Addressing Transboundary Water Issues in the AZ-Sonora Border Region:
The Arizona Perspective
Mission & Vision

To protect and enhance public health and the environment in Arizona.
Through consistent, science-based environmental regulation;
and clear, equitable engagement and communication;
With integrity, respect, and the highest standards of effectiveness and efficiency;

Because Arizonans treasure the unique environment of our state and its essential role in sustaining well-being and economic vitality, today and for future generations.
Arizona-Sonora Border Region

**Characteristics**
- 362 mi / 582 kms
- 4 pairs of major “sister cities”
- “La Paz Agreement” / 62 mi/100 kms

**Challenges**
- Socio-economic & political asymmetries
- Shared environment
- Topography and climate conditions

**Opportunities**
- Shared environment
- Long lasting binational collaboration platforms
Binational Collaboration Platforms

Institutions working together
People creating institutions
The Commissions

➢ Binational Cooperation / Collaboration

➢ Regional/Global Vision/ Local Development

➢ Governance is the institutional sustain through time

God made us neighbors, let us be good neighbors!

Gov. Paul J. Fanning
The Environment & Water Committee

- **$1.5 MD in investment**
- **19 projects**
- **50+ Collaborating Entities**
- **1000+ Trained Participants**

**Phase I**
2017-2021

- **14 Priorities**
  - Air / 3
  - Water / 4
  - Waste Mgmt / 4
  - Wildlife / 3

- **30+ projects**

**Phase II**
2023-2027

- Arizona-Sonora Environmental Strategic Plan 2023-2027
  - Bi-national collaboration to improve the environment and public health in the Arizona-Sonora Border Region.
<table>
<thead>
<tr>
<th>Identified Priorities</th>
<th>Associated Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretreatment and Reuse of Industrial Wastewater with Heavy Metals and Other Pollutants in Nogales, Sonora</td>
<td>Implement a Continuous Monitoring Program for Industrial Establishments with Water and Heavy Metal Management Processes</td>
</tr>
<tr>
<td></td>
<td>Define Pretreatment Alternatives for Wastewater with Heavy Metals and Other Contaminants</td>
</tr>
<tr>
<td></td>
<td>Promote the Training of Water Operators in Sonora Border Cities in Wastewater Pretreatment Programs</td>
</tr>
<tr>
<td>Develop and/or Implement Initiatives that Support Ongoing Strategies Related to Binational Watersheds</td>
<td>Development of a Mechanism to Close Data Gap and a Strategy to Develop a Binational Data Set System between Universities</td>
</tr>
<tr>
<td></td>
<td>Diagnostic Relating to Water Salinity and Drinking Water Wells in Yuma/SLRC Region</td>
</tr>
<tr>
<td>Develop Comprehensive Stormwater Management Plans and Promote Green Infrastructure to Improve Water Quality and Mitigate Flood Impacts in Border Cities</td>
<td>Define an Economically Feasible Project Portfolio Based on the Already Existing Ambos Nogales Green Infrastructure Master Plan</td>
</tr>
<tr>
<td></td>
<td>Develop Binational Green Infrastructure Master Plans in Border Communities of Arizona and Sonora</td>
</tr>
<tr>
<td>Strengthen the Institutional Capacity of Local Authorities for Drinking Water, Sewage, and Stormwater in Sonora Border Cities</td>
<td>Produce a Program Proposal for Maintenance and Operation for Water Infrastructure in Border Cities</td>
</tr>
<tr>
<td></td>
<td>Binational Training on Management and Strengthening of Water, Sewage, and Treatment Utility (Workshops)</td>
</tr>
</tbody>
</table>
The USEPA Border 2025 Program

Border 2025
Frontera 2025

Border 2025 ORGANIZATIONAL STRUCTURE

NATIONAL COORDINATORS

REGIONAL COORDINATORS
- California/Southern California/Tribes*
- Arizona/Sonoran Tribes*
- New Mexico-Texas-Chihuahua/Tribes*
- Texas-Cochiti-Nativo Luján/Tsalagi/Tribes*
- U.S. Federally Recognized Tribes and Indigenous communities in Mexico

POLICY WORKGROUPS
- Air
- Water
- Land
- Emergencies

TASK FORCES
- AIR
- WATER
- LAND
- EMERGENCIES

ADDITIONAL TASK FORCES (OPTIONAL)
- DEPENDING ON THE PROBLEM OR REGION

[Images and text segments indicating various sections and stakeholders associated with the Border 2025 program]
The International Boundary and Water Commission

- Preservation of the Rio Grande and Colorado River as the international boundary
- Protection of lands along the rivers from floods by levee and floodway projects
- Delivery of Colorado River waters allocated to Mexico
- Solution of border sanitation and other border water quality problems.
The “Ambos Nogales” Case Study / Sister Cities
The “Ambos Nogales” Watershed

Photo Credits: Julio Gil, Photographer

Photo Credits: Instituto Municipal de Investigación de Nogales, Sonora (IMIP)
Stormwater

What happens when it rains?
Stormwater
Stormwater
# Stormwater

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Damages Million of Dollars (Nogales Municipality Report)</th>
<th>Evaluate for National Natural Disasters Fund**</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>8.5</td>
<td>5.16</td>
</tr>
<tr>
<td>2010</td>
<td>8.6</td>
<td>5.25</td>
</tr>
<tr>
<td>2014</td>
<td>9.4</td>
<td>4.58</td>
</tr>
<tr>
<td>Totales</td>
<td>23.5</td>
<td>14.99</td>
</tr>
</tbody>
</table>

** Amounts for Emergency Declarations
Un muerto y desaparecidos por lluvias en Sonora

Lluvias dejan crecida de arroyos, una mujer fallecida, un adulto gravemente herido así como cinco personas desaparecidas, entre ellos dos niños.

2007/07/06 16:07  DARIO SANCHEZ/DMC  CNNMEXICO  FOTOS: DARIO SANCHEZ

<table>
<thead>
<tr>
<th>Year</th>
<th>Fatalities</th>
<th>Site</th>
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</thead>
<tbody>
<tr>
<td>2008</td>
<td>4</td>
<td>3 Tecnológico y 1 Los Nogales Ave.</td>
</tr>
<tr>
<td>2010</td>
<td>2</td>
<td>Unidentified</td>
</tr>
<tr>
<td>2014</td>
<td>6</td>
<td>4 Tecnológico y 2 Unidentified</td>
</tr>
<tr>
<td>2015</td>
<td>6</td>
<td>6 Tecnológico</td>
</tr>
<tr>
<td>2021</td>
<td>1</td>
<td>5 de Febrero Ave.</td>
</tr>
<tr>
<td>2022</td>
<td>3</td>
<td>3 Tecnológico</td>
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</tbody>
</table>

** According to Newspapers
Stormwater
Existing flood control infrastructure

<table>
<thead>
<tr>
<th>No.</th>
<th>Project</th>
<th>Year</th>
<th>Funding Source</th>
<th>Amount (US Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chimeneas Gabions Basin</td>
<td>2008</td>
<td>State Water Commission CEA</td>
<td>$108,859.00</td>
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<tr>
<td>2</td>
<td>Bellotas Gabions Basin</td>
<td>2008</td>
<td>Municipal Funds</td>
<td>$121,941.00</td>
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<tr>
<td>3</td>
<td>Capulines Gabions Basin</td>
<td>2008</td>
<td>Border 2012 Program / MEC</td>
<td>$85,907.00</td>
</tr>
<tr>
<td>4</td>
<td>Caesta Blanca Gabions Basin</td>
<td>2008</td>
<td>Border 2012 Program / MEC</td>
<td>$175,000.00</td>
</tr>
<tr>
<td>5</td>
<td>Villa Sonora Retention Basin</td>
<td>2012</td>
<td>National Water Commission (CONAGUA) / Natural Disaster Fund (FONDEN)</td>
<td>$134,795.00</td>
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<tr>
<td>6</td>
<td>UNISON Retention Basin</td>
<td>2012</td>
<td>CONAGUA/FONDEN</td>
<td>$428,495.00</td>
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<tr>
<td>7-12</td>
<td>Pueblitos (Cañada del Muerto) Gabions Control System</td>
<td>2014</td>
<td>FONDEN</td>
<td>$397,791.00</td>
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<td>8</td>
<td>Flores Mapson Rehab Gabions Basin</td>
<td>2014</td>
<td>FONDEN</td>
<td>$85,291.00</td>
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<tr>
<td>9</td>
<td>Solidaridad Gabions Control System</td>
<td>2014</td>
<td>FONDEN</td>
<td>$149,751.5</td>
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<tr>
<td>10</td>
<td>Centeno (Monumentos de Piedra) Gabions Control System</td>
<td>2014</td>
<td>FONDEN</td>
<td>$126,255.00</td>
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<tr>
<td>11</td>
<td>Sdo Febrero Rehab Gabions Basin</td>
<td>2014</td>
<td>FONDEN</td>
<td>$90,240.50</td>
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</tbody>
</table>

Total: $1,902,886.00
Existing green infrastructure

<table>
<thead>
<tr>
<th>No.</th>
<th>Project</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>DIF Recreational Park</td>
<td>2015</td>
</tr>
<tr>
<td>2</td>
<td>Nogales Technological Institute</td>
<td>2015</td>
</tr>
<tr>
<td>3</td>
<td>Municipal High School</td>
<td>2015</td>
</tr>
<tr>
<td>4</td>
<td>Outdoor Recreational and Sport Complex</td>
<td>2015</td>
</tr>
<tr>
<td>5</td>
<td>Urban Water-retention at Cañada del Muerto</td>
<td>2017</td>
</tr>
<tr>
<td>6</td>
<td>El Greco Boulevard</td>
<td>2017</td>
</tr>
<tr>
<td>7</td>
<td>Middle School #8</td>
<td>2019</td>
</tr>
<tr>
<td>8</td>
<td>El Embarcadero Area</td>
<td>2019</td>
</tr>
</tbody>
</table>
SUSTAINABLE STRATEGIES FOR STORMWATER CONTROL AND WASTEWATER IN AMBOS NOGALES

Arizona State University
Feasibility Analysis results:

A. Feasible areas for GI in the watershed

B. Sites selected for the Ambos Nogales GI Network

A total of 103 sites were identified as feasible in the watershed:

- 83 in Nogales, Sonora
- 21 in Nogales, Arizona

Sites on the Sonora are approximately 0.96 Has
Project: “Rain Garden Construction to Improve our Schools and our City of Nogales, Sonora”

Colegio de la Frontera Norte, Ph D Hilda García
ASU/School of Transborder Studies, Ph D Francisco Lara
Sponsor: US Consulate in Nogales Sonora
Validation by: Secretaría de Educación y Cultura de Sonora
Stormwater

Project: “Sustainable Green Infrastructure Network in Nogales, Sonora”

Departamento de Ecología, Dirección de Planeación de Desarrollo Urbano. Nogales, Sonora
PROAmbiente Nogales
Transborder Wastewater Flows
Treated wastewater flows across border east of Nogales

Feb. 13, 2020

A federal environmental team was dispatched to Santa Cruz County this week in response to a report of wastewater flowing across the border from Mexico in an area several miles east of Nogales.

Sally Spencer, spokesperson for the International Boundary and Water Commission, said the investigators found bacteria in treated effluent flowing across the border at a rate of 80 liters per second, but determined that it wasn’t raw sewage.
Transborder Wastewater Flows

Urban planned growth:
4,000 Acres
10 yrs

Puerta de Anza WWTP
Max Cap= 1.5 MGD
Is receiving = 1.4 MGD
Built in 2018

Lomas de Anza WWTP
Max Cap= 0.7 MGD
Is receiving = 0.7 MGD
Built in 2012
Transborder Wastewater Flows

- Hydrological Model
  - Hidrology
  - Flow indexes
    - Soil
    - Topography
  - Land tenure
  - Flora and Fauna

- Feasibility Site Identification
  - GI conceptual proposal
  - Baseline for alternatives
Transborder Wastewater Flows

NIWTP 14.74 MGD
IOI 20,000
4.84 MGD

Arizona
Sonora

300,000
9.9 MGD

IBWC/CILA Minutes 206, 227, 276
Project: “Pretreatment of Wastewater with Heavy Metals and its Reuse in Nogales, Sonora”

OUTPUTS:
1. Inventory and Diagnosis
2. Reuse and nature-based wastewater treatment
Institutions Working Together, People Creating Institutions
eat with your partners!!!

communication

persistence, tolerance & patience

mutual respect
Thank you!

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