

U.S. States Adapting to Climate Change: The Case of California

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Abstract

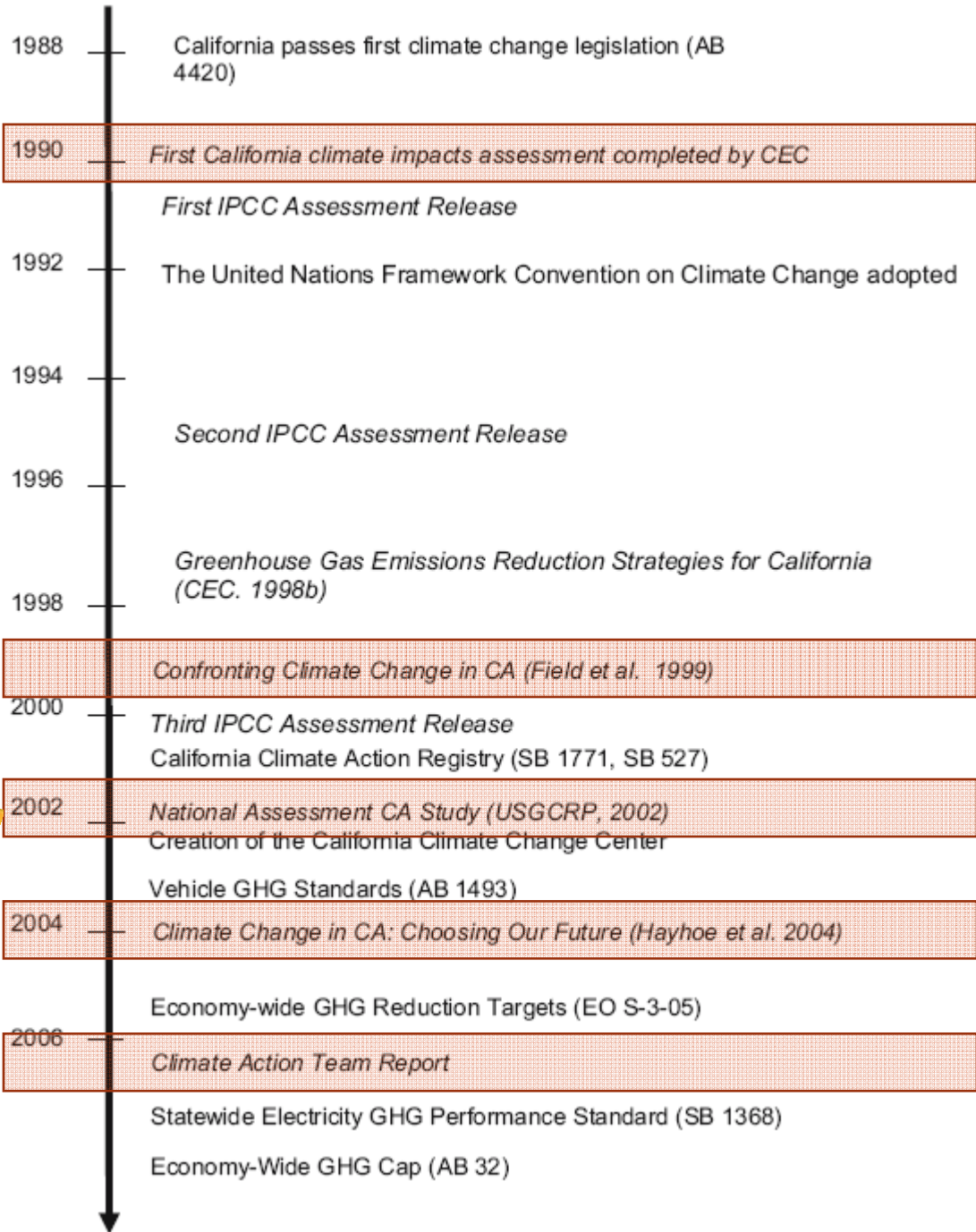
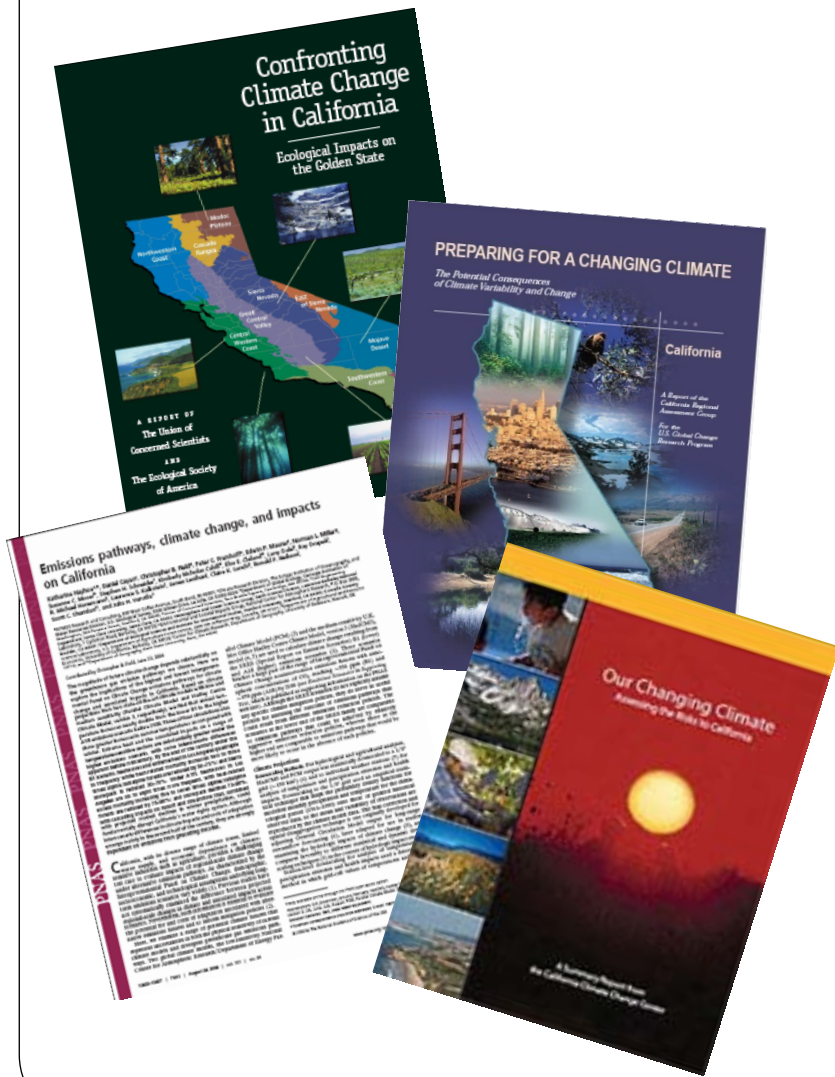
California is among the handful of US states that have begun comprehensive adaptation planning. (Other states have called for such planning in their climate action plans but are at a much earlier stage.) This brief overview will describe the state's process of developing its strategy, highlight some of the key recommendations, and derive a number of lessons being learned from this first step in an ongoing adaptation process. These lessons are echoed in the experience of other states around the country. The presentation will conclude with concrete suggestions for how federal lawmakers and agencies can support state and local adaptation efforts.

California: Adaptation Policy History



- Executive Order S-3-05 (June 2005)
 - ▣ “report on mitigation and adaptation plans to combat these impacts” [of climate change]
- 2006 Climate Scenarios Report to the Governor (First CAT Report)
- 2007: Nat. Resources Agency initiates adaptation planning
- Executive Order S-13-08 (November 14, 2008)
 - ▣ Directing state agencies to plan for sea-level rise and climate change impacts
- 2009 Climate Scenarios Report to the Governor (Second CAT Report) (April 2009)
- **First California Adaptation Strategy** (December 2, 2009)

A Long-standing Commitment



Source: Franco, G. et al. (2008)

A Strong Foundation: Climate Change Research



- California is one of a few states that provides significant funding for climate change research
- It is the only state – anywhere in the world – that has requested biannual updates on climate change science to guide its policy actions
- Knowledge of regional impacts is better than for most other states, countries.

Growing Risks from Climate Change in Sensitive Sectors

■ Public Health

- Heat, air pollution, infectious diseases

■ Coastal Areas

- Flooding, erosion, wetland loss, saltwater intrusion
- Tourism, recreation, development, shipping, infrastructure

■ Agriculture

- Heat, loss of chill hours, water scarcity, pests

■ Forestry

- Productivity, insect pests, fire

■ Water

- Agricultural/urban users, ecological needs, energy production, water quality

■ Biodiversity

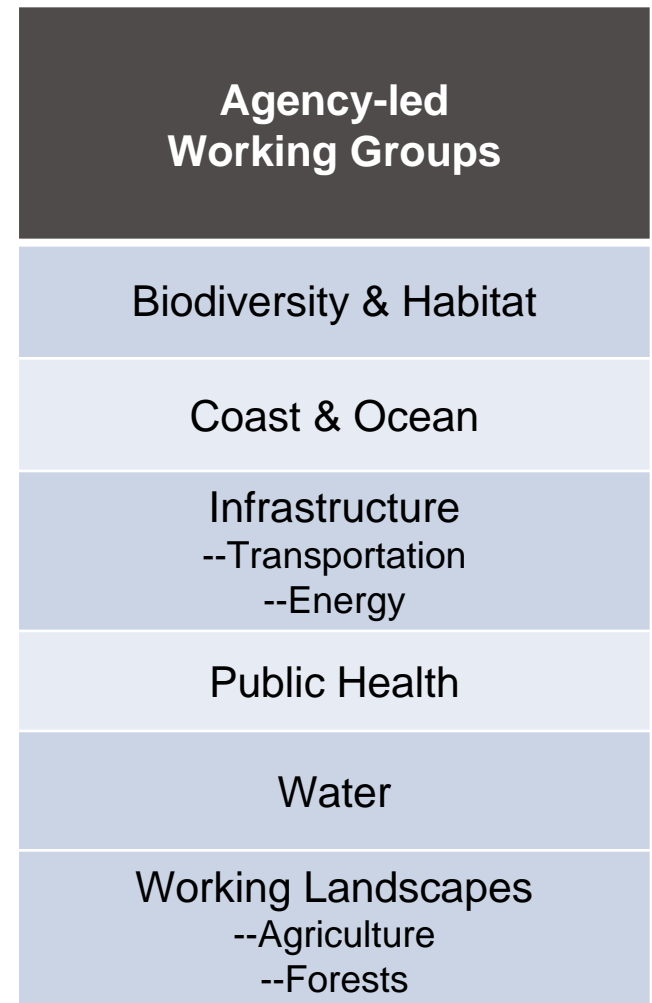
- Phenological shifts, invasives, ecosystem disassembly, habitat fragmentation, migration

■ Energy/Transportation

- Demand, hydropower potential, efficiency losses, infrastructure impacts of extreme events
- Heat, flooding, erosion, fire, mudslides, sea-level rise impacts on roads, rail, harbors, airports

Structure & Process

- Coordination & Leadership: Natural Resources Agency
- Participation: CalEPA, DPH, DWR, OPC, Parks & Rec, DFW, DFFP, DOT, CEC, ...
- Structure: Working Groups (CAWGs)
- Public Participation (limited):
 - Public workshops (several for some CAWGs)
 - Public review of draft strategies (several opportunities)
- Consultant team



California Adaptation Strategy (CAS)

California Climate Adaptation Strategy - Mozilla Firefox

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http://www.climatechange.ca.gov/adaptation/index.html

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California Climate Adaptation Strategy

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Adaptation, Meetings and Documents

- Adaptation Main Page
- Meetings, Agendas, Documents, and Presentations
- Fact Sheets and Reports

Working Groups

- Biodiversity and Habitat
- Infrastructure (roads, levees, buildings, etc.)
- Oceans and Coastal Resources
- Public Health
- Water
- Working Landscapes (forestry and agriculture)
- CAS's Work Area (Password Protected)

California Climate Adaptation Strategy

Governor Schwarzenegger Issues Executive Order Directing State Agencies to Plan for Sea Level Rise and Climate Impacts (November 14, 2008)

Given the serious threat of sea level rise to California's water supply and coastal resources and the impact it would have on our state's economy, population and natural resources, Governor Arnold Schwarzenegger issued an Executive Order (EO) S-13-08 to enhance the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events. For full text of the Executive Order: <http://gov.ca.gov/press-release/11035/>

With the passage and implementation of the Global Warming Solutions Act (AB 32), California is leading the way in the mitigation of climate change through reductions in greenhouse gas (GHG) emissions. In concert with these efforts, the [California Resources Agency](#) has undertaken the complicated task of developing California's first comprehensive **Climate Adaptation Strategy (CAS)**. A new priority in the climate change arena, adaptation promises to offer solutions to climate impacts as a result of past and current emissions. Consequently, our efforts to adapt to expected climate change impacts through careful planning and preparation must occur in parallel to ongoing mitigation efforts.

[Introduction of the CAS Vision and Principles \[Word file\]](#)

How Will Climate Change Affect California?

San Francisco Bay Scenarios for Sea Level Rise SFO

California is experiencing significant climate change impacts, including shifting precipitation patterns, increasing temperatures, sea level rise, increasing severity and duration of wildfires, earlier melting of snow pack and effects on habitats and biodiversity. These and other effects are predicted to intensify in the coming decades

December 2008

S	M	T	W	T	F	S
	01	02	03	04	05	06
07	08	09	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Adaptation Working Groups' Calendar

December 18, 2008
[CA Water Plan Update 2009 - Advisory Committee Meeting](#)

December 19, 2008
[CA Water Plan Update 2009 - Advisory Committee Meeting](#)

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More information at: <http://www.climatechange.ca.gov/adaptation/index.html>

Key Elements of the First CAS



■ Sector-specific strategies

- Short-term (implementable by 2010) – essentially best practices, research, win-win, no-regrets, low risk
- Long-term (unspecified timeline) – more ambitious; require substantially more money, more research, difficult policy changes

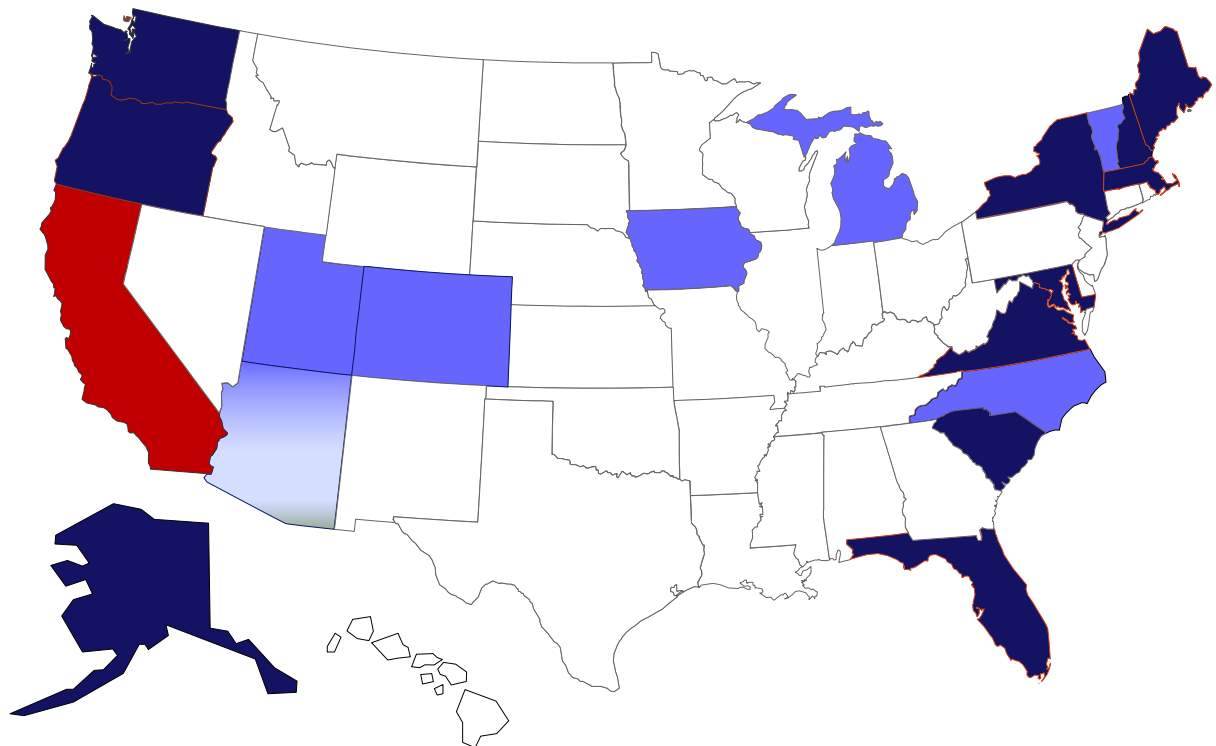
■ Cross-sector strategies

- Appointment of adaptation advisory council, improved cross-agency collaboration, research investment
- State-level and public-sector focus, with mention of local examples (but not yet integration across scales)
- Identifies need for comprehensive vulnerability assessments

Next Steps for California

- Pacific Council on International Policy
 - Next-steps recommendations on implementation on three key threats (SLR, water, fire):
 - Governance
 - Finances
 - Capacity Building
 - Has become: *Governor's Adaptation Advisory Council*
- Continued research on impacts, vulnerability, and adaptation
- Implementation of short-term strategies, if possible
- Deeper policy changes, strategy updates later

States with Ongoing Adaptation Efforts



California - Focus of this presentation (first Adaptation Strategy completed Dec 2, 2009)

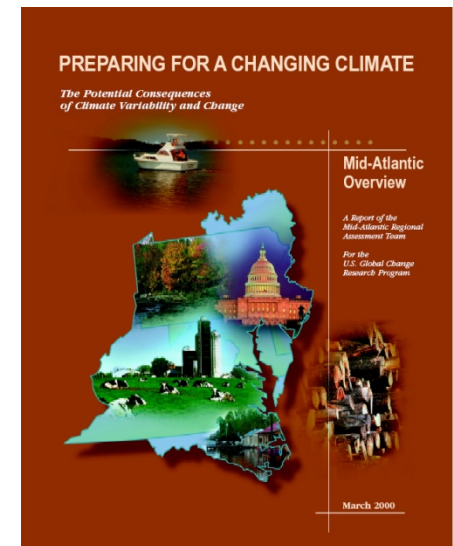
State Adaptation Plans complete or in-progress

Adaptation Plan recommended in Climate Action Plans

Source: Adapted from <http://www.law.georgetown.edu/gcc/stateadaptationplans2.htm>

Motivations to Begin Adaptation Planning

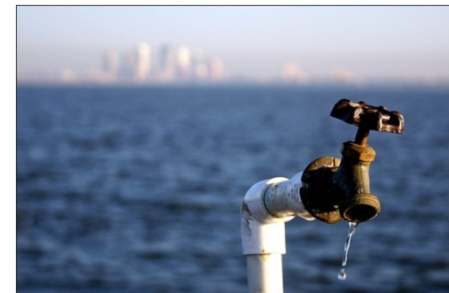
- **Many factors, varying by context**
 - IPCC 2007 findings
 - Recent local experiences of extreme events and/or climate change impacts
 - Al Gore's *An Inconvenient Truth*, and other advocacy efforts
 - Preceding regional and local activities
 - Climate Action Plans
 - Already engagement on mitigation efforts
 - Climate impacts assessments
 - Immediate preconditions
 - Champions
 - Dedication of initiating funds



Lessons from Experience to Date

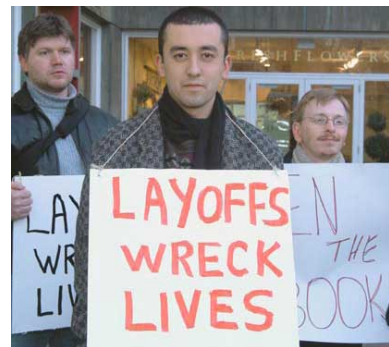
- **Scope of initial plans is quite limited**

- Regional variation: Most likely climate-driven threats
- Sometimes also focus on infrastructure, health
- Frequently, impacts on ecosystems and natural resources
- First-order climatic changes and impacts on natural/physical systems; no higher-order, detailed social or economic impacts
- Missing: marine impacts/fisheries, small-business sector
- Lacking: social or social-ecological vulnerability assessment
- Risk assessments – mostly qualitative



Lessons from Experience to Date (cont.)

- **Key issues constraining early efforts**
 - Funding for research
 - Stakeholder involvement
 - Available expertise (in government, academia, consultants)
 - Limits of downscaled projections
 - Limits of impact studies
 - Virtually complete lack of social or economic science



Lessons about Barriers to Adaptation

Impact of federal impediments (until recently)

- Lack of leadership
- Lack of funding
- Political opposition
- Lack of expertise in federal agencies
- Lack of federal intra- and inter-agency coordination
- Competing priorities
- Lack of federal adaptation mandates
- Legal obstacles

THIS IS RAPIDLY CHANGING!!

State-specific impediments

- Lack of federal guidance
- Lack of/quality of state-level leadership
- Lacking or inadequate expertise in state agencies
- Lack of state- and regionally specific scientific information
- State budget constraints
- Perceived and real competition between mitigation & adaptation
- Reliance on historical conditions
- Lack of public awareness, engagement, grassroots pressure

What States Need from Federal Government

- **Leadership**
- **Capacity Building**
 - Technical, scientific, financial capacity
 - Social-science expertise
 - Staff capacity in federal agencies
 - Consulting expertise
- **Develop Scientific Basis in Concert with State-Level Decision-makers**
 - Decision support requires far more than climate science (NRC, 2009, *Informing Decisions*)
- **Elimination of Federal Impediments to State Adaptation Efforts**
 - Regulation
 - Policies at cross-purposes
 - Counter-productive incentives that place people and assets at risk
 - Perverse subsidies
- **Improved Cross-scale Interaction, Coordination and Communication**
 - Federal-state cooperation on management of public lands and waters
 - Federal-state cooperation on management of transboundary lands and resources
- **Financial Mechanisms to Support States in Planning and Implementation**
 - Federal leverage: Carrots and sticks for risk and vulnerability assessments, adaptation planning
 - Buy-out funds from risky areas

Thank you!

- Participation in California state adaptation planning efforts was made possible through funding from the California Energy Commission's PIER Program
- All involved in the process of developing the first Climate Adaptation Strategy
- John Tribbia and Amy Luers for contributions to California-focused research
- AAAS, AGU, AMS, ESA, and the Pew Center on Global Climate Change for organizing and enabling participation in this briefing.
- Your attendance and attention.

Disclaimer: Material and opinions expressed here are mine, not those of any agency, or employee, of the State of California.



Source: DWR

Further Information/References

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