

# New Mexico Flood Risk Awareness

## Risk Planning Using GIS

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# Presentation Overview

- ▲ New Mexico Silver Jackets
- ▲ State Priority Projects:
  - Critical Infrastructure & Floodplain Boundary Proximity Analysis
  - Potential Low Water Crossing Analysis  
*(part of NOAA Turn Around Don't Drown)*



# USACE Albuquerque District Area of Responsibility

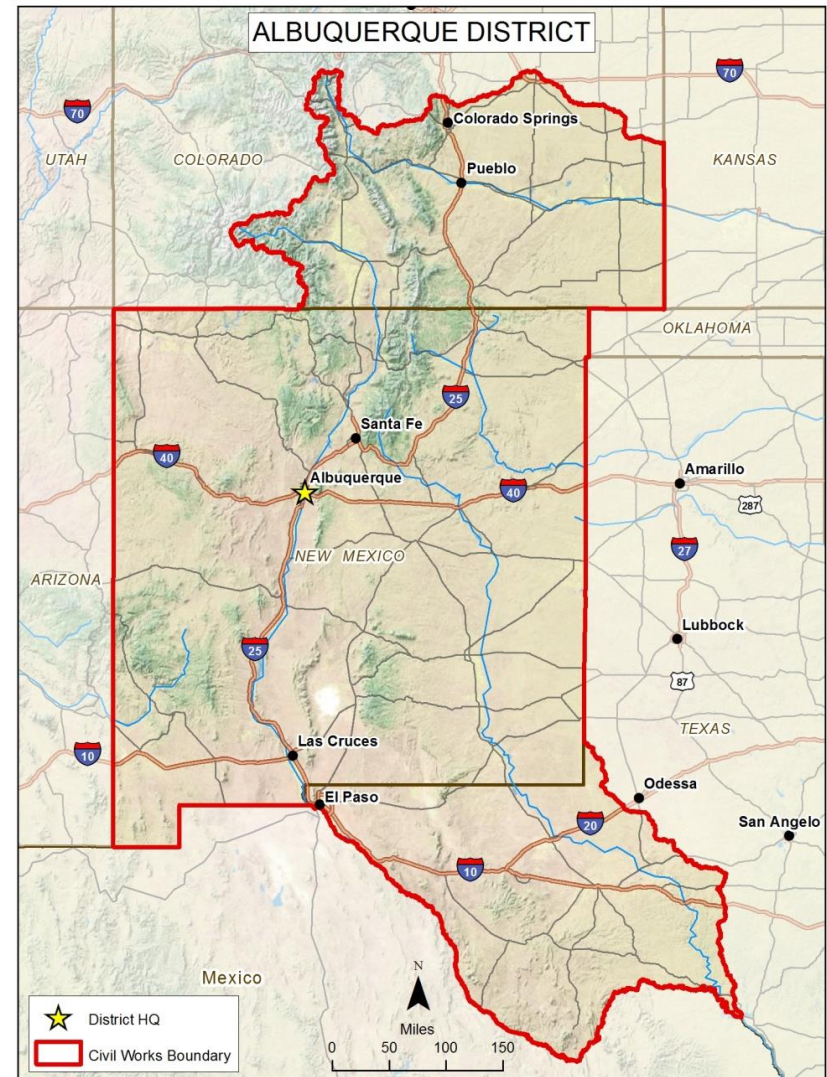
## ▲ South Pacific Division

- Sacramento District
- Los Angeles District
- San Francisco District
- Albuquerque District

## ▲ Colorado – Arkansas, Upper Rio Grande

## ▲ New Mexico – Canadian, Pecos, Upper San Juan, Gila, & Rio Grande

## ▲ Texas – Pecos, Rio Grande



# Silver Jackets

## ▲ National Silver Jackets Program

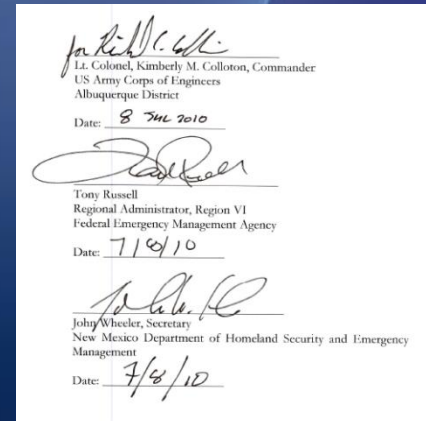
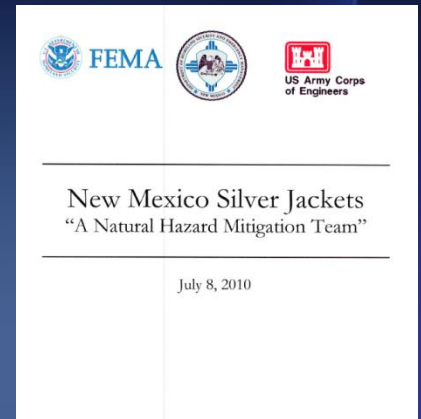
– <http://silverjackets.nfrmp.us>

## ▲ NM Team Charter - 2010

– NM DHSEM

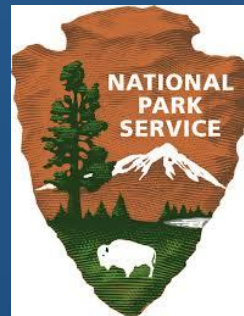
– USACE – Albuquerque District

– FEMA Region VI





# Silver Jackets



# Silver Jackets

- ▲ State-led interagency teams – Networking!
- ▲ Facilitate collaboration among federal and state agencies involved in flood risk and floodplain management
- ▲ Leverage resources to address flood risk as cost-effectively as possible



# Silver Jackets

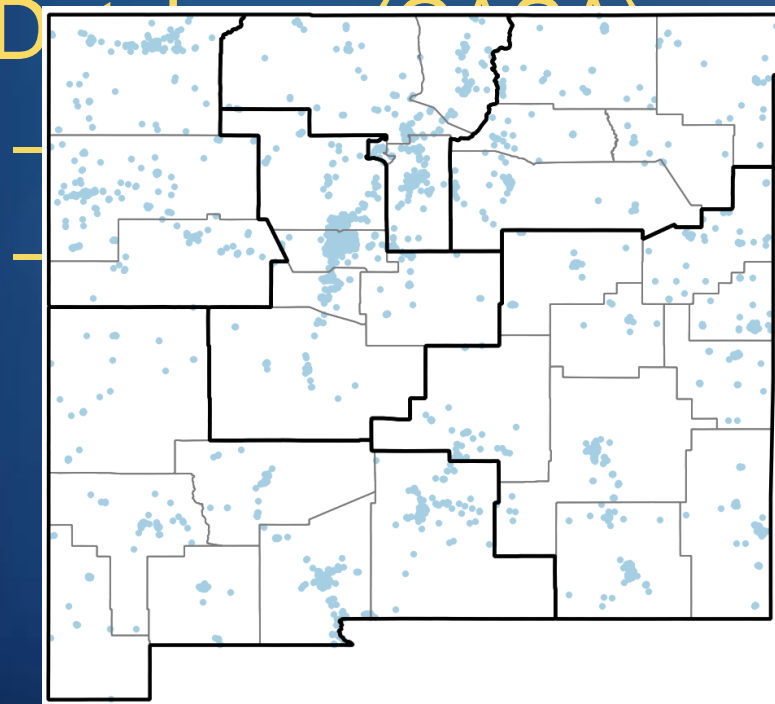
- ▲ Teams bring together multiple agencies with authorities relating to flood risk management
- ▲ Focus on priorities of the states in regards to flood and /or all-hazard risk management issues
- ▲ Current State Priority Projects:
  - Critical Infrastructure & Floodplain Boundary Proximity Analysis
  - Potential Low Water Crossing Analysis



# Critical Infrastructure & Floodplain Proximity

## ▲ Community Anchor System Assessment

Desktop (CASA)



prints

floodin





# Critical Infrastructure

- ▲ Consolidate data to one database
- ▲ Utilize 2016 New Mexico NAIP collection
  - 1 m resolution with full coverage
- ▲ Manual Review
  - 100% review by analyst
  - Target less than 4-5 minutes
- ▲ Process CASA point addresses
  - Google Geocoding API

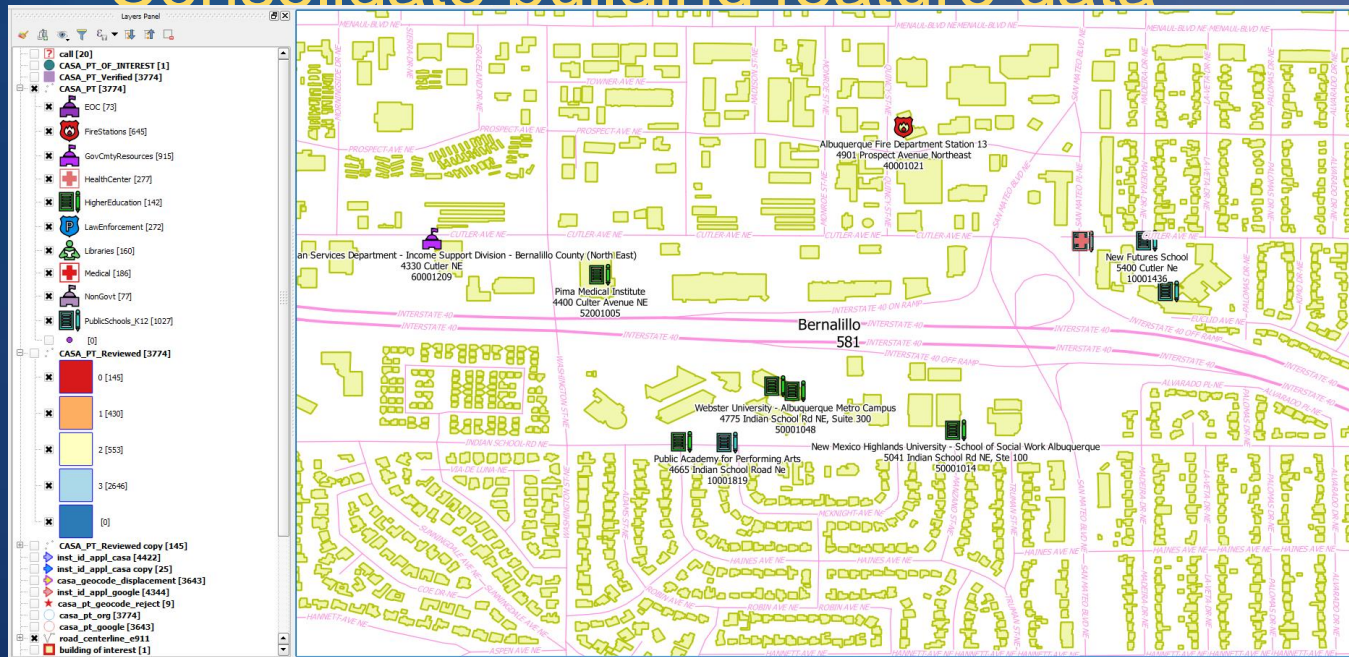


[https://gdg.sc.egov.usda.gov/GDGHome\\_DirectDownload.aspx](https://gdg.sc.egov.usda.gov/GDGHome_DirectDownload.aspx)



# Critical Infrastructure

## – Consolidate building feature data



## – CASA point feature data

- Consolidate 10 feature classes into one



# Critical Infrastructure

## – Reference Data

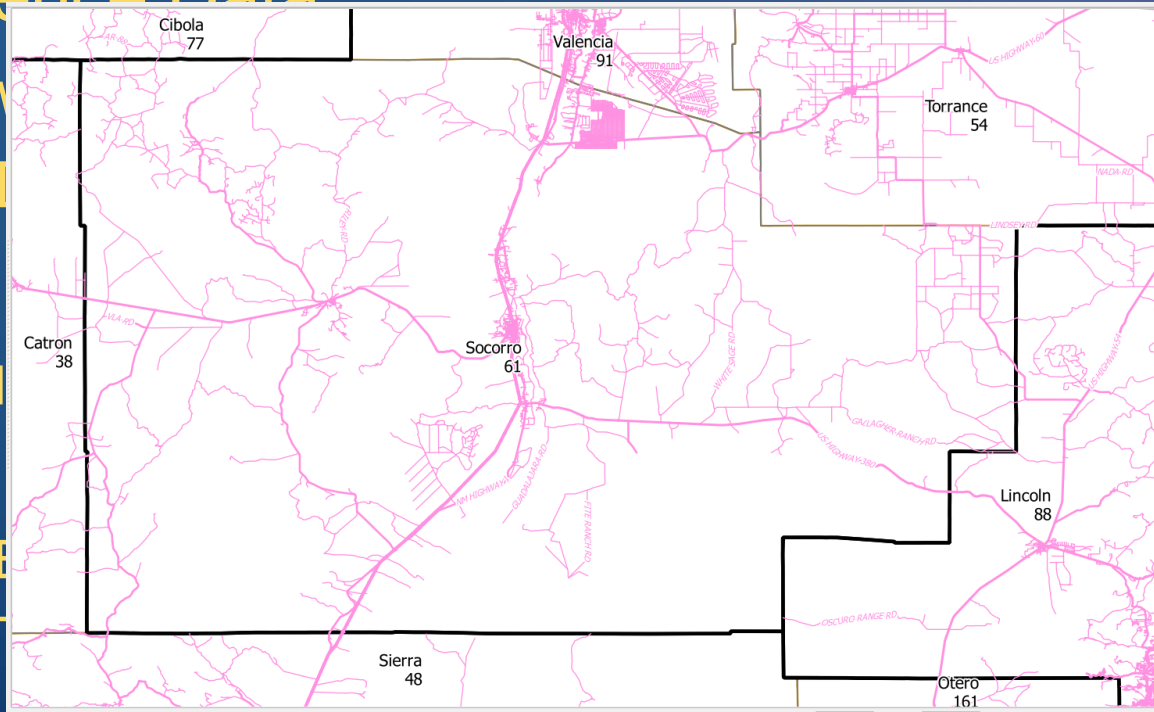
- New
- NMI
- NM

## – Produ

- BHI

- **B**
- **C**
- **D**

- **BHI CASA point tracking attributes**
  - Used to document review process





# Critical Infrastructure





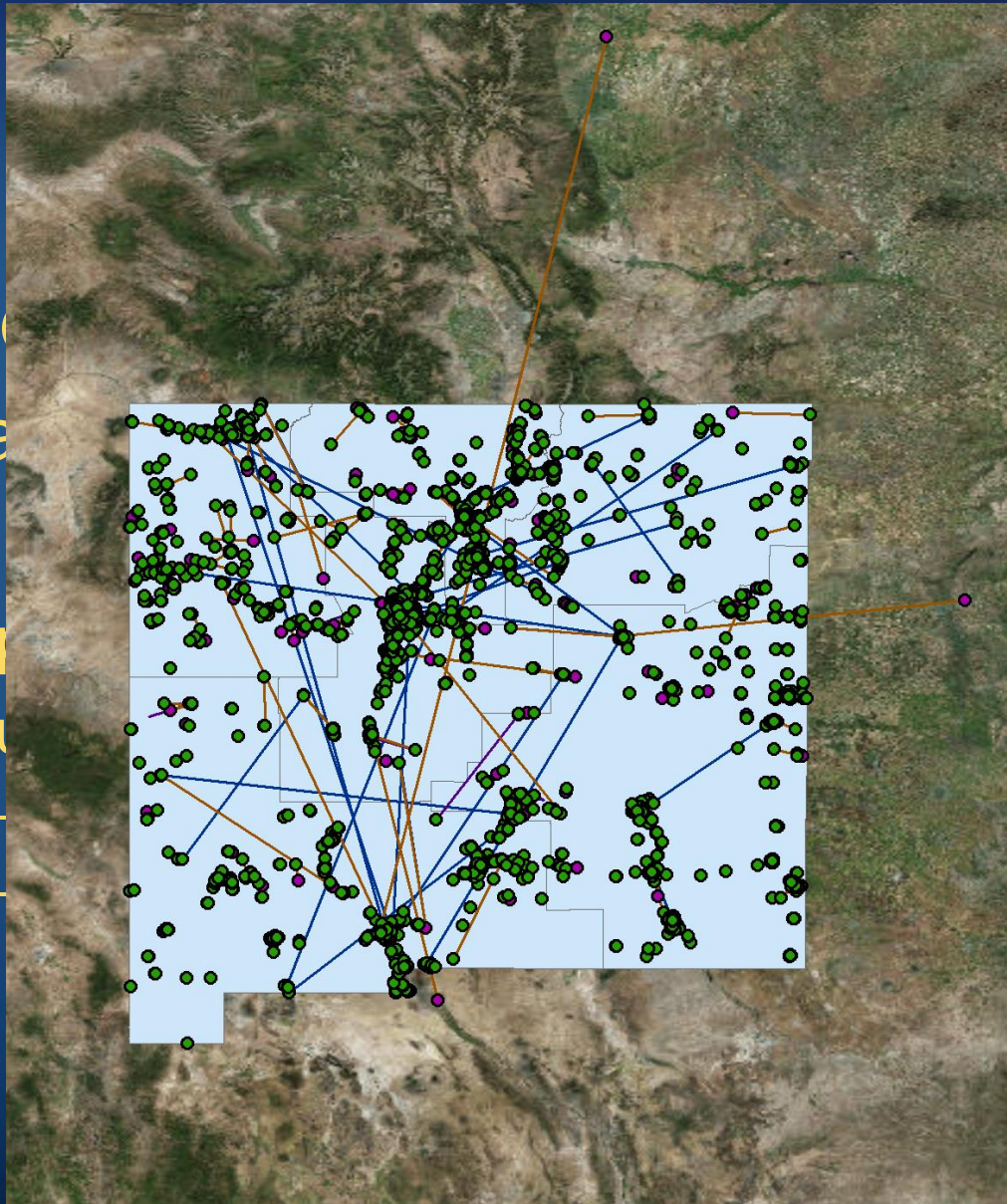
## ▲ Google

– Create

– Use

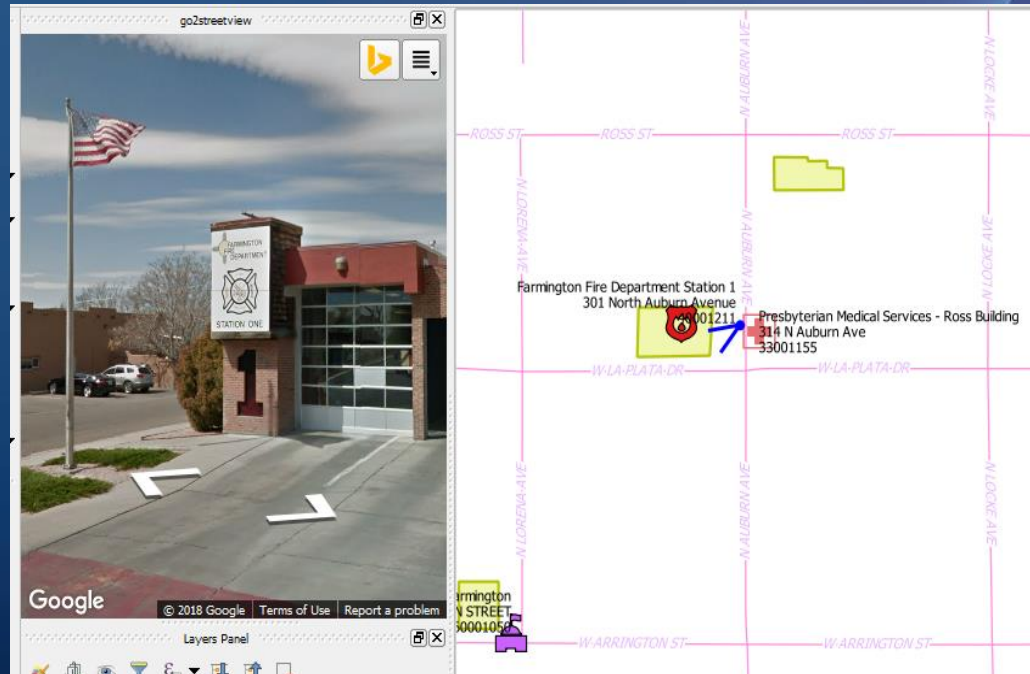
- Inp

- Ou



# Critical Infrastructure

- ▲ Create building footprint for each CASA point



# Critical Infrastructure

- ▲ Based on the source confidence value assigned by analyst
  - 0= Unclassified ( red )
    - Analyst could not locate and utilized full 5 minutes of review time
  - 1= Low ( orange )
    - Analyst could not locate with reference data but found nearby building
  - 2= Moderate ( yellow )
    - Analyst could not 100% locate with reference data
  - 3= High ( blue )
    - Analyst found CASA pt near building in imagery and/or confirmed with ref data

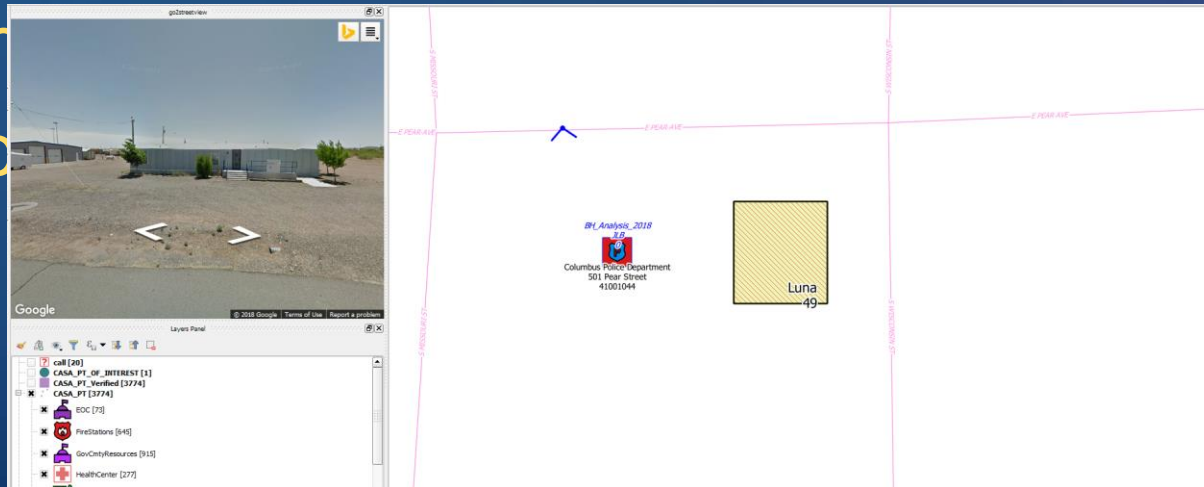




# 0 = Unclassified

## ▲ Inst\_id = 41001044 Columbus Police Department

- Dissolved after 2011 investigation in gun sm
- No





# 1 = Low

▲ Inst\_id 61001365 Hogback Chapterhouse,  
PO Box 1288

**Layers Panel**

- HigherEducation [142]
- LawEnforcement [272]
- Libraries [180]
- Medical [180]
- NonGovt [77]
- PublicSchools\_K12 [1027]
- CASA\_PT\_Reviewed [3774]
  - 0 [145]
  - 1 [430]
  - 2 [353]
  - 3 [2646]
- CASA\_PT\_Reviewed copy [145]
  - inst\_id\_appl\_casa [4422]
  - inst\_id\_appl\_casa copy [25]
  - casa\_geocode\_placement [3643]
  - inst\_id\_appl\_geocode [4341]
  - casa\_pt\_geocode\_reject [9]
  - casa\_pt\_org [3774]
  - casa\_pt\_geocode [3643]
- building\_centerline\_e911
- building\_of\_interest [1]
- building\_w\_inst\_id [3592]
- building [506129]
- NHHSSEH1\_Preparedness\_areas
- IL\_2010\_25\_county10
- tracking [33]
- tracking copy [33]
- IL\_2010\_25\_county10
- ortho\_1-1\_1m\_s\_aoa45\_2016\_1
- New\_Mexico\_2016\_1m
- SFCO2014\_RGB
- MSCOG2016

**Identify Results**

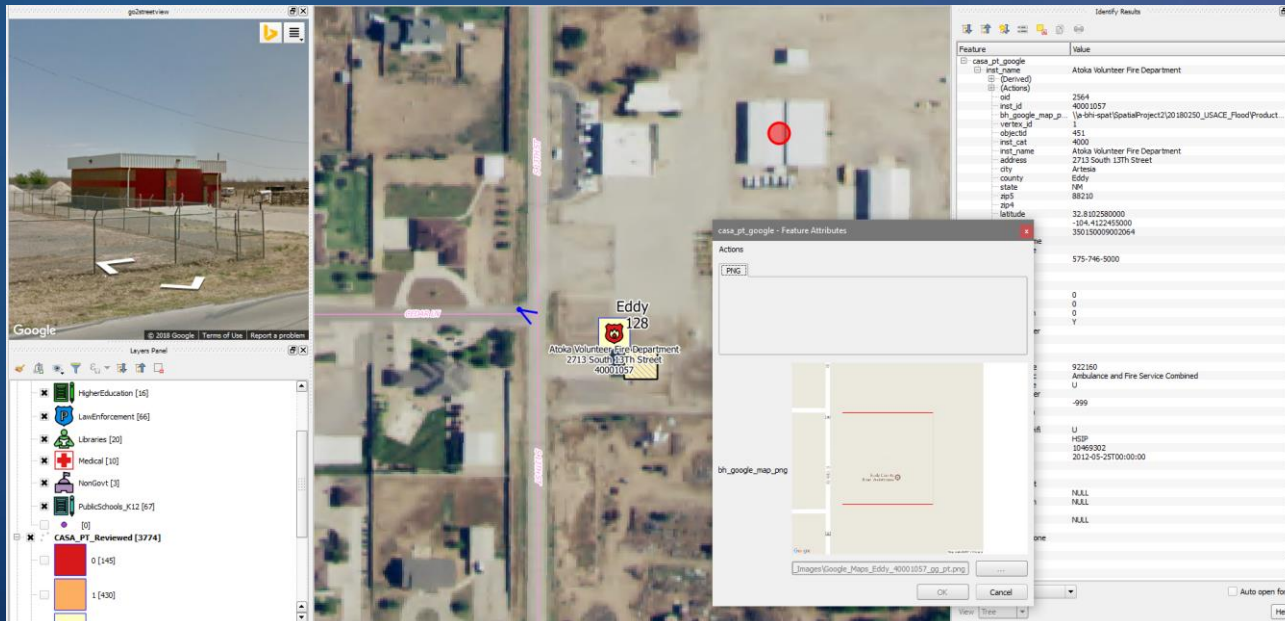
Feature	Value
inst_cat	6100
inst_name	Hogback Chapterhouse
address	P.O. Box 1288
city	Shiprock
county	San Juan
state	NM
zip5	87420
zip4	
latitude	36.7756002730
longitude	-108.608047940
fullpos	350499428021000
admin_name	
admin_title	
phone	505-368-1379
fax	
email	<a href="mailto:hogback@navaarchitects.org">hogback@navaarchitects.org</a>
url	<a href="http://www.casa-esp.org/nm/san-juan/chapters.htm">http://www.casa-esp.org/nm/san-juan/chapters.htm</a>
tot_mbrs	NULL
tot_vols	NULL
num_stabs	NULL
ens	
type_owner	
type_emp	
stabs_id	
perm_id	
naics_code	
naics_desc	
bb_service	Y
bb_provider	Frontier
bb_tech	70
bb_addm	3
bb_pkap	2
bb_pkb_wld	Y
data_src	NHHS
src_id	
data_id	2014-03-18T00:00:00
inst_id	
inst_name	
land_grant	
land_title	NULL
dep_urban	NULL
relc_attr	NULL
ctrl_prime	NULL
inst_cat	
emnts_phone	
agency	
co_sch	
ori	
to_system	
to_type	
inst_id	
cont_name	Arvia Hayes
cont_title	
note_id	
schl_dist	
schl_type	
grades	

Node: Current layer  
View: Tree  
Auto open form: ☐  
Help



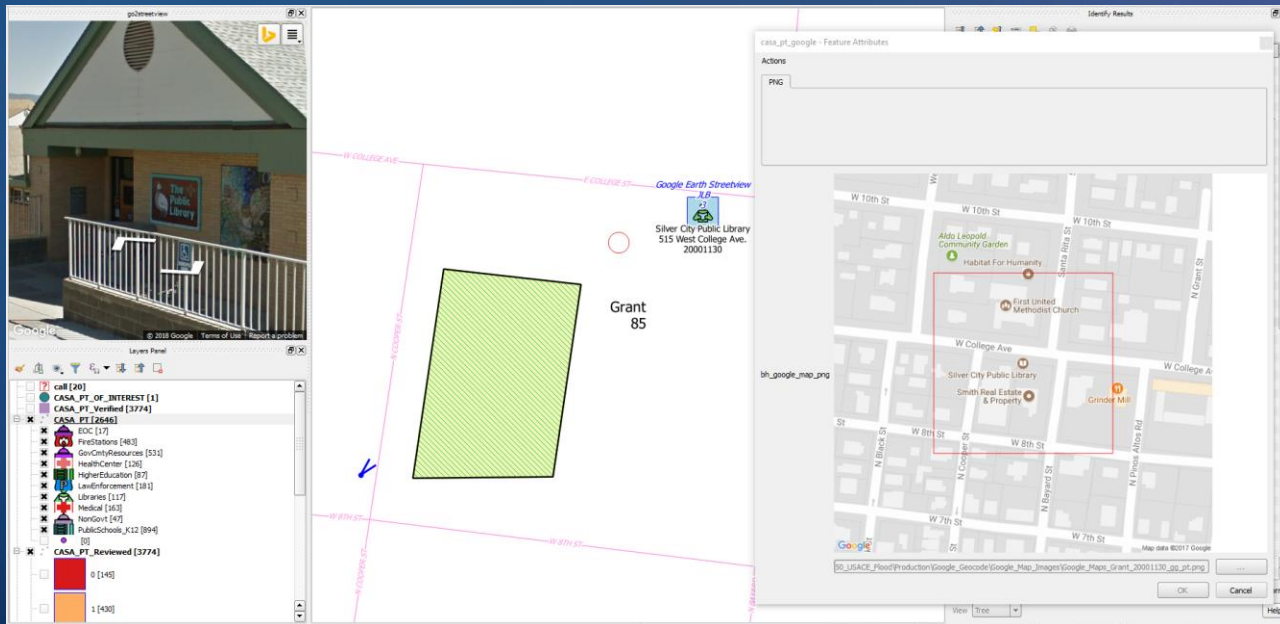
# 2 = Moderate

## ▲ Inst\_id 40001057 Atoka Volunteer Fire Department



# 3 = High

▲ Inst\_id = 20001130 Silver City Public Library



# Attributes

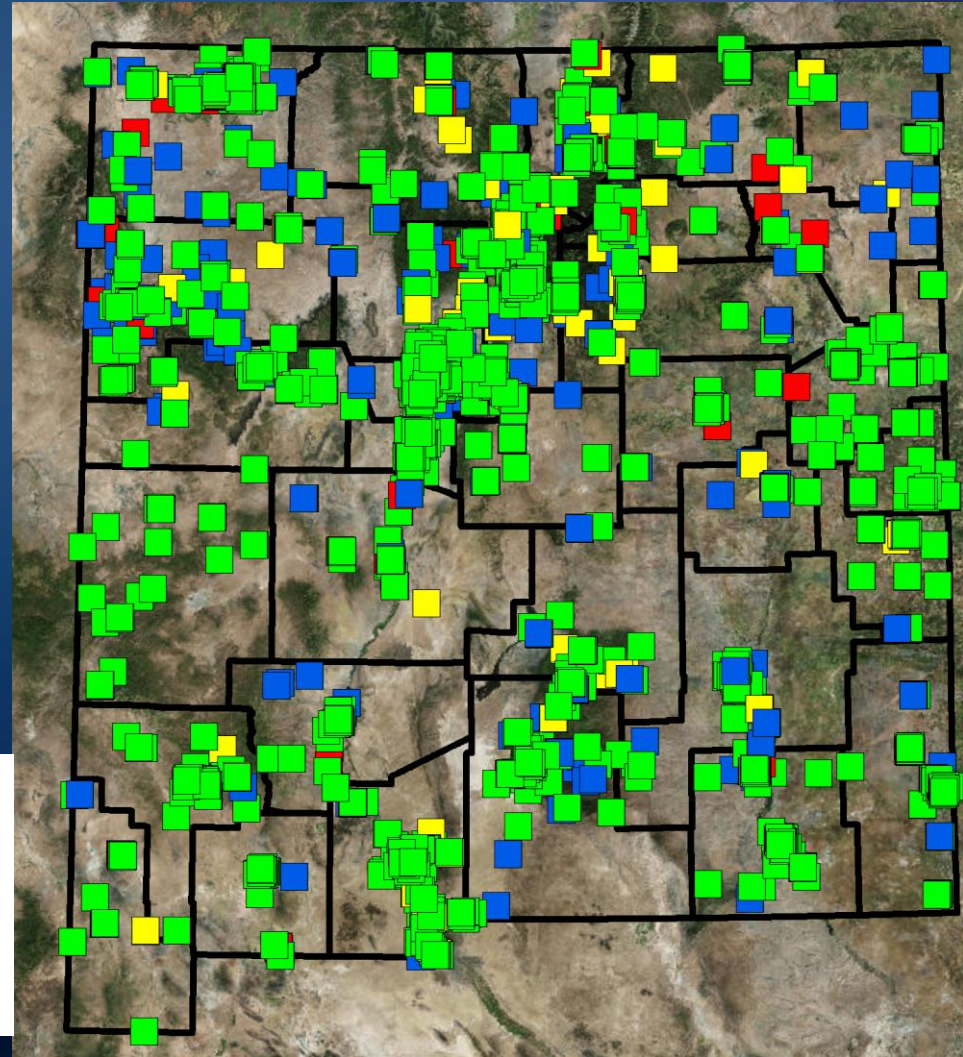
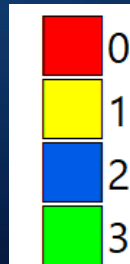
Attribute	Type	Description
BHI_LENGTH_M	Number	Displacement in meter from original to update CASA pt location
BHI_LENGTH_FLAG	Text	Value of displacement greater than 1600 meters. Needs verification and likely address update
BHI_REV_SRC	Text	Review source
BHI_REV_SRC_CLASS	Integer	Review source confidence rating
BHI_REV_SRC_REF	Text	Review source web reference
BHI_REVBY	Text	Initials of review
BHI_REVBY_DATE	Date	Date of review
BHI_REVBY_NOTE	Text	Comments of reviewer
BHI_VERBY	Text	Initial of second review
BHI_VERBY_DATE	Date	Date of second review
BHI_VERBY_NOTE	Text	Comments of second reviewer



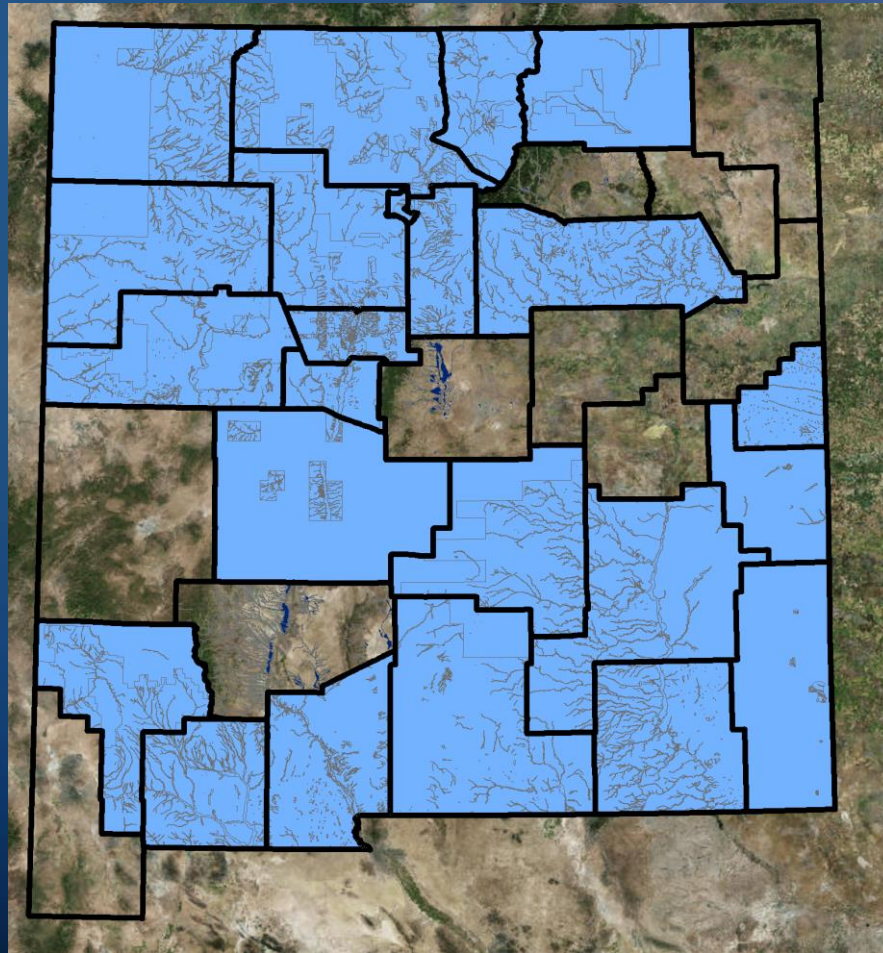


# Results

- ▲ 3774 total points reviewed
  - Unclassified: 128 (3.4%)
  - Low: 435 (11.5%)
  - Moderate: 554 (14.7%)
  - High: 2657 (70.4%)



# Floodplain Proximity

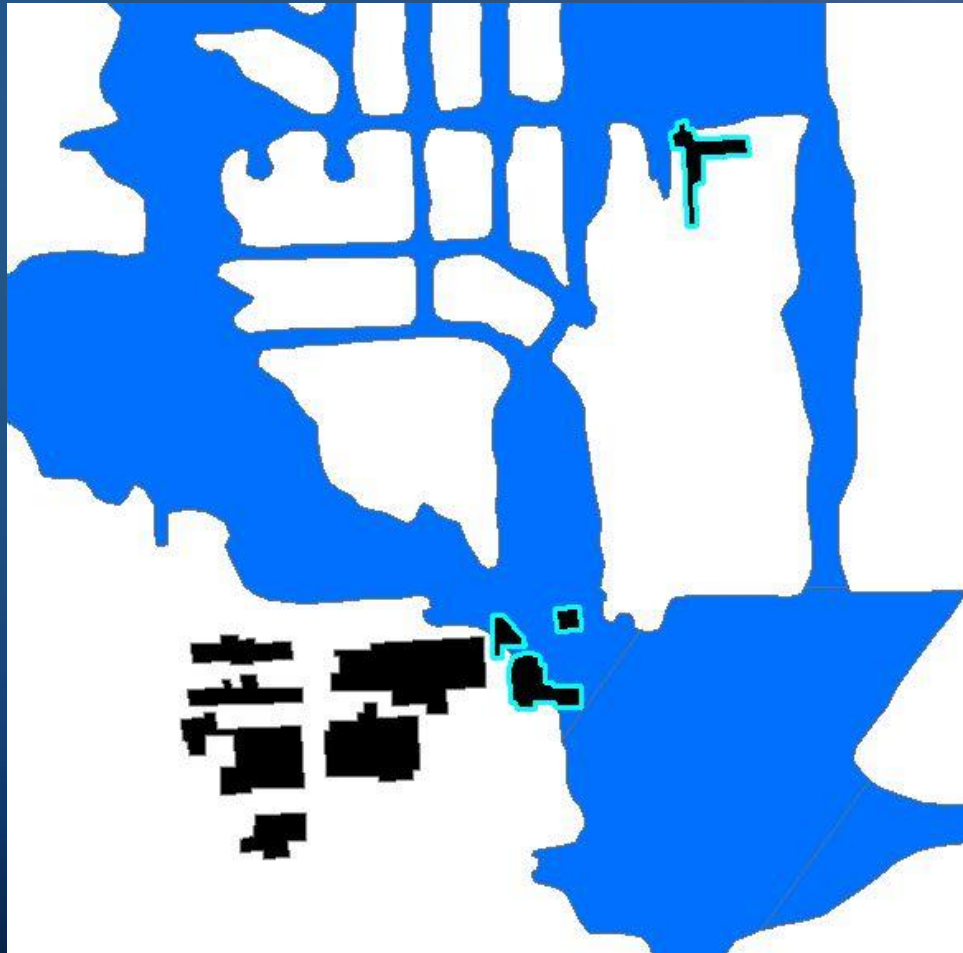




# Floodplain Proximity



# Floodplain Proximity



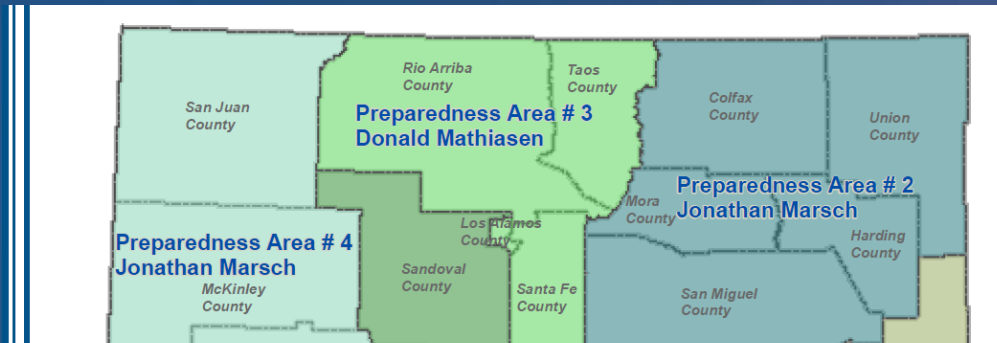


# Floodplain Proximity

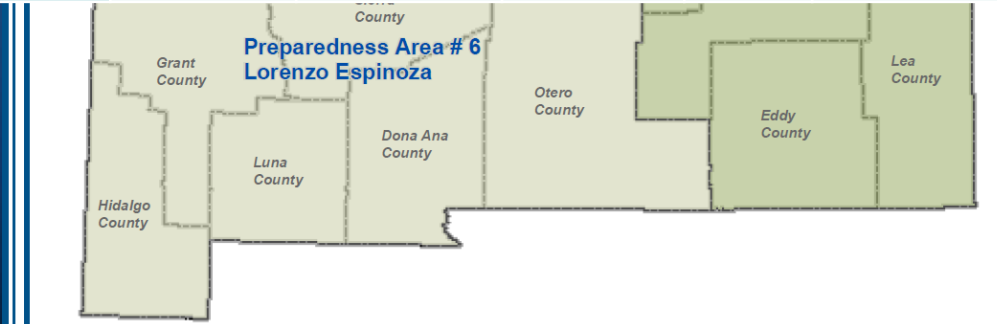
County	Education	Government	Healthcare	Library	Non-Government	Public Safety
Bernalillo	6	4	3	1	0	2
Catron	0	0	0	0	0	0
Chaves	1	1	1	0	0	2
Cibola	5	2	0	2	2	2
Colfax	1	0	0	0	0	0
Curry	3	3	0	0	1	3
De Baca	0	0	0	0	0	0
Dona Ana	7	9	3	1	0	5
Eddy	4	6	1	0	1	5
Grant	0	1	2	0	0	4
Guadalupe	0	0	0	0	0	0
Harding	0	0	0	0	0	0
Hidalgo	0	0	0	0	0	0
Lea	10	3	1	2	1	6
Lincoln	2	3	1	0	1	1
Los Alamos	0	0	0	0	0	0
Luna	0	0	1	0	0	0
McKinley	3	3	0	0	1	2
Mora	2	0	0	0	0	1
Otero	9	13	1	1	3	11
Quay	0	0	0	0	0	0
Rio Arriba	7	2	0	0	0	1
Roosevelt	3	3	0	2	2	3
San Juan	2	0	2	0	0	2
San Miguel	4	1	1	0	0	3
Sandoval	4	2	0	1	1	5
Santa Fe	1	1	0	0	0	0
Sierra	2	0	0	0	0	7
Socorro	0	2	0	0	0	1
Taos	3	1	1	0	0	1
Torrance	11	4	0	1	0	6
Union	0	0	0	0	0	0
Valencia	21	8	0	5	0	13
SUM	111	72	18	16	13	86



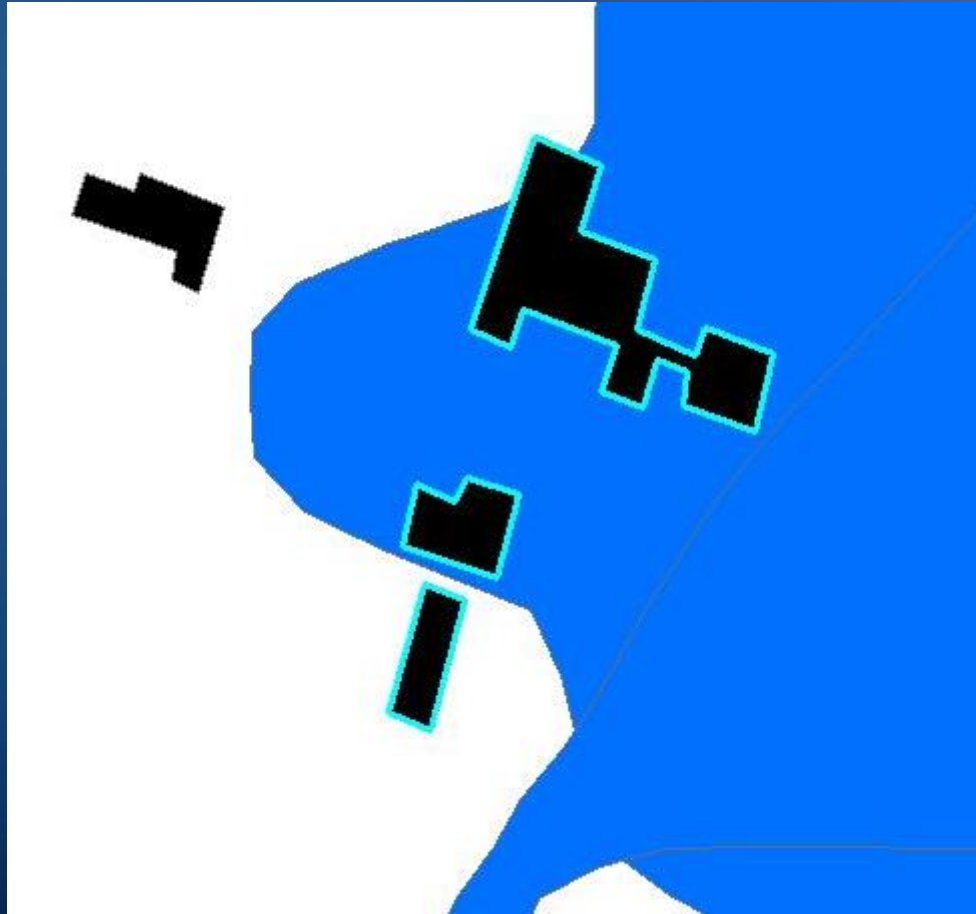
# Floodplain Proximity



Preparedness Zone	Education	Government	Healthcare	Library	Non-Government	Public Safety
1	23	19	4	4	6	20
2	7	1	1	0	0	4
3	11	4	1	0	0	2
4	10	5	2	2	3	6
5	42	20	3	8	1	27
6	18	23	7	2	3	27
<b>SUM</b>	<b>111</b>	<b>72</b>	<b>18</b>	<b>16</b>	<b>13</b>	<b>86</b>



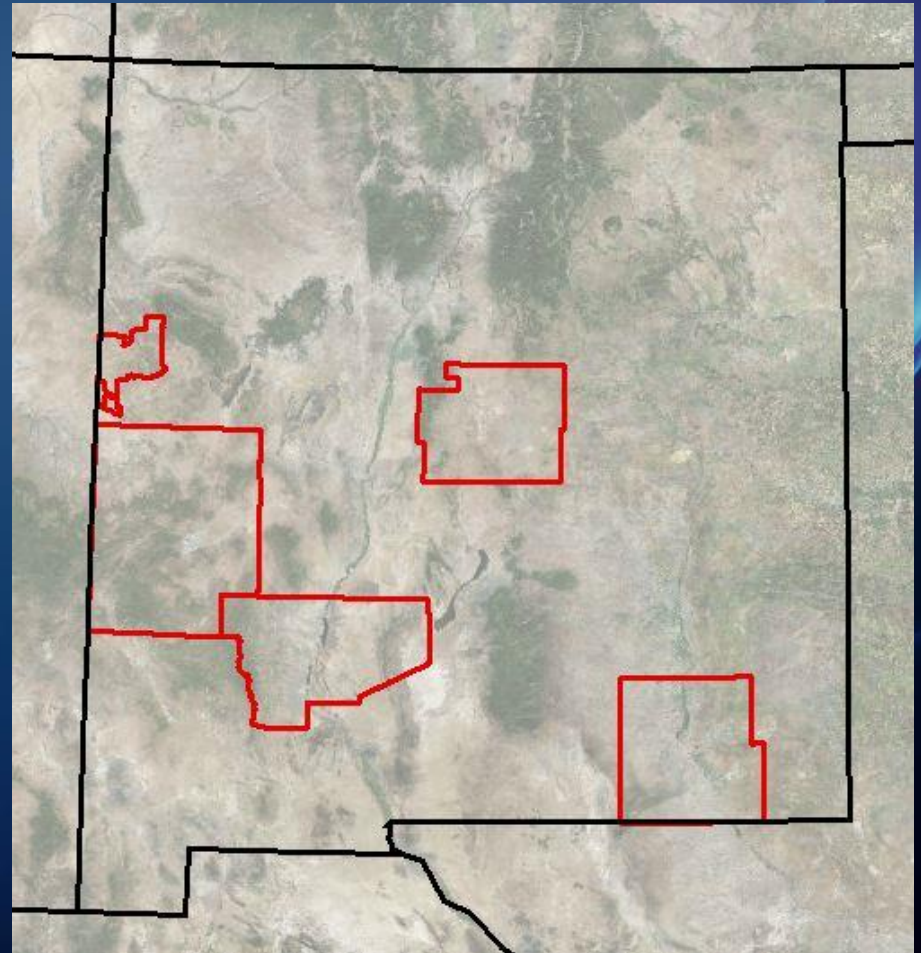
# Floodplain Proximity





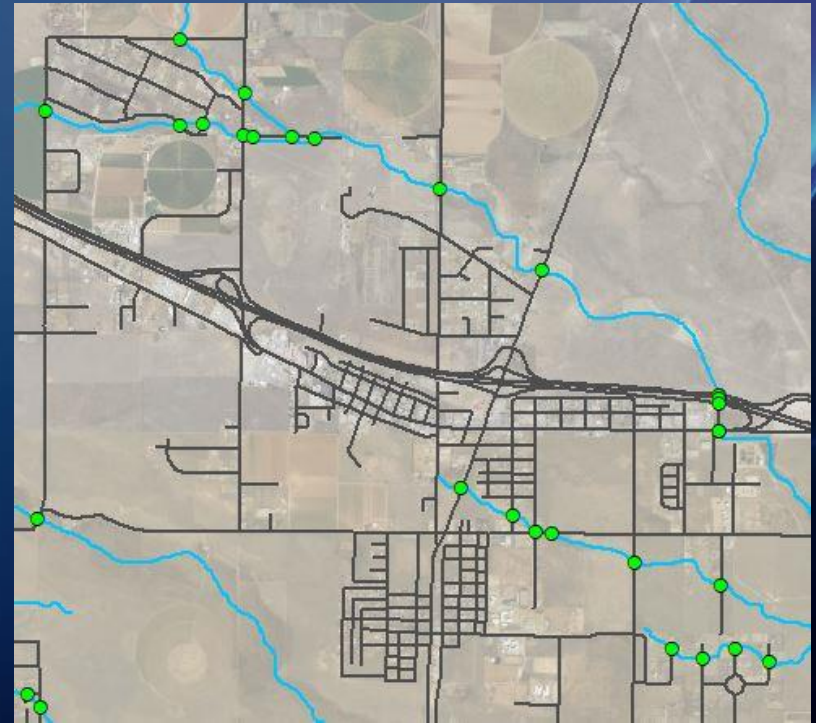
# Low Water Crossing Analysis

- ▲ Zuni Reservation
- ▲ Eddy County
- ▲ Torrance County
- ▲ Catron County
- ▲ Sierra County



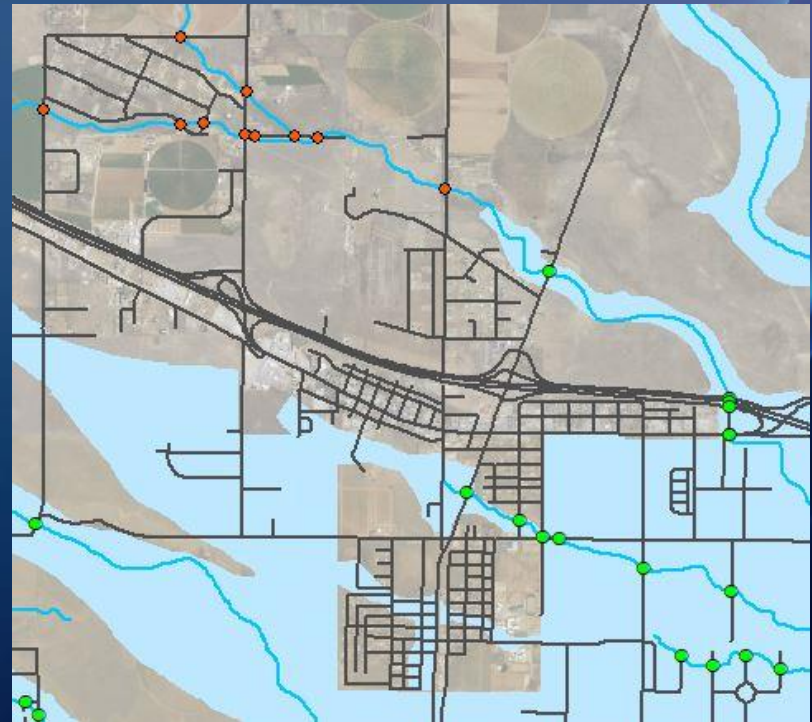
# Low Water Crossing Analysis

- ▲ E911 Transportation dataset
- ▲ NHD flow line dataset
- ▲ Imagery
- ▲ Google Street View
- ▲ Google Maps
- ▲ Google Earth



# Low Water Crossing Analysis

- ▲ Flood Hazard Layer
- ▲ Review for drainage infrastructure





# Structure Review

## ▲ World Imagery



road_class	Flood_Haz	Drain_Str
LOCAL	Yes	Yes
LOCAL	Yes	Other
LOCAL	Yes	No
LOCAL	Yes	No
LOCAL	Yes	No



# Structure Review

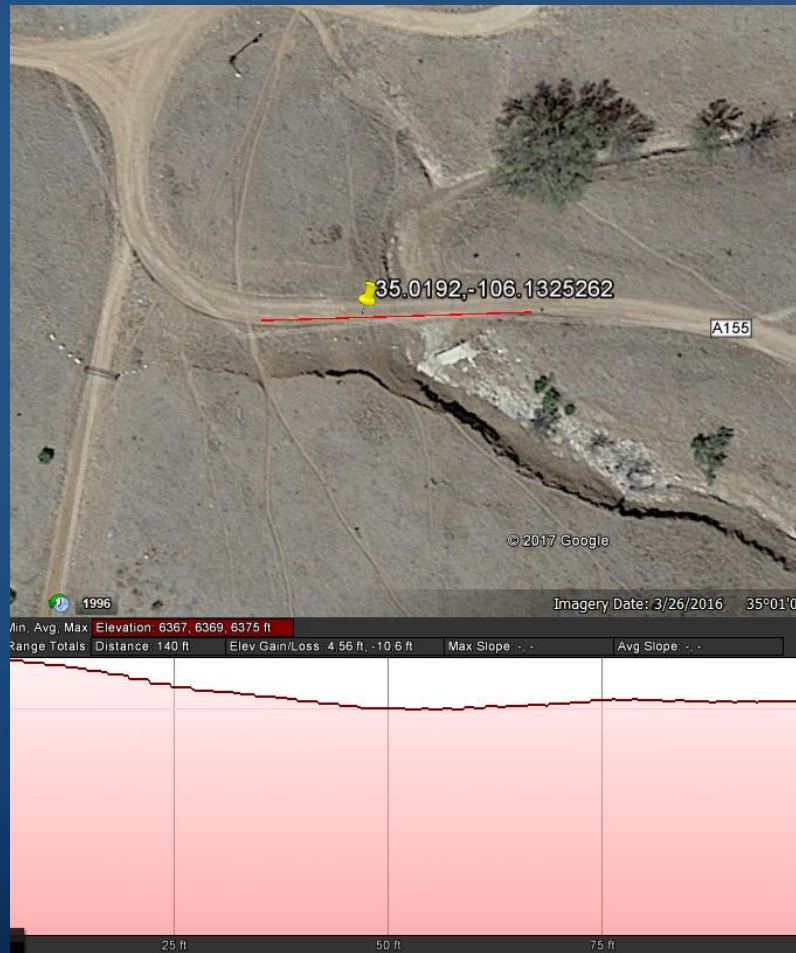
## ▲ Google Street View



Google Street View Python Add-in for  
ArcMap (February, 2015, [ianbroad.com](http://ianbroad.com))



# Structure Review





# Structure Review



# LWC Results

## ▲ Potential LWC

Area	Number of Crossings
Zuni Reservation	117
Eddy County	864
Torrance County	960
Catron County	3040
Sierra County	1494

## ▲ In FHL

Area	Number of Crossings
Zuni Reservation	31
Eddy County	334
Torrance County	184
Catron County	2
Sierra County	696

## ▲ Without a structure

Area	Number of Crossings*
Zuni Reservation	10
Eddy County	199
Torrance County	118
Catron County	1
Sierra County	522



# Conclusion

- ▲ Limited flood hazard
- ▲ NM is not 100% mapped
- ▲ Starting point Databases for Flood risk preparedness in NM

