

Restoration Monitoring: A Spectrum of Questions, Interests, and Audiences



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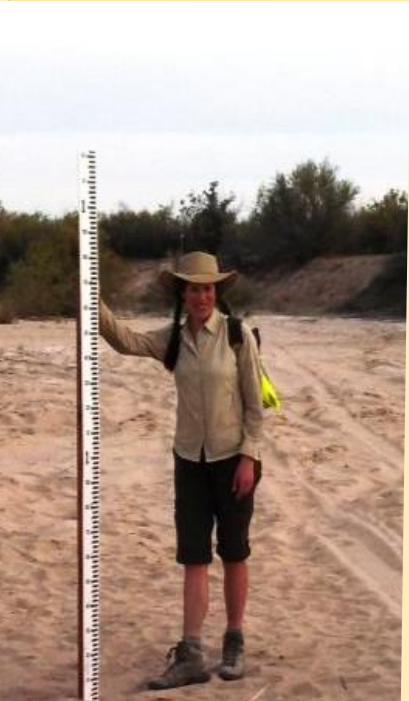
Photo: National Geographic

How do Minutes 319 and 323 work?



A spectrum of interests in restoration monitoring

1. Binational governments
2. Restoration practitioners (NGOs)
3. Donors and potential donors



1. Binational Monitoring and Science: Objectives

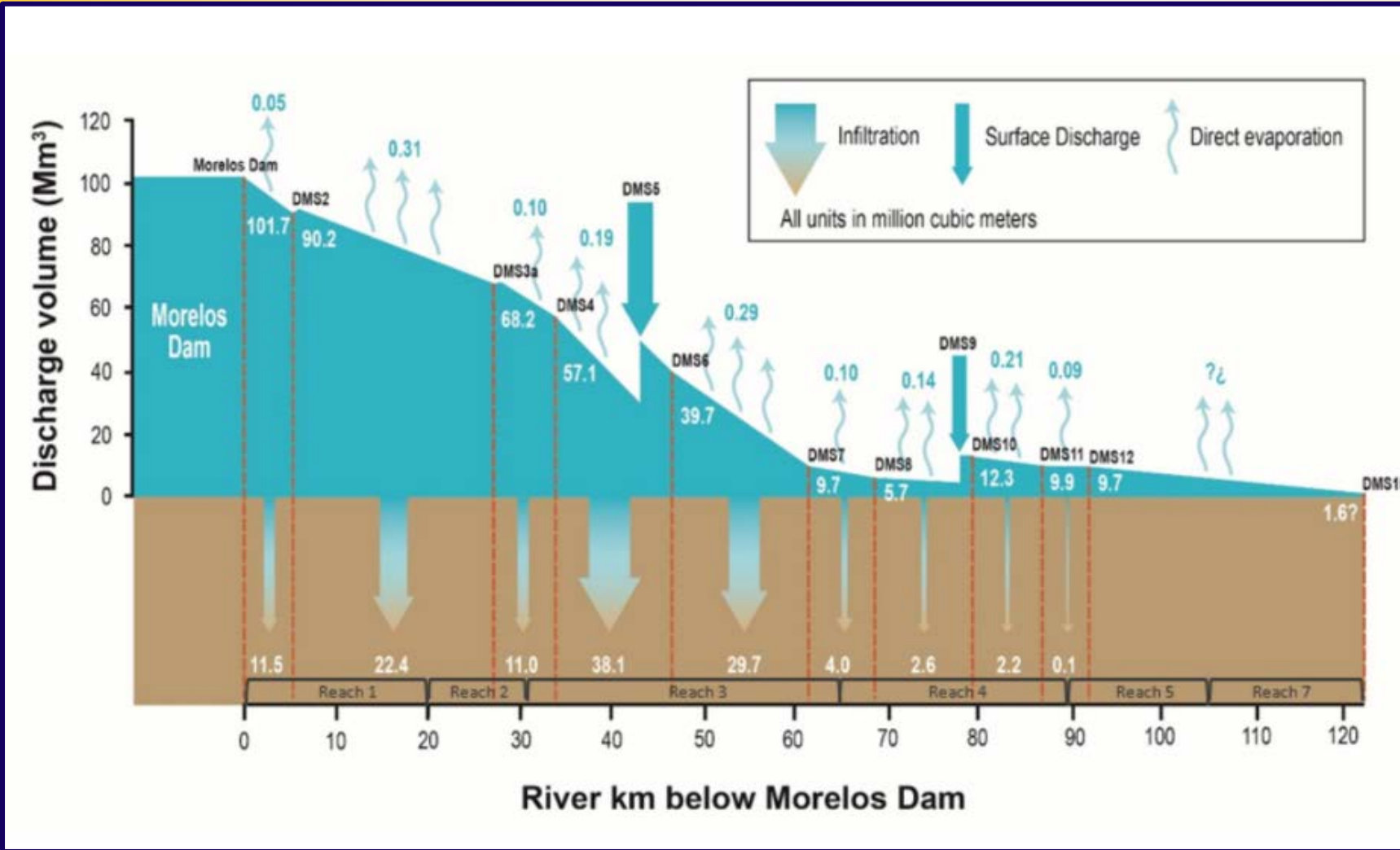
- Assess the effects of restoration
- Inform adaptive management
- Apprise IBWC and the public
- Verify implementation

Adaptive Management Questions

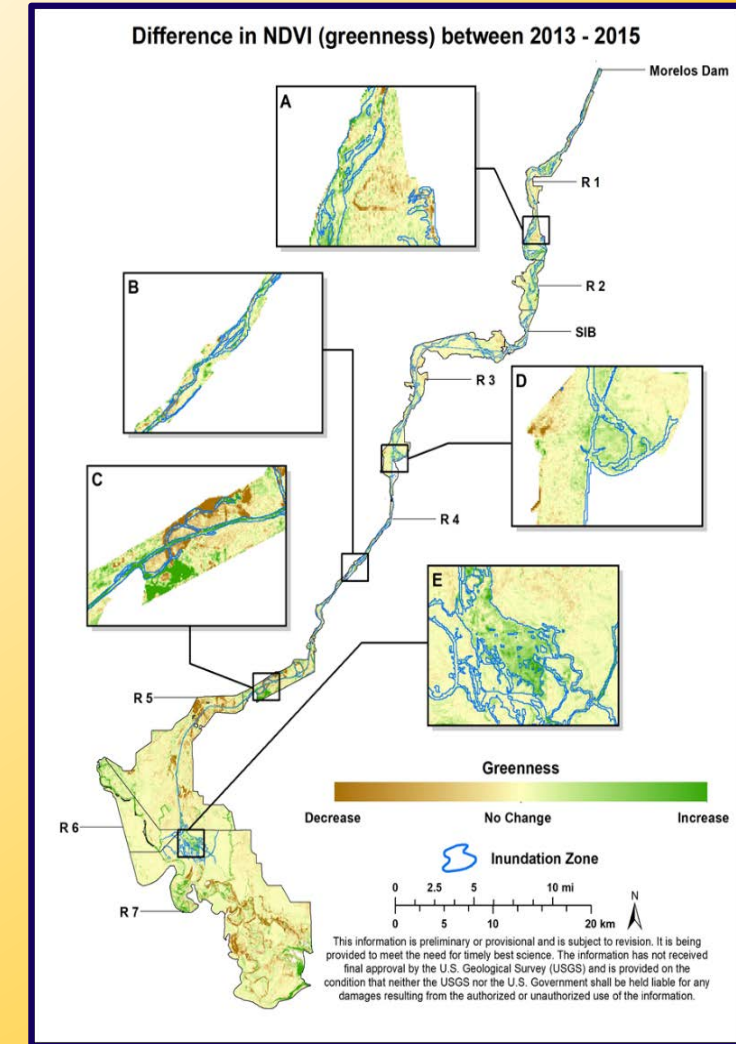
- *How to optimize in-channel water deliveries?*
- *How to optimize irrigation?*
- *What strategies will promote habitat resilience to changing regional conditions?*



Binational Monitoring Scale: Riparian Corridor and Estuary



Pulse flow water budget



Change in NDVI

Binational Monitoring Parameters

Hydrology

- Water delivery rates, volumes
- Groundwater levels, salinity
- Surface water stages, discharges
- Inundation extent, duration
- Evapotranspiration

Riparian Vegetation

- Foliar cover
- Volume
- Canopy height
- Stand age
- NDVI, EVI
- Repeat photos

Estuary

- Water quality, flows, levels
- Salt grass cover
- Zooplankton, fish
 - Abundance
 - Composition

Birds

- Abundance
- Diversity

Social (tentative)

- Jobs
- Visitors
- Volunteers

2. Monitoring Restoration Effectiveness: Objectives

- Standardize indicators of habitat quality at restoration sites
 - Scientifically robust, but easily reported to a broad audience
 - Relatively rapid and affordable for annual reporting
- Inform adaptive management and future restoration designs

Habitats (so far)

- Cottonwood and willow forests
- Mesquite bosque
- Other riparian woodland and shrubland



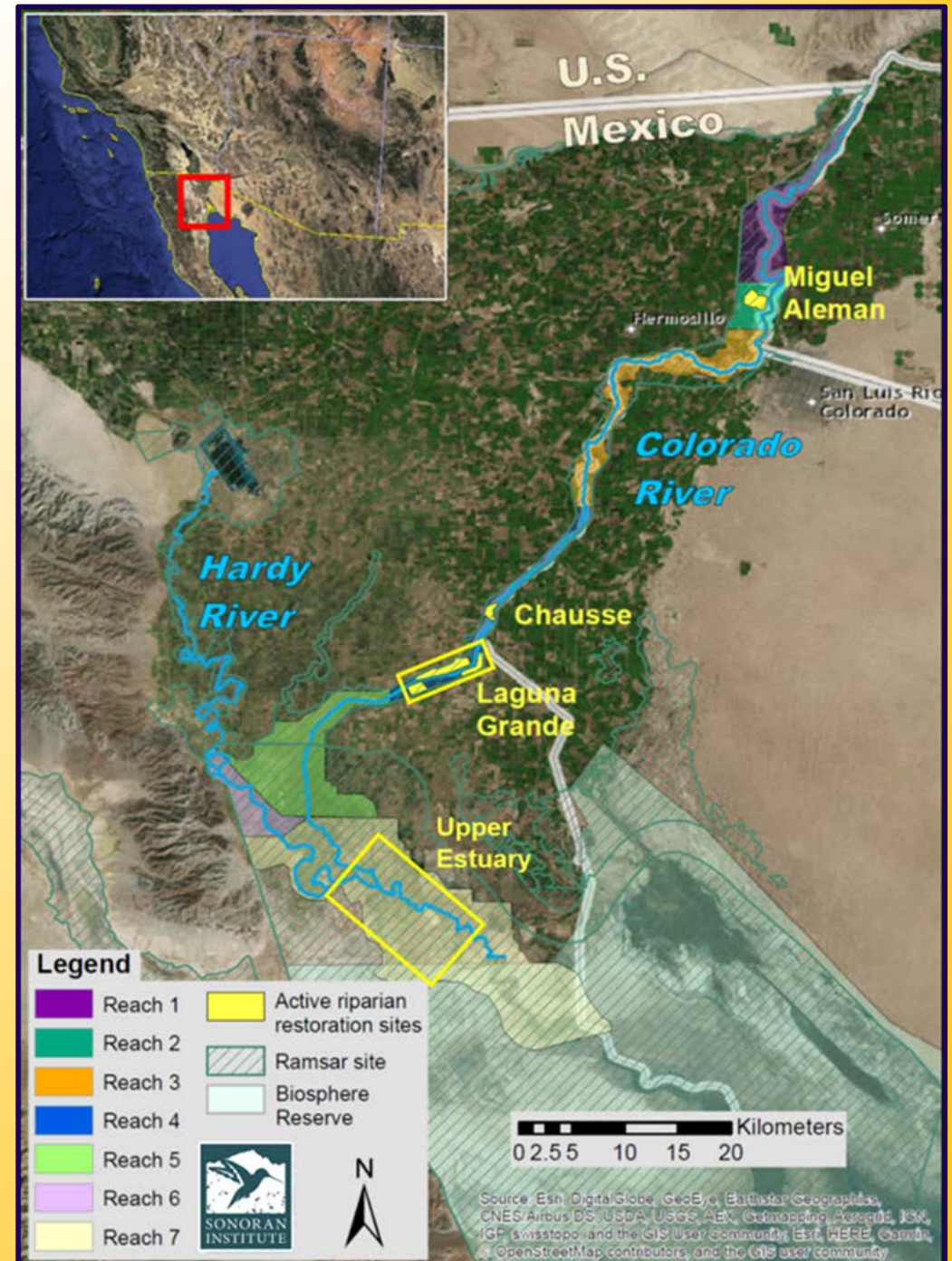
Monitoring Restoration Effectiveness

Scale:

- Established restoration sites
- Planned restoration sites

Compared to:

- Control sites
- Reference sites



Metrics of Restoration Effectiveness



Photo: Bill Hatcher



Bird photos: Sonoran Institute

Birds

- Abundance
- Diversity

Riparian Vegetation

- Foliar cover
- Structure (total volume)

Estuary

- Under development

Social (tentative)

- Jobs, visitors, volunteers

3. Monitoring and Reporting to Donors

Objectives:

- Instill comfort that donations were well used
- Convey pride in accomplishments
- Foster sustained support

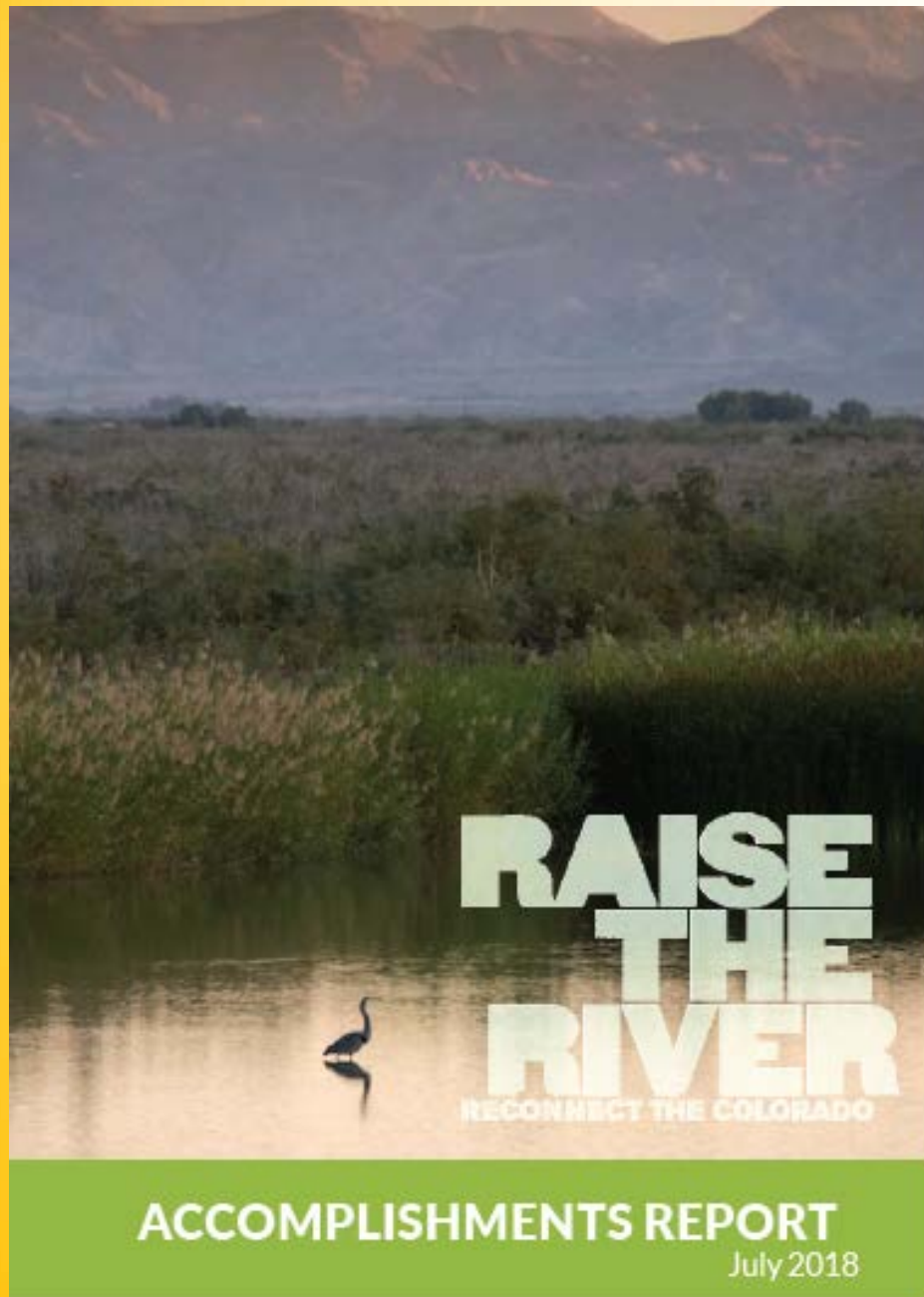
Scale:

- Restoration sites
- Community



Photo: Sonoran Institute

3. Monitoring and Reporting to Private Donors



AT A GLANCE

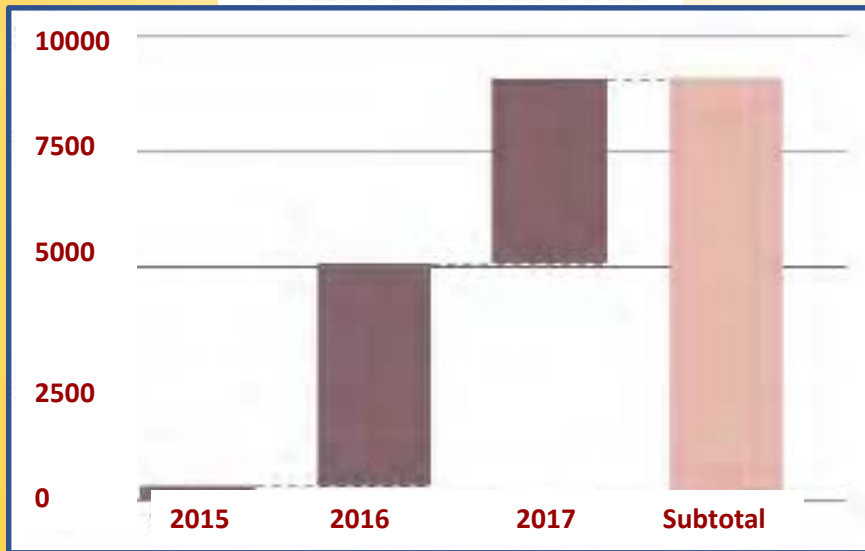
Minute 319 Accomplishments, through year-end 2017:

- Over 1,000 Acres Restored
- > 245,000 Trees Planted
- 57,362 acre-feet of Water Delivered
- Wildlife populations expanding in restored sites
- > 100 Local Jobs Created
- > 3,000 participants per-year average in educational programs (since 2015 initiation)

Coalition Profile

- Established 2012
- Coalition of 6 NGOs working together
- Over \$10 million raised for conservation
- Ongoing Scientific Monitoring, Management, and Reporting

YOUTH PROGRAM PARTICIPATION



TREES PLANTED

2013	2014	2015	2016	2017
26,564	+59,177	+24,176	+124,483	+11,100
Total of 85,741		Total of 109,917	Total of 234,400	Total of 245,500

VOLUNTEERS

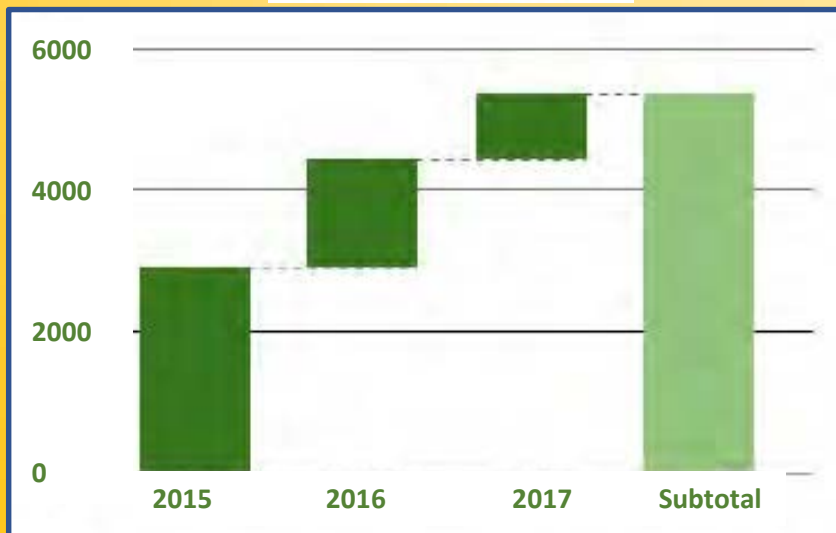
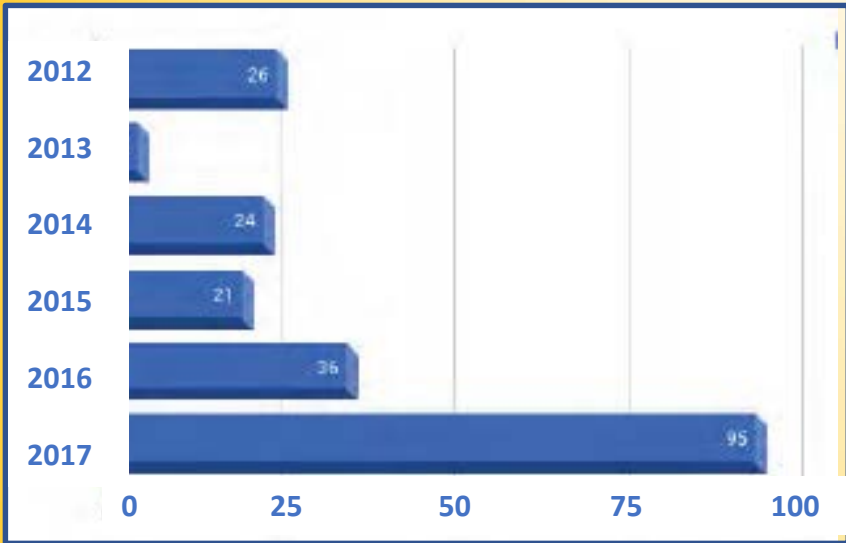


Photo by Sonoran Institute

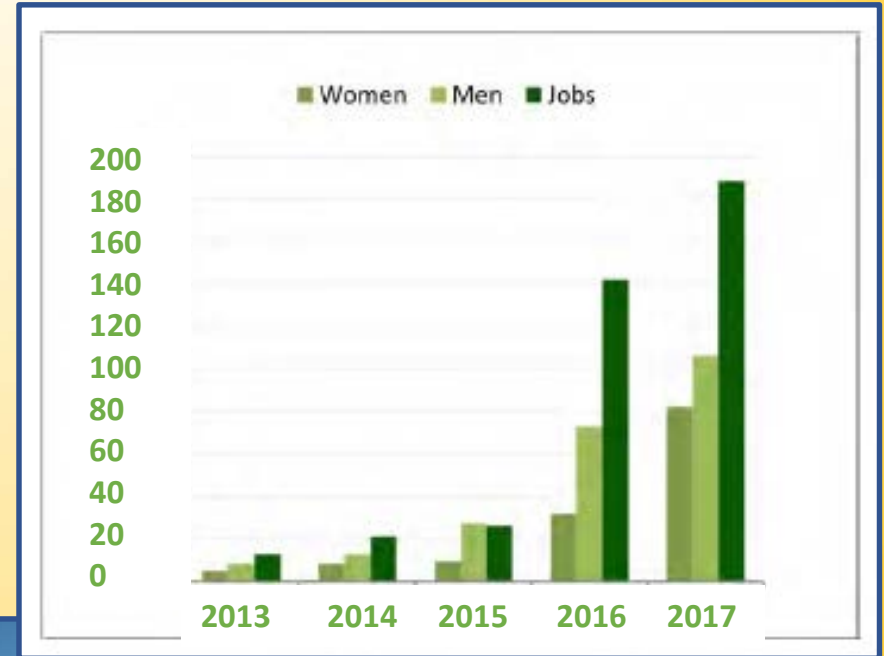


Photo by Sonoran Institute

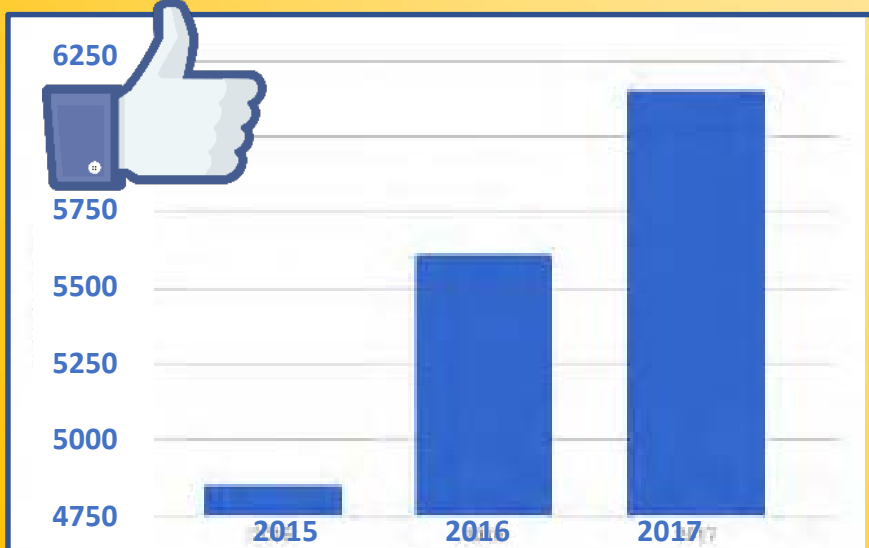
PRESS/ARTICLES PUBLISHED



EMPLOYMENT GENERATED



SOCIAL MEDIA



Photos: Bill Hatcher

Challenges

- **Coordinating diverse entities**
- **Setting expectations with limited budgets**
- **Sharing data**
- **Providing useful feedback**

Thank you!

¡Gracias!

