

Final Report Form - Oil Spill Recovery Institute

An electronic copy of this report shall be submitted by mail, or e-mail to the OSRI Research Program Manager wspogau@pwssc.org and Financial Office poswalt@pwssc.org
Mailing address: P.O. Box 705 - Cordova, AK 99574 -

Deadline for this report: Submittal within 90 days of grant/award expiration. **Also**, note that a summary Financial Statement shall be submitted **within 45 days** of the grant expiration. The final invoice and financial statement is due within 90 days of the grant/award expiration.

Today's date: May 12 2010

Name of awardee/grantee: Robert W. Campbell

OSRI Contract Number: 09-10-11

Project title: Demonstration of a tethered-balloon, surveillance system for spill response

Dates project began and ended: April 1, 2009 – September 30, 2009

PART I - Outline for Final Program or Technical Report

This report must be submitted by all grantees. However, for those whose project work resulted in a peer reviewed publication (whether in draft or final form), this report may be abbreviated and the publication attached as part of the report.

Summary

Oil spill response is highly dependent on being able to find the oil in order to ensure that cleanup operations are properly directed. This is commonly achieved by using airborne observers and observations on the boat. Weather and darkness limits the ability to have flights, and the distance that observers on a boat see is limited by their height off the water. This project demonstrated the utility of using a set of visible and infrared cameras attached to a tethered balloon to increase the height of the observations. The system transmitted its observations wirelessly so all boats in the nearby area would be able to share the observations. The balloon approach does not have the strict Federal Aviation Administration regulations that have limited the use of the unmanned aerial vehicles. The balloon can also be deployed for longer periods of time than other sensors

A Skydoc Aerostat model 13 (10' diameter, 18 lbs lift) helium balloon and carrying rack, and a gimbaled wireless camera system (including both 10X visual and infrared optics) was purchased from Floatograph Technologies LLC in July 2009, and preliminary tests were done in Cordova to ensure the system was operational. The system was delivered to Cook Inlet Spill Prevention and Response, Inc. (CISPRI) by Rob Campbell on August 28th, and a familiarization day was spent with Brian Hack, a spill response technician at CISPRI. The balloon and camera system was demonstrated to the public on August 29th, at Industry appreciation day in the City of Kenai by Rob and Brian (fig. 1), the balloon flew well in spite of gusty winds (~5-15 knots), and the need to keep it at low elevation (the event site was immediately adjacent to Kenai airport). Following an initial problem with the optics (a stickiness in the optical gimbal), the system worked well, and there was considerable interest from the public (example images from the camera system are shown in fig. 2-4).



Figure 1: The balloon over the crowd at Industry Appreciation Day in Kenai.



Figure 2: View of Industry Appreciation Day from the visible wavelength camera on the balloon.



Figure 3: Zoom image (7.6X) of the CISPRI exhibit taken from the balloon camera.



Figure 4: View of Industry Appreciation Day from theUV camera on the balloon.

Objectives from the original proposal

- 1) Purchase a tethered balloon with surveillance camera system.
-Achieved
- 2) Demonstrate the ability to deploy and retrieve the system during the Alaska Ocean Observing System field exercise.
-Not achieved, venue was switched to Industry Appreciation Day (see below).
- 3) Make the system available to oil spill response organizations to test.
-Achieved, the system was left with CISPRI after the event, to test aboard their vessel at a later date.

Problems and Roadblocks

Despite their assurances, the supplier was not able to deliver the system in time to Cordova so that it could be deployed during the AOOS field experiment, as was originally planned. Instead, the system was taken to Kenai so that it could be demonstrated there in a public setting.

Appendix K – OSRI Grant Policy Manual

The camera gimbal exhibited some stickiness, which interfered with its initialization routine and prevented normal operation. This was dealt with manually at the event, and the system has been returned to the manufacturer for inspection.

Following the Industry Appreciation Days event, the balloon and camera were placed on a CISPRI truck, and the balloon ruptured on the ride back to the CISPRI yard. The balloon has been returned to the manufacturer, and replaced with a larger two ply balloon.

Accomplishments

The utility of the system was demonstrated, and received a great deal of interest from the public at Industry Appreciation Day.

Conclusions

Although the system did work well when deployed, the damage to the balloon indicates that perhaps more robust systems should be deployed in the future.