

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188		
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 5/2/11		2. REPORT TYPE FINAL		3. DATES COVERED (From - To) 04/15/2009 - 10/14/2010	
4. TITLE AND SUBTITLE Air-Deployed Ocean Drifters for Typhoon Observations			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER N00014-09-1-0822		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Dr. Luca Centurioni Dr. Peter Niiler			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of California, San Diego Scripps Institution of Oceanography Climate, Atmospheric Science and Physical Oceanography 9500 Gilman Drive La Jolla, CA 92093-0213			8. PERFORMING ORGANIZATION REPORT NUMBER Final - Fund 27284A		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Office of Naval Research 875 North Randolph Street Arlington, VA 22203-1995			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT public					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The purpose of this Defense University Research Instrumentation Program (DURIP) was to acquire an array of air-deployable drifters to be used for the Impact of Typhoons on the Western Pacific Ocean (ITOP) program sponsored by the Office of Naval Research (ONR). The goal was to enhance the basic drifter array (20 units) already funded by ONR for the ITOP project. With this extra DURIP funds, we were therefore able to reach our target of 60 drifter units for this experiment.					
15. SUBJECT TERMS Ocean Drifters, DURIP					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT none	b. ABSTRACT none	c. THIS PAGE none			
			none	6, incl. cover	Dr. Luca Centurioni
					19b. TELEPHONE NUMBER (include area code) 858-534-6182

FINAL TECHNICAL REPORT FOR:
“Air-Deployed Ocean Drifters for Typhoon Observations”

ONR Award #:ONR- N00014-09-1-0822

Pearn P. Niiler
Scripps Institution of Oceanography
9500 Gilman Drive, MC 0213, La Jolla, CA 92093-0213
Phone: (858) 534-0378 ; email: pniiler@ucsd.edu

Luca Centurioni
Scripps Institution of Oceanography
9500 Gilman Drive, MC 0213, La Jolla, CA 92093-0213
Phone: (858) 534-6182; email: lcenturioni@ucsd.edu

Contents

Long Term Goals.....	1
Objectives.....	2
Approach.....	2
Work Accomplished.....	3
Results	3
Impact/Applications.....	4
Transitions.....	4
Related Projects.....	4
Publications from This Grant.....	4

Long Term Goals

The long term goal of our tropical cyclones research theme is to develop and refine an observational methodology to investigate the interaction between the ocean and the atmosphere. Such observations are important to improve models of typhoon intensity and growth and to observe the response, and the subsequent decay of the upper ocean thermal structure.

Objectives

The purpose of this Defense University Research Instrumentation Program (DURIP) was to acquire an array of air-deployable drifters to be used for the Impact of Typhoons on the Western Pacific Ocean (ITOP) program sponsored by the Office of Naval Research (ONR). The goal was to enhance the basic drifter array (20 units) already funded by ONR for the ITOP project. With this extra DURIP funds, we were therefore able to reach our target of 60 drifter units for this experiment.

Approach

To achieve this goal 20 Autonomous Drifting Ocean Stations (ADOS, Figure 1) and 20 Surface Velocity Program Barometer (SVPB, Figure 2) drifters were purchased. The ADOS and the SVPB systems were purchased from Pacific Gyre, Inc.

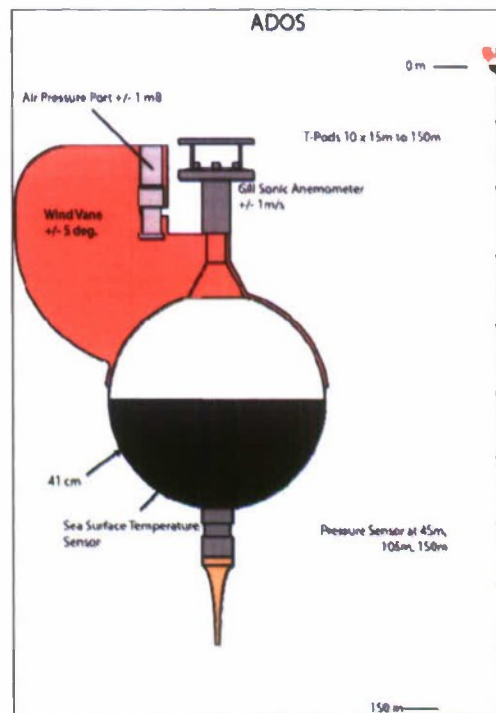


Figure 1: Schematics of the ADOS system.

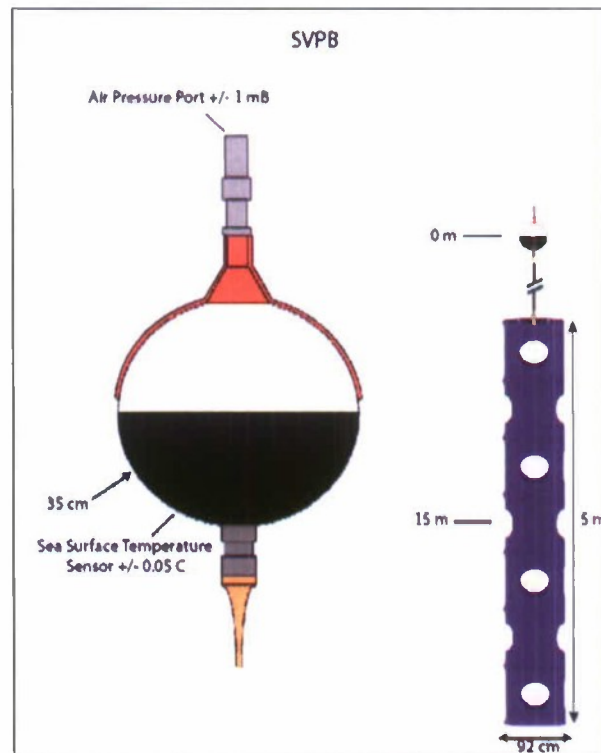


Figure 2: Schematics of the SVPB drifter.

Work Accomplished

The drifters were shipped from Oceanside (California) to Kessler AFB and airlifted to the Anderson AFB in Guam. Two engineers from the SIO drifter's group (Mr. Christopher McCall and Mr. Lancelot Braasch) alternated in Guam to prepare the air-deployable drifter packages and oversee the loading on the C-130J aircraft. The first array of 48 drifters was deployed in front and in the wake of typhoon Fanapi, starting from September 17, 2010. The remaining drifters were deployed in the wake of typhoon Malaks, on September 29, 2010.

Results

Out of the 60 drifters deployed in the two typhoons, 55 returned data (92% success rate). The trajectories of the drifters deployed in front and in the wake of Fanapi (Figure 3) suggest the existence of inertial oscillations in the wake of the storm. The data from the two deployment are now being analyzed and interpreted.

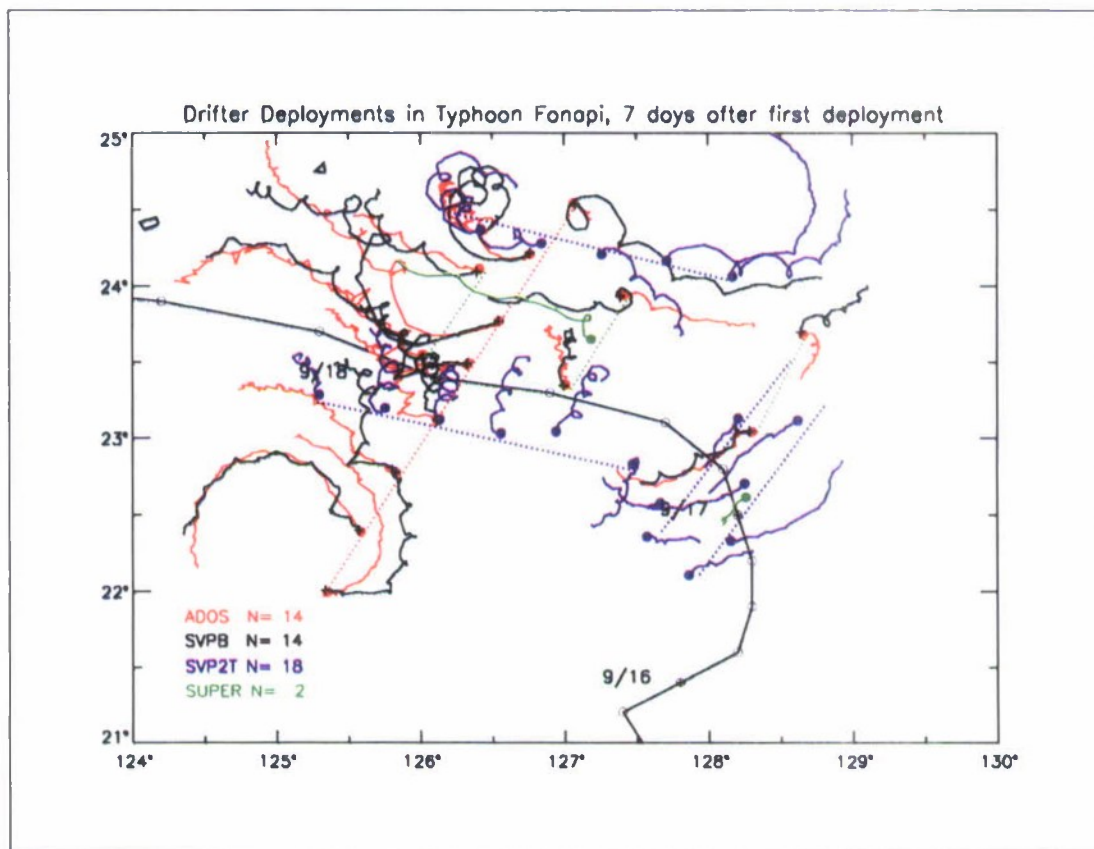


Figure 3: Drifter tracks, typhoon Fanapi, 17-24 September, 2010.

Impact/Applications

The drifter data were placed on the GTS for use by global scientific community and on the ITOP website for the USE of the ITOP group.

Transitions

None to date

Related Projects

The Global Drifter Program

Publications from This Grant

None to date

Acronym	Definition
ADOS	Autonomous Drifting Ocean Stations
AFB	Air Force Base
DURIP	Defense University Research Instrumentation Program
GTS	Global Telecommunication System
ITOP	Impact of Typhoons on the Western Pacific Ocean
ONR	Office of Naval Research
SIO	Scripps Institution of Oceanography
SVPB	Surface Velocity Program Barometer