

# 2014 CALIFORNIA ACADEMY OF SCIENCES CLIMATE ACTION PLAN

## DATA YEAR: FISCAL YEAR 2012-2013

PREPARED BY: ARI HARDING, P.E.

DATE: MARCH 28, 2014

### 1. INTRODUCTION 3

### 2. DEPARTMENTAL PROFILE 3

2a. Departmental Mission	3
2b. Departmental Budget	3
2c. Number of Employees	3
2d. Facilities	3
2e. Vehicles	4
2f. Departmental Contact Information	4
2g. Other Sustainability or Environmental Plan	4

### 3. TOTAL ENERGY CONSUMPTION AND CARBON FOOTPRINT 5

3a. Facilities List Verification Statement	5
3b. Fiscal Year 2012-2013 Facilities Energy Consumption and Carbon Emissions	6
3c. 5-Year Historical Analysis of Facilities Energy Consumption and Carbon Emissions	6
3d. Vehicle List and Fuel Data Verification Statement	6
3e. Fiscal Year 2012-2013 Vehicle Fuel Consumption and Carbon Emissions	6
3f. 5-Year Historical Analysis of Vehicle Fuel Consumption and Carbon Emissions	7

### 4. EFFORTS IN FACILITIES ENERGY REDUCTION 8

4a. Energy Efficiency & Retrofit Projects	8
4b. Energy Benchmarking & Compliance with the Energy Performance Ordinance	8
4c. Compliance with the Commercial Lighting Efficiency Ordinance	8
4d. Information Technology	8
4e. Renewable Energy	8
4f. Green Building	9

### 5. EFFORTS IN WATER USE REDUCTION 9

5a. Water Data Verification Statement	9
5b. Fiscal Year 2012-2013 Water Consumption and Wastewater Discharge	9
5c. 4-Year Historical Analysis of Water Consumption and Wastewater Discharge	9
5d. Water Conservation	9

### 6. EFFORTS IN VEHICLE FUEL REDUCTION 9

6a. Compliance with the Healthy Air and Clean Transportation Ordinance	9
6b. Transit First Campaign	10
6c. Biodiesel	10

**7. OTHER SUSTAINABLE PRACTICES 11**

7a. Zero Waste	11
7b. Carbon Sequestration / Urban Forest	11
7c. Community Wide Impact	12
7d. Resiliency and Adaptation	13

**8. REPORT SUMMARY AND DEPARTMENTAL CLIMATE ACTION GOALS 14**

**APPENDICES 15**

## 1. INTRODUCTION

In 2008 the City of San Francisco began to track its greenhouse gas (GHG) emissions and create climate action plans at the city department level per direction by the Board of Supervisors. This work is captured in Department Climate Action Plans (DepCAPs).

The California Academy of Sciences is a non-profit entity in partnership with the City and County of San Francisco. The oldest scientific research institution in the Western United States, the Academy is the world's greenest museum, and the only institution in the world with a natural history museum, aquarium, and planetarium under one roof. Founded in 1853 by seven scientists and physicians with a passion to discover and protect the flora, fauna, and natural environments of California, today's Academy pursues its mission to explore, explain, and sustain life through global research, exhibitions, and educational engagement. The Academy has welcomed more than 7 million visitors since opening its new facility in late 2008, and is projected to serve 1.3 million visitors annually. The Academy has completed LEED Platinum certifications for New Construction and for Operations and Maintenance.

The Academy is committed to sustainable operations, and has continued to reduce GHG emissions and water consumption in Fiscal Year 2012-2013, as well as increasing online presence and continuing to promote conservation, science education, sustainability, and the study of biodiversity.

## 2. DEPARTMENTAL PROFILE

### 2A. DEPARTMENTAL MISSION

The mission of the California Academy of Sciences is to explore, explain, and sustain life. The Academy accomplishes this through global research, exhibitions, and educational engagement. The Academy has welcomed more than 8 million visitors since opening its new facility in late 2008, and is projected to serve 1.3 million visitors annually. The Academy also provides free access to San Francisco City school groups and greatly discounted access to school groups from surrounding communities.

### 2B. DEPARTMENTAL BUDGET

The Fiscal Year 2012 – 2013 budget included \$4,008,020 From the City and County of San Francisco, out of an \$83,286,889 Total Annual Operating Expense.

### 2C. NUMBER OF EMPLOYEES

Total Full-Time Employees: 411

Total Part-Time Employees: 227

### 2D. FACILITIES

Located at 55 Music Concourse Drive, The California Academy of Sciences is a 5 story building with a 120,000 square foot footprint, and a total building square footage of 450,000. The Academy features the Steinhart Aquarium, a digital planetarium, a natural history museum, and rotating exhibits from around the world. Sustainable features of the facility include a 2.5 acre living roof, solar panel array, significant use of natural ventilation, radiant floor heating, and extensive access to daylight. The facility was designed and built to meet LEED 2.2 Platinum certification for new construction.

The main public floor is naturally ventilated using a system of automated windows, vents and skylights. All other areas of the facility are mechanically ventilated using conventional HVAC systems, though most office spaces have access to manually operated windows for additional ventilation.

The research facility includes extensive collections of marine life, insects, mounted birds and mammals, geological samples, and anthropological specimens and artifacts. The Academy also houses laboratory facilities used for sample preparation and investigation.

The Steinhart Aquarium maintains a collection of over 36,000 live animals, including marine life, snakes, lizards, birds, and butterflies. The aquarium management emphasizes sustainable collection and captive breeding programs.

## 2E. VEHICLES

The Academy owns and operates four gasoline-powered vehicles: A Ford F-250 truck, a Ford E-150 van, a Toyota Tacoma, and a Honda Odyssey

## 2F. DEPARTMENTAL CONTACT INFORMATION

Ari Harding is the Director of Building Systems and Climate Action Plan coordinator.

Kevin Manalili is the Director of Building Operations.

Allan Madison is the Zero-Waste coordinator.

## 2G. OTHER SUSTAINABILITY OR ENVIRONMENTAL PLAN

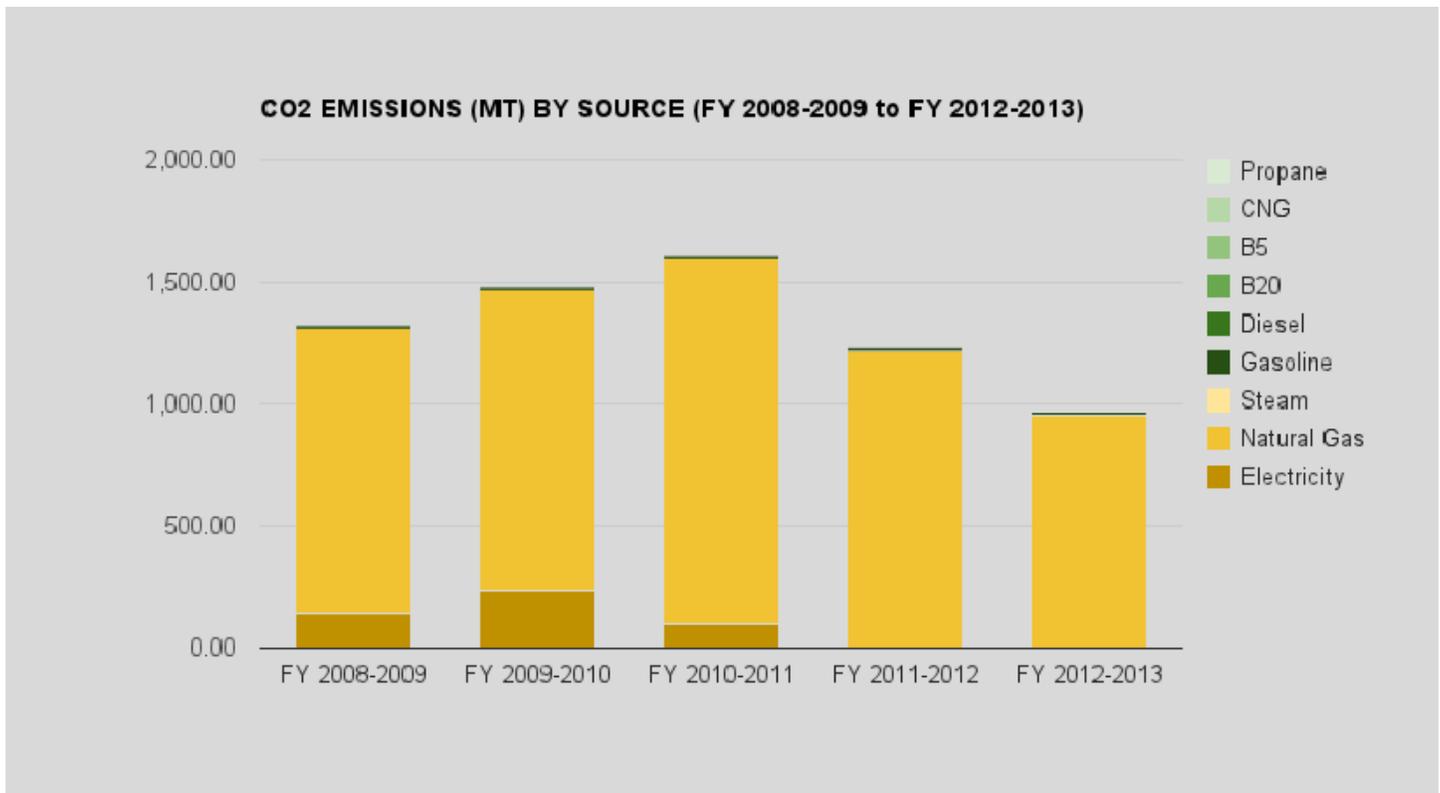
The California Academy of Sciences currently does not maintain a sustainability plan apart from this document.

### 3. TOTAL ENERGY CONSUMPTION AND CARBON FOOTPRINT

For Fiscal Year 2012-2013, The California Academy of Sciences total operational greenhouse gas (GHG) emissions was 966 metric tons of CO<sub>2</sub>. This is based on GHG emissions calculated from the department's consumption of facilities energy and vehicle fuels, which is described in the sections below.

The five year summary of Department's X's annual operational CO<sub>2</sub> emissions is summarized in the table and chart below. A 5-year historical analysis is provided in detail in the sections below.

FY 2008-2009 TO FY 2012-2013 ANNUAL DEPARTMENTAL CO <sub>2</sub> EMISSIONS (MT)					
	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Total CO <sub>2</sub> (mt)	1,323	1,480	1,606	1,231	966



The California Academy of Sciences has achieved a 35% reduction since Fiscal Year 2009-2010. This is due to the zero emission electricity provided by SFPU starting in 2011, and efforts in facilities energy and fuel reduction outlined in the sections below.

The Academy compares energy to FY 2009-2010 as a baseline because the Academy was not fully open at the beginning of FY 2008-2009.

#### 3A. FACILITIES LIST VERIFICATION STATEMENT

The list of facilities used by the Department of the Environment to calculate the FY 2012-2013 Departmental carbon footprint has been verified by The California Academy of Sciences to be accurate and complete. No major changes to operational energy usage is expected in the coming year.

### 3B. FISCAL YEAR 2012-2013 FACILITIES ENERGY CONSUMPTION AND CARBON EMISSIONS

Total Facilities Electricity in Fiscal Year 2012-2013: 12,811,740 kWh consumed, 0 metric tons of CO<sub>2</sub>

Total Facilities Natural Gas in Fiscal Year 2012-2013: 179,928 therms consumed, 954.88 metric tons of CO<sub>2</sub>

The California Academy of Sciences does not use steam.

### 3C. 5-YEAR HISTORICAL ANALYSIS OF FACILITIES ENERGY CONSUMPTION AND CARBON EMISSIONS

The tables below summarize The California Academy of Sciences annual facilities energy consumption and associated GHG emissions for the past five fiscal years.

FY 2008-2009 to FY 2012-2013 Departmental Facilities Energy Consumption					
Emission Source (Units):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Electricity (kWh)	13,735,492	13,095,434	12,981,510	12,933,205	12,811,740
Natural Gas (th)	220,659	233,591	282,150	229,473	179,928
Steam (lbs)	0	0	0	0	0

FY 2008-2009 to FY 2012-2013 CO <sub>2</sub> Emissions from Facilities Energy					
Emission Source (mt):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Electricity	139.22	228.01	96.73	0.00	0.00
Natural Gas	1,171.05	1,239.68	1,497.38	1,217.82	954.88
Steam	0.00	0.00	0.00	0.00	0.00
<b>Total Facilities Energy CO<sub>2</sub> (mt)</b>	<b>1310.27</b>	<b>1467.69</b>	<b>1594.11</b>	<b>1217.82</b>	<b>954.88</b>

Total GHG emissions from Building Energy use has decreased since Fiscal Year 2009-2010. This is primarily due to changes in electric power supplied by the City of San Francisco, and efforts to reduce energy usage at the Academy.

The Academy compares energy to FY 2009-2010 as a baseline because the Academy was not fully open at the beginning of FY 2008-2009.

Please refer to the section titled "Efforts in Facilities Energy Reduction" for details on reduction measures taken at the department.

### 3D. VEHICLE LIST AND FUEL DATA VERIFICATION STATEMENT

The California Academy of Sciences owns and operates four vehicles, including Ford F250 and Toyota Tacoma trucks, a Ford E150 van, and a Honda Odyssey. Vehicles are used regularly for science-related field trips, diving, and community education activities.

### 3E. FISCAL YEAR 2012-2013 VEHICLE FUEL CONSUMPTION AND CARBON EMISSIONS

The California Academy of Sciences used a total of 1351 gallons of gasoline in Fiscal Year 2012-2013, with an associated GHG emission of 12.05 metric tons of CO2.

### 3F. 5-YEAR HISTORICAL ANALYSIS OF VEHICLE FUEL CONSUMPTION AND CARBON EMISSIONS

Total gallons of fuel and GHG equivalents per year for the last five years are listed below.

FY 2008-2009 to FY 2012-2013 Departmental Fuel Consumption					
Fuel Type (Units):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Gasoline (gal)	1502	1485	1421	1534	1351

FY 2008-2009 to FY 2012-2013 CO2 Emissions from Mobile Fuel					
Emission Source (mt):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Gasoline	13.33	13.19	12.61	13.6	12.05

Total fuel use varies year to year depending on operational needs.

## 4. EFFORTS IN FACILITIES ENERGY REDUCTION

### 4A. ENERGY EFFICIENCY & RETROFIT PROJECTS

The California Academy of Sciences is engaged in a multi-year project to optimize the lighting for the Rainforest exhibit. To date, the Academy has been able to eliminate 54,000 Watts of light fixtures and replace them with 4,500 Watts of strategically placed fixtures, for a total reduction of 49,500 Watts, which were operating 14 hours per day. This improvement saves 252,945 kWh per year.

We also in the process of eliminating another 40,000 Watts of Rainforest lighting, to be replaced with 10,800 Watts of new fixtures, for a total reduction of an additional 29,200 Watts, also operating 14 hours per day. Completion of this project will result in a savings of 149,212 kWh per year.

Additional un-tracked lighting retrofits include installing LED lights in aquarium systems where possible in order to reduce the schedules of energy-intensive metal halide lights.

### 4B. ENERGY BENCHMARKING & COMPLIANCE WITH THE ENERGY PERFORMANCE ORDINANCE

In order to comply with the Existing Commercial Buildings Energy Performance Ordinance (Ord 17-11, SF Environment Code Chapter 20), The California Academy of Sciences assisted the SFPUC in producing the 2012 Energy Benchmarking Report for San Francisco Municipal Buildings by providing updated occupancy data specific to the primary EPA ENERGY STAR building category including weekly operating hours, and number of workers on main shift.

The 2012 Energy Benchmarking Report is available at <http://sfwater.org/modules/showdocument.aspx?documentid=4139>

Facility Type	# of Facilities Benchmarked for Department X per Facility Type	Page Number(s) in Benchmarking Report
Museum	1	17

Under the 2012 Energy Benchmarking Report, The California Academy of Sciences measured an Energy Use Index (EUI) of 151.8, which was the second lowest score in the Museum section of the report. The highest score was 302.7, and the lowest score was 52.8. The EUI score was 9.4% lower than the previous year.

### 4C. COMPLIANCE WITH THE COMMERCIAL LIGHTING EFFICIENCY ORDINANCE

All buildings owned by The California Academy of Sciences are compliant with the requirements outlined in the Commercial Lighting Efficiency Ordinance (SF Green Building Code).

### 4D. INFORMATION TECHNOLOGY

All desktop computers, notebooks and monitors purchased must have an Energy Star efficiency rating. All IT recommended laptop and desktop configurations must be Energy Star rated and all users must be guided towards these configurations when making purchases. If a user needs a non-standard configuration to meet a specific need, every attempt is made to find an Energy Star rated configuration that meets the user's need.

Sleep mode configuration is controlled by central server for all department systems which are not required to be on 24/7, such as life support and critical building management systems. Sleep mode is configured to engage after 20 minutes away from the machine, and employees are encouraged to turn off computers and monitors when unused. IT also configures, by default, double-sided printing for computers on the network.

### 4E. RENEWABLE ENERGY

The Academy facility includes a 171 KW (nominal) solar panel array. The system design includes 720 glass laminates each of which will contain 77 PV cells. The PV cells are specified as 125 mm single crystalline as manufactured by Sunpower Corp. of Sunnyvale, California and designated as model A-300. These cells are rated for 3.1 Watts of power each, at 20% minimum efficiency.

The system has generated a total of 960,514 kWh from August 2008 to July 2013, for an average of 195,360 kWh per year.

## 4F. GREEN BUILDING

The California Academy of Sciences has achieved two LEED Platinum Certifications: LEED for New Construction in 2008 and LEED for Existing Buildings Operations and Maintenance in 2011.

The Academy is planning on a second LEED for Existing Buildings Operations and Maintenance certification in 2016.

## 5. EFFORTS IN WATER USE REDUCTION

### 5A. WATER DATA VERIFICATION STATEMENT

The water account used by the Department of the Environment to calculate annual departmental water use has been verified by The California Academy of Sciences to be accurate and complete.

### 5B. FISCAL YEAR 2012-2013 WATER CONSUMPTION AND WASTEWATER DISCHARGE

The California Academy of Sciences used 13,446,796 gallons of water in Fiscal Year 2012-2013, and discharged 12,102,116 gallons.

### 5C. 4-YEAR HISTORICAL ANALYSIS OF WATER CONSUMPTION AND WASTEWATER DISCHARGE

Total water use at The California Academy of Sciences has decreased annually since 2009.

FY 2008-2009 to FY 2012-2013 Annual Water Consumption and Wastewater Discharge				
	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Water (gal)	15,896,496	15,384,116	13,873,156	13,446,796
Wastewater Discharge (gal)	14,306,846	13,845,704	12,485,840	12,102,116

Insert text here.

### 5D. WATER CONSERVATION

Water use is impacted by approximately 1.3 million visitors annually, in addition to water used for aquarium management. All public and private urinals are zero-water systems, saving 1500 gallons of water per day on average.

All of the aquarium systems are designed as re-circulating systems with advanced filtration and biological control systems to reduce water changes. Water consumption has decreased from FY2009-2010 by 2.4 million gallons, primarily due to operational improvements in aquarium water quality.

The Academy uses ground water supplied by the Parks and Recreation department to water the grounds and Living Roof when available. An automated system switches between municipal water and ground water to maintain water availability for the Living Roof Exhibit, with ground water as the default source.

In response to the current draught, the Academy is currently engaged in further water reduction efforts, including verifying that all irrigation and aquarium systems are leak-free and operating correctly, and reducing aquarium backwash cycles by 25%.

## 6. EFFORTS IN VEHICLE FUEL REDUCTION

### 6A. COMPLIANCE WITH THE HEALTHY AIR AND CLEAN TRANSPORTATION ORDINANCE

The Healthy Air and Clean Transportation Ordinance (HACTO) is a mandate that all City employees and departments should use sustainable transportation such as public transit, walking, ridesharing or biking to minimize single-occupancy vehicle transportation as much as possible and, when it is not, to use green vehicles. To implement this ordinance, each department is required to develop

a Transit First plan outlining how your department will implement the various sustainable options to reduce vehicle usage and a Transit First report on implementation. For departments that manage their own fleet of vehicles, fleet size must be reduced by 5% annually.

The California Academy of Sciences is compliant with this year's Healthy Air and Clean Transportation Ordinance requirements, and the "HACTO Submission Forms – FY 1314" is attached as Appendix A to this document.

The California Academy of Sciences encourages employees to commute sustainably to work by offering secure bike-parking and promoting participation in the Pre-Tax Commuter Benefits Program.

## 6B. TRANSIT FIRST CAMPAIGN

This year, City departments implemented Transit First campaigns to educate employees about their Transit First options. The Academy reviewed the results of the 2012 CCSF Transportation Survey and noted that many staff members were not aware of the Emergency Ride Home program, which serves to provide mass-transit and carpool commuters a means to get home for an unexpected event. This program is intended to enable mass transit riders additional flexibility to deal with unexpected events, such as those related to dependent care. To further this effort, the Academy has enrolled in the Emergency Ride Home program and is running an email and poster campaign to advertise the program to staff.

## 6C. BIODIESEL

The California Academy of Sciences has no diesel vehicles.

## 7. OTHER SUSTAINABLE PRACTICES

### 7A. ZERO WASTE

The California Academy of Sciences maintained an average landfill diversion rate of 81% for Fiscal Year 2012-2013. This diversion rate includes waste generated by over 1.3 million visitors. The Academy accomplished this by taking the following steps:

- Clearly labeled compost, recycling, and landfill waste bins readily available to staff and public.
- Waste sorting at the recycling compactor to prevent contamination.
- Careful selection of food service items to reduce contamination and overall waste stream. An example of this is the elimination of the sale of plastic water bottles, and the provision of reusable canteen filling stations.
- The use of washable dishes, cups, and silverware in our public dining facilities.
- A loading dock waste area configuration designed to ensure maximum compliance.
- Establishment of a “Waste Team” composed of Operations, Green Team, and Sustainability staff to spearhead diversion improvement.
- Removal of individual staff trash bins in favor of centralized waste stations in each wing.

### 7B. CARBON SEQUESTRATION / URBAN FOREST

The California Academy of Sciences manages 4.5 acres of landscaped grounds and 2.5 acres of green roof within San Francisco’s Golden Gate Park. These grounds are home to 331 mature and recently planted trees. 75% of these trees are species native to California. The rate of attrition from natural causes and intentional removal has been matched closely by new plantings, leaving out year-over-year inventory stable.

Under the umbrella of the City of San Francisco Department of the Environment regulations for pest management in city parks, we practice chemical-free pest management and use low-impact fertilizers and soil amendments. 90% of the plant nutrition products we apply to our landscape are OMRI certified for use in organic horticulture.

Irrigation was originally handled by overhead sprinklers as well as bubblers, but we have gradually moved to bubblers as the most efficient and effective way of irrigating trees.

The Academy’s Landscape Exhibits Department has worked with certified arborists to establish an annual inspection and pruning program for our mature trees. The majority of the mature trees (75 years or older) are the species typical to established plantings within the park: Blue Gum (*Eucalyptus globulus*), Monterey Cypress (*Cupressus macrocarpa*) and Monterey Pine (*Pinus radiata*).

Most individuals of these latter two species are nearing the senescent stage of their life cycle, and require annual safety pruning to avoid windfall during the winter storm season. This is particularly true of the Monterey Cypress. We have established significant underplantings of replacement Monterey Cypress, in preparation for their eventual removal as they pass from senescence to structural failure over the next 25 to 50 years.

Most older Monterey Pine specimens in the park are severely affected by *Fusarium* pitch canker. Five infected Monterey Pines were removed in 2011. Our remaining Monterey Pines are infected but do not currently pose a safety hazard, and will remain in place as long as possible. In the absence of effective controls for the pitch canker disease, there is no program in place to renovate these stands, but there are abundant volunteer seedlings in the understory.

Blue Gum *Eucalyptus* are long lived and, when properly pruned, sturdy. There are 3 very large specimens in our care, estimated to be more than 100 years old; these trees may live to three times that age. There is no program in place to cultivate new *Eucalyptus* on the grounds, but safety pruning is carried out as needed.

As part of the landscaping for the new Academy building, more than 50 exotic palm specimens were planted. We manage five large (40’ tall) Canary Island Date Palms and 47 Kentia Palms. We work with a specialist palm consultant to monitor the health of these trees. The majority of these trees are in good health, despite the fact that they are far outside of their native range. Fungal disease is the major challenge we face when caring for palms in relatively warm, wet winter conditions. Close monitoring of our plant nutrition

and watering, along with regular inspections and hand cleaning, have created optimum growing conditions and healthy palms over the past three years.

In order to provide greater habitat value and a model of native gardening for the public, we have increased the species diversity of our tree inventory with the gradual addition of previously unrepresented species. Blue Elderberry, California Madrone, Black Oak, Oregon Oak, Pacific Crabapple, Big Leaf Maple, Catalina Ironwood and Oregon Ash are all new introductions added over the past two years.

Our tree care program has provided us with positive results, and our efforts will continue to focus on the maintenance of a healthy urban forest based on an increasingly diverse list of native species. The cornerstones of our approach will continue to be proper irrigation, proper soil management through organic compost and organic soil amendments, and proper seasonal pruning for structure and plant health.

## 7C. COMMUNITY WIDE IMPACT

The California Academy of Sciences provides a wide variety of community education opportunities, with target audiences including school-aged children, adults, and teachers. The programs range from ongoing Citizen Science projects to internship opportunities to the Teacher Institute on Science and Sustainability:

**Online Courses:** The California Academy of Sciences has partnered with leading global learning platform Khan Academy to launch an engaging new digital learning course entitled “Biodiversity,” available for free to anyone worldwide. Khan Academy reaches over 10 million users each month. The Academy has also successfully launched two iTunes U courses: Earthquake, in partnership with KQED, and How Science Works in partnership with the University of California Museum of Paleontology, which have reached 89,885 users total.

**Teacher Institute on Science and Sustainability:** This two-year program provides teams of teachers from schools around the Bay Area with an intensive and transformative experience to support the teaching and learning of science. Immersive summer sessions and coaching is provided throughout the two years. The Academy, in partnership with Stanford University and SRI, has been awarded a two-year grant from the National Science Foundation’s Discovery Research K-12 program for education to support teachers’ learning.

**Next Generation Science Standards Workshops:** The Next Generation Science Standards have been adopted by the State of California and emphasize the process of science and the need to engage students in doing science. Teachers, districts, and administrators are clamoring to learn more about these standards and what the rollout will mean for their teaching. The Academy offers one day and multi-day NGSS workshops which have consistently sold out. We are quickly expanding this program.

**Careers in Science:** This multi-year, year-round internship and youth development program recruits underserved youth to learn about science, do science alongside our scientists, and teach the public. The program equips these youth, who are unrepresented in science fields, to explore STEM careers. The Academy has graduated approximately 150 interns, many of whom have gone on to higher education degrees and careers in STEM fields.

**Science Action Clubs:** This offsite afterschool program uses online and in-person professional development to train after school providers to deliver science and sustainability programs in after school hours. SAC has been rolled out in 83% of San Francisco public schools and we are expanding to the East Bay. Youth in this program explore science-themed activity modules and participate in national authentic citizen science research projects.

**Student Science Fellows:** The Student Science Fellows program pairs highly motivated and accomplished high school students with Academy IBSS scientists. These student fellows conduct authentic research and disseminate the results of their work through professional science venues and journals.

**Enhanced Museum Visits for Students Program (endowed by Arthur and Toni Rembe Rock):** This program provides all 4th and 5th grade students in San Francisco, as well as the teachers and families who support them, with quality science and sustainability education opportunities. Each student, his or her family, and teachers receive free field trips and classes, including transportation,

family and student passes to the museum, and free family nights at the Academy. 70% of all of the 4th and 5th graders in San Francisco are participating in this program, and over 90% of the public schools in San Francisco are participating.

**Citizen Science/iNaturalist:** The Academy's citizen science program seeks to document and preserve biodiversity in the globe's most fragile biodiversity hotspots, including California. The Academy's citizen science volunteers collect and analyze biodiversity data in order to answer real scientific questions that further conservation goals of our partners. Partners include the Marin Municipal Water District at Mt. Tam; the Gulf of the Farallones National Marine Sanctuary, Fitzgerald Marine Reserve and Pillar Point, the City and County of San Francisco, among others. iNaturalist, a global online platform for citizen science observations and community-building, is the Academy's partner in this initiative.

**Science Today:** This global distribution channel presents science news in web-based short film stories often featuring Academy scientists, Fellows, and their work. These stories are used as the basis for instruction in all of our programs. We are about to launch a multi-platform app for Science Today, which will allow science followers around the globe to keep up with cutting edge science, including Academy discoveries.

**Center for Research and Outreach on Amphibian Conservation:** A partnership between the Steinhart Aquarium and the Institute for Biodiversity Science and Sustainability, biologists and IBSS scientists conduct research to uncover the life cycle, evolutionary biology, and taxonomy of threatened species. This information is provided to field-based conservation organizations in the areas of origin of these species. The Academy plans to share the findings and outcomes of this field based conservation and science effort with the public through programs and displays.

**Brilliant!Science:** An extended festival of programming designed to dive deeper into topics of great public interest, this multi-day program engages audiences of all ages. Previous themes have included: Decoding Human Health in March 2013 (in partnership with the Gladstone Institutes) and Extraterrestrial Life in October 2013 (in partnership with SETI). In 2014, Brilliant!Science will be offered in March, June, and September with themes as follows: Incredible Ocean, Get Inside Your Head, and Pandemic! The festival offers onsite and offsite events such as art/science cafes, as well as a weekend family festival.

**Planetarium productions:** The Morrison Planetarium is the largest all-digital planetarium in the world and our visitors consistently rank it as one of the highlights of their Academy visit. As evidenced by national and international awards, the Morrison Planetarium's original productions, Fragile Planet, Life: A Cosmic Story, and Earthquake: Evidence of a Restless Planet have established the Academy's reputation in creating programs with high production values, quality storytelling, and uncompromising science content. Planetarium content is now licensed in 10 countries around the world.

**Public Programs on the floor:** Public Programs offers Academy guests dynamic, interactive, and unforgettable experiences that inspire curiosity and continued engagement with the natural world. Programs, like the popular Penguin Feeding, Philippine Coral Reef Dive Show, and Swamp Talk help visitors connect with our animals and collections, and to feel personally invested in the protection of their natural habitats.

**The Naturalist Center:** Reaching over 170,000 people each year, the Naturalist Center provides on-site and on-line facilitated learning experiences and answers to frequently asked natural history questions from visitors. Scheduled family programs and hands-on learning opportunities with our collections are offered daily, seven days a week by trained naturalists.

For a complete and up-to-date list of teacher and educational resources and workshops, please visit our website:

<http://www.calacademy.org/teachers/>

## 7D. RESILIENCY AND ADAPTATION

The California Academy of Sciences seeks to contribute to the global effort of understanding climate change and enabling sustainability on a global scale. The foundation of this work is the Academy's Institute for Biodiversity Science and Sustainability.

The Institute for Biodiversity Science and Sustainability at the California Academy of Sciences is at the forefront of efforts to understand two of the most important topics of our time: the nature and future of life on Earth. Based in San Francisco, the institute is home to more than 60 research scientists and aquarium biologists, as well as more than 28 million scientific specimens from around the world—nearly 40,000 of which are alive and on display in the Academy’s Steinhart Aquarium. The institute also leverages the expertise and efforts of more than 100 international Research and Field Associates and 300 distinguished Fellows. Through expeditions around the globe, captive breeding programs, and investigations in the lab, the institute’s scientists strive to understand the evolution and interconnectedness of life. Through these same efforts, as well as through partnerships, community outreach, and public engagement initiatives, the institute aims to guide critical conservation decisions and address the challenge of sustainability.

## 8. REPORT SUMMARY AND DEPARTMENTAL CLIMATE ACTION GOALS

The California Academy of Sciences continued to improve sustainability efforts in Fiscal Year 2012-2013. Overall energy use was reduced, mostly by reduction of natural gas consumption. Water consumption was reduced as well, and landfill diversion improved from 75% in FY11-12 to 81% in FY12-13. Many new community education opportunities were introduced, including development of online coursework and citizen science opportunities.

Looking forward, the Academy is committed to further develop its contribution to global conservation and sustainability efforts. To lead this effort, the Academy is pleased to announce that Dr. Meg Lowman joined the institution on January 6, 2014 as its inaugural Chief of Science and Sustainability. In this role, Lowman will be responsible for developing and executing the Academy’s strategic vision for its programs of scientific exploration and research; coordinating the engagement of the Academy’s 300 Fellows in the ongoing educational and research life of the institution; and developing and implementing a strategic plan for programs related to the challenge of sustaining life on Earth, including public engagement activities, advocacy programs, and collaborations with organizations focused on such areas as sustainability, ecology and climate change.

Appendix A

# HACTO Submission Forms 2013

**Department \*** California Academy of Sciences

**Name of Person** Ari Harding, PE  
**Preparing Report \***

**Title of Person** Director of Building Systems  
**Preparing Report \***

**Email of Person** [aharding@calacademy.org](mailto:aharding@calacademy.org)  
**Preparing Report \***

**Name of Department Director \*** Dr. Gregory Farrington

**Acknowledgement \*** I acknowledge that the information provided is accurate.

**Does your department promote or plan to promote employees to use public transit for work-related travel? \*** Yes

**What resources will your department offer? \*** Clipper Card  
Other

**Other: \*** The Academy offers an extensive Commuter Benefits and Incentives Program

**From looking at last** The Academy has a highly successful commuter program, with over 73% of respondees reporting

year's HACTO Plan, please describe the successes and challenges of promoting transit for work-related travel: \*

that they use alternative commuting methods.

Challenges include our location in Golden Gate Park, MUNI reliability, length of time public transportation takes, and the challenges of parents with children who live outside of the City.

Does your department offer employees access to bicycles for work-related travels? \*

No

What are the reasons for not encouraging or planning to encourage employees to use bicycles for work-related travel? \*

The California Academy of Sciences does not have access to City Owned shared bicycles.

Does your department belong or have a plan to belong to a City vehicle pool or car-sharing program for work-related travels? \*

Yes

From looking at last year's HACTO Plan, please describe the successes and challenges of promoting car-sharing for work-related travel: \*

The Academy typically uses owned vehicles for work-related travel. In general, not much work related travel is required by the Academy, as we have only one facility.

Is your department able or have plans to

Yes

host a tele-  
conference call? \*

Is your department  
able or have plans  
be able to host a  
video-conference  
call? \*

Yes

Please use this  
space to describe in  
greater detail all of  
your department's  
Transit-First  
programs related to  
at work travel: \*

In general, not much work related travel is required by the Academy, as we have only one facility.

Does your  
department promote  
or have plans to  
promote the use of  
public transit for  
commuting to/from  
work? \*

Yes

How will you  
promote public  
transit? \*

Encourage participation in the Pre-Tax Commuter Benefits program

Does your  
department promote  
or plan to promote  
the use of bicycles  
for commuting  
to/from work? \*

Yes

How will you  
promote bicycle  
commuting? \*

Provide indoor/safe bike storage

Offer on-site showers and/or lockers

These bicycle-friendly resources are available at: \*

My department only has one location

Does your department plan to promote the use of ridesharing for commuting to/from work? \*

Yes

How will you promote ridesharing? \*

Encourage registration in the 511-matching program

Other

Other: \*

Internal ridesharing opportunities by intranet

From looking at last year's HACTO Plan, please describe the successes and challenges of promoting ridesharing for commuting to/from work: \*

Many employees commute from various areas outside of the City, as well as have a variety of schedules and family requirements. However, there are currently several successful ridesharing partnerships, particularly from areas such as Rohnert Park, Petaluma, and the East Bay.

D. Does your department offer or plan to offer tele-commuting? \*

No

What are the reasons for not encouraging or planning to encourage employees to use tele-commuting? \*

Most employees are required to come to work every day.

Please use this space to describe in greater detail all of your department's Transit-First programs related to commuting

to/from work: \*

## Commuter Benefits and Incentives Program

The program consists of two parts: Commuter Transportation Benefit Plan and Academy Commuter Incentives

### **COMMUTER TRANSPORTATION BENEFIT PLAN**

The Commuter Benefits program allows participants to use pre-tax dollars to pay for mass transit and/or parking expenses related to commuting to work. Using pre-tax dollars saves money on commute costs. This program is available to regular full-time and part-time employees that work 20+ hours per week and on-call employees that work at least 10 hours per week. In accordance with Internal Revenue Service (IRS) tax code 132(f), the amount you can contribute is set by the IRS. For 2014, the limits are:

- Up to \$130 per month for transit
- Up to \$245 per month for parking

The transit benefit allows participants to elect pre-tax and post-tax dollars toward the purchase of monthly commuter passes (such as SF MUNI) and/or e-cash for use on BART, Golden Gate Transit or other services via Clipper Card. Bridge tolls (with or without Fastrak) are not an eligible expense.

AND

Participants may elect pre-tax and post-tax dollars monthly for commute-specific parking (Golden Gate Park garage, BART station parking, or street meters).

Such purchases may only be for actual commute costs for your travel to and from the Academy.

### **How to enroll:**

The Academy uses WageWorks Inc. to administer this benefit. Go to [www.wageworks.com](http://www.wageworks.com) to register and place an order. New orders and changes to existing orders must be placed by the 10th of the month for the following month's purchase. Your purchase will be deducted from your paycheck on a pre-tax basis. Orders may also be placed by telephone: 1-877-924-3967.

### **ACADEMY COMMUTER INCENTIVES**

California Academy of Sciences is serious in its efforts to encourage employees to commute to work sustainably: by bicycle, carpool, public transit or on foot. A benefit eligible regular full-time or part-time employee who works 20+ hours a week and uses an alternative form of transportation, walking, public transportation, bicycling, but NOT a single-user, gas-powered vehicle, for 10 or more days a month may receive **one** of the following incentives:

- \$20 subsidy on monthly transit order via WageWorks
- \$1.00 per day for each day of commute (up to 20 days per month)
- 0.25 vacation days accrual per month (for a total of 3 additional vacation days per year)

Submit the commuter subsidy form for \$20 off your WageWorks order to Human Resources. Submit the commuter incentive form for cash-back or vacation to Payroll.

### **Vanpools and Carpools**

511 Regional Rideshare Program can provide commuting assistance to Bay Area employees and residents who are seeking vanpools, carpools or other Academy employees wishing to carpool to work. Go to [www.511.org](http://www.511.org) or call 511 and say "rideshare". UCSF vanpools also accept riders on a space-available basis. For more information visit: [www.campuslifeservices.ucsf.edu/transportation/rideshare/vanpool/](http://www.campuslifeservices.ucsf.edu/transportation/rideshare/vanpool/).

### **City Carshare Program**

Aimed at helping the environment by reducing the number of vehicles on the road, this non-profit program makes vehicles available on a pay-for-usage basis for both personal and business-related use. All Academy staff members and their spouses or qualified domestic partners may participate in the program. The academy will pay the employees membership application fee and monthly service fee. The employee is responsible to any mileage incurred and for spouse/partner application fees.

**Campaign Options \*** 7. Emergency Ride Home

How many vehicles 0  
is your  
department *planning*

**to remove from  
service in FY13–14  
(July 1, 2013–June  
30, 2014)? \***

**How many vehicles 0  
is your  
department *planning*  
to change the status  
of vehicles turned in  
for credit toward  
your vehicle  
reduction  
requirement in  
FY13–14 (July 1,  
2013–June 30,  
2014)? \***

**The number of  
vehicles your  
department plans to  
remove is: \*** Equal to or more than the number needed to be compliant.

You have completed this section of HACTO. Thank You.