1865 THE UNIVERSITY OF MAINE

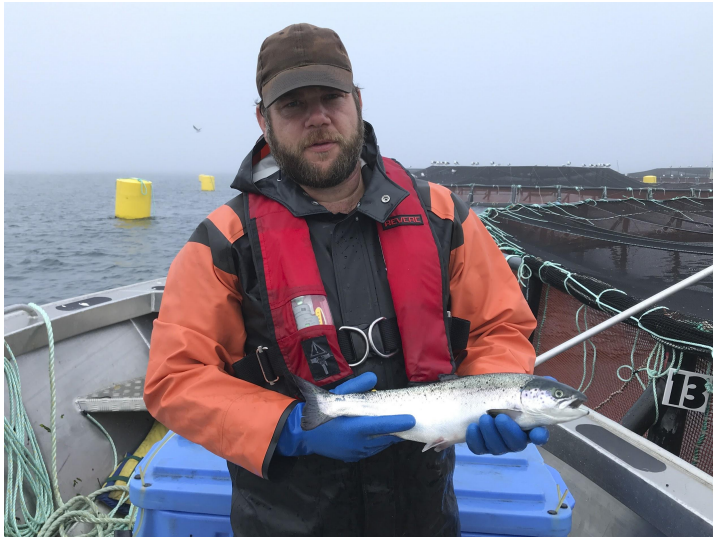
2022 Innovation and Outreach Updates

Aquaculture
Research Institute

ARI 2021 Strategic Framework

Mission

The Aquaculture Research Institute serves Maine as an objective authority on aquaculture research with the goal of advancing a sustainable aquaculture future in Maine and the Nation.



Aquaculture Research Focus Areas

Healthy Species: Aquatic Animal Health

- Nutrition
- Disease and pathogens
- Immunology
- Vaccine development

Healthy Populations: Aquatic Species Biology and Reproduction

- Genetic diversity
- Reproductive endocrinology
- Biology of aquacultured species
- Biological response to climate change

Healthy Ecosystems: Ecological Dimensions of Aquaculture

- Productivity
- Ecosystem modeling
- Ecosystem services
- Climate resilience

Healthy Communities: Social Dimensions of Aquaculture

- Risk communications and perceptions
- Sustainable development
- Policy and regulation
- Food safety and nutrition

USDA Agriculture Research Institute (ARS) Partnership

Finfish (AAHL and Orono Campus)

- New Fish Nutrition program
- Development of sustainable feeds
- Geosmin (off flavor) Testing Lab established
- New and emerging pathogens

Shellfish (DMC and Orono Based)

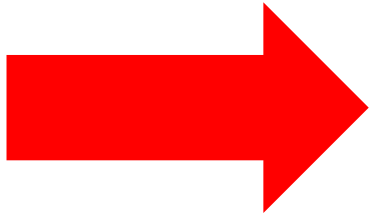
- Aquaculture Innovation Specialist
- Near Infrared Reflectance Spectrometer (NIRS)
- Oyster feeding and growth trials
- Experimental Farm (Lowe's Cove)

RAS-N to SAS^2

RAS-N

RECIRCULATING AQUACULTURE SALMON NETWORK

- 2019-2022
- Solicit stakeholder input to identify research needs
- Develop demonstration projects
- Industry extension and technology transfer
- Public outreach, education and WFD
- Economic feasibility of salmon production
- National R&D efforts identified



SAS^2

Sustainable Aquaculture Systems Supporting Atlantic Salmon

- 2021-2025
- Establish domestic production of salmon eggs f
- Mitigate early maturation and off-flavor
- Alternative feeds
- Increase water conservation and waste removal
- Market research for salmon RAS
- Inclusive RAS Certificate Program, internship programs and STEM curricula for K-12
- Tech transfer and public outreach
- Comprehensive Aquaculture Health Program standards

UMaine Workforce Development Programming

2021

- Youth Microcredential established
- 2 professional development courses piloted
- 4-H aquaponics program expanded
- 9 student externships

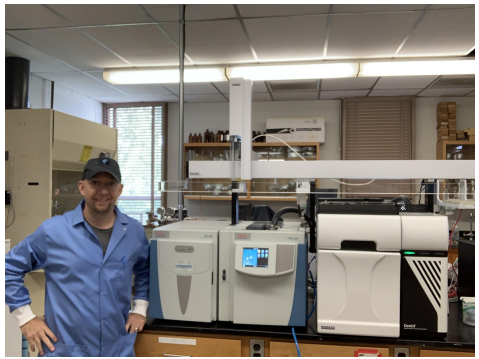
2022

- Adult Microcredential established
- 4 courses for undergraduates and adult learners
- 12-15 student summer externships
- Curriculum for Wabanaki Youth in Science
- Exchanges with with University of Maryland and University of Wisconsin
- MD Sea Grant Aquaculture in Action expands into Maine
- Blue Economy MBA
- Marine Science Summer Camps for Youth at DEI

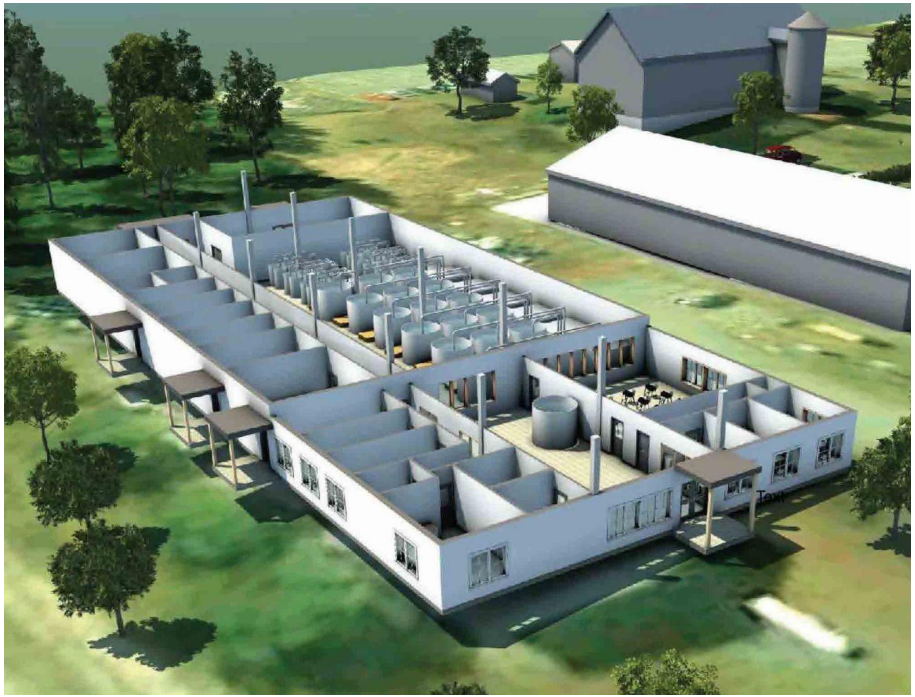
Aquaculture Emerging Research Innovations

- Nanocellulose technologies
- Nanobubble technology
- New and emerging pathogens
- Salmon restoration
- Traditional Ecological Knowledge

- New land-based farmed species
- Emerging shellfish species
- Blue carbon
- Offshore aquaculture
- Artificial intelligence



Sustainable Aquaculture Workforce and Innovation Center (SAWIC)



- 15,000 ft^2 cold-water recirculating aquaculture facility
- Sustainable Aquaculture outreach and demonstration space
- Environmental Change Lab
- Open and flexible tank space
- UMaine aquaculture hub connecting aquaculture across campuses and facilities
- Aquaculture R&D, commercialization and services supporting industry needs
- Classroom and office space

Thank you! Any questions?