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# 2015 AQ Summit: Identified R&D Needs Report

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# 1<sup>st</sup> ANNUAL MAINE AQUACULTURE R&D FORUM



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*Exploring cutting edge solutions to meet the R&D needs of Maine's aquaculture industry*

**January 14, 2015**  
**Holiday Inn By the Bay, Portland, Maine**

**Background:** Maine's aquaculture sector is already strong and vibrant, but has substantial potential to increase in size and productivity, leading to new business and job creation. The vast majority (but not all) of Maine's aquaculture firms have common characteristics such as: small size; small workforce and therefore a reduced diversity of in-company skills to draw on; limited access to capital; and reduced capacity for research and innovation. These characteristics can hinder growth both as a business and a sector.

To support Maine's community of small businesses, and maximize growth for businesses and the aquaculture sector, *collaborative* research and development is required. A vibrant and enabling research environment, with integrated components that are easy to access is essential. This forms a foundation for innovation based economic development that can create jobs, build sustainable businesses, and generate wealth for Maine.

The Maine Aquaculture Coordinating Council recognized these issues and identified the need to strengthen connectivity between key components of the Maine aquaculture research community, and to develop a much greater alignment between research capacity and industry needs with the aim of strengthening the competitiveness and sustainability of the aquaculture sector while growing the research capacity. This includes fostering integration of existing multidisciplinary research capacity and capability not traditionally aligned with aquaculture-related activities. Anticipated impacts of achieving this are:

- Increased alignment of research capacity and industry research needs;
- Integration of new technical skills into aquaculture R&D;
- Enhanced flow of personnel between the research community and industry;
- Integration of Maine's existing research capacity with new market and commercial opportunities for Maine's aquaculture sector;
- Increased number of research active aquaculture businesses;
- Increased number of academia/industry collaborative projects;
- Increased industry leadership and investment into the aquaculture research enterprise.

**The Forum:** On January 14<sup>th</sup>, 2015 the Maine Aquaculture Innovation Center, and the University of Maine Aquaculture Research Institute hosted the first annual Maine Aquaculture R&D Forum. It was held in conjunction with the [Northeast Aquaculture Conference & Exposition](#) (NACE) at the Holiday Inn By the Bay, Portland.

This was a unique opportunity for members of the industry and researchers to meet, exchange ideas, and explore innovative, cutting edge solutions for Maine's aquaculture industry needs.

It was an opportunity for attendees to:

- Hear industry representatives outline the researchable issues the aquaculture industry is facing
- Hear Maine researchers describe how their research sectors can advance aquaculture R&D
- Learn more about funding/entrepreneurial solutions and support systems in place statewide
- Meet dynamic likeminded colleagues
- Learn about some of the exceptional aquaculture research taking place in Maine

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A diverse audience participated in the event including aquaculture producers, manufacturers, processors, distributors, investors, and representatives from municipalities, state and federal agencies, NGOs, and academic and research institutions. Attendees were asked to identify their primary expertise (see Figure 1). Marketing and business was the most common expertise represented by the attendees, with shellfish biology and production being the second most common.



**Figure 1: Expertise distribution of the Forum Audience**

**The Outcome:** During the Forum, the audience identified 40 research priorities for Maine’s aquaculture sector. These were grouped into topic areas, and the audience voted to identify those of greatest importance or urgency. The identified priorities are shown below.

**What Happens Next:** These results will be shared with key groups and organizations across Maine to help focus opportunities to develop R&D programs in the identified priority areas. This will include:

- The members of the Maine Aquaculture Coordinating Council (University of Maine Aquaculture Research Institute, Maine Aquaculture Innovation Center, Maine Aquaculture Association, Maine Sea Grant, Maine Technology Institute, Maine Department of Marine Resources, Maine Department of Economic & Community Development),
- The SEANET research network,
- and a broad range of institutions and groups involved in aquaculture.

This is also a great opportunity to inform federal aquaculture research programs including those at DOC/NOAA and USDA that periodically provide funding opportunities. A register will be compiled of existing working groups working on research in the identified priority areas. More information about the Forum will be available on the Aquaculture Research Institute website [www.umaine.edu/aquaculture](http://www.umaine.edu/aquaculture).

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## How to get involved:

Refining these research priorities: We will be sending out a survey to verify and refine these research priorities. Watch out for an email from us! Your help would be much appreciated and really makes a difference!

Making great research happen: If you are interested in joining a working group to take forward research in any of the identified R&D priority areas, please contact Anne Langston on [anne.langston@umit.maine.edu](mailto:anne.langston@umit.maine.edu) and watch the ARI website for updates [www.umaine.edu/aquaculture](http://www.umaine.edu/aquaculture)

Building an aquaculture-centric, web-based innovation coffeehouse: Over the next few months ARI will develop a web-based forum for researchers, innovators and entrepreneurs to share ideas. Build networks and collaborate. In the meantime you can sign up for the ARI news by joining our email circulation list (contact [anne.langston@umit.maine.edu](mailto:anne.langston@umit.maine.edu) to make this happen!) and by watching the ARI website for updates.

## AQUACULTURE IN MAINE: DETAILED R&D PRIORITIES

Identified Priority*	Relevant Species	Examples of research areas**
<b>Shellfish Aquaculture R&amp;D Priorities in Maine</b>		
Selective breeding	Oysters	Disease resistance, growth rates, tolerance to changing environmental parameters
Site selection for grow out	Any	Tools for efficiently identifying new sites
Harvesting efficiency	Any	Mechanization to reduce labor, optimize production processes
Nursery technology	Oysters, mussels	Water quality, algae production, equipment and process optimization
Seed collection technology	Mussels	Identification of seed sources, Techniques or tools to improve spat settlement
Crop protection	Any	Predation (ducks, green crabs), severe weather events, disease
Shell hardness	Mussels	Identification of factors impacting shell hardness, tools and techniques to manipulate shell hardness, impact of ocean acidification
Vibrio detection/resistance	Oysters	Diagnostics, management
<b>Fin fish Aquaculture R&amp;D Priorities in Maine</b>		
Sea lice	Atlantic salmon	Management, treatment, disease ecology
Feed quality	Any	Sustainable ingredients, feed quality, optimize feed for emerging species
Superchill	Atlantic salmon	Prevention, treatment
Amoebic Gill Disease	Atlantic salmon	Diagnostics, management, treatment, disease ecology
Bacterial Kidney Disease	Atlantic salmon	Diagnostics, management, treatment, disease ecology
Disease diagnostics	Any	Optimization of existing, development of new diagnostic methods
Effluent treatment		Land based systems
Production technology	Blue Fin Tuna	Production in land based systems
<b>Sea Vegetable Aquaculture R&amp;D Priorities in Maine</b>		
Identifying new high value products	Any	Market driven, high value food and non-food products
Processing technology	Any	New innovation, optimization of processing technology
Nursery & Seeding Technology	Any	Water quality, equipment and process optimization
Site selection for grow out	Any	Tools for efficiently identifying new sites
Harvesting efficiency	Any	Mechanization to reduce labor, optimize production processes

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<b>Non-sector specific Aquaculture R&amp;D Priorities in Maine</b>		
Waste utilization	n/a	Optimize production processes, new value added products, multi-trophic AQ research
Social acceptability	n/a	Understanding social aspects of site selection, policies to support direct sales from farms
Identification of new candidate species	n/a	Industry diversification
Management of invasive species	n/a	Understanding impacts, development of management strategies, reducing maintenance costs
Management of impacts of environmental change	n/a	Understanding impacts including on growth rates and disease resistance, development of management strategies, predicting extreme events
Offshore aquaculture	n/a	Feasibility/demonstration, technology transfer, gear development, fisherman training, co-location of AQ and offshore wind
Inter-tidal aquaculture	n/a	Feasibility/demonstration, technology transfer, gear development, fisherman training
Engaging citizen scientists for environmental data	n/a	How to maximize collection of data to inform site selection and share it
Knowledge sharing	n/a	Sharing information between growers on production techniques, making research data easily available
<b>Processing/Product Development Aquaculture R&amp;D Priorities in Maine</b>		
By-product re-use	Any	New valued added products, feed ingredients
Understanding consumer preferences & markets	Atlantic salmon, Oysters, mussels, sea vegetables, baitfish, ornamentals, emerging species	Local and global market intelligence, understanding drivers of consumer/market demand
Value added products for pharma, biotech etc industries	Any	Market driven, high value non-food products
Multi/shared-use processing centers	Any	Feasibility/demonstration
Food traceability	Any	
Social acceptability	Any	Consumer preferences and acceptability of new food and non-food products
<b>Aquaculture Gear Technology R&amp;D Priorities in Maine</b>		
Re-using working waterfront infrastructure for aquaculture	Any	Strategic industry expansion using existing infrastructure, exploring opportunities for land-based AQ, community aquaculture projects
Heating efficiency	Any	Energy efficiency, reusing waste energy
Adapting lobster boats for aquaculture, & using lobster pounds for aquaculture	Any	Adapting infrastructure for multi-use
Gear share schemes	Any	Feasibility/demonstration of pilot scheme, gear loan programs

\* Identified by the AQ R&D Forum attendees

\*\*These are example research questions identified by both forum attendees. These will be verified with industry partners for future reports.

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