Cool Roofs for a Cooler California

June 19, 2014

Jonathan Parfrey • Climate Resolve

CLIMATE RESOLVE


HOLLYWOOD


CityNational Bank

Green outdoor space and community gardens at schools

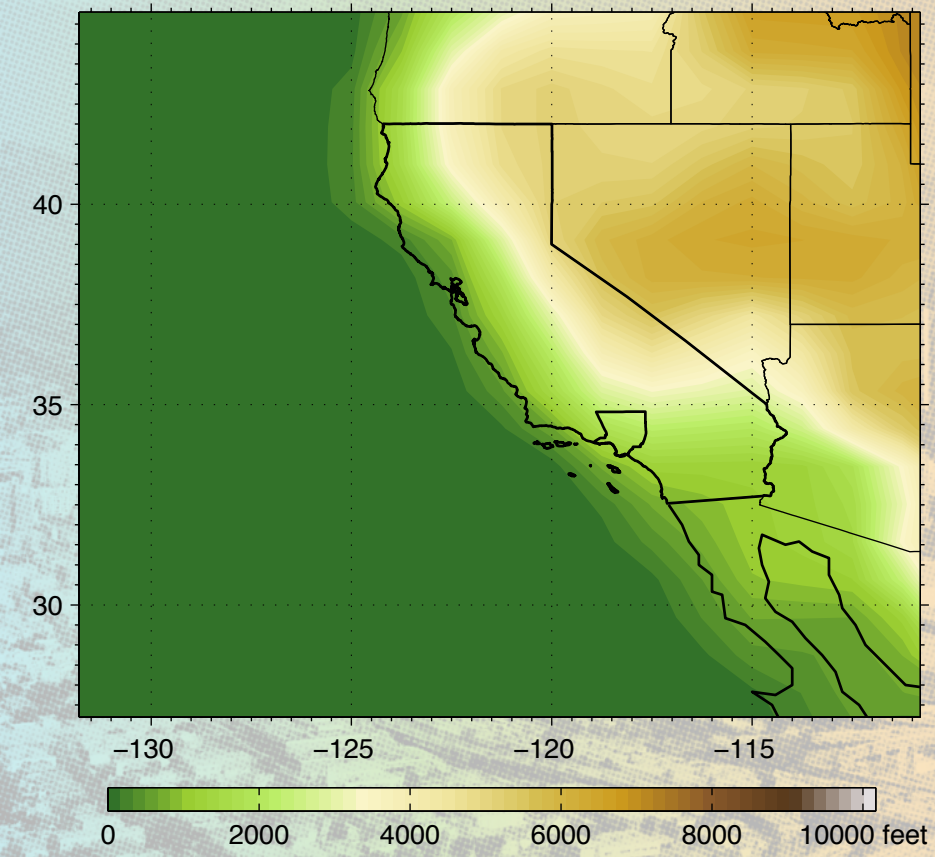
TREEPEOPLE

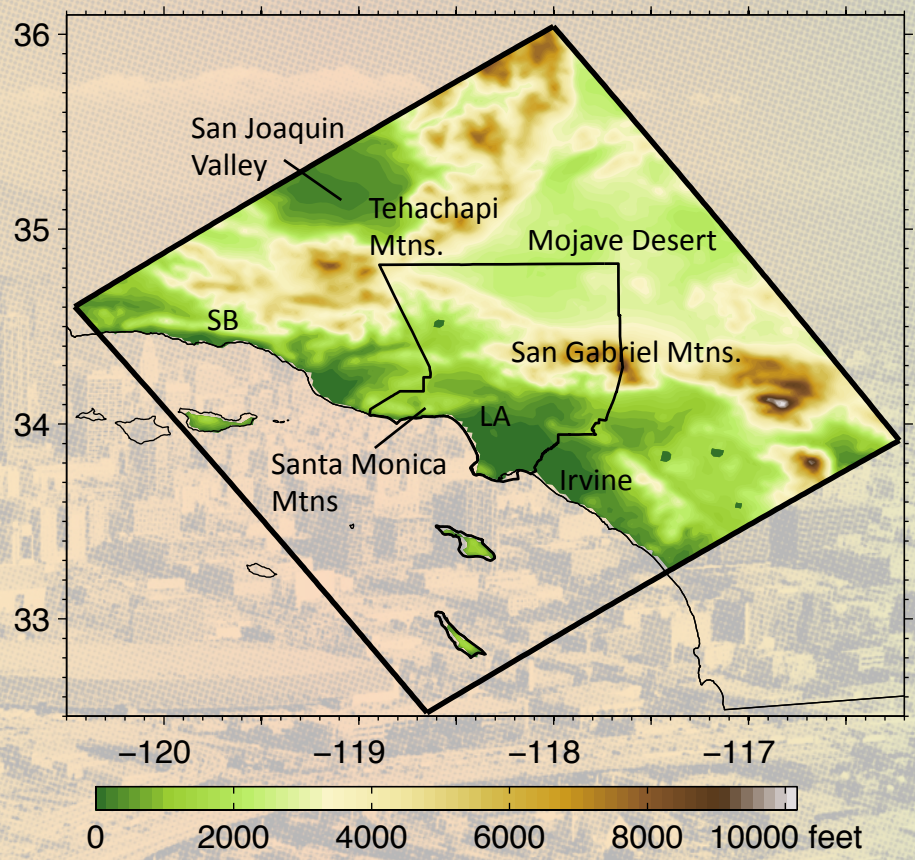
My Figueroa: Complete street improvements

My Figueroa - Multi-Modal Connections

El Sereno - Public Street Plaza near Food 4 Less

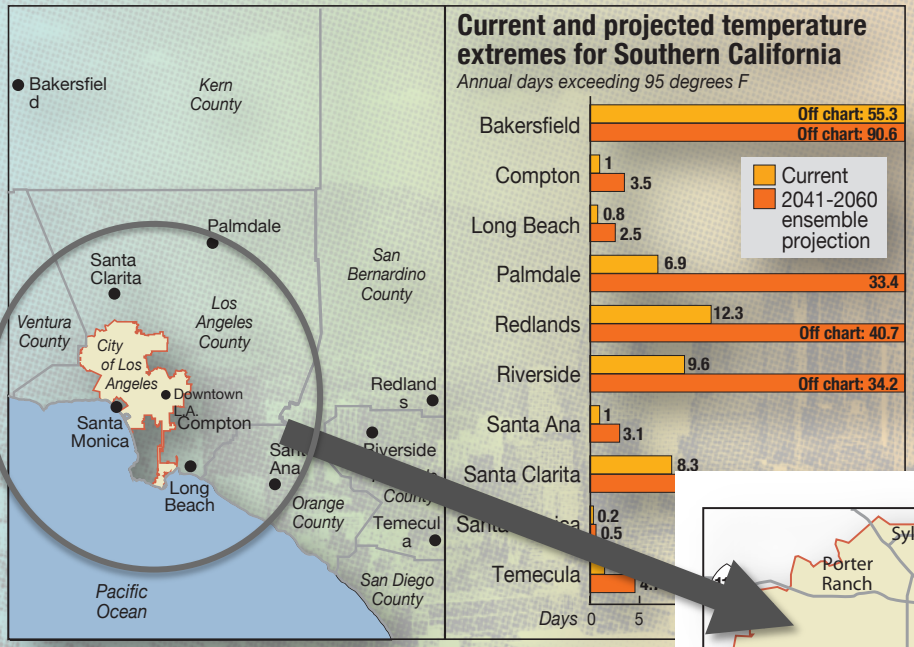
LA River - "greening" of sections through Canoga Park





Topography from a typical global climate model (100-200 km)

Topography and coastline are very well represented in the 2 km resolution innermost domain of the regional climate model



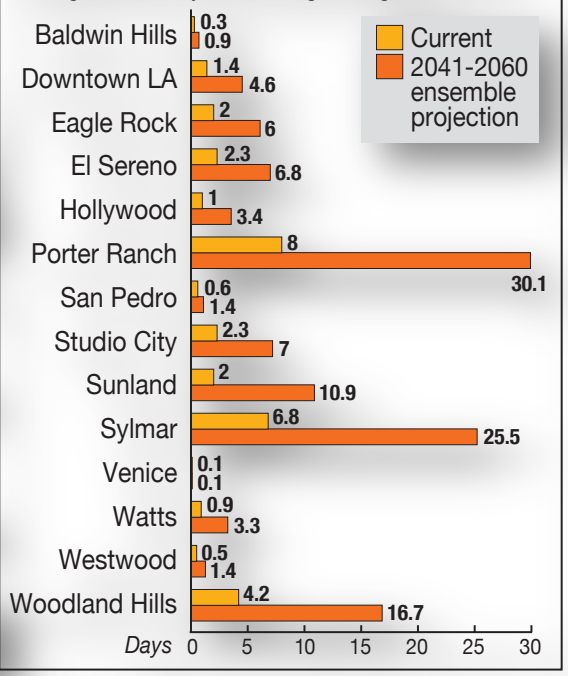
Current and projected temperature extremes for Southern California

Annual days exceeding 95 degrees F

Source: UCLA LARC study, 2012; chart based on the mean/average projected by the

Current and projected temperature extremes for the Los Angeles area

Average annual days exceeding 95 degrees F



Source: UCLA LARC study, 2012; chart based on the mean/average projected by the 19 climate models

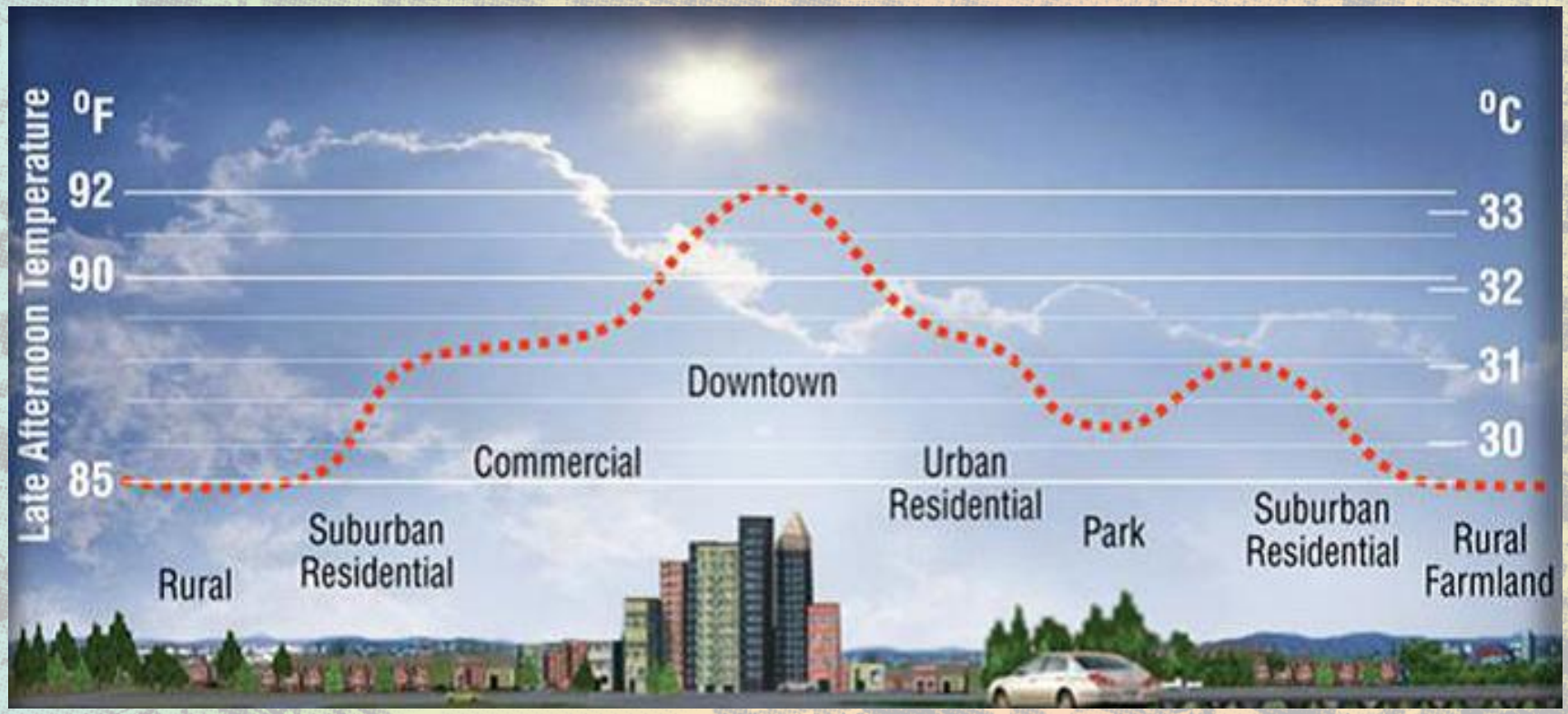
Los Angeles Temperature, 2041-2060

- Coastal areas – 3-4°F
- San Fernando & San Gabriel valleys – 4-4.5°F
- Mountains and Deserts - 4.5-5.5°

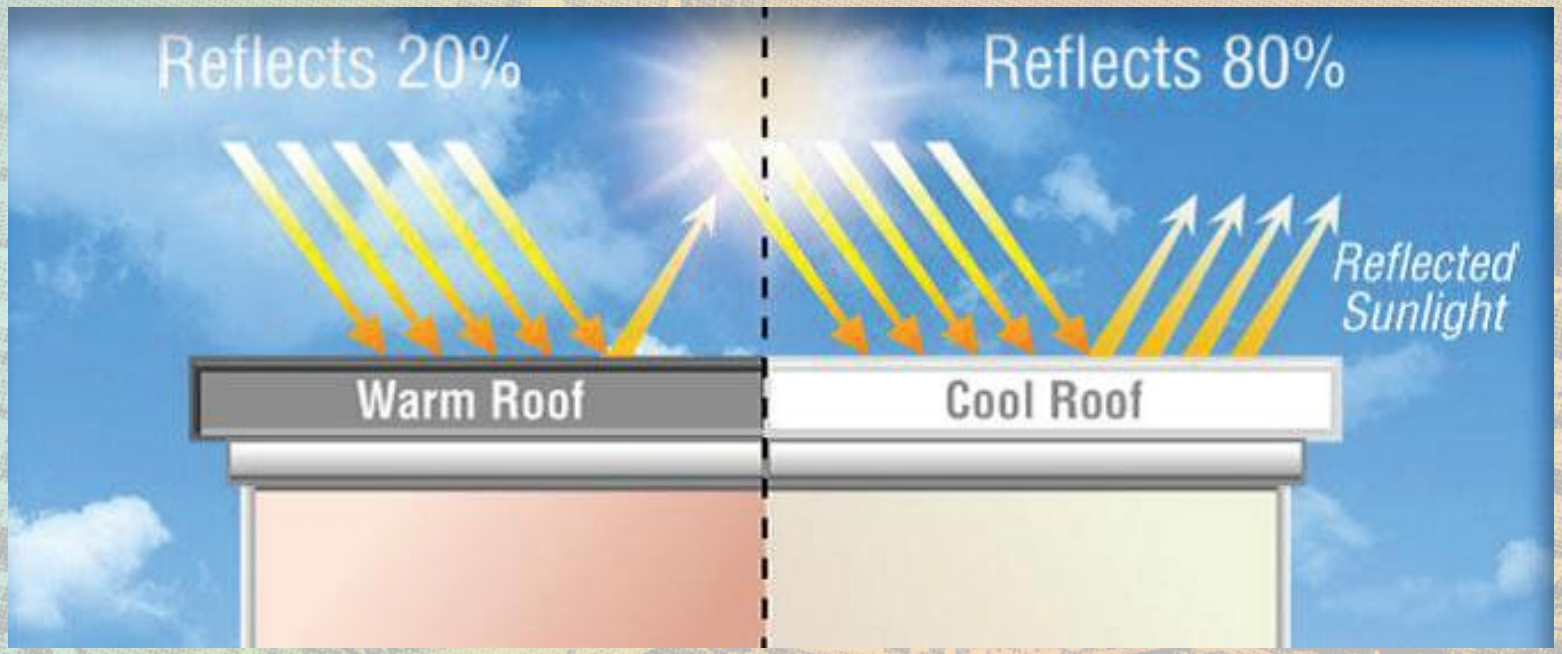
Extreme heat will affect

- Public health
- Air quality
- Food supply
- Energy demand and supply too
- Water: increases evaporation, affecting supply as well as affecting vegetation, habitat, wildfires
- Property values
- Road and rail

Urban Heat Island Effect



Cool Roofs


Reflects 20%
Reflects 80%
Reflected Sunlight
Warm Roof
Cool Roof

Cool Roofs

Benefits of Cool Roofs

cooling of 3-12°F indoors

- Utility customers can save money on their bills
  - In Los Angeles: cumulatively up to $30 million per year
- Decrease greenhouse gas emissions
  - Equivalent to 40 metric tons of CO2
- Provide a healthier environment and greater resilience during heat events
- Utility benefits: reduces likelihood of outages, again aiding resilience

LADWP incentive

- Roofing material must meet the 2014 Los Angeles Green Building Code requirements.
- To qualify for rebates cool roofs must meet the three-year Solar Reflectance Index (SRI) requirements as rated by the Cool Roof Rating Council at www.coolroofs.org.
- Starting May 1, 2013, Rebates will be determined by the slope of the roof and the SRI. There are two levels of rebates:

	Level 1	Level 2
• Low-slope (≤ 2:12) 3 year SRI	≥7	≥85
• Steep –slope (>2:12) 3 year SRI	≥20	≥35
• Incentive per square foot of roof*	$0.20	$0.30

*Square footage is subject to verification by the LADWP. The square footage of parapet is not included in the rebate.

Coolroofs.org

- **Asphalt-shingle:** 61 approved products
- **Bitumen sheet roofing:** 123 approved products
- **Concrete/clay tiles or slate:** 455 approved products
- **Coatings:** 579 approved products
- **Metal products**: 1019 approved products
- **Wood shake/stone aggregate/pavers:** dozens of approved products
- **Thermostatic plastic:** 113 approved products

City of Los Angeles
Coof Roof Ordinance

- **Ordinance No. 182849**: 2013 California Green Building Standards Code is adopted by reference.
  - 99.04.106.5. Cool Roof for Reduction of Heat Island Effect. Roofing material shall comply with the following:
  - 99.04.106.5.1. Solar Reflectance. Roofing material shall have a minimum 3-year aged solar reflectance equal to or greater than the values specified in Table 4.106.5.
  - 99.04.106.5.2. Thermal Emittance. Roofing materials shall have a Cool Roof Rating Council (CRRC) initial or aged thermal emittance equal to or greater than those specified in Table 4.106.5.
  - Solar reflectance values shall be based on the aged reflectance value of the roofing product or the equation in Section A4.1 06.5.1 if the CRRC certified aged solar reflectance are not available.

Another Heat Island Provision

- 99.04.106.7. Reduction of Heat Island Effect for Nonroof Areas [N]. Reduce nonroof heat islands for 25% of pathways, patios, driveways or other paved areas by using one or more of the methods listed.
  - Use trees or other plantings to provide shade and that mature within 5 years of planting. Trees shall be suitable in mature size and environmental requirements for the site. Tree selection and placement shall consider location and size of areas to be shaded, location of utilities, views from the structure, distance to sidewalks and foundations, overhangs onto adjacent properties and streets; other infrastructure and adjacent to landscaping. In addition, shading shall not cast a shadow, as specified, on any neighboring solar collectors pursuant to Public Resources Code Section 25981, et seq. (Solar Shade Control Act);
  - Use high albedo materials with an initial solar reflectance value of at least .30 as determined in accordance with American Society for Testing and Materials (ASTM) Standards E1918 or C1549;
  - Use open grid pavement system or pervious or permeable pavement system;
  - Use solar panel arrays to create a canopy shade system; or
  - Other methods of reducing heat island effects acceptable to the Department.

Next

- Cool Roof road show
  - Local Government Commission
  - Southern California Edison
- Cool Streets
  - Streets = 6500 miles
  - LBNL, LABSS, Western Emulsion: asphalt slurry cocktail
  - *Streets for the Future* coalition

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