

Opportunities, Challenges, and Needs for Successful North Central US & Ohio Aquaculture

ABC-2 Boot Camp
January 14, 2017

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MICHIGAN STATE
UNIVERSITY

Opportunities

Challenges

Needs

What will it take for
Aquaculture in the North
Central Region US & Ohio to
be highly successful?

Opportunities



Opportunity

Global Demand

Global Aquaculture 2012
Value USD 135.10 billion
Volume 66.5 million tons

**Transparency Market Research
Report 2013**



Tilapia cages near Alexandria, Egypt.
Photo by Graeme Macfadyen (Poseidon),
2011

2019 Forecast
USD 195.13 billion
Volume increase at 2.3% annually

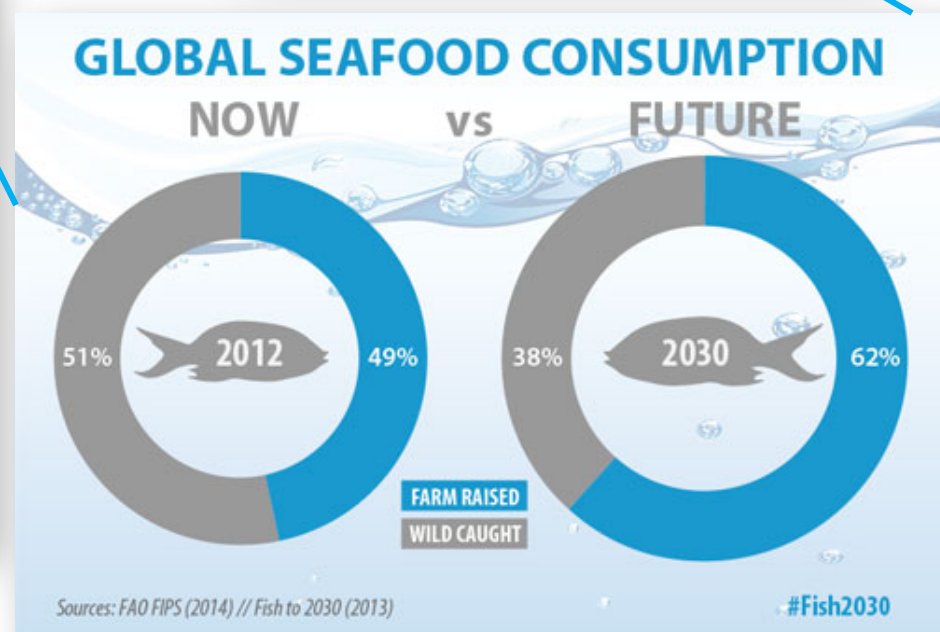
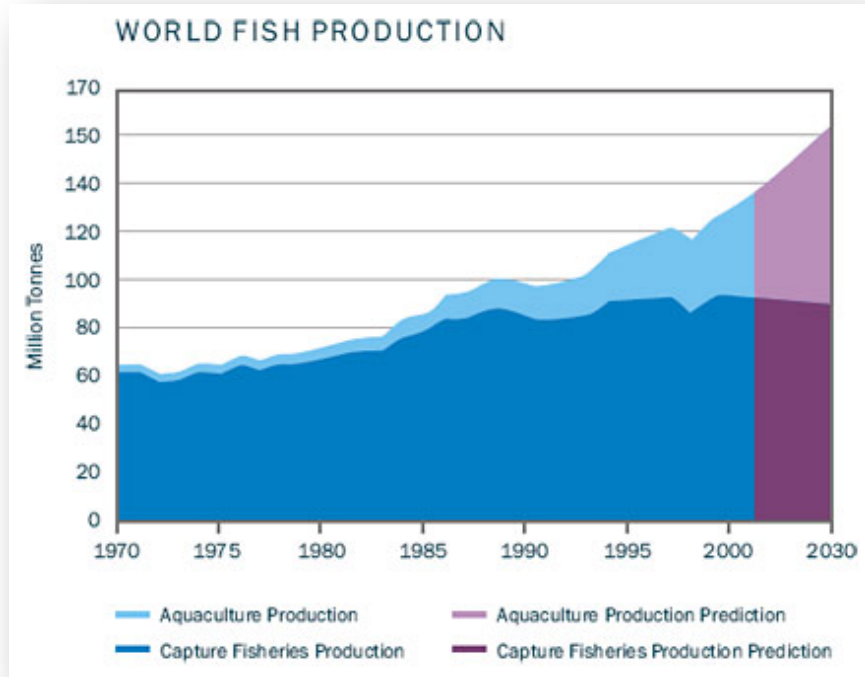
2030 Forecast

Global seafood demand:

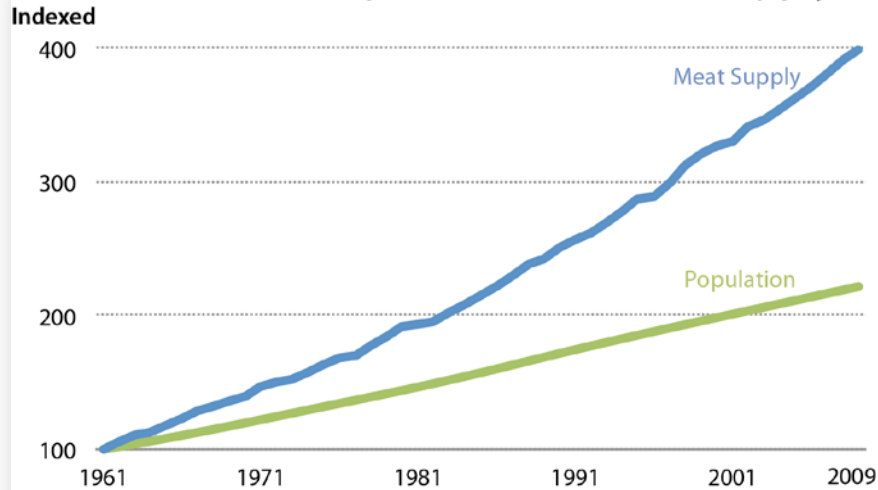


\$330 billion

100-170 billion lbs

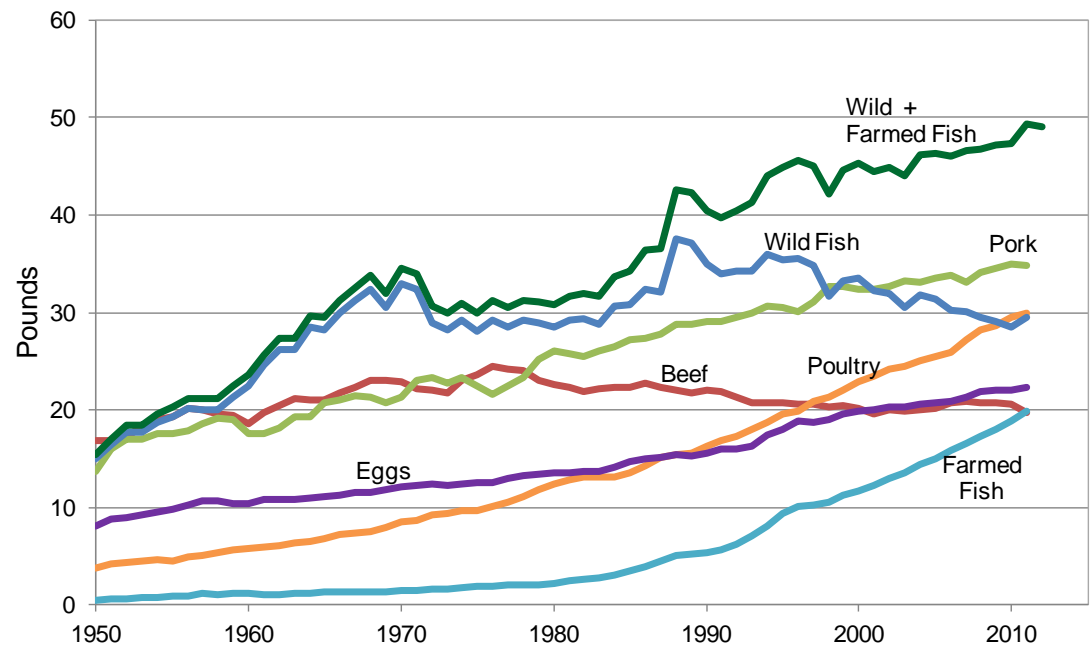


Growth of Population and Meat Supply



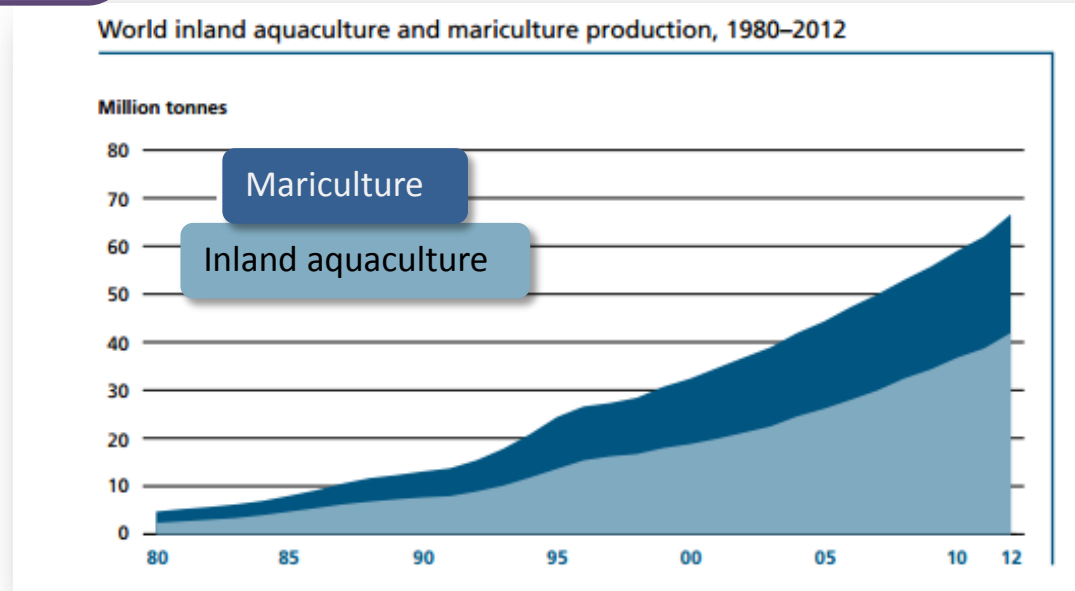
World population
growth and meat
consumption

World Animal Protein Production Per Person



Opportunity

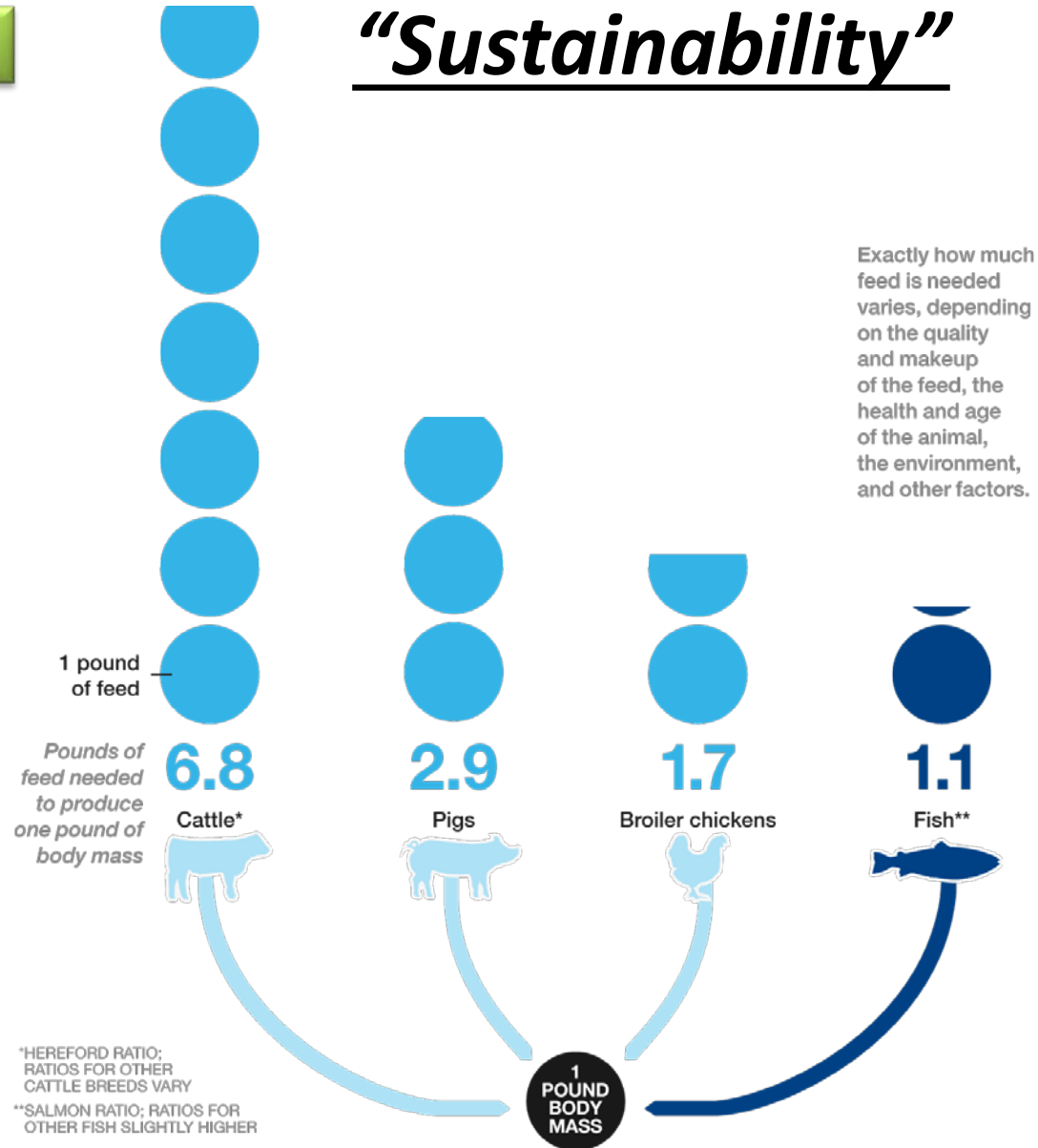
Global Aquaculture



- 2/3 (67%) global production from inland mainly freshwater systems

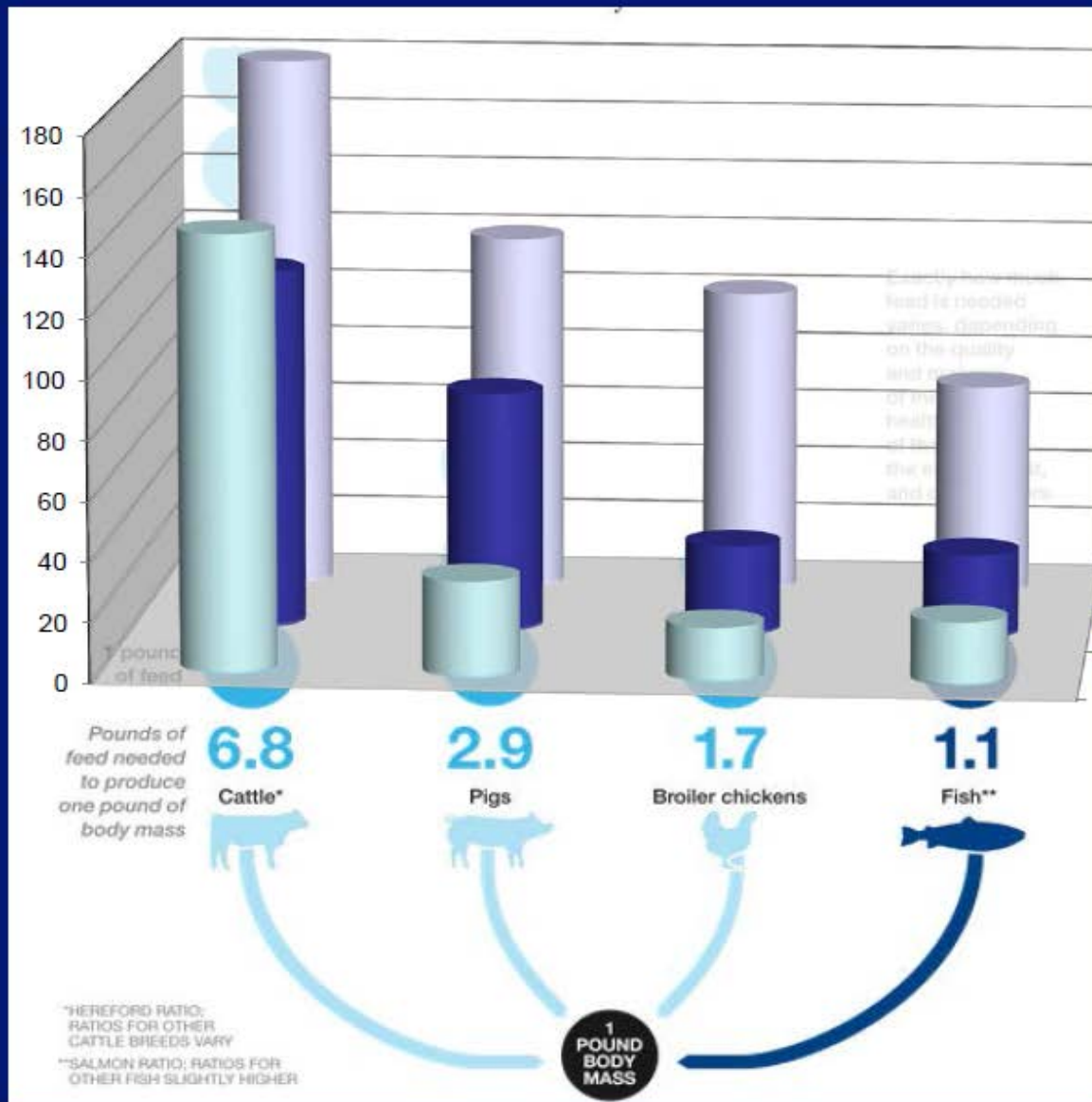
Opportunity

“Sustainability”



Source: National Geographic

Source:
Dr Michael Tlusty
- 2014 Webinar.
Aquaculture's
Prominent Role in
Feeding a
Growing Global
Population



Phosphorus (kg/T protein)
Nitrogen (kg/T protein / 10)
Tonnes CO2 Equiv. x10

Data from

Pelletier & Tyedmers 2007. *Feeding farmed salmon: Is organic better?* *Aquaculture* 272: 399-416.

Hall, S.J., A. Delaporte, M. J. Phillips, M. Beveridge and M. O'Keefe. 2011. *Blue Frontiers:*

Managing the Environmental Costs of Aquaculture. The WorldFish Center, Penang, Malaysia.



New England
Aquarium

Opportunity

Specialty Products



“Sustainable”
Products



Waste Less

Frozen



Thlusty 2014

Fresh



www.icecarvingsecrets.com
http://www.fishmounts.com.au/fish_gallery/barramundi.html

Stoner, J. MS Thesis, Dalhousie University
Stoner & Tyedmers in review



Opportunity

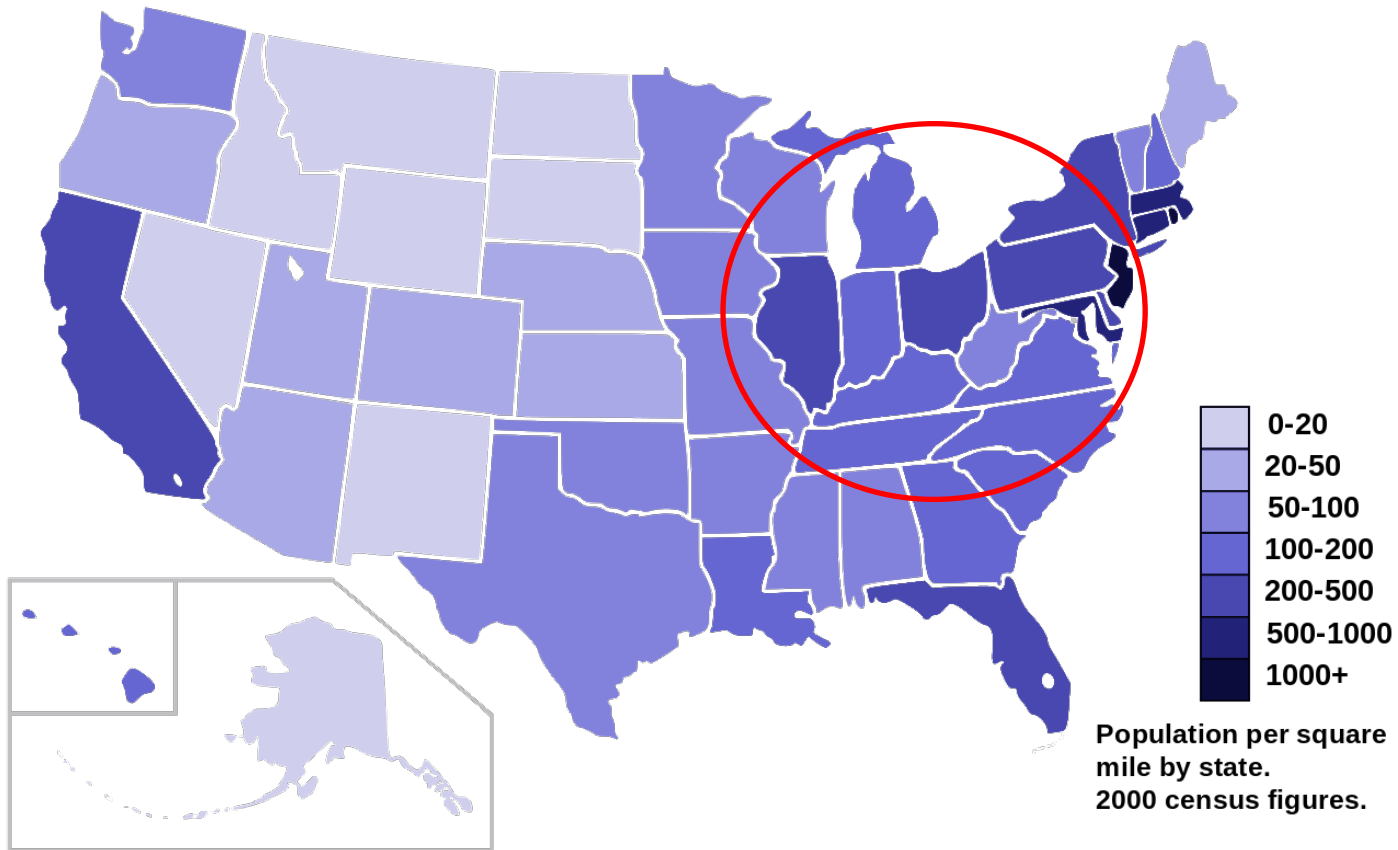
Specialty Products



“Certified”
Products



“Ohio is within a days drive to major US Markets”



Demography Variables and Map Legend

Type: Race

Subtype: Asian

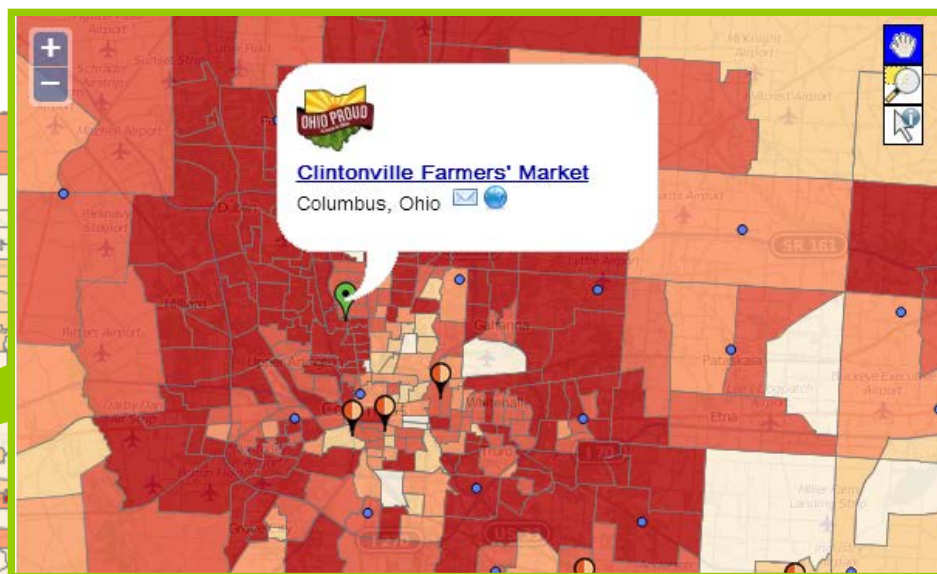
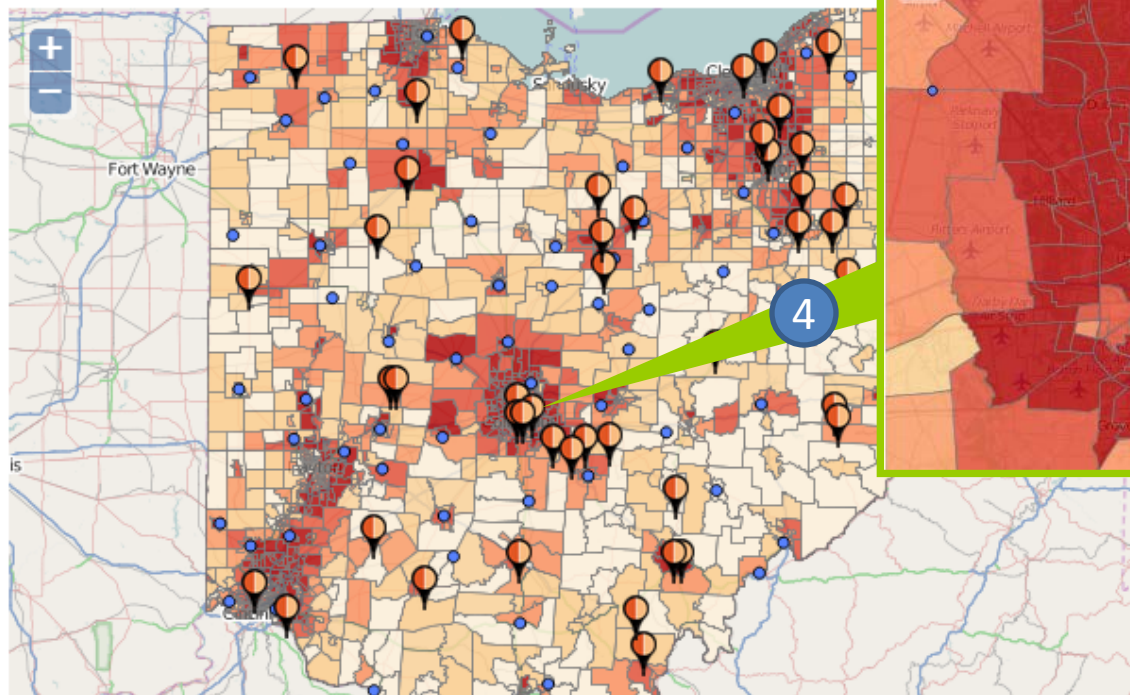
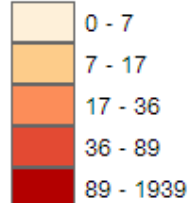
State: Select New State

Region: Ohio

Map it!

☒ 80% Layer Transparency Ratio

Unit: people by census tract



1

Business search:
“Farmer’s Markets”

2

3

4

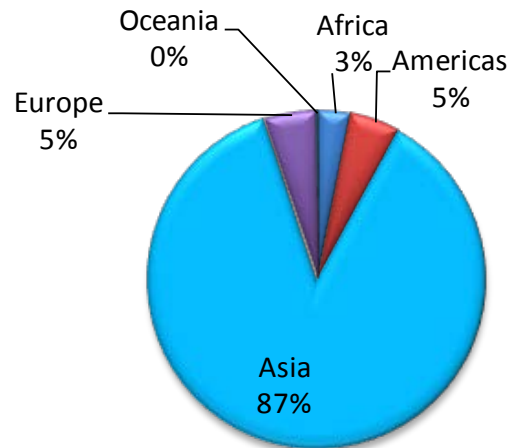
Challenges



Global Competition

- 87% global production by Asia
- 56% global production by China
 - Cheap labor
 - availability of natural resources
 - induced conditions for aquaculture

2012 Global Production by Region





Example

Luoyuan Bay,
China

Luoyuan Bay, China - “The Floating City” formed by a large number of wooden houses on fish rafts. Common species for mariculture include red sea bream and Japanese sea bass.



In 2011 seafood exports from Mekong Delta exceeded \$3.4 billion and rice exports \$3.2 billion.

Catfish farming in the Mekong Delta, Vietnam, the bulk of which is still undertaken by relatively small-scale producers, is one of the largest freshwater aquaculture industries in the world.



global aquaculture
the alliance

PRESS RELEASE
October 29, 2014

For Immediate Release
Contact: [Steven Hedlund](#)
+1-207-517-2191

Vietnam BAP Farmed Pangasius Equivalent to Monterey Bay Aquarium Seafood Watch® 'Good Alternative'

Two-star, three-star and four-star Best Aquaculture Practices (BAP) pangasius standards of the Global Aquaculture Alliance (GAA) certified in Vietnam are equivalent to a yellow "Good Alternative" rating from the Monterey Bay Aquarium Seafood Watch® program. Seafood Watch will recommend that consumers, chefs and businesses consider farmed pangasius assessed under the BAP standards as a good alternative purchasing option.



**Mekong Delta,
Vietnam**

- Capital Investment of All Rearing Systems
- Profit Potential?
 - Biologically proven but production costs of indoor systems high.
 - Pond & Cage Culture production costs lower.
- Economy of Scale (meaning facility size)
- Ability to compete in the filet market with imports.



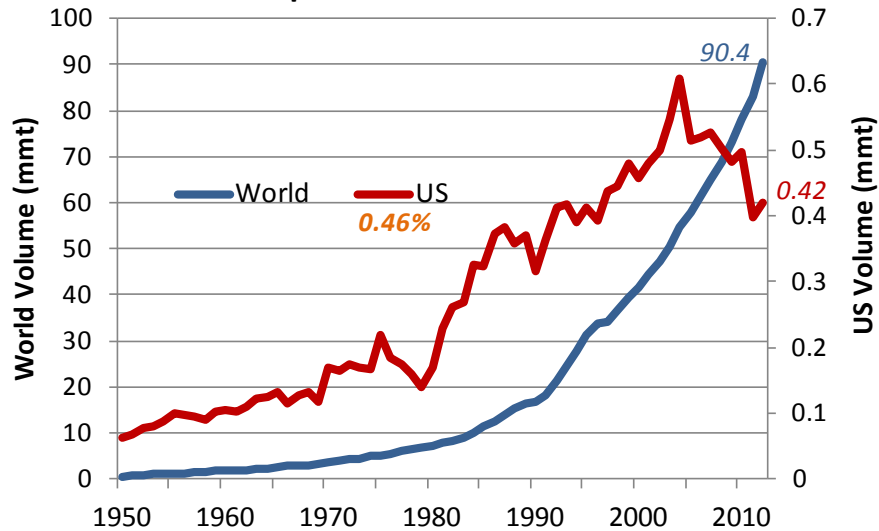
AquaTech Caviar Farm, Abu Dhabi - 56,000 m² (12.4 acres) will produce premium Siberian caviar and sturgeon fish meat.
Construction costs > \$115 million USD



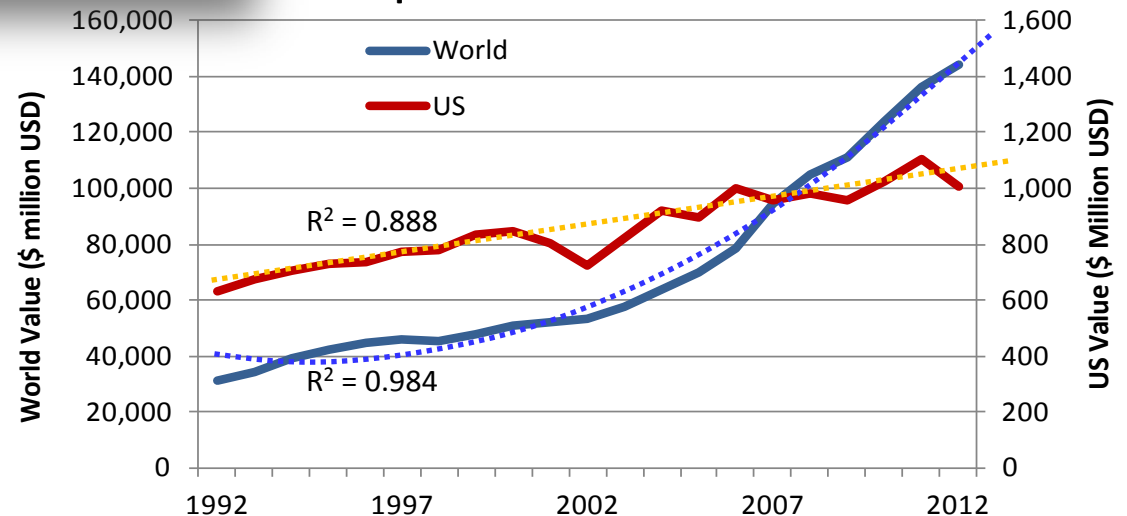
Challenges

Global Vs National Trends

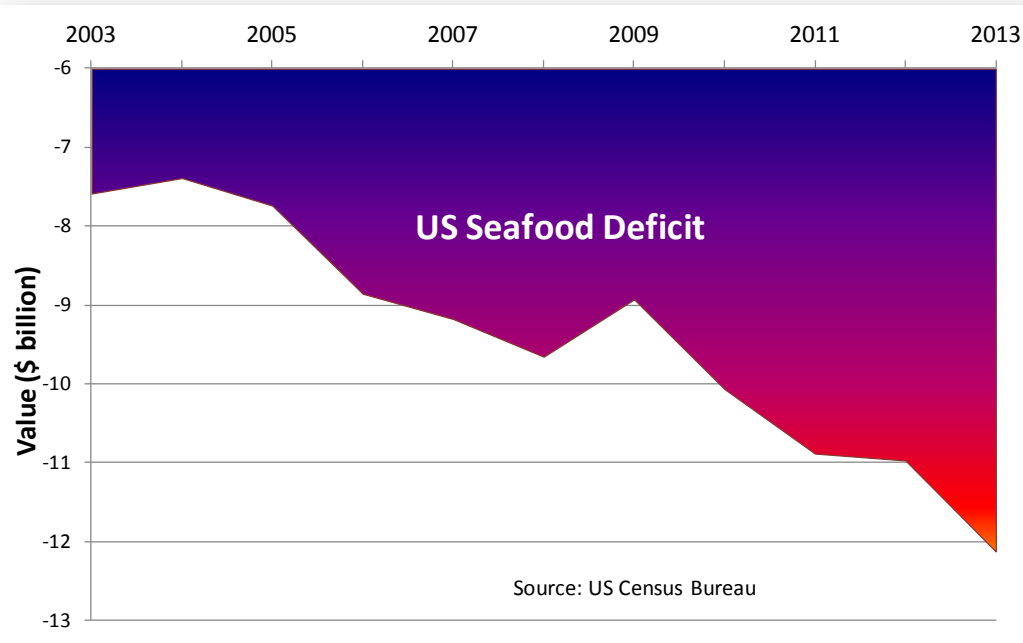
Aquaculture Production



Aquaculture Production

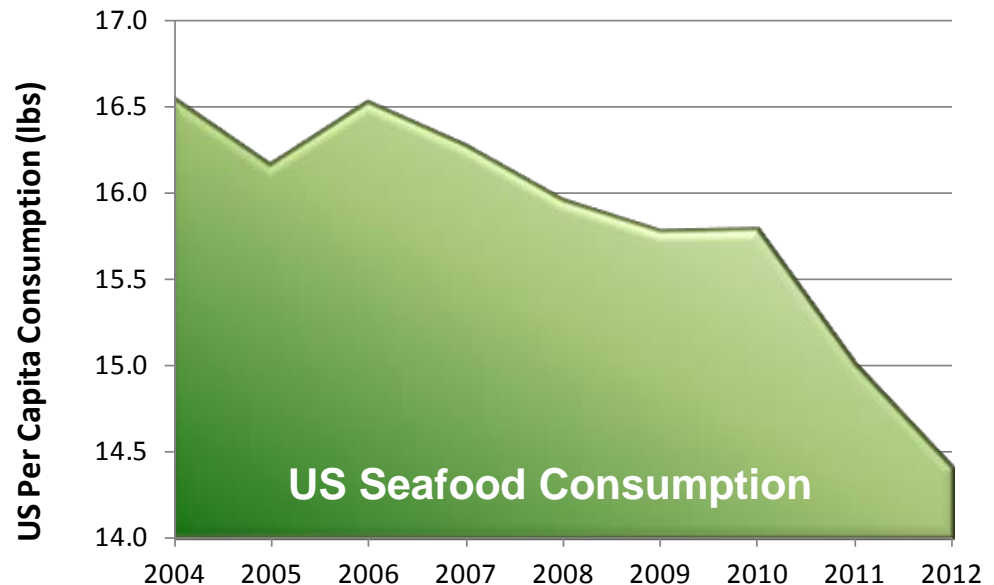


US Trends



US consumers reasons for not eating seafood (Hicks et al. 2008)

- Taste Preference
- Affordability
- Negative message from media





Mixed messaging

Preferred seafood information resource (Hicks et al. 2008)

- Media (30%)
- Internet (14%)
- Health Newsletter (9%)
- Physicians (9%)

ConsumerReports.org®

Find Ratings

Cars ▾

Appliances ▾

Electronics ▾

Home & Garden ▾

Babies & Kids ▾

Home > Consumer Reports magazine > 2014 > October > Special report: Can eating the wrong fish put you at higher risk for

f Like

5.4k

Tweet

g+1

✉

🖨

A A

Special report: Can eating the wrong fish put you at higher risk for mercury exposure?

The government wants you to eat more seafood. The key to limiting your risk is choosing the right fish.

Published: August 2014

Mercury-Contaminated Fish

Fish to Avoid

- swordfish
- shark
- king mackerel
- tilefish
- marlin
- orange roughy

⏸

00:48

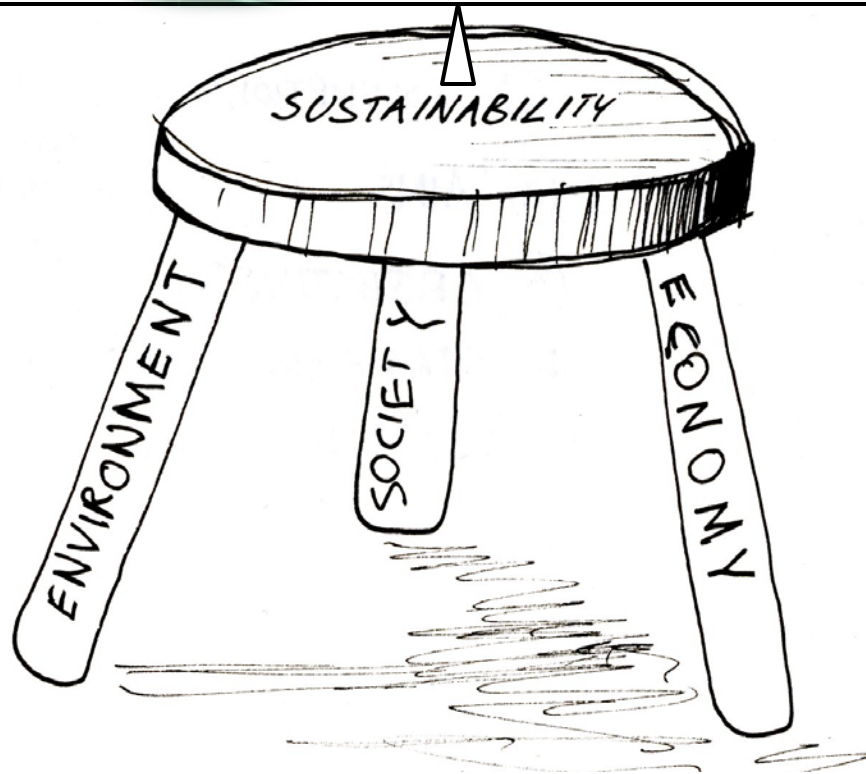
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Challenges

Sustainability



Regulatory Environment

- Permitting is considered a major impediment to increasing US aquaculture production
 - Confusion and complexity
 - Aquaculture as a point source is industrial waste
 - Costly
 - Difficult / unable to obtain siting permits
- Lacey Act and invasive species

Support and Direction

- Industry development support structure
 - Association
 - Government
 - Academic
 - Public
- Strategic planning
- Business planning



Needs

Success Stories

- What do we have to show for 20+ years of commercial aquaculture in Ohio and North Central Region?

Needs

Direction

- Do we really know what our true needs are?

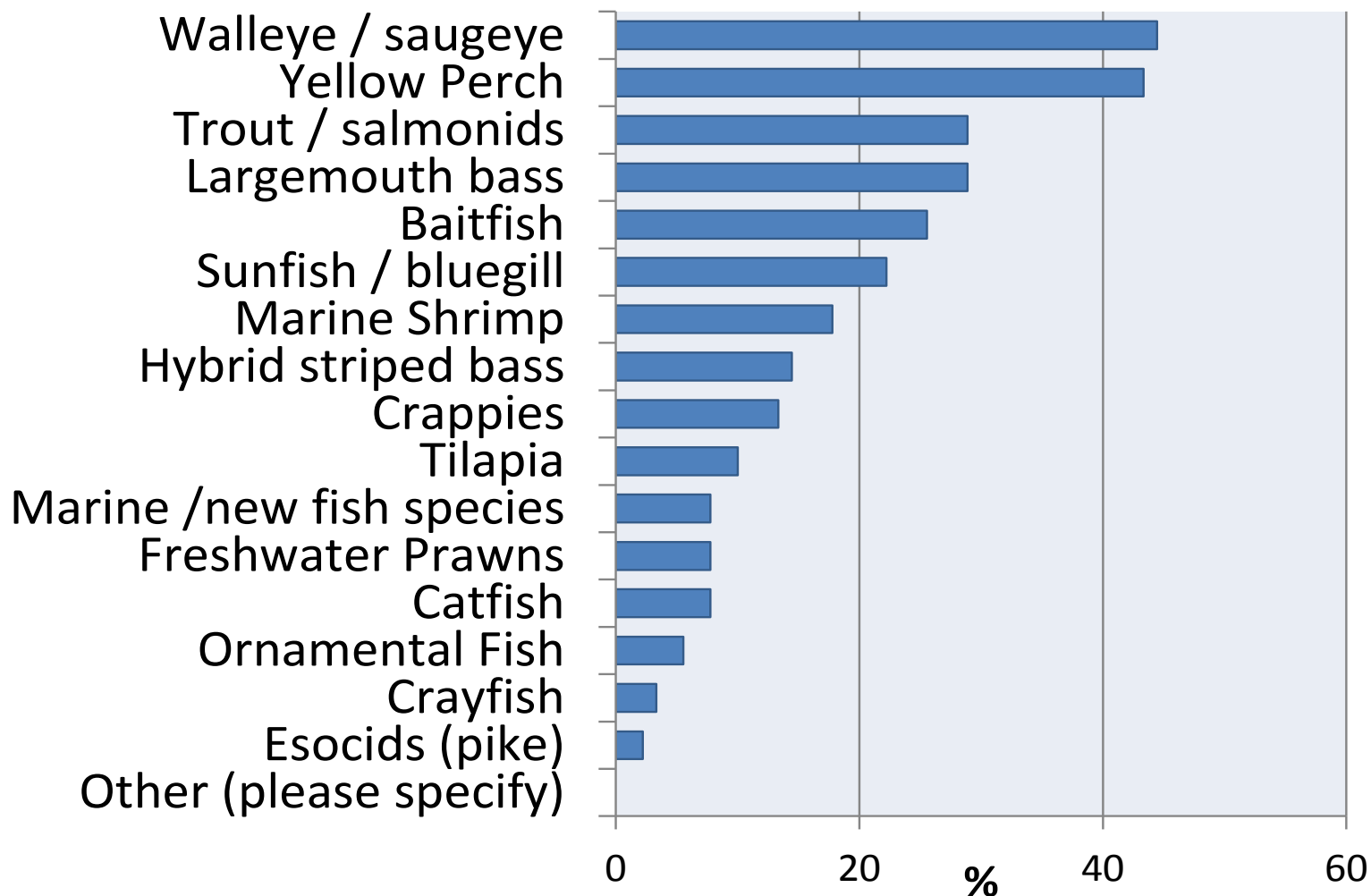
2014 NCR Aquaculture Needs Survey

List top 3 impediments:

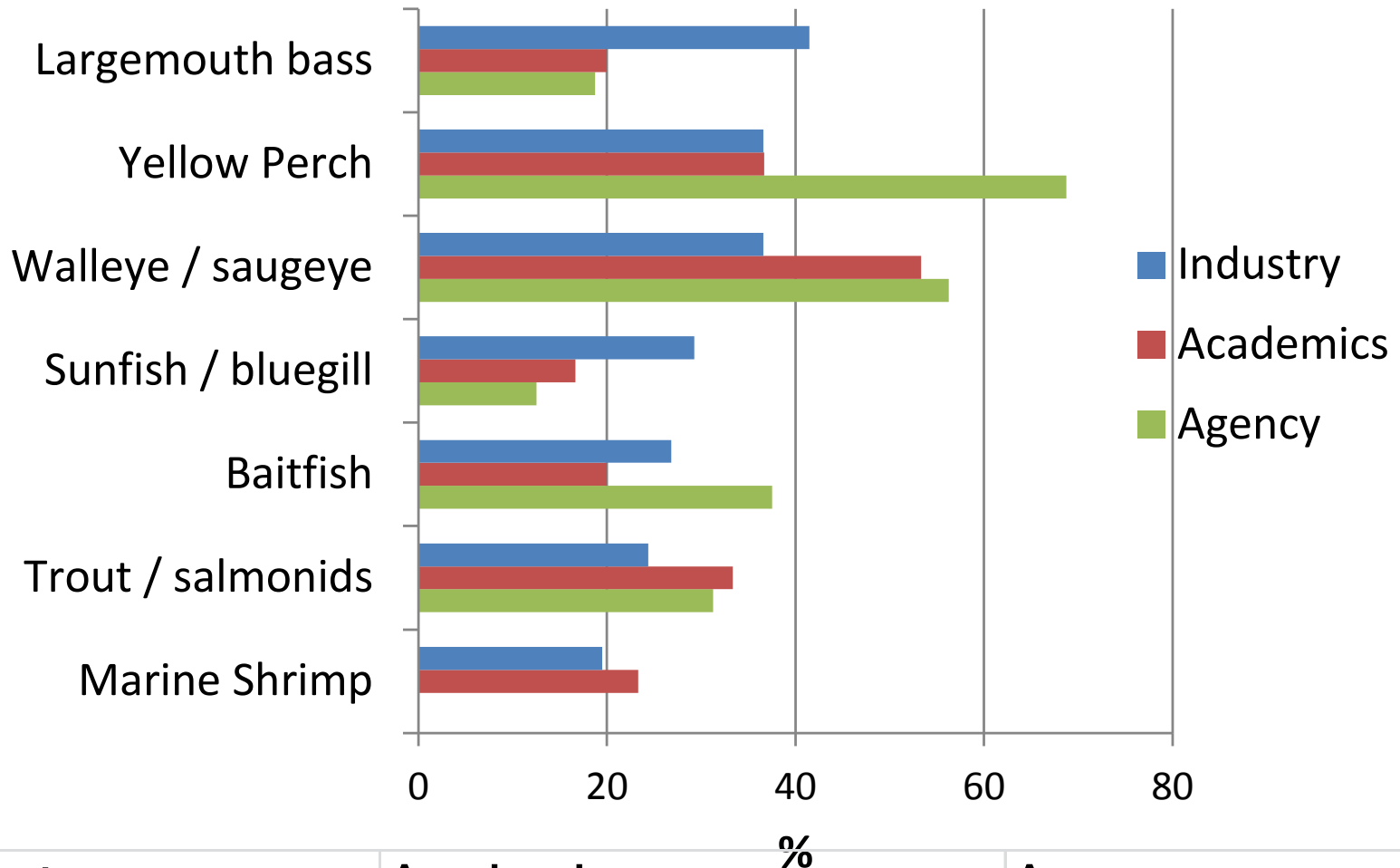
Industry	Academics	Agency
Regulations	Lack of Funding / Loans	Feed Costs
Feed Costs	Fingerling Availability/Costs	Species Specific Diets
Government Support	Government Support	Lack of Funding / Loans

Priorities - Species

All Responses Combined



Priorities (Species) / Industry Top 7



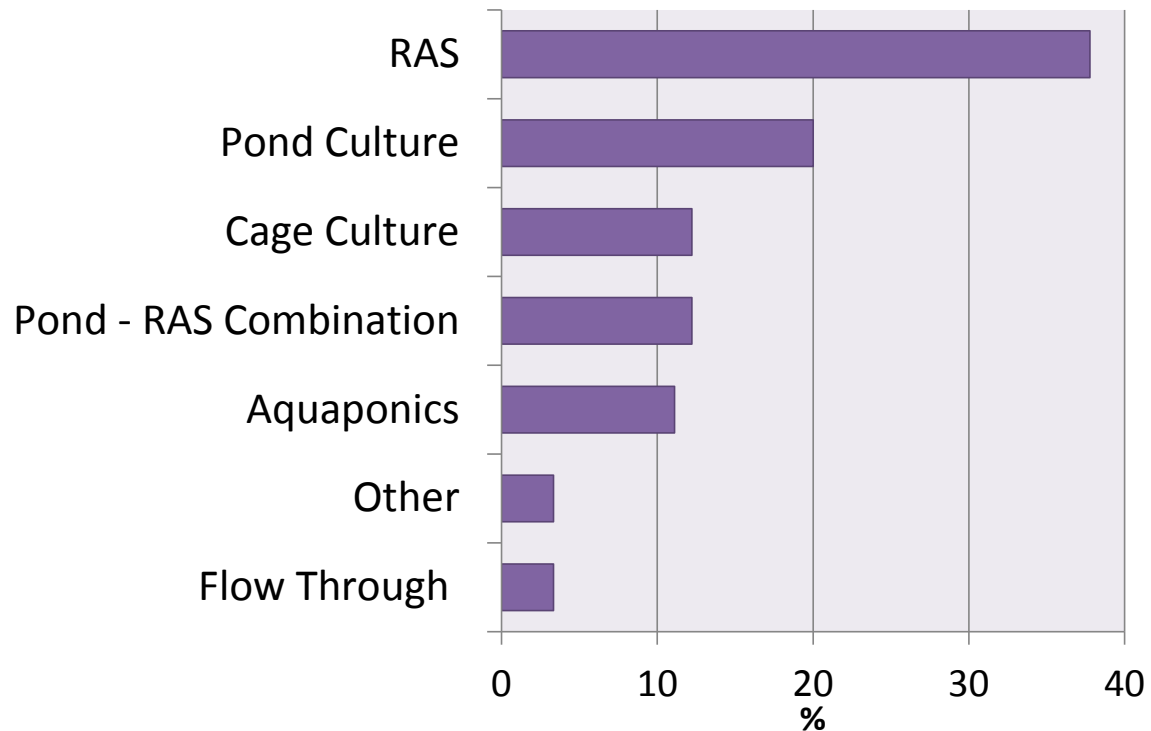
Industry	Academics	Agency
Largemouth Bass	Walleye / Saugeye	Yellow Perch
Yellow Perch	Yellow Perch	Walleye / Saugeye
Walleye / Saugeye	Trout	Baitfish

NCR Species Priorities by State

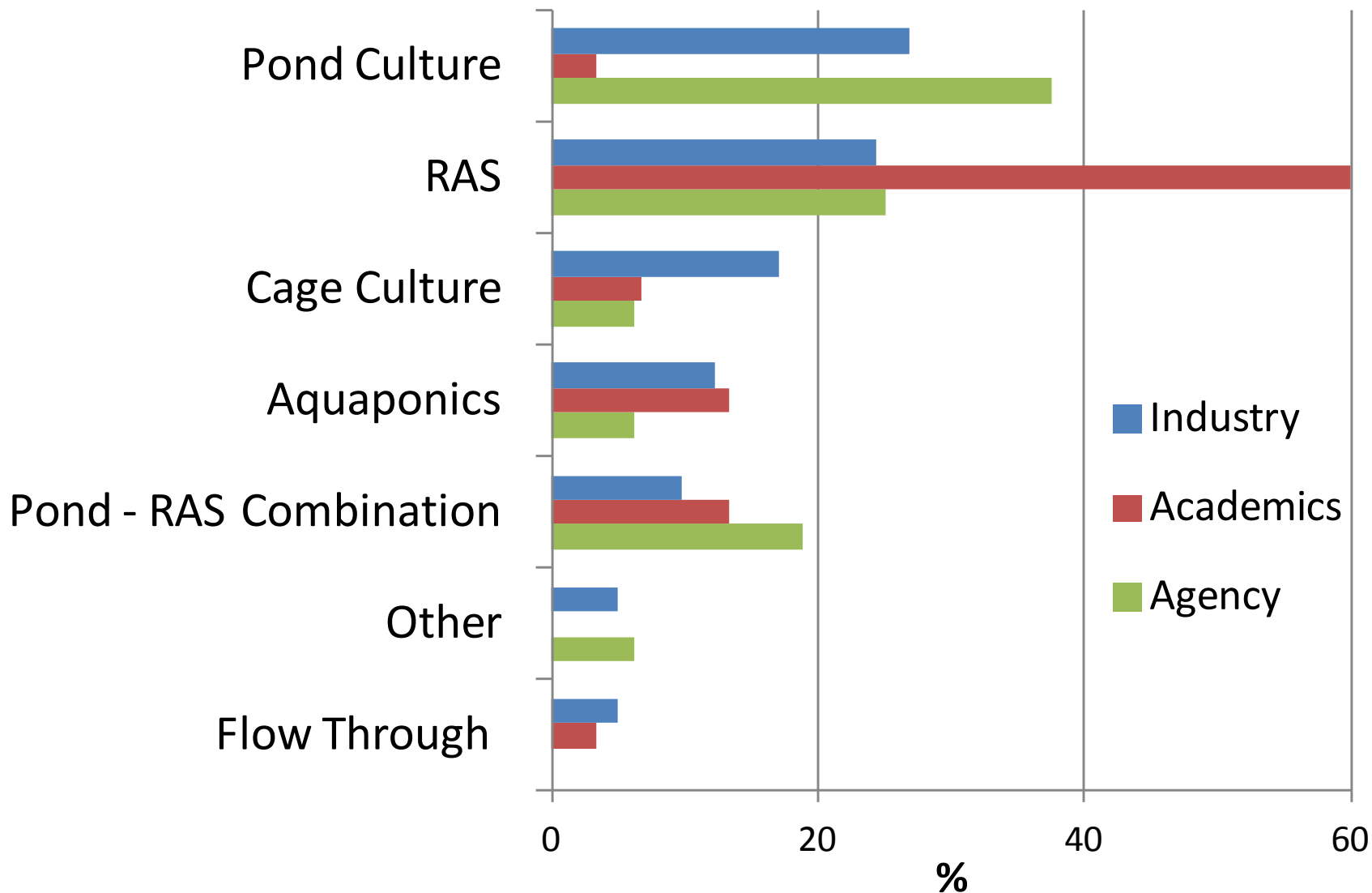
	#1	#2	#3
IL	Tilapia	Largemouth bass	Hybrid striped bass
IN	Largemouth bass	Yellow Perch	Marine Shrimp
IA	Marine Shrimp	Yellow Perch	Walleye / saugeye
KS	Catfish	Sunfish / bluegill	Largemouth bass
MI	Trout / salmonids	Walleye / saugeye	Yellow Perch
MN	Baitfish	Yellow Perch	Walleye / saugeye
MO	Sunfish / bluegill	Largemouth bass	Crappies
NE	Walleye / saugeye	Yellow Perch	Trout / salmonids
OH	Largemouth bass	Yellow Perch	Walleye / saugeye
SD	Baitfish	Yellow Perch	Marine /new
WI	Walleye / saugeye	Trout / salmonids	Yellow Perch

Priorities - Systems

Priorities - Systems



Priorities (Systems) / Industry



Outreach and Extension Tools

Industry	Academics	Agency
Talking to a Fellow Industry Person	Talking to a Fellow Industry Person	Talking to a Fellow Industry Person
Aquaculture Websites	Published Scientific Articles	State or Regional Workshop
Contacting an Extension Professional	Species / Culture Manuals	Aquaculture Websites

Questions: Are we being effective at making use of industry expertise?

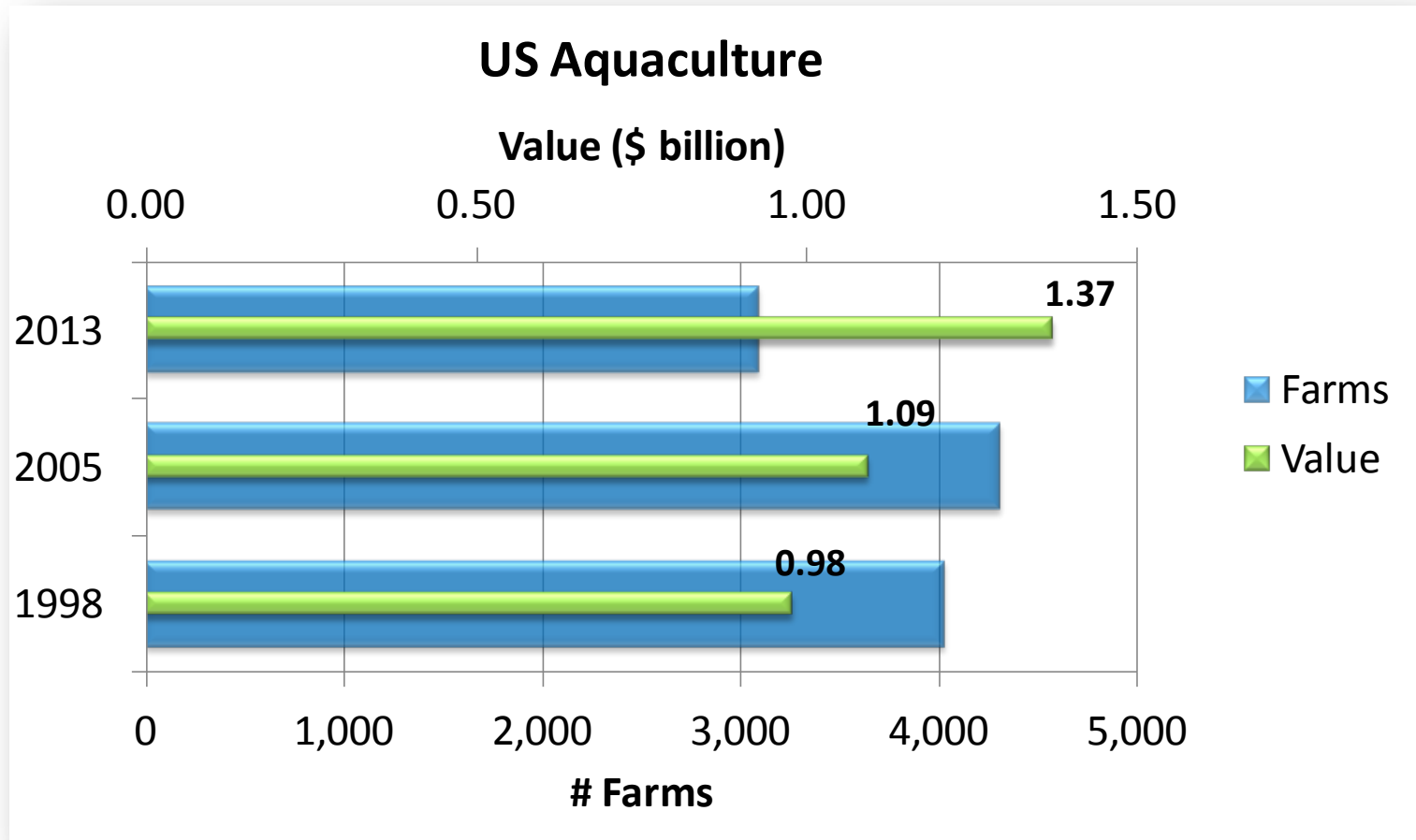
Are we efficiently utilizing internet use (industry) and capabilities (academics)?

Reality Check?

2013 US Census of Aquaculture

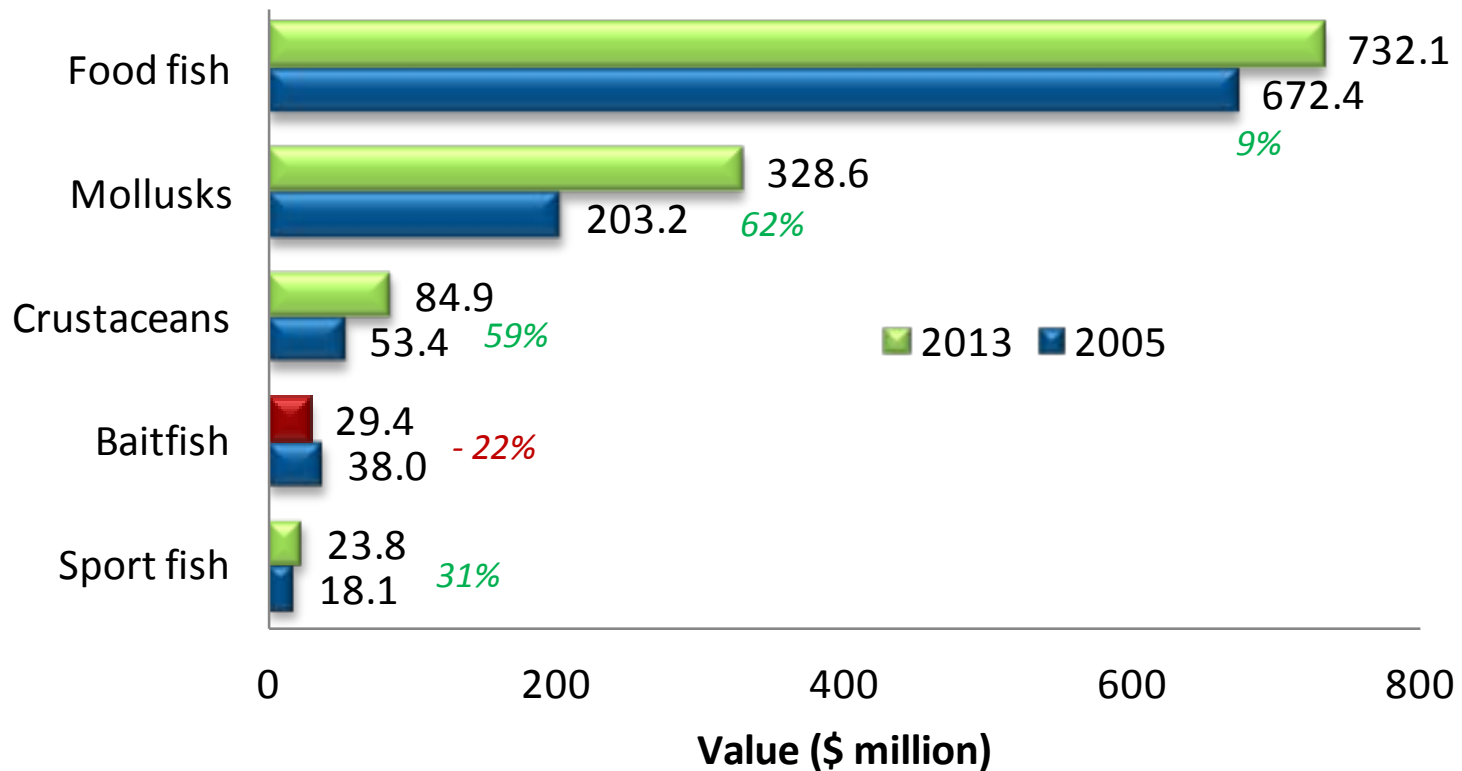
(What do we have to show for 20+ years of
commercial aquaculture?)

US Aquaculture

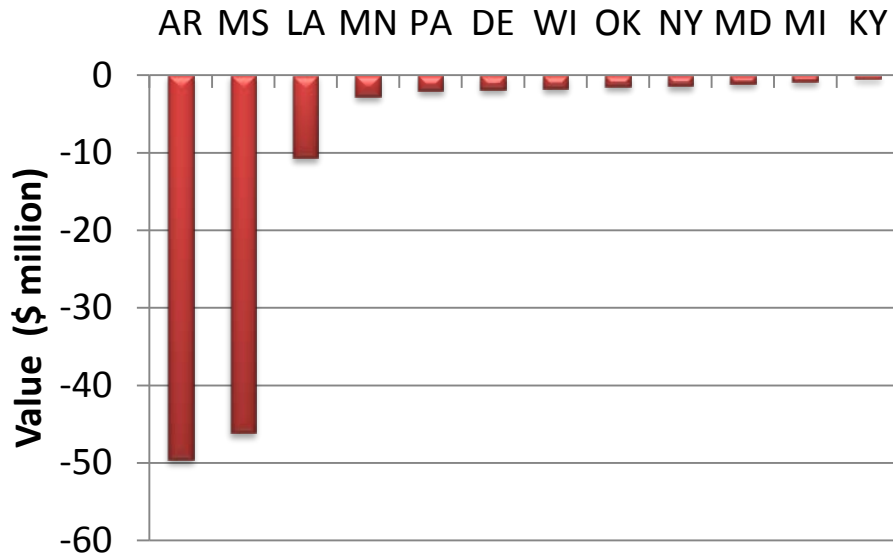


US Aquaculture

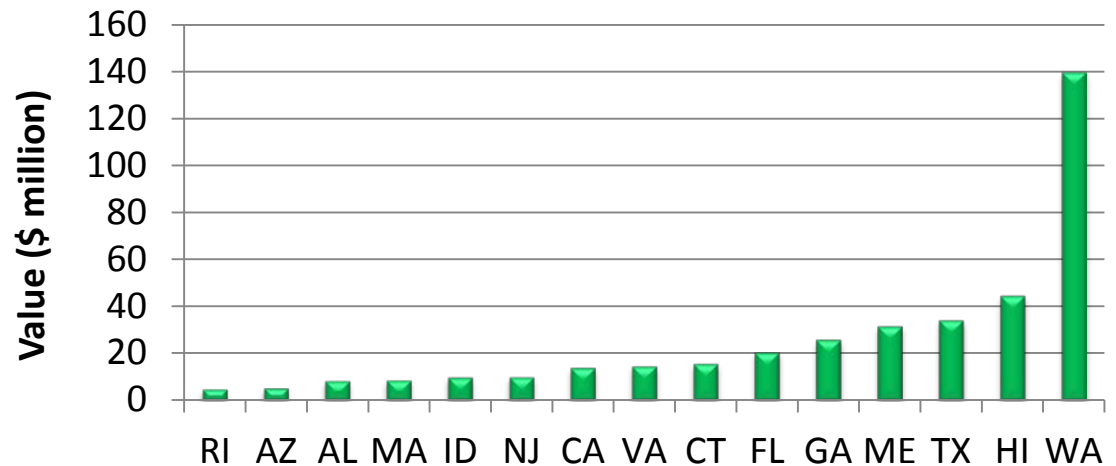
US Aquaculture 2005 / 2013



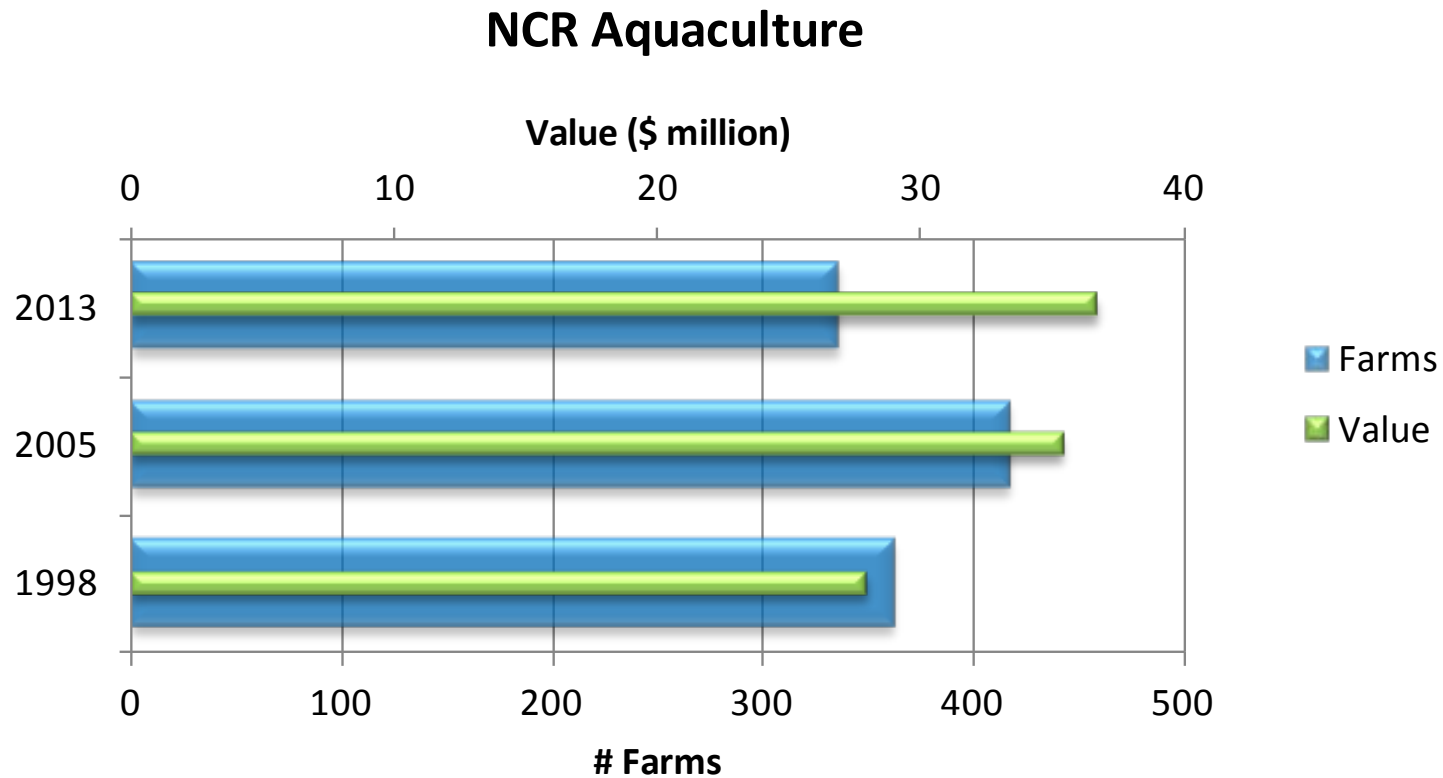
US Aquaculture



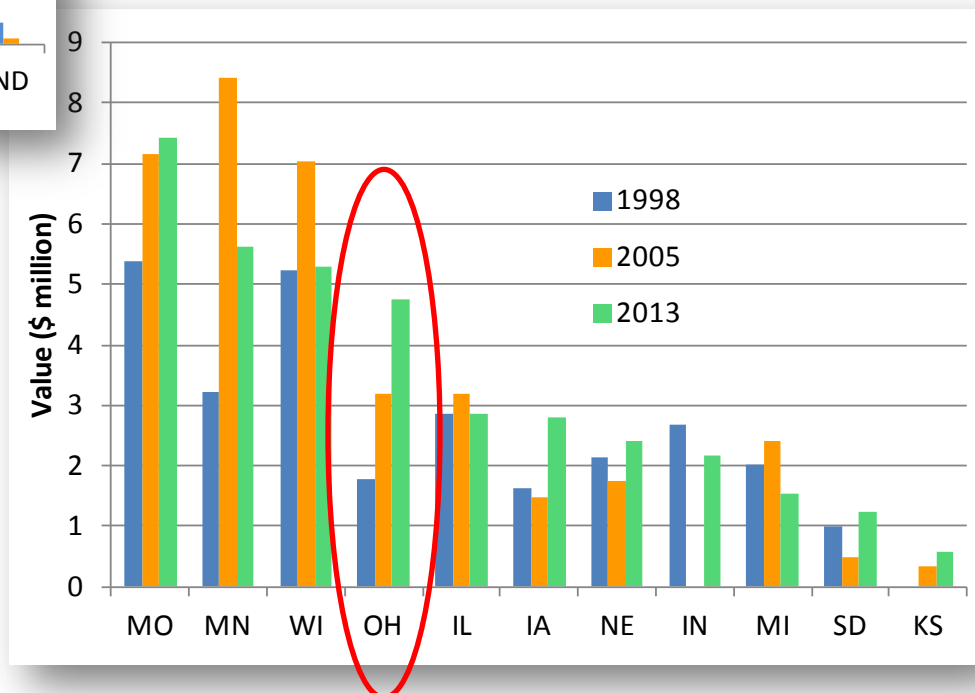
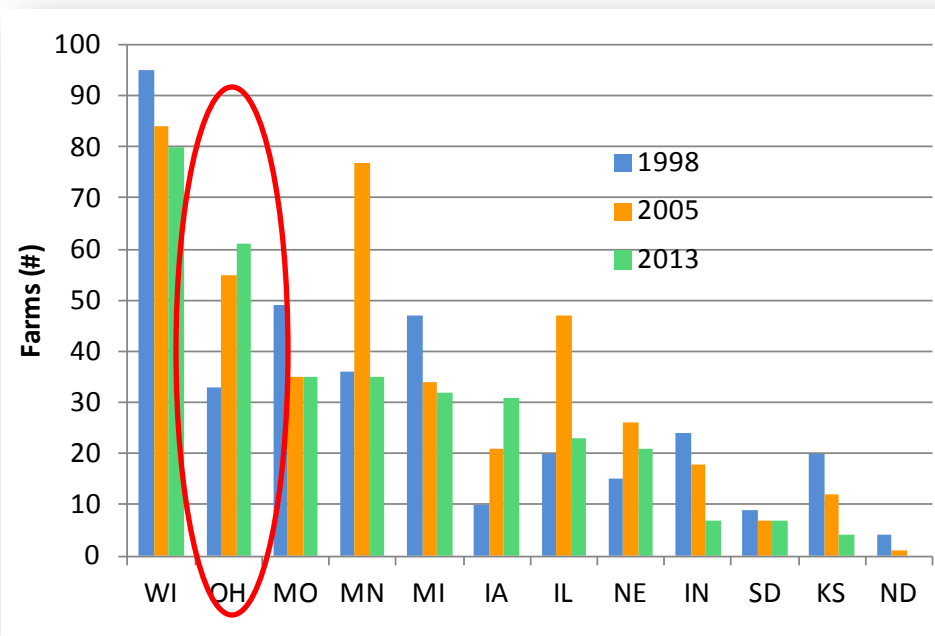
Changes 2005 to
2013



NCR Aquaculture

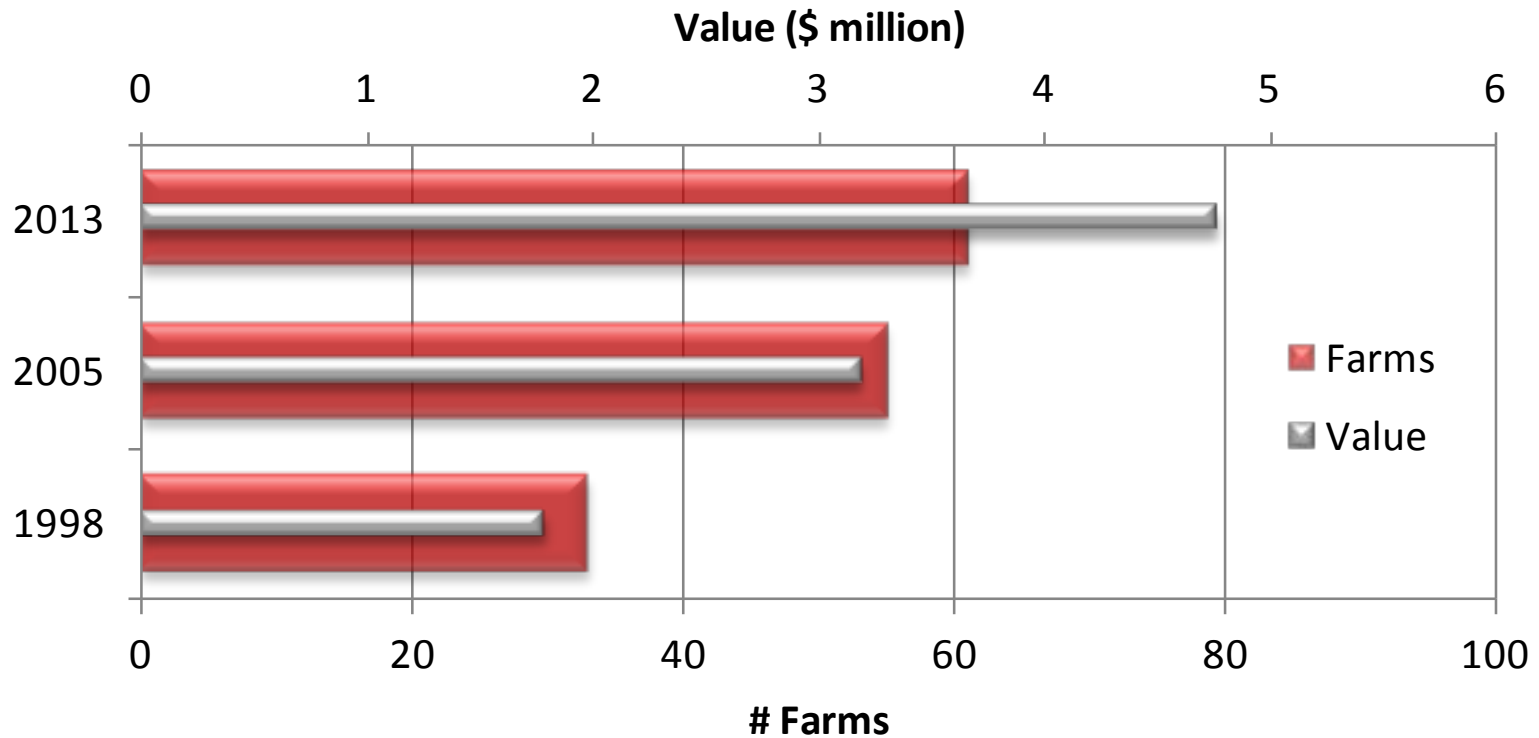


NCR Aquaculture



NCR Aquaculture

Ohio Aquaculture



Ohio Production At A Glance . . .

• Food Fish

- Largemouth bass
- Rainbow trout
- Bluegill / sunfish
- Tilapia
- Yellow perch
- Freshwater prawns

• Sport Fish

- Largemouth bass
- Bluegill / sunfish
- Rainbow trout
- Channel catfish
- Yellow perch
- Tilapia (algae control)
- Redear sunfish
- Koi / goldfish

Opportunities

Challenges

Needs

What will it take for
Aquaculture in Ohio to
be highly successful?

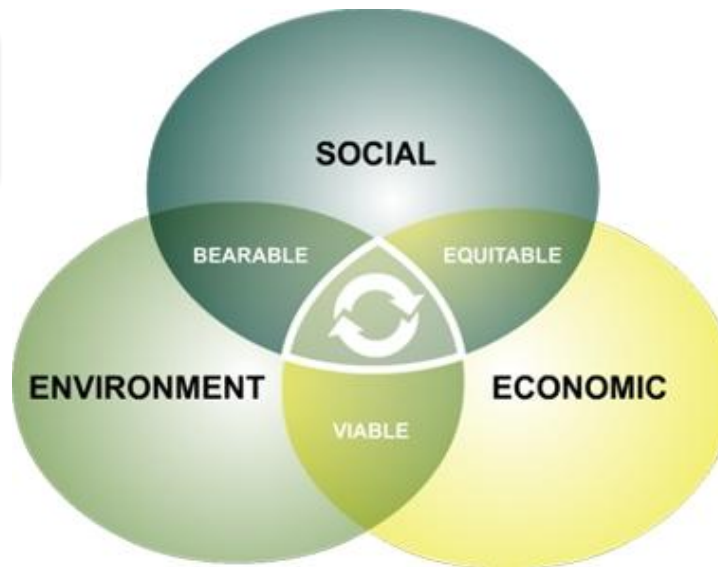
Action Items – 8 Steps to a Growing Industry

1. Gain social acceptance, demonstrate environmental consciousness and political will

Engage stakeholder

Gain government support

“Open for Business”



Engage state leaders

Demonstrate advancement through sustainability

Action Items cont.

2. Short-term, expand and establish aquaculture enterprises along supply chain based on proven species, technologies, and markets



Figure 1. Aerial view of several ponds.



Food Fish Live Haul



Stocking Material

Action Items cont.

3. Longer-term, expand and establish aquaculture enterprises focused on emerging species, technologies, and markets



Invest in research, education and outreach

Action Items cont.

4. Reduction of production costs in all systems



Feed Costs

Fingerling Costs

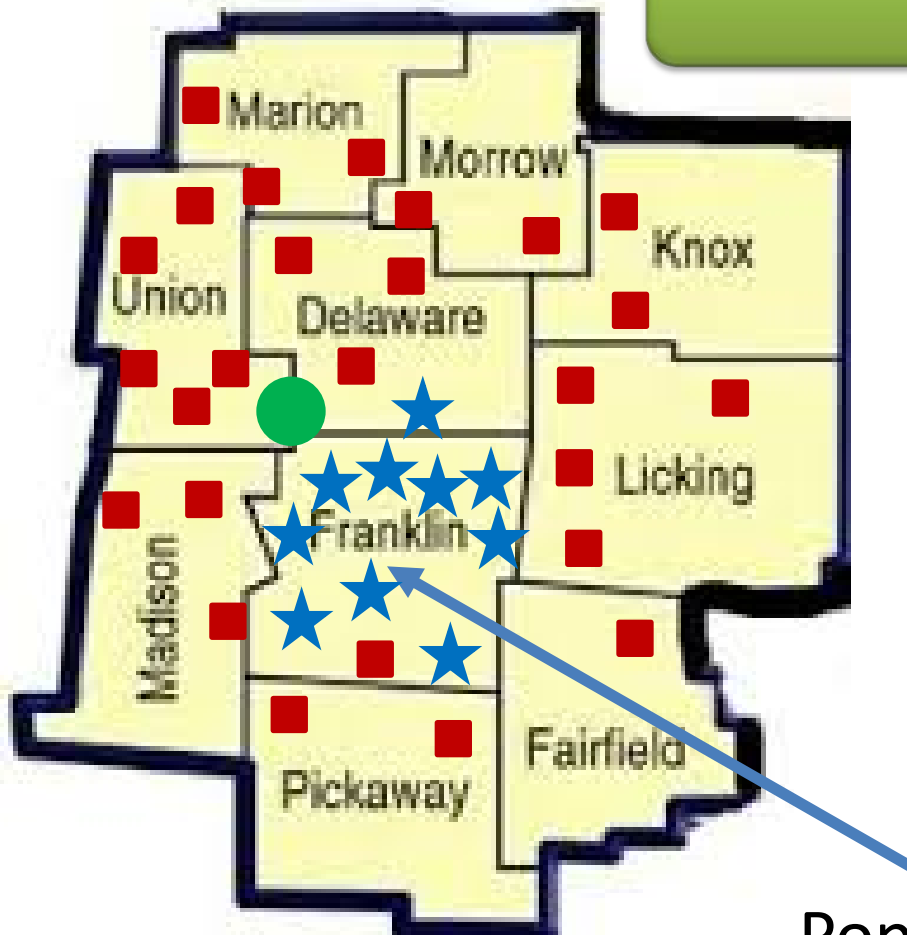
Capital costs

Improve on
energy usage and
costs



Action Items cont.

5. Form Aquaculture Cooperatives



- Coop Member Farms
- Coop Owned Processing Facility
- ★ High-end Restaurants

Columbus

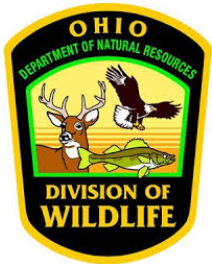
Population: 1 million +

Action Items cont.

6. Permitting and regulation

Continue to drive
simplification of permitting
through state government

“Through **effective**
regulations promote
sustainable industry
sectors”



US Army Corps
of Engineers®

Action Items cont.

7. Develop In-state Aquatic Health Resources

Veterinarians Trained in
Aquatic Health

Strengthen Water
Quality Monitoring

Develop & Encourage
Adoption of BMP's



*Best
Management
Practices*

Action Items cont.

8. Leadership

Effective State
Aquaculture
Association

Strengthen trade
associations

Form and strengthen
partnerships



Ohio Aquaculture

Value (\$ million)

