



CONSULADO GENERAL DE MEXICO



NOGALES GROWING WATER SMART LISTENING SESSION **REPORT**

Nogales, Sonora | First Listening Session | March 9, 2023

Summary

On March 9th, 2023, the Sonoran Institute and The Babbitt Center for Land and Water Policy, a center of the Lincoln Institute of Land Policy, in collaboration with the Mexican and American Consulates in Nogales, hosted a Listening Session to advance the US-MX Border Growing Water Smart Program.

In April 2022, the Sonoran Institute and the Babbitt Center laid groundwork for the program by interviewing 30 experts on cross-border water issues. The report of Growing Water Smart (GWS) Opportunities for the US-Mexico Border is available here in [English](#) or [Spanish](#). The Sonoran Institute and the Babbitt Center are using the valuable feedback from these outreach efforts to build a GWS-inspired training and assistance program – focusing on education, capacity-building, and network building – to improve the integration and collaboration around water and land use planning in communities along the US-MX border. The goal of the program is to strengthen community and watershed resilience in the face of rapid population growth and increasing climate risks in border cities.

The Nogales Son / AZ GWS Listening Session created an inclusive space for a bi-national discussion that empowered local and regional stakeholders involved in water and land use activities to share their ideas around current and future water-related opportunities and challenges along the border. Thirty-five policy leaders participated and provided feedback between three discussion groups. The dialogue centered on two important topics. Those key findings are below:

Topic 1. Nature-based management of stormwater to reduce flooding and improve water quality

Detailed responses are included in the TOPIC 1 OUTCOMES section of this report. Below is a summary of the main ideas.

- Frequent flooding in streets affects Nogales SON and Nogales AZ. Most of the urban runoff is generated in Nogales SON reaching Nogales AZ.
- Storm drains mix stormwater (rainwater) with sewage, due to high pressure and ground saturation. Systems are old and insufficient. This causes pipe breaks and covers to be lifted.
- Trash and sediment clog storm drains and cause flooding.

Although there are ongoing projects and initiatives to address some of these issues, we learned about the following areas of opportunity:

- ❖ Increase communication among organizations.
- ❖ Promote educational programs and outreach.
- ❖ Allocate funding and increase regulation of maintenance and operation of stormwater and sewage systems.
- ❖ There is a need for gathering existing hydrological, floodplain topographical studies, and land use studies of the region.
- ❖ Research other initiatives implemented in similar cities.
- ❖ Increase capacity-building.
- ❖ Implement stormwater and related ordinances and regulations.
- ❖ Find funding opportunities.
- ❖ Rescue natural creeks and implement green infrastructure projects.
- ❖ Involve universities and non-governmental organizations to promote continuity in projects or initiatives.

Topic 2. Water conservation, efficiency, and reuse to preserve regionally shared groundwater (Santa Cruz aquifer) and individual surface water.

- Drinking water pipes in Nogales SON are old. Indoor water leaks can reach up to 250 m³/per month.
- There is limited micro-metering (quantification of water consumption by user).
- Consumption and water rates are not well regulated.
- Lack of water and land use integration on regulations for development.

Areas of opportunity:

- ❖ Increase micro-metering and macro-metering.
- ❖ Measure water supply-demand balance and track billing.
- ❖ Promote projects of water reuse, and water harvesting (e.g., infiltration wells).
- ❖ Implement education campaigns (training and involvement of universities).
- ❖ Find funding opportunities.
- ❖ Incorporate water into comprehensive planning.

The Listening Session findings demonstrate that the Growing Water Smart Program will be an excellent resource for Nogales SON and Nogales AZ communities to tackle important areas of opportunity that strengthen the integration of land use and water coordination. Therefore, the US-MX Border GWS program will continue moving forward this summer with targeted meetings with different city departments of Nogales SON and various funding institutions to help solidify the overall structure. It is anticipated that the first US-MX Border GWS workshop will take place during Winter 2023/2024.

GROWING WATER SMART, NOGALES LISTENING SESSION
March 9th, 2023

Sonoran Institute Team, Waverly Klaw (who attended virtually), Francisco Zamora, and Vivian Hobbins (who attended in person), hosted the GWS Nogales Listening Session with the support of the Consul General of United States in Nogales, Sonora, Laura Biedebach. The following individuals gave introductory remarks:

- Kristen Keener Busby, on behalf of the Babbitt Center for Land and Water Policy (attended virtually).
- Laura Mullahy, on behalf of the Lincoln Institute of Land Policy, (attended virtually).
- Joaquin Marruffo, Department of Environmental Quality of Arizona.
- Jesús Quintanar, Comisión Nacional de Límites y Agua (CILA) México.
- Sonia Menezes, Instituto Tecnológico de Nogales
- Mauricio Bonillas García, Organismo Operador Municipal de Agua Potable, Alcantarillado y Saneamiento (OOMAPAS).
- Laura Biedebach, American Consulate in Nogales

This Listening Session covered 3 hours of presentations, small group discussions, and final discussions in which Sonoran Institute focused on two main topic areas:

1. Nature-based management of stormwater to reduce flooding and improve water quality.
2. Water conservation, efficiency, and reuse to preserve regionally shared groundwater (Santa Cruz aquifer) and individual surface water.

A. MEETING PARTICIPANTS

The Nogales Listening Session was well attended. In total, 41 people attended and participated in the Nogales Listening Session (including 6 staff members from the Sonoran Institute and the U.S. Consulate). Staff members were distributed in the working tables to support note-taking and co-facilitation. Francisco Zamora and two other participants (Claudia Gil and Joaquin Marruffo from AZ Department of Environmental Quality) served as facilitators. The final list of participants is shown below. Staff members are shown in light gray.

Full Name	Organization Name
Joaquin Marruffo (Facilitator)	Arizona Department of Environmental Quality
José de Jesús Quintanar G.	Sección Mexicana de la CILA MEX-EUA
Edward Dickie	City of Nogales
Alma Cota Olea	FESAC Fundación del Empresariado Sonorense AC
Adriana Zuniga-Teran	University of Arizona
Graciela Catalina Treviño Macias	CONAGUA
David Ernesto Baltazar Denogean	Instituto Tecnológico de Nogales
Olivia Ainsa-Kramer	President & CEO of the Nogales-Santa Cruz County Chamber of Commerce
Vivian Hobbins (Co-Facilitator)	Sonoran Institute

Reynaldo Gutierrez Gutierrez	Profesor Instituto Tecnológico de Nogales
Mari Valdez (Note Taker)	General Consulate
Julia Sarabia Zúñiga	Estudiante de Maestría Instituto Tecnológico de Nogales
Alexandra Mejia	Estudiante de Maestría Instituto Tecnológico de Nogales
Francisco Zamora (Facilitator)	Sonoran Institute
Francisco Lara	ASU
Joaquin Murrieta	Borderlands Restoration Network
John E. Kissinger	City of Nogales Arizona
Marcos Moreno Báez	Consulado General de México en Nogales
Ben Lomeli	FOSCR
Lucía Villegas Bojorquez	Instituto Municipal de Investigación y Planeación de Nogales (IMIP)
Alonso Martinez (Co-Facilitator)	General Consulate
Claire Mark (Note Taker)	General Consulate
Perfecto Barragán Peña	Profesor Instituto Tecnológico de Nogales
Samuel Acosta Loaiza	Estudiante de Maestría Instituto Tecnológico de Nogales
Claudia Gil Anaya (Facilitator)	Arizona Department of Environmental Quality
Oscar Ramón Gonzalez Erunes	OOMAPAS Nogales
Francisco Lujan	CILA
Octavio Gradillas Jr	City of Nogales, AZ
Carlos Alberto Gallardo Guevara	Consulado General de México en Nogales
Carlos Jorge Tirado Villapudua	Comisión Estatal del Agua
Veronica Meranza	OOMAPAS
Laura Biedebach	Consulado de EU en Nogales Sonora
Claudio Murrieta	Padre
Alejandro Barcenas	City of Nogales
Isamar Ayala (Note Taker)	General Consulate
Mauricio Bonillas Garcia	OOMAPAS
Sergio Esparza	Maestria Urbanismo
Joel Espinosa	Frente Ciudadano Por Salud Ambiental
Sonia Menezes	Directora ITN
Olga Beatriz Salazar Oliva	Maestria en Urbanismo
Unknown Representative	Santa Cruz County

Participating Organizations:

U.S. Consulate General Nogales, Sonora
Consulate of Mexico Nogales, Arizona
CILA
City of Nogales, AZ
Arizona Department of Environmental Quality (ADEQ)
Comisión Nacional de Agua
Comisión Estatal de Agua Sonora
(OOMAPAS) Nogales
Santa Cruz County
Frente Ciudadano Por Salud Ambiental
Fundación del empresario Sonorense (FESAC)
Instituto Tecnológico de Nogales (ITN)
Arizona State University
University of Arizona
Civil Society (church)

Targeted organizations for future engagement:

IBWC
Gobierno Municipal de Nogales, Sonora
U.S. Environmental Protection Agency (EPA)
Arizona Department of Water Resources
Secretaria de Infraestructura y Desarrollo Urbano – Sonora (SIDUR)
Instituto Municipal de investigación y Planeación (IMIP) () (Municipal planning and investigation institution)
North American Development Bank
Oficina del Representante de Sonora en Arizona
U.S. Army Corps of Engineers
United States Geological Survey (USGS)

B. FINDINGS AND RECOMMENDATIONS

Organization

Sonoran Institute initiated the Growing Water Smart US-Mexico Border Assessment in 2021. The final assessment report, which contained desk research for several sister cities along the US-MX border and information gathered during targeted interviews was published in April, 2022. This assessment summary concluded the importance and need to continue Growing Water Smart efforts in the US-MX border, unlocking steps forward for the organization of sister city Listening Sessions to determine the possibility of US-MX GWS Workshops.

Planning for the Nogales Listening Session started in November 2022. The American Consulate in Nogales and Sonoran Institute established a partnership for the organization of the event. Sonoran Institute's partnership with the American Consulate in Nogales was key to increasing credibility in the community and engaging with different organizations (e.g. OOMAPAS, ITN).

35 participants (not considering staff members) shared their perspectives about two main topic areas for 75 minutes of the 3-hour session. The topics and outcomes are described in the following section.

Outcomes

The 35 participants were divided into three discussion groups. Two groups were assigned to Topic 1 and one group was assigned to Topic 2. Facilitators in the three discussion groups were: Joaquin Marruffo (AZDEQ) (Topic 1 Group A); Francisco Zamora (Sonoran Institute) (Topic 1 Group B); and Claudia Gil (AZDEQ) (Topic 2). The main outcomes for each of the topics are highlighted below. Consensus was reached around some outcomes, which are shown in the last part of this report.

Topic 1. Nature-based management of stormwater to reduce flooding and improve water quality

(Soluciones basadas en la naturaleza para el control de inundaciones y agua pluvial), for example:

- o Green infrastructure projects and code requirements (water retention/detention, curb cuts and bioswales, treatment wetlands) *Proyectos de infraestructura verde e implementación de códigos catastrales (retención y detención de agua pluvial, cortes en los bordes de las aceras y canales con vegetación, lagunas de tratamiento).*
- o Low Impact Development code requirements (pervious pavement, site-scale water retention and infiltration). *Implementación de códigos para el desarrollo de bajo impacto (pavimentación permeable, retención de agua a escala y proyectos de infiltración).*
- o Protecting sensitive areas by restricting development. *Restringir el desarrollo urbano en áreas sensibles a la inundación.*
- o Promoting aquifer recharge. *Promover recarga de acuíferos.*

Topic 2. Water conservation, efficiency, and reuse to preserve regionally shared groundwater (Santa Cruz aquifer) and individual surface water *(Conservación, uso eficiente, y reuso de agua para proteger recursos compartidos de agua subterránea (Acuífero Santa Cruz) y aguas superficiales)*, for example:

- o Replace high water use fixtures, appliances, and landscapes in existing development. *Reemplazar equipos, accesorios, y paisajes de alto consumo de agua en el desarrollo urbano existente.*
- o Regulate new development to be more water efficient (landscape standards, alternative water supply, water budgets, compact development, smaller lot sizes, etc.) *Regular nuevos desarrollos para incrementar la eficiencia del uso de agua (reglamentos de paisaje y áreas verdes, fuentes alternativas de agua, restricciones en los balances de agua, desarrollo compacto, reducir el tamaño de lotes y terrenos de construcción).*
- o Reduce water loss by upgrading infrastructure. *Reducir las pérdidas de agua a través de la renovación de infraestructura (tuberías, equipo de bombeo, infraestructura de almacenamiento).*
- o Harness alternative water supplies (rainwater harvesting, water reuse). *Uso de fuentes de agua alternativas (cosecha de agua de lluvia, reuso de agua).*

TOPIC 1 OUTCOMES

Group A and B

Question #1: Please describe the current conditions around localized flooding and water contamination/pollution in Ambos Nogales?

Team members concur that most of the flooding originated in Nogales SON but transported and affected Nogales AZ.

Where	SON	AZ	AMBOS
Avenida Obregon and streets close to the border	X		X
Avenida Tecnológico	X		X
Potrero creek	X		X
Stream Nogales (it floods during monsoon season). It could be diverted to Stream Internacional			
Paved streets function like rivers			
Trash in the streets			X
The Sewage system is old, and it is mixed with stormwater. Drainage systems are overflowed.			X
Rio Rico has problems of sediment in the streets			
Water pressure during storms in the sewer system is breaking the pipes and lifting the covers.			
Water efficiency	450 GPC D	137 GPC D	

Question #2: What efforts and initiatives are currently underway to address stormwater management and water quality challenges through land use plans, development policies, or programs?

Ongoing projects and initiatives

- Retention-detention Project in Downtown (Nogales SON) – Impacting both sides.
- Mariposa Wash (Nogales SON) – Impacting both sides.
- INFONAVIT regulations for new constructions (unknown status).
- IMIP Green infrastructure regulations.
- Bank stabilization in Nogales AZ – 4 Million dollars.
- Hydrological analysis and report of Nogales (Laura Corman).
- US Army Corps analysis of the hydrological situation of Santa Cruz County.
- Development codes in Nogales AZ include flooding regulations.
- Development code regulation in Nogales SON needs regulation (there are some requirements however they need to be enforced).
- Pilot projects in Nogales SON
- Los Arroyos Watershed project of Francisco Lara
- Atlas de riesgo (project about to start)

Question 2.a. Is some element of this issue NOT being addressed or in need of greater attention? What do you need more information and training on in order to begin taking action?

- Educational programs
 - Change the culture.
 - Early education (pre-school, kindergarten, elementary schools)
 - Outreach
- Binational committees.
- Live station and PTAR (Wastewater treatment plant) Los Alisos.
- NADBank – Gray infrastructure removal.
- NADBank – Automatic pump.
- Maintenance and operation program for the sewer system in Nogales (remove trash and take care of pipes and waterways). This is not in place due to lack of funding and regulation.
- Increase communication between organizations.
- Gather all the hydrological and land use studies and propose holistic projects.
- There is a need for land use and water integration.
- Measure impacts at the watershed level
- Training and assistance needed (capacity building)
- Continuity in implementation and regulations needed
- Sectorization to measure water flow during flooding events
- Improve land use development regulations (locations for growth)
- Infrastructure capacity is exceeded during storm events
- Create a task force or department specialized in flooding

Question #3: How could the Growing Water Smart program (workshop, training, and technical assistance) focused on the integration of water into land use be helpful in furthering the implementation and impact of these initiatives?

Ideas:

- Learn what is being done in other cities (with similar characteristics as Nogales).
- Involve universities and non-governmental organizations to promote continuity
- Find a way to increase funding opportunities for Nogales SON. Most of the funding sources are for Nogales AZ, but the problem originates in Sonora.
- Get authorities involved to rescue natural creeks and implement green infrastructure projects in the city.

Question #4: Who needs to be part of the conversation as part of the Growing Water Smart program?

Attend workshop

Financing institutions

CEA

CNA

Local authorities

Keep informed

Colegio de Ingenieros Civiles

Case studies and information

Laura Norman

USGS

NADBank/EPA

TOPIC 2 OUTCOMES

Question 1: Please describe the current conditions around groundwater and surface water supply in Ambos Nogales?

- Indoor water leaks can reach up to 250 m³/month
- 50 % of the houses have micrometers
- Consumption and water rates are not well regulated. For example, if your consumption is less than 30 m³, you pay only 25 m³
- In Nogales AZ most of the pipelines are very old
- Nogales AZ has an updated user registration

Question #2: What efforts and initiatives are currently underway to implement water conservation/efficiency/reuse strategies through land use plans, development policies, or programs?

- Technical assistance from NADBank

2.a. Is some element of this issue NOT being addressed or in need of greater attention? What do you need more information and training on in order to begin taking action?

- There is a need for micrometering and macrometering with telemetry.
- Need to have a better idea of the water balance (supply, demand and billing).
- Need for projects of water reuse, like infiltration wells.
- Program for users in expired portfolios.
- Sectorization.
- Water harvesting.
- Education campaigns (training and involvement of universities).

Training on how to address problematics, financing options.

Question #4: Who needs to be part of the conversation as part of the Growing Water Smart program?

Attend workshop

Developers and lot owners

Colegio de Ingenieros Civiles y Arquitectos

Students

OOMAPAS

IMPLAN

SIDUR

County and city planning

Keep informed

Mayor
EPA
ADEQ
ADWR
CEA

Case studies and request information

Universities/researchers
Research centers
NADBank/US EPA Border program projects

Large group discussion Highlights

Theme 1 Group A

- Need of mechanisms to regulate water and land use integration.
- Establishment of incentives.
- Education.
- New strategies for funding sources.
- Community outreach and awareness.
- Create a new entity to manage stormwater.
- Address knowledge gaps and lack of communication between organizations.

Theme 1 Group B

- Calculate the social cost of flooding in Nogales SON.
- Establish incentives to promote adequate infrastructure use and best practices.
- Think of watershed terms.
- Nogales SON water use is 3 times more than in Nogales AZ.
- There are gaps of knowledge. Importance of measuring and establishing information systems.
- Include universities and non-governmental organizations in planning and projects to improve the continuity of efforts.
- The program could increase binational collaboration.
- Holistic approach for managing water resources (considering ecosystems, aquifers, watersheds).

Theme 2

- New developments should be regulated. Lack of incorporation of water into comprehensive planning.
- Sectorization is important to manage water pressure and quantity.
- Increased micro metering (only 50% of the population in Nogales SON) has it.
- Need to update the user database in OOMAPAS.
- Water education and culture. Targeting young generations.
- Need of cost-benefit analysis.
- Pilot projects of sectorization would be manageable.
- Infiltration wells.

- Networking/communication between Nogales SON and Nogales AZ officials.
- Program to increase measured supply and users.
- Cost/benefit analysis.
- Civic organizations (e.g. churches) can serve as an important medium of influence and leverage.

LISTENING SESSION EVALUATION

Nogales GWS Listening Session participants provided their feedback on four specific questions about the session by filling out an online survey after the event. The response rate was calculated using the number of responses received for the evaluation.

Number of Community Participants Attended: 35

Number of Evaluation Responses Received: 13

Response Rate: 37%

Questions and results:

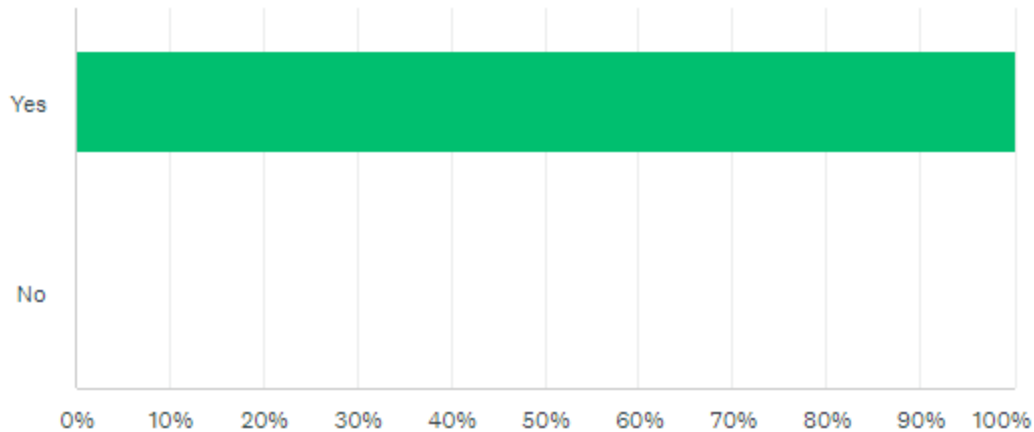
Question 1.

En una escala de 1 al 5, siendo 1 la expresión de mínima satisfacción ¿Que tan útil fue la sesión de escucha para aprender más del programa Creciendo Inteligentemente en el Uso del Agua (Growing Water Smart)? [On a scale of 1-5, How useful was the Listening Session to learn more about the Growing Water Smart program?]

ANSWER CHOICES	RESPONSES
1	0.00% 0
2	0.00% 0
3	7.69% 1
4	30.77% 4
5	61.54% 8
TOTAL	13

Question 2.

Basado en la información proporcionada durante la sesión de escucha, ¿Consideras que el programa GWS podría ser implementado con éxito en tu comunidad? [Based on the information shared during the Listening Session, do you think the Growing Water Smart program could be successfully implemented in your community?]



Question 3.

Además de las organizaciones e individuos invitados a esta sesión de escucha, ¿Qué otros actores deberían ser considerados en futuras reuniones? [Besides the individuals and organizations that attended the Nogales Listening Session, who else should be invited to future meetings?]

- Presidentes municipales [City Major]
- Representantes de los colegios de ingenieros civiles y arquitectos [Association of civil engineers and architects]
- Comunicación y cultura del agua (OOMAPAS) [Communication and Outreach department of the Water Utility Company]
- Escuelas [Schools, Universities]
- Instituciones que financien proyectos [Financing institutions]
- Presidentes de juntas de vecinos, el colegio de ingenieros [Community groups and civic organizations]
- IBWC, Santa Cruz county supervisors and/or staff
- Otras ONGs [NGOs]
- La sociedad civil en los sitios que se desee implementar el programa [Civic organizations]
- Colegios de ingenieros civiles de Nogales, comisiones de legisladores [Legislators]
- Personal que labore en medios de comunicación que ayude a difundir la información para que se cree conciencia en la población y se acerquen más personas que puedan ayudar [Media organizations]
- Líderes de vecinos, desarrolladores urbanos, INFONAVIT, maquiladoras [Developers, maquiladoras]
- El Colegio de Ingenieros Civiles [Civil engineers' association]

Question 3.

¿Tienes alguna sugerencia o comentario sobre la sesión o cómo hacer más efectivo el programa Creciendo Inteligentemente en el Uso del Agua para ambos nogales? [Do you have any suggestions or comments about the Listening Session or about how to make the Growing Water Smart program more effective in Ambos Nogales?]

- Darle seguimiento después de la reunión [Follow up meeting]
- Dejar bien en claro los temas que hay que tratar para todos los participantes de la mesa, y no se vean otros temas [Establish clear delineation of topics or themes]

- Yes, the session was great. Inviting IBWC, and SCC BOS or Staff would be a good augmentation of participants
- Invitación a actores sociales que ya están trabajando algunos temas [Social actors]
- Que la próxima sesión, o taller, sea en Nogales, AZ.
- Fue un buen comienzo.