

# Binational Restoration Efforts to Revive the Colorado River Delta

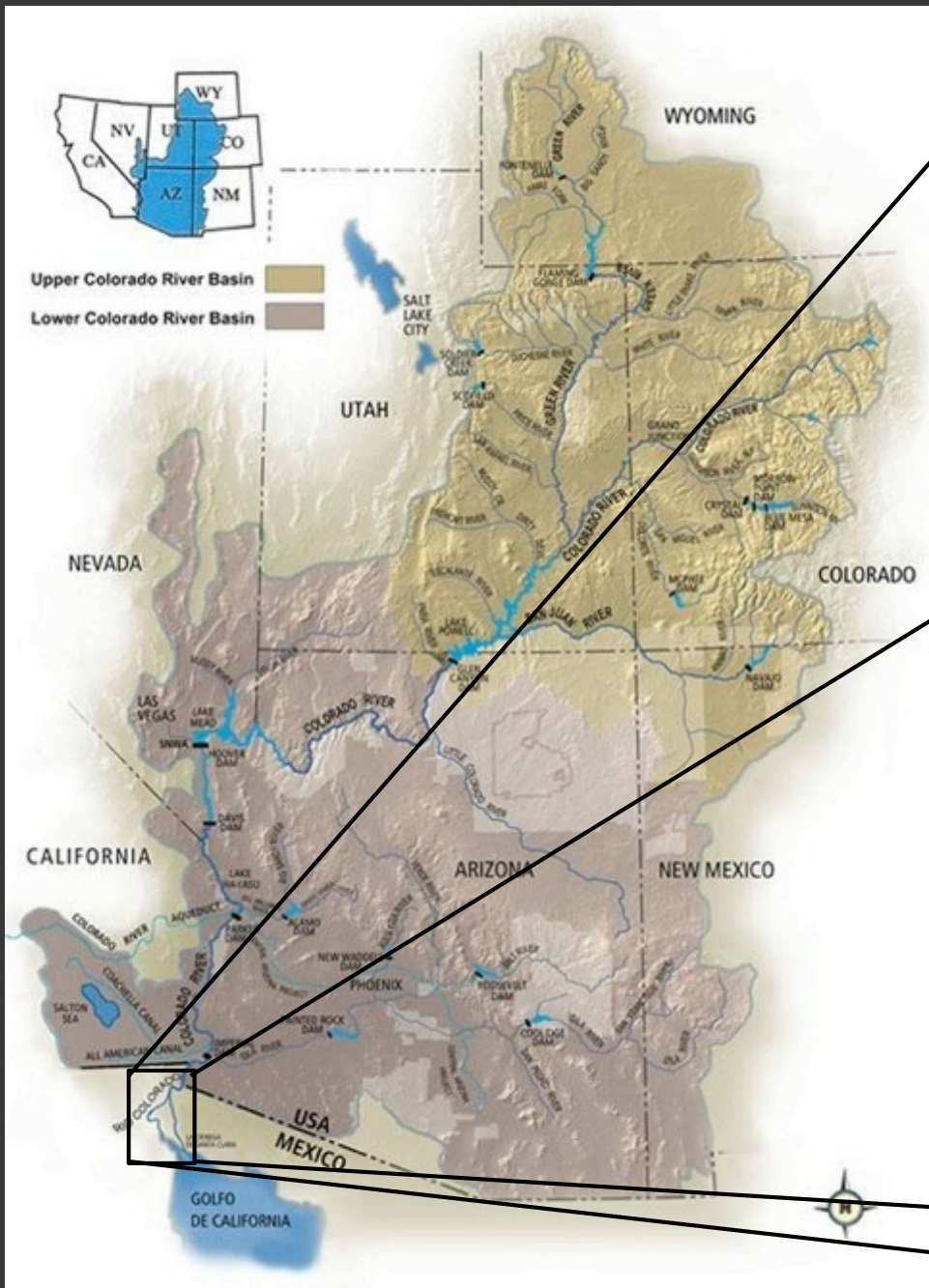
*NCER 2016  
21 April, 2016*

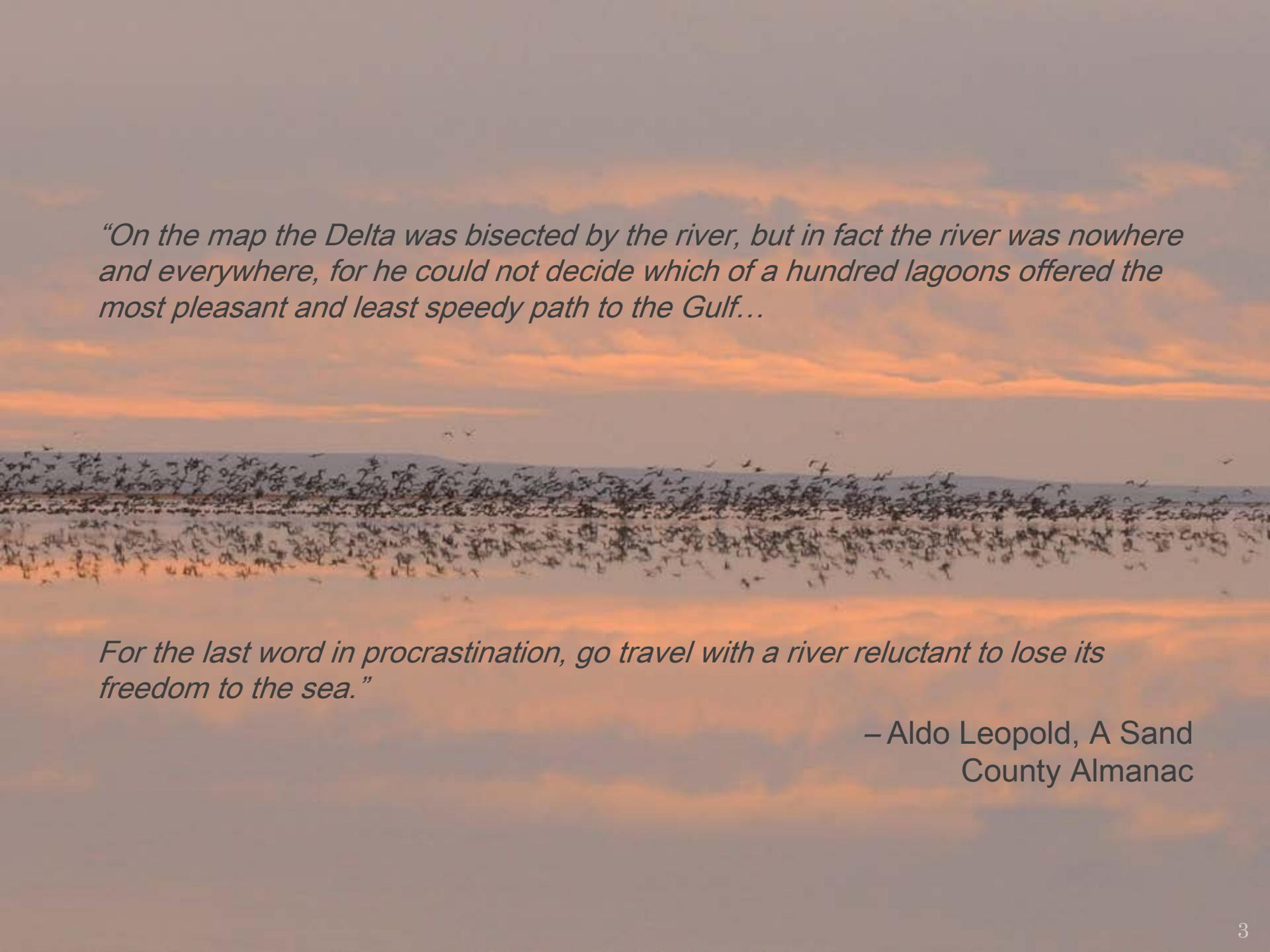


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*“On the map the Delta was bisected by the river, but in fact the river was nowhere and everywhere, for he could not decide which of a hundred lagoons offered the most pleasant and least speedy path to the Gulf...”*

*For the last word in procrastination, go travel with a river reluctant to lose its freedom to the sea.”*

– Aldo Leopold, A Sand  
County Almanac



# Historic Delta

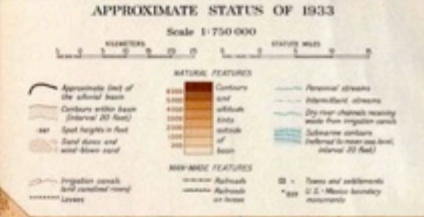


*Photo source: IBWC*

MAY 10 1954



# THE COLORADO DELTA REGION APPROXIMATE STATUS OF 1933

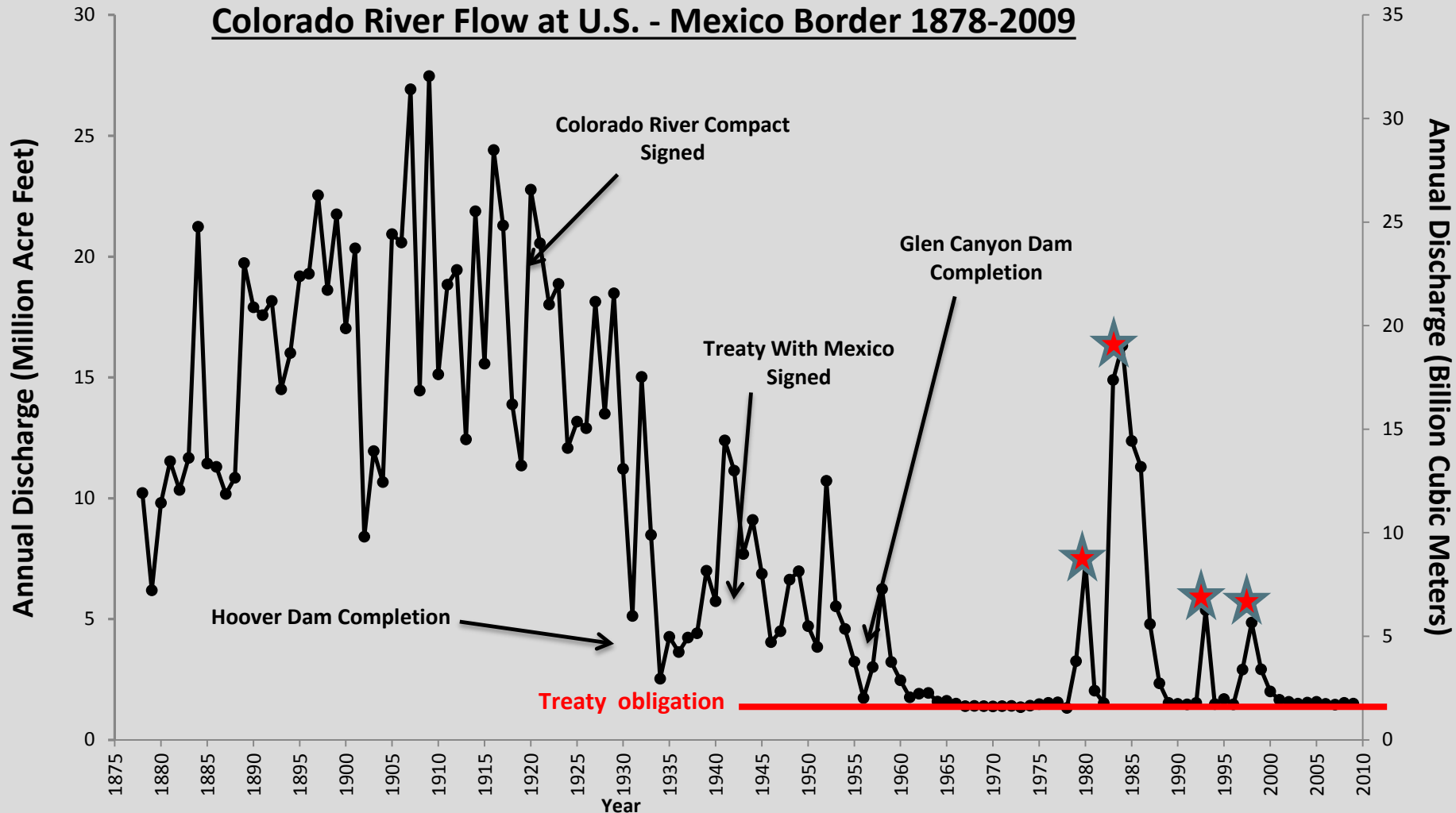


# Historic Delta



Photo source: IBW

# Colorado River Flow to Mexico during 19<sup>th</sup> Century







# The Delta Today





~15 Miles from the Gulf of California





# Colorado River: Challenges and Impacts

## “The American Nile”

- One of the most heavily litigated rivers in the world.
- Arizona vs. California 1934.
- And 1936 and 1963 and 1964 and 1968.
- And 1979 and 1983 and 1984 and 2000.
- And the 320 Minutes to the 1944 US-Mexico water treaty.

## Economic Impacts

- Irrigation of over 5 million acres, using approximately 80% of Colorado River water.
  - 15% of US agricultural production, plus Mexico
- Municipal water support for an estimated 40 million people.
- Hydropower: Up to 12 Billion kwatt hours per year.
- Annual economic impact of \$1.4 trillion.
- Reservoir use, fisheries, etc.



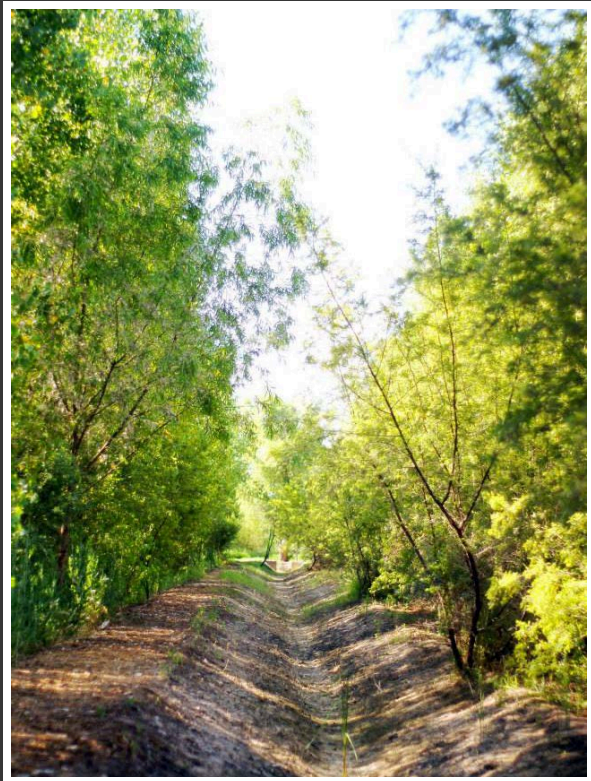


# Hope for the Delta Ecosystem?



# Sonoran Institute Colorado River Delta Vision

RESTORE



RENEW



RECONNECT





# Restoration Milestones in the Riparian Corridor in Mexico

## *Restore*

2008: land concession to Pronatura Mexico and Sonoran Institute for restoration; formation of the Delta Water Trust

2012-2017: Minute 319 dedication of environmental flows and binational commitment to restoration

2014: pulse flow release and Minute 319 monitoring program

### Actively restored area to date:

*(both Minute 319 and non-Minute 319 sites)*

Site Name	Area Restored (acres)	Organization implementing restoration
Miguel Aleman	93	Pronatura Noroeste
Laguna Grande	240	Sonoran Institute



# Sonoran Institute Restoration Overview/Objectives:

- Demonstrate that a relatively small amount of water can revive the Delta Ecosystem.
- Create a diversity of habitat types in restored areas to support wildlife and encourage community engagement.
- Develop an integrated restoration approach to consider ecologic, abiotic, and public interactions.
- Develop and implement a long-term ecological monitoring and adaptive management program to ensure long-term program success.











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# Laguna Grande Monitoring Program





# Community Engagement

## *Renew*

- Adopt-the-River
- ALAS del Delta
- School groups
- Delta tours
- Local community members on staff
- Raise the River campaign





# *Reconnect*

Innovative approaches to connect the river  
to the sea



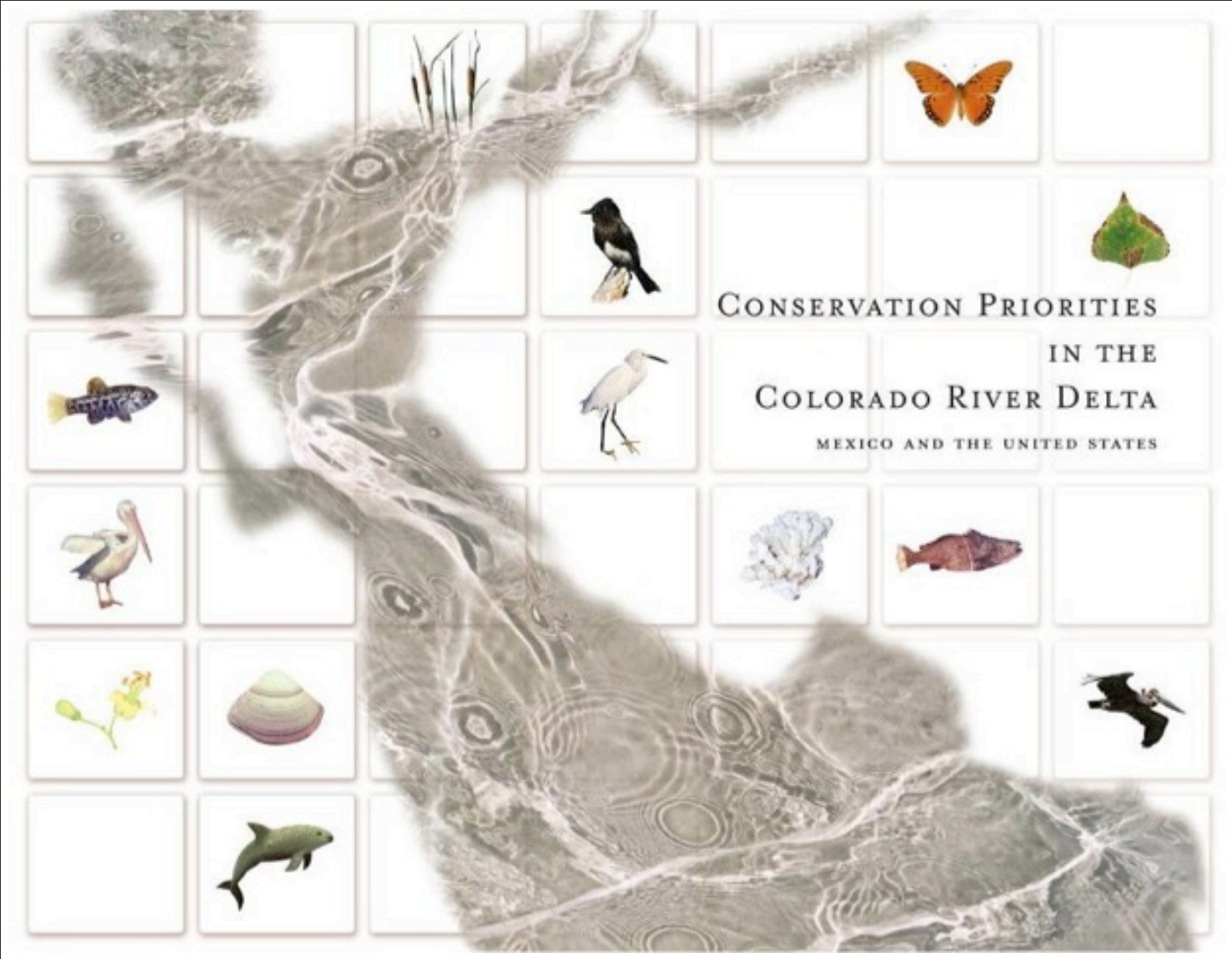
Secure environmental flows for the  
Delta



Enhance physical connectivity lost  
due to the 2010 earthquake

# More than a decade of research and restoration served as foundation for the binational agreement:

2000 - Minute 306 ----- 2012 – Minute 319





# Minute 319

- 5-year agreement signed in November 2012 by US and Mexico
- Establishes new guidelines for the management of Colorado River water during times of drought and promotes investments in water conservation projects
- Water dedicated for ecological flows to the Colorado River in Mexico for the 1<sup>st</sup> time in history
- 105,400 af provided by US and MX for experimental flood pulse flow
- Delta Water Trust to provide 52,700 af for river base flow
- At end of 5-year term, US and MX will determine if/how to expand commitments

# Minute 319 Pulse Flow 130 million cubic meters, March 23-May 18, 2014





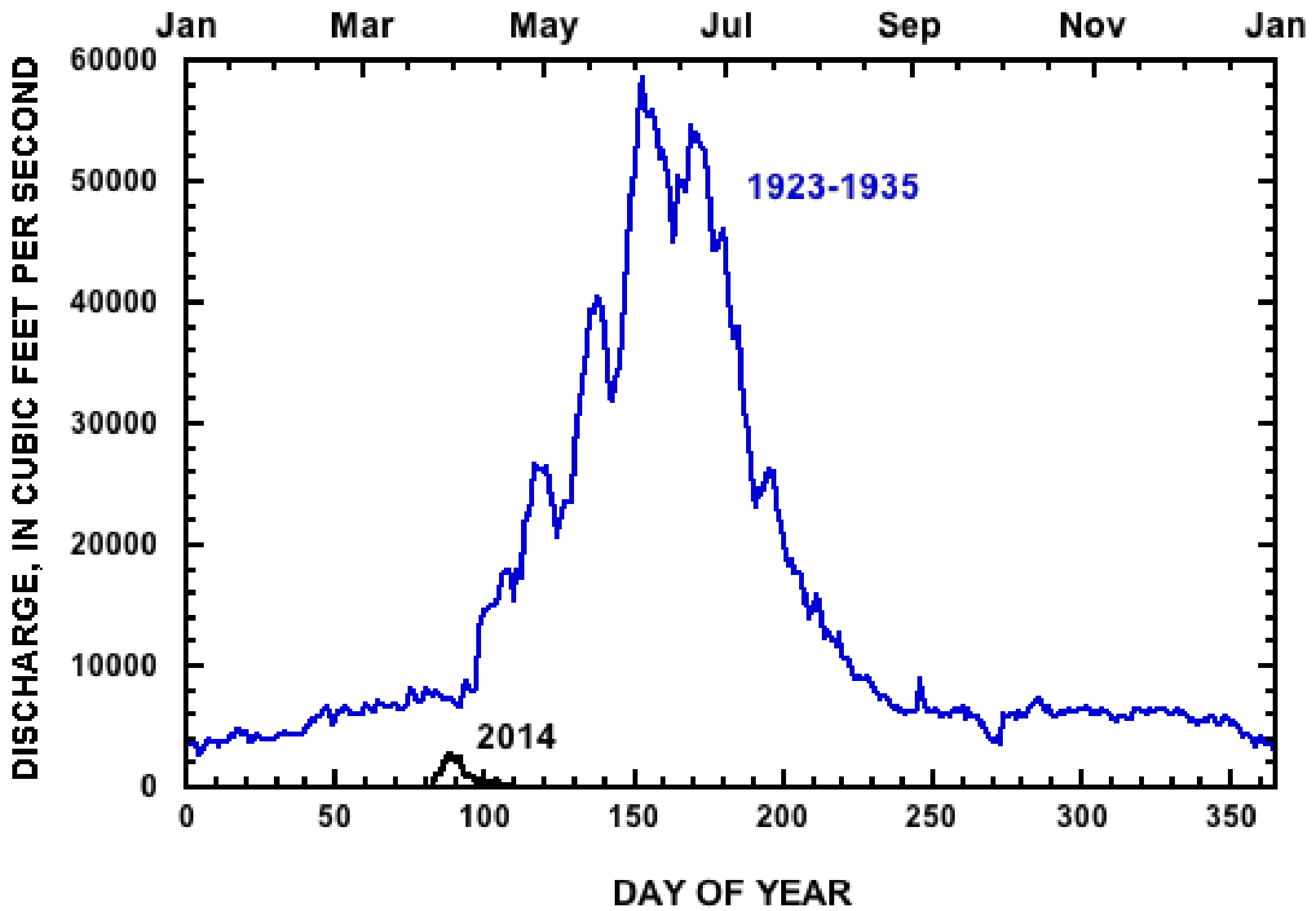


Figure courtesy of Jack Schmidt





# The Minute 319 Science Team

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**Carlos de la Parra**, Colegio de la Frontera

**Ed Glenn**, University of Arizona

**Martha Gomez**, University of Arizona

**Matt Grabau**, Sonoran Institute

**Osvel Hinojosa**, Pronatura Noroeste

**Eloise Kendy**, The Nature Conservancy

**Jeff Kennedy**, USGS

**Jim Leenhouts**, USGS

**Jeff Milliken**, US Bureau of Reclamation

**Erich Mueller**, USGS

**Pamela Nagler**, USGS

**Steven Nelson**, Unaffiliated

**Karen Schlatter**, Sonoran Institute

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**Pat Shafroth**, USGS

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**Dale Turner**, The Nature Conservancy

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**Eliana Rodriguez**, Universidad Autónoma de Baja California

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*Photos courtesy of Dale Turner*





*Photos courtesy of Dale Turner*

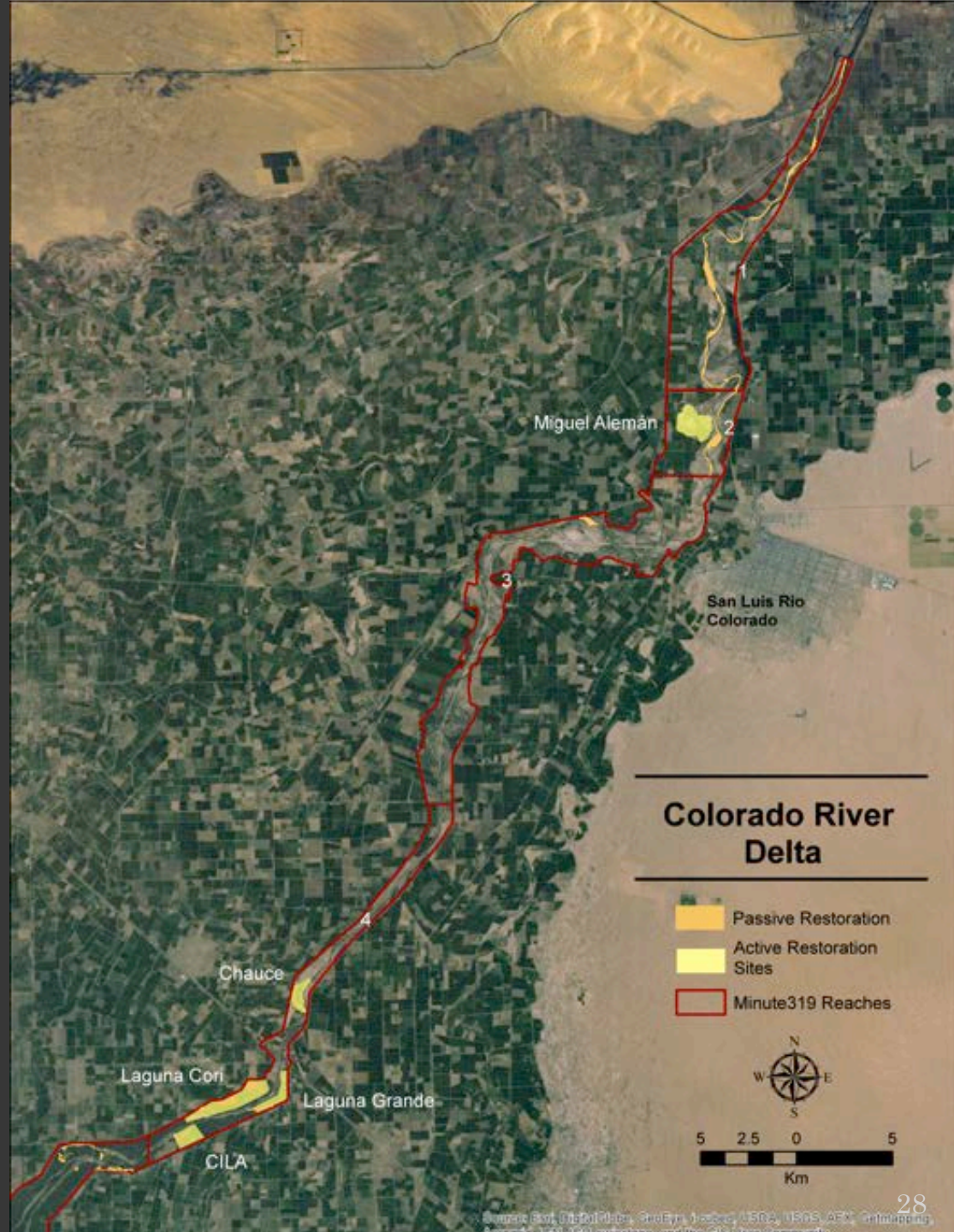


## 5-year restoration goal: 2300 acres

- Targeted delivery locations for pulse and base flows
- Various restoration techniques

## Active restoration sites:

Site Name	Restoration Target (acres)
Miguel Aleman	250
Km 27	50
Chausse	135
Laguna Grande	405
Total	840





# UNANTICIPATED SOCIAL RESPONSE



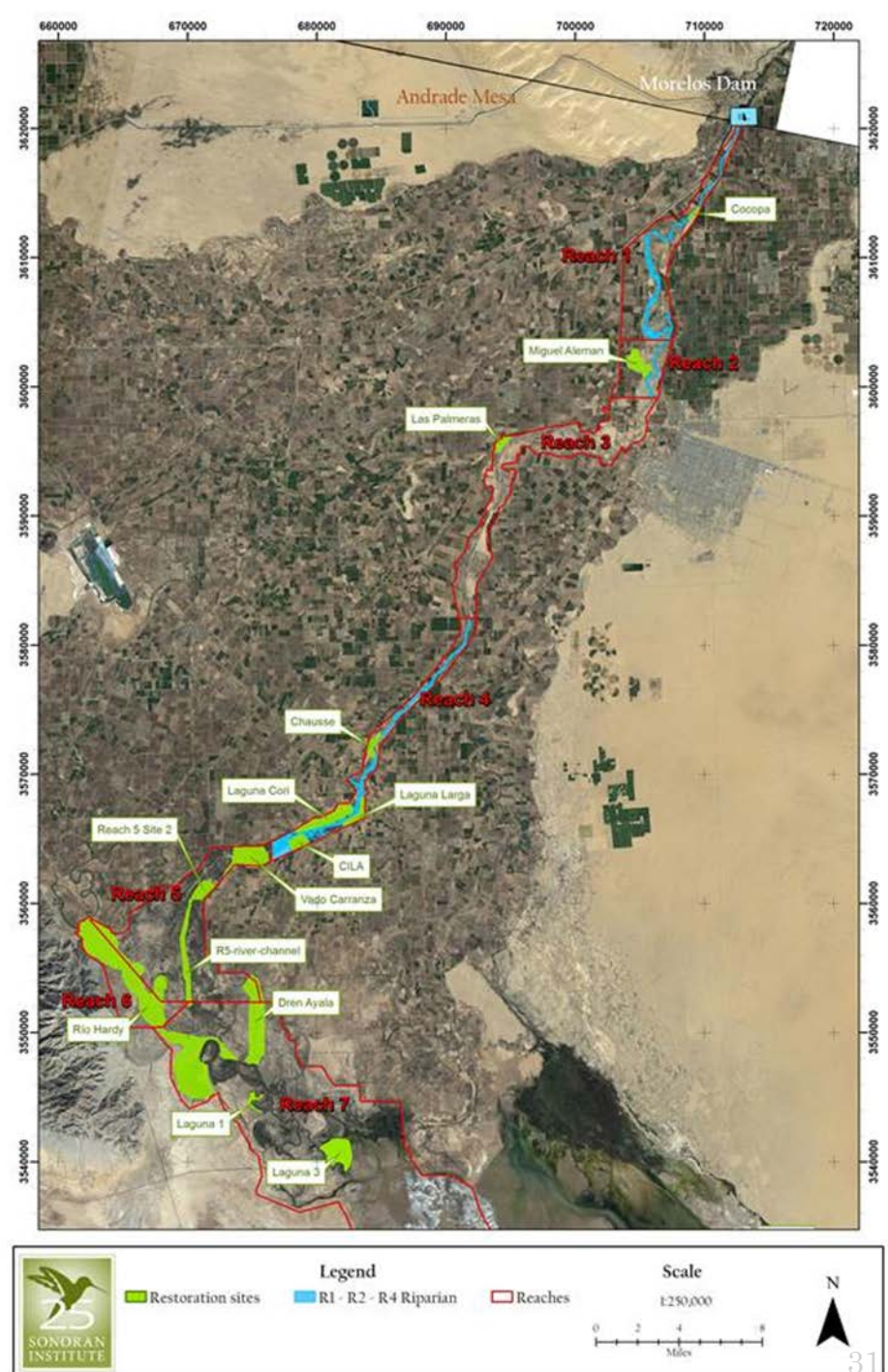






# Moving Forward

- Use Minute 319 science to inform water needs and international negotiations.
- Science-based planning and adaptive management.
  - How much water is needed, where to maximize social and environmental returns.
- Capitalize on the momentum from Minute 319.
- Distribute restoration efforts from Morelos Dam to the estuary.



# Minute 32X Environmental Working Group

Co-Chairs: Pronatura Noroests (MX) and Audubon Society (US)

## Mexican Representatives

- Sonoran Institute
- CILA Mexico
- Conagua
- Conanp
- COLEF
- State of Baja California
- Restauremos el Colorado

## US Representatives

- US IBWC
- US Bureau of Reclamation
- USGS
- States of AZ, CA, CO, NV
- University of Arizona
- The Nature Conservancy





Thank you!

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