

**Final Report  
December 2017  
Rapid Assessment for New Mexico's Playa Region  
Southern High Plains  
Assistance Agreement No. CD-00F586-01-0 (FY 2012)**



**Night Heron at playa edge, July 2017, Photo by Y. Chauvin**

**New Mexico Environment Department  
Surface Water Quality Bureau  
Wetlands Program**

## **Project Goals and Objectives**

This Project is a continuation of the development of wetlands rapid assessment methods geared towards New Mexico arid land wetlands with a focus on playa wetlands of the Southern High Plains in eastern New Mexico. New Mexico Rapid Assessment Method (NMRAM) metric development data and floristic quality data were collected from 36 playa sites principally in Curry, Roosevelt and Lea Counties, New Mexico in 2014. Testing of the final selected metrics for Playa Wetlands was conducted at 12 additional playa wetland Sample Areas (SA) in 2017 to ensure metric sensitivity and applicability in a rapid assessment scenario.

The Project was designed to expand rapid assessment methods for New Mexico to the depressional class of wetlands requiring assessment and protection as waters of the state. The project also resulted in the development of the first NMRAM for playa wetlands of the Southern High Plains. Half of the playa wetland rapid assessment metrics are newly developed for this project and the other half were modified from other approaches. Some of the unique challenges included designing metrics for ephemeral systems with variable annual vegetation species expression that change with seasons, climate and temporary moisture regimes. The project culminated in the “2<sup>nd</sup> Wetlands Across Borders Meeting: Playas of the Southern High Plains” where NMRAM for Playa Wetlands was highlighted as well as the current declining groundwater issues of the Ogallala Aquifer in which playas are the only source of natural groundwater recharge in the region. This Project included the continued enhancements of the SWQB SQUID database to accept and store playa wetlands NMRAM data. Seven New Mexico Wetlands Roundtables, maintained by the SWQB Wetlands Program, were conducted under this project. During this time the Roundtables transitioned from being agency-focused and NGO-focused to geographically focused. The Wetlands Roundtables included one agency Roundtable and one NGO Roundtable in 2013, one combined Agency/NGO Roundtable in 2014, and two Roundtables specifically geared to northern NM (Santa Fe) and two in the southern part (Las Cruces) of the state that were conducted in the spring and fall of 2015 and 2016.

Through this project six major objectives were accomplished. 1) data collection, analysis, and validation for New Mexico’s first depressional wetland NMRAM (Playa Wetlands) including the development of NMRAM for Playa Wetlands Field Guide 1.2 and fillable PDF data collection worksheets (attachment), 2) formation of a Technical Advisory Committee which met two times to provide input to NMRAM development, 3) two trainings for potential end users in Playa Wetlands NMRAM (Technical Transfer), 4) The New Mexico Wetlands Roundtable was maintained - the Northern Wetlands Roundtable and Southern Wetlands Roundtable each meeting twice per year - the meetings focused on the objectives established by the group. 5) SWQB Wetlands Program conducted the *2<sup>nd</sup> Wetlands Across Borders Meeting: Playas of the Southern High Plains* in Clovis, NM, 6) Finally, the SQUID database at SWQB has been expanded to accept NMRAM data for Playa Wetlands. The development of NMRAM has been shared locally and nationally through presentations and public events.

## **Project Outcomes**

- The SWQB Wetlands Program and partners are provided wetland assessment capability to require better wetlands protection, restoration and mitigation.
- This project creates a tool for evaluating the condition of New Mexico's playa wetlands in comparison to a level of human disturbance and that is relevant to New Mexico.
- NMRAM is filling a critical piece of an integrated and comprehensive approach to wetlands protection by SWQB and its partners.
- NMRAM will provide the supporting data and information needed to develop water quality standards for subclasses of New Mexico's wetlands resources.
- The NMRAM can be used to identify reference standard wetlands in need of special protection, and to identify those that are particularly impacted and those that can be restored.
- As future wetlands subclasses are described and assessed, an iterative monitoring program linked to water quality assessments by watershed will continue to be developed, and will increase the capacity and understanding of ecological linkages, natural variability and changes that result from human activities.
- Through our development of an integrated SQUID database at SWQB, wetlands assessment data will be available for inclusion in CWA Section 305(b) reports, increasing access to stakeholders and decision makers to improve their knowledge and understanding of wetlands issues.
- The oversight of NMRAM wetlands data at NMED will provide the capability to combine wetlands data and results with other SWQB water quality programs that will result in overall improvement to water resources of the State.
- Maintaining the Wetlands Roundtable to include meetings especially designed and planned for the Northern as well as the Southern parts of New Mexico, establishes and solidifies new partnerships, increases the capacity of the Wetlands Program to reach a variety of stakeholders with relevant and up-to-date information and data-sharing regarding wetlands in New Mexico.
- Conducting the 2<sup>nd</sup> Wetlands Across Borders Meeting in Clovis, New Mexico expands our ability to reach across state borders as well as in the eastern part of New Mexico addressing relevant water-related topics in the communities affected and where stakeholders and decision makers reside.
- NMRAM for playa wetlands provides an assessment of wetland condition and function and identifies stressors to help manage environmental risks and threats to playa water resources and communities of the Southern High Plains. Playas are imperiled from hydrologic alteration and various contaminants that filter into the Ogallala Aquifer below.



**Figure 2. Chris Canavan (SWQB Watershed Protection Section Supervisor), Shelly Barnes (SWQB Wetlands Program) and Yvonne Chauvin (UNM Nat Her) measuring slope of the annulus from the playa bottom edge and identifying plants around a playa during initial data collection in 2014.**



**Figure 3. Technical Team training on a dry playa south of Clovis, NM. July 2017.**



## Project Location

The project is located in the Southern High Plains of eastern New Mexico (Figure 4). The results of this project have application in neighboring SHP states including Texas, Oklahoma and eastern Colorado.

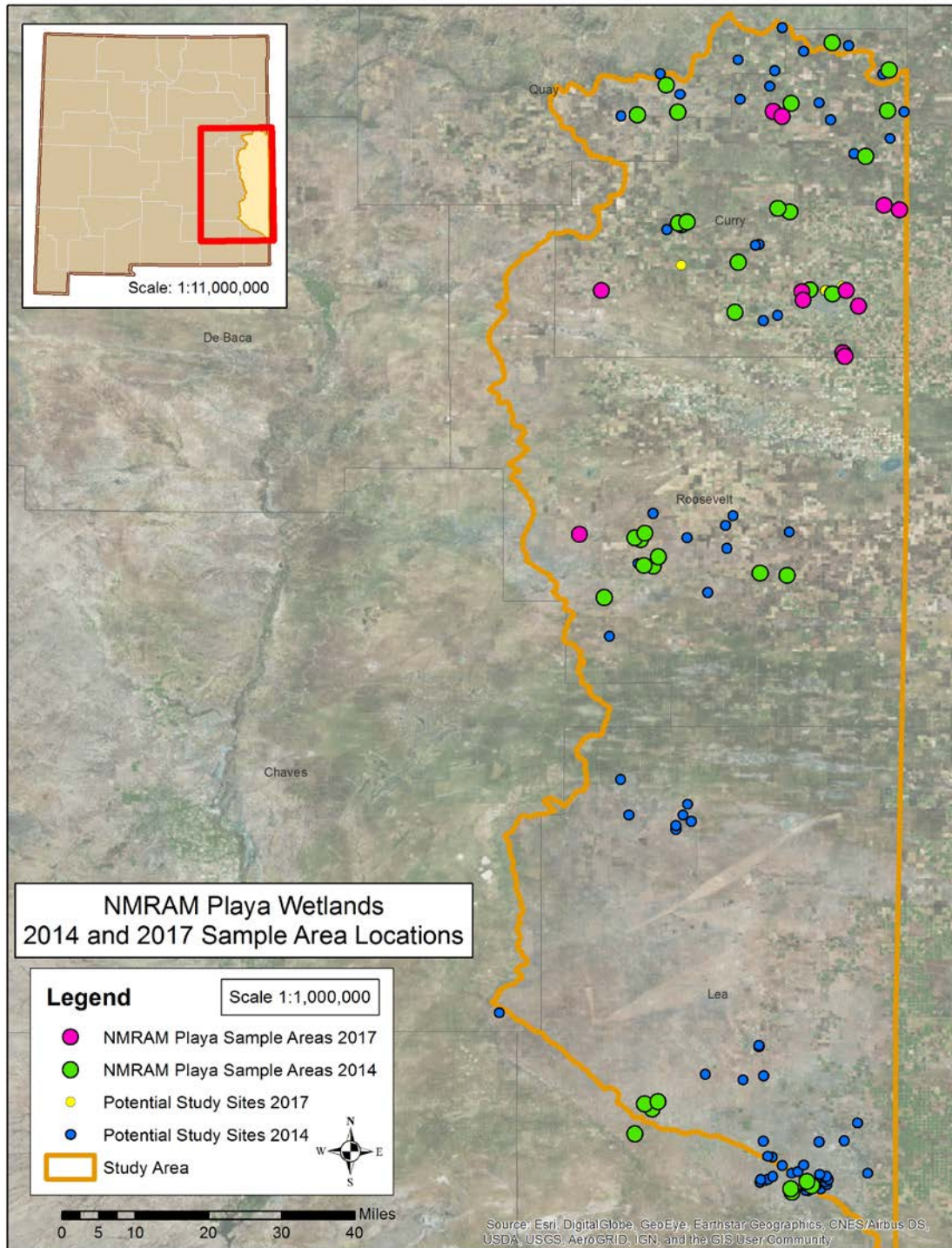


Figure 4. Map of NMRAM Sample Area locations in the Southern High Plains Reference Domain in eastern New Mexico.

## Original Timeframe

The Notice of Award on the Cooperative Agreement CD #00F586-01-0 was issued on August 29, 2012. Signatures on the Cooperative Agreement were completed on September 11, 2012. The project was amended for a no cost extension from December 31, 2016 to December 31, 2017 to complete the reviews of the Field Guide and interactive data collection worksheet PDFs, to complete database development work and to conduct the 2<sup>nd</sup> Wetlands Across Borders Meeting. The stated goals and objectives of the project remained the same, as well as the key project Tasks.

## Partners Involved

UNM Natural Heritage New Mexico was the principal contractor in partnership with SWQB Wetlands Program in developing the Playa Wetlands NMRAM 1.2 for this Project. TEKSystems, Inc. is responsible for developing the enhancements to the SQUID database at SWQB to accept NMRAM data, and for the creation of the interactive data collection worksheets. USEPA (Betty Ashley, Sondra McDonald, Sharon Daugherty and Allison Fontenot) provided project progress guidance and technical assistance.

SWQB Wetlands Program was involved in every aspect of project and co-authored the Field Guides and data collection worksheets along with UNM Natural Heritage New Mexico (co-authors: Esteban Muldavin, Elizabeth Milford and Maryann McGraw). The Project involved an Advisory Committee whose members are as follows:

### Advisory Team Members

<b>Name</b>	<b>Organization</b>
Julia Barnes	First Meeting Facilitator
Jim Dick	US Fish and Wildlife Service
Robert Martin	The Nature Conservancy
Matthew Baumer	Natural Resources Conservation Service
Aaron Miller	Natural Resources Conservation Service
David Certain	New Mexico State Parks
Hannah Burnham	UNM Natural Heritage Program
Chris Canavan	NMED/SWQB
Elizabeth Milford	UNM Natural Heritage Program
Esteban Muldavin	UNM Natural Heritage Program
Christopher Rustay	Playa Lakes Joint Venture
David Haukos, USGS	USGS – via webinar
Tish McDaniel	CEHNM – via webinar
Shelly Barnes	NMED/SWQB Wetlands Program
Charles Enos	Gila River Indian Community
Gwen Kolb	US Fish and Wildlife Service
Corrie Reasner	UNM Natural Heritage Program
Joni Cockman	Bureau of Land Management
Logan Peterson	Natural Resources Conservation Service
Emile Sawyer	NMED/SWQB Wetlands Program
Karen Menetrey	NMED/SWQB Wetlands Program

*Independent Reviewers of the NMRAM Field Guides and Data Collection Worksheets:*

David Haukas    University of Kansas  
Anne Bartuszevige    Playa Lakes Joint Venture

*Playa Wetlands NMRAM Technical Team (field site selection, data collection,  
geodatabase development)*

Hannah Burnham	UNM Nat Her
Chris Canavan	NMED/SWQB
Yvonne Chauvin	UNM Nat Her
Mark Horner	UNM Nat Her
Teri Neville	UNM Nat Her
Rayo McCullough	UNM Nat Her
Shelly Barnes	NMED/SWQB
Emile Sawyer	NMED/SWQB
Dan Gandhi	TEKSystems
Charles Fitch	TEKSystems
Loribeth Tanner	EPA Region 6 ORISE Researcher
Ryan Parks	EPA Region 6 ORISE Researcher

**Northern Wetlands Roundtable Presenters:** Tamarisk Coalition, Reineke Construction, SWQB Watershed Protection Section, USACE, UNM Natural Heritage, NRCS, Society of Wetland Scientists, Hermit's Peak Watershed Alliance, NMED IT, Alpine Eco, WildEarth Guardians, NMED Wetlands Program,

**Joint Roundtable Presenters:** Albuquerque Wildlife Federation, SWQB Watershed Protection Section, River Stewardship Presentation, USACE, NMDGF, Ecotone, River Source.

**Southern Wetlands Roundtables Presenters:** Audubon Society, Eastern Arizona College, SWQB Watershed Protection Section, USACE, USFWS NWR, BLM, NMSU Ecology, NMSU Animal and Range Science, NRCS, NMED Wetlands Program, TNC, USFS Lincoln Nat For., USFS Gila Nat.For., UTEP, Messilla Valley Bosque State Park, Stream Dynamics, Nat Weather Service, EBID.

**2<sup>nd</sup> Wetlands Across Borders; Playas of the Southern High Plains Presenters:** Barbara Johnson (Rio Puerco Alliance (Organizer)), Merle Lefkoff (Center for Emergent Diplomacy (Facilitator)), Warren Conway (Texas Tech U), Esteban Muldavin (UNM), Rachel Owen (U Missouri), Christopher Rustay (PLJV), Maryann McGraw (NMED Wetlands Program), Jerusha Rawlings (Ecosphere Environmental Services), Geoffrey Rawling (NM Bur Geology and Min Resources), Patrick Longmire (NMED Ground Water Quality Bureau), Ladona K. Clayton (City of Clovis Commissioner), Paul Neville (UNM Earth Data Analysis Center (EDAC)), Dawn Privett (Roosevelt SWCD), Gary

Rapid Assessment for New Mexico's Playa Region, Southern High Plains Final Report  
December 2017

Walker (Seeding Operations and Atmospheric Research), David Groenfeldt (Water Culture Institute), Robert G. Hockaday (Energy Related Devices, Inc.)

Playa Field Trip: Christopher Rustay (PLJV), Karen Menetrey (NMED Wetlands Program).

Playa Wetlands NMRAM Training: Esteban Muldavin (UNM), Hannah Burnham (UNM)

Roads and Playas Training: Alan Hadan (Natural Channel Design), Steve Vrooman (Keystone Restoration Ecology)

### **Sponsors for Wetlands Roundtables and Meetings**

Society of Wetland Scientists, Rocky Mountain Chapter, sponsored the November 3, 2014 Northern, and December 4, 2014 Southern Wetlands Roundtables, the November 9, 2015 Southern and November 16, 2015 Northern Wetlands Roundtables.

The Playa Lakes Joint Venture and Rio Puerco Alliance sponsored the December 12-15, 2017 Second Wetlands Across Borders Meeting: Playas of the Southern High Plains meetings.

Additional partners who contributed to this project:

Julia Barnes, professional facilitator, facilitated two Wetlands Roundtables and the first Advisory Committee Meeting and helped with other Wetlands Program planning.

The Central Curry SWCD, and Roosevelt County SWCD, Dawn Privett, helped contact attendees in eastern New Mexico for the Second Wetlands Across Borders Meeting: Playas of the Southern High Plains.

Erik Nelson, New Mexico State Land Office (SLO), was instrumental in planning logistics for the Second Wetlands Across Borders Meeting: Playas of the Southern High Plains.

Aaron Miller and Logan Peterson, NRCS, helped with the development of the Soils metrics for Playa Wetlands NMRAM.

### **Funding**

The original Federal amount was **\$467,090.00** and **\$160,343.00** match. The final federal amount spent was **\$449,724.61**, and the **final match amount** was **\$199,855.44** (**\$39,512.44 overmatched**). See semi-annual reports for details.

### **Major Project Highlights and Chronology**

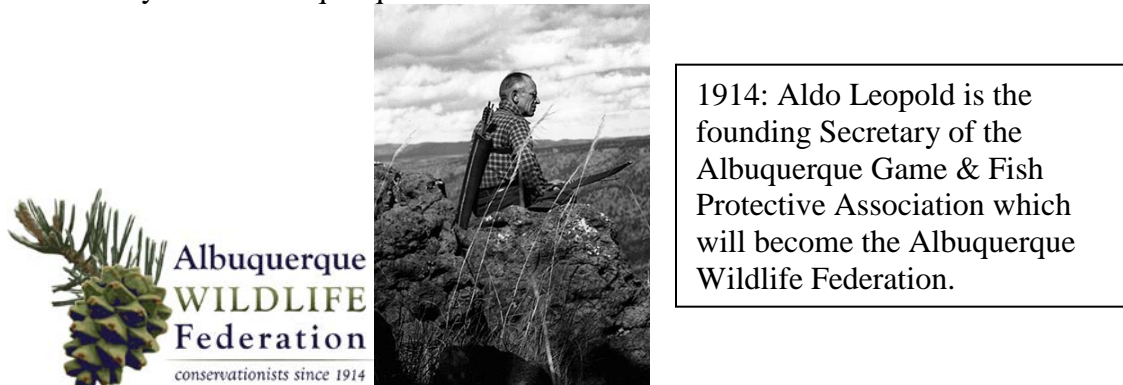
- This project was awarded federal assistance by EPA Region 6 on September 11, 2012, and Maryann McGraw, the Wetlands Program Coordinator (WPC), is the Project Officer for the Project.
- On April 24, 2013, the Wetlands Program Coordinator met with Rick Strait, NRCS State Soil Scientist, Aaron Miller NRCS Wetlands Soil Specialist and other NRCS Rapid Assessment for New Mexico's Playa Region, Southern High Plains Final Report

December 2017



staff as well as EPA Region 6 staff, (Richard Prather and Tom Nystrom (remote)) to talk about coordinating data collection for the playas NMRAM and NRCS Ecological Site Descriptions, which is a current priority for NRCS.

- The WPC participated in planning for Pecos Watershed WQ survey on January 28, 2013, which will also include some playa wetlands of the Southern High Plains.
- An Intergovernmental Agreement with University of New Mexico Natural Heritage New Mexico was completed on June 6, 2013.
- Michelle Barnes, Wetlands Project Officer (WPO) participated in Pecos water quality data collection with SWQB monitoring and assessment staff as match on July 9 and 10, 2013. Some wetland sites were included.
- The First Advisory Committee meeting (Playa Science Meeting) was conducted on July 22, 2013.
- The WPC and Shelly Barnes (WPO) attended and provided a brief Playa NMRAM presentation at four TNC/PLJV workshops in Curry, Roosevelt, Lea and Quay Counties on the New Mexico Southern High Plains in late July, 2013.
- The Agency Wetlands Roundtable was conducted on October 28, 2013 and the NGO Wetlands Roundtable was held October 15, 2013, both in Santa Fe.
- The WPC, Esteban Muldavin, UNM Nat Her Director and Elizabeth Milford UNM conducted a preliminary reconnaissance/pilot study trip to 15 playas in Nov. 2013.
- Metrics development began in Jan. 2014. Metrics development meetings were conducted by the Assessment Team on April 1, April 2, and April 24 and in conference calls and e-mails in May 2014. The Assessment Team met on June 9, June 11, June 18, and June 25, 2014, to develop a preliminary suite of metrics for data collection.
- One combined NGO/Agency Wetlands Roundtable was conducted on March 19, 2014. The meeting was planned and speakers presented in honor of the 50<sup>th</sup> anniversary of the Albuquerque Wildlife Federation.



**Figure 5. Albuquerque Wildlife Federation 50<sup>th</sup> Anniversary Wetlands Roundtable Celebration**

- The WPC has been a part of the science advisory board for the Southern Great Plains Rapid Ecological Assessment Team being conducted by BLM in Oklahoma. This is to ensure that playas are included.
- A Site Selection geodatabase was developed for preliminary ranking of playas and selection of data collection sites.
- The PQAPP was approved on July 18, 2014

- UNM and the WPC held a series of conference calls with the San Francisco Estuary Institute (SFEI) to ask if we could use some of their software or if they were interested in collaborating on our database development. It was determined through a series of meetings with SWQB Bureau Chief and NMED IT staff that we would move the database to NMED for further development and integration with other SWQB databases.
- Data collection packets were prepared by UNM Nat Her for the Technical Team Field training and to collect data from Playas NMRAM Assessment Areas. Some of the data collection field sheets were revised by the WPC in the field according to data needs.
- Two field crews were trained over a three-day period in late July, 2014. On the third day, a full set of data were taken by the field crews at the Lindsey Playa. The data sheets included a long list of metrics for testing, floristic quality, and other metric development tasks.



**Figure 6. Lindsey Playa, Curry County, July 2014.**



**Figure 7. John Moeny (SWQB) collecting soil samples from within the flooded portion of the Lindsey Playa, Hannah Burnham (UNM) taking data and Elizabeth Milford (UNM) collecting swimming fauna during field training.**

- The Technical Team Field Crew collected data from 36 playa sites between July 18 and August 15, 2014. They collected biotic, abiotic and soils data in the field and entered data for landscape metrics from the GIS. They also filled in draft stressor checklists and recorded animal sightings as a demonstration.



**Figure 8. Typical fauna and flora at playa assessment areas. Plains Toad (*Anaxyrus cognatus*) and Frog Fruit (*Phyla nodiflora*).**

- The Northern NGO/Agency Wetlands Roundtable was conducted in Santa Fe on November 3, 2014 with 58 participants in attendance.

- A Contract with TEKSystems (through a Purchase Agreement) was completed on November 11, 2014 to develop the Playas NMRAM database that is integrated with NMED SQUID database.
- The Southern NGO/Agency Wetlands Roundtable was conducted in Las Cruces on December 4, 2014 with 37 participants in attendance.
- A meeting was held on January 22, 2015, with Arron Miller, NRCS Soil Scientist, to understand the results of soils samples collected from the Playa Sampling Areas.
- The Southern NGO/Agency NM Wetlands Roundtable was conducted on April 9, of 2015. Approximately 73 participants were in attendance and the WPO received e-mails encouraging Roundtables in Las Cruces to continue.
- Multi-metric analysis of Playa NMRAM data and metric review is ongoing.
- The WPC met with the database developers weekly to provide input and oversight to the development of the database, electronic field sheets and output/rating reports. Work was stopped on June 30, 2015 due to the need to update the purchase agreement.
- The Southern NGO/Agency NM Wetlands Roundtable conducted on November 9, 2015. Approximately 37 participants were in attendance. The presentations were focused on two themes, making wetlands and landscapes more resilient to climate change, and New Mexico Springs, the science and restoration of springs.
- The Northern NGO/Agency NM Wetlands Roundtable was conducted in Santa Fe on November 16, 2015. Approximately 47 participants were in attendance. The highlight of the meeting was Lynda Saul, Montana DEQ Wetlands Program coordinator who gave a presentation about their Wetlands Planning Initiatives (Priceless Resources) and Montana Wetland Restoration projects.
- A *Clearing the Waters Article* about Playas Restoration was developed for publication in December 2015.
- WPC attended the Prairie Partners Meeting held in Tucumcari on December 3, 2015 where she announced the Wetlands Across Borders meeting for the future.
- WPC met at UNM with Esteban Muldavin and Elizabeth Milford on February 2, 2016, to discuss the review the results of the data collection analyses and to select metrics that will go forward as a set of metrics to be presented to the Advisory Committee for their review. Esteban Muldavin (UNM) presented a short powerpoint on the playas soils data so that we can discuss how to convert it to a Level 2 metric.
- A no-cost amendment to extend the Cooperative Agreement CD#00F586-01-0 to December 31, 2017 was approved by EPA on May 12, 2016.
- A contract and Scope of Work for TEKSystems (authorized under a purchase agreement) #16-667-3000-0016 to continue to develop the database for Playas NMRAM data as part of NMED SQUID database was approved on May 16, 2016.
- UNM Nat Her is using their current version of the NMRAM database for multi-metric analyses of playas field data until the SQUID database can provide data reports.
- During the analysis of vegetation plots from the 37 sites data collections, seven of the plant species collected from playas Sampling Areas proved to be range extensions, one of which was not previously known from New Mexico.



- A no-cost amendment to extend the current IGA with UNM from October 31, 2016 to November 30, 2017 was approved on September 14, 2016.
- A draft of the Field Guide 1.0 based on data analyses and several Assessment Team meetings with UNM Natural Heritage (July 27, September 16, October 14, and November 1, 2016) has been developed and reviewed during this reporting period. This draft will be presented at the Advisory Committee Meeting for further review and input from the Committee.
- The Manual for this project is being developed as an overarching document for all the NMRAMs. The specific descriptions for the Playas NMRAM including the Reference Domain, Subclass Description, rationale for selected metrics and other background data for NMRAMs is included in this document. Este Muldavin, Natural Heritage Director is developing the first draft of this new document and will submit chapters to the WPC for editing and contributions. The Field Guide and Data Collection Worksheets for each NMRAM will be companion documents for the NMRAM Manual.
- TEKSystems developed interactive data collection worksheets (Version 1.0) for ten selected metrics and stressor checklists, including one size metric, two landscape metrics, three biotic metrics and four abiotic metrics.
- The WPC made a presentation on playas at the El Llano Estacado SWCD Prairie Partners meeting in Tucumcari, New Mexico on December 6, 2016. This meeting is attended by ranchers and landowners in the Southern High Plains Region. The WPC also provided an update on the “Wetlands Across Borders” meeting to be held in Clovis, NM in 2017.
- The Playas Wetlands NMRAM Advisory Committee Meeting was held on February 10, 2017.



**Figure 9. NMRAM for Playa Wetlands Advisory Committee Meeting, February 10, 2017. Fourteen members and one remote attendee participated in the all-day discussions.**

- Database and electronic data collection worksheets are being updated to Version 1.1 with changes to some of the metrics after the Advisory Committee Meeting.
- A long-term contract with TEKSystems to work on NMRAM data collection worksheets and entry into the SQUID database has been approved on May 18, 2017.
- The draft New Mexico Rapid Assessment Method Playa Wetlands Field Guide Version 1.0 is being edited to Version 1.1 after the Advisory Committee meeting.
- The WPO attended a Playa Lakes Joint Venture (PLJV) Outreach to the City of Clovis meeting and field trip at the City of Clovis offices in Clovis, New Mexico. The day included a field trip to Clovis-owned playas in need of restoration and included some playas in rural areas. The City of Clovis is contemplating the development of a water conservation and assurance strategy that includes playas as important for their groundwater recharge functions as well as wildlife habitat and wetland conservation.



**Figure 10. PLJV Outreach to the City of Clovis Meeting. Participants including the Mayor of Clovis talking about storm water input and playa conservation at the Bomar Playa near Clovis, NM. The City owns the playa.**

- An MOA with Natural Heritage NM for “New Mexico Rapid Assessment Method for Playa Wetlands Supplemental Field Test and Data Collection” for additional data collection to test the final metrics for Playa Wetlands NMRAM was approved June 27, 2017.
- The QAPP for “Rapid Assessment for New Mexico’s Playa Region, Southern High Plains” was updated for the supplemental data collection and approved on July 20, 2017.
- Natural Heritage NM used the current geodatabase to select 23 more potential Sample Area playas to test the revised field metrics and the data collection worksheets as part of the Supplemental Data Collection, Summer 2017.
- Elizabeth Milford (UNM) contacted 26 agency contacts and landowners to obtain permission to collect data for the Playa Supplemental Data collection effort in late June and early July, 2017.
- The WPO and Esteban Muldavin (UNM) conducted field training on July 24 and 25, 2017 for the Supplemental Data Collection Team for one and one-half days to ensure the new protocols were understood, that questions and issues with data collection and metrics were addressed, that Ryan Parks and Loribeth Tanner (EPA Region 6 ORISE Researchers) were trained, so that data collection would go smoothly. Hannah

Burnham and Yvonne Chauvin (UNM) were the leads for the Supplemental Data Collection Team, who were also on the 2014 data collection team to provide continuity to the data collection efforts. The field training was conducted on three playas near Clovis, New Mexico.



**Figure 11. Field Training for Supplemental Data Collection at a hot dry playa south of Clovis, NM. Esteban Muldavin is talking about the playa annulus to the Team. Also shown is Hannah Burnham, Ryan Parks, Loribeth Tanner and Yvonne Chauvin. Maryann McGraw took the photo.**

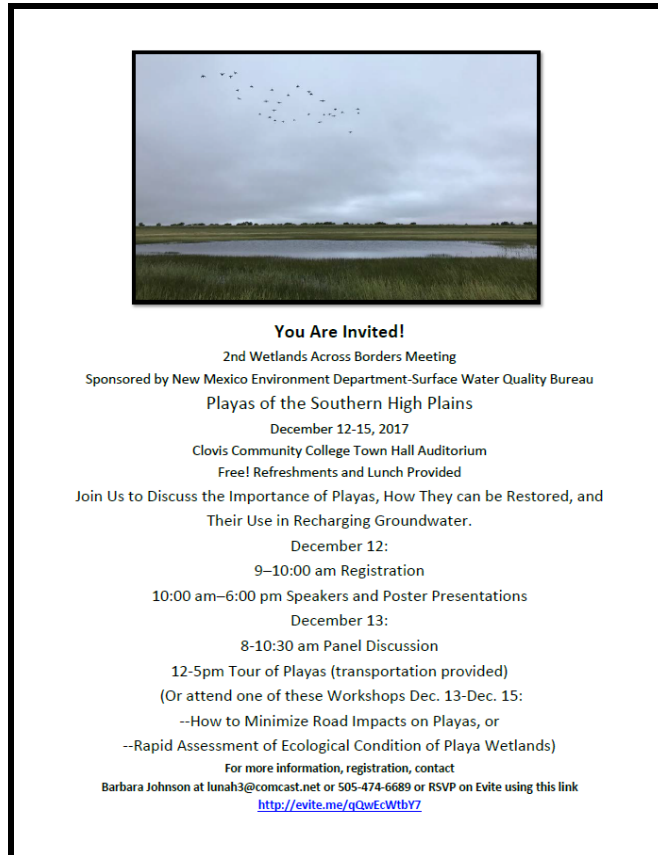
- NMRAM data from 12 supplemental playa sites were collected in July and August for testing the final list of NMRAM for Playa Wetlands metrics. The final number of sites where data were collected for this project is 48.
- Two EPA Region 6 ORISE Researchers, Loribeth Tanner and Ryan Parks, traveled to Clovis, New Mexico to help with the Playa Wetlands Supplemental Data collection in late July 2017.
- The first NMRAM Playa Wetlands training was conducted at the Clovis-Carver Public Library in Clovis, NM on September 27 through 29, 2017, with 13 participants in attendance. The NMRAM Playa Wetlands Version 1.1 was used for this first training.





**Figure 12. Ryan Parks standing in a typical playa bottom and helping with the Soils Metric.**

- A contract with the Rio Puerco Alliance was approved for “Planning and Conducting the 2<sup>nd</sup> Wetlands Across Borders Meeting - Playas of the Southern High Plains” on October 6, 2017.
- The WPO attended Central Curry SWCD and Roosevelt County SWCD meetings on October 11-12, 2017 to let the members know about the upcoming Wetlands Across Borders meeting.
- The WPO attended the National Aquatic Resource Survey (NARS) Workshop in Silver Springs, Maryland December 4-8, 2017.



**Figure 13. Invitation Handout for Central Curry SWCD and Roosevelt County SWCD meetings on October 11-12, 2017**

- The 2<sup>nd</sup> Wetlands Across Borders Meeting - Playas of the Southern High Plains” Meeting was conducted December 12-15, 2017. The meeting consisted of one and one-half days of presentations and panel discussions about playa ecology, conservation, restoration and other important topics about playas. The meeting was followed by three track options – *New Mexico Rapid Assessment Method Training for Playa Wetlands*, a *Playas and Roads workshop*, or a *half-day field trip to look at local playas*. A travel bus and field trip leader were hired by the Contractor for the half-day field trip.
- The 2<sup>nd</sup> Wetlands Across Borders Meeting – Playas of the Southern High Plains Agenda included nine oral presentations followed by Roundtable discussions during the breaks. Two Poster Sessions - one on Roosevelt County water saving and one on LIDAR of the Southern High Plains were displayed in the foyer. The second day began with a “Panel on the Future of Water Resources in the High Plains” with four panelists providing short presentations that would stimulate discussion and brainstorming ideas. The track options then started on the second day after lunch.



Figure 14. Second Wetlands Across Borders Meeting – Playas of the Southern High Plains Sponsors



Figure 15. Town Hall Auditorium at the Clovis Community College where the “2<sup>nd</sup> Wetlands Across Borders Meeting - Playas of the Southern High Plains” was conducted.





**Figure 16. Participants in the tour of local playas half-day field trip, December 13, 2017. The portable speaker system was used by the presenter so everyone could hear in the strong wind.**



**Figure 17. Half-day tour of local Playas, December 13, 2017. Northern Pintails and other waterfowl resting on the Priebe Playa.**



- The Second Playa NMRAM training was conducted December 13 through December 15, 2017 as part of the Wetlands Across Borders Workshop at the Clovis Community College in Clovis, NM, with 10 participants in attendance.



**Figure 18. Playa Wetlands NMRAM Training December 15, 2017. The Abiotic Team digs soil pits and examines soils for the Soil Condition Metric.**



**Figure 19. Playa Wetlands NMRAM Training December 15, 2017. Participants discuss and complete stressor checklists as a group after completing the field-based metrics.**

- A draft of the NMRAM Manual Module for Playa Wetlands has been completed. The subclass description, reference domain description, the rationale for the final selection of metrics, rating rationale and scoring, is included in the Manual Module. The entire NMRAM Manual is still under development by NHNM and NMED and will be submitted as a deliverable under NMRAM for Confined Riverine Subclass.
- The draft New Mexico Rapid Assessment Method Playa Wetlands Field Guide Version 1.0 was edited before the NMRAM training (Version 1.1), and Version 1.2 was completed by the end of December 2017.
- Supplies were purchased for printing the Field Guide.
- Database and electronic data collection worksheets were updated prior to the supplemental data collection, again before the first NMRAM training in September, and prior to the final NMRAM training in December, and finalized at the end of December 2017.
- The SWQB SQUID database has been modified to accept NMRAM for Playa Wetlands Data.
- The Grant closed December 31, 2017 and the Final Report and final bound version of the NMRAM for Playa Wetlands of the Southern High Plains Field Guide Version 1.2 were the final deliverables for this project. A copy of the Field Guide is included with this Final Report.

## Field Guide Summary

**Metrics.** The NMRAM for Playa Wetlands Field Guide Version 1.2 can be accessed at <https://www.env.nm.gov/wp-content/uploads/2018/04/Playa-RAM-Field-Guide-with-Appendices.pdf>. NMRAM for Playa Wetlands includes five novel metrics that were created for playa depressional wetlands and are specific to Southern High Plains Playas. These metrics were created from the data collected in 2014 and then tested in 2017, revised and refined after data collection in the fall of 2017. These include:

**Playa Configuration** – evaluation of the departure of the current playa wetland shape and size from the historical configuration as a function of direct anthropogenic alterations. In addition to the playas sampled, this metric was tested on many playas in the GIS. It was also tested by different users to gage the spread in scores.

**Exotic Annual Plant Abundance** – an index of the relative abundance of exotic annual plant species cover relative to the overall herbaceous plant cover. This metric was developed from the reference Sample Area data that included detailed floristic sampling. Playa wetlands contain seed banks with a variety of flora that emerge depending on the fluctuating ephemeral moisture regime. Annual plants are the most successful under this variable regime in playa wetlands. More exotic annual plants are expected and become dominant especially in playa watersheds that are disrupted and dominated by cropland and disturbance.

**Wetlands Species Index** – an index of wetland condition based on the presence and abundance of dominant or co-dominant wetland species in the current playa basin floor. Playas fill with water on a variable timeframe but functional playas will occasionally hold water if climatic factors are favorable. Natural playa flora communities include wetland obligate and facultative plants that are restricted to the playa and not found in the drier surrounding uplands. Playas where the hydroperiod is reduced or are prevented from flooding will have more upland species as dominants. The presence of wetland species in ephemeral playas reflect overall functionality and ecological integrity.

**Playa Hydroperiod Reduction** – the degree to which the natural playa hydroperiod has been reduced by the existence of a pit excavation in the playa floor. Ubiquitous pit excavations in playa bottoms concentrate water and lower flood height and aerial coverage.

**Soil Condition Index** – an index that assesses the alteration of the playa bottom soils especially by increased sediment accumulation leading to altered hydroperiods, changes in soil characteristics and associated plant communities, and playa function.

The remaining metrics that have undergone considerable analyses and adjustments during metric development:

**Absolute Playa Size** – An assessment of the current size (area) of the playa wetland. The ratings are scaled based on the distribution of sizes within the Reference Domain.

**Surrounding Land Use** - Although this is a metric common to all NMRAMs to date, the list of land-uses is subclass-specific and excludes those uses that cannot be mapped explicitly as cover types.

**Vertical Habitat Disruption** – An assessment of the impact of vertical structures and woody vegetation not historically associated with playa habitat, that have encroached on the playa and degrade wildlife habitat, increase predation, create hazards and disrupt movement.

**Water Source Augmentation** – Water sources that augment playa water supply and that may extend the hydroperiod. These include direct inputs of water from unnatural direct sources.

**Playa Watershed Connectivity** – An assessment of hydrologic connectivity of surface flows from the surrounding playa watershed to the playa. This is based on the observation of features that prevent natural surface runoff from reaching the playa.



**Figure 20. The WPO photographed this degraded playa after the SWCD meetings. Road runoff has created a headcut into a pond that captures flow that normally would be in the playa shown just below the berm. Surrounding wind turbines create hazards for migrating waterfowl using the playa especially on cloudy days and at night. The metrics, Surrounding Land Use, Vertical Habitat Disruption, Playa Watershed Connectivity, and Playa Configuration, would score lower due to these impacts.**





**Figure 21. Abundant annual plants and wetland plants occupying the playa bottom. Lighter colored loamy soil may indicate sediment input. This playa would score high for Wetland Species Index, but lower for Soil Condition Index. Note the lighter plants in the background indicate the upland plants at the playa edge above the playa annulus.**



**Figure 22. Typical dry playa bottom displaying shrink-swell cracks in dark colored clay pan. Woods Playa, Curry County.**

***Stressor Checklists.*** Stressor checklists are found in Appendix A of the NMRAM Playa Wetlands Field Guide Version 1.2. These checklists were modified from previous NMRAM Field Guides for other subclasses, but include stressors that are common in the Southern High Plains and pertinent to playas. The Stressor Checklists are grouped into four categories: Land Use, Vegetation, Hydrologic Modifications, and Physical Structure. Stressors are not included in the ranking of playa condition but provides information that furthers the understanding of the current wetland condition.

***Data Collection Worksheets.*** Interactive PDF versions of the data collection worksheets can be downloaded at <https://www.env.nm.gov/wp-content/uploads/2018/04/Playa-RAM-Field-Guide-with-Appendices.pdf>. These data sheets found in hard copy in the Field Guide Appendix A, computes some of the metric scores and auto-fills the SA Rank Summary Worksheet and headers. The interactive PDF Version also will compute provisional scores when only GIS (Level 1) metrics data are used when the playa is inundated.

***Manual.*** The NMRAM Manual justifies condition scoring and ranking based on analyses using the NMRAM GIS and field data. The final version of the NMRAM Manual for all the subclasses will be available in the future.

## **List of Major Deliverables**

- UNM IGA and Amendment

- First Advisory Committee Invitation, Agenda, sign-in sheet, meeting notes and presentations.
- Soils Metric meeting presentation and notes.
- Presentation for the El Llano Estacado SWCD Prairie Partners meeting in Tucumcari, New Mexico.
- Contract and Amendments for TEKSystems for the development and updating of data collection worksheets and work on SQUID to accept Playas NMRAM data.
- Second Advisory Committee Invitation, Agenda, sign-in sheet, meeting notes and presentations.
- Contract with Clovis Community College for the 2<sup>nd</sup> Wetlands Across Borders Meeting - Playas of The Southern High Plains auditorium and workshop track classrooms.
- SWCD Wetlands Across Borders Invitation Flyer
- Draft Playas Module for the NMRAM Manual
- Final Version 1.2 of the Field Guide with Data Collection worksheets.
- Final Version 1.2 of the fillable PDF Data Collection worksheets.
- Data Collection worksheets with data from twelve 2017 sites.
- NMRAM for Playa Wetlands Training materials, presentations and sign-in sheets.
- NARS Workshop invitation.
- 2<sup>nd</sup> Wetlands Across Borders Meeting - Playas of The Southern High Plains – Invitation, Agenda, Presentations, materials
- Rio Puerco Alliance Final Report for “Planning and Conducting the 2<sup>nd</sup> Wetlands Across Borders Meeting - Playas of The Southern High Plains”
- All NMRAM data sheets and site photos.
- Roundtable agendas and presentations.
- PQAPP and amendments.
- Semi-Annual and Final Reports
- Hard-bound copies of NMRAM Playa Wetlands
- Match Documentation excel spreadsheet for this project

## **Lessons Learned**

This project developed the first NMRAM for depressional wetlands in an arid setting. Issues that required considerable discussion and research were conducting the rapid assessment in varying hydrologic conditions. It was determined that some metrics data could not be collected when playas were full of water. The interactive data collection worksheets allow for a provisional score when only data from Level 1 (GIS) metrics can be collected. An accurate and complete assessment of all metrics requires sampling the playa when it is not inundated and vegetation is present on the playa basin floor (excluding excavated pits).

### *What made the project successful*

NMRAM is proving to be a successful tool for identifying the condition of wetlands by subclass in New Mexico, identifying their range and abundance, and evaluating their



condition. NMRAM adds a useful and versatile tool for the management of the State's wetland resources.

Interactive data collection worksheets have been developed for NMRAM for Playa Wetlands. The interactive data collection worksheets automatically provide scores and ranks as data is entered for each metric. The database also stores key photographs and can be accessed for use with other regional water quality data stored in SQUID.

The expansion of the New Mexico Wetlands Roundtable to meetings in Southern New Mexico has been invaluable as a change agent for the way the state views its wetlands. Wetlands are now more valued and work on assessment, restoration and protecting wetlands is more common. Wetlands are recognized as an indispensable resource.

The acceptance of SWQB to integrate, expand and maintain wetlands data as part of SQUID database ensures compatibility and integration with other state water quality databases and future EPA databases.

*What made the project not so successful?*

This project has been overall successful in achieving its goals.



**Figure 23. Priebe Playa near Clovis.**

## **Technical Transfer**

*What information can you pass along to other agencies, cooperators or local landowners in other watersheds about this project?*

Rapid Assessment for New Mexico's Playa Region, Southern High Plains Final Report  
December 2017



Agencies, Cooperators and local stakeholders have been invited to trainings to promote the understanding and use of NMRAM. The Wetlands Across Borders meeting was successful in attracting participants from other states to the NMRAM Playa Wetlands training.

The WPO continues to provide presentations about NMRAM Playa Wetlands including presenting this rapid assessment method at the Society of Wetland Scientists meeting in May 2018. The WPO participates in Playa Lakes Joint Venture meetings and committees to promote Playa NMRAM as well as playa restoration techniques.

The SQUID will eventually have a web-access feature so that others can view the results on line and enter their own data.



Figure 24. Playa Reconnaissance Site. Photo by E. Muldavin.

### **EPA Feedback Loop**

*What would you suggest that EPA do differently to improve the process in regard to this project?*

EPA was very supportive in all aspects of this project during the project period, especially allowing grant period extensions to complete high quality and meaningful work.

### **Future Activity Recommendations**

- Additional refreshers, botany boosters and trainings will be conducted in NMRAM wetlands assessment methods to engage others in collecting needed wetlands data.

Rapid Assessment for New Mexico's Playa Region, Southern High Plains Final Report  
December 2017

- New Mexico is in the process of developing rapid assessment methods (NMRAM) for various wetland subclasses throughout the state. There is a need to continue validation of our landscape and rapid assessment methods using more detailed and intensive methods and indicators, to ensure that NMRAM is providing an accurate picture of wetland condition.
- SWQB Wetlands Program is developing a demonstration of “All Hands” data collection efforts where we provide direct help to teams that want to use NMRAM for their purposes. Several training attendees indicated that they would participate in this effort.



**Figure 25. Avocet foraging in playa, Curry County.**