

Budget Justification – Year 1

Marine Aquaculture Demonstration Center for Economic Development

a. Personnel (\$299,128)

Salary (\$229,727)

Name	Salary/mo.	Months	Total
Reginald Blaylock, PI (Fall)	\$11,333	1.5	\$17,000
Eric Saillant, Co-PI (Summer)	\$8,441	3.0	\$25,323
Angelos Apeitos, Co-PI (Fall/Spring)	\$5,794	6.0	\$34,764
Andrew Gima, Sys Support Spec. (Fall/Spring)	\$5,167	6.0	\$31,002
Aquaculture Technician II	\$2,567	12.0	\$30,804
Aquaculture Technician III	\$2,742	6.0	\$16,452
Brooke Doucet, Lab Manager (Fall/Spring)	\$3,657	3.0	\$10,971
Kevin Bishop, Biologist II Finfish (Fall/Spring)	\$3,657	3.0	\$10,971
Graduate Students	\$1,900	12.0	\$22,800
Graduate Students	\$1,900	0.0	\$0
Interns / Seasonal Technicians	\$1,235	12.0	\$14,820
Interns / Seasonal Technicians	\$1,235	12.0	\$14,820

Fringe (\$69,405)

Name	%	Yr 1
Reginald Blaylock, PI	30.1028%	\$5,117
Eric Saillant, Co-PI	33.3523%	\$8,446
Angelos Apeitos, Co-PI	34.0362%	\$11,832
Andrew Gima, Sys Support Spec.	35.0110%	\$10,854
Aquaculture Technician II	44.1483%	\$13,599
Aquaculture Technician III	42.9886%	\$7,072
Brooke Doucet, Lab Manager	38.7347%	\$4,250
Kevin Bishop, Biologist II Finfish	38.7347%	\$4,250
Graduate Students	5.7746%	\$1,317
Graduate Students	5.7746%	\$0
Interns / Seasonal Technicians	9.0000%	\$1,334
Interns / Seasonal Technicians	9.0000%	\$1,334

The fringe benefit rate for full-time employees is calculated as a percentage of salary. The benefit includes health insurance \$4,536/year or \$378/mo), life insurance (\$0.09/\$1,000 per mo [\$30,000 min/\$100,000 max]), retirement (\$265,000 maximum gross salary), FICA social security (maximum taxable earnings is \$132,900) FICA medicare (1.45%; unlimited), unemployment (0.09%; \$85 per person per year), and worker's compensation (nonhazardous 0.7%, hazardous 5%; averages).

b. Travel (\$7,000)

Travel includes meetings (air [700], hotel [550], per diem [500]) = \$1750 per person for two people x two trips.

c. Equipment (\$322,500)

Tanks and raceway liners/covers, biofilters, heaters/chillers, harvester, ice slurry equipment, refrigerated food storage system, ozone, skimmers, pumps, and oxygen cones.

d. Supplies (\$230,000)

Culture supplies: Feed, seed, salt, chemicals, gases, feeders, plumbing, glassware, diagnostics, water quality meters/strips, small tanks, pumps, filters, nets, instruments, etc. pumps, growout gear, algae commodities, ploidy commodities; Repro assays, genetic typing, histology supplies; Class Supplies

e. Contractual costs (\$72,500)

3rd Party Service Fees (\$50,000), Health Certifications (\$7,500), Publications and a community event for providing project details to the general public (\$15,000).

f. Other costs (\$43,990)

1. Communications (\$10,000)

Shipping expenses

2. Rents (\$10,000)

USM Boat Rentals

3. Participant costs (\$0)

4. Professional Services (\$10,000)

Repair Fees.

5. Tuition (\$13,990)

6. Subcontracts (\$0)

g. Indirects (\$301,741)

The USM federally approved indirect charge rate is 48% and is applied to the direct cost base minus value of Equipment, Rents, and Tuition [$\$975,118 - \$346,490 * 0.48 = \$301,741$]. A negotiated rate agreement is included in this package.

TOTAL (Year 1) = \$1,276,859

Budget Justification – Year 2

Marine Aquaculture Demonstration Center for Economic Development

a. Personnel (\$273,920)

Salary (\$216,065)

Name	Salary/mo.	Months	Total
Reginald Blaylock, PI (Fall)	\$11,333	1.5	\$17,339
Eric Saillant, Co-PI (Summer)	\$8,441	2.0	\$17,220
Angelos Apeitos, Co-PI (Fall/Spring)	\$5,794	4.0	\$23,640
Andrew Gima, Sys Support Spec. (Fall/Spring)	\$5,167	2.0	\$10,541
Aquaculture Technician II	\$2,567	12.0	\$31,420
Aquaculture Technician III	\$2,742	6.0	\$16,781
Brooke Doucet, Lab Manager (Fall/Spring)	\$3,657	3.0	\$11,190
Kevin Bishop, Biologist II Finfish (Fall/Spring)	\$3,657	3.0	\$11,190
Graduate Students	\$1,900	12.0	\$23,256
Graduate Students	\$1,900	12.0	\$23,256
Interns / Seasonal Technicians	\$1,235	12.0	\$15,116
Interns / Seasonal Technicians	\$1,235	12.0	\$15,116

Fringe (\$57,859)

Name	%	Yr 2
Reginald Blaylock, PI	30.1028%	\$5,220
Eric Saillant, Co-PI	33.3523%	\$5,743
Angelos Apeitos, Co-PI	34.0362%	\$8,046
Andrew Gima, Sys Support Spec.	35.0110%	\$3,691
Aquaculture Technician II	44.1483%	\$13,871
Aquaculture Technician III	42.9886%	\$7,214
Brooke Doucet, Lab Manager	38.7347%	\$4,334

Kevin Bishop, Biologist II Finfish	38.7347%	\$4,334
Graduate Students	5.7746%	\$1,343
Graduate Students	5.7746%	\$1,343
Interns / Seasonal Technicians	9.0000%	\$1,360
Interns / Seasonal Technicians	9.0000%	\$1,360

The fringe benefit rate for full-time employees is calculated as a percentage of salary. The benefit includes health insurance \$4,536/year or \$378/mo), life insurance (\$0.09/\$1,000 per mo [\$30,000 min/\$100,000 max]), retirement (\$265,000 maximum gross salary), FICA social security (maximum taxable earnings is \$132,900) FICA medicare (1.45%; unlimited), unemployment (0.09%; \$85 per person per year), and worker's compensation (nonhazardous 0.7%, hazardous 5%; averages).

b. Travel (\$7,000)

Travel includes meetings (air [700], hotel [550], per diem [500]) = \$1750 per person for two people x two trips.

c. Equipment (\$120,000)

Tanks and raceway liners/covers, biofilters, heaters/chillers, harvester, ice slurry equipment, refrigerated food storage system, ozone, skimmers, pumps, and oxygen cones.

d. Supplies (\$180,000)

Culture supplies: Feed, seed, salt, chemicals, gases, feeders, plumbing, glassware, diagnostics, water quality meters/strips, small tanks, pumps, filters, nets, instruments, etc. pumps, growout gear, algae commodities, ploidy commodities; Repro assays, genetic typing, histology supplies; Class Supplies

e. Contractual costs (\$82,500)

3rd Party Service Fees (\$50,000), Health Certifications (\$7,500), Publications and a community event for providing project details to the general public (\$25,000).

f. Other costs (\$32,690)

1. Communications (\$5,000)

Shipping expenses

2. Rents (\$10,000)

USM Boat Rentals

3. Participant costs (\$0)

4. Professional Services (\$3,000)

Repair Fees.

5. Tuition (\$14,690)

6. Subcontracts (\$0)

g. Indirects (\$264,682)

The USM federally approved indirect charge rate is 48% and is applied to the direct cost base minus value of Equipment, Rents, and Tuition [$\$696,110 - \$144,690 * 0.48 = \$264,682$]. A negotiated rate agreement is included in this package.

TOTAL (Year 2) = \$960,792

Budget Justification – Year 3

Marine Aquaculture Demonstration Center for Economic Development

a. Personnel (\$287,073)

Salary (\$226,282)

Name	Salary/mo.	Months	Total
Reginald Blaylock, PI (Fall)	\$11,333	2.0	\$23,582
Eric Saillant, Co-PI (Summer)	\$8,441	2.0	\$17,564
Angelos Apeitos, Co-PI (Fall/Spring)	\$5,794	4.0	\$24,112
Andrew Gima, Sys Support Spec. (Fall/Spring)	\$5,167	2.0	\$10,751
Aquaculture Technician II	\$2,567	12.0	\$32,048
Aquaculture Technician III	\$2,742	6.0	\$17,117
Brooke Doucet, Lab Manager (Fall/Spring)	\$3,657	3.0	\$11,414
Kevin Bishop, Biologist II Finfish (Fall/Spring)	\$3,657	3.0	\$11,414
Graduate Students	\$1,900	12.0	\$23,721
Graduate Students	\$1,900	12.0	\$23,721
Interns / Seasonal Technicians	\$1,235	12.0	\$15,419
Interns / Seasonal Technicians	\$1,235	12.0	\$15,419

Fringe (\$60,793)

Name	%	Yr 2
Reginald Blaylock, PI	30.1028%	\$7,099
Eric Saillant, Co-PI	33.3523%	\$5,858

Angelos Apeitos, Co-PI	34.0362%	\$8,207
Andrew Gima, Sys Support Spec.	35.0110%	\$3,764
Aquaculture Technician II	44.1483%	\$14,149
Aquaculture Technician III	42.9886%	\$7,358
Brooke Doucet, Lab Manager	38.7347%	\$4,421
Kevin Bishop, Biologist II Finfish	38.7347%	\$4,421
Graduate Students	5.7746%	\$1,370
Graduate Students	5.7746%	\$1,370
Interns / Seasonal Technicians	9.0000%	\$1,388
Interns / Seasonal Technicians	9.0000%	\$1,388

The fringe benefit rate for full-time employees is calculated as a percentage of salary. The benefit includes health insurance \$4,536/year or \$378/mo), life insurance (\$0.09/\$1,000 per mo [\$30,000 min/\$100,000 max]), retirement (\$265,000 maximum gross salary), FICA social security (maximum taxable earnings is \$132,900) FICA Medicare (1.45%; unlimited), unemployment (0.09%; \$85 per person per year), and worker's compensation (nonhazardous 0.7%, hazardous 5%; averages).

b. Travel (\$7,000)

Travel includes meetings (air [700], hotel [550], per diem [500]) = \$1750 per person for two people x two trips.

c. Equipment (\$100,000)

Tanks and raceway liners/covers, biofilters, heaters/chillers, harvester, ice slurry equipment, refrigerated food storage system, ozone, skimmers, pumps, and oxygen cones.

d. Supplies (\$155,000)

Culture supplies: Feed, seed, salt, chemicals, gases, feeders, plumbing, glassware, diagnostics, water quality meters/strips, small tanks, pumps, filters, nets, instruments, etc. pumps, growout gear, algae commodities, ploidy commodities; Repro assays, genetic typing, histology supplies; Class Supplies

e. Contractual costs (\$87,500)

3rd Party Service Fees (\$50,000), Health Certifications (\$7,500), Publications and a community event for providing project details to the general public (\$30,000).

f. Other costs (\$29,131)

1. Communications (\$3,500)

Shipping expenses

2. Rents (\$7,000)

USM Boat Rentals

3. *Participant costs (\$0)*

4. *Professional Services (\$7,000)*

Repair Fees.

5. *Tuition (\$15,424)*

6. *Subcontracts (\$0)*

g. Indirects (\$260,675)

The USM federally approved indirect charge rate is 48% and is applied to the direct cost base minus value of Equipment, Rents, and Tuition [$\$665,497 - \$122,424 * 0.48 = \$260,675$]. A negotiated rate agreement is included in this package.

TOTAL (Year 3) = \$926,172

TOTAL PROJECT COST = \$3,163,823

PI: Blaylock, Reg
 Co-PIs: Saillant, Eric; Apeitos, Angelos
 Proposal Title: Marine Aquaculture Demonstration Center for Economic Development
 Agency: HDMR
 Start Date: 7/1/2025
 End Date: 6/30/2028

46,503 23%

	Monthly Pay Rate	Year 1		Year 2		Year 3		CUMMULATIVE Agency
		Agency	USM	Agency	USM	Agency	USM	
SALARY (SALARY)		# of Mos	# of Mos	# of Mos	# of Mos	# of Mos	# of Mos	
Reginald Blaylock, PI	11,333	1.5	0	1.5	0	2	0	57,921
Eric Saillant, Co-PI	8441	3	0	2	0	2	0	60,107
Angelos Apeitos, Co-PI	5794	6	0	4	0	4	0	82,516
Andrew Gima, Sys Specialists	5167	6	0	2	0	2	0	52,294
Aquaculture Technician II	2967	12	0	12	0	12	0	94,272
Aquaculture Technician III	2742	6	0	6	0	6	0	50,350
Brooke Doucet, Lab Manager	3657	3	0	3	0	3	0	33,575
Kevin Bishop, Biologist II Finfish	3657	3	0	3	0	3	0	33,575
Graduate Students	1900	12	0	12	0	12	0	69,777
Graduate Students	1900	0	0	12	0	12	0	46,977
Interns/ Part time technicians	1235	12	0	12	0	12	0	45,355
Interns/ Part time technicians	1235	12	0	12	0	12	0	45,355
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
Subtotal		229,727	0	216,065	0	226,282	0	672,074
FRINGE (FRINGE)								
Reginald Blaylock, PI	30.1028%	5,117	0	5,220	0	7,099	0	17,436
Eric Saillant, Co-PI	33.3523%	8,446	0	5,743	0	5,858	0	20,047
Angelos Apeitos, Co-PI	34.0362%	11,832	0	8,046	0	8,207	0	28,085
Andrew Gima, Sys Specialists	35.0110%	10,854	0	3,691	0	3,764	0	18,309
Aquaculture Technician II	44.1453%	13,599	0	13,871	0	14,149	0	41,619
Aquaculture Technician III	42.9896%	7,072	0	7,214	0	7,358	0	21,644
Brooke Doucet, Lab Manager	38.7347%	4,250	0	4,334	0	4,421	0	13,005
Kevin Bishop, Biologist II Finfish	38.7347%	4,250	0	4,334	0	4,421	0	13,005
Graduate Students	5.7746%	1,317	0	1,343	0	1,370	0	4,030
Graduate Students	5.7746%	0	0	1,343	0	1,370	0	2,713
Interns/ Part time technicians	9.0000%	1,334	0	1,360	0	1,388	0	4,082
Interns/ Part time technicians	9.0000%	1,334	0	1,360	0	1,388	0	4,082
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
Subtotal		69,405	0	57,859	0	60,793	0	188,057
TOTAL PERSONNEL		299,132	0	273,924	0	287,075	0	860,121
COMMODITIES (COMMOD)		230,000	0	180,000	0	155,000	0	565,000
Salt water@\$0.08/ liter, microdiets, Granular and extruded pellet dry diets @ \$67.00 to \$2.64/ kg, Raw diets @ \$10.73/ kg, vitamin supplements @ \$25/ batch, live feeds @ \$10,500/ run, Quarantine commodities @ \$3000/ batch, feeders @ \$2500-\$300 per, test strips and water quality commodities @ \$3,800/ year, Chemicals @ \$4,000/ year, Misc. husbandry supplies @ \$6000-\$8000/ year, seed supplies @ \$0.08/egg (finfish), \$31.00/million (rotifers-start up cultures), circulation pumps @ \$300-\$1200 per pump, Filter media @ \$200/ CF, PVC supplies @ \$15,000 to \$25,000/ year, Glassware and lab supplies @ \$15,000/ year		150,000		100,000		75,000		325,000
Culture supplies: Feed, seed, salt, chemicals, gases, feeders, plumbing, glassware, diagnostics, water quality, small tanks, pumps, filters, nets, etc.		75,000		75,000		75,000		225,000
Repro assays, genetic typing, histology supplies		5,000		5,000		5,000		15,000
class supplies		10,000		5,000		3,500		18,500
shipping		10,000		5,000		3,500		18,500
COMMUNICATIONS (COMCAT)		10,000	0	5,000	0	3,500	0	18,500
CONTRACTUAL SERVICES (OTCSVC)		72,500	0	82,500	0	87,500	0	242,500
3rd party service fees		50,000		50,000		50,000		150,000
health certifications		7,500		7,500		7,500		22,500
Publication/public relations costs		15,000		25,000		30,000		70,000
PROFESSIONAL FEES (PROFES)		10,000	0	3,000	0	3,000	0	16,000
repair services		10,000		3,000		3,000		16,000
TRAVEL (TRAVEL)		7,000	0	7,000	0	7,000	0	21,000
mileage sampling etc		0		0		0		0
Travel to meetings		7,000		7,000		7,000		21,000
EQUIPMENT (EQUIP) (>\$5,000)		322,500	0	120,000	0	100,000	0	542,500
tanks/raceway liners/covers		50,000		50,000		50,000		150,000
biofilters		60,000		0		25,000		85,000
heater/chillers		80,000		35,000		0		115,000
Harvester		50,000		0		0		50,000
Ice slurry equipment		17,500		0		0		17,500
Refrigerated Food Storage		15,000		0		0		15,000
ozone, skimmers, pumps, oxygen cones		50,000		35,000		25,000		110,000
PARTICIPANT COSTS (PARTIC)		0	0	0	0	0	0	0
RENTS (RENTS)		10,000	0	10,000	0	7,000	0	27,000
USM boat rental		10,000		10,000		7,000		27,000
collections@ \$500/ trip		0	0	0	0	0	0	0
SUBCONTRACTS (SUBCON) (F&A charged on first \$25K/sub)		0	0	0	0	0	0	0
Sub A (add total sub amount; need separate detailed budget)		0	0	0	0	0	0	0
Sub B (add total sub amount; need separate detailed budget)		0	0	0	0	0	0	0
Sub C (add total sub amount; need separate detailed budget)		0	0	0	0	0	0	0
TUITION (SCHOL)		13,990	0	14,690	0	15,424	0	44,104
(AY20-21: \$10,250 (in-state) + 5% increase/yr; add \$2,000 for OOS, if needed)		13,990		14,690		15,424		44,104
TOTAL DIRECT COSTS		975,118	0	696,110	0	665,497	0	2,336,725
MTDC		628,628	0	551,420	0	543,073	0	1,723,121
F&A (INDIRT) MTDC		301,741	0	264,682	0	260,675	0	827,098
*Adjust % as needed		48%		48%		48%		0
TOTAL PROJECTS COSTS		1,276,859	0	960,792	0	926,172	0	3,165,023

Marine Aquaculture Demonstration Center for Economic Development

PROJECT NAME: Marine Aquaculture Demonstration Center for Economic Development

CONTACT: The University of Southern Mississippi, Reginald Blaylock, PhD., [mail to: reg.blaylock@usm.edu](mailto:reg.blaylock@usm.edu), 703 East Beach Blvd, Ocean Springs, MS, 228-818-8003

PROJECT LOCATION: Jackson County, Mississippi

AMOUNTED REQUESTED: \$3,138,916

PROJECT PERIOD: July 1, 2025 – June 30, 2028

PROJECT DESCRIPTION:

Aquaculture, the fastest growing sector of food production (FAO, 2018), already accounts for more than half the production of seafood products worldwide and is forecast to grow by another 14% by 2030 (FAO, 2022). By some estimates, protein production will need to double by 2050 to meet the growing demand of a burgeoning human population (Hencion et.al., 2017). Marine finfish are a relatively cheap, efficient, and sustainable source of healthy protein that could improve access to highly nutritional foods. However, the US ranks 18th in world aquaculture production (FAO, 2022) and meets the domestic seafood demand by importing up to 85% of the seafood consumed (NMFS,2022). As a result, the supply is not secure and we have little control over the quality of products.

Products of marine origin comprise the majority of seafood consumed in the US (65%) and the majority of the imports (79%). However, the growth of the marine aquaculture industry in the US and in general has been constrained by a variety of technological, biological, economic, regulatory, and perception issues. Diversification of seafood products through innovative aquaculture techniques can help build a resilient industry and increase domestic seafood production to fortify food production and distribution systems, meet growing demand, improve the health of the population, reduce poverty, and create a skilled workforce. Domestically, the economic successes of aquaculture in other regions such as New England where \$150 million worth of seafood annually is generated through aquaculture production has created a recognition in their coastal community that aquaculture presents a sustainable business option. Mississippi has the infrastructure such as processing plants, seafood markets, and working waterfronts to support the development of a successful aquaculture sector. Aquaculture operated locally could provide a reliable supply of locally-produced fresh marine fish products to meet the demand and contribute to improvement of health and economic development. Economic impacts extend beyond the establishment of farms as other businesses such as feed suppliers, equipment companies, and repair shops needed to support aquaculture also grow in local communities as the aquaculture industry expands. In addition, aquaculture operations spur technological innovation as current production processes use advanced remote sensing, unmanned systems, and artificial intelligence thus fueling this sector of the blue economy to meet industry needs.

Substantial upfront capital investment is still a major hurdle entrepreneurs need to overcome. The long lag time between initial investment and return also may contribute to discouraging investors, and proven business models for marine aquaculture production systems addressing this bottleneck are still lacking (Sea Grant, 2016). Public-private partnerships will more quickly propel the US marine aquaculture industry forward than stand-alone programs and increase the ability of both government and non-government agencies to facilitate industry development and address priorities as outlined in the White House Executive Order 13921, "Promoting American Seafood Competitiveness and Economic Growth."

Developing marine aquaculture businesses need support for solving problems related to hatchery and growout production system engineering, biological issues such as reproduction, disease, and nutrition that constrain the viability of culture for commercially valuable species,

economic issues that impede effective sales, marketing, and business planning, regulatory issues that impede cohesive policy, permitting, and seafood safety regulations, and technology transfer and outreach/education issues that affect the successful development of an industry and the public's perception of farmed seafood.

By leveraging the financial assistance of GOMESA with the expertise, infrastructure, and relationships of the University of Southern Mississippi's Thad Cochran Marine Aquaculture Center, this project will create a Demonstration Center focused on the development of small- to medium-sized aquaculture enterprises. Demonstration Centers are setup as mechanisms for accomplishing research and development and for providing training for people. Demonstration Centers are a valuable tool and have been used for educating and training farmers since the early 1900's (Kittrell, 1974). Results, driven by nature of design, allow demonstrations to test best production methods and generate the financial, technical and biological information necessary for informed decisions. As such, this project will assist in research and development and provide mentoring, business management, and training support that will help overcome the hurdles that constrain the development of marine aquaculture businesses and facilitate workforce development, development of aquaculture businesses and jobs, and a supply of safe, healthy, local seafood.

The Marine Aquaculture Demonstration Center will:

- 1) Provide the infrastructure and expertise to assist the private sector in testing production technologies on a medium to large scale,
- 2) Provide marketing and business planning, including evaluating investment and regulatory risks for commercial scale production,
- 3) Support technology transfer and commercialization, and
- 4) Provide workforce training.

USM Capabilities:

The University of Southern Mississippi is designated an R1 Doctoral University by the Carnegie Classification of Institutions of Higher Education representing the highest level of research activity for universities. The Thad Cochran Marine Aquaculture Center (TCMAC) is a \$25 million advanced research center and innovation hub. The mission of the Center is to drive aquaculture innovation by alleviating the bottlenecks that constrain the production of marine species. Facilities consist of 100,000 ft² in 13 buildings including 50,000 ft² of culture space for animals and live feeds and 10,000 ft² of experimental space designed to accommodate replicated studies in isolated and biosecure small-, medium-, and large-scale systems with single-pass climate control and generator back-up. The facility is gated, and operating protocols maintain a high level of biosecurity. TCMAC has broodstock, hatchery, nursery, and growout facilities that employ artificial seawater and recirculating aquaculture systems to produce marine species including finfish, crustaceans, molluscan shellfish, algae, and other live feeds.

TCMAC supports industry, academic institutions, government agencies, and non-governmental entities in the advancement of technologies for sustainable marine aquaculture on land and in coastal and marine environments. The Center offers multiple avenues for partnerships, including space and equipment leases, support laboratories, services and research contracts and is committed to establishing mutually beneficial partnerships.

Throughout the years, entrepreneurs, established businesses, government, and not-for-profits have toured the Center, sought advice and information, and partnered with Center researchers.

TCMAC focuses on advancing development and research programs dedicated to aquatic health, genetics, larviculture, reproductive physiology, nutrition/live feeds, recirculating aquaculture system design, technology, site assessment, business planning, and offshore and nearshore aquaculture. TCMAC in conjunction with The USM's Office of Innovation Management and the University of Southern Mississippi's Research Foundation will offer support services being developed in conjunction with the Gulf Blue Initiative. Gulf Blue supports

Blue Economy innovation by bridging the gap between technology innovation and commercialization by providing associated businesses with access to mentoring, program management, business services and critical maritime infrastructure. Also, Gulf Blue hosts an annual Blue Economy accelerator program, Gulf Blue Navigator, which is a cohort-based program for late-stage technology companies. This program is designed to accelerate the growth of these companies and attract them to do business in Mississippi.

JUSTIFICATION:

GOMESA AUTHORIZED USES:

(1) Mitigation of damage to fish, wildlife, or natural resources:

Aquaculture production must increase to alleviate the pressure on overexploited stocks and the pressure to overfish stocks to meet the increasing demand for seafood protein. Wild capture fisheries production has remained stagnant since the late 1980's and the contribution of aquaculture to the supply of this demand for fisheries products has grown from 10% in the late 1980's to over 50% currently (FAO, 2018). The demand for seafood products is expected to grow by more than 20% over the next 20 years (World Bank, 2013). This increased seafood demand cannot be met by increasing wild harvest as most stocks are being fished at or above the maximum sustainable yield (FAO, 2018).

(2) Implementation of federally approved marine coastal or comprehensive conservation management plan:

This project addresses goals outlined in the federally approved "Coast Ecosystem Restoration Council Comprehensive Plan, Restoring the Gulf Coast's Ecosystem and Economy." Specifically, this project addresses **Goal 4, Enhance Community Resilience and Goal 5, Restore and Revitalize the Gulf Economy.**

The Mississippi Gulf Coast marine resources have suffered from the impacts of freshwater flooding, hurricanes, harmful algal blooms, and the Deepwater Horizon oil spill. These disasters have reduced the abundance of some key commercial fisheries resources and have reduced jobs in the seafood industry. Between 2004 and 2014 core maritime industries including fresh and frozen seafood processing, fish and seafood merchant wholesalers, and seafood markets saw job declines of 54%, 10% and 33%, respectively (Mississippi's Blue Economy, 2014). Although the same report was unable to capture information on the fishing industry, commercial license sales in Mississippi between 2004 and 2014 decreased by 270 (GSMFC, 2015). Additionally, commercial landings from 2004 to 2014 for Mississippi's key commercial species including shrimp, crab, oyster, red drum, flounder, and spotted sea trout decreased by 7.5 million pounds according to NMFS Annual Commercial Landings database. Declines in resources, environmental challenges, and declining jobs not only impact the economy but the cultural heritage of the maritime industry on the MS Gulf Coast. Aquaculture is a mechanism to impart resiliency and sustainability in the economy by diversifying seafood supply, creating jobs and continuing the traditions of the maritime sector.

(3) Mitigation of the impact of Outer Continental Shelf activities through funding of onshore infrastructure projects:

The dependence of key aquaculture species on inshore habitats makes them potentially vulnerable to depletion following impacts from environmental stressors such as pollution derived from outer continental shelf activities. This project could contribute to mitigating damage of the resources from impacts of outer continental shelf activities by providing a fishery-independent source of fingerlings cultured in a safe, controlled environment to support a restoration program while mitigating interruptions to the supply of healthy seafood to meet local demand, a process

that mitigates revenue losses of coastal communities promoting financial stability and economic growth.

BUDGET:

Category	Year 1	Year 2	Year 3	Total
Personnel (Salary and Fringe)	299,128	273,920	287,073	860,121
Commodities incl. Shipping	240,000	185,000	158,500	583,500
Contractual	72,500	82,500	87,500	242,500
Travel	7,000	7,000	7,000	21,000
Equipment	322,500	120,000	100,000	542,500
Rents (Vessel)	10,000	10,000	7,000	27,000
Other (Prof. fees)	10,000	3,000	3,000	16,000
Total Direct	975,118	696,110	665,497	2,336,725
Modified Total Direct Cost (MTDC)	628,628	551,420	543,073	1,723,121
F&A MTDC 48%	301,741	264,682	260,675	827,098
Total Cost	1,276,859	960,792	926,172	3,163,823

Budget Justification:

Personnel includes time for research scientists, hatchery staff, curriculum development team, instructors, a full-time program coordinator, a full-time extension agent, graduate students, and paid internships. **Commodities** plus shipping cost is for hatchery or class-based supplies and includes, but is not limited to, feed, seed, salt, chemicals, gases, feeders, plumbing, glassware, diagnostics, water quality meters/strips, small tanks, pumps, filters, nets, and instruments. **Contractual** includes third party service fees such as health checks, diagnostics, public relations costs for recruiting and promoting classes and Innovation services for business planning, prototyping and fabrication access. **Equipment** needed for this program to expand commercial scale production includes a fish harvester, ice bath slurry, food storage, and heater chiller. **Rents** for this project are USM research vessel cost for broodstock collection. **Other** includes subcontracts for outside expertise. **Modified total direct costing** is applied to this project administered by the Department of Interior and the on-campus **Facilities and Administration** is charged in accordance with USM’s federally negotiated rate.

GOALS AND OBJECTIVES:

The **goal** of this program is to stimulate and facilitate aquaculture business development on the Mississippi Gulf Coast.

Objective 1: Partner with private businesses and entrepreneurs to address constraints that impede the development of marine aquaculture by providing access to USM’s personnel, infrastructure, and innovation capabilities.

a). Species centric partnerships aimed at optimizing production for marine finfish species.

The Center will vet and select up to 2 private/industry partners for engagement to optimize the production of marine finfish species. Species for this project will be limited in range to the Gulf of Mexico region and the technological readiness level associated with species provided by the

special report, Status of Marine Finfish Species for US Aquaculture will be considered in selection (Davis et al., 2017). Species centric partnerships are limited in number due to the life cycle of fish. The focus of these partnerships will be to optimize production by addressing the technological, biological, economic, and regulatory constraints for commercial development. Additionally, the Center can assist the partner with facility design, infrastructure needs, site selection, financial documentation, and operating procedures for business development. Selected Industry partners will provide funding match.

b). Technology centric partnerships aimed at creating and demonstrating new aquaculture technologies.

The Center will vet and select up to 4 companies for engagement in developing or demonstrating technological advances in marine aquaculture. The Center will work with Gulf Blue IP and other partners to identify and evaluate companies with technology needing demonstration, testing, or assistance with product development to advance marine aquaculture. These partnerships will leverage the research expertise to assist in technology development, demonstration, and evaluation of the product. In addition to access to the infrastructure of TCMAC for testing and demonstration, access for prototyping and fabrication can be provided as well as start-up business support services and support for technology transfer to aid in commercialization. Selected industry partners will provide funding match.

Objective 2: Provide workforce training and hands-on aquaculture training opportunities.

The Center will create certificate-based training programs that address topics and skills needed by the industry including system design and engineering, hatchery and growout production techniques, captive reproduction and larval rearing, disease management and biosecurity, water quality, data management and analysis, regulatory compliance, and business entrepreneurship. These programs will provide hands-on training and experience that are much needed by the growing aquaculture sector (BEC, 2020). The Center will work with industry, government agencies and non-profits to develop curriculum and the focus will be diversified to include multi-species management, new technologies and production systems. Internships, high-school externships, and graduate student programing will also be supported as part of this program.

Timeline

	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Finfish												
OBJECTIVES												
Demonstration of Partnerships	Demonstration of Partnerships											
<i>Species Centric Finfish 1 Demo</i>					Species Centric Finfish 1 Demo							
<i>Species Centric Finfish 2 Demo</i>									Species Centric Finfish 2 Demo			
<i>Technology Centric Cohort 1</i>					Technology Centric Cohort 1							
<i>Technology Centric Cohort 2</i>									Technology Centric Cohort 2			
Workforce Development	Workforce Development											
Curriculum Development	Curriculum Development											
Class / Hands-On Training					Class / Hands-On Training							
Class / Hands-On Training									Class / Hands-On Training			
Internships / Externships	Internships / Externships											
Internships / Externships					Internships / Externships							
Internships / Externships									Internships / Externships			

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