CALFED Bay-Delta Program Reservoir Yield Evaluations

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Study Objectives

- Determine the possible water supply opportunities from the following reservoir sites:
  - Westside Sacramento Valley
    - Berryessa Enlargement, Colusa, Glenn, Red Banks, Shasta Enlargment, Sites, Thomes Newville
  - Eastside Sacramento Valley
    - Auburn, Deer Creek, Folsom Enlargment, Garden Bar, Waldo
  - Westside/Off-Aqueduct San Joaquin Valley
    - Garzas, Los Banos Grandes, Los Vaqueros, Orestimba, Panoche, San Luis Enlargement
  - Eastside San Joaquin Valley
    - Coppertown, Millerton Enlargement, Montgomery

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Study Approach

- Use a CALFED Post-Processing Operations Model to evaluate the sensitivity of various operational parameters and physical capacities of potential new storage facilities.

- Use spot DWRSIM operation studies for various reservoir locations to compare and adjust results from the CALFED Post-Processing Operation Model

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Spreadsheet Post-Processing Operations Model

- Uses Available Flows and Capacities based on DWRSIM Modeling
- Sequential Operation of New Facilities
- No Re-operation of Existing System
- No Dynamic Delta Modeling

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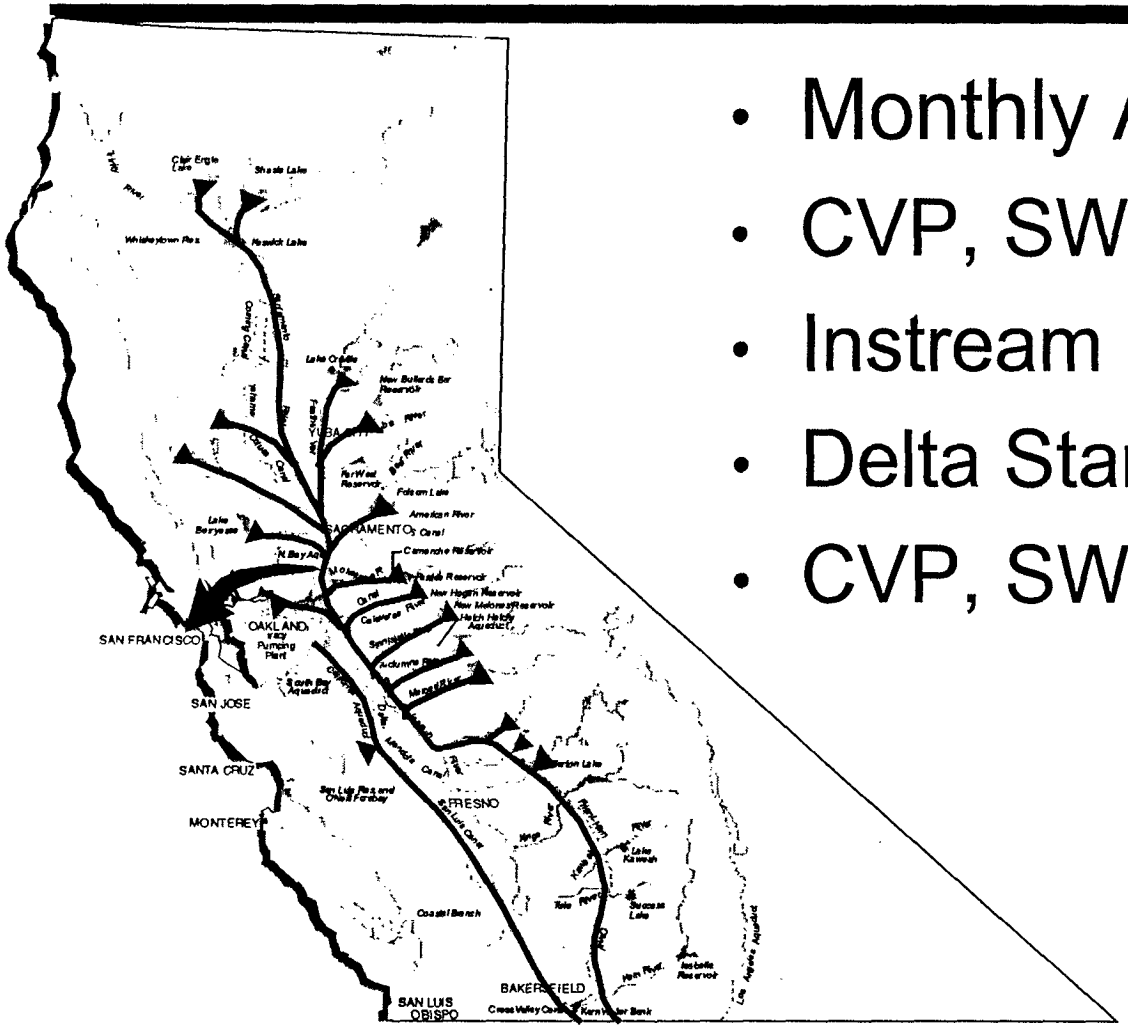
DWRSIM Operations Model



- Monthly Accounting Model
- CVP, SWP Operations
- Instream Flows
- Delta Standards
- CVP, SWP Deliveries

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Modeling Assumptions

- System Demands
  - Ag & Urban: South of Delta SWP & CVP (no upstream water user deliveries)
  - Environmental: None
- Delta Alternative Configuration
  - Existing Delta Configuration

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Modeling Assumptions

- 2020-Level Hydrology
- 3.3-4.2 MAF Variable SWP Demand
- 0-138 TAF Variable SWP Interruptible Demands
- 3.5 MAF w/Level IV Refuge CVP Demand
- Instream Requirements
  - Sacramento & American - April 26, 1996 CVPIA Flow Criteria
  - Stanislaus - CVPIA Draft PEIS Flow Criteria
  - Yuba, Mokelumne & Tuolumne - New FERC Agreements
  - Feather, Merced, San Joaquin - Existing Requirements

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Modeling Assumptions

- Delta Standards
  - May 1995 WQCP
  - CVPIA (b)(2) Water Management
    - Additional Upstream Actions
    - 1:3 to 1:5 April-May Export Restriction
    - Additional Chipps Island X2 Days at 1962 Level of Development for May & June
    - Delta Cross Channel Closed from Sept. thru. June
- Trinity River Diversion 340 TAF/Year

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Spreadsheet vs DWRSIM Model Comparison

- South of Delta Surface Storage
  - 2 MAF Storage Capacity
  - 3500 cfs Intake Capacity
  - Aggressive Operations

- North of Delta Surface Storage
  - 2 MAF Storage Capacity
  - 5000 cfs Intake Capacity
  - Aggressive Operations
  - No Diversion Constraint

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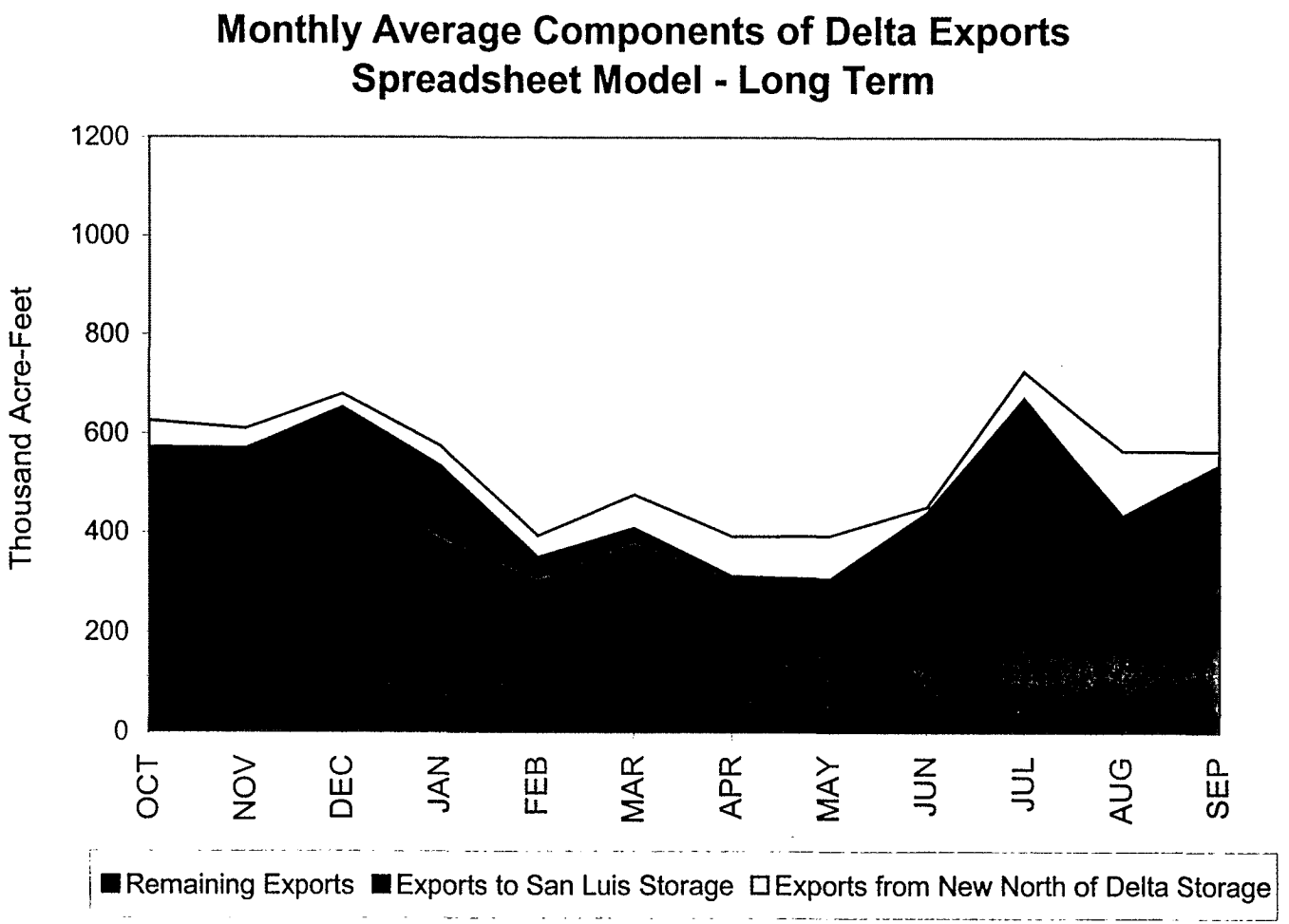
Model Evaluation/Comparison - Delta Exports w/NDSS



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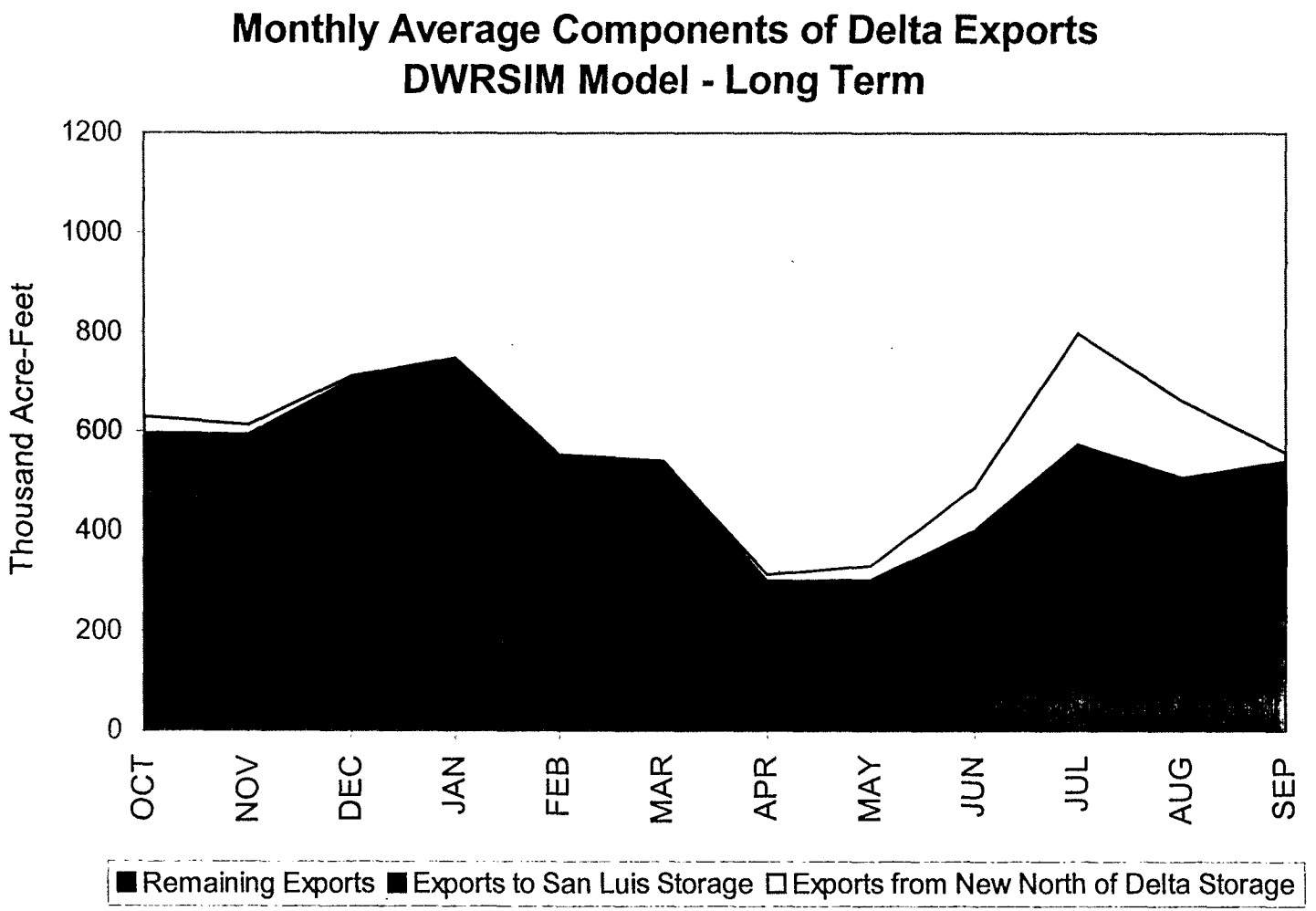
Model Evaluation/Comparison - Delta Exports w/NDSS



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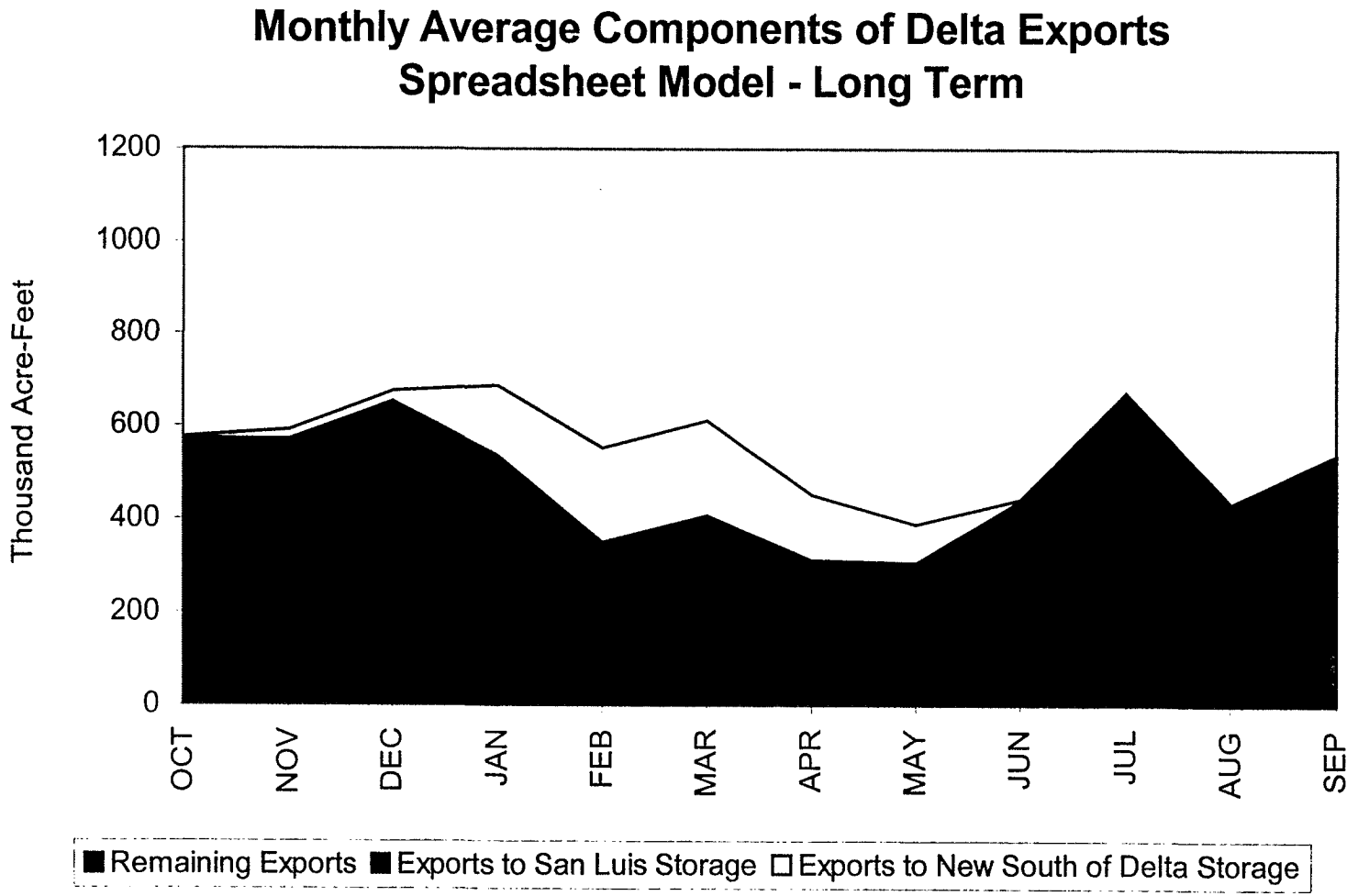
Model Evaluation/Comparison - Delta Exports w/SDSS



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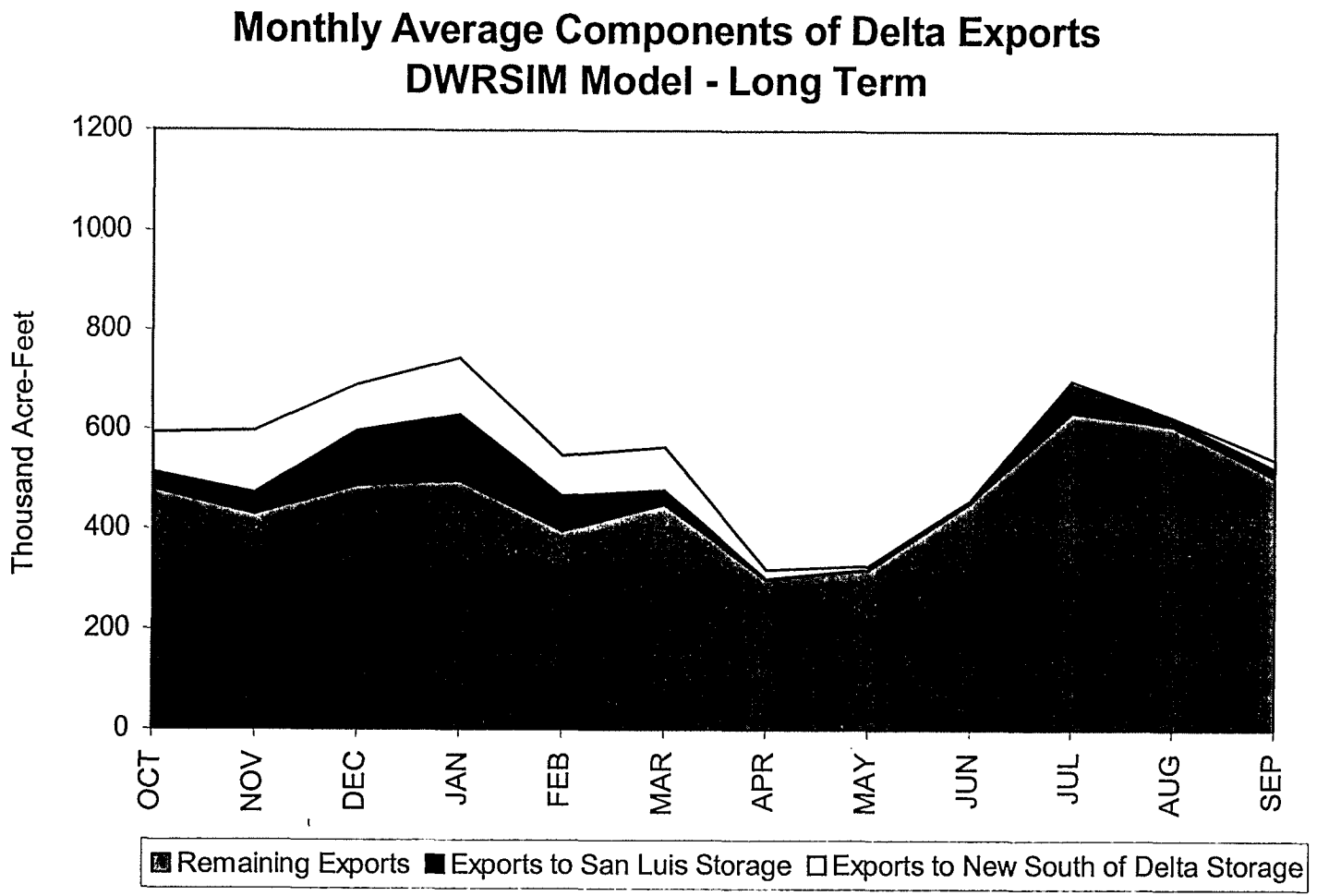
Model Evaluation/Comparison - Delta Exports w/SDSS



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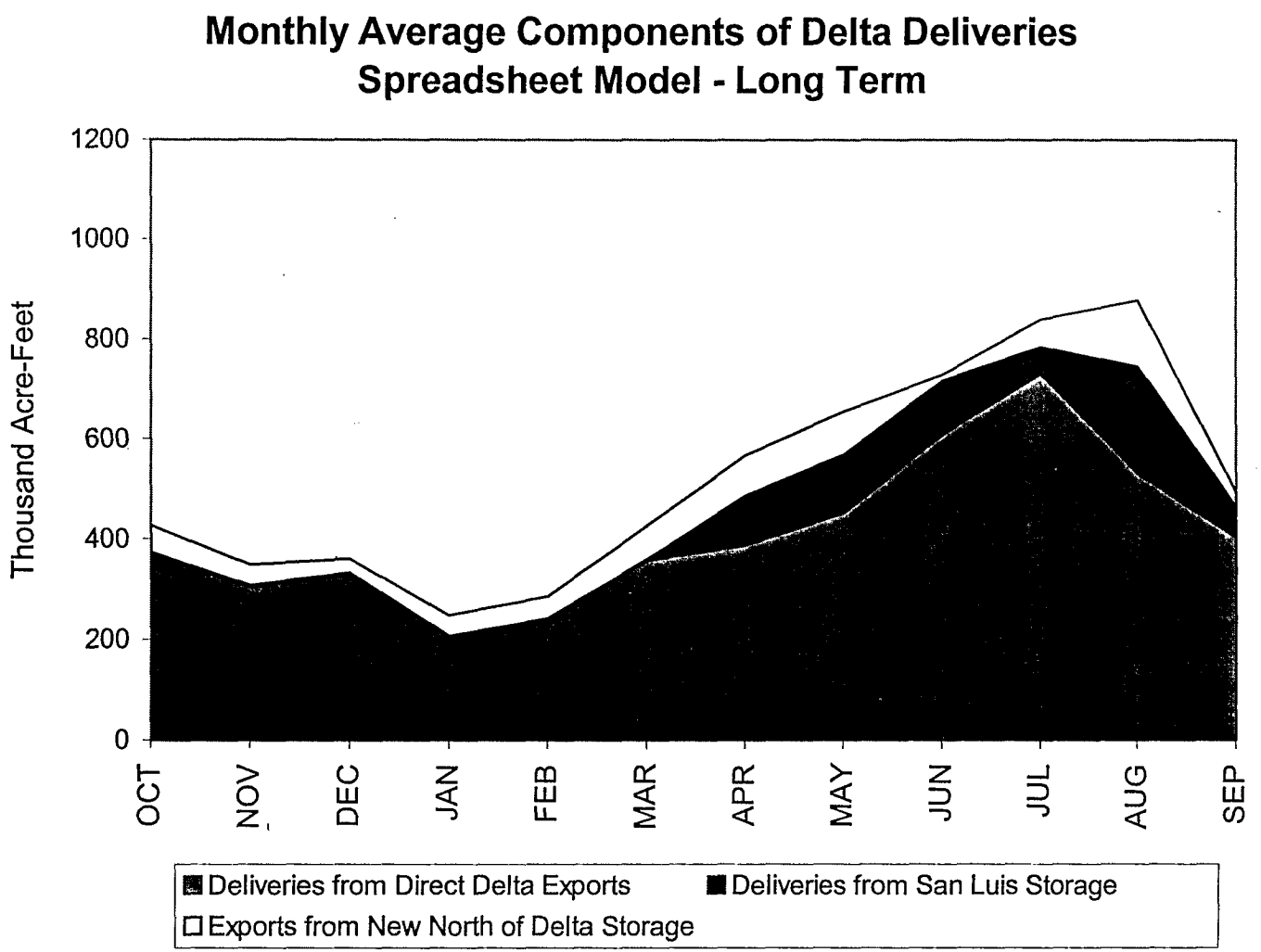
Model Evaluation/Comparison - Total Deliveries w/NDSS



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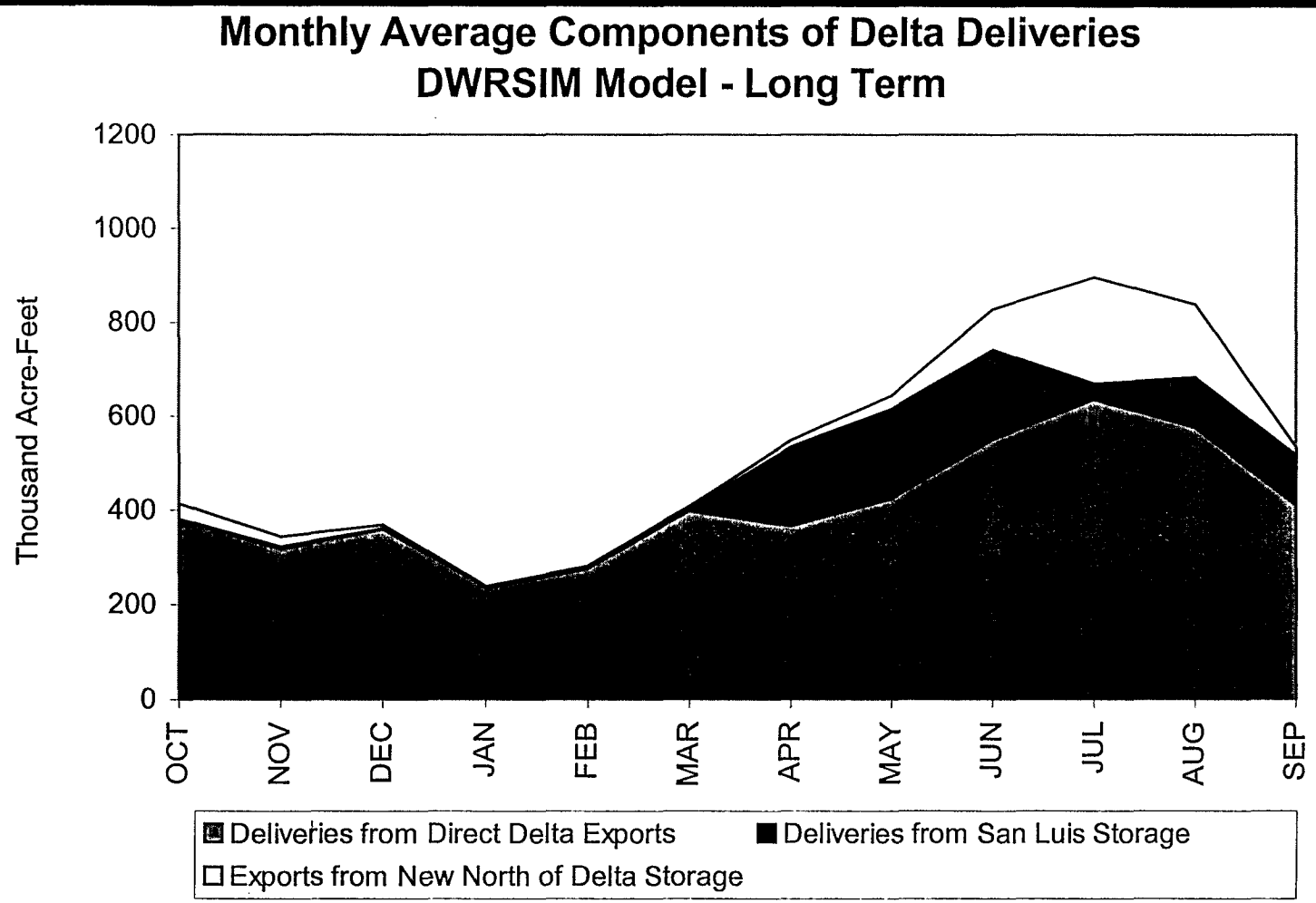
Model Evaluation/Comparison - Total Deliveries w/NDSS



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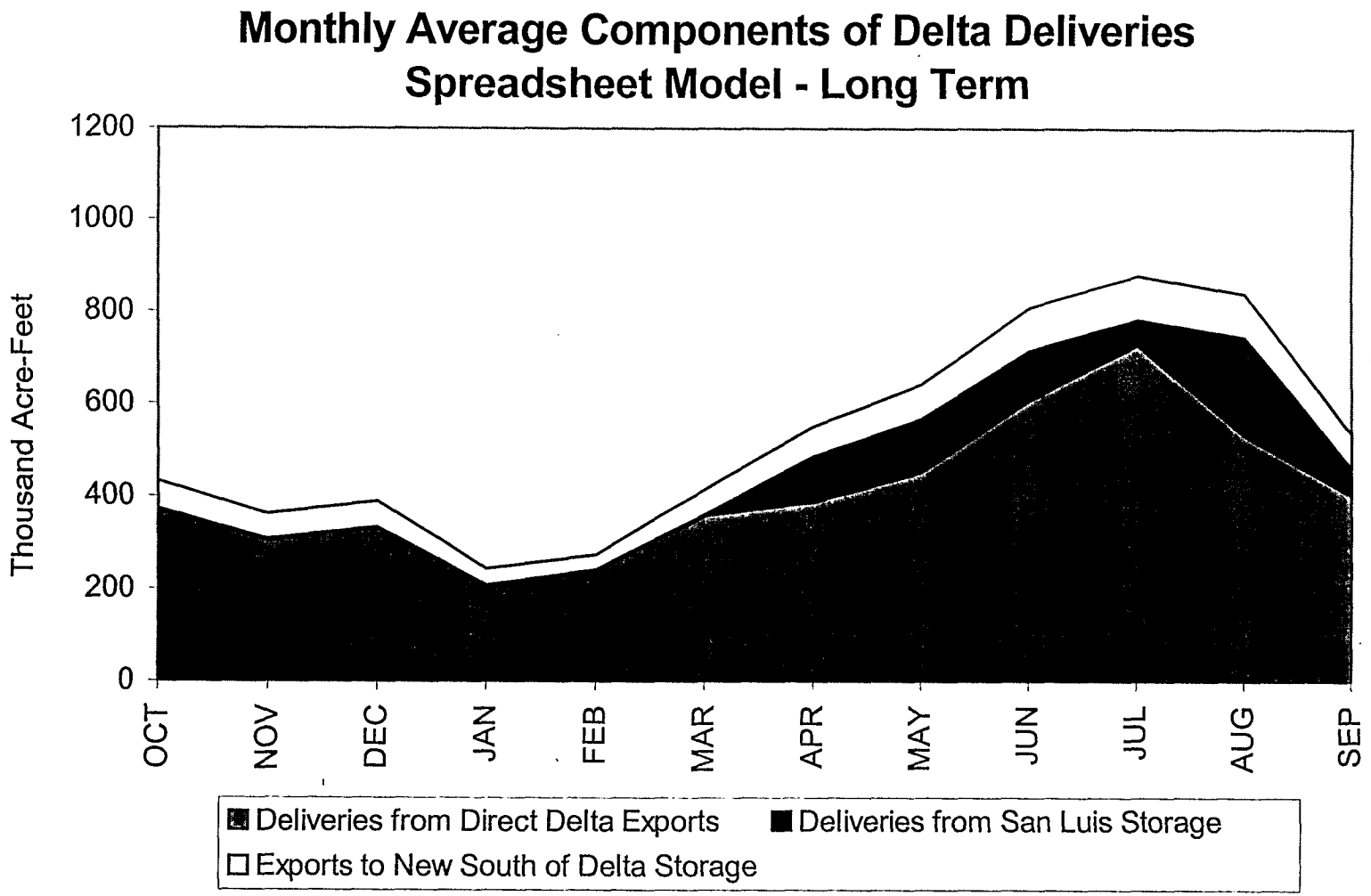
Model Evaluation/Comparison - Total Deliveries w/SDSS



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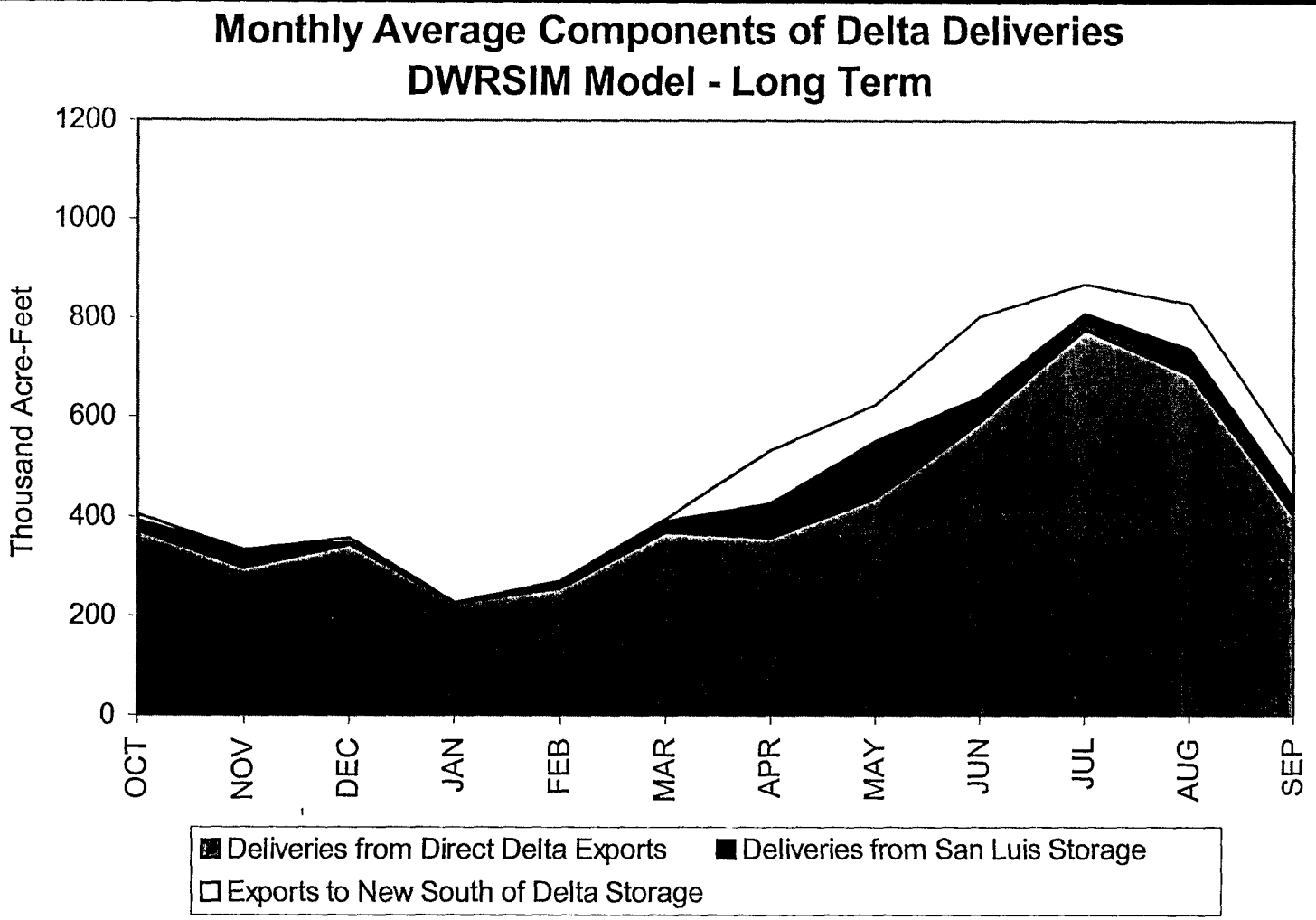
Model Evaluation/Comparison - Total Deliveries w/SDSS



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Spreadsheet vs DWRSIM Model Comparisons

- South of Delta Surface Storage
  - 2 MAF Storage Capacity
  - 3500 cfs Intake Capacity
  - **Aggressive & Conservative** Operations

- North of Delta Surface Storage
  - 2 MAF Storage Capacity
  - 5000 cfs Intake Capacity
  - **Aggressive & Conservative** Operations
  - No Diversion Constraint

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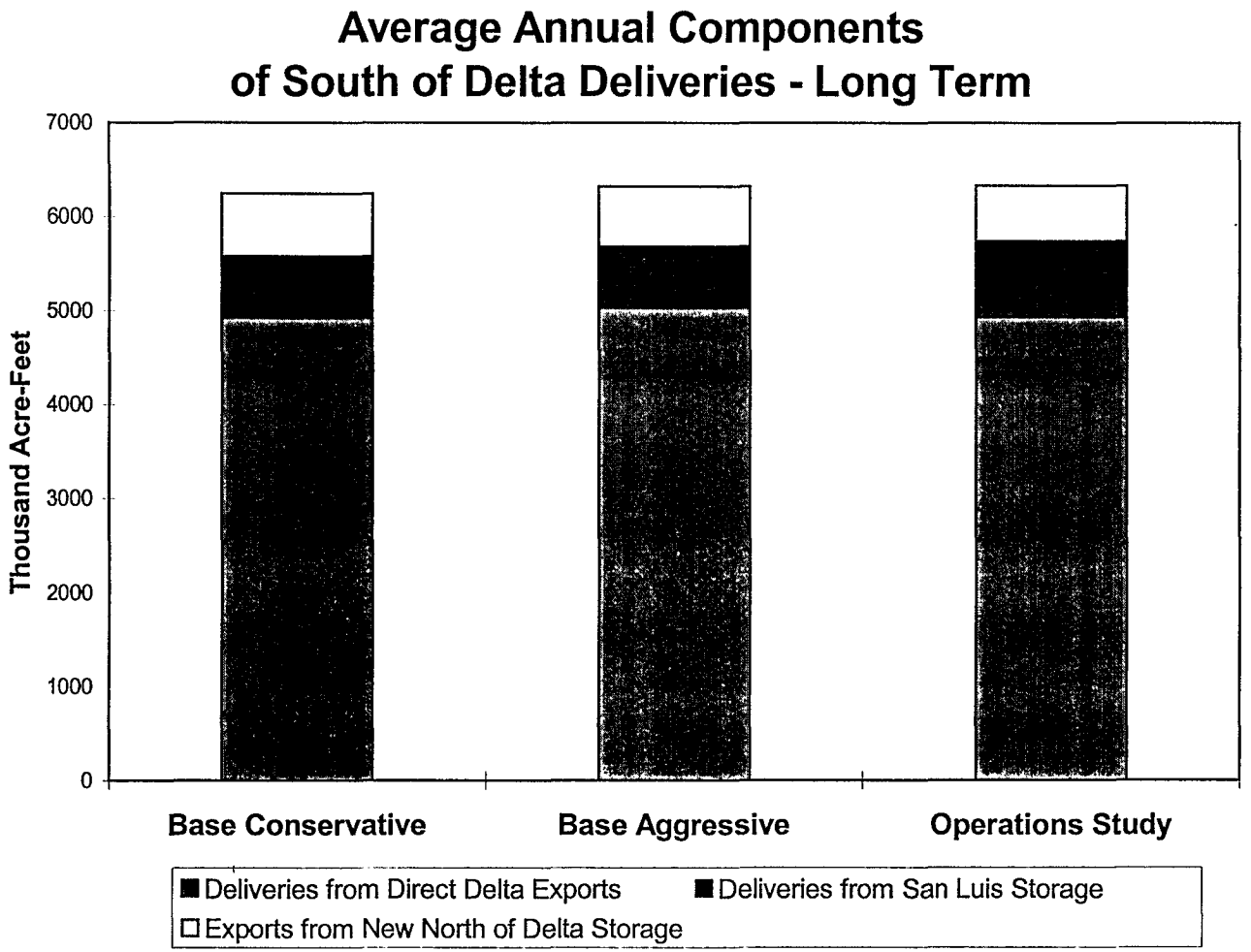
Summary Comparison - Total Deliveries w/NDSS



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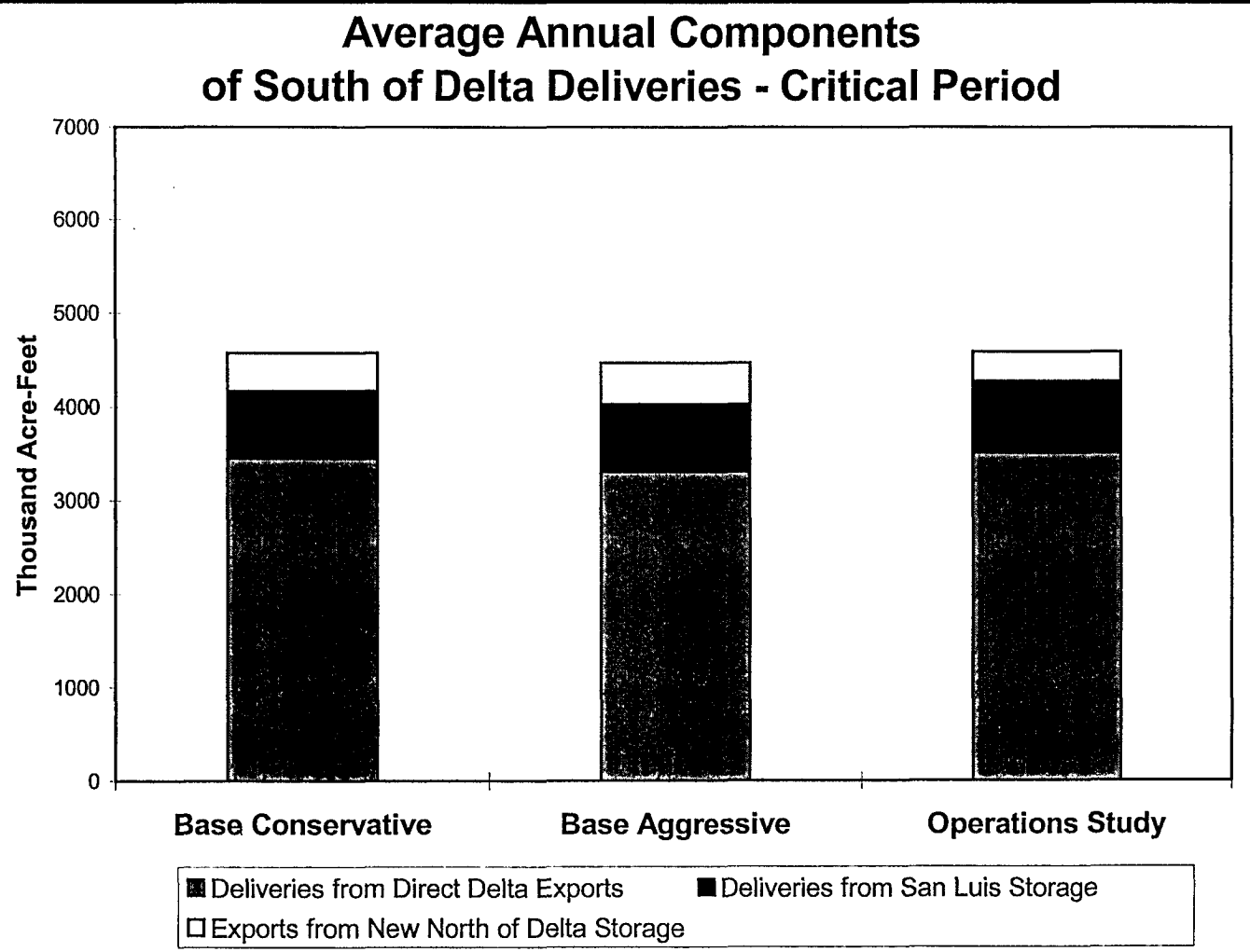
Summary Comparison - Total Deliveries w/NDSS



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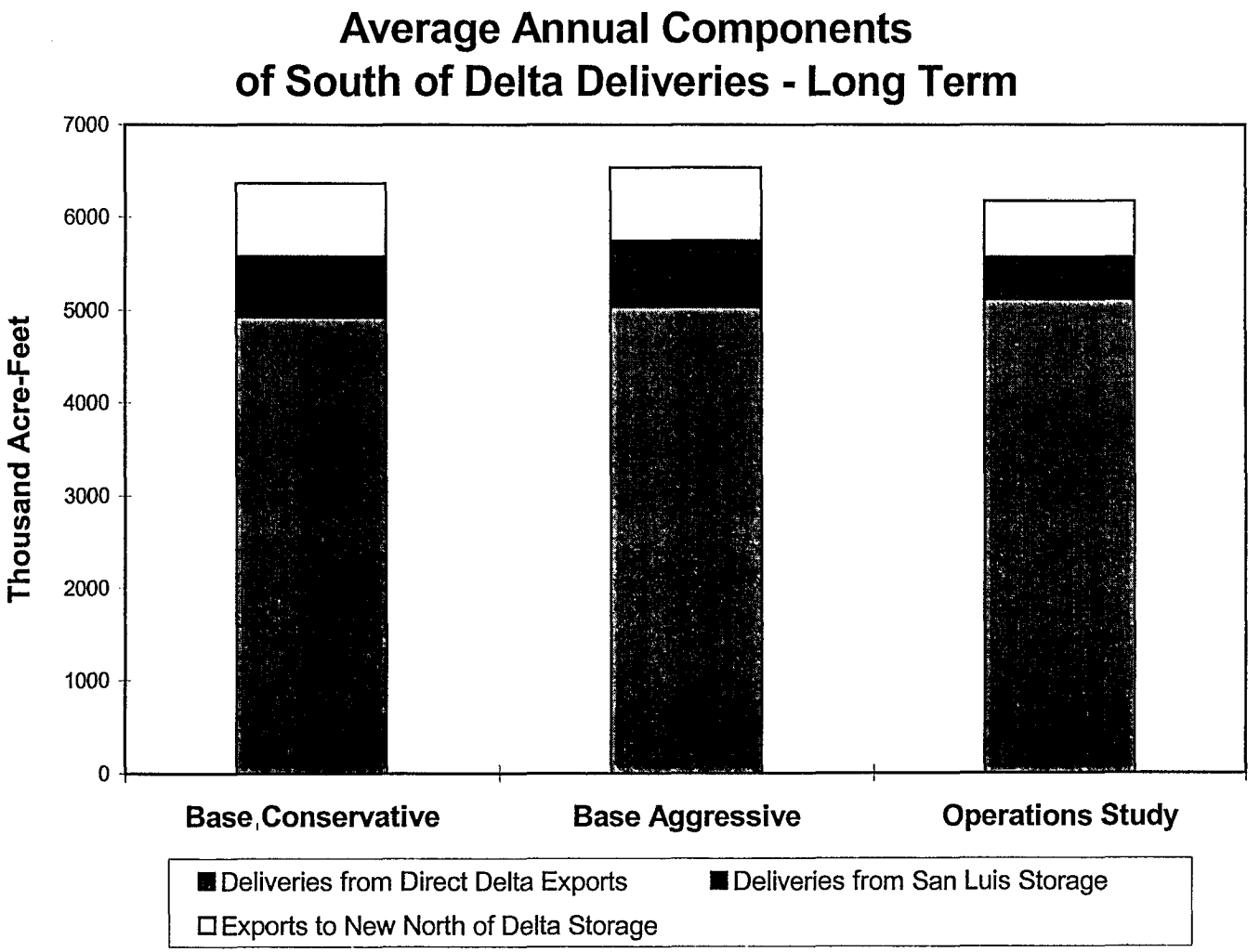
Summary Comparison - Total Deliveries w/SDSS



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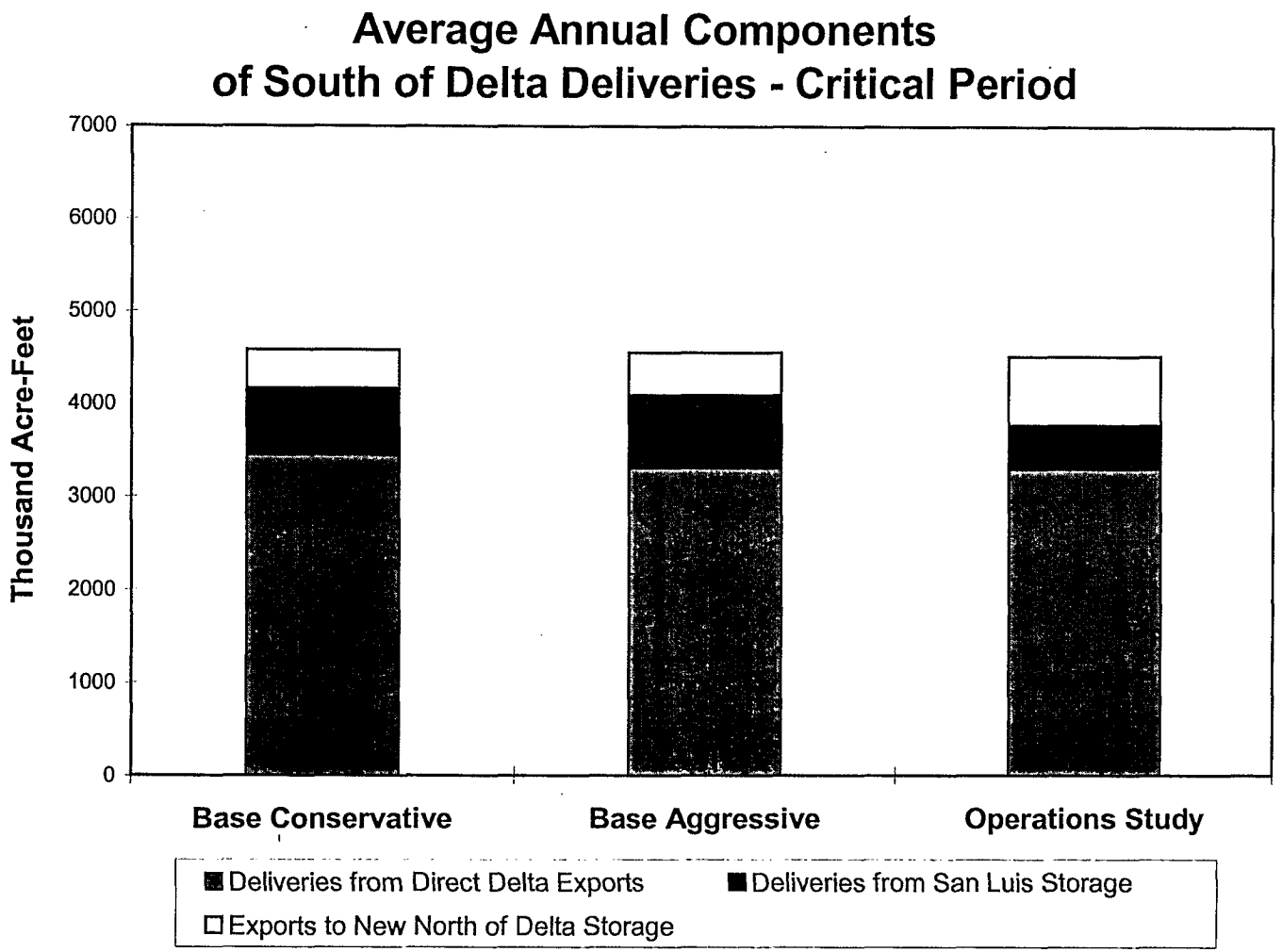
Summary Comparison - Total Deliveries w/SDSS



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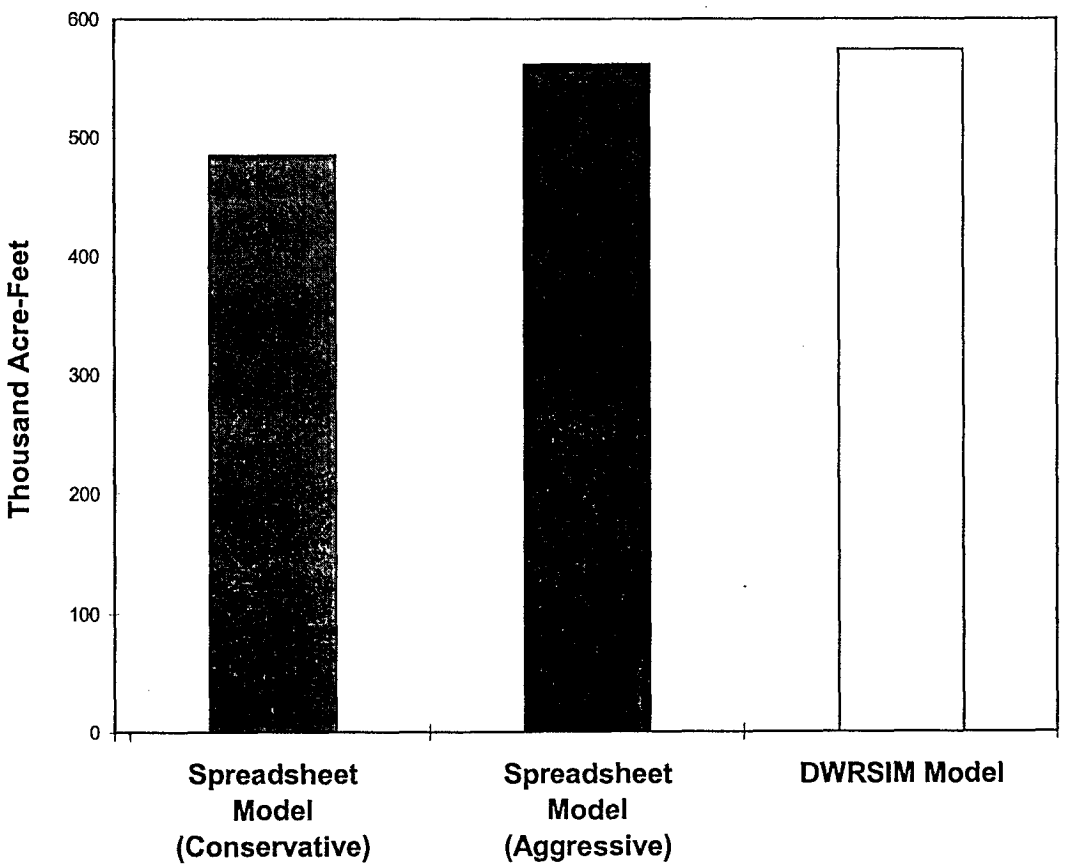
Summary Comparison - NDSS Water Supply Benefits

Average Annual Water Supply Benefits - Long Term



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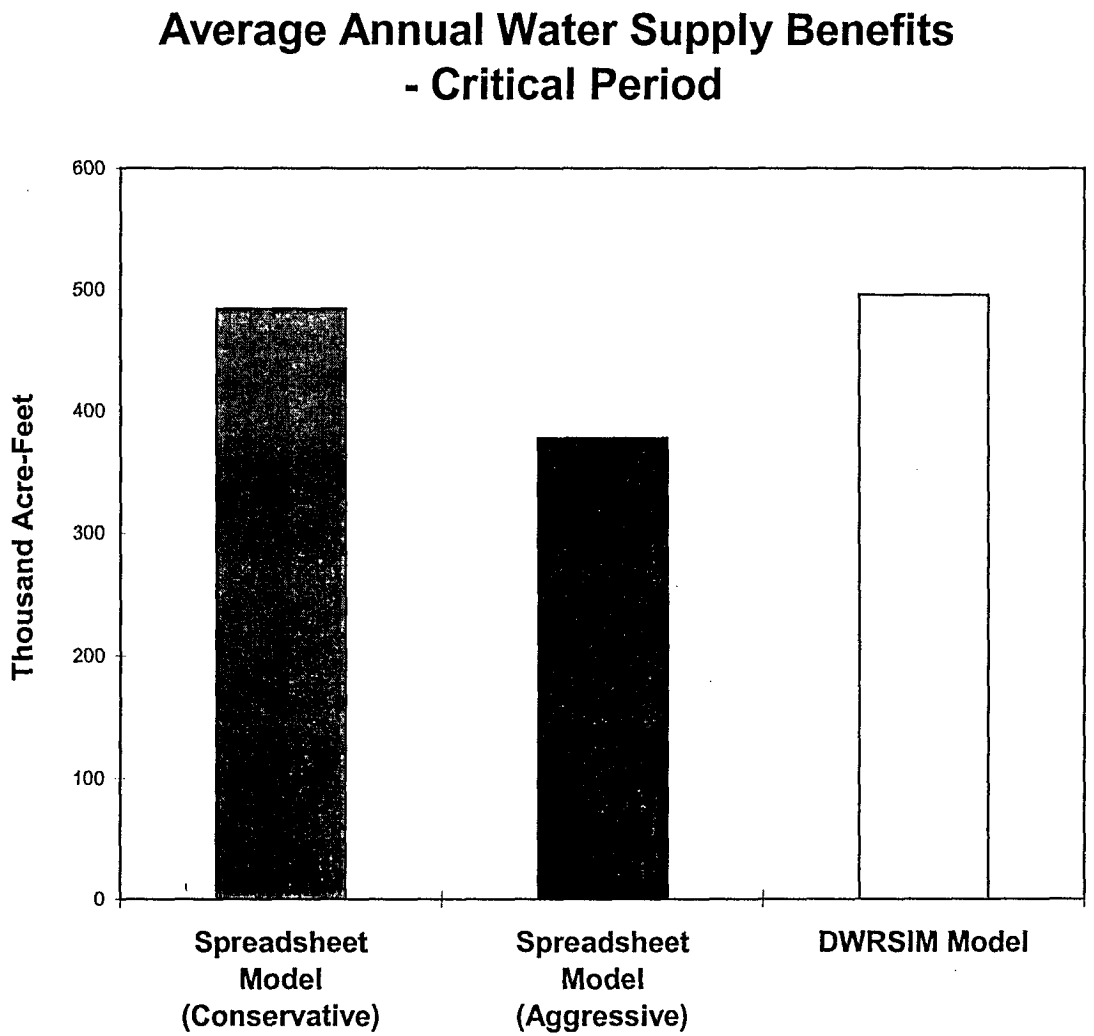
Summary Comparison - NDSS Water Supply Benefits



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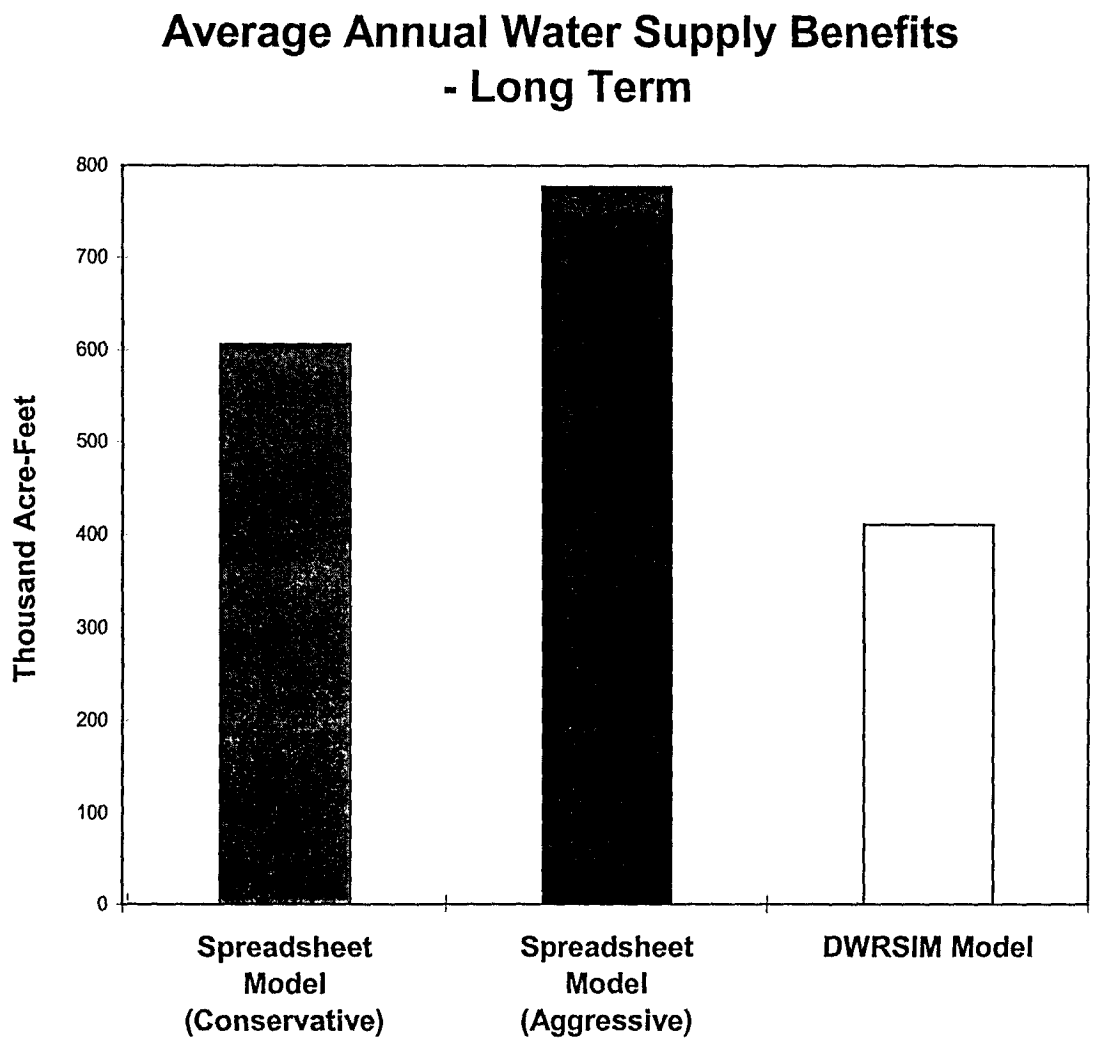
Summary Comparison - SDSS Water Supply Benefits



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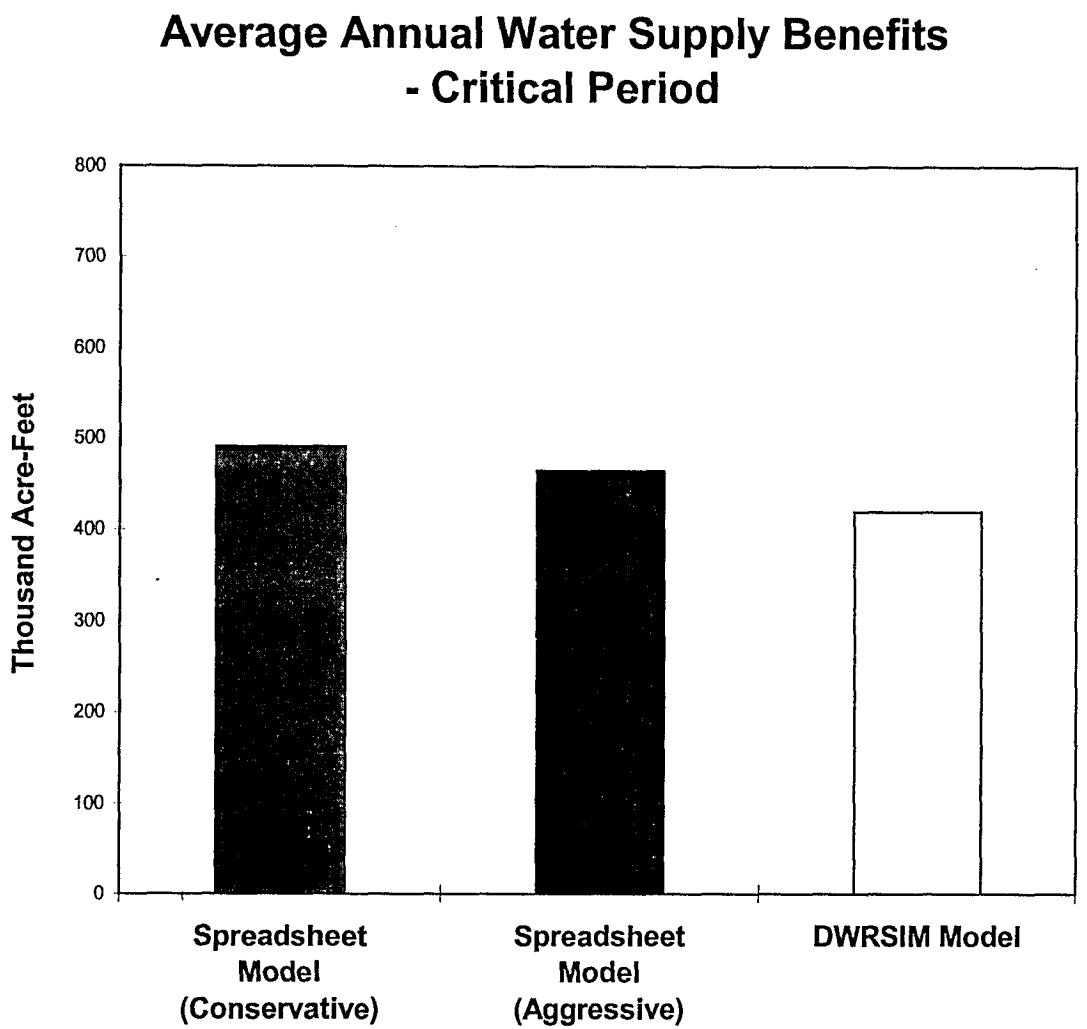
Summary Comparison - SDSS Water Supply Benefits



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Initial Findings

- A variety of measurements and operation parameters/constraints are necessary to fully illustrate water supply benefits.

- Spreadsheet Model can provide fairly accurate estimates of water supply benefits for new surface storage facilities

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Proposed Approach for Yield Evaluations

- Evaluate Water Supply Benefits for a Range of Storage Volumes and Location under Various Combinations of
  - Operational Targets (i.e. Dry Period Supply or Normal Period Supply)
  - River/Stream Diversion Constraints

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Yield Evaluation Overview for Reservoir Screening Process

Modeling Activities	Westside Sacramento Valley							Eastside Sacramento Valley					Off-Aqueduct San Joaquin Valley						Eastside San Joaq.		
	Berryessa Enlargement	Colusa	Glenn	Red Banks	Shasta Enlargement	Sites	Thomes Newville	Auburn	Deer Creek	Folsom Enlargement	Garden Bar	Waldo	Garzas	Los Banos Grandes	Los Vaqueros	Orestimba	Panoche	San Luis Enlargement	Coppertown	Millerton Enlargement	Montgomery
CALFED Spreadsheet Modeling																					
Conservative Operations (Critical Supplies)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Aggressive Operations (Long Term)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
No Upstream Diversion Constraints	-	*	*	*	-	*	*	-	*	-	*	*	-	-	-	-	-	-	*	-	*
Upstream Diversion Constraints	-	*	*	*	-	*	*	-	*	-	*	*	-	-	-	-	-	-	*	-	*
DWRSIM Modeling																					
Existing CALFED Studies	-	-	-	-		*	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
New CALFED Studies	-	-	-	-	-	-	-	-	-	*	-	-	*	-	-	*	*	*	-	-	*
Existing Ag/Urban Studies	-	-	-	-		*	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-
Existing DWR Bull. 160 Studies	-	-	-	-	*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	*	-
New DWR Prop. 204 Studies	-	*	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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