Air Quality Progress and Planning Under the Federal Clean Air Act

November 15, 2012

California Environmental Protection Agency
Air Resources Board

Clean Air Act Framework

- National Ambient Air Quality Standards (NAAQS) set public health goals
- Planning process considers science, technology, feasibility, and costs
- Specified deadline to meet each NAAQS
- SIPs must be enforceable
- Consequences for inaction or delay

NAAQS Define Clean Air

- U.S. EPA sets health-based NAAQS
- PM2.5 and ozone responsible for majority of air pollution-related health effects
- PM2.5 linked to mortality and hospitalization for cardiovascular diseases
- Ozone strongly linked to respiratory effects: asthma exacerbation, reduced lung function, and hospitalization

Multiple NAAQS

Pollutant	Standard	Year Standard Set
1 hour ozone	120 ppb	1979
8 hour ozone	80 ppb	1997
8 hour ozone	75 ppb	2008
Annual PM2.5	15 $\mu g/m^3$	1997
24 hour PM2.5	65 $\mu g/m^3$	1997
24 hour PM2.5	35 $\mu g/m^3$	2006
Annual PM2.5*	12.0 -13.0 $\mu g/m^3$	December 2012
8 hour ozone*	60 - 70 ppb	2014

*to be revised by EPA

Components of the CA SIP

- Emissions inventories
- Air monitoring network
- Adopted rules
- Commitments for action
- Contingency measures
- Other administrative requirements
- Progress, attainment, maintenance plans

Attainment Planning Process

- Attainment demonstrations must show how standards will be met
- Built on strong scientific foundation
- State Implementation Plans (SIPs) span timeframes up to 20 years, but are updated frequently

SIP Approval Process

- Adopted by air districts and ARB
- ARB submits attainment plan to U.S. EPA
- U.S. EPA required to take action within 24 months
- ARB and air districts implement

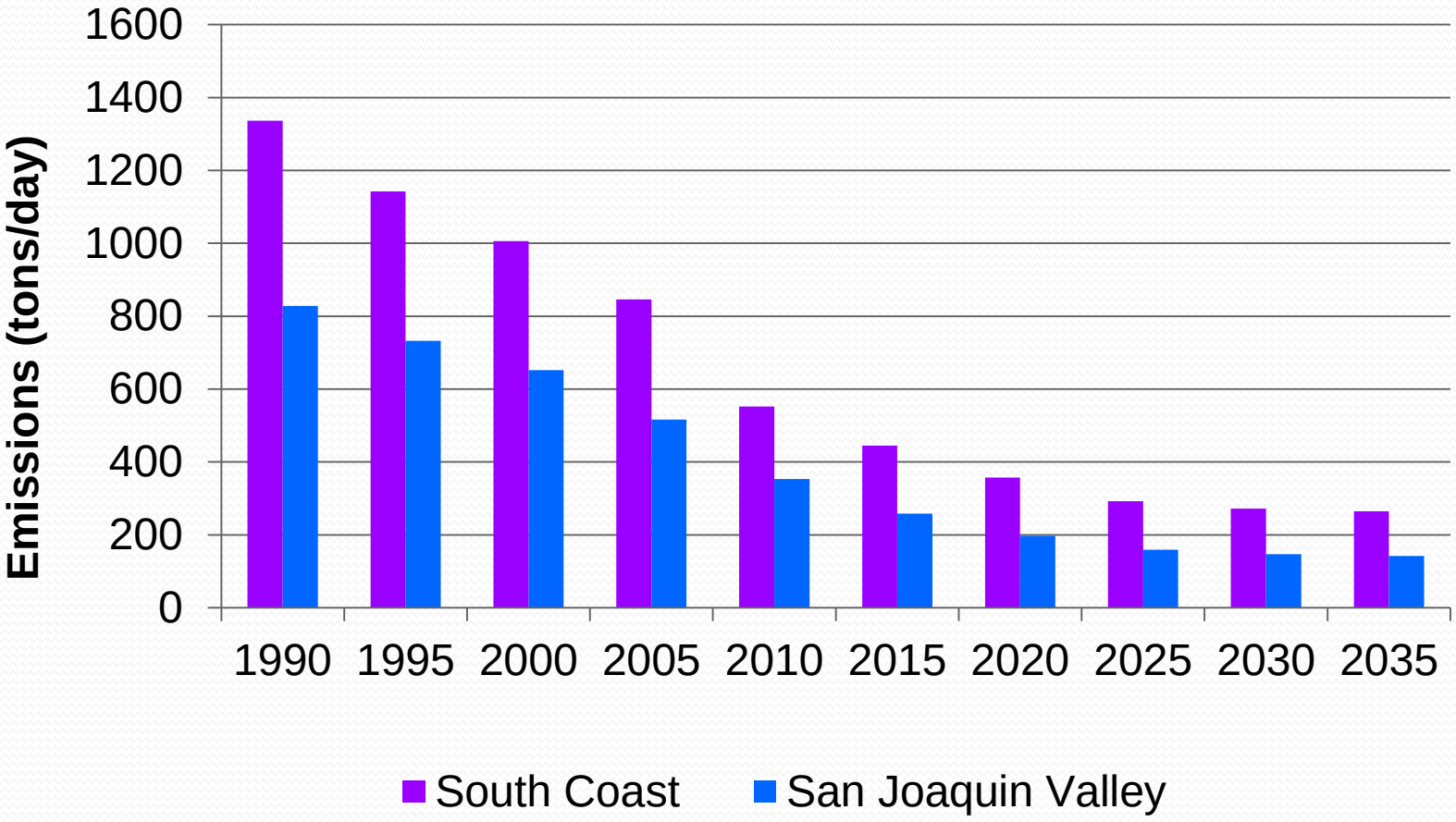
Evolution of ARB Programs

1980s: Focus on Passenger Vehicles	1990s: Focus on Trucks, Cleaner Passenger Vehicles, Off-Road Engines	2000s: Focus on Legacy Fleets and Next Generation Passenger Vehicles
Tail pipe standards	Heavy-duty diesel truck standards	Ports and freight handling equipment
Smog Check	Clean diesel fuels	Retrofit/replace trucks and buses
On-board diagnostics	Low-emission vehicles and clean fuels and reformulated gas	Electric hybrids and plug-ins
Diesel fuel specifications	Small off-road equipment	Marine vessels
	Consumer products	Retrofit/replace off-road equipment

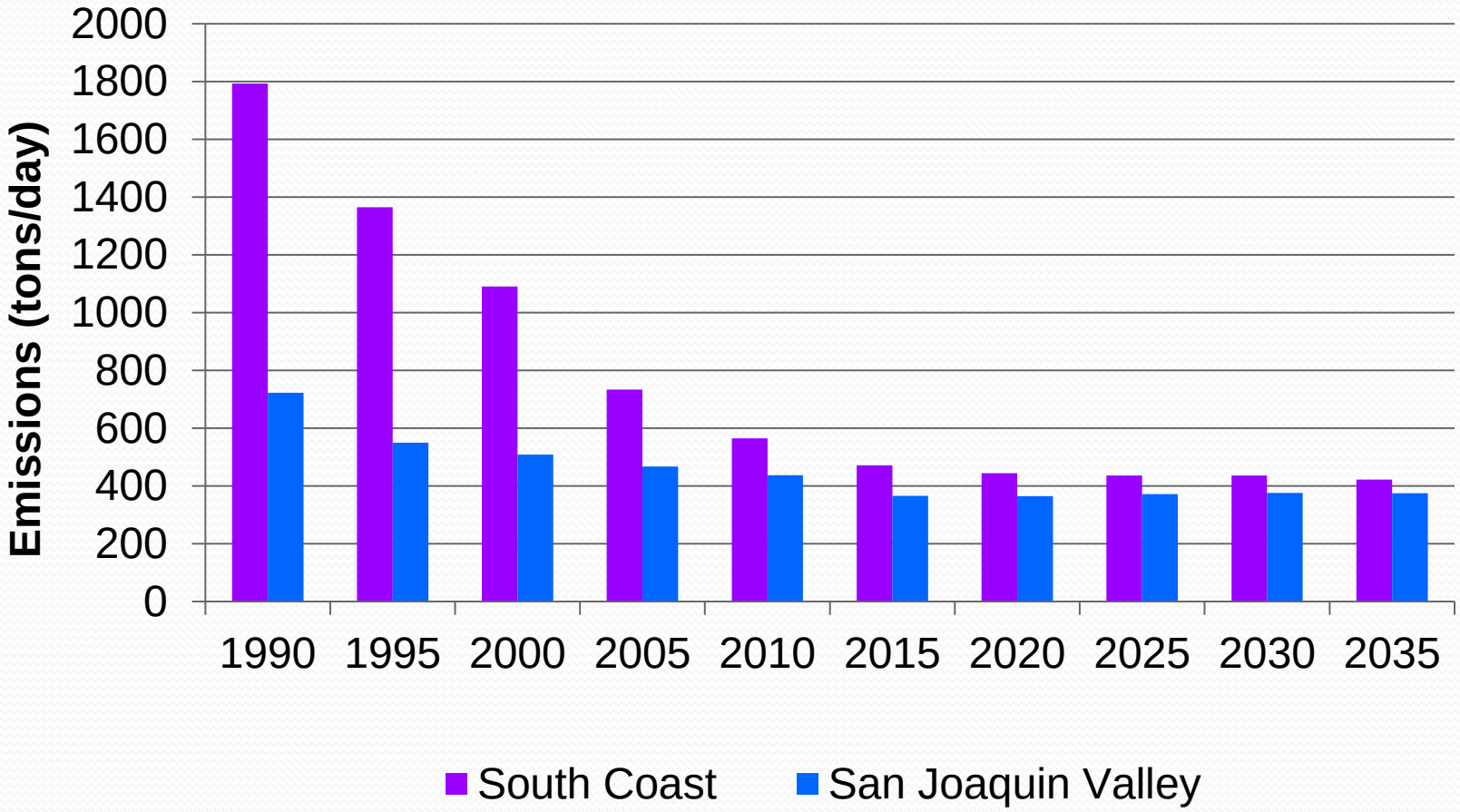
ARB's Ongoing SIP Implementation

- Smog Check
- Heavy-duty NOx standards
- Reformulated gasoline
- Clean diesel fuel
- Lawn and garden equipment
- Off-road engines
- Off-road recreational vehicle standards
- Cargo handling equip.
- Low emission vehicle rules
- Legacy fleet clean-up
- Recreational boats
- Consumer products
- Vapor recovery
- Ocean-going ship auxiliary engines
- Port trucks
- Advanced clean cars

Benefits of CA's Programs: NOx



Benefits of CA's Programs: VOC



Air Quality Status: Ozone

Area	1-hour Ozone Std.	1997 8-hour Ozone Std.
South Coast (Extreme)		
San Joaquin Valley (Extreme)		
Sacramento	✓	
Desert Areas (Coachella/Mojave)	✓	
San Diego	✓	✓
Ventura	✓	✓
Bay Area	✓	✓
Other areas	✓	✓

✓ = no longer exceeds the standard

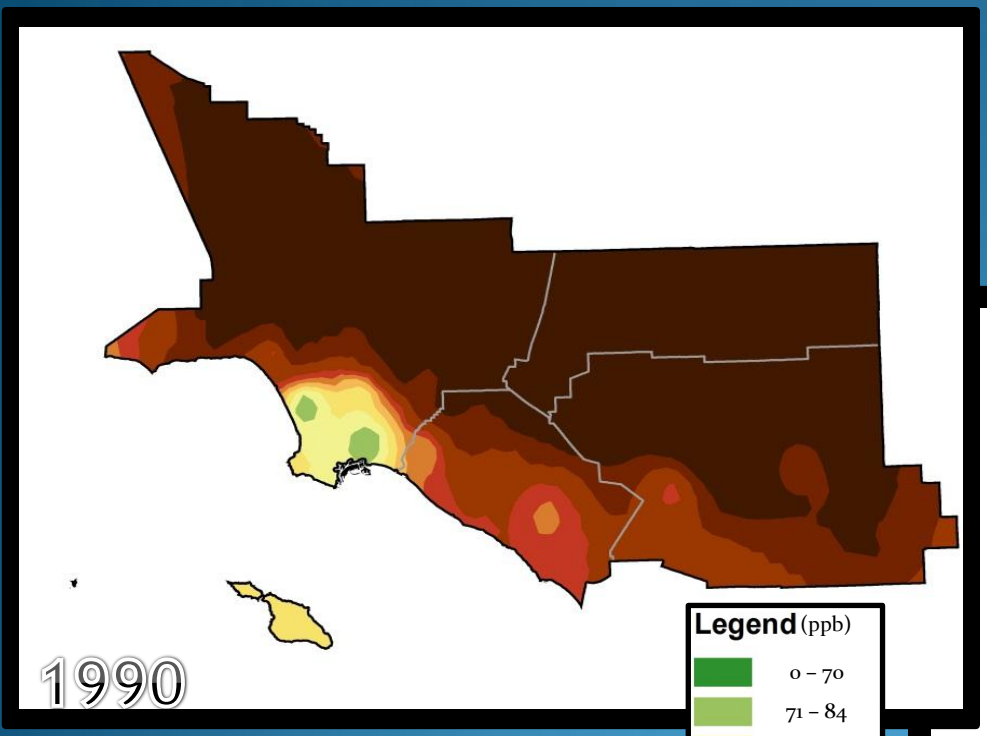
Air Quality Status: PM2.5

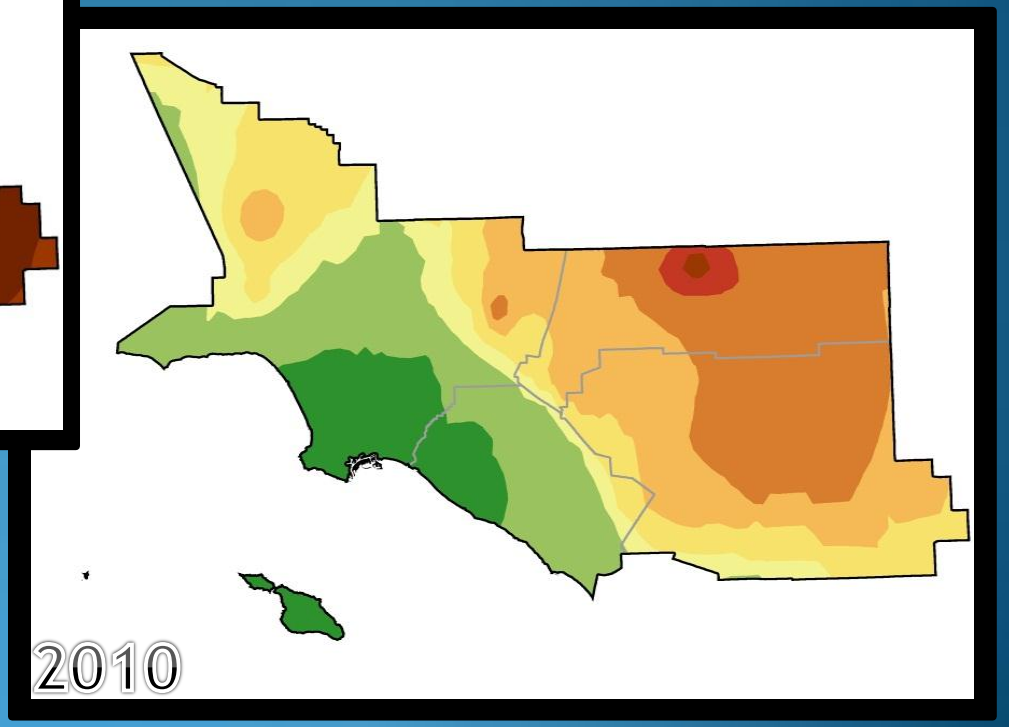
Area	Annual PM2.5 Std.	24-hour PM2.5 Std.
South Coast		
San Joaquin Valley		
Sacramento	✓	✓
Bay Area	✓	✓
Other Areas	✓	✓

✓ = no longer exceeds the standard

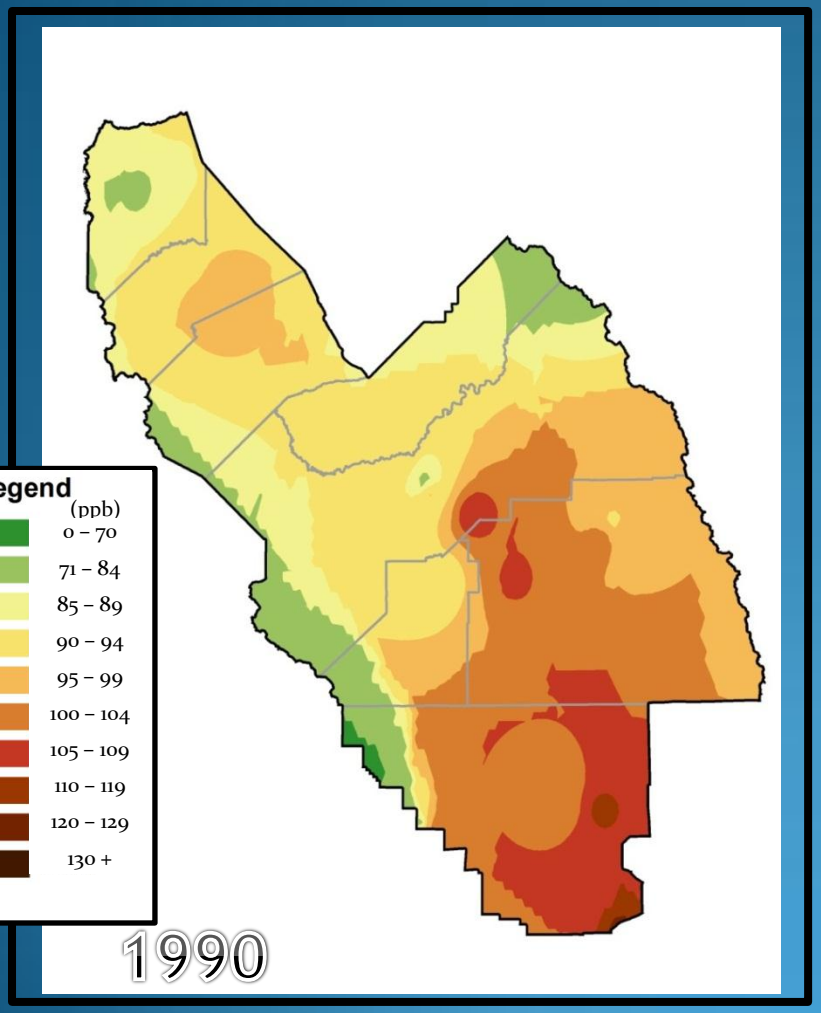
Ozone

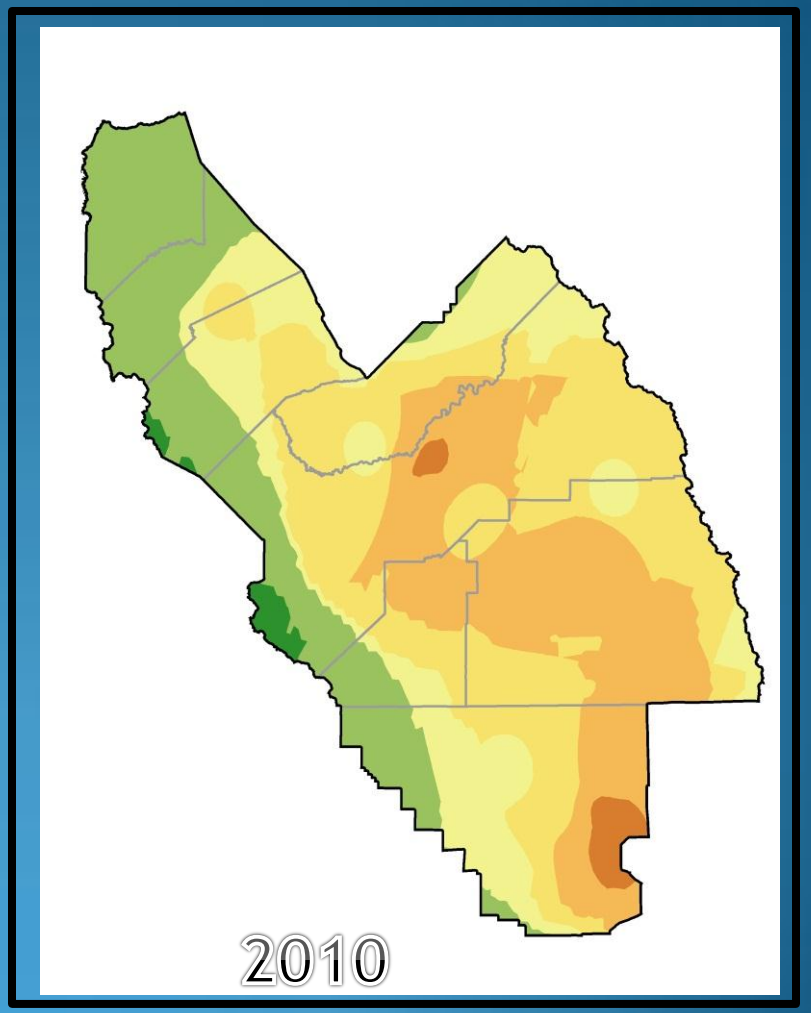
South Coast Air Basin: Progress Towards 8-Hour Ozone Standard





San Joaquin Valley Air Basin: Progress Towards 8-Hour Ozone





Meeting Future Ozone Standards

- Timeframe for attainment of new, tighter ozone standards is 2032
- NOx control is our primary focus
- About 90% NOx reduction from today's level is needed
- Existing programs, new advanced technologies, and other actions needed

Ozone Planning Opportunities and Challenges

- Integrated ozone, PM2.5, and climate planning provides opportunities
- New NAAQS approach background levels
- Increasing importance of:
  - Biogenic emissions
  - Long-range transport
  - Climate impacts

PM2.5

Meeting PM2.5 Standards

- Annual and 24-hour standards
  - Current annual standard under review
- Complex science
  - PM2.5 has many components
  - Regional contributions from NOx sources
  - Localized contributions from wood smoke, commercial cooking

South Coast Air Basin PM2.5 Status

- Since 1999, annual average concentrations have decreased by 47%
- Today, only Mira Loma site in eastern basin exceeds annual PM2.5 standard
- South Coast no longer exceeds 1997 24-hour standard
- Region still exceeds the more stringent 2006 24-hour standard

San Joaquin Valley Air Basin PM2.5 Status

- Since 1999, annual average concentrations have decreased by 34%
- Today, annual PM2.5 standard is exceeded primarily in central and southern San Joaquin Valley
- Valley no longer exceeds 1997 24-hour standard
- Region still exceeds the more stringent 2006 24-hour standard

SIP Planning Activities

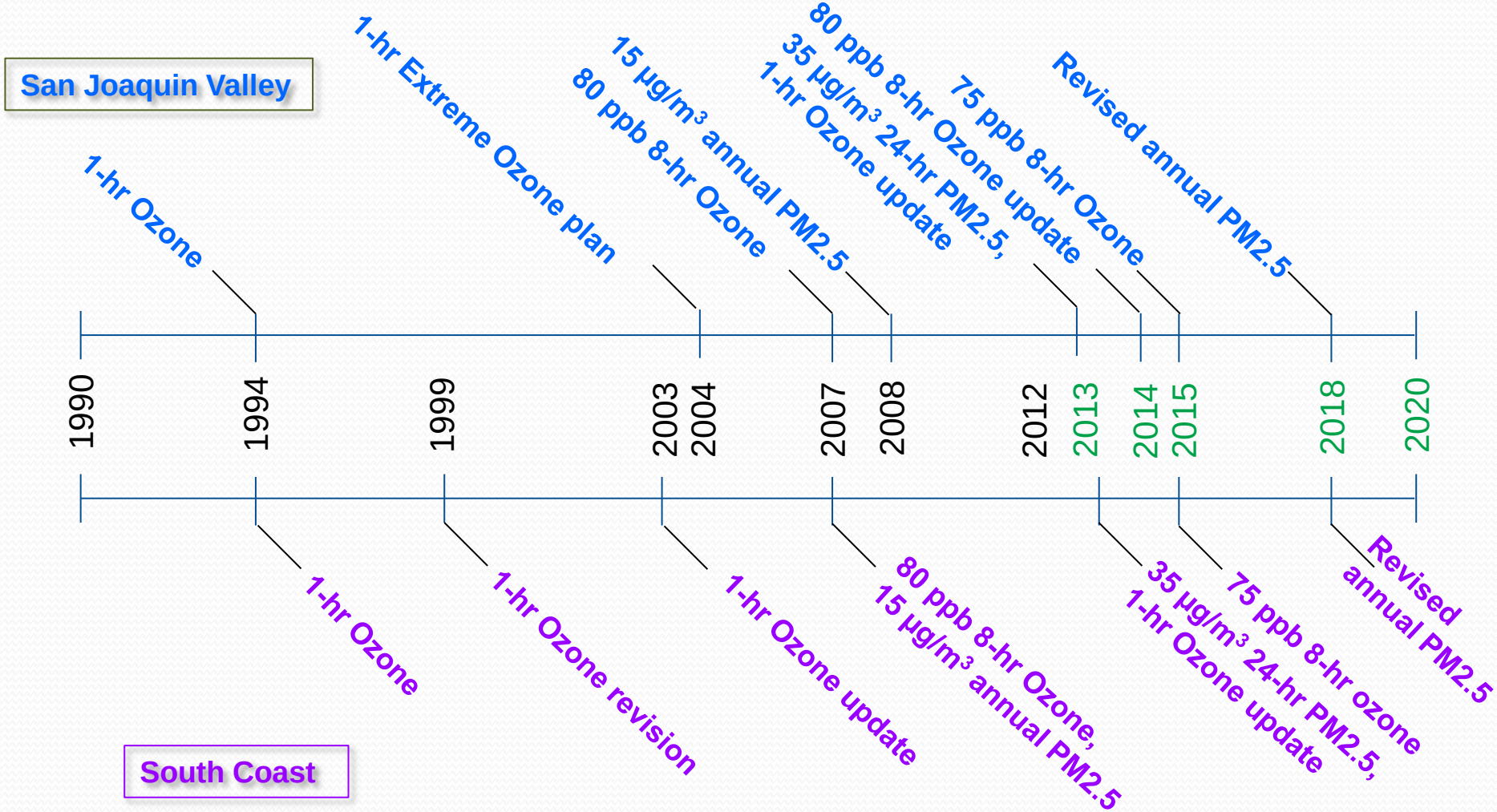
Ozone and PM2.5 Planning Requirements

- Multiple SIPs required over next several years
- South Coast and San Joaquin Valley are nation's only extreme ozone areas
- More stringent ozone and PM2.5 standards under consideration

Attainment Deadlines

- Extreme ozone areas have a 20-year planning horizon
- PM2.5 attainment deadlines—up to 10 years
- Approved SIPs contain advanced technology provisions as authorized by section 182(e)(5) of Clean Air Act

Major California SIPs (1990-2020)



ARB SIP Priorities 2013-2015

- 2013:
  - South Coast 24-hour PM2.5 and 1-hour ozone (Jan.)
  - San Joaquin Valley 24-hour PM2.5 (Jan.)
  - San Joaquin Valley 1-hour ozone (June)
- 2014:
  - San Joaquin Valley 8-hour ozone

ARB SIP Priorities 2013-2015

- 2015:
  - 8-hour ozone SIPs for 75 ppb standard
    - South Coast and San Joaquin Valley—Extreme
    - Sacramento and desert areas—Severe
    - Ventura—Serious

Meeting the Challenge

- California faces greatest air quality challenges in the nation
- SIPs must address increasingly stringent standards with frequent legal challenges
- A combination of regulations, incentives, sustainable land use and transportation systems, and infrastructure investments is needed

Approach to SIP Planning

- Integrate ARB planning efforts for SIPs, AB 32 Scoping Plan, and freight planning
- Expand on longstanding partnerships with air pollution control districts and metropolitan planning agencies
- Develop innovative strategies tailored to California's air quality problems