

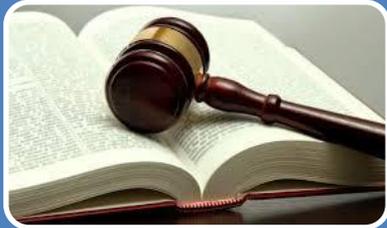


Discussion Panel: Groundwater and Surface Water Interactions: the Case of the Colorado River Basin vs Rio Bravo Basin .

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Social and legal.

- Population growth, increases in water demands.
- Different groundwater legal systems in Mexico and US



Water quality

- Dissolved Solids Concentrations in Colorado River deliveries
- Sanitation problems in the Tijuana and Bravo rivers



Groundwater:

- Less infiltration caused by the lining of the All-American Canal. ($80 Mm^3$ approximately).
- Water transfers to other basins (Los Angeles and San Diego: $1\,480 Mm^3$ annually) that diminish recharge and return flows.

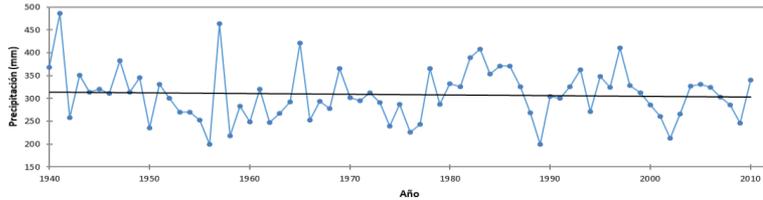


Climate change:

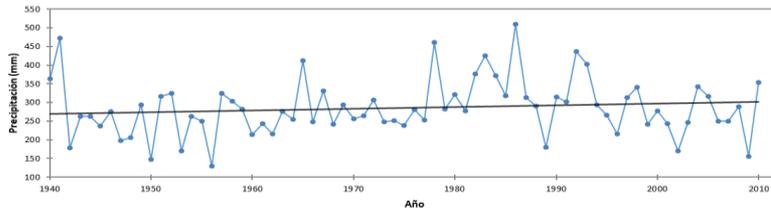
- Increase in temperatures
- Increasing demands and water stress
- Challenges for governance and water security

Precipitation

Precipitación Total Cuenca Alta



Precipitación total Cuenca Baja



- No statistically significant changes in annual precipitation.
- Mean annual runoff is projected to decrease by 8.5% by 2050. (USBR, 2011)

Temperature

- Increases in temperature for the whole basin.
- In upper colorado basin increases in 2°C approximately in 50 years.
- In lower colorado basin increases between 1-2 °C





Tijuana river

- Construction of pressure line for wastewaters.
- International wastewater Treatment plant of San Diego (1997)



Colorado river

- Hoover dam (1931-1936)
- All american canal (1934)
- Glen Canyon dam (1956-1966)
- Ecological degradation of Colorado Delta and the north of Gulf of California



Bravo river

- Falcon dam (1953)
- Amistad dam (1969)
- 289 minute

LEGAL FRAMEWORK

- Treaty *Peace, friendship, limits and settlement*

(february 2, 1848); new international border.

- , Treaty on the Distribution of International Waters (February 3, 1944) after 96 years of negotiations.

- NAFTA (1994); financing of projects within the border region. (NATBANK and COSEF)

- T-MEC (2020); chapter 24 “Environment”

- Continental fresh water was not considered
- Standards to be enforced

- Government cooperation to reach agreements
- Creation of institutions for conflict resolutions
 - International Boundary and Water Commission
- Creation of North American Development Bank (NADB) and Border Environment Cooperation Commission (BECC).



- ▶ More studies and exchange of information are required.
- ▶ US and Mexican government involvement is needed.
- ▶ Surface water-groundwater interaction need to be further studied.
- ▶ Consider population growth and climate change to estimate future water demand
- ▶ Achieve water security and sustainability

