

Arizona Agriculture, 2016 & Beyond

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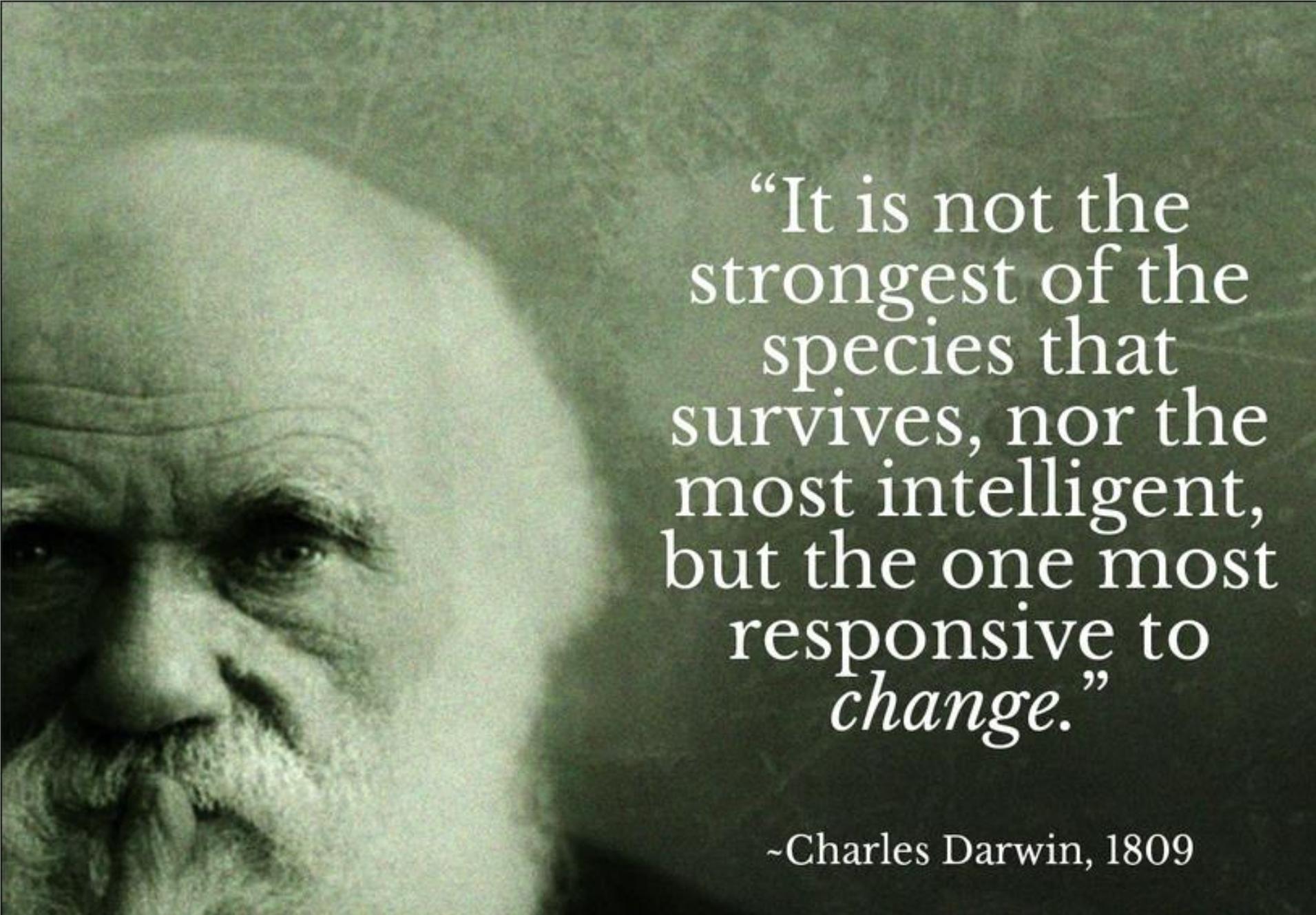


**AGRIBUSINESS
& WATER
COUNCIL**
OF ARIZONA

Arizona Department of Agriculture
&
Agribusiness & Water Council of
Arizona
First Annual
Arizona Agribusiness
Roundtable

Peter Drucker

1. Trying to predict the future is like trying to drive down a country road at night with no lights while looking out the back window.
2. The best way to predict the future is to create it.



“It is not the
strongest of the
species that
survives, nor the
most intelligent,
but the one most
responsive to
change.”

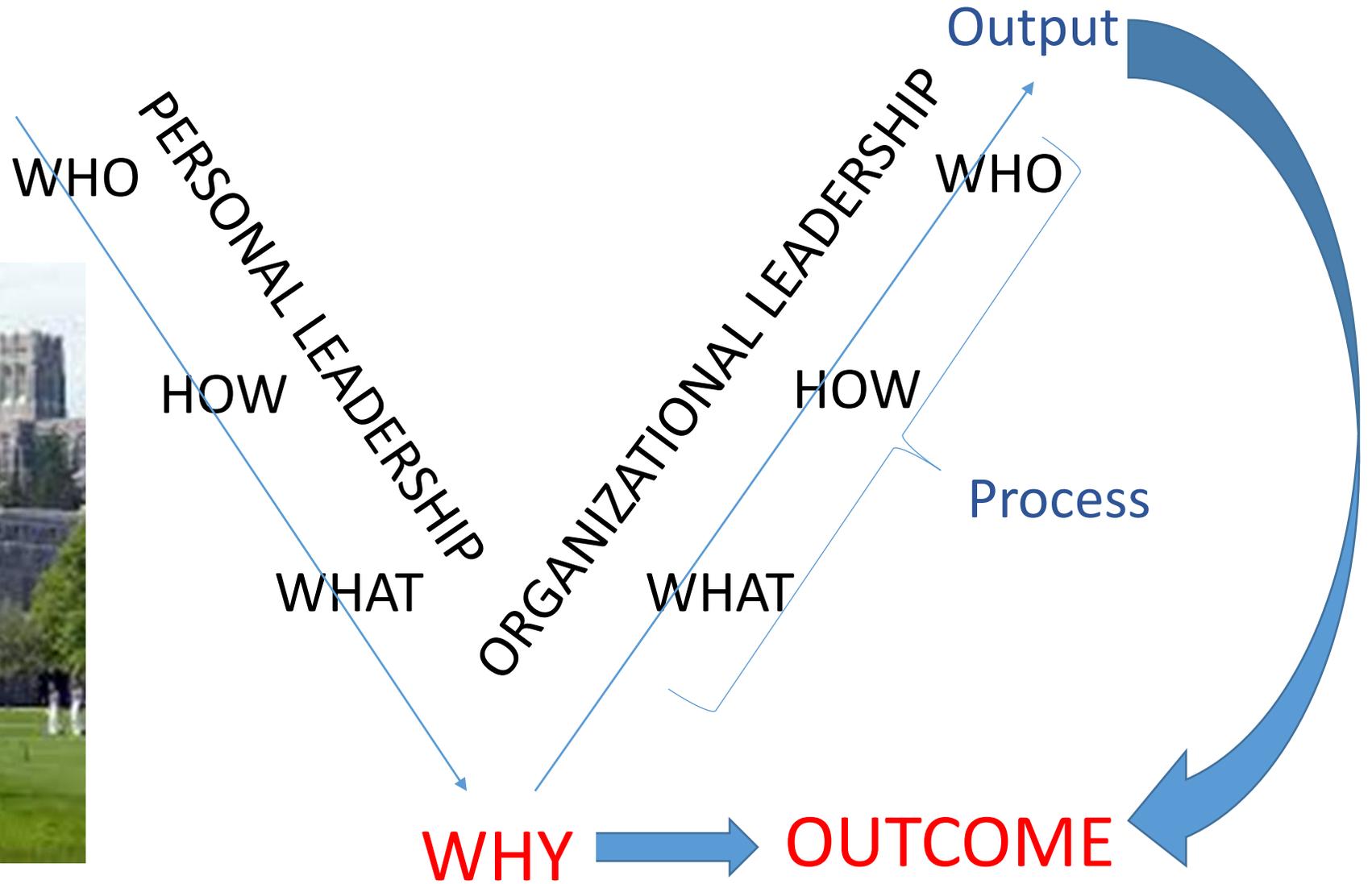
~Charles Darwin, 1809

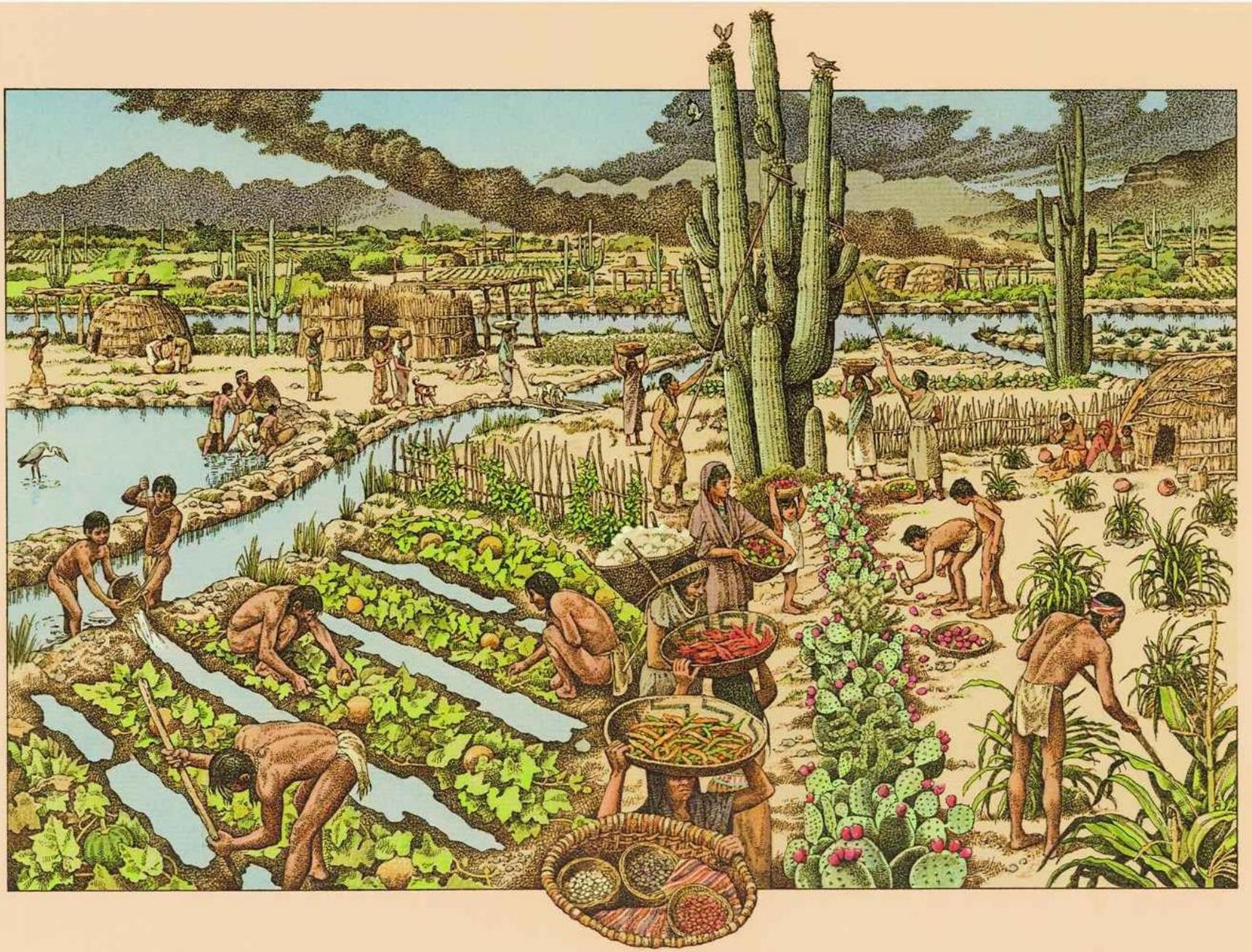
pur·pose

/ˈpɜrpəs/

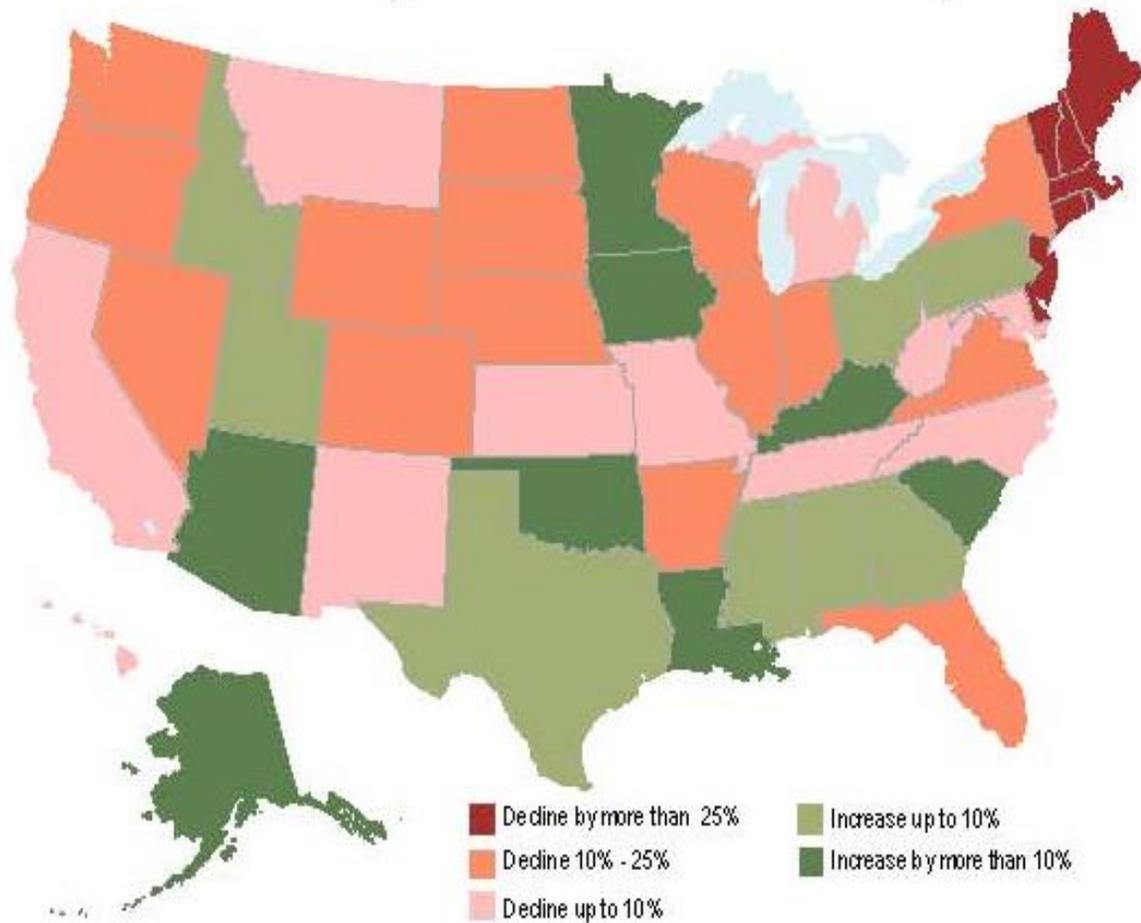
Noun

The reason for which something is done or created or for which something exists.

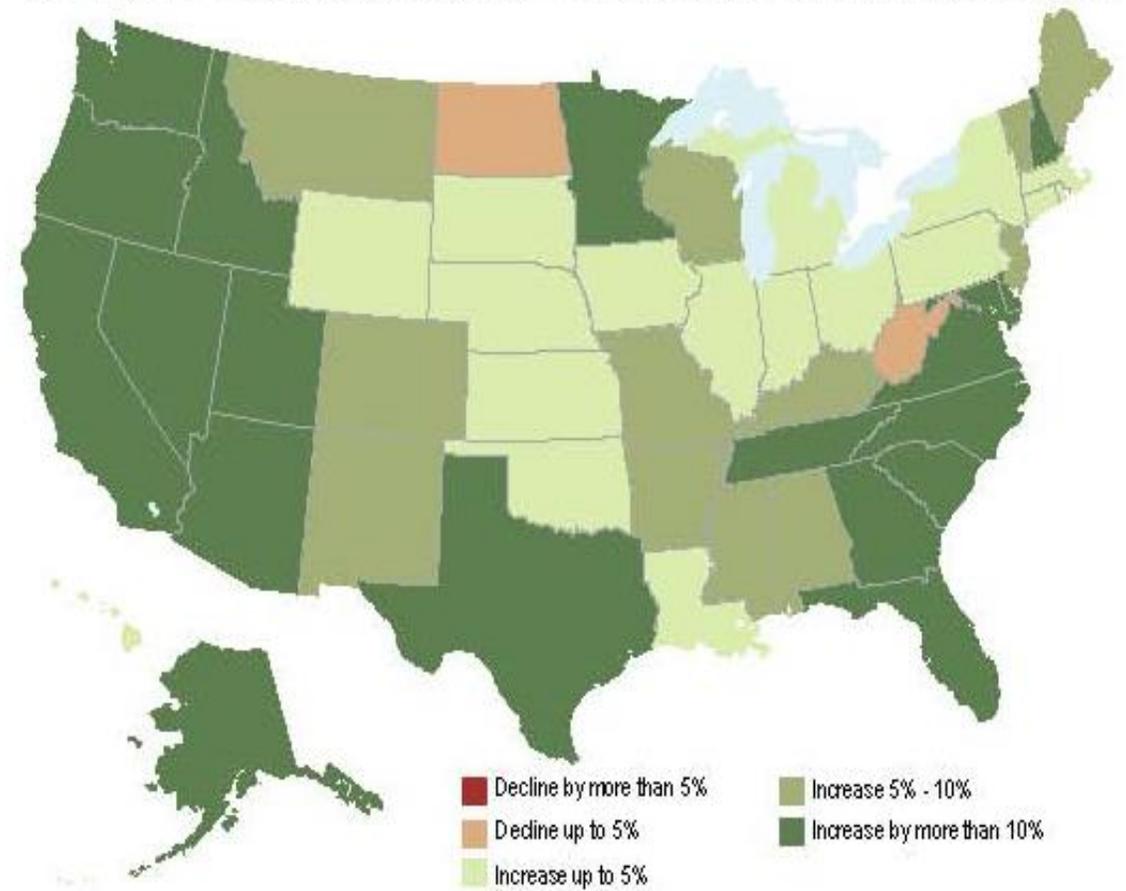




Demand for Veterinary Services for Food Animals Growth, 2012-2025



Demand for Veterinary Services for Companion Animals Growth, 2012-2025



*The Center for Health Workforce Studies, 2013

AZ: AG STATE

15,500 farms and ranches

Enough **Beef** to feed over **4.6 million** Americans

Pork: \$63.7M

Dairy, leading agricultural product, **188,00 dairy cows**

75% of Arizona's land area is grazing land

Value of all principal vegetables and melons: **\$1.19 billion**

Eggs: Hickmans's Family Farms, >8M laying hens

Aquaculture: >1,000,000lbs of tilapia; >400,000lbs of striped bass

Highest **Alfalfa** yield nationally

Pima cotton 3rd nationally

Durum wheat 4th nationally

Yuma, AZ winter **leafy green** capitol of the world

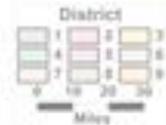
Pecans 4th nationally: **\$51.8 M**

Honey: 1.2 M pounds

14 Watersheds

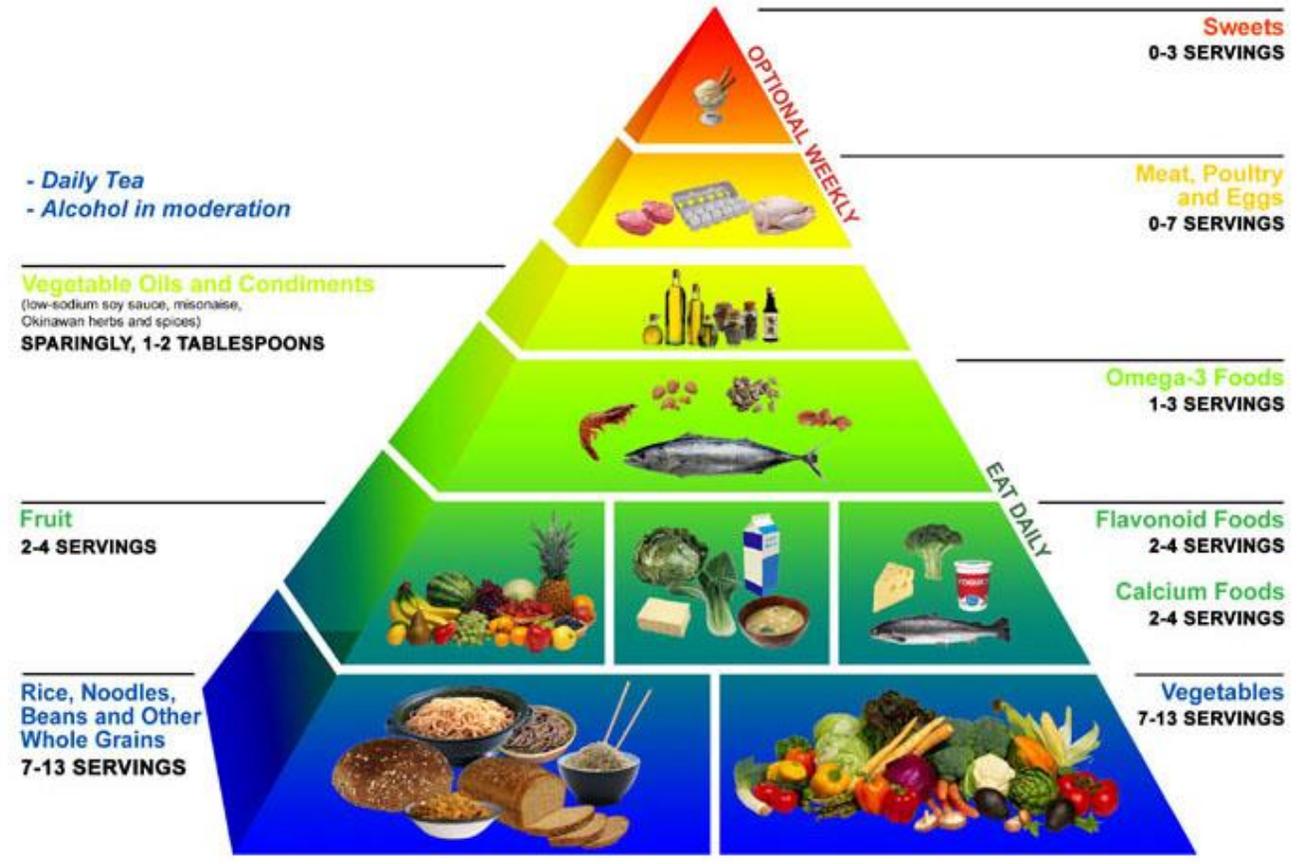
91 Threatened and Endangered Plants and Animals

15% of Arizona's land is privately owned





Okinawan



Mediterranean

AZ: NUTRITION STATE

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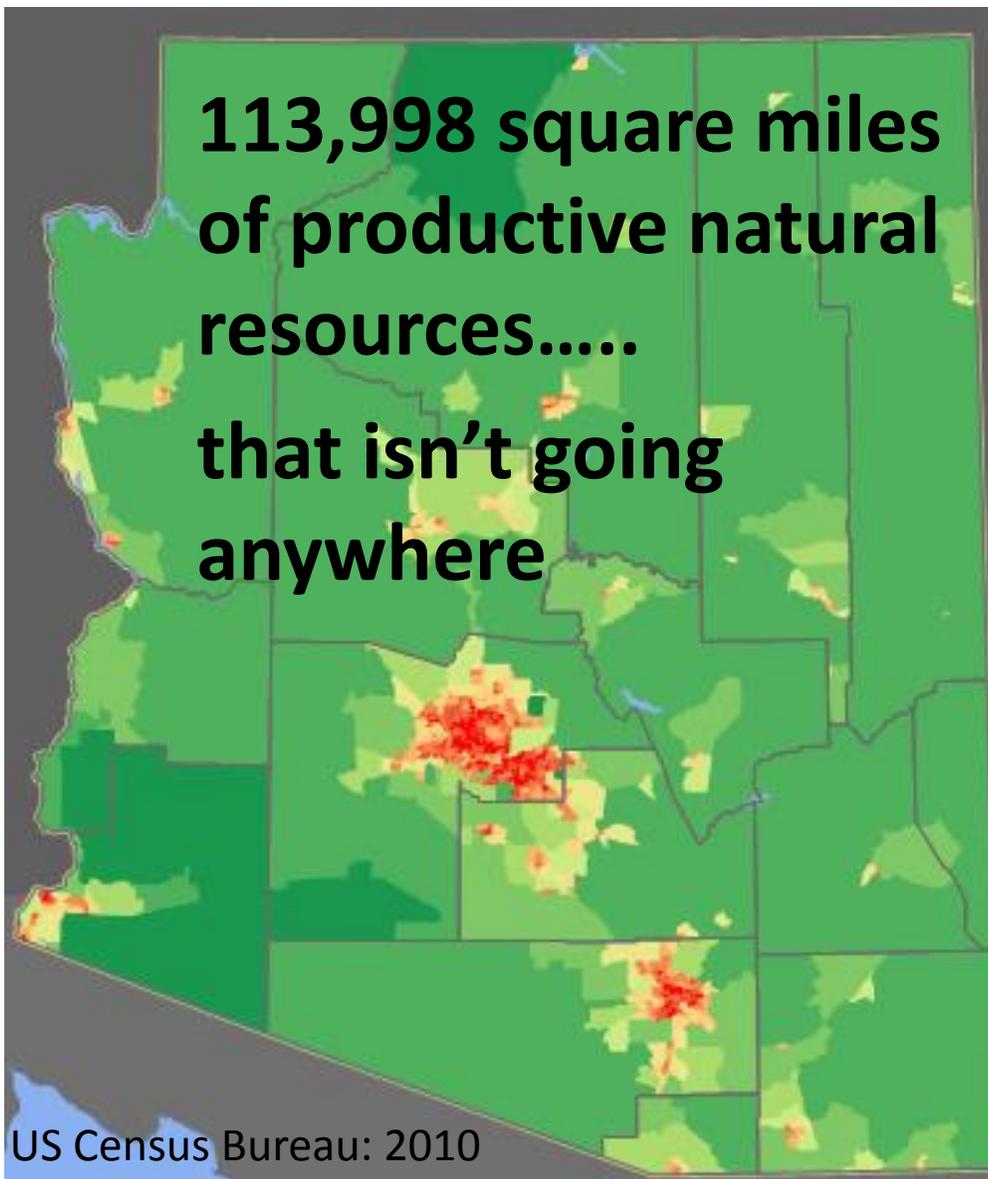
91 Threatened and Endangered Plants and Animals

15% of Arizona's land is privately owned



**113,998 square miles
of productive natural
resources.....
that isn't going
anywhere**

US Census Bureau: 2010



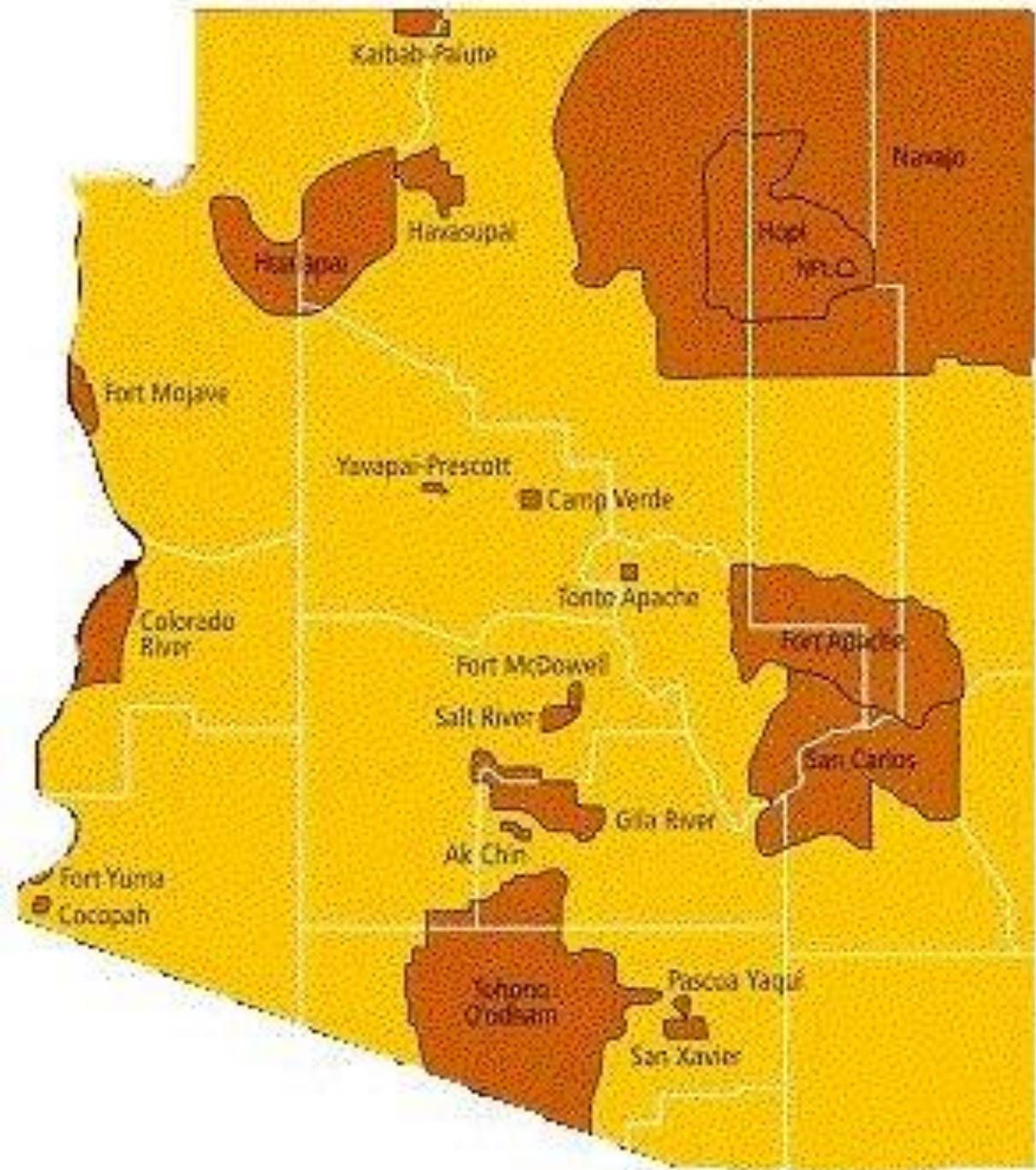
**Production agriculture : >\$17B
direct economic impact.**

**Other uses—most of which is
managed by the agriculture
community: >\$32B**

**...and this excludes the economic
value of all state water except for
that drawn from the Colorado
river.**



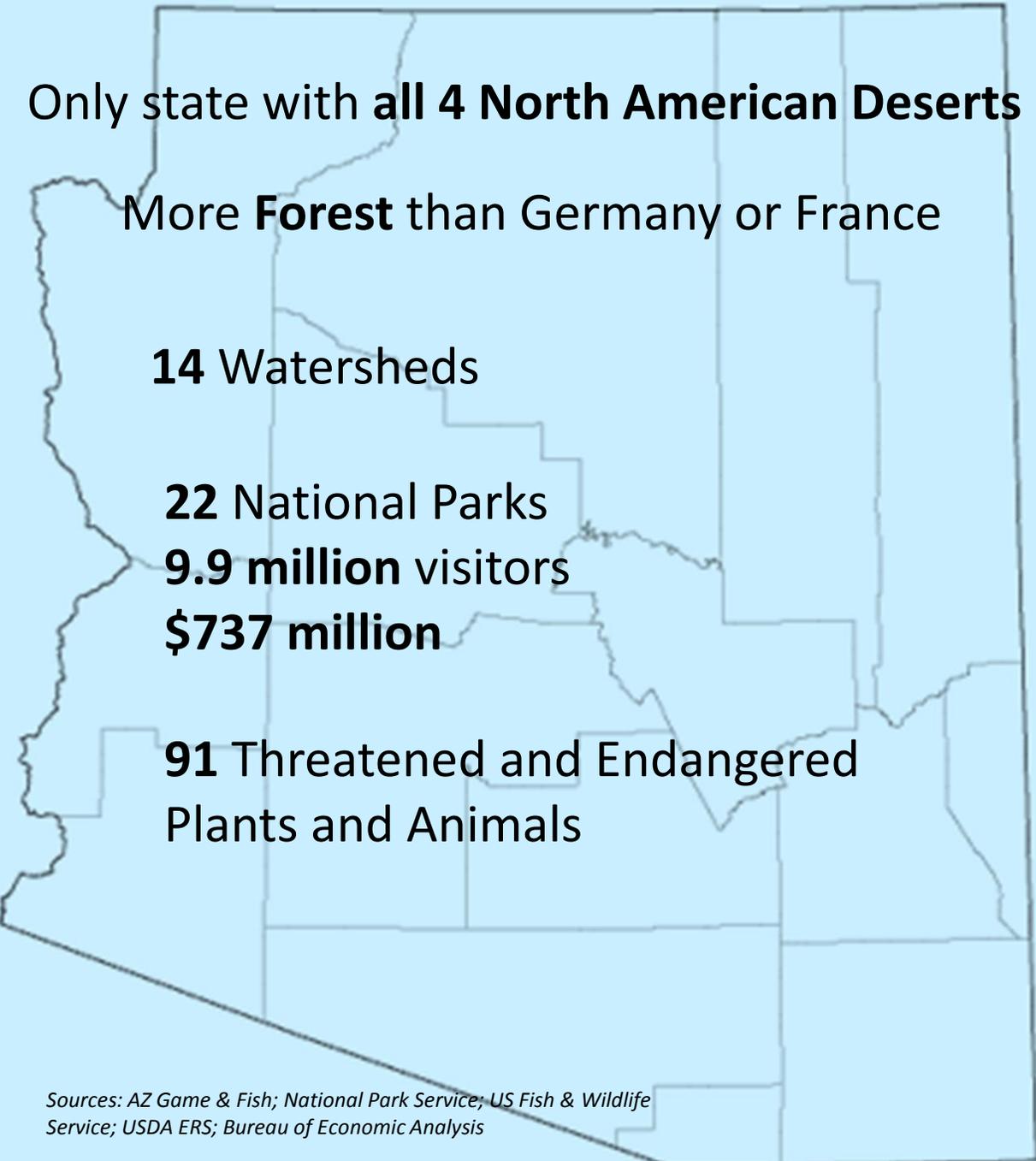
**College of Agriculture and Life Sciences – Office of the Vice Provost and Dean.
The University of Arizona, Tucson, Arizona**



Of the state's 113,998 square miles (295,000 km²), approximately 15% is privately owned.

The remaining area is public forest and park land, state trust land and Native American reservations.

the “Irrigated Agriculture Industry” predominantly consists of three major sectors: agricultural production, agricultural services, and the food processing (sectors).

A light blue map of Arizona with black outlines for county boundaries. Text is overlaid on the map in various locations. The text includes: 'Only state with all 4 North American Deserts' at the top left; 'More Forest than Germany or France' below it; '14 Watersheds' in the upper middle; '22 National Parks' and '9.9 million visitors' and '\$737 million' in the middle left; and '91 Threatened and Endangered Plants and Animals' in the lower middle.

Only state with **all 4 North American Deserts**

More **Forest** than Germany or France

14 Watersheds

22 National Parks

9.9 million visitors

\$737 million

91 Threatened and Endangered
Plants and Animals

Few states have as wide a
range of forest types:

- Piñon-juniper
- Oak woodlands
- Pine forests
- Dry and wet mixed conifer
- Spruce fir and subalpine forest
- Aspen
- Riparian gallery forests

Markets

The world's increasing middle class

2009: 1.8B out of 6.8B = **26%**

2020: 3.2B out of 7.5B = **43%**

2030: 4.9B out of 8.2B = **60%**

OECD DEVELOPMENT CENTRE: THE EMERGING MIDDLE CLASS
IN DEVELOPING COUNTRIES. Homi Kharas. January 2010. Working Paper No. 285

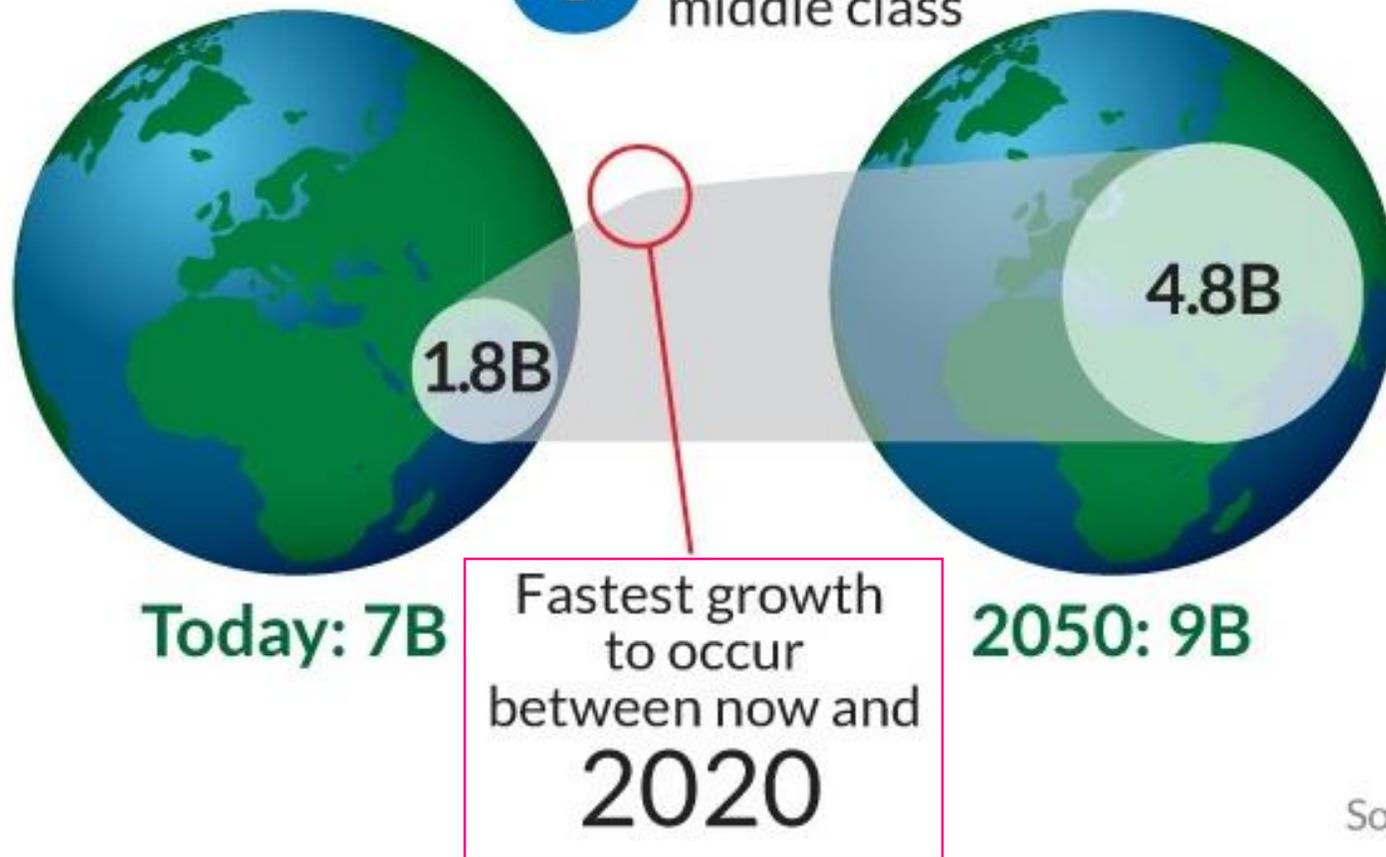


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The University of Arizona, Tucson, Arizona

GROWING MIDDLE CLASS

3 BILLION
join the
middle class



Source: FAO, OECD^{1,2}



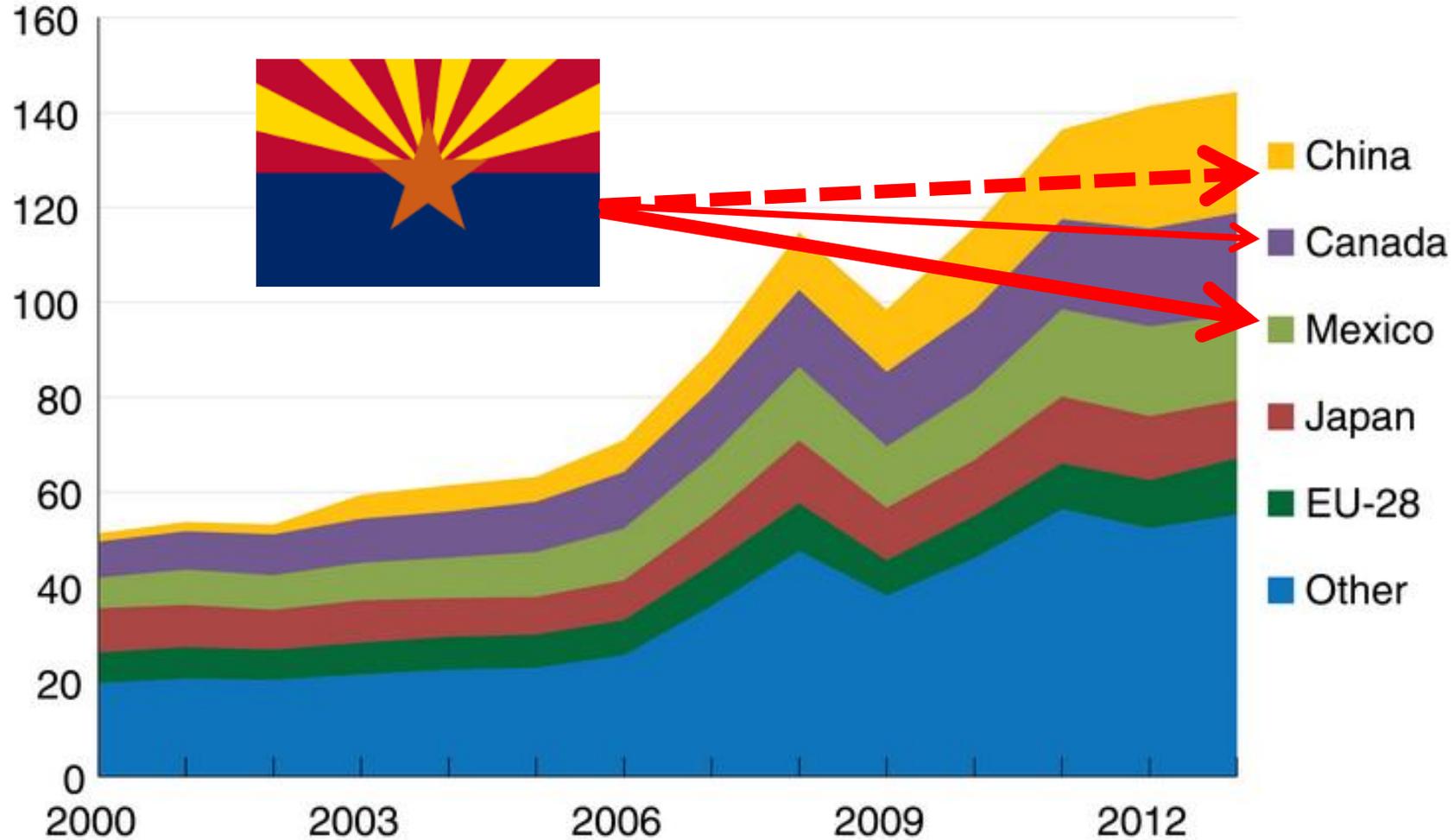
	Japan	Australia	Vietnam	Malaysia	United States	Canada	Mexico
Wins	Car parts	Livestock, dairy, agriculture, services, manufacturing	Manufacturing, fishing	Electronics, chemical products, palm oil, rubber	Livestock, agriculture, technology	Livestock, forestry, aerospace	Agriculture, personal hygiene & cosmetics
Compromises	Livestock, rice	Sugar	Pharmaceuticals	Pharmaceuticals	Car parts, pharmaceuticals, manufacturing	Car parts, dairy, poultry	Car parts

Sources: Bloomberg, Reuters, MarketWatch, Globe and Mail, Financial Review



Top five markets for U.S. agricultural exports, 2000-14

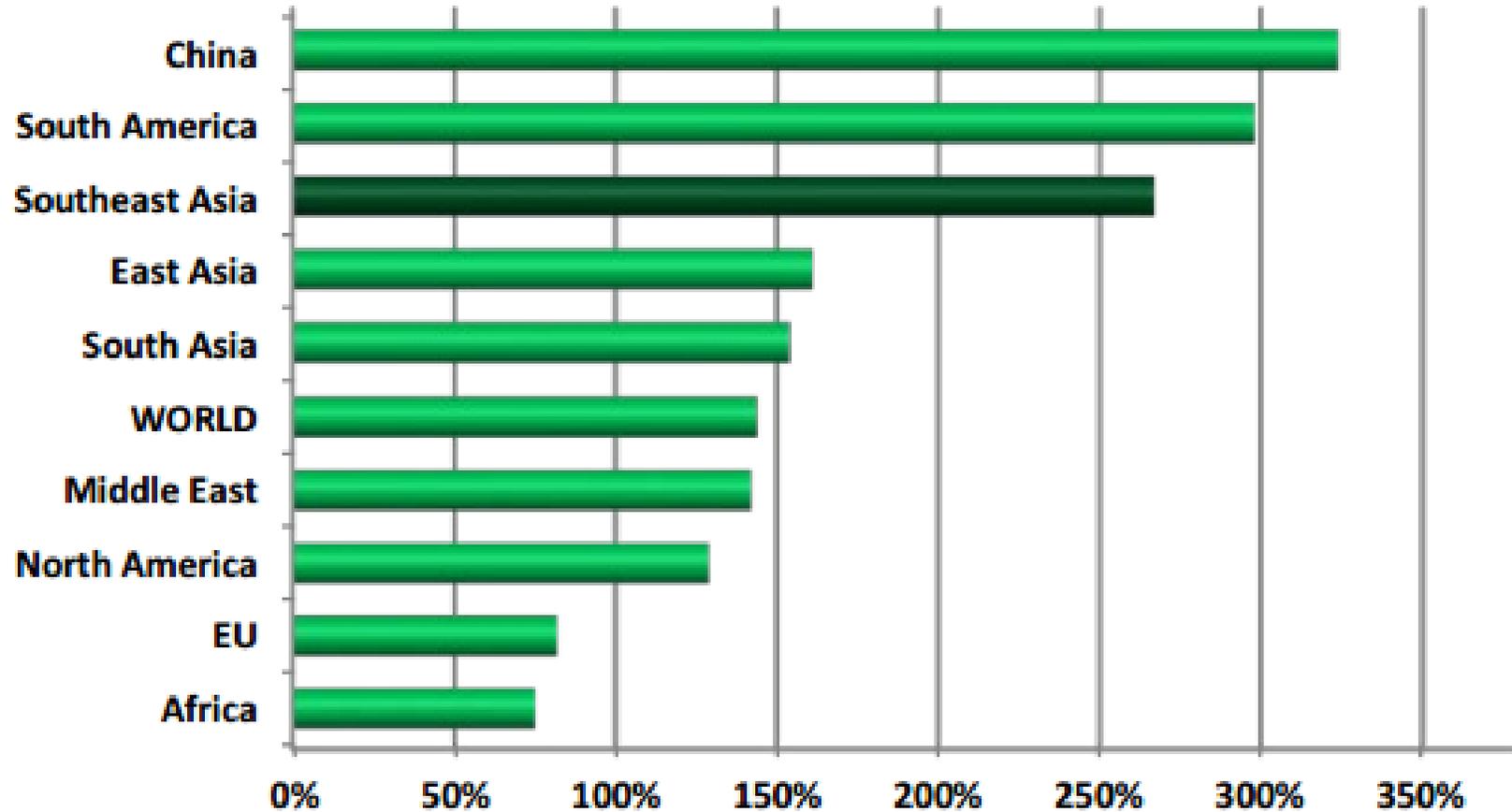
\$ billion



Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Database.

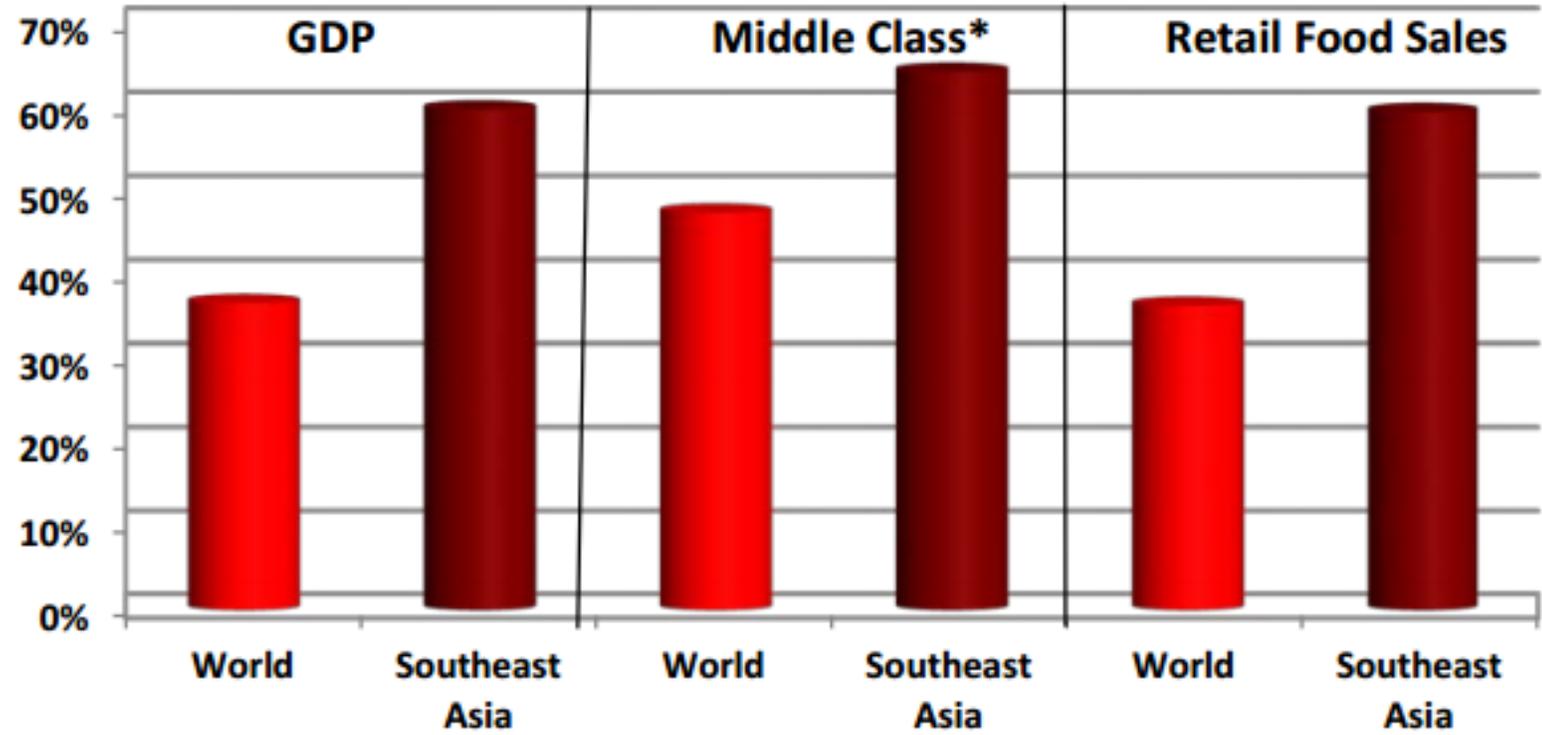
Growth in U.S. Export Value

FY 2004-2014



Source: FAS GATS

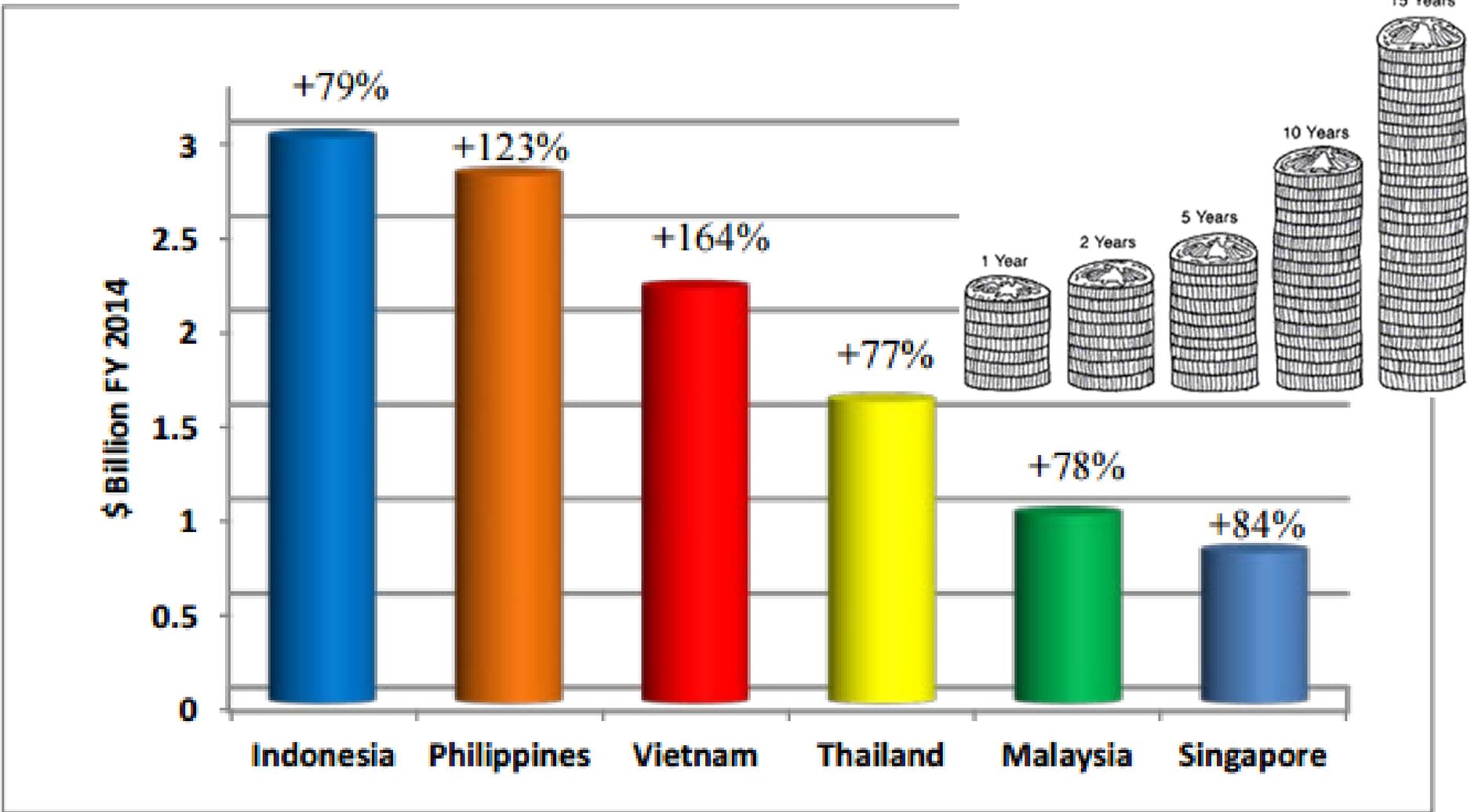
Economic and Food Sales Growth Forecast 2013 to 2023



Data Source: Global Insight *Millions of Households with incomes between \$20,000 and \$150,000 (Constant 2005 US PPP\$)

Largest Markets for U.S. Agriculture in Southeast Asia

With Percentage Increase in past 5 years



Source: FAS/GATS

U.S. Market Share

Market	Total Ag Imports in CY 2013	U.S. Market Share	Largest Supplier
Indonesia	\$18.2 billion	16%	Australia (16%)
Malaysia	\$17.3 billion	6%	Thailand (14%)
Thailand	\$11.0 billion	16%	United States
Vietnam*	\$10.4 billion	12%	United States
Singapore	\$10.4 billion	9%	Malaysia (21%)
Philippines	\$6.8 billion	26%	United States

2013 is the most current year of available import data from UN Data/GATS

*2012 data as 2013 is not yet available for Vietnam

Export Increases for U.S. Agricultural Products to Southeast Asia

Product	FY 2009 Export Value (\$Mil)	FY 2014 Export Value (\$Mil)	Increase
Bulk Total	\$2,532	\$4,342	71%
Soybeans	\$911	\$1,819	100%
Wheat	\$730	\$1,283	76%
Cotton	\$688	\$908	32%
Other Bulk	\$204	\$332	63%
Intermediate Total	\$1,419	\$2,986	110%
Soybean Meal	\$357	\$1,122	214%
Other Feeds	\$331	\$547	65%
DDGs	\$156	\$359	130%
Other Intermediate	\$575	\$958	67%
Consumer-Oriented	\$1,730	\$4,140	139%
Dairy	\$322	\$1,412	338%
Prepared Food	\$219	\$492	125%
Fresh Fruit	\$231	\$439	90%
Other Consumer	\$958	\$1,797	88%
Total	\$5,681	\$11,468	102%

Source: FAS GTA

Trends in AZ Ag Commodity Exports: cash receipts

2013

1.Processed Vegetables, \$240m

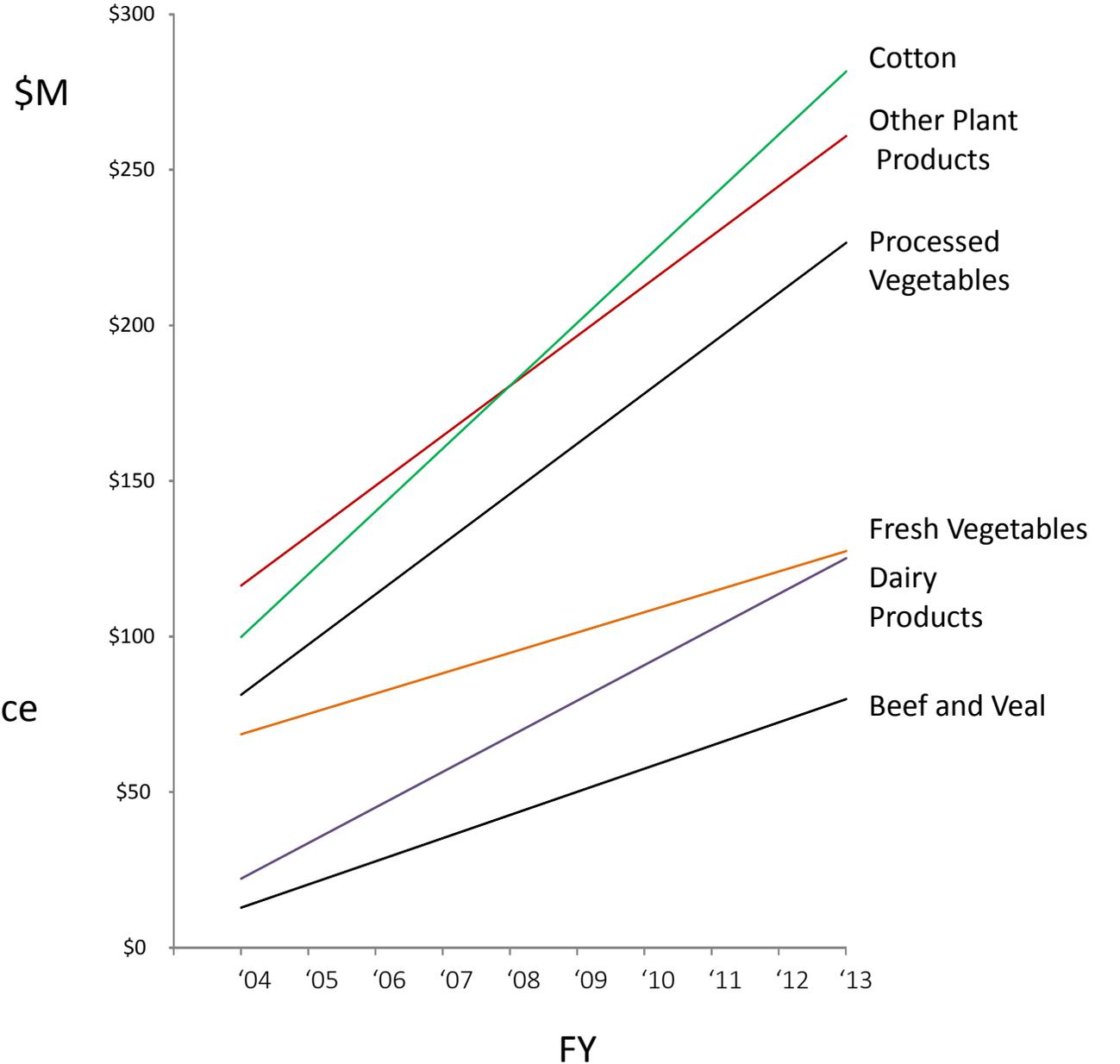
2. Cotton, \$219m

3.Dairy products, \$146m

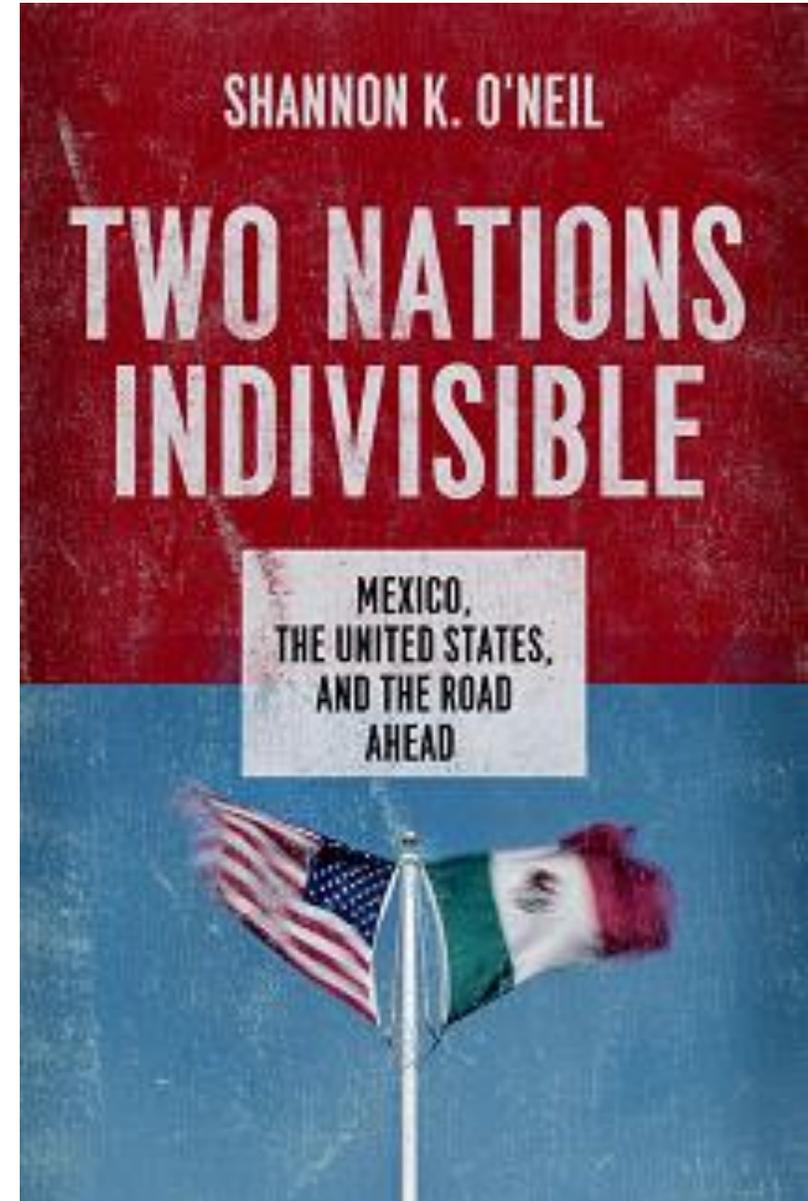
4.Fresh Vegetables, \$134m

5.Beef and veal, \$81m

U.S. Department of Agriculture Foreign Agricultural Service



- NAFTA 21 years old: quadrupled US-MEX trade
- US MEX border is the most economically dynamic region of both countries.
- “Made in Mexico” products are, on average, 40% made in the US (“Made in Canada”: 25%).
- AZ-MEX trade has not kept pace with other boarder states.
- Fresh produce hardest hit: historically 1/2 of trade and today 1/3 of trade.
- 21st Century Economic trend: Rise of global middle class, rise of global supply chain, rise of internet trade.



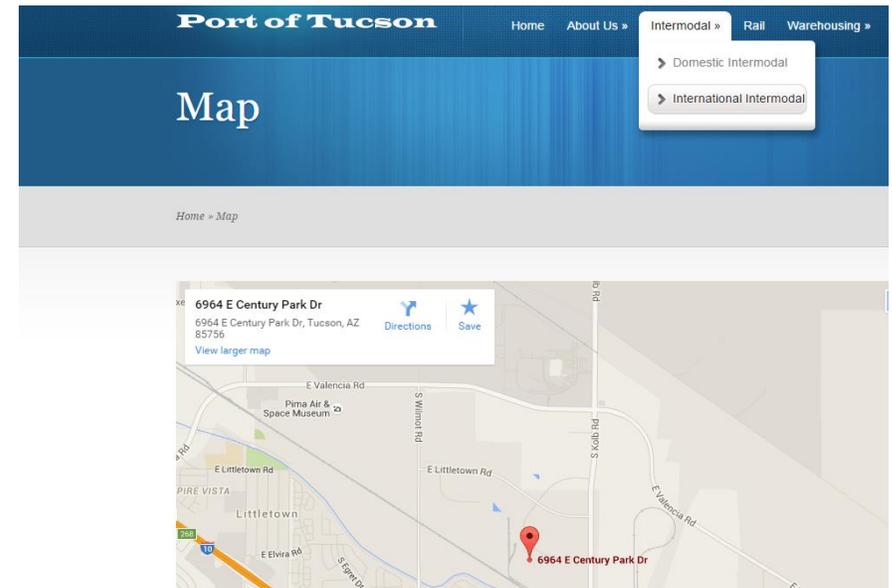
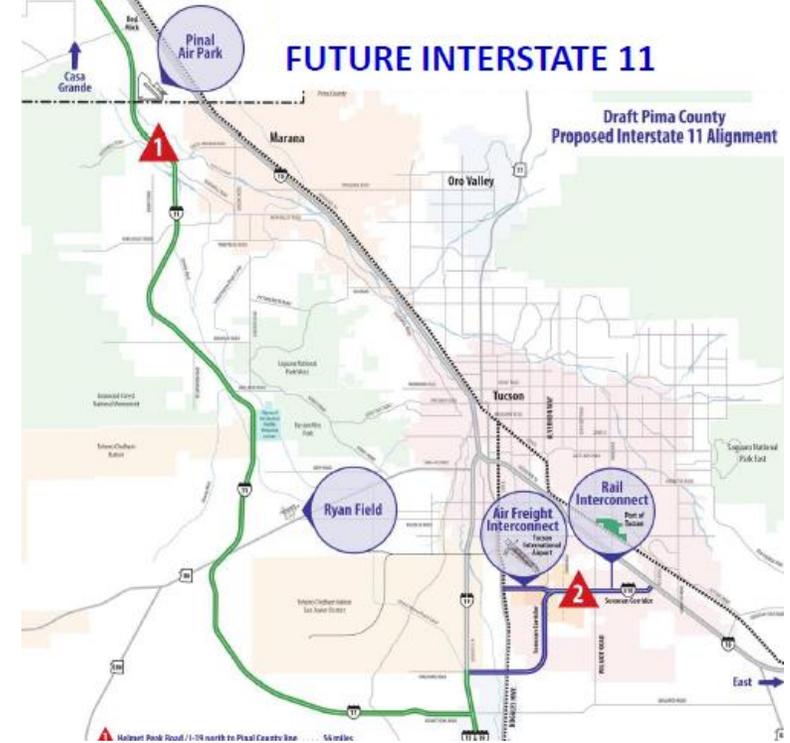
THIS IS THE FIRST SECTION
OF THE
NATIONAL SYSTEM OF INTERSTATE
AND DEFENSE HIGHWAYS
TO BE COMPLETED IN MINNESOTA
MINNESOTA DEPARTMENT OF HIGHWAYS
IN COOPERATION WITH THE BUREAU OF PUBLIC ROADS



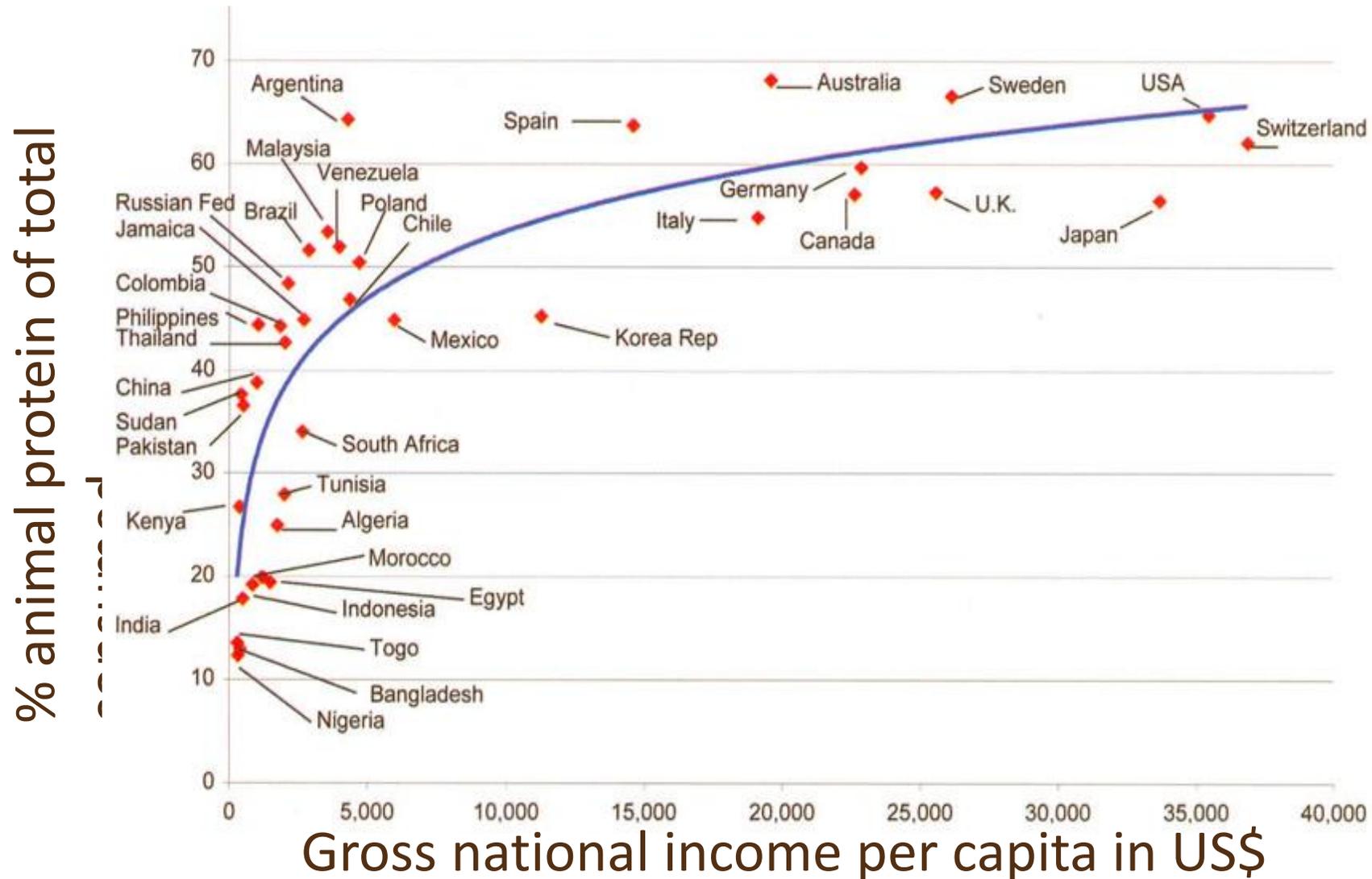
FUTURE INTERSTATE 11

International Trade and Transportation Corridor

Presented by
Chuck Huckelberry
 Pima County Administrator



Global animal protein consumption



Source: Data through 2002, FAO and Word Bank

Eggs:

Egg yolks are one of the few naturally occurring; significant dietary sources of vitamin D. A single egg provides all iron and half of the protein a child needs daily.



Meat:

In addition to being a good source of high-quality protein, one serving of cooked beef provides 40% of the Daily Value for vitamin B12 and zinc, plus much of the recommended intake of bioavailable iron (heme iron).



Milk:

Each serving of milk can supply substantial amounts of vitamin A, riboflavin, vitamin B12 and highly available calcium. Milk consumption may also help achieve and maintain a healthy body weight.



Image: <http://www.sensibletable.com/feeding-9-billion.aspx#food-security-defined>

Nutrition and academic performance: it's not just about underperforming because of hunger.

Quality of food counts as much: Milk, meat, and cheese proteins provide the building blocks for the pathways our brain uses to work. Without the amino acids found in proteins, our brains cannot create the neurotransmitters, or chemical messengers, our brain cells use to communicate with each other.

Animal-derived protein improves child cognitive function.

Improving Test Scores With Meat and Milk (Over 5 School Terms)

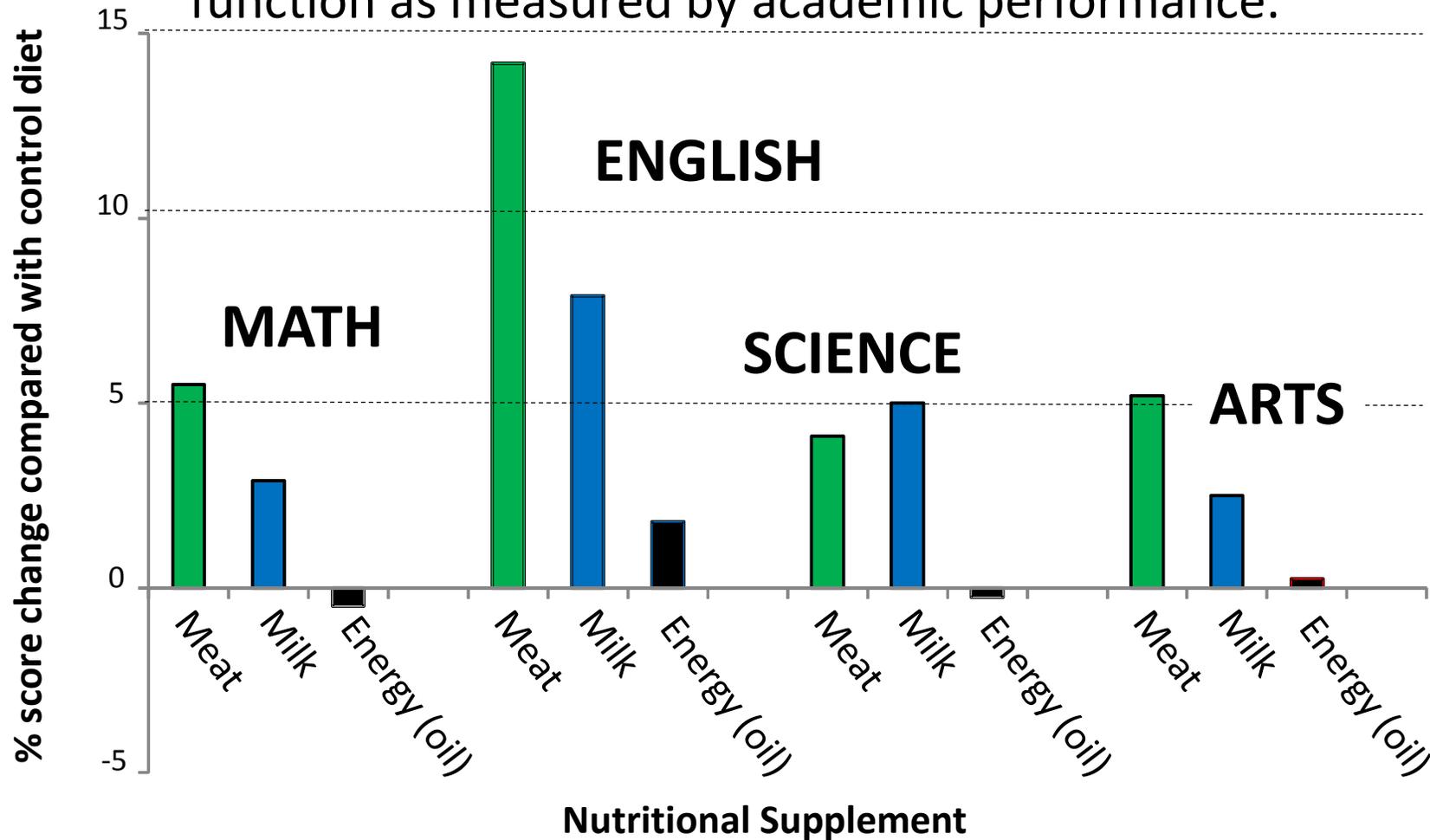
<http://www.sensibletable.com/resources.aspx#enough-report>



Adapted from Hulet, J.L. 2010, UCLA
College of Agriculture and Life Sciences – Office of the Vice President and
Dean.

The University of Arizona, Tucson, Arizona

Animal-derived protein improves childhood cognitive function as measured by academic performance.



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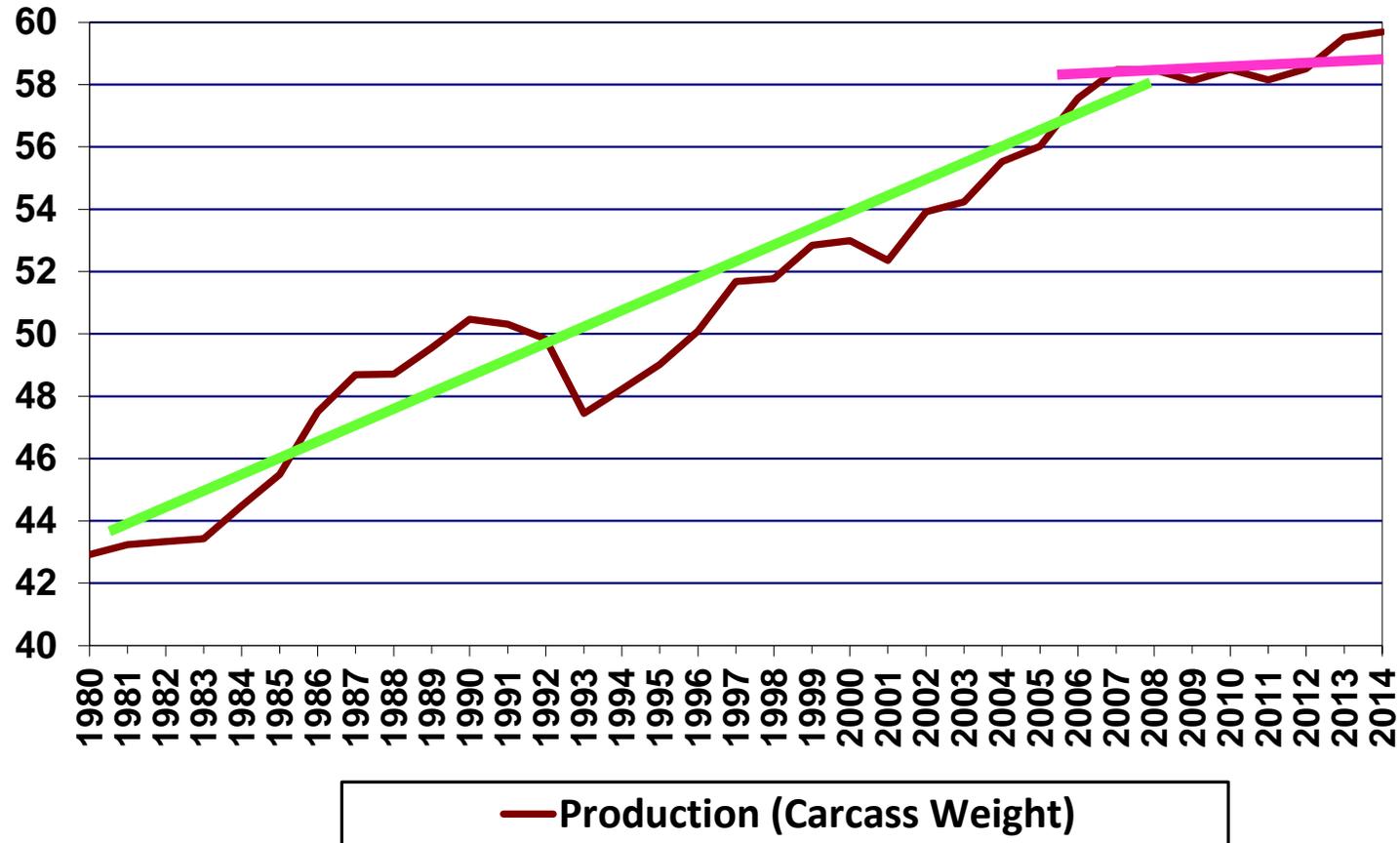


Image: <http://www.sensibletable.com/feeding-9-billion.aspx#food-security-defined>

FAO Link: <http://www.fao.org/economic/esa/esag/en/>

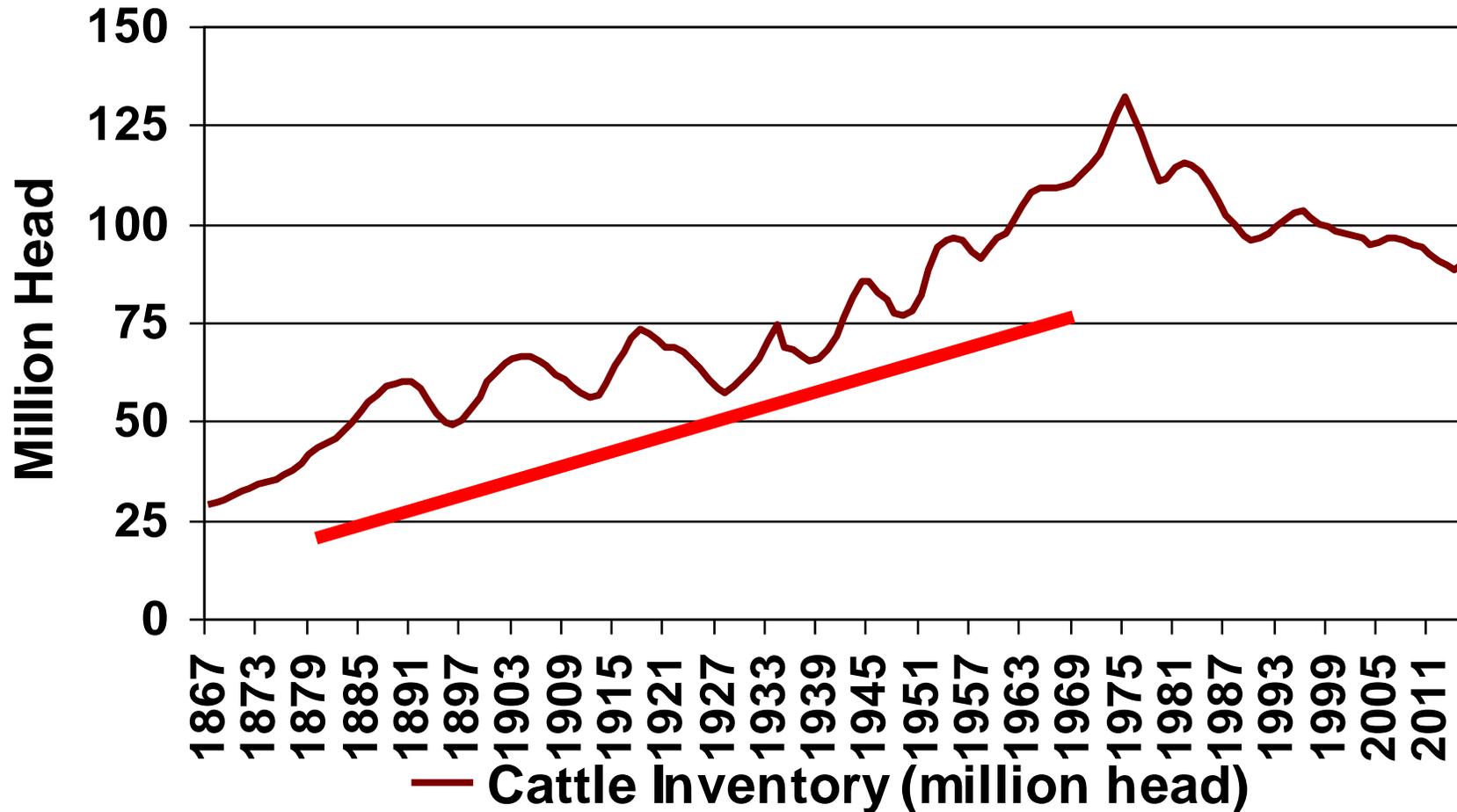
World Beef Production

Million Metric Tons



Source: Foreign Agricultural Service

U.S. Cattle Inventory (January 1)



Source: Livestock Marketing Information Center & MSU Agricultural Marketing Policy Center

2014 (\$255/cwt)

1. **8M head decline in cattle inventory (10%) 2007-2014**
 - a. **Production declining**
 - b. **World production is low**
 - c. **Demand is solid**
2. **Will substantial herd rebuilding occur in the U.S.? Elsewhere?**

Modified from:

Gary Brester MT SU Department of Agricultural Economics and Economics Tucson, AZ, 7/24, '15

Knowledge Economy growth depends on information quantity, quality, and accessibility.

- Greater reliance on intellectual capabilities than on physical inputs or natural resources.
- Products and services based on knowledge-intensive activities further contributing to an accelerated pace of technical and scientific advance.
- More and more rapid creative disruption (incessant product and process innovation with new production units replacing outdated ones).
- New industry emergence.
- Wage and high-quality job inequality.

Figure 2. Trends in U.S. Bioscience and Private Sector Employment, 2001–2012

Source: Battelle analysis of BLS, QCEW data; enhanced from IMPLAN.

Indexed: 2001 = 100

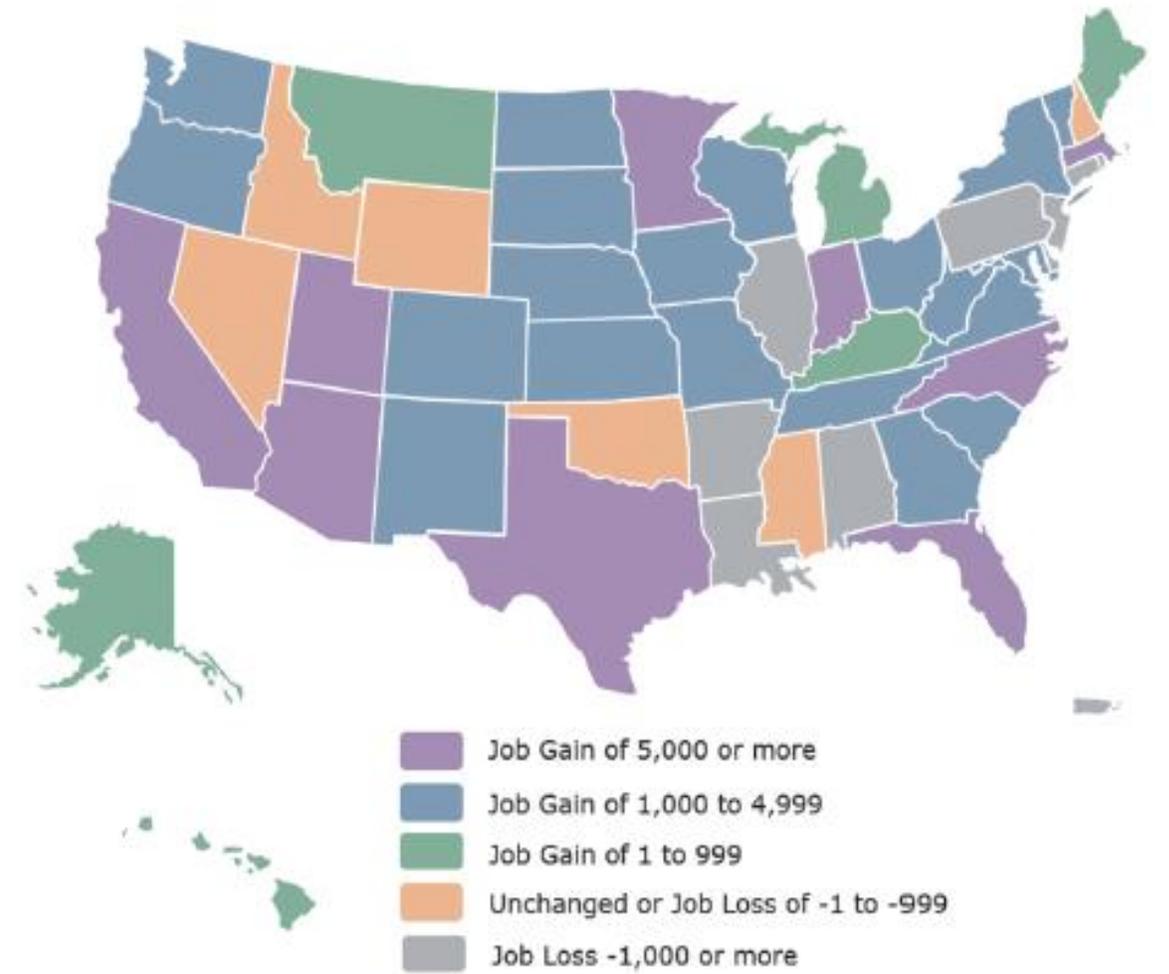
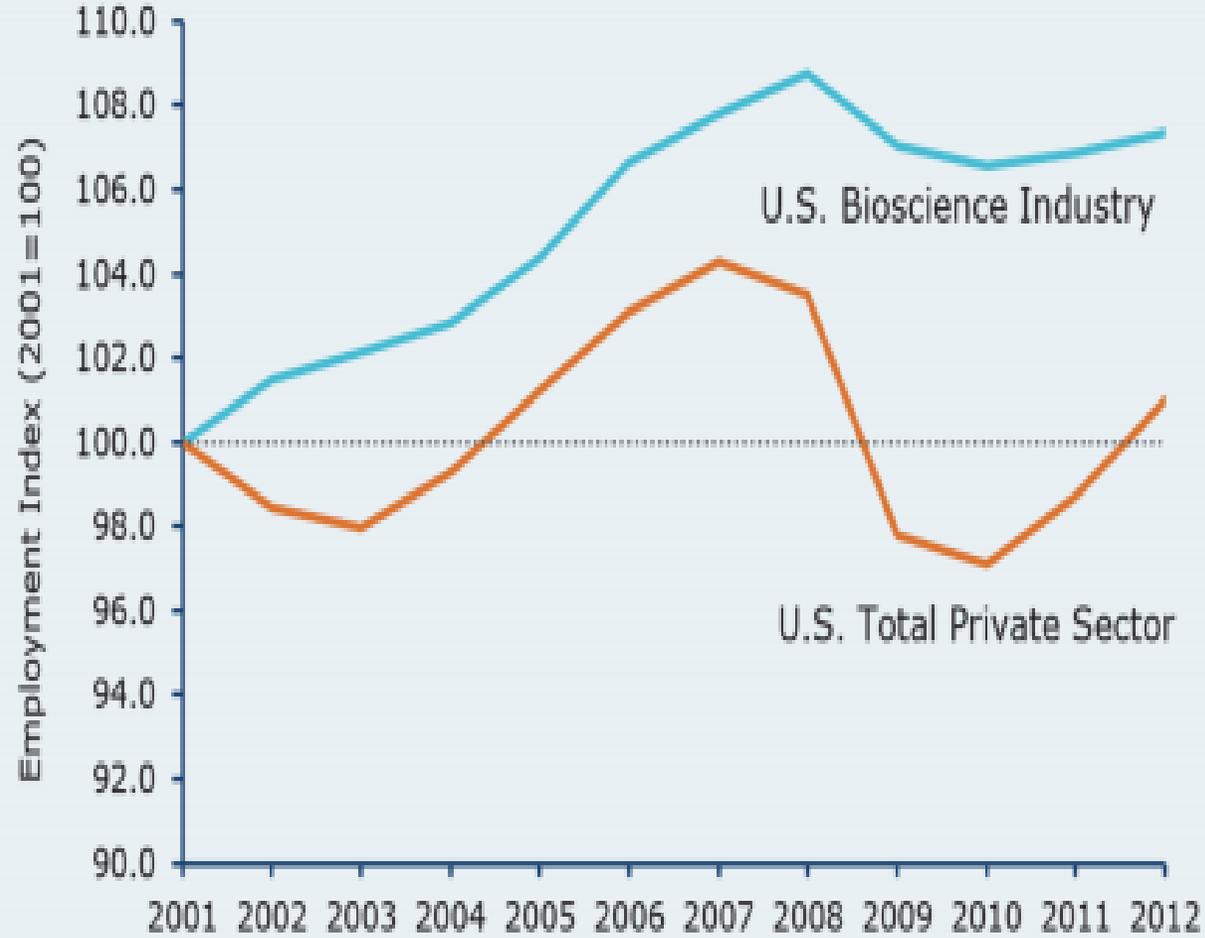


Figure A. Change in Bioscience Employment by State, 2001–2012

Source: Battelle analysis of Bureau of Economic Analysis gross output data.

Growth in Nominal Gross Output for Major Bioscience Subsectors

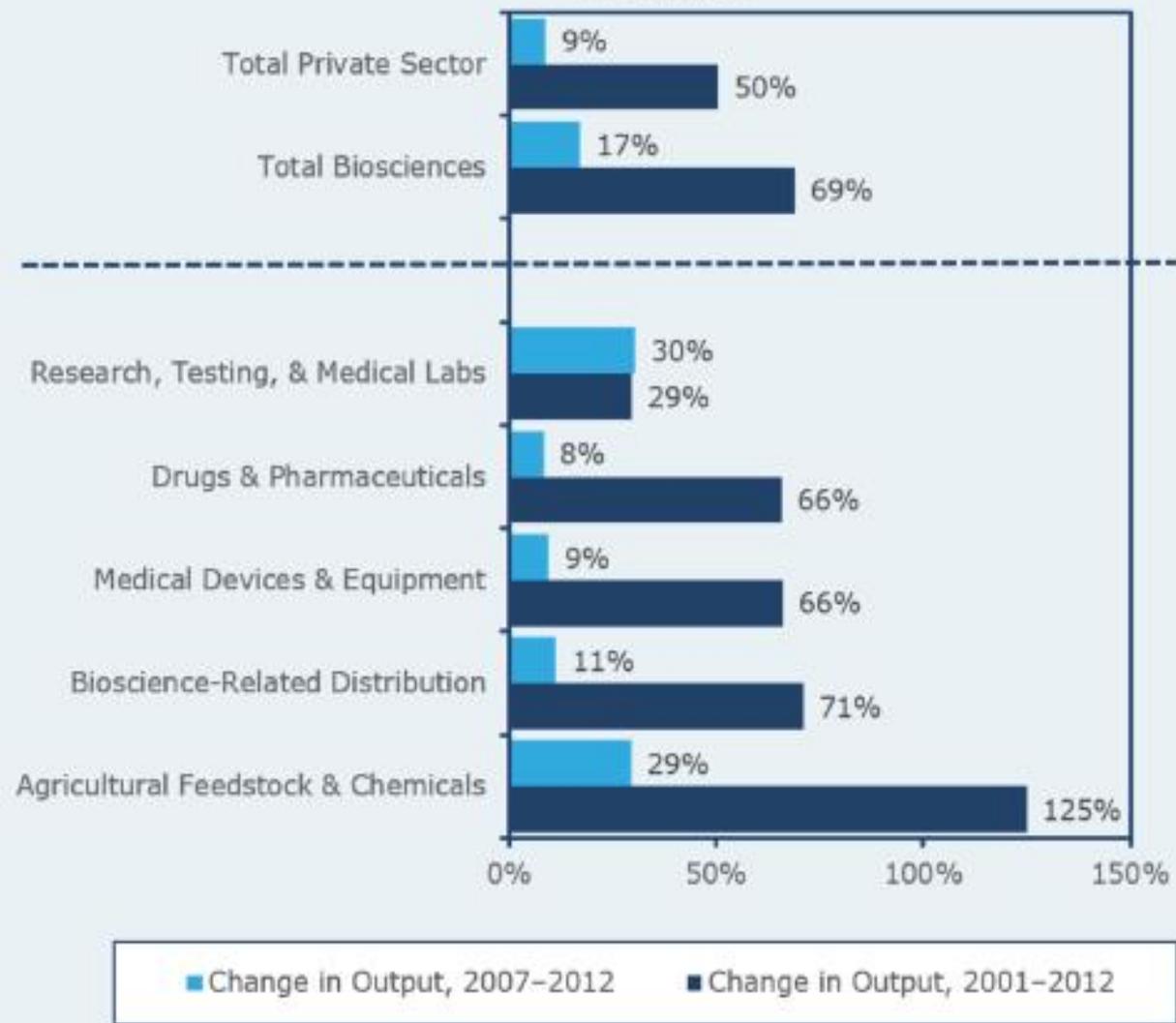
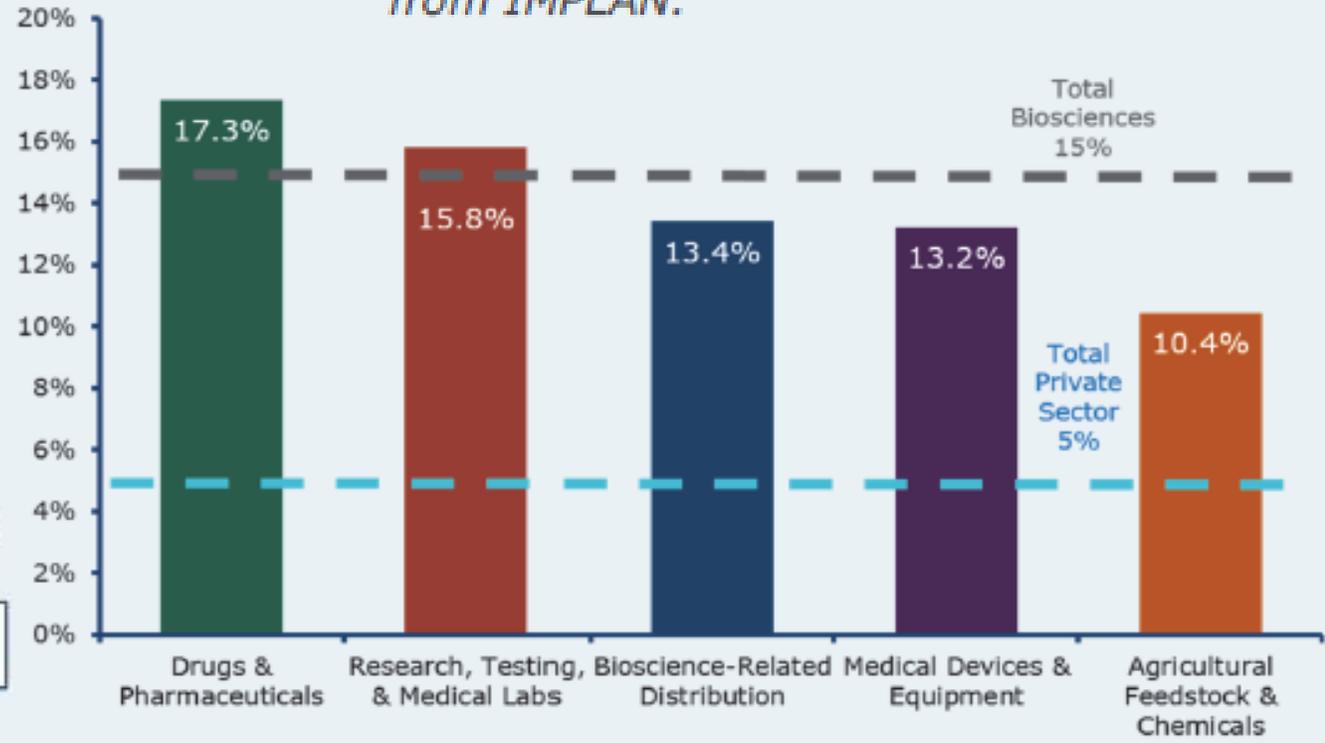


Figure 5. Change in Real Average Annual Wages in the Biosciences, 2001-2012

Source: Battelle analysis of BLS, QCEW data; enhanced from IMPLAN.



Source: Battelle analysis of Bureau of Economic Analysis gross output data.



WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future

Aquaculture

The Aquaculture Pathology Laboratory (APL) is an OIE (Office International des Epizooties or World Animal Health) Reference Laboratory and a USDA APHIS Approved Laboratory for testing of live shrimp and other products intended for export. The services provided by the APL include disease diagnostics, surveillance and reference lab services from the main diagnostic lab, quarantine and disease challenge services at the West Campus Aquaculture facility and technical services and training to governments, companies and aquaculture cooperatives located in the United States, Latin America, Africa, the Middle East, Oceania and in east and southeast Asia.

The APL also carries out a variety of applied research projects for USA-based and foreign companies. This includes quarantine and disease challenge studies to evaluate genetic gains in disease resistance to several OIE-listed shrimp virus diseases provided primarily to commercial shrimp breeding companies located in Hawaii and Florida. Research activities are aimed at developing new tests for shrimp disease diagnosis and for evaluating specific antibacterial and antiviral compounds.



Examining a collection of diseased shrimp from a culture pond in the Me Kong Delta area of Vietnam.
Photo Credit: Cao Thanh Trung



Infectious hypodermal and haematopoietic necrosis

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Infectious myonecrosis

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Spherical baculovirus (Penaeus monodon-type baculovirus)

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White spot disease

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Taura syndrome

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Tetrahedral baculovirus (Baculovirus penaei)

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CERTIFIED

NO Detectable PCBs
NO Detectable Mercury

Tested by an accredited independent laboratory



<http://www.bizjournals.com/phoenix/blog/business/2015/11/study-arizona-a-top-destination-for-businesses.html>

Study: Arizona a top destination for businesses relocating from California

Nov 5, 2015, 10:30pm MST | UPDATED: Nov 6, 2015, 7:22am MST



Eric Jay Toll

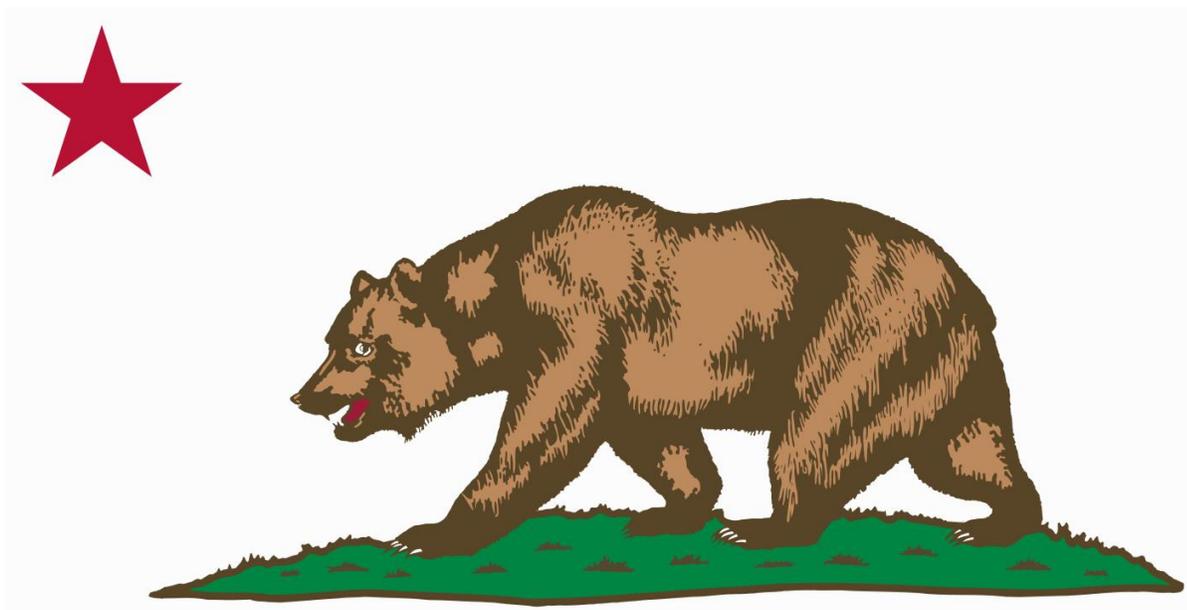
Reporter- *Phoenix Business Journal*

Email | Twitter

Arizona is the third-best market for California disinvestment, according to a seven-year Spectrum Location Solutions study of companies leaving the state.

Texas, Nevada and Arizona are in the top three slots, following by Colorado, Washington, Oregon and North Carolina.

The report also said that a number of foreign nations gained from California losses, with the most jobs going to Mexico, India and China.



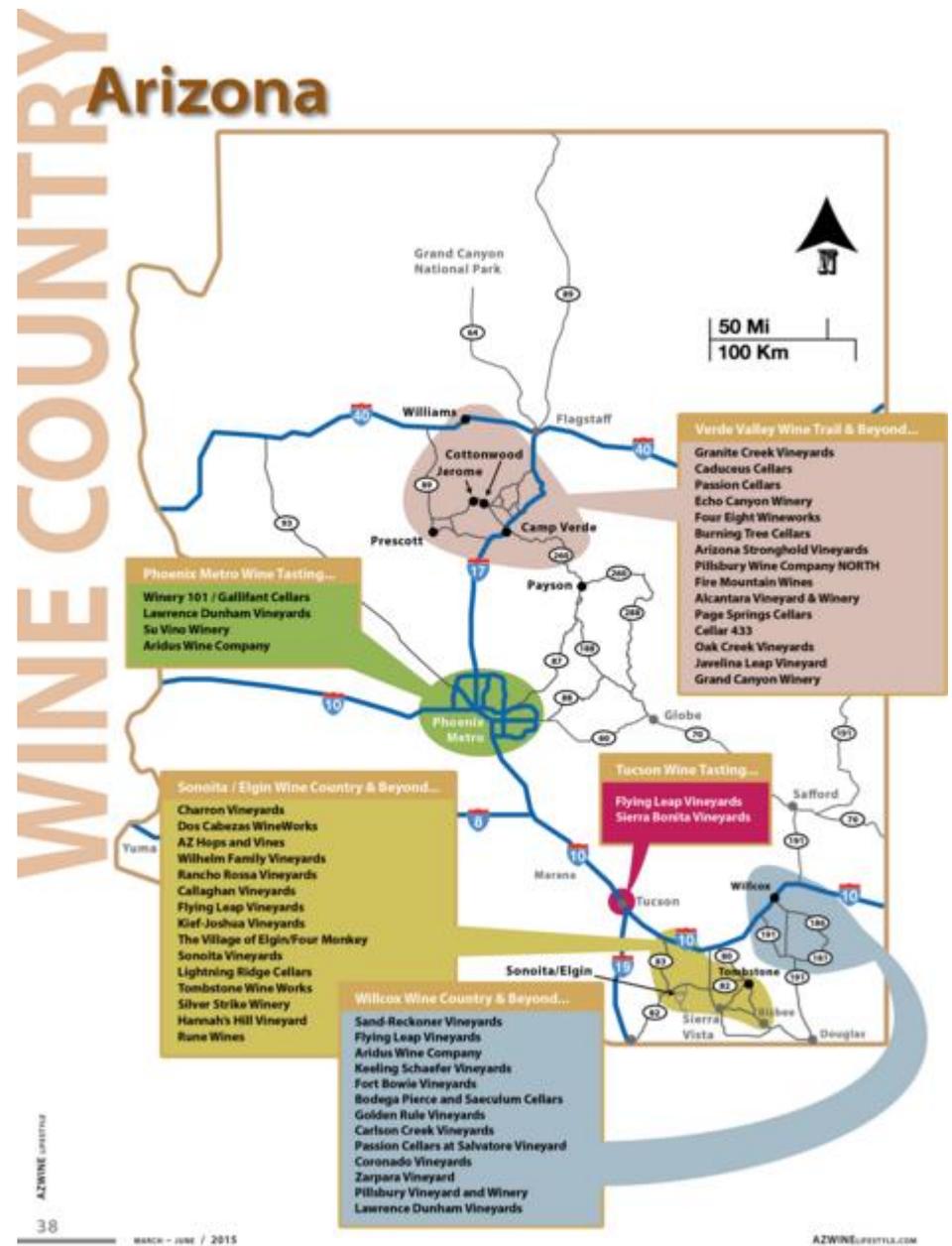
<http://www.jamesrobertwatson.com/images/texasnottexas.jpg>

Interdependence

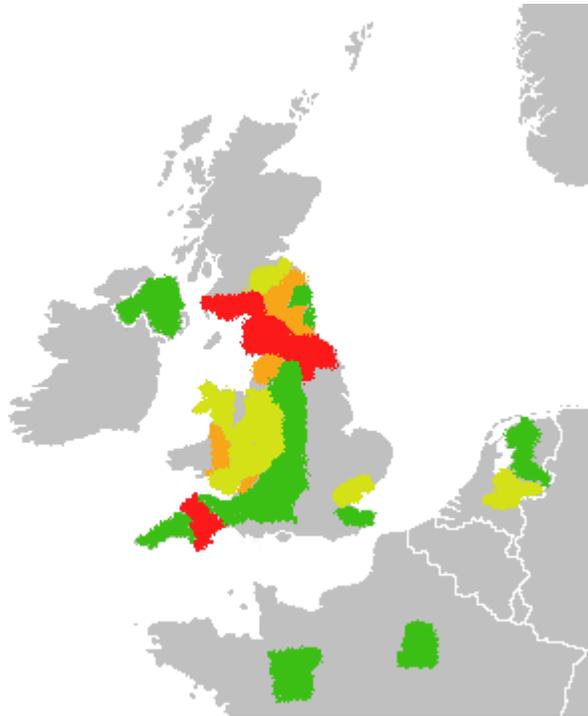




<https://www.arizonawine.org/images/stateMap.gif>



<http://azwinelifestyle.com/wp-content/uploads/2015/04/AZWINEm2015AZSTATEmap1.jpg>



"FMD outbreaks UK 2001" by Flukeman. Licensed under CC BY-SA 2.5 via Commons.
https://commons.wikimedia.org/wiki/File:FMD_outbreaks_UK_2001.png#/media/File:FMD_outbreaks_UK_2001.png



Industries supplying agriculture and the food industries, and especially tourism.

Tourism loss: \$10.7 to \$11.7B U.S.D

Commodities
&
Decommoditization





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The Supima[®] trademark
guarantee that the
they are buying is
extra-long staple

Supima[®]
WORLD'S FINEST COTTONS

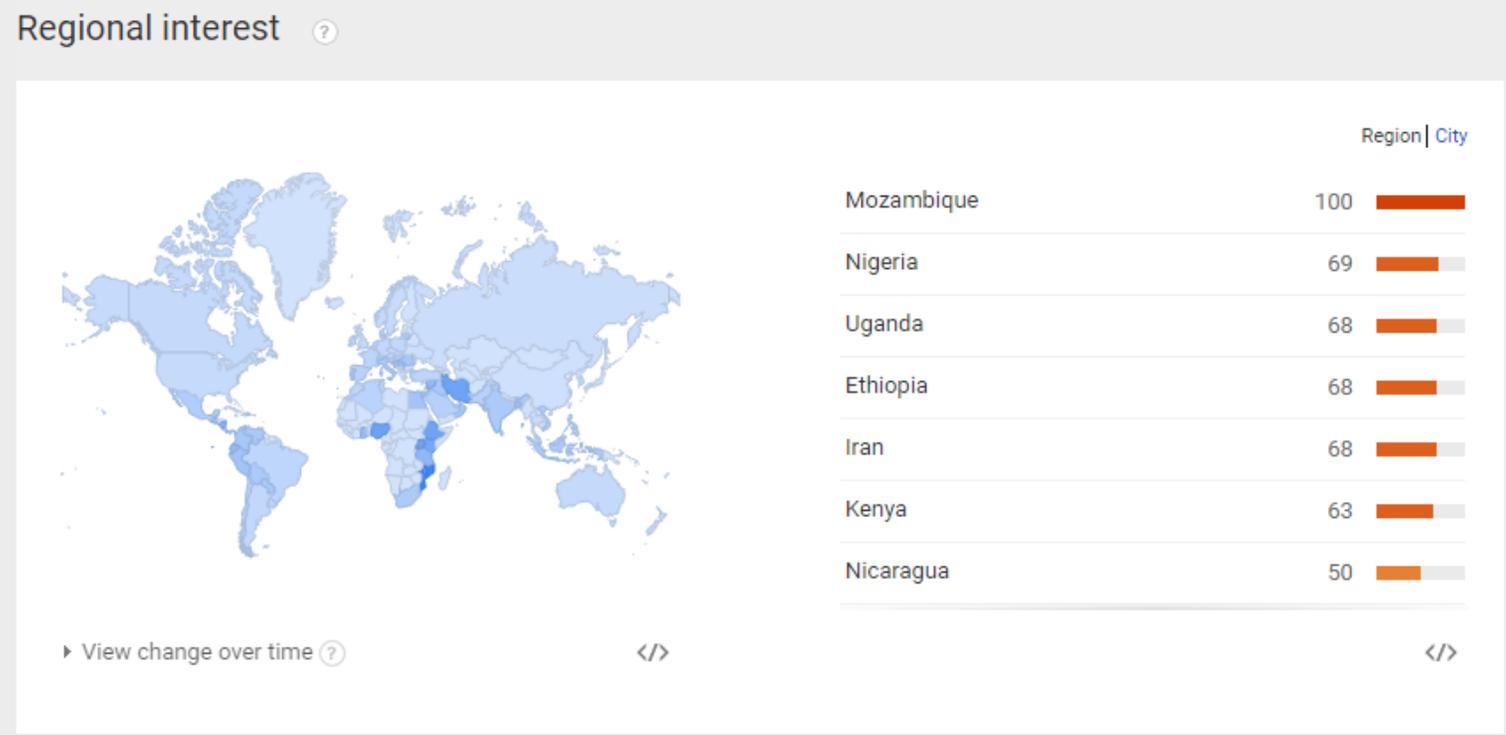
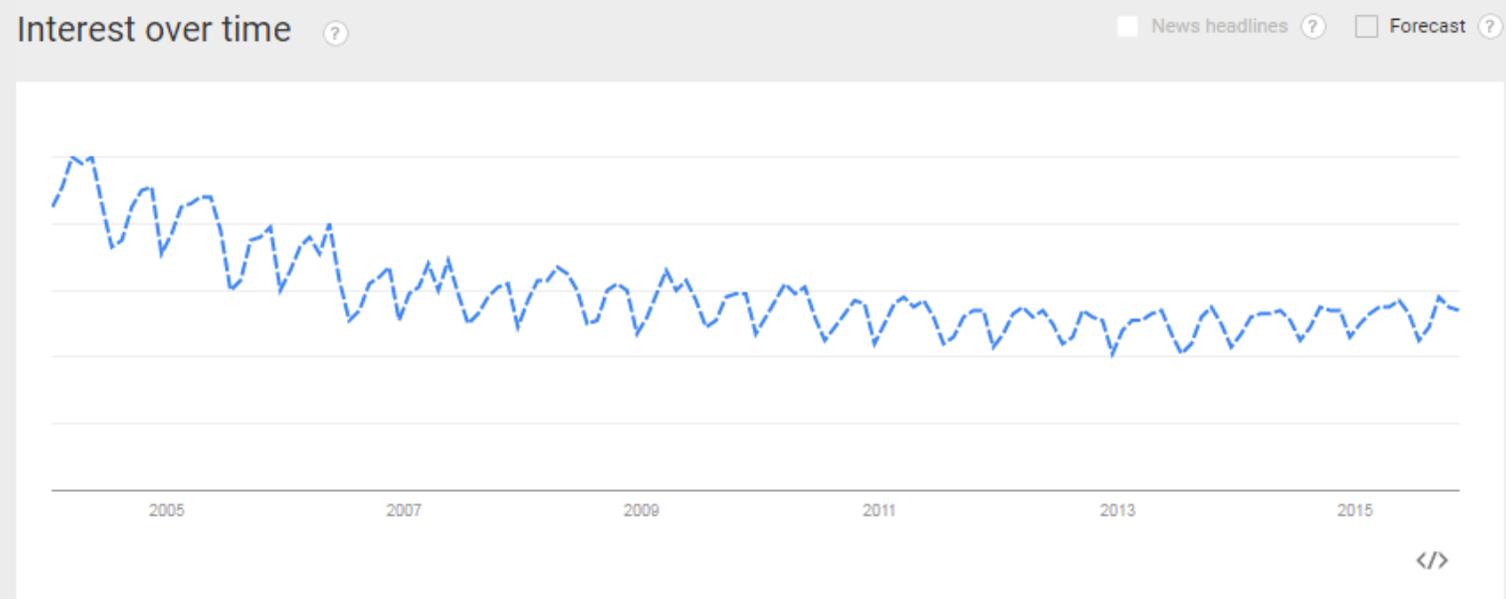




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WIIFM?

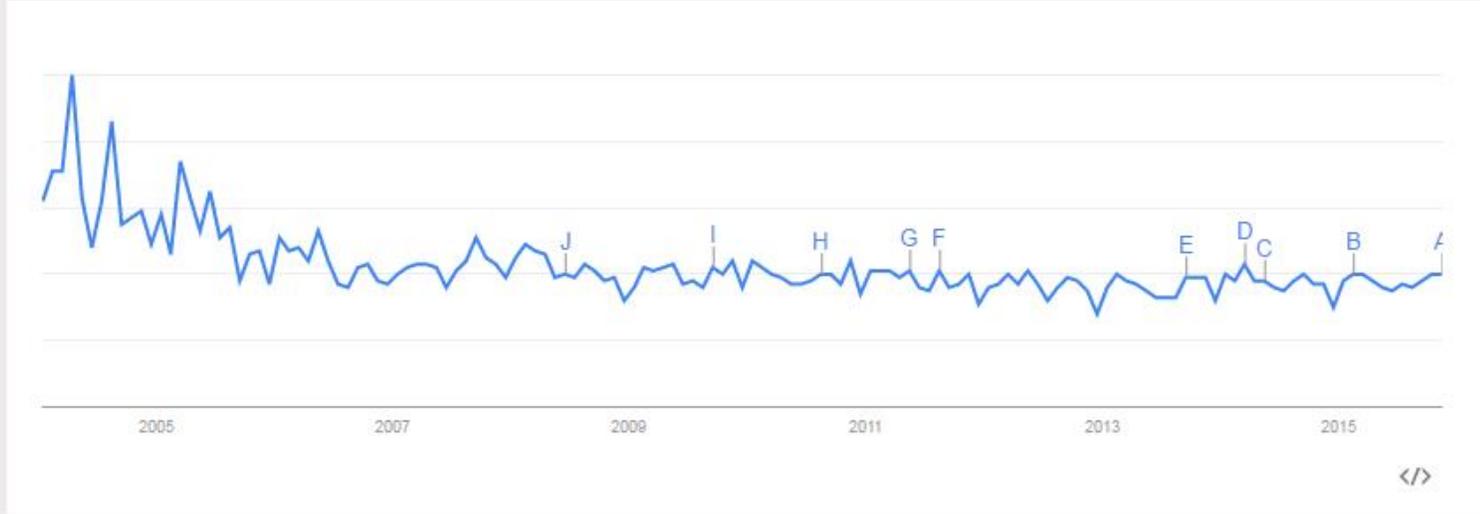
Agriculture



Agribusiness

Interest over time ?

News headlines Forecast ?



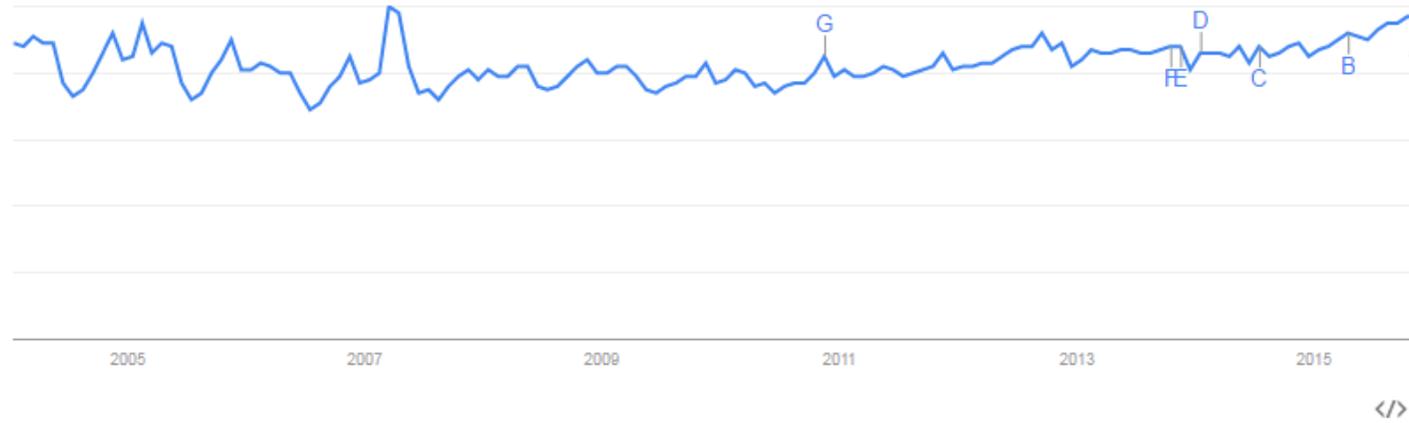
Regional interest ?



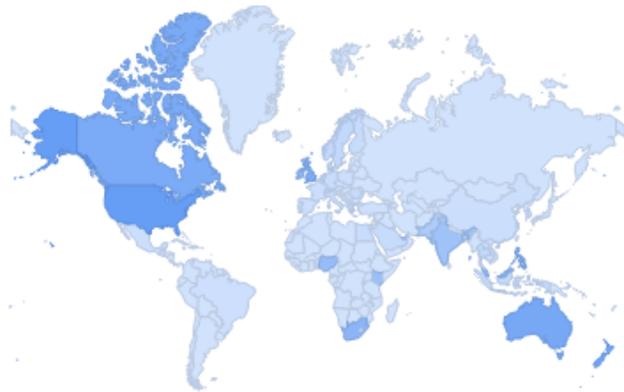
Food

Interest over time ?

News headlines Forecast ?



Regional interest ?



Region	City
Singapore	100
United States	73
New Zealand	65
Australia	62
Canada	59
Philippines	59
United Kingdom	56

▶ View change over time ?

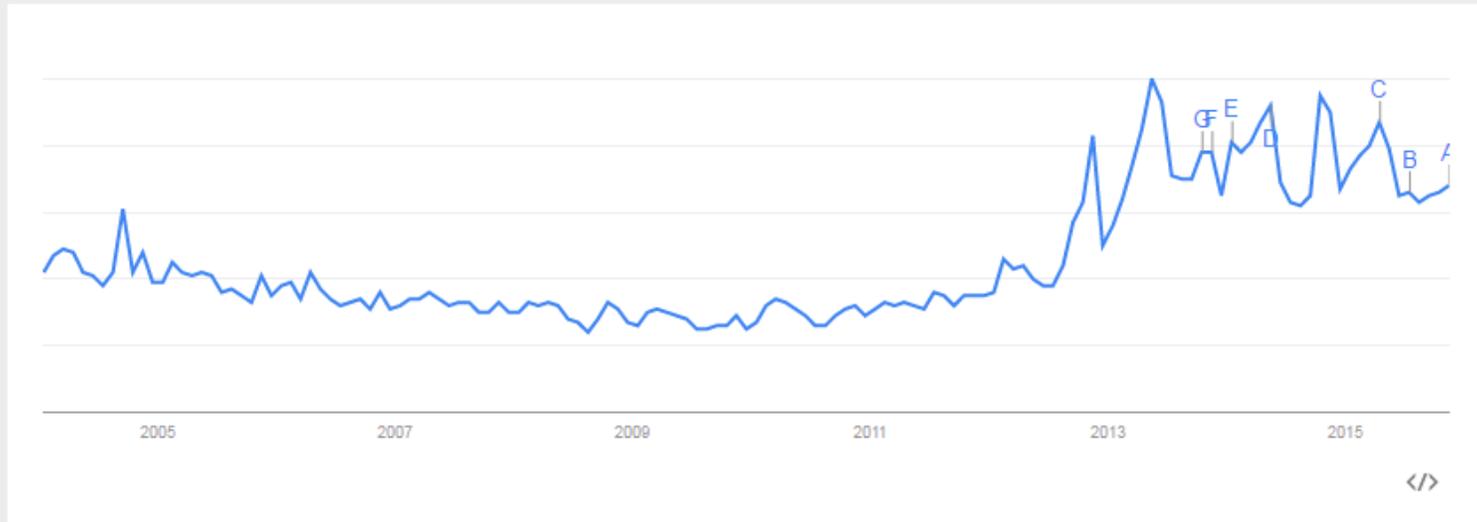
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GMO

Interest over time [?](#)

News headlines Forecast [?](#)



Regional interest [?](#)



▶ View change over time [?](#)

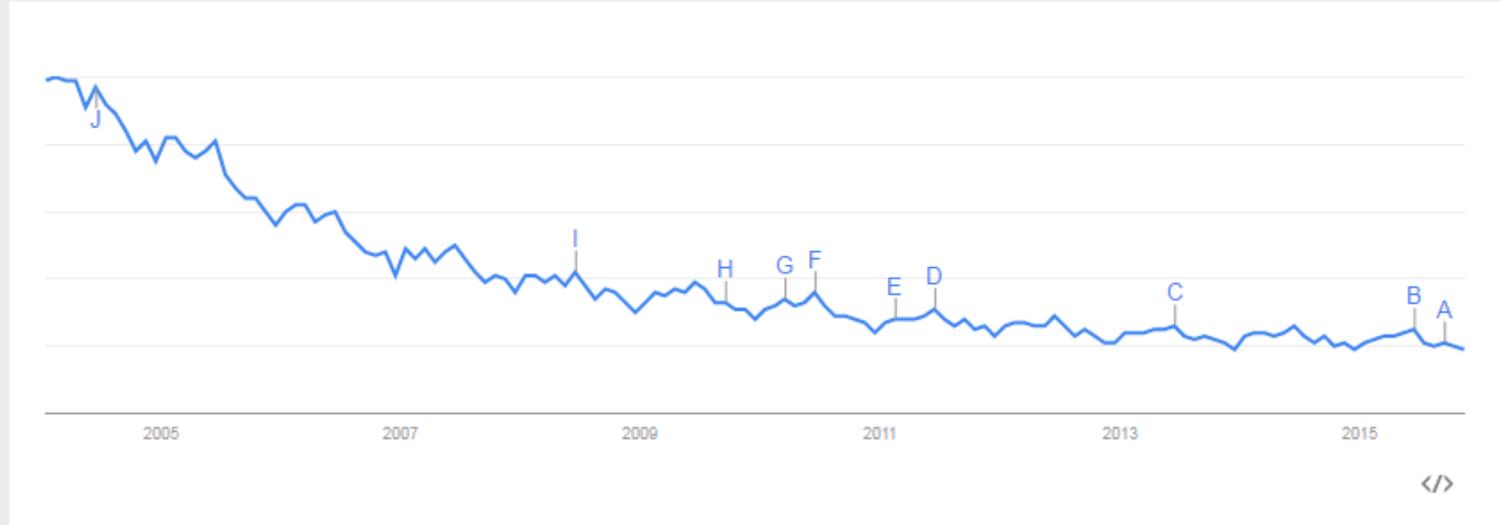
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Biotechnology

Interest over time ?

News headlines Forecast ?



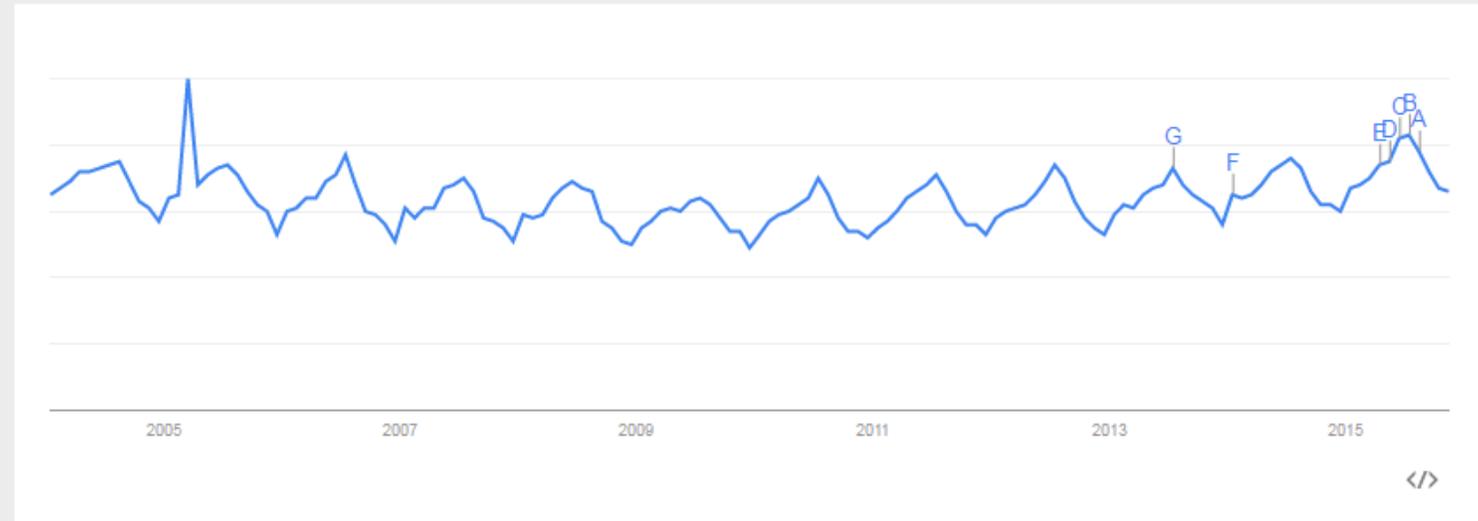
Regional interest ?



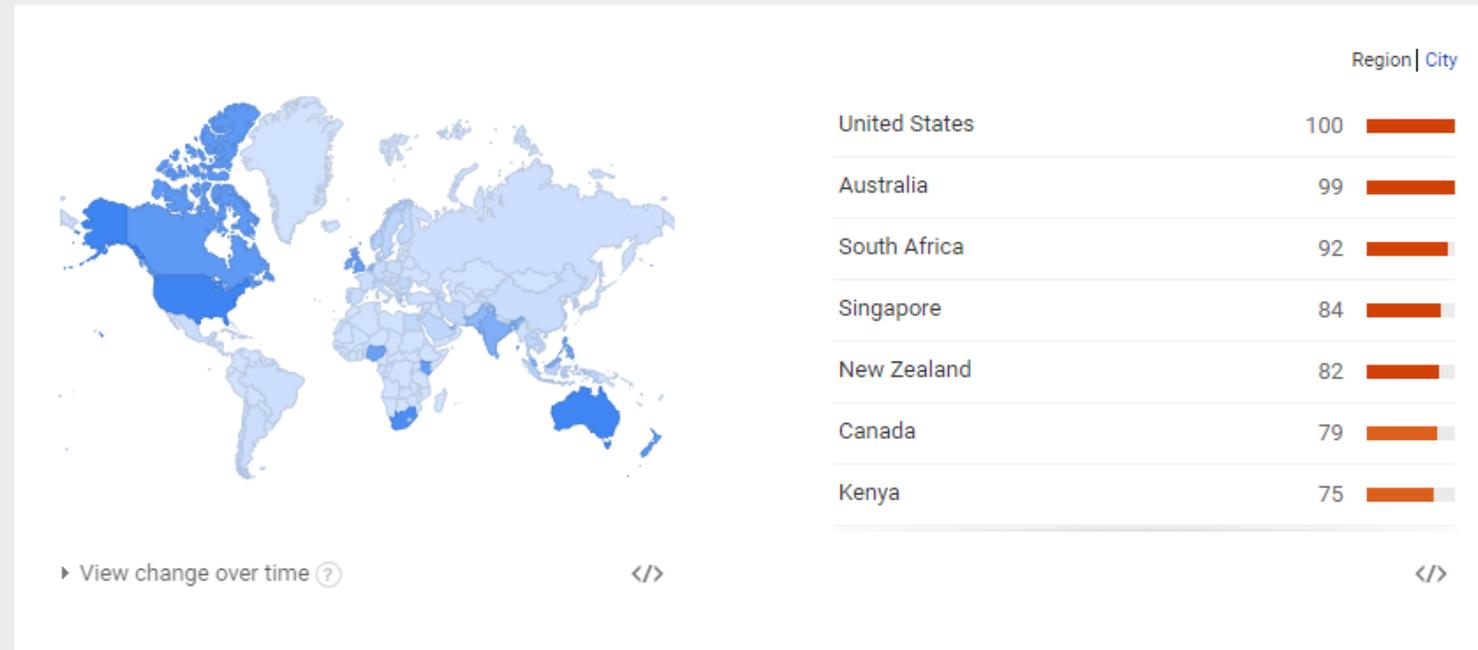
Water

Interest over time ?

News headlines Forecast ?



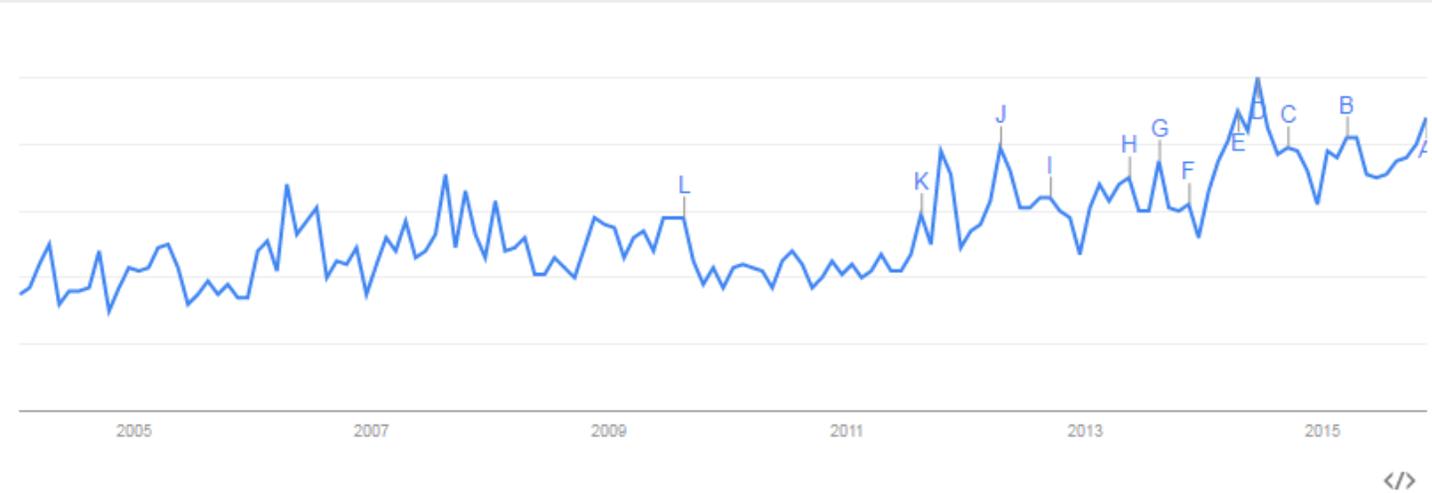
Regional interest ?



Student Debt

Interest over time ?

News headlines Forecast ?



Regional interest ?



Region	City
United States	100 
Canada	46 
United Kingdom	23 
Australia	12 

▶ View change over time ?

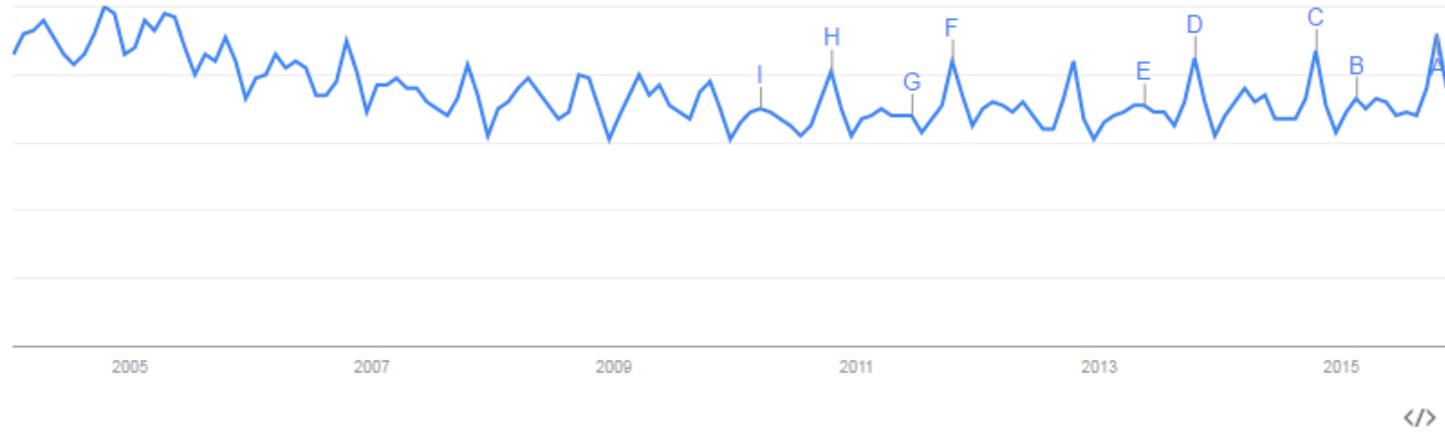
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Cancer

Interest over time ?

News headlines Forecast ?



Regional interest ?

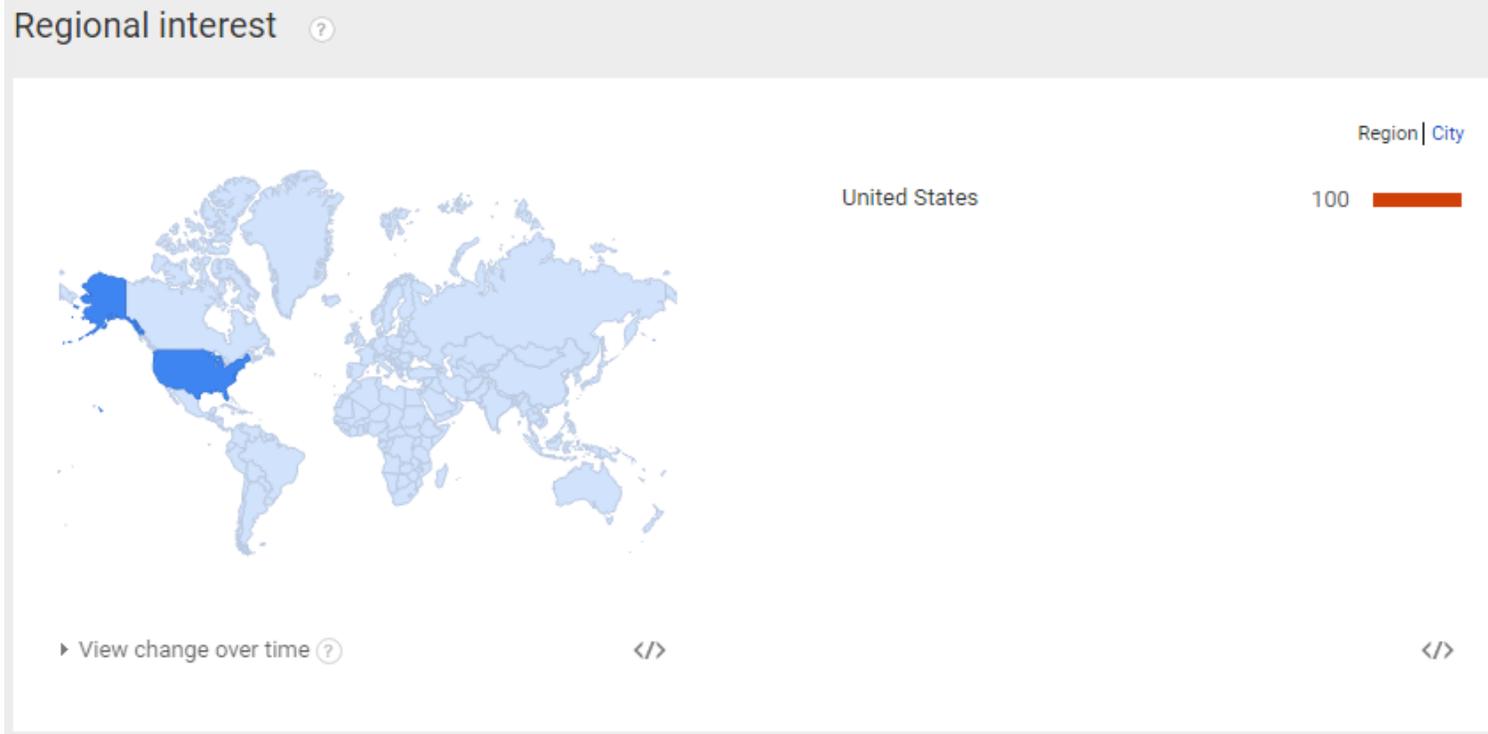
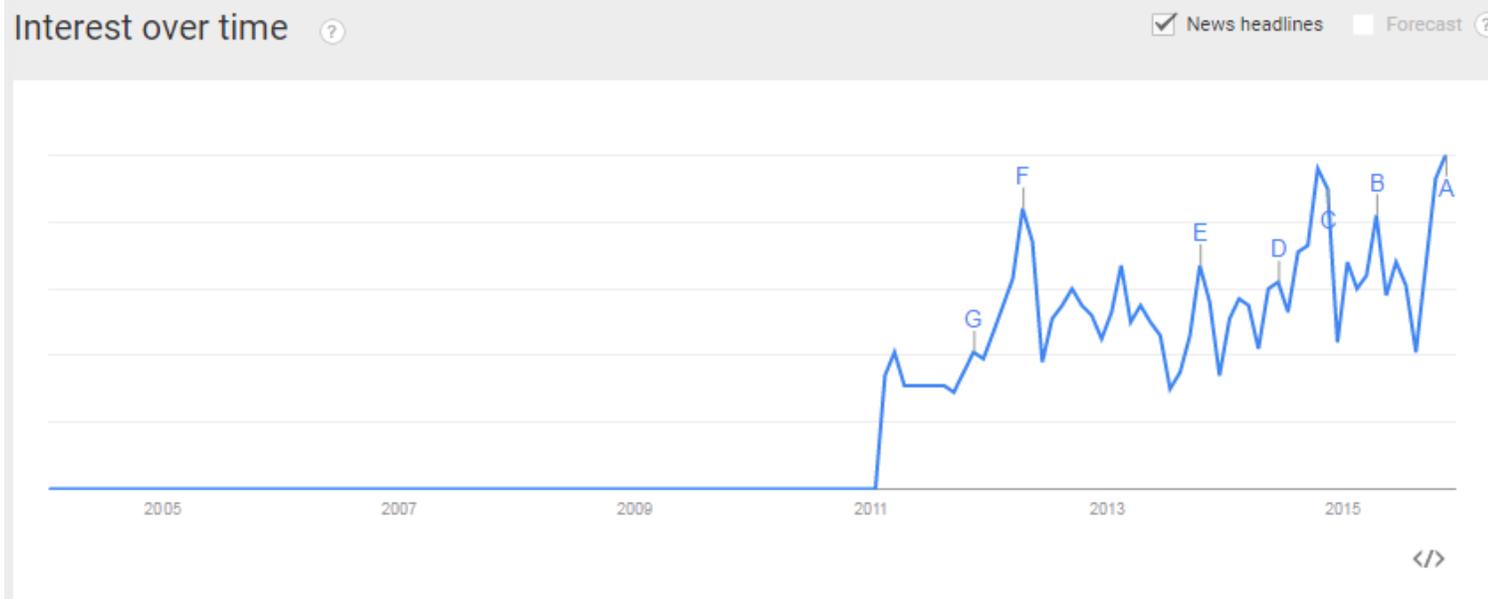


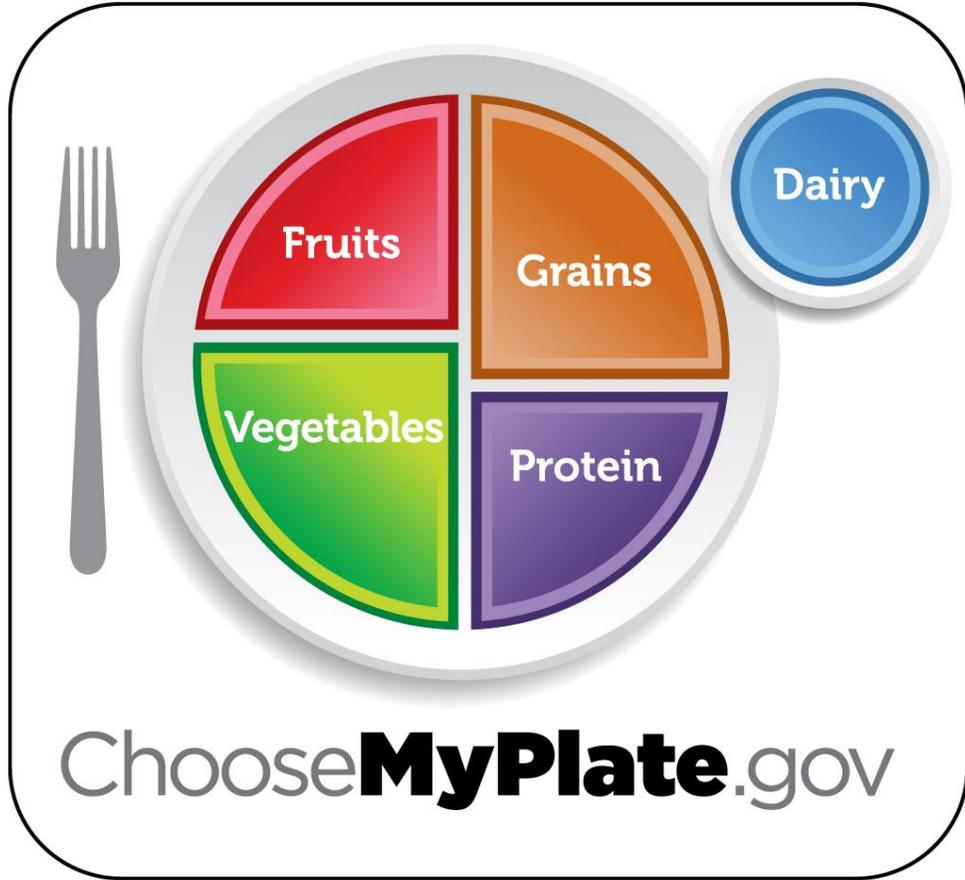
Region	City
United States	100
Canada	99
Australia	95
Puerto Rico	93
United Kingdom	83
Ireland	76
New Zealand	74

▶ View change over time ?



Bioeconomy





Scientific Report of the 2015 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Health and Human Services
and the Secretary of Agriculture

The level of education achieved by Arizonans is just as important to our civic health as it is to our economic prosperity and quality of life. Education drives 12 of 16 indicators tracked by the Civic Health Index based on U.S. Census data. The following five are representative.

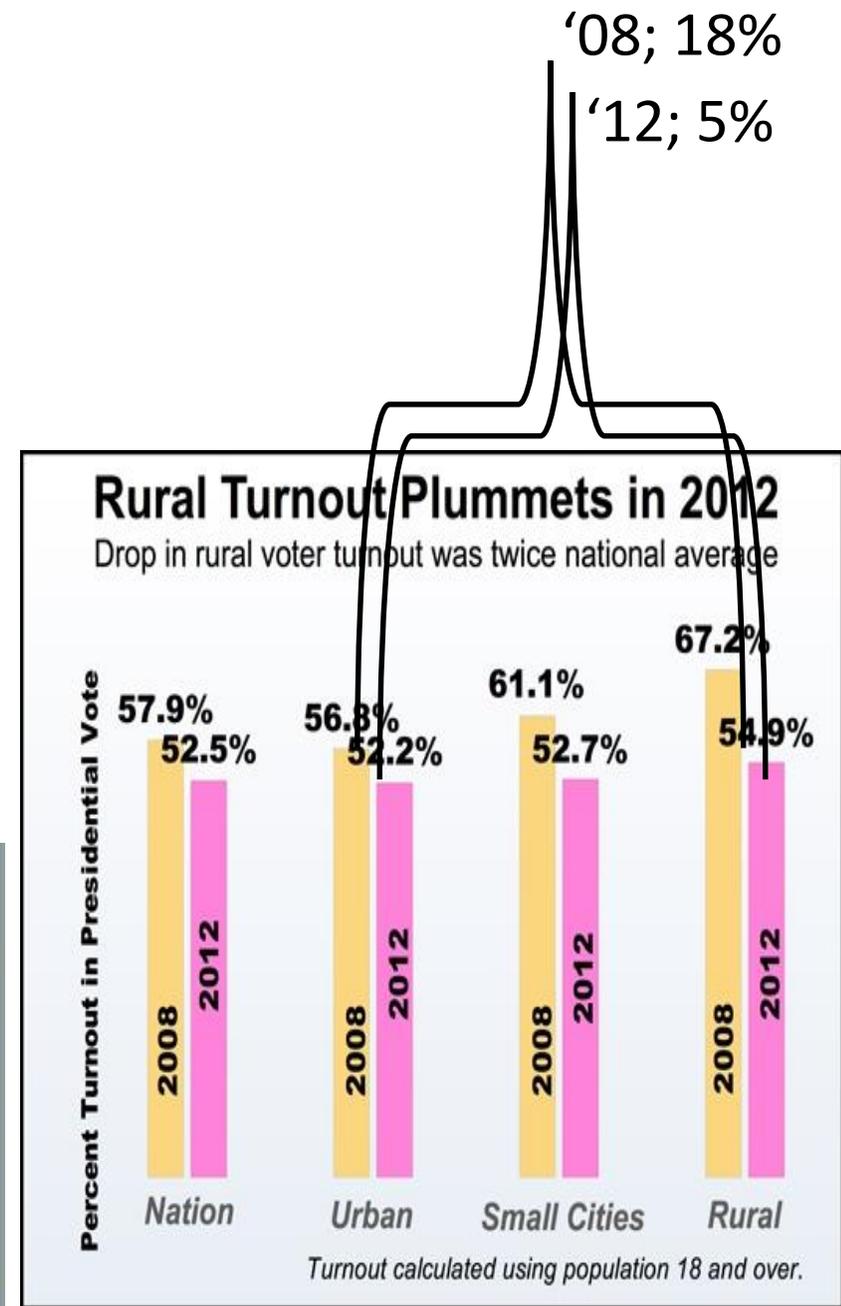
Citizen Participation by Education in Arizona (2012)

	Overall		No HS Diploma		HS Diploma		Some College		BS Degree or Higher	
	AZ	U.S.	AZ	U.S.	AZ	U.S.	AZ	U.S.	AZ	U.S.
Vote	55.9%	61.8%	27.0%	38.0%	43.9%	52.6%	62.1%	64.2%	71.7%	77.1%
Volunteer	23.1%	26.1%	6.6%	9.0%	17.6%	16.7%	23.3%	27.7%	36.8%	39.8%
Attend Public Meetings	4.9%	9.3%	0.9%	2.8%	2.7%	5.2%	5.2%	9.4%	8.7%	15.3%
Work with Neighbors to Fix Something	6.0%	8.4%	0.9%	2.9%	8.4%	5.0%	6.9%	8.8%	7.4%	13.1%
Give to Charity—\$25 or More	53.4%	55.2%	21.2%	30.7%	41.4%	45.5%	61.6%	57.8%	72.3%	71.1%

Source: Arizona Civic Health Index, 2013

THE CONSTITUTIONAL IMPERATIVE

The foresight and commitment of Arizona's early lawmakers is remarkable. A small and largely rural population living on the edges of the frontier established an education system that spanned all levels—from the state's first elementary schools to three institutions of higher education. And it happened decades before statehood.





Just Do It...



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