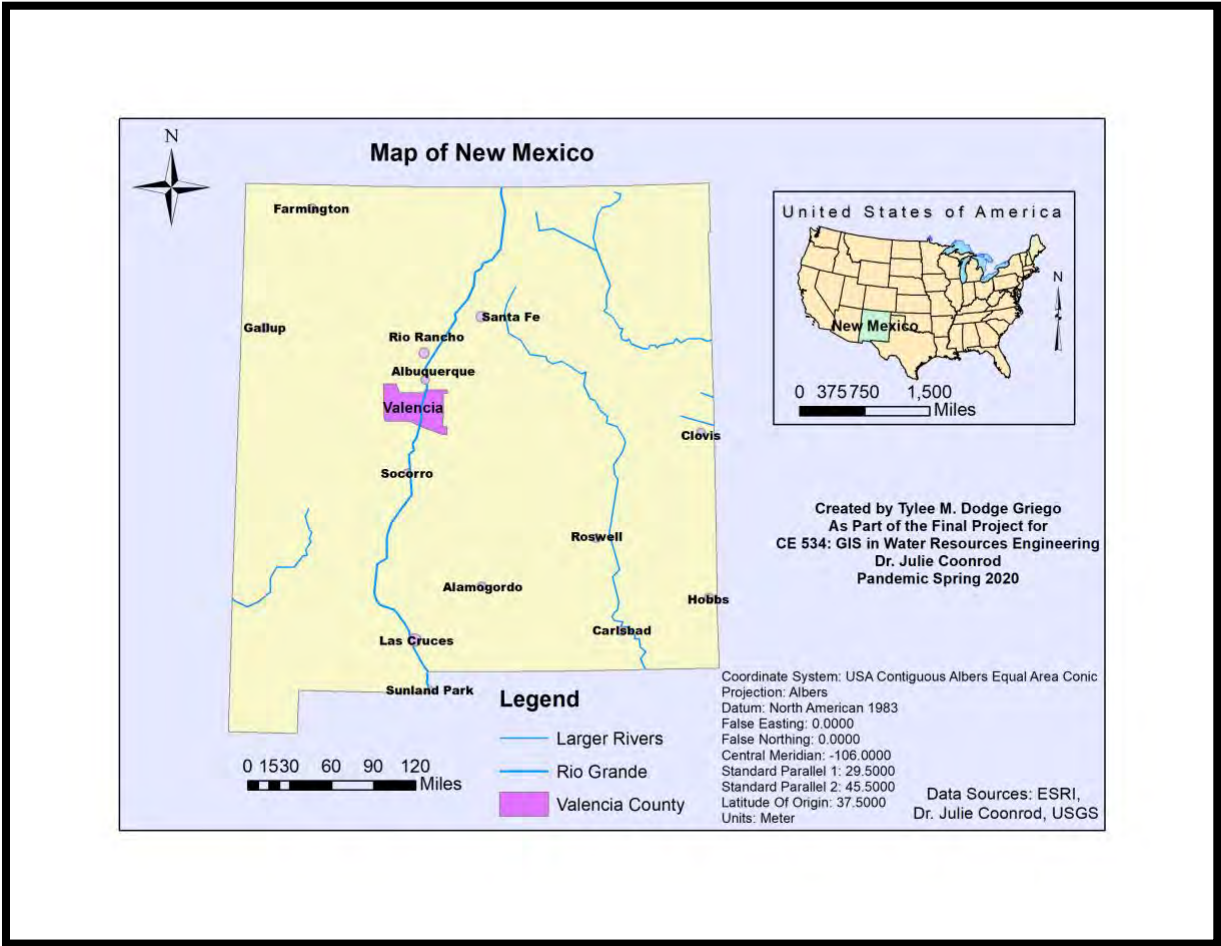
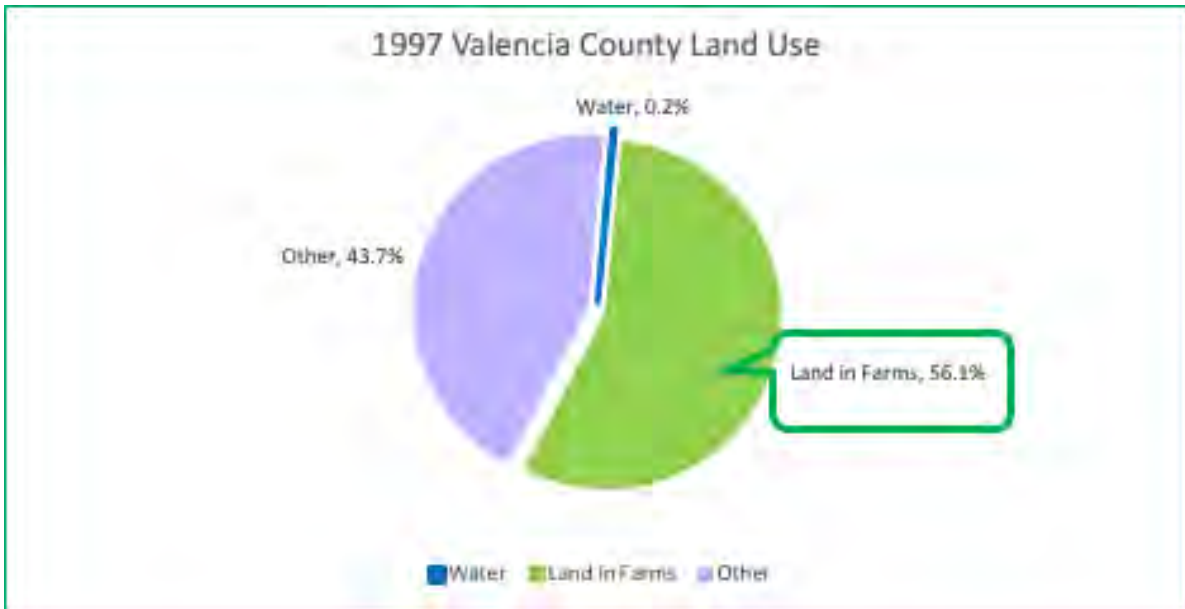


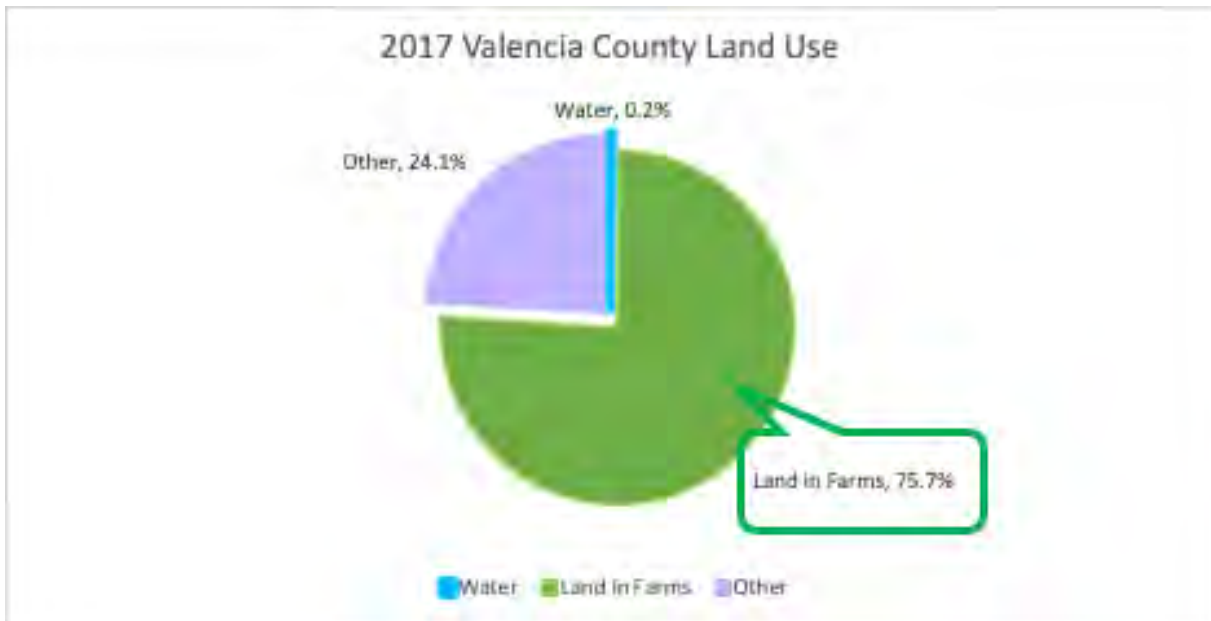
Mapping Valencia County: A Comparison of CropScape Data vs. Census of Agriculture Data



Vicinity Map of Valencia County, New Mexico



Valencia County Land Use Map for 1997 (based on Census of Agriculture Statistics, 1997; Griego et al., 2020)



Valencia County Land Use Map for 2017 (based on Census of Agriculture Statistics, 2017; Griego et al., 2020)



Bosque Farms, 1935, the leveling of a field in preparation for irrigation (Lange, 1935)

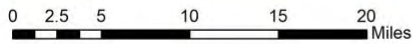


Valencia County, 2020, a unique way to pump irrigation water to the fields (Fleck, 2020)

Valencia County Land Use Map



Created by Tylee, M. Dodge Griego
 CE 547: GIS in Water Resources Engineering
 Final Project
 Dr. Julie Coonrod
 Pandemic Spring 2020



Coordinate System: WGS 1984 UTM Zone 13N
 Projection: Transverse Mercator
 Datum: WGS 1984
 False Easting: 500,000.0000
 False Northing: 0.0000
 Central Meridian: -105.0000
 Scale Factor: 0.9996
 Latitude Of Origin: 0.0000
 Units: Meter

Source Credits: Census of
 Agriculture, Dr. J. Coonrod,
 ESRI, RGIS, & USGS

Legend

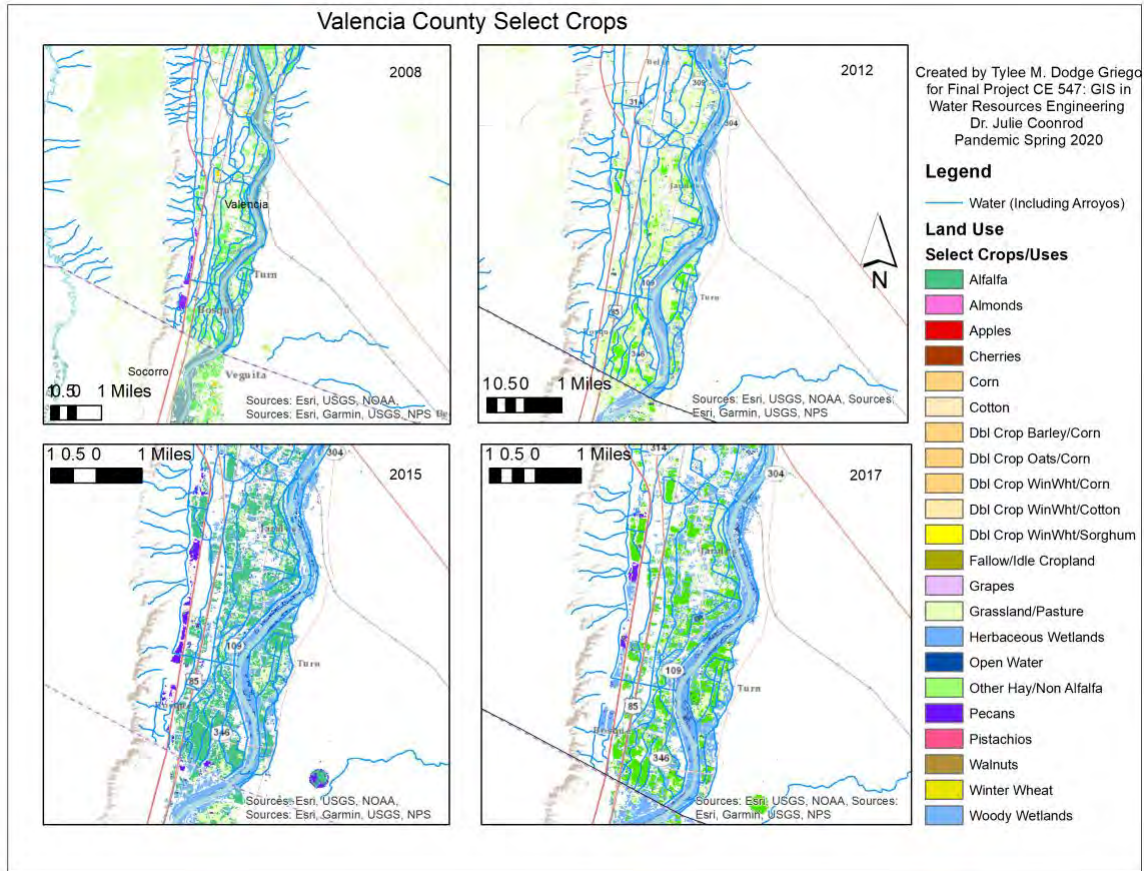
2008 Land Use

Type of Use

- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---------|--------|--------|--------|---------|--------|-------------|------|--------|----------------------|--------------------|------------------------|--------------------------|---------------------------|------------------|--------------------------|-------------------------|-------------------------|----------------------|-----------|-------------|------------------|----------------------|-------------------|---------------------|---------|--------|-----------------------|--------------|------|--------|------------|-------------|-----------------------|--------------------|------------------|---------|------|--------|---------|------------|----------|----------|-----|-----------|---------|--------------|-----------|------------|-----------|-------------|--------------|----------------|
| Alfalfa | Almonds | Apples | Barley | Barren | Cabbage | Canola | Cantaloupes | Corn | Cotton | Dbl Crop Barley/Corn | Dbl Crop Oats/Corn | Dbl Crop Win/Whit/Corn | Dbl Crop Win/Whit/Cotton | Dbl Crop Win/Whit/Sorghum | Deciduous Forest | Developed/High Intensity | Developed/Low Intensity | Developed/Med Intensity | Developed/Open Space | Dry Beans | Durum Wheat | Evergreen Forest | Fallow/Idle Cropland | Grassland/Pasture | Herbaceous Wetlands | Lettuce | Millet | Misc Veggies & Fruits | Mixed Forest | Oats | Onions | Open Water | Other Crops | Other Hay/Non Alfalfa | Other Small Grains | Other Tree Crops | Peanuts | Peas | Pecans | Peppers | Pistachios | Potatoes | Pumpkins | Rye | Shrubland | Sorghum | Spring Wheat | Sunflower | Sweet Corn | Triticale | Watermelons | Winter Wheat | Woody Wetlands |
|---------|---------|--------|--------|--------|---------|--------|-------------|------|--------|----------------------|--------------------|------------------------|--------------------------|---------------------------|------------------|--------------------------|-------------------------|-------------------------|----------------------|-----------|-------------|------------------|----------------------|-------------------|---------------------|---------|--------|-----------------------|--------------|------|--------|------------|-------------|-----------------------|--------------------|------------------|---------|------|--------|---------|------------|----------|----------|-----|-----------|---------|--------------|-----------|------------|-----------|-------------|--------------|----------------|

Valencia County Land Use in 2008

Valencia County Select Crops



Valencia County Select Crops: 2008, 2012, 2015, 2017 (Data sources: CropScope, and as listed on map document)

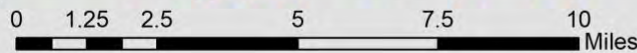
Valencia County 2008 Land Use



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Water Resources Engineering
Dr. Julie Coonrod
Pandemic Spring 2020

Legend

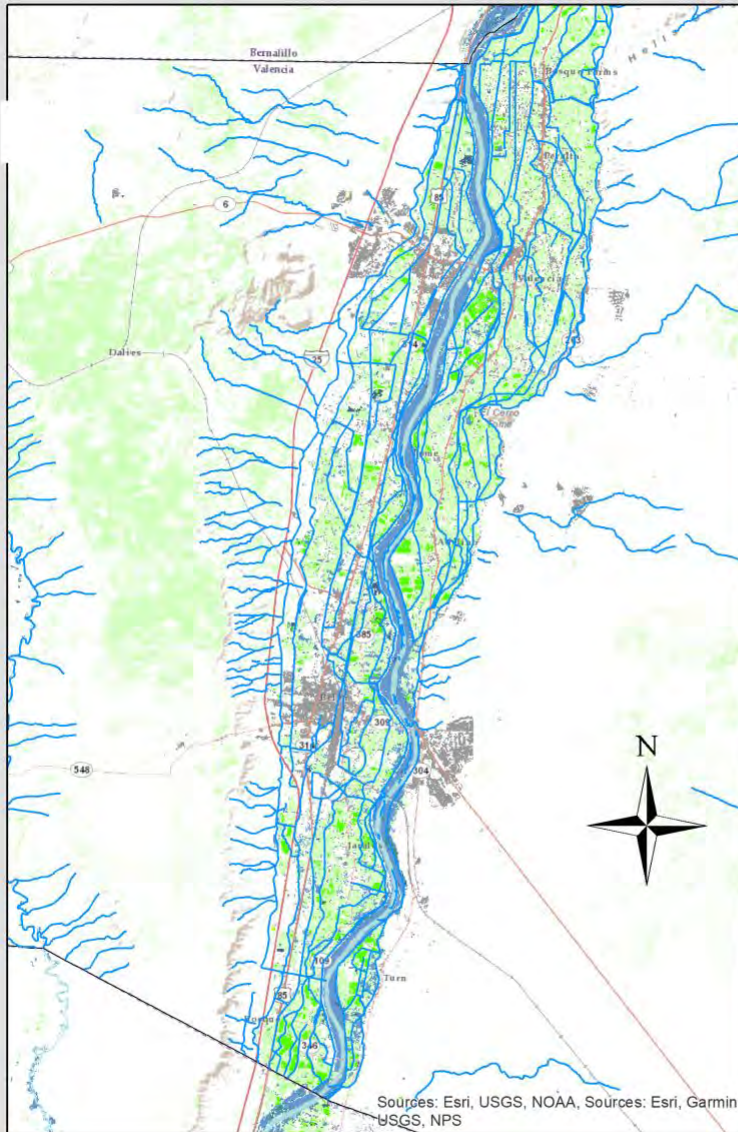
- Water
- 2008 Land Use**
- Select Crops/Uses**
- Alfalfa
- Almonds
- Apples
- Other Agriculture
- Cherries
- Grassland/Pasture/Clover
- Developed
- Forest
- Fallow/Idle Cropland
- Wetlands
- Open Water
- Other Hay/Non Alfalfa
- Other Tree Crops
- Pecans
- Pistachios
- Walnuts



Coordinate System: WGS 1984 UTM Zone 13N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -105.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

Valencia County 2008 Land Use Map
(note pecans shown in purple)

Valencia County 2012 Land Use



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Legend

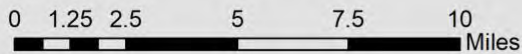
Water

2012 Land Use

Select Crops/Uses

- Alfalfa
- Almonds
- Apples
- Other Agriculture
- Cherries
- Grassland/Pasture/Clover
- Forest
- Developed
- Fallow/Idle Cropland
- Grapes
- Wetlands
- Open Water
- Other Hay/Non Alfalfa
- Other Tree Crops
- Pecans
- Pistachios
- Walnuts

Sources: Esri, USGS, NOAA, Sources: Esri, Garmin, USGS, NPS

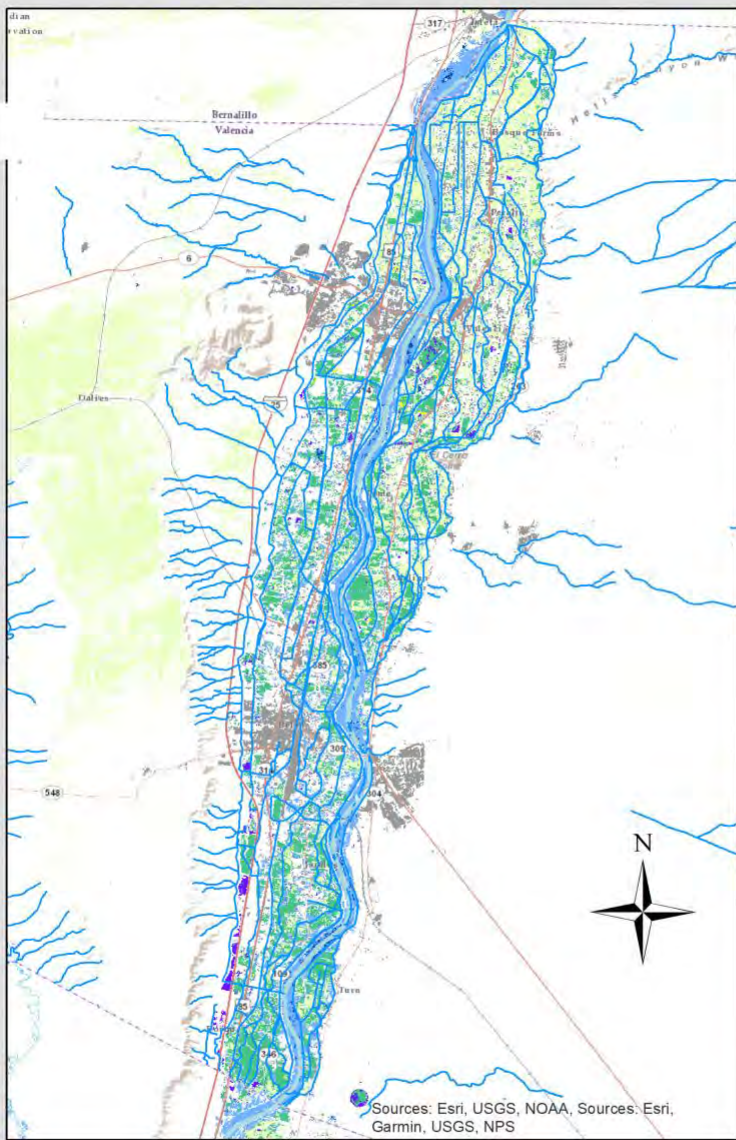


Coordinate System: WGS 1984 UTM Zone 13N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -105.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

Valencia County Land Use
(note pecans shown in purple – are missing)

Valencia County 2015 Land Use

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Water Resources Engineering
Dr. Julie Coonrod
Pandemic Spring 2020



Legend

— Water (Including Arroyos)

2015 Land Use

Select Crops/Uses

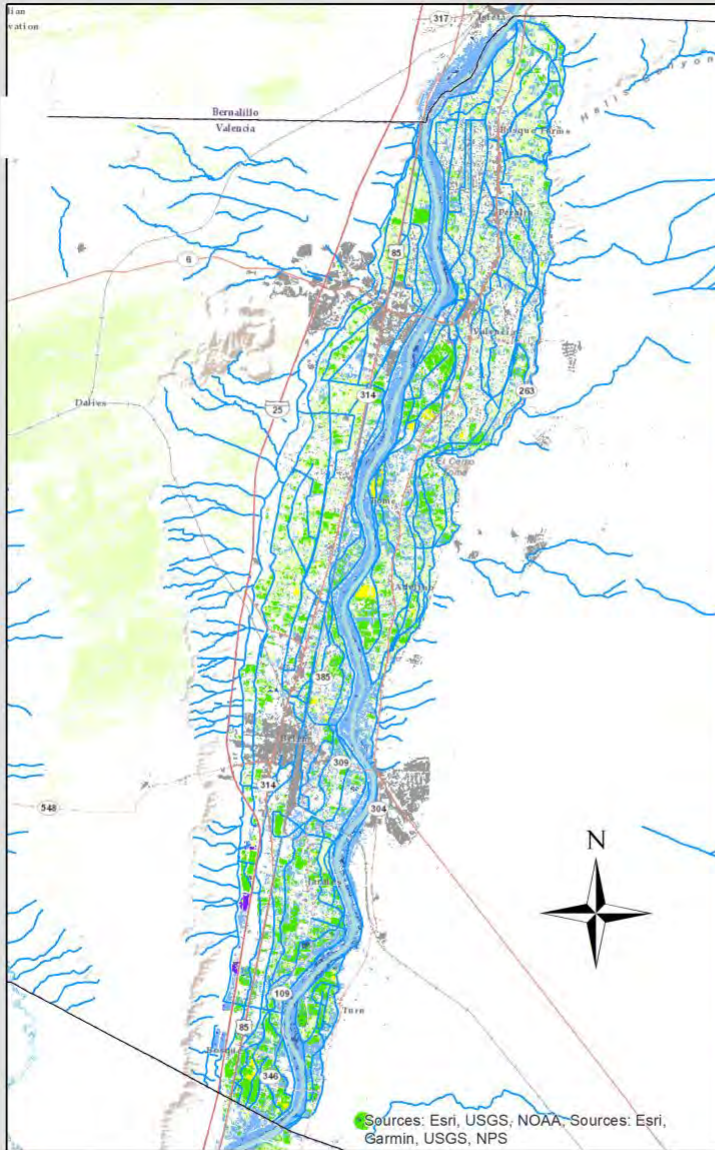
- Alfalfa
- Almonds
- Apples
- Other Agriculture
- Cherries
- Grassland/Pasture/Clover
- Forest
- Developed
- Fallow/Idle Cropland
- Grapes
- Wetlands
- Other Tree Crops
- Open Water
- Other Hay/Non Alfalfa
- Pecans
- Pistachios
- Walnuts

0 1.25 2.5 5 7.5 10 Miles

Coordinate System: WGS 1984 UTM Zone 13N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -105.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

Valencia County 2015 Land Use Map
(note pecans shown in purple – pecans reappear)

Valencia County 2017 Land Use



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Water Resources Engineering
Dr. Julie Coonrod
Pandemic Spring 2020

Legend

— Water (including Arroyos)

2017 Land Use

Select Crops/Uses

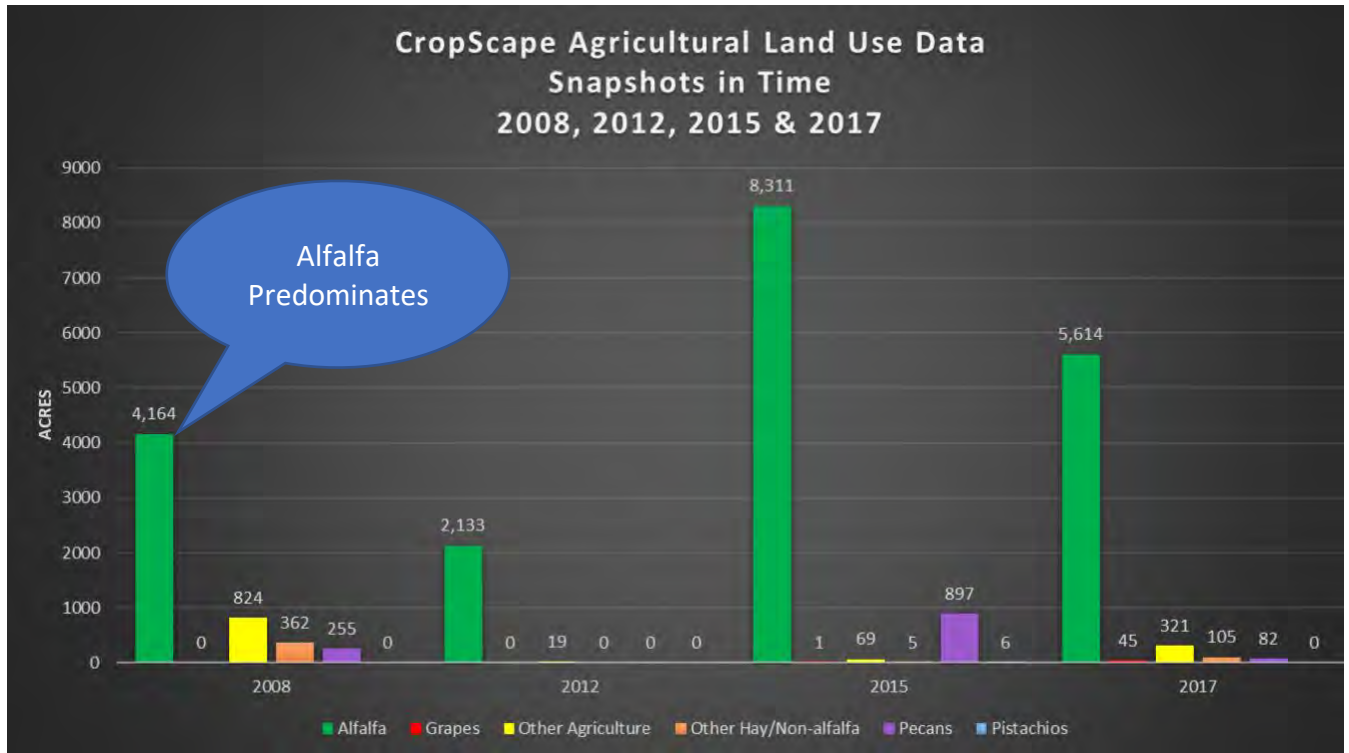
- Alfalfa
- Almonds
- Apples
- Other Tree Crops
- Other Agriculture
- Cherries
- Grassland/Pasture/Clover
- Forest
- Developed
- Fallow/Idle Cropland
- Grapes
- Wetlands
- Open Water
- Other Hay/Non Alfalfa
- Pecans
- Pistachios
- Walnuts

0 1.25 2.5 5 7.5 10
Miles

Coordinate System: WGS 1984 UTM Zone 13N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -105.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

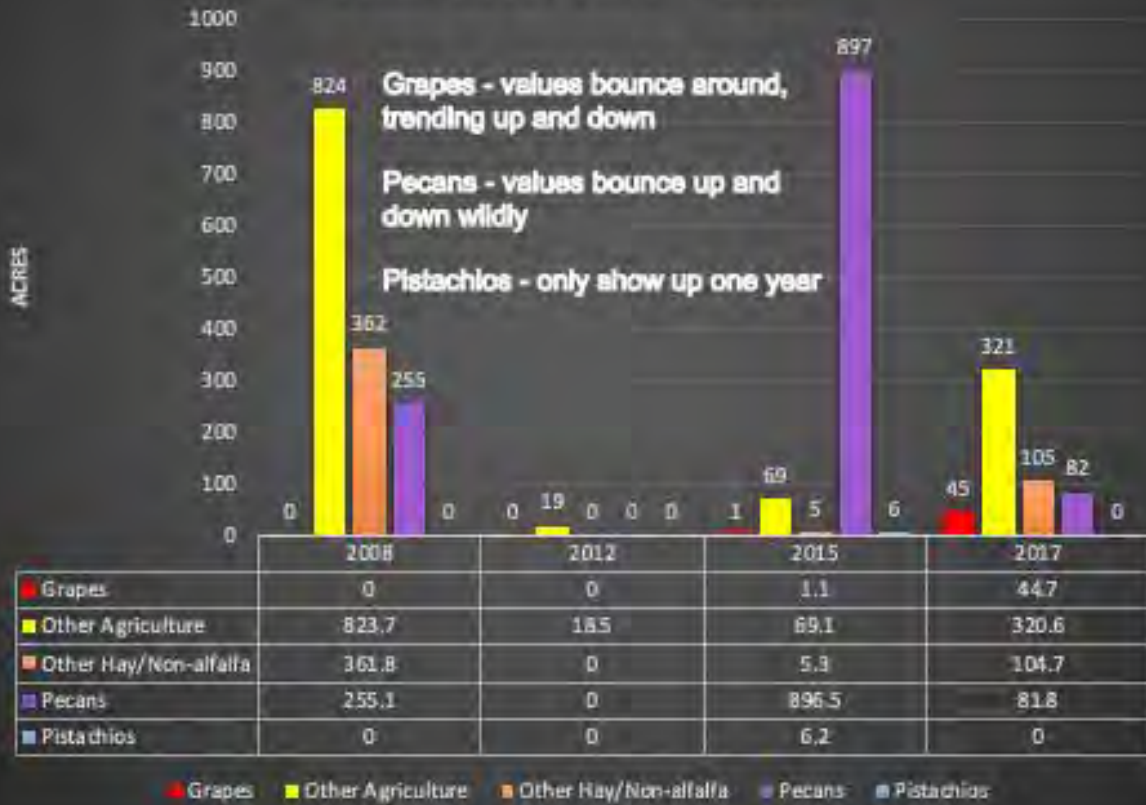
Valencia County 2017 Land Use Map
(note pecans shown in purple)
– some areas of pecan trees are visible again,

while others appear to have become wetlands,
according to CropScape)



**CropScape Agricultural Land Use Data:
Snapshots in Time: 2008, 2012, 2015, 2017
(graph constructed with data from
CropScape, 2008, 2012, 2015, 2017)**

CropScape Agricultural Land Use Data Excluding Alfalfa Snapshots in Time 2008, 2012, 2015 & 2017



CropScape Agricultural Land Use Data (Excluding Alfalfa):

Snapshots in Time: 2008, 2012, 2015, 2017

**(graph constructed with data from
CropScape, 2008, 2012, 2015, 2017)**

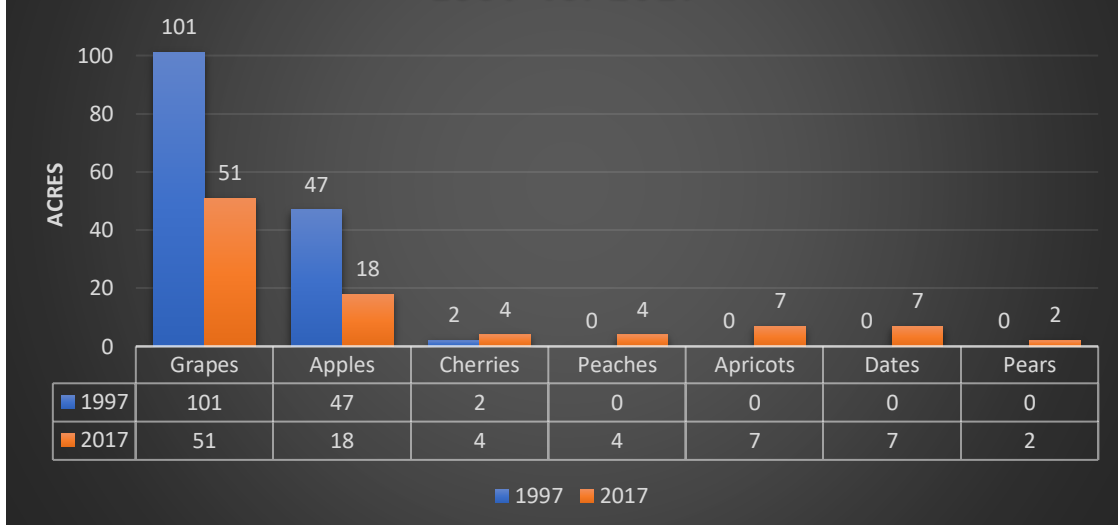
Number of Farms with Orchards or Nut-Producing Trees 1997-2017



Number of Farms with Orchards or Nut-Bearing Trees, 1997-2017

(Data source: *Census of Agriculture*,
1997, 2002, 2007, 2012, 2017)

Acreage in Non-Citrus Fruits (Excluding Berries) 1997 vs. 2017



Acreage in Non-Citrus Fruits (Excluding Berries), 1997 vs. 2017

(Data source: Census of Agriculture, 1997, 2017)

Land Use (acres)	1997 Census of Ag	2007 Census of Ag	Crop-Scape	2012 Census of Ag	Crop-Scape	Crop-Scape	Census of Ag	Crop-Scape
Alfalfa	8306	12201	4164.3	16195	2133.2	8311.3	9809	5613.5
Other Hay/Non-alfalfa	1689	2900	361.8	1000	-	5.3	2461	104.7
Apples	47	26	-	39	-	-	18	-
Cherries	2	1 + #D	-	3 + #D	-	-	4	-
Grapes	101	50	-	20	-	1.1	51	44.7
Orchards, All	156	93	-	580	-	-	559	-
Pecans	0	<9	255.1	472	-	896.5	<462	81.8
Pistachios	0	#D	-	#D, 1 farm	-	6.2	#D, 6 farms	-
Other Tree Crops	<6	≥13 + #D*3	-	≥43 + #D	-	-	≥20 + #D*2 + z	-

Census of Agriculture vs. CropScape:

Comparison of Acreage Quantified for Select Crops

(Data source: Census of Agriculture, 1997-2017;
CropScape, 2008-2017)

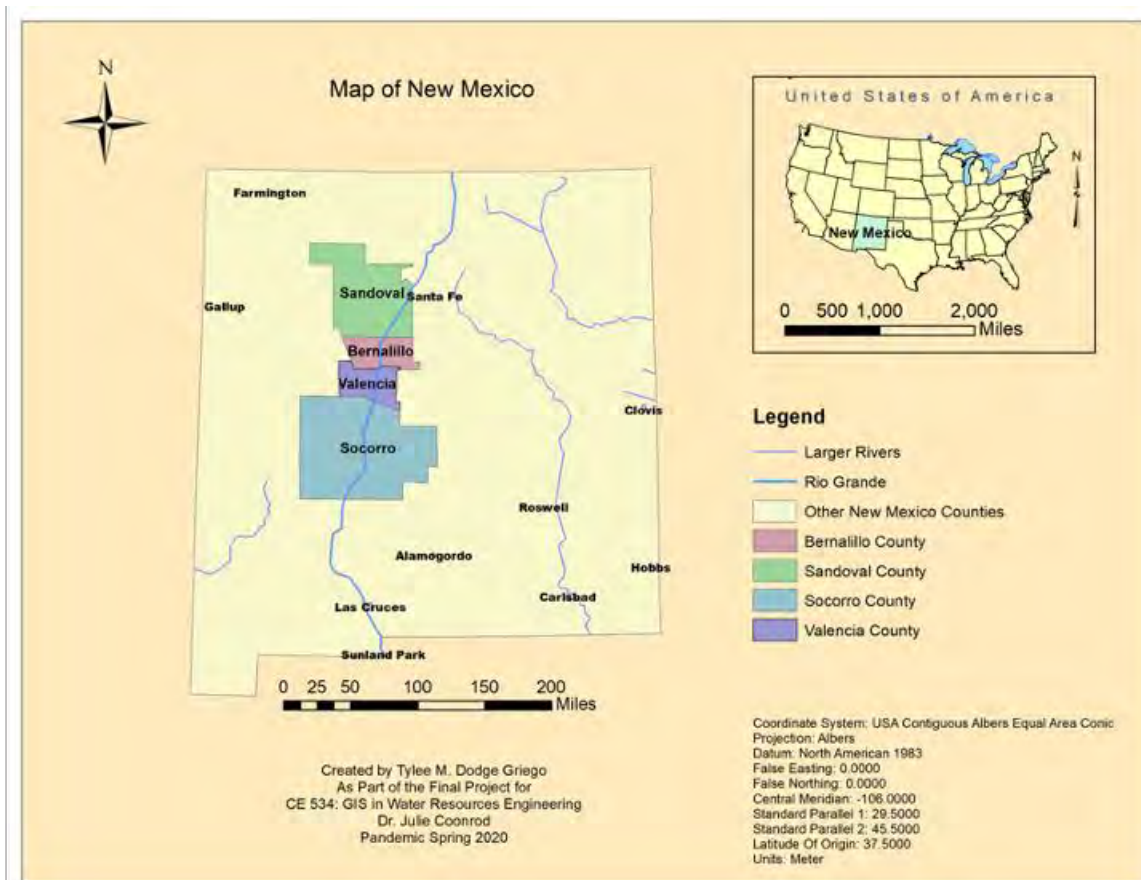
Conclusions

- CropScape does fairly well at correctly identifying crops occupying a larger amount of acreage in other areas.
- In Valencia County, with smaller acreage farms, CropScape is not accurately capturing the crops grown.
- CropScape is not accurately identifying alfalfa or other hay/non-alfalfa acreages.
- Additionally, during certain years, CropScape identifies peppers as growing in the center of the Rio Grande.
- CropScape is completely failing to capture the smaller acreage crops accurately.
 - Apple orchards and cherry orchards are completely absent from CropScape, while, as seen in Table 1, and Figure 19, apple orchards have been decreasing, while cherry orchards have increased slightly in acreage.

- Peaches, Apricots, Pears, and Dates are completely absent from the CropScape data, while in the Census of Agriculture data, each of these categories has been increasing in acreage.
- The results for the grapes are quite off when you compare the results from Figure 19 and Table 1 along with the maps created. CropScape has very different values for grapes than the Census of Agriculture's data, and it is not until 2017 that CropScape even gets close to the Census of Agriculture's data.
- Comparison was made with the maps produced to identify patterns in pecan orchards. The Census of Agriculture data shows us the amount of acreage in pecan orchards is gradually increasing. However, CropScape captures the pecan orchards very poorly, making it appear that pecan orchards appear and disappear from year to year, even becoming wetlands during 2017. Visual inspection of that area of Valencia County shows that the area is not a wetland, but rather a tree orchard.
- At this time, CropScape is an unreliable indicator of agricultural land uses occupying smaller amounts of acreage.

- CropScape may not be effective for use in Valencia County since most farms represent small amounts of acreage as compared to other agricultural areas.

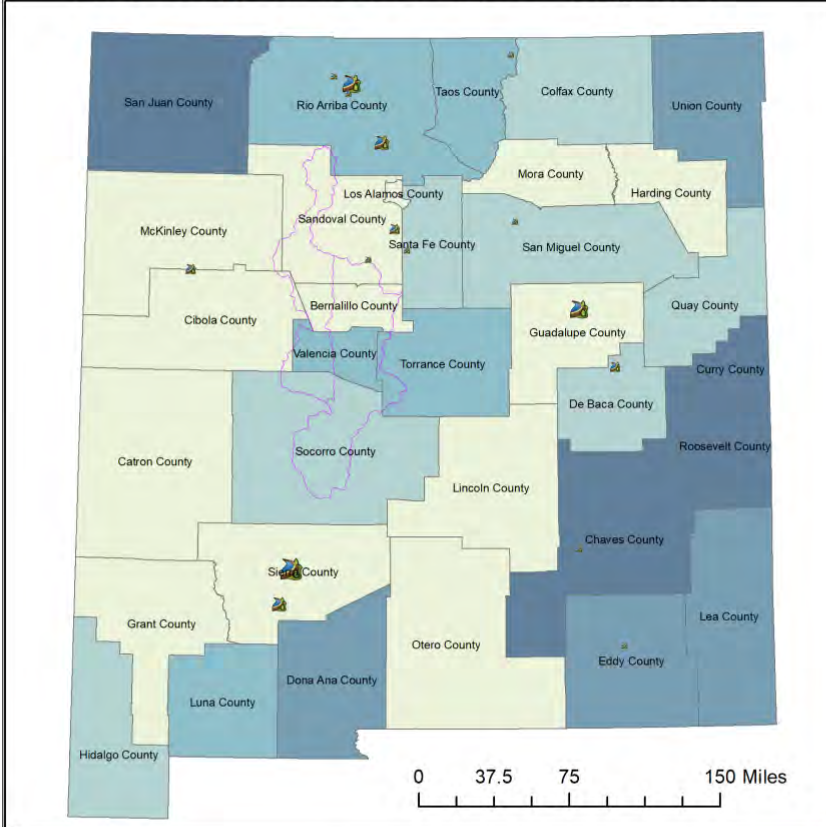
Future Work



Middle Rio Grande Vicinity Map

Additional Maps & Figures

New Mexico: 2010 Surface Irrigation



0 37.5 75 150 Miles

0 25 50 100 Miles

Legend

Reservoirs

Average Flow

- 0 - 30000
- 30001 - 80000
- 80001 - 200000
- 200001 - 500000
- 500001 - 3000000

Valencia County HUC Areas

2010 Water Use

Total Irrigation (in K acres)

- 0.000 - 10.00
- 10.01 - 20.00
- 20.01 - 35.00
- 35.01 - 70.00
- 70.01 - 110.0

Coordinate System: NAD 1983 2011 UTM Zone 13N

Projection: Transverse Mercator

Datum: NAD 1983 2011

False Easting: 500,000.0000

False Northing: 0.0000

Central Meridian: -105.0000

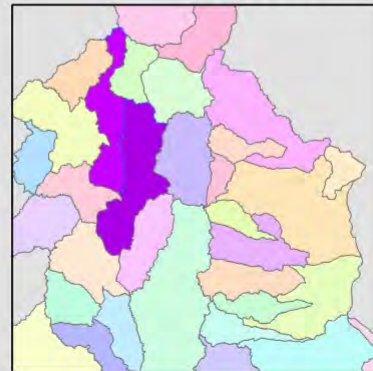
Scale Factor: 0.9996

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Units: Meter

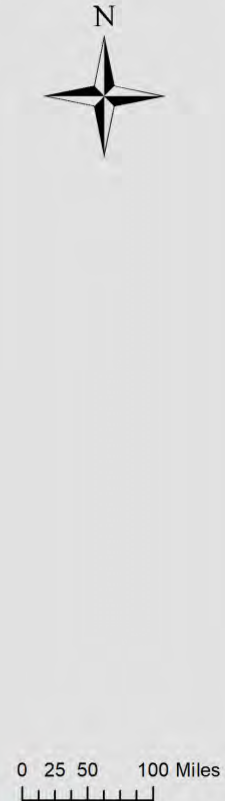
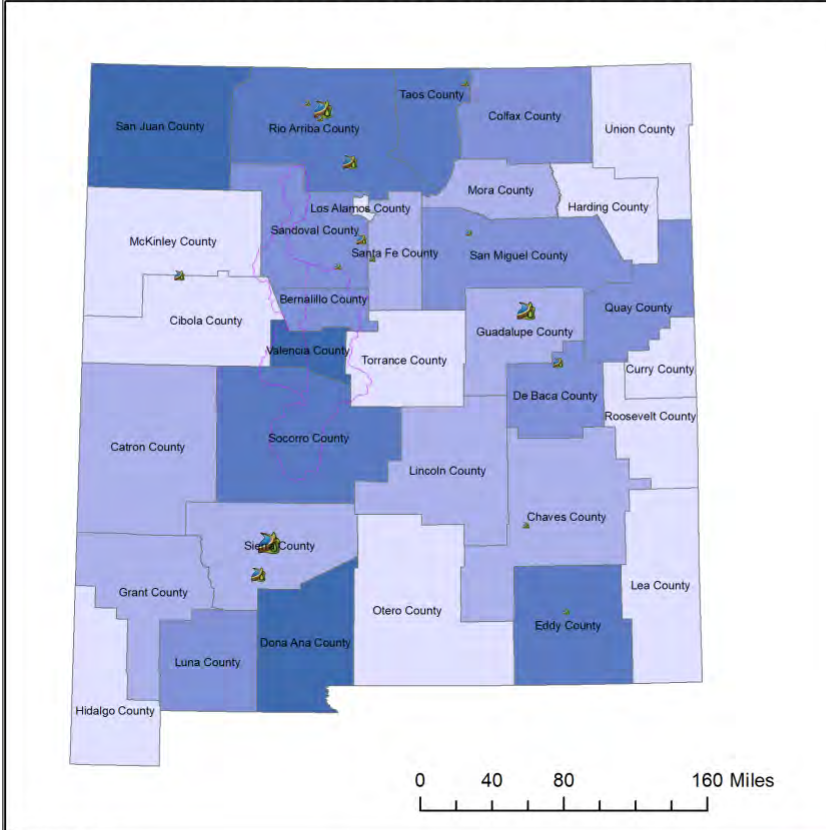
Created by Tylee M. Dodge Griego
for CE 547: GIS in Water Resources
Engineering for Final Project
Pandemic Spring 2020

Service Layer Credits: J. Coonrod,
ESRI, RGIS, USDA USGS



Rio Grande HUC
featuring Valencia
County HUC

New Mexico: 2010 Surface Water Withdrawals for Irrigation



Legend

Reservoirs

Average Flow

- 0 - 30000
- ▲ 30001 - 80000
- 80001 - 200000
- 200001 - 500000
- 500001 - 3000000

Valencia County HUC Areas

2010 Water Use

Mgal/day

- 0-10
- 10-30
- 30-70
- 70-140
- 140-300

Coordinate System: NAD 1983 2011 UTM Zone 13N

Projection: Transverse Mercator

Datum: NAD 1983 2011

False Easting: 500,000.0000

False Northing: 0.0000

Central Meridian: -105.0000

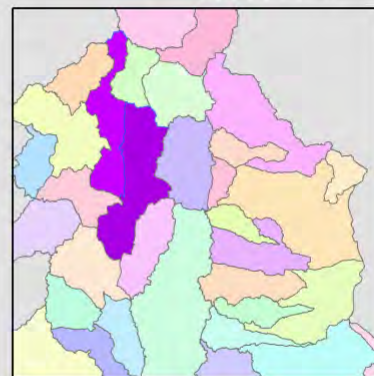
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Units: Meter

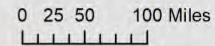
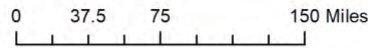
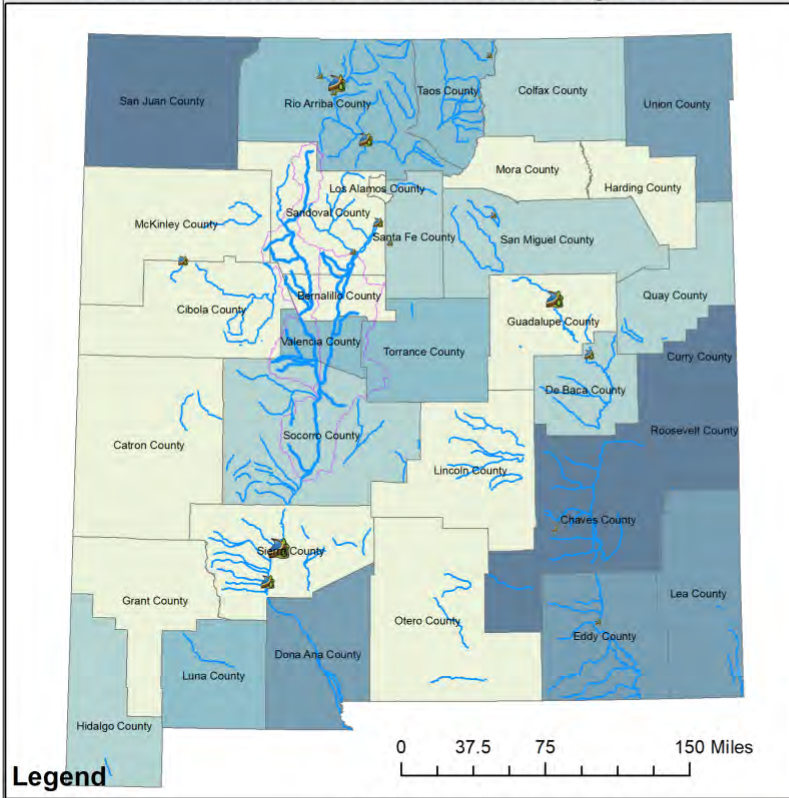
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Pandemic Spring 2020

Service Layer Credits: J. Coonrod,
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Rio Grande HUC
featuring Valencia
County HUC

New Mexico: 2010 Surface Irrigation



Legend

Reservoirs

Average Flow

- 0 - 30000
- ▲ 30001 - 80000
- 80001 - 200000
- 200001 - 500000
- 500001 - 3000000

— New Mexico Streams

▭ Valencia County HUC Areas

2010 Water Use

Total Irrigation (in K acres)

- 0.000 - 10.00
- 10.01 - 20.00
- 20.01 - 35.00
- 35.01 - 70.00
- 70.01 - 110.0

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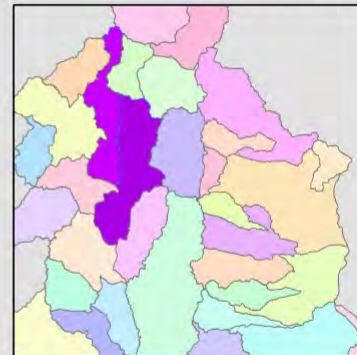
Scale Factor: 0.9996

Latitude Of Origin: 0.0000

Units: Meter

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Engineering for Final Project
Pandemic Spring 2020

Service Layer Credits: J. Coonrod,
ESRI, RGIS, USDA USGS



Rio Grande HUC
featuring Valencia
County HUC