Overview of the Salt River through the Phoenix metropolitan area

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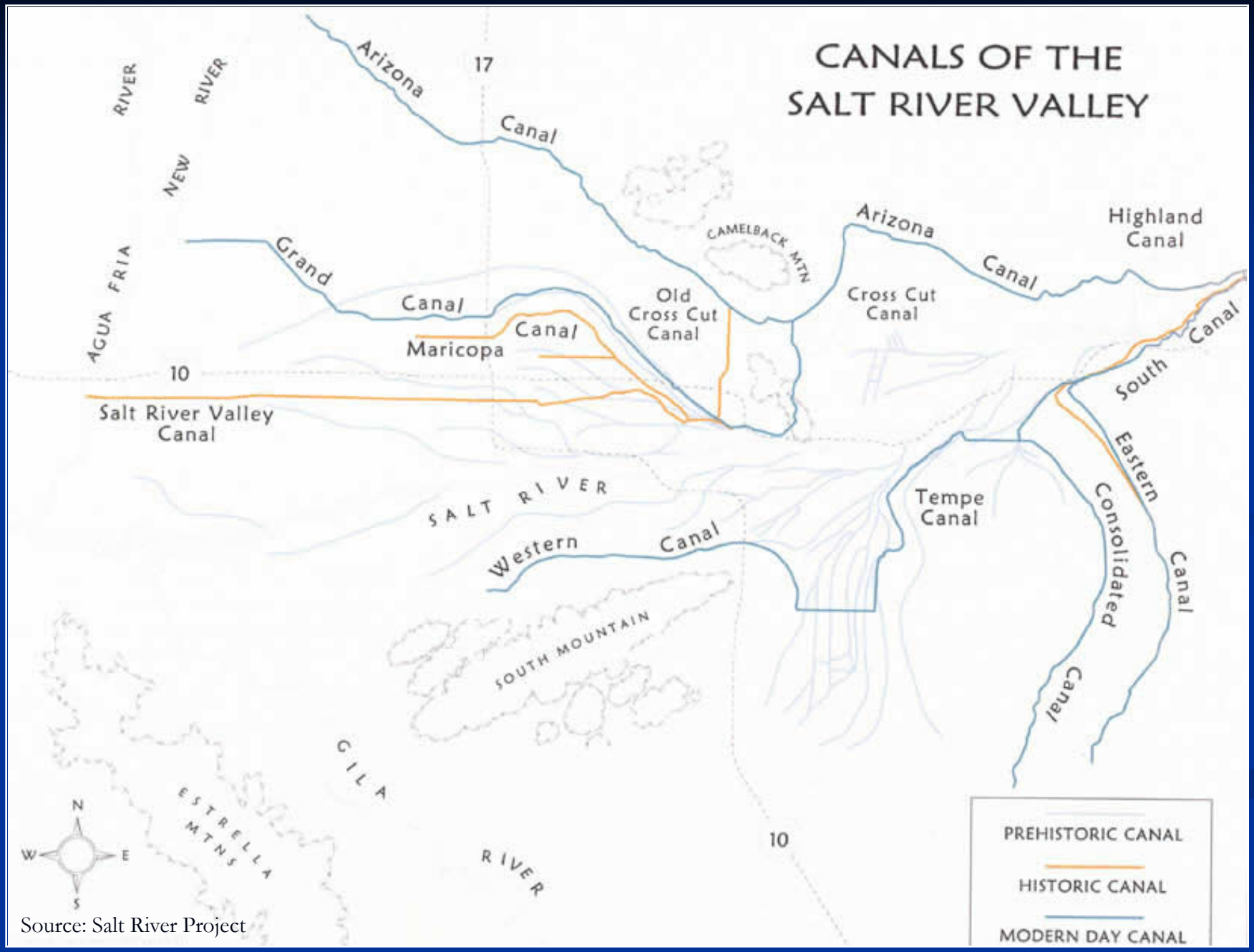
Overview of Salt River

- History of the Salt River
- Influences on channel conditions
- Opportunities for enhancement

History of Salt River

- Prehistoric Hohokam Indians
  - between 500 A.D. to 1450 A.D.
  - created an extensive canal system
- Father Eusebio Kino in 1700s named the river "Rio Salado" (Spanish for Salt River) because the fresh water had a salty taste
- Fur traders in 1833 described the Salt River to be “bountiful in beaver”



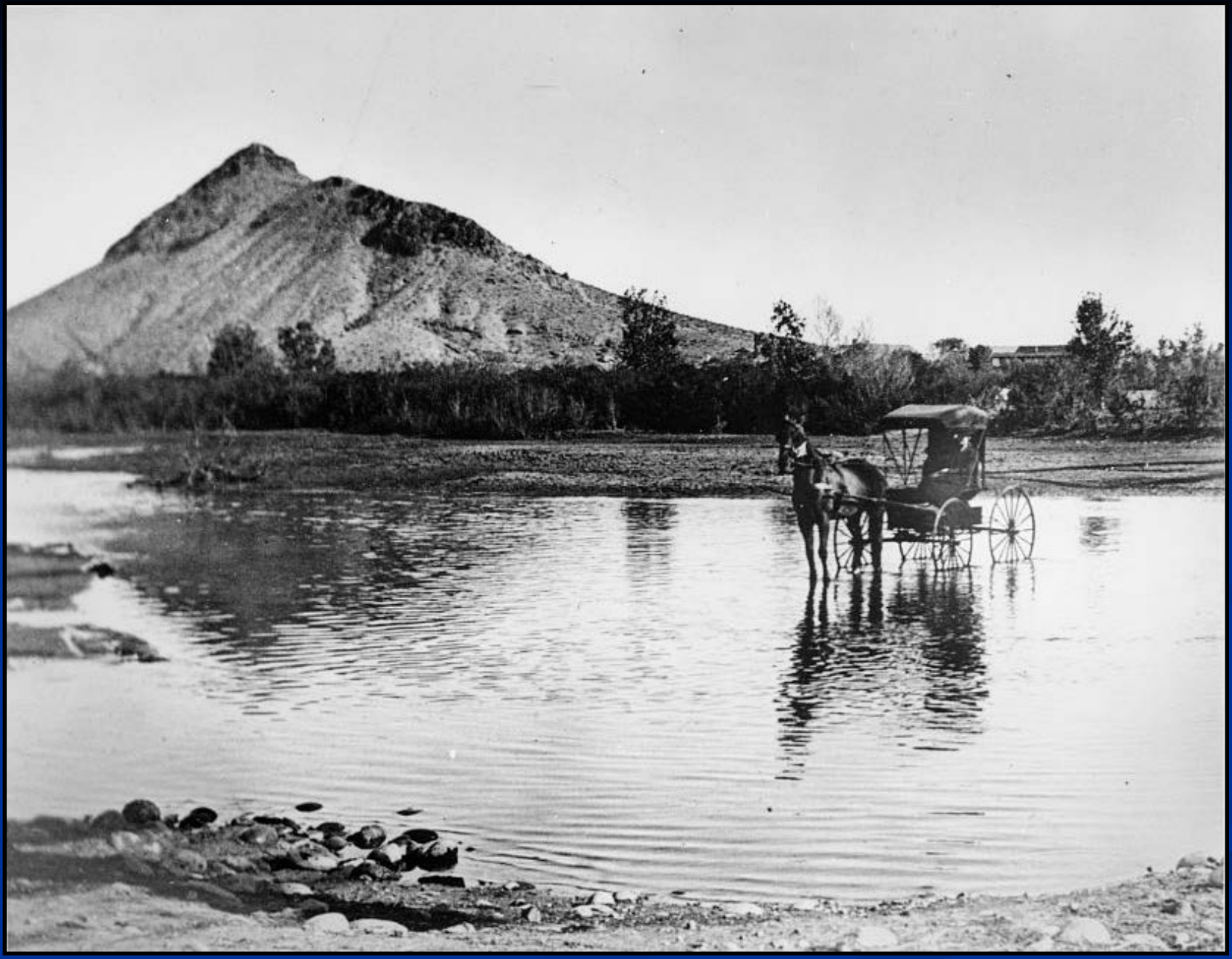
Source: Salt River Project

Settlers in 1800s continued use of canals. Remnants of canals can still be seen

Head of canals are approximately 6 to 9 m (20 to 30 ft) above the present river channel. Indicating downcutting that has occurred.

Photos of McDowell Crossing near Mesa

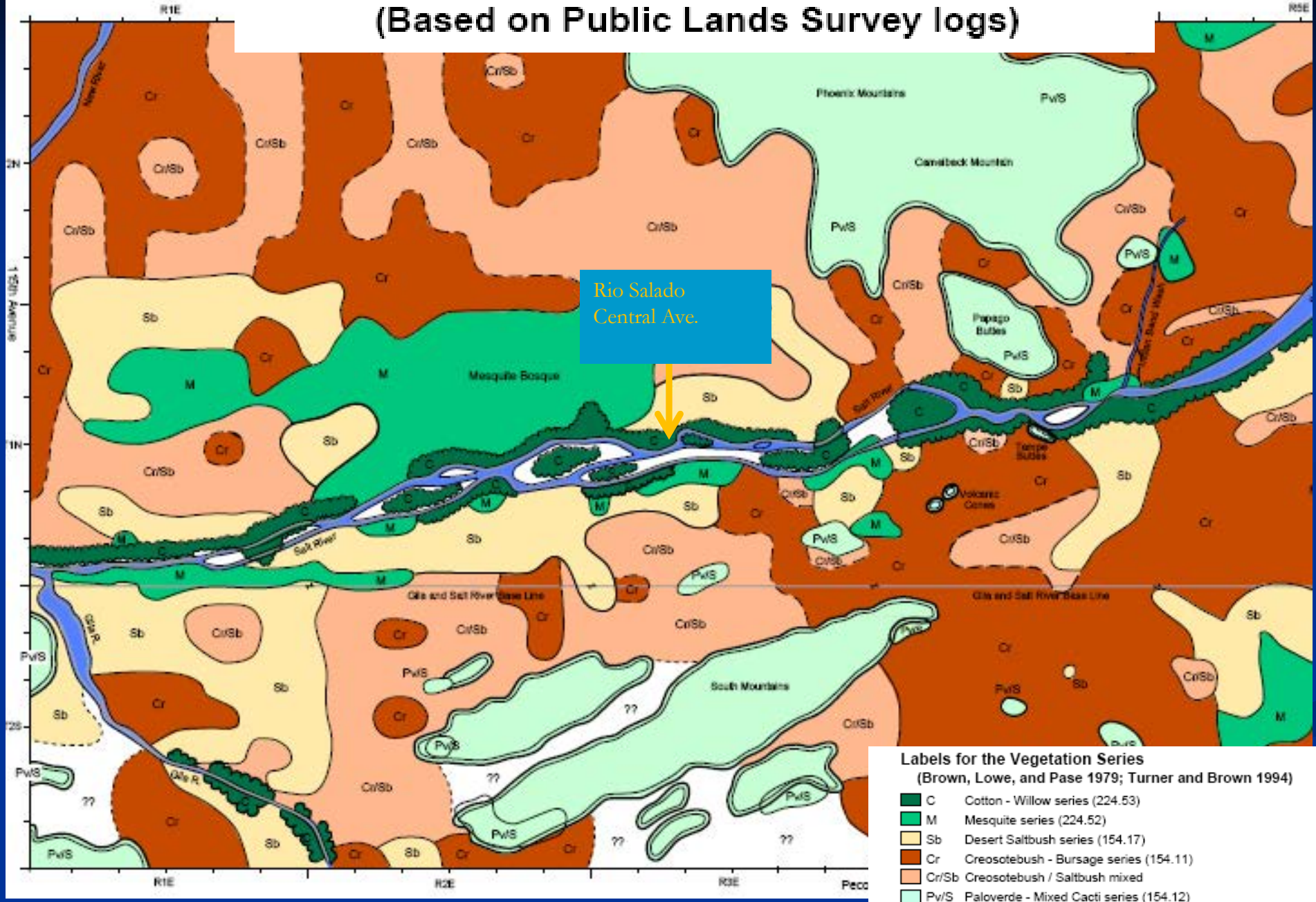
Hayden's Ferry with Ash Avenue in background. Circa 1900.



Circa 1870s - 1880s View showing ford across Salt River at site of Ash Avenue Bridge, looking southeast toward Tempe Butte

Vegetation Map of Phoenix, 1867 - 1868

(Based on Public Lands Survey logs)



- 1891 more than 247,000 ha (100,000 ac) being farmed in SRV
- John Wesley Powell in 1893 estimated the discharge of the Salt River to be about 22.6 cms (800 cfs)
- National Reclamation Act passed in 1902 provided loans to the western states for irrigation projects
- Salt River Project organized farmers in 1903 to finance water projects

Dam building on the Salt and Verde Rivers

- 1908 - Granite Reef Diversion Dam
- 1911 – Roosevelt
- 1927 – Horse Mesa
- 1928 – Morman Flat
- 1930 – Stewart Mountain

SALT

- 1939 – Bartlett
- 1946 – Horseshoe

VERDE

Granite Reef Diversion Dam

Roosevelt Dam

Mormon Flat Dam
Horse Mesa Dam
Stewart Mnt. Dam

Bartlett Dam

Horseshoe Dam

GRUSP water banking

Roosevelt Dam expanded

Pre-1900--------1908--1911-----1925to1930-----1939-----1946----------1994--1996---------2010

2-mile wide river channel and floodplain

SALT RIVER

0.2 mile wide

Granite Reef Diversion Dam

Roosevelt Dam

Horseshoe Dam

240	3,152	11,314	48,118	106,816	581,572	983,403	1,445,632
1870	1890	1910	1930	1950	1970	1990	2010

Changes after dam construction

- After 1941 (after Bartlett Dam was constructed) Salt River was dry except during flood events
- Increase in development near the river channel
- Sand and gravel operations in the river channel

Changes in the river after dam construction

- Channel width narrowed
- Sinuosity reduced
- Channel bed material – less fine material
- Channel degradation
- Reduced vegetation establishment and maintenance

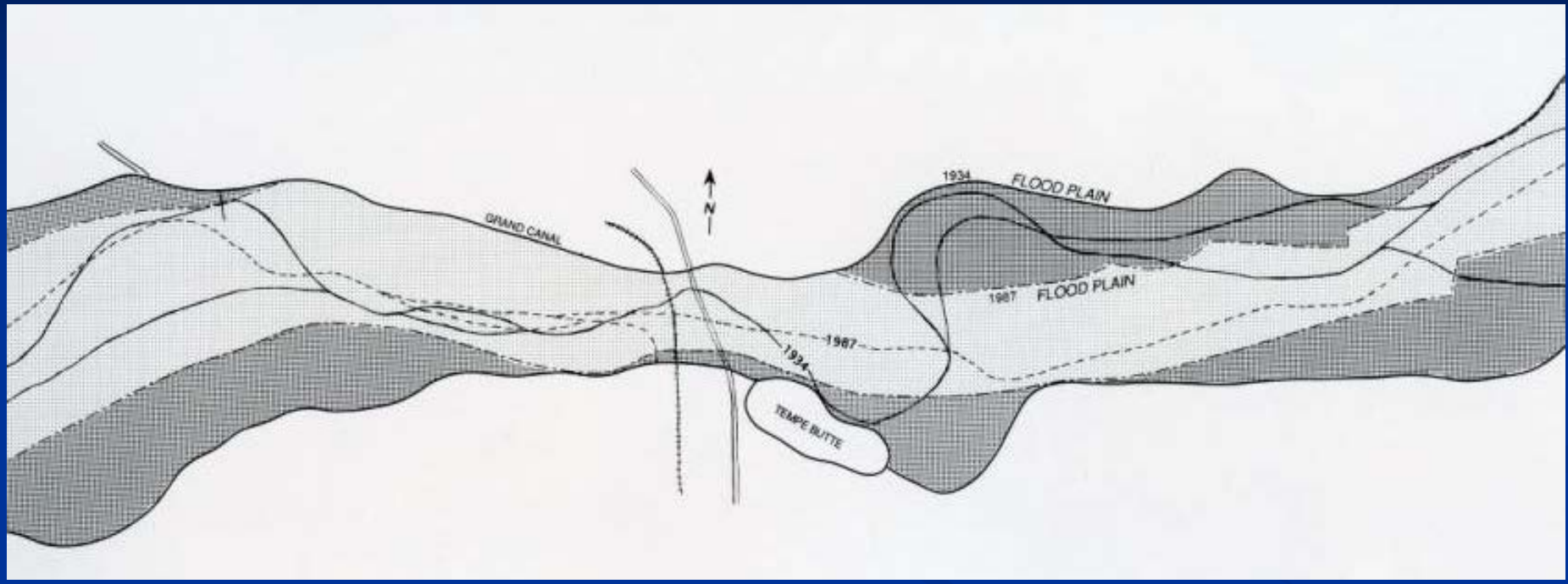
1930

1997

SALT RIVER

NORTH
MAPS NOT TO SCALE.

Channel sinuosity


GRAND CANAL
N
1934
FLOOD PLAIN
1987
FLOOD PLAIN
1987
1934
TEMPE BUTTE

1930

2011

SALT RIVER

This comparison of the lower Salt River is in the vicinity of Tempe's Town Lake from eight decades ago to today. The Salt River at one time was a much more freely-flowing river than most today realize. Since the Roosevelt Dam upstream of this location was built in 1911, the regular flows on the Salt slowed, but the scale of the river is still very evident in these old aerial photographs.

Aerial photographs courtesy of the Flood Control District of Maricopa County—www.fcd.maricopa.gov

NORTH
MAPS NOT TO SCALE.

Channel sinuosity

Can you see the channel?

Bed armoring

1949

Fine sand and alluvial material present

1988

Continuous cobble bed and sand removed by low flows and wind

Channel Degradation

1949

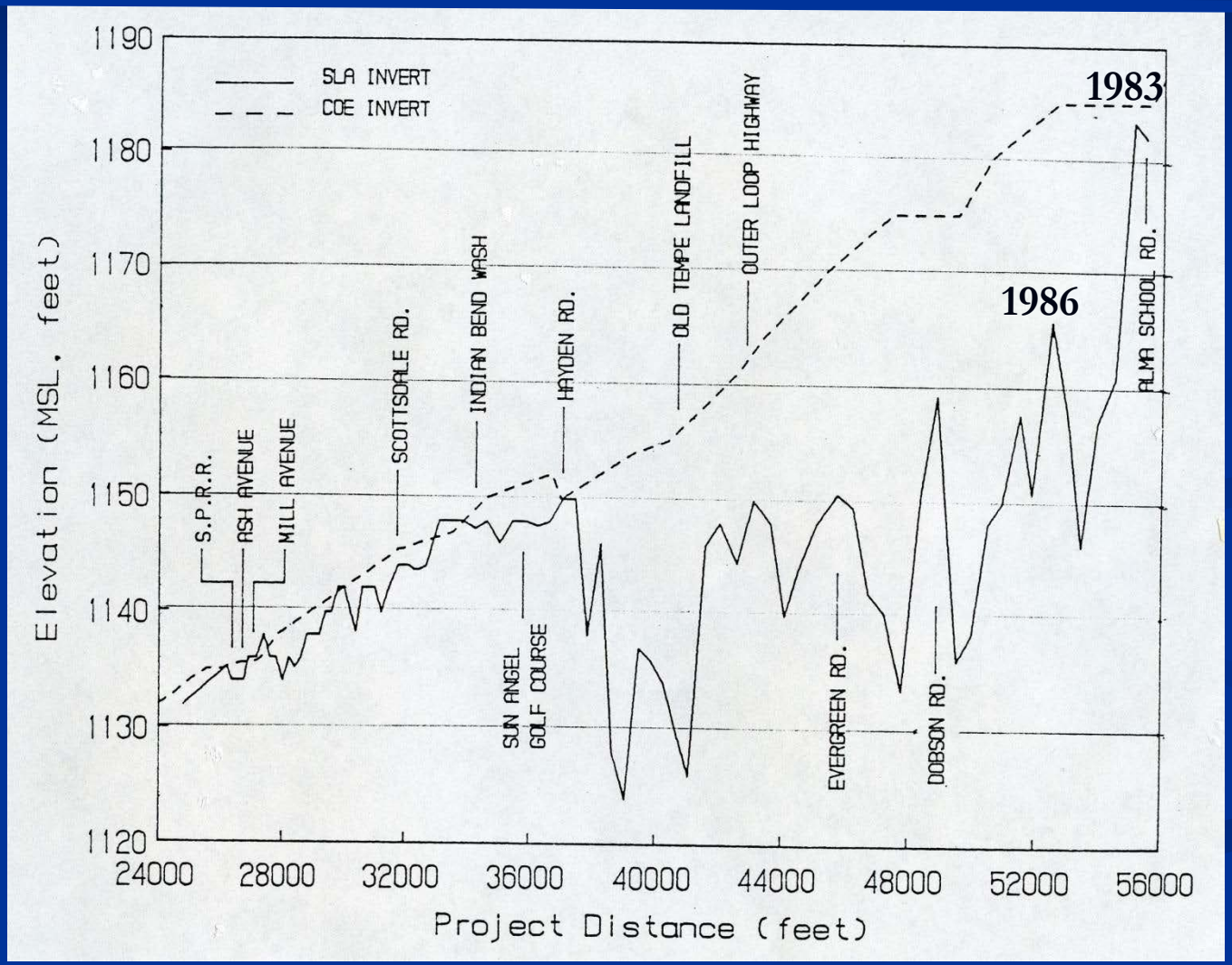
Channel Degradation

1982

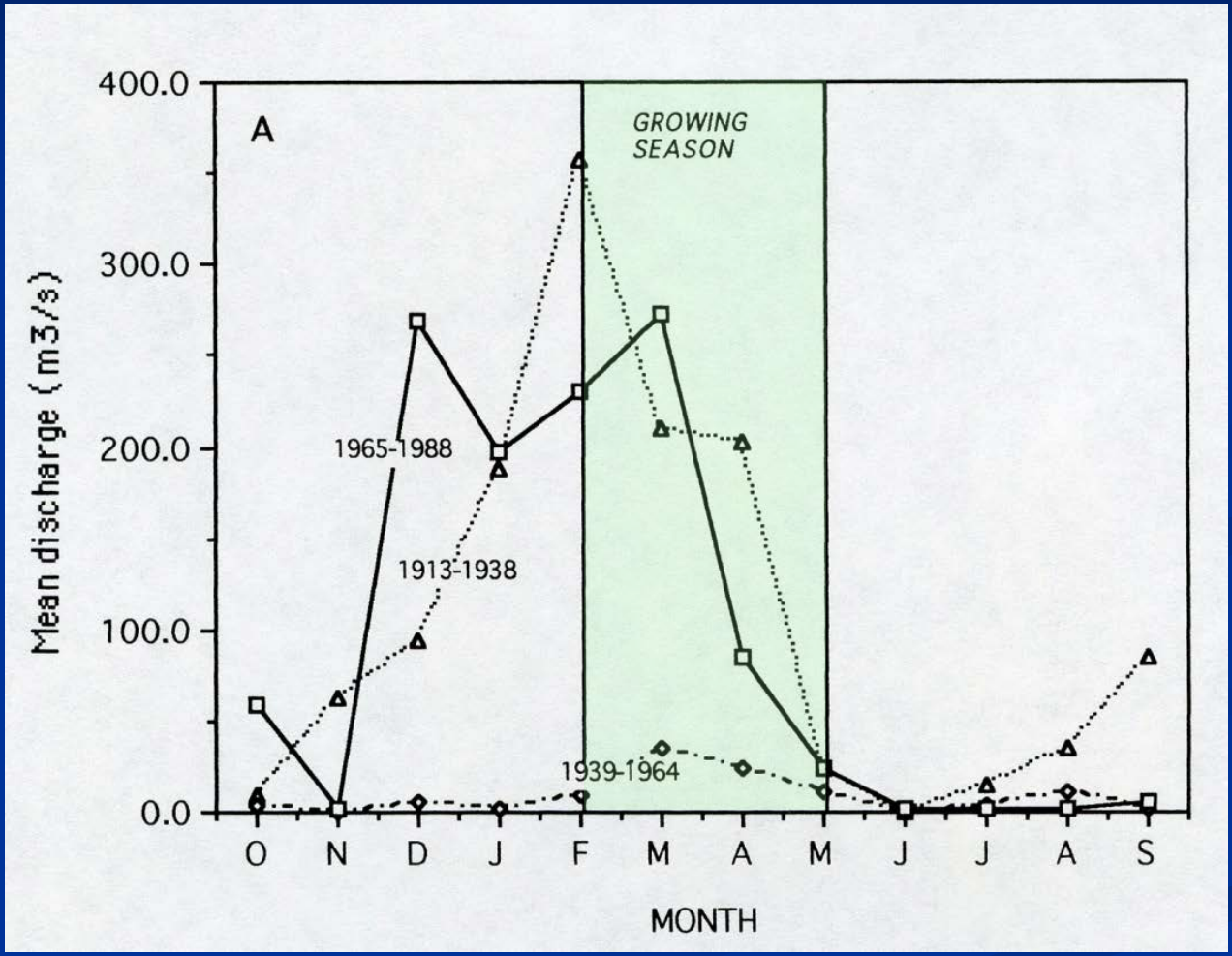
1988

Over 40+ years, Salt River downcut 4 meters (approx. 12 feet)

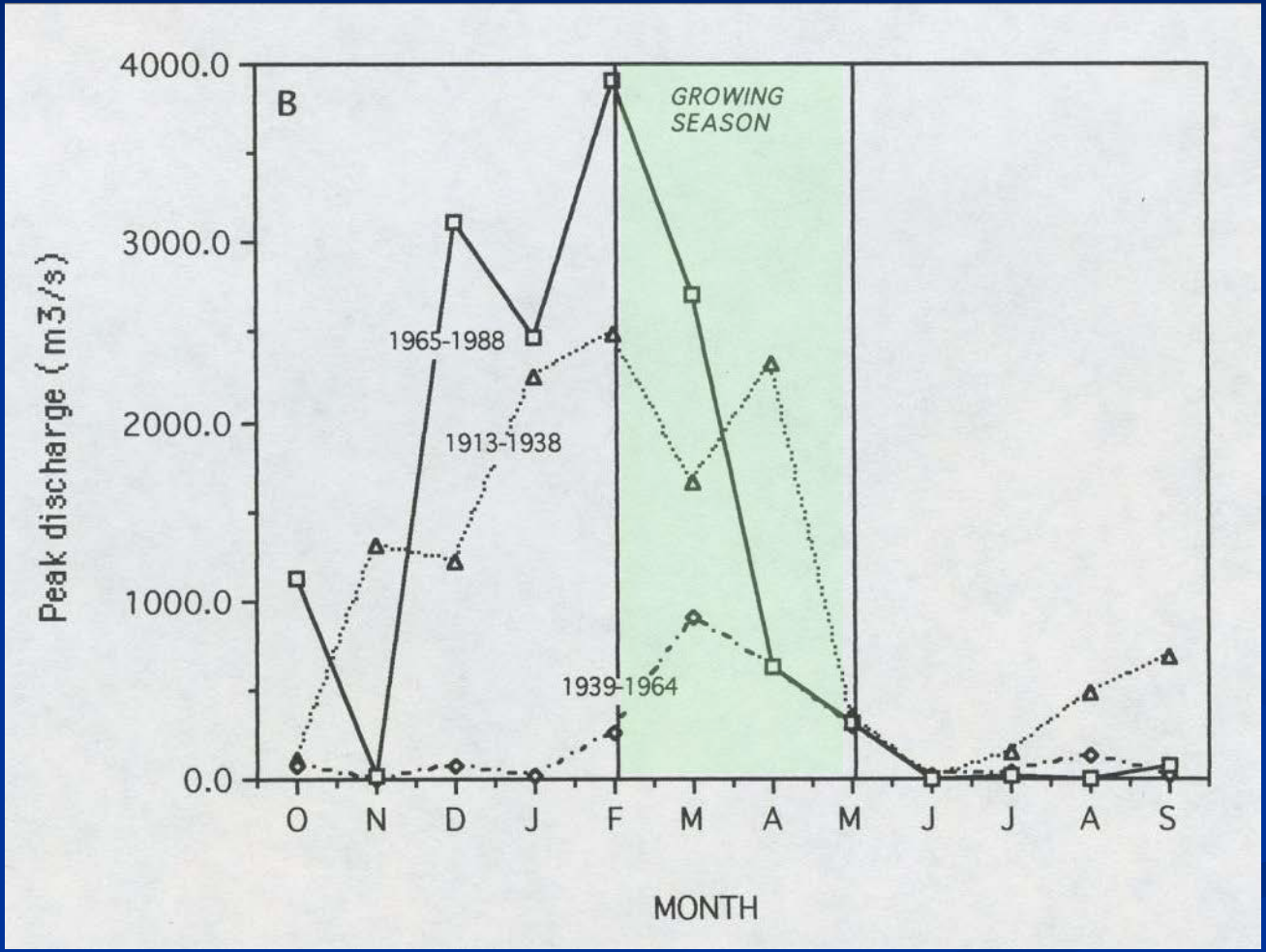
Channel Bed Profiles



Relationship between mean flow from Granite Reef Dam and growing season for cottonwoods for three time periods



Relationship between peak flow from Granite Reef Dam and growing season for cottonwoods for three time periods



Requirements for Establishing Riparian Vegetation

- Water availability
- Suitability of site for establishment and maintenance
- Distance from scouring high flow events

Vegetation at storm drain outflow

Vegetation near canal

Projects to improve the condition of the Salt River

- 1966: Arizona State University students design the "Rio Salado Project". Their plan would fill the Salt River with water from end-to-end
- 1970s: City of Tempe formed the Rio Salado Development District
- 1985: Final Rio Salado Master Plan

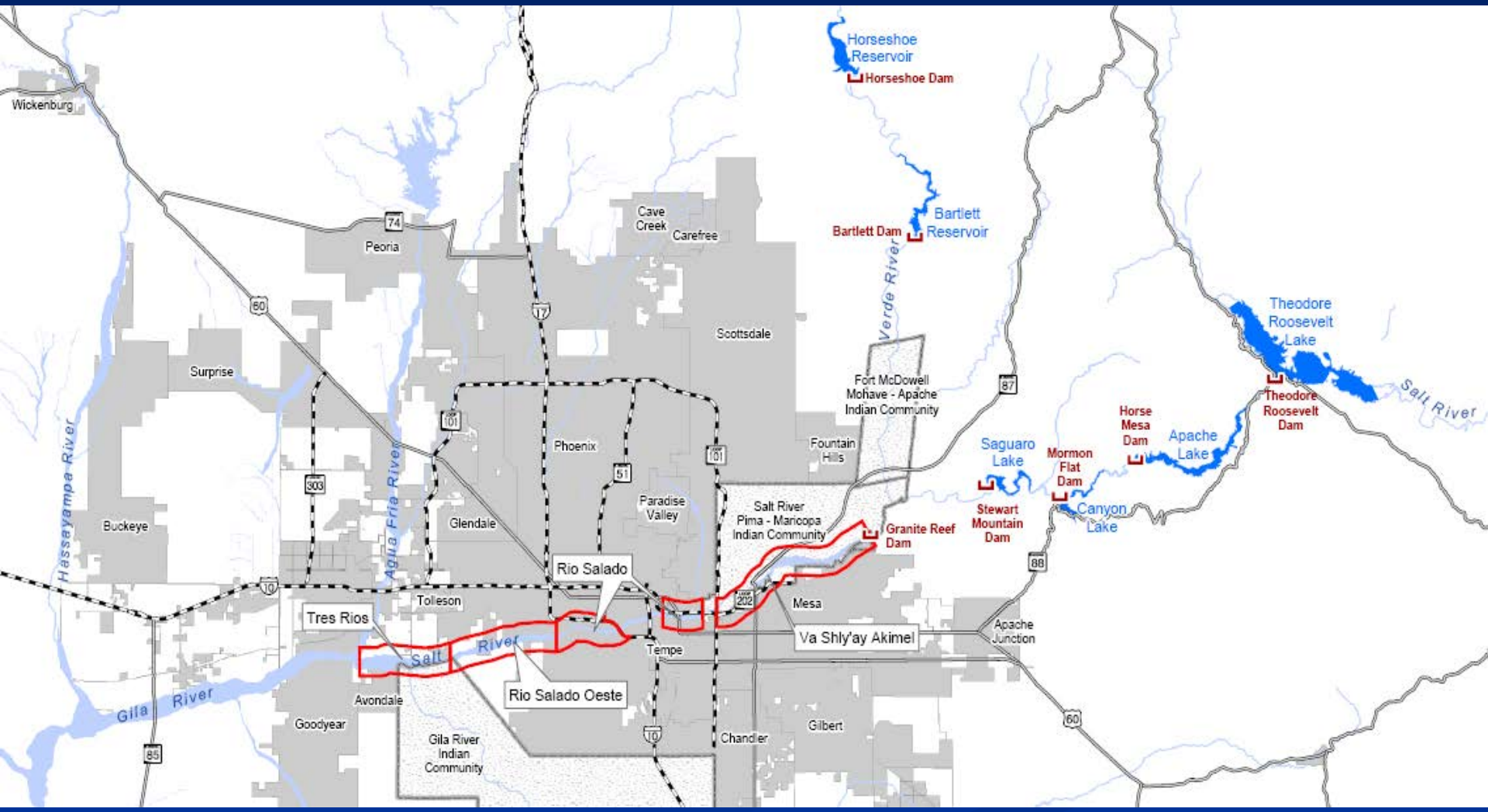
National consciousness in late 1960s and early 1970's

- Wild and Scenic Rivers Act – 1968
- National Environmental Policy Act – 1970
- Clean Water Act – 1972
- Endangered Species Act - 1973

Salt River at Tempe - 1988

Salt River at Tempe - 1993

Projects – some implemented



Railroad Bridge over Salt River collapsed 1902

Salt River 1988