

# How it Works: Virginia's Use-value Assessment Program

Gordon Groover, Extension Economist  
and

Lex Bruce, Senior Research Associate

Department of Agricultural & Applied Economics Virginia Tech

(540) 231-5850

[groover@vt.edu](mailto:groover@vt.edu)

(540) 231-4441

[lbruce@vt.edu](mailto:lbruce@vt.edu)

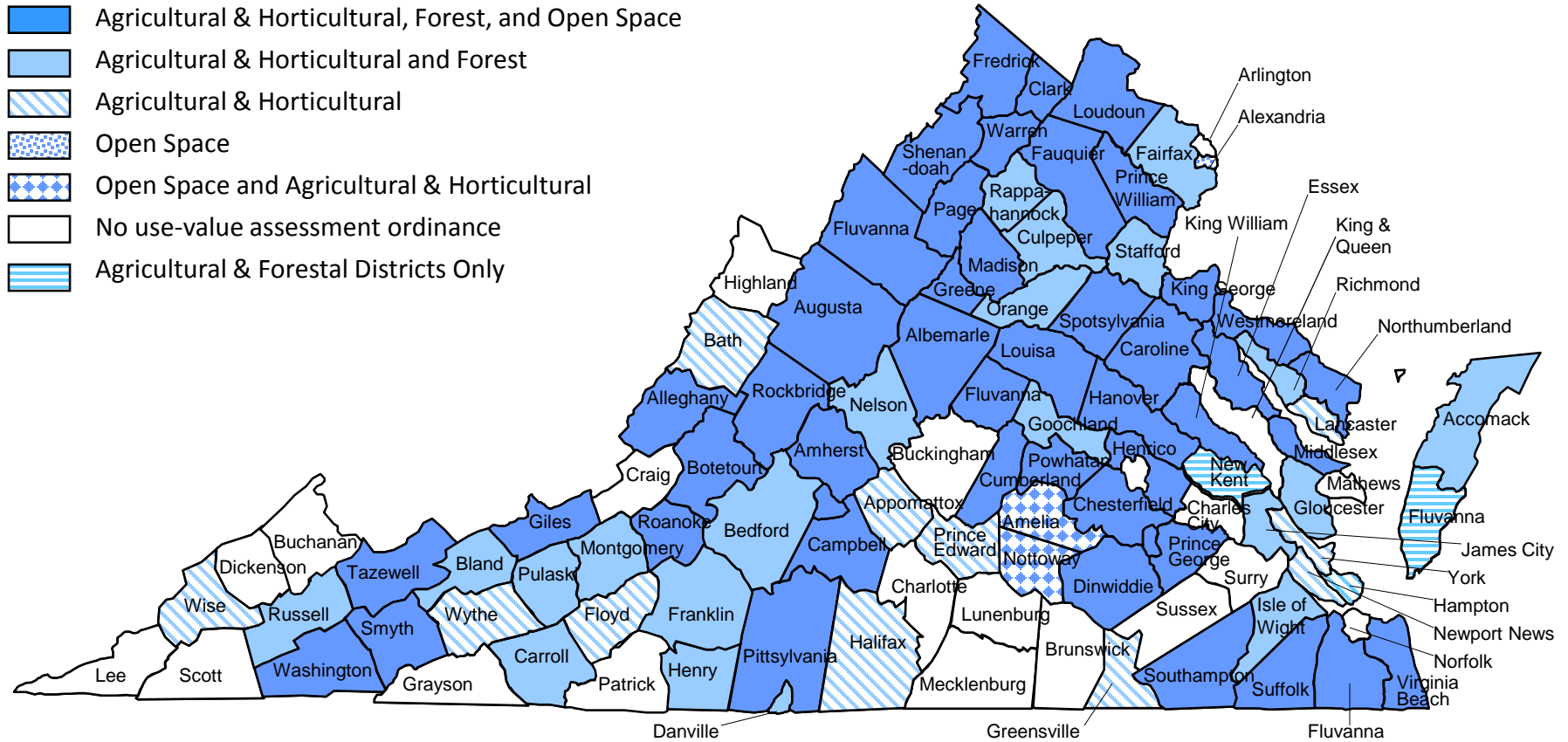
Website: <http://usevalue.agecon.vt.edu/>

August 17, 2016

# Outline

- Brief History
- Why Use-value Assessment?
- Approaches to estimating land values
  - Income approach
  - Rental rate approach
- Discussion

# TY2016: Counties/Cities\* with use-value assessment ordinances



\* Counties/Cities are identified from annual use-value reports and may differ from actual implementation. Contact government officials in each county/city for the current use-value implementation. Not all participating cities are identified on this map.

# ***Use-Value Assessment in Virginia***

- Virginia use-value taxation legislation was passed in 1972, effective for the tax year 1974.
- *Code of Virginia*, Title 58.1 §58.1-3229 through §58.1-3244), enacted in 1971, authorized use-value taxation with the stated purposes of:
  - Encouraging the **preservation** and **proper use** of such **real estate** ...source of... **agricultural, horticultural, and forest** products and **open spaces** within the reach of concentrations of population;
  - **Conserving** natural resources,... prevent **erosion, ...safe water** supplies;

(continued...)

# ***Use-Value Assessment in Virginia***

(continued...)

- ***Preserving scenic natural beauty and open spaces;***
- ***Promoting proper land-use planning and the orderly development***
- ***Promoting a balanced economy and ameliorating pressures*** that force conversion of such real estate ....preservation for **agricultural, horticultural, forestal, or open space** purposes.
- State Land Evaluation and Advisory Council (**SLEAC**) was created in 1973 with the mandate to estimate the use value of eligible land for each jurisdiction participating in the use-value taxation program.

# *Virginia's Use-Value Assessment Program*

- Virginia law allows for the preferential taxation of **agricultural, horticultural, forest,** and **open space** land (**no** open space in a district)
- **Eligible land** in any of these categories can be assessed at the land's **value in use** (use-value) as opposed to the land's **market value**

# *Value in Use?*

4.6.5 Agricultural Property - The Standard on Mass Appraisal of Real Property  
International Association of Assessing Officers (IAAO 2012)

.... to use the income approach for  
agricultural land... Land rents ....

And the Code of VA allows for income and  
rental rate approaches

# Value in use, How?

## Identify components of farmland value?

Market Value of 1.0 acre of farmland	\$7,000
minus	
Proximity to amenities	\$2,000
minus	
Accessibility/distance to the city center	\$1,000
minus	
Cost of conversion or development to non Ag use	\$2,000
minus	
Growth premium – population increase	\$1,000
leaves	
Capitalized annual stream of net income (rents) from farming	\$1,000



# Procedures for Estimating Agricultural and Horticultural Values in Use

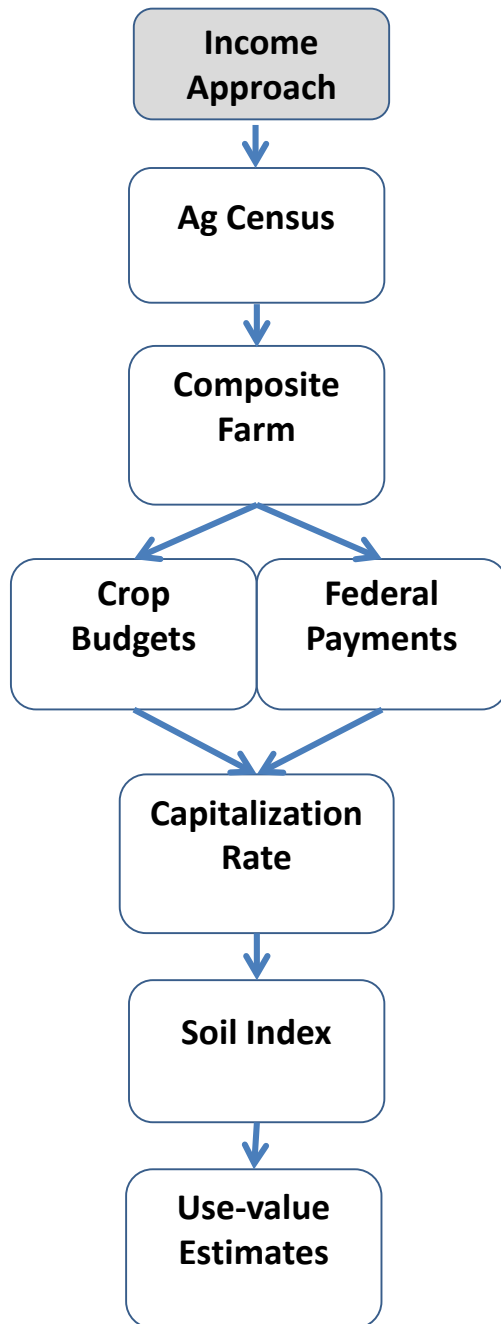
# Two Approaches

## **1. Net income Capitalized (Income Approach)**

Original model developed by Marshal (VT), Fraher, (TAX), Seward (VDACS), Poole (VT Grad Student) ~ 1974-1975.

## **2. Rental rates Capitalized (Rental Rate Approach)**

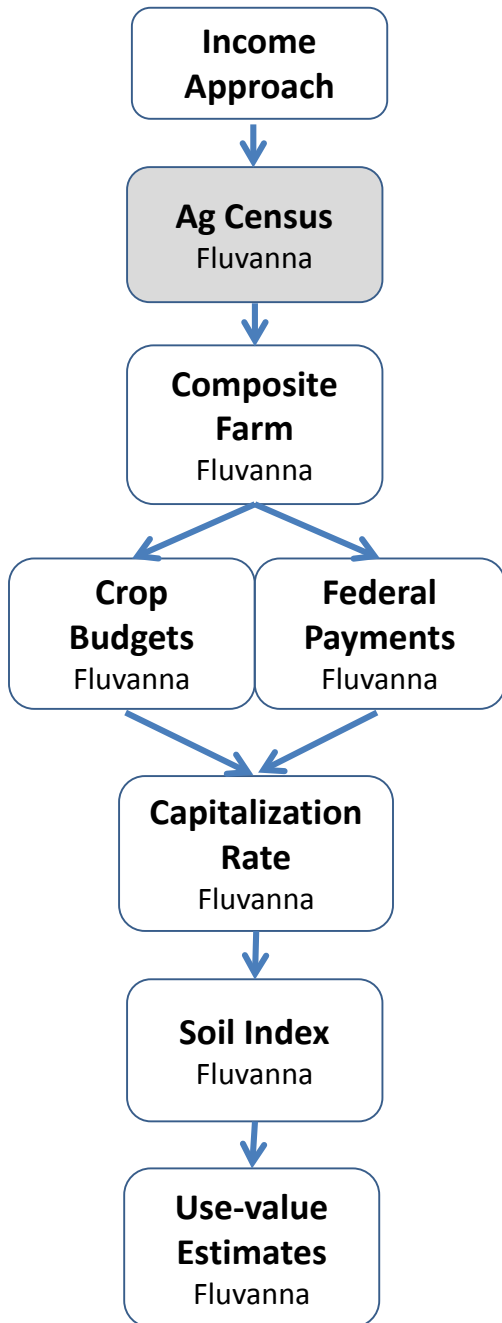
Implemented in 2010 by Groover and Bruce



## Income approach for each County

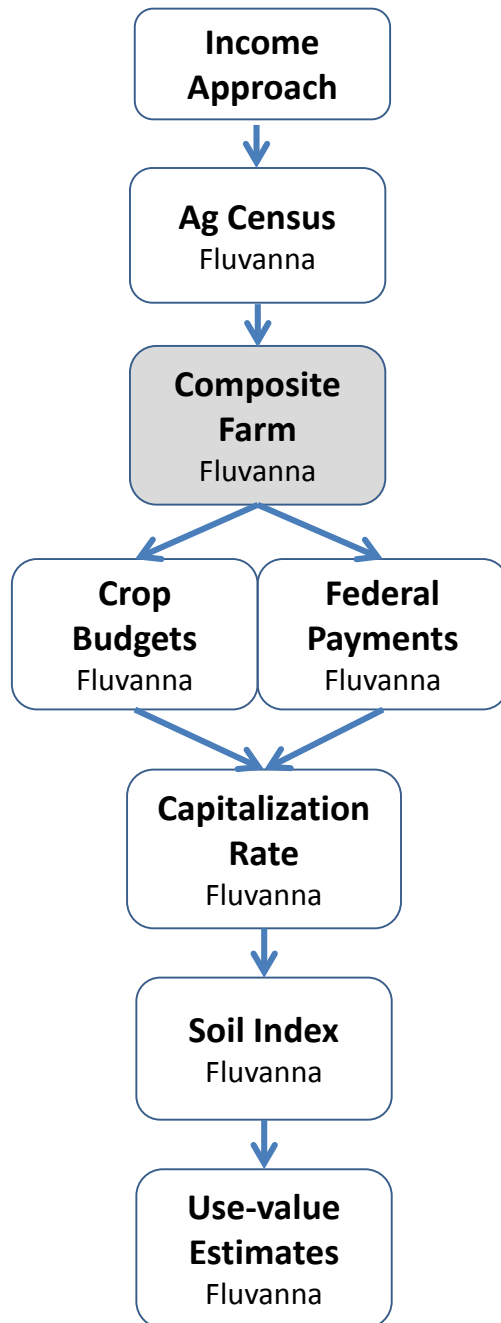
- Task: How to create an annual stream of net income that will be capitalized?
- How?
  - **Build** on secondary/published data
  - Use **Net Returns = Income - Costs**
  - **How?** Define a representative farm (composite farm) – based on current Ag Census for each county
  - **Create** an enterprise budget for each crop to yield **Net Returns (NR)**
  - **Identify** crop-based federal payments
  - **Define** Capitalization Rate
  - **Apply** soil index
  - Final Estimates

# Baseline Data - Ag Census



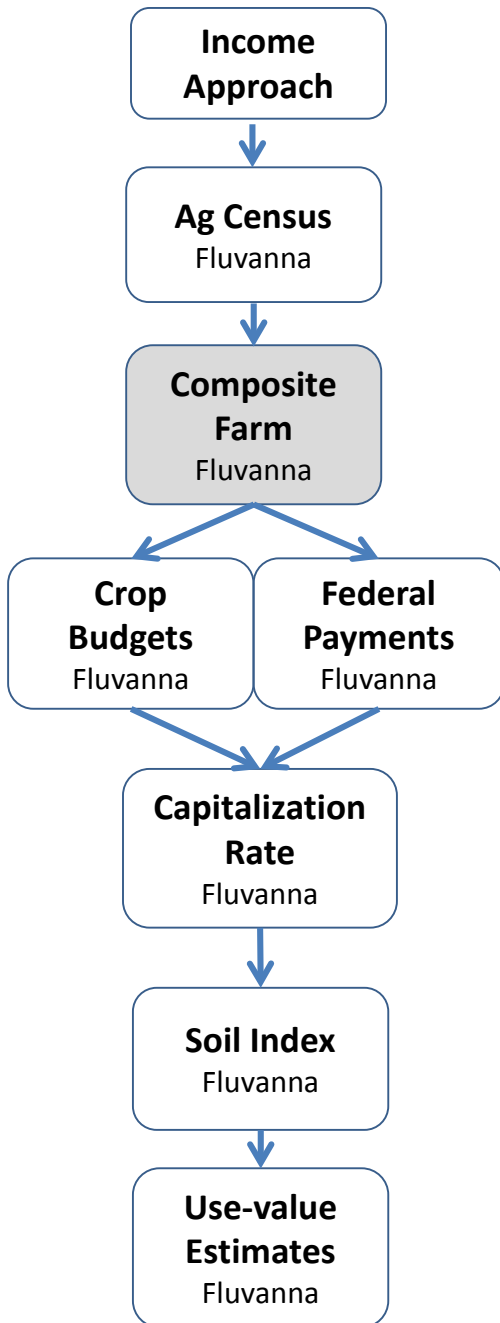
- Conducted and published by National Agricultural Statistics Service (USDA/NASS)
  - Published every 5 years
  - Current Ag Census 2012 (released in 2014)
- Use the following for each county
  - Number of **farms reported**
  - Individual crops grown e.g., corn, wheat, pasture...
  - **Acres** reported for each crop grown

# Composite Farm



- **Define - Composite Farm (CF) A.K.A. Average Farm**
  - For each reported crop: Divide acres by number of farms (Acres ÷ Farms)
  - If the values is **>0.50** ac, included in the CF
  - If **≤ 0.50** ac, excluded from CF
  - Statewide there are **16 crops** that are included in at least one county
- **Fluvanna – 2012 Census**
  - **303** reported farms => more land owners
  - **Five** CF crops, e.i., corn+silage, hay+haylage, pasture, soybeans, and wheat.

# Composite Farm - Fluvanna



2012 Ag Census Fluvanna	
Crop	Reported Acres
Alfalfa	146
Barley	(D)
Corn	1,681
Cotton	0
Hay	7,984
Pasture	12,965

Based on 303 farms	
Composite Farm Acres	
	6
	26
	43

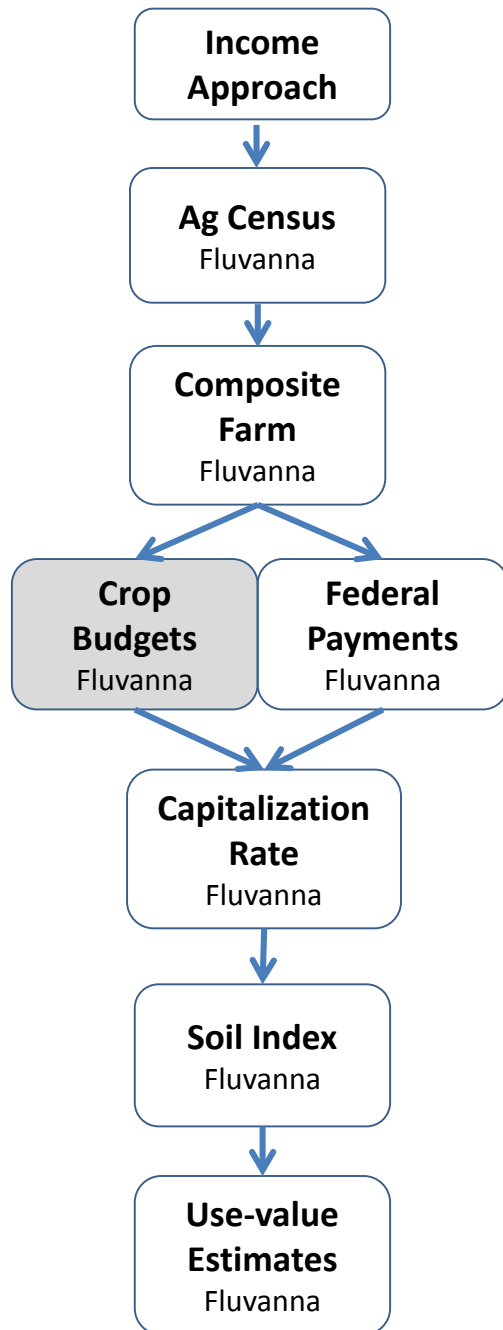
Example for Corn = 1,681 ac / 303 farms = 6 acres of corn in the Composite Farm (CF)

Soybeans	1,683
Sweet Corn	(D)
Tobacco	0
Tomatoes	(D)
Watermelons	(D)
Wheat	1,001
<b>Double-cropped*</b>	<b>(-) 1,001</b>
<b>Total Cropland Harvested</b>	<b>24,466</b>

	6
	3
	<u>(-) 3</u>
	81

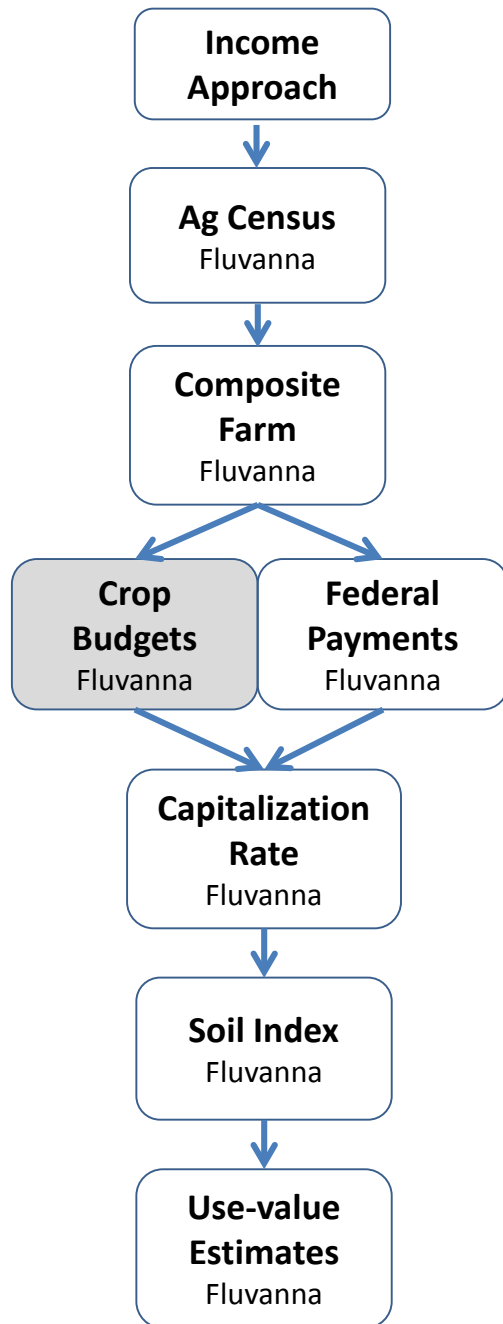
\*Barley, rye, and wheat

# Crop Budgets



- Created for all CF crops
- Based on VCE enterprise budget format
- Yields and Prices -> NASS
- Seeding and lime rates -> VCE recommendation
- N,P, & K inputs are based on yield-driven nutrient removal rates (International Plant Nutrition Institute)
- AgFrist -> short-term interest

# Crop Budgets

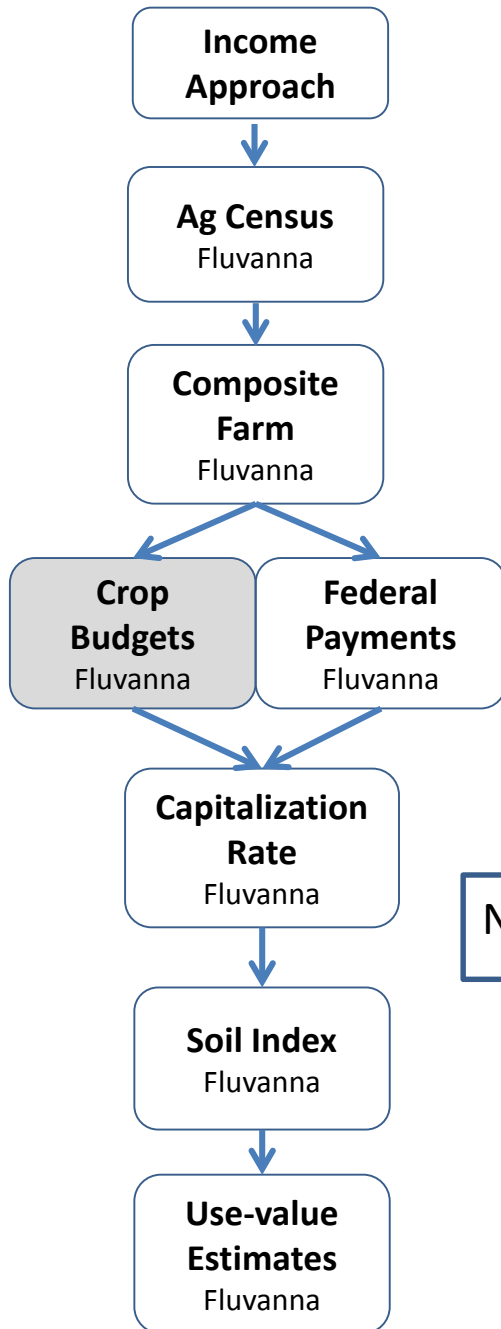


- Pesticides -> Pest Management Guidelines (PMG)
- Application costs -> custom rates
- Machinery usage and costs -> A. Society of Ag and Biological Engineers' equations
- Fuel prices -> U.S. Dept of Energy
- Crop insurance -> USDA-RMA
- Labor hours function of machinery hours
- Labor rate -> NASS
- **Note:** Budgeted Net Returns **lag 2 years**, e.g., Tax Year 2016 reflects 2014 data



# Abbreviated Example Budget

## Fluvanna Corn Grain no-till TY2016



Corn: Yield = 124.70 bu/ac \* Price = \$3.90/bu = \$486.83  
Net Crop Insurance = \$16.40  
**Total Income = \$502.73**

### Net Returns = Income - Costs

$$\text{NR} = \$503 - \$545 = \text{-\$42/ac}$$

**Pre-Harvest Costs:** N 121.6 Lb  
Price = \$0.59/lbs = \$71.73/ac

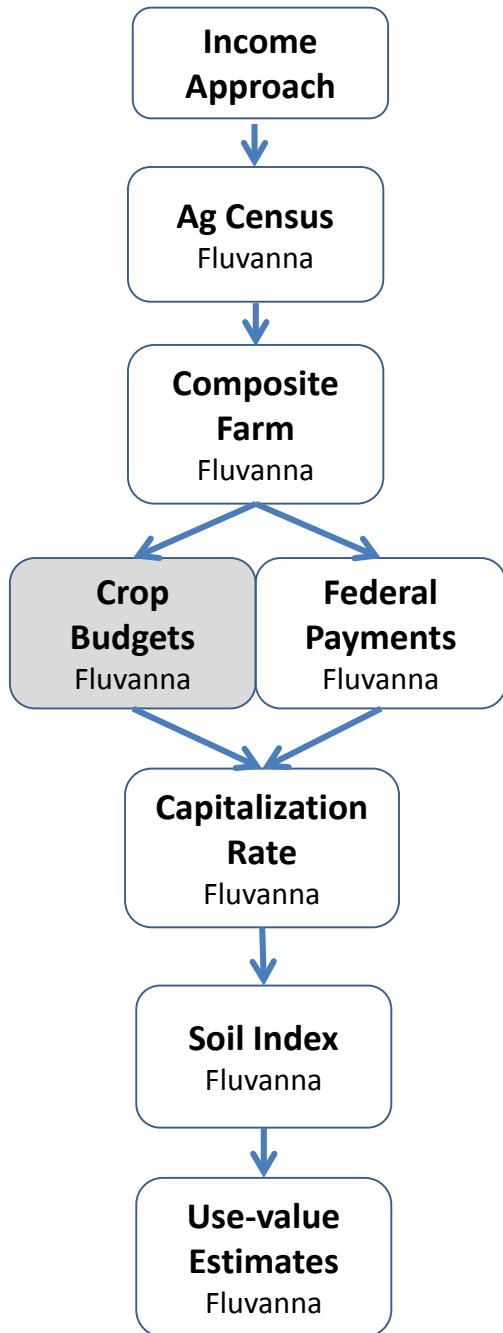
**Harvest Costs:** Labor, fuel & oil,  
drying, hauling = \$86.60/ac

**Fixed Costs:** Machinery and  
Overhead = \$83.26/ac

**Total Costs = \$544.61/ac**

# Olympic Averaging

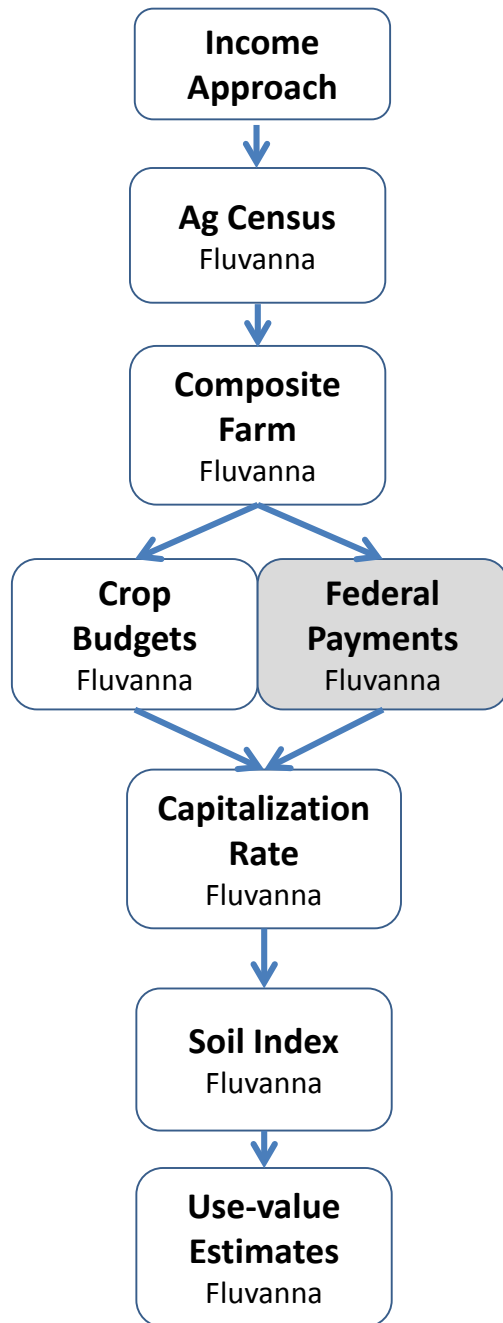
- The Net Return for each CF crop requires 7 - years of crop budgets
- 7-year Olympic Averaging drops the highest and lowest values and then straight averages the remaining 5 values
- Fluvanna Corn Grain example TY2010-2016



Fluvanna: Corn	Crop Budget
TY2010	\$0.00
TY2011	\$0.00
TY2012	\$154.34
TY2013	\$102.15
TY2014	\$406.16
TY2015	\$0.00
TY2016	\$0.00
<b>Olympic AVG</b>	<b>\$51.30</b>

Lowest

Highest



# Federal Payments

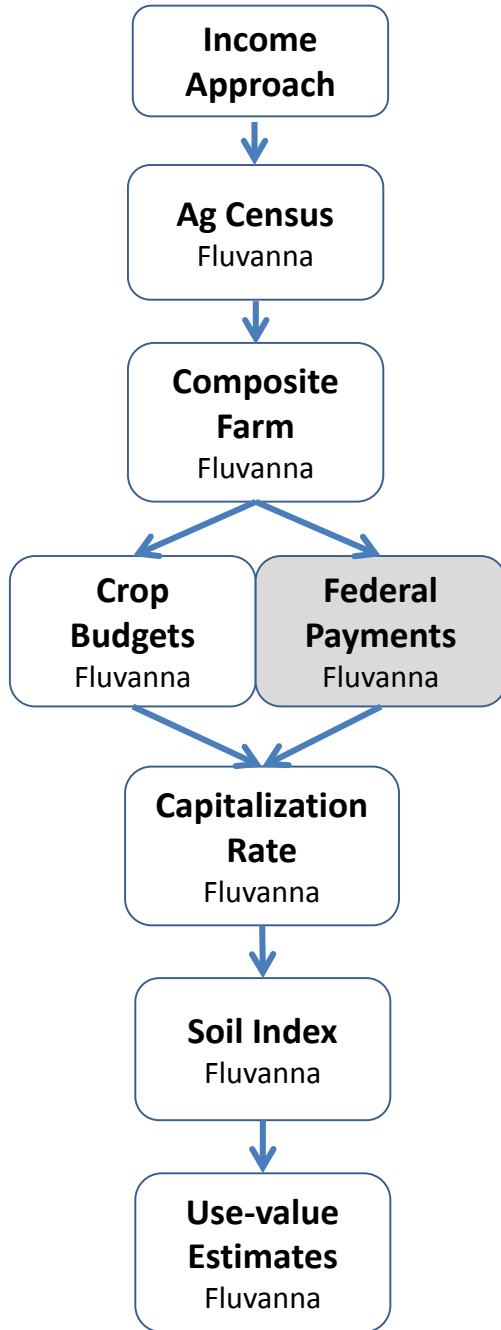
- **USDA-FSA** provides data for program crops by county
- Fluvanna receives payments for **corn, wheat, and soybeans**
- Annual payments = Payment/crop acreage
- For example in TY2015, Fluvanna received **\$12,220 in federal payments for corn.**

$$\text{TY2015 } \$12,220 / 1,681 \text{ ac} = \text{\$7.27/ac}$$

$$\text{TY2016 } \$0.00 / 1,681 \text{ ac} = \text{\$0.00/ac}$$

# Olympic Averaging

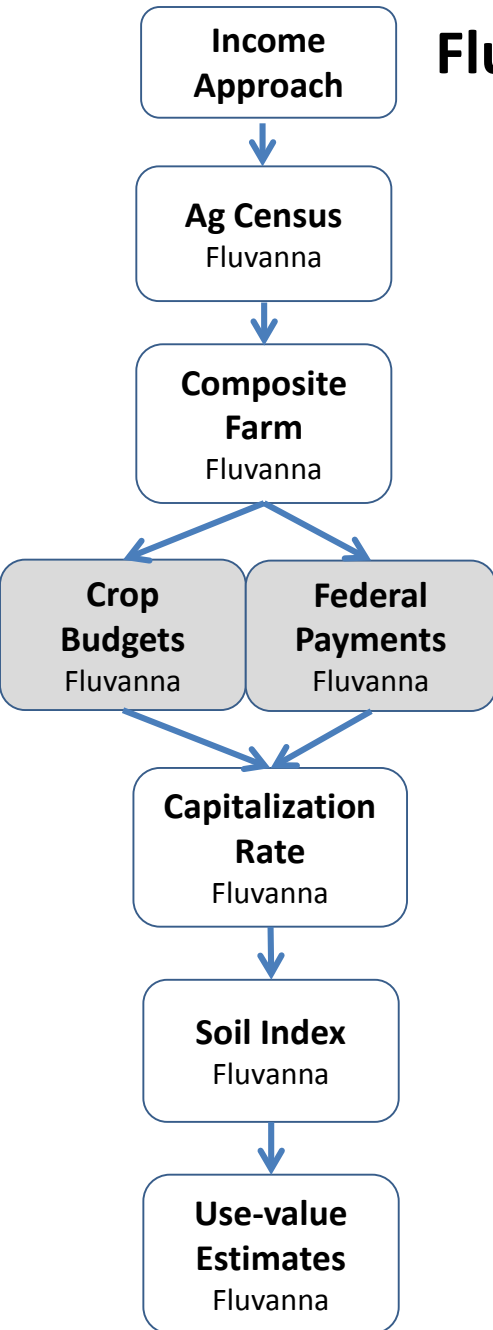
- Fluvanna Corn Grain example 2010-2016



Fluvanna: Corn	Federal Payment	Corn Budget
TY2010	\$7.45	\$0.00
TY2011	\$5.97	\$0.00
TY2012	\$5.68	\$154.34
TY2013	\$12.54	\$102.15
TY2014	\$12.89	\$406.16
TY2015	\$7.27	\$0.00
TY2016	\$0.00	\$0.00
<b>Olympic AVG</b>	<b>\$7.78</b>	<b>\$51.30</b>

- Corn Net Return for TY2016
  - Oly AVG Fed Pay + Oly AVG Budget
  - $\$7.78 + \$51.30 = \mathbf{\$59.08}$

# Fluvanna Budgets and Federal Payments TY2010-16

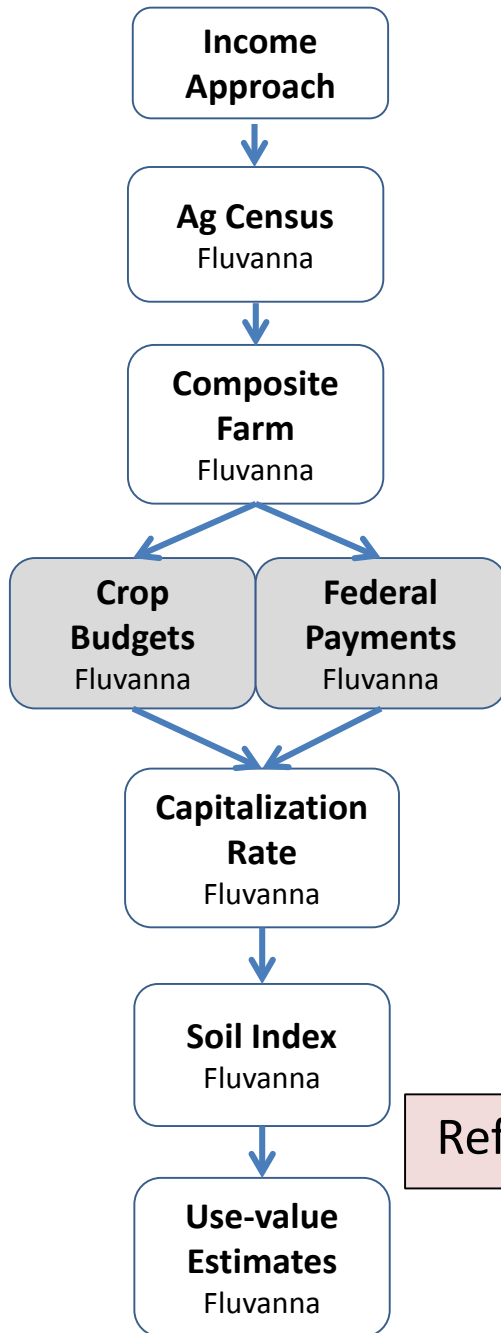


	2016	2015	2014	2013	2012	2011	2010	OLY AVG
<b>Corn</b>	0.00 L	0.00	406.16 H	102.15	154.34	0.00	0.00	\$51.30
Fed Pay	0.00 L	7.27	12.89 H	12.54	5.68	5.97	7.45	\$7.78
							<b>Total</b>	<b>\$59.08</b>
<b>Hay</b>	0.00 L	0.00 H	0.00	0.00	0.00	0.00	0.00	\$0.00
<b>Wheat</b>	0.00 L	0.00	65.32	115.54 H	0.00	0.00	61.31	\$25.33
Fed Pay	0.00 L	7.52	9.06	9.16 H	7.20	5.97	6.63	\$7.28
							<b>Total</b>	<b>\$32.60</b>
<b>Soybean</b>	129.75	160.41	249.19 H	238.36	122.24	34.34 L	14.00	137.02
Fed Pay	0.00 L	0.23	0.57	0.56	0.56	5.97 H	0.64	\$0.51
							<b>Total</b>	<b>\$137.53</b>
<b>Pasture</b>	0.00 L	0.00	0.00	11.89 H	0.00	0.00	0.00	\$0.00
<b>Final Net Return (Weighted AVG)</b>								<b>\$14.85</b>

# Final Net Returns

## Fluvanna County TY2016

- Composite Farm weighted NR by crop acreage



Crop	Estimated Net Return
Corn	\$59.08
Hay	\$0.00
Wheat	\$32.60
Soybeans	\$137.53
Pasture	\$0.00
<b>Final Net Return (per acre)</b>	

CF acres	% weight (e.g. corn 19/93=0.206)	Final\$
6	0.07	\$4.06
26	0.33	\$0.00
3	0.04	\$1.33
6	0.07	\$9.46
43	0.53	\$0.00
<b>81</b>		<b>\$14.85</b>

Reflects double-cropped barley, rye & wheat (3 CF ac)

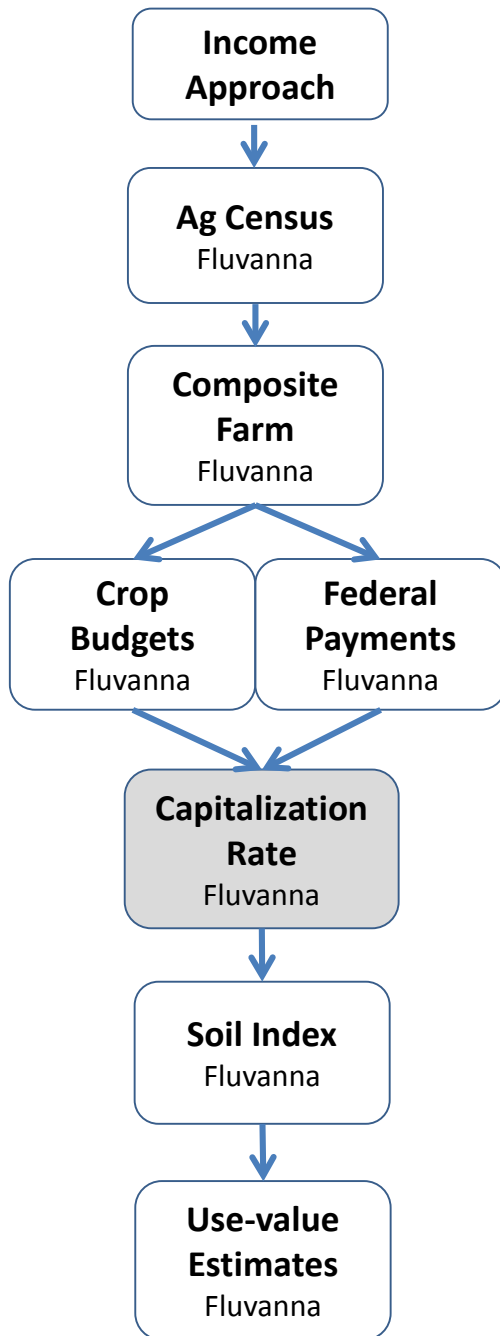
# Capitalization Rate

Why use Capitalization Rate?

- *Cap Rate = Net Return ÷ Value Farmland*
- *Farmland Value = NR ÷ Cap Rate*
- *\$100 per year ÷ 10% = \$1,000*
- **Cap Rate = Interest Rate+Property Tax**

Federal Land Bank long term interest rate - AgFirst (10 year average)

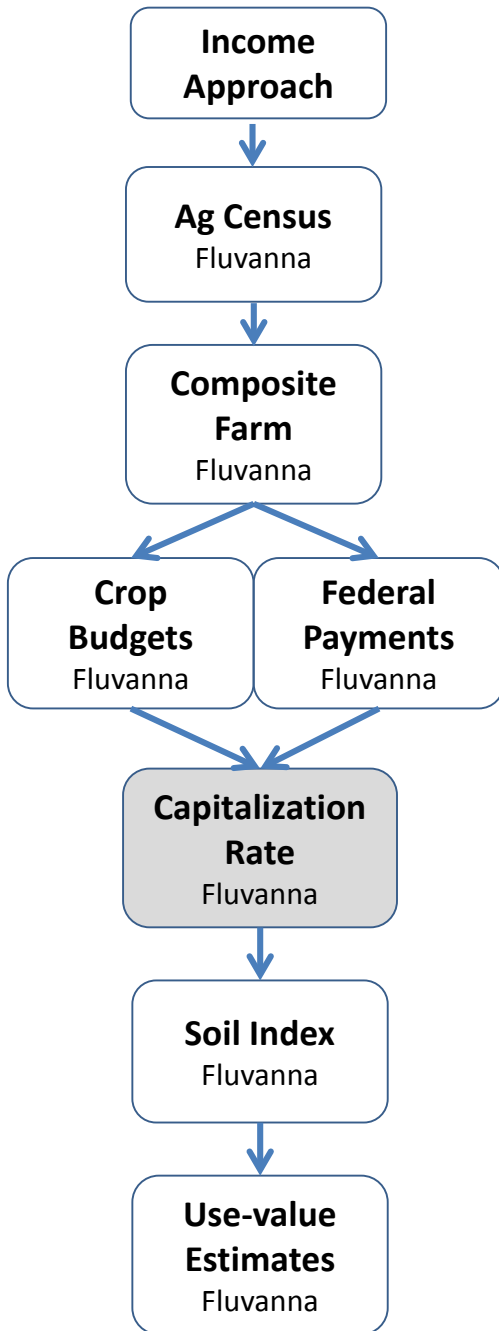
Effective Tax Rates for all counties - VA Department of Taxation (10 year average)



# Fluvanna TY2016

## Cap Rate Components

Interest Rate – statewide (10yr Avg)	0.0626
Property Tax – Fluvanna (10yr Avg)	0.0059
<b>Total without risk</b>	<b>0.0685</b>
Crop loss due to Flooding 5%	0.0034
<b>Total With risk</b>	<b>0.0719</b>

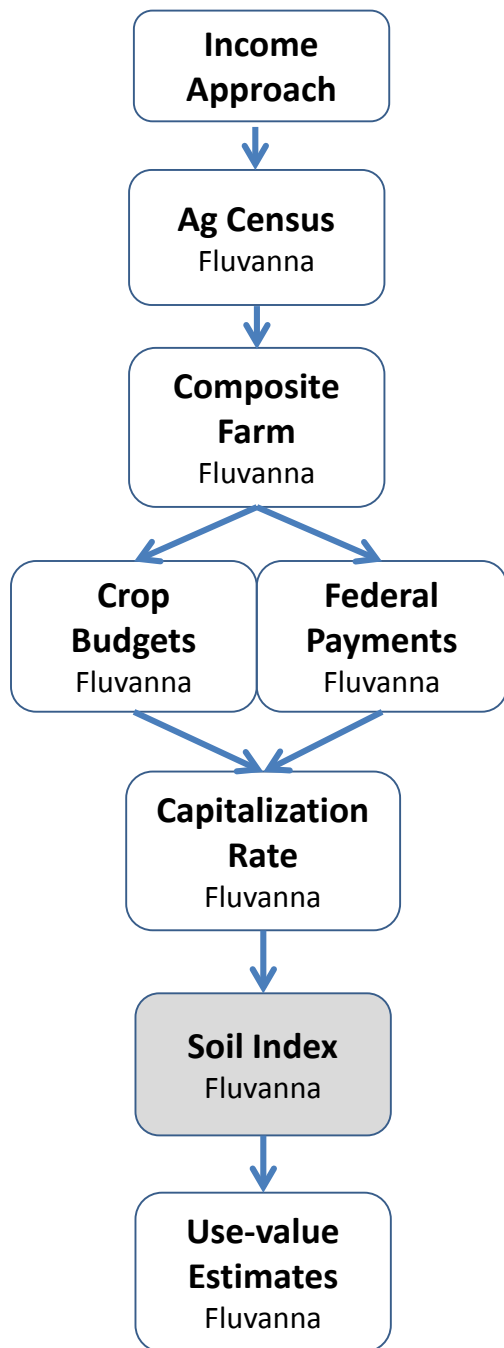


## Use Value Fluvanna TY2016

	Use Value =	Net Returns	÷	Cap Rate
Use Value without risk =	\$14.85	÷	<b>0.0685</b>	
Use Value without risk =				<b>\$216.77</b>
Use Value with risk =	\$14.85	÷	<b>0.0719</b>	
Use Value with risk =				<b>\$206.45</b>



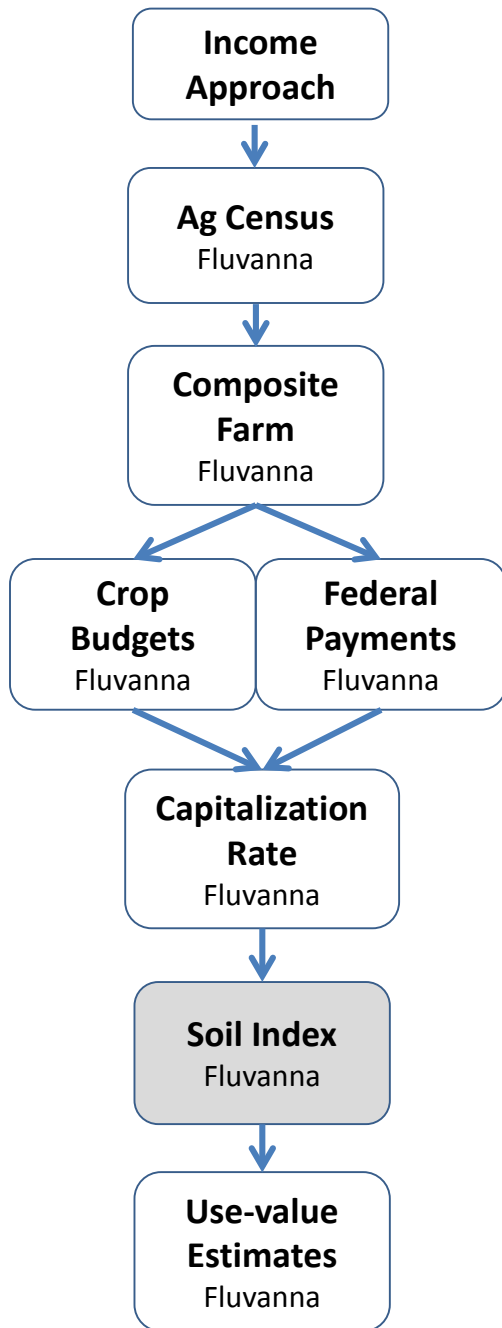
# Adjustments for Soil Capabilities



## USDA Land Classes for Ag use

Land Capability Classes	Productivity Index
Class I - Excellent cropland	1.50
Class II - Good cropland	1.35
<b>Class III - Average cropland</b>	<b>1.00</b>
Class IV - Below average cropland – strip cropping only, hay	0.80
Class V – Good Pasture, hay	0.60
Class VI – Pasture	0.50
Class VII – Very limiting - Pasture only	0.30
Class VIII – Not suitable to agriculture – steep or wet	0.10

# Indexing for Soil Productivity



## Fluvanna

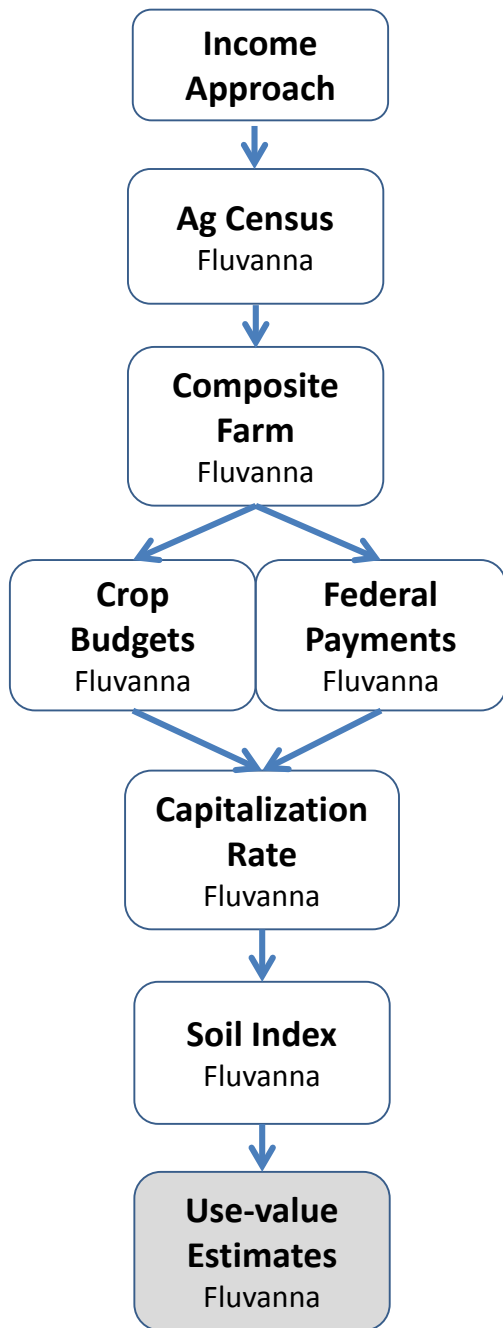
Land Class	Reported Acreage	Productivity Index	Weighted Acreage
I	0	1.50	0.00
II	10,411	1.35	14,054.85
III	7,824	1.00	7,824.00
IV	187	0.80	149.60
Total	18,422		22,028.45
Soil Index Factor $22,028.45 \div 18,422 = 1.196$			

# Adjusting to Class III land

Why?

- Data reflects average soil productivity for each county
- Values are adjusted to reflect Class III productivity

## Use Value Fluvanna TY2016



	Use Value =	Use Value	÷	Soil index
	Without risk =	\$216.77	÷	1.196
	<b>Without Risk Class III =</b>			<b>\$181.28</b>
	With risk	\$206.45	÷	1.196
	<b>With Risk Class III =</b>			<b>\$172.65</b>

# Final Estimates Fluvanna TY2016

	Cropland				Weighted Cropland AVG	Pastureland			Weighted Pasture land AVG	Weighted Ag. Land AVG	VIII
	I	II	III	IV	<i>I-IV</i>	V	VI	VII	<i>V-VII</i>	<i>I-VII</i>	
<b>w/out Risk</b>	270	240	180	150	<b>210</b>	110	90	50	<b>90</b>	<b>180</b>	20
<b>w/ Risk</b>	260	230	170	140	<b>200</b>	100	90	50	<b>80</b>	<b>170</b>	20

- Note: Final estimated values are rounded to the nearest \$10
- The Class III w/out risk estimate of \$181.28 is reported as \$180

# Rental Rate Approach Fluvanna TY2016

- Starting 2009 NASS published rental rate data annually\* for
  - Cropland
  - Irrigated cropland
  - Pasture land
- Fluvanna County rental rates for 2014 (TY2016) (NASS)
  - Cropland = \$17
  - Pastureland = \$12

\*Sometimes biennially based on NASS funding

# Rental Rate Use Value Fluvanna TY2016

	<b>Rental Rate</b>	<b>÷</b>	<b>Cap Rate</b>	<b>=</b>	<b>Value</b>
<b>Cropland</b>	<b>\$17</b>	<b>÷</b>	<b>0.0685</b>	<b>=</b>	<b>\$250</b>
<b>Pasture</b>	<b>\$12</b>	<b>÷</b>	<b>0.0685</b>	<b>=</b>	<b>\$180</b>

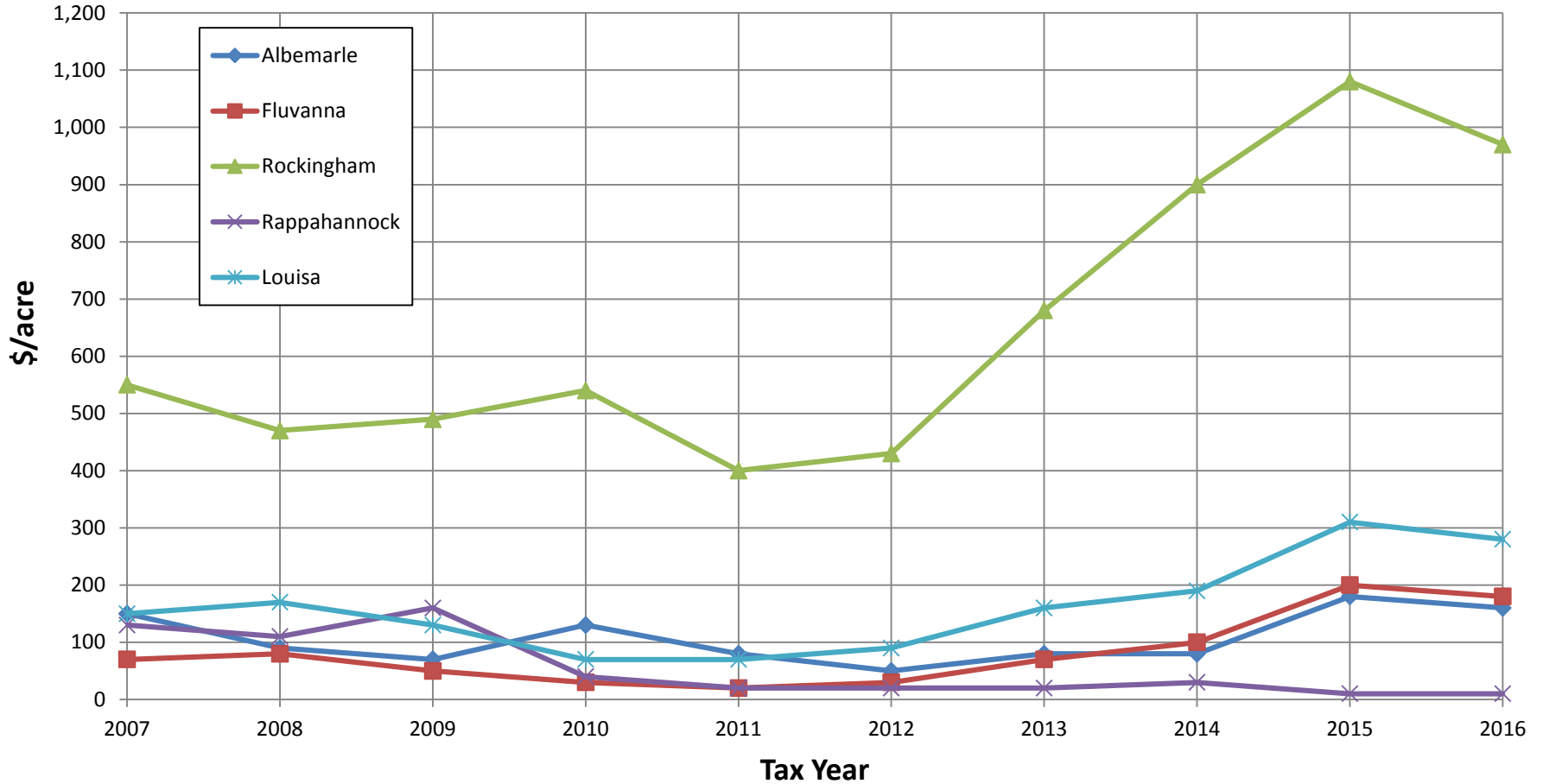
Rental Rate Estimates are published annually  
– **not averaged over time**

## Income Approach and Rental Rate Approach: Compared

Fluvanna	<b>Income Approach</b> (w/out risk)		<b>Rental Rate Approach</b>	
<b>TY2016</b>	Cropland (I-IV AVG)	<b>\$210</b>	Cropland	<b>\$250</b>
	Pastureland (V-VII AVG)	<b>\$90</b>	Pastureland	<b>\$180</b>

# Use-value Estimates: Type III Land (w/out risk)

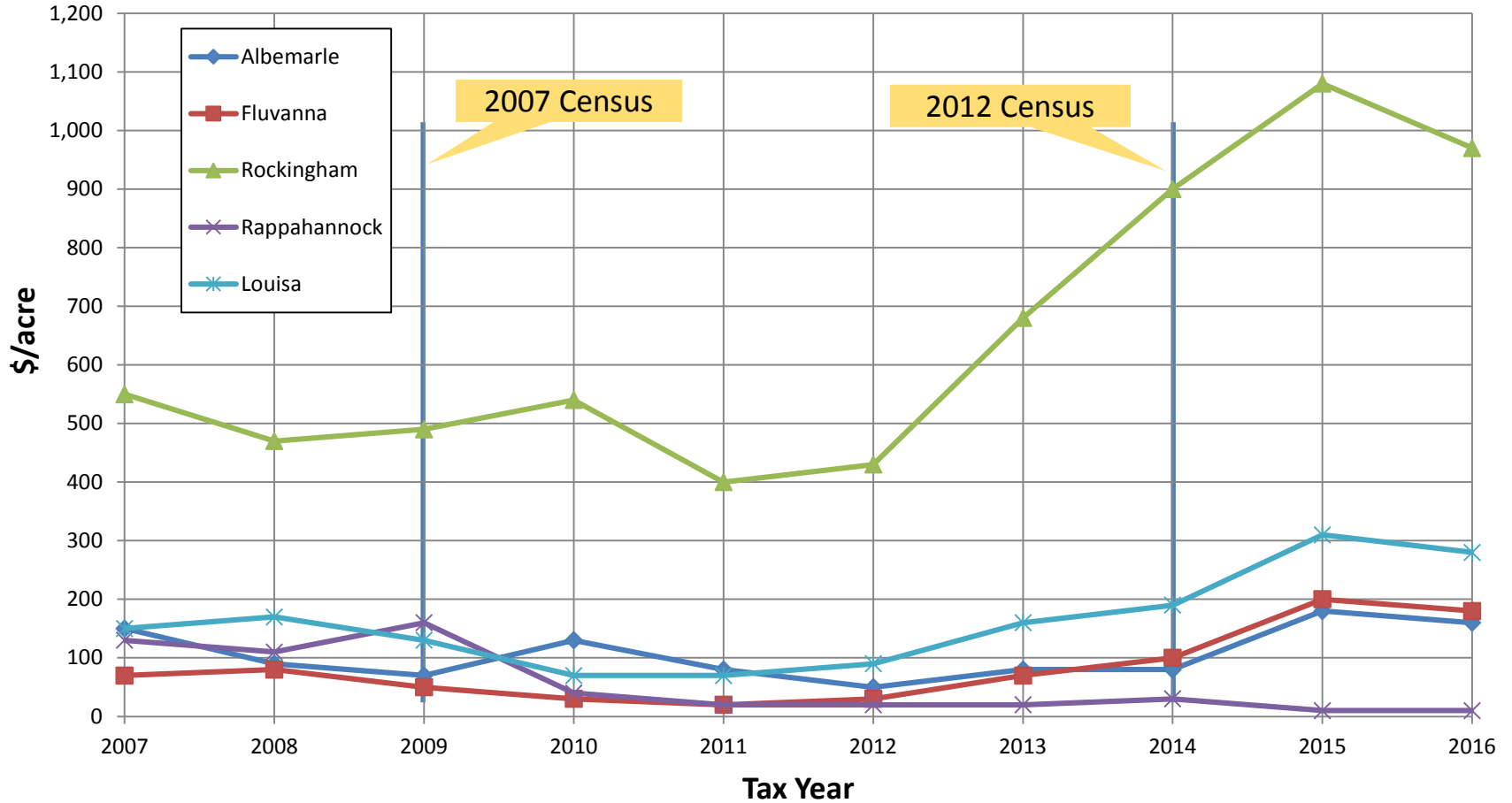
## Selected Jurisdiction Comparison (Tax Years 2007 to 2016)



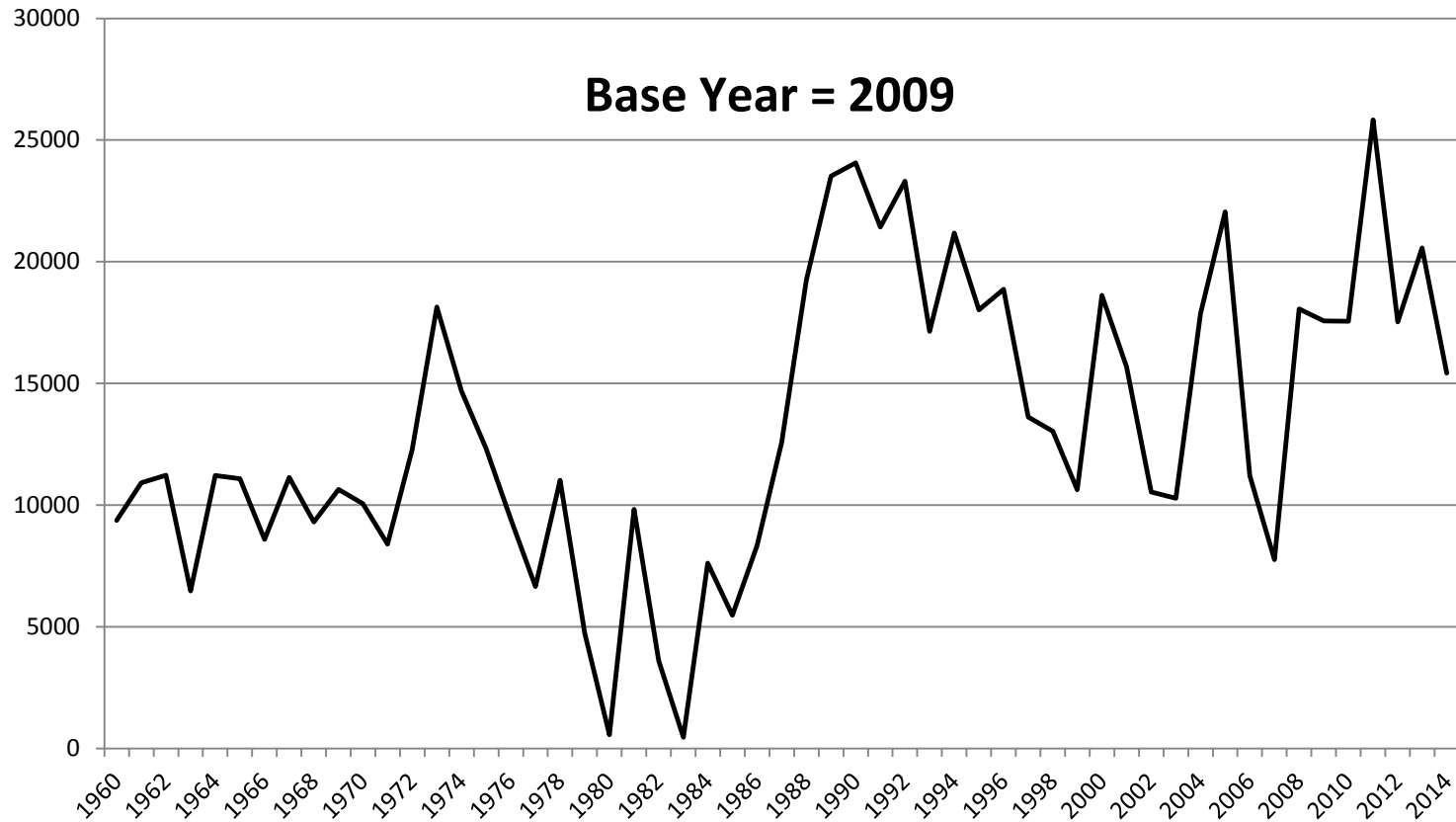


# Use-value Estimates: Type III Land (w/out risk)

## Selected Jurisdiction Comparison (Tax Years 2007 to 2016)



# Real Net Farm Income Virginia \$/farm



Source: USDA/ERS Farms and Land in Farms and USDA/ERS Farm Income and Wealth Statistics

*Thanks!*

*&*

*Discussion & Questions?*

*usevalue.agecon.vt.edu*