

What it Takes to Make A Difference

A Fertilizer Industry Perspective



Jeff Blair

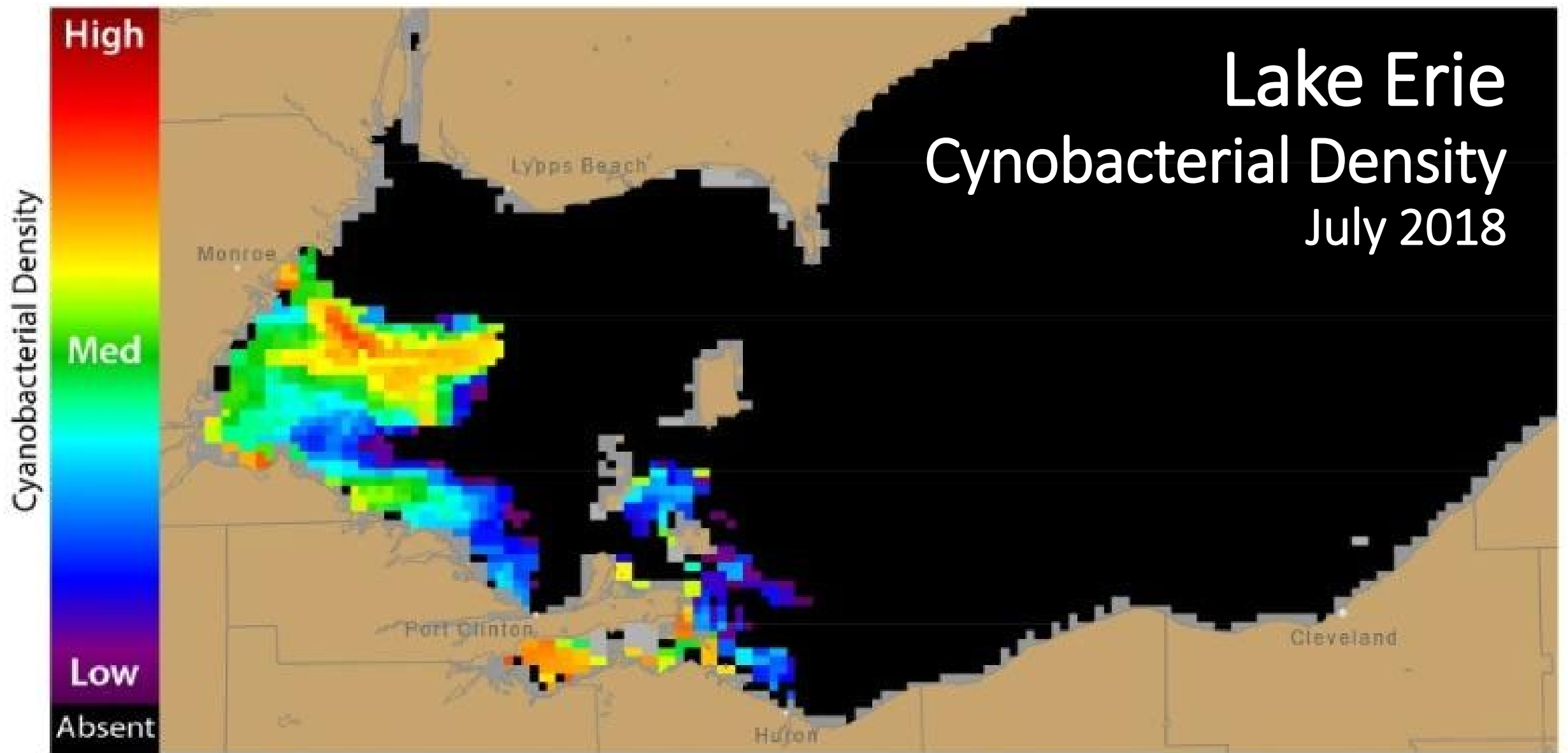
The Andersons, Inc.

President, Plant Nutrients

The 2014 Algae Bloom



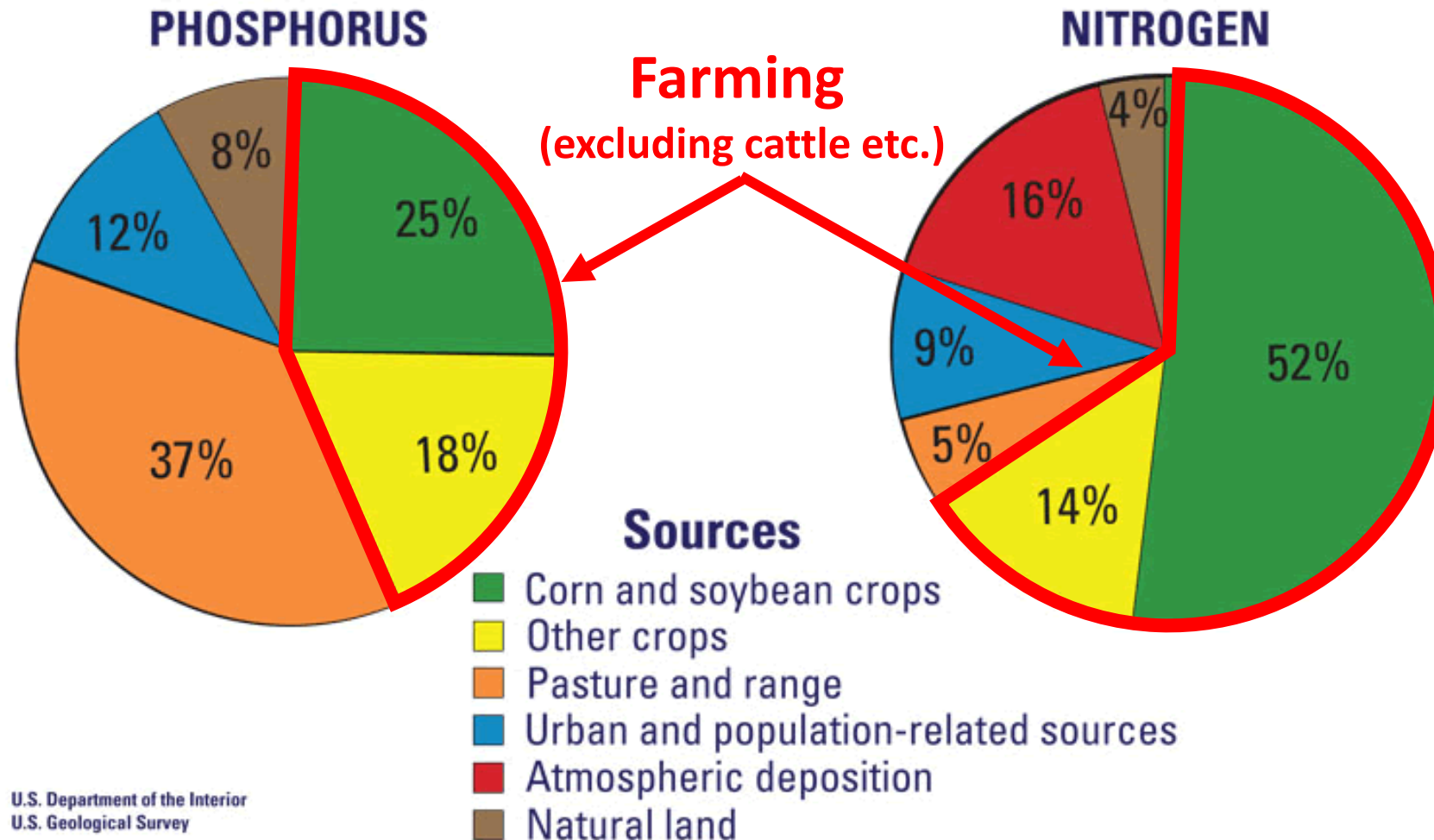
Maumee River



Cyanobacterial Index from NASA MODIS-Terra data collected 25 July, 2018 at 11:56 EST. Grey indicates clouds or missing data. The estimated threshold for cyanobacteria detection is 20,000 cells/mL.

Potential Sources of Phosphorous

Sources of nutrients delivered to the Gulf of Mexico



John Kasich
(R) Governor of Ohio

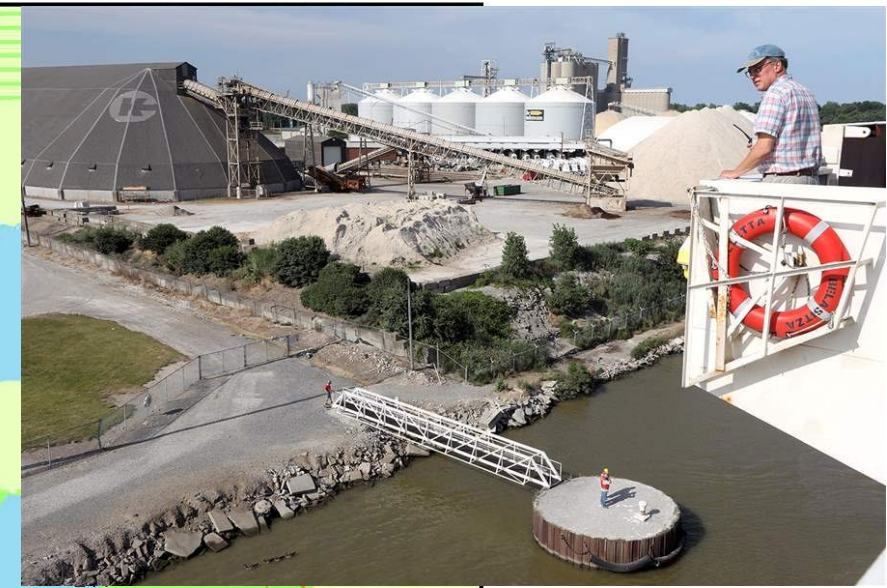
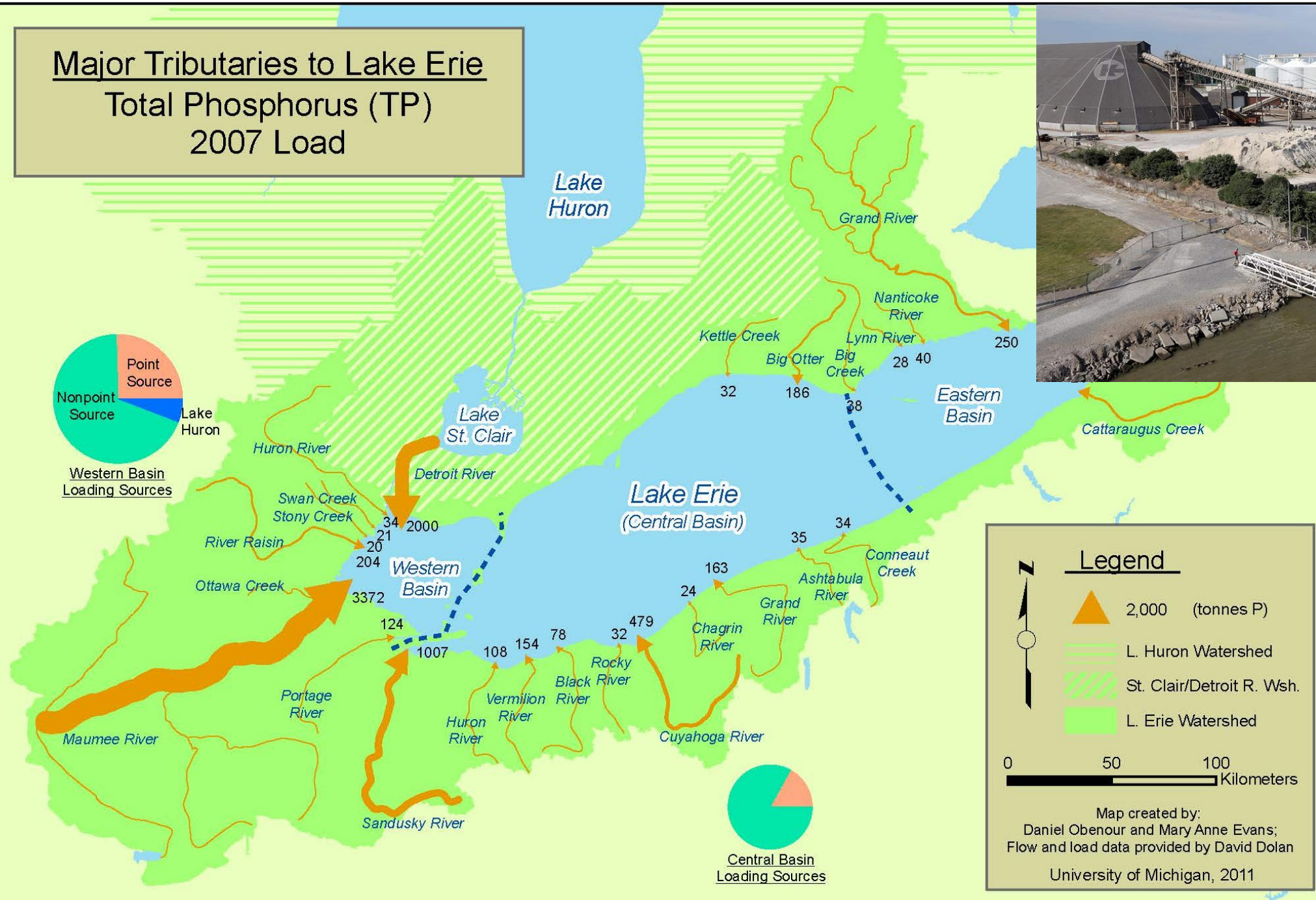




A BETTER LAKE ERIE

“We’ve done a lot to ensure the health of Lake Erie, Ohio’s crown jewel, including investments of more \$3 billion since 2011 to improve water quality in the lake and its watershed. But it’s clear that more aggressive action is needed, especially to reduce or eliminate the algae blooms that have marred the western basin for years. This executive order is intended to kick those efforts into overdrive.”

Major Tributaries to Lake Erie Total Phosphorus (TP) 2007 Load



Legend

▲ 2,000 (tonnes P)

▨ L. Huron Watershed

▨ St. Clair/Detroit R. Wsh.

▨ L. Erie Watershed

0 50 100 Kilometers

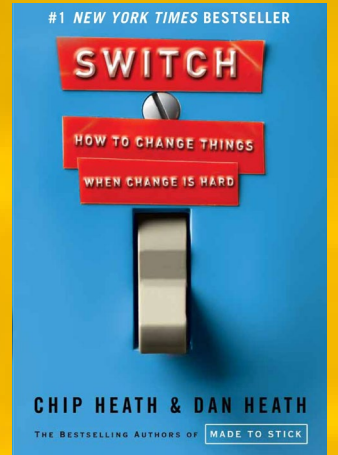
Map created by:
Daniel Obenour and Mary Anne Evans;
Flow and load data provided by David Dolan
University of Michigan, 2011

“No individual
raindrop believes
it is responsible
for the flood”

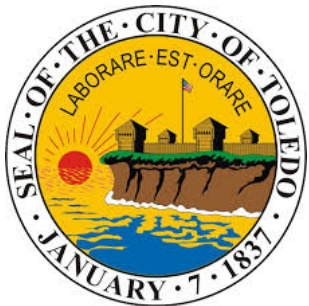
Chinese Proverb



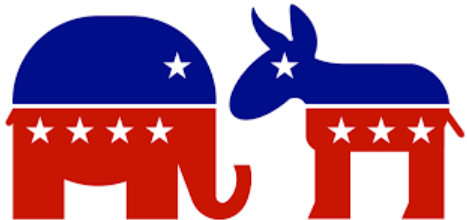
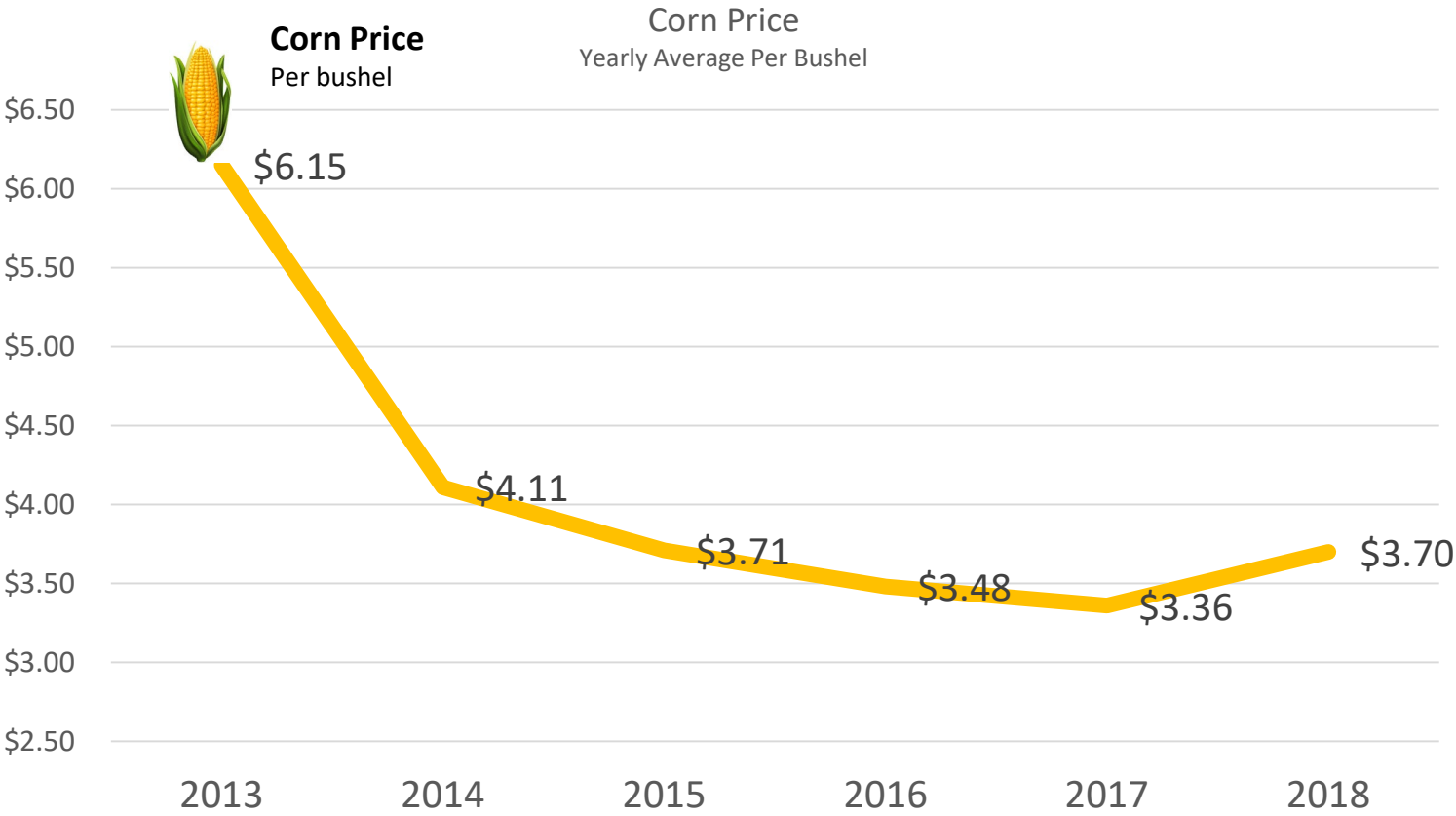
The Rider & the Elephant



The Industry Challenge



< 2%



The Solution

Right Place

Right Time

Right Amount

Right Fertilizer



**And what the
%^\$&*^#
is a “Nutrient
Management
Plan” ???!??**

The 4R Spectrum



Right Place

Right Time

Right Amount

Right Fertilizer

Type	Right Amount	Right Fertilizer	Right Time	Right Place	None	Beginner	Intermediate	Proficient	Advanced
Soil Sampling	X	X		X	No soil sampling. Nutrient application determined by estimated crop removal rates	Low density soil sampling. Limited numbers per field, multiple years between sampling	Higher density soil sampling, 1-2 years between sampling	High density soil testing + tissue sampling during season	High density soil testing + tissue sampling throughout the year
Application Timing			X		Apply when field conditions allow	Avoid application before large rains. No application on frozen ground	Level 1 + working broadcast nutrients into soil	Level 2 + some application during growing season (starters/sidedress)	Level 3 + multiple applications throughout growing season based on plant needs (testing)
Fertilizer Choice		X			Basic NPK + manure as available + others as needed	Stabilized nitrogen or some type of treatment	Level 1 + starter + soil amendments as needed	Level 2 + additional emphasis on soil health	Level 3 + full range of fertilizers, micronutrients, soil amendments and biologicals to maximize soil health
Cover Crops	X		X	X	No cover crops	No cover crops	Cover crops on no till	Cover crops on key areas	Extensive use of cover crops
Fertilizer Application	X			X	Broadcast application	Broadcast Application. Adjustment for large tracks/fields	Variable Rate Technology		VRT, in furrow application of starter.
Filter/Buffer Strips				X	No buffer strips		Minimal buffer strips in key areas		Large buffer strips in all areas susceptible to surface water collection/movement

Equipment & Technology

Arial application



Side Dress



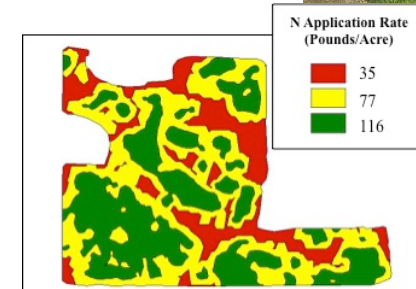
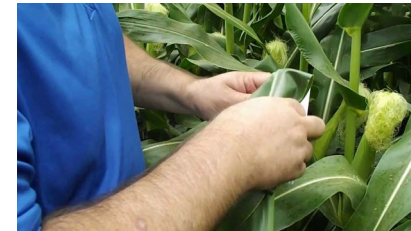
VRT – additional cost



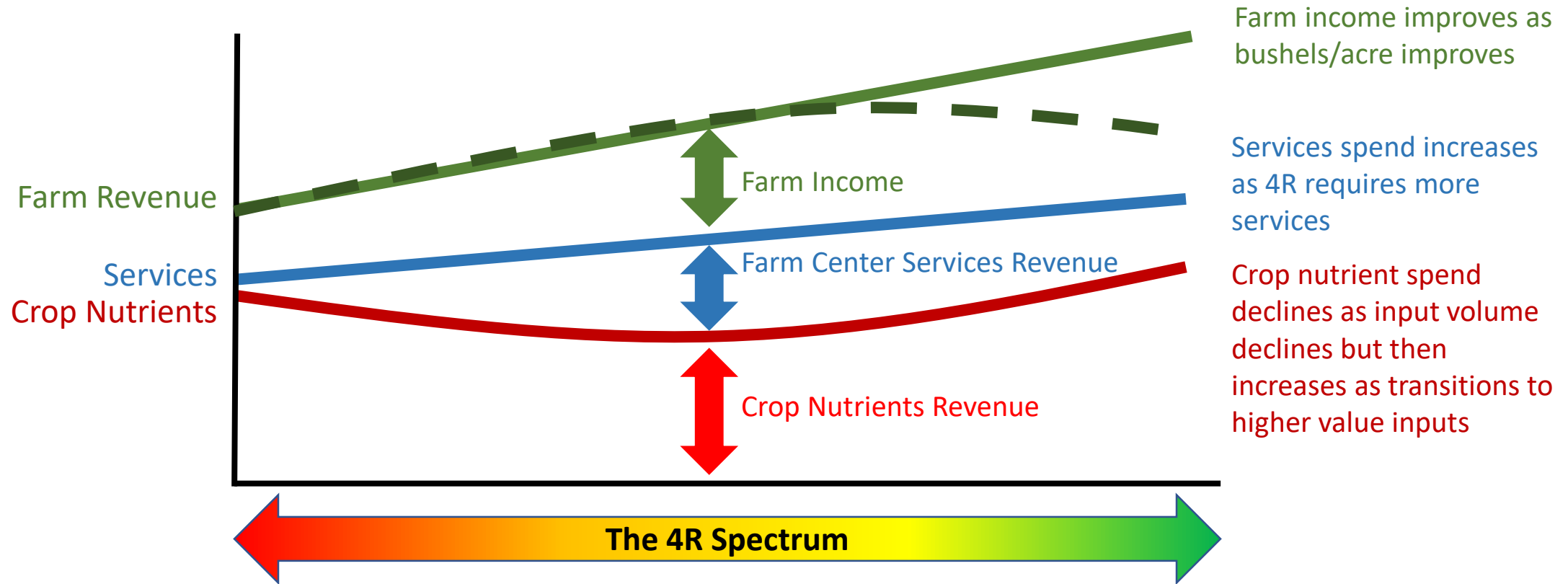
Strip Till --
\$250 + Tractor
(200-300K)



Soil Sampling
equipment --
probes



4R Economics – The Theory*



*Like any economic model, this has huge assumptions. It also ignores the reality that there are far more input costs than crop nutrients and application and agronomic services

The Tough Math of Farm Center Services

	Cost	Acres Per Year	Years of Service	Cost/Acre
Equipment	\$ 350,000.00	30,000	7	\$ 1.67
Maintenance	\$ 35,000.00	30,000		\$ 1.17
Fuel	\$75,000.00	30,000		\$ 2.50

Labor	hourly Rate	Benefits	total cost/hr	hrs/year	Base Cost/Year	Overtime	Net Cost	% per rig	Total Cost/year	Cost/Acre
Driver	\$ 25.00	\$ 8.75	\$ 33.75	2,000	\$ 67,500	10,000	\$ 77,500.00	100%	\$ 77,500.00	\$ 2.58
Mechanic Tow	\$ 50.00	\$ 17.50	\$ 67.50	2,000	\$ 135,000	10,000	\$ 145,000.00	20%	<u>\$ 29,000.00</u>	\$ 0.97
									\$ 106,500.00	

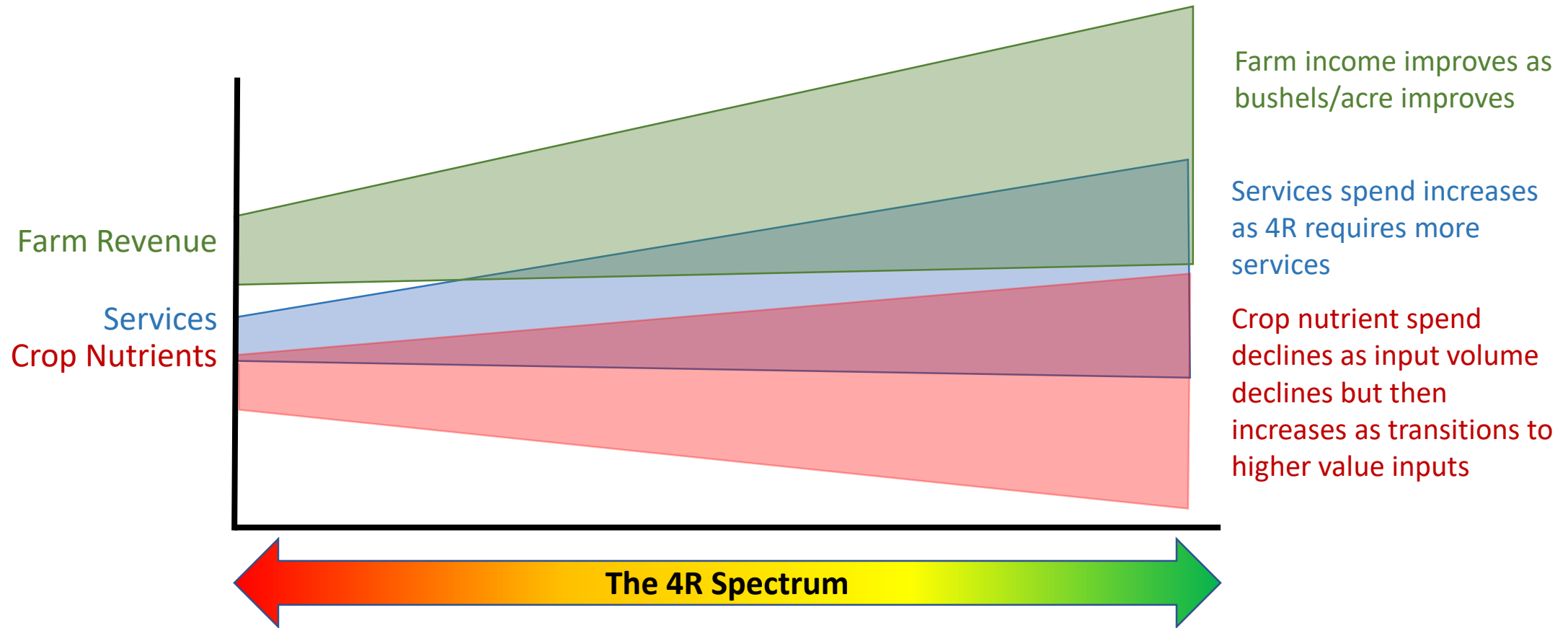
Total Cash Cost	\$ 7.22
Depreciation	\$ 1.67
Interest or Cost of Cash	6%
Net Interest Cost	\$ 21,000.00
Interest Per Acre	\$ 0.70
Insurance & Overhead	\$ 1.50
Net Cost/Acre	\$ 11.08
ROIC	15%
Net Income Expected	\$ 52,500.00
Price Charged Per Acre	\$ 12.84
Income Per Acre	\$ 1.76
Net Income Per Sprayer	\$ 52,700.00

\$350,000 Sprayer @ 30,000 Acres/Year

\$7 to \$11/acre to operate

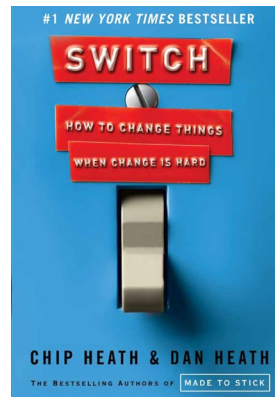
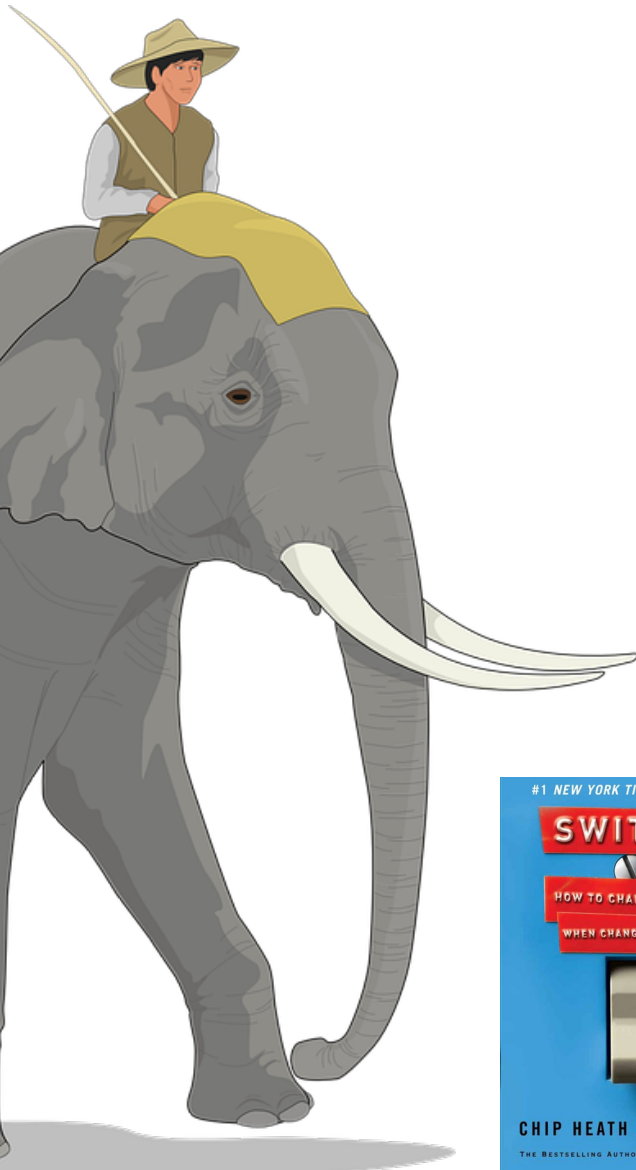
\$8 to \$13/acre to provide adequate return on capital

4R Economics – The Unknown Reality



*Like any economic model, this has huge assumptions. It also ignores the reality that there are far more input costs than crop nutrients and application and agronomic services

Where to from here?



Direct the Rider

- Find the bright spots
 - Prove that 4R works
 - Understand the economics
- Script the critical moves
- Point to the destination

Motivate the Elephant

- Find the feeling – positive and negative
- Shrink the change – step by step
- Shape the path
 - Tweak the environment
 - Build habits
 - Rally the heard

Thank you

