



# Los Angeles Environmental Learning Center

Demonstrating and teaching sustainable  
water resources management

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**ELC is located at the Hyperion Treatment Plant in what was built in the 1970s as the facility's administration building. The two-story building, which had been unoccupied for 10 years before ELC moved in, sits next to Dockweiler Beach and includes 1858 m<sup>2</sup> (20,000 ft<sup>2</sup>) of space on 0.8 ha (2 ac).**

**ELC's location also provides students convenient access to tour and learn firsthand about the wastewater treatment process.** Bureau of Engineering

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ecognizing the need to educate children and adults about sustainable water and solid resources management as a catalyst to change behavior, the City of Los Angeles Department of Public Works' bureaus of Sanitation and Engineering developed the Los Angeles Environmental Learning Center (ELC). It is ELC's vision to become the leading center for environmental learning, inspiring future generations to protect public health and the environment through sustainable practices.

The City of Los Angeles – located in a naturally dry area with warm temperatures, little rainfall, and few local sources of water – relies heavily on imported water. Local groundwater sources account for only 9% of the total supply.

While the city receives 381 mm (15 in.) of rain each year, it often all comes during a few short months – or even days – resulting in peak stormwater flows. Instead of replenishing groundwater, these flows move through concrete-lined channels to the ocean.

To meet its water and stormwater management needs and provide

a more sustainable future, Los Angeles has invested in multibenefit and integrated runoff management projects that capture and use stormwater. The city also has expanded nonpotable uses of recycled water.

ELC, which has been designated by the U.S. Green Building Council (Washington, D.C.) as a LEED (Leadership in Energy and Environmental Design) Gold facility, demonstrates sustainable water management through its design and operation, and provides space to teach sustainable water management with interactive learning exhibits.

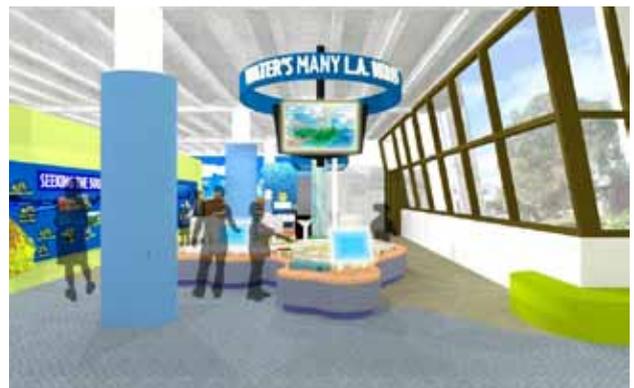


FIRST FLOOR GALLERY

CLEAN WATER AND WATERSHED PROTECTION



Illustrations by Amaze Design



## The exhibits

The first-floor gallery of interpretive exhibits focuses on clean water and watershed protection.

Visitors first learn about drinking water and how water gets to Los Angeles, as well as participate in an exhibit that helps them understand best practices for water use.

The first exhibit experience at ELC presents the role of water in visitors' daily lives within the contexts of Los Angeles' urban infrastructure and watersheds, water's path from source to outflow, and the larger water cycle. Upon arrival, a large

topographic map of the Los Angeles watersheds (Los Angeles River, Ballona Creek, Santa Monica Bay, and Dominguez Channel) with three large monitors above welcomes visitors and sets the scene for their exploration of water.

The Water's Many L.A. Ways exhibit talks about the region's sources of water. Only 9% comes from groundwater, and 1% is recycled water; the rest is imported from the Sacramento Delta, Colorado River, or Mono Lake. From 2005 to 2010, the region has imported an average of 766 million m<sup>3</sup> (621,000 ac-ft) each year.

The My Water, My Choices panel indicates that the average person uses 454 L (120 gal) of water per day and suggests water conservation measures.

The Urban Lifelines and Storm to Sea exhibits cover the city's stormwater programs and wastewater collection system. The goal of these exhibits is to introduce the urban support network beneath the streets of Los Angeles and emphasize that besides drinking water, Los Angeles has two distinct water management systems: storm and sewer. The wastewater and stormwater systems both go to receiving waters. However, in Los Angeles, the sewer system goes to the water resource recovery facilities (WRRFs), and the stormwater is treated separately. Throughout the dimensional display, there are various interpretive panels, such as a house that models best practices to maximize stormwater capture, including use of rain barrels, rain gardens, bioswale, permeable pavers, and drought-tolerant plants.

The Wastewater Treatment Wall represents the treatment processes at the city's four WRRFs and highlights their end

results – ultimate discharge to the river or ocean, as well as reuse. The goals of this exhibit are to let visitors know that people need water, but the way we use water affects its quality and availability, and to encourage visitors to understand and appreciate the city's responsibilities for wastewater management and treatment. The dramatic entrance created by a slice of 3600-mm (12-ft) pipe provides a transition from urban infrastructure to wastewater and makes clear the underlying reason for the process of wastewater treatment – to return the water to the water cycle as clean as possible to protect public health and the environment in Los Angeles. This exhibit seeks to communicate the many uses of recycled water and to demonstrate the science of water recycling. Visitors engage in an activity to explore water quality testing and learn how the city ensures the safety of treated wastewater. Recycled water produced from the city's WRRFs is used for industrial cooling, irrigation, and groundwater replenishment and as a seawater intrusion barrier.



The second-floor gallery discusses solid resources and shows how Los Angeles is on the road to zero waste.

The exhibits are split into two parts: what can be done at home and what the city does with trash. Every city handles its solid waste differently, and these exhibits are specific to Los Angeles.

Each visitor follows his or her solid materials after they have been put out for collection, and along the way, the exhibits identify visitors' personal responsibility and encourage volunteer action needed in the city's waste management process. This learning experience is intended to support high recycling behaviors and improve the disposal habits of its target audience.

Los Angeles already has a 72% diversion rate from the landfills and is working continually to increase the diversion rate to 75% next year, with a long-term objective of achieving zero waste. The goal for 2025 is to increase the diversion rate to 90%. Amaze Design



The walkway leading to ELC's entrance is made of permeable pavers to enable percolation of stormwater. The stream along the right is connected to the wetlands, which is supplied by recycled water from the West Basin Municipal Water District, which receives and treats secondary effluent from the Hyperion Treatment Plant. The plants along the path are drought-tolerant native species. Bureau of Engineering

## The facility

ELC was designed and constructed to maximize efficient water use and management. Key components in the building and adjacent grounds include stormwater runoff capture and percolation through permeable pavers and a vegetated swale, recycled-water use and smart controls for irrigation, recycled-water use for toilets, water-free urinals, a green roof system, and a constructed wetland.

In addition, ELC incorporated other sustainable building practices, including construction and demolition recycling, solar panels, a demonstration wind turbine, a solar water heater, chilled-beam air conditioning, skylights, double-pane windows, a bike rack and showers (to support commuting alternatives), and indoor air quality features (low-volatile-organic-compound-emitting paints and carpet).

**The terraced wetland, built on 641 m<sup>2</sup> (6900 ft<sup>2</sup>), starts shallow and meanders toward a deeper end. It is fed with recycled water from the West Basin facility and stocked with mosquito fish. The mosquito fish help with pest control without the use of harsh chemicals that could harm the workers and the environment.**

Bureau of Engineering



ELC also houses a 94-seat auditorium and a learning lab classroom. ELC's approach to program development is to maximize the use of the center's exhibits and other features. ELC envisions students using the facility to increase their knowledge of collecting, cleaning, and recycling stormwater, wastewater, and solid waste. It also will give them an opportunity to learn more about careers in the environmental field. Bureau of Engineering





Construction on the wetland began in 2009, with the first early planting in 2011. By 2012, the plants had become more established. The Wetlands Pond exhibit includes a viewing deck on the southeast side for visitors to observe and learn about its benefits in nature. The decking is made from recycled materials. Bureau of Engineering



Another outdoor feature of ELC is a bioswale that captures runoff from the building roof drains for percolation. It is lined with native grasses and prevents site runoff and pollution to adjacent areas. The pedestrian bridge above it leads to the beach across the street.

The bioswale is also an aesthetic improvement to the site. To build it, the designers relocated some facilities and demolished abandoned ones. Bureau of Engineering



ELC's roof also has many sustainable features. The building's green roof is irrigated with recycled water, and skylights provide natural light to the second floor. A set of 24 photovoltaic panels – 175 W each – generates electricity to be sent to the grid. A demonstration-size wind turbine also sits on the roof for visitors to see. A solar water heater sitting in the sun preheats the building's hot water, reducing the load on the conventional water heater.

One of the project's major construction elements was to add a stairway to the roof to make it open to the public to show off these features. Visitors also can see the treatment processes at Hyperion, as well as the 1.6-km (1-mi) and 8-km (5-mi) outfall and Santa Monica Bay. Bureau of Engineering

Building ELC required significant resources and efforts. To convert the building, the cost of construction, including the energy-efficient features, totaled \$7.9 million. This work was completed in June 2011. Work on the exhibits began in July 2012 and is expected to be complete in April 2013 at a cost of \$3.4 million.

The ELC design and construction team included many stakeholder groups. Several city agencies participated. Engineering consultants from CDM Smith (Cambridge, Mass.), along with many subcontractors, worked on the architectural, civil, electrical, and structural design. Amaze Design (Boston) created the look and feel of the exhibits.

ELC is planning for its grand opening to the public on April 22, 2013, which is Earth Day.

ELC helps the Bureau of Sanitation increase public awareness about the services it provides, and more importantly, fosters

learning for children and adults to change their behavior about water use and solid resources. This center also will serve as a community resource for environmental education, enabling visitors to learn how their day-to-day activities affect the environment and thereby helping to achieve cleaner and greener neighborhoods.

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