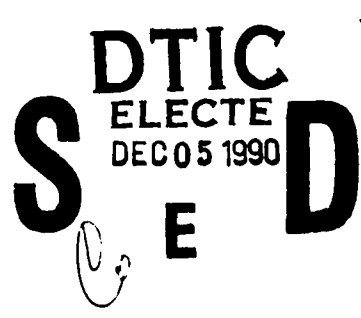


REPORT DOC

AD-A229 478

distribution

1a. REPORT SECURITY CLASSIFICATION Unclassified								
2a. SECURITY CLASSIFICATION AUTHORITY								
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE								
4. PERFORMING ORGANIZATION REPORT NUMBER(S) None				5. MONITORING ORGANIZATION REPORT NUMBER(S)				
6a. NAME OF PERFORMING ORGANIZATION MIT, Dept. of Earth, Atmos- pheric & Planetary Sciences		6b. OFFICE SYMBOL (if applicable)		7a. NAME OF MONITORING ORGANIZATION Same as 6a				
6c. ADDRESS (City, State, and ZIP Code) 77 Massachusetts Avenue Cambridge, MA 02139				7b. ADDRESS (City, State, and ZIP Code)				
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Office of Naval Research		8b. OFFICE SYMBOL (if applicable)		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER N00014-85-J-1241				
8c. ADDRESS (City, State, and ZIP Code) Arlington, VA 22217				10. SOURCE OF FUNDING NUMBERS				
				PROGRAM ELEMENT NO.		PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) Final Report: Studies toward observing and modelling large energetic ocean regions.								
12. PERSONAL AUTHOR(S) Dr. Carl Wunsch								
13a. TYPE OF REPORT Final		13b. TIME COVERED FROM 10/1/85 TO 6/30/90		14. DATE OF REPORT (Year, Month, Day) November 27, 1990		15. PAGE COUNT 3		
16. SUPPLEMENTARY NOTATION Submitted in fulfillment of "Performance Reports" requirement of grant.								
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)					
FIELD	GROUP	SUB-GROUP	Physical oceanography, acoustic tomography, satellite altimetry, Gulf Stream					
19. ABSTRACT (Continue on reverse if necessary and identify by block number)								
								
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS				21. ABSTRACT SECURITY CLASSIFICATION Unclassified				
22a. NAME OF RESPONSIBLE INDIVIDUAL				22b. TELEPHONE (Include Area Code)		22c. OFFICE SYMBOL		

Final Report
Secretary of the Navy Research Chair in Physical Oceanography
Grant #N00014-85-J-1241

This report

The grant was directed mainly at understanding the high energy region near the Gulf Stream system. The final report consists essentially of the attached list of publications completed. *Included topics are*

The Navy Chair constituted a very useful and efficient way for the PI to bring together a number of independently supported efforts in tomography, modelling, altimetry, scatterometry, etc. for the purpose of understanding the near-Gulf Stream region. An unfortunate occurrence during the lifetime of the Grant was the institution of the University Research Initiative Program (URIP). Along with a number of collaborators, the work supported by the present grant was extended to a much more ambitious attempt at observing and understanding the behavior of the western North Atlantic. When the URIP funding unexpectedly collapsed early in that contract, some of the commitments made under it had to be supported (with ONR agreement) under the Chair. This disruption delayed the goals of the grant, but it is believed that the publication list demonstrates a useful degree of achievement despite this problem.

*Keywords: Bibliographies;
Oceanography; Ocean models;
Measurement/test methods;
Acoustic scattering; Altimeters;
Hydrography*

Accession For	
NTIS	GRA&I ☒
DTIC	TAB ☐
Unannounced ☐	
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



Publications Supported Wholly or in Part on This Grant

Barth, N. and C. Wunsch, 1989: Oceanographic experiment design by simulated annealing. J. Phys. Oc., 20, 1249-1263.

Federiuk, J., 1987: Determination of advection and diffusion in a thermohaline staircase region. S. M. thesis, Dept. of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, 90 pp.

Fukumori, I. and C. Wunsch, 1990: Efficient representation of the North Atlantic hydrographic and chemical distributions. Prog. in Oceanog., In press.

Fukumori, I. and C. Wunsch, 1990: Large-scale low frequency fluctuation of North Atlantic sea surface topography observed from GEOSAT. To be published.

Fukumori, I., 1989: Efficient representation of the hydrographic structure of the North Atlantic Ocean and aspects of the circulation from objective methods. PhD thesis, MIT/WHOI, 234 pp.

Fukumori, I., 1990: Circulation about the Mediterranean Tongue: An analysis of an EOF-based ocean. Prog. in Oceanog., In press.

Fukumori, I., F. Martel and C. Wunsch, 1990: The hydrography of the North Atlantic in the early 1980's. An atlas. Prog. in Oceanog., In press.

Gaspar, P. and C. Wunsch, 1989: Estimates from altimeter data of barotropic Rossby waves in the northwestern Atlantic Ocean. J. Phys. Oc., 19, 1821-1844.

Haidvogel, D. B., J. Wilkin and R. Young, 1990: A semi-spectral primitive equation ocean circulation model using vertical sigma and horizontal orthogonal curvilinear coordinates. Journal of Comp. Phys., in press.

Holderied, K., 1988: Comparison study of SEASAT scatterometer and conventional wind fields. S.M. Thesis, MIT/WHOI Joint Program in Oceanography, 217 pp.

Malanotte-Rizzoli, P., R. Young and D. Haidvogel, 1987: Initialization and data assimilation experiments with a primitive equation model,. Dyn. Atm. and Oc., 13,349-378.

Martel, F. and C. Wunsch, 1990: Inversion of a finite difference model for the North Atlantic circulation. in preparation.

Martel, F. and C. Wunsch, 1990: Combined inversion of a finite difference model and altimetric sea surface topography. in preparation.

- Memery, L. and C. Wunsch, 1990: Constraining the North Atlantic Circulation with Tritium Data. *J. Geophys. Res.*, 95, 5229-5256.
- W. Munk and C. Wunsch, 1987: Bias in acoustic travel time through an ocean with adiabatic range-dependence. *Geophys. and Astrophys. Fl. Dyn.*, 39, 1-24.
- Rintoul, S. R. and C. Wunsch, 1990: Mass, heat oxygen and nutrient fluxes in the North Atlantic Ocean. *Deep-Sea Res.*, in press.
- Sakai, S., 1988: Rossby-Kelvin instability: a new type of ageostrophic instability caused by a resonance between a Rossby waves and gravity waves. *J. Fluid Mech.*, 202, 149-176.
- Sirkes, Z. and C. Wunsch, 1990: Orbit error and corrections to the data. Appendix to C. Wunsch, Global scale sea surface variability from combined altimetric and tide gauge measurements. To be published.
- Sirkes, Z. and C. Wunsch, 1990: Note on apparent systematic and periodic errors in GEOSAT orbits. *Geophys. Res. Letters*, 17, 1307-1310.
- Willebrand, J. and C. Wunsch, 1990: Inversion of ocean general circulation models. *EOS*, January 2, 1990, 2-3, 5.
- Wunsch, C., 1986: Calibrating an altimeter: how many tide gauges is enough? *J. Atm. and Oceanic Tech.*, 3, 746-754.
- Wunsch, C., 1986: Using transient tracers: The regularization problem. *Tellus*, 39B, 477-492.
- Wunsch, C., 1987: Acoustic tomography by Hamiltonian methods including the adiabatic expansion. *Revs. Geophys.*, 25, 41-53.
- Wunsch, C., 1988: Transient tracers as a problem in control theory. *J. Geophys. Res.* 93, 8099-8110.
- Wunsch, C., 1989: Sampling characteristics of satellite orbits. *J. Atmo. and Oceanic Tech.*, 6, 891-907.
- Wunsch, C., 1989: Comments on oceanographic instrumentation development. *J. of the Oceanog. Soc.*, 2, No.2, 26-27, 64.
- Wunsch, C., 1990: Ill-posed and time-dependent ill-posed problems. in, *Oceanographic and Geophysical Tomography*, Y. Desaubies, A. Tarantola, and J. Zinn-Justin, eds., North-Holland, Amsterdam.
- Wunsch, C., 1990: Global-scale sea surface variability from combined altimetric and tide gauge measurements. To be published.
- Young, W., G. Ierley, and Y. Sakai, 1990: On the normal modes of a rotating shallow water shear flow. To be published.