South Los Angeles Wetland Park

Research Fellow: Kelly Shannon, PhD, International ASLA, Professor and Director—Graduate Program of Landscape Architecture + Urbanism, University of Southern California with Travis Longcore, PhD, Assistant Professor, University of Southern California

Research Assistant: Christina Hood, MLA Candidate, University of Southern California with Tsaiquan Gatling and Donielle Kaufman, MLA Candidates, University of Southern California

Firm Liaison: Sarah Curran, P.E., Project Manager, Psomas

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The full case study can be found at
https://landscapeperformance.org/case-study-briefs/south-la-wetland-park

Regional context

101 Freeway

Elysian Park

5 Freeway

Downtown

Griffith Park

10 Freeway

Los Angeles River

Elysian Park

Vernon

Southeast
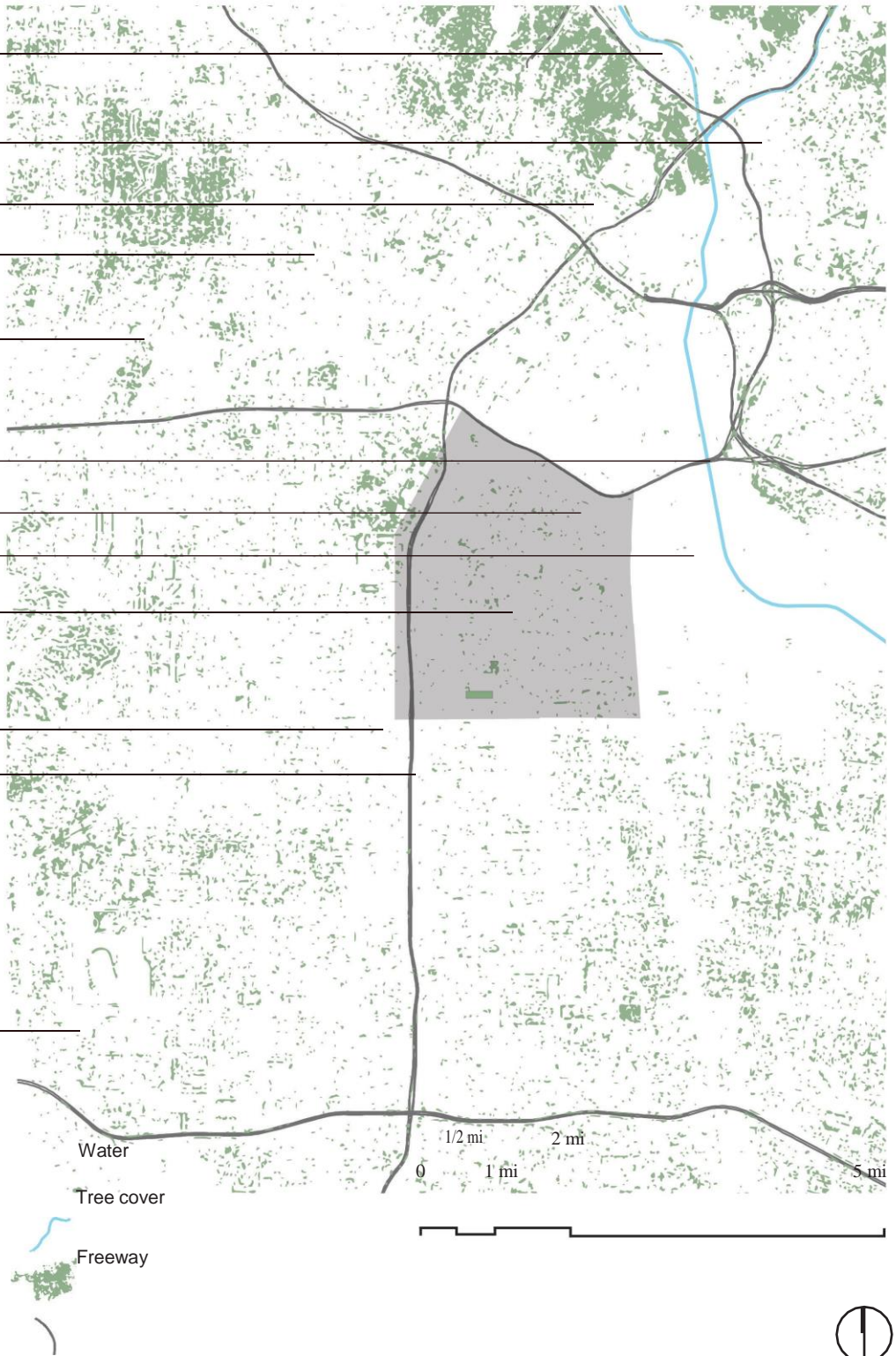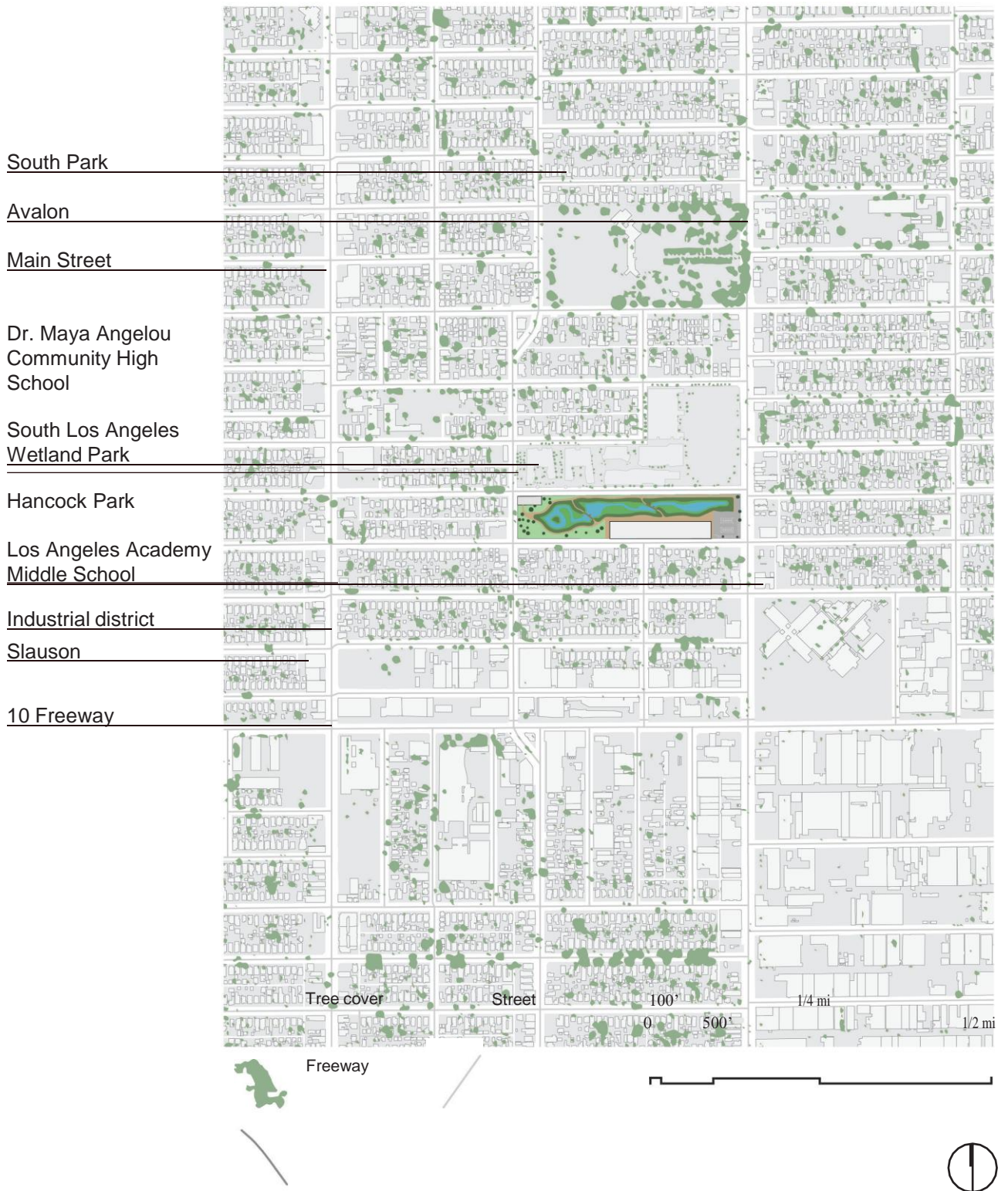Los Angeles - North
Park Study Area

Westlake
Neighborhood

110 Freeway

105 Freeway

Water

Tree cover

Freeway

1/2 mi   2 mi

0   1 mi   5 mi

South LA Context

South Park

Avalon

Main Street

Dr. Maya Angelou
Community High
School

South Los Angeles
Wetland Park

Hancock Park

Los Angeles Academy
Middle School

Industrial district

Slauson

10 Freeway

Tree cover   Street   100'   1/4 mi

0   500'   1/2 mi

Freeway

Neighborhood Context

San Pedro Street

South Los Angeles
Wetland Park

Dr. Maya Angelou
Community High School

Paint Shop Building

E 54th Street

East 55th Street

Avalon Boulevard

25'   250'

0   100'   500'
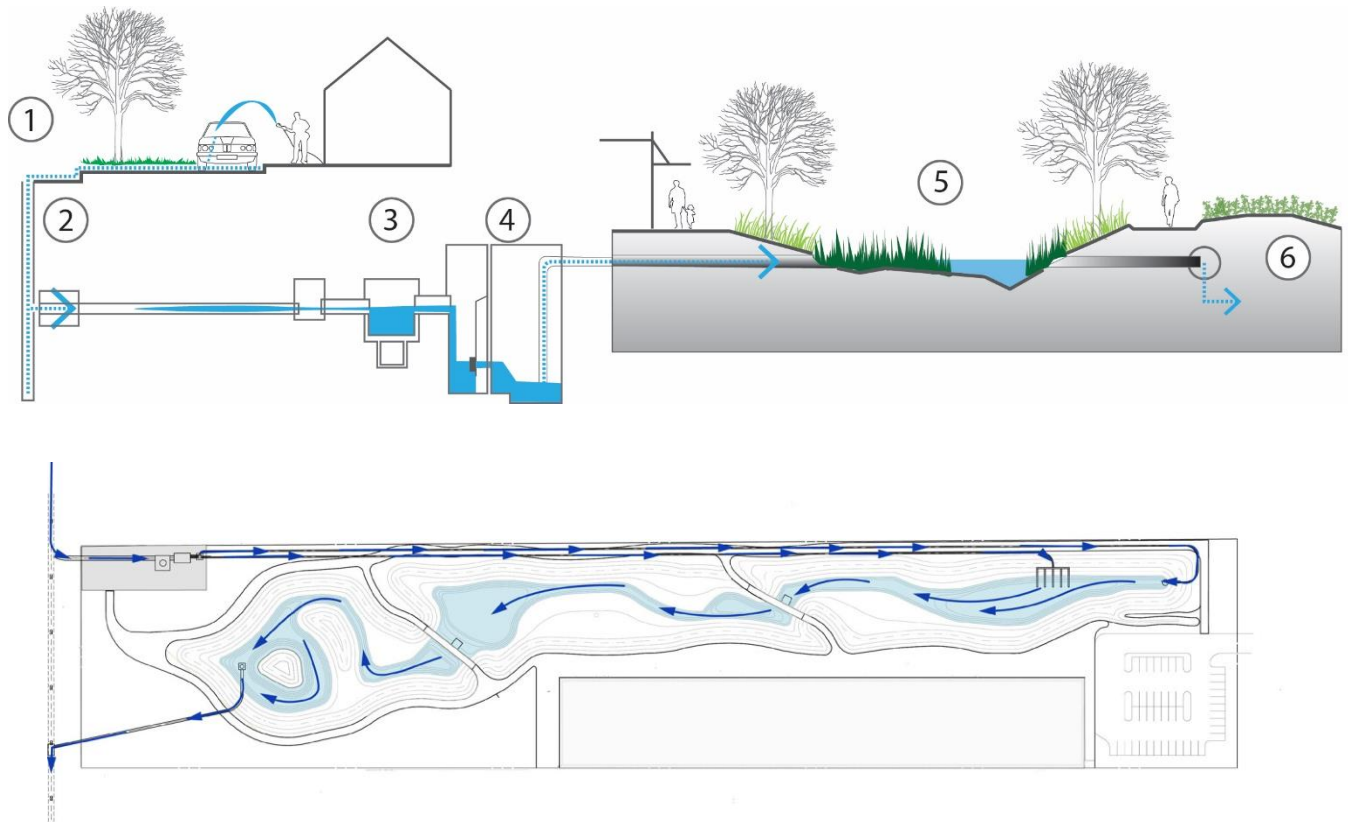
South Los Angeles
Wetland Park tree
cover

Contextual tree cover

10' contour line

Environmental Benefit 1: Treats up to 14,000 gallons of stormwater runoff from the 525-acre watershed per day. This is sufficient capacity to treat all runoff during the dry season.

1. Water from the 525-acre watershed enters the underground stormwater system.
2. A diverter intercepts stormwater.
3. The water goes through a separator, which removes oil, grease, and trash.
4. A trash screen removes any remaining litter from the water.
5. Excess water is released back into the stormwater system after cleaning.

- Calculations
  - 14,000 gallons per day is reported in the Preliminary Design Report.

- Limitations: This information is provided in the Preliminary Design Report, which is based on past data as well as the factual capacities of the wetland system. As climate change progresses, historical patterns may be uprooted. The site has needed to use supplemental potable water for the wetland since stormwater has not been sufficient to maintain the wetland during periods of drought.

- Sources:
  - South Los Angeles Wetland Park Preliminary Design Report, 48.
  - City of Los Angeles Bureau of Engineering, 'South Los Angeles Wetlands Park, Local Drainage Area,' (map and figures), in Envision Award Submission, compiled by Psomas (2013), 'Section LD 2.2 - Improve infrastructure integration', page 5.
  - David Goldstein (2014) 'CBS2 Investigates: South LA Park Proves Major Drain on Water, Taxpayer Money Amid Drought Crisis' (29 April 2014)

Environmental Benefit 2: Removes an estimated 100% of oil and grease, 75% of bacteria, 96% of total suspended solids, 41% of nitrate, and 34% of phosphorous from stormwater runoff.

■ Calculations: Provided in preliminary design report.

Table 8-2 Estimated Pollutant Load Removal				
Constituent	Influent Load (lbs)	Total Removed (lbs)	Effluent Total (lbs)	Percent Removal
Total Petroleum Hydrocarbons	0.15	0	0.15	0%
Total Coliforms*	399088	29931	99771	75%
Fecal Coliforms*	245756	18431	61439	75%
Fecal Enterococcus*	124970	93728	31242	75%
Total Suspended Solids	10318	9930	388	96%
Oil & Grease	153.33	153.33	0	100%[1]
Total Aluminum	164.42	65.77	98.65	40%
Total Cadmium	0.02	0.01	0.01	50%
Total Copper	2.49	1.25	1.24	50%
Total Lead	1.27	0.76	0.51	60%
Total Mercury	0.06 ug/L	0	0.03 ug/L	50%[2]
Total Nickel	0.53	0.21	0.32	40%
Total Zinc	21.1	10.55	10.55	50%
Dissolved Copper	1.23	0.43	0.80	35%[2]
Dissolved Lead	1.22 ug/L	0	0.52 ug/L	57%[2]
Dissolved Zinc	12.97	6.61	6.36	51%[2]
Nitrate as Nitrogen	71.2	29.19	42.01	41%[2]
Total Kjeldahl Nitrogen	291.2	34.94	256.26	12%[2]
Total Phosphorous	0.32 mg/L	0	0.21 mg/L	34%[2]

* = MPN

[1] = hydrodynamic separator unit

[2] = Ballona Freshwater Marsh

South Los Angeles Wetland Preliminary Design Report, page 91.

■ Limitations:
  ○ These are projections based on capabilities of the separator and data from the Ballona Freshwater Marsh Annual Monitoring Report - Year 4, a project of similar function also located in the Los Angeles area. Testing data is not available.

■ Sources:
  ○ Psomas (2008) 'South Los Angeles Wetland Preliminary Design Report,' pages 90 91, February 2008.

Environmental Benefit 3: Generates 8,081 kWh of energy annually, or 66% of the site's total energy use. This saves $1,700 in energy costs each year.

- ■ Calculations:
  - ○ Solar Lighting:
    - Estimated annual energy consumption: 41 lights x 45 watts x 12 hrs/day x 365 days/yr = 8,081 kWh

    - Low Flow Pump System:
      - Annual pump run time: 14,000 gal/day x 365 days/yr ÷ 90 gal/min x 1 hr/60 min = 946 hours
      - Estimated annual energy consumption: 946 hours x 3 hp x 745.7W/hp = 2,116 kWh

    - High Flow Pump System:
      - Time it takes to fill the wetland: 2.1 ac-ft ÷ 2400 gal/min x 1 hr/60 min = 4.75 hours
      - Assuming 15 rainy days per year, annual pump run time = 4.75 hrs x 15 days = 71.25 hours
      - Estimated annual energy consumption: 71.25 hours x 40 hp x 745.7W/hp = 2,125 kWh

    - Total estimated annual energy consumption = 8,081 + 2,116 + 2,125 = 12,322 kWh

    - Renewable / Total = 8,081 / 12,321 = **66% renewable energy**

  - ○ 8,081 kWh annually x ($0.211 / kWh) =$1,705.09

- ■ Limitations:
  - ○ Usage numbers are best estimates and not based on data collected from the site.

- ■ Sources:
  - ○ Psomas (2013), in Envision Award Submission, 'Section RA 2.2-Use renewable energy,' page 1-3.

Environmental Benefit 4: Sequesters an estimated 1.82 tons of atmospheric carbon annually in trees, the carbon equivalent of driving a single passenger vehicle almost 4,000 miles.

Cover class	Points	Landcover (acres)
Tree	19	0.29 ± 0.06
Hardscape	71	1.07 ± 0.12
Building	137	2.06 ± 0.15
Water	70	1.05 ± 0.12
Shrub	146	2.20 ± 0.16
Grass	55	0.83 ± 0.11

- ■ Calculations:
  - ○ Calculations have been performed using i-Tree Canopy.
  - ○ First, a project area was set in Google Earth through the i-Tree Canopy web application. In this case, the project area was set to be the boundaries of South Los Angeles Wetland Park.
  - ○ Second, to create an accurate set of data, a number of "Classes" were added to the analysis. The program creates automatically two classes, Tree and non-Tree. Non-Tree was replaced with a number of categories to more accurately represent the content of the park. The following Classes were added to the data collection: hardscape (impervious surfaces), building, water, shrub, grass, and permeable non-grass (which included decomposed granite and permeable paving).
  - ○ Third, the project location Los Angeles County, California, USA was selected as the project location and denoted as "urban."
  - ○ Points were added on the satellite imagery until all Classes present in the park were represented with an error of 1.75% or less.
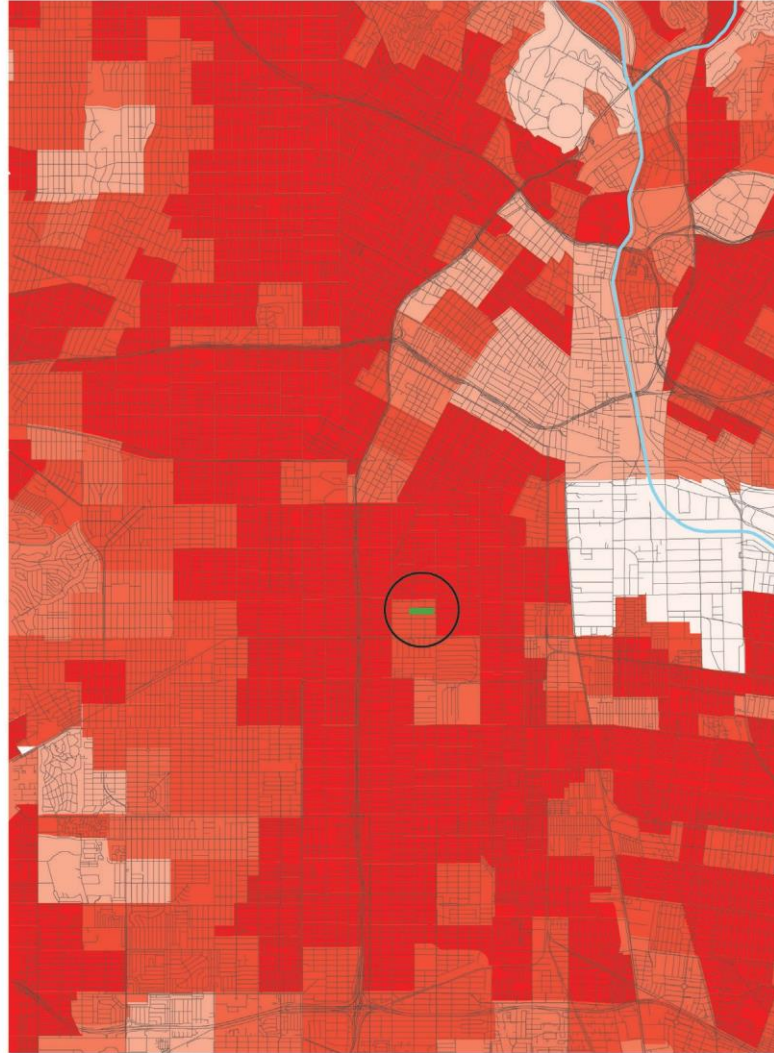 - ○ At this point, the following report was created:

Benefit	Amount	±SE
Carbon monoxide removed annually	10.80 oz	±2.44
Nitrogen dioxide removed annually	4.32 lb	±.97
Ozone removed annually	24.00 lb	±5.42
Particulate Matter less than 2.5 microns removed annually	5.80 oz	± 1.31
Sulfur Dioxide removed annually	13.92 oz	±3.14
Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	6.08 lb	±1.37
Carbon dioxide sequestered annually in trees	1.82 T	±.41

- ■ Limitations:
  - ○ Since the data is based on users assigning classes to randomly placed points using aerial satellite photography, the classification of those points is subject to human error. Certain classes are particularly difficult to distinguish from one another in satellite photography, such as Trees and Shrubs. However, by placing a considerable number of points, until the standard of error for the data is below 1% for all classes, these errors should be minimized by the quantity of data.
  - ○ Although this is a scientifically developed tool, it is still an approximation for the conditions on site.

- ■ Sources:
  - ○ iTree Canopy: http://www.itreetools.org/canopy/
  - ○ US Environmental Protection Agency 'Greenhouse Gas Equivalencies Calculator' https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Social Benefit 1: Increased the per capita park acreage by 11% from 0.54 acres to 0.6 acres per 1,000 residents in the Southeast Los Angeles – North area, a high-density part of Los Angeles that had the second lowest park acreage per capita in the city. Median household income in the adjacent neighborhoods is $29,074, just 58% of the city median.

Serves a high density area of Los Angeles which has historically had some of the lowest levels of park access in the city; the construction of South Los Angeles Wetland Park increased the average park acreage per 1000 residents from 0.54 acres to 0.6 acres, an increase of 11%, in the Southeast Los Angeles – North area, the neighborhood study area assigned to the park in the Los Angeles Countywide Comprehensive Parks and Needs Assessment. At the time the park was constructed, Council District 9, where the park is located, had the second lowest per capita park acreage in the city of Los Angeles.

Population Density, Census 2010 Before park construction

Population per square mile

| 0-4 | 5-49 | 50-999 | 1,000-2,999 | 3,000-4,999 | 5,000-6,999 | 7,000-8,999 | 9,000-14,999 | 15,000+ |

0 1/2 mi   2 mi   5 mi

1 mi

- ■ Calculations:
  - ○ Park acreage per 1000 residents was calculated with the following equation and rounded to two decimal points:

    $$\frac{\text{Total park acreage}}{\text{Total population}} = \frac{X \text{ park acres}}{1000 \text{ residents}}$$

  - ○ To find how the presence of South Los Angeles Wetland Park impacts the park acreage per 1000 residents, the acreage of South Los Angeles Wetland Park was subtracted from total acreage of the Southeast Los Angeles - North area (83.9 - 9.01 = 74.89 acres) and the remaining total was used in the equation above. The population used in the equation is the population used in the Los Angeles Countywide Parks Needs Assessment report, 137,819.

    74.89 / 137,819 = x / 1000
    x = .54 (before South LA Wetland Park)

    83.9 / 137,819 = x / 1000
    x = .6 (after South LA Wetland Park)

    Percent change
    (after – before) / before x 100
    (.6 - .54)/.54 x 100 = 11%

- ■ Limitations:
  - ○ Population within 1/2 mile radius is calculated in GIS using Census Data. Census Data may not be entirely complete and is more likely to omit people of lower economic status. Additionally, the most recent census data is from 2010, before the park was built, and any changes in population or density of the area in the years 2011-2016 are not reflected in this calculation and should be understood as an estimate.

- ■ Sources:
  - ○ Esri, ArcGIS Online Community Analyst report, '2010 Census Profile: South Los Angeles Wetland Park' 1/2 mile radius of South Los Angeles Wetland Park, report created 2016.
  - ○ 'City of LA Southeast Los Angeles - North: Study Area Profile' (2016) Los Angeles Countywide Parks Needs Assessment Report http://lacountyparkneeds.org/FinalReportAppendixA/StudyArea_147.pdf
  - ○ 'Los Angeles Countywide Comprehensive Parks and Recreation Needs Assessment (2016) http://lacountyparkneeds.org/wp-content/uploads/2016/06/FinalReport.pdf
  - ○ Trust for Public Land (2011) '2011 City Park Facts' https://www.tpl.org/sites/default/files/cloud.tpl.org/pubs/ccpe-city-park-facts-2011.pdf
  - ○ US Census Bureau. Population, 2010. Prepared by Social Explorer (3 July 2016).
  - ○ Psomas (2013), in Envision Award Submission, 'Section QL 1.1-Improve Community Quality of Life,' page 57.
  - ○ Psomas (2013), in Envision Award Submission, 'Section QL 3.3-Enhance Public Space,' page 9.

Expands the recreational opportunities for economically disadvantaged residents in the adjacent neighborhoods where the median household income in 2010 within the census tract is $29,074. This is 58% of the median income of the city of Los Angeles ($49,682) and 54% of the median income for Los Angeles County ($53,482).
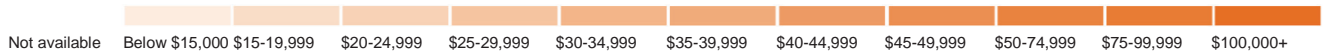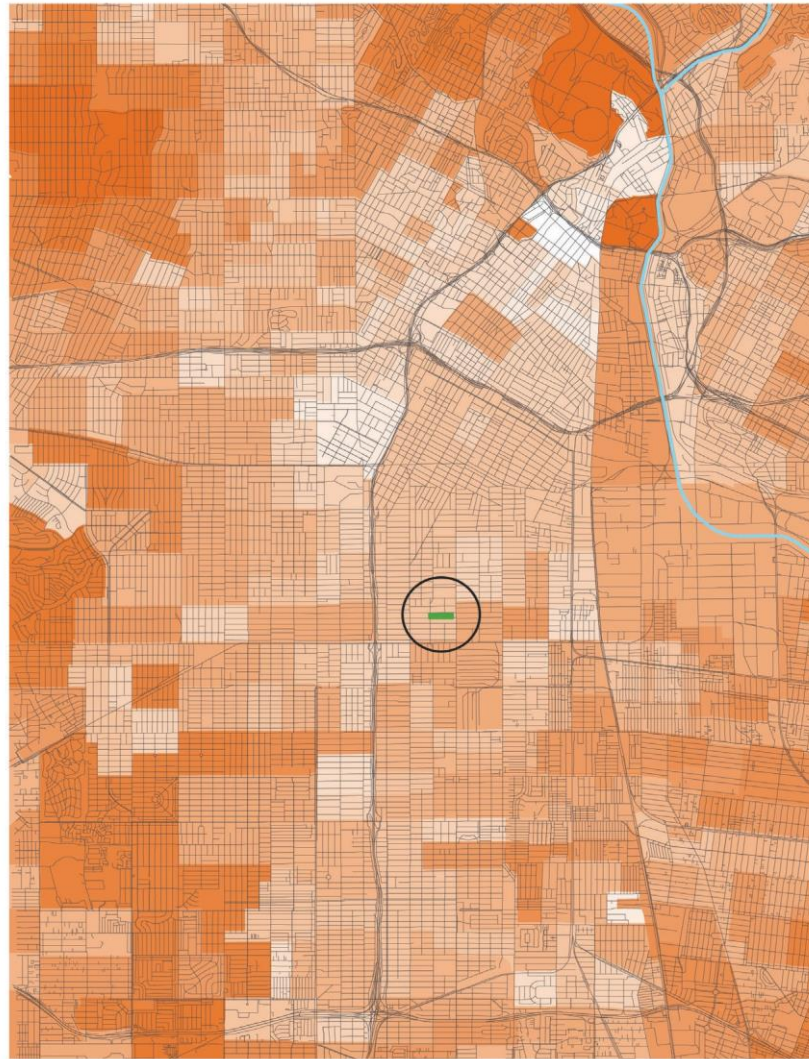
	South Los Angeles Wetland Park (census tract)		
Median Income (2010 US Census)	$29,074		
	Southeast Los Angeles - North	Los Angeles County	City of Los Angeles
Median Income (2010 US Census)	$29,199	$53,482	$49,682

- ■ Calculations:
  - ○ All income figures are taken from the 2010 US Census. Figures for the Southeast Los Angeles - North area, the city of Los Angeles, and Los Angeles County were calculated using the web application Social Explorer. Median incomes calculated within the census tract was calculated using the Community Analyst tool within the ArcGIS Online software.

- ■ Limitations:
  - ○ Calculations are performed in GIS using Census Data. Census Data may not be entirely complete and is more likely to omit people of lower economic status, and may not accurately reflect the incomes of those who participate in informal economies, and those whose wages are not reported.

- ■ Sources:
  - ○ Esri, ArcGIS Online Community Analyst report, '2010 Census Profile: South Los Angeles Wetland Park' 1/2-mile radius of South Los Angeles Wetland Park, report created 2016.
  - ○ US Census Bureau. Population, 2010. Prepared by Social Explorer (8 July 2016).

Median income, Census 2010
Before park construction

1/2 mi   2 mi

0   1 mi   5 mi

Not available   Below $15,000 $15-19,999 $20-24,999 $25-29,999 $30-34,999 $35-39,999 $40-44,999 $45-49,999 $50-74,999 $75-99,999 $100,000+

- **Social Benefit 2:** Supports recreational and social activities as documented on social media platforms: 33% fitness, 15% nature, and 6% cultural or social events.

    Accommodates a wide array of experiences by incorporating contrasting atmospheres in a relatively small area. Of 332 images publicly posted to Instagram in over the lifetime of the park and geotagged as being taken in South Los Angeles Wetlands Park, 33% focus on fitness or recreation, 15% spotlight the park's natural elements, and 6% show cultural or social events. Of 17 photos submitted to Yelp over the park's lifetime, 59% focus on the nature of the site and 18% feature the recreational opportunities of the park. The park currently has 4.0/5 star rating on Yelp, based on 11 reviews.

Fitness/recreation
https://www.instagram.com/p/BHQYH7-gukt/

Event/social
https://www.instagram.com/p/_3GhwTt0bc/

Nature
https://www.instagram.com/p/BC_Af23zAWA/

Other
https://www.instagram.com/p/BGI2_BXDHHf/

- ■ Calculations:
  - ○ Photographs posted on social media site Instagram and on Yelp, a business, service, and location rating website, were collated and organized. For Yelp, the lifetime collection of photos (17) was analyzed, as well as for Instagram (332 photos).
  - ○ Photographs were organized by their content into the categories below. In photographs which contained multiple elements were categorized based on the main focus or motivation for the framing of the photograph.

	Nature	Event/social	Sports/ Recreation	Other
Instagram photo counts	51	27	108	146
Percent	15%	8%	33%	46%
Yelp photo counts	10		3	4
Percent	59%		18%	24%

- ■ Limitations:
  - ○ Not all photo posts are made public.
  - ○ Park users of lower economic levels may not have the same access to internet and internet capable cell phones, and their park usage patterns and priorities may be under- or unrepresented in the data.
  - ○ It appears that many users on Instagram geotag the park as their location when they are nearby, but not in the park. This results in a high percentage of photos falling into the "other" category, but suggests that the park is a visible and known landmark in the community.
  - ○ Since categorizing the images is a somewhat subjective process despite attempts at objectivity, categorization of the photos is subject to implicit bias and/or human error.

- ■ Sources:
  - ○ South Los Angeles Wetland Park, Instagram https://www.instagram.com/explore/locations/9058740/
  - ○ South Los Angeles Wetland Park, Yelp, http://www.yelp.com/biz/south-la-wetlands-

APPENDIX A - Temperature Data and Urban Heat Island Effect

Park Grid

Accessible and inaccessible sites. Temperature locations were added on bridges since reading sites within the habitat area are inaccessible.
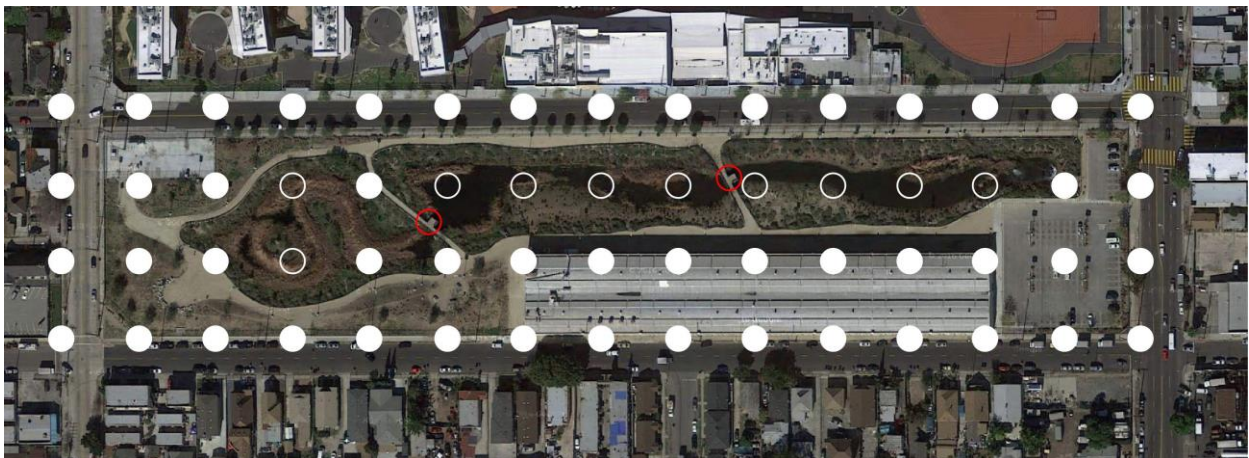
Reduces localized heat island effect by 8.5°F. Construction of the park also resulted in the removal of 87.5% of the heat-producing surfaces which had previously been located onsite.

- ■ Calculations:
    - ○ A 100' grid was placed over the site. The resulting points were then categorized between points that were accessible and those which were inaccessible. Accessible points were labeled by number, and inaccessible points were lettered.
    - ○ Temperatures were recorded at each of the accessible points during three different periods of a single day, July 8, 2016: 7-8:00 AM, 1:00-2:00 PM, and 7:00-8:00 PM.
    - ○ Temperatures were taken using a digital thermometer, Protech MS6508.
    - ○ Temperatures were taken while holding the thermometer approximately 5 feet above ground, with the thermometer shaded to prevent readings from being influenced by radiant heat from the sun. When a temperature location was not located in the shade, the temperature device was shielded from the sun with an opaque shield.
    - ○ Temperature readings corresponding to the times of day were taken from the closest Weather Monitoring Station operated by the National Weather Service, which is the Los Angeles / USC Campus Downtown, CA KCQT weather station. Since field temperature readings spanned an hour, temperature readings from the weather stations from the approximate start and end times of field readings were averaged, and then the two stations' readings were averaged together to approximate the larger city context.
    - ○ Field temperatures taken in the park were averaged for each time of day.
    - ○ Averaged evening temperatures were then subtracted from the averaged afternoon temperatures to see how quickly temperatures decreased.
    - ○ See Appendix A for temperature data and grid mapping.

KCQT Readings	Reading 1	Reading 2	Average
Afternoon	82 (12:47 PM)	78 (1:47 PM)	80
Evening	73 (6:47 PM)	70 (7:47 PM)	71.5
	Average afternoon	Average evening	Difference
Park	84.0	73.3	10.7
KCQT	80	71.5	8.5

- ○ Table of change in heat-producing surfaces:

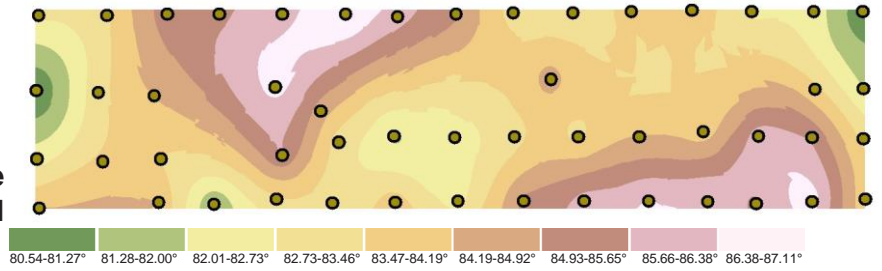| Surface	SRI Value	Existing Area (SF)	Proposed area (SF)	Change
Rooftop	70 (assumed)	104,259	0	- 100%
Concrete	19	4,813	10,793	+ 124%
Asphalt	6	211,919	29,241	- 86%
Overall:		**320,991**	**40,034**	**- 87.5%**

- ■ Limitations:
  - ○ Since it is not possible to take all measurements at an exact identical time, there is some time different between the data points.
  - ○ Zip code data may be influenced by an area which is particularly hot or cold, and thus may not be an accurate representation of the general temperature of the area.
  - ○ The preserved building is not considered in these calculations as it was not included in the scope of work

- ■ Sources:
  - ○ Independent measurements.
  - ○ National Weather Service, 'Weather Conditions for: Los Angeles / USC Campus Downtown, CA. KCQT' http://www.wrh.noaa.gov/map/?wfo=lox&obs=true
  - ○ Psomas (2013), in Envision Award Submission, 'Section CR 2.5-Manage heat islands effect,' page 1.

Relative temperature 7:00-8:00 AM

68.47-68.60° 68.61-68.74° 68.75-68.88° 68.89-69.02° 69.03-69.15° 69.16-69.29° 69.30-69.43° 69.44-69.57° 69.58-69.71°
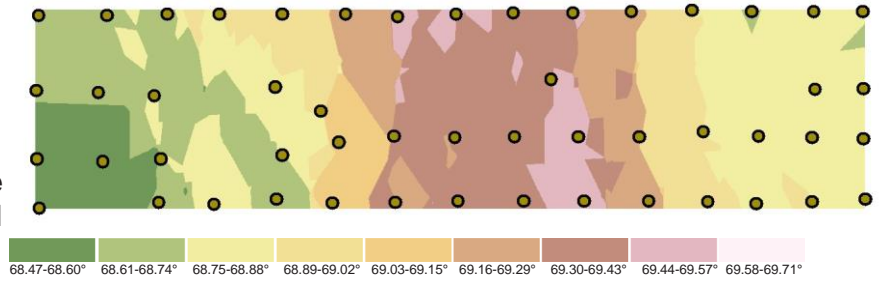
Relative temperature 1:00-2:00 PM

80.54-81.27° 81.28-82.00° 82.01-82.73° 82.73-83.46° 83.47-84.19° 84.19-84.92° 84.93-85.65° 85.66-86.38° 86.38-87.11°

Relative temperature 7:00-8:00 PM

71.17-71.64° 71.65-72.11° 72.12-72.59° 72.60-73.06° 73.07-73.53° 73.54-74.00° 74.01-74.48° 74.49-74.95° 74.95-75.4°
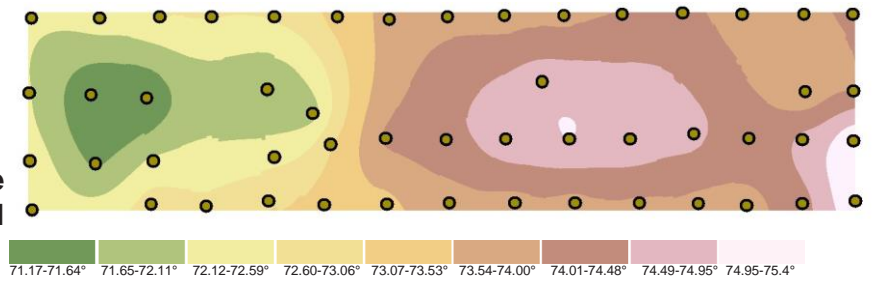
Temperature Measurements

Measurement ID	AM	1PM	7PM
1A	68.3	82.9	72.1
1B	68.3	83.3	72.8
1c	68.7	85.4	73.0
1D	69.2	85.4	72.8
1E	68.5	86.1	72.8
1F	68.9	87.2	73.5
1G	68.9	86.0	73.7
1H	68.7	85.1	73.9
1I	69.2	83.1	73.5
1J	69.4	82.9	73.5
1K	69.2	83.6	73.9
1L	68.3	84.0	74.3
1M	68.5	82.5	73.5
1N	68.7	82.5	74.1
1O	69.0	80.7	74.3
2A	68.5	80.4	72.3
2B	68.9	83.3	70.5
2C	69.0	84.2	70.3
2E	69.8	86.7	71.0
2N	68.5	83.6	72.6
2O	68.5	82.0	73.2
3A	69.4	82.4	72.8
3B	69.4	83.6	71.0
3C	68.5	83.4	72.5
3E	68.9	85.8	72.5
3F	68.9	83.1	73.5
3G	68.7	81.8	74.8
3H	71.4	82.4	74.4
3I	71.9	83.1	75.3
3J	69.6	83.1	75.5
3K	68.5	84.2	75.3
3L	69.8	83.6	75.0
3M	68.5	86.1	74.4
3N	68.5	85.6	75.2
3O	68.5	83.3	76.6
4A	68.1	84.3	72.6

4B	67.8	83.8	73.4
4C	67.6	84.3	73.4
4D	67.8	81.1	72.6
4E	68.0	83.3	73.2
4F	68.3	82.9	73.4
4G	69.0	84.0	73.0
4H	68.9	82.4	73.7
4I	68.7	85.2	73.5
4J	69.0	86.0	73.4
4K	69.2	86.5	73.7
4L	69.2	86.5	73.7
4M	68.9	85.4	73.5
4N	69.4	86.9	73.7
4O	69.0	83.6	75.7
2.5E	69.9	84.5	70.7
1I/J	68.5	84.7	75.2
Park avg	69.3	84.0	73.3
Non park avg	68.7	84.0	73.5

APPENDIX 2: Habitat features

Serves as habitat for numerous species of wildlife, particularly birds, including black-crowned night heron (Nycticorax nycticorax), Anna's hummingbird (Calypte anna), and mourning dove (Zenaida macroura). Users on iNaturalist.org have reported sightings of nine different species, while users on eBird have recorded 35 different species, making it an urban birding hotspot in the Los Angeles area.

- Native upland
- Riparian
- Emergent marsh
- Open water
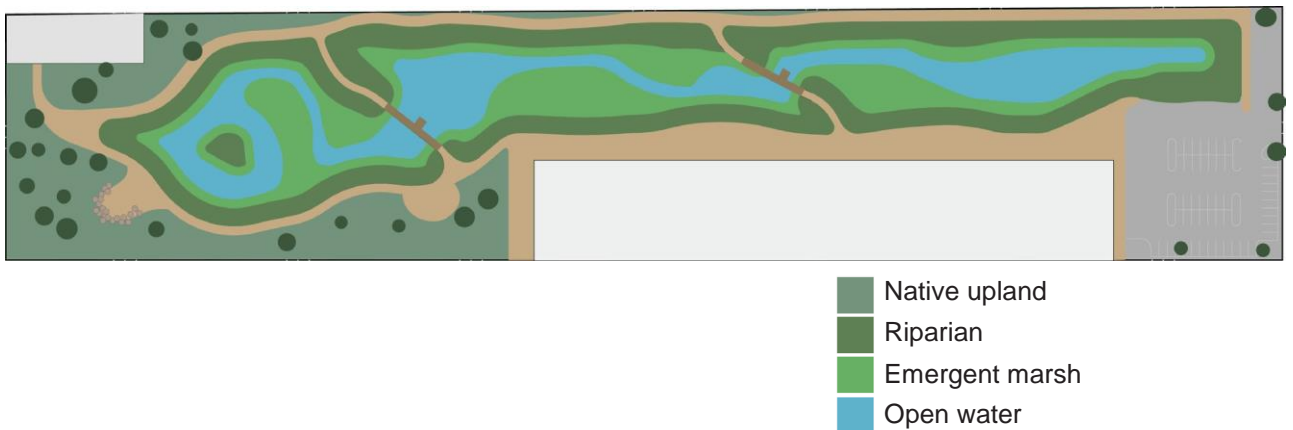
- ■ Limitations:
  - ○ Sightings posted on eBird and iNaturalist may be submitted by hobbyists and enthusiasts, who are more likely to misidentify species than wildlife specialists.
  - ○ Any data based on observations is by definition incomplete since the site cannot be observed at all times.

- ■ Sources:
  - ○ Psomas (2013), in Envision Award Submission, 'Section NW 1.1-Preserve prime habitat,' pages 5-14.
  - ○ 'South Los Angeles Wetland Park' iNaturalist.org (Accessed 7 July 2016) http://www.inaturalist.org/places/south-los-angeles-wetlands-park
  - ○ 'South Los Angeles Wetland Park' eBird.org (Accessed 7 July 2016) http://ebird.org/ebird/hotspot/L1439033

APPENDIX 3 – Irrigation

Requires less than 35% of the irrigation for wetland plants than a traditional turf area would require during months of lowest water flow, which translates to between 0.4 - 0.5 inches/week, as compared to 1.5 inches per week.

- ■ Calculations:

Table 6-2 Average Monthly Irrigation Requirements
(4.5 Acre Wetland Footprint & Baseflow Estimate of 14,000 gpd)

	Monthly Water Balance (from Table 6-1)	Surface Applied Irrigation Requirements	Surface Applied Irrigation Requirements
Month	(ac-ft)	(gal per day)	(inches per week)
Jan	1.36	0	0
Feb	1.31	0	0
Mar	0.76	0	0
Apr	0.11	0	0
May	(0.35)	3,647	0.25
Jun	(0.36)	3,951	0.28
Jul	(0.71)	7,455	0.52
Aug	(0.56)	5,916	0.41
Sep	(0.23)	2,460	0.17
Oct	0.08	0	0
Nov	0.66	0	0
Dec	1.13	0	0

South Los Angeles Wetland Preliminary Design Report, page 60.

  - ○ Chart of estimated required irrigation from the Preliminary Design Report, page 60.
  - ○ City of Los Angeles, Department of Recreation and Parks design irrigation rate is 1.5 inches per week.
  - ○ July: (0.52 inches per week / 1.5 inches per week) x 100 = 34.7%
  - ○ August: (0.41 inches per week / 1.5 inches per week) x 100 = 27.3%

- ■ Limitations: Since this was included in the preliminary report, it is a projection based on past data. Actual irrigation required by the plants may vary, and also there was likely an initial establishment period during which the plants required extra irrigation, particularly because the region entered a drought during the time the park was completed.

■ Sources:
  ○ Psomas (2008) 'South Los Angeles Wetland Preliminary Design Report,' pages 59-60, February 2008.

APPENDIX4 - Home Values

Contributes to increase in home value for homes within an approximate three-block by three-block square centered on the park of $243.43 per square foot, as compared to homes located outside of this area but within a five-block by five-block square centered on the park, averaging $217.14. The closer homes have an increased cost per square-foot of 12%.

■ Calculations:
  ○ Data collected from Redfin.com

$/sq ft	9 block square	$/sq ft	25 block square	
280	352 East 52nd St	274	202 E 49th St	
182	155 E 54th St	241	244 W 50th St	
179	128 East 54th St	168	240 West 51st St	
297	122 E 55th St	229	143 W 52nd St	
212	218 East 56th St	178	142 W 53rd St	
367	371 E 56th St	236	127 W 58th St	
187	626 E 54th St	280	112 West 58th St	
		188	876 East 56th St	
		224	1027 E 56th St	
		211	904 E 52nd Pl	
		227	718 E 52nd St	
		229	626 East 51st St	
		160	755 E 51st St	
		195	898 E 50th St	
243.43	Average $/sq ft	217.14	Average $/sq ft	

(after – before) / before x 100
(243 – 217.14) / 217.14 x 100 = 12%
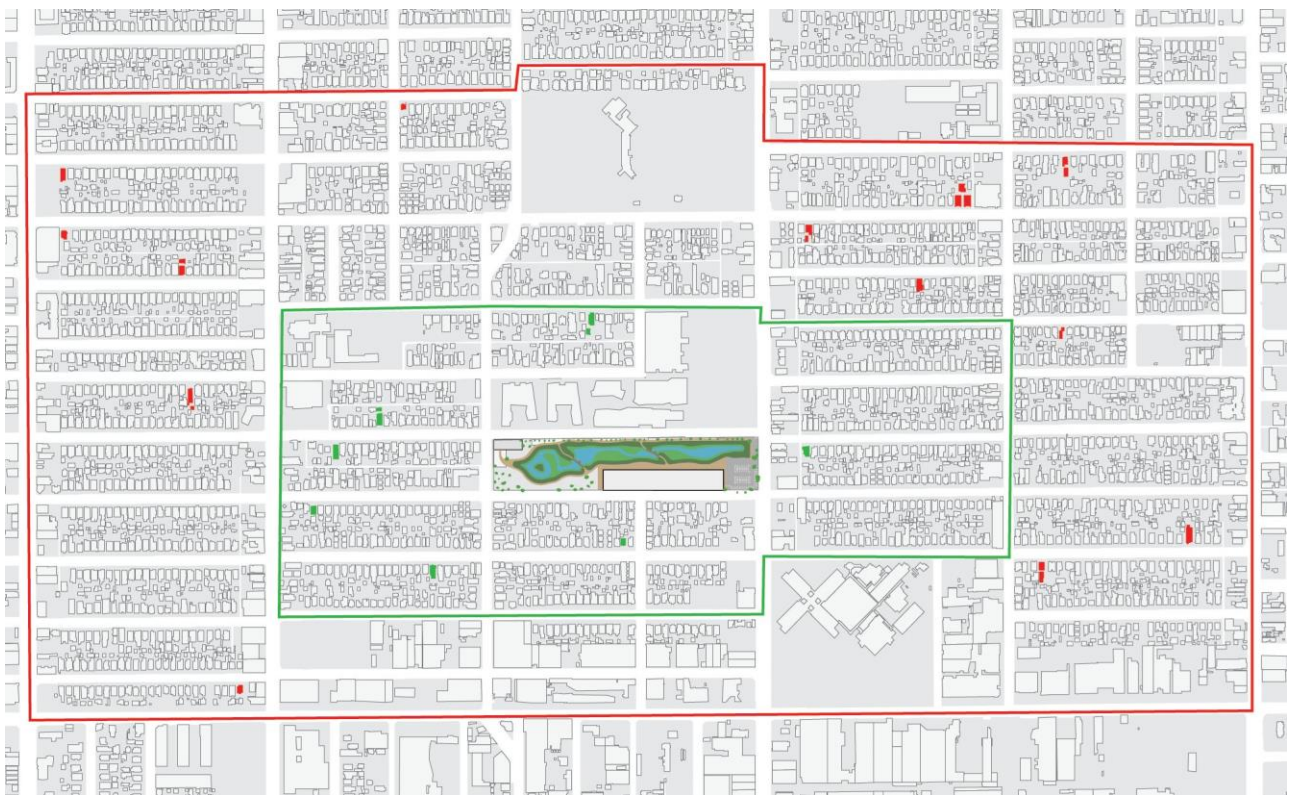
- ■ Limitations:
  - ○ Houses for sale at auction (foreclosures) and homes for sale by owner are not included in these calculations.
  - ○ Increases in home value cannot be solely attributed to South Los Angeles Wetland Park, particularly as the construction of Dr. Maya Angelou Community High School, located across the street from the park, occurred concurrently and likely also contributed to a rise in home values.

- ■ Sources:
  - ○ Redfin.com https://www.redfin.com/city/11203/CA/Los-Angeles/ (accessed 10 July 2016)

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- South Los Angeles Wetland Park Project, Measure O Water Quality Improvement Projects for Los Angeles River Watershed, http://www.lapropo.org/sitefiles/lariver.htm
- Warburton, Rachel L., "Wasteland to Wonderland: Sustainable Brownfield Redevelopment Projects in Low-Income Areas of Los Angeles" (2013). Pitzer Senior Theses. Paper 31. http://scholarship.claremont.edu/pitzer_theses/31
- Envision Platinum Award, Institute for Sustainable Infrastructure http://sustainableinfrastructure.org/envision/project-awards/south-la-wetland-park/
- American Academy of Environmental Engineers and Scientists, Superior Achievement Award winner, http://www.aaees.org/e3competition-winners-2014superiorachievement.php
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- American Council of Engineering Companies National, National Recognition Award http://docs.acec.org/pub/de178b12-ebf2-e5bf-ee7e-c32add49e174