# Treasure Valley Future Water Demand Study

## Treasure Valley

## CAMP Advisory Committee Meeting

**July 30, 2010**

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# Presentation Summary

- Project Background
- Data Collection & Data Gaps
- Basin Understanding
- Approach
  - Methodology

    Urban: DCMI, Domestic Irrigation, Compass. Land Use

    Ag: IDC, ET, IE, Water Year Type, Ranges of Result
- Discussion Points

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# Project Background

- CAMP

  Purpose: Investigate strategies and develop plans which will lead to sustainable water supplies and optimum use of the water resources

  Approach: A series of studies: water demand, climate change, modeling, alternatives analysis, etc.

- Water Demand Studies
  - Treasure Valley Water Demand Study
  - Rathdrum Prairie Water Demand Study

# Scope of Work for TV Demand Study

- Purpose
  - Assess current water-use conditions and forecast future water demand over a 50 year period in 10 year increments
- Tasks
  - Task 1 - Estimate future urban water demand using 50 year population projections
  - Task 2 – Estimate agricultural water demand
  - Task 3 - Qualitative assessment of environmental and water quality needs

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# Deliverables

- Conceptual framework and methodology
- Water demand memorandum
- Presentations
- Status reports

# Focus: Demand Study Not Water Supply Planning

- Purpose is to estimate water demand only
- Demand study is one of the many components of the CAMP process
- Water supply planning is not part of the current study and will be addressed in the next phase

# Project Team

Based on Idaho and CA

Idaho:

- Bryce Contor
- Julia Pierko
- John Petrovsky
- Mike Ciparsky
- R. D. Schmidt

California:

- Saquib Najmus
- Elias Tijerina
- Mesut Cayar
- Jon Traum
- Roger Mann

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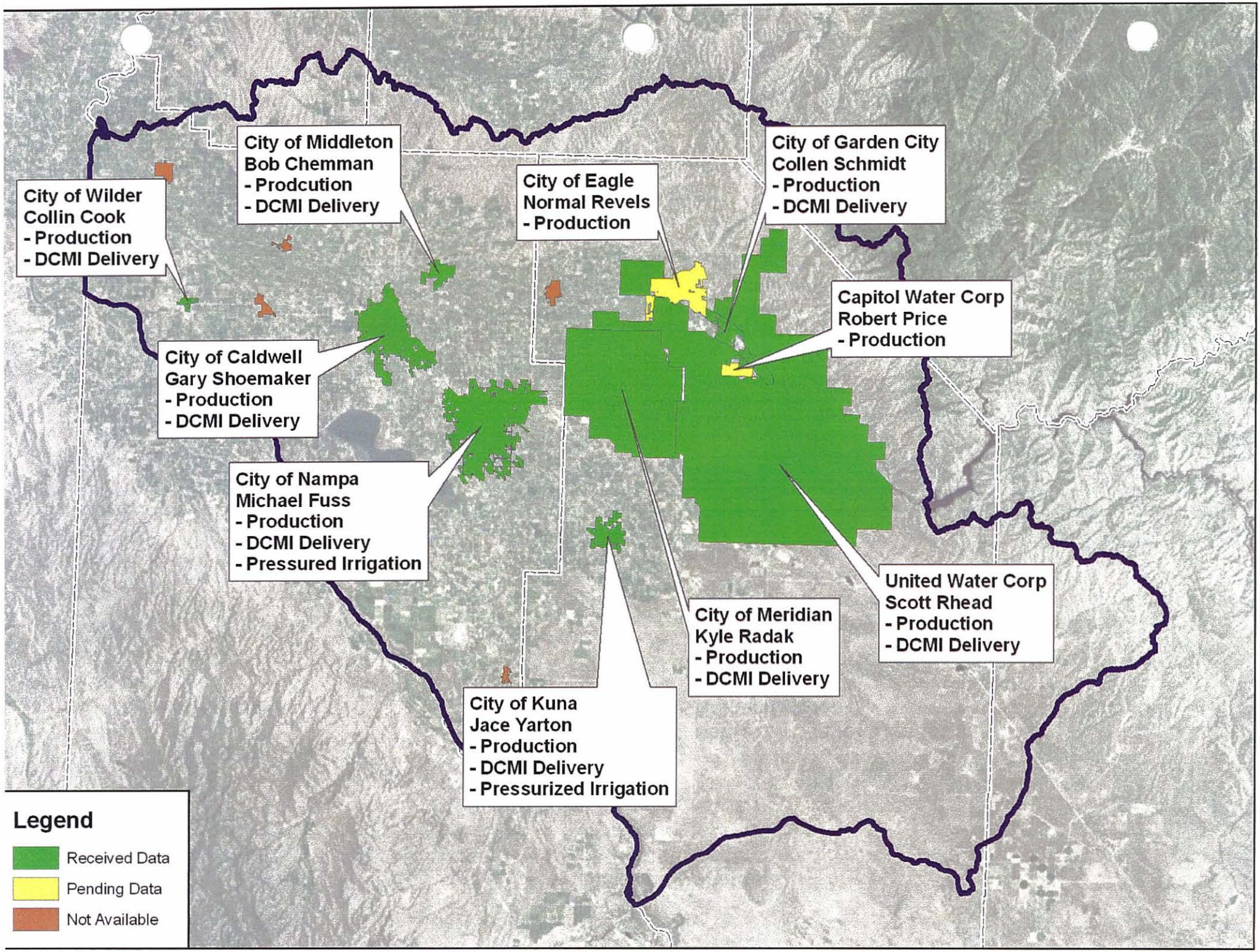
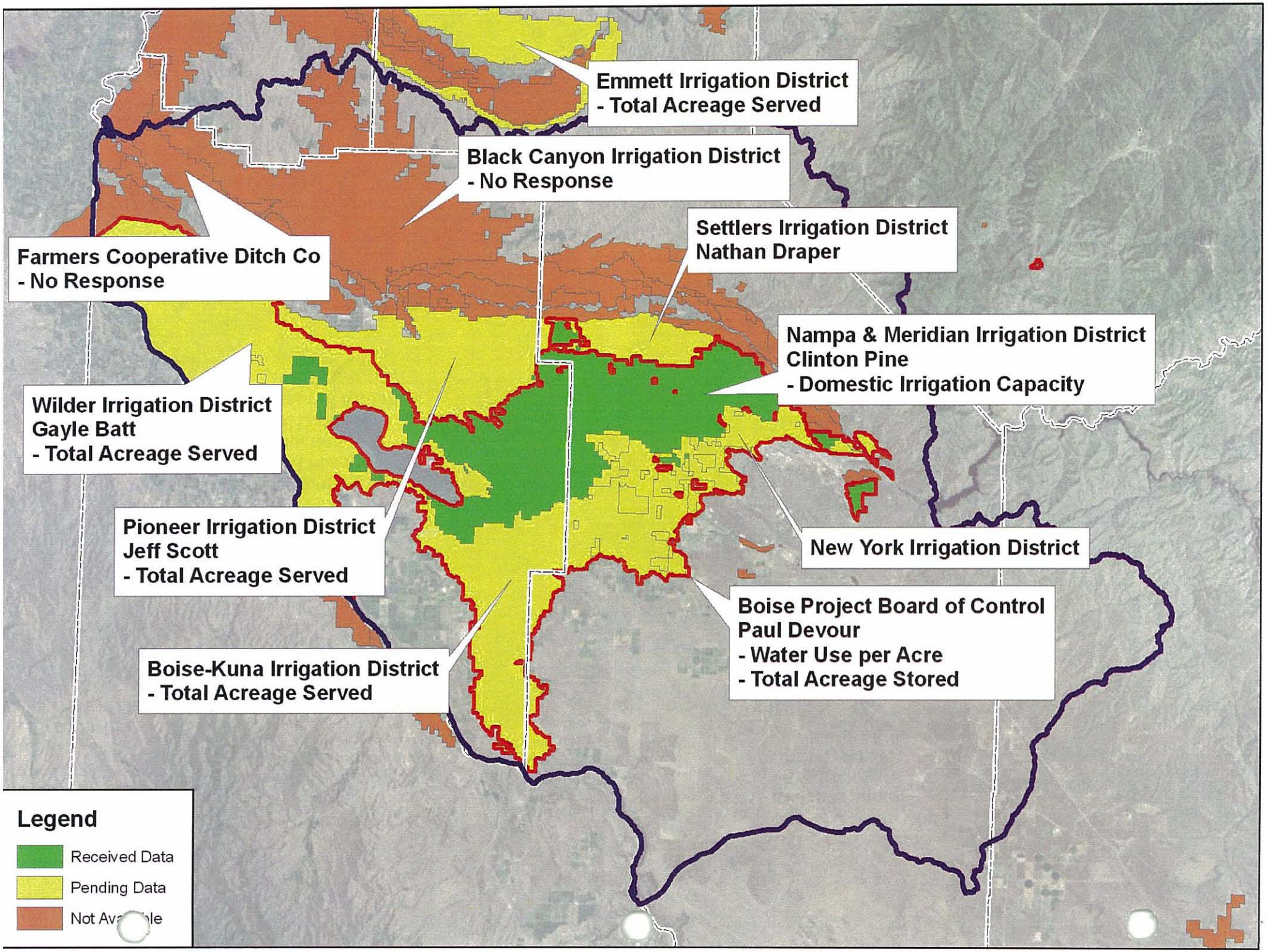
# Study Methodology

# Past Studies

- Treasure Valley Hydrologic Project
- Domestic, Commercial, Municipal, and Industrial Water Demand Assessment and Forecast in Ada and Canyon Counties, 2001
- Water Budget for the Treasure Valley Aquifer System for the Years 1996 and 2000
- Summary of the Treasure Valley Water Summit, 2002
- COMPASS demographic projection

# Data Collection


City of Wilder
Collin Cook
- Production
- DCMI Delivery
City of Middleton
Bob Chemman
- Prodcution
- DCMI Delivery
City of Eagle
Normal Revels
- Production
City of Garden City
Collen Schmidt
- Production
- DCMI Delivery
Capitol Water Corp
Robert Price
- Production
City of Caldwell
Gary Shoemaker
- Production
- DCMI Delivery
City of Nampa
Michael Fuss
- Production
- DCMI Delivery
- Pressured Irrigation
City of Meridian
Kyle Radak
- Production
- DCMI Delivery
United Water Corp
Scott Rhead
- Production
- DCMI Delivery
City of Kuna
Jace Yarton
- Production
- DCMI Delivery
- Pressurized Irrigation
Legend
Received Data
Pending Data
Not Available


Emmett Irrigation District
- Total Acreage Served
Black Canyon Irrigation District
- No Response
Settlers Irrigation District
Nathan Draper
Farmers Cooperative Ditch Co
- No Response
Nampa & Meridian Irrigation District
Clinton Pine
- Domestic Irrigation Capacity
Wilder Irrigation District
Gayle Batt
- Total Acreage Served
Pioneer Irrigation District
Jeff Scott
- Total Acreage Served
New York Irrigation District
Boise Project Board of Control
Paul Devour
- Water Use per Acre
- Total Acreage Stored
Boise-Kuna Irrigation District
- Total Acreage Served
Legend
Received Data
Pending Data
Not Available

# Data Summary Table

| 2009 Water Data | Production | DCMI Delivered | Demand by Pop Est | Domestic Irrigation | Total Demand | %Loss | Population % | Calculated gpcd |
|---|---|---|---|---|---|---|---|---|
| City of Caldwell | 5,565 | 5,119 | | - | 5,565 | 8% | 9.2% | 124 |
| City of Melba | | | 69 | - | 69 | - | 0.1% | |
| City of Middleton | 597 | | | - | 597 | - | 0.8% | 163 |
| City of Nampa | 8,500 | 7,200 | | - | 8,500 | 15% | 18.2% | 96 |
| City of Parma | | | 226 | - | 226 | - | 0.4% | |
| City of Wilder | 190 | 190 | | - | 190 | 0% | 0.4% | 105 |
| City of Boise | | | | | 47,746 | - | 45.7% | 214 |
| Capitol Water Corp (Boise) | 2,845 | | | - | 2,845 | - | | |
| United Water Idaho (Boise) | 44,901 | 42,648 | | - | 44,901 | 5% | | |
| City of Eagle | | | | | 2,937 | - | 4.4% | 136 |
| Eagle Water Company | 2,547 | | | | 2,547 | - | | |
| United Water Idaho (Eagle) | 390 | 335 | | - | 390 | 14% | | |
| City Of Garden City | 4,342 | 2,808 | | - | 4,342 | 35% | 2.7% | 335 |
| City Of Kuna | | | | | 2,668 | - | 2.9% | 186 |
| City of Kuna (excl. Mayfield) | 2,419 | 1,387 | | 637 | 2,419 | 43% | | 169 |
| Mayfield Springs Water Co | 249 | | | | 249 | - | | |
| City Of Meridian | 9,350 | 9,000 | | - | 9,350 | 4% | 13.8% | 139 |
| City Of Greenleaf | | | 110 | - | 110 | - | 0.2% | |
| City of Star | | | 1,135 | | 1,135 | - | 1.2% | |
| City of Notus | | | 77 | | 77 | - | 0.1% | |
| City Subtotal | 81,895 | 68,687 | 1,617 | 637 | 83,512 | 16% | 100% | 167 |
| Rural Areas Ada Co gpcd | | | 13,451 | | 13,451 | - | | |
| Rural Areas Cayon Co gpcd | | | 12,330 | | 12,330 | - | | |
| TOTAL | 163,790 | 137,374 | 16,685 | 1,274 | 25,780 | 16% | | |

# Data gaps

- Incomplete data set for domestic irrigation water deliveries and acres served
- Lack of information on seed crop acreage and water delivery
- Land use maps is available only for certain year

# Current Basin Understanding

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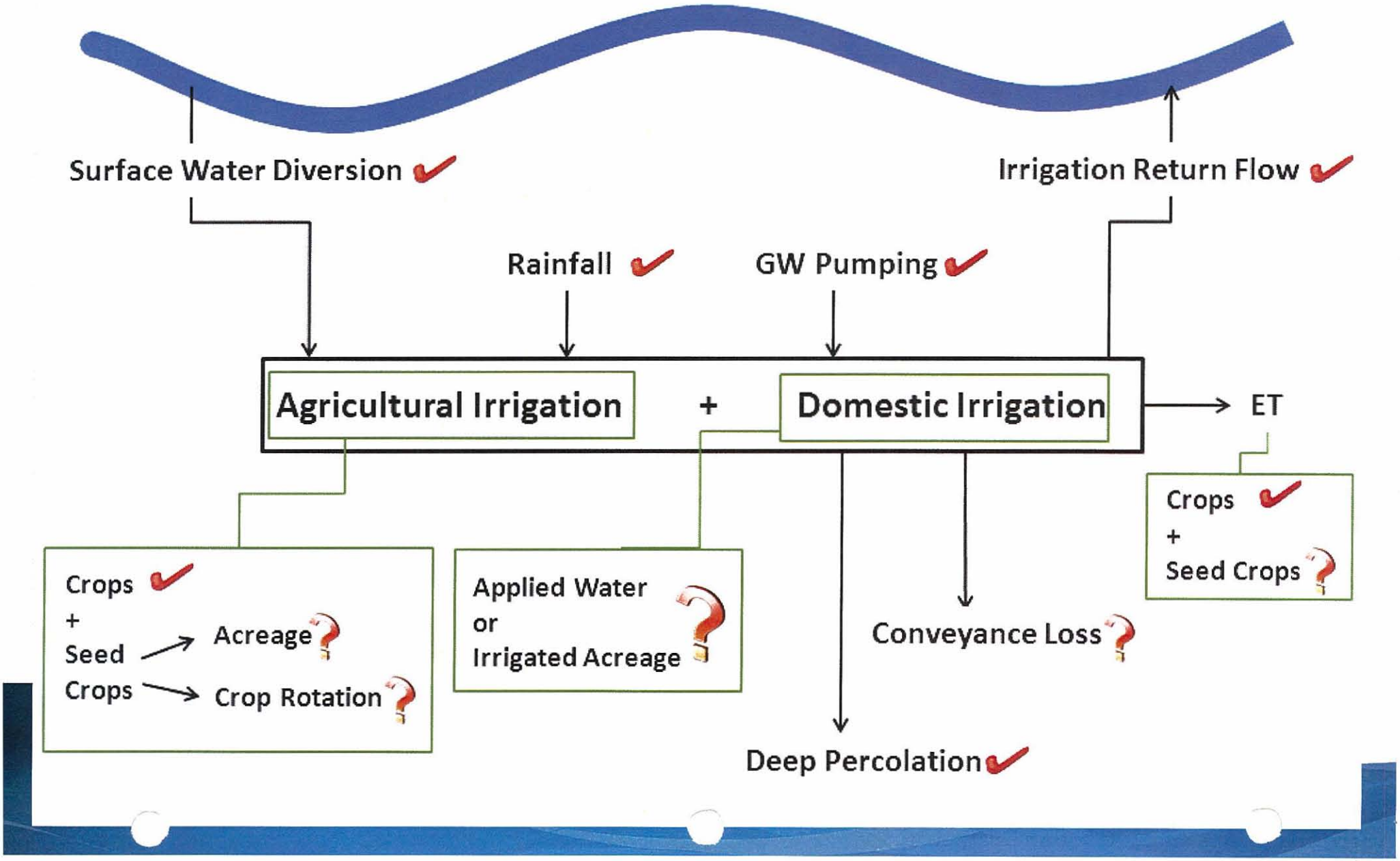
# Irrigation Data Requirements



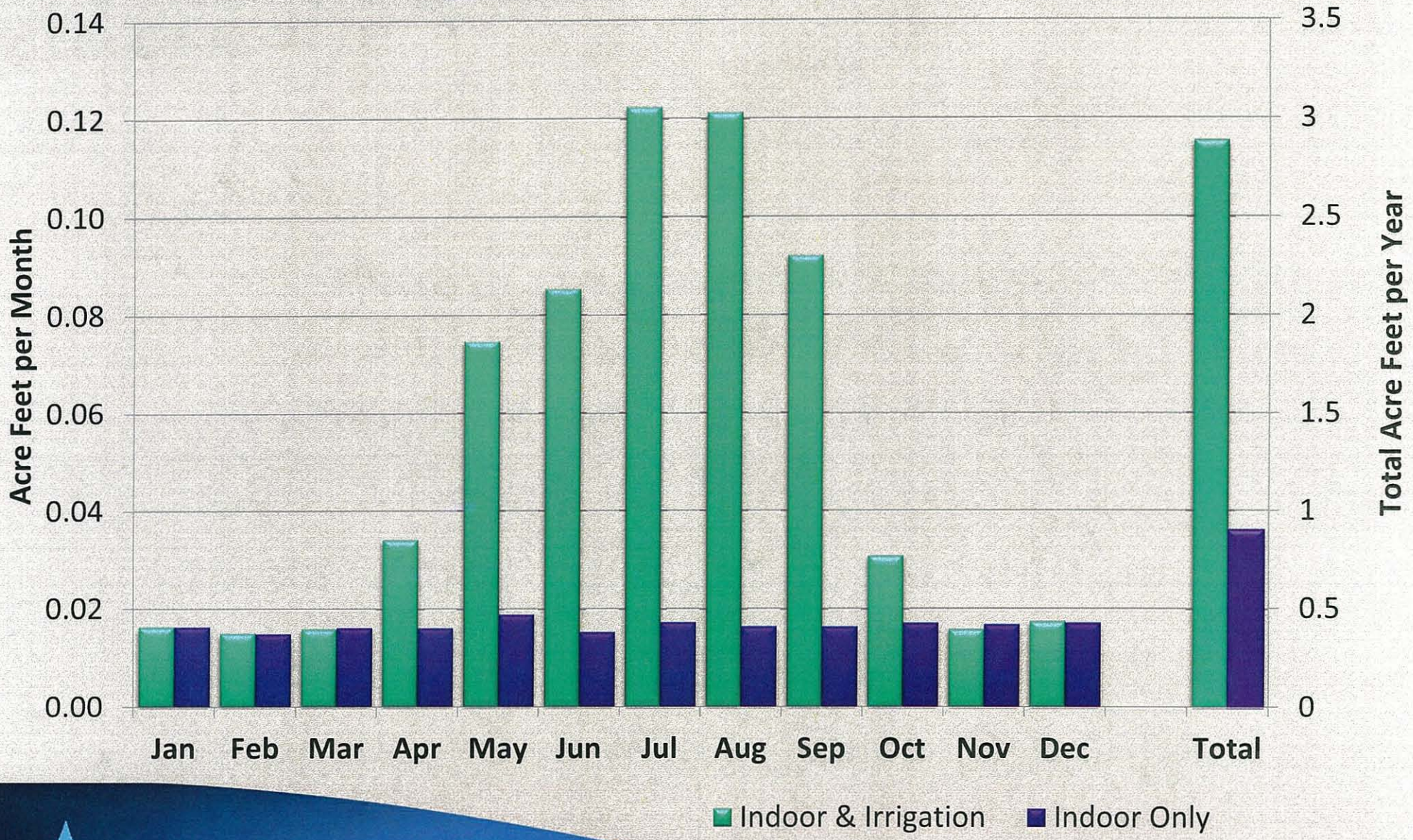
# Water use

- Domestic, Commercial, Municipal, and Industrial water demand
  - Current understanding of dual system
    - Domestic water supplies directly provided by municipalities or private water producers (United Water)
    - Domestic irrigation supplied by irrigation district surface water deliveries by gravity or pressurized irrigation
    - Methods for delivery of domestic irrigation water is "on-demand" or "constant flow"
    - Deliveries are based on water rights. Rights stay with the land

# Water Use

- Two seasons of water use
  - Peak domestic water use during summer months
  - Domestic irrigation estimates
    - » Boise Project (2.52 AF/acre)
    - » United Water (1.8-2.4AF/acre)
    - » Nampa-Meridian ( AF/acre)

# Domestic Irrigation

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# Project Approach

- Establish a basin water demand for current conditions
- Project Water demand 50 years into future
  - Projections will include:
    - Existing urban water demand projection
    - Existing plans for conservation
    - Draft 2035 COMPASS demographic projection

# Project Approach

- Agricultural water demand using Integrated Water Flow Model Demand Calculator (IDC Model)
- Data Elements
  - Land use distribution,
  - Crop acreage,
  - Hydrologic data,
  - Irrigation efficiency/practices,
  - Groundwater/surface water deliveries

# Project Approach

- Land use and crop acreage
  - Historical land use trend in reduction of overall acreage
  - Historical crop acreage
    - Projecting the crop pattern(s) with a declining trend
  - Seed crops
    - Availability of data

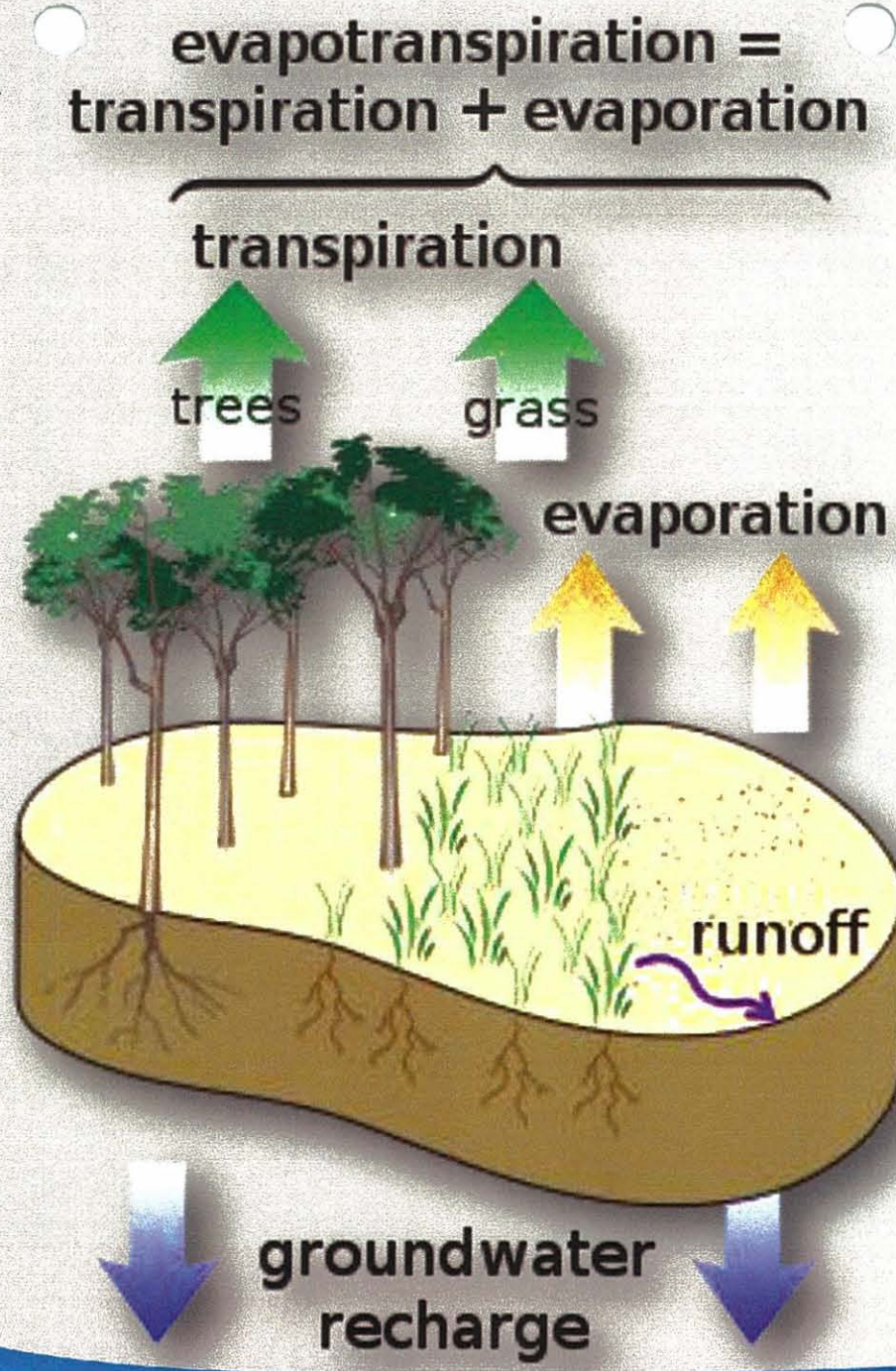
# Evapotranspiration and Consumptive Irrigation Water Requirements

Consumptive Use

Water consumed through evaporation, transpiration, or incorporated into products or crops.

Evapotranspiration (ET)

water discharged to the atmosphere as a result of evaporation from the soil and surface-water bodies and as a result of plant transpiration.

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# Irrigation Efficiencies

| | | Application Eff (%) |
|---|---|---|
| Surface Systems | Furrow | 35-60 |
| | Corrugate | 30-55 |
| | Border, level | 60-75 |
| | Border, graded | 55-75 |
| | Flood, wild | 15-35 |
| | Surge | 50-55 |
| | Cablegation | 50-55 |
| Sprinkler Systems | Stationary lateral | 60-75 |
| | Solid-set lateral | 60-85 |
| | Traveling big gun | 55-67 |
| | Stationary big gun | 50-60 |
| | Center-pivot lateral | 70-85 |
| | Moving lateral | 80-87 |
| Micro-irrigation systems | Surface drip | 90-95 |
| | Subsurface drip | 90-95 |
| | Micro-spray or mist | 85-90 |

(Source: Sterling, R., and W. H. Neibling, 1994. Final Report of the Water Conservation Task Force. IDWR Report. Idaho Department of Water Resources, Boise)

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# Previous Studies Comparison

| Project | | Year | Water Demand (AF/year) | Ag Area (Acres) | Applied Water (AF/Acre/year) |
|---|---|---|---|---|---|
| IDC | Crop Ag Eff = 60% | 1994 | 1,438,029 | 361,154 | 3.98 |
| | Crop Ag Eff = 50% | | 1,725,634 | 361,154 | 4.78 |
| | Average | | 1,581,832 | 361,154 | 4.38 |
| IDC | Crop Ag Eff = 60% | 2000 | 1,384,390 | 358,229 | 3.86 |
| | Crop Ag Eff = 50% | | 1,661,269 | 358,229 | 4.64 |
| | Average | | 1,522,830 | 358,229 | 4.25 |
| TVHP (gravity irrigated land only) | | 1996 | 1,155,500 | 252,000 | 4.59 |
| | | 2000 | 1,209,700 | 269,000 | 4.5 |
| DP (gravity irrigated land only) | | Average 1967-1997 | 1,154,760 | 269,000 | 4.29 |

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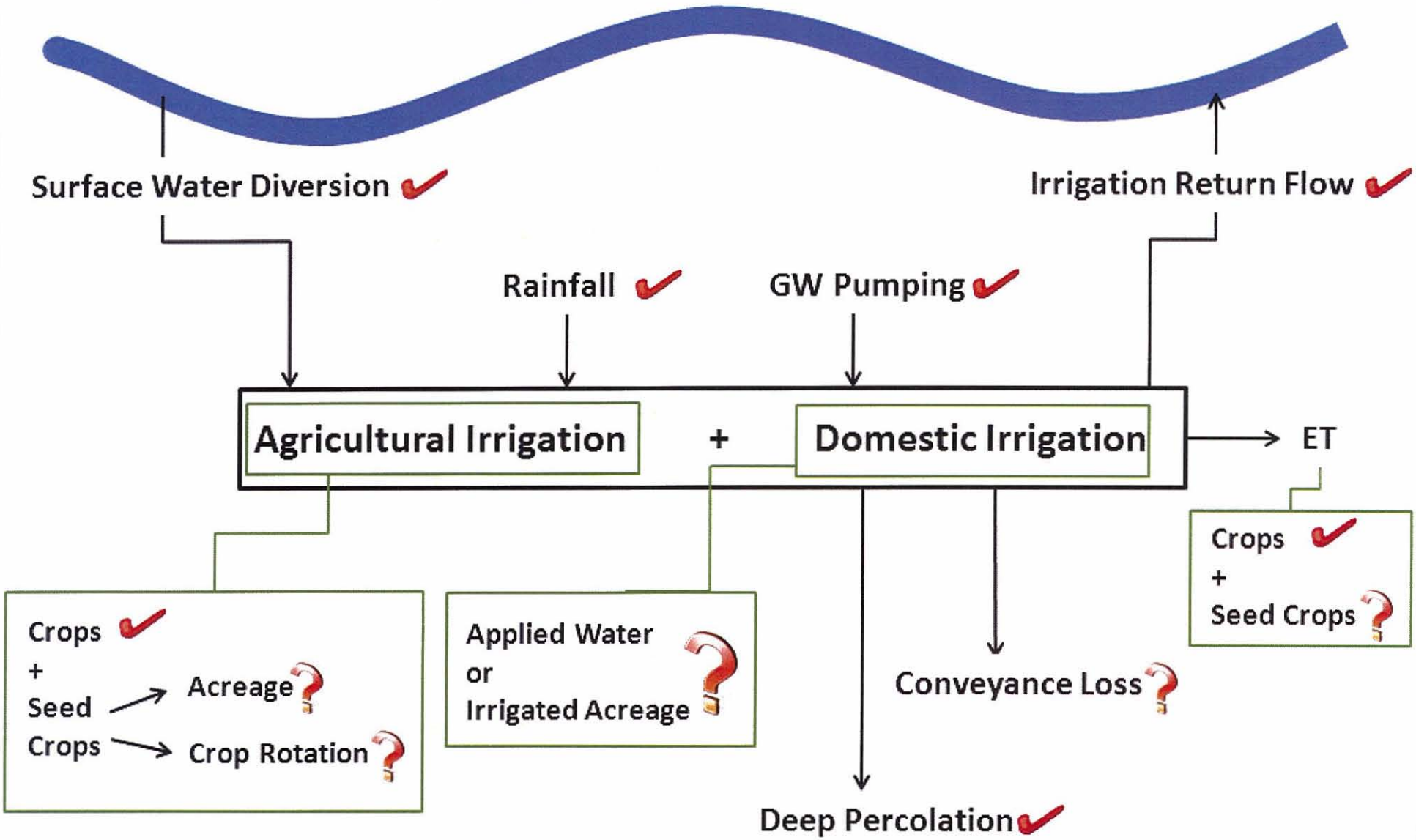
# Resolving Data Gaps

- Differences in water deliveries, drainage, and losses from streams and canals
  - Overall look at how much water is diverted into the basin and how much is used by crops and other beneficial uses of the water (recharge)

# Irrigation Data Requirements



# Discussion Topics from the Individual Meetings with Advisory Committee Members

# Conservation

- All planned conservation provided by agencies is included in demand calculation
- Unplanned conservation or potential conservation is part of future water supply planning, which is out of scope

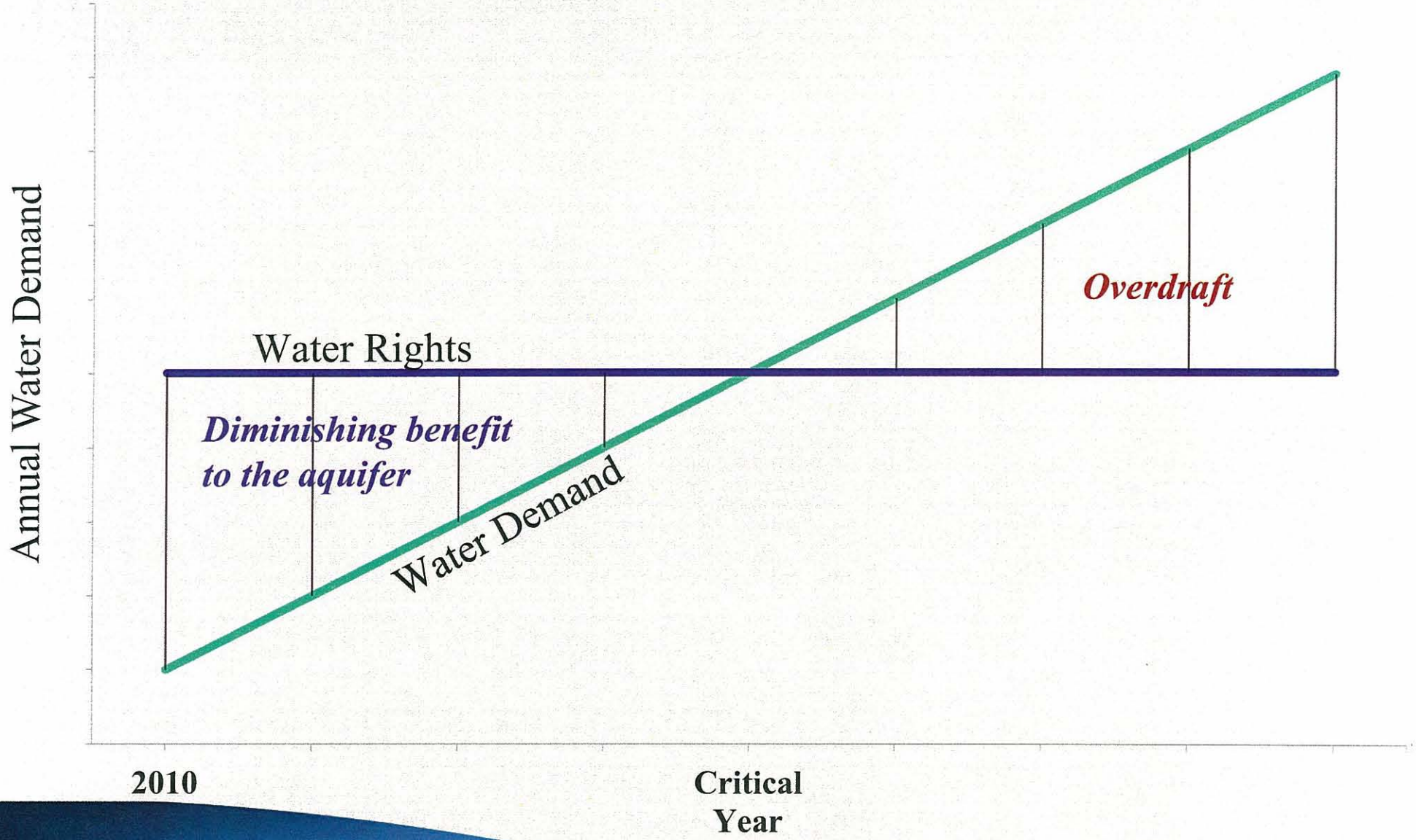
# Demand and Consumptive Use

- Agricultural Water Demand = CUAW/I.E.
- Urban Water Demand = Indoor Demand + Outside Irrigation Demand
- All of the indoor demand is not consumptively used, but may available as a new source of water, such as recycled water, which can be considered in water supply planning

# Water Rights and Demand

- Water rights and demand needs to be integrated during water supply planning

# Comparative Analysis of Water Rights and Water Demand

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