



**Agricultural Research Service  
U.S. Department of Agriculture**



# **USDA Research Support for Marine Finfish Aquaculture**

*Science-based use of our natural resources to meet the seafood demands of a growing global population.*



# **USDA AQUACULTURE RESEARCH, EDUCATION AND ECONOMICS**

- **AGRICULTURE RESEARCH SERVICE**

- **INTRAMURAL RESEARCH, PARTNERSHIP WITH UNIVERSITIES AND OTHER ORGANIZATIONS**

- **NATIONAL INSTITUTE OF FOOD AND AGRICULTURE**

- **EXTRAMURAL RESEARCH, EXTENSION AND EDUCATION**

- **ECONOMIC RESEARCH SERVICE**

- **MONTHLY DATA ON DOMESTIC AQUACULTURE AND US TRADE IN AQUACULTURE PRODUCTS, ...**

- **NATIONAL AGRICULTURAL STATISTICS SERVICE**

- **CENSUS OF AGRICULTURE, CENSUS OF AQUACULTURE, ...**



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# USDA NIFA Aquaculture Programs

- **>30 Competitive Programs with broad eligibility**
  - Agriculture and Food Research Initiative (AFRI)
  - Aquaculture Research (AQUA)
  - Small Business Innovation Research (SBIR)
  - Regional Aquaculture Centers (RAC)
  - Sustainable Agriculture Research and Extension (SARE)
  - Beginning Farmer and Rancher Development Program (BFRDP)
  - Urban Agriculture (new, pending)

[Lakshmi Kumar Matukumalli lakshmi.matukumalli@usda.gov](mailto:lakshmi.matukumalli@usda.gov)

[Amrit Bart Abart@uga.edu](mailto:Amrit Bart Abart@uga.edu)



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# USDA NIFA Aquaculture Programs

- Extension
- Capacity Building

**“USDA NIFA DIVERSIFIES FUNDING FOR AQUACULTURE RESEARCH” – Dr. Amrit Bart**

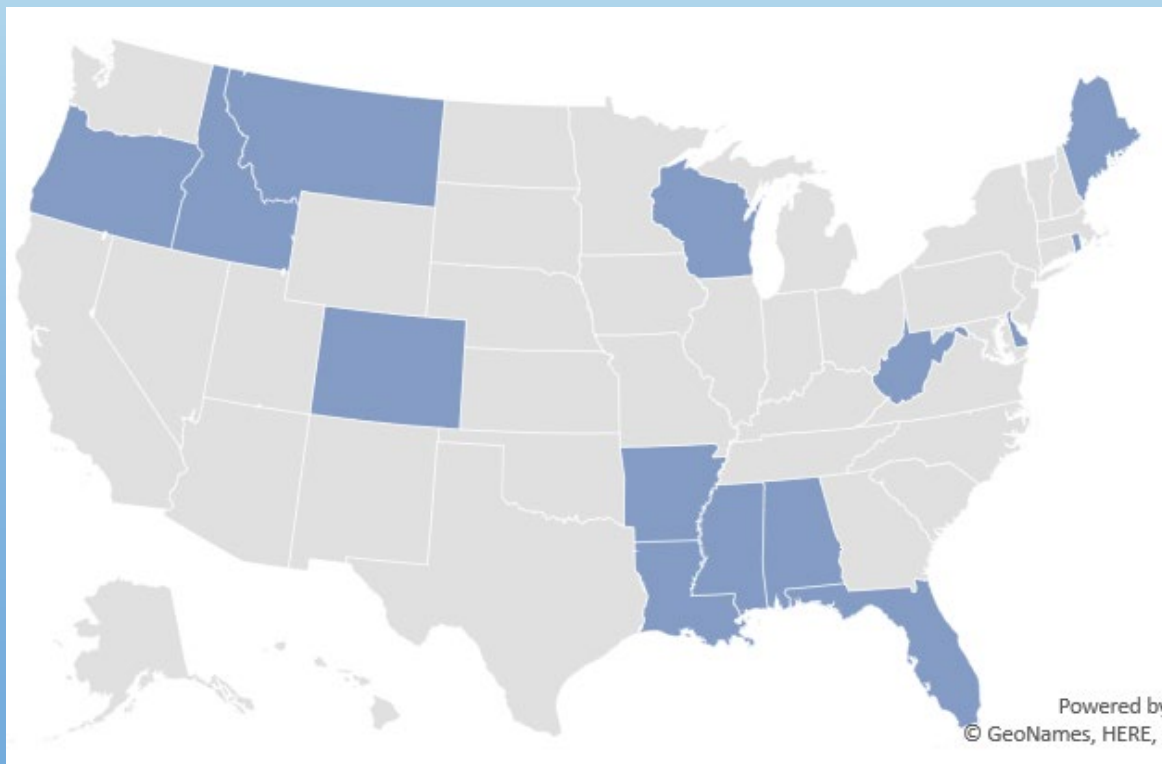
Extension Session, Room 305 Tuesday 12:15

[Lakshmi Kumar Matukumalli lakshmi.matukumalli@usda.gov](mailto:lakshmi.matukumalli@usda.gov)

[Amrit Bart Abart@uga.edu](mailto:Amrit Bart Abart@uga.edu)

# ARS AQUACULTURE NATIONAL PROGRAM 106

Conducting research and delivering technologies that improve domestic aquaculture production efficiency and product quality while minimizing impacts on natural resources.



- AQUACULTURE 1/16 NPS
- FOOD SAFETY, CROPS, HUMAN NUTRITION, ANIMAL PRODUCTION
- 13 “PERMANENT” PROJECTS
- 47 SCIENTISTS
- ~10 FUNDED COLLABORATORS
- 18 LABORATORY SITES
- 14 STATES



# USDA ARS National Program 106 Aquaculture Action Plan 2020 – 2024

## Components

- Improving the Efficiency and Sustainability of **Catfish** Aquaculture
- Improving the Efficiency and Sustainability of **Salmonid** Aquaculture
- Improving the Efficiency and Sustainability of **Hybrid Striped Bass** Aquaculture
- Enhancing **Shellfish** Aquaculture
- Developing **Marine Finfish** Seedstocks

## Themes

Genetic Improvement

Fish Health

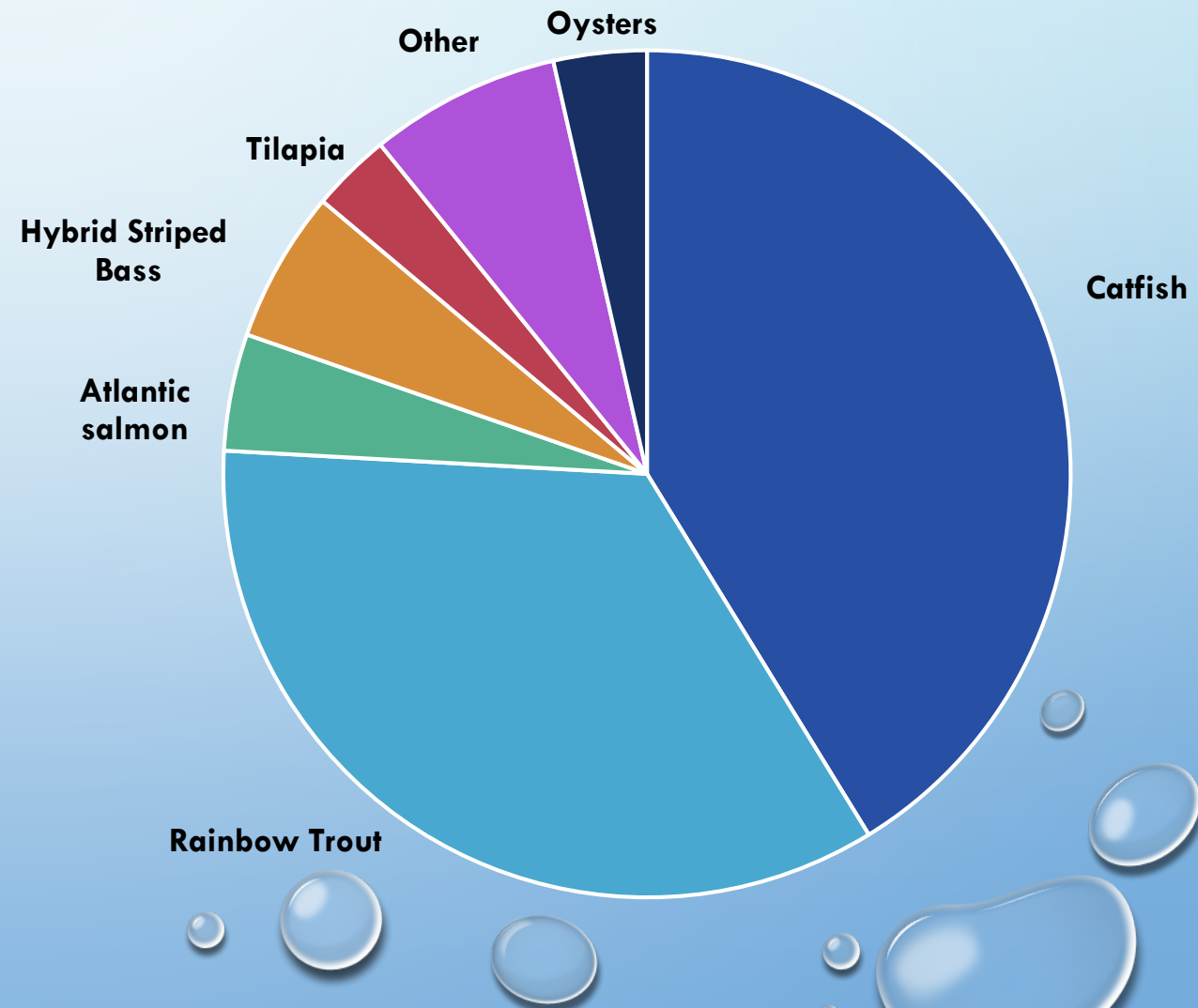
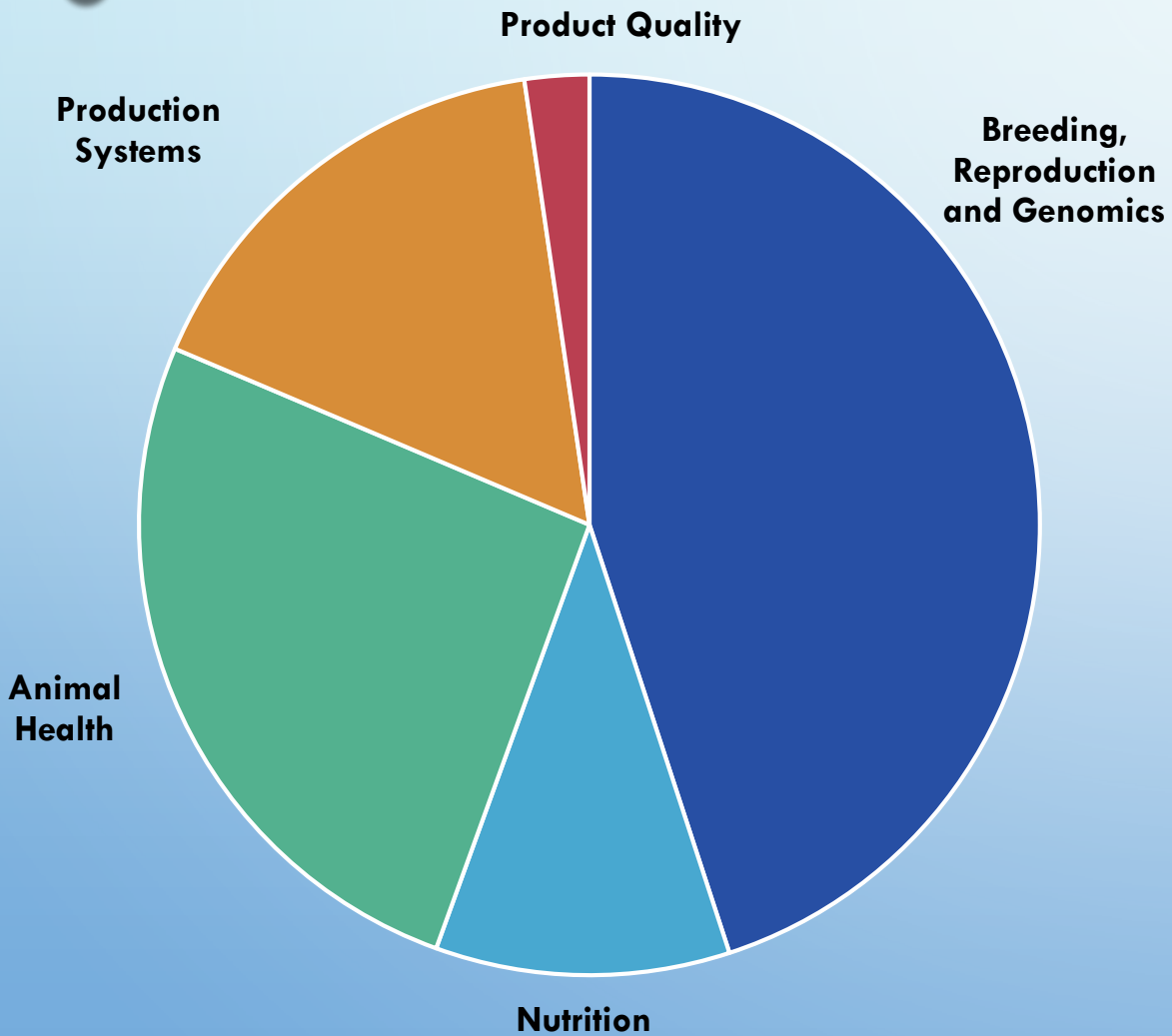
Reproduction and Development

Growth and Nutrition

Production Systems

Product Quality

# ARS Aquaculture Research Annual Investment by Component and Species



# COMPONENT 5: DEVELOPING MARINE FINFISH SEEDSTOCKS

- 2017 MARINE FISH AQUACULTURE SCOPING WORKSHOP HOSTED BY HBOI
- NATIONWIDE SURVEY ON 18 SPECIES HIGHLIGHTED IN THE WORKSHOP
- AQUACULTURE 2019 STATUS OF MARINE FINFISH SPECIES FOR US AQUACULTURE SPECIAL SESSION
- 2019 CONGRESSIONAL APPROPRIATION TO ARS, 2019 AGREEMENT WITH HBOI
- 2019 FALL HBOI/ARS/STAKEHOLDER WORKSHOP ON POMPANO





### **Species which are Experimental/Technologically Feasible**

- Spotted Seatrout, *Cynoscion nebulosus*
- Spotted Wolffish, *Anarhichas minor*
- California Halibut, *Paralichthys californicus*
- Southern Flounder, *Paralichthys lethostigma*
- Summer Flounder, *Paralichthys dentatus*
- Tripletail, *Lobotes surinamensis*
- Greater Amberjack, *Seriola dumerili*

### **Species which are Commercially Ready**

- Almaco Jack, *Seriola rivoliana*
- California Yellowtail, *Seriola lalandi*
- Black Sea Bass, *Centropristis striata*
- Cobia, *Rachycentron canadum*
- Atlantic Cod, *Gadus morhua*
- Striped Bass, *Morone saxatilis*
- White Seabass, *Atractoscion nobilis*
- **Red Drum, *Sciaenops ocellatus***
- **Florida Pompano, *Trachinotus carolinus***
- Sablefish, *Anoplopoma fimbria*
- Olive Flounder, *Paralichthys olivaceus*



# **ESTABLISHING SEEDSTOCKS FOR THE U.S. MARINE FINFISH INDUSTRY**

- **Collaborative Research in in Genetics, Nutrition, Reproduction and Health**
- **Host 3 ARS scientists on the HBOI Campus**
- **Anticipated Products**
  - Protocols optimizing marine finfish reproduction;
  - Breeding programs for marine finfish;
  - Diets optimized for growth and economic returns of fingerlings and food fish, and to improve reproductive efficiency of broodfish; and
  - Strategies for reducing on farm losses to disease.

# ESTABLISHING SEEDSTOCKS FOR THE U.S. MARINE FINFISH INDUSTRY

## *Long Term Potential Benefits*

- Seedstocks optimized for production efficiency
- Increased reproductive success
- Broodstock selected for economically important traits
- Genome-enabled selection tools and technologies will facilitate the genetic improvement.
- An improved understanding of the biology underlying economically important traits to improve management practices and enhance selective breeding.
- Optimized diets will improve growth and survival at the different life stages and reproductive performance, product quality, and production efficiency.
- Increasing the number of high-quality alternative ingredients will provide flexibility in formulating least cost diets.

# THANK YOU!

## **USDA NIFA**

- AMRIT BART
- MARK MIRANDO
- LAKSHMI KUMAR MATUKUMALLI
- GENE KIM (NRCS)

## **HBOI**

- PAUL WILLS
- MEGAN DAVIS
- MARTIN RICHE