



***Kings Basin  
Integrated Regional Water  
Management Plan (IRWMP)***

# **Upper Kings Water Forum Planners Workshop**



**February 8, 2007**


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***Agenda for Upper Kings Basin Forum  
Planners Workshop  
February 8<sup>th</sup>, 2007***

- ▶ **Introduction and Welcome**
- ▶ **State perspective on Integration of Land Use and Water Supply Planning**
- ▶ **Future 'No Project' Land Use and Water Demand/Supply Assumptions**
- ▶ **Review of City and County General Plan**
- ▶ **Panel Discussion**
- ▶ **Workshop Wrap-up**
- ▶ **Forum Meeting**

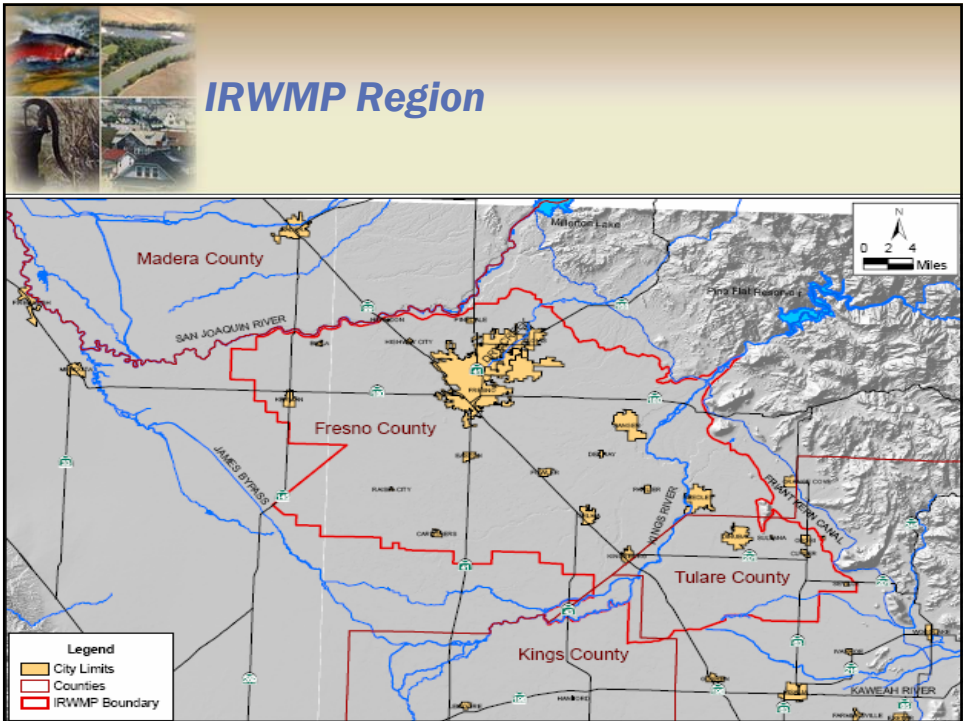
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## Workshop Purpose and Goals

- ▶ **Distribute and discuss two IRWMP work products**
- ▶ **Identify water resources related issues encountered by cities and counties when making land use decisions**
- ▶ **Share ideas and document local solutions to better integrate land use and water supply planning**
- ▶ **Engage city and county staff in discussion of how the IRWMP can be used to meet city, county, and state goals and objectives**

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## **IRWMP Solutions- Water Forum Participants**

*The Water Forum is a voluntary, collaborative, multi-stakeholder process to address agricultural, urban and natural water resource needs.*

<p>Kings River Conservation District</p> <p>Alta Irrigation District</p> <p>Consolidated Irrigation District</p> <p>Fresno Irrigation District</p> <p>Kings River Water Association</p> <p>Raisin City Water District</p> <p>Fresno Audubon Society</p> <p>California Native Plant Society</p> <p>Kings River Fisheries Management Program Public Advisory Group</p> <p>California Water Institute</p> <p>Department of Water Resources</p> <p>Center for Collaborative Policy</p> <p>California Department of Fish &amp; Game</p> <p>Regional Water Quality Control Board</p>	<p>City of Clovis</p> <p>City of Kingsburg</p> <p>City of Reedley</p> <p>City of Sanger</p> <p>City of Selma</p> <p>City of Kerman</p> <p>City of Parlier</p> <p>City of Fowler</p> <p>City of Fresno</p> <p>City of Dinuba</p> <p>County of Fresno</p> <p>County of Kings</p> <p>County of Tulare</p> <p>El Rio Reyes Trust</p>
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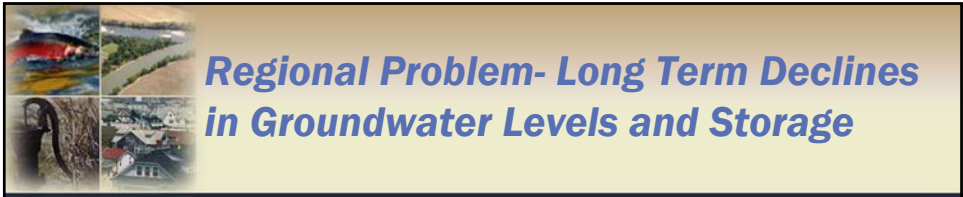
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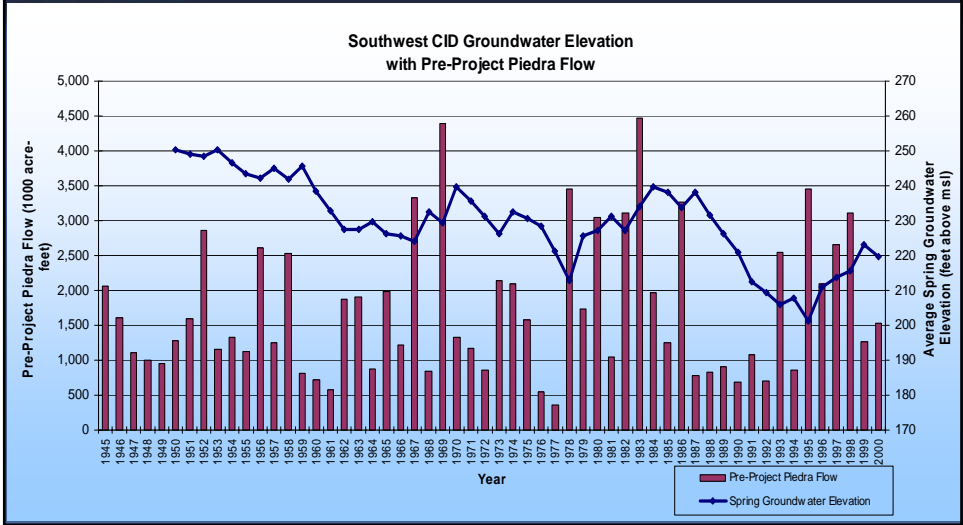
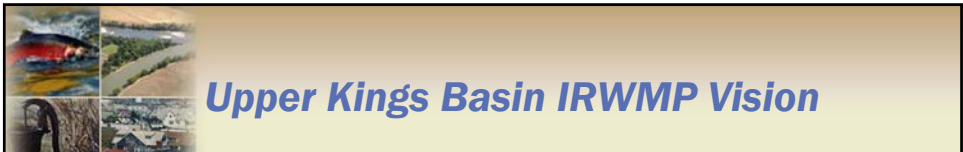
## **Regional Problems and Issues to be Addressed in the IRWMP**

- ▶ **Overdraft**
- ▶ **Water Supply Reliability**
- ▶ **Degradation of Water Quality**
- ▶ **Urban Development**
- ▶ **Protection of Water Rights**
- ▶ **Sustainability of Agricultural Economy**
- ▶ **Flooding Threats to Life and Property**
- ▶ **Protection of the Environment**
- ▶ **Environmental Justice**

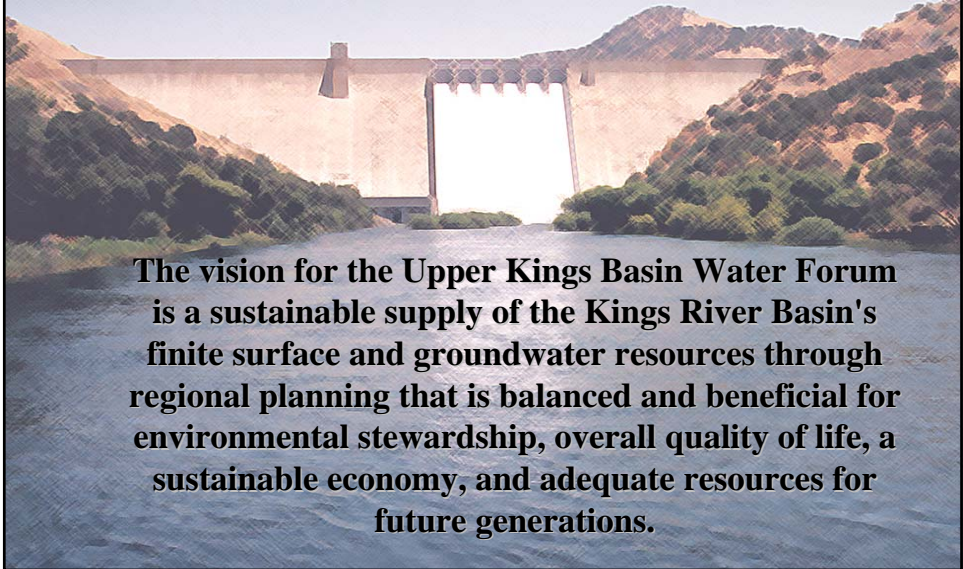
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**Regional Problem- Long Term Declines in Groundwater Levels and Storage**

**Upper Kings Basin IRWMP Vision**

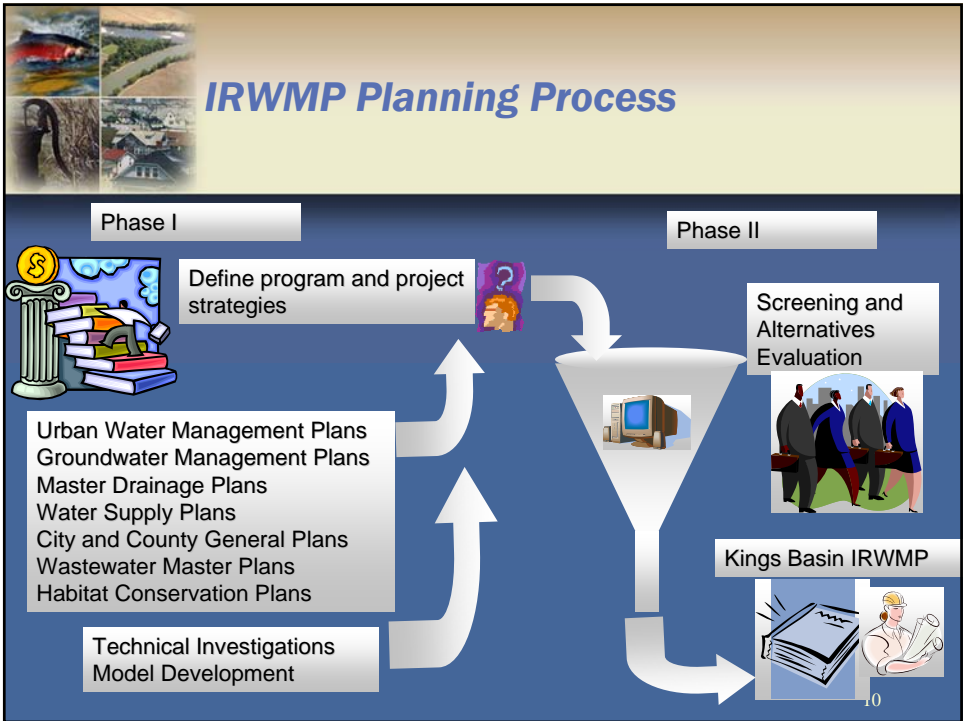




## Kings IRWMP Regional Goals

- ▶ Halt, and ultimately reverse, the current overdraft and provide for sustainable management of surface and groundwater;
- ▶ Increase the water supply reliability, enhance operational flexibility, and reduce system constraints;
- ▶ Improve and protect water quality;
- ▶ Provide additional flood protection; and
- ▶ Protect and enhance aquatic ecosystems and wildlife habitat.

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### *Where we have been....*

- ▶ **Modeling Goals, Objectives and Selection**
- ▶ **Historical Demand and Supply**
- ▶ **Model Development and Calibration**
- ▶ **Engineering and Institutional Baseline**
- ▶ **Developed of Planning Framework**
- ▶ **Worked with the community to define projects**
- ▶ **Identify preliminary projects list**

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### *Where we are going.... Next Steps*

- ▶ **Continue work to define and prioritize projects**
- ▶ **Define assumptions for future No Project Baseline**
- ▶ **Model existing conditions and future 'no project' baseline**
- ▶ **Conduct alternatives analysis**
- ▶ **Define immediate, near, mid, and long term projects and programs**
- ▶ **Develop institutional approaches**
- ▶ **Produce IRWMP**

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# Planners Workshop


## Future No Project Assumptions

### Elias Tijerina



February 8, 2007

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# Local General Plan Summary

	Agency	Last Revision/ Adopted	2005 Population <sup>1</sup>	Build out Population	General Plan Buildout	Plan Year
AID	Dinuba	[2007] DRAFT	19,800	40,464	4,863	2040
	Reedley	1993	22,599	30,205	5,053	2012
CID	Fowler	2005	4,729	7,200	4,370	2025
	Kingsburg	1992	11,237	13,800	2,264	2012
	Parlier	1998	12,709	16,650	1,280	2015
	Sanger	2005	22,105	43,000	6,573	2025
	Selma	1997	22,411	37,631	9,674	2015
FID	Clovis	2005	86,015	173,018	47,468	2030
	Fresno	2002	464,727	790,955	67,136	2025
	Kerman	1993	11,455	15,000	1,280	2013
Other	Fresno County	2000	799,407	1,114,403	3,843,200	2020
	Tulare County	2006 DRAFT	390,791		2,983,040	2025

1. January 1, 2005 Department of Finance

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## Existing Urban Land Use

Land Use	Residential (acres)	Commercial/Industrial (acres)	Landscaped (acres)	Total Urban Area (acres)	Vacant (acres)	Vacant %	
AID	Cutler	560	15	51	626	14	2%
	Dinuba	1631	110	61	1802	450	25%
	East Orosi	36	6	0	43	0	0%
	Orosi	261	46	16	323	41	13%
	Reedley	1949	180	175	2304	225	10%
CID	Caruthers	338	12	32	382	29	8%
	Fowler	702	185	0	887	527	59%
	Kingsburg	1315	227	91	1633	197	12%
	Laton	257	0	62	318	30	10%
	Parlier	751	20	73	844	149	18%
	Sanger	1867	113	97	2077	244	12%
FID	Selma	2287	132	203	2622	500	19%
	BakmanWD	1191	1	15	1206	135	11%
	Biola	99	35	5	139	0	0%
	Clovis	10016	282	367	10666	1560	15%
	Easton	462	0	9	471	22	5%
	Fresno	25423	14443	2304	42170	28958	69%
	Kerman	846	54	75	975	65	7%
	Malaga WD	108	1148	44	1300	0	0%
RCWD	Pinedale WD	1038	0	17	1054	175	17%
	Raisin City	46	16	0	61	0	0%

1. Based on DWR GIS land use files for Fresno (2000) and Tulare County (1999).  
 2. City of Fresno Land use data from Draft Phase I, Urban Water Demands (West Yost Assoc., 2006).



## Population Projection

Population		2005	2010	2015	2020	2025	2030	Buildout Year
AID	Dinuba <sup>2,3</sup>	19,297	<b>22,151</b>	<b>24,375</b>	<b>27,387</b>	<b>27,933</b>	34,199	2040
	Reedley	<b>20,756</b>	22,804	25,054	27,527	30,243	33,228	2012
	Fowler	<b>3,979</b>	4,615	5,352	6,208	<b>7,200</b>	7,910	2025
	Kingsburg	<b>9,199</b>	10,107	11,104	12,200	13,404	14,726	2012
CID	Parlier	<b>11,145</b>	12,245	13,453	14,781	16,239	17,842	2015
	Sanger <sup>2</sup>	<b>18,931</b>	23,241	28,531	35,026	<b>43,000</b>	47,243	2025
	Selma <sup>2</sup>	<b>19,444</b>	27,050	<b>37,631</b>	41,344	45,424	49,907	2015
FID	Clovis <sup>4</sup>	<b>89,972</b>	103,189	122,164	135,000	153,382	173,018	2030
	Fresno	<b>475,061</b>	521,940	573,444	630,031	692,202	760,508	2025
	Kerman	<b>8,551</b>	9,395	10,322	11,340	12,459	13,689	2013

1. Data in bold is from General Plan.  
 2. Population growth rate assumed to be 1.9% beyond GP buildout year.  
 3. Population projection by interpolation from 2005 to buildout population.  
 4. Population growth taken from UWMP.






## Existing & Baseline Conditions Comparison

Agency	2005		2030		SOI Area from GIS	
	Population	Area (Acres)	Population	Area (Acres)		
AID	Dinuba	19,297	1,802	34,199	3,082	4,236
	Reedley	20,756	2,304	33,228	4,627	4,722
CID	Fowler	3,979	887	7,910	3,755	4,474
	Kingsburg	9,199	1,633	14,726	2,614	4,019
	Parlier	11,145	844	17,842	1,460	2,946
	Sanger	18,931	2,077	47,243	6,343	6,872
	Selma	19,444	2,622	49,907	6,730	8,287
FID	Clovis	89,972	10,666	173,018	19,931	20,260
	Fresno	475,061	45,017	760,508	90,698	91,403
	Kerman	8,551	975	13,689	1,958	3,097


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## 2030 Baseline Water Demand


Agency	2030			2005 Historic Water Duty (AF/Acre)
	Urban Water Demand (AF)	Urban Area (Acres)	Calculated Water Duty (AF/Acre)	
AID	Dinuba	7,929	3,082	2.57
	Reedley	9,007	4,627	1.95
	AID Unicorp.	4,841	1,816	2.67
	<b>Subtotal</b>	<b>21,778</b>	<b>9,525</b>	<b>2.29</b>
CID	Fowler	2,561	3,755	0.68
	Kingsburg	5,101	2,614	1.95
	Parlier	4,357	1,460	2.98
	Sanger	12,877	6,343	2.03
	Selma	16,020	6,730	2.38
	CID Unicorp.	1,944	1,707	1.14
<b>Subtotal</b>	<b>42,860</b>	<b>22,609</b>	<b>1.90</b>	
FID	Clovis	48,062	19,931	2.41
	Fresno	275,189	90,698	3.03
	Kerman	3,389	1,958	1.73
	FID Unicorp.	11,860	4,532	2.62
<b>Subtotal</b>	<b>338,500</b>	<b>117,119</b>	<b>2.89</b>	
RCWD	RCWD Unicorp.	72	98	0.73
<b>Subtotal</b>	<b>72</b>	<b>98</b>	<b>0.73</b>	
<b>Total/Average</b>	<b>403,209</b>	<b>149,351</b>	<b>2.70</b>	

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## 2030 Baseline Water Supplies under No-Project Condition

	2030 Water Supplies	Forecasted Demand	Supply					Total
			SW	GW	Banking	Exchange	Recycled	
AID	Dinuba	7,929		8,285			1,120	9,405
	Reedley	9,007		9,820				9,820
	Unicorp.	4,841		6,475				6,475
	<b>Subtotal</b>	<b>21,778</b>		<b>24,580</b>			<b>1,120</b>	<b>25,700</b>
CID	Fowler	2,561		3,676				3,676
	Kingsburg	5,101		6,366				6,366
	Parlier	4,357		6,184				6,184
	Sanger	12,877		14,243				14,243
	Selma	16,020		22,890				22,890
	Unicorp.	1,944		2,019				2,019
<b>Subtotal</b>	<b>42,860</b>		<b>55,376</b>				<b>55,376</b>	
FID	Clovis	48,062	39,828	13,092	9,000	871	9,410	72,201
	Fresno	275,189	212,642	156,842			13,800	383,284
	Kerman	3,389		4,697				4,697
	Unicorp.	11,860		19,035				19,035
	<b>Subtotal</b>	<b>338,500</b>	<b>252,470</b>	<b>193,666</b>	<b>9,000</b>	<b>871</b>	<b>23,210</b>	<b>479,217</b>
RCWD	Raisin City	72		72				72
	<b>Subtotal</b>	<b>72</b>		<b>72</b>				<b>72</b>
<b>Total/Average</b>	<b>403,209</b>	<b>252,470</b>	<b>273,694</b>	<b>9,000</b>	<b>871</b>	<b>24,330</b>	<b>560,365</b>	



## Draft IRWMP 2005 Existing Conditions, 2030 Baseline Assumptions and Example Alternatives

Program Area	2005 Existing Conditions	2030 Baseline, "No Project" Conditions w/o San Joaquin Restoration	Alternative 1- Groundwater Recharge Emphasis	Alternative 2- Surface Water Treatment Emphasis
Land Use & Water Demand	2005 land use and population	2030 land use and population	Same as 2030 Baseline	Same as 2030 Baseline
Facilities				
Recharge Ponds	Existing	<ul style="list-style-type: none"> <li>▪ Waldron Ponds (FID)</li> <li>▪ Harter Ponds (CID)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Expanded Waldron Ponds (FID)</li> <li>▪ Expanded Harter Ponds (CID)</li> <li>▪ CID Ponds</li> <li>▪ Project A</li> <li>▪ Project B</li> </ul>	
Surface Water Treatment Plants (SWTP)	Existing	<ul style="list-style-type: none"> <li>▪ Fresno (30 MGD)</li> <li>▪ Clovis (30 MGD)</li> </ul>		<ul style="list-style-type: none"> <li>▪ Fresno expansion (60 MGD)</li> <li>▪ Clovis expansion (60 MGD)</li> <li>▪ AID (XMGD)</li> </ul>
Reclamation and Recycling	Existing	Existing	Existing	Existing
Aquifer Storage and Recovery Wells	None	None	<ul style="list-style-type: none"> <li>A) With City of Fresno Injection</li> <li>B) Without City of Fresno Injection</li> </ul>	None



## Draft IRWMP 2005 Existing Conditions, 2030 Baseline Assumptions and Example Alternatives

Program Area	2005 Existing Conditions	2030 Baseline, "No Project" Conditions w/o San Joaquin Restoration	Alternative 1- Groundwater Recharge Emphasis	Alternative 2- Surface Water Treatment Emphasis
<b>Operations</b>				
Pine Flat Reservoir Operations	Historical releases and flows	<ul style="list-style-type: none"> <li>Historical flood releases</li> <li>Kings River Fishery Flow Requirements - Schedule C or D</li> </ul>	Same as 2030 Baseline	Same as 2030 Baseline
Surface deliveries	<ul style="list-style-type: none"> <li>Historical Kings River deliveries and diversions</li> <li>Historical CVP Class 1, Class 2, and 215</li> </ul>	Schedule 1 - Revised for capture of flood flows at Waldron/Harter ponds and existing SWTPs	Schedule 2- Increased flood flows and delivery to ponds	Schedule 3- Increased delivery to SWTP
Spreading Operations	None	None	Spreading Scenario Assumption A	None
San Joaquin Settlement Flow Assumptions	No	Yes	Yes	Yes
Imported Water/Banking	None	None	None	None

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## Planners Workshop


# General Plan Review

Matt Zidar



February 8, 2007

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***Purpose of the technical memorandum....***

- ▶ **Document the results of the City and County General Plan review**
- ▶ **Discuss policy “drivers” influencing land use and water supply planning**
- ▶ **Engage stakeholders in the Kings Basin in discussion of issues and solutions related to integrated land use and water resources planning**


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***Policy “Drivers” for Land Use and Water Supply plan and process integration***

- ▶ **Case law**
- ▶ **Legislation**
  - ▶ **Urban Water Management Plans**
  - ▶ **SB610/SB221**
  - ▶ **Cortese-Hertzberg-Knox LAFCO requirements**
- ▶ **Policy Trends**
  - ▶ **IRWMP Funding**
  - ▶ **CEQA standards**
  - ▶ **Office and Planning and Research General Plan Guidelines**


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### *OPR Guidelines Recommendation for Water Element of General Plans*

- ▶ **Water Supply and Demand**
- ▶ **Water Quality**
- ▶ **Other Key Water Elements**
  - ▶ Wastewater treatment
  - ▶ Watershed features and process
  - ▶ Flood management
  - ▶ Stormwater management
  - ▶ Interagency coordination and collaboration

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### *Key evaluation questions and criteria*

- ▶ **Do the city or county general plans recognize regional water management issues identified by the Forum?**
- ▶ **Are the general plans using water management strategies recommended by DWR for the IRWMP?**
- ▶ **Are general plan goals supported by the IRWMP? Are there areas where the IRWMP goals and objectives are different?**


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## *Tulare and Fresno General Plans*

- ▶ **Clear recognition of regional issues**
- ▶ **Propose broad goals and objectives very consistent with the IRWMP goals and objectives**
- ▶ **Define concrete strategies, programs and responsibilities and time lines to implement goals and objectives**

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## *Observations and Findings*

- ▶ **County plans take a regional view**
- ▶ **City plans tend not to recognize regional issues or incorporate the broader water management strategies**
- ▶ **Long term strategies to mitigate overdraft are generally not recognized in city general plans**
- ▶ **Most cities recognize need to ensure safe and reliable water supply but level of detail and specifics are sometimes lacking**
- ▶ **Cities need help to mitigate potential impacts**

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***Kings Basin  
Integrated Regional Water  
Management Plan (IRWMP)***

## **Panel Discussion**



**February 8, 2007**


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***Panel Discussion  
Greg Bourne, Facilitator***

- ▶ **County – Theresa Szymanis, Tulare County Planner**
- ▶ **Water District - Chris Kapheim, CID General Manager**
- ▶ **Large City Public Works- Lon Martin**
- ▶ **Large City Planning- John Wright, Planning Director, City of Clovis**
- ▶ **Smaller City- Dan Mienert, Asst. City Manager, City of Dinuba**
- ▶ **LAFCO- Rick Ballentyne, Fresno Executive Director 26**


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## Questions

- ▶ What your agencies role and responsibilities?
- ▶ Is there a need to better integrate land use and water supply planning?
- ▶ What are the water resources or land use issues your jurisdiction faces on a regular basis?
- ▶ What are the opportunities to better integrate land use and water supply decisions?
- ▶ Are existing plans and policies adequate and helping?
- ▶ Why or why not? (e.g.; UWMP, GWMP, City and County GPs)
- ▶ What could the IRWMP do to help you resolve issues?

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## BREAK

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***Kings Basin  
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Management Plan (IRWMP)***

# **Water Forum Meeting**



**February 8, 2007**


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***Water Forum Meeting Agenda***


- ▶ **Report on Adoption of IRWMP Agreements-in-Principles**
- ▶ **Committee meetings/reports**
  - ▶ TAD and Model Calibration
- ▶ **Briefing on Prop 50, Prop 84 and IE**
- ▶ **IRWMP Budget/schedule status and next steps**

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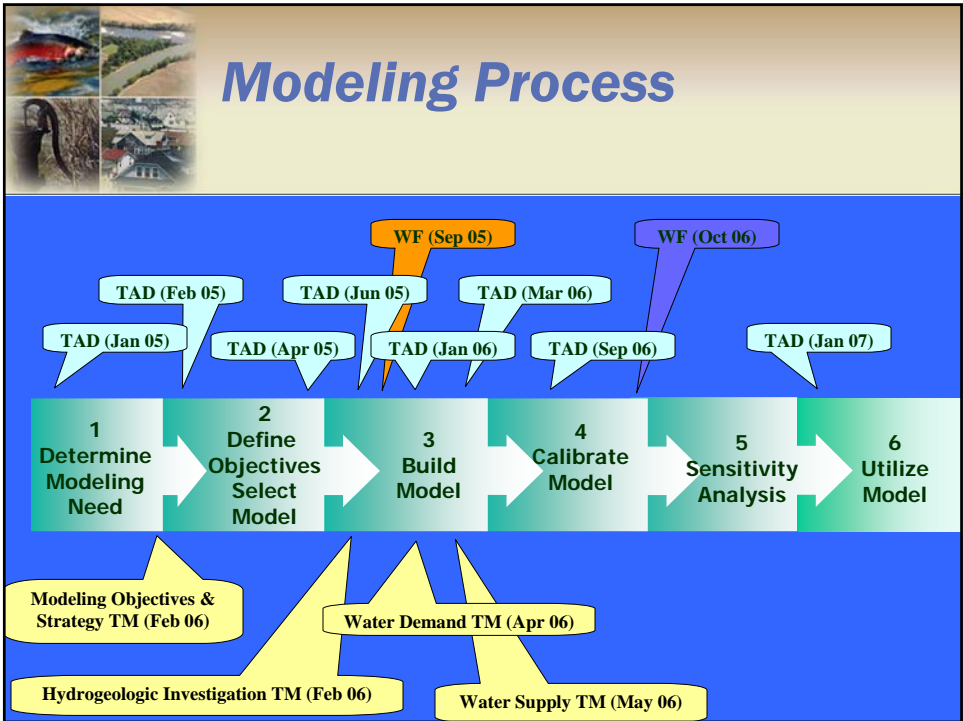
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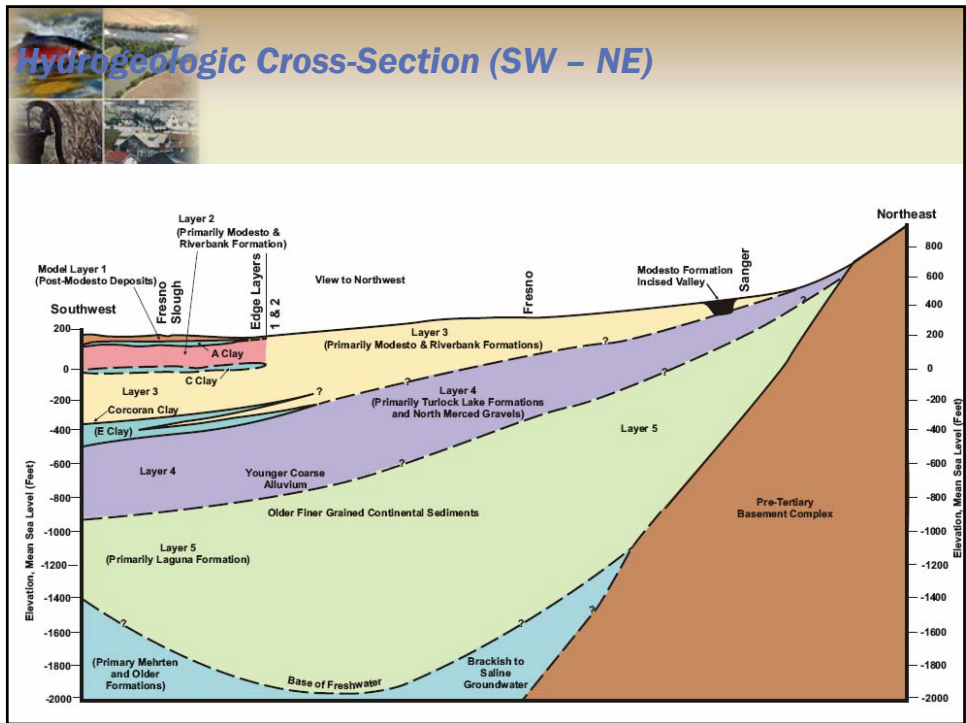
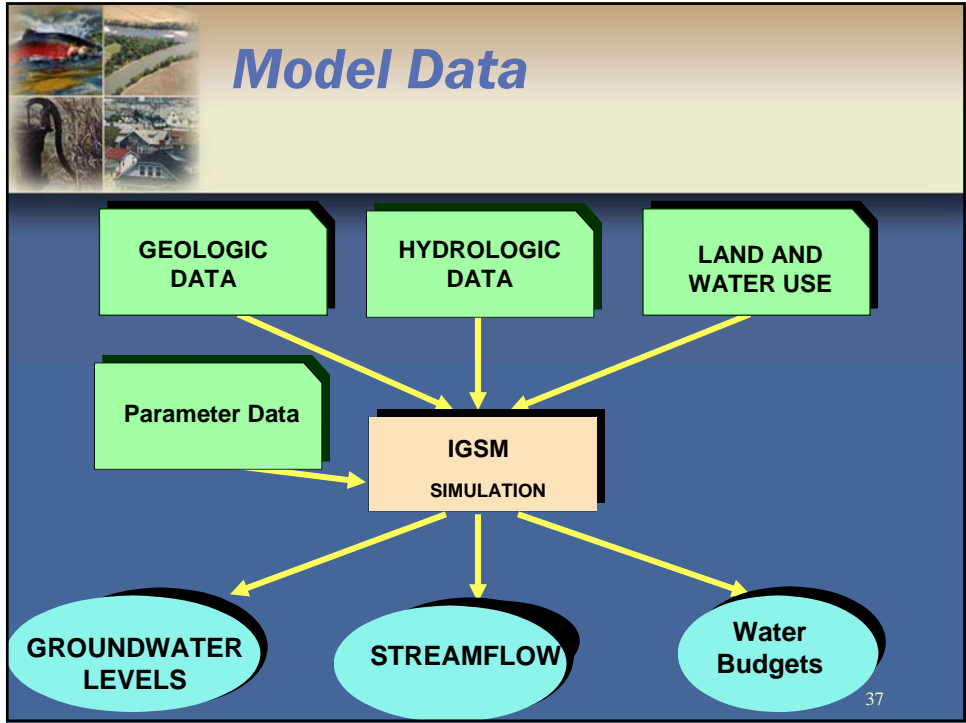
# TAD and Model Status Report

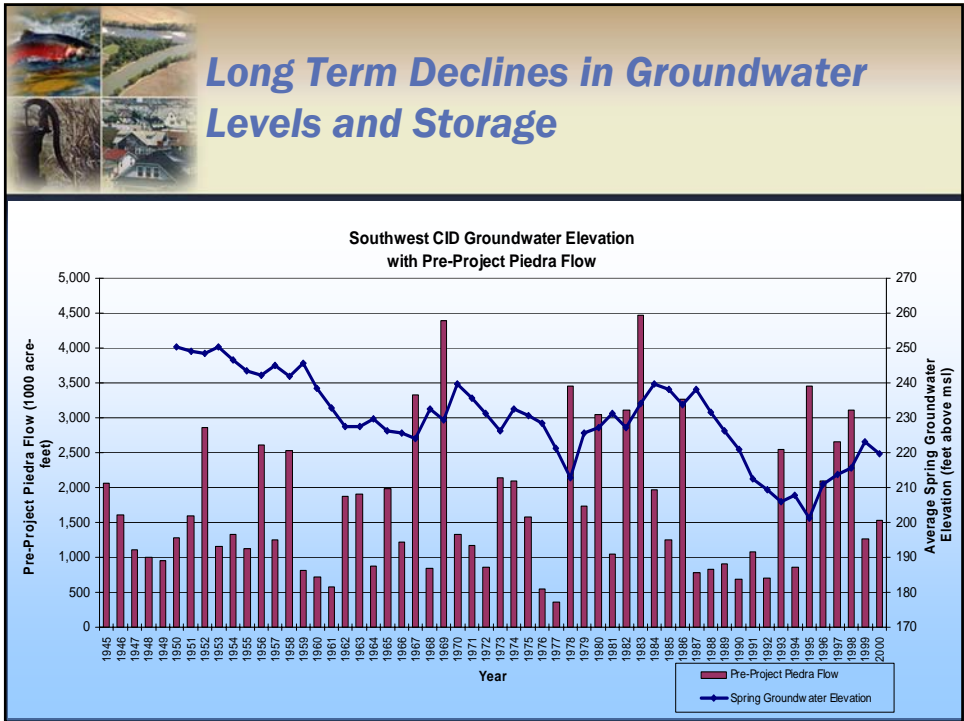
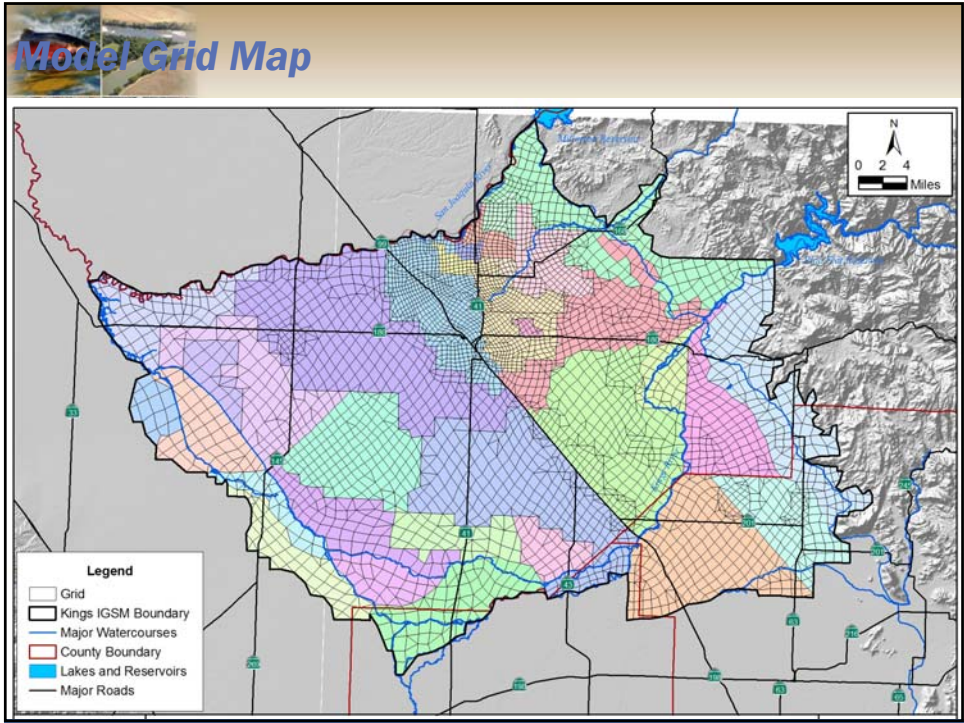


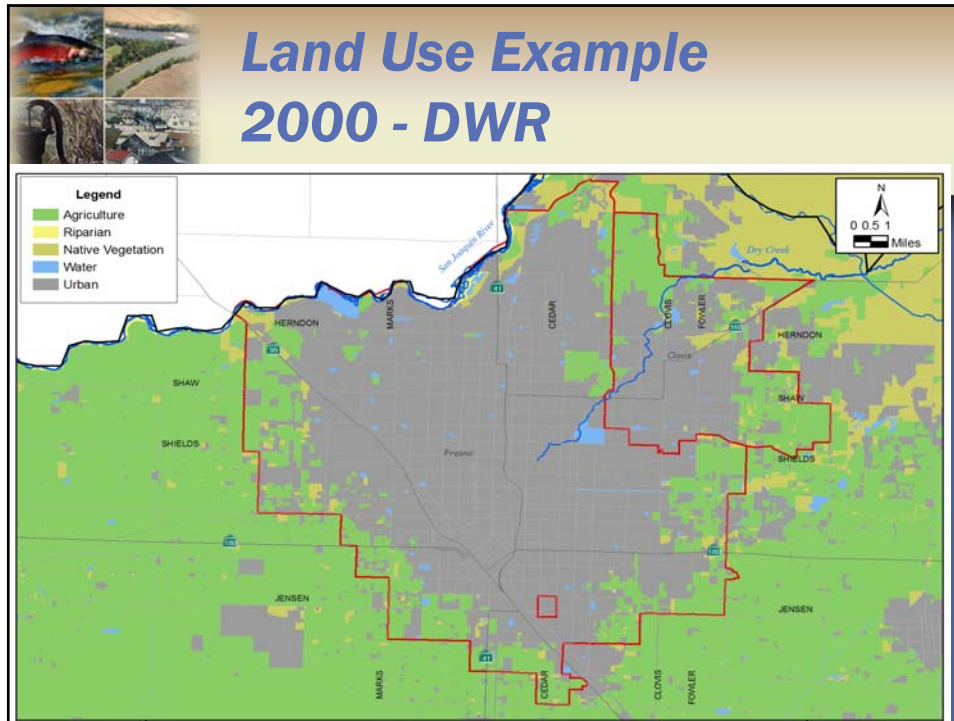
February 8, 2007

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**Calibration Methodology**

- ▶ Calibration is the process of fine-tuning model parameters such that the difference between model simulation results & observed/measured/reported values is minimized.


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## ***Calibration Components***

- ▶ **Model Water Budgets**
- ▶ **Agricultural Water Use & GW Pumping**
- ▶ **Groundwater Levels**
- ▶ **Streamflows**

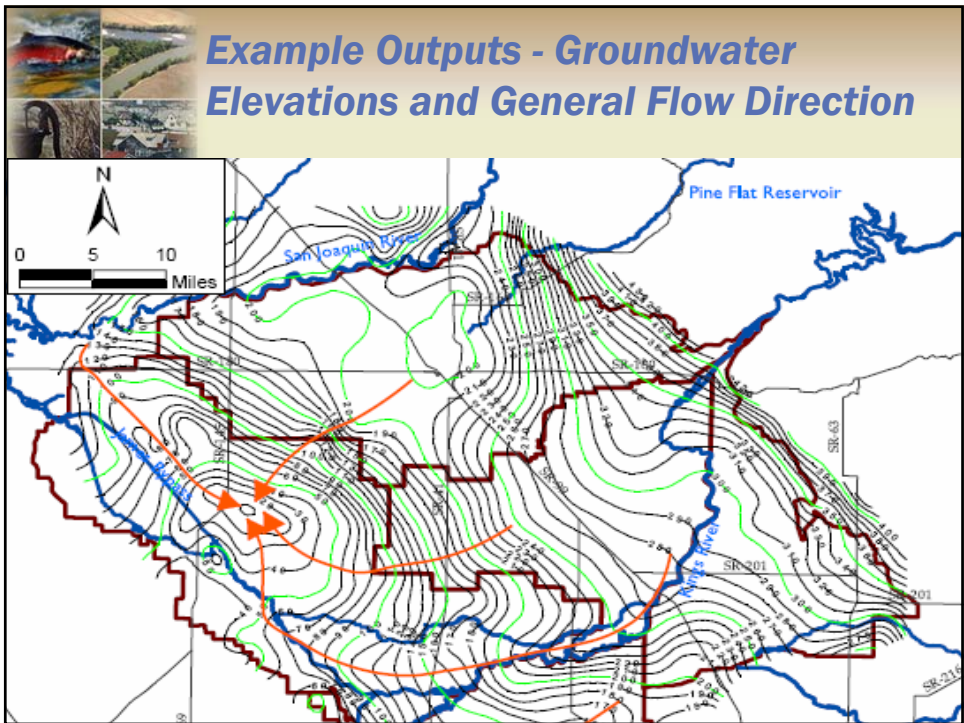
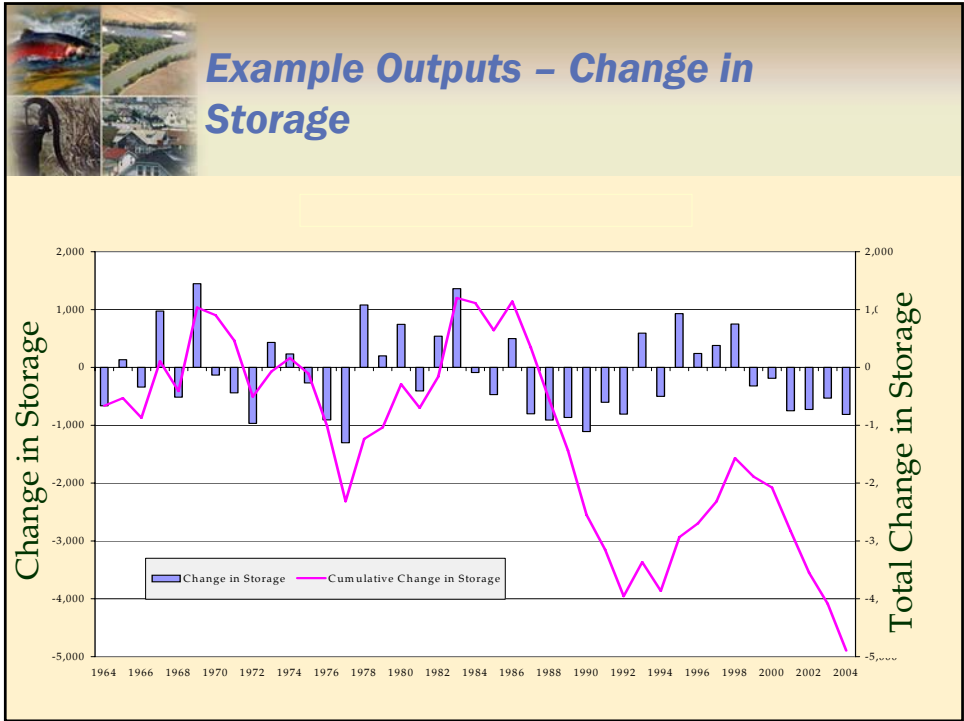
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## ***Model Outputs to Support Project Comparison and Decisions***

- ▶ **Water Budgets- Groundwater, Surface Water, Land Surface**
- ▶ **Groundwater level and streamflow hydrographs**
- ▶ **Rates and direction of flow across different boundaries**

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## *Modeling Next Steps*

- ▶ **Incorporate TAD Comments**
- ▶ **Apply Model for IRWMP & Fresno Metro Plan**
  - **Existing Conditions**
  - **Without Project Conditions**
  - **Project Conditions and Alternatives**

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## *Timelines*

<b>Work Item</b>	<b>Approx. Timeline</b>
<b>Document Model Development &amp; Calibration</b>	<b>March 2007</b>
<b>Baseline Model</b>	<b>February 2007</b>
<b>Alternatives Analysis</b>	<b>Starting March 07</b>

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***Kings Basin  
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# **Project Status Report**



**February 8, 2007**


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***Summary of Work  
Hydrologic Modeling***

- **Model Calibration Completed**
  - **TAD Review Workshop Held in January 2007**
  - **Final Report in Preparation**
  
- **Baseline Model Data in Preparation**

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## **Summary of Work IRWMP Tasks**

- ▶ **Documentation of Project Assumptions- TM Issued**
- ▶ **Conjunctive Use Feasibility/Project Definition Investigations- TM Issued**
- ▶ **Water Quality Evaluation- TM will be shortly**
- ▶ **Definition of Proposed Projects**
  - **Web Based Survey Completed**
  - **Need more interactive sessions with agencies/cities for more detailed**
- ▶ **Governance and Financing- TM Issued**
- ▶ **General Plan Comparative Study - Workshop held earlier**

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## **Work for Next Two Months**

- ▶ **Public Outreach (Ongoing)**
- ▶ **Project Definition**
- ▶ **Existing and Future without Project Baseline conditions Analysis**
- ▶ **Engineering and Modeling Analysis**
- ▶ **Ongoing Discussion on Governance and Finance Plan**
- ▶ **IRWMP Preparation**
- ▶ **Technical Support to Water Forum**

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## *Extra and Backup*

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## *IRWMP will identify, evaluate and integrate Water Management Strategies*

- ▶ Water Supply Reliability
- ▶ Flood management
- ▶ Groundwater management
- ▶ Storm water capture and management
- ▶ Water recycling
- ▶ Ecosystem Restoration
- ▶ Environmental and habitat protection and improvement
- ▶ Recreation and public access
- ▶ Water conservation
- ▶ Water quality protection and improvement
- ▶ Wetlands enhancement and creation
- ▶ Conjunctive use
- ▶ Desalination
- ▶ Imported water
- ▶ Land use planning
- ▶ NPS pollution control
- ▶ Surface storage
- ▶ Watershed planning
- ▶ Water and wastewater treatment
- ▶ Water transfers

Blue text indicates must be considered



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## *Planning Framework & Integration Strategy*



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## *Discussion of Regional Projects*

- ▶ **Regional Conjunctive Use and Groundwater Banking**
- ▶ **Water Quality**
- ▶ **Ecosystem Management**
- ▶ **Flood Control and Flood Plain Management**
- ▶ **Land Use, Public Access and Recreation**

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