

Peter A. Traykovski

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EDUCATION:

B.Se.: Duke University, Durham, NC, 1988
M.S. & Ocean Engineer, Horizontal Directional Spectrum Estimation of the Heard Island Transmissions,
Advisor: Arthur Baggeroer, 1994
Ph.D.: Observations and Modeling of Sand Transport in a Wave Dominated Environment
Advisors: James F. Lynch and James D. Irish, 1998.

PROFESSIONAL EXPERIENCE:

Product Development Engineer, Ventline mfg., Port Elizabeth, South Africa, 1989-1991
Graduate Research Assistant, MIT/WHOI Joint Program, 1992 to June 1998
Post Doctoral Investigator, Applied Ocean Physics and Engineering Department, Woods Hole Oceanographic Institution, June 1998 to May 2000
Assistant Scientist, Applied Ocean Physics and Engineering Department, Woods Hole Oceanographic Institution, May 2000 to April 2004
Associate Scientist with tenure, Applied Ocean Physics and Engineering Department, Woods Hole Oceanographic Institution, Sept 2008 to present

AWARDS:

Office of Naval Research Graduate Fellow, 1992-1994
Office of Naval Research, Young Investigator Award, 2001-2004
Presidential Early Career Award for Scientists and Engineers (PECASE) 2001
Estuarine Research Foundation Pritchard Award for the Geyer, W.R., J.D. Woodruff, P. Traykovski, Sediment Transport and Trapping in the Hudson River Paper, 2003

PROFESSIONAL AFFILIATIONS:

Member, Acoustical Society of America
Member, American Geophysical Union

RESEARCH INTERESTS:

Sediment Transport, Coastal Processes, Acoustical Oceanography.

PROFESSIONAL ACTIVITIES**WHOI:**

Applied Ocean Physics and Engineering Dept. seminar coordinator (2001-2002)
Applied Ocean Physics and Engineering Dept. representative on safety committee (2003-2005)
Coastal Ocean Fluid Dynamics Seminar Series Coordinator (2007-2008)

Oustside WHOI:

Scientific Consulting, Sequoia Scientific, Mercer Island, WA. Jan. 1999 to April 2000
Expert Witness, Palmer Biezup & Henderson, May 2006 to Feb. 2008

PARTICIPATION IN EDUCATION PROGRAM

Taught 2 lectures per term in MIT OE 13.998: Oceanographic Instrumentation (2002-2005)

STUDENTS ADVISED

Colleen Maloney WHOI Joint Program, AOP&E, MS, 2006, (Primary Advisor)
Michael Squibb, WHOI Summer Student Fellow, 2006, (Primary Advisor)
Linda Kalnejais, WHOI Joint Program MC&G, PhD 2005, (Committee Member)
Brendan Gotowka, WHOI Joint Program. AOP&E, MS, 2005, (Primary Advisor)
Malcolm Scully, 2001 VIMS MS (Masters Committee)
Shmuel Link, AOP&E, MS, 2011 (Co-Advisor)

Revised on 10/13/2011

CRUISES, FIELD AND LABORATORY EXPERIMENTS:

LEO-15 Acoustic Backscatter (ABS), Benthic Acoustic Stress Sensor, and Rotary Fan-beam Sonar autonomous tripod deployment, 2 single day cruises. Member of scientific team.

Hudson Estuary Hudflux Experiment: Deployed tripods and moorings to measure channel integrated sediment flux, participated in deployment, turn-around and recovery cruises as a member of the scientific team, March to June 1999.

LEO-15 Quadpod deployment: The pod was cabled to LEO-15 Node with horizontal and vertical pencil beam sonars and Alex Hay's coherent Doppler profiler. Two weeks in residence at Rutgers marine lab. Co-chief scientist Nov. to Dec. 1999.

N.Y. Bight Experiment to measure sediment flux along Hudson Shelf Valley: Participated in deployment and recovery cruises as co-chief scientist with USGS investigators, Dec 1999 to April 2000.

Hudson Estuary HudED (Erosion Deposition) Experiment: Deployed tripods to measure erosion and depositional processes at the Hudson ETM. Co-chief scientist. Oct. 2000 to June 2001

Martha's Vineyard Coastal Observatory Site (MVCO) characterization. Obtained grab samples and coordinated sidescan efforts at MVCO in preparation for Mine Burial and Bedform research, several day cruises on Asterias and RV Nobska as Chief Scientist. June 2001

MVCO Optical mine and rotary fan-beam deployment in fine sand: Also deployed a rotary fan-beam sonar in coarse sand without a mine. Several day cruises on Asterias and RV Nobska as Co-Chief Scientist. Dec 2001 to July 2002

Doppler Near-Bed Sediment Flux Sensor 17-rn flume experiments in WHOL Rinehart Coastal Research Center. June 2002

MVCO site characterization II. Obtained grab samples and coordinated sidescan efforts at MVCO in preparation for Mine Burial and Bedform research and investigated Rippled Scour Depressions. Three days on RV Henlopen and RV Nobska as WHOI coordinator and member of science party. Aug. 2002

Eurostrataform: Deployed two tripods, two trawl resistant ADCP mounts and eight moorings to measure sediment flux on the Adriatic Shelf and Fluid Flow events on the Po Pro-delta. Three one week cruises on the RV Garcia del Cid and RV Seward Johnson II as Co-Chief Scientist and Scientific team member, November 2002 to May 2003

MVCO Doppler Near-Bed Sediment Flux Quadpod deployment in coarse sand: Deployment and recovery cruises on the RV Asterias as Chief Scientist. Dec 2002 Jan 2003

MVCO Optical Mine and rotary fan-beam deployment in coarse sand. Several day cruises on Asterias and RV Nobska as Co-Chief Scientist. Dec 2002 to May 2003,

MVCO Doppler Near-Bed Sediment Flux Quadpod deployment in coarse sand. Deployment and recovery cruises on the RV Asterias as Chief Scientist. July 2003

MVCO Mine Burial Program: Coordinated deployment of 16 instrumented and passive mines and three Univ. of South Florida quad-pods, and various other instruments. Deployed a rotary fan beam sonar in coarse sand and a 2-axis pencil beam and rotary fan-beam sonar in fine sand to image a mine burial. I also coordinated bathymetric survey efforts during this period. Several Cruises on 1 Connecticut and 1 on Asterias as Chief and Co-Chief Scientist and Program Coordinator. Sept 2003 to 2004

MVCO Doppler Near-Red Sediment Flux Quadpod deployment in fine and Coarse sand. Deployment & Recovery cruises on the RV Connecticut and RV Tioga as Chief Scientist. Dec 2003 to 2005

RipplesDRI cruises on RV Pelican on west Florida shelf in September and November 2004. Co-chief PI along with Dan Hanes, USGS

Fluid Mud Interactions under waves MURI cruises on RV Pelican on Louisiana shelf in February, March, April 2007. Chief Scientist

RipplesDRI07 at Martha's Vineyard Coastal Observatory. Chief Scientist on Deployment, turnaround and recovery cruises on the RV Connecticut and Chief Scientist for the experiment (involved planning the experiment and coordinating 4 teams from 5 institutions), Sept 2007.

Skagit Bay deployment and recovery cruises, R/V Centennial, June 2009

Hudson and Connecticut River MAST cruise, December 2010

WORKSHOPS:

LEO-15 Workshop National Underwater Research Center Field station, Tuckerton NJ, 1996
ONR STRATAFORM project annual meeting, 1997, 1998, 1999; shelf group meeting, 2000; modeling group meeting, 2000
ONR EuroSTRATAFORM Program planning and annual meetings 2001/2002/2003/2004
ONR Mine Burial Prediction Program planning and annual meetings 2001/2002/2003/2004
ONR RipplesDRI and SAX04 workshops 2004/2005/2006
ONR Fluid Mud Interactions under waves MURI workshops 2006-2009
ONR Tidal flats Workshops 2008 and 2009
ONR Rivers and Inlets Workshops 2009

PAPERS IN REFEREED JOURNALS AND BOOKS:

1. Traykovski, P., (1996), Travel-time perturbations due to internal waves: Equivalence of modal and ray solutions. *Journal of the Acoustical Society of America*, 99(2): 822-830.
2. Lynch, J.F., J.D. Irish, T.F. Gross, P.L. Wiberg, A.E. Newhall, P.A. Traykovski, and J.D. Warren, (1997), Acoustic measurements of the spatial and temporal structure of the near-bottom boundary layer in the 1990-1991 STRESS experiment. *Continental Shelf Research*, 17(10): 1271-1295.
3. Cacchione, D.A., P.L. Wiberg, J. Lynch, J. Irish, and P. Traykovski, (1999), Estimates of suspended-sediment flux and bedform activity on the inner portion of the Eel continental shelf. *Marine Geology*, 154(1-4): 83-97.
4. Irish, J.D., J.F. Lynch, P.A. Traykovski, A.E. Newhall, K. Prada, and A.E. Hay, (1999), A self-contained sector-scanning sonar for bottom roughness observations as part of sediment transport studies. *Journal of Atmospheric and Oceanic Technology*, 16(11): 1830-1841.
5. Traykovski, P., A.E. Hay, J.D. Irish, and J.F. Lynch, (1999), Geometry, migration, and evolution of wave orbital ripples at LEO-15. *Journal of Geophysical Research-Oceans*, 104(C1): 1505-1524.
6. Traykovski, P., R.J. Latter, and J.D. Irish, (1999), A laboratory evaluation of the laser in situ scattering and transmissometry instrument using natural sediments. *Marine Geology*, 159(1-4): 355-367.
7. Geyer, W.R., P. Hill, T. Milligan, and P. Traykovski, (2000), The structure of the Eel River plume during floods. *Continental Shelf Research*, 20(16): 2067-2093.
8. Traykovski, P., W.R. Geyer, J.D. Irish, and J.F. Lynch, (2000), The role of wave-induced density-driven fluid mud flows for cross-shelf transport on the Eel River continental shelf. *Continental Shelf Research*, 20(16): 2113-2140.
9. Agrawal, Y.C. and P. Traykovski, (2001), Particles in the bottom boundary layer: Concentration and size dynamics through events. *Journal of Geophysical Research-Oceans*, 106(C5): 9533-9542.
10. Geyer, W.R., J.D. Woodruff, and P. Traykovski, (2001), Sediment transport and trapping in the Hudson River estuary. *Estuaries*, 24(5): 670-679.
11. Irish, J.D., A.E. Hay, P. Traykovski, A. Newhall, R. Craig, and W.M. Paul, (2002), On attaching acoustic imaging instrumentation to the LEO-15 observatory for sediment transport and bottom boundary layer studies. *Ieee Journal of Oceanic Engineering*, 27(2): 254-266.
12. Sisson, J.D., J. Shimeta, C.A. Zimmer, and P. Traykovski, (2002), Mapping epibenthic assemblages and their relations to sedimentary features in shallow-water, high-energy environments. *Continental Shelf Research*, 22(4): 565-583.
13. Harris, C.K., B. Butman, and P. Traykovski, (2003), Winter-time circulation and sediment transport in the Hudson Shelf Valley. *Continental Shelf Research*, 23(8): 801-820.
14. Fan, S.J., D.J.P. Swift, P. Traykovski, S. Bentley, J.C. Borgeld, C.W. Reed, and A.W. Niedoroda, (2004), River flooding, storm resuspension, and event stratigraphy on the northern California shelf: observations compared with simulations. *Marine Geology*, 210(1-4): 17-41.
15. Sherwood, C.R., S. Carniel, L. Cavaleri, J. Chiggiato, H. Das, J.D. Doyle, C.K. Harris, A.W. Niedoroda, J. Pullen, Revised on 10/13/2011

- C.W. Reed, A. Russo, M. Sclavo, R.P. Signell, P. Traykovski, and J.C. Warner, (2004), Sediment dynamics in the Adriatic Sea investigated with coupled models. *Oceanography (Washington DC)*, 17(4): 58-69.
16. Traykovski, P., R. Geyer, and C. Sommerfield, (2004), Rapid sediment deposition and fine-scale strata formation in the Hudson estuary. *Journal of Geophysical Research-Earth Surface*, 109(F2).
 17. Goff, J.A., L.A. Mayer, P. Traykovski, I. Buynovich, R. Wilkens, R. Raymond, G. Glang, R.L. Evans, H. Olson, and C. Jenkins, (2005), Detailed investigation of sorted bedforms, or "rippled scour depressions," within the Martha's Vineyard Coastal Observatory, Massachusetts. *Continental Shelf Research*, 25(4): 461-484.
 18. Harris, C.K., P.A. Traykovski, and W.R. Geyer, (2005), Flood dispersal and deposition by near-bed gravitational sediment flows and oceanographic transport: A numerical modeling study of the Eel River shelf, northern California. *Journal of Geophysical Research-Oceans*, 110(C9).
 19. Hatton, K.A., D.L. Foster, P. Traykovski, and H.D. Smith, (2007), Numerical Simulations of the Flow and Sediment Transport Regimes Surrounding a Short Cylinder. *Oceanic Engineering, IEEE Journal of*, 32(1): 249-259.
 20. Hill, P.S., J. M. Fox, J. S. Crockett, K. J. Curran, C. T. Friedrichs, W. R. Geyer, T. G. Milligan, A. S. Ogston, P. Puig, M. E. Scully, P. A. Traykovski, and R. A. Wheatcroft, (2007), *Sediment delivery to the seabed on continental margins, Continental Margin Sedimentation: From Sediment Transport to Sequence Stratigraphy*, in *IAS Special Publication 37*, Editors: C.A. Nittrouer, Austin, J.A., Jr., Field, M.E., Kravitz, J.H., Syvitski, J.P.M., Wiberg, P.L. Blackwell Publishing Ltd: Oxford.
 21. Hsu, T.J., P.A. Traykovski, and G.C. Kineke, (2007), On modeling boundary layer and gravity-driven fluid mud transport. *Journal of Geophysical Research-Oceans*, 112(C4).
 22. Mayer, L.A., R. Raymond, G. Glang, M.D. Richardson, P. Traykovski, and A.C. Trembanis, (2007), High-Resolution Mapping of Mines and Ripples at the Martha's Vineyard Coastal Observatory. *Oceanic Engineering, IEEE Journal of*, 32(1): 133-149.
 23. Parsons, J.D., Friedrichs, C. T., Mohrig, D., Traykovski, P., Imran, J., Syvitski, J. P. M., Parker, G., Puig, P., Buttles, J. and Garcia, M. H., (2007), *The mechanics of marine sediment gravity flows, Continental Margin Sedimentation: From Sediment Transport to Sequence Stratigraphy*, in *IAS Special Publication 37*, Editors: C.A. Nittrouer, Austin, J.A., Jr., Field, M.E., Kravitz, J.H., Syvitski, J.P.M., Wiberg, P.L. Blackwell Publishing Ltd: Oxford.
 24. Traykovski, P., (2007), Observations of wave orbital scale ripples and a nonequilibrium time-dependent model. *Journal of Geophysical Research-Oceans*, 112(C6).
 25. Traykovski, P., M.D. Richardson, L.A. Mayer, and J.D. Irish, (2007), Mine Burial Experiments at the Martha's Vineyard Coastal Observatory. *Oceanic Engineering, IEEE Journal of*, 32(1): 150-166.
 26. Traykovski, P., P.L. Wiberg, and W.R. Geyer, (2007), Observations and modeling of wave-supported sediment gravity flows on the Po prodelta and comparison to prior observations from the Eel shelf. *Continental Shelf Research*, 27(3-4): 375-399.
 27. Trembanis, A.C., C.T. Friedrichs, M.D. Richardson, and P. Traykovski, P.A. Howd, P.A. Elmore, and T.F. Wever, (2007), Predicting Seabed Burial of Cylinders by Wave-Induced Scour: Application to the Sandy Inner Shelf off Florida and Massachusetts. *Oceanic Engineering, IEEE Journal of*, 32(1): 167-183.
 28. M. B. Cardenas, P. L. M. Cook., H. Jiang, and P. Traykovski (2008), Constraining denitrification in permeable wave influenced marine sediment using linked hydrodynamic and biogeochemical modeling, *Earth and Planetary Science Letters*, Vol. 275, Issues 1&2, p 127-137, doi: 10.1016/j.epsl.2008.08.016
 29. Hsu, T.-J., C. E. Ozdemir, and P. Traykovski (2009), High-resolution numerical modeling of wave-supported gravity-driven mudflows, *J. Geophys. Res.*, 114, C05014, doi:10.1029/2008JC005006
 30. Tang, D., F. S. Henyey, B. T. Hefner and P. Traykovski (2009), Simulating Realistic-Looking Sediment Ripple Fields, *IEEE Journal of Oceanic Engineering*. 34 (4) : 444-450. 10.1109/JOE.2009.2025905

SUBMITTED MANUSCRIPTS:

Estuarine dynamics and sediment transport on the Skagit tidal flats, D.K. Ralston, W.R. Geyer, P. Traykovski, and N. Nidzicko, Submitted to Continental Shelf Research

CONFERENCE PROCEEDINGS:

Traykovski, P., J. D. Irish, and J. F. Lynch (1998), Motivations for using a pulsed full spectrum Doppler to measure bedload and near-bottom suspended sediment transport, *Jour. Acoust. Soc. of Am.*, Vol.103 (5), p. 2866.

Richardson, M.D. and P. Traykovski (2002), Real-time observations of mine burial at the Martha's Vineyard Coastal Observatory. 11 pps., *Proceedings of the 5th International Symposium on Technology and the Mine Problem*. Naval Postgraduate School, Monterey California, 22-25 May 2002.

Traykovski, P., and J.A. Goff (2003), Observations and Modeling of large and small scale bedforms at the Martha's Vineyard Coastal Observatory, Coastal Sediments '03, *Proceeding of the 5th International Symposium on Coastal Engineering and Science of Coastal Sediment Processes*

Traykovski P, M.D. Richardson, J.A. Goff, L.A. Mayer, R. Wilkens, B. Gotowoka (2004), Mine Burial Experiments at the Martha's Vineyard Coastal Observatory, *Proceedings of the 6th International Symposium on Technology and the Mine Problem*. Naval Postgraduate School, Monterey, California, 9-13 May 2004, 7 pps.

Traykovski and Jaffre, Development and Field Measurements with Multi-Frequency, Pulse-Coherent Doppler Systems, *The Journal of Ocean Technology*, Vol. 6, No. 2, 2011

INVITED PRESENTATIONS:

P. Traykovski (1997), Using acoustics to help understand sediment transport Invited talk at BBN (Now a division of GTE) Applied Physics & Tactical Sonar Group Meeting

P. Traykovski and Y.C. Agrawal (1999), On the Relationship Between Aggregated Particle Size and Mean Stress Levels, *EOS Transactions*, AGU Vol. 80, No. 49, OS61.

P. Traykovski (2000), Acoustical techniques for observing the processes that control the formation of ocean bottom geology (Mini-tutorial 1-hr long), *Jour. Acoust. Soc. of Am.*, Vol. 107 (5), 2775.

P. Traykovski (2000), Particle size in turbulent flows Virginia Institute of Marine Sciences, Sediment Transport Lecture Series.

P. Traykovski (2005), Inner Shelf Sediment Transport Processes and Morphology, Gordon Research Conference on Coastal Physical Oceanography, Colby Sawyer College, NH.

Traykovski, P. (2005) Observations of Wave-induced gravity flows of fluid mud on Po prodelta, Italy and Eel River shelf, Northern California, John Hopkins University Center for Applied Fluid Mechanics.

Traykovski, P. (2006), A Time Dependent Model for Seafloor Ripples, *Eos Transactions*. AGU, 87(52), Fall Meet. Suppl., Abstract OS22B-05.

Traykovski, P. (2006), Observations of seafloor ripples and a time-dependent ripple geometry model, *J. Acoust. Soc. Am.* 120, 3097.

Traykovski, P. (2007), Sediment flux and turbulence measurements using a pulse coherent Doppler profiler over ripples measured with a 2-axis rotary pencil beam system, Underwater Acoustic Measurements and Technologies and Results, 2nd International Conference, Heraklion Greece

Traykovski, P. (2007), A Different Kind of Turbidity Flow: Wave Supported Turbidity Flows on Relatively Flat Shelves, Geophysical Fluid Dynamics Series Mini -Symposium on Ocean Bottom and Surface Boundary Layers, Woods Hole Oceanographic Institution, MA.

Traykovski, P. (2008), Mechanisms of wave dissipation on the Louisiana shelf: observations of short wavelength
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lutocline internal mode waves, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract OS11F-01

Traykovski, P. (2008), Observations of mechanisms of wave dissipation on the Louisiana shelf: the role of short wavelength lutocline internal mode waves, AGU Chapman Conference on Physics of Wave-Mud Interaction. Amelia Island, Florida, USA, 17–20 November.

Traykovski, P. (2010), Observations of mechanisms of dissipation of wave energy over a muddy seabed (Invited): *Eos Trans. AGU*, 91(26), Ocean Sci. Meet. Suppl., Abstract GO21A-02

Cardenas, B , **Cook, P L**, Jiang, H, Traykovski, P (2010), The coupled hydrodynamics and biogeochemistry of wave-influenced marine sediment under steady and unsteady forcing: lessons from numerical models (Invited), *Eos Trans. AGU*, 91(26), Ocean Sci. Meet. Suppl., Abstract IT11C-02