GIS/CAMA 2019 Conference

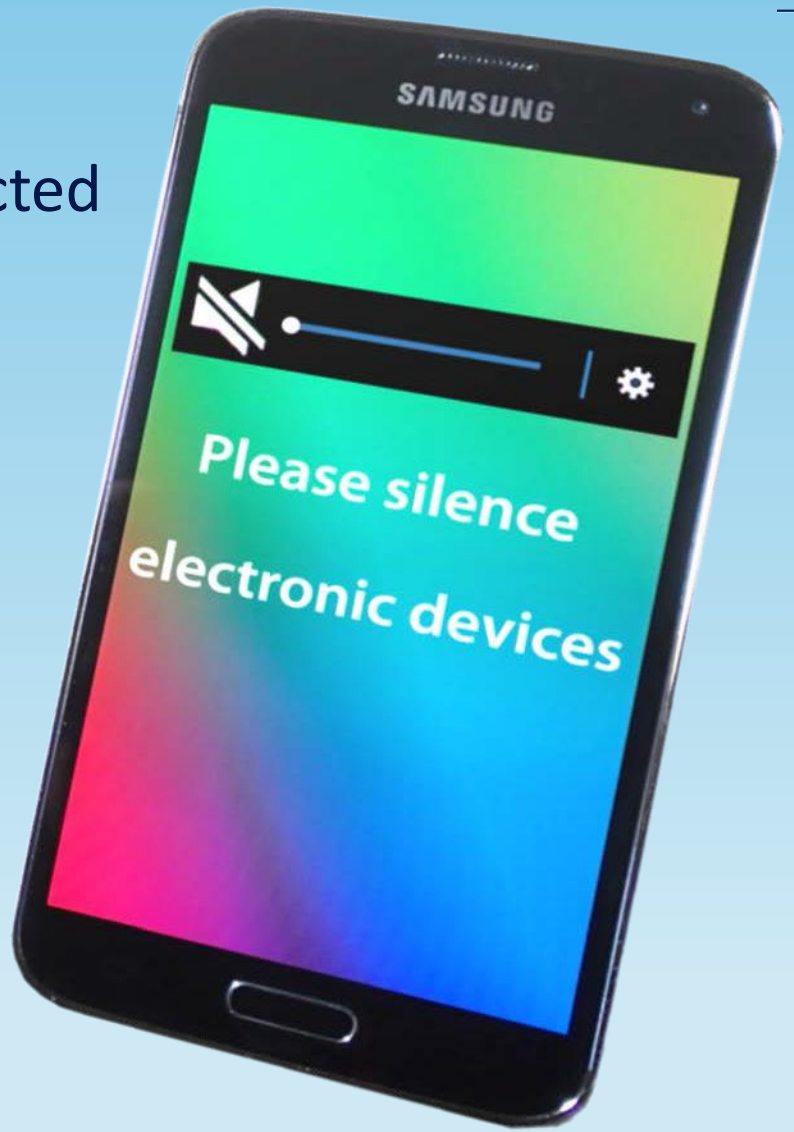
Portland, Oregon • February 25-28, 2019

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

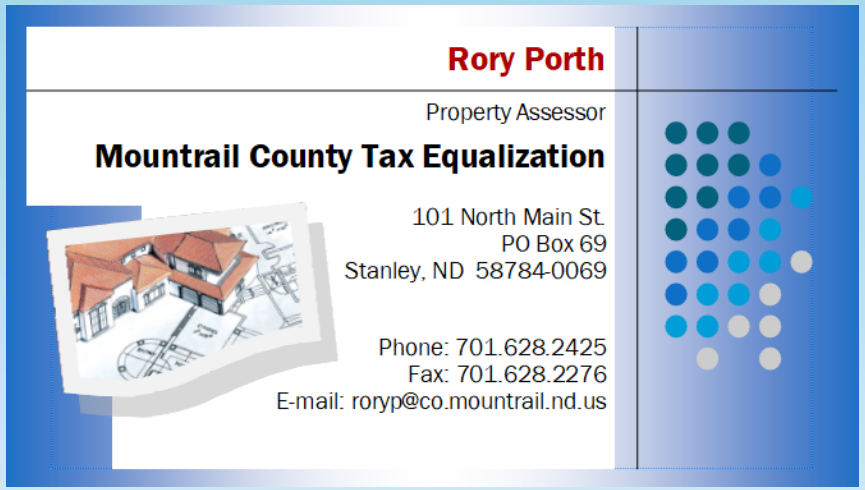
- What is very unique about this picture?

- *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

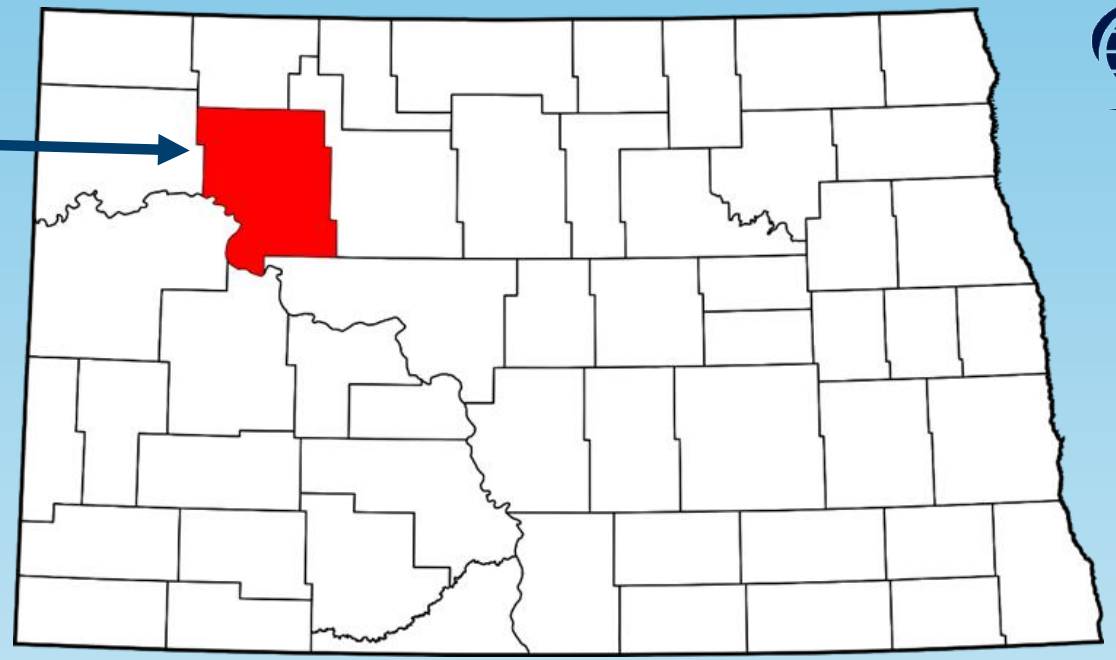


OK… the ‘fam’…


SPACE SHUTTLE ATLANTIS

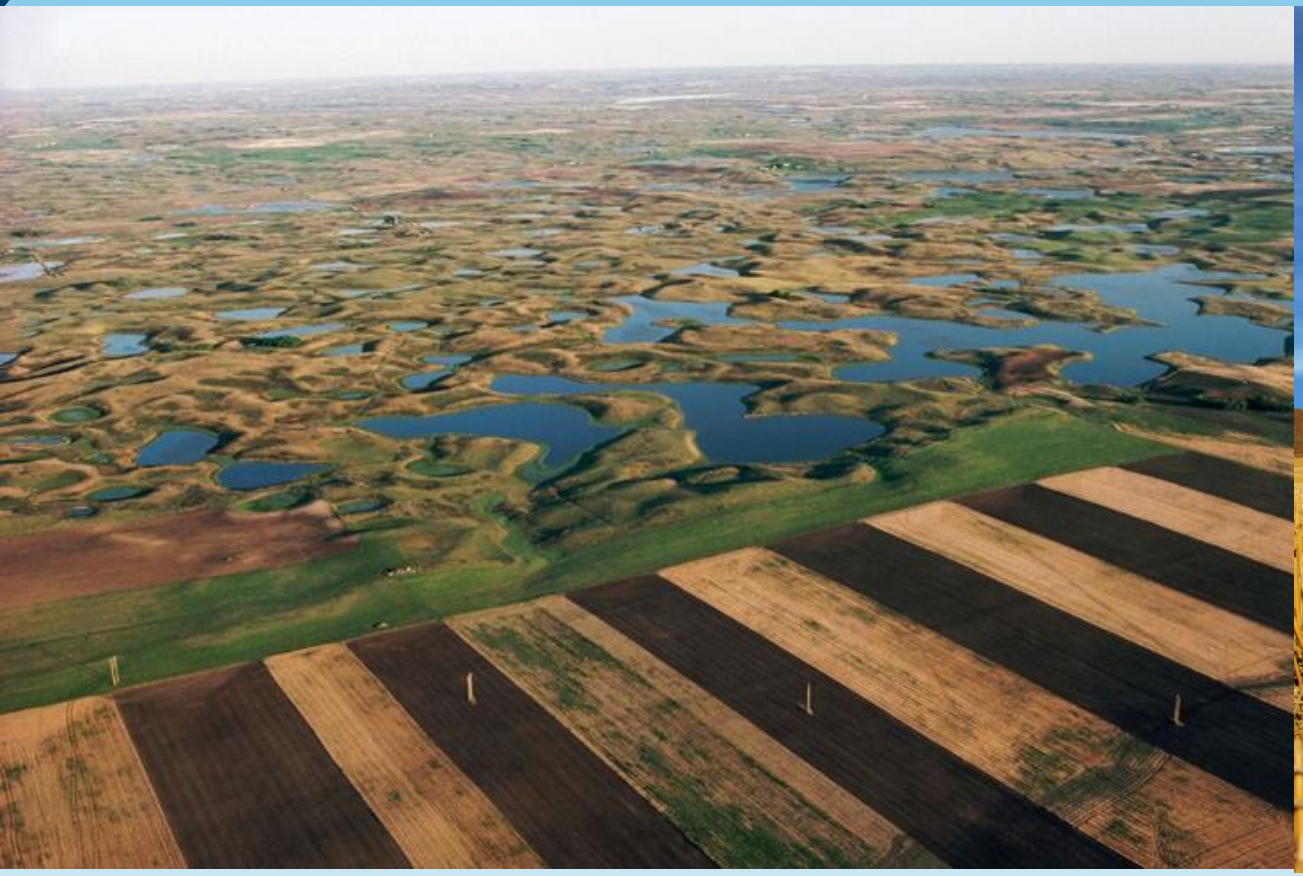

SPACE SHUTTLE ATLANTIS
DISCOVERY PASS

Mountrail County, North Dakota

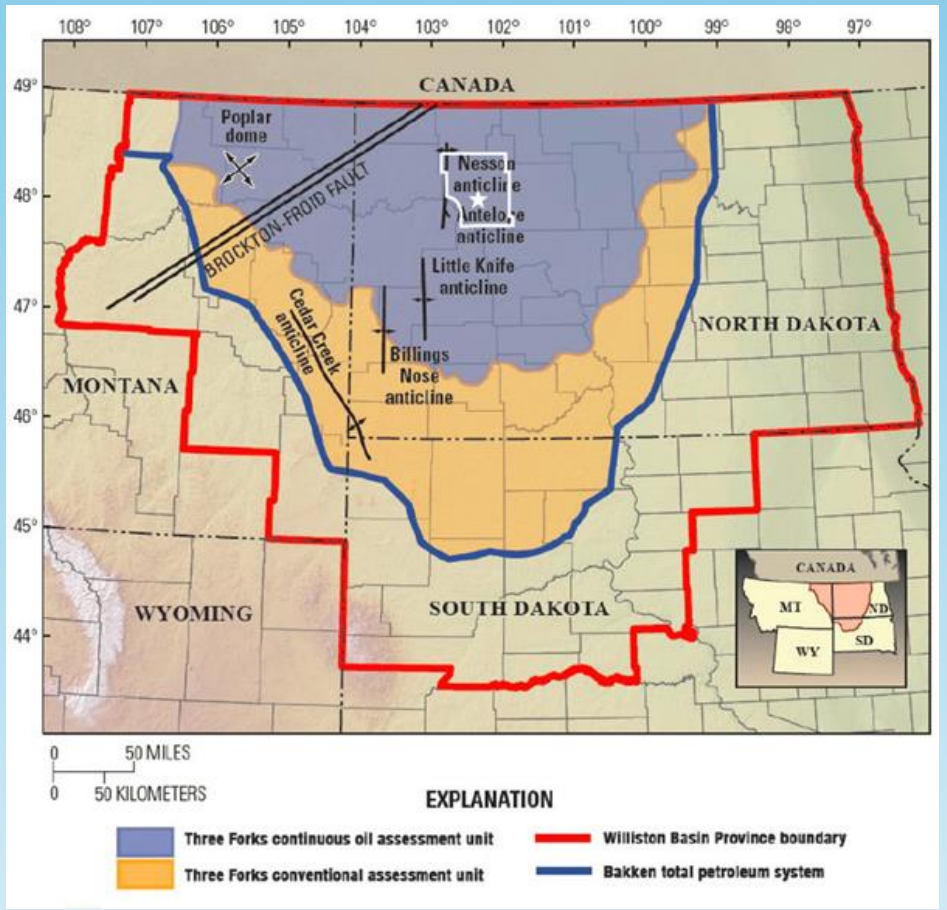


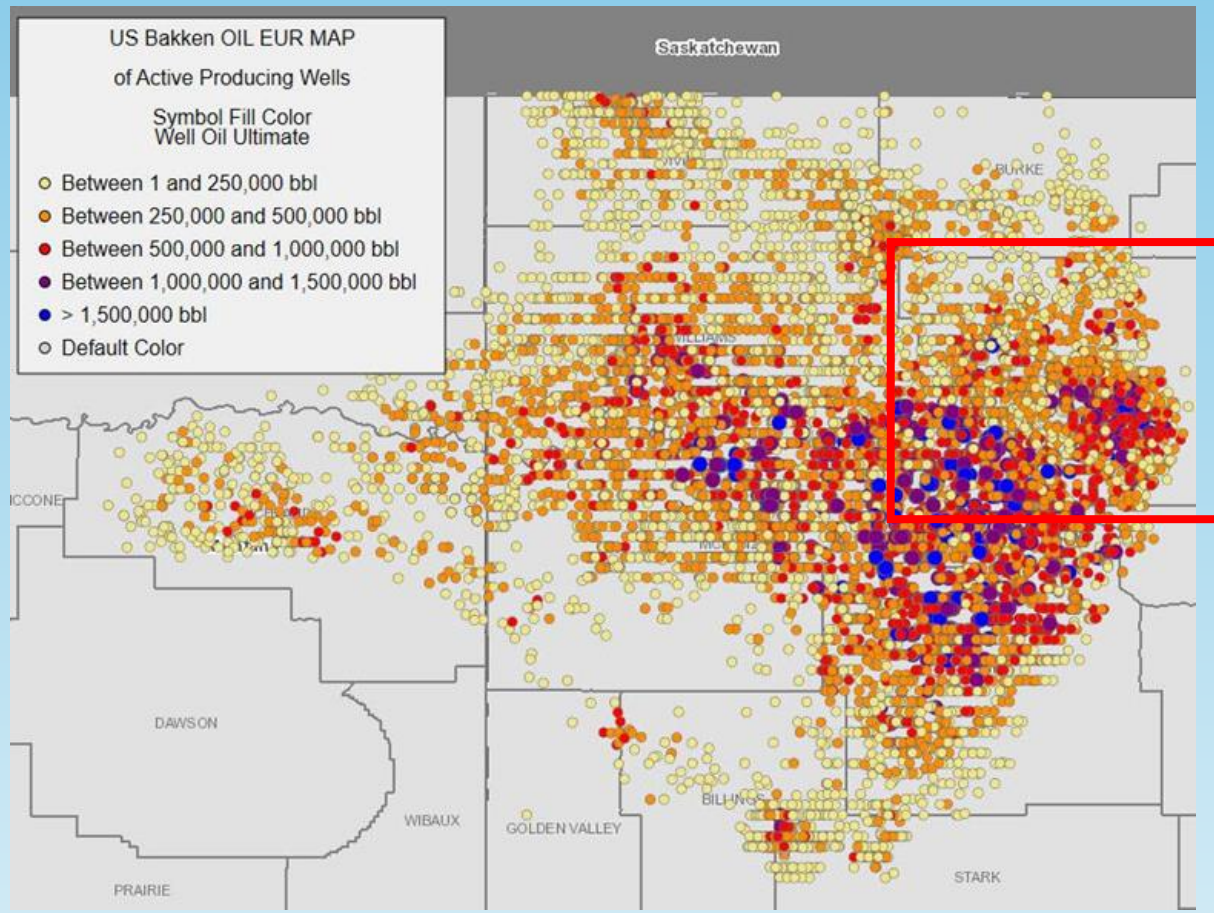
- 9th largest County by sq mi -1,824
- Population – 10,265 (2017 Census est)
- Density – approx. 5.6 persons per sq mi

What does Mountrail look like?



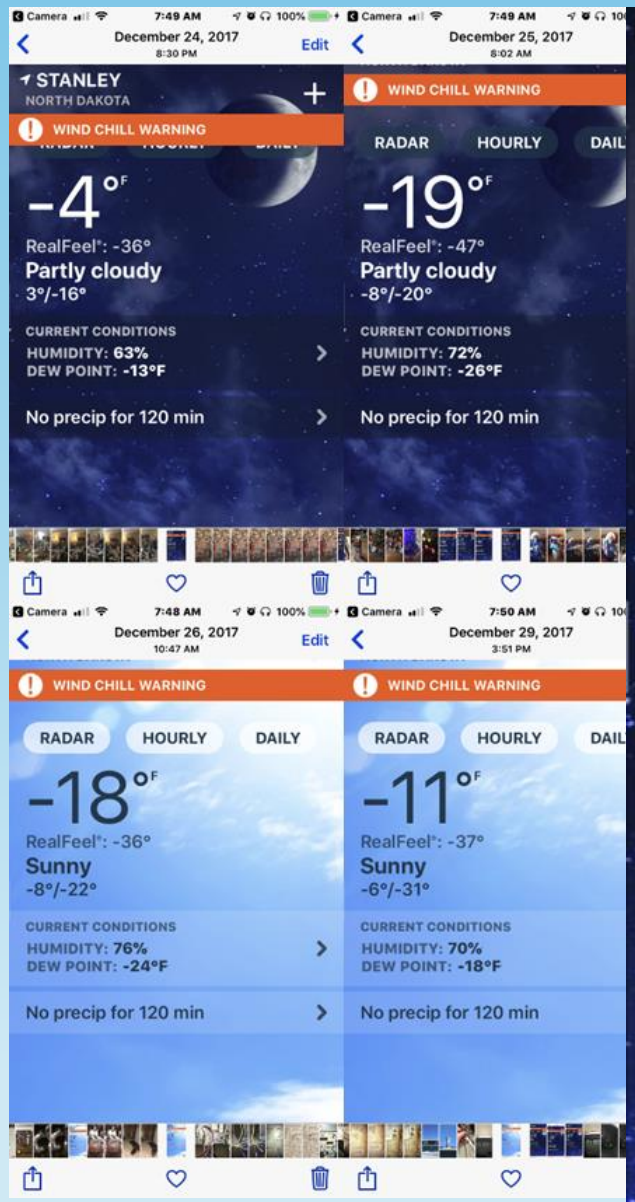
The Bakken - North Dakota is #2 Oil Producer in US





The Bakken

Winter Temps…
Uffda..



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**	

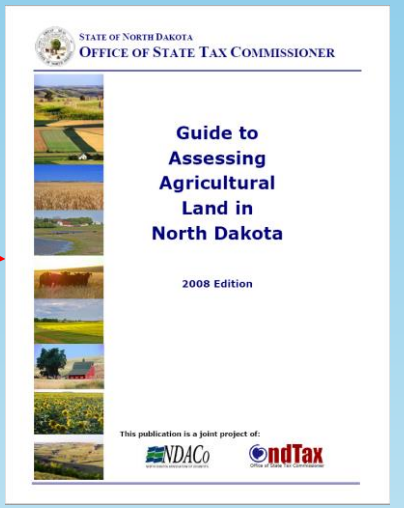
**NOTE: Centrally assessed properties are not included in the list*

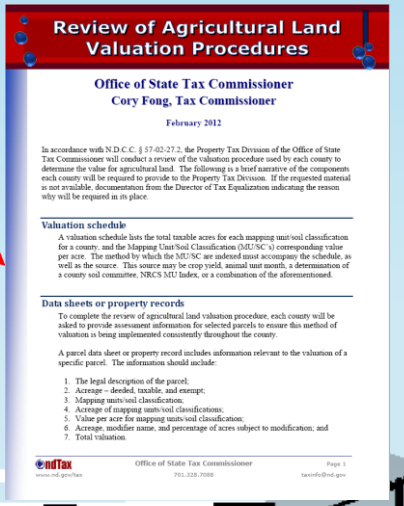
ND Century Code - "the Law"

- 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

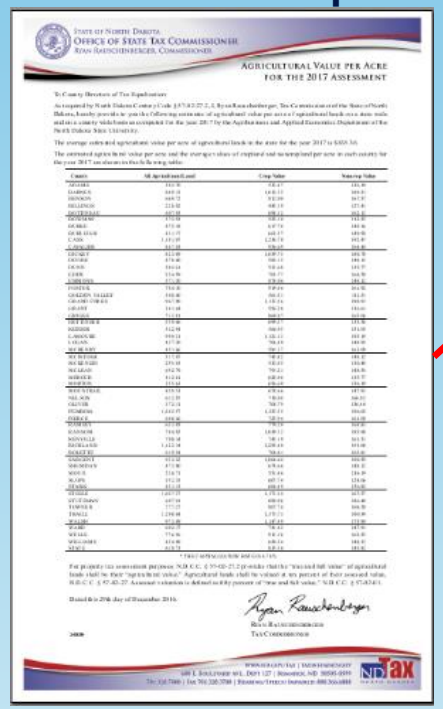
- **Must be based on soil type – detailed or general**
  - **Soils information from NRCS** – *National Resources Conservation Service* – US Dept. of Agriculture
  - Implement NDSU average values by NRCS soil type for Agricultural land valuation
  - State Tax Dept. Ag Land valuation guide & Certification 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

ND Tax Dept


STATE OF NORTH DAKOTA
OFFICE OF STATE TAX COMMISSIONER
RYAN RAUSCHENBERGER, COMMISSIONER

AGRICULTURAL VALUE PER ACRE
FOR THE 2017 ASSESSMENT

NDSU Ag Values

"Capitalized average annual gross return"

2019 Average Ag Land Values

NDSU Ag Land Production Value 2018

Average Ag - $454.62

Cropland - $692.46

NonCrop - $156.54

Problem: How to make Allocation Equitable?

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

How much to Where?

Mountrail Ag Acres

1,048,451.07

X **$454.62**

=

Ag Acre Total Value

$476,646,825

at 100% Threshold

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

Concerned Citizens of Mountrail County, including Charlie Sorenson and Fred Evans

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.

land use. He says that it appears that in the past years non-cropland and grasslands have been valued too low, while good value cropland has been valued too high

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

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

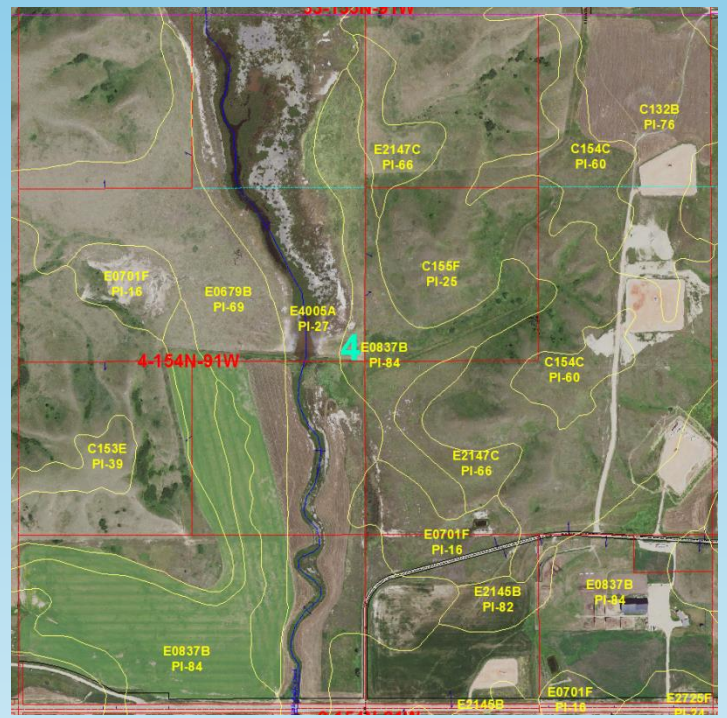
Attend the Mountrail County Equalization Meeting on Tuesday, June 6th at 10:00 a.m. at the courthouse.

Search online "ipetitions Mountrail County" and sign our petition

Paid for by Fred Evans and Charlie Sorenson

Ag Land Valuation

Example Section

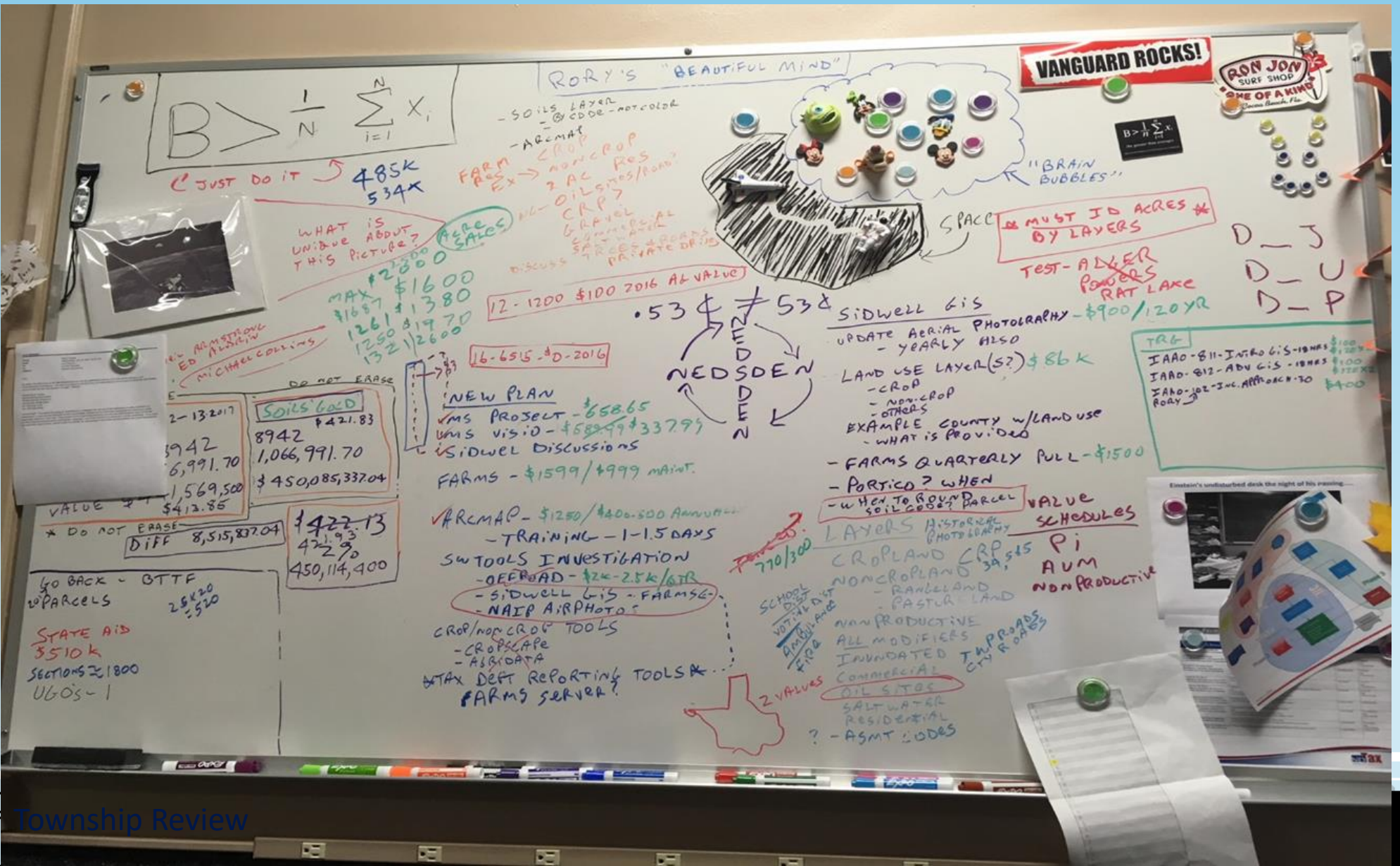


- Each parcel has various soil types within it
- Each soil type has a “Productivity index” associated
- Higher PI’s = better soil
- Higher PI’s have higher $ value applied, lower PI’s have a lower $ value applied
- ***2017 Mountrail used ND State approved ‘breakpoint method’ in setting values – did not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



Actual Land Use – Bounding the Problem

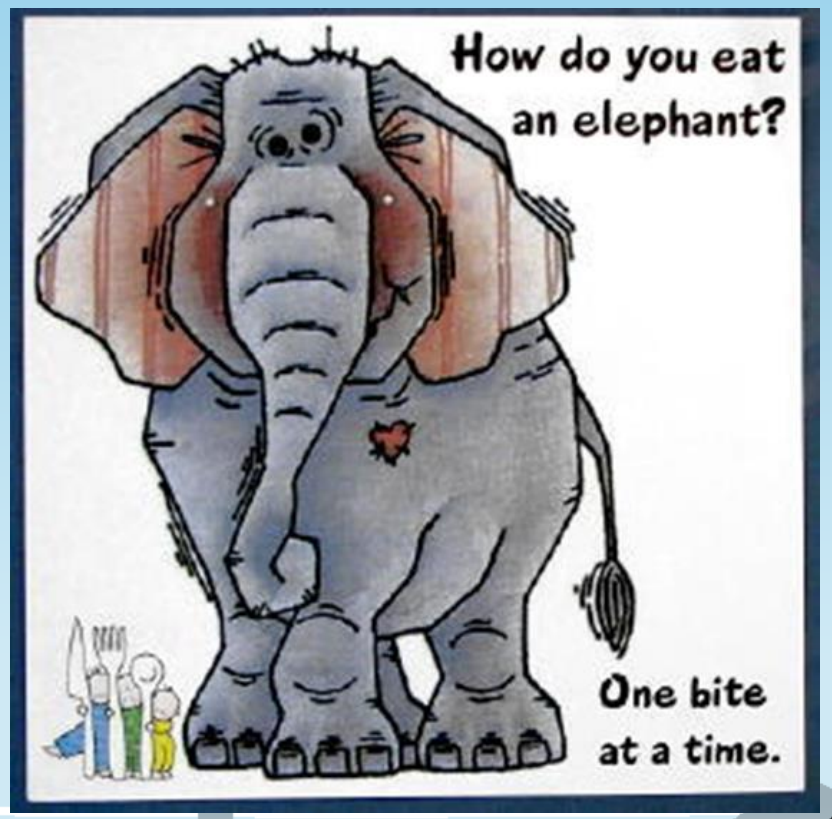
Much to keep track of:

- 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

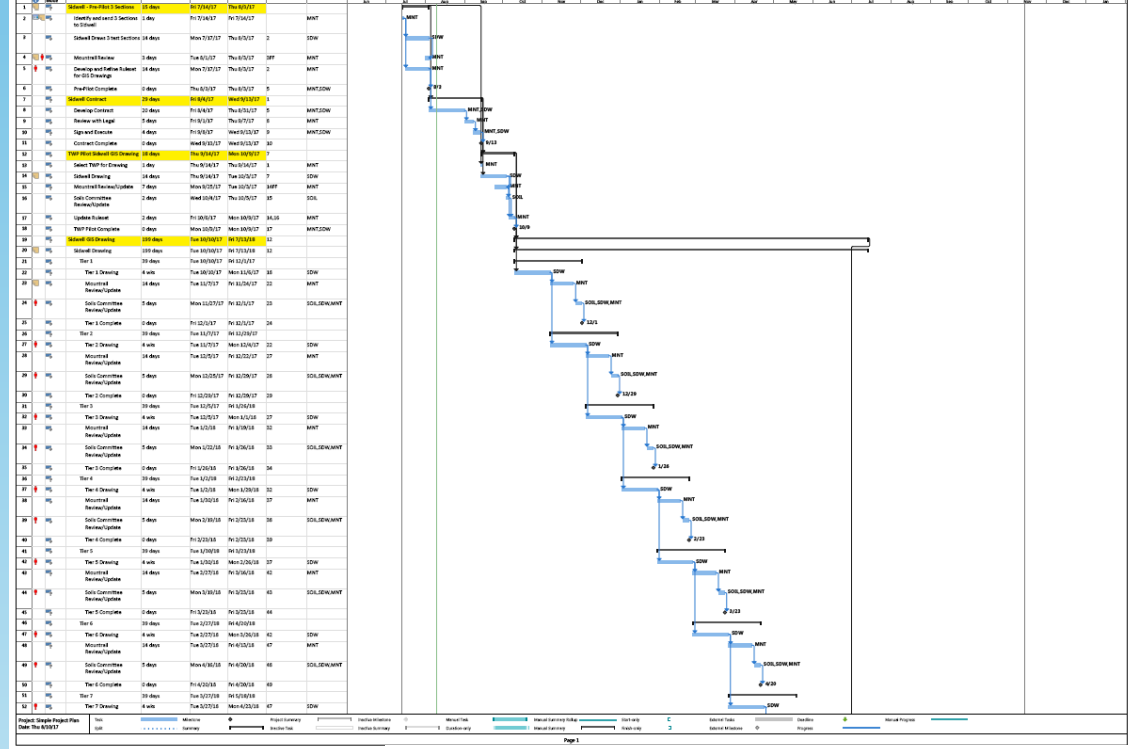
Problem – we were VERY new to GIS

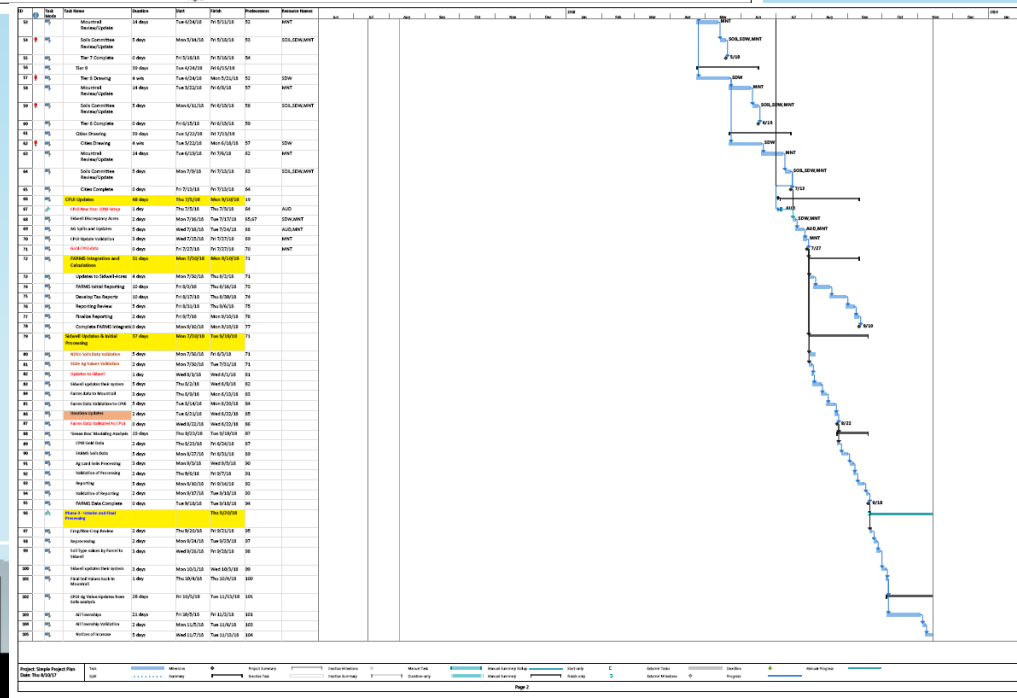
Education needed – our office AND our constituents



Detailed Project Planning

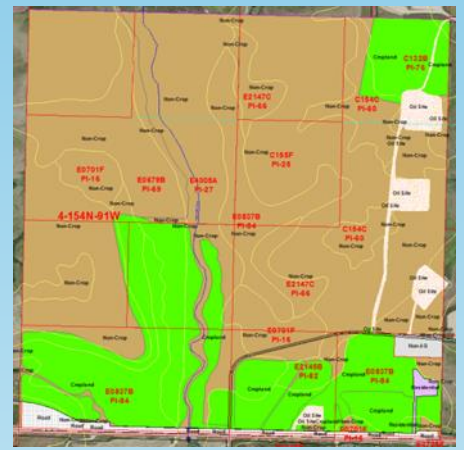
- Encompassed all facets of Project
  - Discovery
  - Solution Selection
  - Pilot project efforts
  - Drawing & Township Reviews
  - Tax System Updates
- County Commissioner approval





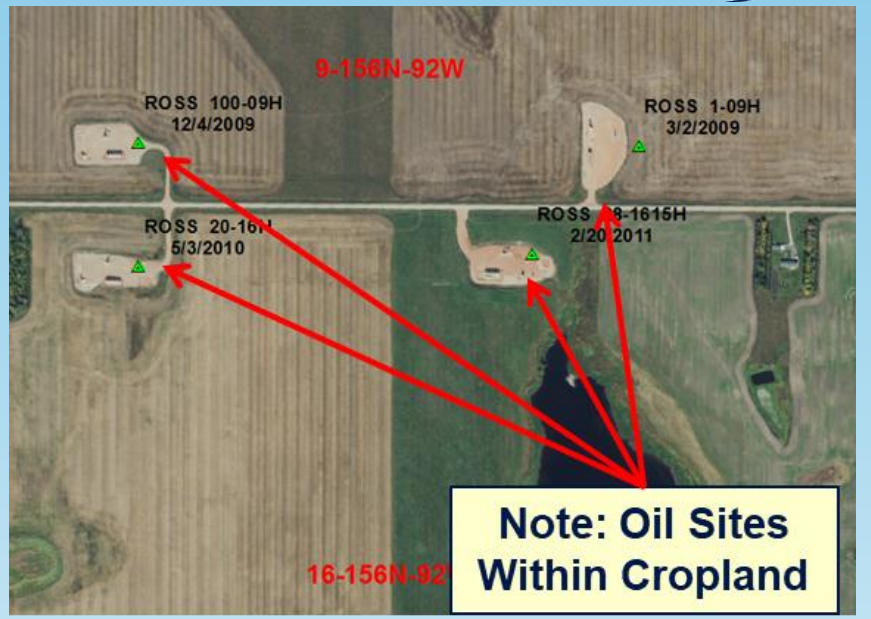
Overall Plan

- 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

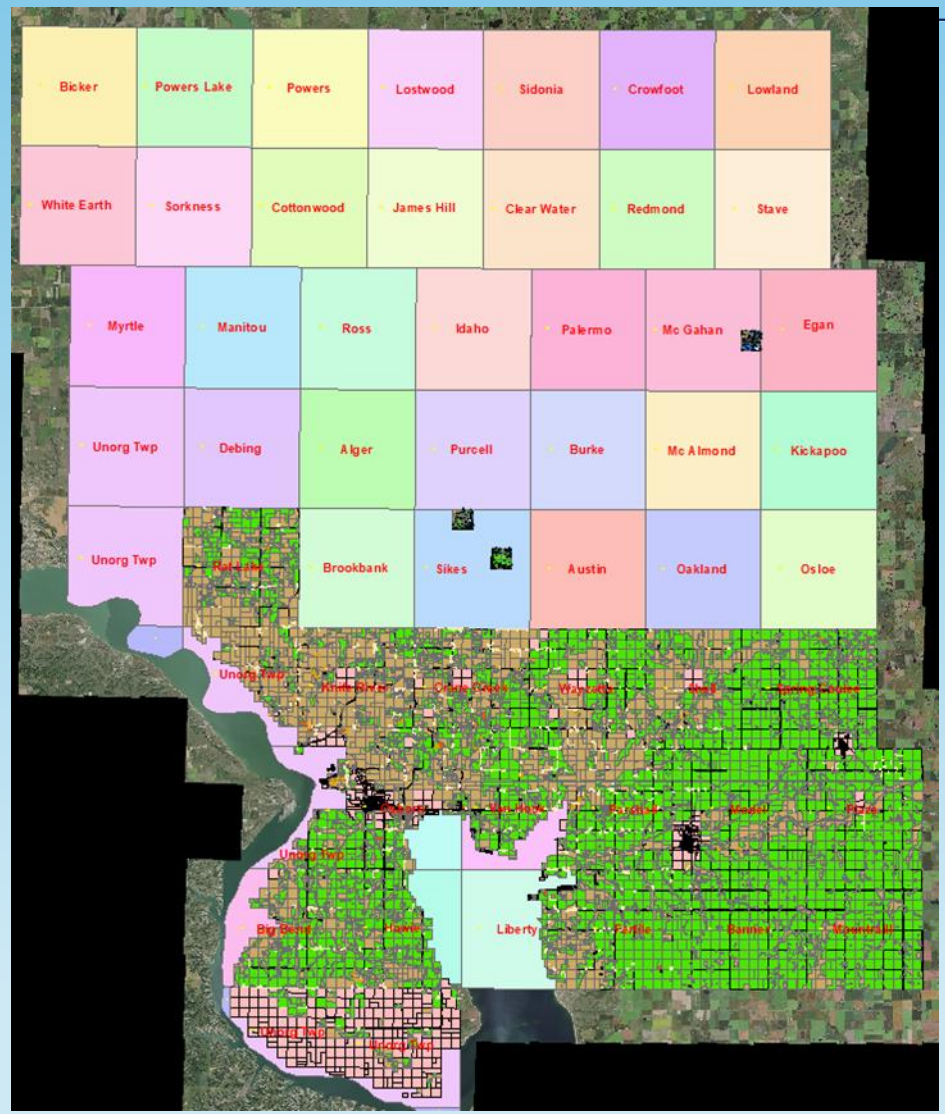
Land Valuation Ruleset

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***
Taxable 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

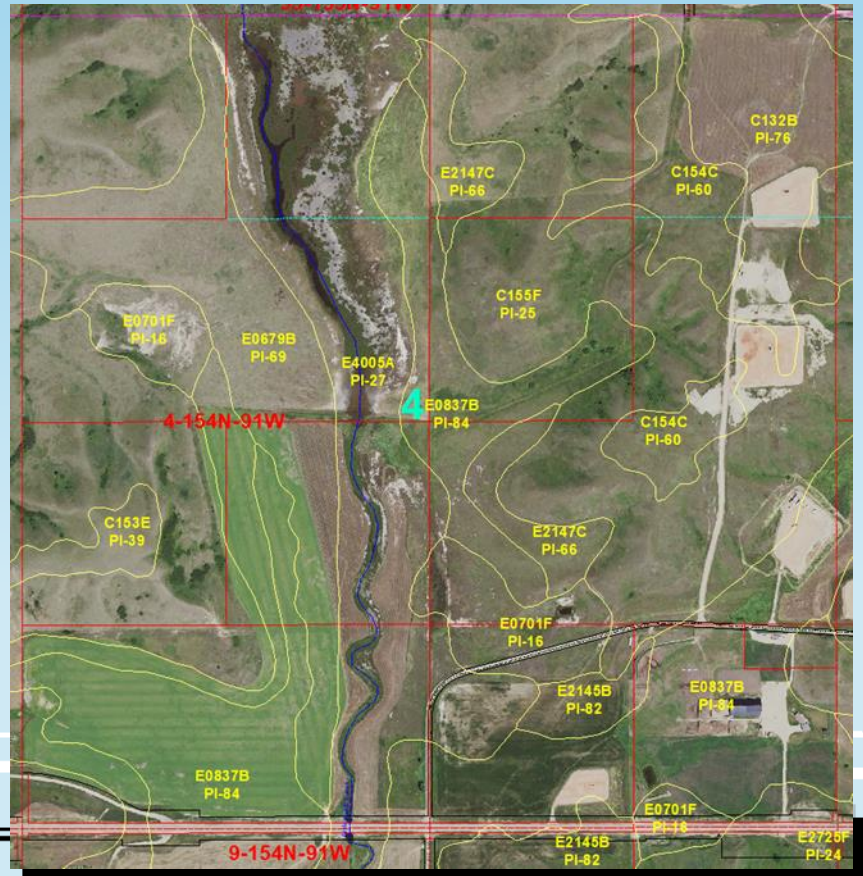
- 3 “Pre-Pilot” Sections
  - Before Contract
  - Used for Developing Drawing Ruleset
- Pilot Township – Rat Lake
  - ***VERY* Precise – 98.5% !**
- Tiers 1 – 8
- Used 2016 NAIP* Photography
  - *“Draw what they see”*
  - *No interpretation*
  - *“Once cropped always cropped” 20 year by Mountrail County*

*(*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



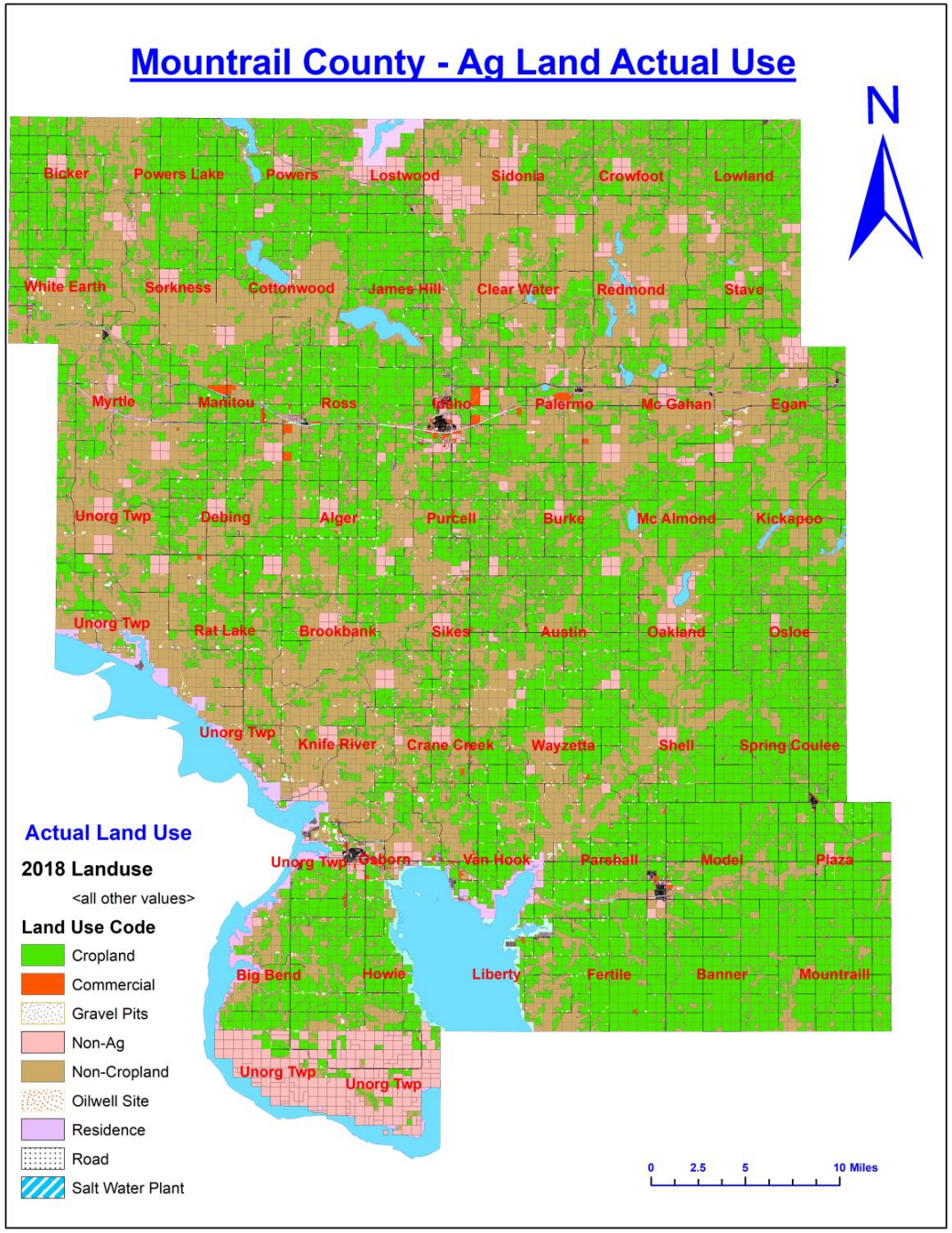
Note Portion
Of Oil Well site

Project Drawing and Review

- **All phases start – July 2017**
  - 3 Sections – “Pre-Pilot”
  - Pilot Section
  - Drawing by Tier
- **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

Cropland Green

NonCropland Beige



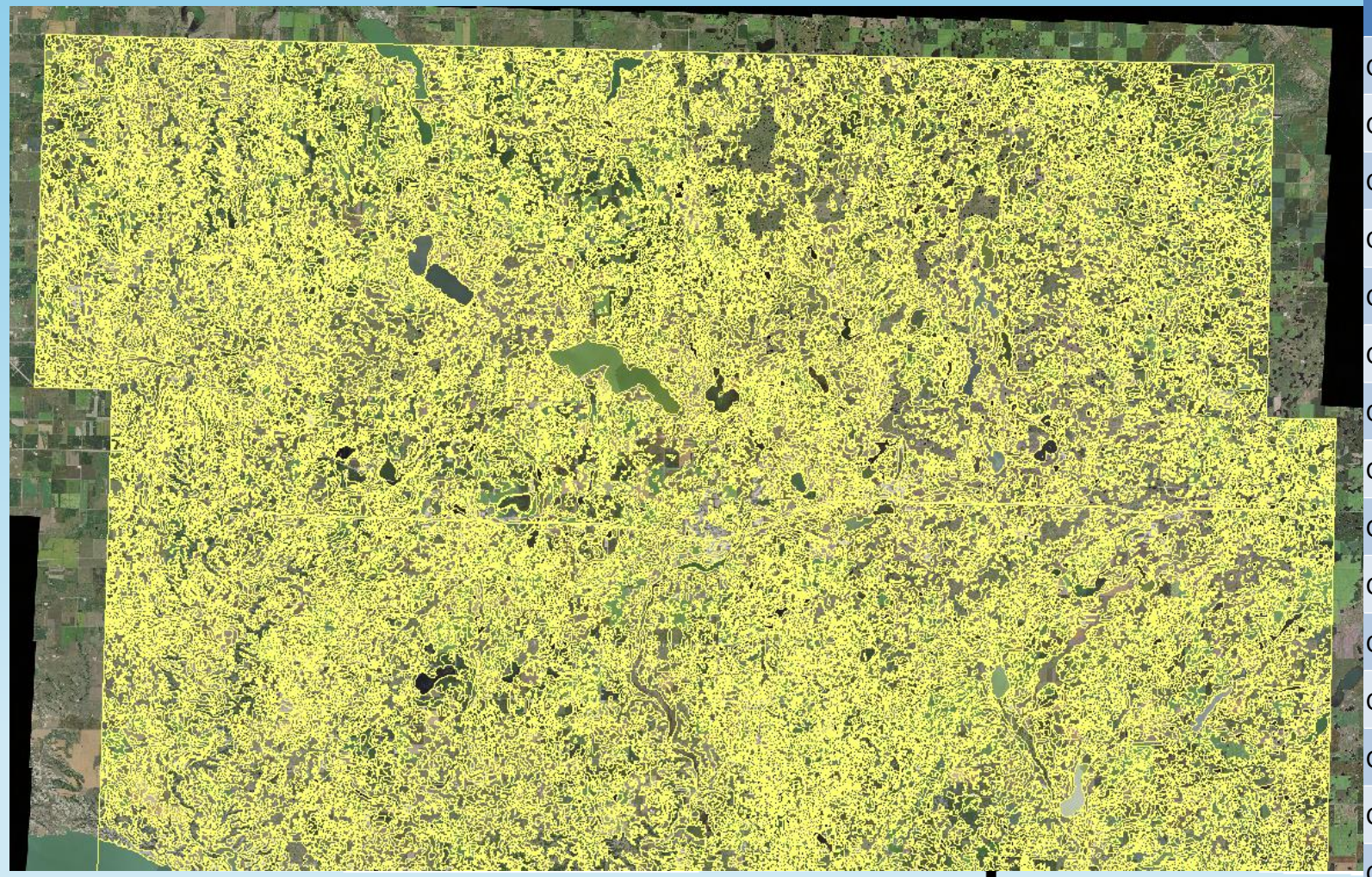
Envisioning Data …. An Idea!

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



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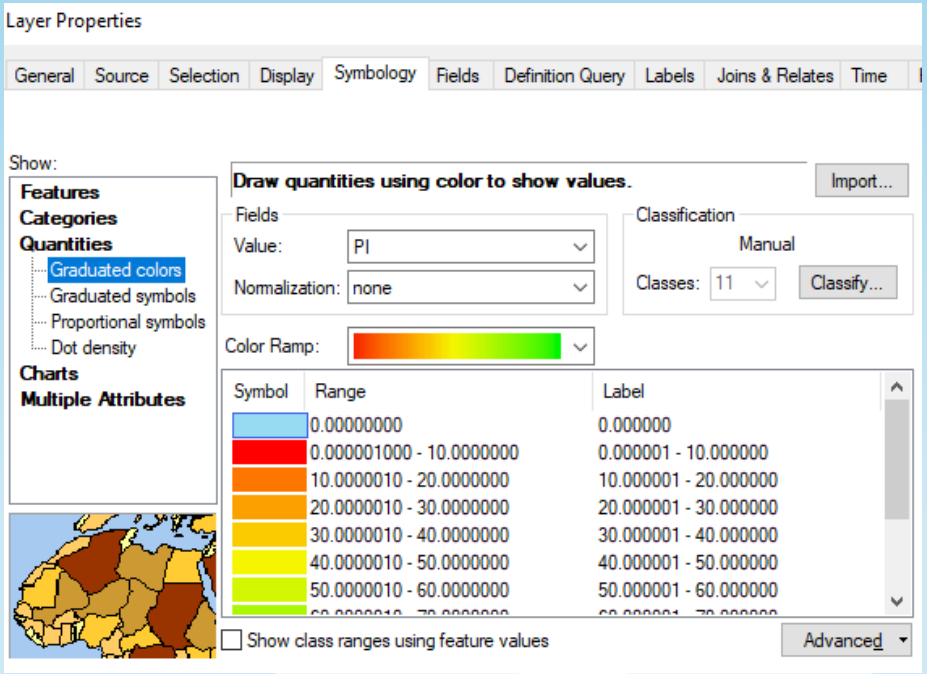
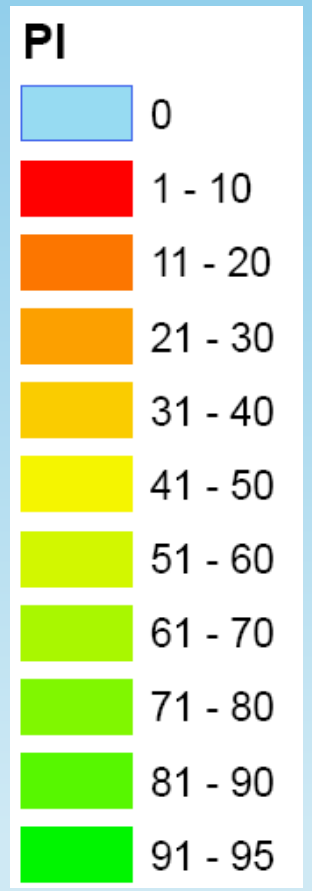
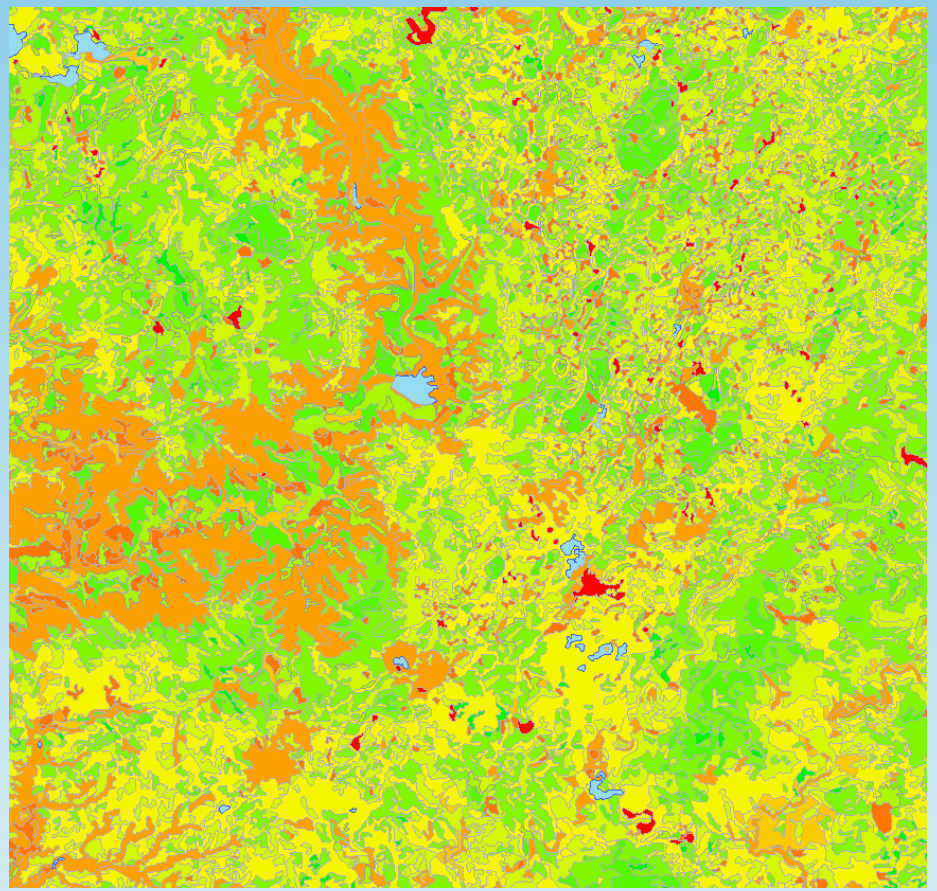
Soil Code by NRCS Productivity Index

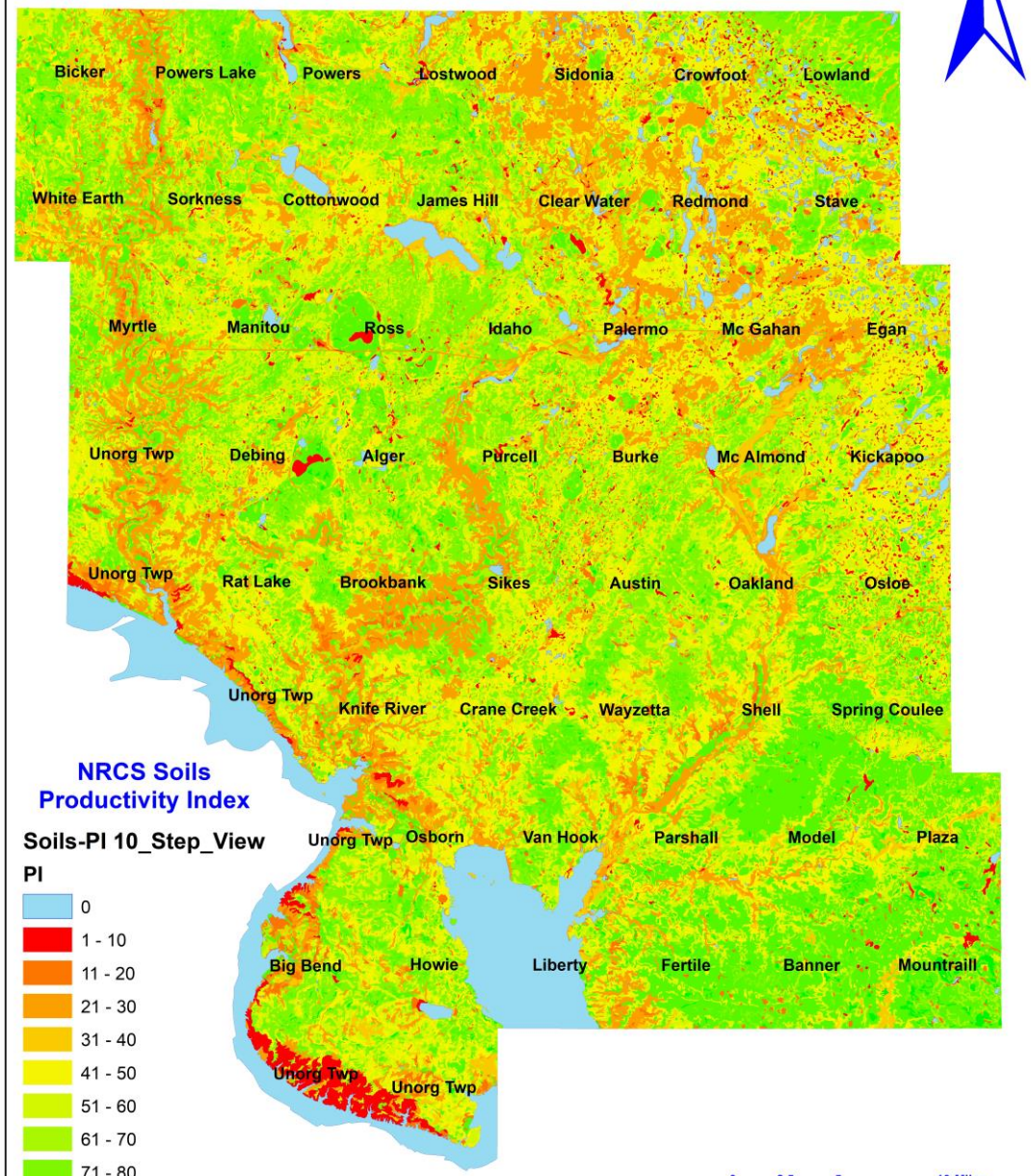
- Symbology - PI Breakdown
  - 0-Blue-Water
  - PI - 10 Step Color change
  - Above 50 varying shades of green



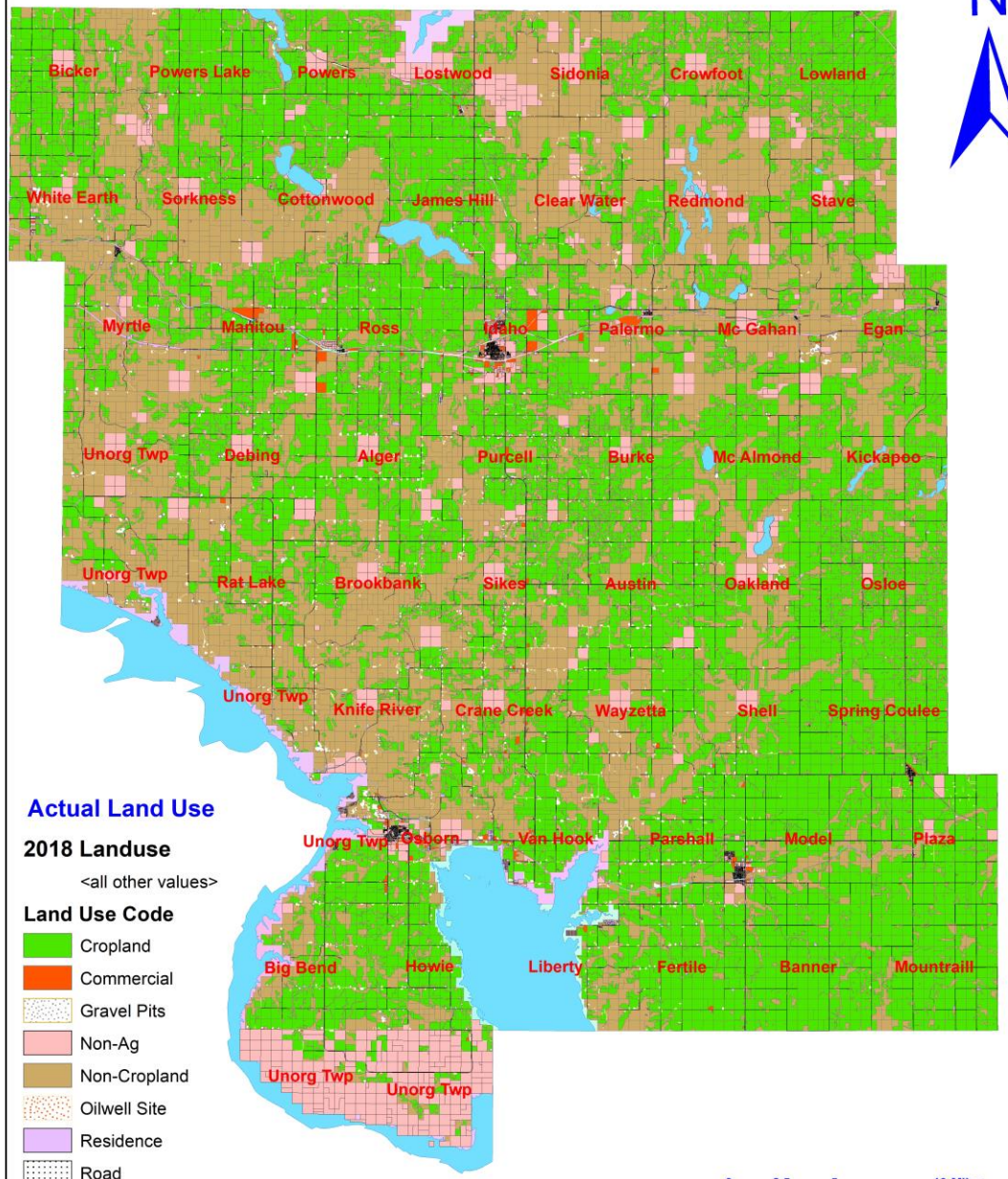




Mountrail County - NRCS Soils



Mountrail County - Ag Land Actual Use



Top Soils in the County – 147 Total Soil Types

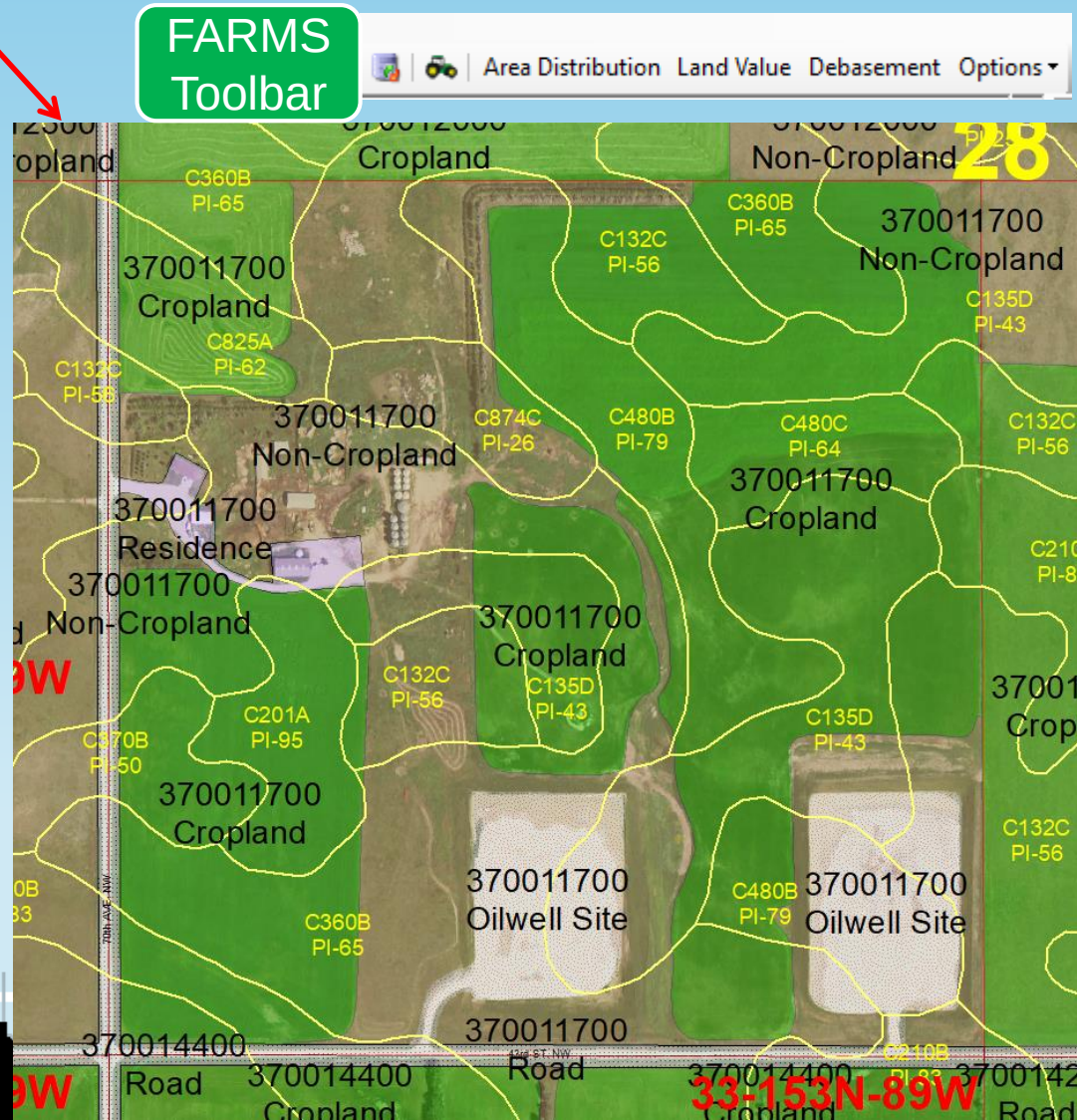
Soilcode - P	Soil Name	Total	Percent	Rank
C135D PI-43	Zahl-Williams loams, 9 to 15 percent slopes	182,468.72	17.1%	1
C132B PI-76	Williams-Zahl loams, 3 to 6 percent slopes	156,232.54	14.6%	2
C154C PI-60	Zahl-Williams-Bowbells loams, 3 to 9 percent slopes	114,829.66	10.8%	3
C132C PI-61	Williams-Zahl-Zahill 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%**

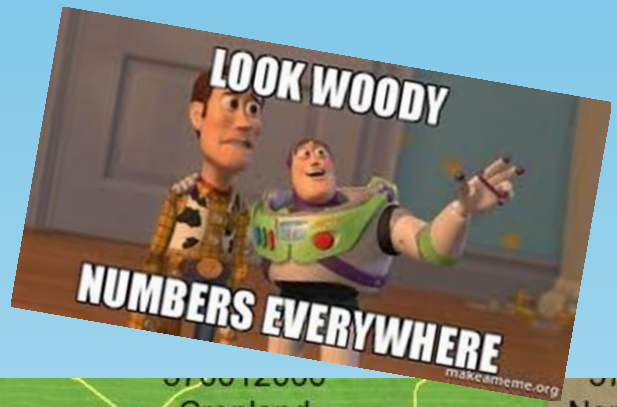
FARMS Processing – FARMS Program

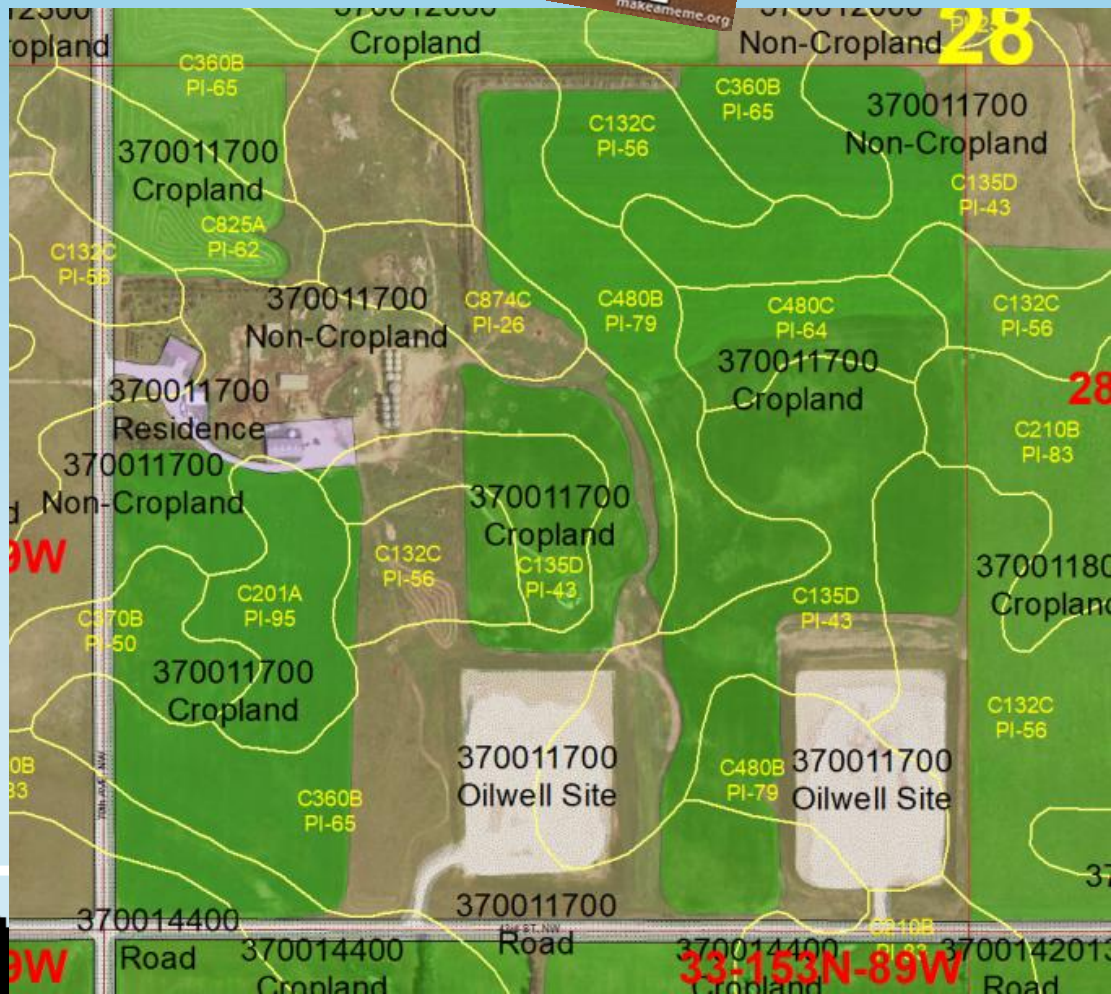
- Cropland, noncrop, Residence, Oil Site, Roads
- Utilizes Soil Types within Actual Land use
- “Slices” Actual Land use and Soil Type layers into acres – used for valuation
- Plenty of data provided
  - This parcel – 32 rows
  - Entire county - 107,671 rows



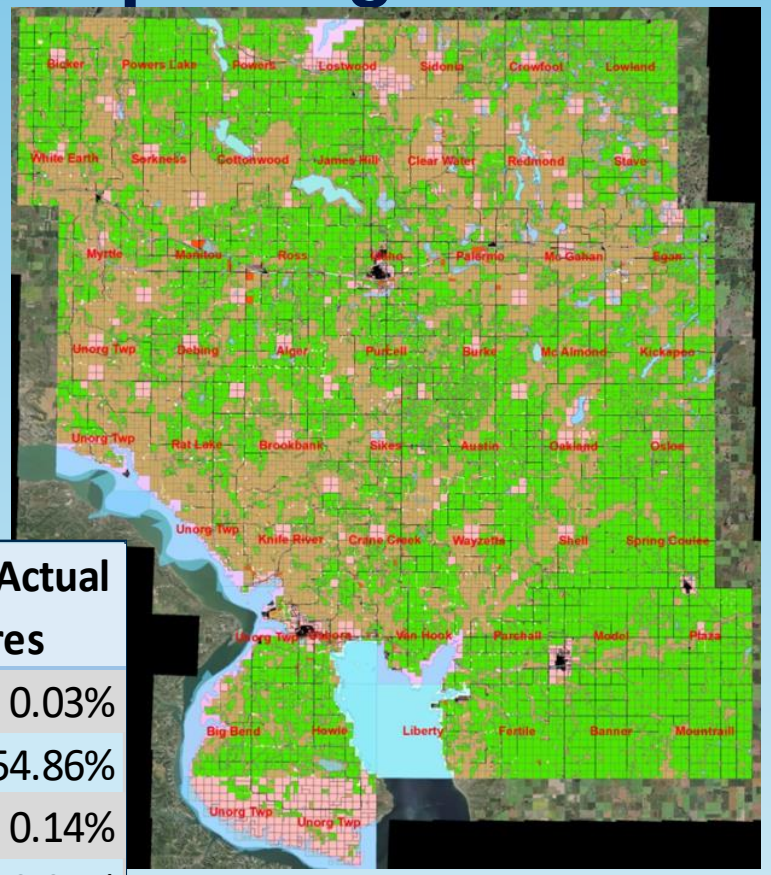
FARMS Program Processing

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





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		
AUM_vPI	Soil_Code	Non-Cropland	Oilwell Site	Grand 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

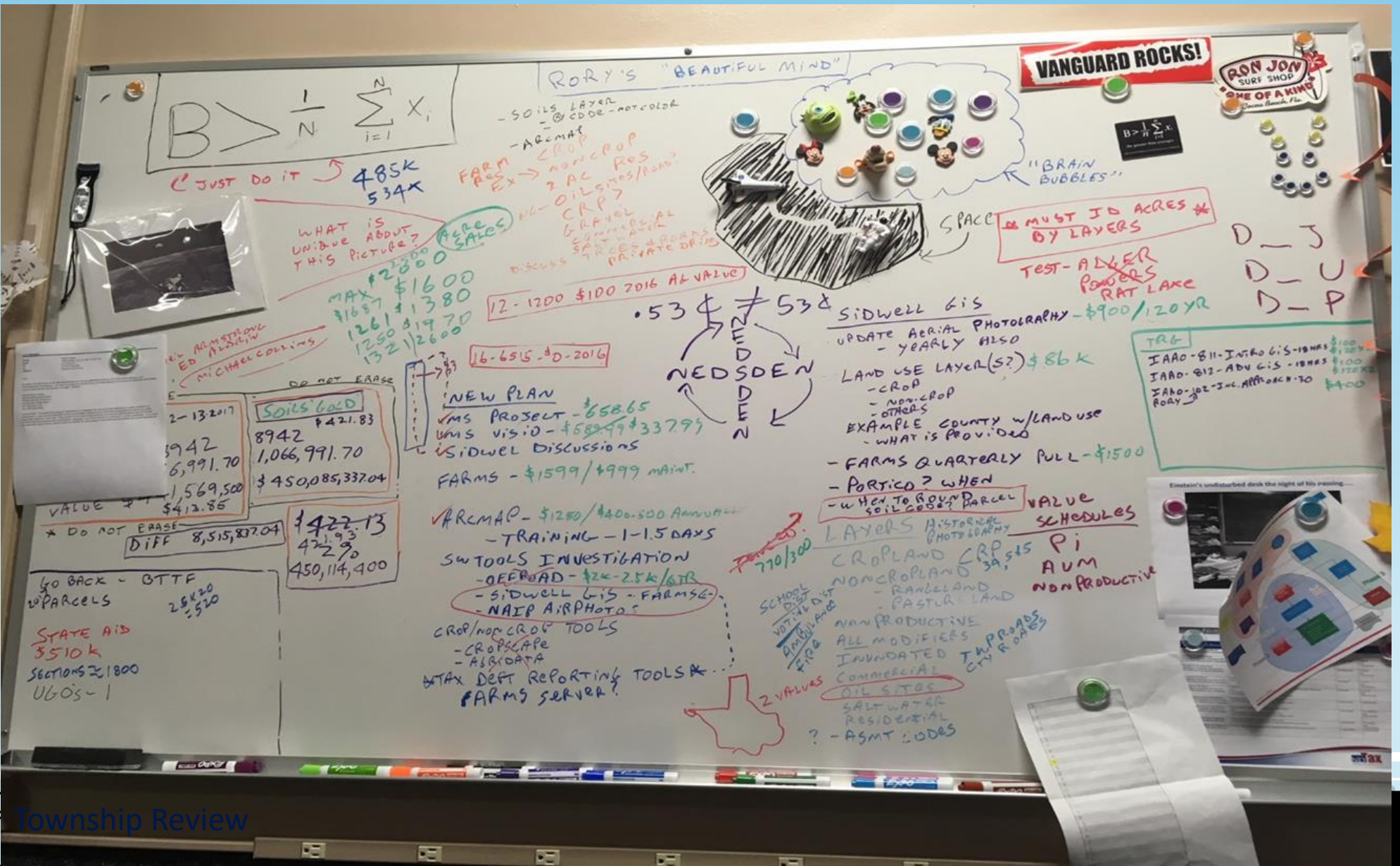
Land Use	Actual Use Acres	Percent of Actual Use Acres	Total Value	Percent of Total Value
Commercial	334.80	0.03%	$0	0.00%
Cropland	583,785.01	54.86%	$391,166,486	84.57%
Gravel Pit	1,496.77	0.14%	$0	0.00%
Non-Ag	123.23	0.01%	$0	0.00%
NonCrop	457,047.22	42.95%	$70,201,573	15.18%
Oilwell Site	7,618.84	0.72%	$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….

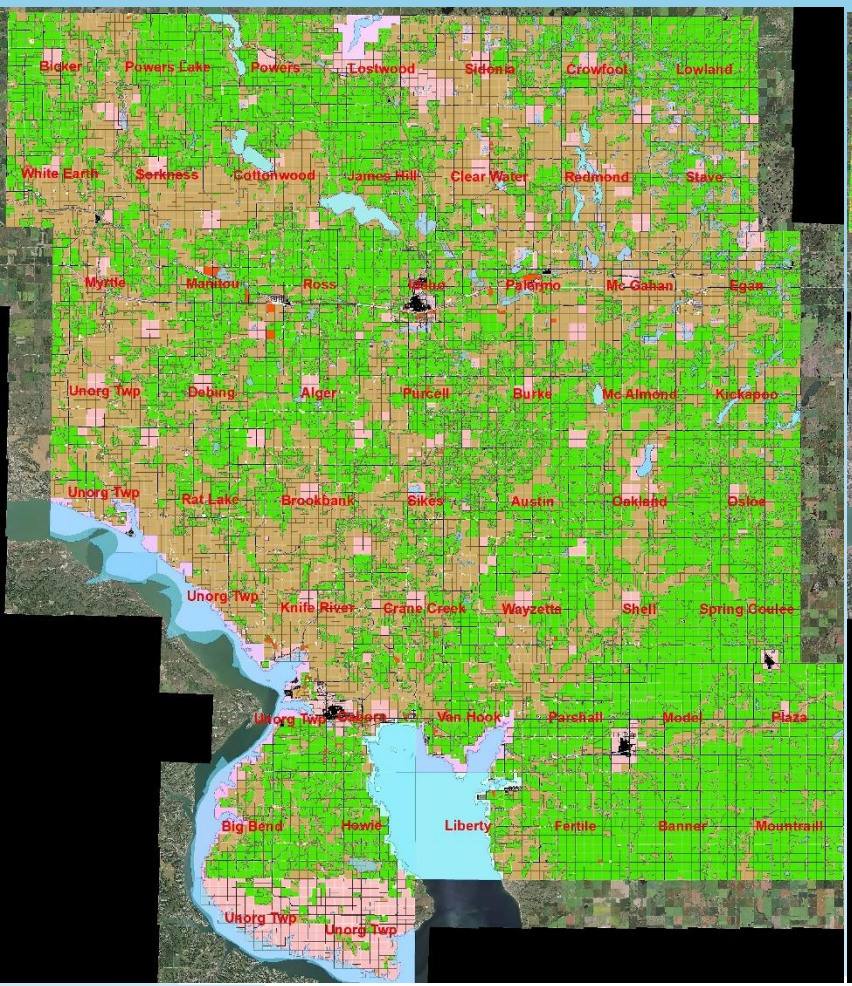
"How do we do this….?"



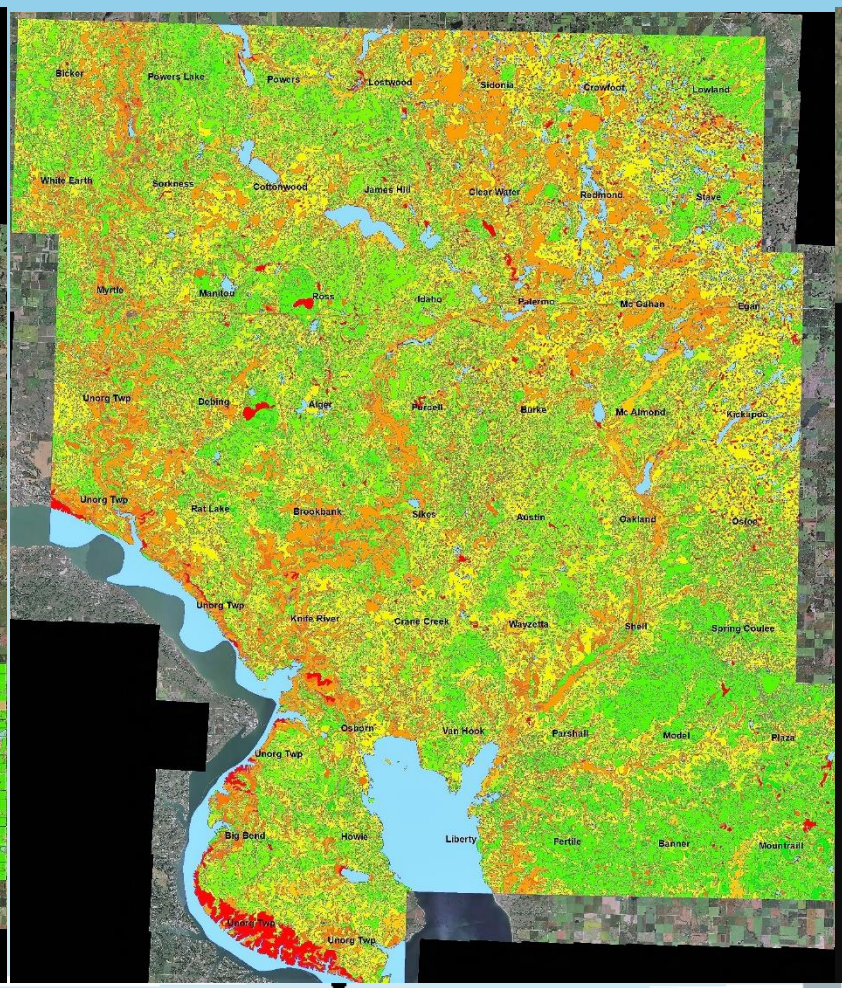
GIS is the Answer!

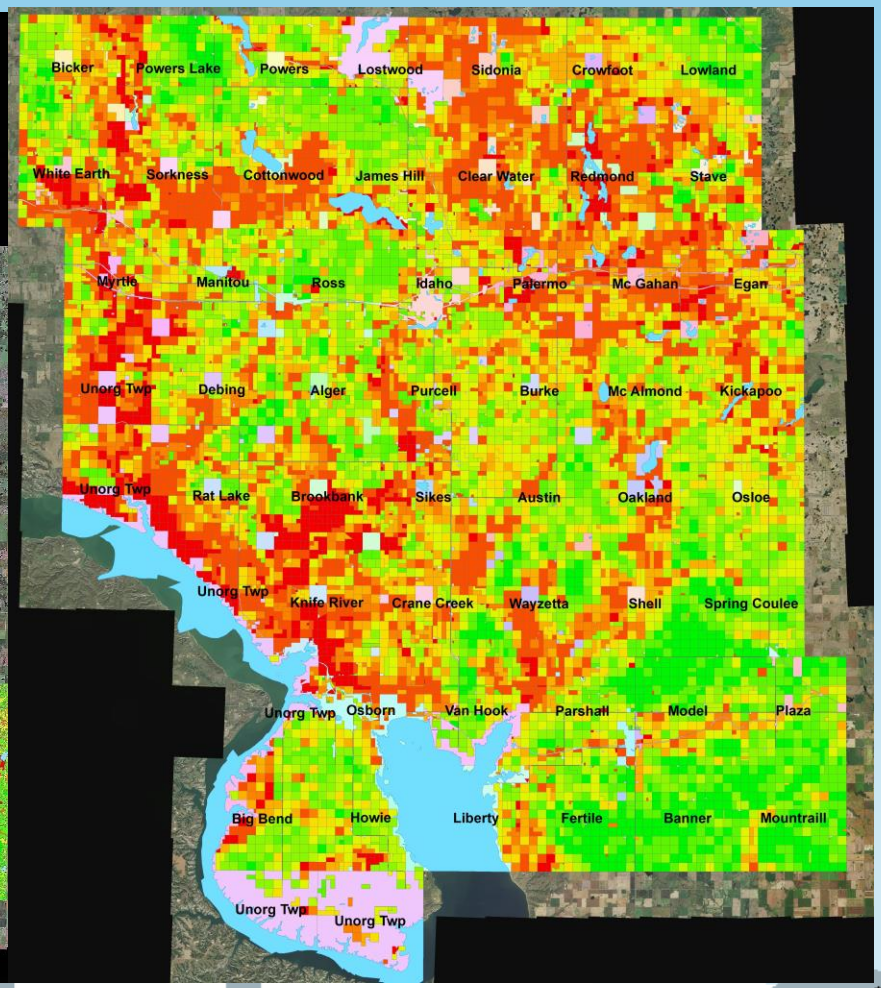
2019 Average Ag Land Value per Acre

Actual Use Layer



NRCS Soils Quality Layer





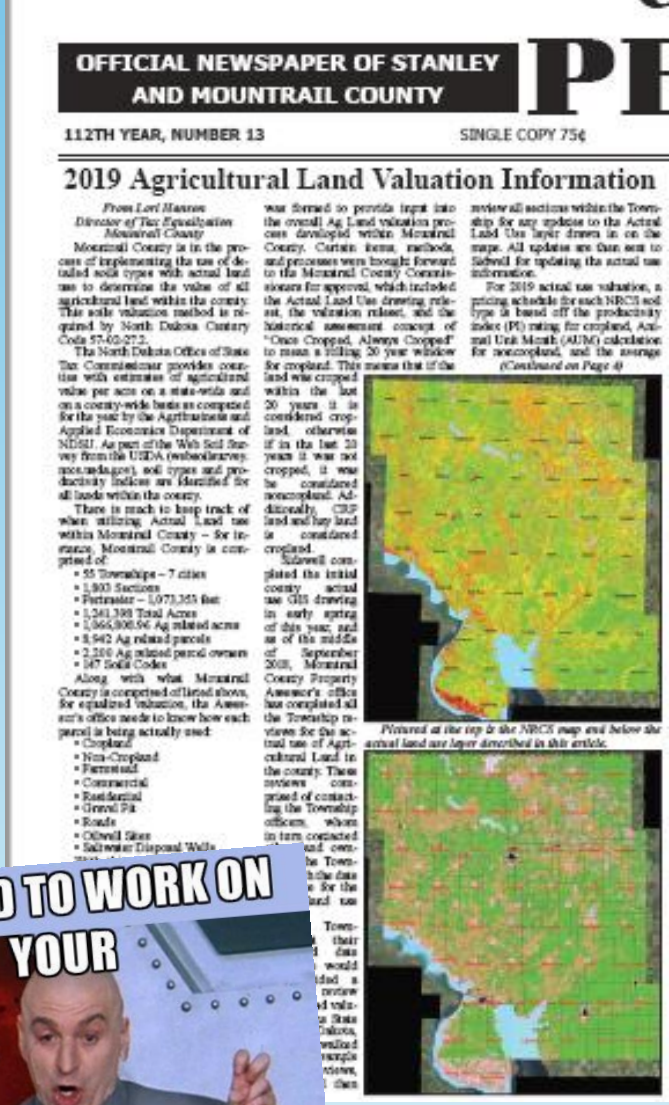
Robust Communication Campaign

- 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


Township Officers Hold Fall Meeting


Township Officers Meet

LAND VALUATION RULESET


OFFICIAL NEWSPAPER OF STANLEY AND MOUNTRAIL COUNTY

112TH YEAR, NUMBER 13 SINGLE COPY 75¢

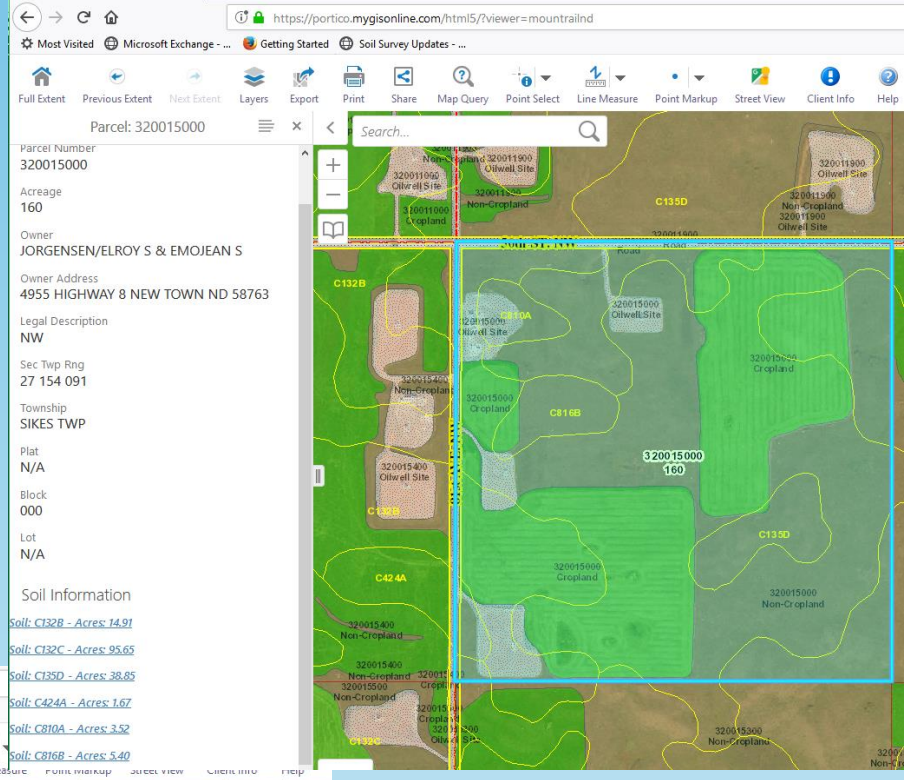
2019 Agricultural Land Valuation Information

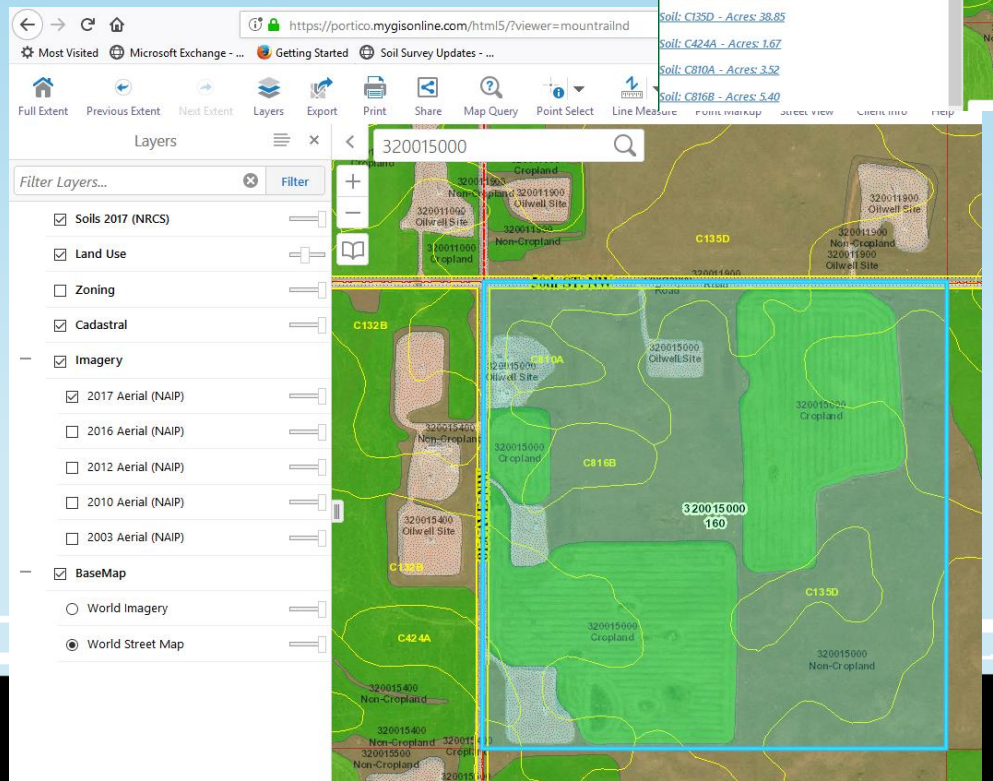
Township Review Meetings

- 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



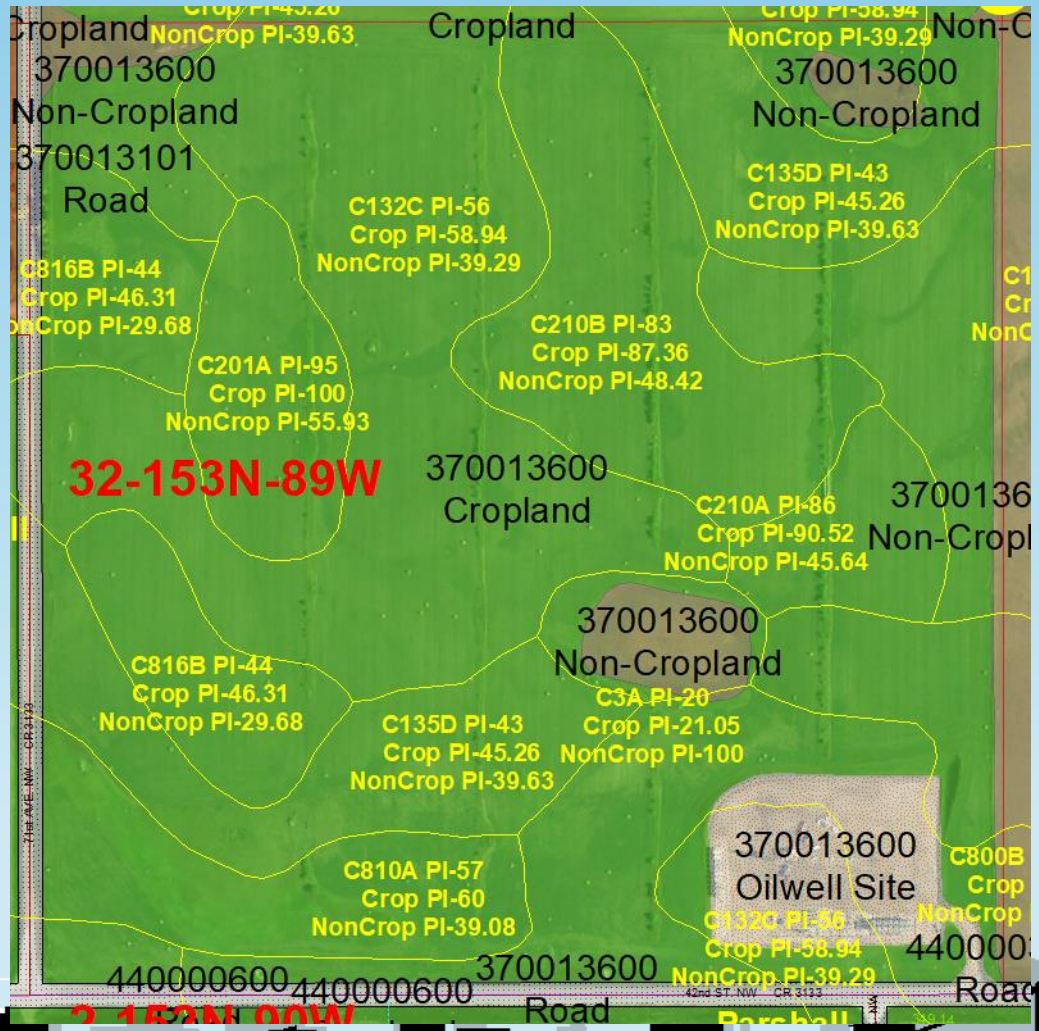


Reporting

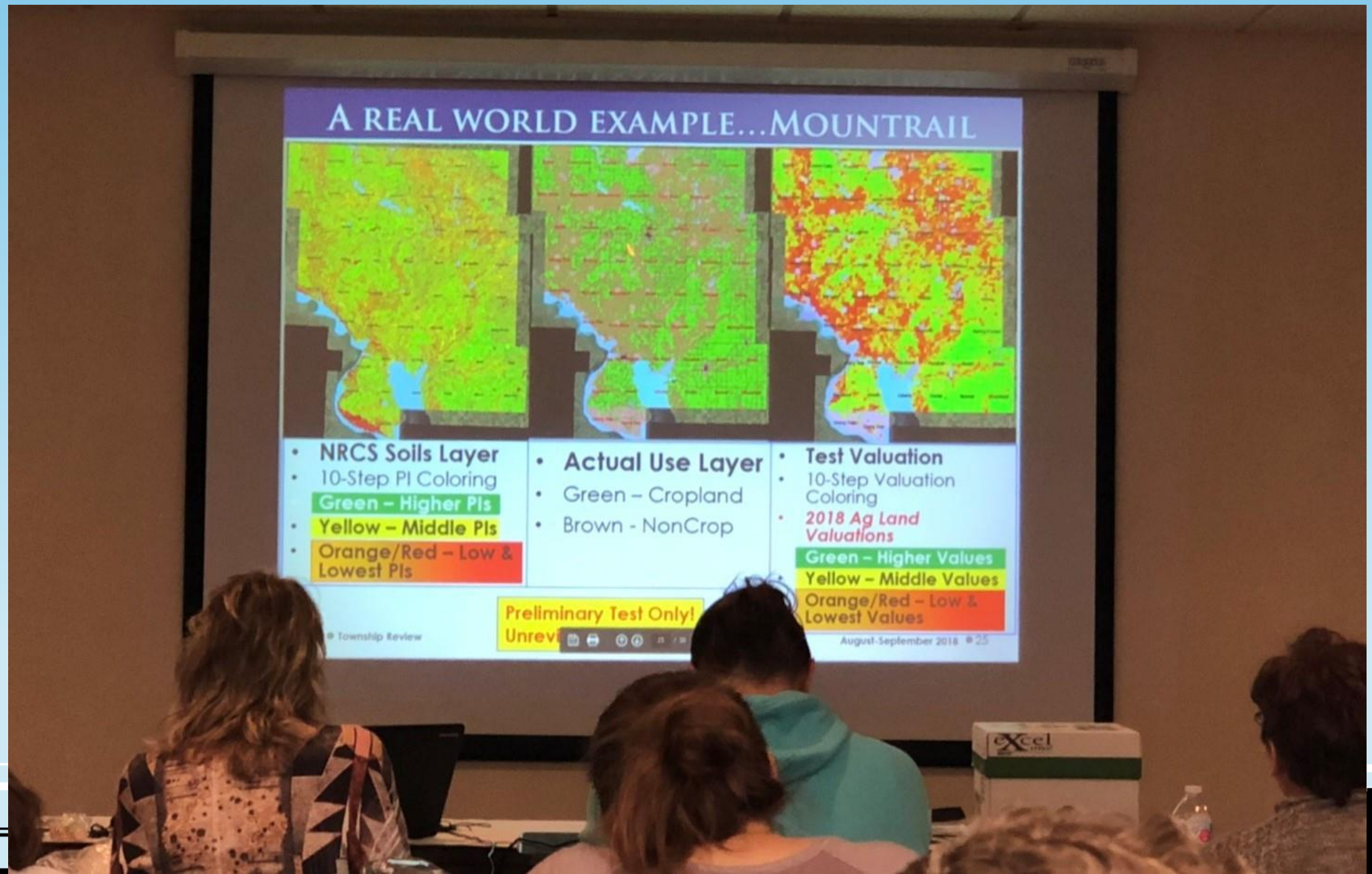
Mountrail

Final Calculation Report

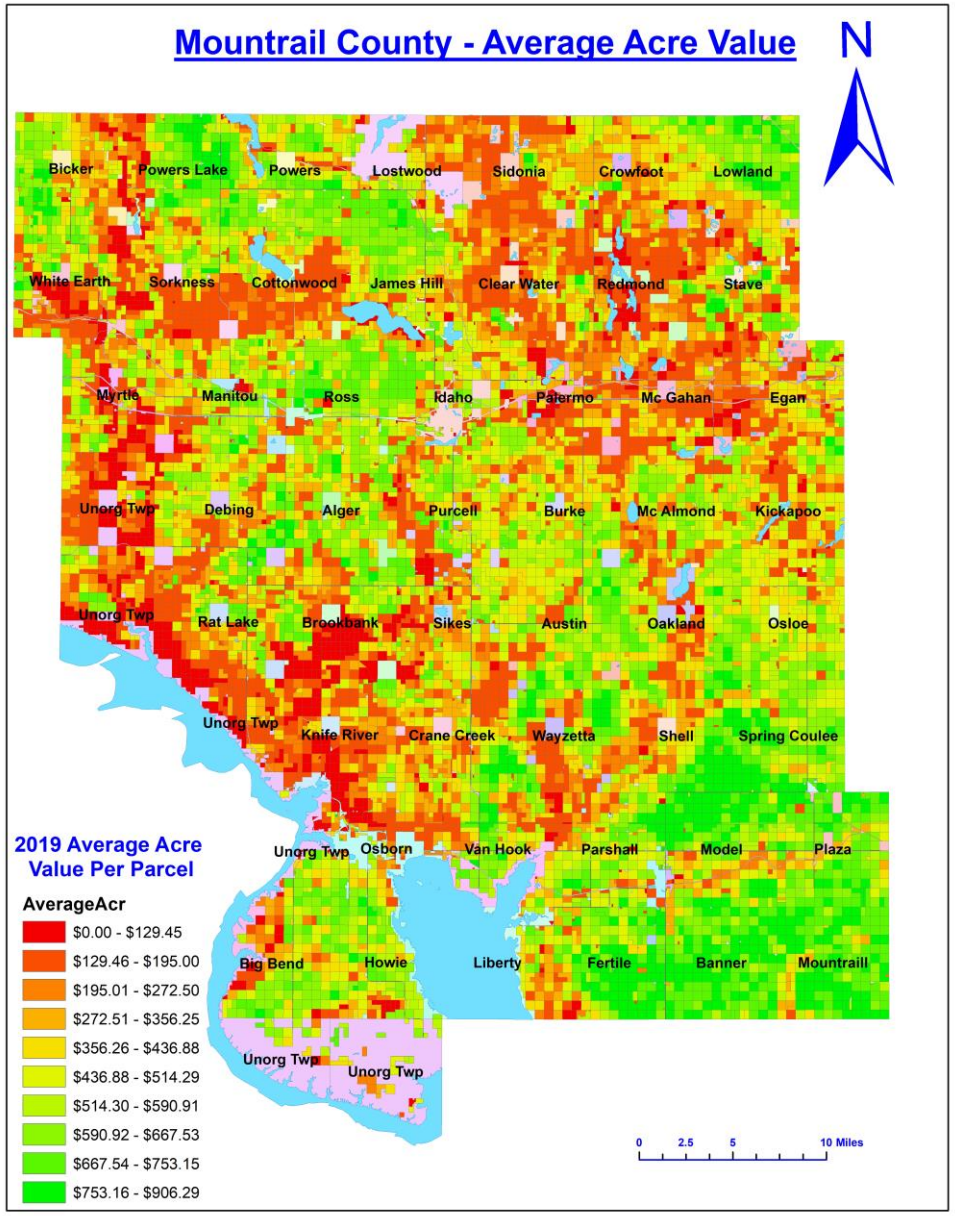
PARCELS	CRP NUMBER	LAND USE	SOIL CODE	SOIL NAME	NET ACRES	RATE	VALUE
37-0013600							
157.49							
		AG					
			C132C	Williams-Zahl-Zahill	47.75	623	29,768.78
			C135D	Zahl-Williams loams,	29.18	438	12,791.05
			C201A	Bowbells loam, 0 to 3	7.31	974	7,120.74
			C210A	Williams-Bowbells	4.95	886	4,387.88
			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**

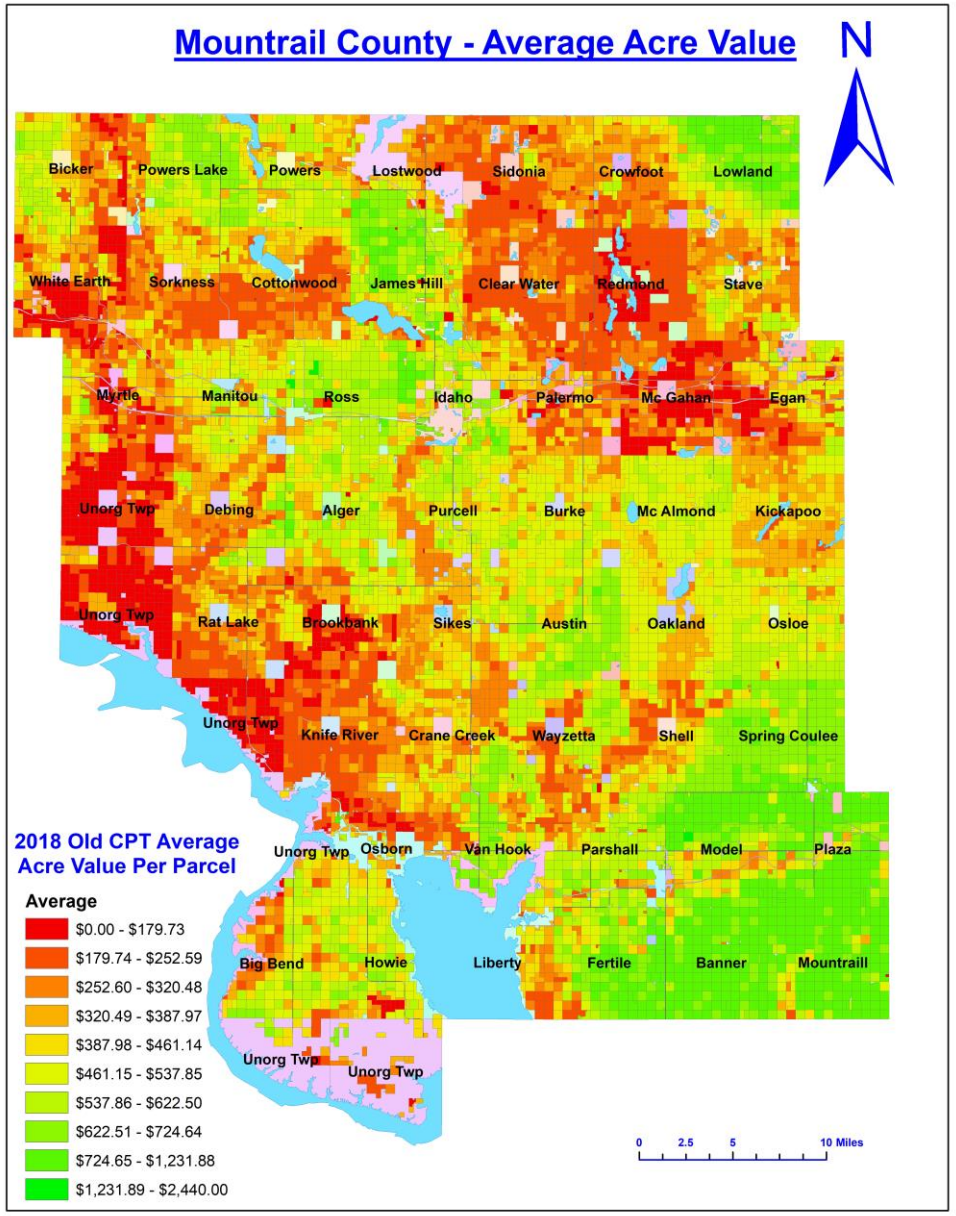


November 2018 ND Agricultural Land Valuation Class



Finally…


Mountrail County - Average Acre Value
N
Bicker
Powers Lake
Powers
Lostwood
Sidonia
Crowfoot
Lowland
White Earth
Sorkness
Cottonwood
James Hill
Clear Water
Redmond
Stave
Myrtle
Manitou
Ross
Idaho
Palermo
Mc Gahan
Egan
Unorg Twp
Debing
Alger
Purcell
Burke
Mc Almond
Kickapoo
Unorg Twp
Rat Lake
Brookbank
Sikes
Austin
Oakland
Osloe
Unorg Twp
Knife River
Crane Creek
Wayzetta
Shell
Spring Coulee
Unorg Twp
Osborn
Van Hook
Parshall
Model
Plaza
Big Bend
Howie
Liberty
Fertile
Banner
Mountraill
Unorg Twp
Unorg Twp
2019 Average Acre Value Per Parcel
AverageAcr
$0.00 - $129.45
$129.46 - $195.00
$195.01 - $272.50
$272.51 - $356.25
$356.26 - $436.88
$436.88 - $514.29
$514.30 - $590.91
$590.92 - $667.53
$667.54 - $753.15
$753.16 - $906.29
0
2.5
5
10 Miles


Mountrail County - Average Acre Value
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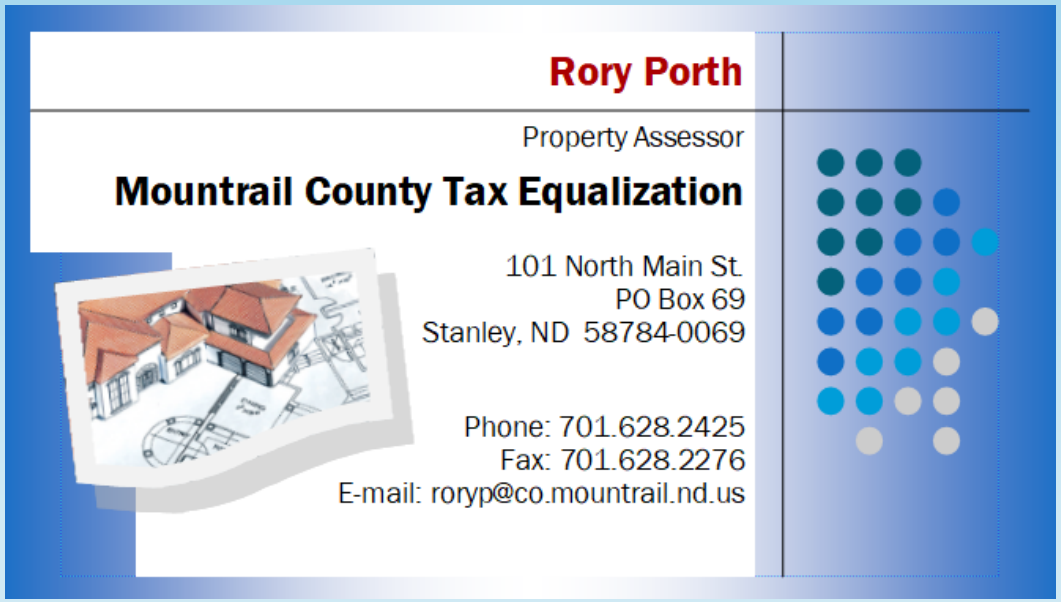
Shell
Spring Coulee
Unorg Twp
Osborn
Van Hook
Parshall
Model
Plaza
Big Bend
Howie
Liberty
Fertile
Banner
Mountraill
Unorg Twp
Unorg Twp
2018 Old CPT Average Acre Value Per Parcel
Average
$0.00 - $179.73
$179.74 - $252.59
$252.60 - $320.48
$320.49 - $387.97
$387.98 - $461.14
$461.15 - $537.85
$537.86 - $622.50
$622.51 - $724.64
$724.65 - $1,231.88
$1,231.89 - $2,440.00
0
2.5
5
10 Miles

Questions?


PRESENTATION FINISHED
ANY QUESTIONS?


PRESENTATION FINISHED
ANY "QUESTIONS" LEFT?
memegenerator.net


ANY
QUESTIONS?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E-mail: roryp@co.mountrail.nd.us

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SEPTEMBER 8-11, 2019
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