

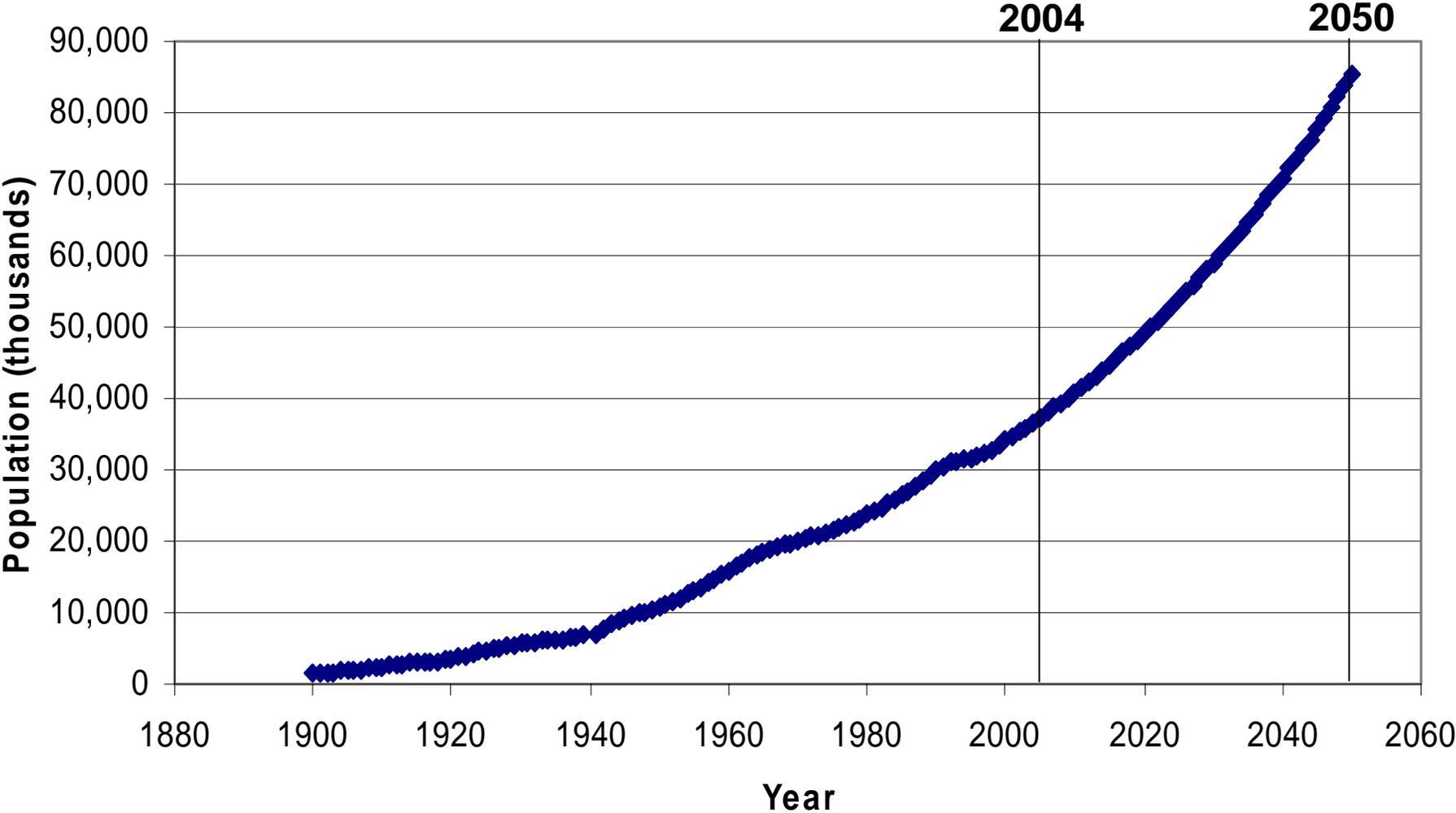
# Science Needs for Continuing EWA: Priorities and Commitments from the Science Program

Fourth EWA Technical Review Meeting  
November 8-10, 2004

Johnnie Moore



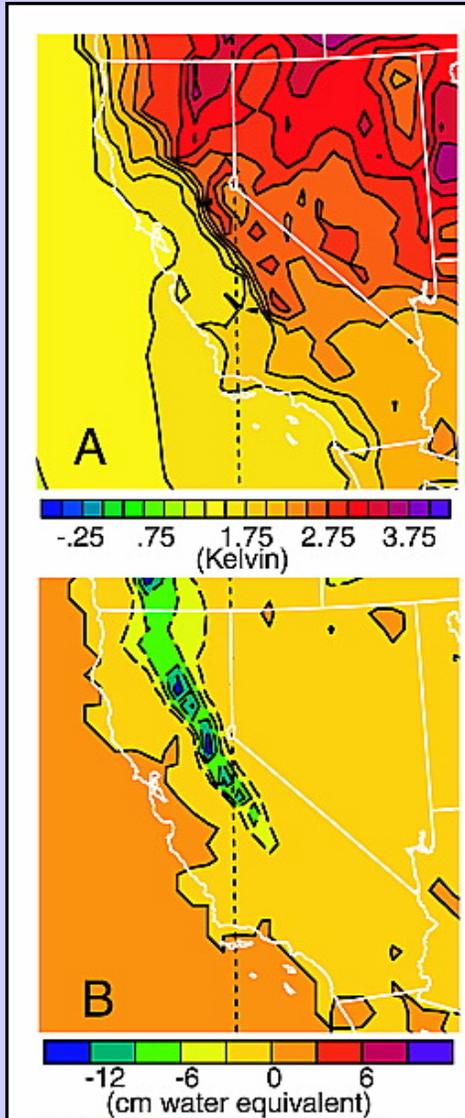
# California Human Population (past and projected)





# External Forcing on "Normal" Conditions

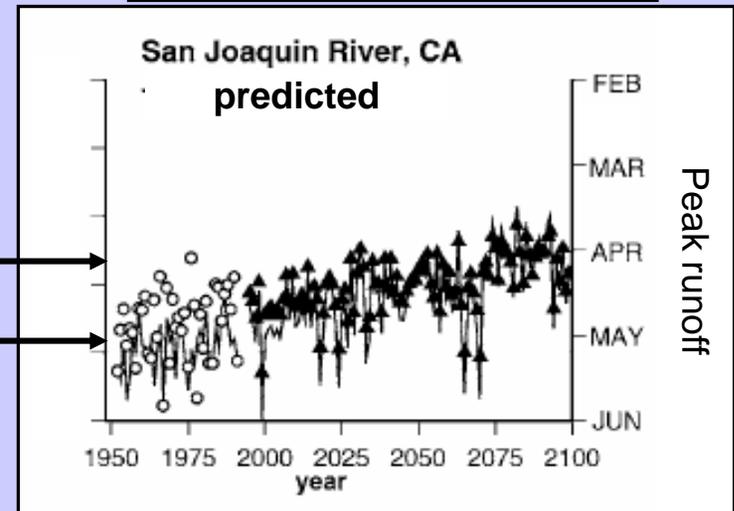
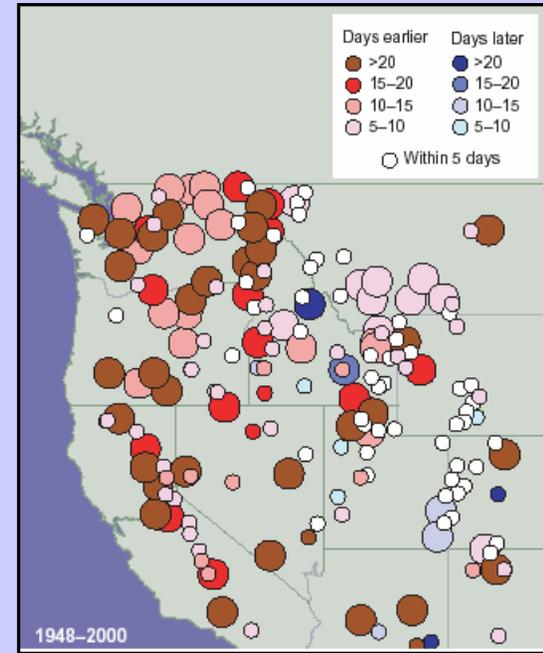
Change with a Doubling of Carbon Dioxide



Annual average temperatures increase substantially

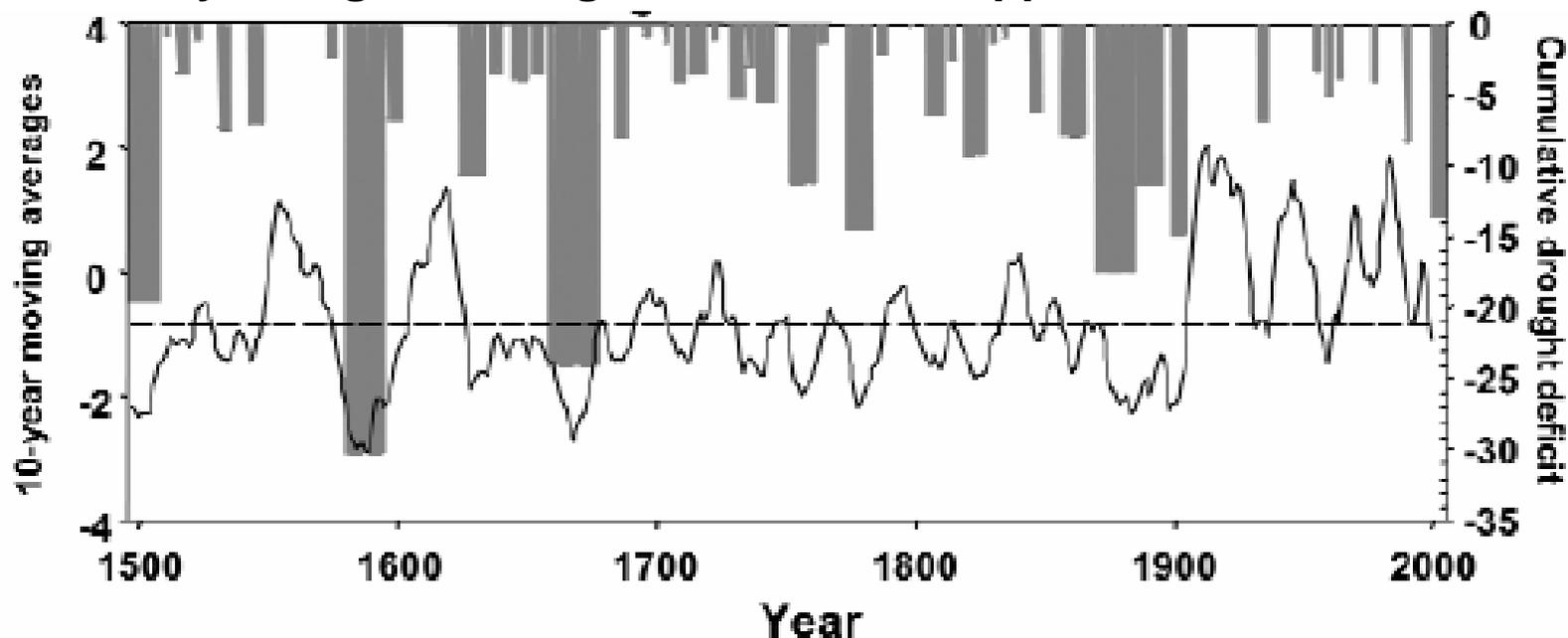
Annual average snow-water equivalent decreases substantially

Change in runoff last 50 years



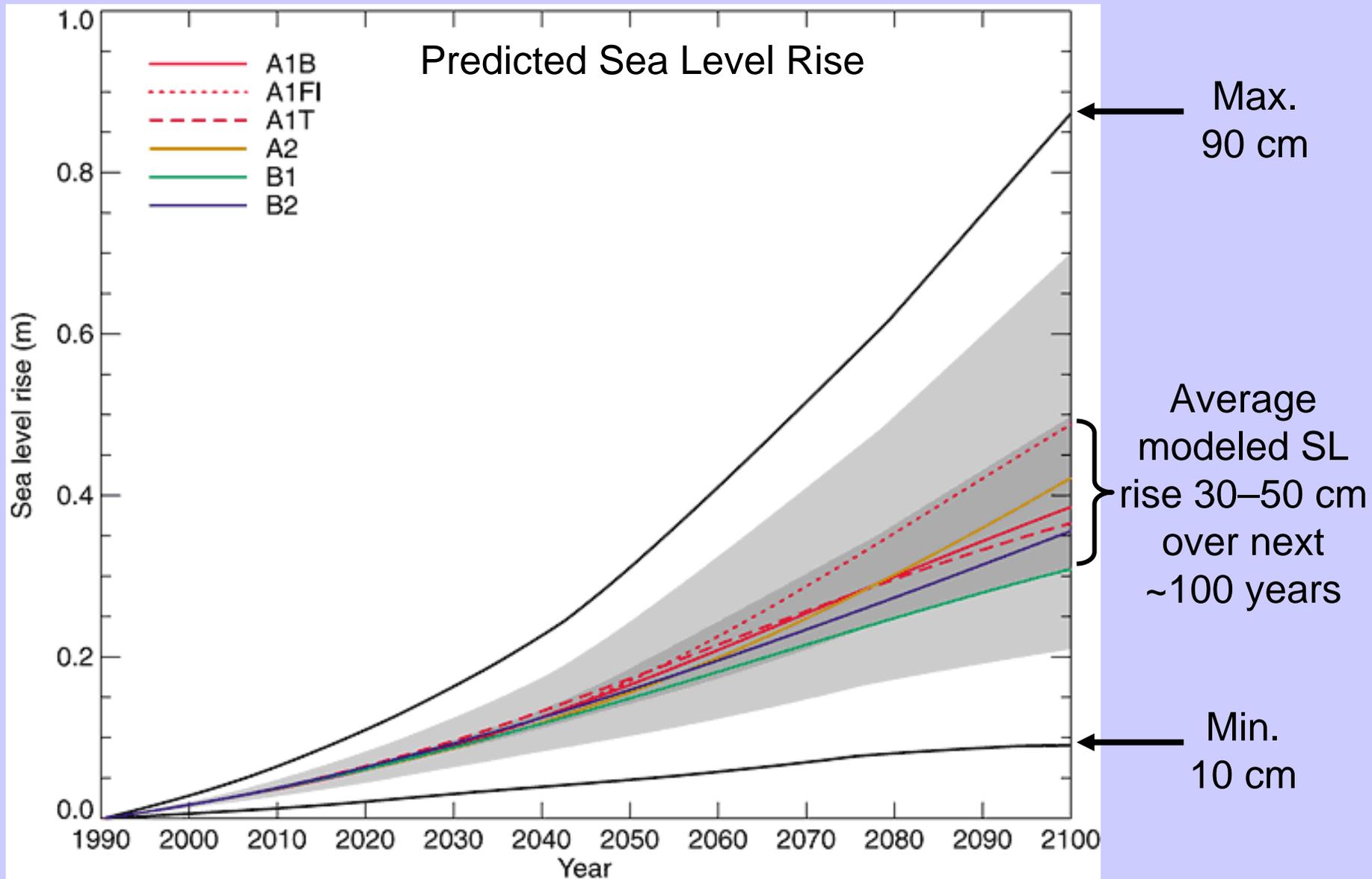
# Climate of the Recent Past

## Palmer Hydrological Drought Index for the Upper Colorado River Basin



*Fig. 2. Drought frequency, duration, and magnitude (vertical bars), and critical periods for water supply shown as 10-year moving averages of stream flow at Cisco, Green, and PHDI (solid line). The long-term mean is shown with a dashed line.*

# External Forcing on “Base Level” in the Delta



IPCC estimates – dark area is average of 35 scenarios for predicted rise in sea level.

# Understanding this requires:

## **Long-term effort:**

Decades-long monitoring of critical components.

Experiments at the system scale (like the Grand Canyon experimental flood but more complex and replication).

## **Research at a Variety of Scales:**

Local to answer project questions and short-term management needs.

Large scale to understand processes across environments/species.

## **Building a culture of science and exploration in the broader society.**

Students (e.g. NSF GLOBE project, etc.)

Citizen science (e.g. Cornell Bird Source, etc.)

# Support Science Critical for EWA (and other environmental water programs)

- Through independent peer-reviewed proposal solicitations ~ \$15-18M/year for next 10 years.
- Overall goal: “Invest in projects that develop new knowledge about how water use and management activities interact with and affect key aquatic species and environmental processes across spatial and temporal scales.”

Present PSP (due date January 6,  
2004):

## Three Major Topics

- **1. Water Operations and Biological Resources:** Studies that will improve knowledge of key aquatic species and how water management activities affect populations of those species across broad spatial and temporal scales ranging from upstream rivers down through the Estuary.

- **2. Ecological Processes and their Relationships to Water Management and Key Species:** Studies that will further develop understandings of ecosystem processes in the Delta, Suisun Marsh, and upstream rivers and their relationships to factors critical for water and aquatic species management.
- **3. Performance Assessment to Improve Tools and Implications of Future Changes:** Analytical frameworks that will support assessments and refined predictions of how likely future changes such as population or climate-related hydrological shifts may affect water operations, ecosystem processes and CALFED projects.

# Peer Review and Transparency

- Support of the EWA Technical Review Panel.
- Continue organizing open technical workshops and panel review meetings.
- Maintain the role of the Science Advisors and Science Program staff to EWA.

# Communicate External Review

- Present panel findings and the lead scientist's response to public policy forums (e.g., CBDA, BDPAC, etc.).
- Communicate panel recommendations to the broader policy and public communities through Science-in-Action, Management Cures, web site, etc.
- Incorporate panel recommendations as part of the annual EWA program plans and annual reviews.

# Meet EWA Information Needs

- Work with agency staff to identify and prioritize EWA relevant monitoring and research questions/needs (workshops/post docs).
- Work with agency staff to identify EWA monitoring and research funding as part of the 10-year EWA program finance plan (ongoing draft plan).
- Include EWA relevant questions developed by the review panel in future Science Program proposal solicitations.

# Common Science Practices

- Foster the transfer of the successful EWA review to other environmental water programs.
- Help the agencies to develop their own workshops and review panels for other programs.
- Make the statement and testing of explicit multiple-working hypotheses a common practice.
- Seek peer-review of proposals.
- Continue to develop and test conceptual models.
- Publish results.