SBIR

Small Business Innovation Research Program

ABSTRACTS OF AWARDS FOR FISCAL YEAR 2008

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

INTRODUCTION

The Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), through the Small Business Innovation Research (SBIR) program, awarded 14 Phase I contracts for FY 2008. These awards of up to $95,000 each, and totaling approximately $1.3 million The awards are for a six-month effort to demonstrate the feasibility of innovative approaches to the research topics identified in the "DOC/NOAA SBIR Program Solicitation for FY 2008 (NOAA 2008-1)." Abstracts of the successful Phase I proposals submitted under this solicitation, and brief comments on their anticipated results are provided in this publication.

In Phase II, funding is provided for projects that are most promising after Phase I is completed. These awards can be for up to $400,000 each and for two years. The DOC/NOAA awarded a total of 6 Phase II contracts in FY 2008 for a total of approximately $2.1 million. Abstracts of successful Phase II proposals and comments on their anticipated results are also provided in this publication.

The SBIR program is highly competitive. A total of 83 proposals were received by DOC/NOAA in response to its FY 2008 solicitation. DOC/NOAA scientists and/or engineers independently reviewed the proposals. With the funds available, only 14 were selected for an award. Final selection was based upon the results of the reviews, relative importance to DOC/NOAA needs, relationship to on-going research, and potential for commercialization.

FY 2008 PHASE I AWARD WINNER

FIRM:	Intelligent Optical Systems, Inc. 2520 W. 237th Street Torrance, CA 90505-5217
AWARD:	$94,996
PHONE:	(424) 263-6346
FAX:	(310) 530-7417
E-MAIL:	sbirproposals@intopsys.com
PRINCIPAL INVESTIGATOR:	Indu Saxena

TITLE OF PROJECT:	High Fidelity, Low Power Omnidirectional Hydrophone
SUBTOPIC NUMBER:	8.1.3R

TECHNICAL ABSTRACT:

Intelligent Optical Systems, Inc. (IOS) proposes to develop a highly reliable, high fidelity, fiber optic hydrophone-based sensor that will consume low power, and offer a high signal-to-noise ratio (SNR) in the frequency range desired for monitoring marine acoustics. There is a need to advance the state-of-the-are of low power, portable hydrophones for recording fish spawning calls. Autonomous underwater vehicle (AUV) mountable hydrophones that reject AUV motor noise are desired. If software to decode the location and size of fish is included to enable automatic source identification, the devices would be extremely useful for fish population monitoring and for understanding the effects of climate and environmental changes.

Underwater monitoring systems are presently prohibitively expensive. There is a long-term reliability issue with them as well, as the electronic acoustic sensor are intrinsically prone to degradation from salt water, as metallic conduits are necessary. These sensors cannot offer long term reliability. In Phase I, IOS will demonstrate the feasibility of developing a cost-effective, battery operated hydrophone offering a SNR > 5.

SUMMARY OF ANTICIPATED RESULTS:

IOS's omnidirectional hydrophone system will enable a more effective, and more power efficient method of monitoring marine life, and potentially lower the cost per unit. Potential commercial uses of the proposed hydrophone array include the monitoring of marine life, and seismic, environmental, and climate studies.

FY 2008 PHASE I AWARD WINNER

FIRM: TECHSHOT, Inc.
7200 Highway 150
Greenville, Indiana 47124-9515

AWARD: $94,985

PHONE: (812) 923-9591 ext. 242
FAX: (812) 923-9598
E-MAIL: ptodd@techshot.com

PRINCIPAL INVESTIGATOR: Paul Todd, Ph.D.

TITLE OF PROJECT: High Pressure Specimen Chamber

SUBTOPIC NUMBER: 8.1.4R

TECHNICAL ABSTRACT:

Even today as a highly technical and advanced world civilization the physiology of deep sea fish and invertebrates continues to remain mysterious and poorly known. Past specimen containers fail to either have the size or volume needed or lack the robustness for high pressure containment or in many cases, lack the repeatability necessary to ensure a reasonable lifetime of continuous use. The Techshot solution for a High Pressure Specimen Chamber is a solid design incorporating modern materials, innovative hatch and containment features with a unique adjustable pressure compensator for specimen collection down to 2000 meters. The Techshot High Pressure Specimen Chamber is an intuitive, user-friendly system allowing for easy pre and post containment operation by human and remotely operated vehicles alike. Techshot's experience developing specimen enclosures for harsh environments permeates this simplistic yet highly innovate High Pressure Specimen Chamber

SUMMARY OF ANTICIPATED RESULTS:

The results from the project are significant. Techshot anticipates upon completion of the Phase II design effort the High Pressure Specimen Chamber will be ready for qualification and immediate use in the field. This robust high pressure specimen chamber will have a long and useful life retrieving live specimens from depths up to 2000 meters.

FY 2008 PHASE I AWARD WINNER

FIRM:	Pettit Applied Technologies 34 Cessna Court Gaithersburg, MD 20879-4145
AWARD:	$94,928.80
PHONE:	(240) 320-7603
FAX:	(301) 926-3549
E-MAIL:	jf-apltech@comcast.net
PRINCIPAL INVESTIGATOR:	Jerome P. Ferrance

TITLE OF PROJECT:	Carbon Nanotube Methods for Molecular Identification of Fish Species
SUBTOPIC NUMBER:	8.1.7F

TECHNICAL ABSTRACT:

Identification of particular fish species based on specific DNA sequences is not currently time or cost effective, but morphological identification is not always possible during early development stages. The project proposed seeks to develop a microfluidic based approach using DNA hybridization, coupled with a sensitive detection method based on the use of carbon nanotubes to rapidly identify fish from very small tissue samples. The Phase I part of this project will evaluate two innovative detection methods using single walled carbon nanotubes to provide the sensitivity to detect DNA sequences without the need for PCR amplification of the fish DNA. Comparison of the two detection methods as part of this work will be used to select the method to be implemented in the Phase II effort. In addition, the need for DNA extraction from fish tissue as part of an integrated microdevice will be evaluated.

FY 2008 PHASE I AWARD WINNER

FIRM:	Synkera Technologies, Inc. 2021 Miller Drive, Suite B Longmont, CO 80501-6787
AWARD:	$95,000
PHONE:	(720) 494-8401 x104
FAX:	(720) 494-8402
E-MAIL:	ckostelecky@synkera.com
PRINCIPAL INVESTIGATOR:	Clayton J. Kostelecky

TITLE OF PROJECT:	A Novel CO2 Sensor for Closed Circuit Mixed Gas Rebreathers
SUBTOPIC NUMBER:	8.1.9SG

TECHNICAL ABSTRACT:

A new, solid-state, carbon dioxide (CO2) sensor for use with closed circuit mixed gas rebreathers is proposed. This novel, polymer composite sensor will be small, low power, and low cost. This sensor will be incorporated with closed circuit rebreathers, allowing the NOAA Advanced Diving Program to perform longer, deeper dives. The use of closed circuit rebreathers provide many advantages over diving using traditional open circuit SCUBA, the major one being increased gas efficiency. However, safety related issues limit the use of closed circuit rebreahters, one being the lack of a reliable CO2 sensor that can warn the diver when CO2 levels in the loop are becoming too high. Currently, divers must rely on training and experience to identify when conditions are becoming unsafe. Use of an electronic sensor to monitor CO2 would offer a substantial improvement in diver safety.

SUMMARY OF ANTICIPATED RESULTS:

It is expected that the successful development of the proposed CO2 sensor and its incorporation into closed circuit rebreathers will help NOAA's Advanced Diving Program meet their objective of extending the bottom time per dive and extend the depth limit from 130 to 300 feet. In addition, it is expected that this sensor will find use in other applications, including the routine monitoring of CO2 in buildings and for ventilation control.

FY 2008 PHASE I AWARD WINNER

FIRM: GINER, Inc.
89 Rumford Avenue
Newton, MA 02466-1311

AWARD: $94,997

PHONE: (781) 529-0505
FAX: (781) 893-6470
E-MAIL: jkosek@ginerinc.com

PRINCIPAL INVESTIGATOR: John A. Kosek, Ph.D.

TITLE OF PROJECT: A Miniaturized Carbon Dioxide Detector

SUBTOPIC NUMBER: 8.1.9SG

TECHNICAL ABSTRACT:

NOAA supports over 25,000 underwater dive programs per year. To increase the duration and depth of these dives, the use of closed circuit mixed gas rebreathers (CCRs) is being considered. As there currently are no sensors to detect CO2 levels in the breathing gas, Giner, Inc. proposes to develop an electrochemical CO2 sensor for CCR use. The technical innovation will be to develop a reversible rechargeable sensing electrode in a solid-polymer electrolyte configuration. The overall objective of the proposed Phase I program is to develop a sensor to quantify CO2 levels in a CCR. The program goal is to demonstrate feasibility of a CO2 specific sensor and demonstrating the ability to accurately monitor up to 5% CO2 in real time. Our approach to develop the proposed CO2 sensor will be to develop a unique sensing electrode that is specific to CO2. Complete sensor cells will be fabricated and evaluated.

SUMMARY OF ANTICIPATED RESULTS:

Successful program completion will result in a CO2 sensor that can detect up to 5% Co2 in a background of oxygen, helium and/or nitrogen over a wide range of temperature and humidity. The miniaturized sensor will be batter powered and have rapid response.

FY 2008 PHASE I AWARD WINNER

FIRM:	Applied Mathematics, Inc. 1622 Route 12 P.O. Box 637 Gales Ferry, CT 06335-0637
AWARD:	$95,000
PHONE:	(860) 464-7259
FAX:	(860) 464-6036
E-MAIL:	tew@applmath.com
PRINCIPAL INVESTIGATOR:	Thomas E. Wood

TITLE OF PROJECT:	Acoustic Propagation Analysis Program for Marine Scientists
SUBTOPIC NUMBER:	8.1.9F

TECHNICAL ABSTRACT:

People who work in the marine sciences field often need to analyze the transmission of sound through the ocean. Today, there are more than 60 different propagation loss models available; no single model is the best in all cases. Choosing the appropriate model, as well as the necessary input data to the model can be a daunting task. In this proposal, we discuss an approach to designing a computer program that would solve this problem by allowing multiple propagation models and databases to coexist for the purposes of analysis, provide a user interface that would guide the user through choosing the appropriate models and data, and provide analysis tools that would allow the user to determine the statistical nature of the acoustic problem being analyzed. As part of this project, we propose to develop a prototype system to demonstrate the feasibility of our approach.

SUMMARY OF ANTICIPATED RESULTS:

There are two main results anticipated from this project. The first would be the development of a design specification that would determine the requirements of the program to be developed in terms of the types of propagation loss models and databases that must be accounted for, development of the theoretical basis for the analysis tools to be incorporated into the program, and a complete description of the user interface. The second result anticipated from this project is the development of a functional prototype system that would demonstrate the feasibility of the approach discussed in this proposal.

FY 2008 PHASE I AWARD WINNER

FIRM:	HLS Research, Inc. 3366 N. Torrey Pines Court, Suite 310 La Jolla, CA 92037-1025
AWARD:	$94,948.30
PHONE:	(858) 457-0800 ext. 104
FAX:	(858) 457-0801
E-MAIL:	martin.siderius@hlsresearch.com
PRINCIPAL INVESTIGATOR:	T. Martin Siderius

TITLE OF PROJECT: SSP Tool: Simplified Sound Propagation Tool

SUBTOPIC NUMBER: 8.1.9F

TECHNICAL ABSTRACT:

In recent years, there has been increasing concern about the role of man-made sound on the marine environment. For this effort, we propose developing an intuitive software interface for sound propagation modeling. This will be based on software developed at HLS Research, Inc. for similar applications. The software will use existing propagation modeling codes that have a long history in the underwater acoustics community. Due to the complex nature of the ocean environment and the disparate types of sound sources and marine life, the software requires a suite of underwater acoustic source and propagation models. T he interface will embody a seemingly simplistic and guided approach to enable a user without highly specialized knowledge to select appropriate model inputs in order to attain meaningful received level metrics. GUI-based software tools will be provided to easily manipulate the results for visual representation or for distillation into text-based parameters for risk assessment.

SUMMARY OF ANTICIPATED RESULTS:

Prototype software for evaluation by NOAA and a final report summarizing Phase I results and Phase II project plans.

FY 2008 PHASE I AWARD WINNER

FIRM:	Ocean Farm Technologies, Inc. 114 Higgins Road N. Searsmont, ME 04973-9712
AWARD:	$94,651
PHONE:	(207) 322-4322
FAX:	(207) 433-1300
E-MAIL:	spage@oceanfarmtech.com
PRINCIPAL INVESTIGATOR:	Stephen H. Page

TITLE OF PROJECT: Wave Energy Conversion to Power Offshore Aquacutlure

SUBTOPIC NUMBER: 8.1.13SG

TECHNICAL ABSTRACT:

Ocean Farm Technologies (OFT) proposes to examine using ocean wave energy to power offshore aquaculture. While developing offshore fish farming systems, OFT has recognized a pressing need for non-polluting, low-cost sources of power for system operations and diver support. The greatest need for power is in the form of pressurized air. OFT's AquaPod™ containment system utilizes air for positioning in the water column and for rotation to support cleaning, maintenance, sorting, and harvesting. In addition, scuba air is routinely used for many husbandry tasks. This project will evaluate a promising way reduce the expense, noise, pollution, and inconvenience of present methods of providing compressed air. A wave-powered system will be designed and tested to evaluate its potential. We will analyze the system costs compared with existing methods. Results will provide the basis for detailed prototype system design to be developed, deployed, and evaluated under a Phase II effort.

SUMMARY OF ANTICIPATED RESULTS:

The proposed wave-powered system for producing compressed air will reduce the capital, energy, and labor costs associated with routine tasks associated with offshore fish farming. OFT intends to commercialize the resulting technology to enhance the performance of its Aquapod™ system and market its use in the broader offshore aquaculture sector.

FY 2008 PHASE I AWARD WINNER

FIRM:	Droplet Measurement Technologies, Inc. 5710 Flatiron Parkway, Suite B Boulder, CO 80301
AWARD:	$94,987.96
PHONE:	(303) 440-5576
FAX:	(303) 440-1965
E-MAIL:	gandrud@dropletmeasurement.com
PRINCIPAL INVESTIGATOR:	Bruce Gandrud

TITLE OF PROJECT:	A Miniature Aerosol Nephelometer for Deployment in Dropsondes or UAVs
SUBTOPIC NUMBER:	8.2.2C

TECHNICAL ABSTRACT:

Two, complementary techniques are proposed that are deployable on dropsondes or mobile measurement platforms and measure the scattering coefficient of atmosphere aerosols. The Phase I activity will be a proof of concept study that evaluates the relative strengths and weaknesses of the two measurement systems and combines a detailed analysis of the optical and electronic systems with a laboratory validation of the optical designs.

SUMMARY OF ANTICIPATED RESULTS:

The deliverables will be a detailed analysis that demonstrates the viability of the optical, electrical and mechanical designs and data from preliminary measurements that compares the results from the two techniques with conventional nephelometers and optical spectrometers.

FY 2008 PHASE I AWARD WINNER

FIRM:	Riverside Technology, Inc. 2290 East Prospect Road, Suite 1 Fort Collins, CO 80525
AWARD:	$94,902
PHONE:	(970) 484-7573
FAX:	(970) 484-7593
E-MAIL:	Graeme.aggett@riverside.com
PRINCIPAL INVESTIGATOR:	Graeme R. Aggett

TITLE OF PROJECT: A Web-Based Climate Change Drought Decision Support System (C2D2S2)

SUBTOPIC NUMBER: 8.2.3C

TECHNICAL ABSTRACT:

Water managers are increasingly recognizing climate change as a significant issue and are requesting detailed information about potential hydrologic impacts suitable for inclusion in planning. Available studies, however, are most often academic in nature and have the added limitation of being incompatible with agency specific water management models or the streamflow period of interest. Commission of system focused studies, are prohibitively expensive for most municipalities and agencies. Our goal is thus to develop a web-based system to provide widespread and low-cost access to tools that can be used to generate scenarios of future streamflow. The proposed project will determine the feasibility of developing a prototype web-based Climate Change Drought Decision Support System (C2D2S2) that will enable water managers at various operational- and time-scales to rapidly assess the impact of predicted climate change on natural flows at critical nodes along a river network

SUMMARY OF ANTICIPATED RESULTS:

This Phase I project will determine the feasibility of developing models and tools to process climate change and hydrologic time series data to generate probabilistic ensembles of stream flows and water availability under projected climate change and drought conditions. Prospective users and commercialization potential will be addressed and evaluated at a level sufficient for feasibility and for further development under a Phase II project.

FY 2008 PHASE I AWARD WINNER

FIRM:	Propagation Research Associates, Inc. 1275 Kennestone Circule Suite 100 Marietta, GA 30066-6032
AWARD:	$95,000
PHONE:	(678) 384-3413
FAX:	(770) 795-8134
E-MAIL:	jim.stagliano@pra-corp.com
PRINCIPAL INVESTIGATOR:	James J. Stagliano, Jr.

TITLE OF PROJECT:	Lightning Probability Nowcasting and Forecasting with PRA Strike Insight Technology
SUBTOPIC NUMBER:	8.4.1W

TECHNICAL ABSTRACT:

There is a strong correlation between cloud-to-ground (CG) lightning and the altitude of the 40-dBZ radar reflectivity levels with respect to the height of the -10^0C level. T he proposed Phase I effort will develop an algorithm for lightning probability based upon these studies, perform basic assessment, prototype a web page for dissemination of the lightning probability or threat risk, and assess the feasibility of nowcasting lightning risk using current storm track features. Theses three primary tasks will be folded into a prototypical product for delivery at the end of Phase I. In addition, the feasibility of integrating the algorithm into the OpenRPG will be examined, as well as integrating lightning detection network data to improve the nowcasting capabilities of the algorithm, using Numerical Weather Prediction (NWP) to provide 3-6 hour forecasts of lightning threat, and incorporating polarimetric radar data into the algorithm in anticipation of the NWS polarimetric upgrade.

SUMMARY OF ANTICIPATED RESULTS:

The result of this work will be a product to nowcast and the forecast lightning threat based upon radar data. The output of this product will feed a web-based visualization system for dissemination of the threat to the general public. This output coupled with a strong educational program will reduce the number of fatalities and injuries due to lightning each year.

FY 2008 PHASE I AWARD WINNER

FIRM:	Airborne Technologies, Inc. 4338 N. Gunflint Trail Wasilla, AK 99654-9217
AWARD:	$94,969
PHONE:	(907) 357-1500
FAX:	(907) 357-1501
E-MAIL:	tveenstra@atiak.com
PRINCIPAL INVESTIGATOR:	Timothy S. Veenstra

TITLE OF PROJECT:	Vessel Launched Unmanned Aerial System for Marine Debris Detection and Tracking
SUBTOPIC NUMBER:	8.4.3D

TECHNICAL ABSTRACT:

Airborne Technologies, Inc. Phase I effort will be to design and demonstrate the feasibility of developing a low-cost, marinized Unmanned Aerial System (UAS) that can be operated easily from small or large vessels and is capable of reliable and repeatable operations in an ocean environment. The UAS will be utilized for the detecting and tracking of marine debris, sea-life or other objects in the open ocean. Using anomaly detection software, the UAS will be able to locate items in the water and either autonomously or thru remote operator input, mark the location of the anomaly by deploying a small tracking buoy with a satellite modem. The Phase I study will prepare us for a future Phase II program of building and testing the Unmanned Aerial System for operations from a small vessel in an ocean environment.

SUMMARY OF ANTICIPATED RESULTS:

The deliverables of the Phase I study will be a final report that details the outcomes of the feasibility studies and the design of the proposed Unmanned Aerial System and UAS deployable tagging buoy for Phase II prototyping and testing.

FY 2008 PHASE I AWARD WINNER

FIRM:	SURVICE Engineering 4695 Millennium Drive Belcamp, MD 21017
AWARD:	$94,975.18
PHONE:	(410) 273-7722
FAX:	(410) 272-6763
E-MAIL:	keith.bowman@survice.com
PRINCIPAL INVESTIGATOR:	W. Keith Bowman

TITLE OF PROJECT: Dredged Channel Depth Monitoring

SUBTOPIC NUMBER: 8.4.4N

TECHNICAL ABSTRACT:

The condition of dredged channels in U.S. waterways is ever-changing due to sedimentation, shoaling, and the growing presence of submerged debris. Furthermore, the lack of the most current and accurate subsurface terrain data (specifically, channel depth as a function of position) at the time of a ship's transit introduces a level of uncertainty that prevents optimal safety and navigational efficiency.

The proposed Phase I SBIR research effort will demonstrate the feasibility of collecting GPS position and single-beam sonar water depth data from a large quantity of mobile marine platforms, then harvesting and processing the data to dynamically maintain waterway nautical charts.

SUMMARY OF ANTICIPATED RESULTS:

The Phase I effort will be focused on demonstrating the feasibility of an automated data collection system, collecting sample data, and providing the collected data to NOAA in a usable format. Once the technology and feasibility is demonstrated in Phase I, Phase II will be an expanded practical application of a prototype system in a high traffic, high value-of-application area within the Chesapeake Bay.

FY 2008 PHASE I AWARD WINNER

FIRM:	Arete Associates P.O. Box 2607 Winnetka, CA 91306-2607
AWARD:	$95,000
PHONE:	(703) 413-0290
FAX:	(703) 413-0295
E-MAIL:	zwilliams@arete.com
PRINCIPAL INVESTIGATOR:	J. Zandy Williams, Ph.D.

TITLE OF PROJECT: Shipping Channel Monitoring Through Remote Sensing and Analysis of Ship Generated Kelvin Waves

SUBTOPIC NUMBER: 8.4.4N

TECHNICAL ABSTRACT:

Monitoring bathymetry changes in shipping channels of rivers and estuaries is vital to the US economy. The standard method of sonar depth sounding from survey ships, though accurate, is slow to perform. Thus, we propose a new and innovative approach for rapid assessment of shipping channel morphology from the kinematics associated with remote sensing of the interaction of Kelvin wakes from boats with river bottoms. This program will develop a passive remote sensing methodology using imagery from airborne or possibly satellite sensors. In Phase I, we will determine the expected performance of the methodology by modeling the sensitivity of the Kelvin wave pattern to a non-uniform shipping channel. The inverse model incorporating wave dynamics associating the interaction of waves with the channel will be accomplished during Phase II and implemented in vetted algorithms.

SUMMARY OF ANTICIPATED RESULTS:

The anticipated result of this program is a rapid assessment capability to monitor dredged shipping channels for sufficient change in bathymetry to warrant a standard bathymetric shipboard sonar survey. If successful through Phase II, the probable gains include rapid survey monitoring and cueing at modestly high spatial resolution, access to depths on the submerged overbanks, simultaneous current retrievals, simultaneous AtoN location survey, and a potential for use on unmanned-aerial-vehicles (UAV) in the future as well as an assessment of the potential of commercial satellite imagery to meet these gains.

FY 2008 PHASE II AWARD WINNER

FIRM:	Desert Star Systems, LLC 3261 Imjin Road Marina, CA 93933-5103
AWARD:	$392,039
PHONE:	(831) 384-8000 x117
FAX:	(831) 384-8062
E-MAIL:	mf@desertstar.com
PRINCIPAL INVESTIGATOR:	Marco Flagg

TITLE OF PROJECT: SeaTag™: Design and Manufacture of a Family of Modular Archival Tags

SUBTOPIC NUMBER: 8.1.3F-E

TECHNICAL ABSTRACT:

The SeaTag™ project proceeds in Phase II to implement and test a family of micro observation stations that go beyond the concepts of traditional electronic data logging animal tags. These will include functions such as communication between SeaTag™ devices to obtain data from many animals when one tag is recovered or transmits. Deployment methods are extended to mounting on predators to monitor interaction with prey, static mounting on the sea-floor and on land, enabling the observation of both the animals under study but also the environment. ZigBee RF hot spots placed at known resting or nesting sites for amphibious animals will support unattended reading of data from tags while the tag remains on the animal. Solar power supports indefinite endurance and lifelong monitoring of animals. The emphasis on small size and low cost continues to enable tracing of more animals, both in terms of size and economic quantity.

SUMMARY OF ANTICIPATED RESULTS:

Phase II will yield four specific devises. These include a very small and inexpensive geo-locating tag, a modular tag with both satellite transmit and acoustic networking capabilities, a camera device with satellite image transmission for environmental monitoring related to tagging studies or otherwise and a refined version of the Phase I indefinite endurance / RF link enabled data logging tag.

FY 2008 PHASE II AWARD WINNER

FIRM:	Green Eyes, LLC Horn Point Lab 2020 Horns Point Road Cambridge, MD 21613
AWARD:	$356,527.32
PHONE:	(410) 829-5601
FAX:	(410) 820-8241
E-MAIL:	vince@greeneyesobserving.com
PRINCIPAL INVESTIGATOR:	Vincent M. Kelly

TITLE OF PROJECT:	CLASP Phase II: Producing a Coastal Long-Term Automated Self-Calibrating Profiler Commercial Prototype
SUBTOPIC NUMBER:	8.1.4N-E

TECHNICAL ABSTRACT:

In our Phase I test, Green Eyes successfully demonstrated the feasibility of a Coastal Long-Term Automated Self-Calibrating Profiler (CLASP) system capable of autonomous operation for one year. The feasibility prototype also incorporated two-way telemetry and near real-time display of processed data. CLASP uses a profiling pump to deliver water to a flow-through multi probe sensor and additional instruments such as nutrient monitors. It provides for environmental control of the sampling and “stand by” sensor environments via a manifold system that enables automated delivery of standards, cleansers and biocides. Our innovative approaches to profiling, biofouling control, sensor cleaning, and automated calibration are the keys to this device and were successfully demonstrated during Phase I. We now propose to construct the CLASP commercial prototype, and to install it at a NOAA tidal station.

SUMMARY OF ANTICIPATED RESULTS:

This research will produce a commercial prototype of a Coastal Long-term Automated Self-calibrating Profiler (CLASP). CLASP will be able to collect water column profiles for one year without service visits. Green Eyes ahs developed innovative solutions to control biofoulding, and to autonomously recalibrate sensors that enable such service intervals. The prototype device that we will deliver to NOAA at the conclusion of the project will measure Temperature, Salinity, Dissolved Oxygen, pH, Chlorophyll Fluorescence, Turbidity, and Nitrate from user defined depths and at specific sampling intervals.

FY 2008 PHASE II AWARD WINNER

FIRM:	Kona Blue Water Farms, LLC P.O. Box 4239 Kailua Kona, HI 96745
AWARD:	$259,000
PHONE:	(808) 331-1188 x211
FAX:	(808) 331-8689
E-MAIL:	imccomas@kona-blue.com
PRINCIPAL INVESTIGATOR:	Ian McComas

TITLE OF PROJECT:	Refining Broodstock, Hatcher and Weaning Strategies: Key to the Commercial Culture of the Imperiled Giant Grouper (*Epinephelus lanceolatus*)
SUBTOPIC NUMBER:	8.1.8SG-E

TECHNICAL ABSTRACT:

Giant Grouper (*E. lanceolatus*) is one of the most desirable marine fish in the world. Its robust nature, tremendous growth rate, superb quality flesh and high value make it ideal for open ocean aquaculture. Phase I research marked the first time this species has been reared in the hatchery outside of Southeast Asia. Broodstock nutrition, spawning seasonality and lunar periodicity were defined. Around 6.5 million viable eggs were obtained from four induced spawns. Several dozen larvae were raised to metamorphosis in one tank, but weaning cannibalism was heavy.

Further research is needed to define the critical criteria for commercial-scale hatchery culture and growout of this species. Phase II research addressed this need. Broodstock manipulation will strive to extend the natural spawning season and, increase spawn viability. Larval rearing trials will evaluate stocking densities and feeding regimes, and improve overall survival to metamorphosis. Refined diets and passive larval grading mechanisms will be tested to reduce cannibalism around weaning. Growout feed trials will compare affects of commercial diets on growth rates and feed conversion ratios. Fish from selected cohorts and size class will be tested to determine parentage, leading to better understanding of spawning behavior, larval fitness and genetic diversity of offspring.

FY 2008 PHASE II AWARD WINNER

FIRM: Ocean Farm Technologies
114 Higgins Road N.
Searsmont, ME 04973-9712

AWARD: $300,000

PHONE: (207) 322-4322
FAX: (207) 433-1300
E-MAIL: spage@oceanfarmtech.com

PRINCIPAL INVESTIGATOR: Stephen H. Page

TITLE OF PROJECT: Automation of Finfish Net Pen Operations

SUBTOPIC NUMBER: 8.1.14SG-E

TECHNICAL ABSTRACT:

Open-ocean finfish aquaculture presents many challenges including net handling, scuba diving in adverse conditions, maintenance, and feeding. In Phase I, Ocean Farm Technologies, Inc. successfully demonstrated the feasibility of pen rotation, which is essential to maintaining a fish pen offshore. Phase II will develop a prototype automated operations system for marine finfish net pens. Automated manipulation of the Aquapod™ net pen will allow remote mortality collection, cleaning, maintenance, inspection and harvesting operations. T his includes hardening of the rotation hardware, buoyancy chambers and valving, needs identified during our feasibility study. Phase II funding will also enable OFT to develop custom electronics for the control system and create a versatile graphic user interface. The Phase I feasibility study also uncovered the potential to add more features tot the control hardware and software, which will broaden the automation from the narrow but critical function of rotation to include environmental and crop monitoring. This latter feature will have commercial potential for marine finfish containment systems other than the Aquapod™. Savings in labor and reduction of scuba diving will be a key selling point OFT intends to market globally the technology developed through this SBIR effort to owners of Aquapod net pen and other submersible and surface net pens.

SUMMARY OF ANTICIPATED RESULTS:

The Phase II development will result in products that can be customized for sale to marine finfish net pen operations utilizing Aquapod™ or other net pen platforms.

FY 2008 PHASE II AWARD WINNER

FIRM:	Remote Sensing Solutions, Inc,. 3179 Main Street Unit #3, P.O. Box 1092 Barnstable, MA 02630-1105
AWARD:	$399,954.48
PHONE:	(508) 362-9400
FAX:	(508) 519-9175
E-MAIL:	Carswell@remotesensingsolutions.com
PRINCIPAL INVESTIGATOR:	James R. Carswell, Ph.D.

TITLE OF PROJECT:	A Novel Internet-based Radar Digital Receiver and Processor (iRAP) System
SUBTOPIC NUMBER:	8.3.5E-W

TECHNICAL ABSTRACT:

The NOAA strategic vision is to help realized “an informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions.” Never is this vision more applicable as it is to tropical cyclones (TCs). These systems pose one of the largest natural threats to our society and economy. The NOAA research aircraft carry several NOAA and other radar systems designed to extract information critical to forecasters and improving our understanding of TCs, as well as collecting the necessary information to improve or lead to new satellite-based sensors that can provide observations of TCs on a global scale. This proposed effort seeks to realize an Internet-based radar digital receiver and processor system that provides compatibility between the NOAA and other radar systems and AAMPS. This novel system takes advantage of recent technology advances in FPGAs, a network processors and communication schemes and utilizes a unique system architecture to realize a solution that leap frogs over today’s commercially available technology, while providing flexibility and modularity to ensure a long life cycle and complying with electrical and manufacturing standards to minimize production and support costs.

SUMMARY OF ANTICIPATED RESULTS:

The company expects the results when compared to current competitive offerings will further solidify iRAP as a needed commercial product. Upon successful testing of the prototype iRAP, RSS anticipated Phase III funding.

FY 2008 PHASE II AWARD WINNER

FIRM:	ProSensing, Inc. 107 Sunderland Road Amherst, MA 01002-1098
AWARD:	$400,000
PHONE:	(413) 549-4402 x15
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E-MAIL:	popstefanija@prosensing.com
PRINCIPAL INVESTIGATOR:	Ivan PopStefanija

TITLE OF PROJECT: Low-Cost Integrated Multi-Channel Microwave Radiometer Receivers for Hurricane Surface Wind Structure Measurement

SUBTOPIC NUMBER: 8.3.7R-W

TECHNICAL ABSTRACT:

This proposal describes the development of compact radiometer receiver modules intended for use in hurricane wind speed imaging radiometers and low cost single beam ocean wind speed sensors. The Hurricane Imaging Radiometer (HIRad), currently under development by a team of government, university and industrial partners, will require ten high performance receiver channels, which must be compact and low cost. During Phase I, ProSensing developed a prototype compact C-band radiometer (CCR) receiver module that employs inexpensive surface mount components to implement a standard Stepped Frequency Microwave Radiometer (SFMR) in a small, lightweight package. In Phase II, we plan to develop a single sideband version of the CCR receiver module that is designed specifically for installation in the HIRad system. A compact-SFMR system will also be developed in Phase II, with a total instrument weight of 3 kg, including the CCR receiver and horn antenna. Two complete compact-SFMR instruments will be delivered to NOAA, one for deployment on a small UAV, and a second for measuring down welling atmospheric brightness temperature on the NOAA P-3 for improved low wind speed and rain rate measurements.

SUMMARY OF ANTICIPATED RESULTS:

Successful completion of Phase I and Phase II R&D will result in the construction of the Hurricane Imaging Radiometer (HIRad) that will provide high resolution (on the order of 500 m) images of ocean surface wind speed and column integrated rain rate over a swath width of 10 km or more.