

# North Carolina Aquaculture Update

2014 Licensing, Production and Processing Data

2015 NC Aquaculture Development Conference

## Navigating Currents of Change

Feb. 25-28, 2015

DoubleTree by Hilton Hotel  
New Bern Riverfront

100 Middle Street,  
New Bern, NC 28560

Aquaponics Course

Feb. 25

Farm Tour

Feb. 26

Conference

Feb. 27-28



2015 sponsors



NORTH CAROLINA  
**AQUACULTURE**  
DEVELOPMENT CONFERENCE

# NC Aquaculture Development Conference

## 27 years of a public/ private partnership

- Premier Sponsors
  - Pentair Aquatic Eco-Systems
  - NC Aquaculture Association
  - NC Farm Bureau
- General Sponsors
  - AquaCal
  - Carolina Classics Catfish
  - Skretting
  - YSI



North Carolina Aquaculture Association



*"Farming Fresh Alternatives"*



# NC Aquaculture Development Conference

## 27 years of a public/ private partnership

- Government/ Agency Sponsors
  - NC Aquaculture Association
  - NCDA&CS
  - NCSU College of Ag & Life Sciences
  - NCSU Department of Applied Ecology
  - NC Small Business Tech. Dev. Center
  - NC Farm Bureau
  - NC Sea Grant
  - NC Shellfish Growers Association

## A 'partnership' for NC Aquaculture

- SBTDC – Michael Twiddy
- NCDA – Ron Fish, John Aydlett  
Debra Sloan, Pete Anderson
- NCCE – Steve Gabel, Mike Frinsko
- Sea Grant – Jack Thigpen, Chuck Weirich
- NC Farm Bureau – Debbie Hamrick
- NCSU – Cathy Smith, Chrissie Shepard
- NCAA – Randy Gray, Nancy Sugg



Thank you to all of the farms and agencies that provided data for this presentation!



For a copy, please see our website:  
[www.ncaquaculture.org](http://www.ncaquaculture.org)

- **NCSU & NC Extension**

- Harry Daniels: Freshwater Aquaculture Production

- **NC Sea Grant**

- Chuck Weirich: Marine Aquaculture Production

- **NCDA&CS**

- Ron Fish: Aquaculture Industry Value & Resources

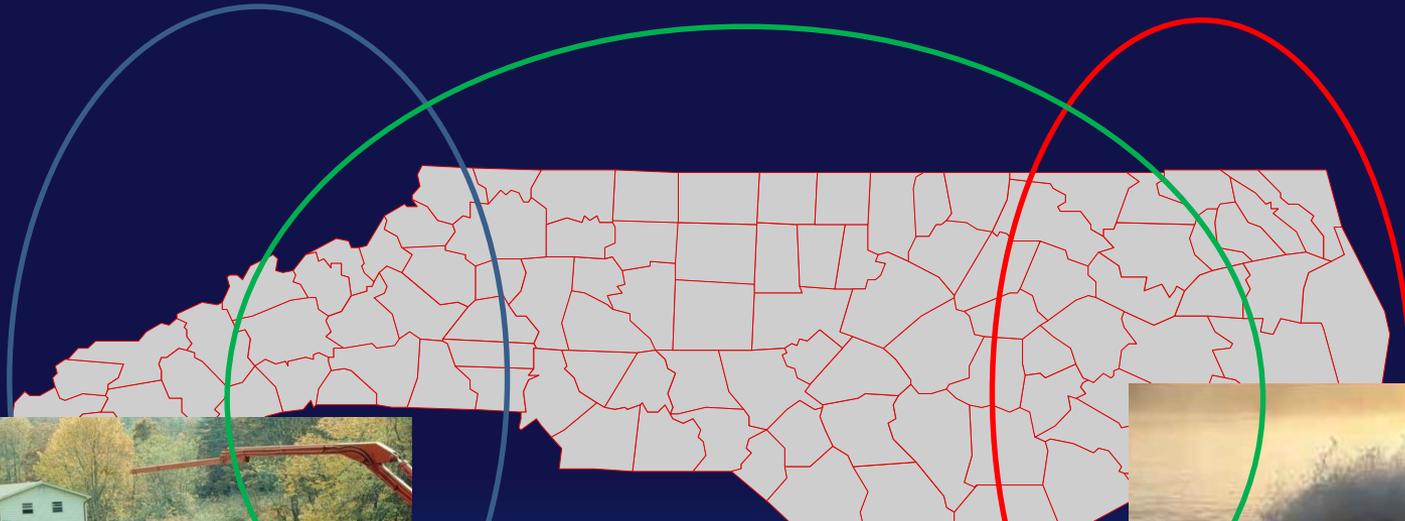
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# NC Aquaculture - Regional Production

Cool & coldwater  
Flow-through  
Tank production

Recirculating tank  
production

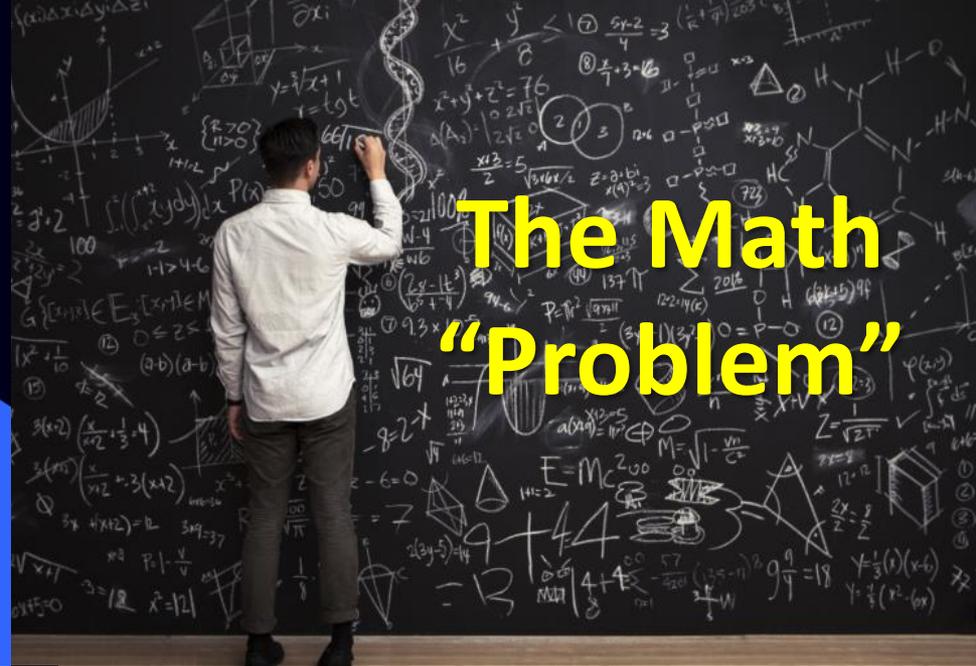
Warmwater pond &  
marine aquaculture



# 2005 NORTH CAROLINA Aquaculture Operations and Farm Gate Value

170 Farms &  
268 Shell Leases

Farm Gate =  
\$31,210,200\*  
(up 19%)



# 2009 NORTH CAROLINA Aquaculture Operations and Farm Gate Value

146 Farms  
257 Shell Fish Leases  
300 Crab Sheddars

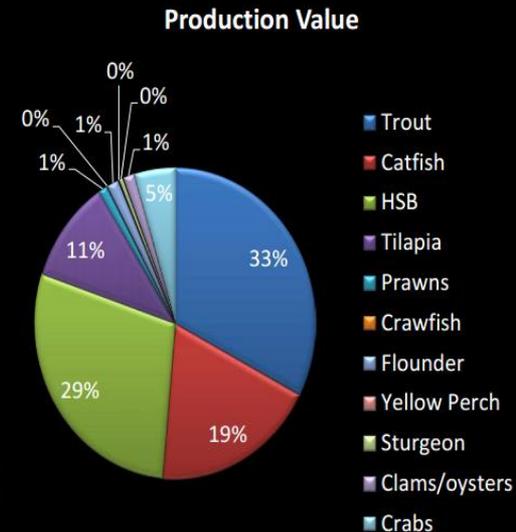
Farm Gate = \$29,924,237

\$29,953,722 (in 2008; - < 0.1%)



# 2012 North Carolina Aquaculture Industry Summary- Farm Gate

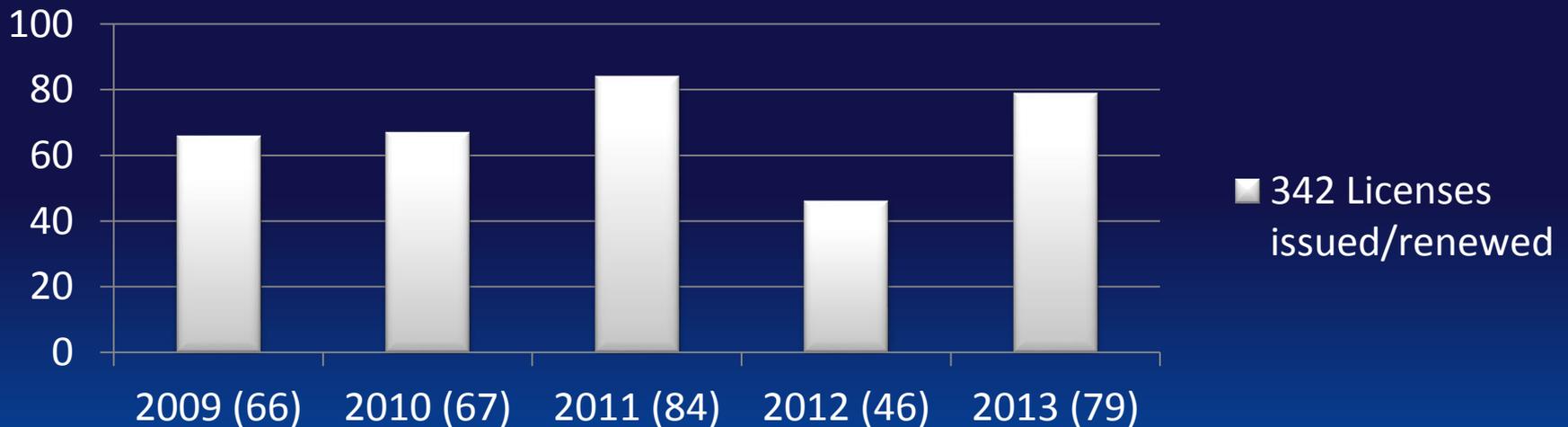
- Includes :
  - Marine species
  - Fingerling production
  - 134 farms
  - 287 crab shedding permit holders
  - Value=\$33,069,209 (+3.8%)



# By the Numbers...

- 710 Licenses issued since 1998
- NCDA License Database = **342 'Active' Licenses**

\*authorization to sell, more grown with WRC /self-consumption



# 2014 NC Aquaculture Industry Survey – License Update/Renewal\*

\* Required

## 2014 NC Aquaculture Industry Survey

PAGE 2 – Species and Production Information

\* All production information is confidential and will not be shared! \*

### 1- Please list the MAJOR aquatic animal produced at your facility: \*

What is the name of the type of fish? Example: tilapia. All secondary species will be listed on page 3, if any.

### 2- For this aquatic animal being produced for: \*

Please choose all applicable

- Food production
- Recreation/Pack Pickings
- Aquaria/Ornamental

### 3- Please choose the production method for the animal: Please describe your farm: \*

What do you grow your fish in?

- PONDS
- RACEWAYS
- RAISEWAYS
- CAGE CULTURE

### 4- For the choice above, please list the total number on your farm in production: \*

How many ponds/ tanks/ raceways/ cages do you have for this aquatic animal?

### 5- What is the approximate total size in production for your MAJOR aquatic animal: \*

How much space are you using to grow this 1 aquatic animal? Please list number of: water acres for ponds, gallons for tanks, cubic feet for cages and raceways

ONLY 41 FARMS  
RESPONDED  
Just need 301 more!

# Side by side comparisons

*Work with what you got...*

- Traditional Method

|               |     |
|---------------|-----|
| – Trout       | 70  |
| – Catfish     | 11  |
| – HSB         | 13  |
| – Tilapia     | 11  |
| – Prawn       | 3   |
| – Crawfish    | 5   |
| – Other       | 2   |
| * TOTAL ..... | 115 |

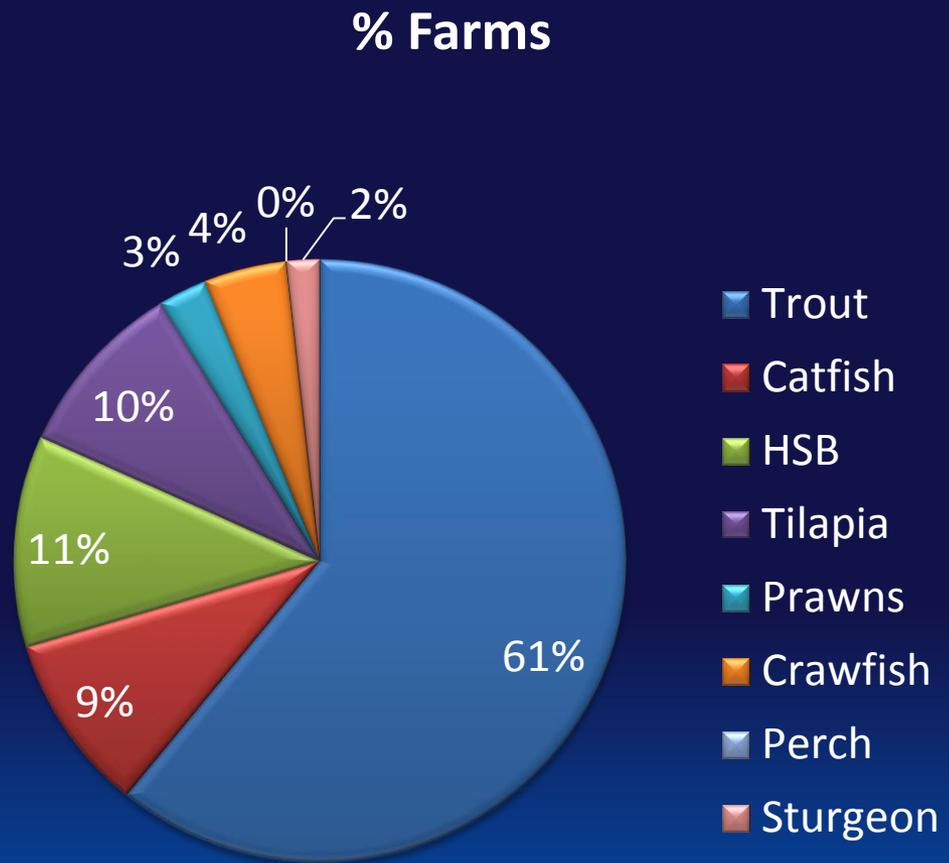
- NCDA Database Numbers

|               |     |
|---------------|-----|
| – Trout       | 71  |
| – Catfish     | 61  |
| – HSB         | 30  |
| – Tilapia     | 52  |
| – Prawn       | 13  |
| – Crawfish    | 12  |
| – Other       | 63  |
| – “All”       | 40  |
| * TOTAL ..... | 342 |

# 2014 North Carolina Freshwater Aquaculture

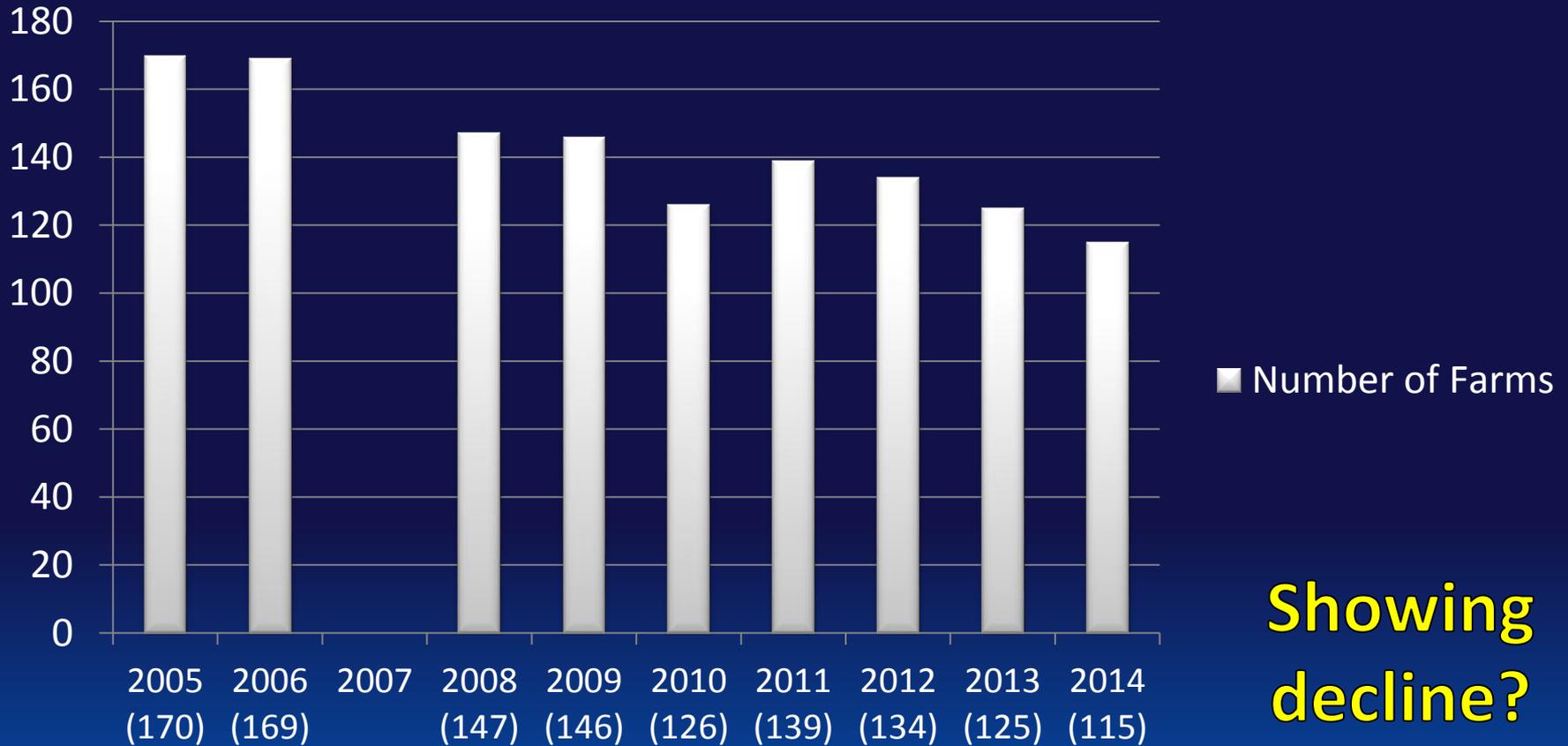
Farms (current number) reporting production in 2014

- 115 farms reporting
  - Trout (70)
  - Catfish (11)
  - Hybrid Striped Bass (13)
  - Tilapia (11)
  - Fresh Water Prawns (3)
  - Crawfish (5)
  - Yellow Perch (0)
  - Sturgeon (2)



# 10 Years of NCADC Surveys

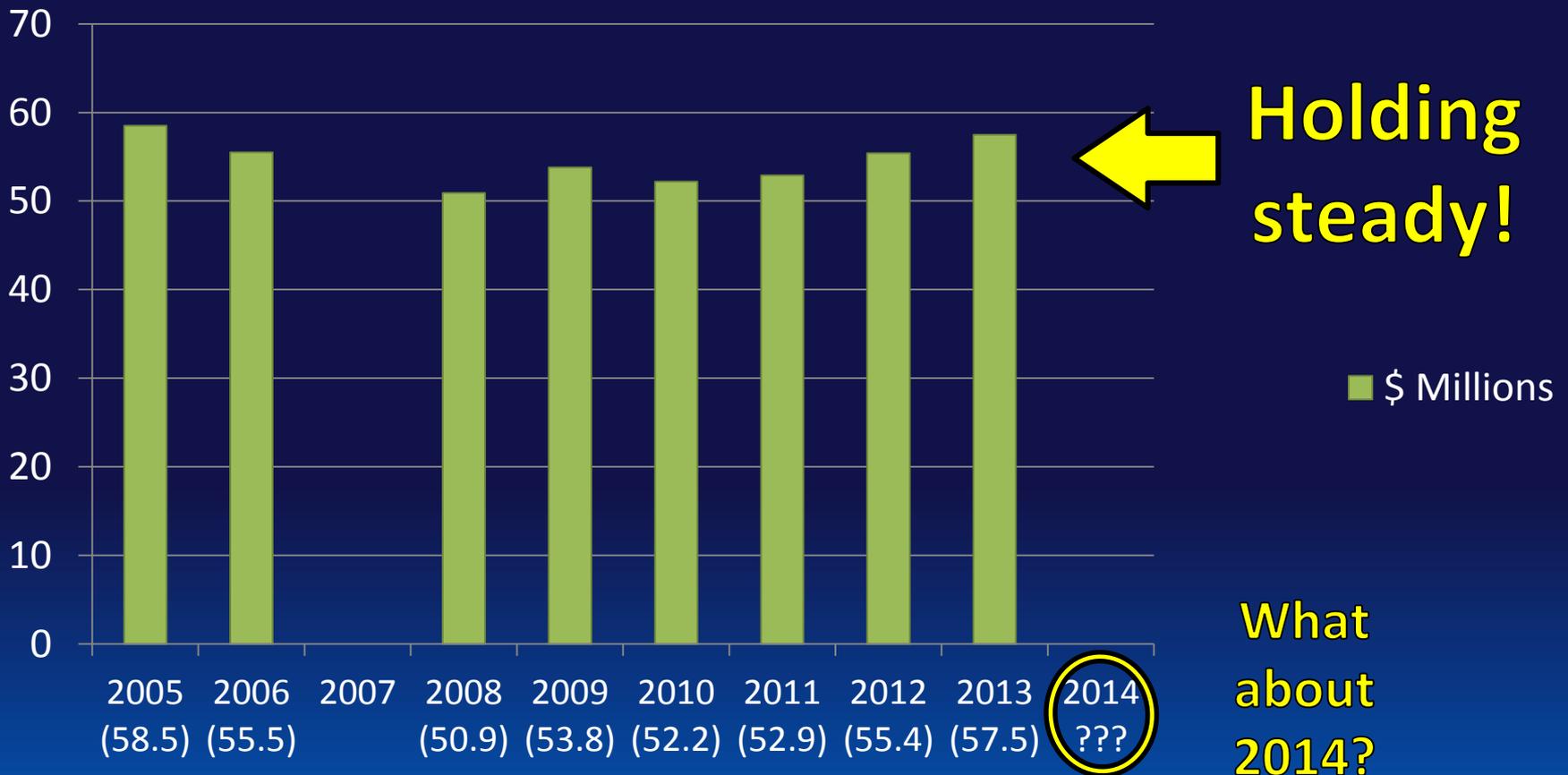
Total number of farms according to NCADC State Update Presentations



**Showing  
decline?**

# 10 Years of NCADC Surveys

Total dollar value from the NC Aquaculture Industry according to NCADC State Update Presentations



- **NCSU & NC Extension**

- Harry Daniels: Freshwater Aquaculture Production

- **NC Sea Grant**

- Chuck Weirich: Marine Aquaculture Production

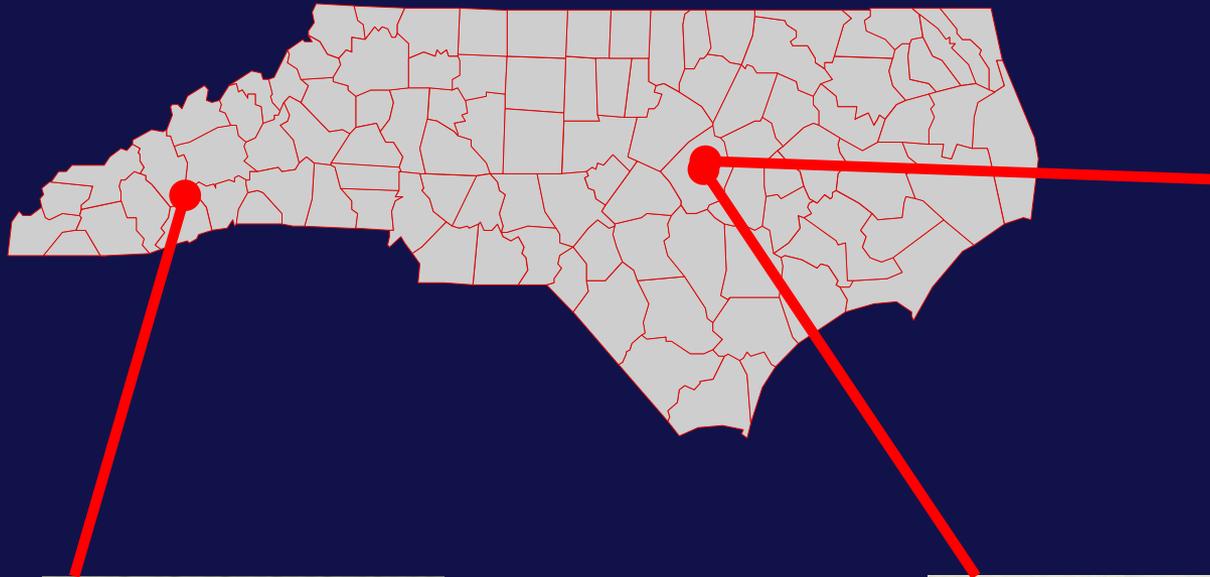
- **NCDA&CS**

- Ron Fish: Aquaculture Industry Value & Resources

**For a copy, please see our website:**

**[www.ncaquaculture.org](http://www.ncaquaculture.org)**

# North Carolina Aquaculture Technical Assistance NCSU Campus-Based



Dr. Harry Daniels  
NC State, Raleigh  
(919 515-4589)



Dr. Jeff Hinshaw  
NC State, Fletcher  
(828 684-3562)



Dr. Ben Reading  
NC State, Raleigh  
(919 515-3830)

# Aquaculture Research Personnel



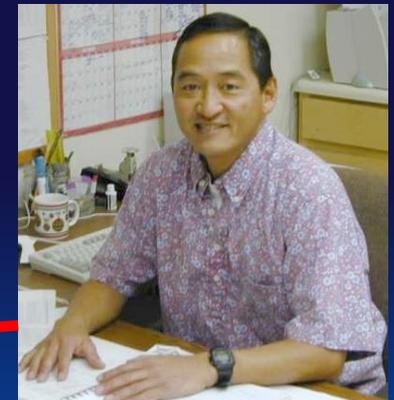
Dr. Russell Borski  
NC State, Raleigh



Dr. Harry Daniels  
NC State, Raleigh



Dr. Ben Reading  
NC State, Raleigh



Dr. Wade Watanabe  
UNC Wilmington

# Aquaculture Research Personnel



Center for Marine Science & Technology, NCSU  
Dr. David Eggleston  
Professor, Center Director



CMAST, NCSU  
Seafood Lab  
Dr. David Green  
Professor  
Ext. Specialist



Marine Aquaculture  
Research Center  
Ryan Kelly  
Extension Assistant

# NCSU College of Veterinary Medicine



Dr. Michael Stoskopf



Dr. Jay Levine



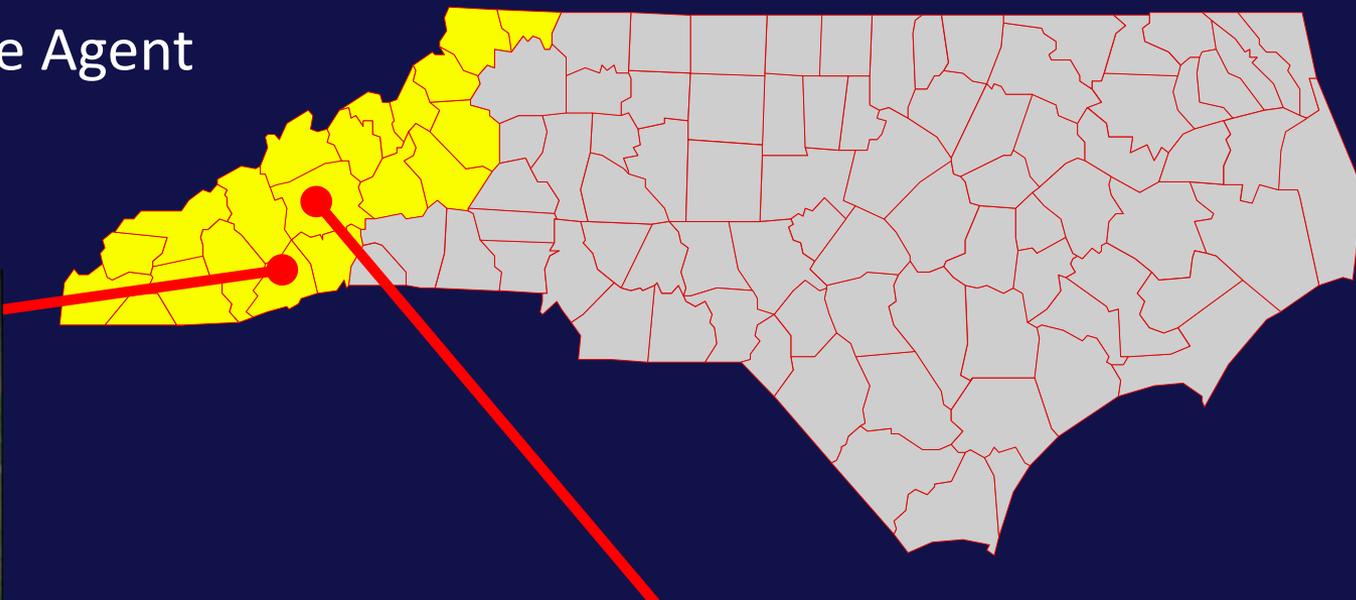
Dr. Greg Lewbart



Dr. Craig Harms

# North Carolina Aquaculture Technical Assistance NC Cooperative Extension (West)

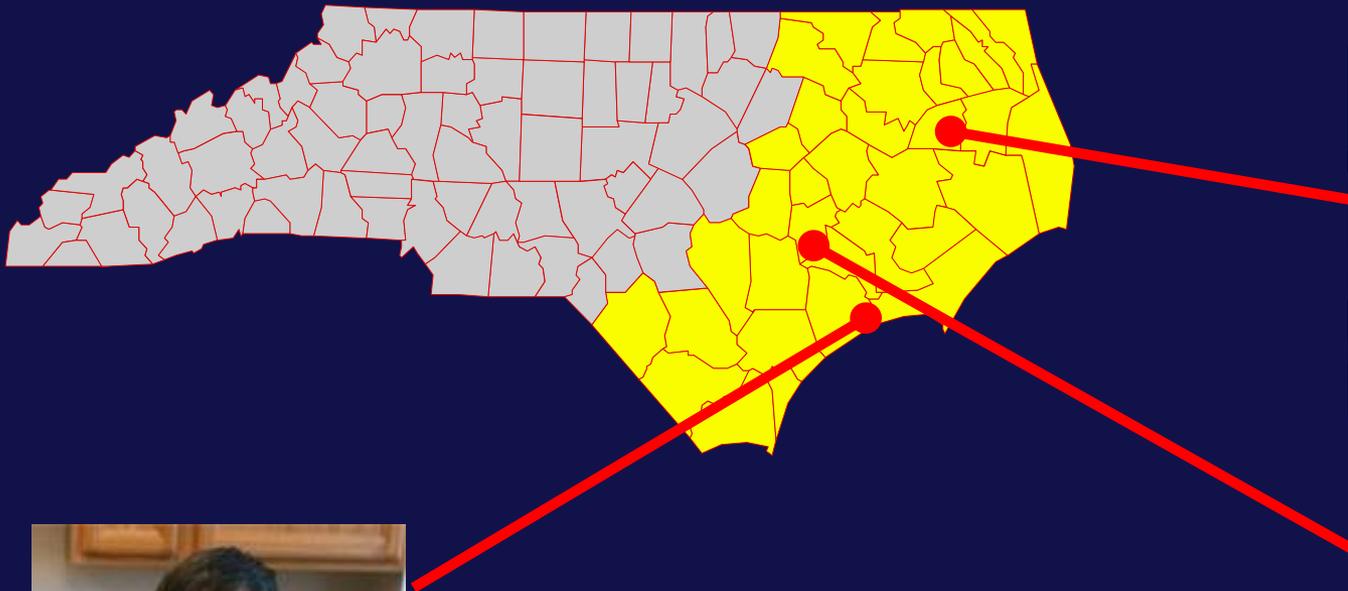
Mr. Skip Thompson  
Area Aquaculture Agent  
Waynesville, NC  
(828 456-3575)



Dr. Jeff Hinshaw  
Aquaculture Specialist  
Fletcher, NC  
(828 684-3562)

# North Carolina Aquaculture Technical Assistance NC Cooperative Extension (East)

Mr. Steve Gabel  
Area Aquaculture Agent  
(252 482-6585)



Dr. David Green  
Seafood Specialist  
(252 222-6304)

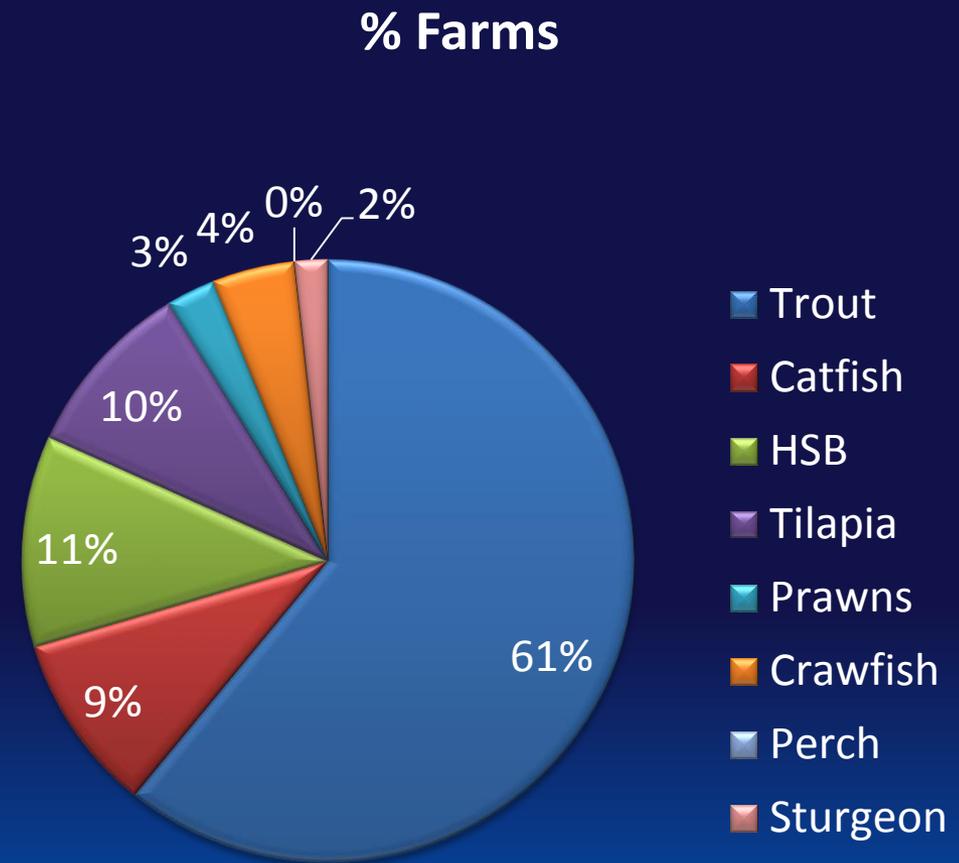
Mr. Mike Frinsko  
Area Aquaculture Agent  
(252 448-9621)



# 2014 North Carolina Freshwater Aquaculture

Farms (current number) reporting production in 2014

- 115 farms reporting
  - Trout (70)
  - Catfish (11)
  - Hybrid Striped Bass (13)
  - Tilapia (11)
  - Fresh Water Prawns (3)
  - Crawfish (5)
  - Yellow Perch (0)
  - Sturgeon (2)



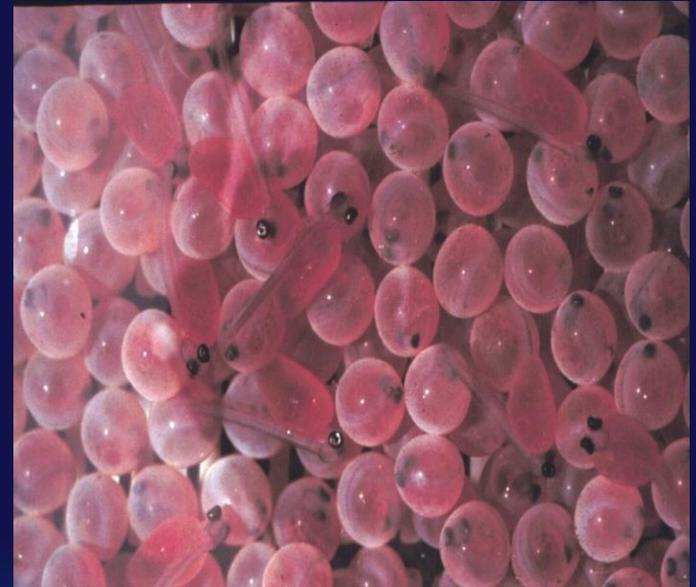
# 2014 North Carolina Trout Industry

- Food fish production
  - 34 producers (n/c)
  - 5,003,000 lbs. (n/c)
  - \$1.76/ lbs. (-3.3%)
- Farm gate value=  
**\$8,805,280 (-3.3%)**



# 2014 North Carolina Trout Industry

- Fingerling production  
15 Hatcheries (n/c)  
7,880,500 fingerlings (+18%)  
\$0.11/ fingerling (+10%)
- Farm gate value=  
**\$866,855 (+30%)**



# 2014 North Carolina Trout Industry

- Fee fishing operations
  - 21 operations (n/c)
  - 242,500 lbs. (n/c)
  - \$5.18/ lb. (+6.1%)
- Farm gate value=  
**\$1,256,150 (+6.1%)**



# 2014 North Carolina Trout Industry

- Processing
  - 3 processors (n/c)
  - 1,665,000 lbs. (+13%)
  - Avg. price \$6.44/ lb. (-1.5%)



Value= \$10,722,600 (+11.5%)

# 2014 North Carolina Trout Industry

- Trends
  - Industry stable
  - Demand is strong
- Total Combined Value  
Farm gate and processing  
**\* \$21,650,885 (+5.3%)**



# 2014 North Carolina Catfish Industry

- Food fish production
  - 11 producers (-2)
  - 1 Broodstock farm
  - 1440 pond acres (-50 ac)
  - 4,200,000 lbs (-10.6%)
  - \$1.18/lb. (+9.3%)
- Farm gate= \$4,960,000 (-2.3%)



# 2014 North Carolina Catfish Industry

- Fingerling production
  - 1 producer (n/c)
  - 3,500,000 (-18%)
  - \$0.10 each (n/c)



Farm gate= \$350,000 (-18%)

# 2014 North Carolina Catfish Industry

- Processing
  - 1 Processor
  - (Carolina Classic Catfish Inc.)
  - All 4,200,000 lbs processed

Processed value

**\$8,550,000 (-1.7%)**



# 2014 North Carolina Feeds Production

- 1 Mill – Greenville, NC  
6,900 tons fishfeed

Production value=  
**\$3,480,000 (+3.9%)**



# 2014 North Carolina Catfish Industry

- Trends
  - Slight decrease in production
  - Slight increase in price
  - Imports and high feed costs
  - Remains a major NC cultivar
- Total Combined Value
  - Farm gate, processing, feed milling
  - \* \$17,340,000 (-1.2%)**



# 2014 NC Hybrid Striped Bass Industry

- Food fish production
  - 14 producers (-1)
  - 13 pond producers
  - 1 tank producers
  - 2,810,400 lbs. (+25%)

## Markets

Live \$4.10 /lb. (-3.5%)

Box \$3.80 /lb. (-3.1%)

**Farm gate= \$11,101,080 (+21%)**



# 2014 NC Hybrid Striped Bass Industry

- Fingerling production

  - 3 producers (-1)

  - 3,000,000 fingerlings produced (+10.5%)

    - \$0.24 / fingerling

      - Phase I - 3,000,000 (15%)

      - Phase II - 0 (-100%)



**Farm gate value \$720,000 (-52%)**

# 2014 NC Hybrid Striped Bass Industry

- The Fish Connection Cooperative
- Trends
  - Food fish Production increased
  - Slight decrease in price
  - Demand for fingerlings on the rise
  - Additional demand outside of NC



- Total Combined Value

Food fish and fingerlings \* \$11,821,080 (+10.6%)

# 2014 North Carolina Tilapia Industry

- Food fish production  
11 producers (+2)  
Tank-based RAS

1,426,057 lbs. (-14%)

\$2.30/ lb. (+0.88%)

Farm gate=

**\$3,279,931 (-13%)**



# 2014 North Carolina Tilapia Industry

- Fingerling production
  - 8 producers (+2)
  - 1,860,000 on farm (+41%)
  - 356,750 sold (-42%)
  - \$0.90/fingerling (+15%)

Farm gate=

**\$321,075 (-33%)**



# 2014 North Carolina Tilapia Industry

- Fresh Keepers Cooperative
- General Trends
  - Production decreased
  - Slight price increase
  - Increase in fingerling production for on-farm
- Total Combined Value  
Food fish and fingerlings  
**\* \$3,601,006 (-15.7%)**



# 2014 NC Freshwater Prawn Industry

- 3 active producers (-8)  
\*7 sat out to build sales  
6.5 water acres (-83%)
- 5600 lbs produced (-81%)  
\$8.00/lb. whole prawn (-11%)
- Farm gate=  
\* \$44,800 (-83%)



# 2014 NC Freshwater Prawn Industry

- American Prawn Cooperative
- 0 Nurseries (-1)
- 1 producer has sold out all product in 2014 to a regional commercial contract buyer and is expanding to add 2 new ponds in 2015, while renovating 2 old ponds for 2016.
- In this instance, regional demand is increasing. 1 producer has obtained nursery equipment for installation in 2016.



# 2014 North Carolina Crawfish Industry

- 5 active growers (n/c)
- 33 pond acres (+10%)
- 9,200 lbs. produced (+77%)
- \$4.00/lb. (n/c)
- Farm gate=  
\* \$36,800 (+77%)



# 2014 NC Yellow Perch Production

- 0 fingerling growers (-1)



- Due to marketing issues, NC's only commercial yellow perch fingerling producer did not operate in 2014.

# 2014 North Carolina Sturgeon Production

- 2 production facilities
  - La Paz Group, Happy Valley, NC
  - Marshallberg Farms, Marshallberg, NC
- 3 species of sturgeon produced in NC:
  - Atlantic
  - Siberian
  - Russian



# 2014 North Carolina Sturgeon Production

- Sturgeon caviar and meat production
  - Caviar - ~ \$441,440
  - Meat - ~ \$54,560

- Product value=  
**\* \$496,000 (+62%)**



- **NCSU & NC Extension**

- Harry Daniels: Freshwater Aquaculture Production

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- Chuck Weirich: Marine Aquaculture Production

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- Ron Fish: Aquaculture Industry Value & Resources

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# 2014 NC Marine Aquaculture Industry Update





# NC Sea Grant Personnel



Dr. Susan White  
Executive Director  
NCSU, Raleigh



Dr. Jack Thigpen  
Extension Director  
NCSU, Raleigh



Terri Kirby Hathaway  
Marine Education Spec.  
Manteo



Sara Mirabilio  
Fisheries Specialist  
Manteo



Barry Nash  
Seafood Technology  
and Marketing Spec.  
CMAST  
Morehead City



Scott Baker  
Fisheries Specialist  
UNCW, Wilmington



Vanda Lewis  
Admin. Support Spec.  
CMAST  
Morehead City



Dr. Chuck Weirich  
Marine Aqua. Spec.  
CMAST  
Morehead City



Lisa Humphrey  
Admin. Support Spec.  
UNCW, Wilmington



# Shellfish and Soft Shell Crab Production Information



Many thanks to:

Wanda Jacobs, Alan Bianchi, Don Hesselman, and Brian Conrad

# 2014 North Carolina Shellfish Aquaculture Status

## Leases and Acreage



**233 Leases (+ 2.6%)**

**1,728 Acres (- 22.5%)**

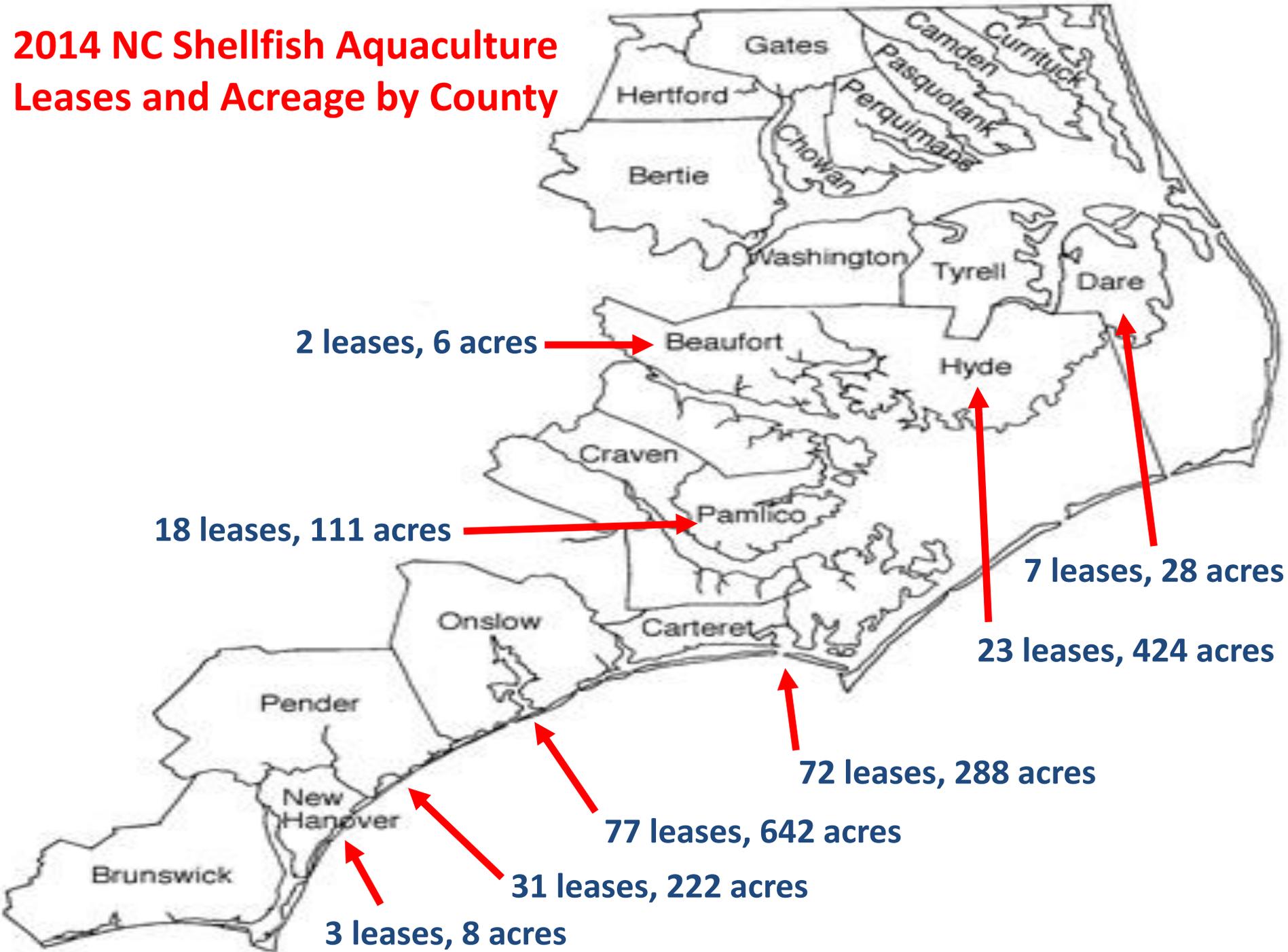
### Leases



### Acreage



# 2014 NC Shellfish Aquaculture Leases and Acreage by County



# 2014 North Carolina Shellfish Aquaculture Status

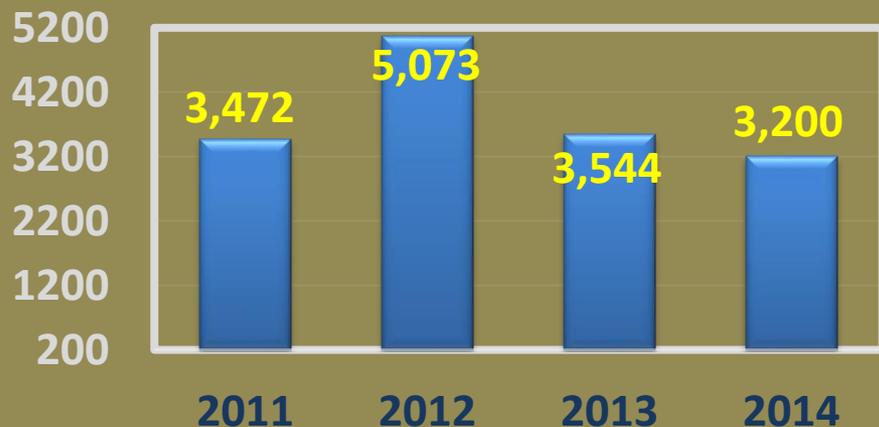
## Clam Production and Farm-Gate Value

3,200 Bushels (- 9.7%)

\$188,822 (- 12.6%)

1,025 Trips (- 18.5%)

### Production (bushels)



### Value (\$)



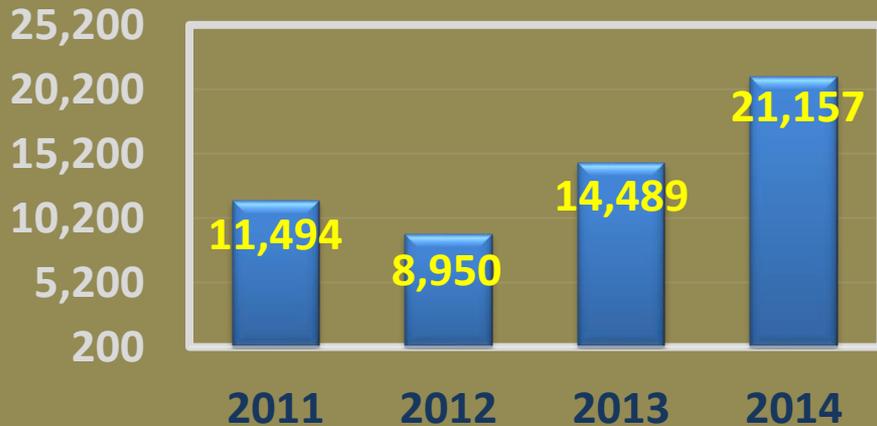


# 2014 North Carolina Shellfish Aquaculture Status

## Oyster Production and Farm-Gate Value

**21,157 Bushels (+ 46.0%), \$343,245 (+ 10.8%), 1,217 Trips (- 21.9%)**

**Production (bushels)**



**Value (\$)**



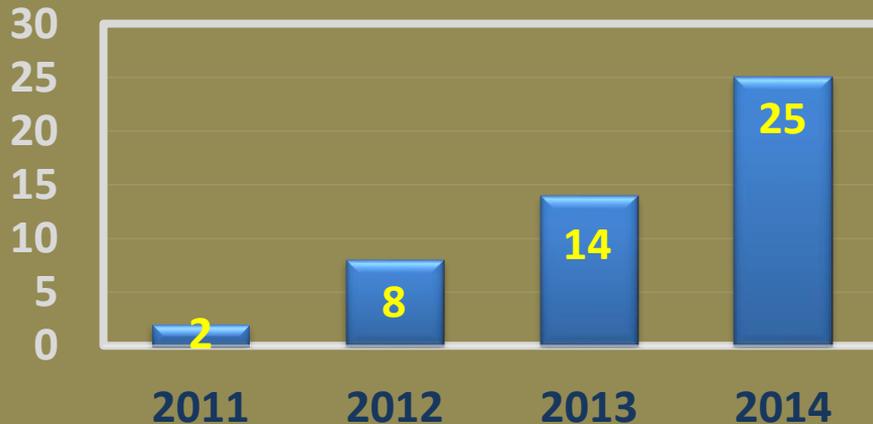
# North Carolina Shellfish Aquaculture Industry Trends and Issues

Increased number of leases and acreage devoted to water column leases

2014 – 25 leases (+ 78.6%)  
76 acres (+ 100.0%)



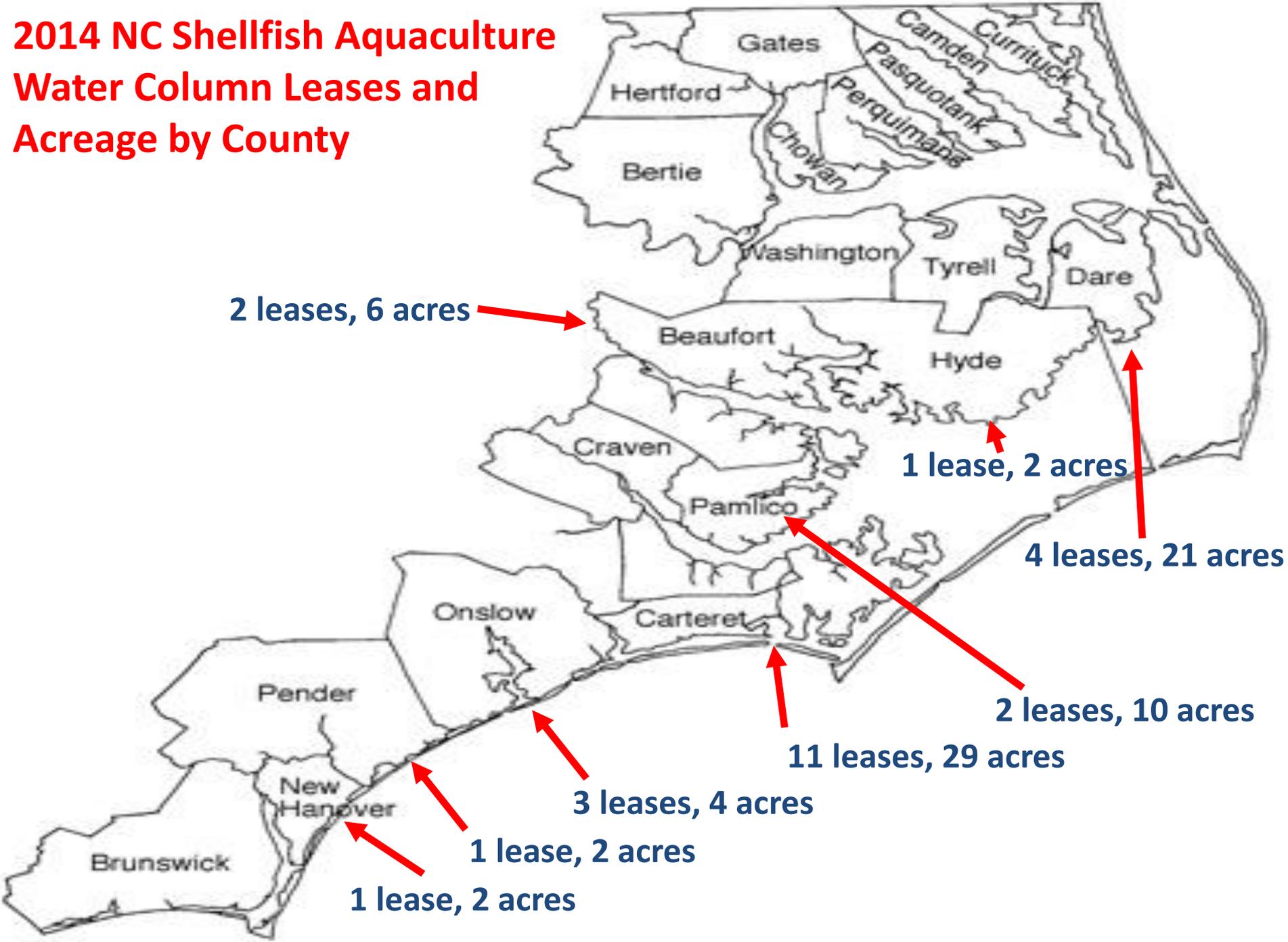
## Water column leases



## Water column acreage



# 2014 NC Shellfish Aquaculture Water Column Leases and Acreage by County



# North Carolina Shellfish Aquaculture Industry Trends and Issues

Intensive culture using containerized systems expanding



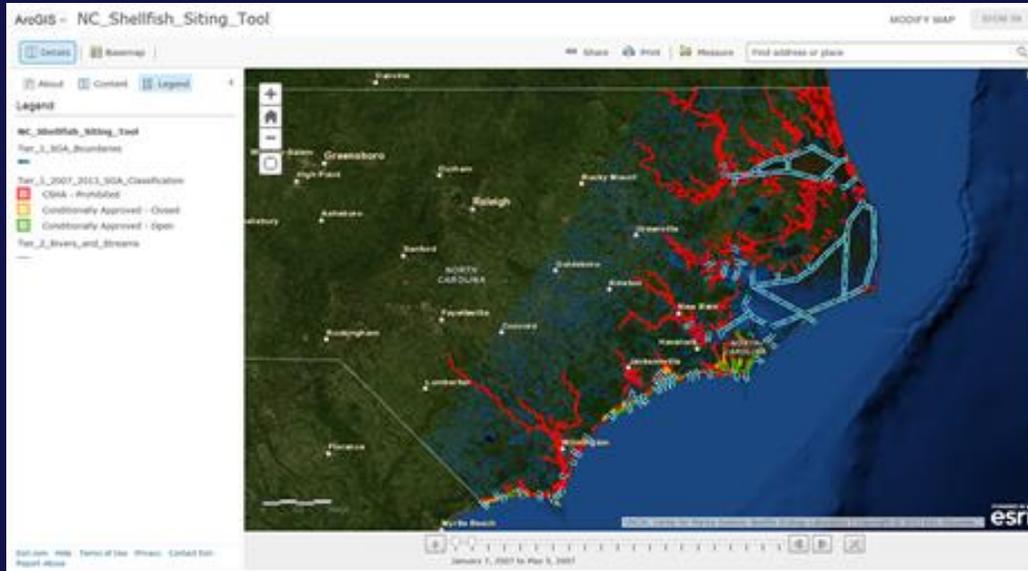
# North Carolina Shellfish Aquaculture Industry Trends and Issues

Market for cultured shellfish remains strong and is growing

Significant potential for market development, including value-added products



# North Carolina Shellfish Aquaculture Industry Trends and Issues



## Siting

*NC Shellfish Siting Tool*

Troy Alphin, UNCW

[alphint@uncw.edu](mailto:alphint@uncw.edu)

(910) 962-2395

Application costs

SAV



# North Carolina Shellfish Aquaculture Industry Trends and Issues



Selective breeding and improved strains



Culture gear evaluation



Species diversification

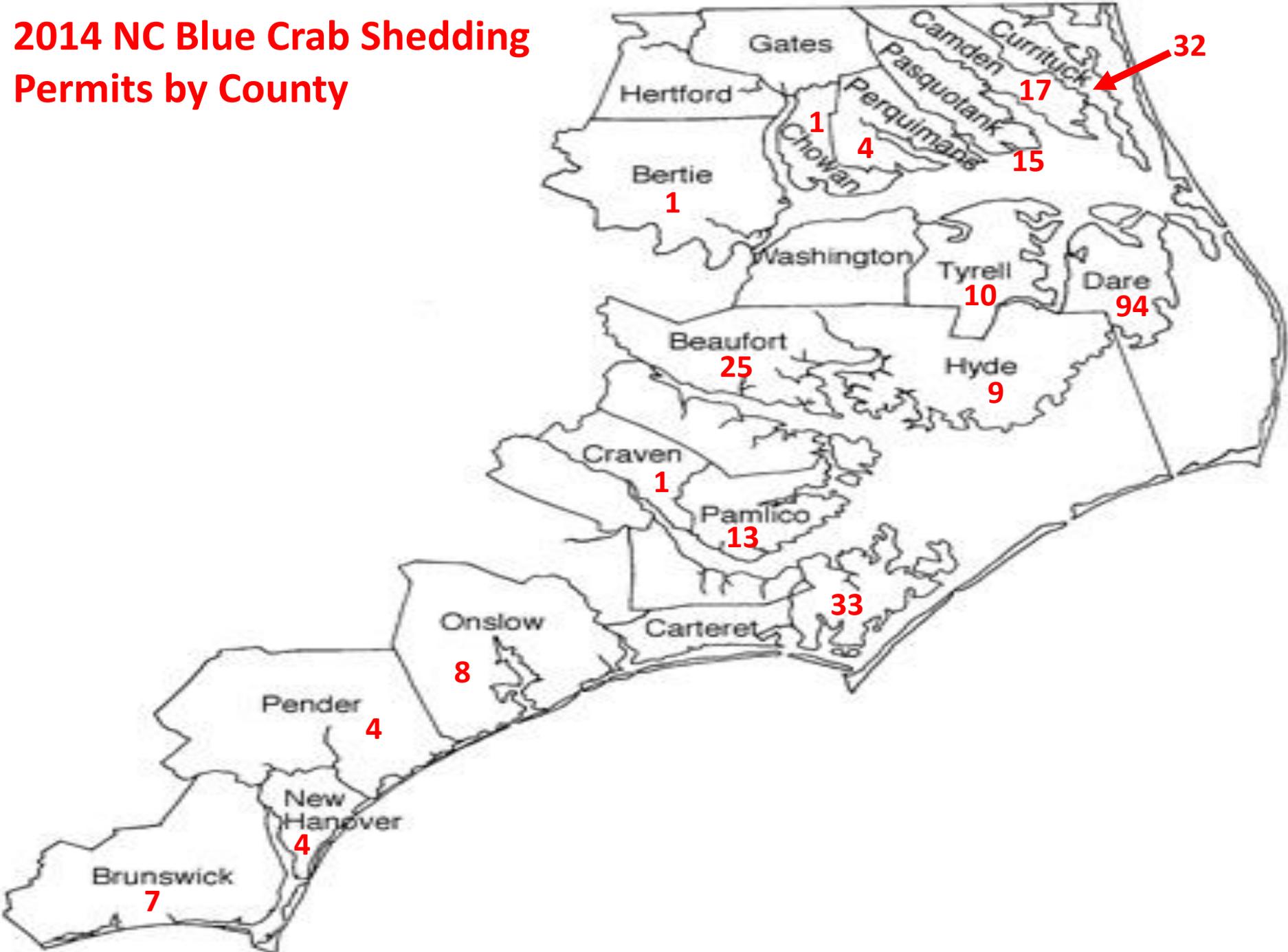


## 2014 North Carolina Blue Crab Shedding Industry Status Permits

279 permits (+ 4.1%)



# 2014 NC Blue Crab Shedding Permits by County



# 2014 North Carolina Blue Crab Shedding Industry Status

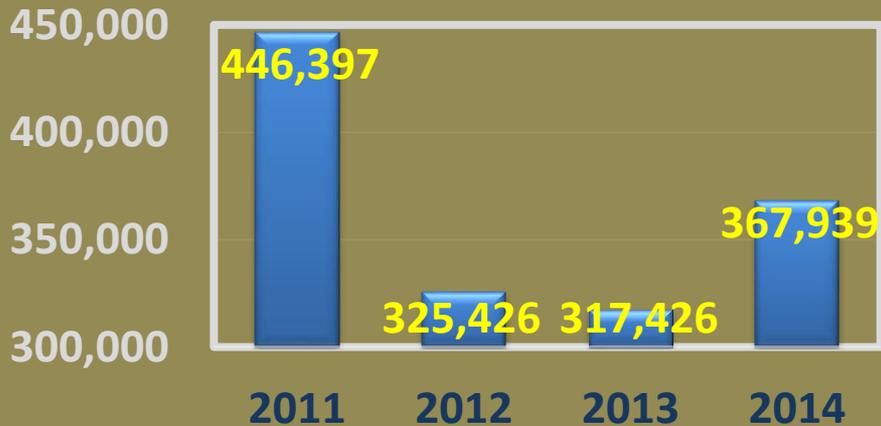
## Production and Farm-Gate Value



**367,939 lbs (+ 15.9%)**

**\$2.48 mill (+ 18.7%)**

### Production (lbs)



### Value (\$ million)



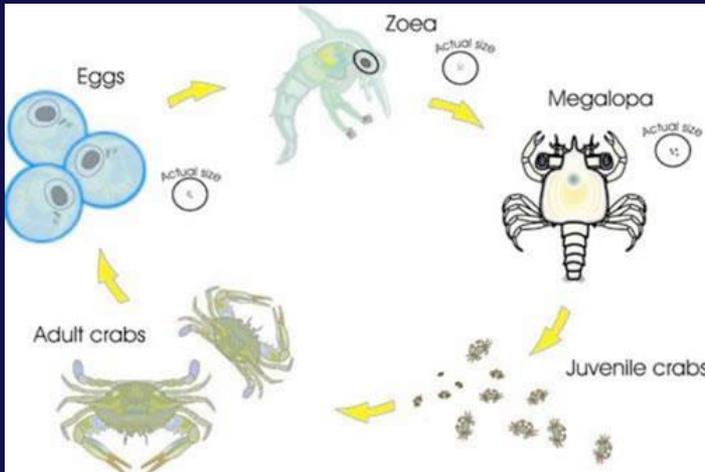
# North Carolina Crab Shedding Industry Trends and Issues



Dependence on wild “caught” product, reductions in stock  
Production based on seasonal availability (highly weather dependent)  
Strong market demand, price- timing is critical



# North Carolina Crab Shedding Industry Trends and Issues



Support research addressing reduced blue crab populations



Hatchery and nursery production of peeler crabs



Use of recirculating aquaculture systems

Alternate crops for off-season production



# On the Horizon (Developmental)



Marine finfish production



Super-intensive (biofloc) shrimp culture



## growing MARINE BAITFISH

A guide to  
Florida's common  
marine baitfish and  
their potential for  
aquaculture



Marine invertebrate and plant culture

- **NCSU & NC Extension**

- Harry Daniels: Freshwater Aquaculture Production

- **NC Sea Grant**

- Chuck Weirich: Marine Aquaculture Production

- **NCDA&CS**

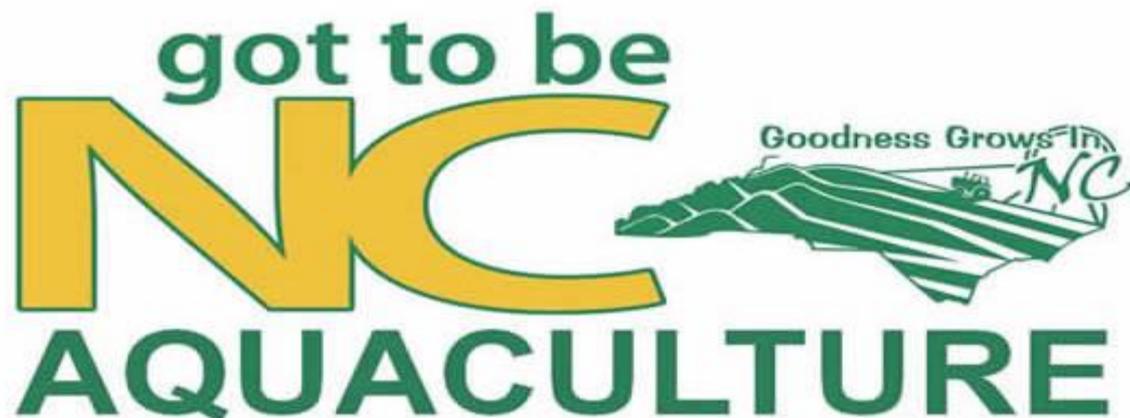
- Ron Fish: Aquaculture Industry Value & Resources

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- [Marketing Division Home](#)
- [Aquaculture Home](#)
- [About Aquaculture and the NCDA & CS](#)
- [Agribusiness Development](#)
- [Aquaculture Contacts](#)
- [NC Aquaculture Association](#)
- [NC Aquaculture Conference](#)
- [Obtaining an Aquaculture License](#)
- [Sources of NC Aquaculture Products](#)
- [Aquaculture Statistics](#)
- [Farm Pond Management](#)
- [NCDA & CS Aquaculture Publications](#)
- [Transport of live animals--contact information by state](#)
- [Links to other sites](#)

## Marketing



Aquaculture is the business of farming aquatic plants and animals. In North Carolina, farmers grow trout, catfish, hybrid striped bass, prawn, crawfish, ornamental fish, baitfish, clams and oysters.

North Carolina is one of the most aquaculture-friendly states in the US. The NC Department of Agriculture and Consumer Services is the lead agency for aquaculture, and [contacts in the Department](#) are here to assist you.

**NCDA&CS Marketing Division, Agribusiness Development - Ron Fish**  
1020 Mail Service Center Raleigh, North Carolina 27699-1020  
Phone: (919) 707-3119 – FAX: (919) 733-0999

# NCDA&CS and the NC Aquaculture Industry



North Carolina Aquaculture Association



*"Farming Fresh Alternatives"*



- HOME
- CONTACTS & STAFF LISTING
- PUBLIC WATER SUPPLY
- WATER PLANNING
- WATER QUALITY PERMITTING
- WATER QUALITY REGIONAL OPERATIONS
- WATER SCIENCES

Permits & Registration » Central Coastal Plain Capacity Use Area

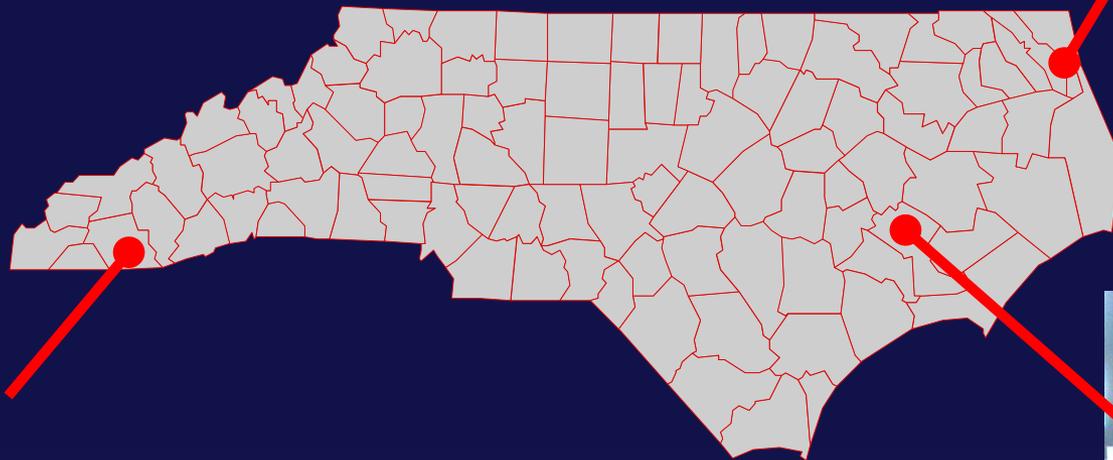
Central Coastal Plain Capacity Use Area





# Business Planning, Permitting & Marketing Assistance for North Carolina Aquaculture

John Aydlett  
Seafood Marketing  
(252) 331-4773



Debra Sloan  
Aquaculture-Agribusiness Advisor  
NASAC President, NC Representative  
Western NC (828) 524-1264

Pete Anderson  
Aquaculture Consultant  
NCAA Representative  
(252) 633-1477



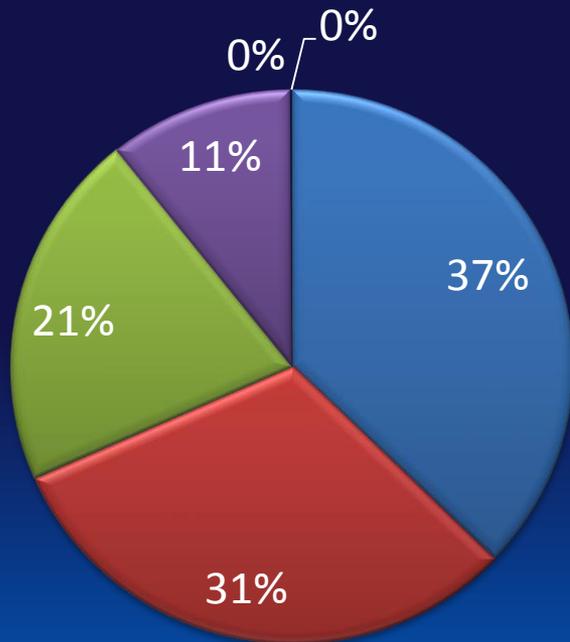


got to be **NC** AGRICULTURE



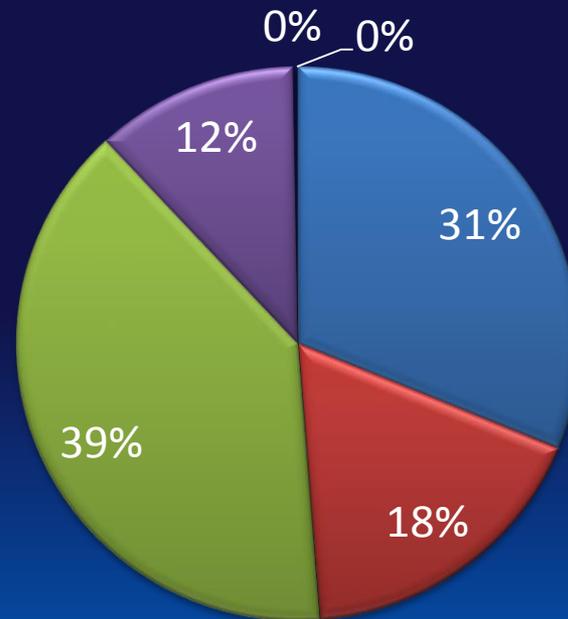
# 2014 North Carolina Aquaculture Industry Value Summary - Freshwater Species (food fish)

**% of Pounds from Food Fish Sold**  
**13,454,257 lbs.**



- Trout
- Catfish
- HSB
- Tilapia
- Prawns
- Crawfish

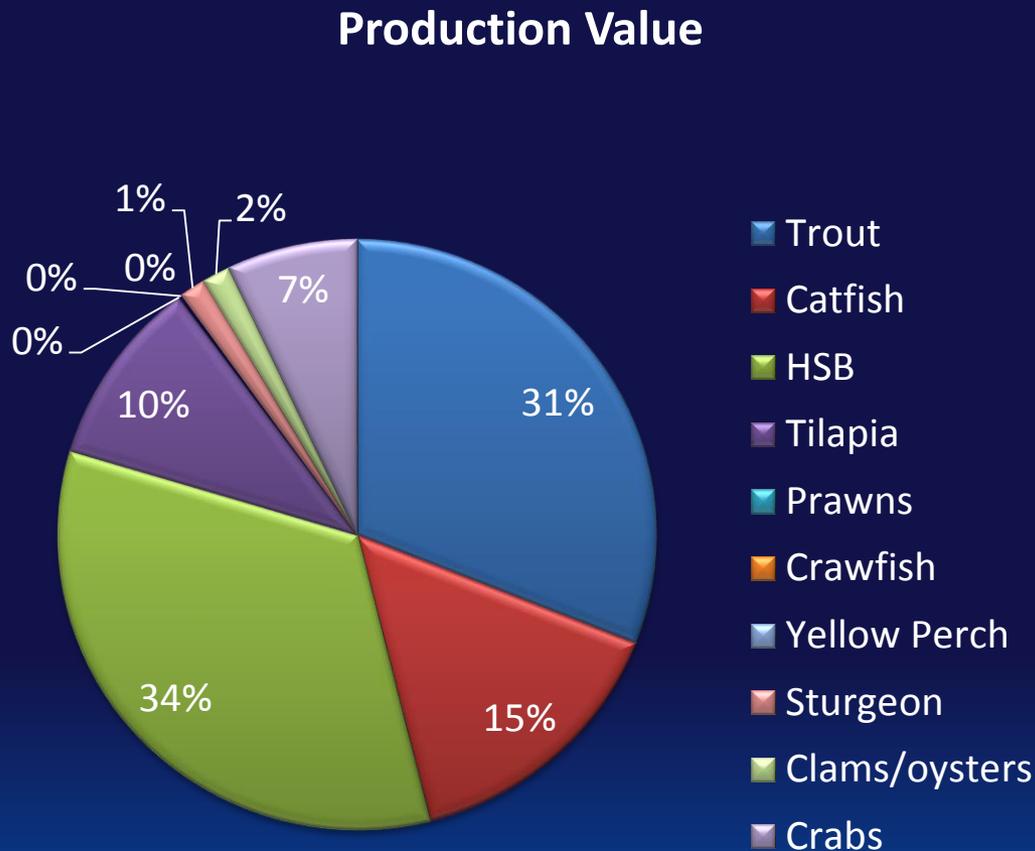
**% of Dollar Value from Farm Gate Food Fish Sales**  
**\$28,227,891**



- Trout
- Catfish
- HSB
- Tilapia
- Prawns
- Crawfish

# 2014 North Carolina Aquaculture Industry Summary - All Except Processed Product

- Includes :
  - Freshwater foodfish
  - Marine species
  - Fingerling production
  - All farms
  - 233 shellfish leases
  - 279 crab shedding permit holders



**Value= \$35,250,038 (-1.7%)**

# 2014 NC Aquaculture Industry Summary

- Processors and product value
  - 4 processing facilities, 3 Trout, 1 Catfish (n/c)

Processed product value= **\$19,272,600 (+5.2%)**



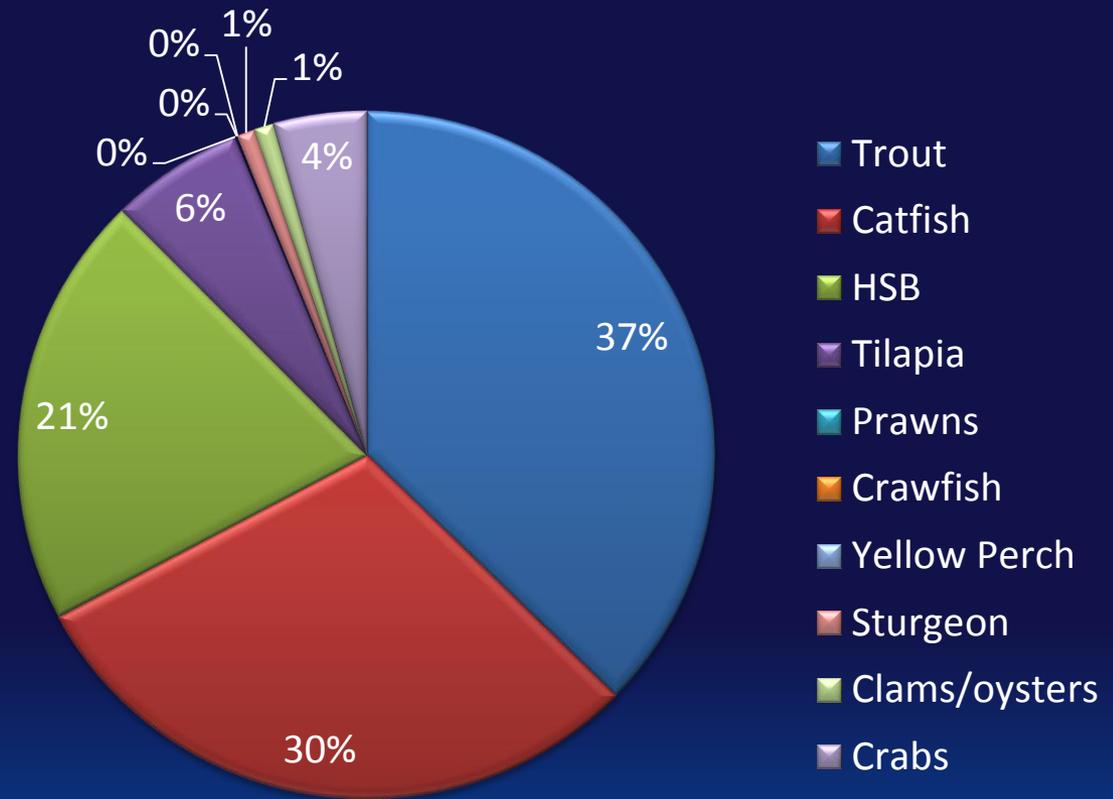
# 2014 NC Aquaculture Industry Summary

- Total Value

Includes :

- Production farm gate
- Processed product
- Feed produced

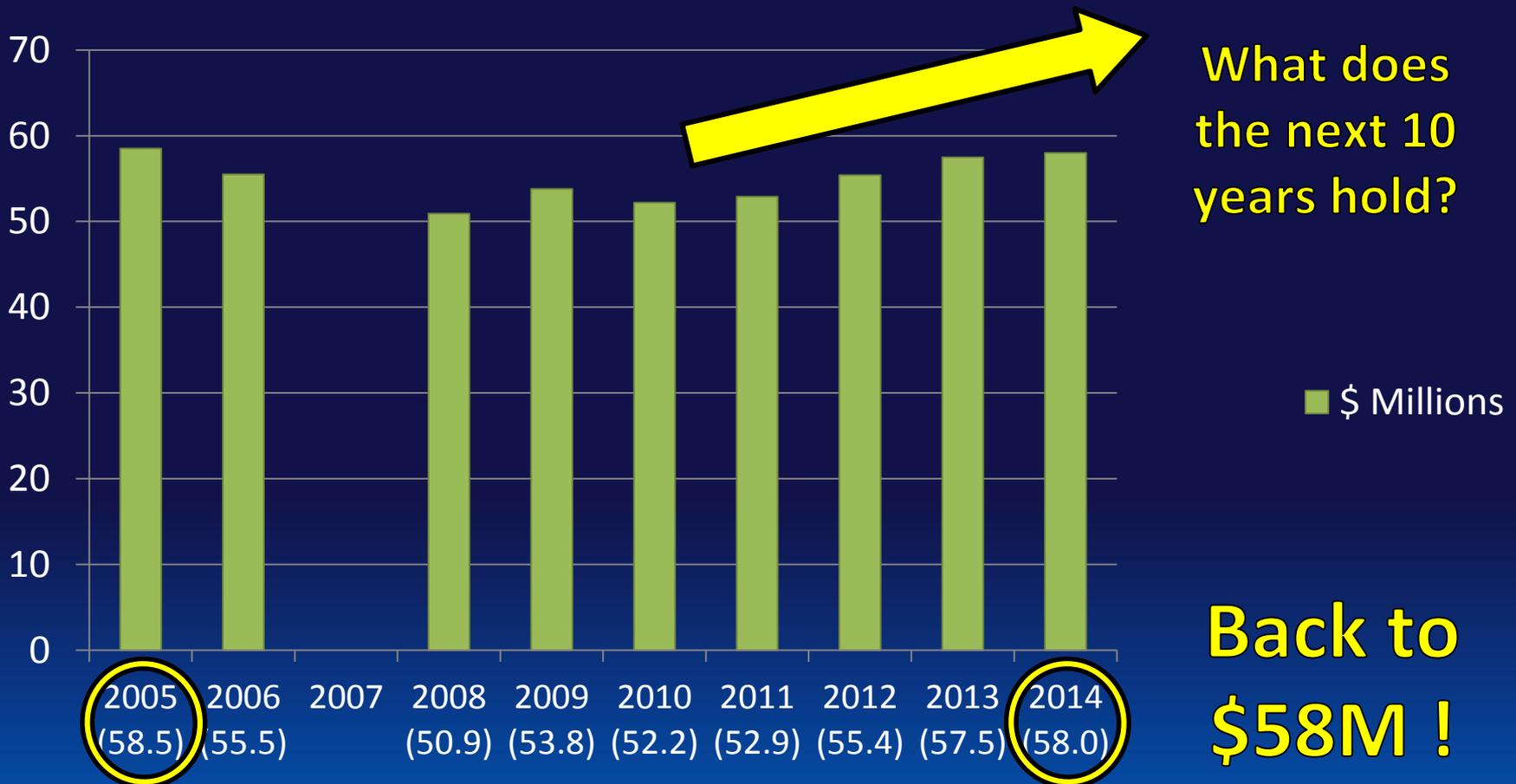
Production Value



**Value to NC = \$58,002,638 (+.84%)**

# So how do we keep it growing?

Total dollar value from the NC Aquaculture Industry according to NCADC State Update Presentations



# Aquaculture Education in North Carolina

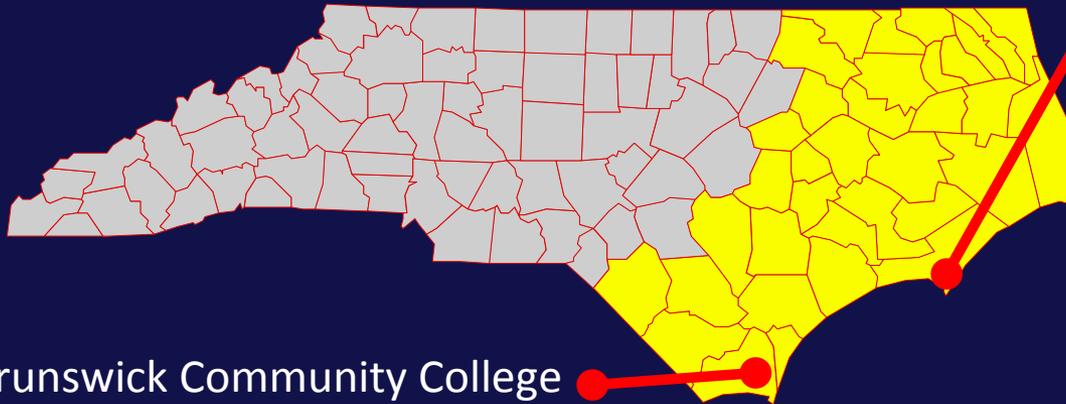
## *Teaching Science & Math through Aquaculture*

- High Schools
  - South Brunswick High School, Barry Bey



# Aquaculture Education in North Carolina

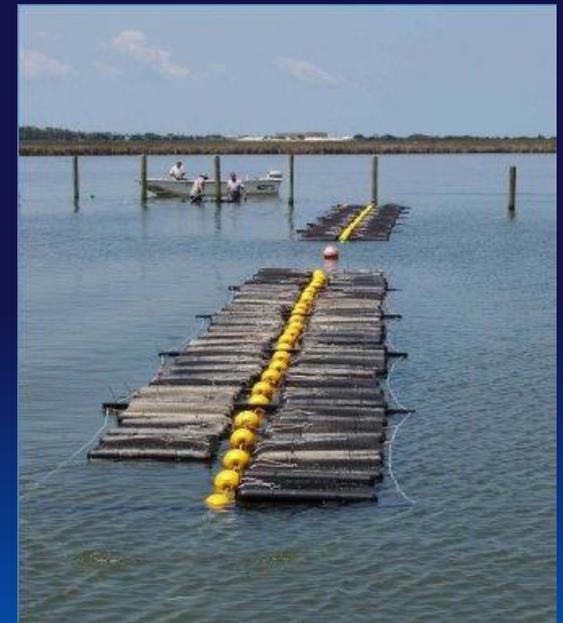
- NC Community College System



Carteret Community College  
(252 222-6114)



Brunswick Community College  
(910 755-7432)





## **2015 NC Aquaculture Development Conference Student Scholarship Application**

**Student Name:** \_\_\_\_\_

**Home Street Address:** \_\_\_\_\_  
(where your check will be sent)

**City, State, Zip Code:** \_\_\_\_\_

**School Attending:** \_\_\_\_\_

**Instructor/Professor:** \_\_\_\_\_

The NC Aquaculture Association (NCAA) is sponsoring partial scholarships for your attendance to this year's Aquaculture Development Conference. The scholarships will cover \$30 off the \$55 student registration fee, leaving you the ability to attend for only \$25.

There is a limited number of 30 scholarships available and offered on a first come, first serve basis ranked by postmark date. (Historically the number of scholarships has been under 30 students for past conferences.)

Please register online at: <http://www.ncaquaculture.org/registration.html>

# NC Aquaculture Association Representatives

*Your Farm, Your Voice, Your Success = OUR GOAL!*

## NCAA Board Members and Areas

Randy Gray – President – ALL\*

Nancy Sugg – Vice President – HSB

Christie Potts – Secretary – Markets

Dale Pridgen – Tilapia & RAS

Sterling Davenport – Crawfish

Sally Eason – Trout

Gary Dillon – Catfish

Charlene Jacobs – Prawn

Pete Anderson – Treasurer – NCDA Rep.



# NC Aquaculture Development Conference

27 years of a public/ private partnership

***THANK YOU AND ENJOY THE CONFERENCE!***

- Premier Sponsors
  - Pentair Aquatic Eco-Systems
  - NC Aquaculture Association
  - NC Farm Bureau
- General Sponsors
  - AquaCal
  - Carolina Classics Catfish
  - Skretting
  - YSI



North Carolina Aquaculture Association



*"Farming Fresh Alternatives"*

