

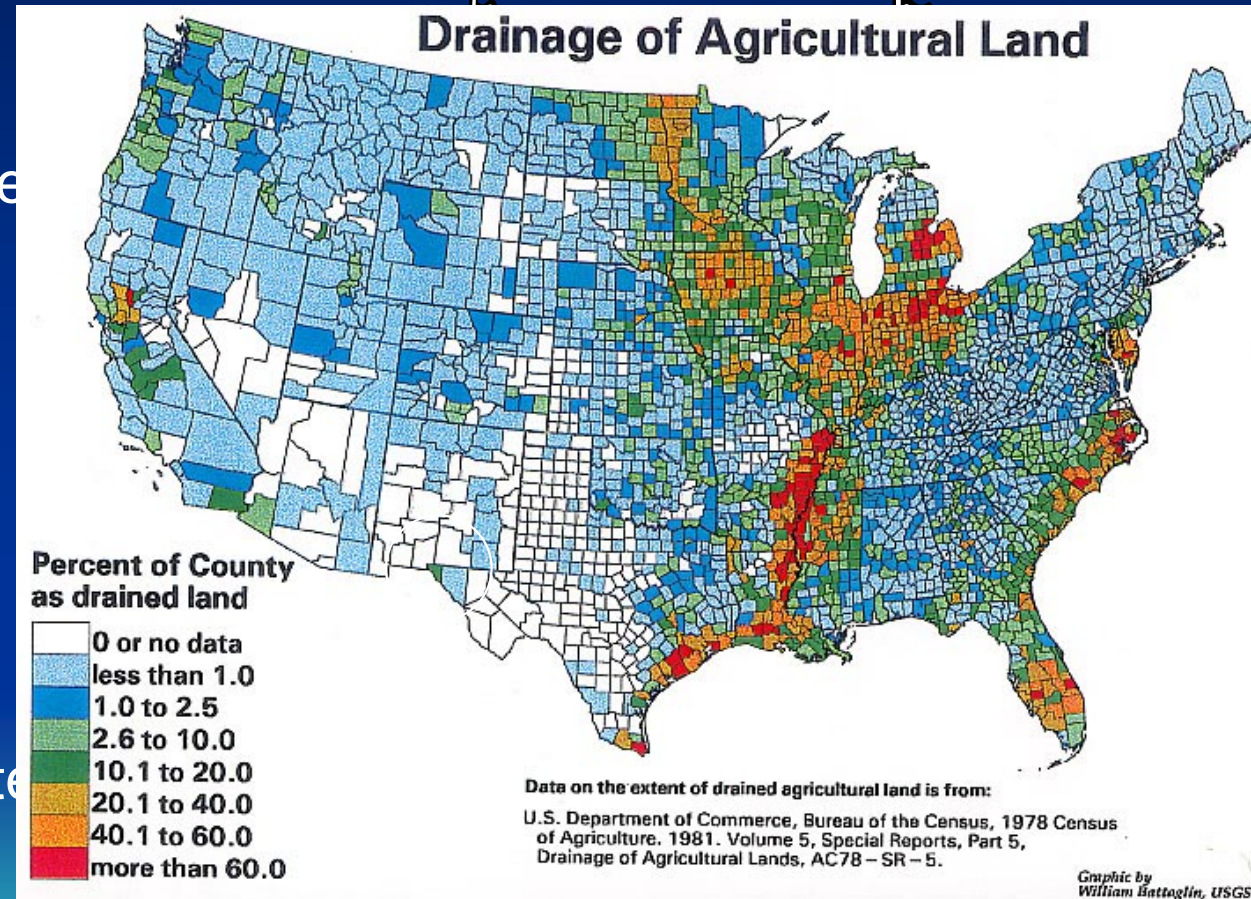
# Agricultural Drainage

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# Classes of Subsurface Drainage Designs

- Steady-state
  - Humid regions
  - Control steady water table
- Non-steady state
  - Arid, Irrigated
  - Drop water table after irrigation/rainfall
- Interceptor
  - Protect cropland from source of high groundwater

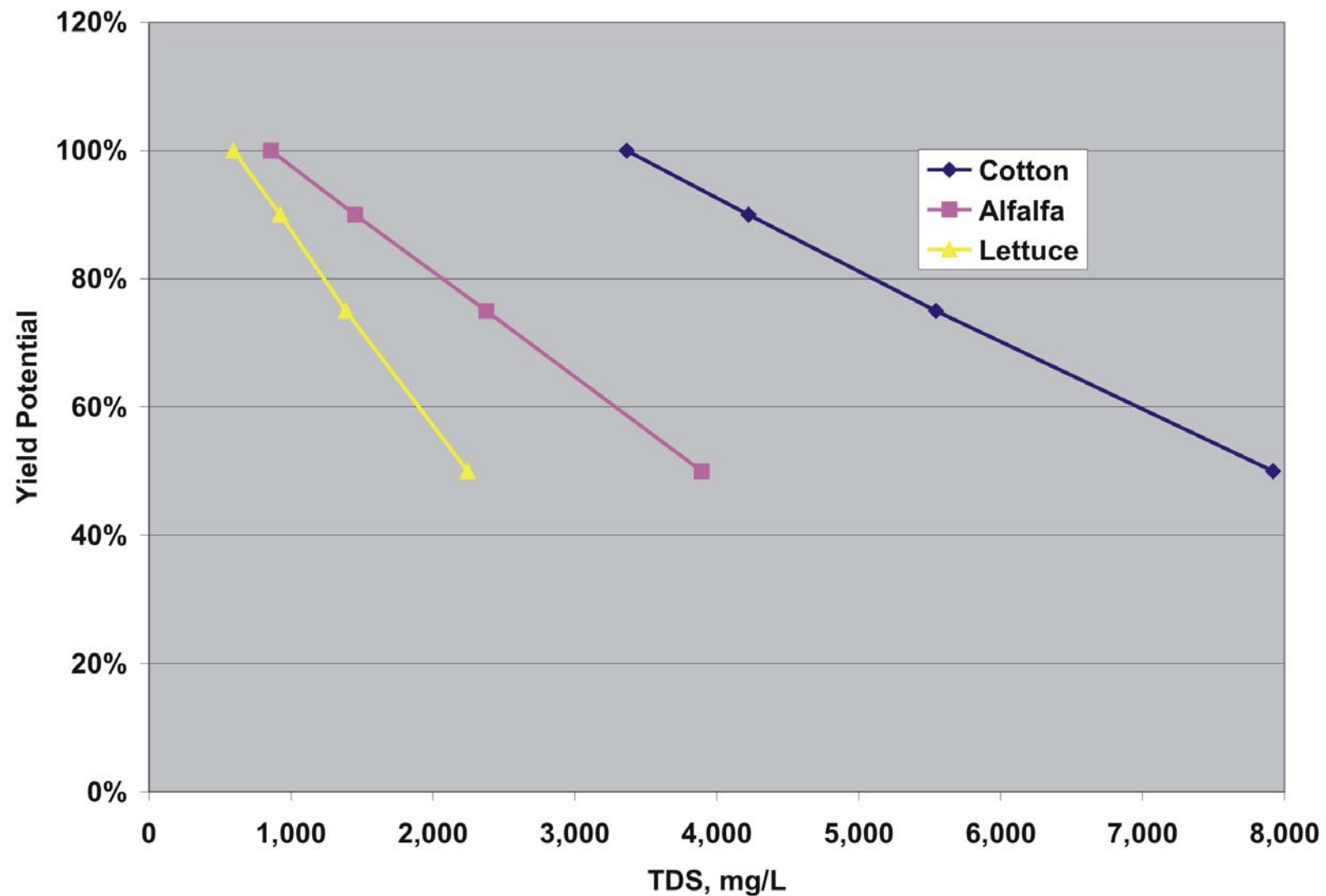


# Primary Functions of Agricultural Drains

- Control of water table – root zone aeration
  - EBID
  - Drainage density of 20 f/acre
- Removal of salt from root zone
  - HCCRD
  - Drainage density of 22 f/acre plus field systems



# Yield effects of Salinity





# Drain Installation – Then & Now



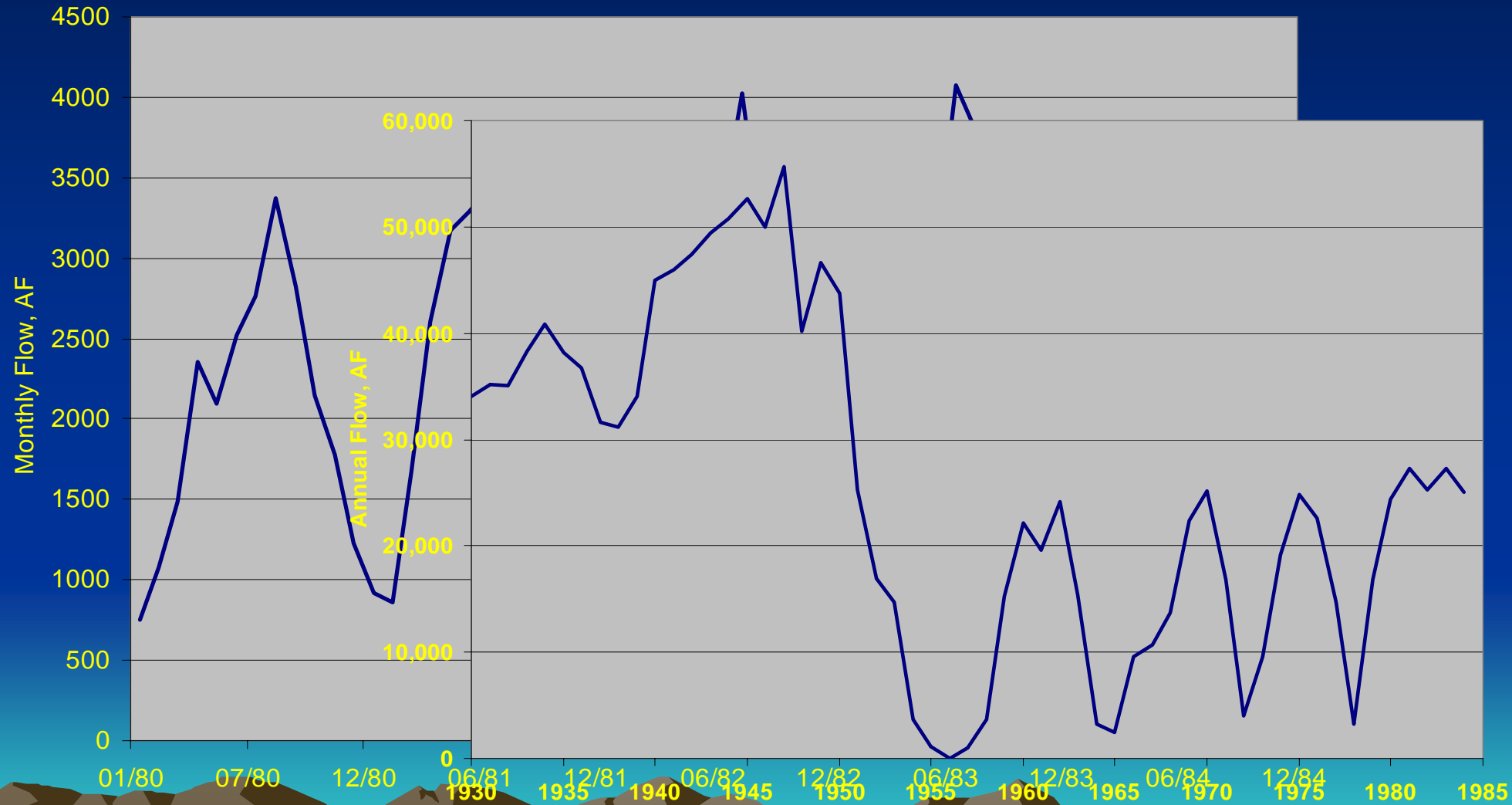
# The local drainage systems

- Open ditch
- Installed in 1920s-1930s
- Functions:
  - Water table control
  - Salt removal
  - Storm water conveyance
  - Operational spill return

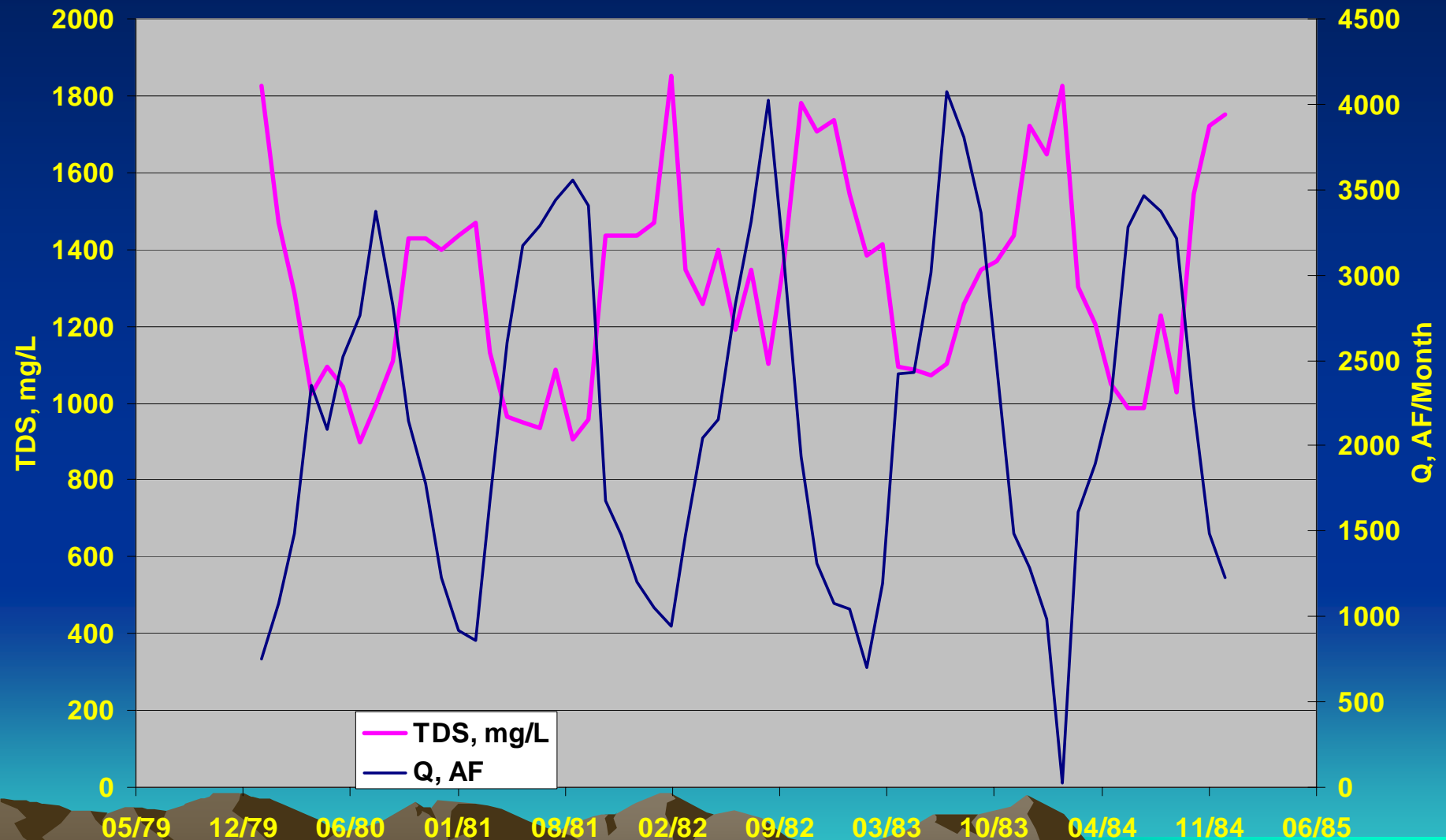




# Seasonal and Long-Term Drain Hydrology – West Drain



# Drain Water Quality – West Drain





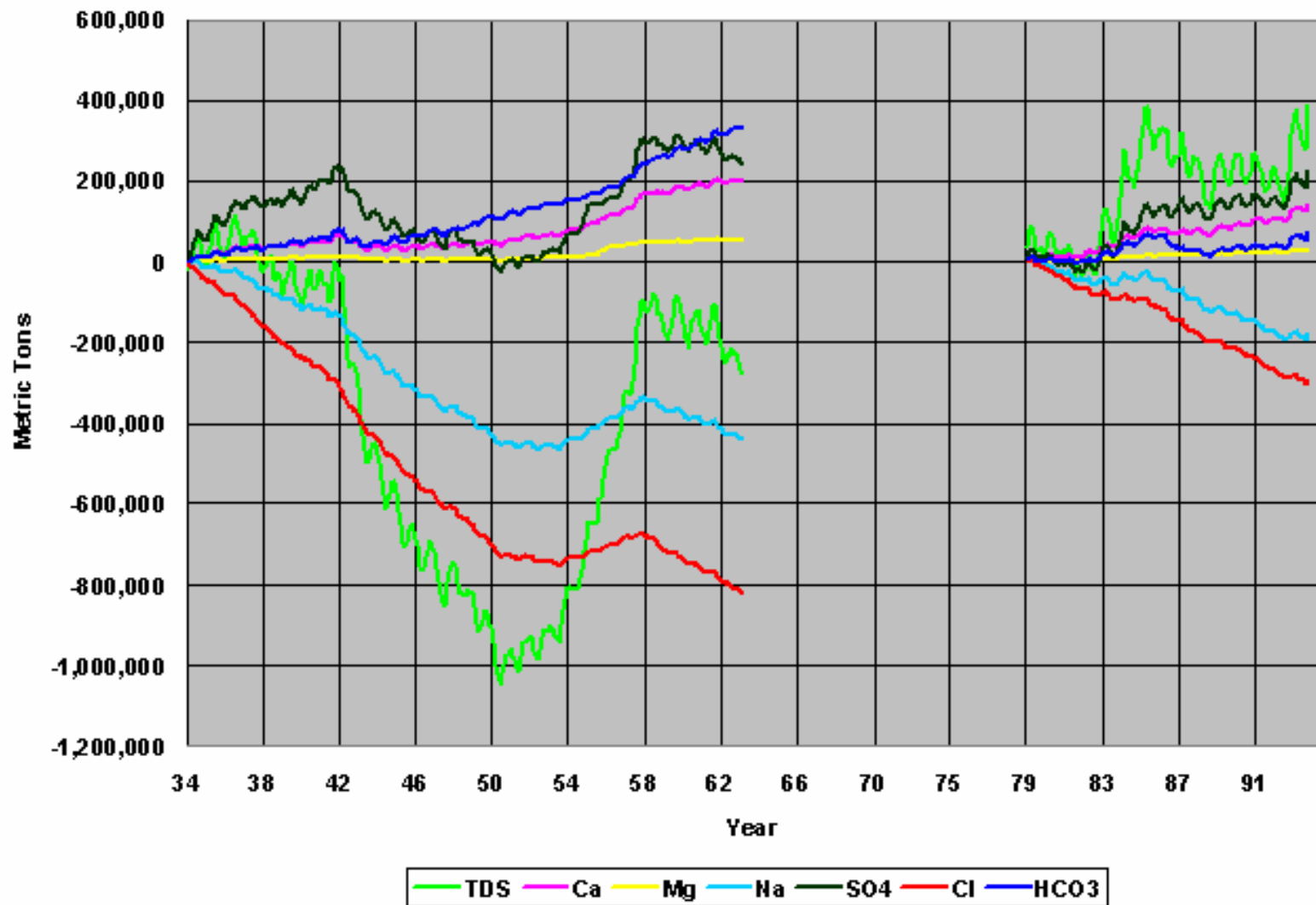
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# Long-Term Salt Balance

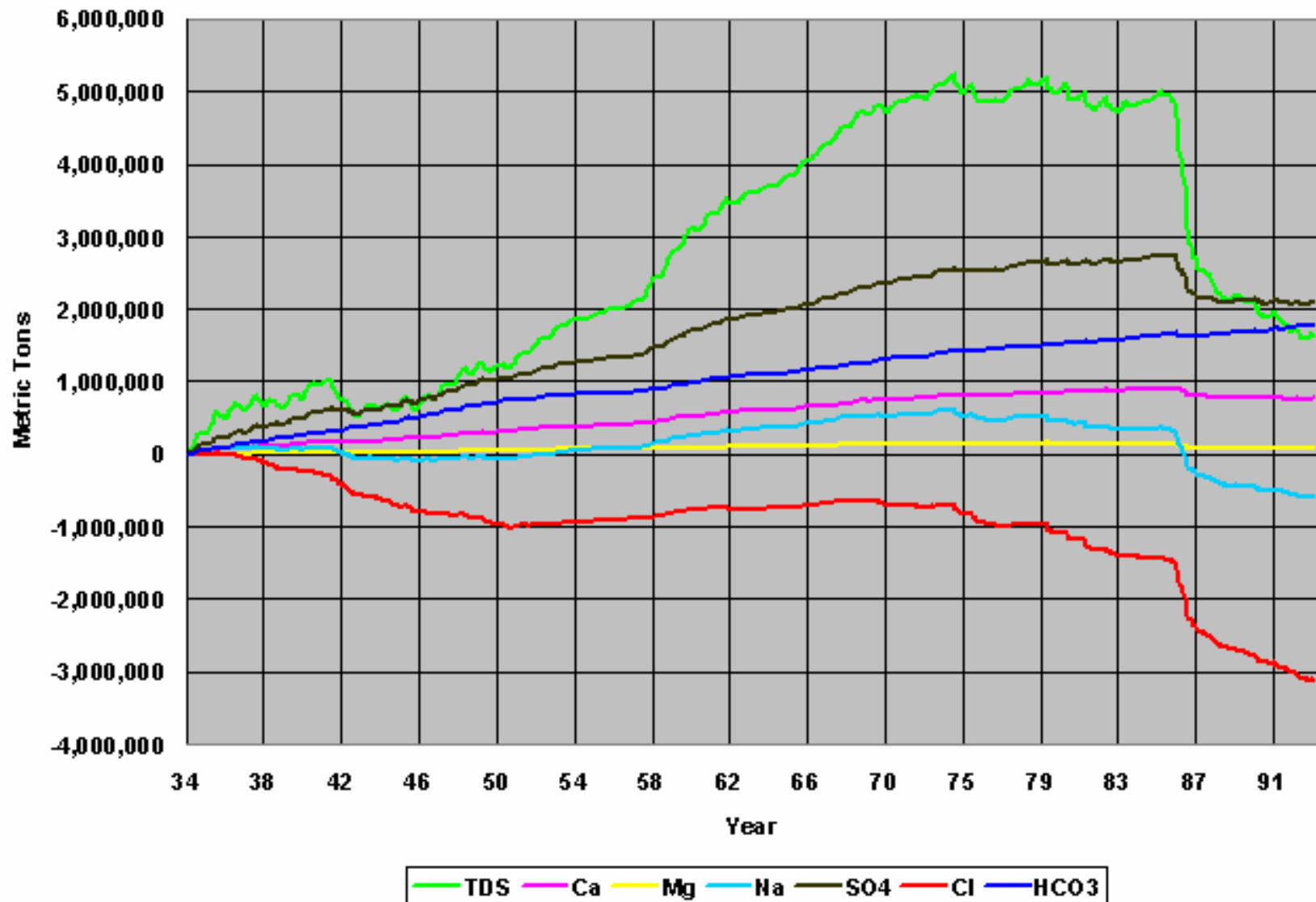
- Mass Balance:  $Q_{in} TDS_{in} - Q_{out} TDS_{out}$
- Elephant Butte to El Paso (Courchesne Bridge)
  - 90,640 acres of EBID + 10,000 acres of EPCWID
- Courchesne Bridge to Fort Quitman
  - 59,000 acres of EPCWID + 18,000 acres of HCCRD
  - Mexico (???)



# Salt Balance, Elephant Butte to El Paso



# Salt Balance, El Paso to Fort Quitman





# The Future

## Legal Considerations

- Possible changes in water quality regulations
- Urbanization and municipal use of Project Water
- Changes in Project operation

- Environmental Considerations

- Drains as habitat
- Restoration efforts on drains
- Illegal dumping in drains



# Picacho Drain Bosque Park

- City of Las Cruces, EBID, and Southwest Environment Center
- NM Fish and Game land
- Picacho Drain right-of-way
- No increased depletion due to habitat restoration
  - Offset open water evaporation with removal of large, dense canopy salt cedar
- Drain function is paramount



# Picacho Drain

