to advance a green economy and a sustainable future or to continue "business as usual." The impact, good or bad, of each of these 3 million individuals lasts a lifetime.



**California's Education & Environment Initiative (EEI) curriculum is expected to bring environmental education into the classrooms of 1,000 California school districts serving 6 million students.**

**"96% of educators reported that students developed higher-level, critical thinking skills than those of their traditional peers,"**



### Environmental Education Improves Learning and Behavior

Environment-based education is much more than learning about the environment. The natural world is a foundation for acquiring learning skills and creating a wider learning context, all of which are guided by teachers using proven educational practices.

Studies show that environment-based education leads to higher scores on standardized tests. Ninety-six percent of educators from 40 schools reported that students developed higher-level, critical thinking skills than those of their traditional peers. Ninety-eight percent reported increased ability to think creatively. Ninety-seven percent reported greater proficiency in solving problems and thinking strategically and 89 percent saw a better application of systems thinking.<sup>1</sup>

Environmental education improves more than just test scores. Studies also show increased attendance, fewer discipline problems, better behavior and increased enthusiasm for learning.

## from the editor

One step in the right direction is the Green Ribbon School Award recently announced by the US Secretary of Education and the EPA Administrator, and originally conceived by the Campaign for Environmental Literacy. The Department of Education will honor with a Green Ribbon those schools which come the closest each year to achieving three interrelated goals: 1) 100 percent of the school's graduates are environmentally literate, 2) the school has a "net zero" environmental impact, and 3) there are no negative health impacts on students or staff from participating in school. More than just another award program, it puts the weight of the US Department of Education behind a comprehensive vision for green schools.

Few doubt that we will leave our children a more problematic and difficult world than the one we inherited from our parents. We are morally bound to provide them with the knowledge, skills and training required for coping with this new world. Parents and local community leaders can encourage their schools to incorporate environmental education and sustainability principles and practices. It just takes a bit of focus and dedication to make it happen. Given the degree to which the environment affects everything from our economy and health to our security and well being, let's do what it takes to get the US to rank first in environmental literacy.

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*Dr. James Elder is a prominent environmental/sustainability education policy expert and strategist who founded the School for Field Studies, building it into the nation's leading environmental field program for undergraduates. He subsequently founded the Campaign for Environmental Literacy (CEL: [www.FundEE.org](http://www.FundEE.org)), a national advocacy network of stakeholder organizations. With the help of its partners, CEL has restored \$200 million in federal environmental/sustainability education funding, passed the Higher Education Sustainability Act and initiated both the No Child Left Inside Act and the Ocean, Coastal and Watershed Education Act.*

