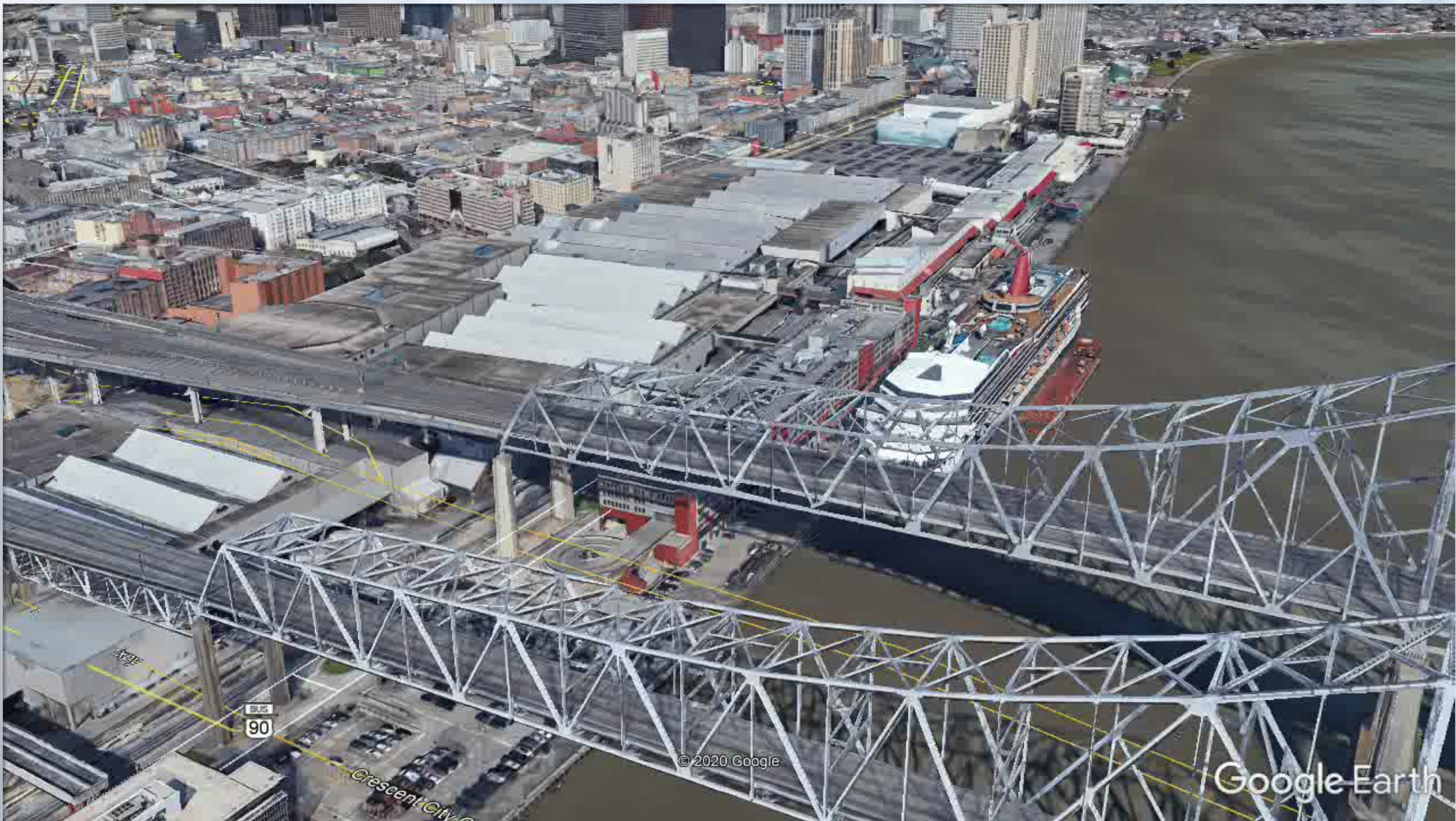


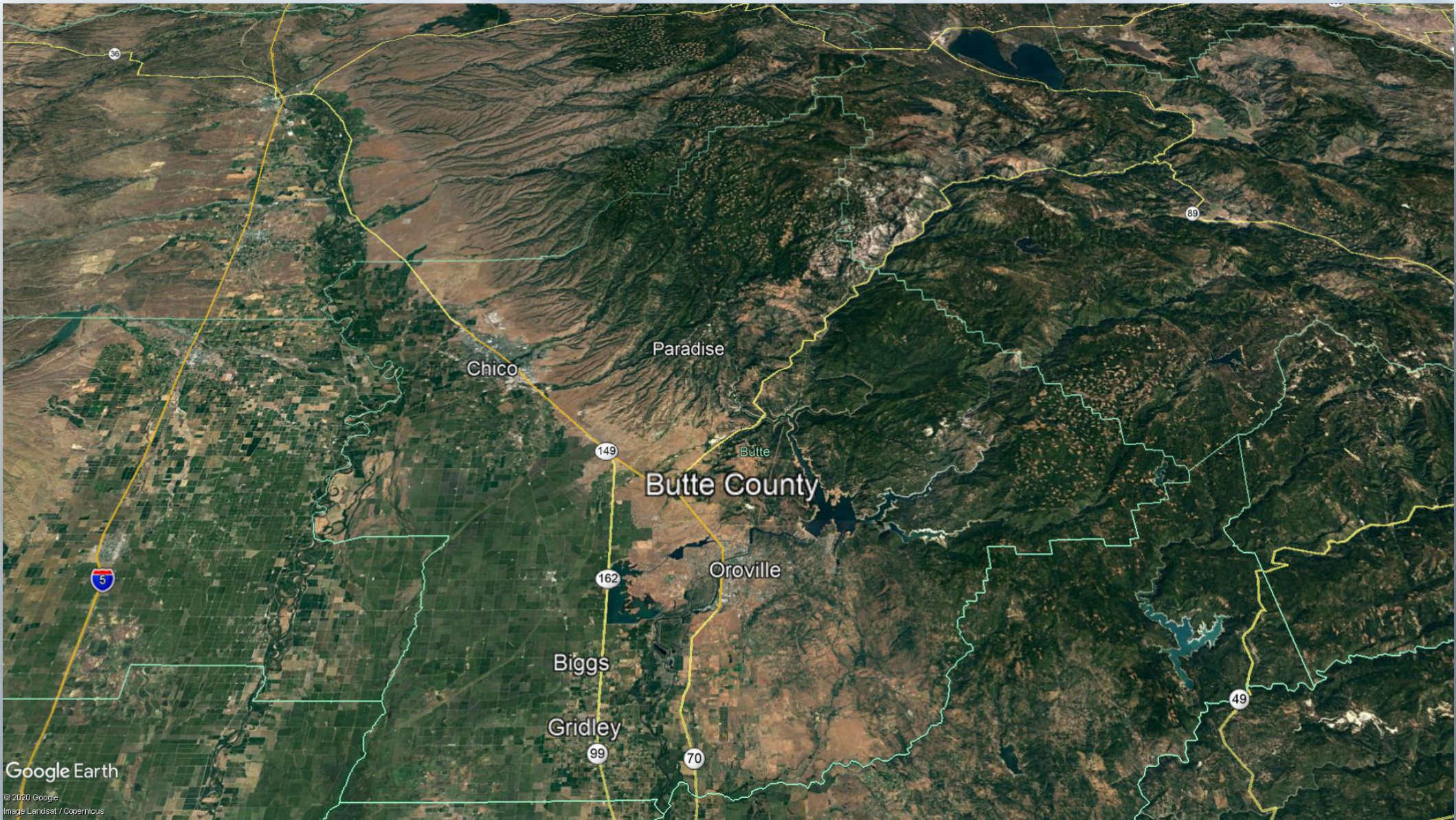
Achieving Attainment Through Wood Smoke Reduction



Jason Mandly, Senior Air Quality Planner
Butte County Air Quality Management District







Google Earth

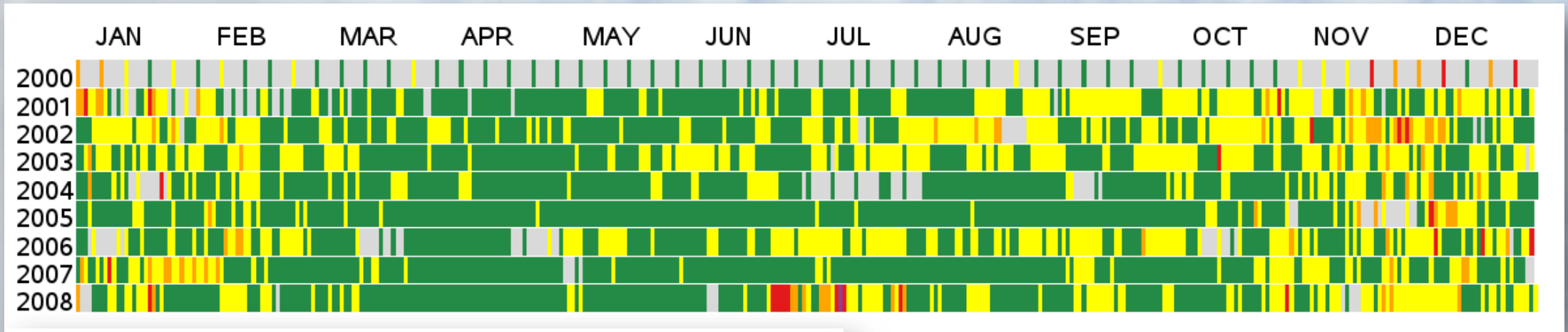
© 2020 Google
Image Landsat / Copernicus



Butte County, California



Challenges in Meeting the 2006 24-hr PM2.5 NAAQS



PM2.5 Daily AQI Values, 2000 to 2008
Butte County, CA

PM2.5 24-hr Design Value – Chico, CA

2003-2005
47ug/m3

2004-2006
56ug/m3

2005-2007
55ug/m3



Officially Designated Nonattainment

California PM-2.5 Nonattainment Areas (2006 Standard)

7/02/2014



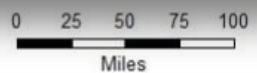
 PM-2.5 Nonattainment Areas with Clean Data
PM-2.5 Nonattainment Classification
 Moderate

CALIFORNIA—PM_{2.5}
[24-hour NAAQS]

Designated area	Designation for the 1997 NAAQS ^a		Designation for the 2006 NAAQS ^a	
	Date ¹	Type	Date ²	Type
Chico, CA: Butte County (part)	Unclassifiable/Attainment	Nonattainment.

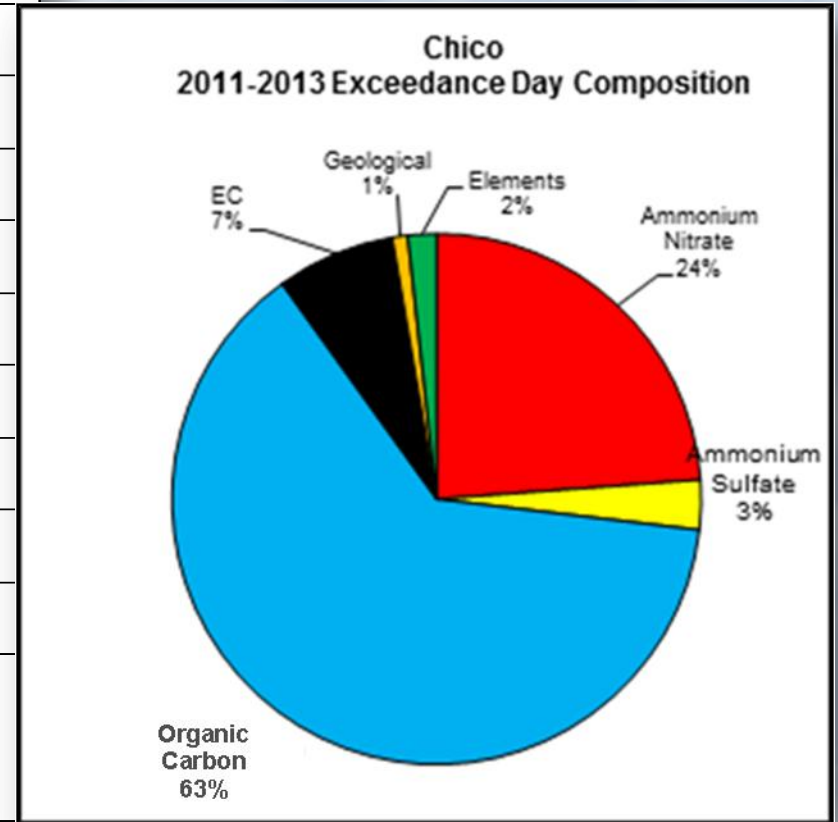
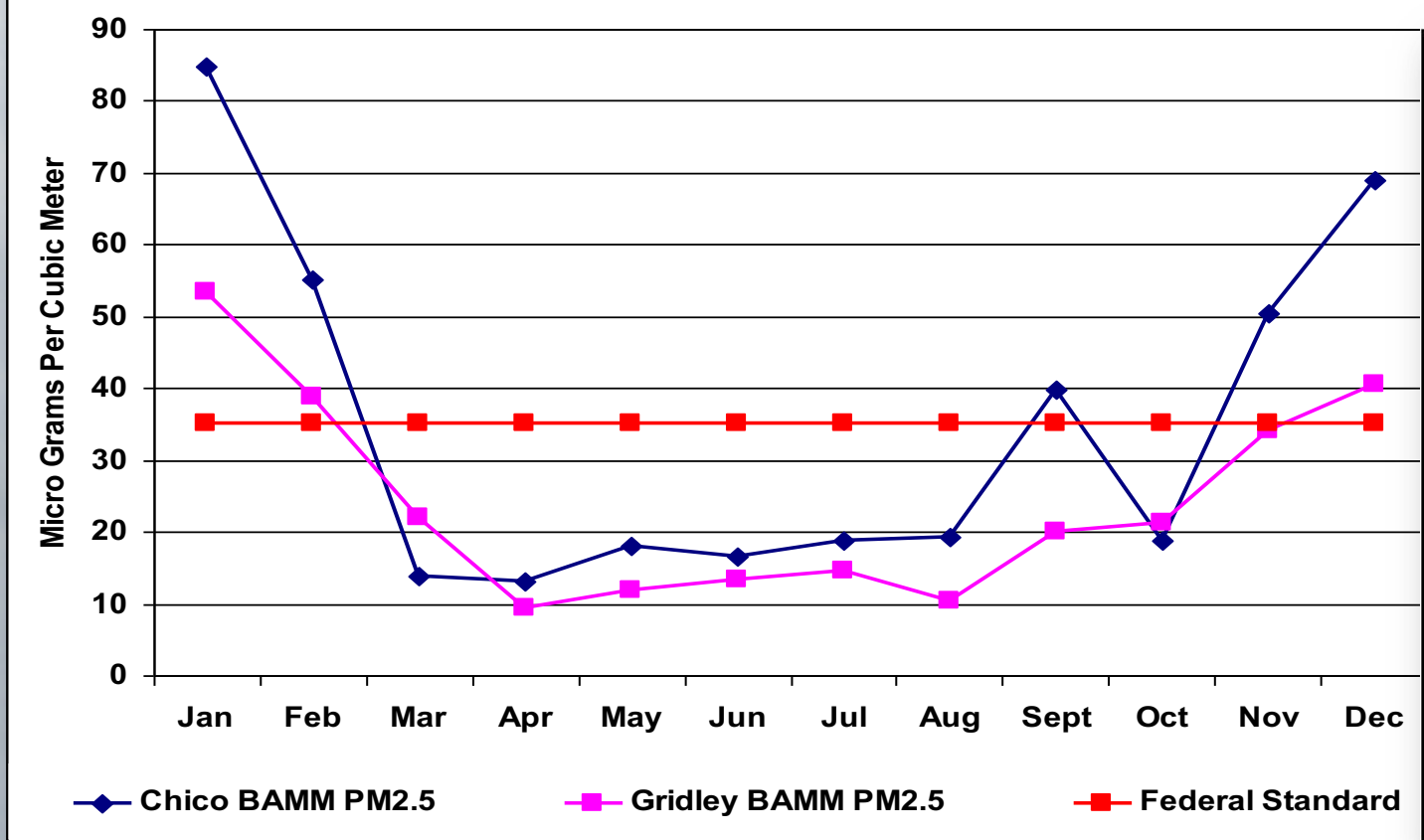
Los Angeles-South Coast

Imperial Co., CA



Identifying the Problem

2007 Daily Maximum PM2.5 BAMB Chico and Gridley



Voluntary Measures: Don't Light Tonight & Check Before You Light

Do Your Part
CHECK BEFORE LIGHT

ButteAirQuality.com

0:11 / 0:15

Check Before You Light

FOR IMMEDIATE RELEASE

**CHECK BEFORE YOU LIGHT
ADVISORY IS IN EFFECT**

ON DECEMBER 17, 2013

The Butte County Air Quality Management District (District) is requesting residents of Chico from using their woodstoves and fireplaces from 12:01 am on Tuesday, December 17, voluntary curtailment has been prompted by an air quality forecast of Unhealthy for Sensitive Groups for the Gridley areas.



The whole neighborhood
benefits when you

CHECK
Before You Light

✓ **332-9409**

✓ **bcaqmd.org**

✓ **@bcaqmd**

Questions? Call **332-9400**



Adopting Rules to Contribute Towards Attainment



TABLE 2—BCAQMD SIP-APPROVED CONTROL MEASURES AND PROGRAMS CONTRIBUTING TOWARDS ATTAINMENT AND MAINTENANCE OF THE 2006 24-HOUR PM_{2.5} NAAQS

Rule	Title	Adoption or amendment date	Status
207	Wood Burning Devices	Amended December 11, 2008	EPA approved—78 FR 21540.
300	Open Burning Requirements, Prohibitions, and Exemptions ^a .	Amended December 9, 2010, February 24, 2011, and August 27, 2015.	EPA approved—81 FR 70018.
400	Permit Requirements	Amended May 26, 2011 and April 24, 2014.	EPA approved—81 FR 93820.
401	Permit Exemptions	Amended May 26, 2011 and April 24, 2014.	EPA approved—81 FR 93820.
432	Federal New Source Review	Adopted May 26, 2011, Amended April 24, 2014 and March 23, 2017.	81 FR 93820 (limited approval/limited disapproval), 83 FR 12694 (proposed approval).
433	Rice Straw Emission Reduction Credits	Amended April 24, 2014	EPA approved—83 FR 17380.
1107	Prevention of Significant Deterioration	Adopted June 28, 2012	EPA approved—80 FR 69880.

rendered permanently inoperable, or is either EPA-Certified, Oregon-Certified, a Pellet-Fueled Wood Heater, or other DISTRICT-approved device as defined in Section 6.1.

3.4 Fuel Types

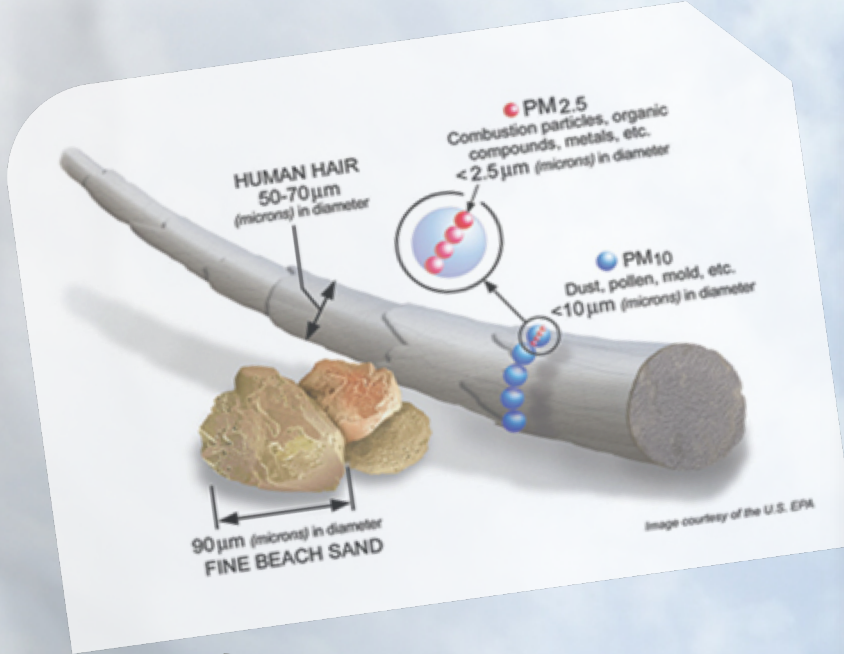
3.4.1 No person shall cause or allow the burning of any materials other than firewood or other wood or plant products designed and marketed specifically for use as a fuel in wood burning devices.

3.4.2 Prohibited fuel types include but are not limited to

- 3.4.2.1 Garbage;
- 3.4.2.2 Treated wood or wood composition products;
- 3.4.2.3 Plastic products;
- 3.4.2.4 Rubber products;
- 3.4.2.5 Petroleum products, including tar or tar paper;
- 3.4.2.6 Paints and paint solvents;
- 3.4.2.7 Coal;
- 3.4.2.8 Other material which may produce noxious or



Public Education and Media Outreach



TEMPERATURE INVERSIONS AFFECT AIR QUALITY

Air Quality	Air Quality Index	Health Advisory
Good	0-50	None
Moderate	51-100	Unusually sensitive people should consider reducing prolonged or heavy exertion.
Unhealthy for Sensitive Groups	101-150	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
Unhealthy	151-200	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
Very Unhealthy	201-300	People with heart or lung disease, older adults, and children should avoid physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.
Hazardous	301-500	People with heart or lung disease, older adults, and children should remain indoors and keep activity levels low. Everyone else should avoid all physical activity outdoors.

What are temperature inversions?

On most days, the temperature of air in the atmosphere is cooler the higher up in altitude you go. This is because most of the sun's energy is converted to sensible heat at the ground, which in turn warms the air at the surface. The warm air rises in the atmosphere, where it expands and cools. Sometimes, however, the temperature of air actually increases with height. The situation of having warm air on top of cooler air is referred to as a temperature inversion, because the temperature profile of the atmosphere is "inverted" from its usual state. There are two types of temperature inversions: surface inversions that occur near the Earth's surface, and aloft inversions that occur higher above the ground. Surface inversions are the most important in the study of air quality.


How do surface temperature inversions form?

The most common manner in which surface inversions form is through the cooling of the air near the ground at night. Once the sun goes down, the ground loses heat very quickly, and this cools the air that is in contact with the ground. However, since air is a very poor conductor of heat, the air just above the surface remains warm. Conditions that favor the development of a strong surface inversion are calm winds, clear skies, and long nights. Calm winds prevent warmer air above the surface from mixing down to the ground, and clear skies increase the rate of cooling at the Earth's surface. Long nights allow for the cooling of the ground to continue over a longer period of time, resulting in a greater temperature decrease at the surface. Since the nights in the wintertime are much longer than nights during the summertime, surface inversions are stronger and more common during the winter months. A strong inversion implies a substantial temperature difference exists between the cool surface air and the warmer air aloft. During the daylight hours, surface inversions normally weaken and disappear as the sun warms the Earth's surface. However, under certain meteorological conditions, such as strong high pressure over the area, these inversions can persist as long as several days. In addition, local topographical features can enhance the formation of inversions, especially in valley locations.



How do inversions affect air quality?

Surface temperature inversions play a major role in air quality, especially during the winter when these inversions are the strongest. The warm air above cooler air acts like a lid, suppressing vertical mixing and trapping the cooler air at the surface. As pollutants from vehicles, fireplaces, and industry are emitted into the air, the inversion traps these pollutants near the ground, leading to poor air quality. The Air Quality Index (AQI) is used to describe the current level of air pollution. The strength and duration of the inversion will control AQI levels near the ground. A strong inversion will confine pollutants to a shallow vertical layer, leading to high AQI levels, while a weak inversion will lead to lower AQI levels. A large contributor to poor air quality during the winter is residential wood burning. Wood smoke contains much higher amounts of particulate pollution than smoke from oil- or gas-fired furnaces. The Butte County Air Quality Management District issues a "Check Before You Light" advisory to curtail the use of woodstoves and fireplaces under certain weather and pollution conditions during the fall and winter.


 This information provided by EPA courtesy of
 Butte County Air Quality Management District
 2525 Dominic Drive, Suite 7
 Chico, CA 95928
 www.bcqmnd.org
 530-891-2882



Reaching Attainment - Barely

Chicoans credited for cleaner

By DEBORAH SCHOCH
Special to the E-R

Regulators are crediting Chico-area residents for helping curb air pollution in 2009 so successfully that Butte County met a key federal clean air standard for the first time in years.

The decrease in so-called particulate matter — microscopic grains that can harm the lungs and heart — may be the result of local residents reducing their use of wood-burning stoves and fireplaces, said Sylvia Zulawnick, manager of the particulate matter analysis section at the California Air Resources Board in Sacra-

mento. “My gut feeling is that people are burning less,” Zulawnick said Friday afternoon in a telephone interview. “They have made a lot of progress.”

That’s welcome news for local officials who have been wrestling with pollution so severe Butte County has repeatedly

flunked standards in the past. “We can say that has been better the last couple of years,” said Jim Wagoner, county air quality control officer at the Butte County Air Quality Management District.

Wagoner said the county is “in check.”

Coming clean

Butte County likely to be dropped from bad air list

By STEVE SCHOONOVER
City Editor

A stretch of good air quality at the

AIR

From 1A

“clean data” ruling from the EPA, according to Jim Wagoner, executive director of the Butte County Air Quality Management District.

That means the cleanup plan for the county is much more streamlined, requiring just an undated inventory of emission sources. That was completed last year.

TABLE 1—2009–2012 24-HOUR PM_{2.5} MONITORING SITE AND DESIGN VALUES FOR THE CHICO NONATTAINMENT AREA.

Monitoring site ^a	AQS site identification No.	98th percentile (µg/m ³)				Design values (µg/m ³)	
		2009	2010	2011	2012 ^b	2009–2011	2010–2012 ^b
Chico-Manzanita	06-007-0002	30.0	29.0	46.2	26.3	35	34
Chico-East	06-007-0008

^a The Chico monitoring site was moved in 2012 to address siting issues, and EPA has approved this network modification request. See August 22, 2013 letter from Meredith Kurpius, Manager, Air Quality Analysis Office, EPA Region IX, to Michael Benjamin, Chief, Monitoring and Laboratory Division, CARB.

^b The 2012 98th percentile and design value are calculated using January 1 through June 30, 2012 data from the Chico-Manzanita site and July 1 through December 31, 2012 data from the new Chico-East site.

Source: AQS Design Value and Raw Data Reports, August 9, 2013.

Non-attainment status requires execution of a plan to clean the air. In extreme cases where a cleanup doesn't work, a cutoff of federal transportation

below the federal standard.

The EPA has yet to make the clean data ruling, and there was an indication it was waiting to see how

ban.

Smoke from wood burning has been found to be the largest contributor to the particulate pollution



Butte County Participates as Third Party Agency in Consent Decree

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA,

Plaintiff,

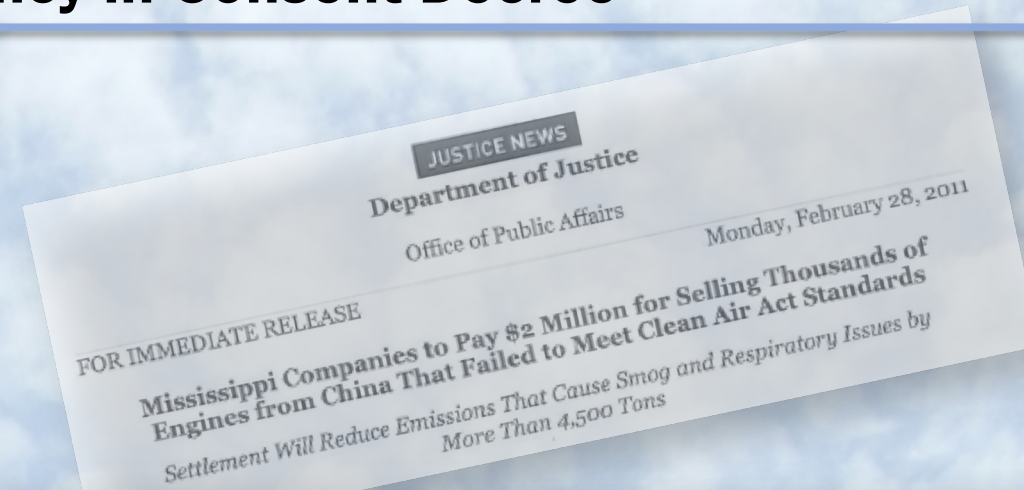
v.

POWERTRAIN, INC.,
WOOD SALES, INC.,
and
TOOL MART, INC.,

Defendants.

Civil Action No. 1:09-cv-00993-RBW

CONSENT DECREE



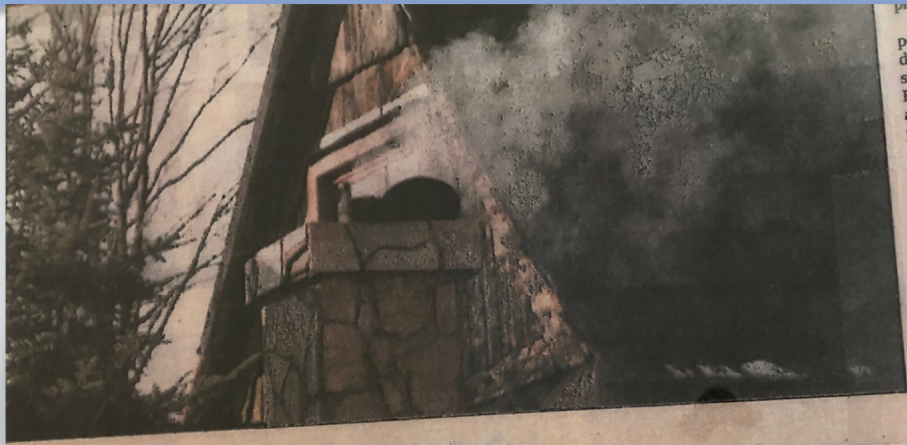
Three Year Summary

- Year 1:
 - 159 vouchers issued (83 wood, 24 pellet, 52 gas)
 - \$248,250 paid out to vouchers
 - Total emissions reductions: 388 tons HC+NOx, 1511 tons CO, 210 tons PM
- Year 2:
 - 160 vouchers issued (86 wood, 23 pellet, 51 gas)
 - \$247,862 paid out to vouchers
 - Total emissions reductions: 390 tons HC+NOx, 1511 tons CO, 211 tons PM
- Year 3:
 - 161 vouchers issued (85 wood, 29 pellet, 47 gas)
 - \$250,103 paid out to vouchers
 - Total emissions reductions: 389 tons HC+NOx, 1517 tons CO, 212 tons PM

Target: 1,511 tons of CO & 51 tons of Hydrocarbons + Oxides of Nitrogen per year for 3 years.



Implementing the Wood-Burning Device Change-out Program



"It's beneficial because... permanent change," Mandy's district rule that when you put a stove in a new building, it has to be an EPA-certified stove—so, once you have an old one and put in an EPA-certified one, you can't backslide. "The more wood stoves that are switched out is going to be a benefit down the road."

County residents previously using wood stoves. The air quality district managed two programs between 2010 and 2015, plus applied civil penalties for new stoves, resulting in 73 new stoves.

In the most recent program, the air quality district issued 100 permits. Demand exceeded supply.

"With the rules that we have for that program, we only have a limited number of low-income vouchers that could issue," Mandy said. "What's different from the past is we have more funds available for households, which is good."

For better breathing

Local agency to offer program to swap out polluting heating devices following string of air-quality issues

routine questioning. She advises patients to do all they can to minimize personal contact with wood smoke. Use electric heat as much as possible, stay away from the stove, try to have someone else place wood on the fire.

and anyone with asthma or other respiratory conditions such as COPD, chronic bronchitis, emphysema, or other chronic pulmonary diseases. Those smaller than 10 years old, pregnant women, and the elderly are especially vulnerable. Howard

by
Evan Tuchinsky

evantuchinsky@newsreview.com



**Butte County
Wood Burning
Device Change-out
Incentive Program**

(\$1,000—\$3,000)

REBATE VOUCHERS



Butte County Air Quality Management District



Residential Wood Smoke Workshop

March 11, 2020

PM2.5 Reductions from Woodstove Replacement Projects (2005 – 2015)

Table 4. Emission reductions achieved from a wood stove change-out program

Device Type	2005	2006	2007	2010	2013-2015*	Total
Wood Stove	16	33	63	21	244	377
Pellet Stove	7	7	10		76	100
Natural Gas	29	31	47	6	149	262
Emissions Before (t/y)	3.544	4.838	8.177	1.840	31.960	50.359
Emissions After (t/y)	0.421	0.861	1.640	0.543	6.387	9.851
Savings (t/y)	3.123	3.978	6.538	1.297	25.573	40.508
Savings (t/d)	0.018	0.023	0.038	0.008	0.150	0.238

* Powertrain Change-out

Butte County PM_{2.5} Redesignation Request and Maintenance Plan Attachment C:
Emissions Reductions Achieved from the Wood Stove Change-out Programs



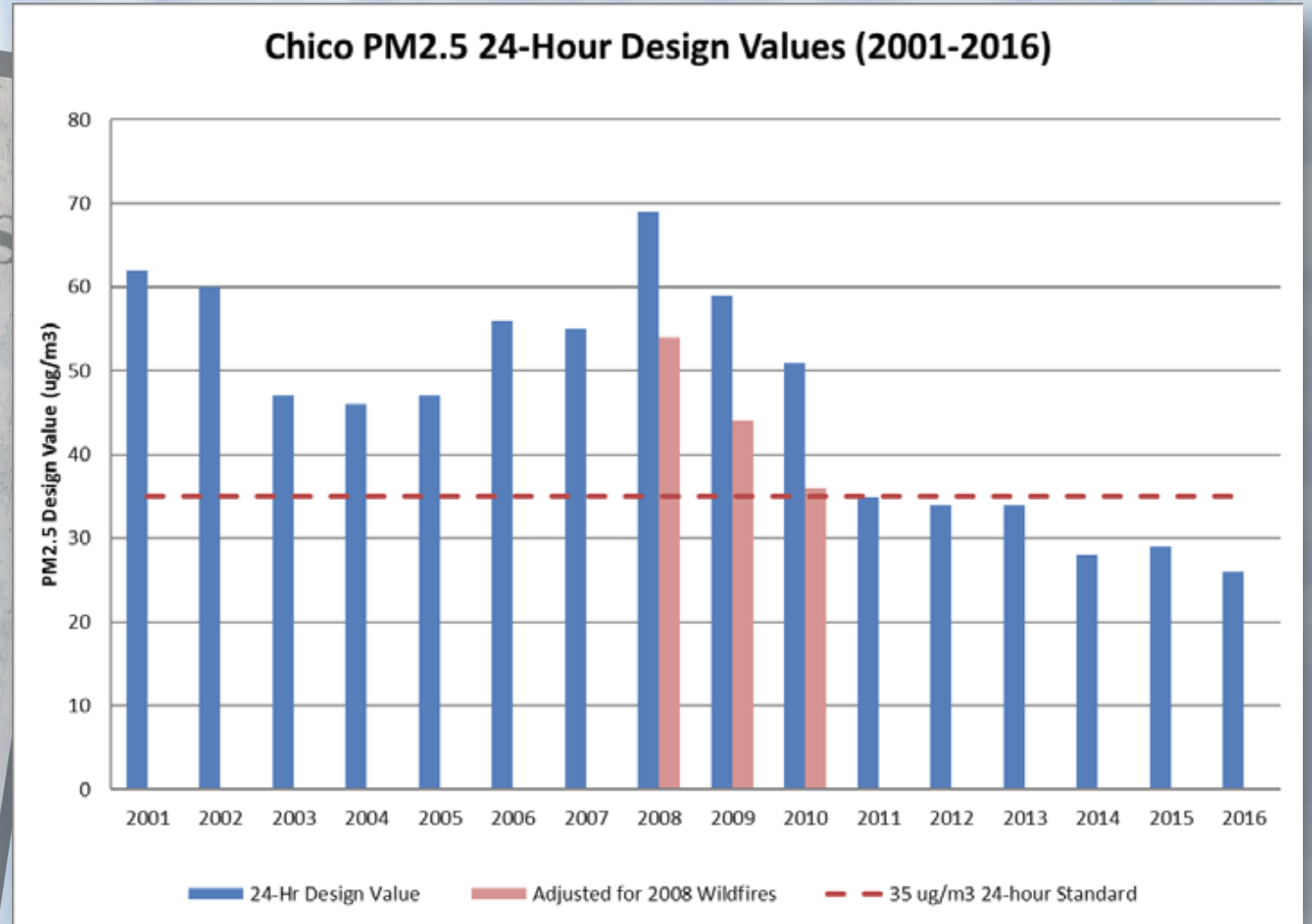
Continuing Improvements

POLLUTION
No bad air nights in county this winter for the first time in years

By Steve Schoonover
sschoonover@chicoer.com
@ER_sschoonover on Twitter

Butte County got through the winter pollution season without a single bad air day, for the first time in more than a decade. The Butte County Air Quality Management District wrapped up its "Check before you light program" Monday without once asking people to forgo wood fires because pollution was forecast to be bad.

County Air Quality Control Officer Jim Wag-



Redesignation Request and Maintenance Plan

Figure 3-3: Trends in Three Year Average Winter Composition on Top 10% of Days – Chico, CA

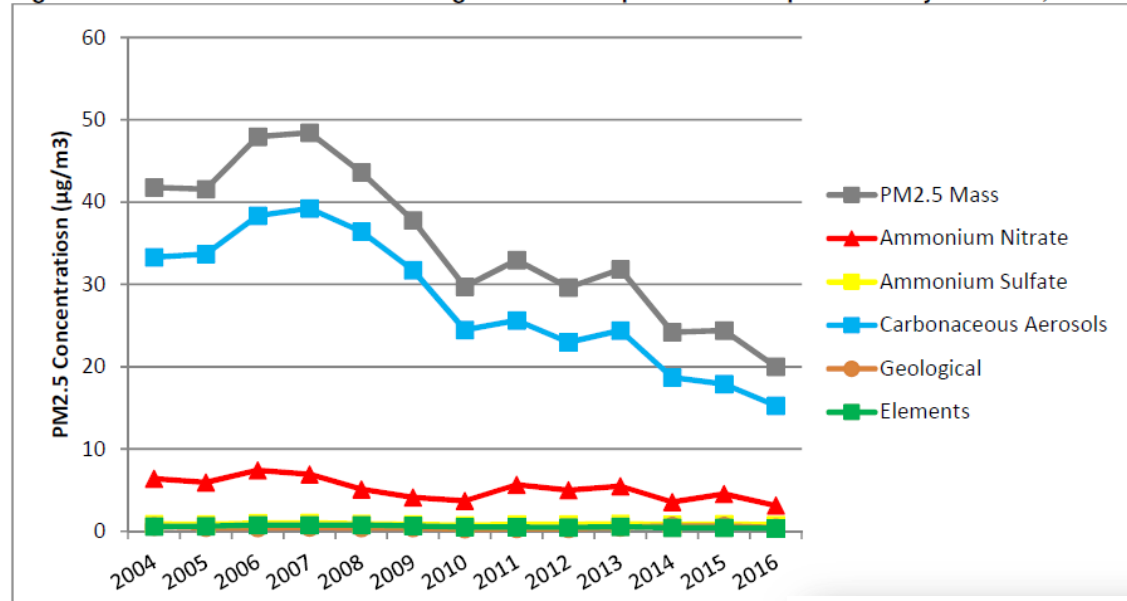


Figure 3.5: Comparison of Three-Year Average Trends in Concentrations of Carbonaceous Aerosols and Soluble Potassium on Top 10% of Days.

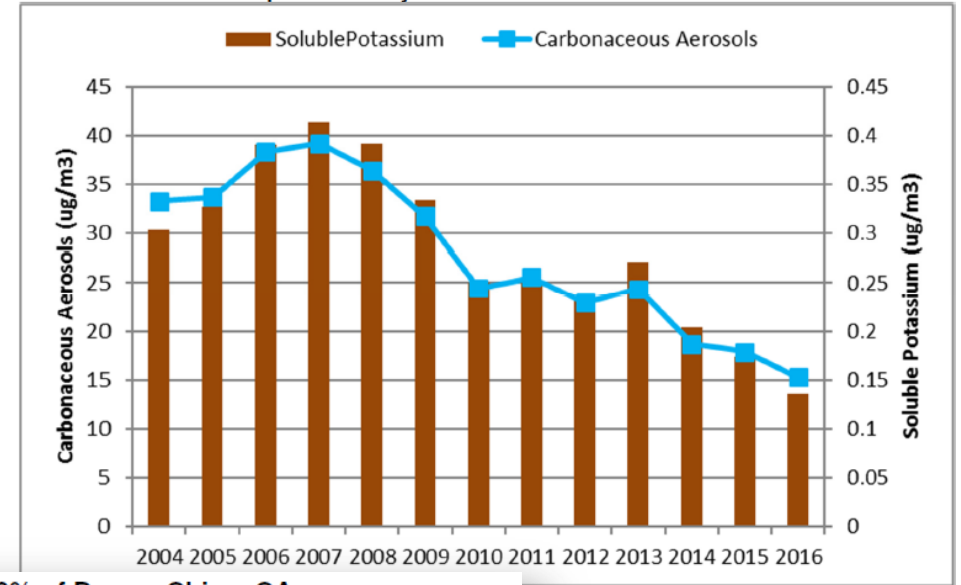
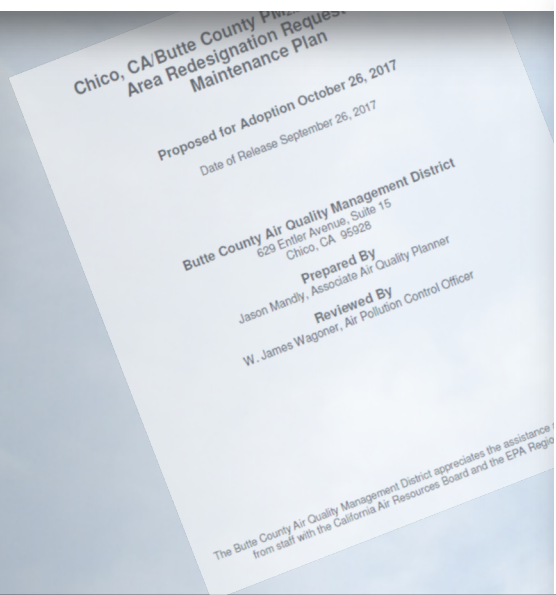
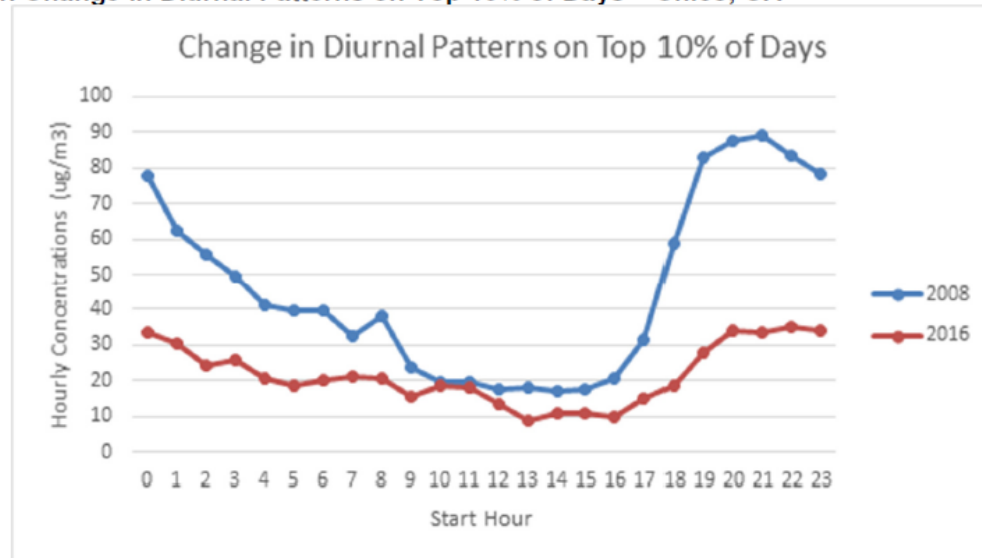


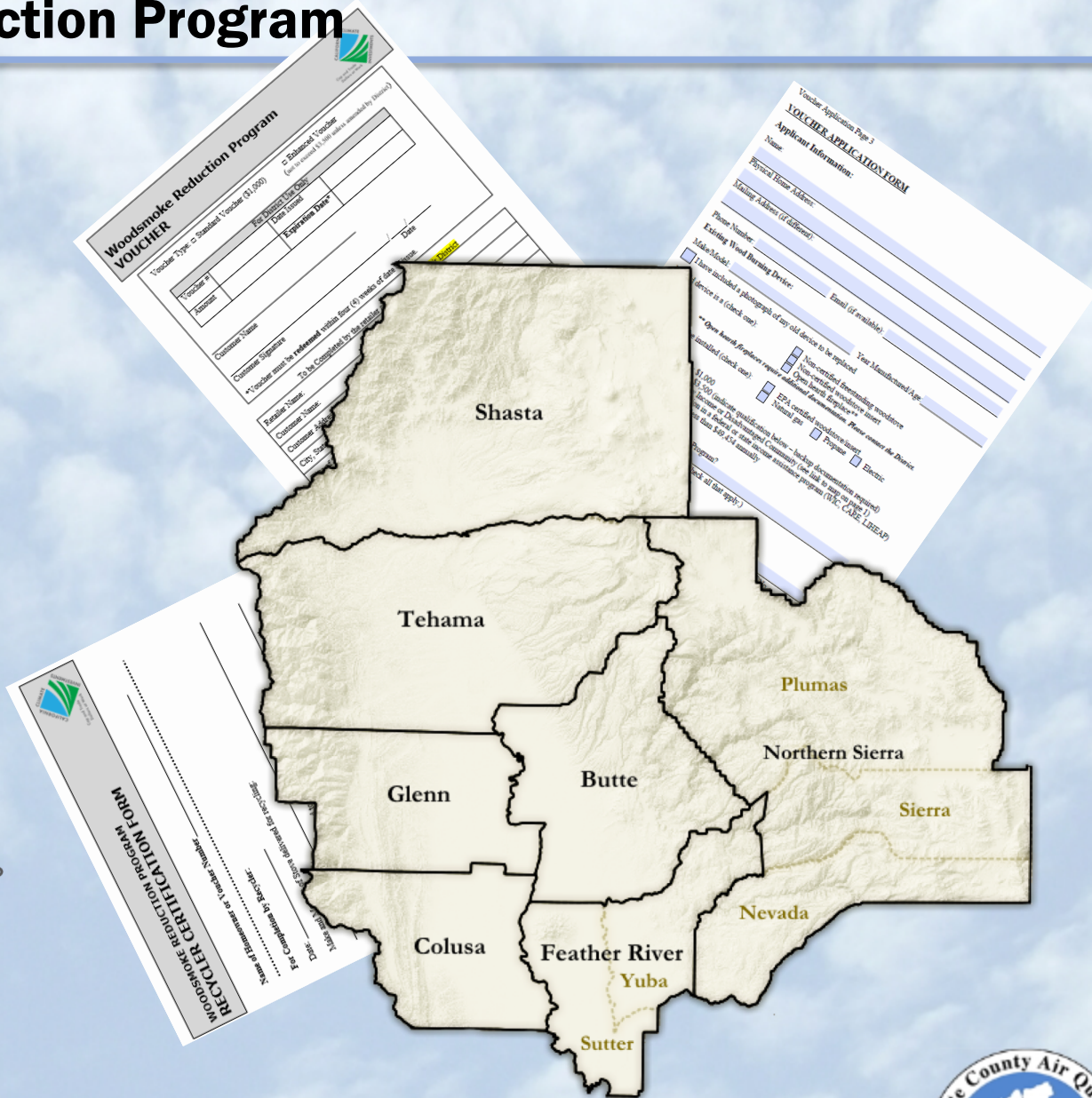
Figure 3-4: Change in Diurnal Patterns on Top 10% of Days – Chico, CA



Participating in Statewide Woodsmoke Reduction Program

In preparing for the Program, the District worked with:

- Neighboring Air Districts
- California Air Resources Board
- CAPCOA
- Local Retailers
- Building Departments



Implementing the Woodsmoke Reduction Program

629 Entler Avenue, Suite 15
Chico, CA 95928

(530) 332-9400
(530) 332-9417 Fax



W. James Wagoner
Air Pollution Control Officer

David J. Lusk
Assistant Air Pollution Control Officer

FOR IMMEDIATE RELEASE

May 21, 2018

WOODSMOKE REDUCTION PROGRAM TO BEGIN IN BUTTE CO

The Butte County Air Quality Management District, along with neighboring air older, inefficient woodstoves or woodstove inserts, and fireplaces.

The Woodsmoke Reduction Pilot Program is funded by California Climate Invest. This program provides an incentive voucher to replace a non-EPA certified wood primary source of heat with either an EPA-certified woodstove or insert, or a na

POLLUTION

Applications opening Wednesday for wood stove swap-out funds

Vouchers of \$1,000 to \$3,500 available

By Steve Schoonover
sschoonover@chicoer.com
@ER_schoonover on twitter

tracts designated low-income or disadvantaged, come or disadvantaged, vouchers to cover the full cost of replacement are available, up to \$3,500. The Wood Smoke Reduction Pilot Program is funded by the state's cap-and-trade program through California Climate Investments.

The program is administered by local air quality districts, and Butte, Glenn and Tehama counties will all start with \$112,500 in project funds, according to Jason Mandly, senior air quality planner for the Butte County Air Quality Management District.

Another \$500,000 is available from a fund for low-income residents or those living in census

the whole air basin, which also includes Colusa, Yuba, Sutter, Plumas, Nevada, Sierra and Shasta counties. "I expect we'll be dipping into that quickly," Mandly said.

He said more money might also be available as it's a statewide program, and some jurisdictions might not participate or have limited participation. Money unspent elsewhere would be shifted to where the program is more popular.

In Butte County, the applications will be available at 8 a.m. through participating retailers, at the Air Quality District office at 629 Entler Ave., Suite 15, Chico, or online at www.bcaqmd.org.

More information and a list of participating retailers is available on the website or by contacting Mandly at jmandly@bcaqmd.org or 332-9400 ext.108.

In Glenn County, applications will be available at participating retailers, in person at the Air District office in Willows, at www.countyofglenn.net/APCD, or mailed by request.

More information and a list of participating retailers is available at the website or by contacting Ian Ledbetter at illedbetter@countyofglenn.net or 934-6500.

To apply, submit a completed voucher application and a photo of the old wood burning device to the air quality district by mail or email, or drop them off in person.

Vouchers will be issued in the order complete applications are received, and are good for four weeks. Within those four weeks, the applicant must select a replacement device from a participating retailer and use the voucher toward the price.

Installations must be done by appropriately licensed contractors with the necessary permits and follow all local fire and building codes. Do-it-yourself installations are not allowed under this program.

Replacing an older wood-burning device with a newer, cleaner burning device increases safety, reduces air pollution, and improves indoor air quality, according to air quality officials.

"I expect we'll be dipping into that quickly."

—Jason Mandly, senior air quality planner for the Butte County Air Quality Management District



Woodsmoke Reduction Program

(For the Counties of Butte, Colusa, Glenn, Nevada, Plumas, Shasta, Sierra, Sutter, Tehama, and Yuba)

(\$1,000—\$3,500)

REBATE VOUCHERS

newsreview.com **downstroke** free

LOCAL STORIES | GREEN | HEALTH | OPINIONS | CALENDAR | ARTS&CULTURE | MUSIC

local stories > downstroke

Like 0 Share Tweet

Replace that stove

Butte County Air Quality Management District offers \$1,000-\$3,500 vouchers to families

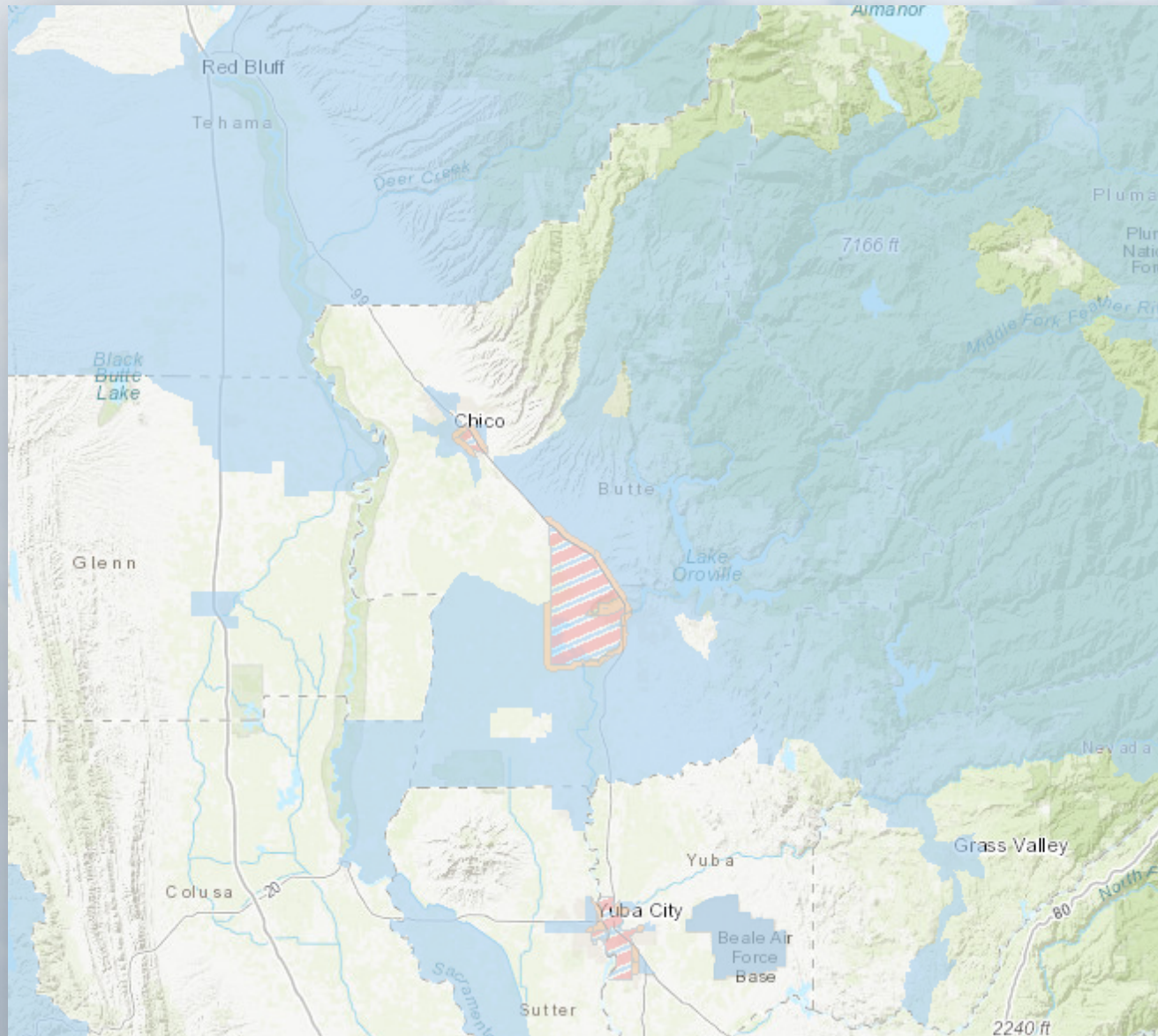


Residential Wood Smoke Workshop

March 11, 2020



Woodsmoke Reduction Program Results So Far



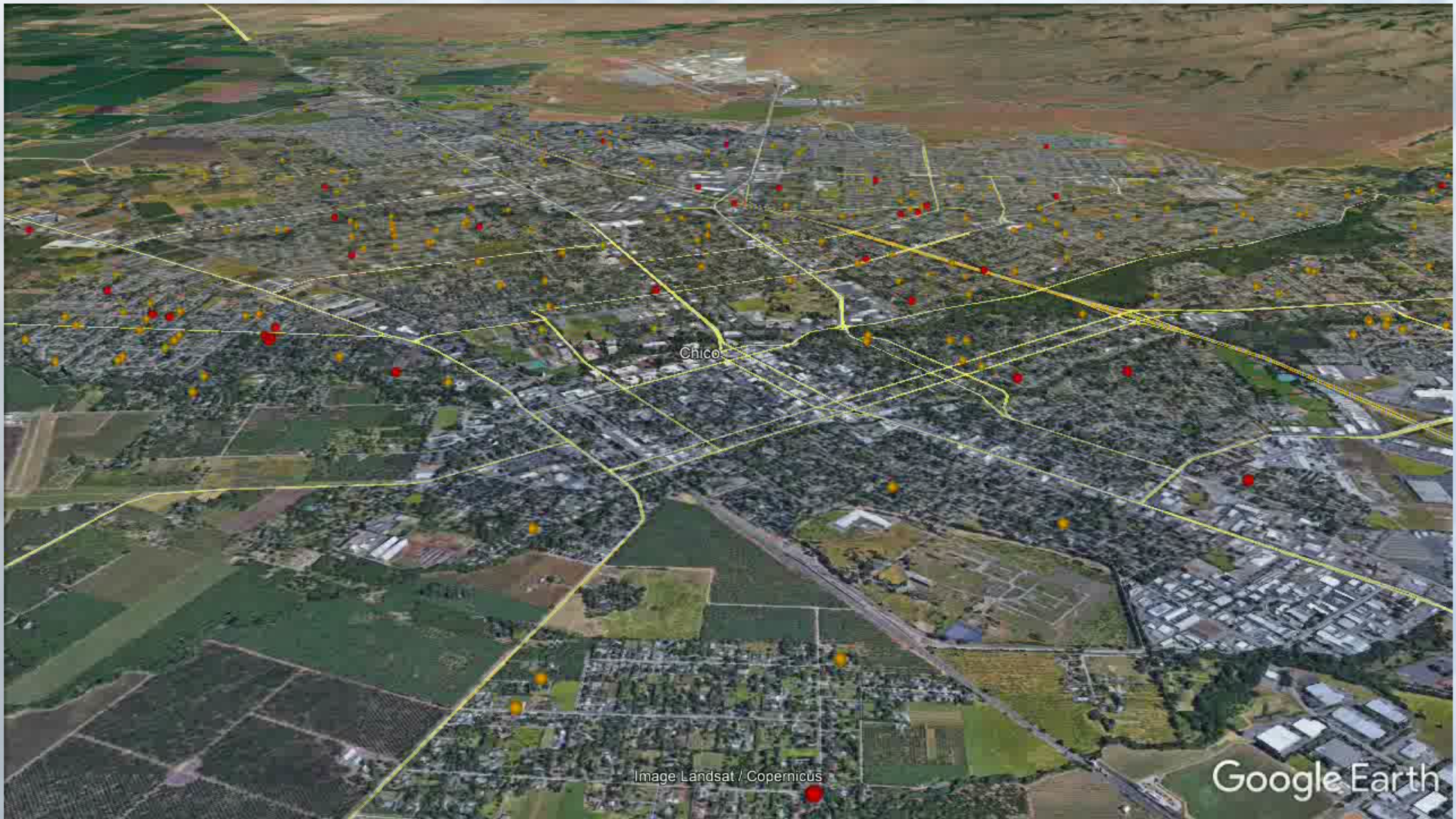
Year 1 (2018):

- **\$360,000 in Project Funds**
- **89 Vouchers Completed**
- **77 Low-Income Qualified Projects**

Year 2 (2020):

- **\$147,000 in Project Funds**
- **In Progress**





EPA Approves Redesignation to Attainment

November 13, 2009 – Most of Butte County Designated Nonattainment

October 10, 2013 – EPA determines that Butte County has attained the 24-hour PM_{2.5} NAAQS

October 31, 2017 – District Submitted Redesignation Request to CARB

July 11, 2018 – Final Rulemaking by EPA approving Redesignation Request and Maintenance Plan

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 52 and 81

[EPA-R09-OAR-2018-0181; FRL-9980-49-Region 9]

Approval and Promulgation of Air Quality State Implementation Plans; California; Chico Redesignation Request and Maintenance Plan for the 2006 24-Hour PM_{2.5} Standard

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is taking final action to approve, as a revision of the California state implementation plan (SIP), the State's request to redesignate the Chico nonattainment area to attainment for the 2006 24-hour fine particulate matter (PM_{2.5}) National Ambient Air Quality Standard (NAAQS or "standard"). The EPA is also taking final action to approve the PM_{2.5} maintenance plan and the determination that contributions from motor vehicle emissions in the Chico nonattainment area are insignificant. The EPA is



Shifting Priorities



Residential Wood Smoke Workshop

March 11, 2020



Thank You!



Residential Wood Smoke Workshop

March 11, 2020

