

Agenda: 6 and 7



# Advisory Council Regular Meeting and Retreat

Saffet Tanrikulu, Ph.D.  
Research and Modeling Manager  
BAAQMD  
January 14, 2015

# Review of 2014 and Discussion of 2015

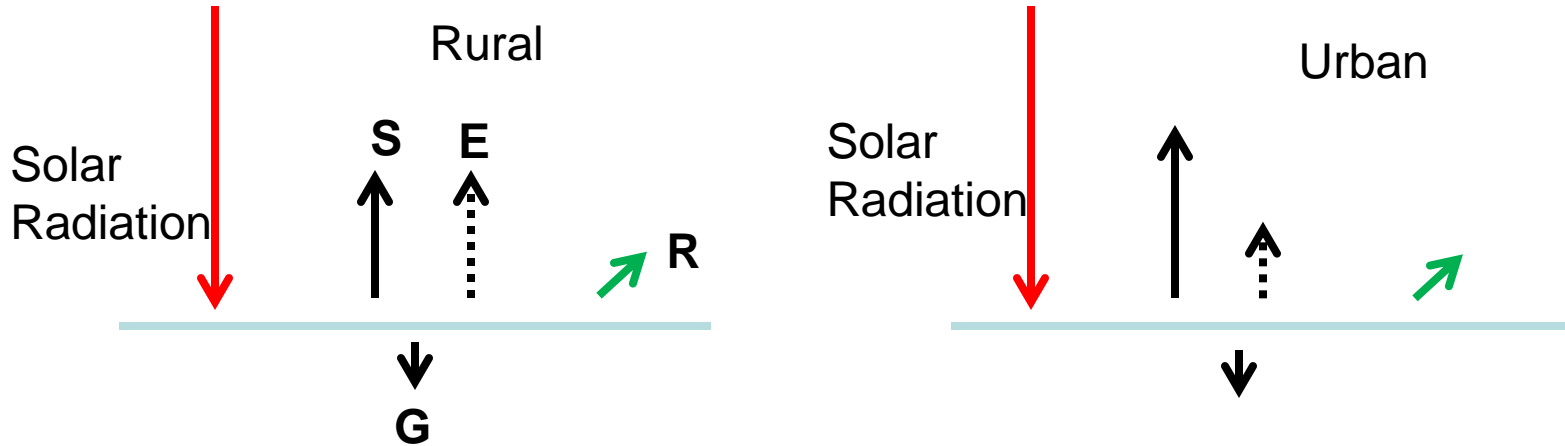
Main Focus: Bay Area's *Energy Future*

Four reports (Eight speakers):

- The Path Forward for the Energy Sector Toward California's 2050 Greenhouse Goal. February – April. [Complete.](#)
- California's Energy Future and the Move Towards the 2050 Greenhouse Gas Goal. May – July. [Complete.](#)
- Energy and Climate Opportunities for the Bay Area. September – November. [Complete.](#)
- The Integrated Grid: Energy Storage and Smart Grid Technologies and their Relationship to 2050 GHG Goal. October – January, 2015. In progress.
- Urban Heat Island. January – June 2015.
- Annual Report (presentation) to the Board of Directors by June 2015.

# Discussion of 2015

## Urban Heat Island; Brief Description



S: Sensible heat flux  
R: Reflection (albedo)

E: Latent heat flux (evaporation)  
G: Ground absorption

# Discussion of 2015 (cont.)

## ***Potential areas for investigation***

### *Definition:*

- Scientific description

### *Impacts on:*

- Energy Use (air conditioner)
- Climate
- Air Pollution (ozone, PM2.5?)
  - Biogenic emissions
  - Ozone chemistry
- GHG Emissions
- Public Health (Example: 2006 heatwave, SF Health Department)

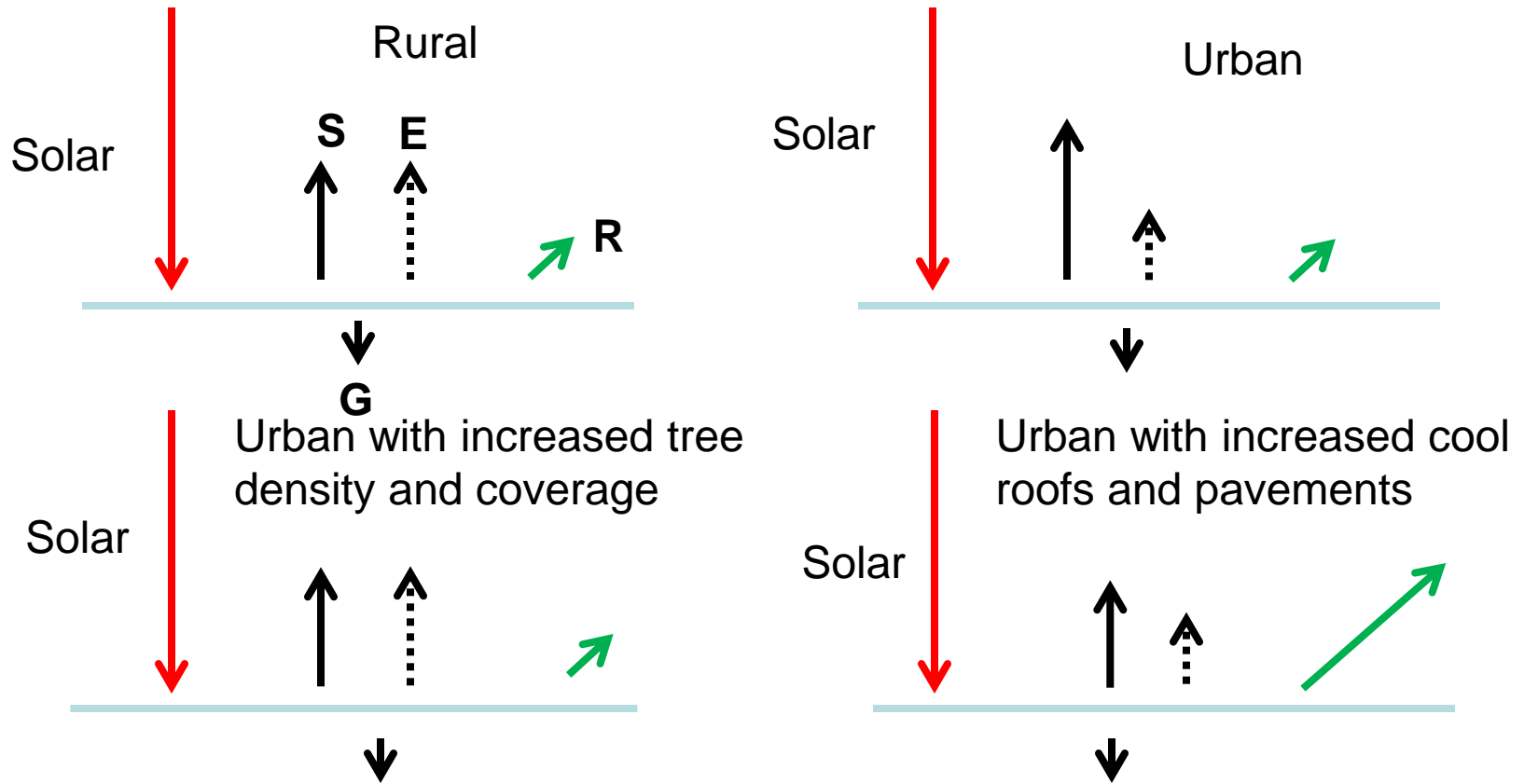
### *Possible Mitigation Strategies:*

- Increasing areas covered with vegetation and trees
- Adopting cool roofs and pavements
- Others

***Very limited information on UHI impacts and mitigation strategies for the Bay Area.***

# Discussion of 2015 (cont.)

## Discussion on Possible Mitigation Strategies



S: Sensible heat flux  
R: Reflection

E: Latent heat flux (evaporation)  
G: Ground absorption

# Discussion of 2015 (cont.)

## ***Possible mitigation strategies:***

Increasing areas covered with vegetation and trees

- Mitigation process: Evapotranspiration
  - Transfers a fraction of sensible heat to latent heat

	<i>Bowen ratio (day-time)</i>
Urban	4.00
Grassland	2.00 (non-irrigated)
Forest	0.60
Water	0.10
San Francisco	0.50
Oakland	0.75
San Jose	2.20
Livermore	2.08
Concord	2.38

Summer average values in the US, estimated by EPA



August values in BA

$$Bowen\ ratio = \frac{Sensible\ heat\ flux}{Latent\ heat\ flux}$$

# Discussion of 2015 (cont.)

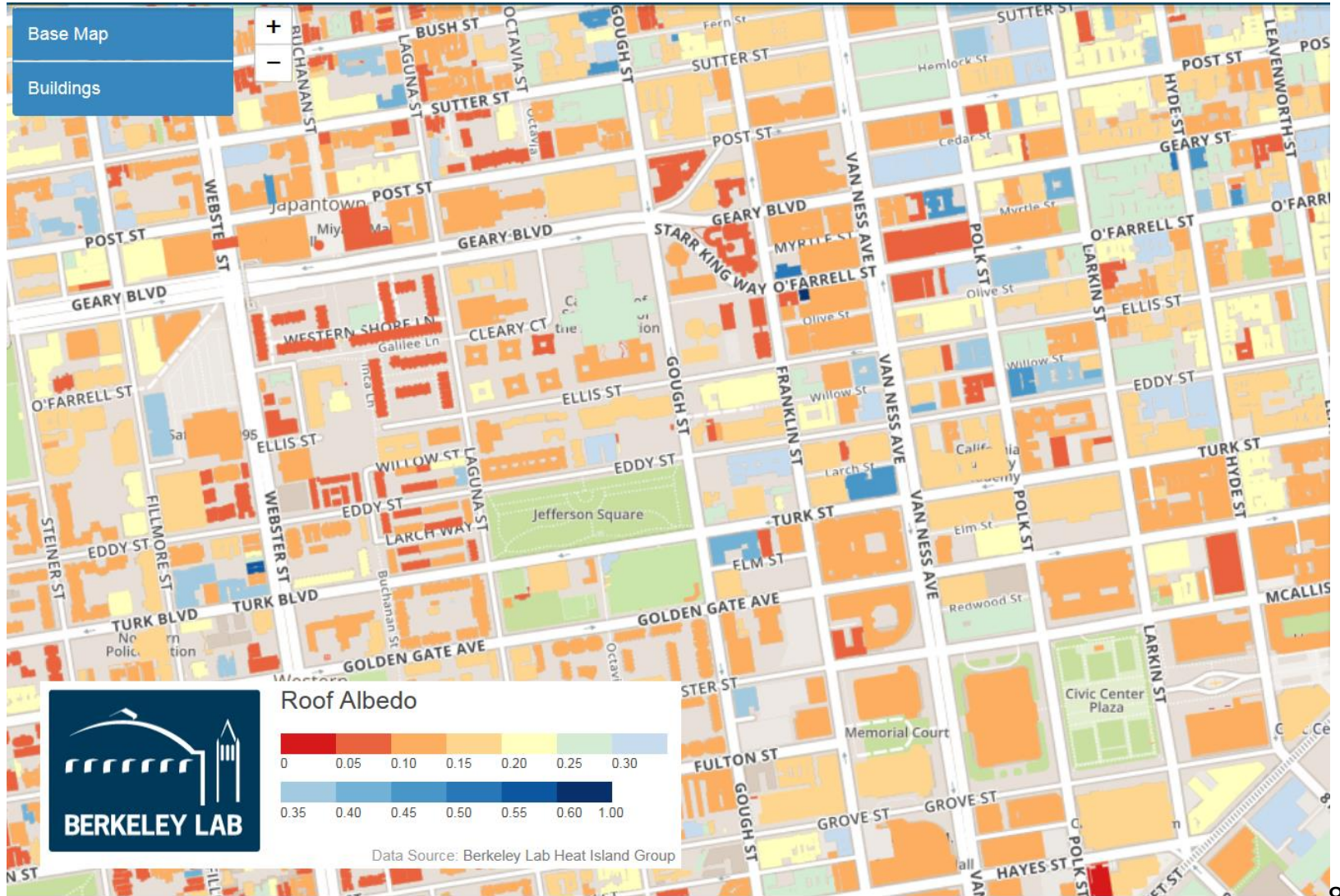
## ***Possible mitigation strategies:***

Adopting cool roofs and pavements

- Mitigation process: Reflects solar energy (reduces heat absorption)
  - Albedo of regular roofs (0.05 – 0.20)
  - Albedo of cool roofs (0.40 – 0.80)
    - Depends on roof angle and color of roof material
  - Albedo of urban and rural areas (0.15 – 0.20); forest (0.12 – 0.15)
  - Cool roofs
  - Cool pavements

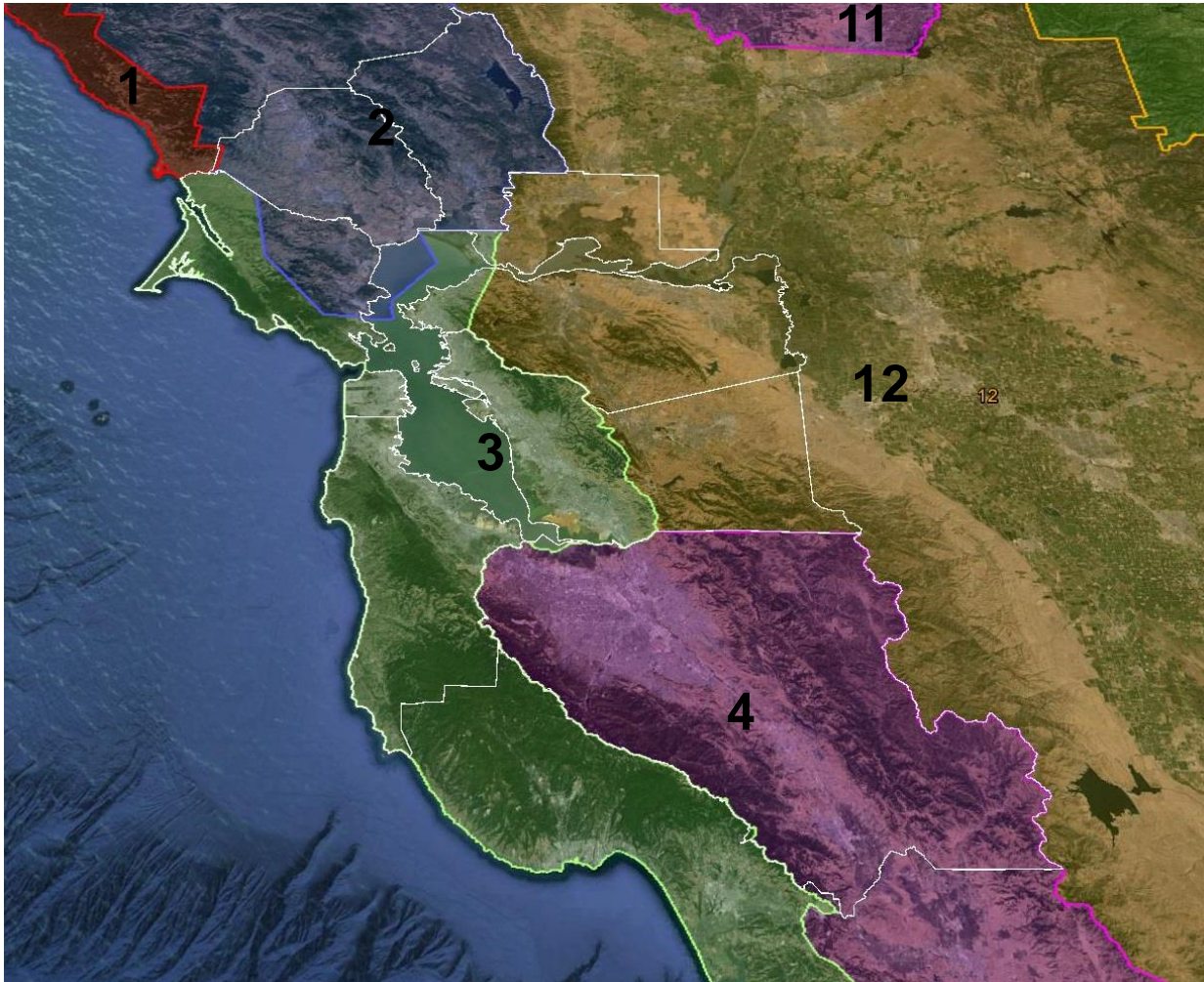


# A Sample Albedo Map of San Francisco





# CEC's Building Climate Zone Map



(used for various regulations and incentives; Title 24)

Based on temperature and energy use

# Discussion of 2015 (cont.)

Presentations on mitigation strategies:

- Mitigation of Urban Heat Island Effects by Increasing Areas Covered with Vegetation and Trees (January 2015).

John Melvin, State Urban Forester

Urban Forestry Advisor Staff

California Department of Forestry and Fire Protection

Sacramento

- Mitigation of Urban Heat Island Effects via adopting cool roof and cool pavement strategies (February 2015).

Ronnen Levinson, Ph.D.

Staff Scientist, Heat Island Group

Lawrence Berkeley National Laboratory

Berkeley

- Others if time permits



# BAAQMD Urban Forestry Overview

January 14, 2015

John Melvin, **CAL FIRE** - State Urban Forester





# About me.

- B.S. in Forestry, Humboldt State University.
- ISA Certified Arborist (WE-5889A)
- CA Urban Forests Council Cert. Urban Forester #101
- Registered Professional Forester #2817
- Wildland Fire Training
- Medical and Hazmat First Responder Training
- Work experience in forestry, urban forestry, arboriculture, wildland fire, medical first response, and GIS.

# What I Do

- **Assist CAL FIRE upper management in developing policy and legislation in regards to urban forestry, urban greening, and climate change.**
- **Run day to day operations of the Urban Forestry Program. (Supervision, grant administration, budgeting, etc.)**
- **Public relations and advocacy within state government and externally.**
- **Media relations.**
- **Policy interpretation and decision making.**
- **Getting urban forestry into other policy areas.**

# *CAL FIRE's* Urban & Community Forestry Program

- Technical assistance and advice
- Public and professional education
- Public events
- Local and regional advocacy
- Networking and partnerships
- Technology transfer
- Grants
- Conduit to national programs



# Why **CAL FIRE** Does Urban Forestry

## The California Urban Forestry Act of 1978 (PRC 4799.06-4799.12)

- **Promote the use of urban forest resources for purposes of increasing integrated projects with multiple benefits in urban communities.**
- **Arrest the decline of our urban forest resources, facilitate the planting of trees in urban communities, and improve the quality of the environment in urban areas through the establishment and improved management of urban forest resources.**
- Facilitate the creation of permanent jobs in tree maintenance and related urban forestry activities in neighborhood, local, and regional urban areas.
- Optimize the potential of tree and vegetative cover in reducing energy consumption and producing fuel and other products.
- **Encourage the coordination of state and local agency activities in urban forestry and related programs and encourage maximum citizen participation in their development and implementation.**
- Prevent the introduction and spread within this state of known and potentially damaging or devastating pests and diseases, including, but not limited to, Dutch elm disease, pine pitch canker, sudden oak death disease, the Asian long-horned beetle, and mistletoe.
- Reduce or eliminate tree loss resulting from these diseases and others that are identified.



# Program Highlights

- Staff of 9, six field specialists, one state coordinator, two analysts
- Websites = [www.ufe.org](http://www.ufe.org) and [www.fire.ca.gov](http://www.fire.ca.gov)
  - SelectTree/CA Big Trees Register/Urbanwood/ForestTree
- CA ReLeaf Network = 100+ Community Groups
- CaUFC/Regional councils
- **Grant Programs (GGRF)**
  - a. Green Trees For The Golden State
  - b. Management Activities
  - c. Green Innovations
  - d. Woods in the Neighborhood
  - e. Urban Wood and Biomass Utilization
- **Tree City USA awards – 162 cities, 12 Tree Line Utilities, 8 Tree Campus**
- **Applied Research & Demonstration**



# CAL FIRE

## Regional Urban Foresters



### Regional Urban Foresters

**Guy Anderson - Central Valley**  
Department of Forestry and Fire Protection  
1234 E. Shaw Avenue  
Fresno, CA 93710-7899  
559-243-4109  
(559) 222-2129 fax

**Glenn Flamik- Northern California**  
Department of Forestry and Fire Protection  
P.O. Box 944246  
Sacramento, CA 94244-2460  
(916) 201-8942  
(916) 653-8957 fax  
Glenn.Flamik@fire.ca.gov

**Lynnette Short- San Diego, Orange, Imperial**  
Department of Forestry and Fire Protection  
2249 Jamacha Road  
El Cajon, CA 92019  
(619) 937-1410  
(619) 590-3127 fax  
Lynnette.Short@fire.ca.gov

**Abigail Srader- Inland Empire**  
Department of Forestry and Fire Protection  
2524 Mulberry Street  
Riverside, CA 92501  
(909) 553-8057  
(951) 782-4248 fax  
Abigail.Srader@fire.ca.gov

**VACANT- Los Angeles, Ventura**  
Department of Forestry and Fire Protection  
3950 Paramount Boulevard #210  
Lakewood, CA 90712

**James Scheid- Bay Area**  
Department of Forestry and Fire Protection  
135 Ridgway Avenue  
Santa Rosa, CA 95401-4318  
(415) 265-9059  
(707) 576-2574 fax  
James.Scheid@fire.ca.gov

### Sacramento Headquarters Staff

**John Melvin, State Urban Forester**  
Department of Forestry and Fire Protection  
P.O. Box 944246  
Sacramento, CA 94244-2460  
(916) 657-2289  
(916) 508-2767 cell  
(916) 653-8957 fax  
John.Melvin@fire.ca.gov

**Deborah Wong, Urban Forestry Analyst**  
Department of Forestry and Fire Protection  
P.O. Box 944246  
Sacramento, CA 94244-2460  
(916) 651-6423  
(916) 653-8957 fax  
Deborah.Wong@fire.ca.gov

**Darla Mills, Urban Forestry Analyst**  
Department of Forestry and Fire Protection  
P.O. Box 944246  
Sacramento, CA 94244-2460  
(916) 651-3289  
(916) 653-8957 fax  
Darla.Mills@fire.ca.gov

For more information visit:  
[http://www.fire.ca.gov/resource\\_mgt/resource\\_mgt\\_urbanforestry.php](http://www.fire.ca.gov/resource_mgt/resource_mgt_urbanforestry.php)

# CAL FIRE

## Regional Urban Foresters





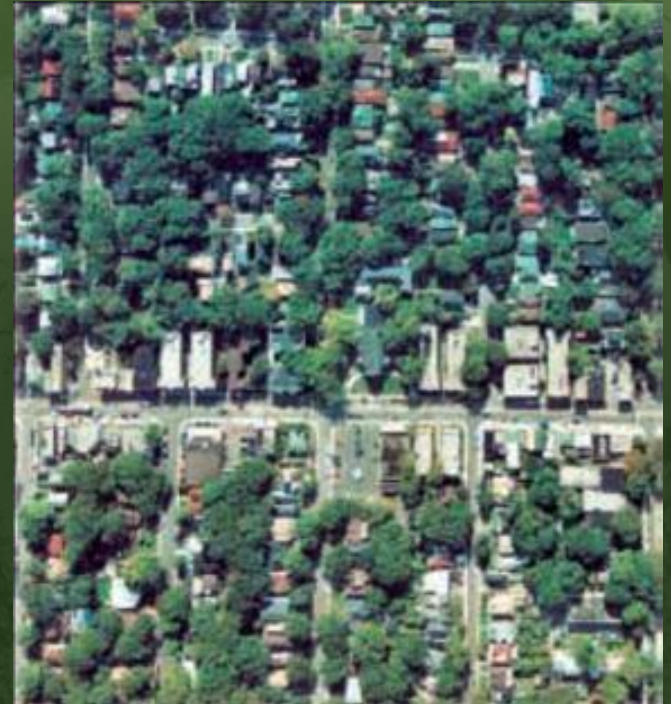


**James Scheid, Regional Urban Forester**

Courtesy of Urban  
ReLeaf and the Golden  
State Warriors



# *Definition?*



# Urban Forestry Defined

## PRC (UF Act Definition)

"Urban forestry" means the cultivation and management of native or introduced trees and related vegetation in urban areas for their present and potential contribution to the economic, physiological, sociological, and ecological well-being of urban society.

***Note: Forests are more than just trees, and so are urban forests!***



**In it's broadest sense, Urban Forestry embraces a multi-managerial system that includes, but is not limited to:**

- **Urban and environmental planning**
- **Landscape architecture**
- **Recycling/utilization of urban biomass**
- **Arboriculture**
- **Social science**
- **Economics**
- **Public health**
- **Fire ecology/fire management**
- **Outdoor recreation opportunities**
- **Fish and wildlife management**
- **Watershed management (water quality, hydrology, storm water management)**
- **Engineering**
- **Forest Management**





# Urban Forestry

- **Ecosystems Management Approach (ex: Greenprint in Sacramento)**
- **Functional Design**
- **Sustainability (economic, social, environmental)**
- **Stewardship – the big buy-in!**
- **Benefits vs. Costs**
- **Common Sense – A Rare Win/Win.**



# Urban Forest Benefits

- **GHG storage and avoided emissions**
- **Energy Conservation**
- **Air Quality**
- **Conserving Runoff**
- **Water quality improvement**
- **Economic (property value +)**
- **Public Health**
- **Much more.**





# The Urban Forest Industry 2009 (Clemson Study)

- \$3.6 billion value added to State economy
- Approx. 60,000 Jobs
- Labor income: \$2.041 Billion
- Total income: \$2,876 Billion
- \$246 Million in state and local taxes



# Overview of AB 32 and SB 535

- AB 32 – The Global Warming Solutions Act of 2006
  - ❑ Air Resources Board is the lead agency. They have a “Scoping Plan”, and an “Investment Plan” to achieve the goals set under AB 32.
  - ❑ <http://www.arb.ca.gov/cc/ab32/ab32.htm> - for more information.
- SB 535 - 2012
  - ❑ Set aside a portion of money collected from cap and trade revenue into a trust fund which will dedicate the money to programs and projects that reduce greenhouse gas emissions and mitigate the direct health effects of climate change for the **most impacted and disadvantaged communities**.
  - ❑ Cal EPA has a methodology for using CalEnviroScreen 2.0 to identify disadvantaged communities, and how to serve them.
  - ❑ <http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auctionproceeds.htm> for more information.

# CAL FIRE Greenhouse Gas Reduction Fund (GGRF) Grants

- California Forest Improvement Program (CFIP)
- Forest Legacy Program (FLP)
- Reforestation Grant Program
- Fuels Reduction Grant Program
- State Demonstration State Forest Grant Program
- Programmatic Timberland Environmental Impact Report Grant Program
- **Urban and Community Forestry Grants**
  - ❑ Green Trees For The Golden State
  - ❑ Green Innovations
  - ❑ Woods In The Neighborhood
  - ❑ Urban Forest Management Activities
  - ❑ Urban Wood and Biomass Utilization
- [http://calfire.ca.gov/resource\\_mgt/resource\\_mgt\\_urbanforestry\\_grants.php#](http://calfire.ca.gov/resource_mgt/resource_mgt_urbanforestry_grants.php#)



# Grant Eligibility

- **Projects must reduce GHG emissions and help meet the goals of AB 32. Details are in the RFP documents and the Procedural Guide.**
- **Grant projects must be in an urban area or urban cluster as defined by the US Census Bureau. See this link:**  
<http://www.census.gov/geo/www/ua/2010urbanruralclass.html>
- **Grant projects must be located in a disadvantaged community or be directly serving a disadvantaged community.**
  - ❑ **Disadvantaged community status will be determined using the CalEnviroScreen 2.0 tool.**
- **Cities, counties, districts and 501C(3) non-profit organizations are eligible to apply (unless otherwise stated in RFP).**
- **Individuals, companies and federal agencies are not eligible.**

# Grant Requirements

- **We always require best management practices.**
- **We inspect all grants at least annually.**
- **We assist grantees throughout the grant application and implementation.**
- **We help grantees overcome obstacles to success. Including advocacy.**
- **We leverage grant funds to accomplish other goals with grantees.**



# Types of Urban Forestry Grant Projects

- **“Green Trees For The Golden State”**
  - ❑ Urban tree planting projects and associated costs
- **“Green Innovations”**
  - ❑ Green infrastructure projects (vegetated swales, green roofs, green walls, etc.)
- **“Woods In The Neighborhood”**
  - ❑ Purchase and improve unused neighborhood parcels
  - ❑ Similar to Green Innovations otherwise
- **“Urban Forest Management Activities”**
  - ❑ Management activities are: Urban forest management plans, tree or urban forest related policies and ordinances, urban tree inventories, and urban forest mapping and analysis.
- **“Urban Wood and Biomass Utilization”**
  - ❑ Development and implementation of an Urban Wood or Urban Biomass Utilization project or program. Better utilizing this resource will lead to improved management of urban vegetation. The focus of this program is to utilize the tree for its highest and best use(s) that leads to reductions in GHG emissions.











# Bay Area Specific Information

- **Urban Forest Map (CAL FIRE/FUF/Urban Ecos)**
- **USFS Bay Area canopy study (2010)**
- **USFS/CAL FIRE San Jose high resolution canopy study (2013)**
- **USFS Tree Guide for Northern Coastal Communities.**





- **Map of San Francisco's urban forest**
- **Open Source**
- **Has city inventory info included**
- **Anybody can add their tree**
- **Has training and ID resources**
- **Shows ecosystem services of selected trees (individuals or groups)**
- **Map and wiki**
- **Mobile App for iPhone and Android has launched.**
- **Also in Sacramento Region, San Diego County, Los Angeles County, Philadelphia PA, Somewhere in MI.**





# As an Example: USFS Bay Area Urban Ecosystem Report

- Urbanization has led to a 10% increase in canopy cover over the last 20 years, but also to a 17% increase in impervious surfaces.
- Excludes undeveloped open space.
- Total annual benefits for the region were estimated at \$5.1 billion per year.
- A modest increase of just 3% in the urban canopy will increase annual benefits by \$475 million or \$69 for each person in the Bay area.
- For those interested in the historic changes in the urban forests of the San Francisco Bay area and the benefits the trees provide, this document provides a wealth of information.





# 2013 San Jose High Resolution Urban Forest Assessment

- Overall canopy cover of 15.4%
- Ranges from 12%- over 20% by council district.
- Approximately 1.6 million trees
- Annual ecosystem services and property values of \$239 million per year.
- 2 million additional potential planting sites – mostly on private property.
- Planting 100,000 of these sites would result in canopy increase to 16.3%, and a 7% increase in annual benefits (\$16.4 Million. The increase takes 20-30 years.
- Total asset value of San Jose's existing urban forest: \$5.7 Billion (\$3,634 per tree, calculated at 4.125% discount rate for 100 years).
- This increases to \$6.1 Billion if the above mentioned 1% canopy increase would occur.





# Northern California Coast Community Tree Guide: Benefits, Costs, and Strategic Planting

- Quantifies benefits of trees on a per-tree basis rather than on a canopy-cover basis (it should not be used to estimate benefits for trees growing in forest stands).
- Average annual net benefits (benefits minus costs) increase with mature tree size.
- Benefits differ based on location:
  - \$29 (public owned) to \$41 (private) for a small tree
  - \$42 (public) to \$60 (private) for a medium tree
  - \$101 (public) to \$122 (private) for a large tree
  - \$142 (public) to \$146 (private) for a large conifer.
- Illustrates how to use this information to estimate benefits and costs for local tree planting projects.

# Urban Forestry Websites

- [www.fire.ca.gov/resource\\_mgt/resource\\_mgt\\_urbanforestry.php](http://www.fire.ca.gov/resource_mgt/resource_mgt_urbanforestry.php) - **CAL FIRE Urban and Community Forestry**
- <http://www.fs.fed.us/ucf/> - **USFS urban forestry website**
- [www.ufe.i.org](http://www.ufe.i.org) - **Cal Poly SLO Urban Forest Ecosystems Institute**
- [www.fs.fed.us/psw/programs/uesd/uep/](http://www.fs.fed.us/psw/programs/uesd/uep/) - **USFS PSW Urban Research**
- [www.californiareleaf.org](http://www.californiareleaf.org) – **statewide umbrella non-profit (100+ local network organizations).**
- [www.caufc.org](http://www.caufc.org) – **statewide industry and municipal professional non-profit**
- [www.wcisa.net](http://www.wcisa.net) – **Western Chapter, International Society of Arboriculture (ISA)**
- [www.arborday.org](http://www.arborday.org) – **National Arbor Day Foundation**
- [www.treesaregood.com](http://www.treesaregood.com) – **ISA public education website**
- [www.urbanforestmap.org](http://www.urbanforestmap.org) - **one of four CA interactive open source urban tree maps (San Diego County, Los Angeles Region, Sacramento Region)**
- [www.ufmptoolkit.com](http://www.ufmptoolkit.com) - **online urban forest management plan development tool**
- <http://depts.washington.edu/hhwb/> - **Green Cities, Good Health website**
- <http://lhhl.illinois.edu/index.htm> - **urban forestry related social science website**
- [www.itreetools.org](http://www.itreetools.org) – **free urban forestry geospatial analysis tools**



# My Best Reasons Why I Do What I Do





# QUESTIONS AND ANSWERS





# Thank You !

John Melvin

CA Dept. of Forestry & Fire Protection (**CAL FIRE**)

State Urban Forester

P.O. Box 944246

Sacramento, CA 94244-2460

(916) 657-2289

(916) 653-8957 fax

[john.melvin@fire.ca.gov](mailto:john.melvin@fire.ca.gov)





BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

AGENDA: 10

# Air District Overview Advisory Council Special Meeting / Retreat

Jack P. Broadbent  
Executive Officer/APCO  
January 14, 2015

# Key 2015 Initiatives

- My Air Online and Website Redesign
- Relocation of Air District Headquarters to 375 Beale Street

# Key 2015 Policy Initiatives

- Refinery Emissions Tracking, Community Monitoring Baseline and Rules
- Climate Strategy Implementation
- Emissions Reduction Rulemakings