

# Shellfish Mariculture Plan Final Report

Joint Legislative Oversight Committee on  
Agriculture and Natural and Economic Resources

*January 10th, 2019*



Policy  
Collaboratory

**Brad Ives**  
Executive Director



# Collaboratory leverage with Private funds

## Case Study: Donations

Energy Storage Project @ NCSU = \$108,650

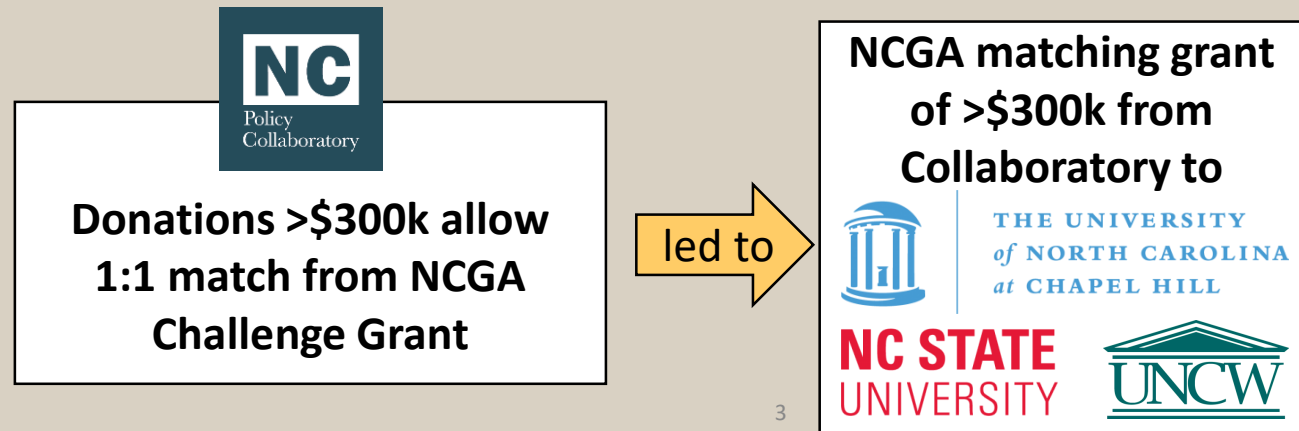
Unrestricted donation for PFAS = \$1,000

Enviro Data Intern Program @ UNCCH = \$21,000

Longleaf Pine Habitat @ NC Zoo and UNCW = \$10,000

Three Zeros Initiative @ UNCCH = \$20,000

UNCCH Gillings / RTI IMPACT project = \$150,000



# Collaboratory leverage with State funds

## Case Study: Hurricane Response

Collaboratory pilot funding for post Hurricane Matthew study at UNC Coastal Resilience Center leveraged additional funding and led to >\$750k in hurricane research



# Collaboratory leverage with State funds

## Case Study: PFAS research

Collaboratory match funding for Per- and Polyfluoroalkyl; Substance research at NC State (Detlef Knappe) leveraged additional funding and led to ~\$1.5M in PFAS research



# Where We Are

## Current Collaborative Campuses



THE UNIVERSITY  
*of* NORTH CAROLINA  
*at* CHAPEL HILL



**NC Central**  
UNIVERSITY

**NC STATE**  
UNIVERSITY



**ECU**

Appalachian  
STATE UNIVERSITY.



**NORTH CAROLINA  
AGRICULTURAL AND TECHNICAL  
STATE UNIVERSITY**



**UNC CHARLOTTE**

**Western  
Carolina**  
UNIVERSITY



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**Duke**  
UNIVERSITY

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Jeffrey Warren, PhD

Research Director

## Research Portfolio Summary (2017-19)

# Oyster / Coastal research = \$510,577.26\*



Peterson (UNCCH)	\$125,000
Fodrie (UNCCH)	\$141,634.63
STAR / Oyster Trail	\$27,500
EDPNC	\$8,800
NC Coastal Federation	\$26,486
NC Sea Grant	\$20,000
Gittman (ECU)	\$58,503.50
Eulie (UNCW)	\$17,653.13
Oyster Highway (Fodrie, UNCCH)	\$85,000

*\*Of total funding, \$150,000 was direct appropriation in FY 2017-18 supplemented through a combination of Collaboratory annual operating funds and matching funds from Collaboratory Challenge Grant authorized by NCGA*



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**Joel Fodrie, PhD**

Assistant Professor

Dept of Marine Sciences / Institute of Marine Sciences

UNC Chapel Hill

# NC Strategic Plan for Shellfish Mariculture: a Vision to 2030



January 10, 2019

NCGA Joint Oversight Committee on Agriculture and Natural and Economic Resources

# Legislative Mandate

S.L. 2016-94 Section 14.11.(d) & Senate Bill 257 Section 13.13.(b)

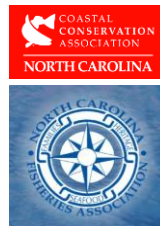
- Shellfish Mariculture Advisory Committee should examine topics to bolster NC's shellfish industry via stakeholder meetings
- Submit Strategic Plan to NCGA Joint Committee on Agriculture and Natural and Economic Resources

Result = 21 Major Recommendations (+4 Supplementary)

- Vision of Industry Development
- Supporting Shellfish Growers
- Meeting Promotional Needs
- Efficient Regulatory Structure
- Statutory Changes
- Improving Water Quality
- Research Needs

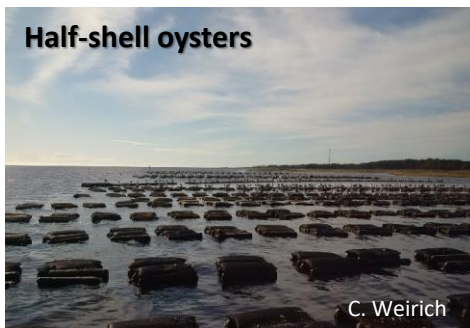


# Broad Stakeholder Participation



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Half-shell oysters



C. Weirich

Bushel oysters



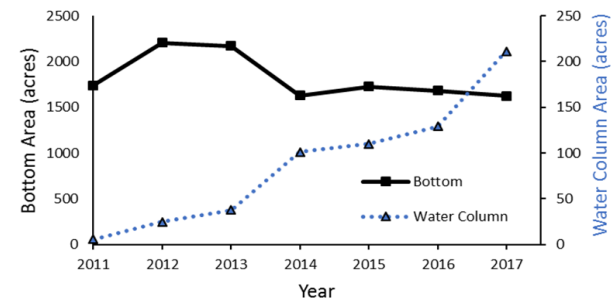
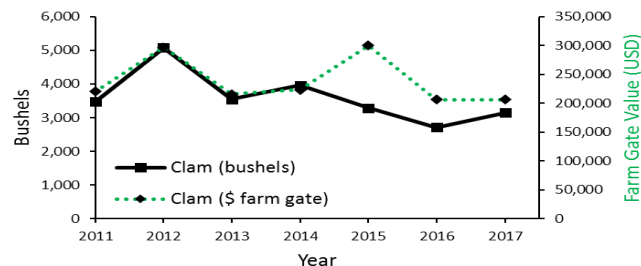
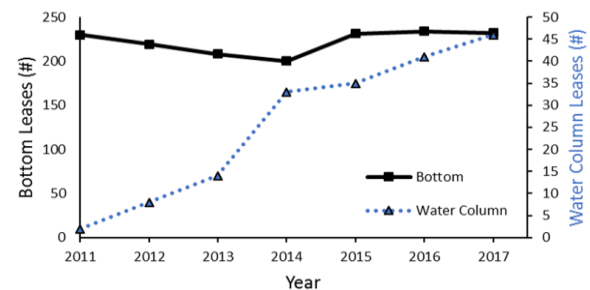
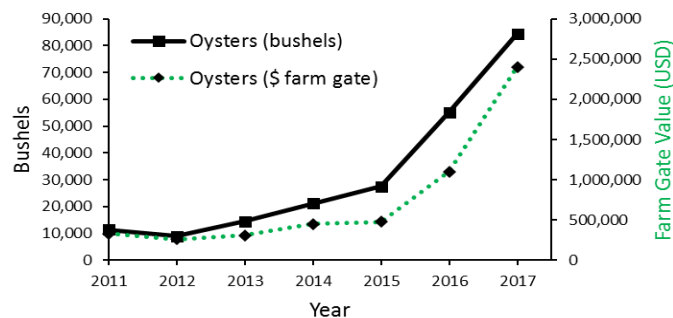
J&W Seafood

Clams



NCSG

# NC Shellfish Mariculture as a Economic Force: Current Trends and \$33M Farm-Gate Goal





# Constraints on Industry Growth

Inadequate insurance

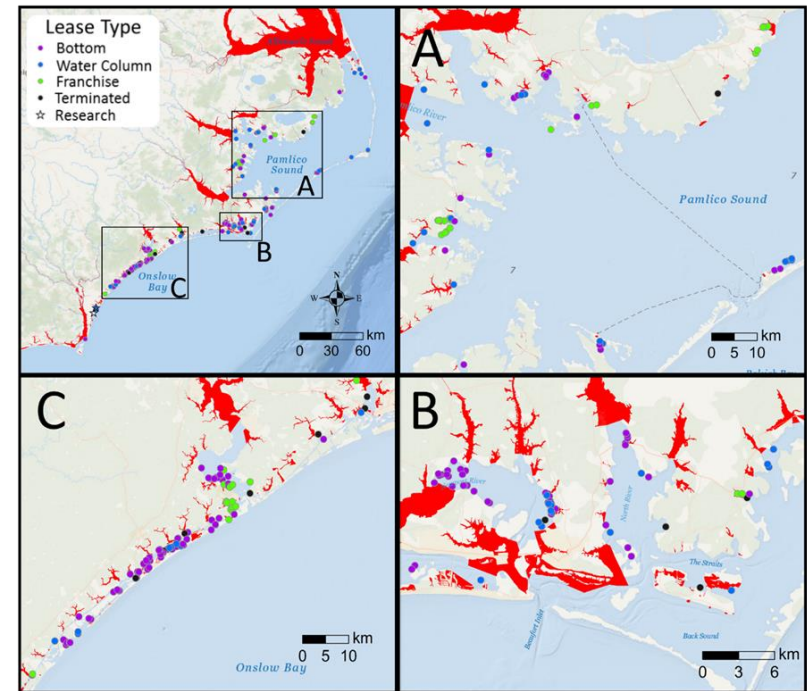
**Solution**: State support for NCSGA's efforts to develop a pilot Federal Crop Insurance Program for Farmed Shellfish

Lack of financing

**Solution**: State-supported low-interest loan program (MARBIDCO model)

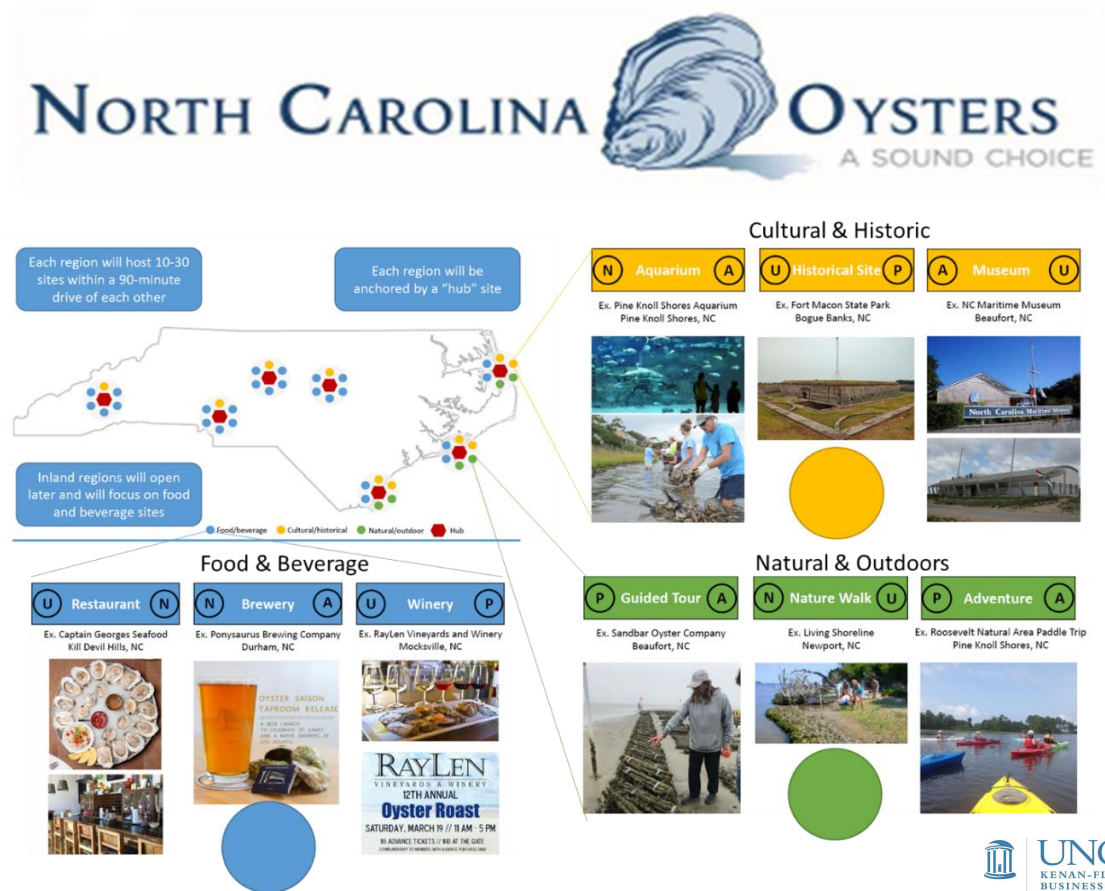
Permanent and temporary water closures

**Solutions**: (A) Strengthen NCDEQ water resources staffing  
(B) State-funded grant scoring should account for benefits to growing waters  
(C) Require LID for State projects as feasible



# Expanding NC Oyster Market Share and Distribution

- Conduct market analysis for NC oysters
- Build NC brand and marketing strategy (NCDA&CS involvement)
- Implement NC Oyster Trail



# What is the Right Growth Model for NC to \$33M?

State	Leases						Production								Shellfish Aquaculture Jobs			State Staffing for Mariculture Governance
	Water Column		Bottom		Cumulative		Oysters			Clams		Oysters	Clams	Data Year	Direct	Indirect	Year	
	# Leases	Acreage	# Leases	Acreage	# Leases	Acreage	Bushels	Pieces	Value	Pieces	Value	Bu/acre	Bu/acre					
ME	--	--	--	--	110	557	N/A	8,804,391	\$5,964,214	--	--	53	--	2014	500	500	2016	6.5**
NH	1.0	2.3	24.0	68.4	25	71	N/A	329,156	\$246,441	--	--	16	--	2017	24	--	2015	1
MA	--	--	--	--	360	1,259	N/A	38,251,358	\$21,711,683	5,554,641	\$132,806	101	11	2016	769	140	2013	2
RI	--	--	--	--	73	296	N/A	8,434,541	\$5,752,886	71,000	\$18,460	95	1	2017	194	--	2016	1
CT	326.0	30,669.0	674.0	22,422.0	1000	53,091	73,367	22,010,000	\$8,010,682	106,323,500	\$17,405,028	1	5	2010	350	--	2018	--
NY	--	--	--	--	859+	4,621	--	--	--	--	--	--	--	--	--	--	--	0 <sup>s</sup>
NJ	--	--	--	--	1742	<3876	N/A	2,029,500	\$1,370,060	--	--	2	--	2016	319+	--	2016	6
DE	--	--	--	--	21	21	Leasing began 2017, no production reported							2017	84+	--	2011	1.5
MD	57.0	222.0	309.0	3,960.0	334	4,182	21,362	3,838,037	\$2,769,867	--	--	8	--	2014	498	--	2014	8
VA	--	--	--	--	5500	120,000	27,000	38,900,000	\$15,900,000	176,000,000	\$37,500,000	1	4	2017	965	--	2016	--
NC	46.0	211.0	232.0	1,626.0	278	1,837	20,983	3,459,740	\$2,400,000	1,260,000	\$206,500	18	2	2017	228+	--	2011	2***
SC	--	112.4	--	946.0	23	1,058	2,520.0	--	\$375,117	2,969,865.0	\$407,333	2.4	7.0	2018	--	--	--	--
GA	--	--	--	--	17	29,186	1,328.0	--	\$119,876	9,488,160	\$1,611,613	0	0.8	2017	--	--	--	--
FL	60.0	156.0	549.0	1,259.0	609	1,415	--	--	--	126,600,000	\$11,900,000	--	224	2012	400	--	2016	7
AL	14.0	28.0	0.0	0.0	14	28	--	2,698,755	\$1,956,766	--	--	321	--	2016	30	--	2016	--
MS	0.0	0.0	7	623.2	7	623	--	299,900	--	--	--	2	--	2010	--	--	--	6
LA	--	--	--	--	8020	403,461	--	227,737,226	\$40,500,000	--	--	2	--	2013	--	4800	--	--
TX	--	--	--	--	43	2,270	--	28,571,428	\$3,700,000	--	--	42	--	2014	--	--	--	0 <sup>s</sup>
CA	--	--	--	--	17	878	--	16,121,835	\$16,096,460	257,640	\$42,940	61	1	2016	200	80	2010	5
OR	--	--	--	--	77	3,837	88,631	--	\$3,102,098	--	--	23	--	2017	--	--	--	0 <sup>s</sup>
WA	--	--	--	--	121	2,058	175,863	--	\$34,853,940	0	\$0	85	0	2013	1900	810	2010	--
AK	39.0	177.0	17.0	87.0	56	264	--	1,161,518	\$796,945	0	\$0	15	0	2016	166	--	2016	5**

(--) Data Unavailable

\*\*Administer all forms of mariculture (e.g. shellfish, seaweed, urchins)

\*\*\* 5 Additional staff assist, but budgetted from Benthic Mapping and Habitat Enhancement Sections

<sup>s</sup> Administered by employees under non-shellfish mariculture budgets



# Statutory Changes Needed to Reach \$33M



## Increased lease area

not unreasonably interfere

← CRITICAL CHANGE

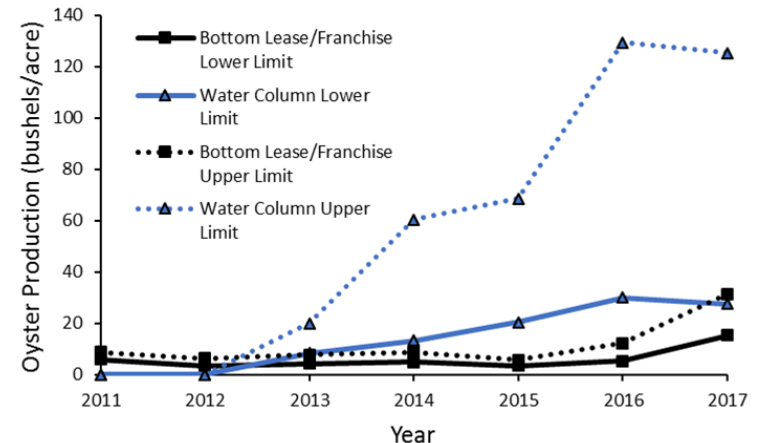
1. Reduce litigation: *Cultivation of shellfish in leased areas will ~~be compatible~~ with [other public uses] ... N.C.G.S. §113-202*
2. Shellfish Enterprise Areas (SEAs): multiple, connected parcels to be applied for and managed by the NC Division of Marine Fisheries
3. Ease paperwork for permitting a few 50-acre leases in Pamlico Sound



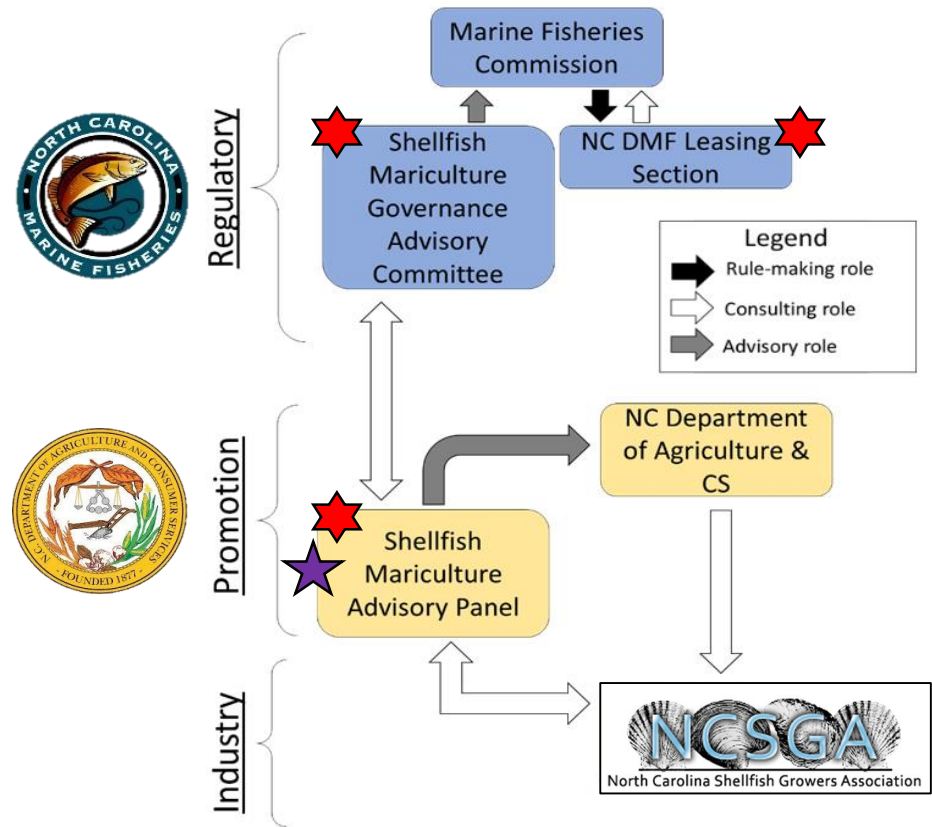
## Increased lease unit-area production\*

- Bottom leases: 40 bushels acre<sup>-1</sup> yr<sup>-1</sup> (up from 10)
- Water-column leases: 100 bushels acre<sup>-1</sup> yr<sup>-1</sup> (up from 40)

\* *production OR investment options*



# Regulatory and Promotion Frameworks to Support NC Shellfish Farming



- ★ New (i.e., needs to be created)
- ★ Responsible for annual report to NCSGA (i.e., accountability)



# Addressing Shellfish Mariculture Research Needs

- Shellfish Mariculture Grant program (NCSG administered)
  - Spatial planning/siting, triploid lines, human health (*Vibrio* spp.), etc.
- Mariculture Resource Grant program (NCSG administered)
  - Grower-led projects: technology transfer, product safety, crop diversification, etc.
- Aquaculture Business Agent (NCSG)

# NCGA and NC Agency Actions Already Supporting Shellfish Farms

- UNCW Shellfish Research Hatchery appropriations
- Northern Shellfish Sanitation Laboratory appropriations
- NCSU Shellfish Pathology Laboratory appropriations
- CCC's Aquaculture Technology Program appropriations
- Increasing % of NCDEQ expenditures directed toward shellfish mariculture
- N.C.G.S. §106-759 directing NCDA&CS to promote aquaculture
- Post-Florence inclusion of shellfish farmers in disaster recovery support





# What the NCGA can act on now!

Recommendation		Cost	
#	Summary	Non-Recurring Appropriation (\$)	Recurring Appropriation (\$)
1	Embrace a \$100 Million Industry Valuation Goal	\$0	\$0
2	Provide FCIC/RMA Concept Proposal Start-Up Funds	\$30,000	\$0
3	Establish a Low-Interest Loan Program	\$2,000,000	\$60,000
4	Specify Eligibility of Shellfish Growers for Agriculture Disaster Funds	\$0 <sup>1</sup>	\$0
5	Commission a Market Analysis	\$30,000	\$0
6	Fund a Shellfish Mariculture Advisory Panel at NCDA&CS	\$0	\$30,000
7	Fund Development of North Carolina Oyster Trail	\$0	\$200,000
8	Establish a Shellfish Mariculture Governance Advisory Committee	\$0	\$30,000
9	Establish a Shellfish Leasing Section at NCDMF	\$0	\$165,000*
10	Amend G.S. 113-202: Increase Secretary's Discretion	\$0	\$0
11	Establish Shellfish Enterprise Areas (SEAs)	\$0	\$0
12	Permit a capped number of larger leases	\$0	\$0
13	Increase Utilization Requirement	\$0	\$0
14	Increase Penalties for Theft from Shellfish Leases	\$0	\$0
15	Allow Nurseries in Prohibited Waters	\$0	\$0
16	Appropriate Funding for Additional NCDEQ Water Resources Staff	\$0	\$183,000*
17	Revise State Grant Scoring to Benefit High Priority Growing Areas	\$0	\$0
18	Require Low-Impact-Development for State Projects	\$0	\$0**
19	Establish a Shellfish Mariculture Grant Program	\$0	\$250,000
20	Establish a Mariculture Resource Grant Program	\$0	\$150,000
21	Fund an Additional Position at North Carolina Sea Grant	\$0	\$80,000 <sup>5</sup>
<b>Totals</b>		<b>\$2,060,000</b>	<b>\$1,138,000</b>

<sup>1</sup> Not a special ask for shellfish growers: Eligibility for disaster relief funds available to other forms of agriculture.  
\* Three Full Time Equivalent Positions (fringe included)  
\*\* Unknown indirect cost  
<sup>5</sup> One Full Time Equivalent Assistant Position (fringe included)



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Farm Income		
NC Rank	Commodities	2016
		<i>x 1000 Dollars</i>
1	Broilers	3,091,561
2	Hogs	2,103,444
3	Turkeys	993,389
4	Tobacco	668,596
5	Soybeans	543,241
6	Chicken eggs	444,403
7	Corn	429,589
8	Sweet potatoes	342,000
9	Cattle and calves	255,295
10	Dairy products, milk	164,160
11	Cotton	159,601
12	Cotton lint	131,619
13	Wheat	76,426
14	Peanuts	68,283
15	Blueberries	66,924
16	Hay	60,078
17	Tomatoes	51,894
18	Watermelon	29,198
19	Cottonseed	27,982
20	Strawberries	26,928
--	Mariculture Oysters	1,100
--	Mariculture Clams	260

# Justification for Appropriations

- 🐚 \$33M farm-gate \* 3x conservative multiplier = \$100M industry
- 🐚 Expands economic opportunities in coastal regions where K-12 schools, county administrations, hospitals, and Walmart are typically largest employers
- 🐚 Achieving \$33M farm-gate could support 1,000 on-the-water jobs. NCGA investment per job per year = 13.5K (an extremely efficient return)
- 🐚 Shellfish farming promotes environmental benefits related to water quality enhancement and finfish/crustacean fishery production that are unique compared to land-based agriculture





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