October 2021: Implementation of the NM Water Data Act

Today's panel includes

- Stacy Timmons, Water Data Initiative Director, NM Bureau of Geology & Mineral Resources
- Hannah Riseley-White, Deputy Director, NM Interstate Stream Commission
- Rodney McKnight, Chief Information Officer, NM Office of State Engineer
- John Rhoderick, Acting Director Water Protection Division, NM Environment Department
- Kevin Myers, Hydrologist, NM Energy Minerals and Natural Resources Dept.

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
Earth Science for the 21st Century

Office of the State Engineer
Interstate Stream Commission

New Mexico Environment Department

New Mexico
emnrd
Energy, Minerals and Natural Resources Department

2013: Magdalena, New Mexico

2

A community without water for several weeks in June 2013

Village makes news headlines:

Magdalena is out of water due to dried out well

Magdalena runs out of water, [Old Timers'] event canceled

Rural New Mexico facing water crisis

New Mexico town offers glimpse of life without water

Water data in New Mexico is stored in a wide range of different “data systems” and siloes

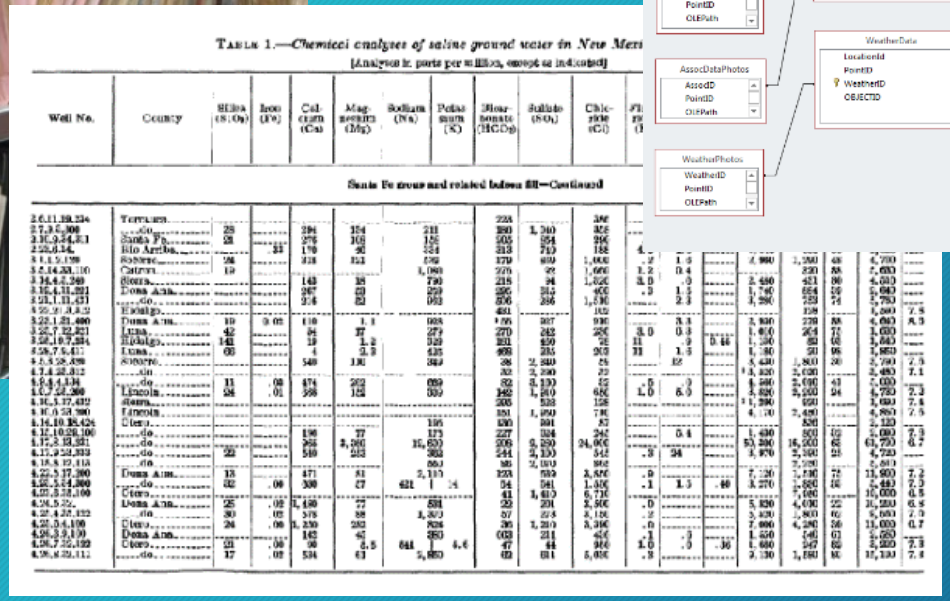
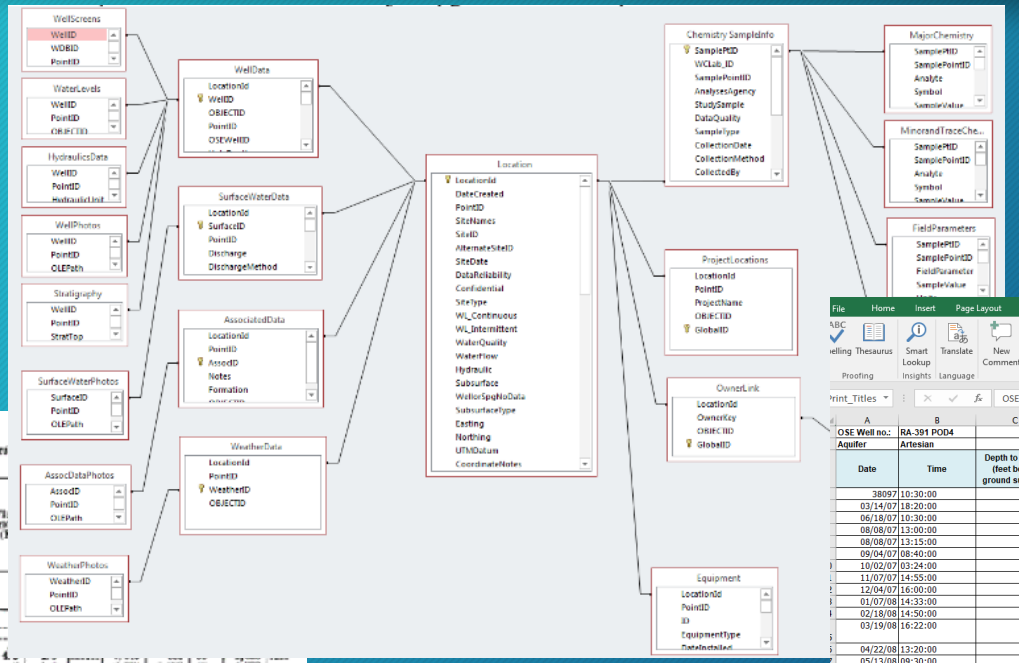
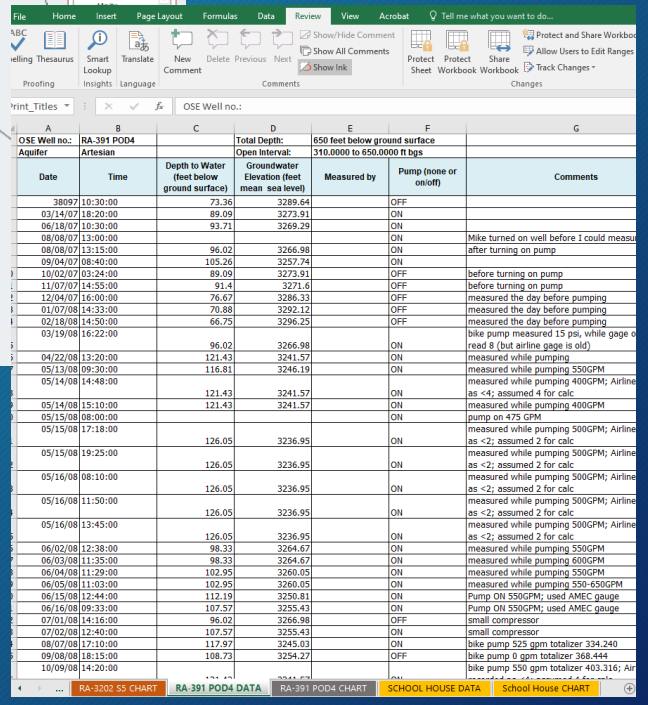


TABLE 1.—*Chemical analyses of saline ground water in New Mexi*

[Analyses in parts per million, except as indicated]

Well No.	County	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fl...
	Santa Fe ground and related waters—Continued										
	Torrance										
	...do	28		284	154	211		226	1,340	326	
	Santa Fe	28		278	105	126		205	954	296	
	Rio Arriba	23		170	90	324		213	710	188	
	Sandoval	38		318	153	592		379	600	1,000	
	Cuba	19				1,060		376	97	1,666	
	Sierra			143	35	790		215	94	1,256	
	Dona Ana			267	93	259		295	315	400	
	...do			216	82	993		306	266	1,836	
	Otero							491	142	1,000	
	Dona Ana	19	0.02	110	1.1	928		199	307	930	
	Luna	42		94	37	279		270	242	290	
	Hidalgo	142		19	1.2	320		231	290	92	
	Luna	60		4	0.9	625		208	285	203	
	Socorro				140	380		38	2,580	25	
	...do							30	2,200	25	
	...do	11	.08	474	262	892		32	2,120	15	
	Lincoln	58	.01	598	125	309		142	1,240	685	
	Otero							205	528	158	
	Lincoln							151	1,490	78	
	Otero					196		190	801	83	
	...do			196	37	173		227	324	242	
	...do			262	3,000	10,650		206	9,250	24,000	
	...do	20		510	205	382		244	2,130	342	
	...do					864		98	2,100	892	
	Dona Ana	13		471	81	2,110		233	582	2,600	
	...do	32	.00	300	67	421		94	941	1,400	
	Otero							61	1,610	6,710	
	Dona Ana	25	.02	1,480	77	588		93	201	2,500	
	...do	30	.02	376	58	1,300		57	254	1,150	
	Otero	24	.00	1,230	293	926		201	1,210	3,300	
	Dona Ana		.02	142	47	283		103	211	454	
	Otero	31	.00	90	6.5	644	4.6	67	44	940	
	...do	17	.02	534	63	2,850		62	611	5,000	





OSE Well no.:

	A	B	C	D	E	F	G
1	OSE Well no.:	RA-391 POD4		Total Depth:	650 feet below ground surface		
2	Aquifer	Artesian		Open Interval:	310.0000 to 650.0000 ft bgs		
3	Date	Time	Depth to Water (feet below ground surface)	Groundwater Elevation (feet mean sea level)	Measured by	Pump (none or on/off)	Comments
4	38097	10:30:00	73.36	3289.64		OFF	
5	03/14/07	18:20:00	89.09	3273.91		ON	
6	06/18/07	10:30:00	93.71	3269.29		ON	
7	08/08/07	13:00:00				ON	Mike turned on well before I could measu
8	08/08/07	13:15:00	96.02	3266.98		ON	after turning on pump
9	09/04/07	08:40:00	105.26	3257.74		ON	
10	10/02/07	03:24:00	89.09	3273.91		OFF	before turning on pump
11	11/07/07	14:55:00	91.4	3271.6		OFF	before turning on pump
12	12/04/07	16:00:00	76.67	3286.33		OFF	measured the day before pumping
13	01/07/08	14:33:00	70.88	3292.12		OFF	measured the day before pumping
14	02/18/08	14:50:00	66.75	3296.25		OFF	measured the day before pumping
15	03/19/08	16:22:00	96.02	3266.98		ON	bike pump measured 15 psi, while gage o read 8 (but airline gage is old)
16	04/22/08	13:20:00	121.43	3241.57		ON	measured while pumping
17	05/13/08	09:30:00	116.81	3246.19		ON	measured while pumping 550GPM
18	05/14/08	14:48:00	121.43	3241.57		ON	measured while pumping 400GPM; Airline as <4; assumed 4 for calc
19	05/14/08	15:10:00	121.43	3241.57		ON	measured while pumping 400GPM
20	05/15/08	08:00:00				ON	pump on 475 GPM
21	05/15/08	17:18:00	126.05	3236.95		ON	measured while pumping 500GPM; Airline as <2; assumed 2 for calc
22	05/15/08	19:25:00	126.05	3236.95		ON	measured while pumping 500GPM; Airline as <2; assumed 2 for calc
23	05/16/08	08:10:00	126.05	3236.95		ON	measured while pumping 500GPM; Airline as <2; assumed 2 for calc
24	05/16/08	11:50:00	126.05	3236.95		ON	measured while pumping 500GPM; Airline as <2; assumed 2 for calc
25	05/16/08	13:45:00	126.05	3236.95		ON	measured while pumping 500GPM; Airline as <2; assumed 2 for calc
26	06/02/08	12:38:00	98.33	3264.67		ON	measured while pumping 550GPM
27	06/03/08	11:35:00	98.33	3264.67		ON	measured while pumping 600GPM
28	06/04/08	11:29:00	102.95	3260.05		ON	measured while pumping 550GPM
29	06/05/08	11:03:00	102.95	3260.05		ON	measured while pumping 550-650GPM
30	06/15/08	12:44:00	112.19	3250.81		ON	Pump ON 550GPM; used AMEC gauge
31	06/16/08	09:33:00	107.57	3255.43		ON	Pump ON 550GPM; used AMEC gauge
32	07/01/08	14:16:00	96.02	3266.98		OFF	small compressor
33	07/02/08	12:40:00	107.57	3255.43		ON	small compressor
34	08/07/08	17:10:00	117.97	3245.03		ON	bike pump 525 gpm totalizer 334.240
35	09/08/08	18:15:00	108.73	3254.27		OFF	bike pump 0 gpm totalizer 368.444
36	10/09/08	14:20:00					bike pump 550 gpm totalizer 403.316; Air

RA-3202 S5 CHART | RA-391 POD4 DATA | RA-391 POD4 CHART | SCHOOL HOUSE DATA | School House CHART

New Mexico Water Data Act of 2019 (NMSA 1978, § 72-4B)

Our vision:

New Mexicans will have accessible and useful data for water management and planning.

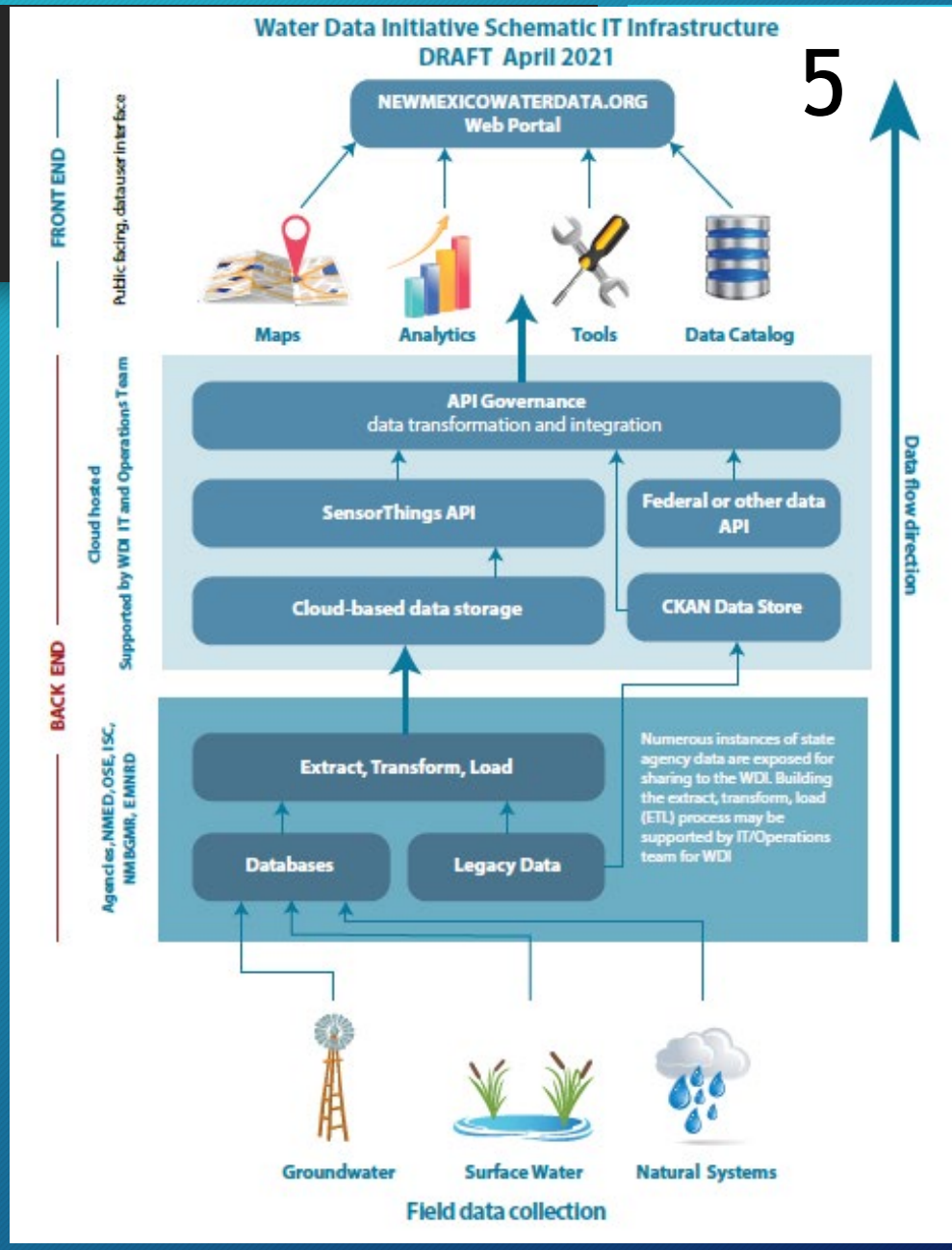
The intent of the Water Data Act (from 2019 HB651):

- Integrate water data using consistent and standardized formats
- Identify key water data, information, and tools, as well as available and unavailable water data for water management and planning
- Ensure compliance with water data standards and best practices
- Encourage collaboration with other federal, state, regional, and local providers

Annual report and a plan submitted to Governor's office and Interim Committees

FEDERATING Water Data: A *paradigm* shift

1. **Data providers collect, maintain and host data**
   - Only share data when ready & QCed
2. **Share data in modern, dynamic ways**
   - Using open source tools (OGC's SensorThings API)
3. **Integrate data**
   - Building transformations
4. **Easy access to data**
   - Data available to build tools, analytics, or download and use through web interface
   - Data available for research



Following NM: USGS has adopted & implemented SensorThings API data format

New Mexico Water Data

Internet of Water

Water data is fundamental to our future planning and water decisions

Build a single platform for easy to access water data and analytics

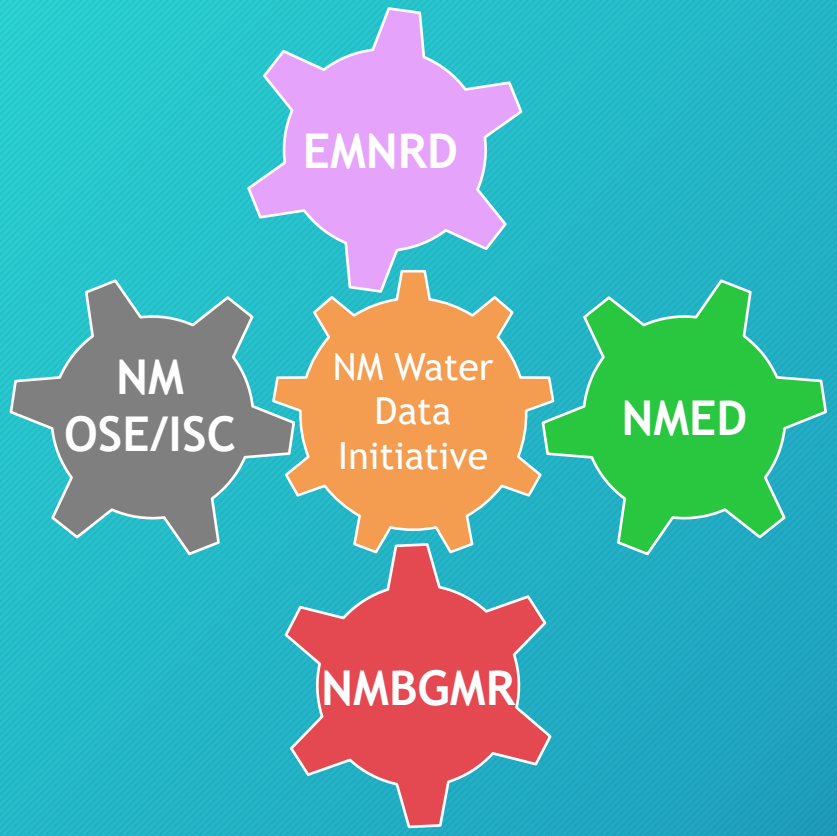
New Mexico Water Data

newmexicowaterdata.org

Potential use-cases to address:

- Planning economic development – is the water use sustainable?
  - Should a new use be permitted?
- Is my water SAFE here?
  - Is it safe to swim?
  - Is it safe to drink?
- Where does my water come from?
- What are the water trends in my location?
  - Should I build or buy in this area?

NM Water Data relies on collaboration



Current condition	Future condition	NMWDI can help
Reactive to crises	Prepared for challenges	Building data community and improved communications
Funding limited	Funded for improvements and action	Currently funded small pilot projects to explore data projects
Siloes - agencies and inaccessible data	Interactive and self-service data & analytics	Raising awareness and illuminating data / stories
Limited data skills	Strong data & analytics state workforce	Develop training and data literacy programs

Funding for NM Water Data Initiative

- In statute, fund is established at NMBGMR (under New Mexico Institute of Mining and Technology)
- State funding to NMT = $100,000 annually
- Philanthropic contributions = $175,000 (cumulative from Healy Foundation)
- Leveraging state funding with 3-Year US Bureau of Reclamation WaterSMART Applied Science Grant = $300,000 (Pecos Valley)
- NO FUNDING currently to state agencies

Funding Goals for NM Water Data Initiative

newmexicowaterdata.org/resources

Directing Agency	One-time Funding	Recurring Funding Need	Main Purpose for One-time and Recurring Funding Purpose
New Mexico Environment Department	$1,500,000	$2,500,000	*One time*: Contract services, IT support, new database acquisitions, cloud-hosting, and modifications to API management. *Recurring funding:* 4 to 6 FTEs, contract services, software licensing, digitizing service or equipment
New Mexico Office of the State Engineer	$280,000	$300,000	*One time:* Contract services, API creation *Recurring funding:* 3 FTEs for developer, data administrator, and water data liaison.
Interstate Stream Commission	$500,000	$300,000	*One time:* Contract services, including start of digitizing paper records and equipment *Recurring funding:* 3 FTEs with focus on water data and water planning, increased monitoring/data collection, and technical support
New Mexico Energy, Minerals and Natural Resources Department	$500,000	$250,000	*One time:* 2 technical and 2 IT staff (contractors, interns or temp staff) *Recurring funding:* 0.5 FTE technical support and 1.5 FTE IT
New Mexico Bureau of Geology and Mineral Resources*	$300,000	$250,000	*One time:* Data management system overhaul/ improvements supported by contractors and staff *Recurring funding:* 1 FTE data management and 1 FTE developer / web services
TOTAL DIRECTING AGENCY ESTIMATE	**$3,080,000**	**$3,600,000**	
GRAND TOTAL (INCLUDING SUPPORT FOR WDI, see Table 3)		**$4,100,000**	

*Separate from funding /support to convene and implement WDI, shown in Table 3.

Opportunities for growth

1. **FUNDING:** Must build funding to agencies providing required water data. Goals for state agencies include:
   a. Staff: short or long term staffing requirements; build data literacy and technical skills within state agencies
   b. Infrastructure: upgrades to data systems for modernizing data management
2. **DATA GAPS:** Substantial data gaps exist, or data are inaccessible (paper form) which make water management and planning more challenging
   a. Groundwater data
   b. Water use data
   c. Education and awareness on water issues
   d. Prioritization plan for digitizing paper records

Thanks to contributors!

New Mexico Water Data

HEALY FOUNDATION ~ INTERNET OF WATER ~ SANDIA NATIONAL LABORATORIES ~ NM INTERSTATE STREAM COMMISSION
UNIVERSITY OF NEW MEXICO - EARTH DATA ANALYSIS CENTER ~ U.S. BUREAU OF RECLAMATION
NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY ~ DATACEQUIA ~ MOXIECRAN MEDIA ~ SOL WEB SOLUTIONS
WEST BIG DATA INNOVATION HUB ~ WESTERN STATES WATER COUNCIL (WADE) ~ USGS NGWMN