

1846-1848 – Mexican-American War
 U.S. Army passes through New Mexico and Arizona with no opposition. Lt. Wm. Emory performs first scientific survey of route along Rio Grande River and Gila Trail. Includes Linnaean classification of flora, fauna, remedial geologic analysis, and charting of water sources. Scientific fascination does not translate into positive view for popular culture of Southwestern landscapes, ecosystems, or agricultural possibilities. Mainstream perception of faceless "Great American Desert" inhabited by "savage" races remains intact. New Mexico and Arizona are places to cross en route to California. Region north of Pimas unknown. Kearney Code adopted in 1846 merging North American and Hispanic traditions.



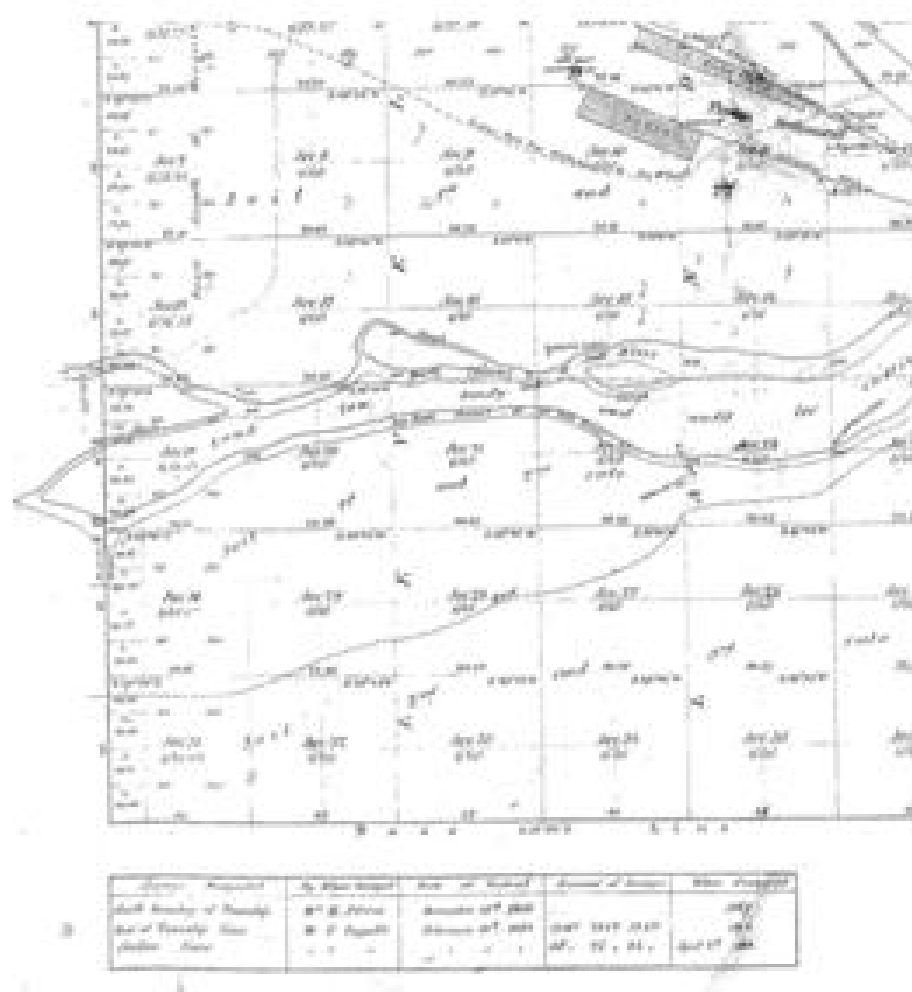
1849-1854: Surveys and Migration
 Gila Trail used by immigrants, U.S. Boundary Commission and Pacific Railroad Surveys perform scientific analyses of 32nd and 35th Parallels as well as Mexican/American Border. Institutional science fascinated with region's diverse flora, fauna, and aboriginal peoples. Region north of Gila River remains relatively unknown. New Mexican Territorial Codes passed in 1850 merge indigenous communal statutes with more individualistic paradigms. Pima villages are valuable stop on Trail and example of successful irrigation agriculture in hot desert environs that provides model for future endeavors.



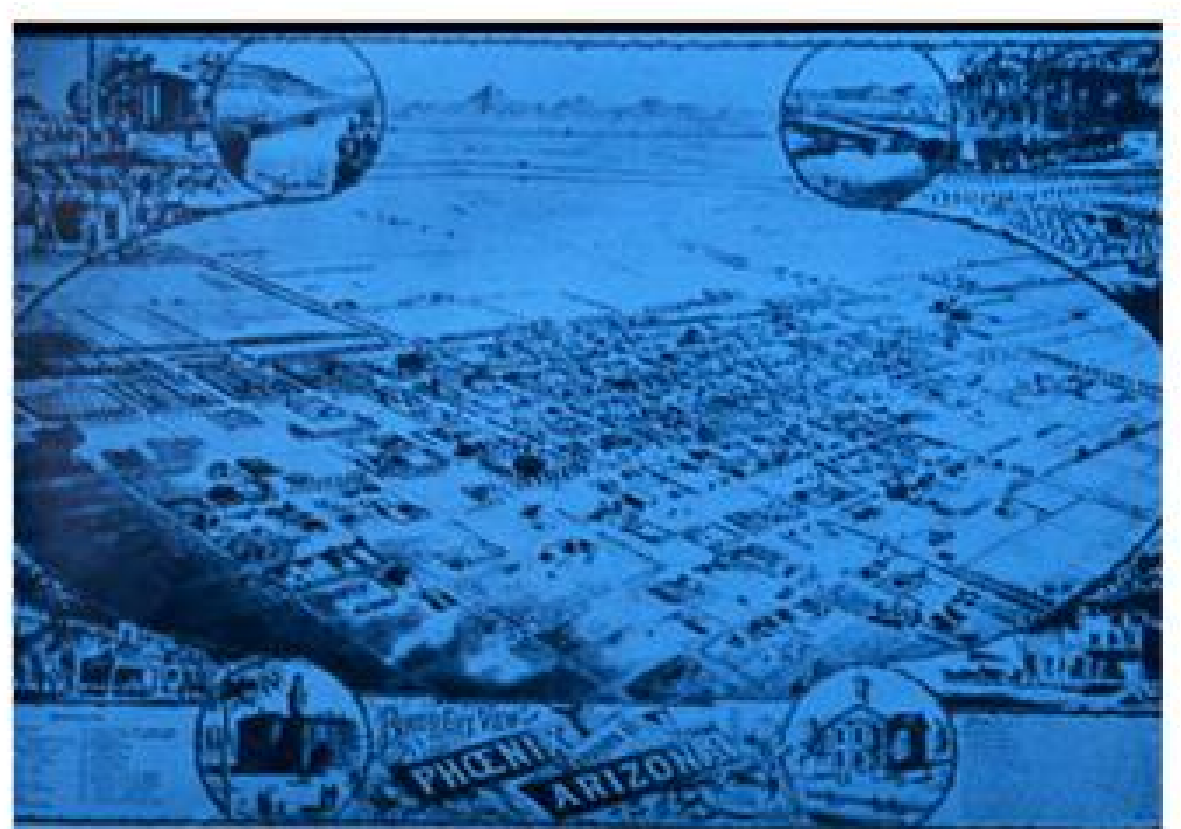
1855-1862: Gadsden Purchase and Early Settlement.
 Santa Cruz River Valley added to American territory. Military forts, stage stops, and mail routes established. Gold strikes on Gila River and Central Highlands attract miners. Mineral strikes make Arizona economically viable, although still considered wasteland by most. Farms emerge around stage stops, army forts, and mining camps combining aboriginal methods and crops with those introduced. Irrigation agriculture not considered component of region's economic future. No military protection between Tucson and Fort Yuma, Indian wars intensify.



1863-1870 --Arizona Territory Established, Salt River Valley Settled
 Arizona Territory established in 1863 with Territorial Capitol placed at Prescott near mining camps. First Legislature held in 1864 with Howell Code adopted, baseline legal document containing inadequate provisions concerning land and water. Fort McDowell on Verde River attempted irrigation agriculture, John Y.T. Smith opened hay station on Salt River to raise hay for Army, Gila Valley settled near Florence. Depletion of placer deposits and local need for foodstuffs forces migration to low deserts including Gila and Salt River Valleys. Jack Swilling entices investors in 1867 to support irrigation venture on north bank of Salt River. Successful canal ventures attract more settlers, leading to 1870 creation of Phoenix townsite. "First in time, first in right" ethic of prior appropriation applies to water and land resources. Indian-white conflict intensifies in Territory.



1871-1878: Growth and Stability
 Maricopa County formed with Phoenix as county seat, Pinal County with Florence as county seat. Apache wars subside, public safety increases, allowing freedom of transportation, more dispersed demographics, and improves Arizona Territory's image. Crops diversify and irrigated acreage on Gila and Salt Rivers increases, creating resource-competition issues and legal battles over allocation and distribution of water. Gila River diversions cause crop failures with Pimas, leading to migration of Indians to Salt River. Canal system remains centered on Hohokam network, although improved excavation technology allows extension beyond watershed physiography. Boosterism increases, Phoenix and Salt River emerge as "garden spot" of Arizona. Road system, regional economy solidifies, and political system matures.



1879-1887: Continued Growth, Resource Competition
 Railroad to Maricopa Wells connects Central Arizona to outside markets, although long wagon trip remains to railhead. Allows greater diversification of crops for shipment to extra-regional markets. Conflicts with Apaches ends with Geronimo's surrender, improving public safety and image of Arizona to settlers and investors. Cooperative nature of irrigation vanishes as speculation and boosterism produces large corporate-backed reclamation projects such as Arizona Canal. Despite improved construction technology, failure to scientifically manage watershed combines with hydrological limits to create legal and ecological crisis. Underground pumping increases, although technological limits and agricultural water demands limit effectiveness. Prior appropriation doctrine codified in 1887 Territorial Statutes, although mechanisms for settling disputes outside courts do not exist.

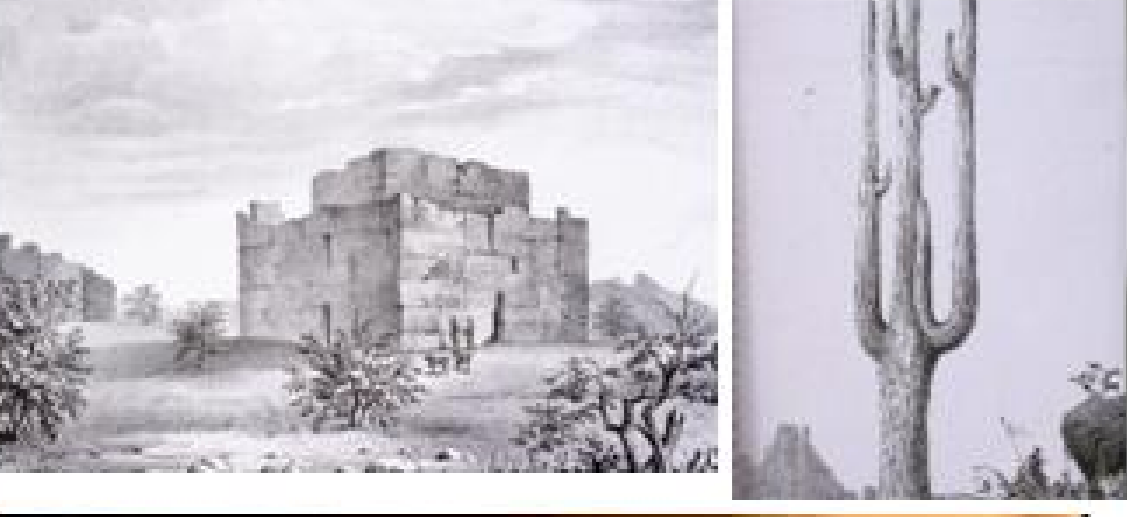


1888-1892: Floods and Failed Reclamation
 Railroad completed from Maricopa Wells to Phoenix, further improving Salt River Valley's connection to outside markets. Territorial Capital permanently moves to Phoenix in 1889, legitimizing Salt River Valley as political and economic center of Arizona and furthering decline of Gila River Valley and Florence area. Crop acreage continues to increase despite unresolved legal issues. *Wormser v. Salt River Valley* case produces 1892 Kibbey Decision that provides legal precedent for future decisions over water rights. Floods underscore need for sophisticated water storage and distribution system, while private companies struggled with large-scale reclamation projects. USGS commences hydrological studies on Salt, Gila, and Verde Rivers. University of Arizona Agricultural Experiment Station formed.



From Purgatorial Wasteland To Reclaimed Garden: Hydrological Development, Water Politics, And Social Engineering In Pre-Statehood Central Arizona

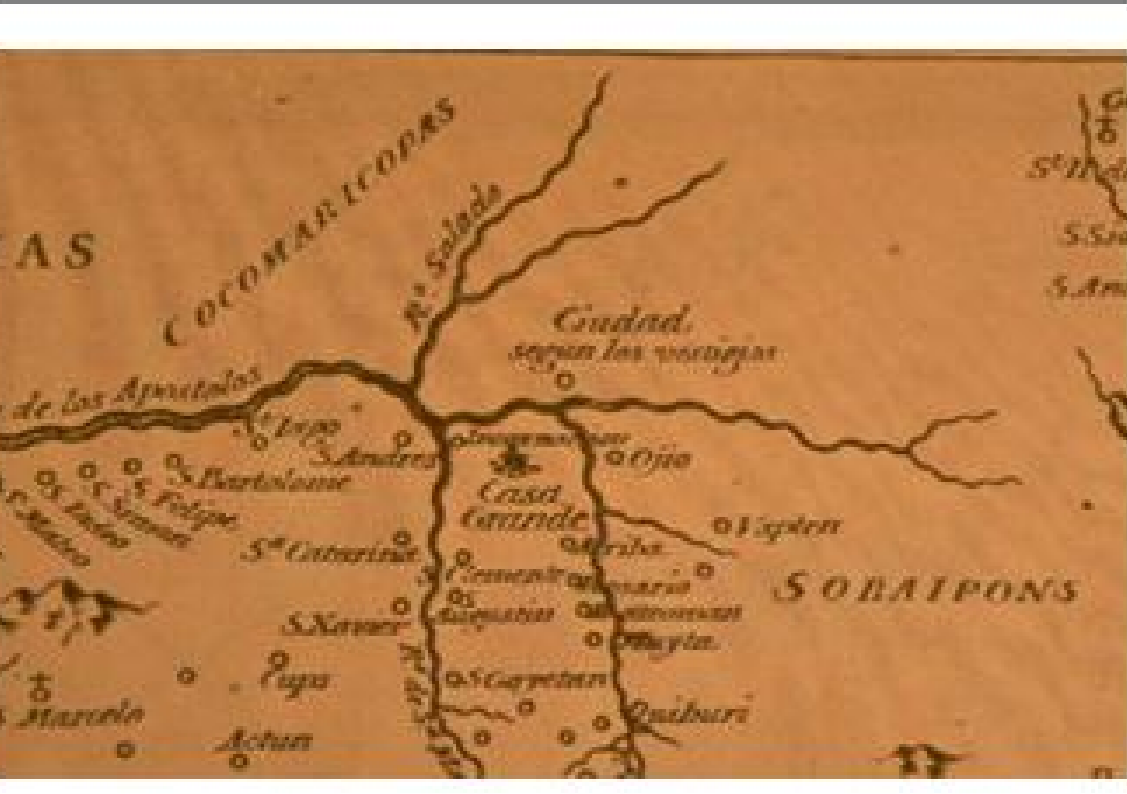
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1821-1846: Mexican Era
 Period characterized by war, economic and social disruption, demographic contraction. Although Pima/Maricopa settlements on Gila River remain strong, Santa Cruz River Valley is conflict zone between Europeans, Papagos and Pimas, with Apaches. Mission system and small outposts abandoned, Tucson presidio and Pima villages become the safest locations. Irrigated acreage diminishes, as Gila River settlements become increasingly important source of foodstuffs, with Piman economic power translating to political capital. Arizona perceived by Mexicans and Americans as savage wasteland.

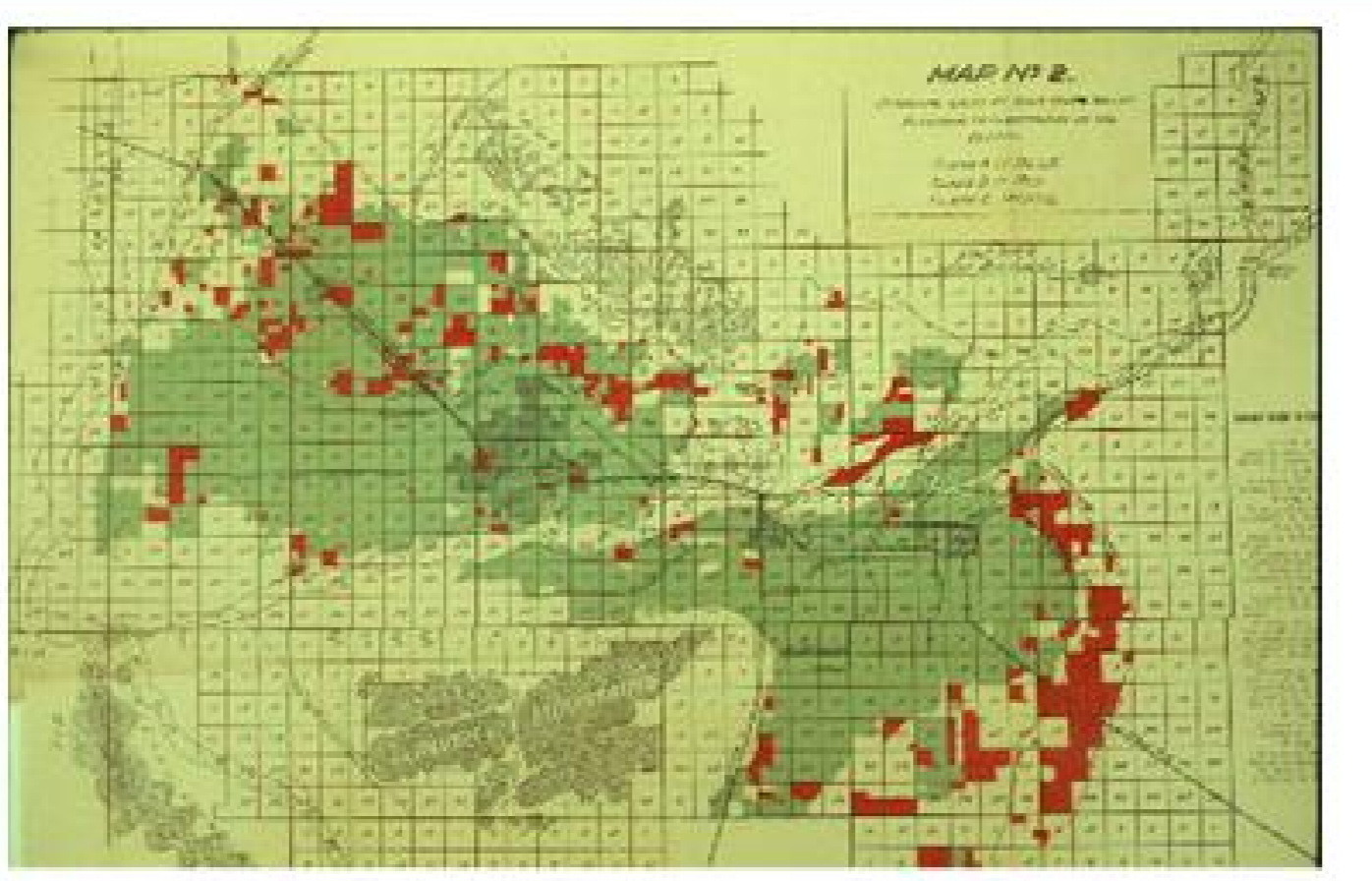


1687-1821: Spanish Colonial Entry into Arizona
 Let by Jesuit Eusebio Kino, Spanish missionary efforts extend to Pimas in Santa Cruz and Gila River Valleys. Although no permanent European settlements until mid-1700s in present-day Arizona, Spanish extend geographic knowledge and introduce crops, increasing Piman food output. Further mission system expansion under Franciscan Tomas Garces in late 18th century, Spanish power declines. Spain never adopts science as way of understanding natural world, cosmology sharply bifurcated between Christian civilization and "savage" nature.



1528-1604: Spanish Entrada
 Spanish entry into Southwest capped by Coronado expedition. Spaniards note Puebloan agriculture which feeds interest for colonization. Onate colonizes New Mexico, Farfan extends geographic knowledge to Colorado River. Cultural and physical geography uncivilized, outside God's realm.

Timeline



Water Diversions and Survival of the Fittest



Utilitarian Ideal of Agrarian Landscape



Written Culture, Transportation Networks, and World Systems

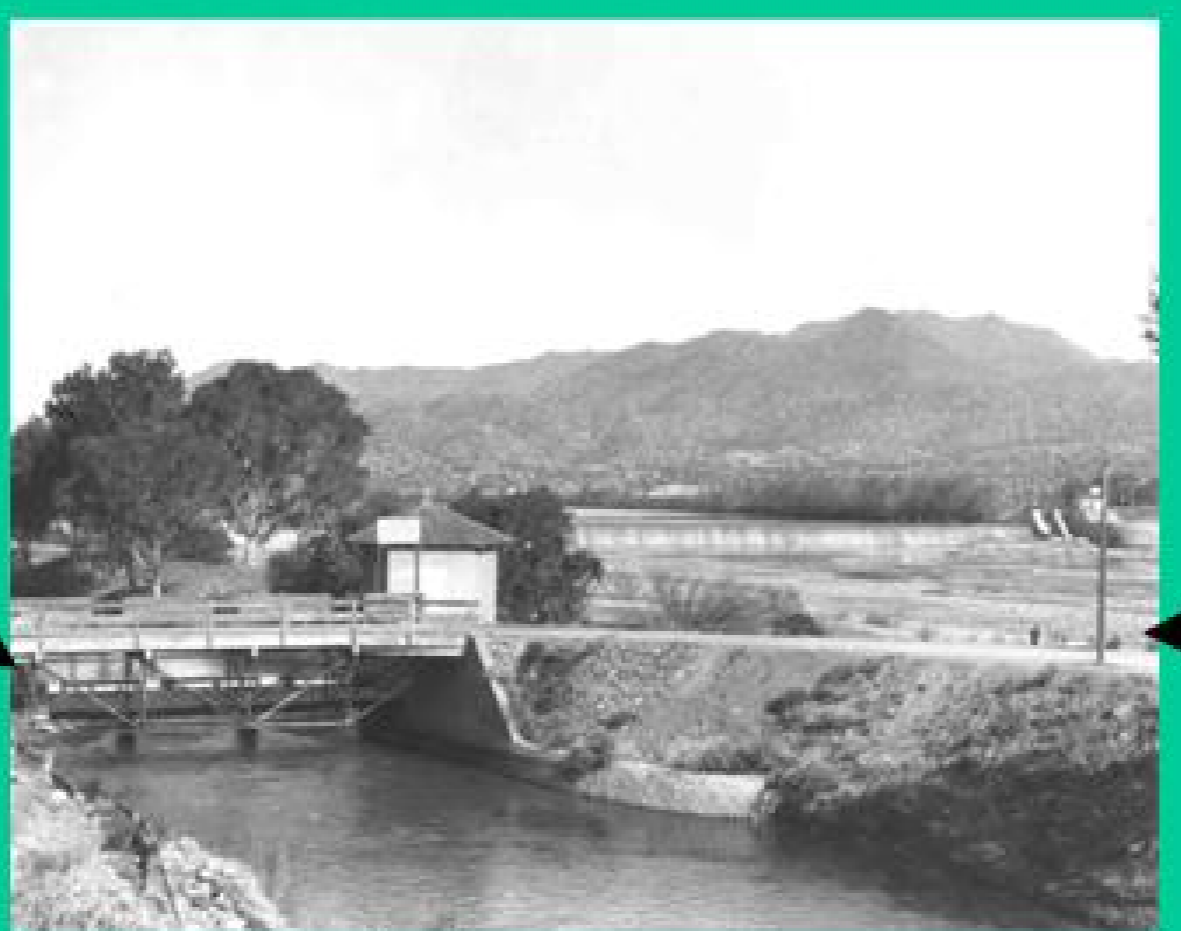


High Water Use – Alfalfa and Cattle

Dialectics of Water and Agriculture in Central Arizona



Groundwater Pumping "Reserve Resource"



Surface Water Diversions



Reclamation: Hydrological and Social Engineering



The Idealized Agrarian Garden

---Key Concepts---

- 1) **Perception:** Mainstream impression of Arizona as wasteland was transformed into "garden" and exemplar of humankind's conquest of nature in engineered rural/urban setting. Scientific interest in region's indigenous flora, fauna, geology, and human societies remained with educated elite, not extending to popular culture until later in 20th century. There exists dialectic between philosophy and material dynamics.
- 2) **Politics and Law:** *Prior Appropriation* doctrine unworkable after resource-competition issues intensified. Prodded by necessity and courts, government and citizens at local and national levels produced public/private merger of Reclamation Service and Salt River Valley Water Users Association. Kent Decree in 1910 provides baseline legal decision and scheme for equitable distribution of water.
- 3) **Demographics:** Population in Salt and Gila River Valleys settled in towns and rural areas along canals and transportation network. Salt River Valley wide open for settlement while Gila River Valley limited by hydrological shortcomings and Pima/Maricopa Reservation. Initial migrations and developments driven by combination of ideals, wants, and boosterism, permanence by ecology and economics.
- 4) **Crops and Irrigation:** Grains raised for military uses augmented by foodstuffs for self-sufficiency and boundaries of market brought on by improvements in transportation network – both roads and railways – that connected Central Arizona with world system. Little consideration for high water demand flora until 1890 when agricultural science, water engineering, and legal issues began to be resolved.

- 5) **Cultural Exceptionalism:** Driving force behind persistence of development and settlement, self-image of institutional reclamation and Salt River Valley. Central to racial attitudes and justification for excluding the region's aboriginal peoples from water and resources, as well as assessment of the region's long-duree ecological limits.
- 6) **Ethics:** Mainstream culture's narrow humanism was extended toward "nature" by ideational and material dynamics concerning relationship between natural and human components. Progressive Era institutions and ideology mitigate harshness of arid environs and Darwinistic ethic. Native Americans remain outside mainstream ethical parameters.
- 7) **Ecological Limits:** Despite stresses on the region's hydrological system and soil resources, physical and social engineering allows human society to avoid severe negative consequences. Resource manipulation would later extend outward and downward to extra-regional and subsurface water that provided short-term security but potential long-range problems.
- 8) **Written Culture and World Systems:** Abstractions and broader "connective tissue" of written culture and world systems allowed for greater manipulation and the oretical separation from the "state of nature" more nakedly experienced by less sophisticated societies. Potentially breeds disregard for absolute limiting factors such as water, endangering long-term futures.

1903-1910: SRP, Kent Decree, and Modern Era
 Salt River Valley Water Users Association formed, construction on Roosevelt Dam begins, ensuring dominance of Phoenix and Salt River Valley in Arizona politics and economics. Pinal County continues slide toward political and economic marginalization. Migration to Salt River Valley intensifies and urban uses increase. Irrigated acreage and monoculture agriculture continues to grow. Kent Decree in 1910 details historical development of water claims in relation to use, allowing Salt River Project to proceed with degree of legal certainty. USGS and AES involvement in water development planning and agricultural practices creates more scientific approach to farming and regional planning. Exceptionalist ethos surrounding reclamation creates area of invincibility.



1893-1902: Storm Before the Calm
 Kibbey Decision ignored by canal companies who continue development schemes on Gila and Salt Rivers, suggesting public/private reclamation concept. Fifth Irrigation Congress held in Phoenix in 1896, water users association formed, USGS studies Salt and Gila Rivers for scientifically planned water development. Boosters continue promoting Central Arizona as "garden spot" with unlimited agricultural potential. After 1894 Carey Act fails to address western reclamation problems, 1902 Reclamation Act marks progressive merger between private and public interests. Crop acreage and canal mileage increases despite uncertainties; monoculture agriculture more prevalent. Ground water pumping increases dramatically because of waters needs and technological innovation.