

Aquaculture Research Institute Workforce Development

Dr. Scarlett Tudor

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Outreach and Research Coordinator



Huge Collaborative Effort



ARI Industry Internship Program 2019





Sophie Garbuz (left) and Jess Moore (right), worked with University of Maine Aquatic Animal Health Lab on measuring Atlantic salmon feeding rates for a pharmacokinetic study.



Grace Robie worked at the Department of Marine Resources on a phytotoxin monitoring program



Sea Fellows Symposium 2019

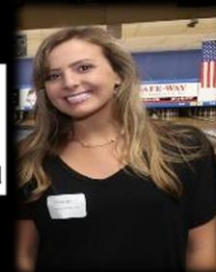
Hallie Arno worked on Hurricane Island studying pH buffering capacity of kelp in scallop aquaculture



Selah Smith worked in Heather Hamlin's lab on therapies for Atlantic salmon parasites.



Emma Christman (left) and Tessa Houston (right) examined the effects of ocean acidification on oysters.



Kenny Lamm (left) and Callie Stout (right), worked with American Unagi on value added produces in eel culture and recirculating systems operations.

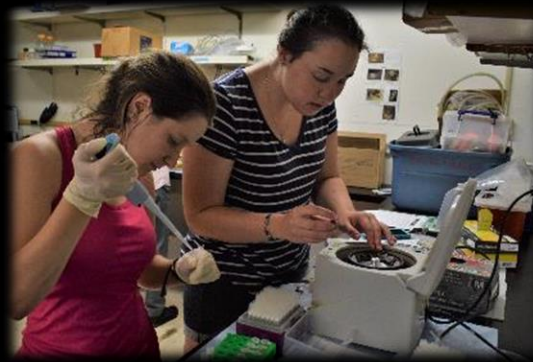


Emily Tarr worked in the ARI office to create outreach content about aquaculture in Maine.

Increasing Capacity for Research

ARI had 13 paid interns for 2019:

- 5 of the interns are continuing work with paid research positions.
- Working to increase these opportunities for students and industry partners with the undergraduate capstone program
- Goal in conduct research for industry that may not be possible otherwise



Pharmacokinetic study with new in-feed therapy formulations



Sea lice bioassay and behavior studies



Creation of aquaculture outreach materials





Research article

Ecologically relevant arsenic exposure alters female mate preference and anxiety-like behavior in *Betta splendens*



M. Scarlett Tudor^{a,c,*}, Rebecca N. Lopez-Anido^b, Charly A. Yocius^b, Sarah M. Conlin^b, Heather J. Hamlin^{b,c}

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Original Articles

Effects of temperature on larval American lobster (*Homarus americanus*): Is there a trade-off between growth rate and developmental stability?



Amalia M. Harrington^{a,b,*}, M. Scarlett Tudor^{c,b}, Helen R. Reese^a, Deborah A. Bouchard^{c,b}, Heather J. Hamlin^{a,b}

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RESEARCH ARTICLE

The impact of ocean acidification on the byssal threads of the blue mussel (*Mytilus edulis*)

Grant Dickey, Brian M. Preziosi^{a,*}, Charles T. Clark, Timothy J. Bowden^a

School of Food and Agriculture, Aquaculture Research Institute, University of Maine, Hitchner Hall, Orono, ME, United States of America

Bull Mar Sci. 95(3):409–420. 2019
<https://doi.org/10.5343/bms.2019.0037>

research paper

Influence of temperature regime and epizootic shell disease on ecdysterone concentrations in American lobster from the Gulf of Maine

¹ School of Marine Sciences, 5751 Murray Hall, University of Maine, Orono, Maine 04469.

² Aquaculture Research Institute, Margaret Chase Smith Policy Center, York Complex #4, Orono, Maine 04469.

Heather J Hamlin^{1,2,*}

M Scarlett Tudor^{2,3}

Emily Tarr¹

Deborah A Bouchard^{2,3}

Aquaculture Certificate Program at University of Maine

- Four model program ending with paid industry internship (12 total credits)
 - Increasing the aquaculture minor
 - Increasing courses available to non-credit seeking people
- Goal to make a certificate that is valuable to the industry
- UMaine DLL piloting this program to workout logistics of certificate program for other departments
- Use of multiple facilities within the UMaine system
- Lots of logistics to work out
 - Dual audiences – possible??
 - Financial backing?



Courses Piloting in 2020

Aquaculture Systems
(SMS 449) Spring

Bivalve Culture
(SMS 209) Summer



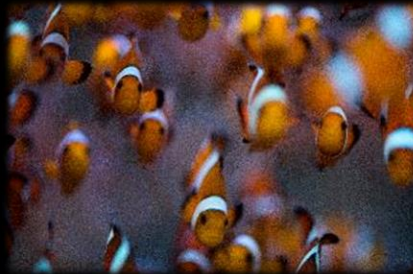
Commercial
Scale RAS



Emerging Species
in RAS



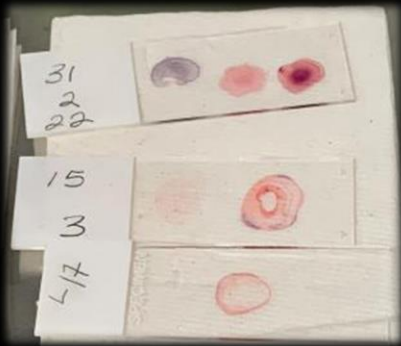
Ornamentals in RAS



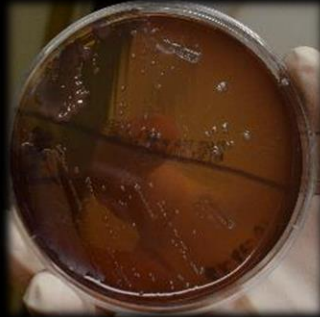
Course Development in 2020

Aquatic Animal Health and Diagnostics

Gram Stains



Bacteriology



Aquatic Animal Husbandry



Laboratory assays



New Diagnostic and Research Laboratory



Student
Engagement



Biocontainment
Research Assoc.
Dr. Andy Holmes

- Specialized containment aquaria facilities
- Adjoining Biosafety Level 3 laboratories
- Ability to conduct advanced research on new and emerging pathogens and species exotic to Maine
- Increased potential for collaboration with Maine's biotechnology sector

Interpretation Center at ARC



- 1,500 diverse visitors annually
- Exposure to species important to the aquaculture industry
- Interactive Digital Touch Screens
 - Interactive Map of Maine and Aquaculture
- Virtual Reality Experiences
 - Scientific Diving
 - Disease room experiments

Any content ideas greatly appreciated!



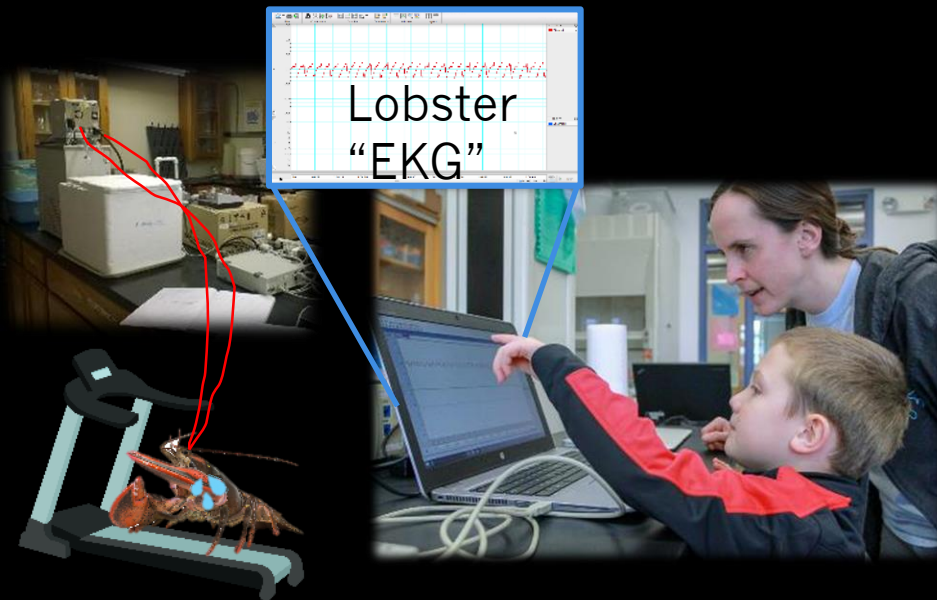
Hands-on Activities for High School and Up

Expanding Your Horizons



Exposing youth to:

- Use of scientific equipment
- Scientific method
- Integrated research
- The diversity of science applied within the aquaculture industry
- Outreach training for undergraduate students
- Recruitment tool
 - School of Marine Science
 - School of Food and Agriculture



** Meeting in January bringing K-12 educators and scientists together to collaborate on these types of efforts

Teaching Labs Increase Undergraduate Course Capacity



- Diversity of recirculating systems
 - Climate change environmental chambers
 - Research specific systems
 - Aquaponics system
 - Freshwater Ornamentals
 - Reef systems
- New water quality equipment

Grant Examining the Perceptions of Recirculating Aquaculture



PI: Laura Rickard
University of Maine
Communication and
Journalism

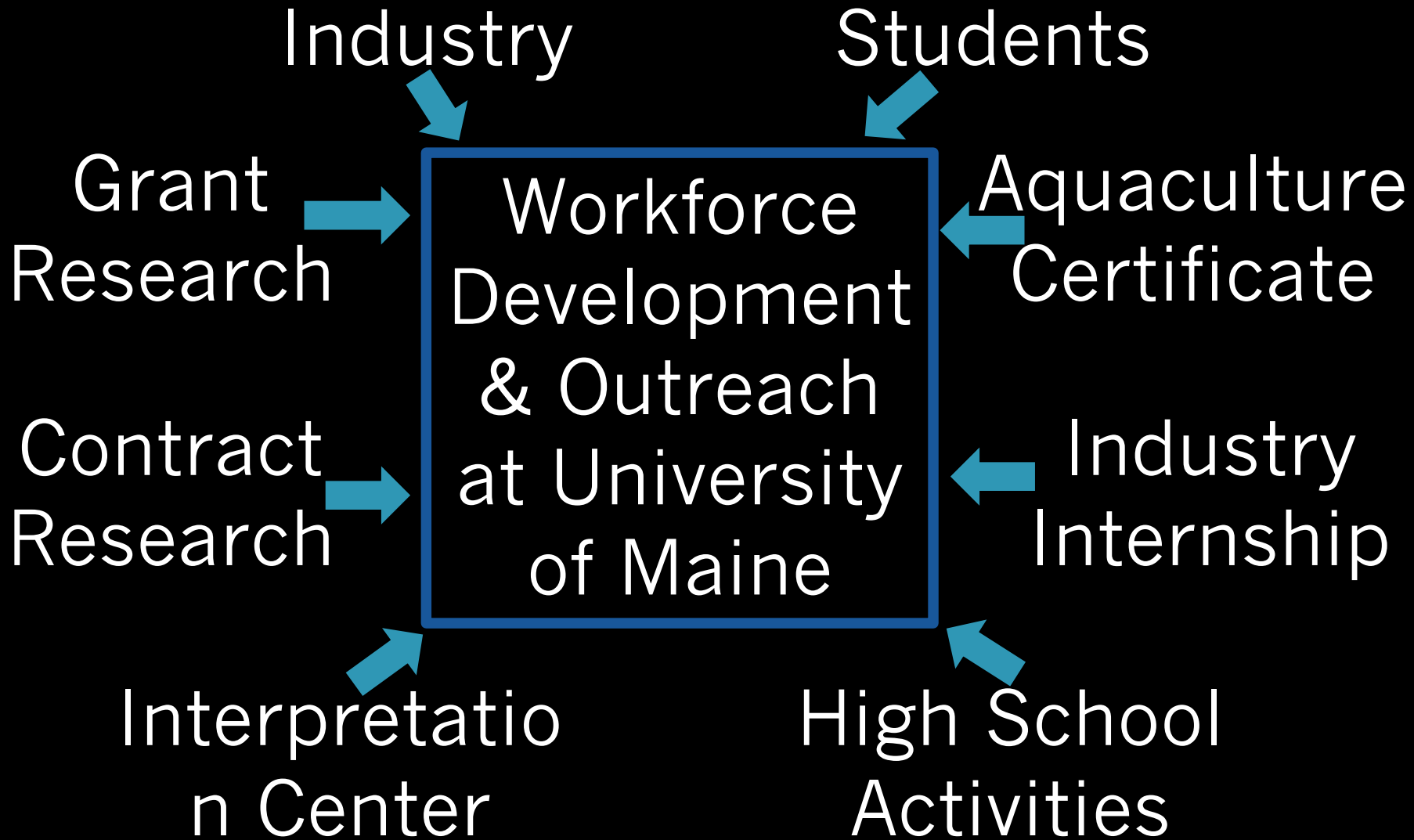
Fish, farms, and shared futures: Defining public perceptions of land-based aquaculture to support sustainable decision-making



Results from this grant and others can help to highlight focus topics needed for outreach projects

Interpretation center mechanism for faculty outreach

Many, Many Collaborations



Thank You and Questions?

