

## **APPENDIX I.**

This appendix contains a short CV for the PI, Prof. Chris Mooers/PSU and short Resumes for the Co-PIs, Dr. Cort Cooper/Chevron and Mr. Dave Driver/ BP America.

**CHRISTOPHER N.K. MOOERS**  
**University of Miami**

**Main Fields of Research:** Coastal ocean circulation and ocean mesoscale dynamics; numerical simulations of the circulation of marginal and semi-enclosed seas; coastal ocean prediction

**Educational History:**

U.S. Naval Academy	Naval Science	B.S. w/Distinction	1957
Univ. of Connecticut	Physics	M.S.	1964
Oregon State Univ.	Physical Oceanography	Ph.D.	1969

**Employment History:**

1957-1964	U.S. Naval Officer	Various
1969-1970	NATO Postdoc	University of Liverpool/Oceanography
1970-1976	Assistant/Assoc. Prof.	University of Miami/RSMAS/Physical Oceanography
1976-1979	Associate/Professor	University of Delaware/CMS
1979-1986	Professor and Chairman	Naval Postgraduate School/Oceanography Department
1986-1989	Director/Scientific Advisor	UCAR/Institute for Naval Oceanography
1989-1991	Research Professor	University of New Hampshire/EOS
1991-1993	Chair	University of Miami/RSMAS/Applied Marine Physics
1991 - 2008	Professor	University of Miami/RSMAS/Applied Marine Physics
1991 - 2008	Coordinator	RSMAS/Coastal Ocean Sciences Program
1992 - 2008	Director	RSMAS/ Ocean Prediction Experimental Laboratory (OPEL)
1993 - 2008	Fellow	University of Miami/RSMAS/CIMAS
2008 – to date	Professor Emeritus	University of Miami/RSMAS/Applied Marine Physics
2008 – to date	Research Professor	Portland State University, Department of Civil and Environmental Engineering

**Public service:**

Secretary, President-Elect, President, Ocean Sciences Section, AGU, 1978 to 1984  
Chairman, Eastern Pacific Oceanic Conference, 1979 to 1986  
Interim Councilor, The Oceanography Society, 1988 to 1989  
Member, USNC/IUGG, 1991 to 1995; Chair, USNC/IUGG, 1996 to 1999  
Chair, UNOLS Fleet Improvement Committee, 1994 to 1997  
Co-Chair, PICES WG-10 on The Circulation and Ventilation of the Sea of Japan and Adjacent Waters, 1995 to 1998  
Chair, AMS/STAC on Coastal Environments (née Meteorology and Oceanography of the Coastal Zone), 1996 to 2002  
Member, NRC-AIC/USA-Mexican Joint Working Group on Cooperative Ocean Science, 1995 to 1998  
Chair, NODC Working Group on Coastal Ocean Data Acquisition, 1997 to 1999  
Co-Chair, SCOR WG 111 (Coupling of Winds, Waves, and Currents in Coastal Models), 1998 to 2009  
Chair, IOOS Modeling and Analysis Steering Team, 2006 to 2008  
President, University of Miami Chapter, Sigma Xi, 2006 to 2008

**Editorial service:**

Consulting Editor, *Weatherwise* (1978 to 2005)  
Managing Editor, *Coastal and Estuarine Studies*, Springer-Verlag, then AGU (1979 to 1999)  
Editor, *Journal of Physical Oceanography* (1991 to 1996)

**All publications in past five years**

- (2003) (with C. Andrade and D. Barton) Evidence for an Eastward Undercurrent along the South American Caribbean Coast) *J. Geophys. Res.* Vol. 108, No. C6, 3185, pp. 16-1 – 16-11.
- (2003) (with H. Seim, B. Bacon, C. Barans, M. Fletcher, K. Gates, R. Jahnke, E. Kearns, R. Lea, M. Luther, J. Nelson, D. Porter, L. Shay, M. Spranger, J. Thigpen, R. Weisberg, and F. Werner) SEACOOS: A Model for a Multi-State, Multi-Institution Regional Observation System. *Mar. Tech. Soc. Jour.*, 37 (3), pp. 92-101.

- (2003) (with J. Fietcher) Simulation of Frontal Eddies on the East Florida Shelf. *Geophys. Res. Lett.*, 30(22), 2151, doi: 10.1029/2003GLO18307, pp. OCE 3-1 – OCE 3-4.
- (2003) On the Dynamics of Semi-Enclosed Seas. IN: Proceedings of the International Conference "Mathematical Methods in Geophysics", Part I. Novosibirsk, Russia, Publisher Institute of Computational Mathematics and Mathematical Geophysics, pp. 27-39.
- (2004) Coastal Oceanography, in *Encyclopedia of Earth and Atmospheric Sciences*, in *Oceanography*, edited by Jacques C.J. Nihoul and Chen-Tung Arthur Chen, in *Encyclopedia of Life Support Systems (EOLSS)*, Developed under the auspices of the UNESCO, Eolss Publishers, Oxford, UK, [<http://www.eolss.net>]. pp. 1145-1163.
- (2005) (with H. Kang) Diagnoses of Simulated Water Mass Subduction/Formation/ Transformation in the Japan/East Sea (JES). *Deep-Sea Res.*, II, 52, pp.1505-1524.
- (2005) (with I. Bang and F. Sandoval) Synoptic Comparisons of Numerical Simulations with CREAMS II Observations of JES Circulation (Flow and Mass Fields). *Deep-Sea Res.* II, 52, pp.1639-1661.
- (2005) (with I. Bang and S.L. Vaughan) Initial Steps Toward Validation of a Seasonal Cycle Simulation for Prince William Sound, Alaska. *Circulation (Flow and Mass) Fields. Con. Shelf Res.*, 25, pp. 901-934.
- (2005) (with I. Bang) An Assessment of a Nowcast/Forecast System for the Straits of Florida/Florida Current Regime. *J. Ocean University of China (English edition)*, 4(4), pp. 288-292.
- (2005) (with J. Fiechter) Numerical Simulations of Mesoscale Variability in the Straits of Florida. *Ocean Dynamics*. Doi: 10.1007/s10236-005-0019-0, pp. 309-325.
- (2005) (with C.S. Meinen, M.O. Baringer, I. Bang, R. Rhodes, C.N. Barron and F. Bub) Cross Validating Ocean Prediction and Modeling Systems. *EOS, Transactions, American Geophysical Union*, 86(29), pp.269, 272-273.
- (2006) (with Y. Liu and R.H. Weisberg) Performance Evaluation of the Self-Organizing Map for Feature Extraction. *J. Geophys. Res.*, 111, C05018, doi: 10.1029/2005JC003117, pp. 1 - 14.
- (2006) (with H.S. Kang, I. Bang, and D.P. Snowden) Some Lessons Learned from Comparisons of Numerical Simulations and Observations of the JES Circulation. *Oceanography*, 19(3), pp. 86-95.
- (2006) (with J. Fiechter and K.L. Steffen, and B. K. Haus) Hydrodynamics and Sediment Transport in a Southeast Florida Tidal Inlet. *Estuarine, Coastal, and Shelf Science*, 70, pp. 297-306.
- (2007) (with M.M. Criales, J.A. Browder, M.B. Robblee, H. Cardenas, and T. L. Jackson) Cross-Shelf Transport of Pink Shrimp Larvae: Interactions of Tidal Currents, Larval Vertical Migrations and Internal Tides. *Mar Ecol Prog Ser*, 345, doi:10.3354/meps06916, pp. 167-184.
- (2007) (with J. Fiechter) Primary Production Associated with the Florida Current along the East Florida Shelf: Weekly to Seasonal Variability from Mesoscale-Resolution Biophysical Simulations. *Journal of Geophysical Research-Oceans*, 112, C12002, doi:10.1029/2006JC003576, pp 1 - 21.
- (2007) (with X. Wu and I. Bang) Performance of a Nowcast/Forecast System for Prince William Sound, Alaska. *Con. Shelf Res.*, doi: 10.1016/j.csr.2007.09.008, pp. 1-19.
- (2008) (with J. Fiechter, B.K. Haus, and N. Melo) Physical Processes Impacting Coral Larvae Transport and Reef Connectivity in the Upper Florida Keys. *Continental Shelf Research*, 28, 1261-1272, doi: 10.1016/j.csr.2008.02.018.
- (2008) (with H. Seim) Prologue to SEACOOS. *Marine Technology Society Journal*, 43(3), pp.14 – 16.
- (2008) (with H. Seim, J. Nelson, M. Fletcher, L. Spence, R.H. Weisberg, F. Werner, S.M. Smith, R. Lea) SEACOOS Program Management. *Marine Technology Society Journal*, 43 (3), pp. 17-27.
- (2009) (with H.E. Seim, J.R. Nelson, R. H. Weisberg, and M. Fletcher) Towards a Regional Coastal Ocean Observing System Design for the Southeast Coastal Ocean Observing Regional Association. *Journal of Marine Systems*, 77, pp. 261-277, doi: 10.1016/j.jmarsys.2007.12.016.
- (2009) (with W. G. Mendoza, J.E. Corredor, J. Morell, D.-S. Ko, R. G. Zika) Developmental Strategy for Effective Sampling to Detect Possible Nutrient Fluxes in Oligotrophic Coastal Reef Waters in the Caribbean. *Journal of Operational Oceanography*, 2 (1), pp.35-47.
- (2009) (with H.-S. Kang and D.-S. Ko). The Response of the JES to Synoptic Scale Atmospheric Forcing as Estimated by EASNFS. *Journal of Marine Systems*, (under minor revision).

**Career Summary:**

- 20 years in the offshore oil industry in the field of meteorological and oceanographic engineering, with emphasis on the development and application of metocean design criteria
- 8 years with the US Army Corps of Engineers studying wind, wave, and current conditions on US coastlines

**Education:**

- Old Dominion University Norfolk, VA  
M.S. Physical Oceanography 1981
- University of Virginia Charlottesville, VA  
B.A Environmental Science 1975

**Experience:**

2008 to present BP America, Inc. Houston, TX  
**Gulf of Mexico – Metocean Technical Authority**

Technical authority for all metocean issues for the Gulf of Mexico.

1991 to 2008 BP America, Inc Houston, TX  
Upstream Technology Group

**Metocean Specialist**

Responsible for the development of meteorological and oceanographic (metocean) design/operational criteria in support of offshore business units. Involves modeling and measurement of metocean parameters (winds, waves, and currents) and data analysis to provide estimates of extreme and operational environments to aid in the design of safe, efficient, and cost effective offshore production facilities.

Responsible for the planning and coordination of metocean technology development for deepwater applications, including the development of a strategy for addressing the unique set of problems associated with operating in deepwater, particularly those associated with currents. Particular emphasis in recent years in Gulf of Mexico, including measurement and analysis of Loop Current and Loop Current Eddies and the nature and characterization of strong bottom currents off the Sigsbee Escarpment.

Served as Chairman or Administrator on several industry JIPs, including the development of a hindcast wind, wave, and current database for the Russian Arctic, a deepwater current measurement program in the Gulf of Mexico, and a study designed to investigate methodologies for getting more reliable estimates of very low probability wave heights.

1983  
to 1991

U.S. Army corps of Engineers  
Coastal Engineering Research Center

Vicksburg, MS

**Research Oceanographer**

Responsible for development of wind and wave hindcast database for U.S coastal waters. This information was used to drive nearshore sediment transport models in support of major beach replenishment projects.

Served as Remote Sensing Coordinator, responsible for the evaluation of existing and emerging remote sensing technologies for monitoring coastal waves and currents.

1981  
to 1983

Cities Service Company

Tulsa, OK

**Physical Oceanographer/Metoccean Engineer**

Responsible for field coordination and supervision of pipeline survey and installation of pipeline supports for offshore field development in the South China Sea.

Statistical analysis of measured environmental data for development of design criteria.

## RESUME

### CORTIS K. COOPER

#### EDUCATION

- 1987 Ph.D., Environmental Engineering, U. of Maine. Course work emphasized numerical modeling. Thesis: Hurricane-generated currents on the outer continental shelf and slope.
- 1977 M.Sc. & B.Sc., Civil Engineering, MIT. Course work emphasized fluid dynamics. Graduate research included review of oil spill trajectory models. Thesis: development of a 3-D spectral current model.

#### EXPERIENCE

- 2002 to present Fellow, Chevron. One of 17 scientists and engineers acknowledged by the Corporation for their outstanding technical contributions. Duties include advising upper management on technical issues and mentoring young scientist.
- 1990 to present Scientist/engineer at Chevron Technology. Provided metocean criteria for operation and design of offshore facilities worldwide including oil spill fates and effects; modeled hurricane alleys in Gulf of Mexico; modeled sea level in the Caspian Sea; provided forecasts of oil spills; measured and forecast Loop Current and associated eddies in the Gulf of Mexico; supervised major modeling efforts in the Gulf of Mexico and Australia

#### Books & Published Reports

Duce et. al., 2007, A Review of the Ocean Research Priorities Plan and Implementation Strategy, National Academy Press.

Gyakum, et al., 2007, Review of the US Climate Change Science camp programs sent to assist and assessment product 3.3, "Weather and Climate Extremes in any Changing Climate", National Academy Press.

Kantha et al., 2005, A regional data-assimilative model for operational use in the Gulf of Mexico, in *Circulation in the Gulf of Mexico: Observations and Models*, AGU Mongraph Series, V 161, 360 pp. ISBN 0-87590-426-2.

Seager, Linkov, and Cooper, 2004, Performance metrics for oil spill response, recovery, and restoration: a critical review and agenda for research, *Strategic Management of Marine Ecosystems*, Kluwer Academic Publishers, New York.

Coleman et al., 2003, *Oil in the Sea III*, National Academy of Sciences Press.

Roed and Cooper, 1986, Open boundary conditions in numerical ocean models, *Proc. of the Nato ASI on Advanced Phys. Oceanogr. Modeling*, Elsevier.

**Journal Publications**

Dukhovskoy, et al., 2009, Simulation of high-speed near bottom currents over the Sigsbee Escarpment in the Gulf of Mexico with a high resolution model, Ocean Modeling, Apr.

Oey, et al, 2005, An exercise in forecasting Loop Current and eddy frontal positions in the Gulf of Mexico, Geophys. Res. Letters, V 32, L12611

Kvenvolden and Cooper, 2003, Natural seepage of crude oil into the marine environment, Geo-Mar Lett, 23: 140-146.

Johansen, Rye, and Cooper, 2002, DeepSpill – field study of a simulated oil and gas blowout in deep water, Spill Sci. & Tech. Bull., 8 (5-6), 433-443.

Chouinard, Lui, and Cooper, 1996, A model for the severity of hurricanes in the Gulf of Mexico, J. Waterways, ASCE,

Cooper and Forristall, 1996, On the use of satellite wave data to estimate extreme wave heights, J. of Atmos. and Ocean Tech.

Cooper, Forristall, Hamilton, and Ebbesmeyer, 1993, Utilization of offshore oil platforms for meteorological and oceanographic measurements, Marine Tech. Society J., 27, 10-23.

Forristall, Schaudt, and Cooper, 1992, Evolution and kinematics of a Loop Current Eddy in the Gulf of Mexico during 1985, J. Geophys. Res.

Cooper, Forristall, and Joyce, 1990, Velocity and hydrographic structure of two Gulf of Mexico warm-core rings, J. Geophys. Res. (Oceans).

Cooper and Thompson, 1989, Hurricane-driven currents on the outer continental shelf - I. model formulation and verification, J. Geophys. Res. (Oceans).

Cooper and Thompson, 1989, Hurricane-driven currents on the outer continental shelf - II. model sensitivity studies, J. Geophys. Res. (Oceans).

**OTHER**

MMS Corporate Citizenship Award in 1999, 2002, and 2007.

National Academy of Sciences (NRC) committee member, Review of the effect of global warming on severe weather (SAP 3.3), 2007

National Academy of Sciences (NRC) committee member, Review of the National Ocean Research Plan, 2007

National Academy of Sciences (NRC) committee member, Oil in the Sea subcommittee, 1999-2002

National Academy of Sciences (NRC) Ocean Sciences Board, 1999-2002

MMS National Scientific Advisory Board, 1996-2001