

# Michigan Netpen Aquaculture



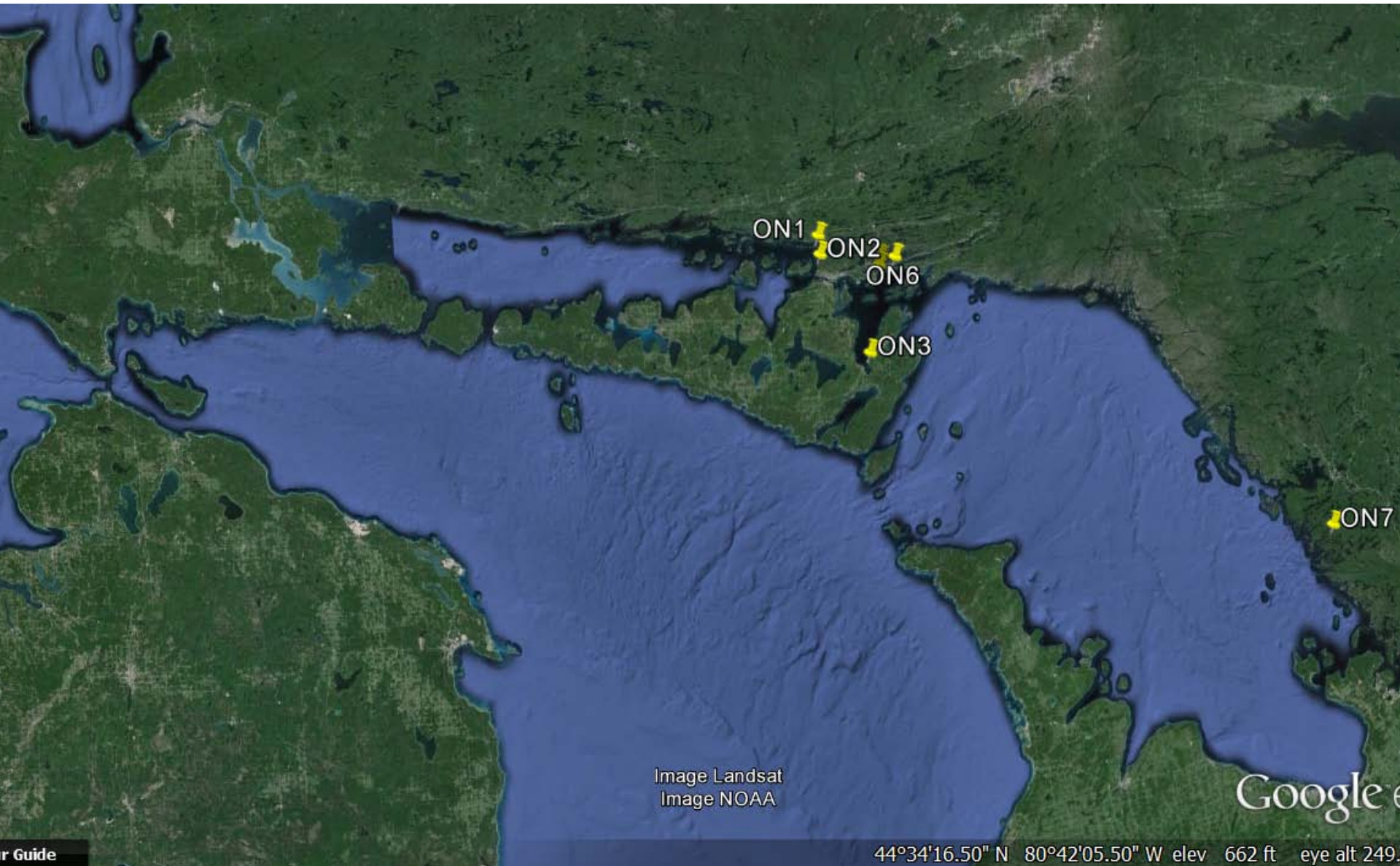
## North Central Aquaculture Conference with WAA

March 12-13, 2016, Milwaukee WI

Chris Weeks  
Aquaculture Extension Specialist  
Michigan State University/ NCRAC



Ontario rainbow trout available at Meijer's and Kroger stores across Mid Michigan



ON1

ON2

ON6

ON3

ON7

Image Landsat  
Image NOAA

Google

r Guide

44°34'16.50" N 80°42'05.50" W elev 662 ft eye alt 249.



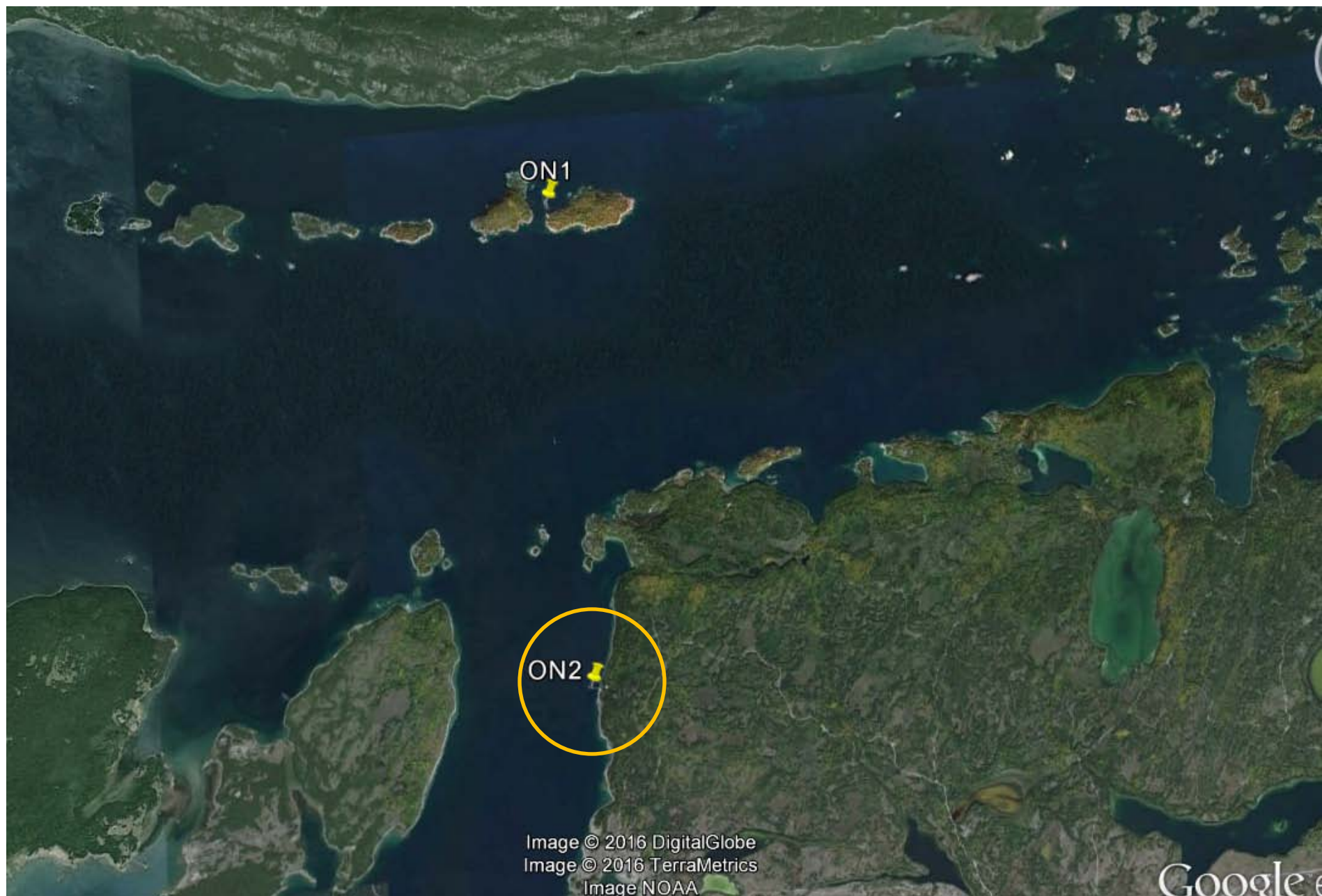


Image © 2016 DigitalGlobe  
Image © 2016 TerraMetrics  
Image NOAA

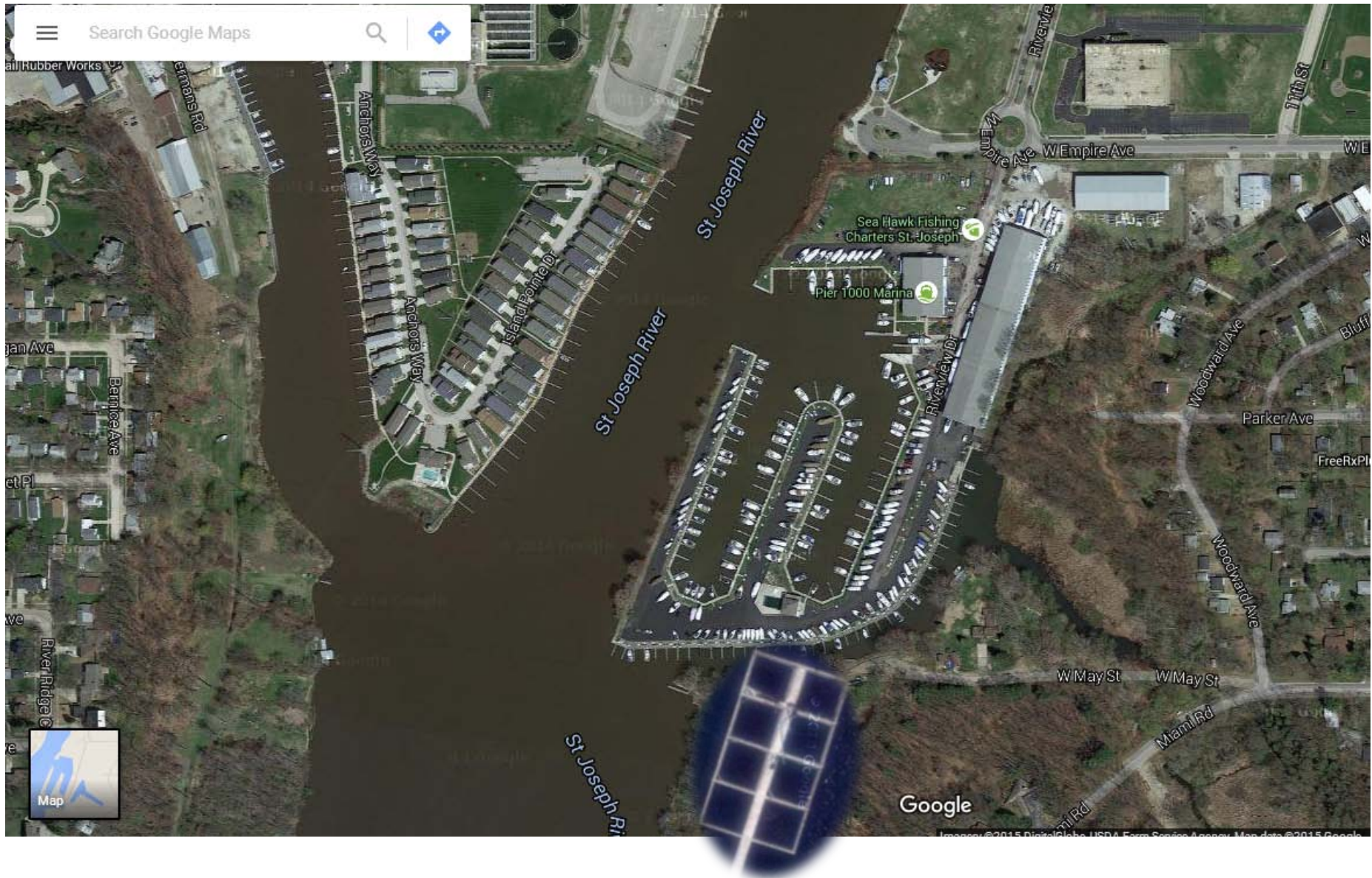
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North Wind Fisheries  
Manitoulin Island,  
Ontario





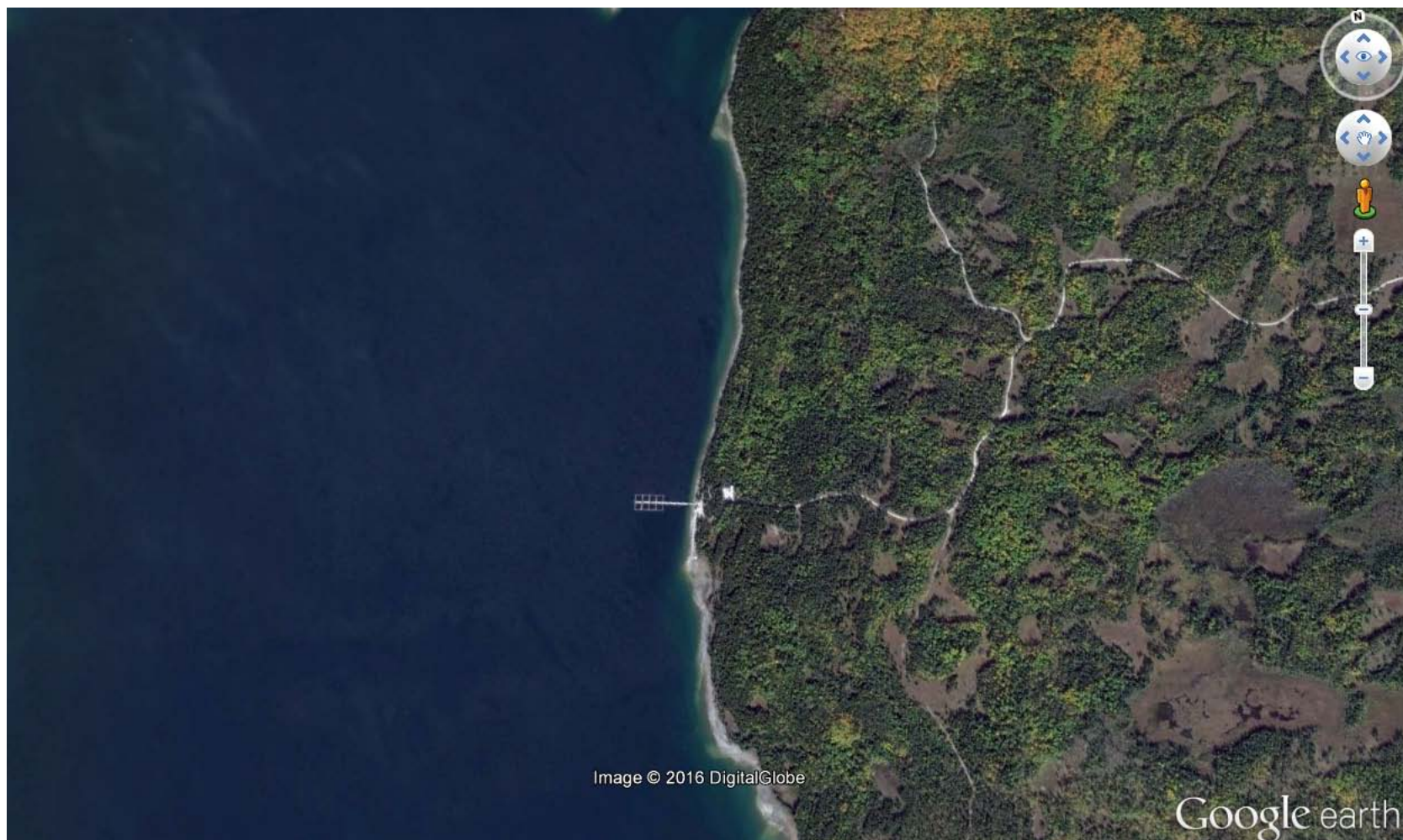


Approximate Scale





From 2,200 ft



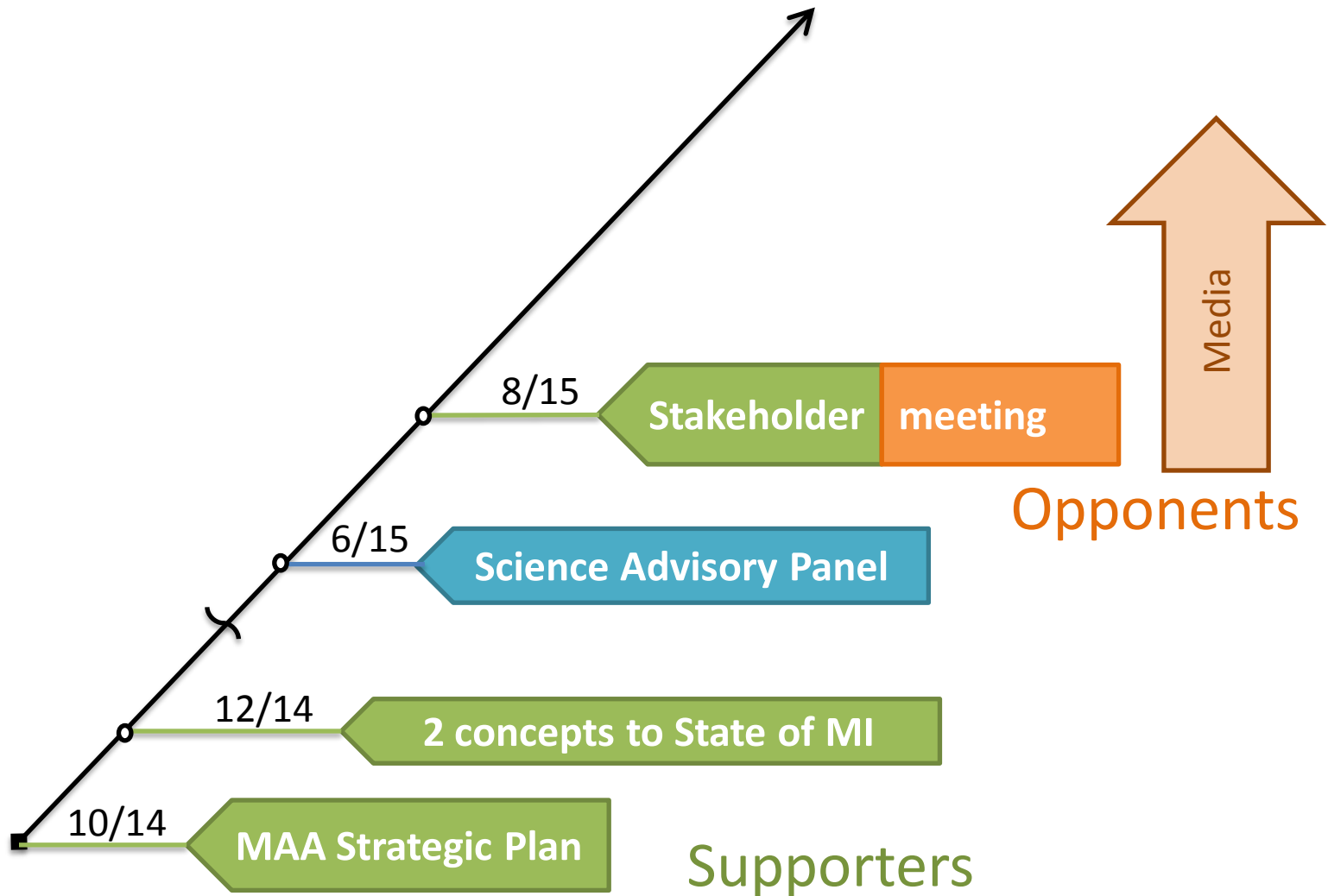
9,500 ft





20,200 ft

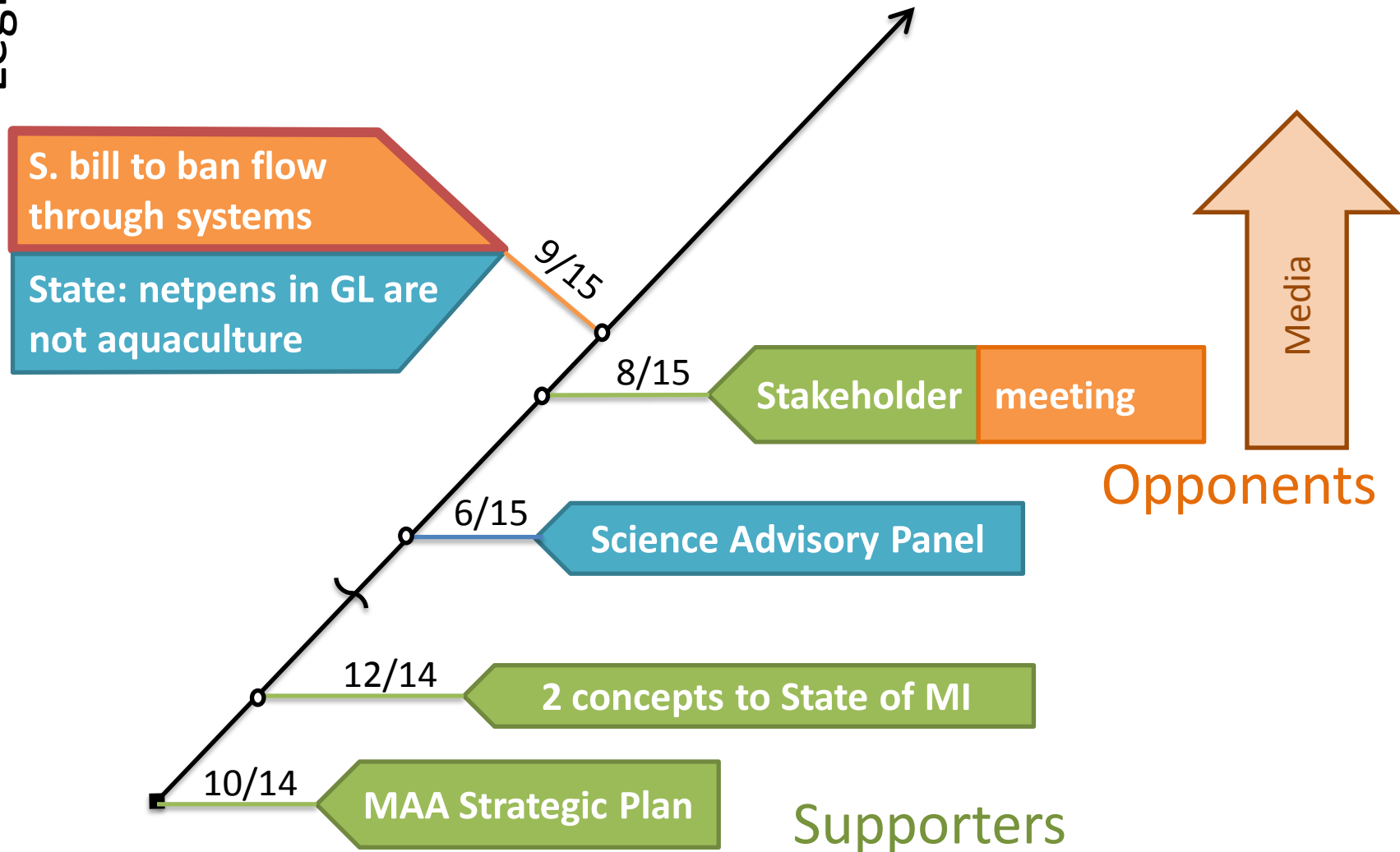
# Michigan Netpen Development





# Michigan Netpen Development

Legislation



# Pending Legislation

- **SB 526** (September 2015)
  - Would prohibit all aquaculture operations that discharge to waters that are connected to the Great Lakes





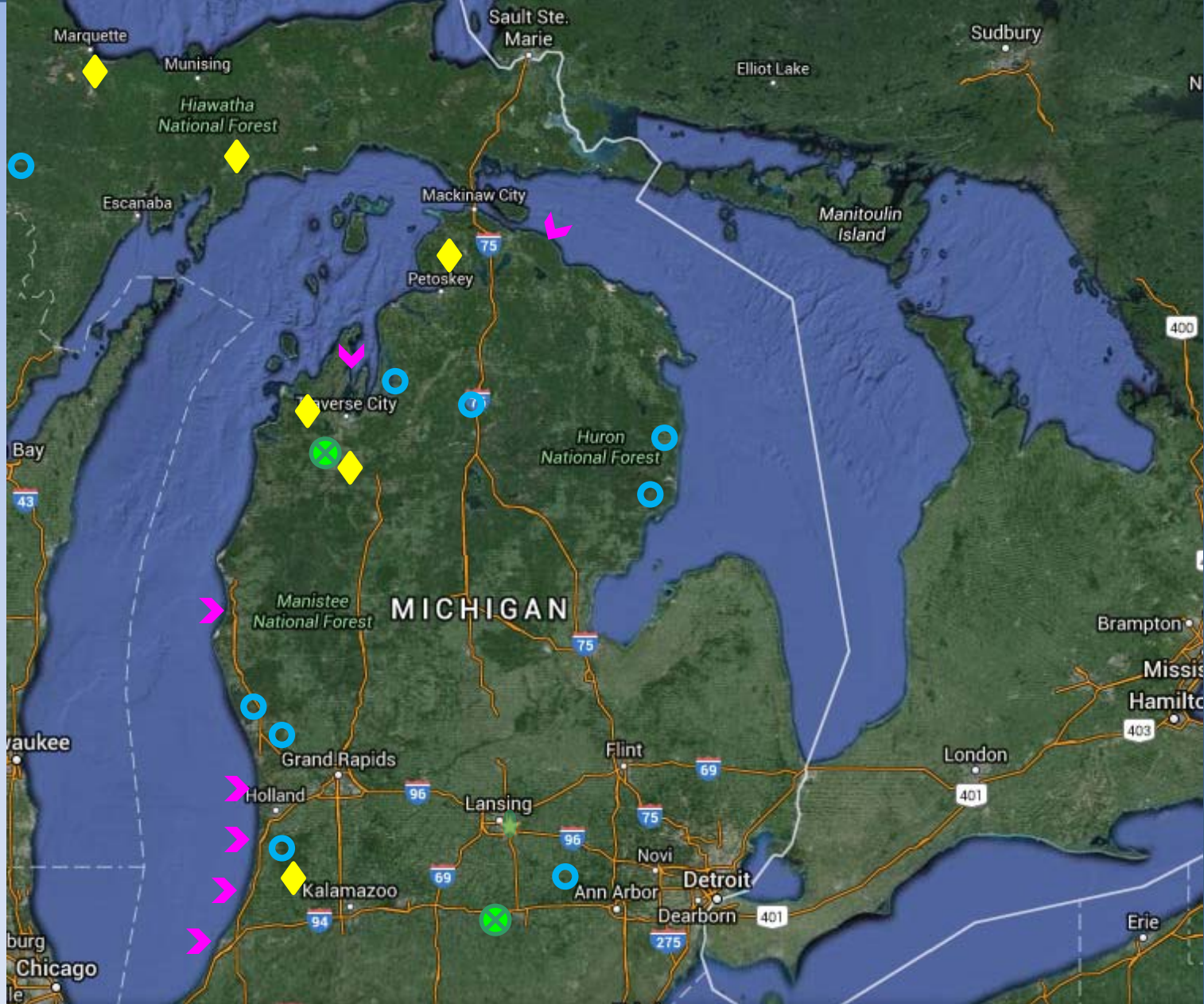
**State hatcheries**  
**20+ million fish**  
**in 2014**



**Private**  
**1,000 - 20,000**  
**lbs/y each**



**Private**  
**> 100,000 lbs/y**  
**each**



**State netpen hold and release**  
**3.36 million fish 2010-2014**

# MICHIGAN AQUACULTURE DEVELOPMENT ACT

Act 199 of 1996

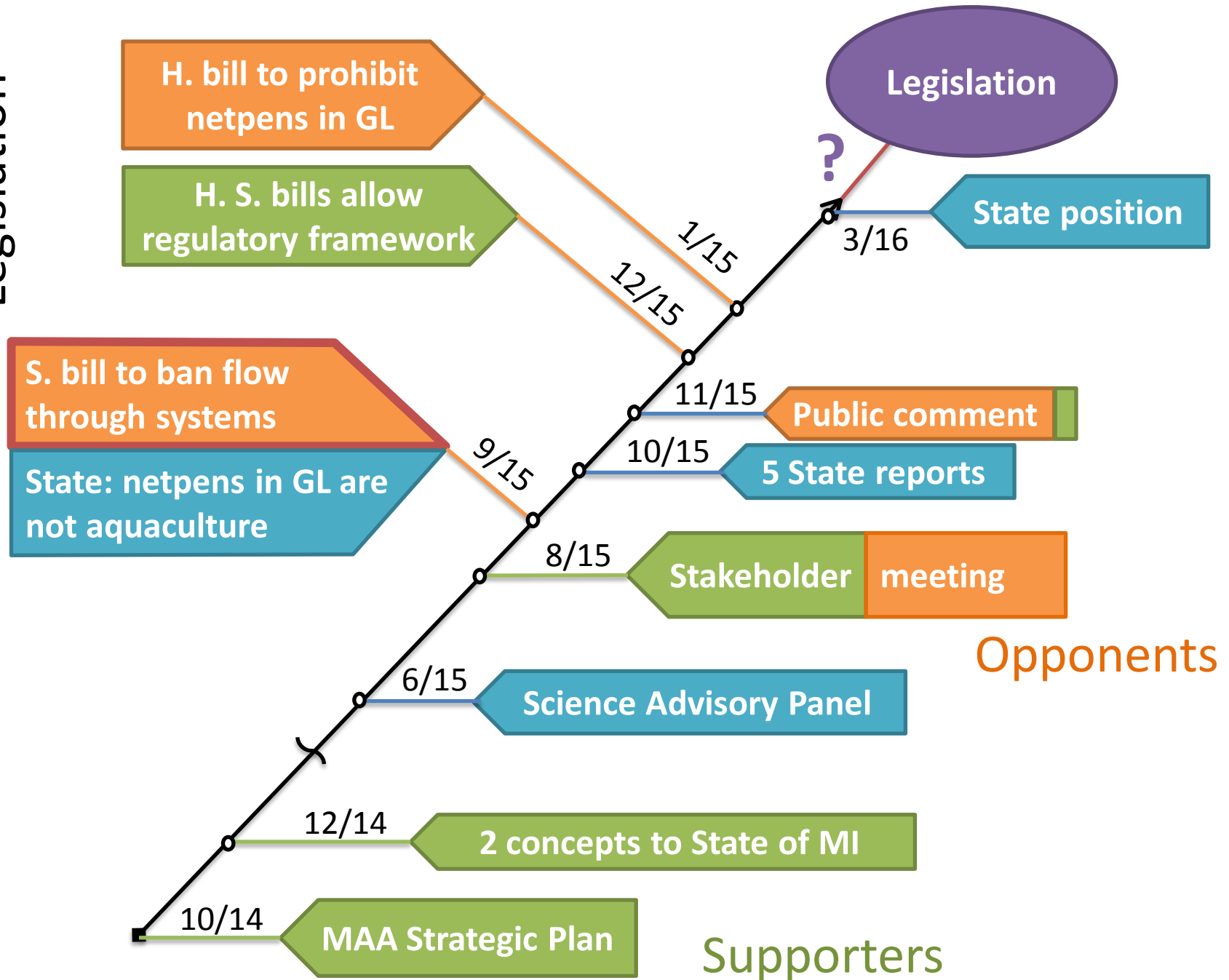
(excludes state hatcheries)

- “Aquaculture” means the **commercial husbandry** of aquaculture species on the approved list of aquaculture species
- “Aquaculture facility” means a farm or farm **operation engaged** in any aspect of aquaculture **in privately controlled waters**
- “**Privately controlled waters**” means waters **controlled within ponds, vats, raceways, tanks, and any other indoor or outdoor structure wholly within or on land owned or leased by an aquaculturist** and used with an aquaculture facility

(according to the State of MI AG office, GL netpens are not in privately controlled waters even if under bottom land leases)



Legislation



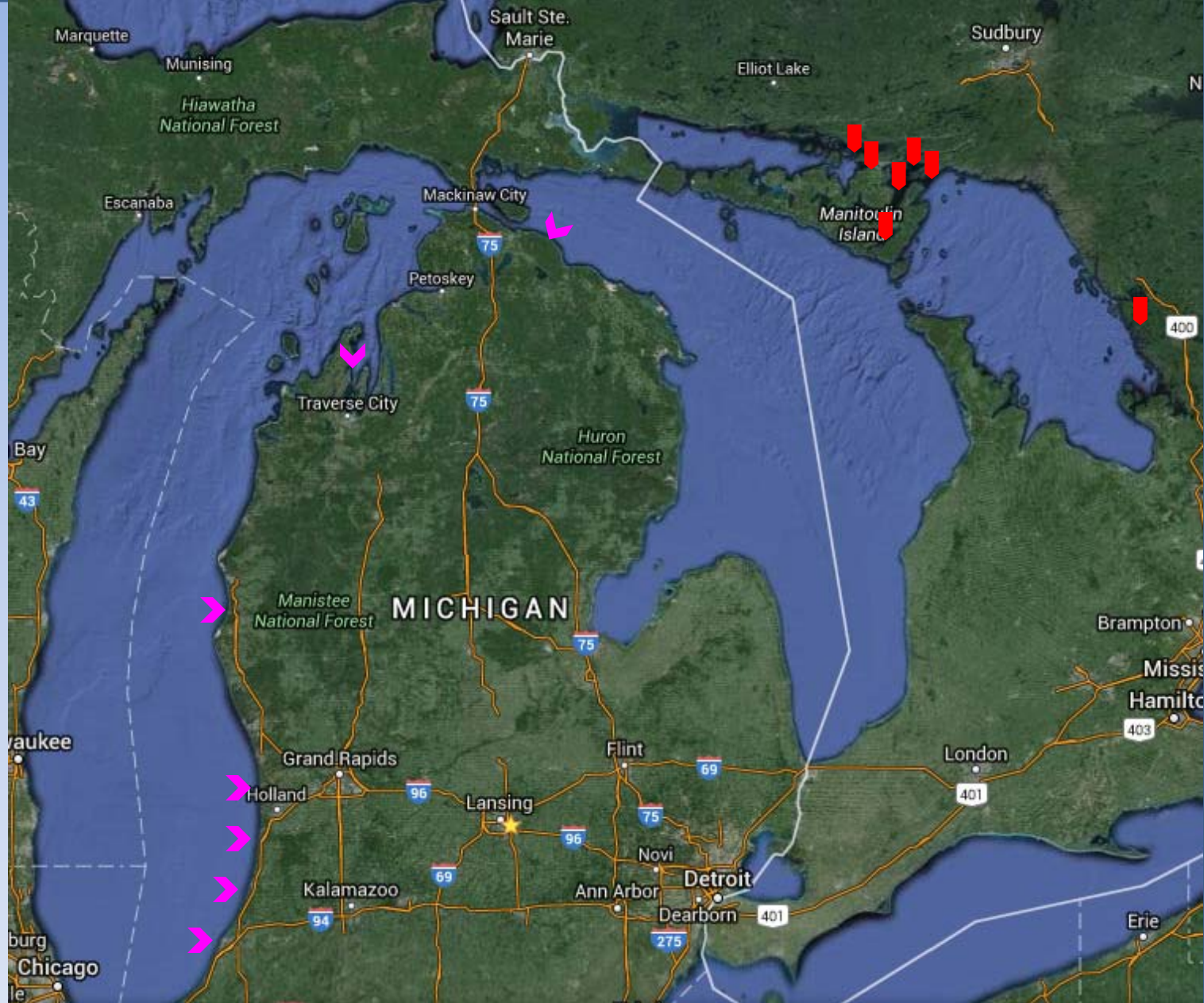
# Pending Legislation

- **SB 526** (September 2015)
  - Would prohibit aquaculture that discharges to waters that are connected to the Great Lakes
- **HB 5255** (January 2016)
  - **Defines netpen aquaculture**
  - **Prohibits netpen aquaculture in Great Lakes and tributaries up to first dam**

# Pending Legislation

- **HB 5166, 5167, 5168 / SB 681, 682, 683** (December 2015)
  - Defines aquaculture similar to the National Aquaculture Act definition
  - Defines “water-based aquaculture facility”
  - Allows for up to 10 netpen facilities in first 5 years
  - Creates an Office of Aquaculture in State Ag Dept
  - Help streamline permitting





➤ State netpen hold and release  
3.36 million fish 2010-2014

➤ Ontario commercial netpens  
17 million lbs/y



MDNR netpens for imprinting





Aqua-Cage Fisheries Ltd,  
Parry Sound, Ontario



North Wind Fisheries





## Public Input Process & Comments

Science-based review

- [Great Lakes Net-Pen Commercial Aquaculture: A Short Summary of the Science](#)

Regulations-based review

- [A Regulatory Analysis of Proposed Commercial Net-Pen Aquaculture in the Great Lakes](#)

Economics-based reviews

- [Overview of Natural Resource Values Potentially at Risk from Consequences of Net-Pen Aquaculture](#)
- [Expected Economic Impact of Cage Trout Aquaculture on Michigan's Great Lakes](#)
- [Aquaculture Industry Report from IBIS World Industry Report 11251- Fish & Seafood Aquaculture in the US](#)

# Science Report

## Experts urge cautious approach on Great Lakes fish farming

By JOHN FLESHER Oct. 30, 2015 1:14 PM EDT



1 photo



FILE - In this May 31, 2002 file photo, the sun sets over the Mackinac Bridge, the dividing line

TRAVERSE CITY, Mich. (AP) — If Michigan allows commercial fish farming in the Great Lakes, the industry should begin on a small and experimental scale to enable careful monitoring of the effect on the environment and report to state officials.

The recommendation was among many in five reports submitted by a panel of scientists, who advise regulators considering whether a process known as "net-pen aquaculture" would be suitable for Great Lakes waters within Michigan's boundaries.

If Michigan allows commercial fish farming in the Great Lakes, the industry should begin on a small and experimental scale to enable careful monitoring of the effect on the environment and wild fish populations, scientists said in a report to state officials.

Source: <http://bigstory.ap.org>

# Legislators debate Great Lakes fish farming

By PETER PAYETTE • FEB 8, 2016

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*Harvesting farm fish in Georgian Bay in wintertime.*

CREDIT GORD COLE / AQUA-CAGE FISHERIES

and spoke with David Cassleman.

The debate over fish farming in the Great Lakes is underway in Lansing.

Committees in the state house are considering competing bills. One package of bills would create rules allowing what's called cage or net pen aquaculture. Other legislation would ban fish farms in the Michigan waters of the Great Lakes. IPR News Director Peter Payette has been following this story



## Guest commentary

# Don't allow fish farms in Michigan waters

by Howard



One of  
on issue  
friends

But I'm  
the water  
River.

There are many mistakes to learn from when it comes to using our public waters as the sewers for private companies raising and selling fish.

All around the globe, fish farming in public waters has led to water pollution, spread of fish disease, and widespread opposition by those who have to live with the visual pollution and other consequences of fish farming.

When I think of Michigan's latest infatuation with aquaculture – be it in Grayling on the Au Sable River, or in the Great Lakes – I am reminded of a saying: Some people learn from their mistakes. Smart people learn from the mistakes of others.


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**Action Alert | Protect Great Lakes Fisheries!**

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Michigan United Conservation Clubs <admin@mucc.org>  
To: release@mirsnews.com

Thu, Jan 28, 2016 at 3:21 PM



Michigan  
United  
Conservation  
Clubs

FOR IMMEDIATE RELEASE

January 28, 2016

Contact: Drew YoungeDyke | [dyoungedyke@mucc.org](mailto:dyoungedyke@mucc.org) | 734.757.0408

**Legislators Need Your Phone  
Calls to Protect Great Lakes  
Fisheries**

***New Legislation Introduced to Ban Fish Farms  
in the Great Lakes***

“Commercial cage culture poses serious risks to wild fisheries,”

“These risks include escapement and breeding with wild fish, making them less genetically fit ..., passing disease from immune domestic fish to wild fish which are not immune to the diseases, and, especially, the effluent deposited by concentrated populations of domestic fish into lakes.”

# Fish Farms in the Great Lakes?

Posted on [November 4, 2015](#) by [greatlakesoutdoors](#)

Caged fish that are essentially CAFO's directly *IN* our Great Lakes.

Just say no Michigan.

Its that simple.

Just say no Michigan  
It's that simple



Pure Michigan? credit NOAA

12/7/2015 update: [NWF](#) and our state affiliate [Michigan United Conservation Clubs](#) submitted  
at our concerns with the potential of net pen aquaculture in our



**Proponents** of fish farms in the Great Lakes **say** they could help the state supply the nation's appetite for seafood, but Michigan **sporting and environmental groups are lining up in opposition** to proposals they say threaten the **\$7 billion fishing industry** with concentrated "**fish poo.**"

reduced to \$4 billion in Committee hearings

[HOME](#)[NEWS](#)[SPORTS](#)[AUTOS](#)[BUSINESS](#)[LIFE](#)[ENTERTAINMENT](#)[OPINION](#)[ADVICE](#)[MITCH ALBO](#)

## Fish farms threaten Great Lakes

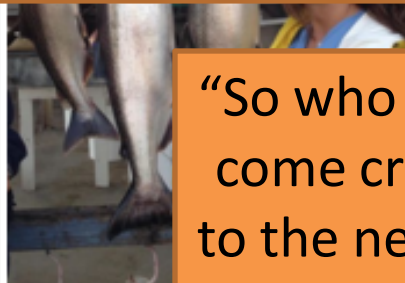
September 28, 2015

"They will escape... and when they do, they will destroy our Great Lakes fishery. These fugitive fish compete with wild fish ..., disrupt their reproduction and interfere with their genetic diversity, ultimately making it very difficult for the wild fish to survive."

Michigan waves are  
ough the waves — 3-to  
they terrify my  
o the bay, and it's all



16



(Photo: Lydia L  
Free Press)

"So who supports this? The defenders will surely come crawling out of the woodwork, appealing to the need to feed a starving world. They're just looking for a handout on the public dime. Don't believe a word of it."

alewives reeked and plugged up waterways with

## Jones: Fish poo is not Pure Michigan

Justin A. Hinkley, Lansing State Journal

11:30 a.m. EDT September 24, 2015



1



(Photo: Photo provided)

LANSING — As Canadian fisheries propose commercial fish farms for Great Lakes waters around Michigan, state Sen. Rick Jones, R-Grand Ledge, announced he's crafting legislation to ban the practice.

Jones said he practice of fish farming — in which cultured fish are grown in watery pens for commercial food consumption — threatens the waters with pollution and invasive species.

"Concentrated fish poo is just not Pure Michigan," Jones said [in a written statement](#). "Regardless of how many safeguards are put in place, there is

always some threat that will be unaccounted for, and one mistake here can threaten the entire Great Lakes economy."



# Environmentalists oppose Great Lakes net pens, support current aquaculture practices

Mark Johnson (989) 732-1111 [mjohnson@gaylordheraldtimes.com](mailto:mjohnson@gaylordheraldtimes.com) | Posted: Monday, November 23, 2015 3:35 pm

MICHIGAN — Two proposals are on the table to allow a fish-raising practice that some say would benefit the economy, while others say it would put the Great Lakes at risk.

A public comment period is underway, allowing citizens to express their opinions on the controversial net-pen aquaculture proposals with state agencies including the Michigan Departments of Agriculture and Rural Development, Natural Resources, and Environmental Quality. A public hearing was held in Gaylord last week to gather some of these comments.

Some local environmentalists say the net-pen proposals — one for rainbow trout in northern Lake Michigan and another for northern Lake Huron — are dangerous and unnecessary as they say there is already an efficient method of aquaculture practiced in Michigan.

“We’re not against aquaculture, just this particular kind of aquaculture,” said Grenetta Thomassey, program director at Tip of the Mitt Watershed Council. “We already know how to do aquaculture in Michigan.”

Recirculating  
Michigan, raise  
from the fish

already being implemented in  
the water and captures the waste

**“We’re not against aquaculture, just this particular kind of aquaculture... We already know how to do aquaculture in Michigan”**

**“Recirculating aquaculture... is already being implemented in Michigan, raise mass amounts of fish... a practice.. well suited to vacant warehouses ”**

# US RAS - Status

- Operational
- Unknown
- Failed

Information sources:

<http://www.thebetterfish.com/barra-blog/so-you-want-to-be-a-fish-farmer>

[http://www.ccb.se/wp-content/uploads/2015/11/Freshwater-Institute\\_Brian-Vinci\\_day1.pdf](http://www.ccb.se/wp-content/uploads/2015/11/Freshwater-Institute_Brian-Vinci_day1.pdf)

Weeks 2015 unpublished data from 2015 NCR survey to aquaculture extension personnel

# Operational RAS in US

4+ yrs  
operating

Species	Number	Lbs
Tilapia	14	7,725,000
Barramundi	2	2,100,000
Goldfish, Koi	2	
Largemouth Bass	1	
Marine Shrimp	1	
Unknown	1	
total	21	



# US RAS – closed / failures

State	Qty	State	Qty
AI	1	MT	2
CA	3	NC	3
GA	1	ND	1
IA	2	NH	1
ID	1	NV	2
IL	7	NY	3
IN	3	OH	17
KY	1	PA	4
LA	2	TX	1
MA	3	VA	3
MD	2	WA	1
ME	1	WI	9
MI	5	WV	2
MN	4		
		total	85

~ 80% failure rate to date  
(based on available information)

# RAS in the NCR

survey to aquaculture Extension and Industry

Number commercial RAS in state successfully operating for 5+ years	5
Number producing 100,000 lbs+ annually	2
Number failures you can recall in your state	43
Average 5 year success rate (%)	10

# Land Based RAS and Open Pen Salmon Aquaculture: Comparative Economic and Environmental Assessment

**Trond W. Rosten, Kristian Henriksen, Erik Skontorp Hognes**

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SINTEF Fisheries and Aquaculture  
Norway

**Brian Vinci, Steven Summerfelt**

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The Conservation Fund  
Freshwater Institute  
USA

<http://tidescanada.org/wp-content/uploads/files/salmon/workshop-sept-2013/NEWD1-11TrondRostenandBrianVinci.pdf>



# Model Land-based RAS to model Norwegian net pen farm

**3300 MT (7.25 million lbs) HOG Atlantic salmon**

## Model Land-based RAS

Investment	<b>\$32 million</b>
Density	<b>80 kg/m<sup>3</sup></b>
Production cost	<b>\$3.98/kg HOG</b>
Total production costs	\$13.13 million
Price/kg	\$5.66
Earnings (EBIT)	<b>\$5.5 million</b>

kg CO<sub>2</sub>/kg Salmon  
(fresh to US)

**7.36**

## Model Net Pen

Investment	<b>\$12.3 million</b>
Density	<b>25 kg/m<sup>3</sup></b>
Production cost	<b>\$4.24 /kg</b>
Total production costs	\$18.67 million
Price/kg	\$5.66
Earnings (EBIT)	<b>\$4.68 million</b>

kg CO<sub>2</sub>/kg Salmon  
(fresh to US)  
(frozen)

**8.24**

**3.39**

- The land-based production has a higher CO<sub>2</sub> footprint than a net pen system unless 90% hydro power incorporated
- Land based production has lower production costs but higher ROI than net pen unless getting 30% premium for RAS

Rosten et al. 2013

- Systems do not approach commercial viability until capacities exceeding 2,500 t are reached (S. Summerfelt)

Init Investment  
RAS \$10,000-20,000 /MT  
x 2,500 = \$25-50 million

# Great Lakes fish farming debate picks up speed in Michigan legislature



Undated photo of a Cold Water Fisheries rainbow trout fish farm in Lake Huron's Georgian Bay near Manitoulin Island. (NOAA/Northern Ontario Aquaculture Association/DFO)

## FLINT WATER CRISIS



- Snyder ordered DEQ to withhold Flint lead test results, emails claim
- Gov Snyder proposes \$195M for Flint water as protesters call for his removal
- Involuntary manslaughter among crimes considered in AG's probe
- How government poisoned Flint

📺 A look at how we got here



# MICHIGAN FARM NEWS

MICHIGAN'S ONLY STATEWIDE FARM NEWSPAPER

February 13, 2016

SEARCH

CROPS

LIVESTOCK

FRUITS AND VEGETABLES

MARKETS AND WEATHER

POLITICS

TECHNOLOGY

PEOPLE

OPINION

Your local  
agent  
insures your

**Crops**

## Legislation introduced to reform Michigan aquaculture

December 21, 2015 Category: Politics

by *Jeremy C. Nagel*

Legislation introduced last week by Dist. 35 State Senator Darwin Booher aims to encourage the expansion of Michigan aquaculture and, in turn, help meet rising demands for seafood among American consumers.

"The U.S. currently imports 90 percent of the seafood Americans consume," said Booher (R-Evart). "Given the interest consumers have in buying locally grown, fresh and healthy foods, there is a real opportunity for Michigan to responsibly use its land and water resources to produce more seafood."

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# 3/9/16 News Release

- ... the state's “quality of life” agencies -- MDARD, DEQ and DNR -- recommended not pursuing commercial aquaculture in the Great Lakes.
- Among the reasons given “would pose significant risks to fishery management and other types of recreation and tourism.”
- Environmental and conservation groups celebrated the administration and sided with them, as the Michigan United Conservation Clubs and the Michigan Environmental Council had been railing against allowing such activities.



Lake Superior

Green Bay

Michigan

Wisconsin

Lake Michigan

Chicago

Lake Huron

Georgian Bay

Toronto

Lake Ontario

Lake Erie

Pennsylvania

Image NOAA  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
© 2016 Google  
Image Landsat

Ohio

Appalachian Mountains

41°03'37.95" N 79°17'05.30" W elev 1330 ft

# Questions?



## Soy Aquaculture Alliance

February 25, 2016

Chris Weeks

Aquaculture Extension Specialist

[weekschr@msu.edu](mailto:weekschr@msu.edu)

517-353-2298