State of the State's Air Quality

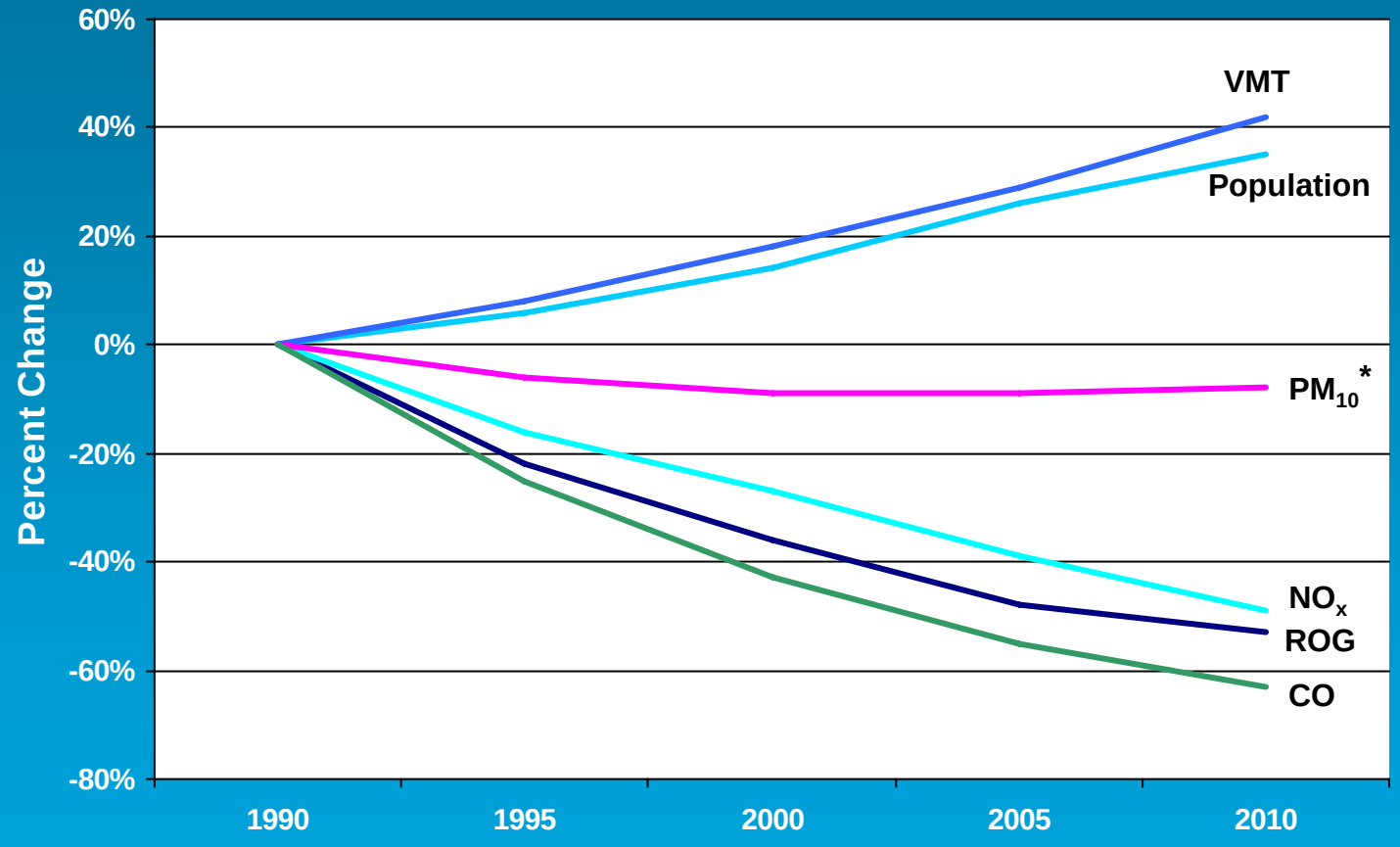
January 22, 2004

Purpose of Presentation

- Discuss statewide progress since 1990 Federal Clean Air Act
- Present California's Federal and State Air Quality Standards
- Highlight progress towards State Standards
- Show reduced statewide exposure to air toxics

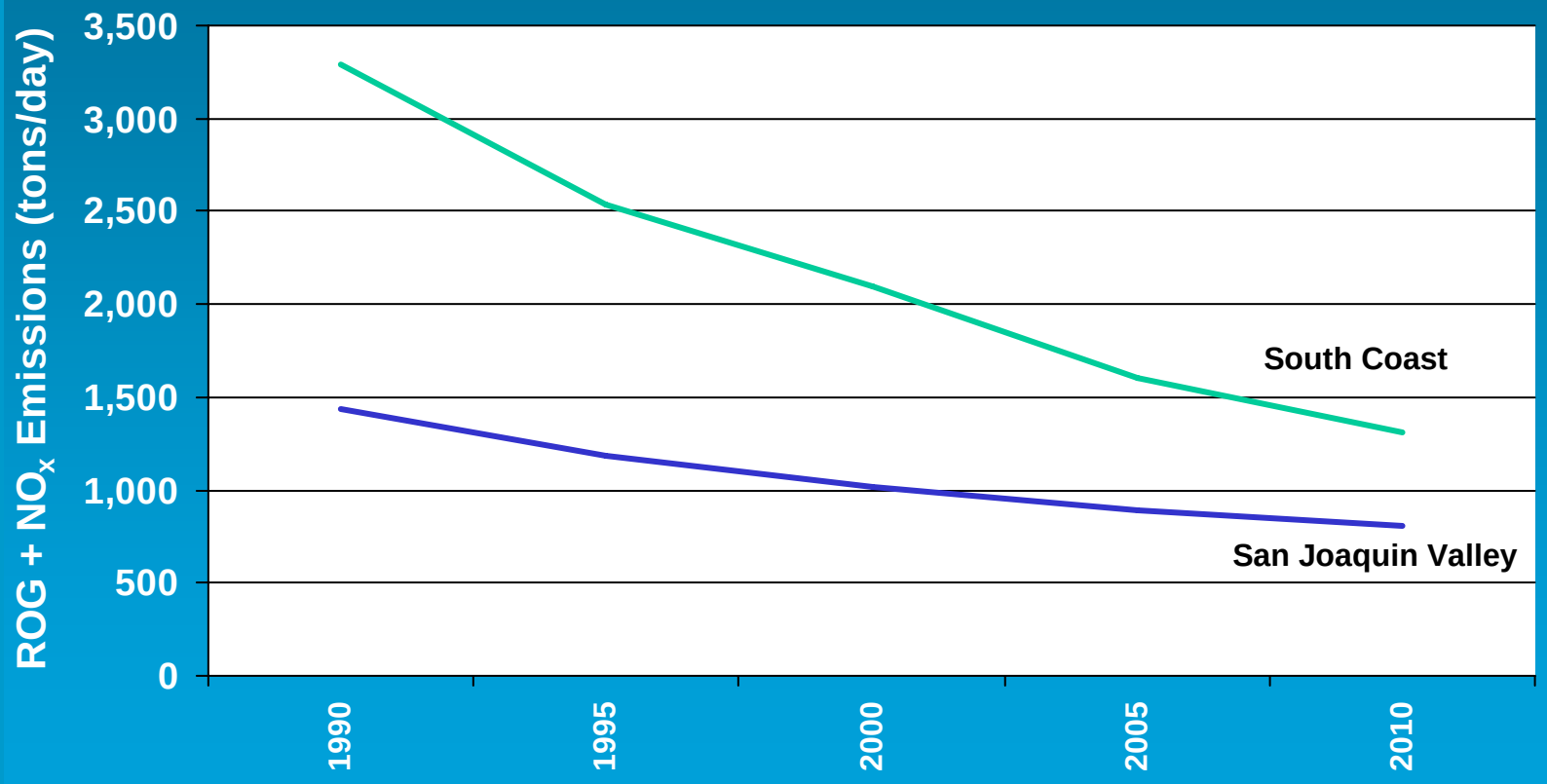
Background

Statewide Emissions & Growth Trends



* Weighted based on source apportionment for typical urban area in California, assuming 50:50 direct:secondary split

South Coast & San Joaquin Valley Emission Trends (ROG + NOx)



Federal
Ozone Air Quality Standards

What are the Ozone Standards?

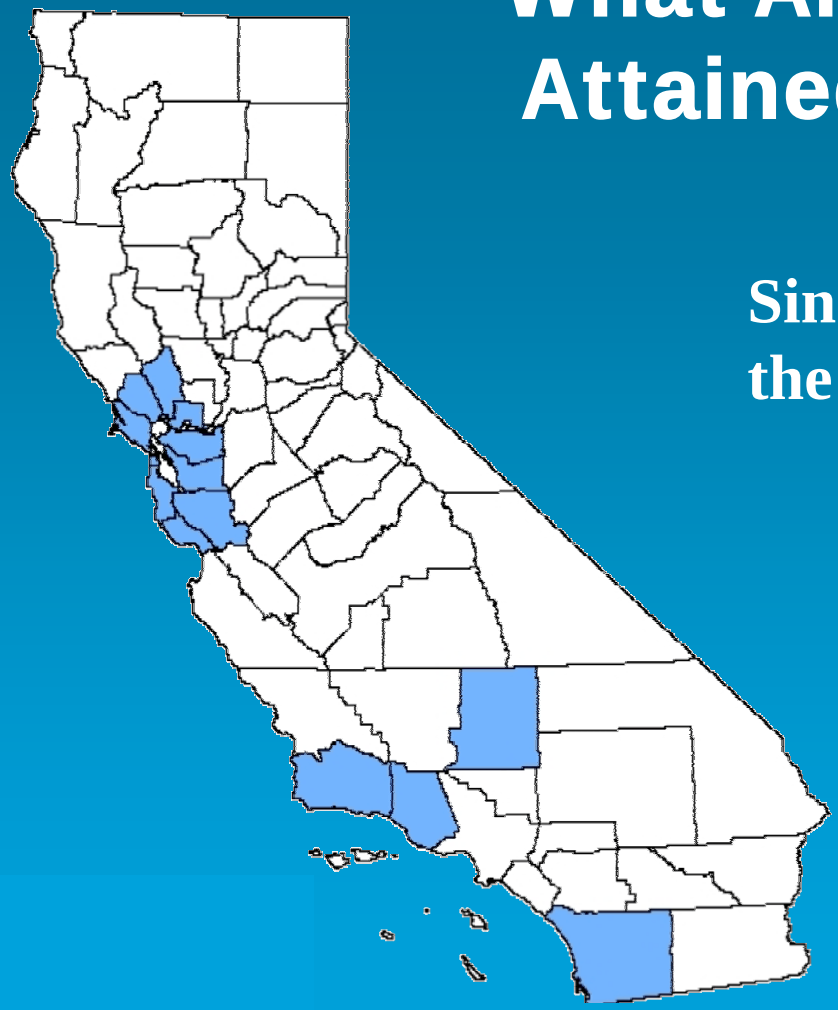
- Federal
  - 1 Hour (0.12 ppm)
  - 8 Hour (0.08 ppm)
- State
  - 1 Hour (0.09 ppm)
- Current air quality plans address Federal and State standards

How Do We Assess Progress?

- Monitor peak concentrations
- Track the number of days over the standard
- Look at how widespread the violations are geographically
- Use “Design Value” for planning

1-Hour Federal Ozone Standard

What Areas Have Recently Attained the Federal 1-Hr Standard?



Since 1990, 6 new areas have met the standard

- San Francisco Air Basin 2003
- Ventura County 2002
- San Diego County 2001
- Eastern Kern County 2001
- Santa Barbara County 1999
- Monterey County 1990

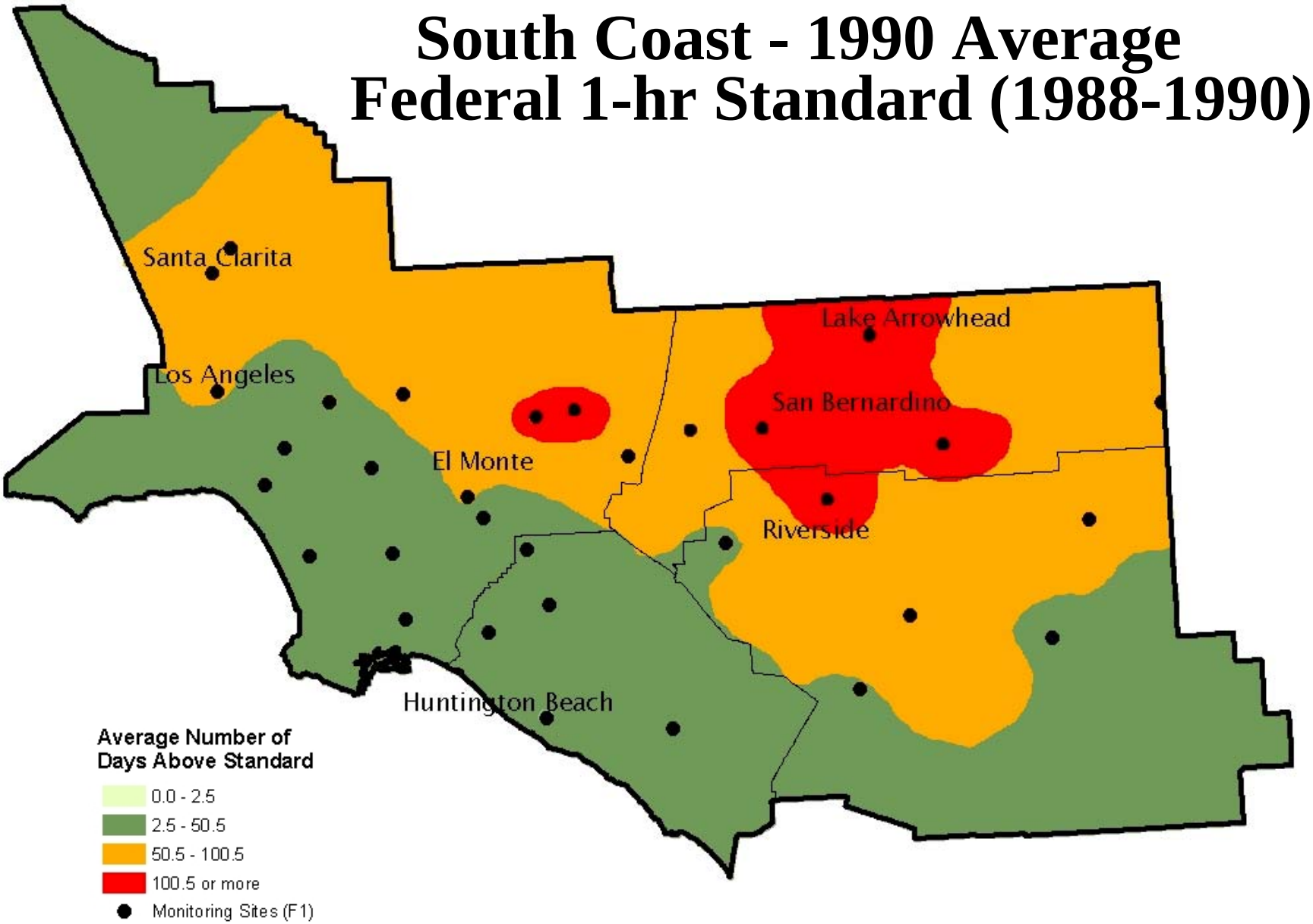
What Are the Remaining Nonattainment Areas?

- The major remaining nonattainment areas are:
  - South Coast Air Basin and Southeast Desert
  - San Joaquin Valley
  - Sacramento Region
- More progress made in South Coast but less progress has occurred in inland valleys
- Imperial County

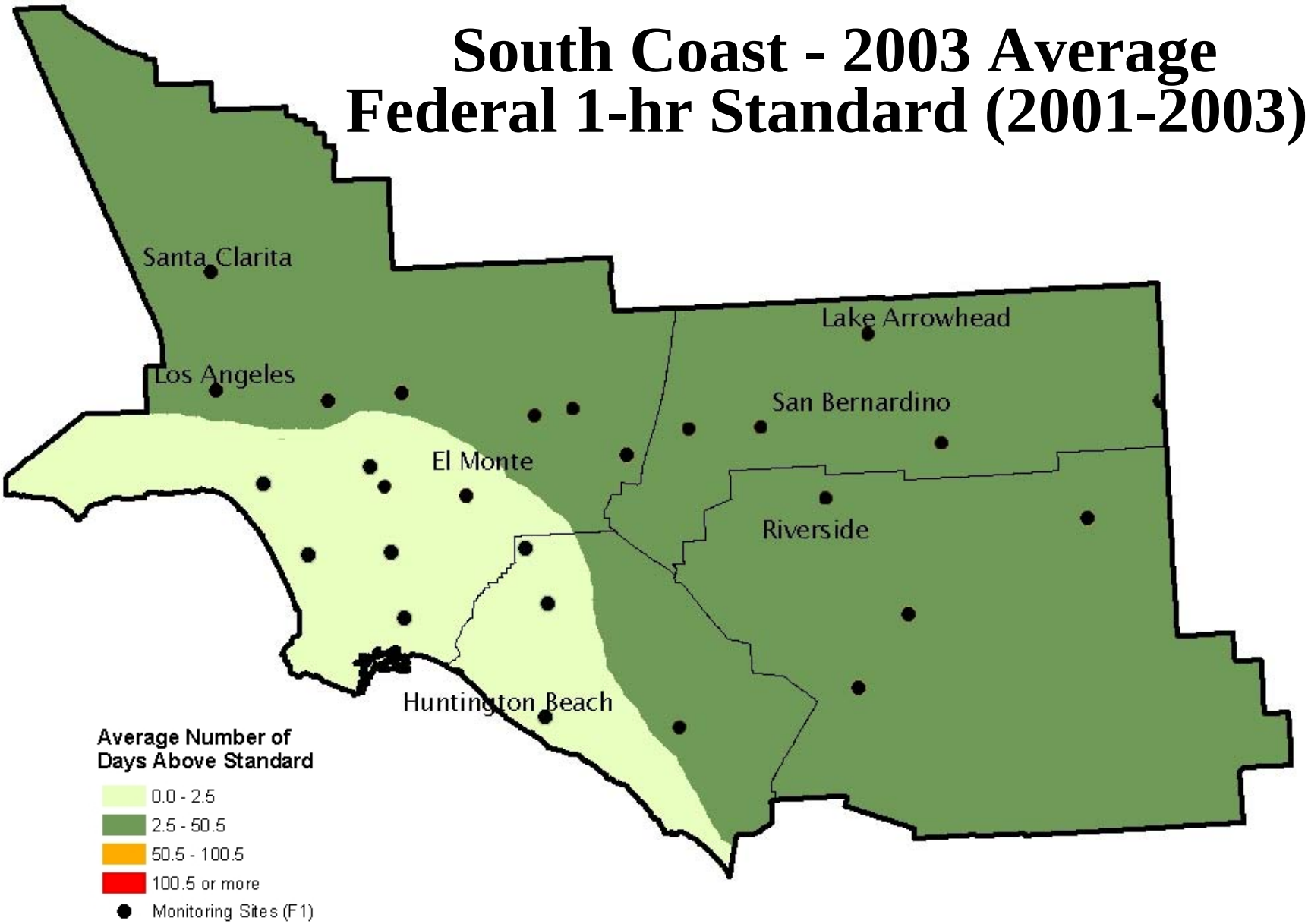
What Progress Has Been Made in the South Coast Air Basin?

- Significant reduction in peak levels
- Coastal areas close to attainment
- Inland exceedance days and peaks have declined
- Some areas still have relatively high peaks
  - Santa Clarita
  - Eastern portion of basin

South Coast - 1990 Average Federal 1-hr Standard (1988-1990)

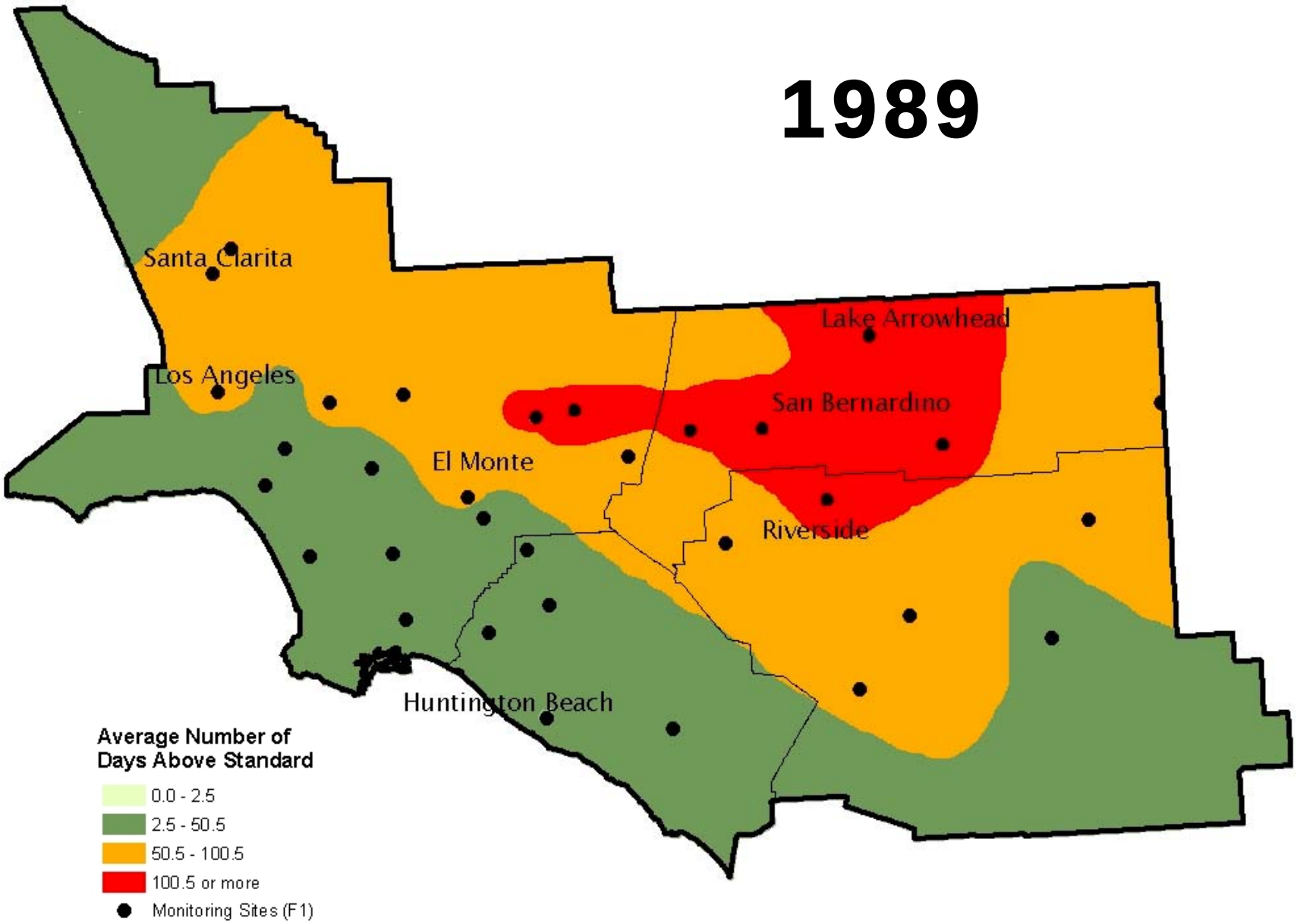


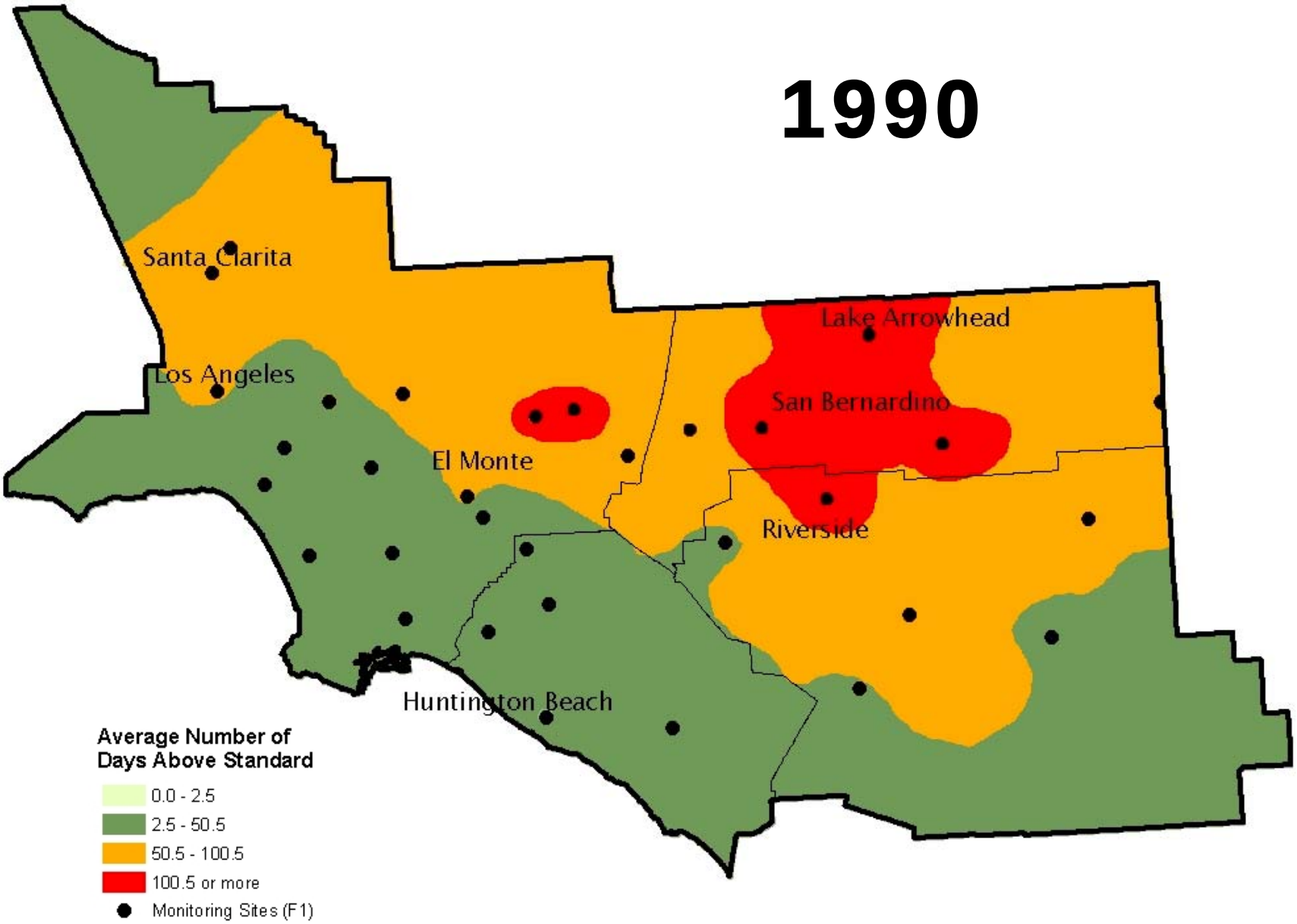
South Coast - 2003 Average Federal 1-hr Standard (2001-2003)

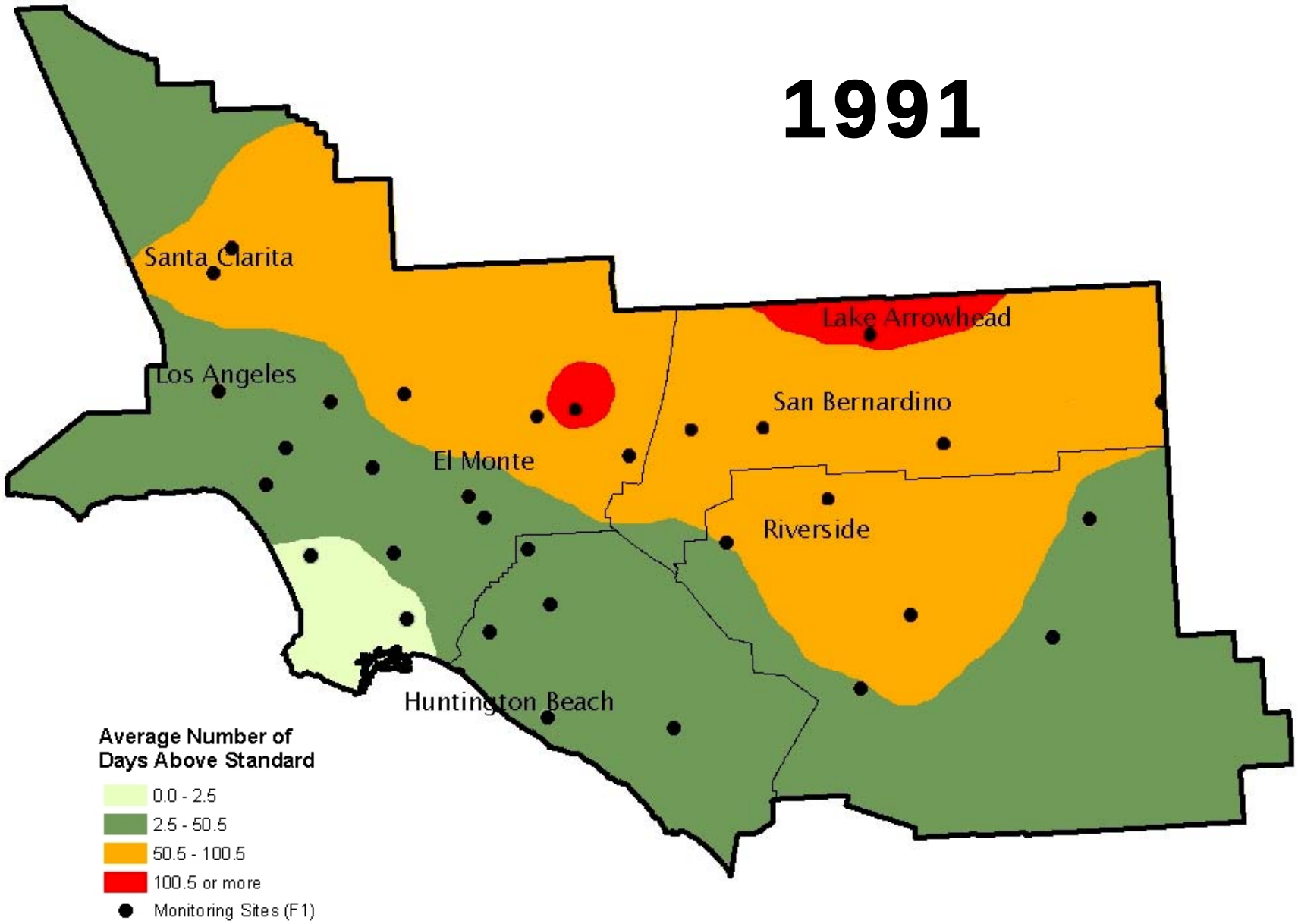


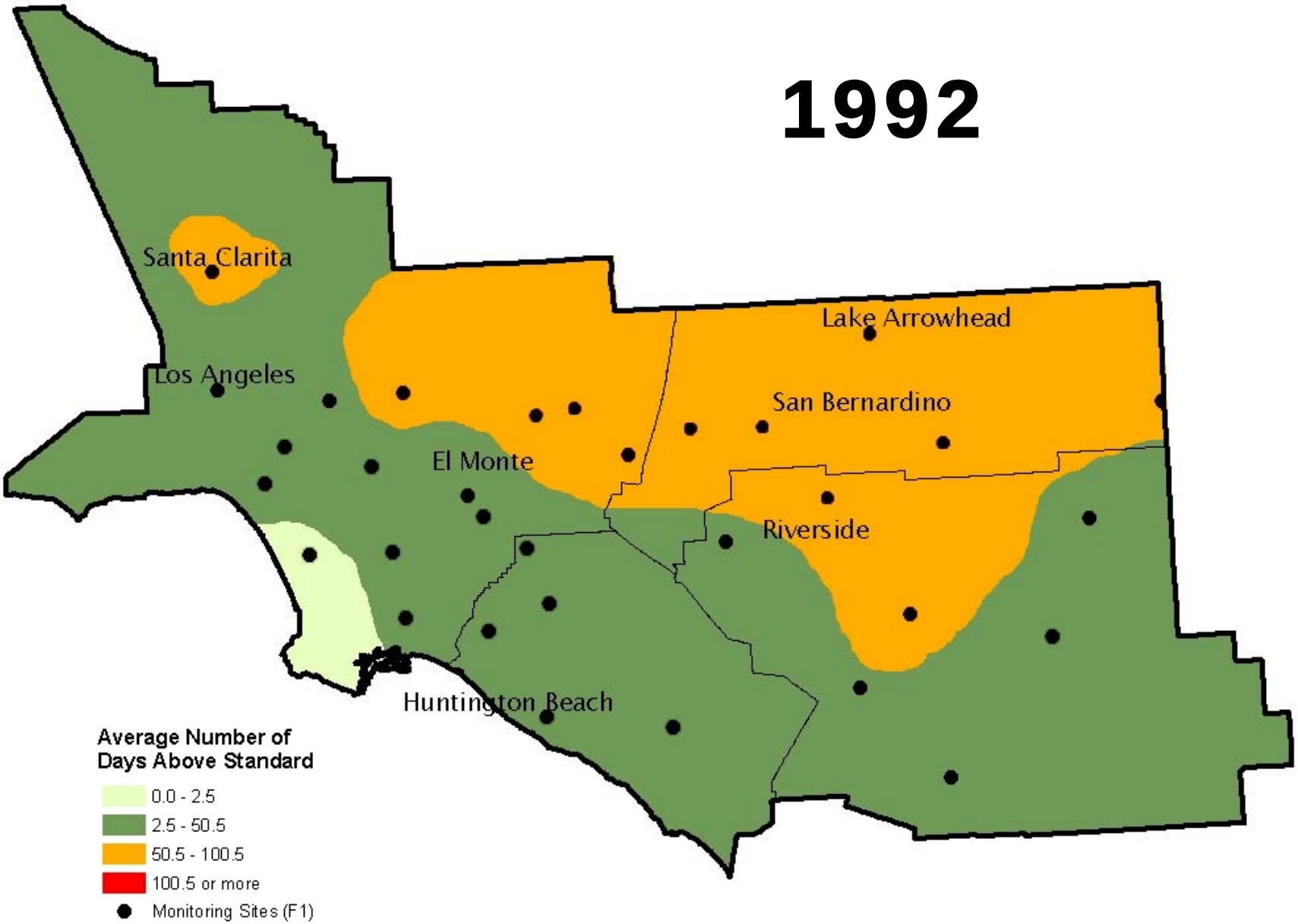
Why Did This Progress Occur?

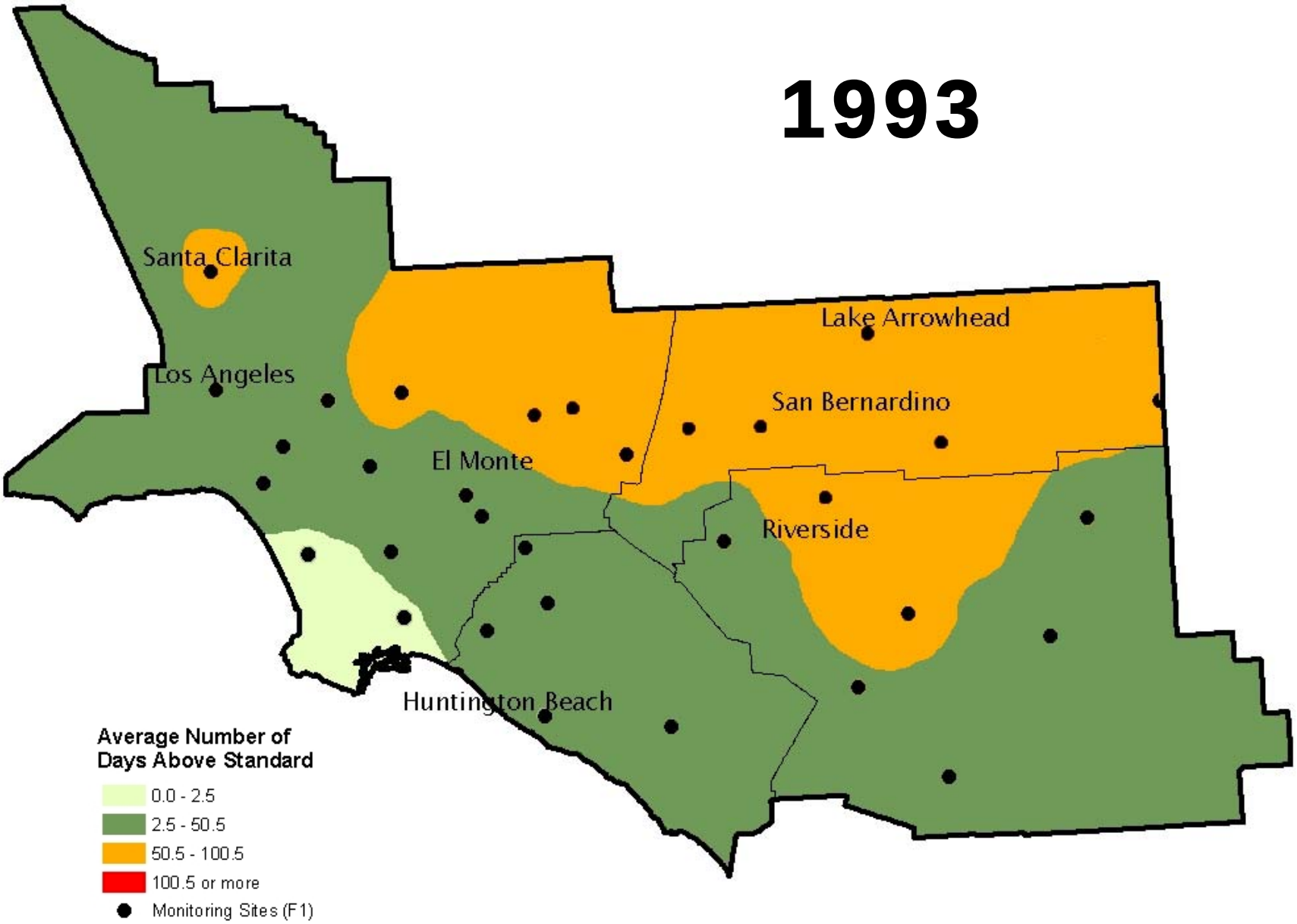
- Progress is a result of comprehensive emission control programs
- Year to year variations in weather also affect ozone levels
- Series of maps illustrates the combination of emission reductions and weather influences

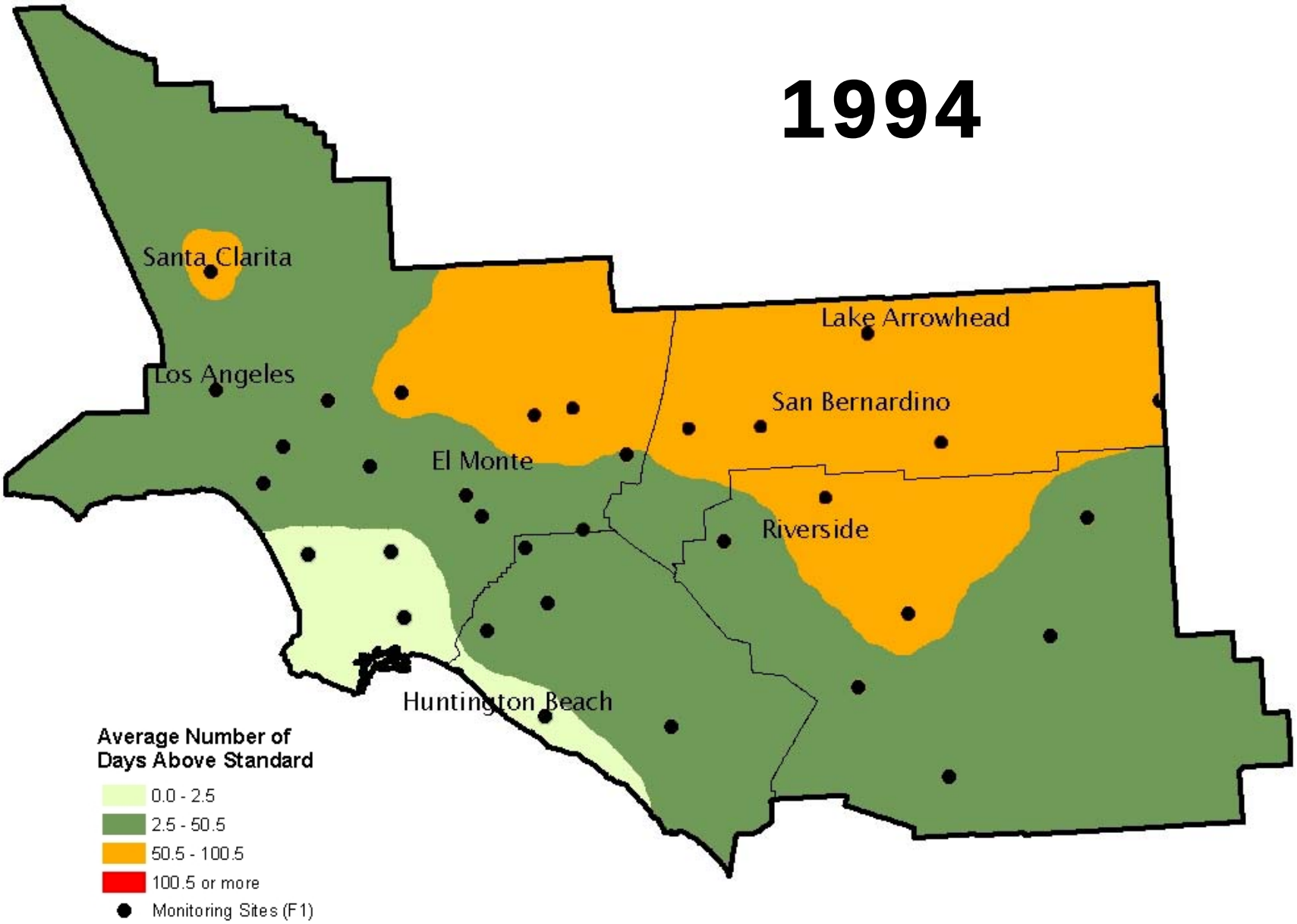

1989
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

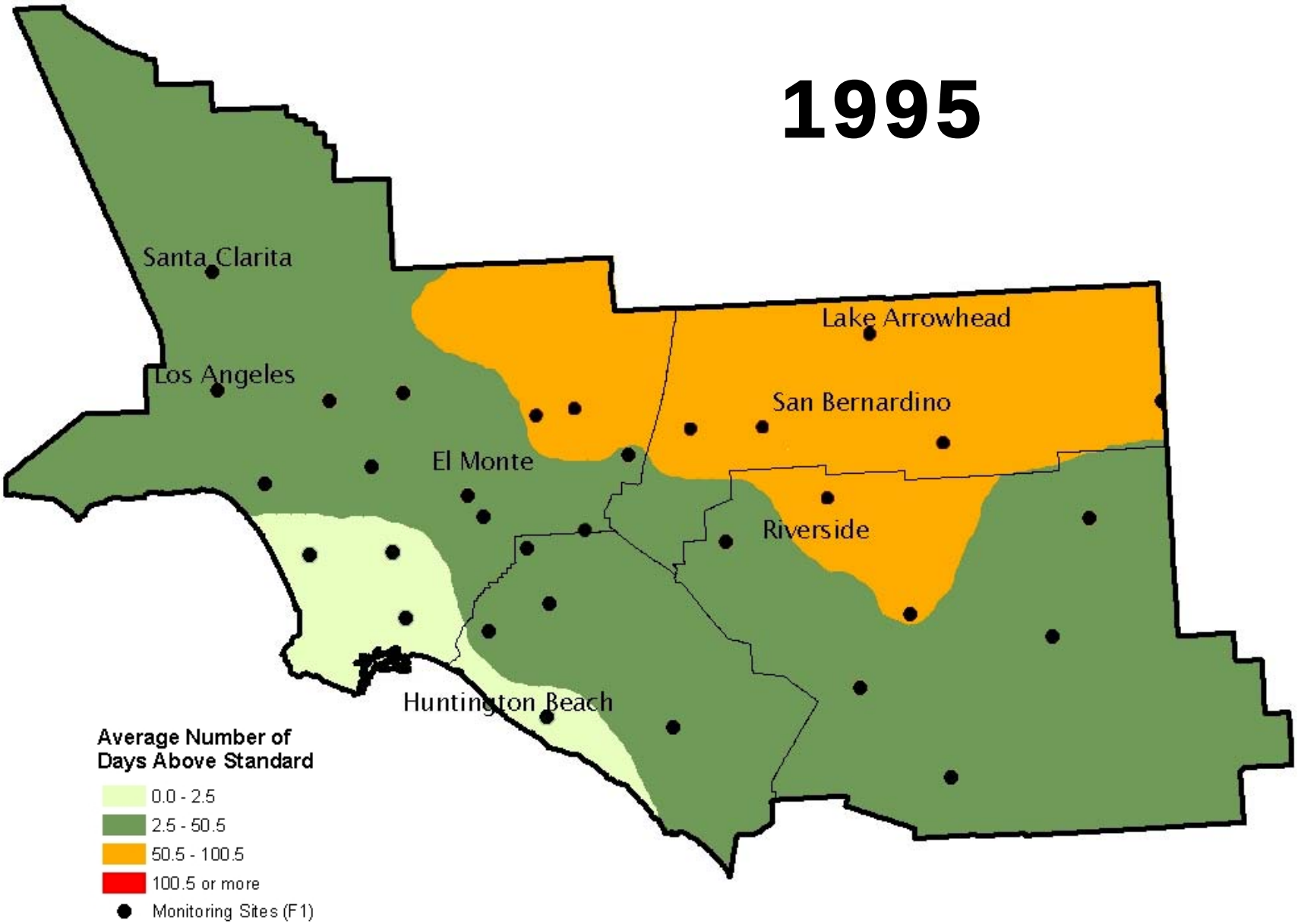

1990
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

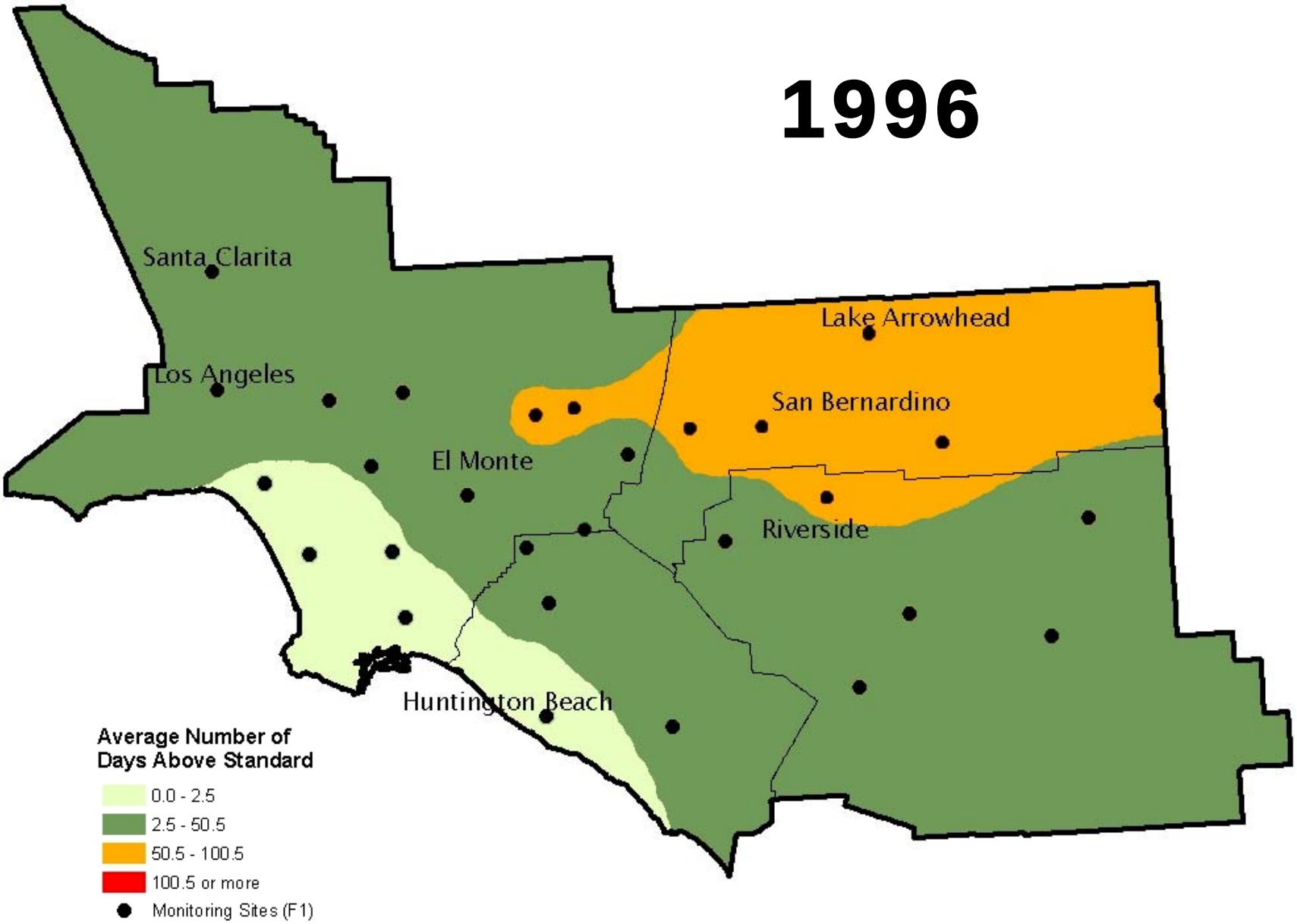

1991
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

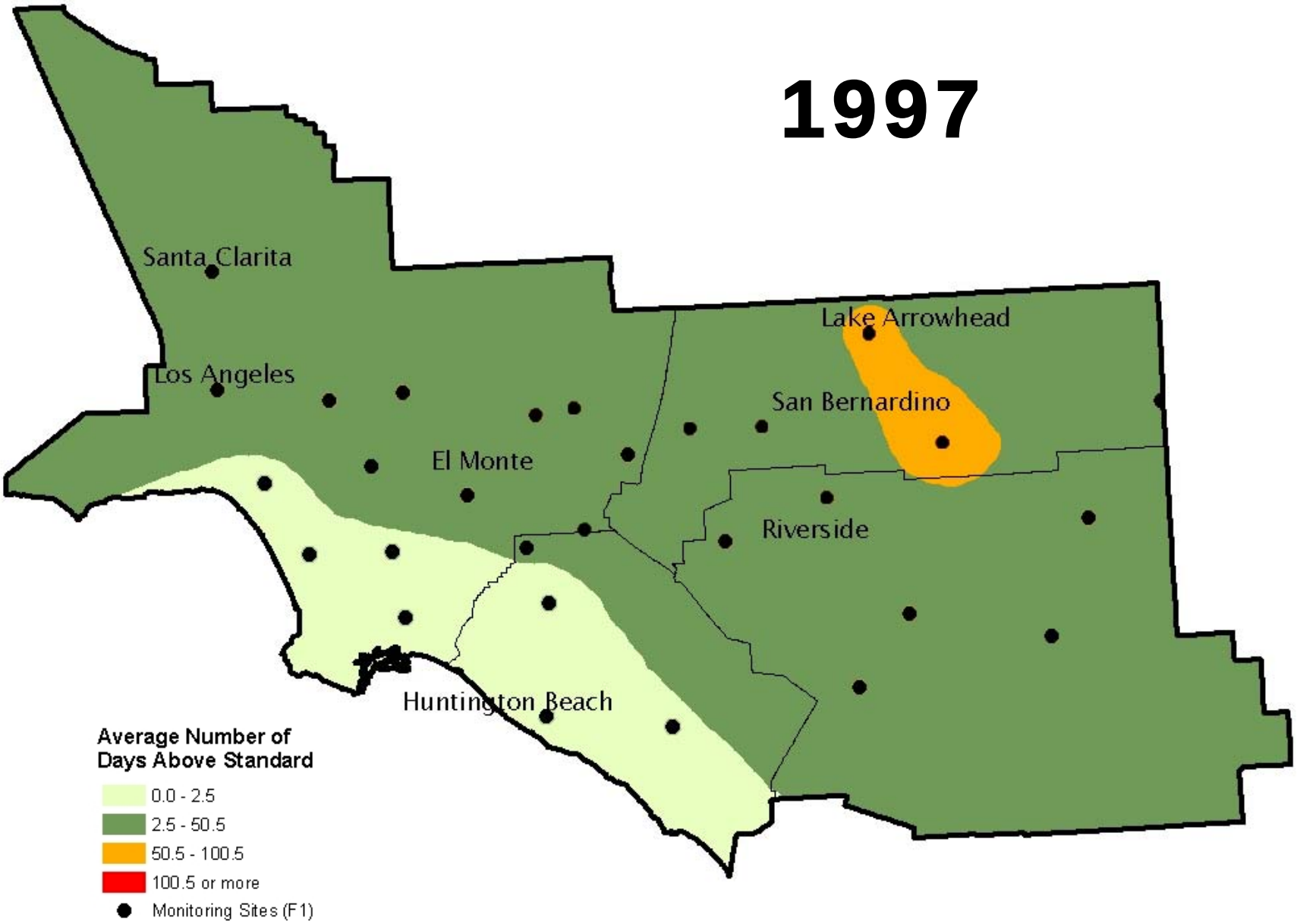

1992
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

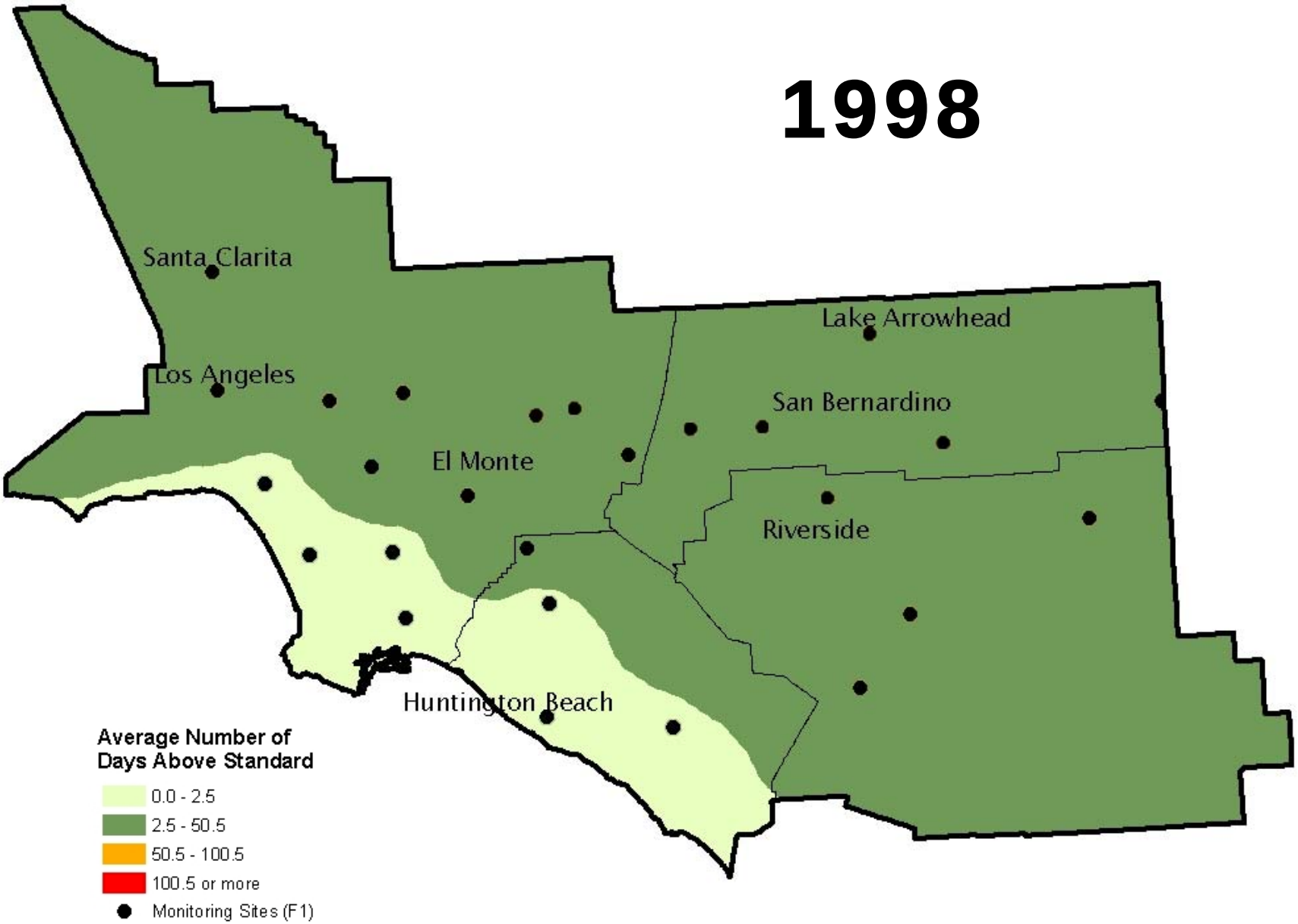

1993
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

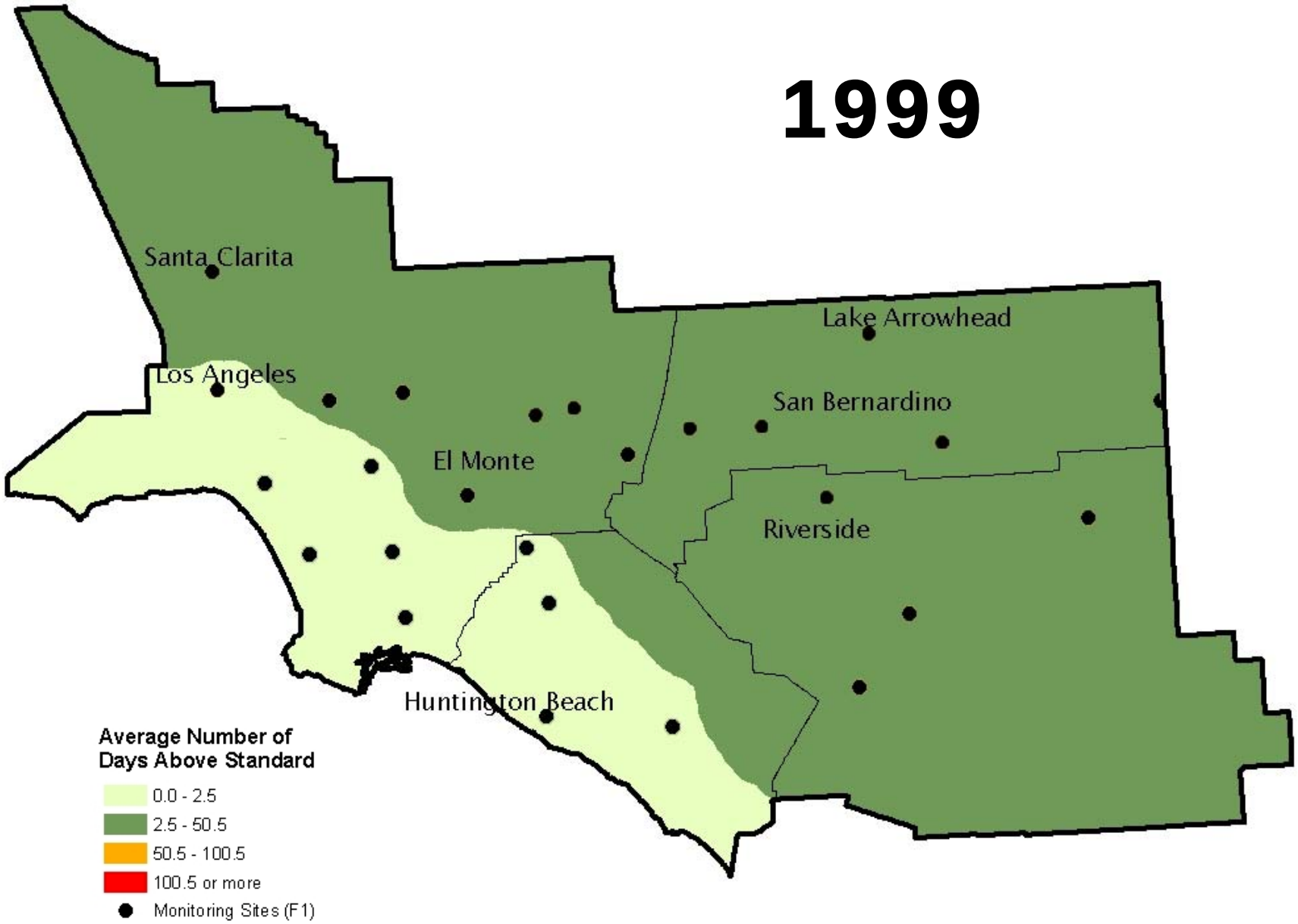

1994
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

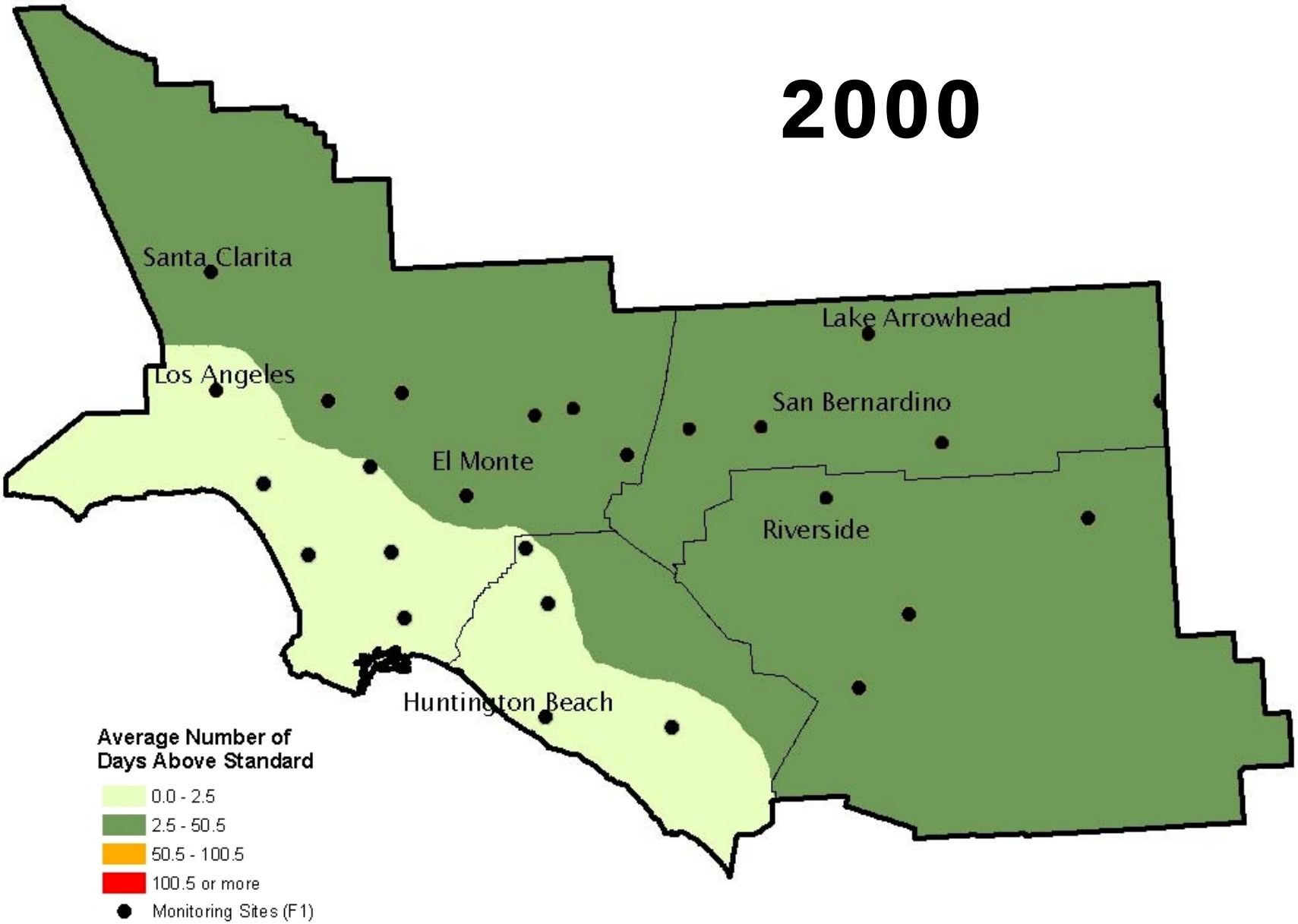

1995
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

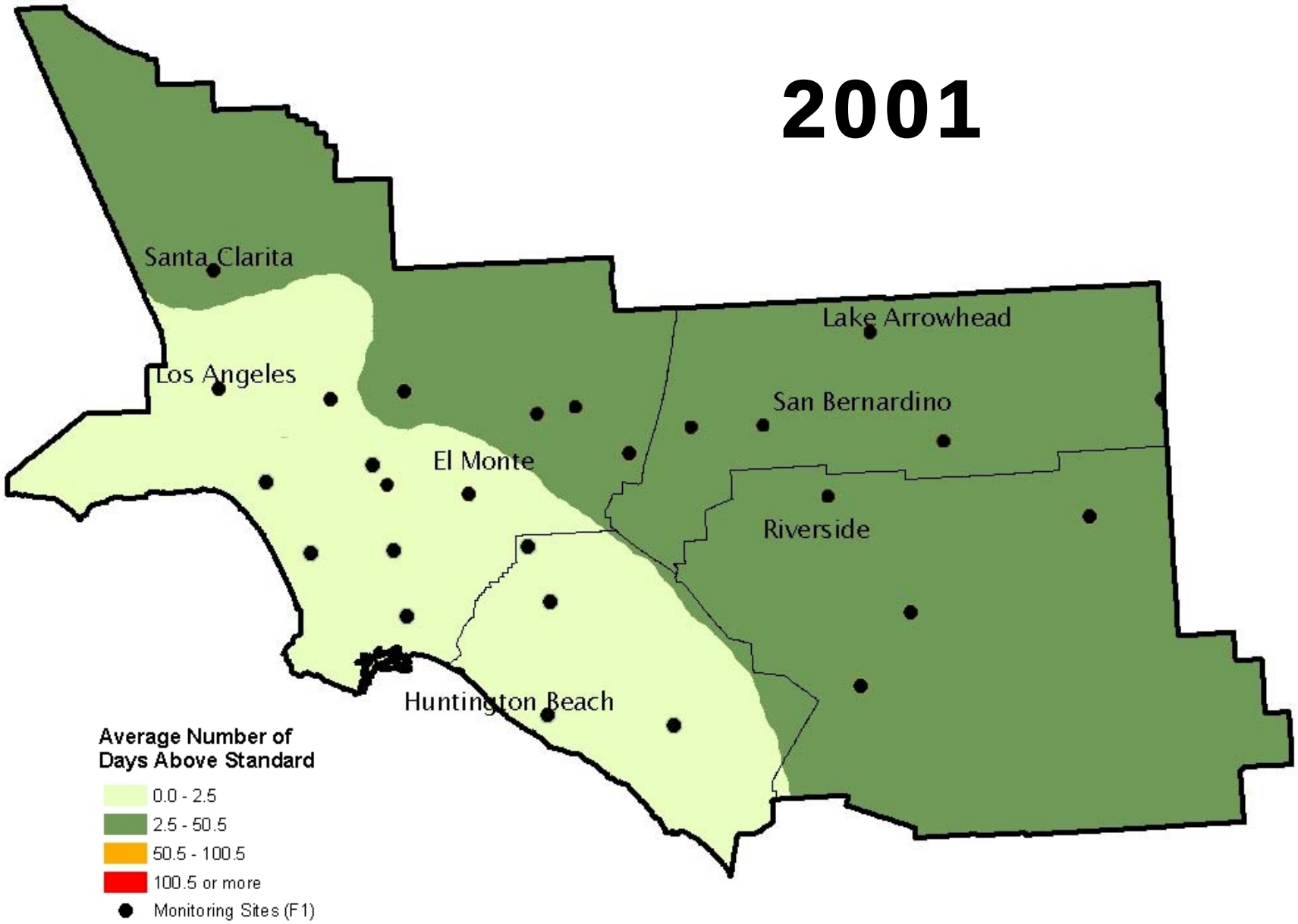

1996
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

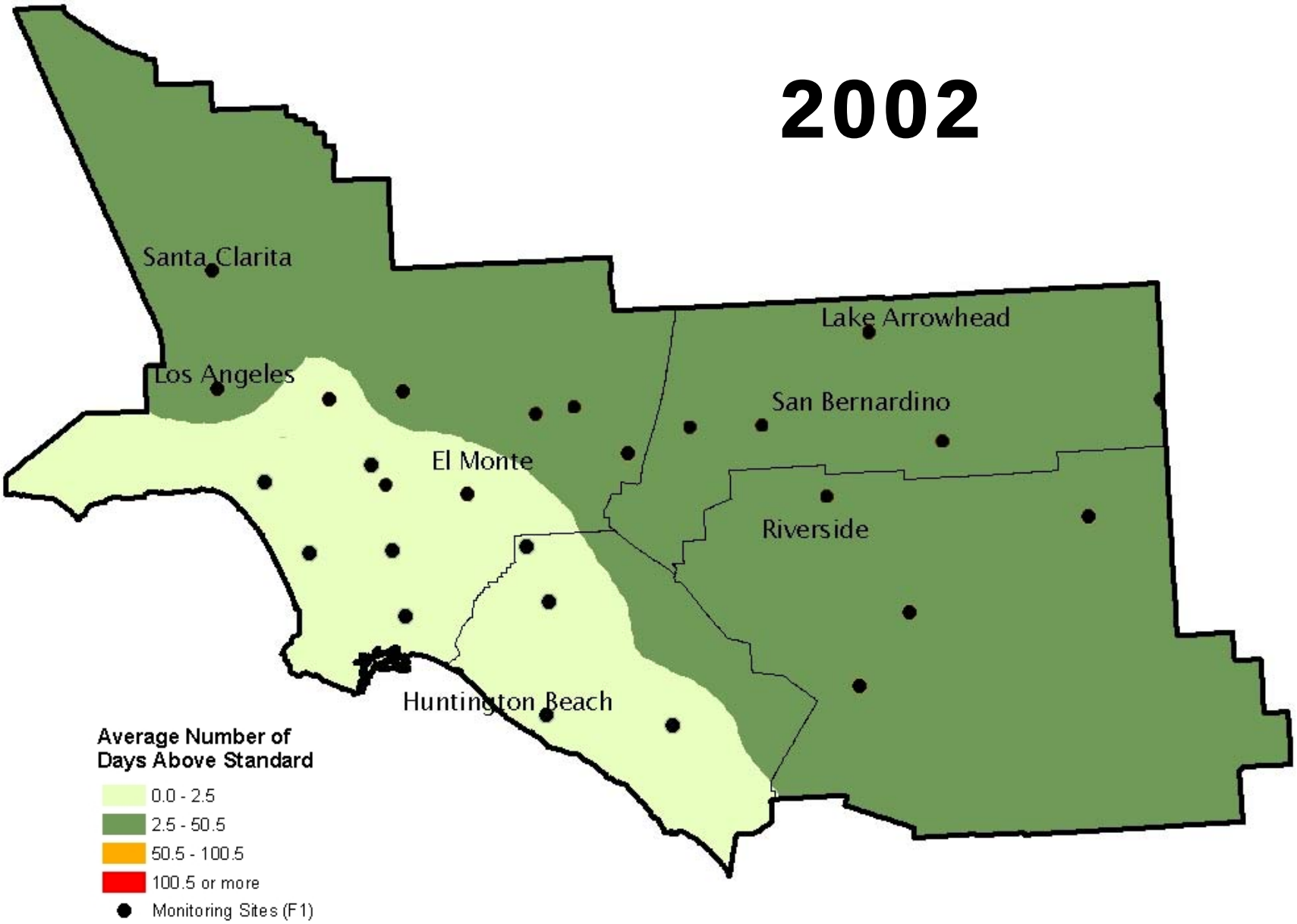

1997
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

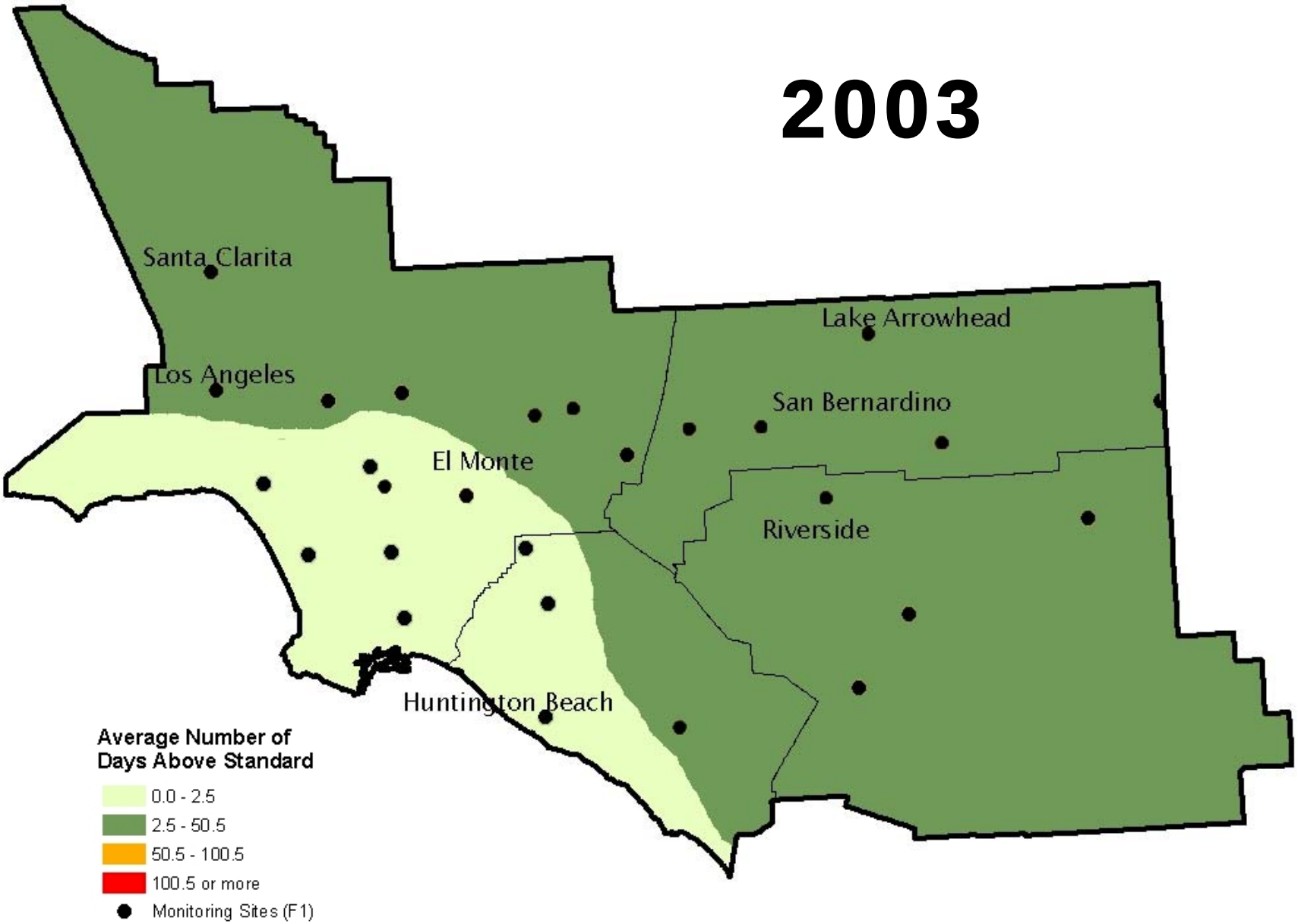

1998
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)


1999
Santa Clarita
Lake Arrowhead
Los Angeles
San Bernardino
El Monte
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)


2000
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)


2001
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)


2002
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)


2003
Santa Clarita
Los Angeles
El Monte
Lake Arrowhead
San Bernardino
Riverside
Huntington Beach
Average Number of
Days Above Standard
0.0 - 2.5
2.5 - 50.5
50.5 - 100.5
100.5 or more
Monitoring Sites (F1)

What Happened in the South Coast in 2003?

- Apparent reversal of progress
- More days above the standard than previous five years
- First Stage I alert since 1998
- Uncommonly severe weather

What Weather Conditions Lead to High Ozone?

- Intense sunlight
- Hot temperatures
- Calm or light winds
- Low inversions
- Few or no clouds to block sunlight

How Did 2003 Compare to Previous Years?

- 2003 had more ozone-conducive days than the last 24 years
- 1998 and 2003 each had a Stage I alert under similar weather conditions
  - Extreme weather in both cases
  - Peak was lower in 2003
- In addition, 1998 had 5 more Stage I alerts

Summary of Progress in South Coast

	1990*	2003**
Days over Standard	156	49
Peak levels (ppm)	0.34	0.18
2003 "Design Value"	--	0.17

* Annual average for 1988 - 1990
** Annual average for 2001 - 2003
2003 data are preliminary

What Progress Has Been Made in the San Joaquin Valley?

- Number of days over the standard dropped about 40% in the last decade
- Relatively high peaks remain
- Both major urban areas exceed the standard -- Fresno and Bakersfield
- Geography and climate pose significant challenge
- District requested new reclassification to ‘extreme’

Summary of Progress in San Joaquin Valley

	1990*	2003**
Days over Standard	58	35
Peak levels (ppm)	0.18	0.17
2003 "Design Value"	--	0.15

* Annual average for 1988 - 1990
** Annual average for 2001 - 2003
2003 data are preliminary

What Progress Has Been Made in the Sacramento Region?

- Number of days over the standard declined about 60% in the last decade
- Highest peaks are found downwind of Sacramento Metropolitan area
- As areas approach the standard, annual variation in weather can play a large role
- Attainment by 2005 is too close to call

Summary of Progress in the Sacramento Region

	1990*	2003**
Days over Standard	19	6
Peak levels	0.16	0.16
2003 "Design Value"	--	0.14

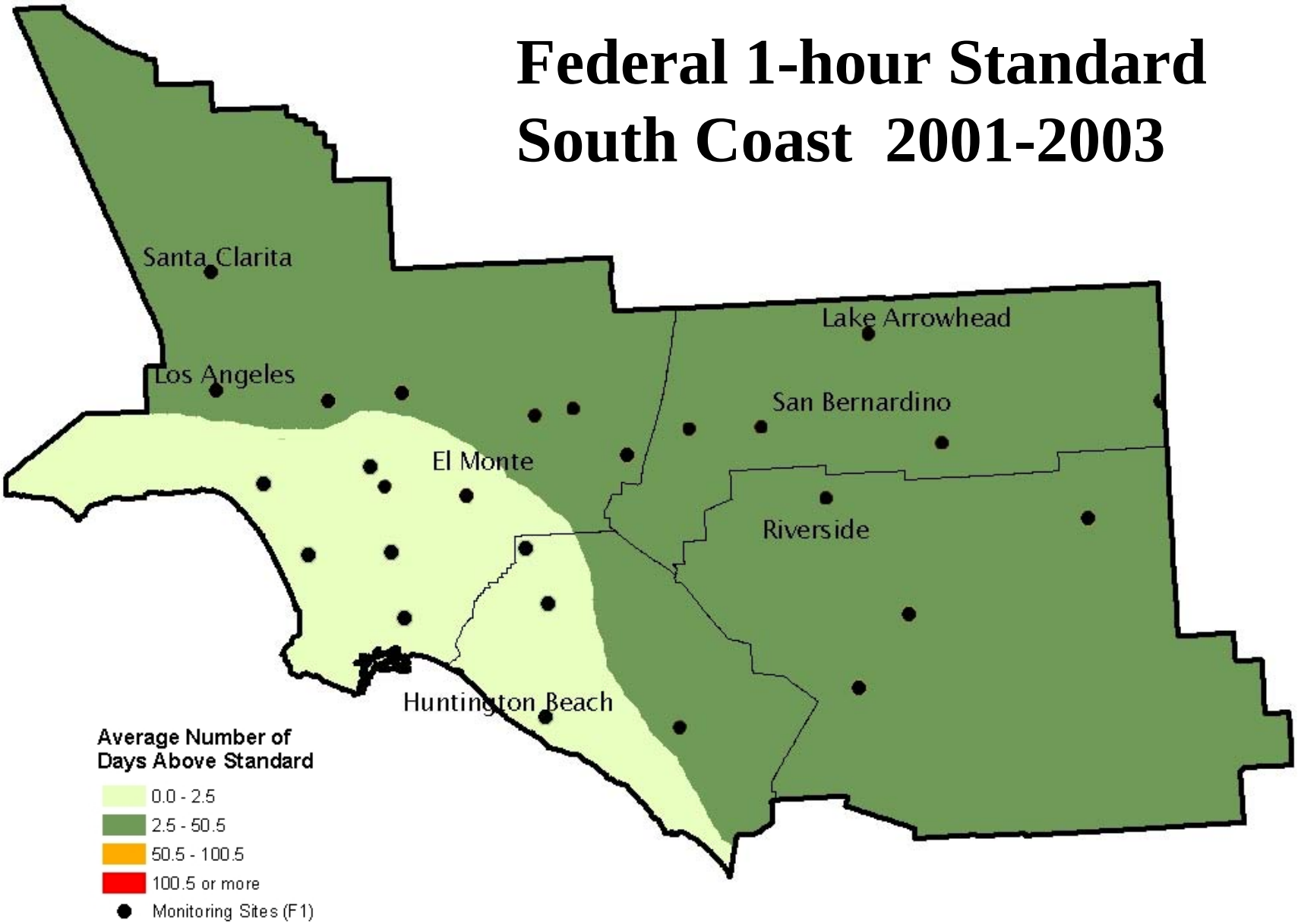
* Annual average for 1988 - 1990
** Annual average for 2001 - 2003
2003 data are preliminary

8-Hour Federal Ozone Standard

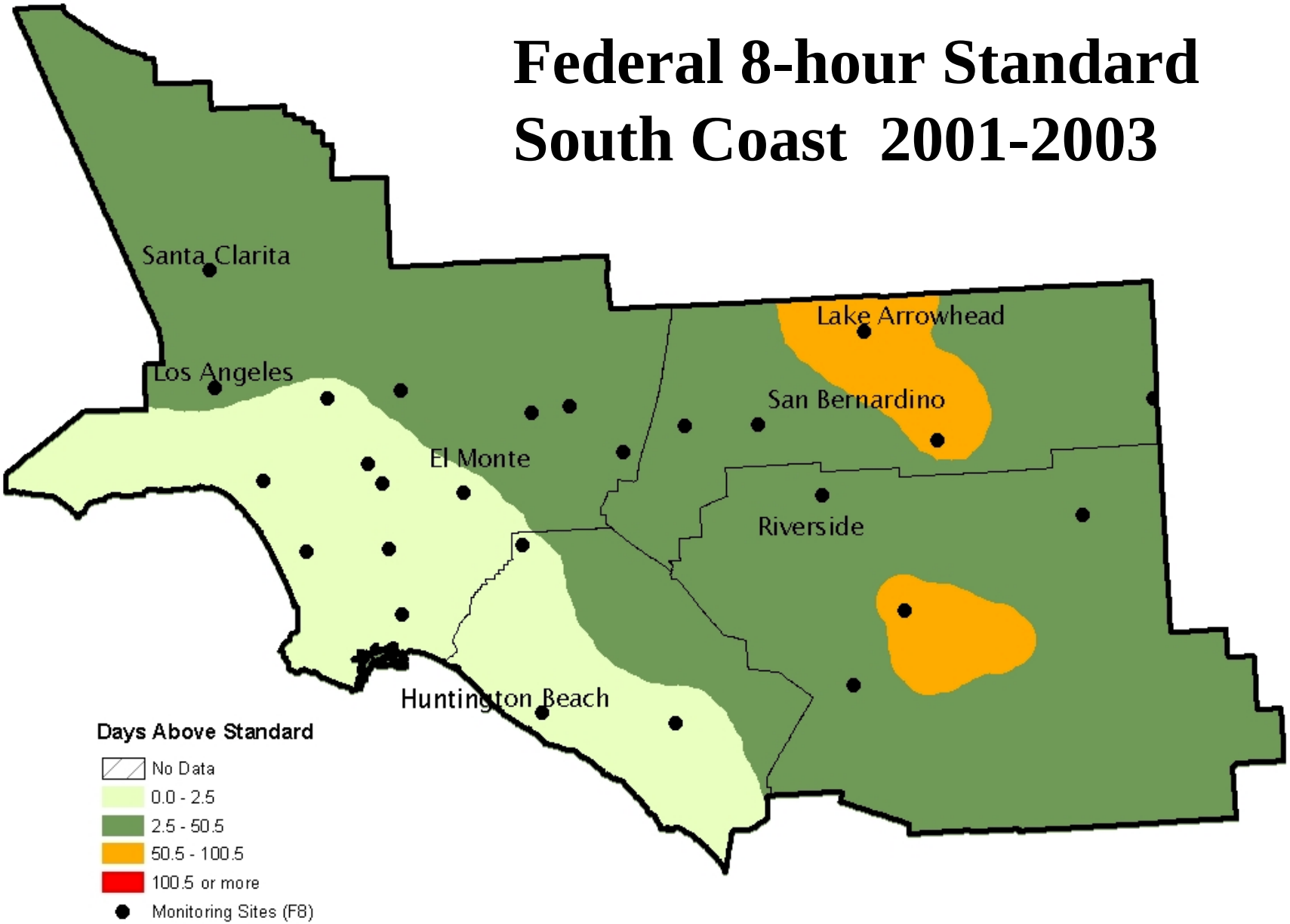
How Do the Federal 8-Hour and 1-Hour Standards Compare?

- 8-hour standard (0.08 ppm) more health protective
- More emissions reductions needed
- Attainment deadlines will be post-2010
- State Implementation Plans will be due in 2007

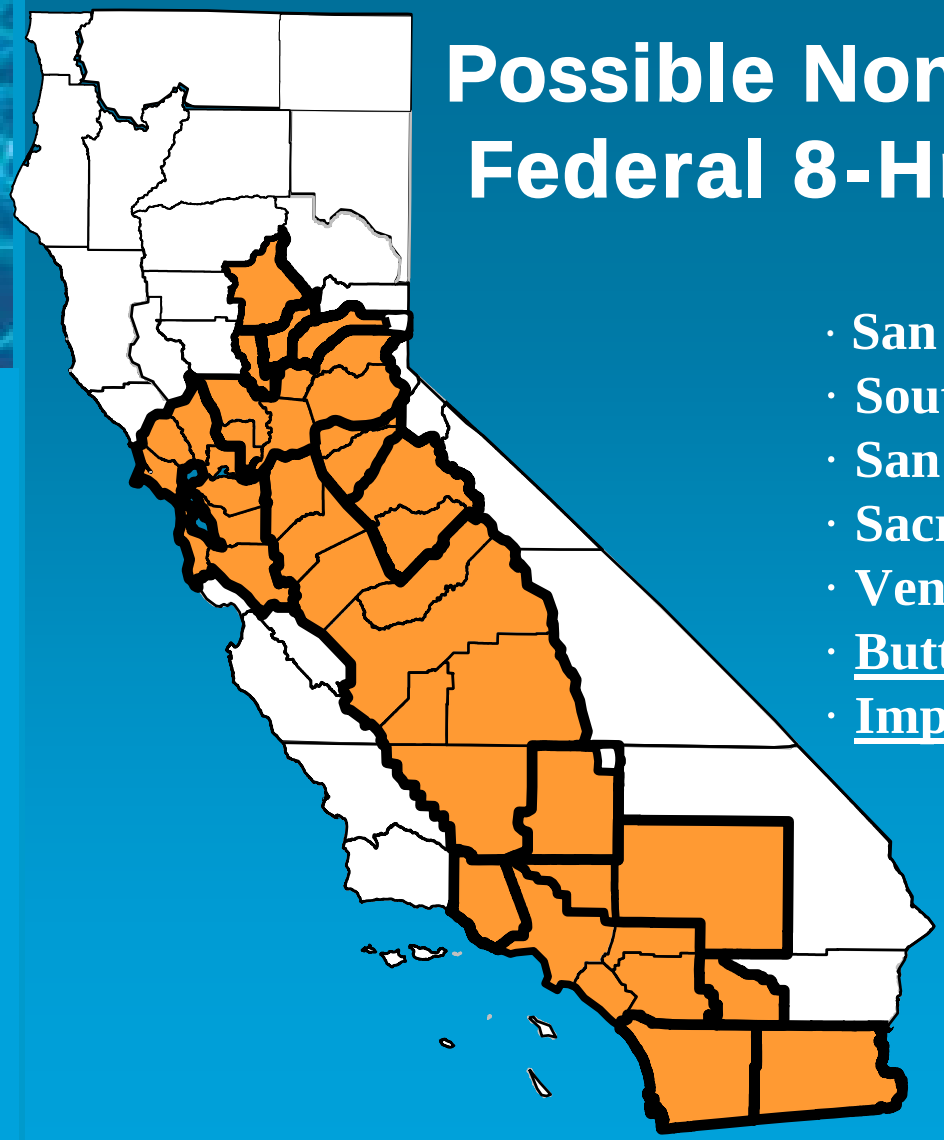
Federal 1-hour Standard
South Coast 2001-2003



Federal 8-hour Standard
South Coast 2001-2003



Possible Nonattainment Areas Federal 8-Hr Ozone Standard



- San Francisco Bay Area
- South Coast and Desert Areas
- San Joaquin Valley
- Sacramento Region
- Ventura and San Diego Counties
- <u>Butte, Sutter, and Yuba Counties</u>
- <u>Imperial and Mountain Counties</u>

Areas that are underlined are new to the Federal ozone planning process

Summary of Progress Toward Federal Ozone Standards

- 6 new areas now meet the Federal 1-hr standard
- 3 major areas still exceed the Federal 1-hr standard
- Attaining 8-hour standard will be a considerable challenge
- Control strategies for 1-hour standard have contributed to progress on 8-hr standard

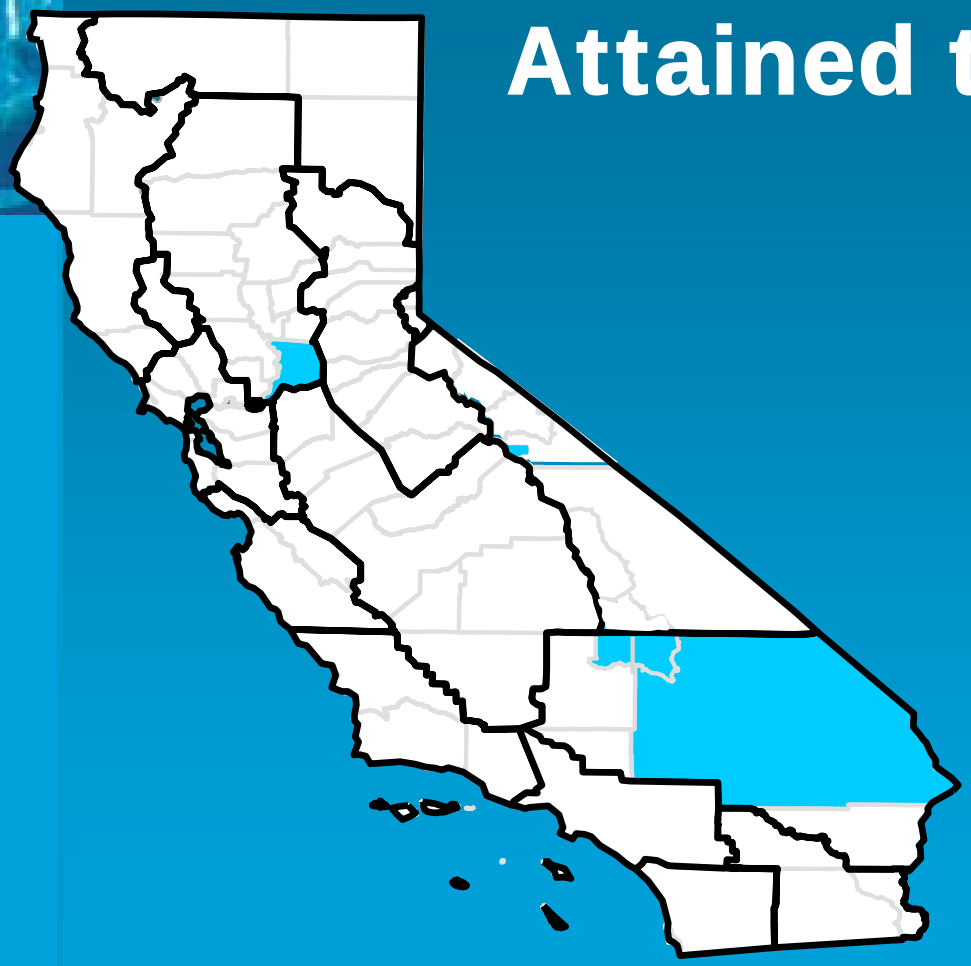
Federal Particulate Matter Standards (PM10 & PM2.5)

What are the Particulate Matter Standards?

- Multiple standards address the complexity of particulate matter pollution
- Standards encompass:
  - Both State and Federal Standards
  - 24-hour and annual averaging times
  - PM2.5 and PM10 size fractions
  - PM2.5 is a component of PM10

Federal PM10 Standards

What Areas Have Recently Attained the Standard?



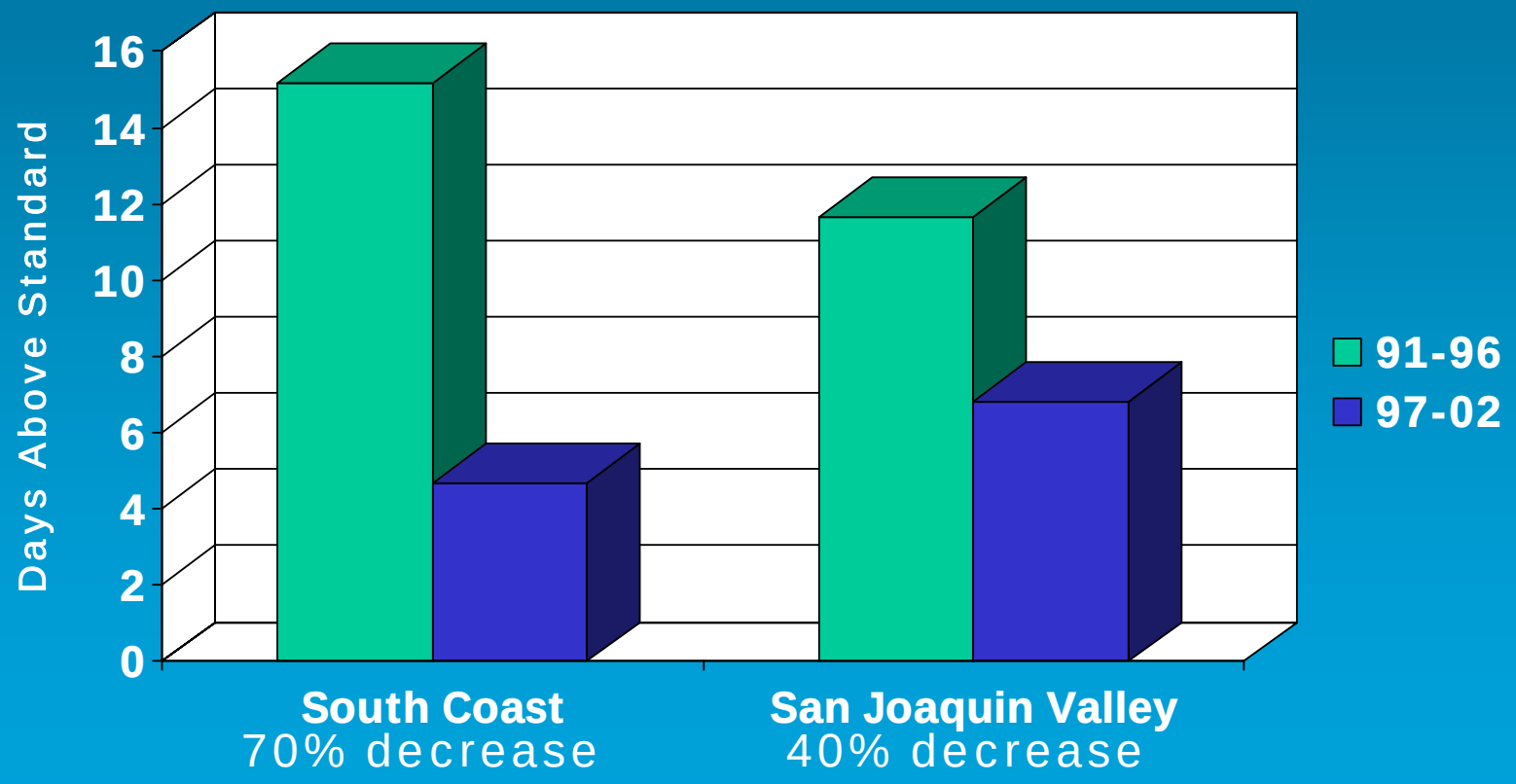
Since 1990, 4 areas now meet Federal PM10 standards

- Sacramento County
- Mammoth Lakes
- 2 Areas in Searles Valley
- Portion of San Bernardino County

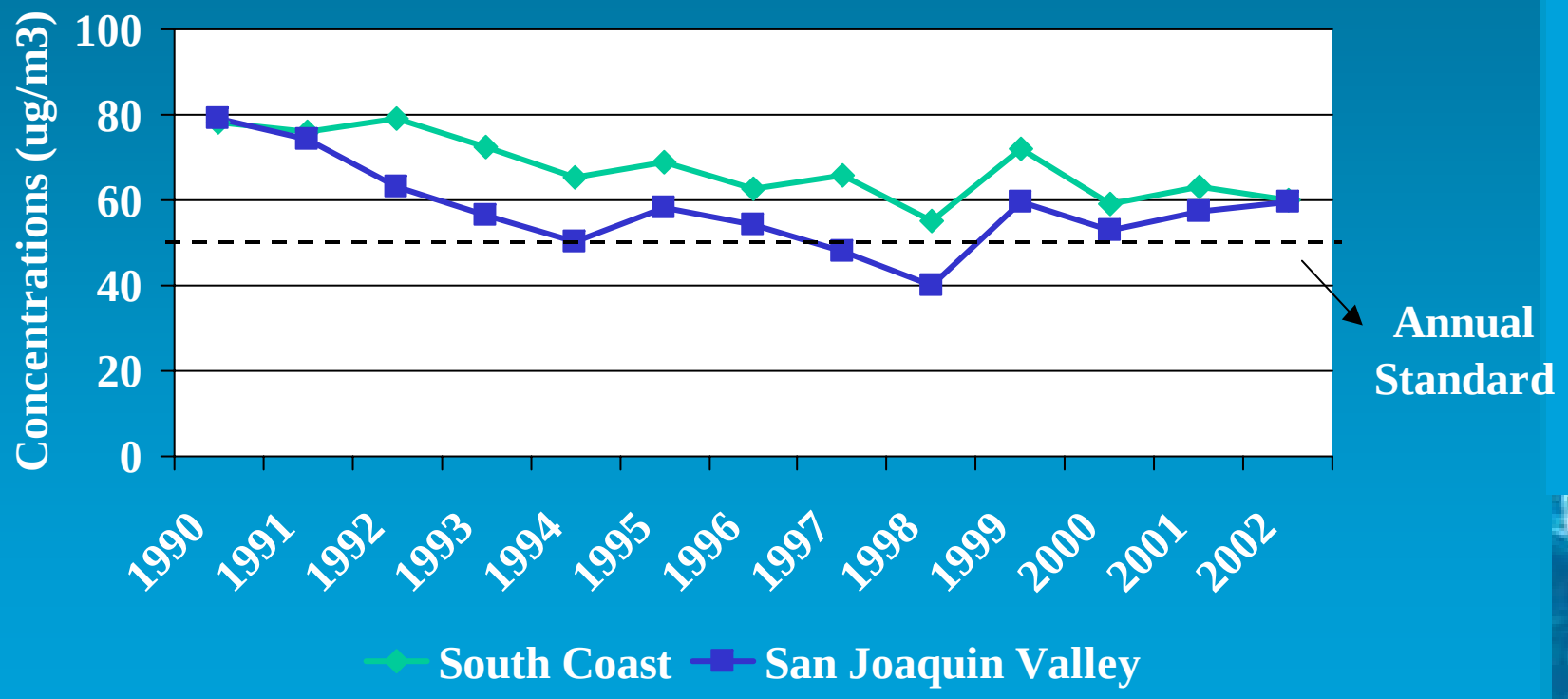
What are the Remaining PM10 Nonattainment Areas?

- Owens Lake and Coso Junction, Mono Lakes and Coachella Valley
  - Fugitive dust measures underway
- Imperial County
  - Fugitive dust and transport from Mexico need to be addressed
- South Coast, San Joaquin Valley
  - Complex particulate matter problems
  - SIPs updated in 2003 with variety of control measures

What Progress Has Been Made Toward Attaining the 24-Hr PM10 Standard?



What Progress Has Been Made Toward Attaining the Annual PM10 Standard?



Federal PM2.5 Standards

What Progress Has Been Made Toward Attaining the PM2.5 Standards?

- 20% - 30% reduction in PM2.5 since 1988
- Reduction in precursor emissions have reduced the secondary component of particulate matter
- More extensive monitoring for PM2.5 began in 1999

What are the Expected Federal PM2.5 Nonattainment Areas?

- San Joaquin Valley
- South Coast
- San Diego
- City of Calexico

How Severe is the PM2.5 Problem?

- **San Joaquin Valley**
  - far above annual and 24-hour standards
- **South Coast**
  - far above annual standard and slightly above 24-hour standard
- **San Diego**
  - slightly above annual standard
- **City of Calexico**
  - slightly above annual standard

What are the PM2.5 Planning Timeframes?

- U.S. EPA expected to designate by December 2004
- State Implementation Plans due 3 years later - 2007
- Attainment deadlines - 2009-2014

Summary of Particulate Matter Progress

- Federal PM10 standards attained in several fugitive dust areas
- Progress shown towards 2006 attainment in South Coast and 2010 attainment in San Joaquin
- Average statewide reduction in PM2.5 of 20-30% since 1988

State Standards

How Do State Standards Compare With Federal Standards?

- California standards are more health protective
- Board recently revised PM10 and adopted new PM2.5 standards
- Ozone and NO_2 standards scheduled for review within the next 2 years

What is the Attainment Status for State Standards?

- Most urban areas exceed State ozone standard
- Most of State exceeds State PM10 standard
- CO Standard attained statewide except for localized area in South Coast and Calexico
- NO_2 standard attained statewide

What are the State Ozone & PM Nonattainment Areas?

Ozone

PM10

What Progress Has Been Made Since 1990?

- 3 new areas have attained the State ozone standard
  - North Coast Air Basin, San Luis Obispo, and South Lake Tahoe
- Most progress on the State Standards has occurred in the South Coast
- Less progress in other urban areas

What are the State Standard Timeframes?

- No specific attainment deadline
- Attain expeditiously as possible
- All feasible measures in California Clean Air Act Plans
- ARB approves triennial plans

Toxics

Toxics Statewide

- Statewide cancer risk is driven by 3 pollutants:
  - Diesel Particulate Matter
  - Benzene
  - 1, 3 Butadiene
- Diesel Particulate Matter is about 70% of risk
- Other pollutants are near source pollutants

What Statewide Progress Has Been Made in Air Toxics Since 1990?

- Statewide Reductions:
  - Diesel Particulate Matter* - 56%
  - Benzene - 75%
  - 1,3 Butadiene - 55%
  - Perchloroethylene - 70%

*Diesel estimate is emissions based

Summary

- Statewide air quality has improved
- Ozone, particulate matter, and toxics exposures have declined
- New areas attain our air quality standards
- Less improvement occurred in inland valleys for ozone and PM10
- Improvement was made despite growth in population and vehicle miles traveled

Looking Ahead

- Focus on
  - Reducing air pollution by 50%
  - Attaining State and Federal Standards
  - Reducing air toxics