



BayArea **Plan**

The Rising Tide of San Francisco Bay

Asilomar Conference
August 31, 2011

Steve Heminger, MTC Executive Director
August 25, 2011

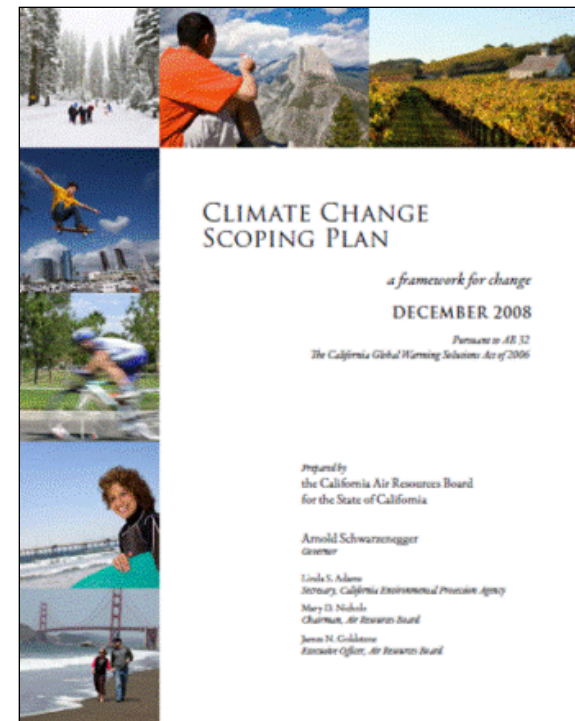
Where Credit Is Due...



**Will Travis, Executive Director
Bay Conservation and Development Commission
www.bcdc.ca.gov**

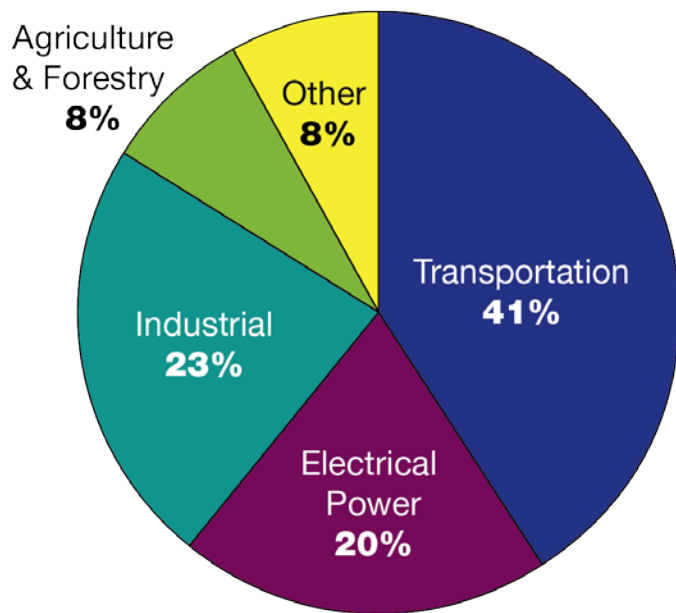
AB 32 Global Warming Solutions Act of 2006

- **AB 32 establishes the first comprehensive program of regulatory and market mechanisms in the nation to achieve greenhouse gas (GHG) emissions reductions**
- **AB 32 sets GHG emissions limit for 2020 at 1990 level**
 - Acknowledges that 2020 is not the endpoint
 - Points way towards 80% reduction by 2050
- **Air Resources Board (ARB) adopted a Scoping Plan to achieve AB 32's GHG emissions reduction target**



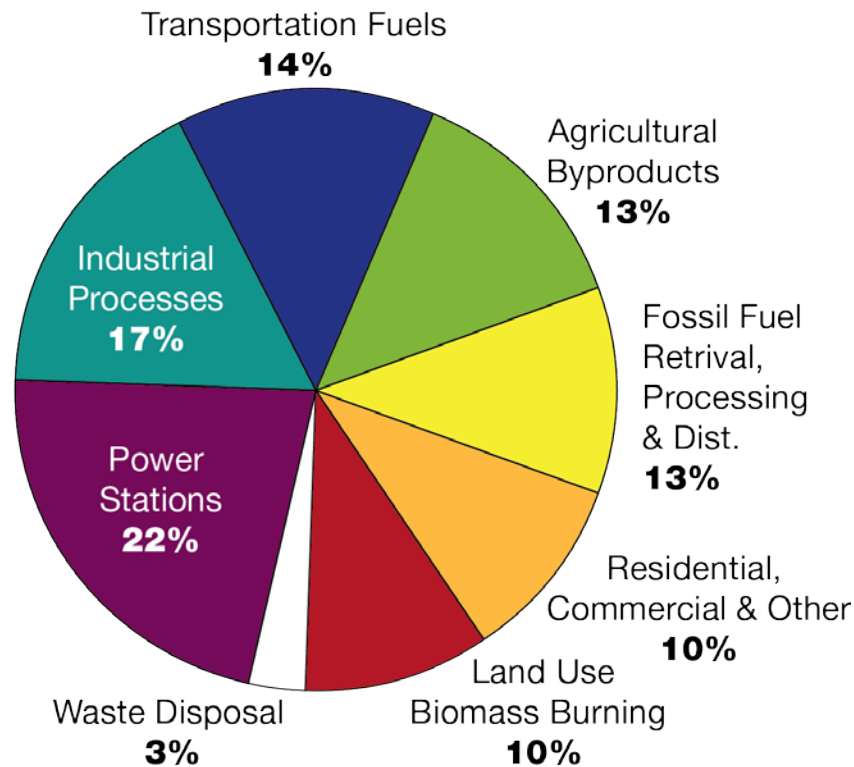
Greenhouse Gas Emissions By Source

California Greenhouse Gas Emissions By Source



Source: California Climate Action Team

World Greenhouse Gas Emissions By Source



Source: U.S. Energy Information Administration

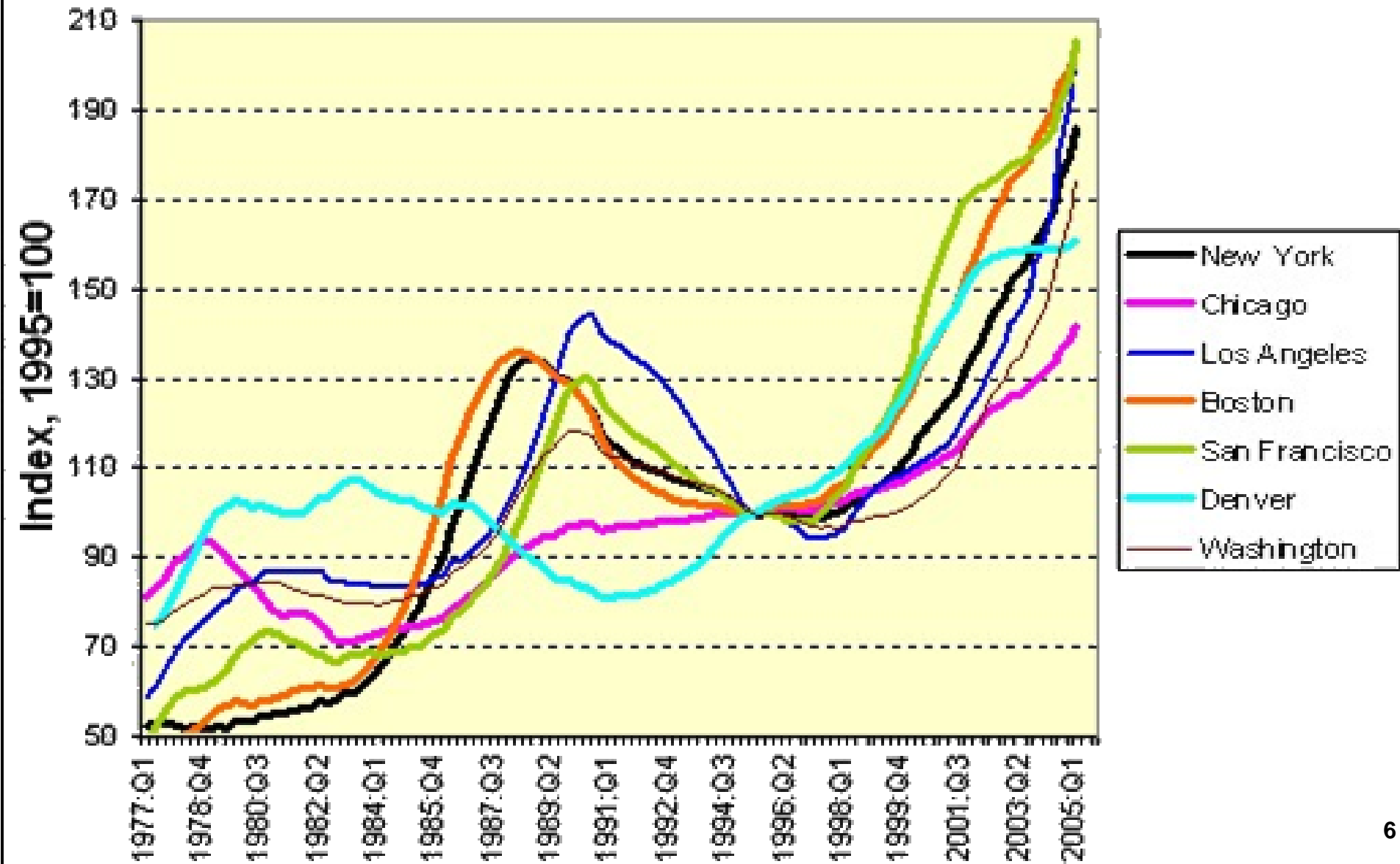
California's Three Pronged Approach to Reducing Transportation Greenhouse Gases

(with AB 32 Scoping Plan estimates for GHG reductions in 2020)

- **Cleaner vehicles (Pavley, AB 32) — 38 tons**
- **Cleaner fuels (Low-Carbon Fuel Standard) — 15 tons**
- **More sustainable communities (SB 375) — 5 tons**



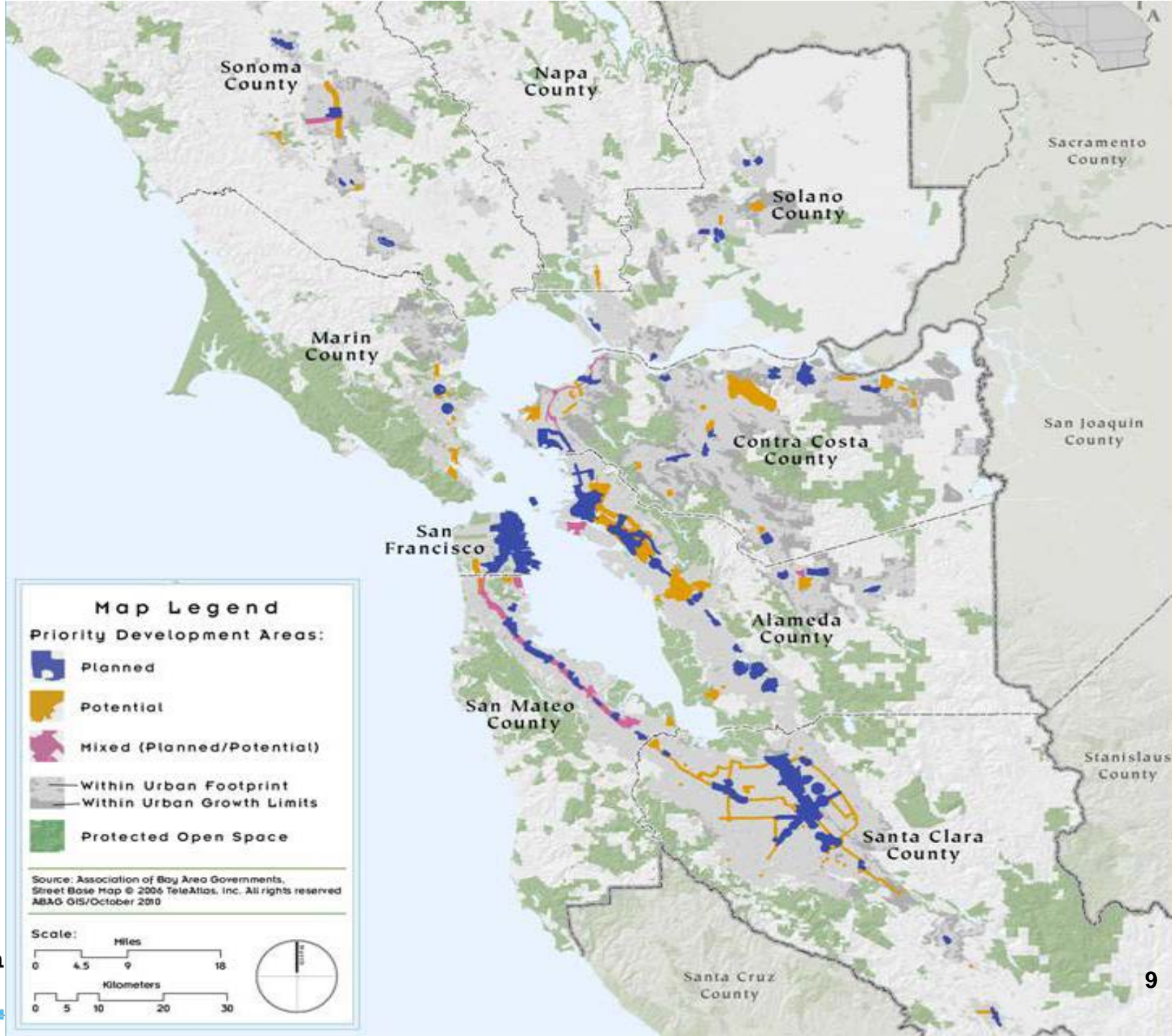
Inflation-adjusted House Prices by Metro Area, 1977-2005





**HOME
FOR
SALE**



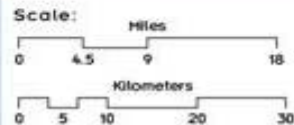


Map Legend

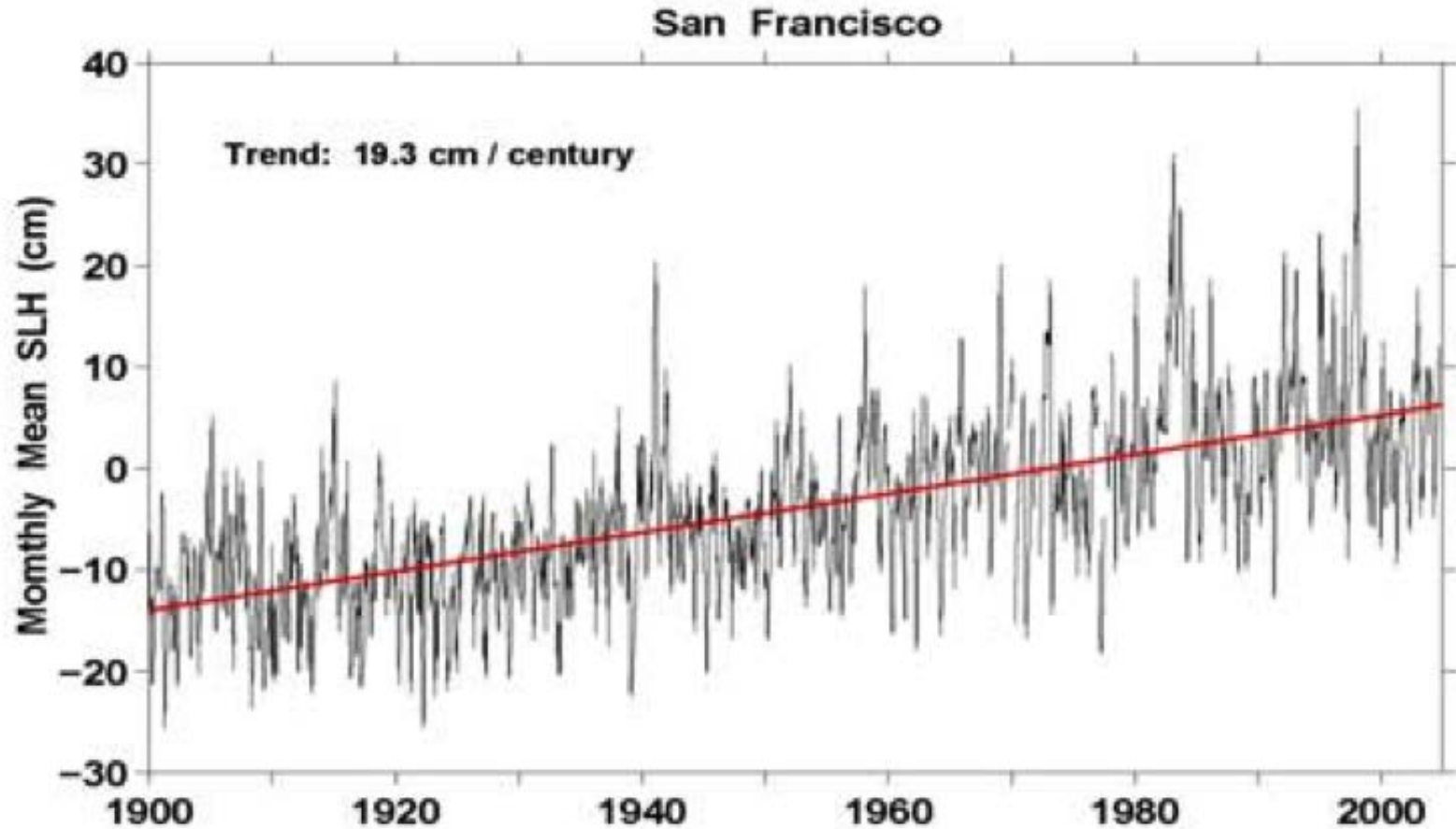
Priority Development Areas:

-  Planned
-  Potential
-  Mixed (Planned/Potential)
-  Within Urban Footprint
-  Within Urban Growth Limits
-  Protected Open Space

Source: Association of Bay Area Governments,
Street Base Map © 2004 TeleAtlas, Inc. All rights reserved
ABAG GIS/October 2010



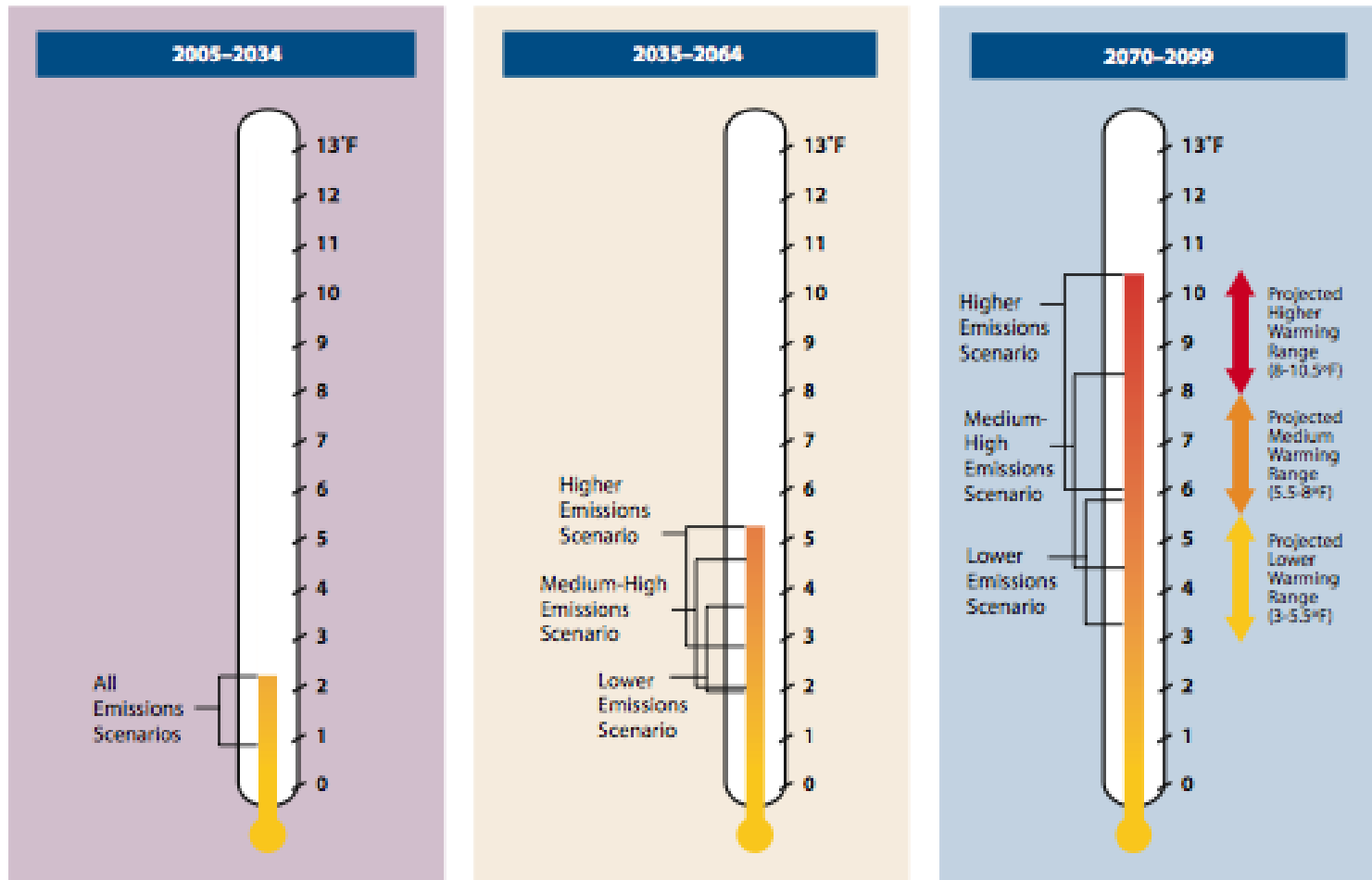
San Francisco Observed Sea Level with trend of 19.3 cm (0.63 feet) per century



Source: California Climate Action Team Report 2006

Climate Change Scenarios for California

Three Emissions Scenarios: Lower, Medium-High, Higher



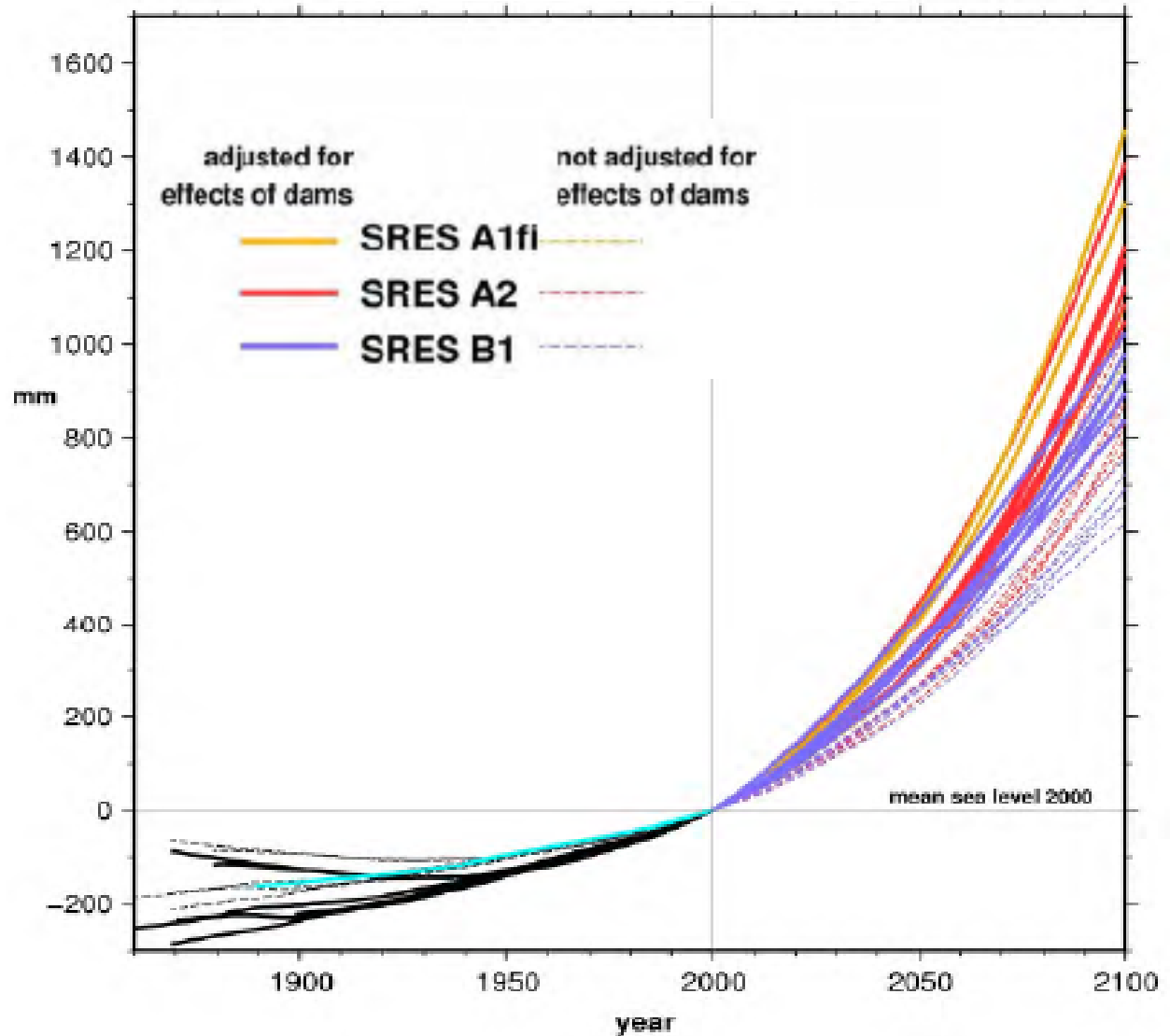
Projected Sea Level Rise

Three Emissions Scenarios:



A1fi – High

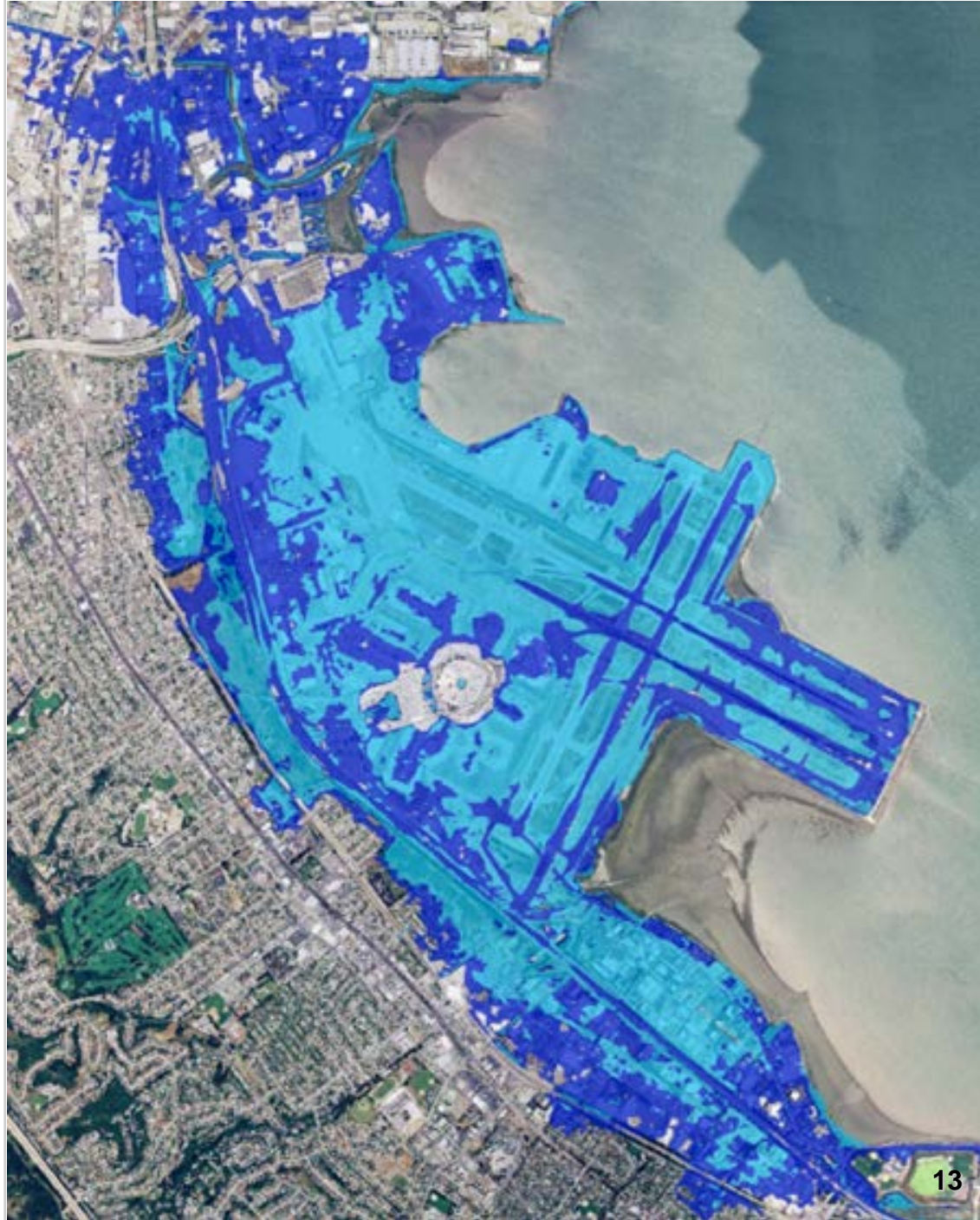
A2 – Medium High

B1 - Low





San Francisco International Airport

-  Sixteen Inch Sea Level Rise and
-  Fifty-five Inch Sea Level Rise





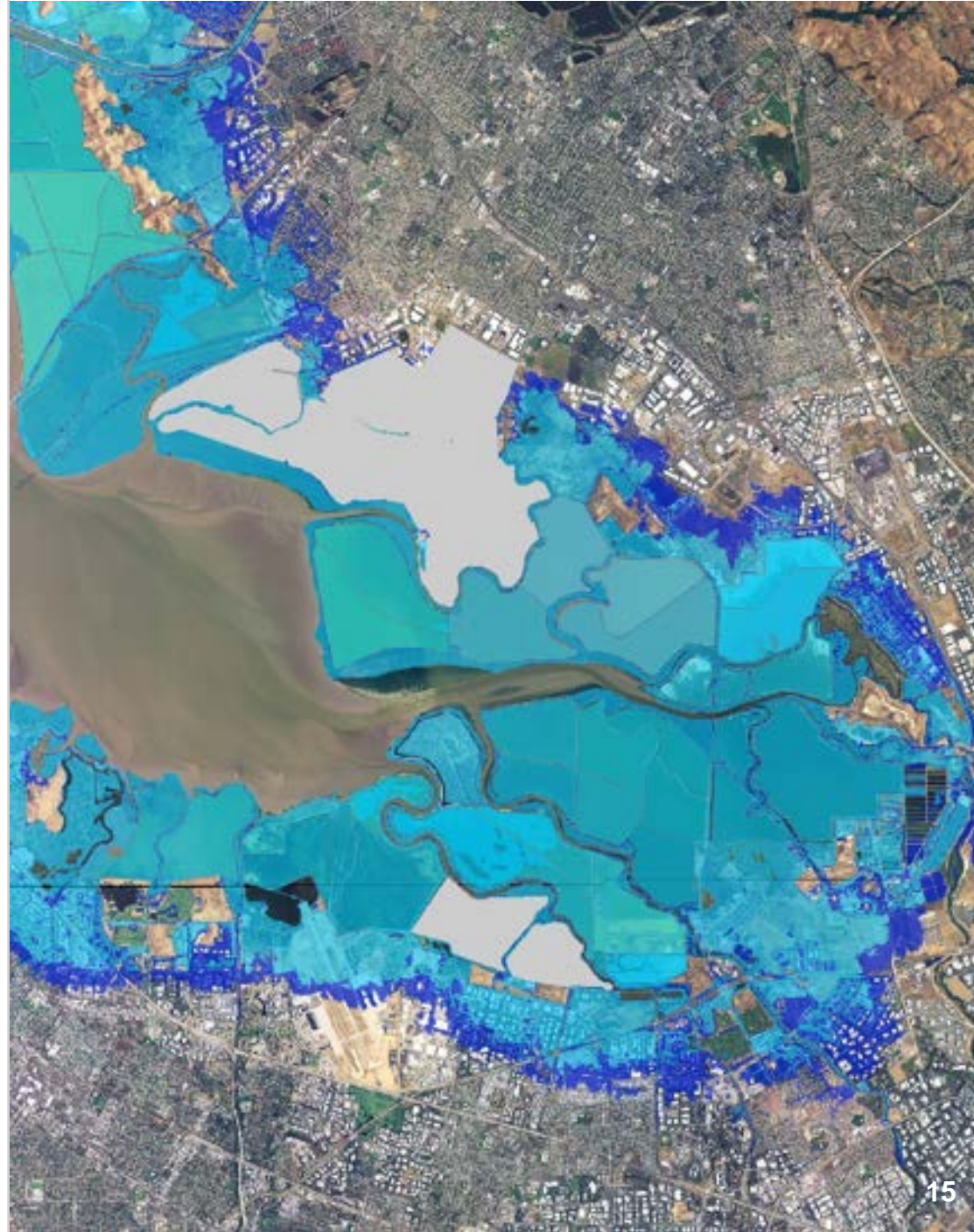
Oakland International Airport

-  Sixteen Inch Sea Level Rise and
-  Fifty-five Inch Sea Level Rise



Silicon Valley

-  Sixteen Inch Sea Level Rise and
-  Fifty-five Inch Sea Level Rise









Oh what to to, what to dooo?





HEAD FOR THE HILLS







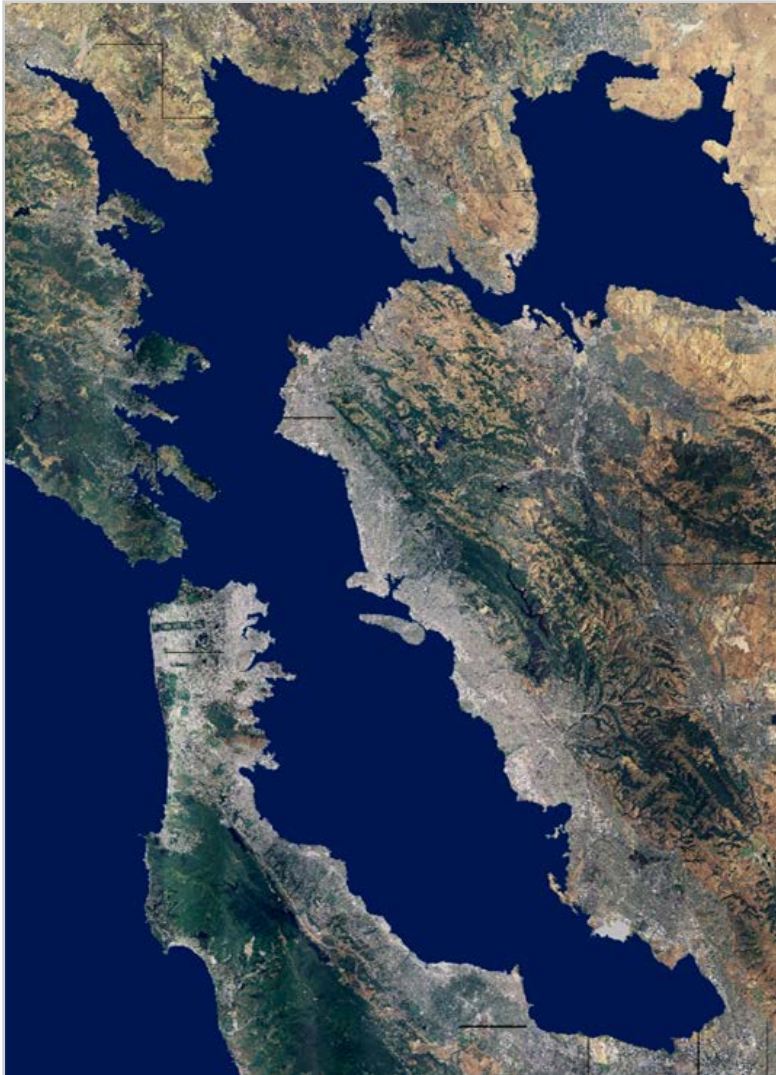




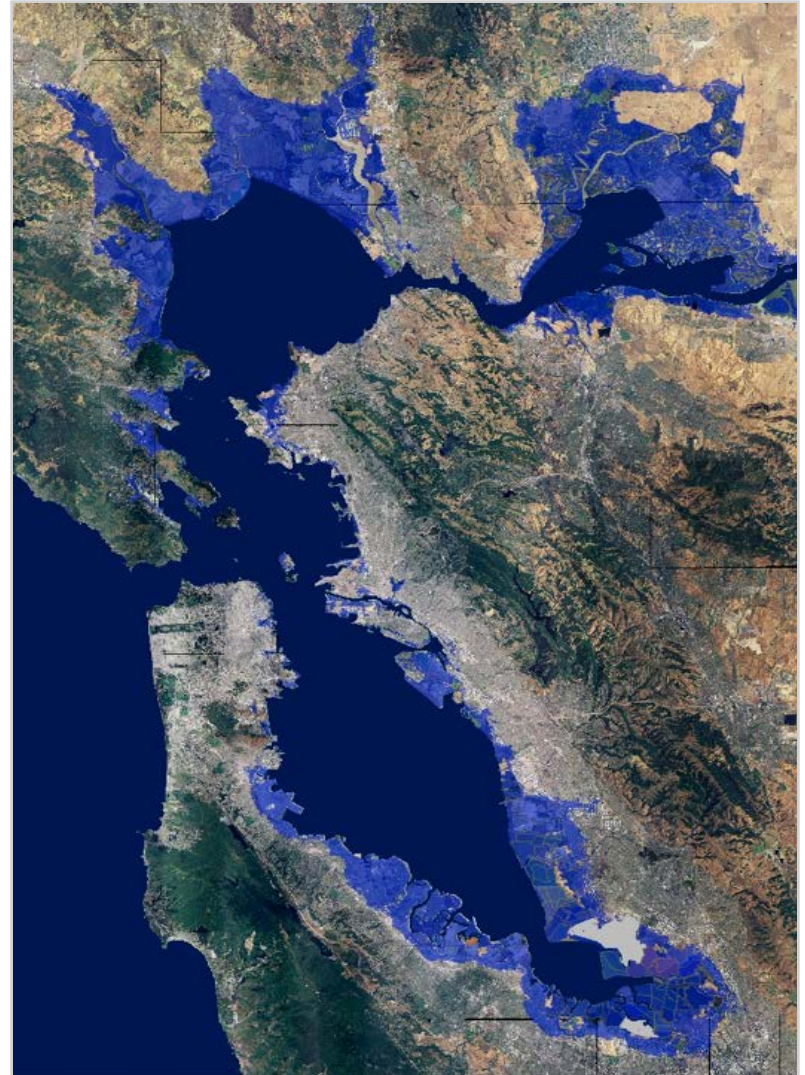
San Francisco Bay Plan

San Francisco Bay Conservation
and
Development Commission

1849



2100





Oh what to to, what to dooo?





Adapting to a Rising Bay

Bay Area Cost of Required Defenses to Guard Against Flooding from 1.4 meter sea-level rise: **\$5.3 billion**

Replacement Value of Bay Area Buildings and Contents at Risk of 100-year Flood due to 1.4 meter sea-level rise: **\$62 billion** (50% residential cost)



Source: Impacts of Sea-Level Rise On the California Coast, Pacific Institute, May 2009

RISING TIDES



call for ideas



Rising Tides Design Ideas Competition

www.risingtidescompetition.com

RISING TIDES

Throughout the world, estuaries like Chesapeake Bay, the Tampa Bay Delta, Puget Sound and San Francisco Bay are natural barriers that contribute to the resiliency of their regional environments as well as the global economy. Sea level rise from global warming stands to have dire consequences for these critical coastal areas.

Nearly every day, we learn more about the expected sea level rise from warming oceans, with current estimates predicting a rise of 1.4 meters (50 inches) over the next 100 years or even higher depending upon the rate at which glaciers and other ice sheets melt. Individually and collectively, people are seeking solutions to this phenomenon.

Although the issue of rising tides is a global issue, it will certainly have site-specific local consequences. Therefore, when starting about how to adapt to sea level rise, the obvious place to start is where we live.

The San Francisco Bay Conservation and Development Commission (BCDC) has noted that continued sea level rise from global warming will have profound impacts in residential development around the Bay. Over 82,000 acres of residential development around the Bay is vulnerable to a 35-inch rise in sea level. The Pacific Institute reports that 270,000 people would be vulnerable to flooding and that the cost of damages to shoreline development would be \$62 billion.

SHORELINE AREAS VULNERABLE TO SEA LEVEL RISE: SAN FRANCISCO BAY AREA



The Rising Tides Competition was held as a way to generate ideas about how to adapt to rising tides. The top winning idea is the San Francisco Bay Area. The goal was to identify the best possible response to the threat of rising tides. The winning idea is the San Francisco Bay Area. The goal was to identify the best possible response to the threat of rising tides.

THE RISING TIDES COMPETITION SOLICITED RESPONSES TO SUCH DESIGN CHALLENGES AS:

- HOW CAN WE BUILD IN AN AREA THAT IS TOO HIGH BUT MAY BE FLOODING IN THE FUTURE?
- HOW CAN WE RETROFIT AND PROTECT EXISTING URBAN INFRASTRUCTURE, SUCH AS SHIPPING PORTS, HIGHWAYS, AIRPORTS AND UTILITY PLANTS?
- SHOULD WE SEEK A DIFFERENT URBAN CONFIGURATION THAT ALLOWS TEMPORARY INFILTRATION FROM EXTREME FLOOD EVENTS?
- IS IT POSSIBLE TO PROTECT VULNERABLE AREAS AS WATER LEVELS RISE?

Some technologies for dealing with sea level rise are still under development and will often have not yet been commercialized. The best ideas are projects of innovation and creativity. The following table highlights solutions, such as seawalls and levees, as well as offering an entirely new approach.

Through the Rising Tides Competition, BCDC and its stakeholders have invited a new vision for addressing the challenges of rising tides. The winning ideas will be used to guide the planning and design of the region's response to rising tides. The winning ideas will be used to guide the planning and design of the region's response to rising tides.

RISING TIDES



A series of smaller informational panels and maps, including a detailed map of the San Francisco Bay Area and various charts and diagrams illustrating the impact of rising tides and potential solutions.



Adapting to Rising Tides

The ART Project



Photo: Ingrid Taylor



San Francisco Bay Conservation and Development Commission

The ART Subregion



The ART Project



Goal

The goal of the ART project is to increase the preparedness and resilience of Bay Area communities to sea level rise and other climate change impacts while protecting ecosystem and community services.

ART Comprehensive Approach



“There is high confidence that neither adaptation nor mitigation alone can avoid all climate change impacts; however, they can complement each other and together can significantly reduce the risks of climate change.”

– 2007 IPCC Fourth Assessment Report

Photo: Ingrid Taylor

ART Teaming up with Mitigation

Teaming up with mitigation efforts

California is moving ahead with mitigation at regional, state, and local levels. To leverage resources and increase the value and effectiveness of results, the ART project will coordinate with regional-scale mitigation programs.

FOCUS

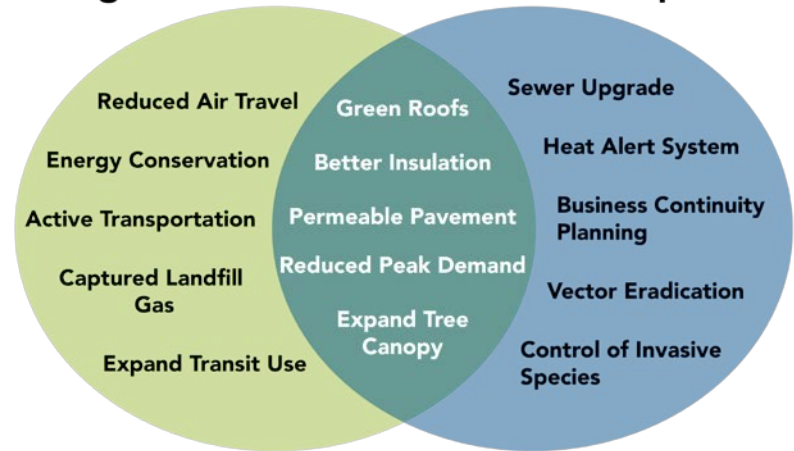
A development and conservation strategy for the San Francisco Bay Area

OneBayArea

Collaborative efforts for developing the region's Sustainable Communities Strategy

Mitigation

Adaptation



Source: Penney, J., 2008, "Emerging Climate Change Adaptation Strategies," Clean Air Partnership.

Mitigation and Adaptation

A climate strategy involves both mitigation and adaptation. **Mitigation** refers to policies to reduce greenhouse gas emissions or enhance greenhouse gas sinks. **Adaptation** refers to actions undertaken to reduce the vulnerability of the built and natural environment to the actual or expected effects of climate change.

Source: Intergovernmental Panel on Climate Change, 2007



ART Partnerships

Funding and Support

- NOAA Coastal Services Center
- FHWA
- MTC
- Caltrans
- ICLEI



