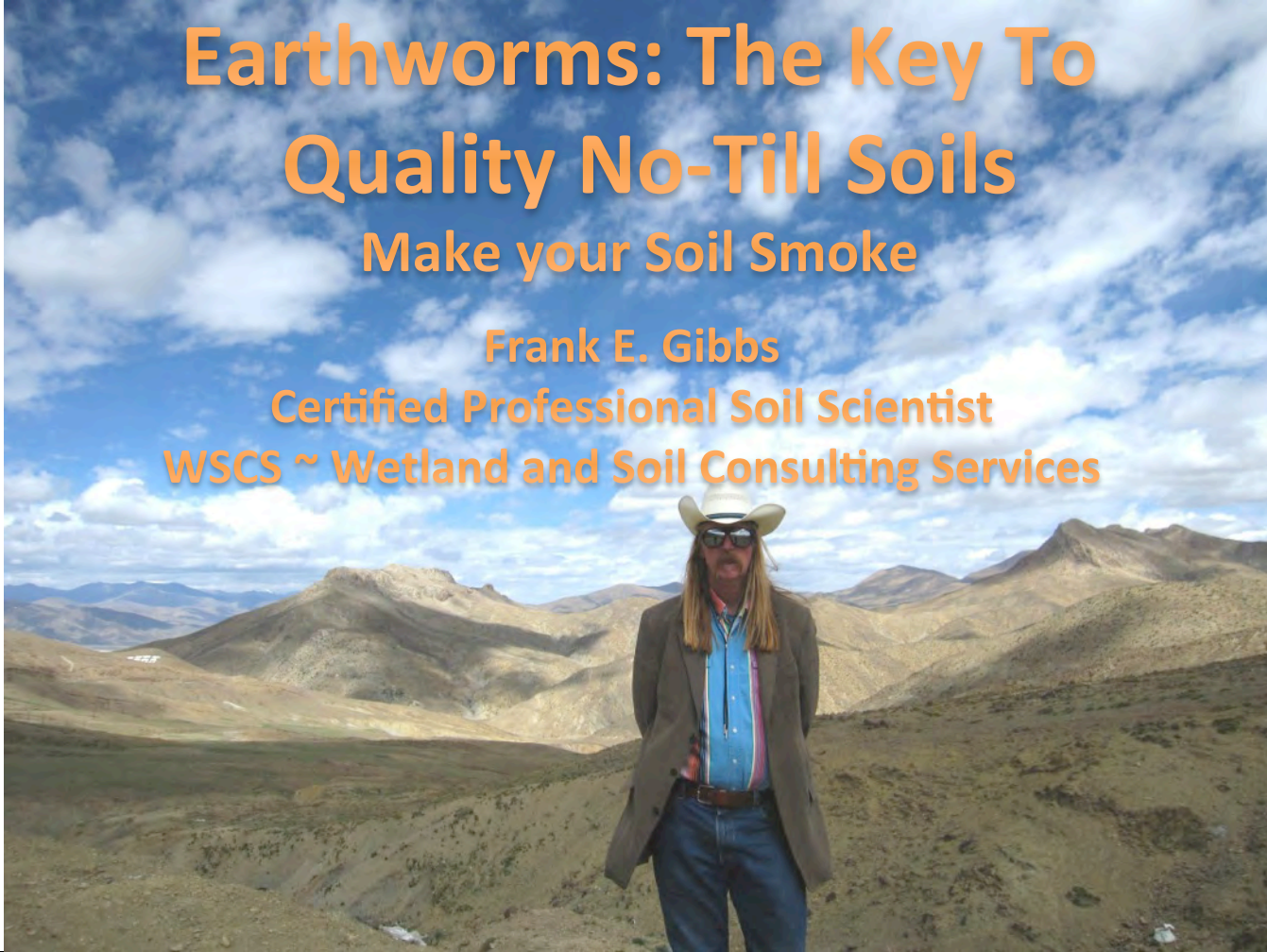


# Earthworms: The Key To Quality No-Till Soils

Make your Soil Smoke

Frank E. Gibbs  
Certified Professional Soil Scientist  
WSCS ~ Wetland and Soil Consulting Services



# 36 Years with SCS/NRCS



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# **Wetland and Soil Consulting Services, LLC**

## **WSCS, LLC**

**Email: fegibbs21@gmail.com**

**IPhone: 419-963-2542**

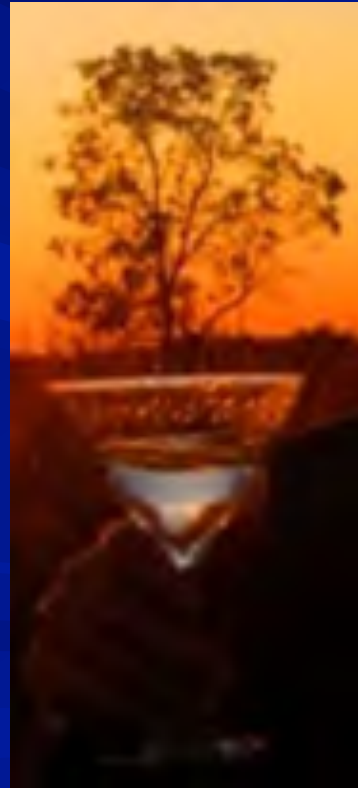
Professional Wetland Scientist

**PWS**

Certified Professional Soil Classifier

**CPSC**

- ~Army Corp/EPA Wetlands
- ~Wetland Delineations
- ~Wetland Scoring For Mitigations
- ~Wetland Restorations
- ~Problem Soils Investigations
- ~Hydric Soil Delineations
- ~Teaching/Training/Instruction



Certified Professional Soil Scientist

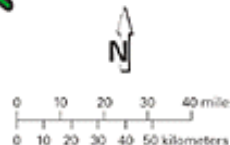
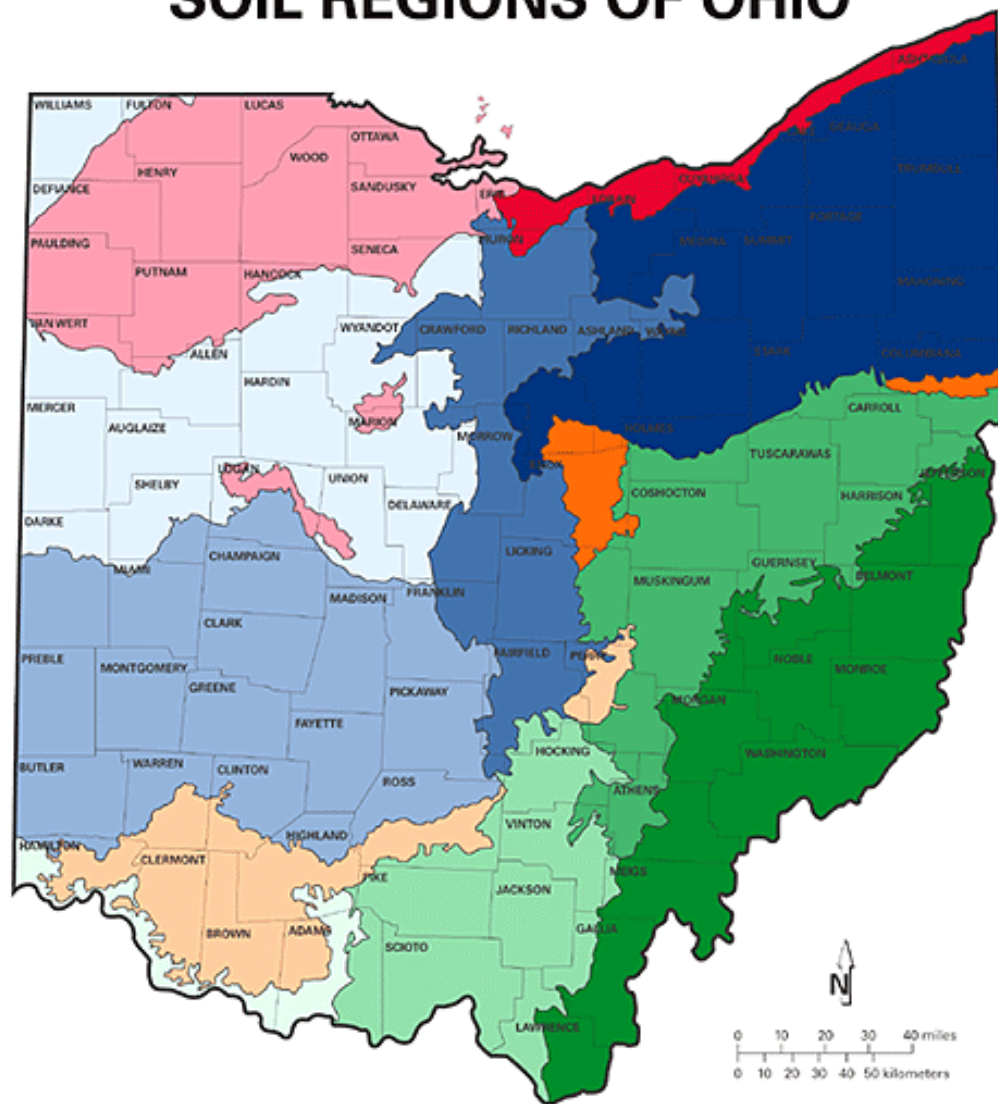
**CPSS**

Certified Crop Advisor

**CCA**

- ~Soil Compaction Diagnosis
- ~Soil Quality/Cover Crops
- ~Soil Drainage Issues
- ~Controlled Traffic Evaluations
- ~Preferential Flow Issues  
(Liq. Manure and Phos.)
- ~Smoking Tile Field Days
- ~Meeting Speaker World Wide  
Soil Adventures

# SOIL REGIONS OF OHIO



## LEGEND\*

- |                                      |   |   |
|--------------------------------------|---|---|
| 1 Hoytville-Nappanee-Paulding-Toledo | 5 Bennington-Cardington-Centerburg        | 9 Eden-Bratton-Brushcreek                 |
| 2 Conotton-Conneaut-Allis            | 6 Mahoning-Canfield-Rittman-Chili         | 10 Shelocta-Brownsville-Latham-Steinsburg |
| 3 Blount-Pewamo-Glywood              | 7 Clermont-Rossmoynne-Avonburg-Cincinnati | 11 Coshocton-Westmoreland-Berks           |
| 4 Miamian-Kokomo-Eldean              | 8 Westmoreland-Homewood-Loudonville       | 12 Gilpin-Upshur-Lowell-Guernsey          |

\*Soil regions are identified by the names of the soil series that are common in that region.



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**First 4-Row Planter  
in  
Union Twp**



# 1993 Hancock SWED Outstanding Cooperatives



# Dave Gibbs



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# Earthworms

## Conservation Systems:

- ~ Conservation Tillage
- ~ Controlled Traffic
- ~ Cover Crops
- ~ Drainage



# Rainfall Comparison in inches

Month	2011	2010	1972
January	1.62	0.84	1.12
February	4.41	1.67	0.78
March	3.14	2.40	2.55
April	6.22	2.83	5.95
May	7.42	8.14	4.16
June	2.24	6.67	3.37
July	2.35	1.90	4.30
August	6.03	2.80	3.04
<b>September</b>	<b>7.66</b>	1.19	<b>8.26</b>
October	4.26	1.37	1.85
November	5.03	4.28	4.54
December	4.48	0.66	3.07
Total	54.86	34.75	38.99

Past rainfall record year 1950 = 50.39 inches

Average Annual Rainfall = 34.50 inches

Provided by Guy Verhoff, Pandora Weather Observer



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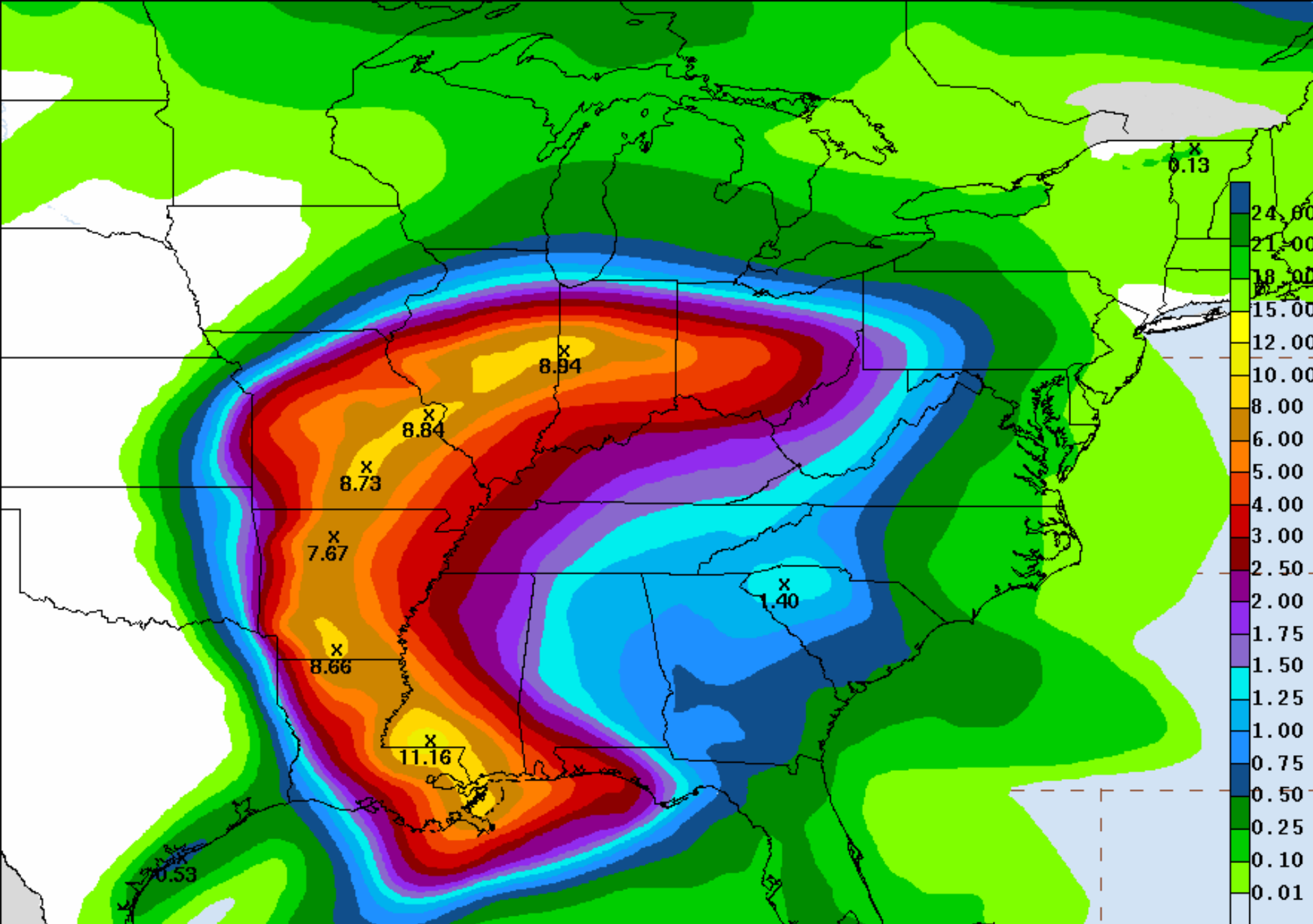




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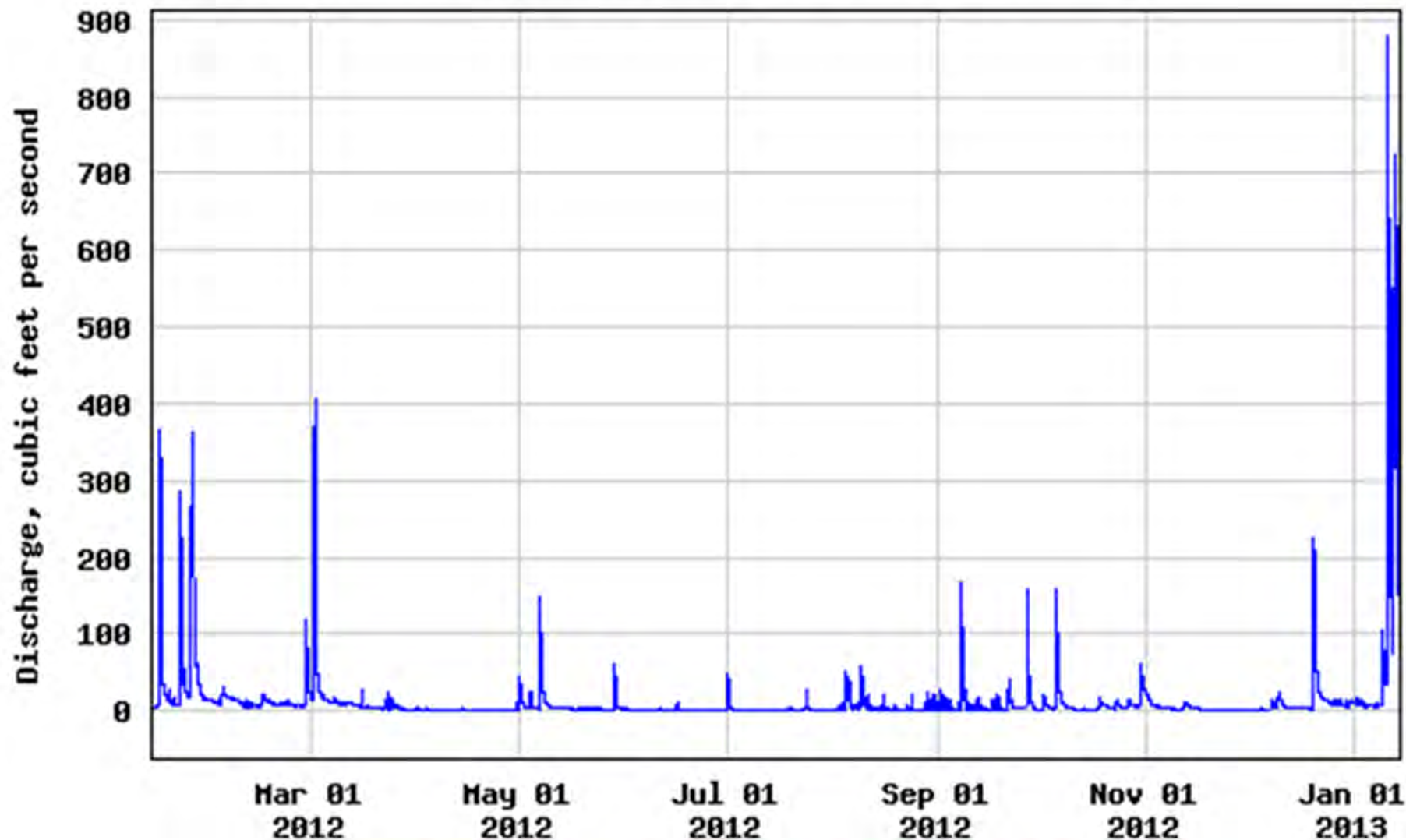




**Tropical Storm Isaac**  
120-hour Day 1-5 Rainfall Forecast (in)  
Created 5:09 PM EDT Wed Aug 29 2012



# USGS 402913084285400 Chickasaw Creek at St. Marys OH



----- Provisional Data Subject to Revision -----



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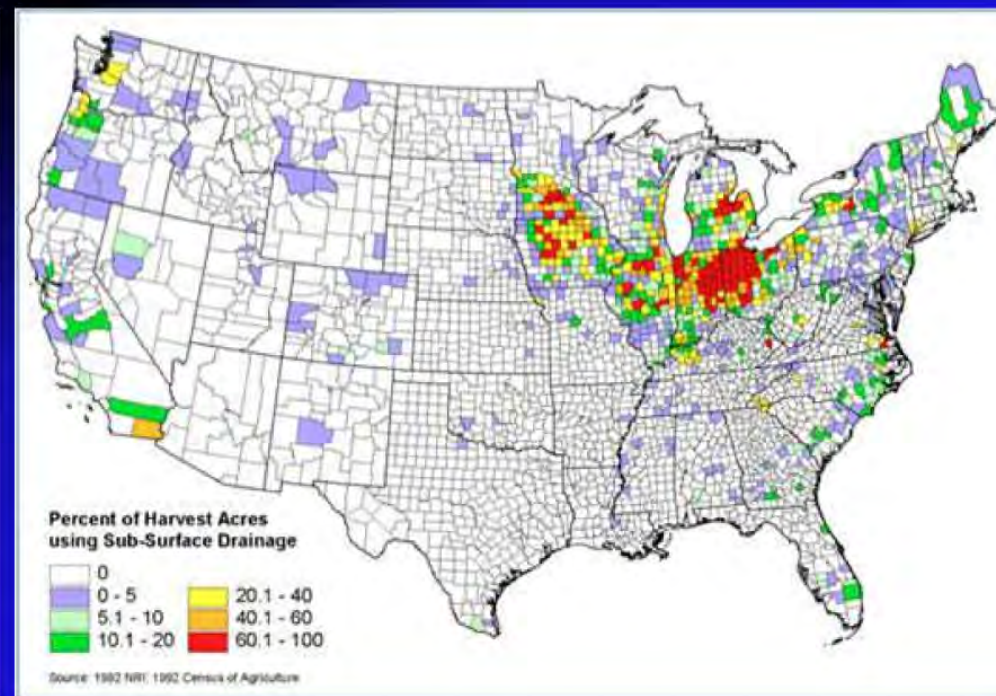
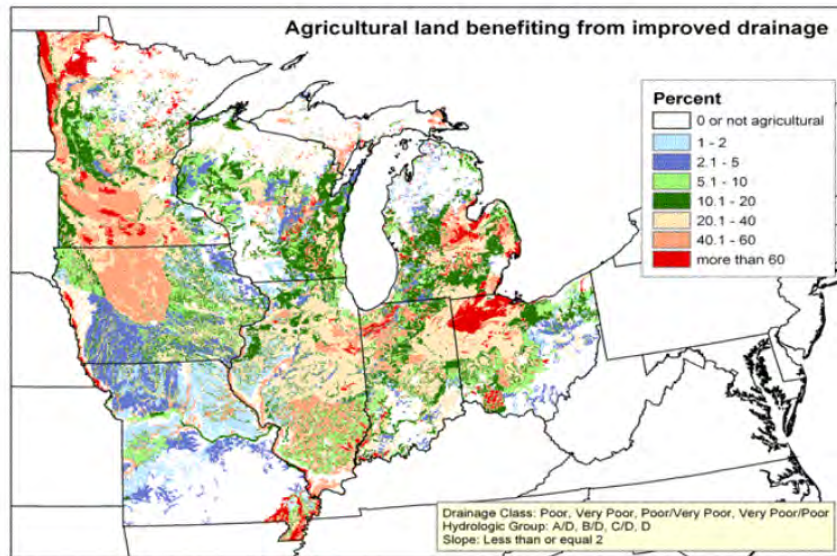


# Extent of Tile Drainage

43 million ha of soil in US classified as wet; 31 million drained (Pavlis, 1987)

37% of cropland acres in the Midwest (Zucker and Brown, 1998)

- number of acres drained essentially remaining constant
- random drains converted to systematic drains and aging drainage infrastructures are being updated
- intensity (split spacing) increasing to accommodate larger farming enterprises and shorter windows for agricultural practices





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**Crop Production**

**Soil Quality**



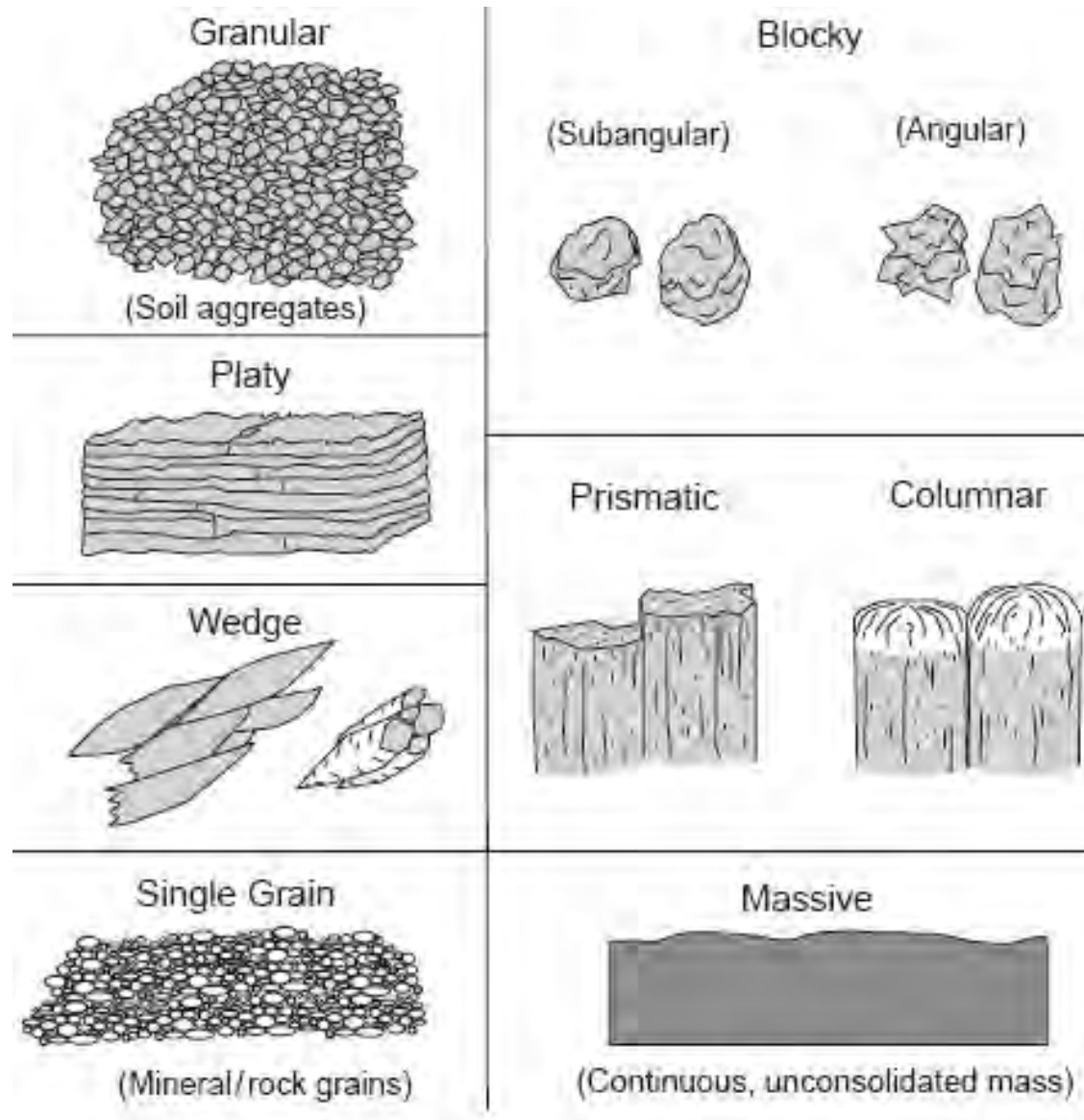
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# Structure Types

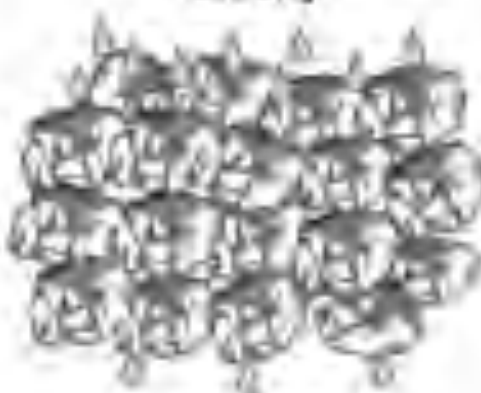


Single-grain



Rapid

Blocky



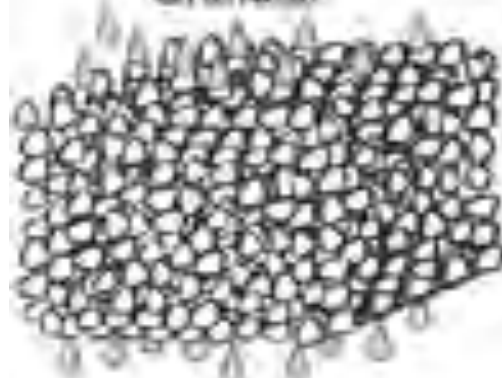
Moderate

Platy



Slow

Granular



Rapid

Prismatic



Moderate

Massive



Slow



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## Two Situations:

### 1) Isolated (Load Out Zones/Wet Spots)

~GPS in to deal with later...

~Do what's necessary to level out...

~Follow on your yield maps...

Drain, Subsoil follow with legumes/radishes

# Avoid Messing the whole field up By doing wet deep tillage



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## 2) Almost Every Pass Across the Field



**~GPS What's practical...**

**Light Shallow Tillage when it dry's on top**

**No Tillage if it's another wet spring...**

**Follow on Yield Maps...**

**Drain, subsoil, follow with legumes/radishes...**



# "Smearred Goobers"





**Systematically Destroyed Soil Structure**

# Principals of Soil Health

- Limit Soil Disturbance
- Increase Soil Microbial Diversity
- Grow Living Roots Year Round
- Keep the Soil Covered
- Reduce Compaction



# Dave Brandt



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# Allen Dean





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# Joe Nester



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# VRT Strip till with Auto Steer



# “Un” Controlled Traffic



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# Oil Seed Radishes



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Heavy Clay Soils



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Cereal Rye



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# Food Source For Night Crawlers



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# Bret Margraf





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# Jerry and Les Seiler





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# Crop Patrol



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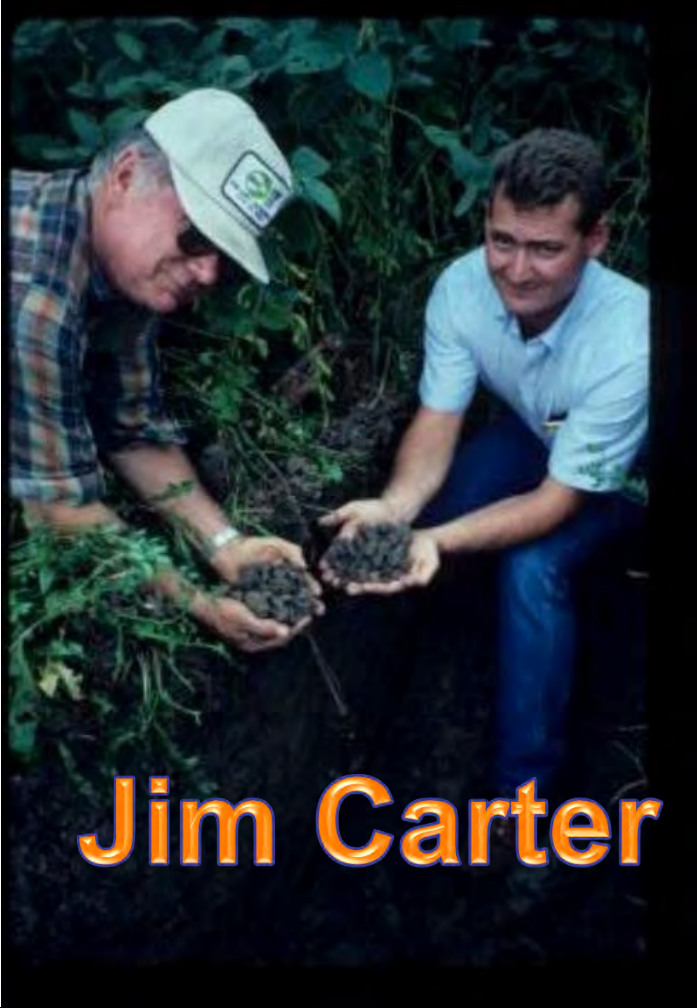




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**Jim Carter**

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**ALT/TAB 1**



**Controlled Traffic Duals**



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## There are ~ 3000 Species of Earthworms

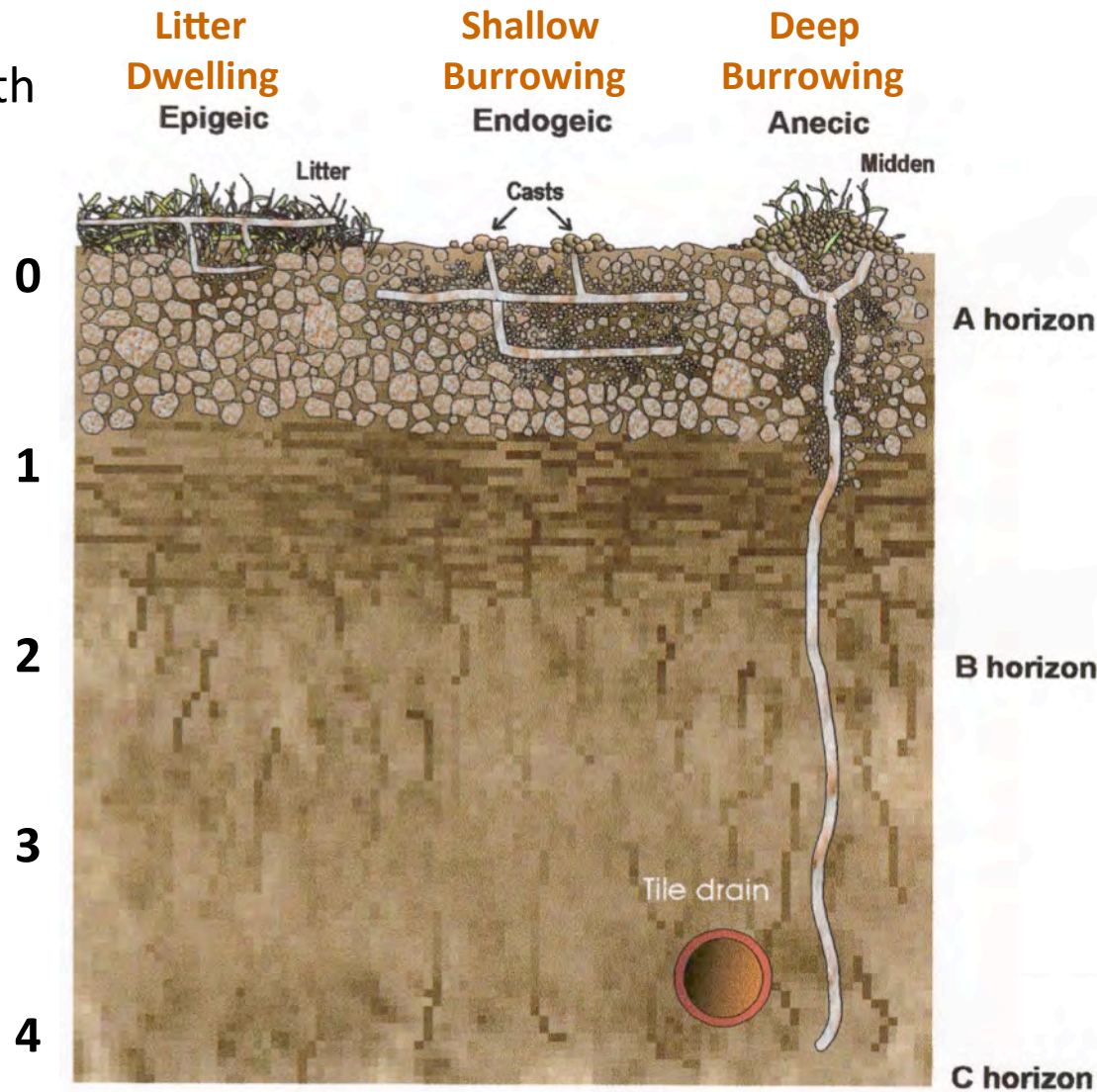
- Litter Dwelling (*Epigeic*) Species

- Shallow Burrowing (*Endogeic*) Species

- Deep Burrowing (*Anecic*) Species

- construct burrows that extend ~3-4 feet deep
- cannot tolerate dry or frozen soil
- come to the soil surface to feed, breed, and migrate

Depth  
Feet





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The logo for the 22nd Annual National No-Tillage Conference. It features a stylized sun or flower icon with a central 'O' on a yellow background. To the right of the icon, the text reads "22nd Annual National No-Tillage Conference" in green and black. Below this, it says "Springfield, Ill. • Jan. 15-18, 2014" and "An Honest No-Till Education" in black text on a green background.

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# White 6 Row~Tillage Radishes 7 Row Splitter~Austrian Peas



# Sugar Beet Plate Radishes



Low Pressure



# Spiked Closing Wheel



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# Narrow Wave Colter



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Radishes

Peas

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# Red Worm Holes



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Cereal Rye  
Flown on

Brookston  
Silty Clay Loam





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# Wheat 20 Years of NoTill



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# Cereal Rye 20 Years of NoTill



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# New Field Chisel/Field Cultivators 2<sup>nd</sup> Year of Notill



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# Course, Platy Structure



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# Getting on The Wagon



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**Soil Information**

A woman in a bright yellow jacket is standing on the left side of a deep soil trench, gesturing as she speaks to a large group of men. The men are sitting on hay bales along the edge of the trench, listening attentively. In the background, there are various pieces of farm machinery, including a yellow tractor and a trailer, and a large crowd of people. The scene is outdoors in a field setting.

**Share Your Knowledge  
Share Your Story**

# The Key to Earthworms and Quality Soils

## Conservation Systems:

- ~ Conservation Tillage
- ~ Controlled Traffic
- ~ Cover Crops
- ~ Controlled Drainage



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