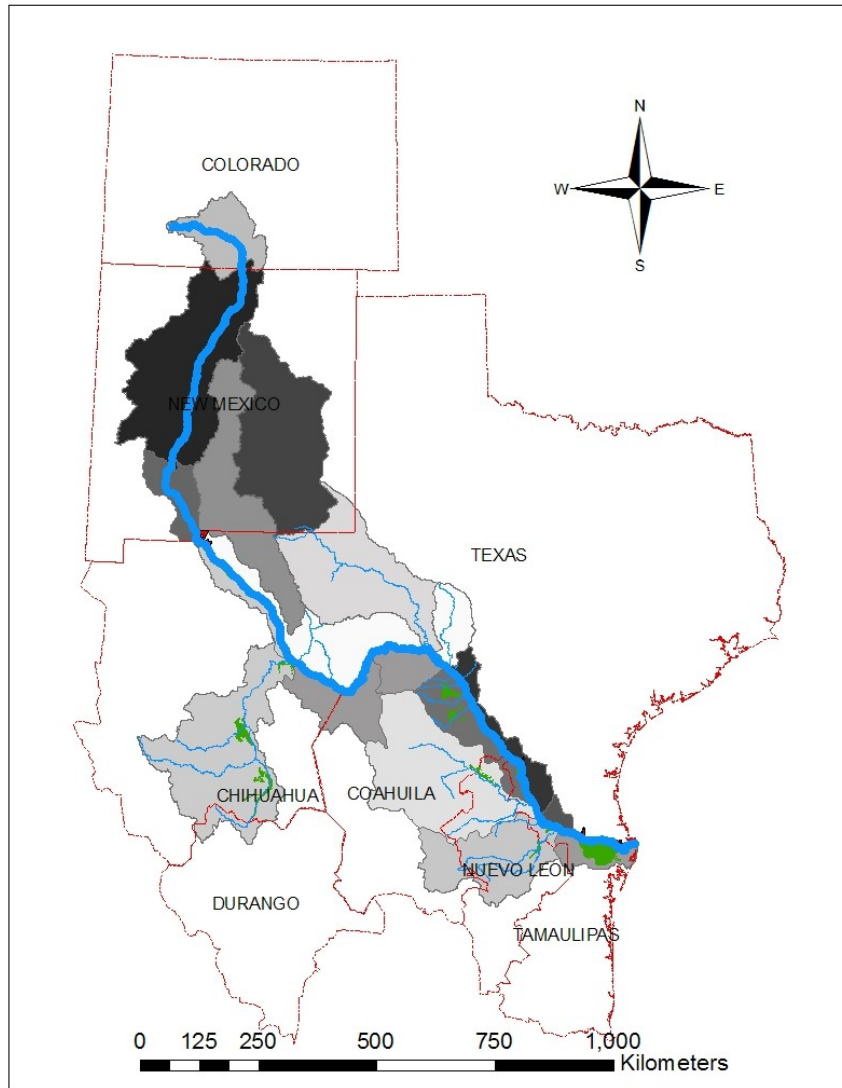


# WATER MANAGEMENT POLICIES TO REDUCE THE OVER-ALLOCATION OF WATER IN THE RIO GRANDE

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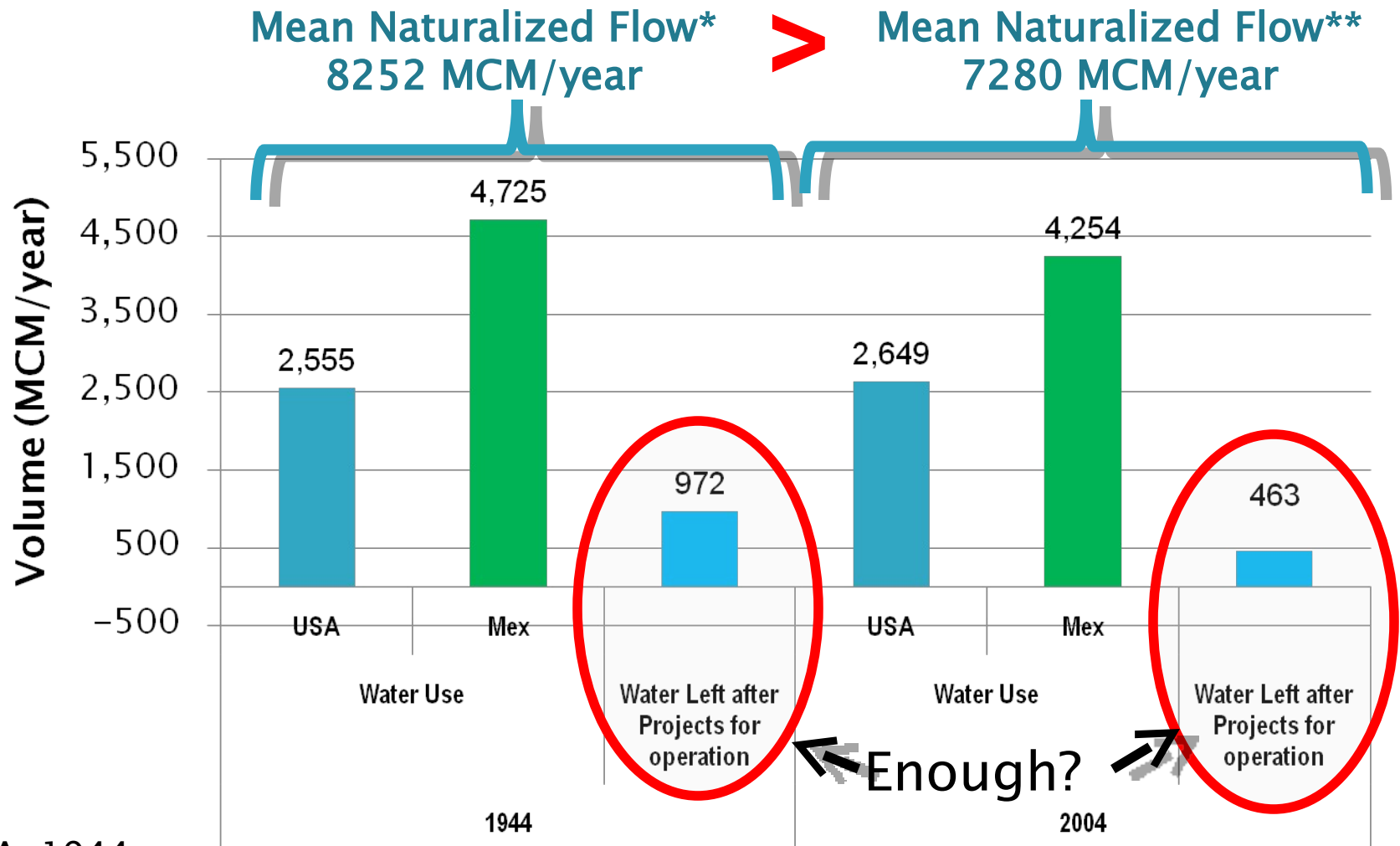
# Rio Grande/Bravo Basin



- Area:
  - 557,722 km<sup>2</sup>
  - Mexico: 48%
  - U.S.: 52%
- Length
  - 2892 km
  - 2034 km international border
- Population over 12 million

# Problematic

## Over allocation of Water Rights

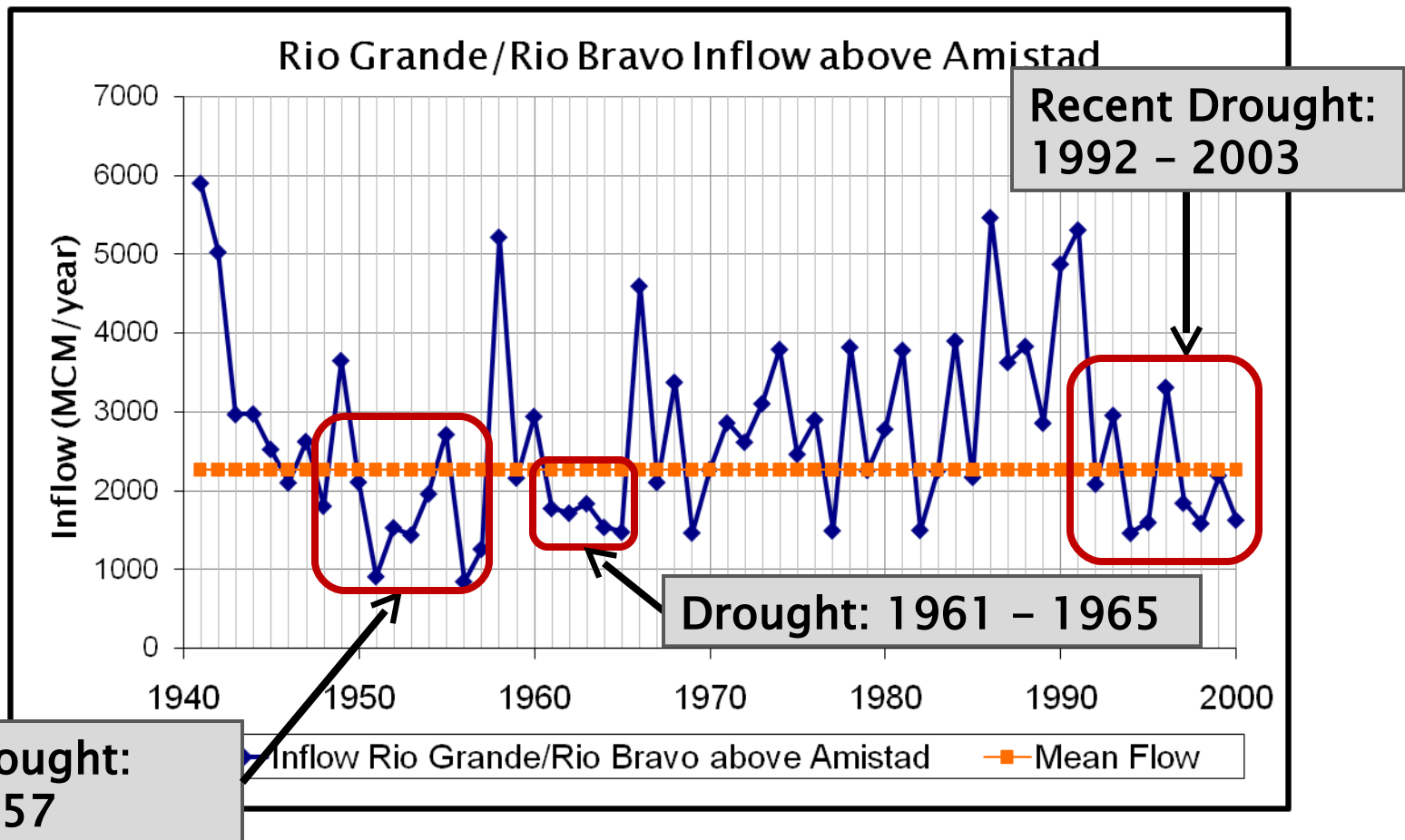


\* CILA, 1944

\*\* CONAGUA, 2004

# Problematic

Over allocation of Water Rights and  
Extended Drought Periods



# Physical Assessment Project

Objective: To examine the hydro-physical opportunities to improve the water management in the whole basin.



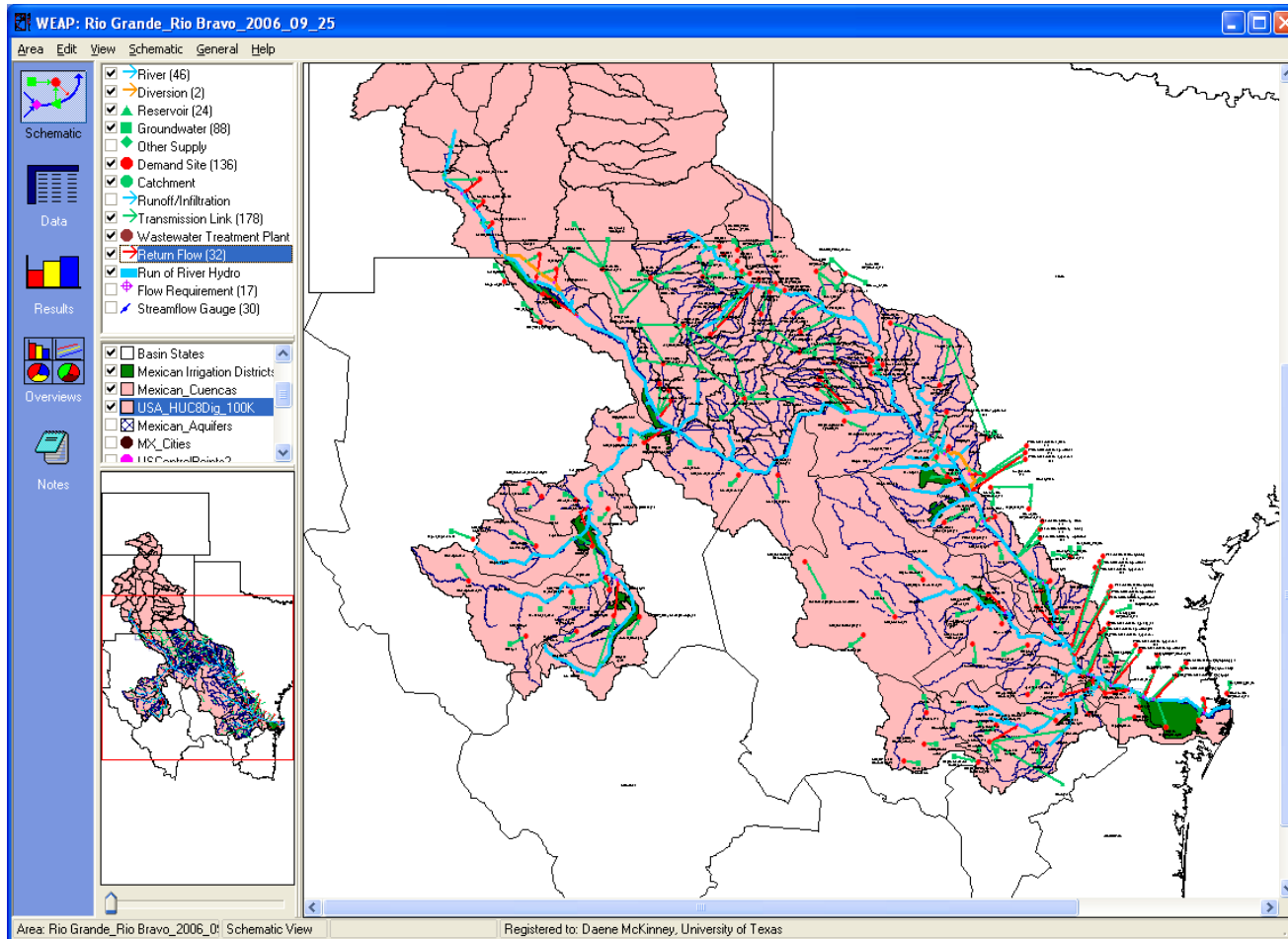
Define a set the scenarios by conducting extensive interviews with: water users, planning agencies, research institutes, NGO's, state and nation government institutions from both sides of the Border

Construction of a basin wide model to simulate the Rio Grande/Bravo Basin as an entity to evaluate the effects of the alternative policies called "Scenarios"



# Stakeholder Suggested Areas for Improvement

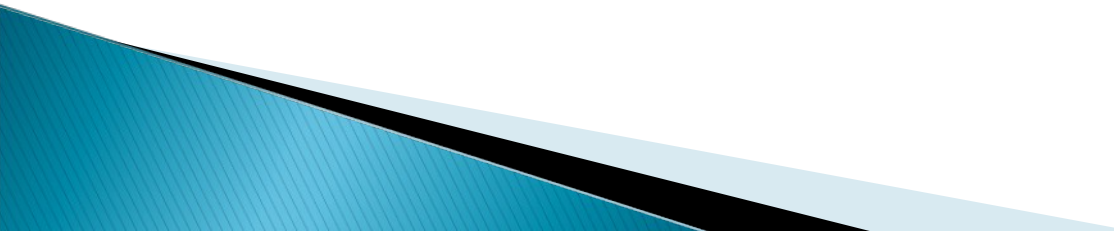
- ▶ Water Right Buybacks & Transfers
- ▶ Groundwater Banking & Conjunctive Management
- ▶ Non-Treaty Tributary Flow Inclusion
- ▶ Water Conservation & Reuse
- ▶ Facility Reconfiguration & Reoperation
- ▶ Brackish Water Desalination
- ▶ Environmental Flows
  
- ▶ Total of 28 Water Management Scenarios
  - Currently 9 have been modeled



Baseline Scenario

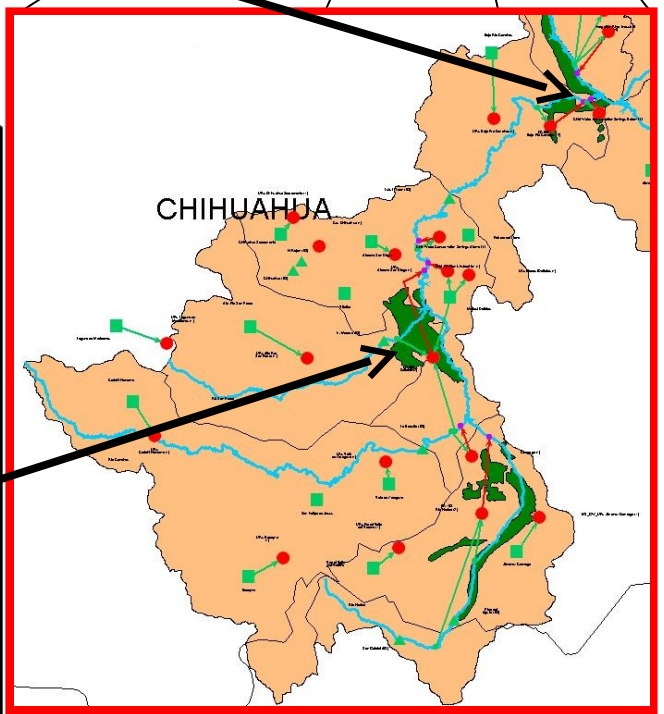
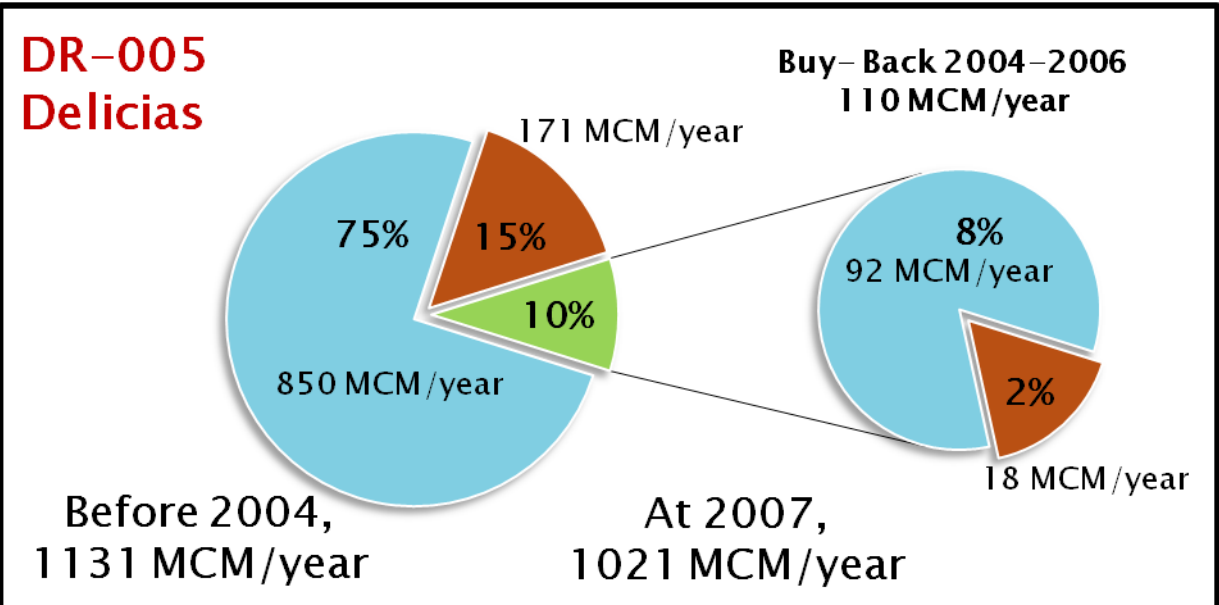
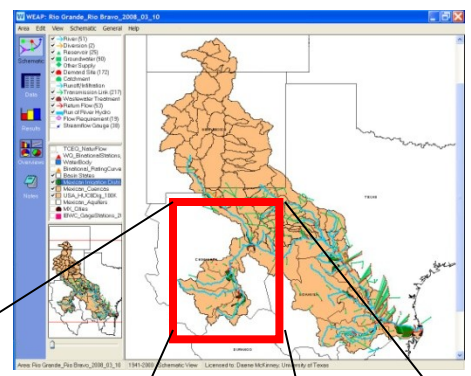
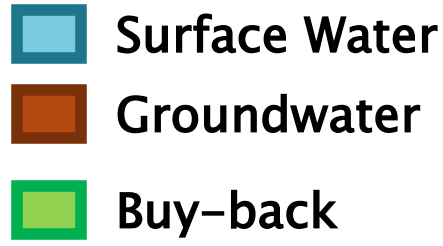
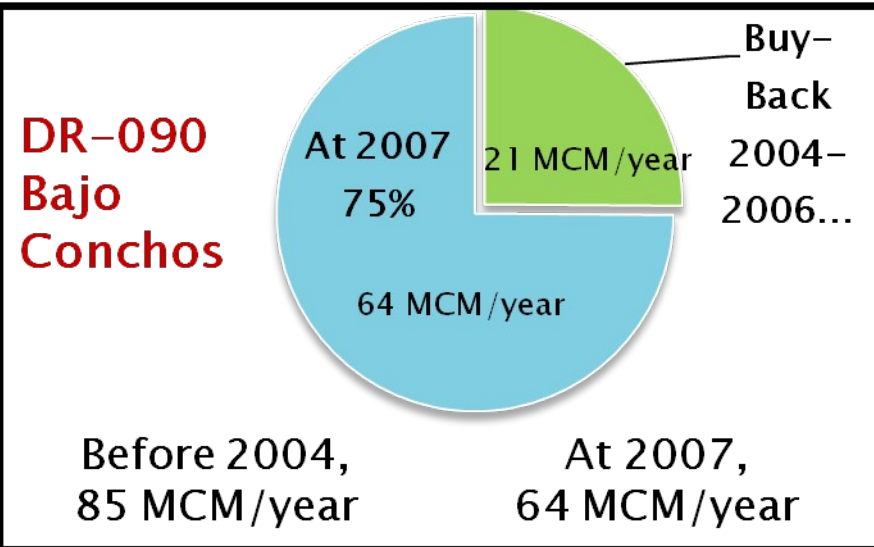
Geodatabase of the Rio Grande/Bravo Basin

# Methodology

- ▶ Scenarios modeled in WEAP
  - ▶ Determine hydrologic feasibility
  - ▶ Comparison to baseline scenario
  - ▶ Quantify the changes in water management planning and management
- 

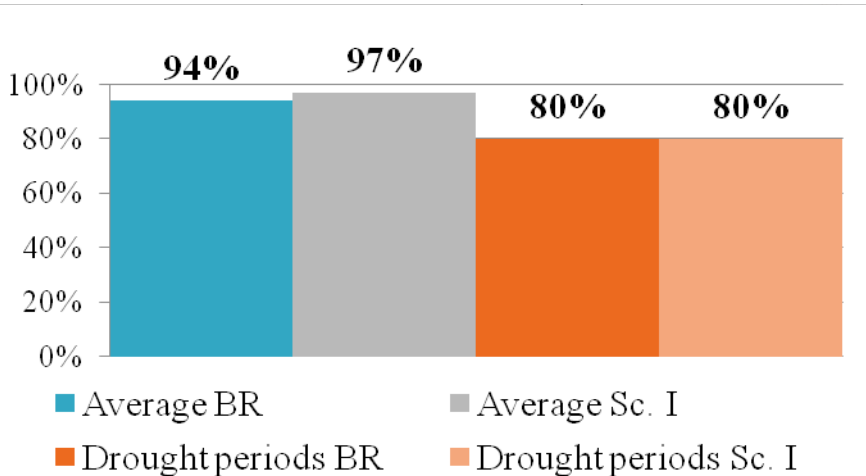


# Buy-Back of Water Rights

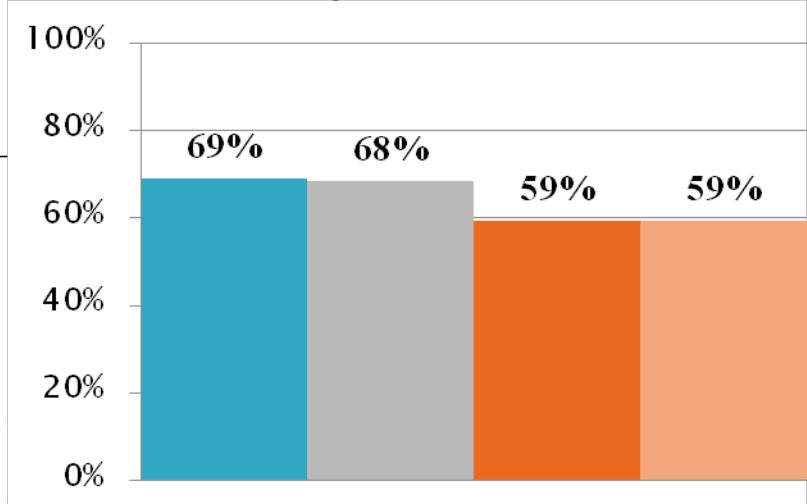


# Avg. Supply during normal & drought periods

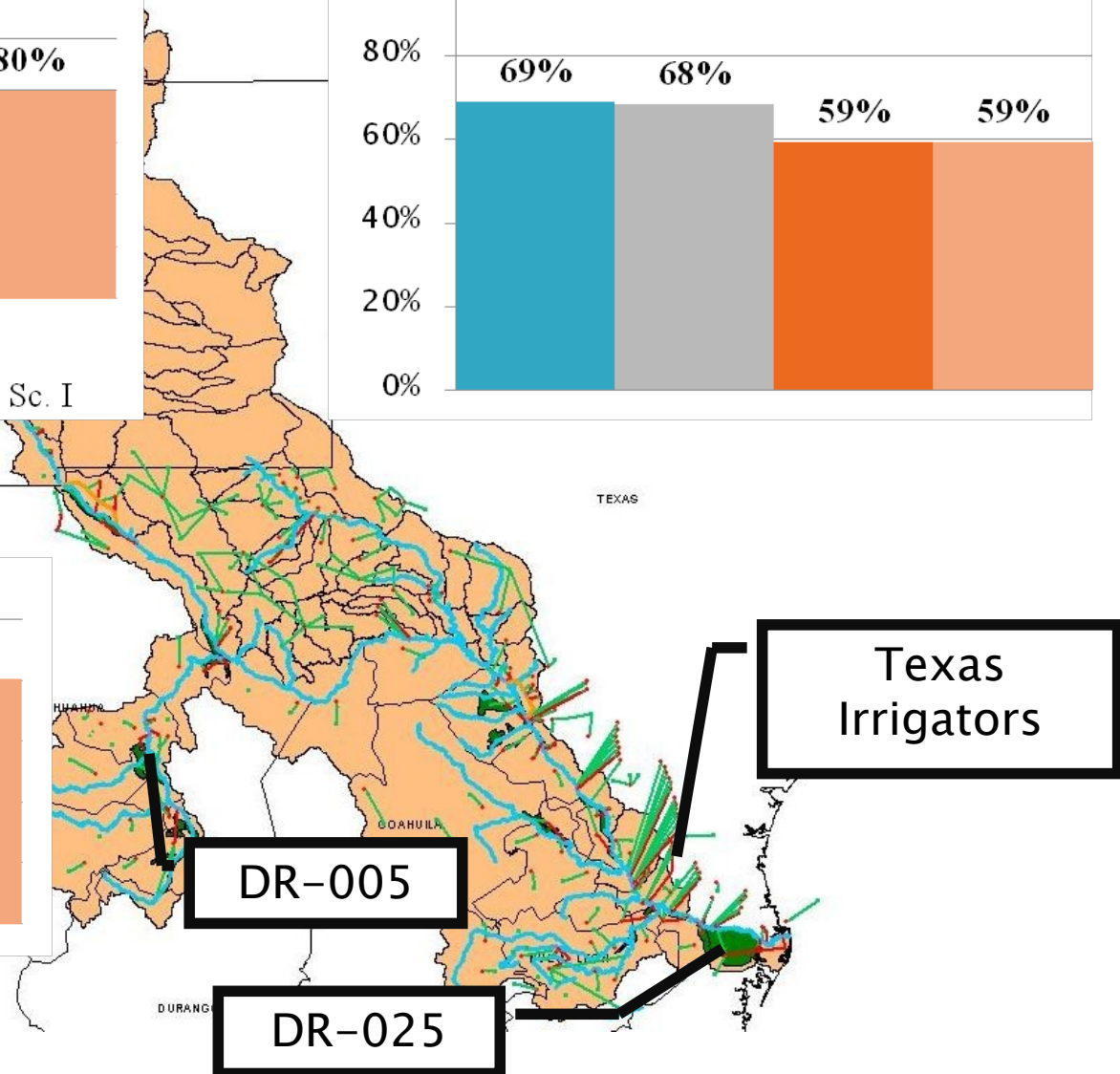
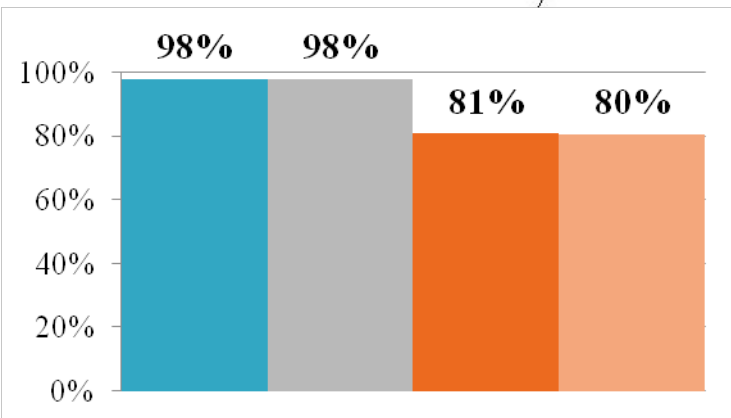
## DR-005 Delicias (1130 MCM/year)



## Lower Basin Texas Irrigators (1801 MCM/year)



## DR-025 Bajo Rio Bravo (861 MCM/year)



BR - Baseline Run  
 Sc. I - Scenario I

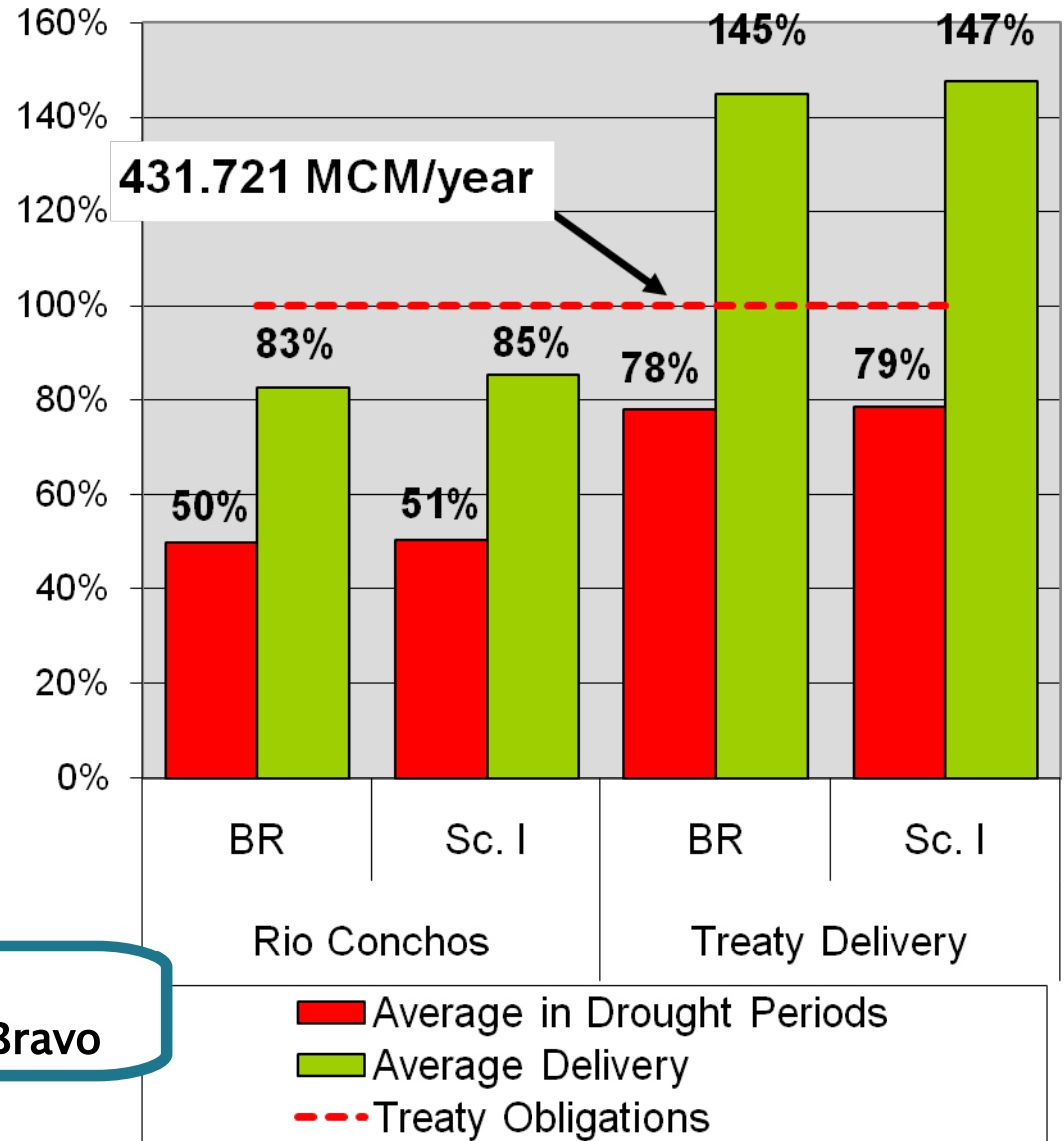
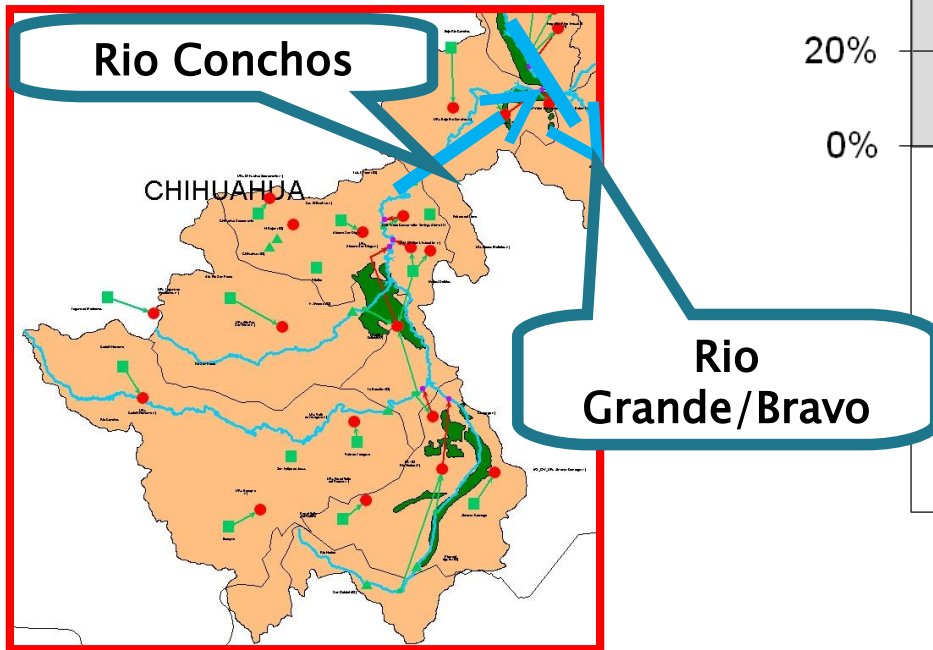
# Treaty Deliveries

Increase in Treaty Deliveries  
from Rio Conchos

Mean Delivery:

Baseline 357 MCM/year

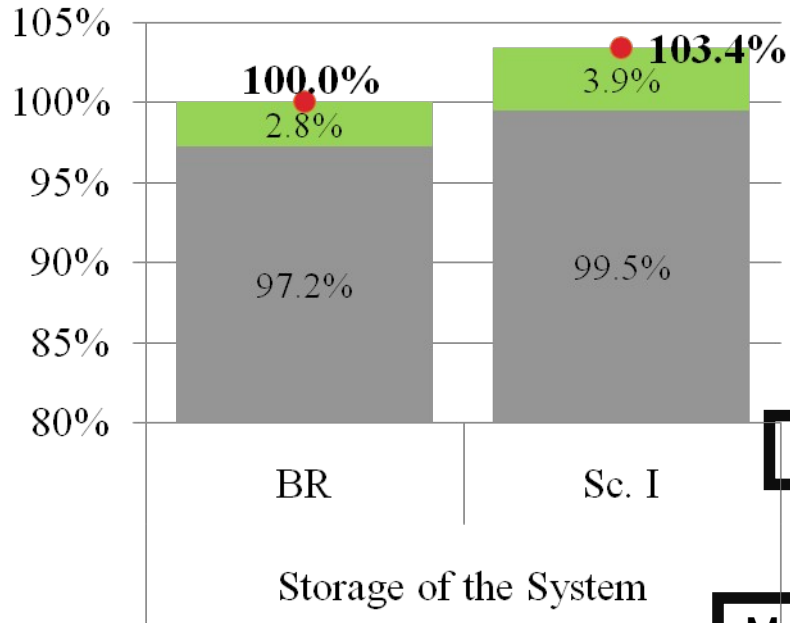
Buy-Backs 368 MCM/year



BR - Baseline Run

Sc. I - Water Buy-Backs

# Long-Term Average System Storage



Storage of the System

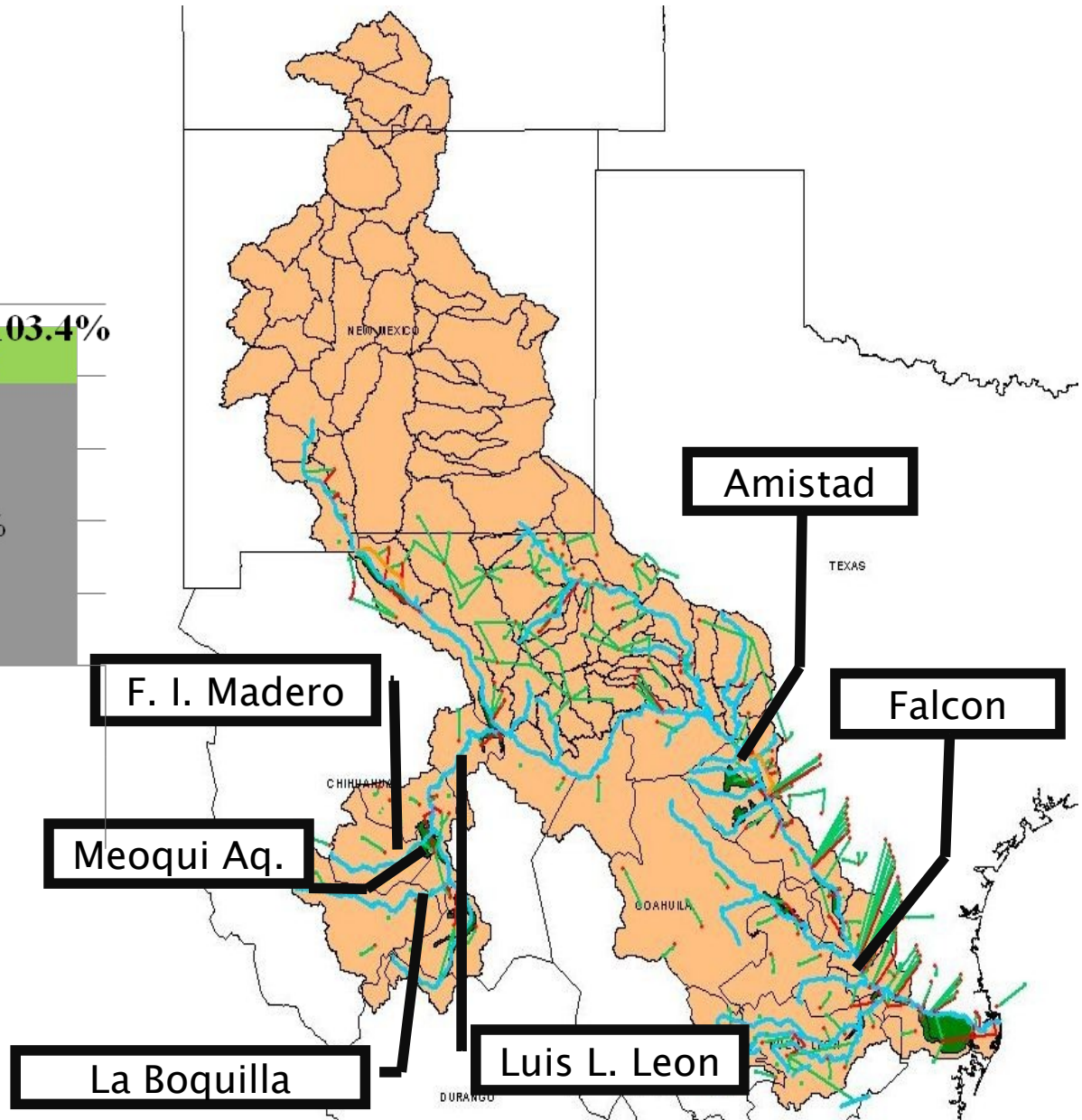
■ Meoqui Aquifer Storage

■ Dam Storage

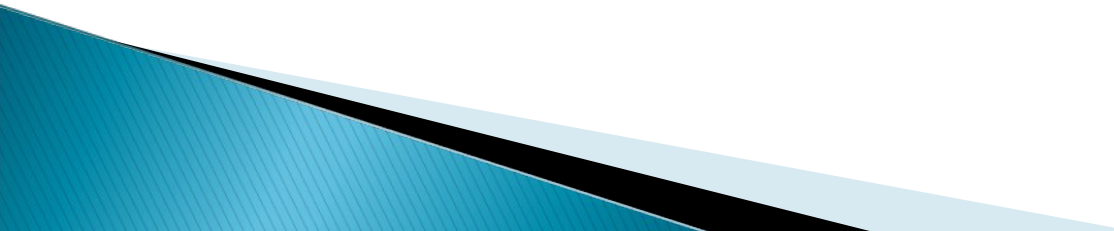
● Storage of the System

BR - Baseline Run

Sc. I – Water Buy-Backs



# Summary of Results

- Increase in mean supply under normal conditions and no increase under drought conditions
  - Increase in mean delivery to treaty
  - Increase in the storage of the system
  - **Mostly, Local benefits**
- 

# Thank you

Acknowledgements:  
Carlos Patiño-Gomez, PhD and CONACYT



Respond:

- Which are hydrologically feasible?
- How do they improve the water plann. & manag.?

Policies already implemented

- **PADUA:** Permanent Buy Back of Water Rights
- **Minute 309:** Improvement in Infrastructure

Policies proposed

- **GW Bank :** Change in water allocation policy
- **Env. Flows:** Hydrological Feasibility

Minute 309 + Env Flows  
GW Bank + Minute 309  
PADUA + GW Bank  
PADUA + Env. Flows

PADUA  
Minute 309

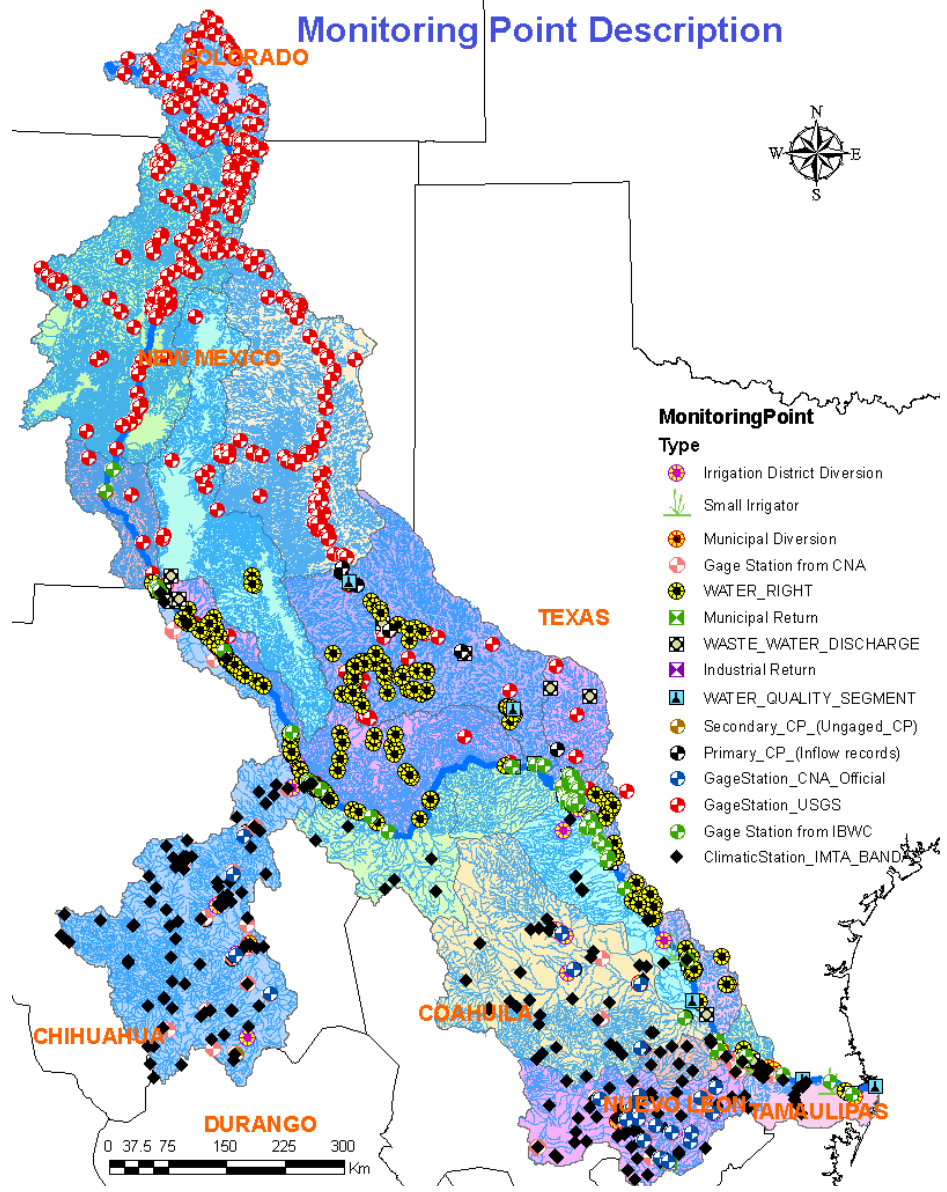
Comparison

Comparison

Baseline Scenario

Geodatabase of the Rio Grande/Bravo Basin





Geodatabase of the Rio Grande/Bravo Basin