



# STORAGE AND FLOOD CONDITIONS IN THE RIO GRANDE BASIN

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Lower Rio Grande Citizens' Forum Meeting  
October 29, 2008

# PRESENTATION OUTLINE

- Overview of the basin
- Water delivery under the 1944 Water Treaty
- September-October 2008 flood at Presidio-Ojinaga
- Current conditions

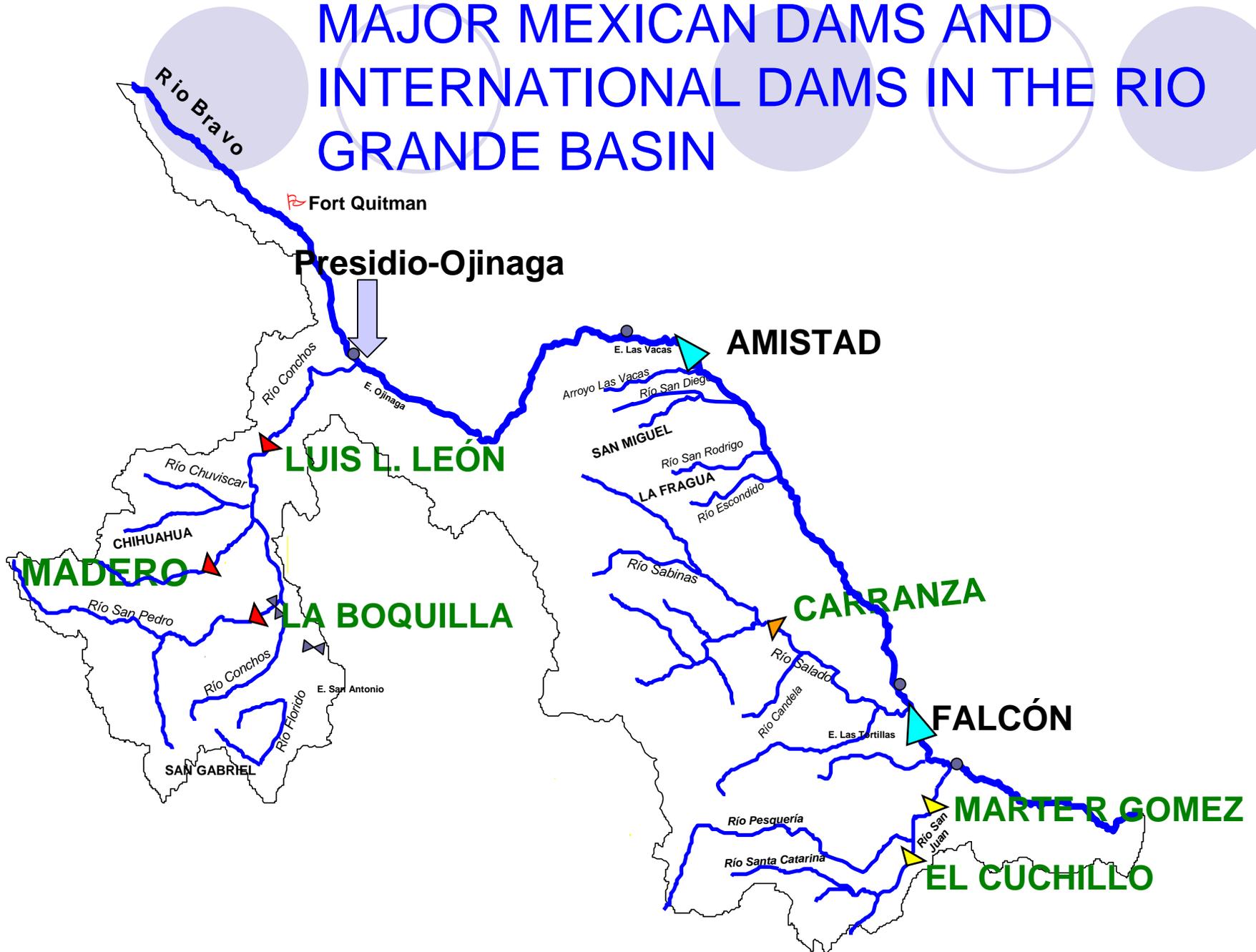


# MAJOR MEXICAN DAMS

- Conchos River Basin
  - Boquilla Dam
  - Francisco Madero Dam (Las Virgenes)
  - Luis Leon Dam (El Granero)
  - Conchos-Rio Grande confluence at Presidio-Ojinaga
- Salado River
  - Venustiano Carranza Dam
  - Salado River flows into Falcon Dam
- San Juan River
  - Marte Gomez Dam
  - El Cuchillo Dam
  - San Juan-Rio Grande confluence at Rio Grande City



# MAJOR MEXICAN DAMS AND INTERNATIONAL DAMS IN THE RIO GRANDE BASIN



# AMISTAD DAM

- IBWC International Dam/Storage Reservoir
- Located at Del Rio, TX-Cd. Acuña, Coah.
- Uses
  - Water Storage
  - Flood Control
  - Hydropower
  - Recreation



# AMISTAD DAM



# FALCON DAM

- IBWC International Dam/Storage Reservoir
- Located along the border between Laredo and McAllen, TX
- Purposes
  - Water Storage
  - Flood Control
  - Hydropower
- Releases from Falcon affect Lower Rio Grande Valley



# LOWER RIO GRANDE FLOOD CONTROL PROJECT

- 180 river miles from Peñitas, TX to Gulf of Mexico
- 270 miles of U.S. levees
- 30,000 acres of interior floodway in U.S.
- 2 diversion dams able to divert flood flows into U.S. and Mexican interior floodways



# LOWER RIO GRANDE FLOOD CONTROL PROJECT



# LOWER RIO GRANDE FLOOD CONTROL PROJECT



**Anzalduas Dam**



# LOWER RIO GRANDE FLOOD CONTROL PROJECT



**Retamal Dam**



# 1944 WATER TREATY– RIO GRANDE

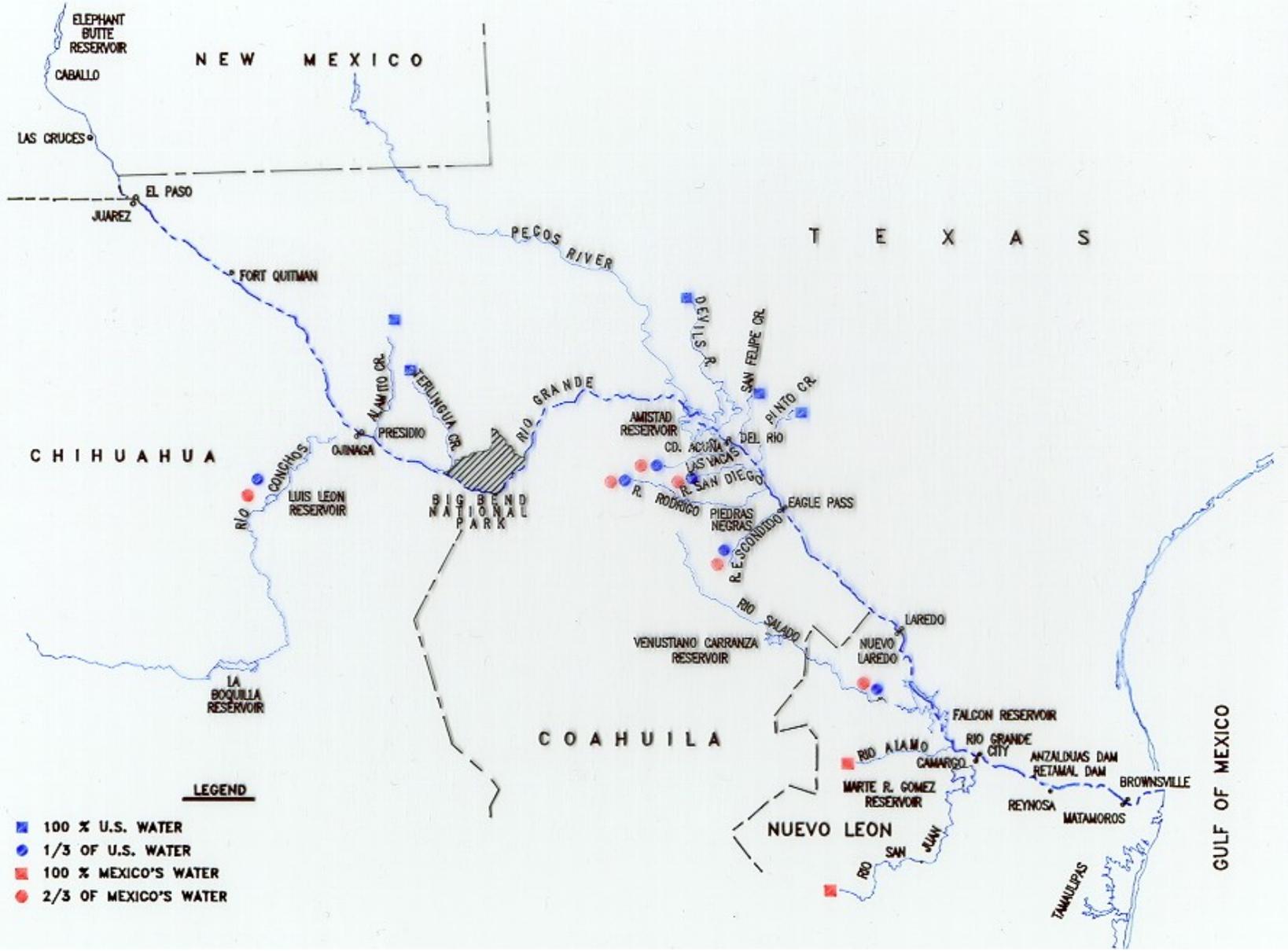
- U.S. receives 1/3 of the waters arriving in the Rio Grande from six Mexican tributaries
  - Conchos
  - Salado
  - San Rodrigo
  - Escondido
  - Arroyo de las Vacas
  - San Diego



# 1944 WATER TREATY– RIO GRANDE

- Mexico delivers water to the U.S. in cycles of five years between Ft. Quitman and the Gulf
  - Minimum annual average of 350,000 acre-feet
  - 1,750,000 acre-feet 5-year delivery obligation
- Conchos River is the main tributary for water deliveries to the U.S.
- When U.S. conservation capacity is reached in Amistad and Falcon Dams, all debts are paid and a new five-year cycle begins
- Mexico incurred a deficit in deliveries in the 1990s but paid off the deficit in 2005





ELEPHANT BUTTE RESERVOIR  
 CABALLO  
 LAS CRUCES  
 EL PASO  
 JUAREZ

NEW MEXICO

T E X A S

CHIHUAHUA

COAHUILA

NEW LEO N

GULF OF MEXICO

PECOS RIVER  
 RIO GRANDE  
 RIO CONCHOS  
 RIO SALADO  
 RIO ALAMO  
 RIO SAN JUAN  
 DEVILS R.  
 SAN FELIPE CR.  
 PINTO CR.  
 DEL RIO  
 LAS VACAS  
 R. SAN DIEGO  
 R. RODRIGO  
 PIEDRAS NEGRAS  
 R. ESCOBEDO  
 EAGLE PASS  
 LAREDO  
 NUEVO LAREDO  
 FALCON RESERVOIR  
 RIO GRANDE CITY  
 ANZALDUAS DAM  
 RETAMAL DAM  
 BROWNSVILLE  
 REYNOSA  
 MATAMOROS  
 TAMULIPS

AMISTAD RESERVOIR  
 CD. ACUÑA  
 PRESIDIO  
 QUINAGA  
 OJINAGA  
 MAMITO CR.  
 TERLINDIA CR.  
 BIG BEND NATIONAL PARK

VENUSTIANO CARRANZA RESERVOIR  
 LUIS LEON RESERVOIR  
 LA BOQUILLA RESERVOIR  
 MARTE R. GOMEZ RESERVOIR

# PRESIDIO FLOOD CONTROL PROJECT

- 15 miles of U.S. levees
- Levees 6-14 feet in height; 25-year design flood
- Protects 5400 acres of land – farmland, City of Presidio
- Series of gaging stations on Rio Grande and tributaries



# PRESIDIO FLOOD

- Heavy precipitation in the Conchos River basin in Aug. & Sept. filled Mexican Dams, requiring spills/releases
- USIBWC began flood operations at Presidio Sept. 5
- Peak flow of 53,000 cfs on September 16 (levees designed for 42,000 cfs)
- Downstream portion of U.S. levee failed, flooding farmland and a golf course
- Widespread flooding in Ojinaga due to failure of Mexican levees; international bridge closed for weeks
- Massive effort to shore up remaining U.S. levee, protect the City of Presidio
- USIBWC deployed available personnel from TX, NM
- Flood operations continued through mid-October



# PRESIDIO FLOOD



September 18, 2008



# PRESIDIO FLOOD



Summer 2007



# PRESIDIO FLOOD



Madero Dam, September 2008



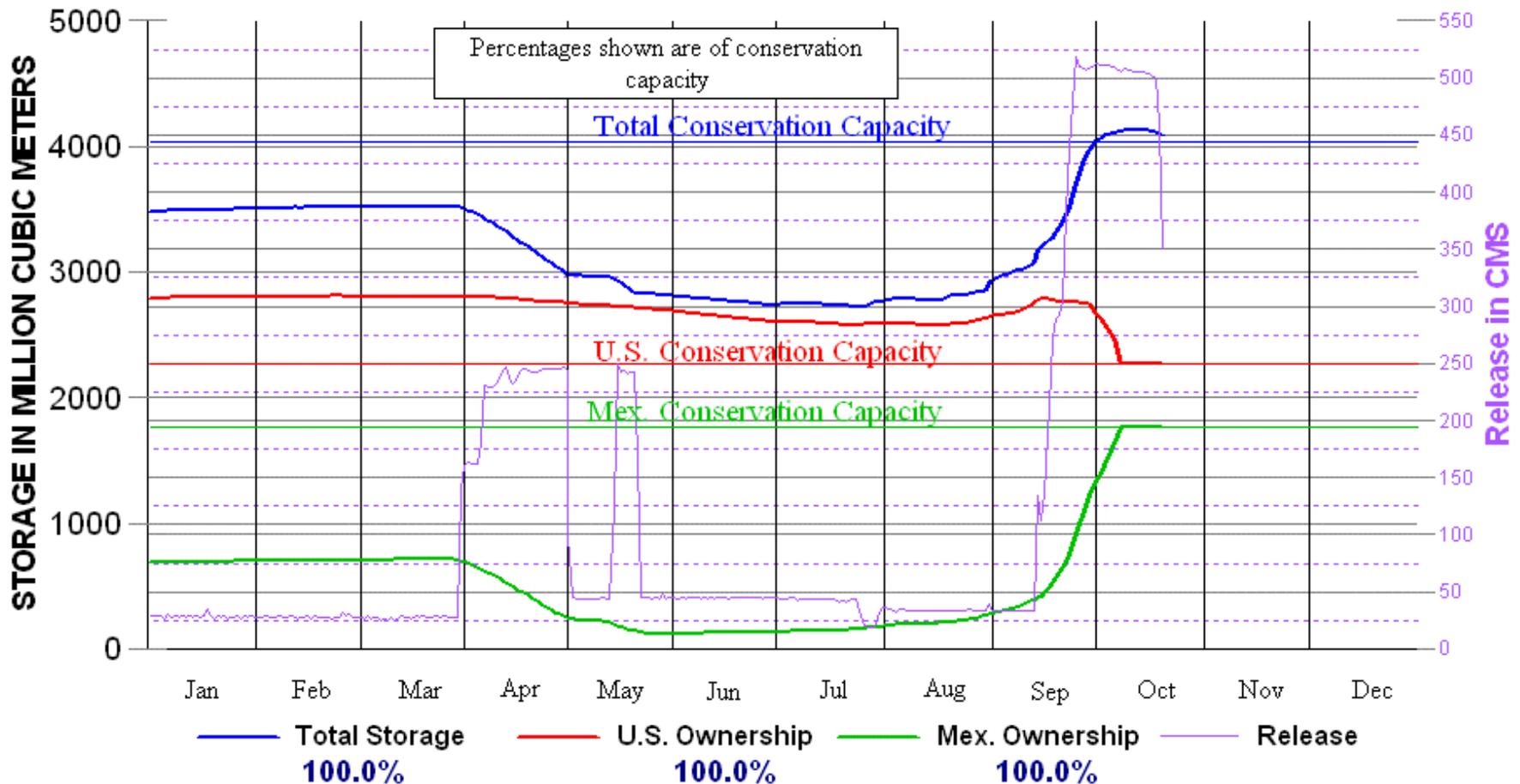
# PRESIDIO FLOOD DOWNSTREAM EFFECTS

- Flows from the Conchos entered the Rio Grande and filled Amistad Dam
- Amistad Dam went into flood operations at the end of September, releasing 17,657 cfs
- Releases reduced Oct. 17 as inflows tapered off
- Minor flooding downstream of Amistad
- Falcon levels have increased significantly



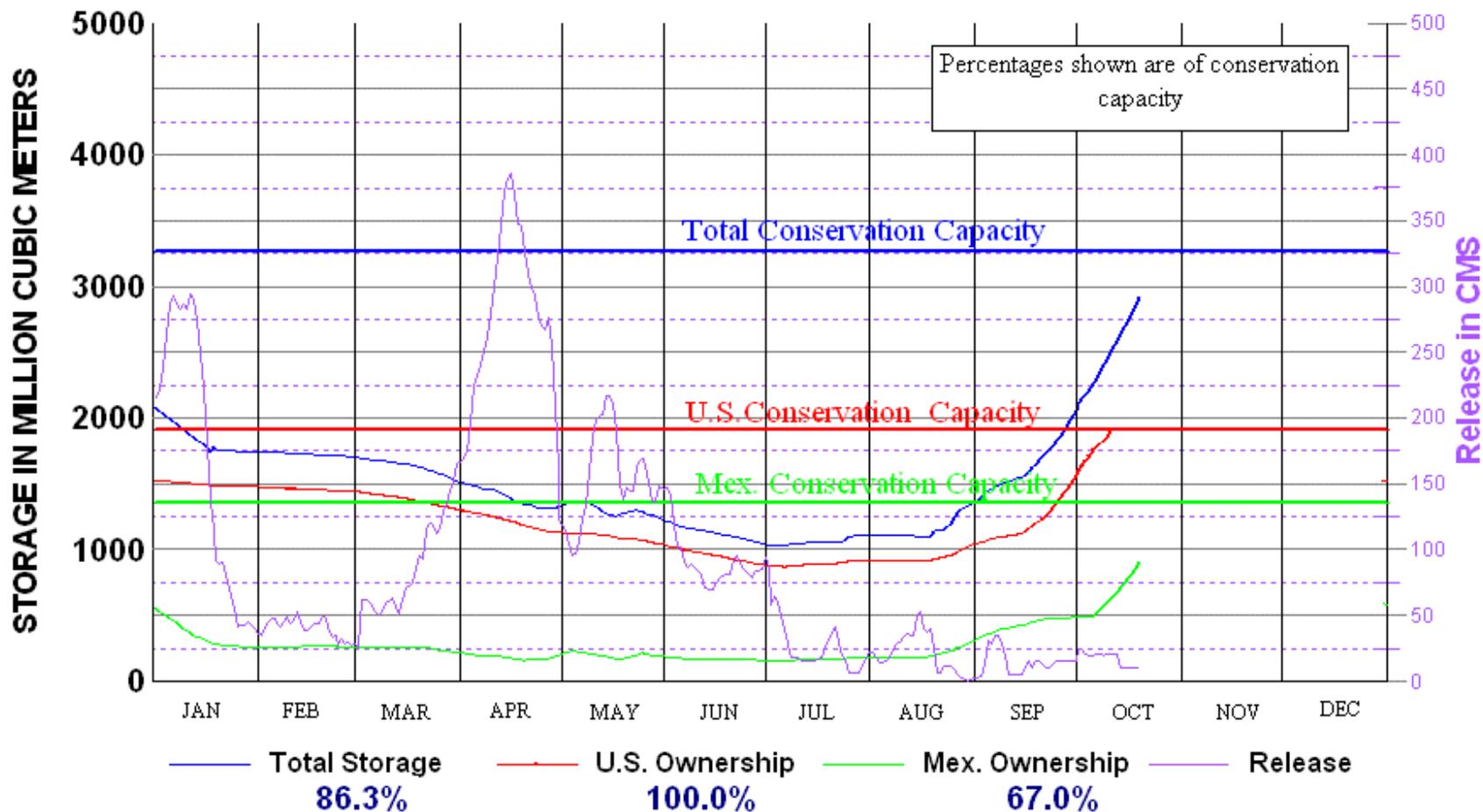
# PRESIDIO FLOOD DOWNSTREAM EFFECTS

AMISTAD RESERVOIR  
as of October 18, 2008

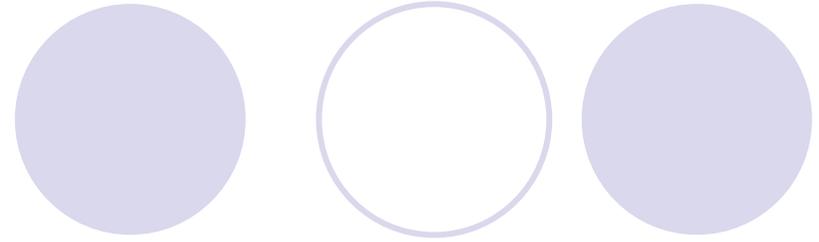


# PRESIDIO FLOOD DOWNSTREAM EFFECTS

## FALCON RESERVOIR as of October 18, 2008



# PRESIDIO FLOOD TREATY EFFECTS



- U.S. conservation capacity at Falcon was reached October 8, 2008
- Per treaty, a 5-year cycle ends when U.S. conservation capacity is reached at both reservoirs (previously reached at Amistad)
- Entire cycle lasted one year; total delivery of 788,544 acre-feet



# SAN JUAN RIVER

- Mexico went into flood operations on the San Juan River in September
- Spills from Marte Gomez Dam of approx. 7000 cfs began in early October
- Increased flow from the San Juan River has elevated levels in the Rio Grande from Rio Grande City to Gulf



# PROJECTIONS

- Spills from Marte Gomez to continue into November
- IBWC hopes to avoid flood releases from Falcon while San Juan flow remains high
- IBWC plans to set a higher temporary conservation capacity at the international dams to store more water, avoid additional flood releases
- When U.S. storage at both dams fluctuates above conservation capacity, this affects the duration of water delivery cycles



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UNITED STATES SECTION



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