Ag and Hort Update

Gordon Groover, Extension Economist Emeritus
and
Lex Bruce, Senior Research Associate
Department of Agricultural & Applied Economics Virginia Tech
(540) 231-5850
groover@vt.edu
(540) 231-4441
lbruce@vt.edu

Website: *http://usevalue.agecon.vt.edu/*

July 11, 2018

TY2018: Counties/Cities* with use-value assessment ordinances

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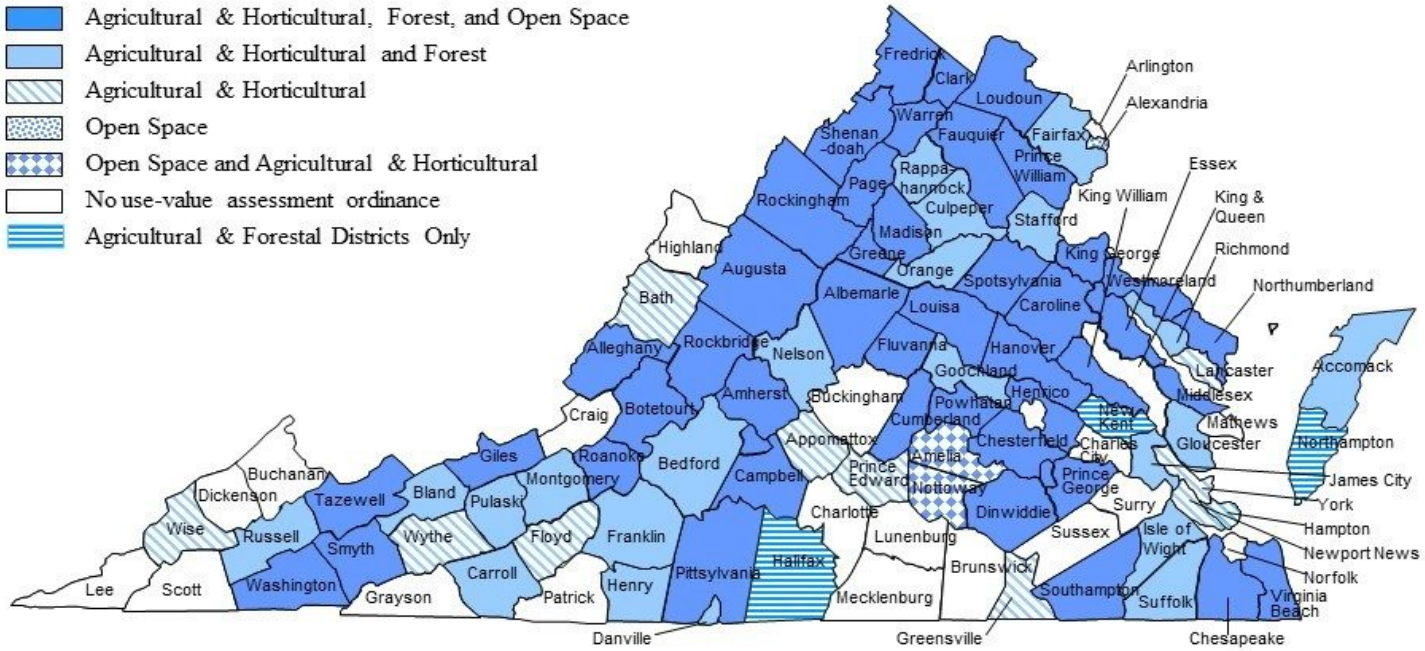
(Agricultural & Horticultural, Forest, and Open Space)



* 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.

Updates: Personnel

- Matt Holt, AAEC Department
- Lex and I are still working
  - Maybe one more year?
- The search for our replacements will start soon?
- There is support for an orderly transition

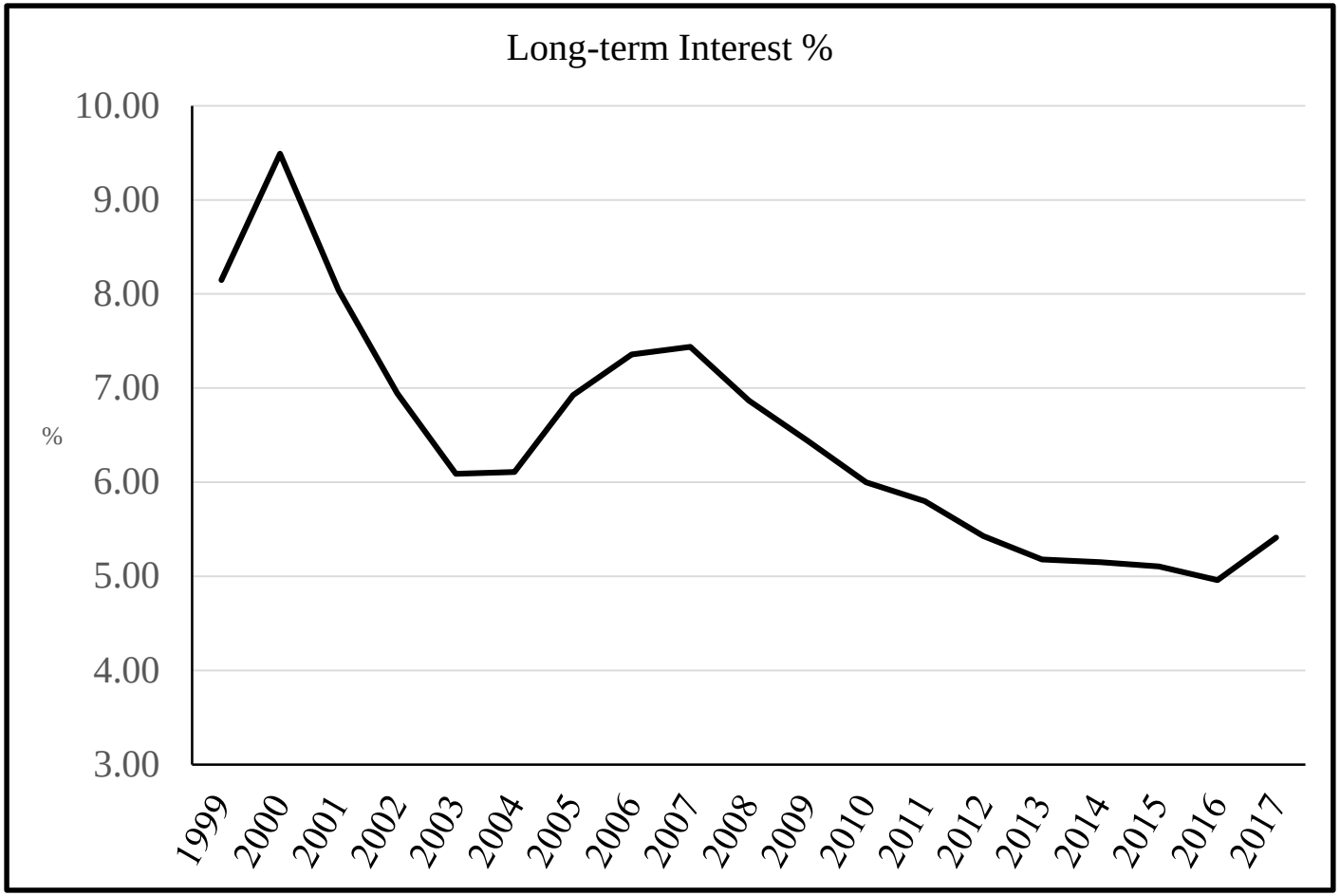
Updates: Cap Rates

- Updated Cap Rate data averaging
  - long-term interest (Federal Land Bank)
  - Property tax rates (Department of Taxation)
- Now use a 7 years straight average
- Previous years used a 10 year straight average

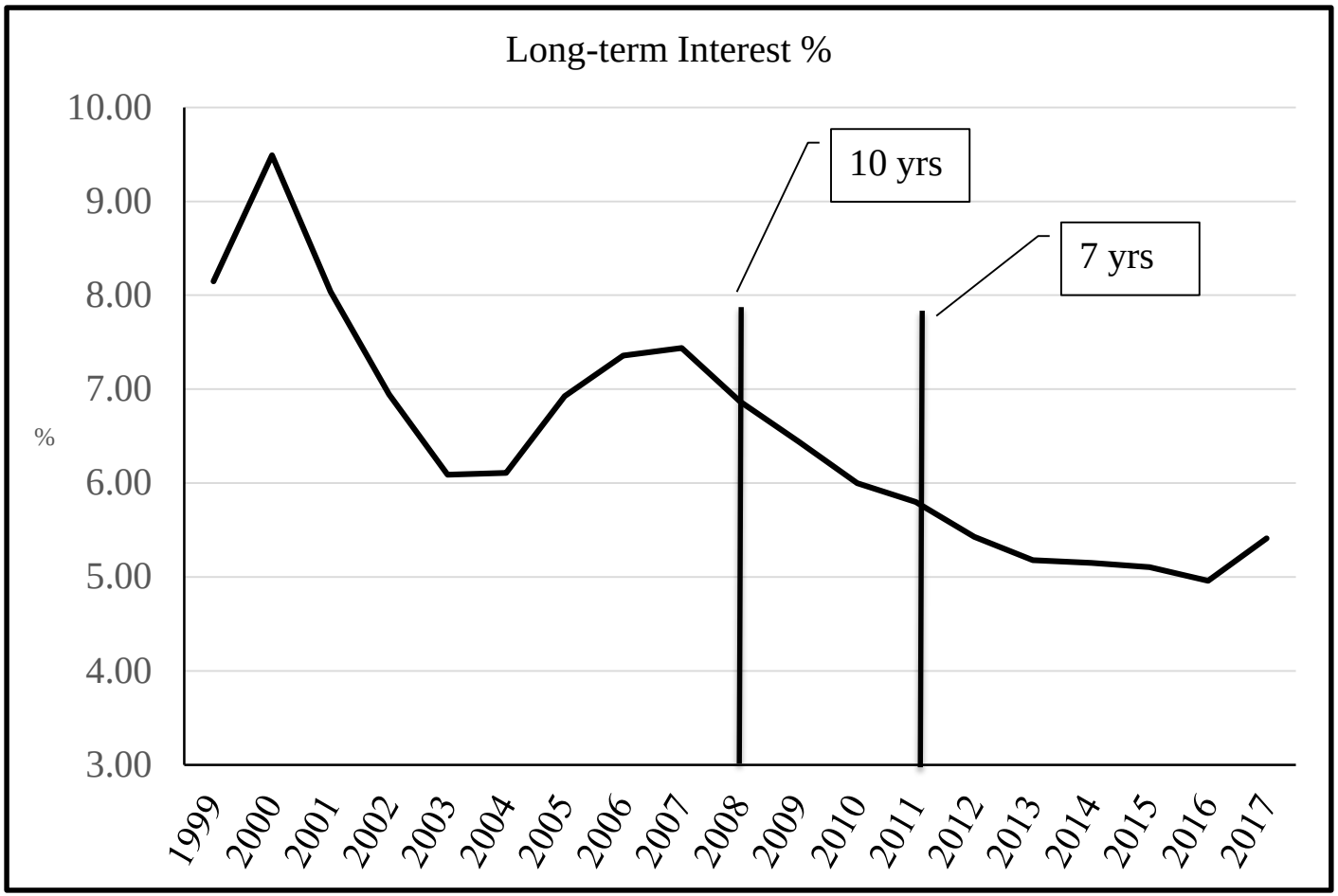
Cap Rate Background

- First Q of 2007 Federal Reserve began stimulating the economy by reducing federal fund rates
- Not directly related to Federal Land Bank rates but help reduce rates (2007 to 2016)
- The interest rate competent of the cap rate is larger relative to the local tax value
- Thus interest rates drive the Cap Rate

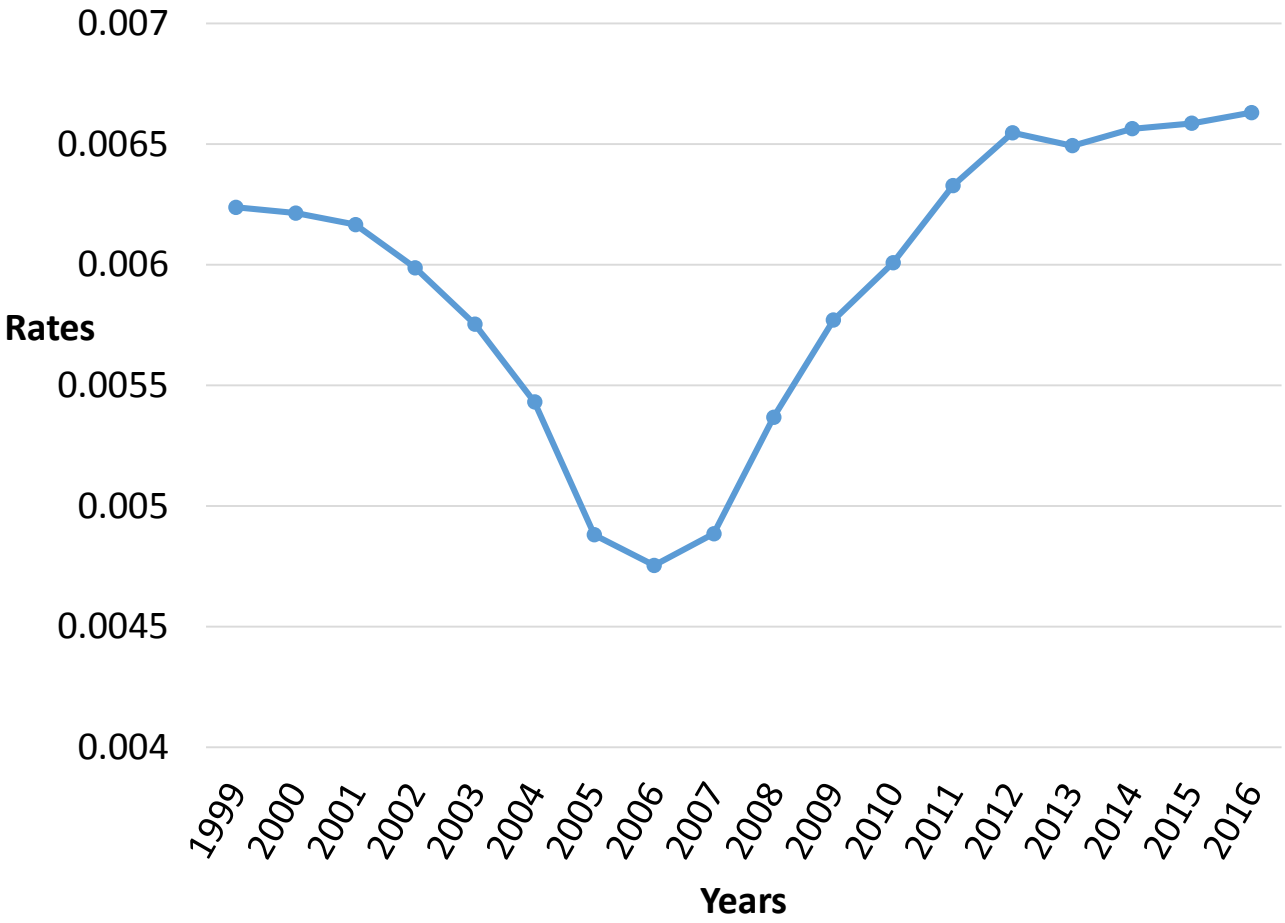
Federal Land Bank Rates



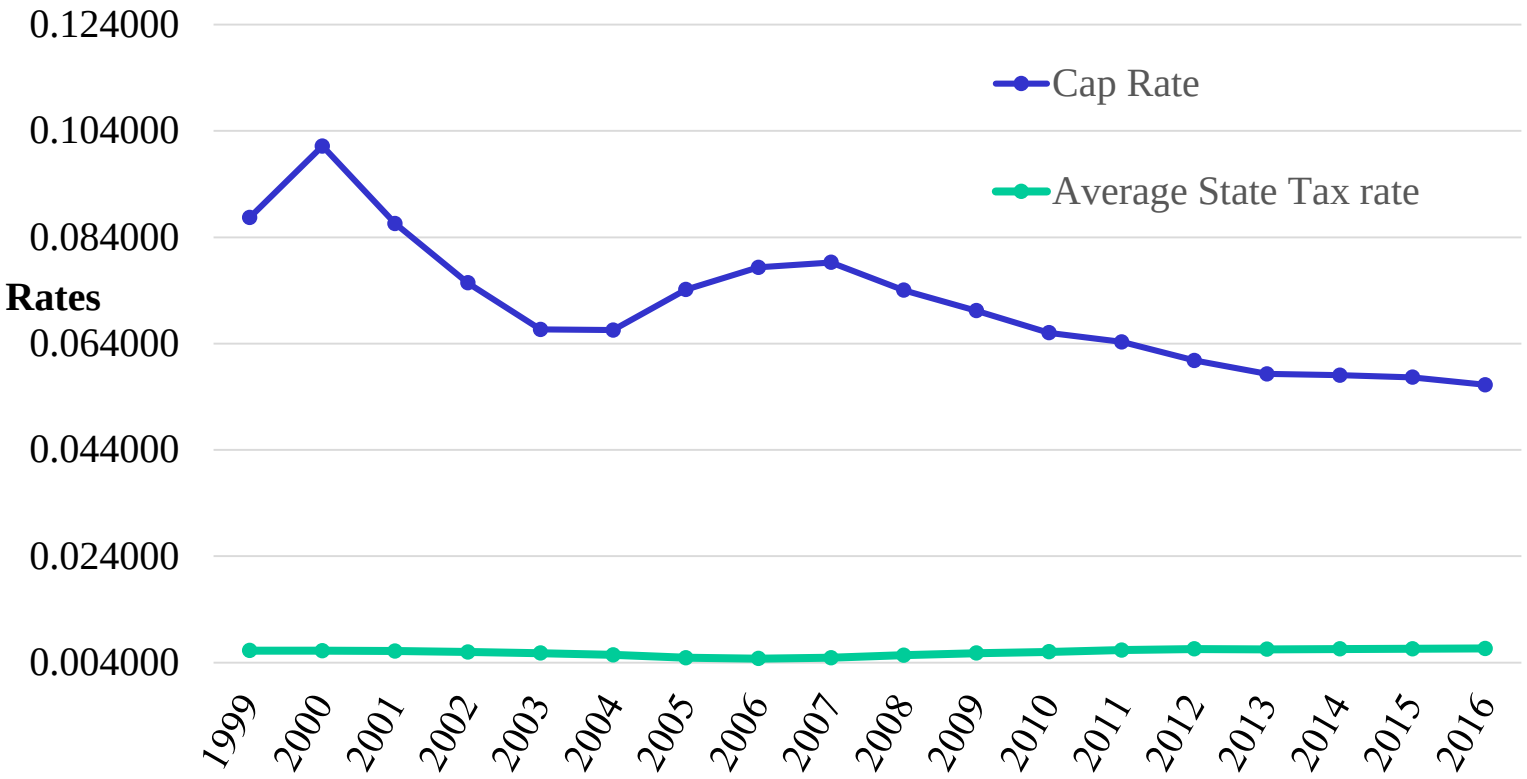
Federal Land Bank Rates



Average Virginia Tax Rates by Year



Tax and Cap Rates by Year



Cap Rates Summary

- Changing from a 10-year (2008-2017) to a 7-year (2011-2017) cap rate averaging results in a lower cap rate, fewer higher years (2008-2010) averaged.
- Decreases in capitalization rates increase use-value estimates. For example
  - If a county's net returns remained at $50 for the new year
  - capitalization rates decreased from 0.06% to 0.05%.
  - Estimates would increase from $50/0.06 = $833 to $50/0.05 = $1,000

Updates: Model

- In TY2018 updated the non-irrigated land capability classes acreages data for land class I-VII
- Data obtained from the Web Soil Survey https://websoilsurvey.nrcs.usda.gov

Update: Census

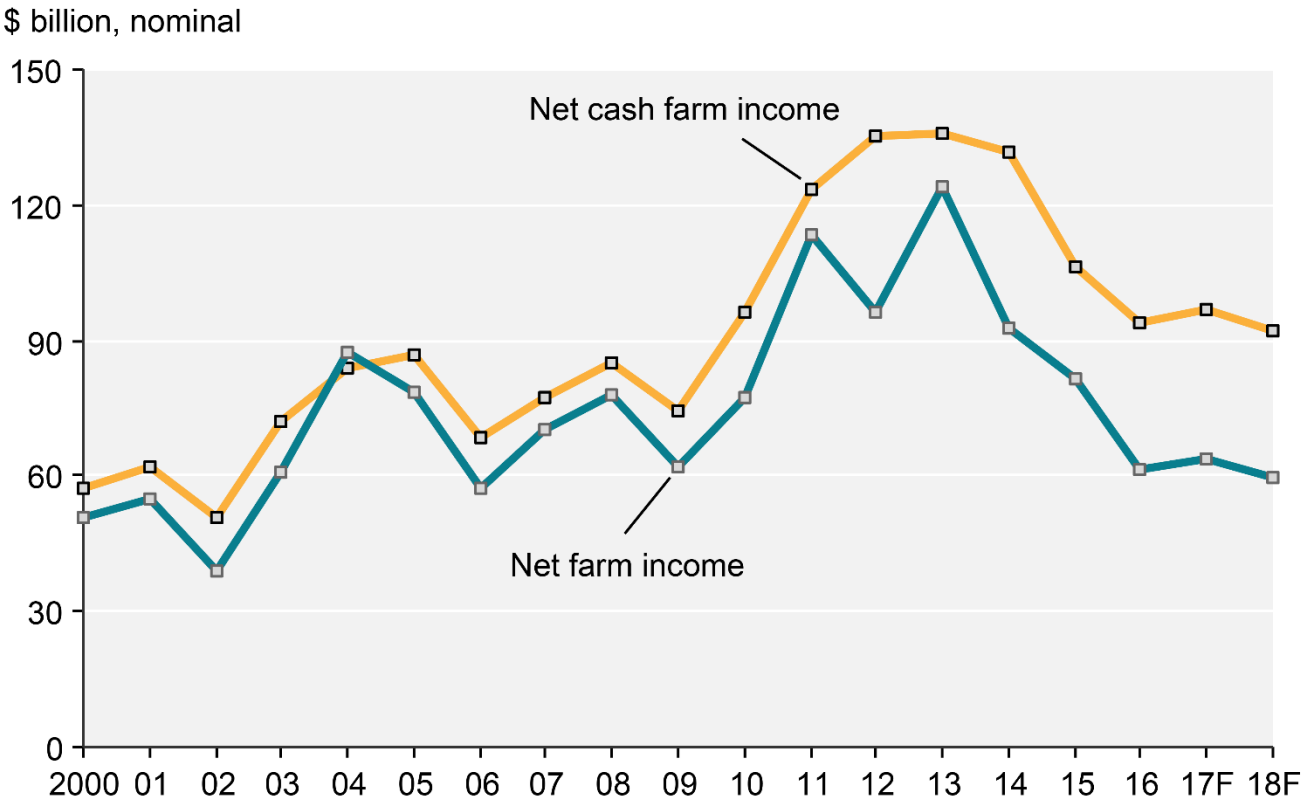
- Deadline was February 5, 2018
- Farmers are still completing forms (June)
- Selected farm visits by USDA (summer)
- Response rate at this time is lower than 2012 (June)
- Hope county level data is out by May 2019
- Concerned about “D” nondisclosure in urbanizing counties

Questions from the Field

- Soils data, how is it used?
- Can local government set maximum values?
- Why are estimates still high, too high?
- Open space, if its not a golf/racquet club, then what is it, valuations based on…?
- When can values be updated, during general reassessment, or annually?
- What about the Farm Bill, implications?
- Apples/Grapes estimates?

Profits?

Net farm income and net cash farm income, 2000-18F



Note: F = forecast.
Source: USDA, Economic Research Service, Farm Income and Wealth Statistics.
Data as of February 7, 2018.

Thanks!

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Discussion & Questions?

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See site for presentations

Procedures for Estimating Agricultural and Horticultural Values in Use

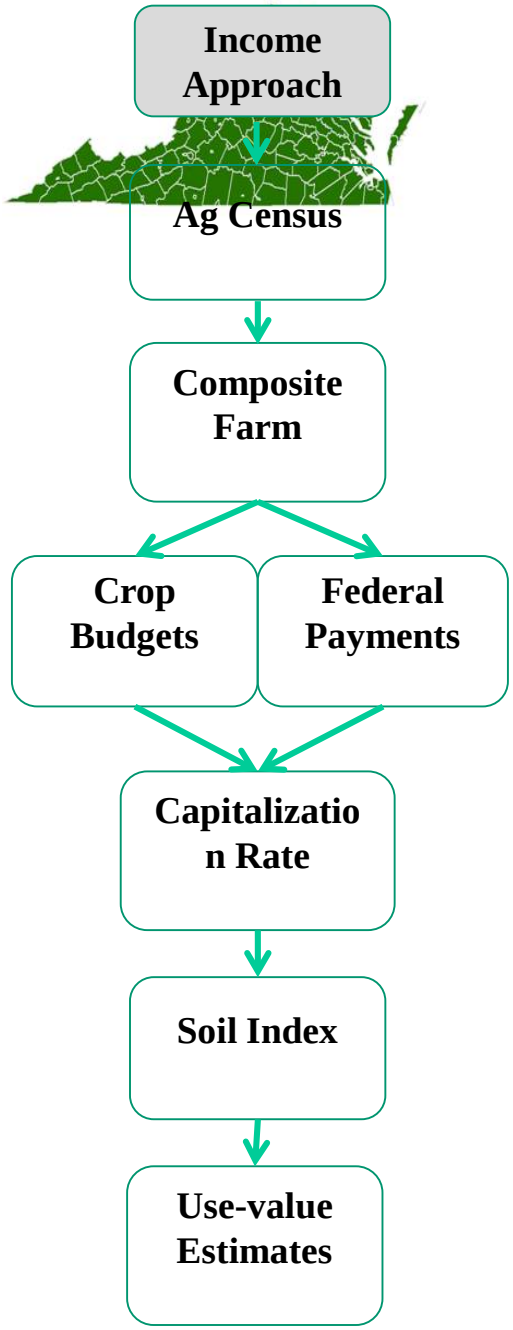
Two Approaches

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

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

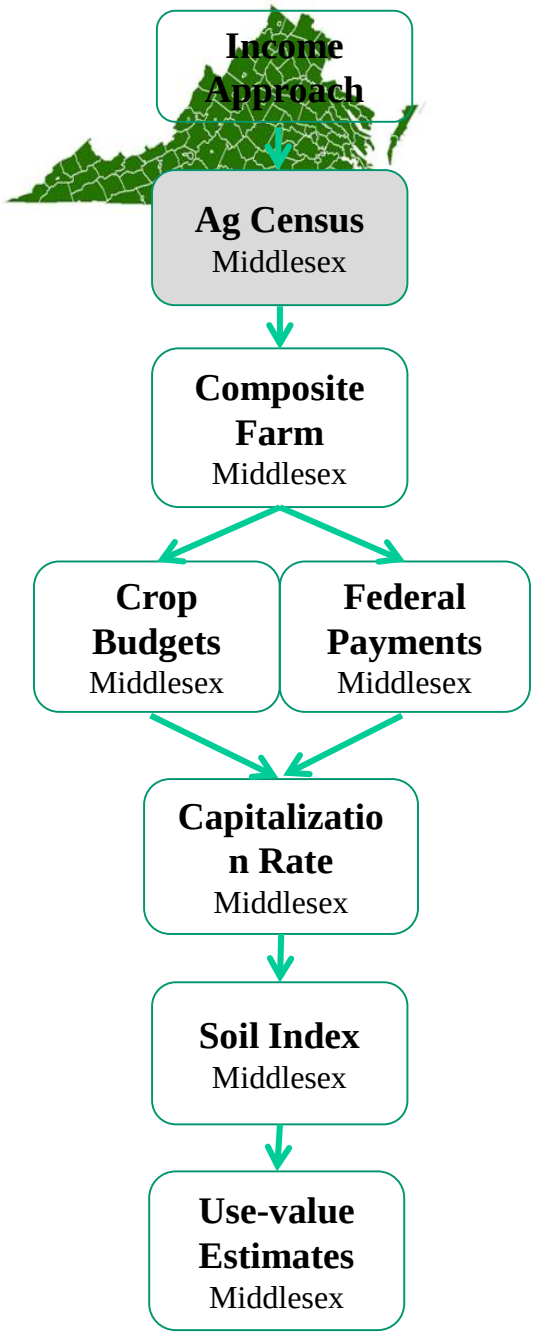
2. **Rental rates** Capitalized (Rental Rate Approach)

   Implemented in 2010 by Groover and Bruce



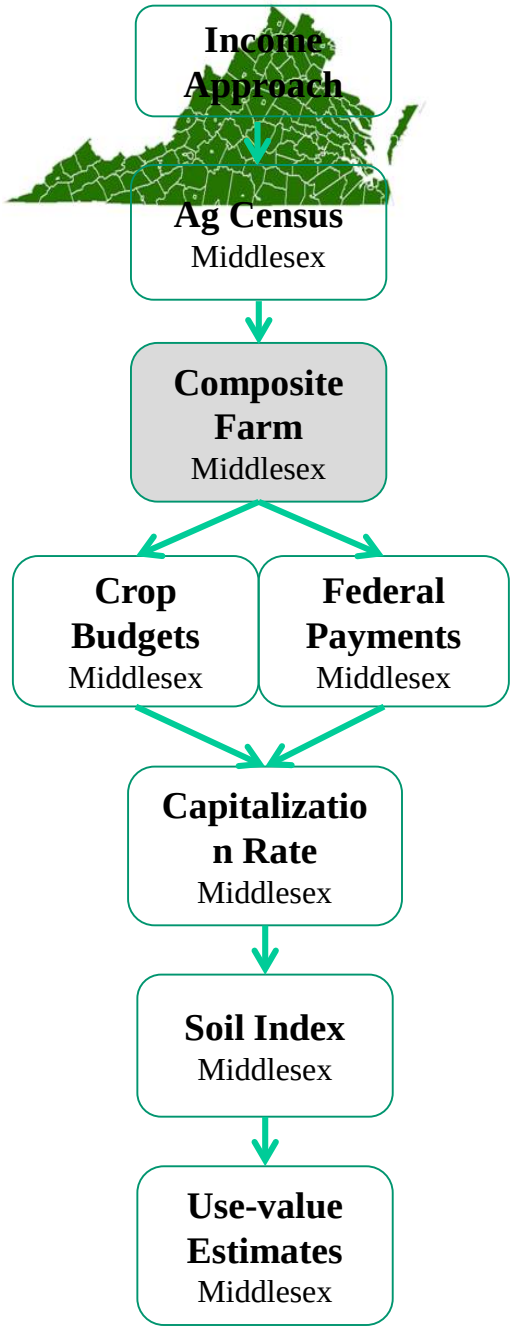
Income approach for each County

- 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
- **Middlesex - 2012**
  - **73** reported farms => more land owners
  - **Five** CF crops, e.g., corn+silage, hay+haylage, pasture, soybeans, and wheat.

Income Approach

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Ag Census
Middlesex

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Composite Farm
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Crop Budgets
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Federal Payments
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Soil Index
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Use-value Estimates
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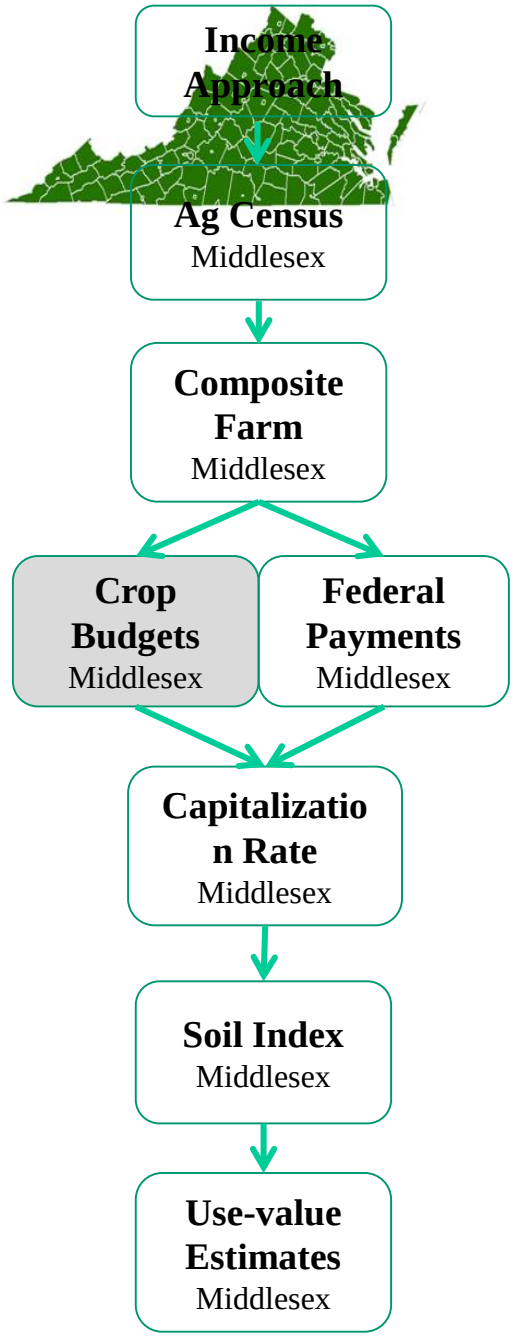
Composite Farm - Middlesex

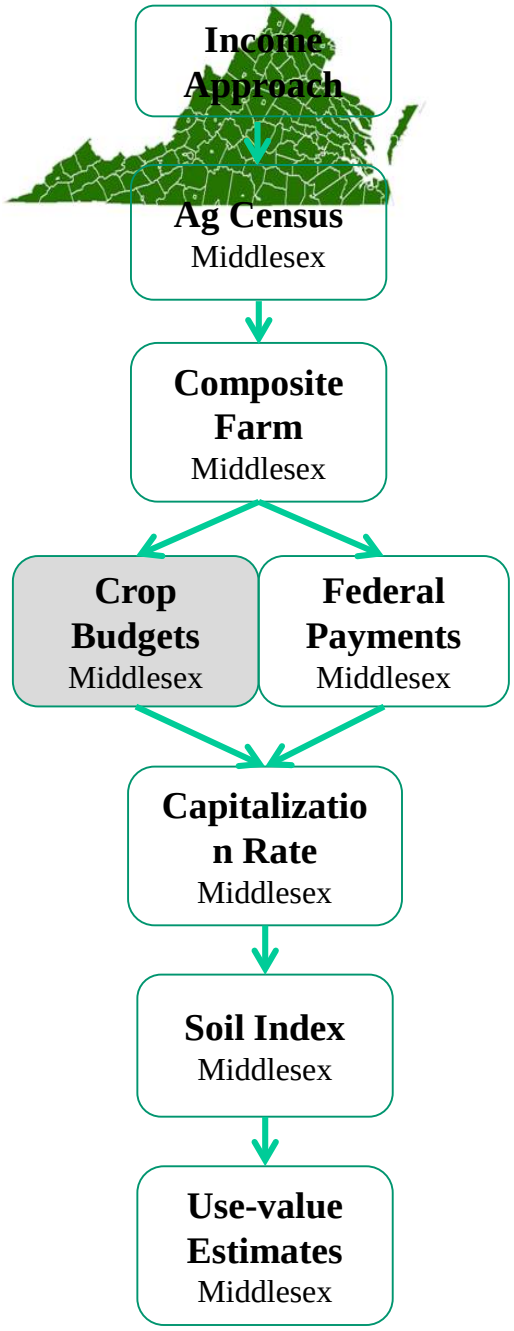
2012 AgCensus		Based on 73 farms
Crop	**Reported Acres**	**Composite Farm Acres**
Alfalfa	0	
Barley	(D)	
Corn	4,637	64
Cotton	0	
Hay	1,300	18
Snap Beans	(D)	
Soybeans	5,843	80
Sweet Corn	(D)	
Tobacco	0	
Tomatoes	(D)	
Watermelons	23	
Wheat	3,183	44
Double-cropped	**(-) 3,183**	(-) 44
Total Cropland Harvested	12,502	172

Example for Corn = 4,637 ac / 73 farms = 64 acres of corn in the Composite Farm (CF)



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 2018 reflects 2016 data

Example Budget
Middlesex Corn Grain no-till
TY2018

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Corn: Yield = 147.5 bu/ac * Price = $3.75/bu = $553.13
Net Crop Insurance = $44.74

Total Income = $597.87

Net Returns = Income - Costs

NR = $598 - $535 = **$63/ac**

Pre-Harvest Costs: N 144 Lb Price = $0.44/lbs = $63.28/ac

Harvest Costs: Labor, fuel & oil, drying, hauling = $77/ac

Fixed Costs: Machinery and Overhead = $83/ac

Total Costs = $535/ac

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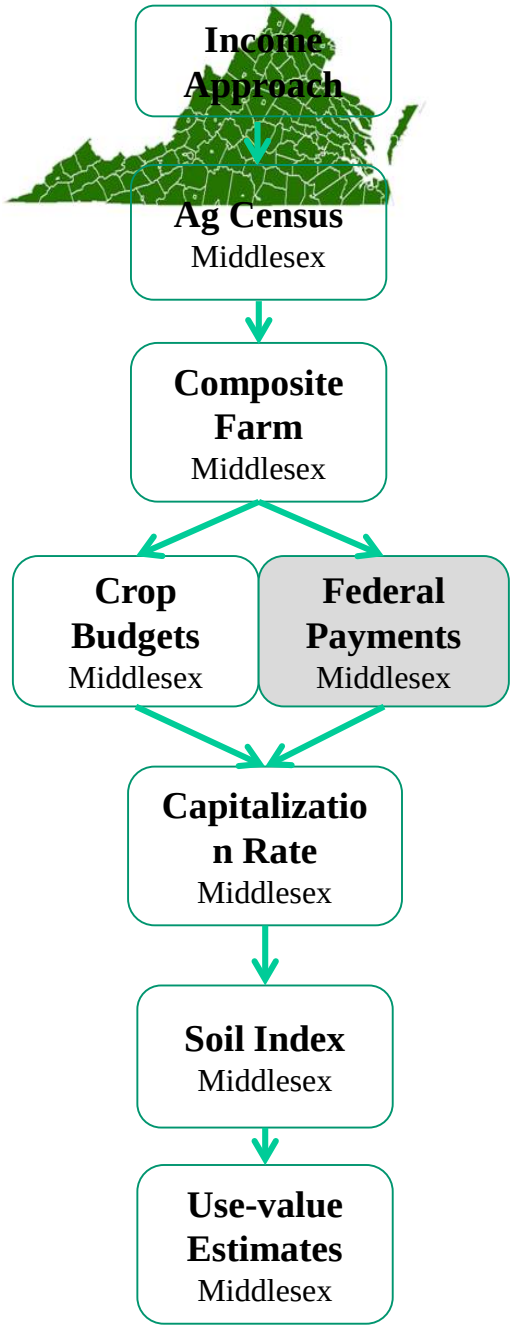
Olympic Averaging

- 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
- Middlesex Corn Grain example 2012-2018

Corn	Crop Budget
TY2012	$86.76
TY2013	$339.57
TY2014	$303.19
TY2015	$134.23
TY2016	$18.91
TY2017	$114.43
TY2018	$62.52
Olympic AVG	**$157.89**

Highest

Lowest

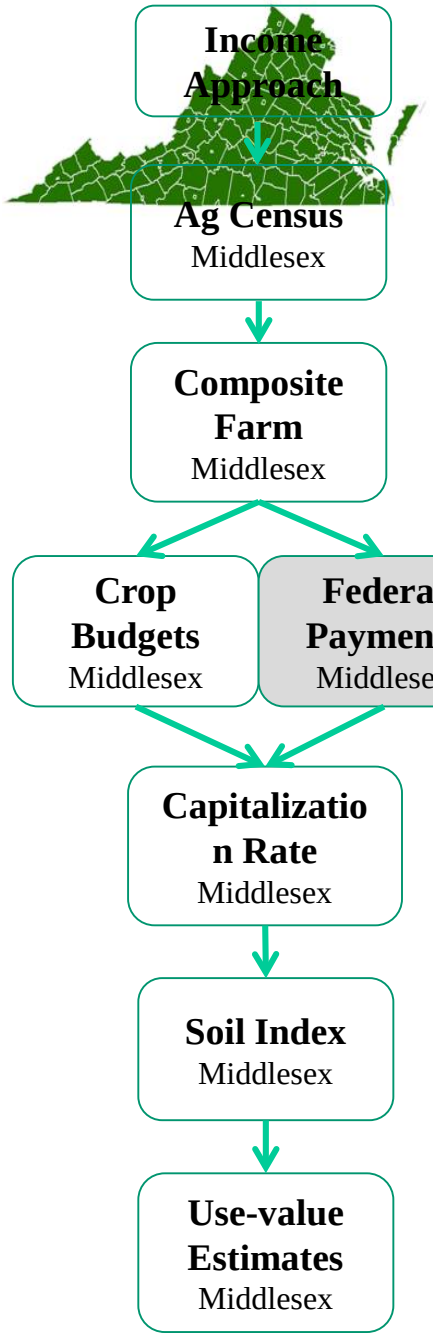


Federal Payments

- **USDA-FSA** provides data for program crops by county
- Middlesex receives payments for **corn, soybeans, and wheat.**
- Annual payments = Payment/crop acreage
- For example in TY2018, Middlesex received **$23,646 in federal payments for corn.**

  TY2017 $163,626.54/8,239 ac = **$19.86/ac**

  TY2018 $23,645.93/8,239 ac = **$2.87/ac**

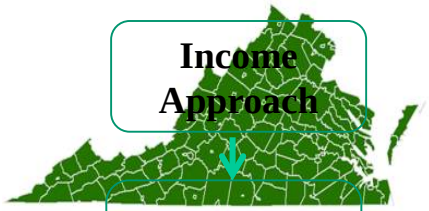


Olympic Averaging

Middlesex Corn Grain example 2012-2018

Corn	Federal Payment		Corn Budget	
TY2012	$14.53		$86.76	
TY2013	$25.40		$339.57	Highest
TY2014	$25.67	Highest	$303.19	
TY2015	$31.82		$134.23	
TY2016	$0.00	Lowest	$18.91	Lowest
TY2017	$19.86		$114.43	
TY2018	$2.87		$62.52	
Olympic AVG	**$17.67**		**$140.23**	

- Corn Net Return for TY2018
  - Oly AVG Fed Pay + Oly AVG Budget
  - $17.67 + $140.23 = **$157.89**



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Middlesex Crop Budgets and Federal Payments Tax Years 2010-2018

	2018	2017	2016	2015	2014	2013	2012	OLY AVG
Corn	$62.52	$114.43	$18.91	$134.23	$303.19	$339.57	$86.76	$140.23
Fed Pay	*$2.87*	*$19.86*	*$0.00*	*$31.82*	*$25.67*	*$25.40*	*$14.53*	*$17.67*
							Total	**$157.89**
Hay	-$16.92	-$34.68	-$157.37	-$163.99	-$12.09	-$23.39	-$46.16	**$0.00**
Pasture	$22.89	$40.53	-$40.27	-$16.18	$76.64	$30.57	-$6.17	**$18.80**
Soybean	$79.08	$59.10	$106.52	$175.54	$318.04	$245.41	$172.06	$155.72
Fed Pay	*$31.73*	*$19.86*	*$0.00*	*$12.72*	*$16.47*	*$15.82*	*$9.39*	*$14.85*
							Total	**$170.57**
Wheat	$7.03	$42.94	$21.85	$75.90	$162.62	$173.70	$68.06	$74.27
Fed Pay	*$19.87*	*$19.86*	*$0.00*	*$19.39*	*$25.72*	*$25.57*	*$14.94*	*$19.93*
							Total	**$94.20**
							Final Net Return (Weighted AVG)	**$163.32**

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Final Net Returns Middlesex County TY2018

- Composite Farm weighted NR by crop acreage

Crop	Estimated Net Return
Corn	$157.89
Hay	$0.00
Pasture	$18.80
Soybeans	$170.57
Wheat	$94.20
Final Net Return (per acre)	

CF acres	Weight (e.g. corn 64/172=0.37)	Final$
64	0.37	$58.56
18	0.10	$0.00
10	0.06	$1.05
80	0.47	$79.72
44	0.26	$23.98
172		**$163.32**

Reflects double-cropped wheat (44 ac)

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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)

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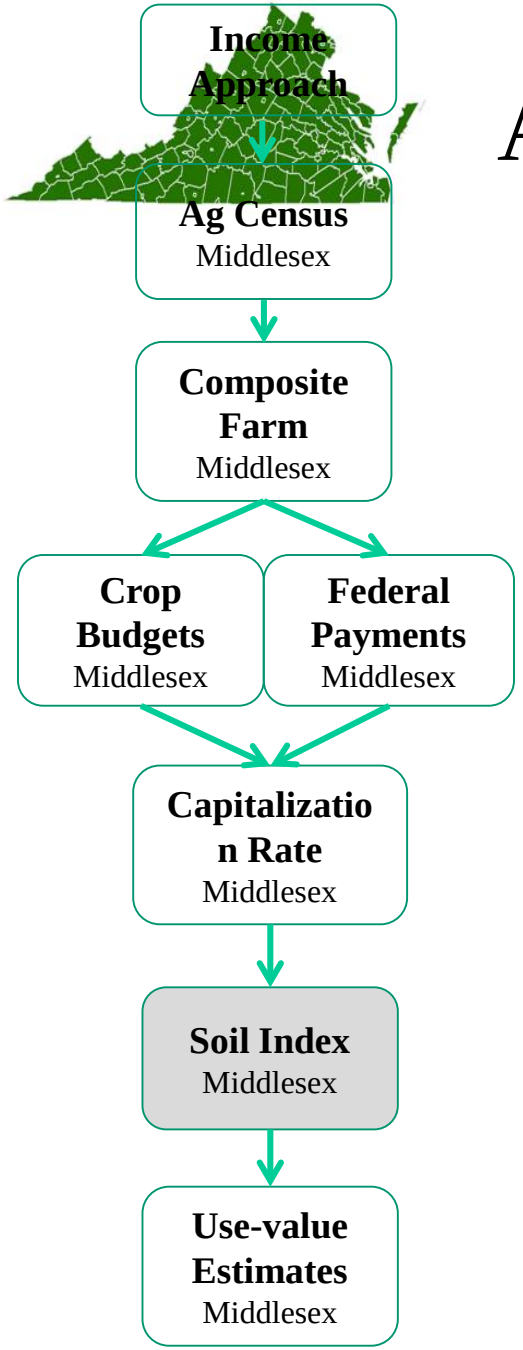
Middlesex TY2018

Cap Rate Components

Interest Rate – statewide (10yr Avg)	0.0584
Property Tax – Middlesex (10yr Avg)	0.0039
Total without risk	**0.0623**
Crop loss due to Flooding 5%	0.0031
Total With risk	**0.0654**

Use Value Middlesex TY2018

Use Value =	**Net Returns**	**÷**	**Cap Rate**
Use Value without risk =	$163.32	÷	0.0623
Use Value without risk =	**$2,622.73**		
Use Value with risk	$163.32	÷	0.0654



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
Class III - Average cropland	**1.00**
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

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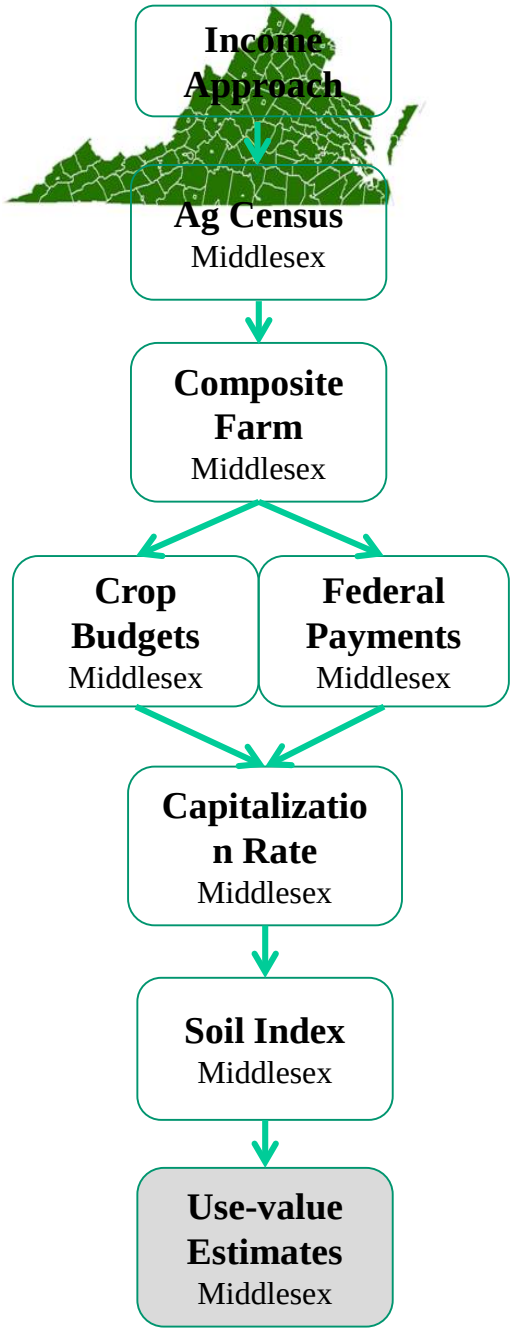
Indexing for Soil Productivity

Middlesex

Land Class	Reported Acreage	Productivity Index	Weighted Acreage
1	3,223	1.5	4,834.41
2	14,164	1.35	19,120.91
3	453	1	452.80
4	1,634	0.8	1,310.53
5	0	0.6	0.00
6	157	0.5	78.51
7	520	0.3	155.85
Total	**20,154**		**25,953**
Soil Index Factor 25,953 ÷ 20,154 = **1.288**			



Adjusting to Class III land

Why?

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

Use Value Middlesex TY2018

Use Value =	**Use Value**	**÷**	**Soil index**
Without risk =	$2,622.73	÷	1.288
Without Risk Class III =	**$2,036.71**		
With risk	$2,497.84	÷	1.288
With Risk Class III =	**$1,939.72**		

Final Estimates Middlesex TY2018

	Cropland				*Weighted Cropland AVG*	Pastureland			*Weighted Pasture land AVG*	*Weighted Ag. Land AVG*	
	I	II	III	IV	***I-IV***	V	VI	VII	***V-VII***	***I-VII***	VIII
w/out Risk	3,060	2,750	2,040	1,630	***2,690***	1,220	1,020	610	***710***	***2,620***	200
w/ Risk	2,910	2,620	1,940	1,550	***2,560***	1,160	970	580	***670***	***2,500***	190

- Note: Final estimated values are rounded to the nearest $10
- The Class III w/out risk estimate of $2,036.71 is reported as $2,040

Rental Rate Approach Middlesex TY2018

- Starting 2009 NASS published rental rate data annually* for
  - Cropland
  - Irrigated cropland
  - Pasture land
- Middlesex County rental rates for TY2018 (NASS)
  - Cropland = $1,020 Eastern District (Combined County)
  - Pastureland = not published

*Sometimes biennially based on NASS funding

Rental Rate Use Value Middlesex TY2018

	Rental Rate	÷ Cap Rate	= Value
Cropland	$63.50[1]	÷ 0.0623	= **$1,020**
Pasture	Not Published		

[1]Eastern District Cropland combined county

Rental Rate Estimates are published annually

– not averaged over time

Income Approach and Rental Rate Approach: Compared

Middlesex	Income Approach (w/out risk)		Rental Rate Approach	
TY2018	Cropland (**I-IV AVG**)	**$2,690**	Cropland	**$1,020**
	Pastureland (**V-VII AVG**)	**$710**	Pastureland	---

Thanks!
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Discussion & Questions?

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