

FY 2012 PHASE I AWARD WINNER

FIRM: Sunburst Sensors, LLC
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AWARD: \$94,998

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PRINCIPAL INVESTIGATOR: James C. Beck, MSME, President/CEO

TITLE OF PROJECT: Development of a Long Term pH and $p\text{CO}_2$
Lagrangian Drifter

SUBTOPIC NUMBER: 8.3.1C

TECHNICAL ABSTRACT:

Quantifying oceanic CO_2 uptake and ocean acidification and understanding their impact on global climate and ocean ecology are key goals of NOAA's climate change research programs. NOAA's request for *Development of a long-term Lagrangian pH and $p\text{CO}_2$ drifter* aims to address these goals by developing technology that measures both $p\text{CO}_2$ and pH that can be widely deployed in the world's oceans.

Sunburst Sensors proposes to develop an innovative pH and $p\text{CO}_2$ prototype sensor based on the patented technology of its SAMI sensors. We will determine the feasibility of a new compact, cost-effective sensor design that can reliably measure both quantities with the required accuracy and precision.

We will investigate two innovations that will significantly simplify and reduce the cost of our current sensors. First, we will combine the optics and flow cell using microfluidics techniques, resulting in a compact, inexpensive, modular sensor. Second, we will use a single reagent for both $p\text{CO}_2$ and pH measurements in a single system.

Phase I will culminate with a design based on the success of these innovations. This design will be refined and integrated into a surface float with satellite telemetry and become available as a commercial product in Phase II.

SUMMARY OF ANTICIPATED RESULTS:

This research will result in a design for new compact, cost-effective sensor designs that can reliably measure both pH and $p\text{CO}_2$ with the required accuracy and precision for oceanographic carbon cycle research.