

**MTAF Round 3  
Notice of Intent Submissions  
Sector: Aquaculture & Marine**

MTAF #	Project Title	Name	County	State	Amount (\$)
3003	Community-Based Research to Support the Maine Lobster Industry	Gulf of Maine Research Institute	Cumberland	ME	500,000.00
3010	Instrumentation to Support Bivalve Aquaculture in the Damariscotta River Estuary	University of Maine	Penobscot	ME	97,000.00
3011	FISHLab: Fisheries Innovation, Sustainability & Health Lab	University of Maine	Penobscot	ME	600,000.00
3014	Biomass Engineered Fuel	University of Maine	Penobscot	ME	1,500,000.00
3019	Building Infrastructure for Innovation in Downeast Coastal Maine	Downeast Institute	Washington	ME	975,000.00
3020	TidGen Power System Commercialization	Ocean Renewable Power Company	Cumberland	ME	920,000.00
3030	Ornamental Hatchery Utilizing Artemia Replacement Technology	University of New England	York	ME	10,000.00

**Form Data****1. Project Title. Character limitation: 80 including spaces.**

**Project Title** Community-Based Research to Support the Maine Lobster Industry

**2. Lead Institution**

**Name** Gulf of Maine Research Institute

**Lead Organization Type: Choose One**

Profit

**Mailing Address 1** 350 Commercial Street

**Mailing Address 2** None given.

**City** Portland

**County** Cumberland

**State** ME

**ZIP** 04101

**3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.**

**Rep. First Name** Don

**Rep. Last Name** Perkins

**Rep. Title** President

**Rep. Institution** Gulf of Maine Research Institute

**Rep. Telephone** 207.228.1634

**Rep. Email Address** dperkins@gmri.org

**Rep. Mailing Address 1** 350 Commercial Stree

**Rep. Mailing Address 2** None given.

**Rep. City** Portland

**Rep. State** ME

**Rep. ZIP** 04101

**4. Project Director: Scientific lead and/or project manager.**

**Dir. First Name** Jason

**Dir. Last Name** Stockwell

**Dir. Title** Research Scientist

**Dir. Organization** Gulf of Maine Research Institute

**Dir. Mailing Address 1** 350 Commercial Street

**Dir. Mailing Address 2** None given.

**Dir. City** Portland

**Dir. State** ME

**Dir. ZIP** 04101

**Dir. Telephone** 207.228.1658

**Dir. Email Address** jstockwell@gmri.org

**Dir. Fax** 207.772.6855

**5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."**

**Collaborators** Patrice McCarron, Maine Lobstermen's Association Erin Pelletier, Gulf of Maine Lobster Foundation Michael Jech and Jonathan Deroba, National Marine Fisheries Service Maine Department of Marine Resources

**6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.**

Amount (\$) 500000

## 7. Technology Sector

Chose One Sector Aquaculture & Marine

## 8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

### Scientific Disciplines Involved

Fishery resource assessment, hydroacoustic surveys

## 9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 Chris Taylor, NOAA chris.taylor@noaa.gov

Reviewer 2 Lars Rudstam, Cornell University lgr1@cornell.edu

## 10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from None

## 11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.

### Character limitation: 6,000 including spacing

#### Description Area

There are approximately 5,800 commercial lobster license holders in Maine with an additional 1,300 student and apprentice license holders. The Maine lobster fishery supports lobstermen and their families, processors, dealers, marine outfitters, boat makers, retailers, and restaurants. It is estimated that 6,000 jobs are directly related to inventorying, processing, and distributing lobsters. The Maine lobster fishery is the lifeline for Maine coastal communities, contributing nearly \$1B annually to Maine's economy in recent years and supporting hundreds of small, coastal villages in Maine where there are few other economic opportunities. Over the past several years, bait shortages have caused fresh herring bait prices to soar. Between 2006 and 2009, the quota for herring in coastal Maine waters was reduced by 25% despite numerous and well-recognized problem with the resource assessment. Consequently, the price for fresh herring bait has more than doubled. Further cuts to the herring quota in 2010 (reduced 57% from 2006) are expected to continue and increase the economic burden on lobstermen, their families, and coastal communities. Additionally, cuts to the herring quota have also impacted the commercial herring fishing industry and was a major factor in the decision to close the Stinson Seafood Plant in Prospect Harbor, resulting in 128 lost jobs in a region with few other economic opportunities. Acoustic surveys in coastal Gulf of Maine waters are essential to provide the critical information necessary to manage the Atlantic herring resource with much greater certainty, to the short- and long-term benefit of the Maine lobster industry and the Maine economy. Currently there are no surveys in coastal Maine waters where most of the harvest for fresh herring bait has occurred historically. Decisions to cut the quota have been made in a vacuum of scientific data, based on stock assessment with many well-recognized problems. The Gulf of Maine Research Institute (GMRI), in partnership with the Maine Lobstermen's Association (MLA), the Gulf of Maine Lobster Foundation (GMLF), the Maine Department of Marine Resources (ME DMR), and the National Marine Fisheries Service (NMFS), request funds to provide the necessary infrastructure to rigorously implement an industry-based survey of Atlantic herring in coastal Maine waters. Funds from MTAF would be used to purchase scientific acoustic equipment to outfit ten lobster boats (with home ports distributed along the entire Maine coast), associated computers, data storage systems, and data processing software. Matching funds will be used to contract lobster boats to run pre-determined survey transects in their respective regions, one night per week from August to December. This community-based approach will provide the necessary (and unprecedented) coverage required to adequately assess the herring resource in a critical management area that is highly controversial, and for which no data exist. Commercial herring boats will be contracted to periodically provide biological samples to verify acoustic data. GMRI will analyze the data to generate herring population estimates in

Maine coastal waters and will work with Maine DMR and NMFS stock assessment biologists, and the lobster and herring industries, to incorporate data from the lobster industry-based surveys into the herring resource assessment. Participating Organizations and Their Roles  
MLA and GMLF - The Maine lobster industry is recognized globally for its successful grass roots approach to sustainably managing its fishery. Engaging the lobster industry and its conservation ethic to develop credible and rigorous herring resource assessment brings a community-based approach to responsible ecological and economic stewardship of Maine's herring resource. NMFS ♦ Assist in coordination of herring surveys (proposed Gulf of Maine work and ongoing Georges Bank work), data processing, and data reporting to ensure compatibility with NMFS offshore survey and herring stock assessment needs. Maine Department of Marine Resources ♦ Assist with sampling logistics, herring survey design, and data reporting to ensure data compatibility with herring stock assessment needs. Gulf of Maine Research Institute ♦ Develop and execute collaborative herring surveys with commercial fishing and research communities, including both herring and lobster industries.

**Please review your submission carefully.**

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In addition, within two business days MTI will send an e-mail to the Project Director providing an application number to be included on each page of the formal application, and an acknowledgement that the Notice of Intent is complete.

**Submission Metadata**

<b>IP</b>	127.0.0.1
<b>Browser</b>	Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 5.1; Trident/4.0; GTB0.0; .NET CLR 1.1.4322; .NET CLR 2.0.50727; InfoPath.1; .NET CLR 3.0.4506.2152; .NET CLR 3.5.30729)

MTAF 3003

**Form Data****1. Project Title. Character limitation: 80 including spaces.**

**Project Title** Instrumentation to Support Bivalve Aquaculture in the Damariscotta River Estuary

**2. Lead Institution**

**Name** University of Maine

**Lead Organization Type: Choose One**

Academic

**Mailing Address 1** Office of Research & Sponsored Programs

**Mailing Address 2** 5717 Corbett Hall

**City** Orono

**County** Penobscot

**State** ME

**ZIP** 04469-5717

**3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.**

**Rep. First Name** Michael

**Rep. Last Name** Hastings

**Rep. Title** Director, Office of Research & Sponsored Programs

**Rep. Institution** University of Maine

**Rep. Telephone** 207-581-1484

**Rep. Email Address** umgrants@maine.edu

**Rep. Mailing Address 1** 5717 Corbett Hall

**Rep. Mailing Address 2** None given.

**Rep. City** Orono

**Rep. State** ME

**Rep. ZIP** 04469-5717

**4. Project Director: Scientific lead and/or project manager.**

**Dir. First Name** Mary Jane

**Dir. Last Name** Perry

**Dir. Title** Professor

**Dir. Organization** School of Marine Sciences

**Dir. Mailing Address 1** Darling Marine Center

**Dir. Mailing Address 2** 193 Clark's Cove Road

**Dir. City** Walpole

**Dir. State** ME

**Dir. ZIP** 04573

**Dir. Telephone** 207-563-3146 x245

**Dir. Email Address** perrymj@maine.edu

**Dir. Fax** None given.

**5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."**

**Collaborators** Maine Aquaculture Innovation Center, Dr. Chris Davis

**6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.**

**Amount (\$)** 97000

**7. Technology Sector"**

**Chose One Sector** Aquaculture & Marine

**8. Scientific Disciplines Involved. Character limitation: 125 including spaces.**

**Scientific Disciplines Involved**

Aquaculture Bivalve biology Phytoplankton ecology Seawater chemistry

**9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."**

**Reviewer 1** Professor John Marra Department of Geology 123 Ingersoll Hall Extension Brooklyn College  
2900 Bedford Avenue Brooklyn, NY 11210

**Reviewer 2** Dr. Sandra E. Shumway Department of Marine Sciences University of Connecticut 1080  
Shennecossett Road Groton, CT 06340 Ph: 860 405 9282 FAX: 860 405 9153

**10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."**

**Withhold from** None

**11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.**

**Character limitation: 6,000 including spacing**

**Description Area** We proposed to procure a state of the art suite of instrumentation to study environmental parameters that are critical for growth and productivity of aquacultured bivalves in the Damariscotta River Estuary. The instrument suite includes: 1) Sunburst Sensors pH meter to measure in situ pH with accuracy of 0.003 units; 2) Fluid Imaging Technologies's bench top FlowCAM for laboratory imaging of phytoplankton. Changing nutrient chemistry associated with changing rainfall / runoff patterns, decreasing seawater pH, and increasing winter-time temperatures can be expected to have both direct and indirect effect on oyster reproduction, growth, and economic value. The suite of instruments we propose to acquire will allow us to investigate how changes in environmental forcing factors may impact the commercial bivalve industry in the Damariscotta River Estuary and other sites in Maine, now and in the future.

**Please review your submission carefully.**

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**Submission Metadata**

**IP** 127.0.0.1

**Browser** Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1; .NET CLR 1.1.4322; InfoPath.2)"

**Form Data 'fIA Um\$' z&\$%\$ 'Uh\$' .) - .&+ 'DA Ł****1. Project Title. Character limitation: 80 including spaces.**

**Project Title** FISHLab: Fisheries Innovation, Sustainability & Health Lab

**2. Lead Institution**

**Name** University of Maine

**Lead Organization Type: Choose One**

Academic

**Mailing Address 1** Office of Research & Sponsored Programs

**Mailing Address 2** 5717 Corbett Hall

**City** Orono

**County** Penobscot

**State** ME

**ZIP** 04469-5717

**3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.**

**Rep. First Name** Michael

**Rep. Last Name** Hastings

**Rep. Title** Director, Office of Research & Sponsored Programs

**Rep. Institution** University of Maine

**Rep. Telephone** 207-581-1484

**Rep. Email Address** umgrants@maine.edu

**Rep. Mailing Address 1** 5717 Corbett Hall

**Rep. Mailing Address 2** None given.

**Rep. City** Orono

**Rep. State** ME

**Rep. ZIP** 04469-5717

**4. Project Director: Scientific lead and/or project manager.**

**Dir. First Name** Ian

**Dir. Last Name** Bricknell

**Dir. Title** Libra Professor of Aquaculture

**Dir. Organization** University of Maine

**Dir. Mailing Address 1** 5737 Hitchner Hall

**Dir. Mailing Address 2** None given.

**Dir. City** Orono

**Dir. State** ME

**Dir. ZIP** 04469

**Dir. Telephone** 207-581-4315

**Dir. Email Address** ian.bricknell@umit.maine.edu

**Dir. Fax** None given.

**5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."**

**Collaborators** Collaborators include: Cook Aquaculture (D. Miller), Great Bay Aquaculture of Maine (G. Nardi), Micro-Technologies, Inc. (B. Keleher), Dept. of Inland Fisheries & Wildlife, Dept. of Marine Resources, USDA APHIS, several other UMaine affiliates, and private businesses (veterinary clinics, biotech firms, fishermen) UMaine's team includes: School of Marine Science (L. Kling, P. Rawson, S. Brawley, I. Bricknell); Lobster Institute (R. Bayer); UMAHL (A. Lichtenwalner, D. Bouchard); Biomedical Sciences (C. Kim); and Industrial Cooperation"

(J. Ward). UMaine is partnering with the USDA ARS (B. Wolters).

**6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.**

Amount (\$) 600000

**7. Technology Sector**

Chose One Sector Aquaculture & Marine

**8. Scientific Disciplines Involved. Character limitation: 125 including spaces.**

**Scientific Disciplines Involved**

Marine Sciences, Animal & Vet Sciences, Biomedical Sciences, Microbiology, Food Science, Marine Bio-resource, Chemistry

**9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."**

Reviewer 1 None

Reviewer 2 None given.

**10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."**

Withhold from None

**11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.**

**Character limitation: 6,000 including spacing**

<b>Description Area</b>	This project will advance R&D related to the aquaculture and marine fishery industries in Maine and internationally. Science and technology derived from this R&D will both create new commercial opportunities and sustain the thousands of jobs these industries now support. This proposal is for the addition of a module to house a wet lab for quarantine of infectious organisms to the existing ♦Fish Building♦ at UMaine, which houses the Aquaculture Research Center. It would augment the capabilities of the aquatic facilities at UMaine♦s Animal Health Lab (UMAHL), a unique laboratory in Maine that focuses on a wide range of species ie: crustaceans (lobster, crab, etc.); molluscs (mussels, oysters, clams); and finfish aquaculture. The lab will be a key piece of an evolving complex at UMaine for multidisciplinary fishery/ aquaculture research. It would accommodate both University research projects as well as State groups (biotech companies, Maine Department of Marine Resources, etc.) using the lab for a fee. This facility would attract users from outside the state as well. Establishing an isolation and research wet lab will be a perfect complement to the State♦s previous investment in the UMAHL through the Marine Research Fund, which was used to equip the aquatic lab with high-tech diagnostic equipment and a samples repository.
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**Form Data 'A Um\$' ž&\$%\$ 'Uh\$(.%. ) ( 'DA Ł****1. Project Title. Character limitation: 80 including spaces.**

**Project Title** Biomass Engineered Fuel

**2. Lead Institution**

**Name** University of Maine

**Lead Organization Type: Choose One**

Academic

**Mailing Address 1** Office of Research & Sponsored Programs

**Mailing Address 2** 5717 Corbett Hall

**City** Orono

**County** Penobscot

**State** ME

**ZIP** 04469-5717

**3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.**

**Rep. First Name** Michael

**Rep. Last Name** Hastings

**Rep. Title** Director, Office of Research & Sponsored Programs

**Rep. Institution** University of Maine

**Rep. Telephone** 207-581-1484

**Rep. Email Address** umgrants@maine.edu

**Rep. Mailing Address 1** 5717 Corbett Hall

**Rep. Mailing Address 2** None given.

**Rep. City** Orono

**Rep. State** ME

**Rep. ZIP** 04469-5717

**4. Project Director: Scientific lead and/or project manager.**

**Dir. First Name** Michael

**Dir. Last Name** Bilodeau

**Dir. Title** Director, PDC

**Dir. Organization** Process Development Center

**Dir. Mailing Address 1** 5737 Jenness Hall

**Dir. Mailing Address 2** None given.

**Dir. City** Orono

**Dir. State** ME

**Dir. ZIP** 04469

**Dir. Telephone** 207-581-2387

**Dir. Email Address** mbilodeau@maine.edu

**Dir. Fax** 207-581-4174

**5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."**

**Collaborators** Food Processor, Pulp Manufacturer, University of Maine (three campuses & Extension Service), Maine Community College, Maine Farmers, Fuel technology company

**6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.**

**Amount (\$)** 1500000

**7. Technology Sector**

Chose One Sector                      Aquaculture & Marine

**8. Scientific Disciplines Involved. Character limitation: 125 including spaces.****Scientific Disciplines Involved**

Natural Sciences ♦ Forestry and Agriculture, Chemical Engineering, Business and Economics.

**9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."**

Reviewer 1                              None

Reviewer 2                              None given.

**10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."**

Withhold from                          None

**11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.****Character limitation: 6,000 including spacing**

<b>Description Area</b>	This project will fund the purchase and installation of equipment to process purpose-grown energy crops into a solid biofuel. The energy crops will be grown on marginal or fallow farmland to produce an engineered biofuel for industrial, institutional, and residential thermal and electrical generation applications. The process will employ patented technology to produce engineered fuels that meet the specific needs of the targeted applications in a cost effective manner. This technology overcomes many of the challenges facing current processing technologies, including high energy consumption, relatively low energy density, acute water sensitivity, poor impact resistance, and a narrow range of operating parameters. The economic impact from this project on rural communities will be in the form of incremental farm employment, fossil energy displacement, new manufacturing and distribution jobs, and associated indirect effects. The magnitude of the economic impact from this initial commercial installation to the Northern Maine economy is expected to be in excess of \$15.8 MM per year (GDP impact) following the end of the project period. Several University of Maine groups, including the Extension Service, Process Development Center, Advanced Manufacturing Center, School of Business and Economics, will provide outreach services and technical support to this project and to the Bioenergy Sector in general. The University of Maine, the Northern Maine Community College, and a Pulp manufacturer will all consume biofuel produced from this project. Some of the funding will be used to purchase test equipment for the University of Maine to conduct biofuel product testing, crop development, and boiler efficiency testing. The food processing company will be responsible for the operation and maintenance of the biofuel production equipment. The fuel technology company will provide a technology license and technical support for the project.
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**Form Data fIA Um\$ ( z & \$ % \$ Uh \$ + . % & . % ) ' 5 A t****1. Project Title. Character limitation: 80 including spaces.**

**Project Title** Building Infrastructure for Innovation in Downeast Coastal Maine

**2. Lead Institution**

**Name** Downeast Institute

**Lead Organization Type: Choose One**

Profit

**Mailing Address 1** 39 Wildflower Lane

**Mailing Address 2** P.O. Box 83

**City** Beals

**County** Washington

**State** ME

**ZIP** 04611

**3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.**

**Rep. First Name** Brian

**Rep. Last Name** Beal

**Rep. Title** Director of Research

**Rep. Institution** Downeast Institute

**Rep. Telephone** 207.497.5769

**Rep. Email Address** bbeal@maine.edu

**Rep. Mailing Address 1** 39 Wildflower Lane

**Rep. Mailing Address 2** P.O.Box 83

**Rep. City** Beals

**Rep. State** ME

**Rep. ZIP** 04611

**4. Project Director: Scientific lead and/or project manager.**

**Dir. First Name** Brian

**Dir. Last Name** Beal

**Dir. Title** Professor of Marine Ecology

**Dir. Organization** University of Maine at Machais

**Dir. Mailing Address 1** 116 O'Brien Avenue

**Dir. Mailing Address 2** None given.

**Dir. City** Machias

**Dir. State** ME

**Dir. ZIP** 04654

**Dir. Telephone** 207.255.1314

**Dir. Email Address** bbeal@maine.edu

**Dir. Fax** 207.255.1390

**5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."**

**Collaborators** University of Maine at Machias University of Maine Maine Aquaculture Innovation Center

**6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.**

**Amount (\$)** 975,000

**7. Technology Sector"**

**Chose One Sector** Aquaculture & Marine

**8. Scientific Disciplines Involved. Character limitation: 125 including spaces.**

**Scientific Disciplines Involved**

Marine Biology Marine Ecology Shellfish Aquaculture

**9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."**

**Reviewer 1** Dr. John Commito Gettysburg College Gettysburg, Virginia

**Reviewer 2** Dr. Victor Kennedy Horn Point Laboratory University of Maryland Cambridge, Maryland

**10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."**

**Withhold from** None

**11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.**

**Character limitation: 6,000 including spacing**

**Description Area** The Downeast Institute (DEI), a non-profit organization, and its academic partner, the University of Maine at Machias (UMM), have been working for over a decade to increase infrastructure for education and economic innovation in Downeast Maine. We have been successful to a degree, obtaining federal and state funds in 2006 to purchase an 11-acre coastal tract at Black Duck Cove on Great Wass Island in the town of Beals, and renovating a short-term storage facility for lobsters into a shellfish hatchery production/research center. That 8,000 square-foot facility has the capacity to raise commercially important shellfish such as lobsters, soft-shell clams, northern quahogs, sea scallops, European oysters, Stimpson's surf clam, and other species for public stock enhancement projects, commercial aquaculture endeavors, and applied research. The facility and the property are owned by the non-profit organization. A memorandum of agreement between DEI and the university allow faculty, staff, and students at UMM to use the property and its facilities as its marine field station. One overarching goal of the non-profit and the university has been to create the easternmost marine research laboratory and education center in the United States. The coastal region in the Jonesport-Beals area of eastern Maine is among the most pristine in the state. There is no large industry, no mills, no large manufacturing centers, etc. The economy is closely linked to its abundant marine resources. It is an area that most marine scientists would envy for the opportunities that exist for both basic and applied research. We think that creating the infrastructure that would allow marine scientists and their students to visit, work, and collaborate with other scientists and local fishermen will 1) enhance learning opportunities for our undergraduate students in UMM's Marine Biology degree program; 2) generate new economic opportunities for this rural economy through collaborations with fishermen and other entrepreneurs; and 3) produce new academic and other partnerships that will increase our fundamental understanding of this coldwater, marine environment. In 2009, with funding from the state of Maine and National Science Foundation, we have begun the second phase in attaining our goal. We have hired an architect and engineering firm to help us plan for the expansion (Education Center/Classroom; Marine Research Laboratory) of our existing infrastructure, and in June 2010 will begin the construction of a 1,200 square-foot Education Center that will accommodate up to 24 students. The Center will contain a men's and women's room, a small prep room, and a janitor's closet. The Center will be built adjacent to the existing shellfish hatchery, and the interaction of the two will complement efforts in each. In addition, we have been able to fund the construction of a new 30-foot x 100-foot pier (built primarily of composite fiber material) that will allow visitors to come by boat and enable us unfettered access to deep water. For the present funding opportunity, we will rely on our planning efforts that have gone beyond the Education Center to focus on the marine laboratory portion of our infrastructure expansion. Our plans are to construct a modest, 6,200 square-foot laboratory. It would consist of 5 offices (100 ft<sup>2</sup> each), a clean lab for"

processing samples and for microbiological/genetic testing (425 ft<sup>2</sup>), a cold culture lab for rearing boreal species such as ocean quahogs, sea scallops, Stimpson's surf clams, etc. (545 ft<sup>2</sup>), a cold room for storing/holding specimens for brief periods of time (110 ft<sup>2</sup>), a quarantine lab for investigators who wish to work with invasive or other non-endemic species (230 ft<sup>2</sup>), and a running seawater laboratory (1,008 ft<sup>2</sup>) that will accommodate many different size tanks that can be used for lab experiments, holding live animals before transferring to experiments in the field, or for testing commercial marine applications such as gear design (e.g., lobster trap) or enhancement of gonad roe in sea urchins. The lab will have running ambient, heated, and chilled seawater. The remaining footprint will be devoted to a reception area (800 ft<sup>2</sup>), carpentry area (150 ft<sup>2</sup>), SCUBA storage (150 ft<sup>2</sup>), foyer (65 ft<sup>2</sup>), kitchen (110 ft<sup>2</sup>), shower (120 ft<sup>2</sup>), closets, entrances and corridors. We estimate construction costs for the third phase of infrastructure development to be approximately \$400 per square foot, or \$2.48 million. Funds from the MTAF award will be matched with monies from a variety of other public and private sources. Once complete, the facilities at our Black Duck Cove setting will allow marine biology students at UMM to enjoy the kinds of marine research amenities that their peers at larger institutions enjoy. We expect that marine scientists with interests other than shellfish research will want to use these facilities, and some may stay for extended periods of time. These investigators will complement the existing strengths and expertise of UMM's marine biology faculty, and they may wish to teach short courses or even semester-long courses in some facet of marine science that our students will benefit from. We anticipate that this easternmost marine research laboratory and education center will attract visiting groups of scientists and students from more southern climates in the U.S., and that this will create new educational opportunities for exchanges (students; programs, etc.) with other marine laboratories. We think that in time, collaborations between visiting marine scientists and fishermen/entrepreneurs will occur, as they currently do between UMM faculty and local fishermen, and that these collaborations may result in the creation of new wealth in this region.

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**Submission Metadata**

<b>IP</b>	127.0.0.1
<b>Browser</b>	Mozilla/5.0 (Windows; U; Windows NT 6.1; en-US; rv:1.9.2.3) Gecko/20100401 Firefox/3.6.3 (.NET CLR 3.5.30729)"

**Form Data fIA Um\$( ž & \$ % \$ Uh\$, .) (. % % 5A Ł****1. Project Title. Character limitation: 80 including spaces.**

**Project Title** TidGen Power System Commercialization

**2. Lead Institution**

**Name** Ocean Renewable Power Company

**Lead Organization Type: Choose One**

Profit

**Mailing Address 1** 120 Exchange St,, Suite 508

**Mailing Address 2** None given.

**City** Portland

**County** Cumberland

**State** ME

**ZIP** 04101

**3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.**

**Rep. First Name** John

**Rep. Last Name** Ferland

**Rep. Title** Vice President-Project Development

**Rep. Institution** Ocean Renewable Power Company

**Rep. Telephone** 207-221-6247

**Rep. Email Address** jferland@oceanrenewablepower.com

**Rep. Mailing Address 1** 120 Exchange St.,

**Rep. Mailing Address 2** None given.

**Rep. City** Portland

**Rep. State** ME

**Rep. ZIP** 04101

**4. Project Director: Scientific lead and/or project manager.**

**Dir. First Name** Jarlath

**Dir. Last Name** McEntee

**Dir. Title** VP, Technology & Engineering

**Dir. Organization** Ocean Renewable Power Company

**Dir. Mailing Address 1** 120 Exchange St., Suite 508

**Dir. Mailing Address 2** None given.

**Dir. City** Portland

**Dir. State** ME

**Dir. ZIP** 04101

**Dir. Telephone** 207-2216245

**Dir. Email Address** jmcentee@oceanrenewablepower.com

**Dir. Fax** 207-772-7708

**5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."**

**Collaborators** University of Maine; Maine Marine Technology Center-City of Eastport; Eastport Port Authority; Many other private, public, and non-profit organizations

**6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.**

**Amount (\$)** 920000"

**7. Technology Sector**

**Chose One Sector** Aquaculture & Marine

**8. Scientific Disciplines Involved. Character limitation: 125 including spaces.**

**Scientific Disciplines Involved**

Marine Hydrokinetic

**9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."**

**Reviewer 1** Roger Bedard ERPI

**Reviewer 2** Rick Driscoll NREL

**10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."**

**Withhold from** WITHELD BY MTI

**11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.**

**Character limitation: 6,000 including spacing**

<b>Description Area</b>	<p>Background ORPC Maine, LLC (ORPC) is a wholly-owned subsidiary of Ocean Renewable Power Company, LLC, a Maine-based developer of tidal energy technology and projects. Its proprietary technology, developed with the participation of numerous leading research institutions, will generate clean, reliable electricity from tidal currents for the power markets throughout the Northeast, Alaska and, eventually, Florida. ORPC has Preliminary Permits from the Federal Energy Regulatory Commission (FERC) and is preparing a final Pilot Project license application to FERC for two tidal sites off Eastport, Maine—Cobscook Bay and Western Passage. The core component of ORPC’s technology is the proprietary turbine-generator unit (TGU). In 2008 in a yearlong Prototype TGU Demonstration Project, ORPC firmly established the technical viability of the TGU, becoming the first company to generate electricity from Bay of Fundy tidal currents. Starting in mid 2009 with partial funding from the Maine Technology Asset Fund (MTAF) Round II, ORPC designed, engineered, procured, fabricated and assembled a complete tidal energy system, including a pre-commercial —Beta— TGU based on ORPC’s commercial design. The Beta TGU features the first all composite underwater turbines manufactured in the U.S., a low RPM underwater permanent magnet generator, a TGU support frame incorporating significant use of composite materials, and a complete power electronics system to convert variable generator output to grid-compatible power. Deployment of the Beta TGU in Cobscook Bay commenced in March 2010, with startup, testing and environmental monitoring continuing through September 2010. The Project The goal of the proposed TidGen— Power System Commercialization Project (the Project) is to advance ORPC’s technology from beta pre-commercial status to a commercial system capable of stand-alone operation in water depths of up to 150 feet. We expect that the Project will be the first in the United States to sell tidal generated electricity through a utility grid. The TidGen— Power System will include a TGU with on-board power electronics mounted on a bottom support frame. An underwater transmission line will connect the TidGen— TGU to an on-shore substation. ORPC seeks \$920,000 from MTAF to be used over a 12 month period for TidGen— Power System procurement, fabrication, supply, assembly, installation and startup, including turbines, generator, power electronics, bottom support frame, underwater transmission line and grid interconnect system. The system will be deployed in Cobscook Bay. The Project will include extensive environmental and performance monitoring. Scientific Rationale for Proposal The TidGen— Power System includes substantial advances beyond the Beta TGU. Demonstrating the science behind these advances is critical to establishing the commercial viability of the system. ORPC intends to demonstrate the following: ► Reliability of the analytical basis for and the efficacy of the bottom support frame design ► Stability and effectiveness of the”</p>
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TGU chassis and connection to the bottom support frame ▶ Sufficiency of protective coatings for corrosion control and mitigation of marine growth ▶ Optimization of the driveline design to withstand the torque transfer and bearing considerations brought about by the first coupling of two turbines in sequence ▶ Optimal orientation of the TidGen™ TGU with respect to the current flow ▶ Verification of efficiency improvements in TGU design ▶ Effectiveness of the ballasting system design and operational plan for submergence and resurfacing ▶ Use of remotely operated vehicle technologies for installation and inspection operations ▶ Remote operation and control of the TidGen™ Power System ▶ Environmental monitoring protocols that will set an industry standard Participating Organizations The ORPC Project team is comprised of the ORPC management team, ORPC consultants, and a team of key Maine-based collaborators, including: ▶ University of Maine (tank testing, and environmental studies, geological survey) ▶ Maine Marine Technology Center - City of Eastport (TGU staging, assembly, shop testing and deployment facility) ▶ Eastport Port Authority (marine and tug services) ▶ Many other private, public and non-profit organizations providing a variety of services including fabrication, machining, and assembly of both composite and metal components; marine field services; mechanical engineering; environmental consulting and legal services; and other needs. In past projects ORPC has worked with more than 30 subcontractors. Potential Economic Impact Areas ORPC™s commercialization of the TidGen™ technology and site development will create significant statewide economic benefits in the emerging green economy, including job retention and expansion, creation of higher incomes, workforce development and additional tax revenues for local and state government. ORPC™s prior efforts have already pumped over \$5 million into the Maine economy, with a considerable percentage spent in Washington County. Over the last three years, ORPC has created or retained over 80 jobs in Maine, with approximately three dozen local subcontractors employed in the Eastport area during the height of fabrication and deployment activities, providing critical low season income. ORPC estimates that within five to seven years following successful completion of the Project, 400 to 500 new jobs will be created in Maine through up to \$1 billion of new investment, resulting in new markets for Maine™s composites industry and new jobs for Maine™s young people.

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**Submission Metadata**

<b>IP</b>	127.0.0.1
<b>Browser</b>	Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.1; WOW64; Trident/4.0; SLCC2; .NET CLR 2.0.50727; .NET CLR 3.5.30729; .NET CLR 3.0.30729; Media Center PC 6.0; MDDR)"



**Form Data fIA Um\$( ž & \$ % \$ Uh % % ) - . % & ' 5 A Ł****1. Project Title. Character limitation: 80 including spaces.**

**Project Title** Ornamental Hatchery Utilizing Artemia Replacement Technology

**2. Lead Institution**

**Name** University of New England

**Lead Organization Type: Choose One**

Profit

**Mailing Address 1** 11 Hills Beach Rd

**Mailing Address 2** None given.

**City** Biddeford

**County** York

**State** ME

**ZIP** 04005

**3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.**

**Rep. First Name** Jeri

**Rep. Last Name** Fox

**Rep. Title** Program Coordinator

**Rep. Institution** University of New England

**Rep. Telephone** (207) 602-2876

**Rep. Email Address** jlfox@une.edu

**Rep. Mailing Address 1** 11 Hills Beach Rd

**Rep. Mailing Address 2** None given.

**Rep. City** Biddefors

**Rep. State** ME

**Rep. ZIP** 04005

**4. Project Director: Scientific lead and/or project manager.**

**Dir. First Name** Richard

**Dir. Last Name** Greenlaw

**Dir. Title** Project Manager

**Dir. Organization** Independent

**Dir. Mailing Address 1** 144 Old Rd

**Dir. Mailing Address 2** None given.

**Dir. City** Eliot

**Dir. State** ME

**Dir. ZIP** 03903

**Dir. Telephone** 207-286-7767

**Dir. Email Address** rjgreenlaw@gmail.com

**Dir. Fax** None given.

**5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."**

**Collaborators** Skretting Nick King: Hatchery Feeds Manager

**6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.**

**Amount (\$)** 10000

**7. Technology Sector**

**Chose One Sector** Aquaculture & Marine

**8. Scientific Disciplines Involved. Character limitation: 125 including spaces.**

**Scientific Disciplines Involved**

None given.

**9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."**

**Reviewer 1** None

**Reviewer 2** None given.

**10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."**

**Withhold from** None

**11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.**

**Character limitation: 6,000 including spacing**

**Description Area**

The proposed project will be the world's first ornamentals hatchery utilizing high density and artemia replacement protocols. These methods have been established in the foodfish sector, but have not yet been employed by the ornamental fish industry. The scientific reasoning for these protocols is very sound. Growing fish in a higher density allows the larvae to out-compete other pathogenic or otherwise invasive organisms seeking to colonize the tanks. It encourages the larvae to compete against each other as well, resulting in increased feeding efficiency, improved mobility, and overall heartiness. The importance of replacing artemia (brine shrimp) as a feed source is very important on many levels. Firstly, it greatly reduces mortality due to bacterial infection of the GI tract, which is a major issue during the artemia phase of any fish production. Secondly, the feed itself is higher in protein and fatty acids than enriched artemia, which allows for better neurological development and overall increased growth rate. In addition to the scientific motivations for replacing this food source, the elimination of artemia also results in a net labor decrease, while allowing for maximum production density. This, in turn, reduces the production cost per fish. This hatchery would have a major economic impact for the industry in Maine. There are several current wholesalers in the New England region, whose end users include restaurants, aquariums, private residences, and research institutions. These wholesalers currently purchase nearly all of their fish from out of state growers and harvesters, resulting in a net trade loss between Maine and the grower locations, mostly in Florida. This past year, most of the farms in Florida suffered 80-100% mortality after several weeks of record low temperature. New England's wholesalers are now paying top-dollar for their fish as a result. As mentioned earlier, UNE will be participating in the project. Dr. Jeri Fox will lend her 20 years of culture expertise to the project, as well as help from students, and assistance in the procurement of equipment. She will also aid the collecting of broodstock. Richard Greenlaw will be acting as the project manager, as an independent entity. Using the experience gained from his experience as a production manager for Great Bay Aquaculture for the last 3 years, he will design, build, and maintain the system, while overseeing production of juveniles. Mr. Greenlaw also assisted in 3 trials for Skretting that led to the development of the artemia replacement diet. Nick King, Hatchery Feeds Manager for Skretting, will collaborate on the project, and will assist with the purchasing of feed.

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