Status of Technical Improvements and Quantifying Scenarios

Water Plan Update 2009
Plenary Meeting
September 19th, 2008

Overview

- Summarize Integrated Data and Analysis Chapter
- Provide status on quantifying scenarios for Update 2009

Integrated Data and Analysis

Chapter 6

Purpose and Motivation

- Analytical capabilities and data lag behind growing challenges facing water managers
- Need new investments in our technical infrastructure
  - Support decision making in light of uncertainties
  - Support integrated regional water management

Recent Studies and Forums

- Update 2005
- CWEMF Strategic Analysis Framework
- San Francisco Estuary & Watershed Science Paper
  - "Internalizing Climate Change - Scientific Resource Management and the Climate Change Challenges"
- DWR Climate White Paper
- SWAN

Specific Information and Modeling Needs

- Information gaps and limitations
- 3 examples of technically challenging problems for IRWMPs
  - Integrated flood management
  - Ecosystem restoration
  - Adapting to climate change

Implementing Shared Vision Planning to achieve long-term technical Improvements

- Water management information
- Integration of water management information
- Common model schematics
- Common conceptual models
- Modeling protocols and standards

Implementing analytical improvements for Water Plan Update 2009

- Scenario analysis with WEAP

Related Update 2009 Content

- Managing risk and uncertainty (Chapter 5)
- Climate change white paper
- Climate science paper
- August 2008 version of WEAP Proposal

Status on Quantifying Scenarios for Update 2009

Deliverables for Update 2009
Using WEAP

- DWR is using WEAP platform for Update 2009 to quantify future scenarios and water management responses
  - Successful WEAP application for IEUA
  - Contracting mechanism and expertise in place
  - Graphical nature supports collaboration
  - Shorter learning curve than alternatives

Technical Outreach and Refinement of Proposal

- December 2007 – WEAP proposal
- April 2008 – Shared Vision Planning
- June 2008 – WEAP proposal
  - Climate change
  - Environmental water
  - Flood management
  - Water quality

Hydrologic Region Analysis

- Monthly, climate-driven demands to 2050
  - reflect global climate change projections
- Inventory current supplies by source
- Coarse representation of response packages

All 10 Hydrologic Regions

Sacramento and San Joaquin River Regions - Planning Area

- Hydrologically-based water system simulation by month to 2050
  - reflect global climate change projections
- Estimate environmental flows, system operations, deliveries, and reliability
- More direct representation of response packages

Sacramento River & San Joaquin River Hydrologic Regions

Summary of CWP 2009 Update Scenario Framework

Sacramento and San Joaquin River Region Analysis

Scenario Factors	Management Strategies
Economic and Financial Institutional and Political Natural System (climate factors) Technological Social Practices	Water use efficiency New surface storage Recycled wastewater use Desalination Conjunctive management Conveyance
Models	**Outcomes**
Water Evaluation And Planning model Planning Area for Sacramento and San Joaquin River regions (monthly time step from 2005-2050)	Demand Available supply Shortage frequency and magnitude Reliability Delta salinity Hydro power and flood performance Economic measures

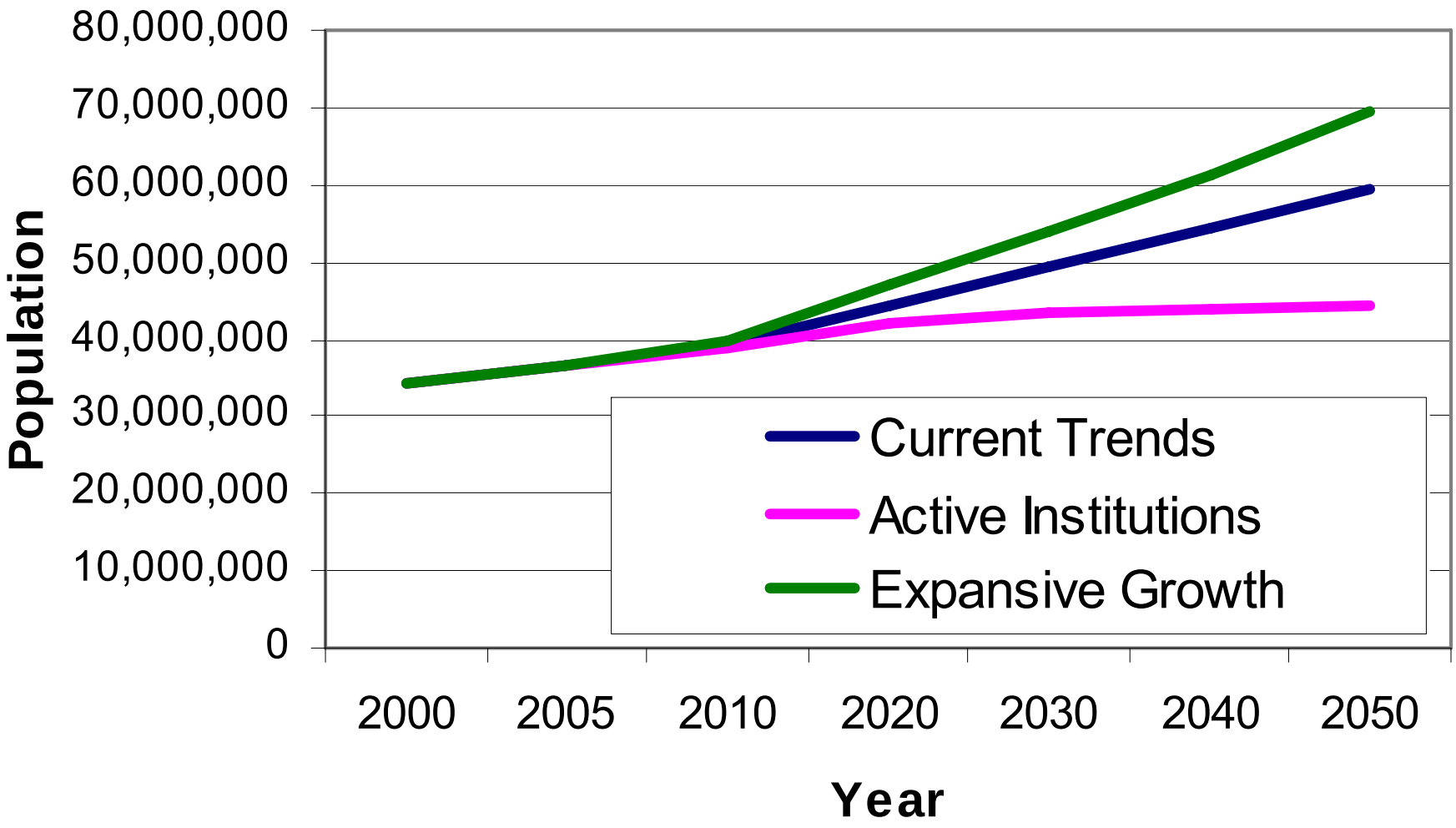
Draft Summary of Scenario Factors

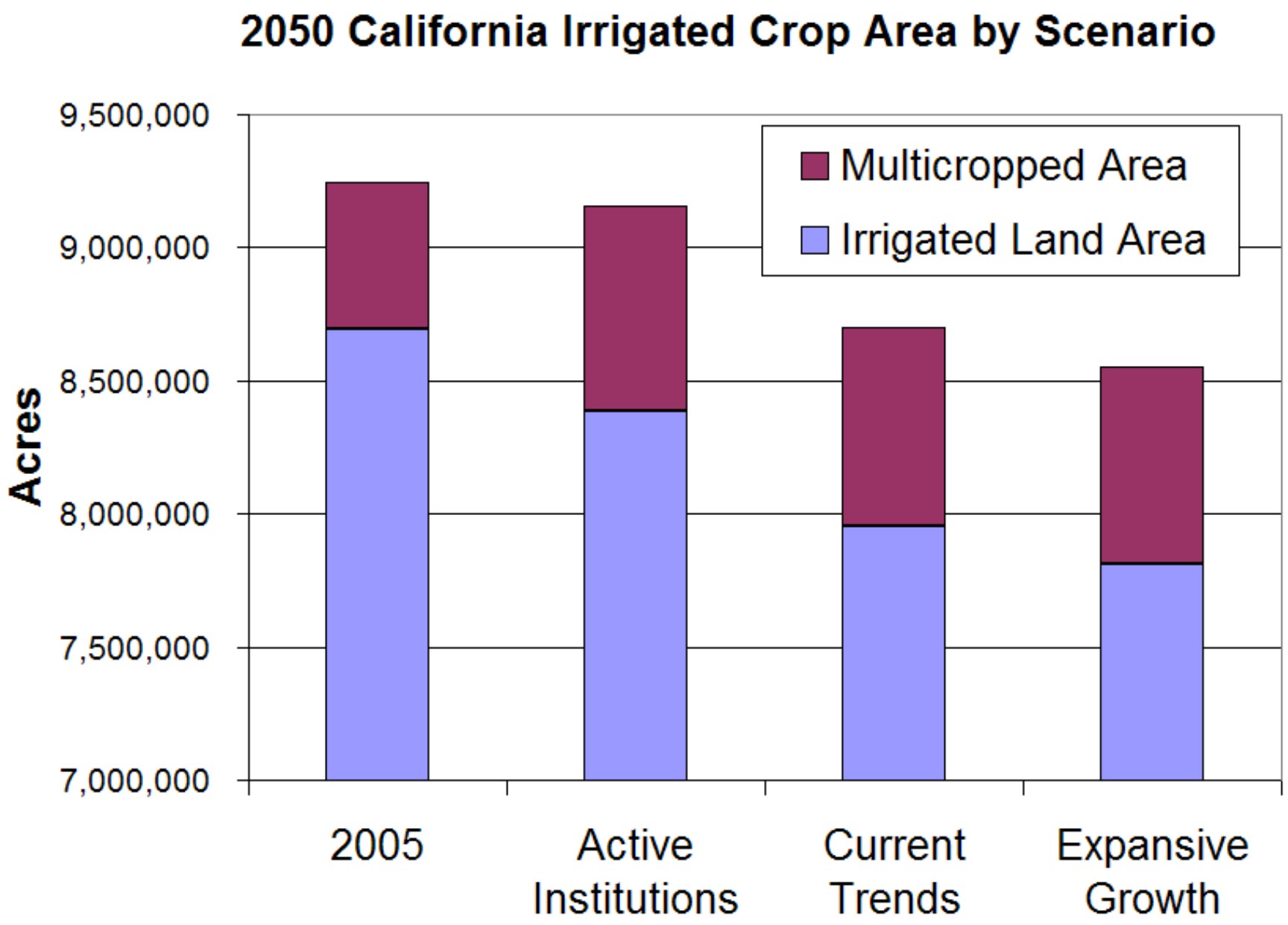
DRAFT Scenario Storylines

- Scenario 1 – Current Trends
- Scenario 2 – Active Institutions
- Scenario 3 – Expansive Growth

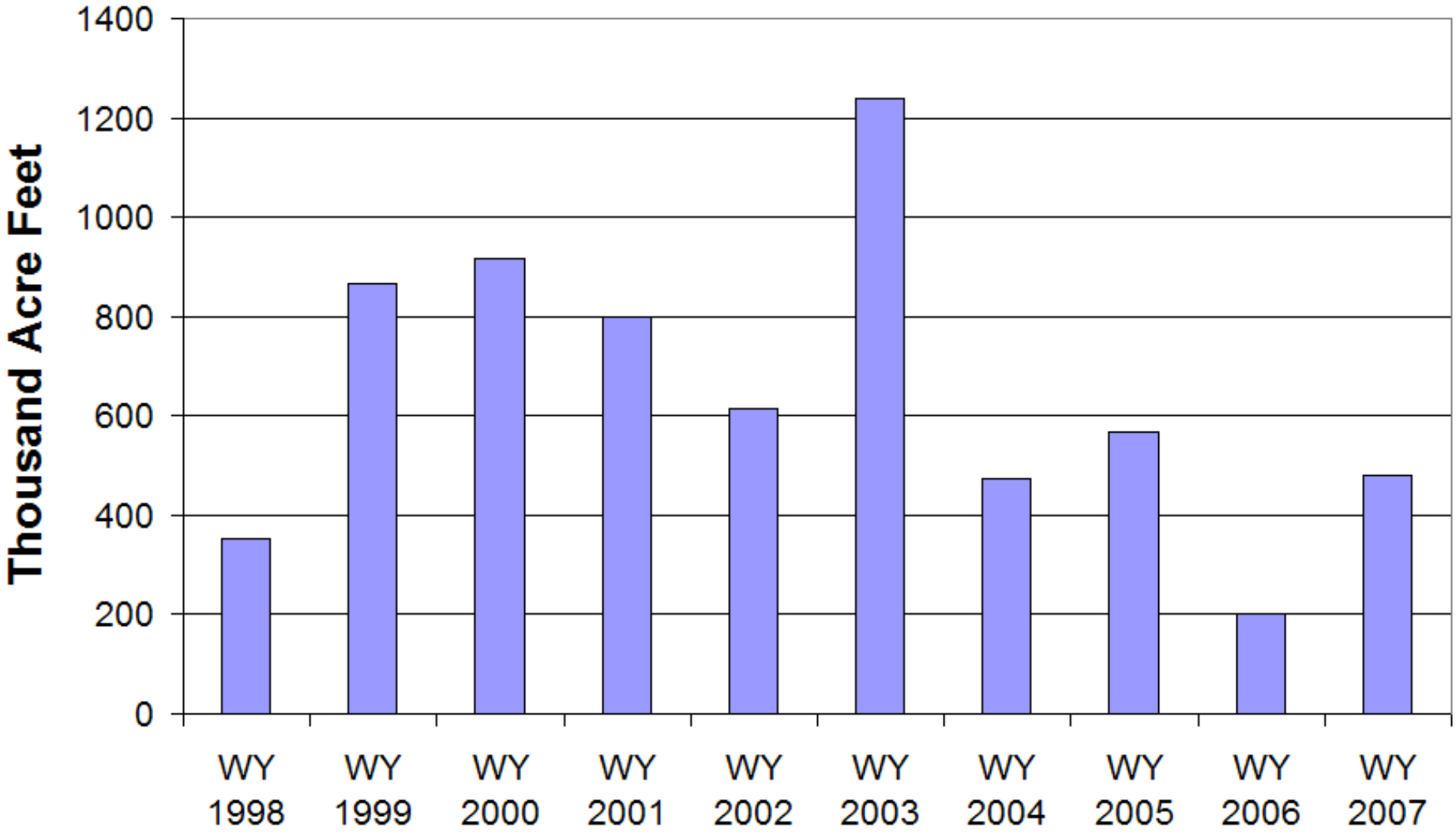
NOTE: All scenarios evaluated against climate variation (climate change, multiple year droughts, wet years)

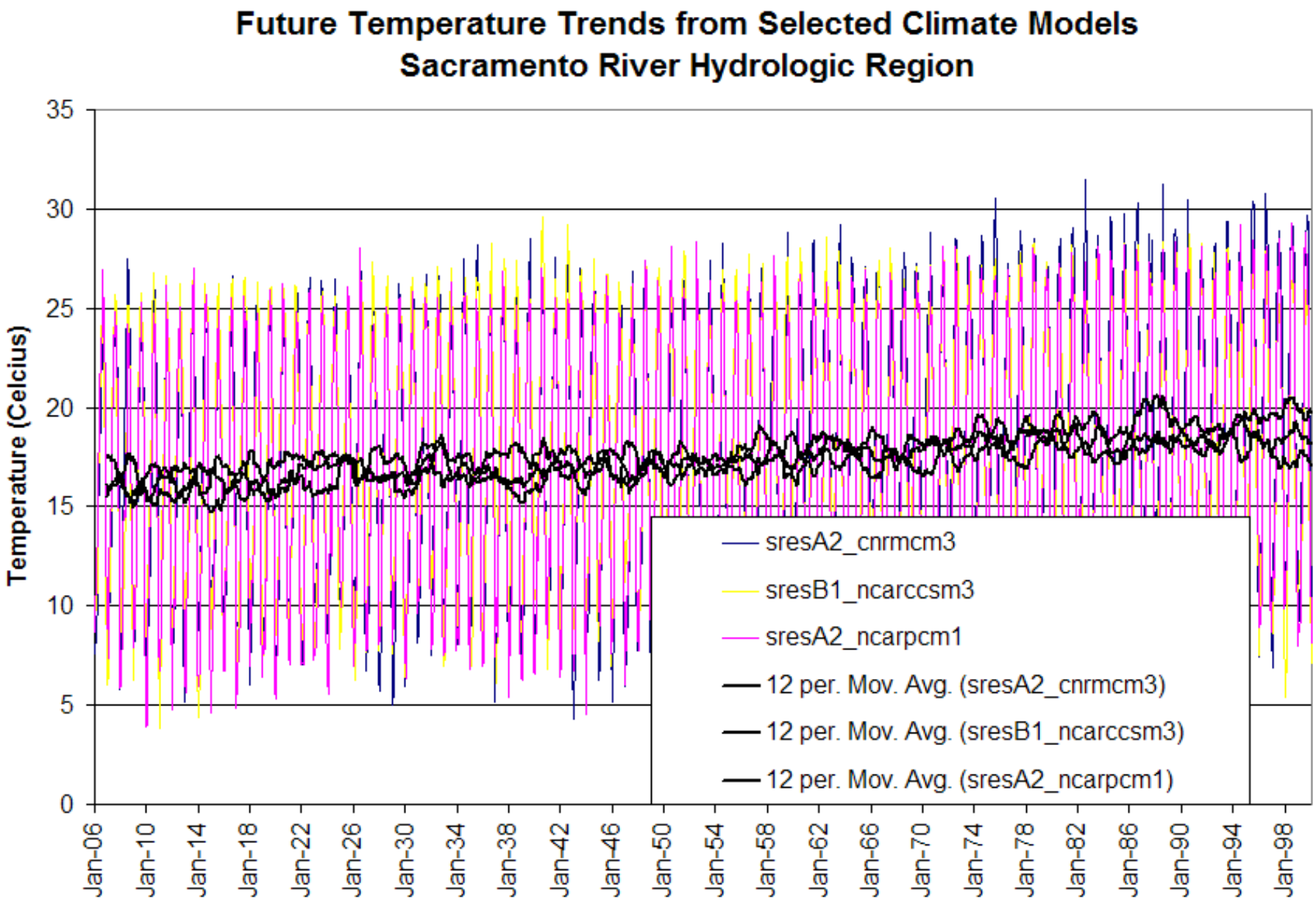
California Population by Scenario




2050 California Irrigated Crop Area by Scenario
Acres
9,500,000
9,000,000
8,500,000
8,000,000
7,500,000
7,000,000
Multicropped Area
Irrigated Land Area
2005
Active Institutions
Current Trends
Expansive Growth

Summary of Unmet Environmental Objectives




Future Temperature Trends from Selected Climate Models
Sacramento River Hydrologic Region
Temperature (Celcius)
35
30
25
20
15
10
5
0
Jan-06
Jan-10
Jan-14
Jan-18
Jan-22
Jan-26
Jan-30
Jan-34
Jan-38
Jan-42
Jan-46
Jan-50
Jan-54
Jan-58
Jan-62
Jan-66
Jan-70
Jan-74
Jan-78
Jan-82
Jan-86
Jan-90
Jan-94
Jan-98
sresA2_cnrmcm3
sresB1_ncarccsm3
sresA2_ncarpcm1
12 per. Mov. Avg. (sresA2_cnrmcm3)
12 per. Mov. Avg. (sresB1_ncarccsm3)
12 per. Mov. Avg. (sresA2_ncarpcm1)

Approximate Project Schedule

- Project scoping
  - Scenario factors (though August)
  - Response packages (though August)
  - Performance metrics (though August)
- Model development
  - Sacramento River model (through September)
  - San Joaquin River model (through September)
- Model calibration
  - October 2008
- Scenario analysis
  - December 2008 – February 2009

Reference Information

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- SWAN
  - http://www.waterplan.water.ca.gov/swan