



URISA

GIS/CAMA 2019 Conference

Portland, Oregon • February 25-28, 2019

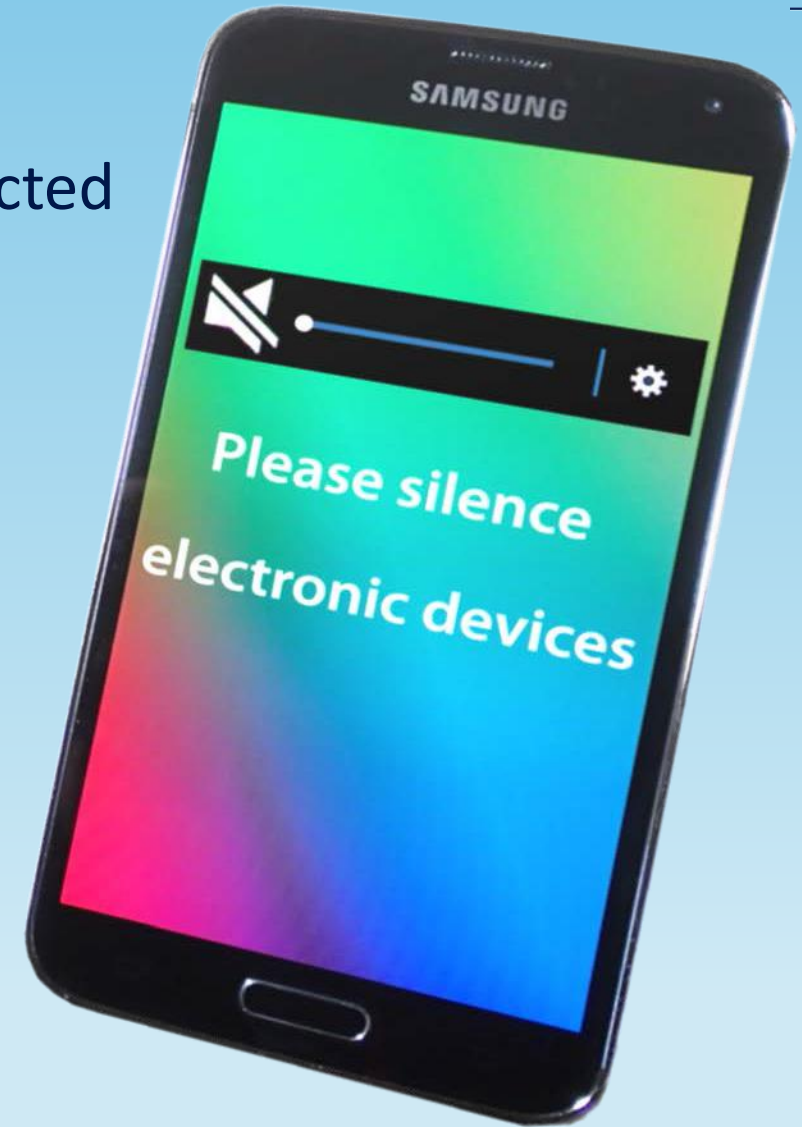


Continuing Education (CE) Credit

Recertification Credit forms for CE credit can be collected from the registration desk on Thursday.

Housekeeping

- The conference proceedings will be available approximately 8 weeks after the conference.
- Please silence your electronic devices
- Attendance at this conference counts toward GIS Professional (GISP) Certification and Renewal.



PROJECT BACK TO THE FUTURE



- ▶ Agricultural Land Valuation in Mountrail County, ND



Starting out

- ▶ What is very unique about this picture?
- ▶ *Hint – Apollo 11 ‘Eagle’ lunar lander returning to command module from the historic first moon walk*
- ▶ **The astronaut who took this photo – command module pilot Michael Collins, is the only human, alive or dead that isn't in the frame of this picture, 1969**



Introduction - Our Journey



- ▶ Quick Bio
 - ▶ Class 1 Property Assessor in Mountrail County – relatively new to role
 - ▶ Previously – complex systems integrator / consultant
 - ▶ Certified Information Systems Auditor (CISA) – ISACA – Information Systems Audit and Control Association
- ▶ Where / what is Mountrail county?
- ▶ A few pictures
- ▶ “The Bakken” – oil & natural gas production
- ▶ Ag Land Valuation – a little history and lots of work
 - ▶ **Maps, numbers, spreadsheets**
- ▶ What we did and where we are

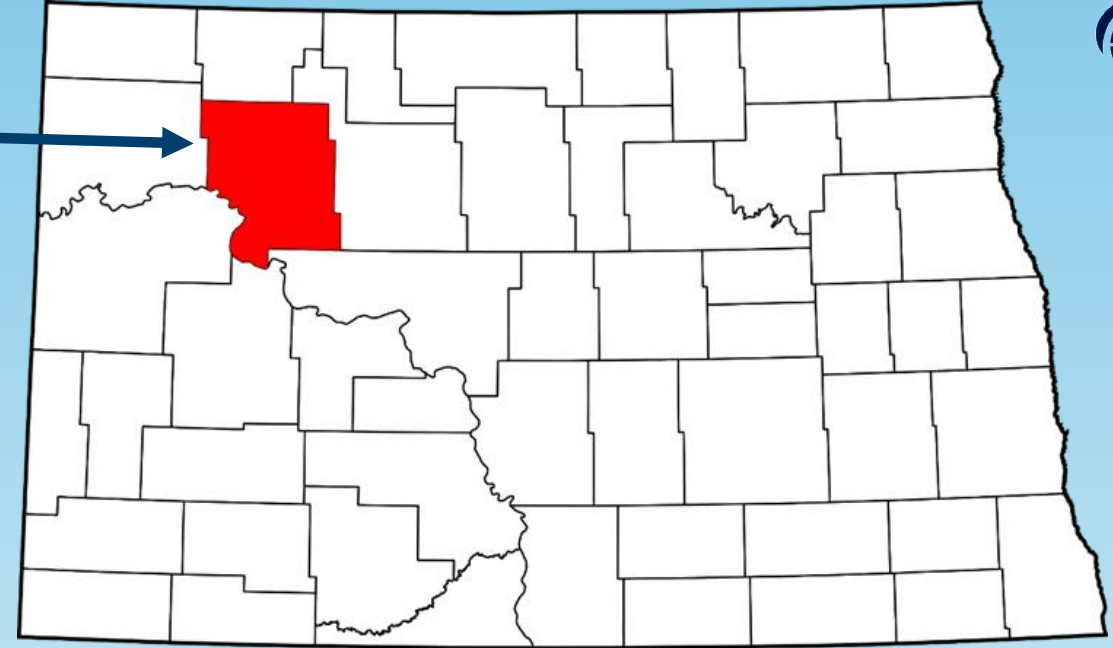
A business card for Rory Porth, Property Assessor for Mountrail County Tax Equalization. The card features a white background with a blue border on the right side. On the left, there is a small image of a house with a red roof and a map. The text on the card includes the name 'Rory Porth' in red, the title 'Property Assessor', and the organization 'Mountrail County Tax Equalization'. Contact information is provided: '101 North Main St. PO Box 69 Stanley, ND 58784-0069', 'Phone: 701.628.2425', 'Fax: 701.628.2276', and 'E-mail: roryp@co.mountrail.nd.us'. The right side of the card has a decorative pattern of blue and white dots.



OK... the 'fam'...



Mountrail County, North Dakota



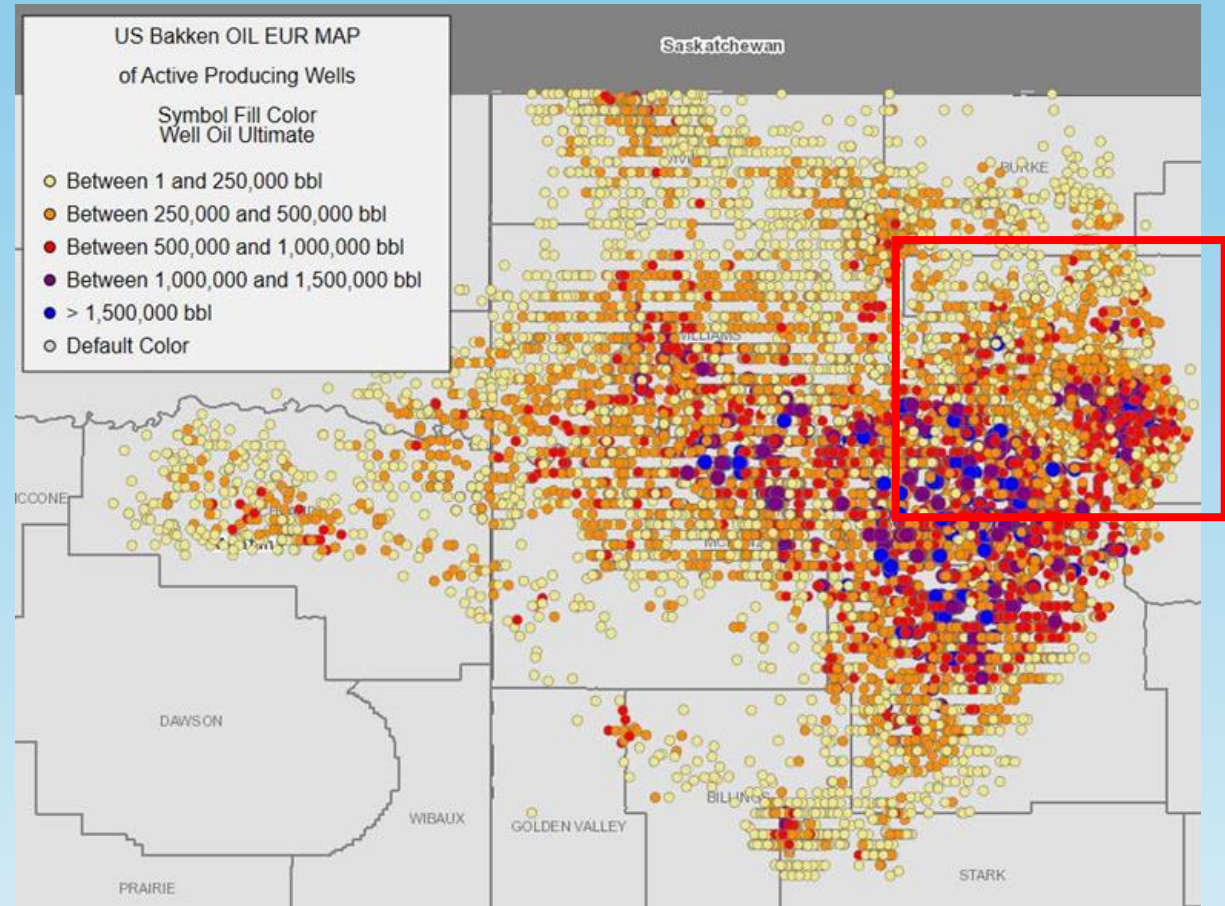
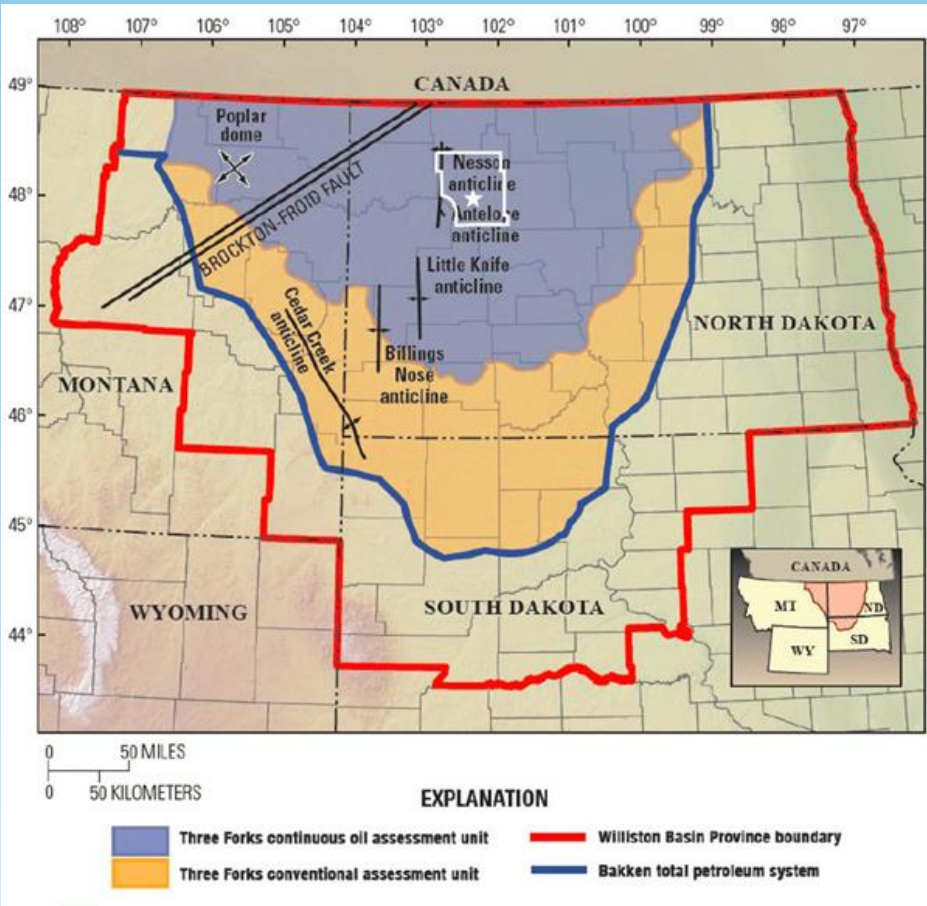
- ▶ 9th largest County by sq mi -1,824
- ▶ Population – 10,265 (2017 Census est)
- ▶ Density – approx. 5.6 persons per sq mi



What does Mountrail look like?



The Bakken - North Dakota is #2 Oil Producer in US



The Bakken



Winter Temps... Uffda..



December 24, 2017 8:30 PM
STANLEY NORTH DAKOTA
WIND CHILL WARNING
-4°F
RealFeel®: -36°
Partly cloudy
3°/-16°
CURRENT CONDITIONS
HUMIDITY: 63%
DEW POINT: -13°F
No precip for 120 min

December 25, 2017 8:02 AM
STANLEY NORTH DAKOTA
WIND CHILL WARNING
-19°F
RealFeel®: -47°
Partly cloudy
-8°/-20°
CURRENT CONDITIONS
HUMIDITY: 72%
DEW POINT: -26°F
No precip for 120 min

December 26, 2017 10:47 AM
STANLEY NORTH DAKOTA
WIND CHILL WARNING
-18°F
RealFeel®: -36°
Sunny
-8°/-22°
CURRENT CONDITIONS
HUMIDITY: 76%
DEW POINT: -24°F
No precip for 120 min

December 29, 2017 3:51 PM
STANLEY NORTH DAKOTA
WIND CHILL WARNING
-11°F
RealFeel®: -37°
Sunny
-6°/-31°
CURRENT CONDITIONS
HUMIDITY: 70%
DEW POINT: -18°F
No precip for 120 min

7:44 AM 20%
STANLEY NORTH DAKOTA
WIND CHILL WARNING
RealFeel®: -56°
-26°F
Clear
Check MinuteCast®
TODAY: -12°/-21°
AccuWeather



Valuation in Mountrail - 2018 Values



Assessment

| Code* | Description | Parcels | Parcel % | True & Full Value | Value % |
|-------|-------------|---------|----------|-------------------|---------|
|-------|-------------|---------|----------|-------------------|---------|

| | | | | | |
|-----|--------------|-------|-------|---------------|-------|
| 101 | Agricultural | 8,946 | 59.3% | \$462,571,200 | 29.3% |
|-----|--------------|-------|-------|---------------|-------|

| | | | | | |
|-----|-------------|-------|-------|---------------|-------|
| 201 | Residential | 3,331 | 22.1% | \$385,144,700 | 24.4% |
|-----|-------------|-------|-------|---------------|-------|

| | | | | | |
|-----|------------|-----|------|---------------|-------|
| 233 | Commercial | 880 | 5.8% | \$694,445,700 | 44.0% |
|-----|------------|-----|------|---------------|-------|

| | | | | | |
|-----|-------------|-------|-------|--------------|------|
| 250 | Vacant Land | 1,931 | 12.8% | \$37,875,100 | 2.4% |
|-----|-------------|-------|-------|--------------|------|

| | | | | | |
|--------------|--|---------------|--|------------------------|--|
| Total | | 15,088 | | \$1,580,036,700 | |
|--------------|--|---------------|--|------------------------|--|

**NOTE: Centrally assessed properties are not included in the list*



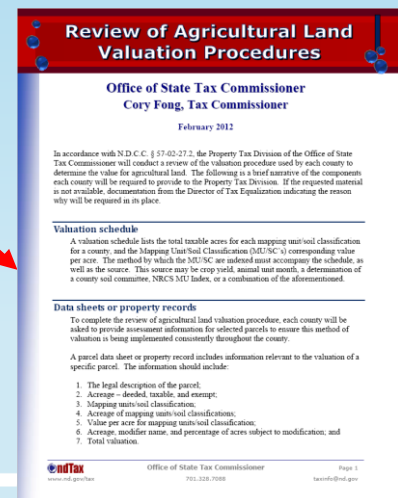
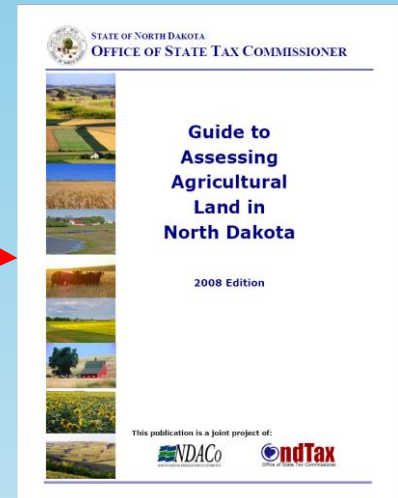
ND Century Code - “the Law”

- ▶ North Dakota Century Code (N.D.C.C.) §57-02-27.2(8)(a) in part provides: In determining the relative value of each assessment parcel, the local assessor shall apply **the following considerations**, which are listed in **descending order of significance** to the assessment determination:
 - ▶ **Soil type and soil classification data from detailed or general soil surveys**
 - ▶ **The schedule of modifiers** that must be used to adjust agricultural property assessments within the county as approved by the state supervisor of assessments under subsection 9
 - ▶ **Actual use of the property** for cropland or non-cropland purposes by the owner of the parcel.



Basically Two Methods

- ▶ **Must be based on soil type – detailed or general**
 - ▶ **Soils information from NRCS** – *National Resources Conservation Service* – US Dept. of Agriculture
 - ▶ Implement NDSU average values by NRCS soil type for Agricultural land valuation
 - ▶ State Tax Dept. Ag Land valuation guide & Certification guide
- ▶ **1. “Breakpoint”** – generalized use “*Productivity Index*”
 - ▶ Better quality soils considered “cropland”
 - ▶ Lower quality soils considered “non cropland”
 - ▶ Much Simpler to implement
- ▶ **2. “Actual Ag Land Use”** – use GIS to map land use acres
 - ▶ More complex and time consuming to implement – most precise





North Dakota Ag Land Valuation Overview

2019 Average Ag Land Values

ND Tax Dept

| County | Market Value | Class Value | Weight Value |
|-----------------------|--------------|-------------|--------------|
| ADAMS COUNTY | | | |
| ADAMS CO | 444.95 | 1,047.77 | 445.00 |
| ADAMS CO | 444.95 | 1,047.77 | 445.00 |
| ADAMS CO | 444.95 | 1,047.77 | 445.00 |
| BALCON COUNTY | | | |
| BALCON CO | 232.50 | 498.33 | 277.60 |
| BALCON CO | 232.50 | 498.33 | 277.60 |
| BALCON CO | 232.50 | 498.33 | 277.60 |
| BENNETT COUNTY | | | |
| BENNETT CO | 417.66 | 877.74 | 424.46 |
| BENNETT CO | 417.66 | 877.74 | 424.46 |
| BENNETT CO | 417.66 | 877.74 | 424.46 |
| BUDWICK COUNTY | | | |
| BUDWICK CO | 1,117.97 | 2,246.76 | 945.80 |
| BUDWICK CO | 1,117.97 | 2,246.76 | 945.80 |
| BUDWICK CO | 1,117.97 | 2,246.76 | 945.80 |

NDSU Ag Land Production Value 2018
Average Ag - \$454.62
Cropland - \$692.46
NonCrop - \$156.54

How much to Where?

Mountrail Ag Acres
1,048,451.07
X \$454.62
=
Ag Acre Total Value
\$476,646,825
at 100% Threshold

Problem: How to make Allocation Equitable?

Need to know how many crop and noncrop acres, other types of land



NDSU Ag Values
“Capitalized average annual gross return”



Breakpoint Method - 2017 Valuation



Better Soils

Poorer Soils

| Productivity Index (PI) or AUM (noncrop) | Land Valuation – “Cropland” | Land Valuation – “NonCrop” |
|--|-----------------------------|----------------------------|
| 95 | \$917 | -- N/A -- |
| 90 | \$880 | -- N/A -- |
| 80 | \$770 | -- N/A -- |
| 70 | \$688 | -- N/A -- |
| 60 | \$578 | -- N/A -- |
| 50 | \$486 | -- N/A -- |
| 49 | -- N/A -- | \$217 |
| 40 | -- N/A -- | \$178 |
| 30 | -- N/A -- | \$132 |
| 20 | -- N/A -- | \$89 |
| 10 | -- N/A -- | \$40 |
| 0 | -- N/A -- | \$15 |

2017 Ag Values

Average Ag - \$458.53

Crop - \$678.66

NonCrop - \$147.91

Breakpoint

Cropland

Non-Cropland

Note the Difference between Soil Types - \$269



2017 Breakpoint Method Implemented – Processed New Ag Land Values



- ▶ Different method for the county – changed historical Ag Land values
- ▶ Updated 8,900+ parcels
- ▶ ND “Notice of Increase” – approx. 3,000 letters sent out
 - ▶ \$3,000+ increase in valuation **AND** 10% or more of previous value
- ▶ Minimal communication with public – one small article in paper
 - ▶ **(our “bad”)**
- ▶ Result?
- ▶ Confusion, some angst, some happy – **some *VERY* unhappy vocally...**



Contention!

May 10, 2017 Paper

ATTENTION MOUNTRAIL COUNTY LANDOWNERS! Do Your 2017 Farmland Valuations Make Sense?

Sign our petition today at

<https://www.ipetitions.com/petition/reverse-mountrail-countys-taxation-method>

The petition reads: "We, the undersigned, call on Mountrail County Commissioners to continue to use 2016 farmland valuations until: 1. A new valuation method is developed based on actual land use as cropland or non cropland. 2. A Soils Committee is formed to recommend tax assessment methods to the county commission."

The site is easy to use, just follow the instructions.

Let your voice be heard concerning proposed changes in taxable valuations in Mountrail County.

Voice your concerns, not only by signing the petition, but also call your county commissioners and attend the Commissioners Meeting on Tuesday, May 16 at noon at the Courthouse in Stanley

ship met with the Board to discuss the soil implementation. Also present from the Tax Directors Office was Rory Porth, Assessor and Teresa Captain, Deputy Tax Director. Fred Evans stated the County is not utilizing the implementation of soils correctly and feels usage should be utilized.

Charlie Sorenson suggested a soil board be created that would make suggestions to the Tax Director's Office. Charlie Sorenson stated the land should be split into pasture vs crop land.

Assessor Porth explained that the surrounding counties are following the same procedures.

States Attorney Enget stated that modifiers are not dead but it does have to be approved by the state before implementation and the assessing rules come from the legislation.

May 24, 2017 Paper

Landowners Question 2017 Taxable Valuations



Since receiving their new taxable valuations on agricultural land, some landowners in Mountrail County have been expressing their concerns to County Commissioners. Landowner Charlie Sorenson addressed the commission saying they will keep coming back to the meetings as they believe it is important to all citizens to do the valuations cor-

There clearly are some flawed issues with the Revised/Proposed Taxation of Land in Mountrail County.

We see the main Problem is land use, assessing crop-land and non-cropland the same.

The ND Century Code is very clear on landuse and how it is to be dealt with.

Concerned citizens can do two things:

1. Sign the petition on-line (ipetitionmountrailcounty) it will pop up. It asks to continue 2016 tax rate for 2017 and start a five member soil committee.

No need to donate!

2. Come to the Mountrail County Commissioners meeting on June 6th, 9:00 a.m. and Tax Equalization meeting at 10 a.m. Be ready to hear people share their concerns, along with being ready to share your concerns.

Paid for by Charlie Sorenson and Fred Evans

URISA



May 31, 2017 Paper

IT'S THE LAW

The assessor shall apply "Actual use of the property for cropland or noncropland purposes by the owner of the parcel" (subsection 8 of NDCC 57-02-27.2)

2017 valuations of agricultural property in Mountrail County do not consider use and have been made in direct violation of this law.

Persuade Mountrail County Commissioners to change direction

Attend the Mountrail County Equalization Meeting on Tuesday, June 6th at 10:00 a.m. at the courthouse.

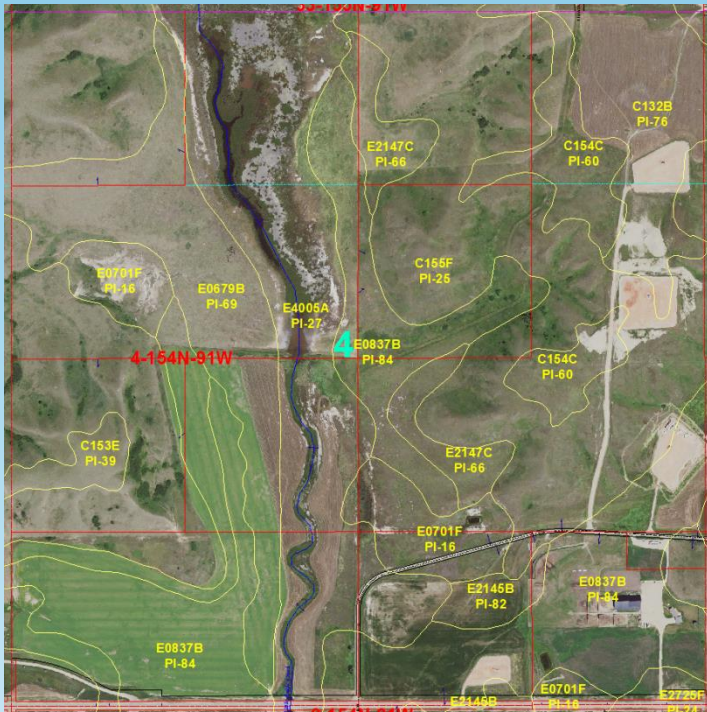
Search online "ipetitions Mountrail County" and sign our petition

Paid for by Fred Evans and Charlie Sorenson

Ag Land Valuation



Example Section



- ▶ Each parcel has various soil types within it
- ▶ Each soil type has a “Productivity index” associated
- ▶ Higher PI’s = better soil
- ▶ Higher PI’s have higher \$ value applied, lower PI’s have a lower \$ value applied
- ▶ ***2017 Mountrail used ND State approved ‘breakpoint method’ in setting values – did not use actual use***

June 2017 - County Board of equalization voted to utilize actual land use for valuation

WENT *BACK* TO 2016 LAND VALUES FOR THE *FUTURE* OF ACTUAL LAND USE



A Year and a Half Ago....

"How do we do this....?"



Math: $B > \frac{1}{N} \sum_{i=1}^N X_i$

JUST DO IT \rightarrow 485K
534K

WHAT IS UNIQUE ABOUT THIS PICTURE?

MAX \$2300
\$1600
\$1687
\$1380
\$1261
\$11970
\$1280
\$12600

| Year | Value |
|--------------|------------------|
| 2-13-2017 | 8942 |
| | 6,991.70 |
| | 1,569,500 |
| | \$412.85 |
| Soils 6/2017 | \$421.83 |
| | 1,066,991.70 |
| | \$450,085,337.04 |
| DIFF | 8,515,837.04 |

Do NOT ERASE

Go BACK - BTTF
w/ PARCELS
26x30
= 520

STATE AID
5510k
SECTIONS 2-1800
UGOs - 1

RORY'S "BEAUTIFUL MIND"

- SOILS LAYER
- @ CODE - not color
- AERMAP
- FARM CROP
- Ex \rightarrow non-crop
- 2 AC RES
- OIL SITES/HOME?
- CRP
- GRAVEL
- SALTY WATER
- DISCUSS TREES + BORDERS
- PRIVATE DRIVE

VANGUARD ROCKS!

RON JOY SURF SHOP
ONE OF A KIND

"BRAIN BUBBLES"

SPACE

MUST ID ACRES BY LAYERS

TEST - A LAYER
POWERS
RAT LAKE

D - J
D - U
D - P

Sidwell GIS
UPDATE AERIAL PHOTOGRAPHY - \$900/120YR
- YEARLY ALSO

LAND USE LAYER(S?) \$86K
- CROP
- non-crop
- OTHERS

EXAMPLE COUNTY w/ LAND USE
- WHAT IS PROVIDED

- FARMS QUARTERLY PULL - \$1500
- PORTICO? WHEN
- WHEN TO ROUND SOIL CODES? PARCEL

LAYERS HISTORICAL PHOTOGRAPHY
CROPLAND CRP 3A, 5S
NONCROPLAND
- RANGELAND
- PASTURE LAND
NON PRODUCTIVE
ALL MODIFIERS
INNOVATED TAMP ROADS, CITY ROADS

CONCRETE
OIL SITES
SALT WATER
RESIDENTIAL
- ASMT CODES

12-1200 \$100 2016 AB VALUE

16-6515 - D - 2016

NEW PLAN
VMS PROJECT - \$5265
VMS VISID - \$689,999 + \$337,999
SIDWELL DISCUSSIONS
FARMS - \$1599 / \$999 MAINT.

ARC MAP - \$1250 / \$400-500 ANNUAL
- TRAINING - 1-1.5 DAYS

SW TOOLS INVESTIGATION
- OFFROAD - \$24-25K/ATR
- SIDWELL GIS - FARMS
- NAIP AIRPHOTO

CROP/NON CROP TOOLS
- CROPSCAPE
- ASBIDATA
BTAX DEFT REPORTING TOOLS &
FARMS SERVER

2 VALUES

NEED DEN

Actual Land Use – Bounding the Problem



Much to keep track of:

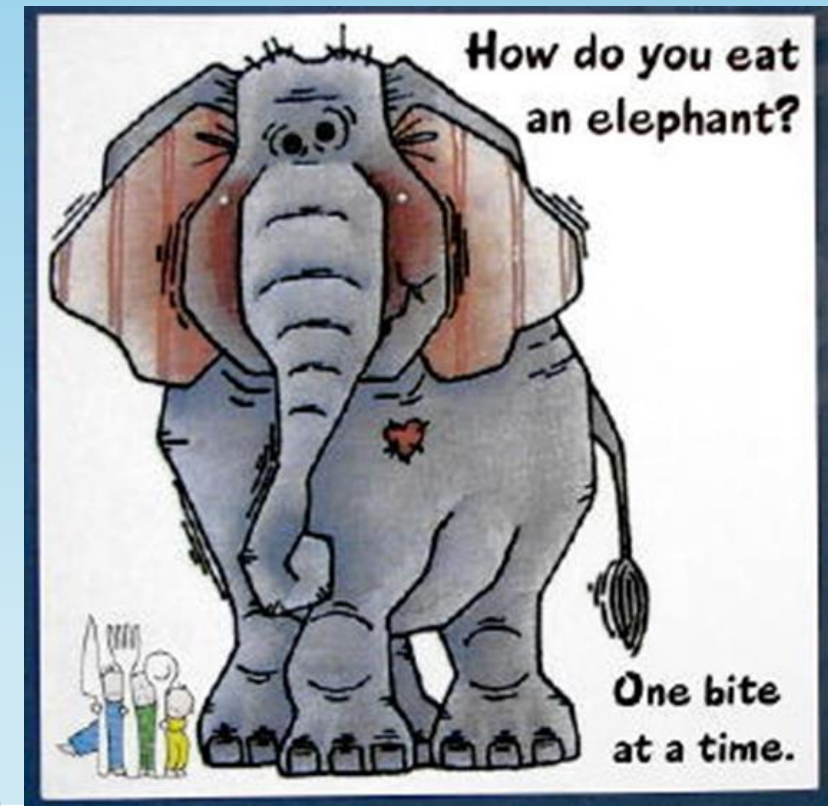
- ▶ Mountrail County Comprised of
 - ▶ 55 Townships – 7 cities
 - ▶ 1,803 Sections
 - ▶ 1,048,451.07 Ag related acres
 - ▶ 8,946 Ag related parcels
 - ▶ 2,200 Ag related parcel owners
 - ▶ 147 Soils Codes - \$ values applied
 - ▶ Where are those soils?
- ▶ How is each parcel being used?
 - ▶ Cropland
 - ▶ Non-Cropland
 - ▶ Farmstead
 - ▶ Commercial
 - ▶ Gravel Pit
 - ▶ Roads
 - ▶ Oilwell Sites
 - ▶ Saltwater disposal



Answer? – utilize a GIS system

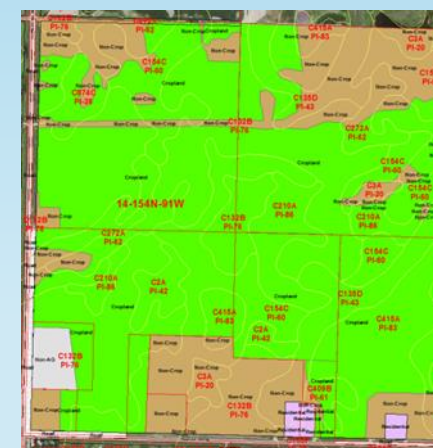
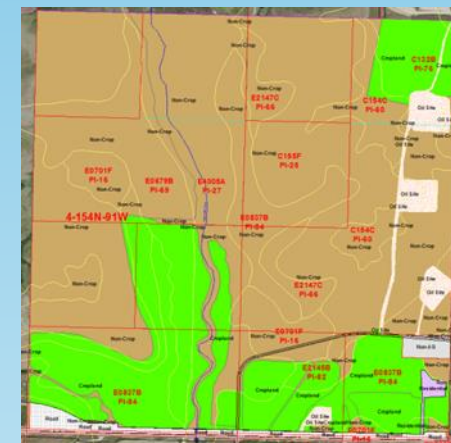
Problem – we were VERY new to GIS

Education needed – our office AND our constituents



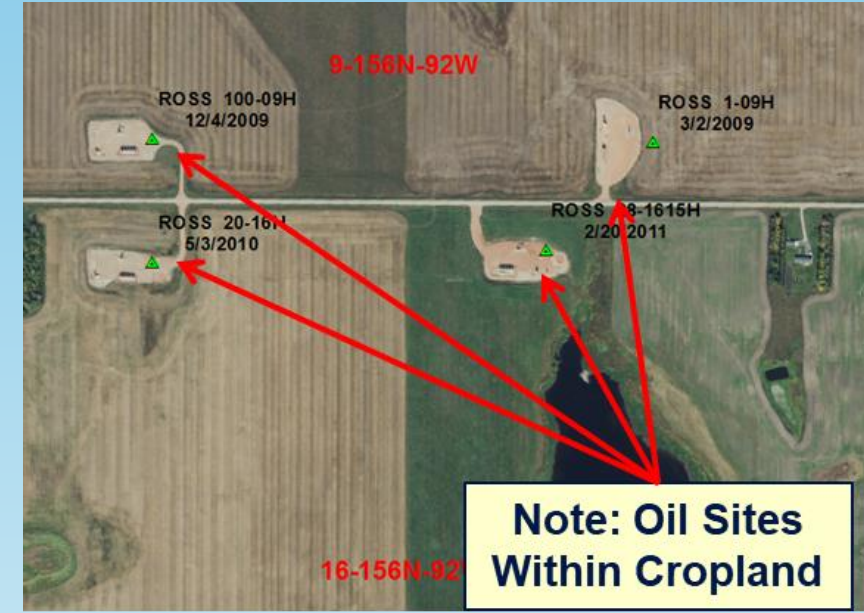
Overall Plan

- ▶ GIS Software in House – ArcMAP
 - ▶ ArcMap Publisher, Sidwell FARMS
- ▶ Soils Committee Formed
- ▶ [Drawing Ruleset](#) Defined and Approved
- ▶ [Valuation Ruleset](#) Drafted and Approved
- ▶ 3 ‘pre-pilot’ Test Sections Drawn by Sidwell Co. – GIS vendor
- ▶ Review of various areas within County for potential ‘challenges’ in drawing of sections
 - ▶ i.e. Non-cropland areas within cropland – **what size to draw down to?** i.e. “Rockpiles”...
- ▶ Pilot Township Drawn In and Reviewed
- ▶ County drawn in by ‘Tier’



Drawing Ruleset Example - Oilwell Sites

- ▶ ND Century Code – “Ag property used for oil, natural gas, or subsurface minerals must continue to be assessed as Ag property for the remainder....”
- ▶ **Challenge: Was it cropland or noncropland before?**
 - ▶ Some parcels found oil sites partially on crop land, partially on non-cropland
 - ▶ Very difficult to manage acres
- ▶ **Simplified Approved Decision** – all oil site acreage will be valued as non-cropland based off soil types underneath oil site (includes road leading to oil site)



Land Used for Extraction of Oil, Natural Gas, or Subsurface Minerals

Land that was assessed as agricultural property at the time the land was put to use for extraction of oil, natural gas, or subsurface minerals as defined in N.D.C.C. § 38-12-01 must continue to be assessed as agricultural property if the remainder of the surface owner's parcel of property on which the subsurface mineral activity is occurring continues to qualify for assessment as agricultural property under subsection 1 of N.D.C.C. § 57-02-01.

Farmsteads and Modifiers

- ▶ Farmsteads are considered ‘non-crop’ and are valued at non-cropland value based off soils under farmstead
- ▶ With **Actual Land use** – modifiers are **not** necessary and are not used
 - ▶ With breakpoint method, modifiers could be considered and are used for cropland areas only



| Rocky* | Very Rocky* | Salinity* |
|-------------------------------|---------------|------------------|
| Non-Productive | Obstacles | Multiple Factors |
| Irregular Field | Trees | Inaccessibility |
| Electrical Transmission Lines | Public Road | Brush & Ponding |
| Abandoned Railroad | Oil Well Site | Non-Tilled |
| Pasture | Non-Cropland | Drain Ditch |
| Marsh | Land Use (?) | Easements |

Examples of Modifiers from ND State List

*Items handled By NRCS Soil Survey



Land Valuation Ruleset



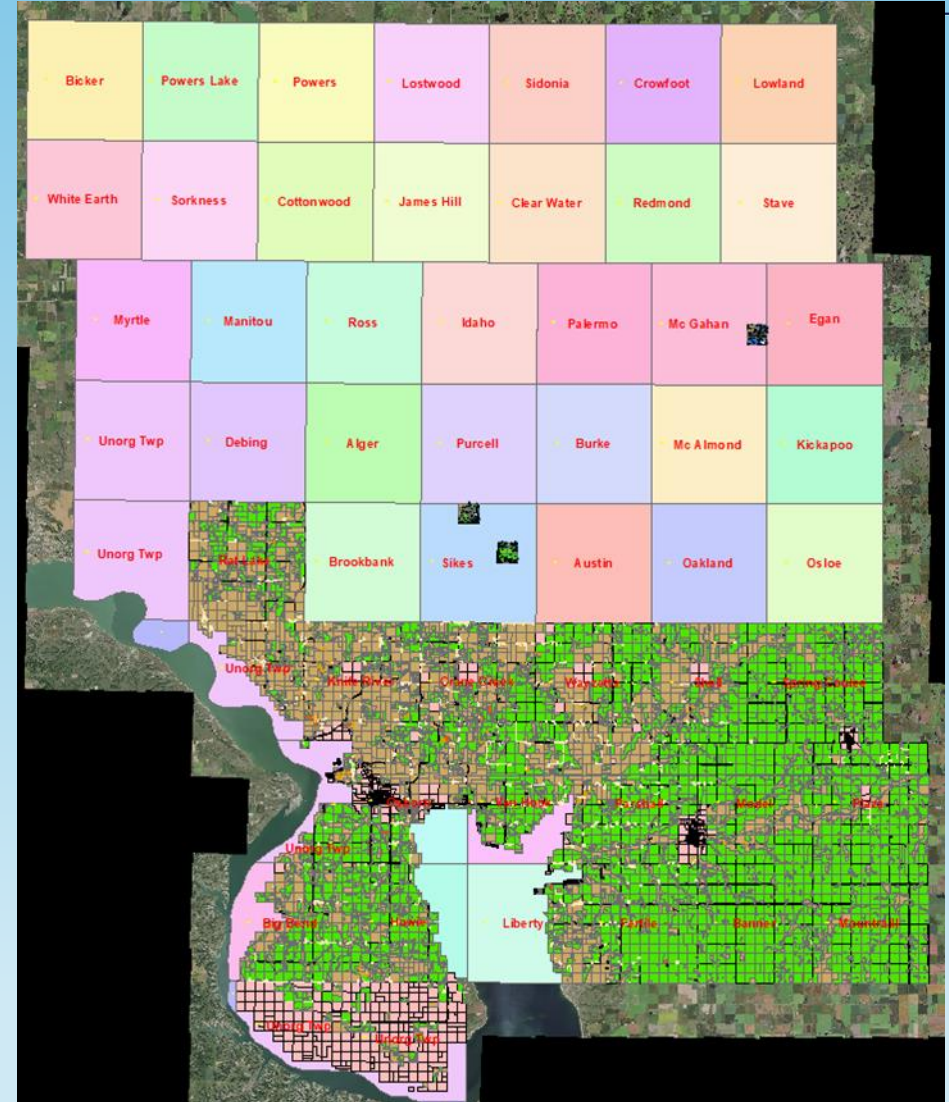
| GIS Item | Valuation Method |
|--------------------------------|--|
| Cropland | Cropland values - Productivity Index (PI) |
| Non Cropland | Noncrop values – based off AUM (Animal Unit Month) calculation |
| Farmsteads | Noncrop values |
| Oilwell Sites | Noncrop values |
| Salt Water Wells | 1) Commercial wells @ Commercial Values (Tax Dept) 2) Private Wells @ Noncrop values |
| <u>Taxable</u> Rural Residence | 2 Acres at \$2,000 / acre |
| Roads | \$0 for Right-of-Way acreage of TWP Certified Roads, County Roads, State Highways |
| Commercial Land / Structures | Commercial Values (Tax Dept) |
| Gravel Pits | Commercial Values (Tax Dept) |
| Non-Ag (vacant land) | Vacant Land Values (Tax Dept) |



Overview of Drawing Process

- 3 “Pre-Pilot” Sections
 - Before Contract
 - Used for Developing Drawing Ruleset
- Pilot Township – Rat Lake
 - ****VERY* Precise – 98.5% !***
- Tiers 1 – 8
- Used 2016 NAIP* Photography
 - *“Draw what they see”*
 - *No interpretation*
 - *“Once cropped always cropped” 20 year by Mountrail County*

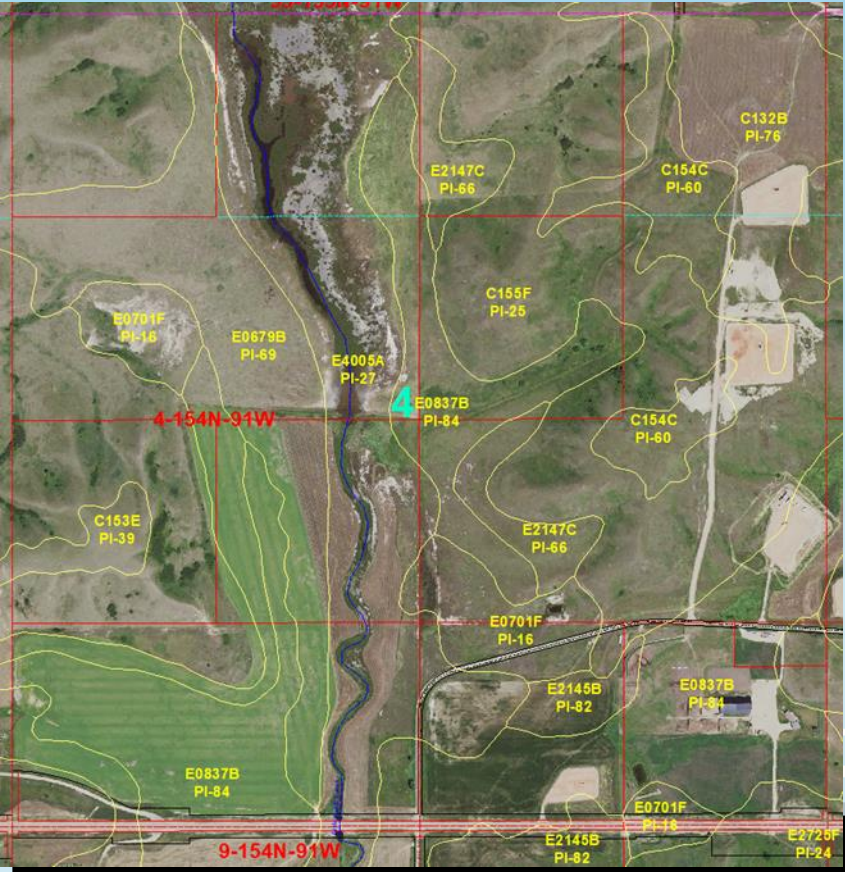
*(*NAIP – National Agriculture Imagery Program)*



What it looks like...



- Left – Section with NRCS Soil Layer
- Right – Same section with Actual Use drawn in
- Types – Cropland, non-cropland, Residential, Roads, Oil Sites, others



Note Portion Of Oil Well site



Project Drawing and Review

▶ All phases start – July 2017

- ▶ 3 Sections – “Pre-Pilot”
- ▶ Pilot Section
- ▶ Drawing by Tier

Cropland Green

NonCropland Beige

▶ Tier Deliveries Started Fall 2017

- ▶ Department Review section by section
- ▶ Township Reviews Started late Fall 2017
 - ▶ Section by Section

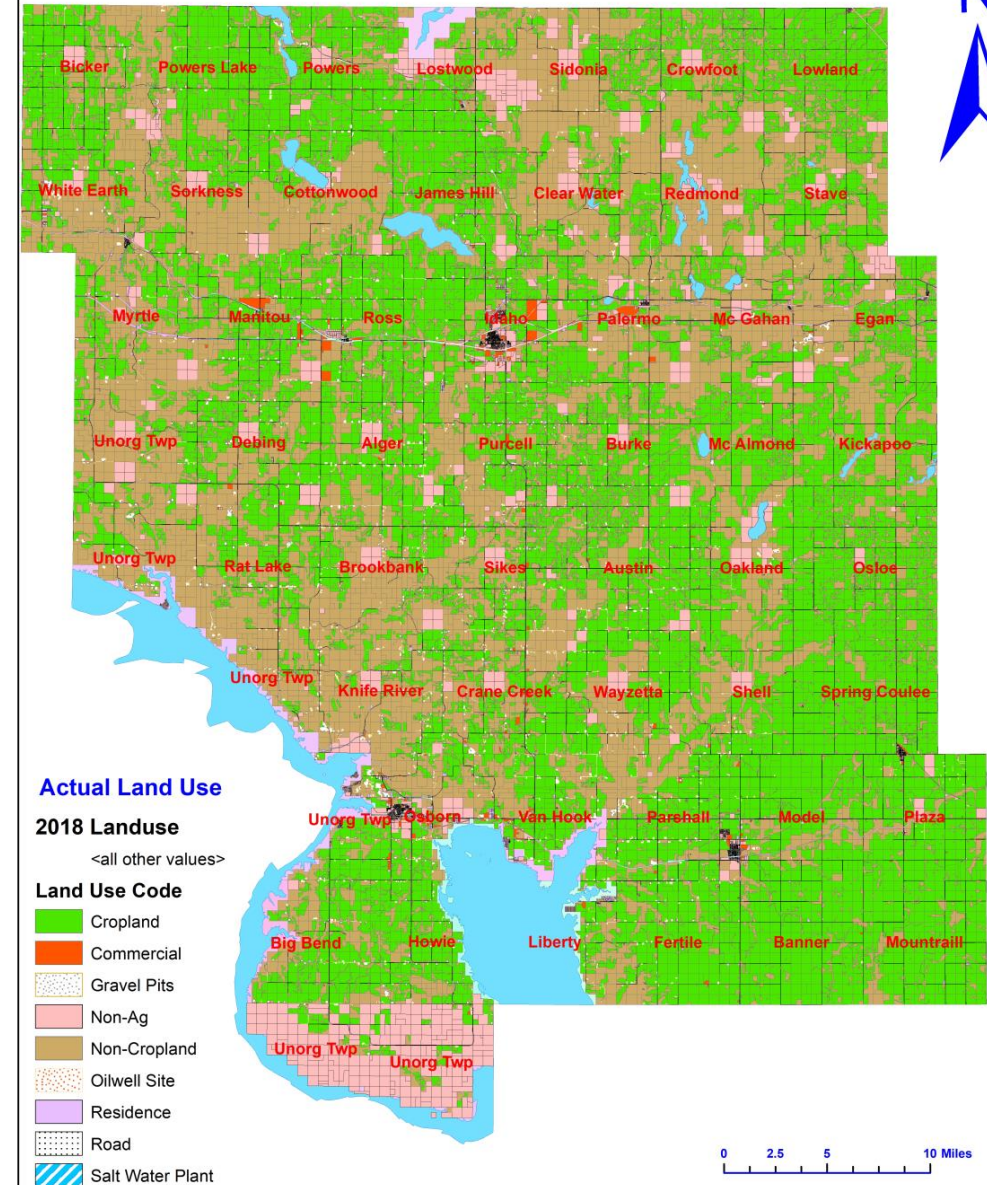
▶ Total Tier county delivery – Feb 2018

- ▶ Township by Township Reviews ongoing
- ▶ Final Township Review September 2018

▶ 2017 Aerial Photography Reviews-Update

- ▶ Completed December 2018

Mountrail County - Ag Land Actual Use



Envisioning Data An Idea!



NRCS Soils Info

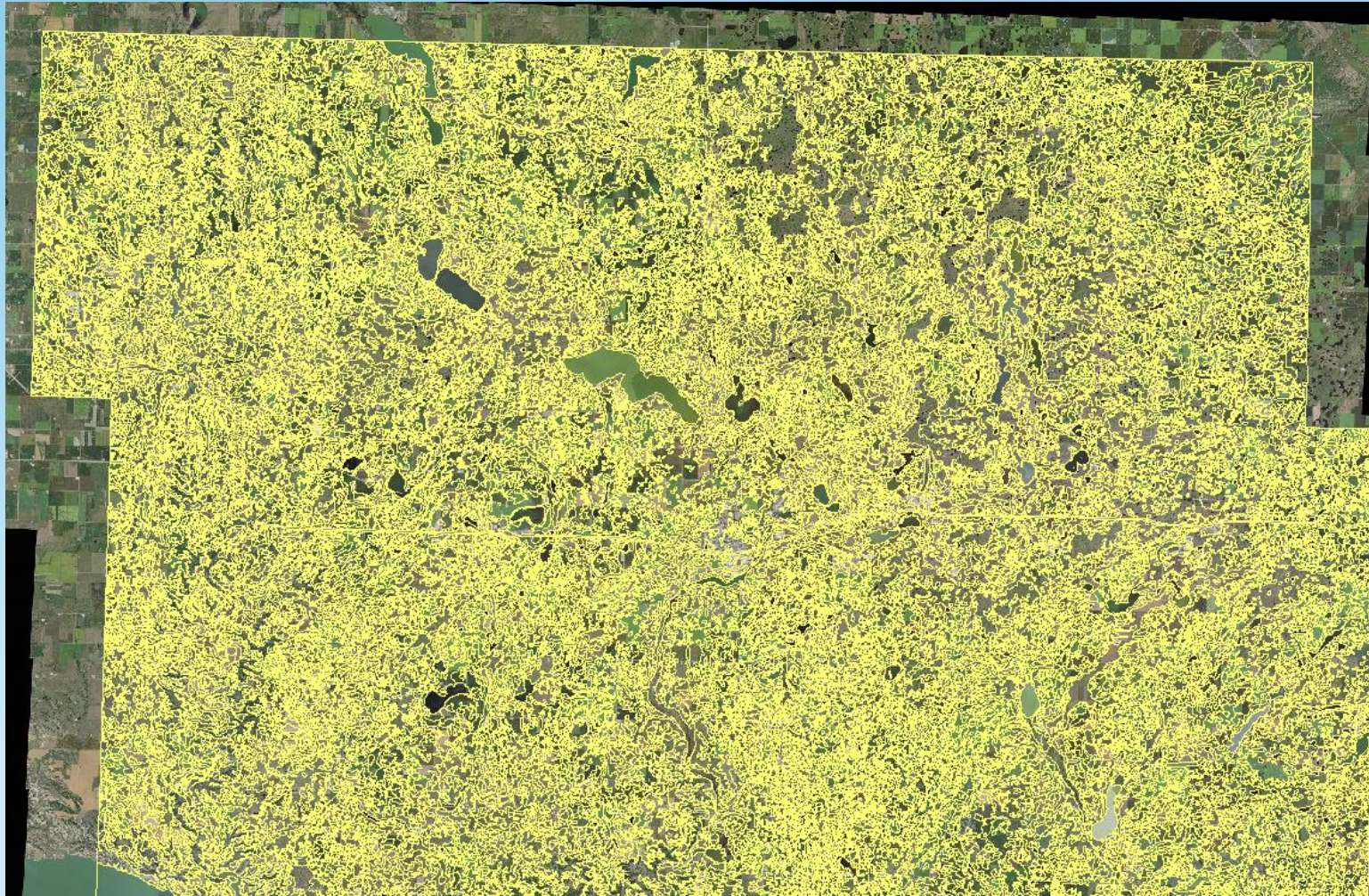


| Map unit symbol | Map unit name | PI | Acres in AOI |
|-----------------|--|----|--------------|
| C2A | Tonka silt loam, 0 to 1 percent slopes | 42 | 5,040.90 |
| C3A | Parnell silty clay loam, 0 to 1 percent slopes | 20 | 20,932.00 |
| C5A | Southam silty clay loam, 0 to 1 percent slopes | 5 | 12,561.50 |
| C6A | Tonka-Parnell complex, 0 to 1 percent slopes | 80 | 22.2 |
| C64C | Wamduska, west-Mauvai complex, 1 to 9 percent slopes | 32 | 15 |
| C75A | Vallers loam, moderately saline, 0 to 1 percent slopes | 37 | 3,237.70 |
| C132B | Williams-Zahl loams, 3 to 6 percent slopes | 76 | 168,009.50 |
| C132C | Williams-Zahl-Zahill complex, 6 to 9 percent slopes | 56 | 99,634.10 |
| C135C | Zahl-Williams-Zahill complex, 6 to 9 percent slopes | 56 | 1,706.80 |
| C135D | Zahl-Williams loams, 9 to 15 percent slopes | 43 | 201,198.10 |
| C148C | Williams-Zahl-Parnell complex, 0 to 9 percent slopes | 51 | 104.6 |
| C149B | Williams-Bowbells-Tonka complex, 0 to 6 percent slopes | 79 | 475.8 |
| C153E | Zahl-Max loams, 15 to 25 percent slopes | 39 | 4,003.70 |
| C154C | Zahl-Williams-Bowbells loams, 3 to 9 percent slopes | 60 | 122,042.40 |
| C155E | Zahl-Max-Arnegard loams, 9 to 25 percent slopes | 36 | 400.2 |
| C155F | Zahl-Max-Arnegard loams, 15 to 60 percent slopes | 25 | 28,940.40 |



Soil Code 'Productivity Index'

▶ North Mountrail County with NRCS Soils Layer



| Map unit symbol | Map unit name | PI | Acres in AOI |
|-----------------|--|----|--------------|
| C2A | Tonka silt loam, 0 to 1 percent slopes | 42 | 5,040.90 |
| C3A | Parnell silty clay loam, 0 to 1 percent slopes | 20 | 20,932.00 |
| C5A | Southam silty clay loam, 0 to 1 percent slopes | 5 | 12,561.50 |
| C6A | Tonka-Parnell complex, 0 to 1 percent slopes | 80 | 22.2 |
| C64C | Wamduska, west-Mauvai complex, 1 to 9 percent slopes | 32 | 15 |
| C75A | Vallers loam, moderately saline, 0 to 1 percent slopes | 37 | 3,237.70 |
| C132B | Williams-Zahl loams, 3 to 6 percent slopes | 76 | 168,009.50 |
| C132C | Williams-Zahl-Zahill complex, 6 to 9 percent slopes | 56 | 99,634.10 |
| C135C | Zahl-Williams-Zahill complex, 6 to 9 percent slopes | 56 | 1,706.80 |
| C135D | Zahl-Williams loams, 9 to 15 percent slopes | 43 | 201,198.10 |
| C148C | Williams-Zahl-Parnell complex, 0 to 9 percent slopes | 51 | 104.6 |
| C149B | Williams-Bowbells-Tonka complex, 0 to 6 percent slopes | 79 | 475.8 |
| C153E | Zahl-Max loams, 15 to 25 percent slopes | 39 | 4,003.70 |
| C154C | Zahl-Williams-Bowbells loams, 3 to 9 percent slopes | 60 | 122,042.40 |
| C155E | Zahl-Max-Arnegard loams, 9 to 25 percent slopes | 36 | 400.2 |
| C155F | Zahl-Max-Arnegard loams, 15 to 60 percent slopes | 25 | 28,940.40 |



Soil Code by NRCS Productivity Index

► Symbology - PI Breakdown

- 0-Blue-Water
- PI - 10 Step Color change
- Above 50 varying shades of green

Layer Properties

General Source Selection Display Symbology Fields Definition Query Labels Joins & Relates Time

Show:

Features
Categories
Quantities
 Graduated colors
 Graduated symbols
 Proportional symbols
 Dot density
Charts
Multiple Attributes

Draw quantities using color to show values. Import...

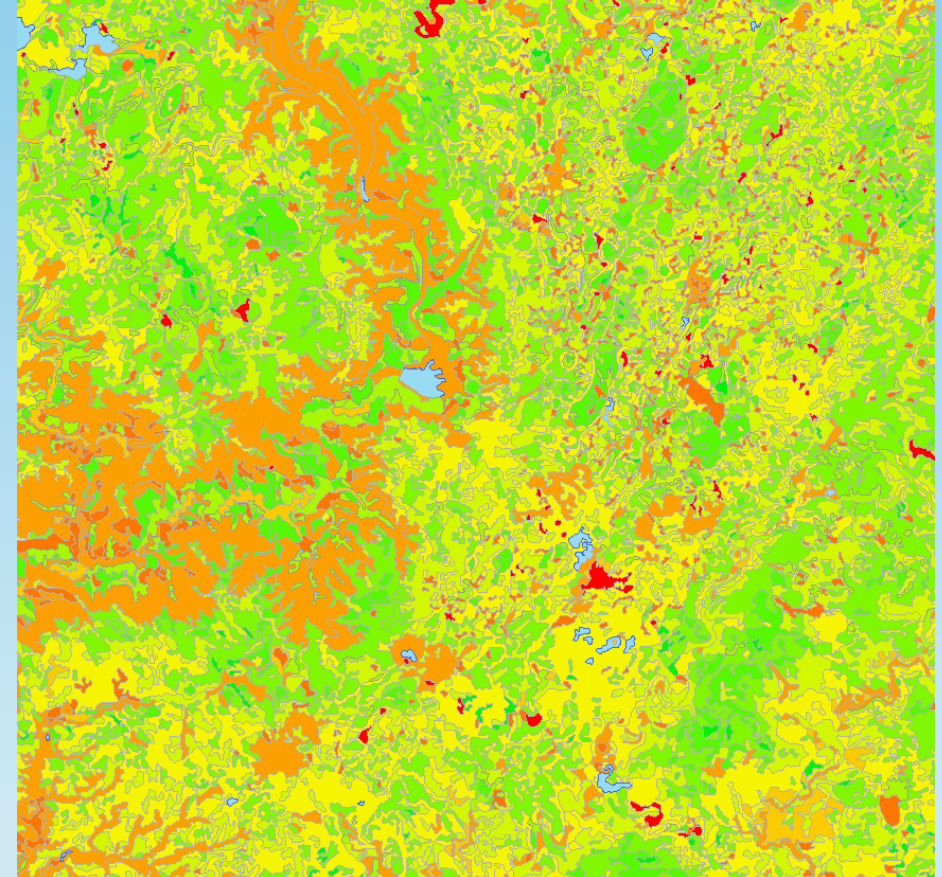
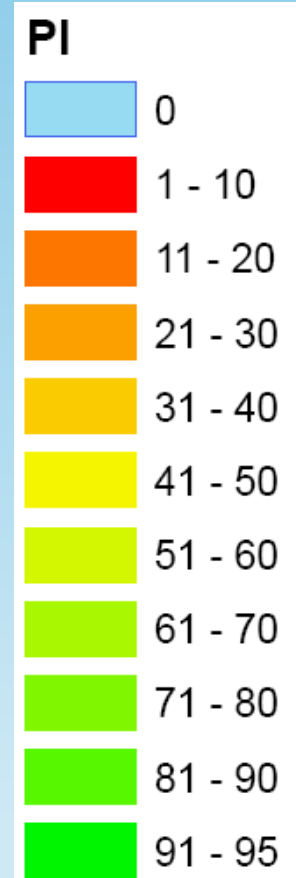
Fields
Value: PI
Normalization: none

Classification
Manual
Classes: 11 Classify...

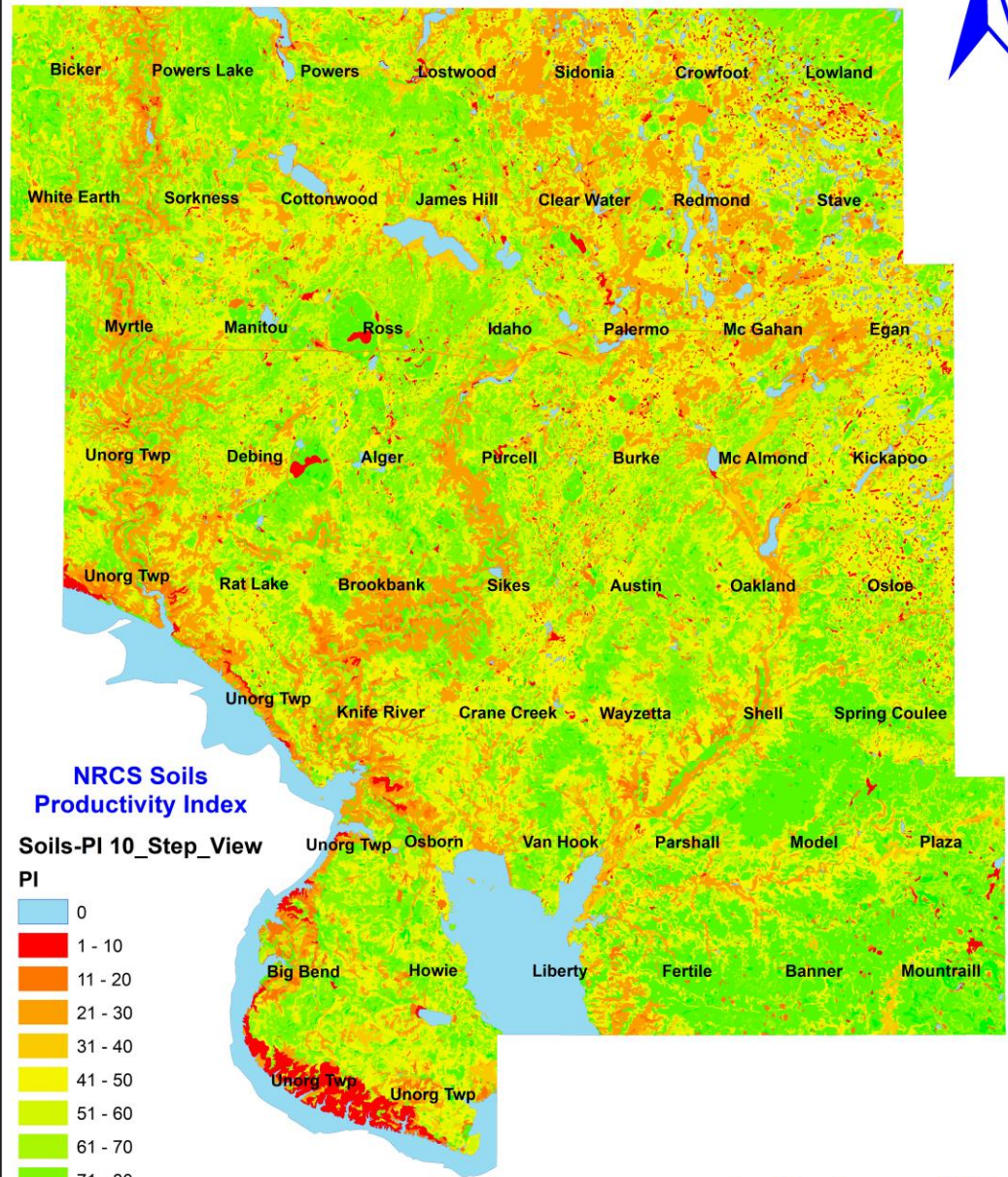
Color Ramp: [Color Ramp]

| Symbol | Range | Label |
|-------------------|--------------------------|------------------------|
| [Blue] | 0.00000000 | 0.000000 |
| [Red] | 0.000001000 - 10.0000000 | 0.000001 - 10.000000 |
| [Orange] | 10.0000010 - 20.0000000 | 10.000001 - 20.000000 |
| [Light Orange] | 20.0000010 - 30.0000000 | 20.000001 - 30.000000 |
| [Yellow-Orange] | 30.0000010 - 40.0000000 | 30.000001 - 40.000000 |
| [Yellow] | 40.0000010 - 50.0000000 | 40.000001 - 50.000000 |
| [Light Green] | 50.0000010 - 60.0000000 | 50.000001 - 60.000000 |
| [Green] | 60.0000010 - 70.0000000 | 60.000001 - 70.000000 |
| [Dark Green] | 70.0000010 - 80.0000000 | 70.000001 - 80.000000 |
| [Very Dark Green] | 80.0000010 - 90.0000000 | 80.000001 - 90.000000 |
| [Darkest Green] | 90.0000010 - 100.0000000 | 90.000001 - 100.000000 |

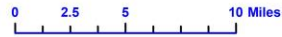
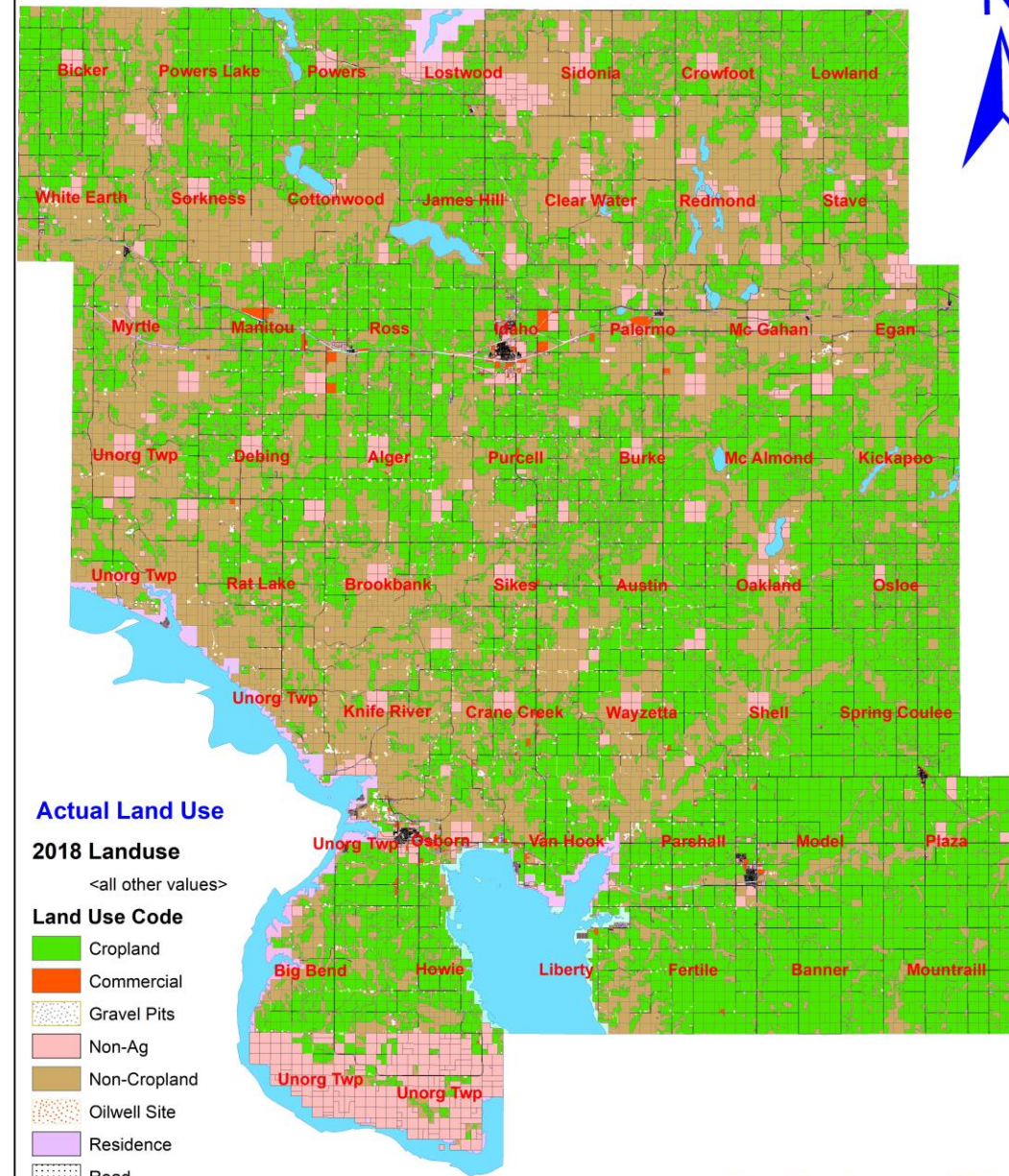
Show class ranges using feature values Advanced



Mountrail County - NRCS Soils



Mountrail County - Ag Land Actual Use



Top Soils in the County – 147 Total Soil Types



| Soilcode - P | Soil Name | Total | Percent | Rank |
|--------------|---|------------|---------|------|
| C135D PI-43 | Zahl-Williams loams, 9 to 15 percent slopes | 182,468.72 | 17.1% | 1 |
| C132B PI-76 | Williams-Zahl loams, 3 to 6 percent slopes | 156,232.54 | 14.6% | 2 |
| C154C PI-60 | Zahl-Williams-Bowbells loams, 3 to 9 percent slopes | 114,829.66 | 10.8% | 3 |
| C132C PI-61 | Williams-Zahl-Zahill complex, 6 to 9 percent slopes | 90,592.61 | 8.5% | 4 |
| C210B PI-83 | Williams-Bowbells loams, 3 to 6 percent slopes | 60,192.04 | 5.6% | 5 |
| C210A PI-86 | Williams-Bowbells loams, 0 to 3 percent slopes | 48,405.76 | 4.5% | 6 |
| C165F PI-30 | Zahl-Max-Parnell complex, 0 to 35 percent slopes | 40,837.62 | 3.8% | 7 |
| E2725F PI-24 | Arikara-Shambo-Cabba loams, 9 to 70 percent slopes | 29,865.31 | 2.8% | 8 |
| C155F PI-25 | Zahl-Max-Arnegard loams, 15 to 60 percent slopes | 24,810.81 | 2.3% | 9 |
| C870E PI-23 | Wabek-Lehr-Appam complex, 9 to 25 percent slopes | 21,744.79 | 2.0% | 10 |
| C816B PI-44 | Lehr loam, 2 to 6 percent slopes | 21,484.77 | 2.0% | 11 |
| C3A PI-20 | Parnell silty clay loam, 0 to 1 percent slopes | 19,765.69 | 1.9% | 12 |
| C272A PI-62 | Hamerly-Tonka complex, 0 to 3 percent slopes | 18,084.12 | 1.7% | 13 |
| C424A PI-83 | Nutley silty clay, low precipitation, 0 to 2 percent slopes | 15,534.03 | 1.5% | 14 |
| C874C PI-26 | Wabek-Appam complex, 6 to 9 percent slopes | 14,188.33 | 1.3% | 15 |
| C800B PI-38 | Appam sandy loam, 2 to 6 percent slopes | 12,965.15 | 1.2% | 16 |
| C5A PI-5 | Southam silty clay loam, 0 to 1 percent slopes | 11,551.57 | 1.1% | 17 |
| C996 PI-0 | Water | 11,315.72 | 1.1% | 18 |
| C415A PI-83 | Tansem loam, 0 to 2 percent slopes | 10,955.16 | 1.0% | 19 |
| C825A PI-62 | Divide loam, 0 to 2 percent slopes | 8,748.43 | 0.8% | 20 |
| C201A PI-95 | Bowbells loam, 0 to 3 percent slopes | 7,347.66 | 0.7% | 21 |
| C810A PI-57 | Bowdle loam, 0 to 2 percent slopes | 7,283.29 | 0.7% | 22 |
| C205A PI-75 | Bowbells-Tonka complex, 0 to 3 percent slopes | 5,932.05 | 0.6% | 23 |
| C424B PI-80 | Nutley silty clay, low precipitation, 2 to 6 percent slopes | 5,507.21 | 0.5% | 24 |
| E4005A PI-27 | Harriet loam, 0 to 2 percent slopes, occasionally flooded | 5,323.18 | 0.5% | 25 |
| E2145B PI-82 | Shambo loam, 2 to 6 percent slopes | 4,828.32 | 0.5% | 26 |
| C2A PI-42 | Tonka silt loam, 0 to 1 percent slopes | 4,788.72 | 0.4% | 27 |
| F661B PI-74 | Forman-Buse loams, west, 3 to 6 percent slopes | 4,731.57 | 0.4% | 28 |
| C665B PI-58 | Noonan-Niobell-Williams loams, 0 to 6 percent slopes | 4,622.56 | 0.4% | 29 |
| C584A PI-26 | Harriet loam, 0 to 2 percent slopes | 4,594.73 | 0.4% | 30 |

▶ Top 30 soils in the County

| | Acres | Percent |
|--------------------|---------------------|---------------|
| Top 3 Soils | 453,530.92 | 42.5% |
| Top 5 Soils | 604,315.57 | 56.6% |
| Top 10 Soils | 769,979.86 | 72.2% |
| Top 20 Soils | 914,572.83 | 85.7% |
| Top 30 Soils | 969,532.12 | 90.9% |
| Total Soils | 1,066,892.05 | 100.0% |



FARMS Processing – FARMS Program

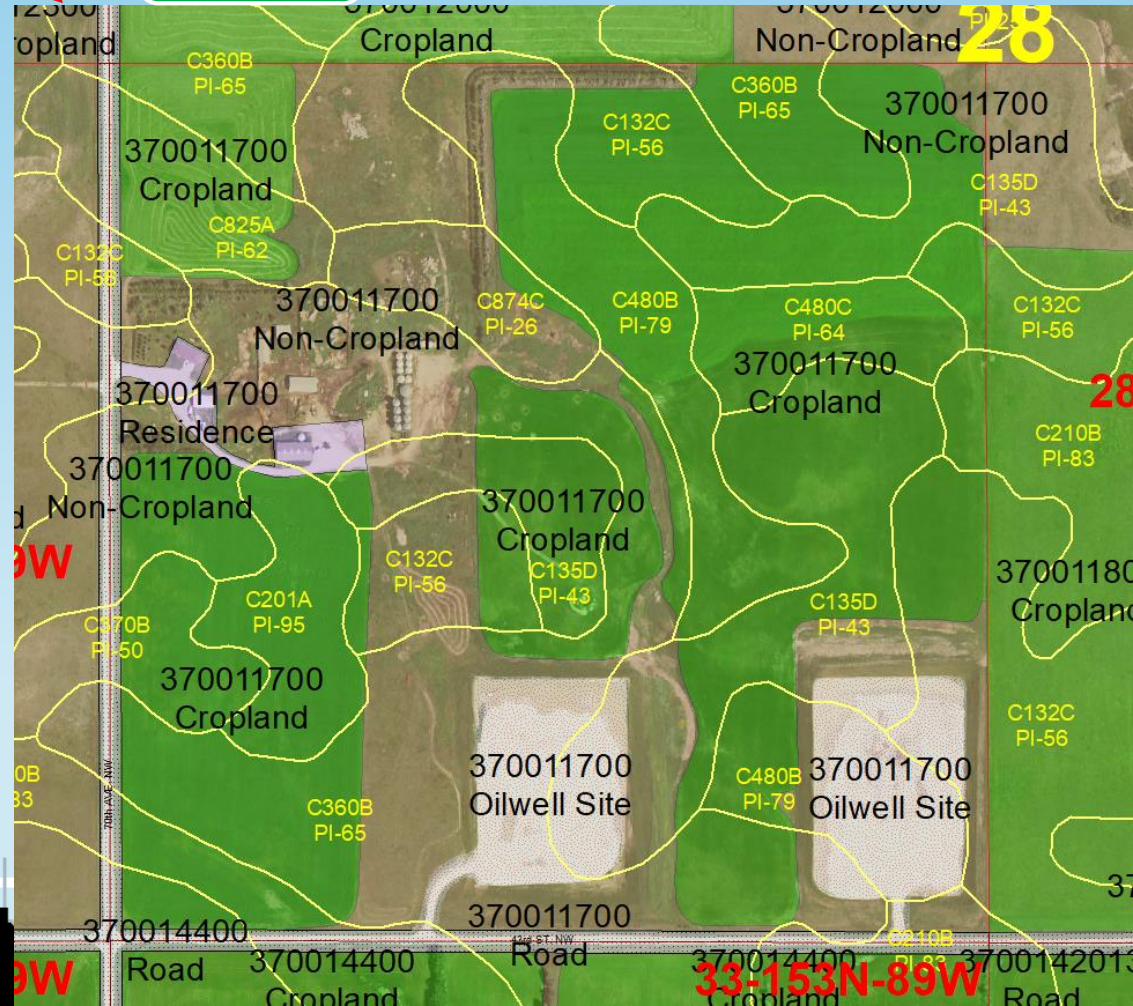


Sample Parcel –
SW ¼ Section

- ▶ Cropland, noncrop, Residence, Oil Site, Roads
- ▶ Utilizes Soil Types within Actual Land use
- ▶ “Slices” Actual Land use and Soil Type layers into acres – used for valuation
- ▶ Plenty of data provided
 - ▶ This parcel – 32 rows
 - ▶ Entire county - 107,671 rows

FARMS
Toolbar

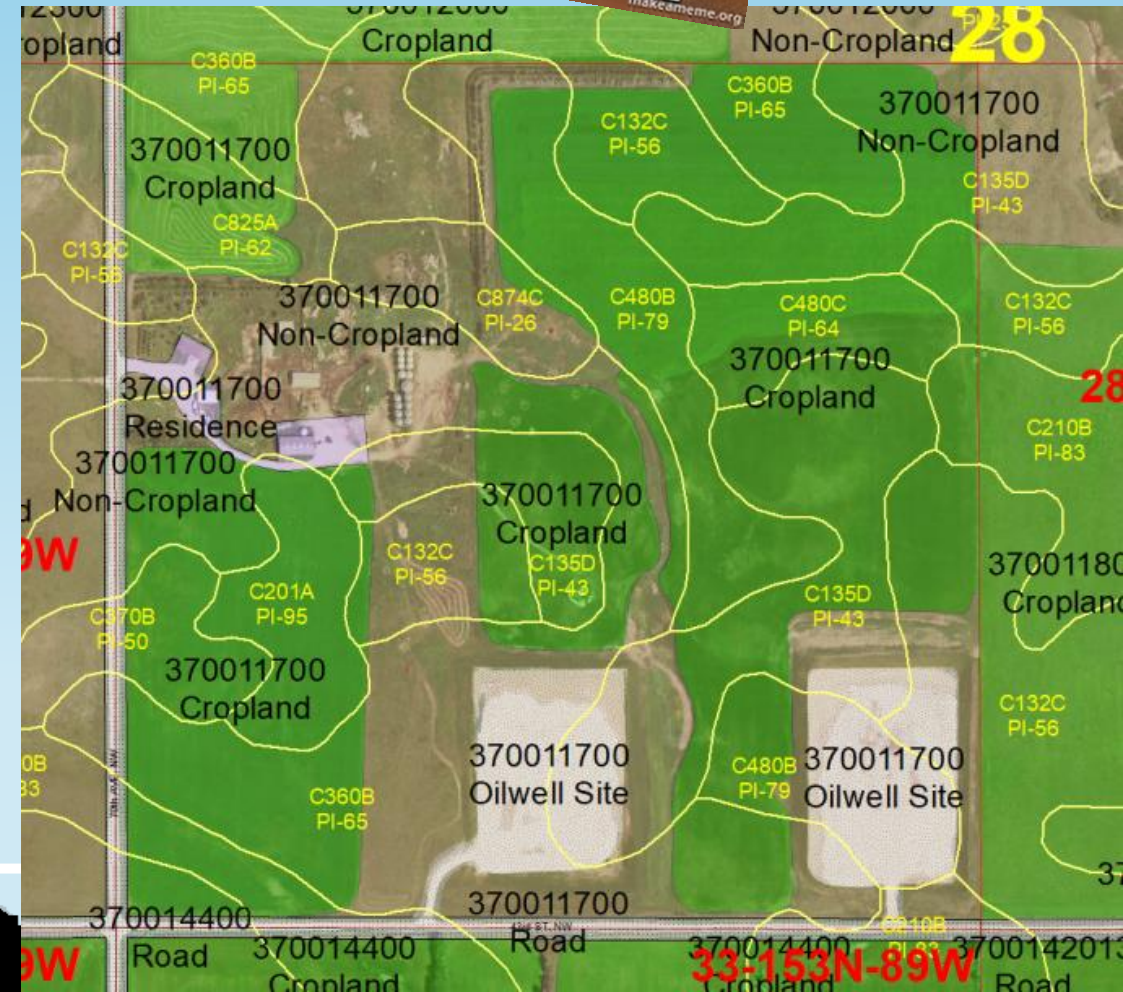
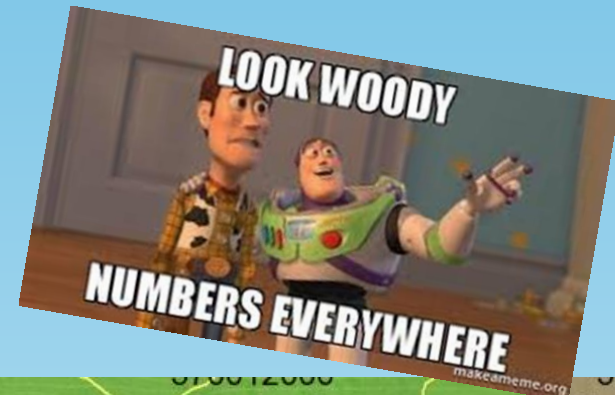
Area Distribution Land Value Debasement Options



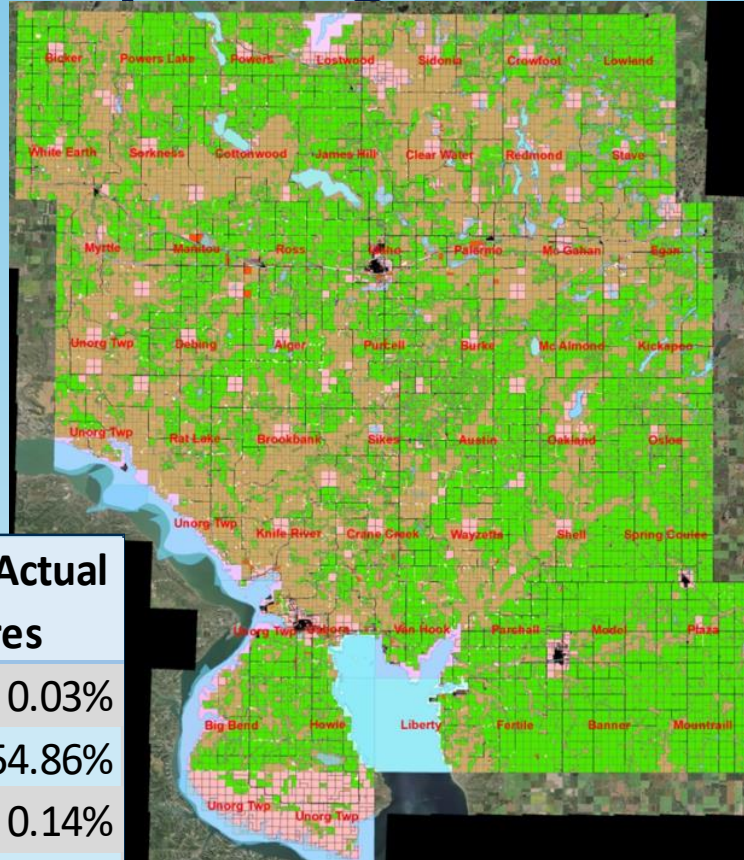
FARMS Program Processing



| ParcelNo | Township | Soil_Code | Soil_Name | SpotSymDB_Code | Productivity Index | AUM | Distributed_Acre | Landuse |
|-----------|-----------------|-----------|---|----------------|--------------------|-------|------------------|--------------|
| 370011700 | 37-Shell 153-89 | C201A | Bowbells loam, 0 to 3 percent slopes | | 95 | 55.94 | 6.3 | Cropland |
| 370011700 | 37-Shell 153-89 | C210B | Williams-Bowbells loams, 3 to 6 percent slopes | | 83 | 48.43 | 3.26 | Cropland |
| 370011700 | 37-Shell 153-89 | C480B | Shambo loam, 2 to 6 percent slopes | | 79 | 42.57 | 12.06 | Cropland |
| 370011700 | 37-Shell 153-89 | C360B | Livona fine sandy loam, 0 to 6 percent slopes | | 65 | 42.31 | 24.07 | Cropland |
| 370011700 | 37-Shell 153-89 | C480C | Shambo loam, 6 to 9 percent slopes | | 63 | 39.82 | 5.09 | Cropland |
| 370011700 | 37-Shell 153-89 | C825A | Divide loam, 0 to 2 percent slopes | | 62 | 60.45 | 4.28 | Cropland |
| 370011700 | 37-Shell 153-89 | C132C | Williams-Zahl-Zahill complex, 6 to 9 percent slopes | | 61 | 40.97 | 11.45 | Cropland |
| 370011700 | 37-Shell 153-89 | C370B | Krem-Lihen loamy fine sands, 0 to 6 percent slopes | | 50 | 42.63 | 3.42 | Cropland |
| 370011700 | 37-Shell 153-89 | C135D | Zahl-Williams loams, 9 to 15 percent slopes | | 43 | 39.64 | 21.11 | Cropland |
| 370011700 | 37-Shell 153-89 | C874C | Wabek-Appam complex, 6 to 9 percent slopes | | 26 | 28.89 | 0.46 | Cropland |
| 370011700 | 37-Shell 153-89 | C201A | Bowbells loam, 0 to 3 percent slopes | | 95 | 55.94 | 0.03 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C210B | Williams-Bowbells loams, 3 to 6 percent slopes | | 83 | 48.43 | 1.48 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C480B | Shambo loam, 2 to 6 percent slopes | | 79 | 42.57 | 2.57 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C360B | Livona fine sandy loam, 0 to 6 percent slopes | | 65 | 42.31 | 20.76 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C825A | Divide loam, 0 to 2 percent slopes | | 62 | 60.45 | 0.69 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C132C | Williams-Zahl-Zahill complex, 6 to 9 percent slopes | | 61 | 40.97 | 10.88 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C135D | Zahl-Williams loams, 9 to 15 percent slopes | | 43 | 39.64 | 6.05 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C874C | Wabek-Appam complex, 6 to 9 percent slopes | | 26 | 28.89 | 4.55 | Non-Cropland |
| 370011700 | 37-Shell 153-89 | C210B | Williams-Bowbells loams, 3 to 6 percent slopes | | 83 | 48.43 | 0.17 | Oilwell Site |
| 370011700 | 37-Shell 153-89 | C480B | Shambo loam, 2 to 6 percent slopes | | 79 | 42.57 | 4.28 | Oilwell Site |
| 370011700 | 37-Shell 153-89 | C360B | Livona fine sandy loam, 0 to 6 percent slopes | | 65 | 42.31 | 4.8 | Oilwell Site |
| 370011700 | 37-Shell 153-89 | C132C | Williams-Zahl-Zahill complex, 6 to 9 percent slopes | | 61 | 40.97 | 1.21 | Oilwell Site |
| 370011700 | 37-Shell 153-89 | C135D | Zahl-Williams loams, 9 to 15 percent slopes | | 43 | 39.64 | 3.11 | Oilwell Site |
| 370011700 | 37-Shell 153-89 | C201A | Bowbells loam, 0 to 3 percent slopes | | 95 | 55.94 | 0.11 | Residence |
| 370011700 | 37-Shell 153-89 | C201A | Williams-Bowbells loams, 3 to 6 percent slopes | | 95 | 55.94 | 0.11 | Residence |



Detailed Acreage Reporting



| Land Use | Actual Use Acres | Percent of Actual Use Acres |
|--------------------|---------------------|-----------------------------|
| Commercial | 334.80 | 0.03% |
| Cropland | 583,785.01 | 54.86% |
| Gravel Pit | 1,496.77 | 0.14% |
| Non-Ag | 123.23 | 0.01% |
| NonCrop | 457,047.22 | 42.95% |
| Oilwell Site | 7,618.84 | 0.72% |
| Residence | 790.80 | 0.07% |
| Road | 12,964.26 | 1.22% |
| (blank) | | 0.00% |
| Grand Total | 1,064,160.93 | 100.00% |

| Land Use | Actual Use Acres | Percent of Actual Use Acres |
|----------------------------|------------------|-----------------------------|
| 01-Lowland 158-88 | | |
| Cropland | 16,906.39 | 15.67% |
| NonCrop | 4,837.26 | 4.48% |
| Residence | 3.97 | 0.00% |
| Road | 343.95 | 0.32% |
| 02-Crowfoot 158-89 | | |
| Cropland | 10,858.88 | 10.06% |
| NonCrop | 10,366.88 | 9.61% |
| Oilwell Site | 17.07 | 0.02% |
| Residence | 7.32 | 0.01% |
| Road | 250.69 | 0.23% |
| 03-Sidonia 158-90 | | |
| Cropland | 4,662.05 | 4.32% |
| NonCrop | 15,002.39 | 13.90% |
| Oilwell Site | 98.18 | 0.09% |
| Residence | 5.95 | 0.01% |
| Road | 200.89 | 0.19% |
| 34-Rat Lake 154-93 | | |
| Commercial | 6.04 | 0.01% |
| Cropland | 8,380.50 | 7.77% |
| Gravel Pit | 60.42 | 0.06% |
| NonCrop | 12,473.27 | 11.56% |
| Oilwell Site | 295.64 | 0.27% |
| Residence | 11.24 | 0.01% |
| Road | 206.27 | 0.19% |
| 48-Mountrail 151-88 | | |
| Cropland | 19,619.87 | 18.18% |
| NonCrop | 2,959.16 | 2.74% |
| Road | 334.56 | 0.31% |



Data used for generating values for each soil code



| Acres Total | | Landuse | |
|-------------|-----------|-----------|-------------|
| PI | Soil_Code | Cropland | Grand Total |
| 95 | C201A | 5,963.54 | 5,963.54 |
| 95 | E3501A | 3.45 | 3.45 |
| 93 | C451B | 1.92 | 1.92 |
| 91 | C411A | 2,237.44 | 2,237.44 |
| 89 | C201B | 1.86 | 1.86 |
| 89 | E0835A | 101.18 | 101.18 |
| 88 | C477A | 642.65 | 642.65 |
| 88 | F656B | 8.65 | 8.65 |
| 87 | C419A | 4.03 | 4.03 |
| 87 | F658A | 3,959.30 | 3,959.30 |
| 86 | C210A | 43,994.26 | 43,994.26 |
| 85 | C164A | 0.33 | 0.33 |
| 85 | C501A | 243.98 | 243.98 |
| 84 | E0837B | 1,136.29 | 1,136.29 |
| 84 | F658B | 78.49 | 78.49 |
| 83 | C210B | 54,669.65 | 54,669.65 |
| 83 | C415A | 9,522.17 | 9,522.17 |
| 83 | C419B | 7.57 | 7.57 |
| 83 | C424A | 13,689.88 | 13,689.88 |
| 83 | F657B | 14.82 | 14.82 |
| 82 | C477B | 334.55 | 334.55 |
| 82 | E2145B | 2,929.06 | 2,929.06 |
| 82 | E4137A | 1,072.02 | 1,072.02 |
| 81 | C527A | 823.85 | 823.85 |
| 81 | F659A | 191.62 | 191.62 |
| 80 | C424B | 4,824.32 | 4,824.32 |
| 80 | F655A | 152.36 | 152.36 |
| 79 | C149B | 389.51 | 389.51 |
| 79 | C164B | 1.22 | 1.22 |
| 79 | C480B | 3,328.54 | 3,328.54 |
| 78 | C418B | 3,359.05 | 3,359.05 |

| Acres Total | | Landuse | | Grand Total |
|-------------|-----------|--------------|--------------|-------------|
| AUM_vPI | Soil_Code | Non-Cropland | Oilwell Site | Total |
| 100.00 | C3A | 16,516.76 | 16.85 | 16,533.61 |
| 94.22 | E4751A | 18.54 | | 18.54 |
| 89.59 | F3A | 78.91 | | 78.91 |
| 77.40 | F2A | 88.04 | | 88.04 |
| 75.28 | C2A | 1,864.67 | 10.29 | 1,874.96 |
| 69.25 | C207A | 0.17 | | 0.17 |
| 68.55 | C272A | 5,540.78 | 70.66 | 5,611.44 |
| 67.64 | F100A | 23.47 | | 23.47 |
| 62.65 | C270A | 2,023.17 | 21.50 | 2,044.67 |
| 62.20 | C205A | 1,028.56 | 38.50 | 1,067.06 |
| 61.81 | C75A | 2,587.72 | 3.21 | 2,590.93 |
| 60.45 | C825A | 3,915.22 | 38.37 | 3,953.59 |
| 60.35 | F656B | 0.12 | | 0.12 |
| 59.52 | C580A | 212.66 | 0.43 | 213.09 |
| 58.19 | F659A | 43.13 | 1.21 | 44.34 |
| 57.33 | C584A | 4,221.58 | 6.37 | 4,227.95 |
| 55.94 | C201A | 1,231.90 | 53.06 | 1,284.96 |
| 55.85 | C451B | 0.24 | 0.21 | 0.45 |
| 55.83 | F659B | 94.01 | | 94.01 |
| 55.08 | C165F | 37,330.95 | 137.45 | 37,468.40 |
| 54.49 | F655A | 18.33 | | 18.33 |
| 54.12 | C148C | 55.67 | 0.27 | 55.94 |
| 53.83 | C149B | 18.67 | | 18.67 |
| 53.43 | F658A | 158.10 | | 158.10 |
| 51.83 | F146C | 47.80 | | 47.80 |
| 49.76 | E4767A | 63.38 | | 63.38 |
| 49.17 | F658B | 18.16 | | 18.16 |
| 48.43 | C210B | 4,184.81 | 225.67 | 4,410.48 |
| 47.52 | E4137A | 1,207.68 | 1.05 | 1,208.73 |
| 46.29 | F661B | 290.62 | 0.71 | 291.33 |
| 46.19 | F147C | 1.08 | | 1.08 |

- ▶ Valuation sheet utilizes acres, PI or AUM
- ▶ Based off State Average Acre values
- ▶ Weighted calculation
- ▶ Arrives at a per acre value for each soil code for crop and noncrop



Soils Valuation Actual Land use – 2019 Values



Better Soils



Poorer Soils

| Productivity Index (PI) or AUM | Land Valuation – Cropland | Non-Crop AUM |
|--------------------------------|---------------------------|--------------|
| 95 | \$974 | \$380 |
| 90 | \$872 | \$342 |
| 80 | \$818 | \$295 |
| 70 | \$720 | \$270 |
| 60 | \$614 | \$228 |
| 50 | \$516 | \$192 |
| 40 | \$409 | \$152 |
| 30 | \$312 | \$114 |
| 20 | \$205 | \$76 |
| 10 | \$93 | \$38 |
| 0 (Water) | \$16 | \$16 |

2019 Values

NDSU Ag Land
Production Value
Average Ag - \$454.62
Cropland - \$692.46
NonCrop - \$156.54



FARMS processed and overall Ag Land Values



| Land Use | Actual Use Acres | Percent of Actual Use Acres | Total Value | Percent of Total Value |
|--------------------|---------------------|-----------------------------|----------------------|------------------------|
| Commercial | 334.80 | 0.03% | \$0 | 0.00% |
| Cropland | 583,785.01 | 54.86% | \$391,166,486 | 84.57% |
| Gravel Pit | 1,496.77 | 0.14% | \$0 | 0.00% |
| Non-Ag | 123.23 | 0.01% | \$0 | 0.00% |
| NonCrop | 457,047.22 | 42.95% | \$70,201,573 | 15.18% |
| Oilwell Site | 7,618.84 | 0.72% | \$1,184,966 | 0.26% |
| Residence | 790.80 | 0.07% | \$0 | 0.00% |
| Road | 12,964.26 | 1.22% | \$0 | 0.00% |
| (blank) | | 0.00% | | 0.00% |
| Grand Total | 1,064,160.93 | 100.00% | \$462,553,026 | 100.00% |

***Note: Only Ag Related Acres are valued**

| Land Use | Actual Use Acres | Percent of Actual Use Acres | Total Value |
|----------------------------|------------------|-----------------------------|--------------|
| 01-Lowland 158-88 | | | |
| Cropland | 16,906.39 | 15.67% | \$11,669,808 |
| NonCrop | 4,837.26 | 4.48% | \$705,233 |
| Residence | 3.97 | 0.00% | \$0 |
| Road | 343.95 | 0.32% | \$0 |
| 02-Crowfoot 158-89 | | | |
| Cropland | 10,858.88 | 10.06% | \$6,451,763 |
| NonCrop | 10,366.88 | 9.61% | \$1,647,974 |
| Oilwell Site | 17.07 | 0.02% | \$2,596 |
| Residence | 7.32 | 0.01% | \$0 |
| Road | 250.69 | 0.23% | \$0 |
| 03-Sidonia 158-90 | | | |
| Cropland | 4,662.05 | 4.32% | \$2,557,570 |
| NonCrop | 15,002.39 | 13.90% | \$2,650,996 |
| Oilwell Site | 98.18 | 0.09% | \$15,830 |
| Residence | 5.95 | 0.01% | \$0 |
| Road | 200.89 | 0.19% | \$0 |
| 34-Rat Lake 154-93 | | | |
| Commercial | 6.04 | 0.01% | \$0 |
| Cropland | 8,380.50 | 7.77% | \$5,551,158 |
| Gravel Pit | 60.42 | 0.06% | \$0 |
| NonCrop | 12,473.27 | 11.56% | \$1,931,692 |
| Oilwell Site | 295.64 | 0.27% | \$45,240 |
| Residence | 11.24 | 0.01% | \$0 |
| Road | 206.27 | 0.19% | \$0 |
| 48-Mountrail 151-88 | | | |
| Cropland | 19,619.87 | 18.18% | \$15,466,023 |
| NonCrop | 2,959.16 | 2.74% | \$527,571 |
| Road | 334.56 | 0.31% | \$0 |



A Year and a Half Ago....

"How do we do this....?"



RORY'S "BEAUTIFUL MIND"

VANGUARD ROCKS!

RON JOY SURF SHOP
ONE OF A KIND

BRAIN BUBBLES!

MUST ID ACRES BY LAYERS

TEST-AXLER POWERS RAT LAKE

TRG

IAAO-811-INTRO GIS-18HRS \$100
 IAAO-812-ADV GIS-18HRS \$100
 IAAO-102-INC. APPROACH-30 ROY \$400

SOILS LAYER
 - @ CODE - not color
 - ARCMAP
 - FARM RES Ex → non-crop
 - 2 AC RES
 - OILSITES/ROADS
 - CRP
 - GRAVEL
 - SPECIAL
 - TREES + BORDERS
 - PRIVATE DRIVE

WHAT IS UNIQUE ABOUT THIS PICTURE?

MAX \$2800
 \$1600
 \$1697
 \$1380
 \$1261
 \$1970
 \$1260
 \$1260

12-1200 \$100 2016 AB VALUE

16-6515 -D-2016

NEW PLAN

VMS PROJECT - \$5265
 VMS VISIO - \$68999 + \$33799
 SIDWELL DISCUSSIONS
 FARMS - \$1599 / \$999 MAINT.

ARC MAP - \$1250 / \$400-500 ANNUAL
 - TRAINING - 1-1.5 DAYS

SW TOOLS INVESTIGATION
 - OFFROAD - \$24-25K/ATR
 - SIDWELL GIS - FARMS
 - NAIP AIRPHOTO

CROP/NON CROP TOOLS
 - CROPSCAPE
 - ASBIO DATA

B/TAX DEFT REPORTING TOOLS & FARMS SERVER

SCHOOL DIST
 VOTING DIST
 AMBUANCE
 FIRE

770/300

2 VALUES

NEED DEN

SIDWELL GIS
 UPDATE AERIAL PHOTOGRAPHY - \$900/120YR
 - YEARLY ALSO

LAND USE LAYER(S) \$86K
 - CROP
 - NON-CROP
 - OTHERS

EXAMPLE COUNTY W/LAND USE
 - WHAT IS PROVIDED

FARMS QUARTERLY PULL - \$1500

PORTICO WHEN
 - WHEN TO ROUND SOIL CODES? PARCEL

LAYERS HISTORICAL PHOTOGRAPHY
 CROPLAND CRP
 NONCROPLAND 3A, 515
 - RANGELAND
 - PASTURE LAND
 NON PRODUCTIVE
 ALL MODIFIERS
 INNOVATED TAMP ROADS, CITY ROADS

COMMERCIAL OIL SITES
 SALT WATER
 RESIDENTIAL
 ? - ASMT CODES

VALUE SCHEDULES
 Pi
 AUM
 NON PRODUCTIVE

DO NOT ERASE

SOILS' GAO
 \$421.83
 8942
 1,066,991.70
 \$450,085,337.04

2-132017
 3942
 6,991.70
 1,569,500
 \$412.85

DO NOT ERASE

Diff 8,515,872.04

\$422.13
 422.93
 450,114,400

Go BACK - BTTF
 w/PARCELS
 26x30
 = 520

STATE AID
 5510K
 SECTIONS ≈ 1800
 UG's - 1

WHAT IS UNIQUE ABOUT THIS PICTURE?

W/ AMSTRONG
 ED ALLEN
 MICHAEL COLLINS

DISCUSS TRACES + BORDERS PRIVATE DRIVE

SPACE

D-U
D-U
D-P

GIS is the Answer!

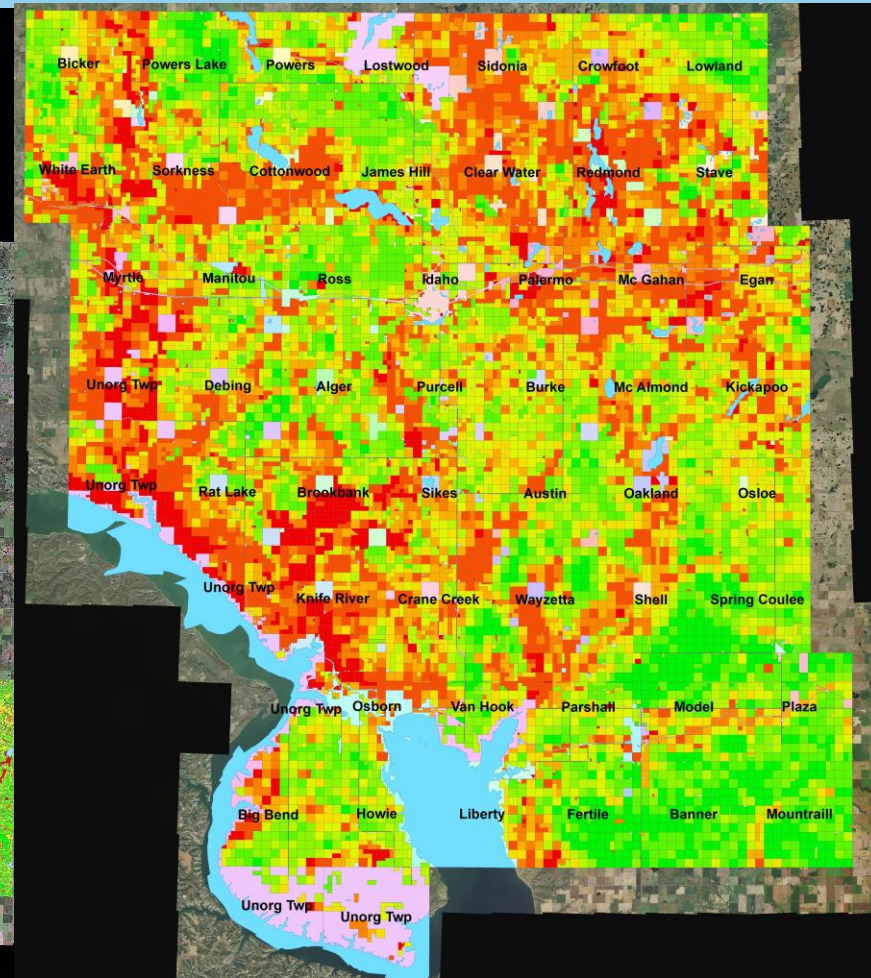
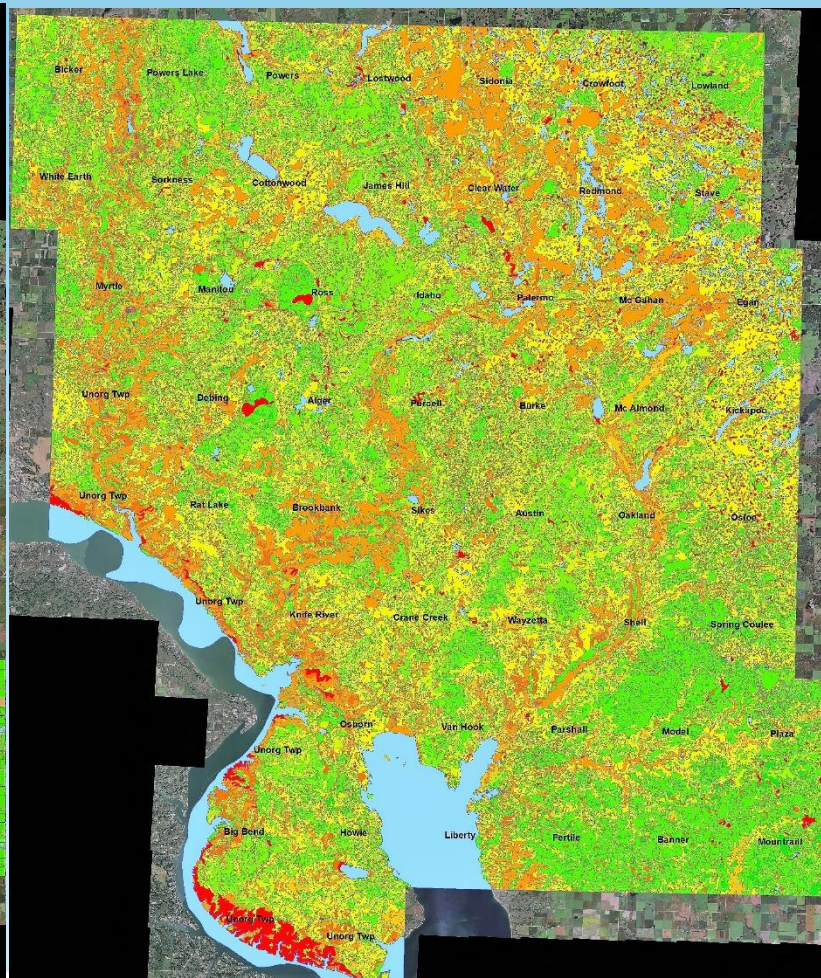
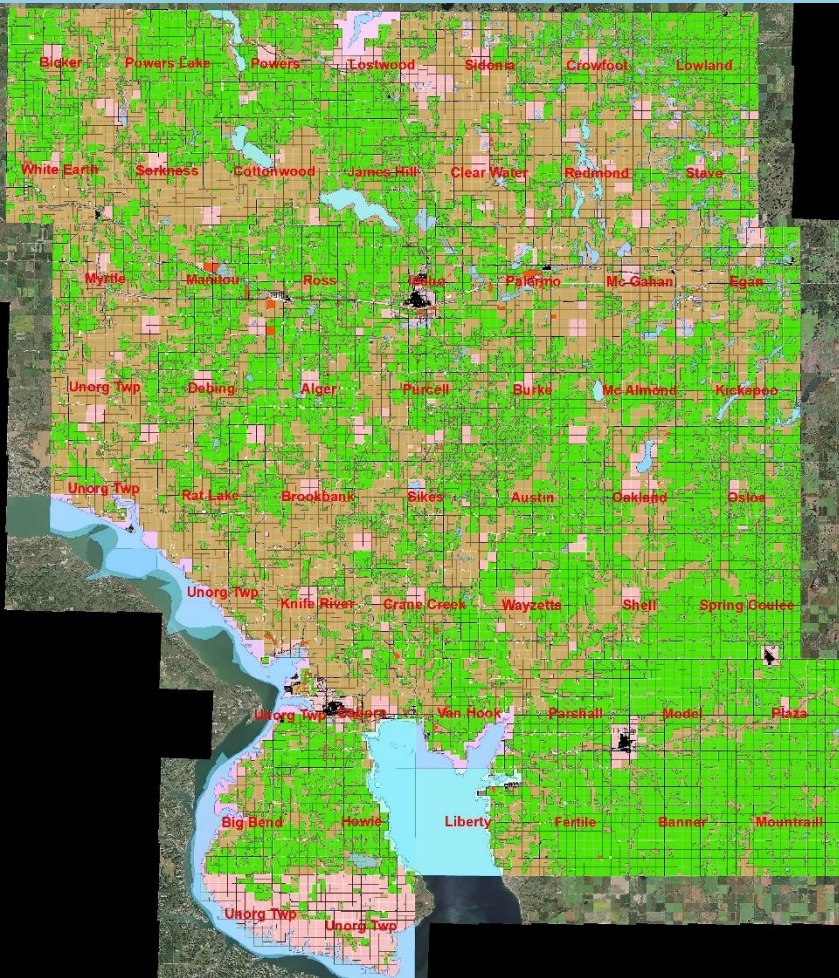


2019 Average Ag Land

Actual Use Layer

NRCS Soils Quality Layer

Value per Acre



Robust Communication Campaign

- ▶ Ongoing throughout life of project
- ▶ Several Soils Committee meetings
 - ▶ Collaborative effort for rulesets
 - ▶ Additional input and suggestions
- ▶ Attendance at Township Review Meetings
- ▶ **Result? - “Ownership” of Ag Land Solution**
- ▶ Articles in the official County paper
- ▶ Presentations at County Commissioner meetings
- ▶ Presentations at Township Officer’s meetings
- ▶ Presentation to Lion’s Club
- ▶ Township Review Meetings – 55 Townships!
 - ▶ Ag Land Valuation overview
 - ▶ Reviewed and updated individual’s land for Actual Land Use



Page 3

Township Officers Meet

(Continued from Page 1)

legislative bodies that they speak to and be heard. The proposed legislative changes mean to help municipal officers in most entities, but townships are “ground zero” and they need to be heard because even a small change can make a big impact. Richard also encouraged townships to take advantage of the county maintenance and assistance programs as well as the uniform permit system.

Tom Wheeler of the New Township Officers Association reminded officers about the state meeting in Blomington on December 4 and 5 and the speakers they lined up. He stressed also the township officers’ communication with the state organization about what they need. They are an advisory board to help townships and he encouraged townships to use their website to find information.

He also expressed his concerns about how townships are getting out, using townships’ ability to speak up, get out there and be heard. Townships in western North Dakota need money to keep the roads in good shape. Meanwhile there is the perception that the area has more money than they need. Roads are finally getting better, but if funding isn’t there they will be back where they were. He also worried about the next legislative session and the impact it will have on the producing counties.

The final presentation came from the County Treasurer’s office, Lori Hansen, Rory Poth and Teresa Caplan were on hand. Hansen first discussed the annual township tax equalization meeting, saying that townships consider holding those meetings in centralized locations so that her office can hold several in the same day in consecutive order. Some townships did that last year and it made the process easier.

Up next, they discussed the changes to land valuation after the county’s equalization meeting this year. They had originally proposed to use the benchmark method, but after that meeting it was decided to use actual land use and detailed acre as a valuation method. To do that, a contract was established and they are developing the land use drawings. Using Richard, they started with three sections of land as the first test and did a pilot township use with Rice Lake Township. This is a complex process and they were offering information to help township officers understand what they are in the process and how it will move forward.

Rory Poth started by describing the process of going through the 1.65 million acres of agricultural land in Mountain County. The state requirements and rules are a complex process. They will be using the latest GIS, NRCS data and township and the county tax system as they move forward.

The GIS system will provide data layers. Right now the county website has the soil types layer, but they will also be adding the land use layer and more as they go. The maps can include much more information, here as they go. The committee

LAND VALUATION RULESET

| Category | Options/Notes |
|---------------------------|---|
| Residential | Commercial/Industrial/Office/PA |
| Non-Agricultural | Agricultural - General Use, Rural Limited Use, Wildlife Rehabilitation |
| Public/Utility | Recreation/Amusement |
| Special Use | 1. Residential with 50,000 sq ft or less (The 2015 20-year rule for 20-year-old homes) |
| Single-Family Residential | 2. Agricultural with 50,000 sq ft or less (The 2015 20-year rule for 20-year-old homes) |
| Commercial/Land Use | 3. All other agricultural uses (The 2015 20-year rule for 20-year-old homes) |
| Other | 4. All other agricultural uses (The 2015 20-year rule for 20-year-old homes) |
| Commercial/Land Use | Commercial/Industrial/Office/PA |
| Other | Commercial/Industrial/Office/PA |
| Other | Commercial/Industrial/Office/PA |

2019 Agricultural Land Valuation Information

From Lori Hansen, Director of Tax Equalization, Mountain County

Mountain County is in the process of implementing the use of detailed soil types with actual land use to determine the value of all agricultural land within the county. This actual valuation method is required by North Dakota Century Code 57-02-212.

The North Dakota Office of State Tax Commissioner provides counties with estimates of agricultural land value per acre on a state-wide and on a county-wide basis as compared for the year by the Agricultural and Applied Economics Department of NDSU. As part of the Web Soil Survey from the USDA (websoilsurvey.nrcs.usda.gov), soil types and productivity indices are identified for all lands within the county.

There is much to keep track of when utilizing Actual Land Use within Mountain County – for instance, Mountain County is comprised of:

- 55 Townships – 7 cities
- 1,903 Sections
- 1,071,355 Acres
- 1,241,393 Total Acres
- 2,565,000 SQ. AG. related acres
- 8,542 Ag related parcels
- 2,216 Ag related parcel owners
- 147 Soil Codes

Along with what Mountain County is comprised of listed above, for equalized valuations, the Assessor's office needs to know how each parcel is being actually used:

- Cropland
- Non-Cropland
- Farmstead
- Commercial
- Residential
- Gravel Pit
- Roads
- Oilwell Sites
- Solid-waste Disposal Units

Mountain County Property Assessor's office has completed all the Township reviews for the actual use of Agricultural Land in the county. These reviews consisted of contacting the Township officers, who are in turn contacted and contacted the Township officers to update the data for the actual use of Agricultural Land in the county. These reviews consisted of contacting the Township officers, who are in turn contacted and contacted the Township officers to update the data for the actual use of Agricultural Land in the county.

review all sections within the Township for any updates to the Actual Land Use layer drawn in on the map. All updates are then sent to the Assessor's office for approval, which included: the Actual Land Use drawing, the valuation release, and the historical assessment concept of "Once Cropped, Always Cropped" to make a 20 year window for cropland. This means that if the land was cropped within the last 20 years it is considered cropland, otherwise if in the last 20 years it was not cropped, it was considered non-cropland. Additionally, CRP land and hay land is considered cropland.

Richard also completed the initial county actual use GIS drawing in early spring of this year, and as of the middle of September 2018, Mountain County Property Assessor's office has completed all the Township reviews for the actual use of Agricultural Land in the county. These reviews consisted of contacting the Township officers, who are in turn contacted and contacted the Township officers to update the data for the actual use of Agricultural Land in the county.



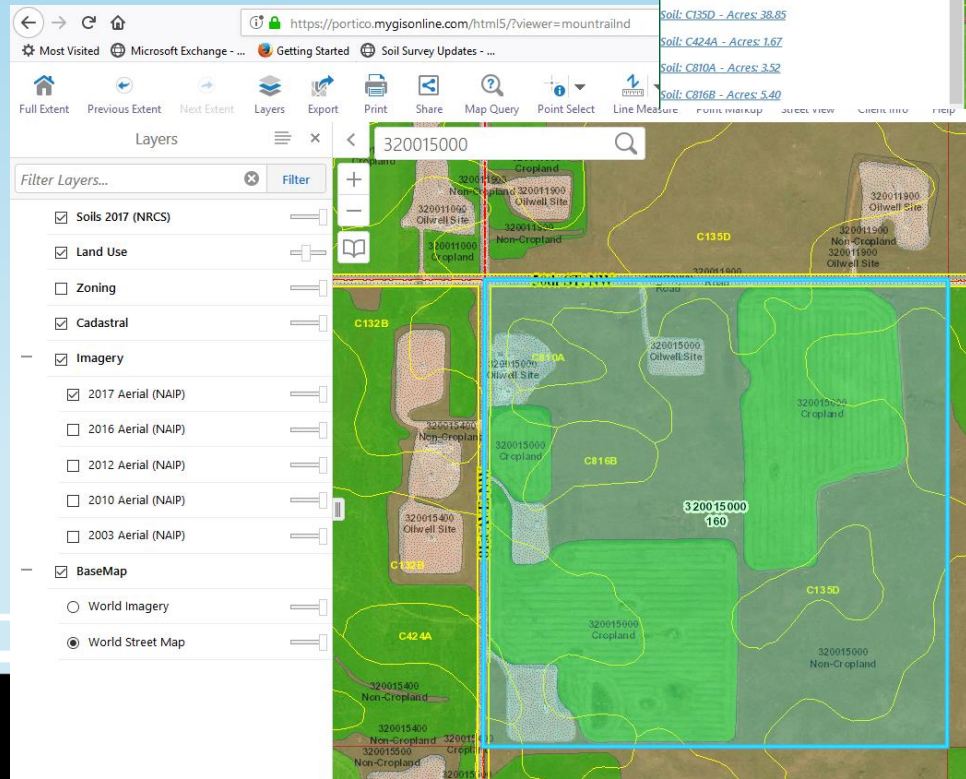
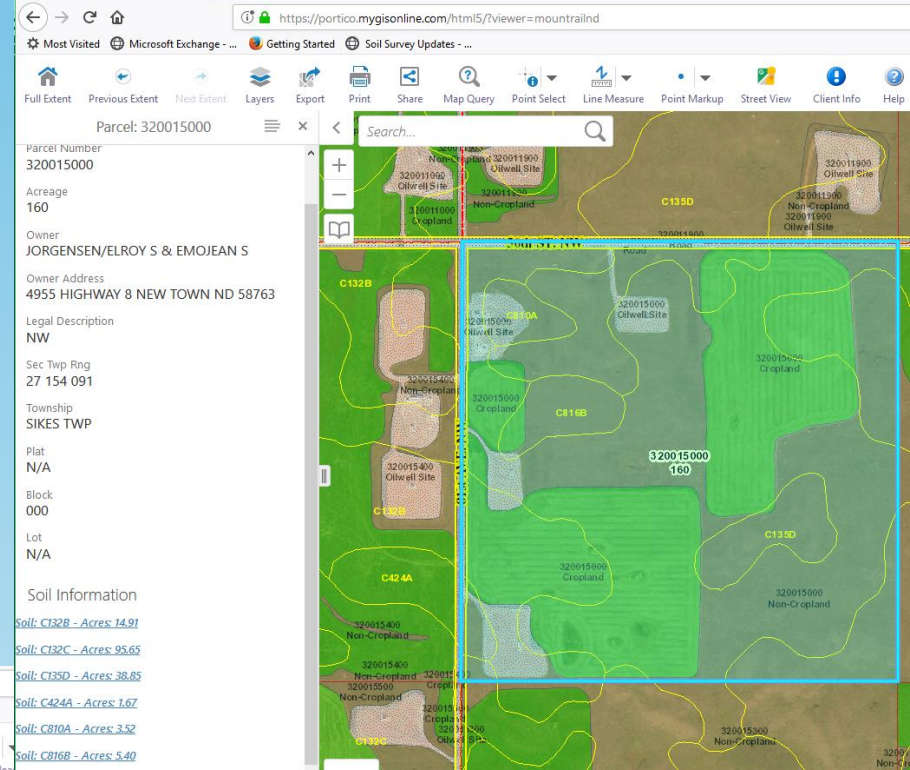
Township Review Meetings

▶ Section by Section Reviews



GIS – Public Facing

- ▶ Various search capabilities
- ▶ Several NAIP Years Aerial Photography available
- ▶ Actual use Layer
- ▶ Soils Layer and information
- ▶ Valuation Reporting

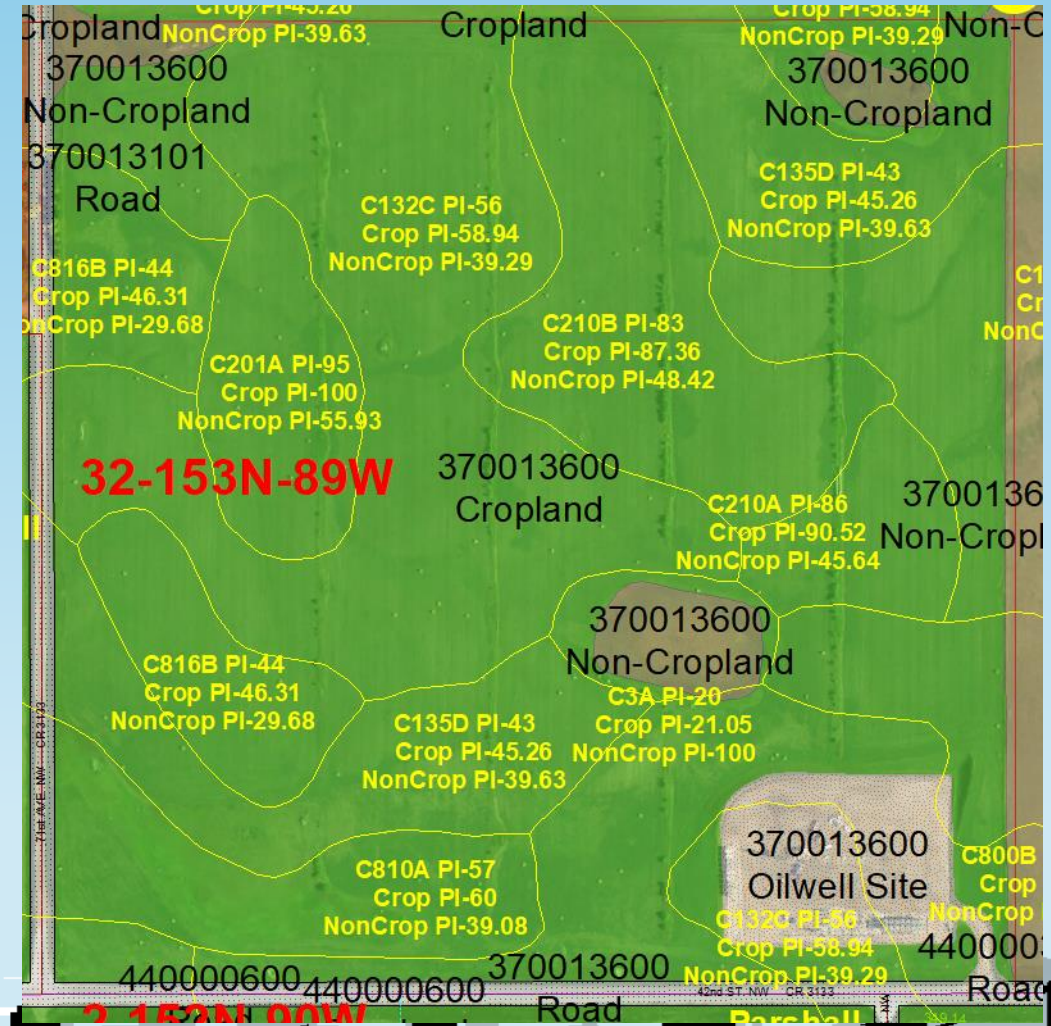


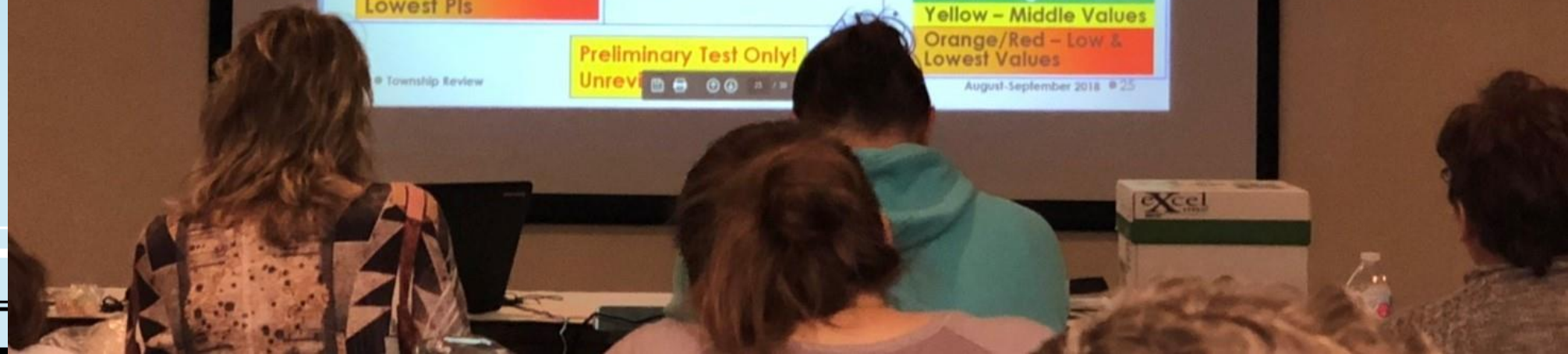
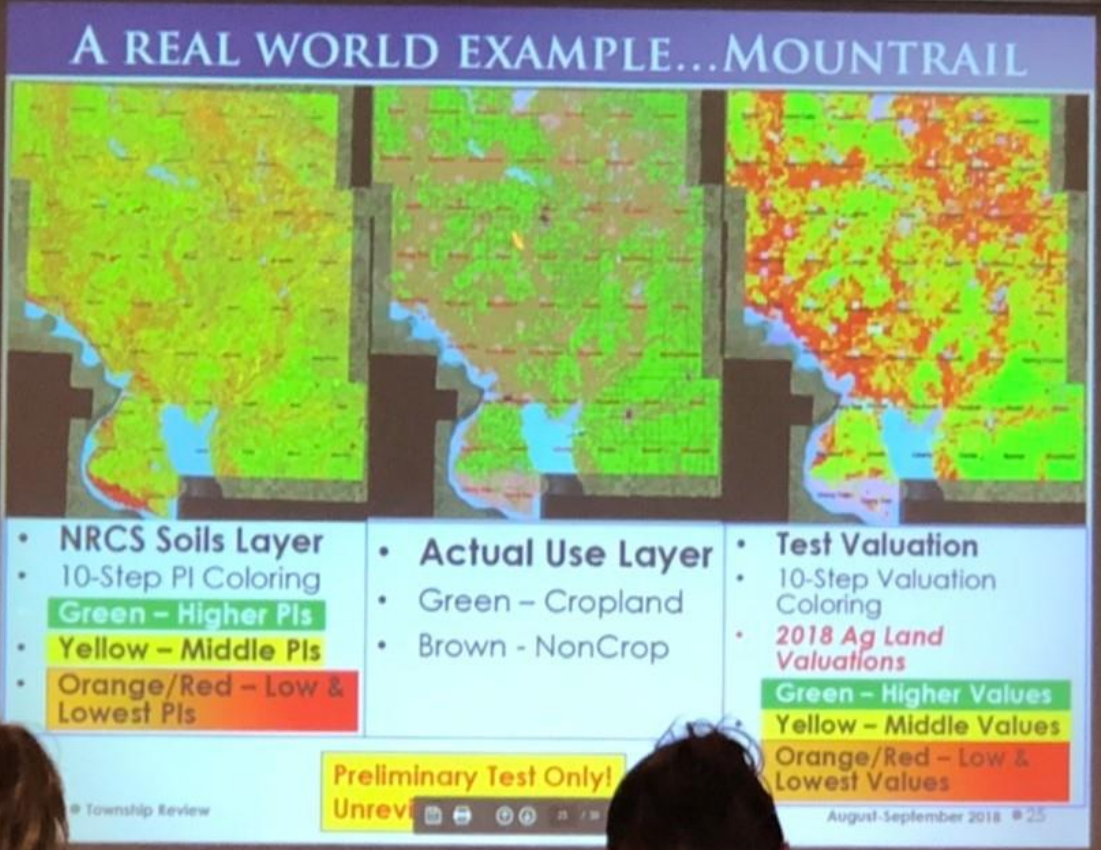
Reporting



Mountrail Final Calculation Report

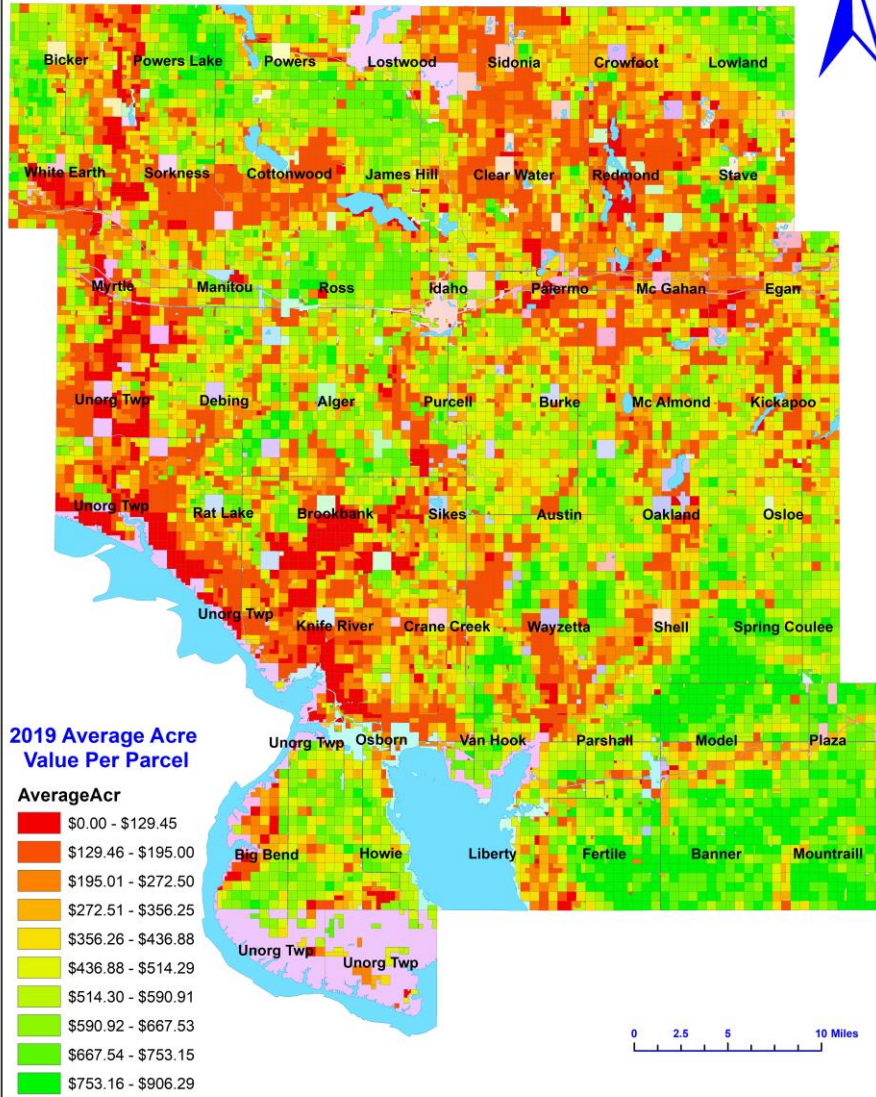
| PARCELS | CRP NUMBER | LAND USE | SOIL CODE | SOIL NAME | NET ACRES | RATE | VALUE |
|------------|------------|----------|-----------|--------------------------|-----------|------|-----------|
| 37-0013600 | | | | | | | |
| 157.49 | | | | | | | |
| | | AG | | | | | |
| | | | C132C | Williams-Zahl-Zahill | 47.75 | 623 | 29,768.78 |
| | | | C135D | Zahl-Williams loams, | 29.18 | 438 | 12,791.05 |
| | | | C201A | Bowbells loam, 0 to 3 | 7.31 | 974 | 7,120.74 |
| | | | C210A | Williams-Bowbells | 4.95 | 886 | 4,387.88 |
| | | | C210B | Williams-Bowbells | 16.78 | 847 | 14,220.55 |
| | | | C3A | Parnell silty clay loam, | 1.42 | 205 | 290.48 |
| | | | C800B | Appam sandy loam, 2 | 12.29 | 390 | 4,788.80 |
| | | | C810A | Bowdle loam, 0 to 2 | 9.79 | 584 | 5,721.96 |
| | | | C816B | Lehr loam, 2 to 6 | 11.12 | 448 | 4,982.76 |
| | | | | | 140.59 | | 84,073.00 |
| | | NCR | | | | | |
| | | | C132C | Williams-Zahl-Zahill | 1.74 | 156 | 270.99 |
| | | | C135D | Zahl-Williams loams, | 1.76 | 152 | 267.43 |
| | | | C3A | Parnell silty clay loam, | 2.50 | 380 | 949.65 |
| | | | C800B | Appam sandy loam, 2 | 0.25 | 156 | 38.94 |
| | | | | | 6.25 | | 1,527.01 |
| | | OS | | | | | |
| | | | C132C | Williams-Zahl-Zahill | 3.34 | 156 | 520.17 |
| | | | C135D | Zahl-Williams loams, | 0.13 | 152 | 19.75 |
| | | | C800B | Appam sandy loam, 2 | 3.27 | 156 | 509.27 |
| | | | | | 6.74 | | 1,049.19 |
| | | RD | | | | | |
| | | | C132C | Williams-Zahl-Zahill | 0.96 | 0 | 0.00 |
| | | | C135D | Zahl-Williams loams, | 0.66 | 0 | 0.00 |
| | | | C800B | Appam sandy loam, 2 | 1.45 | 0 | 0.00 |
| | | | C810A | Bowdle loam, 0 to 2 | 0.40 | 0 | 0.00 |
| | | | C816B | Lehr loam, 2 to 6 | 0.44 | 0 | 0.00 |
| | | | | | 3.91 | | 0.00 |
| | | | | | 157.49 | | 86,649.20 |
| | | | | | 157.49 | | 86,649.20 |



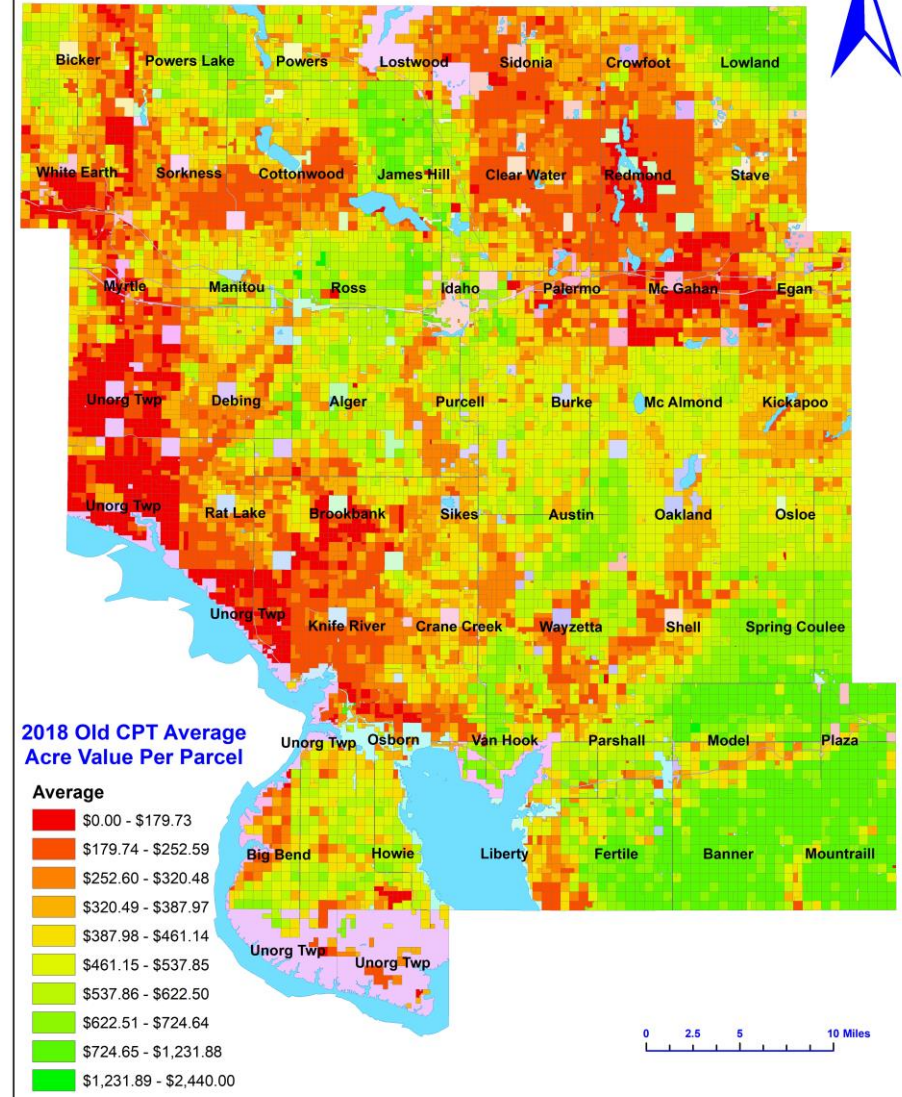


Finally...

Mountrail County - Average Acre Value



Mountrail County - Average Acre Value




Questions?



Rory Porth
Property Assessor
Mountrail County Tax Equalization

101 North Main St.
PO Box 69
Stanley, ND 58784-0069

Phone: 701.628.2425
Fax: 701.628.2276
E-mail: roryp@co.mountrail.nd.us

An illustration of a house with a red roof and a map, likely representing property assessment or tax equalization. The house is shown from a slightly elevated perspective, and the map is overlaid on the ground in front of it.



URISA



The logo for URISA, featuring the letters in a stylized, white, cursive font with a star-like shape at the end of the 'A'.

URISA

A photograph of the New Orleans skyline at night, with illuminated buildings and their reflections on the water. The text is overlaid on the bottom right of the image.

GIS-Pro 2019
September 28-October 2, 2019
New Orleans, LA

85TH ANNUAL IAAAO



CONFERENCE & EXPOSITION

SEPTEMBER 8-11, 2019  NIAGARA FALLS, ONTARIO, CANADA

Celebrating 60 Years of International Partnerships